Recommended chip breaker for workpiece

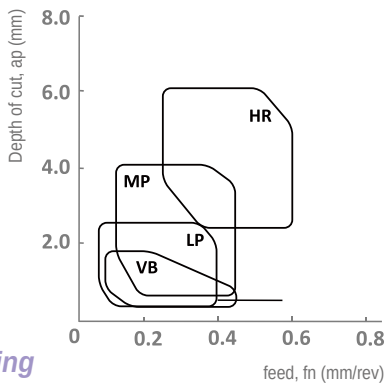
Workpiece P Steel

Materials : SM10C, SM15C, SM25C, SS400, SCr415, SCM415, etc. Soft steel
Hardness : under 180HB

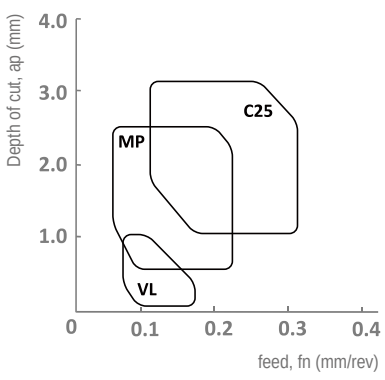
	Depth of cut (mm)	C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	Insert shape 80°	55°	90°	60°	35°	80°
Negative	0.2 ~ **0.8** ~ 1.5 finishing	VL		0.1 ~ **0.2** ~ 0.35	NC3215 NC3225 CN1500 CN2500	305 250 260 230	CNMG p. B20	DNMG p. B27	SNMG p. B35	TNMG p. B43	VNMG p. B49	WNMG p. B51
	0.5 ~ **1.0** ~ 1.5 finishing	VF		0.05 ~ **0.15** ~ 0.35	NC3215 NC3220 NC3225 NC5330	305 270 270 210	CNMG p. B20	DNMG p. B26	SNMG p. B35	TNMG p. B43	VNMG p. B49	WNMG p. B51
	0.5 ~ **1.0** ~ 2.0 finishing	VB		0.15 ~ **0.2** ~ 0.4	NC3215 NC3225 CN1500 CN2500	340 250 240 210	CNMG p. B20	DNMG p. B26		TNMG p. B42		WNMG p. B51
	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. B21	DNMG p. B28	SNMG p. B36	TNMG p. B44	VNMG p. B49	WNMG p. B52
	0.5 ~ **1.0** ~ 2.5 medium to finishing	LP		0.10 ~ **0.25** ~ 0.40	NC3215 NC3225	300 250	CNMG p. B21	DNMG p. B27	SNMG p. B35	TNMG p. B44	VNMG p. B49	WNMG p. B52
	0.5 ~ **1.5** ~ 4.5 medium to finishing	MP		0.15 ~ **0.30** ~ 0.45	NC3215 NC3225	300 265	CNMG p. B22	DNMG p. B28	SNMG p. B37	TNMG p. B45	VNMG p. B50	WNMG p. B53
	1.0 ~ **2.5** ~ 5.0 medium to finishing	VM		0.10 ~ **0.25** ~ 0.50	NC3215 NC3220 NC3225 NC5330 CN1500 CN2500	295 260 260 205 220 200	CNMG p. B22	DNMG p. B29	SNMG p. B37	TNMG p. B45	VNMG p. B50	WNMG p. B53
	2.5 ~ **4.0** ~ 7.0 roughing	HR		0.25 ~ **0.45** ~ 0.65	NC3215 NC3220 NC3225 NC5330	270 240 240 190	CNMG p. B24	DNMG p. B31	SNMG p. B38	TNMG p. B47		WNMG p. B54
	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. B25		SNMM p. B39			
	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. B25		SNMM p. B39			

●: 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 305 NC3220 270 NC3225 270 NC5330 210 CN1500 260 CN2500 240		CCMT p. B58	DCMT p. B62	SCMT p. B64	TCMT p. B68	VB(C)MT p. B74(B76)	
	0.1 ~ 0.5 ~ 1.5 finishing	VF		0.05 ~ 0.15 ~ 0.25	NC3215 305 NC3220 270 NC3225 270 NC5330 210 CC1500 260 CN1500 250 CN2500 230		CCMT p. B57	DCMT p. B62	SCMT p. B64	TC(P)MT p. B68(B72)	VB(C)MT p. B74(B76)	
	0.5 ~ 1.0 ~ 3.0 medium to finishing	MP		0.1 ~ 0.2 ~ 0.35	NC3215 300 NC3225 250 CN1500 240 CN2500 200		CCMT p. B58	DCMT p. B62	SCMT p. B64	TC(P)MT p. B68(B72)	VB(C)MT p. B73(B76)	
	0.5 ~ 1.5 ~ 3.0 medium to finishing	HMP		0.08 ~ 0.20 ~ 0.40	NC3215 320 NC3220 285 NC3225 285 NC5330 225 CN1500 240 CN2500 220		CCMT p. B58	DCMT p. B62	SCMT p. B64	TCMT p. B68	VB(C)MT p. B73(B76)	
	1.0 ~ 2.0 ~ 3.0 medium	C25		0.10 ~ 0.25 ~ 0.35	NC3215 320 NC3220 285 NC3225 285 NC5330 225 CN1500 230 CN2500 210		CCMT p. B58	DCMT p. B62	SCMT p. B64	TCMT p. B69		

