



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 for all manufacturers' requirements.

A

GRADES & CHIP BREAKERS

KORLOY's new grades are designed with optimal substrates for each application and are PVD coated for high temperature, high hardness and oxidation resistance, or CVD coated for high temperature and wear resistance. Additionally, the improved post-coating treatment provides superior surface finishes to ensure the highest levels of quality and productivity.

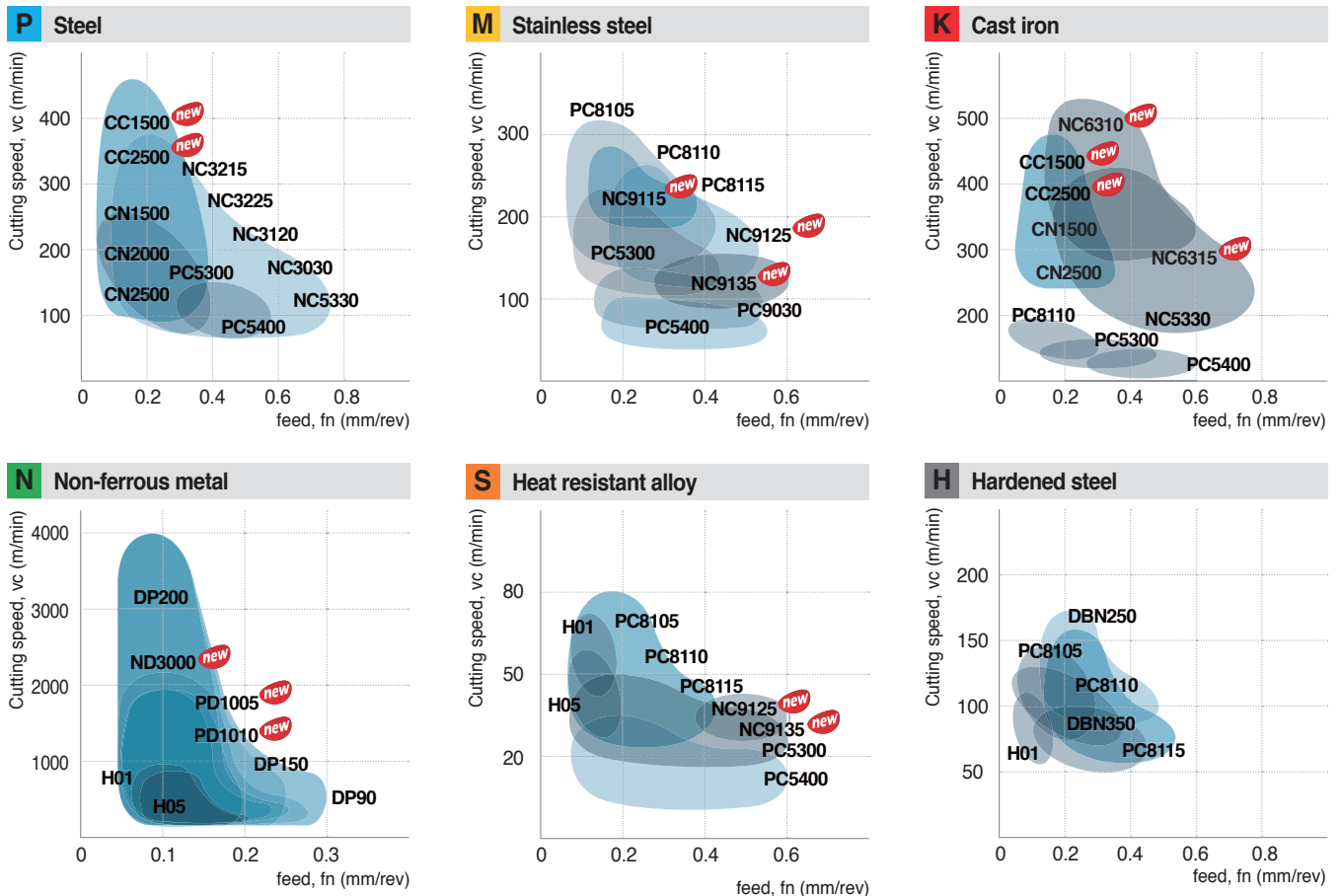


Turning grade selections

Selection system

Workpiece	P Steel					M Stainless steel				K Cast iron				S HRSA				N Nonferrous				H Hardened							
	ISO	P01	P10	P20	P30	P40	P50	M10	M20	M30	M40	K01	K10	K20	K30	S01	S10	S20	S30	N01	N10	N20	N30	H01	H10	H20	H30		
Coated carbide			NC3215					PC8105				NC6310 <i>new</i>			PC8105					ND3000 <i>new</i>							PC8105		
			NC3225					PC8110					NC6315		PC8110						PD1005 <i>new</i>						PC8110		
			NC3120					NC9115 <i>new</i>							PC8115							PD1010 <i>new</i>					PC8115		
			NC3030					NC9125 <i>new</i>					NC5330			NC9125 <i>new</i>											PC8115		
			NC5330					NC5330					PC5300			NC9135 <i>new</i>												PC8115	
			PC5300					PC5300						PC5300			PC5300												
			PC5400					PC9030							PC5400														
								PC5400																					
	Cermets		CC1500 <i>new</i>										CC1500 <i>new</i>																
		CC2500 <i>new</i>										CC2500 <i>new</i>																	
		CN1500										CN1500																	
		CN2000																											
		CN2500																											
cBN / PCD												DBN700				DB7000					DP90						DNC100		
												DBN800									DP150						DNC250		
												DBN500									DP200						DNC400		
																											DNC350		
Uncoated carbide		ST10						U20				H01				H01					H01						H01		
			ST20									H05				H05						H05							
			ST30A										G10																

Application range of turning grades



CVD coated grades

NC3215/NC3225

- Universal grade especially for machining forged automobile components and bearing steel both in continuous and interrupted cutting
- Available for all kinds of steels - carbon steel, alloy steel, rolled steel, tool steel, mild steel, bearing steel and other special kinds of steel
- New coating technology increases welding resistance and chipping resistance, which leads to longer tool life.

Features

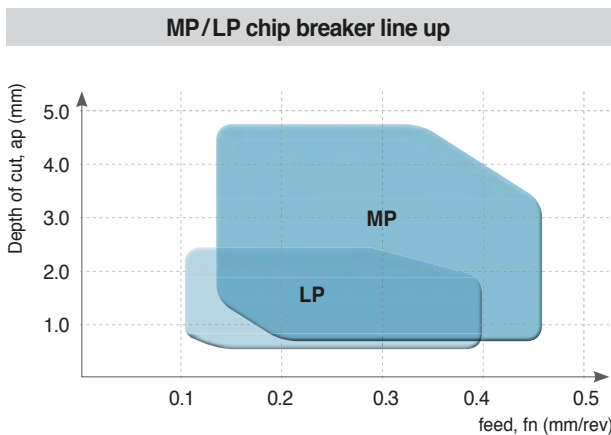
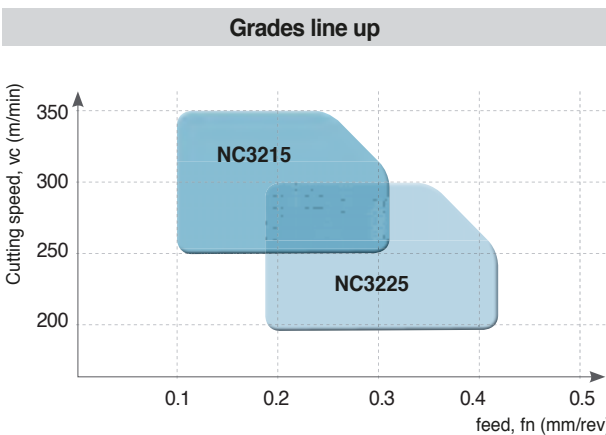
- Stable tool life → Higher production stability
- Longer tool life & Higher removal rate → High cutting conditions and shorter cutting time available
- Ideal combination of a grade and chip breakers → Prolongs tool life → Wide applications ranging from roughing to finishing



• Disperse cutting force → Reduce chipping → Increase tool life → Improved productivity



Application range



CVD coated grades

CVD coated grade for high efficiency and quality turning of cast iron

NC6310 ^{new} / NC6315

- CVD coating with improved wear resistance and chipping resistance.
- Solutions for the most common issues in cast iron machining: Preventing excessive wear on rake and flank surfaces of insert, chipping and burr

Features of NC6310

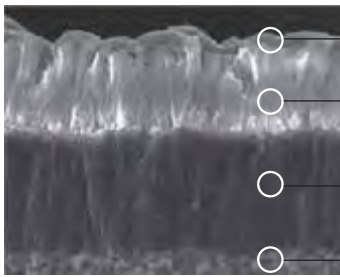
Normal wear on rake surface and nose radius



NC6310

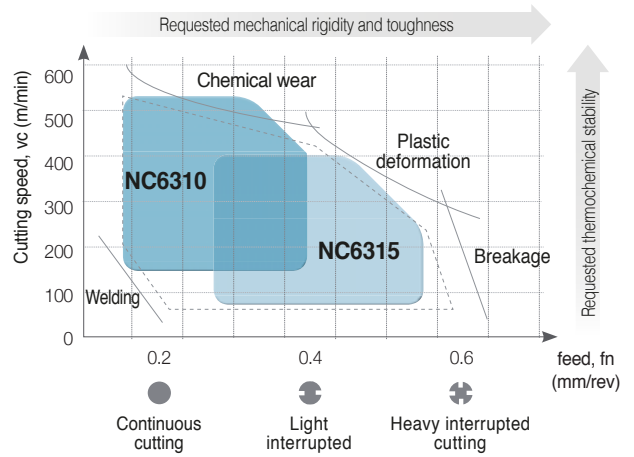


Existing grade (K10)



- Titanium layer with excellent lubrication identifying wear
- Alumina layer specialized for heat resistance
- Titanium layer with improved fracture resistance
- Functional substrate optimized for high speed cast iron machining

Recommended machining range for each grade

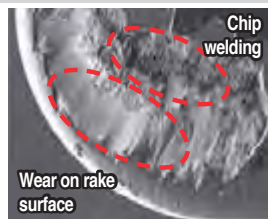


Features of NC6315

Improved flaking resistance and wear resistance on rake surface



NC6315



Existing grade (K15)

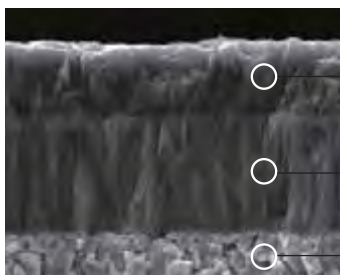
Normal wear on flank surface



NC6315



Existing grade (K15)



- Alumina layer with better surface finish and improved wear resistance and welding resistance
- Titanium layer with improved fracture resistance
- Functional substrate optimized for high feed and heavy interrupted cast iron machining



CVD coated grades

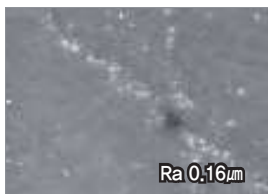
Turning grades for stainless steel

NC9115 **new** / NC9125 **new** / NC9135 **new**

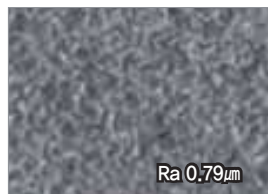
- Optimized for reducing built-up edges, notch wear, plastic deformation and burrs, and for machining stainless steel
- Ideal combination of a grade and MM/RM chip breakers for stable tool life and wide applications ranging from roughing to finishing
- Stable tool life even at high speeds, feeds and depth of cuts (for STS316, vc over 150m/min available), shortening cutting time
- Excellent versatility responding to workpiece change, covering the austenite, the martensite and the ferrite
- NC9115 is for P20 class, mild steel and forged steel machining.

Features

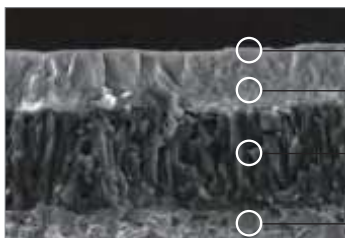
- Improved surface finish thanks to the new lubricative CVD coating

Lubricative coating layer to prevent built-up edge

NC9100 Series



Existing coating



- Top coat with improved welding resistance
- Alumina coating layer for high speed cutting
- Titanium coating layer with stronger resistance to chipping
- Tough substrate optimized for continuous cutting and both light & heavy interruption

- Lubricative coating layers → Improves welding resistance

- Coated layers of stronger chipping resistance and the substrate of high toughness → Inhibits notch wear creation

Inhibited built-up edge and blade damage

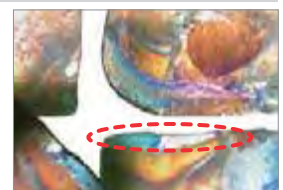
NC9125 (M25)



Competitor (M25)

Inhibited wear on notch and relief surface

NC9135 (M35)

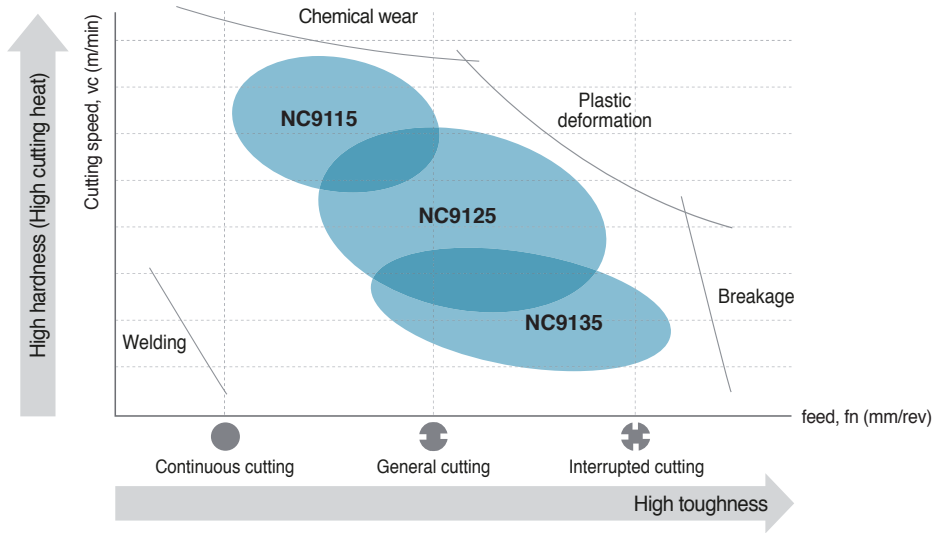


Competitor (M35)

A Turning Grades

CVD coated grades

Grades line up



Recommended grade and chip breaker per stainless steel type

[Austenitic stainless steel]

Grade	Cutting speed (m/min)				
	50	100	150	200	250
NC9115				160	220
NC9125			150	200	
NC9135		100	150		

[Duplex stainless steel]

Grade	Cutting speed (m/min)				
	50	100	150	200	250
NC9115			120	160	
NC9125			100	140	
NC9135		60	100		

[Ferritic / Martensitic stainless steel]

Grade	Cutting speed (m/min)				
	50	100	150	200	250
NC9115			150	250	
NC9125			120	220	
NC9135		100	150		

[Precipitation hardened (PH) stainless steel]

Grade	Cutting speed (m/min)				
	50	100	150	200	250
NC9115	50	110			
NC9125	40	110			
NC9135	30	100			



Selection system of CVD coated grade

Workpiece	Machining types	Recommended grade	Recommended cutting speed (m/min)	ISO	Application range
P	Continuous cutting	NC3215	295 (170 ~ 420)	P10	
		NC3225	260 (150 ~ 370)	P15	← NC3215
	Interrupted cutting	NC3120	260 (120 ~ 370)	P20	
		NC3030	205 (120 ~ 290)	P25	← NC3225
		NC5330	205 (120 ~ 290)	P30	← NC3120
M	Continuous cutting	NC9115 ^{new}	240 (220 ~ 260)	M10	
		NC9125 ^{new}	210 (190 ~ 230)	M20	← NC9115 ^{new}
	Interrupted cutting	NC9135 ^{new}	180 (160 ~ 200)	M30	
				M40	← NC9125 ^{new}
					← NC5330
K	Continuous cutting	NC6310 ^{new}	380 (300 ~ 500)	K10	
		NC6315	280 (200 ~ 400)	K20	← NC6310 ^{new}
	Interrupted cutting	NC5330	190 (110 ~ 270)	K30	← NC6315
S	Continuous cutting	NC9125 ^{new}	40 (20 ~ 60)	S10	
	Interrupted cutting	NC9135 ^{new}		S20	← NC9125 ^{new}

The features of CVD coated grades

CVD Coated grades	ISO	Features
NC3215	P10 ~ P15	<ul style="list-style-type: none"> Continuous machining of general steel and forged steel at high speed Substrate with excellent thermal crack/plastic deformation resistance, coating with improved chipping resistance for continuous machining • MT-TiCN + Al₂O₃ + TiN
NC3225	P20 ~ P25	<ul style="list-style-type: none"> Universal grade for general steel and forged steel 1st recommended grade for general machining with the use of high toughness substrate and coating layer with improved welding/chipping resistance • MT-TiCN + Al₂O₃ + TiN
NC3120	P20 ~ P25	<ul style="list-style-type: none"> Medium to roughing for steel Combining excellent fracture resistance substrate with chipping resistance and heat resistance Al₂O₃ increased stability • MT-TiCN + TiC + Al₂O₃
NC3030	P25 ~ P35	<ul style="list-style-type: none"> Medium to low speed machining of steel and interrupted roughing Harmony between substrate with excellent wear/fracture resistance and Al₂O₃ film with excellent thermal/chipping resistance Increased stability in wide ranges of cutting conditions • MT-TiCN + TiC + Al₂O₃ + TiN
NC5330	P30 ~ P35 M25 ~ M35 K15 ~ K25 S15 ~ S25	<ul style="list-style-type: none"> Stainless Steel - General cutting for mild steel & forging steel Excellent cutting performance in hard to cut materials which are vulnerable to built up edge, due to the high tough substrate with improved fracture resistance and the coated layers • MT-TiCN + Al₂O₃ + TiN
NC9115 ^{new}	M10 ~ M20	<ul style="list-style-type: none"> High speed cutting for ferritic and martensitic stainless steels • MT-TiCN + Al₂O₃ + TiN
NC9125 ^{new}	M20 ~ M30	<ul style="list-style-type: none"> General cutting of stainless steel and heat resistant alloys • MT-TiCN + Al₂O₃ + TiN
NC9135 ^{new}	M30 ~ M40	<ul style="list-style-type: none"> Interrupted cutting of stainless steel and heat resistant alloys • MT-TiCN + Al₂O₃ + TiN
NC6310 ^{new}	K01 ~ K10	<ul style="list-style-type: none"> High speed and continuous cutting of grey cast iron Increased tool life due to coating layer with high wear resistance • MT-TiCN + Al₂O₃ + TiN
NC6315	K10 ~ K20	<ul style="list-style-type: none"> Universal grade for ductile and gray cast Iron Excellent performance thanks to the alumina (Al₂O₃) coating's improved grip on the tough substrate • MT-TiCN + Al₂O₃

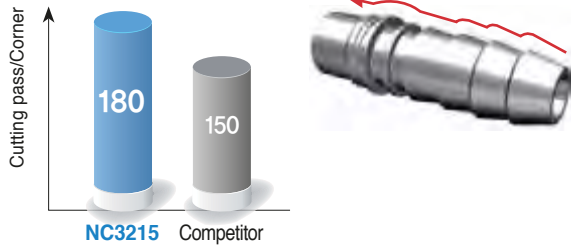


Application examples (NC3215/NC3225)

P Carbon steel (SM20C)

- **Workpiece** Part for fuel system
- **Cutting condition** vc (m/min) = 250~380, fn (mm/rev) = 0.2~0.3
 ap (mm) = 1.5~2.0, wet
- **Designation** **Insert** : CNMG120412-MP (NC3215)
Holder : PCLNL2525-M12

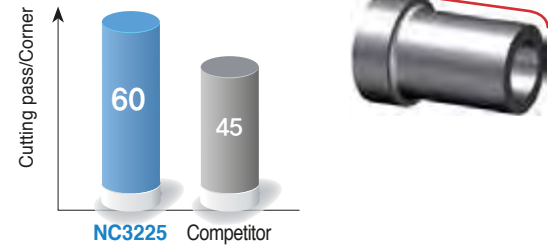
■ Test result



P Alloy steel (SNCM, cast)

- **Workpiece** Part for engine
- **Cutting condition** vc (m/min) = 100, fn (mm/rev) = 0.15
 ap (mm) = 3.0, wet
- **Designation** **Insert** : CNMG120408-MP (NC3225)
Holder : PCLNR2525-M12

■ Test result



P Carbon steel (SM40C, cold forging)

- **Workpiece** Part for steering
- **Cutting condition** vc (m/min) = 170, fn (mm/rev) = 0.3
 ap (mm) = 2.7~3.0, wet
- **Designation** **Insert** : DNMG150408-MP (NC3215)
Holder : DDJNL2525-M15

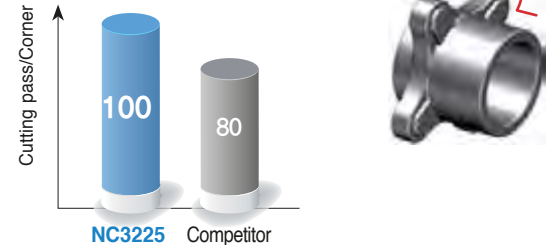
■ Test result



P Carbon steel (S55CR, hot forging)

- **Workpiece** Part for steering
- **Cutting condition** vc (m/min) = 230, fn (mm/rev) = 0.3
 ap (mm) = 0.5~1.5, wet
- **Designation** **Insert** : CNMG120408-MP (NC3225)
Holder : PCLNL2525-M12

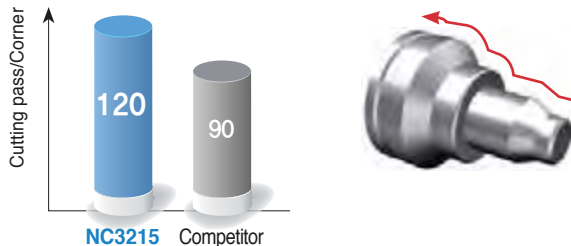
■ Test result



P Carbon steel (SM45C, cold forging)

- **Workpiece** Part for steering
- **Cutting condition** vc (m/min) = 200~250, fn (mm/rev) = 0.25~0.35
 ap (mm) = 1.0~2.0, wet
- **Designation** **Insert** : DNMG150612-LP (NC3215)
Holder : DDJNL2525-M15

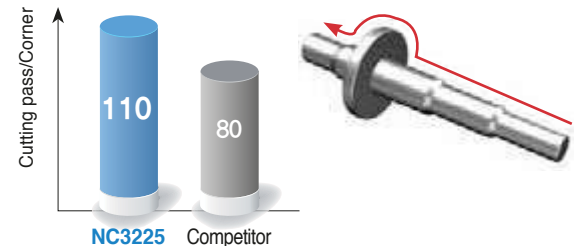
■ Test result



P Alloy steel (SCR420, cold forging)

- **Workpiece** Part for mission
- **Cutting condition** vc (m/min) = 160, fn (mm/rev) = 0.13
 ap (mm) = 1.0, wet
- **Designation** **Insert** : DNMG150608-LP (NC3225)
Holder : DDJNL2525-M15

■ Test result



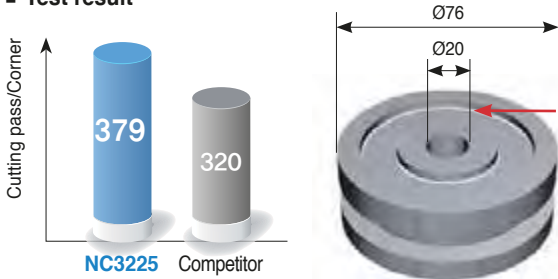
Application examples (NC3225)

P Alloy steel (SCR420H, hot forging)

■ **Cutting condition** vc (m/min) = 360~430, fn (mm/rev) = 0.2
 ap (mm) = 1.2~1.5 (external machining/facing), wet

■ **Designation** Insert : CNMG120408-VB (NC3225)
 Holder : PCLNR2225-M12

■ **Test result**

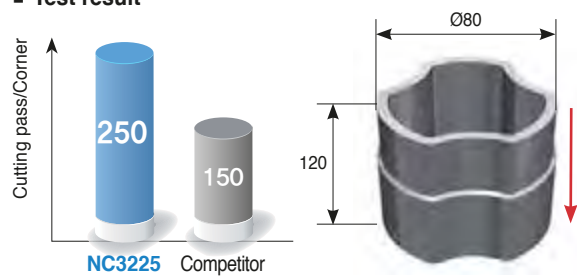


P Carbon steel (SM48C, cold forging)

■ **Cutting condition** vc (m/min) = 280, fn (mm/rev) = 0.2~0.25
 ap (mm) = 1, dry

■ **Designation** Insert : CNMG120412-VB (NC3225)
 Holder : PCLNR2525-M12

■ **Test result**

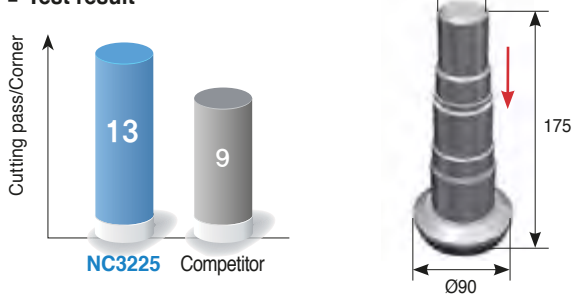


P Alloy steel (SCM420H, hot forging)

■ **Cutting condition** vc (m/min) = 80~500
 fn (mm/rev) = 0.15~0.3 (External machining/facing/grooving/tapping), ap (mm) = 0.7~1.5, wet

■ **Designation** Insert : DNMG150608-VB (NC3225)
 Holder : PDJNR2525-M15

■ **Test result**

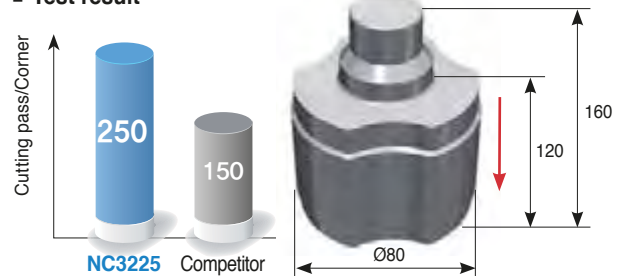


P Carbon steel (SM53C, cold forging)

■ **Cutting condition** vc (m/min) = 280
 fn (mm/rev) = 0.2~0.25 (External machining/internal machining), ap (mm) = 1, dry

■ **Designation** Insert : DNMG150608-VB (NC3225)
 Holder : PDJNR2525-M15

■ **Test result**

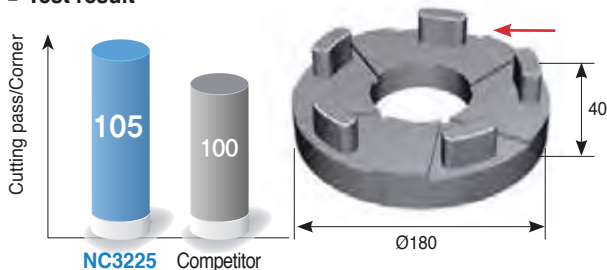


P Alloy steel (SCR series, cold forging)

■ **Cutting condition** vc (m/min) = 314
 fn (mm/rev) = 0.25 (external machining/facing)
 ap (mm) = 1, wet

■ **Designation** Insert : CNMG120408-VM (NC3225)
 Holder : PCLNR2525-M12

■ **Test result**

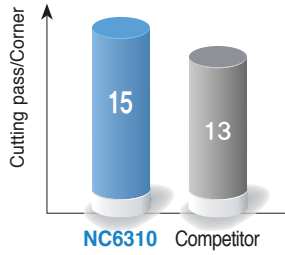


Application examples (NC6310)

K Ductile cast iron (GCD500)

- **Workpiece** Fly wheel
- **Cutting condition** vc (m/min) = 450, n (rpm) = 550, fn (mm/rev) = 0.3, ap (mm) = 2, dry
- **Designation** Insert : CNMG120408-MK (NC6310)
Holder : DCLNR2525

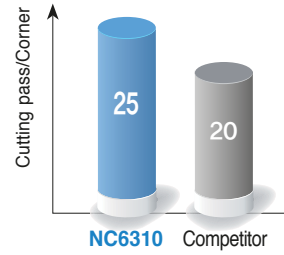
■ Test result



K Gray cast iron (GC250D)

- **Workpiece** Break disc
- **Cutting condition** vc (m/min) = 550, n (rpm) = 547, fn (mm/rev) = 0.3, ap (mm) = 1, wet
- **Designation** Insert : CNMA120412 (NC6310)
Holder : DCLNR2525

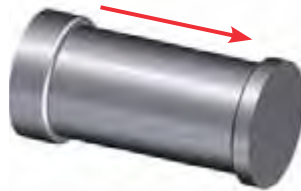
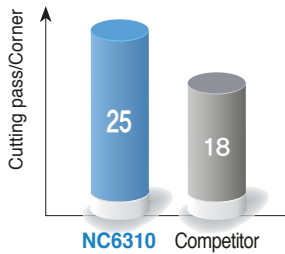
■ Test result



K Gray cast iron (GC250D)

- **Workpiece** Cylinder Liner
- **Cutting condition** vc (m/min) = 450, n (rpm) = 1100, fn (mm/rev) = 0.25, ap (mm) = 1.5, dry
- **Designation** Insert : CNMA120408 (NC6310)
Holder : DCLNR2525

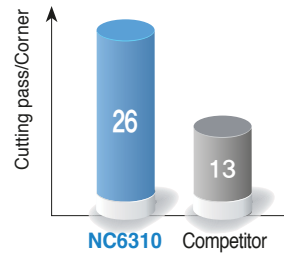
■ Test result



K Gray cast iron (GC300D)

- **Workpiece** Fly wheel housing
- **Cutting condition** vc (m/min) = 560, n (rpm) = 298, fn (mm/rev) = 0.3, ap (mm) = 1, wet
- **Designation** Insert : CNMG120412-RK (NC6310)
Holder : DCLNR2525

■ Test result

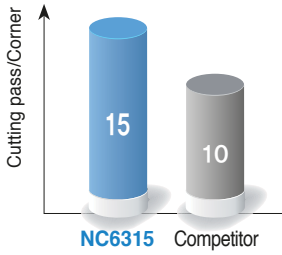


Application examples (NC6315)

K Ductile cast iron (GCD500)

- **Workpiece** Hub
- **Cutting condition** vc (m/min) = 320, n (rpm) = 318, fn (mm/rev) = 0.4, ap (mm) = 2, wet
- **Designation** **Insert** : WNMG080412-RK (NC6315)
Holder : DCLNR2525

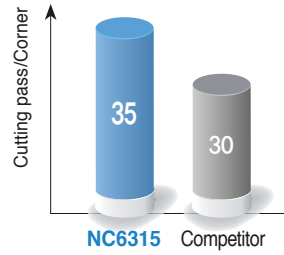
■ **Test result**



K Ductile cast iron (GCD500)

- **Workpiece** Fly wheel
- **Cutting condition** vc (m/min) = 400, n (rpm) = 398, fn (mm/rev) = 0.3, ap (mm) = 2, wet
- **Designation** **Insert** : CNMA120408 (NC6315)
Holder : DCLNR2525

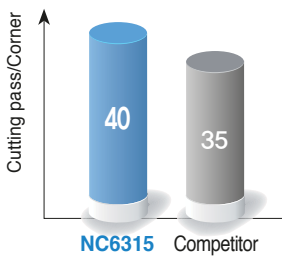
■ **Test result**



K Ductile cast iron (GCD700)

- **Workpiece** Diff. case mission
- **Cutting condition** vc (m/min) = 360, n (rpm) = 716, fn (mm/rev) = 0.25, ap (mm) = 1.5, wet
- **Designation** **Insert** : CNMG120408-MK (NC6315)
Holder : DCLNR2525

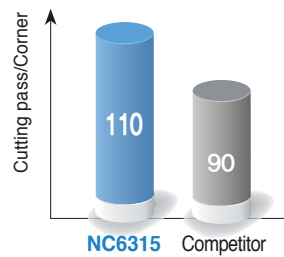
■ **Test result**



K Ductile cast iron (GCD500)

- **Workpiece** Knuckle
- **Cutting condition** vc (m/min) = 200, n (rpm) = 1100, fn (mm/rev) = 0.25, ap (mm) = 2, wet
- **Designation** **Insert** : DNMG150608-MK (NC6315)
Holder : DDJLNR2525

■ **Test result**

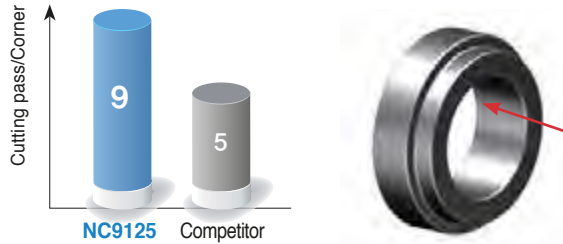


Application examples (NC9100 Series)

M Stainless steel (STS304)

- **Workpiece** Hydraulics part (Mechanical seal)
- **Cutting condition** vc (m/min) = 140, fn (mm/rev) = 0.28, ap (mm) = 3.0, wet
- **Designation** Insert : CNMG120408-MM (NC9125)
Holder : S32S-PCLCR-12

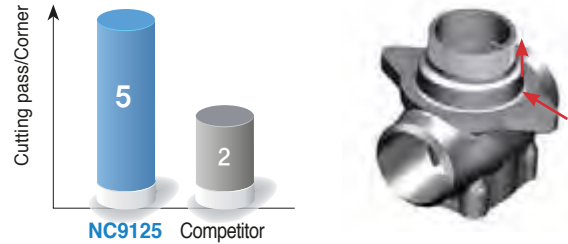
■ Test result



M Stainless steel (STS304)

- **Workpiece** Valve part (Piston valve)
- **Cutting condition** vc (m/min) = 140, fn (mm/rev) = 0.28, ap (mm) = 3.0, wet
- **Designation** Insert : CNMG120408-MM (NC9125)
Holder : DCLNL2525-M12

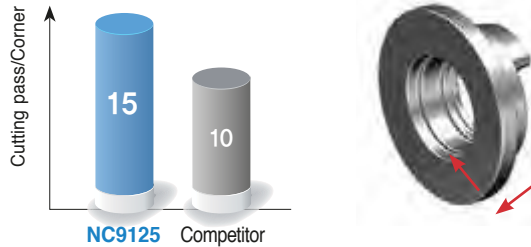
■ Test result



M Stainless steel (STS317L)

- **Workpiece** Wind power/offshore plant part (Flange)
- **Cutting condition** vc (m/min) = 150, fn (mm/rev) = 0.3~0.5, ap (mm) = 4.0~6.0, wet
- **Designation** Insert : CNMG160616-MM (NC9125)
Holder : PCLNR3232-P16

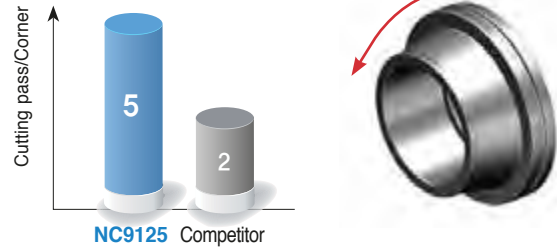
■ Test result



M Stainless steel (STS316)

- **Workpiece** Wind power plant part (Flange)
- **Cutting condition** vc (m/min) = 175, fn (mm/rev) = 0.3~0.8, ap (mm) = 0.5, wet
- **Designation** Insert : TNMG220416-RM (NC9135)
Holder : PTFNR3232-P22

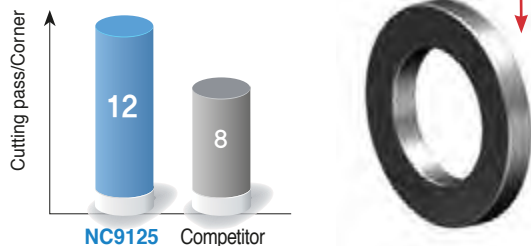
■ Test result



M Stainless steel (Super duplex)

- **Workpiece** Plant part (Flange)
- **Cutting condition** vc (m/min) = 100, fn (mm/rev) = 0.5, ap (mm) = 3, wet
- **Designation** Insert : CNMG160616-MM (NC9125)
Holder : PCLNR323-P16

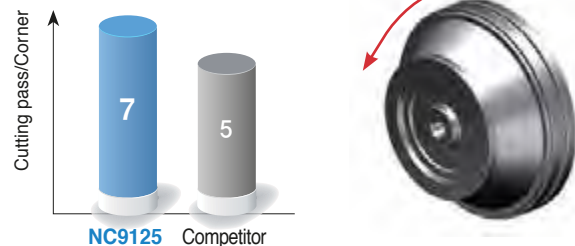
■ Test result



M Stainless steel (Duplex)

- **Workpiece** Hydraulics part
- **Cutting condition** vc (m/min) = 120, fn (mm/rev) = 0.4, ap (mm) = 6, wet
- **Designation** Insert : CNMG160616-RM (NC9125)
Holder : DCLNR3232-P16

■ Test result



PVD coated grades

Turning grade for heat resistant alloy and stainless steel

PC8105

- Micro grain carbide minimizes chipping of cutting edge due to enhanced edge strength
- Latest PVD coating technology with high hardness and high temperature oxidation resistance
- Excellent tool life when finishing heat resistant alloys and stainless steels at high speeds

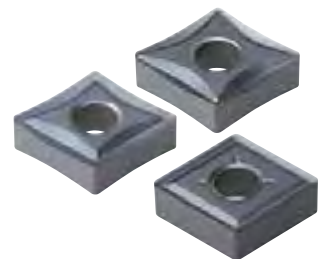
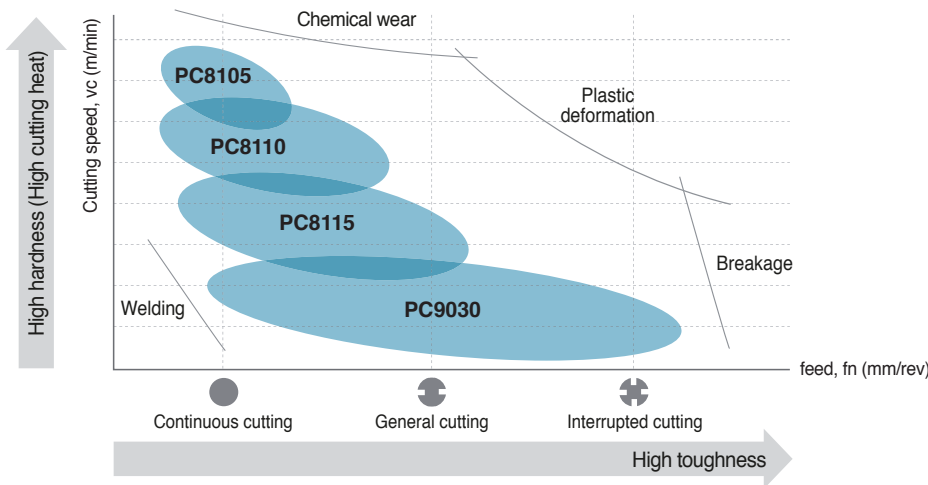
PC8110

- Substrate with superior wear resistance and plastic deformation resistance at high temperature
- PVD coating technology with high hardness and oxidation resistance at high temperature
- Long tool life when machining heat resistant alloy and stainless steel at high speed

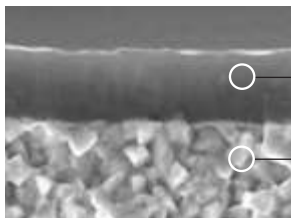
PC8115

- Ultra fine matrix technology increases wear resistance and chipping resistance.
- PVD coating technology with high hardness and oxidation resistance at high temperature
- Strong cutting edge and excellent chipping resistance guarantees stable machining
- Long tool life when machining heat resistant alloy and stainless steel at middle to low speed and medium cutting to roughing

Grades line up



Features of PC8100 series



- It prevents wear at a high temperature to apply excellent surface roughness and coating with oxidation resistance and high hardness
- It improves wear resistance to equalize submicron matrix, secure stability between corners and improve chipping- and wear resistance

Coating surface treatment technology (Pictures of coating layer)

Soft coating surface

PC8100 Series

Rough coating surface

Conventional coating

Oxidation resistant coating technology (Pictures of coating layer heat-treated at 900°C)

Oxidized layer easily happens

PC8100 Series

Oxidized layer is prevented

Competitor



A Turning Grades

Selection system of PVD coated grade

Workpiece	Machining types	Recommended grade	Recommended cutting speed (m/min)	ISO	Application range
P Steel	Continuous cutting	PC5300	175 (100 ~ 250)	P30	PC5300
	Interrupted cutting		145 (80 ~ 120)	P40	
M Stainless steel	Continuous cutting	PC8105	175 (120 ~ 230)	M01	PC8105, PC8110, PC8115, PC5300, PC9030, PC5400
		PC8110	160 (110 ~ 210)	M10	
	PC8115	150 (100 ~ 200)	M20		
	Interrupted cutting	PC5300	135 (80 ~ 190)	M30	
		PC9030	130 (80 ~ 180)	M40	
		PC5400	110 (80 ~ 140)	M50	
K Cast iron	Continuous cutting	PC8110	135 (95 ~ 180)	K10	PC8110, PC5300, PC5400
				K20	
	Interrupted cutting	PC5300	105 (75 ~ 140)	K30	
		PC5400	90 (65 ~ 120)	K40	
S Heat resistant alloy	Continuous cutting	PC8105	55 (40 ~ 70)	S01	PC8105, PC8110, PC8115, PC5300, PC5400
		PC8110	50 (35 ~ 65)	S10	
		PC8115	45 (30 ~ 60)	S20	
	Interrupted cutting	PC5300	40 (20 ~ 60)	S30	
		PC5400	35 (20 ~ 50)	S40	
H Hardened	Interrupted cutting	PC8105	110 (80 ~ 140)	H01	PC8105, PC8110, PC8115
		PC8110	100 (70 ~ 130)	H05	
		PC8115	90 (65 ~ 115)	H10	

The features of PVD coated grades

PVD Coated grades	ISO	Features
PC8105	M05 ~ M15 S01 ~ S10 H01 ~ H05	<ul style="list-style-type: none"> For high speed and continuous finishing of hard-to-cut materials and STS Excellent cutting performance with high wear resistance and oxidation resistance Ultra fine substrate and the new TiAlN coating layer
PC8110	M10 ~ M20 K10 ~ K20 S05 ~ S15 H05 ~ H10	<ul style="list-style-type: none"> For high speed and continuous medium cutting of hard-to-cut materials and STS Excellent tool life with high wear/plastic deformation resistance at high temperature New TiAlN coating layer and substrate with excellent thermal resistance
PC8115	M15 ~ M25 S10 ~ S20 H10 ~ H15	<ul style="list-style-type: none"> For medium to low speed and medium to rough cutting of hard-to-cut materials and STS Excellent tool life with high wear resistance and chipping resistance Ultra fine substrate and the new TiAlN coating layer
PC5300	P30 ~ P40 M20 ~ M30 K20 ~ K25 S15 ~ S25	<ul style="list-style-type: none"> Universal grade for stainless, HRSA, steel and interrupted cast iron machining High chipping and welding resistance for longer tool life New TiAlN coating and ultra fine grain substrate adopted
PC9030	M25 ~ M35	<ul style="list-style-type: none"> Medium, roughing and heavy interrupted cutting for stainless steel TiAlN coating and ultra fine grain substrate adopted High chipping and welding resistance for stable machining
PC5400	P35 ~ P45 M30 ~ M40 K30 ~ K35 S25 ~ S35	<ul style="list-style-type: none"> For medium cutting for hard-to-cut materials, stainless steel, steel, and cast iron at medium or low speed Stable machinability with chipping resistance, fracture resistance and welding resistance Ultra fine substrate with high toughness and new AlCrN layer



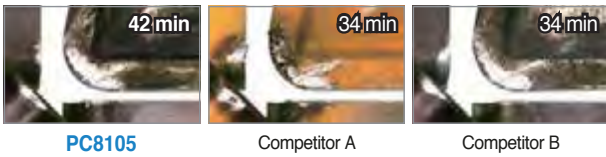
Application examples (PC8105/PC8110/PC8115)

S Inconel 718

■ **Cutting condition** vc (m/min) = 50
 fn (mm/rev) = 0.15
 ap (mm) = 0.5, wet

■ **Designation** **Insert** : CNMG120408-VP3 (PC8105)
 Holder: PCLNR2525-M12

■ **Test result**

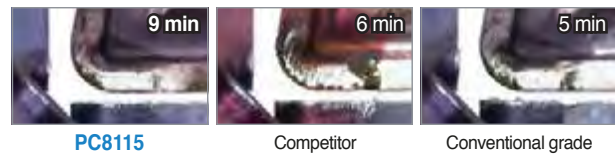


S Inconel 718

■ **Cutting condition** vc (m/min) = 50
 fn (mm/rev) = 0.15
 ap (mm) = 1.5, wet

■ **Designation** **Insert** : CNMG120408-VP3 (PC8115)
 Holder: PCLNR2525-M12

■ **Test result**

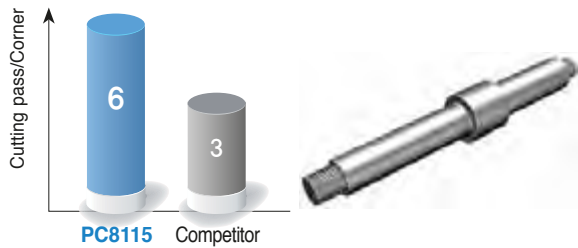


M Stainless steel (STS316L)

