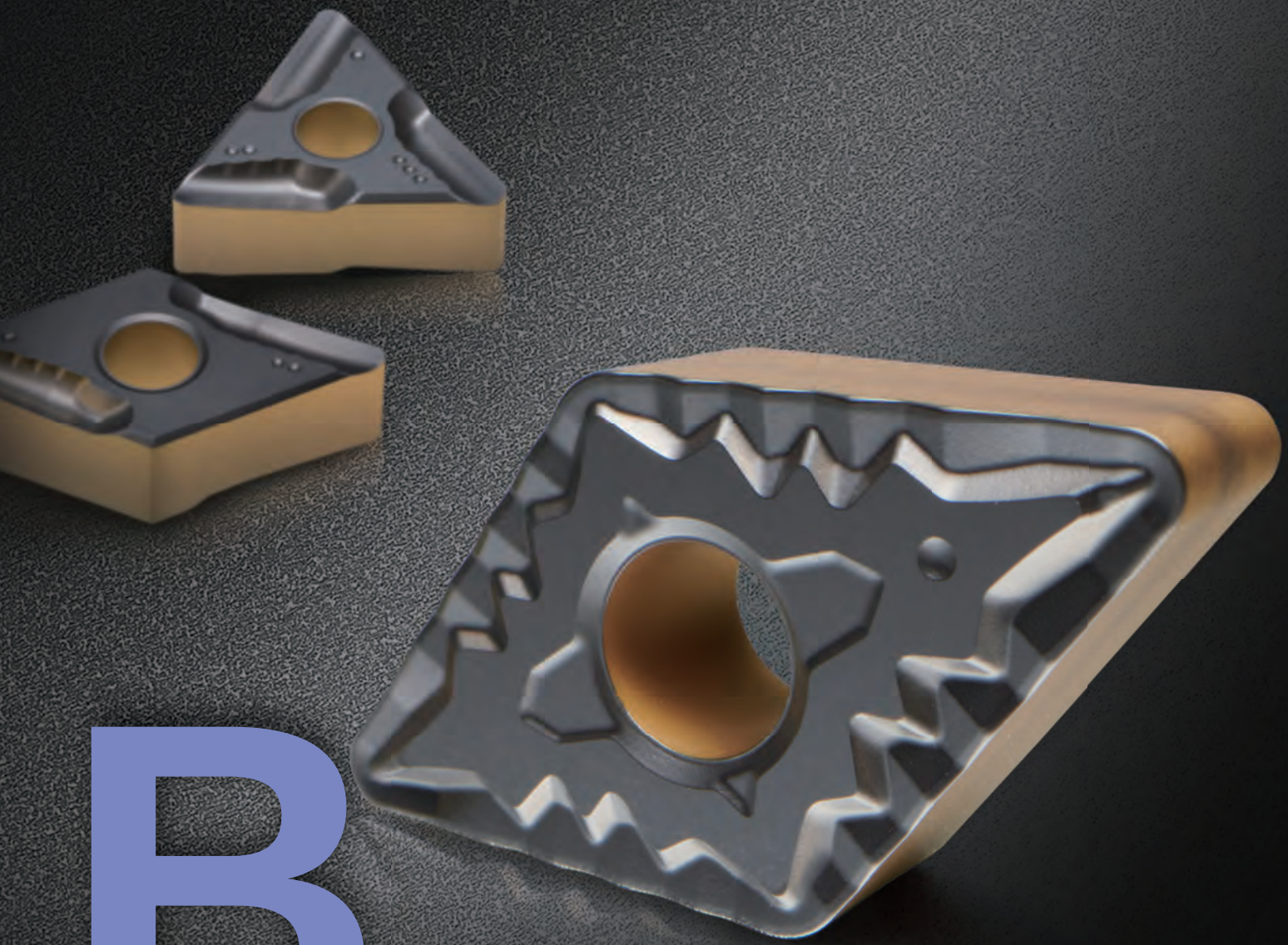
TURNING

Korloy turning tools cover a wide application range with a full line-up of ISO tools that produce high quality and high precision parts all for manufacturers' requirements.



B

Turning Chip Breakers

Inserts

SAVE TURN

Auto Tools

Multi Turn

Bearing Solutions

External Tool Holder

High Pressure Coolant

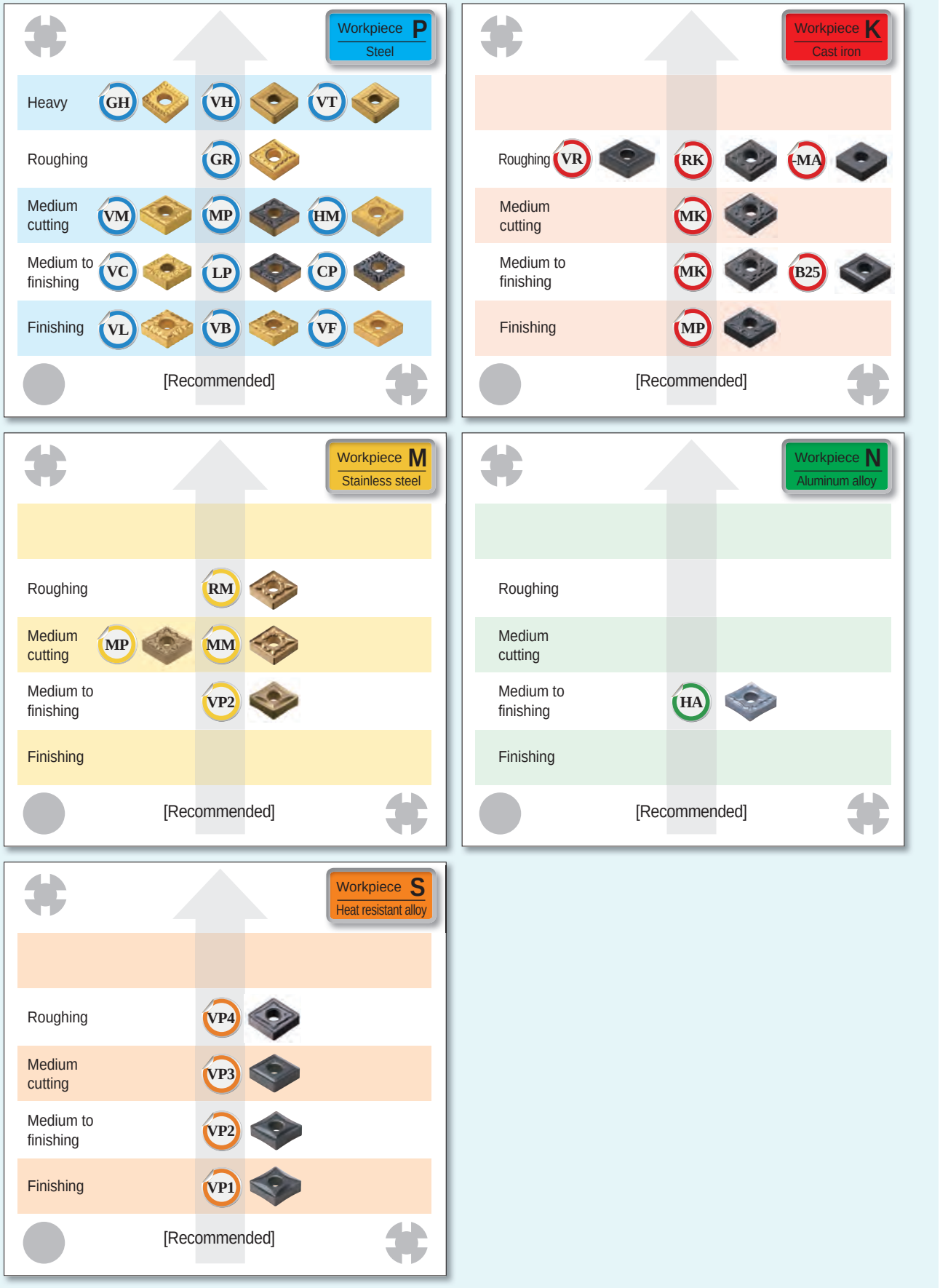
Boring Bar

HSK/KM Tooling System

Cartridges

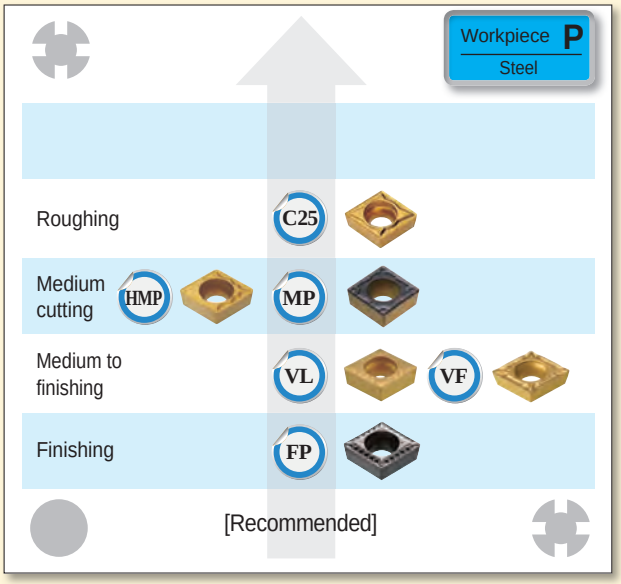
Applications range of chip breakers

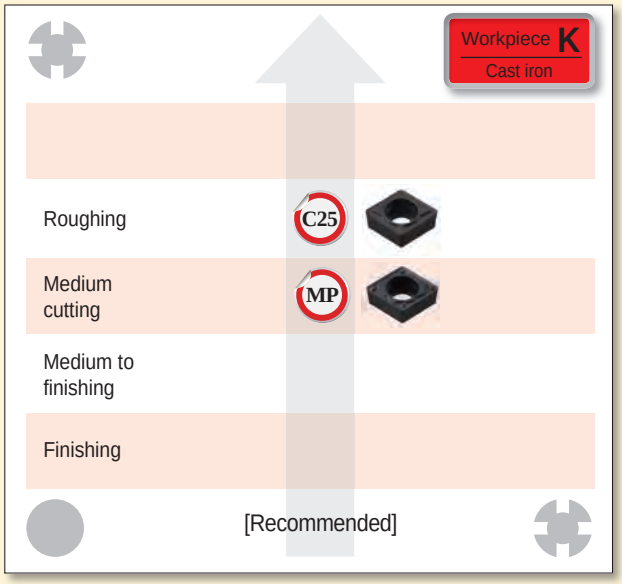
Negative inserts

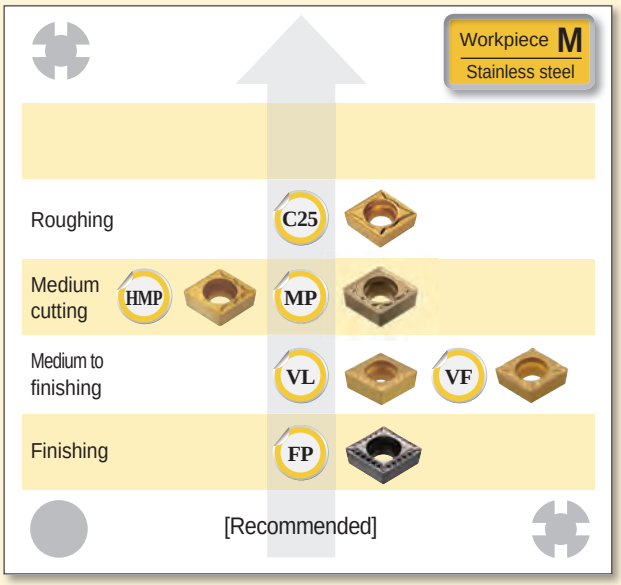


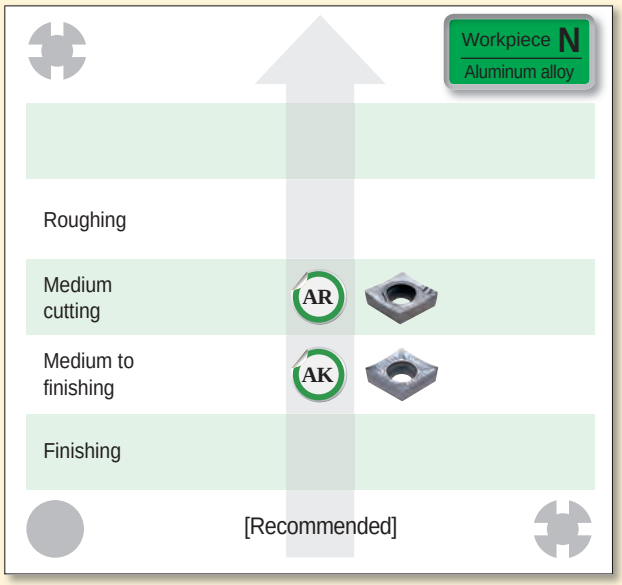
Applications range of chip breakers

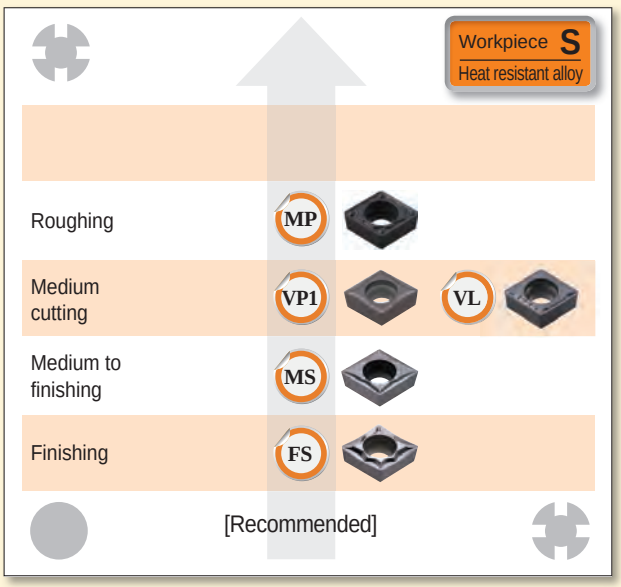
Positive inserts









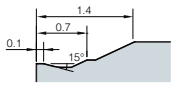
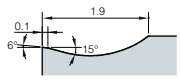
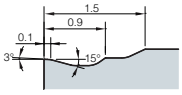
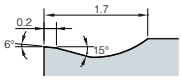
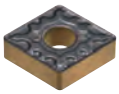
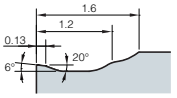
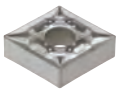
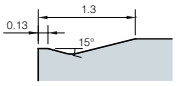
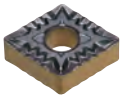
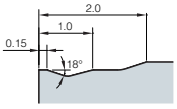
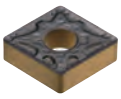
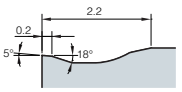
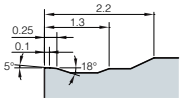
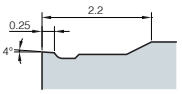