●: 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°
Negative	0.5 ~ **1.0** ~ 1.5 finishing	VF		0.05 ~ **0.15** ~ 0.35	NC3215 NC3225 NC5330	305 270 250	CNMG p. B20	DNMG p. B26	SNMG p. B35	TNMG p. B43	VNMG p. B49	WNMG p. B51
	0.5 ~ **1.0** ~ 2.0 finishing	VB		0.15 ~ **0.2** ~ 0.4	NC3215 NC3225 CN1500 CN2500	340 250 230 190	CNMG p. B20	DNMG p. B26		TNMG p. B42		WNMG p. B51
	0.5 ~ **1.0** ~ 2.5 medium	LP		0.10 ~ **0.25** ~ 0.40	NC3215 NC3225	300 250	CNMG p. B21	DNMG p. B27	SNMG p. B35	TNMG p. B44	VNMG p. B47	WNMG p. B52
	0.5 ~ **1.5** ~ 4.5 medium	MP		0.15 ~ **0.30** ~ 0.45	NC3215 NC3225	300 250	CNMG p. B22	DNMG p. B28	SNMG p. B37	TNMG p. B45	VNMG p. B50	WNMG p. B53
	0.5 ~ **1.5** ~ 3.5 Medium to finishing	VC		0.12 ~ **0.25** ~ 0.45	NC3215 NC3220 NC3225 NC5330	285 255 250 200	CNMG p. B21	DNMG p. B28	SNMG p. B36	TNMG p. B44	VNMG p. B49	WNMG p. B52
	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	CNMG p. B22	DNMG p. B29	SNMG p. B37	TNMG p. B45	VNMG p. B50	WNMG p. B53
	2.5 ~ **4.0** ~ 7.0 Roughing	HR		0.25 ~ **0.45** ~ 0.65	NC3215 NC3220 NC3225 NC5330	270 240 240 190	CNMG p. B24	DNMG p. B31	SNMG p. B38	TNMG p. B47		WNMG p. B54
	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. B25		SNMM p. B39			
	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. B25		SNMM p. B39			
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. B58	DCMT p. B62	SCMT p. B64	TCMT p. B61	VB(C)MT p. B74(76)	
	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. B57	DCMT p. B62	SCMT p. B64	TC(P)MT p. B68(B72)	VCMT p. B74(76)	
	0.30 ~ **1.5** ~ 3.0 Medium to finishing	MP		0.05 ~ **0.15** ~ 0.35	NC3215 NC3225	300 250	CCMT p. B58	DCMT p. B62	SCMT p. B64	TC(P)MT p. B68(B72)	VB(C)MT p. B73(B76)	
	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. B58	DCMT p. B62	SCMT p. B64	TCMT p. B69		