■ **Cutting condition** vc (m/min) = 80
 fn (mm/rev) = 0.2
 ap (mm) = 7.0, wet

■ **Designation** **Insert** : CNMG120408-VP3 (PC8115)
 Holder: PCLNR2525-M12

■ **Test result**

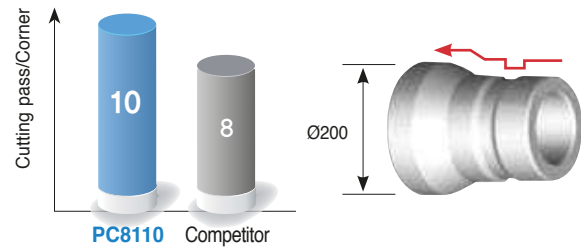


S Inconel 625

■ **Cutting condition** vc (m/min) = 60
 fn (mm/rev) = 0.2
 ap (mm) = 2, wet

■ **Designation** **Insert** : DNMG150608-MM (PC8110)
 Holder: DDLNL2525-MS15

■ **Test result**



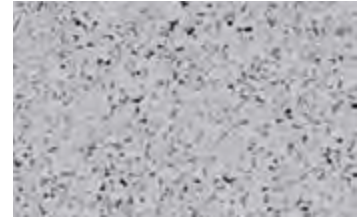
A Turning Grades

Uncoated carbide grades

Uncoated carbide grades for turning application of titanium

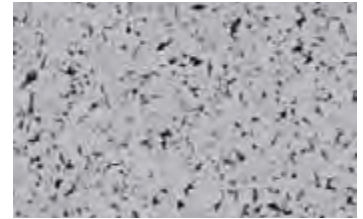
H01

- Increased wear resistance and chipping resistance with the use of ultra fine substrate
- Improved welding resistance and chipping resistance with the use of special surface treatment and sharp cutting edge of VP chip breaker
- Excellent tool life when finishing titanium alloy at high speed

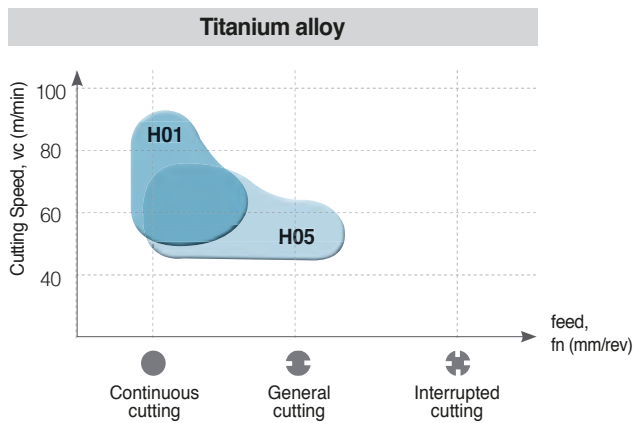


H05

- The 1st recommended grade for machining titanium alloy in a variety of cutting conditions
- Improved welding resistance and chipping resistance with the use of special surface treatment and sharp cutting edge of VP chip breaker
- Ideal for medium cutting of titanium alloy



Grades line up



Selection system of uncoated carbide grades

Workpiece	Recommended grade	Recommended cutting speed (m/min)	ISO	Application range
P Steel	ST10	110 (70 ~ 140)	P10	← ST10
	ST20	80 (50 ~ 110)	P20	← ST20
	ST30A	70 (40 ~ 90)	P30	← ST30A
M Stainless steel	U20	70 (40 ~ 90)	M25	← U20
K Cast iron	H01	105 (60 ~ 140)	K01	← H01
	H05	105 (60 ~ 140)	K10	← H05
	G10	90 (50 ~ 120)	K20	← G10
N Aluminum alloy	H01	600 (450 ~ 750)	N10	← H01
Copper alloys	H05	425 (320 ~ 530)	N20	← H05
S Titanium alloy	H01	55 (40 ~ 70)	S01	← H01
	H05	50 (35 ~ 65)	S10	← H05
H High hardness steel	H01	80 (55 ~ 105)	H10	← H01

Main composition and application range

Workpiece	Composition	Features	Workpiece
P	WC-TiC-TaC-Co	Heat resistance, excellent plastic deformation resistance	Carbon steel, Alloy steel, Stainless steel
M	WC-TiC-TaC-Co	General tools stable heat resistance with strength	Carbon steel, Alloy steel, Stainless steel, Cast steel
K	WC-Co	High strength and superior wear resistance	Cast iron, Non-ferrous metal, Plastic, etc
S	WC-Co	Excellent wear resistance and chipping resistance	Titanium alloy



➤ The physical properties of uncoated carbide grades

Workpiece	Grade	Hardness (HRA)	TRS (kgf/mm ²)	Young's modulus (10 ³ kgf/mm ²)	Thermal expansion coefficient (10 ⁻⁶ /°C)	Thermal conductivity (cal/cm · sec·°C)
P	ST10	92.1	175	48	6.2	25
	ST20	91.9	200	56	5.2	45
	ST30A	91.3	230	53	5.2	-
M	U20	91.1	210	-	-	88
	ST30A	91.3	230	53	5.2	-
K	H01	92.9	210	66	4.7	109
	G10	90.9	250	63	-	105
S	H01	92.9	210	66	4.7	109
	H05	91.8	250	-	-	-

1KPa = 102kgf/m², 1w/mk = 2.39×10⁻³cal/cm·sec·°C

Application examples (H01/H05)

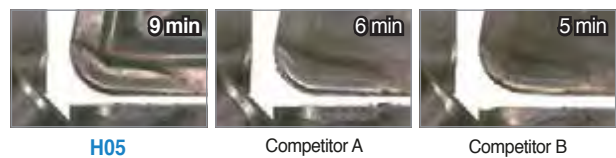
S Titanium alloy (Ti-6Al-4V)

- **Cutting condition** vc (m/min) = 100
fn (mm/rev) = 0.1
ap (mm) = 0.5, wet
- **Designation** Insert : CNMG120408-VP1 (H01)
Holder : PCLNR2525-M12
- **Test result**



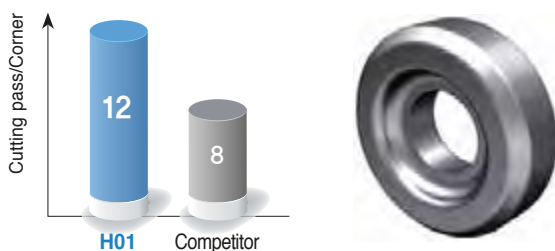
S Titanium alloy (Ti-6Al-4V)

- **Cutting condition** vc (m/min) = 80
fn (mm/rev) = 0.2
ap (mm) = 2.0, wet
- **Designation** Insert : CNMG120408-VP3 (H05)
Holder : PCLNR2525-M12
- **Test result**



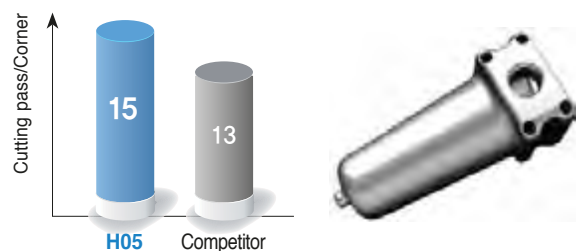
S Titanium alloy (Ti-6Al-4V)

- **Workpiece** Part of an industrial machine
- **Cutting condition** vc (m/min) = 60, fn (mm/rev) = 0.2
ap (mm) = 0.8, wet
- **Designation** Insert : CNMG120408-VP3 (H01)
Holder : PCLNR2525-M12
- **Test result**



S Titanium alloy (Ti-6Al-4V)

- **Workpiece** Part of an industrial machine
- **Cutting condition** vc (m/min) = 50, fn (mm/rev) = 0.15
ap (mm) = 2.0, wet
- **Designation** Insert : CNMG120408-VP3 (H05)
Holder : PCLNL2525-M12
- **Test result**



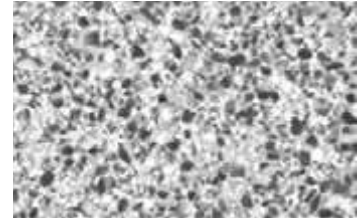
A Turning Grades

Cermet grades

Solution for turning application of steel

CN1500

- For continuous machining of cold/hot forged steel and Sintered ferrous alloy at high speed and low depth of cut
- Excellent wear resistance and crater resistance
- Improved surface roughness acquired by optimized cutting edges



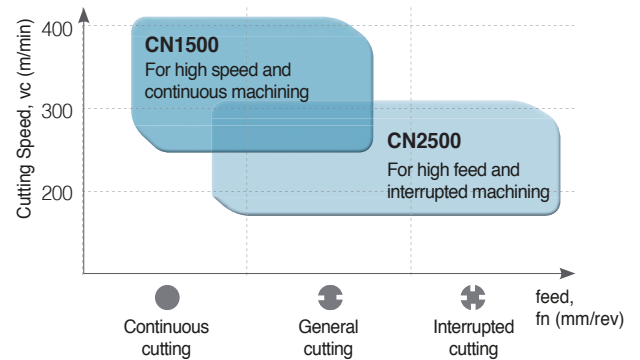
CN2500

- For high interrupted machining of cold/hot forged steel and Sintered ferrous alloy at high feed and high depth of cut
- Excellent resistance against chipping, fracture and thermal crack
- Improved surface roughness acquired by optimized cutting edges

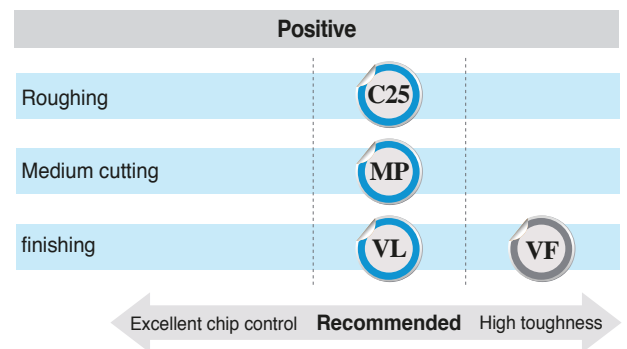
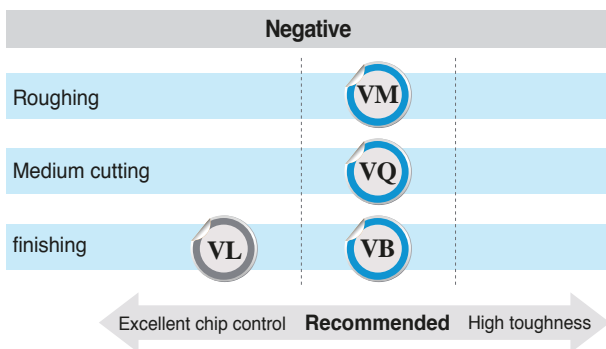
Recommended cutting condition

Division	Workpiece	Grade	Recommended cutting speed (m/min)		
			Minimum	Recommended	Maximum
Turning	SM10C, SS440	CN1500	150	270	400
		CN2500	130	240	350
	SM45C	CN1500	150	250	350
		CN2500	130	220	300
	SCM440, Sintered fe ferrous alloy	CN1500	120	220	300
		CN2500	100	200	250

Grades line up



Chip breakers line up



Selection system of cermet grades

Workpiece	Machining types	Recommended grade	Recommended cutting speed (m/min)	ISO	Application range
P Steel	Continuous cutting	CN1500	250 (150 ~ 350)	P10	
	Interrupted cutting	CN2500	220 (130 ~ 300)	P20	
				P30	



Comparison of chip breakers

Insert types	Machining types	Application range	Chip breakers				
			KORLOY	CompetitorA	CompetitorB	CompetitorC	CompetitorD
Nega type	Continuous cutting	For machining mild steel with enhanced chip control	VL	FA	GP	TF	FA
	General cutting	For low interrupted cutting with stronger cutting edges than VG chip breaker	VB	FG	XP CQ	TSF TS	LU SE
	General cutting	For medium cutting to finishing at low interruption	VQ	MC	HQ	AS, ZM	SU
	Interrupted cutting	For medium cutting to roughing at high interruption	VM	MT	HS	TM	GU
Posi type	Continuous cutting	For machining mild steel with enhanced chip control	VL	FA	GP	PF	FP
	Continuous cutting	Enhanced chip control when machining internal diameter with stronger cutting edges than VL chip breaker	VF	FG-PC	HQ	PS	LU
	General cutting	For medium cutting to finishing at low interruption	MP	FG	HQ	PS	LU
	Interrupted cutting	For medium cutting to roughing at high interruption	C25	MT	GK	24	SC

Application examples (CN1500)

P Carbon steel (SM45C)

- Cutting condition** vc (m/min) = 200, n (rpm) = 1,800
fn (mm/rev) = 0.1, ap (mm) = 0.3
wet
- Designation** Insert : CCMT09T304-MP (CN1500)
Holder : SCLCR2020-K09
- Test result**

P Alloy steel (SCM430)

- Cutting condition** vc (m/min) = 230, n (rpm) = 2,000
fn (mm/rev) = 0.12, ap (mm) = 0.8
wet
- Designation** Insert : TNMG160404-VQ (CN1500)
Holder : DTGNR3232-P16
- Test result**

P Bearing steel (STB2)

- Cutting condition** vc (m/min) = 200, n (rpm) = 2,500
fn (mm/rev) = 0.1, ap (mm) = 0.3
wet
- Designation** Insert : DCMT11T302-VF (CN1500)
Holder : SDJCR2525-M11
- Test result**

P Sintered ferrous alloy

- Cutting condition** vc (m/min) = 160, n (rpm) = 1,200
fn (mm/rev) = 0.17, ap (mm) = 0.2
wet
- Designation** Insert : SNMG120408-VM (CN1500)
Holder : MSRNR2525-M12
- Test result**



Application examples (CN2500)

P Carbon steel (SM45C)

- Cutting condition**

vc (m/min) = 185, n (rpm) = 2,300

fn (mm/rev) = 0.15, ap (mm) = 0.4

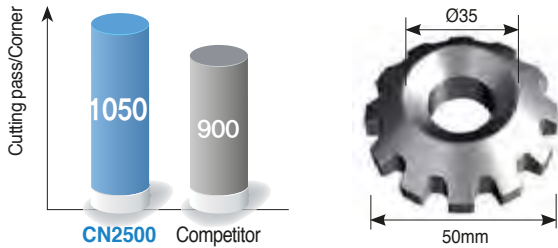
wet

- Designation**

Insert : CCMT09T304-MP (CN2500)

Holder : SCLCR2020-K09

- Test result**



P Alloy steel (SCR420H)

- Cutting condition**

vc (m/min) = 200, n (rpm) = 2,000

fn (mm/rev) = 0.15, ap (mm) = 0.2

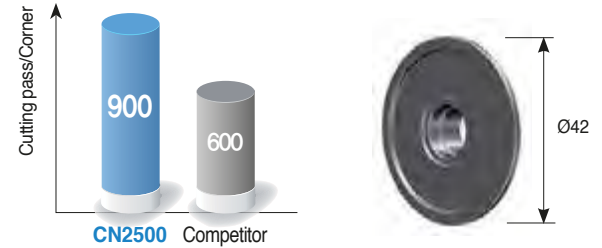
wet

- Designation**

Insert : DCMT11T304-MP (CN2500)

Holder : SDJCR2525-M11

- Test result**



P Sintered ferrous alloy

- Cutting condition**

vc (m/min) = 280, n (rpm) = 2,000

fn (mm/rev) = 0.2, ap (mm) = 0.2

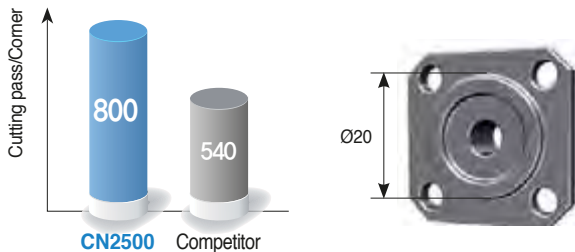
wet

- Designation**

Insert : VBMT160404-MP (CN2500)

Holder : SVABL-2020-K16

- Test result**



P Alloy steel (SCM415)

- Cutting condition**

vc (m/min) = 300, n (rpm) = 2,200

fn (mm/rev) = 0.25, ap (mm) = 0.3

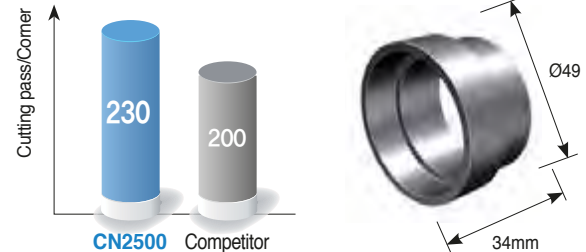
wet

- Designation**

Insert : CNMG120408-VM (CN2500)

Holder : PCLNR2525-M12

- Test result**



P Carbon steel (SM45C)

- Cutting condition**

vc (m/min) = 300, n (rpm) = 2,800

fn (mm/rev) = 0.25, ap (mm) = 0.4

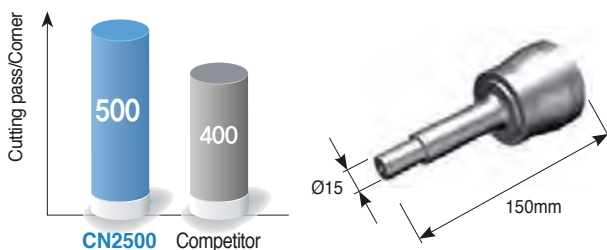
wet

- Designation**

Insert : CNMG120404-VB (CN2500)

Holder : PCLNR3232P-16

- Test result**



P Alloy steel (SCR420)

- Cutting condition**

vc (m/min) = 200, n (rpm) = 2,300

fn (mm/rev) = 0.2, ap (mm) = 0.3

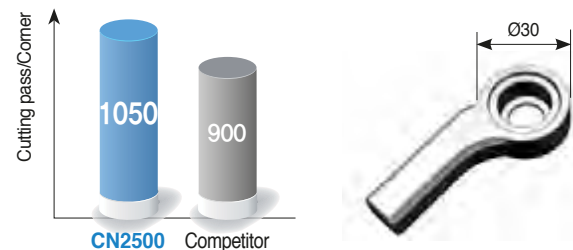
wet

- Designation**

Insert : CCMT09T304-MP (CN2500)

Holder : SCLCR2020-K09

- Test result**



Coated cermet grades

Coated cermet for machining carbon steel, alloy steel and sintered ferrous components

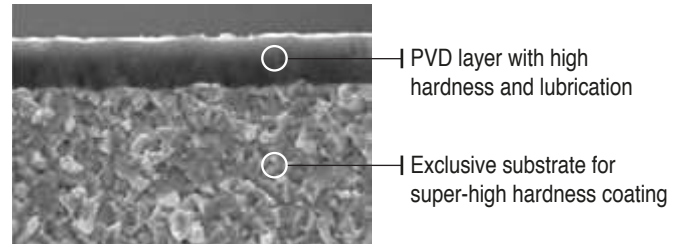
CC1500 new

- Maximized resistance to built-up edge and oxidation in continuous cutting at high speeds and low depth of cuts
- Superior wear resistance vs. existing tools in continuous cutting of carbon steel and alloy steel

CC2500 new

- Maximized resistance to built-up edge and oxidation in interrupted cutting at high feeds and high depth of cuts
- Superior impact resistance vs. existing tools in interrupted cutting of carbon steel and alloy steel

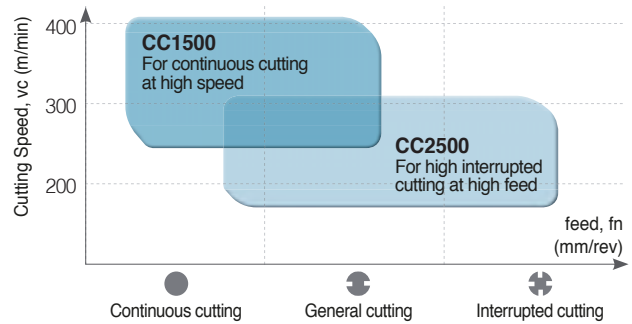
Features



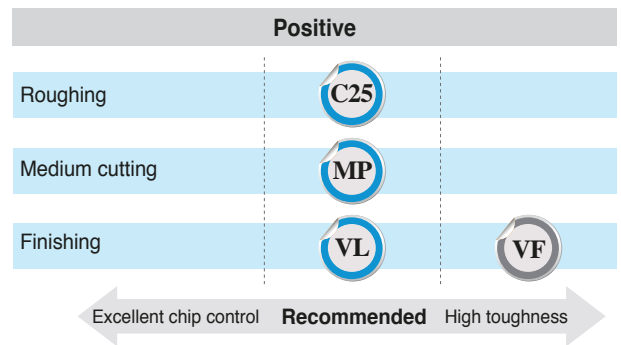
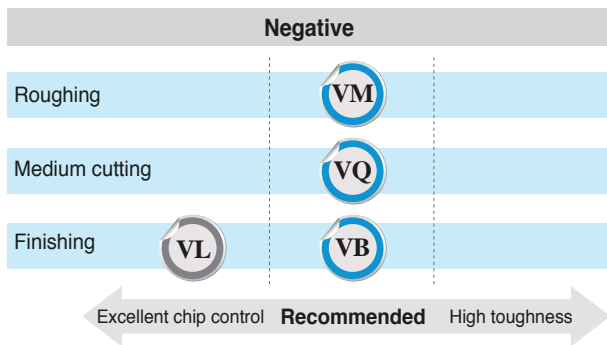
Recommended cutting condition

Division	Workpiece	Grade	Recommended cutting speed (m/min)		
			Minimum	Recommended	Maximum
Turning	SM10C, SS440	CN1500	200	350	450
		CN2500	180	290	400
	SM45C	CN1500	200	300	400
		CN2500	180	270	350
	SCM440, Sintered fe ferrous alloy	CN1500	180	270	350
		CN2500	150	250	300

Grades line up



Chip breakers line up



Selection system of coated cermet grades

Workpiece	Machining types	Recommended grade	Recommended cutting speed (m/min)	ISO	Application range
P Steel	Continuous cutting	CC1500	325 (200 ~ 450)	P10	← CC1500
	Interrupted cutting	CC2500	265 (180 ~ 350)	P20, P30	← CC2500
K Cast iron	Continuous cutting	CC1500	270 (180 ~ 350)	K10	← CC1500
	Interrupted cutting	CC2500	250 (150 ~ 300)	K20	← CC2500

The features of coated cermet grade

Coated cermet	ISO	Features
CC1500	P10 ~ P20 / K05 ~ K15	• PVD coated Cermet • Light cutting for steel and cast iron in high speed machining • Optimized for precision boring
CC2500	P20 ~ P30 / K10 ~ K20	• PVD coated Cermet • Light cutting for steel and cast iron in medium or high speed machining • Dry and wet cutting are available

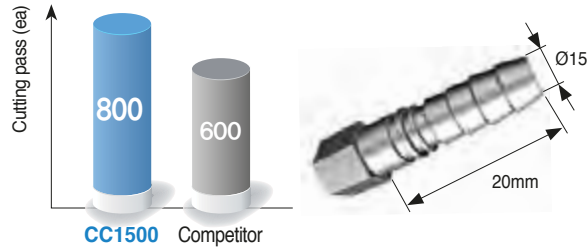


Application examples (CC1500)

P Carbon steel (SM20C)

- **Workpiece** Nipple
- **Cutting condition** vc (m/min) = 170, n (rpm) = 2,000
 fn (mm/rev) = 0.12, ap (mm) = 0.12, wet
- **Designation** **Insert** : TPMT110304-MP (CC1500)
Holder : S20R-STWPR-11

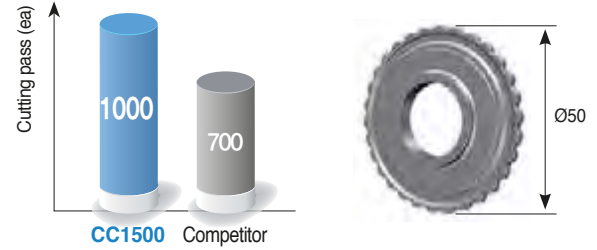
■ Test result



P Alloy steel (SCM440)

- **Workpiece** Plate carrier
- **Cutting condition** vc (m/min) = 450, n (rpm) = 2,500
 fn (mm/rev) = 0.2, ap (mm) = 0.2, wet
- **Designation** **Insert** : DCMT11T304-MP (CC1500)
Holder : SDJCR2525M11

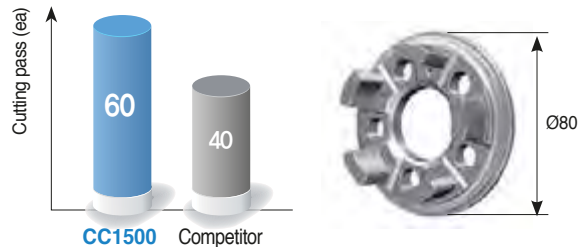
■ Test result



P Carbon steel (SM45C)

- **Workpiece** Cut plate carrier
- **Cutting condition** vc (m/min) = 300, n (rpm) = 2,500
 fn (mm/rev) = 0.3, ap (mm) = 0.4, wet
- **Designation** **Insert** : CCMT09T304-C25 (CC1500)
Holder : SCACR1212-F09

■ Test result



P Alloy steel (SCM420)

- **Workpiece** Pinion
- **Cutting condition** vc (m/min) = 250, n (rpm) = 2,500
 fn (mm/rev) = 0.2, ap (mm) = 0.5, wet
- **Designation** **Insert** : DNMG150604-VL (CC1500)
Holder : PDJNR2525-M15

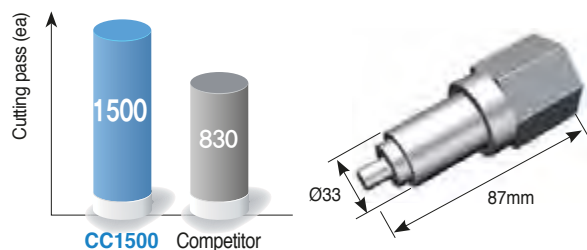
■ Test result



P Hot forging (SCM430)

- **Workpiece** Valve
- **Cutting condition** vc (m/min) = 230, fn (mm/rev) = 0.8
 ap (mm) = 0.12, wet
- **Designation** **Insert** : TNMG160404-VQ (CC1500)
Holder : PTTNR1616-H16

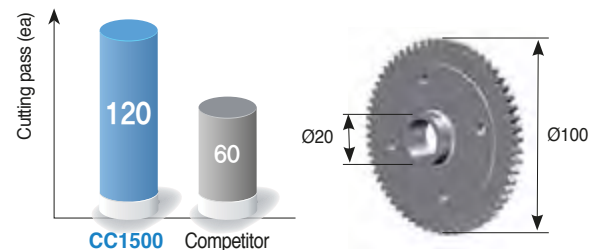
■ Test result



P Sintered ferrous alloy

- **Workpiece** Sprocket
- **Cutting condition** vc (m/min) = 160, fn (mm/rev) = 0.17
 ap (mm) = 0.2, wet
- **Designation** **Insert** : SNMG120408-VM (CC1500)
Holder : MSKNR3232-P12

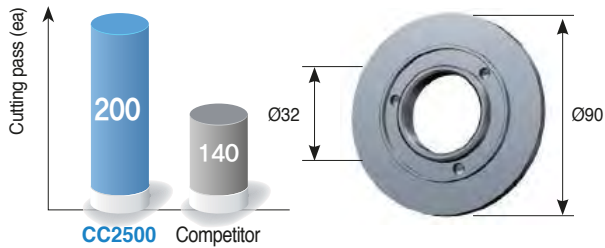
■ Test result



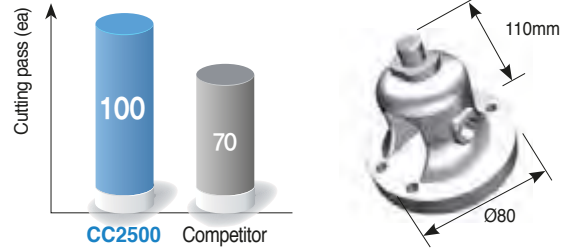
Application examples (CC2500)

P Carbon steel (SM45C)

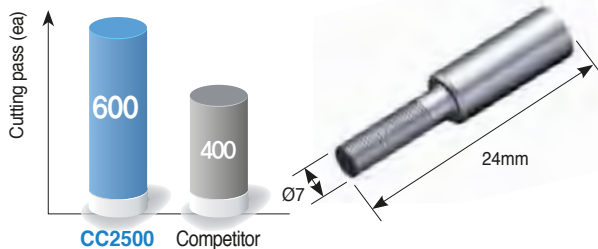
- **Workpiece** Swash-Plate
- **Cutting condition** vc (m/min) = 250, n (rpm) = 890
 fn (mm/rev) = 0.06, ap (mm) = 0.1, wet
- **Designation** **Insert** : DNMG110404-VQ (CC2500)
Holder : SDJCR2525-M11

■ **Test result****K** Ductile cast iron (FCD400)

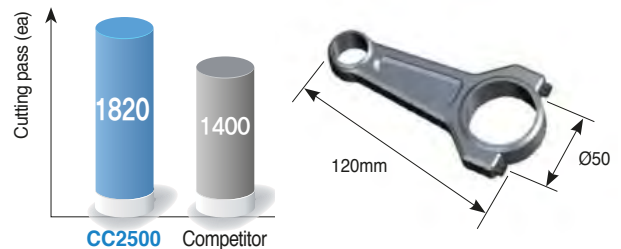
- **Workpiece** Diff. case
- **Cutting condition** vc (m/min) = 150, n (rpm) = 600
 fn (mm/rev) = 0.15, ap (mm) = 0.3, wet
- **Designation** **Insert** : VBMT160404-MP (CC2500)
Holder : SVJBR2525-M16

■ **Test result****P** Carbon steel (SM35C)

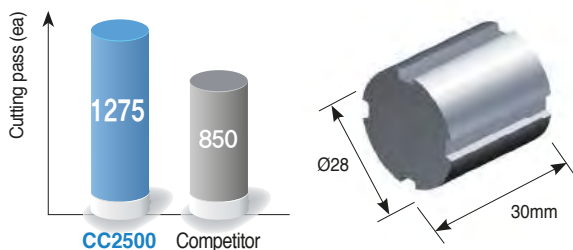
- **Workpiece** Piston Rod
- **Cutting condition** vc (m/min) = 122, n (rpm) = 4,800
 fn (mm/rev) = 0.15, ap (mm) = 2.0, wet
- **Designation** **Insert** : DNMG150604-VM (CC2500)
Holder : MDQNR2525-M15

■ **Test result****P** Alloy steel (SCM420)

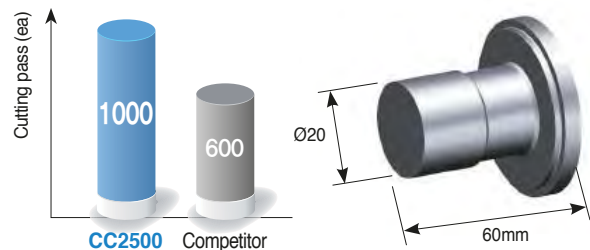
- **Workpiece** Connecting Rod
- **Cutting condition** vc (m/min) = 340, n (rpm) = 2,100
 fn (mm/rev) = 0.15, ap (mm) = 0.07, wet
- **Designation** **Insert** : TPMT110304-MP (CC2500)
Holder : S10M-STFPR-11

■ **Test result****P** Alloy steel (SCM415)

- **Workpiece** Bush
- **Cutting condition** vc (m/min) = 314, n (rpm) = 3,500
 fn (mm/rev) = 1, ap (mm) = 0.2, wet
- **Designation** **Insert** : CNMG120408-VQ (CC2500)
Holder : MCLNR2525-M12

■ **Test result****P** Alloy steel (SWCH18A)

- **Workpiece** Shaft
- **Cutting condition** vc (m/min) = 367, n (rpm) = 5,800
 fn (mm/rev) = 0.02, ap (mm) = 1.55, wet
- **Designation** **Insert** : TBT4405R-D38-R0.25 (CC2500)
Holder : TBH425-45R

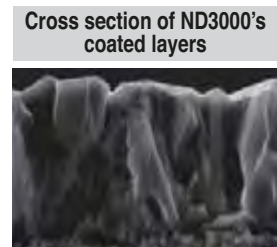
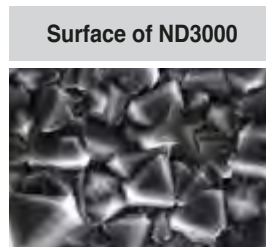
■ **Test result**

Diamond coated grades

Grade for graphite and ceramic

ND3000 **new**

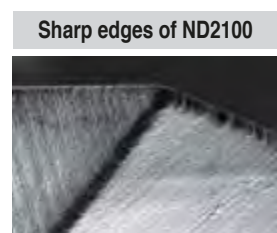
- SP3-crystalline diamond coatings of high purity and high hardness
- Improved adhesion between coated layers and the substrate that is specialized for diamond coatings
- Excellent tool life when machining graphite and ceramic



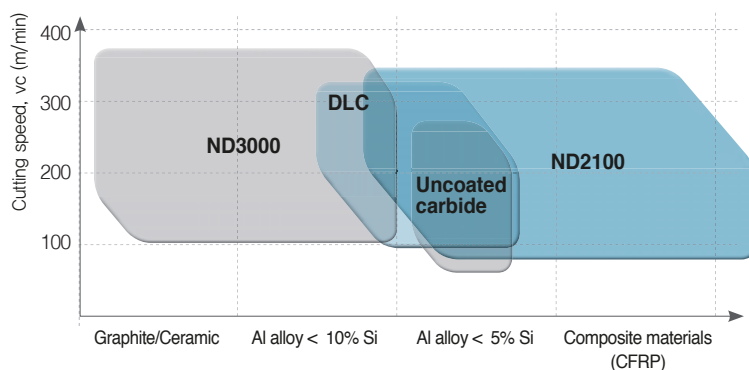
Grade for composite materials

ND2100 **new**

- Improved surface finish and wear resistance due to the control technology of nano-crystalline diamond particles
- Improved flaking resistance due to the substrate that is specialized for diamond coatings
- High quality and high precision machining availability thanks to sharp edges
- Excellent tool life when machining composite materials



Application range



Selection system

Workpiece		Grade	ISO	Application range
N Nonferrous	Graphite/ Ceramic	ND3000 new	N01	ND3000 new
	Al alloy	ND3000 new ND2100 new	N05	
	Composite materials	ND2100 new	N10	ND2100 new

The features of diamond coated grades

Grade	ISO	Features
ND3000 new	N01 ~N05	<ul style="list-style-type: none"> • For continuous roughing of graphite, ceramic, and Al alloy at high speeds • Exceptional cutting performance due to high resistance to wear and flaking • High hardness diamond coatings of high purity SP3-crystalline structure
ND2100 new	N03~N08	<ul style="list-style-type: none"> • For continuous finishing of composite materials and Al alloy at high speeds • Stable machinability due to durable sharp edges • Nano-crystalline diamond coatings under particle control



DLC coated grades

DLC-Coated Inserts for Non-Ferrous Metals

PD1005 ^{new} / PD1010 ^{new}

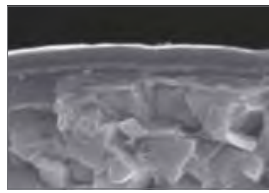
- High hardness and low friction DLC coating technology
- Lubrication and maximized wear resistance increases machinability and machining quality.
- Optimal substrate for each workpiece ensures stable and long tool life
- For non-ferrous metals such as aluminum, Al-Si alloy, copper and etc. machining

Features

Smooth coating surface

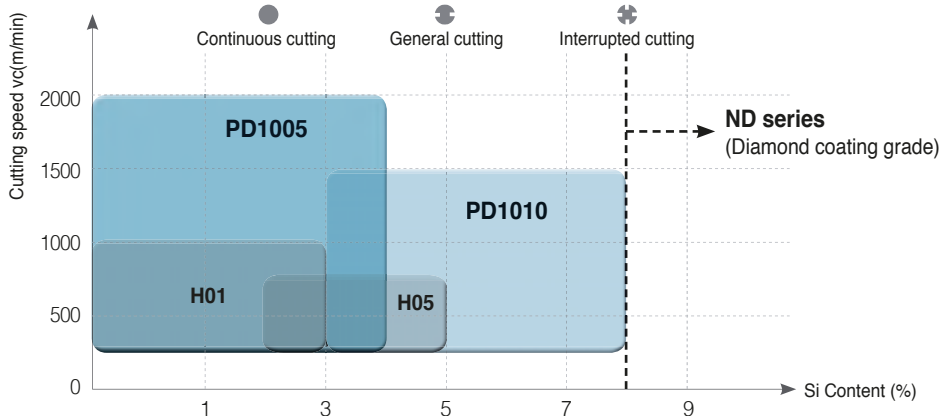


Hard DLC coating



Grade	Wear resistance and Welding resistance	Surface finish	Chip curl
Carbide non coated			
DLC PD1010			

Application range



Selection criteria

Workpiece		Grade	ISO	Application range
N	Non-ferrous metals	Aluminum and copper (Soft non-ferrous metals)	PD1005	N05
		Aluminum alloy	PD1005 PD1010	N10
		Al-Si alloy (Hardened non-ferrous metals)	PD1010	N15

The features of DLC coating grades

Grade	ISO	Features
PD1005	N05	<ul style="list-style-type: none"> • For high speed and continuous machining of Aluminum and copper • High wear and welding resistance realize good machinability • High performance of DLC coating with high hardness and low friction
PD1010	N10	<ul style="list-style-type: none"> • For medium to high and interrupted machining of aluminum alloy and Al-Si alloy • Stable tool life due to substrate with chipping resistance • High performance DLC coating with high hardness and low friction



Application examples (ND3000/ND2100)

N Graphite mold

- **Cutting condition** vc (m/min) = 100, fz (mm/t) = 0.11, ap (mm) = 0.26, dry
- **Designation** Endmill : DBE4060-110-N250S06 (ND3000)
- **Test result**

Tool	Cutting time
ND3000	8h
Competitor	6.5h

N Graphite mold

- **Cutting condition** vc (m/min) = 300, fz (mm/t) = 0.1, ap (mm) = 0.15, dry
- **Designation** Endmill : DBE2060-080-N250S06 (ND3000)
- **Test result**

Tool	Cutting time
ND3000	6h
Competitor	5h

N CFRP

- **Cutting condition** vc (m/min) = 200, fn (mm/rev) = 0.21, ap (mm) = 10, ae (mm) = 2.8
- **Designation** Endmill : CCR2080-075 (ND2100)
- **Test result**

Tool	Cutting length
ND2100	19m
Competitor	8.5m

N CFRP

- **Cutting condition** vc (m/min) = 200, fz (mm/t) = 0.17, ap (mm) = 10, ae (mm) = 1.2
- **Designation** Endmill : CCLR4080-075 (ND2100)
- **Test result**

Tool	Cutting length
ND2100	40m
Competitor	20m

Application examples (PD1005/PD1010)

N Al-Si alloy

- **Workpiece** Aluminum die casting materials, ALDC7 (Si 8%)
- **Cutting condition** vc (m/min) = 400, fn (mm/rev) = 0.25-0.3, ap (mm) = 1.0-1.5, wet
- **Designation** Insert : CNMG120408-HA (PD1005)
Holder : PCLNR2525-M12
- **Test result**

Tool	Cutting pass (ea)
PD1005	80
Competitor	30

N Al-Si alloy

- **Workpiece** Aluminum forging materials, AC4C (Si 7%)
- **Cutting condition** vc (m/min) = 740, fn (mm/rev) = 0.15, ap (mm) = 1.0-1.5, wet
- **Designation** Insert : XEKT19M504FR-MA (PD1010)
Holder : PAXS5032HR-A
- **Test result**

Tool	Cutting pass (ea)
PD1010	900
Competitor	480



cBN inserts grades

Features

- Excellent hardness and thermal resistance by sintering KORLOY's main constituents and special ceramic binder at high pressure and high temperature
- Excellent hardness and wear resistance for higher productivity in machining cast iron and heat-treated alloy at high speed

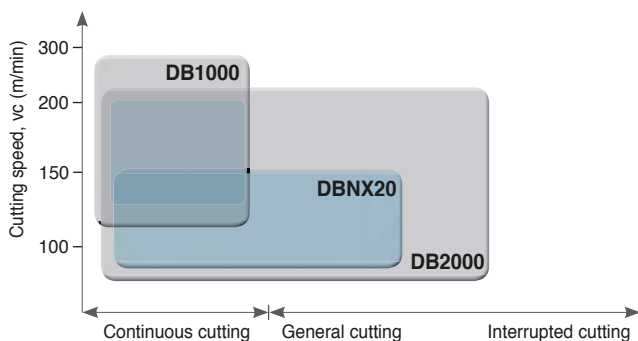
Insert type

High precision		Wear resistance		Productivity	
For regrinding type	One use type	Multi-corner type	Multi-corner type (coated)	Solid type	Grooving type

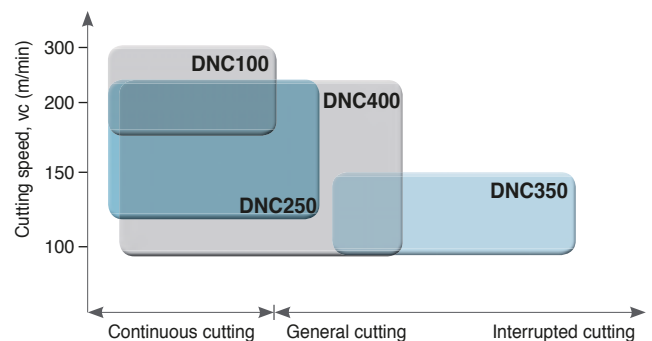
cBN inserts

Multi edge coated type		One use type	
	 2NU-CNGA120408		 NU-CNGA120408
<ul style="list-style-type: none"> • Easy handling of corners • Strong Brazing • Excellent tool life compared to non-coated insertse 		<ul style="list-style-type: none"> • Economic price • Easy handling of tools • A wide variety of series • Smaller than expensive cBN and dramatic cost down • Strong weld face and stable cutting performance 	
Multi edge type		Regrinding type	
	 2NU-CNGA120408		 CNMA120408
<ul style="list-style-type: none"> • Price per edge is more reasonable compare to normal single cornered, one-used type • Insert with several brazed cBN • Wide application of continuous to interrupted machining 		<ul style="list-style-type: none"> • Long tool life • Excellent wear resistance, High hardness • Saved tool cost due to the regrinding insert 3~4 time 	

















cBN application range



Coated cBN application range



➤ Cutting condition of cBN grades

Workpiece	Grades	Insert color	Application	Cutting speed, vc (m/min)	Feed, fn (mm/rev)	Depth of cut, ap (mm)	
H High hardness steel	Coated	DNC100 ^{new} 	Continuous cutting at high speed	180  300	0.03 ~ 0.3	0.03 ~ 0.3	
		DNC250 	Continuous and low interrupted cutting at high speed	120  220	0.05 ~ 0.3	0.05 ~ 0.3	
		DNC350 	Medium and high interrupted cutting	90  150	0.05 ~ 0.3	0.05 ~ 0.3	
		DNC400 ^{new} 	Continuous and medium interrupted cutting	90  220	0.05 ~ 0.3	0.05 ~ 0.5	
	Non coated	DB1000		Continuous cutting at high speed	130  250	0.03 ~ 0.15	0.03 ~ 0.2
		DB2000		Medium and low interrupted cutting	80  200	0.03 ~ 0.2	0.03 ~ 0.3
		DBNX20		Highly efficient cutting	120  150	0.03 ~ 0.3	0.03 ~ 0.5
		DBN250		Medium and low interrupted cutting	80  120	0.03 ~ 0.2	0.03 ~ 0.3
		DBN350		High interrupted cutting		0.03 ~ 0.2	0.03 ~ 0.3
		DBN400		High speed and high depth of cut	120  220	0.10 ~ 0.3	0.5
S HRSA	DB7000		Continuous cutting at high speed	100  300	0.05 ~ 0.2	0.1 ~ 1.0	
K Cast iron	DBN700A		Continuous cutting at high speed	500  2000	0.10 ~ 0.4	0.1 ~ 0.4	

Solid type cBN DBN400

➤ Features

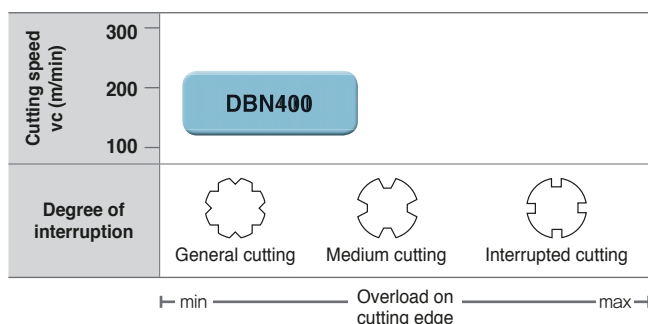
- For medium and light interrupted cutting of heat-treated steel
- Balanced grade of wear resistance and shock resistance
- Solid type for highly efficient machining

