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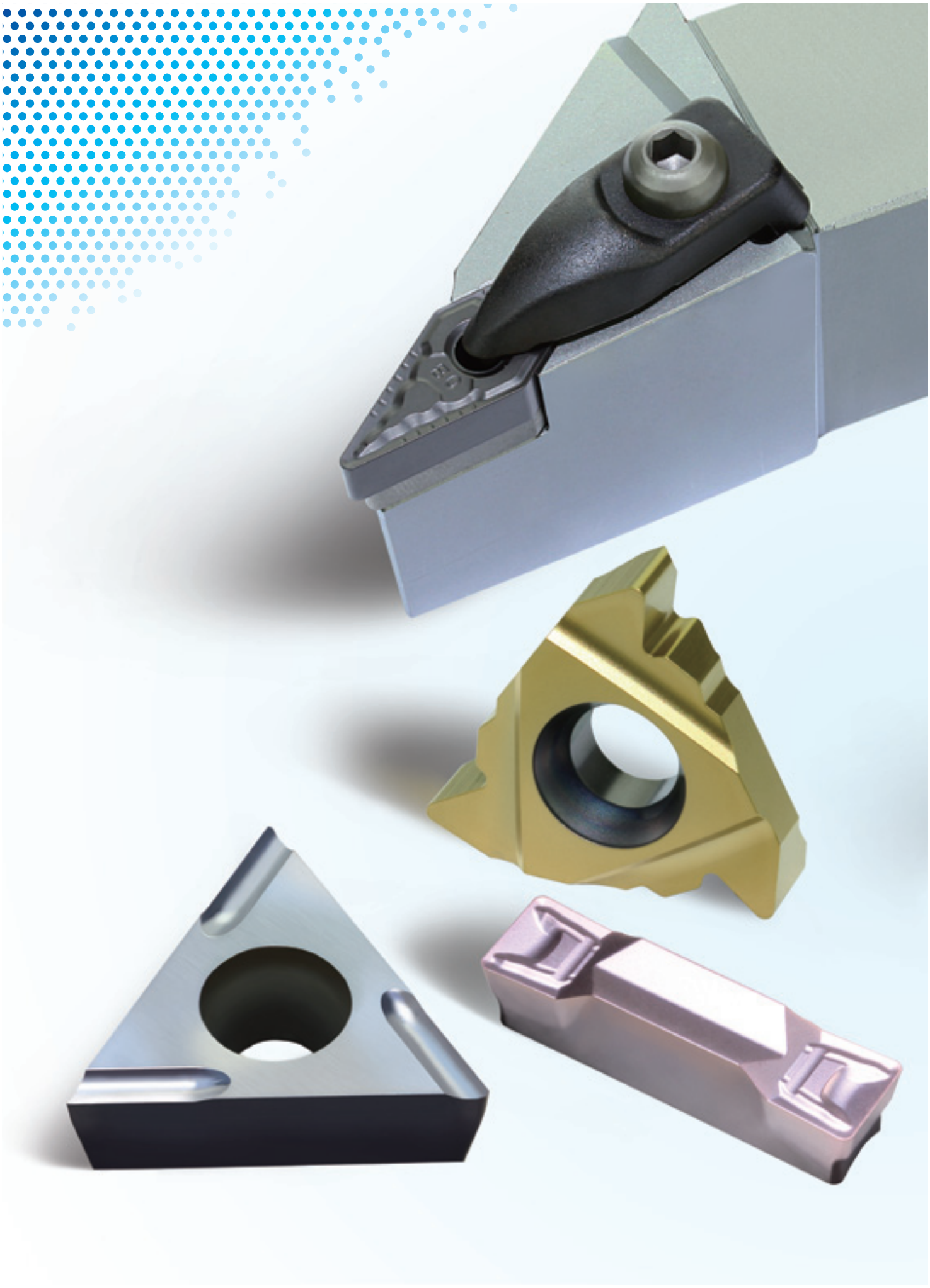
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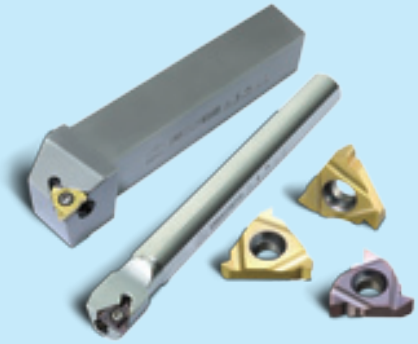
Turning Tools

General turning tools
Parting and grooving tools
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Turning A

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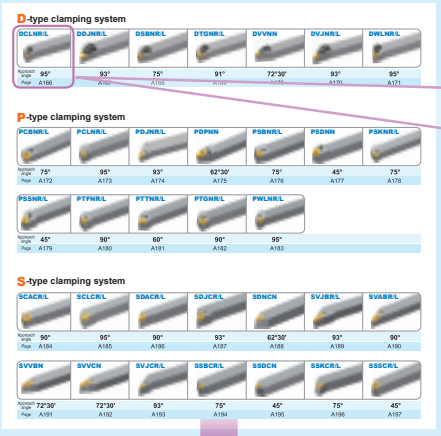
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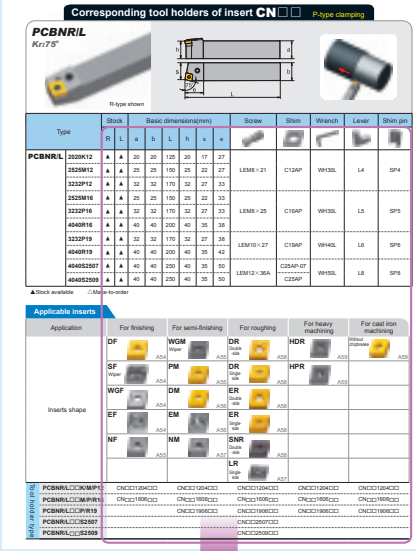
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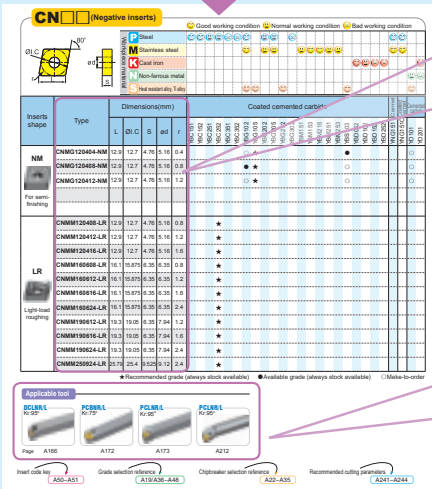
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Guide to selecting general turning tools

Selection B









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



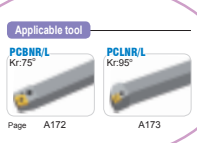


Step **2** : **Details of tool holder**
•Tool holder type, Size, •Operation genre
•Applicable inserts



Dimensions(mm)				
L	I.C	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



Step **4** : **Return to locate tool holder**

Guide to selecting parting and grooving tools

Parting and grooving tools

QE□□R/L



QECDR/L



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QF□□RR/LL

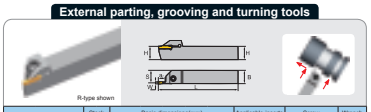


QF□DR/L



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External parting, grooving and turning tools

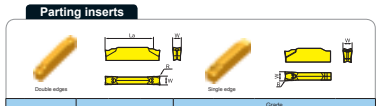


R-type shown

Type	Stock R	Stock L	Basic dimensions(mm) H×B	L	S	W	Applicable inserts	Screw	Wrench
QEAD	1212R/L07	▲	12×12	125	11.4	1.5	7	ZCAD015□□		
	1212R/L12	▲	12×12	125	11.4	1.5	12	ZCAD015□□		
	1616R/L07	▲	16×16	125	15.4	1.5	7	ZCAD015□□		
	1616R/L12	▲	16×16	125	15.4	1.5	12	ZCAD015□□		
	2020R/L07	▲	20×20	125	19.4	1.5	7	ZCAD015□□		
	2020R/L12	▲	20×20	125	19.4	1.5	12	ZCAD015□□		
QEBD	1212R/L07	▲	12×12	125	11.2	2	7	ZCBD02□□		
	1212R/L10	▲	12×12	125	11.2	2	10	ZCBD02□□		
	1212R/L14	▲	12×12	125	11.2	2	14	ZCBD02□□		
	1616R/L07	▲	16×16	125	15.2	2	7	ZCBD02□□		
	1616R/L10	▲	16×16	125	15.2	2	10	ZCBD02□□		
	1616R/L14	▲	16×16	125	15.2	2	14	ZCBD02□□		
	2020R/L07	▲	20×20	125	19.2	2	7	ZCBD02□□		
	2020R/L10	▲	20×20	125	19.2	2	10	ZCBD02□□		
	2020R/L14	▲	20×20	125	19.2	2	14	ZCBD02□□		
	2525R/L07	▲	25×25	150	24.2	2	7	ZCBD02□□		
	2525R/L10	▲	25×25	150	24.2	2	10	ZCBD02□□		
	2525R/L14	▲	25×25	150	24.2	2	14	ZCBD02□□		
QEED	1616R/L10	▲	16×16	125	15	2.5	10	ZCED025□□		
	1616R/L17	▲	16×16	125	15	2.5	17	ZCED025□□		
	2020R/L10	▲	20×20	125	19	2.5	10	ZCED025□□		
	2020R/L17	▲	20×20	125	19	2.5	17	ZCED025□□		
	2525R/L10	▲	25×25	150	24	2.5	10	ZCED025□□		
	2525R/L17	▲	25×25	150	24	2.5	17	ZCED025□□		
QEFD	1616R/L10	▲	16×16	125	14.8	3	10	ZcFD03□□		
	1616R/L17	▲	16×16	125	14.8	3	17	ZCFD03□□		
	2020R/L10	▲	20×20	125	18.8	3	10	ZCFD03□□		
	2020R/L17	▲	20×20	125	18.8	3	17	ZCFD03□□		
	2525R/L10	▲	25×25	150	23.8	3	10	ZCFD03□□		
	2525R/L17	▲	25×25	150	23.8	3	17	ZCFD03□□		
QEGD	2020R/L13	▲	20×20	140	18.5	4	13	ZCGD04□□		
	2020R/L22	▲	20×20	140	18.5	4	22	ZCGD04□□		
	2525R/L13	▲	25×25	150	23.5	4	13	ZCGD04□□		

▲Stock available △Make-to-order

Parting inserts



Double edges

Single edge

Type	Basic dimensions(mm) W±0.1	R±0.1	Cutting depth La max.	Grade CVD Coating YBC151	YBC251	PVD Coating YBG205	YBG302	Cemented carbide 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			○	★	○	

The single-edge insert is only mounted on parting blade.

■Recommended grade (always stock available) ●Available grade (always stock available) □Make-to-order

1 Selection of tool holder type

2 Tool holder type, Size and applicable inserts

3 Insert type, Chip-breaker, Size and grade

Parting and grooving inserts

Little squirrel series

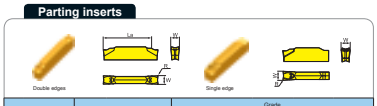






	ZP□D-MG	ZP□S-MG	ZT□D-MG
Cutting edge width	1.5,2,2.5,3,4,5,6	2.5,3,4,5,6	2.5,3,4,5,6
Page	A259	A259	A260

Parting inserts



Double edges

Single edge

Type	Basic dimensions(mm) W±0.1	R±0.1	Cutting depth La max.	Grade CVD Coating YBC151	YBC251	PVD Coating YBG205	YBG302	Cemented carbide 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			○	★	○	

The single-edge insert is only mounted on parting blade.

■Recommended grade (always stock available) ●Available grade (always stock available) □Make-to-order

1 Selecting insert type

2 Insert type, Chip-breaker, Size and grade

Guide of selecting threading tools

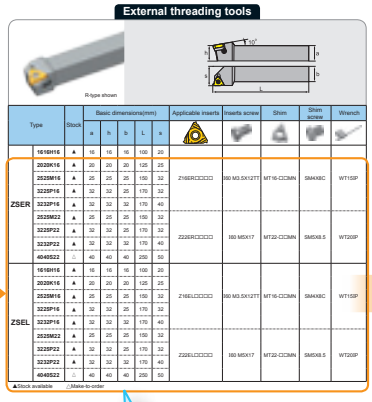
Threading tools



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1 Selection of tool holder type

External threading tools



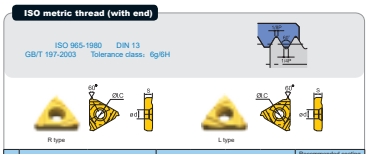
Type		Stock	Basic dimensions(mm)					Applicable inserts	Inserts screw	Shim	Shim screw	Wrench
			H	h	b	L	s					
ZSER	1616H16	▲	16	16	16	100	20	Z16ERCDDD	860 M3.5X12TT	MT16-CDMN	SM4X8C	WT15IP
	2020K16	▲	20	20	20	125	25					
	2525M16	▲	25	25	25	150	32					
	3225P16	▲	32	32	25	170	32					
	3232P16	▲	32	32	32	170	40					
	2525M22	▲	25	25	25	150	32	Z22ERCDDD	860 M5X17	MT22-CDMN	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	Z16ELDDDD	860 M3.5X12TT	MT16-CDMN	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	Z22ELDDDD	860 M5X17	MT22-CDMN	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

2 Tool holder type, Size and applicable inserts

ISO metric thread (with end)

ISO 965-1980 DIN 13
GB/T 197-2003 Tolerance class: 6g/6H



Type			Basic dimensions(mm)				Recommended coating grade	
	The right hand tools	The left hand tools	Pitch	S	Ø1.C	ed	YBG205	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

3 Insert type, Chip-breaker, Size and grade

Threading inserts

Right hand type shown

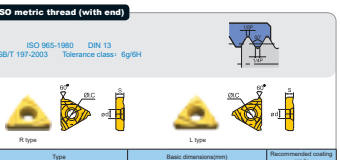


	External thread	Internal thread	External thread	Internal thread
Pitch/ Number of pitch	0.5~6	0.5~6	0.5~5	0.5~5
Page	A298	A299	A300	A300

1 Selecting insert category

ISO metric thread (with end)

ISO 965-1980 DIN 13
GB/T 197-2003 Tolerance class: 6g/6H



Type			Basic dimensions(mm)				Recommended coating grade	
	The right hand tools	The left hand tools	Pitch	S	Ø1.C	ed	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

2 Insert type, Chip-breaker, Size and grade

Cemented carbide and cermet inserts

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

	Wiper	For finishing				
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					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

Negative inserts

						
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	16,22,27	16,22	06,08				
Page: A78	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

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	A59	A66	A74	A80	A86

Positive inserts

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	A93	A100	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	A89	A93	A100	A105	A108	A110	A111	A112



	TPGT-SF	TPGH-L
Cutting edge length	09,11	09,11
Page	A113	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	A105	A108	A89	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	A98	A101	A102	A105	A105	A108	A108	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	A90	A90	A94	A94	A98	A98	A103

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	A95

All round









	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	A99

Without chipbreaker









	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	A112

Negative inserts

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

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

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)	
Thin threading inserts series						
	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

CKJNR/L	CKNNR/L
	
Approach angle 93°	63°
Page A204	A204

Turning tool holders for ceramic inserts

CRDCR/L	CRDPR/L
	
Approach angle	
Page A205	A205

Turning tool holders for internal machining

P-type clamping system

PCLNR/L	PDPNR/L	PDUNR/L	PSKNR/L	PTFNR/L	PWLNR/L
					
Approach angle 95°	62°30'	93°	75°	90°	95°
Page A212	A213	A214	A215	A216	A217

S-type clamping system

SCLCR/L	SDQCR/L	SDUCR/L	SDZCR/L	SSKCR/L	STFCR/L	SVQCR/L
						
Approach angle 95°	107°30'	93°	95°	75°	90°	107°30'
Page A218	A219	A220	A221	A222	A223	A224

SVUCR/L	SVQBR/L	SVUBR/L	SCLPR/L	SDQPR/L	SDUPR/L	STUPR/L
						
Approach angle 93°	107°30'	93°	95°	107°30'	93°	93°
Page A225	A226	A227	A228	A229	A230	A231

SCFCR	SCLCR
	
Approach angle 90°	95°
Page A232	A233

Damping tool holders

SCLPR/L	SDQPR/L	SDUPR/L	STUPR/L	SVQCR/L	SVUCR/L
					
Approach angle 95°	107°30'	93°	93°	107°30'	93°
Page A235	A236	A237	A238	A239	A240

Parting and grooving tools

QE□□R/L	QECDR/L	QX□DR/L	QE□SR/L	QE□S□□N	QZS□	QF□□R/L
						
Page A272-A273	A273	A274	A274	A275	A275	A276-A277

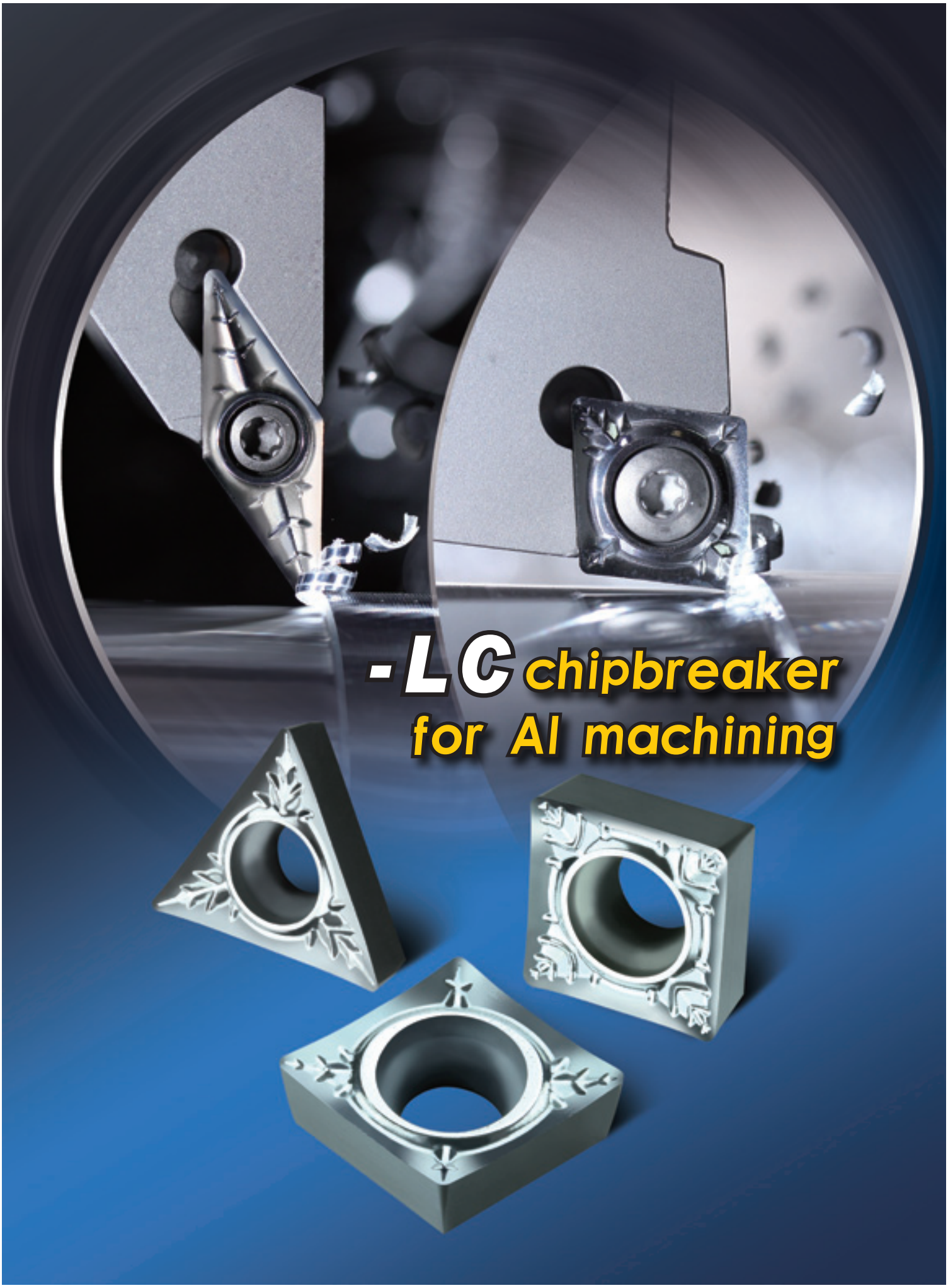
QF□□RR/LL	QF□DR/L	C□□□-Q□DR/L	C40X-Q□DR/L	QZQ□□R/L	GQCR/L	S□□□-QC□□□□R/L
						
Page A278-A281	A282-A283	A284	A284	A288	A286	A286

Threading tools

ZSER/L	ZSIR/L
	
Page A313	A314


-WGM
Wiper
-WGF


-HPR
New Generation of
Roughing Chipbreaker
-LR


-LC chipbreaker
for Al machining


YBM215
Outstanding wear nesrrtance,extends the tool life
achieves high effrcrent processing
Grade for stainless
steel machrning
YBM153
Best choice for cutting stainless steel
with high speed unceer 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 YBC251 YBC152	YBG102 YBG202	YNG151	YNG151C					YBG202 YBG203	YBC151 YBC251	YBG205 YBG302	YC10
	20	YBC252 YBC351											
	30	YBC352											YC40
	40												
M Stainless steel	01												
	10	YBM151 YBM153 YBM251	YBG202 YBM215 YBG205	YNG151	YNG151C					YBG202 YBG203		YBG205	
	20	YBM253										YBG302	
	30												
	40												
K Cast iron	01							BK1011 BK1021					
	10	YBD052 YBD102 YBD152		YNG151	YNG151C	CN3100	YD201			YBG202 YBG203		YBG205	YD201
	20	YBD252						BK2541 BK2511				YBG302	
	30												
N Non ferrous metal	01								DN1021 DN0121				
	10						YD101			YBG202 YBG203			YD101
	20												
	30								DN3021				
S Heat resistant alloy & Ti alloy	01							BS1011					
	10		YBS103 YBG102			CN3100	YD101			YBG202 YBG203		YBS103 YBG102	YD101
	20		YBG105 YBG212 YBG202					BS2011				YBG105 YBG302 YBG212 YBG202	
	30							BS3011					
H Super hard material	01							BH0121 BH1020					
	10					CN3100				YBG202 YBG203			
	20							BH2511 BH2011					
	30							BH3511					

How to select general turning inserts

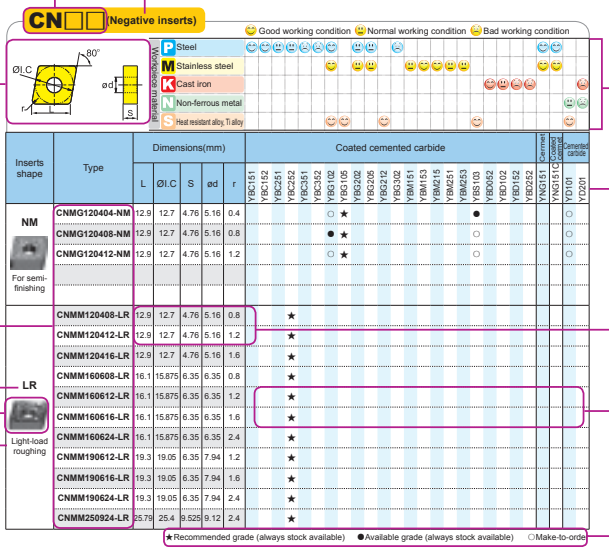
Turning inserts list

- 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

Grade

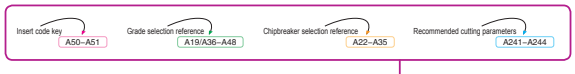
Type

Size

Stock

Illustration of stock





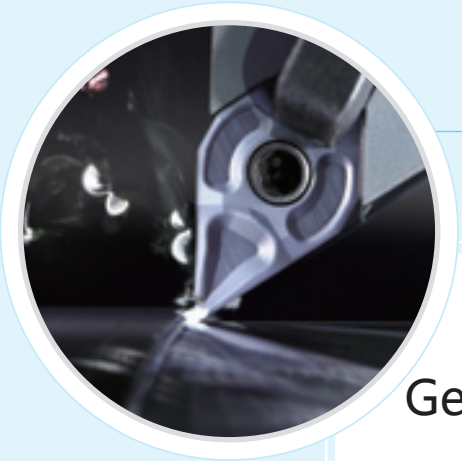
Reference page of tool holders

Application of inserts

Shape

Insert chipbreaker
Chipbreaker code

Recommended cutting parameters
Chipbreaker selection reference
Grade selection reference
Insert code key



TURNING A

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

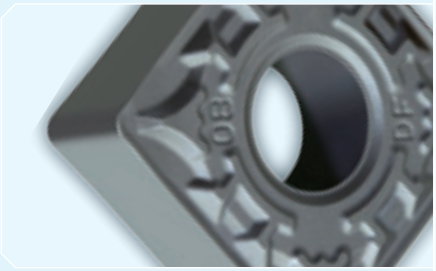
PCBN&PCD inserts code key A116-A117

PCBN&PCD inserts A118-A149

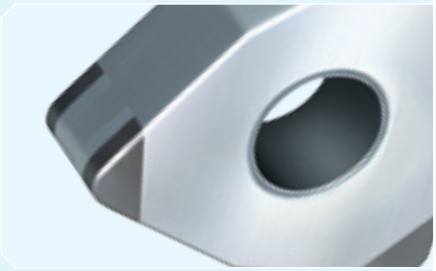
Ceramic inserts A150-A152

Ceramic inserts code key A150-A151

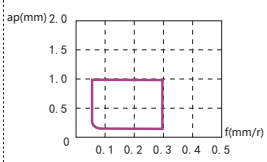
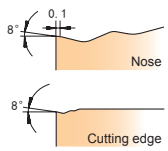
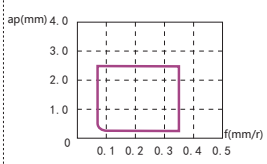
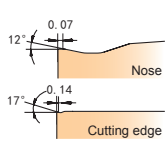
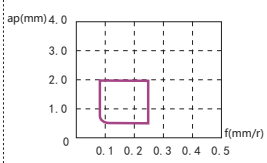
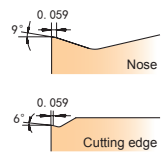
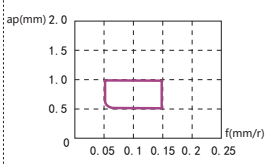
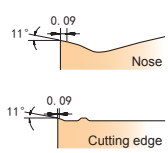
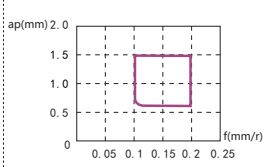
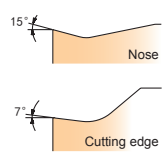
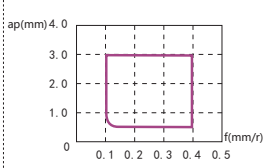
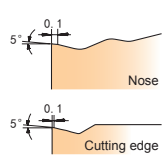
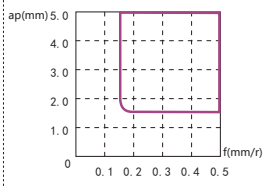
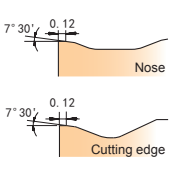
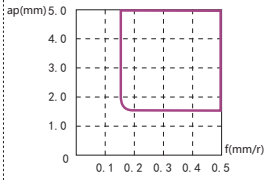
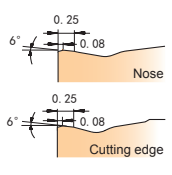
Ceramic inserts A152



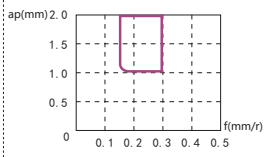
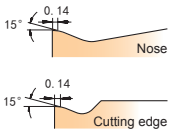
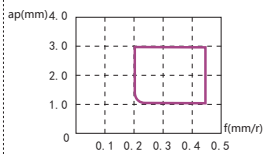
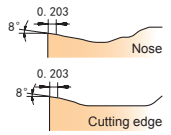
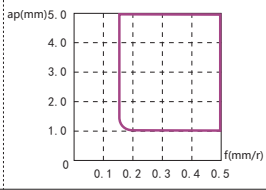
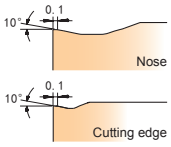
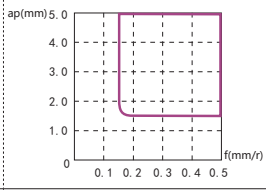
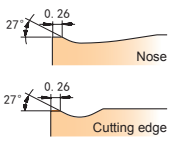
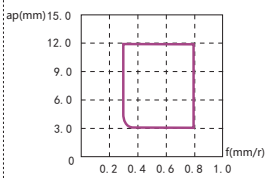
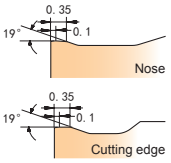
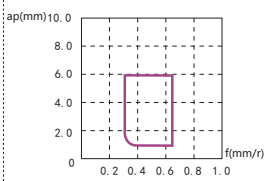
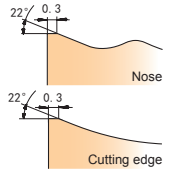
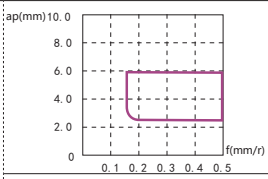
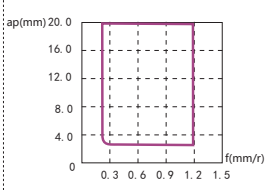
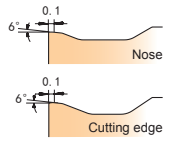
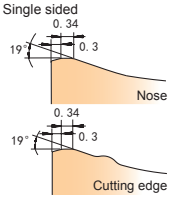




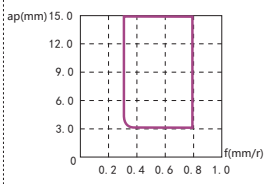
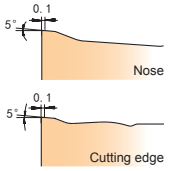
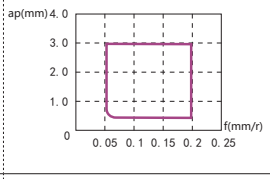
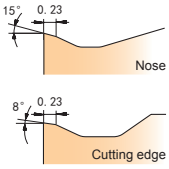
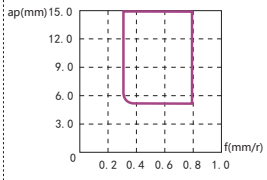
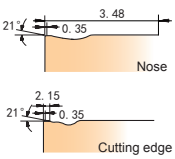
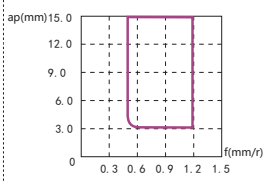
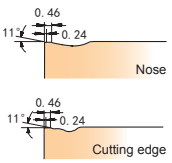
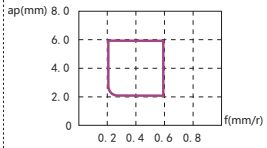
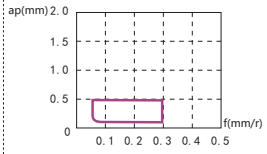
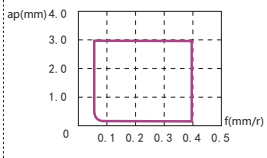
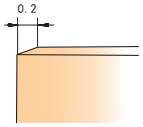
Negative inserts with hole

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 	M			**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 	M			**Recommended chipbreaer 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. 

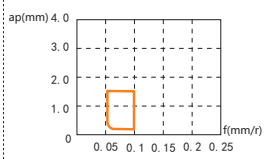
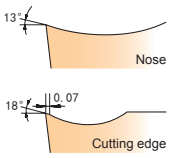
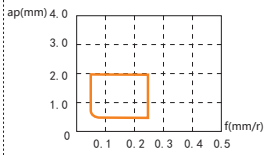
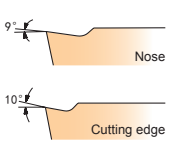
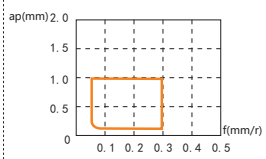
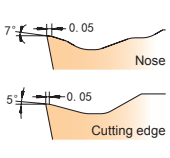
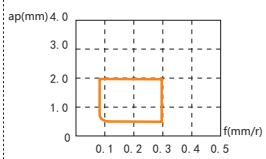
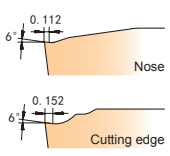
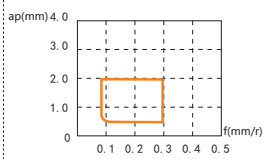
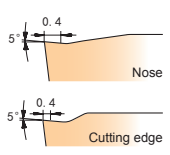
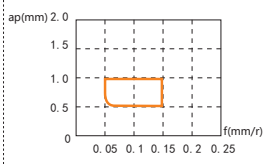
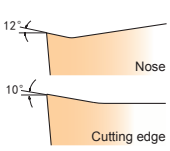
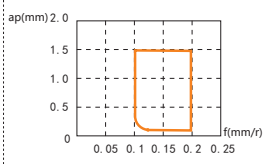
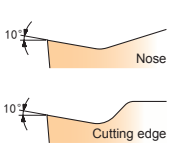
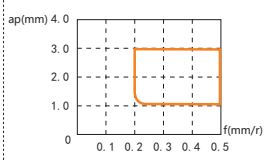
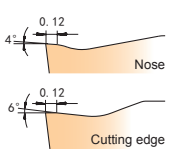
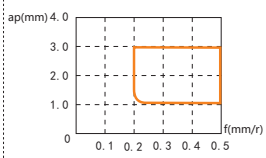
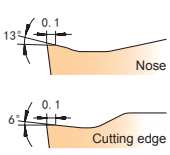
Negative inserts with hole

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	M			**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	M			**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	M			**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	M			**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 reduces the contact area with chips, so that heat can easily be dissipated. 
For roughing	ER Single/Double side	M	 	Double sided  Single sided 	**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. 

Negative inserts with hole

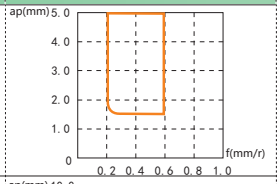
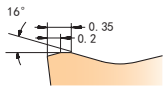
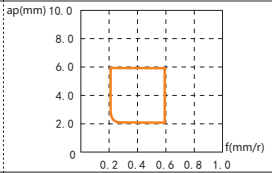
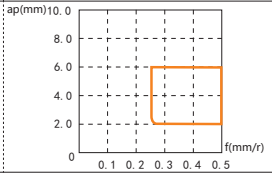
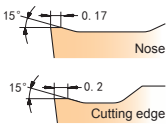
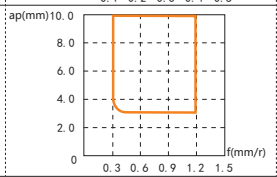
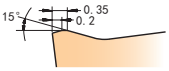
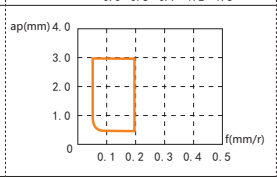
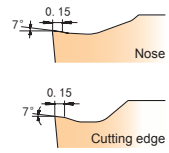
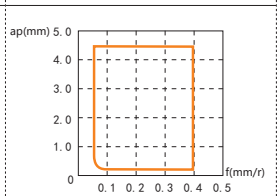
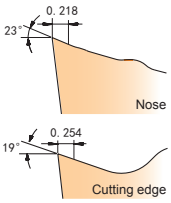
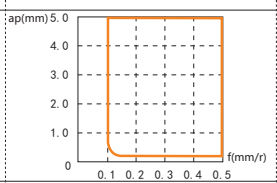
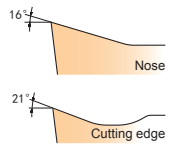
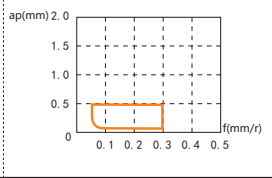
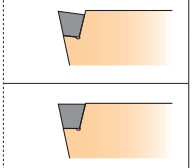
Appli-cation	Chipbreaker	Preci-sion	Recommended cutting parameters	Chipbreaker profile	Feature/Shape of insert
For roughing	DR Single-side	M			**Recommended chipbreaker for roughing of P-type materials** Single-sided chipbreaker with M-level tolerance has high security of cutting edge, which can achieve high feed rate and low cutting forces at great cutting depth and high feed rate. 
	SNR	M			**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			**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	M			**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			**For cast iron machining** Double-sided chipbreaker with M-level tolerance has high cutting edge strength. It can overcome inferior factors such as intettruption and vibration, etc. when machining cast iron. 
Super hard inserts	Without chipbreaker	G			**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			**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. 

Positive inserts with hole

Appli-cation	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 chipobreaker 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. 

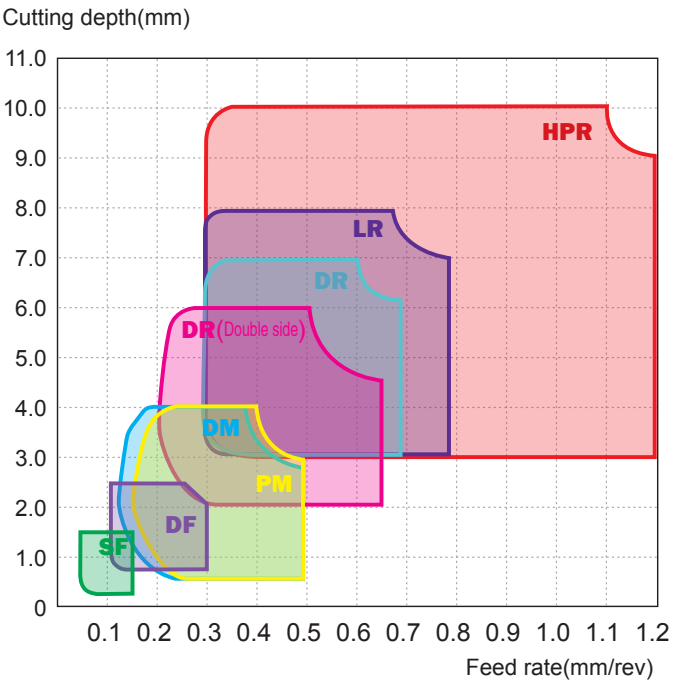
General turning inserts overview

Positive inserts with hole

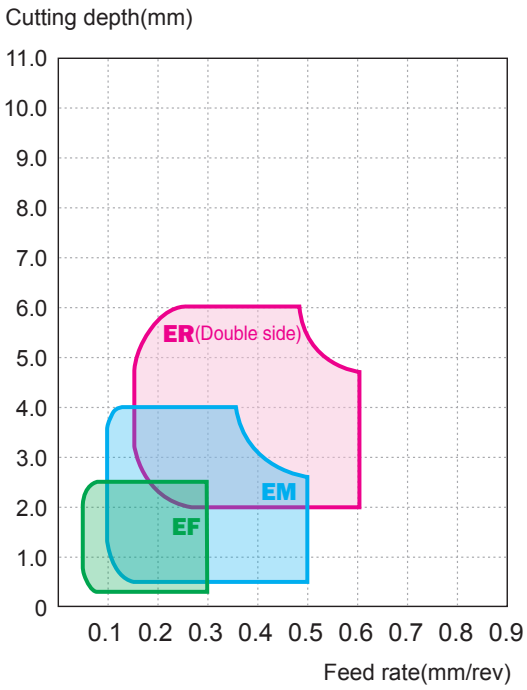
Application	Chipbreaker	Precision	Recommended cutting parameters	Chipbreaker profile	Feature/Shape of insert
For semi-finishing	All round 	M			**Recommended chipbreaker for semi-finishing of M-type materials** With M-level tolerance, it is suitable for profile machining materials like steel, cast iron, etc. 
Cast iron machining	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 chipobreaker 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

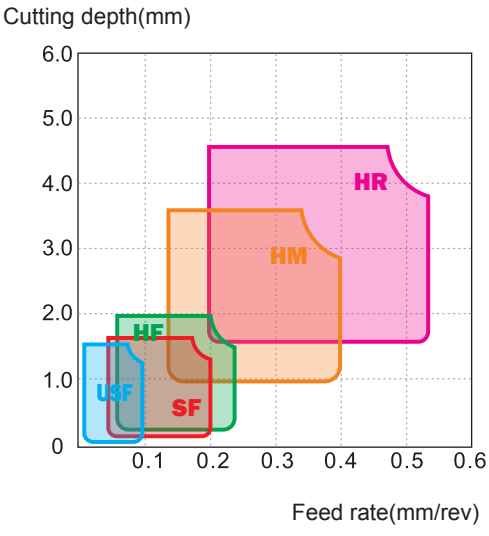


▶ Workpiece material: 45# steel

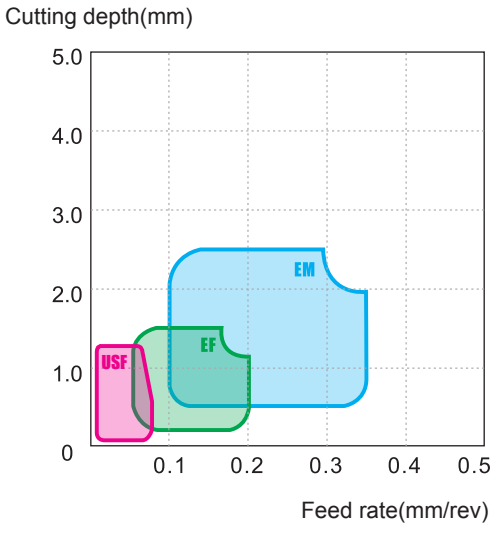


▶ Workpiece material: stainless steel (1Cr18Ni9Ti)

Positive inserts



▶ Workpiece material: 45# steel

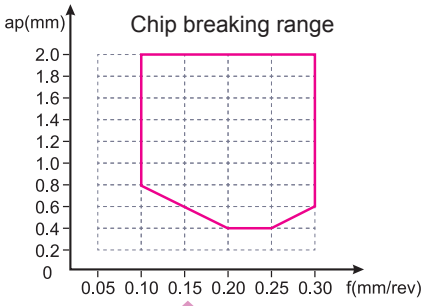


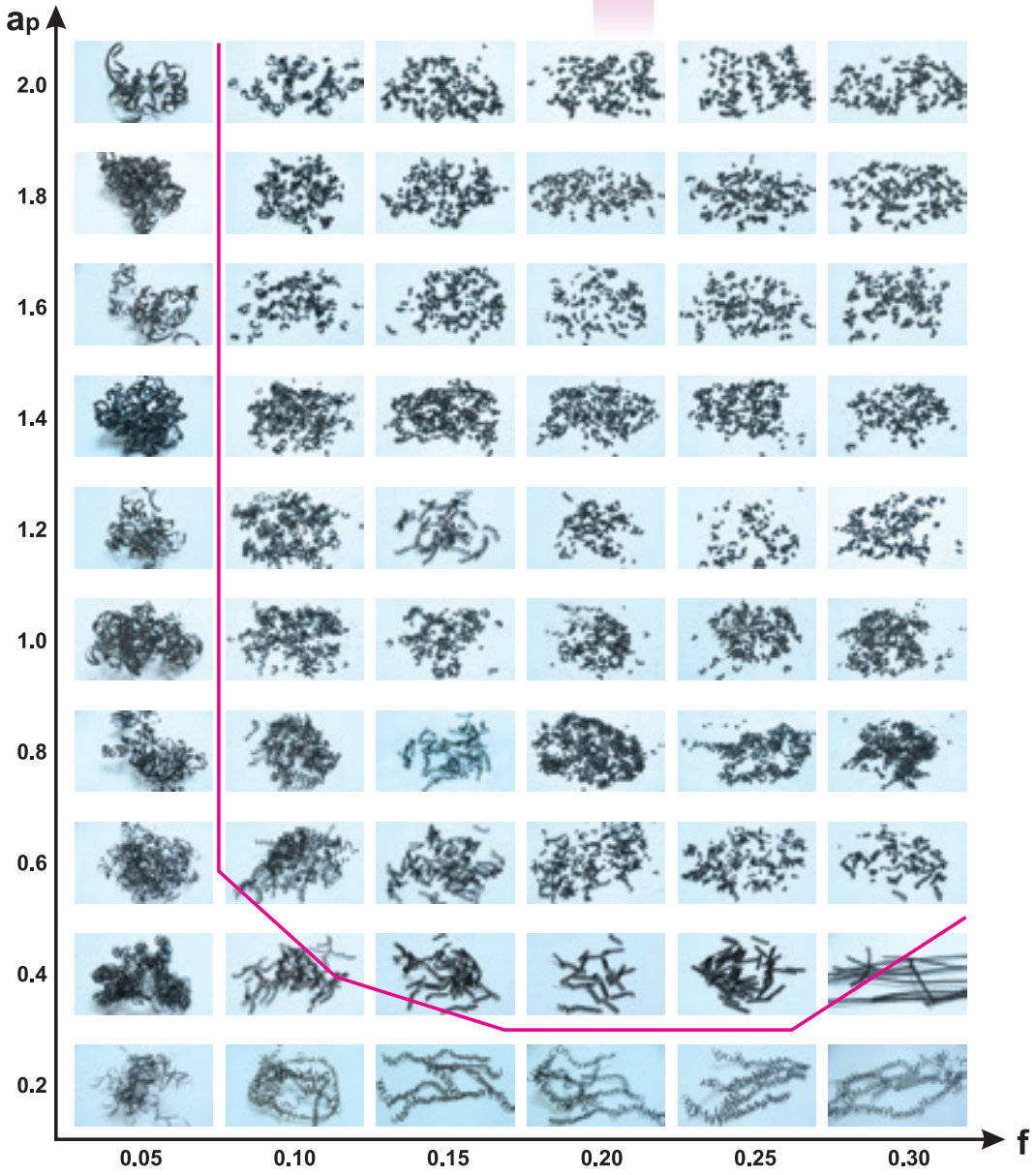
▶ Workpiece material: stainless steel (1Cr18Ni9Ti)

Cutting test for chip breaking range of general turning inserts

Case

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

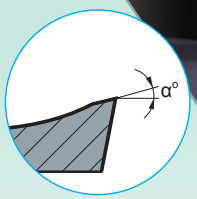




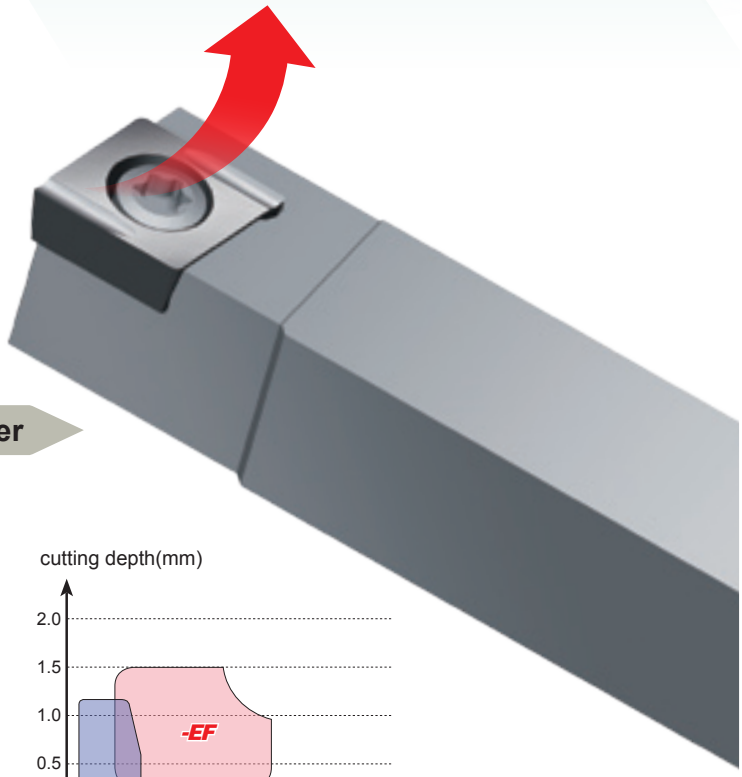
-USF

Precision turning chipbreaker

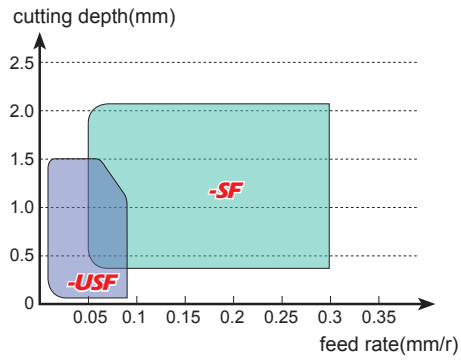
- Effective chip control due to the proper chipbreaker.
- Large rake angle makes cutting easier and faster.



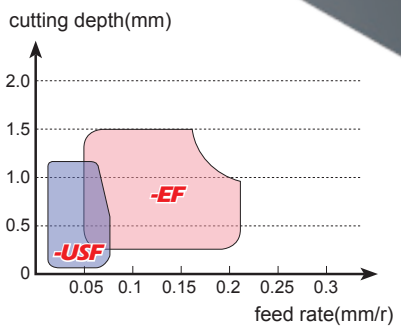
- Nose radius precision controlled within 0.02mm for excellent machining precision.
- Special surface after-treatment for better surface quality.
- High strength screw clamping ensures good repeatability and accuracy .



Application range of USF chipbreaker



Workpiece material: 42CrMo

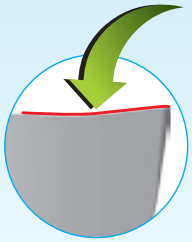


Workpiece material: 1Cr18Ni9Ti

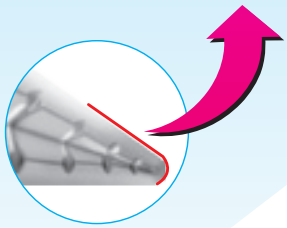
-LC chipbreaker for aluminum

- -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 resistence, 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.

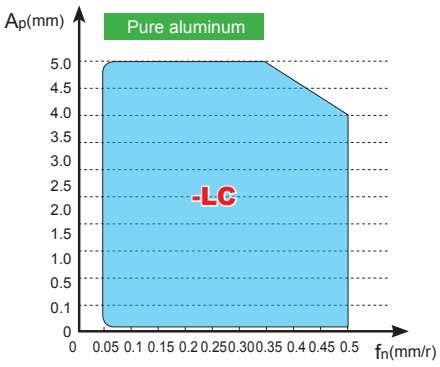


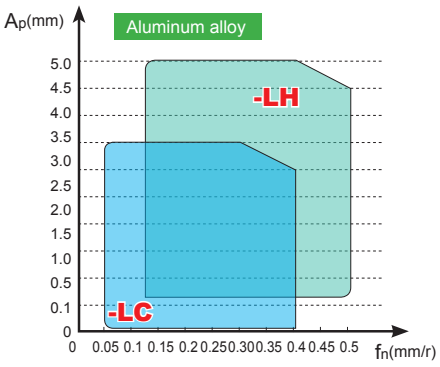
Smooth connection of insert nose and cutting edge makes rake face smoother.



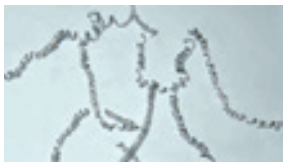
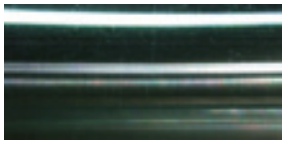
–LC and –LH chipbreaker characteristics and machining range

-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 Ap=0.2mm F=0.2mm/r	
Chips		
Surface quality		
	-LC chipbreaker	similar products from overseas manufacturers

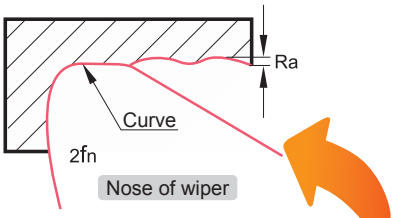
- **-LH chipbreaker is more suitable for machining aluminum alloy in condition of large cutting depth and high feed rate.**
- **-LC chipbreaker is more suitable for machining aluminum alloy in condition of small cutting depth and low feed rate.**
- **-LC chipbreaker can be used in machining pure aluminum.**



-WGF/WGM

chipbreaker series
Turning inserts with wiper





High efficiency

Roughness remains the same when feed rate is doubled.



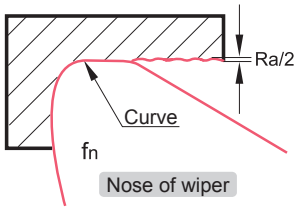
Wiper is assembled by three curves to form a circular arc edge. The nose of wiper provides less profile height on the surface that is formed by the cutting edge, resulting in a smooth turning surface.

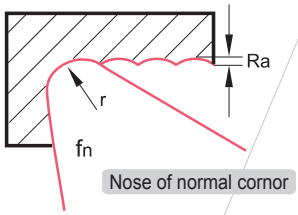
Inserts with wiper has high efficiency when used for finish and semi-finish turning. The surface quality remains the same even at double feed rate.

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.

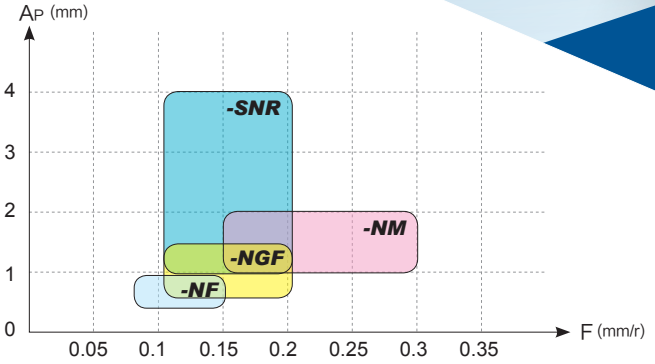
S- Ni-based Superalloy Machining

Difficulties Overcame

Features of Ni-based superalloy machining

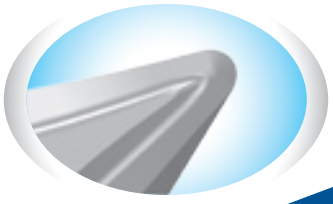
- High cutting resistance (containing a large amount of alloying elements, severe hardening, great plastic deformation ;
- High cutting temperature;
- Severe wear of inserts.

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



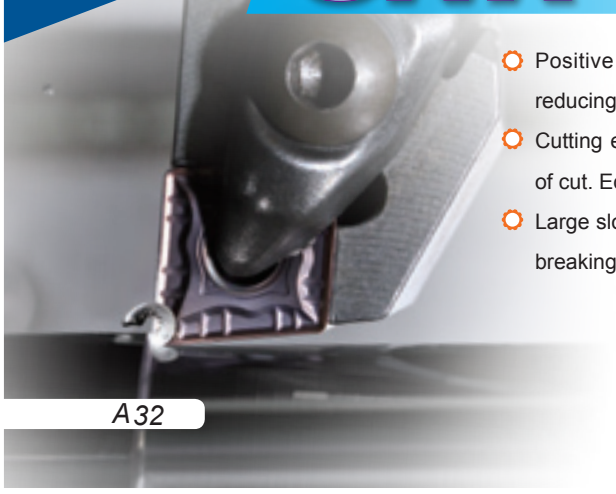
-NM for semi-finishing ***-SNR*** for high efficiency roughing

-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.

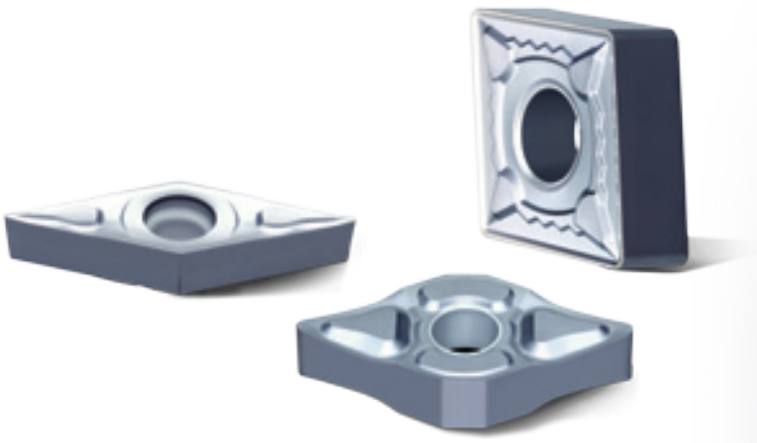


-NGF Chipbreaker for General Finishing

- 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.

-NF/NM Chipbreaker for General Finishing

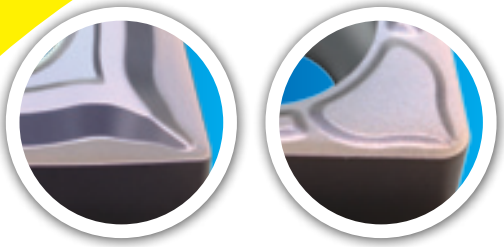
- -NF chipbreaker has sharp cutting edge, while -NM chipbreaker high cutting edge strength.
- Smooth surface of chipbreaker ensures unobstructed chip flow.
- High wear resistance of cutting edge after special treatment.





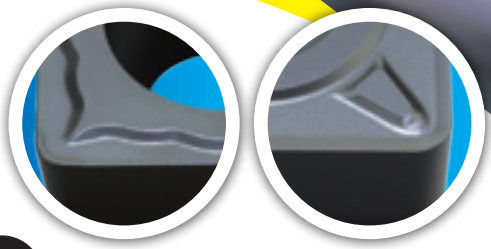
-EF -EM -ER

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



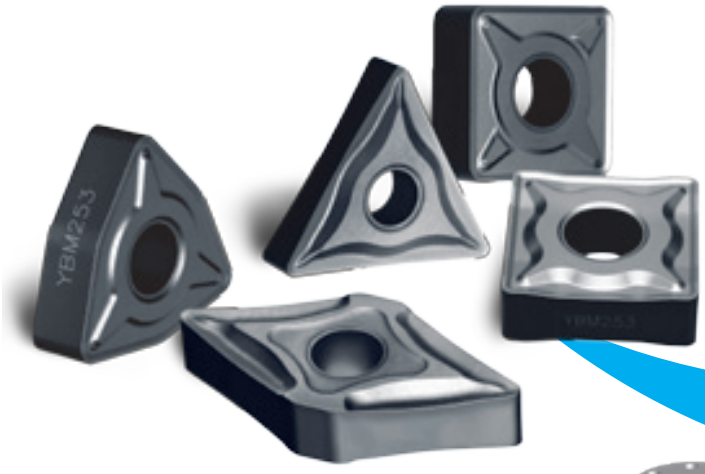
-EF

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.



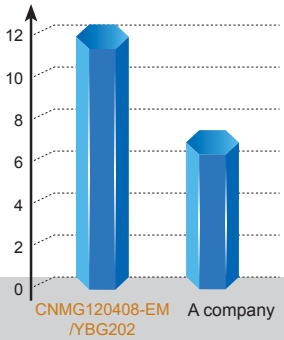


-ER

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

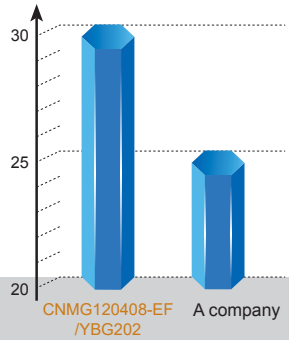




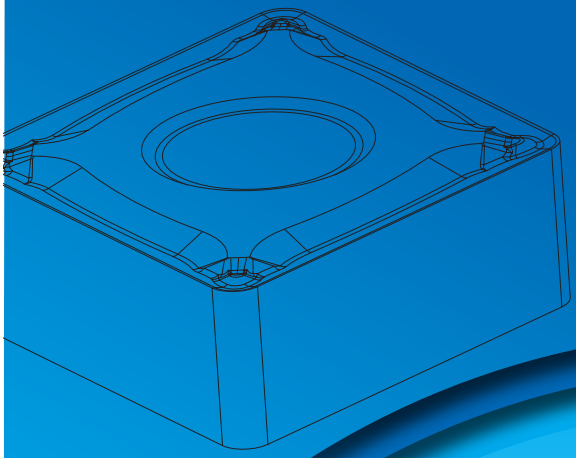
Machining external of valve

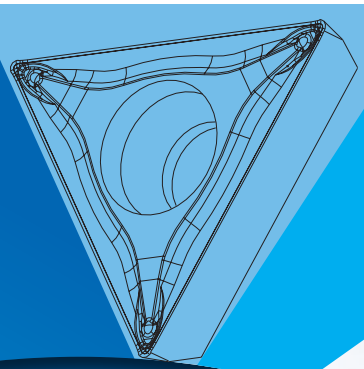
Machining end surface of valve (intermittent machining)
Workpiece diameter:135mm
Rotating speed:350rpm
Feed rate:0.25mm/r
Cutting depth:1.5mm

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

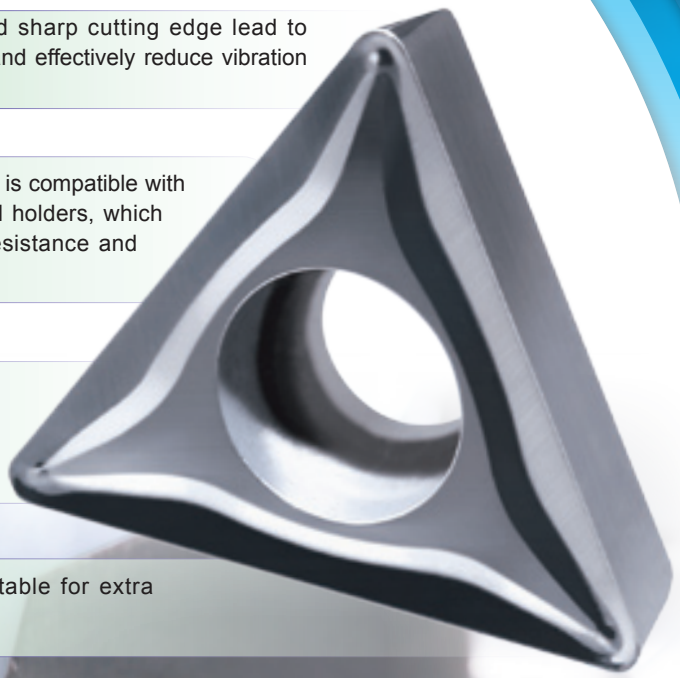




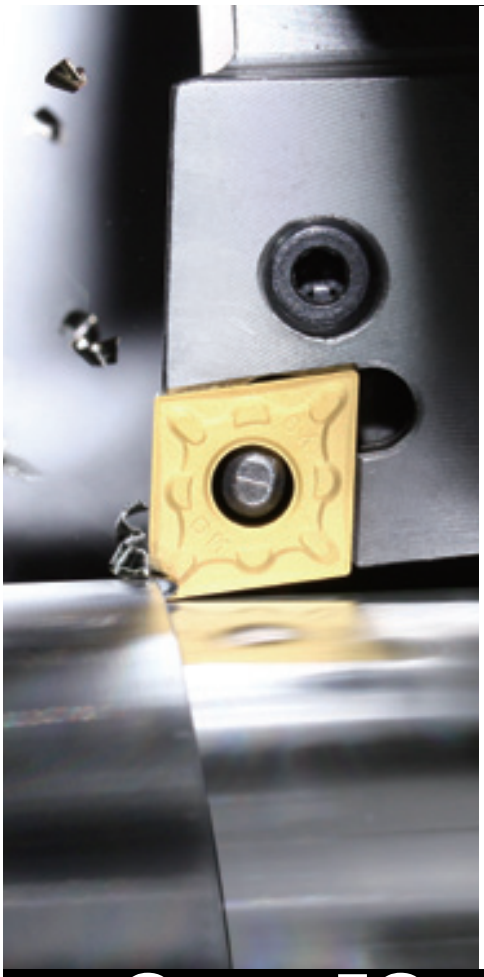


-SF Chipbreaker for finishing

- 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 Al_2O_3 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 Al_2O_3 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 Al_2O_3 layer and TiN makes it suitable for finishing and semi-finishing of cast iron materials.

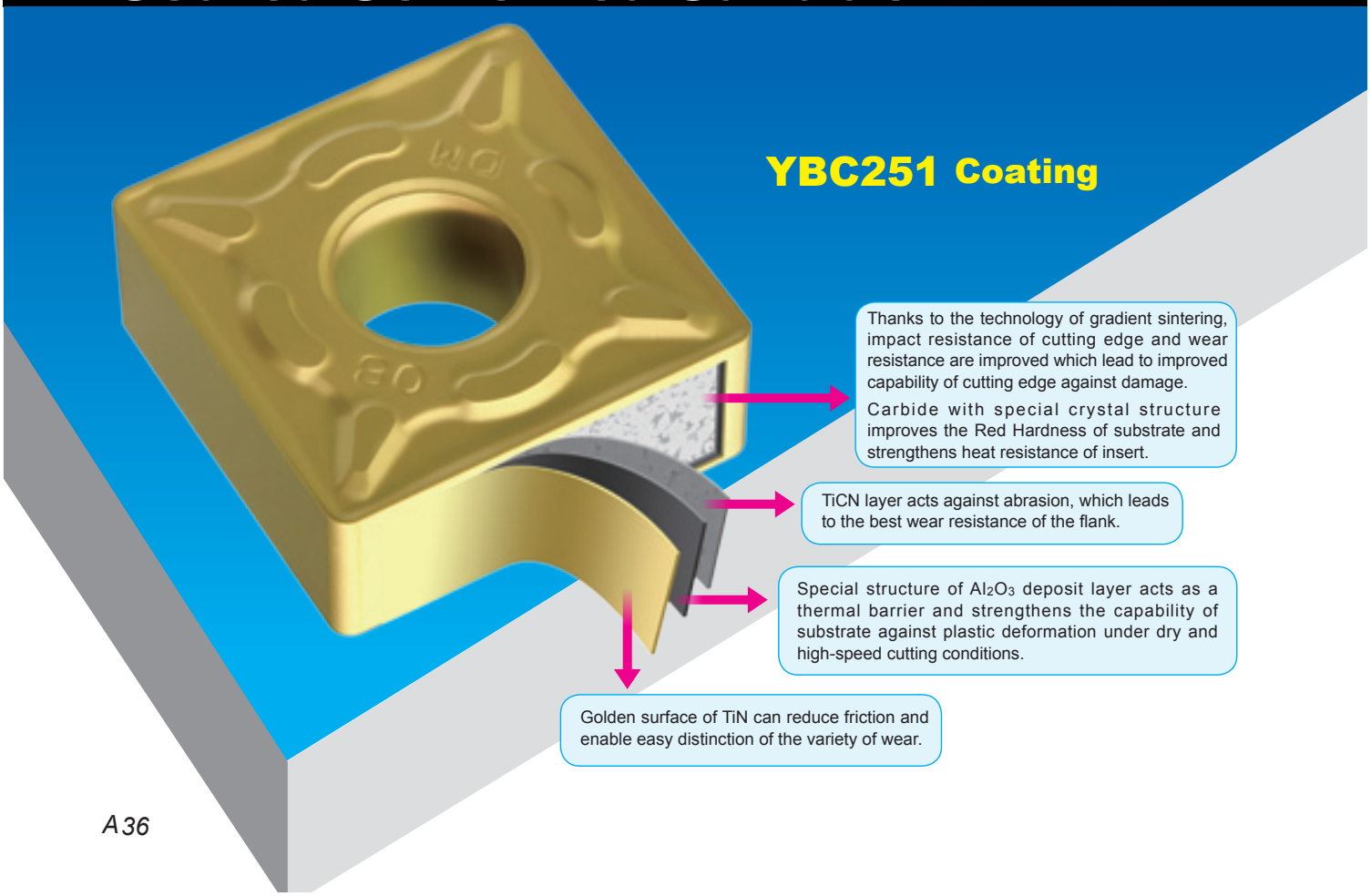
YBM151

Substrate with special structure, in combination with coating composed of TiCN, thin Al_2O_3 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 Al_2O_3 layer and TiN makes it suitable for semi-finishing and roughing of stainless steel.

Coated Cemented Carbide CVD

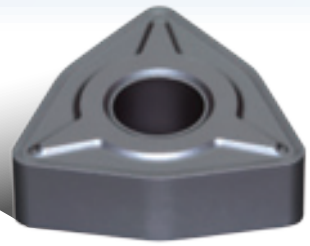


BLACK DIAMOND INSERTS

Innovation of machining techniques for stainless steel turning

YBM

YBM153



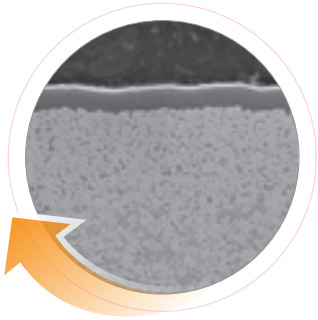
Best choice for roughing of stainless steel with high-speed under good working condition

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

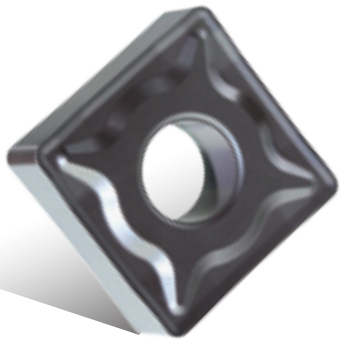
- Added with resist high temperature rare element, inserts shows a good capability against plastic deformation and good capability of Red Hardness.
- Unique manufacturing technology improves high temperature toughness and wear resistance of substrate.





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



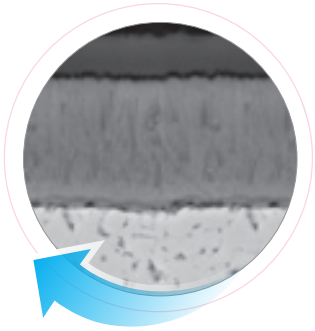
Ideal grade for turning of stainless steel with high cutting depth and high feed rate under bad working condition

Coating

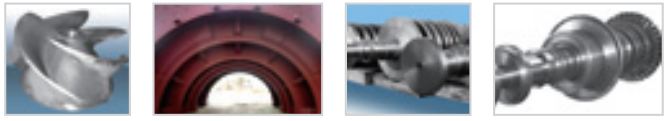
- Ultra-fine grain coating technology provides better wear resistance and toughness;
- Improved remain internal stress design ensures good toughness and anti-cracking performance;
- Polishing treatment on coating surface makes it suitable for cutting adhesive materials.

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.





BLACK DIAMOND INSERTS

Achieving both higher cutting speed and longer tool life

Second generation of YBC

Coated Cemented Carbide CVD

YBC152

Thick TiCN and thick Al_2O_3 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.

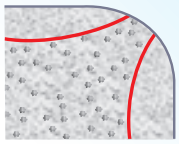
YBC252

Comprising of thick TiCN and thick Al_2O_3 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.

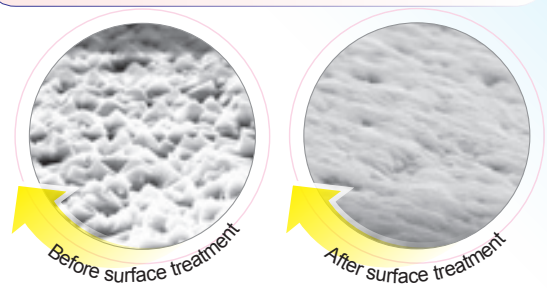
YBC352

Thickness TiCN and Al_2O_3 coating, with strongest toughness and plastic deformation resistance, the ideal grade for high efficient steel rough machining under the bad condition.

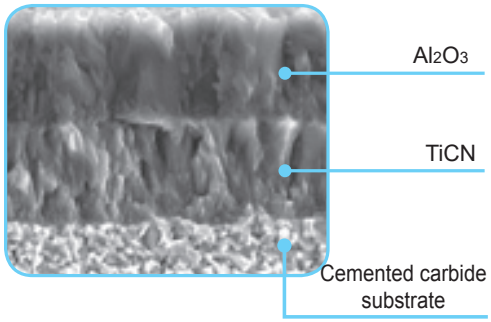
Perfect unification of toughness and anti-plastic deformation.
Specially designed cutting edge with “skeleton” realizes perfect unification of toughness and anti-plastic deformation.



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.

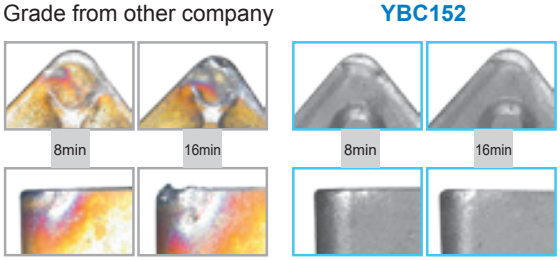


The perfect combination of fibrous TiCN and fine grain Al_2O_3 obviously improves abrasion resistance and anti-breakage of inserts.



Test comparison of inserts abrasion

Workpiece material：45#steel
Inserts：CNMG120408-DM
Cutting parameters：Vc=400m/min a_p=1mm fn=0.2mm/r





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.

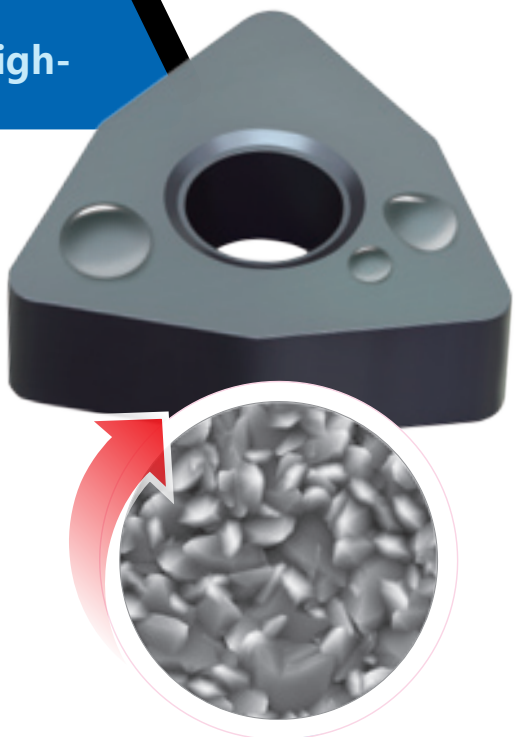
YBD252

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.



Layer of fine grain with compact surface

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.

Recommended combination of grade and chipbreaker

For machining of P-type materials

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

For machining of M-type materials

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

For machining of K-type materials

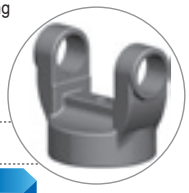
Grade	Type
YBD052	Without chipbreaker PM
YBD102	Without chipbreaker PM
YBD152	Without chipbreaker
YBD252	Without chipbreaker

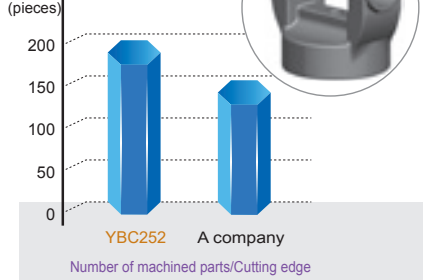
Recommended cutting parameters

Workpiece material	Range of machining	Grade	Recommended cutting speed(m/min)
P Steel	For finishing	YBC151	180-460
		YBC152	220-500
	For semi-finishing	YBC251	160-440
		YBC252	180-480
	For roughing	YBC351	130-380
		YBC352	
M Stainless steel	For finishing For semi-finishing For roughing	YBM151 YBM153 YBM251 YBM253	110-280
K Cast iron	For finishing	YBD052	200-500
		YBD102	200-480
	For semi-finishing	YBD151	180-450
		YBD152	190-450
	For roughing	YBD252	150-380

Case

Insert: YBC252/WNMG060408-PM
Material and hardness of workpiece: 45#Steel HB220
Cutting conditions:
Vc=220m/min, a_p=1.5~2mm,f=0.25mm/r
Cutting fluid: Dry cutting

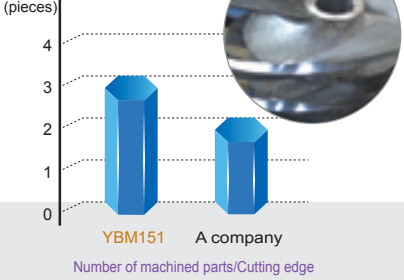




Number of machined parts/Cutting edge

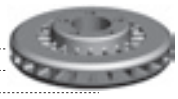
Insert: YBM151/CNMG190616-ER
Material and hardness of workpiece:
Double phase stainless steel HB260
Cutting conditions:
Vc=103m/min,a_p=1.5mm, f=0.3mm/r
Cutting fluid: Dry cutting

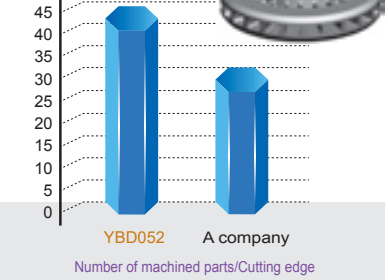




Number of machined parts/Cutting edge

Insert: YBD052/TNMA220412
Material and hardness of workpiece:
Gray cast iron HB280
Cutting conditions:
Vc_{max}=400m/min, a_p=1.3~2.5mm,f=0.4~1.1mm/r
Cutting fluid: Dry cutting





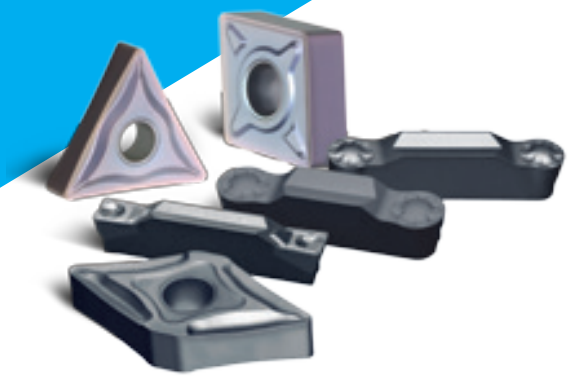
Number of machined parts/Cutting edge

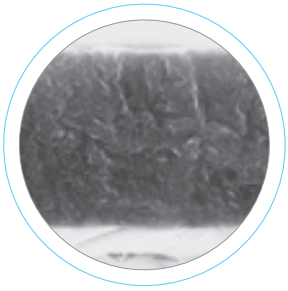
Coated Cemented Carbide PVD

makes it easy to machine materials which are hard to be machined

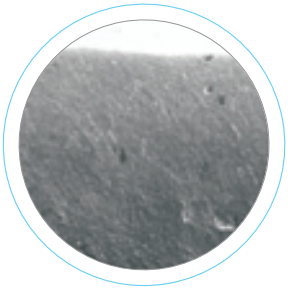
New nano coating grade

- 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

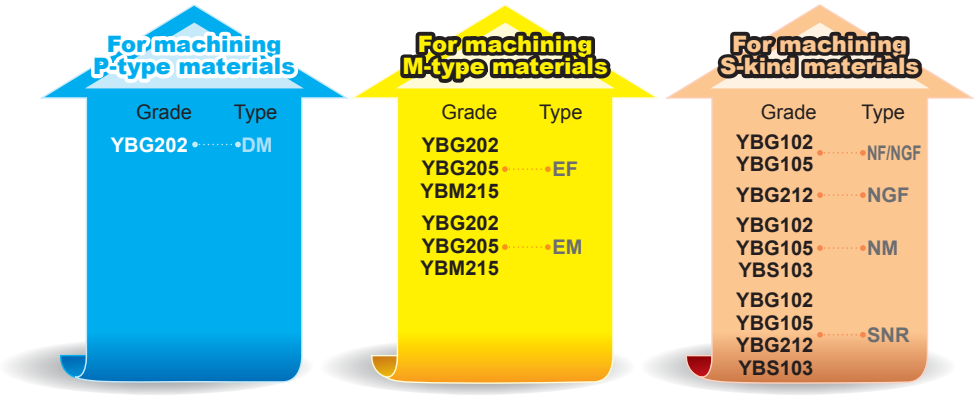
Fine wear resistance, and good capability against built-up edge and heat resistance. Suitable for turning of Ni-based materials.

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



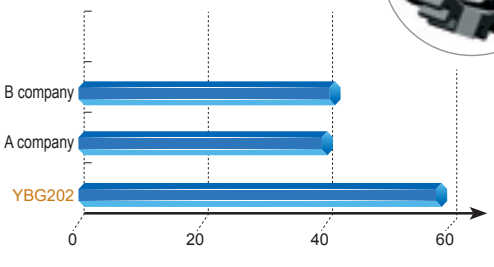
Recommended cutting parameters

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

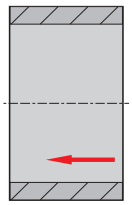
Insert : YBG202/TNMG120404-EF
Hardness and material of workpiece : 0Cr18Ni9 HB240
Cutting conditions : Vc=200m/min, a_p=1mm, f=0.15mm/r
Cutting fluid : Dry cutting

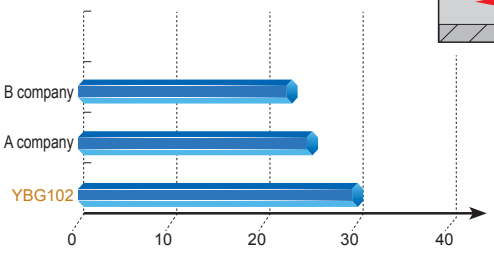




Number of machined parts/Cutting edge

Insert : YBG102/DNEG150404-NF
Hardness and material of workpiece :
High temperature alloy Inconel 718 HRC≥39
Cutting conditions : Vc=80m/min, a_p=0.3mm, f=0.15mm/r
Cutting fluid : Dry cutting





Tool life (min)

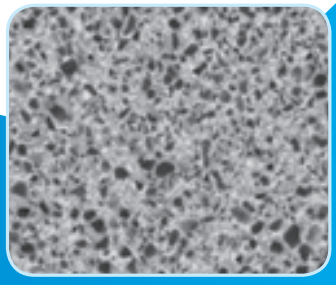
Cermet & Coated Cermet

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 conductibility 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)
P Steel	For finishing	YNG151	260-550
		YNG151C	260-580
M Stainless steel		YNG151	170-330
		YNG151C	160-350
K Cast iron		YNG151	250-400
		YNG151C	270-420

Case

Insert: YNG151/CNMG120404-SF

Hardness and material of workpiece:

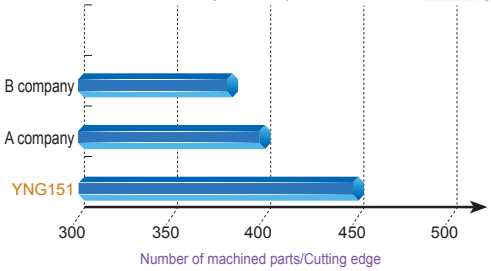
20CrMnTi HB180-223

Cutting parameters: V_c=220m/min

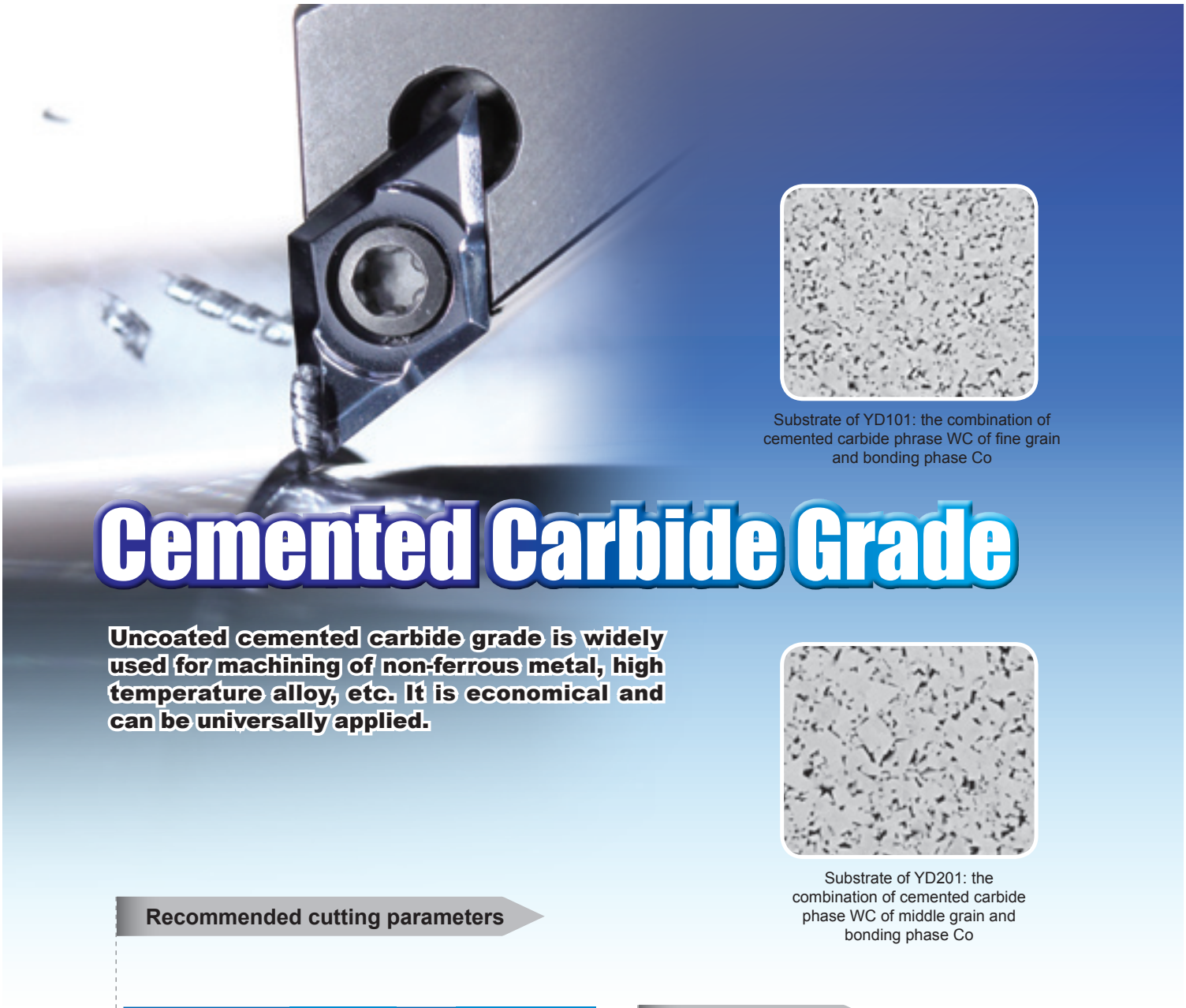
a_p=0.5~1.0mm

f=0.14mm/r





Outstanding chip breaking Good surface quality



Substrate of YD101: the combination of cemented carbide phrase 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

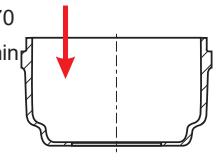
Insert：YD101/CCGX09T304-LH

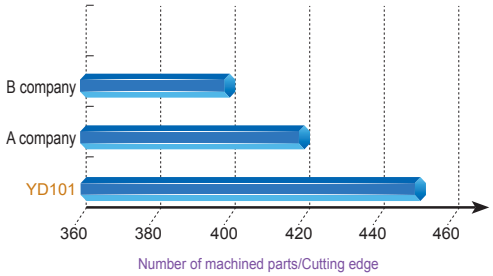
Workpiece material：ZL105 HB70

Cutting parameters：Vc=400m/min

a_p=1mm

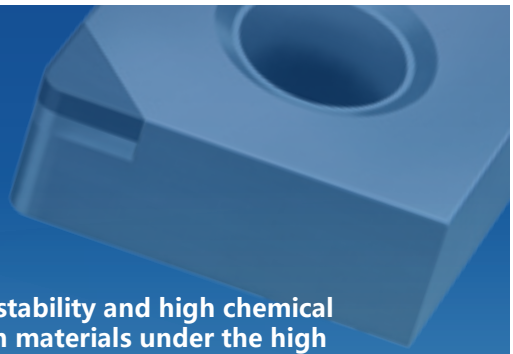
f=0.3mm/r



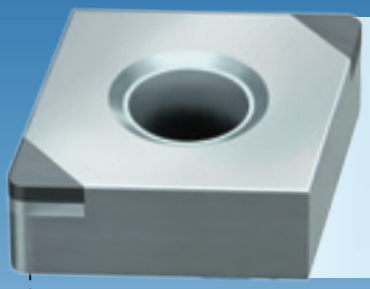


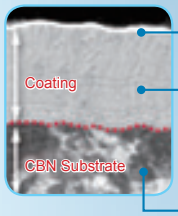
Workpiece has high surface quality and high dimensional precision.

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℃ ,Suitable for cutting hardened steel, cast iron, powder metallurgy and high temperature alloys.





High-performance special ceramic coating

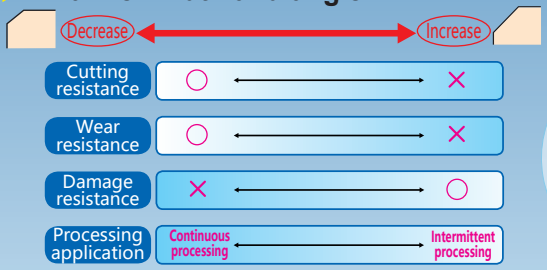
Incorporate a solid interface

High wear resistance and good toughness

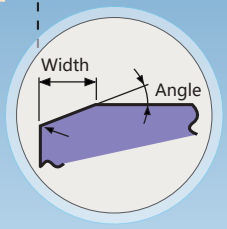
- High hardness and high heat resistance to achieve tool long life and high-speed processing;
- Effectively inhibit crater wear and realize stable processing;
- Improve the stress of the matrix and reduce the micro chipping and spalling of the cutting edge.



Chamfer width and angle

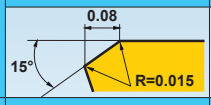
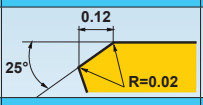
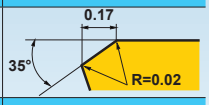
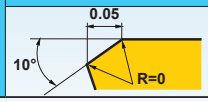
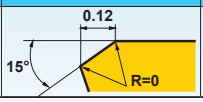
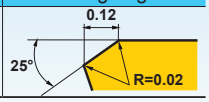


The shape of chamfering



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.)

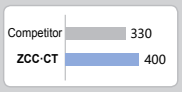
High hardness material processing	Low cutting force	Universal type	Highly damage resistance
			
Cast iron processing	Low cutting force	Universal type	High intensity of cutting edge
			

Case

Machining differential gears



Workpiece material: carburizing steel 20CrMnTi, HRC58-62
Insert model: VNGA160404AS01225-2
Grade: BH0121
Cutting parameters: Vc=130m/min; f=0.1mm/r; ap=0.15mm
Processing method: turning the side of the inner groove
Cooling method: dry cutting
Processing requirements: surface finish Ra ＜ 0.8μm



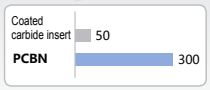
- 21% increase in processing life
- 42% savings in insert cost



Machining cylinder liner

Workpiece material: gray cast iron HT250, HB220
Insert model: CNGA120416AS01015-2
Insert grade: BK1011
Cutting parameters: Vc=600m/min; f=0.2mm/r; ap=0.15mm
Processing method: turning outer circle
Cooling method: wet cutting
Processing requirements: surface finish Ra ＜ 1.6μm and no dimension deviation.

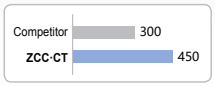




- Machining life increased by 5 times
- Processing efficiency increased by 1 times

Machining of high-temperature alloy bars

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



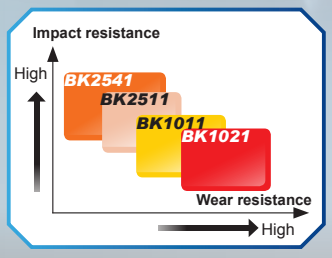
- Machining life increased by 6 times
- Processing efficiency increased by 5 times



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.

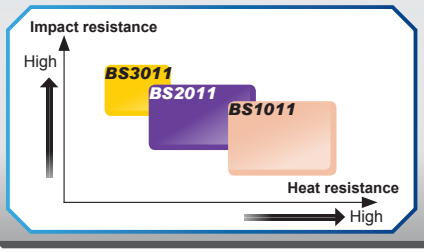
S Powder metallurgy and high temperature alloy processing category:

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%.

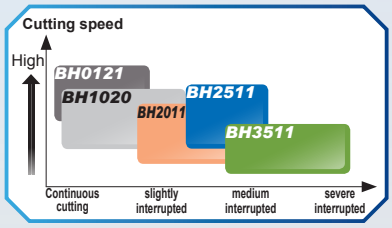
BS3011
Very high hardness and wear resistance.
Suitable for continuous to interrupted machining of powder metallurgy and high temperature alloy parts.
Typical application industries: automotive parts, high temperature resistant parts.



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.

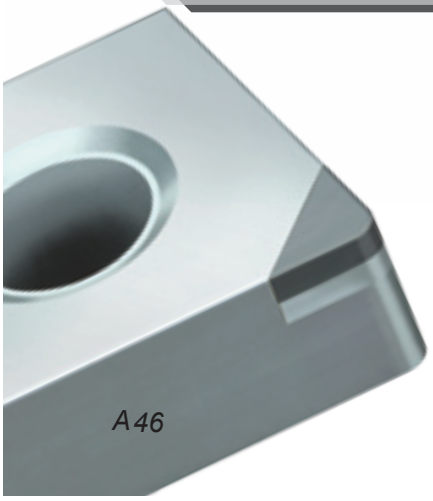


BH2511
Excellent heat resistance and impact strength;
Suitable for continuous to moderate intermittent finishing;
Suitable for machining carburized hardened steels such as 20CrMnTi, 20CrMn, 18Cr2Ni4WA, etc.
Typical application industries: Gears, bearings.

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.

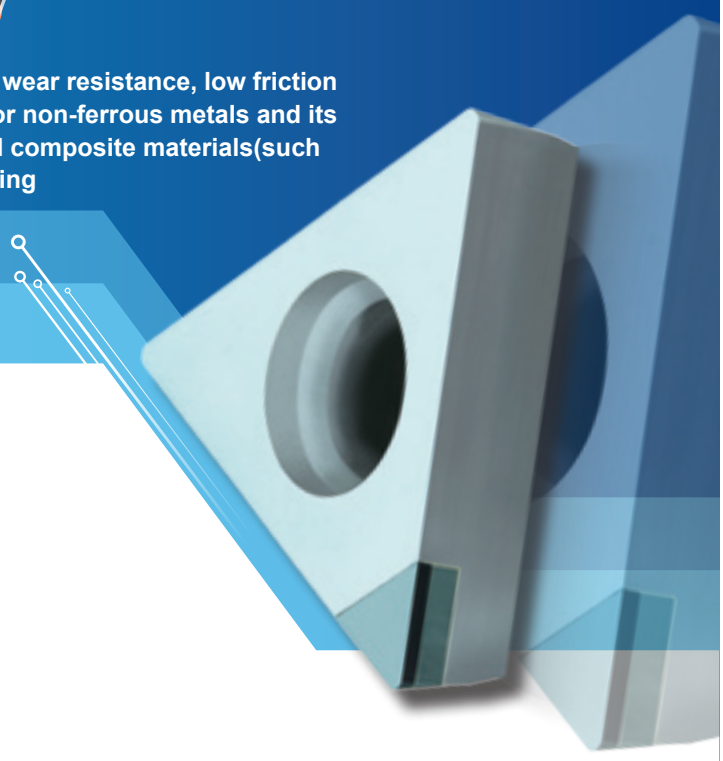


Recommended cutting data

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
BK2541	Hard cast iron	50-150	0.1-0.5	1-3
BH0121	Hardened steel	150-250	0.05-0.5	0.05-0.1
BH1020		140-220	0.05-0.5	0.05-0.1
BH2011		100-170	0.05-0.5	0.05-0.1
BH2511		120-180	0.05-0.5	0.05-0.1
BH3511		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
BS2011		100-200	0.05-0.25	0.03-0.2
BS3011		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

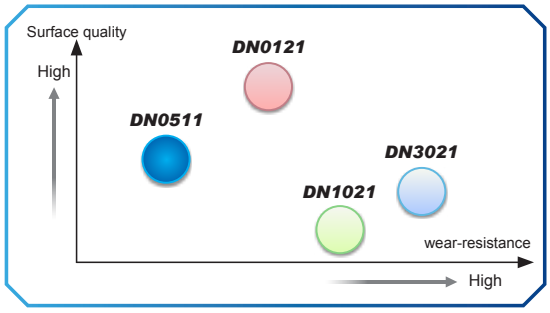
Application range:
strong universality, particular suitable for low-medium silumin materials in milling.

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

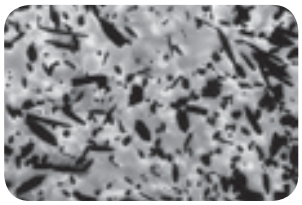
Application range:
suitable for MMC, high silumin, high-strength silumin and bimetallic materials



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
		Milling	600~2400
	Metal base compound	Turning /Milling	1500~1800
	Coppeer and magnesium alloyssilumin	Turning /Milling	400~1260
	Cemented carbide	Turning	20~40
DN1021	Silumin (Si≤12%)	Turning	400~1200
		Milling	250~1400
	Coppeer and magnesium alloyssilumin	Turning /Milling	400~1260
DN3021	Silumin (Si≤12%)	Turning	300~700
		Milling	500~1000
	Metal base compound	Milling	500~1000
	Unsintered ceramic materials	Turning	100~200
	Sintered Ceramic	Turning	20~50
	Bimetallic materials	Milling	200~300

Ceramic Grade



CN3100

A -siaon/ β -siaon matrix, the latest developmed 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.

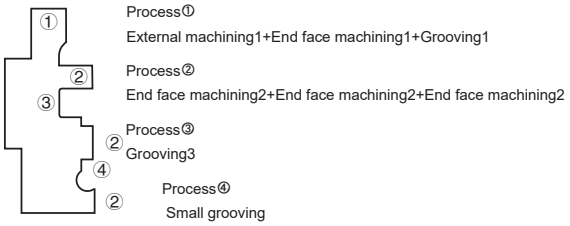


Figure 1

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	0.82	0.79
	Nodular cast iron	HB250	1.33	1.21	1.09	1.0	0.91	0.84	0.75	0.70	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=150m/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 Vc=250×0.84=210m/min.

Correctional coefficient table between tool life and cutting speed

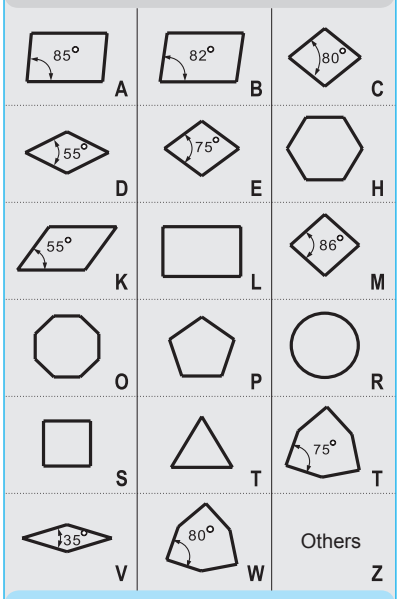
Tool life / Insert materials	Correctional coefficient between tool life and cutting speed					
	10 minutes	15 minutes (Standard life)	30 minutes	45 minutes	60 minutes	90 minutes
YBC151	1.12	1.00	0.82	0.73	0.67	0.60
YBC251	1.11	1.00	0.84	0.76	0.71	0.64
YBC351	1.11	1.00	0.84	0.76	0.70	0.63
YBC152	1.25	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=250m/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 Vc=250×0.67=167.5m/min.