●: 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 ~ 1.5 finishing	VF		0.08 ~ 0.15 ~ 0.30	NC3215 NC3220 NC3225	180 159 159	CNMG p. B20	DNMG p. B26	SNMG p. B35	TNMG p. B43	VNMG p. B49	WNMG p. B51
	0.5 ~ 1.0 ~ 2.0 finishing	VB		0.15 ~ 0.2 ~ 0.4	NC3215 NC3225 CN1500 CN2500	200 148 220 200	CNMG p. B20	DNMG p. B26		TNMG p. B42		WNMG p. B51
	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. B21	DNMG p. B28	SNMG p. B36	TNMG p. B44	VNMG p. B49	WNMG p. B52
	0.5 ~ 1.0 ~ 2.5 medium	LP		0.10 ~ 0.25 ~ 0.40	NC3215 NC3225	250 200	CNMG p. B21	DNMG p. B27	SNMG p. B35	TNMG p. B44	VNMG p. B49	WNMG p. B52
	0.5 ~ 1.5 ~ 4.5 medium	MP		0.15 ~ 0.30 ~ 0.45	NC3215 NC3225	250 200	CNMG p. B22	DNMG p. B28	SNMG p. B37	TNMG p. B45	VNMG p. B50	WNMG p. B52
	1.0 ~ 2.5 ~ 5.0 medium	VM		0.15 ~ 0.25 ~ 0.50	NC3215 NC3220 NC3225 CN1500 CN2500	174 153 153 120 100	CNMG p. B22	DNMG p. B29	SNMG p. B37	TNMG p. B45	VNMG p. B50	WNMG p. B53
	2.5 ~ 4.0 ~ 7.0 Roughing	HR		0.25 ~ 0.35 ~ 0.60	NC3215 NC3220 NC3225 NC5330	159 142 142 112	CNMG p. B24	DNMG p. B31	SNMG p. B38	TNMG p. B47		WNMG p. B54
	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. B25		SNMM p. B39			
	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. B25		SNMM p. B39			
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	CCMT p. B58	DCMT p. B62	SCMT p. B63	TCMT p. B68	VB(C)MT p. B74(B76)	
	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	CCMT p. B57	DCMT p. B62	SCMT p. B64	TC(P)MT p. B68(B72)	VB(C)MT p. B74(B76)	
	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	CCMT p. B58	DCMT p. B62	SCMT p. B64	TC(P)MT p. B68(B72)	VB(C)MT p. B73(B76)	
	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	CCMT p. B58	DCMT p. B62	SCMT p. B64	TCMT p. B69		

●: The first recommended cutting condition

Recommended chip breaker for workpiece

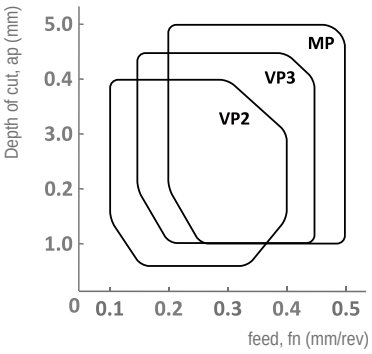
Workpiece **M** Stainless steel

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

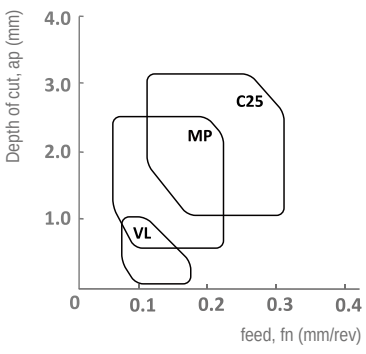
	Depth of cut (mm)	C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	Insert shape					
							80°	55°	90°	60°	35°	80°
Negative	0.5 ~ **1.5** ~ 4.0 Medium to finishing	VP2		0.10 ~ **0.20** ~ 0.40	PC8105 PC8110 PC8115 PC5300 **PC5400**	185 170 160 135 **120**	CNMG p. B22	DNMG p. B29	SNMG p. B36	TNMG p. B45		WNMG p. B52
	1.0 ~ **2.0** ~ 4.5 medium	VP3		0.15 ~ **0.23** ~ 0.45	PC8105 PC8110 PC8115 PC5300 **PC5400**	175 160 150 130 **110**	CNMG p. B22	DNMG p. B28	SNMG p. B37	TNMG p. B45	VNMG p. B50	WNMG p. B53
	1.0 ~ **2.5** ~ 4.0 medium	HS		0.10 ~ **0.20** ~ 0.40	PC8110 **PC5300** PC9030	160 **140** 135	CNMG p. B21	DNMG p. B30	SNMG p. B36	TNMG p. B44	VNMG p. B50	WNMG p. B52
	0.5 ~ **1.5** ~ 4.5 Roughing	MP		0.15 ~ **0.30** ~ 0.45	PC8105 PC8110 PC8115 **PC5300**	195 160 150 **130**	CNMG p. B22	DNMG p. B29	SNMG p. B37	TNMG p. B45	VNMG p. B50	WNMG p. B53
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. B57	DCMT p. B62	SCMT p. B64	TCMT p. B68	VB(C)MT p. B73(B76)	
	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. B58	DCMT p. B62	SCMT p. B64	TC(P)MT p. B68(B72)	VB(C)MT p. B73(B76)	
	1.0 ~ **1.5** ~ 3.0 medium	C25		0.08 ~ **0.13** ~ 0.25	PC8110 **PC5300** PC9030	170 **155** 155	CCMT p. B58	DCMT p. B62	SCMT p. B64	TCMT p. B69		