Recommended chip breaker for workpiece

Workpiece **P** Steel

Materials: SM10C, SM15C, SM25C, SS400, SCr415, SCM415, etc. Soft steel

Hardness: under 180HB

	Depth of cut (mm)	C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	Insert shape 80°	55°	90°	60°	35°	80°
Negative	0.2 ~ **0.8** ~ 1.5 Finishing	VL	 	0.10 ~ **0.20** ~ 0.35	NC3215 **NC3225** CN1500 CN2500	305 **250** 260 230	CNMG p. B36	DNMG p. B43	SNMG p. B50	TNMG p. B58	VNMG p. B66	WNMG p. B68
	0.5 ~ **1.0** ~ 2.0 Finishing	VB	 	0.15 ~ **0.20** ~ 0.40	NC3215 **NC3225** CN1500 CN2500	340 **250** 240 210	CNMG p. B36	DNMG p. B43		TNMG p. B58		WNMG p. B68
	0.5 ~ **1.0** ~ 1.5 Finishing	VF	 	0.05 ~ **0.15** ~ 0.35	NC3215 NC3220 **NC3225** NC5330	305 270 **270** 210	CNMG p. B36	DNMG p. B43	SNMG p. B50	TNMG p. B58	VNMG p. B66	WNMG p. B68
	0.5 ~ **1.5** ~ 3.5 Medium to finishing	VC	 	0.12 ~ **0.25** ~ 0.45	NC3215 **NC3220** **NC3225** NC5330	285 **250** **255** 200	CNMG p. B36	DNMG p. B44	SNMG p. B50	TNMG p. B59	VNMG p. B66	WNMG p. B68
	0.5 ~ **1.0** ~ 3.5 Medium to finishing	LP	 	0.10 ~ **0.25** ~ 0.40	NC3215 **NC3225** NC5330	300 **250** 200	CNMG p. B36	DNMG p. B43	SNMG p. B50	TNMG p. B58	VNMG p. B66	WNMG p. B68
	0.5 ~ **1.3** ~ 3.5 Medium to finishing	VQ	 	0.12 ~ **0.2** ~ 0.42	NC3215 **NC3225** NC5330	300 **250** 200	CNMG p. B38	DNMG p. B45	SNMG p. B52	TNMG p. B60	VNMG p. B67	WNMG p. B70
	0.5 ~ **1.3** ~ 3.5 Medium to finishing	CP	 	0.1 ~ **0.28** ~ 0.35	NC3215P **NC3225P**	285 **250**	CNMG p. B36	DNMG p. B44	SNMG p. B50	TNMG p. B50	VNMG p. B66	WNMG p. B68
	0.5 ~ **1.5** ~ 4.5 Medium cutting	MP	 	0.15 ~ **0.30** ~ 0.45	NC3215 **NC3225** NC5330	300 **265** 200	CNMG p. B37	DNMG p. B44	SNMG p. B51	TNMG p. B59	VNMG p. B66	WNMG p. B69
	1.0 ~ **2.5** ~ 5.0 Medium cutting	VM	 	0.10 ~ **0.25** ~ 0.50	NC3215 NC3220 **NC3225** NC5330 CN1500 CN2500	295 260 **260** 205 220 200	CNMG p. B37	DNMG p. B45	SNMG p. B51	TNMG p. B59	VNMG p. B67	WNMG p. B69
	1.5 ~ **2.5** ~ 5.5 Medium cutting	HM	 	0.12 ~ **0.28** ~ 0.52	NC3215 **NC3225** NC5330	300 **265** 200	CNMG p. B37	DNMG p. B44	SNMG p. B51	TNMG p. B59	VNMG p. B66	WNMG p. B69

●: The first recommended cutting condition

Recommended chip breaker for workpiece

Workpiece P Steel

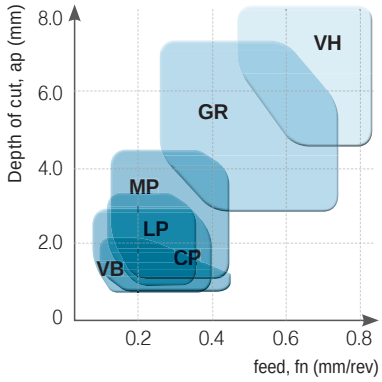
Materials: SM10C, SM15C, SM25C, SS400, SCr415, SCM415, etc. Soft steel

Hardness: under 180HB

	Depth of cut (mm)	C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	Insert shape 80°	55°	90°	60°	35°	80°
Negative	1.0 ~ 3.0 ~ 4.5 Roughing	GR	0.28, 3.1, 21°	0.20 ~ 0.35 ~ 0.50	NC3125 NC3225 NC5330	180~370 150~330 130~280	CNMG p. B38	DNMG p. B45	SNMG p. B52	TNMG p. B60		WNMG p. B69
	3.0 ~ 7.0 ~ 11.0 Heavy	GH	0.28, 8°	0.30 ~ 0.80 ~ 1.30	NC3125 NC3225 NC5330	180~370 150~330 130~280	CNMM p. B42		SNMM p. B57			
	6.0 ~ 10.0 ~ 15.0 Heavy (General)	VH	0.6, 0.25, 20°, 28°	0.70 ~ 1.00 ~ 1.40	NC3215 NC3030 NC500H NC5330	50~250 50~150 50~150 50~150	CNMM p. B42		SNMM p. B57			
	7.0 ~ 12.0 ~ 17.0 Heavy (High feed cutting)	VT	0.5, 0.25, 20°, 20°	0.75 ~ 1.20 ~ 1.60	NC3215 NC3030 NC500H NC5330	50~250 50~150 50~150 50~150	CNMM p. B42		SNMM p. B57			

●: The first recommended cutting condition

P Negative



Recommended chip breaker for workpiece

Workpiece **P** Steel

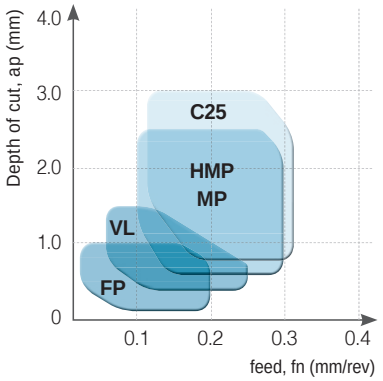
Materials: SM10C, SM15C, SM25C, SS400, SCr415, SCM415, etc. Soft steel

Hardness: under 180HB

	Depth of cut (mm)	C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	Insert shape: 80°	55°	90°	60°	35°	80°
Positive	0.1 ~ **0.5** ~ 1.0 Finishing	FP	0.5, 20°	0.01 ~ **0.06** ~ 0.20	NC3215 NC3225 CN1500 CN2500	350 270 260 240	CCMT p. B73	DCMT p. B79	SCMT p. B84	TCMT p. B88	VB(C)MT p. B94	
	0.1 ~ **0.5** ~ 1.0 Medium to finishing	VL	1.4, 0.6, 5°	0.05 ~ **0.10** ~ 0.20	NC3215 NC3220 NC3225 NC5330 CN1500 CN2500	305 270 270 210 260 240	CCMT p. B73	DCMT p. B79	SCMT p. B84	TCMT p. B88	VB(C)MT p. B94	
	0.1 ~ **0.5** ~ 1.5 Medium to finishing	VF	1.5, 0.6, 0.1, 12°	0.05 ~ **0.15** ~ 0.25	NC3215 NC3220 NC3225 NC5330 CC1500 CN1500 CN2500	305 270 270 210 260 250 230	CCMT p. B73	DCMT p. B79	SCMT p. B84	TC(P)MT p. B88	VB(C)MT p. B94	
	0.6 ~ **1.5** ~ 2.5 Medium cutting	HMP	1.9, 0.7, 0.15, 6°	0.10 ~ **0.20** ~ 0.30	NC3215 NC3220 NC3225 NC5330 CN1500 CN2500	320 285 285 225 240 220	CCMT p. B73	DCMT p. B79	SCMT p. B84	TCMT p. B88	VB(C)MT p. B94	
	0.6 ~ **1.0** ~ 2.5 Medium cutting	MP	1.7, 0.2, 7°, 15°	0.10 ~ **0.20** ~ 0.30	NC3215 NC3225 CN1500 CN2500	300 250 240 200	CCMT p. B73	DCMT p. B79	SCMT p. B84	TC(P)MT p. B88	VB(C)MT p. B94	
	0.8 ~ **2.0** ~ 3.0 Roughing	C25	1.9, 0.15, 15°	0.12~ **0.25** ~ 0.32	NC3215 NC3220 NC3225 NC5330 CN1500 CN2500	320 285 285 225 230 210	CCMT p. B74	DCMT p. B80	SCMT p. B84	TCMT p. B89		

●: The first recommended cutting condition

P Positive



Recommended chip breaker for workpiece

Workpiece P Steel

Materials: SM45C, SM55C, SCM430, SCM440, etc. General steel

Hardness: under 180~260HB

	Depth of cut (mm)	C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	Insert shape 80°	55°	90°	60°	35°	80°
Negative	0.5 ~ **1.0** ~ 2.0 Finishing	VB	1.9, 0.1, 6°, 15°	0.15 ~ **0.20** ~ 0.40	NC3215 NC3225 CN1500 CN2500	340 250 230 190	CNMG p. B36	DNMG p. B43		TNMG p. B58		WNMG p. B68
	0.5 ~ **1.0** ~ 1.5 Finishing	VF	1.5, 0.9, 0.1, 3°, 15°	0.08 ~ **0.15** ~ 0.35	NC3215 NC3225 NC5330	305 270 250	CNMG p. B36	DNMG p. B43	SNMG p. B50	TNMG p. B58	VNMG p. B66	WNMG p. B68
	0.5 ~ **1.0** ~ 3.5 Medium to finishing	VC	1.7, 0.2, 6°, 15°	0.12 ~ **0.25** ~ 0.45	NC3215 NC3220 NC3225 NC5330	285 255 250 200	CNMG p. B36	DNMG p. B44	SNMG p. B50	TNMG p. B59	VNMG p. B66	WNMG p. B68
	0.5 ~ **1.0** ~ 2.5 Medium cutting	LP	1.6, 1.2, 0.13, 6°, 20°	0.10 ~ **0.25** ~ 0.40	NC3215 NC3225 NC5330	300 250 200	CNMG p. B36	DNMG p. B43	SNMG p. B50	TNMG p. B58	VNMG p. B66	WNMG p. B68
	0.5 ~ **1.5** ~ 4.5 Medium cutting	MP	2.2, 0.2, 5°, 18°	0.15 ~ **0.30** ~ 0.45	NC3215 NC3225 NC5330	300 250 200	CNMG p. B37	DNMG p. B44	SNMG p. B51	TNMG p. B59	VNMG p. B66	WNMG p. B69
	1.0 ~ **2.5** ~ 5.0 Medium cutting	VM	2.2, 1.3, 0.25, 0.1, 5°, 18°	0.15 ~ **0.25** ~ 0.50	NC3215 NC3220 NC3225 NC5330 CN1500 CN2500	260 245 245 205 210 170	CNMG p. B37	DNMG p. B45	SNMG p. B51	TNMG p. B59	VNMG p. B67	WNMG p. B69
	1.0 ~ **3.0** ~ 4.5 Medium to roughing	GR	3.1, 0.28, 21°	0.20 ~ **0.35** ~ 0.50	NC3125 NC3225 NC5330	180~370 150~330 130~280	CNMG p. B38	DNMG p. B45	SNMG p. B52	TNMG p. B60		WNMG p. B69
	6.0 ~ **10.0** ~ 15.0 Heavy (General)	VH	0.6, 0.25, 20°, 28°	0.70 ~ **1.00** ~ 1.40	NC3215 NC3030 NC500H NC5330	50~250 50~150 50~150 50~150	CNMM p. B42		SNMM p. B57			
	7.0 ~ **12.0** ~ 17.0 Heavy (High feed cutting)	VT	0.5, 0.25, 20°, 20°	0.75 ~ **1.20** ~ 1.60	NC3215 NC3030 NC500H NC5330	50~250 50~150 50~150 50~150	CNMM p. B42		SNMM p. B57			

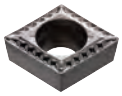
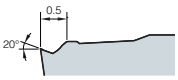
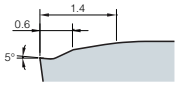
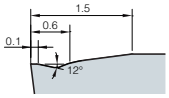
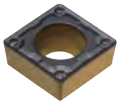
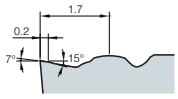
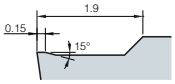
●: The first recommended cutting condition

