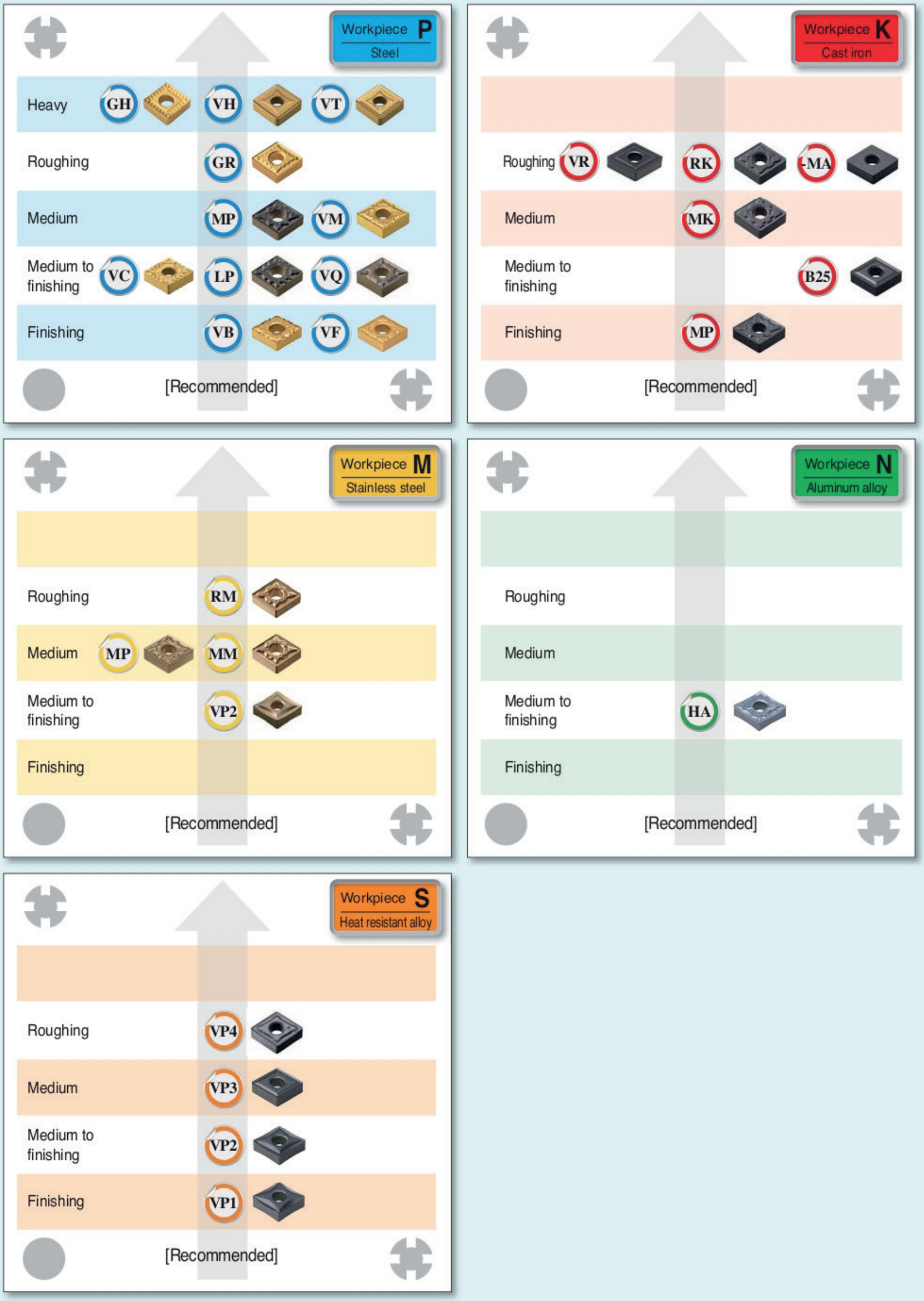
Applications range of chip breakers

Negative inserts



Applications range of chip breakers

Positive inserts

Workpiece P — Steel

Roughing		
Medium	C25	
Medium to finishing	HMP 	MP 
Finishing	VL 	VF 

[Recommended]

Workpiece K — Cast iron

Roughing		
Medium	C25 	
Medium to finishing	MP 	
Finishing		

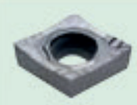
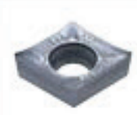
[Recommended]

Workpiece M — Stainless steel

Roughing		
Medium	C25 	
Medium to finishing	HMP 	MP 
Finishing	VL 	

[Recommended]

Workpiece N — Aluminum alloy

Roughing		
Medium	AR 	
Medium to finishing	AK 	
Finishing		

[Recommended]

Workpiece S — Heat resistant alloy

Roughing		
Medium		
Medium to finishing	MP 	
Finishing	VP1 	VL 

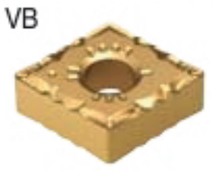
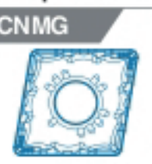
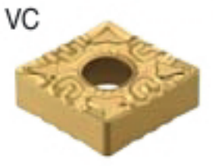
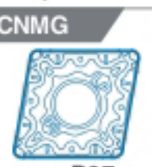
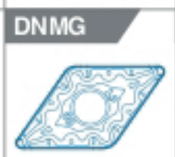
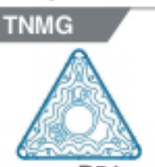
[Recommended]

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 		0.1 ~ **0.2** ~ 0.35	NC3215 NC3225 CN1500 CN2500	305 250 260 230	CNMG  p. B27	DNMG  p. B34	SNMG  p. B43	TNMG  p. B51	VNMG  p. B56	WNMG  p. B58
	0.5 ~ **1.0** ~ 1.5 Finishing	VF 		0.05 ~ **0.15** ~ 0.35	NC3215 NC3220 NC3225 NC5330	305 270 270 210	CNMG  p. B26	DNMG  p. B34	SNMG  p. B43	TNMG  p. B51	VNMG  p. B56	WNMG  p. B58
	0.5 ~ **1.0** ~ 2.0 Finishing	VB 		0.15 ~ **0.2** ~ 0.4	NC3215 NC3225 CN1500 CN2500	340 250 240 210	CNMG  p. B26	DNMG  p. B33		TNMG  p. B50		WNMG  p. B58
	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. B27	DNMG  p. B35	SNMG  p. B43	TNMG  p. B52	VNMG  p. B56	WNMG  p. B59
	0.5 ~ **1.0** ~ 2.5 Medium	LP 		0.10 ~ **0.25** ~ 0.40	NC3215 NC3225 NC5330	300 250 200	CNMG  p. B27	DNMG  p. B35	SNMG  p. B43	TNMG  p. B51	VNMG  p. B56	WNMG  p. B59
	0.5 ~ **1.5** ~ 4.5 Medium	MP 		0.15 ~ **0.30** ~ 0.45	NC3215 NC3225 NC5330	300 265 200	CNMG p. B29	DNMG p. B36	SNMG p. B45	TNMG p. B53	VNMG p. B57	WNMG p. B60
	1.0 ~ **2.5** ~ 5.0 Medium	VM		0.10 ~ **0.25** ~ 0.50	NC3215 NC3220 NC3225 NC5330 CN1500 CN2500	295 260 260 205 220 200	CNMG p. B30	DNMG p. B37	SNMG p. B45	TNMG p. B53	VNMG p. B57	WNMG p. B60
	1.0 ~ **3.0** ~ 4.5 Medium to roughing	GR		0.20 ~ **0.35** ~ 0.50	NC6205 NC6210 NC6215	180~370 150~330 130~280	CNMG p. B30	DNMG p. B38	SNMG p. B46	TNMG p. B54		WNMG p. B60
	6.0 ~ **10.0** ~ 15.0 Heavy (general)	VH		0.7 ~ **1.0** ~ 1.4	NC3215 NC3030 NC500H NC5330	50~250 50~150 50~150 50~150	CNMM p. B32		SNMM p. B47			
	7.0 ~ **12.0** ~ 17.0 Heavy (high feed cutting)	VT		0.75 ~ **1.2** ~ 1.6	NC3215 NC3030 NC500H NC5330	50~250 50~150 50~150 50~150	CNMM p. B32		SNMM p. B47			

● : The first recommended cutting condition

P Negative

P Positive

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	VL 		0.05 ~ **0.1** ~ 0.2	NC3215 NC3220 NC3225 NC5330 CN1500 CN2500	305 270 270 210 260 240	CCMT  p. B64	DCMT  p. B69	SCMT  p. B71	TCMT  p. B75	VB(C)MT  p. B81	
	0.1 ~ **0.5** ~ 1.5 Finishing	VF 		0.05 ~ **0.15** ~ 0.25	NC3215 NC3220 NC3225 NC5330 CC1500 CN1500 CN2500	305 270 270 210 260 250 230	CCMT  p. B64	DCMT  p. B68	SCMT  p. B70	TC(P)MT  p. B75	VB(C)MT  p. B80	
	0.5 ~ **1.0** ~ 3.0 Medium to finishing	MP 		0.1 ~ **0.2** ~ 0.35	NC3215 NC3225 CN1500 CN2500	300 250 240 200	CCMT  p. B65	DCMT  p. B69	SCMT  p. B71	TC(P)MT  p. B76	VB(C)MT  p. B81	
	0.5 ~ **1.5** ~ 3.0 Medium to finishing	HMP 		0.08 ~ **0.20** ~ 0.40	NC3215 NC3220 NC3225 NC5330 CN1500 CN2500	320 285 285 225 240 220	CCMT  p. B64	DCMT  p. B69	SCMT  p. B71	TCMT  p. B75	VB(C)MT p. B81	
	1.0 ~ **2.0** ~ 3.0 Medium	C25		0.10 ~ **0.25** ~ 0.35	NC3215 NC3220 NC3225 NC5330 CN1500 CN2500	320 285 285 225 230 210	CCMT p. B65	DCMT p. B69	SCMT p. B71	TCMT p. B76		