General turning inserts code key

Insert shape

Insert shape/Code



Chipbreaker and clamping system

Metric

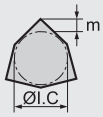
Code	With/Without hole	With/Without chipbreaker	Section plane of insert	Code	With/Without hole	With/Without chipbreaker	Section plane of insert
B	With	Without	> 65°	N	Without	Without	
H	With	Single-side	> 65°	R	Without	Single-side	
C	With	Without	> 65°	F	Without	Double-side	
J	With	Double-side	> 65°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

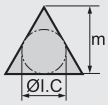
T N M G

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 angles

Tolerance







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

(Reference) Details of M-level tolerance (Identified by shape)

● Nose height tolerance(mm)

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

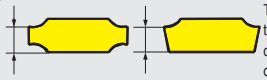
● Tolerance of inscribed circle ØI.C(mm)

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

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

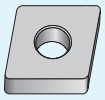
Nose radius code

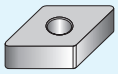
Code	Nose radius (mm)
00	No radius
02	0.2
04	0.4
08	0.8
12	1.2
16	1.6
20	2.0
24	2.4
32	3.2
X	Others
Diameter of insert (Metric)	Round insert

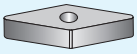
Chipbreaker code

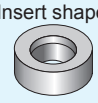
DF	DM	DR
HF	HM	HR
EF	EM	ER
NF	NM	SF
PM	WGF	SNR

Metric and inch comparison table of negative inserts

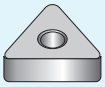
C-type negative angle	(ISO)	(Inch)	Chipbreaker
Insert shape 	090304	321	-DF
	090308	322	-WGF
	120404	431	-SF
	120408	432	-EF
	120412	433	-NF
	120416	434	-WGM
	160608	542	-PM
	160612	543	-DM
	160616	544	-EM
	190608	642	-NM
	190612	643	-DR
	190616	644	-ER
	190624	646	-LR
	250724	856	-HDR
	250732	858	-HPR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

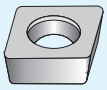
R-type negative angle	(ISO)	(Inch)	Chipbreaker
Insert shape 	120400	43	

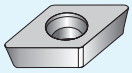
W-type negative angle	(ISO)	(Inch)	Chipbreaker
Insert shape 	06T304	3(2.5)1	-DF
	06T308	3(2.5)2	-WGF
	06T312	3(2.5)3	-SF
	060404	331	-EF
	060408	332	-NF
	060412	333	-WGM
	080404	431	-PM
	080408	432	-DM
	080412	433	-EM
			-NM
			-DR
			-SNR

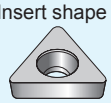
T-type negative angle	(ISO)	(Inch)	Chipbreaker
Insert shape 	110304	221	-DF
	110308	222	-WGF
	160404	331	-SF
	160408	332	-EF
	160412	333	-WGM
	220404	431	-PM
	220408	432	-DM
	220412	433	-EM
	220416	434	-DR
	270608	542	-ER
	270612	543	-LR
	270616	544	-HDR
			-SNR

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	-PM
	150608	542	-DM
	150612	543	-EM
	150616	544	-NM
	190412	633	-DR
	190424	636	-ER
	190612	643	-LR
	190616	644	-HDR
	250724	856	-HPR
	250732	858	-SNR
	250924	866	
	250932	868	

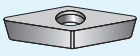
Metric and inch comparison table of positive insert

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

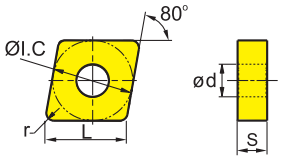
D-type positive angle	(ISO)	(Inch)	Chipbreaker
Insert shape 	070202	2(1.5)0	-USF
	070204	2(1.5)1	-SF
	070208	2(1.5)2	-HF
	11T302	3(2.5)0	-EF
	11T304	3(2.5)1	-HM
	11T308	3(2.5)2	-EM
	11T312	3(2.5)3	-HR
			-LH
			-LC

T-type positive angle	(ISO)	(Inch)	Chipbreaker
Insert shape 	06T102	1.2(1.2)0	
	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	-USF
	110302	220	-SF
	110304	221	-HF
	110308	222	-EF
	16T302	3(2.5)0	-HM
	16T304	3(2.5)1	-EM
	16T308	3(2.5)2	-HR
	16T312	3(2.5)3	-LH
	160400	330	-LC
	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	
	09T302	3(2.5)0	
	09T304	3(2.5)1	
	09T308	3(2.5) 2	-HF
	120404	431	-EF
	120408	432	-HM
	120412	433	-EM
	150404	531	-HR
	150408	532	-LH
	150412	533	-LC
	190408	632	
	190412	633	
	190416	634	

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

CN□□ (Negative inserts)



Good working condition Normal working condition Bad working condition

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

Inserts shape	Type	Dimensions(mm) 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
							Coated cemented carbide																						Cermet	Coated cermet	Cemented carbide	
DF	CNMG090304-DF	9.7	9.525	3.18	3.81	0.4		○		○					○																	
	CNMG090308-DF	9.7	9.525	3.18	3.81	0.8		○	○	○																						
	CNMG120404-DF	12.9	12.7	4.76	5.16	0.4		★	●	★					○							○							○			
	CNMG120408-DF	12.9	12.7	4.76	5.16	0.8		★	●	★	○				○							○							●			
For finishing	CNMG120412-DF	12.9	12.7	4.76	5.16	1.2		★	○	○												○										
WGF	CNMG120404-WGF	12.9	12.7	4.76	5.16	0.4		★												★					★							
	CNMG120408-WGF	12.9	12.7	4.76	5.16	0.8		★												★					★							
For finishing Wiper																																
SF	CNMG090304-SF	9.7	9.525	3.18	3.81	0.4							○																○			
	CNMG090308-SF	9.7	9.525	3.18	3.81	0.8							○																○	★		
	CNMG120404-SF	12.9	12.7	4.76	5.16	0.4							○																	★		
	CNMG120408-SF	12.9	12.7	4.76	5.16	0.8							○																	★		
For finishing	CNMG120412-SF	12.9	12.7	4.76	5.16	1.2							○																○			
EF	CNMG090304-EF	9.7	9.525	3.18	3.81	0.4									●	★				★	○											
	CNMG090308-EF	9.7	9.525	3.18	3.81	0.8									○	★				★	○											
	CNMG120404-EF	12.9	12.7	4.76	5.16	0.4									●	★				★	★											
	CNMG120408-EF	12.9	12.7	4.76	5.16	0.8							●		●	★				★	★											
For finishing	CNMG120412-EF	12.9	12.7	4.76	5.16	1.2									○	★				★	★											

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

Applicable tool

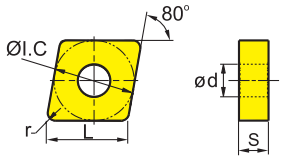

DCLNR/L
Kr:95°
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PCBNR/L
Kr:75°
A172


PCLNR/L
Kr:95°
A173


PCLNR/L
Kr:95°
A212

CN□□ (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
NF	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							○	★																	○	
For finishing																																
WGM	CNMG120408-WGM	12.9	12.7	4.76	5.16	0.8				★						★											★					
	CNMG120412-WGM	12.9	12.7	4.76	5.16	1.2				★						★											★					
For finishing Wiper																																
PM	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		★	●	○	○																★					
For semi-finishing	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



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A173

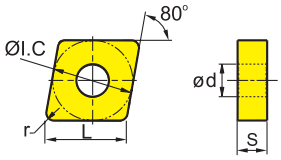


A212

Insert code key A50–A51
Grade selection reference A19/A36–A48
Chipbreaker selection reference A22–A35
Recommended cutting parameters A241–A244

CN□□ (Negative inserts)

Good working condition Normal working condition Bad working condition



Workpiece material

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

Inserts shape	Type	Dimensions(mm) L	ØI.C	S	ød	r	Coated cemented carbide																			Cermet	Coated cermet	Cemented carbide	
							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	CNMG090304-DM	9.7	9.525	3.18	3.81	0.4		○	●	○												●									
	CNMG090308-DM	9.7	9.525	3.18	3.81	0.8			○	○												●									
	CNMG120404-DM	12.9	12.7	4.76	5.16	0.4		★	●	★	○				●			○				●							●			
	CNMG120408-DM	12.9	12.7	4.76	5.16	0.8	●	★	●	★	●				●			●	○			●							●			
	CNMG120412-DM	12.9	12.7	4.76	5.16	1.2		★	●	★	●				○							●										
	CNMG120416-DM	12.9	12.7	4.76	5.16	1.6			●	○	●											○										
	CNMG160608-DM	16.1	15.875	6.35	6.35	0.8		★	●	★	○											●										
	CNMG160612-DM	16.1	15.875	6.35	6.35	1.2		○	●	★	○											○										
	CNMG160616-DM	16.1	15.875	6.35	6.35	1.6		★	●	○	●											○										
	CNMG190608-DM	19.3	19.05	6.35	7.94	0.8		○	●	○												○										
	CNMG190612-DM	19.3	19.05	6.35	7.94	1.2		★	●	★	○											○										
	CNMG190616-DM	19.3	19.05	6.35	7.94	1.6			●	★	○											○										
EM	CNMG120404-EM	12.9	12.7	4.76	5.16	0.4									●	★					★		★									
	CNMG120408-EM	12.9	12.7	4.76	5.16	0.8									●	★					★		★									
	CNMG120412-EM	12.9	12.7	4.76	5.16	1.2									●	★					★		★									
	CNMG160608-EM	16.1	15.875	6.35	6.35	0.8							○		○	★					○		★									
	CNMG160612-EM	16.1	15.875	6.35	6.35	1.2									○	★					○		★									
	CNMG160616-EM	16.1	15.875	6.35	6.35	1.6									○	★					○		★									

DM: For semi-finishing

EM: For semi-finishing

★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°



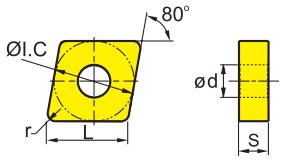
A173

PCLNR/L Kr:95°



A212

CN□□ (Negative inserts)



Good working condition 😊 Normal working condition 😐 Bad working condition

Workpiece material		Coated cemented carbide																						Cermet	Coated cermet	Cemented carbide	
		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
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
NM	CNMG120404-NM	12.9	12.7	4.76	5.16	0.4							○	★										●							○	
	CNMG120408-NM	12.9	12.7	4.76	5.16	0.8							●	★										○							○	
	CNMG120412-NM	12.9	12.7	4.76	5.16	1.2							○	★										○							○	
For semi-finishing																																
LR	CNMM120408-LR	12.9	12.7	4.76	5.16	0.8				★																						
	CNMM120412-LR	12.9	12.7	4.76	5.16	1.2				★																						
	CNMM120416-LR	12.9	12.7	4.76	5.16	1.6				★																						
	CNMM160608-LR	16.1	15.875	6.35	6.35	0.8				★																						
	CNMM160612-LR	16.1	15.875	6.35	6.35	1.2				★																						
	CNMM160616-LR	16.1	15.875	6.35	6.35	1.6				★																						
Light-load roughing	CNMM160624-LR	16.1	15.875	6.35	6.35	2.4				★																						
	CNMM190612-LR	19.3	19.05	6.35	7.94	1.2				★																						
	CNMM190616-LR	19.3	19.05	6.35	7.94	1.6				★																						
	CNMM190624-LR	19.3	19.05	6.35	7.94	2.4				★																						
	CNMM250924-LR	25.79	25.4	9.525	9.12	2.4				★																						

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

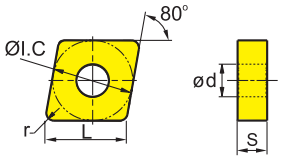
Applicable tool

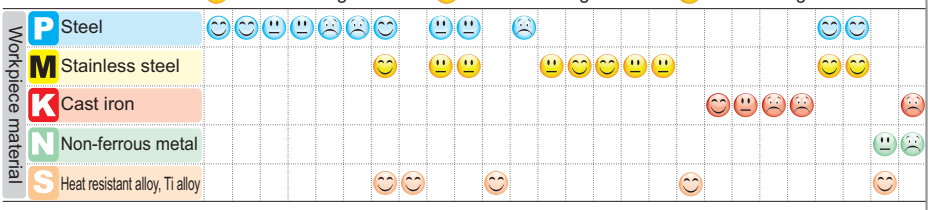
DCLNR/L Kr:95°	PCBNR/L Kr:75°	PCLNR/L Kr:95°	PCLNR/L Kr:95°
			
Page A166	A172	A173	A212

Insert code key A50–A51
Grade selection reference A19/A36–A48
Chipbreaker selection reference A22–A35
Recommended cutting parameters A241–A244

CN□□ (Negative inserts)

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
DR For light roughing	CNMG120408-DR	12.9	12.7	4.76	5.16	0.8		★	●	★	●												●			●						
	CNMG120412-DR	12.9	12.7	4.76	5.16	1.2		○	●	★	○												●			●						
	CNMG120416-DR	12.9	12.7	4.76	5.16	1.6		○		○													●			●						
	CNMG160608-DR	16.1	15.875	6.35	6.35	0.8			○	○													○									
	CNMG160612-DR	16.1	15.875	6.35	6.35	1.2			●	★	○												●			○						
	CNMG160616-DR	16.1	15.875	6.35	6.35	1.6			○	★	●																					
	CNMG190608-DR	19.3	15.875	6.35	7.94	0.8			○	○													●			○						
	CNMG190612-DR	19.3	19.05	6.35	7.94	1.2		○	●	★	●												○			○						
	CNMG190616-DR	19.3	19.05	6.35	7.94	1.6		○	●	★	●															○						
	CNMG190624-DR	19.3	19.05	6.35	7.94	2.4		○	●	○	●																					
DR For roughing	CNMM120412-DR	12.9	12.7	4.76	5.16	1.2			●		○																					
	CNMM160612-DR	16.1	15.875	6.35	6.35	1.2			●		○																					
	CNMM160616-DR	16.1	15.875	6.35	6.35	1.6					○																					
	CNMM190612-DR	19.3	19.05	6.35	7.94	1.2			●	○	●																					
	CNMM190616-DR	19.3	19.05	6.35	7.94	1.6			●	★	●																					
	CNMM190624-DR	19.3	19.05	6.35	7.94	2.4		○	○		○																					
	CNMM250924-DR	25.79	25.4	9.525	9.12	2.4			○	★	○																					
ER For roughing	CNMG120408-ER	12.9	12.7	4.76	5.16	0.8													●				★									
	CNMG120412-ER	12.9	12.7	4.76	5.16	1.2													●				★									
	CNMG160612-ER	16.1	15.875	6.35	6.35	1.2													●				★									
	CNMG160616-ER	16.1	15.875	6.35	6.35	1.6																	★									
	CNMG190612-ER	19.3	19.05	6.35	7.94	1.2																	★									
	CNMG190616-ER	19.3	19.05	6.35	7.94	1.6																	★									
ER For roughing	CNMM250724-ER	25.79	25.4	7.94	9.12	2.4				★													★									
	CNMM250732-ER	25.79	25.4	7.94	9.12	3.2				★													★									
	CNMM250924-ER	25.79	25.4	9.525	9.12	2.4				★													★									
	CNMM250932-ER	25.79	25.4	9.525	9.12	3.2				★													★									
SNR For roughing	CNMG120408-SNR	12.9	12.7	4.76	5.16	0.8							○	●			○							●								
	CNMG120412-SNR	12.9	12.7	4.76	5.16	1.2							○	●			○							●								
	CNMG160608-SNR	16.1	15.875	6.35	6.35	0.8							○	●			○							●								
	CNMG190616-SNR	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°

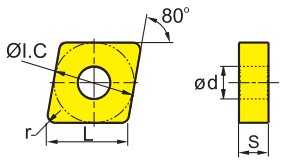
A173

PCLNR/L Kr:95°

A212

CN□□ (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
HDR  For heavy machining	CNMM120408-HDR	12.9	12.7	4.76	5.16	0.8		○	●	○	○	○																				
	CNMM120412-HDR	12.9	12.7	4.76	5.16	1.2			○	○	○	○																				
	CNMM120416-HDR	12.9	12.7	4.76	5.16	1.6			○		○	○																				
	CNMM160612-HDR	16.1	15.875	6.35	6.35	1.2			○		○	○																				
	CNMM160616-HDR	16.1	15.875	6.35	6.35	1.6				○	○	○																				
	CNMM190616-HDR	19.3	19.05	6.35	7.94	1.6			○	○	○	○																				
	CNMM190624-HDR	19.3	19.05	6.35	7.94	2.4		○	○	○	○	○																				
HPR  For heavy machining	CNMM190616-HPR	19.5	19.05	6.35	7.94	1.6				★		○																				
	CNMM250924-HPR	25.19	25.4	9.525	9.12	2.4				★		○																				
Without chipbreaker 	CNMA120404	12.9	12.7	4.76	5.16	0.4																		★	○	○						
	CNMA120408	12.9	12.7	4.76	5.16	0.8																		★	★	★						
	CNMA120412	12.9	12.7	4.76	5.16	1.2																		★	★	★						
	CNMA120416	12.9	12.7	4.76	5.16	1.6																		★	★	○						
	CNMA160608	16.1	15.875	6.35	6.35	0.8																			○						
	CNMA160612	16.1	15.875	6.35	6.35	1.2																			★						
	CNMA160616	16.1	15.875	6.35	6.35	1.6																		○	★	○						
	CNMA160620	16.1	15.875	6.35	6.35	2.0																				○						
	CNMA160630	16.1	15.875	6.35	6.35	3.0																				○						
	CNMA190612	19.3	19.05	6.35	7.94	1.2																		★	○	★						
	CNMA190616	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



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A172



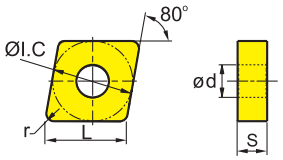
A173



A212

Insert code key A50–A51
Grade selection reference A19/A36–A48
Chipbreaker selection reference A22–A35
Recommended cutting parameters A241–A244

CN□□ (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
All round 	CNMG120404	12.9	12.7	4.76	5.16	0.4	●		●													●				○						
	CNMG120408	12.9	12.7	4.76	5.16	0.8	●	★	●	★	○											●				★	★	★				
	CNMG120412	12.9	12.7	4.76	5.16	1.2	●	★	●	★															○	○	○					
	CNMG160608	16.1	15.875	6.35	6.35	0.8	●		●													○										
	CNMG160612	16.1	15.875	6.35	6.35	1.2			●		○																					
	CNMG160616	16.1	15.875	6.35	6.35	1.6			○																							
	CNMG190608	19.3	19.05	6.35	7.94	0.8	○		○		○																					
	CNMG190612	19.3	19.05	6.35	7.94	1.2	○		●		○																					
	CNMG190616	19.3	19.05	6.35	7.94	1.6	○		○		○																					
All round 	CNMM120404	12.9	12.7	4.76	5.16	0.4	○																									
	CNMM120408	12.9	12.7	4.76	5.16	0.8	○		○																							
	CNMM120412	12.9	12.7	4.76	5.16	1.2	○																									
	CNMM190608	19.3	19.05	6.35	7.94	0.8					○																					
	CNMM190612	19.3	19.05	6.35	7.94	1.2			○		○																					
	CNMM190616	19.3	19.05	6.35	7.94	1.6			○																							
	CNMM190624	19.3	19.05	6.35	7.94	2.4					○																					

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

Applicable tool

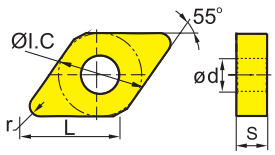

DCLNR/L
Kr:95°
Page A166


PCBNR/L
Kr:75°
A172

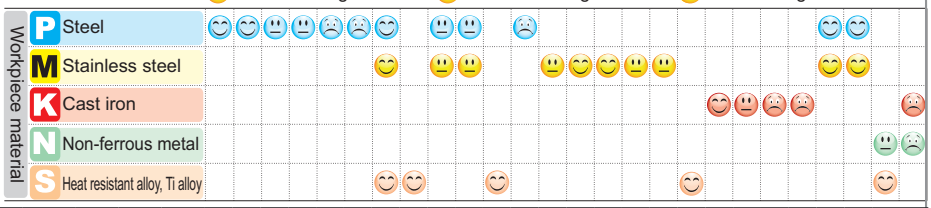

PCLNR/L
Kr:95°
A173


PCLNR/L
Kr:95°
A212

DN□□ (Negative inserts)



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	4.761	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

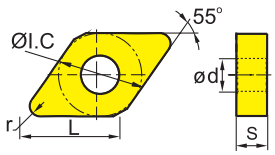
Applicable tool



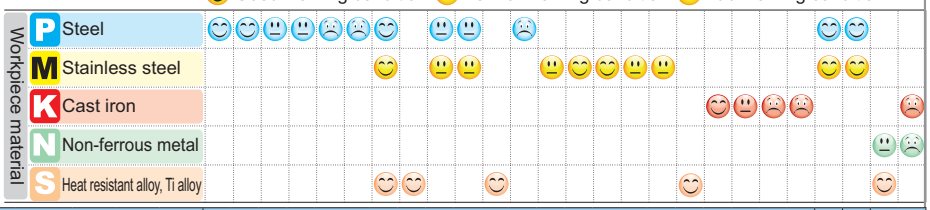
DDJNR/L Kr:93°	PDJNR/L Kr:93°	PDPNN Kr:62°30'	PDPNR/L Kr:62°30'	PDUNR/L Kr:93°
Page A167	A174	A175	A213	A214

Insert code key A50–A51
Grade selection reference A19/A36–A48
Chipbreaker selection reference A22–A35
Recommended cutting parameters A241–A244

DN□□ (Negative inserts)



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
SF	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							○																○	★		
For finishing	DNMG150608-SF	15.5	12.7	6.35	5.16	0.8							○																○	★		
EF	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									●	★				★	○											
For finishing	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	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							●	★																	○	
For finishing	DNEG150608-NF	15.5	12.7	6.35	5.16	0.8							●	★																	○	
NGF	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							○	●			○															
For finishing	DNEG150612-NGF	15.5	12.7	6.35	5.16	1.2							○	●			○															

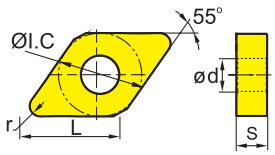
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool

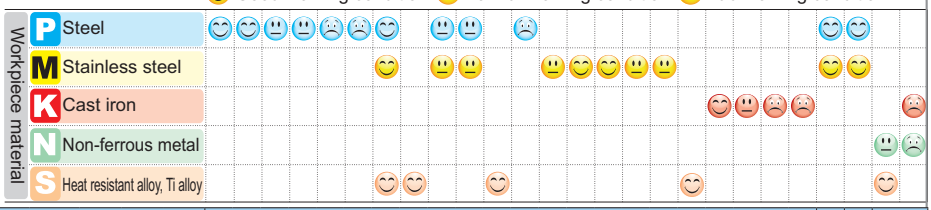


DDJNR/L	PDJNR/L	PDPNN	PDPNR/L	PDUNR/L
Kr:93°	Kr:93°	Kr:62°30'	Kr:62°30'	Kr:93°
Page A167	A174	A175	A213	A214

DN□□ (Negative inserts)



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
WGM	DNMX150408-WGM	15.5	12.7	4.76	5.16	0.8				★						★											★					
	DNMX150412-WGM	15.5	12.7	4.76	5.16	1.2				★						★											★					
	DNMX150608-WGM	15.5	12.7	6.35	5.16	0.8				★						★											★					
For semi-finishing Wiper	DNMX150612-WGM	15.5	12.7	6.35	5.16	1.2				★						★											★					
PM	DNMG110404-PM	11.6	9.525	4.76	3.81	0.4		●	●	○																	●					
	DNMG110408-PM	11.6	9.525	4.76	3.81	0.8		●	●	○	○															★	○	○				
	DNMG110412-PM	11.6	9.525	4.76	3.81	1.2			○	○																						
	DNMG150404-PM	15.5	12.7	4.76	5.16	0.4		●	●	○																						
	DNMG150408-PM	15.5	12.7	4.76	5.16	0.8	●	●	●	○	○															★	★	○				
	DNMG150412-PM	15.5	12.7	4.76	5.16	1.2			●	○			○													○	★	○				
For semi-finishing	DNMG150416-PM	15.5	12.7	4.76	5.16	1.6			○	○																						
	DNMG150604-PM	15.5	12.7	6.35	5.16	0.4		●	●	○	○															★	★					
	DNMG150608-PM	15.5	12.7	6.35	5.16	0.8	●	○	●	★	●															★	★	○				
	DNMG150612-PM	15.5	12.7	6.35	5.16	1.2		★	●	★	○															★	○					
	DNMG150616-PM	15.5	12.7	6.35	5.16	1.6			○	○																						

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

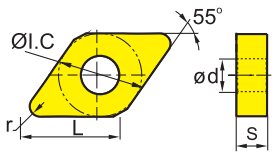
Applicable tool



Page A167 A174 A175 A213 A214

Insert code key A50–A51
Grade selection reference A19/A36–A48
Chipbreaker selection reference A22–A35
Recommended cutting parameters A241–A244

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) L	ØI.C	S	ød	r	Coated cemented carbide YBC151	YBC152	YBC251	YBC252	YBC351	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBM151	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YBD252	Cermet YNG151	Coated cermet YNG151C	Cemented carbide 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


DDJNR/L
Kr:93°
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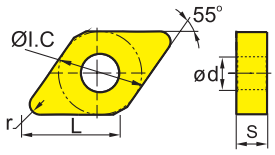

PDJNR/L
Kr:93°
A174


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

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
LR	DNMM150608-LR	15.5	12.7	6.35	5.16	0.8				★																					
	DNMM150612-LR	15.5	12.7	6.35	5.16	1.2				★																					
Light-load roughing	DNMM150616-LR	15.5	12.7	6.35	5.16	1.6				★																					
DR	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		★	○	○	○														●	●					
For light roughing	DNMG150612-DR	15.5	12.7	6.35	5.16	1.2		○	●	★	○														○	●					
	DNMG150616-DR	15.5	12.7	6.35	5.16	1.6					○															○					
DR	DNMM150608-DR	15.5	12.7	6.35	5.16	0.8		○	○																						
	DNMM150612-DR	15.5	12.7	6.35	5.16	1.2		○	●																						
For roughing	DNMM150616-DR	15.5	12.7	6.35	5.16	1.6					○																				
ER	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																															
ER	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																															
SNR	DNMG150608-SNR	15.5	12.7	6.35	5.16	0.8							○	●		○								●							
	DNMG150612-SNR	15.5	12.7	6.35	5.16	1.2							○	●		○								●							
For roughing																															

★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'



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PDPNR/L Kr:62°30'



A213

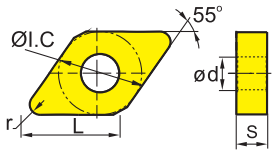
PDUNR/L Kr:93°



A214

Insert code key A50–A51
Grade selection reference A19/A36–A48
Chipbreaker selection reference A22–A35
Recommended cutting parameters A241–A244

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
HDR  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

DDJNR/L Kr:93°

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PDJNR/L Kr:93°

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PDPNN Kr:62°30'

A175

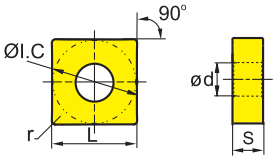
PDPNR/L Kr:62°30'

A213

PDUNR/L Kr:93°

A214

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

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	SNMG090304-DF	9.525	9.525	3.18	3.81	0.4		○																							
	SNMG090308-DF	9.525	9.525	3.18	3.81	0.8		○																							
	SNMG120404-DF	12.7	12.7	4.76	5.16	0.4		○																							
	SNMG120408-DF	12.7	12.7	4.76	5.16	0.8		○	●	○																		○			
For finishing	SNMG120412-DF	12.7	12.7	4.76	5.16	1.2		○		○																					
EF	SNMG090304-EF	9.525	9.525	3.18	3.81	0.4									○	★				★	○										
	SNMG090308-EF	9.525	9.525	3.18	3.81	0.8									○	★				★	○										
	SNMG090312-EF	9.525	9.525	3.18	3.81	1.2									○	★				★	○										
	SNMG120404-EF	12.7	12.7	4.76	5.16	0.4									●	★				★	★										
	SNMG120408-EF	12.7	12.7	4.76	5.16	0.8									●	★				★	★										
For finishing	SNMG120412-EF	12.7	12.7	4.76	5.16	1.2									○	★				★	★										
	SNMG150608-EF	15.875	15.875	6.35	6.35	0.8									○	★				★	○										
	SNMG150612-EF	15.875	15.875	6.35	6.35	1.2									○	★				★	○										
SF	SNMG090304-SF	9.525	9.525	3.18	3.81	0.4							○															○	★		
	SNMG090308-SF	9.525	9.525	3.18	3.81	0.8							○															○	★		
	SNMG120404-SF	12.7	12.7	4.76	5.16	0.4							○															○	★		
	SNMG120408-SF	12.7	12.7	4.76	5.16	0.8							○															○	★		
For finishing	SNMG120412-SF	12.7	12.7	4.76	5.16	1.2							○															○			
	SNMG150608-SF	15.875	15.875	6.35	6.35	0.8							○															○			

★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

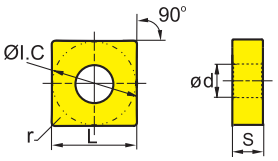

PSKNR/L
Kr:75°
A178


PSSNR/L
Kr:45°
A179


PSKNR/L
Kr:75°
A215

Insert code key A50–A51
Grade selection reference A19/A36–A48
Chipbreaker selection reference A22–A35
Recommended cutting parameters A241–A244

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

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	SNMG090304-PM	9.525	9.525	3.18	3.81	0.4		○	●	○																					
	SNMG090308-PM	9.525	9.525	3.18	3.81	0.8		○	●	○	○														○						
	SNMG090312-PM	9.525	9.525	3.18	3.81	1.2		○		○																					
	SNMG120404-PM	12.7	12.7	4.76	5.16	0.4		○	●	○	○														○						
	SNMG120408-PM	12.7	12.7	4.76	5.16	0.8		●	●	○	●														★	★	★				
	SNMG120412-PM	12.7	12.7	4.76	5.16	1.2		●	●	○	○														★	★	★				
	SNMG120416-PM	12.7	12.7	4.76	5.16	1.6			●	○	○															○					
	SNMG150608-PM	15.875	15.875	6.35	6.35	0.8				○																					
	SNMG150612-PM	15.875	15.875	6.35	6.35	1.2		●	●	○															○	●					
	SNMG190616-PM	19.05	19.05	6.35	7.94	1.6			●	○																					
DM	SNMG090304-DM	9.525	9.525	3.18	3.81	0.4		○		○																					
	SNMG090308-DM	9.525	9.525	3.18	3.81	0.8		○	●	○	○																				
	SNMG120404-DM	12.7	12.7	4.76	5.16	0.4		★	●	○																					
	SNMG120408-DM	12.7	12.7	4.76	5.16	0.8				○												○							○		
	SNMG120412-DM	12.7	12.7	4.76	5.16	1.2		★	●	★																					
	SNMG120416-DM	12.7	12.7	4.76	5.16	1.6			●	○	○																					
	SNMG150608-DM	15.875	15.875	6.35	6.35	0.8		○	●	○												●									
	SNMG150612-DM	15.875	15.875	6.35	6.35	1.2		●	●	★	●																				
	SNMG150616-DM	15.875	15.875	6.35	6.35	1.6				○																					
	SNMG190612-DM	19.05	19.05	6.35	7.94	1.2		○	●	○	○											○									
	SNMG190616-DM	19.05	19.05	6.35	7.94	1.6				○																					

PM: For semi-finishing
DM: For semi-finishing

★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

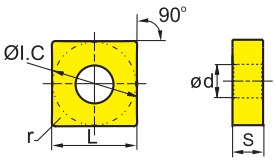

PSDNN Kr:45°
A177


PSKNR/L Kr:75°
A178

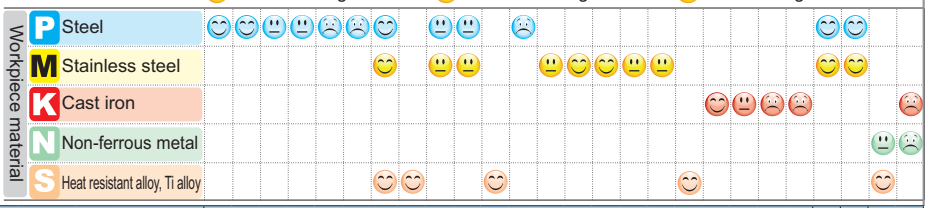

PSSNR/L Kr:45°
A179


PSKNR/L Kr:75°
A215

SN□□ (Negative inserts)



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
EM	SNMG120404-EM	12.7	12.7	4.76	5.16	0.4									●	★					★		★									
	SNMG120408-EM	12.7	12.7	4.76	5.16	0.8									●	★					★		★									
	SNMG120412-EM	12.7	12.7	4.76	5.16	1.2									●	★					★		★									
	SNMG120416-EM	12.7	12.7	4.76	5.16	1.6									○	★					○		★									
For semi-finishing	SNMG150612-EM	15.875	15.875	6.35	6.35	1.2									●	★					○		★									
	SNMG150616-EM	15.875	15.875	6.35	6.35	1.6									○	★					○		★									
NM	SNMG120408-NM	12.7	12.7	4.76	5.16	0.8							●	★										○							○	
	SNMG120412-NM	12.7	12.7	4.76	5.16	1.2							○	★										○							○	
For semi-finishing																																
LR	SNMM120408-LR	12.9	12.7	4.76	5.16	0.8				★																						
	SNMM120412-LR	12.9	12.7	4.76	5.16	1.2				★																						
	SNMM120416-LR	12.9	12.7	4.76	5.16	1.6				★																						
	SNMM150612-LR	15.875	15.875	6.35	6.35	1.2				★																						
	SNMM150616-LR	15.875	15.875	6.35	6.35	1.6				★																						
	SNMM190612-LR	19.3	19.05	6.35	7.94	1.2				★																						
Light-load roughing	SNMM190616-LR	19.3	19.05	6.35	7.94	1.6				★																						
	SNMM190624-LR	19.3	19.05	6.35	7.94	2.4				★																						
	SNMM250924-LR	25.79	25.4	9.525	9.12	2.4				★																						

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

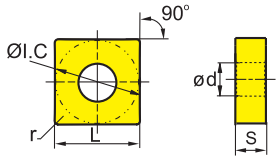
Applicable tool



Page A168 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

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

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
DR	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			●	○	○																					
DR	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					○																					

For light roughing

For roughing

★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

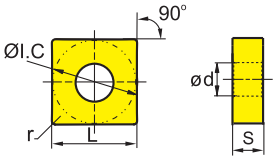

PSDNN Kr:45°
A177


PSKNR/L Kr:75°
A178


PSSNR/L Kr:45°
A179


PSKNR/L Kr:75°
A215

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

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
DR	SNMM190612-DR	19.05	19.05	6.35	7.94	1.2			●	○	○																				
	SNMM190616-DR	19.05	19.05	6.35	7.94	1.6		○	●	★	●																				
	SNMM190624-DR	19.05	19.05	6.35	7.94	2.4		★	●	○	●																				
	SNMM250724-DR	25.4	25.4	7.94	9.12	2.4			●		○																				
For roughing	SNMM250924-DR	25.4	25.4	9.525	9.12	2.4			●	★	●																				
ER	SNMG120408-ER	12.7	12.7	4.76	5.16	0.8																	★								
	SNMG120412-ER	12.7	12.7	4.76	5.16	1.2																	★								
	SNMG150608-ER	15.875	15.875	6.35	6.35	0.8																	★								
	SNMG150612-ER	15.875	15.875	6.35	6.35	1.2																	★								
For roughing	SNMG190612-ER	19.05	19.05	6.35	7.94	1.2																	★								
	SNMG190616-ER	19.05	19.05	6.35	7.94	1.6																	★								
ER	SNMM250724-ER	25.4	25.4	7.94	9.12	2.4				●													★								
	SNMM250732-ER	25.4	25.4	7.94	9.12	3.2				●													★								
	SNMM250924-ER	25.4	25.4	9.525	9.12	2.4				●													★								
For roughing	SNMM250932-ER	25.4	25.4	9.525	9.12	3.2				●													★								
SNR	SNMG120408-SNR	12.7	12.7	4.76	5.16	0.8							○	●			○							●							
For roughing																															

★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

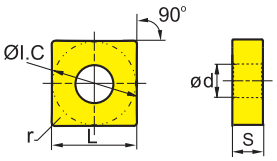

PSSNR/L
Kr:45°
A179

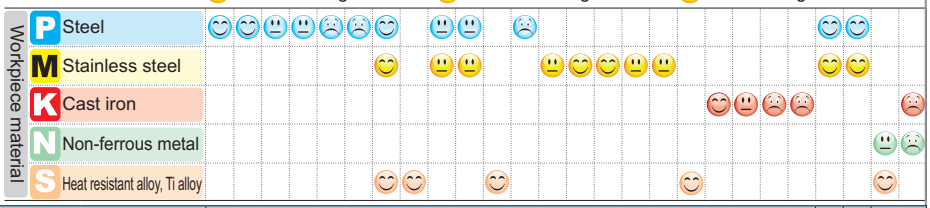

PSKNR/L
Kr:75°
A215

Insert code key A50–A51
Grade selection reference A19/A36–A48
Chipbreaker selection reference A22–A35
Recommended cutting parameters A241–A244

SN□□ (Negative inserts)

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
HDR  For heavy machining	SNMM120408-HDR	12.7	12.7	4.76	5.16	0.8			○		○	○																				
	SNMM120412-HDR	12.7	12.7	4.76	5.16	1.2			○		○	○																				
	SNMM120416-HDR	12.7	12.7	4.76	5.16	1.6					○	○																				
	SNMM150608-HDR	15.875	15.875	6.35	6.35	0.8			○		○	○																				
	SNMM150612-HDR	15.875	15.875	6.35	6.35	1.2			●		○	○																				
	SNMM150616-HDR	15.875	15.875	6.35	6.35	1.6			○		○	○																				
	SNMM150624-HDR	15.875	15.875	6.35	6.35	2.4					○	○																				
	SNMM190608-HDR	19.05	19.05	6.35	7.94	0.8					○	○																				
	SNMM190612-HDR	19.05	19.05	6.35	7.94	1.2			○		○	○																				
	SNMM190616-HDR	19.05	19.05	6.35	7.94	1.6			○	○	○	○																				
	SNMM190624-HDR	19.05	19.05	6.35	7.94	2.4					○	○																				
	SNMM250724-HDR	25.4	25.4	7.94	9.12	2.4				★	●	○																				
	SNMM250924-HDR	25.4	25.4	9.525	9.12	2.4					○	○																				
HPR  For heavy machining	SNMM190616-HPR	19.5	19.05	6.35	7.94	1.6				★		○																				
	SNMM250924-HPR	25.4	25.4	9.525	9.12	2.4				★		○																				

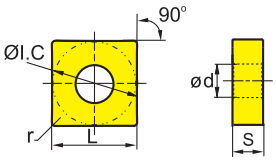
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool



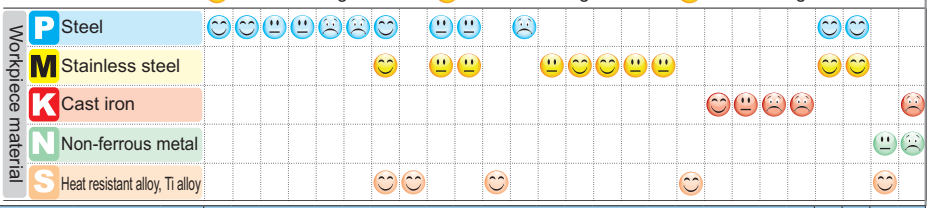
DSBNR/L Kr:75°	PSBNR/L Kr:75°	PSDNN Kr:45°	PSKNR/L Kr:75°	PSSNR/L Kr:45°	PSKNR/L Kr:75°
Page A168	A176	A177	A178	A179	A215

SN□□ (Negative inserts)



Good working condition Normal working condition Bad working condition

Workpiece material



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
All round	SNMG090304	9.525	9.525	3.18	3.81	0.4			○																					
	SNMG090308	9.525	9.525	3.18	3.81	0.8			○		○																				
	SNMG120404	12.7	12.7	4.76	5.16	0.4			●																					
	SNMG120408	12.7	12.7	4.76	5.16	0.8	○		●		○											●				○					
	SNMG120412	12.7	12.7	4.76	5.16	1.2			○	○	●																				
	SNMG120416	12.7	12.7	4.76	5.16	1.6	○		○																						
	SNMG150608	15.875	15.875	6.35	6.35	0.8			○																						
	SNMG150612	15.875	15.875	6.35	6.35	1.2	○		●																						
	SNMG190612	19.05	19.05	6.35	7.94	1.2	○		●		○																				
	SNMG190616	19.05	19.05	6.35	7.94	1.6	○		●																						
	SNMG250724	25.4	25.4	7.94	9.12	2.4	○		○		●																				
	SNMG250924	25.4	25.4	9.525	9.12	2.4			○		●																				
All round	SNMM090304	9.525	9.525	3.18	3.81	0.4																									○
	SNMM090308	9.525	9.525	3.18	3.81	0.8			○																						
	SNMM120408	12.7	12.7	4.76	5.16	0.8	○																								
	SNMM120412	12.7	12.7	4.76	5.16	1.2			○																						
	SNMM120416	12.7	12.7	4.76	5.16	1.6			○																						

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

Applicable tool

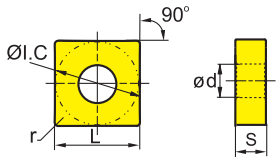


Page A168 A176 A177 A178 A179 A215

Insert code key A50–A51
Grade selection reference A19/A36–A48
Chipbreaker selection reference A22–A35
Recommended cutting parameters A241–A244

SN□□ (Negative inserts)

Good working condition / Normal working condition / Bad working condition



Workpiece material

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

Inserts shape	Type	Dimensions(mm) L	ØI.C	S	ød	r	Coated cemented carbide																			Cermet	Coated cermet	Cemented carbide	
							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
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

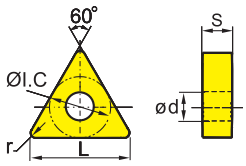

PSDNN Kr:45° — A177


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

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	TNMG160404-DF	16.5	9.525	4.76	3.81	0.4		★	●	★												○						●			
	TNMG160408-DF	16.5	9.525	4.76	3.81	0.8		★	○	★																		●			
	TNMG160412-DF	16.5	9.525	4.76	3.81	1.2		○	○	○																					
	TNMG220408-DF	22	12.7	4.76	5.16	0.8		★	○	○																					
For finishing	TNMG220412-DF	22	12.7	4.76	5.16	1.2		○																							
WGF	TNMX160404-WGF	16.5	9.525	4.76	3.81	0.4		★												★					★						
	TNMX160408-WGF	16.5	9.525	4.76	3.81	0.8		★												★					★						
For finishing Wiper																															
SF	TNMG110304-SF	11	6.35	3.18	2.26	0.4							○																○	★		
	TNMG160404-SF	16.5	9.525	4.76	3.81	0.4							○																○	★		
	TNMG160408-SF	16.5	9.525	4.76	3.81	0.8							○																○	★		
	TNMG220408-SF	22	12.7	4.76	5.16	0.8							○																○	★		
For finishing	TNMG220412-SF	22	12.7	4.76	5.16	1.2							○																○	★		

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

Applicable tool


DTGNR/L Kr:91° — Page A169


PTFNR/L Kr:90° — A180

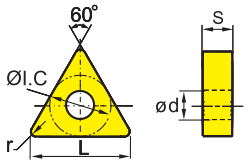

PTTNR/L Kr:60° — A181


PTGNR/L Kr:90° — A182


PTFNR/L Kr:90° — A216

Insert code key A50–A51
Grade selection reference A19/A36–A48
Chipbreaker selection reference A22–A35
Recommended cutting parameters A241–A244

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

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	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									○	★				★	★											
For finishing	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	TNMX160408-WGM	16.5	9.525	4.76	3.81	0.8				★						★											★					
	TNMX160412-WGM	16.5	9.525	4.76	3.81	1.2				★						★											★					
For semi-finishing Wiper																																
PM	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		★	●	○	○															★	★	○				
For semi-finishing	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


DTGNR/L
Kr:91°
Page A169

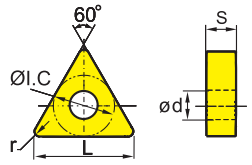

PTFNR/L
Kr:90°
A180


PTTNR/L
Kr:60°
A181


PTGNR/L
Kr:90°
A182


PTFNR/L
Kr:90°
A216

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

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	TNMG110308-DM	11	6.35	3.18	2.26	0.8		○		○																						
	TNMG160404-DM	16.5	9.525	4.76	3.81	0.4		★	●	★	○				○														●			
	TNMG160408-DM	16.5	9.525	4.76	3.81	0.8		★	●	★	●				●							●							○			
	TNMG160412-DM	16.5	9.525	4.76	3.81	1.2		○	○	★	○																					
	TNMG220404-DM	22	12.7	4.76	5.16	0.4		★	●	★	○											○										
	TNMG220408-DM	22	12.7	4.76	5.16	0.8		★	●	★	●											○							○			
	TNMG220412-DM	22	12.7	4.76	5.16	1.2		○	○	○	○																					
	TNMG220416-DM	22	12.7	4.76	5.16	1.6		○	○	○																						
EM	TNMG160404-EM	16.5	9.525	4.76	3.81	0.4									●	★					★		★									
	TNMG160408-EM	16.5	9.525	4.76	3.81	0.8									●	★					★		★									
	TNMG160412-EM	16.5	9.525	4.76	3.81	1.2									○	★					★		★									
	TNMG220408-EM	22	12.7	4.76	5.16	0.8									●	★					○		★									
	TNMG220412-EM	22	12.7	4.76	5.16	1.2									○	★					○		★									
	TNMG220416-EM	22	12.7	4.76	5.16	1.6									○	★					○		★									
LR	TNMM160408-LR	16.5	9.525	4.76	3.81	0.8				★																						
	TNMM160412-LR	16.5	9.525	4.76	3.81	1.2				★																						
	TNMM220408-LR	22	12.7	4.76	5.16	0.8				★																						
	TNMM220412-LR	22	12.7	4.76	5.16	1.2				★																						
	TNMM220416-LR	22	12.7	4.76	5.16	1.6				★																						


For semi-finishing


For semi-finishing


Light-load roughing

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

Applicable tool

DTGNR/L Kr:91°



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PTFNR/L Kr:90°



A180

PTTNR/L Kr:60°



A181

PTGNR/L Kr:90°



A182

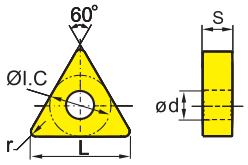
PTFNR/L Kr:90°



A216

Insert code key A50–A51
Grade selection reference A19/A36–A48
Chipbreaker selection reference A22–A35
Recommended cutting parameters A241–A244

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

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
DR	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					○																					
DR	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					○																					
ER	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																	★									
SNR	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

For light roughing

For roughing

For roughing

For roughing

Applicable tool

DTGNR/L Kr:91°



Page A169

PTFNR/L Kr:90°



A180

PTTNR/L Kr:60°



A181

PTGNR/L Kr:90°



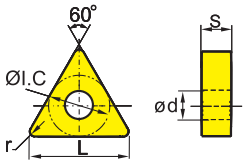
A182

PTFNR/L Kr:90°



A216

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	😊😊😊😊

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
HDR For heavy machining	TNMM160408-HDR	16.5	9.525	4.76	3.81	0.8					○	○																				
	TNMM160412-HDR	16.5	9.525	4.76	3.81	1.2					○	○																				
	TNMM220408-HDR	22	12.7	4.76	5.16	0.8					○	○																				
	TNMM220412-HDR	22	12.7	4.76	5.16	1.2					○	○																				
	TNMM220416-HDR	22	12.7	4.76	5.16	1.6					○	○																				
	TNMM270612-HDR	27.5	15.875	6.35	6.35	1.2					○	○																				
	TNMM270616-HDR	27.5	15.875	6.35	6.35	1.6					○	○																				
	TNMM270624-HDR	27.5	15.875	6.35	6.35	2.4					○	○																				
All round	TNMG110308	11	6.35	3.18	2.26	0.8			○																							
	TNMG160404	16.5	9.525	4.76	3.81	0.4	○		●																							
	TNMG160408	16.5	9.525	4.76	3.81	0.8	●	○	●																							
	TNMG160412	16.5	9.525	4.76	3.81	1.2	●		●	○												○										
	TNMG220404	22	12.7	4.76	5.16	0.4	○		●		○																					
	TNMG220408	22	12.7	4.76	5.16	0.8	○		●		○											○										
	TNMG220412	22	12.7	4.76	5.16	1.2	●		●		○																					
	TNMG220416	22	12.7	4.76	5.16	1.6			○																							
	TNMG270612	27.5	15.875	6.35	6.35	1.2			●		●																					
	TNMG270616	27.5	15.875	6.35	6.35	1.6			○		○																					
	TNMG330916	33	19.05	9.525	7.94	1.6					●																					
	TNMG330924	33	19.05	9.525	7.94	2.4	○		○		●																					

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

Applicable tool


DTGNR/L Kr:91°
Page A169


PTFNR/L Kr:90°
A180

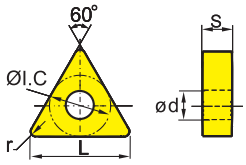

PTTNR/L Kr:60°
A181


PTGNR/L Kr:90°
A182

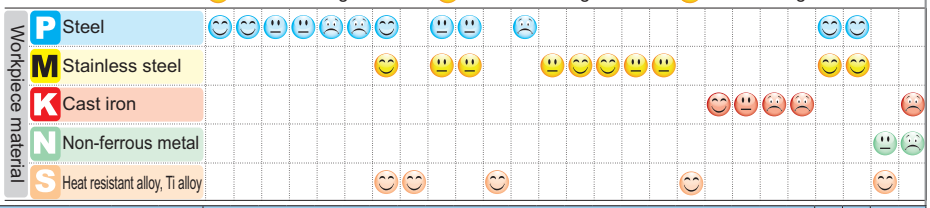

PTFNR/L Kr:90°
A216

Insert code key A50–A51
Grade selection reference A19/A36–A48
Chipbreaker selection reference A22–A35
Recommended cutting parameters A241–A244

TN□□ (Negative inserts)



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
All round	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			●		○																				
Without chipbreaker	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


DTGNR/L Kr:91° Page A169

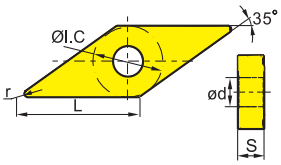

PTFNR/L Kr:90° A180


PTTNR/L Kr:60° A181


PTGNR/L Kr:90° A182


PTFNR/L Kr:90° A216

VN□□ (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
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							○																○			
For finishing																																

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

Applicable tool

DVVNN
Kr:72°30'



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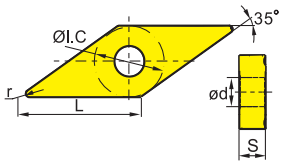
DVJNR/L
Kr:93°



A170

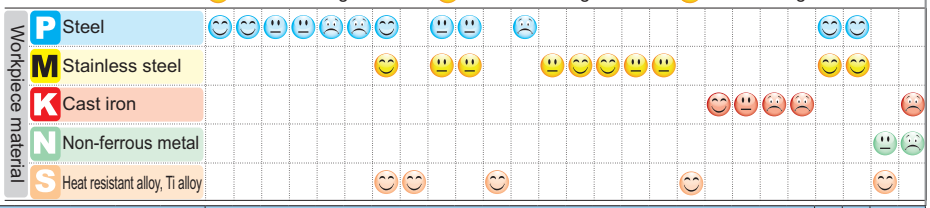
Insert code key A50–A51
Grade selection reference A19/A36–A48
Chipbreaker selection reference A22–A35
Recommended cutting parameters A241–A244

VN□□ (Negative inserts)



Good working condition Normal working condition Bad working condition

Workpiece material



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	VNMG160404-PM	16.6	9.525	4.76	3.81	0.4		★	●	○	○																○	○				
	VNMG160408-PM	16.6	9.525	4.76	3.81	0.8		★	●	○																★	★	○				
 For semi-finishing	VNMG160412-PM	16.6	9.525	4.76	3.81	1.2			○	○																○	○					
DM	VNMG160408-DM	16.6	9.525	4.76	3.81	0.8		★	●	★	○											○										
 For semi-finishing	VNMG160412-DM	16.6	9.525	4.76	3.81	1.2		○	○	○												○										
EM	VNMG160404-EM	16.6	9.525	4.76	3.81	0.4									●	★					★		★									
 For semi-finishing	VNMG160408-EM	16.6	9.525	4.76	3.81	0.8									●	★					★		★									
NM	VNMG160412-NM	16.6	9.525	4.76	3.81	1.2							○	★										○							○	
 For semi-finishing																																
SNR	VNMG160408-SNR	16.6	9.525	4.76	3.81	0.8							○	●			○							●								
 For roughing	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'



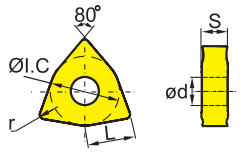
Page A170

DVJNR/L
Kr:93°



A170

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

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

Applicable tool

DWLNR/L Kr:95°



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PWLNR/L Kr:95°



A183

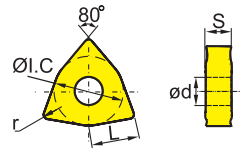
PWLNR/L Kr:95°



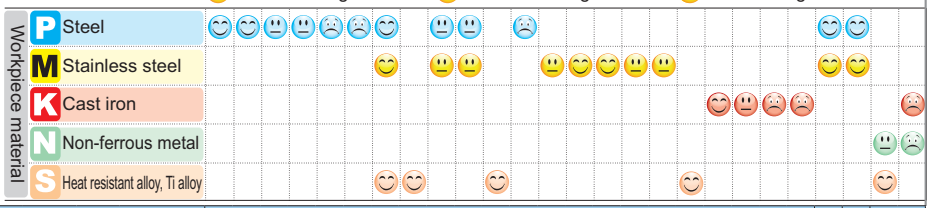
A217

Insert code key A50–A51
Grade selection reference A19/A36–A48
Chipbreaker selection reference A22–A35
Recommended cutting parameters A241–A244

WN□□ (Negative inserts)



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
EF	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									●	★				★	○											
For finishing	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							○		●	★				★	★											
NF	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 finishing																																
WGM	WNMG060408-WGM	6.5	9.525	4.76	3.81	0.8				★						★										★						
	WNMG060412-WGM	6.5	9.525	4.76	3.81	1.2				★						★										★						
For semi-finishing Wiper	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°



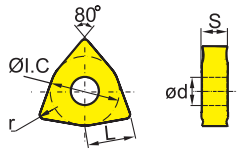
A183

PWLNR/L Kr:95°



A217

WN□□ (Negative inserts)



Good working condition Normal working condition Bad working condition

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
PM For semi-finishing	WNMG060408-PM	6.5	9.525	4.76	3.81	0.8		★	●	○	○															★	★					
	WNMG060412-PM	6.5	9.525	4.76	3.81	1.2		○		○																★	★					
	WNMG080404-PM	8.7	12.7	4.76	5.16	0.4		○	●	○	○																					
	WNMG080408-PM	8.7	12.7	4.76	5.16	0.8		★	●	★	●															★	★	★				
	WNMG080412-PM	8.7	12.7	4.76	5.16	1.2		★	●	★	●															★	★	★				
	WNMG080416-PM	8.7	12.7	4.76	5.16	1.6				○																○	○					
	WNMG080608-PM	8.7	12.7	6.35	5.16	0.8				○																						
DM For semi-finishing	WNMG06T304-DM	6.5	9.525	3.97	3.81	0.4				○																						
	WNMG06T308-DM	6.5	9.525	3.97	3.81	0.8			○	○																						
	WNMG06T312-DM	6.5	9.525	3.97	3.81	1.2				○																						
	WNMG060408-DM	6.5	9.525	4.76	3.81	0.8		★	●	★	●											●										
	WNMG060412-DM	6.5	9.525	4.76	3.81	1.2			○	○																						
	WNMG080404-DM	8.7	12.7	4.76	5.16	0.4		★	●	★	○				○							○										
	WNMG080408-DM	8.7	12.7	4.76	5.16	0.8		★	●	★	●											○										
	WNMG080412-DM	8.7	12.7	4.76	5.16	1.2		★	●	★												○										
	WNMG080416-DM	8.7	12.7	4.76	5.16	1.6				○																						
EM For semi-finishing	WNMG06T304-EM	6.5	9.525	3.97	3.81	0.4									○	★					○		★									
	WNMG06T308-EM	6.5	9.525	3.97	3.81	0.8									○	★					○		★									
	WNMG06T312-EM	6.5	9.525	3.97	3.81	1.2									○	★					○		★									
	WNMG060404-EM	6.5	9.525	4.76	3.81	0.4									○	★					○		★									
	WNMG060408-EM	6.5	9.525	4.76	3.81	0.8									●	★					○		★									
	WNMG080404-EM	8.7	12.7	4.76	5.16	0.4									●	★					★		★									
	WNMG080408-EM	8.7	12.7	4.76	5.16	0.8									●	★					★		★									
	WNMG080412-EM	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°

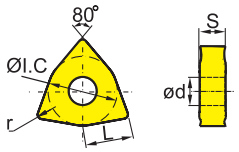


A217

Insert code key A50–A51
Grade selection reference A19/A36–A48
Chipbreaker selection reference A22–A35
Recommended cutting parameters A241–A244

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

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
NM	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 semi-finishing																																
DR	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		○	○	★	○															●	●					
For roughing	WNMG080412-DR	8.7	12.7	4.76	5.16	1.2		○	○	★	○															●	●					
	WNMG080416-DR	8.7	12.7	4.76	5.16	1.6				○																○	○					
SNR	WNMG080408-SNR	8.7	12.7	4.76	5.16	0.8							○	●			○							●								
	WNMG080412-SNR	8.7	12.7	4.76	5.16	1.2							○	●			○							●								
For roughing																																
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

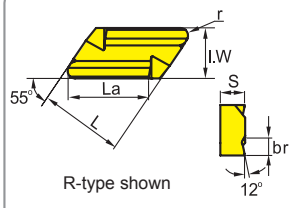
Applicable tool


DWLNR/L
Kr:95°
Page A171


PWLNR/L
Kr:95°
A183


PWLNR/L
Kr:95°
A217

KN□□ (Negative inserts)



R-type shown

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	
		La	L	l.W	S	brn	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
 Profile turning	KNUX160405L11	16	16.15	9.525	4.76	2.2	0.5	○		●	★	○											●										
	KNUX160410L11	16	16.15	9.525	4.76	2.2	1.0			●													○										
	KNUX160405L12	16	16.15	9.525	4.76	2.2	0.5	○		●													○										
	KNUX160410L12	16	16.15	9.525	4.76	2.2	1.0	○	○	●													○										
	KNUX160415L12	16	16.15	9.525	4.76	2.2	1.5			○																							
	KNUX160405R11	16	16.15	9.525	4.76	2.2	0.5	●		●	○	●											●										
	KNUX160410R11	16	16.15	9.525	4.76	2.2	1.0	○		●													○										
	KNUX160405R12	16	16.15	9.525	4.76	2.2	0.5	●		●													○										
	KNUX160410R12	16	16.15	9.525	4.76	2.2	1.0	○	○	●		○											○										
	KNUX160415R12	16	16.15	9.525	4.76	2.2	1.5			○																							

Note: KNUX160405L11
Chipbreaker code: 11→Declining chipbreaker 12→Straight chipbreaker

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



Applicable tool

CKJNR/L Kr:93°



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CKNNR/L Kr:63°

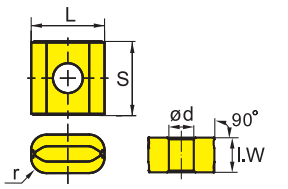


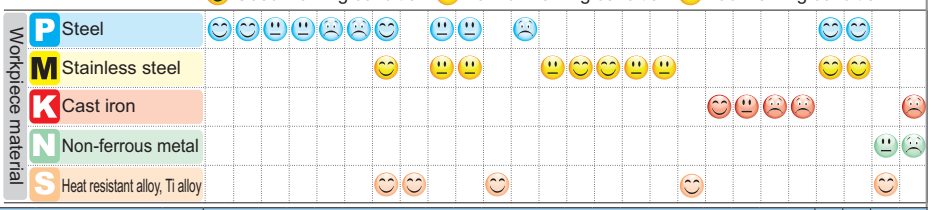
A204

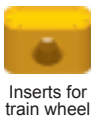
Insert code key A50–A51
Grade selection reference A19/A36–A48
Chipbreaker selection reference A22–A35
Recommended cutting parameters A241–A244

Heavy turning(Negative inserts)

Good working condition Normal working condition Bad working condition

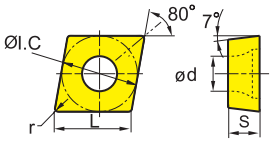




Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																			Cermet	Coated cermet	Cemented carbide	
		L	l.W	S	ød	r	YBC151	YBC152	YBC251	YBC252	YBC351	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBM151	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YBD252	YNG151	YNG151C	YD101	YD201
 Inserts for train wheel hub	**175.32-191940-22**	19.05	10	19.05	6.35	4.0	●		●																						
	175.32-191940-27	19.05	10	19.05	7.2	4.0			●																						
 Inserts for train wheel hub	**175.32-191940-24**	19.05	10	19.05	6.35	4.0	○		●																						
	175.32-301940-24	30	10	19.05	6.35	4.0	○		●																						
 Inserts for train wheel hub	**175.32-191940-25**	19.05	10	19.05	6.35	4.0			●																						
 Inserts for train wheel hub	**175.32-191940-28**	19.05	10	19.05	6.35	4.0	●	★	●	○																					

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

CC□□ (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
USF  For extra finishing	CCGT09T301R-USF	9.7	9.525	3.97	4.4	0.1									○	○																
	CCGT09T302R-USF	9.7	9.525	3.97	4.4	0.2									●	○																
	CCGT09T304R-USF	9.7	9.525	3.97	4.4	0.4									○	○																
USF  For extra finishing	CCGT09T301L-USF	9.7	9.525	3.97	4.4	0.1									○	○																
	CCGT09T302L-USF	9.7	9.525	3.97	4.4	0.2									●	○																
	CCGT09T304L-USF	9.7	9.525	3.97	4.4	0.4									○	○																
SF  For extra finishing	CCGT060202-SF	6.4	6.35	2.38	2.8	0.2							○																○	○		
	CCGT060204-SF	6.4	6.35	2.38	2.8	0.4							○																○	○		
	CCGT09T304-SF	9.7	9.525	3.97	4.4	0.4							○																○	★		
HF  For finishing	CCMT060202-HF	6.4	6.35	2.38	2.8	0.2		★	●	★					●														○			○
	CCMT060204-HF	6.4	6.35	2.38	2.8	0.4		★	●	○	○				●													●	●		●	
	CCMT060208-HF	6.4	6.35	2.38	2.8	0.8		★	●		○				●							○							●			
	CCMT09T302-HF	9.7	9.525	3.97	4.4	0.2			●	○					●														●			○
	CCMT09T304-HF	9.7	9.525	3.97	4.4	0.4		★	●	★	○				●												●	●	●	○		○
	CCMT09T308-HF	9.7	9.525	3.97	4.4	0.8		★	●	○	○				●							○			○	○	○		●		○	○
	CCMT120404-HF	12.9	12.7	4.76	5.56	0.4	●	○	●	○																	●		○			
	CCMT120408-HF	12.9	12.7	4.76	5.56	0.8		○																								

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

Applicable tool


SCACR/L Kr:90°
Page A184


SCLCR/L Kr:95°
A185

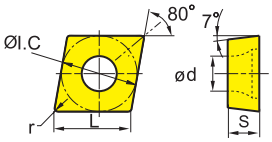

SCLCR/L Kr:95°
A218


SCFCR/L Kr:90°
A232

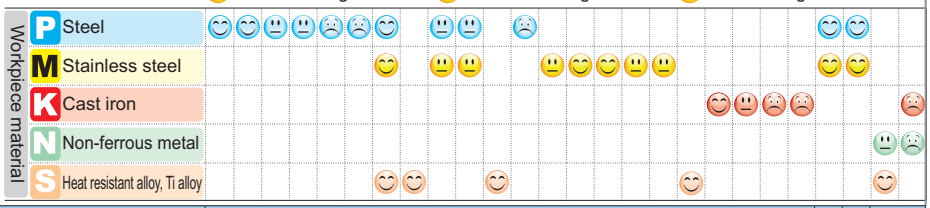

SCLCR/L Kr:95°
A233

Insert code key A50–A51
Grade selection reference A19/A36–A48
Chipbreaker selection reference A22–A35
Recommended cutting parameters A241–A244

CC□□ (Positive inserts)



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
EF	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							○		●	★				○	○											
HM	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		○	○																	○						
EM	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									●	★					○		★									

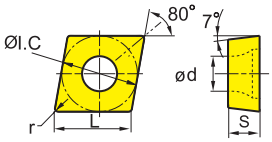
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool



Page A184 A185 A218 A232 A233

CC□□ (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
HR	CCMT060204-HR	6.4	6.35	2.38	2.8	0.4		○	●	○	○				○																	
	CCMT060208-HR	6.4	6.35	2.38	2.8	0.8		○	●		●											●					●					
	CCMT09T304-HR	9.7	9.525	3.97	4.4	0.4			●		○				○																	
	CCMT09T308-HR	9.7	9.525	3.97	4.4	0.8		★	●	★	●											●			●	●	●				●	
For roughing	CCMT120408-HR	12.9	12.7	4.76	5.56	0.8		★	●		●				○							●			●	●	●				●	●
	CCMT120412-HR	12.9	12.7	4.76	5.56	1.2		○	●		●											○				●	○					
LC	CCGX060202-LC	6.4	6.35	2.38	2.8	0.2																								★	
	CCGX060204-LC	6.4	6.35	2.38	2.8	0.4																								★	
	CCGX09T302-LC	9.7	9.525	3.97	4.4	0.2																								★	
	CCGX09T304-LC	9.7	9.525	3.97	4.4	0.4																								★	
For Al machining	CCGX09T308-LC	9.7	9.525	3.97	4.4	0.8																								★	
	CCGX120404-LC	12.9	12.7	4.76	5.5	0.4																								★	
	CCGX120408-LC	12.9	12.7	4.76	5.5	0.8																								★	
LH	CCGX060202-LH	6.4	6.35	2.38	2.8	0.2																								★	
	CCGX060204-LH	6.4	6.35	2.38	2.8	0.4																								★	●
	CCGX060208-LH	6.4	6.35	2.38	2.8	0.8																								★	
For Al machining	CCGX09T302-LH	9.7	9.525	3.97	4.4	0.2																								★	

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

Applicable tool


SCACR/L Kr:90°
Page A184


SCLCR/L Kr:95°
A185

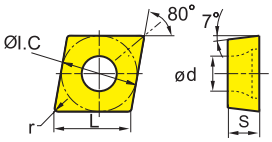

SCLCR/L Kr:95°
A218


SCFCR/L Kr:90°
A232

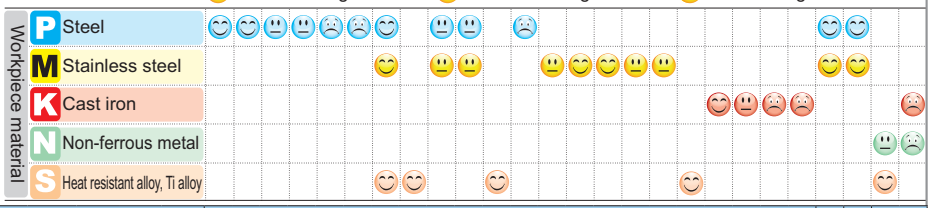

SCLCR/L Kr:95°
A233

Insert code key A50–A51
Grade selection reference A19/A36–A48
Chipbreaker selection reference A22–A35
Recommended cutting parameters A241–A244

CC□□ (Positive inserts)



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
LH  For Al machining	CCGX09T304-LH	9.7	9.525	3.97	4.4	0.4																								★	●
	CCGX09T308-LH	9.7	9.525	3.97	4.4	0.8																								★	
	CCGX120402-LH	12.9	12.7	4.76	5.56	0.2																								○	
	CCGX120404-LH	12.9	12.7	4.76	5.56	0.4																								★	
	CCGX120408-LH	12.9	12.7	4.76	5.56	0.8																								★	
	CCGX120412-LH	12.9	12.7	4.76	5.56	1.2																								○	
Without chipbreaker 	CCMW060204	6.4	6.35	2.38	2.8	0.4																								●	
	CCMW09T304	9.7	9.525	3.97	4.4	0.4																								●	●
	CCMW09T308	9.7	9.525	3.97	4.4	0.8	○																							○	
	CCMW120404	12.9	12.7	4.76	5.56	0.4																									●
	CCMW120408	12.9	12.7	4.76	5.56	0.8																								●	○

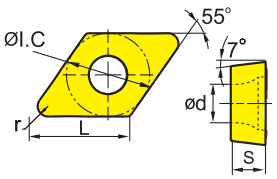
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool



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

DC□□ (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
USF	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									●	○																
For extra finishing	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	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									●	○																
For extra finishing	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	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							○																			
For extra finishing	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	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		★	●	○					●														○			○
For finishing	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

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

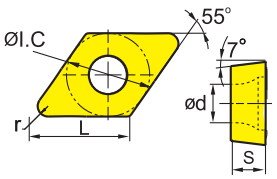
SDZCR/L Kr:95°



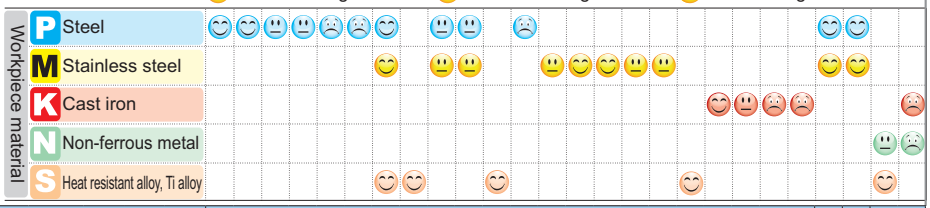
A221

Insert code key A50–A51
Grade selection reference A19/A36–A48
Chipbreaker selection reference A22–A35
Recommended cutting parameters A241–A244

DC□□ (Positive inserts)



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
EF	DCMT070202-EF	7.8	6.35	2.38	2.8	0.2							○		●	★				★	○											
	DCMT070204-EF	7.8	6.35	2.38	2.8	0.4							○		●	★				★	○											
	DCMT11T302-EF	11.6	9.525	3.97	4.4	0.2							○		●	★				★	○											
	DCMT11T304-EF	11.6	9.525	3.97	4.4	0.4							○		●	★				★	○											
For finishing	DCMT11T308-EF	11.6	9.525	3.97	4.4	0.8							○		●	★				○	○											
HM	DCMT070204-HM	7.8	6.35	2.38	2.8	0.4		★	●	★	●				●							●					●					
	DCMT070208-HM	7.8	6.35	2.38	2.8	0.8		★	●	★					○							○					○					
	DCMT11T304-HM	11.6	9.525	3.97	4.4	0.4	●	★	●	★	○				●							●				●	●		●		●	○
For semi-finishing	DCMT11T308-HM	11.6	9.525	3.97	4.4	0.8	●	★	●	★	●				●							●				●	○		○			○
	DCMT11T312-HM	11.6	9.525	3.97	4.4	1.2			○																							
EM	DCMT070204-EM	7.8	6.35	2.38	2.8	0.4									●	★					○		★									
	DCMT070208-EM	7.8	6.35	2.38	2.8	0.8									●	★					○		★									
	DCMT11T304-EM	11.6	9.525	3.97	4.4	0.4									●	★					○		★									
For semi-finishing	DCMT11T308-EM	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

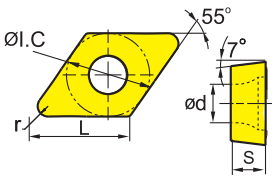
SDNCN Kr:62°30'
A188

SDQCR/L Kr:107°30'
A219

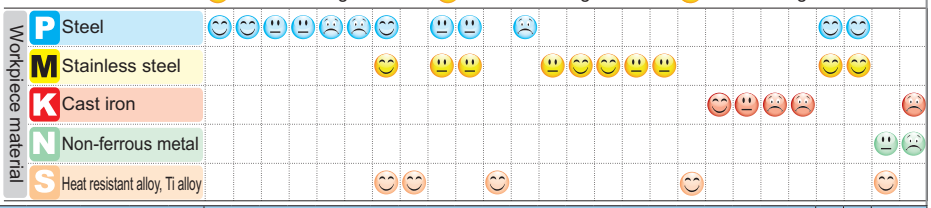
SDUCR/L Kr:93°
A220

SDZCR/L Kr:95°
A221

DC□□ (Positive inserts)



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
HR	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 roughing																															
LC	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																								★	
For Al machining	DCGX11T308-LC	11.6	9.525	3.97	4.4	0.8																								★	
LH	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																								★	●
For Al machining	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°



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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°

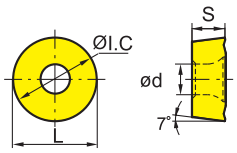


A221

Insert code key A50–A51
Grade selection reference A19/A36–A48
Chipbreaker selection reference A22–A35
Recommended cutting parameters A241–A244

RC□□ (Positive inserts)

Good working condition / Normal working condition / Bad working condition

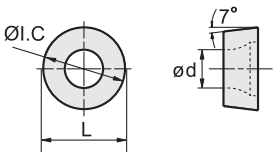


Workpiece material:
- P Steel
- M Stainless steel
- K Cast iron
- N Non-ferrous metal
- S Heat resistant alloy, Ti alloy

Inserts shape	Type	Dimensions(mm) L	ØI.C	S	ød	Coated cemented carbide YBC151	YBC152	YBC251	YBC252	YBC351	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBM151	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YBD252	Cermet YNG151	Coated cermet YNG151C	Cemented carbide YD101	YD201
	RCGT1204MO	12	12	4.76	4.4			○																							
	RCMT0803MO	8.0	8.0	3.18	3.36				○																						
	RCMT10T3MO	10	10	3.97	4.4				○																						
	RCMT1204MO	12	12	4.76	4.4	○		●	★															★	★	○					
	RCMT1606MO	16	16	6.35	5.5	○		●		●														★							

★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

Inserts shape	Type	Dimensions(mm) L	ØI.C	S	ød	Coated cemented carbide YBC151	YBC152	YBC251	YBC252	YBC351	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBM151	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YBD252	Cermet YNG151	Coated cermet YNG151C	Cemented carbide YD101	YD201
LH  For Al machining	RCGX0803MO-LH	8.0	8.0	3.18	3.36																									★	

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

Applicable tool

SRDCN

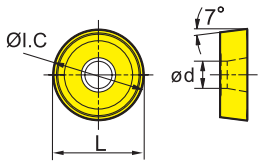


SRGCR/L



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RC□□ (Positive inserts)



Good working condition　Normal working condition　Bad working condition

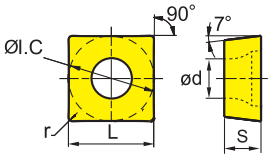
Workpiece material

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

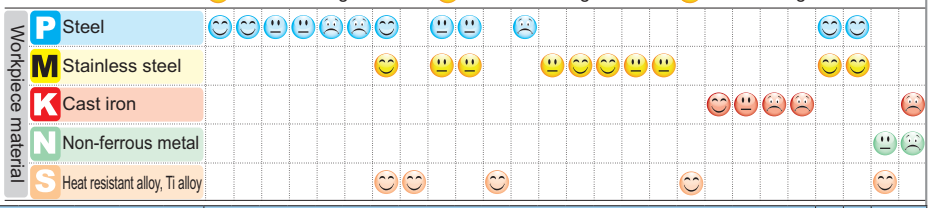
Inserts shape	Type	Dimensions(mm)				Coated cemented carbide																	Cermet	Coated cermet	Cemented carbide	
		L	ØI.C	S	ød	YBC151	YBC152	YBC251	YBC252	YBC351	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBM151	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YBD252	YNG151	YNG151C	YD101	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

SC□□ (Positive inserts)



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
HF	**SCMT09T302-HF**	9.525	9.525	3.97	4.4	0.2		○	○						○												○					
	SCMT09T304-HF	9.525	9.525	3.97	4.4	0.4		●	●	○																					
	SCMT09T308-HF	9.525	9.525	3.97	4.4	0.8		●	○						○												○				○
For finishing																															
EF	**SCMT09T302-EF**	9.525	9.525	3.97	4.4	0.2							○		●	★				★	○											
	SCMT09T304-EF	9.525	9.525	3.97	4.4	0.4							○		●	★				★	○											
	SCMT09T308-EF	9.525	9.525	3.97	4.4	0.8							○		●	★				○	○											
For finishing																															
HM	**SCMT09T304-HM**	9.525	9.525	3.97	4.4	0.4		○	●													●				●	●				
	SCMT09T308-HM	9.525	9.525	3.97	4.4	0.8		●	●	○	●				○							●				●	○				
	SCMT120404-HM	12.7	12.7	4.76	5.56	0.4		○	●		○																●				
	SCMT120408-HM	12.7	12.7	4.76	5.56	0.8		●	●	○	○		●		○							●				●					
For semi-finishing	**SCMT120412-HM**	12.7	12.7	4.76	5.56	1.2		○	○													○									
EM	**SCMT09T304-EM**	9.525	9.525	3.97	4.4	0.4									●	★					○		★								
	SCMT09T308-EM	9.525	9.525	3.97	4.4	0.8									●	★					○		★								
	SCMT120404-EM	12.7	12.7	4.76	5.56	0.4									●	★					○		★								
	SCMT120408-EM	12.7	12.7	4.76	5.56	0.8									●	★					○		★								
For semi-finishing	**SCMT120412-EM**	12.7	12.7	4.76	5.56	1.2									●	★					○		★								

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

Applicable tool



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A195



A196

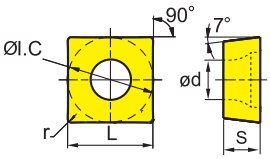


A197



A222

SC□□ (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
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																								○	
For Al machining	SCGX120408-LH	12.7	12.7	4.76	5.56	0.8																								★	
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		○	●		○																				
For roughing	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

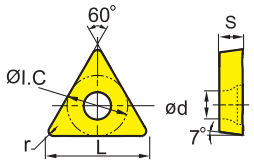

SSKCR/L
Kr:75°
A196


SSSCR/L
Kr:45°
A197

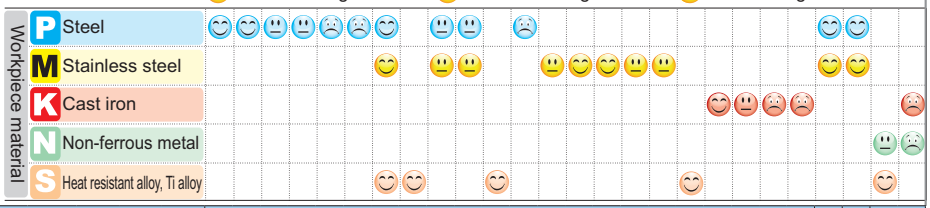

SSKCR/L
Kr:75°
A222

Insert code key A50–A51
Grade selection reference A19/A36–A48
Chipbreaker selection reference A22–A35
Recommended cutting parameters A241–A244

TC□□ (Positive inserts)



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	TCGT110301R-USF	11	6.35	3.18	2.8	0.1									●	○																
	TCGT110302R-USF	11	6.35	3.18	2.8	0.2									●	○																
For extra finishing																																
USF	TCGT110301L-USF	11	6.35	3.18	2.8	0.1									●	○																
	TCGT110302L-USF	11	6.35	3.18	2.8	0.2									●	○																
For extra finishing																																
SF	TCGT090202-SF	9.6	5.56	2.38	2.5	0.2							○																			
	TCGT090204-SF	9.6	5.56	2.38	2.5	0.4							○																	○		
	TCGT090208-SF	9.6	5.56	2.38	2.5	0.8							○																			
	TCGT110302-SF	11	6.35	3.18	2.8	0.2							○																○			
For extra finishing	TCGT110304-SF	11	6.35	3.18	2.8	0.4							○																○	○		
	TCGT110308-SF	11	6.35	3.18	2.8	0.8							○																			

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

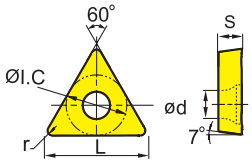


Applicable tool



Page A198 A198 A199 A200 A223

TC□□ (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
HF  For finishing	TCMT090202-HF	9.6	5.56	2.38	2.5	0.2		★	●													○						○		○	
	TCMT090204-HF	9.6	5.56	2.38	2.5	0.4		★	●																			●			
	TCMT090208-HF	9.6	5.56	2.38	2.5	0.8			○																	○					
	TCMT110202-HF	11	6.35	2.38	2.8	0.2			●						●							○									
	TCMT110204-HF	11	6.35	2.38	2.8	0.4	●	★	●	★												●					●		○			
	TCMT110208-HF	11	6.35	2.38	2.8	0.8		○	●	○					●							○				○				○	
	TCMT16T302-HF	16.5	9.525	3.97	4.4	0.2		○																							
	TCMT16T304-HF	16.5	9.525	3.97	4.4	0.4		●	●						○												●	●			
	TCMT16T308-HF	16.5	9.525	3.97	4.4	0.8		○	●																			○		○	

★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

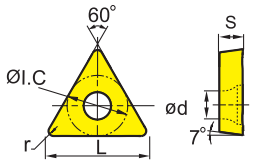

STGCR/L Kr:91°
A199


STECR/L Kr:60°
A200

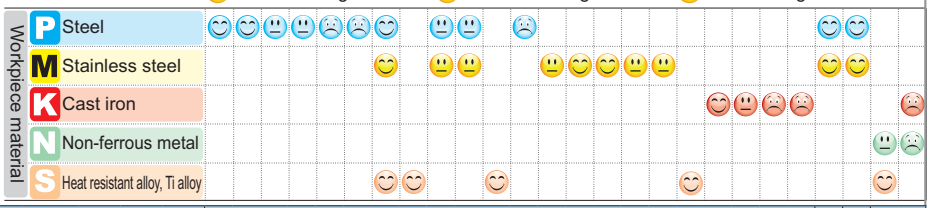

STFCR/L Kr:90°
A223

Insert code key A50–A51
Grade selection reference A19/A36–A48
Chipbreaker selection reference A22–A35
Recommended cutting parameters A241–A244

TC□□ (Positive inserts)



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
EF For finishing	TCMT090202-EF	9.6	5.56	2.38	2.5	0.2							○		●	★				★	○											
	TCMT090204-EF	9.6	5.56	2.38	2.5	0.4							○		●	★				★	○											
	TCMT110202-EF	11	6.35	2.38	2.8	0.2							○		●	★				★	○											
	TCMT110204-EF	11	6.35	2.38	2.8	0.4							○		●	★				★	○											
	TCMT110208-EF	11	6.35	2.38	2.8	0.8							○		●	★				○	○											
	TCMT16T304-EF	16.5	9.525	3.97	4.4	0.4							○		●	★				★	○											
	TCMT16T308-EF	16.5	9.525	3.97	4.4	0.8							○		●	★				○	○											
EM For semi-finishing	TCMT090204-EM	9.6	5.56	2.38	2.8	0.4									●	★					○		★									
	TCMT090208-EM	9.6	5.56	2.38	2.8	0.8									●	★					○		★									
	TCMT110204-EM	11	6.35	2.38	2.8	0.4									●	★					○		★									
	TCMT110208-EM	11	6.35	2.38	2.8	0.8									●	★					○		★									
	TCMT110212-EM	11	6.35	2.38	2.8	1.2									●	★					○		★									
	TCMT16T304-EM	16.5	9.525	3.97	4.4	0.4									●	★					○		★									
	TCMT16T308-EM	16.5	9.525	3.97	4.4	0.8									●	★					○		★									
	TCMT16T312-EM	16.5	9.525	3.97	4.4	1.2									●	★					○		★									

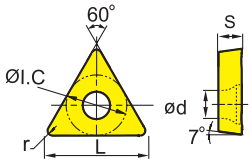
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Applicable tool

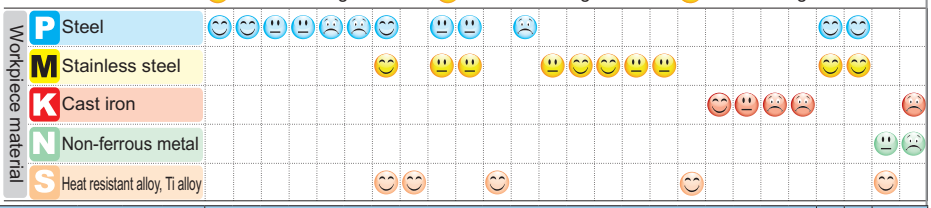


STACR/L Kr:90°	STFCR/L Kr:90°	STGCR/L Kr:91°	STECR/L Kr:60°	STFCR/L Kr:90°
Page A198	A198	A199	A200	A223

TC□□ (Positive inserts)



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
HM	TCMT090204-HM	9.6	5.56	2.38	2.5	0.4		★	●		○											○					●				
	TCMT090208-HM	9.6	5.56	2.38	2.5	0.8		○	●		○																				
	TCMT110204-HM	11	6.35	2.38	2.8	0.4		★	●	○	○				●							●				●	●		○		
	TCMT110208-HM	11	6.35	2.38	2.8	0.8		★	●		○																●				
For semi-finishing	TCMT16T304-HM	16.5	9.525	3.97	4.4	0.4		★	●	★	●											●				○	●				
	TCMT16T308-HM	16.5	9.525	3.97	4.4	0.8		★	●	★	●											●				●	●			○	
	TCMT16T312-HM	16.5	9.525	3.97	4.4	1.2			●		●											○									
HR	TCMT090204-HR	9.6	5.56	2.38	2.5	0.4			○																						
	TCMT090208-HR	9.6	5.56	2.38	2.5	0.8																					○				●
	TCMT110204-HR	11	6.35	2.38	2.8	0.4			○																						
	TCMT110208-HR	11	6.35	2.38	2.8	0.8			○																						
For roughing	TCMT16T304-HR	16.5	9.525	3.97	4.4	0.4		○	●																						
	TCMT16T308-HR	16.5	9.525	3.97	4.4	0.8		●	●		●															●	●				
	TCMT16T312-HR	16.5	9.525	3.97	4.4	1.2		○	●																	●	●				○
	TCMT220408-HR	22	12.7	4.76	5.5	0.8		○	●		○											●									
LC	TCGX090202-LC	9.6	5.56	2.38	2.5	0.2																								★	
	TCGX090204-LC	9.6	5.56	2.38	2.5	0.4																								★	
	TCGX110202-LC	11	6.35	2.38	2.8	0.2																								★	
	TCGX110204-LC	11	6.35	2.38	2.8	0.4																								★	
For Al machining	TCGX110208-LC	11	6.35	2.38	2.8	0.8																								★	
	TCGX16T304-LC	16.5	9.525	3.97	4.4	0.4																								★	
	TCGX16T308-LC	16.5	9.525	3.97	4.4	0.8																								★	

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

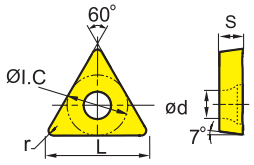
Applicable tool



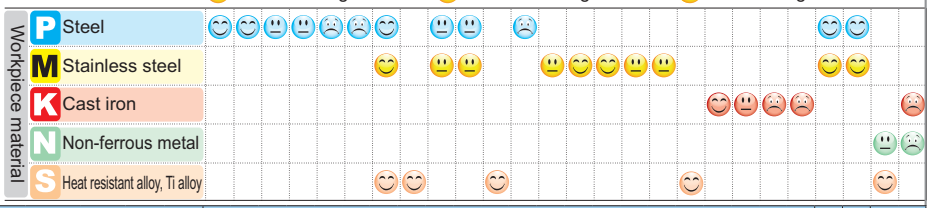
Page A198 A198 A199 A200 A223

Insert code key A50–A51
Grade selection reference A19/A36–A48
Chipbreaker selection reference A22–A35
Recommended cutting parameters A241–A244

TC□□ (Positive inserts)



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
LH  For Al 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


STACR/L Kr:90°
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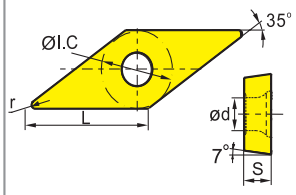

STFCR/L Kr:90°
A198


STGCR/L Kr:91°
A199


STECR/L Kr:60°
A200


STFCR/L Kr:90°
A223

VC□□ (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
USF	VCGT080201R-USF	8	4.76	2.38	2.3	0.1									○	○																
	VCGT080202R-USF	8	4.76	2.38	2.3	0.2									●	○																
For extra finishing	VCGT110301R-USF	11	6.35	3.18	2.8	0.1									●	○																
	VCGT110302R-USF	11	6.35	3.18	2.8	0.2									●	○																
USF	VCGT080201L-USF	8	4.76	2.38	2.3	0.1									○	○																
	VCGT080202L-USF	8	4.76	2.38	2.3	0.2									○	○																
For extra finishing	VCGT110301L-USF	11	6.35	3.18	2.8	0.1									○	○																
	VCGT110302L-USF	11	6.35	3.18	2.8	0.2									●	○																
SF	VCGT110302-SF	11	6.35	3.18	2.8	0.2							○																○	★		
	VCGT110304-SF	11	6.35	3.18	2.8	0.4							○																○	★		
For extra finishing																																
HF	VCGT110304-HF	11	6.35	3.18	2.8	0.4			●																							
																																
For finishing																																
NF	VCGT160408-NF	16.5	9.525	4.76	4.4	0.8							●	★																		
																																
For finishing																																
NGF	VCGT160408-NGF	16.5	9.525	4.76	4.4	0.8							○	●			○															
																																
For finishing																																

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

Applicable tool



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A225



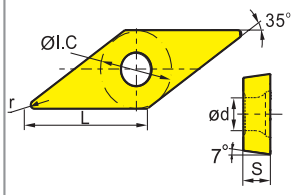
A192



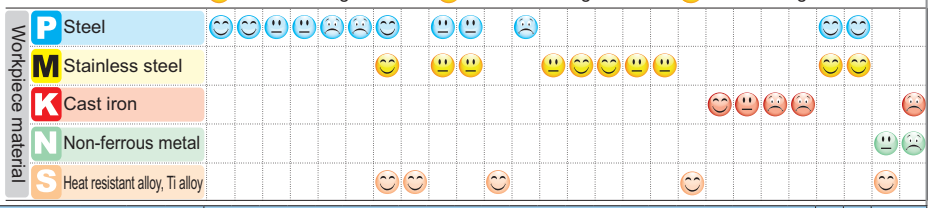
A193

Insert code key A50–A51
Grade selection reference A19/A36–A48
Chipbreaker selection reference A22–A35
Recommended cutting parameters A241–A244

VC□□ (Positive inserts)



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
LC  For Al machining	VCGX110301-LC	11	6.35	3.18	2.8	0.1																								★	
	VCGX110302-LC	11	6.35	3.18	2.8	0.2																								★	
	VCGX110304-LC	11	6.35	3.18	2.8	0.4																								★	
	VCGX110308-LC	11	6.35	3.18	2.8	0.8																								★	
	VCGX160404-LC	16.6	9.525	4.76	4.4	0.4																								★	
	VCGX160408-LC	16.6	9.525	4.76	4.4	0.8																								★	
	VCGX160412-LC	16.6	9.525	4.76	4.4	1.2																								★	
	VCGX220530-LC	22	12.7	5.56	5.5	3.0																								★	
LH  For Al machining	VCGX110202-LH	11	6.35	2.38	2.8	0.2																								○	
	VCGX110204-LH	11	6.35	2.38	2.8	0.4																								★	
	VCGX110301-LH	11	6.35	3.18	2.8	0.1																								★	●
	VCGX110302-LH	11	6.35	3.18	2.8	0.2																								★	●
	VCGX110304-LH	11	6.35	3.18	2.8	0.4																								★	●
	VCGX110308-LH	11	6.35	3.18	2.8	0.8																								○	
	VCGX160402-LH	16.6	9.525	4.76	4.4	0.2																								★	
	VCGX160404-LH	16.6	9.525	4.76	4.4	0.4																								★	○
	VCGX160408-LH	16.6	9.525	4.76	4.4	0.8																								★	○
	VCGX160412-LH	16.6	9.525	4.76	4.4	1.2																								★	●
	VCGX220530-LH	22	12.7	5.56	5.5	3.0																								★	●

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

Applicable tool



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A225

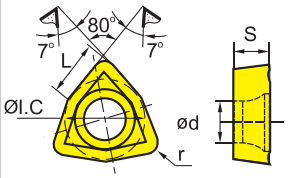


A192



A193

WC□□ (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
53 	WCMX040208R-53	4.3	6.35	2.38	3.1	0.8			●																						○
	WCMX06T308R-53	6.5	9.525	3.97	3.7	0.8	●		○																						○
	WCMX080412R-53	8.7	12.7	4.76	4.3	1.2									○	○	○										○				

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



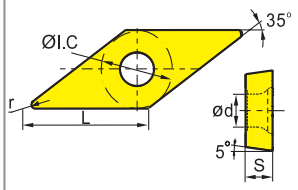
Applicable tool

SWACR/L
Kr:90°

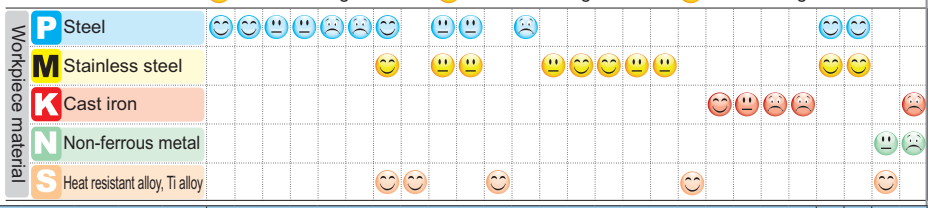


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VB□□ (Positive inserts)



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
SF  For extra finishing	**VBGT110302-SF**	11	6.35	3.18	2.8	0.2							○																○	○		
	VBGT110304-SF	11	6.35	3.18	2.8	0.4							○																○	○		
EF  For finishing	**VBMT110302-EF**	11	6.35	3.18	2.8	0.2							○		●	★				★	○											
	VBMT110304-EF	11	6.35	3.18	2.8	0.4							○		●	★				★	○											
	VBMT110308-EF	11	6.35	3.18	2.8	0.8							○		●	★				○	○											
	VBMT160404-EF	16.5	9.525	4.76	4.4	0.4							○		●	★				★	●											
	VBMT160408-EF	16.5	9.525	4.76	4.4	0.8							○		●	★				○	●											
HF  For finishing	**VBMT110202-HF**	11	6.35	2.38	2.8	0.2			●		○				●																	
	VBMT110204-HF	11	6.35	2.38	2.8	0.4			●						○												○					
	VBMT110208-HF	11	6.35	2.38	2.8	0.8			●						○																	
NF  For finishing	**VBET160404-NF**	16.5	9.525	4.76	4.4	0.4							●	★																		
	VBET160408-NF	16.5	9.525	4.76	4.4	0.8							●	★																		
NGF  For finishing	**VBET160404-NGF**	16.5	9.525	4.76	4.4	0.4							○	●			○															
	VBET160408-NGF	16.5	9.525	4.76	4.4	0.8							○	●			○															
	VBET160412-NGF	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



Page A189



A190



A191

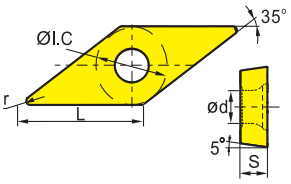


A226

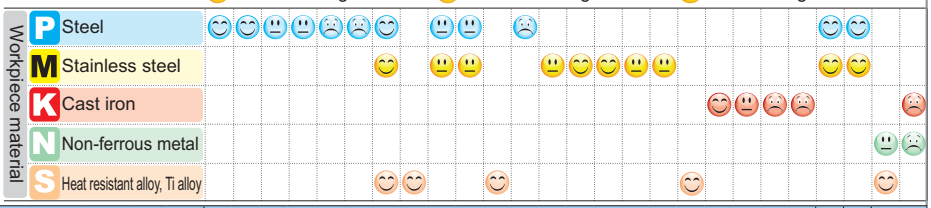


A227

VB□□ (Positive inserts)



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
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 semi-finishing																																
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					○																					
For roughing	**VBGT160408-HR**	16.5	9.525	4.76	4.4	0.8			○																							
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							○	●			○							○								
For roughing																																

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

Applicable tool

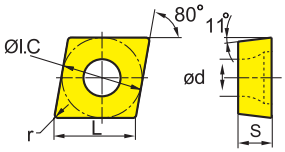


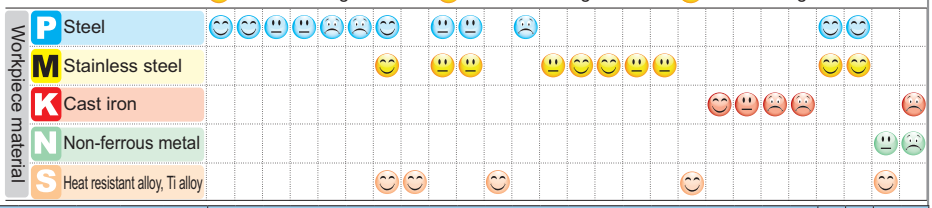
SVJBR/L Kr:93°	SVABR/L Kr:90°	SVVBN Kr:72°30'	SVQBR/L Kr:107°30'	SVUBR/L Kr:93°
Page A189	A190	A191	A226	A227

Insert code key A50–A51
Grade selection reference A19/A36–A48
Chipbreaker selection reference A22–A35
Recommended cutting parameters A241–A244

CP□□ (Positive inserts)

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
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

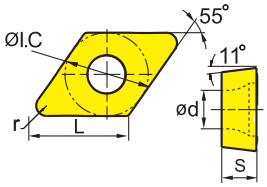
Applicable tool

SCLPR/L
Kr:95°



Page A228

DP□□ (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
USF	DPGT0702005R-USF	7.8	6.35	2.38	2.8	0.05									○	○																
	DPGT070201R-USF	7.8	6.35	2.38	2.8	0.1									○	○																
For extra finishing	DPGT11T301R-USF	11.6	9.525	3.97	4.4	0.1									●	○																
USF	DPGT0702005L-USF	7.8	6.35	2.38	2.8	0.05									○	○																
	DPGT070201L-USF	7.8	6.35	2.38	2.8	0.1									○	○																
For extra finis hing	DPGT11T301L-USF	11.6	9.525	3.97	4.4	0.1									○	○																
SF	DPGT070202-SF	7.8	6.35	2.38	2.8	0.2							○																○	○		
	DPGT070204-SF	7.8	6.35	2.38	2.8	0.4							○																○			
	DPGT070208-SF	7.8	6.35	2.38	2.8	0.8							○																			
For extra finishing	DPGT11T304-SF	11.6	9.525	3.97	4.4	0.4							○																○			
	DPGT11T308-SF	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

SDQPR/L
Kr:107°30'



Page A229

SDUPR/L
Kr:93°

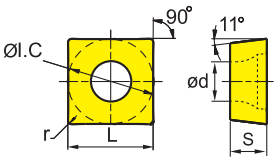


A230

Insert code key A50–A51
Grade selection reference A19/A36–A48
Chipbreaker selection reference A22–A35
Recommended cutting parameters A241–A244

SP□□ (Positive inserts)

Good working condition Normal working condition Bad working condition



Workpiece material

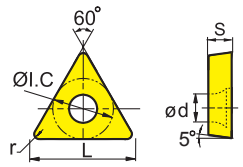
P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

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
Without chipbreaker 	**SPMW09T304**	9.525	9.525	3.97	4.4	0.4			○																					○	
	SPMW09T308	9.525	9.525	3.97	4.4	0.8	●																								
	SPMW120408	12.7	12.7	4.76	5.56	0.8																									○

★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



Workpiece material

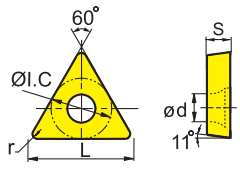
P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

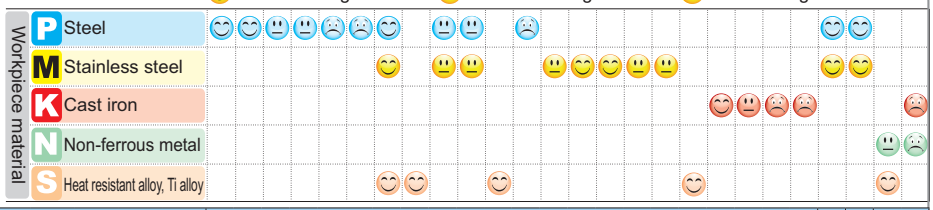
Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																		Cermet	Coated cermet	Cemented carbide	
		L	ØI.C	S	ød	r	YBC151	YBC152	YBC251	YBC252	YBC351	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBM151	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YBD252	YNG151	YNG151C	YD101	YD201
 For extra finishing	**TBGH060102L**	6.4	3.97	1.59	2.2	0.2							★																★			
	TBGH060104L	6.4	3.97	1.59	2.2	0.4							★																			

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

TP□□ (Positive inserts)

Good working condition Normal working condition Bad working condition



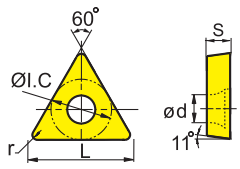


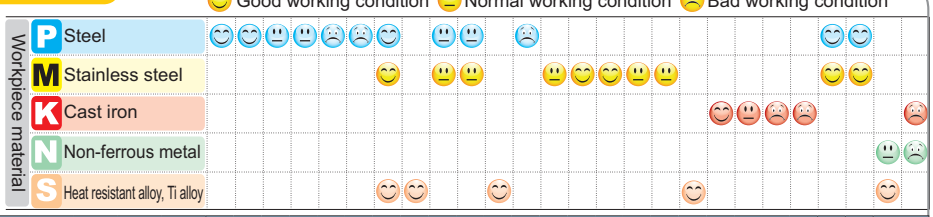
Inserts shape	Type	Dimensions(mm)					Coated cemented carbide																Cermet	Coated cermet	Cemented carbide	
		L	ØI.C	S	ød	r	YBC151	YBC152	YBC251	YBC252	YBC351	YBC352	YBG102	YBG105	YBG202	YBG205	YBG212	YBG302	YBM151	YBM153	YBM215	YBM251	YBM253	YBS103	YBD052	YBD102	YBD152	YBD252	YNG151	YNG151C	YD101	YD201
 For extra finishing	TPGH090202L	9.6	5.56	2.38	2.8	0.2							●																○			
	TPGH090204L	9.6	5.56	2.38	2.8	0.4							●																●			
	TPGH110302L	11	6.35	3.18	3.18	0.2							○																●			
	TPGH110304L	11	6.35	3.18	3.18	0.4							●																●			

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

TP□□ (Positive inserts)

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
SF  For extra finishing	TPGT090202-SF	9.6	5.56	2.38	2.5	0.2							○																	○		
	TPGT090204-SF	9.6	5.56	2.38	2.5	0.4							○																○	★		
	TPGT090208-SF	9.6	5.56	2.38	2.5	0.8							○																○			
	TPGT110302-SF	11	6.35	3.18	2.8	0.2							○																○			
	TPGT110304-SF	11	6.35	3.18	2.8	0.4							○																○	○		
	TPGT110308-SF	11	6.35	3.18	2.8	0.8							○																	○		

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

Applicable tool

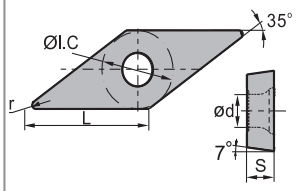
STUPR/L
Kr:93°



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Insert code key A50–A51
Grade selection reference A19/A36–A48
Chipbreaker selection reference A22–A35
Recommended cutting parameters A241–A244

VP□□ (Positive inserts)

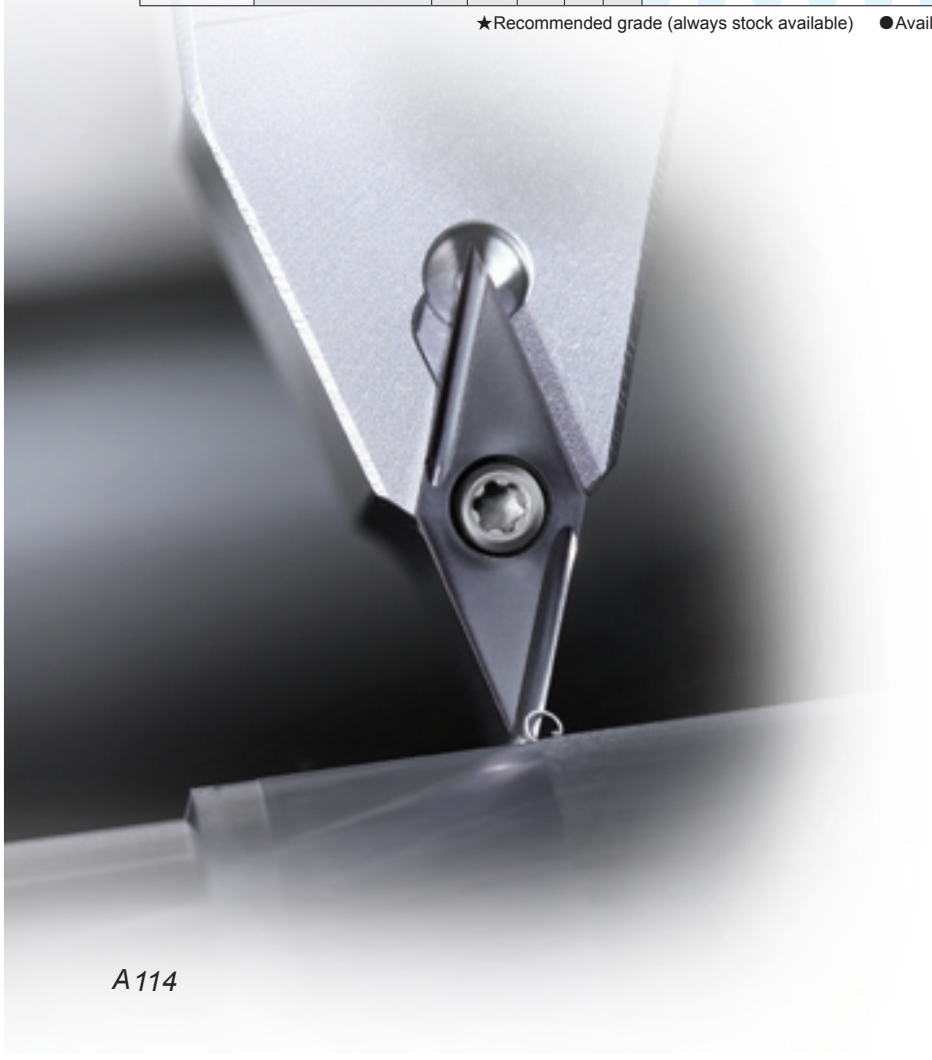


Good working condition Normal working condition Bad working condition

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
USF	VPGT080201R-USF	8	4.76	2.38	2.3	0.1									○	○																
	VPGT080202R-USF	8	4.76	2.38	2.3	0.2									○	○																
For extra finishing	VPGT110301R-USF	11	6.35	3.18	2.8	0.1									●	○																
USF	VPGT080201L-USF	8	4.76	2.43	2.3	0.1									●	○																
	VPGT080202L-USF	8	4.76	2.43	2.3	0.2									●	○																
For extra finishing	VPGT110301L-USF	11	6.35	3.18	2.8	0.1									○	○																

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

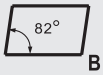




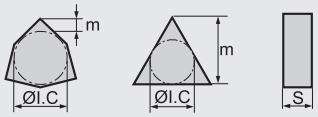
PCBN&PCD Insert

PCBN&PCD inserts code key

Insert shape

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

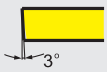
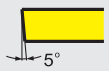
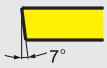
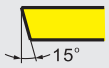
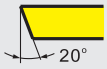
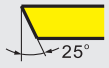
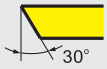
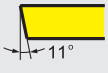
Tolerance class



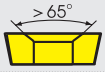
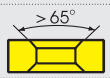
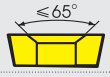
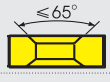
Code	Nose height M Tolerance(mm)	Inscribed circle Tolerance(mm)	Thickness S Tolerance(mm)	Code	Nose height M Tolerance(mm)	Inscribed circle Tolerance(mm)	Thickness S Tolerance(mm)
A	±0.005	±0.025	±0.025	J	±0.005	±0.05-±0.13	±0.025
F	±0.005	±0.013	±0.025	K	±0.013	±0.05-±0.13	±0.025
C	±0.013	±0.025	±0.025	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

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

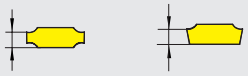
Code	With/ Without hole	Section plane of insert
N	Without	
B	With	 > 65°
C	With	 > 65°
A	With	
W	With	 ≤65°
Q	With	 ≤65°
X	---	Special

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				

PCBN&PCD inserts code key

Insert thickness



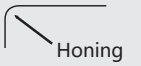
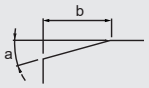
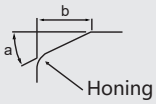
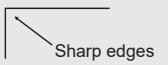
Thickness is defined as height from bottom of insert to the highest part of cutting edge.