➤ Features of solid type




- Increased productivity at high speed and high depth of cut
- Ideal for removing cemented layer and machining the welds
- Stable welding with the use of 3-face blazing
- Excellent performance at varying depth of cuts



➤ Application range



➤ Recommended cutting condition

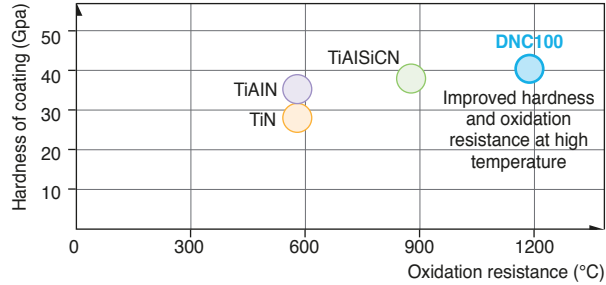
Cutting speed vc (m/min)	120  220
Feed fn (mm/rev)	0.1  0.3
Depth of cut per time ap (mm)	 0.5

A Others

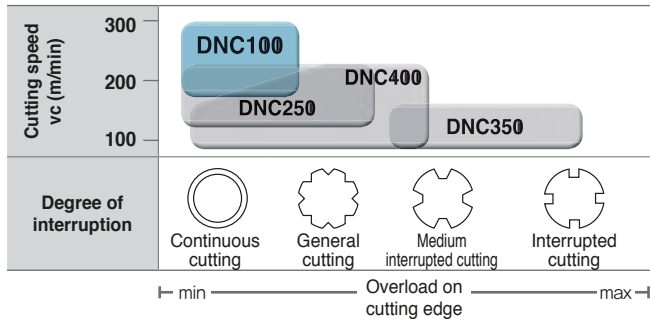
Coated cBN

DNC100 new

- Features**
- Excellent thermal resistance
 - Coating layer with high hardness, oxidation resistance and chipping resistance



Application range



Recommended cutting condition

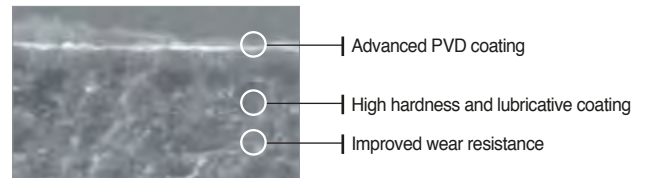
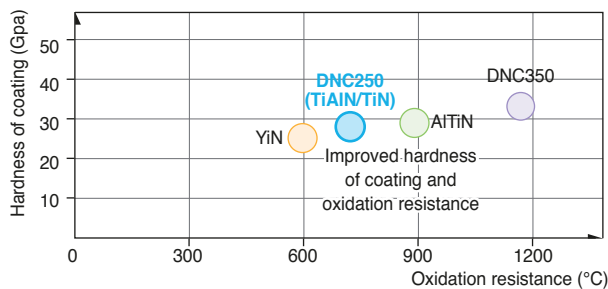
Cutting speed v_c (m/min)	180 ————— 300
Feed f_n (mm/rev)	0.03 ————— 0.3
Depth of cut per time a_p (mm)	0.03 ————— 0.3

- Increased oxidation resistance and wear resistance due to high hardness coating layer
- Dramatically improved fracture resistance and chipping resistance

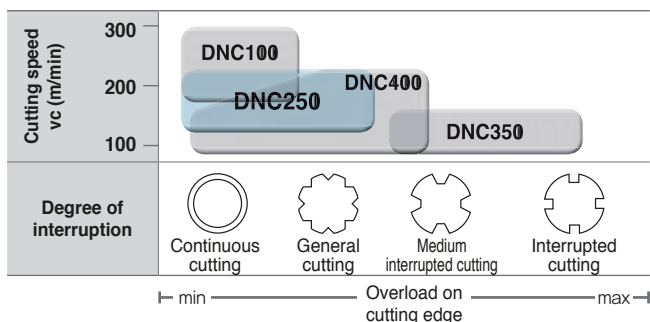
Multi-corner coated cBN for high efficient cutting of heat-treated alloy

DNC250

- Features**
- Stable and long tool life
 - Cost effective by multi-cornered one-use insert



Application range



Recommended cutting condition

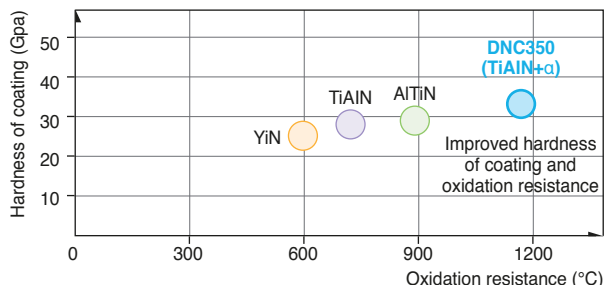
Cutting speed v_c (m/min)	120 ————— 220
Feed f_n (mm/rev)	0.05 ————— 0.3
Depth of cut per time a_p (mm)	0.05 ————— 0.3



Coated cBN for high interrupted cutting

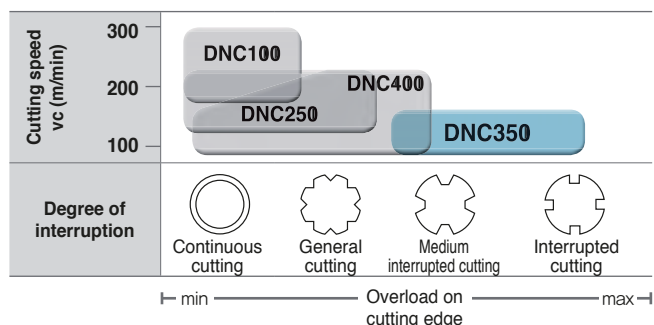
DNC350

- Features**
- Excellent tool life and productivity in interrupted cutting
 - New PVD coating applied with high hardness and oxidation resistance



- High hardness and oxidation-resistant coating
- High tough coating
- Fine cBN + High tough substrate

Application range



Recommended cutting condition

Cutting speed v_c (m/min)	90 ————— 150
Feed f_n (mm/rev)	0.05 ————— 0.3
Depth of cut per time a_p (mm)	0.05 ————— 0.3

Solid type coated cBN

DNC400 new

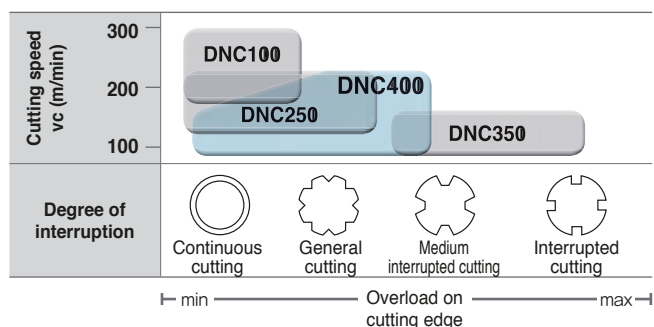
- Features**
- For machining heat-treated steel in continuous and medium interrupted cutting
 - Longer tool life due to coating layer
 - Solid type for universal purpose

Features of solid type cBN

- Increased productivity at high speed and high depth of cut
- Ideal for removing cemented layer and the welds
- Better welding stability due to 3-face blazing
- Excellent cutting performance at varying depth of cuts



Application range



Recommended cutting condition

Feed f_n (mm/rev)	DNC400	0.05 ————— 0.3
	DNC250	0.05 ————— 0.3
	DNC350	0.05 ————— 0.3
Depth of cut per time a_p (mm)	DNC400	0.05 ————— 0.5
	DNC250	0.05 ————— 0.3
	DNC350	0.05 ————— 0.3



A Others

Non-coated cBN

DB1000

- **Features**
 - Non-coated cBN with the highest wear resistance at high speed
 - Excellent tool life in continuous to light interrupted cutting
 - Improved fracture resistance along with high wear resistance
 - Higher thermal resistance and hardness due to pure TiCN ceramic binder



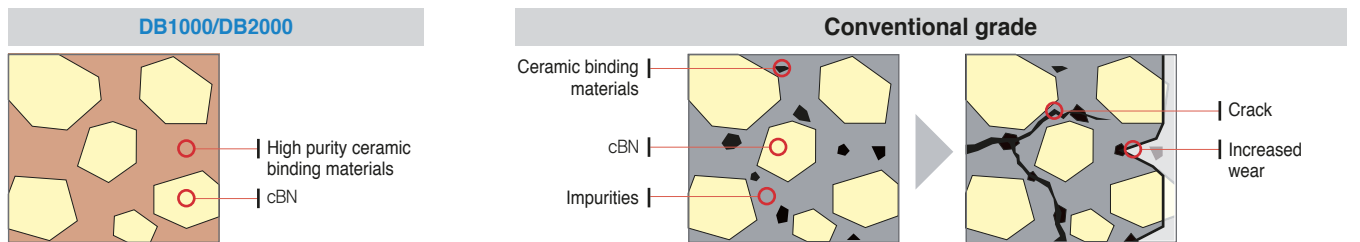
Non-coated cBN

DB2000

- **Features**
 - Universal grade for overall machining of heat-treated
 - Stable tool life in continuous to low/medium interrupted cutting
 - Both fracture resistance and wear resistance acquired with the use of pure ceramic binder
 - Stable surface roughness



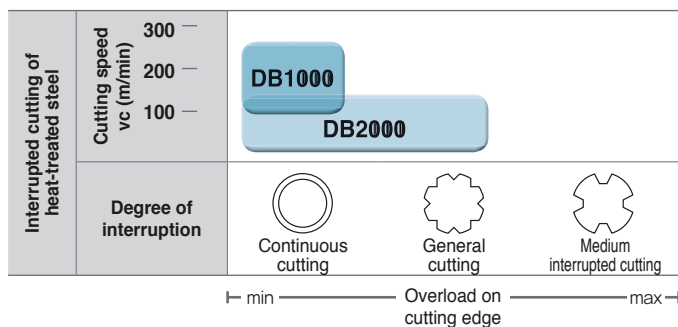
➤ New technology of high purity ceramic binding materials



DB2000 dramatically minimizes impurities with the use of high purity ceramic binding materials and enhances thermal resistance and toughness.

Impurities included in conventional grade's ceramic binder caused inferior thermal resistance and hardness of sintered compounds, which led to crack (fracture) and wear

➤ Application range



➤ Recommended cutting condition (DB1000)

Cutting speed v_c (m/min)	130 ————— 250
Feed f_n (mm/rev)	0.03 ————— 0.15
Depth of cut a_p (mm)	0.03 ————— 0.2

➤ Recommended cutting condition (DB2000)

Cutting speed v_c (m/min)	80 ————— 200
Feed f_n (mm/rev)	0.03 ————— 0.2
Depth of cut a_p (mm)	0.03 ————— 0.3



PCD inserts grades

Features

KORLOY PCD products are manufactured by using high quality PCD tips under ultra high temperatures and pressure. The PCD tip is welded on the qualified KORLOY carbide insert. KORLOY high quality PCD products meet a wide range of application needs in turning, milling, and endmills.

- Excellent tool life for aluminum alloy and copper alloy
- Excellent tool life for Ceramic, high-silicon aluminum and rock or stone
- Excellent tool life for rubber, carbon, graphite and wood

PCD grade

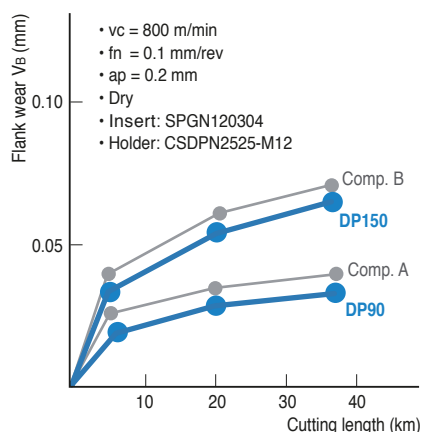
Grade	Features	Application	Grain size (μm)	Hardness (Hv)	TRS (kgf/mm ²)
DP90	Coarse diamond grain has been used to get excellent wear resistance enough to machine cemented-carbide, high Si aluminum alloy	Cemented carbide Ceramic roughing High Si aluminum alloy Rock, Stone	50	10,000 ~ 12,000	110
DP150	By use of fine diamond grain having good bonding property, it is suitable for machining of Non-ferrous metal, graphite	High Si aluminum alloy Copper, Bronze alloy Rubber, Wood, Carbon	5	10,000 ~ 12,000	200
DP200	By use of ultra fine diamond grain, it is possible to make sharp cutting edge. Thus it is appropriate grade to machine Non-ferrous material	Plastic Wood Precise finishing of aluminum	0.5	8,000 ~ 10,000	220

Recommended cutting condition

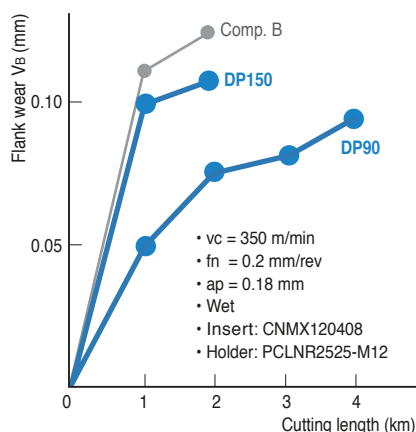
Workpiece	Cutting speed (m/min)	Feed (mm/rev)	Depth of cut (mm)	Recommended grade	
				1 st	2 nd
Aluminum alloy (4%~8%Si)	1000 ~ 3000	0.1 ~ 0.6	~ 3	DP150	DP200
Aluminum alloy (9%~14%Si)	600 ~ 2500	0.1 ~ 0.5	~ 3	DP150	DP200
Aluminum alloy (15%~18%Si)	300 ~ 700	0.1 ~ 0.4	~ 3	DP150	DP200
Copper, Bronze alloy	~ 1000	0.05 ~ 0.2	~ 3	DP150	DP200
Reinforced plastic	~ 1000	0.1 ~ 0.3	~ 2	DP150	DP200
Wood	~ 4000	0.1 ~ 0.4	-	DP150	DP200
Cemented carbide	10 ~ 30	~ 0.2	~ 0.5	DP90	DP150

Cutting performance

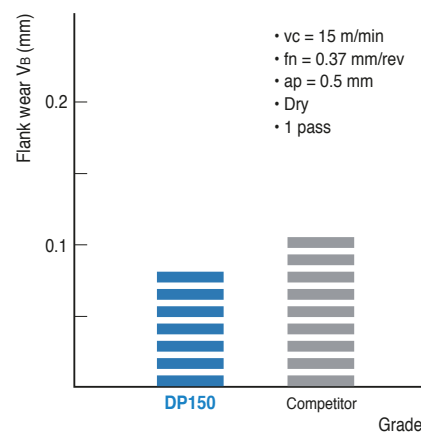
Continuous cutting test (Workpiece: Al-25%Si)



Interrupted cutting test (Workpiece: Al-20%Si)



Cutting test of cemented carbide





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 for all manufacturers' requirements.

B Turning Chip Breakers

Applications range of chip breakers

➤ Negative inserts

Workpiece P
Steel

Heavy	GH	VH	VT
Roughing	GR		
Medium cutting	VM	MP	HM
Medium to finishing	VC	LP	VQ
Finishing	VL	VB	VF

[Recommended]

Workpiece K
Cast iron

Roughing	VR	RK	MA
Medium cutting		MK	
Medium to finishing		MK	B25
Finishing		MP	

[Recommended]

Workpiece M
Stainless steel

Roughing	RM		
Medium cutting	MP	MM	
Medium to finishing		VP2	
Finishing			

[Recommended]

Workpiece N
Aluminum alloy

Roughing			
Medium cutting			
Medium to finishing		HA	
Finishing			

[Recommended]

Workpiece S
Heat resistant alloy

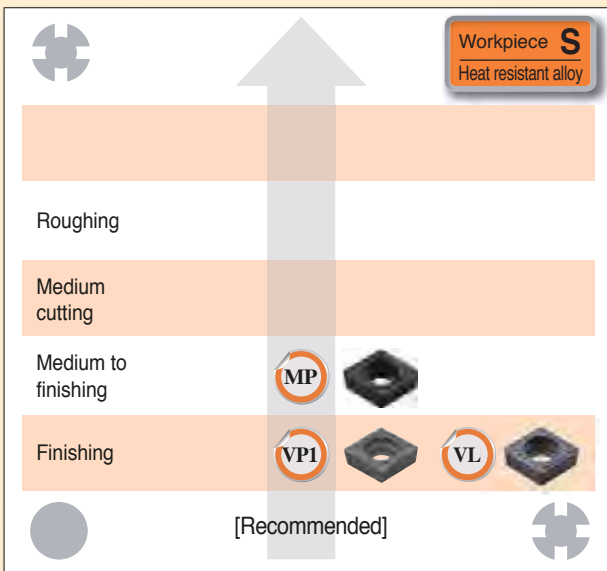
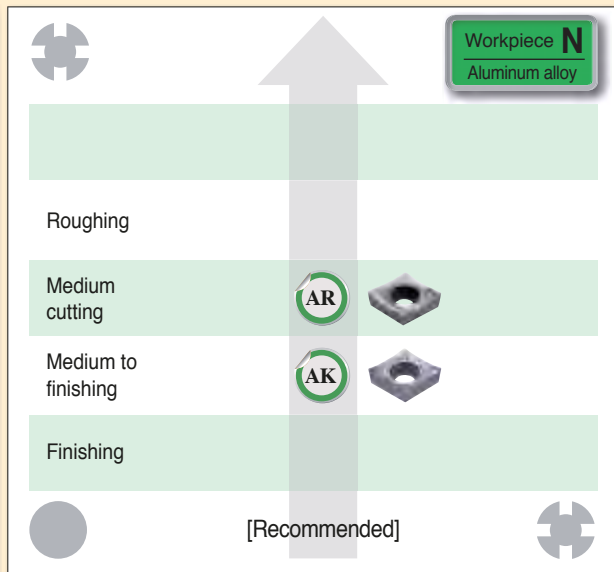
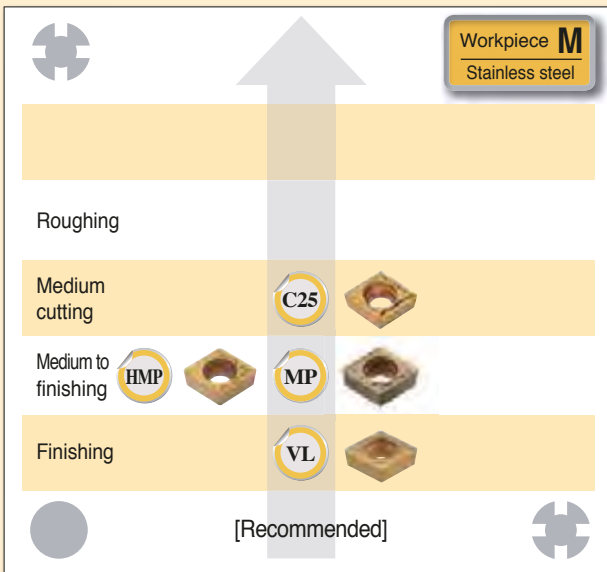
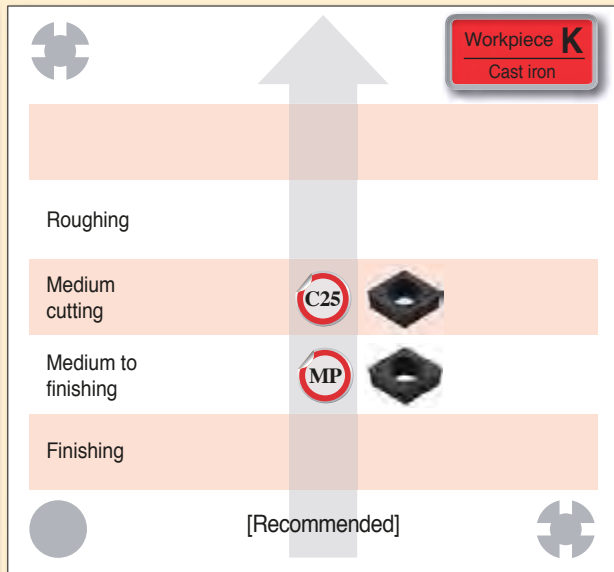
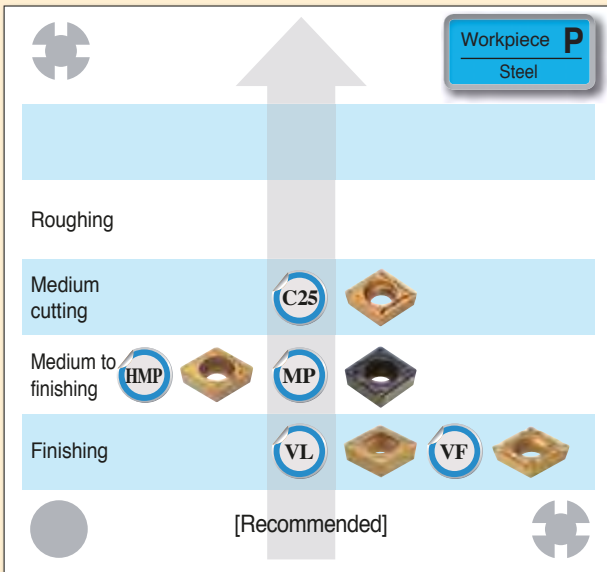
Roughing	VP4		
Medium cutting	VP3		
Medium to finishing	VP2		
Finishing	VP1		

[Recommended]



Applications range of chip breakers

Positive inserts



B Turning Chip Breakers

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. B29	DNMG p. B37	SNMG p. B46	TNMG p. B55	VNMG p. B60	WNMG p. B62
	0.5 ~ 1.0 ~ 2.0 Finishing	VB	0.15 ~ 0.20 ~ 0.40	NC3215 NC3225 CN1500 CN2500	340 250 240 210	CNMG p. B28	DNMG p. B36		TNMG p. B54		WNMG p. B62
	0.5 ~ 1.0 ~ 1.5 Finishing	VF	0.05 ~ 0.15 ~ 0.35	NC3215 NC3220 NC3225 NC5330	305 270 270 210	CNMG p. B28	DNMG p. B37	SNMG p. B46	TNMG p. B55	VNMG p. B60	WNMG p. B62
	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. B29	DNMG p. B38	SNMG p. B46	TNMG p. B55	VNMG p. B60	WNMG p. B63
	0.5 ~ 1.0 ~ 2.5 Medium to finishing	LP	0.10 ~ 0.25 ~ 0.40	NC3215 NC3225 NC5330	300 250 200	CNMG p. B29	DNMG p. B38	SNMG p. B46	TNMG p. B55	VNMG p. B60	WNMG p. B63
	0.5 ~ 1.3 ~ 3.5 Medium to finishing	VQ	0.12 ~ 0.28 ~ 0.42	NC3215 NC3225 NC5330	300 250 200	CNMG p. B30	DNMG p. B38	SNMG p. B47	TNMG p. B56	VNMG p. B61	WNMG p. B63
	0.5 ~ 1.5 ~ 4.5 Medium cutting	MP	0.15 ~ 0.30 ~ 0.45	NC3215 NC3225 NC5330	300 265 200	CNMG p. B31	DNMG p. B39	SNMG p. B48	TNMG p. B56	VNMG p. B61	WNMG p. B64
	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. B32	DNMG p. B40	SNMG p. B48	TNMG p. B57	VNMG p. B61	WNMG p. B64
	1.5 ~ 2.5 ~ 5.5 Medium cutting	HM	0.12 ~ 0.28 ~ 0.52	NC3215 NC3225 NC5330	300 265 200	CNMG p. B30	DNMG p. B39	SNMG p. B47	TNMG p. B56	VNMG p. B61	WNMG p. B63
	1.0 ~ 3.0 ~ 4.5 Roughing	GR	0.20 ~ 0.35 ~ 0.50	NC3125 NC3225 NC5330	180~370 150~330 130~280	CNMG p. B33	DNMG p. B41	SNMG p. B49	TNMG p. B58		WNMG p. B64
5.0 ~ 8.0 ~ 3.5 Heavy	GH		NC3125 NC3225 NC5330	180~370 150~330 130~280	CNMM p. B35		SNMM p. B51				
6.0 ~ 10.0 ~ 15.0 Heavy (General)	VH		NC3215 NC3030 NC500H NC5330	50~250 50~150 50~150 50~150	CNMM p. B35		SNMM p. B51				
7.0 ~ 12.0 ~ 17.0 Heavy (High feed cutting)	VT		NC3215 NC3030 NC500H NC5330	50~250 50~150 50~150 50~150	CNMM p. B35		SNMM p. B51				

• The first recommended cutting condition



Workpiece
P
Steel

Recommended chip breaker for workpiece

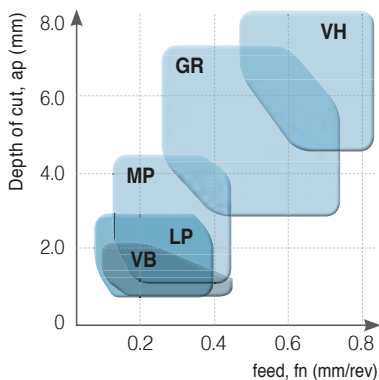
Materials: SM10C, SM15C, SM25C, SS400, SCr415, SCM415, etc. Soft steel

Hardness: under 180HB

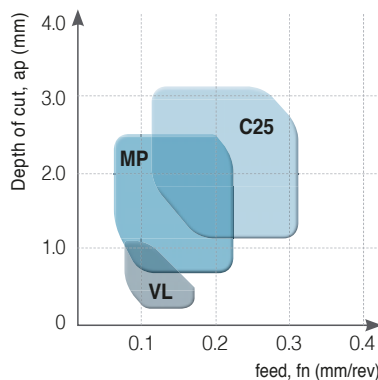
Depth of cut (mm)	C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	Insert shape					
						80°	55°	90°	60°	35°	80°
Positive	VL		0.05 ~ 0.10 ~0.20	NC3215 NC3220 NC3225 NC5330 CN1500 CN2500	305 270 270 210 260 240	CCMT p. B68	DCMT p. B73	SCMT p. B75	TCMT p. B79	VB(C)MT p. B85	
	VF		0.05 ~ 0.15 ~0.25	NC3215 NC3220 NC3225 NC5330 CC1500 CN1500 CN2500	305 270 270 210 260 250 230	CCMT p. B68	DCMT p. B72	SCMT p. B74	TC(P)MT p. B79	VB(C)MT p. B84	
	HMP		0.08 ~ 0.20 ~0.40	NC3215 NC3220 NC3225 NC5330 CN1500 CN2500	320 285 285 225 240 220	CCMT p. B69	DCMT p. B73	SCMT p. B75	TCMT p. B79	VB(C)MT p. B85	
	MP		0.10 ~ 0.20 ~0.35	NC3215 NC3225 CN1500 CN2500	300 250 240 200	CCMT p. B69	DCMT p. B73	SCMT p. B75	TC(P)MT p. B79	VB(C)MT p. B84	
	C25		0.10 ~ 0.25 ~0.35	NC3215 NC3220 NC3225 NC5330 CN1500 CN2500	320 285 285 225 230 210	CCMT p. B69	DCMT p. B73	SCMT p. B75	TCMT p. B80		

• The first recommended cutting condition

P Negative



P Positive



B Turning Chip Breakers

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	0.15 ~ 0.20 ~0.40	NC3215 NC3225 CN1500 CN2500	340 250 230 190	CNMG p. B28	DNMG p. B36		TNMG p. B54		WNMG p. B62
	0.5 ~ 1.0 ~1.5 Finishing	VF	0.05 ~ 0.15 ~0.35	NC3215 NC3225 NC5330	305 270 250	CNMG p. B28	DNMG p. B37	SNMG p. B46	TNMG p. B55	VNMG p. B60	WNMG p. B62
	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. B29	DNMG p. B38	SNMG p. B46	TNMG p. B55	VNMG p. B60	WNMG p. B63
	0.5 ~ 1.0 ~2.5 Medium to finishing	LP	0.10 ~ 0.25 ~0.40	NC3215 NC3225 NC5330	300 250 200	CNMG p. B29	DNMG p. B38	SNMG p. B46	TNMG p. B55	VNMG p. B60	WNMG p. B63
	0.5 ~ 1.5 ~4.5 Medium cutting	MP	0.15 ~ 0.30 ~0.45	NC3215 NC3225 NC5330	300 250 200	CNMG p. B31	DNMG p. B39	SNMG p. B48	TNMG p. B56	VNMG p. B61	WNMG p. B64
	1.0 ~ 2.5 ~5.0 Medium cutting	VM	0.10 ~ 0.25 ~0.50	NC3215 NC3220 NC3225 NC5330 CN1500 CN2500	260 245 245 205 210 170	CNMG p. B32	DNMG p. B40	SNMG p. B48	TNMG p. B57	VNMG p. B61	WNMG p. B64
	1.0 ~ 3.0 ~4.5 Roughing	GR	0.20 ~ 0.35 ~0.50	NC3125 NC3225 NC5330	180~370 150~330 130~280	CNMG p. B33	DNMG p. B41	SNMG p. B49	TNMG p. B58		WNMG p. B64
	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. B35		SNMM p. B51			
	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. B35		SNMM p. B51			
	Positive	0.1 ~ 0.5 ~1.0 Finishing	VL	0.05 ~ 0.10 ~0.20	NC3215 NC3220 NC3225 NC5330 CN1500 CN2500	345 310 310 240 250 210	CCMT p. B68	DCMT p. B73	SCMT p. B75	TCMT p. B79	VB(C)MT p. B85
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. B68	DCMT p. B72	SCMT p. B74	TC(P)MT p. B79	VCMT p. B84	
0.3 ~ 1.5 ~3.0 Medium to finishing		MP	0.05 ~ 0.15 ~0.35	NC3215 NC3225	300 250	CCMT p. B69	DCMT p. B73	SCMT p. B75	TC(P)MT p. B80	VB(C)MT p. B85	
1.0 ~ 2.0 ~3.0 Medium cutting		C25	0.10 ~ 0.15 ~0.35	NC3215 NC3220 NC3225 NC5330 CN1500 CN2500	320 285 285 225 230 200	CCMT p. B69	DCMT p. B73	SCMT p. B75	TCMT p. B80		

• The first recommended cutting condition


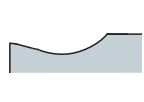


















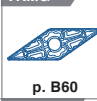


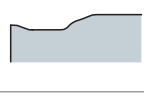




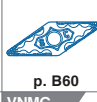


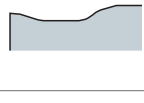







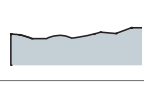




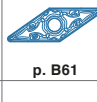


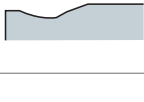

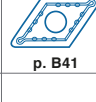
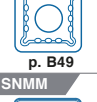
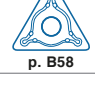







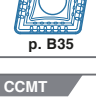
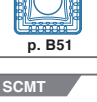






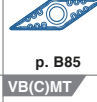

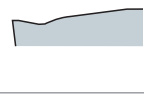





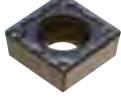





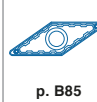








Workpiece
P
 Steel

Recommended chip breaker for workpiece

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			0.15 ~ 0.20 ~0.40	NC3215 200 NC3225 148 CN1500 220 CN2500 200	CNMG  p. B28	DNMG  p. B36		TNMG  p. B55		WNMG  p. B62
	0.5 ~ 1.0 ~1.5 Finishing			0.08 ~ 0.15 ~0.30	NC3215 180 NC3220 159 NC3225 159	CNMG  p. B28	DNMG  p. B37	SNMG  p. B46	TNMG  p. B55	VNMG  p. B60	WNMG  p. B62
	0.5 ~ 1.5 ~3.5 Medium to finishing			0.12 ~ 0.25 ~0.45	NC3215 168 NC3220 148 NC3225 150 NC5330 200	CNMG  p. B29	DNMG  p. B38	SNMG  p. B46	TNMG  p. B55	VNMG  p. B60	WNMG  p. B63
	0.5 ~ 1.0 ~2.5 Medium to finishing			0.10 ~ 0.25 ~0.40	NC3215 250 NC3225 200 NC5330 200	CNMG  p. B29	DNMG  p. B38	SNMG  p. B46	TNMG  p. B55	VNMG  p. B60	WNMG  p. B63
	0.5 ~ 1.5 ~4.5 Medium cutting			0.15 ~ 0.30 ~0.45	NC3215 250 NC3225 200 NC5330 200	CNMG  p. B31	DNMG  p. B39	SNMG  p. B48	TNMG  p. B56	VNMG  p. B61	WNMG  p. B64
	1.0 ~ 2.5 ~5.0 Medium cutting			0.15 ~ 0.25 ~0.50	NC3215 174 NC3220 153 NC3225 153 CN1500 120 CN2500 100	CNMG  p. B32	DNMG  p. B40	SNMG  p. B48	TNMG  p. B57	VNMG  p. B61	WNMG  p. B64
	1.0 ~ 3.0 ~4.5 Roughing			0.20 ~ 0.35 ~0.50	NC3125 180~370 NC3225 150~330 NC5330 130~280	CNMG  p. B33	DNMG  p. B41	SNMG  p. B49	TNMG  p. B58		WNMG  p. B64
	6.0 ~ 10.0 ~15.0 Heavy (General)			0.70 ~ 1.00 ~1.40	NC3215 50~250 NC3030 50~150 NC500H 50~150 NC5330 50~150	CNMM  p. B35		SNMM  p. B51			
	7.0 ~ 12.0 ~17.0 Heavy (High feed cutting)			0.75 ~ 1.20 ~1.60	NC3215 50~250 NC3030 50~150 NC500H 50~150 NC5330 50~150	CNMM  p. B35		SNMM  p. B51			
	Positive	0.1 ~ 0.5 ~1.0 Finishing			0.05 ~ 0.10 ~0.20	NC3215 305 NC3220 310 NC3225 310 NC5330 240 CN1500 210 CN2500 190	CCMT  p. B68	DCMT  p. B73	SCMT  p. B75	TCMT  p. B79	VB(C)MT  p. B85
0.1 ~ 0.5 ~1.5 Finishing				0.05 ~ 0.15 ~0.25	NC3215 330 NC3220 300 NC3225 300 NC5330 230 CC1500 260 CN1500 250 CN2500 240	CCMT  p. B68	DCMT  p. B72	SCMT  p. B74	TC(P)MT  p. B79	VB(C)MT  p. B84	
0.3 ~ 1.5 ~3.0 Medium to finishing				0.05 ~ 0.15 ~0.35	NC3215 305 NC3225 285 NC5300 225 CN1500 240 CN2500 220	CCMT  p. B69	DCMT  p. B73	SCMT  p. B75	TC(P)MT  p. B80	VB(C)MT  p. B85	
1.0 ~ 2.0 ~3.0 Medium cutting				0.10 ~ 0.15 ~0.35	NC3215 320 NC3220 285 NC3225 285 NC5330 225 CN1500 100 CN2500 80	CCMT  p. B69	DCMT  p. B73	SCMT  p. B75	TCMT  p. B80		

• The first recommended cutting condition

B Turning Chip Breakers

Recommended chip breaker for workpiece

Workpiece
M
Stainless steel

Materials: STS304, STS316, STS430, STS630

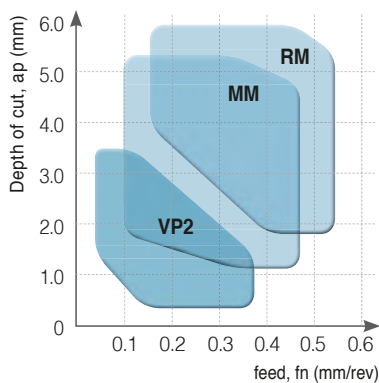
Ferrite, austenite, martensite, precipitation hardening stainless steels

Hardness: 135~300HB

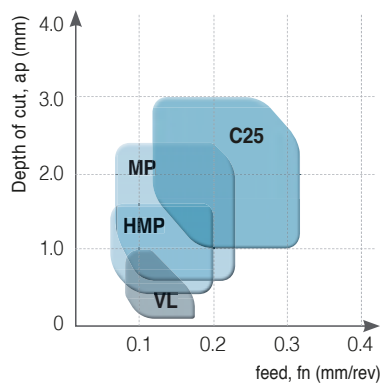
Depth of cut (mm)	C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	Insert shape					
						80°	55°	90°	60°	35°	80°
Negative	0.5 ~ 1.5 ~ 4.0 Medium to finishing	VP2	0.10 ~ 0.20 ~ 0.40	PC8105 185 PC8110 170 PC8115 160 PC5300 135 PC5400 120	185 170 160 135 120	CNMG p. B30	DNMG p. B38	SNMG p. B46	TNMG p. B55	WNMG p. B63	
	1.0 ~ 2.0 ~ 4.5 Medium cutting	MP	0.15 ~ 0.23 ~ 0.45	PC8105 175 PC8110 160 PC8115 150 PC5300 130 PC5400 110	175 160 150 130 110	CNMG p. B31	DNMG p. B39	SNMG p. B48	TNMG p. B56	VNMG p. B61 WNMG p. B64	
	0.5 ~ 3.0 ~ 5.5 Medium cutting	MM	0.12 ~ 0.25 ~ 0.45	NC9115 190 NC9125 170 NC9135 130 PC8115 160 PC5300 150	190 170 130 160 150	CNMG p. B31	DNMG p. B39	SNMG p. B47	TNMG p. B56	VNMG p. B61 WNMG p. B63	
	2.0 ~ 4.0 ~ 6.0 Roughing	RM	0.15 ~ 0.30 ~ 0.55	NC9115 190 NC9125 170 NC9135 130 PC8110 160 PC8115 150 PC5300 130	190 170 130 160 150 130	CNMG p. B33	DNMG p. B42	SNMG p. B50	TNMG p. B58	VNMG p. B61 WNMG p. B65	
Positive	0.1 ~ 0.5 ~ 1.0 Finishing	VL	0.05 ~ 0.10 ~ 0.20	PC8105 215 PC8110 195 PC8115 190 PC5300 165 PC5400 135 NC5330 165 NC9025 165	215 195 190 165 135 165 165	CCMT p. B68	DCMT p. B73	SCMT p. B75	TCMT p. B79	VB(C)MT p. B85	
	0.3 ~ 1.0 ~ 2.0 Medium to finishing	HMP	0.05 ~ 0.10 ~ 0.25	PC8105 190 PC8110 175 PC8115 170 PC5300 135 PC5400 120 NC5330 150 NC9025 150	190 175 170 135 120 150 150	CCMT p. B69	DCMT p. B73	SCMT p. B75	TCMT p. B79	VB(C)MT p. B85	
	0.3 ~ 1.5 ~ 3.0 Medium to finishing	MP	0.05 ~ 0.15 ~ 0.35	PC8105 190 PC8110 175 PC8115 170 PC5300 135 PC5400 120 NC5330 150 NC9025 150	190 175 170 135 120 150 150	CCMT p. B69	DCMT p. B73	SCMT p. B75	TC(P)MT p. B80	VB(C)MT p. B85	
	1.0 ~ 1.5 ~ 3.0 Medium cutting	C25	0.08 ~ 0.13 ~ 0.25	PC8110 170 PC9030 155	170 155	CCMT p. B69	DCMT p. B73	SCMT p. B75	TCMT p. B80		

• The first recommended cutting condition

M Negative



M Positive



Workpiece
K
Cast iron

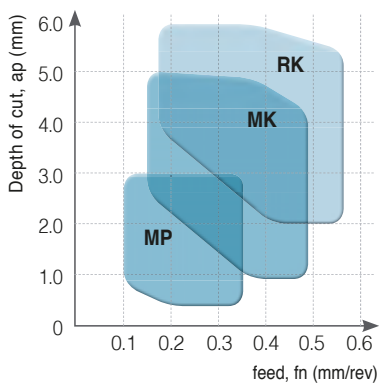
Recommended chip breaker for workpiece

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

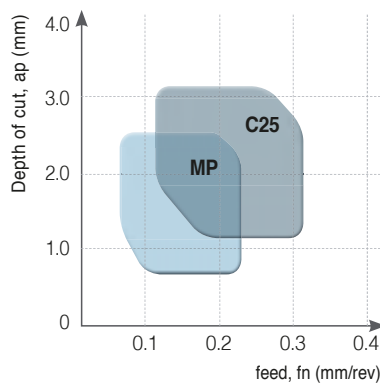
Depth of cut (mm)	C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	Insert shape					
						80°	55°	90°	60°	35°	80°
Negative	1.0 ~ 3.0 ~4.5 Roughing	VR	0.20 ~ 0.35 ~0.60	NC6310	220~420	CNMG p. B34	DNMG p. B42	SNMG p. B50	TNMG p. B58		WNMG p. B65
	1.5 ~ 3.0 ~6.0 Roughing	RK	0.20 ~ 0.30 ~0.60	NC6310	350~550	CNMG p. B33	DNMG p. B41	SNMG p. B49	TNMG p. B58		WNMG p. B65
	1.0 ~ 2.5 ~6.0 Roughing	C/B 無	0.15 ~ 0.30 ~0.60	DBNX10 DBN500 DBN700 NC6310 NC6315	150~200 200~500 500~2000 140~420 120~290	CNMA p. B28	DNMA p. B36	SNMA p. B45	TNMA p. B54		
	1.0 ~ 2.5 ~5.0 Medium to finishing	MK	0.10 ~ 0.25 ~0.50	NC6310	350~550	CNMG p. B30	DNMG p. B39	SNMG p. B47	TNMG p. B56	VNMG p. B61	WNMG p. B63
	0.5 ~ 2.0 ~3.5 Medium to finishing	B25	0.20 ~ 0.35 ~0.60	NC6310 NC6315	140~380 120~290	CNMG p. B32	DNMG p. B41	SNMG p. B49	TNMG p. B57		
	0.5 ~ 1.0 ~2.5 Finishing	MP	0.10 ~ 0.25 ~0.45	NC6310 NC6315	140~380 120~290	CNMG p. B31	DNMG p. B39	SNMG p. B48	TNMG p. B56	VNMG p. B61	WNMG p. B64
Positive	0.3 ~ 1.5 ~3.0 Medium to finishing	MP	0.10 ~ 0.20 ~0.35	NC6310	225~290	CCMT p. B69	DCMT p. B73	SCMT p. B75	TC(P)MT p. B80	VB(C)MT p. B85	
	1.0 ~ 2.0 ~3.5 Medium cutting	C25	0.10 ~ 0.25 ~0.40	NC6310 NC6315	285~340 200	CCMT p. B69	DCMT p. B73	SCMT p. B75	TCMT p. B80		

●: The first recommended cutting condition

K Negative



K Positive



B Turning Chip Breakers

Workpiece
N
Aluminum alloy

Recommended chip breaker for workpiece

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 to finishing	HA		0.10 ~ 0.20 ~ 0.50	H01	500	CNMG p. B29	DNMG p. B37	SNMG p. B46	TNMG p. B55	VNMG p. B60	WNMG p. B62
Positive	0.1 ~ 1.0 ~ 4.0 Medium to finishing	AK		0.03 ~ 0.20 ~ 0.40	H01 ND1000 PD1000	1000	CCGT p. B91	DCGT p. B92	SCGT p. B94	TCGT p. B93	VB(C)GT p. B95	RCGT p. B93
	0.5 ~ 1.5 ~ 4.0 Medium cutting	AR		0.05 ~ 0.30 ~ 0.50	H01 ND1000 PD1000	1000	CCGT p. B91	DCGT p. B92	SCGT p. B94	TCGT p. B95	VB(C)GT p. B96	RCGT p. B93

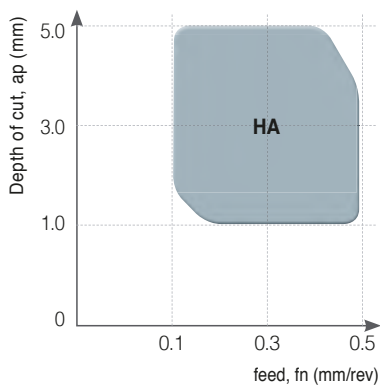
Materials: Copper Bronze alloy

Hardness: 20~110HB

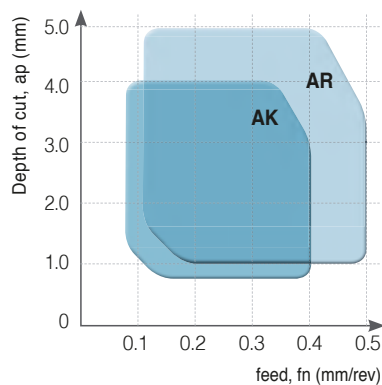
	Depth of cut (mm)	C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	Insert shape					
							80°	55°	90°	60°	35°	80°
Negative	0.5 ~ 2.0 ~ 4.0 Medium to finishing	HA		0.10 ~ 0.20 ~ 0.50	H01	1000	CNMG p. B29	DNMG p. B37	SNMG p. B46	TNMG p. B55	VNMG p. B60	WNMG p. B62
Positive	0.1 ~ 1.0 ~ 3.0 Medium to finishing	AK		0.03 ~ 0.20 ~ 0.30	H01	1000	CCGT p. B91	DCGT p. B92	SCGT p. B94	TCGT p. B95	VB(C)GT p. B96	RCGT p. B93
	0.5 ~ 1.5 ~ 3.0 Medium cutting	AR		0.05 ~ 0.25 ~ 0.40	H01	1000	CCGT p. B91	DCGT p. B92	SCGT p. B94	TCGT p. B95	VB(C)GT p. B96	RCGT p. B93