●: The first recommended cutting condition

Recommended chip breaker for workpiece

Workpiece **P** Steel

Materials: S45C, S55C, 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°
							CNMG	DNMG	SNMG	TNMG	VNMG	WNMG
Negative	0.5 ~ **1.0** ~ 1.5 Finishing	VF		0.05 ~ **0.15** ~ 0.35	NC3215 NC3225 NC5330	305 270 250	p. B26	p. B34	p. B43	p. B51	p. B56	p. B58
	0.5 ~ **1.0** ~ 2.0 Finishing	VB		0.15 ~ **0.2** ~ 0.4	NC3215 NC3225 CN1500 CN2500	340 250 230 190	p. B26	p. B33		p. B50		p. B58
	0.5 ~ **1.0** ~ 2.5 Medium	LP		0.10 ~ **0.25** ~ 0.40	NC3215 NC3225 NC5330	300 250 200	p. B27	p. B35	p. B43	p. B51	p. B56	p. B59
	0.5 ~ **1.5** ~ 4.5 Medium	MP		0.15 ~ **0.30** ~ 0.45	NC3215 NC3225 NC5330	300 250 200	p. B29	p. B36	p. B45	p. B53	p. B57	p. B60
	0.5 ~ **1.5** ~ 3.5 Medium to finishing	VC		0.12 ~ **0.25** ~ 0.45	NC3215 NC3220 NC3225 NC5330	285 255 250 200	p. B27	p. B35	p. B43	p. B52	p. B56	p. B59
	1.0 ~ **2.5** ~ 5.0 Medium	VM		0.10 ~ **0.25** ~ 0.50	NC3215 NC3220 NC3225 NC5330 CN1500 CN2500	260 245 245 205 210 170	p. B30	p. B37	p. B45	p. B53	p. B57	p. B60
	1.0 ~ **3.0** ~ 4.5 Medium to roughing	GR		0.20 ~ **0.35** ~ 0.50	NC6205 NC6210 NC6215	180~370 150~330 130~280	p. B30	p. B38	p. B46	p. B54		p. B60
	6.0 ~ **10.0** ~ 15.0 Heavy (general)	VH		0.7 ~ **1.0** ~ 1.4	NC3215 NC3030 NC500H NC5330	50~250 50~150 50~150 50~150	CNMM p. B32		SNMM p. B47			
	7.0 ~ **12.0** ~ 17.0 Heavy (high feed cutting)	VT		0.75 ~ **1.2** ~ 1.6	NC3215 NC3030 NC500H NC5330	50~250 50~150 50~150 50~150	CNMM p. B32		SNMM p. B47			
Positive	0.1 ~ **0.5** ~ 1.0 Finishing	VL		0.05 ~ **0.1** ~ 0.2	NC3215 NC3220 NC3225 NC5330 CN1500 CN2500	345 310 310 240 250 210	CCMT p. B64	DCMT p. B69	SCMT p. B71	TCMT p. B75	VB(C)MT p. B81	
	0.1 ~ **0.5** ~ 1.5 Finishing	VF		0.05 ~ **0.15** ~ 0.25	NC3215 NC3220 NC3225 NC5330 CC1500 CN1500 CN2500	265 300 300 230 260 240 210	CCMT p. B64	DCMT p. B68	SCMT p. B70	TC(P)MT p. B75	VCMT p. B80	
	0.30 ~ **1.5** ~ 3.0 Medium to finishing	MP		0.05 ~ **0.15** ~ 0.35	NC3215 NC3225	300 250	CCMT p. B65	DCMT p. B69	SCMT p. B71	TC(P)MT p. B76	VB(C)MT p. B81	
	1.0 ~ **2.0** ~ 3.0 Medium	C25		0.1 ~ **0.15** ~ 0.35	NC3215 NC3220 NC3225 NC5330 CN1500 CN2500	320 285 285 225 230 200	CCMT p. B65	DCMT p. B69	SCMT p. B71	TCMT p. B76		

●: 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

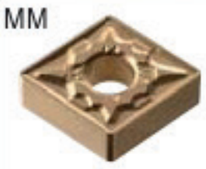
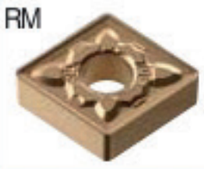
	Depth of cut (mm)	C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	Insert shape: 80°	55°	90°	60°	35°	80°
							CNMG	DNMG	SNMG	TNMG	VNMG	WNMG
Negative	0.5 ~ **1.0** ~ 1.5 Finishing	VF		0.08 ~ **0.15** ~ 0.30	NC3215 NC3220 NC3225	180 159 159	p. B26	p. B34	p. B43	p. B51	p. B56	p. B58
	0.5 ~ **1.0** ~ 2.0 Finishing	VB		0.15 ~ **0.2** ~ 0.4	NC3215 NC3225 CN1500 CN2500	200 148 220 200	p. B26	p. B33		p. B50		p. B58
	0.5 ~ **1.5** ~ 3.5 Medium to finishing	VC		0.12 ~ **0.25** ~ 0.45	NC3215 NC3220 NC3225 NC5330	168 148 150 200	p. B27	p. B35	p. B43	p. B52	p. B56	p. B59
	0.5 ~ **1.0** ~ 2.5 Medium	LP		0.10 ~ **0.25** ~ 0.40	NC3215 NC3225 NC5330	250 200 200	p. B27	p. B35	p. B43	p. B51	p. B56	p. B59
	0.5 ~ **1.5** ~ 4.5 Medium	MP		0.15 ~ **0.30** ~ 0.45	NC3215 NC3225 NC5330	250 200 200	p. B29	p. B36	p. B45	p. B53	p. B57	p. B60
	1.0 ~ **2.5** ~ 5.0 Medium	VM		0.15 ~ **0.25** ~ 0.50	NC3215 NC3220 NC3225 CN1500 CN2500	174 153 153 120 100	p. B30	p. B37	p. B45	p. B53	p. B57	p. B60
	1.0 ~ **3.0** ~ 4.5 Medium to roughing	GR		0.20 ~ **0.35** ~ 0.50	NC6205 NC6210 NC6215	180~370 150~330 130~280	p. B30	p. B38	p. B46	p. B54		p. B60
	6.0 ~ **10.0** ~ 15.0 Heavy (general)	VH		0.7 ~ **1.0** ~ 1.4	NC3215 NC3030 NC500H NC5330	50~250 50~150 50~150 50~150	CNMM p. B32		SNMM p. B47			
	7.0 ~ **12.0** ~ 17.0 Heavy (high feed cutting)	VT		0.75 ~ **1.2** ~ 1.6	NC3215 NC3030 NC500H NC5330	50~250 50~150 50~150 50~150	CNMM p. B32		SNMM p. B47			
							CCMT	DCMT	SCMT	TCMT	VB(C)MT	
Positive	0.1 ~ **0.5** ~ 1.0 Finishing	VL		0.05 ~ **0.1** ~ 0.2	NC3215 NC3220 NC3225 NC5330 CN1500 CN2500	305 310 310 240 210 190	p. B64	p. B69	p. B71	p. B75	p. B81	
	0.1 ~ **0.5** ~ 1.5 Finishing	VF		0.05 ~ **0.15** ~ 0.25	NC3215 NC3220 NC3225 NC5330 CC1500 CN1500 CN2500	330 300 300 230 260 250 240	p. B64	p. B68	p. B70	p. B75	p. B80	
	0.30 ~ **1.5** ~ 3.0 Medium to finishing	MP		0.05 ~ **0.15** ~ 0.35	NC3215 NC3225 NC5300 CN1500 CN2500	305 285 225 240 220	p. B65	p. B69	p. B71	p. B76	p. B81	
	1.0 ~ **2.0** ~ 3.0 Medium	C25		0.1 ~ **0.15** ~ 0.35	NC3215 NC3220 NC3225 NC5330 CN1500 CN2500	320 285 285 225 100 80	p. B65	p. B69	p. B71	p. B76		

●: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. B28	DNMG  p. B35	SNMG  p. B43	TNMG  p. B52		WNMG  p. B59
	1.0 ~ **2.0** ~ 4.5 Medium	MP 		0.15 ~ **0.23** ~ 0.45	PC8105 PC8110 PC8115 PC5300 PC5400	175 160 150 130 110	CNMG  p. B29	DNMG  p. B36	SNMG  p. B45	TNMG  p. B53	VNMG  p. B57	WNMG  p. B60
	0.50 ~ **3.0** ~ 5.5 Medium	MM 		0.12 ~ **0.25** ~ 0.45	NC9115 NC9125 NC9135 PC8110 PC8115 PC5300	190 170 130 160 150 130	CNMG  p. B29	DNMG  p. B36	SNMG  p. B44	TNMG  p. B52	VNMG  p. B57	WNMG  p. B59
	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. B31	DNMG  p. B39	SNMG  p. B46	TNMG  p. B54	VNMG  p. B57	WNMG  p. B61
Positive	0.1 ~ **0.5** ~ 1.0 Finishing	VL 		0.05 ~ **0.1** ~ 0.2	PC8105 PC8110 PC8115 PC5300 PC5400 NC5330 NC9025	215 195 190 165 135 165 165	CCMT  p. B64	DCMT  p. B69	SCMT  p. B71	TCMT  p. B75	VB(C)MT  p. B81	
	0.30 ~ **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. B65	DCMT p. B69	SCMT p. B71	TC(P)MT p. B76	VB(C)MT p. B81	
	1.0 ~ **1.5** ~ 3.0 Medium	C25		0.08 ~ **0.13** ~ 0.25	PC8110 PC5300 PC9030	170 155 155	CCMT p. B65	DCMT p. B69	SCMT p. B71	TCMT p. B76		

●: The first recommended cutting condition

M Negative

M Positive

Recommended chip breaker for workpiece

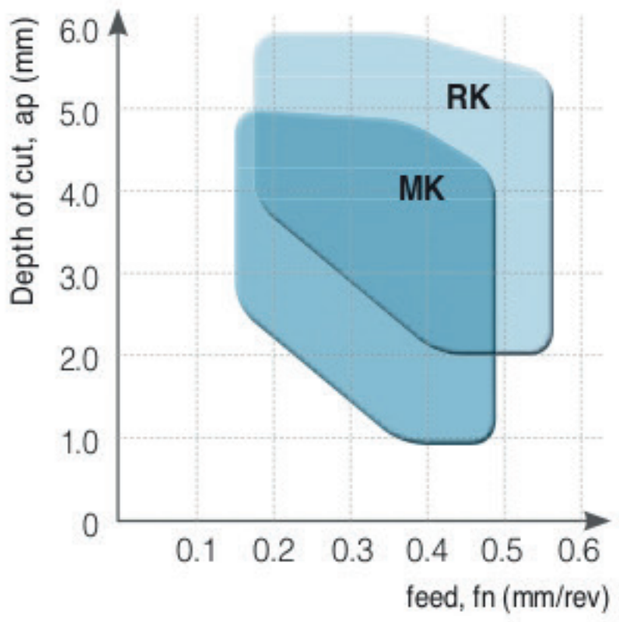
Workpiece K Cast iron

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

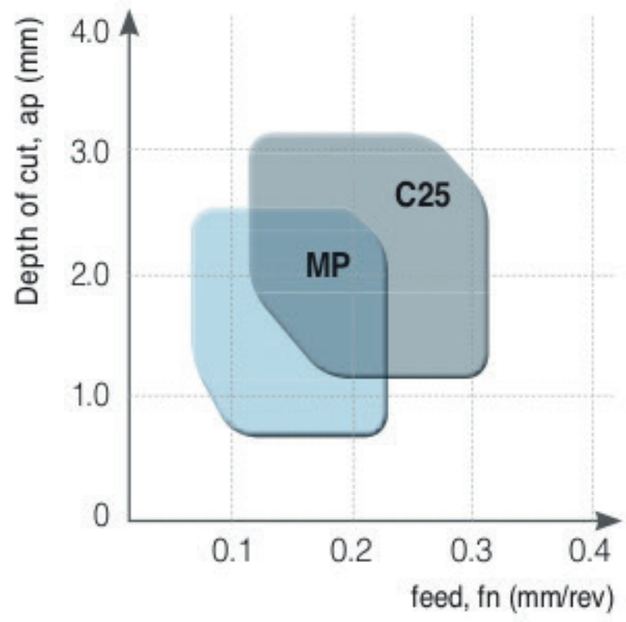
	Depth of cut (mm)	C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	Insert shape 80°	55°	90°	60°	35°	80°
Negative	1.0 ~ **2.5** ~ 6.0 Roughing	C/B 無		0.15 ~ **0.30** ~ 0.60	DBNX10 DBN500 DBN700 NC6205 NC6210 NC6215	150 ~ 200 200 ~ 500 500 ~ 2000 170 ~ 420 140 ~ 350 120 ~ 290	CNMA p. B26	DNMA p. B33	SNMA p. B42	TNMA p. B50		
	1.5 ~ **3.0** ~ 6.0 Roughing	RK		0.20 ~ **0.30** ~ 0.60	NC6315	150~450	CNMG p. B31	DNMG p. B38	SNMG p. B46	TNMG p. B54		WNMG p. B61
	1.0 ~ **3.0** ~ 4.5 Roughing	VR		0.2 ~ **0.35** ~ 0.60	NC6215	200~250	CNMG p. B31	DNMG p. B39	SNMG p. B47	TNMG p. B54		WNMG p. B61
	0.5 ~ **2.0** ~ 3.5 Medium to finishing	B25		0.2 ~ **0.35** ~ 0.60	NC6205 NC6210 NC6215	170~380 140~320 120~290	CNMG p. B30	DNMG p. B38	SNMG p. B45	TNMG p. B53		
	1.0 ~ **2.5** ~ 5.0 Medium to finishing	MK		0.10 ~ **0.25** ~ 0.50	NC6315	150~450	CNMG p. B28	DNMG p. B36	SNMG p. B44	TNMG p. B52	VNMG p. B57	WNMG p. B59
Positive	0.30 ~ **1.5** ~ 3.0 Medium to finishing	MP		0.1 ~ **0.2** ~ 0.35	NC6215	200-250	CCMT p. B65	DCMT p. B69	SCMT p. B71	TC(P)MT p. B76	VB(C)MT p. B81	
	1.0 ~ **2.0** ~ 3.5 Medium	C25		0.10 ~ **0.25** ~ 0.40	NC6205 NC6210 NC6215	340 285 200	CCMT p. B65	DCMT p. B69	SCMT p. B71	TCMT p. B76		