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

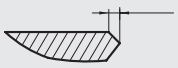
Code	Type of cutting edge	Picture
E	Honing	
T	Chamfering	
S	Chamfering +honing	
F	Sharp edges	

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

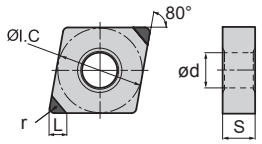
Cutting edge number

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

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	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

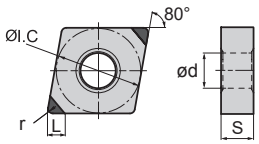
Applicable tool


DCLNR/L
Kr:95°
Page A166


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		
				ØI.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

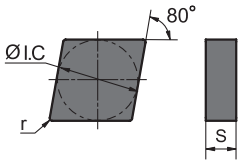
Applicable tool


DCLNR/L
Kr:95°
Page A166


PCLNR/L
Kr:95°
A173


PCLNR/L
Kr:95°
A212

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																

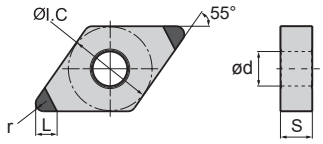
Type	Shape of insert	Model	Specifi-cation	Dimension(mm)			Cast iron				Hardened steel					Powder alloy& Superalloy		
				ØI.C	S	r	BK1011	BK1021	BK2511	BK2541	BH0121	BH1020	BH2011	BH2511	BH3511	BS1011	BS2011	BS3011
Intact insert		CNGN120404BE	BE	12.7	4.76	0.4			○									
		CNGN120408BE		12.7	4.76	0.8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

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					○	○	○					

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

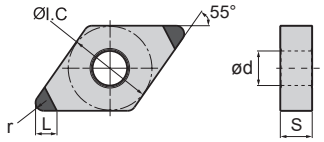

PDJNR/L
Kr:93°
A174


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
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

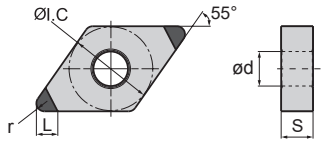

PDJNR/L Kr:93° A174


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

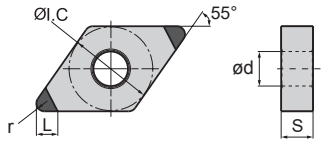

PDJNR/L
Kr:93°
A174


PDPNN
Kr:62°30'
A175


PDPNR/L
Kr:62°30'
A213


PDUNR/L
Kr:93°
A214

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
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

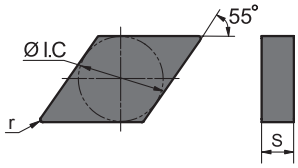

PDJNR/L
Kr:93°
A174


PDPNN
Kr:62°30'
A175


PDPNR/L
Kr:62°30'
A213


PDUNR/L
Kr:93°
A214

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	

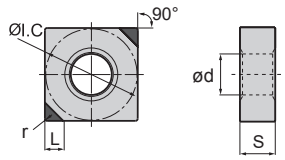
Type	Shape of insert	Model	Specifi-cation	Dimension(mm)			Cast iron				Hardened steel					Powder alloy& Superalloy		
				ØI.C	S	r	BK1011	BK1021	BK2511	BK2541	BH0121	BH1020	BH2011	BH2511	BH3511	BS1011	BS2011	BS3011
Intact insert		DNGN150404BE	BE	12.7	4.76	0.4			○									
		DNGN150408BE		12.7	4.76	0.8			○									
		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			○									

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

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

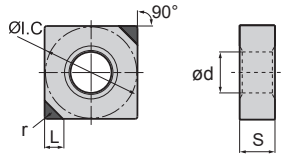

PSDNN Kr:45°
A177


PSKNR/L Kr:75°
A178


PSSNR/L Kr:45°
A179


PSKNR/L Kr:75°
A215

SN□□ (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		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

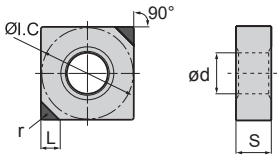

PSDNN Kr:45°
A177


PSKNR/L Kr:75°
A178


PSSNR/L Kr:45°
A179


PSKNR/L Kr:75°
A215

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

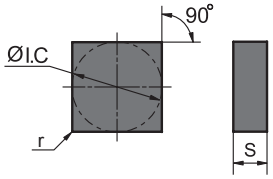

PSDNN Kr:45°
A177


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

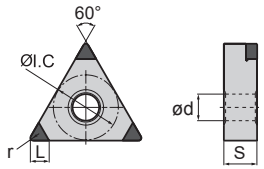
Type	Shape of insert	Model	Specifi-cation	Dimension(mm)			Cast iron				Hardened steel					Powder alloy& Superalloy		
				ØI.C	S	r	BK1011	BK1021	BK2511	BK2541	BH0121	BH1020	BH2011	BH2511	BH3511	BS1011	BS2011	BS3011
Intact insert		SNGN120404BE	BE	12.7	4.76	0.4			○									
		SNGN120408BE		12.7	4.76	0.8			○									
		SNGN120412BE		12.7	4.76	1.2			○									
		SNGN120404BT01215	T01215	12.7	4.76	0.4			★									
		SNGN120408BT01215		12.7	4.76	0.8			★									
		SNGN120412BT01215		12.7	4.76	1.2			★									
		SNGN120404BS01225	S01225	12.7	4.76	0.4			○									
		SNGN120408BS01225		12.7	4.76	0.8			○									
		SNGN120412BS01225		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

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		
				ØI.C	S	ød	r	L	BK1011	BK1021	BK2511	BK2541	BH0121	BH1020	BH2011	BH2511	BH3511	BS1011	BS2011	BS3011
Single-sided insert		TNGA160404AE-3	AE	9.525	4.76	3.81	0.4	2.5	○	○								○	○	○
		TNGA160408AE-3		9.525	4.76	3.81	0.8	2.2	○	○								○	○	○
		TNGA160412AE-3		9.525	4.76	3.81	1.2	2.0	○	○								○	○	○
		TNGA160404AT01215-3	T01215	9.525	4.76	3.81	0.4	2.5	○	○								○	○	○
		TNGA160408AT01215-3		9.525	4.76	3.81	0.8	2.2	○	○								○	○	○
		TNGA160412AT01215-3		9.525	4.76	3.81	1.2	2.0	○	○								○	○	○
		TNGA160404AS01225-3	S01225	9.525	4.76	3.81	0.4	2.5	○	○			○	○	○	○	○	○	○	○
		TNGA160408AS01225-3		9.525	4.76	3.81	0.8	2.2	○	○			○	○	○	○	○	○	○	○
		TNGA160412AS01225-3		9.525	4.76	3.81	1.2	2.0	○	○			○	○	○	○	○	○	○	○
		TNGA160404AS00815-3	S00815	9.525	4.76	3.81	0.4	2.5					○	○	○					
		TNGA160408AS00815-3		9.525	4.76	3.81	0.8	2.2					○	○	○					
		TNGA160412AS00815-3		9.525	4.76	3.81	1.2	2.0					○	○	○					
		TNGA160404AS01735-3	S01735	9.525	4.76	3.81	0.4	2.5							○	○	○			
		TNGA160408AS01735-3		9.525	4.76	3.81	0.8	2.2							○	○	○			
		TNGA160412AS01735-3		9.525	4.76	3.81	1.2	2.0							○	○	○			
Double-sided insert		TNGA160404DE-6	DE	9.525	4.76	3.81	0.4	2.5	○	○								○	○	○
		TNGA160408DE-6		9.525	4.76	3.81	0.8	2.2	○	○								○	○	○
		TNGA160412DE-6		9.525	4.76	3.81	1.2	2.0	○	○								○	○	○
		TNGA160404DT01215-6	T01215	9.525	4.76	3.81	0.4	2.5	★	★								★	★	★
		TNGA160408DT01215-6		9.525	4.76	3.81	0.8	2.2	★	★								★	★	★
		TNGA160412DT01215-6		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


DTGNR/L Kr:90°
Page A169

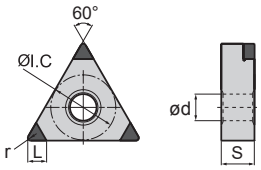

PTFNR/L Kr:90°
A180


PTTNR/L Kr:60°
A181


PTGNR/L Kr:90°
A182


PTFNR/L Kr:90°
A216

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		
				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


DTGNR/L Kr:90°
Page A169

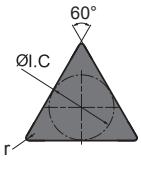

PTFNR/L Kr:90°
A180


PTTNR/L Kr:60°
A181


PTGNR/L Kr:90°
A182


PTFNR/L Kr:90°
A216

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													

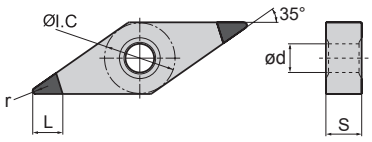
Type	Shape of insert	Model	Specifi -cation	Dimension(mm)			Cast iron				Hardened steel					Powder alloy& Superalloy		
				ØI.C	S	r	BK1011	BK1021	BK2511	BK2541	BH0121	BH1020	BH2011	BH2511	BH3511	BS1011	BS2011	BS3011
Intact insert		TNGN160404BE	BE	9.525	4.76	0.4			○									
		TNGN160408BE		9.525	4.76	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

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		
				ØI.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

DVVNN Kr:72°30'



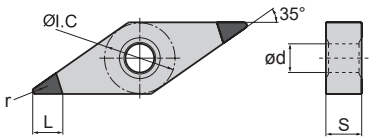
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DVJNR/L Kr:93°



A170

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		
				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'



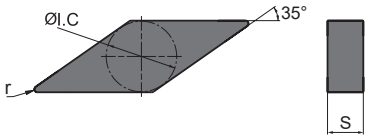
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DVJNR/L
Kr:93°



A170

VN□□ (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

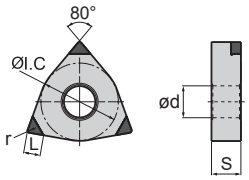
Type	Shape of insert	Model	Specifi-cation	Dimension(mm)			Cast iron				Hardened steel					Powder alloy& Superalloy		
				ØI.C	S	r	BK1011	BK1021	BK2511	BK2541	BH0121	BH1020	BH2011	BH2511	BH3511	BS1011	BS2011	BS3011
Intact insert		VNGN160402BE	BE	9.525	4.76	0.4			○									
		VNGN160404BE		9.525	4.76	0.4			○									
		VNGN160408BE		9.525	4.76	0.8												
		VNGN160412BE		9.525	4.76	1.2			○									
		VNGN160402BT01215	T01215	9.525	4.76	0.4			★									
		VNGN160404BT01215		9.525	4.76	0.4			★									
		VNGN160408BT01215		9.525	4.76	0.8			★									
		VNGN160412BT01215		9.525	4.76	1.2			★									
		VNGN160402BS01225	S01225	9.525	4.76	0.4			○									
		VNGN160404BS01225		9.525	4.76	0.4			○									
		VNGN160408BS01225		9.525	4.76	0.8												
		VNGN160412BS01225		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

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	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

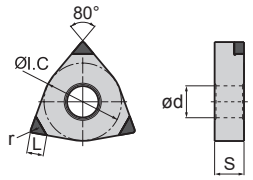
Applicable tool


DWLNR/L
Kr:95°
Page A171


PWLNR/L
Kr:95°
A183


PWLNR/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		
				ØI.C	S	ød	r	L	BK1011	BK1021	BK2511	BK2541	BH0121	BH1020	BH2011	BH2511	BH3511	BS1011	BS2011	BS3011
Double-sided insert		WNGA080404DS01225-6		12.7	4.76	5.16	0.4	2.5	○	○										
		WNGA080408DS01225-6	S01225	12.7	4.76	5.16	0.8	2.4	○	○										
		WNGA080412DS01225-6		12.7	4.76	5.16	1.2	2.3	○	○										
		WNGA080404DS00815-6		12.7	4.76	3.81	0.4	2.5					★	★	○					
		WNGA080408DS00815-6	S00815	12.7	4.76	3.81	0.8	2.2					★	★	○					
		WNGA080412DS00815-6		12.7	4.76	3.81	1.2	2.0					★	★	○					
		WNGA080404DS01225-6		12.7	4.76	3.81	0.4	2.5					★	★	★	★	★			
		WNGA080408DS01225-6	S01225	12.7	4.76	3.81	0.8	2.2					★	★	★	★	★			
		WNGA080412DS01225-6		12.7	4.76	3.81	1.2	2.0					★	★	★	★	★			
		WNGA080404DS01735-6		12.7	4.76	3.81	0.4	2.5							○	★	○			
		WNGA080408DS01735-6	S01735	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		12.7	4.76	5.16	0.4	2.5			○									
		WNGN080408CE-3	CE	12.7	4.76	5.16	0.8	2.4			○									
		WNGN080412CE-3		12.7	4.76	5.16	1.2	2.3			○									
		WNGA080404CT01215-3		12.7	4.76	5.16	0.4	2.5			★									
		WNGN080408CT01215-3	T01215	12.7	4.76	5.16	0.8	2.4			★									
		WNGN080412CT01215-3		12.7	4.76	5.16	1.2	2.3			★									
		WNGA080404CS01225-3		12.7	4.76	5.16	0.4	2.5			○									
		WNGN080408CS01225-3	S01225	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

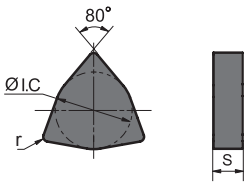
Applicable tool


DWLNR/L
Kr:95°
Page A171


PWLNR/L
Kr:95°
A183


PWLNR/L
Kr:95°
A217

WN□□ (Negative angle)



Good working condition Normal working condition Bad working condition

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

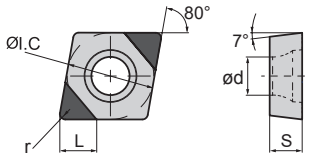
Type	Shape of insert	Model	Specifi-cation	Dimension(mm)			Cast iron				Hardened steel					Powder alloy& Superalloy		
				ØI.C	S	r	BK1011	BK1021	BK2511	BK2541	BH0121	BH1020	BH2011	BH2511	BH3511	BS1011	BS2011	BS3011
Intact insert		**WNGN080404BE**	**BE**	12.7	4.76	0.4			○									
		WNGN080408BE		12.7	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

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

Insert shape	Sepcification	Dimsension(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
	CCGW060202AE-2	6.35	2.38	2.8	0.2	2.5	○	○								○	○	○
	CCGW060204AE-2	6.35	2.38	2.8	0.4	2.5	○	○								○	○	○
	CCGW060208AE-2	6.35	2.38	2.8	0.8	2.4	○	○								○	○	○
	CCGW060202AS01225-2	6.35	2.38	2.8	0.2	2.5					○	○	○	○		○	○	○
	CCGW060204AS01225-2	6.35	2.38	2.8	0.4	2.5					○	○	○	○		○	○	○
	CCGW060208AS01225-2	6.35	2.38	2.8	0.8	2.4					○	○	○	○		○	○	○
	CCGW060202AT01225-2	6.35	2.38	2.8	0.2	2.5	○	○								○	○	○
	CCGW060204AT01225-2	6.35	2.38	2.8	0.4	2.5	○	○								○	○	○
	CCGW060208AT01225-2	6.35	2.38	2.8	0.8	2.4	○	○								○	○	○
	CCGW09T302AE-2	9.525	3.97	4.4	0.2	2.5	○	○								○	○	○
	CCGW09T304AE-2	9.525	3.97	4.4	0.4	2.5	○	○								○	○	○
	CCGW09T308AE-2	9.525	3.97	4.4	0.8	2.4	○	○								○	○	○
	CCGW09T302AS01225-2	9.525	3.97	4.4	0.2	2.5					○	○	○	○		○	○	○
	CCGW09T304AS01225-2	9.525	3.97	4.4	0.4	2.5					○	○	○	○		○	○	○
	CCGW09T308AS01225-2	9.525	3.97	4.4	0.8	2.4					○	○	○	○		○	○	○
	CCGW09T302AT01225-2	9.525	3.97	4.4	0.2	2.5	○	○								○	○	○
	CCGW09T304AT01225-2	9.525	3.97	4.4	0.4	2.5	○	○								○	○	○
	CCGW09T308AT01225-2	9.525	3.97	4.4	0.8	2.4	○	○								○	○	○
	CCGW120402AE-2	12.7	4.76	5.5	0.2	2.5	○	○								○	○	○
	CCGW120404AE-2	12.7	4.76	5.5	0.4	2.5	○	○								○	○	○
	CCGW120408AE-2	12.7	4.76	5.5	0.8	2.4	○	○								○	○	○
	CCGW120402AS01225-2	12.7	4.76	5.5	0.2	2.5					○	○	○	○		○	○	○
	CCGW120404AS01225-2	12.7	4.76	5.5	0.4	2.5					○	○	○	○		○	○	○
	CCGW120408AS01225-2	12.7	4.76	5.5	0.8	2.4					○	○	○	○		○	○	○
	CCGW120402AT01225-2	12.7	4.76	5.5	0.2	2.5	○	○								○	○	○
	CCGW120404AT01225-2	12.7	4.76	5.5	0.4	2.5	○	○								○	○	○
	CCGW120408AT01225-2	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.

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

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

Applicable tool


SCACR/L Kr:90°
Page A184

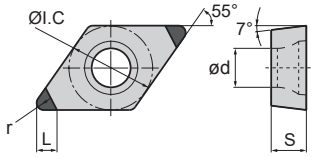

SCLCR/L Kr:95°
A185


SCLCR/L Kr:95°
A218


SCFCR/L Kr:90°
A232


SCLCR/L Kr:95°
A233

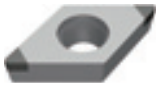
DC□□ (Positive angle)



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

Insert shape	Sepcification	Dimsension(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
	DCGW070202AE-2	6.35	2.38	2.8	0.2	2.7	○	○								○	○	○
	DCGW070204AE-2	6.35	2.38	2.8	0.4	2.5	○	○								○	○	○
	DCGW070208AE-2	6.35	2.38	2.8	0.8	2.1	○	○								○	○	○
	DCGW070202AS01225-2	6.35	2.38	2.8	0.2	2.7					○	○	○	○		○	○	○
	DCGW070204AS01225-2	6.35	2.38	2.8	0.4	2.5					○	○	○	○		○	○	○
	DCGW070208AS01225-2	6.35	2.38	2.8	0.8	2.1					○	○	○	○		○	○	○
	DCGW070202AT01225-2	6.35	2.38	2.8	0.2	2.7	○	○								○	○	○
	DCGW070204AT01225-2	6.35	2.38	2.8	0.4	2.5	○	○								○	○	○
	DCGW070208AT01225-2	6.35	2.38	2.8	0.8	2.1	○	○								○	○	○
	DCGW11T302AE-2	9.525	3.97	4.4	0.2	2.7	○	○								○	○	○
	DCGW11T304AE-2	9.525	3.97	4.4	0.4	2.5	○	○								○	○	○
	DCGW11T308AE-2	9.525	3.97	4.4	0.8	2.1	○	○								○	○	○
	DCGW11T302AS01225-2	9.525	3.97	4.4	0.2	2.7					○	○	○	○		○	○	○
	DCGW11T304AS01225-2	9.525	3.97	4.4	0.4	2.5					○	○	○	○		○	○	○
	DCGW11T308AS01225-2	9.525	3.97	4.4	0.8	2.1					○	○	○	○		○	○	○
	DCGW11T302AT01225-2	9.525	3.97	4.4	0.2	2.7	○	○								○	○	○
	DCGW11T304AT01225-2	9.525	3.97	4.4	0.4	2.5	○	○								○	○	○
	DCGW11T308AT01225-2	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.

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

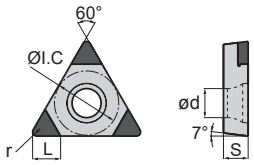

SDNCN
Kr:62°30'
A188


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

Workpiece material

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

Insert shape	Sepcification	Dimsension(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
	TCGW090202AE-3	5.56	2.38	2.5	0.2	2.5	○	○								○	○	○
	TCGW090204AE-3	5.56	2.38	2.5	0.4	2.5	○	○								○	○	○
	TCGW090208AE-3	5.56	2.38	2.5	0.8	2.2	○	○								○	○	○
	TCGW090202AS01225-3	5.56	2.38	2.5	0.2	2.5					○	○	○	○		○	○	○
	TCGW090204AS01225-3	5.56	2.38	2.5	0.4	2.5					○	○	○	○		○	○	○
	TCGW090208AS01225-3	5.56	2.38	2.5	0.8	2.2					○	○	○	○		○	○	○
	TCGW090202AT01225-3	5.56	2.38	2.5	0.2	2.5	○	○								○	○	○
	TCGW090204AT01225-3	5.56	2.38	2.5	0.4	2.5	○	○								○	○	○
	TCGW090208AT01225-3	5.56	2.38	2.5	0.8	2.2	○	○								○	○	○
	TCGW110202AE-3	6.35	2.38	2.8	0.2	2.5	○	○								○	○	○
	TCGW110204AE-3	6.35	2.38	2.8	0.4	2.5	○	○								○	○	○
	TCGW110208AE-3	6.35	2.38	2.8	0.8	2.2	○	○								○	○	○
	TCGW110202AS01225-3	6.35	2.38	2.8	0.2	2.5					○	○	○	○		○	○	○
	TCGW110204AS01225-3	6.35	2.38	2.8	0.4	2.5					○	○	○	○		○	○	○
	TCGW110208AS01225-3	6.35	2.38	2.8	0.8	2.2					○	○	○	○		○	○	○
	TCGW110202AT01225-3	6.35	2.38	2.8	0.2	2.5	○	○								○	○	○
	TCGW110204AT01225-3	6.35	2.38	2.8	0.4	2.5	○	○								○	○	○
	TCGW110208AT01225-3	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.

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

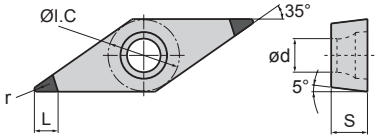

STFCR/L
Kr:90°
A198


STGCR/L
Kr:91°
A199


STECR/L
Kr:60°
A200


STFCR/L
Kr:90°
A223

VB□□ (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	

Insert shape	Sepcification	Dimsension(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

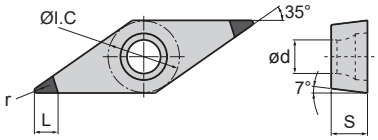

SVABR/L
Kr:90°
A190


SVVBN
Kr:72°30'
A191


SVQBR/L
Kr:107°30'
A226


SVUBR/L
Kr:93°
A227

VC□□ (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

Insert shape	Sepcification	Dimsension(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
	VCGW160402AE-2	9.525	4.76	4.4	0.2	3.3	○	○								○	○	○
	VCGW160404AE-2	9.525	4.76	4.4	0.4	2.8	○	○								○	○	○
	VCGW160408AE-2	9.525	4.76	4.4	0.8	2.5	○	○								○	○	○
	VCGW160402AS01225-2	9.525	4.76	4.4	0.2	3.3					○	○	○	○		○	○	○
	VCGW160404AS01225-2	9.525	4.76	4.4	0.4	2.8					○	○	○	○		○	○	○
	VCGW160408AS01225-2	9.525	4.76	4.4	0.8	2.5					○	○	○	○		○	○	○
	VCGW160402AT01225-2	9.525	4.76	4.4	0.2	3.3	○	○								○	○	○
	VCGW160404AT01225-2	9.525	4.76	4.4	0.4	2.8	○	○								○	○	○
	VCGW160408AT01225-2	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

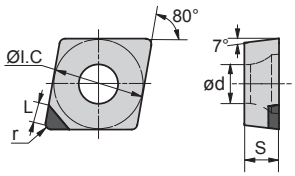

SVVCN
Kr:72°30'
Page A192


SVJCR/L
Kr:93°
A193


SVQCR/L
Kr:107°30'
A224


SVUCR/L
Kr:93°
A225

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

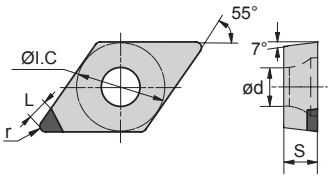

SCLCR/L Kr:95°
A185


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

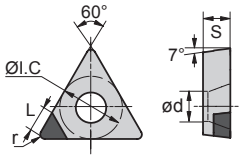

SDNCN Kr:62°30'
A188


SDQCR/L Kr:107°30'
A219


SDUCR/L Kr:93°
A220


SDZCR/L Kr:95°
A221

TC□□ (Positive inserts)



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

Workpiece material	DN0121	DN0511	DN1021	DN3021
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

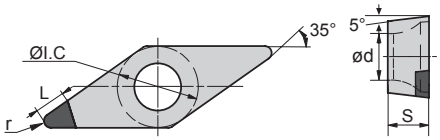

STFCR/L Kr:90°
A198


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 angl		**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

Applicable tool


SVJBR/L Kr:93°
Page A189

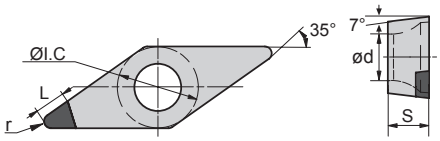

SVABR/L Kr:90°
A190


SVVBN Kr:72°30'
A191


SVQBR/L Kr:107°30'
A226


SVUBR/L Kr:93°
A227

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

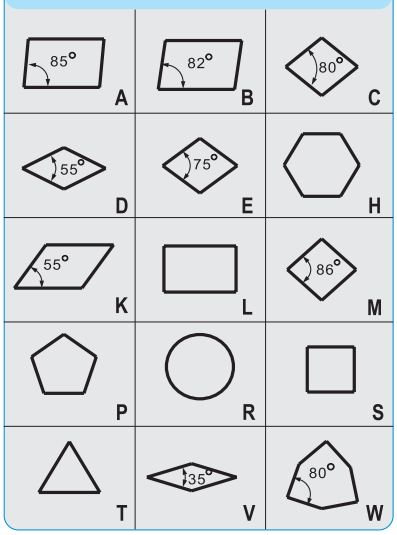
Abnormal failure		Solution
Breakage	Breakage occurs on chamfer of rake face	Enlarge chamfered negative rake angle
	Edge crashing appears when finishing grey cast iron	
Abrasion	Abrasion occurs when machining nodular cast iron	Change to dry cutting
	Abrasion under dry cutting conditions	Reduce cutting 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

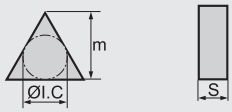
Abnormal failure			Solution
Breakage	Cutting edge breakage		Enlarge chamfered negative rake angle; raise cutting speed and reduce feed
	Flaking and crater wear on rake face		Reduce cutting speed
	Thermal cracks		Change to dry cutting; reduce cutting speed
Abrasion	Wear occurs on chamfer of rake face		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

Ceramic inserts code key

Insert shape



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

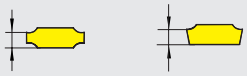
Chipbreaker and clamping system

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



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

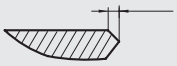
Code	Nose radius(mm)
00	No radius
02	0.2
04	0.4
08	0.8
12	1.2
16	1.6
20	2.0
24	2.4
32	3.2
X	Others
Diameter of insert (Metric)	Round insert

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)



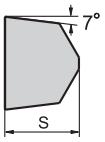
010	0.10	040	0.40
015	0.15	045	0.45
020	0.20	050	0.50
025	0.25	100	1.00
030	0.30	200	2.00
035	0.35		

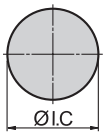
Chamfer angle



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

V-type positioning surface





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

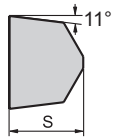
Applicable tool

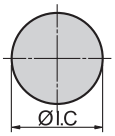
1 **CRDCR/L**



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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

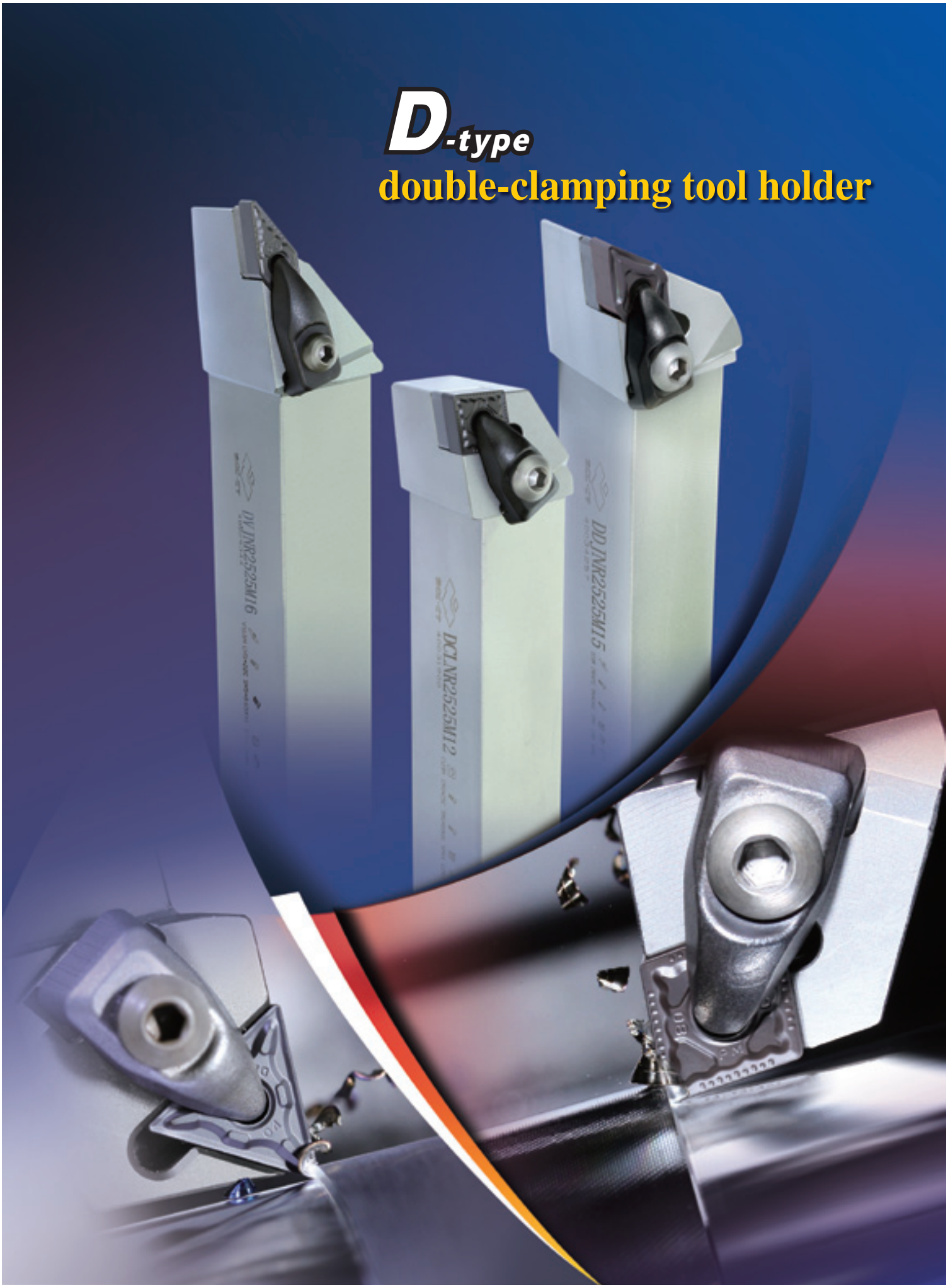
1 **CRDPR/L**



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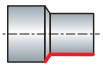
2.Tailor-made nonstandard CRXCR

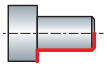
D-type
double-clamping tool holder

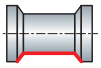


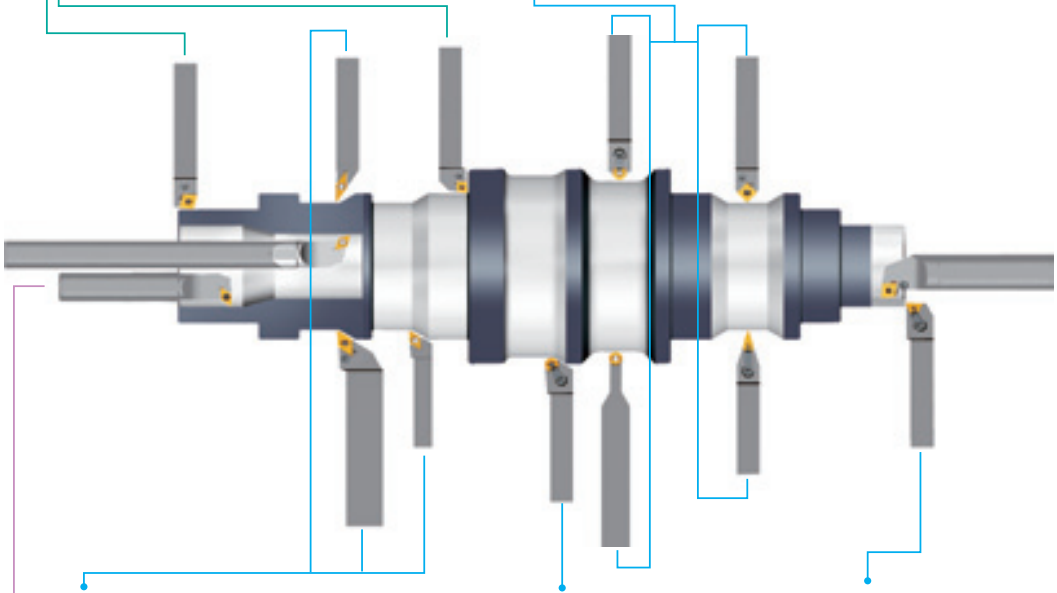
Applications sketch map of turning tools

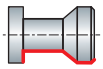
External and internal turning

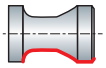
External turning	Tool holder type						
	DTGNR/L□□	DSBNR/L□□	PCBNR/L□□	PSBNR/L□□	PSSNR/L□□	PTGNR/L□□	PTTNR/L□□
	SCACR/L□□	SSBCR/L□□	SSSCR/L□□	STACR/L□□	STGCR/L□□	STECR/L□□	SWACR/L□□

External and end surface turning	Tool holder type	
	DCLNR/L□□	DWLNR/L□□
	PCLNR/L□□	PWLNR/L□□
	SCLCR/L□□	

Profile turning	Tool holder type			
	DVVNN□□	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□□

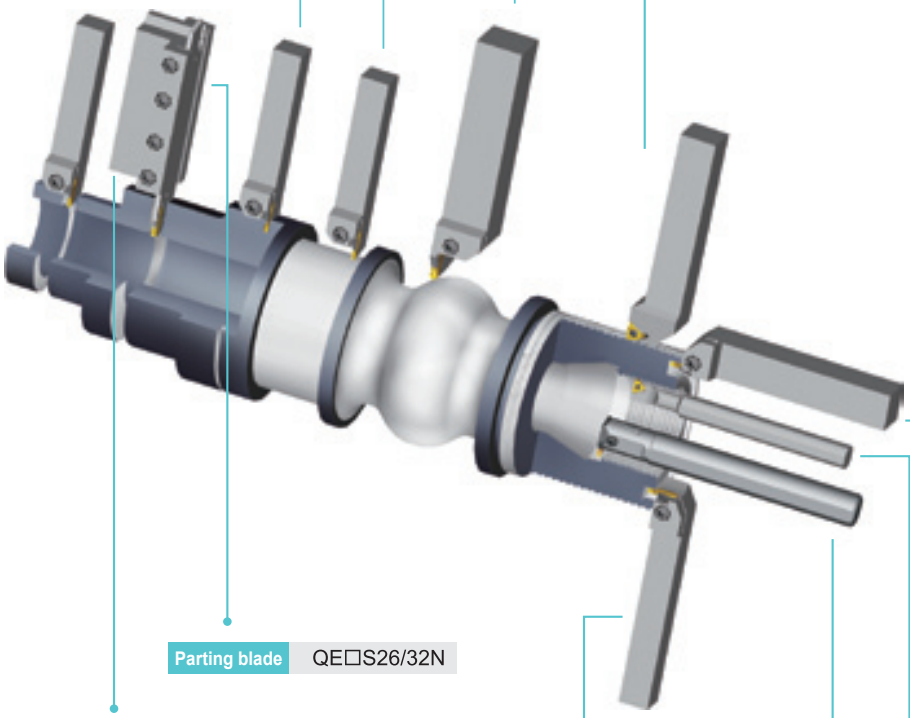
Profile turning	Tool holder type
	SRGCR/L□□

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□-PWLNR/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



External threading tools	ZSER/L□
End surface grooving, turning	QF□D□□R/L□-□H
Parting blade	QE□S26/32N
Parting blade holder	QZS□26/32
Internal threading tools	ZSIR/L□
Internal grooving, turning	C□-Q□DR/L□ the Little Squirrel series
End surface grooving, turning	QF□D□R/L□-□L

External parting, grooving, turning and profilin	QE□D□R/L□	the Little Squirrel series
	QZQ□R/L□	
	ZQS□R/L□	
Precise grooving and turning	QECD□R/L025	the Little Squirrel series
External recess and profiling	QX□D□R/L□-45	the Little Squirrel series
External grooving for hard-to-machine materials	QE□S□R/L□-□N	the Little Squirrel series

How to select external turning tools

Explanation of external turning tools detailed table

- Listed according to clamping types.

Approach angle of tools

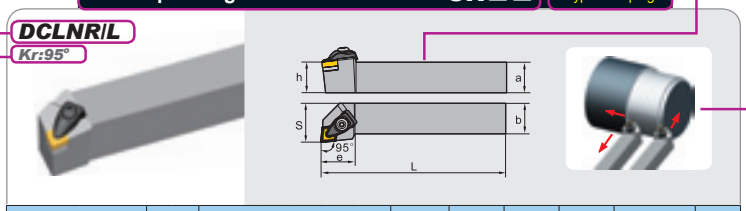
Tools type
The first 4 letters in the type description stands for tool shape and application

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



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

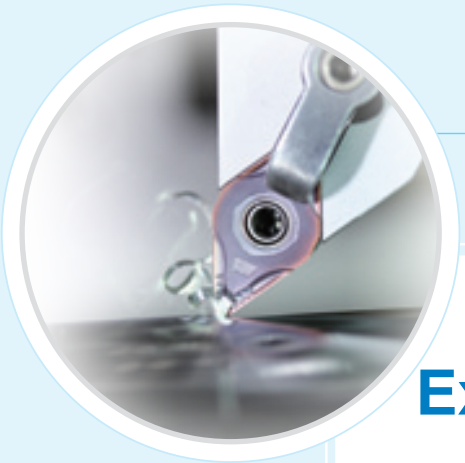
▲Stock available △Make-to-order

Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining	PCBN&PCD inserts
Inserts shape	DF 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 A

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

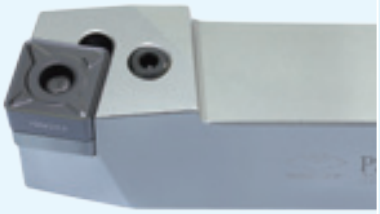
External turning tool holders by P type clamping A172-A183

External turning tool holders by S type clamping A184-A203

External turning tool holders by C type clamping A204

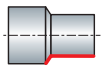
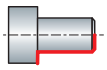
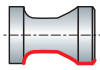
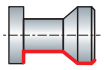
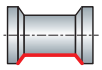
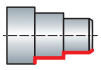
Detailed table of external turning tools (ceramic) A205



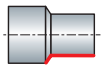
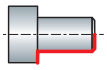
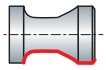
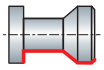
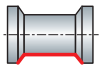
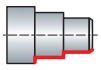




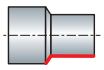
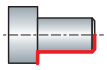
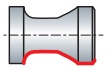
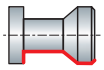
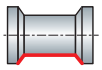
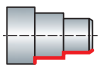
External turning tools overview

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

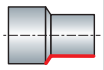
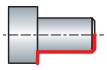
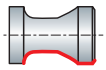
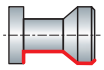
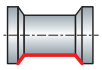
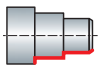
Clamping system	Tool type	Approach angle(Kr°)	Turning type						Applicable workpiece shape		Page
			External turning	End surface turning	External and end surface turning	Profile turning	Profile turning	Profile turning	Short, Thick	Thin, Long	
											
P	PSBNR/L 	75	☺						☺		A176
	PSDNN 	45						☺	☺		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

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	
											
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

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	
											
S	STACR/L 	90	☺						☺	☺	A198
S	STFCR/L 	90		☺					☺		A198
S	STGCR/L 	91	☺						☺	☺	A199
S	STECR/L 	60	☺						☺		A200
S	SWACR/L 	90	☺						☺	☺	A201
S	SRDCN 	--						☺	☺		A202
S	SRGCR/L 	--				☺			☺		A203
C	CKJNR/L 	93					☺		☺		A204
C	CKNNR/L 	63						☺	☺		A204
C	CRDCR/L CRDPR/L 	--					☺		☺		A205

☺ Recommended ☺ Available

External turning tools code key

Clamping system



D – double clamping



P – Hole clamping



S – Screw on

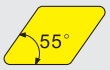


C – Top clamping

Insert shape



C



D



R



S



T

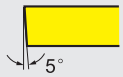


V

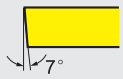


W

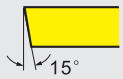
Clearance angle of insert



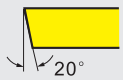
B



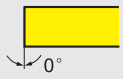
C



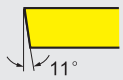
D



E

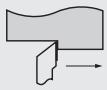


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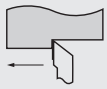


P

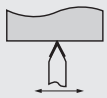
Cutting direction



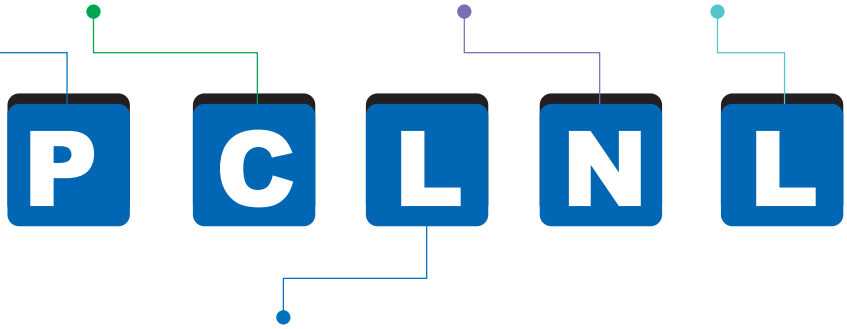
L - Left-hand



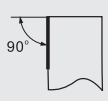
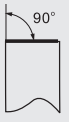
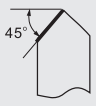
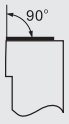
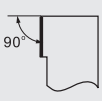
R - Right-hand

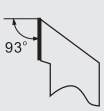
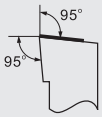
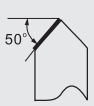
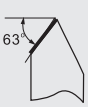


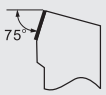
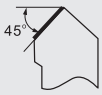
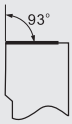
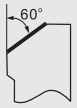
N - Right and left hand



Tool holder style and approach angle

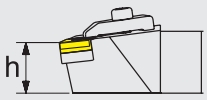
A	B	C	D	E	F	G	H
							

J	K	L	M	N	O	P	Q
							

R	S	T	U	V	W	X	
							

External turning tools code key

Nose height (mm)



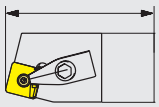
Code	Height
12	12
16	16
20	20
25	25
32	32
40	40
50	50

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)

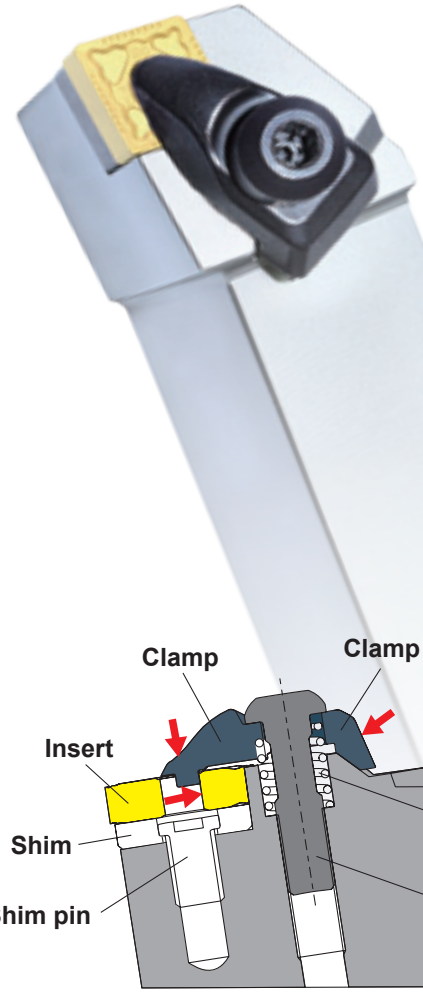


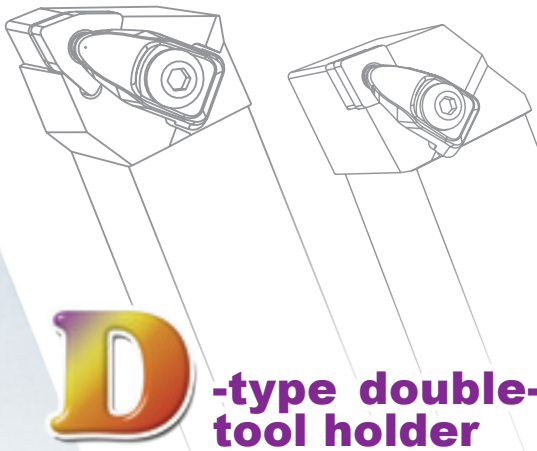
Code	Length
E	70
F	80
H	100
K	125
M	150
P	170
Q	180
R	200
S	250
T	300

25 25 M 12

Length of cutting edge

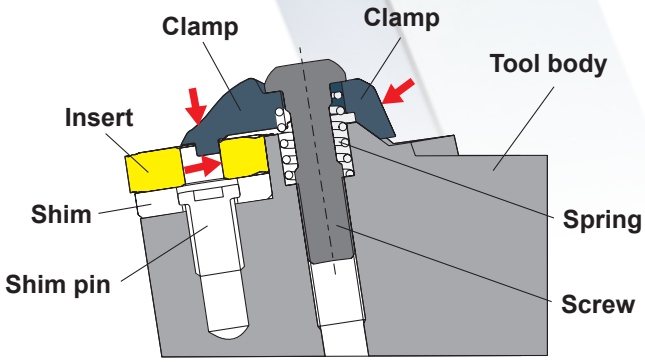
Inserts shape	C	D	R	S	T	V	W
							
Inscribed circle (mm)	Length of cutting edge(mm)						
5.556	---	---	---	---	09	---	---
6.350	06	07	---	---	11	---	---
9.525	09	11	09	09	16	16	06
12.700	12	15	12	12	22	22	08
15.875	16	19	15	15	27	---	---
19.050	19	---	19	19	33	---	---
25.400	25	---	25	25	44	---	---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





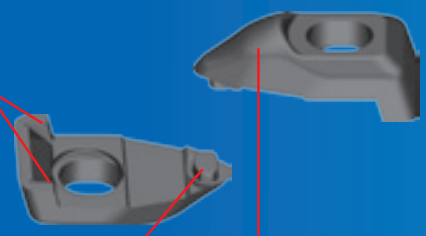
D-type double-clamping tool holder

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.



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.

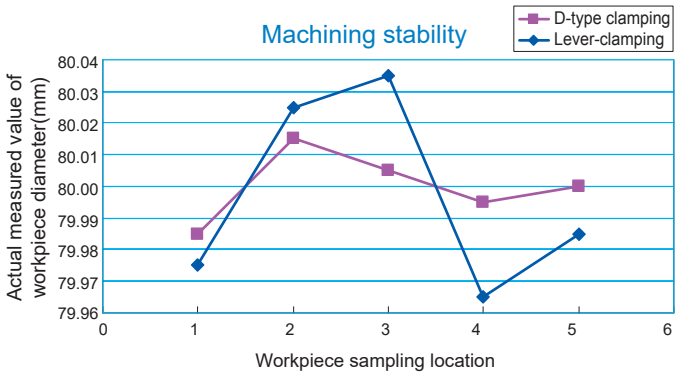
Convenient secure clamping device



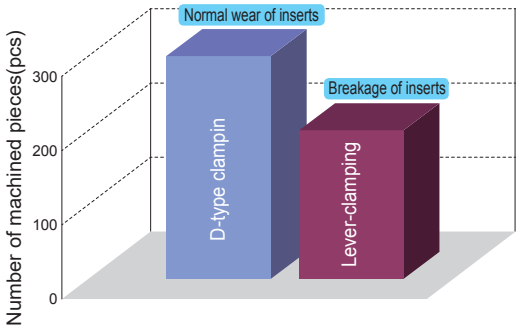
Slots in the tool body match perfectly with the clamp, realizing simple and easy clamping.

Compared with lever-clamping:

① Accurate locating ensures more stable machining accuracy.



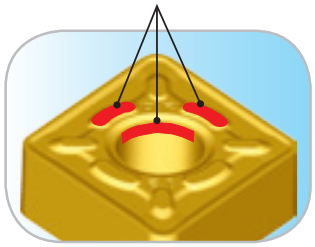
② High clamping rigidity effectively improves resistance to breakage of insert.



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

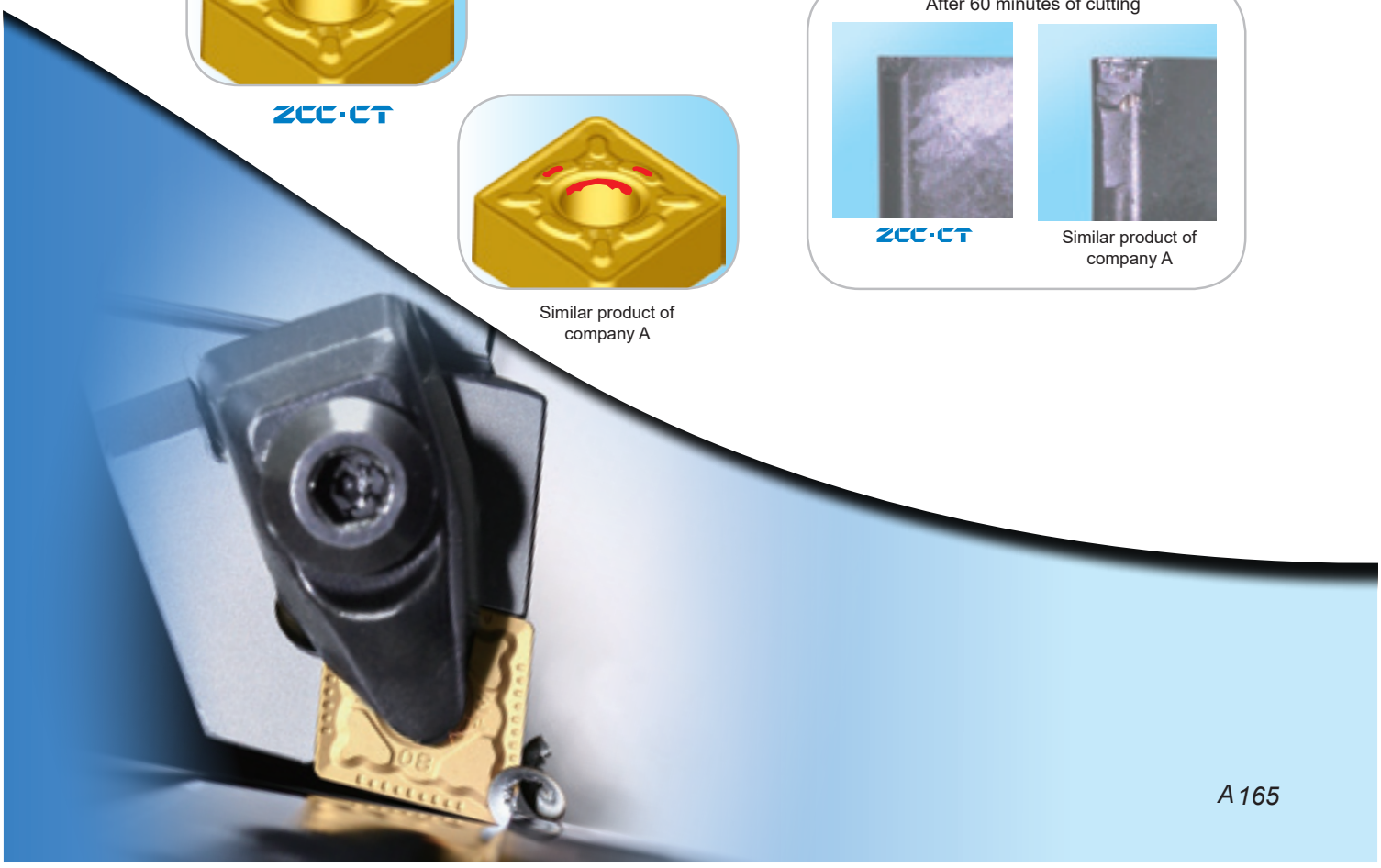
② Effect on tool life:

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

After 60 minutes of cutting

ZCC·CT

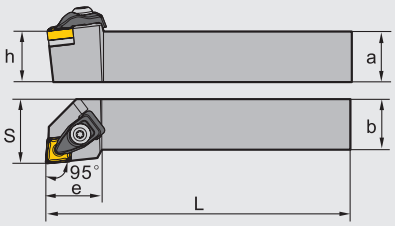
Similar product of company A

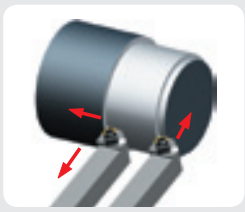


Corresponding tool holders of insert CN□□ D-type clamping

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	1616H09	▲	△	16	16	100	16	20	24	CM5×22C	C09BM	WH30L	C1RA	SM5×8.65XA1	SPR6
	2020K09	▲	△	20	20	125	20	25	24						
	2525M09	▲	△	25	25	150	25	32	24						
	2020K12	▲	▲	20	20	125	20	25	28	CM6×25C	C12BM	WH40L	C2RA	SM6×10XA1	SPR4
	2525M12	▲	▲	25	25	150	25	32	28						
	3225P12	▲	▲	32	25	170	32	32	28						

▲Stock available △Make-to-order

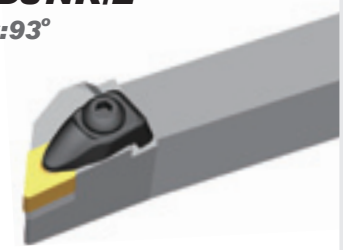
Applicable inserts

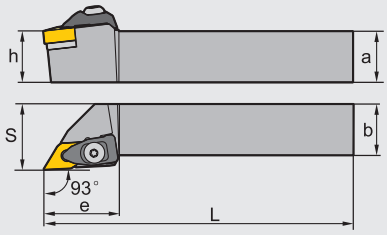
Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining	PCBN&PCD inserts
Inserts shape	DF A54	WGM Wiper A55	DR Double-side A58	HDR A59	Without chipbreaker A59	A118
	WGF Wiper A54	PM A55	DR Single-side A58	HPR A59		A118 -A119
	SF A54	DM A56	ER Double-side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

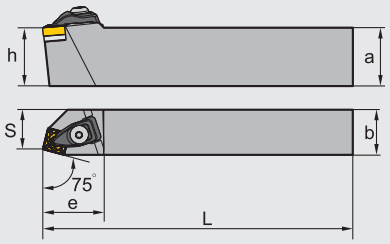
Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining	PCBN&PCD inserts
Inserts shape	DF A61	WGM Wiper A63	DR Double-side A65	HDR A66	Without chipbreaker A66	A121 -A122
	WGF Wiper A61	PM A63	DR Single-side A65			A122 -A123
	SF A62	DM A64	ER Double-side A65			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□□	DN□□1506□□

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	CM6×25C	S12BM	WH40L	C2RA	SM6×10XA1	SPR4
	2525M12	▲	▲	25	25	150	25	22	34						
	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

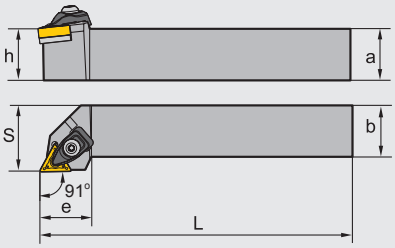
Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining	PCBN&PCD inserts
Inserts shape	**DF** A67	**PM** A68	**DR** Double-side A70	**HDR** A72	Without chipbreaker A74	A126
	EF A67	**DM** A68	**DR** Single-side A70-71	**HPR** A72		A127
	SF A67	**EM** A69	**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□□	SN□□1204□□
	DSBNR/L□□P15	SN□□1506□□	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	CM5×22C	T16BM	WH30L	C1RA	SM5×8.65XA1	SPR6
	2020K16	▲	▲	20	20	125	20	25	25						
	2525M16	▲	▲	25	25	150	25	32	25						

▲Stock available △Make-to-order

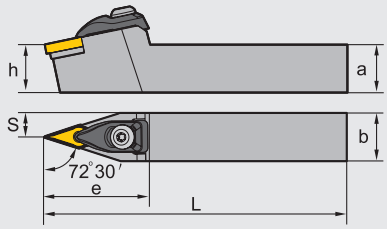
Applicable inserts

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** 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□□	TN□□1604□□

Corresponding tool holders of insert VN□□ D-type clamping

DVVNN
Kr:72°30'



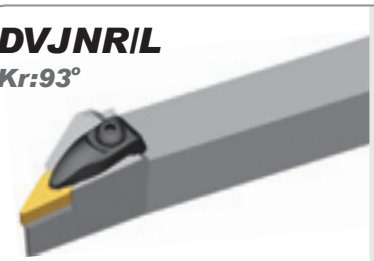


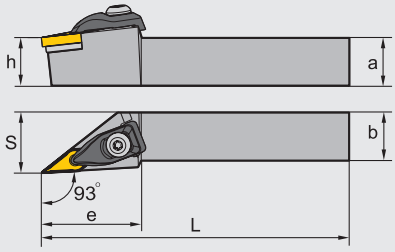


Type		Stock	Basic dimensions(mm)						Screw	Shim	Wrench	Clamp	Shim screw	Spring
			a	b	L	h	s	e						
DVVNN	2020K16	△	20	20	125	20	10	44	CM5×22C	V16BM	WH30L	C6RA	SM5×8.65XA1	SPR6
	2525M16	▲	25	25	150	25	12.5	44						

▲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

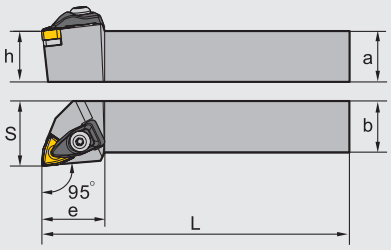
Applicable inserts

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□□	VN□□1604□□
DVJNR/L□□K/M16	VN□□1604□□	VN□□1604□□	VN□□1604□□	VN□□1604□□

Corresponding tool holders of insert WN□□ D-type clamping

DWLNR/L
Kr:95°







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

▲Stock available △Make-to-order

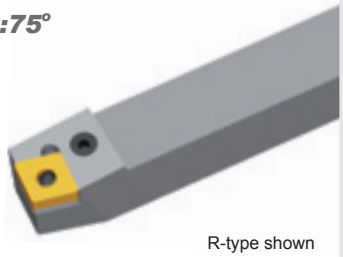
Applicable inserts

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 **DWLNR/L□□H/K/M06**	WN□□0604□□	WN□□0604□□	WN□□0604□□	WN□□0604□□	
DWLNR/L□□K/M/P08	WN□□0804□□	WN□□0804□□	WN□□0804□□	WN□□0804□□	WN□□0804□□

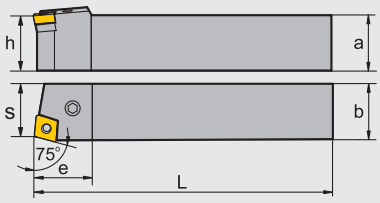
Corresponding tool holders of insert CN□□ P-type clamping

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	LEM12×36A	C25AP-07	WH50L	L8	SP8
	4040S2509	▲	▲	40	40	250	40	35	50		C25AP			

▲Stock available △Make-to-order

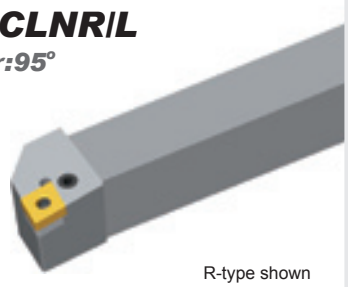
Applicable inserts

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	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining
PCBNR/L□□K/M/P12	CN□□1204□□	CN□□1204□□	CN□□1204□□	CN□□1204□□	CN□□1204□□
PCBNR/L□□M/P/R16	CN□□1606□□	CN□□1606□□	CN□□1606□□	CN□□1606□□	CN□□1606□□
PCBNR/L□□P/R19		CN□□1906□□	CN□□1906□□	CN□□1906□□	CN□□1906□□
PCBNR/L□□S2507			CN□□2507□□		
PCBNR/L□□S2509			CN□□2509□□		

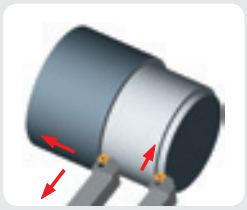
Corresponding tool holders of insert CN□□ P-type clamping

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

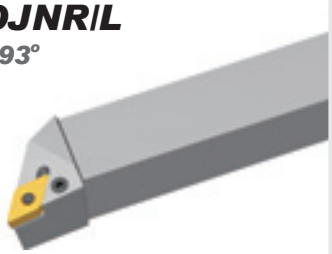
Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining	PCBN&PCD inserts
Inserts shape	DF A54	WGM Wiper A55	DR Double-side A58	HDR A59	Without chipbreaker A59	A118
	WGF Wiper A54	PM A55	DR Single-side A58	HPR A59		A118 -A119
	SF A54	DM A56	ER Double-side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

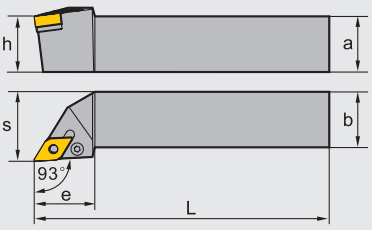
Corresponding tool holders of insert DN□□ P-type clamping

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	LEM8×21	D15AP	WH30L	L4B	SP4
	2525M15	▲	▲	25	25	150	25	32	35					
	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

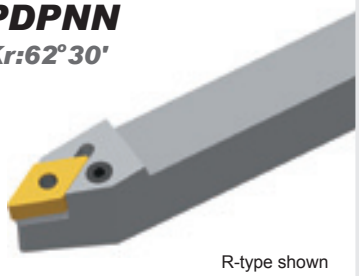
Applicable inserts

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			

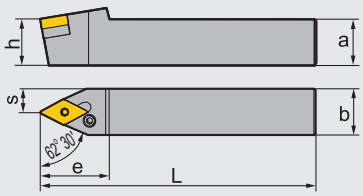
Tool holder type							
	PDJNR/L□□H/K/M11	DN□□1104□□	DN□□1104□□			DN□□1104□□	
	PDJNR/L□□K/M/P15	DN□□1506□□	DN□□1506□□	DN□□1506□□	DN□□1506□□	DN□□1506□□	DN□□1506□□
	PDJNR/L□□K/M/P15-3	DN□□1504□□	DN□□1504□□			DN□□1504□□	DN□□1504□□

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

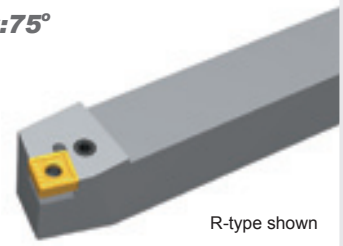
Applicable inserts

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□□	DN□□1506□□
PDPNN□□K/M/P15-3	DN□□1504□□	DN□□1504□□			DN□□1504□□	DN□□1504□□

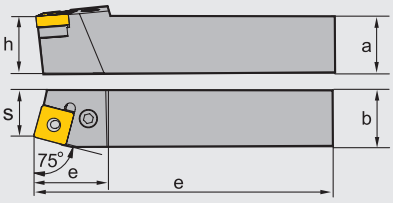
Corresponding tool holders of insert SN□□ P-type clamping

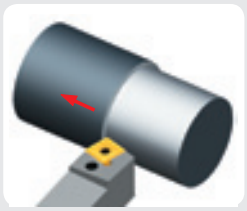
PSBNR/L

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	LEM8×21	S12AP	WH30L	L4	SP4
	2525M12	▲	▲	25	25	150	25	22	28					
	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

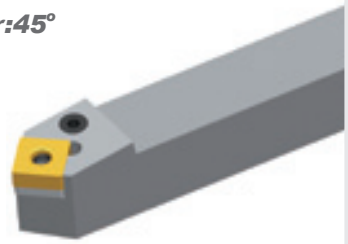
Applicable inserts

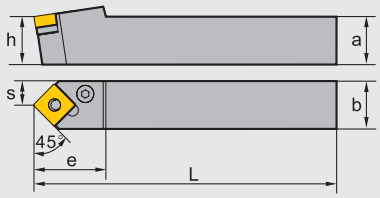
Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining	PCBN&PCD inserts
Inserts shape	DF  A67	PM  A68	DR Double-side  A70	HDR  A72	Without chipbreaker  A74	 A126
	EF  A67	DM  A68	DR Single-side  A70 -71	HPR  A72		 A127
	SF  A67	EM  A69	ER Double-side  A71			 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□□	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

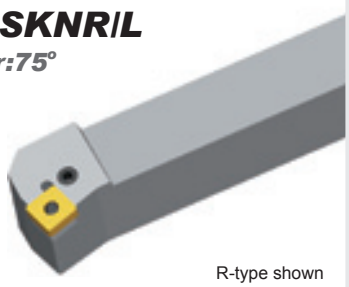
Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining	PCBN&PCD inserts
Inserts shape	**DF** A67	**PM** A68	**DR** Double-side A70	**HDR** A72	Without chipbreaker A74	A126
	EF A67	**DM** A68	**DR** Single-side A70 -71	**HPR** A72		A127
	SF A67	**EM** A69	**ER** Double-side A71			A128
		NM A69	**ER** Single-side A71			
			SNR Double-side A71			
			LR Single-side A69			

Tool holder type							
	PSDNN□□K/M/P12	SN□□1204□□	SN□□1204□□	SN□□1204□□	SN□□1204□□	SN□□1204□□	SN□□1204□□
	PSDNN□□M/P15	SN□□1506□□	SN□□1506□□	SN□□1506□□	SN□□1506□□	SN□□1506□□	
	PSDNN□□P/R19		SN□□1906□□	SN□□1906□□	SN□□1906□□	SN□□1906□□	

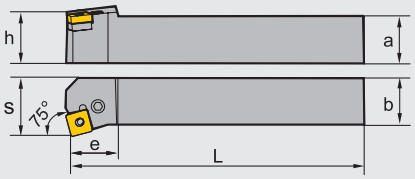
Corresponding tool holders of insert SN□□ P-type clamping

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	LEM8×21	S12AP	WH30L	L4	SP4
	2525M12	▲	▲	25	25	150	25	32	26					
	3232P12	▲	▲	32	32	170	32	40	26					
	2525M15	▲	▲	25	25	150	25	32	32	LEM8×25	S15AP	WH30L	L5	SP5
	3232P15	▲	▲	32	32	170	32	40	32					
	3232P19	▲	▲	32	32	170	32	40	36	LEM10×27	S19AP	WH40L	L6	SP6
	4040R19	▲	▲	40	40	200	40	50	40					

▲Stock available △Make-to-order

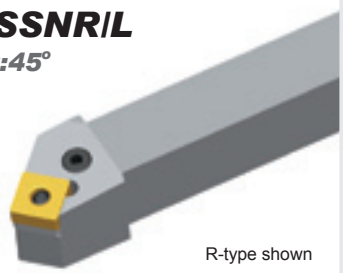
Applicable inserts

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			

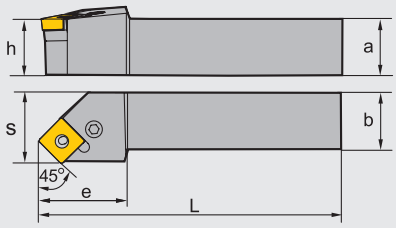
Tool holder type							
	PSKNR/L□□H/K09	SN□□0903□□	SN□□0903□□			SN□□0903□□	
	PSKNR/L□□K/M/P12	SN□□1204□□	SN□□1204□□	SN□□1204□□	SN□□1204□□	SN□□1204□□	SN□□1204□□
	PSKNR/L□□M/P15	SN□□1506□□	SN□□1506□□	SN□□1506□□	SN□□1506□□	SN□□1506□□	
	PSKNR/L□□P/R19		SN□□1906□□	SN□□1906□□	SN□□1906□□	SN□□1906□□	

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	LEM8×21	S12AP	WH30L	L4	SP4
	2525M12	▲	▲	25	25	150	25	32	30					
	3232P12	▲	▲	32	32	170	32	40	40					
	2525M15	▲	▲	25	25	150	25	32	30	LEM8×25	S15AP	WH30L	L5	SP5
	3232P15	▲	▲	32	32	170	32	40	40					
	3232P19	▲	▲	32	32	170	32	40	40	LEM10×27	S19AP	WH40L	L6	SP6
	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

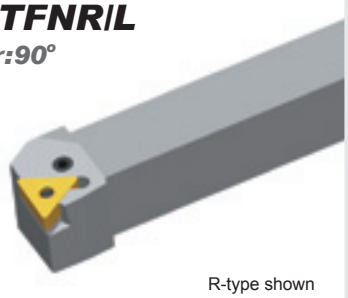
Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining	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			

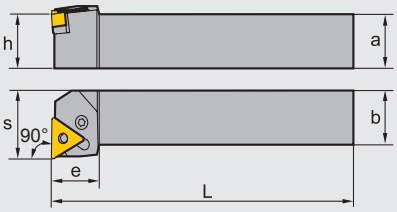
Tool holder type						
	PSSNR/L□□H/K09	SN□□0903□□	SN□□0903□□	SN□□0903□□		SN□□0903□□	
	PSSNR/L□□K/M/P12	SN□□1204□□	SN□□1204□□	SN□□1204□□	SN□□1204□□	SN□□1204□□	SN□□1204□□
	PSSNR/L□□M/P15	SN□□1506□□	SN□□1506□□	SN□□1506□□	SN□□1506□□	SN□□1506□□	
	PSSNR/L□□P/R19		SN□□1906□□	SN□□1906□□	SN□□1906□□	SN□□1906□□	
	PSSNR/L□□S2507			SN□□2507□□	SN□□2507□□		
	PSSNR/L□□S2509			SN□□2509□□	SN□□2509□□		

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

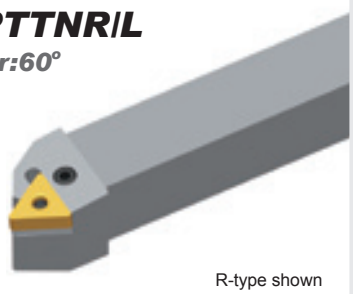
Applicable inserts

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			

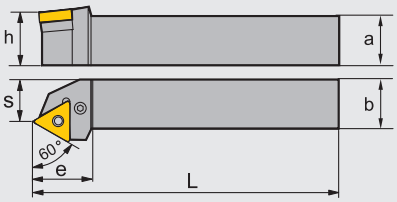
Tool holder type							
	PTFNR/L□□H/K/M16	TN□□1604□□	TN□□1604□□	TN□□1604□□	TN□□1604□□	TN□□1604□□	TN□□1604□□
	PTFNR/L□□M/P22	TN□□2204□□	TN□□2204□□	TN□□2204□□	TN□□2204□□	TN□□2204□□	
	PTFNR/L□□P/S27			TN□□2706□□	TN□□2706□□	TN□□2706□□	

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					
	2525M22	▲	▲	25	25	150	20	22	32	LEM8×21	T22AP	WH30L	L4	SP4

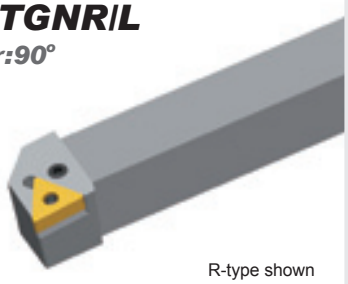
▲Stock available △Make-to-order

Applicable inserts

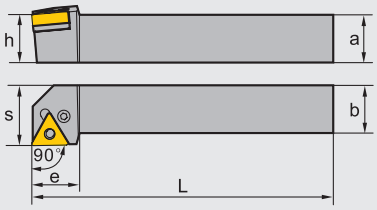
Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining	PCBN&PCD inserts
Inserts shape	DF A75	WGM Wiper A76	DR Double-side A78	HDR A79	Without chipbreaker A80	A130
	WGF Wiper A75	PM A76	DR Single-side A78			A130 -A131
	SF A75	DM A77	ER Double-side A78			A131
	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□□		

Corresponding tool holders of insert TN□□ P-type clamping

PTGNR/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					
PTGNR/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

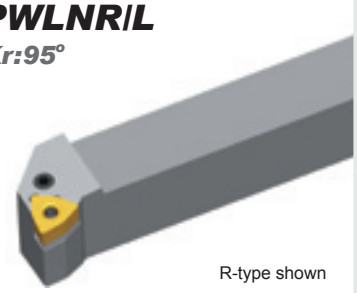
Applicable inserts

Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining	PCBN&PCD inserts
Inserts shape	**DF** 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							
	PTGNR/L□□H/K/M/P16	TN□□1604□□	TN□□1604□□	TN□□1604□□	TN□□1604□□	TN□□1604□□	TN□□1604□□
	PTGNR/L□□M/P22	TN□□2204□□	TN□□2204□□	TN□□2204□□	TN□□2204□□		
	PTGNR/L□□P/S27			TN□□2706□□	TN□□2706□□		

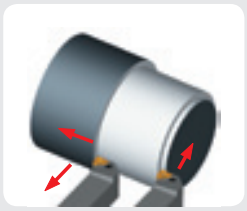
Corresponding tool holders of insert WN□□ P-type clamping

PWLNR/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					
PWLNR/L	**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					

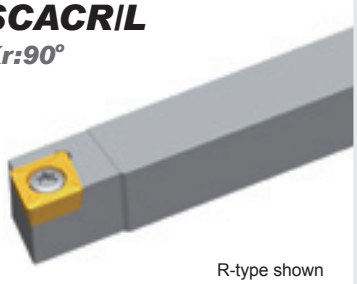
▲Stock available △Make-to-order

Applicable inserts

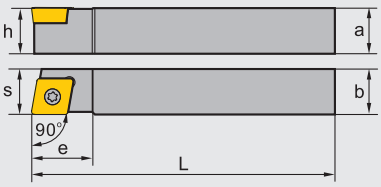
Application	For finishing	For semi-finishing	For roughing	For cast iron machining	PCBN&PCD inserts
Inserts shape	**DF** A83	**WGM** Wiper A84	**DR** Double -side A86	Without chipbreaker A86	A136
	WGF Wiper A83	**PM** A85	**SNR** Double -side A86		A136 -A137
	SF A83	**DM** A85			A137
	EF A84	**EM** A85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

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

SCACR/L
Kr:90°



R-type shown

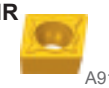




Type		Stock		Basic dimensions(mm)						Screw	Wrench
		R	L	a	b	L	h	s	e		
SCACR/L	**0808F06**	△	△	8	8	80	8	8	16	I60M2.5×6.5	WT07IP
	1010H06	▲	△	10	10	100	10	10	16		
	1212H06	△	△	12	12	100	12	12	16		
	1212H09	▲	▲	12	12	100	12	12	20	I60M3.5×8	WT15IP
	1616H09	△	△	16	16	100	16	16	20		

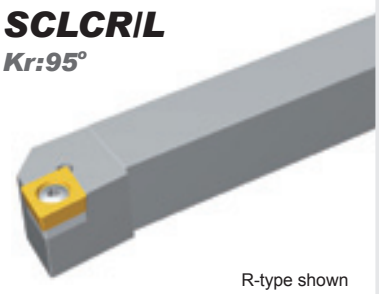
▲Stock available △Make-to-order

Applicable inserts

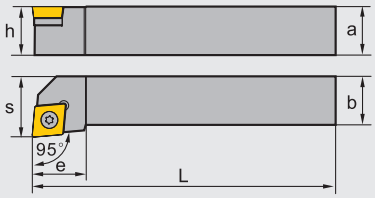
Application	For extra finishing	For finishing	For semi-finishing	For roughing	For Al machining	For cast iron machining	PCBN&PCD inserts
Inserts shape	**USF**  A89	**HF**  A89	**HM**  A90	**HR**  A91	**LH**  A91-92	Without chipbreaker  A92	 A139
	SF  A89	**EF**  A90	**EM**  A90		**LC**  A91		 A144
Tool 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□□

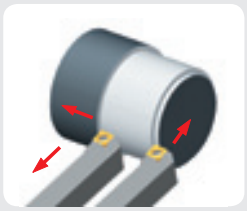
Corresponding tool holders of insert CC□□ S-type clamping

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

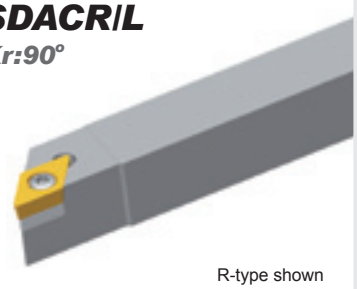
Applicable inserts

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□□

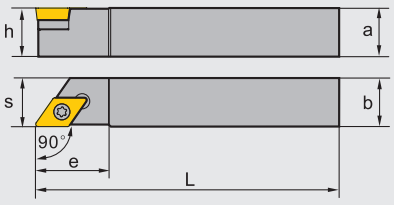
Corresponding tool holders of insert DC□□ S-type clamping

SDACR/L

Kr:90°



R-type shown

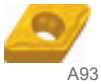




Type		Stock		Basic dimensions(mm)						Screw	Shim	Shim screw	Wrench
		R	L	a	b	L	h	s	e				
SDACR/L	**0808K07**	△	△	8	8	125	8	8	15	I60M2.5×6.5	---	---	WT07IP
	1010K07	△	△	10	10	125	10	10	15				
	1212K07	△	△	12	12	125	10	10	15				
	1212K11	△	△	12	12	125	12	12	22	I60M3.5×8	---	---	WT15IP
	1616K11	△	△	16	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				

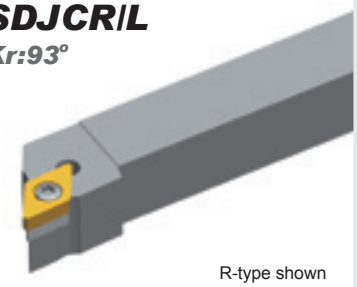
▲Stock available △Make-to-order

Applicable inserts

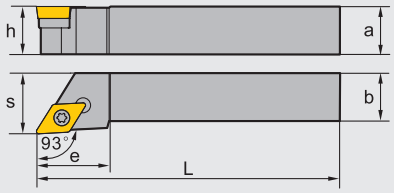
Application	For extra finishing	For finishing	For semi-finishing	For roughing	For Al machining	For cast iron machining	PCBN&PCD inserts
Inserts shape	**USF**  A93	**HF**  A93	**HM**  A94	**HR**  A95	**LH**  A95	Without chipbreaker  A95	 A140
	SF  A93	**EF**  A94	**EM**  A94		**LC**  A95		 A145
Tool holder 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□□	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				

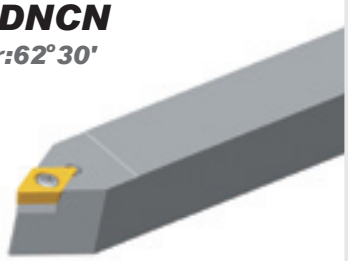
▲Stock available △Make-to-order

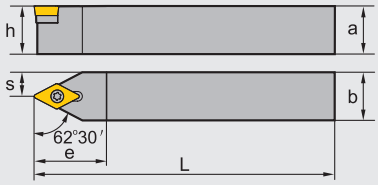
Applicable inserts

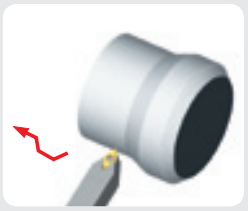
Application	For extra finishing	For finishing	For semi-finishing	For roughing	For Al machining	For cast iron machining	PCBN&PCD inserts
Inserts shape	**USF**  A93	**HF**  A93	**HM**  A94	**HR**  A95	**LH**  A95	Without chipbreaker  A95	 A140
	SF  A93	**EF**  A94	**EM**  A94		**LC**  A95		 A145
Tool holder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

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				

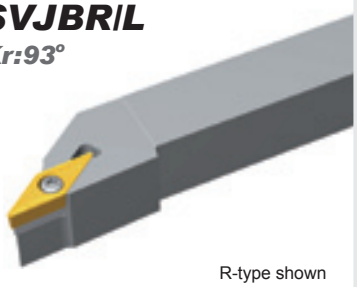
▲Stock available △Make-to-order

Applicable inserts

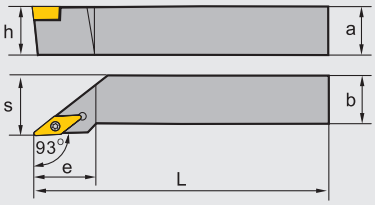
Application	For extra finishing	For finishing	For semi-finishing	For roughing	For Al machining	For cast iron machining	PCBN&PCD inserts
Inserts shape	**USF** A93	**HF** A93	**HM** A94	**HR** A95	**LH** A95	Without chipbreaker A95	A140
	SF A93	**EF** A94	**EM** A94		**LC** A95		A145
Tool holder type **SDNCN□□F/H/K/M07**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

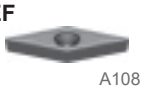




Type		Stock		Basic dimensions(mm)						Screw	Shim	Shim screw	Wrench
		R	L	a	b	L	h	s	e				
SVJBR/L	**1212H11**	▲	▲	12	12	100	12	16	25	I60M2.5×6.5	---	---	WT07IP
	1616H11	▲	▲	16	16	100	16	20	25				
	2020K11	▲	▲	20	20	125	20	25	25				
	2525M11	▲	▲	25	25	150	25	32	25				
	1616H16	▲	▲	16	16	100	16	20	35	I60M3.5×12	V16BS	SM5×8.65XA	WT15IP WH35L
	2020K16	▲	▲	20	20	125	20	25	35				
	2525M16	▲	▲	25	25	150	25	32	35				

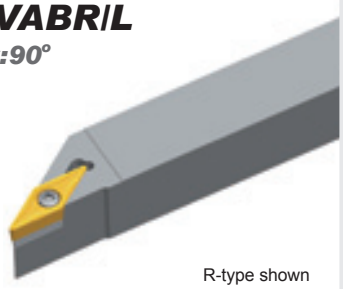
▲Stock available △Make-to-order

Applicable inserts

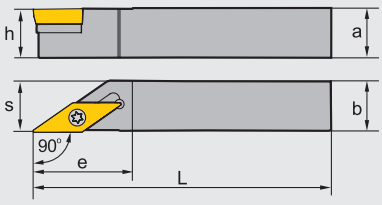
Application	For extra finishing	For finishing	For semi-finishing	For roughing	PCBN&PCD inserts
Inserts shape	**SF**  A108	**HF**  A108	**HM**  A109	**HR**  A109	 A142
		NF  A108	**EM**  A109	**SNR**  A109	 A147
		EF  A108			
		NGF  A108			
Tool holder type **SVJBR/L□□H/K/M11**	VB□□1103□□	VB□□1103□□	VB□□1103□□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

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

SVABR/L
Kr:90°



R-type shown

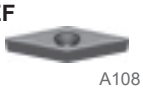




Type		Stock		Basic dimensions(mm)						Screw	Shim	Shim screw	Wrench
		R	L	a	b	L	h	s	e				
SVABR/L	**1010F11**	△	△	10	10	80	10	10	25	I60M2.5×6.5	---	---	WT07IP
	1616H16	△	△	16	16	100	16	16	28	I60M3.5×12	V16BS	SM5×8.65XA	WT15IP WH35L
	2020K16	△	△	20	20	125	20	20	28				
	2525M16	△	△	25	25	150	25	25	28				

▲Stock available △Make-to-order

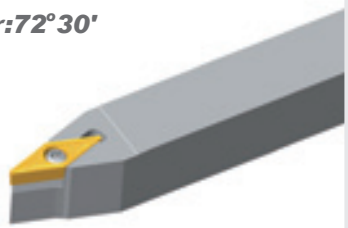
Applicable inserts

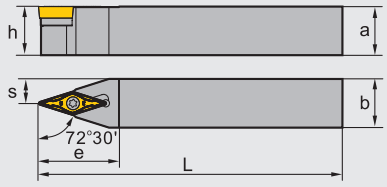
Application	For extra finishing	For finishing	For semi-finishing	For roughing	PCBN&PCD inserts
Inserts shape	**SF**  A108	**HF**  A108	**HM**  A109	**HR**  A109	 A142
		NF  A108	**EM**  A109	**SNR**  A109	 A147
		EF  A108			
		NGF  A108			

Tool holder type						
	SVABR/L□□F11	VB□□1103□□	VB□□1103□□	VB□□1103□□		
	SVABR/L□□H/K/M16		VB□□1604□□	VB□□1604□□	VB□□1604□□	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				

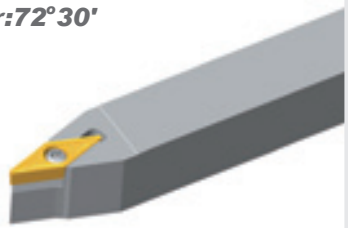
▲Stock available △Make-to-order

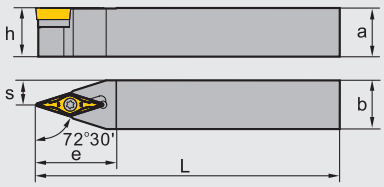
Applicable inserts

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□□	VB□□1604□□

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				

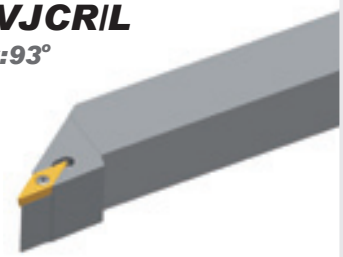
▲Stock available △Make-to-order

Applicable inserts

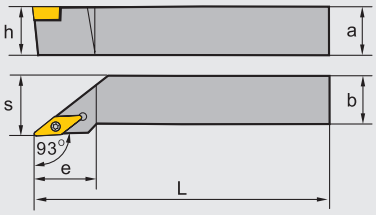
Application	For extra finishing	For finishing	For Al machining	PCBN&PCD inserts
Inserts shape	**USF**  A105	**HF**  A105	**LH**  A106	 A143
	SF  A105	**NF**  A105	**LC**  A106	 A148
		NGF  A105		
Tool holder type: **SVVCN□□H/K/M11**	VC□□1103□□	VC□□1103□□	VCGX1103□□	
Tool holder type: **SVVCN□□H/K/M16**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

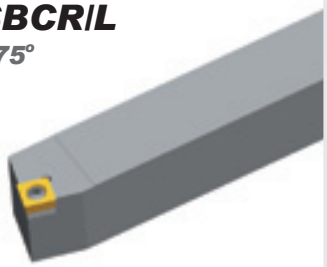
▲Stock available △Make-to-order

Applicable inserts

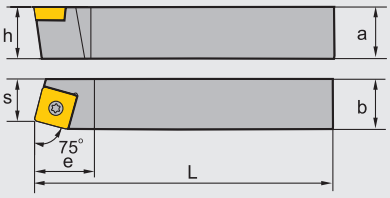
Application	For extra finishing	For finishing	For Al machining	PCBN&PCD inserts
Inserts shape	**USF**  A105	**HF**  A105	**LH**  A106	 A143
	SF  A105	**NF**  A105	**LC**  A106	 A148
		NGF  A105		
Tool holder type **SVJCR/L□□H/K/M11**	VC□□1103□□	VC□□1103□□	VCGX1103□□	
SVJCR/L□□H/K/M16		VC□□1604□□	VCGX1604□□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

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	I60M3.5×12	S09BS	SM5×8.65XA	WT15IP WH35L
	2020K09	△	△	20	20	125	20	17	20				
	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				

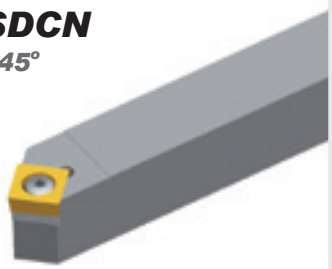
▲Stock available △Make-to-order

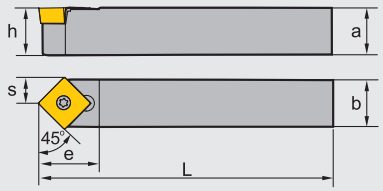
Applicable inserts

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□□	SCGX09T3□□	SC□□09T3□□
SSBCR/L□□K/M12		SC□□1204□□	SC□□1204□□	SCGX1204□□	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	I60M3.5×12	S09BS	SM5×8.65XA	WT15IP WH35L
	2020K09	△	20	20	125	20	10	20				
	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

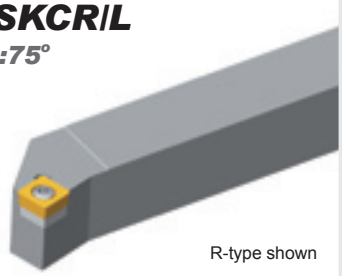
Applicable inserts

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□□	SC□□09T3□□	SCGX09T3□□	SC□□09T3□□
	SSDCN□□M12		SC□□1204□□	SC□□1204□□	SCGX1204□□	SC□□1204□□

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				

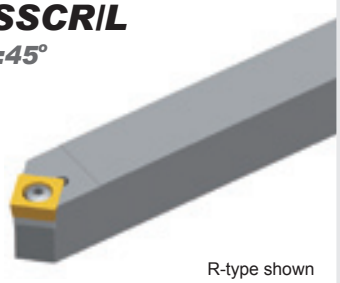
▲Stock available △Make-to-order

Applicable inserts

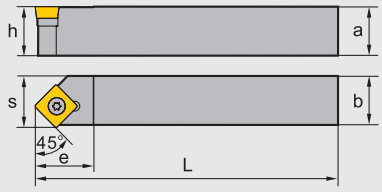
Application	For finishing	For semi-finishing	For roughing	For Al machining	For cast iron machining
Inserts shape	**HF**  A98	**HM**  A98	**HR**  A99	**LH**  A99	Without chipbreaker  A99
	EF  A98	**EM**  A98		**LC**  A99	
Tool holder type **SSKCR/L□□H/K/M09**	SC□□09T3□□	SC□□09T3□□	SC□□09T3□□	SCGX09T3□□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

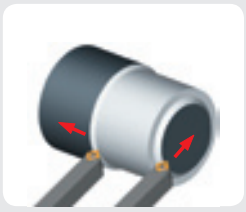
Corresponding tool holders of insert SC□□ S-type clamping

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				
	2020K12	▲	▲	20	20	125	20	21	24	I60M4×11X	S12BS	SM6×10XA	WT15IP WH40L
	2525M12	△	△	25	25	150	25	32	22				

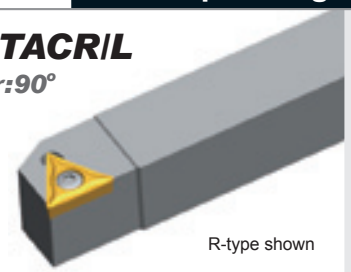
▲Stock available △Make-to-order

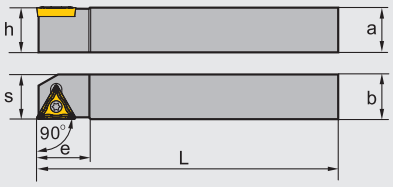
Applicable inserts

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 **SSSCR/L□□H/K/M09**	SC□□09T3□□	SC□□09T3□□	SC□□09T3□□	SCGX09T3□□	SC□□09T3□□
SSSCR/L□□K/M12		SC□□1204□□	SC□□1204□□	SCGX1204□□	SC□□1204□□

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

STACR/L
Kr:90°


R-type shown

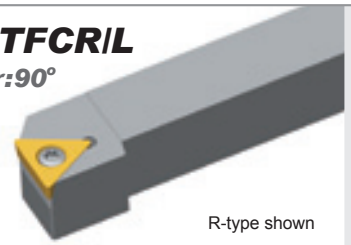


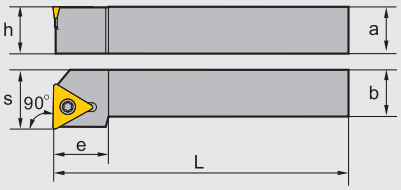


Type		Stock		Basic dimensions(mm)						Screw	Wrench	---	---
		R	L	a	b	L	h	s	e			---	---
STACR/L	1010K11	△	△	10	10	100	10	10	12	I60M2.5×6.5	WT07IP	---	---
	1212F11	△	△	12	12	100	12	12	14				
	1616K11	△	△	16	16	100	16	16	16				

▲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

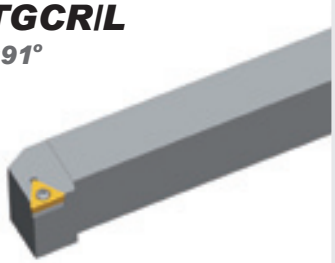
Applicable inserts

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□□	TC□□1102□□
	STFCR/L□□H/K/M11	TC□□1102□□	TC□□1102□□	TC□□1102□□	TCGX1102□□	TC□□1102□□	TC□□1102□□
	STFCR/L□□K/M16	TC□□16T3□□	TC□□16T3□□	TC□□16T3□□	TCGX16T3□□	TC□□16T3□□	

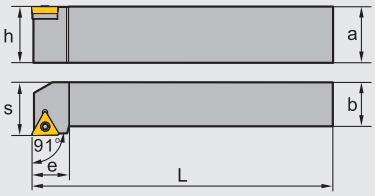
Corresponding tool holders of insert TC□□ S-type clamping

STGCR/L

Kr:91°



R-type shown





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				
	1616K16	△	△	16	16	125	16	20	20	I60M3.5×12	T16BS	SM5×8.65XA	WT15IP WH35L
	2020K16	▲	▲	20	20	125	20	25	21				
	2525M16	▲	▲	25	25	150	25	32	21				

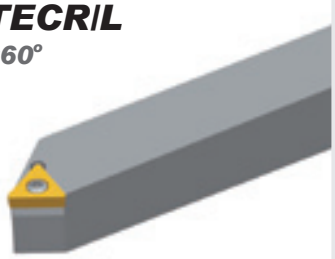
▲Stock available △Make-to-order

Applicable inserts

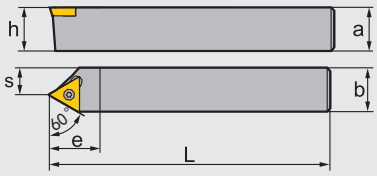
Application		For extra finishing	For finishing	For semi-finishing	For roughing	For Al machining	For cast iron machining	PCBN&PCD inserts
Inserts shape		USF  A100	HF  A101	HM  A103	HR  A103	LH  A104	Without chipbreaker  A104	 A141
		SF  A100	EF  A102	EM  A102		LC  A103		
Tool holder type	STGCR/L□□F/H09	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□□	

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				WT35IP

▲Stock available △Make-to-order

Applicable inserts

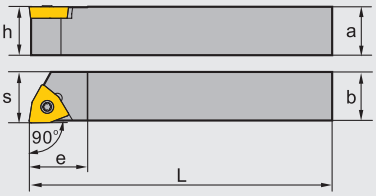
Application		For finishing	For semi-finishing	For roughing	For Al machining	For cast iron machining	PCBN&PCD inserts
Inserts shape		**HF**  A101	**HM**  A103	**HR**  A103	**LH**  A104	Without chipbreaker  A104	 A141
		EF  A102	**EM**  A102		**LC**  A103		
Tool holder type	**STECR/L□□H/K11**	TC□□1102□□	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

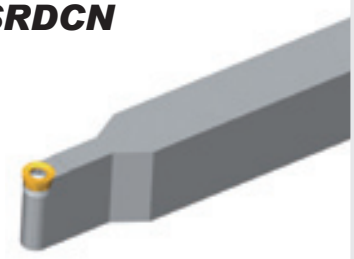
Applicable inserts

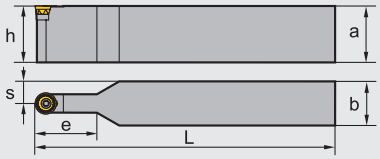
Application	For finishing
Inserts shape	**53** A107
Tool holder type **SWACR/L□□E/F04**	WC□X0402□□
Tool holder type **SWACR/L□□H06**	WC□X06T3□□
Tool holder type **SWACR/L□□K08**	WC□X0804□□



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				

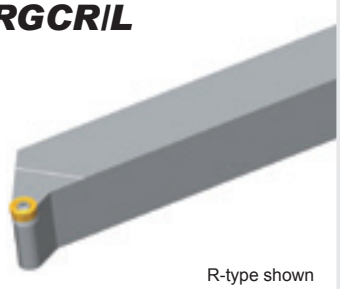
▲Stock available △Make-to-order

Applicable inserts

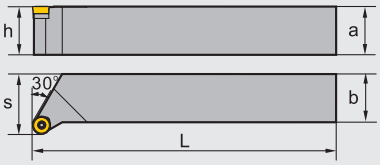
Application	For semi-finishing	For roughing	For Al machining
Inserts shape	 A96	 A96	LH  A96
Tool holder type: SRDCN□□K/M/H08	RCMT0803MO	RCMT0803MO	RCGX0803MO-LH
SRDCN□□K/M10	RCMT10T3MO	RCMT10T3MO	
SRDCN□□M/P12	RCMT1204MO	RCMT1204MO	
SRDCN□□P/S16	RCMT1606MO	RCMT1606MO	

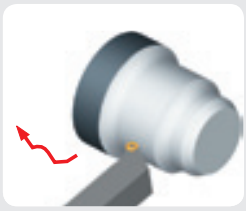
Corresponding tool holders of insert RC□□ S-type clamping

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

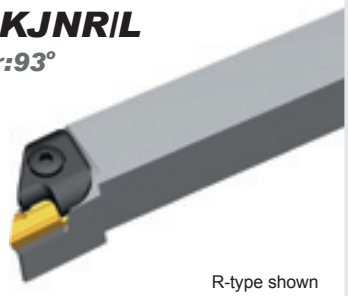
▲Stock available △Make-to-order

Applicable inserts

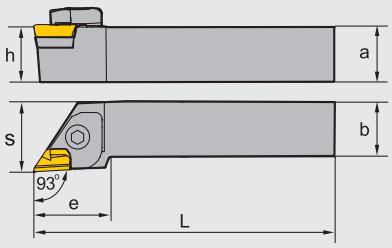
Application		For semi-finishing	For roughing	For Al machining
Inserts shape		 A96	 A96	LH  A96
Tool holder type	SRGCR/L□□H/K/M08	RCMT0803MO	RCMT0803MO	RCGX0803MO-LH
	SRGCR/L□□H/K/M10	RCMT10T3MO	RCMT10T3MO	
	SRGCR/L□□K/M12	RCMT1204MO	RCMT1204MO	
	SRGCR/L□□P16	RCMT1606MO	RCMT1606MO	

Corresponding tool holders of insert KNUX□□ C-type clamping

CKJNR/L
Kr:93°



R-type shown





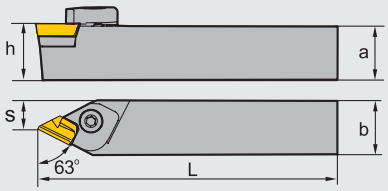
Type		Stock	Basic dimensions(mm)						Applicable inserts	Clamp	Clamp screw	Spring	Clamping stud	Shim	Shim screw	Wrench
			a	b	L	h	s	e								
CKJNR	2525M16	△	25	25	150	25	32	32	KNUX1604□□R A87	C6R1T	CM6×25A	SPR1 SPR2	P0515	K16CC	SM3×10B	WH20L WH40L
	3232P16	△	32	32	170	32	40	32								
	4040R16	△	40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



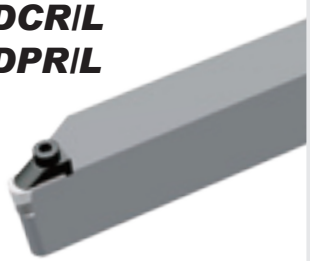


Type		Stock	Basic dimensions(mm)					Applicable inserts	Clamp	Clamp screw	Spring	Clamping stud	Shim	Shim screw	Wrench
			a	b	L	h	s								
CKNNR	2525M16	△	25	25	150	25	14.3	KNUX1604□□R A87	C6R1T	CM6×25A	SPR1 SPR2	P0515	K16CC	SM3×10B	WH20L WH40L
	3232P16	△	32	32	170	32	16.8								
CKNNL	2525M16	△	25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

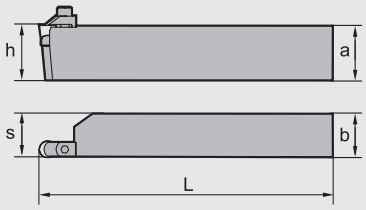
▲Stock available △Make-to-order

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

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

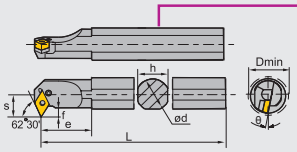
Application chart
The arrow shows suitable applications such as internal turning, profiling and end turning, etc.