●: The first recommended cutting condition

M Negative



M Positive



Recommended chip breaker for workpiece

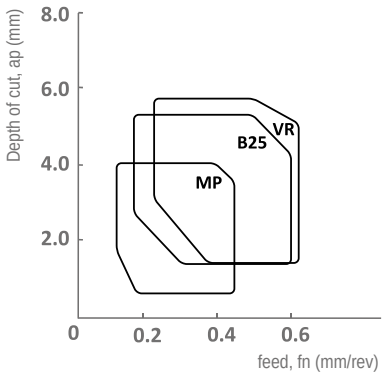
Workpiece
K
Cast iron

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

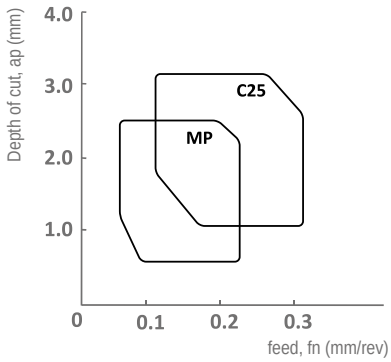
	Depth of cut (mm)	C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	Insert shape 80°	55°	90°	60°	35°	80°
Negative	1.0 ~ 2.5 ~ 6.0 Roughing	C/B no		0.15 ~ 0.30 ~ 0.60	KB410 KB350 KB370 NC6205 NC6210 NC6215	150 ~ 200 200 ~ 500 500 ~ 2000 170 ~ 420 140 ~ 350 120 ~ 290	CNMA p. B20	DNMA p. B26	SNMA p. B34	TNMA p. B42		
	1.0 ~ 2.5 ~ 5.0 Roughing	VK		0.15 ~ 0.25 ~ 0.60	NC6205 NC6210 NC6215	450~550 350~450 200~250	CNMG p. B23	DNMG p. B30	SNMG p. B38	TNMG p. B47	VNMG p. B50	WNMG p. B54
	1.0 ~ 3.0 ~ 4.5 Roughing	VR		0.2 ~ 0.35 ~ 0.60	NC6215	200~250	CNMG p. B24	DNMG p. B31	SNMG p. B38	TNMG p. B47		WNMG p. B54
	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. B23	DNMG p. B30	SNMG p. B38	TNMG p. B46		WNMG p. B54
	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. B23	DNMG p. B30	SNMG p. B37	TNMG p. B46		
	0.5 ~ 1.0 ~ 2.5 finishing	MP		0.10 ~ 0.25 ~ 0.40	NC6215	200~250	CNMG p. B22	DNMG p. B22	SNMG p. B37	TNMG p. B45	VNMG p. B50	WNMG p. B53
Positive	0.30 ~ 1.5 ~ 3.0 Medium to finishing	MP		0.1 ~ 0.2 ~ 0.35	NC6215	200~250	CCMT p. B58	DCMT p. B62	SCMT p. B64	TC(P)MT p. B68	VB(C)MT p. B74(B76)	
	1.0 ~ 2.0 ~ 3.5 medium	C25		0.10 ~ 0.25 ~ 0.40	NC6205 NC6210 NC6215	340 285 200	CCMT p. B58	DCMT p. B62	SCMT p. B64	TCMT p. B69		

●: The first recommended cutting condition

K Negative



K Positive



Recommended chip breaker for workpiece

Workpiece **N** Aluminum alloy

Materials : Aluminum alloy
Hardness : 20~110HB

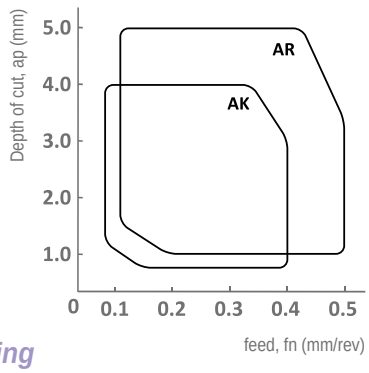
	Depth of cut (mm)	C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	Insert shape 80°	55°	90°	60°	35°	80°
Negative	0.5 ~ **2.0** ~ 6.0 medium	HA		0.1 ~ **0.2** ~ 0.5	H01	500	CNMG p. B21	DNMG p. B27	SNMG p. B35	TNMG p. B43	VNMG p. B49	WNMG p. B51
Positive	0.1 ~ **1.0** ~ 4.0 Medium to finishing	AK		0.03 ~ **0.2** ~ 0.4	H01 ND1000 PD1000	1000 1000 1000	CCGT p. B80	DCGT p. B81	SCGT p. B83	TCGT p. B84	VB(C)GT p. B85(B86)	RCGT p. B82
	0.5 ~ **1.5** ~ 4.0 medium	AR		0.05 ~ **0.3** ~ 0.5	H01 ND1000 PD1000	1000 1000 1000	CCGT p. B80	DCGT p. B81	SCGT p. B83	TCGT p. B84	VB(C)GT p. B85(B86)	RCGT p. B82