●: 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	HA		0.1 ~ **0.2** ~ 0.5	H01	500	CNMG p. B27	DNMG p. B34	SNMG p. B43	TNMG p. B51	VNMG p. B56	WNMG p. B58
Positive	0.1 ~ **1.0** ~ 4.0 Medium to finishing	AK		0.03 ~ **0.2** ~ 0.4	H01 ND1000 PD1000	1000 1000 1000	CCGT p. B87	DCGT p. B88	SCGT p. B90	TCGT p. B91	VB(C)GT p. B92	RCGT p. B89
	0.5 ~ **1.5** ~ 4.0 Medium	AR		0.05 ~ **0.3** ~ 0.5	H01 ND1000 PD1000	1000 1000 1000	CCGT p. B87	DCGT p. B88	SCGT p. B90	TCGT p. B91	VB(C)GT p. B92	RCGT p. B89

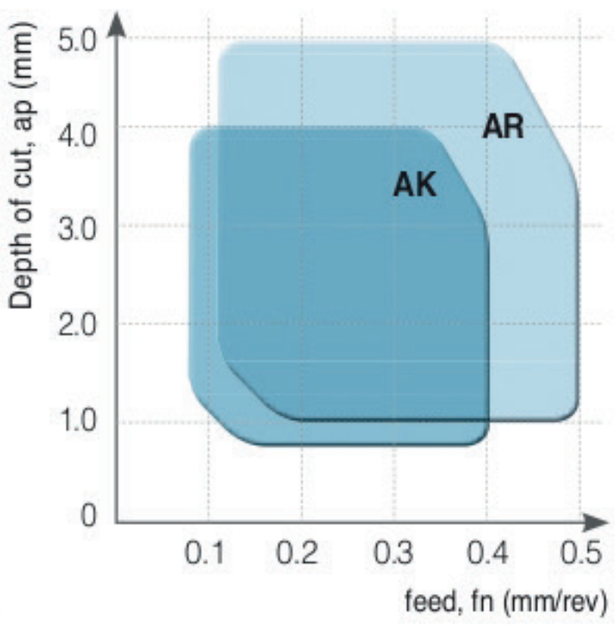
Materials: Copper Bronze alloy

Hardness: 20~110HB

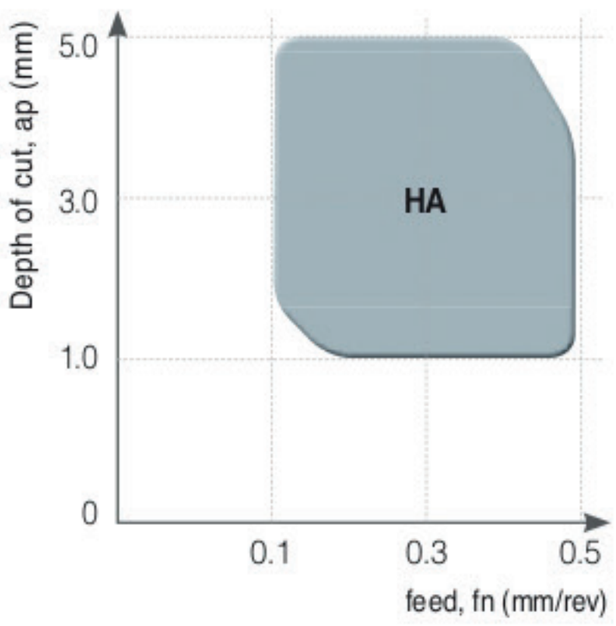
	Depth of cut (mm)	C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	Insert shape: 80°	55°	90°	60°	35°	80°
Negative	0.5 ~ **2.0** ~ 4.0 Medium to finishing	HA		0.1 ~ **0.2** ~ 0.5	H01	1000	CNMG p. B27	DNMG p. B34	SNMG p. B43	TNMG p. B51	VNMG p. B56	WNMG p. B58
Positive	0.1 ~ **1.0** ~ 3.0 Medium to finishing	AK		0.03 ~ **0.2** ~ 0.3	H01	1000	CCGT p. B87	DCGT p. B88	SCGT p. B90	TCGT p. B91	VB(C)GT p. B92	RCGT p. B89
	0.5 ~ **1.5** ~ 3.0 Medium	AR		0.05 ~ **0.25** ~ 0.4	H01	1000	CCGT p. B87	DCGT p. B88	SCGT p. B90	TCGT p. B91	VB(C)GT p. B92	RCGT p. B89

●: The first recommended cutting condition

N Negative



N Positive



Recommended chip breaker for workpiece

Workpiece **S** Heat resistant alloy

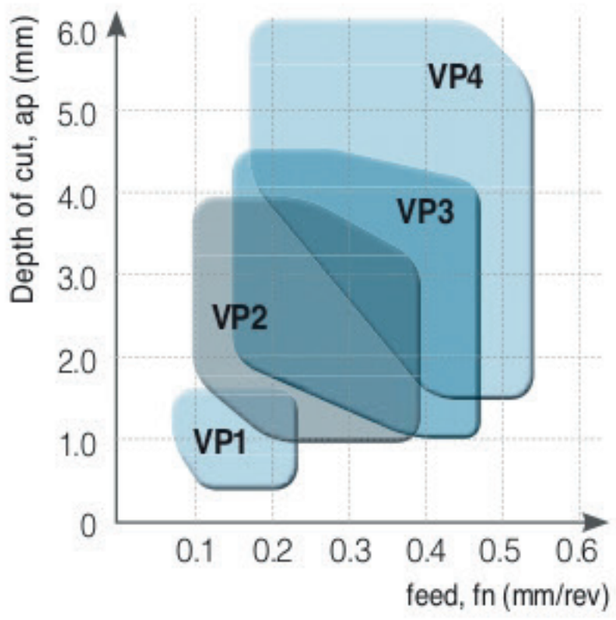
Materials: Inconel, Nimonic, Stellite, Ti alloy

Hardness: 160~350HB

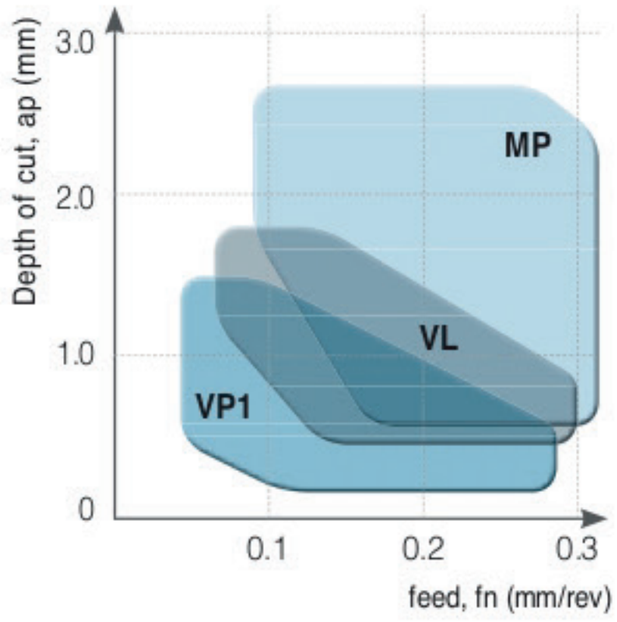
	Depth of cut (mm)	C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	Insert shape: 80°	55°	90°	60°	35°	80°
Negative	0.1 ~ 0.5 ~ 1.5 Finishing	VP1		0.05 ~ 0.10 ~ 0.20	PC8110 PC5300 NC5330	60 50 50	CNGG p. B26	DNGG p. B33				
	0.5 ~ 1.5 ~ 4.0 Medium to finishing	VP2		0.10 ~ 0.20 ~ 0.40	PC8110 PC5300	60 45	CNMG p. B28	DNMG p. B35	SNMG p. B43	TNMG p. B52		WNMG p. B59
	0.05 ~ 2.0 ~ 3.0 Medium	VP3		0.05 ~ 1.15 ~ 0.25	PC8110 PC5300	60 40	CNMG p. B30	DNMG p. B37	SNMG p. B45	TNMG p. B53	VNMG p. B57	WNMG p. B60
	1.0 ~ 2.5 ~ 4.0 Roughing	VP4		0.15 ~ 0.20 ~ 0.35	PC8115	60 40	CNMG p. B31	DNMG p. B39	SNMG p. B46	TNMG p. B54		WNMG p. B61
Positive	0.1 ~ 0.5 ~ 1.5 Finishing	VP1		0.05 ~ 0.10 ~ 0.20	PC8110 PC5300	60 45	CCGT p. B63	DCGT p. B68			VCGT p. B82	
	0.1 ~ 0.5 ~ 1.0 Finishing	VL		0.05 ~ 0.1 ~ 0.2	PC8110 PC8115	60 50	CCMT p. B64	DCMT p. B69	SCMT p. B71	TCMT p. B75	VCMT p. B83	
	0.5 ~ 1.0 ~ 3.0 Medium	MP		0.1 ~ 0.2 ~ 0.35	PC8110 PC8115	60 50	CCMT p. B65	DCMT p. B69	SCMT p. B71	TC(P)MT p. B76	VB(C)MT p. B81(B83)	

●: The first recommended cutting condition

S Negative



S Positive



Features of Chip Breaker

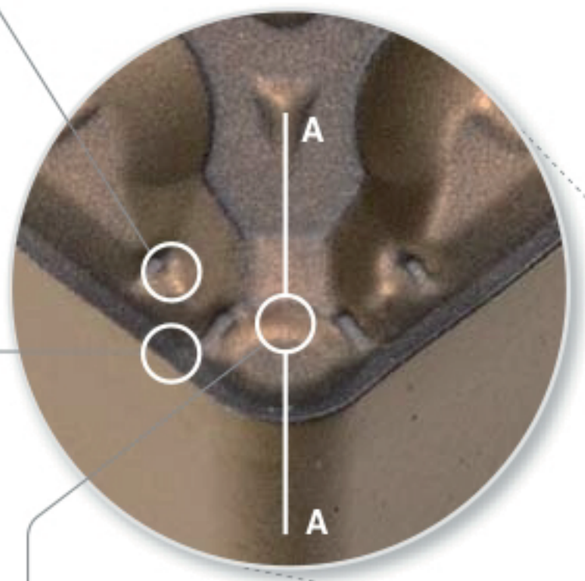
LP Chip Breaker new [For medium cutting to finishing]