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 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□□	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 A

Internal turning tools

Internal turning tools overview A209

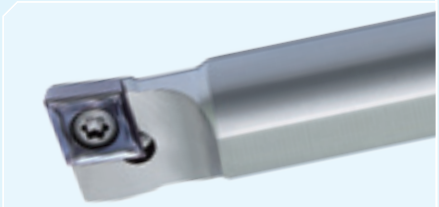
Internal turning tools code key A210-A211

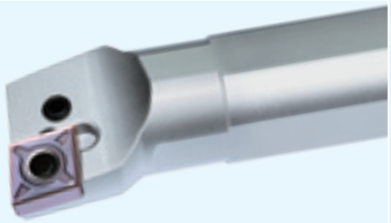
Detailed table of internal turning tools A212-A240

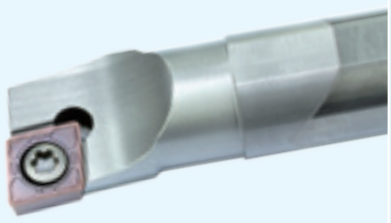
Internal turning Tools by P-type clamping A212-A217

Internal turning tools by S-type clamping A218-A233

Damping internal turning tools and their features A234-A240







Internal turning tools



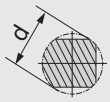
Name	Feature	62°30′	75°	90°	90°	93°	93°	95°	95°	107°30′
P-type internal turning tools	●The minimum machining diameter is 20mm. ●Applicable inserts are economic negative inserts. ●Hole clamping	PDPN  A213	PSKN  A215	PTFN  A216			PDUN  A214		PCLN  A212	
									PWLN  A217	
S-type internal turning tools	●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

Internal turning tools code key

Type of tool holder

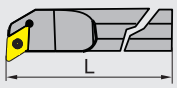
Code	Type
A	Steel tool holder with oil-hole
C	Cemented carbide tool holder
E	Cemented carbide tool holder with oil hole
S	Steel tool holder
X	Special inserts applied

Diameter of tool holder



Code	Diameter
08	08
10	10
16	16
20	20
25	25
32	32
40	40
50	50

Length of tool holder



Code	Length
H	100
K	125
M	150
N	160
Q	180
R	200
S	250
T	300
U	350
V	400

Clamping system



P-Hole clamping



M-Top and hole clamping

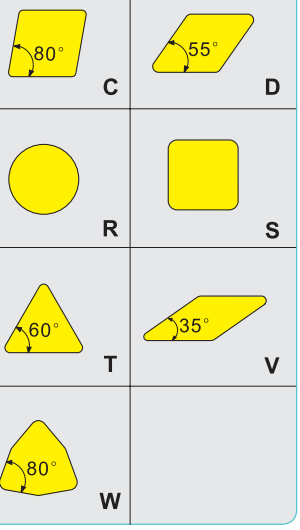


S-Screw on



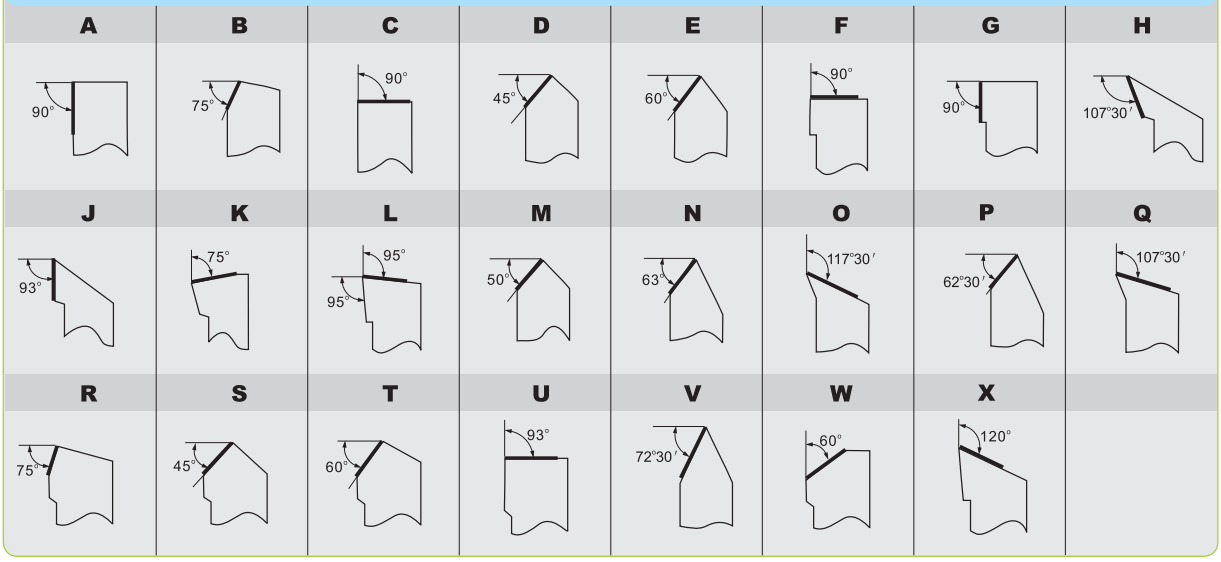
C-Top clamping

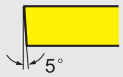
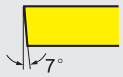
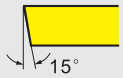
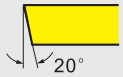
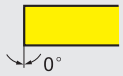
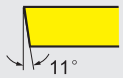
Inserts shape

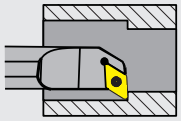
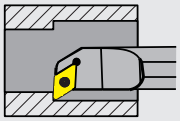


S 16 R - S D U

Tool holder style and approach angle

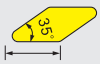


Clearance angle of insert	
	B
	C
	D
	E
	N
	P

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

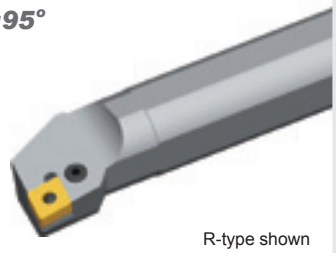


Length of cutting edge							
Inserts shape	C	D	R	S	T	V	W
							
Inscribed circle	Length of cutting edge(mm)						
5.556	---	---	---	---	09	---	---
6.350	06	07	---	---	11	---	---
9.525	09	11	09	09	16	16	06
12.700	12	15	12	12	22	22	08
15.875	16	19	15	15	27	---	---
19.050	19	---	19	19	33	---	---
25.400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

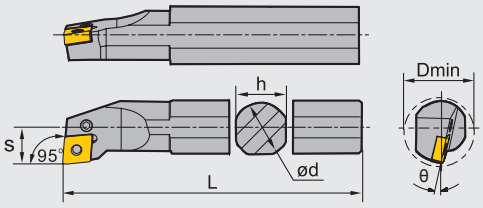
Corresponding tool holders of insert CN□□ P-type clamping

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	LEM5×12	WH20L	L3C	---	---
S20R-PCLNR/L09	△	△	25	20	19	200	12.5					
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	LEM8×21	WH30L	L4	C12APB	SP4
S40U-PCLNR/L12	▲	▲	50	40	38	350	26					
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	LEM10×27	WH40L	L6	C19AP	SP6
S50W-PCLNR/L19	▲	▲	63	50	47	450	35					

▲Stock available △Make-to-order

Applicable inserts

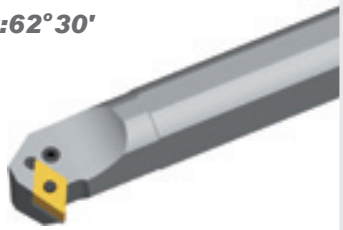
Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining	PCBN/PCD inserts
Inserts shape	**DF** A54	**WGM** Wiper A55	**DR** Double-side A58	**HDR** A59	Without chipbreaker A59	A118
	WGF Wiper A54	**PM** A55	**DR** Single-side A58	**HPR** A59		A118 -A119
	SF 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□□	CN□□1204□□
	□□-PCLNR/L16	CN□□1606□□	CN□□1606□□	CN□□1606□□	CN□□1606□□	CN□□1606□□	
	□□-PCLNR/L19		CN□□1906□□	CN□□1906□□	CN□□1906□□	CN□□1906□□	

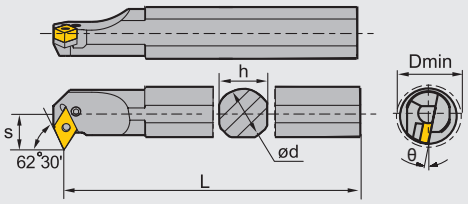
Corresponding tool holders of insert DN□□ P-type clamping

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

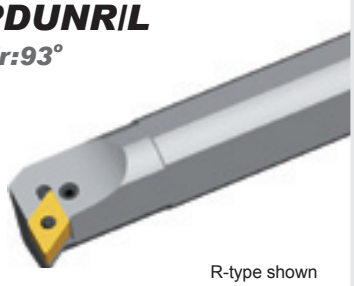
Applicable inserts

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 **□□-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□□	DN□□1506□□

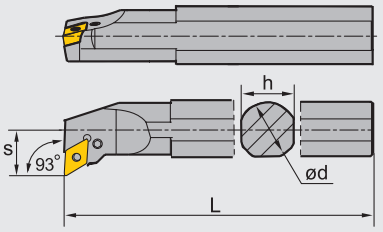
Corresponding tool holders of insert DN□□ P-type clamping

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			

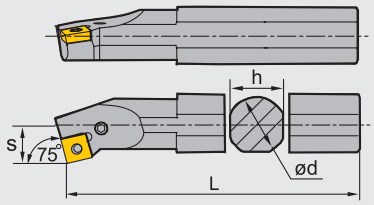
Tool holder type							
	□□-PDUNR/L11	DN□□1104□□	DN□□1104□□		DN□□1104□□		
	□□-PDUNR/L15-3	DN□□1504□□	DN□□1504□□	DN□□1504□□	DN□□1504□□	DN□□1504□□	DN□□1504□□
	□□-PDUNR/L15	DN□□1506□□	DN□□1506□□	DN□□1506□□	DN□□1506□□	DN□□1506□□	DN□□1506□□

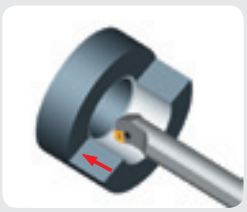
Corresponding tool holders of insert SN□□ P-type clamping

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					

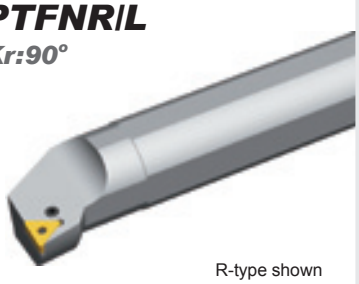
▲Stock available △Make-to-order

Applicable inserts

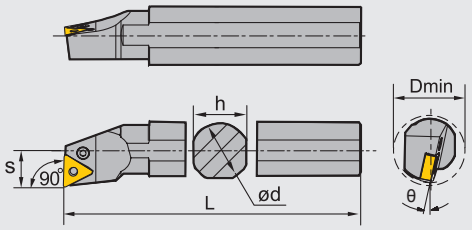
Application	For finishing	For semi-finishing	For roughing	For heavy machining	For roughing	PCBN/PCD inserts
Inserts shape	**DF**  A67	**PM**  A68	**DR** Double-side  A70	**HDR**  A72	Without chipbreaker  A74	 A126
	EF  A67	**DM**  A68	**DR** Single-side  A70 -71	**HPR**  A72		 A127
	SF  A67	**EM**  A69	**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□□	SN□□1204□□

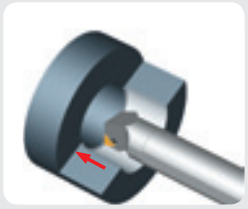
Corresponding tool holders of insert TN□□ P-type clamping

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					

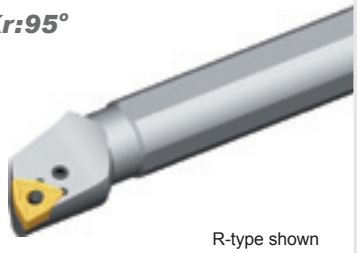
▲Stock available △Make-to-order

Applicable inserts

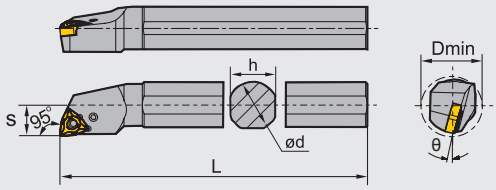
Application	For finishing	For semi-finishing	For roughing	For heavy machining	For cast iron machining	PCBN/PCD inserts
Inserts shape	**DF** A75	**WGM** Wiper A76	**DR** Double-side A78	**HDR** A79	Without chipbreaker A80	A130
	WG Wiper A75	**PM** A76	**DR** Single-side A78			A130 -A131
	SF A75	**DM** 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□□

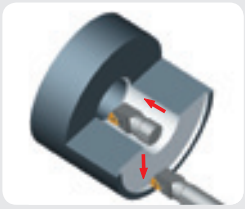
Corresponding tool holders of insert WN□□ P-type clamping

PWLNR/L
Kr:95°



R-type shown





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

▲Stock available △Make-to-order

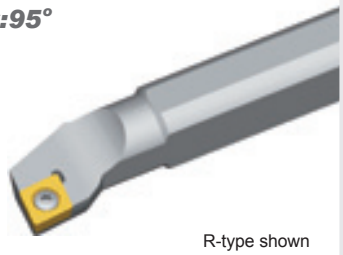
Applicable inserts

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□□

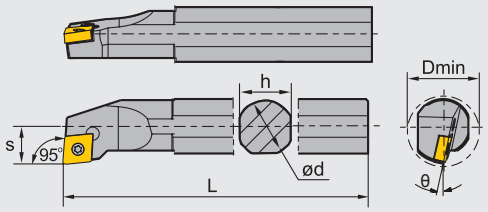
Corresponding tool holders of insert CC□□ S-type clamping

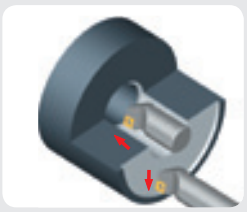
SCLCR/L

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			
S25S-SCLCR/L09	△	△	32	25	24	250	15.5		WT15IP	---	---
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 WT15IP	C12BS	SM6×10×A
S40U-SCLCR/L12	△	△	50	40	38	350	24.5				

▲Stock available △Make-to-order

Applicable inserts

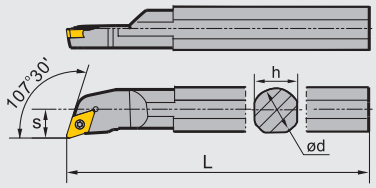
Application	For extra finishing	For finishing	For semi-finishing	For roughing	For Al machining	For cast iron machining	PCBN/PCD inserts
Inserts shape	USF  A89	HF  A89	HM  A90	HR  A91	LH  A91-92	Without chipbreaker  A92	 A139
	SF  A89	EF  A90	EM  A90		LC  A91		 A144
Tool holder type □□-SCLCR/L06	CC□□0602□□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

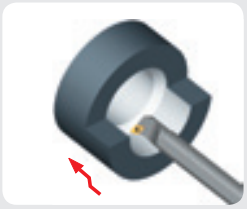
Corresponding tool holders of insert DC□□ S-type clamping

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	WT07IP	---	---
S12M-SDQCR/L07	▲	▲	16	12	11	150	9	I60M2.5×6.5			
S16Q-SDQCR/L07	△	△	20	16	15	180	11				
S20R-SDQCR/L11	△	△	25	20	19	200	13	I60M3.5×8	WT15IP	---	---
S25S-SDQCR/L11	△	△	32	25	24	250	17	I60M3.5×10			
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□□	DC□□11T3□□	DCGX11T3□□	DC□□11T3□□	DC□□11T3□□

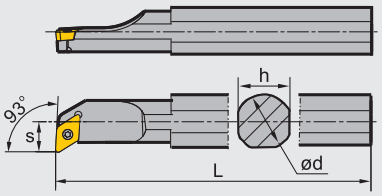
Corresponding tool holders of insert DC□□ S-type clamping

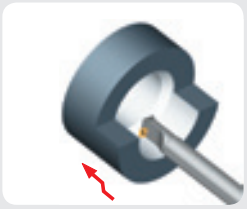
SDUCR/L

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	I60M2.5×6.5			
S16Q-SDUCR/L07	△	△	20	16	15	180	11				
S20R-SDUCR/L11	△	△	25	20	19	200	13	I60M3.5×8	WT15IP	---	---
S25S-SDUCR/L11	△	△	32	25	24	250	17	I60M3.5×10			
S32T-SDUCR/L11	△	△	40	32	30	300	22				
S40U-SDUCR/L11	△	△	50	40	38	350	27				

▲Stock available △Make-to-order

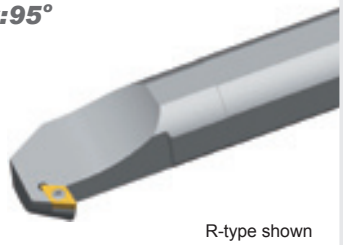
Applicable inserts

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□□	DC□□11T3□□	DCGX11T3□□	DC□□11T3□□	DC□□11T3□□

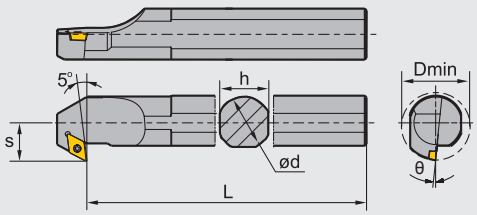
Corresponding tool holders of insert DC□□ S-type clamping

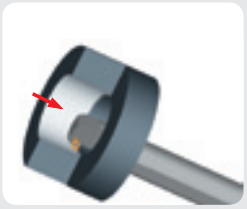
SDZCR/L

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 WH35L	D11BS	SM5×8.65XA
S40U-SDZCR/L11	△	△	48	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 **□□-SDZCR/L11**	DC□□11T3□□	DC□□11T3□□	DC□□11T3□□	DC□□11T3□□	DCGX11T3□□	DC□□11T3□□	DC□□11T3□□

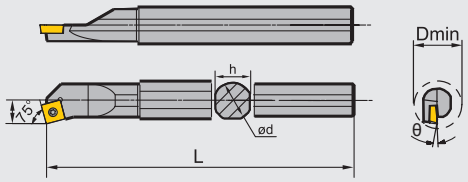
Corresponding tool holders of insert SC□□ S-type clamping

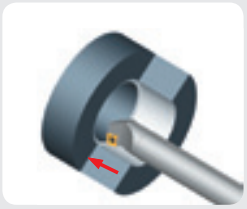
SSKCR/L

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	S12BS	SM6×10XA

▲Stock available △Make-to-order

Applicable inserts

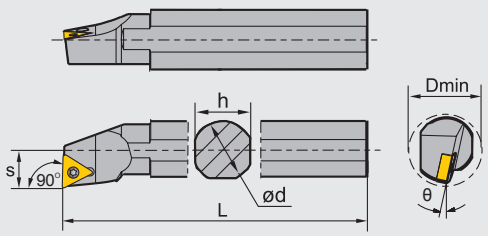
Application	For finishing	For semi-finishing	For roughing	For Al machining	For cast iron machining
Inserts shape	**HF**  A98	**HM**  A98	**HR**  A99	**LH**  A99	Without chipbreaker  A99
	EF  A98	**EM**  A98		**LC**  A99	
Tool holder type **□□-SSKCR/L09**	SC□□09T3□□	SC□□09T3□□	SC□□09T3□□	SCGX09T3□□	SC□□09T3□□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

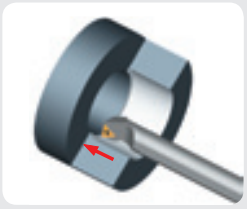
Corresponding tool holders of insert TC□□ S-type clamping

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

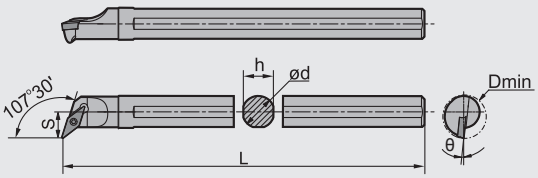
Application	For finishing	For semi-finishing	For roughing	For Al machining	For cast iron machining	PCBN/PCD inserts
Inserts shape	**HF**  A101	**HM**  A103	**HR**  A103	**LH**  A104	Without chipbreaker  A104	 A141
	EF  A102	**EM**  A102		**LC**  A103		
Tool holder type **□□-STFCR/L11**	TC□□1102□□	TC□□1102□□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

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				

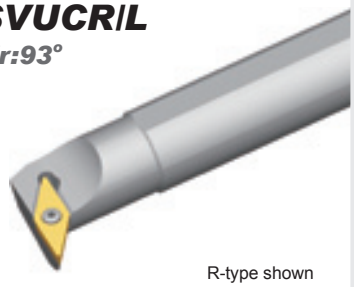
▲Stock available △Make-to-order

Applicable inserts

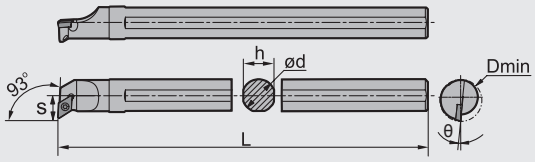
Application		For extra finishing	For finishing	For Al machining	PCBN/PCD inserts
Inserts shape		**USF**  A105	**HF**  A105	**LH**  A106	 A143
		SF  A105	**NF**  A105	**LC**  A106	 A148
Tool holder type	**□□-SVQCR/L11**	VC□□1103□□	VC□□1103□□	VCGX1103□□	
	□□-SVQCR/L16		VC□□1604□□	VCGX1604□□	VC□□1604□□

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		
S32T-SVUCR/L16	△	△	42	32	30	300	23		WT15IP WH35L	V16BS	SM5×8.65×A

▲Stock available △Make-to-order

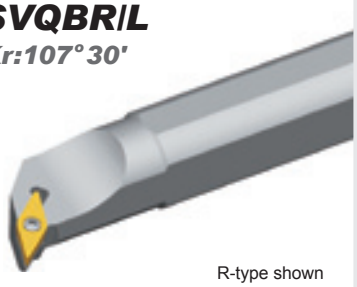


Applicable inserts

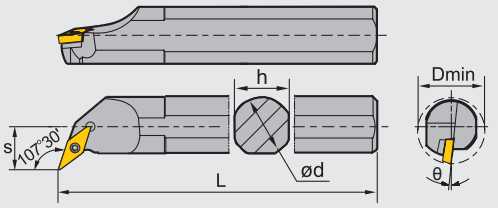
Application	For extra finishing	For finishing	For Al machining	PCBN/PCD inserts
Inserts shape	**USF**  A105	**HF**  A105	**LH**  A106	 A143
	SF  A105	**NF**  A105	**LC**  A106	 A148
Tool holder type **□□-SVUCR/L11**	VC□□1103□□	VC□□1103□□	VCGX1103□□	
□□-SVUCR/L16		VC□□1604□□	VC□□1604□□	VC□□1604□□

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

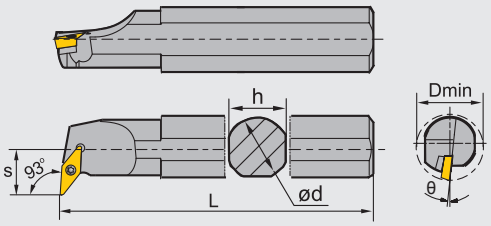
Application	For finishing	For semi-finishing	For roughing	PCBN/PCD inserts
Inserts shape	**EF**  A108	**HM**  A109	**HR**  A109	 A147
	NF  A108	**EM**  A109	**SNR**  A109	 A147
	NGF  A108			
Tool holder type **□□-SVQBR/L16**	VB□□1604□□	VB□□1604□□	VB□□1604□□	VB□□1604□□

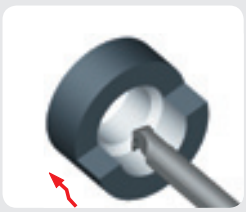
Corresponding tool holders of insert VB□□ S-type clamping

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

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□□	VB□□1604□□

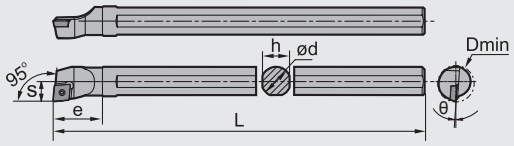
Corresponding tool holders of insert CP□□ S-type clamping

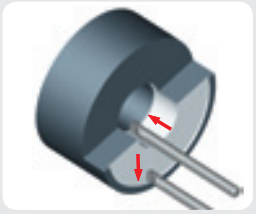
SCLPR/L

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				

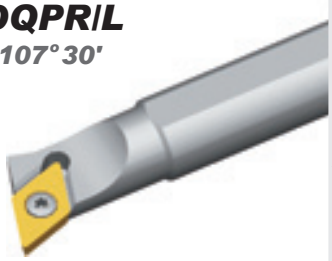
▲Stock available △Make-to-order

Applicable inserts

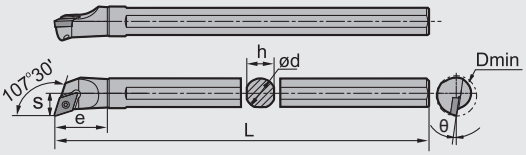
Application	For extra finishing
Inserts shape	SF  A110
Tool holder type **□□-SCLPR/L06**	CP□□0602□□
Tool holder type **□□-SCLPR/L09**	CP□□09T3□□

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

SDQPR/L
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	I60M2.5×6.5			
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

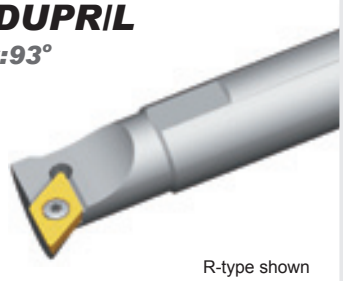
Application	For extra finishing
Inserts shape	**USF**  A111
	SF  A111
Tool holder type **□□-SDQPR/L07**	DP□□0702□□
□□-SDQPR/L11	DP□□11T3□□



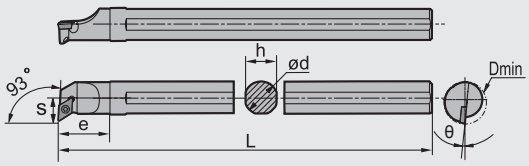
Corresponding tool holders of insert DP□□ S-type clamping

SDUPR/L

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	WT07IP	---	---
S12M-SDUPR/L07	▲	△	16	12	11	150	9	-8°	19				
S16Q-SDUPR/L07	△	△	20	16	15	180	11	-6°	25	I60M2.5×6.5			

▲Stock available △Make-to-order

Applicable inserts

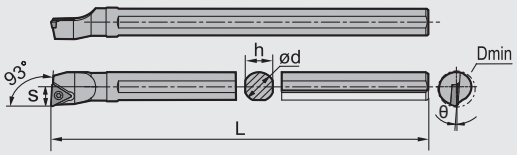
Application	For extra finishing
Inserts shape	SF  A111
Tool holder type □□-SDUPR/L07	DP□□0702□□

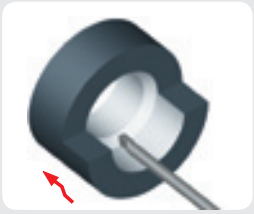
Corresponding tool holders of insert TP□□ S-type clamping

STUPR/L
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

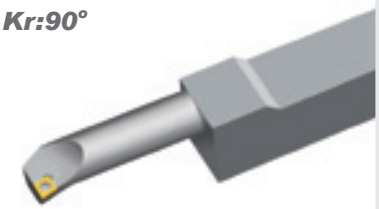
Applicable inserts

Application	For extra finishing
Inserts shape	SF  A113
Tool holder type □□-STUPR/L09	TP□□0902□□
Tool holder type □□-STUPR/L11	TP□□1103□□

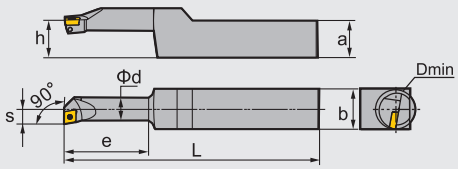
Corresponding tool holders of insert CC□□ S-type clamping

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

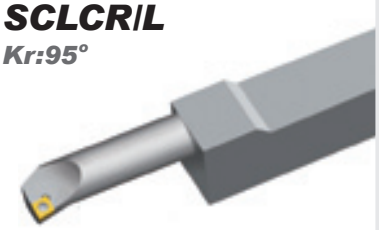
Applicable inserts

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□□

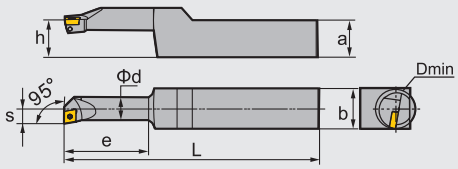
Corresponding tool holders of insert CC□□ S-type clamping

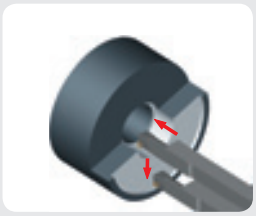
SCLCR/L

Kr:95°



R-type shown



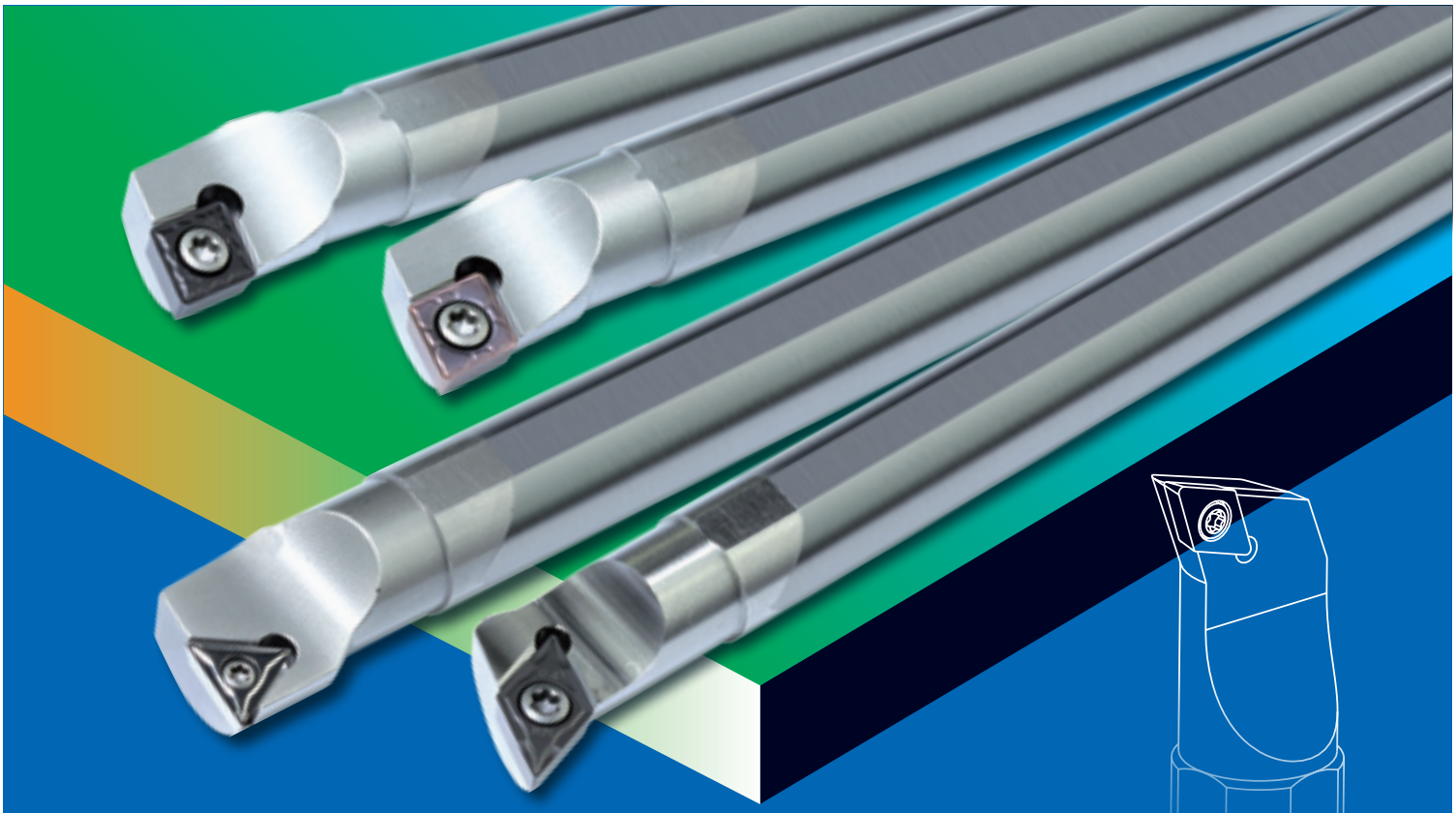


Type	Stock		Basic dimensions(mm)							Screw	Wrench	---	---
	R	L	Dmin	ød	L	s	a	b	e			---	---
S10M-SCLCR/L06S20	▲	▲	13	10	150	7	22	20	30	I60M2.5×5.5	WT07IP	---	---
S12P -SCLCR/L06S20	▲	▲	16	12	170	9	22	20	35				
S16Q-SCLCR/L09S20	▲	▲	20	16	180	11	22	20	40	I60M3.5×8	WT15IP	---	---
S20R-SCLCR/L09S20	△	△	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□□	CC□□0602□□	CCGX0602□□	CC□□0602□□	CC□□0602□□
□□-SCLCR/L09S20	CC□□09T3□□	CC□□09T3□□	CC□□09T3□□	CC□□09T3□□	CCGX09T3□□	CC□□09T3□□	CC□□09T3□□



Damping tool holders for internal turning

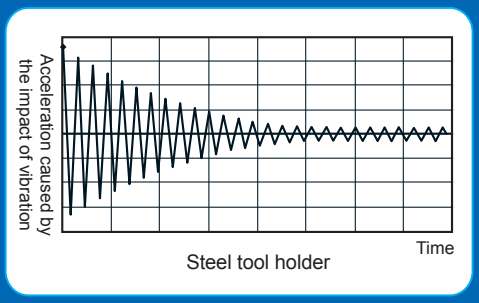
Technical features

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.

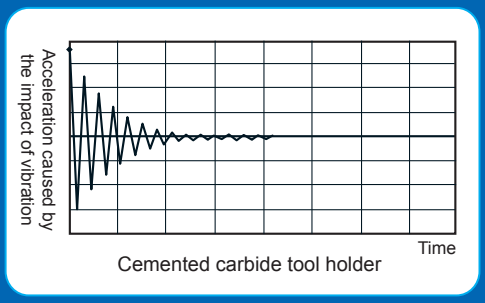


Under the same machining condition

the maximum overhang of cemented carbide tool holder can reach L≤6D, while the recommended maximum overhang of steel tool holder is L≤3D.



Steel tool holder



Cemented carbide tool holder

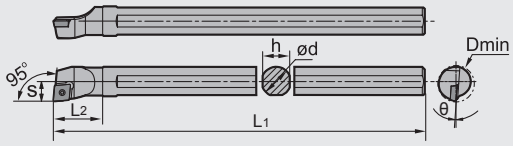
Corresponding tool holders of insert CP□□ (Damping tool holder) S-type clamping

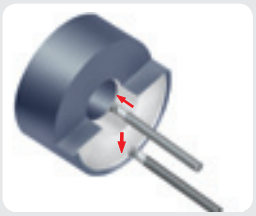
SCLPR/L

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  A110
Tool holder type □□-SCLPR/L06	CP□□0602□□
Tool holder type □□--SCLPR/L09	CP□□09T3□□

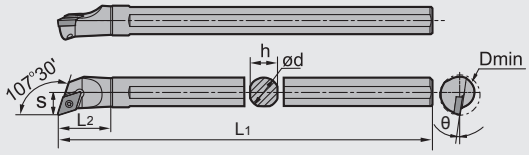
Corresponding tool holders of insert DP□□ (Damping tool holder) S-type clamping

SDQPR/L

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°	I60M2.5×6.5			
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

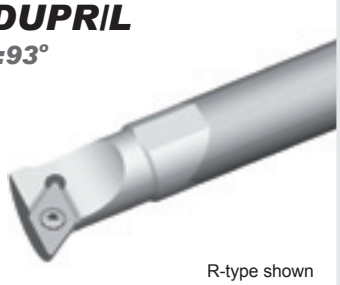
Applicable inserts

Application	For extra finishing
Inserts shape	**SF**  A111
Tool holder type □□-SDQPR/L07	DP□□0702□□
Tool holder type □□-SDQPR/L11	DP□□11T3□□

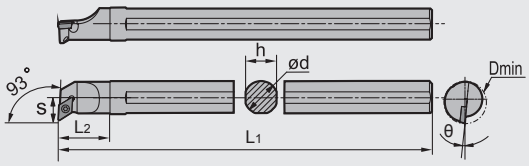
Corresponding tool holders of insert DP□□ (Damping tool holder) S-type clamping

SDUPR/L

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□□

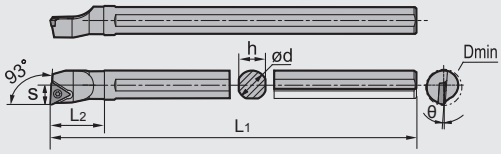
Corresponding tool holders of insert TP□□ (Damping tool holder) S-type clamping

STUPR/L

Kr:93°



R-type shown



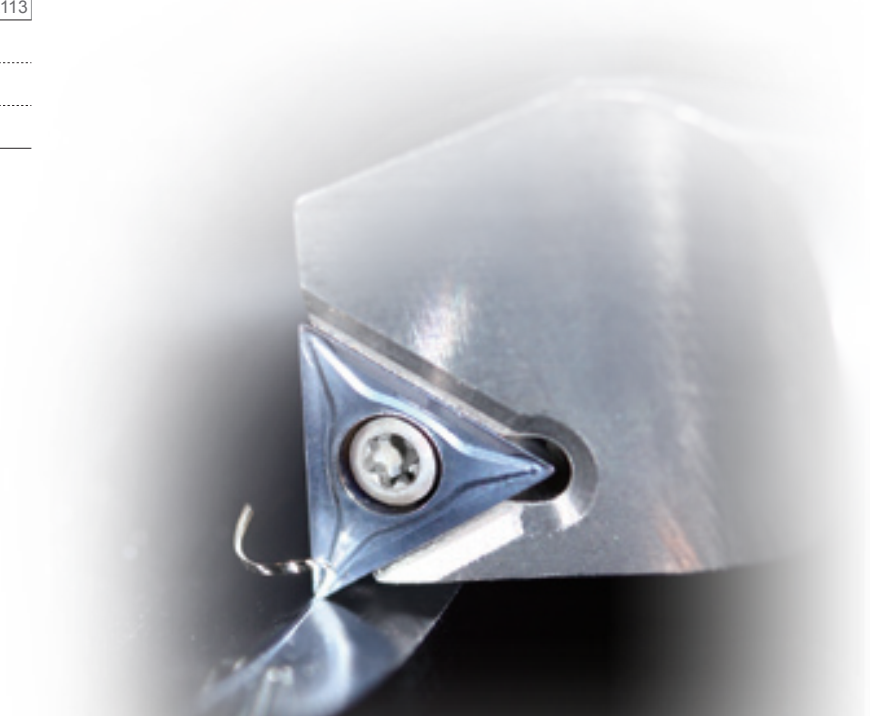


Type	Stock		Basic dimensions(mm)							Screw	Wrench	---	---
	R	L	Dmin	ød	s	L_1	L_2	h	θ			---	---
C10M-STUPR/L09	▲	△	12	10	6	150	20	9	-6°	I60M2.2×5.5	WT07IP	---	---
C12Q-STUPR/L09	▲	△	16	12	8	180	22	11	-4°				
C12Q-STUPR/L11	▲	△	16	12	8	180	25	11	-4°	I60M2.5×6.5	WT07IP	---	---
C16R-STUPR/L11	▲	△	20	16	10	200	27	15	-3°				

▲Stock available △Make-to-order

Applicable inserts

Application	For extra finishing
Inserts shape	SF  A113
Tool holder type □□-STUPR/L09	TP□□0902□□
Tool holder type □□-STUPR/L11	TP□□1103□□

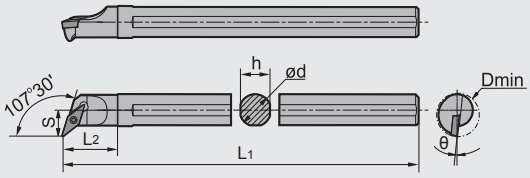


Corresponding tool holders of insert VC□□(Damping tool holder) S-type clamping

SVQCR/L
Kr:107°30'



R-type shown





Type	Stock		Basic dimensions(mm)							Screw	Wrench	---	---
	R	L	Dmin	ød	s	L_1	L_2	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 Al machining
Inserts shape	**USF**  A105	**HF**  A105	**LH**  A106
	SF  A105		**LC**  A106
Tool holder type **□□-SVQCR/L11**	VC□□1103□□	VC□□1103□□	VCGX1103□□

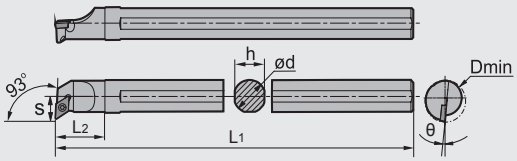
Corresponding tool holders of insert VC□□ (Damping tool holder) S-type clamping

SVUCR/L

Kr:93°



R-type shown





Type	Stock		Basic dimensions(mm)							Screw	Wrench	---	---
	R	L	Dmin	ød	s	L_1	L_2	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 Al machining
Inserts shape	**USF**  A105	**HF**  A105	**LH**  A106
	SF  A105		**LC**  A106
Tool holder type **□□-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

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, nonleaded 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

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									
K	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			

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
N	fibre reinforced composite materials	200~1000			
N	Metal base compound		1500~1800		
N	Coppeer and magnesium alloyssilumin		400~1260	400~1260	
N	Cemented carbide		20~40		
N	Unsintered ceramic materials				100~200
N	Sintered Ceramic				20~50

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≥Φ16mm)	
				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.

Frequent problems of turning and solutions

Common problem	Cause	Solutions	Tool material: Harder materials	Tool material: Tougher materials	Cutting conditions: Cutting speed	Cutting conditions: Feed rate	Cutting conditions: Cutting depth	Cutting conditions: Cutting liquid	Tool shape: Change chipbreaker of inserts	Tool shape: Rake face	Tool shape: Nose radius	Tool shape: Approach angle	Tool shape: Cutting edge strength	Tool shape: Increase precision of inserts	Tool shape: Increase rigidity of tool holder	Machine clamping system: Clamping of tool holder and workpiece	Machine clamping system: Overhang of tool holder	Machine clamping system: Power, gap
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	Vibration and impact		✓		↓	↓		✓			↓	↑		✓	✓	✓	✓
	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	✓						✓	↑	↑		↑		✓	✓	✓	✓

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 hig. 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

How to select parting and grooving tools

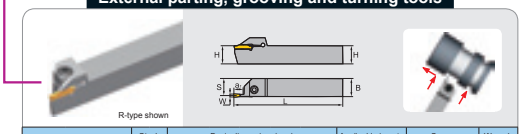
Structure of parting and grooving tools selection table

- 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

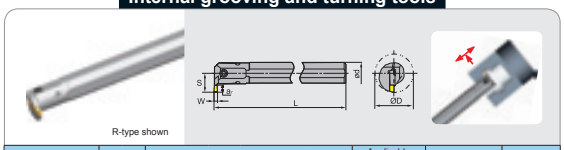


R-type shown

Type		Stock R	Stock L	Basic dimensions(mm) H×B	L	S	W	ar max	Applicable inserts	Screw	Wrench
QEAD	1212R/L07	▲	▲	12×12	125	11.4	1.5	7	ZCAD015□□	GB70-85-M4×12	WH30L
	1212R/L12	▲	▲	12×12	125	11.4	1.5	12	ZCAD015□□		
	1616R/L07	▲	▲	16×16	125	15.4	1.5	7	ZCAD015□□	GB70-85-M5×16	WH40L
	1616R/L12	▲	▲	16×16	125	15.4	1.5	12	ZCAD015□□		
	2020R/L07	▲	▲	20×20	125	19.4	1.5	7	ZCAD015□□		
	2020R/L12	▲	▲	20×20	125	19.4	1.5	12	ZCAD015□□		
QEBD	1212R/L07	▲	▲	12×12	125	11.2	2	7	ZCBD02□□	GB70-85-M4×12	WH30L
	1212R/L10	▲	▲	12×12	125	11.2	2	10	ZCBD02□□		
	1212R/L14	▲	▲	12×12	125	11.2	2	14	ZCBD02□□		
	1616R/L07	▲	▲	16×16	125	15.2	2	7	ZCBD02□□	GB70-85-M5×16	WH40L
	1616R/L10	▲	▲	16×16	125	15.2	2	10	ZCBD02□□		
	1616R/L14	▲	▲	16×16	125	15.2	2	14	ZCBD02□□		
	2020R/L07	▲	▲	20×20	125	19.2	2	7	ZCBD02□□		
	2020R/L10	▲	▲	20×20	125	19.2	2	10	ZCBD02□□		
	2020R/L14	▲	▲	20×20	125	19.2	2	14	ZCBD02□□		
	2525R/L07	▲	▲	25×25	150	24.2	2	7	ZCBD02□□	GB70-85-M6×20	WH50L
	2525R/L10	▲	▲	25×25	150	24.2	2	10	ZCBD02□□		
	2525R/L14	▲	▲	25×25	150	24.2	2	14	ZCBD02□□		
QEED	1616R/L10	▲	▲	16×16	125	15	2.5	10	ZCED025□□	GB70-85-M5×20	WH40L
	1616R/L17	▲	▲	16×16	125	15	2.5	17	ZCED025□□		
	2020R/L10	▲	▲	20×20	125	19	2.5	10	ZCED025□□	GB70-85-M6×20	WH50L
	2020R/L17	▲	▲	20×20	125	19	2.5	17	ZCED025□□		
	2525R/L10	▲	▲	25×25	150	24	2.5	10	ZCED025□□		
	2525R/L17	▲	▲	25×25	150	24	2.5	17	ZCED025□□		
QEFD	1616R/L10	▲	▲	16×16	125	14.8	3	10	ZCFD03□□	GB70-85-M5×20	WH40L
	1616R/L17	▲	▲	16×16	125	14.8	3	17	ZCFD03□□		
	2020R/L10	▲	▲	20×20	125	18.8	3	10	ZCFD03□□	GB70-85-M6×20	WH50L
	2020R/L17	▲	▲	20×20	125	18.8	3	17	ZCFD03□□		
	2525R/L10	▲	▲	25×25	150	23.8	3	10	ZCFD03□□		
	2525R/L17	▲	▲	25×25	150	23.8	3	17	ZCFD03□□		
QEGD	2020R/L13	▲	▲	20×20	140	18.5	4	13	ZCGD04□□	GB70-85-M6×20	WH50L
	2020R/L22	▲	▲	20×20	140	18.5	4	22	ZCGD04□□		
	2525R/L13	▲	▲	25×25	150	23.5	4	13	ZCGD04□□		

▲Stock available △Make-to-order

Internal grooving and turning tools

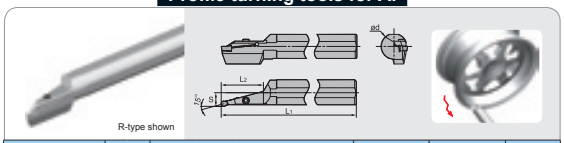


R-type shown

Type	Stock R	Stock L	Basic dimensions(mm) ød	L	S	W	ar max	ØDmin	Applicable inserts	Screw	Wrench
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 R	Stock L	Basic dimensions(mm) ØD (Minimum machining diameter)	ød	S	L1	L2	Applicable inserts	Screw	Wrench
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.

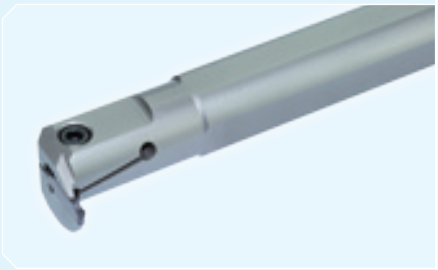


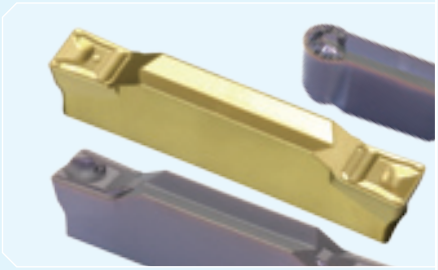
TURNING A

Parting and grooving tools

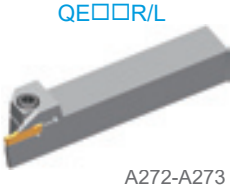
Parting and grooving tools overview A250-A252
Parting and grooving inserts A253-A269
Introduction of Little Squirrel series inserts chipbreaker A254-A257
Parting, grooving and profiling inserts code key A258
Inserts of Little Squirrel series A259-A265
QC series shallow grooving inserts code key A266
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
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Application information on parting and grooving A289-A290



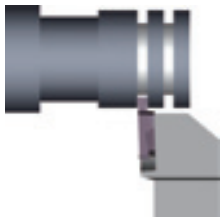
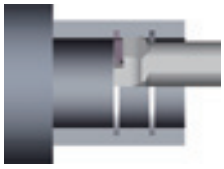




Parting and grooving tools overview

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 width1.2~2.4mm	● Grinded insert used for precise grooving ● Edge width can be anything between 1.0-6.5mm, customized according to users' needs. ● ZT□□D□□-EG inserts: 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.
			Little squirrel series QE□□R/L  A272-A273	Precise grooving ZT□D□□-EG  Edge width2.4~6.5mm	

Parting and grooving tools overview

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.
Internal machining	Grooving and turning		Little squirrel series C□□-Q□□R/L□  A284	Grooving, Turning ZT□D□□  Profile turning ZR□D□□ 	● 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.
	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.
End surface machining	Grooving and turning		Little squirrel series QF□□□□H  A278-A281	Grooving, Turning ZT□D□□  Profile turning ZR□D□□ 	● 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.
			Little squirrel series QF□□□□L  A282-A283	Grooving, Turning ZT□D□□  Profile turning ZR□D□□ 	● 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□□D□□□  A274	Grooving, Turning ZT□D□□  Profile turning ZR□D□□ 	● The unique tool for recess machining. ● Complete range of specifications, able to achieve various recess machining.

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

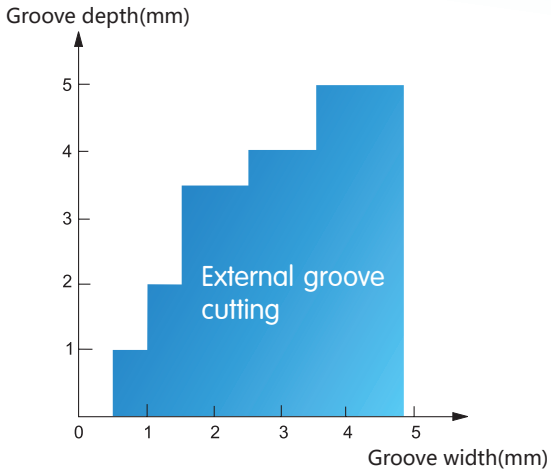


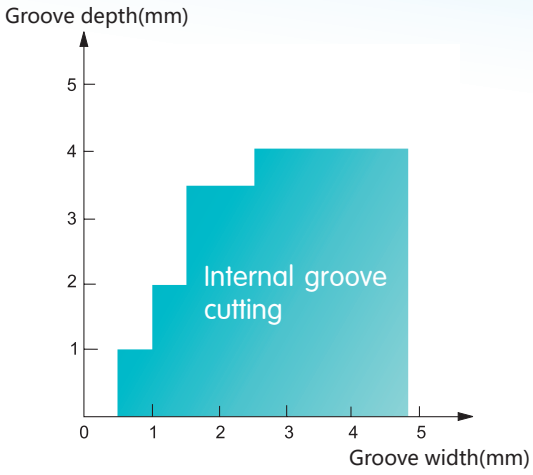
QC series
shallow grooving tools

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





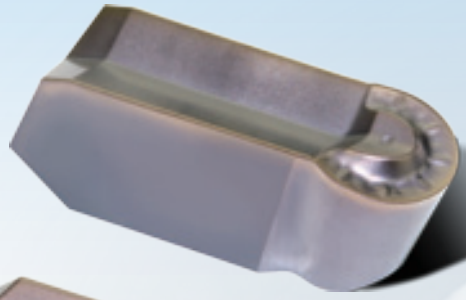
Little-Squirrel Series

Profile turning inserts for parting of aviation titanium alloy. high temperature alloy

-NF

Single-headed precision profile turning inserts

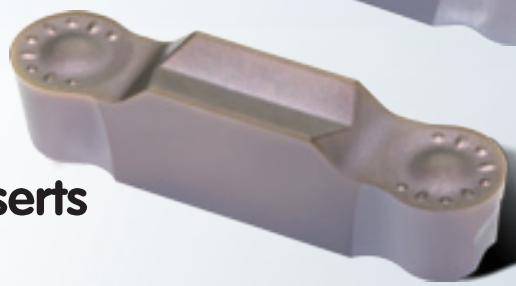
Sharp edge, small cutting force, good surface quality;
Indexing accuracy reaches ±0.025mm, safe and stable clamping;
Mainly applied in finishing of high-temperature alloy, titanium alloy.



-NM

Precision profile turning inserts

Sharp edge, small cutting force, good surface quality;
Indexing accuracy reaches ±0.025mm;
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

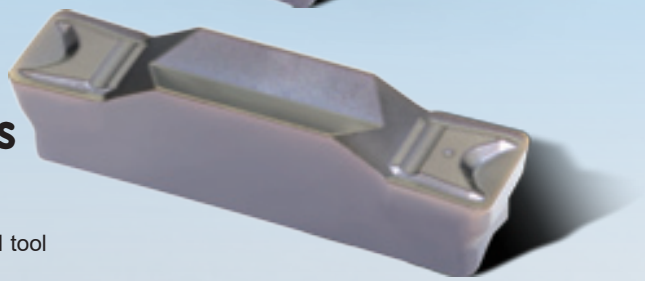
Straight edge, excellent surface quality;
Sharp edge, smaller cutting force;
Good chip breaking;
Mainly used for rough machining of high-temperature alloy and titanium alloy.



-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：Vc=45m/min, f=0.2mm/r
Coolant：Water



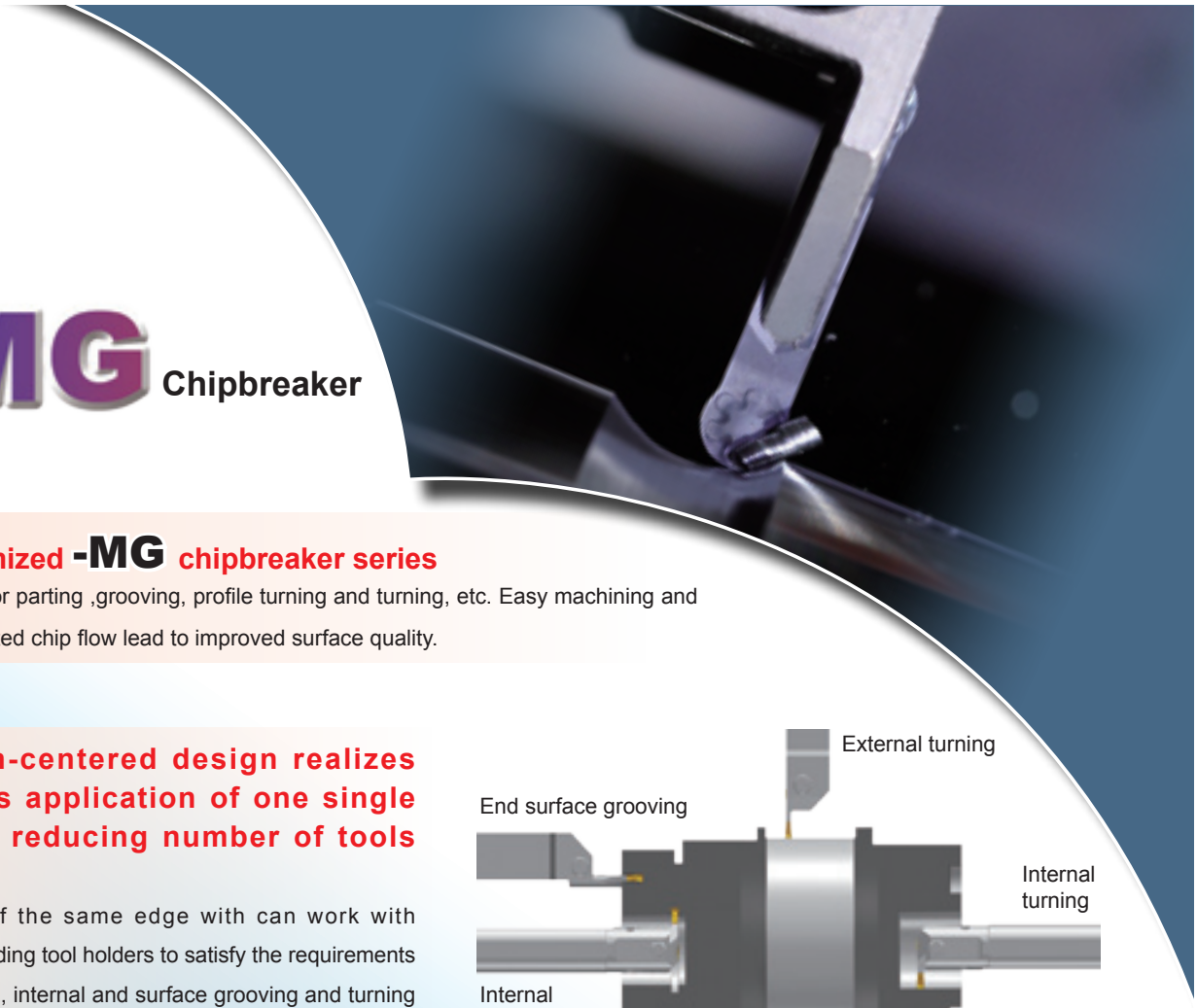
Products of company A



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

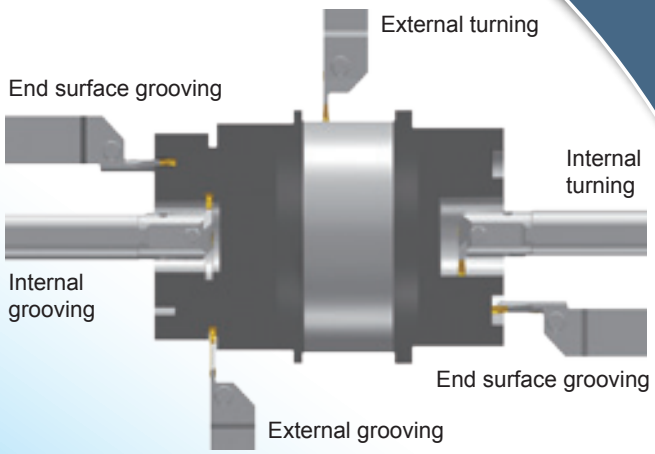


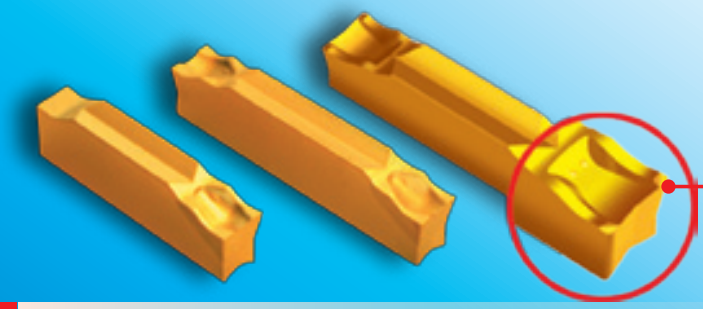
Customized -MG chipbreaker series

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.

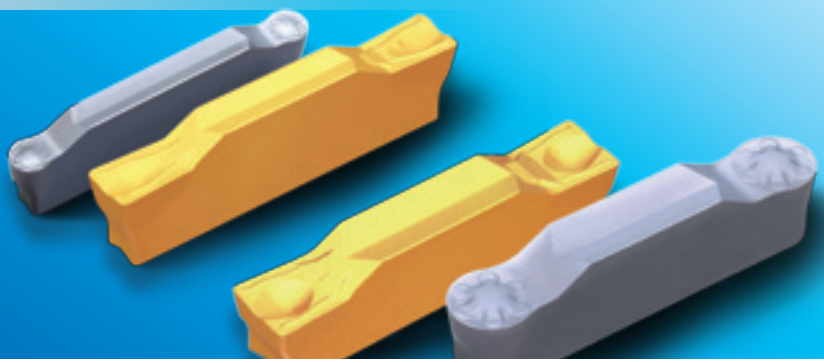




The cutting force is reduced by 20%, and the vibration is diminished.

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

-EG

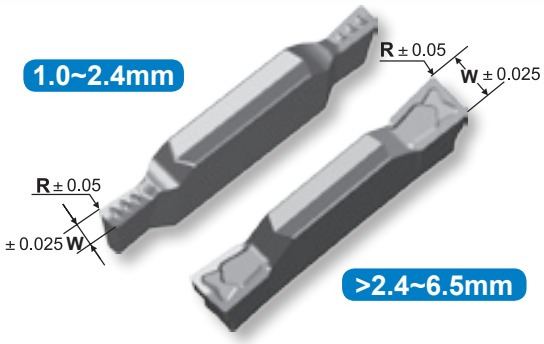
Precision grooving and profile turning inserts

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.

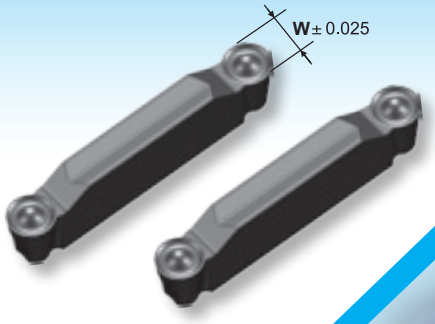
-EG Precision grooving inserts

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.

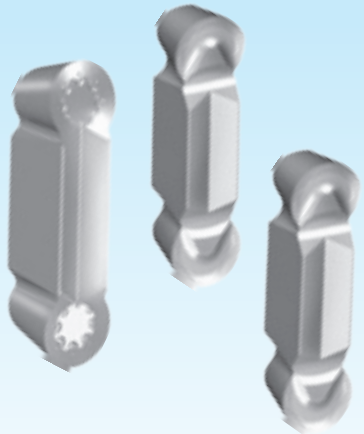
-EG Precision profile turning inserts



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.

Little squirrel series parting, grooving and profiling inserts code key

Insert applications

ZP ➤ Parting **ZT** ➤ Grooving and turning
ZR ➤ Profiling

Code of locating slot

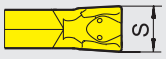
Code of locating slot	A	B	E	F	G	H	K	L
Corresponding edge width of inserts	1.5	2.0	2.5	3.0	4.0	5.0	6.0	8.0

Code of cutting edge number

S ➤ Single cutting edge **D** ➤ Double cutting edge

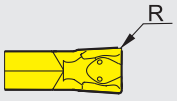
ZP G D 04 04 - M G

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



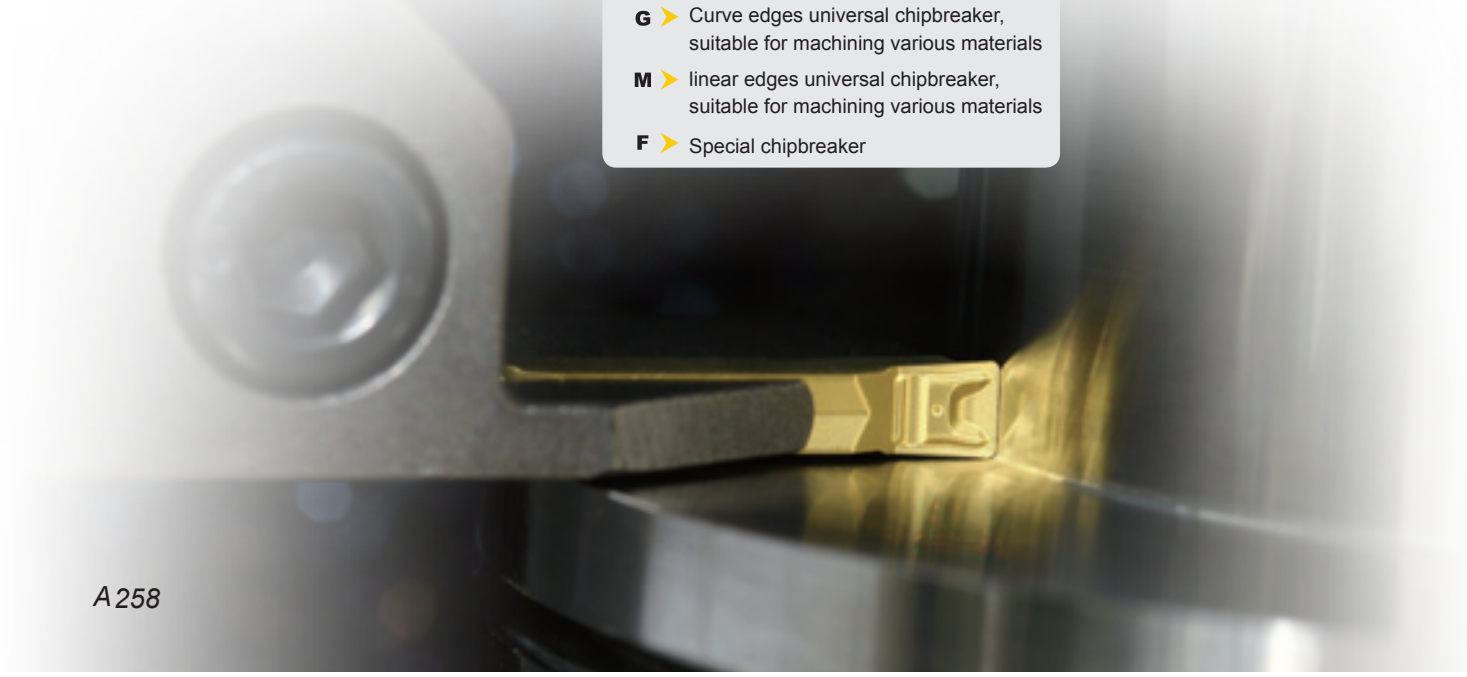
02=0.2mm
03=0.3mm
04=0.4mm
08=0.8mm

Tolerance class

M ➤ M-level tolerance
E ➤ E-level tolerance

Chipbreaker code

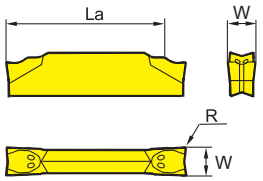
G ➤ Curve edges universal chipbreaker, suitable for machining various materials
M ➤ linear edges universal chipbreaker, suitable for machining various materials
F ➤ Special chipbreaker



Parting inserts

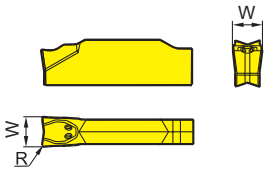


Double edges



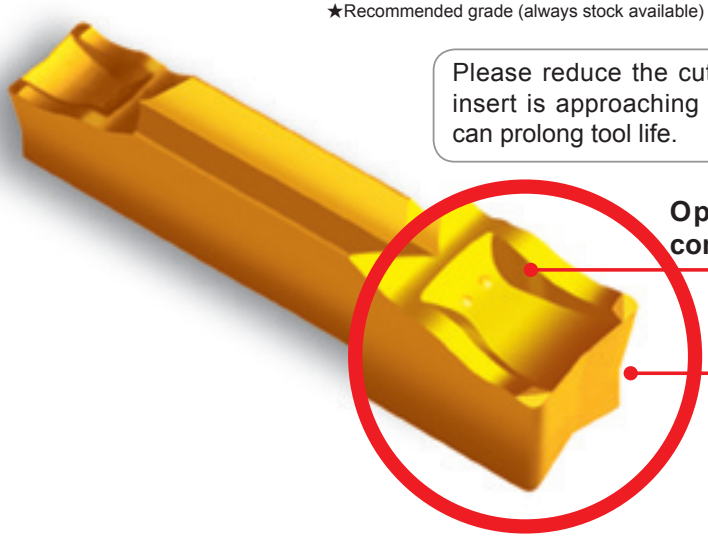


Single edge



Type		Basic dimensions(mm)			Grade				
					CVD Coating		PVD Coating		Cemented carbide
		$W^{+0.1}_{0}$	R±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									

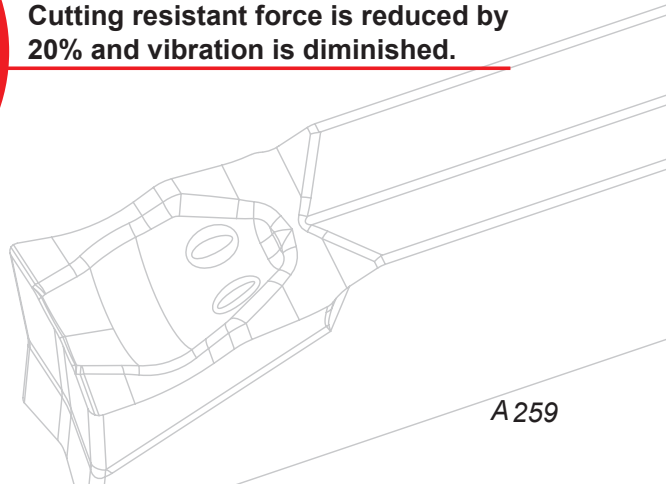
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order



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.

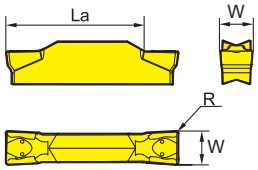
Cutting resistant force is reduced by 20% and vibration is diminished.



Grooving and turning inserts

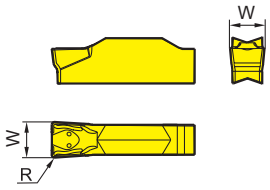


Double edges





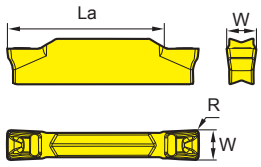
Single edge



Type		Basic dimensions(mm)			Grade					
					CVD Coating		PVD Coating			Cemented carbide
		$W^{+0.1}_{0}$	R±0.10	Cutting depth La_{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





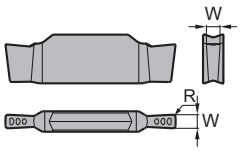
Type		Basic dimensions(mm)			Grade					
					CVD Coating		PVD Coating			Cemented carbide
		W	R±0.1	Cutting depth La_{max}	YBC151	YBC251	YBG202	YBG205	YBG302	YD101
Double edges	**ZTAD01502-MM**	1.5±0.03	0.2	12	○	○	●	★	○	
	ZTBD02002-MM	2.0±0.03	0.2	14	○	○	●	★	○	
	ZTED02503-MM	2.5±0.03	0.3	17	○	○	●	★	○	
	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

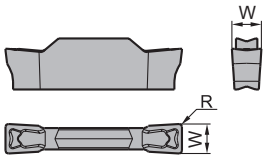


1.0~2.4mm series





>2.4~6.5mm series

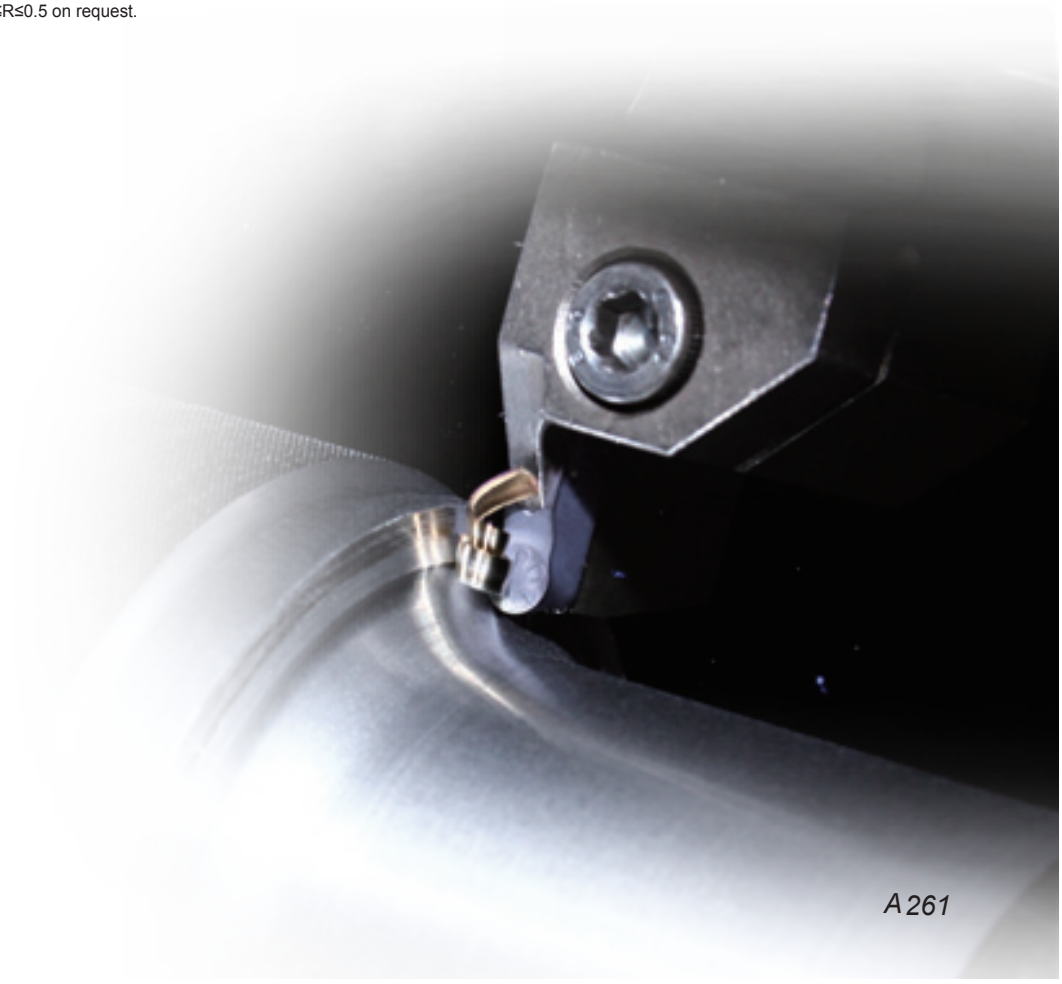


Type		Basic dimensions(mm)			Grade					
					CVD Coating		PVD Coating			Cemented carbide
		W±0.025	R(2)±0.05	Cutting depth La_{max}	YBC151	YBC251	YBG202	YBG205	YBG302	YD101
Double edges	**ZTCD□□□□□□(1)-EG**	1.0~1.6	See note. (2)	2.6	○	○	○	★	○	
		1.6~2.4		3.4						
	ZTED□□□□□-EG	2.4~3.0		17	○	○	○	★	○	
	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

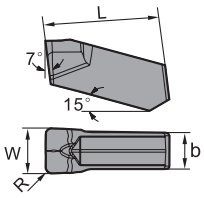
Note: (1) □ The code here in the description is determined by edge width and nose radius requested by customers. For example, when the customer requires an edge width of 3.5mm and a nose radius of 0.3mm, the description of the insert would be ZTFD03503-EG.

(2) The nose radius range is 0.2≤R≤0.5 on request.



Single-edge grooving and turning inserts for semi-finishing and roughing difficult-to-machine materials



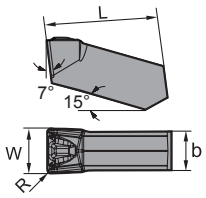


Type	Basic dimensions(mm)				Grade				
					PVD Coating				Cemented carbide
	W±0.05	R±0.1	b	L	YBG102	YBG202	YBG205	YBS103	YD101
ZIMF304N-NM	3	0.4	2.4	15.3	★	○	★	●	○
ZIMF406N-NM	4	0.6	3.2	15.3	★	○	★	●	○
ZIMF506N-NM	5	0.6	4.0	15.3	★	○	★	○	○
ZIMF608N-NM	6	0.8	4.0	15.3	★	○	★	○	○

★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



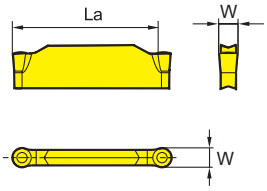


Type	Basic dimensions(mm)				Grade				
					PVD Coating				Cemented carbide
	W±0.05	R±0.1	b	L	YBG105	YBG212	YBG205	YBS103	YD101
ZIMF304N-SM	3	0.4	2.4	15.3	★	★		●	○
ZIMF404N-SM	4	0.4	3.2	15.3	★	★		○	○
ZIMF504N-SM	5	0.4	4.0	15.3	★	★		○	○
ZIMF604N-SM	6	0.4	5.1	15.3	★	★		○	○

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

Profiling inserts



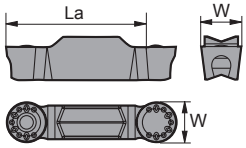


Type		Basic dimensions(mm)		Grade					
				CVD Coating		PVD Coating			Cemented carbide
		$W^{+0.1}_{0}$	Cutting depth La_{max}	YBC151	YBC251	YBG202	YBG205	YBG302	YD101
Double edges	**ZRED025-MG**	2.5	17.5		○	●	★	★	
	ZRFD03-MG	3.0	17		○	●	★	★	
	ZRGD04-MG	4.0	21		○	●	★	★	
	ZRHD05-MG	5.0	20		○	○	★	★	
	ZRKD06-MG	6.0	19		○	●	★	★	

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

Profiling inserts



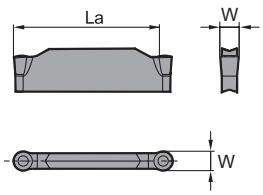


Type		Basic dimensions(mm)		Grade						
				CVD Coating		PVD Coating				Cemented carbide
		W±0.025	Cutting depth La_{max}	YBC151	YBC251	YBG105	YBG212	YBG302	YBS103	YD101
Double edges	**ZRFD03-NM**	3	17			★	★		●	
	ZRGD04-NM	4	21			★	★		●	
	ZRHD05-NM	5	20			★	★		○	
	ZRKD06-NM	6	19			★	★		○	

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

Precision profiling inserts



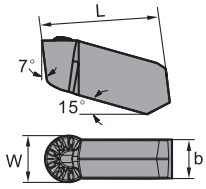


Type		Basic dimensions(mm)		Grade				
				CVD Coating		PVD Coating		Cemented carbide
		W±0.025	Cutting depth La_{max}	YBC151	YBC251	YBG202	YBG302	YD101
Double edges	**ZRFD03- EG**	3.0	17		○		○	
	ZRGD04- EG	4.0	21		○		○	
	ZRHD05-EG	5.0	20		○		○	
	ZRKD06-EG	6.0	19		○		○	

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

Single-edge inserts for profiling materials hard to be machined



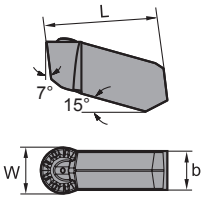


Type	Basic dimensions(mm)			Grade			
				PVD Coating			Cemented carbide
	W±0.025	b	L	YBG102	YBG202	YBS103	YD101
ZIGQ3N-NM	3	2.4	15.3	★	○	●	○
ZIGQ4N-NM	4	3.2	15.3	★	○	●	○
ZIGQ5N-NM	5	4.0	15.3	★	○	○	○
ZIGQ6N-NM	6	5.0	15.3	★	○	○	○

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

Single-edge inserts for profiling materials hard to be machined



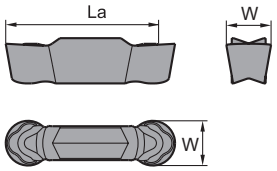


Type	Basic dimensions(mm)			Grade			
				PVD Coating			Cemented carbide
	W±0.025	b	L	YBG105	YBG212	YBS103	YD101
ZIGQ3N-NF	3	2.4	15.3	★	★	●	
ZIGQ4N-NF	4	3.2	15.3	★	★	○	
ZIGQ5N-NF	5	4.0	15.3	★	★	○	
ZIGQ6N-NF	6	5.0	15.3	★	★	○	

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

Profiling inserts for Al



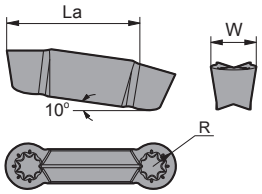


Type	Basic dimensions(mm)		Grade
			Cemented carbide
	W±0.02	Cutting depth Lamax	YD101
ZRKD06-LH	6.0	19	★
ZRLD08-LH	8.0	22	★

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

Profiling inserts for Al





Type	Basic dimensions(mm)			Grade
				Cemented carbide
	W±0.02	R	Cutting depth Lamax	YD101
ZILD08-LC	8.0	4.0	22	●

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

QC series shallow grooving inserts code key

● Square head shallow groove inserts

QC **22** **R** **300** - **R** **03**

QC — Shallow grooving inserts

22 — Cutting edge length code / Inner tangent circle diameter(mm)

Cutting edge length code	Inner tangent circle diameter(mm)
11	6.35
16	9.525
22	12.70

R — Direction

Code	Form
R	Rightward
L	Leftward

300 — Grooving width(mm)

Code	Width
050	0.50
100	1.00
...	...
480	4.80

R — Inserts tip form

Code	Form
R	Circular arc
C	Chamfering

03 — Rounding or chamfering(mm)

Code	Size
02	0.2
03	0.3
04	0.4

● Round head shallow groove inserts

QC **22** **R** **300** **R**

QC — Shallow grooving inserts

22 — Cutting edge length code / Inner tangent circle diameter(mm)

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)

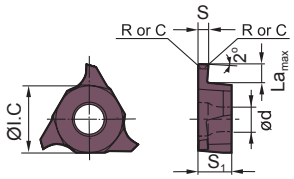
Code	Width
050	0.50
100	1.00
...	...
480	4.80

R — Head form: round head

Square head shallow groove inserts



R-type shown



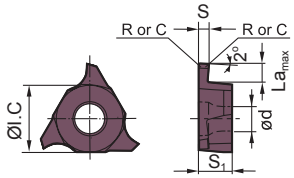
Type		Basic dimensions(mm)						Grade	
								PVD Coating	
		$S^{\pm 0.025}$	La_{max}	R/C	ØI.C	S_1	Ød	YBG202	YBG205
QC11R/L	120-R02	1.20	1.50	R0.2	6.35	3.18	2.8	○	○
	125-R02	1.25	1.50	R0.2	6.35	3.18	2.8	○	○
	145-R02	1.45	1.50	R0.2	6.35	3.18	2.8	○	○
	150-R02	1.50	1.50	R0.2	6.35	3.18	2.8	○	○
	200-R02	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

Square head shallow groove inserts



R-type shown



Type		Basic dimensions(mm)						Grade	
								PVD Coating	
		S±0.025	La_{max}	R/C	ØI.C	S_1	Ød	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	○	○

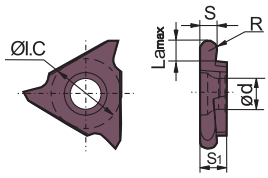
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

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



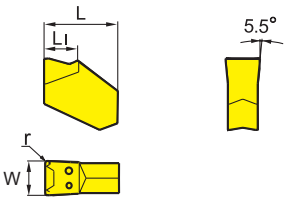
Type		Basic dimensions(mm)						Grade	
								PVD Coating	
		S±0.025	La_{max}	R/C	ØI.C	S_1	Ød	YBG202	YBG205
QC16R/L	200R	2.00	2.50	1.00	12.70	3.18	4.4	○	○
	300R	3.00	2.50	1.50	12.70	3.18	4.4	○	○
QC22R/L	100R	1.00	2.00	0.50	12.70	4.76	5.5	○	○
	150R	1.50	3.50	0.75	12.70	4.76	5.5	○	○
	200R	2.00	3.50	1.00	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.

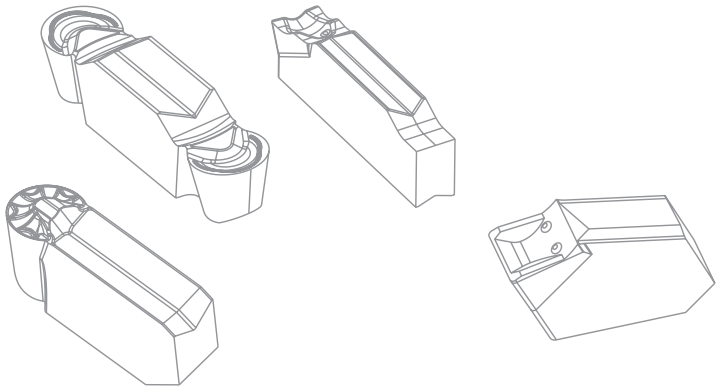
ZQMX series





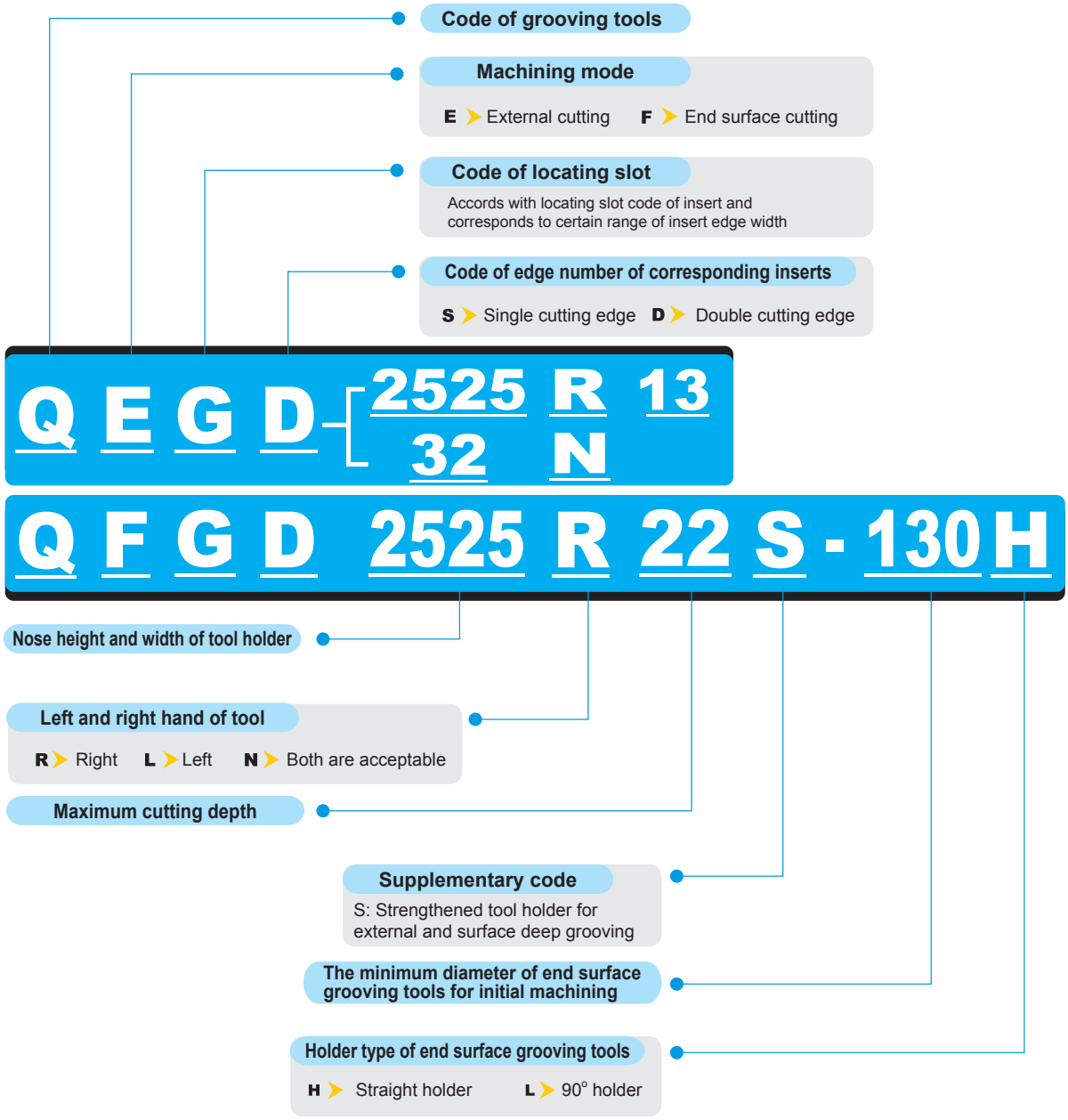
Type	Basic dimensions(mm)				Grade		
					CVD Coating	Cemented carbide	
	L1	W	r	L	YBC251	YC40	YD201
ZQMX3N11-1E	4.4	3.125	0.3	11	●	●	●
ZQMX4N11-1E	4.95	4.125	0.3	11	●	●	●
ZQMX5N11-1E	5.0	5.125	0.3	11	●	●	●
ZQMX6N11-1E	5.28	6.4	0.3	11	●	●	○
ZQMX7N11-1E	4.53	7.05	0.3	14		○	

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

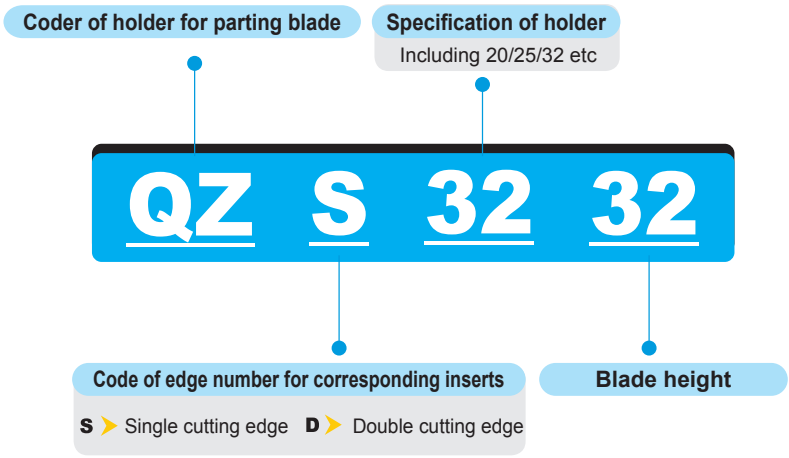


Little squirrel series parting and grooving tools code key

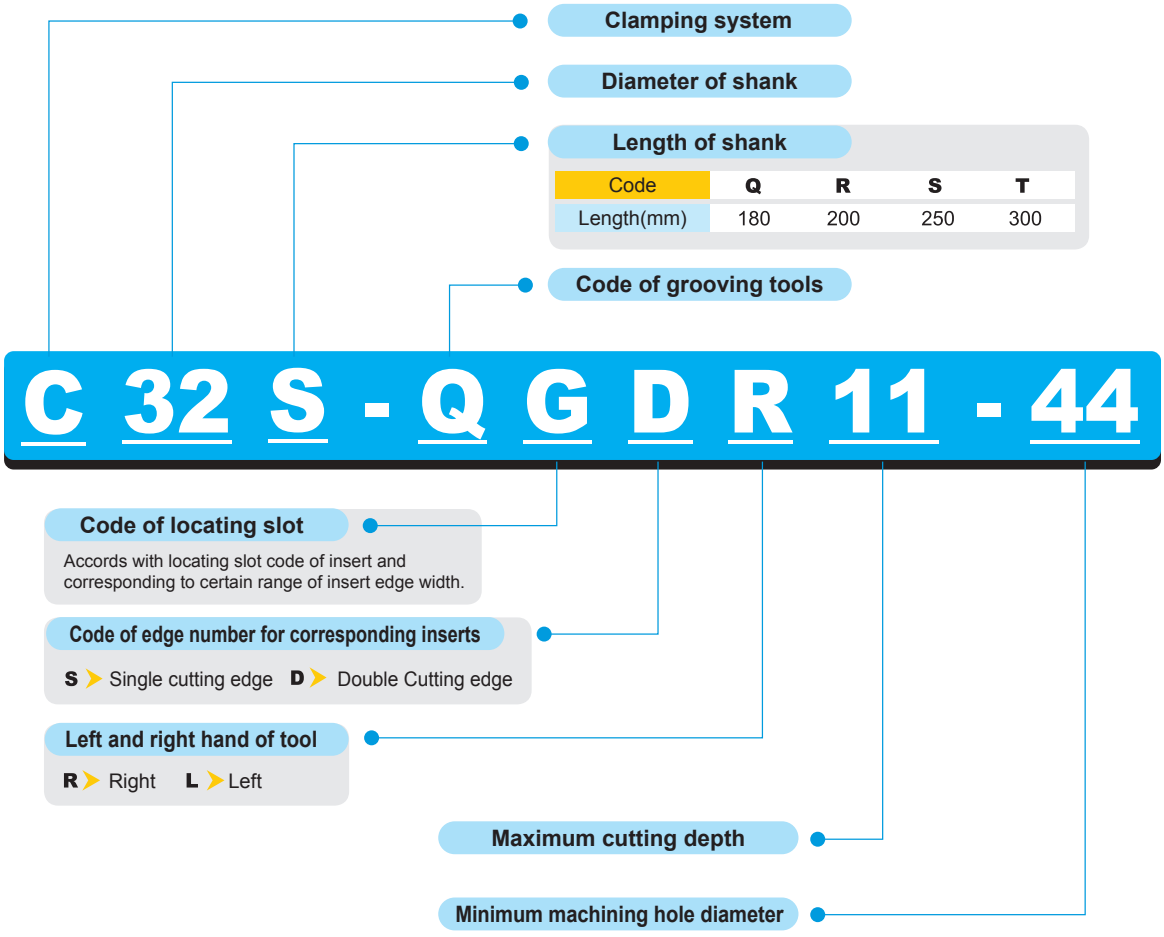
● External and surface turning



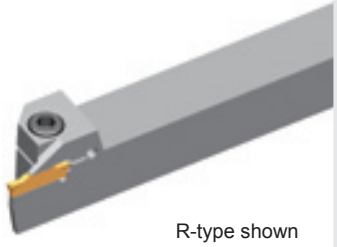
● Holder for parting blade



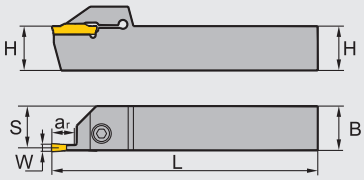
● Internal machining



External parting, grooving and turning tools



R-type shown

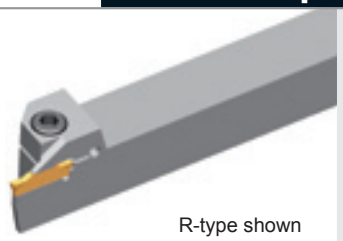




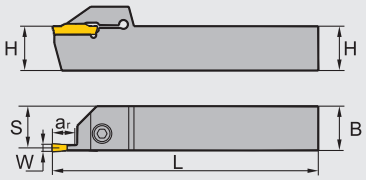
Type		Stock		Basic dimensions(mm)					Applicable inserts	Screw	Wrench
		R	L	H×B	L	S	W	$a_{r\,max}$			
QEAD	**1212R/L07**	▲	▲	12×12	125	11.4	1.5	7	ZD□AD015□□	GB70-85-M4×12	WH30L
	1212R/L12	▲	▲	12×12	125	11.4	1.5	12	ZD□AD015□□		
	1616R/L07	▲	▲	16×16	125	15.4	1.5	7	ZD□AD015□□	GB70-85-M5×16	WH40L
	1616R/L12	▲	▲	16×16	125	15.4	1.5	12	ZD□AD015□□		
	2020R/L07	▲	▲	20×20	125	19.4	1.5	7	ZD□AD015□□		
	2020R/L12	▲	▲	20×20	125	19.4	1.5	12	ZD□AD015□□		
QEBD	**1212R/L07**	▲	▲	12×12	125	11.2	2	7	ZD□BD02□□	GB70-85-M4×12	WH30L
	1212R/L10	▲	▲	12×12	125	11.2	2	10	ZD□BD02□□		
	1212R/L14	▲	▲	12×12	125	11.2	2	14	ZD□BD02□□		
	1616R/L07	▲	▲	16×16	125	15.2	2	7	ZD□BD02□□	GB70-85-M5×16	WH40L
	1616R/L10	▲	▲	16×16	125	15.2	2	10	ZD□BD02□□		
	1616R/L14	▲	▲	16×16	125	15.2	2	14	ZD□BD02□□		
	2020R/L07	▲	▲	20×20	125	19.2	2	7	ZD□BD02□□		
	2020R/L10	▲	▲	20×20	125	19.2	2	10	ZD□BD02□□		
	2020R/L14	▲	▲	20×20	125	19.2	2	14	ZD□BD02□□		
	2525R/L07	▲	▲	25×25	150	24.2	2	7	ZD□BD02□□	GB70-85-M6×20	WH50L
	2525R/L10	▲	▲	25×25	150	24.2	2	10	ZD□BD02□□		
	2525R/L14	▲	▲	25×25	150	24.2	2	14	ZD□BD02□□		
QEED	**1616R/L10**	▲	▲	16×16	125	15	2.5	10	ZD□ED025□□	GB70-85-M5×20	WH40L
	1616R/L17	▲	▲	16×16	125	15	2.5	17	ZD□ED025□□		
	2020R/L10	▲	▲	20×20	125	19	2.5	10	ZD□ED025□□	GB70-85-M6×20	WH50L
	2020R/L17	▲	▲	20×20	125	19	2.5	17	ZD□ED025□□		
	2525R/L10	▲	▲	25×25	150	24	2.5	10	ZD□ED025□□		
	2525R/L17	▲	▲	25×25	150	24	2.5	17	ZD□ED025□□		
QEFD	**1616R/L10**	▲	▲	16×16	125	14.8	3	10	ZD□FD03□□	GB70-85-M5×20	WH40L
	1616R/L17	▲	▲	16×16	125	14.8	3	17	ZD□FD03□□		
	2020R/L10	▲	▲	20×20	125	18.8	3	10	ZD□FD03□□	GB70-85-M6×20	WH50L
	2020R/L17	▲	▲	20×20	125	18.8	3	17	ZD□FD03□□		
	2525R/L10	▲	▲	25×25	150	23.8	3	10	ZD□FD03□□		
	2525R/L17	▲	▲	25×25	150	23.8	3	17	ZD□FD03□□		
QEGD	**2020R/L13**	▲	▲	20×20	140	18.5	4	13	ZD□GD04□□	GB70-85-M6×20	WH50L
	2020R/L22	▲	▲	20×20	140	18.5	4	22	ZD□GD04□□		
	2525R/L13	▲	▲	25×25	150	23.5	4	13	ZD□GD04□□		

▲Stock available △Make-to-order

External parting, grooving and turning tools



R-type shown

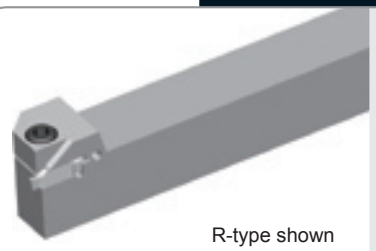




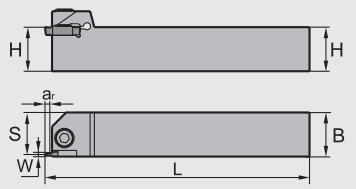
Type		Stock		Basic dimensions(mm)					Applicable inserts	Screw	Wrench
		R	L	H×B	L	S	W	a_r max			
QEGD	2525R/L22	▲	▲	25×25	150	23.5	4	22	ZC□GD04□□	GB70-85-M6×20	WH50L
	3232R/L13	▲	▲	32×32	170	30.5	4	13	ZC□GD04□□		
	3232R/L22	▲	▲	32×32	170	30.5	4	22	ZC□GD04□□		
QEHD	2525R/L13	▲	▲	25×25	150	23	5	13	ZC□HD05□□	GB70-85-M6×20	WH50L
	2525R/L22	▲	▲	25×25	150	23	5	22	ZC□HD05□□		
QEHS	2525N30	▲	▲	25×25	150	12.5	5	30	ZC□HS05□□		
QEHD	3232R/L13	▲	▲	32×32	170	30	5	13	ZC□HD05□□		
	3232R/L22	▲	▲	32×32	170	30	5	22	ZC□HD05□□		
QEHS	3232N30	▲	▲	32×32	170	16	5	30	ZC□HS05□□		
QEKD	2525R/L13	▲	▲	25×25	150	22.6	6	13	ZC□KD06□□	GB70-85-M6×20	WH50L
	2525R/L22	▲	▲	25×25	150	22.6	6	22	ZC□KD06□□		
QEKS	2525N30	▲	▲	25×25	150	12.5	6	30	ZC□KS06□□		
QEKD	3232R/L13	▲	▲	32×32	170	29.6	6	13	ZC□KD06□□		
	3232R/L22	▲	▲	32×32	170	29.6	6	22	ZC□KD06□□		
QEKS	3232N30	▲	▲	32×32	170	16	6	30	ZC□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



R-type shown

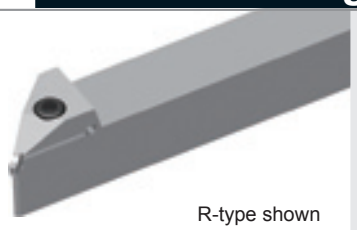


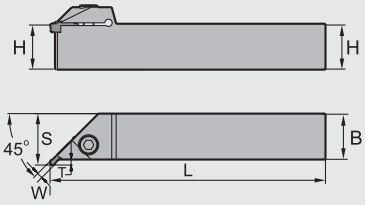


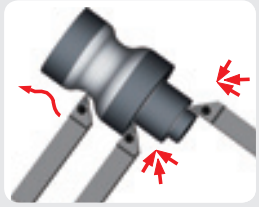
Type		Stock		Basic dimensions(mm)					Applicable inserts	Screw	Wrench
		R	L	H×B	L	S	W	a_r max			
QECD	1616R/L025	△	△	16×16	125	14.75	1.0~2.4	2.5	ZTCD□□□□□-EG	GB70-85-M5×20	WH40L
	2020R/L025	▲	△	20×20	125	18.75				GB70-85-M6×20	WH50L
	2525R/L025	▲	△	25×25	150	23.75					

▲Stock available △Make-to-order

External relief groove machining and profiling tools


R-type shown

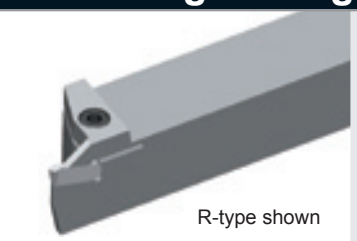


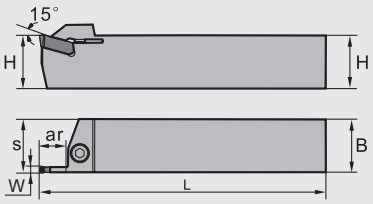


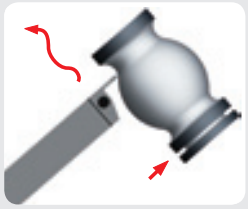
Type		Stock		Basic dimensions(mm)					Applicable inserts	Screw	Wrench
		R	L	H×B	L	S	W	ar max			
QXFD	2020R/L03-45	△	△	20×20	125	23	3.0	3.0	ZR(T)FD03-□□	GB70-85-M6×20	WH50L
	2525R/L03-45	△	△	25×25	150	28					
	3232R/L03-45	△	△	32×32	170	35					
QXGD	2020R/L03-45	△	△	20×20	125	23	4.0	3.0	ZR(T)GD04-□□		
	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



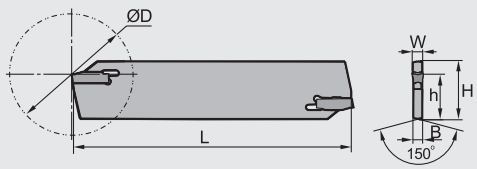


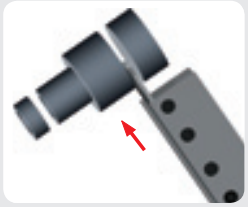
Type		Stock		Basic dimensions(mm)					Applicable inserts	Screw	Wrench
		R	L	H×B	L	S	W	ar max			
QEFS	2525R/L12-3N	△	△	25×25	150	25.3	3	12	ZIGQ3N-□□ ZIMF304N-□□	GB70-85-M6×20	WH50L
	3232R/L22-3N	△	△	32×32	170	32.3	3	22			
QEGS	2525R/L12-4N	△	△	25×25	150	25.3	4	12	ZIGQ4N-□□ ZIMF40□N-□□		
	3232R/L22-4N	△	△	32×32	170	32.3	4	22			
QEHS	2525R/L12-5N	△	△	25×25	150	25.4	5	12	ZIGQ5N-□□ ZIMF50□N-□□		
	3232R/L22-5N	△	△	32×32	170	32.4	5	22			
QEKS	2525R/L12-6N	△	△	25×25	150	25.4	6	12	ZIGQ6N-□□ ZIMF60□N-□□		
	3232R/L22-6N	△	△	32×32	170	32.4	6	22			

▲Stock available △Make-to-order

Blade for external parting





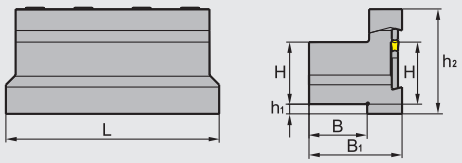


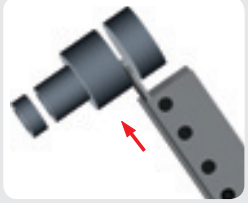
Type	Stock	Basic dimensions(mm)						Applicable inserts	Wrench
		L	H	h	B	W	ØDmax (Maximum parting diameter)		
QEES26N	▲	110	26	19	2	2.5	60	ZPES02502-MG	W50RL
QEFS26N	▲	110	26	19	2.4	3	60	ZPFS0302-MG	
QEGS26N	▲	110	26	19	3.2	4	70	ZPGS0402-MG	
QEHS26N	▲	110	26	19	4	5	70	ZPHS0503-MG	
QEKS26N	▲	110	26	19	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



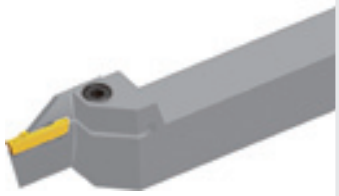




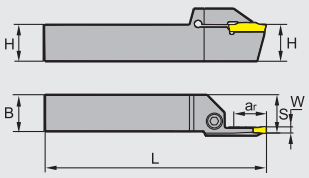
Type	Stock	Basic dimensions(mm)						Clamp	Screw	Wrench
		L	H	h_1	h_2	B	B_1			
QZS2026	▲	86	20	10	46.6	19	38	QZC26	GB70-85-M6×20	WH50L
QZS2526	▲	86	25	5	46.6	23	42	QZC26		
QZS3226	▲	86	30	3	51.6	30	48	QZC26		
QZS2032	▲	110	20	13	50	19	38	QZC32		
QZS2532	▲	110	25	8	50	23	42	QZC32		
QZS3232	▲	110	32	5	54	30	48	QZC32		

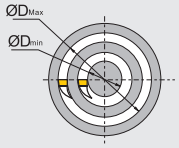
▲Stock available △Make-to-order

End surface grooving and turning tools



L-type shown





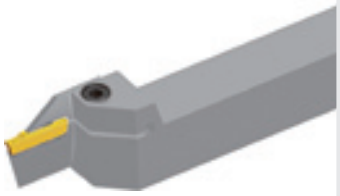
Diameter range of entering



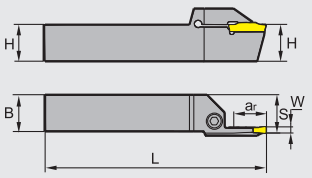
Type		Stock		Basic dimensions(mm)						Applicable inserts	Screw	Wrench
		R	L	H×B	L	S	W	ar max	ØD (min-max)			
QFFD	**2020R/L7-48H**	▲	▲	20×20	150	21	3	7	48-66	ZTFD0303-□□	GB70-85-M6×20	WH50L
	2020R/L10-48H	▲	▲	20×20	150	21	3	10	48-66			
	2525R/L10-48H	▲	▲	25×25	150	26	3	10	48-66			
	2525R/L17-48H	▲	▲	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-□□		
	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			

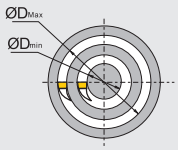
▲Stock available △Make-to-order

End surface grooving and turning tools



L-type shown





Diameter range of entering



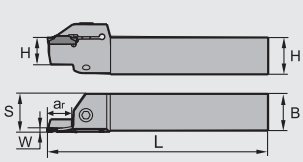
Type		Stock		Basic dimensions(mm)						Applicable inserts	Screw	Wrench
		R	L	H×B	L	S	W	ar max	ØD (min-max)			
QFHD	**2525R/L13-58H**	▲	▲	25×25	150	26	5	13	58-96	ZTHD0504-□□	GB70-85-M6×20	WH50L
	2525R/L22-58H	▲	▲	25×25	150	26	5	22	58-96			
	2525R/L13-86H	△	▲	25×25	150	26	5	13	86-140			
	2525R/L22-86H	▲	▲	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

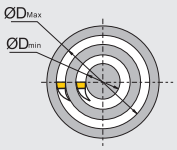
▲Stock available △Make-to-order

End surface grooving and turning tools



RR-type shown





Diameter range of entering



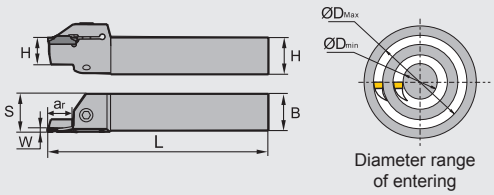
Type		Stock	Basic dimensions(mm)						Applicable inserts	Screw	Wrench
			H×B	L	S	W	ar max	ØD (min-max)			
QFFD	**2020RR7-48H**	△	20×20	150	21	3	7	48-66	ZTFD0303-□□	GB70-85-M6×20	WH50L
	2020RR10-48H	△	20×20	150	21	3	10	48-66			
	2525RR10-48H	△	25×25	150	26	3	10	48-66			
	2525RR17-48H	△	25×25	150	26	3	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



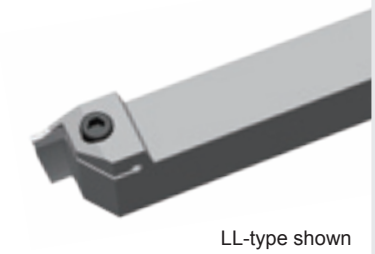
Diameter range of entering



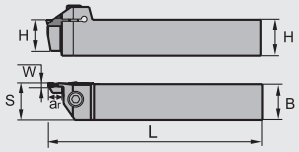
Type		Stock	Basic dimensions(mm)						Applicable inserts	Screw	Wrench
			H×B	L	S	W	ar max	ØD (min-max)			
QFHD	**2525RR13-58H**	△	25×25	150	26	5	13	58-96	ZTHD0504-□□	GB70-85-M6×20	WH50L
	2525RR22-58H	△	25×25	150	26	5	22	58-96			
	2525RR13-86H	△	25×25	150	26	5	13	86-140			
	2525RR22-86H	△	25×25	150	26	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		

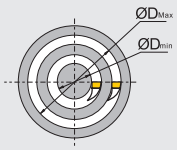
▲Stock available △Make-to-order

End surface grooving and turning tools



LL-type shown





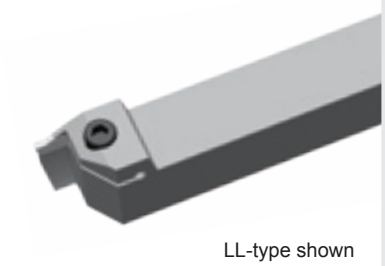
Diameter range of entering



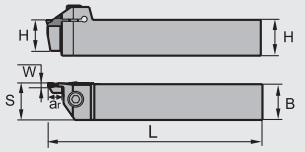
Type		Stock	Basic dimensions(mm)						Applicable inserts	Screw	Wrench
			H×B	L	S	W	ar max	ØD (min-max)			
QFFD	**2020LL7-48H**	△	20×20	150	21	3	7	48-66	ZTFD0303-□□	GB70-85-M6×20	WH50L
	2020LL10-48H	△	20×20	150	21	3	10	48-66			
	2525LL10-48H	△	25×25	150	26	3	10	48-66			
	2525LL17-48H	△	25×25	150	26	3	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-□□		
	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			

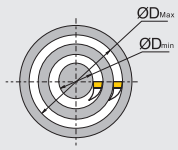
▲Stock available △Make-to-order

End surface grooving and turning tools



LL-type shown





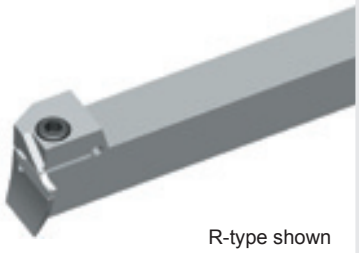
Diameter range of entering



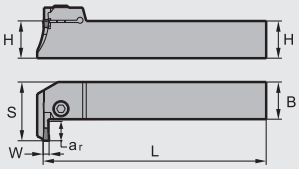
Type		Stock	Basic dimensions(mm)						Applicable inserts	Screw	Wrench
			H×B	L	S	W	ar max	ØD (min-max)			
QFHD	**2525LL13-58H**	△	25×25	150	26	5	13	58-96	ZTHD0504-□□	GB70-85-M6×20	WH50L
	2525LL22-58H	△	25×25	150	26	5	22	58-96			
	2525LL13-86H	△	25×25	150	26	5	13	86-140			
	2525LL22-86H	△	25×25	150	26	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		

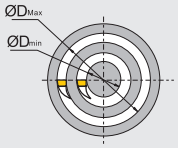
▲Stock available △Make-to-order

L type tools for surface grooving and turning



R-type shown





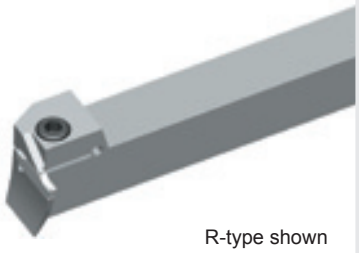
Diameter range of entering



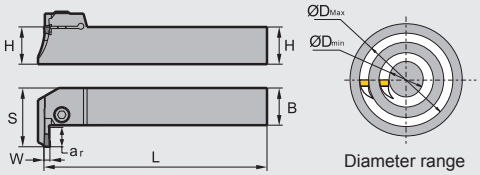
Type		Stock		Basic dimensions(mm)						Applicable inserts	Screw	Wrench
		R	L	H×B	L	S	W	ar max	ØD (min-max)			
QFFD	**2020R/L7-48L**	△	△	20×20	150	28.5	3	7	48-66	ZTFD0303-□□	GB70-85-M6×20	WH50L
	2020R/L10-48L	△	△	20×20	150	31.5	3	10	48-66			
	2525R/L10-48L	▲	▲	25×25	150	36.5	3	10	48-66			
	2525R/L17-48L	△	△	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-□□		
	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



R-type shown

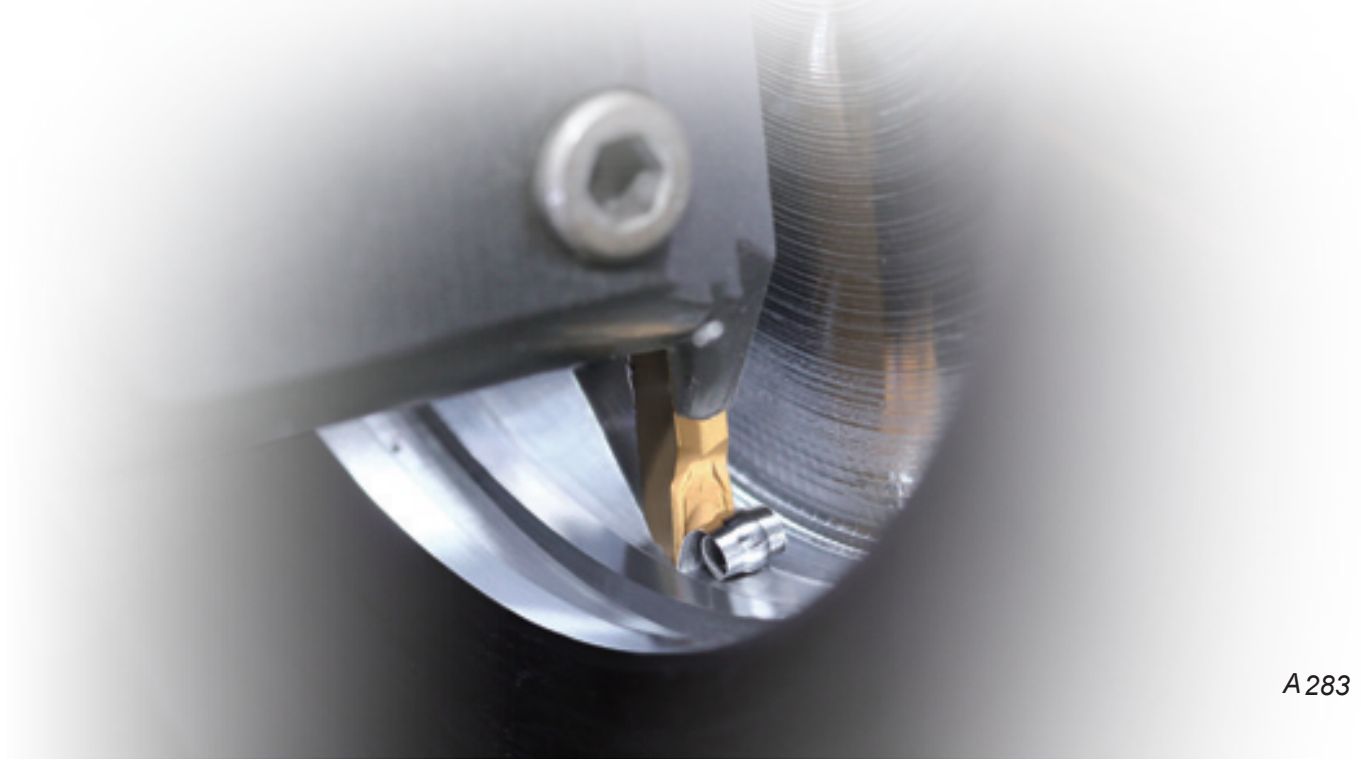


Diameter range of entering



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			

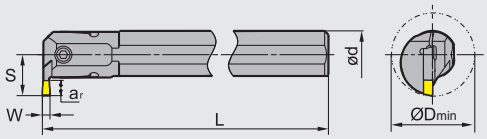
▲Stock available △Make-to-order

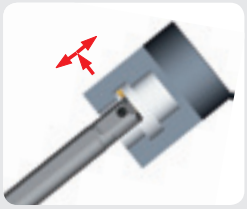


Internal grooving and turning tools



R-type shown

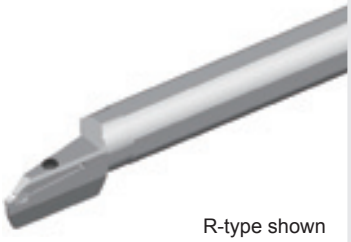




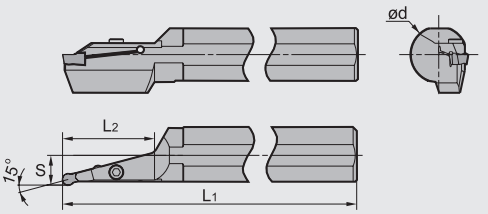
Type	Stock		Basic dimensions(mm)						Applicable inserts	Screw	Wrench
	R	L	ød	L	S	W	$a_{r\,max}$	ØDmin			
C20Q-QEDR/L05-27	▲	▲	20	180	15.2	2.5	5	27	ZTED025□□ ZRED025□□	GB70-85-M4×12	WH30L
C25R-QEDR/L07-33	▲	▲	25	200	20.3	2.5	7	33		GB70-85-M5×16	WH40L
C32S-QEDR/L09-42	▲	▲	32	250	25.3	2.5	9	42		GB70-85-M5×20	
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	L_1	L_2			
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

Cutting direction

R	Rightward
L	Leftward

Inserts tip height(mm)

Code	Height
16	16
20	20
25	25

Applicable insert width range(mm)

15	0.5≤S<1.8(QC16□□□) 1.0≤S<2.3(QC22□□□)
25	1.8≤S<3.0(QC16□□□) 2.3≤S<3.3(QC22□□□)
35	3.3≤S≤4.8

GQC R 20 20 K 22 - 15

External shallow groove tools

Toolholder shank width(mm)

Code	Width
16	16
20	20
25	25

Toolholder shank length(mm)

Code	Length
K	125
M	150

Cutting edge length code / Inner tangent circle diameter(mm)

11	6.35
16	9.525
22	12.70

● Internal shallow groove tools

Toolholder type

Code	Type
S	Steel shank
C	Carbide shank
A	Steel shank + internal cooling

Toolholder shank length(mm)

Code	Length
H	100
K	125
M	150

Cutting edge length code / Inner tangent circle diameter(mm)

11	6.35
16	9.525
22	12.70

Cutting direction

R	Rightward
L	Leftward

S 20 K - QC 16 15 R 25

Shank diameter(mm)

Code	Diameter
16	16
20	20
25	25

Shallow groove

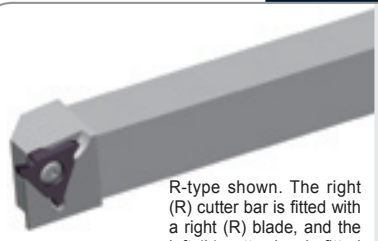
Applicable insert width range(mm)

15	0.5≤S<1.8(QC11□□□, QC16□□□) 1.0≤S<2.3(QC22□□□)
25	1.8≤S<3.0(QC11□□□, QC16□□□) 2.3≤S<3.3(QC22□□□)
35	3.3≤S≤4.8

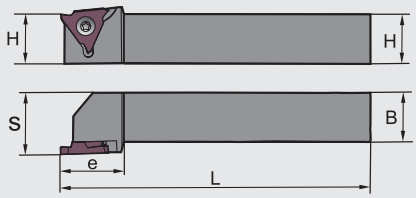
Minimum processing diameter(mm)

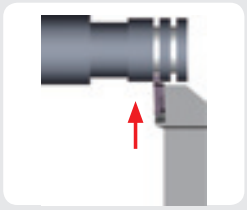
Code	Diameter
16	16
20	20
25	25
35	35

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.