Recommended chip breaker for workpiece

Workpiece **P** Steel

Materials: SM45C, SM55C, SCM430, SCM440, etc. General steel

Hardness: under 180~260HB

	Depth of cut (mm)	C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	Insert shape 80°	55°	90°	60°	35°	80°
Positive	0.1 ~ **0.5** ~ 1.0 Finishing	FP 		0.01 ~ **0.06** ~ 0.20	NC3215 NC3225 **CN1500** CN2500	350 270 **260** 240	CCMT  p. B73	DCMT  p. B79	SCMT  p. B84	TCMT  p. B88	VB(C)MT  p. B94	
	0.4 ~ **0.5** ~ 1.0 Medium to finishing	VL 		0.05 ~ **0.10** ~ 0.25	NC3215 **NC3220** **NC3225** NC5330 CN1500 CN2500	345 **310** **310** 240 250 210	CCMT  p. B73	DCMT  p. B79	SCMT  p. B84	TCMT  p. B88	VB(C)MT  p. B94	
	0.1 ~ **0.5** ~ 1.5 Medium to finishing	VF 		0.05 ~ **0.15** ~ 0.25	NC3215 NC3220 **NC3225** NC5330 CC1500 CN1500 CN2500	265 300 **300** 230 260 240 210	CCMT  p. B73	DCMT  p. B79	SCMT  p. B84	TC(P)MT  p. B88	VB(C)MT  p. B94	
	0.6~ **1.5** ~ 2.5 Medium cutting	MP 		0.10 ~ **0.15** ~ 0.30	NC3215 **NC3225**	300 **250**	CCMT  p. B73	DCMT  p. B79	SCMT  p. B84	TC(P)MT  p. B88	VB(C)MT  p. B94	
	0.8 ~ **2.0** ~ 3.0 Roughing	C25 		0.12 ~ **0.15** ~ 0.32	NC3215 NC3220 **NC3225** NC5330 CN1500 CN2500	320 285 **285** 225 230 200	CCMT  p. B74	DCMT  p. B80	SCMT  p. B84	TCMT  p. B89		

●: The first recommended cutting condition

Recommended chip breaker for workpiece

Workpiece P Steel

Materials: SNC415, SNC815, SNCM240, SNCM439, STS12, STS61, etc
SCM440, Hardened steel
Hardness: 260~350HB

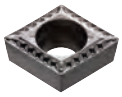
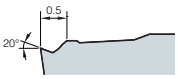
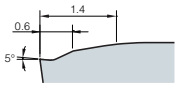
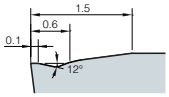
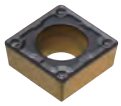
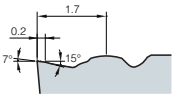
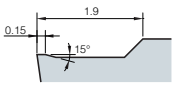
	Depth of cut (mm)	C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	Insert shape 80°	55°	90°	60°	35°	80°
Negative	0.5 ~ **1.0** ~ 2.0 Finishing	VB		0.15 ~ **0.20** ~ 0.40	NC3215 **NC3225** CN1500 CN2500	200 **148** 220 200	CNMG p. B36	DNMG p. B43		TNMG p. B58		WNMG p. B68
	0.5 ~ **1.0** ~ 1.5 Finishing	VF		0.08 ~ **0.15** ~ 0.30	NC3215 **NC3220** NC3225	180 **159** 159	CNMG p. B36	DNMG p. B43	SNMG p. B50	TNMG p. B58	VNMG p. B66	WNMG p. B68
	0.5 ~ **1.5** ~ 3.5 Medium to finishing	VC		0.12 ~ **0.25** ~ 0.45	NC3215 **NC3220** **NC3225** NC5330	168 **148** **150** 200	CNMG p. B36	DNMG p. B44	SNMG p. B50	TNMG p. B59	VNMG p. B66	WNMG p. B68
	0.5 ~ **1.0** ~ 2.5 Medium cutting	LP		0.10 ~ **0.25** ~ 0.40	NC3215 **NC3225** NC5330	250 **200** 200	CNMG p. B36	DNMG p. B43	SNMG p. B50	TNMG p. B58	VNMG p. B66	WNMG p. B68
	0.5 ~ **1.5** ~ 4.5 Medium cutting	MP		0.15 ~ **0.25** ~ 0.45	NC3215 **NC3225** NC5330	250 **200** 200	CNMG p. B37	DNMG p. B44	SNMG p. B51	TNMG p. B59	VNMG p. B66	WNMG p. B69
	1.0 ~ **2.5** ~ 5.0 Medium cutting	VM		0.15 ~ **0.25** ~ 0.50	NC3215 NC3220 **NC3225** CN1500 CN2500	174 153 **153** 120 100	CNMG p. B37	DNMG p. B45	SNMG p. B51	TNMG p. B59	VNMG p. B67	WNMG p. B69
	1.0 ~ **3.0** ~ 4.5 Medium to roughing	GR		0.20 ~ **0.35** ~ 0.50	NC3125 **NC3225** NC5330	180~370 **150~330** 130~280	CNMG p. B38	DNMG p. B45	SNMG p. B52	TNMG p. B60		WNMG p. B69
	6.0 ~ **10.0** ~ 15.0 Heavy (General)	VH		0.70 ~ **1.00** ~ 1.40	**NC3215** NC3030 NC500H NC5330	**50~250** 50~150 50~150 50~150	CNMM p. B42		SNMM p. B57			
	7.0 ~ **12.0** ~ 17.0 Heavy (High feed cutting)	VT		0.75 ~ **1.20** ~ 1.60	**NC3215** NC3030 NC500H NC5330	**50~250** 50~150 50~150 50~150	CNMM p. B42		SNMM p. B57			

●: The first recommended cutting condition

Recommended chip breaker for workpiece

Workpiece **P** Steel

Materials: SNC415, SNC815, SNCM240, SNCM439, STS12, STS61, etc
SCM440, Hardened steel
Hardness: 260~350HB

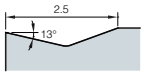
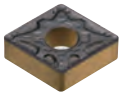
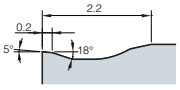
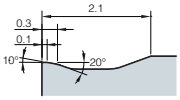
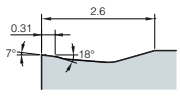
	Depth of cut (mm)	C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	Insert shape 80°	55°	90°	60°	35°	80°
Positive	0.1 ~ **0.5** ~ 1.0 Finishing	FP 		0.01 ~ **0.06** ~ 0.20	NC3215 NC3225 **CN1500** CN2500	350 270 **260** 240	CCMT  p. B73	DCMT  p. B79	SCMT  p. B84	TCMT  p. B88	VB(C)MT  p. B94	
	0.4 ~ **0.5** ~ 1.5 Medium to finishing	VL 		0.05 ~ **0.10** ~ 0.25	NC3215 **NC3220** **NC3225** NC5330 CN1500 CN2500	305 **310** **310** 240 210 190	CCMT  p. B73	DCMT  p. B79	SCMT  p. B84	TCMT  p. B88	VB(C)MT  p. B94	
	0.1 ~ **0.5** ~ 1.5 Medium to finishing	VF 		0.05 ~ **0.15** ~ 0.25	NC3215 NC3220 **NC3225** NC5330 CC1500 CN1500 CN2500	330 300 **300** 230 260 250 240	CCMT  p. B73	DCMT  p. B79	SCMT  p. B84	TC(P)MT  p. B88	VB(C)MT  p. B94	
	0.6 ~ **1.5** ~ 2.5 Medium cutting	MP 		0.10 ~ **0.15** ~ 0.30	NC3215 **NC3225** NC5300 CN1500 CN2500	305 **285** 225 240 220	CCMT  p. B73	DCMT  p. B79	SCMT  p. B84	TC(P)MT  p. B88	VB(C)MT  p. B94	
	0.8 ~ **2.0** ~ 3.0 Roughing	C25 		0.12 ~ **0.15** ~ 0.32	NC3215 NC3220 **NC3225** NC5330 CN1500 CN2500	320 285 **285** 225 100 80	CCMT  p. B74	DCMT  p. B80	SCMT  p. B84	TCMT  p. B89		

●: The first recommended cutting condition

Recommended chip breaker for workpiece

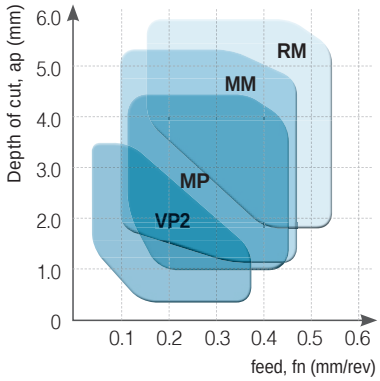
Workpiece
M
Stainless steel

Materials: STS304, STS316, STS430, STS630
Ferrite, austenite, martensite, precipitation hardening stainless steels
Hardness: 135~300HB

	Depth of cut (mm)	C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	Insert shape 80°	55°	90°	60°	35°	80°
Negative	0.5 ~ 1.5 ~ 4.0 Medium to finishing	VP2 		0.10 ~ 0.20 ~ 0.40	PC8105 PC8110 PC8115 PC5300 PC5400	185 170 160 135 120	CNMG  p. B41	DNMG  p. B47	SNMG  p. B55	TNMG  p. B63		WNMG  p. B71
	1.0 ~ 2.0 ~ 4.5 Medium cutting	MP 		0.15 ~ 0.23 ~ 0.45	PC8105 PC8110 PC8115 PC5300 PC5400	175 160 150 130 110	CNMG  p. B37	DNMG  p. B44	SNMG  p. B51	TNMG  p. B59	VNMG  p. B66	WNMG  p. B69
	0.5 ~ 3.0 ~ 5.5 Medium cutting	MM 		0.12 ~ 0.25 ~ 0.45	NC9115 NC9125 NC9135 PC8110 PC8115 PC5300	190 170 130 160 150 130	CNMG  p. B40	DNMG  p. B46	SNMG  p. B54	TNMG  p. B62	VNMG  p. B67	WNMG  p. B71
	2.0 ~ 4.0 ~ 6.0 Roughing	RM 		0.15~ 0.30 ~ 0.55	NC9115 NC9125 NC9135 PC8110 PC8115 PC5300	190 170 130 160 150 130	CNMG  p. B40	DNMG  p. B47	SNMG  p. B55	TNMG  p. B63	VNMG  p. B67	WNMG  p. B71

●: The first recommended cutting condition

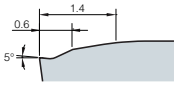
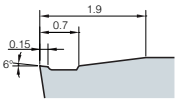
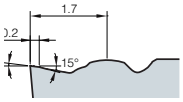
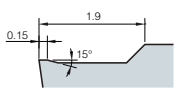
M Negative



Recommended chip breaker for workpiece

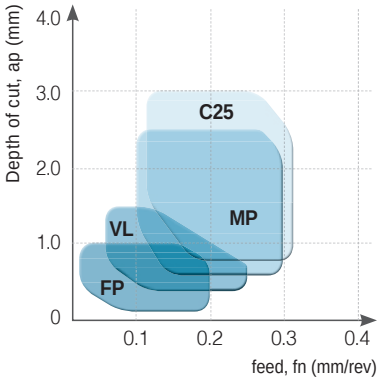
Workpiece **M** Stainless steel

Materials: STS304, STS316, STS430, STS630
Ferrite, austenite, martensite, precipitation hardening stainless steels
Hardness: 135~300HB

	Depth of cut (mm)	C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	Insert shape 80°	55°	90°	60°	35°	80°
Positive	0.1 ~ 0.5 ~ 1.0 Finishing	VL 		0.05 ~ 0.10 ~ 0.20	PC8105 PC8110 PC8115 PC5300 PC5400 NC5330 NC9025	215 195 190 165 135 165 165	CCMT  p. B73	DCMT  p. B79	SCMT  p. B84	TCMT  p. B88	VB(C)MT  p. B94	
	0.3 ~ 1.0 ~ 2.0 Medium to finishing	HMP 		0.05 ~ 0.10 ~ 0.25	PC8105 PC8110 PC8115 PC5300 PC5400 NC5330 NC9025	190 175 170 135 120 150 150	CCMT  p. B73	DCMT  p. B79	SCMT  p. B84	TCMT  p. B88	VB(C)MT  p. B94	
	0.3 ~ 1.5 ~ 3.0 Medium to finishing	MP 		0.05 ~ 0.15 ~ 0.35	PC8105 PC8110 PC8115 PC5300 PC5400 NC5330 NC9025	190 175 170 135 120 150 150	CCMT  p. B73	DCMT  p. B79	SCMT  p. B84	TC(P)MT  p. B88	VB(C)MT  p. B94	
	1.0 ~ 1.5 ~ 3.0 Medium cutting	C25 		0.08 ~ 0.13 ~ 0.25	PC8110 PC5300 PC9030	170 155 155	CCMT  p. B74	DCMT  p. B80	SCMT  p. B84	TCMT  p. B89		

●: The first recommended cutting condition

M Positive



Recommended chip breaker for workpiece

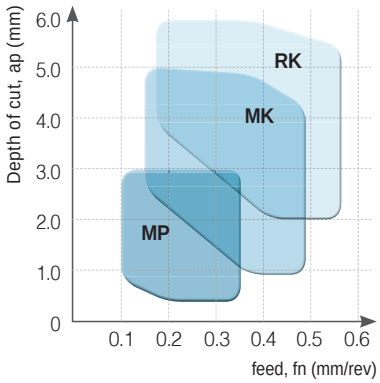
Workpiece K Cast iron

Materials: GC250, GC300, GCD400, GCD700, etc : Gray cast iron, Ductile cast iron
Hardness: 135~185HB
Tensile strength: under 450N/mm²