• The first recommended cutting condition

N Negative



N Positive



Workpiece
S
Heat resistant alloy

Recommended chip breaker for workpiece

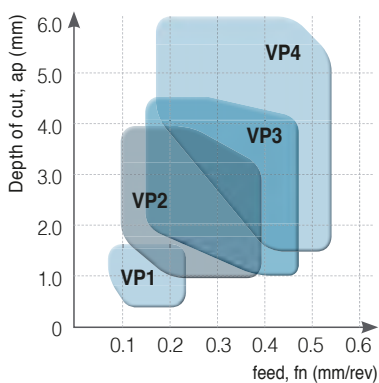
Materials: Inconel, Nimonic, Stellite, Ti alloy

Hardness: 160~350HB

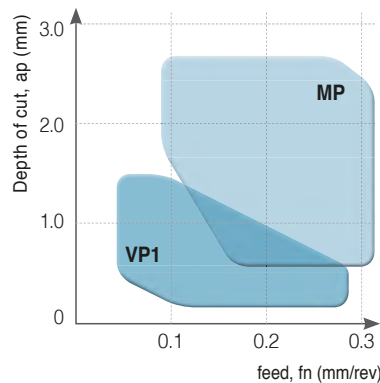
Depth of cut (mm)	C/B	Cutting edge	Feed (mm/rev)	Grades	Cutting Speed (m/min)	Insert shape					
						80°	55°	90°	60°	35°	80°
Negative 0.1 ~ 0.5 ~ 1.5 Finishing 0.5 ~ 1.5 ~ 4.0 Medium to finishing 0.05 ~ 2.0 ~ 3.0 Medium cutting 1.0 ~ 2.5 ~ 4.0 Roughing	VP1		0.05 ~ 0.10 ~ 0.20	PC8110 PC5300 NC5330	60 50 50	CNGG p. B28	DNGG p. B36				
	VP2		0.10 ~ 0.20 ~ 0.40	PC8110 PC5300	60 45	CNMG p. B30	DNMG p. B38	SNMG p. B46	TNMG p. B55		WNMG p. B63
	VP3		0.05 ~ 0.15 ~ 0.25	PC8110 PC5300	60 40	CNMG p. B32	DNMG p. B40	SNMG p. B48	TNMG p. B57	VNMG p. B61	WNMG p. B64
	VP4		0.15 ~ 0.20 ~ 0.35	PC8115	60 40	CNMG p. B34	DNMG p. B42	SNMG p. B50	TNMG p. B58		WNMG p. B65
Positive 0.1 ~ 0.5 ~ 1.5 Finishing 0.1 ~ 0.5 ~ 1.0 Finishing 0.5 ~ 1.0 ~ 3.0 Medium to finishing	VP1		0.05 ~ 0.10 ~ 0.20	PC8110 PC5300	60 45	CCGT p. B67	DCGT p. B72			VCGT p. B86	
	VL		0.05 ~ 0.10 ~ 0.20	PC8110 PC8115	60 50	CCMT p. B68	DCMT p. B73	SCMT p. B75	TCMT p. B79		VCMT p. B87
	MP		0.10 ~ 0.20 ~ 0.35	PC8110 PC8115	60 50	CCMT p. B69	DCMT p. B73	SCMT p. B75	TC(P)MT p. B80		VB(C)MT p. B85(B87)

●: The first recommended cutting condition

S Negative



S Positive



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

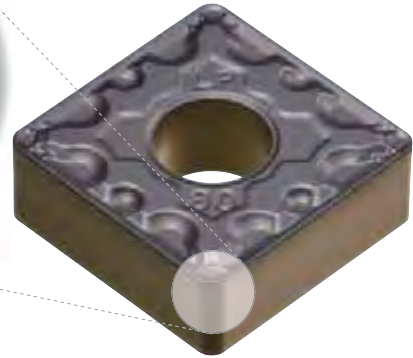
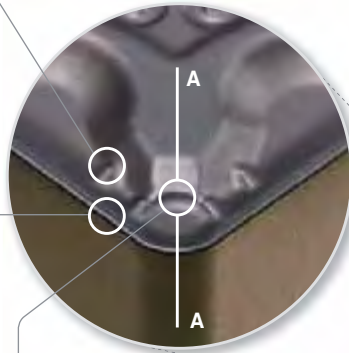
Features of LP chip breaker

▶ Front dot

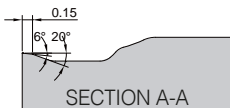
- Higher stability of chip curls at high feed
- Excellent chip control when copying
- Lower cutting force at low depth of cut and high feed

▶ Variable land

- Less crater wear
- Prevents chipping on minor cutting edge

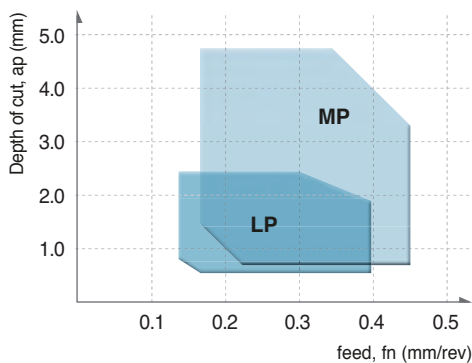


▶ Flat zone



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

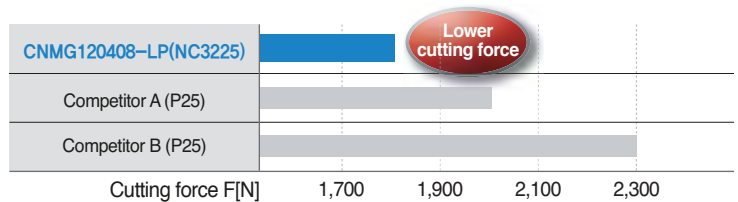
Application range



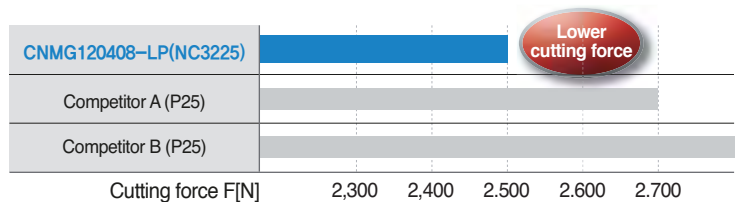
Performance evaluation (Evaluation of cutting force)

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

Medium feed (0.25 mm/rev)



High feed (0.40 mm/rev)



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

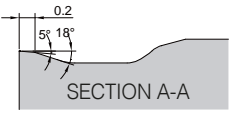
► **Front two step dot**

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

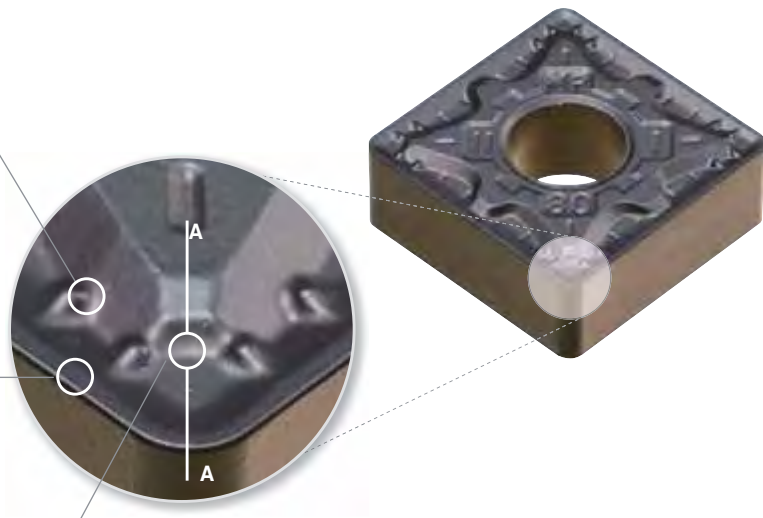
► **Variable land**

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

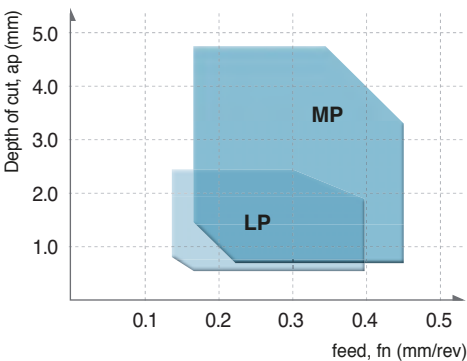
► **Flat zone**



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

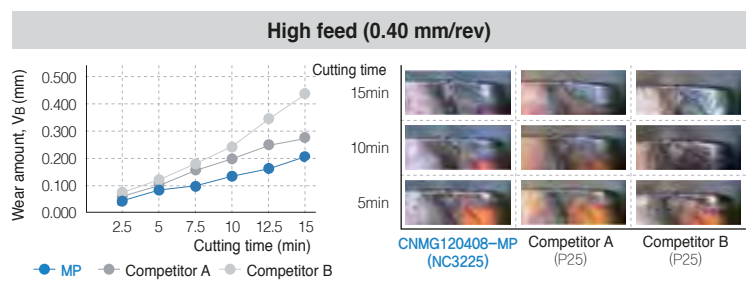
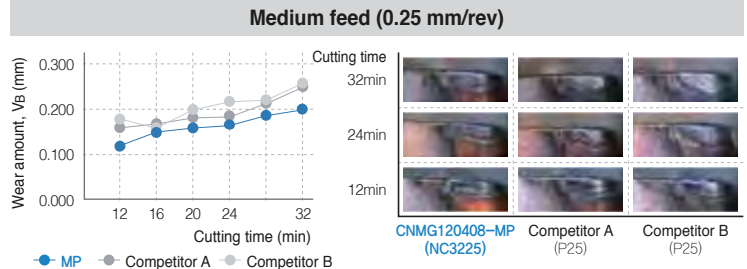


Application range



Performance evaluation

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



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

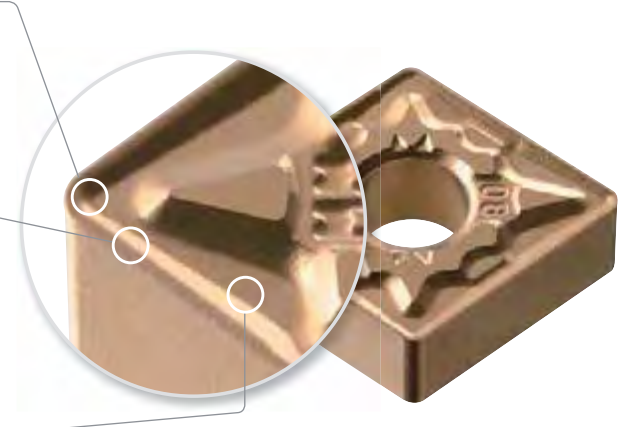
- Excellent chip control and sharp cutting at low depths of cut
- Delays crater wear
- Prevents plastic deformation

▶ 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

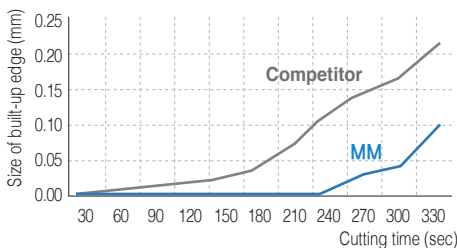
- **Workpiece** STS405 (Ferrite)
- **Cutting condition** vc (m/min) = 180, fn (mm/rev) = 0.3, ap (mm) = 3.0, wet
- **Tools** **Insert** : CNMG120408-MM (NC9125)
Holder : PCLNL2525-M12



MM(NC9125)



Competitor



Plastic deformation

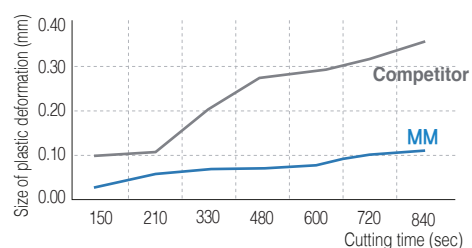
- **Workpiece** STS316 (Austenite)
- **Cutting condition** vc (m/min) = 200, fn (mm/rev) = 0.35, ap (mm) = 2.0, dry
- **Tools** **Insert** : CNMG120408-MM (NC9135)
Holder : PCLNL2525-M12



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

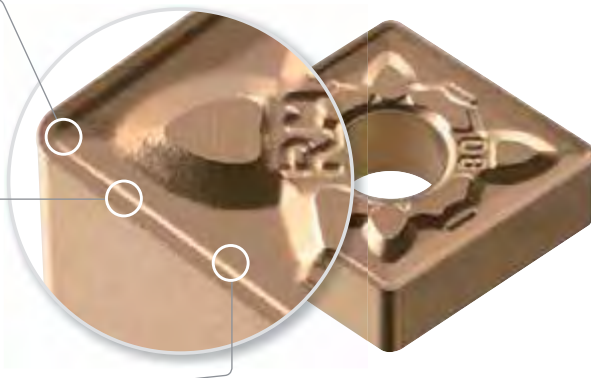
- Excellent chip control and sharp cutting at low depths of cut
- Delays crater wear
- Prevents plastic deformation

▶ 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

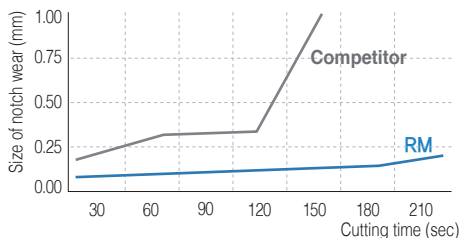
- **Workpiece** STS410 (Martensite)
- **Cutting condition** vc (m/min) = 150, fn (mm/rev) = 0.25, ap (mm) = 3.0, wet
- **Tools** **Insert** : CNMG120408-RM (NC9115)
Holder : PCLNL2525-M12



RM (NC9115)



Competitor



Burr

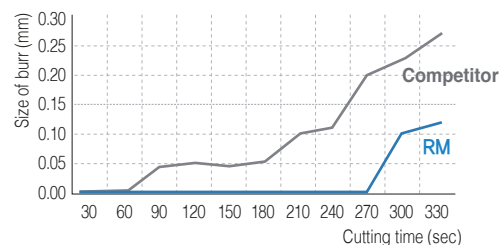
- **Workpiece** Duplex
- **Cutting condition** vc (m/min) = 120, fn (mm/rev) = 0.2, ap (mm) = 2.0, dry
- **Tools** **Insert** : CNMG120408-RM (NC9125)
Holder : PCLNL2525-M12



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 test

- **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



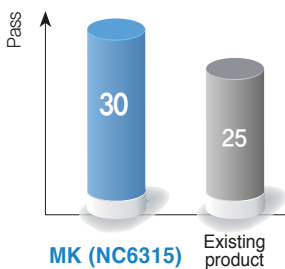
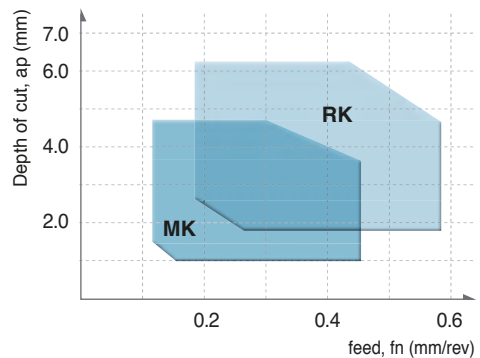
MK (NC6315)



Existing product

130% increased flank wear resistance

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

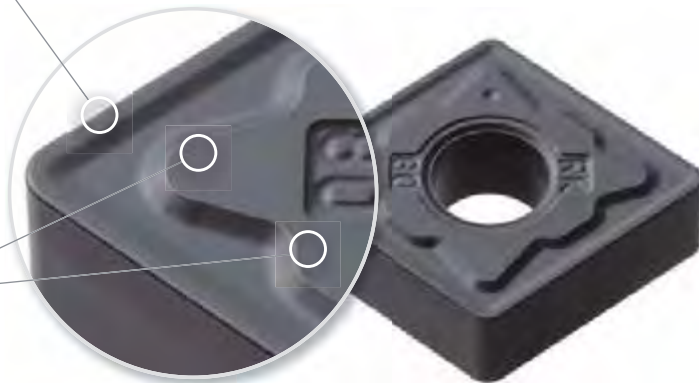
Flat land



- 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** 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

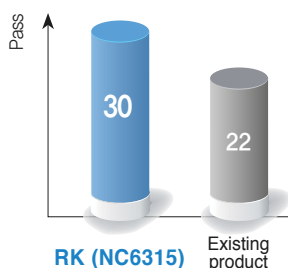


RK (NC6315)

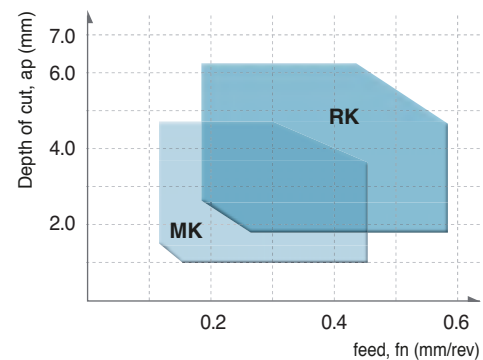


Existing product

125% increased
chipping
resistance



Recommended cutting 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: f_n (mm/rev) = 0.05~0.2, a_p (mm) = 0.1~1.5

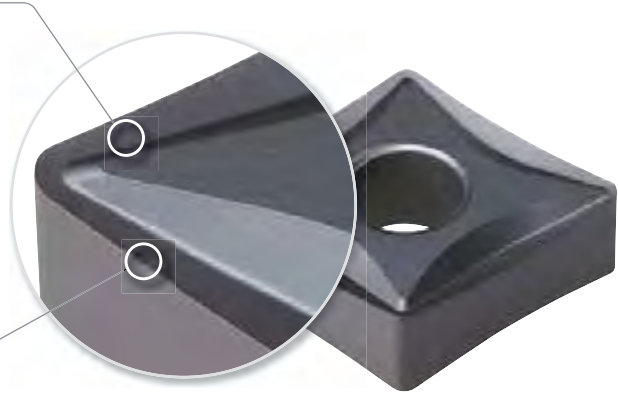
Optimized design for finishing



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

High-positive blade design

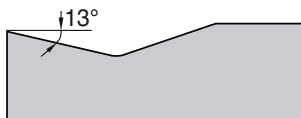
- Minimizes cutting heat by reducing the contact area between flank surface and chips
- Prevents built-up edge and extends tool life



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: f_n (mm/rev) = 0.1~0.4, a_p (mm) = 0.5~4.5

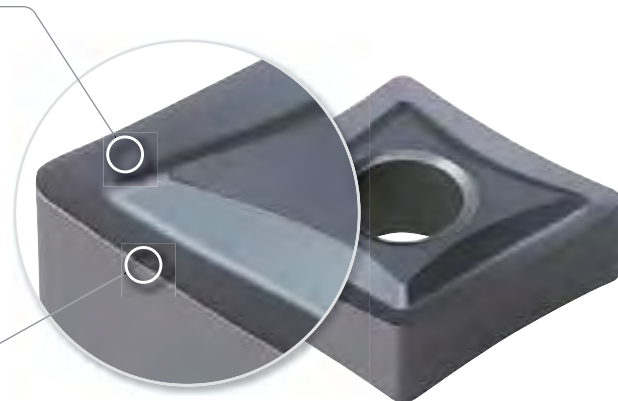
Sharp blades and wide chip pockets



- 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

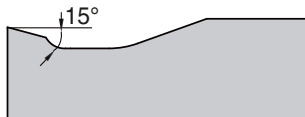


Features of Chip Breaker

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: f_n (mm/rev) = 0.1~0.45, a_p (mm) = 0.5~5.0

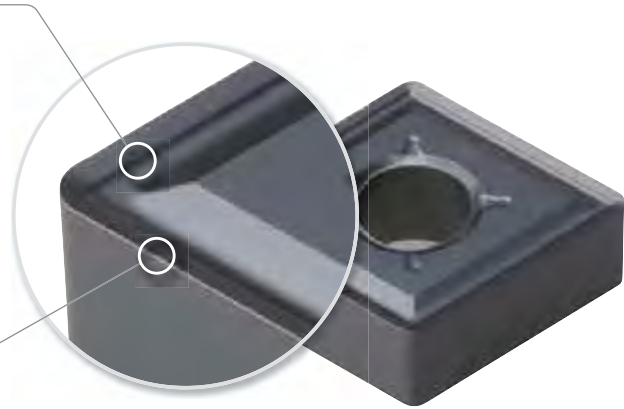
Chip pocket design leading to a R-shaped cutting edge



- 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

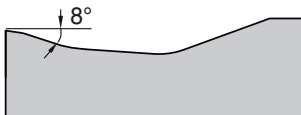
- Minimize heat concentration at high depth of cut
- Improves stability in interrupted machining of a tough workpiece



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

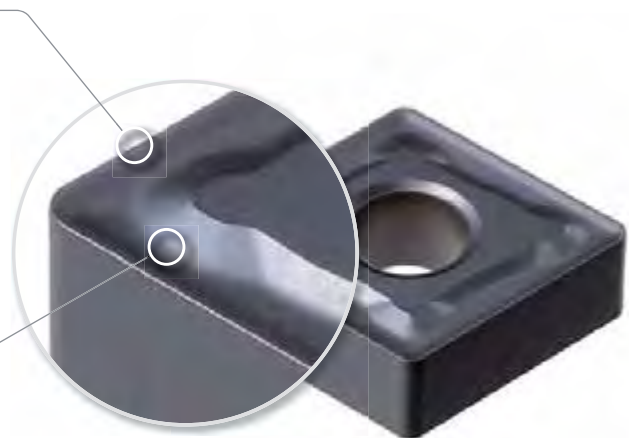
Rake angle design resistant to high hardness cutting



- 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]



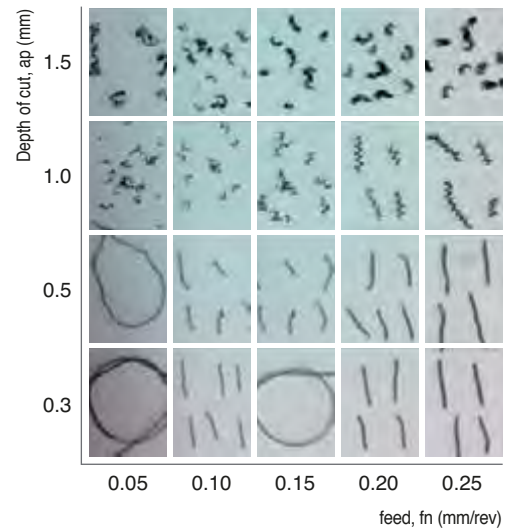
- The sharp flank surface and the chip breaker design significantly improve chip control when machining tough materials such as low carbon steel, pipe steel, and iron plates
- Sharp cutting edges reduce cutting resistance and provide excellent chip control at low depth of cuts, leading to stable machining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

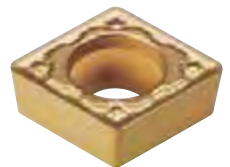
Chip control test

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



Single-sided MP Chip Breaker

[For medium to finishing]



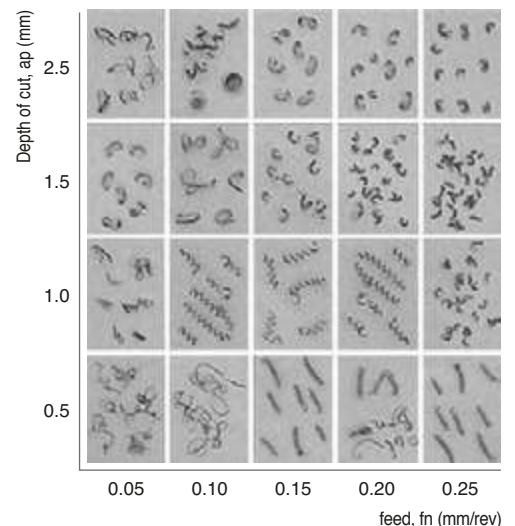
- For continuous cutting of forged steel at high feed
- Turning insert for internal machining of automobile components

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, $ap = 0.5\sim 2.5$ mm, $fn = 0.05\sim 0.25$ 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
- 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

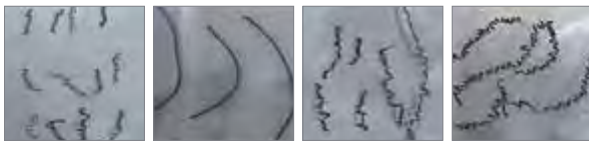


Features of VC chip breaker

- **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

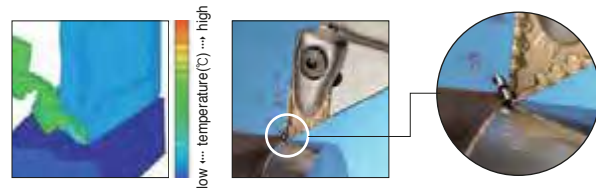
- **Workpiece** SM20C
- **Cutting conditions** $vc = 250$ m/min, $ap = 0.5$ mm
 $fn = 0.2$ mm/rev (Side), wet
- **Tools** DNMG150408-VL



VL
Chip Breakers

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

B Turning Chip Breakers

Features of Chip Breaker

VC Chip Breaker [For medium to finishing]

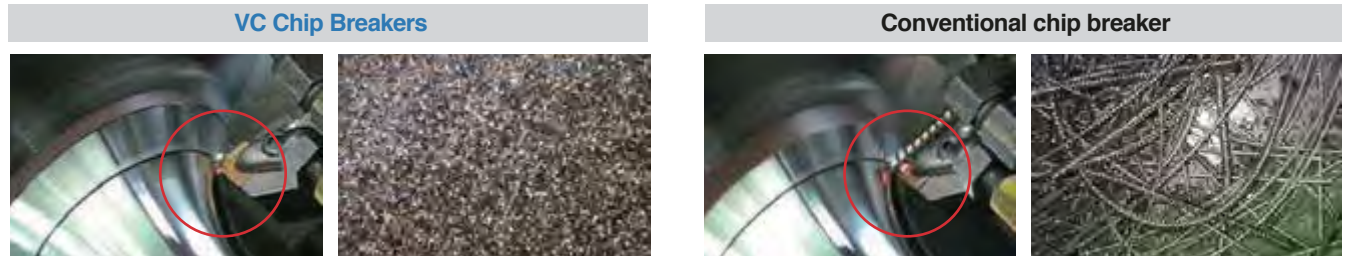


- Superior chip evacuation in high speed and continuous machining of various workpieces (carbon steel, alloy steel etc.)
- Korloy 3 dimensional chip breaker ensures longer tool life due to low cutting load and improved cutting edge strength
- Stable chip control in copying and internal machining

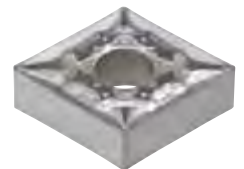
Features of VC chip breaker

- 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)



VQ Chip Breaker [For medium to finishing_For cermet]



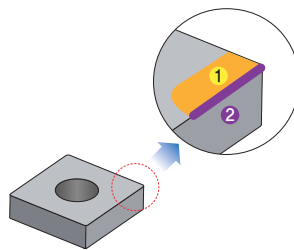
- Excellent cutting performance and reinforced cutting edges
- Improved chip control at low depth of cuts

Features of VQ chip breaker

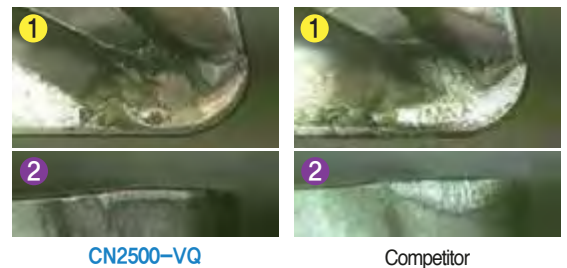
- | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • Three dimensional rake angle <ul style="list-style-type: none"> - Improved surface finish thanks to sharp cutting performance - Less cutting heat and longer tool life thanks to low cutting resistance | <ul style="list-style-type: none"> • Beveled protruding structure <ul style="list-style-type: none"> - Smooth chip flow at low depth of cuts - Wide application range |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Performance evaluation

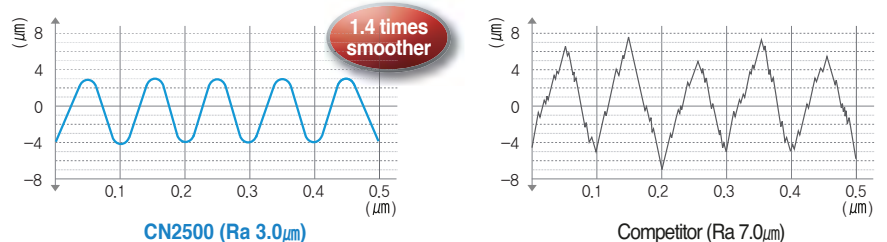
- **Workpiece** SCM440(Alloy steel), Ø100, External diameter turning
- **Cutting condition** vc = 280 m/min, ap = 1.5 mm, fn = 0.25 mm/rev
- **Tools** CNMG120408-VQ



Wear comparison



Surface roughness comparison



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

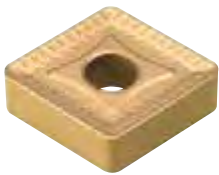
For good chip control in heavy machining (comprehensive type)



- 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

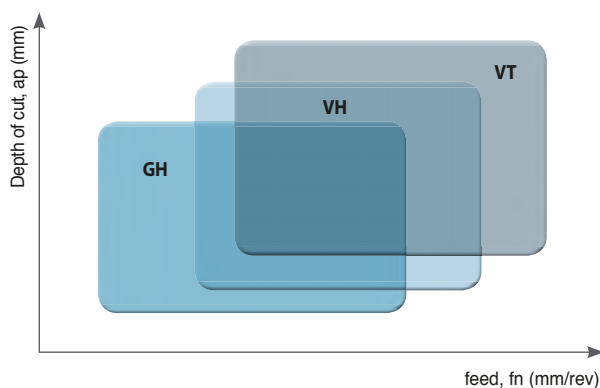
Features of VT chip breaker

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



GH : $ap(\text{mm}) = 5.0\sim 12.0$, $fn(\text{mm/rev}) = 0.55\sim 1.20$

VH : $ap(\text{mm}) = 6.0\sim 15.0$, $fn(\text{mm/rev}) = 0.70\sim 1.40$

VT : $ap(\text{mm}) = 7.0\sim 17.0$, $fn(\text{mm/rev}) = 0.75\sim 1.60$

B Turning 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

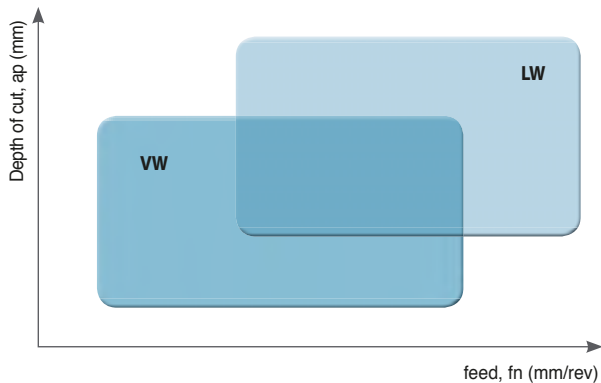
Features of VW chip breaker



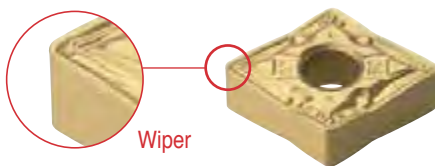
[Medium to finishing]

- **Excellent Finishing applications** - Excellent chip control
- **Insert design great for stable clamping** - 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

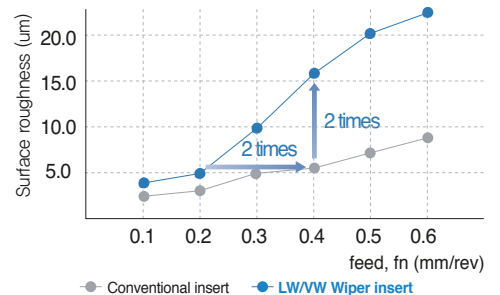
Applications range of Chip breakers



Wiper Insert



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

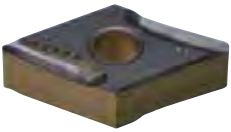


Features of Chip Breaker

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

➤ The features of chip breaker, SR



[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

➤ The features of chip breaker, SH



[For medium cutting]

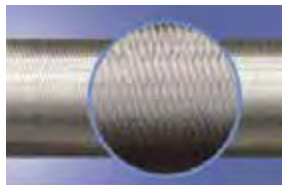
- Specialized for interrupted and medium cutting
- Efficient heat evacuation due to concave shaped back side of insert

Surface finish evaluation



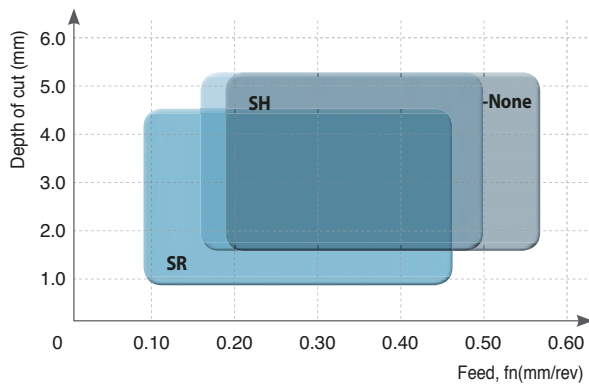
Chip breaker SR

Improved surface finish



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

B Turning Insert Code System (ISO)



1 Insert Shape

C N M G 12 04 08 - MP

C D E K L
R S T V W

2 Relief Angle

C N M G 12 04 08 - MP

B C D E
F N P O

3 Tolerance

C N M G 12 04 08 - MP

d : Inscribed circle
t : Thickness
m : Refer to figure

삽	d	m	t
A	±0.025	±0.005	±0.025
C	±0.025	±0.013	±0.025
H	±0.013	±0.013	±0.025
E	±0.025	±0.025	±0.025
G	±0.025	±0.025	±0.13
J*	±0.05 ~ ±0.15	±0.005	±0.025
K*	±0.05 ~ ±0.15	±0.013	±0.025
L*	±0.05 ~ ±0.15	±0.025	±0.025
M*	±0.05 ~ ±0.15	±0.08 ~ ±0.20	±0.13
N*	±0.05 ~ ±0.15	±0.08 ~ ±0.18	±0.025
U*	±0.08 ~ ±0.25	±0.13 ~ ±0.38	±0.13

(mm)

* Sides are based on unground insert

Tolerance on C, H, R, T, W Insert Shape (Exceptional case)

d	Tolerance on d		Tolerance on m	
	J, K, L, M, N	U	M, N	U
6.35	±0.05	±0.08	±0.08	±0.13
9.525	±0.05	±0.08	±0.08	±0.13
12.7	±0.08	±0.13	±0.13	±0.20
15.875	±0.10	±0.18	±0.15	±0.27
19.05	±0.10	±0.18	±0.15	±0.27
25.4	±0.13	±0.25	±0.18	±0.38

Tolerance on D Insert Shape (Exceptional case)

d	Tolerance on d		Tolerance on m	
6.35	±0.05		±0.11	
9.525	±0.05		±0.11	
12.7	±0.08		±0.15	
15.875	±0.10		±0.18	
19.05	±0.10		±0.18	

4 Cross Section Type

C N M G 12 04 08 - MP

A B C
F G H
J M N
Q R T
U W X



04

08

-

MP

6

7

8

Height of Cutting Edge

Nose "r"

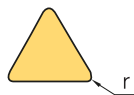
Chip Breaker for Turning

5 Cutting Edge Length, Diameter of Inscribed Circle
C N M G 12 04 08 - MP

Symbol							Inch	IC d(mm)
C	d	S	T	R	V	W		
03	04	03	06	03	-	02	1.2(5)	3.97
04	05	04	08	04	08	S3	1.5(6)	4.76
05	06	05	09	05	09	03	1.8(7)	5.56
-	-	-	-	06	-	-	-	6.00
06	07	06	11	06	11	04	2	6.35
08	09	07	13	07	13	05	2.5	7.94
-	-	-	-	08	-	-	-	8.00
09	11	09	16	09	16	06	3	9.525
-	-	-	-	10	-	-	-	10.00
11	13	11	19	11	19	07	3.5	11.11
-	-	-	-	12	-	-	-	12.00
12	15	12	22	12	22	08	4	12.70
14	17	14	24	14	24	09	4.5	14.29
16	19	15	27	15	27	10	5	15.875
-	-	-	-	16	-	-	-	16.00
17	21	17	30	17	30	11	5.5	17.46
19	23	19	33	19	33	13	6	19.05
-	-	-	-	20	-	-	-	20.00
22	27	22	38	22	38	15	7	22.225
-	-	-	-	25	-	-	-	25.00
25	31	25	44	25	44	17	8	25.40
32	38	31	54	31	54	21	10	31.75
-	-	-	-	32	-	-	-	32.00

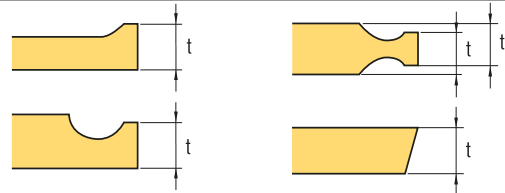
() Symbol for small size insert

7 Nose "r"
C N M G 12 04 08 - MP



Symbol		Nose "r"	
Metric	Inch	Metric	Inch
003	0.1	0.1	0.004
005	0.13	0.2	0.008
01	0.2	0.4	1/64
02	0.5	0.8	1/32
04	1	1.2	3/64
08	2	1.6	1/16
12	3	2.0	5/64
16	4	2.4	3/32
20	5	2.8	7/64
24	6	3.2	1/8
28	7	Round insert (Inch)	
32	8	Round insert (Metric)	
00	-		
M0	-		

6 Height of Cutting Edge
C N M G 12 04 08 - MP

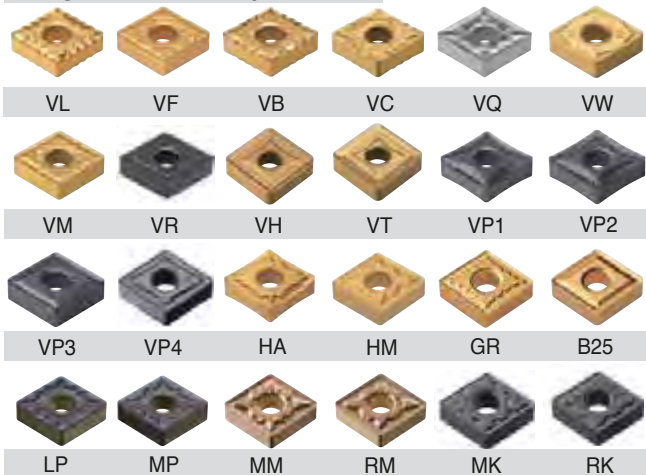


Symbol		Height of Cutting Edge (t)	
mm	Inch	mm	Inch
01	1(2)	1.59	1/16
T0	1.125	1.79	9/128
T1	1.2	1.98	5/64
02	1.5(3)	2.38	3/32
T2	1.75	2.78	7/64
03	2	3.18	1/8
T3	2.5	3.97	5/32
04	3	4.76	3/16
05	3.5	5.56	7/32
06	4	6.35	1/4
07	5	7.94	5/16
09	6	9.52	3/8
11	7	11.11	7/16
12	8	12.70	1/2

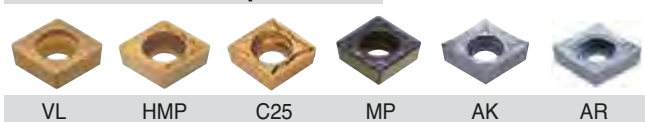
() Symbol for small size insert

8 Chip Breaker for Turning
C N M G 12 04 08 - MP

Negative Insert Chip Breaker



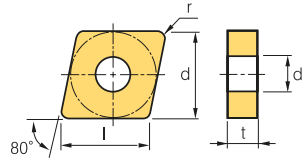
Positive Insert Chip Breaker



B Turning Insert (Negative)

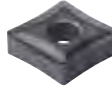
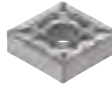


CN○○○

 Rhombic **80° Negative**



Dimensions (mm)			
Size	d	t	d ₁
09	9.525	3.18	3.81
12	12.7	4.76	5.16
16	15.875	6.35	6.35
19	19.05	6.35	7.93

Workpiece	Material Compatibility													Machining types					
	Steel	Stainless steel	Cast iron	Non-ferrous metal	Heat resistant alloy, Titanium alloy	Hardened steel	P	M	K	N	S	H	●	●	●	●	●	●	●
Steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Stainless steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Cast iron	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Non-ferrous metal	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Heat resistant alloy, Titanium alloy	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Hardened steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Inserts	Designation	Cermets		Coated		Coated										Uncoated		Cutting Condition									
		CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6310	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	f _n (mm/rev)	a _p (mm)	
Medium to finishing 	CNMG 120404-VP2							●									●	●	●	●	●	●	●	●	0.05-0.30	0.10-3.00	
	CNMG 120408-VP2																●	●	●	●	●	●	●	●	0.10-0.40	0.50-4.50	
	CNMG 160618-VP2																								0.12-0.45	0.80-5.00	
	CNMG 190608-VP2																								0.12-0.50	1.00-5.20	
	CNMG 190612-VP2																									0.15-0.50	1.20-5.50
	CNMG 190616-VP2																									0.18-0.50	1.50-5.50
Medium to finishing  [Cermets]	CNMG 090304-VQ																								0.05-0.30	0.50-3.50	
	CNMG 090308-VQ																									0.08-0.30	0.80-4.00
	CNMG 090408-VQ									●																0.05-0.30	0.50-3.50
	CNMG 090412-VQ									●																0.08-0.30	0.80-4.00
	CNMG 120404-VQ	●	●	●	●	●																				0.05-0.30	0.80-4.00
	CNMG 120408-VQ	●	●	●	●	●																				0.08-0.40	0.80-4.00
	CNMG 120412-VQ																									0.10-0.40	0.80-4.00
Medium cutting 	CNMG 090304-HM									●															0.12-0.40	0.50-3.80	
	CNMG 120404-HM							●	●	●												●			0.05-0.30	0.90-5.00	
	CNMG 120408-HM							●	●	●						●						●			0.10-0.50	1.00-5.00	
	CNMG 120412-HM							●															●			0.18-0.50	1.00-5.00
	CNMG 190612-HM																									0.13-0.60	1.30-7.00
Medium cutting 	CNMG 120404-MK											●	●												0.05-0.30	0.90-4.00	
	CNMG 120408-MK											●	●												0.10-0.50	1.00-5.00	
	CNMG 120412-MK											●	●												0.13-0.60	1.30-5.00	
	CNMG 120416-MK												●	●											0.15-0.60	1.30-5.00	
	CNMG 160608-MK																								0.28-0.70	1.80-7.00	
	CNMG 160612-MK																								0.28-0.72	2.00-8.00	
	CNMG 160616-MK																								0.28-0.74	2.00-8.00	
	CNMG 190608-MK																								0.33-0.78	2.50-9.00	
	CNMG 190612-MK																								0.35-0.78	2.60-9.50	
CNMG 190616-MK																								0.35-0.80	2.60-10.00		

 Cutting edge geometry **A52~A61**
 Recommended chip breaker **B04~B11**
 Code system **B26~B27**
● : Stock item

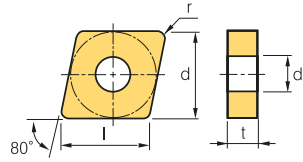
Available tool holders			
Designation	Page	Designation	Page
MCKNR/L	B171	MCRNR/L	B172
MCLNR/L	B171	PCBNR/L	B159
MCMNN	B171	PCLNR/L	B160



B Turning Insert (Negative)





CN○○○

 Rhombic **80° Negative**



Dimensions (mm)			
Size	d	t	d ₁
09	9.525	3.18	3.81
12	12.7	4.76	5.16
16	15.875	6.35	6.35
19	19.05	6.35	7.93
25	25.4	9.52	9.12

Workpiece	Material													Machining types			
	Steel	Stainless steel	Cast iron	Non-ferrous metal	Heat resistant alloy, Titanium alloy	Hardened steel	P	M	K	N	S	H	●	●	●	●	●
Steel							●	●	●	●	●	●	●	●	●	●	●
Stainless steel		●					●	●	●	●	●	●	●	●	●	●	●
Cast iron			●				●	●	●	●	●	●	●	●	●	●	●
Non-ferrous metal				●			●	●	●	●	●	●	●	●	●	●	●
Heat resistant alloy, Titanium alloy					●		●	●	●	●	●	●	●	●	●	●	●
Hardened steel						●	●	●	●	●	●	●	●	●	●	●	●