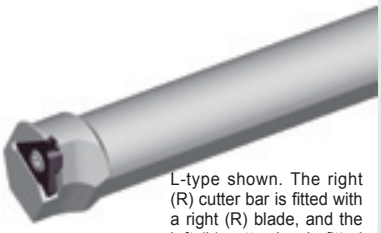




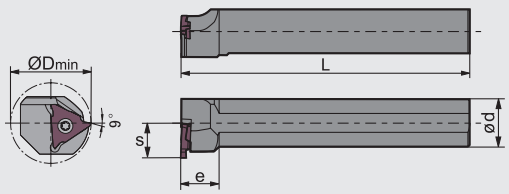
Type		Stock	Basic dimensions(mm)					Width (mm)	Applicable inserts	Screw	Wrench
			H	B	S	e	L				
GQCR/L	**1616K16-15**	▲	16	16	21	25.5	125	1.1-1.8	QC16R/L 110~180	I60M3.5×10	WT15IP
	2020K16-15	▲	20	20	25		125				
	2525M16-15	▲	25	25	30		150				
	1616K16-25	▲	16	16	21		125	1.8-3.0	QC16R/L 180~300		
	2020K16-25	▲	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	2.3-3.3	QC22R/L 230~330		
	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				

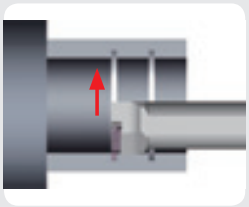
▲Stock available △Make-to-order

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.



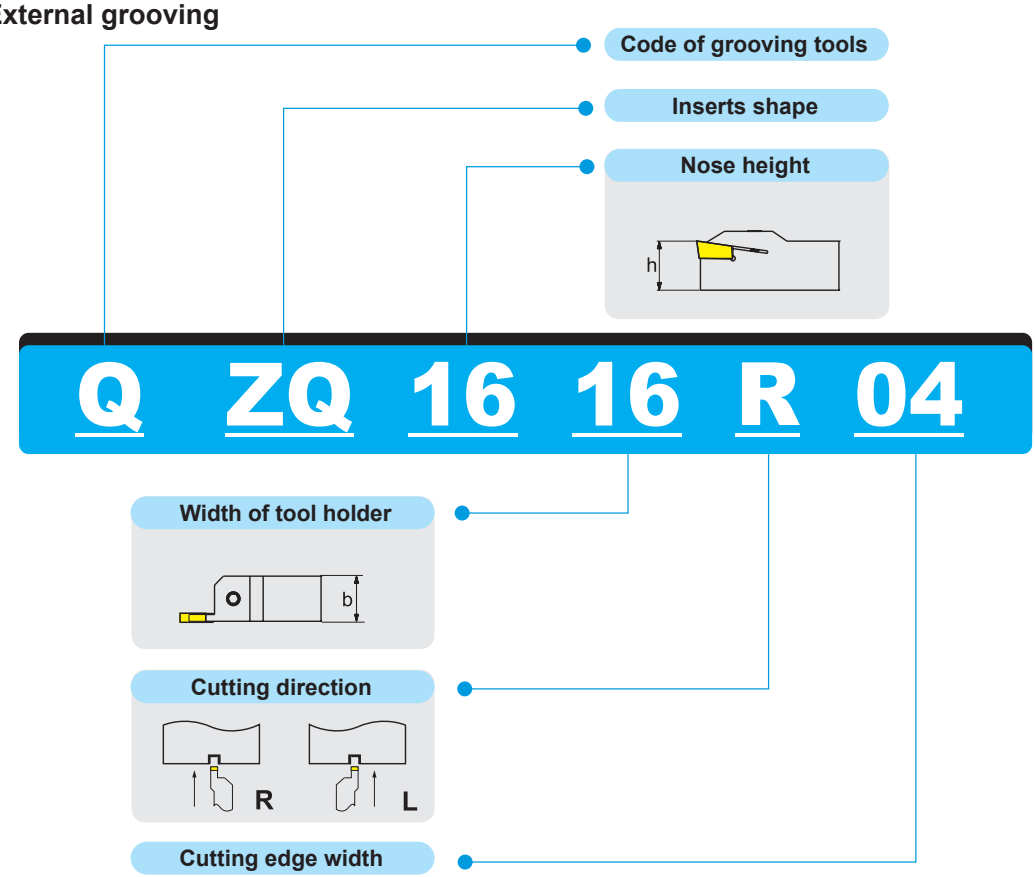


Type	Stock	Basic dimensions(mm)					Width (mm)	Applicable inserts	Screw	Wrench
		ØDmin	ød	S	e	L				
S20K-QC1115R/L 16	▲	16	20	11.1	40	125	1.2-1.8	QC11R/L 120~180	I60M2.5×6.5	WT07IP
S20K-QC1125R/L 16	▲	16	20	11.1	40	125	1.8-3.0	QC11R/L180~300		
S16H-QC1115R/L 20	▲	21	16	11.5	12	100	1.2-1.8	QC11R/L 120~180		
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			1.0-2.3	QC22R/L100~230	I60M5×13	WT20IP
S25M-QC2225R/L 35	▲			18.2	20		2.3-3.3	QC22R/L230~330		
S25M-QC2235R/L 35	▲			18.2	20		3.3-4.8	QC22R/L 330~480		

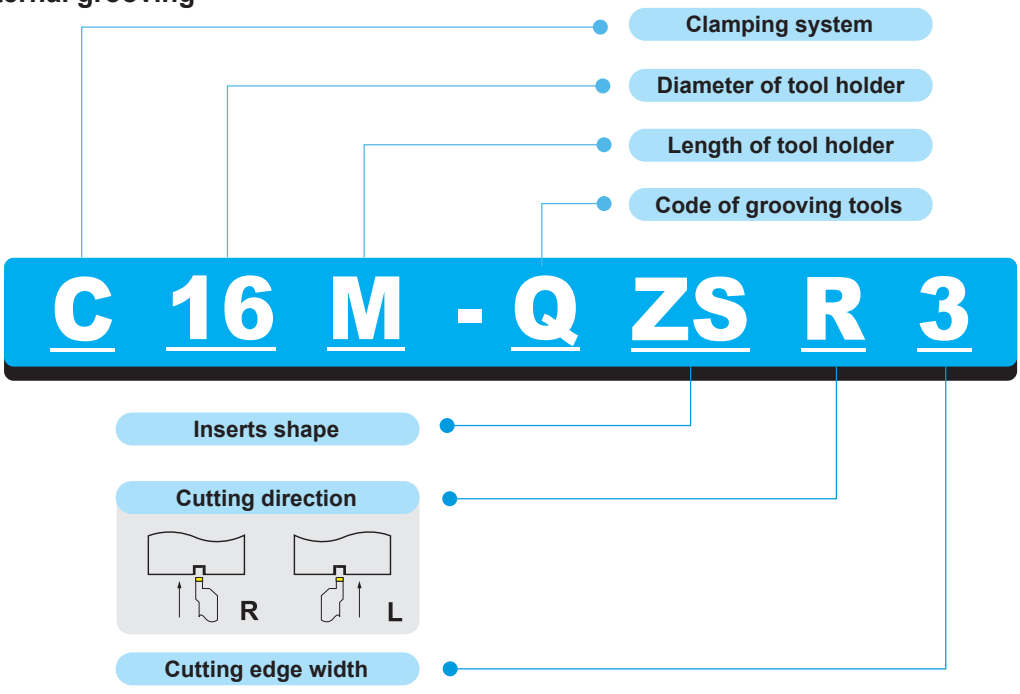
▲Stock available △Make-to-order

Parting and grooving tools code key

● External grooving



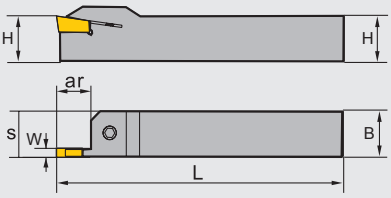
● Internal grooving

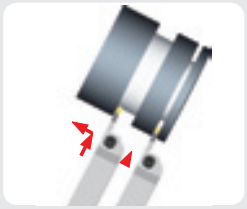


External parting and grooving tools: QZQ series



R-type shown



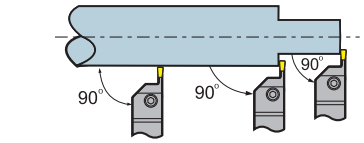


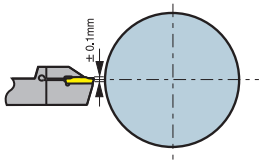
Type		Stock		Basic dimensions(mm)						Applicable inserts	Screw	Wrench
		R	L	H	B	L	S	W	ar max			
QZQ	1616R/L03	▲	▲	16	16	100	16.4	3	16	ZQMX3N11-IE	GB70-85-M5×16	WH40L
	1616R/L04	▲	▲	16	16	100	16.4	4	18	ZQMX4N11-IE		
	2020R/L03	▲	▲	20	20	125	20.4	3	20	ZQMX3N11-IE	GB70-85-M6×20	WH50L
	2020R/L04	▲	▲	20	20	125	20.4	4	20	ZQMX4N11-IE		
	2525R/L03	▲	▲	25	25	150	25.4	3	20	ZQMX3N11-IE		
	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

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 ±0.1mm, especially for lever parting and grooving workpieces with small diameter. This can improve tool life, reduce cutting resistant force, and diminish burrs.





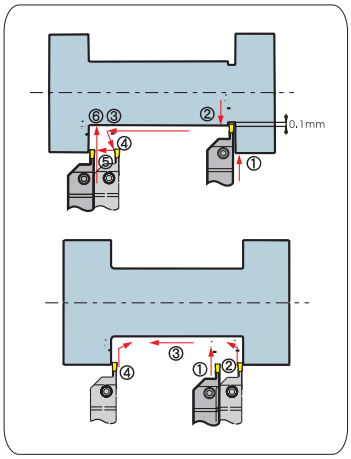
Conventional diagram of height difference of tool center line

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.

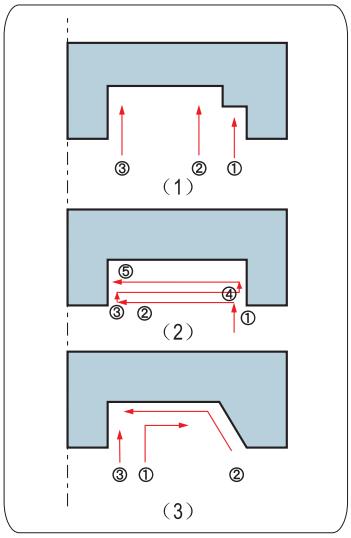
External grooving, turning and profiling

- In-feed sequence: When cutting depth>0.5mm, radial in-feed (Max. cutting depth can be 0.75×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.



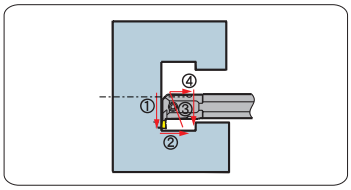
Surface grooving and turning

- 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×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.



Application information of parting and grooving

The cutting parameters recommended are suitable for wet machining.

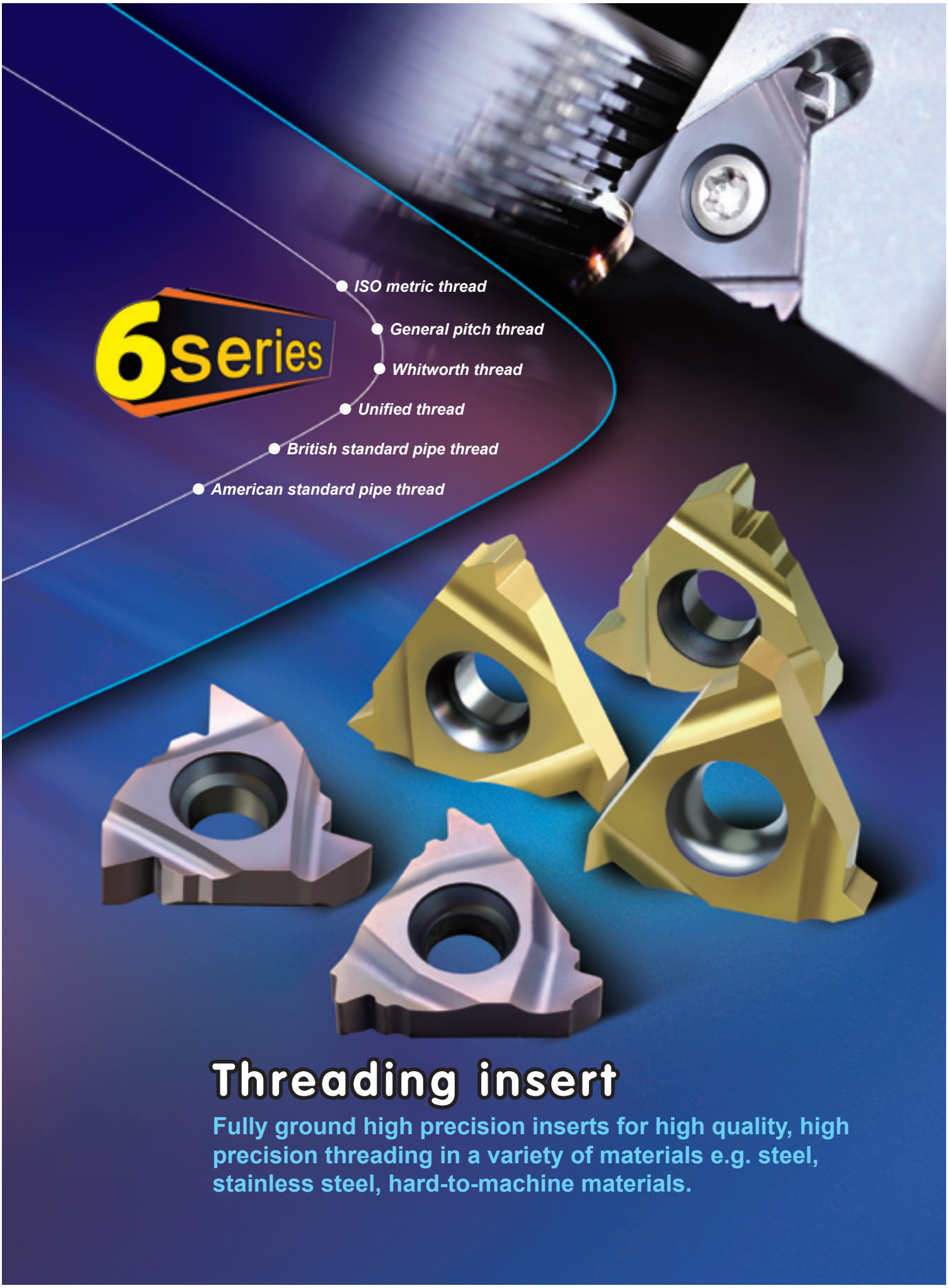
Insert size	Recommended feed rate(mm/r)					
Insert width(mm)	Parting	Grooving	Grooving(-MM)	Turning	Turning(-MM)	Profiling
2.5	0.05-0.15	0.05-0.15	0.05-0.2	0.05-0.15	0.05-0.2	0.05-0.15
3	0.05-0.15	0.05-0.15	0.05-0.2	0.07-0.15	0.07-0.2	0.1-0.2
4	0.05-0.2	0.05-0.2	0.05-0.25	0.07-0.25	0.07-0.3	0.1-0.2
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%.							



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.

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.

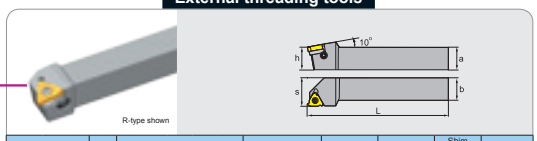
Dimensions of product

Indicating external threading or internal threading

Threading insert type
Including type, standard, tolerance class

Diagram of thread pitch

External threading tools



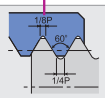
Type		Stock	Basic dimensions(mm) a	h	b	L	s	Applicable inserts	Inserts screw	Shim	Shim screw	Wrench
ZSER	1616H16	▲	16	16	16	100	20	Z16ER□□□□	I60 M3.5X12TT	MT16-□□MN	SM4X8C	WT15IP
	2020K16	▲	20	20	20	125	25					
	2525M16	▲	25	25	25	150	32					
	3225P16	▲	32	32	25	170	32					
	3232P16	▲	32	32	32	170	40					
	2525M22	▲	25	25	25	150	32	Z22ER□□□□	I60 M5X17	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 M3.5X12TT	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 M5X17	MT22-□□MN	SM5X8.5	WT20IP
	3225P22	▲	32	32	25	170	32					
	3232P22	▲	32	32	32	170	40					
	4040S22	△	40	40	40	250	50					

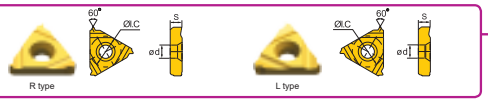
▲Stock available △Make-to-order

Product specification
Including type (right hand and left hand), basic dimensions, applicable inserts, spare parts

ISO metric thread (with end)

ISO 965-1980 DIN 13
GB/T 197-2003 Tolerance class：6g/6H





	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

Product specification
Including type (right hand and left hand), basic dimensions, stock

Dimension diagram of insert



TURNING A

Threading Tools

Threading tools overview A294-A295

Introduction on threading insert grade and chipbreaker A296

Threading insert A297-A304

Thin Threading insert code key A297

Thin ISO metric external thread A298-A299

Thin General pitch thread A300

Thin Whitworth thread A301

Thin Unified thread A302

Thin British standard pipe thread A303

Thin American standard pipe thread A304

Thin threading insert code key A305

Thin ISO metric external thread A306

Thin general pitch thread A307

Thin Whitworth thread A308

Thin unified thread A309

Thin British standard pipe thread A310

Thin American standard pipe thread A311

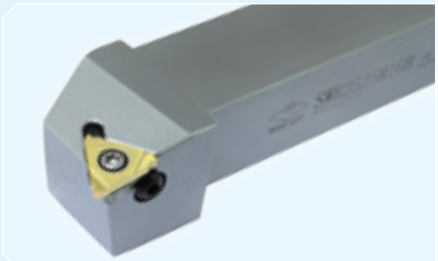
Threading tools A312-A314

Threading tools code key A312

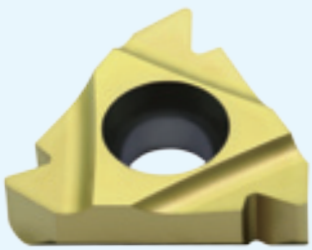
External threading tools A313

Internal threading tools A314

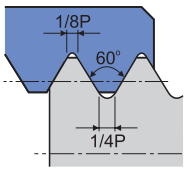
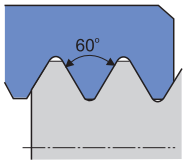
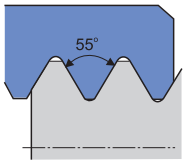
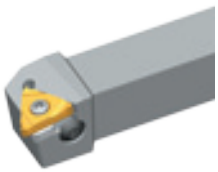
Application information on threading A315-A325

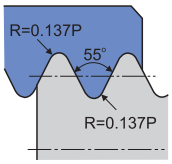
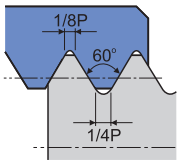
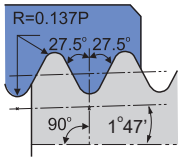
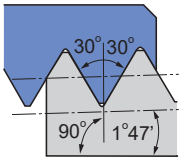






Threading tools overview

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 piper 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

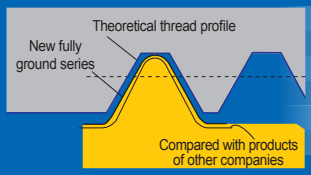
YBG203

New nano coating grade

suitable for threading in a variety of materials

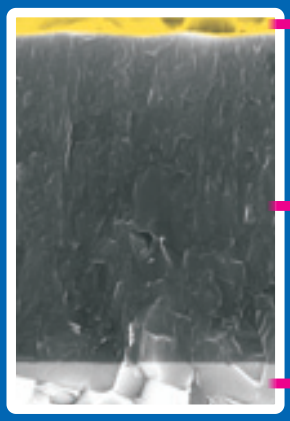


- **Specially treated edge for superior surface quality**
- **Sharp nose with small cutting resistance and superior performance**
- **Full ground inserts with high dimensional precision for high quality threading**



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

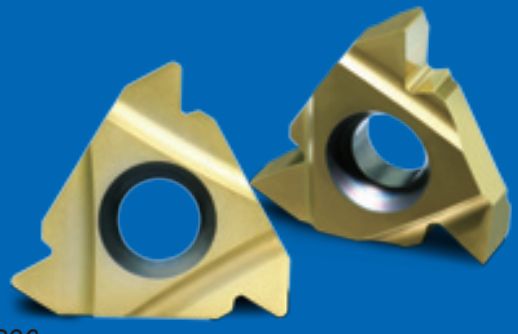
- **New nano coating grade specially designed for threading with longer insert life**



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 structre, improving coating stress, enhancing bond strength of coating and substrate.



Case:

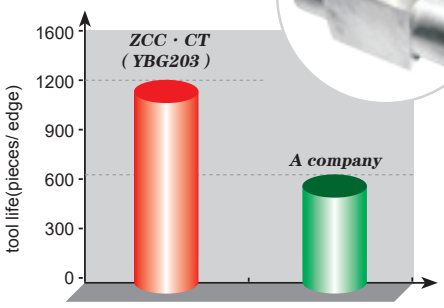
Workpiece material: 42CrMo(HB260)

Insert: Z16ER2.0ISO/YBG203

Thread pitch: p=2.0mm

Cutting data: Vc=120 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-Righ

L-Left

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 piper thread

NPT—American standard taper piper thread

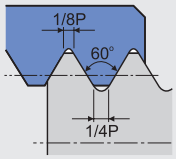
Chip breaker

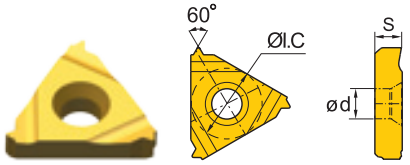
□-fully ground edge insert

PP –3-Dimensional chip-breaking insert

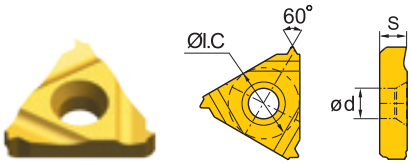
ISO metric thread (with end)

ISO 965-1980 DIN 13
GB/T 197-2003 Tolerance class：6g/6H





R type



L type

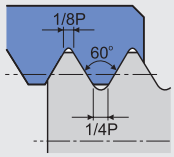
	Type		Basic dimensions(mm)				Recommended coating grade	
	The right hand tools	The left hand tools	Pitch	S	ØI.C	ød	YBG203	YBG205
External thread	**Z16ER0.5ISO**	**Z16EL0.5ISO**	0.50	3.52	9.525	4.0	★	○
	Z16ER0.75ISO	**Z16EL0.75ISO**	0.75	3.52	9.525	4.0	★	○
	Z16ER1.0ISO	**Z16EL1.0ISO**	1.00	3.52	9.525	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	★	○

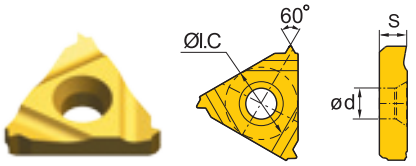
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order



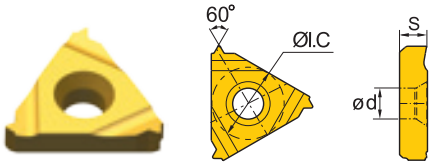
ISO metric thread (with end)

ISO 965-1980 DIN 13
GB/T 197-2003 Tolerance class：6g/6H





R type

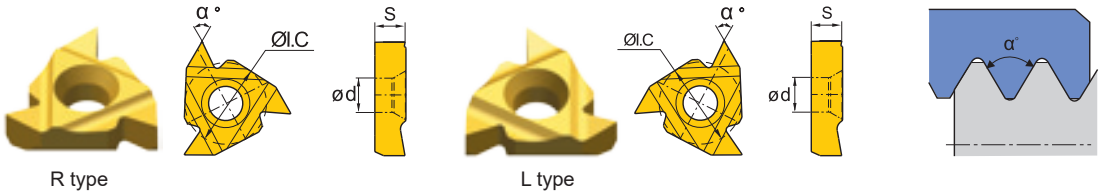


L type

	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 pitch thread (without end)



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	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



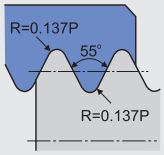
R type　　L type

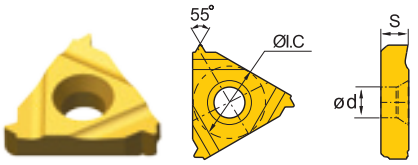
		Type		Basic dimensions(mm)					Recommended coating grade	
		The right hand tools	The left hand tools	Pitch/mm (pitch/Inch)	S	ØI.C	ød	α°	YBG203	YBG205
Internal thread	55°	**Z11IRA55**	**Z11ILA55**	0.5-1.5(48-16)	3.05	6.35	3.2	55°	★	○
		Z16IRA55	**Z16ILA55**	0.5-1.5(48-16)	3.52	9.525	4.0	55°	★	○
		Z16IRG55	**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

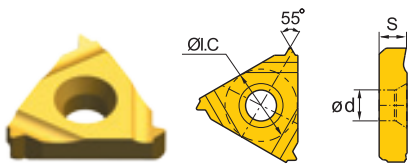
Whitworth thread (with end)

ISO 228/1:1982,
DIN 259, B.S.84:1956
Tolerance class：Medium class A





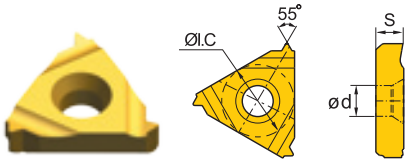
R type



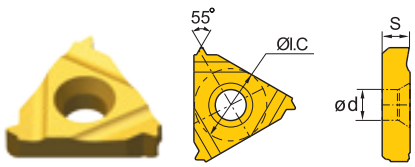
L type

	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



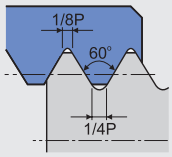
L type

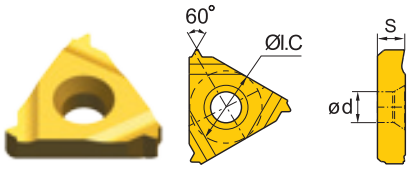
	Type		Basic dimensions(mm)				Recommended coating grade	
	The right hand tools	The left hand tools	Pitch/mm (pitch/Inch)	S	ØI.C	ød	YBG203	YBG205
Internal thread	**Z16IR8W**	**Z16IL8W**	8	3.52	9.525	4.0	★	○
	Z16IR9W	**Z16IL9W**	9	3.52	9.525	4.0	★	○
	Z16IR10W	**Z16IL10W**	10	3.52	9.525	4.0	★	○
	Z16IR11W	**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

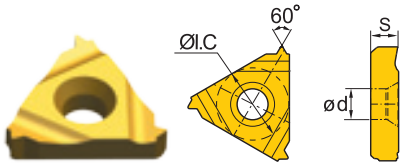
Unified thread (with end)

ASME B1.1-1989
Tolerance class：2A/2B





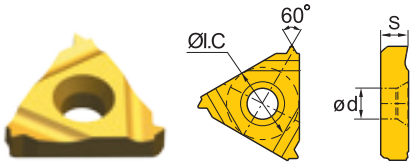
R type



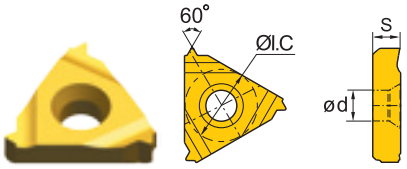
L type

	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



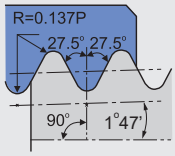
L type

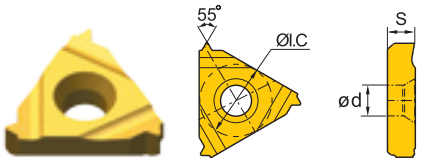
	Type		Basic dimensions(mm)				Recommended coating grade	
	The right hand tools	The left hand tools	Pitch/mm (pitch/Inch)	S	ØI.C	ød	YBG203	YBG205
Internal thread	**Z16IR8UN**	**Z16IL8UN**	8	3.52	9.525	4.0	★	○
	Z16IR10UN	**Z16IL10UN**	10	3.52	9.525	4.0	★	○
	Z16IR12UN	**Z16IL12UN**	12	3.52	9.525	4.0	★	○
	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

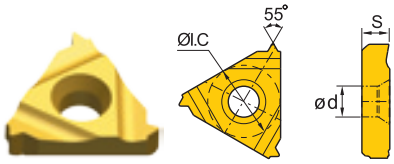
British standard taper piper thread (with end)

ISO 7/1:1994
B.S.21:1985
Standard BSPT





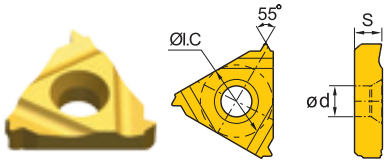
R type



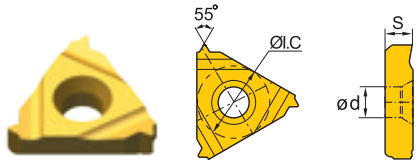
L type

	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	**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



R type



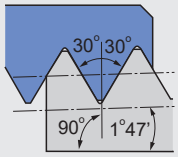
L type

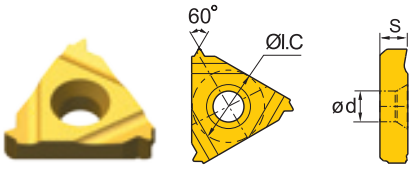
	Type		Basic dimensions(mm)				Recommended coating grade	
	The right hand tools	The left hand tools	Pitch/mm (pitch/Inch)	S	ØI.C	ød	YBG203	YBG205
Internal thread	**Z16IR11BSPT**	**Z16IL11BSPT**	11	3.52	9.525	4.0	★	○
	Z16IR14BSPT	**Z16IL14BSPT**	14	3.52	9.525	4.0	★	○
	Z16IR19BSPT	**Z16IL19BSPT**	19	3.52	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

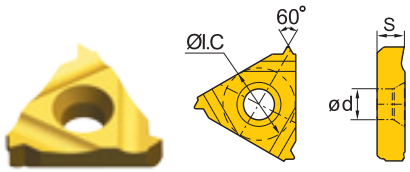
American standard taper piper thread (with end)

ASME B1.20.1-1983
Standard NPT





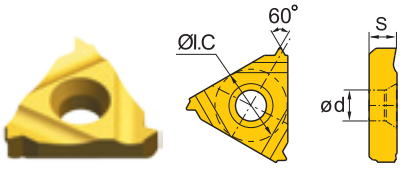
R type



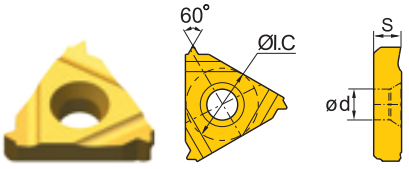
L type

	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	41/2-4

Threaded tooth shape

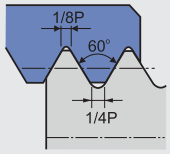
GM	ISO metric 60° thread
60	60° general pitch thread
55	55° general pitch thread
W	Whitworth thread
UN	Unified thread
BSPT	British standard pipe thread
NPT	American standard pipe thread

Supplementary number

B ➤ Thin Threaded Inserts

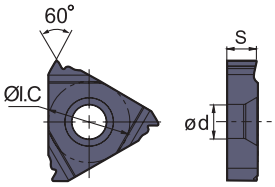
ISO metric thread (with end) Thin type

ISO 965-1980, DIN 13, GB/T 197-2003
Tolerance class：6g/6H





R type

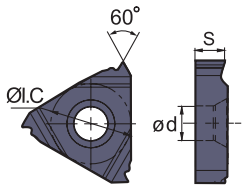


	Type	Basic dimensions(mm)				Recommended coating grade
	The right hand tools	Pitch/mm	S	ØI.C	ød	YBG202
External thread	**RT16.01W-0.50GMB**	0.50	3.52	9.525	4.0	★
	RT16.01W-0.75GMB	0.75	3.52	9.525	4.0	★
	RT16.01W-1.00GMB	1.00	3.52	9.525	4.0	★
	RT16.01W-1.25GMB	1.25	3.52	9.525	4.0	★
	RT16.01W-1.50GMB	1.50	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



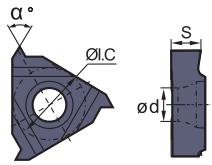
	Type	Basic dimensions(mm)				Recommended coating grade
	The right hand tools	Pitch/mm	S	ØI.C	ød	YBG202
Internal thread	**RT16.01N-0.50GMB**	0.50	3.52	9.525	4.0	★
	RT16.01N-0.75GMB	0.75	3.52	9.525	4.0	★
	RT16.01N-1.00GMB	1.00	3.52	9.525	4.0	★
	RT16.01N-1.25GMB	1.25	3.52	9.525	4.0	★
	RT16.01N-1.50GMB	1.50	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	★

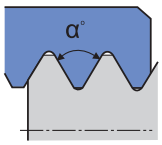
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

General pitch thread (without end) Thin type



R type



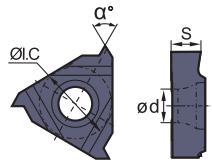


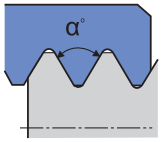
		Type	Basic dimensions(mm)					Recommended coating grade
		The right hand tools	Pitch/mm (pitch/Inch)	S	ØI.C	ød	α°	YBG202
External thread	60°	**RT16.01W-A60B**	0.5-1.5(48-16)	3.52	9.525	4.0	60°	★
		RT16.01W-G60B	1.75-3.0(14-8)	3.52	9.525	4.0	60°	★
		RT16.01W-AG60B	0.5-3.0(48-8)	3.52	9.525	4.0	60°	★
	55°	**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



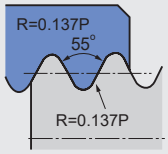


		Type	Basic dimensions(mm)					Recommended coating grade
		The right hand tools	Pitch/mm (pitch/Inch)	S	ØI.C	ød	α°	YBG202
Internal thread	60°	**RT16.01N-A60B**	0.5-1.5(48-16)	3.52	9.525	4.0	60°	★
		RT16.01N-G60B	1.75-3.0(14-8)	3.52	9.525	4.0	60°	★
		RT16.01N-AG60B	0.5-3.0(48-8)	3.52	9.525	4.0	60°	★
	55°	**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

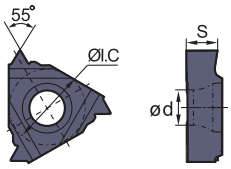
Whitworth thread (with end) Thin type

ISO 228/1:1982,DIN 259,B.S.84:1956
Tolerance class：Medium class A





R type

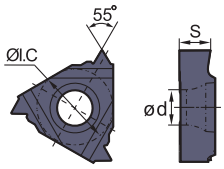


	Type	Basic dimensions(mm)				Recommended coating grade
	The right hand tools	Pitch/mm (pitch/Inch)	S	ØI.C	ød	YBG202
External thread	**RT16.01W-8WB**	8	3.52	9.525	4.0	★
	RT16.01W-9WB	9	3.52	9.525	4.0	★
	RT16.01W-10WB	10	3.52	9.525	4.0	★
	RT16.01W-11WB	11	3.52	9.525	4.0	★
	RT16.01W-12WB	12	3.52	9.525	4.0	★
	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

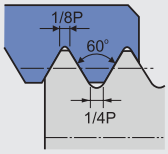


	Type	Basic dimensions(mm)				Recommended coating grade
	The right hand tools	Pitch/mm (pitch/Inch)	S	ØI.C	ød	YBG202
Internal thread	**RT16.01N-8WB**	8	3.52	9.525	4.0	★
	RT16.01N-9WB	9	3.52	9.525	4.0	★
	RT16.01N-10WB	10	3.52	9.525	4.0	★
	RT16.01N-11WB	11	3.52	9.525	4.0	★
	RT16.01N-12WB	12	3.52	9.525	4.0	★
	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

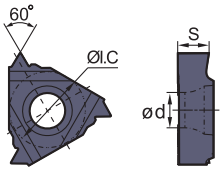
Unified thread (with end) Thin type

ASME B1.1-1989
Tolerance class：2A/2B





R type

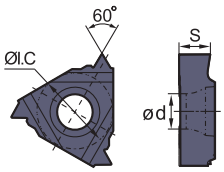


	Type	Basic dimensions(mm)				Recommended coating grade
	The right hand tools	Pitch/mm (pitch/Inch)	S	ØI.C	ød	YBG202
External thread	**RT16.01W-8UNB**	8	3.52	9.525	4.0	★
	RT16.01W-10UNB	10	3.52	9.525	4.0	★
	RT16.01W-12UNB	12	3.52	9.525	4.0	★
	RT16.01W-14UNB	14	3.52	9.525	4.0	★
	RT16.01W-16UNB	16	3.52	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

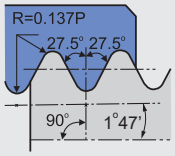


	Type	Basic dimensions(mm)				Recommended coating grade
	The right hand tools	Pitch/mm (pitch/Inch)	S	ØI.C	ød	YBG202
Internal thread	**RT16.01N-8UNB**	8	3.52	9.525	4.0	★
	RT16.01N-10UNB	10	3.52	9.525	4.0	★
	RT16.01N-12UNB	12	3.52	9.525	4.0	★
	RT16.01N-14UNB	14	3.52	9.525	4.0	★
	RT16.01N-16UNB	16	3.52	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

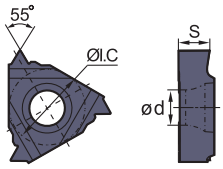
British standard taper piper thread (with end) Thin type

ISO 7/1:1994,B.S.21:1985
Standard BSPT





R type

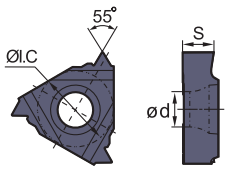


	Type	Basic dimensions(mm)				Recommended coating grade
	The right hand tools	Pitch/mm (pitch/Inch)	S	ØI.C	ød	YBG202
External thread	**RT16.01W-11BSPTB**	11	3.52	9.525	4.0	★
	RT16.01W-14BSPTB	14	3.52	9.525	4.0	★
	RT16.01W-19BSPTB	19	3.52	9.525	4.0	★
	RT16.01W-28BSPTB	28	3.52	9.525	4.0	★

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



R type

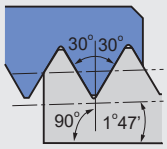


	Type	Basic dimensions(mm)				Recommended coating grade
	The right hand tools	Pitch/mm (pitch/Inch)	S	ØI.C	ød	YBG202
Internal thread	**RT16.01N-11BSPTB**	11	3.52	9.525	4.0	★
	RT16.01N-14BSPTB	14	3.52	9.525	4.0	★
	RT16.01N-19BSPTB	19	3.52	9.525	4.0	★
	RT16.01N-28BSPTB	28	3.52	9.525	4.0	★

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

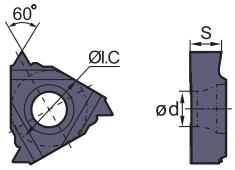
American standard taper piper thread (with end) Thin type

ASME B1.20.1-1983
Standard NPT





R type

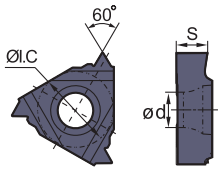


	Type	Basic dimensions(mm)				Recommended coating grade
	The right hand tools	Pitch/mm (pitch/Inch)	S	ØI.C	ød	YBG202
External thread	**RT16.01W-8NPTB**	8	3.52	9.525	4.0	★
	RT16.01W-11.5NPTB	11.5	3.52	9.525	4.0	★
	RT16.01W-14NPTB	14	3.52	9.525	4.0	★
	RT16.01W-18NPTB	18	3.52	9.525	4.0	★
	RT16.01W-27NPTB	27	3.52	9.525	4.0	★

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



R type



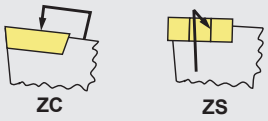
	Type	Basic dimensions(mm)				Recommended coating grade
	The right hand tools	Pitch/mm (pitch/Inch)	S	ØI.C	ød	YBG202
Internal thread	**RT16.01N-8NPTB**	8	3.52	9.525	4.0	★
	RT16.01N-11.5NPTB	11.5	3.52	9.525	4.0	★
	RT16.01N-14NPTB	14	3.52	9.525	4.0	★
	RT16.01N-18NPTB	18	3.52	9.525	4.0	★
	RT16.01N-27NPTB	27	3.52	9.525	4.0	★

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

Threading tools code key

Clamping system

Top clamping — Screw clamping



Thread type

I ➤ Internal thread

E ➤ External thread

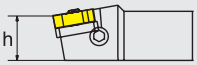
Cutting direction

Right hand — Left hand



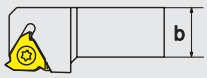
ZS E R 20 20 K 16

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.

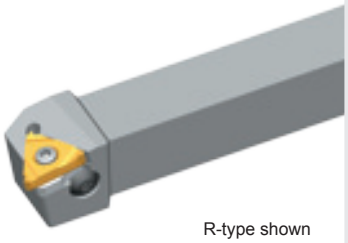
Tool length

Code	H	K	M	P	Q	R	S	T	U
Length	100	125	150	170	180	200	250	300	350

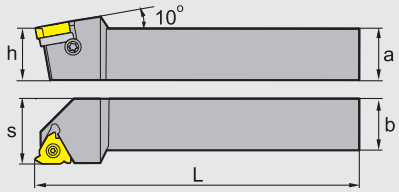
Insert size

Code	11	16	22
Triangle side length	11	16	22
Inscribed circle	6.35	9.525	12.70

External threading tools



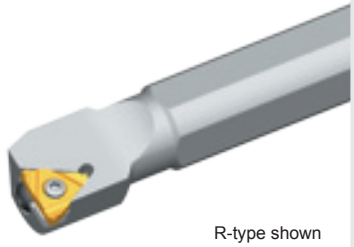
R-type shown



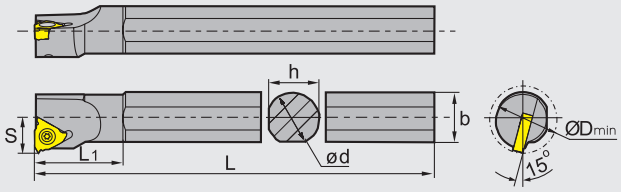
Type		Stock	Basic dimensions(mm)					Applicable inserts	Inserts screw	Shim	Shim screw	Wrench
			a	h	b	L	s					
ZSER	1616H16	▲	16	16	16	100	20	Z16ER□□□□	I60 M3.5×12TT	MT16-□□MN	SM4X8C	WT15IP
	2020K16	▲	20	20	20	125	25					
	2525M16	▲	25	25	25	150	32					
	3225P16	▲	32	32	25	170	32					
	3232P16	▲	32	32	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

Internal threading tools



R-type shown



Type		Stock	Basic dimensions(mm)							Applicable inserts	Inserts screw	Shim	Shim screw	Wrench
			d	L	b	Dmin	s	h	L1					
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					
	0016M16	▲	16	150	15.5	20	12	15	27	Z16IR□□□□	I60 M3.5X08TT	---	---	WT15IP
	0020M16	▲	20	150	19	25	14	18	28.7		I60 M3.5X12TT	MT16-□□MN	SM4X8C	
	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					
	0050U16	▲	50	350	48.5	63	35	49	40.2					
	0020Q22	▲	20	180	19	25	15	18	35	Z22IR□□□□	I60 M5×13.2	---	---	WT20IP
	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					
	0016M16	▲	16	150	16	20	12	15	27	Z16IL□□□□	I60 M3.5X08TT	---	---	WT15IP
	0020M16	▲	20	150	19	25	14	18	28.7		I60 M3.5X12TT	MT16-□□MN	SM4X8C	
	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					
	0050U16	▲	50	350	48.5	63	35	49	40.2					
	0020Q22	▲	20	180	19	25	15	18	35	Z22IL□□□□	I60 M5×13.2	---	---	WT20IP
	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					

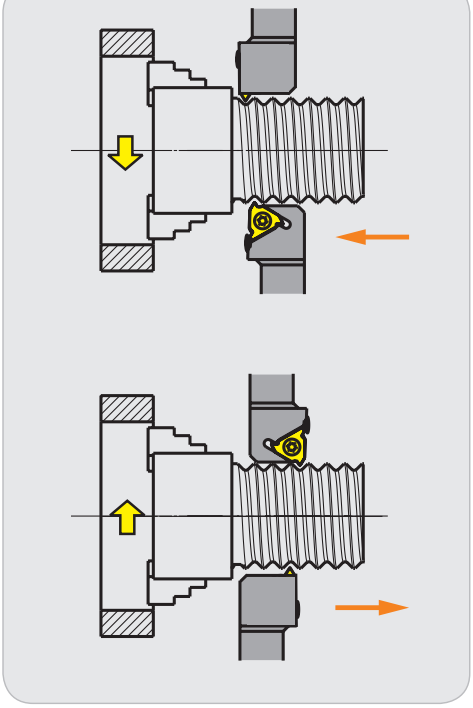
▲Stock available △Make-to-order

Please follow the following steps to get the best threading result:

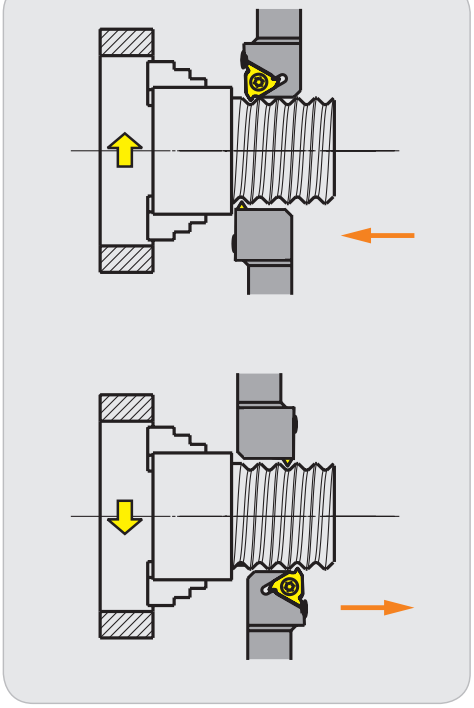
1. Select proper thread machining method.
2. Define helical angle and select shim.
3. Select proper insert and tool holder size.
4. By checking reference table of standard threading programs, select feasible cutting parameters.
5. Select feed way.

Machining method of threading tools

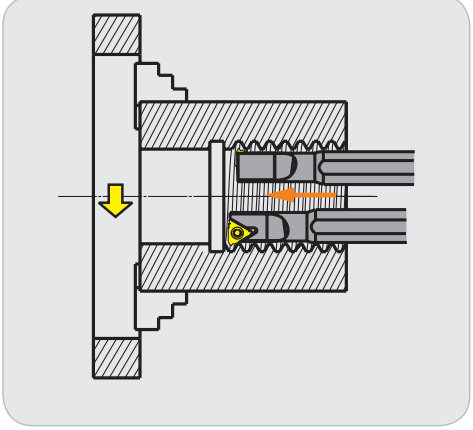
External threading machining (Right thread)



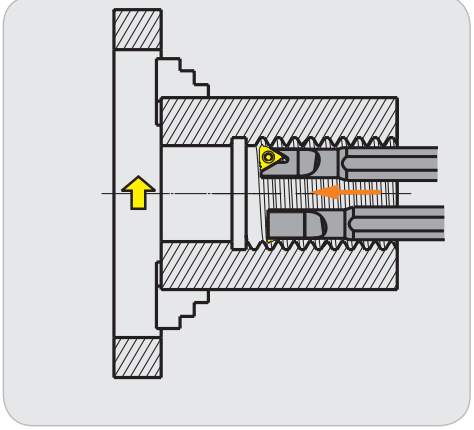
External threading machining (Left thread)



Internal threading machining (Right thread)



Internal threading machining (Left thread)



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:

$$e = \arctan \frac{p}{d_2 \times \pi}$$

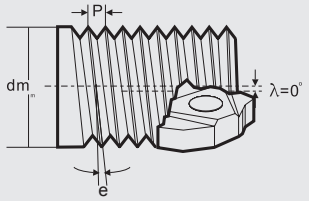
P= Pitch
d_2= pitch diameter
The most common inclined angle is 1°. MT standard shim and its inclined angle is also 1°.
Calculation of clearance angle:
Clearance angle is calculated as below:

$$\beta = \arctan (\tan\theta \times \tan\alpha)$$

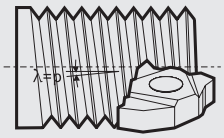
2θ=Thread profile angle
α=The rake angle of external standard threading tools is 10°; the rake angle of internal standard threading tools is 15°.

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°.

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°

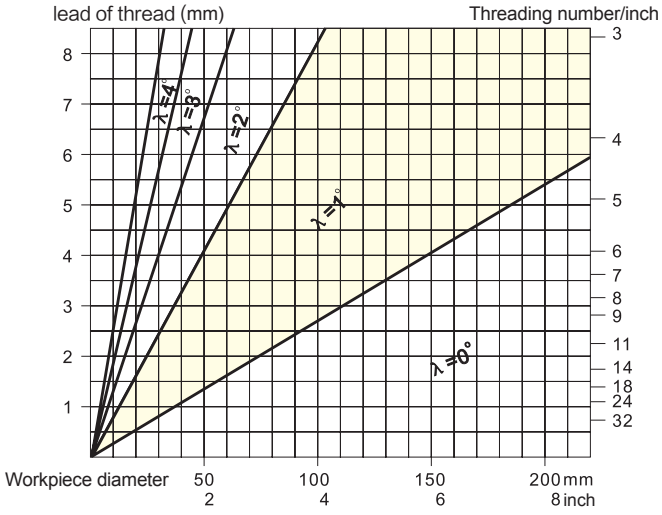
For example: when P=1.5, d2=24mm,
helical angle1.14°-(2°~0°)=inclined angle (-0.86°~1.14°)
it is feasible to use standard shim 1°.

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)

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/-

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/-

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 / —	0.210 / —	0.233 / —	0.226 / —	0.196 / —	0.229 / —	0.220 / —	0.214 / —	0.210 / —	0.211 / —	0.213 / —	0.218 / —	0.229 / —
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

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

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 / —	0.211 / —	0.223 / —	0.196 / —	0.223 / —	0.226 / —	0.246 / —	0.236 / —	0.230 / —	0.255 / —	0.195 / —	0.197 / —	0.204 / —
2	0.134 / 0.070	0.172 / 0.089	0.181 / 0.094	0.186 / 0.097	0.213 / 0.111	0.234 / 0.122	0.255 / 0.133	0.226 / 0.139	0.282 / 0.147	0.304 / 0.158	0.322 / 0.167	0.361 / 0.189	0.421 / 0.219
3	0.104 / 0.054	0.132 / 0.069	0.139 / 0.072	0.143 / 0.074	0.163 / 0.085	0.180 / 0.093	0.197 / 0.102	0.206 / 0.106	0.216 / 0.113	0.233 / 0.121	0.247 / 0.128	0.278 / 0.145	0.323 / 0.168
4	0.087 / 0.045	0.111 / 0.058	0.117 / 0.061	0.120 / 0.063	0.138 / 0.072	0.151 / 0.079	0.165 / 0.086	0.172 / 0.090	0.182 / 0.095	0.197 / 0.102	0.208 / 0.108	0.234 / 0.122	0.272 / 0.142
5	0.077 / 0.040	0.098 / 0.051	0.103 / 0.054	0.106 / 0.055	0.121 / 0.063	0.133 / 0.069	0.145 / 0.076	0.152 / 0.079	0.161 / 0.084	0.1738 / 0.090	0.183 / 0.095	0.207 / 0.108	0.240 / 0.125
6		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
7				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
8				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
9						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
10								0.104 / 0.054	0.111 / 0.058	0.119 / 0.062	0.126 / 0.066	0.142 / 0.074	0.165 / 0.086
11									0.105 / 0.055	0.113 / 0.059	0.120 / 0.062	0.135 / 0.070	0.157 / 0.082
12										0.108 / 0.056	0.114 / 0.060	0.129 / 0.067	0.150 / 0.078
13											0.110 / 0.055	0.124 / 0.064	0.144 / 0.075
14												0.119 / 0.062	0.138 / 0.072
15												0.115 / 0.060	0.133 / 0.069
16													0.129 / 0.067

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

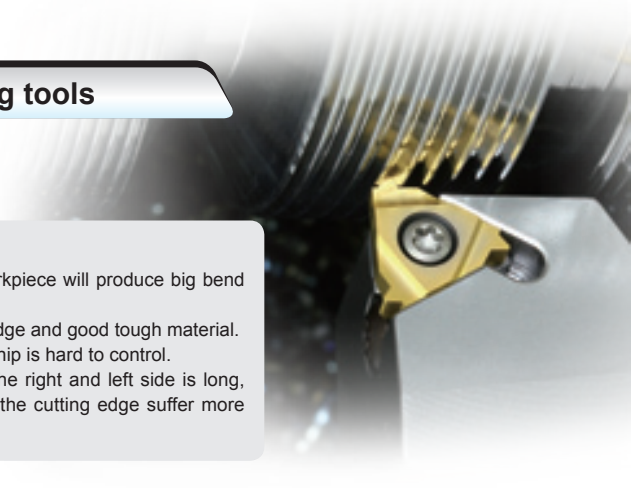
Screw pitch	28	19	14	11
Total in-feed	0.581	0.856	1.162	1.479
Number of passes	5	6	8	10
Order to follow in threading operation	Value of radial in-feed (X) and flank in-feed (Z)			
	X/Z	X/Z	X/Z	X/Z
1	0.179/-	0.223/-	0.222/-	0.214/-
2	0.134/0.070	0.181/0.094	0.213/0.111	0.242/0.126
3	0.103/0.054	0.139/0.072	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

Table of recommended cutting parameters

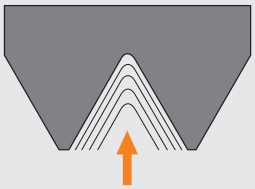
ISO	Material			Unit cutting force Kc0.4 N/mm²	Hardness HB	Grade YBG202 YBG203 YBG205 Cutting speed(m/min)
P	Carbon steel	C=0.15%		1900	125	150-175
		C=0.35%		2100	150	140-155
		C=0.60%		2250	200	130-145
	Alloy steel	Anneal		2100	180	110-130
		Hardened		2600	275	80-100
		Hardened		2700	300	70-90
		Hardened		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		500	60	1300-1450
		Aging treatment		800	100	450-500
	Cast aluminum alloy	Non-aging treatment		750	75	430-470
		Aging treatment		900	90	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	4150	350	10-20
			Casting	4150	320	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.

In-feed way of threading tools



Radial in-feed



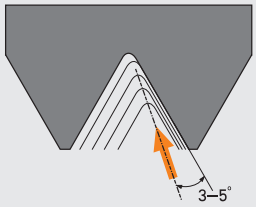
- Easy operating, high general.
- V-shape chip caused by long chip steel workpiece will produce big bend stress on cutting edge.
- It requires low cutting depth, sharp cutting edge and good tough material.
- Big quantity of heat when cutting ,V-shape chip is hard to control.
- Because the interface of 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.

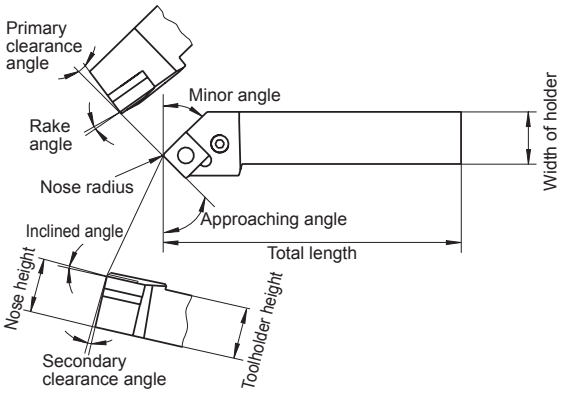
Recommend adopting flank in-feed or alternate flank in-feed under allowable range of machining equipment or programmer, it can eliminate the machining vibration effectively, and it has enough space discharge the chips between pitch. Cutting edge suffer a small stress, machining stable, it likes the general turning process when machining thread, good chip control without extra chips.

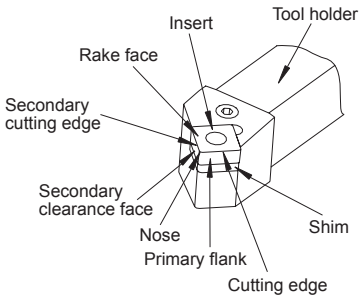
Common problems in threading and solutions

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.

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.

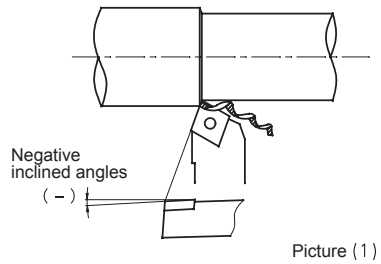
The principle of choosing clearance angle: Choose small clearance angle if friction is not serious.

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.

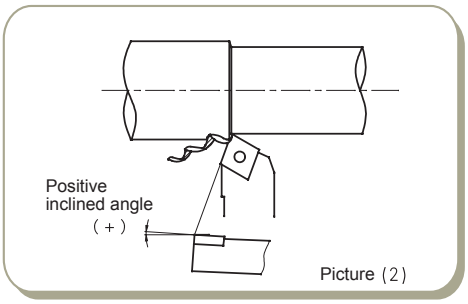
◆As diagram (1) shows, when the inclined angle is negative, namely nose is in the lowest point as apposed to the bottom of tool, chips flow to the machined surface of workpiece.



Picture (1)

◆ 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.

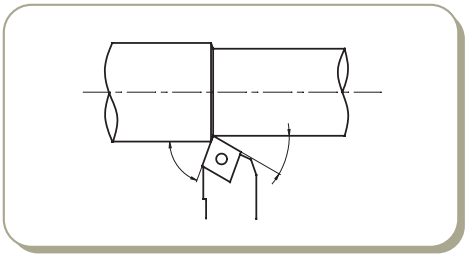


Picture (2)

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

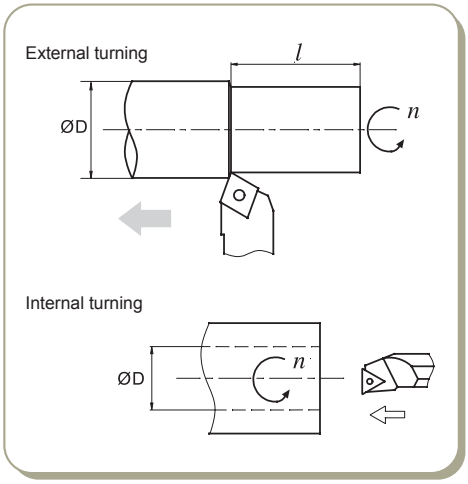
Nose radius significantly affects nose strength and surface quality.

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

1 Calculation of cutting speed



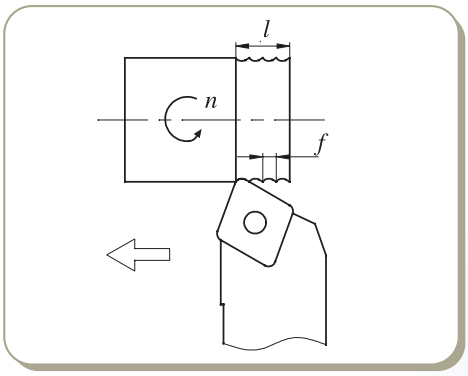
$$Vc=\frac{\pi \times D \times n}{1000}\ (m/min)$$

In the formula: Vc: 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:

$$Vc=\frac{\pi \times D \times n}{1000}\ (m/min)\ =132(m/min)$$

2 Calculation of feed rate



$$f=\frac{l}{n}\ (mm/rev)$$

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:

$$f=\frac{l}{n}=\frac{100}{500}=0.2(mm/rev)$$



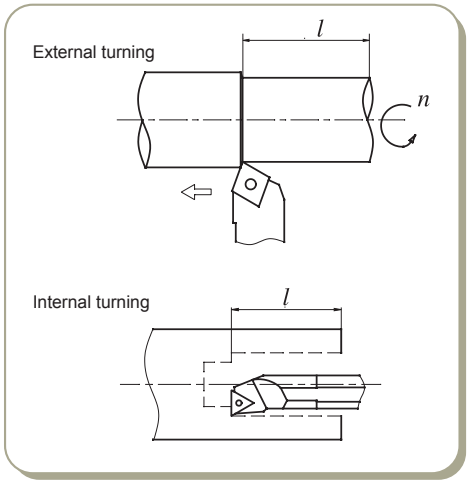
3 Cutting time calculation of external and internal turning

$$T=\frac{l}{f\times n}\ (min)$$

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:

$$T=\frac{l}{f\times n}=\frac{150}{0.2\times 250}=3(min)$$

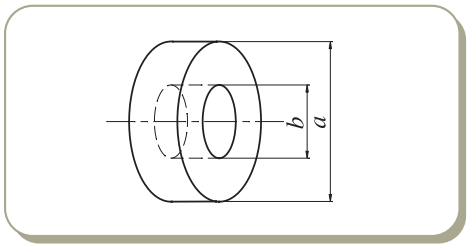


4 Time calculation for end surface turning (constant linear speed)

$$T=\frac{\pi\times(a^2-b^2)}{4000\times Vc\times f}\ (min)$$

In the formula: T: Cutting time (min)
Vc: Cutting speed (m/min)
f: Feed rate (mm/rev)

For end surface without hole, b=0, the formula is still valid.



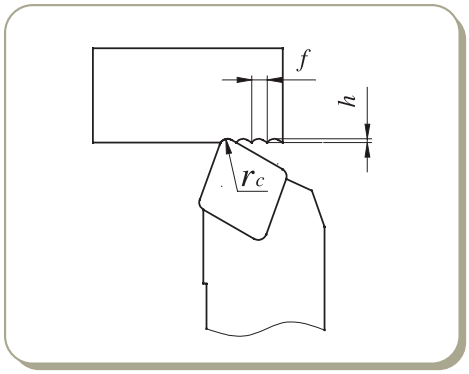
5 Theoretical value calculation of machined surface roughness

$$R=\frac{f^2}{8r_c}\times 1000\ (\mu m)$$

In the formula: R: Theoretical roughness value of machined surface
f: Feed rate (mm/rev)
rc: 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:

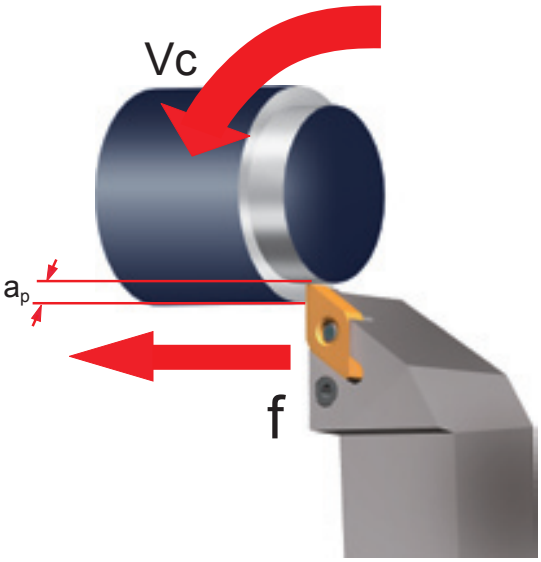
$$R=\frac{f^2}{8r_c}\times 1000=\frac{0.2^2}{8\times 0.4}\times 1000=12.5(\mu m)$$



Effect of three main turning parameters on machining

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 (Vc)

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 (fn)

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 (ap)

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 insert chipbreaker

Negative inserts

ISO	Machining range	ZCCCT	SANDVIK	KORLOY	TaeguTec	WALTER	SECO	MITSUBISHI	SUMITOMO	KENNAMETAL	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 MF5 M3 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, CJ, GS, PS HS, PT	F3, F4(8A), M2(2C), M3 M4, M5(5B), M6, M7, 55, M8
	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 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	

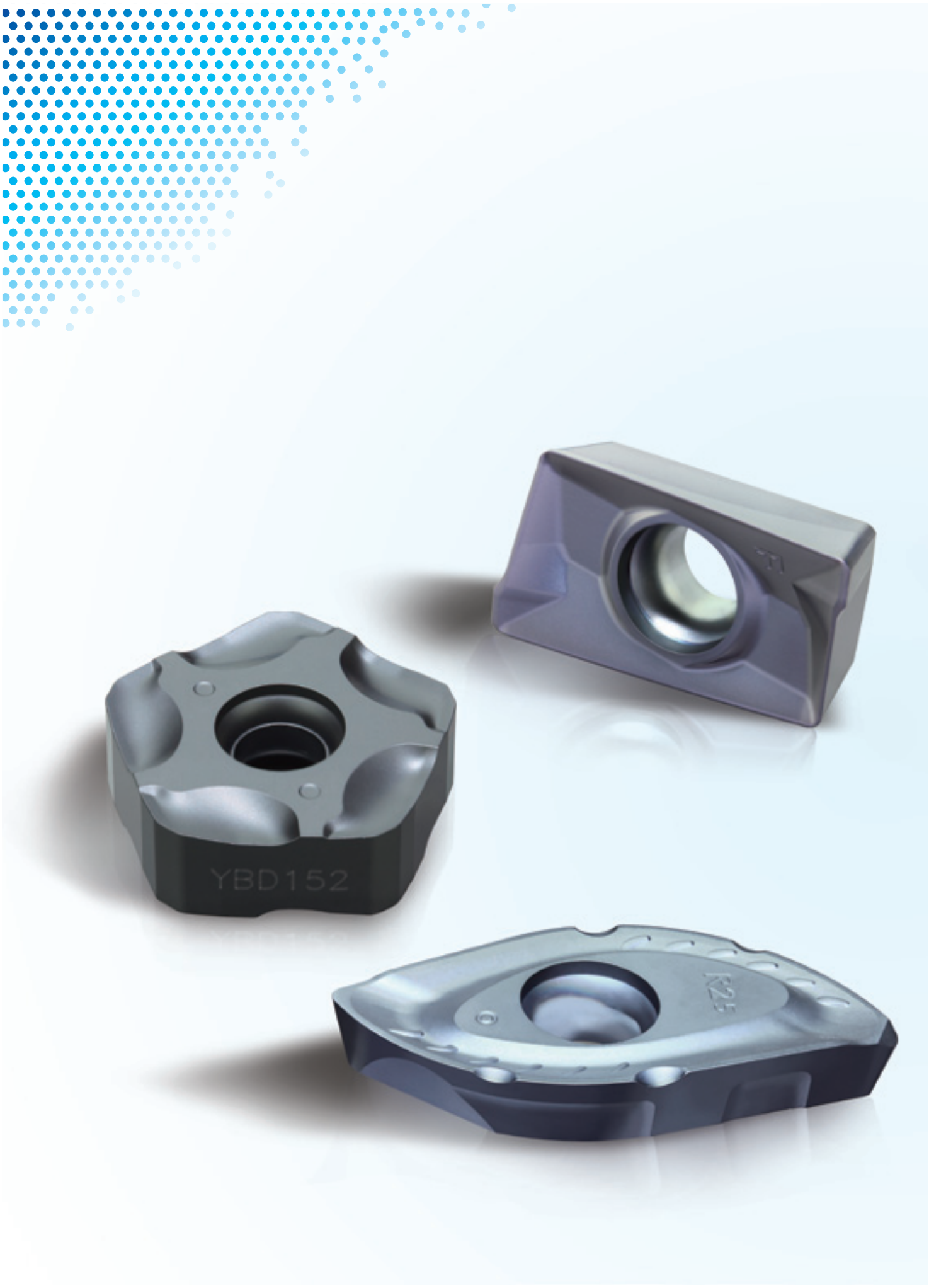
※ Periphery grinding type

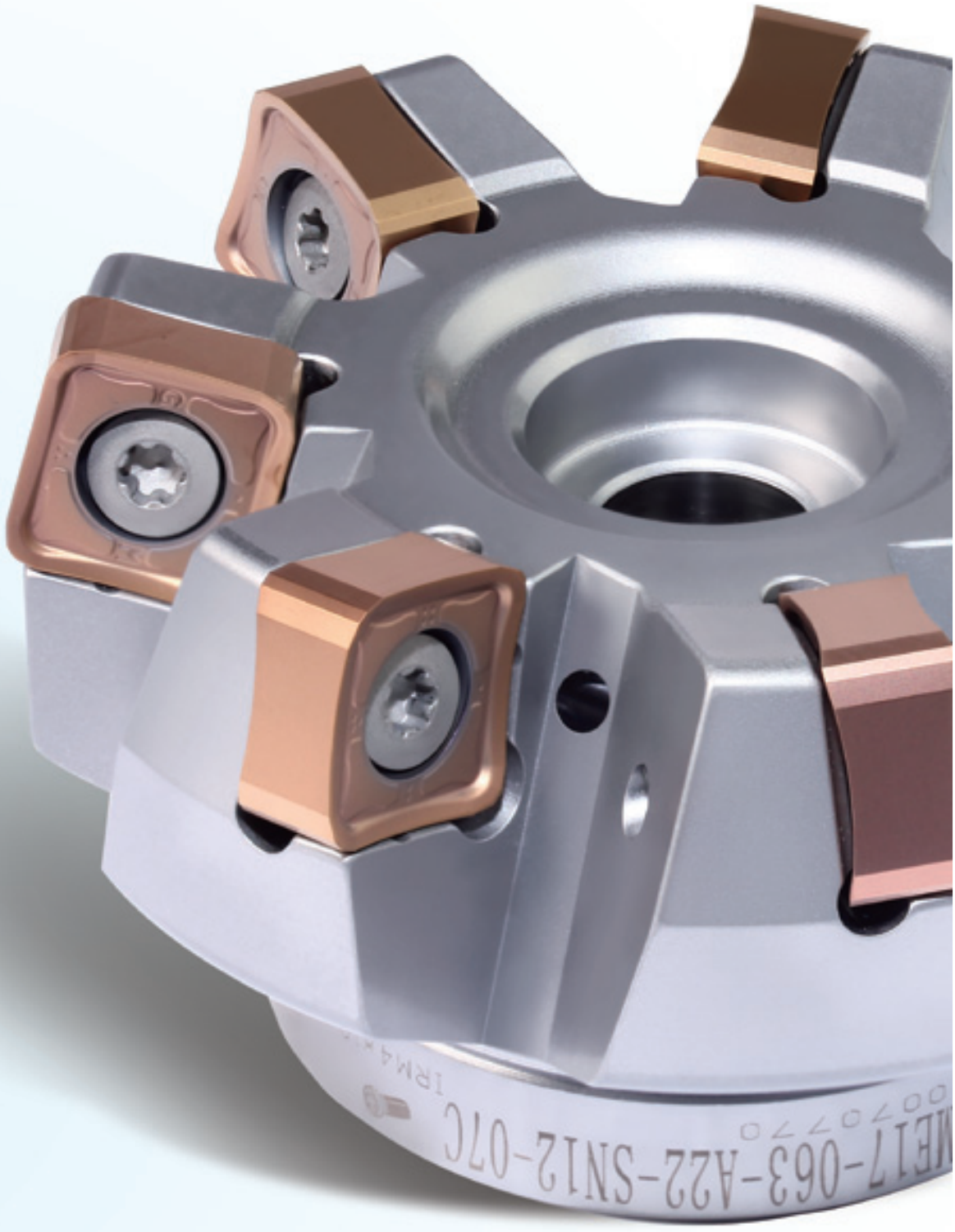
Comparison table for turning insert chipbreaker

Positive inserts

ISO	Machining range	ZCCCT	SANDVIK	KORLOY	TaeguTec	WALTER	SECO	MITSUBISHI	SUMITOMO	KENNAMETAL	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 KR	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※, FS-P※ LS-P※	SL※	LF※ HP※				MQ	PM2, 1A 2A
N	For general turning	LH	AL	TA AK MA	FL	PM2, FN2 MN2	AL※	AZ※	AG	HP※	ALU ACB ASF		AL※	AH※	1L, 1A 2A

※ Periphery grinding type


YBD152



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
YBM253
FMA14 series



New generation of the tangential milling cutter

EMP09 series

Milling

B





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


New Champion in Milling YBC302
Black Diamond Series grade

How to choose the right indexable milling tools

■ Classification of milling tools

According to types of machining operation

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

Product series

Type of machining

Workpiece materials

Approach angle

Structure and coupling size

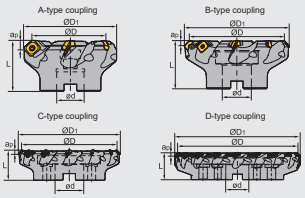
Inserts specification
Insert shape, type, dimensions, grade, stock, etc.

Face milling tools Kr:45°

FMA01 P M K N S



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



Specification of tools

Type		Stock R	Stock L	Basic dimensions(mm) ØD	ØD1	ød	L	apmax	Number of teeth Z	Type of coupling	Weight (kg)
FMA01 Coarse pitch	-050-A22-SE12-04	▲	△	50	61	22	40	6	4	A	0.3
	-063-A22-SE12-05	▲	△	63	74	22	40	6	5	A	0.5
	-080-A27-SE12-06	▲	△	80	91	27	50	6	6	A	1.2
	-100-B32-SE12-07	▲	△	100	107	32	50	6	7	B	1.52
	-125-B40-SE12-08	▲	△	125	136	40	63	6	8	B	2.6
	-160-B40-SE12-07	▲	△	160	174	40	63	6	7	B	4.548
	-160-B40-SE12-10	▲	△	160	170	40	63	6	10	B	4.92
	-200-C60-SE12-08	▲	△	200	214	60	63	6	8	C	6.175
	-200-C60-SE12-12	▲	△	200	210	60	63	6	12	C	7.6
	-250-C60-SE12-10	▲	△	250	264	60	63	6	10	C	12.596
	-250-C60-SE12-14	▲	△	250	260	60	63	6	14	C	13.5
	-315-D60-SE12-18	▲	△	315	325	60	70	6	18	D	20.8
	-100-B32-SE18-04	▲	△	100	120	32	63	10.4	4	B	2.22
	-125-B40-SE18-05	▲	△	125	145	40	63	10.4	5	B	3.15
	-160-B40-SE18-06	▲	△	160	180	40	63	10.4	6	B	5.01
	-200-C60-SE18-08	▲	△	200	220	60	63	10.4	8	C	6.9
	-250-C60-SE18-10	▲	△	250	270	60	63	10.4	10	C	13.1
	-315-D60-SE18-12	▲	△	315	335	60	80	10.4	12	D	24.5

▲Stock available △Make-to-order

Spare parts

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



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

Spare parts

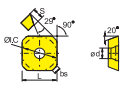
Tools specification
Tool shape, dimensions, stock, etc

Tool shape

Assembly of tools and spare parts

Tools code key, reference to grade selection, technical data

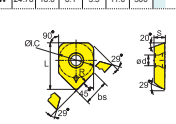
Selection of inserts

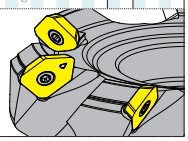


Good working condition / Normal working condition / Bad working condition

Workpiece material	Steel	Stainless steel	Cast iron	Non-ferrous metal	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm) L	Ø.I.C	S	ød	bs	R	CVD Coating	PVD Coating	Cermet	Cemented carbide
	SEET12T3-DF	13.4	13.4	3.97	4.1	2.55	–	● ★ ●	★ ○		
	SEET12T3-CF	13.4	13.4	3.97	4.1	2.55	–	○	★ ★ ○		
	SEET12T3-EF	13.4	13.4	3.97	4.1	2.55	–		★ ○ ●		
	SEET12T3-DM	13.4	13.4	3.97	4.1	2.55	–	● ★ ● ○	★ ★		
	SEET12T3-CM	13.4	13.4	3.97	4.1	2.55	–	★	★ ○		
	SEET12T3-EM	13.4	13.4	3.97	4.1	2.55	–	● ●	★ ★ ●		
	SEET18T6-DM	18.0	18.0	6.1	5.5	1.5	–	○ ○			
	SEET18T6-EM	18.0	18.0	6.1	5.5	1.5	–	○	○		
	SEET12T3-DR	13.4	13.4	3.97	4.1	2.55	–	● ★ ●	★ ★		
	SEET12T3-CR	13.4	13.4	3.97	4.1	2.55	–	● ★	★ ★		
	SEET12T3-LH	13.4	13.4	3.97	4.1	2.55	–				○ ★
	SEET12T3-W	17.82	13.4	3.97	4.1	9.46	500	★ ● ★	★	★	
	SEET18T6-W	24.78	18.0	6.1	5.5	11.0	500		○		





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

Chipbreaker selection for FMA01 milling inserts

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

Chipbreaker selection

How to choose indexable milling inserts

■ Detailed information for indexable milling inserts

Listed according to insert shape

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

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

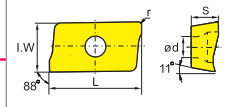
😃 Normal working condition: machine works normally. There are certain requirements for dimensional precision of components and surface quality.

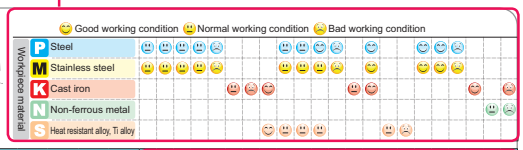
☹ Bad working condition: machine works with bad stability. There are high requirements for high metal removal rate.