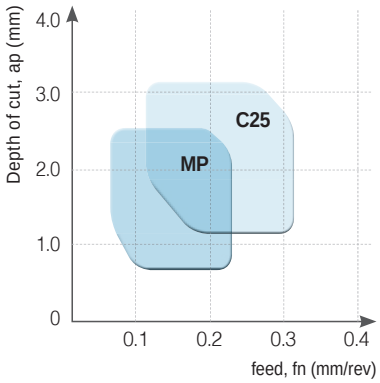
	Depth of cut (mm)	C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	Insert shape 80°	55°	90°	60°	35°	80°
Negative	1.0 ~ 3.0 ~ 4.5 Roughing	VR	2.9, 0.32, 18°	0.20 ~ 0.35 ~ 0.60	NC6310	220~420	CNMG p. B39	DNMG p. B46	SNMG p. B54	TNMG p. B62		WNMG p. B70
	1.5 ~ 3.0 ~ 6.0 Roughing	RK	2.5, 0.35, 15°	0.20 ~ 0.30 ~ 0.60	NC6310	350~550	CNMG p. B39	DNMG p. B46	SNMG p. B54	TNMG p. B62		WNMG p. B70
	1.0 ~ 2.5 ~ 6.0 Roughing	C/B none		0.15 ~ 0.30 ~ 0.60	DB1000 DBN500 DBN700A NC6310 NC6315	150 ~ 200 200 ~ 500 500 ~ 2000 140 ~ 420 120 ~ 290	CNMA p. B39	DNMA p. B46	SNMA p. B53	TNMA p. B61		
	1.0 ~ 2.5 ~ 5.0 Medium ~ Medium to finishing	MK	2.0, 0.25, 3°, 16°	0.10 ~ 0.25 ~ 0.50	NC6310	350~550	CNMG p. B38	DNMG p. B46	SNMG p. B53	TNMG p. B61	VNMG p. B67	WNMG p. B70
	0.5 ~ 2.0 ~ 3.5 Medium to finishing	B25	2.0, 0.25, 14°	0.20 ~ 0.35 ~ 0.60	NC6310 NC6315	140~380 120~290	CNMG p. B38	DNMG p. B45	SNMG p. B52	TNMG p. B60		
	0.5 ~ 1.0 ~ 2.5 Finishing	MP	2.2, 0.2, 5°, 18°	0.10 ~ 0.25 ~ 0.45	NC6310 NC6315	140~380 120~290	CNMG p. B37	DNMG p. B44	SNMG p. B51	TNMG p. B59	VNMG p. B66	WNMG p. B69
Positive	1.0 ~ 3.0 ~ 4.5 Roughing	MP	1.7, 0.2, 7°, 15°	0.10 ~ 0.20 ~ 0.35	NC6310	225~290	CCMT p. B73	DCMT p. B79	SCMT p. B84	TC(P)MT p. B88	VB(C)MT p. B94	
	1.5 ~ 3.0 ~ 6.0 Roughing	C25	1.9, 0.15, 15°	0.10 ~ 0.25 ~ 0.40	NC6310 NC6315	285~340 200	CCMT p. B74	DCMT p. B80	SCMT p. B84	TCMT p. B89		

●: The first recommended cutting condition

K Negative



K Positive



Recommended chip breaker for workpiece

Workpiece N Aluminum alloy

Materials: Aluminum alloy

Hardness: 20~110HB

	Depth of cut (mm)	C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	Insert shape 80°	55°	90°	60°	35°	80°
Negative	0.5 ~ 2.0 ~ 6.0 Medium cutting	HA	2.5, 0.6, 9°, 13°	0.10 ~ 0.20 ~ 0.50	H01	500	CNMG p. B41	DNMG p. B48	SNMG p. B56	TNMG p. B63	VNMG p. B67	WNMG p. B72
Positive	0.1 ~ 1.0 ~ 4.0 Medium to finishing	AK	25°	0.03 ~ 0.20 ~ 0.40	H01 ND1000 PD1000	1000 1000 1000	CCGT p. B103	DCGT p. B104	SCGT p. B106	TCGT p. B107	VB(C)GT p. B108	RCGT p. B105
	0.5 ~ 1.5 ~ 4.0 Medium cutting	AR	13°	0.05 ~ 0.30 ~ 0.50	H01 ND1000 PD1000	1000 1000 1000	CCGT p. B103	DCGT p. B104	SCGT p. B106	TCGT p. B107	VB(C)GT p. B108	RCGT p. B105

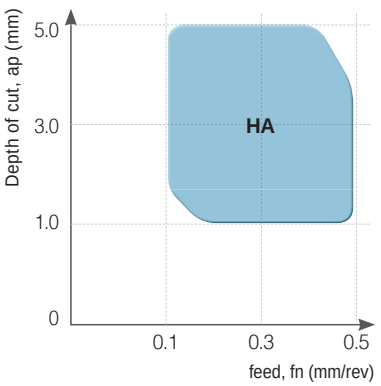
Materials: Copper, Bronze alloy

Hardness: 20~110HB

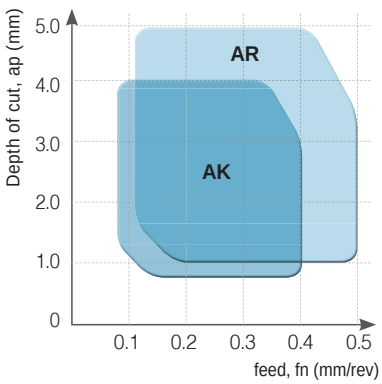
	Depth of cut (mm)	C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	Insert shape 80°	55°	90°	60°	35°	80°
Negative	0.5 ~ 2.0 ~ 4.0 Medium to finishing	HA	2.5, 0.6, 9°, 13°	0.10 ~ 0.20 ~ 0.50	H01	1000	CNMG p. B41	DNMG p. B48	SNMG p. B56	TNMG p. B63	VNMG p. B67	WNMG p. B72
Positive	0.1 ~ 1.0 ~ 3.0 Medium to finishing	AK	25°	0.03 ~ 0.20 ~ 0.30	H01	1000	CCGT p. B103	DCGT p. B104	SCGT p. B106	TCGT p. B107	VB(C)GT p. B108	RCGT p. B105
	0.5 ~ 1.5 ~ 3.0 Medium cutting	AR	13°	0.05 ~ 0.25 ~ 0.40	H01	1000	CCGT p. B103	DCGT p. B104	SCGT p. B106	TCGT p. B107	VB(C)GT p. B108	RCGT p. B105

●: The first recommended cutting condition

N Negative



N Positive



Recommended chip breaker for workpiece

Workpiece **S** Heat resistant alloy

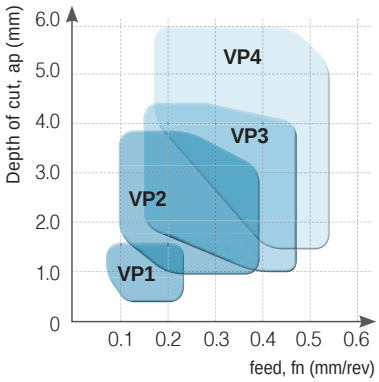
Materials: Inconel, Nimonic, Stellite, Ti alloy

Hardness: 160~350HB

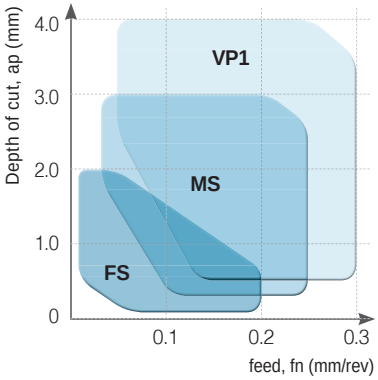
	Depth of cut (mm)	C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	Insert shape 80°	55°	90°	60°	35°	80°
Negative	0.1 ~ **0.5** ~ 1.5 Finishing	VP1	1.2, 18°	0.05 ~ **0.10** ~ 0.20	PC8110 PC5300 NC5330	60 50 50	CNGG p. B40	DNGG p. B47				
Negative	0.5 ~ **1.5** ~ 4.0 Medium to finishing	VP2	2.5, 13°	0.10 ~ **0.20** ~ 0.40	PC8110 PC5300	60 45	CNMG p. B41	DNMG p. B47	SNMG p. B55	TNMG p. B63		WNMG p. B71
Negative	0.05 ~ **2.0** ~ 3.0 Medium cutting	VP3	2.4, 0.5, 15°	0.05 ~ **0.15** ~ 0.25	PC8110 PC5300	60 40	CNMG p. B41	DNMG p. B47	SNMG p. B55	TNMG p. B63	VNMG p. B67	WNMG p. B71
Negative	1.0 ~ **2.5** ~ 4.0 Roughing	VP4	2.6, 0.17, 8°, 18°	0.15 ~ **0.20** ~ 0.35	PC8115	60 40	CNMG p. B41	DNMG p. B48	SNMG p. B55	TNMG p. B63		WNMG p. B71
Positive	0.5 ~ **2.0** ~ 4.0 Medium cutting	VP1	1.2, 18°	0.05 ~ **0.23** ~ 0.30	PC8110 PC5300	60 45	CCGT p. B74	DCGT p. B81			VCGT p. B98	
Positive	0.2 ~ **1.0** ~ 2.5 Medium cutting	MS	0.5, 12°	0.03 ~ **0.10** ~ 0.25	PC8110 PC5300	60 45	CCGT p. B74	DCGT p. B80			VCGT p. B98	
Positive	0.1 ~ **0.8** ~1.5 Finishing	FS	0.4, 16°	0.01 ~ **0.08** ~ 0.20	PC8110 PC5300	60 45	CCGT p. B74	DCGT p. B80		TCGT p. B89	VCGT p. B98	

●: The first recommended cutting condition

S Negative



S Positive



Features of Chip Breaker

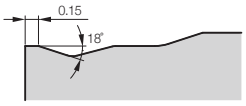
CP Chip Breaker new [For medium to finishing]

- Chip breaker with strong cutting edge for heavy interrruption in the range of medium to finishing
- Effective chip control in the range from low depth of cut to high depth of cut due to 2-stepped back angle
- Stable chip evacuation and breaking long chip in deep cutting by side rake angle and continuous bumps

Features of CP chip breaker

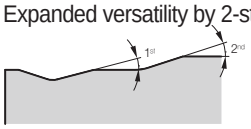
▶ Flat land

- Strong cutting edge in interrupted roughing
- Keeping the balance between continuous cutting and interrupted cutting
- Expanded versatility



▶ 2-steped back side

- Better chip control in low depth of cut machining
- Improved chip evacuation in high feed machining
- Expanded versatility by 2-steped rake angle



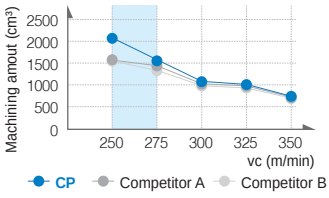
▶ Side rake angle + continuous bumps

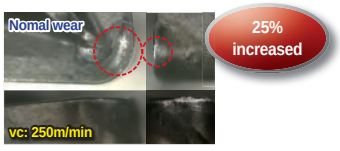
- Enhanced surface finish
- Improved chip evacuation
- Breaking long chips

Performance evaluation

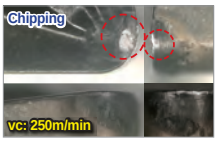
V-T (Vc-Tool life)

- **Workpiece** Alloy steel (SCM440), External machining
- **Cutting condition** vc (m/min) = 250, 300, 350, fn (mm/rev) = 0.3, ap (mm) = 0.5, wet
- **Tools** **Insert** : CNMG120408-RM (NC9115)
  Holder: PCLNL2525-M12

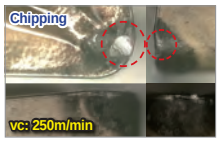




CP



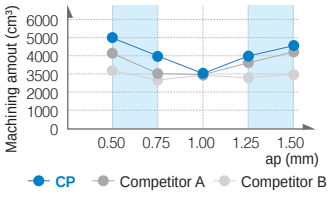
Competitor A

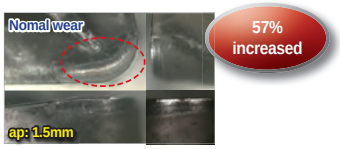


Competitor B

D-T (Depth of cut-Tool life)

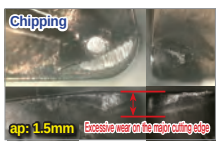
- **Workpiece** Alloy steel (SCM440), External machining
- **Cutting condition** vc (m/min) = 250, fn (mm/rev) = 0.2, ap (mm) = 0.50, 0.75, 1.00, 1.25, 1.50, wet
- **Tools** **Insert** : CNMG120408-CP (NC3215P)
  Holder : PCLNL2525-M12





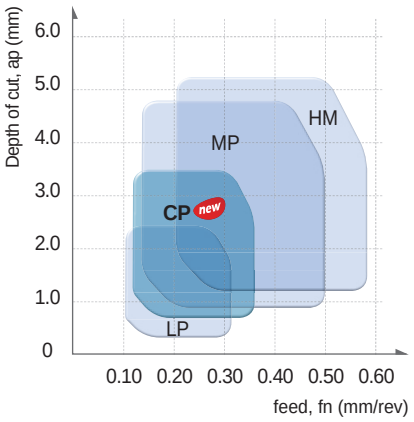
CP

Competitor A



Competitor B

Application range



Features of Chip Breaker

FP Chip Breaker new [For chip control in finishing]

- Chip breaker applied on one side of insert controls chip in mild steel machining with low depth of cut
- Chip control in poor machining (with lower depth of cut than nose R, in machining minor cutting edge and in back cutting)
- Decreased cutting load and excellent surface finish due to 3-dimensional cutting edge and side rake angle

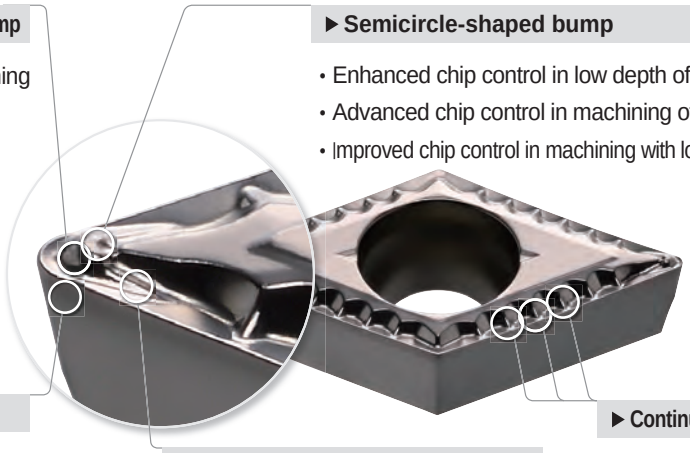
Features of FP chip breaker

▶ Concave form of semicircle-shaped bump

- Better chip curling in mild steel machining
- Enhanced chip control in low depth of cut and low feed machining