Inserts	Designation	Cermet		Coated		Coated										Uncoated		Cutting Condition											
		CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6310	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	f _n (mm/rev)	a _p (mm)			
Medium cutting 	CNMG 090304-VM																									0.05~0.30	0.90~3.50		
	CNMG 090308-VM						●		●																		0.10~0.45	1.00~3.50	
	CNMG 120404-VM	●	●	●			●		●	●						●	●						●				0.05~0.30	0.90~5.00	
	CNMG 120408-VM	●	●	●			●	●	●	●						●	●			●			●				0.10~0.50	1.00~5.00	
	CNMG 120412-VM						●		●	●						●	●			●							0.13~0.60	1.30~5.00	
	CNMG 120416-VM										●																0.20~0.60	1.50~5.50	
	CNMG 160608-VM										●																0.10~0.50	1.00~6.70	
	CNMG 160612-VM																											0.13~0.60	1.30~6.70
	CNMG 190608-VM										●																	0.13~0.65	1.30~7.00
	CNMG 190612-VM											●																0.15~0.70	1.50~7.00
CNMG 190616-VM																											0.18~0.75	1.80~7.00	
Medium cutting 	CNMG 120404-VP3																●	●	●	●	●		●	●		0.05~0.30	0.10~3.00		
	CNMG 120408-VP3																●	●	●	●	●		●	●			0.10~0.40	0.50~4.50	
	CNMG 120412-VP3																●	●	●	●	●		●	●			0.12~0.50	0.50~5.00	
	CNMG 120416-VP3																											0.25~0.45	1.00~4.00
	CNMG 160608-VP3																											0.15~0.35	0.80~6.00
	CNMG 160612-VP3																											0.20~0.40	1.00~6.00
	CNMG 160616-VP3																											0.20~0.40	1.00~6.00
	CNMG 190608-VP3																											0.20~0.50	1.00~7.00
	CNMG 190612-VP3																											0.25~0.55	1.00~8.00
	CNMG 190616-VP3																											0.30~0.60	1.00~8.00
Medium cutting 	CNMG 120408-LW						●	●	●																		0.15~0.60	1.00~5.00	
	CNMG 120412-LW						●	●																				0.20~0.70	1.00~6.00
General 	CNMG 120404-B25	●	●	●			●	●	●	●						●											0.17~0.45	1.00~5.00	
	CNMG 120408-B25	●	●	●			●	●	●	●						●	●			●			●				0.23~0.60	1.50~5.00	
	CNMG 120412-B25			●			●	●	●	●																		0.25~0.60	2.00~5.00
	CNMG 160608-B25						●	●	●	●																		0.25~0.60	2.00~6.50
	CNMG 160612-B25						●	●	●																			0.27~0.60	2.00~6.50
	CNMG 160616-B25						●	●	●																			0.27~0.60	2.00~6.50
	CNMG 190604-B25									●	●																	0.20~0.45	3.00~8.00
	CNMG 190608-B25						●	●	●	●	●																	0.25~0.60	3.00~8.00
	CNMG 190612-B25						●	●	●	●	●						●	●			●							0.30~0.60	3.00~8.00
	CNMG 190616-B25						●	●																				0.23~0.70	3.00~8.00

 Cutting edge geometry A52~A61
  Recommended chip breaker B04~B11
  Code system B26~B27
 ● : Stock item

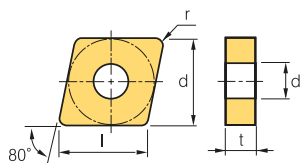
Available tool holders			
Designation	Page	Designation	Page
MCKNR/L	B171	MCRNR/L	B172
MCLNR/L	B171	PCBNR/L	B159
MCMNN	B171	PCLNR/L	B160



B Turning Insert (Negative)


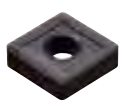


CN○○○

 Rhombic **80° Negative**



Dimensions (mm)			
Size	d	t	d ₁
12	12.7	4.76	5.16
16	15.875	4.76~6.35	6.35
19	19.05	6.35	7.93

Workpiece	Machining types												
	P	M	K	N	S	H							
Steel	●	●	●	●	●	●	●	●	●	●	●	●	●
Stainless steel	●	●	●	●	●	●	●	●	●	●	●	●	●
Cast iron	●	●	●	●	●	●	●	●	●	●	●	●	●
Non-ferrous metal	●	●	●	●	●	●	●	●	●	●	●	●	●
Heat resistant alloy, Titanium alloy	●	●	●	●	●	●	●	●	●	●	●	●	●
Hardened steel	●	●	●	●	●	●	●	●	●	●	●	●	●

Inserts	Designation	Cermets		Coated		Coated										Uncoated		Cutting Condition									
		CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6310	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	f _n (mm/rev)	a _p (mm)	
Roughing 	CNMG 120408-VP4																								0.15~0.35	1.00~4.00	
	120412-VP4																									0.20~0.40	1.00~4.00
	160608-VP4																									0.20~0.45	1.00~6.50
	160612-VP4																									0.25~0.50	1.50~6.50
	190608-VP4																									0.15~0.45	1.00~8.00
	190612-VP4																									0.20~0.50	1.20~8.50
Roughing 	CNMG 120404-VR																								0.20~0.50	1.00~6.50	
	120408-VR																									0.25~0.55	1.20~7.00
	120412-VR																									0.30~0.60	1.50~7.00
	120416-VR																									0.35~0.65	1.70~7.00
	120508-VR																									0.25~0.55	1.20~7.00
	120512-VR																									0.30~0.60	1.50~7.00
	160612-VR																									0.35~0.70	2.00~8.00
	160616-VR																									0.35~0.75	2.20~8.00
190612-VR							●	●																	0.35~0.70	2.00~10.00	
190616-VR							●	●																	0.35~0.75	2.20~10.00	
Medium to finishing 	CNMM 120408-HA																								0.10~0.40	0.80~3.50	
Roughing 	CNMM 120408-GR																								0.20~0.50	1.00~7.00	
	120412-GR																									0.25~0.50	1.30~7.00
	190612-GR								●																	0.30~0.75	1.70~10.00
	190616-GR																									0.30~0.80	1.80~10.00

 Cutting edge geometry **A52~A61**
 Recommended chip breaker **B04~B11**
 Code system **B26~B27**
● : Stock item

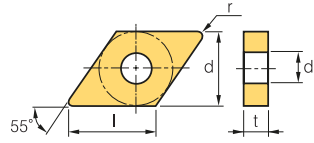
Available tool holders			
Designation	Page	Designation	Page
MCKNR/L	B171	MCRNR/L	B172
MCLNR/L	B171	PCBNR/L	B159
MCMNN	B171	PCLNR/L	B160



B Turning Insert (Negative)

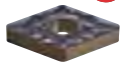



DN ○ ○



 Rhombic 55° Negative



Dimensions (mm)			
Size	d	t	d ₁
11	9.525	4.76	3.81
15	12.7	4.76~6.35	5.16

Workpiece	Machining types															
	P	M	K	N	S	H										
Steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Stainless steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Cast iron	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Non-ferrous metal	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Heat resistant alloy, Titanium alloy	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Hardened steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Inserts	Designation	Cermet		Coated		Coated													Uncoated		Cutting Condition							
		CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6310	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	f _n (mm/rev)	a _p (mm)		
Medium to finishing 	DNMG 110402-LP																									0.06~0.30	0.25~1.20	
	110404-LP						●	●																			0.07~0.30	0.30~1.50
	110408-LP																										0.10~0.40	0.30~1.50
	110504-LP																										0.07~0.30	0.30~1.50
	110508-LP																										0.10~0.40	0.30~1.50
	150404-LP						●	●	●																		0.10~0.35	0.30~2.00
	150408-LP						●	●	●																		0.10~0.40	0.50~2.50
	150412-LP						●	●	●																		0.13~0.45	0.80~3.00
	150604-LP						●	●	●																		0.10~0.35	0.30~2.00
	150608-LP						●	●	●																		0.10~0.40	0.50~2.50
150612-LP						●	●	●																		0.13~0.45	0.80~3.00	
Medium to finishing 	DNMG 150404-VC					●	●																			0.10~0.35	0.30~2.00	
	150408-VC					●	●	●																			0.15~0.40	0.50~3.00
	150412-VC					●	●	●																			0.15~0.45	0.50~3.00
	150604-VC					●	●	●																			0.10~0.35	0.30~2.00
	150608-VC					●	●	●																			0.15~0.40	0.50~3.00
150612-VC					●	●	●																			0.15~0.45	0.50~3.00	
Medium to finishing 	DNMG 150404-VP2															●	●	●	●	●	●	●	●	●	●	0.05~0.30	0.10~3.00	
	150408-VP2															●	●	●	●	●	●	●	●	●	●	0.10~0.40	0.50~4.50	
	150604-VP2															●	●	●	●	●	●	●	●	●	●	0.05~0.30	0.10~3.00	
	150608-VP2								●							●	●	●	●	●	●	●	●	●	●	0.10~0.40	0.50~4.50	
Medium to finishing  [Cermet]	DNMG 110404-VQ	●		●																						0.05~0.30	0.50~3.50	
	110408-VQ																									0.08~0.40	0.80~4.00	
	110412-VQ																									0.10~0.40	1.00~4.00	
	150404-VQ	●	●	●	●	●																				0.05~0.30	0.80~3.50	
	150408-VQ	●		●	●	●																				0.08~0.40	0.80~4.00	
	150412-VQ																									0.10~0.40	0.50~4.20	
	150604-VQ	●	●	●	●	●																				0.05~0.30	0.80~4.00	
	150608-VQ	●	●	●	●	●																				0.08~0.40	0.80~4.00	
150612-VQ																									0.10~0.40	0.50~4.20		

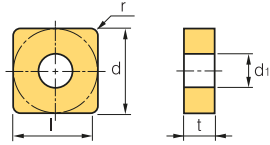
 Cutting edge geometry A52~A61
  Recommended chip breaker B04~B11
  Code system B26~B27
 ● : Stock item

Available tool holders			
Designation	Page	Designation	Page
MCKNR/L	B171	MCRNR/L	B172
MCLNR/L	B171	PCBNR/L	B159
MCMNN	B171	PCLNR/L	B160



B Turning Insert (Negative)

SN ○ ○



Dimensions (mm)			
Size	d	t	d ₁
09	9.525	3.18	3.81
12	12.7	4.76	5.16
15	15.875	6.35	6.35
19	19.05	6.35	7.93

□ Square 90° Negative

Workpiece	Material		Machining types																	
	Symbol	Color	●	⊙	⊛	●	⊙	⊛	●	⊙	⊛	●	⊙	⊛	●	⊙	⊛	●	⊙	⊛
Steel	P	Blue	●	⊙	⊛	●	⊙	⊛	●	⊙	⊛	●	⊙	⊛	●	⊙	⊛	●	⊙	⊛
Stainless steel	M	Yellow	●	⊙	⊛	●	⊙	⊛	●	⊙	⊛	●	⊙	⊛	●	⊙	⊛	●	⊙	⊛
Cast iron	K	Red	●	⊙	⊛	●	⊙	⊛	●	⊙	⊛	●	⊙	⊛	●	⊙	⊛	●	⊙	⊛
Non-ferrous metal	N	Green																		
Heat resistant alloy, Titanium alloy	S	Orange																		
Hardened steel	H	Grey																		

● Continuous cutting
 ⊙ General cutting
 ⊛ Interrupted cutting

Inserts	Designation	Cermet		Coated		Coated										Uncoated		Cutting Condition											
		CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6310	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)			
Roughing		SNGA 090304																								0.17-0.50	0.50-4.50		
		090308																									0.17-0.50	0.50-4.50	
		120404																									0.15-0.60	1.50-8.00	
		120408																									0.15-0.60	1.50-8.00	
		120412																									0.20-0.80	1.50-8.00	
		150608																									0.20-0.80	2.00-10.00	
		150616																									0.20-0.90	2.00-10.00	
		190608																										0.15-0.60	3.00-12.00
		190612																										0.20-0.80	3.00-12.00
		Medium cutting		SNGG 090304R																								0.12-0.35	1.00-3.00
090308R																											0.15-0.35	1.00-3.00	
120404R	●																										0.15-0.35	1.00-4.00	
120408R																											0.15-0.35	1.00-4.00	
120412R																											0.15-0.35	1.00-4.00	
090304L																											0.12-0.35	1.00-3.00	
090308L																											0.15-0.35	1.00-3.00	
120404L																												0.15-0.35	1.00-4.00
120408L																												0.15-0.35	1.00-4.00
120412L																												0.15-0.35	1.00-4.00
Medium cutting		SNGG 120404-VP3																	●	●	●	●	●	●	0.05-0.30	0.10-3.00			
		120408-VP3																		●	●	●	●	●	●	0.10-0.45	1.00-5.00		
		120412-VP3																			●	●	●	●	●	●	0.12-0.50	1.00-5.00	

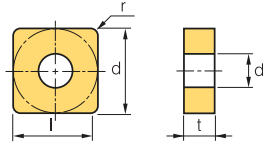
↻ Cutting edge geometry A52~A61
 ↻ Recommended chip breaker B04~B11
 ↻ Code system B26~B27
 ● : Stock item

Available tool holders					
Designation	Page	Designation	Page	Designation	Page
MSBNR/L	B173	MSRNR/L	B174	PSDNN	B163
MSDNN	B173	MSSNR/L	B175	PSKNR/L	B164, 199
MSKNR/L	B174	PSBNR/L	B163	PSSNR/L	B164



B Turning Insert (Negative)

SN ○ ○



Dimensions (mm)			
Size	d	t	d ₁
09	9.525	3.18	3.81
12	12.7	3.18~4.76	5.16

○ Square **90° Negative**

Workpiece	Machining types												
	P	M	K	N	S	H							
Steel	●	●	●	●	●	●	●	●	●	●	●	●	●
Stainless steel	●	●	●	●	●	●	●	●	●	●	●	●	●
Cast iron	●	●	●	●	●	●	●	●	●	●	●	●	●
Non-ferrous metal	●	●	●	●	●	●	●	●	●	●	●	●	●
Heat resistant alloy, Titanium alloy	●	●	●	●	●	●	●	●	●	●	●	●	●
Hardened steel	●	●	●	●	●	●	●	●	●	●	●	●	●

Inserts	Designation	Cermets		Coated		Coated										Uncoated		Cutting Condition										
		CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6310	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	f _n (mm/rev)	a _p (mm)		
Finishing	VB	SNMG 120404-VB	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	0.15~0.35	0.30~2.00	
		120408-VB	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	0.15~0.40	0.50~2.00
Finishing	VF	SNMG 090304-VF	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	0.07~0.30	0.50~1.50	
		090308-VF	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	0.07~0.30	0.50~1.50	
		120404-VF	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	0.07~0.30	0.50~1.50
		120408-VF	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	0.10~0.40	0.50~1.50
		120412-VF	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	0.20~0.50	0.50~1.50
Finishing	VL	SNMG 120408-VL	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	0.10~0.35	0.20~1.50	
Medium to finishing	HA	SNMG 120404-HA	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	0.10~0.35	0.80~3.50	
		120408-HA	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	0.10~0.40	0.80~3.50	
		120412-HA	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	0.13~0.55	0.80~3.50
Medium to finishing	LP	SNMG 090308-LP	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	0.10~0.30	0.30~1.50	
		090408-LP	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	0.10~0.30	0.30~1.50	
		120404-LP	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	0.10~0.35	0.30~2.00	
		120408-LP	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	0.10~0.40	0.50~2.50	
		120412-LP	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	0.13~0.45	0.80~3.00
Medium to finishing	VC	SNMG 120408-VC	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	0.15~0.40	0.50~3.50	
Medium to finishing	VP2	SNMG 120404-VP2	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	0.05~0.35	0.10~3.00	
		120408-VP2	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	0.10~0.45	0.50~4.50	
		120412-VP2	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	0.10~0.50	0.50~5.00	

🔄 Cutting edge geometry A52~A61 🔄 Recommended chip breaker B04~B11 🔄 Code system B26~B27 ● : Stock item

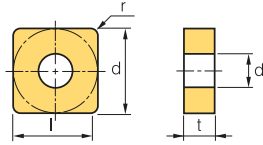
Available tool holders					
Designation	Page	Designation	Page	Designation	Page
MSBNR/L	B173	MSRNR/L	B174	PSDNN	B163
MSDNN	B173	MSSNR/L	B175	PSKNR/L	B164, 199
MSKNR/L	B174	PSBNR/L	B163	PSSNR/L	B164



B Turning Insert (Negative)

SN ○ ○

□ Square 90° Negative



Dimensions (mm)			
Size	d	t	d ₁
09	9.525	3.18	3.81
12	12.7	4.76	5.16
15	15.875	6.35	6.35
19	19.05	6.35	7.93
25	25.4	7.94	9.12

Workpiece	Machining types															
	P	M	K	N	S	H										
Steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Stainless steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Cast iron	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Non-ferrous metal	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Heat resistant alloy, Titanium alloy	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Hardened steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Inserts	Designation	Cermet		Coated		Coated										Uncoated		Cutting Condition									
		CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6310	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	f _n (mm/rev)	a _p (mm)	
Medium cutting 	SNMG 090304-MP						●	●	●																0.10-0.40	0.40-3.80	
	090308-MP						●	●	●																	0.15-0.40	0.50-4.00
	090312-MP																									0.15-5.00	0.80-4.20
	090404-MP																									0.10-0.40	0.40-3.80
	090408-MP																									0.15-0.40	0.50-4.00
	090412-MP																									0.15-0.50	0.80-4.20
	120404-MP							●	●	●			●	●	●			●	●							0.10-0.40	0.40-4.00
	120408-MP							●	●	●			●	●	●			●	●							0.15-0.45	0.50-4.50
	120412-MP							●	●	●			●	●	●											0.15-0.50	0.80-5.00
	120416-MP							●	●	●			●	●	●											0.18-0.60	0.80-7.00
	150608-MP																									0.15-5.00	0.50-7.00
	150612-MP																									0.18-0.60	0.80-8.50
	190608-MP																									0.15-0.50	0.50-8.50
	190612-MP																									0.18-0.60	0.80-8.50
Medium cutting 	SNMG 090304-VM																								0.05-0.30	0.90-3.50	
	090308-VM																									0.10-5.00	1.00-3.50
	120404-VM	●							●							●	●								0.05-0.30	0.90-5.00	
	120408-VM	●						●	●	●						●	●		●	●					0.10-0.50	1.00-5.00	
	120412-VM								●							●	●									0.13-0.60	1.30-5.00
	190612-VM																									0.25-0.60	2.50-7.50
190616-VM																									0.25-0.60	2.50-7.50	
Medium cutting 	SNMG 120404-VP3															●	●	●	●	●		●	●	0.05-0.30	0.10-3.00		
	120408-VP3															●	●	●	●	●		●	●	0.10-0.45	1.00-5.00		
	120412-VP3															●	●	●	●	●		●	●	0.12-0.50	1.00-5.00		
	120416-VP3															●	●	●	●	●		●	●	0.25-0.45	0.50-4.00		
	160608-VP3																								0.15-0.35	0.80-6.00	
	160612-VP3																								0.20-0.40	1.00-6.00	
	160616-VP3																								0.20-0.40	1.00-6.00	
	190608-VP3																									0.15-0.35	0.80-7.00
	190612-VP3																									0.20-0.40	1.00-7.00
190616-VP3																									0.25-0.45	1.00-7.00	

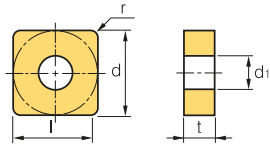
🔄 Cutting edge geometry A52~A61 🔄 Recommended chip breaker B04~B11 🔄 Code system B26~B27 ● : Stock item

Available tool holders					
Designation	Page	Designation	Page	Designation	Page
MSBNR/L	B173	MSRNR/L	B174	PSDNN	B163
MSDNN	B173	MSSNR/L	B175	PSKNR/L	B164, 199
MSKNR/L	B174	PSBNR/L	B163	PSSNR/L	B164



B Turning Insert (Negative)

SN



Dimensions (mm)			
Size	d	t	d ₁
12	12.7	4.76	5.16
15	15.875	6.35	6.35
19	19.05	6.35	7.93
25	25.4	7.94~9.52	9.12

Square **90° Negative**

Workpiece	Machining types															
	P	M	K	N	S	H										
Steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Stainless steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Cast iron	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Non-ferrous metal	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Heat resistant alloy, Titanium alloy	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Hardened steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Inserts	Designation	Cermets		Coated		Coated										Uncoated		Cutting Condition									
		CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6310	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	f _n (mm/rev)	a _p (mm)	
Roughing 	SNMG 120404-RM												●	●	●	●					●				0.10~0.50	2.00~6.00	
	120408-RM												●	●	●	●					●	●	●			0.15~0.55	2.00~6.00
	120412-RM													●	●	●					●					0.20~0.60	2.00~6.00
	120416-RM																					●				0.25~0.70	2.00~6.00
	150608-RM																									0.20~0.60	0.20~6.00
	150612-RM													●	●	●						●				0.20~0.60	2.00~8.00
	150616-RM																									0.25~0.70	2.00~8.00
	190608-RM														●	●	●					●				0.20~0.60	2.00~10.00
	190612-RM														●	●	●					●				0.20~0.60	2.00~10.00
	190616-RM																									0.27~0.70	2.00~10.00
	190624-RM																									0.30~0.75	3.00~10.00
250924-RM																									0.40~1.20	4.00~14.00	
Roughing 	SNMG 120408-VP4																								0.15~0.35	1.00~4.00	
	120412-VP4																									0.20~0.40	1.00~4.00
	150612-VP4																									0.20~0.45	1.00~5.00
	190608-VP4																									0.20~0.50	1.00~9.00
	190612-VP4																									0.23~0.55	1.00~9.00
	190616-VP4																									0.27~0.60	1.00~9.00
Roughing 	SNMG 120408-VR																									0.25~0.55	1.20~7.00
	120412-VR																									0.30~0.60	1.50~7.00
	120416-VR																									0.35~0.60	2.00~7.00
	190612-VR						●	●																		0.35~0.70	2.00~10.00
	190616-VR						●	●																		0.35~0.75	2.20~10.00
Roughing 	SNMM 120408-GR																									0.20~0.50	1.00~7.00
	120412-GR								●																	0.25~0.65	1.30~7.00
	190612-GR								●																	0.25~0.65	1.30~11.50
	190616-GR																									0.32~0.85	1.80~11.50

Cutting edge geometry **A52~A61**
 Recommended chip breaker **B04~B11**
 Code system **B26~B27**
● : Stock item

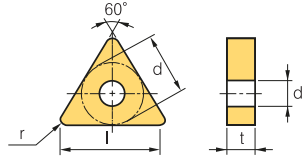
Available tool holders					
Designation	Page	Designation	Page	Designation	Page
MSBNR/L	B173	MSRNR/L	B174	PSDNN	B163
MSDNN	B173	MSSNR/L	B175	PSKNR/L	B164, 199
MSKNR/L	B174	PSBNR/L	B163	PSSNR/L	B164



B Turning Insert (Negative)

TN ○ ○

Triangular 60° Negative



Dimensions (mm)			
Size	d	t	d ₁
11	6.35	3.18	2.40
16	9.525	3.18~4.76	3.81
22	12.7	4.76	5.16
27	15.875	6.35	6.35

Workpiece	Machining types											
	P	M	K	N	S	H	●	●	●	●	●	●
Steel	●	●	●	●	●	●	●	●	●	●	●	●
Stainless steel	●	●	●	●	●	●	●	●	●	●	●	●
Cast iron	●	●	●	●	●	●	●	●	●	●	●	●
Non-ferrous metal	●	●	●	●	●	●	●	●	●	●	●	●
Heat resistant alloy, Titanium alloy	●	●	●	●	●	●	●	●	●	●	●	●
Hardened steel	●	●	●	●	●	●	●	●	●	●	●	●

Inserts	Designation	Cermets		Coated		Coated										Uncoated		Cutting Condition								
		CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6310	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	f _n (mm/rev)	a _p (mm)
Medium to finishing VQ [Cermets]	TNMG 110304-VQ																								0.05~0.30	0.50~3.00
	160404-VQ	●	●	●	●	●																			0.05~0.30	0.80~3.50
	160408-VQ	●		●	●	●																			0.08~0.40	0.80~3.50
	160412-VQ																								0.10~0.40	0.80~3.50
	220404-VQ																								0.05~0.35	0.80~4.00
Medium cutting HM	TNMG 110308-HM							●																	0.17~0.40	1.50~3.00
	160404-HM							●	●	●						●						●			0.05~0.30	0.90~4.00
	160408-HM							●	●	●	●														0.10~0.50	1.00~4.00
	160412-HM																						●		0.13~0.60	1.30~4.00
	220404-HM								●	●	●														0.15~0.45	0.60~5.00
	220408-HM									●															0.18~0.48	0.80~5.80
Medium cutting MK <i>new</i>	TNMG 160404-MK											●	●												0.05~0.30	0.90~3.50
	160408-MK												●												0.10~0.50	1.00~4.00
	160412-MK												●												0.12~0.60	1.20~4.50
	160416-MK													●											0.13~0.60	1.20~4.50
	220404-MK																								0.17~0.45	1.50~5.00
	220408-MK																								0.21~0.50	1.30~5.50
	220412-MK																								0.23~0.52	1.40~5.50
	220416-MK																								0.25~0.53	1.60~6.00
270612-MK																								0.25~0.55	3.00~7.00	
Medium cutting MM <i>new</i>	TNMG 160404-MM												●	●	●	●					●	●	●		0.10~0.40	0.50~4.80
	160408-MM												●	●	●	●					●	●	●		0.12~0.45	0.50~4.80
	160412-MM													●	●	●							●		0.18~0.65	0.50~4.80
	160416-MM														●	●	●								0.18~0.65	0.50~4.80
	220404-MM																								0.10~0.40	0.50~6.50
	220408-MM													●	●	●						●	●		0.12~0.45	0.50~6.50
	220412-MM													●	●	●						●	●		0.15~0.60	0.50~6.50
	220416-MM														●	●	●								0.18~0.65	0.50~6.50
Medium cutting MP <i>new</i>	TNMG 110308-MP							●	●																0.15~0.42	0.50~3.50
	160404-MP							●	●	●	●										●	●			0.10~0.40	0.40~3.50
	160408-MP							●	●	●	●										●	●			0.15~0.45	0.50~4.00
	160412-MP							●	●	●	●										●	●			0.15~0.50	0.80~4.50
	160616-MP																								0.18~0.50	1.00~4.50
	220404-MP							●	●	●	●														0.10~0.35	0.40~5.00
	220408-MP							●	●	●	●														0.15~0.45	0.50~5.50
	220412-MP							●	●	●	●														0.15~0.50	0.80~6.00
	220416-MP							●	●	●	●														0.20~0.55	1.00~6.00
	270612-MP																								0.28~0.60	1.20~8.00

➤ Cutting edge geometry A52~A61 ➤ Recommended chip breaker B04~B11 ➤ Code system B26~B27 ● : Stock item

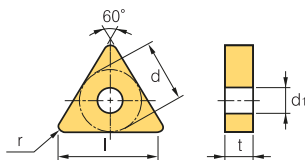
Available tool holders					
Designation	Page	Designation	Page	Designation	Page
MTENN	B175	PTFNR/L	B165, 199	WTJNR/L	B167
MTFNR/L	B175	PTGNR/L	B165	WTXNR/L	B167
MTGNR/L	B176	PTTNR/L	B166		
MTJNR/L	B176	WTENN	B167		



B Turning Insert (Negative)

TN ○ ○

Triangular 60° Negative



Dimensions (mm)			
Size	d	t	d ₁
16	9.525	4.76	3.81
22	12.7	4.76	5.16
27	15.875	6.35	6.35
33	19.05	7.94~9.52	7.93

Workpiece	Material	Machining types													
		●	●	●	●	●	●	●	●	●	●	●	●	●	●
Steel	P	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Stainless steel	M	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Cast iron	K	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Non-ferrous metal	N	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Heat resistant alloy, Titanium alloy	S	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Hardened steel	H	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Inserts	Designation	Cermert		Coated		Coated											Uncoated		Cutting Condition								
		CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6310	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	f _n (mm/rev)	a _p (mm)	
Roughing GR	TNMG 160408-GR							●	●																0.20~0.50	1.00~7.00	
	160412-GR							●																		0.23~0.54	1.20~8.00
	220408-GR							●	●	●	●															0.22~0.61	1.10~7.80
	220412-GR							●	●	●																0.28~0.78	1.20~7.80
	220416-GR									●																0.31~0.75	1.50~7.80
	270608-GR									●																0.31~0.75	1.50~7.80
	270612-GR								●	●																0.31~0.75	1.50~7.80
	270616-GR									●																	0.36~1.00
330924-GR									●																	0.40~1.00	2.00~9.00
Roughing RK	TNMG 160408-RK											●	●													0.23~0.53	1.50~5.00
	160412-RK											●	●													0.28~0.53	1.80~5.00
	160416-RK											●														0.28~0.53	1.80~5.00
	220408-RK											●														0.23~0.53	1.50~6.00
	220412-RK											●														0.28~0.53	1.80~6.00
	220416-RK											●														0.28~0.63	2.00~6.00
Roughing RM	TNMG 160404-RM													●	●	●	●			●	●	●				0.10~0.50	2.00~5.50
	160408-RM													●	●	●	●			●	●	●				0.15~0.55	2.00~5.50
	160412-RM													●	●											0.20~0.60	2.00~5.50
	220408-RM													●	●	●					●					0.10~0.50	2.00~7.50
	220412-RM													●	●	●					●					0.15~0.55	2.00~7.50
	220416-RM														●	●	●									0.25~0.70	2.00~7.50
Roughing VP4	TNMG 160408-VP4																				●					0.15~0.35	1.00~4.00
	160412-VP4																				●					0.20~0.40	1.00~4.00
Roughing VR	TNMG 160404-VR																									0.20~0.50	0.80~7.00
	160408-VR																									0.25~0.55	1.20~7.00
	160412-VR																									0.35~0.65	1.70~7.00
	160416-VR																									0.35~0.70	2.00~10.0
	220408-VR																									0.35~0.70	2.00~10.0
	220412-VR																									0.35~0.70	2.00~10.0
	220416-VR																									0.35~0.75	2.20~10.0

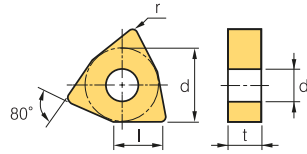
➤ Cutting edge geometry A52~A61
➤ Recommended chip breaker B04~B11
➤ Code system B26~B27
● : Stock item

Available tool holders					
Designation	Page	Designation	Page	Designation	Page
MTENN	B175	PTFNR/L	B165, 199	WTJNR/L	B167
MTFNR/L	B175	PTGNR/L	B165	WTXNR/L	B167
MTGNR/L	B176	PTTNR/L	B166		
MTJNR/L	B176	WTENN	B167		



B Turning Insert (Negative)

WN○○○



Dimensions (mm)			
Size	d	t	d ₁
06	9.525	4.76	3.81
08	12.7	4.76	5.16

Trigon 80° Negative

Workpiece	Material		Machining types																			
	Symbol	Code	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Steel		P	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Stainless steel		M	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Cast iron		K	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Non-ferrous metal		N																				
Heat resistant alloy, Titanium alloy		S																				
Hardened steel		H																				

● Continuous cutting
 ● General cutting
 ● Interrupted cutting

Inserts	Designation	Cermets		Coated		Coated										Uncoated		Cutting Condition												
		CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6310	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	f _n (mm/rev)	a _p (mm)				
Medium cutting	VP3	WNGG	080404-VP3																							0.10-0.45	0.50-5.00			
	Roughing	WNMA	060404																								0.10-0.30	0.50-3.00		
060408																											0.10-0.30	0.50-3.00		
060412																												0.10-0.40	1.00-3.00	
080404																												0.15-0.60	1.00-5.00	
080408																													0.15-0.60	1.00-6.00
080412																													0.15-0.70	1.50-6.00
080416																													0.15-0.70	1.50-6.00
Finishing	VNB	WNUMG	080404-VNB																								0.10-0.35	0.30-1.50		
		080408-VNB																										0.15-0.45	0.50-2.00	
		080412-VNB																										0.18-0.45	0.80-2.50	
Finishing	VNF	WNUMG	060404-VNF																									0.07-0.30	0.50-1.50	
		060408-VNF																										0.10-0.40	0.50-1.50	
		080404-VNF																										0.07-0.30	0.50-1.50	
		080408-VNF																										0.10-0.40	0.50-1.50	
		080412-VNF																										0.20-0.50	0.50-1.50	
Finishing	VNL	WNUMG	060404-VNL																									0.05-0.25	0.20-1.50	
		080404-VNL																										0.05-0.25	0.10-1.00	
		080408-VNL																										0.10-0.35	0.20-1.50	
Finishing	VNV	WNUMG	060404-VNV																									0.05-0.30	0.40-3.00	
		060408-VNV																										0.08-0.30	0.40-3.50	
		080404-VNV																										0.10-0.30	0.50-3.00	
		080408-VNV																										0.15-0.50	0.50-4.00	
		080412-VNV																										0.18-0.50	1.00-4.00	
Medium to finishing	HA	WNUMG	060404-HA																								0.05-0.30	0.10-3.00		
		060408-HA																										0.10-0.40	0.80-3.50	
		080404-HA																										0.05-0.30	0.80-3.50	
		080408-HA																										0.10-0.40	0.80-3.50	
		080412-HA																										0.13-0.55	0.80-3.50	

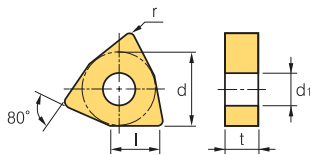
Cutting edge geometry A52~A61
 Recommended chip breaker B04~B11
 Code system B26~B27
 ● : Stock item

Available tool holders			
Designation	Page	Designation	Page
MWLNRL	B177	WWLNRL	B168
PWLNRL	B200		



B Turning Insert (Negative)

WN○○○



Dimensions (mm)			
Size	d	t	d ₁
06	9.525	4.76	3.81
08	12.7	4.76	5.16
13	19.05	6.35	7.93

Trigon 80° Negative

Workpiece	Material Compatibility													Machining types				
	Steel	Stainless steel	Cast iron	Non-ferrous metal	Heat resistant alloy, Titanium alloy	Hardened steel	P	M	K	N	S	H	●	●	●	●	●	
Steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Stainless steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Cast iron	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Non-ferrous metal	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Heat resistant alloy, Titanium alloy	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Hardened steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Inserts	Designation	Cermets		Coated		Coated										Uncoated		Cutting Condition										
		CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6310	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	f _n (mm/rev)	a _p (mm)		
Medium cutting MP	WNMG 06T304-MP																									0.10-0.40	0.40-2.80	
	06T308-MP																										0.15-0.45	0.50-3.00
	060404-MP						●	●	●				●													0.10-0.40	0.40-2.80	
	060408-MP						●	●	●	●			●													0.15-0.45	0.50-3.00	
	060412-MP																									0.15-0.50	0.80-3.20	
	080404-MP						●	●	●				●	●	●				●	●	●					0.10-0.40	0.40-4.00	
	080408-MP						●	●	●				●	●	●				●	●	●					0.15-0.45	0.50-4.50	
	080412-MP						●	●	●				●	●	●				●	●						0.15-0.50	0.80-5.00	
	080416-MP						●	●	●																	0.18-0.55	0.10-5.00	
Medium cutting VM	WNMG 060404-VM									●						●	●									0.10-0.45	1.00-3.50	
	060408-VM						●	●	●							●	●									0.10-0.50	1.00-4.00	
	060412-VM																									0.13-0.60	1.30-4.00	
	080404-VM						●		●							●	●									0.05-0.30	0.90-5.00	
	080408-VM						●	●	●	●						●	●			●		●				0.10-0.50	1.00-5.00	
	080412-VM						●		●							●	●									0.10-0.50	1.00-5.00	
080416-VM																									0.10-0.50	1.20-5.00		
Medium cutting VP3	WNMG 060408-VP3																									0.60-0.38	0.40-3.50	
	060412-VP3																									0.60-0.38	0.40-3.50	
	080404-VP3															●	●	●	●	●		●	●			0.10-0.45	0.50-5.00	
	080408-VP3															●	●	●	●	●		●	●			0.12-0.50	0.50-5.00	
	080412-VP3															●	●	●	●	●		●	●			0.05-0.30	0.10-3.00	
	130612-VP3																									0.20-0.40	1.00-5.00	
Medium cutting LW	WNMG 060408-LW						●	●					●													0.15-0.60	0.50-3.50	
	060412-LW																									0.20-0.70	0.80-3.50	
	080408-LW						●	●	●				●													0.15-0.60	1.00-5.00	
	080412-LW																									0.20-0.70	1.00-6.00	
General B25	WNMG 080404-B25						●	●	●																	0.17-0.45	1.00-5.00	
	080408-B25						●	●	●	●																0.23-0.60	1.50-5.00	
	080412-B25						●	●	●																	0.25-0.60	2.00-5.00	
Roughing GR	WNMG 080404-GR																									0.15-0.50	0.08-6.00	
	080408-GR						●	●	●	●																0.20-0.50	1.00-7.00	
	080412-GR						●	●	●	●																0.25-0.50	1.30-7.00	
	080416-GR																									0.25-0.60	1.80-6.00	

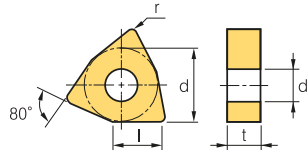
🔄 Cutting edge geometry A52~A61
 🔄 Recommended chip breaker B04~B11
 🔄 Code system B26~B27
 ● : Stock item

Available tool holders			
Designation	Page	Designation	Page
MWLNLR/L	B177	WWLNLR/L	B168
PWLNLR/L	B200		



WN

Trigon 80° Negative



Dimensions (mm)			
Size	d	t	d ₁
06	9.525	4.76	3.81
08	12.7	4.76	5.16
10	15.875	6.35	6.35
13	19.05	6.35	7.93

Workpiece	Material												Machining types				
	Steel	Stainless steel	Cast iron	Non-ferrous metal	Heat resistant alloy, Titanium alloy	Hardened steel	P	M	K	N	S	H	●	●	✱	●	●
Steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Stainless steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Cast iron	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Non-ferrous metal	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Heat resistant alloy, Titanium alloy	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Hardened steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Inserts	Designation	Cermet		Coated		Coated										Uncoated		Cutting Condition										
		CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6310	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	f _n (mm/rev)	a _p (mm)		
Roughing	 RK <small>new</small>	WNMG 060408-RK																								0.10~0.40	1.00~3.50	
		WNMG 060412-RK																									0.23~0.40	1.50~5.00
		WNMG 080404-RK											●														0.23~0.50	1.50~6.00
		WNMG 080408-RK											●	●													0.23~0.53	1.50~6.00
		WNMG 080412-RK											●	●													0.28~0.53	1.80~6.00
		WNMG 080416-RK												●													0.25~0.60	2.00~6.00
Roughing	 RM <small>new</small>	WNMG 060404-RM													●	●										0.10~0.50	1.50~3.00	
		WNMG 060408-RM													●	●										0.15~0.55	1.50~3.00	
		WNMG 060412-RM													●	●										0.20~0.60	1.50~3.00	
		WNMG 080404-RM																●	●							0.10~0.50	2.00~4.00	
		WNMG 080408-RM													●	●	●	●			●	●	●			0.15~0.55	2.00~4.00	
		WNMG 080412-RM													●	●	●	●				●				0.20~0.60	2.00~4.00	
Roughing	 VP4 <small>new</small>	WNMG 080408-VP4																								0.15~0.35	1.00~4.00	
		WNMG 080412-VP4																								0.20~0.40	1.00~4.00	
Roughing	 VR	WNMG 060408-VR																								0.20~0.40	1.00~6.00	
		WNMG 080404-VR																								0.20~0.50	0.80~7.00	
		WNMG 080408-VR																								0.25~0.55	1.20~7.00	
		WNMG 080412-VR																								0.30~0.60	1.50~7.00	
		WNMG 080416-VR																								0.40~0.60	1.50~4.00	
Medium to roughing	 B25	WNMM 100608-B25																								0.30~0.80	3.00~8.00	
		WNMM 130612-B25																								0.40~0.90	4.00~10.00	
Finishing	 SR <small>new</small>	WNMX 080404R-SR																								0.10~0.35	0.70~3.00	
		WNMX 080408R-SR																								0.12~0.40	1.00~3.00	
		WNMX 080404L-SR																								0.10~0.35	0.70~3.00	
		WNMX 080408L-SR																								0.12~0.40	1.00~3.00	
Medium cutting	 SH <small>[Shaft]</small>	WNMX 080404R-SH																								0.15~0.30	1.00~4.00	
		WNMX 080408R-SH																								0.15~0.50	1.50~5.00	
		WNMX 080404L-SH																								0.15~0.30	1.00~4.00	
		WNMX 080408L-SH																								0.15~0.50	1.50~5.00	

↻ Cutting edge geometry A52~A61
↻ Recommended chip breaker B04~B11
↻ Code system B26~B27
● : Stock item

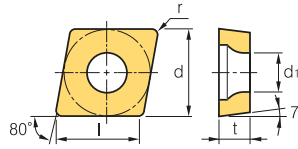
Available tool holders			
Designation	Page	Designation	Page
MWLNRL	B177	WWLNRL	B168
PWLNRL	B200		



B Turning Insert (Positive)

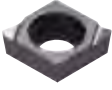
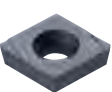
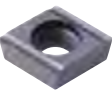


Rhombic 80° Positive
Relief Angle: 7°



Dimensions (mm)			
Size	d	t	d ₁
03	3.5	1.39	1.9
04	4.3	1.79	2.3
06	6.35	2.38	2.8
09	9.525	3.97	4.4

Workpiece	Machining types															
	P	M	K	N	S	H										
Steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Stainless steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Cast iron	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Non-ferrous metal	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Heat resistant alloy, Titanium alloy	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Hardened steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Inserts	Designation	Cermets		Coated		Coated										Uncoated		Cutting Condition											
		CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6310	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	fn (mm/rev)	ap (mm)			
Finishing		CCET 0301005R																								0.01~0.05	0.10~0.30		
		030101R																									0.01~0.05	0.10~0.30	
		030102R																									0.01~0.05	0.10~0.30	
		030104R																									0.01~0.05	0.10~0.30	
		0401005R																									0.01~0.10	0.10~0.50	
		040101R																									0.01~0.10	0.10~0.50	
		040102R																									0.01~0.10	0.10~0.50	
		040104R																									0.01~0.10	0.10~0.50	
		0301005L																										0.01~0.05	0.10~0.30
		030101L																										0.01~0.05	0.10~0.30
		030102L		●																					●	●		0.01~0.05	0.10~0.30
		030104L																										0.01~0.05	0.10~0.30
		0401005L																										0.01~0.10	0.10~0.50
		040101L																										0.01~0.10	0.10~0.50
		040102L			●																					●	●	0.01~0.10	0.10~0.50
040104L																										0.01~0.10	0.10~0.50		
Finishing	 [High precision]	CCET 0602005MFR-KF															●			●						0.01~0.06	0.04~1.30		
		060201MFR-KF																●			●						0.02~0.08	0.05~1.50	
		060202MFR-KF																●			●						0.03~0.11	0.06~1.70	
		09T3005MFR-KF																●			●						0.02~0.08	0.05~1.50	
		09T301MFR-KF																●			●						0.03~0.11	0.06~1.70	
		09T302MFR-KF																●			●						0.04~0.15	0.08~2.00	
		0602005MFL-KF																●			●						0.01~0.06	0.04~1.30	
		060201MFL-KF																●			●						0.02~0.08	0.05~1.50	
		060202MFL-KF																●			●						0.03~0.11	0.06~1.70	
		09T3005MFL-KF																●			●						0.02~0.08	0.05~1.50	
		09T301MFL-KF																●			●						0.03~0.11	0.06~1.70	
		09T302MFL-KF																●			●						0.04~0.15	0.08~2.00	
Medium to finishing	 [High precision]	CCET 0602005MFR-KM															●			●						0.01~0.06	0.04~1.30		
		060201MFR-KM																●			●						0.02~0.08	0.05~1.50	
		060202MFR-KM																●			●						0.03~0.11	0.06~1.70	
		09T3005MFR-KM																●			●						0.02~0.08	0.05~1.50	
		09T301MFR-KM																●			●						0.03~0.11	0.06~1.70	
		09T302MFR-KM																●			●						0.04~0.15	0.08~2.00	
		0602005MFL-KM																●			●						0.01~0.06	0.04~1.30	
		060201MFL-KM																●			●						0.02~0.08	0.05~1.50	
		060202MFL-KM																●			●						0.03~0.11	0.06~1.70	
		09T3005MFL-KM																●			●						0.02~0.08	0.05~1.50	
		09T301MFL-KM																●			●						0.03~0.11	0.06~1.70	
		09T302MFL-KM																●			●						0.04~0.15	0.08~2.00	

➤ Cutting edge geometry A52~A61
 ➤ Recommended chip breaker B04~B11
 ➤ Code system B26~B27
 ● : Stock item

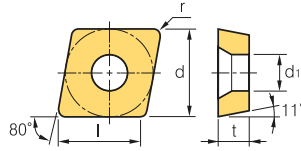
Available tool holders			
Designation	Page	Designation	Page
SCACR/L	B113, 178	SCLCR/L	B113, 178, 204, 214