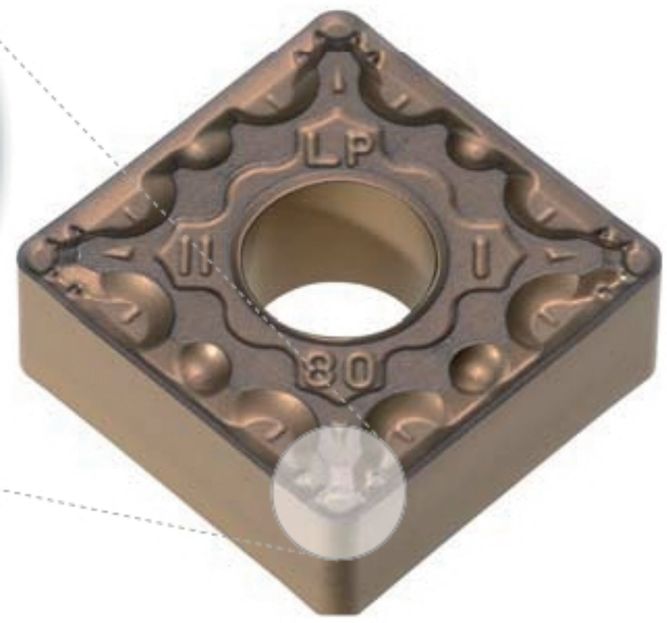
- Chip breaker for forged steel of automobile parts and normal steel
- Quad dots improve productivity through efficient chip control at high feed
- Angle land minimizes cutting force

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

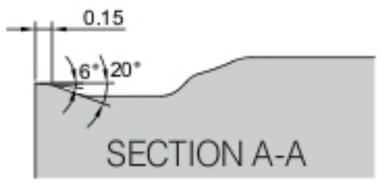




▶ Variable land

- Less crater wear
- Prevents chipping on minor cutting edge

▶ Flat zone

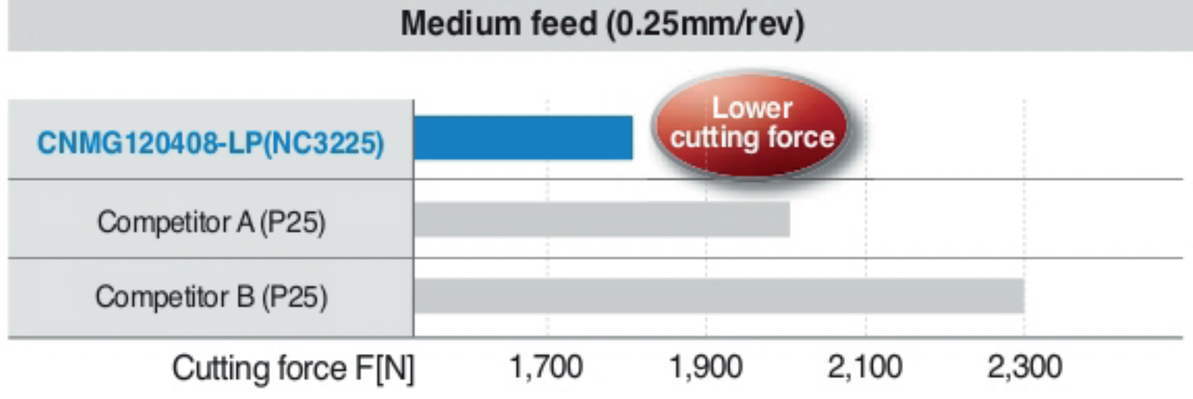


- Larger chip pocket for better chip evacuation at high feed
- Reduced cutting force with larger contact surface of chips

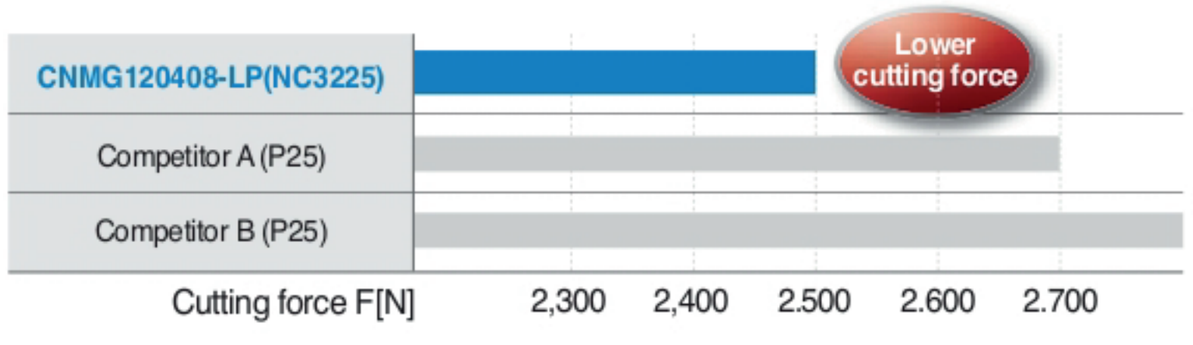
Performance evaluation (Evaluation of cutting force)

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

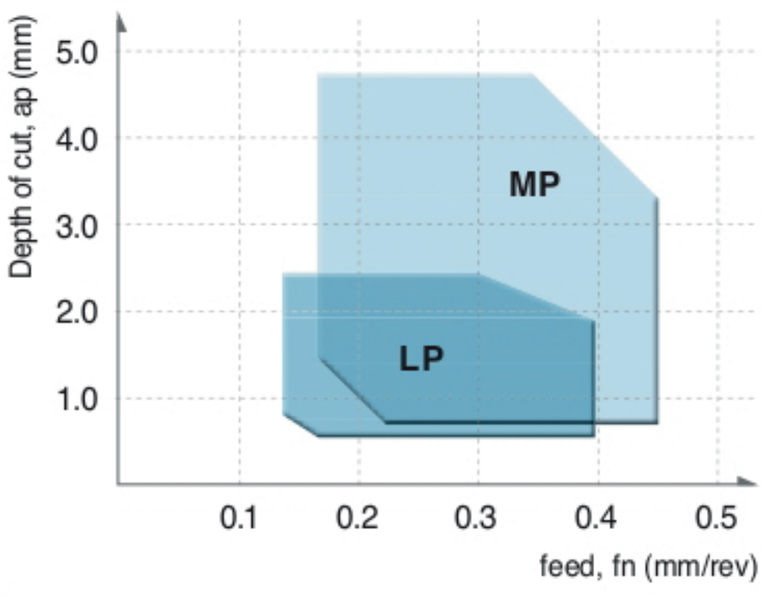
Medium feed (0.25mm/rev)



High feed (0.40mm/rev)



Application range



Features of Chip Breaker

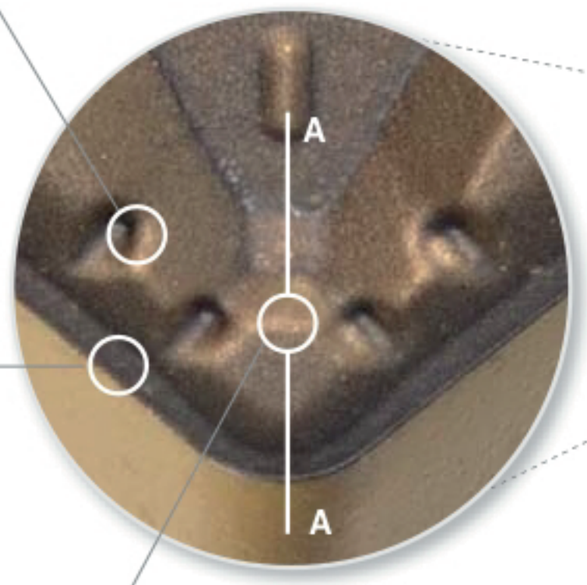
MP Chip Breaker new [For medium cutting]

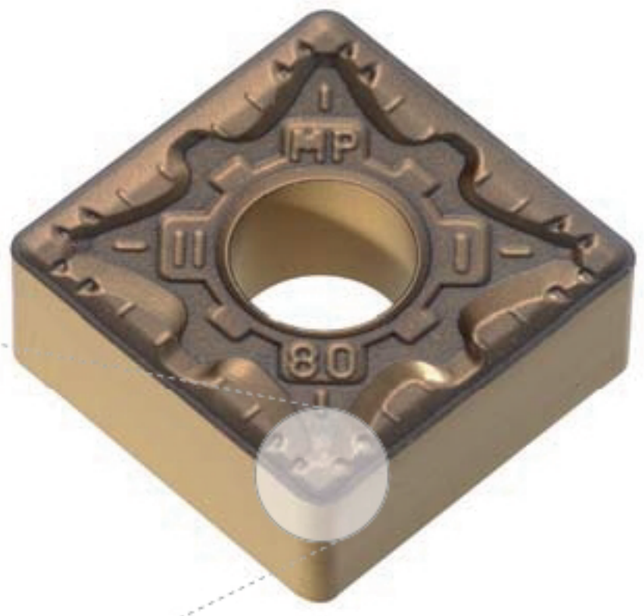
- Chip breaker for forged steel of automobile parts and all other steels
- Quad dots improve productivity through efficient chip control at high feed
- Angle land minimizes cutting force

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

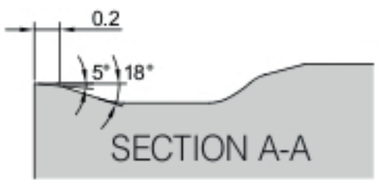




▶ Variable land

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

▶ Flat zone



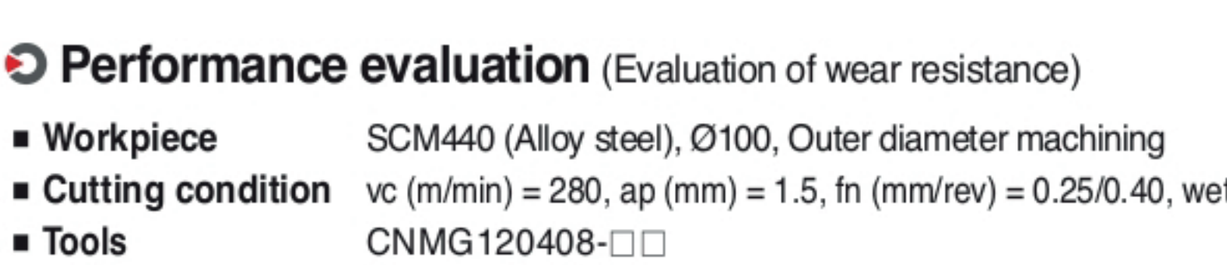
- Larger chip pocket for better chip evacuation at high feed
- Reduced cutting force with larger contact surface of chips

Performance evaluation (Evaluation of wear resistance)

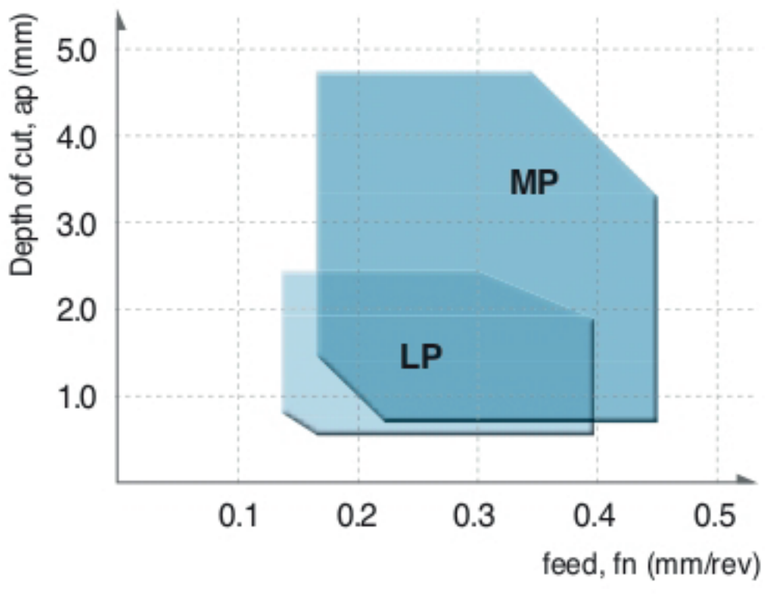
- **Workpiece** SCM440 (Alloy steel), Ø100, Outer diameter machining
- **Cutting condition** vc (m/min) = 280, ap (mm) = 1.5, fn (mm/rev) = 0.25/0.40, wet
- **Tools** CNMG120408-□□

Medium feed (0.25mm/rev)