▶ Semicircle-shaped bump

- Enhanced chip control in low depth of cut machining
- Advanced chip control in machining of minor cutting edge
- Improved chip control in machining with lower depth of cut than nose R



▶ 3-dimensional side rake angle

- Ensuring surface finish and guiding chip to right dirction

▶ Assistant bump on flank surface

- Better chip curling in high depth of cut and low feed machining
- Preventing chip twist

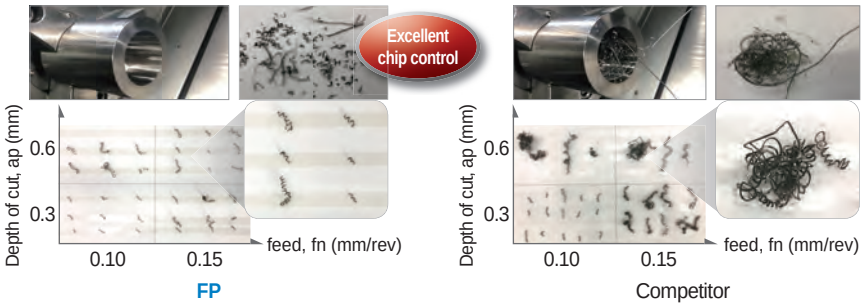
▶ Continuous bump on flank surface

- Cutting long chip

Performance evaluation

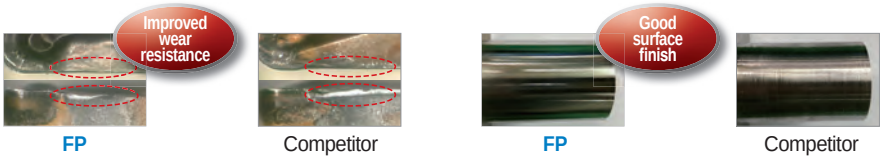
Chip control

- **Workpiece** Mild steel (SM20C), Ø40 Internal machining
- **Cutting condition** vc (m/min) = 200, n (rpm) = 1,600, fn (mm/rev) = 0.03, ap (mm) = 0.5, wet
- **Tools** **Insert** : CCMT09T304-FP (NC3215)
  Holder : S16M-SCLCR-M09

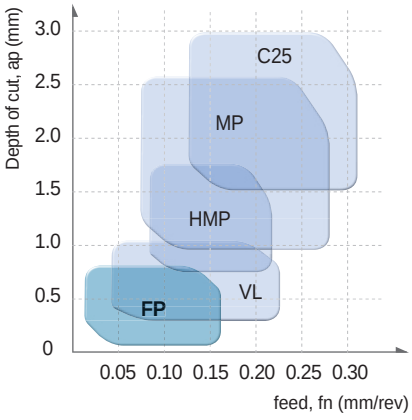


Surface finish

- **Workpiece** Mild steel (SM20C), Ø30 External machining
- **Cutting condition** vc (m/min) = 200, n (rpm) = 2,000, fn (mm/rev) = 0.08, ap (mm) = 0.8, wet
- **Tools** **Insert** : CCMT09T304-FP (NC3215)
  Holder : SCLCR1616-M09



Application range



Features of Chip Breaker

FS Chip Breaker new [For finishing]

- Chip breaker for ultra-precision automatic Swiss lathe machining (for lower depth of cut and lower feed cutting range than VP1 and MS)
- Available for various workpieces, P, M and S
- Reduced cutting load and good surface finish due to sharp cutting edge

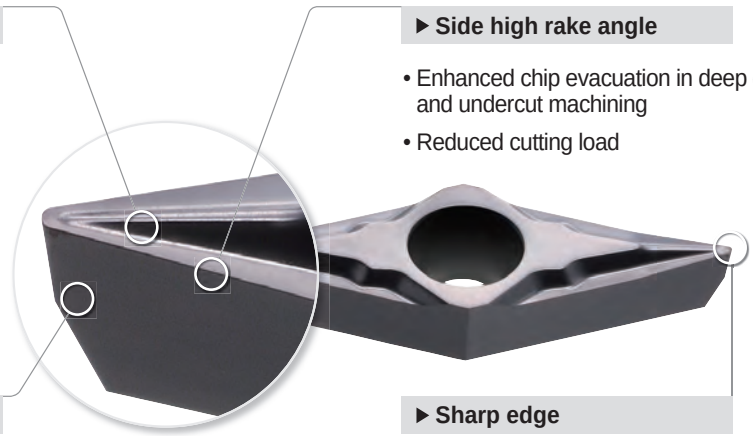
Features of FS chip breaker

▶ Variable elevated triangular pyramid shape

- Applicable for various cutting range due to optimally designed chip breaker
- Enhanced chip evacuation function per variation of cutting depth
- Enhanced chip control with low depth of cut
- Lowered cutting load in high feed machining

▶ Side high rake angle

- Enhanced chip evacuation in deep grooving and undercut machining
- Reduced cutting load



▶ Side grinding

- Periphery grinding G class
- High precision grinding

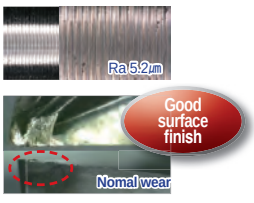
▶ Sharp edge

- Reduced cutting resistance
- Improved chip control

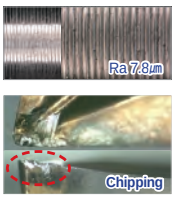
Performance evaluation

Workpiece size and surface finish

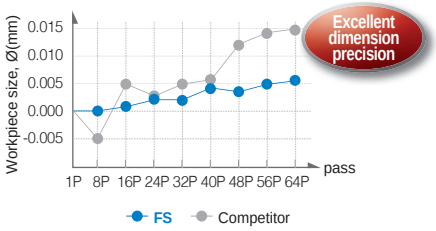
- **Workpiece** Stainless steel (STS406)
- **Cutting condition** vc (m/min) = 80, n (rpm) = 1,000, fn (mm/rev) = 0.05, ap (mm) = 0.1, wet
- **Tools** **Insert** : VCGT110301-FS (PC8110)
  Holder: SVJCR1212-X11A



FS

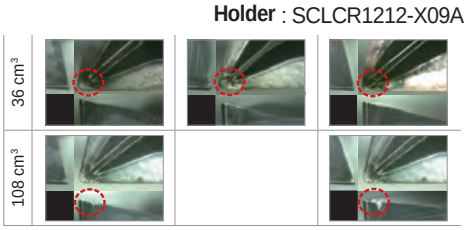


Competitor

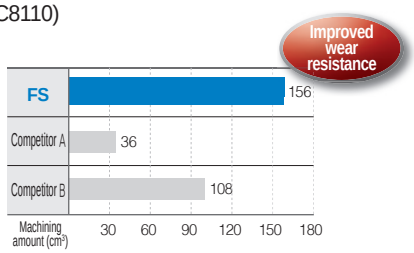


Wear resistance

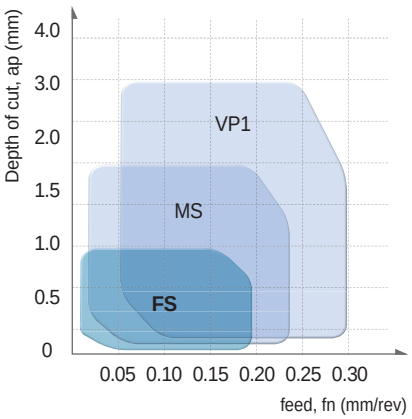
- **Workpiece** Alloy steel (SCM440)
- **Cutting condition** vc (m/min) = 100, n (rpm) = 1,000, fn (mm/rev) = 0.05, ap (mm) = 0.5, wet
- **Tools** **Insert** : CCGT09T304-FS (PC8110)
  Holder : SCLCR1212-X09A



FS Competitor A Competitor B



Application range



Features of Chip Breaker

MS Chip Breaker

new [For medium to finishing]

- Sharp cutting edge with welding resistance reducing the cutting heat is necessary for machining hard-to-cut materials
- Chip evacuation is increased in low to high feed cutting conditions

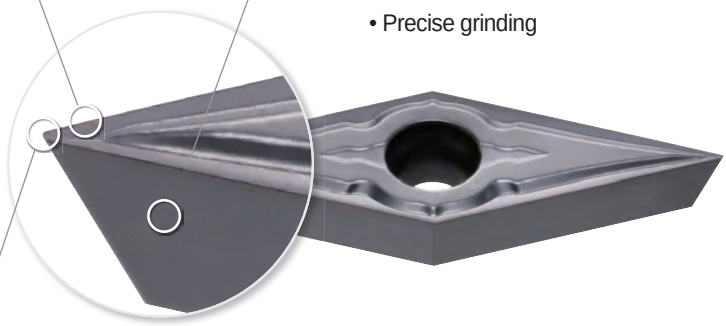
Features of MS chip breaker

▶ Sharp cutting edge

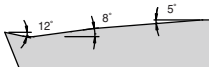
- Decreased cutting heat
- Minimized welding

▶ Flank surface grinding

- G grade of periphery grinding
- Precise grinding



▶ 2-level angle back area

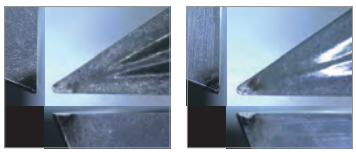


- Improved chip curl and chip control in low feed cutting range
- Better chip evacuation in high feed cutting range
- Reduced cutting resistance
- Protected cutting edge without chip blockage

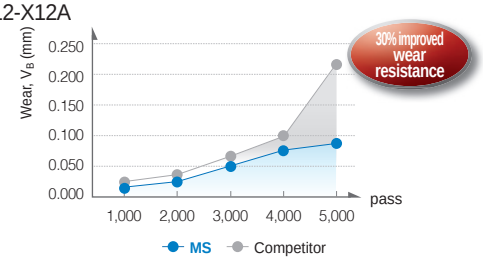
Performance evaluation

Wear resistance

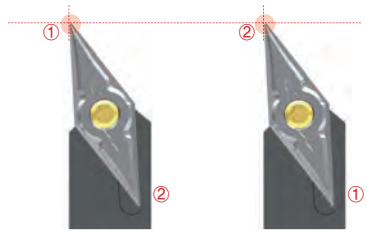
- **Workpiece** Pure titanium (Grade4)
- **Cutting condition** vc (m/min) = 100, n (rpm) = 3,500, fn (mm/rev) = 0.03, ap (mm) = 0.5, wet
- **Tools** **Insert** : VCGT1203008FN-MS (PC8110)
  Holder: SVJCR1212-X12A

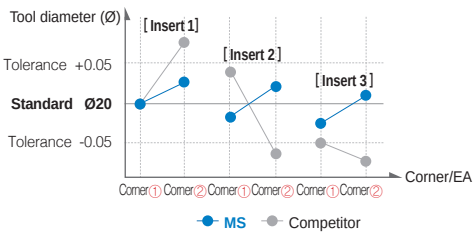


▶ Ultra-fine substrate and high hardness coating ensurestable tool life.



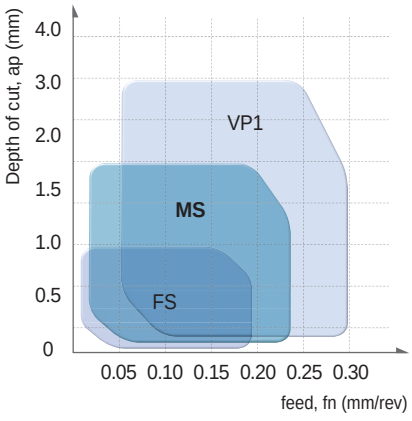
Dimension precision





▶ Changing tool offset in switching insert corners and items is not necessary using MS chip breaker due to tight dimension deviation management.