Materials : Copper Bronze alloy
Hardness : 20~110HB

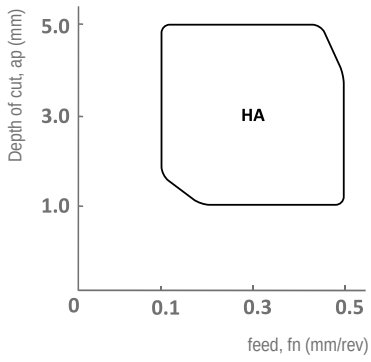
	Depth of cut (mm)	C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	Insert shape 80°	55°	90°	60°	35°	80°
Negative	0.5 ~ **2.0** ~ 4.0 Medium to finishing	HA		0.1 ~ **0.2** ~ 0.5	H01	1000	CNMG p. B21	DNMG p. B27	SNMG p. B35	TNMG p. B43	VNMG p. B49	WNMG p. B51
Positive	0.1 ~ **1.0** ~ 3.0 Medium to finishing	AK		0.03 ~ **0.2** ~ 0.3	H01	1000	CCGT p. B80	DCGT p. B81	SCGT p. B83	TCGT p. B84	VB(C)GT p. B85(B86)	RCGT p. B82
	0.5 ~ **1.5** ~ 3.0 medium	AR		0.05 ~ **0.25** ~ 0.4	H01	1000	CCGT p. B80	DCGT p. B81	SCGT p. B83	TCGT p. B84	VB(C)GT p. B85(B87)	RCGT p. B82

● : The first recommended cutting condition

N Negative



N Positive



Recommended chip breaker for workpiece

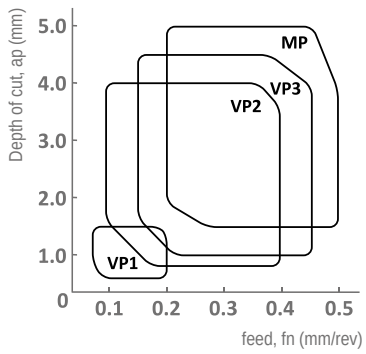
Workpiece **S** Heat resistant alloy

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. B20	DNGG p. B26				
	0.5 ~ **1.5** ~ 4.0 Medium to finishing	VP2		0.10 ~ **0.20** ~ 0.40	PC8110 PC5300	60 45	CNMG p. B21	DNMG p. B28	SNMG p. B36	TNMG p. B44		WNMG p. B52
	1.0 ~ **2.0** ~ 4.5 medium	VP3		0.15 ~ **0.23** ~ 0.45	PC8110 PC5300	60 40	CNMG p. B22	DNMG p. B29	SNMG p. B37	TNMG p. B45	VNMG p. B50	WNMG p. B53
	1.5 ~ **2.0** ~ 4.5 Roughing	MP		0.15 ~ **0.3** ~ 0.45	PC8110 PC8115	60 50	CNMG p. B22	DNMG p. B28	SNMG p. B37	TNMG p. B45	VNMG p. B50	WNMG p. B53
	1.5 ~ **3.0** ~ 5.5 Roughing	GS		0.10 ~ **0.25** ~ 0.50	PC8110 PC5300	50 40	CNMG p. B23	DNMG p. B30	SNMG p. B37	TNMG p. B46		WNMG p. B53
Positive	0.1 ~ **0.5** ~ 1.5 finishing	VP1		0.05 ~ **0.10** ~ 0.20	PC8110 PC5300	60 45	CCGT p. B57	DCGT p. B61			VCGT p. B75	
	0.1 ~ **0.5** ~ 1.0 finishing	VL		0.05 ~ **0.1** ~ 0.2	PC8110 PC8115	60 50	CCMT p. B58	DCMT p. B62	SCMT p. B64	TCMT p. B68	VCMT p. B74(B76)	
	0.5 ~ **1.0** ~ 3.0 medium	MP		0.1 ~ **0.2** ~ 0.35	PC8110 PC8115	60 50	CCMT p. B58	DCMT p. B62	SCMT p. B64	TC(P)MT p. B68	VB(C)MT p. B74(B76)	

●: The first recommended cutting condition

S Negative



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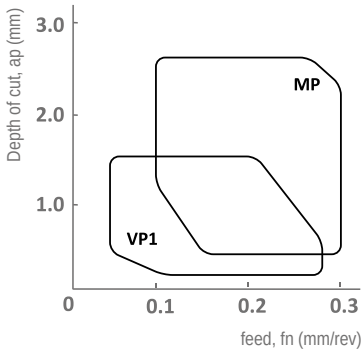


New Chip Breakers

LP Chip Breaker [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.