Insert shape and size

Insert shape

APKT





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

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

Insert grade

Stock condition

Insert shape

Insert dimension

Insert type

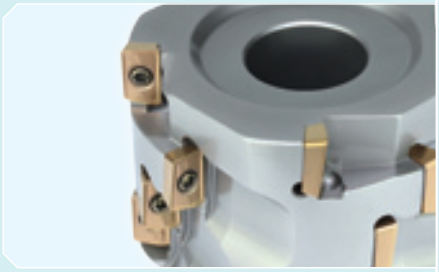


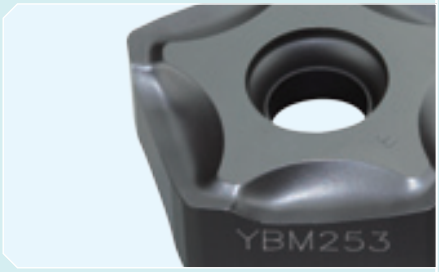
B MILLING

Indexable Milling Tools

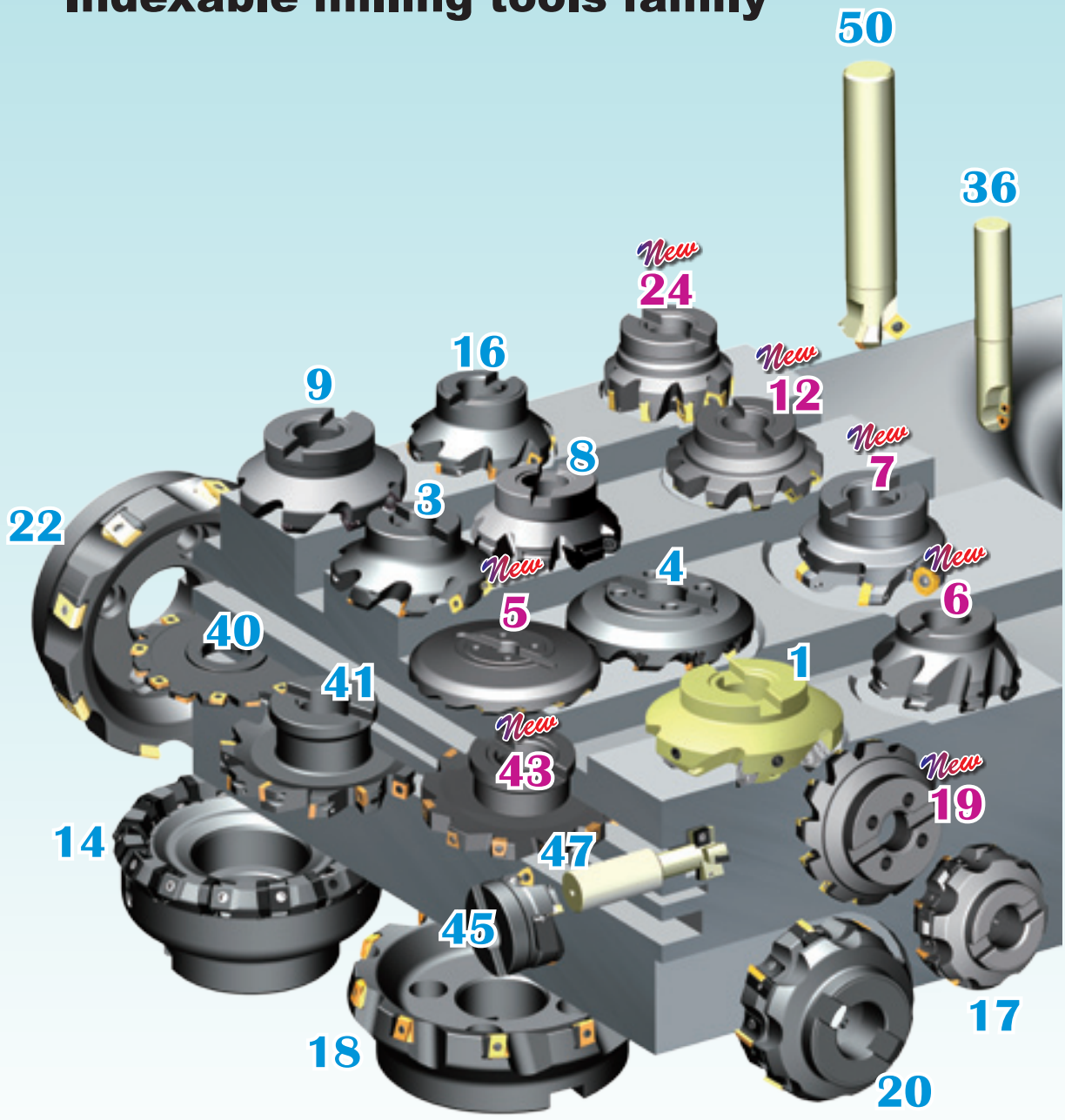
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Indexable milling tools overview	B9-B17
Milling insert grades overview	B19
Grade classification for milling inserts	B20-B23
Indexable milling tools code key	B24-B25
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High-speed High-precision milling 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
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Chamfer milling tool series	B198-B201
Indexable milling inserts overview	B202-B203
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Technical information	B234-B240







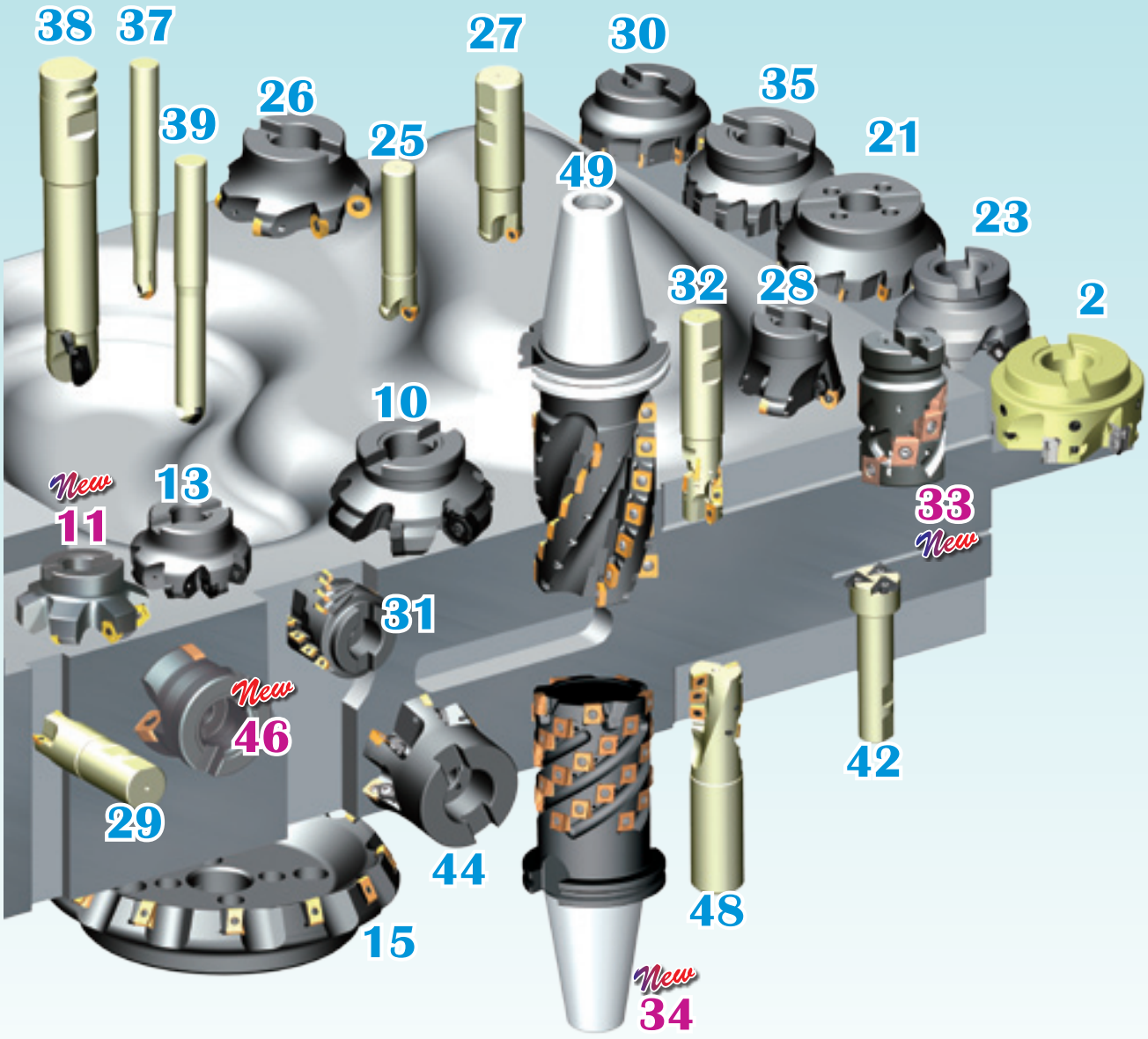
Indexable milling tools family



Number	Tool category	Page
1	AMA01	B27
2	AMP01	B29
3	FMA01	B31
4	FMA03	B36
5	FMA03A	B37
6	FMA04(OFKT05□□)	B40
7	FMA04(ODH/MT06□□)	B42
8	FMA07	B46
9	FMA11	B51

Number	Tool category	Page
10	FMA12	B55
11	FMA14	B59
12	FMA17	B61
13	FMD02(PN11)	B64
14	FMD02(HN09)	B69
15	FMD03	B71
16	FME02	B73
17	FME03	B75
18	FME04	B79

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20	FMP01	B83
21	FMP02	B85
22	FMP03	B90
23	FMP12	B93
24	FMP17	B96
25	FMR01	B99
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27	FMR03	B106



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34	EMP09 BT	B131
	EMP09 JT	B132
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Number	Tool category	Page
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46	XMR03	B189
47	TMP01	B191
48	HMP01(Ø40-Ø50)	B193
49	HMP01(Ø50-Ø80)	B194
	HMP01 EC(Ø50-Ø80)	B195
50	CM□01	B198


WHIRLWIND
FMD02
milling cutter series

Indexable milling tools overview

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

Indexable milling tools overview

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

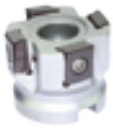
Indexable milling tools overview

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

Indexable milling tools overview

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

Indexable milling tools overview

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

Indexable milling tools overview

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

Indexable milling tools overview

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

Indexable milling tools overview

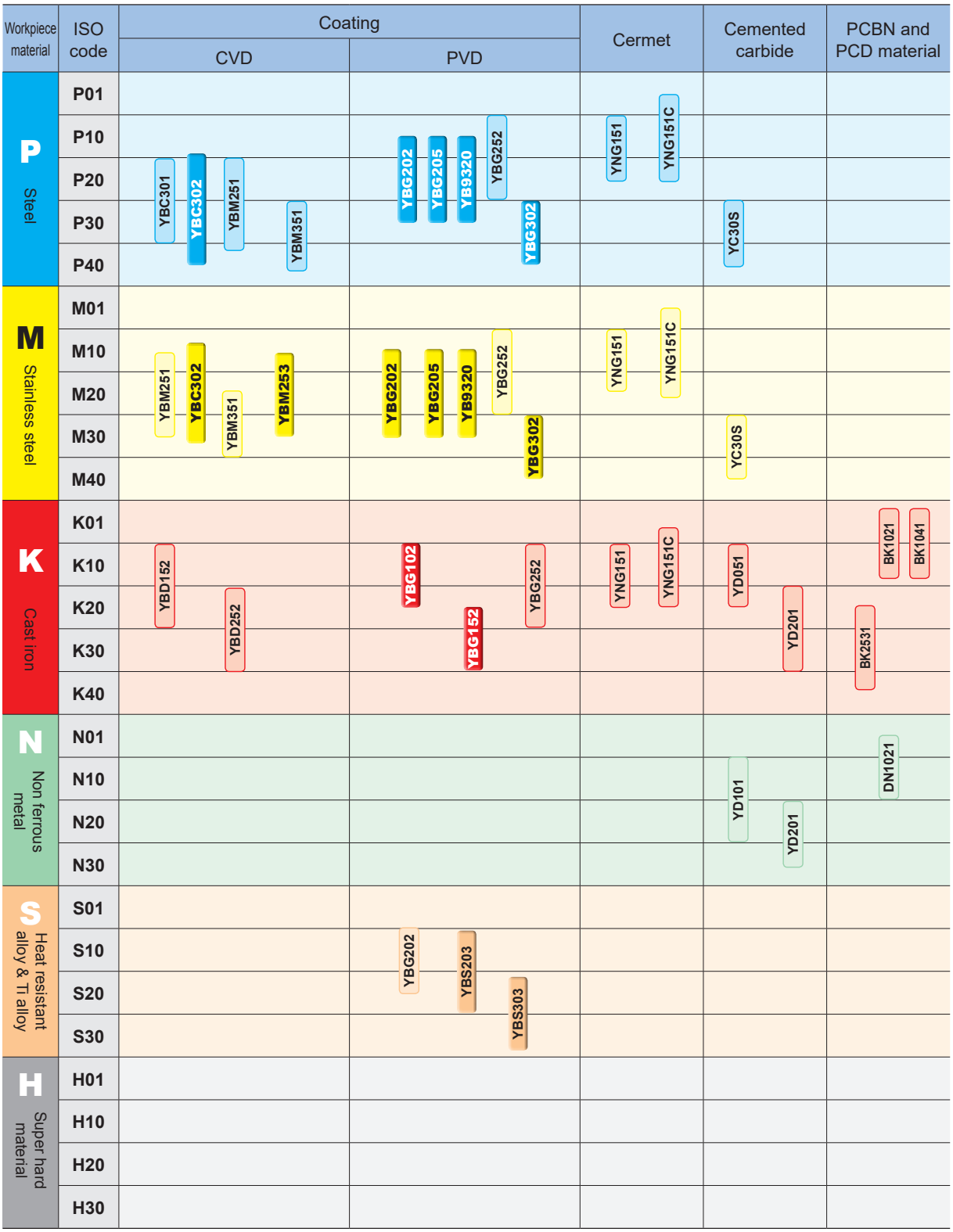
Operating pattern	Series/Shape	Approach angle / Max. cutting depth.	Applicable insert	Application overview	Features
Special milling (high feed)	**XMR01**  B178  B179  B181  B182	cutting depth: see the detailed information about tool specifications	SDMT□□-DM/PM/NM	Slot milling of steel, stainless steel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

Indexable milling tools overview

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

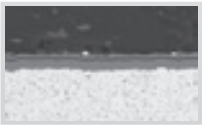
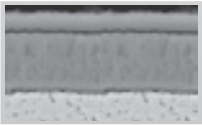
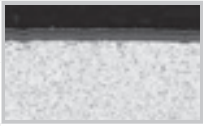
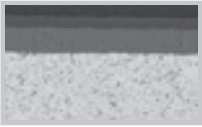

Profile milling tools
series

Milling insert grades overview

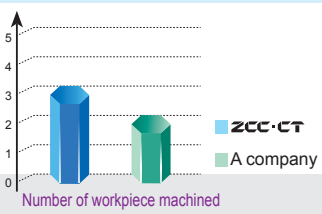
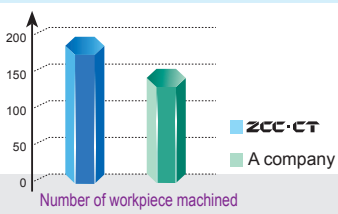


Grade classification for milling inserts

Coated Cemented Carbide CVD

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

Application case

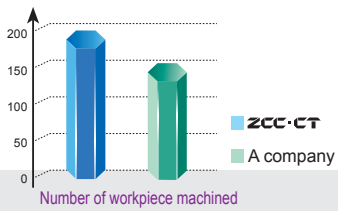
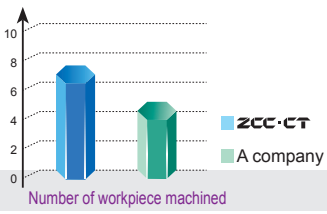
Component shape		
Machine and cooling	Vertical machining center, dry machining	Horizontal machining center, dry machining
Workpiece material and hardness	45# Forged steel HB240-270	HT250 HB220
Type of machining	Milling surface	Milling surface
Applicable tool	FMA01-125-B40-SE12-08	FMP02-100-B32-SE12-07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

Grade classification for milling inserts

Coated Cemented Carbide PVD

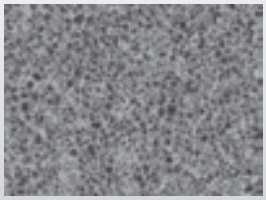
Grade	Coating structure	ISO applied range	Application field
YBG102	fine carbide substrate + Nano coating	K05~K20	Suitable for finish and semi-finish milling of K-type material
YBG202	Substrate with excellent deformation resistance + Nano coating	P10~30 M10~30 S05~20	PVD grade with wide application, widely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

Application case

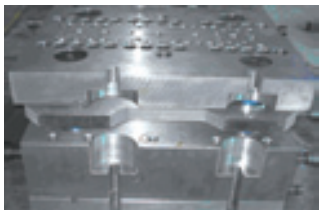
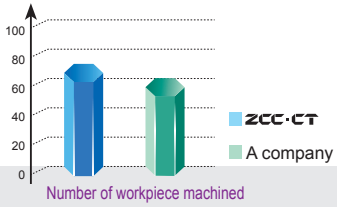
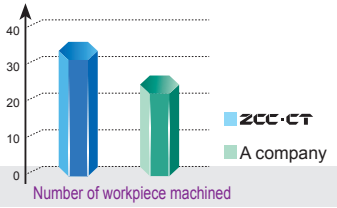
Component shape		
Machine and cooling	Machining center, dry cutting	Plane milling machine, dry cutting
Workpiece material and hardness	Nodular cast iron HB 220	7CrSiMoV HRC25
Type of machining	Milling surface	Cavity milling
Applicable tool	EMP02-050-A22-AP11-06	BMR03-050-MT5-M
Applicable insert	YB9320/APKT11T308-APM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

Grade classification for milling inserts

Cermet

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

Application case

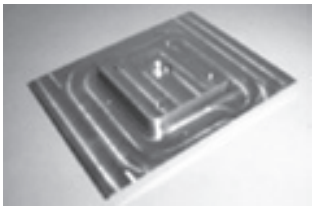
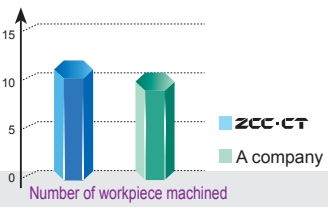
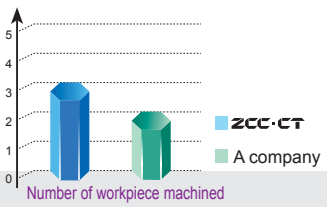
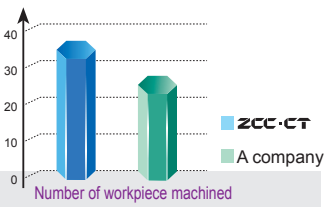
Component shape		
Machine and cooling	Machining center, dry cutting	Machining center, dry cutting
Workpiece material and hardness	45# HB 170~220	NAK80 HRC42~48
Type of machining	Finish milling surface	Finish milling surface
Applicable tool	FMA03-160-B40-SE12-08	FME03-160-B40-SP12-10
Applicable insert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

Grade classification for milling inserts

Cemented Carbide

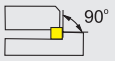
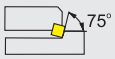
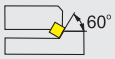
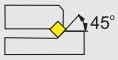
Grade	Coating structure	ISO applied range	Application field
YC30S		P25~40 M25~40	Suitable for rough milling of P- and M-type material
YD051		K05~20	Suitable for finish milling of K-type material
YD101		N05~25	Suitable for rough milling of N-type material
YD201		K15~35 N15~30	Suitable for rough and semi-finish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

Application case

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

Indexable milling tools code key

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

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

Series code

Cutting diameter ØD

Side and face milling tool : diameter X cutting edge width

Coupling structurebe (see below)

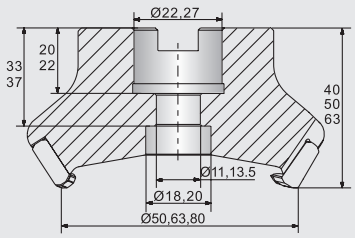
A	A-type coupling	XP	Weldon shank
B	B-type coupling	G	Straight shank
C	C-type coupling	MW	Morse adapter with a conical hole and without a flat tail
D	D-type coupling		

Coupling size(mm) (see below)

FM E 03 - 100 - B 32

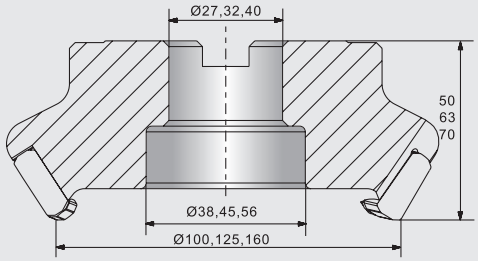
Coupling structure of arbor

A-type coupling



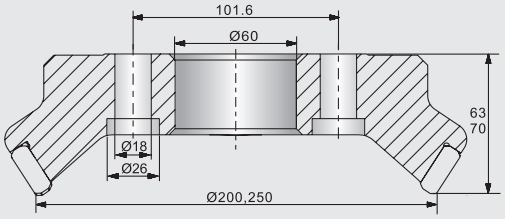
Ø50- Ø80 arbor face milling cutter as per GB5342-96

B-type coupling



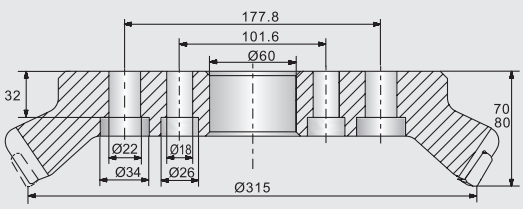
Ø100- Ø160 arbor face milling cutter as per GB5342-96

C-type coupling



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

D-type coupling



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

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

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

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

Length of cutting edge

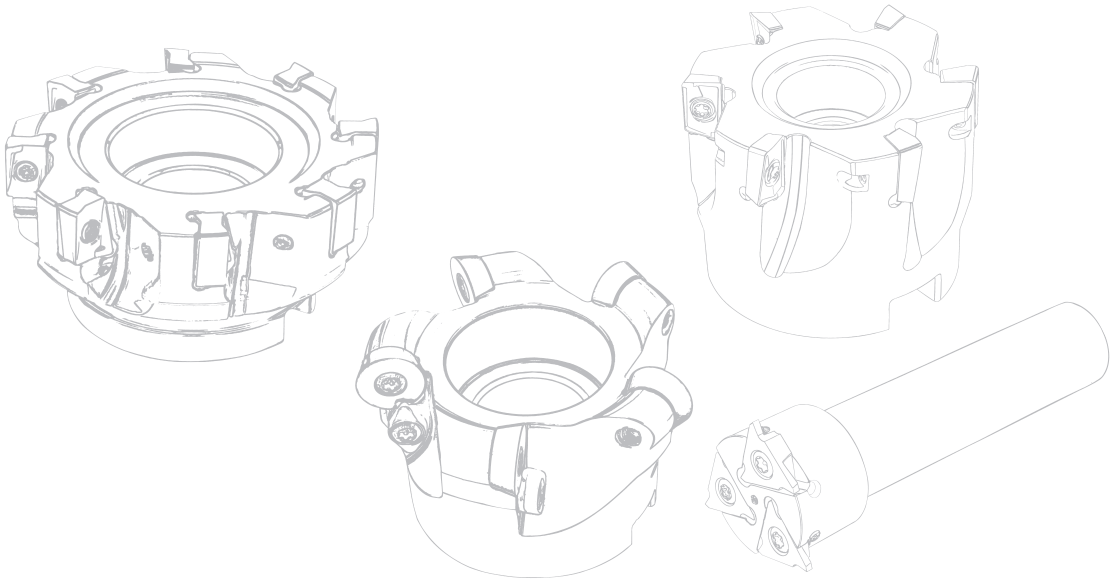
Diameter of insert's inscribed circle	Insert shape					
	C	D	R	S	T	L
5.556	—	—	—	—	09	—
6.350	06	07	—	—	11	—
9.525	09	11	09	09	16	—
12.700	12	15	12	12	22	—
15.875	16	19	15	15	27	—
19.050	19	—	19	19	33	—
25.400	25	—	25	25	44	2

-SP12-06LC

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

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

Internal cooling structure





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

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

●Comparison of tool life

Number of workpiece machined(pieces)

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

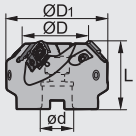
AMA01 Series High-speed High-precision milling tools

Kr:45° Face milling Chamfering

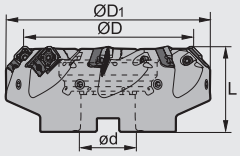
AMA01 N K



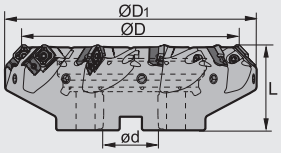
A-type coupling



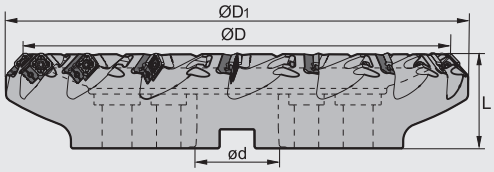
B-type coupling



C-type coupling



D-type coupling



Specification of tools

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

▲Stock available △Make-to-order

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

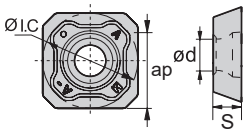
Spare parts

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



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

Selection of inserts



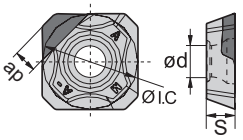
Good working condition Normal working condition Bad working condition

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

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

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

Selection of inserts



Good working condition Normal working condition Bad working condition

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

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

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

Recommended cutting parameters

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

AMA01 Series High-speed High-precision milling tools

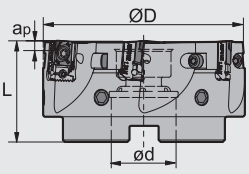
Kr:90° Face milling Step shoulder

AMP01

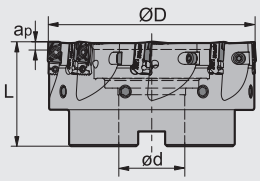


Close even pitch

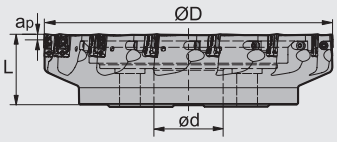
A-type coupling



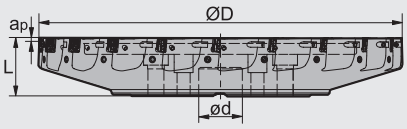
B-type coupling



C-type coupling



D-type coupling



Specification of tools

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

▲Stock available △Make-to-order

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

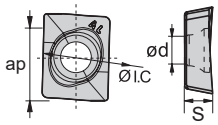
Spare parts

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



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

Selection of inserts



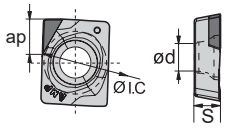
Good working condition Normal working condition Bad working condition

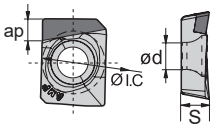
Workpiece material				
K	Cast iron		😊	☹
N	Non-ferrous metal	😐		😐

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

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

Selection of inserts





Good working condition Normal working condition Bad working condition

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

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

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

Recommended cutting parameters

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

Face milling tools

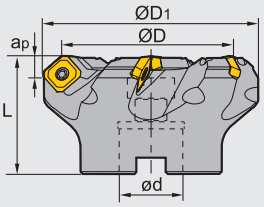
Kr:45°

Face milling Chamfering

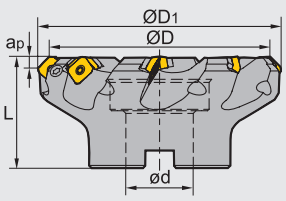
FMA01 P M K N S



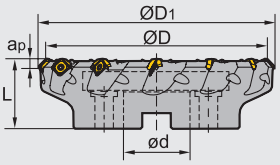
A-type coupling



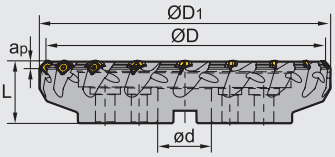
B-type coupling



C-type coupling



D-type coupling



Specification of tools

Type		Stock		Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
		R	L	ØD	ØD1	ød	L	apmax			
FMA01 Coarse pitch	**-050-A22-SE12-04**	▲	△	50	61	22	40	6	4	A	0.3
	-063-A22-SE12-05	▲	△	63	74	22	40	6	5	A	0.5
	-080-A27-SE12-06	▲	△	80	91	27	50	6	6	A	1.2
	-100-B32-SE12-07	▲	△	100	107	32	50	6	7	B	1.52
	-125-B40-SE12-08	▲	△	125	136	40	63	6	8	B	2.6
	-160-B40-SE12-07	▲	△	160	174	40	63	6	7	B	4.548
	-160-B40-SE12-10	▲	△	160	170	40	63	6	10	B	4.92
	-200-C60-SE12-08	▲	△	200	214	60	63	6	8	C	6.175
	-200-C60-SE12-12	▲	△	200	210	60	63	6	12	C	7.6
	-250-C60-SE12-10	▲	△	250	264	60	63	6	10	C	12.596
	-250-C60-SE12-14	▲	△	250	260	60	63	6	14	C	13.5
	-315-D60-SE12-18	▲	△	315	325	60	70	6	18	D	20.8
	-100-B32-SE18-04	▲	△	100	120	32	63	10.4	4	B	2.22
	-125-B40-SE18-05	▲	△	125	145	40	63	10.4	5	B	3.15
	-160-B40-SE18-06	▲	△	160	180	40	63	10.4	6	B	5.01
	-200-C60-SE18-08	▲	△	200	220	60	63	10.4	8	C	6.9
	-250-C60-SE18-10	▲	△	250	270	60	63	10.4	10	C	13.1
	-315-D60-SE18-12	▲	△	315	335	60	80	10.4	12	D	24.5

▲Stock available △Make-to-order

Spare parts

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



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

Face milling tools

Kr:45°

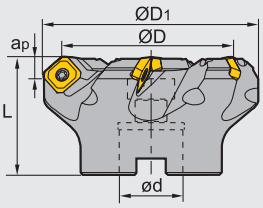
Face milling Chamfering

FMA01 P M K N S

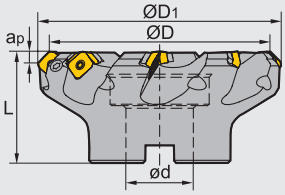


Close and equal pitch

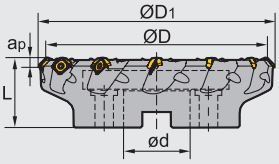
A-type coupling



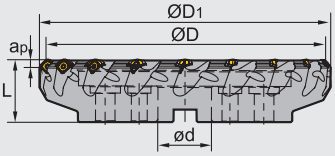
B-type coupling



C-type coupling



D-type coupling



Specification of tools

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

▲Stock available △Make-to-order

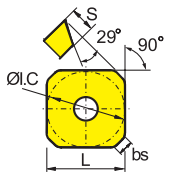
Spare parts

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



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

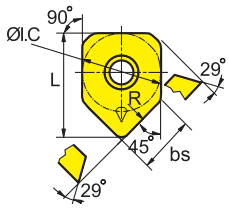
Selection of inserts

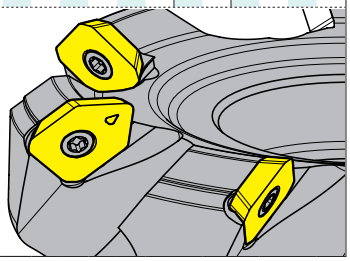


Good working condition Normal working condition Bad working condition

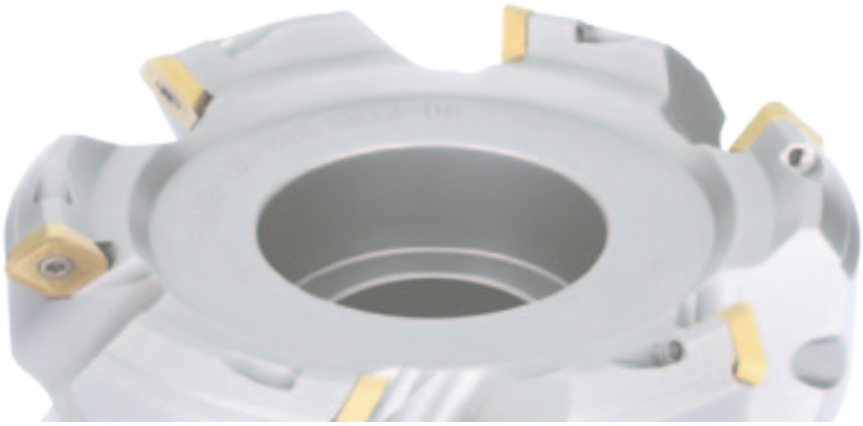
Workpiece material	
P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating									Cermet		Cemented carbide			
		L	ØI.C	S	ød	bs	R	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SEET12T3-DF	13.4	13.4	3.97	4.1	2.55	--	●	★	●							★		○										
	SEET12T3-CF	13.4	13.4	3.97	4.1	2.55	--						○		★		★		○										
	SEET12T3-EF	13.4	13.4	3.97	4.1	2.55	--										★		○				●						
	SEET12T3-DM	13.4	13.4	3.97	4.1	2.55	--	●	★	●		○					★		★										
	SEET12T3-CM	13.4	13.4	3.97	4.1	2.55	--						★				★		○										
	SEET12T3-EM	13.4	13.4	3.97	4.1	2.55	--			●		●					★		★				●						
	SEET18T6-DM	18.0	18.0	6.1	5.5	1.5	--		○		○																		
	SEET18T6-EM	18.0	18.0	6.1	5.5	1.5	--				○							○											
	SEET12T3-DR	13.4	13.4	3.97	4.1	2.55	--	●	★			●					★		★										
	SEET12T3-CR	13.4	13.4	3.97	4.1	2.55	--	●					★				★		★										
	SEET12T3-LH	13.4	13.4	3.97	4.1	2.55	--																				○	★	
	SEET12T3-W	17.82	13.4	3.97	4.1	9.46	500		★	●			★				★							★					
	SEET18T6-W	24.78	18.0	6.1	5.5	11.0	500										○												





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



Chipbreaker selection for FMA01 milling inserts

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

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters			
				V_c(m/min)	f_z(mm/z)		
					-DF	-DM	-DR
P	Low-carbon steel、Soft steel	≤180	YBM251 YBC301	270(220-350)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
			YBG205 YB9320	270(200-360)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
			YBG302 YBM253	230(170-350)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
	High-carbon steel、Alloy steel	180-280	YBM251 YBC302 YBC301	240 (200-320)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
			YBG205 YB9320	240 (180-350)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
			YBG302 YBM253	220 (150-330)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
	Alloy tool steel	280-350	YBM251 YBM351 YBC301	220 (180-300)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
			YBG205 YB9320	220 (170-340)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
			YBG302 YBM253	190 (130-300)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
M					-EF	-EM	
	Stainless steel	≤270	YBM251	150 (120-240)	0.15(0.1-0.2)	0.2 (0.1-0.3)	
			YBG205 YB9320	160 (110-270)	0.15(0.1-0.2)	0.2 (0.1-0.3)	
			YBG302	140 (100-250)	0.15(0.1-0.2)	0.2 (0.1-0.3)	
K					-CF	-CM	-CR
	Cast iron	180-250	YBG102	210 (120-300)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
			YBD152	240 (180-300)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.4)
N					-LH		
	Al alloy steel	--	YD101	300-	0.25 (0.1-0.4)		
			YD201	300-			
S					-EF	-EM	
	High-temperature alloy	≤400	YBG102	50(20-60)	0.1 (0.1-0.2)	0.15 (0.1-0.3)	
			YBS303	100(60-120)	0.1 (0.1-0.2)	0.15 (0.1-0.25)	

Case for FMA01





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

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

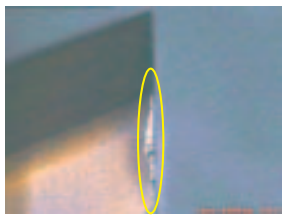
Surface roughness of workpiece:

ZCC-CT:Ra1.2

Similar overseas products：Ra1.6



●Comparison of insert abrasion

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

Face milling tools

Kr:45°

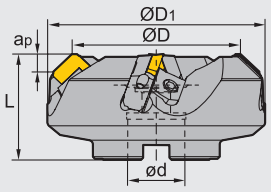

Face milling


Chamfering

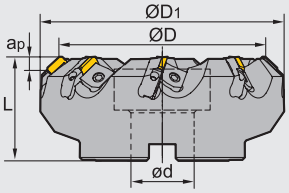
FMA03 P M K



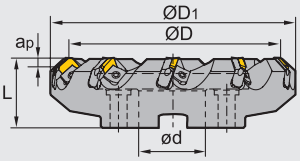
A-type coupling



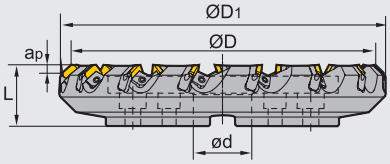
B-type coupling



C-type coupling



D-type coupling



Specification of tools

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

▲Stock available △Make-to-order

Spare parts

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



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

Face milling tools

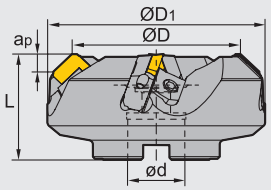
Kr:45°

Face milling Chamfering

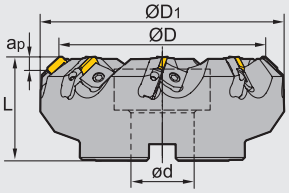
FMA03A P M K



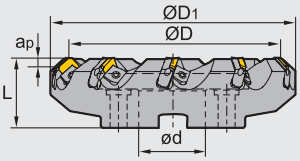
A-type coupling



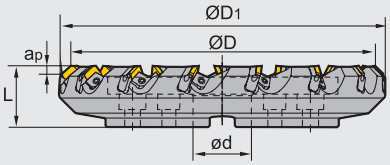
B-type coupling



C-type coupling



D-type coupling



Specification of tools

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

▲Stock available △Make-to-order 1.875"=47.625mm 2.00"=50.8mm

Cutter diameter — Insert type — Left cutter

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

Cutter type — Coupling type — Right cutter

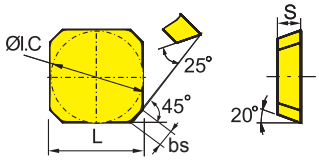
Spare parts

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



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

Selection of inserts

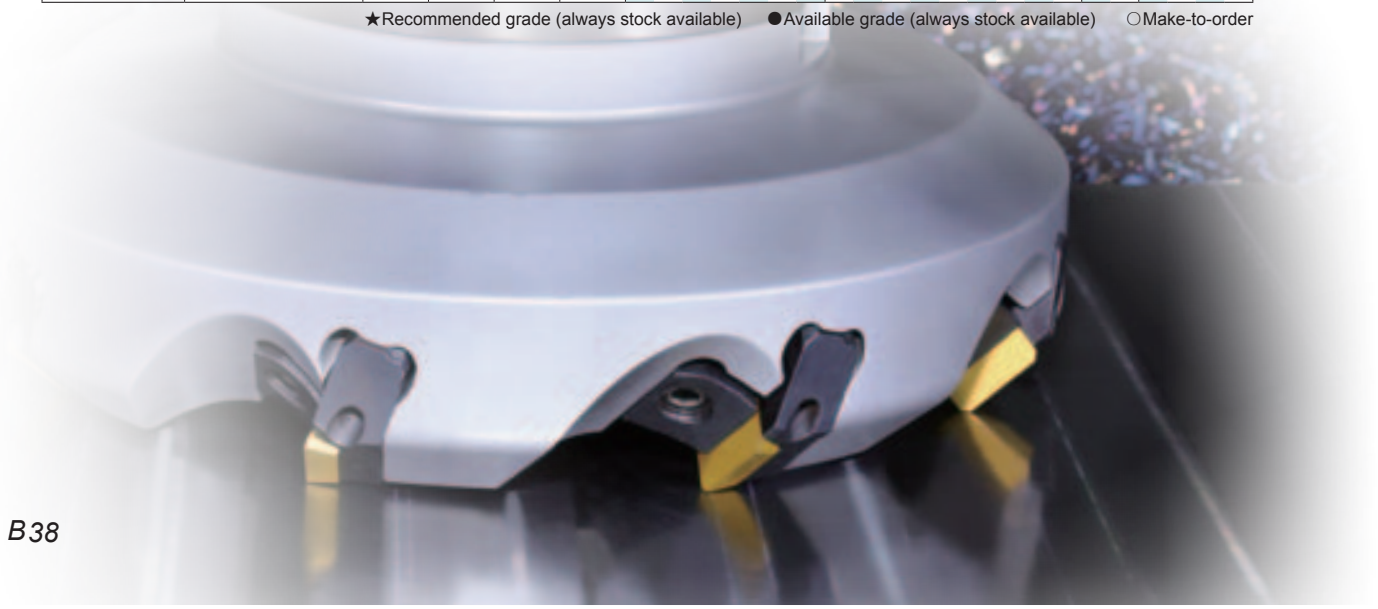


Good working condition Normal working condition Bad working condition

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

Insert shape	Type	Basic dimensions(mm)				CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	ØI.C	S	bs	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SEEN1203AFTN	12.7	12.7	3.18	1.8									○								●					
	SEKN1203AFFN	12.7	12.7	3.18	1.8								★														
	SEKN1203AFN	12.7	12.7	3.18	1.8	●								○										●			○
	SEKN1203AFTN	12.7	12.7	3.18	1.8	●		●		●				★			○							●			●
	SEKR1203AFN	12.7	12.7	3.18	1.8	●								○			○										
	SEMR1203AN-M	12.7	12.7	3.3	-										●												
	SEKR1203AN-M	12.7	12.7	3.3	-										●												
	SEKN1504AFN	15.875	15.875	4.76	1.6	●		●																			●
	SEKN1504AFTN	15.875	15.875	4.76	1.6	○		●		●							○							●			●
	SEKR1504AFN	15.875	15.875	4.76	1.6							★					★							●			
	SEMR1504AN-M	15.875	15.875	4.9	-										●												
	SEKR1504AN-M	15.875	15.875	4.9	-										●												

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



Recommended cutting parameters

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

Face milling tools

Kr:45°


Face milling

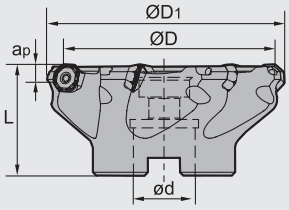

Chamfering

FMA04 P M K N

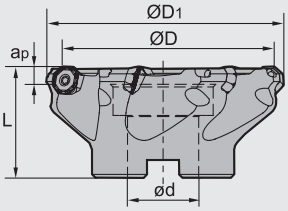


Screw clamping

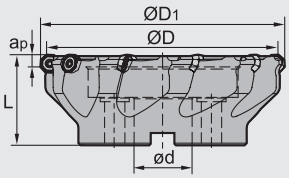
A-type coupling



B-type coupling



C-type coupling



Specification of tools

Type		Stock		Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
		R	L	ØD	ØD1	ød	L	apmax			
FMA04	-050-A22-OF05-04	▲	△	50	56	22	40	3.5	4	A	0.3
	-050-A22-OF05-05	△	△	50	56	22	40	3.5	5	A	0.4
	-063-A22-OF05-05	▲	△	63	69	22	40	3.5	5	A	0.5
	-080-A27-OF05-06	▲	△	80	86	27	50	3.5	6	A	0.8
	-100-B32-OF05-07	▲	△	100	106	32	50	3.5	7	B	1.2
	-125-B40-OF05-08	▲	△	125	130	40	63	3.5	8	B	2.7
	-160-B40-OF05-10	▲	△	160	165	40	63	3.5	10	B	5.1
	-160-C40-OF05-10	△	△	160	165	40	63	3.5	10	C	4.1

▲Stock available △Make-to-order

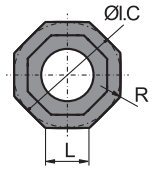
Spare parts

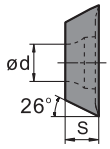
Diameter ØD	Insert screw	Wrench
Ø50- Ø63	I60M4×8.4	WT15IS
Ø80 -Ø160	I60M4×10	



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

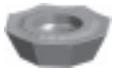
Selection of inserts





Good working condition Normal working condition Bad working condition

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

Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	ØI.C	S	ød	R	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**OFKT05T3-DF**	5.26	12.7	3.97	4.4	0.5								○	★	★											
	**OFKT05T3-DM**	5.26	12.7	3.97	4.4	0.5			○			○	○	★	★	★	★	★										
	**OFKT05T3-LH**	5.26	12.7	3.97	4.4	0.5																				○	

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

Recommended cutting parameters

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

Face milling tools

Kr:45°

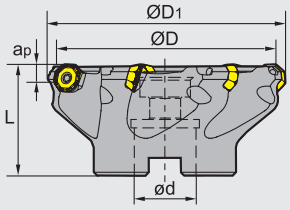
Face milling Chamfering

FMA04 P M K N S

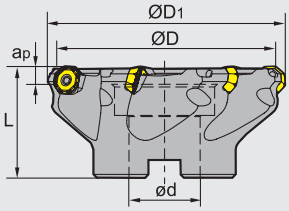


Screw clamping

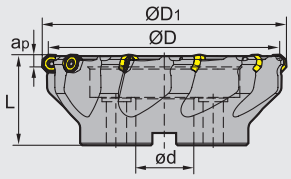
A-type coupling



B-type coupling



C-type coupling

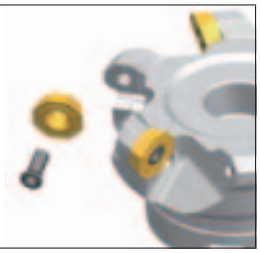


Specification of tools

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

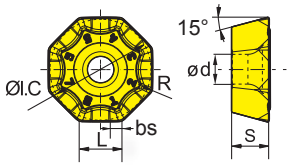
▲Stock available △Make-to-order

Spare parts

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

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

Selection of inserts



Good working condition 😊 Normal working condition 😐 Bad working condition

Workpiece material

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

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

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

Chipbreaker selection for FMA04 milling inserts

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

Recommended cutting parameters

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

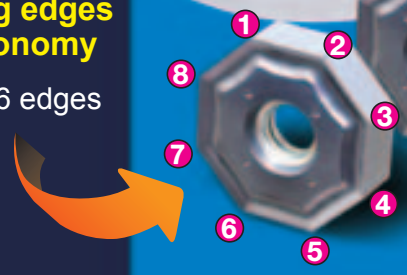
HURRICANE

FMA07 milling cutter series

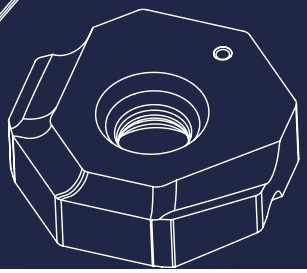
New generation of high economy milling cutters

16 cutting edges high economy

⑧×2=16 edges







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

Face milling tools

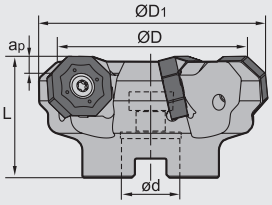
Kr:45°

Face milling Chamfering

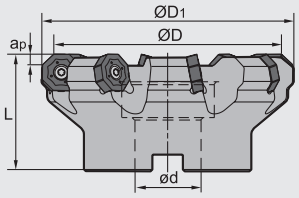
FMA07 P M K



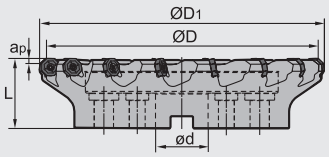
A-type coupling



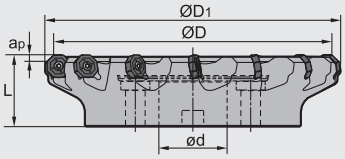
B-type coupling



C-type coupling



D-type coupling



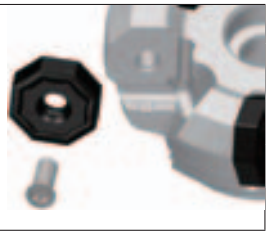
Specification of tools

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

▲Stock available △Make-to-order

Spare parts

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



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

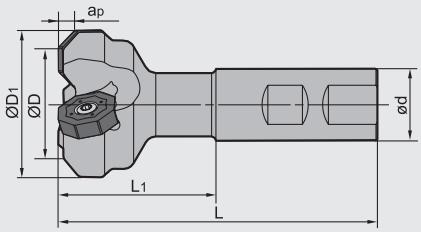
Face milling tools

Kr:45°

Face milling Chamfering

FMA07 P M K





Specification of tools

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

▲Stock available △Make-to-order

Spare parts

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



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

Case for FMA07

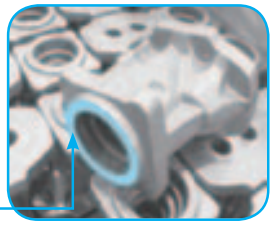




Tool type：FMA07-100-B32-ON08-07

Insert type/grade：ONHU08T508-PM/YBD152

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



●Comparison of insert abrasion

Abrasion on rake face



ZCC·CT

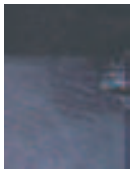


similar product of company A

Abrasion on clearance face



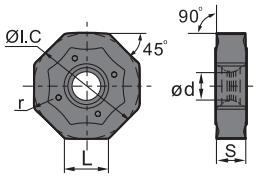
ZCC·CT



similar product of company A



Selection of inserts

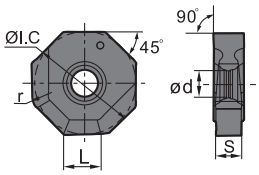


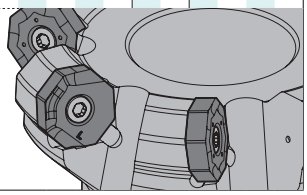
Good working condition Normal working condition Bad working condition

Workpiece material

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

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





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

Recommended cutting parameters

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

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

FMA11 Kr:45° Series

With outstanding economy and high performance



4 × 2=8 edge

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



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

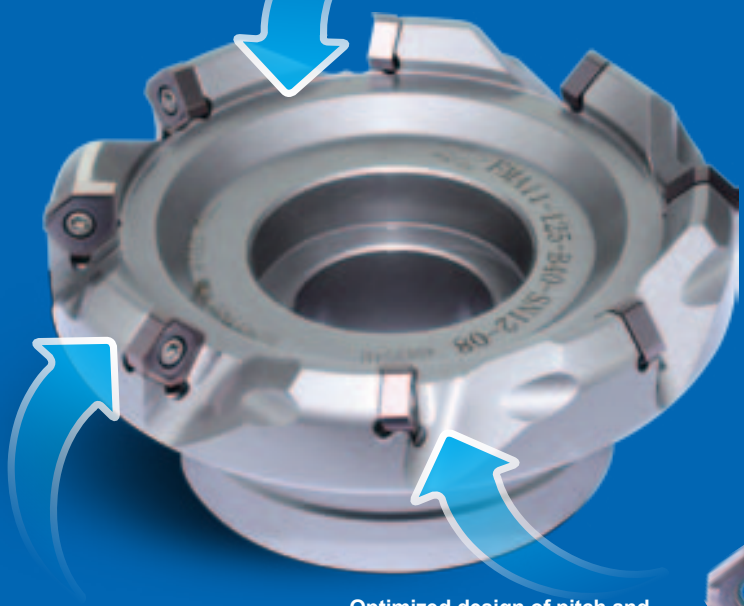


New -HGR geometry, high edge strength, excellent breakage resistance.



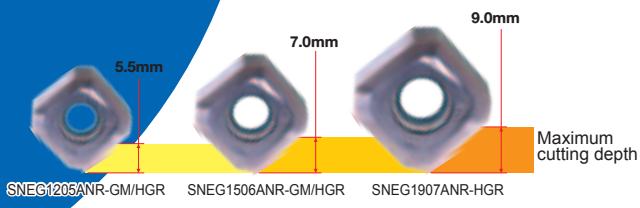
Insert with wiper, smoother surface roughness.

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



Double negative structure, excellent impact resistance.

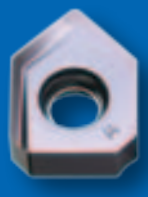
Optimized design of pitch and chip pocket, for unobstructed chip flow, and higher cutting efficiency.



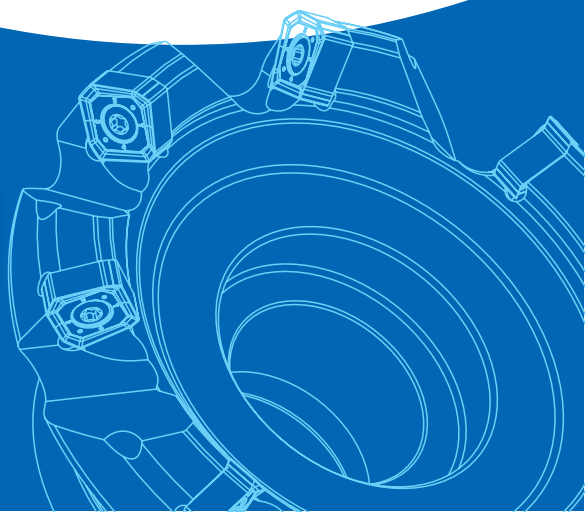


-W special wiper geometry, wiper designed with large arc to improve surface quality the workpiece;

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







Face milling tools

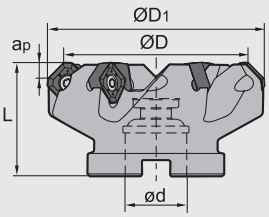
Kr:45°

Face milling Chamfering

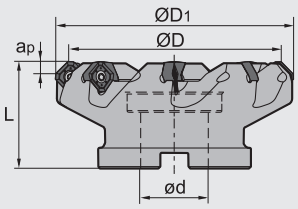
FMA11 P K M S



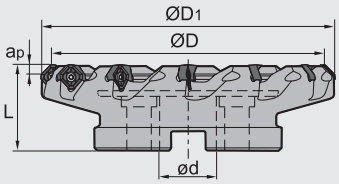
A-type coupling



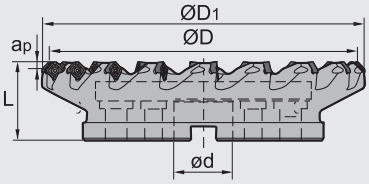
B-type coupling



C-type coupling



D-type coupling



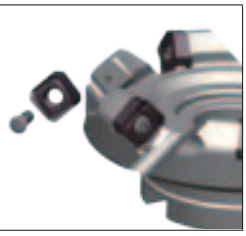
Specification of tools

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

▲Stock available △Make-to-order

Spare parts

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



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

Face milling tools

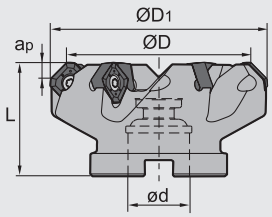
Kr:45°

Face milling Chamfering

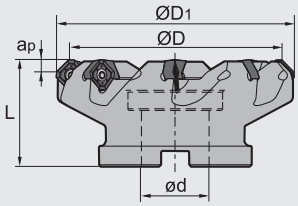
FMA11 P K M S



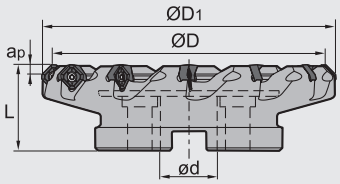
A-type coupling



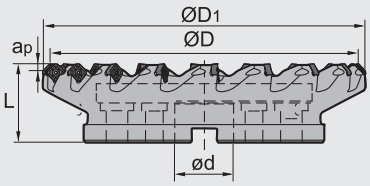
B-type coupling



C-type coupling



D-type coupling



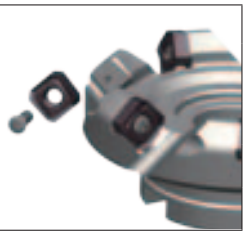
Specification of tools

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

▲Stock available △Make-to-order

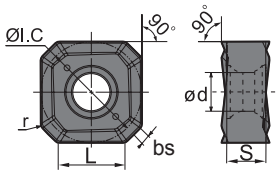
Spare parts

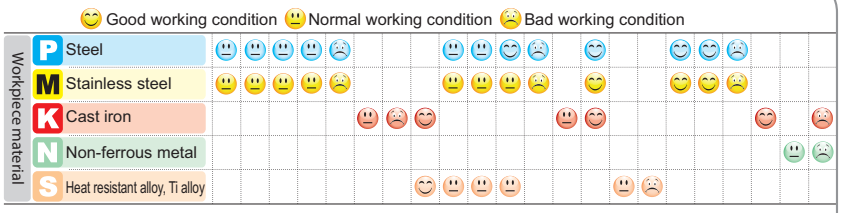
Diameter ØD	Inserts	Insert screw	Wrench	
Ø63 -Ø160	SNEG1205ANR-GM/HGR/W	I60M3.5×10	--	WT15IS
Ø63 -Ø315	SNEG1506ANR-GM/HGR/W	I60M5×13	WT20IT	--
Ø125 -Ø315	SNEG1907ANR-HGR	I43M6×16	WT25IT	--

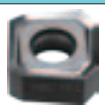


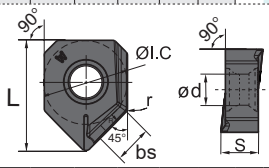
Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

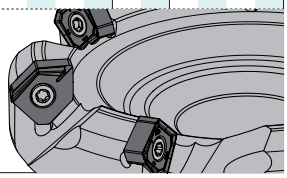
Selection of inserts





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





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

Recommended cutting parameters

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

Case for FMA11

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

●Tool Life Comparison

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



FMA12 Series

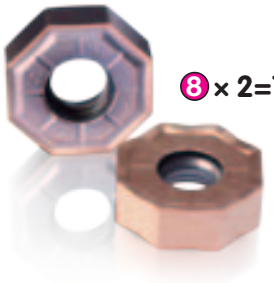
Kr:45°

High Performance Face Mill with 16 edges for outstanding economy

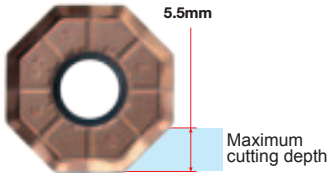




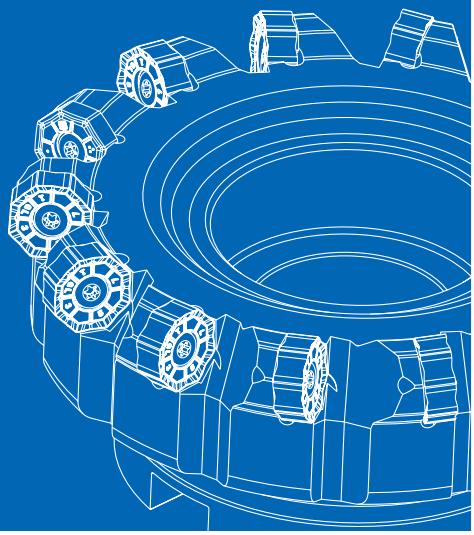
Double negative rake angle, in combination with helical insert structure, achieves double positive axial angle, which will help reduce cutting resistance and improve chip evacuation.



8 × 2=16 edges



ONHU09T508ANN-GM



Face milling tools

Kr:45°

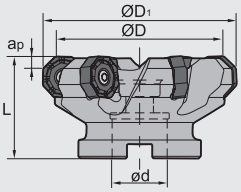

Face milling


Chamfering

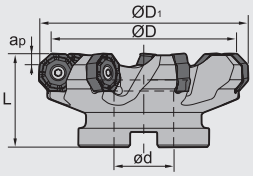
FMA12 P M K S



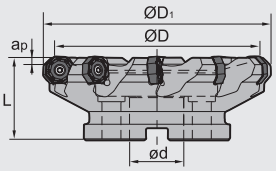
A-type coupling



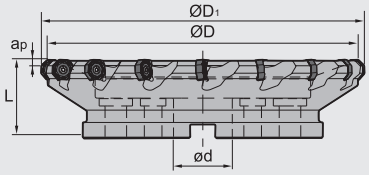
B-type coupling



C-type coupling



D-type coupling



Specification of tools

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

▲Stock available △Make-to-order

Face milling tools

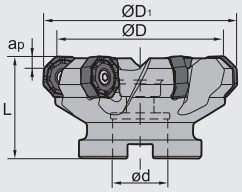
Kr:45°

Face milling Chamfering

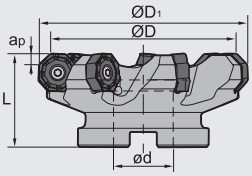
FMA12 P M K S



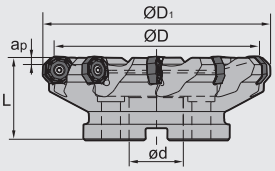
A-type coupling



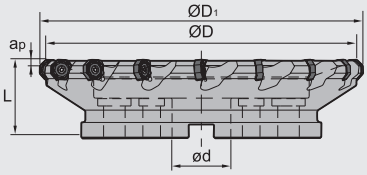
B-type coupling



C-type coupling



D-type coupling



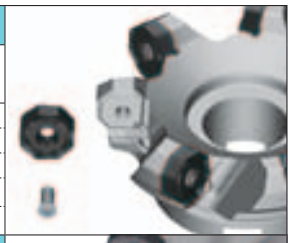
Specification of tools

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

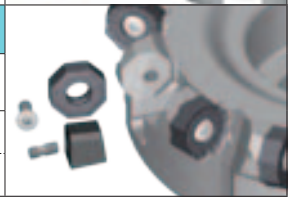
▲Stock available △Make-to-order

Spare parts

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

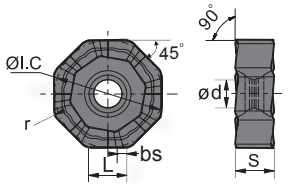


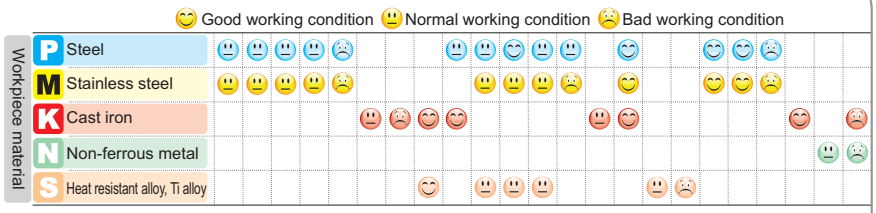
Diameter ØD	Inserts	Insert screw	Adjustment block	Insert screw	Wrench
					
Ø125	ONMU06□□□□-GM/GH	DM6X20A	ADJ-M6X1.0A	IRM4X10	WT15IS
Ø160-Ø200	ONHU06□□□□ANN-GM/GH/GL ONHU0604AN-W				WT15IT



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

Selection of inserts





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

●Inserts are suitable for both left and right cuts

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

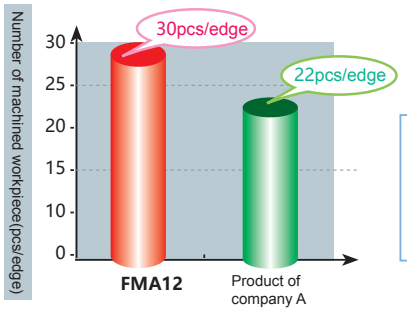
Recommended cutting parameters

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

Case for FMA12



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

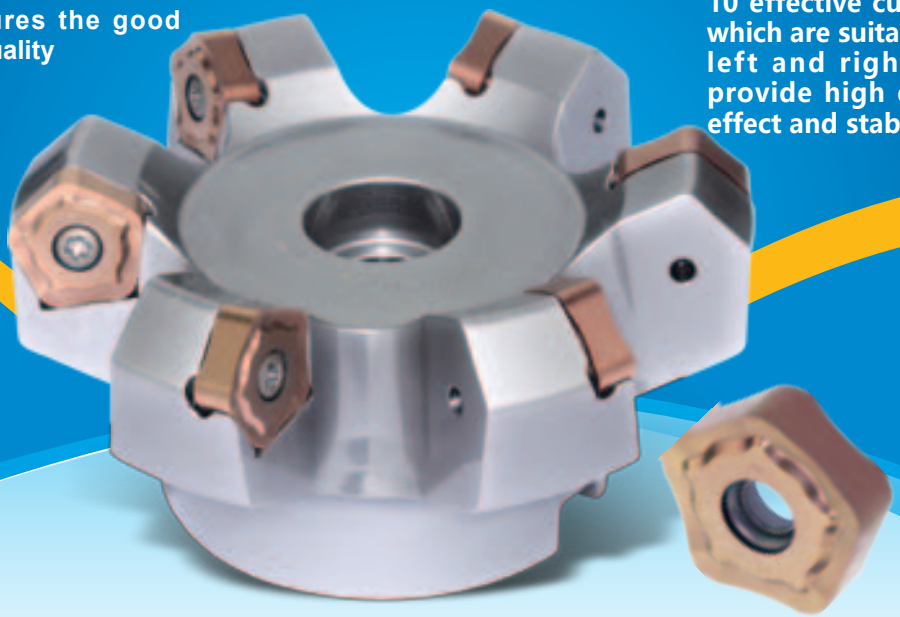


Tool Life comparison
Being compared to the similar product of company A, our FMA12 has longer cutting tool life.

FMA14

The general milling cutter with high-effective multiple cutting edges

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



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

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

The abundant chipbreaker series could deal with different machining condition

-GL: Emphasis on stable machining

Suitable for low cutting forces and the insufficient machine load situation

-GM: First choice for P material machining

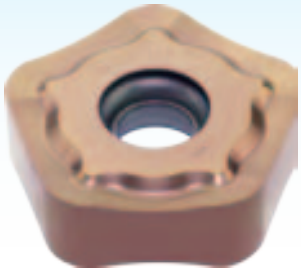
The large radius cutting edge with optimized cutting edge design

-GH: Emphasis on anti-breakage machining

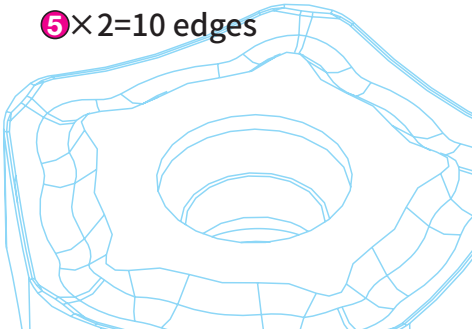
The high strength of the cutting edge significantly control the breakage risks

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

-GL/-GM/-GH



5×2=10 edges



Face milling tools

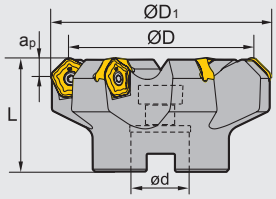
Kr:45°

Face milling Chamfering

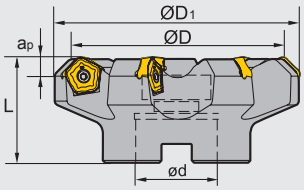
FMA14 P M K



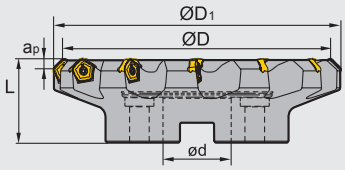
A-type coupling



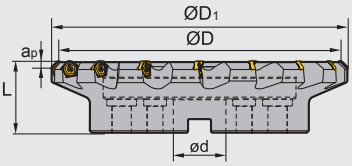
B-type coupling



C-type coupling



D-type coupling



Specification of tools

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

▲Stock available △Make-to-order

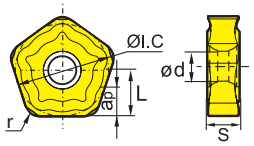
Spare parts

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



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

Selection of inserts



Good working condition Normal working condition Bad working condition

Workpiece material

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

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

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

Recommended cutting parameters

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

Case for FMA14

Workpiece material: 42CrMo

Tool: FMA14-125-B40-PN11-08

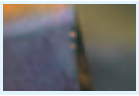
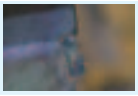
Insert: PNEG110530-GM/YB9320

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

Machine: 3-axis machining center

Cooling system: Dry cutting

Comparison of insert abrasion

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

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

Face milling tools

Kr:45°

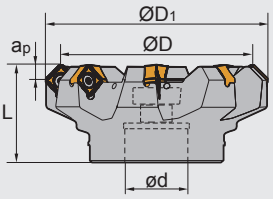

Face milling


Chamfering

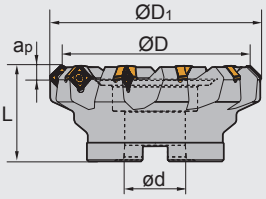
FMA17 P M K S



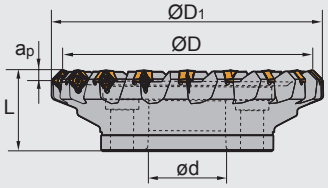
A-type coupling



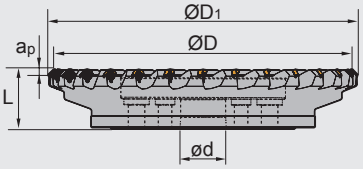
B-type coupling



C-type coupling



D-type coupling



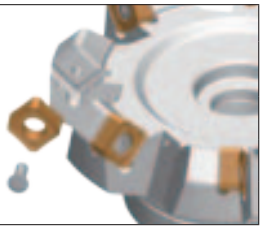
Specification of tools

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

▲Stock available △Make-to-order

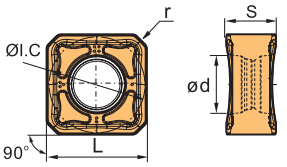
Spare parts

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



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

Selection of inserts



Good working condition Normal working condition Bad working condition

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

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

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

Recommended cutting parameters

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

Case for FMA17

Workpiece: Gear box housing

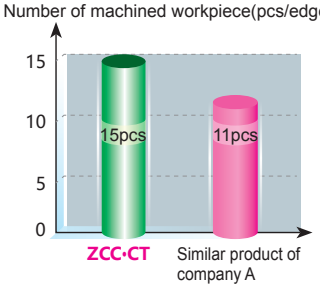
The material of workpiece: HT250(HB220)

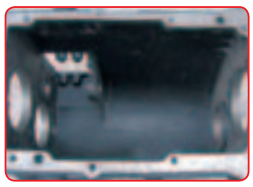
Tool: FMA17-160-C40-SN12-12

Insert: SNGX1205ANN-GM/YBD152

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

Type of cooling: External cooling



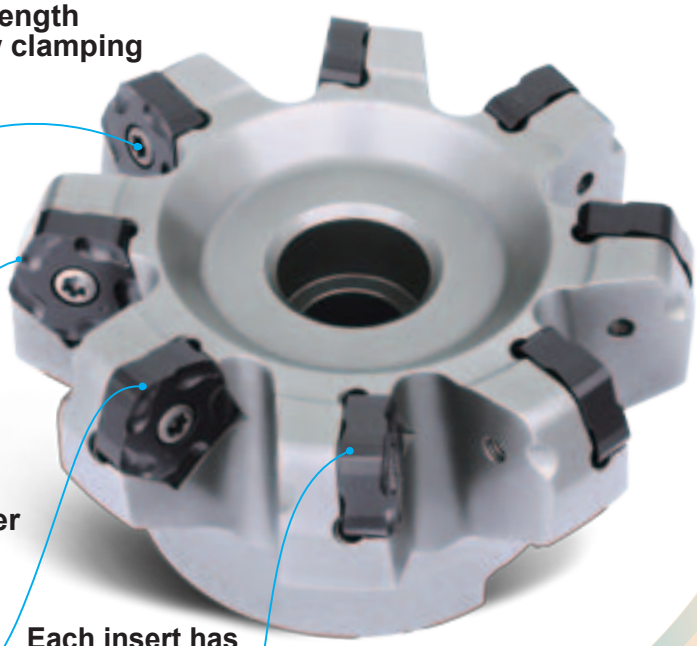


WHIRLWIND FMD02 milling cutter series

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



High strength screw clamping



67° approach angle

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



Wiper

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



Each insert has 10 cutting edges



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



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



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

New chipbreaker for cast iron
-KH -KM -KL



-KH

The optimized cutting edge design emphasis on anti-breakage machining



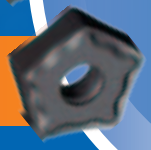
-KM

general machining chipbreaker. The first choice for cast iron machining



-KL

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

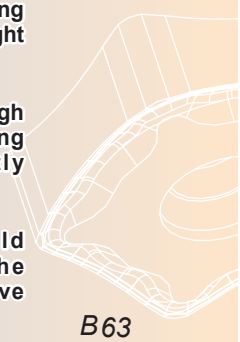


The helical cutting design with chamfered double-rake angle which can perfectly match different cutting depth requirement.

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

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

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



Face milling tools

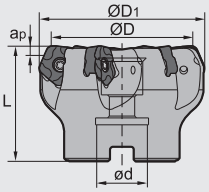
Kr:67°

Face milling

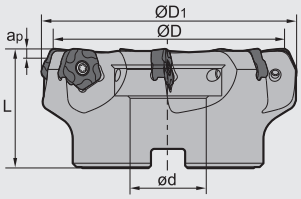
FMD02 P K



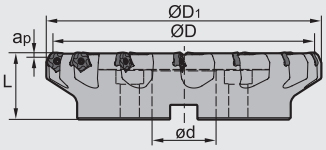
A-type coupling



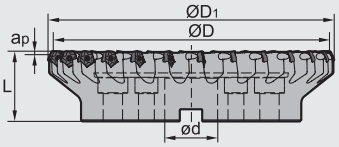
B-type coupling



C-type coupling



D-type coupling



Specification of tools

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

▲Stock available △Make-to-order

Spare parts

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



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

Face milling tools

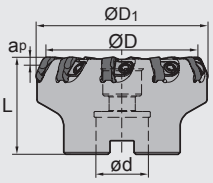
Kr:67°


Face milling

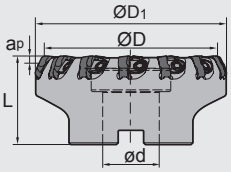
FMD02 P K



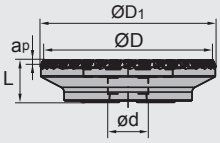
A-type coupling



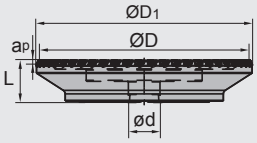
B-type coupling



C-type coupling



D-type coupling



Specification of tools

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

▲Stock available △Make-to-order



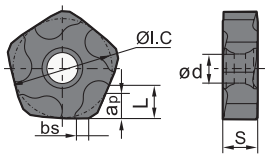
Spare parts

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



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

Selection of inserts



Good working condition Normal working condition Bad working condition

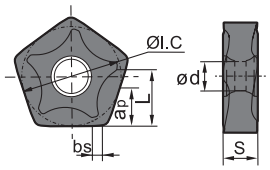
Workpiece material

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

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

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

Selection of inserts



Good working condition Normal working condition Bad working condition

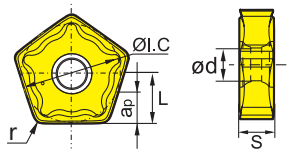
Workpiece material

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

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

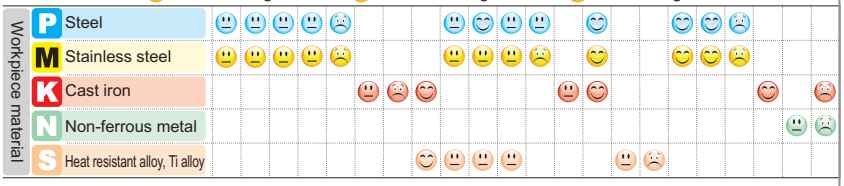
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Selection of inserts



Good working condition Normal working condition Bad working condition

Workpiece material



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

●Inserts are suitable for both left and right cuts

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

Recommended cutting parameters

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

Case for FMD02

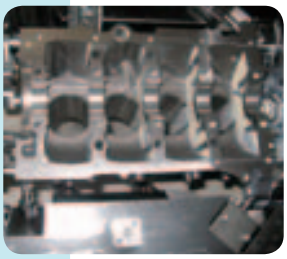
Application case

ZCC-CT

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

similar product of company A

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

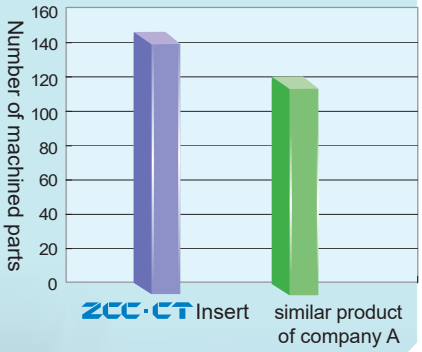




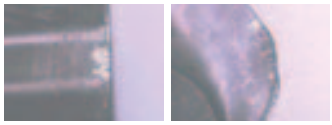
Tool type: FMD02-100-B32-PN11-10

Insert type/grade: PNEG110512R-CR/YBD152

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



● Comparison of insert abrasion



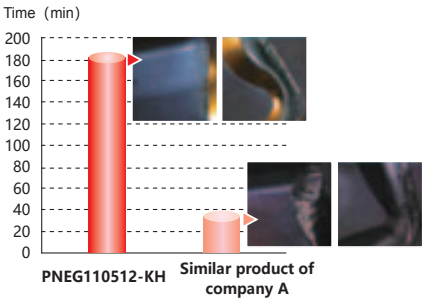
ZCC-CT insert after 80 minutes machining



Insert of company A after 48 minutes machining

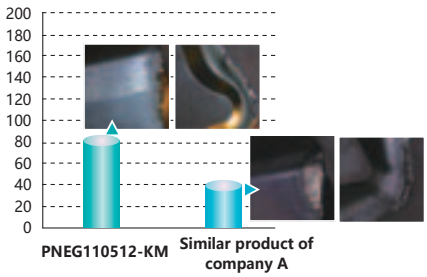
Application case

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



Abrasion comparision

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



Abrasion comparision

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



Face milling tools

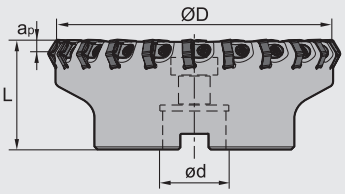
Kr:55°

Face milling

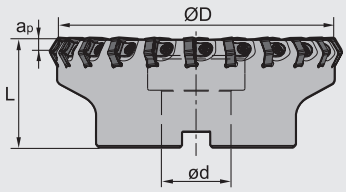
FMD02 K



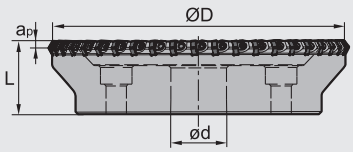
A-type coupling



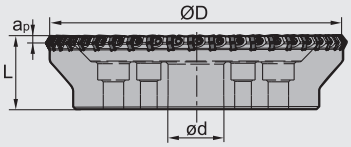
B-type coupling



C-type coupling



D-type coupling



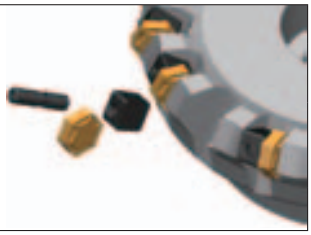
Specification of tools

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

▲Stock available △Make-to-order

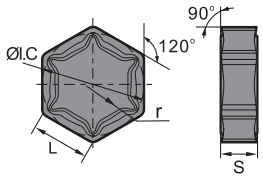
Spare parts

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

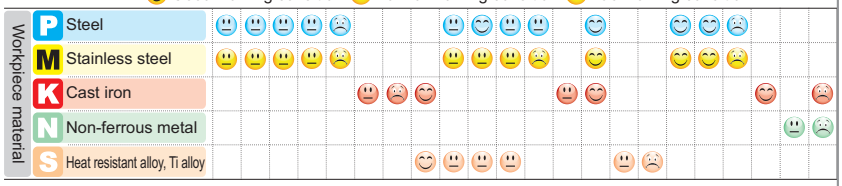


Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Selection of inserts



Good working condition Normal working condition Bad working condition



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

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

Chipbreaker selection for FMD02 milling inserts

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

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters			
				V_c(m/min)	f_z(mm/z)		
					-DF	-DM	-DR
K	Cast iron	180-250	YBD152	180 (110-250)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3(0.2-0.5)
			YBD252	130 (110-200)	0.2(0.1-0.2)	0.25 (0.1-0.3)	0.3(0.2-0.5)

Face milling tools

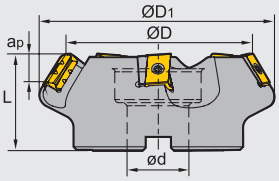
Kr:60°

Face milling

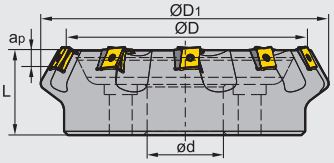
FMD03 P M K



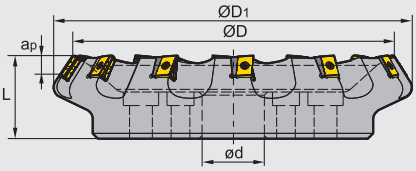
B-type coupling



C-type coupling



D-type coupling



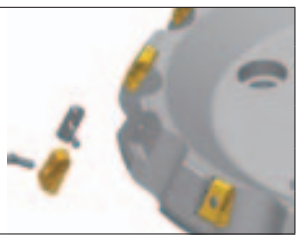
Specification of tools

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

▲Stock available △Make-to-order

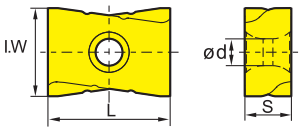
Spare parts

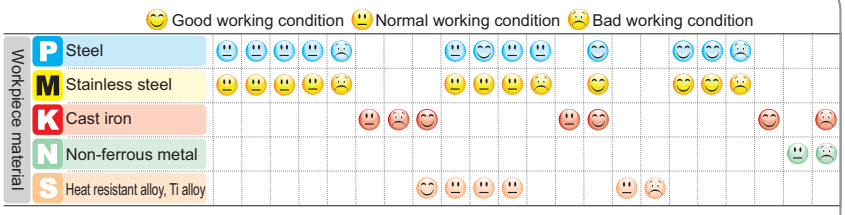
Inserts	Shim	Shim screw	Insert screw	Wrench	
LNKT2007DN-ZR	LLN20R-ZR	I60M3×7	I60M4×15	WT15IS	WT10IS
LNKT2510-ZR	LLN25R-ZR	I60M3.5×10.4	I60M5×17	WT20IT	WT15IS



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

Selection of inserts





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

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

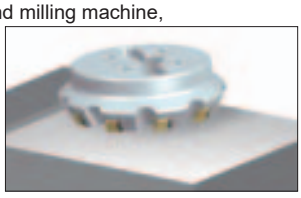
Recommended cutting parameters

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

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

Case for FMD03

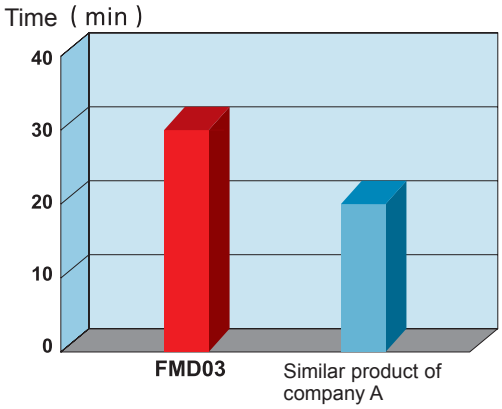
Workpiece material：ASTM A743 CA-6NM(HB200)
Cooling system: Dry cutting
Machine: NC floor type boring and milling machine,
spindle power≥30KW
Cutting parameters：
Vc=120m/min
a_p=12mm
f_z=0.55mm/z
a_e=230mm





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

●Comparison of machining time



Face milling tools

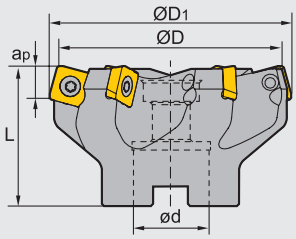
Kr:75°

Face milling

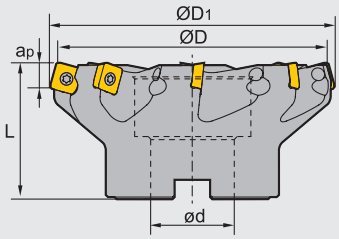
FME02 P M K



A-type coupling



B-type coupling



Specification of tools

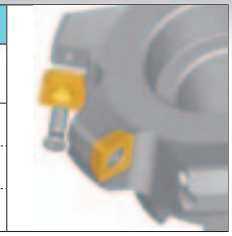
Type		Stock	Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
			ØD	ØD1	ød	L	apmax			
FME02	-050-A22-SP12-04	△	50	54	22	40	6	4	A	0.3
	-063-A22-SP12-05	△	63	66	22	50	6	5	A	0.6
	-080-A27-SP12-06	△	80	83	27	50	6	6	A	0.9
	-100-B32-SP12-07	△	100	103	32	50	6	7	B	1.4
	-125-B40-SP12-08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

▲Stock available △Make-to-order



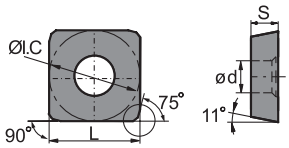
Spare parts

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



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

Selection of inserts



Good working condition 😃 Normal working condition ☹ Bad working condition

Workpiece material

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

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

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

Cutting edge treatment selection for FME02 milling inserts

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

Recommended cutting parameters

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

Face milling tools

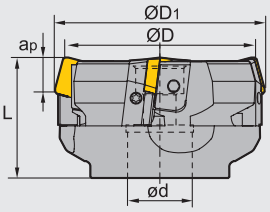
Kr:75°

Face milling

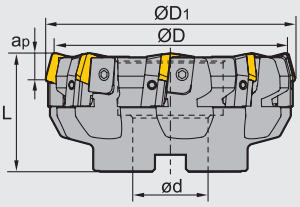
FME03 P M K



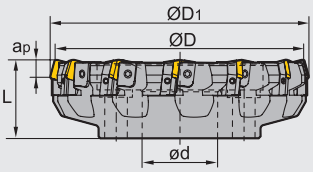
A-type coupling



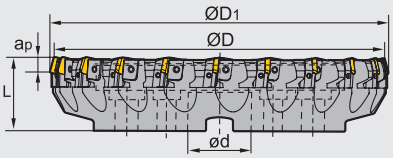
B-type coupling



C-type coupling



D-type coupling

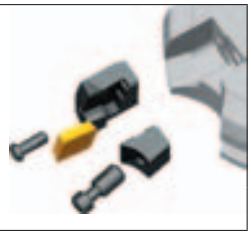


Specification of tools

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

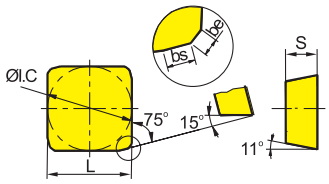
▲Stock available △Make-to-order

Spare parts

Diameter ØD	Inserts	Locator	Wedge	Wedge Screw	Locator screw	Wrench	
							
Ø80-Ø100	SP12	LSP12R/L	W04R/L	WM8×17	LOM5×15.1	WT20T WT25T	
Ø125-Ø315				WM8×22			
Ø80-Ø315	SP15	LSP15R/L	W04R/L	WM8×22			

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

Selection of inserts



Good working condition Normal working condition Bad working condition

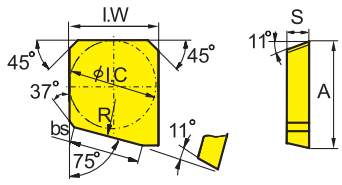
Workpiece material	
P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	ØI.C	S	be	bs	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SPKN1203EDER	12.7	12.7	3.18	1	1.4									○													
	SPKN1203EDEL	12.7	12.7	3.18	1	1.4									○													
	SPKN1203EDFR	12.7	12.7	3.18	1	1.4								★	○													●
	SPKN1203EDFL	12.7	12.7	3.18	1	1.4								○	○													○
	SPKN1203EDSKR	12.7	12.7	3.18	1	1.4												○							○			
	SPKN1203EDSKL	12.7	12.7	3.18	1	1.4												○							○			
	SPKN1203EDTKR	12.7	12.7	3.18	1	1.4	●				●				○			★							●			○
	SPKN1203EDTKL	12.7	12.7	3.18	1	1.4									○			○							○			○
	SPKN1203EDS31R	12.7	12.7	3.18	1	1.4												○							○			
	SPKN1203EDS31L	12.7	12.7	3.18	1	1.4												○							○			
	SPKN1203EDT31R	12.7	12.7	3.18	1	1.4	●				●				○			★							●			○
	SPKN1203EDT31L	12.7	12.7	3.18	1	1.4									○			○							○			○
	SPKR1203EDR-GM	12.7	12.7	3.18	1	1.4			●						★			★							●			●
	SPKR1203EDL-GM	12.7	12.7	3.18	1	1.4			●						★			★							●			●
	SPKN1504EDER	15.875	15.875	4.76	1	1.4									○													
	SPKN1504EDEL	15.875	15.875	4.76	1	1.4									○													
	SPKN1504EDFR	15.875	15.875	4.76	1	1.4								○	○													○
	SPKN1504EDFL	15.875	15.875	4.76	1	1.4								○	○													○
	SPKN1504EDSKR	15.875	15.875	4.76	1	1.4												○							○			
	SPKN1504EDSKL	15.875	15.875	4.76	1	1.4												○							○			
	SPKN1504EDTKR	15.875	15.875	4.76	1	1.4	●								★			○							●			●
	SPKN1504EDTKL	15.875	15.875	4.76	1	1.4									○			○							○			●
	SPKN1504EDS32R	15.875	15.875	4.76	1	1.4												○							○			
	SPKN1504EDS32L	15.875	15.875	4.76	1	1.4												○							○			
	SPKN1504EDT32R	15.875	15.875	4.76	1	1.4	●								★			○							●			●
	SPKN1504EDT32L	15.875	15.875	4.76	1	1.4									○			○							○			●
	SPKR1504EDR-GM	15.875	15.875	4.76	1	1.4			●						★			★							●			●
	SPKR1504EDL-GM	15.875	15.875	4.76	1	1.4			●						★			★							●			●

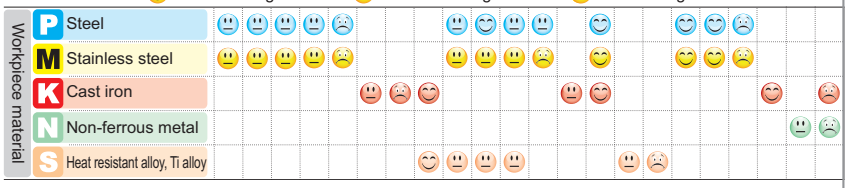
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

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

Selection of inserts



Good working condition Normal working condition Bad working condition



Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating								Cermet		Cemented carbide			
		A	ØI.C	I.W	S	bs	R	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
inserts with wiper 	SPEX1203EDL-1	15	12.7	12.7	3.18	10	500																						●
	SPEX1203EDR-1	15	12.7	12.7	3.18	10	500																						●
	SPEX1504EDL-1	18.2	15.875	15.875	4.76	10	500																				○		●
	SPEX1504EDR-1	18.2	15.875	15.875	4.76	10	500																				○		●

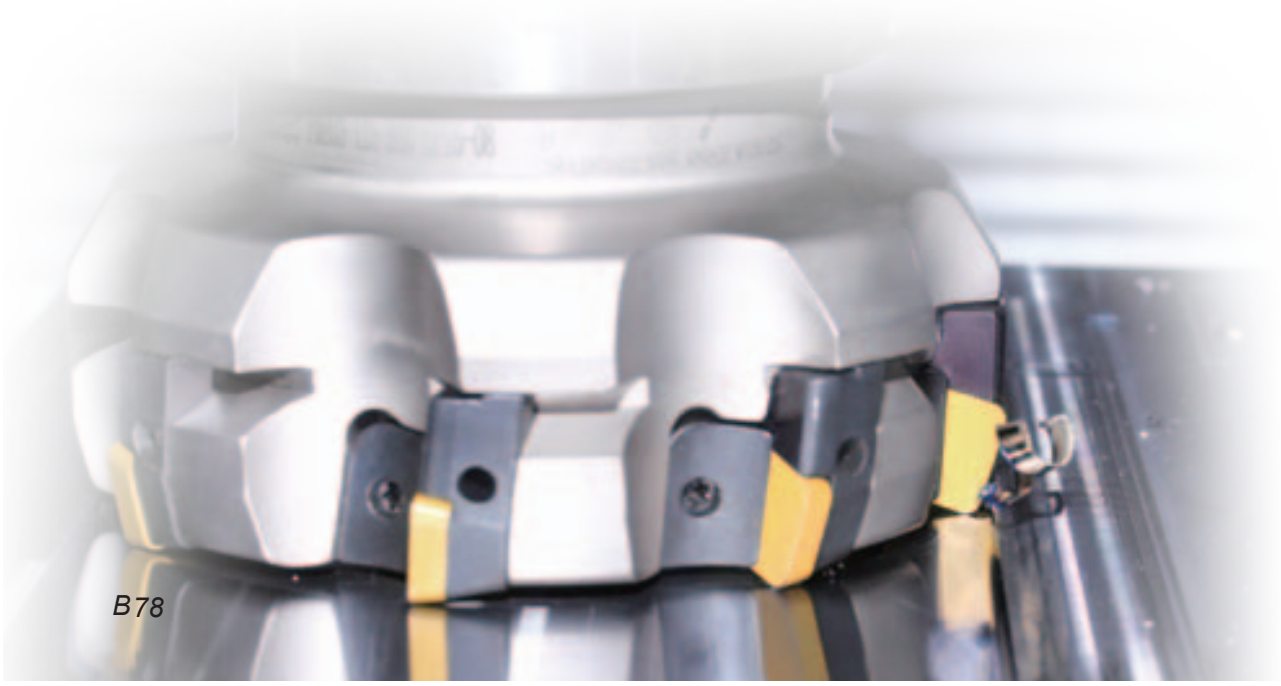
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Cutting edge treatment selection for FME03 milling inserts

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

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters	
				V_c(m/min)	f_z(mm/z)
P	Low-carbon steel、Soft steel	≤180	YBG202	270 (200-360)	0.2 (0.1-0.4)
			YBG302	230 (170-350)	0.24 (0.1-0.3)
			YBM251 YBC301	270(220-350)	0.2 (0.1-0.4)
			YBM351	220 (180-300)	0.25 (0.15-0.3)
			YC30S	140 (100-220)	0.22 (0.1-0.3)
	High-carbon steel、Alloy steel	180-280	YBG202	240 (180-350)	0.2 (0.1-0.3)
			YBG302	220 (150-330)	0.24 (0.1-0.3)
			YBM251 YBC301	240 (200-320)	0.2 (0.1-0.4)
			YBM351	200 (160-280)	0.25 (0.15-0.3)
			YC30S	120 (80-200)	0.22 (0.1-0.3)
	Alloy tool steel	280-350	YBG202	220 (170-340)	0.2 (0.1-0.3)
			YBG302	190 (130-300)	0.24 (0.1-0.3)
			YBM251 YBC301	220 (180-300)	0.2 (0.1-0.4)
			YBM351	180 (150-250)	0.25 (0.15-0.3)
			YC30S	100 (60-180)	0.22 (0.1-0.3)
M	Stainless steel	≤270	YBG202	160 (110-270)	0.2 (0.1-0.3)
			YBG302	140 (100-250)	0.24 (0.1-0.3)
			YBM251	150 (120-240)	0.2 (0.1-0.4)
			YBM351	140 (100-240)	0.25 (0.15-0.3)
K	Cast iron	180-250	YBG102	210 (120-300)	0.12 (0.08-0.3)
			YBG302	160 (120-200)	0.2 (0.1-0.3)
			YD201	100 (80-160)	0.24 (0.15-0.4)



Face milling tools

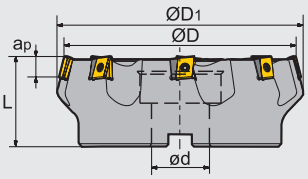
Kr:75°


Face milling

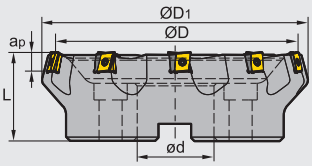
FME04 P M K



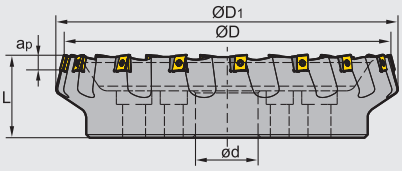
B-type coupling



C-type coupling



D-type coupling

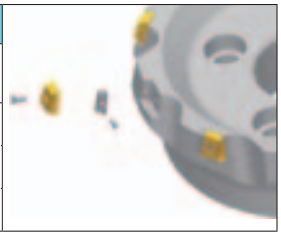


Specification of tools

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

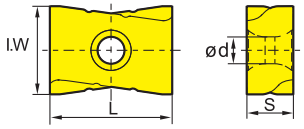
▲Stock available △Make-to-order

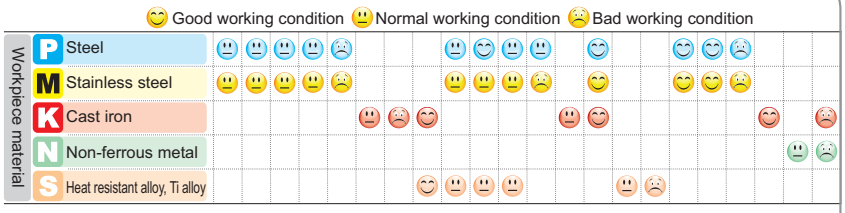
Spare parts

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

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

Selection of inserts





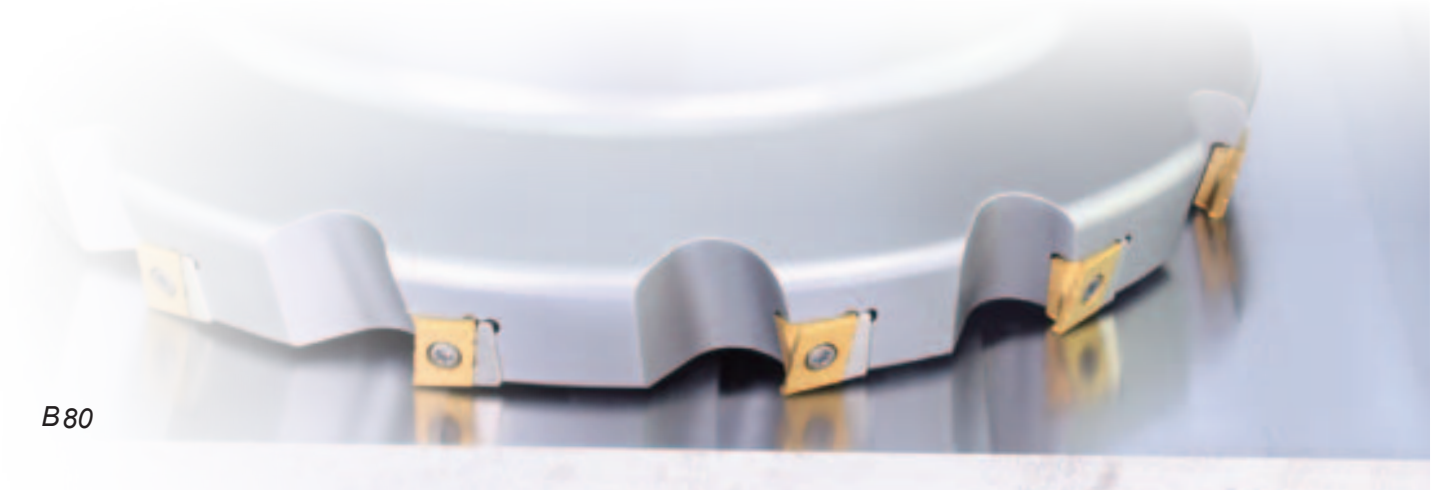
Insert shape	Type	Basic dimensions(mm)				CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	I.W	S	ød	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**LNKT1506EN-ZR**	15.875	14	6.35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

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

Recommended cutting parameters

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

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

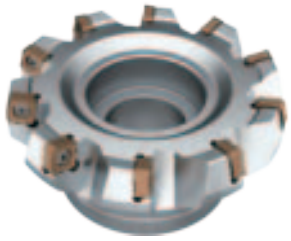


Face milling tools

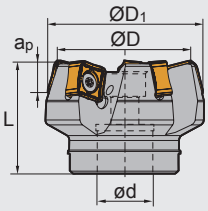
Kr:75°

Face milling

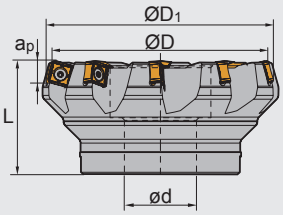
FME17 P M K S



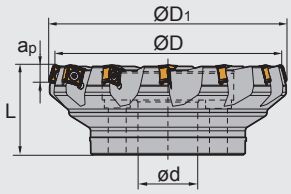
A-type coupling



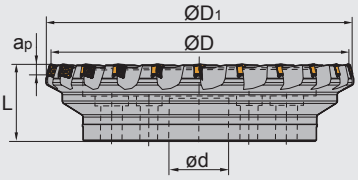
B-type coupling



C-type coupling



D-type coupling



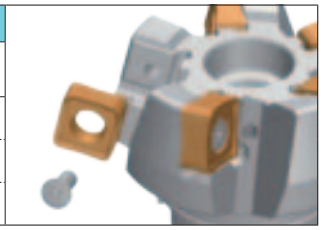
Specification of tools

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

▲Stock available △Make-to-order

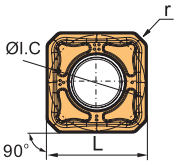
Spare parts

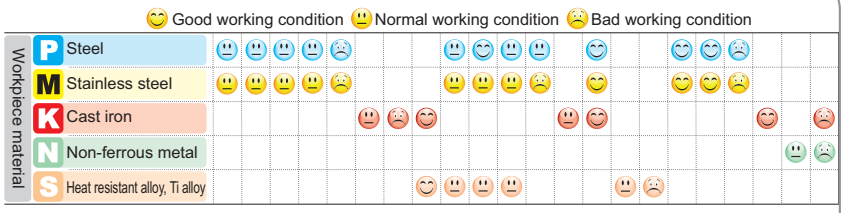
Diameter ØD	Insert screw	Wrench
Ø50-Ø63	IRM4×10	WT15IP
Ø80 ~ Ø125		WT15IS
Ø160 ~ Ø400		WT15IT



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

Selection of inserts





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

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

Recommended cutting parameters

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

Case for FME17



Workpiece：Transmission

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

Processing part：Upper face

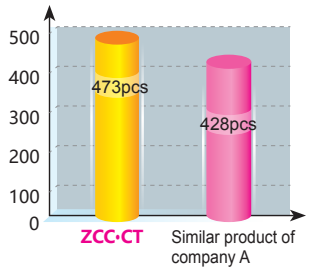
Tool: FME17-125-B40-SN12-10

Insert: SNGX1205ENN-GM/YB9320

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

Type of cooling:External cooling

Number of machined workpiece(pcs/edge)



Face milling tools

Kr:90°

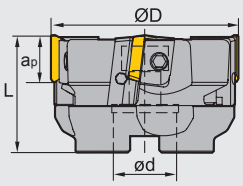

Face milling


Step shoulder

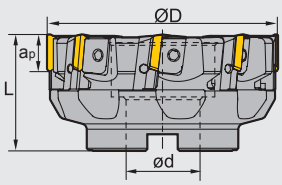
FMP01 P M K



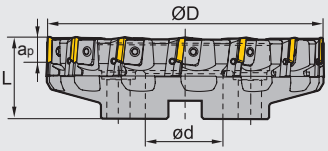
A-type coupling



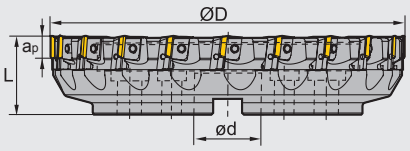
B-type coupling



C-type coupling



D-type coupling



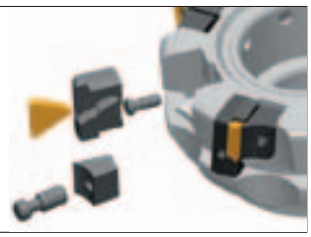
Specification of tools

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

▲Stock available △Make-to-order

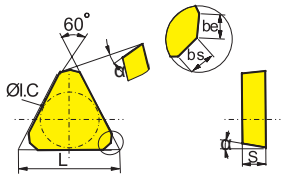
Spare parts

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



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

Selection of inserts



Good working condition Normal working condition Bad working condition

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

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

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

Recommended cutting parameters

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

Face milling tools

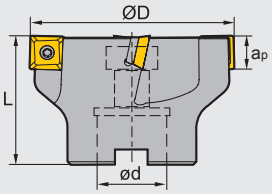
Kr:90°

Face milling Step shoulder

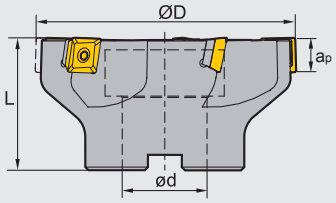
FMP02 P M K S



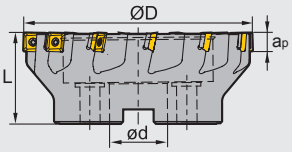
A-type coupling



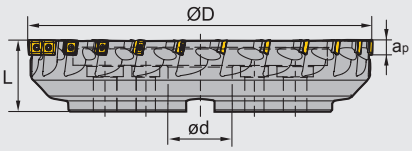
B-type coupling



C-type coupling



D-type coupling



Specification of tools

Type		Stock	Basic dimensions(mm)				Number of teeth Z	Type of coupling	Weight (kg)
			ØD	ød	L	a_{pmax}			
FMP02	**-040-A16-SE09-04**	△	40	16	40	6.7	4	A	0.2
	-040-A16-SE09-06	△	40	16	40	6.7	6	A	0.22
	-050-A22-SE09-05	▲	50	22	40	6.7	5	A	0.3
	-050-A22-SE09-07	△	50	22	40	6.7	7	A	0.313
	-063-A22-SE09-06	▲	63	22	40	6.7	6	A	0.5
	-063-A22-SE09-08	△	63	22	40	6.7	8	A	0.479
	-080-A27-SE09-08	▲	80	27	50	6.7	8	A	0.9
	-080-A27-SE09-10	△	80	27	50	6.7	10	A	1.079
	-100-B32-SE09-08	▲	100	32	50	6.7	8	B	1.7
	-100-B32-SE09-10	△	100	32	50	6.7	10	B	1.7
	-125-B40-SE09-12	△	125	40	63	6.7	12	B	2.6

▲Stock available △Make-to-order

Specification of tools

Type		Stock	Basic dimensions(mm)				Number of teeth Z	Type of coupling	Weight (kg)
			ØD	ød	L	apmax			
FMP02	**-050-A22-SE12-03**	▲	50	22	40	10.8	3	A	0.3
	-063-A22-SE12-04	▲	63	22	40	10.8	4	A	0.4
	-080-A27-SE12-04	▲	80	27	50	10.8	4	A	0.9
	-100-B32-SE12-05	▲	100	32	50	10.8	5	B	1.2
	-125-B40-SE12-06	▲	125	40	63	10.8	6	B	3.1
	-160-C40-SE12-08	▲	160	40	63	10.8	8	C	4.1
	-200-C60-SE12-10	△	200	60	63	10.8	10	C	5.718
	-250-C60-SE12-12	▲	250	60	63	10.8	12	C	11.1
	-050-A22-SE12-04	▲	50	22	40	10.8	4	A	0.3
	-063-A22-SE12-05	▲	63	22	40	10.8	5	A	0.4
	-080-A27-SE12-06	▲	80	27	50	10.8	6	A	0.8
	-100-B32-SE12-07	▲	100	32	50	10.8	7	B	1.2
	-125-B40-SE12-08	▲	125	40	63	10.8	8	B	3.0
	-160-C40-SE12-12	▲	160	40	63	10.8	12	C	3.9
	-050-A22-SE12-05	▲	50	22	40	10.8	5	A	0.2
	-063-A22-SE12-06	▲	63	22	40	10.8	6	A	0.4
	-080-A27-SE12-08	▲	80	27	50	10.8	8	A	0.8
	-100-B32-SE12-10	▲	100	32	50	10.8	10	B	1.2
	-125-B40-SE12-12	▲	125	40	63	10.8	12	B	2.9
	-160-C40-SE12-15	△	160	40	63	10.8	15	C	4.061
	-200-C60-SE12-16	▲	200	60	63	10.8	16	C	6.1
	-250-C60-SE12-18	▲	250	60	63	10.8	18	C	10.9
	-315-D60-SE12-24	▲	315	60	63	10.8	24	D	21.6

▲Stock available △Make-to-order

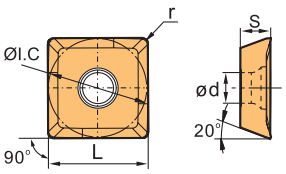
Spare parts

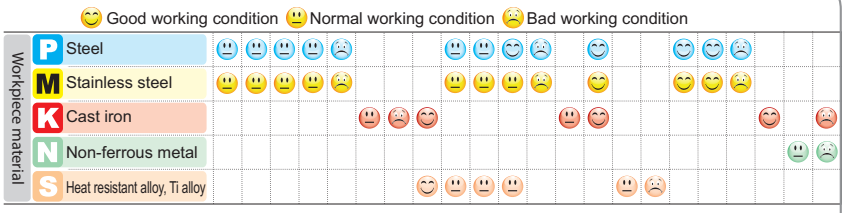
Diameter ØD	Inserts	Shim	Insert screw	Shim screw	Wrench	Wrench
						
Ø50 ~ Ø125	SE09	--	I60M3×7	--	WT09IS	--
Ø50	SE12	--	I60M3.5×10	--	WT15IS	--
Ø63 ~ Ø315		S12BSX	I60M3.5×12	SM5×7×A		WH35L



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

Selection of inserts

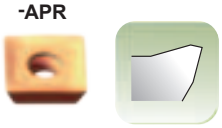




Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	ØI.C	S	ød	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**SEET09T308PER-APF**	9.525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

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

Chipbreaker selection for FMP02 milling inserts

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

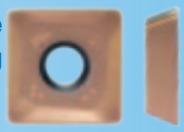
Features of FMP02 Series Milling Tools



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



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



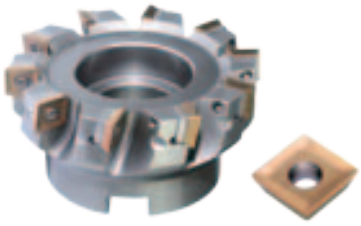
- Screw down clamping resulting in better chip evacuation.