Application range



Features of Chip Breaker

LP Chip Breaker new [For medium to finishing]

- Chip breaker for forged steel of automobile parts and normal steel
- Quad dots improve productivity through efficient chip control at high feed
- Angle land minimizes cutting force

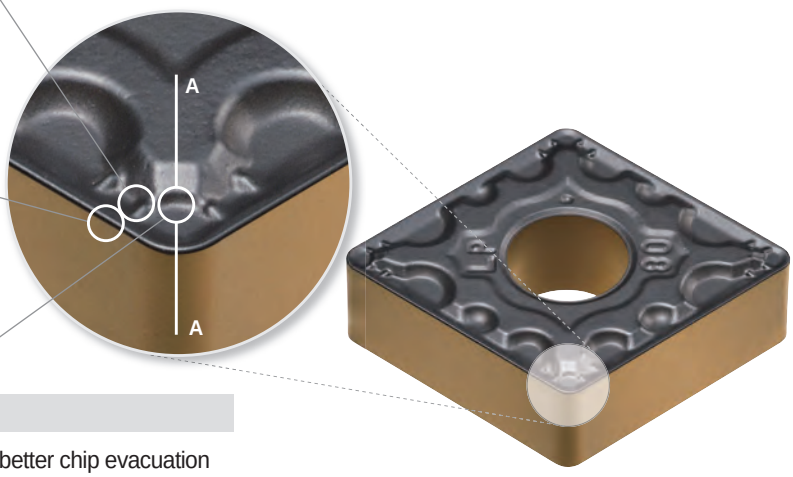
Features of LP chip breaker

▶ Front dot

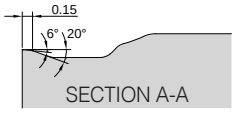
- Higher stability of chip curls at high feed
- Excellent chip control when copying
- Lower cutting force at low depth of cut and high feed

▶ Variable land

- Less crater wear
- Prevents chipping on minor cutting edge



▶ Flat zone

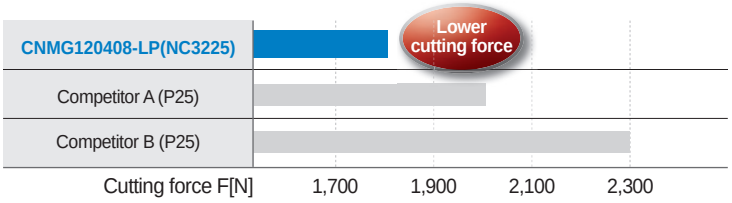


- Larger chip pocket for better chip evacuation at high feed
- Reduced cutting force with larger contact surface of chips

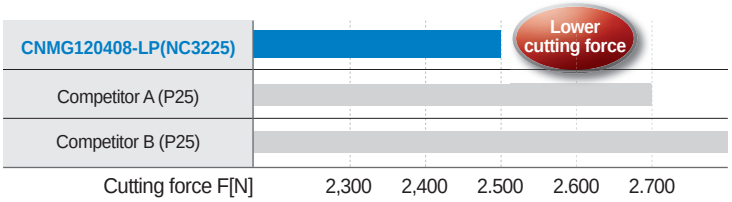
Performance evaluation (Evaluation of cutting force)

- **Workpiece** SM45C, Ø100, External machining
- **Cutting condition** vc (m/min) = 250, ap (mm) = 1.0, fn (mm/rev) = 0.25/0.40, wet
- **Tools** CNMG120408-□□

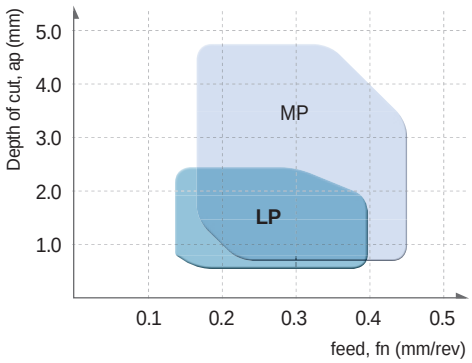
Medium feed (0.25 mm/rev)



High feed (0.40 mm/rev)



Application range



Features of Chip Breaker

MP Chip Breaker new [For medium cutting]

- Chip breaker for forged steel of automobile parts and all other steels
- Quad dots improve productivity through efficient chip control at high feed
- Angle land minimizes cutting force

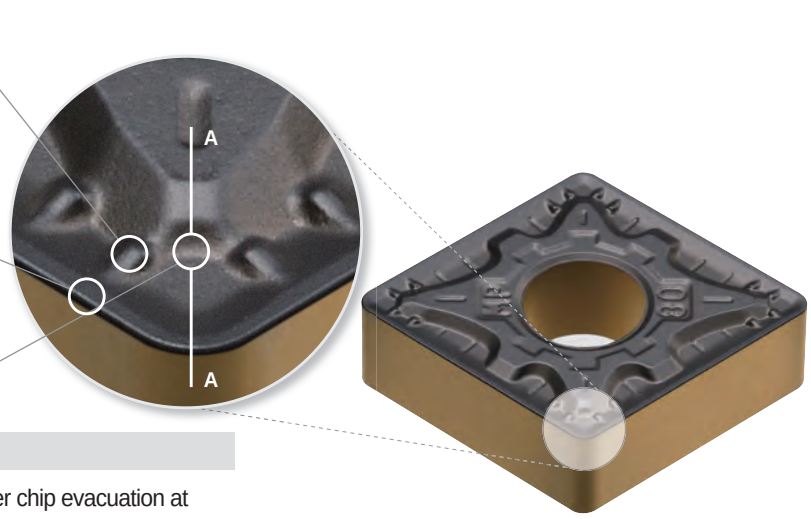
Features of MP chip breaker

▶ Front two step dot

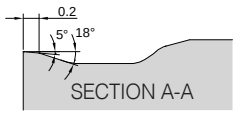
- Higher stability of chip curls at high feed
- Excellent chip control when copying
- Lower cutting force at high depth of cut

▶ Variable land

- Less crater wear
- Prevents chipping on minor cutting edge
- Higher toughness at high depth of cut and interrupted cutting



▶ Flat zone

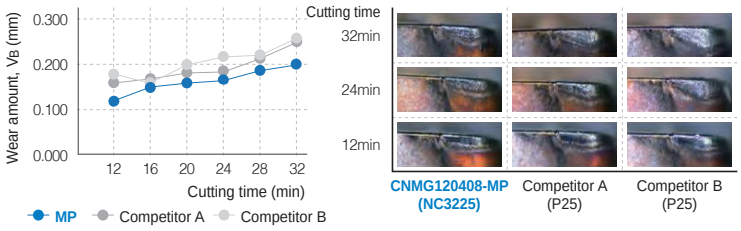


- Larger chip pocket for better chip evacuation at high feed
- Reduced cutting force with larger contact surface of chips

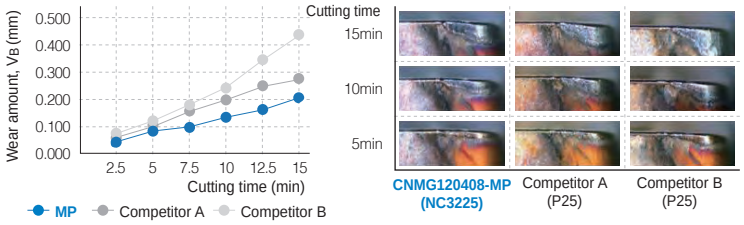
Performance evaluation

- **Workpiece** Alloy steel (SCM440), Ø100, External machining
- **Cutting condition** vc (m/min) = 280, ap (mm) = 1.5, fn (mm/rev) = 0.25/0.40, wet
- **Tools** CNMG120408-□□

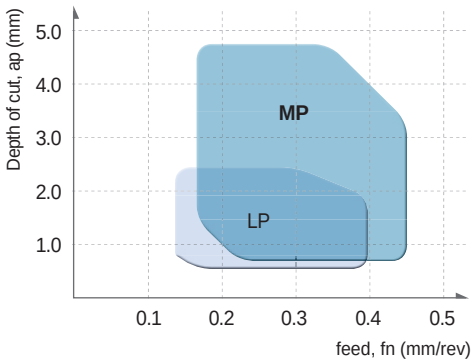
Medium feed (0.25 mm/rev)



High feed (0.40 mm/rev)



Application range



Features of Chip Breaker

MM Chip Breaker new [For medium cutting]

- The 1st recommended chip breaker for stainless steel machining
- Change to: A dual land achieves sharp cutting performance and insert toughness
- Wide chip pockets for stable chip evacuation at high feeds/depths of cut

Features of MM chip breaker

▶ Variable Land

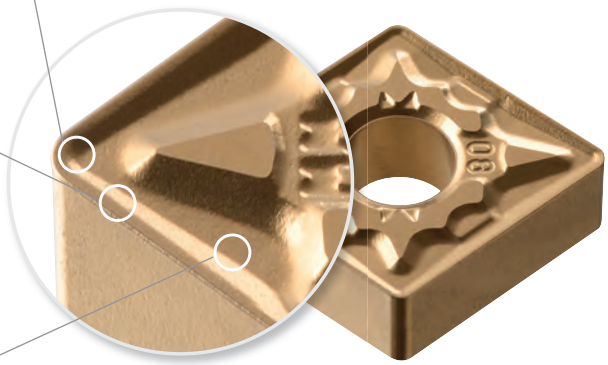
- Excellent chip control and sharp cutting at low depths of cut
- Delays crater wear
- Prevents plastic deformation

▶ Dual Land

- Balance between requirements of sharp and tough cutting edges
- Sharp cutting edge for high speed machining
- Prevents chipping in interrupted machining

▶ Wide Chip Pocket

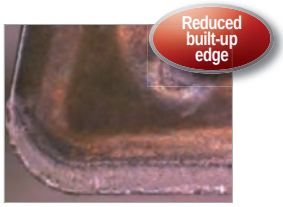
- Stable chip evacuation at high speeds/feeds
- Improved surface finishes by reduced workpiece scratches caused by work-hardened chips at high depths of cut
- Prevents built-up edge



Performance evaluation

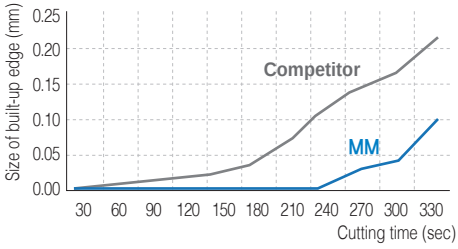
Built-up edge

- **Workpiece** STS405 (Ferrite)
- **Cutting condition** vc (m/min) = 180, fn (mm/rev) = 0.3, ap (mm) = 3.0, wet
- **Tools** **Insert** : CNMG120408-MM (NC9125)
  Holder: PCLNL2525-M12



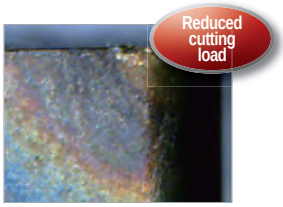
MM(NC9125)

Competitor

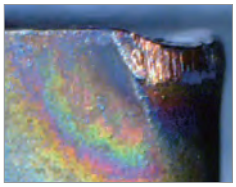


Plastic deformation

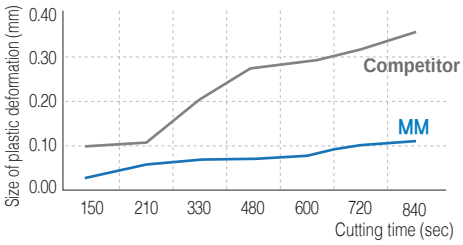
- **Workpiece** STS316 (Austenite)
- **Cutting condition** vc (m/min) = 200, fn (mm/rev) = 0.35, ap (mm) = 2.0, dry
- **Tools** **Insert** : CNMG120408-MM (NC9135)
  Holder: PCLNL2525-M12



MM(NC9135)



Competitor



Features of Chip Breaker

RM Chip Breaker new [For roughing]

- The 1st recommended chip breaker for rough and interrupted machining of stainless steel
- Prevents notch wear and burrs at high feeds and depths of cut
- Reduced cutting force extends tool life in high feed machining

Features of RM chip breaker

▶ Variable Land

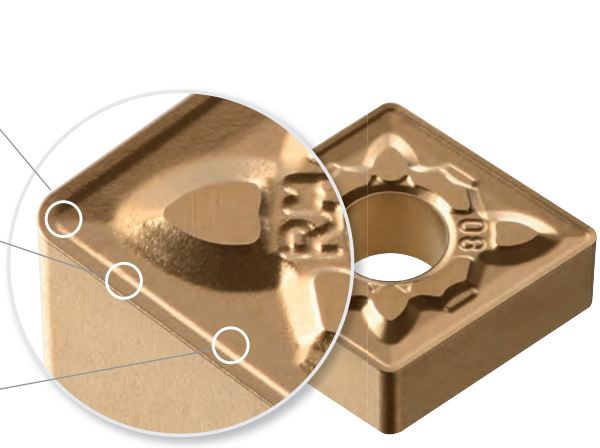
- Excellent chip control and sharp cutting at low depths of cut
- Delays crater wear
- Prevents plastic deformation

▶ Wide land & Gentle front angle

- Sharp cutting edges and a wide land reduce cutting force
- Reduced burrs
- Dispersed cutting load enables higher toughness

▶ Stepped Design

- Stepped design makes chip evacuation easier
- Smooth chip evacuation prevents plastic deformation



Performance evaluation

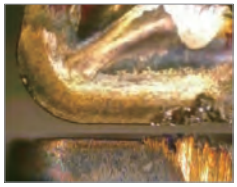
Notch wear

■ **Workpiece** STS410 (Martensite)

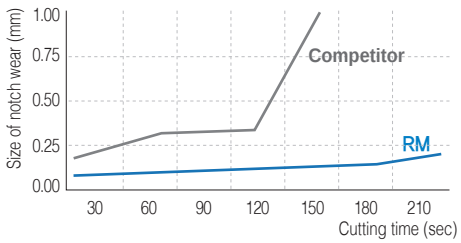
■ **Cutting condition** vc (m/min) = 150, fn (mm/rev) = 0.25, ap (mm) = 3.0, wet

■ **Tools** **Insert** : CNMG120408-RM (NC9115)
Holder: PCLNL2525-M12

RM(NC9115)



Competitor

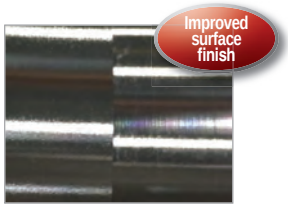


Burr

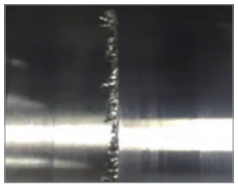
■ **Workpiece** Duplex

■ **Cutting condition** vc (m/min) = 120, fn (mm/rev) = 0.2, ap (mm) = 2.0, dry

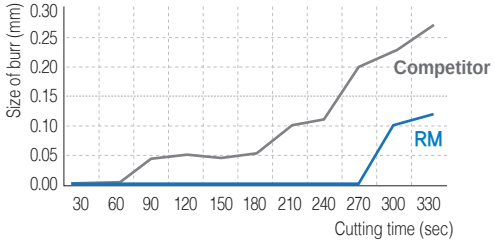
■ **Tools** **Insert** : CNMG120408-RM (NC9125)
Holder: PCLNL2525-M12



RM(NC9125)



Competitor



Features of Chip Breaker

MK Chip Breaker new [For medium cutting]

- Ideally suited for continuous cutting of ductile cast iron and gray cast iron
- Angle lands provide upgraded surface finish