B Turning Insert (Positive)


CP○○○

 Rhombic **80° Positive**
Relief Angle: 11°



Dimensions (mm)			
Size	d	t	d ₁
06	6.35	2.38	2.8
08	7.94	2.38	3.4
09	9.525	3.18	4.4

Workpiece	Machining types															
	P	M	K	N	S	H										
Steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Stainless steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Cast iron	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Non-ferrous metal	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Heat resistant alloy, Titanium alloy	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Hardened steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Inserts	Designation	Cermets		Coated		Coated										Uncoated		Cutting Condition												
		CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6310	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	f _n (mm/rev)	a _p (mm)				
Finishing		CPGT 080202																								0.06-0.20	0.10-2.00			
		080204	●	●																							0.08-0.20	0.30-2.00		
		080208																										0.10-0.25	0.50-2.00	
		090302																										0.04-0.20	0.30-1.50	
		090304	●	●																									0.06-0.25	0.50-2.00
		090308																											0.08-0.30	0.70-2.50
Medium to finishing	HMP	CPGT 090308-HMP																									0.05-0.20	0.70-2.00		
Finishing	VF	CPMT 080204-VF																									0.05-0.20	0.30-1.20		
		080208-VF																										0.10-0.25	0.30-1.20	
		090304-VF								●																		0.05-0.20	0.30-1.50	
		090308-VF								●																			0.10-0.25	0.30-1.50
Finishing	VL	CPMT 080204-VL																										0.03-0.08	0.08-1.00	
		080208-VL																											0.04-0.12	0.10-1.00
		090304-VL																											0.05-0.10	0.10-1.00
		090308-VL																											0.08-0.15	0.10-1.00
Medium cutting	C25	CPMT 060204-C25																									0.05-0.15	0.60-2.30		

 Cutting edge geometry **A52~A61**
 Recommended chip breaker **B04~B11**
 Code system **B26~B27**
● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SCLPR/L	B205		

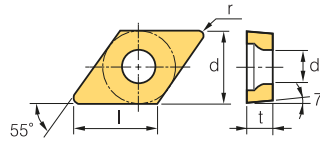


B Turning Insert (Positive)

DC ○ ○ ○



Rhombic **55° Positive**
Relief Angle: 7°



Dimensions (mm)			
Size	d	t	d ₁
07	6.35	2.38	2.8
11	9.525	3.97	4.4

Workpiece	Machining types											
	P	M	K	N	S	H						
Steel	●	●	●	●	●	●	●	●	●	●	●	●
Stainless steel	●	●	●	●	●	●	●	●	●	●	●	●
Cast iron	●	●	●	●	●	●	●	●	●	●	●	●
Non-ferrous metal	●	●	●	●	●	●	●	●	●	●	●	●
Heat resistant alloy, Titanium alloy	●	●	●	●	●	●	●	●	●	●	●	●
Hardened steel	●	●	●	●	●	●	●	●	●	●	●	●

Inserts	Designation	Cermets		Coated		Coated										Uncoated		Cutting Condition										
		CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6310	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	f _n (mm/rev)	a _p (mm)		
Finishing VP1 	DCGT 070201-VP1															●		●	●	●			●		0.03-0.06	0.06-1.00		
	070202-VP1															●		●	●	●			●		0.03-0.10	0.08-1.50		
	070204-VP1															●		●	●	●			●		0.05-0.12	0.10-1.50		
	11T301-VP1															●			●					●		0.03-0.13	0.06-1.00	
	11T302-VP1															●		●	●	●				●		0.04-0.15	0.08-1.50	
	11T304-VP1															●		●	●	●				●		0.06-0.20	0.10-1.50	
Finishing VP1 [High precision]	DCGT 070201MFN-VP1															●			●						0.03-0.06	0.06-1.00		
	070202MFN-VP1															●			●						0.03-0.10	0.08-1.50		
	070204MFN-VP1															●			●						0.05-0.12	0.10-1.50		
	11T301MFN-VP1															●			●						0.03-0.13	0.06-1.00		
	11T302MFN-VP1															●		●	●						0.04-0.15	0.08-1.50		
	11T304MFN-VP1															●		●	●						0.06-0.20	0.10-1.50		
Medium to finishing KM 	DCGT 0702003R-KM																								0.01-0.06	0.04-1.30		
	070201R-KM																									0.02-0.08	0.05-1.50	
	070202R-KM																									0.03-0.11	0.06-1.50	
	11T3003R-KM																									0.02-0.08	0.05-1.50	
	11T301R-KM																									0.03-0.11	0.06-1.70	
	11T302R-KM																									0.04-0.15	0.08-2.00	
	0702003L-KM																									0.01-0.06	0.04-1.30	
	070201L-KM																										0.02-0.08	0.05-1.50
	070202L-KM																										0.03-0.11	0.06-1.50
	11T3003L-KM																										0.02-0.08	0.05-1.50
	11T301L-KM																										0.03-0.11	0.06-1.70
	11T302L-KM																										0.04-0.15	0.08-2.00
Finishing VF [High precision]	DCMT 070202-VF			●						●										●					0.03-0.10	0.06-1.00		
	070204-VF		●	●						●						●				●						0.05-0.20	0.30-1.20	
	11T302-VF	●								●																0.04-0.15	0.08-1.50	
	11T304-VF	●	●	●						●						●				●						0.05-0.20	0.30-1.50	
	11T308-VF	●		●												●				●						0.10-0.25	0.30-1.50	

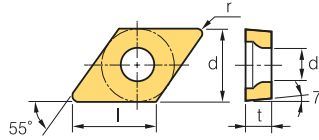
Cutting edge geometry A52~A61
 Recommended chip breaker B04~B11
 Code system B26~B27
 ● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SDACR/L	B178	SDQCR/L	B206
SDJCR/L	B113, 179	SDUCR/L	B207
SDNCN	B114, 179	SDZCR/L	B208



DC ○ ○

 Rhombic **55° Positive**
Relief Angle: 7°



Dimensions (mm)			
Size	d	t	d ₁
07	6.35	2.38	2.8
11	9.525	3.97	4.4

Workpiece	Material												Machining types				
	Steel	Stainless steel	Cast iron	Non-ferrous metal	Heat resistant alloy, Titanium alloy	Hardened steel	P	M	K	N	S	H	●	⊙	⊛	⊞	
Steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Stainless steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Cast iron	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Non-ferrous metal	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Heat resistant alloy, Titanium alloy	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Hardened steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Inserts	Designation	Cermet		Coated		Coated										Uncoated		Cutting Condition											
		CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6310	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	f _n (mm/rev)	a _p (mm)			
Finishing VL	DCMT 070202-VL																									0.02~0.10	0.06~0.80		
	DCMT 070204-VL	●		●	●	●								●	●	●	●	●	●	●	●	●	●	●	●	●	0.04~0.10	0.08~0.90	
	DCMT 070208-VL						●		●								●										0.06~0.12	0.10~1.00	
	DCMT 11T302-VL																										0.03~0.10	0.07~0.80	
	DCMT 11T304-VL	●		●	●	●	●								●	●	●	●	●	●	●	●	●	●	●	●	0.05~0.10	0.10~1.00	
	DCMT 11T308-VL	●		●	●	●	●								●	●	●	●	●	●	●	●	●	●	●	●	0.08~0.15	0.10~1.00	
	DCMT 11T312-VL																										0.08~0.15	0.30~1.50	
Finishing VP1	DCMT 070204-VP1																										0.05~0.12	0.10~1.50	
	DCMT 11T304-VP1																										0.06~0.20	0.10~1.50	
	DCMT 11T308-VP1																										0.08~0.23	0.10~1.50	
Medium to finishing HMP	DCMT 070202-HMP																										0.03~0.12	0.10~1.50	
	DCMT 070204-HMP																											0.06~0.17	0.20~2.30
	DCMT 070208-HMP																											0.08~0.23	0.40~2.30
	DCMT 11T302-HMP																											0.04~0.22	0.10~2.00
	DCMT 11T304-HMP				●																							0.08~0.23	0.30~3.00
	DCMT 11T308-HMP																											0.10~0.30	0.50~3.00
Medium to finishing MP	DCMT 070202-MP	●		●	●	●	●																					0.04~0.12	0.12~1.80
	DCMT 070204-MP	●		●	●	●	●																					0.05~0.15	0.30~1.80
	DCMT 070208-MP	●		●	●	●	●																					0.08~0.22	0.30~1.80
	DCMT 11T302-MP	●		●	●	●	●																					0.04~0.15	0.30~2.00
	DCMT 11T304-MP	●		●	●	●	●																					0.08~0.20	0.50~2.30
	DCMT 11T308-MP	●		●	●	●	●																					0.10~0.30	0.50~2.30
	DCMT 11T312-MP																											0.25~0.35	0.80~3.00
Medium cutting C25 <small>new</small>	DCMT 070202-C25	●	●	●	●	●																						0.03~0.15	0.30~2.00
	DCMT 070204-C25	●	●	●	●	●																						0.05~0.20	0.50~2.50
	DCMT 070208-C25	●	●	●	●	●																						0.06~0.25	0.80~2.50
	DCMT 11T302-C25	●	●	●	●	●																						0.04~0.25	0.50~2.50
	DCMT 11T304-C25	●	●	●	●	●																						0.08~0.30	0.80~3.00
	DCMT 11T308-C25	●	●	●	●	●																						0.10~0.30	1.00~3.00

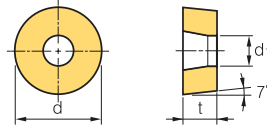
Cutting edge geometry **A52~A61**
 Recommended chip breaker **B04~B11**
 Code system **B26~B27**
 ● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SDACR/L	B178	SDQCR/L	B206
SDJCR/L	B113, 179	SDUCR/L	B207
SDNCN	B114, 179	SDZCR/L	B208



B Turning Insert (Positive)

RC



Dimensions (mm)			
Size	d	t	d ₁
08	8.0	3.18	3.35
10	10.0	3.97	3.6
12	12.0	4.76	4.2
16	16.0	6.35	5.2
20	20.0	6.35	6.5
25	25.0	7.94	7.25
32	32.0	9.52	9.55

Round **R° Positive**
Relief Angle: 7°

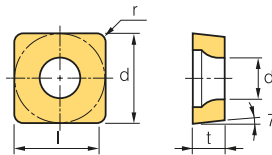
Workpiece	Machining types												
	P	M	K	N	S	H							
Steel	●	●	●	●	●	●	●	●	●	●	●	●	●
Stainless steel	●	●	●	●	●	●	●	●	●	●	●	●	●
Cast iron	●	●	●	●	●	●	●	●	●	●	●	●	●
Non-ferrous metal	●	●	●	●	●	●	●	●	●	●	●	●	●
Heat resistant alloy, Titanium alloy	●	●	●	●	●	●	●	●	●	●	●	●	●
Hardened steel	●	●	●	●	●	●	●	●	●	●	●	●	●

Inserts	Designation	Cermert		Coated										Uncoated		Cutting Condition													
		CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6310	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	f _n (mm/rev)	a _p (mm)			
Medium cutting	VM	RCMT	0803M0-VM																							0.05~0.30	0.80~2.50		
		10T3M0-VM																									0.05~0.35	0.90~3.00	
		1204M0-VM																										0.10~0.50	1.00~3.50
		1606M0-VM																										0.13~0.60	1.30~6.50
Medium cutting	RCMX	1003M0						●	●	●	●	●														0.25~0.50	1.50~4.00		
		1204M0						●	●	●	●	●	●														0.30~0.60	2.50~5.00	
		1606M0							●	●	●	●	●	●													0.40~0.70	3.00~7.00	
		2006M0								●	●	●	●	●														0.48~0.90	3.50~9.00
		2507M0									●	●	●	●	●													0.55~1.20	4.00~12.00
		3209M0									●	●	●	●	●													0.65~1.50	5.00~15.00

➤ Cutting edge geometry A52~A61 ➤ Recommended chip breaker B04~B11 ➤ Code system B26~B27 ● : Stock item

Available tool holders			
Designation	Page	Designation	Page
PRDCN	B162	PRGCR/L	B162

SC



Dimensions (mm)			
Size	d	t	d ₁
09	9.525	3.97	4.4

Square **90° Positive**
Relief Angle: 7°

Workpiece	Machining types												
	P	M	K	N	S	H							
Steel	●	●	●	●	●	●	●	●	●	●	●	●	●
Stainless steel	●	●	●	●	●	●	●	●	●	●	●	●	●
Cast iron	●	●	●	●	●	●	●	●	●	●	●	●	●
Non-ferrous metal	●	●	●	●	●	●	●	●	●	●	●	●	●
Heat resistant alloy, Titanium alloy	●	●	●	●	●	●	●	●	●	●	●	●	●
Hardened steel	●	●	●	●	●	●	●	●	●	●	●	●	●

Inserts	Designation	Cermert		Coated										Uncoated		Cutting Condition											
		CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6310	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	f _n (mm/rev)	a _p (mm)	
Finishing	VF	SCMT	09T304-VF						●								●									0.05~0.20	0.30~1.50

➤ Cutting edge geometry A52~A61 ➤ Recommended chip breaker B04~B11 ➤ Code system B26~B27 ● : Stock item

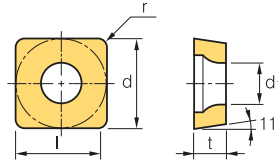
Available tool holders			
Designation	Page	Designation	Page
SSBCR/L	B180	SSKCR/L	B181, 208
SSDCN	B180	SSSCR/L	B181, 234



B Turning Insert (Positive)

SP ○○

Square 90° Positive
Relief Angle: 11°



Dimensions (mm)			
Size	d	t	d ₁
06	6.35	2.38	2.8
07	7.94	2.38	-
09	9.525	3.18	3.4
12	12.7	4.76	-
15	15.875	4.76	-
19	19.05	4.76	-

Workpiece	Machining types															
	P	M	K	N	S	H										
Steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Stainless steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Cast iron	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Non-ferrous metal	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Heat resistant alloy, Titanium alloy	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Hardened steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Inserts	Designation	Cermets		Coated		Coated										Uncoated		Cutting Condition												
		CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6310	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	f _n (mm/rev)	a _p (mm)				
Medium to finishing	SPGA	060204																								0.50-0.25	0.50-2.00			
		090308T	●	●																							0.10-0.25	0.70-3.00		
		090308T-Z		●																							0.10-0.25	0.70-3.00		
		(Z = Special Nega land)																												
Medium to finishing	SPGN	070202																									0.03-0.10	0.50-2.00		
		070208																										0.10-0.25	0.70-3.00	
		090302																										0.03-0.10	0.50-3.00	
		090304																										0.08-0.20	0.70-3.50	
		090308																										0.10-0.25	0.70-3.50	
		120302																										0.03-0.20	0.50-3.00	
		120304																										0.08-0.20	1.00-5.00	
		120308									●																		0.10-0.25	1.00-5.00
		120312																											0.15-0.30	1.00-5.00
		120316																											0.18-0.33	1.00-5.00
		120402																											0.03-0.20	0.50-3.00
		120404																											0.08-0.20	1.00-5.00
		120408																											0.10-0.25	1.00-5.00
		120412																											0.15-0.30	1.00-5.00
		120416																											0.18-0.33	1.00-5.00
		120430																											0.20-0.60	2.00-5.00
		120440																											0.25-0.70	3.00-5.00
		150404																											0.08-0.20	1.50-7.00
		150408																											0.10-0.25	1.50-7.00
		150412																											0.15-0.30	1.50-7.00
150416																											0.18-0.33	1.50-7.00		
150420																											0.20-0.45	1.50-7.00		
190404																											0.08-0.20	1.50-9.00		
190408																											0.10-0.25	1.50-9.00		
190412																											0.15-0.45	1.50-9.00		
190416																											0.18-0.60	1.50-9.00		
190424																											0.25-0.70	2.50-9.00		
Finishing	SPGR	090304-F																									0.05-0.20	0.30-2.00		
		120304-F																									0.10-0.25	0.50-2.00		

➤ Cutting edge geometry A52~A61
➤ Recommended chip breaker B04~B11
➤ Code system B26~B27
● : Stock item

Available tool holders			
Designation	Page	Designation	Page
CSDPN	B169	SSKPR/L	B208
CSKPR/L	B170		

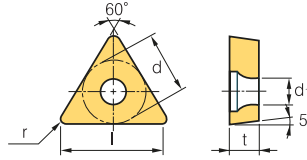


B Turning Insert (Positive)

TB ○○



Triangular **60° Positive**
Relief Angle: 5°



Dimensions (mm)			
Size	d	t	d ₁
06	3.97	1.59	2.16

Workpiece	Machining types																							
	P	M	K	N	S	H	NC3215	NC3120	NC3225	NC3030	NC5330	NC6310	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05
Steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Stainless steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Cast iron	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Non-ferrous metal	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Heat resistant alloy, Titanium alloy	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Hardened steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Inserts	Designation	Cermets		Coated														Uncoated		Cutting Condition						
		CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6310	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	f _n (mm/rev)	a _p (mm)
Finishing	TBGT	060102L	●																				●	●	0.05~0.20	0.10~1.30
		060104L	●																							0.08~0.20
Finishing	TBMT	060102-VL																							0.03~0.06	0.05~0.60

Cutting edge geometry **A52~A61**
 Recommended chip breaker **B04~B11**
 Code system **B26~B27**
 ● : Stock item

Available tool holders			
Designation	Page	Designation	Page
STUBR/L	B214		

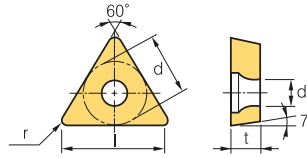


B Turning Insert (Positive)

TC ○○



Triangular **60° Positive**
Relief Angle: 7°



Dimensions (mm)			
Size	d	t	d ₁
09	5.56	2.38	2.5
11	6.35	2.38	2.8
16	9.523	3.97	4.4

Workpiece	Machining types												
	P	M	K	N	S	H							
Steel	●	●	●	●	●	●	●	●	●	●	●	●	●
Stainless steel	●	●	●	●	●	●	●	●	●	●	●	●	●
Cast iron	●	●	●	●	●	●	●	●	●	●	●	●	●
Non-ferrous metal	●	●	●	●	●	●	●	●	●	●	●	●	●
Heat resistant alloy, Titanium alloy	●	●	●	●	●	●	●	●	●	●	●	●	●
Hardened steel	●	●	●	●	●	●	●	●	●	●	●	●	●

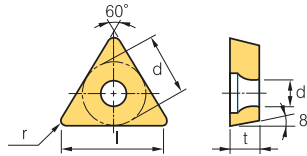
Inserts	Designation	Cermets		Coated											Uncoated		Cutting Condition											
		CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6310	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	f _n (mm/rev)	a _p (mm)		
Medium to finishing 	TCMT	090204-MP												●	●											0.05~0.18	0.10~1.00	
		090208-MP												●	●	●											0.08~0.20	0.10~1.20
		110202-MP						●	●		●			●	●	●				●	●						0.03~0.12	0.20~1.50
		110204-MP						●	●		●			●	●	●				●	●						0.05~0.15	0.20~15.0
		110208-MP						●	●		●			●	●	●				●	●						0.10~0.28	0.25~2.00
		16T302-MP																									0.08~0.25	0.20~1.50
		16T304-MP		●	●	●	●	●	●		●			●	●	●	●	●	●	●	●	●	●				0.08~0.20	0.30~2.50
		16T308-MP		●	●	●	●	●	●		●			●	●	●	●	●	●	●	●	●	●				0.10~0.30	0.50~2.50
		16T312-MP							●	●		●			●	●	●				●	●					0.20~0.40	0.50~2.50
220408-MP																									0.20~0.40	0.50~3.50		
Medium cutting 	TCMT	090204-C25	●	●	●	●	●	●	●	●		●				●	●		●							0.06~0.18	0.40~2.50	
		090208-C25	●	●	●	●	●	●	●	●		●				●	●		●							0.08~0.25	0.80~2.50	
		110202-C25	●	●	●	●	●	●	●	●						●	●		●							0.04~0.12	0.40~2.00	
		110204-C25	●	●	●	●	●	●	●	●	●		●			●	●		●							0.06~0.20	0.60~2.50	
		110208-C25	●	●	●	●	●	●	●	●	●		●			●	●		●			●	●			0.08~0.25	0.80~2.50	
		16T304-C25	●	●	●	●	●	●	●	●	●		●			●	●		●			●	●			0.08~0.28	0.80~3.00	
16T308-C25	●	●	●	●	●	●	●	●	●		●			●	●		●			●	●			0.10~0.30	1.00~3.00			

➤ Cutting edge geometry A52~A61 ➤ Recommended chip breaker B04~B11 ➤ Code system B26~B27 ● : Stock item

TO ○○



Triangular **60° Positive**
Relief Angle: 8°



Dimensions (mm)			
Size	d	t	d ₁
06	3.97	1.59	2.15
09	5.56	2.38	2.8
14	8.2	3.0	3.8

Workpiece	Machining types												
	P	M	K	N	S	H							
Steel	●	●	●	●	●	●	●	●	●	●	●	●	●
Stainless steel	●	●	●	●	●	●	●	●	●	●	●	●	●
Cast iron	●	●	●	●	●	●	●	●	●	●	●	●	●
Non-ferrous metal	●	●	●	●	●	●	●	●	●	●	●	●	●
Heat resistant alloy, Titanium alloy	●	●	●	●	●	●	●	●	●	●	●	●	●
Hardened steel	●	●	●	●	●	●	●	●	●	●	●	●	●

Inserts	Designation	Cermets		Coated											Uncoated		Cutting Condition											
		CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6310	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	f _n (mm/rev)	a _p (mm)		
Medium to finishing 	TOEH	060102L																								0.05~0.17	0.10~1.50	
		090204L																									0.05~0.20	0.30~2.50
		140304L	●																								0.05~0.25	0.30~2.50

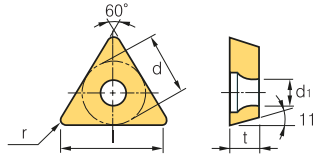
➤ Cutting edge geometry A52~A61 ➤ Recommended chip breaker B04~B11 ➤ Code system B26~B27 ● : Stock item



TP



Triangular 60° Positive
Relief Angle: 11°



Dimensions (mm)			
Size	d	t	d ₁
08	4.76	2.38	2.3
09	5.56	2.38	-
11	6.35	2.38~3.18	3.4
16	9.525	3.18~4.76	4.4
22	12.7	4.76	-
27	15.875	4.76~6.35	-

Workpiece	Machining types															
	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Stainless steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Cast iron	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Non-ferrous metal	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Heat resistant alloy, Titanium alloy	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Hardened steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Inserts	Designation	Cermets		Coated		Coated													Uncoated		Cutting Condition							
		CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6310	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	f _n (mm/rev)	a _p (mm)		
Finishing	TPGH	080202L	●																							0.01~0.12	0.06~1.70	
		080204L	●	●																						0.01~0.15	0.08~1.70	
		110202L																									0.01~0.12	0.06~2.00
		110204L																									0.01~0.15	0.08~2.00
Medium to finishing	TPGN	090204																								0.07~0.20	0.70~2.00	
		110302																								0.05~0.15	0.50~2.00	
		110304								●														●		0.07~0.20	0.70~3.00	
		110308								●														●		0.10~0.25	1.00~3.00	
		160302																								0.05~0.18	1.00~5.00	
		160304								●	●													●		0.07~0.20	1.00~5.00	
		160308								●	●													●		0.10~0.25	1.00~5.00	
		160310																									0.10~0.25	1.00~5.00
		160312																									0.15~0.30	1.00~5.00
		160316																									0.15~0.30	1.00~5.00
		160404																									0.07~0.20	1.00~5.00
		220404									●																0.07~0.20	1.50~7.00
		220408									●	●															0.10~0.25	1.50~7.00
		220412									●																0.15~0.30	1.50~7.00
		220430																									0.30~0.45	1.50~7.00
		220440																									0.30~0.50	1.50~7.00
270408																									0.15~0.25	3.00~8.00		
270608																									0.15~0.25	3.00~8.00		
Finishing	TPGR	110302-F																								0.05~0.15	0.10~1.50	
		110304-F																								0.05~0.20	0.30~1.50	
		160304-F																								0.08~0.25	0.50~2.00	
Medium cutting	TPGR	110308-M																								0.13~0.30	1.00~3.00	
		160308-M																								0.13~0.30	1.00~5.00	

➡ Cutting edge geometry A52~A61
➡ Recommended chip breaker B04~B11
➡ Code system B26~B27
● : Stock item

Available tool holders			
Designation	Page	Designation	Page
STFPR/L	B210	STUPR/L	B215
CTFPR/L	B170	CTGPR/L	B170

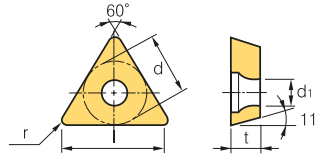


B Turning Insert (Positive)

TP ○○



Triangular 60° Positive
Relief Angle: 11°



Dimensions (mm)			
Size	d	t	d ₁
08	4.76	2.38	2.3
09	5.56	2.38	3.0
11	6.35	3.18	3.4
16	9.525	3.18~4.76	4.4
22	12.7	4.76	-

Workpiece	Machining types															
	P	M	K	N	S	H										
Steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Stainless steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Cast iron	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Non-ferrous metal	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Heat resistant alloy, Titanium alloy	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Hardened steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Inserts	Designation	Cermets		Coated		Coated										Uncoated		Cutting Condition											
		CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6310	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	f _n (mm/rev)	a _p (mm)			
Medium to finishing	TPGT	080202R																								0.05-0.20	0.30-1.50		
		110302R																									0.05-0.20	0.30-1.50	
		110304R	●																								0.05-0.20	0.50-2.00	
		110308R																									0.07-0.25	0.50-2.00	
		160404R	●																								0.05-0.20	0.70-3.00	
		160408R																									0.05-0.20	0.70-3.00	
		080202L	●																				●	●			0.05-0.20	0.30-1.50	
		110302L																										0.05-0.20	0.30-1.50
		110304L	●	●																								0.05-0.20	0.50-2.00
		110308L																										0.07-0.25	0.50-2.00
		160404L	●																									0.05-0.20	0.70-3.00
160408L																										0.05-0.20	0.70-3.00		
Medium to finishing	TPGX	090202L																								0.10-0.20	0.30-1.00		
		090204L		●																							0.10-0.25	0.50-1.00	
		090208L																									0.10-0.30	1.00-1.00	
		110304L																									0.10-0.25	0.50-1.20	
Finishing	TPMR	090202-F																								0.05-0.15	0.10-1.00		
		090204-F																									0.05-0.15	0.10-1.00	
		110302-F																									0.05-0.15	0.10-1.50	
		110304-F						●	●	●													●				0.05-0.20	0.30-1.50	
		110308-F																										0.05-0.25	0.30-1.50
		160304-F																					●	●				0.08-0.25	0.50-2.00
160308-F																										0.08-0.25	0.50-3.00		
Medium cutting	TPMR	110304-M																									0.10-0.25	0.70-3.00	
		110308-M									●		●														0.13-0.30	1.00-3.00	
		160304-M										●		●													0.10-0.25	1.00-5.00	
		160308-M								●	●	●		●													0.13-0.30	1.00-5.00	
		160312-M										●																0.15-0.35	1.00-5.00
		220408-M										●																0.13-0.30	1.50-7.00

Cutting edge geometry A52~A61
 Recommended chip breaker B04~B11
 Code system B26~B27
 ● : Stock item

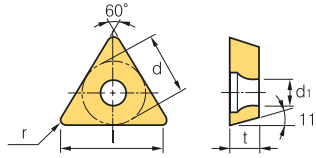
Available tool holders			
Designation	Page	Designation	Page
STFPR/L	B210	STUPR/L	B215
CTFPR/L	B170	CTGPR/L	B170



TP



Triangular 60° Positive
Relief Angle: 11°



Dimensions (mm)			
Size	d	t	d ₁
09	5.56	3.18	-
11	6.35	3.18	3.4
16	9.525	3.18~4.76	4.4
22	12.7	4.76	-
33	19.05	6.35	-

Workpiece	Material												Machining types		
	Steel	Stainless steel	Cast iron	Non-ferrous metal	Heat resistant alloy, Titanium alloy	Hardened steel	P	M	K	N	S	H	Continuous cutting	General cutting	Interrupted cutting
Steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Stainless steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Cast iron	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Non-ferrous metal	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Heat resistant alloy, Titanium alloy	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Hardened steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Inserts	Designation	Cermets		Coated		Coated										Uncoated		Cutting Condition										
		CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6310	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	f _n (mm/rev)	a _p (mm)		
Finishing 	TPMT	110304-VF	●					●	●								●									0.05~0.20	0.30~1.50	
		110308-VF						●	●											●						0.10~0.25	0.30~1.50	
		160404-VF																								0.05~0.20	0.30~2.00	
		160408-VF																								0.10~0.25	0.30~2.00	
Finishing 	TPMT	090204-VL																								0.04~0.10	0.10~0.90	
		090208-VL																								0.06~0.12	0.10~1.00	
		110304-VL	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	0.05~0.15	0.10~1.30
		110308-VL					●							●	●											0.08~0.20	0.10~1.30	
		160404-VL																								0.05~0.20	0.30~1.50	
		160408-VL																								0.05~0.20	0.30~1.50	
Medium to finishing 	TPMT	090202-MP																								0.03~0.15	0.10~1.00	
		090204-MP																								0.05~0.18	0.10~1.00	
		110302-MP																								0.03~0.12	0.20~1.50	
		110304-MP	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	0.05~0.20	0.20~1.50
		110308-MP					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	0.10~0.28	0.30~2.00
		160402-MP																								0.06~0.20	0.30~2.50	
		160404-MP						●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	0.08~0.20	0.30~2.50
		160408-MP						●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	0.10~0.30	0.50~2.50
Medium to finishing 	TPUN	090308																								0.10~0.30	0.50~2.00	
		110208																								0.15~0.40	1.00~3.00	
		110304																								0.10~0.30	1.00~3.00	
		110308																								0.15~0.40	1.00~3.00	
		160304								●																0.10~0.30	1.00~5.00	
		160308								●							●									0.15~0.40	1.00~5.00	
		160308TN																								0.15~0.40	1.00~5.00	
		160312																								0.20~0.50	1.50~5.00	
		160312TN																								0.20~0.50	1.50~5.00	
		220404																								0.10~0.30	1.50~7.00	
		220408									●															0.15~0.40	1.50~7.00	
		220412																								0.20~0.50	1.50~7.00	
		220412TN																								0.20~0.50	1.50~7.00	
		330620																								0.30~0.70	3.00~10.00	

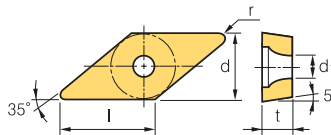
🔄 Cutting edge geometry A52~A61
🔄 Recommended chip breaker B04~B11
🔄 Code system B26~B27
● : Stock item

Available tool holders			
Designation	Page	Designation	Page
STFPR/L	B210	STUPR/L	B215
CTFPR/L	B170	CTGPR/L	B170



B Turning Insert (Positive)

VB



Dimensions (mm)			
Size	d	t	d ₁
11	6.35	3.18	2.8
16	9.525	4.76	4.4

Rhombic **35° Positive**
Relief Angle: 5°

Workpiece	Machining types											
	P	M	K	N	S	H						
Steel	●	●	●	●	●	●	●	●	●	●	●	●
Stainless steel	●	●	●	●	●	●	●	●	●	●	●	●
Cast iron	●	●	●	●	●	●	●	●	●	●	●	●
Non-ferrous metal	●	●	●	●	●	●	●	●	●	●	●	●
Heat resistant alloy, Titanium alloy	●	●	●	●	●	●	●	●	●	●	●	●
Hardened steel	●	●	●	●	●	●	●	●	●	●	●	●

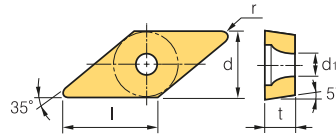
Inserts	Designation	Cermets		Coated		Coated												Uncoated		Cutting Condition								
		CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6310	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	f _n (mm/rev)	a _p (mm)		
Finishing 	VBGT	1103003R-KF																								0.01-0.06	0.04-1.30	
		110301R-KF																									0.02-0.08	0.05-1.50
		110302R-KF																						●			0.03-0.13	0.06-1.70
		1103003L-KF																									0.01-0.06	0.04-1.30
		110301L-KF																									0.02-0.08	0.05-1.50
		110302L-KF																									0.03-0.13	0.06-1.70
Finishing 	VBGT	110302-VP1																								0.03-0.10	0.08-1.50	
		160402-VP1																								0.04-0.20	0.16-1.50	
		160404-VP1																								0.05-0.20	0.18-1.80	
Medium to finishing 	VBGT	160404																								0.07-0.20	0.50-1.50	
		160408																								0.15-0.25	0.70-2.00	
Medium to finishing 	VBGT	1103003R-KM																								0.01-0.06	0.04-1.30	
		110301R-KM																									0.02-0.08	0.05-1.50
		110302R-KM																									0.03-0.13	0.06-1.70
		160404R-KM																									0.05-0.15	0.50-2.00
		1103003L-KM																									0.01-0.06	0.04-1.30
		110301L-KM																									0.02-0.08	0.05-1.50
		110302L-KM																									0.03-0.13	0.06-1.70
		160404L-KM																									0.05-0.15	0.50-2.00
Finishing 	VBMT	110302-VB																								0.05-0.15	0.20-1.20	
		110304-VB																								0.06-0.18	0.20-1.20	
		110308-VB																								0.08-0.20	0.60-1.20	
		160402-VB																								0.06-0.20	0.05-1.00	
		160404-VB	●	●						●																	0.08-0.20	0.20-1.50
		160408-VB	●	●						●																	0.10-0.23	0.50-1.50
		160412-VB																									0.12-0.25	0.80-1.50
Finishing 		160404-VF	●	●	●				●	●						●				●					0.05-0.20	0.30-1.00		
		160408-VF	●	●	●												●									0.10-0.25	0.30-1.00	

Cutting edge geometry A52~A61
 Recommended chip breaker B04~B11
 Code system B26~B27
 ● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SVABR/L	B183	SVVBN	B184
SVHBR/L	B183	SVQBR/L	B211
SVJBR/L	B115, 183	SVUBR/L	B212



VB



Dimensions (mm)			
Size	d	t	d ₁
11	6.35	2.38~3.18	2.8~3.4
16	9.525	4.76	4.4

Rhombic 35° Positive
Relief Angle: 5°

Workpiece	Steel	P															Machining types
	Stainless steel	M															
Cast iron	K															● Continuous cutting ● General cutting ✱ Interrupted cutting	
Non-ferrous metal	N																
Heat resistant alloy, Titanium alloy	S																
Hardened steel	H																

Inserts	Designation	Cermet		Coated		Coated										Uncoated		Cutting Condition										
		CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6310	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	f _n (mm/rev)	a _p (mm)		
Finishing [Mild steel]	VBMT 110302-VL																									0.03~0.20	0.20~1.20	
	110304-VL																										0.04~0.20	0.20~1.20
	110308-VL																										0.08~0.20	0.20~1.20
	160402-VL																										0.03~0.20	0.30~1.50
	160404-VL	●		●	●	●	●		●		●		●	●	●	●	●	●	●	●	●	●					0.05~0.20	0.30~1.50
	160408-VL	●		●	●	●	●		●		●		●	●	●	●	●	●	●	●	●	●					0.10~0.20	0.30~1.50
	160412-VL																										0.10~0.25	0.30~1.50
Finishing 	VBMT 160402-VP1																									0.04~0.20	0.16~1.50	
	160404-VP1																										0.05~0.20	0.18~1.80
	160408-VP1																										0.06~0.20	0.20~1.80
Medium to finishing 	VBMT 160404		●					●		●		●														0.07~0.20	0.50~1.50	
	160408							●	●	●		●															0.15~0.25	0.70~2.00
Medium to finishing 	VBMT 110304-HMP							●																		0.03~0.20	0.15~2.70	
	110308-HMP							●																			0.05~0.25	0.40~2.70
	160404-HMP							●		●	●		●				●			●							0.07~0.20	0.20~2.70
	160408-HMP							●	●	●	●		●				●			●							0.09~0.27	0.50~2.70
	160412-HMP																										0.11~0.32	0.50~2.70
Medium to finishing 	VBMT 110302-MP																										0.04~0.14	0.20~1.50
	110304-MP							●		●																	0.05~0.15	0.20~1.50
	110308-MP							●		●																	0.10~0.28	0.30~2.00
	160402-MP																										0.06~0.16	0.25~2.00
	160404-MP	●		●	●	●	●	●		●		●	●	●	●	●	●	●	●	●	●	●					0.08~0.20	0.30~2.00
	160408-MP	●		●	●	●	●	●		●		●	●	●	●	●	●	●	●	●	●	●					0.10~0.25	0.50~2.30
	160412-MP	●		●				●		●		●															0.10~0.35	0.50~2.30

🔄 Cutting edge geometry A52~A61
🔄 Recommended chip breaker B04~B11
🔄 Code system B26~B27
● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SVABR/L	B183	SVVBN	B184
SVHBR/L	B183	SVQBR/L	B211
SVJBR/L	B115, 183	SVUBR/L	B212

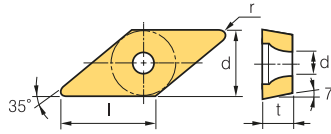


B Turning Insert (Positive)

VC ○ ○



Rhombic 35° Positive
Relief Angle: 7°



Dimensions (mm)			
Size	d	t	d ₁
11	6.35	3.18	2.8~3.4
16	9.525	4.76	4.4

Workpiece	Material Groups												Machining types			
	P	M	K	N	S	H										
Steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Stainless steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Cast iron	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Non-ferrous metal	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Heat resistant alloy, Titanium alloy	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Hardened steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

● Continuous cutting
 ● General cutting
 ● Interrupted cutting

Inserts	Designation	Cermets		Coated		Coated										Uncoated		Cutting Condition										
		CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6310	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	f _n (mm/rev)	a _p (mm)		
Finishing KF [High precision]	VCET	1103005MFR-KF														●										0.01~0.06	0.04~1.30	
		110301MFR-KF															●				●						0.02~0.08	0.05~1.50
		110302MFR-KF															●				●						0.03~0.11	0.06~1.70
		1103005MFL-KF															●										0.01~0.06	0.04~1.30
		110301MFL-KF																●									0.02~0.08	0.05~1.50
		110302MFL-KF																●				●						0.03~0.11
Medium to finishing KM [High precision]	VCET	1103005MFR-KM															●									0.02~0.08	0.05~1.50	
		110301MFR-KM															●				●						0.03~0.11	0.06~1.70
		110302MFR-KM																●				●					0.04~0.15	0.08~2.00
		1103005MFL-KM																●									0.02~0.08	0.05~1.50
		110301MFL-KM																	●								0.03~0.11	0.06~1.70
		110302MFL-KM																	●								0.04~0.15	0.08~2.00
Finishing KF	VCGT	1103003R-KF																								0.01~0.06	0.04~1.30	
		110301R-KF																								0.02~0.08	0.05~1.50	
		110302R-KF																						●		0.03~0.13	0.06~1.70	
		1103003L-KF																								0.01~0.06	0.04~1.30	
		110301L-KF																								0.02~0.08	0.05~1.50	
		110302L-KF																								0.03~0.13	0.06~1.70	
Finishing VP1	VCGT	110301-VP1														●	●	●	●	●	●	●	●	●	0.02~0.15	0.05~0.50		
		110302-VP1														●	●	●	●	●	●	●	●	●	0.02~0.18	0.10~1.00		
		110304-VP1														●	●	●	●	●	●	●	●	●	0.03~0.18	0.15~1.20		
		160404-VP1								●																0.05~0.20	0.18~1.80	
		160408-VP1								●																	0.06~0.20	0.20~1.80
		Finishing VP1 [High precision]	VCGT	110301MFN-VP1														●				●					0.02~0.15	0.05~0.50
110302MFN-VP1																●				●					0.02~0.18	0.10~1.00		
110304MFN-VP1																●				●					0.03~0.18	0.15~1.20		
1203008FN-VP1																	●									0.03~0.12	0.06~1.20	
120301FN-VP1																		●								0.04~0.13	0.08~1.20	
120302FN-VP1																		●								0.04~0.15	0.08~1.20	
Medium to finishing KM	VCGT	1103003R-KM																							0.01~0.06	0.04~1.30		
		110301R-KM																							0.02~0.08	0.05~1.50		
		110302R-KM																						●	0.03~0.13	0.06~1.70		
		1103003L-KM																							0.01~0.06	0.04~1.30		
		110301L-KM																							0.02~0.08	0.05~1.50		
		110302L-KM																							0.03~0.13	0.06~1.70		

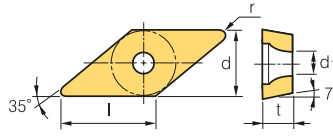
↻ Cutting edge geometry A52~A61
 ↻ Recommended chip breaker B04~B11
 ↻ Code system B26~B27
 ● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SVJCR/L	B115, 184, 211	SVQCR/L	B212
SVVCN	B184	SVUCR/L	B212



VC

Rhombic **35° Positive**
Relief Angle: 7°



Dimensions (mm)			
Size	d	t	d ₁
08	4.76	2.38	2.3
11	6.35	3.18	2.8~3.4
12	7.5	3.18	2.8
16	9.525	4.76	4.4

Workpiece	Machining types															
	P	M	K	N	S	H	●	●	●	●	●	●	●	●	●	●
Steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Stainless steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Cast iron	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Non-ferrous metal	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Heat resistant alloy, Titanium alloy	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Hardened steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Inserts	Designation	Cermet		Coated		Coated										Uncoated		Cutting Condition									
		CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6310	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	f _n (mm/rev)	a _p (mm)	
Finishing [High precision]	VCGX	120300MFR-VP1														●				●					0.02~0.10	0.05~0.50	
		120301MFR-VP1														●				●						0.02~0.15	0.05~0.50
		120302MFR-VP1														●				●						0.02~0.18	0.10~1.00
		120304MFR-VP1														●				●						0.03~0.20	0.12~1.20
		120308MFR-VP1														●				●						0.05~0.20	0.15~1.20
Finishing 	VCMT	080202-VF																							0.05~0.20	0.30~1.00	
		080204-VF									●														0.10~0.25	0.30~1.00	
		110304-VF								●															0.03~0.18	0.15~1.20	
		160404-VF								●		●									●				0.04~0.20	0.15~1.50	
Finishing [Mild steel]	VCMT	080202-VL					●		●		●					●									0.03~0.08	0.10~0.80	
		080204-VL					●		●		●					●									0.04~0.10	0.10~0.90	
		160404-VL					●		●		●					●				●	●				0.05~0.20	0.30~1.50	
		160408-VL					●		●		●					●				●	●				0.05~0.20	0.30~1.50	
		160412-VL																							0.10~0.25	0.30~1.50	
Finishing 	VCMT	160404-VP1																							0.05~0.20	0.18~1.80	
		160408-VP1																							0.06~0.20	0.20~1.80	
Medium to finishing 	VCMT	160404-HMP								●		●				●				●	●				0.10~0.25	0.30~2.60	
		160408-HMP								●		●				●				●	●				0.13~0.33	0.60~2.60	
Medium to finishing new	VCMT	080202-MP					●		●																0.03~0.15	0.10~1.00	
		080204-MP					●		●																0.05~0.18	0.10~1.00	
		110302-MP																							0.06~0.18	0.20~1.80	
		110304-MP																							0.06~0.18	0.20~1.80	
		160404-MP						●		●			●	●	●	●				●	●				0.08~0.18	0.30~2.00	
		160408-MP						●		●			●	●	●	●				●	●				0.10~0.23	0.50~2.30	
		160412-MP														●	●	●		●	●				0.10~0.33	0.50~2.30	

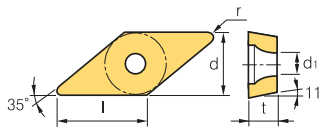
↻ Cutting edge geometry **A52~A61**
 ↻ Recommended chip breaker **B04~B11**
 ↻ Code system **B26~B27**
 ● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SVJCR/L	B115, 184, 211	SVQCR/L	B212
SVVCN	B184	SVUCR/L	B212



B Turning Insert (Positive)

VP ○ ○



Dimensions (mm)			
Size	d	t	d ₁
08	6.35	2.38	2.3
11	6.35	3.18	2.8

Rhombic **35° Positive**
Relief Angle: 11°

Workpiece	Machining types											
	P	M	K	N	S	H						
Steel	●	●	●	●	●	●	●	●	●	●	●	●
Stainless steel	●	●	●	●	●	●	●	●	●	●	●	●
Cast iron	●	●	●	●	●	●	●	●	●	●	●	●
Non-ferrous metal	●	●	●	●	●	●	●	●	●	●	●	●
Heat resistant alloy, Titanium alloy	●	●	●	●	●	●	●	●	●	●	●	●
Hardened steel	●	●	●	●	●	●	●	●	●	●	●	●