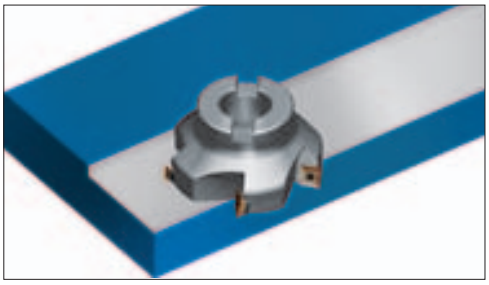
Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters			
				Vc(m/min)	fz(mm/z)		
					-APF	-APM	-APR
P	Low-carbon steel、Soft steel	≤180	YBG202	270(200-360)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
			YB9320	270(200-360)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
	High-carbon steel、Alloy steel	180-280	YBM351	240 (200-320)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
			YBG202	240 (180-350)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
			YB9320	240 (180-350)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
	Alloy tool steel	280-350	YBM351	220 (180-300)	0.1(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
			YBG202	220 (170-340)	0.1(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
			YB9320	220 (170-340)	0.1(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
M	Stainless steel	≤270	YBM351	150 (120-240)	0.1(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
			YBG202	160 (110-270)	0.1(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
			YB9320	160 (110-270)	0.1(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
K	Cast iron	180-250	YBG202	160 (120-200)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
			YBD152	270 (150-300)	0.15(0.1-0.2)	0.2 (0.1-0.3)	0.3 (0.2-0.4)
S	Difficult-to-machine materials	≤400	YBS303	100 (60-120)	0.1(0.08-0.2)	0.15 (0.1-0.25)	--

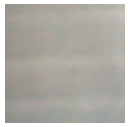
Case for FMP02

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





●SEET120308PER-APM inserts tests

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



-APM



Product of company B

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

Face milling tools

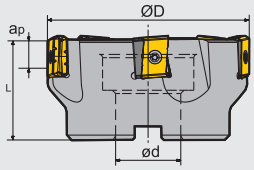
Kr:90°

Face milling | Step shoulder

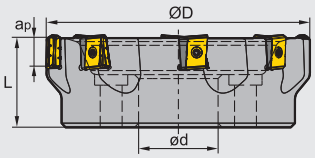
FMP03 P M K



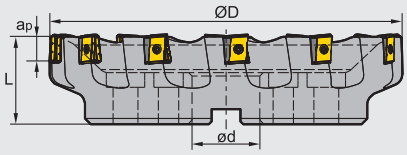
B-type coupling



C-type coupling



D-type coupling



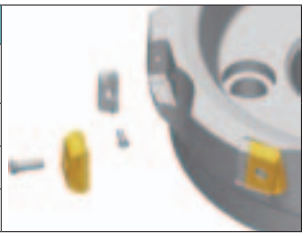
Specification of tools

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

▲Stock available △Make-to-order

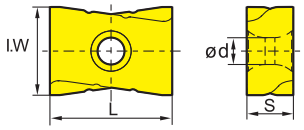
Spare parts

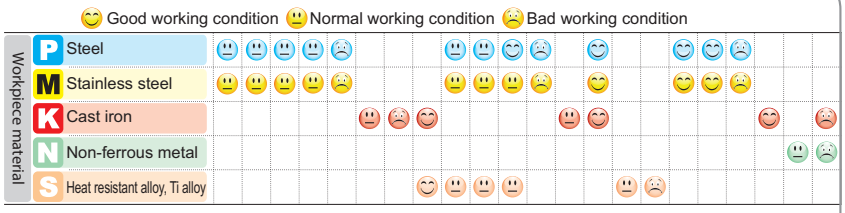
Inserts	Shim	Shim screw	Insert screw	Wrench	
LNKT1506EN-ZR	LLN15-ZR	I60M3×7	I60M4×12	WT15IS	WT09IS
LNKT2007DN-ZR	LLN20R-ZR	I60M3×7	I60M4×15	WT15IS	WT09IS
LNKT2510-ZR	LLN25R-ZR	I60M3.5×10.4	I60M5×17	WT20IT	WT15IS



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

Selection of inserts





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

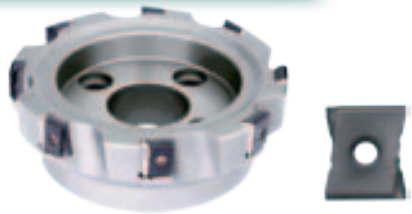
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

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

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

Case for FMP03



Tool type：FMP03-200-C60-LN25-08

Insert type/grade：LNKT2510-ZR/YBG302

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

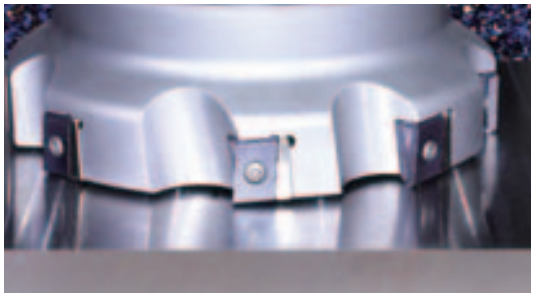
Workpiece material：45#

Hardness(HB)：190

Cooling system: Dry cutting

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

a_e=140mm



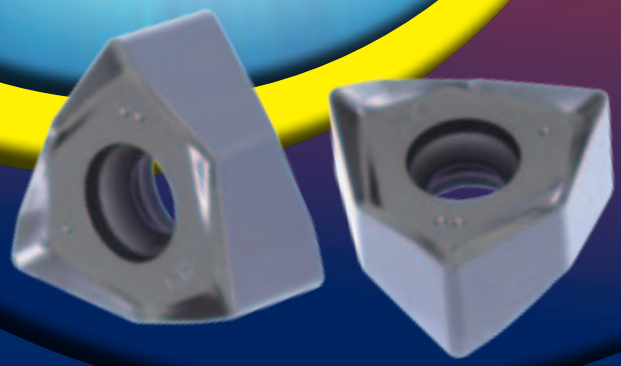
FMP12

Series Milling Tools

Kr:90°



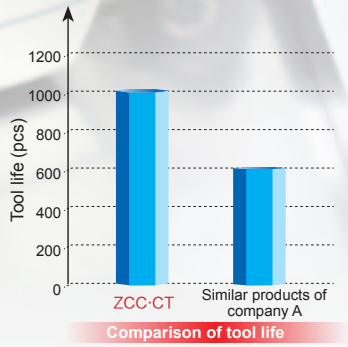
- **Double negative angle of the cutter, combined with unique insert structure, to achieve double positive tool angle, which is beneficial to reducing cutting force;**
- **6-flute cutting double-sided slot milling inserts, enabling high-quality 90° square shoulder milling, face milling and slot milling;**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



Application case

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





Comparison of tool life

Face milling tools

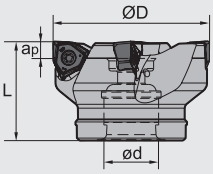
Kr:90°



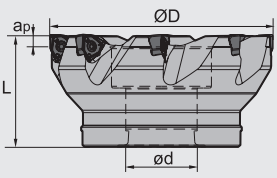
FMP12 P K N



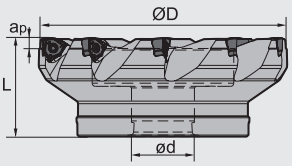
A-type coupling



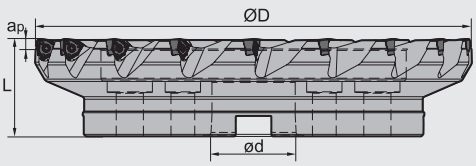
B-type coupling



C-type coupling



D-type coupling



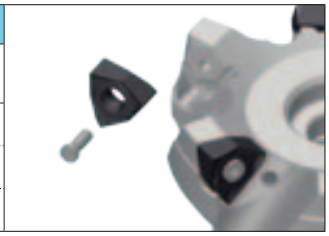
Specification of tools

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

▲Stock available △Make-to-order

Spare parts

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



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

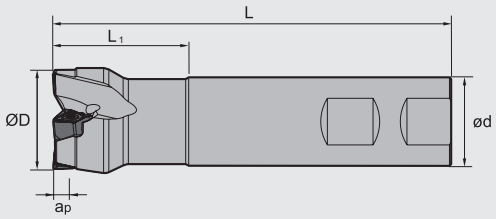
Face milling tools

Kr:90°



FMP12 P K





Specification of tools

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

▲Stock available △Make-to-order

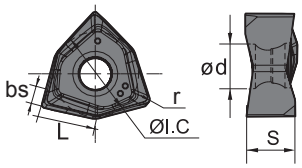
Spare parts

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



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

Selection of inserts



Good working condition Normal working condition Bad working condition

Workpiece material

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

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

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

Recommended cutting parameters

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

Face milling tools

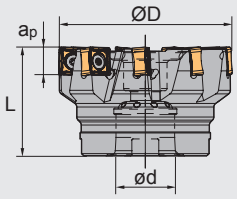
Kr:88°



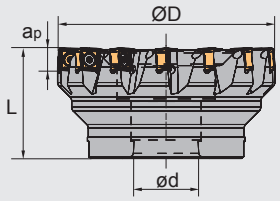
FMP17 P M K S



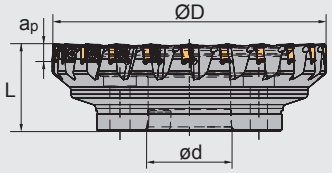
A-type coupling



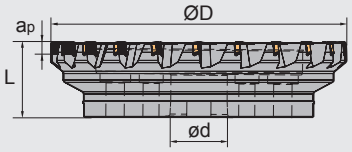
B-type coupling



C-type coupling



D-type coupling



Specification of tools

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

▲Stock available △Make-to-order

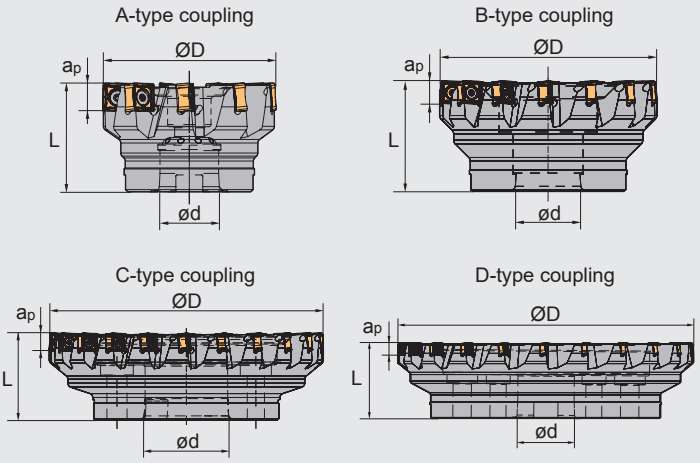
Face milling tools

Kr:88°



FMP17 P M K S





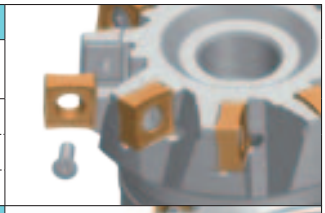
Specification of tools

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

▲Stock available △Make-to-order

Spare parts

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

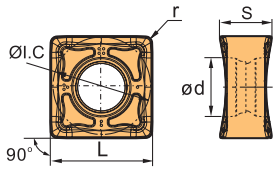


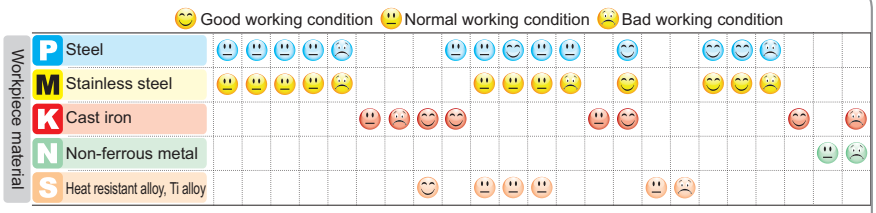
Diameter ØD	Insert	Insert screw	Wedge screw	Adjustment block	Wrench
					
Ø125-Ø200	SNG□□XPNN-GH/GL/GM SNMX□□□-GH/GL/GM SNCU120420-W4	IRM4×10	DM6X20A	ADJ-M6X1.0A	WT15IT



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

Selection of inserts





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

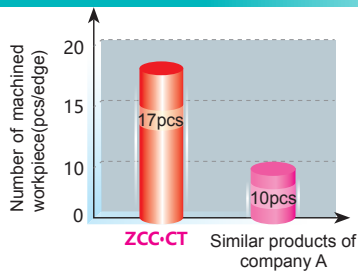
●Inserts are suitable for both left and right cuts ★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

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

Case for FMP17

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

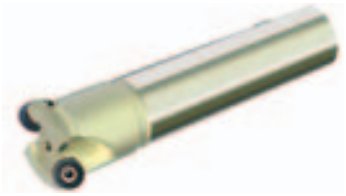


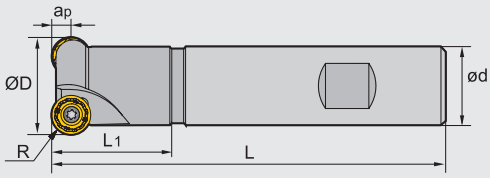


Face milling tools



FMR01 P M K S



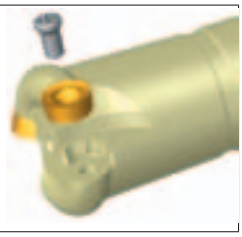


Specification of tools

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

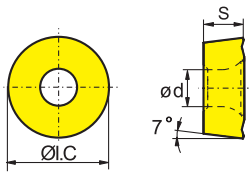
▲Stock available △Make-to-order

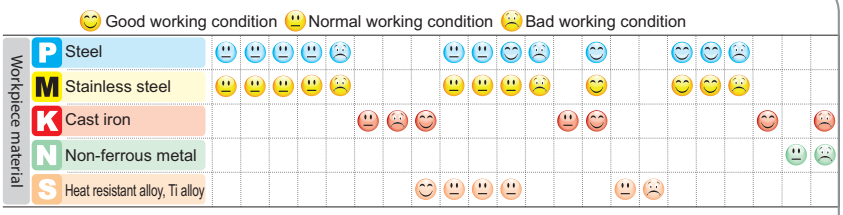
Spare parts

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

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

Selection of inserts





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

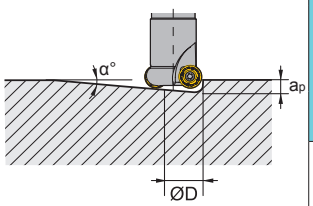
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

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

Ramp milling, helical interpolation milling

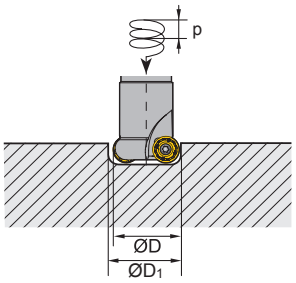
● Ramp milling



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

α:Plunge angle

● Helical interpolation milling



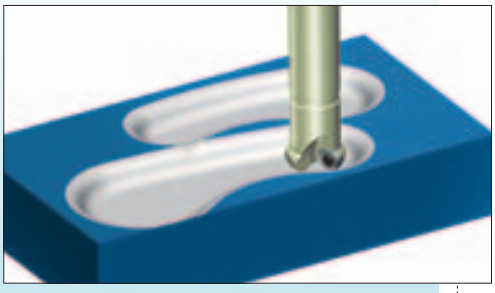
$$P = \tan\alpha \times \pi \times D_1$$

α:Helix angle

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

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

Case for FMR01



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



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

●Comparison of insert abrasion

ZCC·CT



22minutes later

Similar overseas products



22minutes later

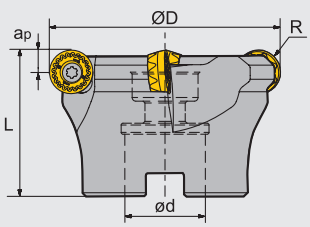
Face milling tools



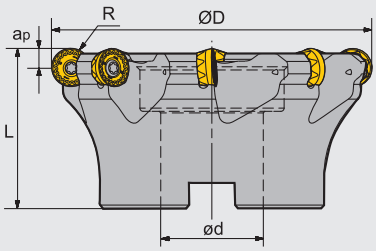
FMR02 P M K S



A-type coupling



B-type coupling



Specification of tools

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

▲Stock available △Make-to-order

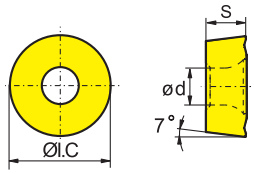
Spare parts

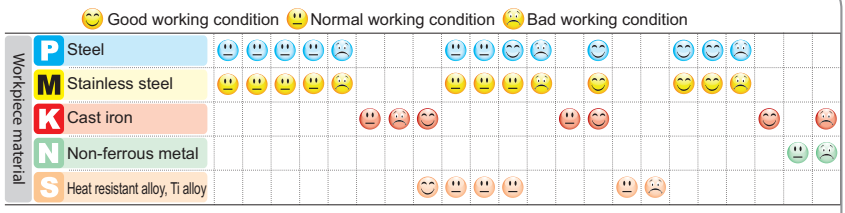
Diameter ØD	Insert	Insert screw	Wrench	
				
Ø50 -Ø100	RC□□1204MO-□□	I60M3.5×10	WT15IS	--
Ø63 -Ø125	RC□□1606MO-□□	I60M5×13	--	WT20IT
Ø125 -Ø160	RC□□2006MO-□□	I43M6×16	--	WT25IT



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

Selection of inserts

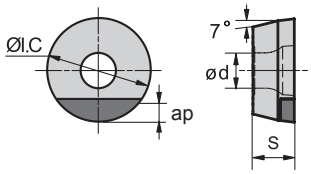


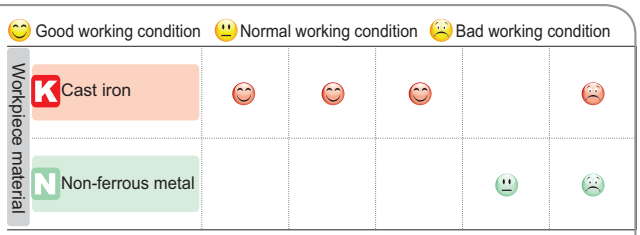


Insert shape	Type	Basic dimensions(mm)			CVD Coating							PVD Coating								Cermet		Cemented carbide			
		ØI.C	S	ød	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**RCKT1204MO-DM**	12.0	4.76	4.0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

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

Selection of inserts





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

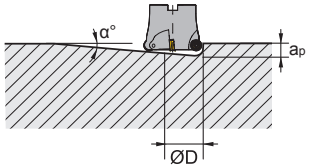
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

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

Ramp milling, helical interpolation milling

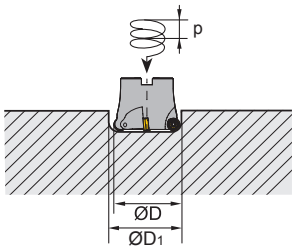
● Ramp milling



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

α:Plunge angle

● Helical interpolation milling



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

α:Helix angle

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

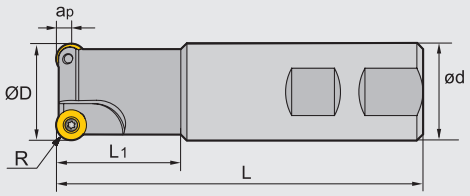
Reduce the feed rate when plunging and circular milling.
Attention-drilling lead to long chips.

Face milling tools



FMR03 P M K S





Specification of tools

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

▲Stock available △Make-to-order

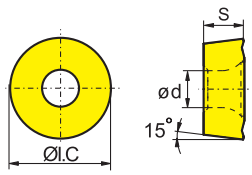
Spare parts

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

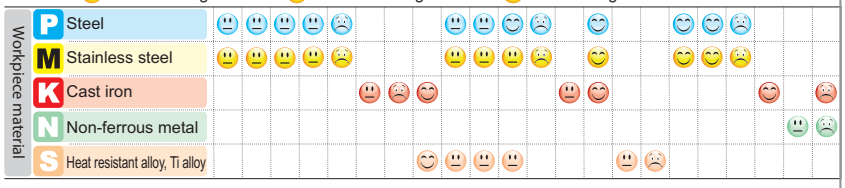


Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Selection of inserts



Good working condition Normal working condition Bad working condition



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

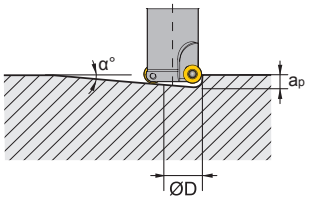
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters	
				V_c(m/min)	f_z(mm/z)
P	Low-carbon steel、Soft steel	≤180	YBM251 YBC301	270 (220-350)	0.2 (0.08-0.45)
			YBM351 YBG302	220 (180-300)	0.25 (0.15-0.45)
			YBG202 YBG205	270 (200-360)	0.2 (0.1-0.45)
	High-carbon steel、Alloy steel	180-280	YBM251 YBC301	240 (200-320)	0.2 (0.08-0.45)
			YBM351 YBG302	200 (160-280)	0.25 (0.15-0.45)
			YBG202 YBG205	240 (180-350)	0.2 (0.1-0.45)
	Alloy tool steel	280-350	YBM251 YBC301	220 (180-300)	0.2 (0.08-0.45)
			YBM351 YBG302	180 (150-250)	0.25 (0.15-0.45)
			YBG202 YBG205	220 (170-340)	0.2 (0.1-0.45)
M	Stainless steel	≤270	YBG205	150 (120-240)	0.2 (0.08-0.45)
			YBM251	150 (120-240)	0.2 (0.08-0.45)
			YBM351	150 (100-220)	0.25 (0.1-0.45)
			YBG202 YBG205	160 (110-270)	0.2 (0.1-0.45)
K	Cast iron	180-250	YBG302	210 (120-300)	0.2 (0.1-0.45)
S	Difficult-to-machine materials	≤400	YBS203 YBS303	100 (60-120)	0.15 (0.1-0.3)

Ramp milling, helical interpolation milling

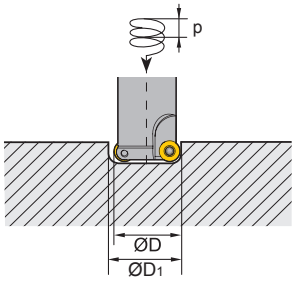
● Ramp milling



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

α:Plunge angle

● Helical interpolation milling



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

α:Helix angle

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

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

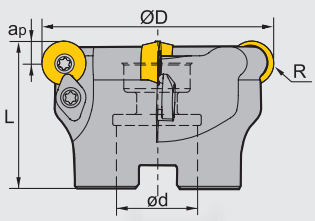
Face milling tools



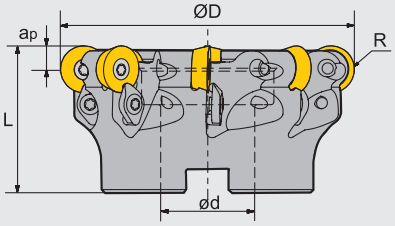
FMR04 P M K



A-type coupling



B-type coupling



Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
			ØD	ød	L	R	$a_p$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

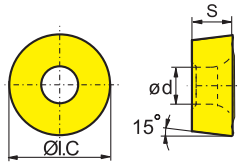
Spare parts

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

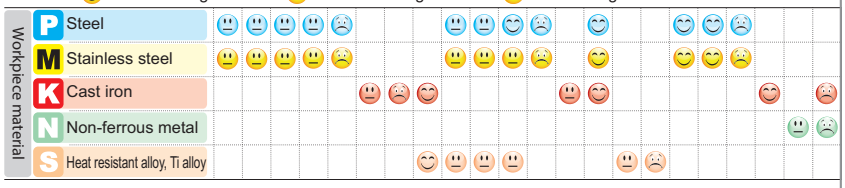


Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Selection of inserts



Good working condition Normal working condition Bad working condition



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

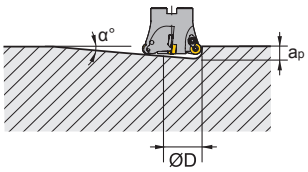
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters	
				Vc(m/min)	f(mm/z)
P	Low-carbon steel、Soft steel	≤180	YBM251 YBC301	270 (220-350)	0.2 (0.08-0.45)
			YBM351 YBG302	220 (180-300)	0.25 (0.15-0.45)
			YBG202 YBG205	270 (200-360)	0.2 (0.1-0.45)
	High-carbon steel、Alloy steel	180-280	YBM251 YBC301	240 (200-320)	0.2 (0.08-0.45)
			YBM351 YBG302	200 (160-280)	0.25 (0.15-0.45)
			YBG202 YBG205	240 (180-350)	0.2 (0.1-0.45)
	Alloy tool steel	280-350	YBM251 YBC301	220 (180-300)	0.2 (0.08-0.45)
			YBM351 YBG302	180 (150-250)	0.25 (0.15-0.45)
			YBG202 YBG205	220 (170-340)	0.2 (0.1-0.45)
M	Stainless steel	≤270	YBG205	150 (120-240)	0.2 (0.08-0.45)
			YBM251	150 (120-240)	0.2 (0.08-0.45)
			YBM351 YBG302	150 (100-220)	0.25 (0.1-0.45)
			YBG202 YBG205	160 (110-270)	0.2 (0.1-0.45)
K	Cast iron	180-250	YBG302	210 (120-300)	0.2 (0.1-0.45)

Ramp milling, helical interpolation milling

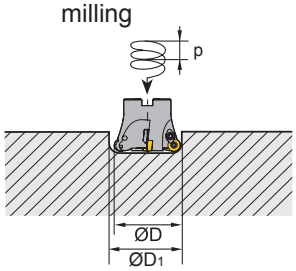
● Ramp milling



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

α:Plunge angle

● Helical interpolation milling



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

α:Helix angle

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

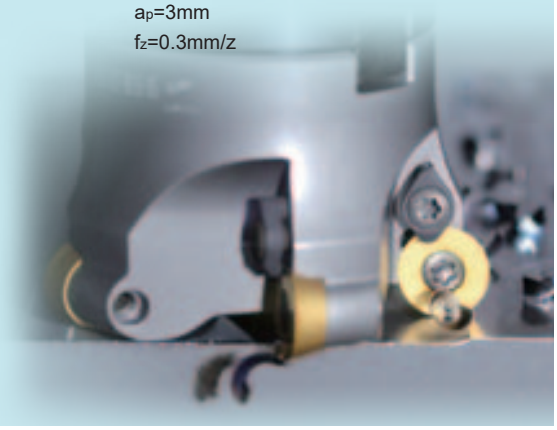
Reduce the feed rate when plunging and circular milling.
Attention-drilling lead to long chips.

Case for FMR04





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



Tool type：FMR04-063-A22-RD12-04

Insert type/grade：RDKW1204MO/YBG202

●Abrasion comparison after 90 minutes cavity milling

ZCC-CT



Similar overseas products



Square shoulder milling tools

Kr:90°


Step shoulder


Slot milling


Ramp milling

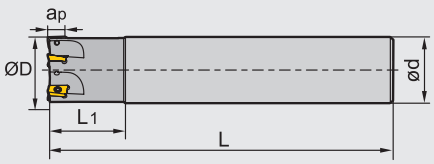

Helical machining


Plunge milling

EMP01 P M K S N



Straight shank



Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Weight (kg)
			ØD	ød	L	L_1	$a_p$max		
EMP01 Straight shank	**-010-G10-AP07-02C(25/85)**	△	10	10	85	25	6.0	2	0.043
	-010-G10-AP07-02C(25/120)	△	10	10	120	25	6.0	2	0.063
	-012-G12-AP07-02C(25/85)	△	12	12	85	25	6.0	2	0.061
	-012-G12-AP07-02C(25/120)	△	12	12	120	25	6.0	2	0.089
	-014-G16-AP07-03C(25/85)	△	14	16	85	25	6.0	3	0.104
	-014-G16-AP07-03C(25/120)	△	14	16	120	25	6.0	3	0.153
	-016-G16-AP07-03C(25/85)	△	16	16	85	25	6.0	3	0.112
	-016-G16-AP07-03C(25/120)	△	16	16	120	25	6.0	3	0.162
	-012-G16-AP11-01	▲	12	16	85	25	10.5	1	0.1
	-016-G16-AP11-02	▲	16	16	90	25	10.5	2	0.1
	-016-G16-AP11-02C(25/85)	△	16	16	85	25	10.5	2	0.108
	-016-G16-AP11-02C(25/120)	△	16	16	120	25	10.5	2	0.16
	-016-G16-AP11-02C(25/180)	△	16	16	180	25	10.5	2	0.248
	-020-G16-AP11-03C(25/85)	△	20	16	85	25	10.5	3	0.121
	-020-G20-AP11-02	▲	20	20	100	30	10.5	2	0.2
	-020-G20-AP11-02C(30/100)	△	20	20	100	30	10.5	2	0.18
	-020-G20-AP11-02C(30/150)	△	20	20	150	30	10.5	2	0.312
	-020-G20-AP11-02C(30/200)	△	20	20	200	30	10.5	2	0.401
	-020-G20-AP11-03C(30/100)	△	20	20	100	30	10.5	3	0.2
	-020-G20-AP11-03C(30/150)	△	20	20	150	30	10.5	3	0.357
	-020-G20-AP11-03C(30/200)	△	20	20	200	30	10.5	3	0.424
	-025-G25-AP11-03	▲	25	25	115	35	10.5	3	0.4
	-025-G25-AP11-03C(35/115)	△	25	25	115	35	10.5	3	0.357
	-025-G25-AP11-03C(35/170)	△	25	25	170	35	10.5	3	0.577
	-025-G25-AP11-03C(35/220)	△	25	25	220	35	10.5	3	0.758
	-025-G25-AP11-04C(35/115)	△	25	25	115	35	10.5	4	0.376
	-025-G25-AP11-04C(35/170)	△	25	25	170	35	10.5	4	0.575
	-025-G25-AP11-04C(35/220)	△	25	25	220	35	10.5	4	0.686

▲Stock available △Make-to-order

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

Effective cutting depth/Overall length

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

Specification of tools

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

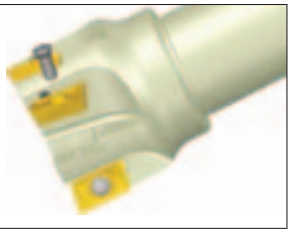
▲Stock available △Make-to-order

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

Effective cutting depth/Overall length

Spare parts

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



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

Square shoulder milling tools

Kr:90°


Step shoulder

Slot milling

Ramp milling

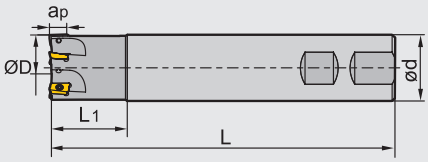
Helical machining

Plunge milling

EMP01 P M K S N



Weldon shank



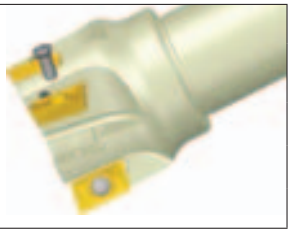
Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Weight (kg)
			ØD	ød	L	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

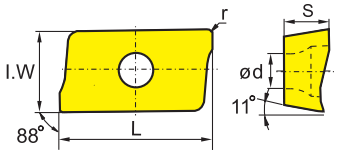
Spare parts

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

Selection of inserts



Good working condition Normal working condition Bad working condition

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

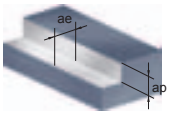
Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	I.W	S	ød	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	APKT070204-APF	7.32	4.34	2.38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

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

Chipbreaker selection

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

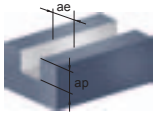
1 Square shoulder milling



Recommended cutting parameters (D: Diameter)

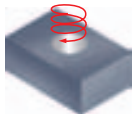
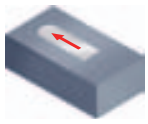
Workpiece material		Hardness HB	Insert grade	Cutting parameters			
				Vc(m/min)	fz(mm/z)		ae(mm)
					-APF	-APM	
P	Low-carbon steel、Soft steel	⩽180	YBC302	320 (240-400)	0.1 (0.08-0.2)	--	⩽0.5D
			YB9320	320 (200-400)	0.1 (0.08-0.2)	0.2 (0.1-0.3)	
			YBM253	300 (320-350)	0.1 (0.08-0.2)	0.2 (0.1-0.3)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

2 Slot milling



Recommended cutting parameters (D: Diameter)

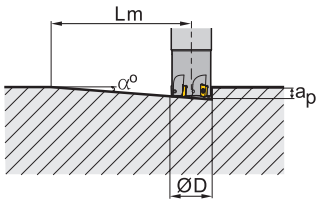
Workpiece material		Hardness HB	Insert grade	Cutting parameters			
				Vc(m/min)	fz(mm/z)		ae(mm)
					-APF	-APM	
P	Low-carbon steel、Soft steel	⩽180	YBC302	190 (170-250)	0.1 (0.08-0.15)	--	D
			YB9320	190 (140-250)	0.1 (0.08-0.15)	0.15 (0.1-0.25)	
			YBM253	150 (130-210)	0.1 (0.08-0.15)	0.15 (0.1-0.25)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

3 Ramp milling, helical interpolation milling

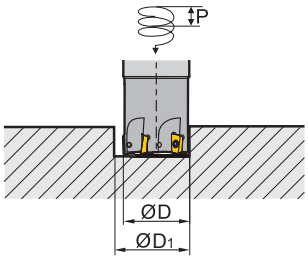
Recommended cutting parameters (D: Diameter)

● Ramp milling



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

● Helical interpolation milling



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

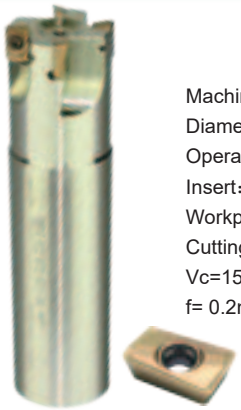
Diameter ØD(mm)	APKT Ramp milling, helical interpolation milling (Inserts-7)				
	Ramp milling			Helical interpolation milling	
	Maximum cutting depth	Maximum ramp angle	Minimum length	Minimum diameter	Maximum pitch
	a_p(mm)	α°	L_m(mm)	$ØD_1$(mm)	(mm)
10	6	6	57	12	2.0
12	6	4	85	15	2.0
14	6	3	114	18	2.0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

Diameter ØD(mm)	APKT Ramp milling, helical interpolation milling (Inserts-11)				
	Ramp milling			Helical interpolation milling	
	Maximum cutting depth	Maximum ramp angle	Minimum length	Minimum diameter	Maximum pitch
	a_p(mm)	α°	L_m(mm)	$ØD_1$(mm)	(mm)
16	10.0	10.0	56.7	20.0	2.0
20	10.0	5.0	114.4	28.0	2.0
25	10.0	4.5	127.0	40.0	2.0
30	10.0	3.5	153.0	48.0	2.0
32	10.0	3.0	190.8	56.0	2.0
40	10.0	2.0	286.4	70.0	2.0

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

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

Case for EMP01



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

Insert specification/grade：APKT160408-APM/YB9320

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

●Comprehensively improve mould cavity machining efficiency



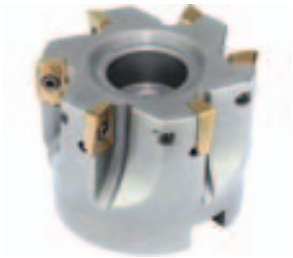
Optimized structure in combination with brand-new "golden drill" coating technique, ZCC·CT products with APM chipbreaker is more suitable for mold cavity machining, greatly improve machining efficiency when compare with competitors similar products.

Square shoulder milling tools Kr:90°

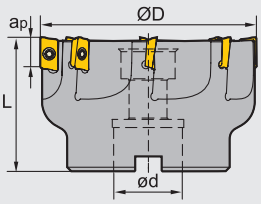

Face milling


Step shoulder

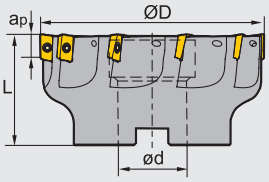
EMP02 P M K S N



A-type coupling



B-type coupling



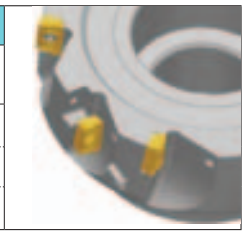
Specification of tools

Type		Stock	Basic dimensions(mm)				Number of teeth Z	Type of coupling	Weight (kg)
			ØD	ød	L	apmax			
EMP02	-050-A22-AP11-06	▲	50	22	40	10.5	6	A	0.3
	-063-A22-AP11-08	▲	63	22	40	10.5	8	A	0.6
	-080-A27-AP11-08	▲	80	27	50	10.5	8	A	1.2
	-100-B32-AP11-10	▲	100	32	50	10.5	10	B	1.7
	-050-A22-AP16-05	▲	50	22	40	15.5	5	A	0.3
	-063-A22-AP16-06	▲	63	22	40	15.5	6	A	0.5
	-080-A27-AP16-07	▲	80	27	50	15.5	7	A	1.1
	-100-B32-AP16-08	▲	100	32	50	15.5	8	B	1.6
	-125-B40-AP16-10	▲	125	40	63	15.5	10	B	3.2
	-160-B40-AP16-10	▲	160	40	63	15.5	10	B	6.3

▲Stock available △Make-to-order

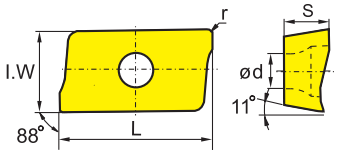
Spare parts

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



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

Selection of inserts



Good working condition Normal working condition Bad working condition

Workpiece material

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

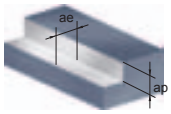
Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	I.W	S	ød	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	APKT11T304-APF	12.24	6.6	3.6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

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

Chipbreaker selection

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

1 Square shoulder milling



Recommended cutting parameters (D: Diameter)

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

Square shoulder milling tools

Kr:90°


Step shoulder


Slot milling

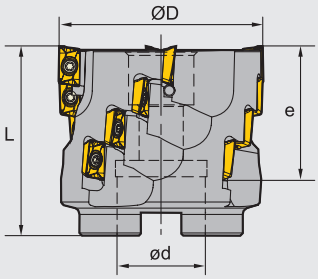

Face milling


Side milling

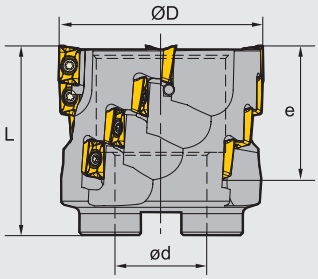
EMP03 P M K S N



A-type coupling



B-type coupling



Specification of tools

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

▲Stock available △Make-to-order

Spare parts

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

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

Square shoulder milling tools Kr:90°


Step shoulder

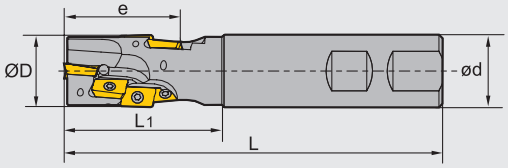

Slot milling


Side milling

EMP04 P M K S N



Weldon shank



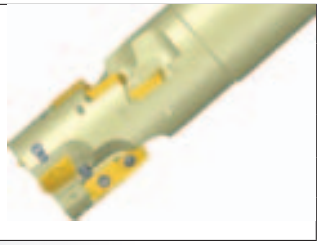
Specification of tools

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

▲Stock available △Make-to-order

Spare parts

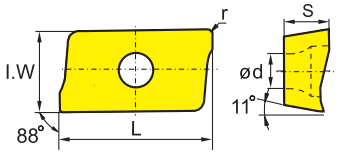
Diameter ØD	Screw	Wrench
		
Ø20-Ø40	I60M2.5×6.5T	WT08IS





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

Selection of inserts



Good working condition 😊 Normal working condition 😐 Bad working condition

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

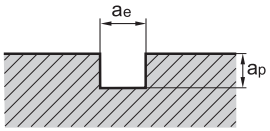
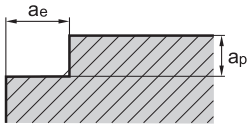
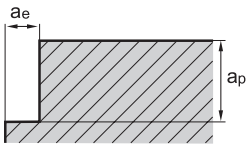
Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	I.W	S	ød	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**APKT11T304-APF**	12.24	6.6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

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

Chipbreaker selection

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

Recommended cutting parameters

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

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

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



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

Kr:90°

A New Generation of Tangential Milling Cutter EMP09 Series

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





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

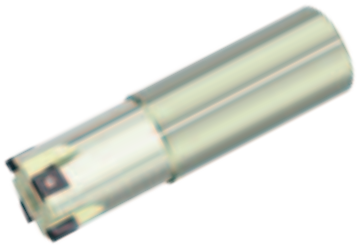
Square shoulder milling tools Kr:90°


Face milling

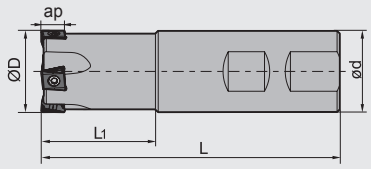
Step shoulder

Slot milling

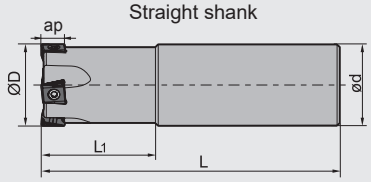
EMP09 P M K S



Weldon shank



Straight shank



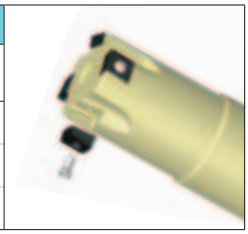
Specification of tools

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

▲Stock available △Make-to-order

Spare parts

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



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

Square shoulder milling tools Kr:90°

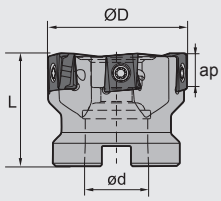

Face milling


Step shoulder

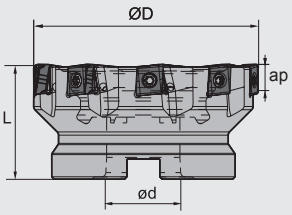
EMP09 P M K S



A-type coupling



B-type coupling



Specification of tools

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

▲Stock available △Make-to-order

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

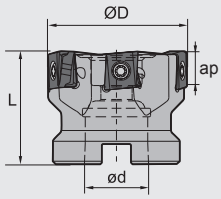
Square shoulder milling tools Kr:90°

Face milling Step shoulder

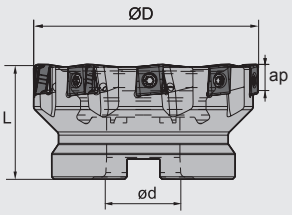
EMP09 P M K S



A-type coupling



B-type coupling



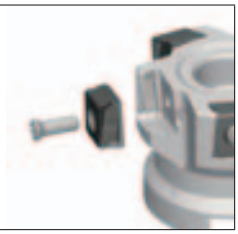
Specification of tools

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

▲Stock available △Make-to-order

Spare parts

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



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

Square shoulder milling tools

Kr:90°


Step shoulder

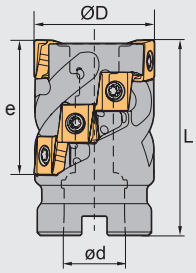

Slot milling


Face milling


Side milling

EMP09 P M K S



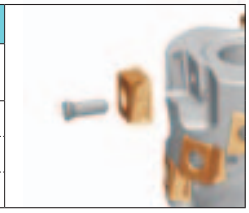


Specification of tools

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

▲Stock available △Make-to-order

Spare parts

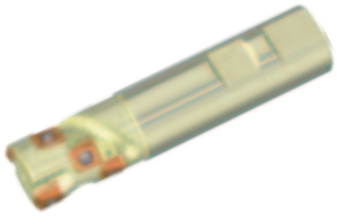
Diameter ØD	Inserts	Screw	Wrench	
				
Ø32×38-Ø50×45	LN□T0804□□-GM/GL	I60M3×7	WT09IP	
Ø40×33-Ø63×53	LN□T1206□□-GM/GL	I60M4×12	WT15IP	
Ø80×43-Ø100×63			WT15IS	

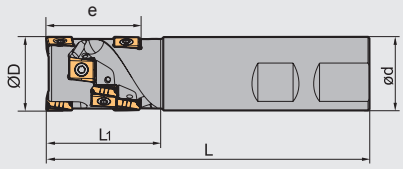
Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Square shoulder milling tools Kr:90°

Step shoulder | Slot milling | Side milling

EMP09 P M K S





Specification of tools

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

▲Stock available △Make-to-order

Spare parts

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

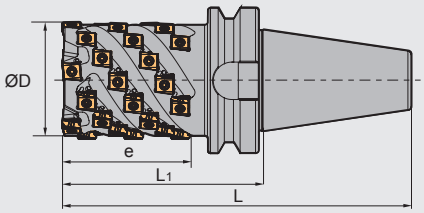
Tools code key B24–B25 | Grade selection guide B19–B23 | Technical data B234–B240

Square shoulder milling tools Kr:90°



EMP09 P M K S



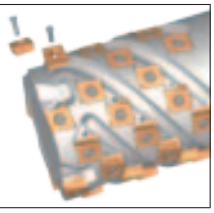


Specification of tools

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

▲Stock available △Make-to-order

Spare parts

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

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

Square shoulder milling tools Kr:90°

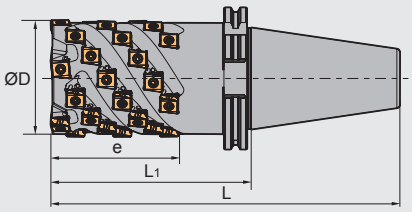

Step shoulder


Slot milling


Side milling

EMP09 P M K S



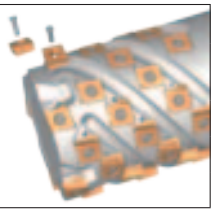


Specification of tools

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

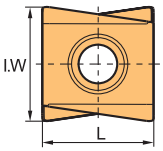
▲Stock available △Make-to-order

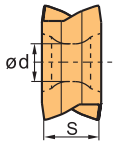
Spare parts

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

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

Selection of inserts





Good working condition Normal working condition Bad working condition

Workpiece material

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

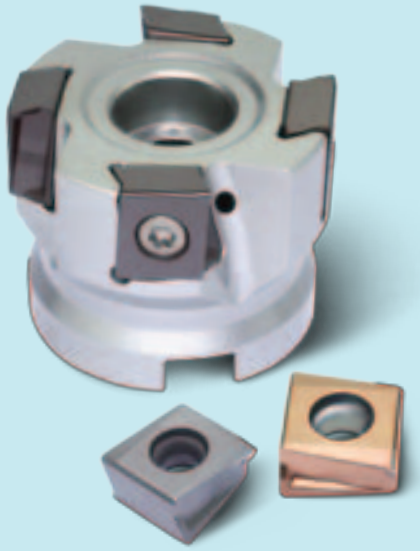
Insert shape	Type	Basic dimensions(mm) L	I.W	S	ød	r	CVD Coating YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	PVD Coating YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	Cermet YNG151	YNG151C	Cemented carbide YC30S	YD051	YD101	YD201
	**LNKT080404PNR-GM**	8.75	8.5	4.45	3.4	0.4				★	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

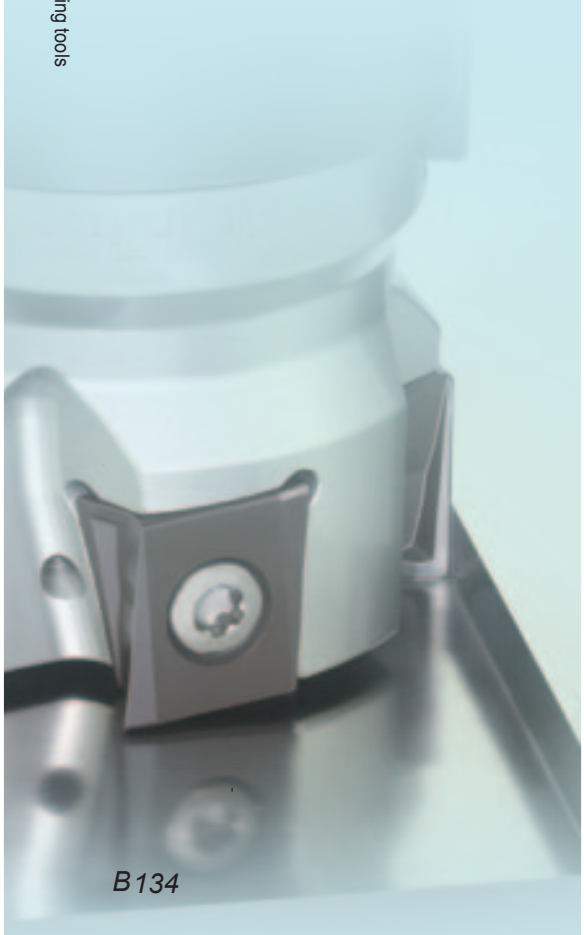
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Recommended cutting parameters

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

Case for EMP09

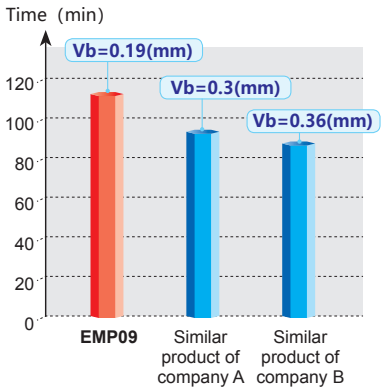




●Ultra-long working life

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

Comparison of tool life



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

●Better surface quality

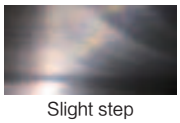
The material of workpiece：NAK80
Hardness：HRC(33−37)
Machine tool：Planer−type milling machine
Type of cooling：No cooling
The machining type：Shoulder milling
Toolholder：EMP09−050−A22−LN12−05C
Insert：LNKT120608PNR−GM (YB9320)
Similar product of company A
Cutting parameter：Vc=240m/min，Ap=8mm
Ae=2mm，fz=0.2mm/z

EMP09



No obvious gear mark

Similar product of company A



Slight step

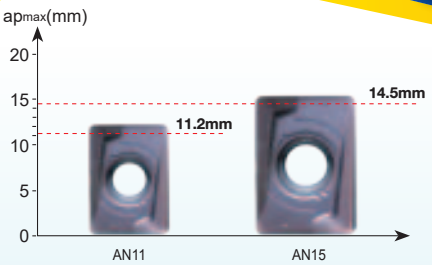
Result: EMP09 series of tangential milling cutter has higher precision and better surface quality, no obvious gear mark, and runout value, which is better than the similar product of company A.



Kr:90°

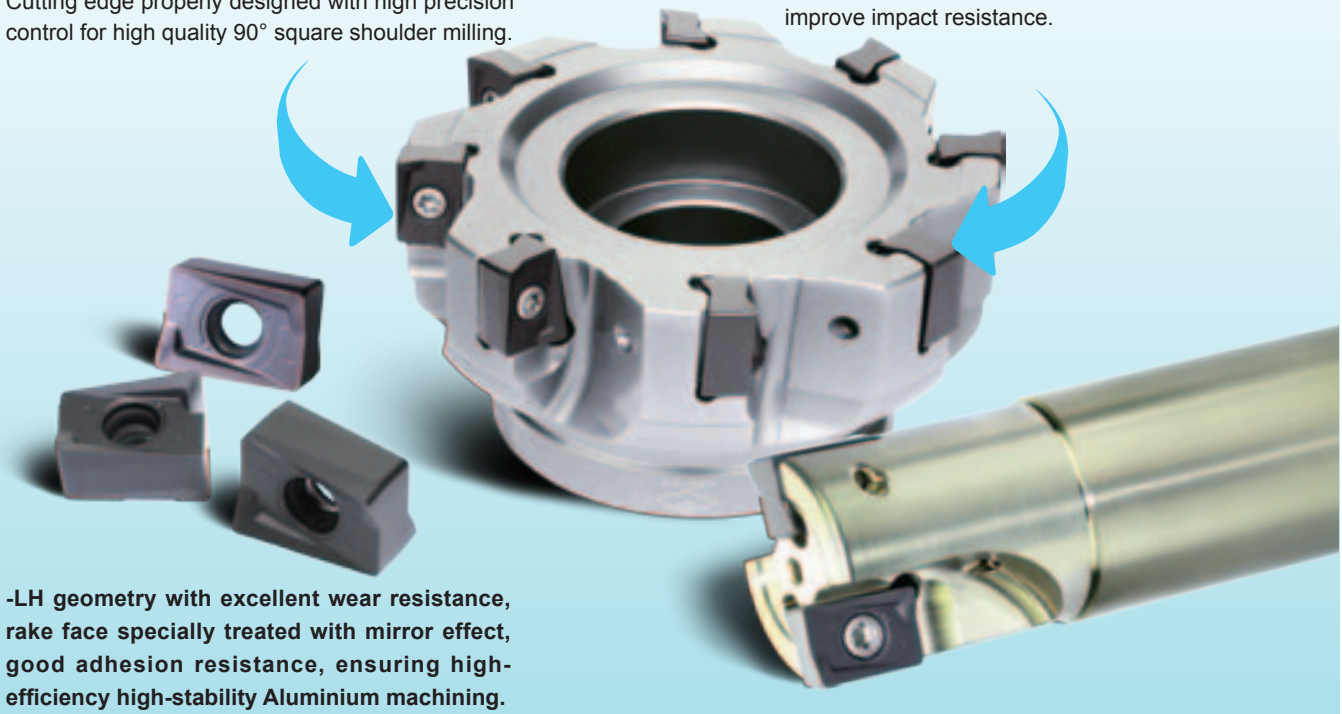
Achieving high quality 90° square shoulding milling

EMP13 Series Square Shoulder Milling Tools



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

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



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

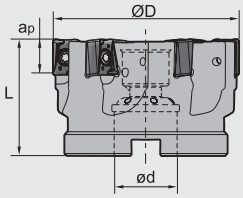
Square shoulder milling tools Kr:90°

Face milling Step shoulder

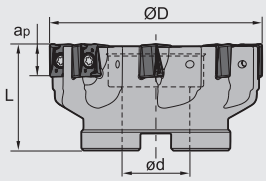
EMP13 P M K N S



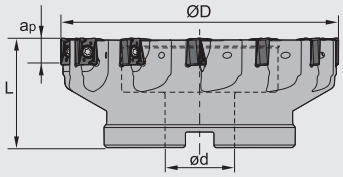
A-type coupling



B-type coupling



C-type coupling



Specification of tools

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

▲Stock available △Make-to-order

Spare parts

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



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

Square shoulder milling tools Kr:90°


Face milling


Step shoulder

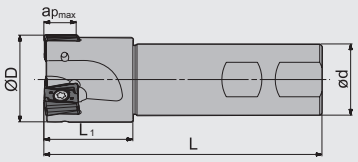

Slot milling

EMP13 P M K N S

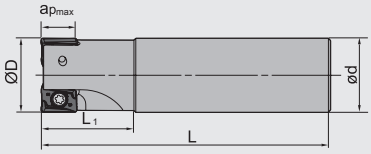

Straight shank


Weldon shank

Weldon shank



Straight shank



Specification of tools

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

▲Stock available △Make-to-order

Spare parts

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

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

Square shoulder milling tools

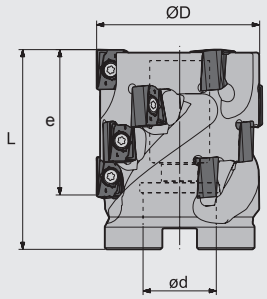
Kr:90°

Face milling | Step shoulder | Slot milling | Side milling

EMP13 P M K N S



A-type coupling



Specification of tools

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

▲Stock available △Make-to-order

Spare parts

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



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

Square shoulder milling tools

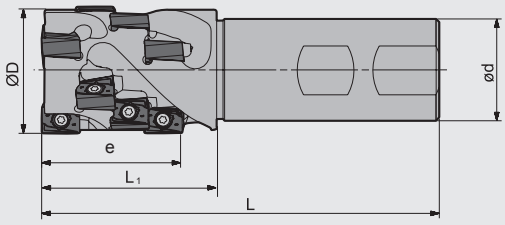
Kr:90°

Face milling | Step shoulder | Slot milling | Side milling

EMP13 P M K N S



Weldon shank



Specification of tools

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

▲Stock available △Make-to-order

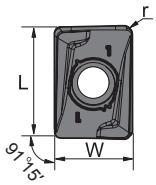
Spare parts

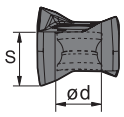
Diameter ØD	Inserts	Screw	Wrench
			
Ø32-Ø40	AN□X11□□□□-GM/LH	I60M3X9	WT09IS
Ø40-Ø50	AN□X15□□□□-GM/LH	I60M4X12	WT15IS



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

Selection of inserts





Good working condition Normal working condition Bad working condition

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

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

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

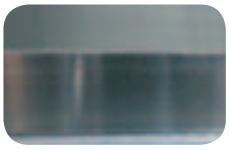
Recommended cutting parameters

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

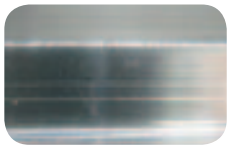
Case for EMP13

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

●Surface quality comparison



EMP13



Company A

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

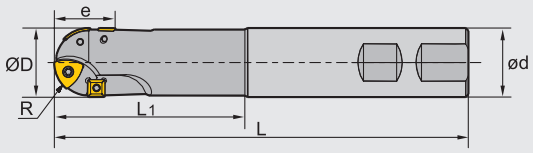
Profile milling tools



BMR01 P M K



Weldon shank



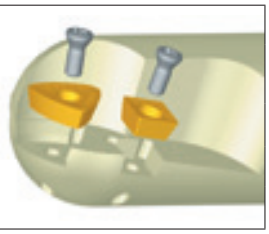
Specification of tools

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

▲Stock available △Make-to-order

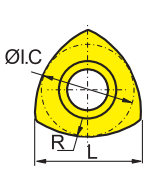
Spare parts

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



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

Selection of inserts

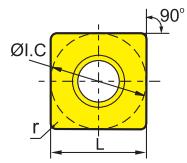


Good working condition 😊 Normal working condition 😐 Bad working condition

Workpiece material		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) R	L	ØI.C	S	ød	α	CVD Coating YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	PVD Coating YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	Cermet YNG151	YNG151C	Cemented carbide YC30S	YD051	YD101	YD201
	ZDET08T2CYR10	10	8.4	6.75	2.78	2.8	14°			○									○										
	ZDET1103CYR12.5	12.5	10.6	8.5	3.18	2.8	14°			○									○										
	ZDET13T3CYR16	16	13.2	10.5	3.97	4.4	14°			○									○										
	ZPNT2204CY(R20)	20	16.1	12.7	4.76	5.56	11°			○									○										
	ZPNT2204CY(R25)	25	16.9	12.7	4.76	5.56	11°			○									○										
	ZPNT2204CY(R31)	31.5	17.6	12.7	4.76	5.56	11°			○									○										

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



Good working condition 😊 Normal working condition 😐 Bad working condition

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

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

Recommended cutting parameters

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

Profile milling tools



BMR02 P M K





Specification of tools

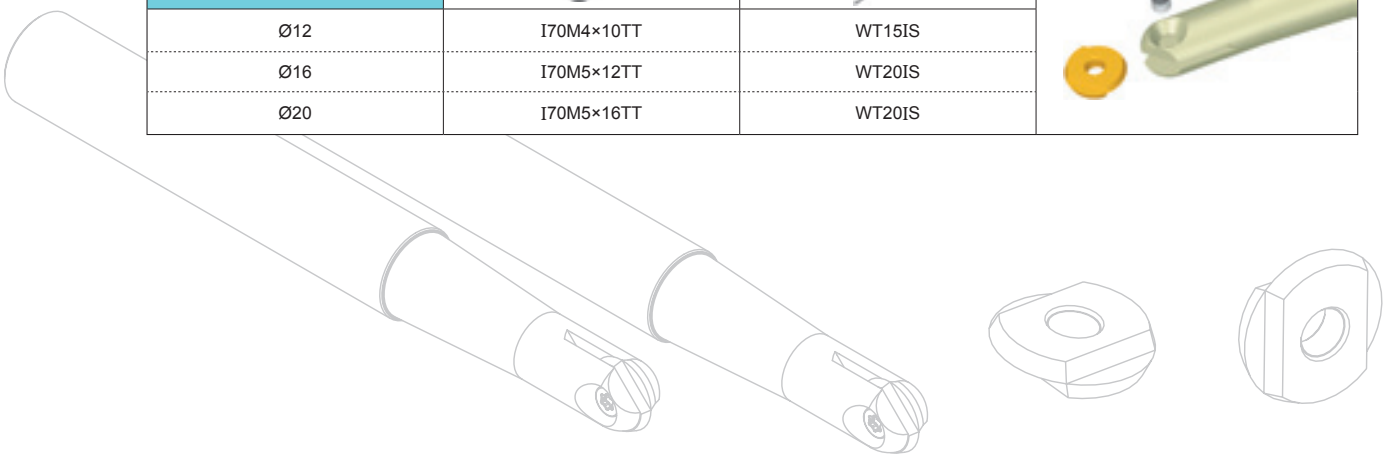
Type		Stock	Basic dimensions(mm)					Weight (kg)
			R	ØD	ød	L	L_1	
BMR02	-012-G16-S	▲	6	12	16	110	40	0.1
	-012-G16-M	▲	6	12	16	130	50	0.2
	-012-G16-L	▲	6	12	16	160	50	0.2
	-016-G20-S	▲	8	16	20	140	45	0.3
	-016-G20-M	▲	8	16	20	170	65	0.3
	-016-G20-L	▲	8	16	20	200	65	0.4
	-020-G25-S	▲	10	20	25	160	60	0.5
	-020-G25-M	▲	10	20	25	200	80	0.6
	-020-G25-L	▲	10	20	25	240	80	0.8

▲Stock available △Make-to-order

Spare parts

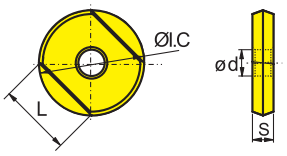
Diameter ØD	Screw	Wrench
Ø12	I70M4×10TT	WT15IS
Ø16	I70M5×12TT	WT20IS
Ø20	I70M5×16TT	WT20IS

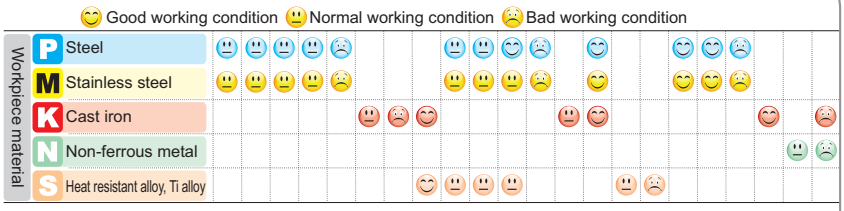




Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Selection of inserts





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

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

Recommended cutting parameters

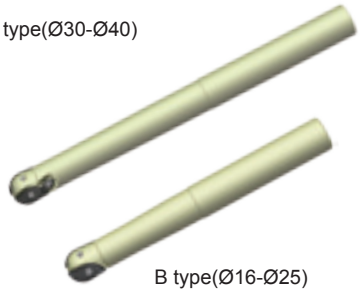
Workpiece material		Hardness HB	Insert grade	Cutting parameters	Diameter		
					Ø12	Ø16	Ø20
P	Carbon steel	HB≤180	YBG252	Vc(m/min)	100~200	100~200	100~200
				fz(mm/z)	0.15~0.25	0.2~0.3	0.2~0.3
				a_{pmax}(mm)	0.8	1.0	1.25
				a_{emax}(mm)	0.8	1.0	1.25
	Alloy steel	HB180~280		Vc(m/min)	80~180	80~180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

Profile milling tools



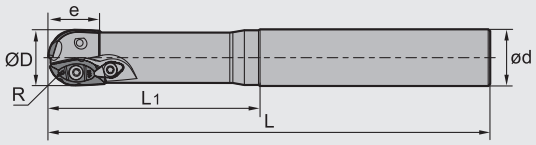
BMR03 P M K

A type(Ø30-Ø40)

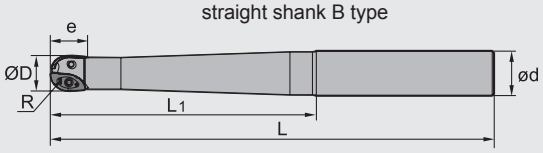


B type(Ø16-Ø25)

straight shank A type



straight shank B type



Specification of tools

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

▲Stock available △Make-to-order

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

Profile milling tools



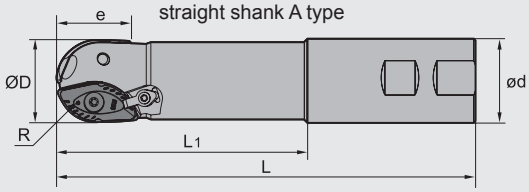
BMR03 P M K

A type(Ø30-Ø50)

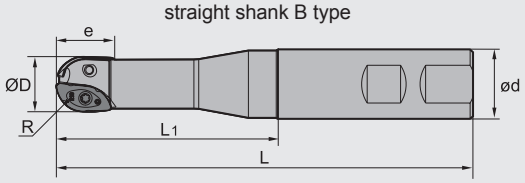


B type(Ø16-Ø25)

straight shank A type



straight shank B type



Specification of tools

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

▲Stock available △Make-to-order

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

Profile milling tools



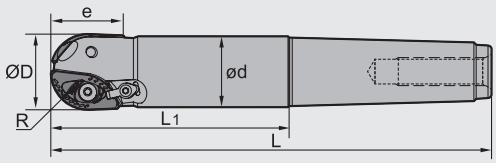
BMR03 P M K

A type(Ø30-Ø50)

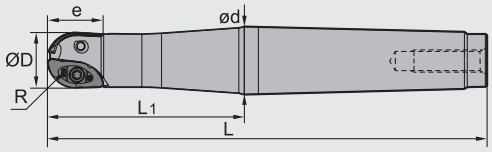


B type(Ø20-Ø25)

Morse taper shank A type



Morse taper shank B type



Specification of tools

Type		Stock	Basic dimensions(mm)						Number of teeth Z	Weight (kg)	Type	Clamp
			R	ØD	ød	L	L1	e				
BMR03	**-020-MT3-M**	▲	10	20	18.7	156	70	20	2	0.4	B	--
	-020-MT3-L	△	10	20	18.7	186	100	20	2	0.4	B	
	-025-MT3-M	▲	12.5	25	23.5	156	70	25	2	0.4	B	
	-025-MT3-L	△	12.5	25	23.5	186	100	25	2	0.4	B	
	-030-MT4-M	▲	15	30	28.2	189	70	30	2	0.8	A	WD-208
	-030-MT4-L	△	15	30	28.2	229	120	30	2	1.0	A	
	-032-MT4-M	▲	16	32	29.2	179	70	32	2	0.9	A	
	-032-MT4-L	△	16	32	29.2	209	100	32	2	0.9	A	
	-040-MT4-M	▲	20	40	36.9	199	100	40	2	1.0	A	CBH5R1
	-040-MT5-L	▲	20	40	36.9	226	90	40	2	1.8	A	
	-040-MT5-XL	▲	20	40	36.9	256	120	40	2	2.0	A	
	-050-MT5-M	▲	25	50	46.8	236	100	50	2	2.2	A	
	-050-MT5-L	▲	25	50	46.8	286	150	50	2	2.9	A	

▲Stock available △Make-to-order

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

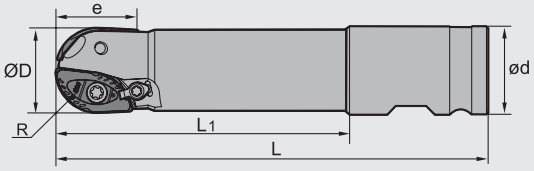
Profile milling tools

Profile | Side milling(R) | Slot milling | Helical machining

BMR03 P M K



Compound shank



Specification of tools

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

▲Stock available △Make-to-order

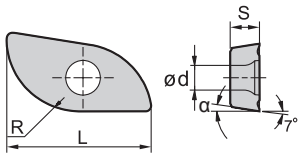
Spare parts

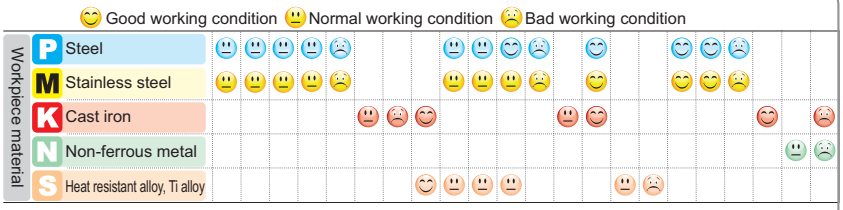
Diameter ØD	Clamp	Screw	Wrench	
Ø16	--	I60M2.5×6.5	--	WT07P
Ø20	--	I60M3.5×08TT		WT10IP
Ø25	--	I60M4×10		WT15S
Ø30	WD-208	I60M5×13	WT20IT	--
Ø32	WD-208	I60M5×13		
Ø40	CBH5R1	I43M6×16	WT25IT	
Ø50	CBH5R1	I43M8×21 I43M6×16	WT25IT WT30IT	



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

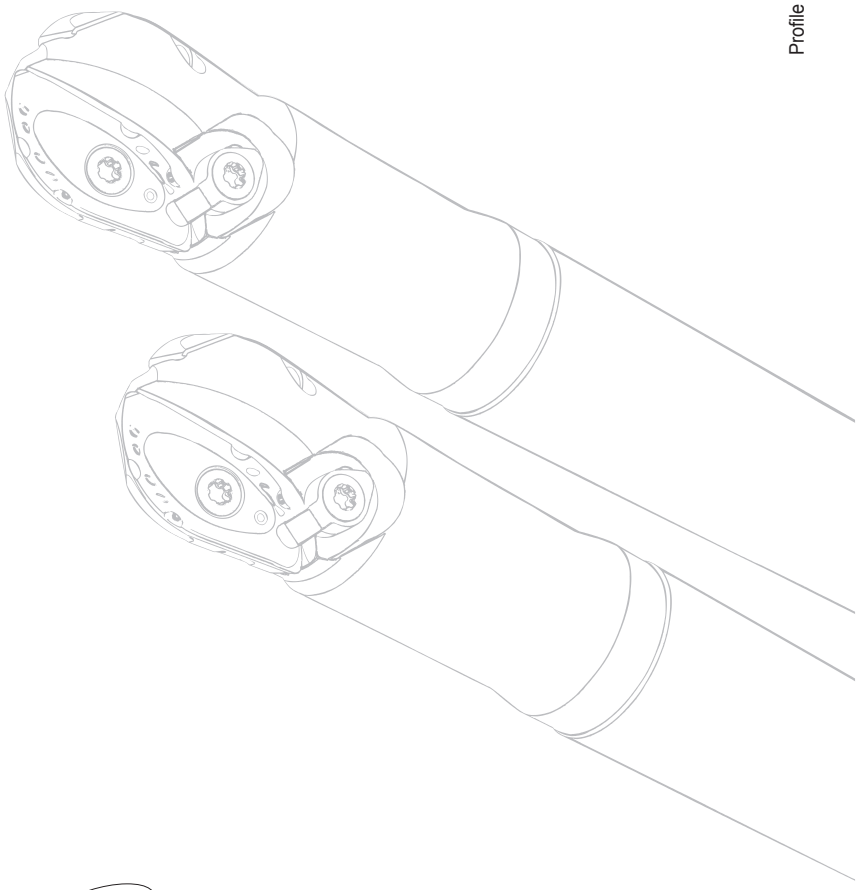
Selection of inserts



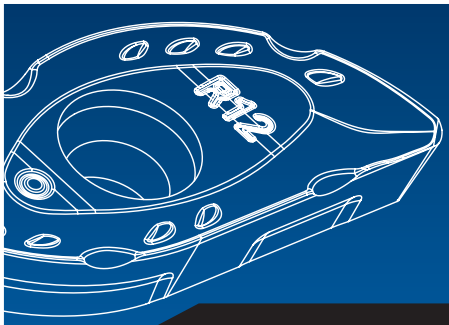


Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating								Cermet		Cemented carbide			
		R	ød	S	α	L	Applicable tools	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**XPHT16R0803-GM**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

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



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





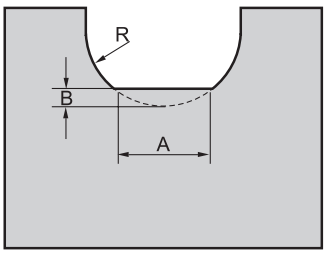
BMR03

series ball nose end milling tools



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

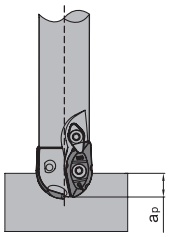
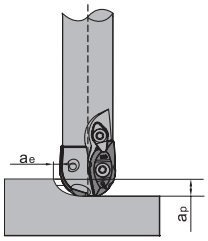
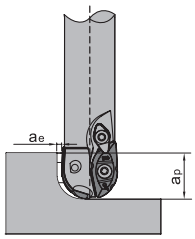
Slot shape after machining



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

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

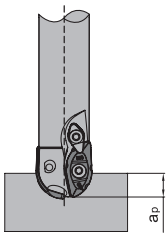
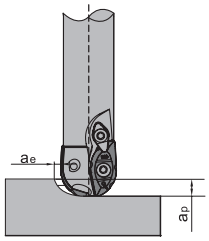
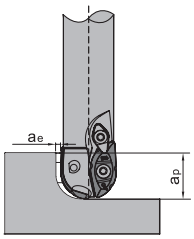
Recommended cutting parameters Diameter Ø16

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

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

2. Wind cooling to be preferred.

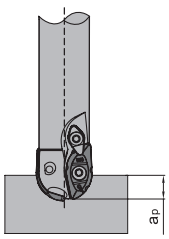
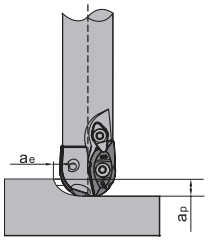
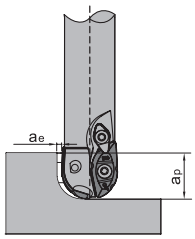
Recommended cutting parameters Diameter Ø20

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

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

2. Wind cooling to be preferred.

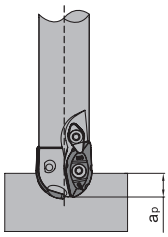
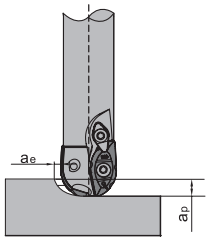
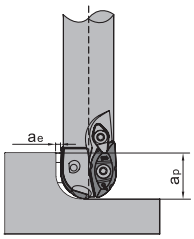
Recommended cutting parameters Diameter Ø25

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

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

2. Wind cooling to be preferred.

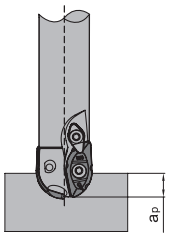
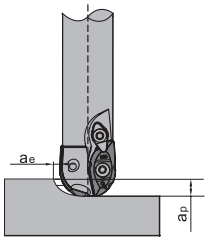
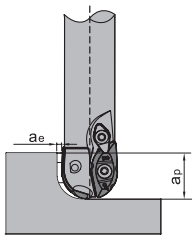
Recommended cutting parameters Diameter Ø30, Ø32

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

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

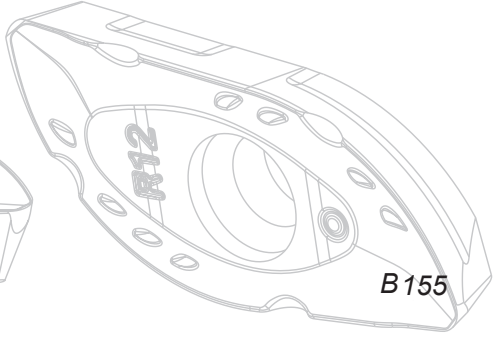
2. Wind cooling to be preferred.

Recommended cutting parameters Diameter Ø40

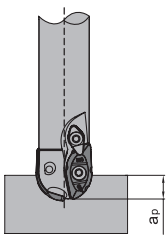
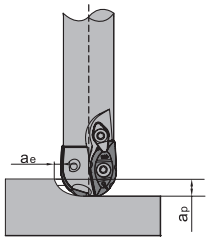
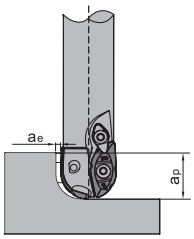
Operations					
Workpiece material	Cutting parameters	Machining of slot	Side milling (slight)		Side milling (deep)	Insert grade
Medium carbon steel Hardness 150~250HB	Vc(m/min)	150~220	150~220	150~220	150~220	YBG302
	Fz(mm/z)	0.1~0.4	0.1~0.4	0.1~0.4	0.1~0.4	
	a_p(mm)	12	10	20	35	
	a_e(mm)	--	8	12	8	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

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

2. Wind cooling to be preferred.



Recommended cutting parameters Diameter Ø50

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

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

2. Wind cooling to be preferred.

Profile milling tools


Side milling(R)

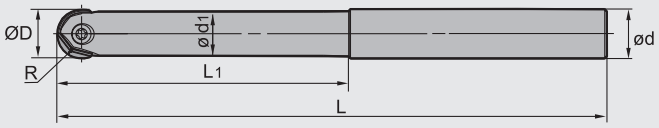
Slot milling

Profile

BMR04 P M K



Straight shank with straight neck



Specification of tools

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

▲Stock available △Make-to-order

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

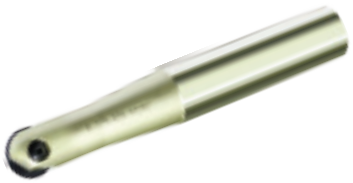
Profile milling tools


Side milling(R)

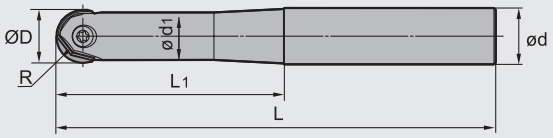
Slot milling

Profile

BMR04 P M K



Straight shank with taper neck



Specification of tools

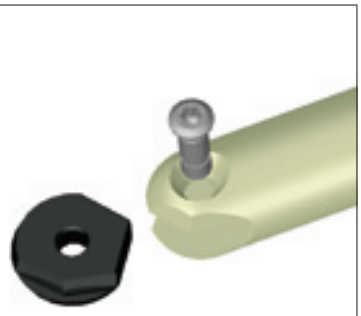
Type		Stock	Basic dimensions(mm)						Weight (kg)
			R	ØD	ød	ød1	L1	L	
BMR04	-012-G16-M	▲	6	12	16	11	50	125	0.2
	-012-G16-L	△	6	12	16	11	60	150	0.2
	-016-G20-M	▲	8	16	20	14	60	150	0.3
	-016-G20-L	△	8	16	20	14	80	180	0.3
	-020-G25-M	▲	10	20	25	18	75	180	0.6
	-020-G25-L	△	10	20	25	18	85	200	0.6
	-025-G32-M	▲	12.5	25	32	23	90	200	1.0
	-025-G32-L	△	12.5	25	32	23	110	250	1.3
	-030-G40-M	▲	15	30	40	27	110	250	2.0
	-030-G40-L	△	15	30	40	27	125	300	2.4
	-032-G40-M	▲	16	32	40	29	110	250	2.0
	-032-G40-L	△	16	32	40	29	125	300	2.4

▲Stock available △Make-to-order

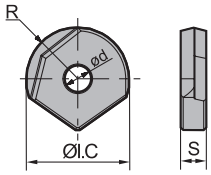
Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

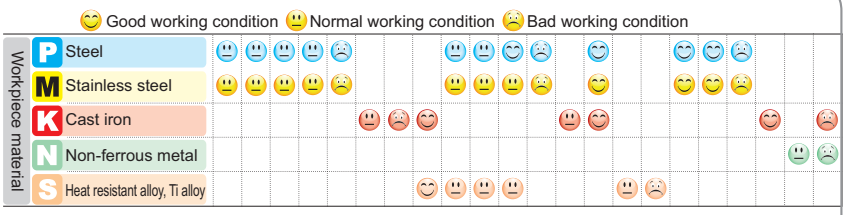
Spare parts

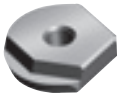
Diameter	Screw	Wrench	
Ø12	I70M4×10TT	WT15IP	--
Ø16	I70M5×12TT	WT20IP	--
Ø20	I70M5×16TT	WT20IP	--
Ø25	I70M6×20TT	WT20IP	--
Ø30	I70M8×25TT	--	WT30IT
Ø32	I70M8×25TT	--	WT30IT



Selection of inserts





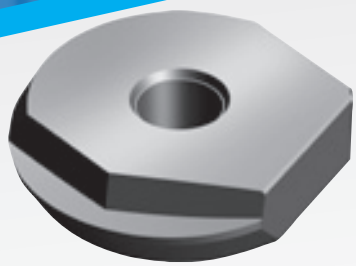
Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating							Cermet		Cemented carbide			
		R	ØI.C	S	ød	Applicable insert ØD	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	ZOHX1203-GF	6	12	3	4	Ø12													★								
	ZOHX1604-GF	8	16	4	5	Ø16													★								
	ZOHX2005-GF	10	20	5	5	Ø20													★								
	ZOHX2506-GF	12.5	25	6	6	Ø25													○								
	ZOHX3007-GF	15	30	7	8	Ø30													○								
	ZOHX3207-GF	16	32	7	8	Ø32													○								
	ZOHX1203-GM	6	12	3	4	Ø12													★								
	ZOHX1604-GM	8	16	4	5	Ø16													★								
	ZOHX2005-GM	10	20	5	5	Ø20													★								
	ZOHX2506-GM	12.5	25	6	6	Ø25													★								
	ZOHX3007-GM	15	30	7	8	Ø30													★								
	ZOHX3207-GM	16	32	7	8	Ø32													★								

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



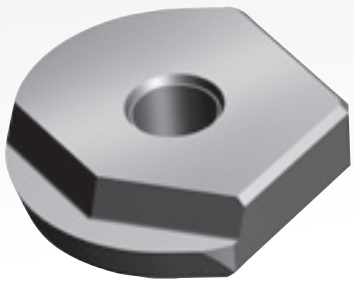
BMR04

Series ball nose finishing end milling tools



-GF

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



-GM

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

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

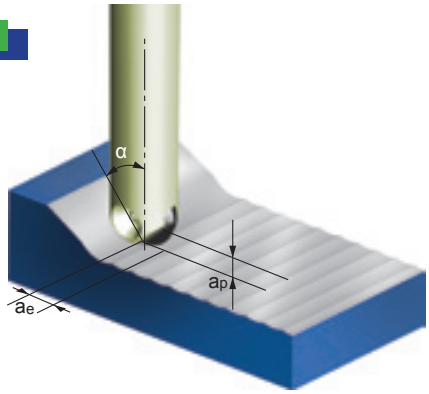
Calculation of cutting speed for BMR02/04 series ball nose end mills

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

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

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

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



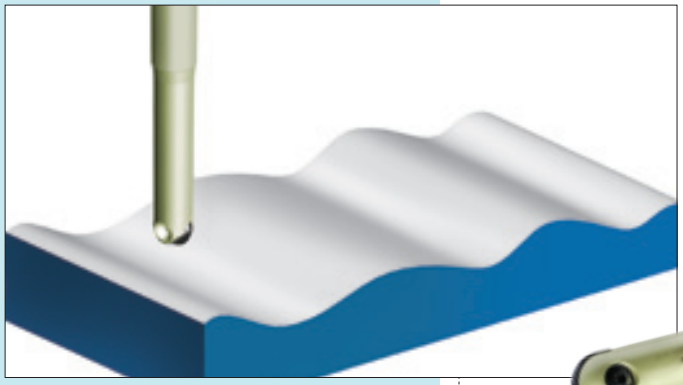
2.When there is an inclined angle between the tool axial line and the surface being machined, the recommended cutting speed should be multiplied by a factor in the table below to obtain the cutting speed used for programming.

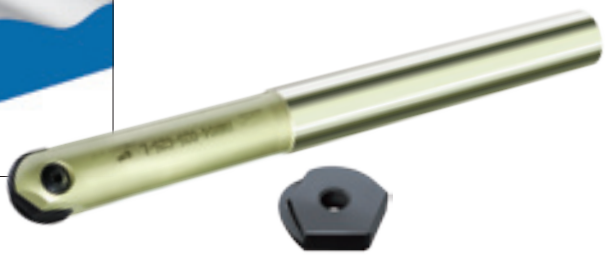
Diameter(mm)		Ø12		Ø16		Ø20		Ø25		Ø30		Ø32	
Cutting depth ap(mm)		0.2	0.5	0.2	0.5	0.5	1	0.5	1	0.5	1.5	0.5	1.5
Inclined angle α	15°	1.00	1.00	1.00	1.00	1.00	1.02	1.00	1.01	1.00	1.00	1.00	1.00
	30°	1.04	1.01	1.05	1.01	1.02	1.04	1.03	1.04	1.04	1.01	1.04	1.00
	45°	1.16	1.07	1.18	1.10	1.12	1.06	1.14	1.08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

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters	Tool specification					
					Ø12	Ø16	Ø20	Ø25	Ø30	Ø32
P	Carbon steel	HB≤180	YBG252	Vc(m/min)	100~200	100~200	100~200	100~200	100~200	100~200
				fz(mm/z)	0.15~0.25	0.2~0.3	0.2~0.3	0.25~0.35	0.25~0.35	0.25~0.35
				$a_p$max(mm)	0.8	1.0	1.25	1.5	2.0	2.0
				$a_e$max(mm)	0.8	1.0	1.25	1.5	2.0	2.0
	Alloy stee	HB180~280		Vc(m/min)	80~180	80~180	80~180	80~180	80~180	80~180
				fz(mm/z)	0.15~0.25	0.2~0.3	0.2~0.3	0.25~0.35	0.25~0.35	0.25~0.35
				$a_p$max(mm)	0.8	1.0	1.25	1.5	2.0	2.0
				$a_e$max(mm)	0.8	1.0	1.25	1.5	2.0	2.0
	Hardened steel	HRC55~65		Vc(m/min)	60~100	60~100	60~100	60~100	60~100	60~100
				fz(mm/z)	0.15~0.25	0.2~0.3	0.2~0.3	0.25~0.35	0.25~0.35	0.25~0.35
				$a_p$max(mm)	0.4	0.5	0.6	0.8	1.0	1.0
				$a_e$max(mm)	0.4	0.5	0.6	0.8	1.0	1.0
M	Stainless steel	HB≤270		Vc(m/min)	70~150	70~150	70~150	70~150	70~150	70~150
				fz(mm/z)	0.1~0.2	0.1~0.25	0.1~0.25	0.2~0.3	0.2~0.3	0.2~0.3
				$a_p$max(mm)	0.6	0.8	1.0	1.25	1.5	1.5
				$a_e$max(mm)	0.6	0.8	1.0	1.25	1.5	1.5
K	Cast iron	HB180~250		Vc(m/min)	160~300	160~300	160~300	160~300	160~300	160~300
				fz(mm/z)	0.2~0.3	0.25~0.35	0.25~0.35	0.3~0.4	0.3~0.4	0.3~0.4
				$a_p$max(mm)	1.0	1.5	1.8	2.0	2.5	2.5
				$a_e$max(mm)	1.0	1.5	1.8	2.0	2.5	2.5

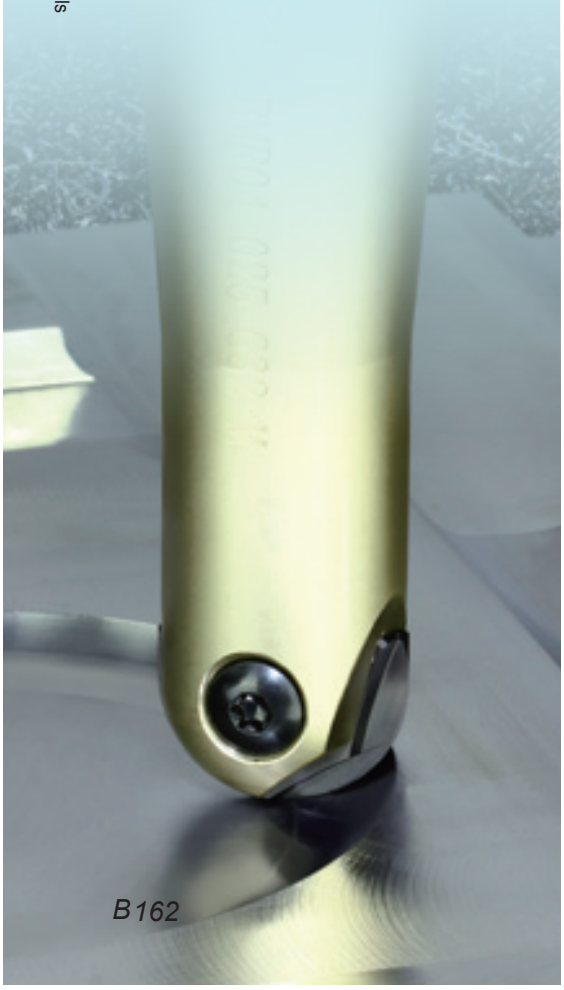
Case for BMR04





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

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

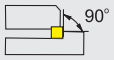
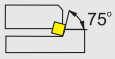
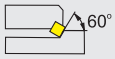
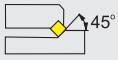
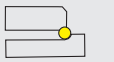


●Abrasion comparison of inserts after milling curved face

	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

Side and face milling tools code key

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

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

Sequence number of series

Cutting diameter ØD (mm)

Cutting width of milling tools

Coupling structure and demension

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

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

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

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

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

Cutting direction

(R: Right L: Left)

Number of teeth

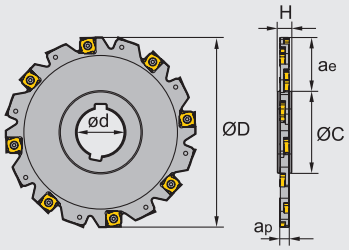
Side and face milling tools

Machining of slot

SMP01 P M K



K-type coupling



Specification of tools

Type		Stock	Basic dimensions(mm)						Applicable inserts	Number of teeth Z	Type of coupling	Weight (kg)
			ØD	ød	øc	H	ap	aemax				
SMP01 Mounting by keyway	**-100×4-K27-SN12-10**	△	100	27	45	12	4	25	XSEQ1202	10	K	0.2
	-125×4-K40-SN12-12	△	125	40	56	12	4	32		12	K	0.3
	-160×4-K40-SN12-16	△	160	40	67	12	4	44		16	K	0.5
	-100×5-K27-SN12-10	△	100	27	45	12	5	25	XSEQ1203	10	K	0.2
	-125×5-K40-SN12-12	△	125	40	56	12	5	32		12	K	0.3
	-160×5-K40-SN12-16	△	160	40	67	12	5	44		16	K	0.6
	-100×6-K27-SN12-10	△	100	27	45	12	6	25	XSEQ12T3	10	K	0.3
	-125×6-K40-SN12-12	△	125	40	56	12	6	32		12	K	0.4
	-160×6-K40-SN12-16	△	160	40	67	12	6	44		16	K	0.7
	-200×6-K50-SN12-18	△	200	50	71	12	6	62		18	K	1.1
	-250×6-K50-SN12-24	△	250	50	71	12	6	87		24	K	1.7
	-100×7-K27-SN12-10	△	100	27	45	12	7	25	XSEQ1204	10	K	0.3
	-125×7-K40-SN12-12	△	125	40	56	12	7	32		12	K	0.4
	-160×7-K40-SN12-16	△	160	40	67	12	7	44		16	K	0.8
	-200×7-K50-SN12-18	△	200	50	71	12	7	62		18	K	1.2
	-250×7-K50-SN12-24	△	250	50	71	12	7	87		24	K	1.9
	-100×8-K27-SN12-10	△	100	27	45	12	8	25	XSEQ12T4	10	K	0.3
	-125×8-K40-SN12-12	△	125	40	56	12	8	32		12	K	0.5
	-160×8-K40-SN12-16	△	160	40	67	12	8	44		16	K	0.9
	-200×8-K50-SN12-18	△	200	50	71	12	8	62		18	K	1.4
	-250×8-K50-SN12-24	△	250	50	71	12	8	87		24	K	2.2

▲Stock available △Make-to-order

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

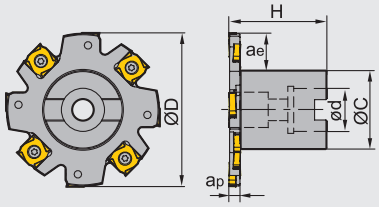
Side and face milling tools


Machining of slot

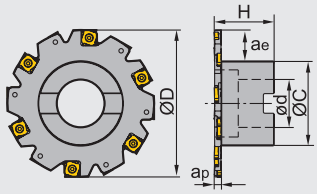
SMP01 P M K



A-type coupling



B-type coupling



Specification of tools

Type		Stock		Basic dimensions(mm)						Applicable inserts	Number of teeth Z	Type of coupling	Weight (kg)
		R	L	ØD	ød	øc	H	a_p	a_{emax}				
SMP01 Arbor mounting	**-063×4-A22-SN12-06**	△	△	63	22	32	40	4	14	XSEQ1202	6	A	0.2
	-080×4-A22-SN12-08	△	△	80	22	40	50	4	18		8	A	0.4
	-100×4-A27-SN12-10	△	△	100	27	48	50	4	23		10	A	0.6
	-063×5-A22-SN12-06	△	△	63	22	32	40	5	14	XSEQ1203	6	A	0.2
	-080×5-A22-SN12-08	△	△	80	22	40	50	5	18		8	A	0.4
	-100×5-A27-SN12-10	△	△	100	27	48	50	5	23		10	A	0.7
	-063×6-A22-SN12-06	△	△	63	22	32	40	6	14	XSEQ12T3	6	A	0.2
	-080×6-A22-SN12-08	△	△	80	22	40	50	6	18		8	A	0.5
	-100×6-A27-SN12-10	△	△	100	27	48	50	6	23		10	A	0.7
	-125×6-B32-SN12-12	△	△	125	32	70	50	6	30		12	B	1.0
	-160×6-B40-SN12-16	△	△	160	40	70	50	6	41		16	B	1.3
	-063×7-A22-SN12-06	△	△	63	22	32	40	7	14	XSEQ1204	6	A	0.2
	-080×7-A22-SN12-08	△	△	80	22	40	50	7	18		8	A	0.5
	-100×7-A27-SN12-10	△	△	100	27	48	50	7	23		10	A	0.7
	-125×7-B32-SN12-12	△	△	125	32	70	50	7	30		12	B	1.1
	-160×7-B40-SN12-16	△	△	160	40	70	50	7	41		16	B	1.4
	-063×8-A22-SN12-06	△	△	63	22	32	40	8	14	XSEQ12T4	6	A	0.2
	-080×8-A22-SN12-08	△	△	80	22	40	50	8	18		8	A	0.5
	-100×8-A27-SN12-10	△	△	100	27	48	50	8	23		10	A	0.8
	-125×8-B32-SN12-12	△	△	125	32	70	50	8	30		12	B	1.1
	-160×8-B40-SN12-16	△	△	160	40	70	50	8	41		16	B	1.5

▲Stock available △Make-to-order

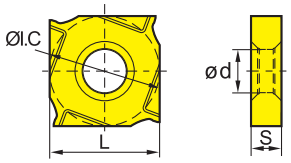
Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

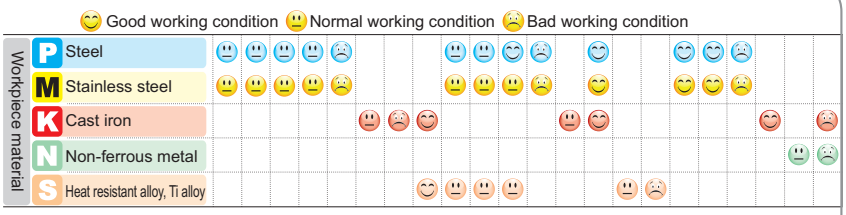
Spare parts

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



Selection of inserts





Insert shape	Type	Basic dimensions(mm)				CVD Coating							PVD Coating							Cermet		Cemented carbide			
		ØI.C	L	S	ød	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**XSEQ1202**	12.7	12.7	2.3	5.0												★										
	XSEQ1203	12.7	12.7	3.0	5.0												★										
	XSEQ12T3	12.7	12.7	3.5	5.0												★										
	XSEQ1204	12.7	12.7	4.0	5.0												★										
	XSEQ12T4	12.7	12.7	4.5	5.0												★										

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

Recommended cutting parameters

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

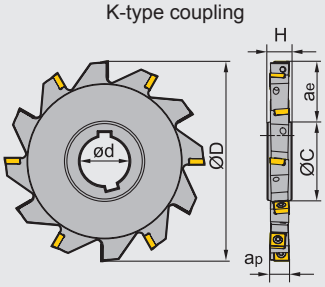
Side and face milling tools


Machining of slot

SMP03 P M K



K-type coupling



Specification of tools

Type		Stock	Basic dimensions(mm)						Applicable inserts	Number of teeth Z	Type of coupling	Weight (kg)
			ØD	øc	ød	a_{emax}	a_p	H				
SMP03 Mounting by keyway	**-080×8-K27-MP06-10**	△	80	43	27	17	8	12	MPHT060304-DM	10	K	0.2
	-100×8-K32-MP06-14	△	100	47	32	25	8	12		14	K	0.3
	-100×10-K32-MP06-14	△	100	47	32	25	10	14		14	K	0.4
	-125×10-K40-MP06-16	△	125	55	40	34	10	14		16	K	0.6
	-125×12-K40-MP08-12	△	125	55	40	34	12	16	MPHT080305-DM	12	K	0.7
	-160×12-K40-MP08-14	△	160	62	40	47	12	16		14	K	1.3
	-160×16-K40-MP12-12	△	160	62	40	49	16	20	MPHT120408-DM	12	K	1.6
	-160×18-K40-MP12-12	△	160	62	40	49	18	24		12	K	1.9
	-160×20-K40-MP12-12	△	160	62	40	49	20	26		12	K	2.1
	-200×16-K50-MP12-14	△	200	72	50	62	16	20		14	K	2.5
	-200×18-K50-MP12-14	△	200	72	50	62	18	24		14	K	2.9
	-200×20-K50-MP12-14	△	200	72	50	62	20	26		14	K	3.3

▲Stock available △Make-to-order

Spare parts

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



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

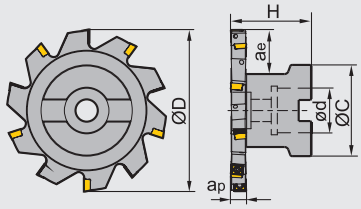
Side and face milling tools

Machining of slot

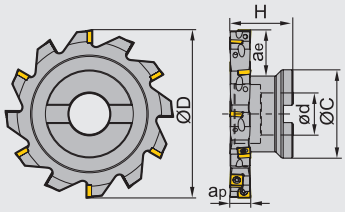
SMP03 P M K



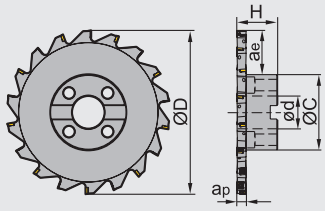
A-type coupling



B-type coupling



C-type coupling



Specification of tools

Type		Stock		Basic dimensions(mm)						Applicable inserts	Number of teeth Z	Type of coupling	Weight (kg)
		R	L	ØD	øc	ød	$a_e$max	a_p	H				
SMP03 Arbor mounting	**-080×8-A22-MP06-10**	△	△	80	45	22	21	8	40	MPHT060304-DM	10	A	0.4
	-100×8-B27-MP06-14	△	△	100	55	27	24	8	40		14	B	0.6
	-100×10-B27-MP06-14	△	△	100	55	27	24	10	40		14	B	0.7
	-125×10-B32-MP06-16	△	△	125	65	32	33	10	45		16	B	1.1
	-125×12-B32-MP08-12	△	△	125	65	32	33	12	45	MPHT080305-DM	12	B	1.4
	-160×12-B40-MP08-14	△	△	160	80	40	45	12	50		14	B	1.9
	-200×12-C40-MP08-18	△	△	200	92	40	53	12	50		18	C	3.2
	-125×16-B32-MP12-10	△	△	125	65	32	33	16	50	MPHT120408-DM	10	B	2.3
	-160×16-B40-MP12-12	△	△	160	80	40	45	16	60		12	B	2.3
	-160×18-B40-MP12-12	△	△	160	80	40	45	18	60		12	B	2.4
	-200×16-C40-MP12-14	△	△	200	92	40	53	16	50		14	C	3.6
	-200×18-C40-MP12-14	△	△	200	92	40	53	18	50		14	C	3.9
	-200×20-C40-MP12-14	△	△	200	92	40	53	20	50		14	C	4.2

▲Stock available △Make-to-order

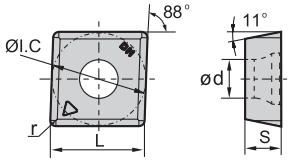
Spare parts

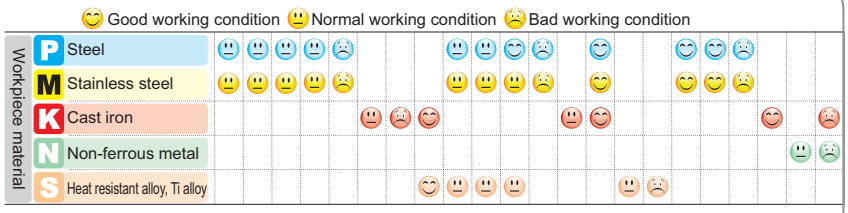
Diameter ØD	Inserts	Screw	Wrench	
				
Ø80-Ø125	MP06	I60M2.5×6.5	WT07IP	--
Ø125-Ø200	MP08	I60M3×7	WT09IP	--
Ø125-Ø200	MP12	I60M5×13	--	WT20IS



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

Selection of inserts





Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating								Cermet		Cemented carbide			
		ØI.C	L	S	ød	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**MPHT060304-DM**	6.35	6.35	3.18	2.8	0.4												★										
	MPHT080305-DM	8.3	8.3	3.18	3.4	0.5												★										
	MPHT120408-DM	12.7	12.7	4.76	5.56	0.8												★										

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

Recommended cutting parameters

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



SMP05 Slot milling

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

Slot milling specification code

Slot milling	Weldon shank	Insert	Teeth

SMP05 - 039×3.0 - XP 25 - QC 16- 03

Minimum machining diameter(mm)

Code	Diameter
25	25
39	39
44	44

Maximum cutting width(mm)

Code	Cutting width
3.0	3.0
4.8	4.8

Cutter diameter(mm)

Code	Diameter
25	25
32	32

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

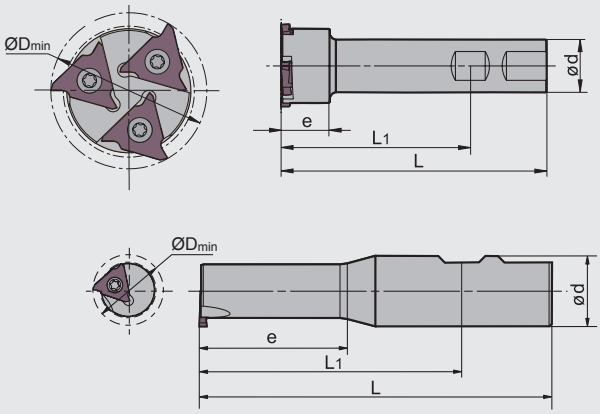
Side and face milling tools


Machining of slot

SMP05 P M K



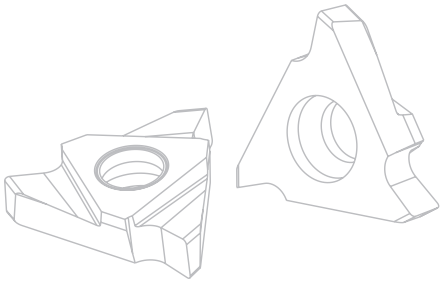


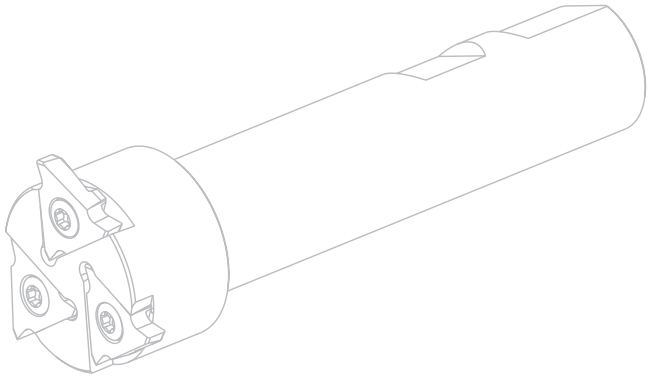


Specification of tools

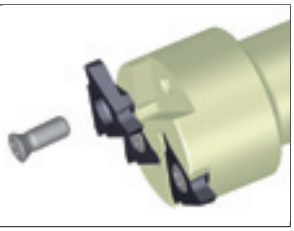
Type		Stock	Basic dimensions(mm)					Number of teeth Z	Applicable inserts	Width(mm)
			ØDmin	ød	e	L1	L			
SMP05	**-025×3.0-XP25-QC16-01**	△	25	25	40	89	125	1	QC16L 110~300	1.10-3.00
	-039×3.0-XP25-QC16-03	△	39	25	23	89	125	3	QC16L 110~300	1.10-3.00
	-044×4.8-XP25-QC22-03	△	44	25	23	89	125	3	QC22L 125~480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

▲Stock available △Make-to-order



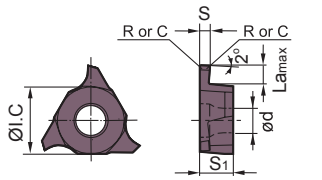


Spare parts

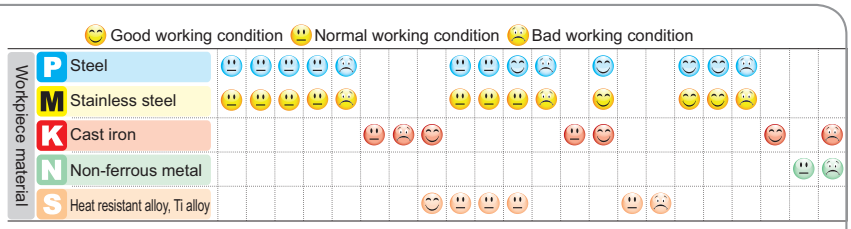
Diameter ØD	Screw	Wrench	
Ø25	I60M3.5×10	WT15IP	
Ø39	I60M3.5×10	WT15IP	
Ø44	I60M5×13	WT20IP	

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

Selection of inserts



Good working condition Normal working condition Bad working condition



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

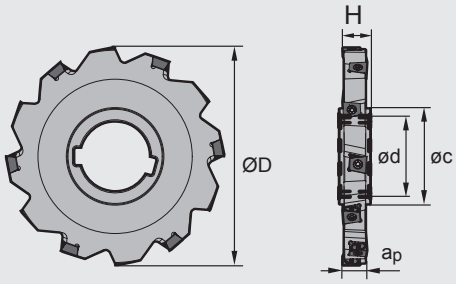
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Side and face milling tools


Machining of slot

SMP09 P M K





K-type coupling

Specification of tools

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

▲Stock available △Make-to-order

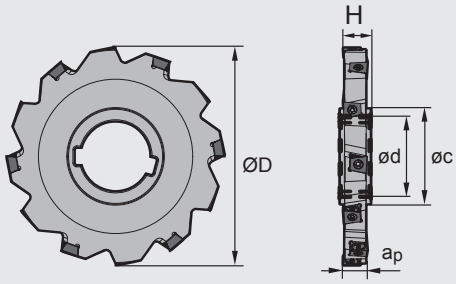
Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Side and face milling tools

Machining of slot

SMP09 P M K





K-type coupling

Specification of tools

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

▲Stock available △Make-to-order

Spare parts

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



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

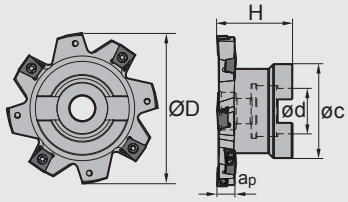
Side and face milling tools

Machining of slot

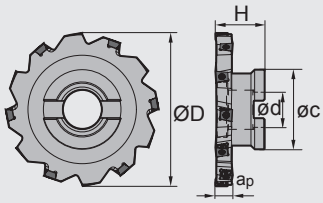
SMP09 P M K



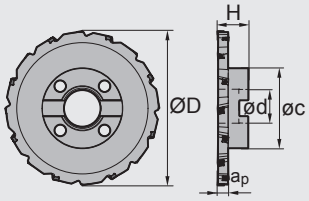
A-type coupling



B-type coupling



C-type coupling



Specification of tools

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

▲Stock available △Make-to-order

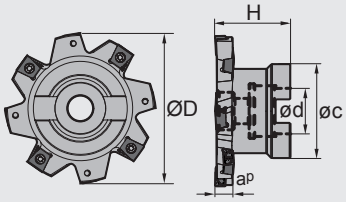
Side and face milling tools

Machining of slot

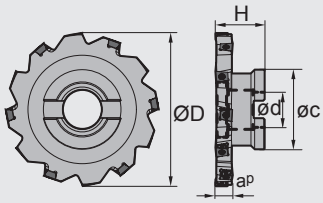
SMP09 P M K



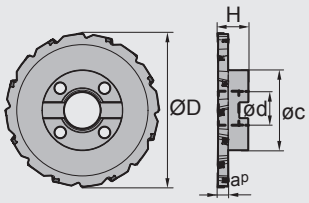
A-type coupling



B-type coupling



C-type coupling



Specification of tools

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

▲Stock available △Make-to-order

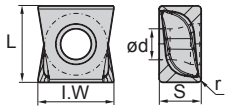
Spare parts

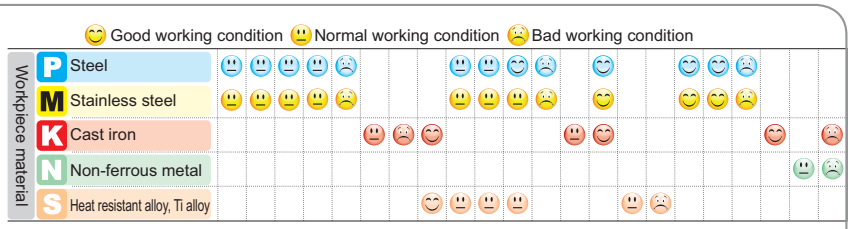
Diameter ØD	Edge width a_p	Inserts	Screw	Wrench
Ø80-Ø200	10	LNGX1005□□-GM	I60M3.5×8TT	WP10IS
Ø100-Ø200	12	LNGX1407□□-GM	I60M4×10	WP15IS
Ø100-Ø250	14-18	LNGX1005□□-GM	I60M3.5×8TT	WP10IS
Ø125-Ø315	20-25	LNGX1407□□-GM	I60M4×12	WP15IS



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

Selection of inserts





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

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

Recommended cutting parameters

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

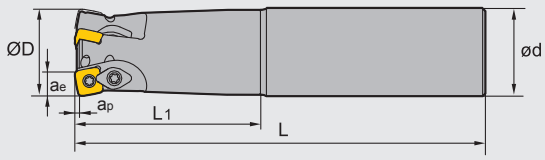
High feed milling cutters



XMR01 P M K S



S-type insert, straight shank



Specification of tools

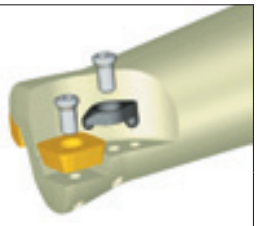
Type		Stock	Basic dimensions(mm)						Number of teeth Z	Weight (kg)
			ØD	a_p	a_e	L_1	L	ød		
XMR01	-020-G20-SD06-02	▲	20	0.8	4.45	50	130	20	2	0.26
	-020-G20-SD06-02CL	△	20	0.8	4.45	100	180	20	2	0.364
	-020-G20-SD06-02CXL	△	20	0.8	4.45	130	250	20	2	0.522
	-025-G25-SD06-03	▲	25	0.8	4.45	60	140	25	3	0.46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

▲Stock available △Make-to-order

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

Spare parts

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



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

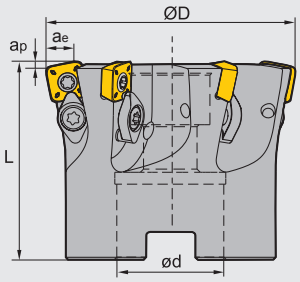
High feed milling cutters



XMR01 P M K S



S type insert milling cutter



Specification of tools

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

▲Stock available △Make-to-order

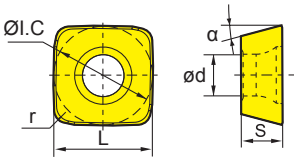
Spare parts

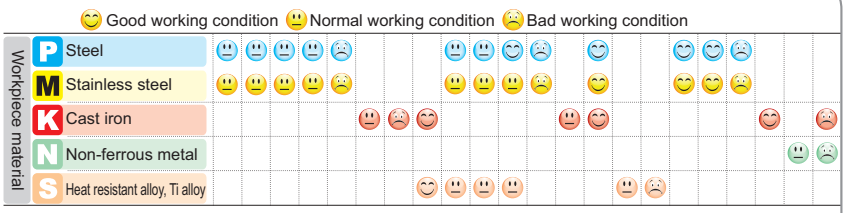
Tool type	Screw	Clamp Screw	Clamp	Wrench	
XMR01□□-SD06□□	I60M2.2×5.5	--	--	WT07IP	--
XMR01□□-SD09□□	I60M3.5×08TT	I60M4×8.4	WD-204	WT10IP	WT15IP
XMR01□□-SD12□□	I60M4×8.4			WT15IP	
XMR01□□-SD15□□	I60M5×13		WD-208	WT20IP	--



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

Selection of inserts





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

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

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



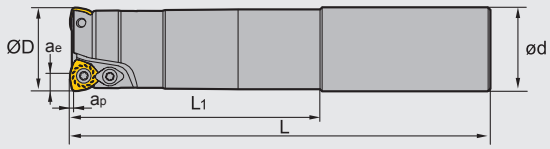
High feed milling cutters



XMR01 P M K



W-type insert, straight shank



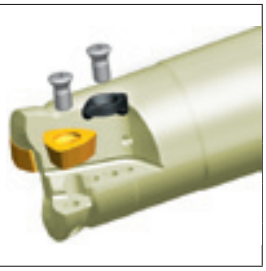
Specification of tools

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

Spare parts

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



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

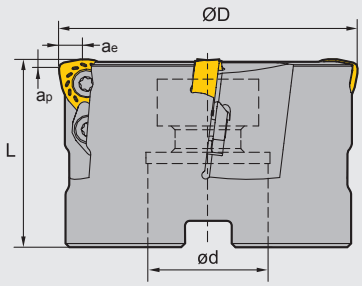
High feed milling cutters



XMR01 P M K



W-type insert, arbor mounting



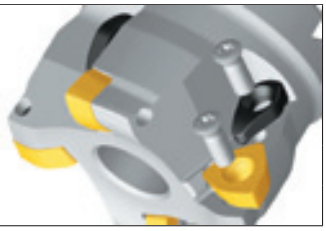
Specification of tools

Type		Stock	Basic dimensions(mm)					Number of teeth Z	Type of coupling	Weight (kg)
			ØD	a_p	a_e	L	ød			
XMR01	**-050-A22-WP06-04**	△	50	1.5	4.35	40	22	4	A	0.4
	-050-A22-WP08-03	△	50	1.5	5.66	50	22	3	A	0.4
	-063-A22-WP08-04C	△	63	1.5	5.66	50	22	4	A	0.7
	-063-A27-WP08-04C	△	63	1.5	5.66	50	27	4	A	0.7
	-080-A27-WP08-05C	△	80	1.5	5.66	63	27	5	A	1.5
	-100-B32-WP08-06	△	100	1.5	5.66	63	32	6	B	2.2
	-125-B40-WP08-07	△	125	1.5	5.66	63	40	7	B	3.5
	-160-B40-WP08-08	△	160	1.5	5.66	63	40	8	B	6.0
	-063-A22-WP09-03C	△	63	3.0	6.8	50	22	3	A	0.7
	-080-A27-WP09-04C	△	80	3.0	6.8	63	27	4	A	1.4
	-100-B32-WP09-05	△	100	3.0	6.8	63	32	5	B	2.1
	-125-B40-WP09-06	△	125	3.0	6.8	63	40	6	B	3.7
	-160-B40-WP09-07	△	160	3.0	6.8	63	40	7	B	6.3

▲Stock available △Make-to-order

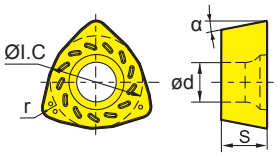
Spare parts

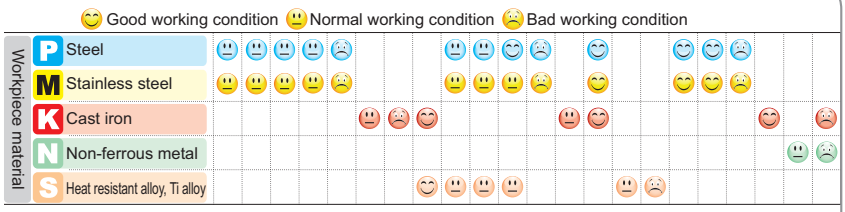
Tool type	Clamp/Insert screw	Clamp	Wrench	
				
XMR01□□-WP06□□	I60M4×8.4	--	WT15S	--
XMR01□□-WP08□□	I60M5×13	WD-208	--	WT20IT
XMR01□□-WP09□□	I60M5×13	WD-208	--	



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

Selection of inserts



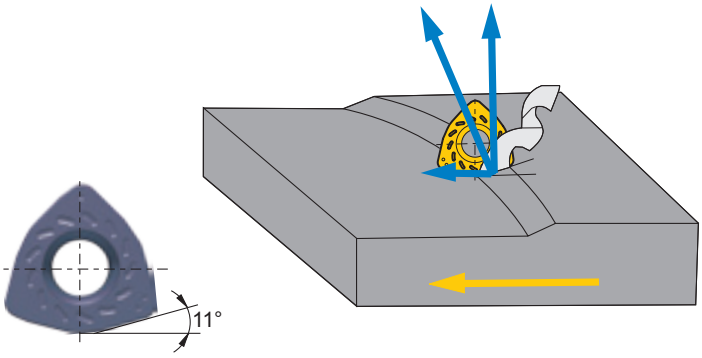


Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating								Cermet		Cemented carbide			
		ØI.C	r	S	ød	α	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	WPGT050315ZSR	7.94	1.5	3.5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

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

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

XMR01 series milling tools

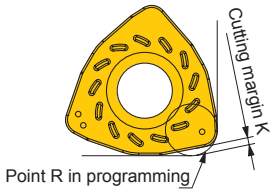


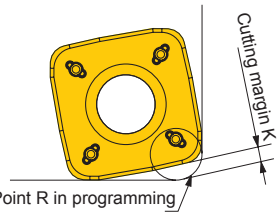


The main feature of high feed tools is to resolve the major cutting force to the axial direction, greatly reducing the radial cutting force, thus improve tool's vibration resistance. In addition, this structure can effectively reduce vibration in long-overhang milling operation.