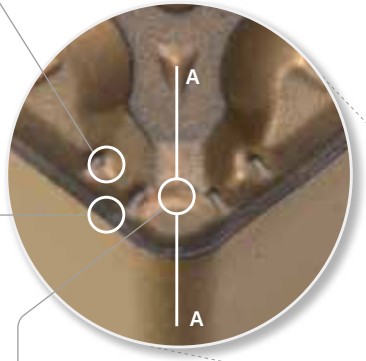
Features of LP chip breaker

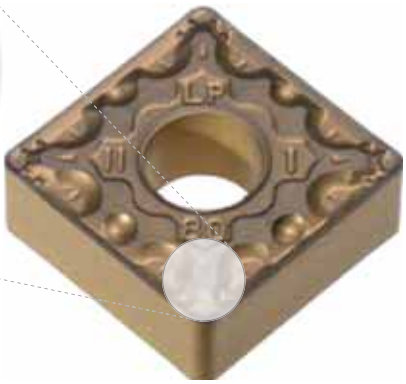
▶ Front dot

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

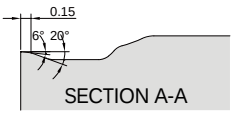
▶ Variable land

- Less crater wear
- Prevents chipping on minor cutting edge





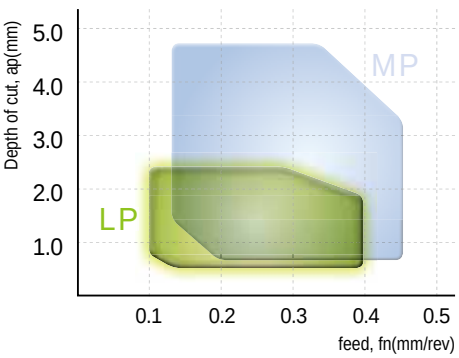
▶ Flat zone



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

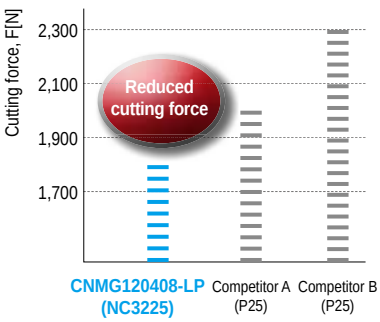
Application Range

(Medium to finish cutting)

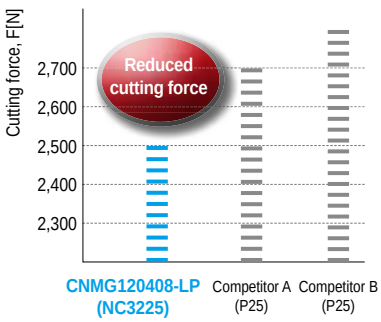


Cutting performance

Medium feed (0.25mm/rev)



High feed (0.40mm/rev)



New Chip Breakers

MP Chip Breaker [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

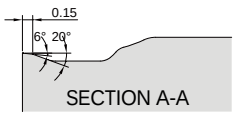
▶ Front two step dot

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

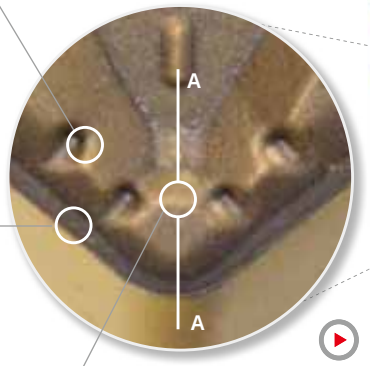
▶ Variable land

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

▶ Flat zone

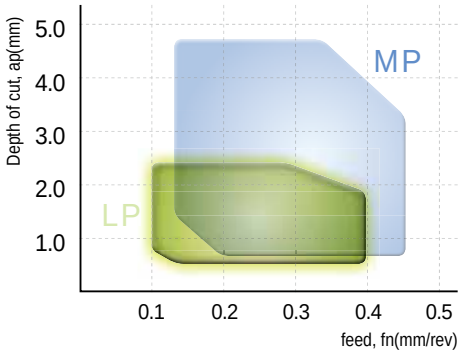


- Larger chip pocket for better chip evacuation at high feed
- Reduced cutting force with larger contact surface of chips