Inserts	Designation	Cermets		Coated		Coated										Uncoated		Cutting Condition										
		CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6310	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	f _n (mm/rev)	a _p (mm)		
Finishing [High precision]	VPET	0802005MFR-KF															●			●						0.01~0.12	0.05~0.50	
		080201MFR-KF																●			●						0.02~0.15	0.05~0.50
		080202MFR-KF																●			●						0.02~0.18	0.10~1.00
		0802005MFL-KF																●			●						0.01~0.12	0.05~0.50
		080201MFL-KF																●			●						0.02~0.15	0.05~0.50
		080202MFL-KF																●			●						0.02~0.18	0.10~1.00
Medium to finishing [High precision]	VPET	0802005MFR-KM															●			●						0.01~0.12	0.05~0.50	
		080201MFR-KM															●			●						0.02~0.15	0.05~0.50	
		080202MFR-KM															●			●						0.02~0.18	0.10~1.00	
		0802005MFL-KM															●			●						0.01~0.12	0.05~0.50	
		080201MFL-KM															●			●						0.02~0.15	0.05~0.50	
		080202MFL-KM															●			●						0.02~0.18	0.10~1.00	
Finishing 	VPGT	110301-VP1															●		●	●	●		●		0.02~0.15	0.05~0.50		
		110302-VP1															●		●	●	●		●		0.02~0.18	0.10~1.00		
		110304-VP1															●		●	●	●		●		0.03~0.18	0.15~1.20		
Finishing [High precision]	VPGT	110301MFN-VP1															●		●					0.02~0.15	0.05~0.50			
		110302MFN-VP1															●		●					0.02~0.18	0.10~1.00			
		110304MFN-VP1															●		●					0.03~0.18	0.15~1.20			

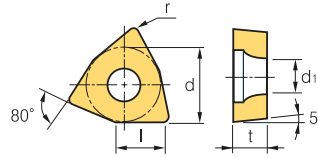
Cutting edge geometry **A52~A61**
 Recommended chip breaker **B04~B11**
 Code system **B26~B27**
 ● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SVABR/L	B183	SVVBN	B184
SVJBR/L	B115, 183		



WB

Dimensions (mm)			
Size	d	t	d ₁
02	3.97	1.59	2.2
S3	4.76	2.38	2.4



Trigon 80° Positive
Relief Angle: 5°

Workpiece	Machining types															
	P	M	K	N	S	H	1	2	3	4	5	6	7	8	9	10
Steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Stainless steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Cast iron	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Non-ferrous metal	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Heat resistant alloy, Titanium alloy	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Hardened steel	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Inserts	Designation	Cermet		Coated		Coated										Uncoated		Cutting Condition										
		CN1500	CN2000	CN2500	CC1500	CC2500	NC3215	NC3120	NC3225	NC3030	NC5330	NC6310	NC6315	NC9115	NC9125	NC9135	PC5300	PC5400	PC8105	PC8110	PC8115	PC9030	H01	H05	f _n (mm/rev)	a _p (mm)		
Medium to finishing	WBGT 020102R																									0.01~0.05	0.10~0.30	
	S30204R																										0.01~0.10	0.10~0.50
	020102L	●																					●	●		0.01~0.08	0.10~0.40	
	S30202L																										0.01~0.08	0.10~0.40
	S30204L																										0.01~0.10	0.10~0.50

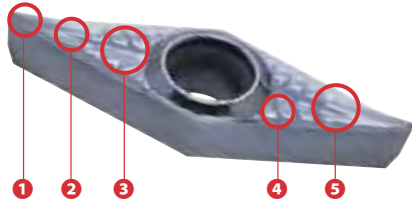
➡ Cutting edge geometry **A52~A61**
 ➡ Recommended chip breaker **B04~B11**
 ➡ Code system **B26~B27**
 ● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SWUBR/L	B216		

Technical Information for Aluminum

AK special chip breaker for aluminum

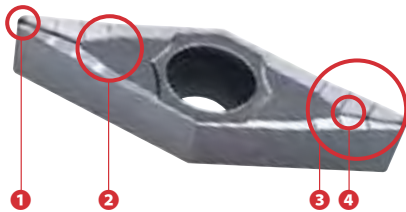
- Unique and 3-dimensional rake angle controls chip breaking and chip flow ensuring longer tool life and reducing cutting load
- High rake angle at cutting edge part reduces cutting load to increase tool life
- Buffed finish on top face controls chip flow reducing built-up edge



- 1 High rake angle & tabby pattern chip pocket - Low cutting load
- 2 Unique rake angle design - Effective chip breaking and good chip flow
- 3 Unique and 3-dimensional top face - Longer tool life & Excellent surface roughness
- 4 Tabby pattern & Sharp cutting edge - Distributing cutting load, long tool life
- 5 Buffed on top face - Excellent machining, Reducing built-up edge, Excellent chip flow

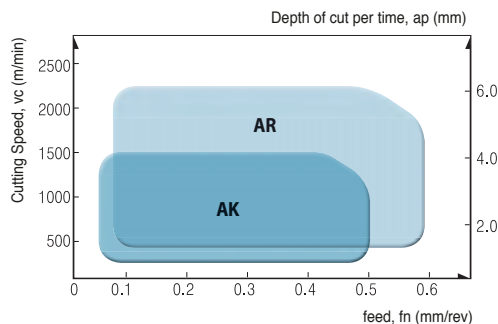
AR special chip breaker for aluminum

- AR chip breaker ensures reliability and good cutting performance at high feed, speed and interrupted machining

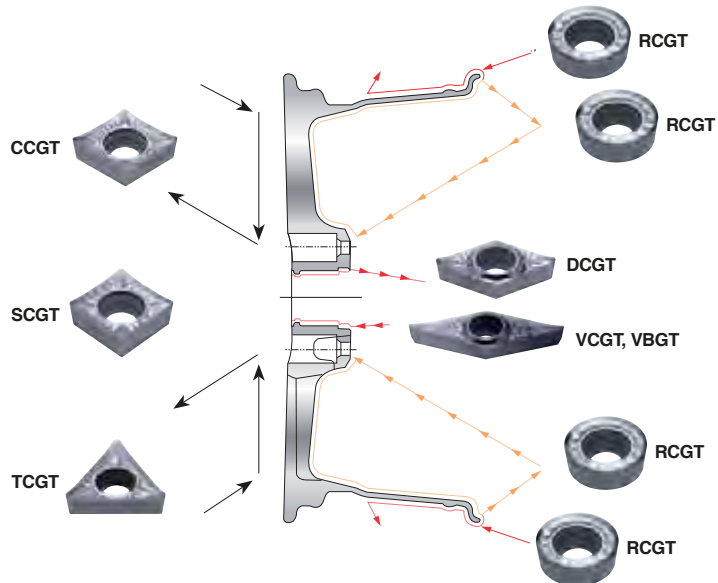


- 1 Flat corner cutting edge improved productivity at high feed machining and ensures good surface roughness and reliability owing to strong cutting edge
- 2 Specially buffed on top face controls chip flow reducing built-up edge
- 3 KORLOY's own technology applied for cutting edge and corner shape controlling chip flow ensures longer tool life
- 4 KORLOY special chip breaker design controls chip flow at high speed machining

AK and AR chip breaker specially developed for aluminum



	Recommendation range	Grades
AK	ap=0.1~5.0 mm fn=0.03~0.5 mm/rev	H01 (Uncoated cemented carbides K10~K20) ND1000 (Diamond coating) PD1000 (DLC coating)
AR	ap=0.5~6.0 mm fn=0.05~0.6 mm/rev	H01 (Uncoated cemented carbides K10~K20) ND1000 (Diamond coating) PD1000 (DLC coating)



Features of H01 and cutting conditions

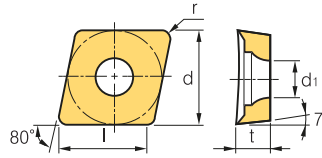
- Good for aluminum and alloy steel machining - Surface treatment reduces built-up edge
- 3-dimensional design reduces cutting resistance and ensures high machinability in high feed and speed machining

Workpiece		Hardness (HB)	kc (MPa)	vc (m/min)	fn (mm/rev)
Aluminum alloy (forged)	before heat treatment	50~70	500~600	1000~2500	0.1~0.6
	after heat treatment	90~110	700~900	300~1000	0.1~0.5
Aluminum alloy (cast)	before heat treatment	70~80	700~800	300~1000	0.1~0.6
	after heat treatment	80~100	800~950	200~600	0.1~0.4
Copper alloy	-	90~110	700	250~600	0.1~0.5
Non-ferrous metal, etc	-	100	1700	150~300	0.1~0.6



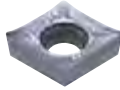
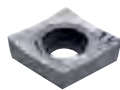
CC ○ ○

 Rhombic **80° Positive**
Relief Angle: 7°



Dimensions (mm)			
Size	d	t	d ₁
06	6.35	2.38	2.8
09	9.525	3.97	4.4
12	12.7	4.76	5.5

Workpiece	Steel	P						Machining types	
	Stainless steel	M						● Continuous cutting ● General cutting ✦ Interrupted cutting	
	Cast iron	K							
	Non-ferrous metal	N	✦	●	✦	✦	✦		
	Heat resistant alloy, Titanium alloy	S							
Hardened steel	H								


Inserts	Designation	Coated			Uncoated		Cutting Condition		
		PC5040	PD1000	PD1010	H01	H05	fn (mm/rev)	ap (mm)	
AK 	CCGT	060202-AK	●			●	●	0.01~0.12	0.05~3.00
		060204-AK	●		●	●	●	0.02~0.15	0.10~3.00
		060208-AK				●	●	0.02~0.20	0.10~4.00
		09T302-AK	●		●	●	●	0.02~0.20	0.05~3.00
		09T304-AK	●		●	●	●	0.02~0.30	0.10~5.00
		09T308-AK	●			●	●	0.03~0.50	0.10~5.00
		120402-AK				●	●	0.02~0.30	0.05~4.00
		120404-AK	●		●	●	●	0.03~0.50	0.10~5.00
		120408-AK				●	●	0.04~0.80	0.10~5.50
	AR 	CCGT	060202-AR				●	●	0.02~0.30
		060204-AR						0.03~0.35	0.50~4.50
		060208-AR						0.04~0.50	0.50~4.50
		09T302-AR				●	●	0.03~0.45	0.30~4.00
		09T304-AR				●	●	0.04~0.50	0.50~4.50
		09T308-AR				●	●	0.05~0.60	0.50~6.00
		120402-AR						0.04~0.50	0.30~5.00
		120404-AR				●	●	0.05~0.60	0.50~6.00
		120408-AR				●	●	0.06~0.65	0.50~6.00
		120412-AR						0.08~0.70	0.50~6.50

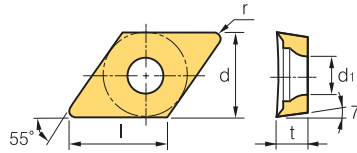
 Cutting edge geometry **A52~A61**
  Recommended chip breaker **B04~B11**
  Code system **B26~B27**
 ● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SCACR/L	B113, 178	SCLCR/L	B113, 178, 204

B Aluminum Insert (Positive)


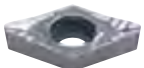
DC ○○

 Rhombic **55° Positive**
Relief Angle: 7°



Dimensions (mm)			
Size	d	t	d ₁
07	6.35	2.38	2.8
11	9.525	3.97	4.4

Workpiece	Steel	P						Machining types
	Stainless steel	M						
Cast iron	K							
Non-ferrous metal	N	✱	●	✱	●	✱		
Heat resistant alloy, Titanium alloy	S							
Hardened steel	H							

Inserts	Designation	Coated			Uncoated		Cutting Condition	
		PC5040	PD1000	PD1010	H01	H05	f _n (mm/rev)	a _p (mm)
AK 	DCGT 070202-AK	●			●	●	0.01~0.20	0.05~3.00
	070204-AK	●		●	●	●	0.02~0.30	0.10~4.00
	070208-AK	●			●	●	0.03~0.40	0.10~4.00
	11T302-AK	●		●	●	●	0.02~0.30	0.05~4.00
	11T304-AK	●	●	●	●	●	0.03~0.50	0.10~5.00
	11T308-AK	●		●	●	●	0.03~0.50	0.10~5.00
	11T312-AK					●	●	0.04~0.60
AR 	DCGT 070202-AR				●	●	0.02~0.30	0.30~4.00
	070204-AR				●	●	0.03~0.40	0.50~5.00
	070208-AR				●	●	0.04~0.50	0.50~5.00
	11T302-AR						0.03~0.45	0.30~6.00
	11T304-AR				●	●	0.04~0.50	0.50~6.00
	11T308-AR				●	●	0.05~0.60	0.50~6.00
	11T312-AR				●	●	0.08~0.65	0.50~6.50

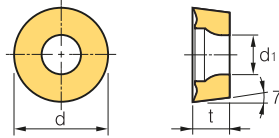
 Cutting edge geometry **A52~A61**
 Recommended chip breaker **B04~B11**
 Code system **B26~B27**
●: Stock item

Available tool holders			
Designation	Page	Designation	Page
SDACR/L	B178	SDQCR/L	B206
SDJCR/L	B113, 179	SDUCR/L	B207
SDNCN	B114, 179	SDZCR/L	B208



RC

Round **Positive**
Relief Angle: 7°



Dimensions (mm)			
Size	d	t	d ₁
06	6.0	2.38	2.8
08	8.0	3.18	3.35
10	10.0	3.18~3.97	4.4
12	12.0	4.76	4.4

Workpiece	Steel	P					Machining types
	Stainless steel	M					
Cast iron	K						<ul style="list-style-type: none"> ● Continuous cutting ● General cutting ✦ Interrupted cutting
Non-ferrous metal	N	✦	●	✦	✦	✦	
Heat resistant alloy, Titanium alloy	S						
Hardened steel	H						

Inserts	Designation	Coated			Uncoated		Cutting Condition	
		PC5040	PD1000	PD1010	H01	H05	f _n (mm/rev)	a _p (mm)
AK 	RCGT 0602M0-AK				●	●	0.05~0.20	0.50~2.00
	0803M0-AK				●	●	0.05~0.25	0.50~2.50
	1003M0-AK				●	●	0.10~0.30	1.00~3.00
	10T3M0-AK						0.10~0.30	1.00~3.00
	1204M0-AK				●	●	0.10~0.35	1.00~3.50
AR 	RCGT 0602M0-AR						0.05~0.20	0.50~2.00
	0803M0-AR						0.05~0.25	0.50~2.50
	1003M0-AR				●	●	0.10~0.30	1.00~3.00
	10T3M0-AR						0.10~0.30	1.00~3.00
	1204M0-AR						0.10~0.35	1.00~3.50

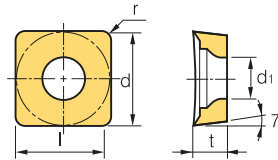
Cutting edge geometry **A52~A61**
 Recommended chip breaker **B04~B11**
 Code system **B26~B27**
 ● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SRDCN	B179	SRGCR/L	B180

B Aluminum Insert (Positive)

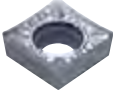
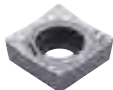
SC ○○

 Square **90° Positive**
Relief Angle: 7°



Dimensions (mm)			
Size	d	t	d ₁
09	9.525	3.97	4.4
12	12.7	4.76	5.5

Workpiece	Machining types						
	Steel						
Stainless steel							
Cast iron							
Non-ferrous metal		✱	●	✱	●	✱	
Heat resistant alloy, Titanium alloy							
Hardened steel							

Inserts	Designation	Coated			Uncoated		Cutting Condition	
		PC5040	PD1000	PD1010	H01	H05	f _n (mm/rev)	a _p (mm)
	SCGT	09T302-AK	●			●	0.02~0.30	0.10~4.00
		09T304-AK	●			● ●	0.04~0.40	0.10~5.00
		09T308-AK				● ●	0.03~0.40	0.10~5.00
		120404-AK				● ●	0.03~0.50	0.10~5.00
		120408-AK				● ●	0.04~0.60	0.15~5.50
		120416-AK					0.04~0.60	0.15~5.50
	SCGT	09T302-AR					0.03~0.40	0.50~5.00
		09T304-AR				● ●	0.04~0.50	0.50~6.00
		09T308-AR					0.04~0.50	0.50~6.50
		120404-AR				● ●	0.05~0.60	0.50~6.50
		120408-AR					0.05~0.60	0.50~7.00
		120416-AR					0.05~0.60	0.50~7.00

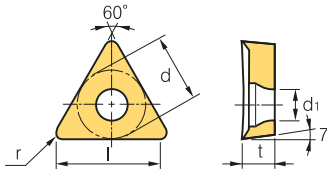
Cutting edge geometry **A52~A61**
 Recommended chip breaker **B04~B11**
 Code system **B26~B27**
●: Stock item

Available tool holders			
Designation	Page	Designation	Page
SSBCR/L	B180	SSKCR/L	B181
SSDCN	B180	SSSCR/L	B181





TC

Triangular 60° Positive
Relief Angle: 7°



Dimensions (mm)			
Size	d	t	d ₁
09	5.56	2.38	2.5
11	6.35	2.38	2.8
16	9.525	3.97	4.4

Workpiece	Steel	P						Machining types
	Stainless steel	M						
Cast iron	K							
Non-ferrous metal	N	✦	●	✦	✦	✦		
Heat resistant alloy, Titanium alloy	S							
Hardened steel	H							

Inserts	Designation	Coated		Uncoated		Cutting Condition		
		PC5040	PD1000	H01	H05	f _n (mm/rev)	a _p (mm)	
AK 	TCGT			●	●	0.01~0.12	0.05~3.00	
		090202-AK			●	●	0.02~0.15	0.10~4.00
		090204-AK			●	●	0.02~0.20	0.05~4.00
		110202-AK	●		●	●	0.03~0.30	0.10~4.00
		110204-AK	●		●	●	0.03~0.40	0.10~5.00
		110208-AK			●	●	0.02~0.30	0.05~5.00
		16T302-AK			●	●	0.03~0.40	0.10~5.50
		16T304-AK			●	●	0.03~0.50	0.10~5.50
		16T308-AK			●	●	0.04~0.60	0.15~5.50
		16T312-AK			●	●	0.05~0.80	0.15~5.50
		16T316-AK			●	●	0.06~0.90	0.20~7.00
	16T325-AK							
AR 	TCGT			●	●	0.02~0.18	0.30~3.00	
		090202-AR			●	●	0.02~0.25	0.30~5.00
		090204-AR			●	●	0.02~0.30	0.30~4.00
		110202-AR			●	●	0.03~0.40	0.30~5.00
		110204-AR			●	●	0.04~0.45	0.50~6.00
		110208-AR			●	●	0.03~0.45	0.30~5.00
		16T302-AR			●	●	0.04~0.50	0.50~6.00
		16T304-AR			●	●	0.05~0.60	0.50~6.00
		16T308-AR			●	●	0.06~0.65	0.50~6.00
		16T312-AR					0.08~0.70	0.50~6.50
		16T316-AR					0.10~0.10	0.80~7.00
	16T325-AR							

 Cutting edge geometry **A52~A61**
  Recommended chip breaker **B04~B11**
  Code system **B26~B27**
 ● : Stock item

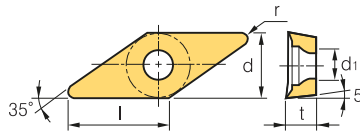
Available tool holders			
Designation	Page	Designation	Page
STACR/L	B114,181	STTCR/L	B182, 235
STFCR/L	B182, 234	STWCR/L	B235
STGCR/L	B182		



B Aluminum Insert (Positive)



VB ○○

 Rhombic **35° Positive**
Relief Angle: 5°



Dimensions (mm)			
Size	d	t	d ₁
11	6.35	3.18	2.8
16	9.525	4.76	4.4

Workpiece	Steel	P					Machining types
	Stainless steel	M					
Cast iron	K						● Continuous cutting
Non-ferrous metal	N	✱	●	✱	●	✱	● General cutting
Heat resistant alloy, Titanium alloy	S						✱ Interrupted cutting
Hardened steel	H						

Inserts	Designation	Coated			Uncoated		Cutting Condition	
		PC5040	PD1000	PD1010	H01	H05	fn (mm/rev)	ap (mm)
AK 	VBGT 110302-AK				●	●	0.02~0.15	0.05~3.00
	110304-AK				●	●	0.02~0.15	0.10~4.00
	110308-AK					●	0.03~0.18	0.10~5.00
	160402-AK					●	0.03~0.30	0.05~4.00
	160404-AK				●	●	0.03~0.40	0.10~5.00
	160408-AK				●	●	0.03~0.50	0.10~5.00
	160412-AK					●	0.05~0.60	0.10~5.50
AR 	VBGT 110302-AR						0.02~0.35	0.30~3.00
	110304-AR						0.03~0.45	0.30~4.00
	110308-AR						0.03~0.50	0.50~6.00
	160402-AR						0.04~0.45	0.30~5.00
	160404-AR				●	●	0.04~0.50	0.50~6.00
	160408-AR				●	●	0.05~0.60	0.50~6.00
	160412-AR						0.05~0.70	0.50~6.50

➡ Cutting edge geometry **A52~A61**

➡ Recommended chip breaker **B04~B11**

➡ Code system **B26~B27**

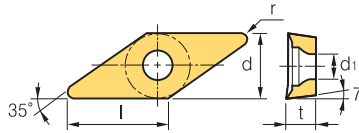
● : Stock item

Available tool holders			
Designation	Page	Designation	Page
SVABR/L	B183	SVVBN	B184
SVHBR/L	B183	SVQBR/L	B211
SVJBR/L	B115, 183	SVUBR/L	B212



VC ○○

Rhombic 35° Positive
Relief Angle: 7°



Dimensions (mm)			
Size	d	t	d ₁
11	6.35	3.18	2.8
13	7.94	3.18	3.4
16	9.525	4.76	4.4
22	12.7	5.56	5.6

Workpiece	Steel	P					Machining types
	Stainless steel	M					
Cast iron	K						● Continuous cutting
Non-ferrous metal	N	✱	●	✱	✱	✱	● General cutting
Heat resistant alloy, Titanium alloy	S						✱ Interrupted cutting
Hardened steel	H						

Inserts	Designation	Coated			Uncoated		Cutting Condition	
		PC5040	PD1000	PD1010	H01	H05	fn (mm/rev)	ap (mm)
AK 	VC GT	110301-AK			●		0.02~0.15	0.05~3.00
	110302-AK	●			●	●	0.02~0.20	0.05~3.00
	110304-AK	●		●	●	●	0.02~0.25	0.10~4.00
	110308-AK				●	●	0.03~0.30	0.10~5.00
	130302-AK	●			●	●	0.02~0.35	0.10~5.00
	130304-AK	●			●	●	0.03~0.35	0.10~5.00
	130308-AK						0.04~0.40	0.10~5.00
	160402-AK				●	●	0.02~0.30	0.05~5.00
	160404-AK		●	●	●	●	0.03~0.40	0.10~5.00
	160408-AK			●	●	●	0.03~0.50	0.10~5.00
	160412-AK				●	●	0.03~0.50	0.10~5.00
	220516-AK				●	●	0.03~0.60	0.10~7.00
	220525-AK					●	0.05~0.70	0.10~7.00
	220530-AK				●	●	0.08~1.00	0.10~7.00
AR 	VC GT	110301-AR					0.02~0.20	0.10~3.00
	110302-AR				●	●	0.02~0.25	0.30~3.00
	110304-AR				●	●	0.03~0.35	0.30~4.00
	110308-AR						0.04~0.45	0.50~6.00
	130302-AR					●	0.02~0.40	0.50~3.00
	130304-AR				●	●	0.03~0.45	0.50~4.00
	130308-AR						0.04~0.50	0.50~5.00
	160402-AR				●	●	0.03~0.40	0.30~5.00
	160404-AR				●	●	0.04~0.50	0.50~6.00
	160408-AR				●	●	0.05~0.60	0.50~6.00
	160412-AR						0.06~0.65	0.50~6.50
	220516-AR						0.10~0.65	0.80~6.50
	220525-AR						0.10~0.70	0.80~7.00
	220530-AR				●	●	0.12~0.75	1.00~7.00

Cutting edge geometry **A52~A61**
 Recommended chip breaker **B04~B11**
 Code system **B26~B27**
 ● : Stock item


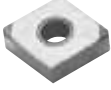

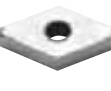

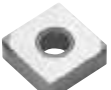
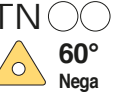


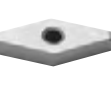
Available tool holders			
Designation	Page	Designation	Page
SVJCR/L	B115, 184, 211	SVQCR/L	B212
SVVCN	B184	SVUCR/L	B212



cBN

Multi-Corner Type (Negative)

Dimensions (mm)			
Size	d	t	d ₁
12	12.7	4.76	5.16
15	12.7	4.76~6.358	3.4
16	9.525	4.76	3.81

Inserts	Designation	Coated			Uncoated						Available tool holders								
		DNC250	DNC350	DNC400	DB1000	DB2000	DBN400	DBN250	DBN300	DBN700A	DBN20	Designation		Page					
 80° Nega		2NU-CNGA	120404	●	●		●	●					●	DCBNR/L	DCLNR/L	B154	B154		
			120404F	●				●							MCKNR/	MCLNR/L	B171	B171	
			120404T	●				●	●						MCMNN	PCBNR/L	B171	B159	
			120404W	●											PCLNR/L		B160		
			120404WF	●															
			120408	●	●			●	●										
			120408F	●					●										
			120408T	●				●	●										
			120408W	●	●			●	●										
			120408WF	●					●										
			120408WT					●	●										
			120412	●	●														
			120412F	●															
			120412T	●															
			120412W	●					●	●					●				
			120412WF	●						●									
			120412WT						●	●									
	T-2NU-CNGA	120408	●																
	2NU-CNMA	120404								●									
		120408									●								
	2NS-CNGA	120408			●					●									
 55° Nega		2NU-DNGA	150404	●	●		●	●		●		●	DDJNR/L	MDJNR/L	B155	B172			
			150404F	●				●						MDNNN	MDQNR/L	B172	B173		
			150404T	●				●	●					MDUNR/L	PDJNR/L	B202	B160		
			150408	●	●			●	●		●		●	PDNNR/L	PDSNR/L	B161	B197		
			150408F	●					●					PDUNR/L		B198			
			150408T	●				●	●										
			150412	●	●														
			150412F	●															
			150412T	●															
			150608																●
			T-2NU-DNGA	150412	●														
			2NS-DNGA	150408			●					●							
		 90° Nega		4NU-SNGA	120404	●			●	●				●	DSBNR/L	MSBNR/L	B155	B173	
	120404F								●					MSDNN	MSKNR/L	B173	B174		
	120404T							●	●					MSRRN/L	MSSNR/L	B174	B175		
	120408			●				●	●				●	PSBNR/L	PSDNN	B163	B163		
	120408F								●					PSKNR/L		B164			
	120408T							●	●										
	120412																	●	
	2NS-SNGA	120408			●					●									
 60° Nega		3NU-TNGA	160404	●	●		●	●		●		●	MTENN	MTFNR/L	B175	B175			
			160404F	●					●					MTGNR/	MTJNR/L	B176	B176		
			160404T	●				●	●					PTFNR/L	PTGNR/L	B165	B165		
			160408	●	●			●	●				●	PTTNR/L	WTENN	B166	B167		
			160408F	●					●					WTJNR/L	WTXNR/L	B167	B167		
			160408T	●				●	●										
			160412		●														
	2NS-TNGA	160408			●					●									
 35° Nega		2NU-VNGA	160404	●	●		●	●		●		●	MVJNR/L		B176				
			160404F	●					●					MVQNR/L		B177			
			160404T	●				●	●					MVUNR/L		B203			
			160408	●	●			●	●		●		●	MVVNN		B177			
			160408F	●					●										
			160408T	●				●	●										
			2NS-VNGA	160408			●					●							


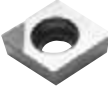


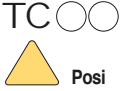

● : Stock item



cBN

Multi-Corner Type (Positive)

Dimensions (mm)			
Size	d	t	d ₁
06	6.35	2.38	2.8
07	6.35	2.38	2.8
09	9.525	3.97	4.4
11	9.525	3.97	4.4

Inserts	Designation	Coated			Uncoated						Available tool holders			
		DNC250	DNC350	DNC400	DB1000	DB2000	DBN400	DBN250	DBN300	DBN700A	DBNX20	Designation	Page	
 	2NU-CCGW	060202	●									SCACR/L	B178	
		060202F	●										SCLCR/L	B178
		060202T	●											
		060204	●			●	●							
		060204F	●				●							
		060204T	●			●	●							
		060208				●	●							
		060208F					●							
		060208T				●	●							
		09T304	●	●		●	●		●		●			
		09T304F	●				●							
		09T304T	●			●	●							
		09T308	●	●		●	●		●		●			
		09T308F	●				●							
		09T308T	●			●	●							
		09T308W	●											
		09T308WF	●											
 	2NU-DCGW	070204				●	●					SDACR/L	B178	
		070204F					●						SDJCR/L	B179
		070204T					●	●					SDNCN	B179
		070208					●	●					SDQCR/L	B206
		070208F						●					SDUCR/L	B207
		070208T					●	●					SDZCR/L	B208
		11T304	●	●		●	●		●		●			
		11T304F	●				●							
		11T304T	●			●	●							
		11T308	●	●		●	●		●		●			
		11T308F	●				●							
11T308T	●			●	●									
	T-2NU-DCGW	11T304	●											
 	3NU-TCGW	090204	●									STACR/L	B181	
		090204F	●										STFCR/L	B182
		090204T	●										STGCR/L	B182
													STTCR/L	B182






●: Stock item



cBN

Multi-Corner Type (Positive)

Dimensions (mm)			
Size	d	t	d _i
11	6.35	3.18	2.4
16	9.525	4.76	3.81

Inserts	Designation	Coated			Uncoated						Available tool holders			
		DNC250	DNC350	DNC400	DB1000	DB2000	DBN400	DBN250	DBN300	DBN700A	DBN20	Designation	Page	
 <p>TP 60° Posi</p>	3NU-TPGB	110304	●					●				CTFPR/L	B170	
		110304F	●										CTGPR/L	B170
		110304T	●											
		110308	●						●					
		110308F	●											
		110308T	●											
 <p>TP 60° Posi</p>	3NU-TPGN	110304			●	●						CTFPR/L	B170 B201	
		110304F					●						CTGPR/L	B170
		110304T				●	●							
		110308				●	●							
		110308F					●							
		110308T				●	●							
 <p>TP 60° Posi</p>	3NU-TPGW	110304	●	●		●	●				●			
		110304F	●				●							
		110304T	●			●	●							
		110308	●	●		●	●					●		
		110308F	●				●							
		110308T	●			●	●							
 <p>VB 35° Posi</p>	2NU-VBGW	160404	●	●		●	●		●		●	SVABR/L	B183	
		160404F	●				●						SVHBR/L	B183
		160404T	●			●	●						SVJBR/L	B183
		160408	●	●		●	●		●			●	SVQBR/L	B211
		160408F	●				●						SVUBR/L	B212
		160408T	●			●	●							
 <p>VC 35° Posi</p>	2NU-VCGW	160404	●	●		●	●				●			
		160404F	●				●							
		160404T	●			●	●							
		160408	●	●		●	●					●		
		160408F	●				●							
		160408T	●			●	●							

● : Stock item

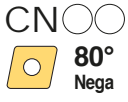


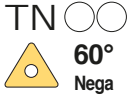
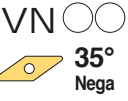
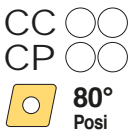
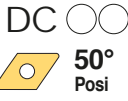
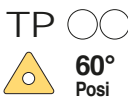



cBN

Regrinding Type (Negative/Positive)

Dimensions (mm)			
Size	d	t	d ₁
09	9.525	3.97	4.4
11	6.35~9.525	3.8~3.97	3.4~4.4
12	12.7	4.76	5.16

Dimensions (mm)			
Size	d	t	d ₁
15	12.7	4.76	5.16
16	9.525	4.76	3.81~4.4

Inserts	Designation	Coated			Uncoated							Available tool holders			
		DNC250	DNC350	DNC400	DB1000	DB2000	DBN400	DBN250	DBN300	DBN700A	DBNX20	Designation		Page	
 CN ○○ 80° Nega	CNMA	120404						●				DCBNR/L	MCKNR/L	B154	B171
		120408						●			●	DCLNR/L	MCLNR/L	B154	B171
	T-CNMA	120408						●				PCBNR/L	MCMNN	B159	B171
												PCLNR/L		B160	
 DN ○○ 55° Nega	DNMA	150404						●				DDJNR/L	MDJNR/L	B155	B172
		150408						●	●			MDNNN	MDQNR/L	B172	B173
												MDUNR/L	PDJNR/L	B202	B160
												PDNNR/L	PDSNR/L	B161	B197
												PDUNR/L		B198	
 SN ○○ 90° Nega	SNMA	120404						●				DSBNR/L	MSBNR/L	B155	B173
		120408						●				MSDNN	MSKNR/L	B173	B174
												MSRNR/L	MSSNR/L	B174	B175
												PSBNR/L	PSDNN	B163	B163
												PSKNR/L		B164	
 TN ○○ 60° Nega	TNMA	160404						●				MTENNS	MTFNR/L	B175	B175
		160408						●				MTGNR/L	MTJNR/L	B176	B176
												PTFNR/L	PTGNR/L	B165	B165
												PTTNR/L	WTENN	B166	B167
												WTJNR/L	WTXNR/L	B167	B167
 VN ○○ 35° Nega	VNMA	160404						●				MVJNR/L		B176	
		160408						●				MVQNR/L		B177	
	T-VNMA	160404						●				MVUNR/L		B203	
												MVVNN		B177	
 CC ○○ 80° Posi	CCMW	09T304						●				SCACR/L		B178	
												SCLCR/L		B178	
 DC ○○ 50° Posi	DCGW	11T308						●				SDACR/L		B178	
	T-DCGW	11T308						●				SDJCR/L		B179	
												SDNCN		B179	
 TP ○○ 60° Posi	TPGB	110304						●	●			CTFPR/L		B170	B201
		110308						●				CTGPR/L		B170	
 VB ○○ 35° Posi	VBMW	160404						●				SVABR/L		B183	
		160408						●				SVHBR/L		B183	
												SVJBR/L		B183	
												SVQBR/L		B211	
												SVUBR/L		B212	

●: Stock item

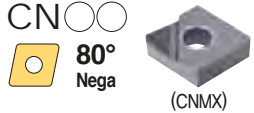
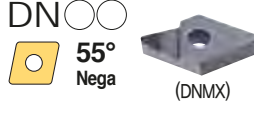


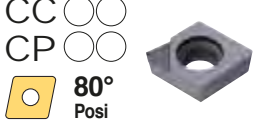
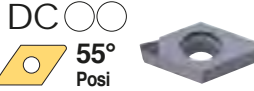
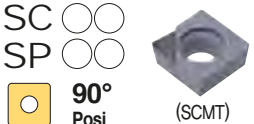


PCD

Insert (Negative/Positive)

Dimensions (mm)			
Size	d	t	d ₁
06	6.35	2.38	2.8
07	6.35	2.38	2.8
08	7.94	2.38	3.4
09	9.525	3.18	4.4

Dimensions (mm)			
Size	d	t	d ₁
11	9.525	3.97	4.4
12	12.7	4.76	5.16
15	12.7	4.76	5.16
16	9.525	4.76	3.81

Inserts	Designation	PCD			Available tool holders				
		DP90	DP150	DP200	Designation		Page		
	CNMM	120404	●		DCBNR/L	DCLNR/L	B154	B154	
		120408	●		MCKNR/L	MCLNR/L	B171	B171	
		120412			MCMNN	PCBNR/L	B171	B159	
	CNMX	120404				PCLNR/L		B160	
		120408							
		120412							
	DNMM	150404	●		DDJNR/L	MDJNR/L	B155	B172	
		150408	●		MDNNN	MDQNR/L	B172	B173	
		150412			MDUNR/L	PDJNR/L	B202	B160	
	DNMX	150404				PDNNR/L	PDSNR/L	B161	B197
		150408				PDUNR/L		B198	
		150412							
	TNMX	160404			MTENN	MTFNR/L	B175	B175	
		160408			MTGNR/L	MTJNR/L	B176	B176	
		160412			PTFNR/L	PTGNR/L	B165	B165	
					PTTNR/L	WTENN	B166	B167	
					WTJNR/L	WTXNR/L	B167	B167	
	VNMX	160404			MVJNR/L		B176		
		160408			MVQNR/L		B177		
		160412			MVUNR/L		B203		
					MVVNN		B177		
	CCMT	060202		●	SCACR/L		B178		
		060204		●	SCLCR/L		B178		
		060208							
		09T304		●					
		09T308		●					
		09T312							
	CPMT	080204							
		080208							
		080212							
		090304							
		090308							
	DCMT	070202		●	SDACR/L		B178		
		070204		●	SDJCR/L		B179		
		070208			SDNCN		B179		
		11T302			SDQCR/L		B206		
		11T304		●	SDUCR/L		B207		
		11T308		●	SDZCR/L		B208		
	SCMT	09T304			SSBCR/L		B180		
		09T308			SSDCN		B180		
		09T312			SSKCR/L		B181		
	SPGW	090302				SSSCR/L		B181	
		090304							
		090308							

● : Stock item








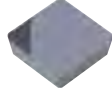


PCD

Insert (Positive)

Dimensions (mm)			
Size	d	t	d ₁
06	3.97	1.59	2.8
08	4.76	2.38	2.4
09	5.56~9.525	2.38~3.18	2.55

Dimensions (mm)			
Size	d	t	d ₁
11	9.525	3.97	4.4
12	6.35	2.38~3.18	2.8~3.4
16	12.7	3.18	4.4

Inserts	Designation	PCD			Available tool holders				
		DP90	DP150	DP200	Designation	Page			
<p>TB ○○ TC ○○ TP ○○</p>  <p>60° Posi</p> 	TBGW	060102 060104				STUBR/L B214			
	TCMT	090201 090202 090204 110201 110202 110204				STACR/L STFCR/L STFPR/L STGCR/L STTCR/L B181 B182 B210 B182 B182			
	TPGB	080204 080208 090204 090208 110304 110308		●					
	TPGW	080202 080204 090204 090208 110302 110304 110308 160404 160408		●					
	TPGT	110302 110304					STFPR/L STUPR/L B210 B215		
	<p>VB ○○ VC ○○</p>  <p>35° Posi</p> 	VBMT	110302 110304 110308 160402 160404 160408 160412		●		SVABR/L SVHBR/L SVJBR/L SVQBR/L SVUBR/L B183 B183 B183 B211 B212		
		VCMT	110302 110304 110308 160404 160408 160412		●		SVJCR SVVCN B184 B184		
		<p>TP ○○</p>  <p>60° Posi</p> 	TPGN	090204 090208 110302 110304 110308 160302 160304 160308		●		CTFPR/L CTGPR/L B170 B170	
			<p>SP ○○</p>  <p>90° Posi</p> 	SPGN	090304 090308 120304 120308		●		CSDPN CSKPR/L B169 B170

●: Stock item



B Technical Information for Save Turn

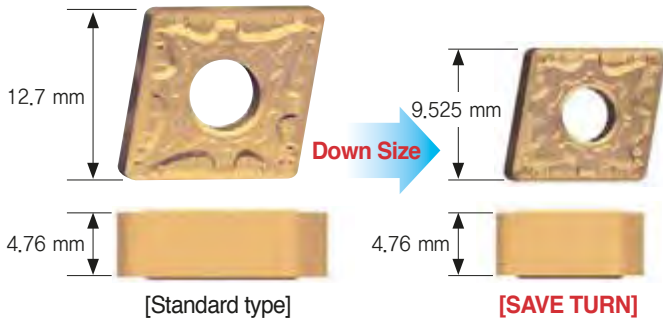
Economical small insert with powerful cutting performance

SAVE TURN

- Strongly recommended turning insert for machining smaller diameter than $\varnothing 100$
- Small but powerful and economical insert which performs the same like standard-sized inserts under the depth of cut of 3.0 mm

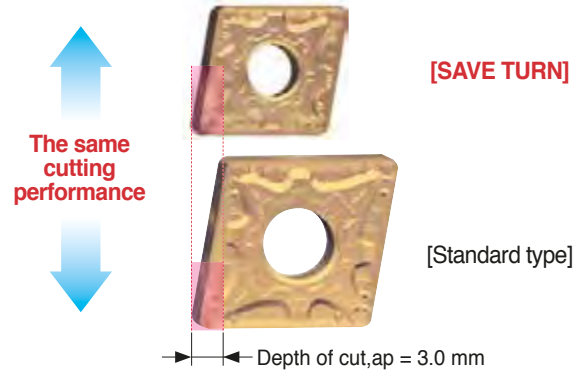
Features

Comparison of insert sizes




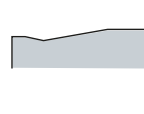

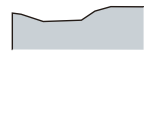

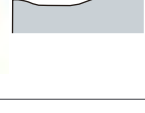
- Optimized size of the same performance like the standard type

Comparison of cutting performance

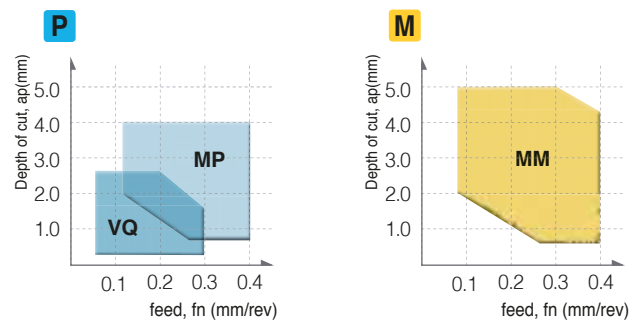


- Performs the same like standard type inserts under the depth of cut of 3.0 mm

Features of chip breaker

Insert shape	Cutting edge	Features
		<ul style="list-style-type: none"> • For finishing steel • Efficient chip breaking and low cutting resistance • Various application available at low depth of cut • Recommended depth of cut: 0.5~2.5 mm
		<ul style="list-style-type: none"> • For medium cutting of steel • 4 dots for improved chip control in medium cutting to finishing • Stable chip evacuation at high depth of cut • Stable tool life due to lower cutting loads at high feed • Recommended depth of cut: 0.5~4.0 mm
		<ul style="list-style-type: none"> • For medium cutting of stainless steel • Limits plastic deformation caused by heat • Stable tool life thanks to the balanced cutting performance and toughness • Stable chip flow at high speeds and feeds • Recommended depth of cut: 0.5~5.0 mm

Application area of chip breaker



VQ : Depth of cut, ap = 0.5~2.5 mm / feed, fn = 0.05~0.30 mm/rev

MP : Depth of cut, ap = 0.5~4.0 mm / feed, fn = 0.15~0.40 mm/rev

MM : Depth of cut, ap = 0.5~5.0 mm / feed, fn = 0.10~0.40 mm/rev

Application example

Alloy steel (SCM440)

- **Cutting conditions** vc (m/min) = 250, fn (mm/rev) = 0.25
ap (mm) = 2.0~3.0, continuous cutting, wet

- **Cutting Result**



CNMG090408-HM
SAVE TURN

CNMG120408-HM
Standard type

Alloy steel (SCM440)

- **Cutting conditions** vc (m/min) = 250, fn (mm/rev) = 0.25
ap (mm) = 2.0~3.0, interrupted cutting, wet

- **Cutting Result**



CNMG090408-HM
SAVE TURN

CNMG120408-HM
Standard type





Type	Picture	Designation	Coated					Dimensions (mm)				cutting conditions		Configuration	Available tool holders page
			NC9215	NC9225	NC5330	NC9125	NC9135	PC9030	d	t	r	d ₁	ap (mm)		
C type		CNMG 090408-VQ			●			9.525	4.76	0.8	3.81	0.50~2.50	0.08~0.30		B106 B109
		090412-VQ			●			9.525	4.76	1.2	3.81	0.50~2.50	0.10~0.30		
		CNMG 090404-MP						9.525	4.76	0.4	3.81	0.50~4.00	0.10~0.40		B106 B109
		090408-MP						9.525	4.76	0.8	3.81	0.50~4.00	0.15~0.40		
		090412-MP						9.525	4.76	1.2	3.81	0.50~4.00	0.15~0.45		
		CNMG 090404-MM						9.525	4.76	0.4	3.81	0.50~5.00	0.08~0.35		B106 B109
090408-MM							9.525	4.76	0.8	3.81	0.50~5.00	0.10~0.40			
090412-MM							9.525	4.76	1.2	3.81	0.50~5.00	0.12~0.45			
D type		DNMG 110508-VQ			●			9.525	5.56	0.4	3.81	0.50~2.50	0.08~0.30		B106 B107 B109 B110
		110512-VQ			●			9.525	5.56	0.8	3.81	0.50~2.50	0.10~0.30		
		DNMG 110504-MP						9.525	5.56	0.4	3.81	0.50~4.00	0.10~0.40		B106 B107 B109 B110
		110508-MP						9.525	5.56	0.8	3.81	0.50~4.00	0.15~0.40		
		110512-MP						9.525	5.56	1.2	3.81	0.50~4.00	0.15~0.45		
		DNMG 110504-MM						9.525	5.56	0.4	3.81	0.50~5.00	0.08~0.35		B106 B107 B109 B110
110508-MM							9.525	5.56	0.8	3.81	0.50~5.00	0.10~0.40			
110512-MM							9.525	5.56	1.2	3.81	0.50~5.00	0.12~0.45			
S type		SNMG 090408-VQ			●			9.525	4.76	0.4	3.81	0.50~2.50	0.08~0.30		B107 B108 B110
		090412-VQ			●			9.525	4.76	0.8	3.81	0.50~2.50	0.10~0.30		
		SNMG 090404-MP						9.525	4.76	0.4	3.81	0.50~4.00	0.10~0.40		B107 B108 B110
		090408-MP						9.525	4.76	0.8	3.81	0.50~4.00	0.15~0.40		
		090412-MP						9.525	4.76	1.2	3.81	0.50~4.00	0.15~0.45		
		SNMG 090404-MM						9.525	4.76	0.4	3.81	0.50~5.00	0.08~0.35		B107 B108 B110
090408-MM							9.525	4.76	0.8	3.81	0.50~5.00	0.10~0.40			
090412-MM							9.525	4.76	1.2	3.81	0.50~5.00	0.12~0.45			
W type		WNMG 060404-VQ						9.525	4.76	0.4	3.81	0.30~2.00	0.06~0.30		B109 B110
		060408-VQ						9.525	4.76	0.8	3.81	0.50~2.00	0.08~0.30		
		060412-VQ						9.525	4.76	1.2	3.81	0.50~2.00	0.10~0.30		
		WNMG 060404-MP	●	●	●	●		9.525	4.76	0.4	3.81	0.50~3.50	0.10~0.40		B109 B110
		060408-MP	●	●	●	●		9.525	4.76	0.8	3.81	0.50~3.50	0.15~0.40		
		060412-MP						9.525	4.76	1.2	3.81	0.50~3.50	0.15~0.45		
	WNMG 060404-MM						9.525	4.76	0.4	3.81	0.50~4.00	0.08~0.35		B109 B110	
	060408-MM			●	●	●	9.525	4.76	0.8	3.81	0.50~4.00	0.10~0.40			
	060412-MM			●	●	●	9.525	4.76	1.2	3.81	0.50~4.00	0.12~0.45			