Approximate R in machining program

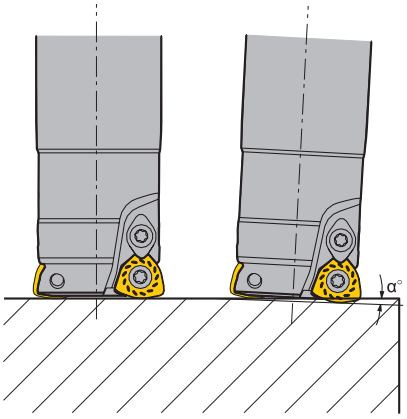
Applicable insert	Approximate R(mm)	Cutting margin K(mm)
WPGT050315ZSR/-PM	2	0.5
WPGT060415ZSR/-PM	2.5	0.7
WPGT080615ZSR/-PM	2.5	0.7
WPGT090725ZSR/-PM	4.5	1.2
SDMT06T208-DM/-PM/NM	1.6	0.5
SDMT09T312-DM/-PM/NM	2.5	0.87
SDMT120412-DM/-PM/NM	4.0	0.93
SDMT150520-DM/-PM/NM	4.0	1.38



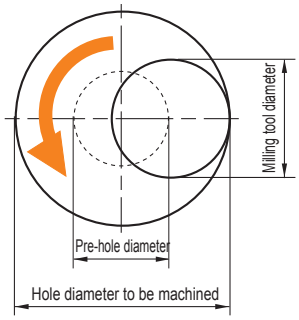


Different machining styles

■ Ramp machining



■ Helical interpolation milling



- Reduce the feed rate in ramp and helical machining operations.
- Set the axial feed rate below 0.2mm/rev in drilling operation.
- Be careful ! Long chips may fly off in drilling operation.
- The cutting depth of each rotation must not exceed the maximum cutting depth (a_p).
- The S-type insert can be used for plunge milling in addition to the machining operations mentioned above.

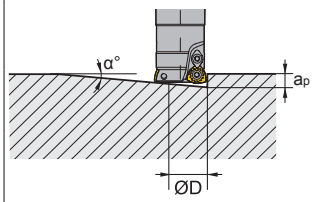
Selection guide for XMR01 series

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

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

Ramp milling, helical interpolation milling

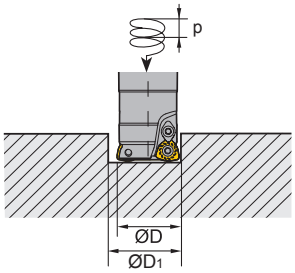
● Ramp milling



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

α:Plunge angle

● Helical interpolation milling



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

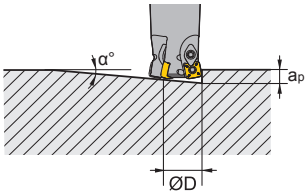
α:Helix angle

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

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

Ramp milling, helical interpolation milling

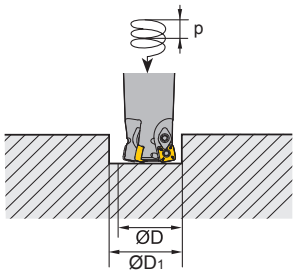
● Ramp milling



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

α:Plunge angle

● Helical interpolation milling



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

α:Helix angle

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

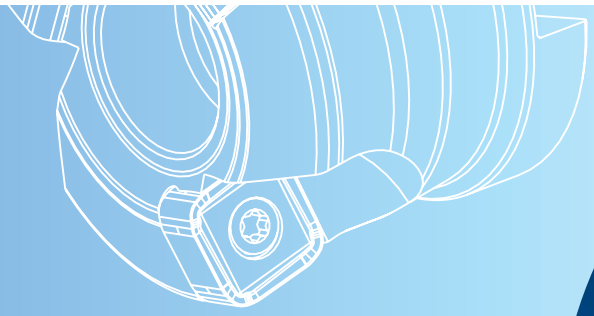
Reduce the feed rate when plunging and circular milling.
For drilling operations (axial) set the feed rate under 0.2mm.
"Attention"—drilling can produce long chips.

Recommended cutting parameters

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

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting speed (m/min)	Ø40		Ø50/63		Ø80/100	
					Axial cutting depth	Feed rate per tooth	Axial cutting depth	Feed rate per tooth	Axial cutting depth	Feed rate per tooth
P	Soft steel Carbon Steel	≤HB180 HB180-280	YBC302 YBM351 YBM253 YBG205 YB9320	170(120-220) 150(100-200)	0.6~1.5	0.8~1.5	0.6~1.5	0.8~1.5	0.6~1.5	0.5~1.5
P	Alloy steel Alloy tool steel	HB280-350	YBC302 YBM351 YBM253 YBG205 YB9320	130(80-180)	0.4~1.2	0.6~1.5	0.4~1.3	0.6~1.5	0.4~1.3	0.5~1.5
P	pre-hardened steel	≤HRC35	YBC302 YBM351 YBM253 YBG205 YB9320	120(80-160)	0.4~1.0	0.5~1.0	0.4~1.3	0.5~1.0	0.4~1.3	0.5~1.0
M	Stainless steel	≤HB270	YBM351 YBM253	120(80-160)	0.8~1.2	0.8~1.2	1.1~1.5	0.9~1.3	1.0~1.5	0.8~1.3
			YBG205 YB9320	120(80-190)						
K	Common cast iron	Tensile strength ≤350MPa	YBG302	150(100-200)	0.6~1.5	0.8~1.6	0.6~1.5	0.8~1.7	0.6~1.5	0.6~1.7
K	Nodular cast iron	Tensile strength ≤800MPa	YBG302	120(80-160)	0.4~1.2	0.6~1.4	0.6~1.3	0.6~1.5	0.4~1.3	0.5~1.5
S	Difficult-to-machine materials	≤400	YBS203	80(60-120)	0.8~1.2	0.6~1.0	1.1~1.5	0.6~1.2	1.0~1.5	0.4~1.2
			YBS303	60(45-110)	0.4~1.0	0.4~1.0	0.6~1.2	0.6~1.0	0.4~1.0	0.4~0.8



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

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

Screw clamping achieves high positioning accuracy and good economy.



XMR03 Series of High Feed Milling Cutter



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



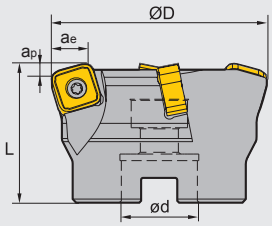
High feed milling cutters



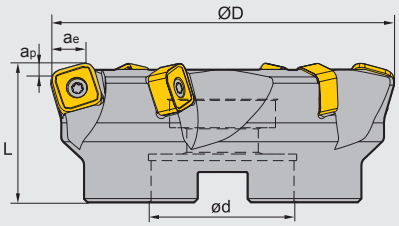
XMR03 P M



A-type coupling



B-type coupling



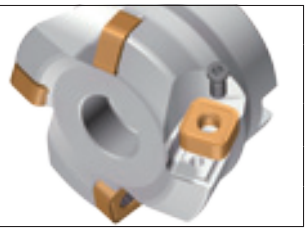
Specification of tools

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

▲Stock available △Make-to-order

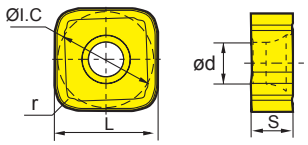
Spare parts

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

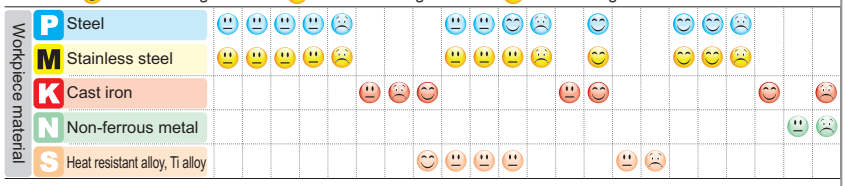


Tools code key B24–B25
Grade selection guide B19–B23
Technical data B234–B240

Selection of inserts



Good working condition Normal working condition Bad working condition



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

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

Recommended cutting parameters

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

XMR03series milling cutter processing case

Workpiece：718H(HRC 34)

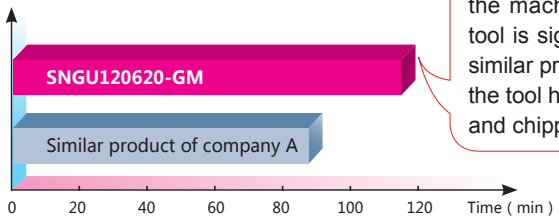
Toolholder：XMR03-050-A22-SN12-03

Insert：SNGU120620-GM/YB9320

Cutting parameter：

Vc=142m/min， fz=1.25mm/z，

ap=0.8mm



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

T-slot milling tools

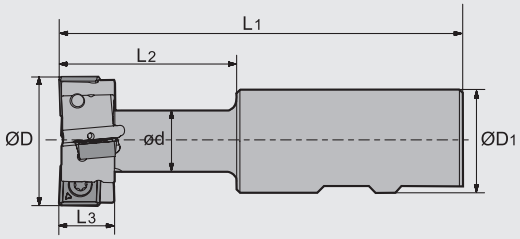
Kr:90°


Machining T slot

TMP01 K



Weldon shank



Specification of tools

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

▲Stock available △Make-to-order

Spare parts

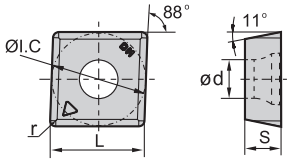
Tool type	Screw	Wrench	
			
TMP01-021-XP25-MP06-01	I60M2.5×5.5	WT07IP	--
TMP01-025-XP25-MP06-01	I60M2.5×5.5		
TMP01-032-XP32-MP08-02	I60M3×7	WT10IP	--
TMP01-040-XP32-MP12-02	I60M5×10	--	WT20IT
TMP01-050-XP40-MP12-02	I60M5×10		
TMP01-060-XP50-MP12-02	I60M5×10		

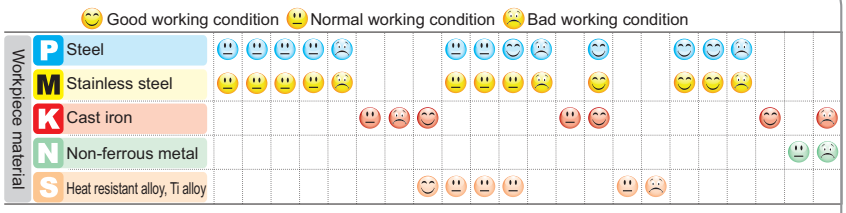


Caution: When installing inserts, make sure the insert nose marked with “DM” or “Δ” is pointing to the slot.

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

Selection of inserts

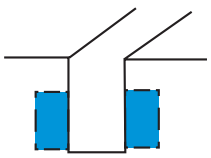




Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating							Cermet		Cemented carbide			
		ØI.C	L	s	ød	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**MPHT060304-DM**	6.35	6.35	3.18	2.8	0.4												★										
	MPHT080305-DM	8.3	8.3	3.18	3.4	0.5												★										
	MPHT120408-DM	12.7	12.7	4.76	5.56	0.8												★										

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

◆Workpiece before machining



Recommended cutting parameters

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

Helical milling

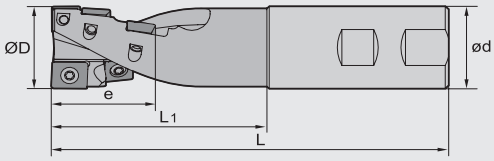
Kr:90°

Side milling Slot milling

HMP01 P K



Weldon shank



Specification of tools

Type		Stock		Basic dimensions(mm)					Number of flute Z	Number of inserts		Shank type
		R	L	ØD	ød	e	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–B25
Grade selection guide B19–B23
Technical data B234–B240

Helical milling

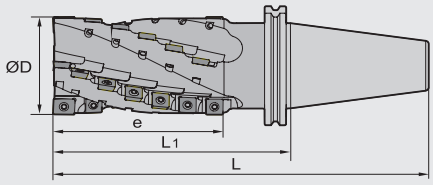
Kr:90°

Side milling Slot milling

HMP01 P K



JT shank/ BT shank (JT shank shown)



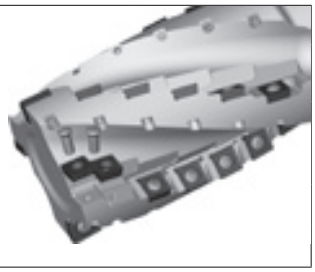
Specification of tools

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

▲Stock available △Make-to-order

Spare parts

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



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

Helical milling

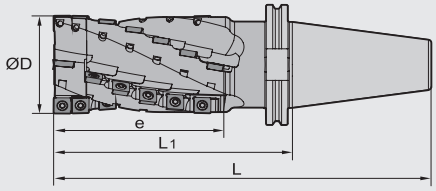
Kr:90°

Side milling Slot milling

HMP01 EC P K



JT shank/ BT shank (JT shank shown)



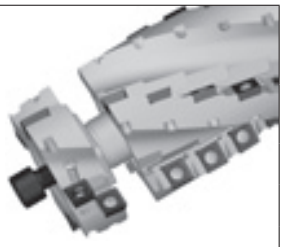
Specification of tools

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

▲Stock available △Make-to-order

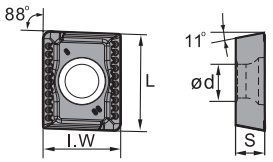
Spare parts

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



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

Selection of inserts



Good working condition Normal working condition Bad working condition

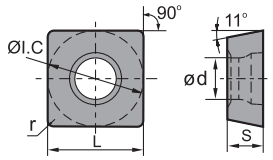
Workpiece material

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

Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	I.W	S	ød	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**APKT150412-PM**	16.33	12.7	4.76	5.4	1.2				★								●									
	APKT150412-KM	16.33	12.7	4.76	5.4	1.2												●	○								

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

Selection of inserts



Good working condition Normal working condition Bad working condition

Workpiece material

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

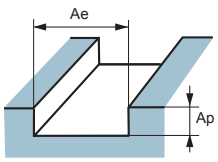
Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	ØI.C	S	ød	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**SPMT120408-PM**	12.7	12.7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

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

Chipbreaker selection for HMP01 milling inserts

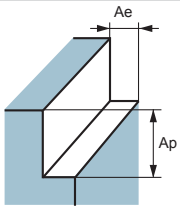
Classification \ Function	For semi-finishing	For roughing
P	-PM	-PM
K	-KM	-KM

A Slot milling



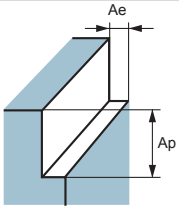
Ae=D
Ap=0.5D(cast iron)
Maximum 12mm(steel)

B Square shoulder milling



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

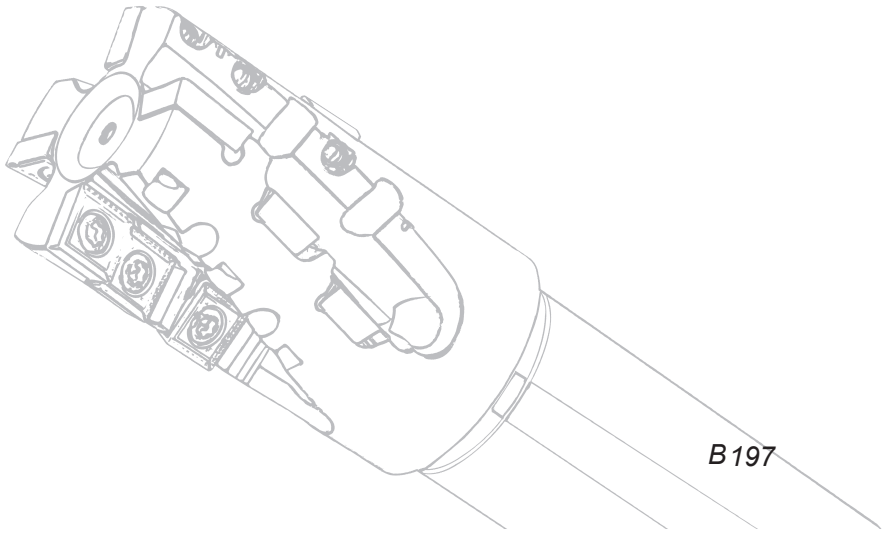
C Narrow shoulder milling



Ae=0.1D
Ap≤Maximum cutting length

Recommended cutting parameters

Workpiece material		Hardness HB	Insert grade	Cutting parameters		Operation (figure)
				Cutting speed(m/min)	Feed speed(mm/z)	
P	Low-carbon steel、Soft steel	⩽180	YBM253 YBG302	80(60-90)	0.25(0.1-0.35)	A
				90(70-120)	0.3(0.15-0.4)	B
				90(70-120)	0.3(0.15-0.4)	C
	High-carbon steel、Alloy steel	180-280	YBM253 YBG302	70(60-100)	0.2(0.1-0.35)	A
				80(60-120)	0.25(0.15-0.35)	B
				90(70-120)	0.25(0.15-0.35)	C
	Alloy tool steel	280-350	YBM253 YBG302	50(40-80)	0.15(0.08-0.25)	A
				60(50-100)	0.2(0.1-0.35)	B
				70(50-100)	0.2(0.1-0.35)	C
K	Cast iron	180-250	YBG152 YBG302	70(50-100)	0.2(0.1-0.35)	A
				80(60-120)	0.25(0.15-0.35)	B
				90(80-120)	0.25(0.15-0.35)	C



Chamfer milling

Kr:30°

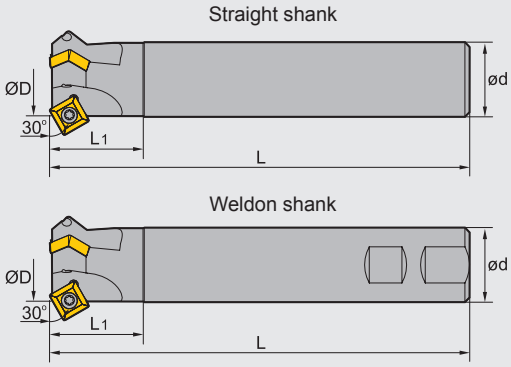

Chamfering


Face milling


Hole stomata chamfer

CMZ01 P M K



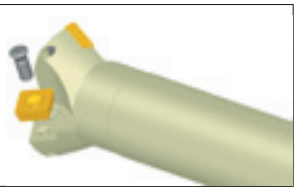


Specification of tools

Type		Stock	Basic dimensions(mm)				Number of teeth Z	Weight (kg)
			ØD	ød	L	L_1		
CMZ01 Straight shank	**-012-G20-SP12-01**	△	12	20	100	40	1	0.2
	-025-G25-SP12-02	△	25	25	120	40	2	0.8
	-032-G32-SP12-03	△	32	32	180	40	3	1.1
Weldon shank	**-012-XP20-SP12-01**	△	12	20	100	40	1	0.2
	-025-XP25-SP12-02	△	25	25	120	40	2	0.6
	-032-XP32-SP12-03	△	32	32	180	40	3	1.0

▲Stock available △Make-to-order

Spare parts

Diameter ØD	Screw	Wrench	
			
Ø12-Ø32	I43M5×11	WT20IS	

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

Chamfer milling

Kr:45°

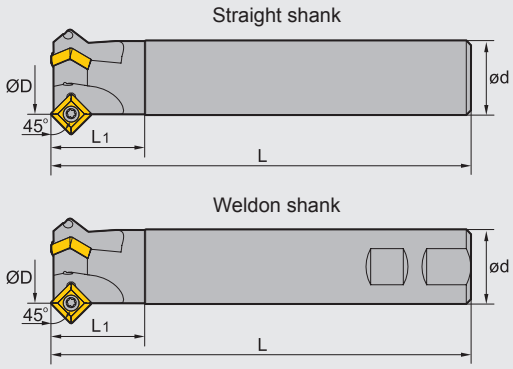

Chamfering


Face milling


Hole stomata chamfer

CMA01 P M K



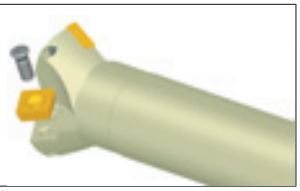


Specification of tools

Type		Stock	Basic dimensions(mm)				Number of teeth Z	Weight (kg)
			ØD	ød	L	L_1		
CMA01 Straight shank	**-012-G20-SP12-01**	▲	12	20	100	40	1	0.2
	-025-G25-SP12-02	▲	25	25	120	40	2	0.8
	-032-G32-SP12-03	▲	32	32	180	40	3	1.1
Weldon shank	**-012-XP20-SP12-01**	▲	12	20	100	40	1	0.2
	-025-XP25-SP12-02	▲	25	25	120	40	2	0.6
	-032-XP32-SP12-03	▲	32	32	180	40	3	1.0

▲Stock available △Make-to-order

Spare parts

Diameter ØD	Screw	Wrench	
			
Ø12-Ø32	I43M5×11	WT20IS	

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

Chamfer milling tools

Kr:60°


Chamfering

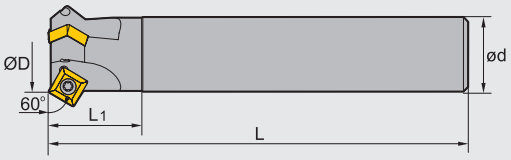

Face milling


Hole stomata chamfer

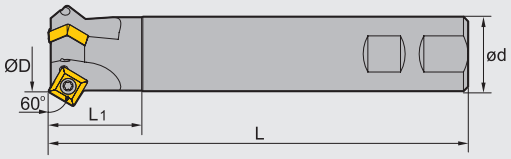
CMD01 P M K



Straight shank



Weldon shank

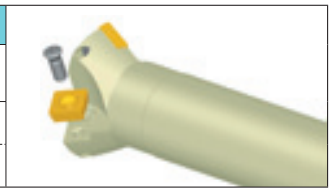


Specification of tools

Type		Stock	Basic dimensions(mm)				Number of teeth Z	Weight (kg)
			ØD	ød	L	L_1		
CMD01 Straight shank	**-012-G20-SP12-01**	▲	12	20	100	40	1	0.2
	-025-G25-SP12-02	▲	25	25	120	40	2	0.8
	-036-G32-SP12-03	▲	36	32	180	40	3	1.0
Straight shank	**-012-XP20-SP12-01**	▲	12	20	100	40	1	0.2
	-025-XP25-SP12-02	▲	25	25	120	40	2	0.6
	-036-XP32-SP12-03	▲	36	32	180	40	3	1.0

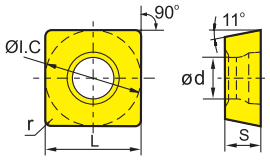
▲Stock available △Make-to-order

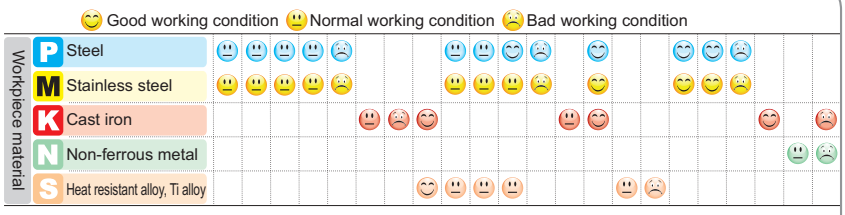
Spare parts

Diameter ØD	Screw	Wrench	
			
Ø12-Ø36	I43M5×11	WT20IS	

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

Selection of inserts





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

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

Recommended cutting parameters

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

PCD&PCBN inserts

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

Inserts for face milling

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

Inserts for face milling


SEET□PER-APF | SEET□PER-APM | SEET□PER-APR | WNHU-GM | WNHU-LH | RCKT-DM | RCKT-DR | RCKT-ER

Page	B221	B221	B221	B231	B231	B216	B216	B216


RCKT-NM | RCMW | RDKW□MO | RDKT□MO | RDKT□MO-NM

Page	B216	B216	B217	B217	B217

Inserts for square shoulder milling


APHT-AL | APKT-APF | APKT-APM | APKT-ALH | ANGX□PNR-GM | ANMX□PNR-GM | ANGX□PNR-LH | LNKT-GM

Page	B206	B207	B207	B207	B208	B208	B208	B210


LNKT-GL | LNMT-GM

Page	B210	B210

Inserts for profile milling


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

Page	B232	B233	B218/B224	B217	B232	B233	B233

Inserts for side and face milling


LNGX-GM | XSEQ | MPHT | QC□□L

Page	B209	B232	B210	B215

Inserts for high feed


SDMT-DM | SDMT-PM | SDMT-NM | WPGT | WPGT-PM | SNGU-GM

Page	B218	B218	B218	B231	B231	B223

Inserts for T-slot milling


MPHT

Page	B210

Inserts for helical milling


APKT-PM/KM | SPMT-PM/KM

Page	B207	B224

Inserts for chamfer milling

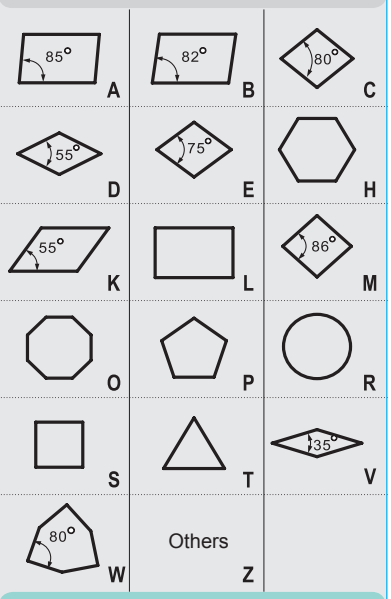

SPMT

Page	B224

Indexable milling inserts code key

Insert shape

Insert Shape / Code



Chipbreaker and clamping system

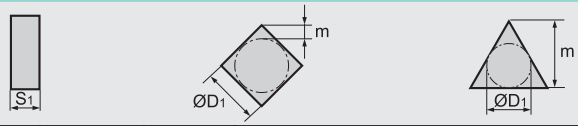
Metric							
Code	With/Without hole	With/Without chipbreaker	Section plane of Insert	Code	With/Without hole	With/Without chipbreaker	Section plane of Insert
B	With	Without	>65°	N	Without	Without	
H	With	Single-side	>65°	R	Without	Single-side	
C	With	Without	>65°	F	Without	Double-side	
J	With	Double-side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

S P K N

Clearance angle of main cutting edge

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

Tolerance



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

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

● Nose height tolerance(mm)

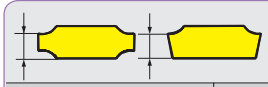
Inscribed circle	Regular triangle	Square	Diamond with 80°	Diamond with 55°	Diamond with 35°	Round
6.35	±0.08	±0.08	±0.08	±0.11	±0.16	---
9.525	±0.08	±0.08	±0.08	±0.11	±0.16	---
12.7	±0.13	±0.13	±0.13	±0.15	---	---
15.875	±0.15	±0.15	±0.15	±0.18	---	---
19.05	±0.15	±0.15	±0.15	±0.18	---	---
25.4	---	±0.18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

● Tolerance of Inscribed Circle ØD1(mm)

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

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

Length of cutting edge



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

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

Insert thickness

12 04 ED T21 R -DM

Wiper

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

Chamfer (mm)

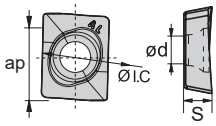
F	0-5°	0-0.10	K
E	1-10°	1-0.15	P
	2-15°	2-0.20	
	3-20°	3-0.25	
T	4-25°	4-0.30	W
	5-30°	5-0.35	
		6-0.40	
S		7-0.45	No mark

Chipbreaker code

Cutting direction

R	Right hand
L	Left hand
N	Neutral

APㅁㅁ



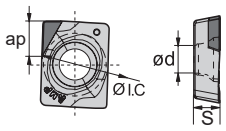
Good working condition Normal working condition Bad working condition

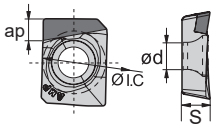
Workpiece material				
	K Cast iron		☺	☹
	N Non ferrous metal	😐		😐

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

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

APㅁㅁ





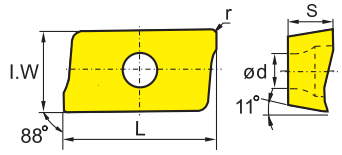
Good working condition Normal working condition Bad working condition

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

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

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

APKT



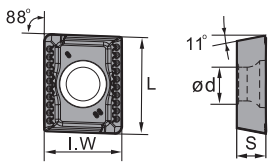
Good working condition Normal working condition Bad working condition

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

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

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

APKT



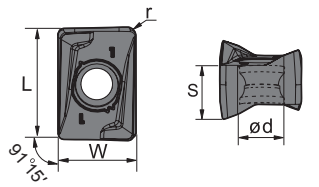
Good working condition Normal working condition Bad working condition

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

Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	I.W	S	ød	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	APKT150412-PM	16.33	12.7	4.76	5.4	1.2				★								●										
	APKT150412-KM	16.33	12.7	4.76	5.4	1.2												●	○									

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

AN□□



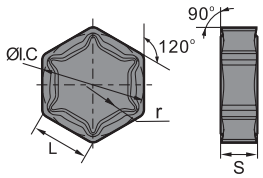
Good working condition Normal working condition Bad working condition

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

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

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

HN□□



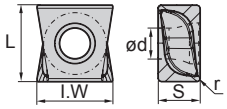
Good working condition Normal working condition Bad working condition

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

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

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

LN□□



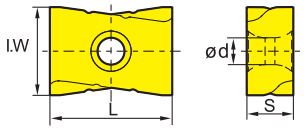
Good working condition Normal working condition Bad working condition

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

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

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

LN□□



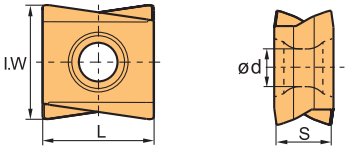
Good working condition Normal working condition Bad working condition

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

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

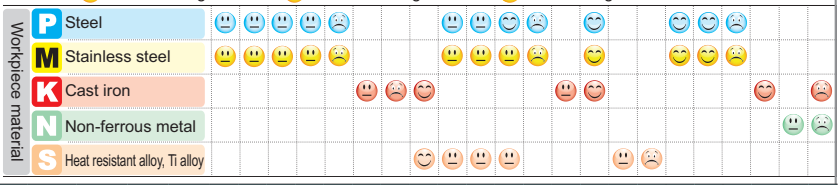
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

LN□□



Good working condition Normal working condition Bad working condition

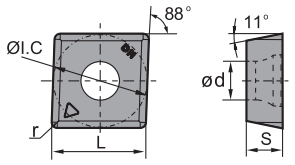
Workpiece material



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

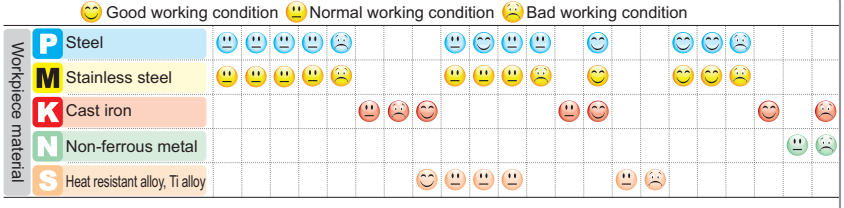
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

MP□□



Good working condition Normal working condition Bad working condition

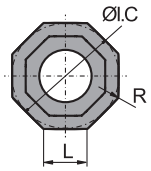
Workpiece material



Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating								Cermet		Cemented carbide			
		ØI.C	L	s	ød	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**MPHT060304-DM**	6.35	6.35	3.18	2.8	0.4												★									
	MPHT080305-DM	8.3	8.3	3.18	3.4	0.5												★									
	MPHT120408-DM	12.7	12.7	4.76	5.56	0.8												★									

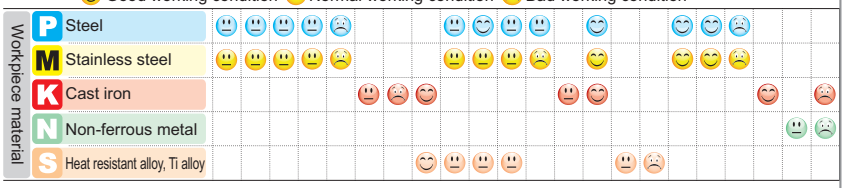
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

OF□□



Good working condition Normal working condition Bad working condition

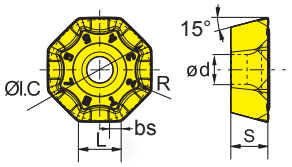
Workpiece material



Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating									Cermet		Cemented carbide			
		L	ØI.C	S	ød	R	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	OFKT05T3-DF	5.26	12.7	3.97	4.4	0.5								○	★	★												
	OFKT05T3-DM	5.26	12.7	3.97	4.4	0.5			○			○	○	★	★	★	★	★										
	OFKT05T3-LH	5.26	12.7	3.97	4.4	0.5																				○		

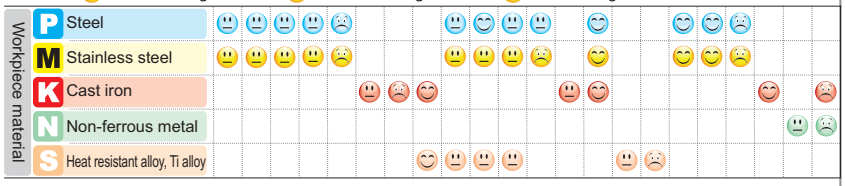
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

OD□□



Good working condition Normal working condition Bad working condition

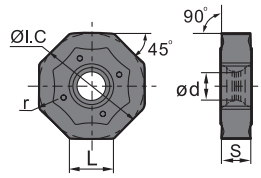
Workpiece material



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

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

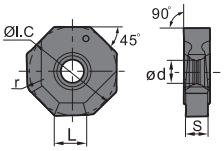
ON□□



Good working condition Normal working condition Bad working condition

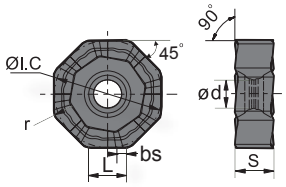
Workpiece material
- P Steel
- M Stainless steel
- K Cast iron
- N Non-ferrous metal
- S Heat resistant alloy, Ti alloy

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



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

ON□□



Good working condition Normal working condition Bad working condition

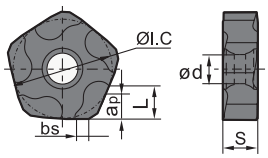
Workpiece material
- P Steel
- M Stainless steel
- K Cast iron
- N Non-ferrous metal
- S Heat resistant alloy, Ti alloy

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

●Inserts are suitable for both left and right cuts.

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

PN□□



Good working condition Normal working condition Bad working condition

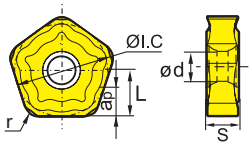
Workpiece material

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

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

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

PN□□



Good working condition Normal working condition Bad working condition

Workpiece material

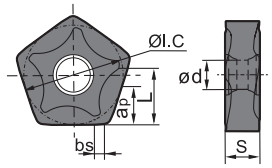
P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	ØI.C	S	ød	r	apmax	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	PNEG110512-GL	7.5	15.875	5.56	4.64	1.2	5.5				●						●	★											
	PNEG110530-GM	7.5	15.875	5.56	4.64	3.0	5.5				●						●	★											
	PNEG110530-GH	7.5	15.875	5.56	4.64	3.0	5.5				●						●	★											

●Inserts are suitable for both left and right cuts.

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

PN□□



Good working condition Normal working condition Bad working condition

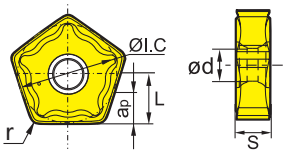
Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	ØI.C	S	ød	bs	a_{pmax}	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	PNEG110512R-PF	7.5	15.875	5.56	4.64	1.4	7.5		★		●																		
	PNEG110512L-PF	7.5	15.875	5.56	4.64	1.4	7.5		★		●																		
	PNEG110512R-PM	7.5	15.875	5.56	4.64	1.4	7.5		★		●																		
	PNEG110512L-PM	7.5	15.875	5.56	4.64	1.4	7.5		★		●																		
	PNEG110512R-PR	7.5	15.875	5.56	4.64	1.4	7.5		★		●																		
	PNEG110512L-PR	7.5	15.875	5.56	4.64	1.4	7.5		★		●																		

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

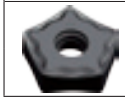
PN□□



Good working condition Normal working condition Bad working condition

Workpiece material

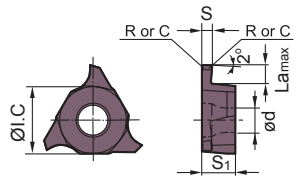
P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	ØI.C	S	ød	r	a_{pmax}	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	PNEG110512-KL	6.5	15.875	5.56	4.64	1.2	6.5						●	●															
	PNEG110512-KM	6.5	15.875	5.56	4.64	1.2	6.5						●	●															
	PNEG110512-KH	6.5	15.875	5.56	4.64	1.2	6.5						●	●															

●Inserts are suitable for both left and right cuts.

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

QC□□



Good working condition Normal working condition Bad working condition

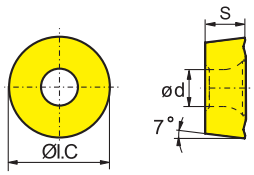
Workpiece material

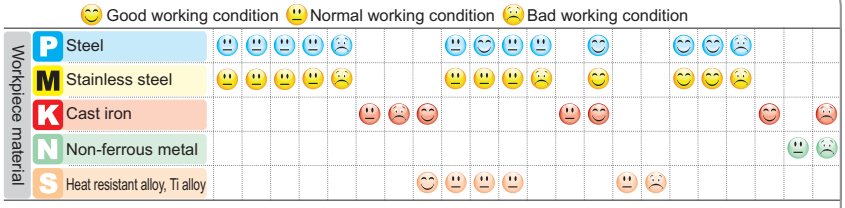
- P Steel
- M Stainless steel
- K Cast iron
- N Non-ferrous metal
- S Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating										Cermet		Cemented carbide			
		S±0.025	Lamax	R/C	ØI.C	S1	ød	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	QC16L110-R01	1.10	2.00	R0.1	9.525	3.18	4.4									○	○												
	QC16L125-R02	1.25	2.00	R0.2	9.525	3.18	4.4									○	○												
	QC16L145-R02	1.45	2.00	R0.2	9.525	3.18	4.4									○	○												
	QC16L150-R02	1.50	2.00	R0.2	9.525	3.18	4.4									○	★												
	QC16L175-R02	1.75	2.00	R0.2	9.525	3.18	4.4									○	○												
	QC16L185-R02	1.85	2.50	R0.2	9.525	3.18	4.4									○	○												
	QC16L200-R02	2.00	2.50	R0.2	9.525	3.18	4.4									○	★												
	QC16L250-R02	2.50	2.50	R0.2	9.525	3.18	4.4									○	★												
	QC16L300-R02	3.00	3.00	R0.2	9.525	3.18	4.4									○	★												
	QC22L125-R02	1.25	2.00	R0.2	12.70	4.76	5.5									○	○												
	QC22L145-R02	1.45	2.00	R0.2	12.70	4.76	5.5									○	○												
	QC22L150-R02	1.50	3.50	R0.2	12.70	4.76	5.5									○	★												
	QC22L175-R02	1.75	3.50	R0.2	12.70	4.76	5.5									○	○												
	QC22L185-R02	1.85	3.50	R0.2	12.70	4.76	5.5									○	○												
	QC22L200-R02	2.00	3.50	R0.2	12.70	4.76	5.5									○	★												
	QC22L230-R02	2.30	3.50	R0.2	12.70	4.76	5.5									○	○												
	QC22L250-R03	2.50	4.00	R0.3	12.70	4.76	5.5									○	★												
	QC22L265-R03	2.65	4.00	R0.3	12.70	4.76	5.5									○	○												
	QC22L280-R03	2.80	4.00	R0.3	12.70	4.76	5.5									○	○												
	QC22L300-R03	3.00	4.00	R0.3	12.70	4.76	5.5									○	★												
	QC22L320-R03	3.20	4.00	R0.3	12.70	4.76	5.5									○	○												
	QC22L330-R03	3.30	4.00	R0.3	12.70	4.76	5.5									○	○												
	QC22L350-R03	3.50	5.00	R0.3	12.70	4.76	5.5									○	★												
	QC22L400-R04	4.00	5.00	R0.4	12.70	4.76	5.5									○	★												
	QC22L430-R04	4.30	5.00	R0.4	12.70	4.76	5.5									○	○												
	QC22L450-R04	4.50	5.00	R0.4	12.70	4.76	5.5									○	○												
	QC22L480-R04	4.80	5.00	R0.4	12.70	5.06	5.5									○	○												

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

RC□□

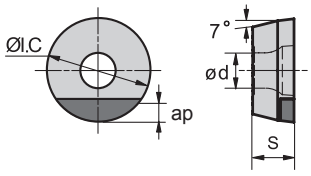


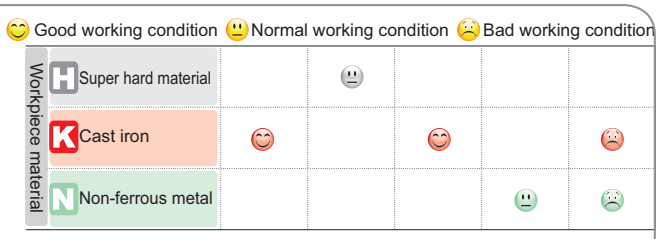


Insert shape	Type	Basic dimensions(mm)			CVD Coating							PVD Coating									Cermet		Cemented carbide			
		ØI.C	S	ød	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**RCKT10T3MO-DM**	10.0	3.97	4.4	●								●	★												
	**RCKT1204MO-DM**	12.0	4.76	4.0	●		●		●	○			●	★		●										
	RCKT1606MO-DM	16.0	6.35	5.56	●											●										
	**RCKT1204MO-DR**	12.0	4.76	4.0	○		○		○				●	★												
	RCKT1606MO-DR	16.0	6.35	5.56	●				●		○		●	★												
	RCKT2006MO-DR	20.0	6.35	6.55	●				●		○		○	★		●										
	**RCKT1204MO-ER**	12.0	4.76	4.0				★																		
	RCKT1606MO-ER	16.0	6.35	5.56				★																		
	RCKT2006MO-ER	20.0	6.35	6.55				★																		
	**RCKT1204MO-NM**	12.0	4.76	4.0				○							○	○			○	○						
	RCKT1606MO-NM	16.0	6.35	5.56				○							○	○			○	○						

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

RC□□

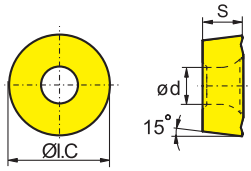




Insert shape	Type	Basic dimensions(mm)				PCBN		Cemented carbide		
		ØI.C	S	ød	apmax	BK1041	BK2531	YD051	YD101	YD201
	**RCMW1204MOBS01225**	12.0	4.76	4.1	2.7	○	○			
	RCMW1204MOAS01225	12.0	4.76	4.1	2.7	○	○			

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

RD□□



Good working condition Normal working condition Bad working condition

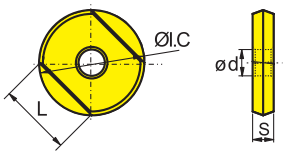
Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)			CVD Coating							PVD Coating									Cermet		Cemented carbide			
		ØI.C	S	ød	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	RDKW0702MO	7	2.38	2.8			○		●				●													
	RDKW0803MO	8	3.18	3.4	○				○				●	★		○										
	RDKW10T3MO	10	3.97	4.4	○				●				●	★												
	RDKW1204MO	12	4.76	4.4	●		●		●				●	★		●										
	RDKW1605MO	16	5.56	5.5	○				○				○	★		○										
	RDKW2006MO	20	6.35	6.5	○				○					○												
	RDKT10T3MO-NM	10	3.97	4.4										○					○	○						

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

RO□□



Good working condition Normal working condition Bad working condition

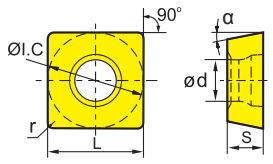
Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)				CVD Coating							PVD Coating									Cermet		Cemented carbide			
		ØI.C	L	S	ød	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	ROHX1203	12	8.5	3	4														○							
	ROHX1604	16	11.3	4	5														○							
	ROHX2005	20	14.1	5	5														○							

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

SD□□



Good working condition Normal working condition Bad working condition

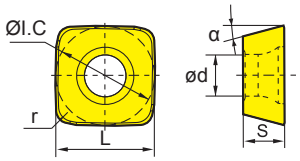
Workpiece material

		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) r	L	ØI.C	S	ød	α	CVD Coating							PVD Coating									Cermet		Cemented carbide			
								YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**SDMT090308**	0.8	9.525	9.525	3.18	4.4	15°			○									○										

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

SD□□



Good working condition Normal working condition Bad working condition

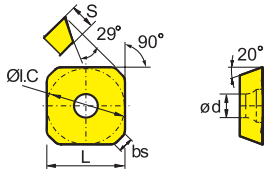
Workpiece material

		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) ØI.C	L	r	S	ød	α	CVD Coating							PVD Coating									Cermet		Cemented carbide			
								YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**SDMT06T208-DM**	6.35	6.35	0.8	2.58	2.5	15°		★			★						●	○				●						
	SDMT09T312-DM	9.525	9.525	1.2	3.97	4.0	15°		★			★						●	○										
	SDMT120412-DM	12.7	12.7	2.0	4.76	4.4	15°		★			★					★	●	○										
	SDMT150520-DM	15.875	15.875	2.0	5.56	5.5	15°		★			★					●	●	○										
	**SDMT06T208-PM**	6.35	6.35	0.8	2.58	2.5	15°		★		○						●					●	●						
	SDMT09T312-PM	9.525	9.525	1.2	3.97	4.0	15°		★		●						●												
	SDMT120412-PM	12.7	12.7	2.0	4.76	4.4	15°		★		●						●												
	SDMT150520-PM	15.875	15.875	2.0	5.56	5.5	15°		★		●						●												
	**SDMT06T208-NM**	6.35	6.35	0.8	2.58	2.5	15°				●												●						
	SDMT09T312-NM	9.525	9.525	1.2	3.97	4.0	15°				○											○	○						
	SDMT120412-NM	12.7	12.7	1.2	4.76	4.4	15°				○							○				○	○						
	SDMT150520-NM	15.875	15.875	2.0	5.56	5.5	15°				●							●					●						

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

SE□□

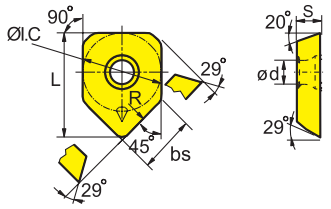


Good working condition Normal working condition Bad working condition

Workpiece material

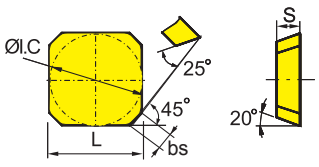
- P Steel
- M Stainless steel
- K Cast iron
- N Non-ferrous metal
- S Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating									Cermet		Cemented carbide			
		L	ØI.C	S	ød	bs	R	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SEET12T3-DF	13.4	13.4	3.97	4.1	2.55	--	●	★	●							★		○										
	SEET12T3-CF	13.4	13.4	3.97	4.1	2.55	--						○		★		★		○										
	SEET12T3-EF	13.4	13.4	3.97	4.1	2.55	--										★		○										
	SEET12T3-DM	13.4	13.4	3.97	4.1	2.55	--	●	★	●		○					★		★										
	SEET18T6-DM	18.0	18.0	6.1	5.5	1.5	--		○		○																		
	SEET12T3-CM	13.4	13.4	3.97	4.1	2.55	--						★				★		○										
	SEET12T3-EM	13.4	13.4	3.97	4.1	2.55	--			●		●					★		★										
	SEET18T6-EM	18.0	18.0	6.1	5.5	1.5	--				○							○											
	SEET12T3-DR	13.4	13.4	3.97	4.1	2.55	--	●	★			●					★		★										
	SEET12T3-CR	13.4	13.4	3.97	4.1	2.55	--	●					★				★		★										
	SEET12T3-LH	13.4	13.4	3.97	4.1	2.55	--																				○	★	
	SEET12T3-W	17.82	13.4	3.97	4.1	9.46	500		★	●			★				★							★					
	SEET18T6-W	24.78	18.0	6.1	5.5	11.0	500										○												

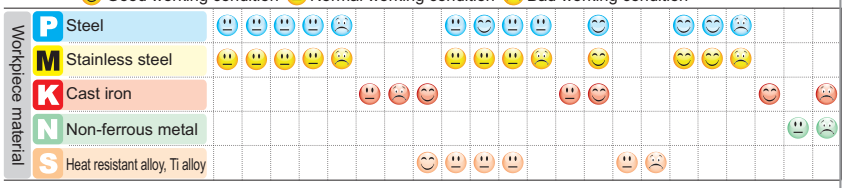


★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

SE□□



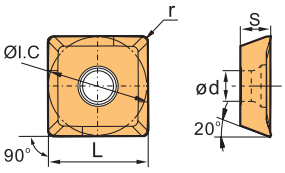
Good working condition Normal working condition Bad working condition



Insert shape	Type	Basic dimensions(mm)				CVD Coating							PVD Coating									Cermet		Cemented carbide			
		L	ØI.C	S	bs	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**SEEN1203AFTN**	12.7	12.7	3.18	1.8									○								●					
	SEKN1203AFFN	12.7	12.7	3.18	1.8								★														
	SEKN1203AFN	12.7	12.7	3.18	1.8	●								○										●			○
	SEKN1203AFTN	12.7	12.7	3.18	1.8	●		●		●				★			○							●			●
	**SEKR1203AFN**	12.7	12.7	3.18	1.8	●								○			○										
	**SEMR1203AN-M**	12.7	12.7	3.3	-										●												
	**SEKR1203AN-M**	12.7	12.7	3.3	-										●												
	**SEKN1504AFN**	15.875	15.875	4.76	1.6	●		●																			●
	SEKN1504AFTN	15.875	15.875	4.76	1.6	○		●		●							○							●			●
	**SEKR1504AFN**	15.875	15.875	4.76	1.6							★					★							●			
	**SEMR1504AN-M**	15.875	15.875	4.9	-										●												
	**SEKR1504AN-M**	15.875	15.875	4.9	-										●												

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

SE□□



Good working condition Normal working condition Bad working condition

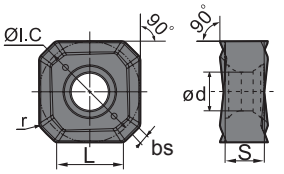
Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	ØI.C	S	ød	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**SEET09T308PER-APF**	9.525	9.525	4.01	3.3	0.8					●	★			●		★											
	SEET120308PER-APF	13.308	13.308	4.04	4.1	0.8					●	★			●		★											
	**SEET09T308PER-APM**	9.525	9.525	4.01	3.3	0.8					●	★			●		★											
	SEET120308PER-APM	13.308	13.308	4.04	4.1	0.8					●	★			●		★											
	**SEET09T308PER-APR**	9.525	9.525	4.01	3.3	0.8					●	★			●		★											
	SEET120308PER-APR	13.308	13.308	4.04	4.1	0.8					●	★			●		★											

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

SN□□

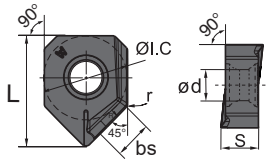


Good working condition Normal working condition Bad working condition

Workpiece material

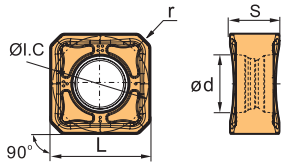
P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	ØI.C	S	bs	ød	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**SNEG1205ANR-GM**	7.6	12.0	4.76	1.05	4.6	0.8		★		★		★				★	★				○	○						
	SNEG1506ANR-GM	9.4	15.0	5.54	1.30	5.5	0.9		★		★		★				★	★					○						
	**SNEG1205ANR-HGR**	7.6	12.0	4.76	1.05	4.6	0.8		★		★			○			★	★										
	SNEG1506ANR-HGR	9.4	15.0	5.54	1.30	5.5	0.9		★		★			○			★	★										
	SNEG1907ANR-HGR	12.1	19.0	7.0	1.67	7.2	1.0		★		★			○			★	★										
	**SNEG1205ANR-W**	15.9	12.0	4.76	4.07	4.6	0.6										●											
	SNEG1506ANR-W	19.9	15.0	5.54	4.97	5.5	0.9										●											



★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

SN□□



Good working condition 😊 Normal working condition 😐 Bad working condition

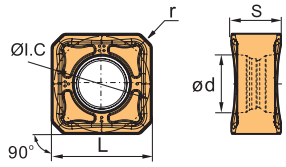
Workpiece material		CVD Coating							PVD Coating									Cermet		Cemented carbide			
		YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
P	Steel	😐	😐	😐	😐	😐	☹			😐	😊	😐	😐		😊			😊	😊	☹			
M	Stainless steel	😐	😐	😐	😐	☹				😐	😐	😐	☹		😊			😊	😊	☹			
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	ød	r	$a_p$max	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SNGX1205ANN-GL	12.7	12.7	6.5	5.9	0.8	6.5				●		●					★										
	SNMX120512-GL	12.7	12.7	6.5	5.9	1.2	6.5				●		●					★										
	SNGX1205ANN-GM	12.7	12.7	6.5	5.9	0.8	6.5				●		●					★				●						
	SNMX1205ANN-GM	12.7	12.7	6.5	5.9	0.8	6.5				●		●					★				●						
	SNMX120512-GM	12.7	12.7	6.5	5.9	1.2	6.5				●		●					★				●						
	SNGX1205ANN-GH	12.7	12.7	6.5	5.9	0.8	6.5				●		●					★										
	SNMX120512-GH	12.7	12.7	6.5	5.9	1.2	6.5				●		●					★										

•Inserts are suitable for both left and right cuts.

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

SN□□



Good working condition 😊 Normal working condition 😐 Bad working condition

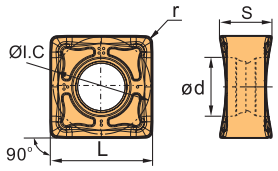
Workpiece material		CVD Coating							PVD Coating									Cermet		Cemented carbide			
		YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
P	Steel	😐	😐	😐	😐	😐	☹			😐	😊	😐	😐		😊			😊	😊	☹			
M	Stainless steel	😐	😐	😐	😐	☹				😐	😐	😐	☹		😊			😊	😊	☹			
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	ød	r	$a_p$max	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SNGX1205ENN-GL	12.7	12.7	6.5	5.9	0.8	8.0				●		●					★										
	SNMX120512-GL	12.7	12.7	6.5	5.9	1.2	8.0				●		●					★										
	SNGX1205ENN-GM	12.7	12.7	6.5	5.9	0.8	8.0				●		●					★				●						
	SNMX120512-GM	12.7	12.7	6.5	5.9	1.2	8.0				●		●					★				●						
	SNGX1205ENN-GH	12.7	12.7	6.5	5.9	0.8	8.0				●		●					★										
	SNMX120512-GH	12.7	12.7	6.5	5.9	1.2	8.0				●		●					★										

•Inserts are suitable for both left and right cuts.

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

SN□□



Good working condition Normal working condition Bad working condition

Workpiece material

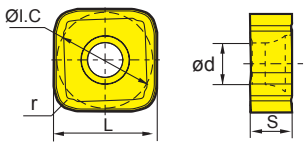
P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating									Cermet		Cemented carbide			
		L	ØI.C	S	ød	r	apmax	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG105	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SNGX1205PNN-GL	12.7	12.7	6.5	5.9	0.8	10.5				●		●					★											
	SNMX120512-GL	12.7	12.7	6.5	5.9	1.2	10.5				●		●					★											
	SNGX1205PNN-GM	12.7	12.7	6.5	5.9	0.8	10.5				●		●					★					●					
	SNMX120512-GM	12.7	12.7	6.5	5.9	1.2	10.5				●		●					★					●					
	SNGX1205PNN-GH	12.7	12.7	6.5	5.9	0.8	10.5				●		●					★										
	SNMX120512-GH	12.7	12.7	6.5	5.9	1.2	10.5				●		●					★										
	SNCU120420-W4	12.7	12.7	4.8	5.9	2	10.5								●														

●Inserts are suitable for both left and right cuts.

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

SN□□



Good working condition Normal working condition Bad working condition

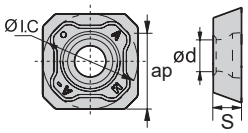
Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating									Cermet		Cemented carbide			
		L	ØI.C	r	S	ød	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SNGU120620-GM	12.7	12.7	2.0	5.6	4.4				●						●	●											

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

SE□□



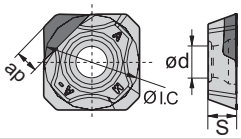
Good working condition 😊 Normal working condition 😐 Bad working condition

Workpiece material			
K Cast iron		😊	☹
N Non ferrous metal	😐		😐

Insert shape	Type	Basic dimensions(mm)				PCD	PCBN	Cemented carbide
		ØI.C	S	ød	$a_p$max	DN1021	BK1021	YD201
	SEHT12T3AFFN-AL	12.7	3.97	4.4	6.6			★

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

SE□□



Good working condition 😊 Normal working condition 😐 Bad working condition

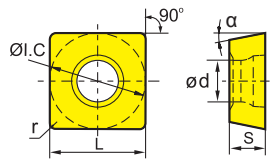
Workpiece material			
K Cast iron		😊	☹
N Non ferrous metal	😐		😐

Insert shape	Type	Basic dimensions(mm)				PCD	PCBN	Cemented carbide
		ØI.C	S	ød	$a_p$max	DN1021	BK1021	YD201
	SEHT12T308AFFN-PCD	12.7	3.97	4.4	2.5	★		
	SEHT12T308AFFN-CBN	12.7	3.97	4.4	2		○	

CBN insert edge can be treated as per machining requirements

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

SP□□



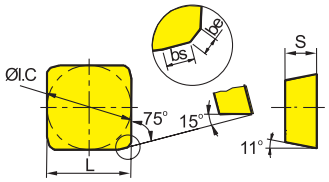
Good working condition 😊 Normal working condition 😐 Bad working condition

Workpiece material																										
P Steel	😐	😐	😐	😐	☹				😐	😐	😊	☹		😊			😊	😊	☹							
M Stainless steel	😐	😐	😐	😐	☹				😐	😐	😐	☹		😊			😊	😊	☹							
K Cast iron						😐	☹	😊					😐	😊						😊		☹				
N Non-ferrous metal																							😐	☹		
S Heat resistant alloy, Ti alloy								😊	😐	😐	😐				☹	☹										

Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating								Cermet		Cemented carbide			
		r	L	ØI.C	S	ød	α	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SPMT060304	0.4	6.35	6.35	3.18	2.8	11°			○									○										
	SPMT120408	0.8	12.7	12.70	4.76	5.5	11°	●		●		●							★							○			
	SPMT120408-PM	0.8	12.7	12.70	4.76	5.5	11°				★								●										
	SPMT120408-KM	0.8	12.7	12.70	4.76	5.5	11°												●	○									
	SPKT1204EDR	--	12.7	12.7	4.76	5.56	11°								★														

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

SP□N



Good working condition Normal working condition Bad working condition

Workpiece material

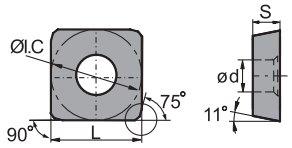
P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating									Cermet		Cemented carbide			
		L	ØI.C	S	be	bs	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SPKN1203EDER	12.7	12.7	3.18	1	1.4									○													
	SPKN1203EDEL	12.7	12.7	3.18	1	1.4									○													
	SPKN1203EDFR	12.7	12.7	3.18	1	1.4								★	○													●
	SPKN1203EDFL	12.7	12.7	3.18	1	1.4								○	○													○
	SPKN1203EDSKR	12.7	12.7	3.18	1	1.4												○							○			
	SPKN1203EDSKL	12.7	12.7	3.18	1	1.4												○							○			
	SPKN1203EDTKR	12.7	12.7	3.18	1	1.4	●				●				○			★							●			○
	SPKN1203EDTKL	12.7	12.7	3.18	1	1.4									○			○							○			○
	SPKN1203EDS31R	12.7	12.7	3.18	1	1.4												○							○			
	SPKN1203EDS31L	12.7	12.7	3.18	1	1.4												○							○			
	SPKN1203EDT31R	12.7	12.7	3.18	1	1.4	●				●				○			★							●			○
	SPKN1203EDT31L	12.7	12.7	3.18	1	1.4									○			○							○			○
	SPKN1504EDER	15.875	15.875	4.76	1	1.4									○													
	SPKN1504EDEL	15.875	15.875	4.76	1	1.4									○													
	SPKN1504EDFR	15.875	15.875	4.76	1	1.4								○	○													○
	SPKN1504EDFL	15.875	15.875	4.76	1	1.4								○	○													○
	SPKN1504EDSKR	15.875	15.875	4.76	1	1.4												○							○			
	SPKN1504EDSKL	15.875	15.875	4.76	1	1.4												○							○			
	SPKN1504EDTKR	15.875	15.875	4.76	1	1.4	●								★			○							●			●
	SPKN1504EDTKL	15.875	15.875	4.76	1	1.4									○			○							○			●
	SPKN1504EDS32R	15.875	15.875	4.76	1	1.4												○							○			
	SPKN1504EDS32L	15.875	15.875	4.76	1	1.4												○							○			
	SPKN1504EDT32R	15.875	15.875	4.76	1	1.4	●								★			○							●			●
	SPKN1504EDT32L	15.875	15.875	4.76	1	1.4									○			○							○			●

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Ordering guide: **SPKN1203EDT3 1 R** chamfering angle 20° , chamfering width 0.15mm. For other edge shapes, see inserts code key standard.

SP□W



Good working condition Normal working condition Bad working condition

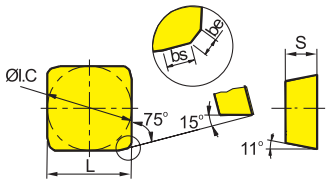
Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating									Cermet		Cemented carbide			
		r	L	ØI.C	S	ød	α	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SPKW1204EDFR	---	12.7	12.7	4.76	5.56	11°									○													
	SPKW1204EDSR	---	12.7	12.7	4.76	5.56	11°									○													

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

SP□R



Good working condition Normal working condition Bad working condition

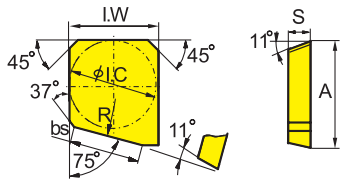
Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating									Cermet		Cemented carbide			
		L	ØI.C	S	be	bs	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SPKR1203EDR-GM	12.7	12.7	3.18	1	1.4			●						★			★							●			●
	SPKR1203EDL-GM	12.7	12.7	3.18	1	1.4			●						★			★							●			●
	SPKR1504EDR-GM	15.875	15.875	4.76	1	1.4			●						★			★							●			●
	SPKR1504EDL-GM	15.875	15.875	4.76	1	1.4			●						★			★							●			●

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

SP□X



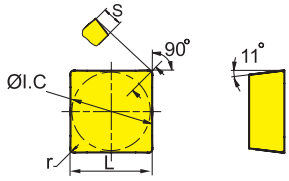
Good working condition Normal working condition Bad working condition

Workpiece material	
P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating								Cermet		Cemented carbide			
		A	ØI.C	l.W	S	bs	R	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SPEX1203EDL-1	15	12.7	12.7	3.18	10	500																						●
	SPEX1203EDR-1	15	12.7	12.7	3.18	10	500																						●
	SPEX1504EDL-1	18.2	15.875	15.875	4.76	10	500																				○		●
	SPEX1504EDR-1	18.2	15.875	15.875	4.76	10	500																				○		●

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

SP□□



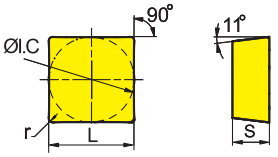
Good working condition Normal working condition Bad working condition

Workpiece material	
P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)				CVD Coating							PVD Coating										Cermet		Cemented carbide			
		L	ØI.C	s	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SPMR090304	9.525	9.525	3.18	0.4			○														○					
	SPMR09T304	9.525	9.525	3.97	0.4									○													
	SPMR090308	9.525	9.525	3.18	0.8			○																			
	SPMR120304	12.7	12.7	3.18	0.4			○														○					
	SPMR120308	12.7	12.7	3.18	0.8			○																			
	SPMR120312	12.7	12.7	3.18	1.2			○		○				○													

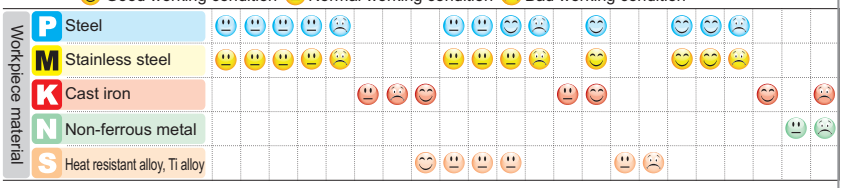
★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

SP□□



Good working condition Normal working condition Bad working condition

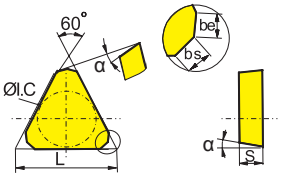
Workpiece material



Insert shape	Type	Basic dimensions(mm)				CVD Coating							PVD Coating									Cermet		Cemented carbide			
		L	ØI.C	s	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	SPUN090304	9.525	9.525	3.18	0.4																				○		
	SPUN090308	9.525	9.525	3.18	0.8																			○		○	
	SPUN120304	12.7	12.7	3.18	0.4																	○		○			○
	SPUN120308	12.7	12.7	3.18	0.8			○		○														●		○	○
	SPUN120312	12.7	12.7	3.18	1.2																			○			
	SPUN150408	15.875	15.875	4.76	0.8																			○			○
	SPUN150412	15.875	15.875	4.76	1.2																			○		○	○
	SPUN190408	19.05	19.05	4.76	0.8																			○		○	
	SPUN190412	19.05	19.05	4.76	1.2																			○			
	SPUN190416	19.05	19.05	4.76	1.6																			○			
	SPGN090304	9.525	9.525	3.18	0.4																	●				●	
	SPGN090308	9.525	9.525	3.18	0.8																				○	○	○
	SPGN120308	12.7	12.7	3.18	0.8									○										●			●
	SPGN120404	12.7	12.7	4.76	0.4																			○			○
	SPGN120408	12.7	12.7	4.76	0.8								○											○			
	SPGN120412	12.7	12.7	4.76	1.2																			○			○
	SPGN150404	15.875	15.875	4.76	0.4																				●	○	
	SPGN150408	15.875	15.875	4.76	0.8																			●			
	SPGN190408	19.05	19.05	4.76	0.8																					○	
	SPGN190416	19.05	19.05	4.76	1.6								○														

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

TP□□



Good working condition Normal working condition Bad working condition

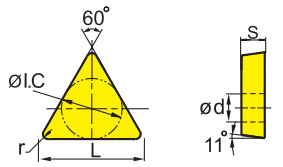
Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	ØI.C	S	be	bs	α	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	TPKN2204PDFR	22	12.7	4.76	1.4	0.7	11°								○														○
	TPKN2204PDFL	22	12.7	4.76	1.4	0.7	11°								○														○
	TPKN2204PDR	22	12.7	4.76	1.4	0.7	11°	●				●			★	★			★							●	○	○	●
	TPKN2204PDL	22	12.7	4.76	1.4	0.7	11°																				●		
	TPKN2204PDTR	22	12.7	4.76	1.4	0.7	11°	●																			●		
	TPKN2204PDTL	22	12.7	4.76	1.4	0.7	11°	○																			○		

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

TP□□



Good working condition Normal working condition Bad working condition

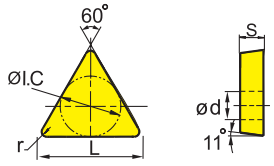
Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)				CVD Coating							PVD Coating									Cermet		Cemented carbide			
		L	ØI.C	s	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	TPGN090204	9.6	5.56	2.38	0.4																					○	
	TPGN090208	9.6	5.56	2.38	0.8																				○		
	TPGN110204	11	6.35	2.38	0.4																					○	
	TPGN110304	11	6.35	3.18	0.4																				○	●	○
	TPGN110308	11	6.35	3.18	0.8																				○		○
	TPGN160304	16.5	9.525	3.18	0.4																			●	○	○	
	TPGN160308	16.5	9.525	3.18	0.8																				○		●
	TPGN160312	16.5	9.525	3.18	1.2																						○
	TPGN160316	16.5	9.525	3.18	1.6																						○
	TPGN220404	22	12.7	4.76	0.4																					○	
	TPGN220408	22	12.7	4.76	0.8																			○			○
	TPGN220412	22	12.7	4.76	1.2																						○
	TPGN270408	27.5	15.875	4.76	0.8																						○

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

TP□□



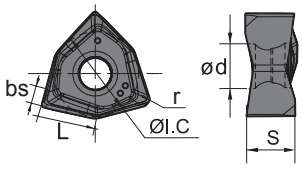
Good working condition Normal working condition Bad working condition

Workpiece material	
P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)				CVD Coating							PVD Coating									Cermet		Cemented carbide			
		L	ØI.C	s	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	**TPUN110208**	11	6.35	2.38	0.8	○																		○			
	TPUN110304	11	6.35	3.18	0.4																			○			
	TPUN110308	11	6.35	3.18	0.8	○																		●		○	○
	TPUN160304	16.5	9.525	3.18	0.4			○																○		○	○
	TPUN160308	16.5	9.525	3.18	0.8			○		○														●		●	○
	TPUN160312	16.5	9.525	3.18	1.2			○																●			
	TPUN160408	16.5	9.525	4.76	0.8																			○			○
	TPUN160412	16.5	9.525	4.76	1.2																			○			○
	TPUN220404	22	12.7	4.76	0.4																					○	
	TPUN220408	22	12.7	4.76	0.8	●		○																●		○	
	TPUN220412	22	12.7	4.76	1.2					○														●			○
	TPUN220416	22	12.7	4.76	1.6																						○
	**TPMR090204**	9.6	5.56	2.38	0.4			○																			
	TPMR110304	11	6.35	3.18	0.4			●														○					
	TPMR110308	11	6.35	3.18	0.8			○														○					
	TPMR160304	16.5	9.525	3.18	0.4			●		○												○		○			
	TPMR160308	16.5	9.525	3.18	0.8			●		●														○			○
	TPMR160312	16.5	9.525	3.18	1.2					○																	
	TPMR220412	22	12.7	4.76	1.2					○																	
	TPMR330916	33	19.05	9.52	1.6												★										

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

WN□□



Good working condition Normal working condition Bad working condition

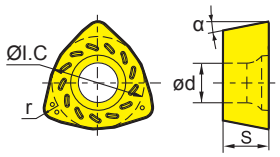
Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating								Cermet		Cemented carbide			
		L	ØI.C	S	ød	bs	r	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	WNHU060404PNR-GM	5.7	9.525	4.0	3.5	1.35	0.4				★		★				★	★											
	WNHU060408PNR-GM	5.7	9.525	4.0	3.5	1.35	0.8				★		★				★	★											
	WNHU080608PNR-GM	7.7	12.7	5.4	4.4	1.6	0.8				★		★				★	★											
	WNHU080612PNR-GM	7.7	12.7	5.4	4.4	1.6	1.2				★		★				★	★											
	WNHU080616PNR-GM	7.7	12.7	5.4	4.4	1.6	1.6				★		★				★	★											
	WNHU080608PNR-LH	7.7	12.7	5.4	4.4	1.6	0.8																				★	

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

WP□□



Good working condition Normal working condition Bad working condition

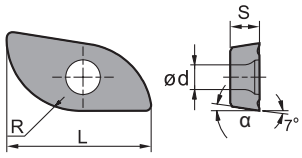
Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating								Cermet		Cemented carbide			
		ØI.C	r	S	ød	α	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	WPGT050315ZSR	7.94	1.5	3.5	4.0	11°		★		●	●																	
	WPGT060415ZSR	9.525	1.5	4.2	4.4	11°		★		●	●						●											
	WPGT080615ZSR	12.85	1.5	6.35	5.5	11°		★		●	●						●											
	WPGT090725ZSR	15.00	2.5	7.00	5.5	11°		★		●	●						●											
	WPGT050315ZSR-PM	7.94	1.5	3.5	4.0	11°		★			●						●											
	WPGT060415ZSR-PM	9.525	1.5	4.2	4.4	11°		★			●						●					○						
	WPGT080615ZSR-PM	12.85	1.5	6.35	5.5	11°		★			●						●					○						
	WPGT090725ZSR-PM	15.00	2.5	7.00	5.5	11°		★			●						●											

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

XP□□



Good working condition Normal working condition Bad working condition

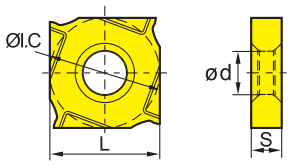
Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)					CVD Coating							PVD Coating							Cermet		Cemented carbide			
		R	ød	S	α	L	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	XPHT16R0803-GM	8	3.1	3.18	9°	16												●									
	XPHT20R10T3-GM	10	4.0	3.97	9°	20												●									
	XPHT25R1204-GM	12.5	4.7	4.76	9°	25												●									
	XPHT30R1506-GM	15	5.8	6.35	11°	30												●									
	XPHT32R1606-GM	16	5.8	6.35	9°	32												●									
	XPHT40R2007-GM	20	6.7	7.94	9°	40												●									
	XPHT50R2507-GM	25	9.2	7.94	9°	50												●									

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

XS□□



Good working condition Normal working condition Bad working condition

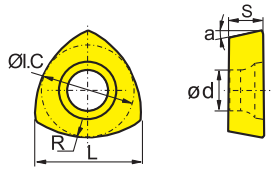
Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)				CVD Coating							PVD Coating								Cermet		Cemented carbide			
		ØI.C	L	S	ød	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	XSEQ1202	12.7	12.7	2.3	5.0												★									
	XSEQ1203	12.7	12.7	3.0	5.0												★									
	XSEQ12T3	12.7	12.7	3.5	5.0												★									
	XSEQ1204	12.7	12.7	4.0	5.0												★									
	XSEQ12T4	12.7	12.7	4.5	5.0												★									

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

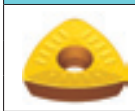
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Good working condition Normal working condition Bad working condition

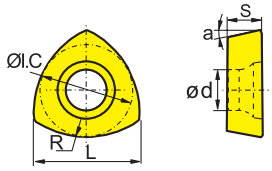
Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating							Cermet		Cemented carbide			
		ØI.C	L	S	R	ød	α	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	ZDET08T2CYR10	6.75	8.4	2.78	10	2.8	14°			○									○										
	ZDET1103CYR12.5	8.5	10.6	3.18	12.5	2.8	14°			○									○										
	ZDET13T3CYR16	10.5	13.2	3.97	16	4.4	14°			○									○										

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

ZP□□



Good working condition Normal working condition Bad working condition

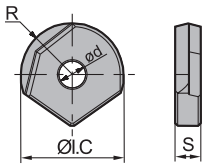
Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

Insert shape	Type	Basic dimensions(mm)						CVD Coating							PVD Coating								Cermet		Cemented carbide			
		ØI.C	L	S	R	ød	α	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	ZPNT2204CY(R20)	12.7	16.1	4.76	20	5.56	11°			○									○										
	ZPNT2204CY(R25)	12.7	16.9	4.76	25	5.56	11°			○									○										
	ZPNT2204CY(R31)	12.7	17.6	4.76	31.5	5.56	11°			○									○										

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

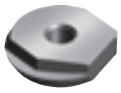
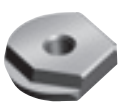
ZO□□



Good working condition Normal working condition Bad working condition

Workpiece material

P	Steel
M	Stainless steel
K	Cast iron
N	Non-ferrous metal
S	Heat resistant alloy, Ti alloy

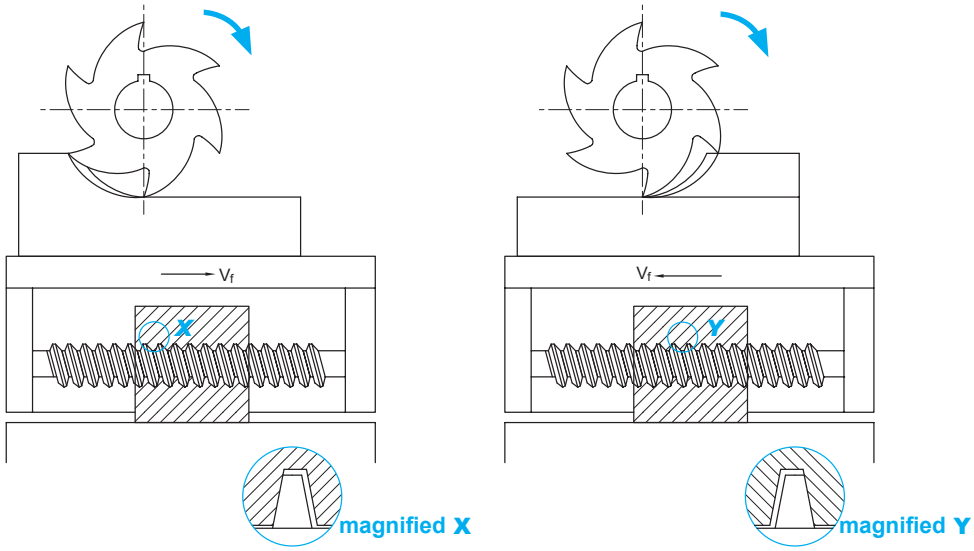
Insert shape	Type	Basic dimensions(mm)				CVD Coating							PVD Coating									Cermet		Cemented carbide			
		R	ØI.C	S	ød	YBC301	YBC302	YBM251	YBM253	YBM351	YBD152	YBD252	YBG102	YBG202	YBG205	YB9320	YBG302	YBG152	YBG252	YBS203	YBS303	YNG151	YNG151C	YC30S	YD051	YD101	YD201
	ZOHX1203-GF	6	12	3	4														●								
	ZOHX1604-GF	8	16	4	5														●								
	ZOHX2005-GF	10	20	5	5														●								
	ZOHX2506-GF	12.5	25	6	6														○								
	ZOHX3007-GF	15	30	7	8														○								
	ZOHX3207-GF	16	32	7	8														○								
	ZOHX1203-GM	6	12	3	4														●								
	ZOHX1604-GM	8	16	4	5														●								
	ZOHX2005-GM	10	20	5	5														●								
	ZOHX2506-GM	12.5	25	6	6														●								
	ZOHX3007-GM	15	30	7	8														●								
	ZOHX3207-GM	16	32	7	8														★								

★Recommended grade (always stock available) ●Available grade (always stock available) ○Make-to-order

Common problems in milling and solutions

Failure			Main points of solution and inspection: Selection of tool material: Material with higher hardness	Selection of tool material: Material with perfect toughness	Cutting condition: Cutting speed	Cutting condition: Feed rate	Cutting condition: Cutting depth	Cutting condition: Change the diameter and width of milling tools	Cutting condition: Cutting liquid	Tool shape: Rake angle	Tool shape: Approach angle	Tool shape: Strength of cutting edge	Tool shape: Number of teeth	Tool shape: Increase the width of chip pocket	Tool shape: Examine the geometry shape of Minor cutting edge.	Tool shape: check the end face run-out	Tool shape: Improve the rigidity of tool	Machine clamping system: Clamping system of workpiece	Machine clamping system: Overhang of tool	Machine clamping system: Power, gap
Fracture of tool nose	severe abrasion on clearance face	Improper cutting condition			↓				✓												
		Unsuitable geometry shape of cutting edge	✓							↑		↓									
	severe abrasion on rake face	Improper cutting condition			↓	↓	↓		✓												
		Unsuitable geometry shape of cutting edge	✓							↑	↓	↓									
	Fracture of cutting edge	Improper cutting condition				↓	↓														
		Unsuitable geometry shape of cutting edge		✓							↓	↑			✓	✓	✓	✓	✓	✓	
	Thermal cracking	Improper cutting condition			↓	↓	↓		✓												
		Unsuitable geometry shape of cutting edge								↑		↓									
	Build-up edge	Improper cutting condition			↑	↑			✓												
		Unsuitable geometry shape of cutting edge								↑		↓									
Machining precision	Bad surface roughness	Abrasion of tool Great vibration of milling tool	✓		↑	↓	↓		✓			↓			Wiper	✓					
	Burrs occuring	Unsuitable geometry shape of cutting edge			↓	↓	↓	✓													
		Improper geometry shape of cutting edge								↑	↑	↓			✓						
	Side collapse	Unsuitable geometry shape of cutting edge				↓	↓														
		Unsuitable geometry shape of cutting edge								↑	↓	↓	↑		✓		✓				
	Planeness and parallelism deterioration	Improper geometry Improper technique				↓	↓			↑	↑		↓		✓	✓	✓	✓	✓	✓	
Other	Vibration	Cutting condition Improper technology			↓	↓	↓	✓		↑	↑	↓					✓	✓	✓	✓	✓
	Chips twisting and jamming	Improper cutting condition			↑	↑↓		✓	✓				↓								
		Unsuitable geometry shape of cutting edge								↑			↓	✓							

Difference and selection between down milling and up milling



Up milling

Down milling

Climb milling (also called down milling): the feed direction of workpiece is the same as that of the milling rotation at the connecting position.

Conventional milling (also called up milling): the feed direction of workpiece is opposite to that of the milling rotation at the connecting position.

In down milling, the major force of cutting edge is the compressive stress, while in up milling is the tensile stress. The compressive strength of cemented carbide material is much larger than its tensile strength. In down milling, as chips become thin from thick gradually, cutting edge and workpiece press against each other. The friction between edge and workpiece is small, thus reducing the abrasion of edge, the hardening of workpiece surface and the surface roughness (Ra). In up milling, chips become thick from thin gradually. When the insert is cutting into the workpiece, it produces strong friction and more heat than in down milling, and make workpiece surface hardened.

In up milling, because horizontal direction of cutting force milling cutter conducting on workpiece is opposite to the feed direction of workpiece, the lead screw of worktable joints closely with one side of the screw nut. In down milling, the direction of cutting force is the same as the feed direction. When edge's radial force on workpiece is large enough, the worktable will bounce left and right, thus make the gap fall behind. The gap will return to the front side with the continuing rotation of lead screw. At this moment the worktable stops motion, however, it will bounce left and right again when the radial cutting force is large enough again. The periodical bounce of worktable will cause poor surface quality of workpiece and tool breakage.

When using end mills for down milling, the edges always starts cutting at the workpiece surface, therefore end mills are not suitable for machining workpiece with hardened surface.

Up milling is recommended for milling thin-wall components or square milling with high requirement for precision.

Pitch selection

Pitch is the distance between one point on one cutting edge and the same point on the next edge. Milling cutters are mainly classified into coarse, close and extra close pitches.

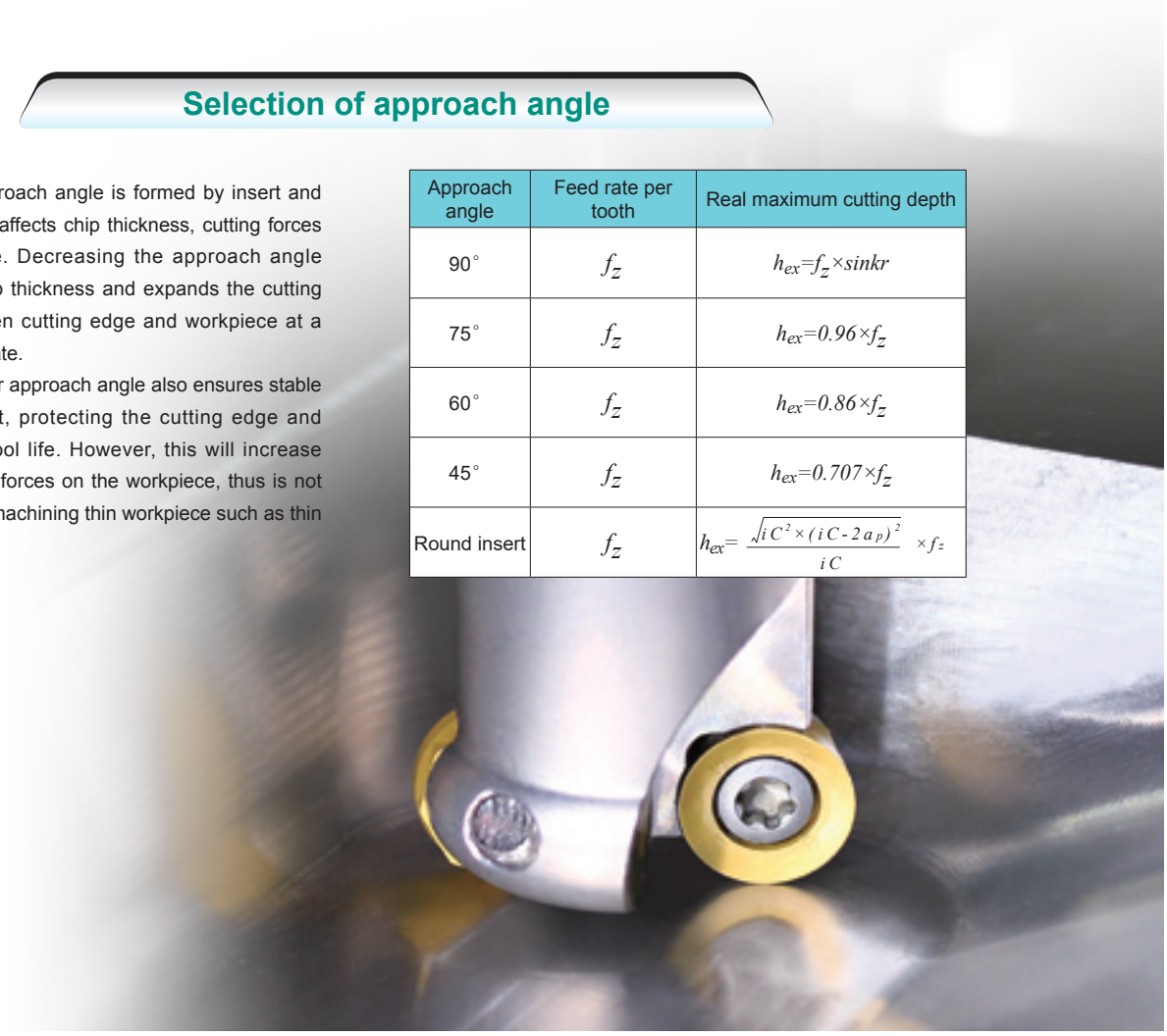
optimized stability		
L (Low)	**M** (Medium)	**H** (High)
Coarse pitch Unequal pitch design 	**Close pitch** 	**Extra close pitch** 
When the milling width is equal to diameter of cutter, the machining system is stable and main power of machine is sufficient, the use of coarse pitch can achieve high productive efficiency.	Used in general milling and multiple mixed productions.	When the milling width is less than diameter of cutter, cutting by maximum edges can achieve high productive efficiency.

Selection of approach angle

The approach angle is formed by insert and tool body. It affects chip thickness, cutting forces and tool-life. Decreasing the approach angle reduces chip thickness and expands the cutting area between cutting edge and workpiece at a given feed rate.

A smaller approach angle also ensures stable entry or exit, protecting the cutting edge and extending tool life. However, this will increase axial cutting forces on the workpiece, thus is not suitable for machining thin workpiece such as thin plate.

Approach angle	Feed rate per tooth	Real maximum cutting depth
90°	f_z	$h_{ex}=f_z \times sinkr$
75°	f_z	$h_{ex}=0.96 \times f_z$
60°	f_z	$h_{ex}=0.86 \times f_z$
45°	f_z	$h_{ex}=0.707 \times f_z$
Round insert	f_z	$h_{ex}=\frac{\sqrt{iC^2 \times (iC-2a_p)^2}}{iC} \times f_z$



General formula

V_c : cutting speed(*m/min*)
D_c : nominal diameter of milling tool(*mm*)
n : spindle speed(*rev/min*)
z_n : number of teeth
Q : metal removal rate(*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_z : feed rate per revolution (*mm/rev*)

- Cutting speed

$$V_c = \frac{\pi \times D_c \times n}{1000} \text{ (m/min)}$$

- Spindle speed

$$n = \frac{1000 \times V_c}{\pi \times D_c} \text{ (rev/min)}$$

- Feed rate of worktable (feed speed)

$$V_f = f_z \times n \times z_n \text{ (mm/min)}$$

- Feed rate per tooth

$$f_z = \frac{V_f}{n \times Z_n} \text{ (mm/z)}$$

- Feed rate per revolution

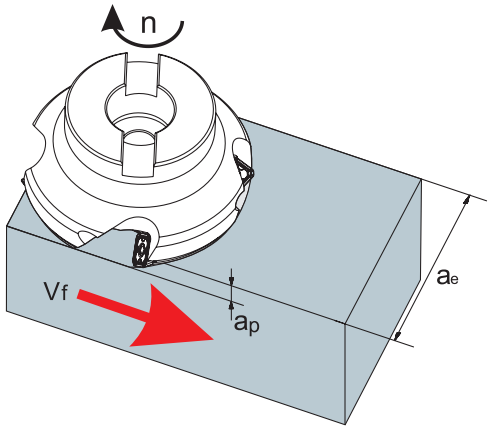
$$f_n = \frac{V_f}{n} \text{ (mm/rev)}$$

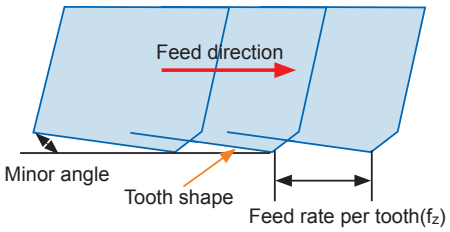
- Machining time

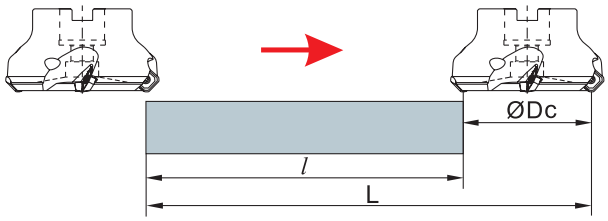
$$T_c = \frac{L}{V_f} \text{ (min)}$$

- Metal removal rate

$$Q = \frac{a_p \times a_e \times V_f}{1000} \text{ (cm^3/min)}$$

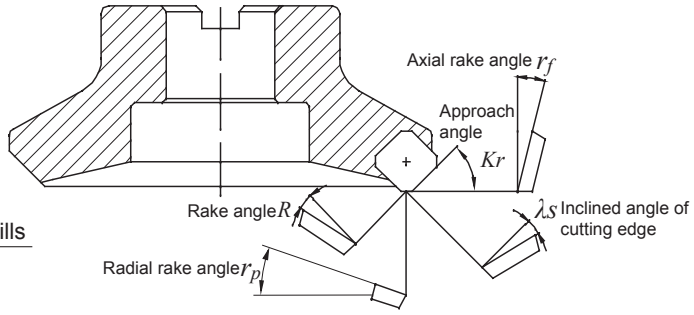






Function of each part in face milling

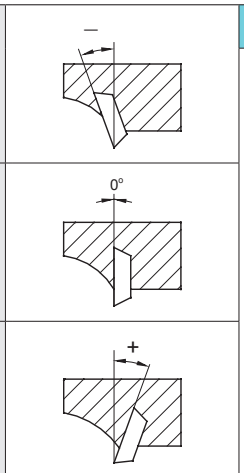
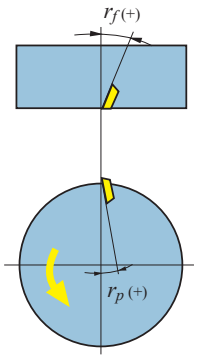
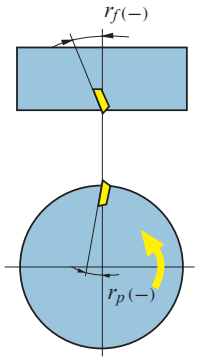
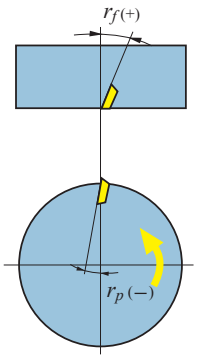
Main angles of face mills



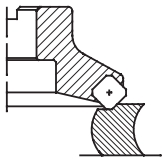
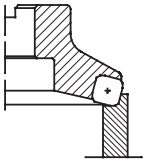
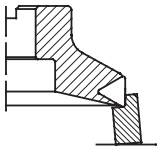
■Main angles of face mills

Designation	Function	Effect		
Axial rake angle r_f	Determining the chip direction	Negative angle, excellent capability of chip removal		
Radial rake angle r_p	Determining whether the cutting is easy and fast or not	Positive angle: good cutting performanc		
Approach angle Kr	Determining the chip thickness	Kr↑, chip thickness↑; Kr↓, chip thickness↓;		
Rake angle R	Determining whether easy and fast the cutting is or not	Poor cutting performance, High-strength cutting edge	(−)←0→(+)	Good cutting performance, Low-strength cutting edge
Inclined angle of cutting edge λs	Determining the chip flow direction	Poor capability of chip removal, High-strength cutting edge	(−)←0→(+)	Good performance of chip removal, Low-strength cutting edge

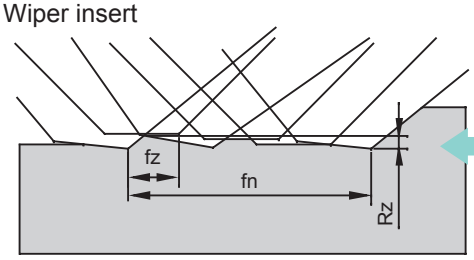
■Characteristics of different rake angles combined

		Double positive rake angle	Double negative rake angle	Positive and negative rake angle
Negative rake angle 0° rake angle Positive rake angle				
Axial rake angle r_f		+	−	+
Radial rake angle r_p		+	−	−
Applicable material machined	**P**	√		√
	M	√		√
	K		√	√
	N	√		
	S	√		√

■Cutting performances of different approach angles

Approach angle	**45°**	**75°**	**90°**
Schematic diagram			
Instruction	Axial force is the largest. It will bend when machining thin-wall workpiece, reducing the precision of workpiece. It can help avoid fringe breakage of workpiece when machining cast iron.	The main force is radial cutting force. It is often used in general face milling.	The axial force is zero in theory, suitable for milling thin plate workpiece.

Wiper insert

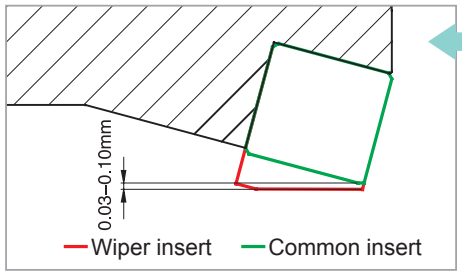


It has axial and radial run-out because tools and inserts have manufacturing tolerance. The axial run-out leads to poor surface roughness.

Solution

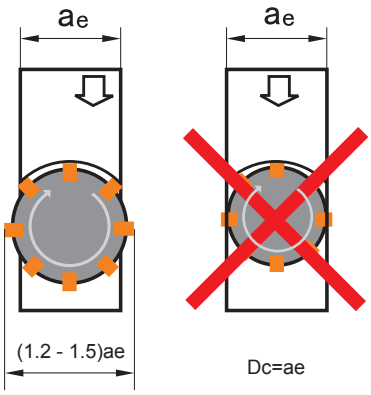
Mounting wiper inserts

usage



The wiper insert must protrude below the other inserts by 0.03-0.10 mm at axial direction, so that the wiping function can take effect. Generally speaking, a cutter just needs only one wiper insert. If the diameter of cutter is much larger or cutter's feed rate per revolution is higher than the length of wiper edge, 2 to 3 wiper inserts can be mounted.

■Selection of cutting width and tool cutting diameter in face milling



Dc：Tool cutting diameter
ae：Cutting width

Generally speaking, the relation between cutting width and tool cutting diameter is Dc=(1.2—1.5) ae.
In practical machining, same center line of tool center and work piece center should be avoided.