High feed (0.40mm/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

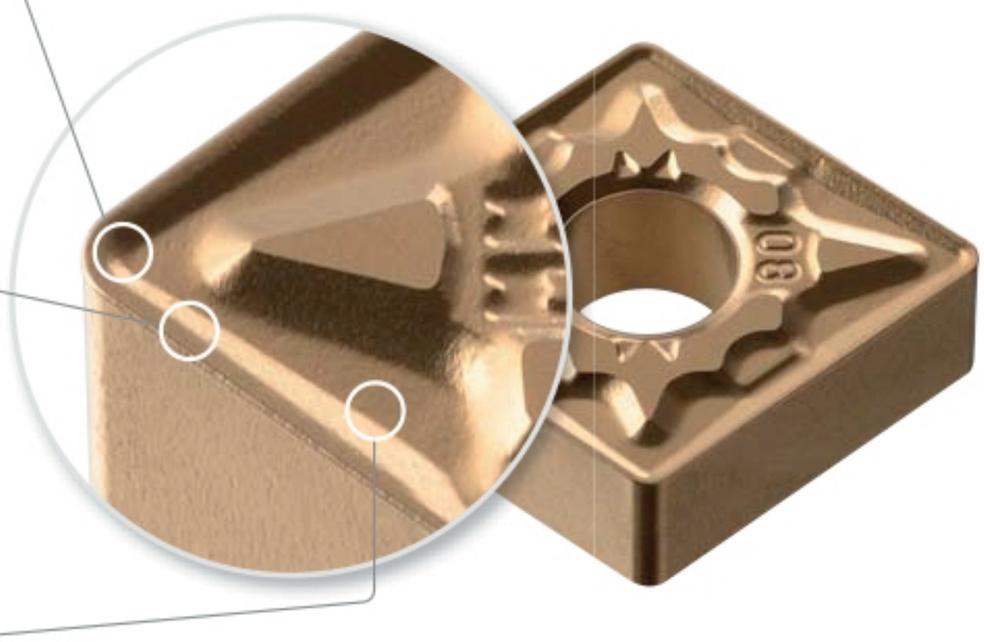
- Excellent chip control and sharp cutting at low depths of cut
- Delays crater wear
- Prevents plastic deformation

▶ 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

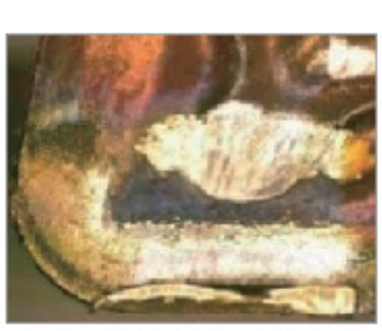
Built-up edge

- **Workpiece** X6CrAl13 (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

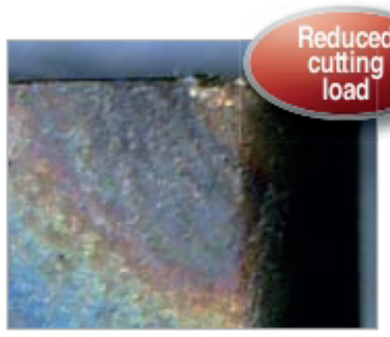
Plastic deformation

- **Workpiece** X5CrNiMo17-12-2 (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

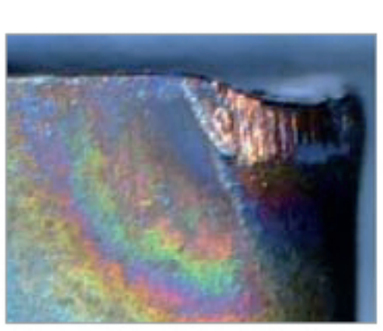
MM (NC9125)



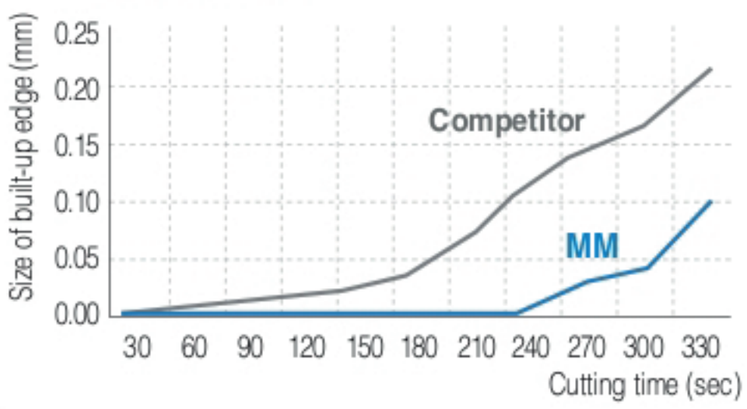
Competitor

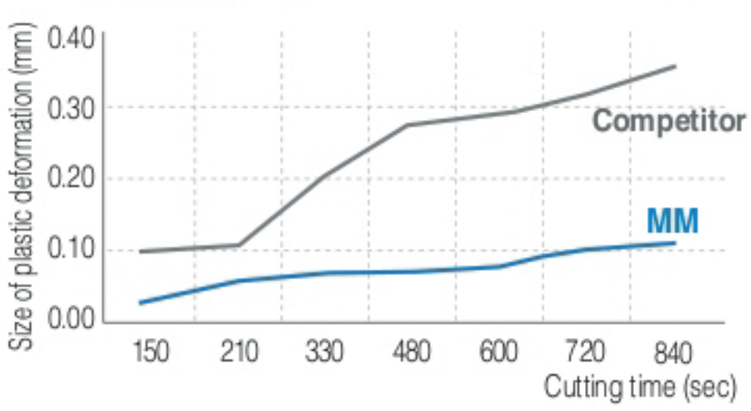


MM (NC9135)



Competitor





Features of Chip Breaker

RM Chip Breaker new [For rough cutting]

- 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

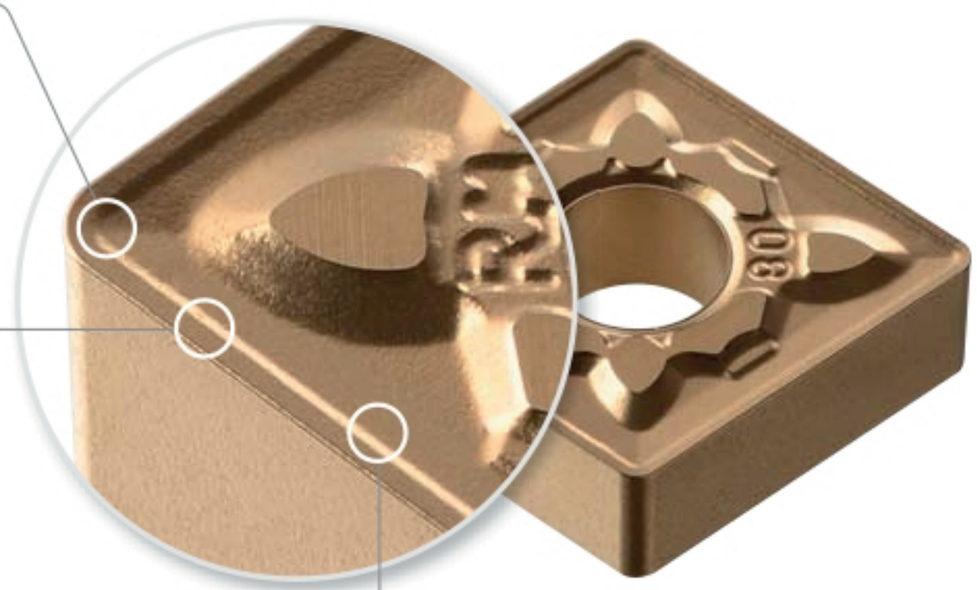
- Excellent chip control and sharp cutting at low depths of cut
- Delays crater wear
- Prevents plastic deformation

▶ 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



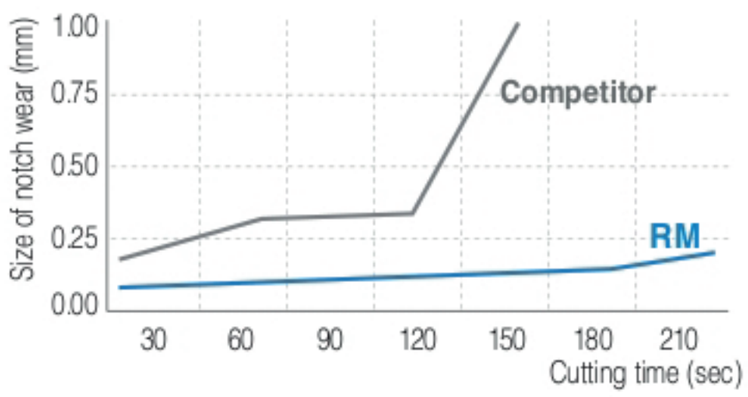
Performance evaluation

Notch wear

- **Workpiece** X12Cr13 (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)

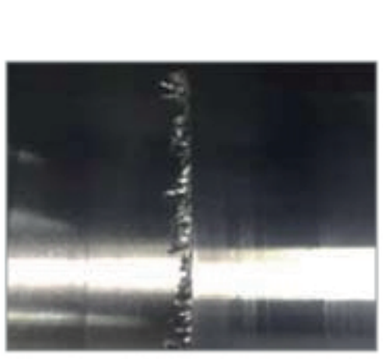
Competitor



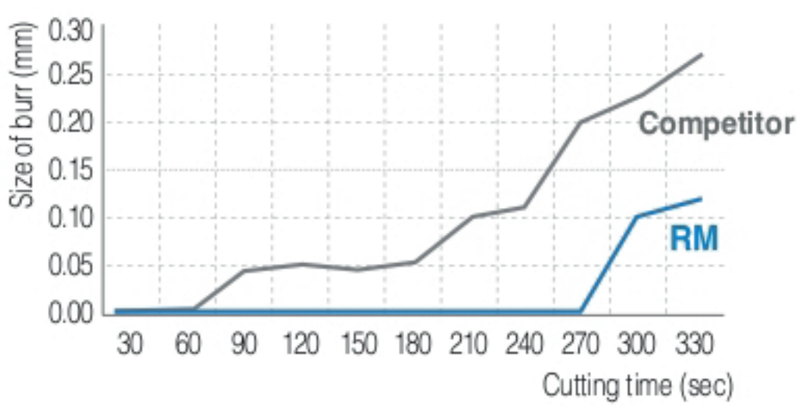
Burr

- **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

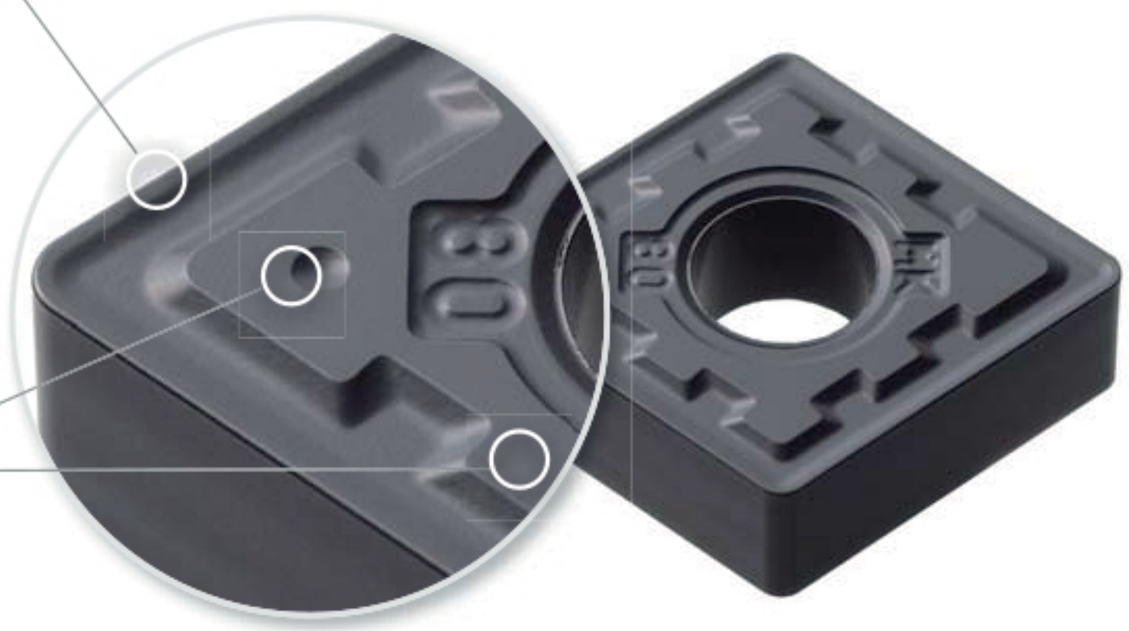
MK Chip Breaker new [For medium cutting]