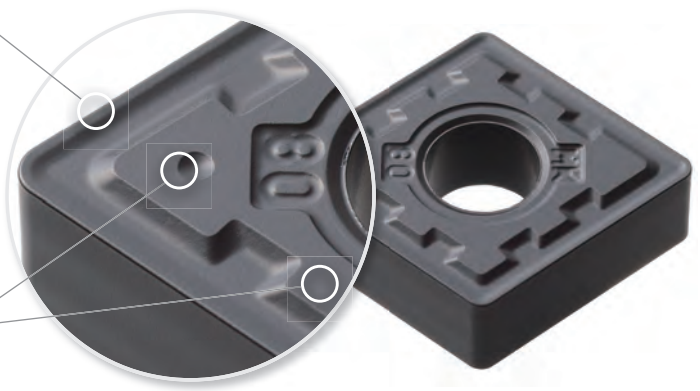
Features of MK chip breaker

▶ Angle land

- Angle lands provide sharper cutting performance
- Maximized wear resistance in continuous cutting
- High quality results in surface finish

▶ Wide supporting area

- Higher clamping stability
- Prevents chipping at vibrations during operation

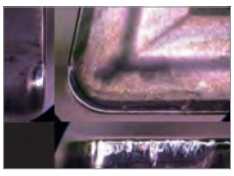


Performance evaluation

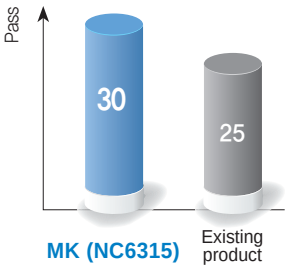
Wear resistance

- **Workpiece** GCD500(KS), Ø90 (Spherical tube) → Ø30 machining
- **Cutting conditions** vc (m/min) = 400, fn (mm/rev) = 0.35, ap (mm) = 2.5, wet
- **Cutting time** 30 passes with results of normal wear on rake/flank surface
- **Tools** **Insert** : CNMG120408-MK (NC6315)
  Holder: DCLNR2525-M12

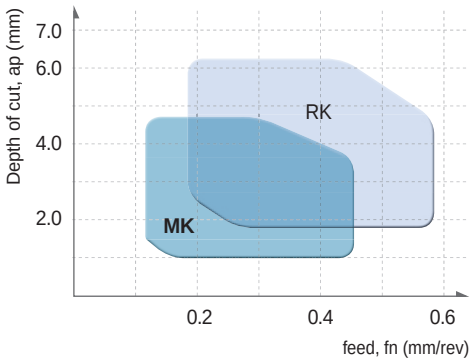
MK (NC6315)



Existing product



Application range



Features of Chip Breaker

RK Chip Breaker new [For roughing]

- Ideally suited for high speed / high feed cutting of ductile cast iron and gray cast iron
- Flat lands provide upgraded toughness and chipping resistance

Features of RK chip breaker

▶ Flat land

- Flat lands provide upgraded toughness and chipping resistance
- Stable machining availability under high cutting loads at high depth of cuts or interrupted cutting
- Optimized land width for high feed machining

▶ Wide supporting area

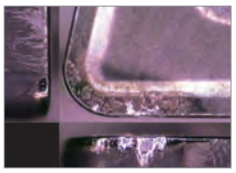
- Higher clamping stability
- Minimizes vibration and chipping.

Performance evaluation

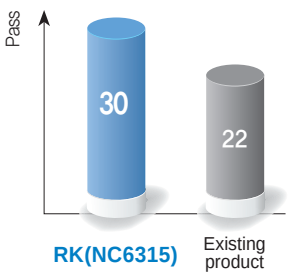
Impact resistance

Workpiece	GCD500 (KS), Ø90 (Triangular tube) → Ø30 machining
Cutting conditions	vc (m/min) = 380, fn (mm/rev) = 0.35, ap (mm) = 2, wet
Cutting time	15 passes with results of normal rake surface wear and good chipping resistance
Tools	**Insert** : CNMG120408-RK (NC6315) **Holder**: DCLNR2525-M12

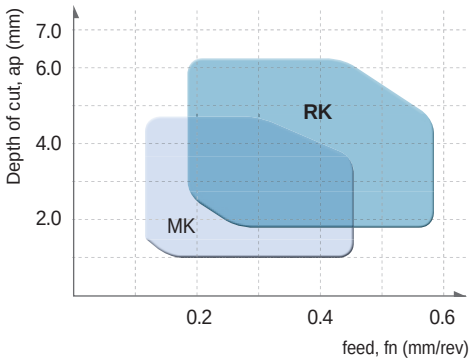
RK(NC6315)



Existing product



Application range



Features of Chip Breaker

VP1 Chip Breaker [For finishing]

- Cutting edges designed in high-positive
  - Reduced contact area between rake surface and chip minimizes cutting heat and improved tool life
- Recommended cutting conditions: fn (mm/rev) = 0.05~0.2, ap (mm) = 0.1~1.5

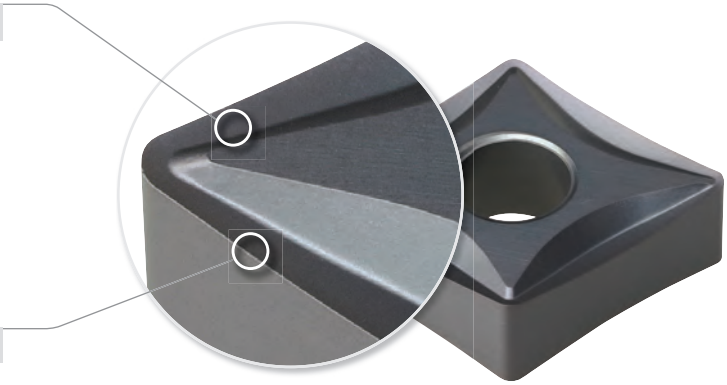
Features of VP1 chip breaker

▶ Optimized design for finishing

- Obtains excellent cutting performance and quality surface finish at low depth of cut and high speed

▶ High-positive blade design

- Minimizes cutting heat by reducing the contact area between flank surface and chips
- Prevents built-up edge and extends tool life



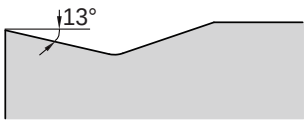
VP2 Chip Breaker [For medium to finishing]

- High-positive cutting edge design/Side rake angle applied
  - Stable chip control improves machinability when ball machining at variable depths of cut
- Recommended cutting conditions: fn (mm/rev) = 0.1~0.4, ap (mm) = 0.5~4.5

Features of VP2 chip breaker

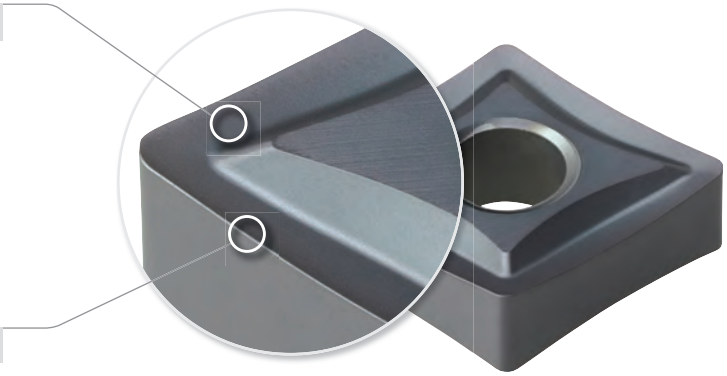
▶ Sharp blades and wide chip pockets

- Increase productivity
- Ideal for medium to finish cutting



▶ High-positive blade design

- Improves cutting performance with its stable chip control at varying depth of cuts



Features of Chip Breaker

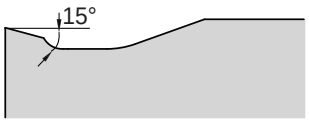
VP3 Chip Breaker [For medium cutting]

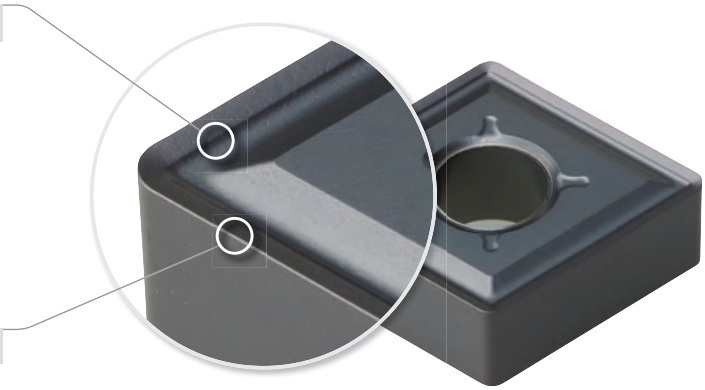
- High-positive cutting edge design/Wide land applied
  - Improved stability at interrupted cutting when toughness is required. Stable chip control and machinability at high depth of cut
- Recommended cutting conditions: fn (mm/rev) = 0.1~0.45, ap (mm) = 0.5~5.0

Features of VP3 chip breaker

▶ Chip pocket design leading to a R-shaped cutting edge

- Creates a stepped space between edge and land to make smooth chip flow at low and high depth of cuts





▶ High-positive blade design / Wide land

- Minimize heat concentration at high depth of cut
- Improves stability in interrupted machining of a tough workpiece

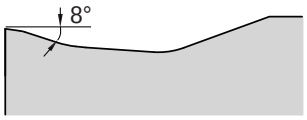
VP4 Chip Breaker new [For roughing]

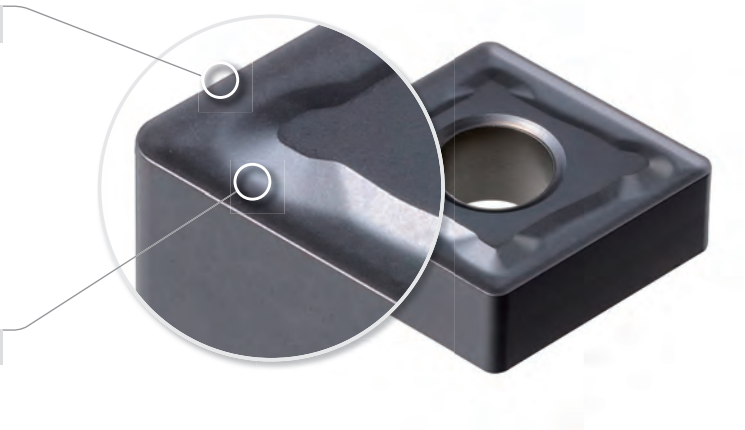
- The 1st recommended chip breakers for machining Inconel which remains highly resistant to and hard at high temperature
- Rough machining stability resulting from reinforced cutting edges and wide chip pockets

Features of VP4 chip breaker

▶ Rake angle design resistant to high hardness cutting

- Reinforces cutting edges and prevents notch wear in rough surface machining
- Prevents chipping in interrupted cutting



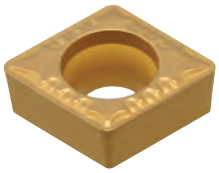


▶ Wide chip pockets

- Reduce cutting loads and improve stability even at high depth of cut in roughing

Features of Chip Breaker

Single-sided VL Chip Breaker



[For finishing]

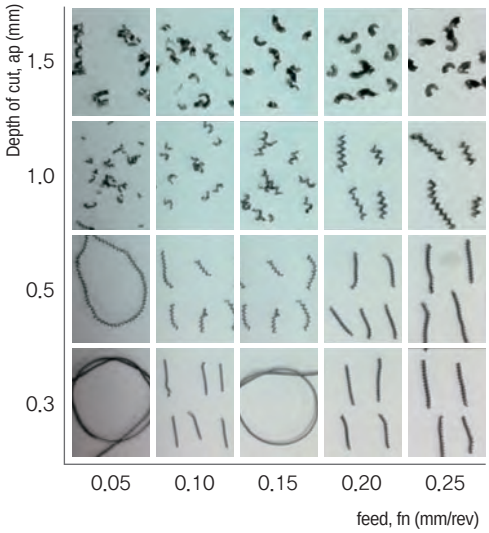
- The sharp flank surface and the chip breaker design significantly improve chip control when machining tough materials such as low carbon steel, pipe steel, and iron plates
- Sharp cutting edges reduce cutting resistance and provide excellent chip control at low depth of cuts, leading to stable machining on automated production lines

Features of VL chip breaker

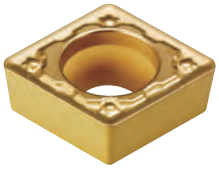
- **Sharp cutting edges**
  - High rake cutting edges provide improved surface finishes
  - Low cutting resistance reduces cutting heat
- **2-step rear rake angle**
  - Stable chip control regardless of varying feed rates
  - Excellent machinability even when machining mild workpieces

Chip control test

■ **Workpiece**	SCM440(Alloy steel), Ø50, Internal diameter turning
■ **Cutting condition**	vc = 250 m/min, ap = 0.3~1.5 mm, fn = 0.05~0.25 mm/rev
■ **Tools**	CCMT09T304-VL



Single-sided MP Chip Breaker



[For medium to finishing]

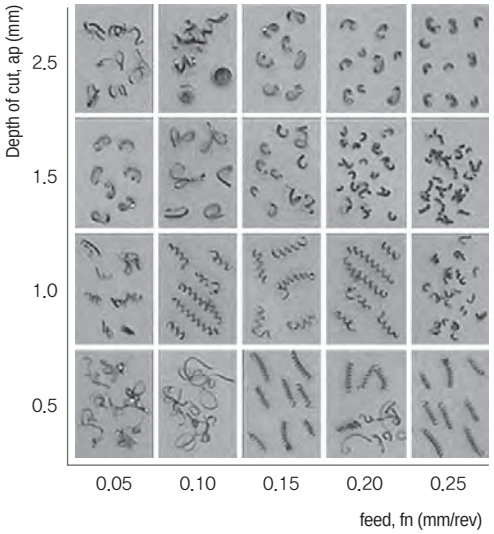
- For continuous cutting of forged steel at high feed
- Turning insert for internal machining of automobile components