Application Range

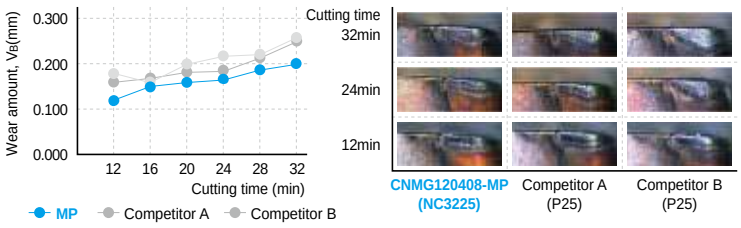
(Medium to finish cutting)



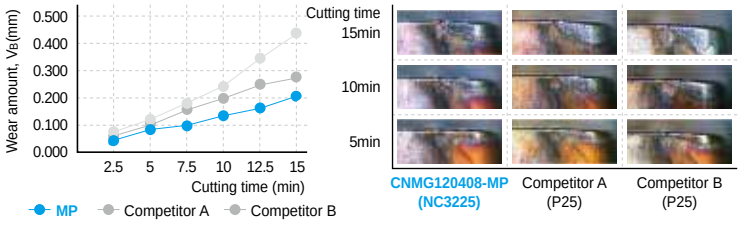
Wear resistance test

■ **Workpiece**	SCM440 (Alloy steel) Ø100 Outer diameter machining
■ **Cutting conditions**	vc(m/min) = 280 ap(mm) = 1.5 fn(mm/rev) = 0.25 / 0.40 wet
■ **Tool**	CNMG120408-MP

Medium feed (0.25mm/rev)



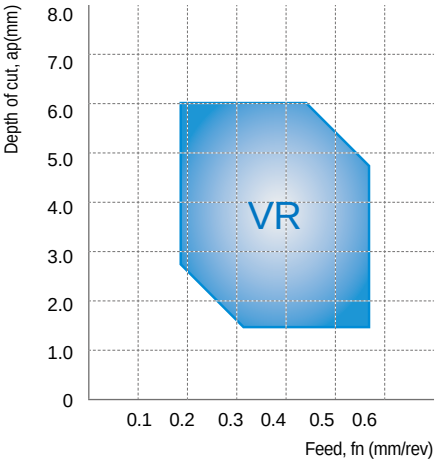
High feed (0.40mm/rev)



New Chip Breakers

VR Chip Breaker [For roughing]

- Increased stability when machining gray cast iron and ductile cast iron
- Increased productivity at high speed and high feed



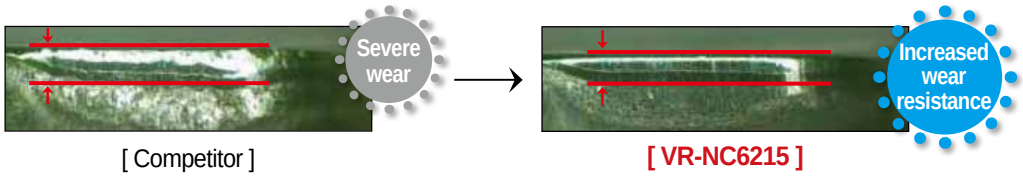
Features of VR chip breaker

- Wide land and pocket improve cutting performance at high feed
- Optimal cutting edge design for unstable and interrupted machining

Performance

■ Severe wear in continuous/interrupted machining of cast iron

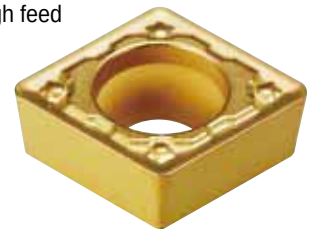
⋯› Longer tool life due to new VR chip breaker which is specially designed for high feed machining

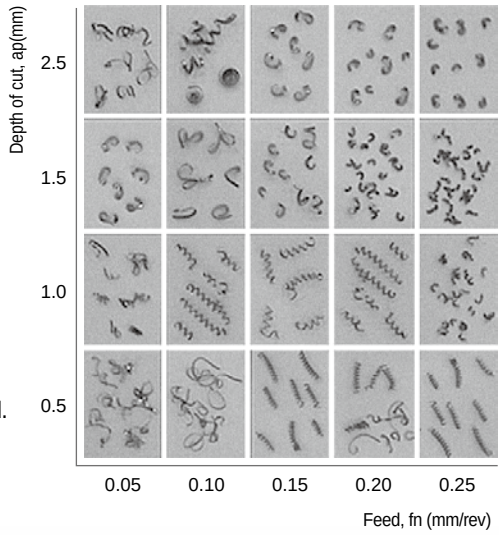


[Competitor] [VR-NC6215]