- 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

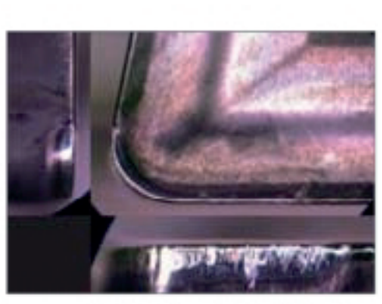
- Higher clamping stability
- Prevents chipping at vibrations during operation

Performance evaluation

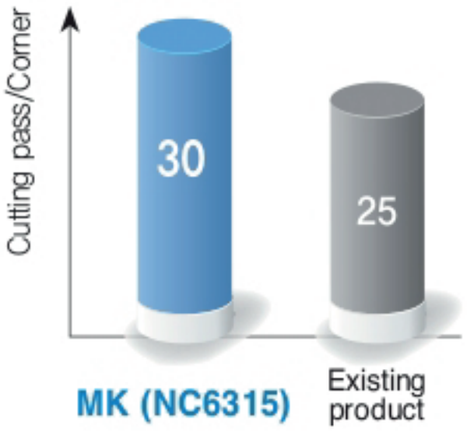
Wear resistance test

- **Workpiece** 500-7 (ISO), 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

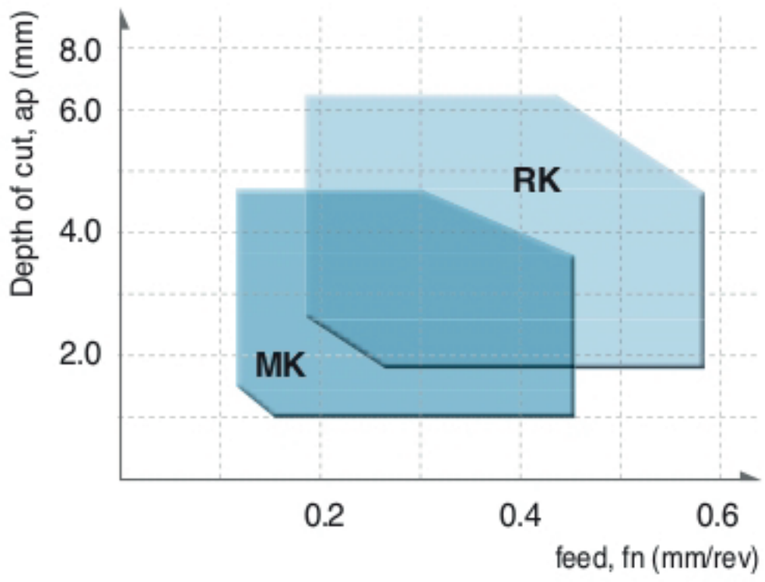
MK (NC6315)



Existing product



Recommended cutting 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

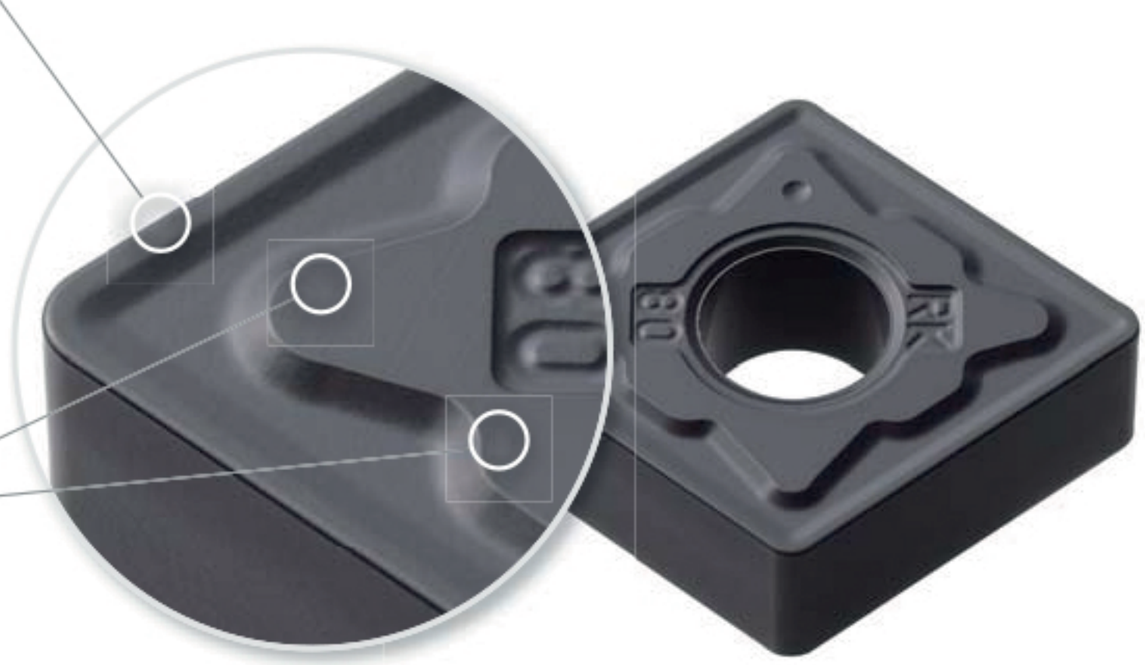
Features of RK chip breaker

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.



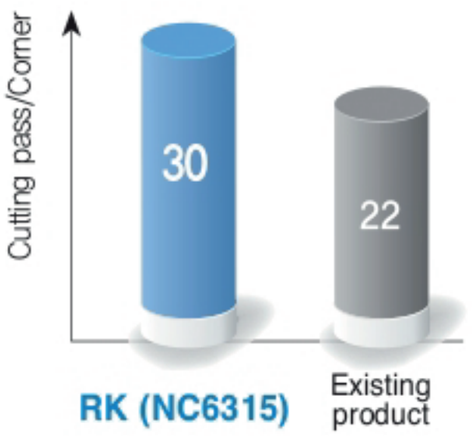
Performance evaluation

Impact resistance test

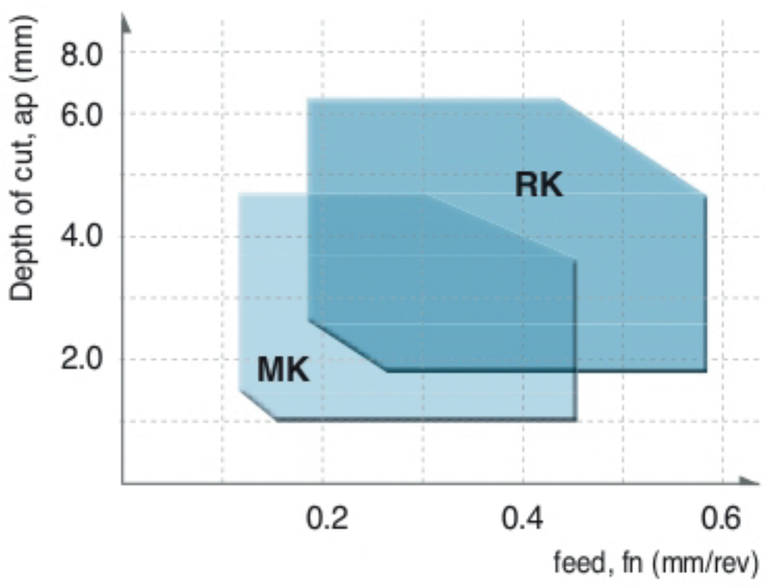
■ **Workpiece**	500-7 (ISO), Ø90 (Triangular tube) → Ø30 machining
■ **Cutting conditions**	vc (m/min) = 380, fn (mm/rev) = 0.35, ap (mm) = 2, wet
■ **Cutting time**	15 passes with results of normal rake surface wear and good chipping resistance
■ **Tools**	**Insert** : CNMG120408-RK (NC6315) **Holder** : DCLNR2525-M12

RK (NC6315)

Existing product



Recommended cutting range



Features of Chip Breaker

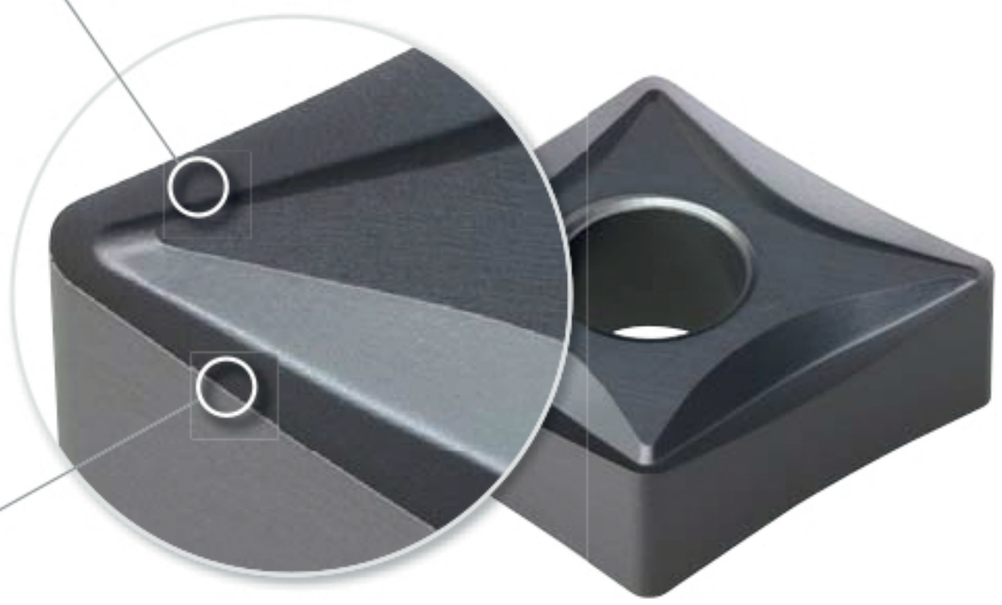
VP1 Chip Breaker

- 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

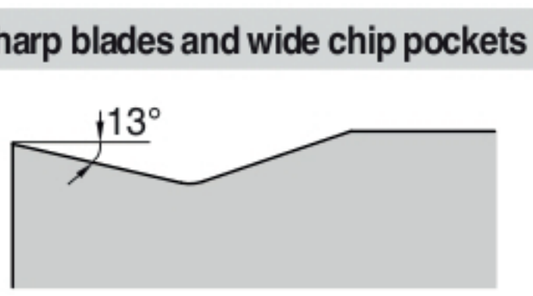
- Minimizes cutting heat by reducing the contact area between flank surface and chips
- Prevents built-up edge and extends tool life