Features of MP chip breaker

- **Three-dimensional 2 step chip breaker**
  - Stable chip control in unstable internal machining
  - Prevents chip blocking at internal diameter at varying depth of cut and feed.
- **Stronger cutting edge and wide chip pocket**
  - Increased chipping resistance in unstable internal machining

Chip control test

■ **Workpiece**	SCM440
■ **Cutting condition**	vc = 200 m/min, ap = 0.5~2.5 mm, fn = 0.05~0.25 mm/rev
■ **Tools**	CCMT09T304-MP



Features of Chip Breaker

VL Chip Breaker [For finishing]

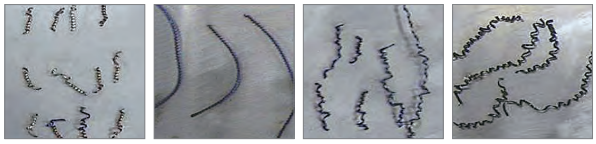
- Improved chip control for machining material that have high toughness such as low carbon steel, pipe, steel plate etc
- mproved chip control and decreased cutting load on external, facing, and copying applications
- Improved strength of the cutting edge for measurable efficiency in automated production

Features of VL chip breaker

- **2 steps designed chip-breaker** - Suitable Mild steel
  - Stable chip control on the low feed and cutting depth
- **Designed with special dots** - Stable chip breaking on the low cutting depth
- **Applied side rake angle** - Improved chip control on facing, copying applications
  - Decreased cutting load and better surface finish

Chip control test

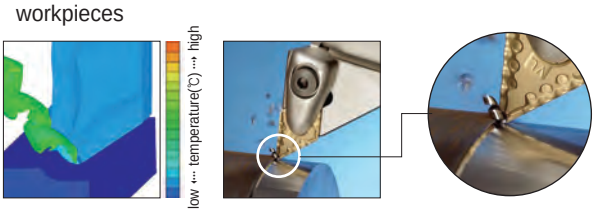
- **Workpiece** SM20C
- **Cutting conditions** vc = 250 m/min, ap = 0.5 mm, fn = 0.2 mm/rev (Side), dry
- **Tools** DNMG150408-VL



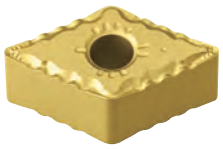
VL Chip Breakers | Competitor A | Competitor B | Competitor C

FEM Cutting simulation analysis in the design

- For design of geometry, chip shapes and chip flow are predictable
- Optimal chip breaker design by various cutting conditions and workpieces



VB Chip Breaker [For finishing]



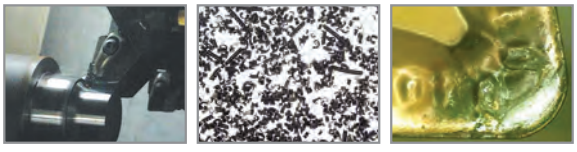
- Excellent chip evacuation in continuous and high speed machining of various workpieces
- 3-dimensional chip breaker achieves lower cutting resistance, high rigidity of the cutting edge, and longer tool life
- Stable chip control in copying and internal machining

Features of VB chip breaker

- **6 bumps on the insert corner** - Superior chip control and chip cutting in copying with various depths of cut
- **Side rake angle** - Superb chip cutting in facing and copying. Superior tool life due to improved surface roughness and lower cutting resistance
- **Cutting edge on 100° part for medium machining (For CNMG)** - Excellent chip evacuation and toughness in machining with high depth of cut

Performance

Better machining **Better Chip control** **Longer tool life**



VB Chip Breakers

Conventional chip breaker

Features of Chip Breaker

VC Chip Breaker [For medium to finishing]

- Superior chip evacuation in high speed and continuous machining of various workpieces (carbon steel, alloy steel etc)
- KORLOY 3 dimensional chip breaker ensures longer tool life due to low cutting load and improved cutting edge strength
- Stable chip control in copying and internal machining

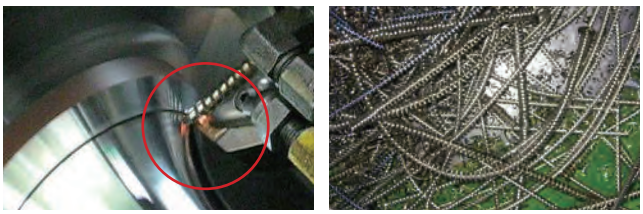
Features of VC chip breaker

• 4 bums on the insert corner
- Excellent chip control in various depths of cut and superb chip cutting in external, internal, copy machining and facing

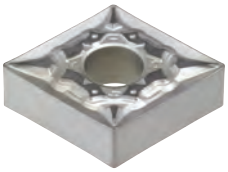
Evaluation of chip control (Copying)

VC Chip Breakers

Conventional chip breaker



VQ Chip Breaker [For medium to finishing_For cermet]



- Excellent cutting performance and reinforced cutting edges
- Improved chip control at low depth of cuts

Features of VQ chip breaker

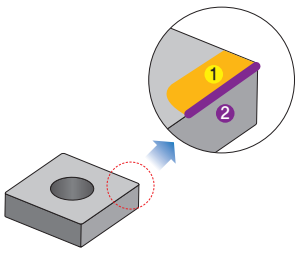
• Three dimensional rake angle
- Improved surface finish thanks to sharp cutting performance
- Less cutting heat and longer tool life thanks to low cutting resistance

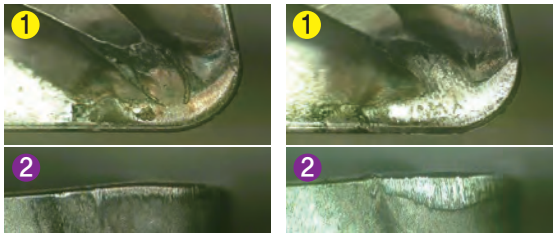
• Beveled protruding structure
- Smooth chip flow at low depth of cuts
- Wide application range

Performance evaluation

■ **Workpiece**	SCM440(Alloy steel), Ø100, External diameter turning
■ **Cutting condition**	vc = 280 m/min, ap = 1.5 mm, fn = 0.25 mm/rev
■ **Tools**	CNMG120408-VQ (CN2500)

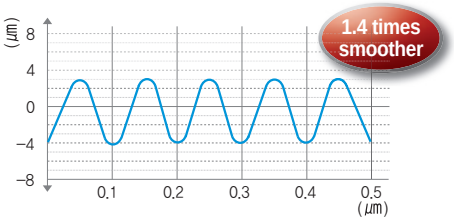
Wear comparison



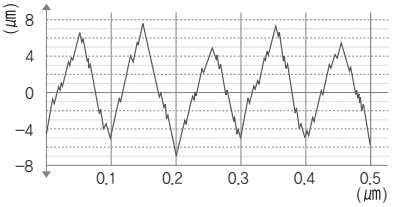


CN2500–VQ　　Competitor

Surface roughness comparison



CN2500 (Ra 3.0 ㎛)



Competitor (Ra 7.0 ㎛)

Features of Chip Breaker

VH/VT Chip Breaker [For heavy duty machining]

- Heavy duty chip breaker suitable for Heavy machining in the ship building and power plant industries
- Suitable for large vertical machines when machining shafts, rollers, rotors and optimal for the big flange machining

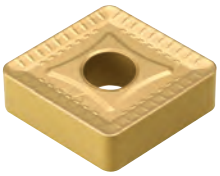
Features of VH chip breaker

▶ For good chip control in heavy machining (comprehensive type)

- Designed from the study of heavy cutting mechanism
- Smooth chip control from the high rake angle
- Wider cutting edge land provides stronger cutting
- Unique cutting edge treatment provides smooth cutting
- Optimized chip pocket design provides smooth chip flow

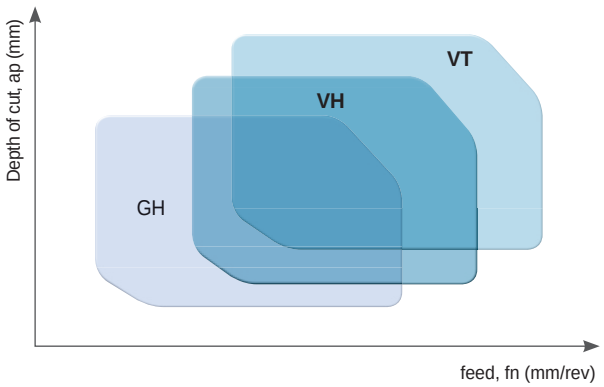
Features of VT chip breaker

▶ For long tool life and stable cutting (higher feeds, big depth) in heavy machining



- Designed from the study of heavy cutting mechanism
- Strong edge design provides long and stable cutting (2 step rake angle of cutting edge)
- Varied cutting edge land strengthens the cutting edge
- The positioning of the chip breaking convex dot deflect the machining heat, optimizes inserts wear & absorb shock

Applications range of chip breakers

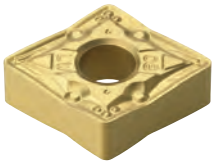


Features of Chip Breaker

LW/VW Chip Breaker [For high feed cutting]

- Improved productivity with higher feed rates and surface finishes
- Improved wear resistance and toughness

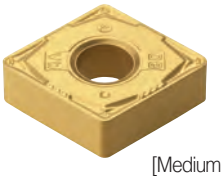
Features of LW chip breaker



[For medium cutting]

- **Curvilinear cutting edge** - Reduces cutting force
- **Cutting edge design able to handle deeper depth of cuts** - lower cutting load & reduces heat
- **Greater chip control at shallow depths of cuts** - Chip pocket design improves smooth chip flow
- **For shallow depth cutting and low speed machining** - 3D design at the corner

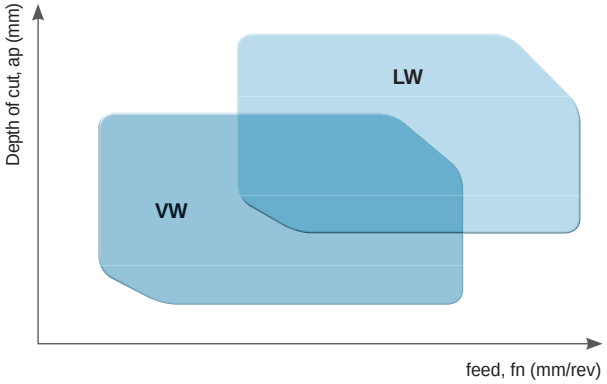
Features of VW chip breaker



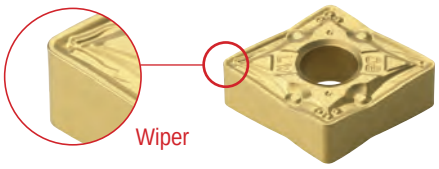
[Medium to finishing]

- **Excellent Finishing applications** - Excellent chip control
- **Insert design great for stable clmaping** - Chip breaker designed close to the cutting edge
- **Similar cutting edge to C/B for medium** - strong cutting edge
- **3 Dimensional dot design on cutting corner**
  - reduces cutting force and good chip control at shallow depth of cut

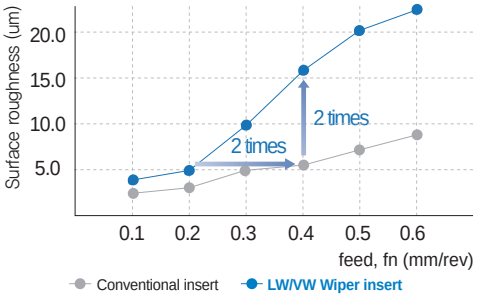
Applications range of chip breakers



Wiper Insert



- High productivity
- Improved surface roughness
- High feed-reducing machining time
- Improved tool life due to reduce cutting force

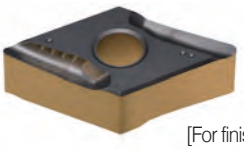


Features of Chip Breaker

SR/SH Chip Breaker new [For machining a shaft]

- Specialized for machining slender bars and thin walls
- High rake helix angle to reduce cutting resistance
- For machining steel and stainless steel

Features of SR chip breaker



[For finishing]

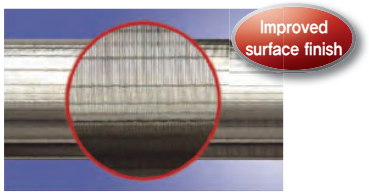
- The first recommended chip breaker for machining a shaft
- For continuous finishing
- Improved chip and heat evacuation due to high rake cutting edge and 3-dimensional shape
- Good surface finish
- Preventing fracture due to chamfering on the cutting edge

Features of SH chip breaker

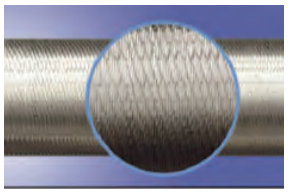
[For medium cutting]

- Specialized for interrupted and medium cutting
- Efficient heat evacuation due to concave shaped back side of insert

Surface finish evaluation

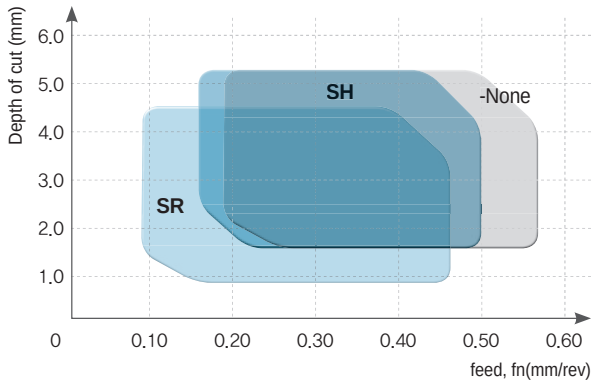


SR chip breaker



Other chip breakers

Applications range of chip breakers



Machining	C/B	ap (mm)	fn (mm/rev)
Medium to rough cutting	-None	1.5~5.0	0.20~0.55
Medium cutting	SH	1.5~5.0	0.15~0.50
Finish cutting	SR	1.0~4.5	0.12~0.45