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

Cutting performance

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

New Chip Breakers

VH / VT Chip Breaker [Heavy duty machining]

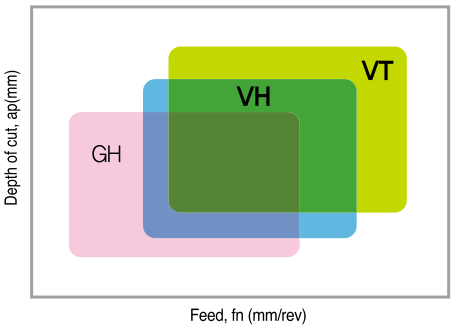
- Heavy duty chip breaker suitable for Heavy machining in the ship building and power plant industries
- Suitable for large vertical machines when machining shafts, rollers, rotors and optimal for the big flange machining

Special features of VH

• 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

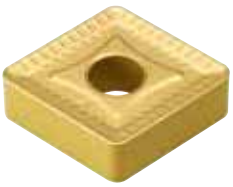
Applications range of Chip breakers



GH : ap=5.0~12.0mm / fn=0.55~1.20mm/rev
VH : ap=6.0~15.0mm / fn=0.70~1.40mm/rev
VT : ap=7.0~17.0mm / fn=0.75~1.60mm/rev

Special features of VT

• 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 deflects the machining heat, optimizes inserts wear & absorb shock

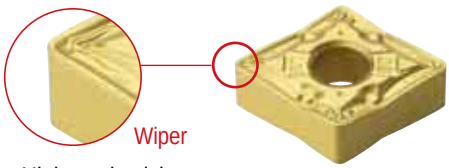
LW / VW Chip Breaker [High feed cutting]

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

Special features of LW

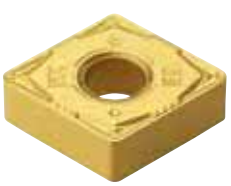
- ▶ **Curvilinear cutting edge**
  - Reduces cutting force
- ▶ **Cutting edge design able to handle deeper depth of cuts**
  - lower cutting load & reduces heat
- ▶ **Greater chip control at shallow depths of cuts**
  - Chip pocket design improves smooth chip flow
- ▶ **For shallow depth cutting and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

Wiper Insert

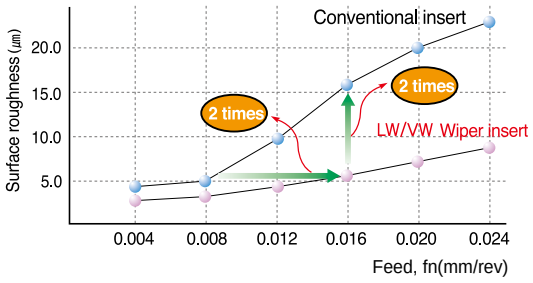


- ▶ High productivity
- ▶ Improved surface roughness
- ▶ High feed-reducing machining time
- ▶ Improved tool life due to reduce cutting force

Special features of VW



- ▶ **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



New Chip Breakers

VL Chip Breaker [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

Special features of VL

- ▶ **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

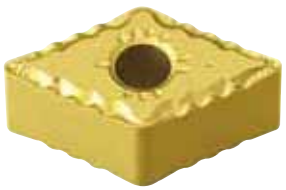
VL Chip Breakers | Competitor A | Competitor B | Competitor C

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

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 [Copying]



- Excellent chip evacuation in continuous and high speed machining of various workpieces.
- Longer tool life due to 3 dimensional chip breaker realizing low cutting resistance and high rigidity of the cutting edge.
- Stable chip control in copying and internal machining.

Special features of VB

6 bumps on the insert corner

Superior chip control and chip cutting in copying with various depths of cut

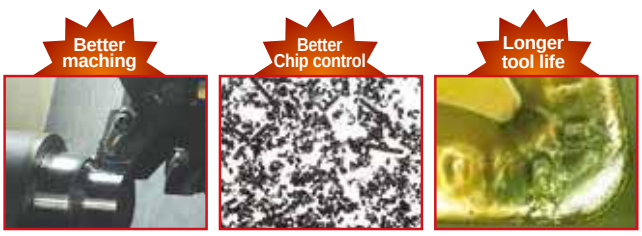
Side rake angle

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



VB Chip Breakers

Conventional chip breaker