VP2 Chip Breaker

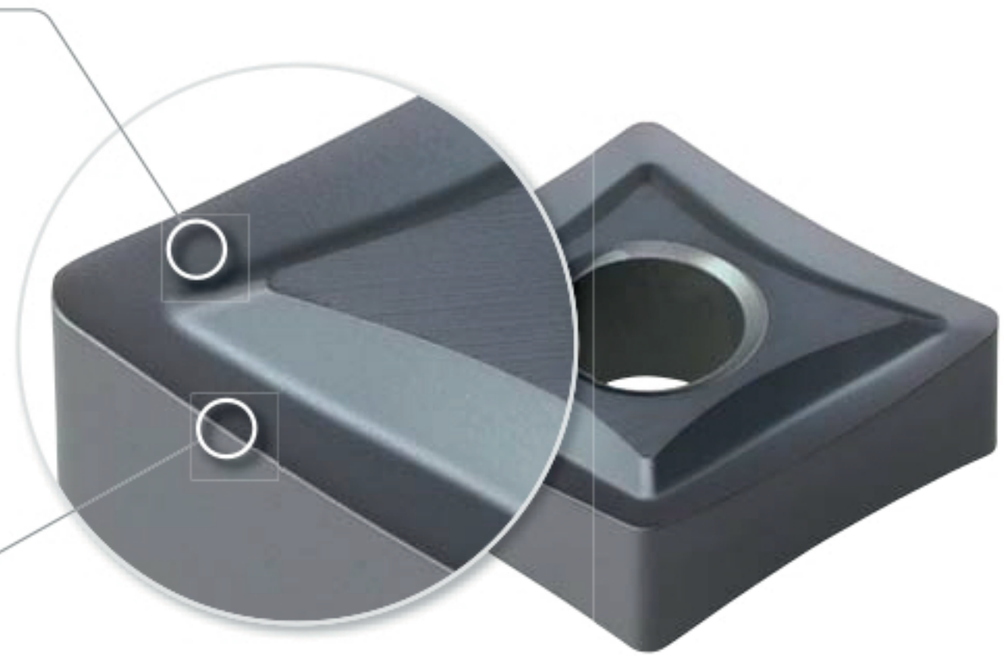
- High-positive cutting edge design/Side rake angle applied
  - Stable chip control improves machinability when ball machining at variable depths of cut
- Recommended cutting conditions: fn (mm/rev) = 0.1~0.4, ap (mm) = 0.5~4.5

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

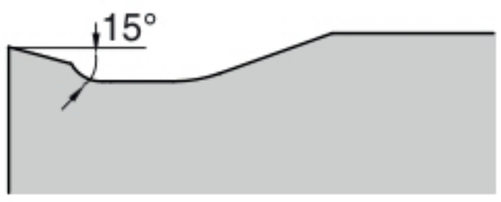
Features of Chip Breaker

VP3 Chip Breaker

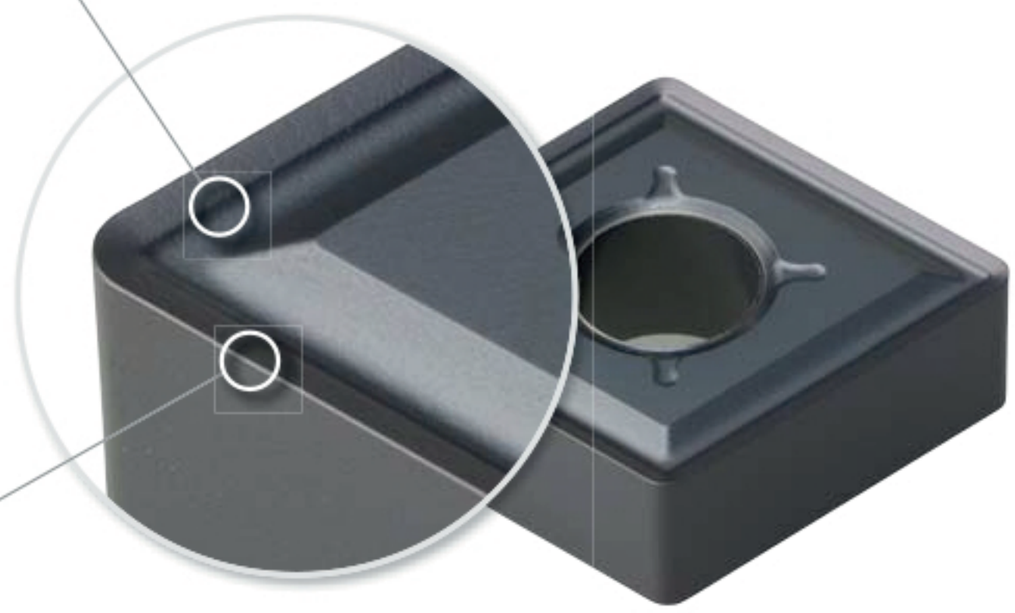
- High-positive cutting edge design/Wide land applied
  - Improved stability at interrupted cutting when toughness is required. Stable chip control and machinability at high depth of cut
- Recommended cutting conditions: fn (mm/rev) = 0.1~0.45, ap (mm) = 0.5~5.0

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

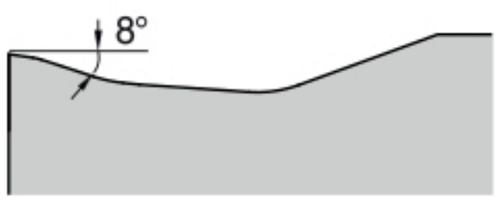
- Minimize heat concentration at high depth of cut
- Improves stability in interrupted machining of a tough workpiece

VP4 Chip Breaker new

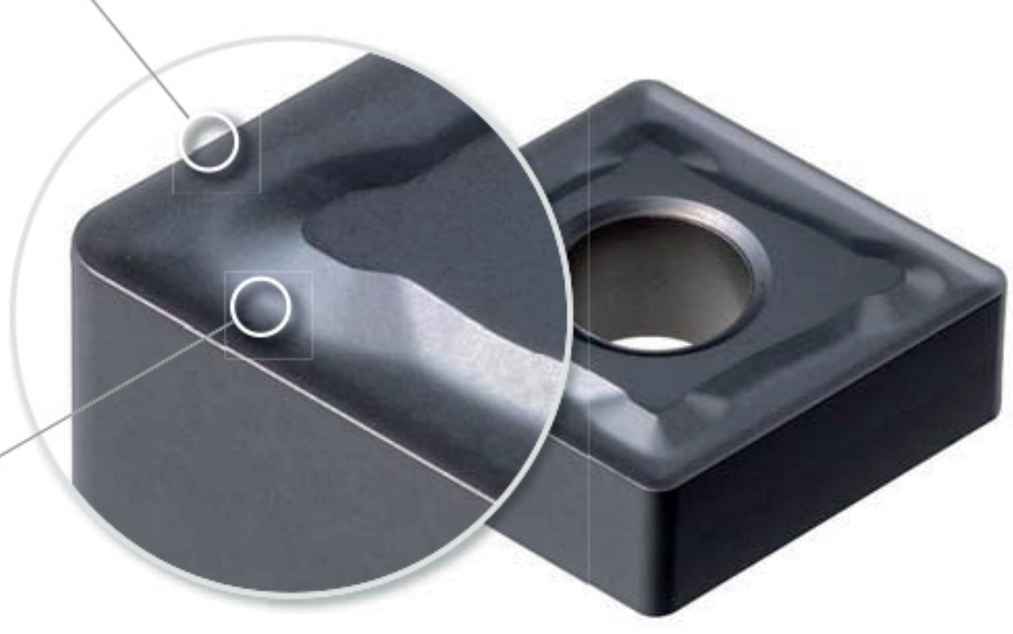
- The 1st recommended chip breakers for machining Inconel which remains highly resistant to and hard at high temperature
- Rough machining stability resulting from reinforced cutting edges and wide chip pockets

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

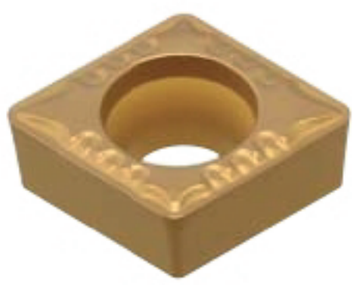


Wide chip pockets

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

Features of Chip Breaker

Single-sided VL Chip Breaker



[For medium to finish cutting]

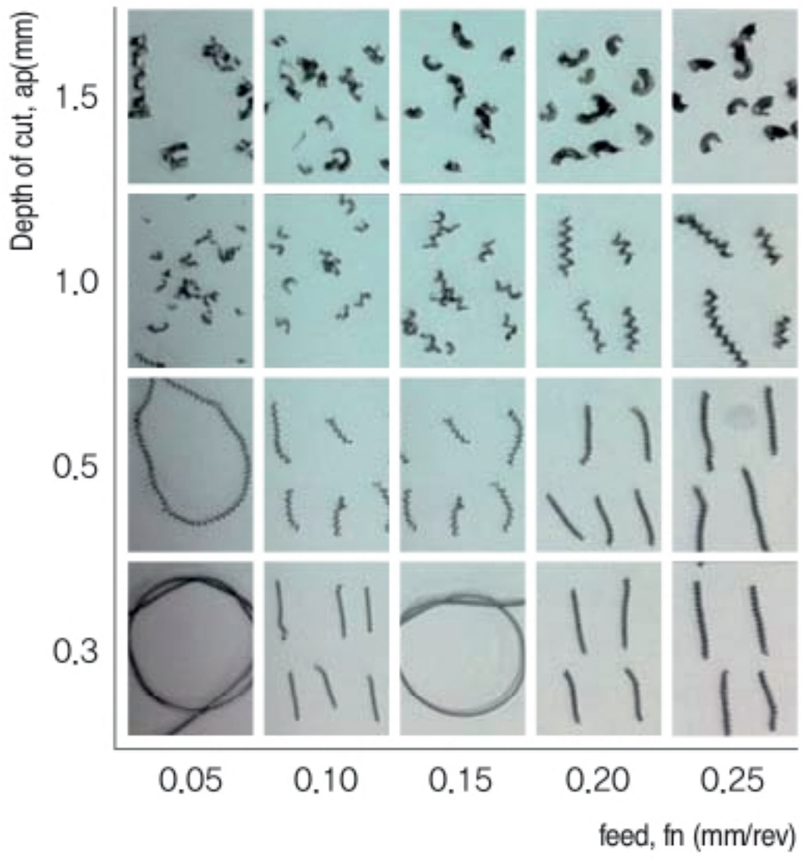
- The sharp flank surface and the chip breaker design significantly improve chip control when machining tough materials such as low carbon steel, pipe steel, and iron plates
- Sharp cutting edges reduce cutting resistance and provide excellent chip control at low depth of cuts, leading to stable machining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

Features of VL chip breaker

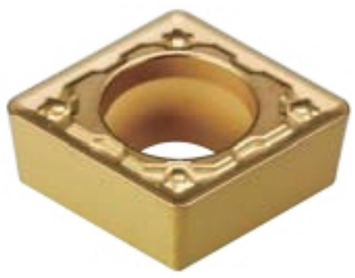
- **Sharp cutting edges**
  - High rake cutting edges provide improved surface finishes
  - Low cutting resistance reduces cutting heat
- **2-step rear rake angle**
  - Stable chip control regardless of varying feed rates
  - Excellent machinability even when machining mild workpieces

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 cutting]

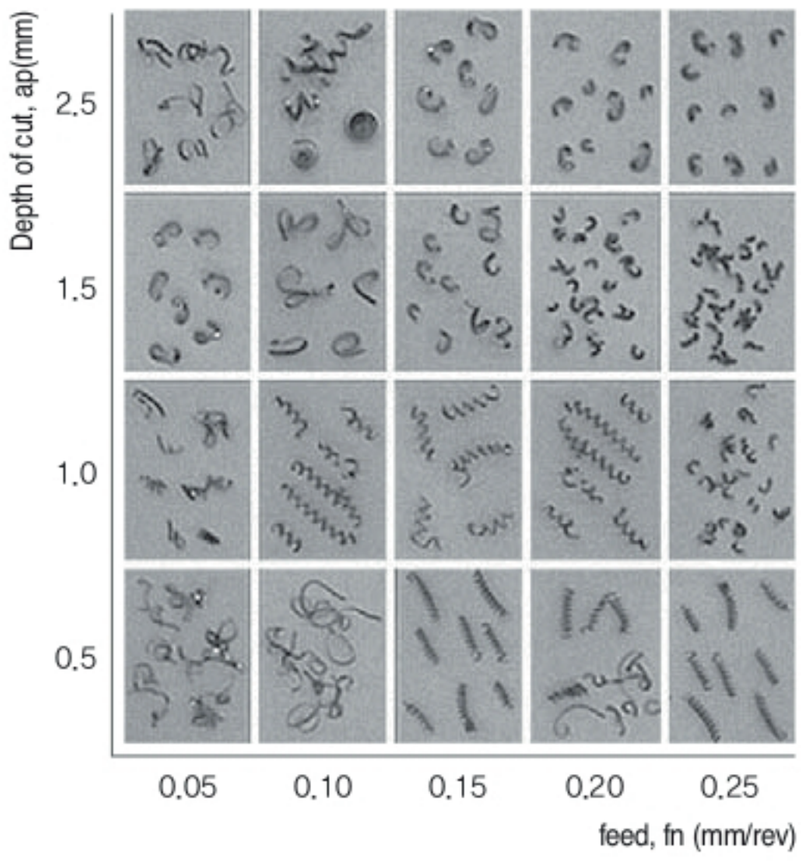
- For continuous cutting of forged steel at high feed
- Turning insert for internal machining of automobile components

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 mild steel]

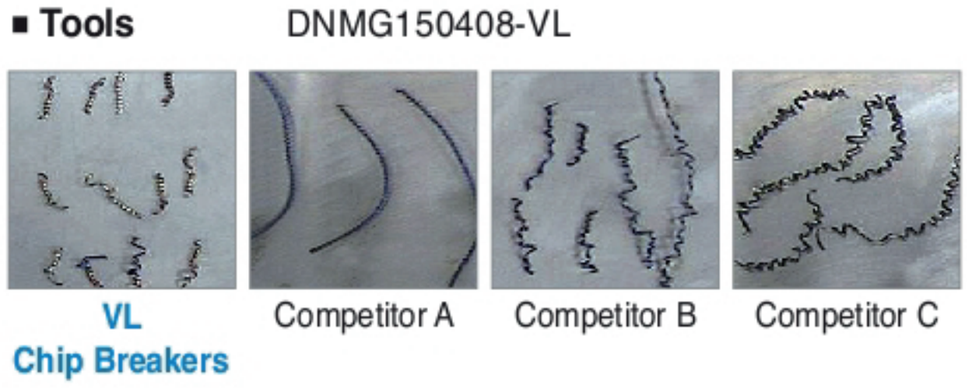
- Improved chip control for machining material that have high toughness such as low carbon steel, pipe, steel plate etc
- Improved chip control and decreased cutting load on external, facing, and copying applications
- Improved strength of the cutting edge for measurable efficiency in automated production

Features of VC 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

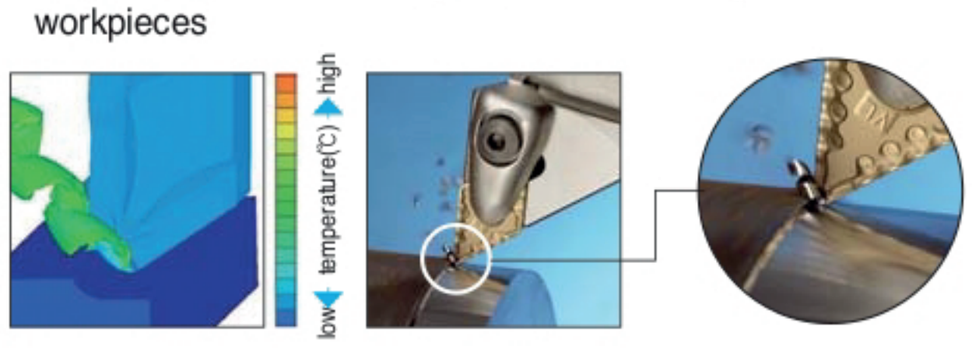
- **Workpiece** SM20C
- **Cutting conditions** vc = 250 m/min, ap = 0.5 mm, fn = 0.2 mm/rev (Side), wet
- **Tools** DNMG150408-VL



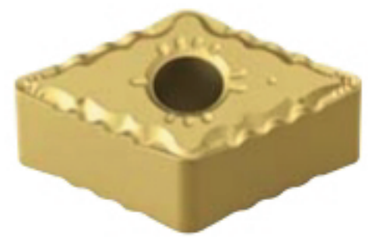
VL Chip Breakers | Competitor A | Competitor B | Competitor C

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 copying]



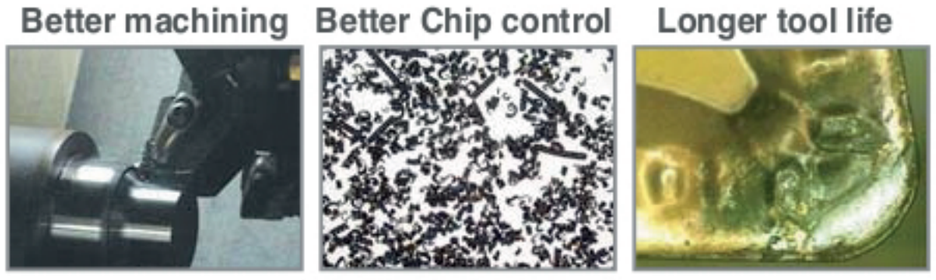
- Excellent chip evacuation in continuous and high speed machining of various workpieces
- 3-dimensional chip breaker achieves lower cutting resistance, high rigidity of the cutting edge, and longer tool life
- Stable chip control in copying and internal machining

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 finish cutting]

- 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

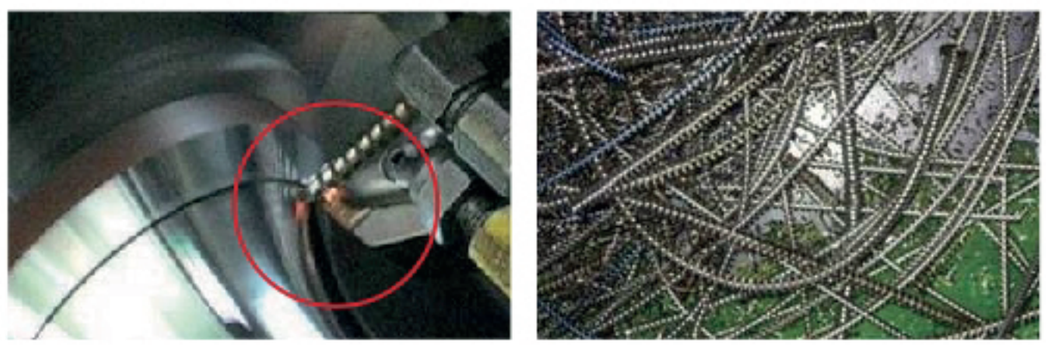
Features of VC chip breaker

• 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

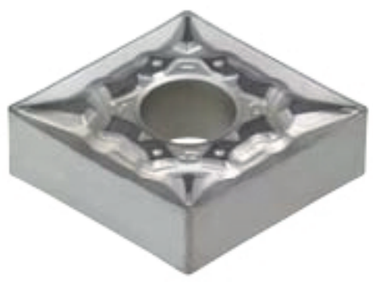
Evaluation of chip control (Copying)

VC Chip Breakers

Conventional chip breaker



VQ Chip Breaker [For medium to finish cutting]



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

Features of VQ chip breaker

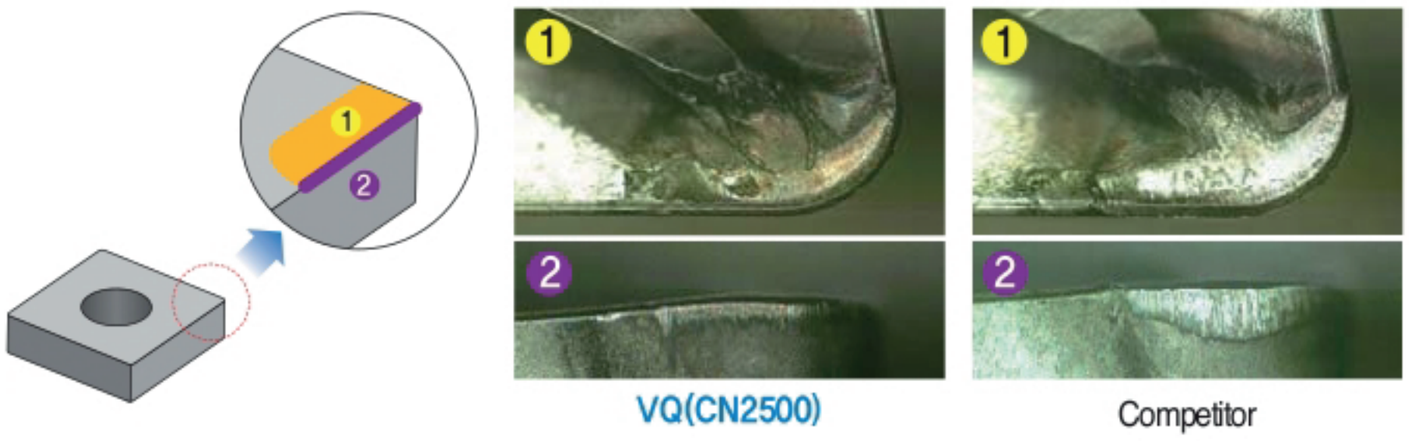
• Three dimensional rake angle
- Improved surface finish thanks to sharp cutting performance
- Less cutting heat and longer tool life thanks to low cutting resistance

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

Performance evaluation

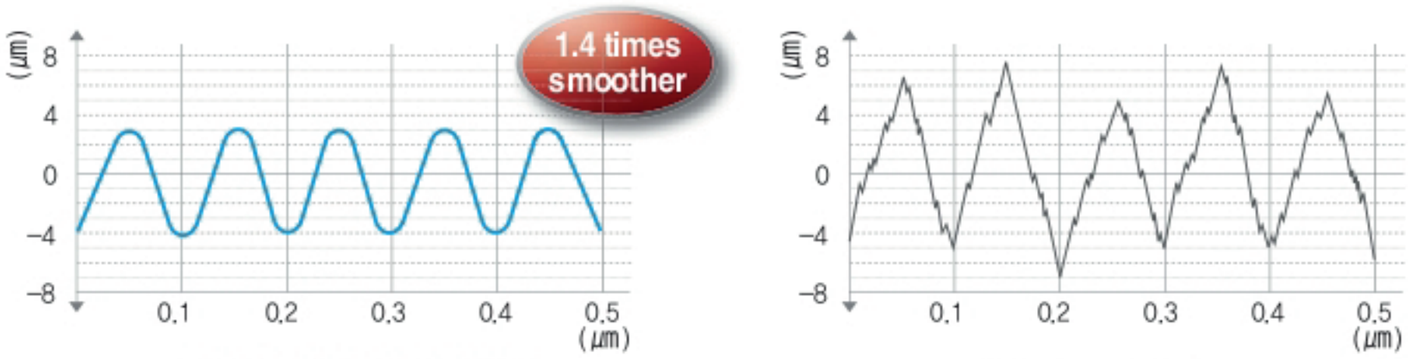
- **Workpiece** SCM440(Alloy steel), Ø100, External diameter turning
- **Cutting condition** vc = 280 m/min, ap = 1.5 mm, fn = 0.25 mm/rev
- **Tools** CNMG120408-VQ

Wear comparison



VQ(CN2500) Competitor

Surface roughness comparison



VQ (CN2500) (Ra 3.0μm) Competitor (Ra 7.0μm)