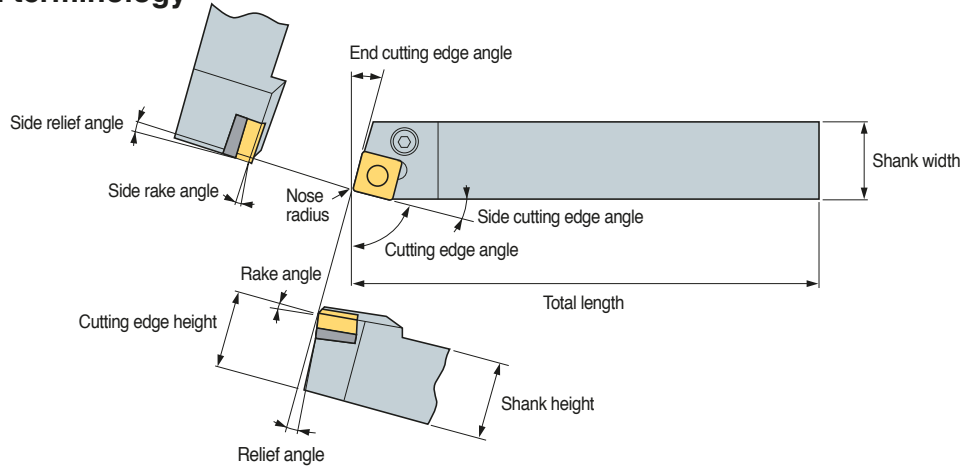
L

TECHNICAL INFORMATION



L Turning

➤ Insert shape and terminology

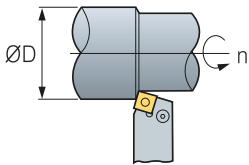


● Relating angles between tool and workpiece

Cutting edge inclination	Terminology	Function	Effect
Rake angle	Side rake angle Rake angle	• Cutting force, Cutting heat, The effects of chip control on tool life	<ul style="list-style-type: none"> • (+): Excellent machine-ability(reducing cutting force, weakening cutting edge strength) • (+): When machining excellent machine-ability or thin workpiece • (-): When strong cutting edge is needed at interrupted condition or mill scale
Relief angle	Relief angle Side relief angle	• Only cutting edge contact with cutting face	• (-): Cutting edge is strong but has short tool life to make bad influence on flank wear
Cutting edge angle	Cutting edge angle	• Affects chip control and cutting force direction	• (+): Improved chip control because chip thickness is big
	Side cutting edge angle	• Affects chip control and cutting force direction	<ul style="list-style-type: none"> • (+): Strong cutting edge due to distributed cutting force but chip control is bad by thin chip thickness • (-): Improved chip performance
	End cutting edge angle	• Prevent friction between cutting edge and cutting face	• (-): Cutting edge is strong but has short tool life to make bad influence on flank wear

➤ Calculation formulas for machining

● Cutting speed



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

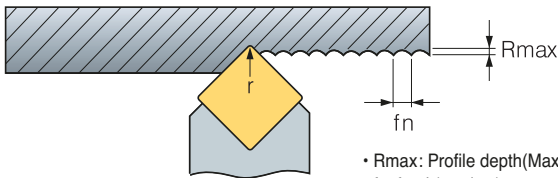
- vc: Cutting speed (m/min)
- D: Diameter (mm)
- n: Revolution per minute (min⁻¹)
- π: Circular constant (3.14)

● Feed

$$fn = \frac{vf}{n} \text{ (mm/rev)}$$

- fn: Feed per revolution (mm/rev)
- vf: Table feed (mm/min)
- n: Revolution per minute (min⁻¹)

● Surface finish



- Rmax: Profile depth(Maximum height roughness) (μ)
- fn: feed (mm/rev)
- r: nose radius

• Theoretical surface roughness

$$R_{max} = \frac{fn^2}{8r} 1000 (\mu\text{m})$$

• Practical surface roughness

Steel: $R_{max} \times (1.5\sim3)$
Cast iron: $R_{max} \times (3\sim5)$

● Power requirement

$$P_{kw} = \frac{Q \times kc}{60 \times 102 \times \eta}$$

$$P_{HP} = \frac{P_{kw}}{0.75}$$

$$Q = \frac{vc \times fn \times ap}{1000}$$

- P_{kw}: Power requirement [kW]
- P_{HP}: Power requirement (horse power) [HP]
- vc: Cutting speed [m/min]
- ap: Depth of cut [mm]
- fn: Feed per revolution [mm/rev]
- kc: Specific cutting resistance [kg/mm²]
- η: Machine efficiency rate (0.7~0.8)

Rough Kc	
Mild steel	190
Medium carbon steel	210
High carbon steel	240
Low alloy steel	190
High alloy steel	245
Cast iron	93
Malleable cast iron	120
Bronze, Brass	70

● Material removal rate

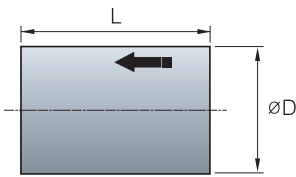
$$Q \text{ (cm}^3\text{/min)} = vc \times ap \times fn$$

- Q: Material removal rate [cm³/min]
- ap: Depth of cut [mm]
- vc: Cutting speed [m/min]
- fn: Feed per revolution [mm/rev]



● Machining time

External face machining 1



Constant revolution per minute

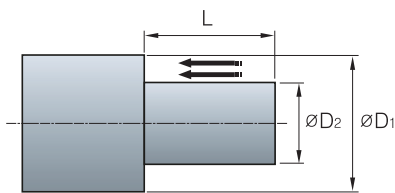
$$T = \frac{60 \times L}{f_n \times n}$$

Constant cutting speed

$$T = \frac{60 \times \pi \times L \times D}{1000 \times f_n \times v_c}$$

T: Machining time [sec]
L: Cutting length [mm]
f_n: Feed per revolution [mm/rev]
n: Revolution per minute [min⁻¹]
D: Diameter of workpiece [mm]
v_c: Cutting speed [m/min]

External face machining 2



Constant revolution per minute

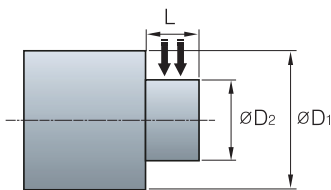
$$T = \frac{60 \times L}{f_n \times n} \times N$$

Constant cutting speed

$$T = \frac{60 \times \pi \times L \times (D_1 + D_2)}{2 \times 1000 \times f_n \times v_c} \times N$$

T: Machining time [sec]
L: Cutting length [mm]
f_n: Feed per revolution [mm/rev]
n: Revolution per minute [min⁻¹]
D₁: Maximum diameter of workpiece [mm]
D₂: Minimum diameter of workpiece [mm]
v_c: Cutting speed [m/min]
N: The number of pass = (D₁-D₂)/d/2

Facing



Constant revolution per minute

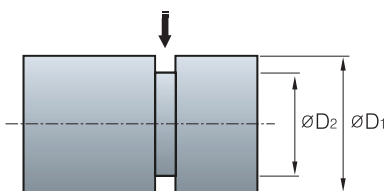
$$T = \frac{60 \times (D_1 - D_2)}{2 \times f_n \times n} \times N$$

Constant cutting speed

$$T_1 = \frac{60 \times \pi \times (D_1 + D_2) \times (D_1 - D_2)}{4000 \times f_n \times v_c} \times N$$

T: Machining time [sec]
T₁: Machining time before the maximum rpm[sec]
L: Width of machining [mm]
f_n: Feed per revolution [mm/rev]
n: Revolution per minute [min⁻¹]
D₁: Maximum diameter of workpiece [mm]
D₂: Minimum diameter of workpiece [mm]
v_c: Cutting speed [m/min]
N: The number of pass = (D₁-D₂)/d/2

Grooving



Constant revolution per minute

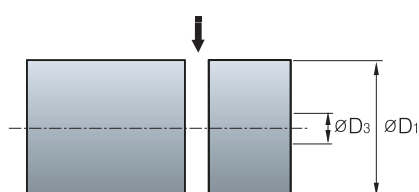
$$T = \frac{60 \times (D_1 - D_2)}{2 \times f_n \times n}$$

Constant cutting speed

$$T_1 = \frac{60 \times \pi \times (D_1 + D_2) \times (D_1 - D_2)}{4000 \times f_n \times v_c}$$

T: Machining time [sec]
T₁: Machining time before the maximum rpm[sec]
L: Width of machining [mm]
f_n: Feed per revolution [mm/rev]
n: Revolution per minute [min⁻¹]
D₁: Maximum diameter of workpiece [mm]
D₂: Minimum diameter of workpiece [mm]
v_c: Cutting speed [m/min]

Parting



Constant revolution per minute

$$T = \frac{60 \times D_1}{2 \times f_n \times n}$$

Constant cutting speed

$$T_1 = \frac{60 \times \pi \times (D_1 + D_3) \times (D_1 - D_3)}{4000 \times f_n \times v_c}$$

$$T_3 = T_1 + \frac{60 \times D_3}{2 \times f_n \times n_{\max}}$$

T: Machining time [sec]
T₁: Machining time before the maximum rpm[sec]
T₃: Machining time till maximum RPM[sec]
f_n: Feed per revolution [mm/rev]
n: Revolution per minute [min⁻¹]
n_{max}: Maximum revolution per minute [min⁻¹]
D₁: Maximum diameter of workpiece [mm]
D₃: Maximum diameter at maximum RPM [mm]
v_c: Cutting speed [m/min]

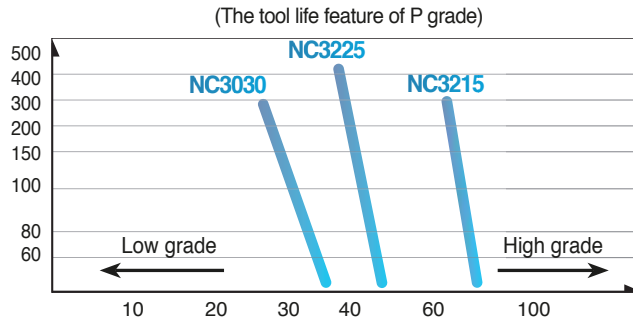
L Turning

➤ The affects of cutting condition

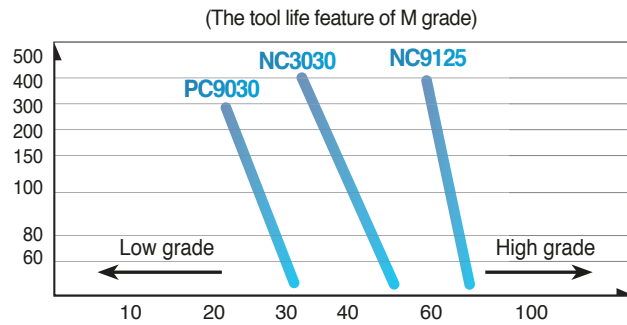
- The most desirable machining means short machining time, long tool life and good precision
This is the reason that proper cutting condition for each tools should be selected according to material's properties, hardness, shapes, the efficiency of machine

➤ Cutting speed

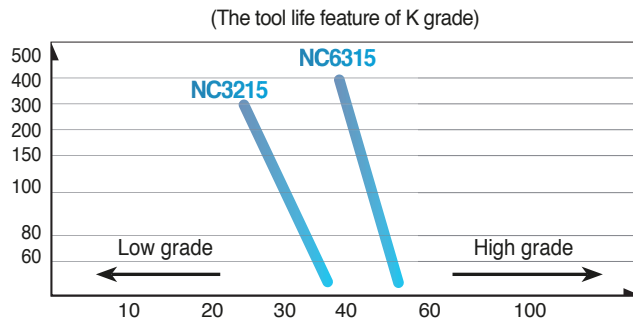
- **Workpiece:** S45C (180HB)
- **Tool life criterion:** VB = 0.2 mm
- **Depth of cut:** 1.5 mm
- **Feed:** 0.3 mm/rev
- **Holder:** PCLNR2525-M12
- **Insert:** CNMG120408, Dry cutting



- **Workpiece:** STS304 (200HB)
- **Tool life criterion:** VB = 0.2 mm
- **Depth of cut:** 1.5 mm
- **Feed:** 0.3 mm/rev
- **Holder:** PCLNR2525-M12
- **Insert:** CNMG120408, Dry cutting



- **Workpiece:** GC300 (180HB)
- **Tool life criterion:** VB = 0.2 mm
- **Depth of cut:** 1.5 mm
- **Feed:** 0.3 mm/rev
- **Holder:** PCLNR2525-M12
- **Insert:** CNMG120408, Dry cutting



➤ Cutting Speed's effects

- When the cutting speed increases up to 20% in an application, the tool life respectively decreases down 50%
Although inversely, if the cutting speed increases up to 50% the tool life decreases 20%. On the other hand if cutting speed is too low (20-40m/min) Tool life shortens due to vibration



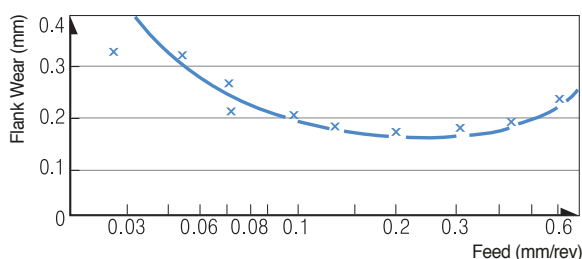
➤ Feed

- The feed rate in turning means the progressed interval of a distance in a work piece within 1 revolution
The feed rate in a milling application means the table feed divided by number of teeth of cutter (feed rate per tooth)

➤ The effects of feed

- When the feed rate decreases the flank wear is increased. When the feed rate is too low, the tool life shortens radically
- When the feed rate increases, the flank wear increases due to high temperatures, however the feed rates effects tool life less than the cutting speed. And higher feed rates improve machining efficiency

(Relationship between feed and flank wear in steel turning)

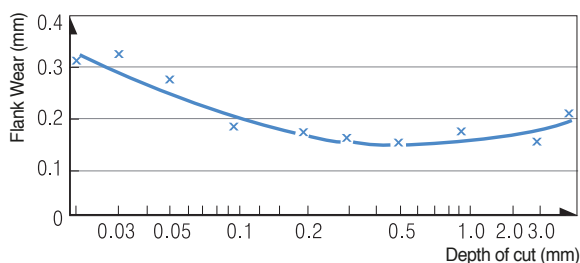


- **Workpiece:** SNCN431
- **Grade:** ST20
- **Cutting speed:** 200 m/min
- **Depth of cut:** 1.0 mm
- **Cutting time:** 10 min

➤ Depth of cut

- Determined by the required allowances in machining a material and the capacity the machine can tolerate
There are cutting limits according to the different shapes and sizes of the insert

(Relationship between depth of cut and flank wear in steel turning)

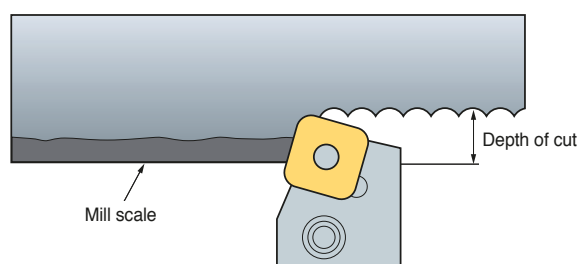


- **Workpiece:** SNCN431
- **Grade:** ST20
- **Cutting speed:** 200 m/min
- **Feed:** 0.2 mm/rev
- **Cutting time:** 10 min

➤ The effect of a depth of cut

- The depth of cut does not have a big influence on tool life
- When the depth of cut is small the work piece is not cut but rather rubbed. In these cases, machine off the work hardened parts that decrease tool life
- When machining a cast skin or milling scale smaller depth of cuts usually cause chipping and abnormal wear because of hard impurities in the surface of the work piece

(Surface parts including mill scale Roughing)



Relief angle

- Relief angle avoids the friction between workpiece and relief face and makes cutting edge move along workpiece easily

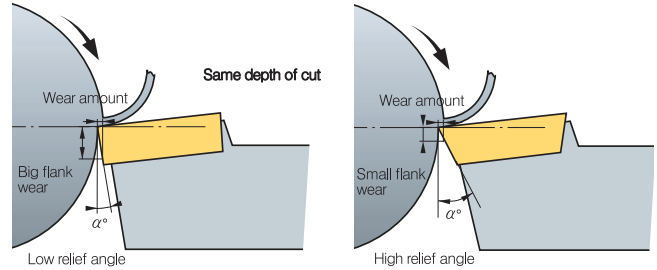
Relationship between various relief angle and flank wear

Affects

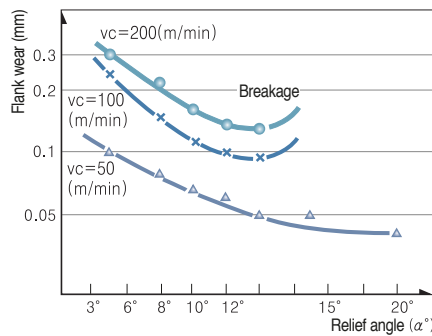
- If relief angle is big Flank wear decreases
- If relief angle is big Cutting edge strength weakens
- If relief angle is small Chattering occurs

Selection system

- Hard workpiece/When strong cutting edge is needed
 - Low relief angle
- Soft workpiece/Workpiece turning to work hardening easily
 - High relief angle



- Workpiece: SNCM431 (HB)
- Grade: P20
- Depth of cut: 1 mm
- Feed: 0.32 mm/rev
- Cutting time: 20 min



Side cutting edge angle

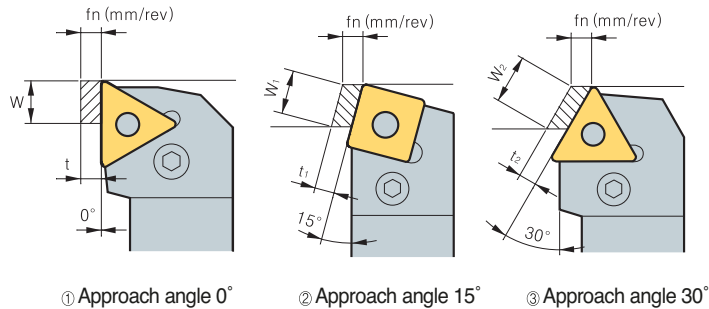
- Side cutting edge angle has big influence on chip flow and cutting force therefore proper Side cutting edge angle is very important

Side cutting edge angle and chip thickness

- As side cutting edge angle is getting bigger chips are getting thinner and wider (refer to left picture)
- At the same feed and depth of cut with approach angle 0° Chip thickness is the same as feed ($t = f_n$) and chip width is equal to depth of cut ($W = ap$)

$$t_1 = 0.97t, W_1 = 1.04W$$

$$t_2 = 0.87t, W_2 = 1.15W$$



Side cutting edge angle and 3 cutting forces

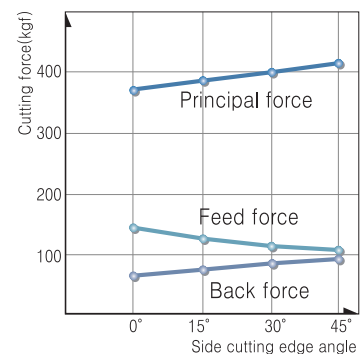
Affects

- Big side cutting edge angle with the same feed makes chip attaching length longer and chip thickness thinner. So that cutting forces scatter to long cutting edge therefore tool life gets longer
- Big side cutting edge angle for machining long bars can cause bending

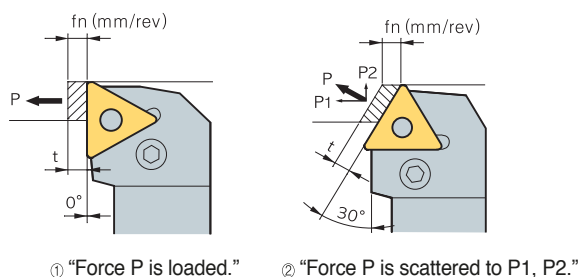
Selection system

- Deep depth of cut finishing/Long thin workpiece/Low machine rigidity
 - Side cutting edge angle
- Hard and high calorific power workpiece/Roughing big workpiece/High machine rigidity - Side cutting edge angle

- Workpiece : SCM440 (HB250)
- Grade: TNGA220412
- vc: 100 m/min
- ap: 4 mm
- fn: 0.45 mm/rev



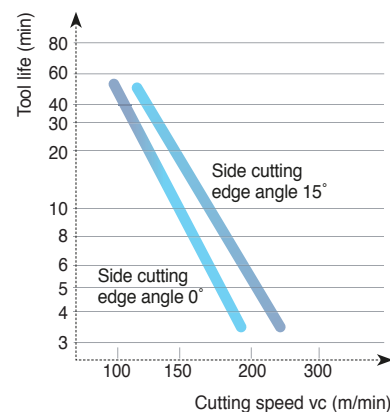
● Side cutting edge angle and cutting load



As approach angle gets bigger Back force gets bigger and feed force gets smaller

● Side cutting edge angle and tool life

- Workpiece: SCM440
- Grade: P20
- Depth of cut: 3 mm
- Feed: 0.2 mm/rev



● Side cutting edge angle and cutting performance

Specification	Low	← Approach angle →	High
Wear rate	High		Low
Workpiece	Easy to cut material		Difficult to cut material
Machining power	Small		Big
Chatter	Hard to occur		Easy to occur
How to machine	Finishing		Roughing
Workpiece rigidity	Long thin workpiece		Thick workpiece
Machine rigidity	In case of low rigidity		In case of high rigidity

🔍 End cutting edge angle

- It affects machined surface to prevent interference between surface of workpiece and insert

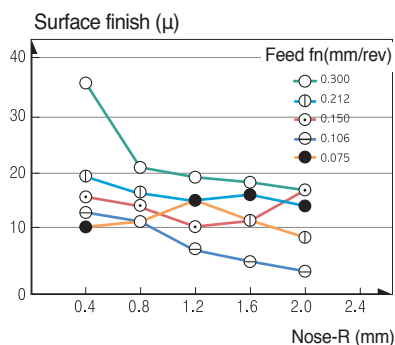
Affects

1. If end cutting edge angle reduces cutting edge get stronger but cutting heat generated by machining increases
2. Small end cutting edge angle can cause chattering due to the increases cutting force

🔍 Nose-R

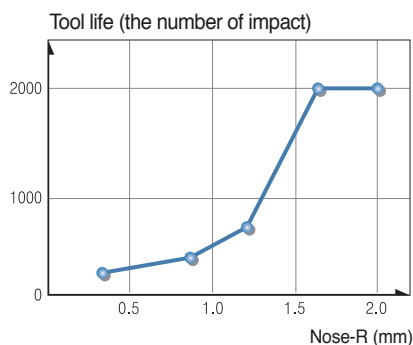
- Nose-R affects not only surface roughness but strength of cutting edge
- In general, It's desirable that Nose-R is 2~3 times bigger than feed

● Nose R and surface finish



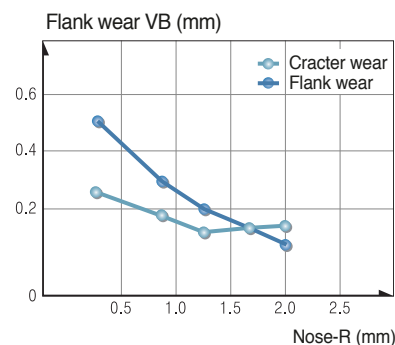
- Workpiece: SNCM439, HB200
- Grade: P20
- v_c : 120 m/min
- ap : 0.5 mm

● Nose R and tool life



- Workpiece: SCM440, HB280
- Grade: P10
- v_c : 100 m/min, ap : 0.5 mm
- fn : 0.3 mm/rev

● Nose R and wear of tool



- Workpiece: SNCM439, HB200
- Grade: P10
- v_c : 140 m/min, ap : 2 mm
- fn : 0.2 mm/rev, T : 10 min

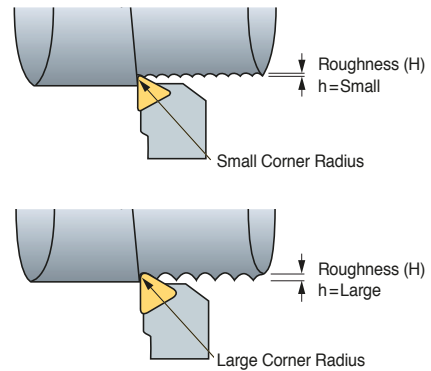
➤ Nose-R

Affects

1. Big Nose-R improves surface finish
2. Big Nose-R improves cutting edge strength
3. Big Nose-R reduces flank wear and crater wear
4. Too big Nose-R causes chattering due to increased cutting force

Selection system

1. For finishing with small depth of cut/long and thin workpiece/
When machine power is low - Small Nose-R
2. For applications that need strong cutting edge such as intermittent
and machining mill scale/For roughing of big workpiece/When
the machine power is strong enough - Big Nose-R



● Relationship between nose radius, feed and various surface roughness

Nose R \ Feed (mm/rev)	0.4	0.8	1.2
0.15			
0.26			
0.46			

➤ Cutting edge shape and the affects

● Rake angle (α)

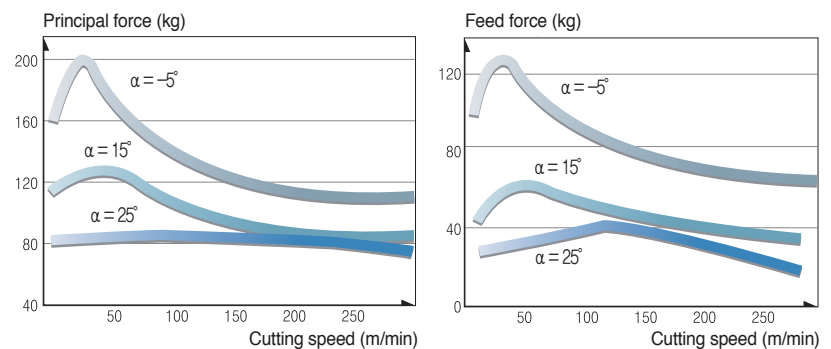
Rake angle has big influence on cutting force, chip flow and tool life

Affects

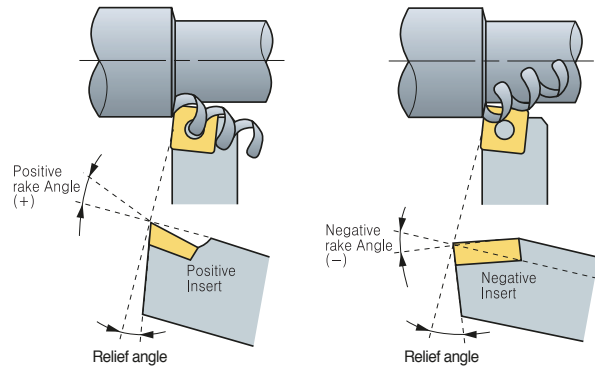
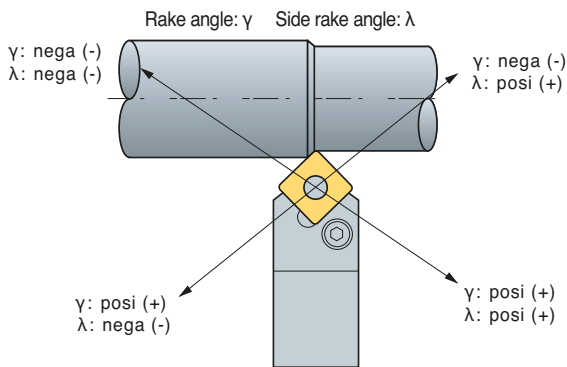
1. High rake angle results in good surface finish
2. As the rake angle increases by 1° Machining power decreases by 1%.
3. High rake angle weakens cutting edge

Selection system

1. For hard workpiece/For applications that need strong cutting edge such as interrupted and machining mill scale - Low rake angle
2. For soft workpiece/Easy to cut material/When the rigidity of machine power and workpiece is low - High rake angle



● Rake angle and the direction of chip flow



In order to prevent machined surface from damages Avoid nega, posi combination.
 γ : nega (-) λ : posi (+)

➤ Selecting proper tools

- Nowadays, It's very difficult to select the best tools in complicating tooling system and various cutting conditions
- However, It can be simplified by classifying basic factors below

● Selection of inserts and tool holder

Listed below is the basic factors and choose B according to A

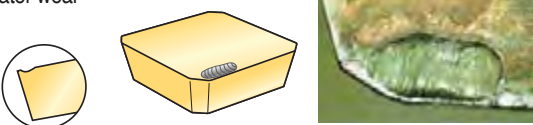
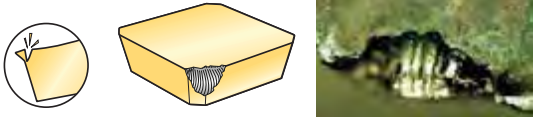
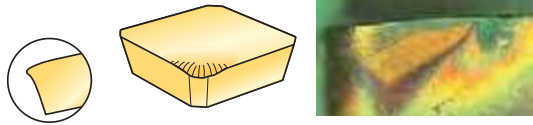






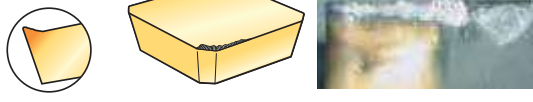
A : Basic factors

- Workpiece material
- Workpiece shape
- Workpiece size
- Hardness of workpiece
- Surface roughness of workpiece (before machining)
- Surface finish required
- Type of lathe machine
- Condition of lathe machine (rigidity, power etc)
- Horse power of machine
- Clamping method of workpiece

B : Selection system

- ① Select as big approach angle as possible
- ② Select as big shank as possible
- ③ Select as strong cutting edge of insert as possible
- ④ Select as big nose radius as possible
- ⑤ In finishing, Select the insert using many corners
- ⑥ Select as small insert as possible
- ⑦ Cutting speed should be determined carefully according to cutting conditions
- ⑧ Select as deep depth of cut as possible
- ⑨ Select as fast feed as possible
- ⑩ Cutting condition should be determined within chip breaker application ranges

🔧 Trouble shooting

Tool failure	Cause	Solution
<p>Crater wear</p> 	<ul style="list-style-type: none"> • Improper grade • Excessive cutting condition 	<ul style="list-style-type: none"> • Choose harder grade • Decrease cutting condition
<p>Fracture</p> 	<ul style="list-style-type: none"> • Improper grade • Excessive feed • Shorten cutting edge strength • Insufficient rigidity of holder 	<ul style="list-style-type: none"> • Choose tougher grade • Decrease feed • Apply to large honed or chamfered edge • Choose bigger size holder
<p>Plastic deformation</p> 	<ul style="list-style-type: none"> • Improper grade • Excessive cutting condition • High cutting temperature 	<ul style="list-style-type: none"> • Choose harder grade • Decrease cutting condition • Choose grade with heat conductivity are big
<p>Wear on nose radius (Flank wear)</p> 	<ul style="list-style-type: none"> • When the hardness of workpiece is too high compare with tool • When machining surface hardened workpiece • Improper grade • Excessive cutting speed • Too small relief angle • Too low feed 	<ul style="list-style-type: none"> • Choose harder grade • Decrease cutting speed • Choose larger relief angle • Increase feed
<p>Thermal crack</p> 	<ul style="list-style-type: none"> • Expansion and shrinking by cutting temperature • Improper grade (*Specially milling operation) 	<ul style="list-style-type: none"> • Apply to dry cutting (In case of wet cutting, use enough coolant) • Choose tougher grade
<p>Chipping</p> 	<ul style="list-style-type: none"> • Improper grade • Excessive feed • Shorten cutting edge strength • Insufficient rigidity of holder 	<ul style="list-style-type: none"> • Choose tougher grade • Decrease feed • Apply to large honing or chamfer edge • Choose bigger size holder
<p>Notch wear</p> 	<ul style="list-style-type: none"> • Surface hardened workpiece • Friction due to bad chip geometry (Generate vibration) 	<ul style="list-style-type: none"> • Choose harder grade • Improve chip control form large rake angle
<p>Flaking</p> 	<ul style="list-style-type: none"> • Deposition on cutting edge • Bad chip control 	<ul style="list-style-type: none"> • Improve cutting performance from large rake angle • Apply to chip pocket with big size
<p>Complete breakage</p> 	<ul style="list-style-type: none"> • Unusable condition due to wear off the most parts of cutting edge by progress of wear 	<ul style="list-style-type: none"> • Reduce the feed rate. • Reduce the depth of cut. • Select a tougher grade. • Select a stronger chipbreaker. • Select a thicker insert.
<p>Built-up edge</p> 	<ul style="list-style-type: none"> • Slow cutting speed • Sticky materials 	<ul style="list-style-type: none"> • Increase cutting speed. • Use more positive rake geometry. • Use tougher grade



Types of tool failure and trouble shooting

Troubles	Causes	Solution																
		Cutting conditions				Selecting insert grade				Tool shape				Machine clamping				
		Cutting speed	Feed	Depth of cut	Coolant	Select harder grade	Select tougher grade	Select better heat-impact resistance grade	Select better adhesion resistance grade	Chip breaker valuation	Flake angle	Nose radius	Side cutting edge angle	Cutting edge strength Honing	Improving insert precision M class → G class	Improving holder rigidity	Clamping workpiece	Holder overhang
Poor precision Unstable machining size	Insert precision is variable													●				
	Workpiece, Separation of tool								●	↑	↓				●	●	●	●
Cutting edge back thrust is big It's necessary to adjust because machining precision changes during operation.	Flank wear increase					●					↑							
	Cutting condition is improper	↓	↑			●												
Poor surface roughness for finishing Criterion of tool life.	Weakened cutting force by increasing wear of tool	↓			Wet cutting			●	●	↑	↑		↓	●				
	Cutting edge chipping		↓	↓		●			●		↑		↑			●	●	●
	Adhesion, built-up edge	↑	↑		Wet cutting			●	●	↑			↓	●				
	Improper cutting conditions	↑	↓	↓	Wet cutting													
	Improper tool and shape of cutting edge								●		↑		↓	●				
	Vibration, chattering	↓	↓	↓	Wet cutting	●			●	↑	↓		↓		●	●	●	●
Cutting heat generation Poor machining precision and short tool life by cutting heat	Improper cutting conditions	↓	↓	↓		●												
	Improper tool and shape of cutting edge								●	↑			↓					
Burr, chipping, nap steel, aluminum (burr)	Improper cutting conditions	↓	↑		Wet cutting	●												
	Wear on the tool, improper shape of cutting edge							⊙	●	↑	↓		↓					
Cast iron (Weak chipping)	Improper cutting conditions		↓	↓		●												
	Wear on the tool, improper shape of cutting edge								●	↑	↑		↓		●	●	●	●
Soft steel (nap)	Improper cutting conditions	↑	↑		Wet cutting	●												
	Wear on the tool, improper shape of cutting edge							⊙	●	↑			↓					

↑: Increase ↓: Decrease ●: use ⊙: Correct use

Tool life criterion

● KS B0813

Flank wear width	Value	Application
	0.2 mm	Precision light cutting, Finishing in nonferrous alloy
	0.4 mm	Machining special steel
	0.7 mm	General cutting in cast iron, steel etc
	1~1.25 mm	General cutting in cast iron, steel etc
Depth of crater wear	In general 0.05~0.1 mm	

● ISO (B8688)

Tool life criterion	Application
Complete breakage	Machining special steel
Flank wear width VB = 0.3 mm	Even flank wear of cemented carbides, Ceramic tool
VBmax = 0.5 mm	Uneven flank wear
Crater wear width KT = 0.06+0.3fmm (f:mm/rev)	Cemented carbides tool
Criterion by surface roughness 1, 1.6, 2.5, 4, 6.3, 10 μ Ra	When surface roughness is important



The comparison of chip breakers

APPLICATION		KORLOY	KYOCERA	TAEGUTEC	SUMITOMO	SANDVIK	KENNAMETAL	ISCAR	WLATER	MITSUBISHI	SECO	TUNGALLOY		
NEGATIVE	P	Application	Ultra-Finishing	-	DP (G-class)	-	FA	PMC	FF (G-class)	SF	-	PK (G-class), FY	FF1	TF
			VL	GP	FA	FL, FB	QF	UF	PF	NF3	FH, FS, SY	FF2	NS, ZF	
		Finishing	VF	PP	FG	LU, FE	PF, XF	FN	NF, SM	NF4	FP		NM, NS, SS	
			VB	-	SF	SU	61	K	F3P	FP5	LP, SH, SA	MF2	TS, TSF	
		Medium to finishing	VQ, VC	HQ, CQ	MC	SE	HM	LF, CT	TF	NS6	C (Cermet)		AS	
			LP	PQ, CJ	FC	SX	PMC	-	-	MP3	MV	MF5	ZM, AM	
	Medium machining	VM, HM	HK, GS, HS, PS	MP, MT	GU (UG)	QM, SM	MP, MN	PP, TF	NM4, NP5	MA, MH	M3, M5	TQ, TM		
		MP	PG	PC	GE, UX	PM, XM	-	M3P	MP5	MP	-	DM, None C/B		
	Roughing	B25				-	RP, MR	GN	-	GM, None C/B	M5	TH		
		GR	PT, GT, HT, PH	RT	MU, ME, MX	PR, WR	RN, None C/B	R3P	RP5, NM9	GH, RP	MR5, MR6, MR7	THS		
Heavy duty machining	GH	PX	HB, RH, RX	HG, MP	PR, XMR	RH	NR, HT	RP7, NR4, NRF	HZ	R4, R5	CH			
	VH	-	HZ, EH	HP	QR	RM	HR	NRR, NR8	HX	R6, R7, R8, PR6	THS, TRS			
	VT	-	HT, HY, HD	HU, HW, HF	HR	MM	T3P	-	HV	PR9, R56, R57, R68	65, TUS			
Low carbon steel	Soft steel	VL	XF, XP, XP-T	SF	FL	LC	-	-	FY	-	-			
		-	XQ, XS	-	-	-	-	-	SY	-	-			
High feed	Wiper	VW	WP, WF	WS	LUW, SEW	WF, WL	FW	WF	NF	SW	FF2, MF2	AFW, FW		
		LW	WQ, WE	WT	GUW	WM, WMX	MW	WG	NM	MW	MF5, M3	ASW, SW		
		-	-	-	-	WR	RW	-	-	-	R4, R7	-		
Application	Shaft (long bar)	SH	CJ, ST	FS, VF, FX	HM	K	-	-	-	ES	UX	P, S		
		KNUX-	KNMX-	KNUX-	-	KNUX-71	-	-	-	KNMX-19	-	KNMX		
M	Stainless steel	Finishing	VP2, MP	MQ, GU, SK	EA, SF	SU, EF	MF, XF	FP, FF	SF, VL, F3M	NF4, FM5	SH, LM	FF1, MF1	SS, SF, SA	
		Medium cutting	MM	HU, TK, MS	MP, EM	EX, EG, GU	MM, XM, QM, MMC	MP, UP, MS	PP, TF, M3M	NM4, NR4	MS, GM, MM	MF3, MF4	SM	
		Roughing	RM	MU	ET	MU, HM, EM	MR, XMR, MRR	RP, P	MR, R3M	RM5, NRS	MA, ES	MF5, M5	S, SH	
K	Cast iron	Finishing	MP	None C/B, C, KQ	MT	UZ	KF, PMC, XF	T-20, FN	TF	NM, MK5	LK, MA	M4	CF	
		Medium cutting	B25, MK	ZS, KG	RT, KT	UX, GZ	KM, XM	UN, RP	GN	NM5, RK5	MK, GK, None C/B	M5	CM, None C/B	
		Roughing	-MA, RK	-MA, GC, KH	-MA	-MA	KR, XMR, KRR	MR, S-20, -MA	-MA, NR	-MA, RK7	RK, -MA	MR7	CH	
S	HRSA	Ultra-finishing	VP1	MQ, SK	EA	EF	SF, SGF	FS (G-class) LF (G-class)	SF, PF	NF4	FJ(G-class)	M1	SF	
		Finishing	VP2	TK	ML	UP, EG	23.SR, XF, SMC	UP	PP	NFT	LS	MF1	HMM	
		Medium cutting	VP3	MS	EM	EX	SM, SMR, XM	MS, GP, P, UN	TF	NMS, NMT	MS	MF4, MR3	HRF	
		Roughing	VP4	MU	ET	MU	XMR	RP	MR	NRS, NRT	RS, GJ	MR4	HRM	
N	Aluminium alloy	HA	AH	ML	AX	23	GP, MS	NF, PP	FN2, PF2, MN2, PM2	MJ	MF1	P		
POSITIVE	P M K	Application	Finishing	VL	XP, PP	FA, FX	FC	PF, XF	11	PF	FP4	SMG (G-class), FV	FF1	01
				VF	GP	-	FB, LU (FP, FK)	UF	UF	F3P	FK6	SV, FP	F1	PSF, PF
			Medium cutting	HMP	XQ	FG	LB, NF	PM, XM	LF, FP	14	MP4, FM2, FM4, MK4	LP	MF2	PSS
				MP	HQ, GK	PC, FM	SU, SC	UM, PMC	MP, T-20	SM	FP6, MM4, FM6, RK4	MV	F2, M3	PS
	Roughing	C25	None C/B	MT	MU	PR, UR, XR	MF, GM, -C	19	RP4, RM4, RK6	None C/B, MP	M5	PM		
Wiper	-	WP	-	LUW	WL, WF	FW	WF	PM	SW	-	-			
	-	-	WT	SDW	WM, WMX	MW	WG	-	MW	-	-			
M S	Stainless steel For HRSA	Finishing	VP1	CF, GF, GQ	FG	FC, FM	MF, MM, MMC	11, UF, LF	PF	FM4, NM4	FJ (G-class), FM, LM	F1, MF2	PSF, PSS	
		Medium to finish cutting	VL	MQ, MF	SA	LB, SI	MR, XR, SMC	MF	SM, M3M	RM4	MM, None C/B	M3, M5	PS, PM	
K	Cast iron	Medium cutting	MP	HQ	PC	MU	KF, KM	LF	17	FK6	MK	M3	CM	
		Roughing	C25	GK	MT	None C/B	KR	MF, UF	19	MK4, RK6	None C/B, -MW	M5	None C/B	
N	Aluminium alloy	AK, AR	AH	FL	AW, AG, AY	AL	HP, LF	AS, AF	PM2	AZ, FS	AL	AL		
High precision bar turning (tolerance class G&E)		KF, KM	FSF, USF, J, A3	GF, FF, GW	FY, FX, FZ	K, F, UM	GH	LF, RF, XL	-	F, SR, SS, SM	UX	JS, J10, JRP, JPP		



The comparison of grade for turning

WC

ISO	KORLOY	SUMITOMO	KYOCERA	ISCAR	SANDVIK	SECO	KENAMETAL	TOSHIBA	mitsubishi	HITACHI	VALENITE	WALTER	TAEGUTEC	NTK	DIJET
Turning	P	ST10	ST10P					TX10S	ST110T	SRN5	S1F		P10		
		ST20	ST20E			S1P		TX20	ST120T	WS20B			P20		
		ST30A	A30	PW30	IC50M	SM30	TTX	K45	TX30	UTi20T	EX35	VC6		P30	
		ST40E		IC54	S6	TTR	K420	TX40		EX40	VC5		P40		
										EX45	VC56				
	M	U20	U10E			AT10		TU10	UTi20T	WAM10B			M10		
		U2	A30		H13A	AT15	K2885	TU20		EX35	VC27		M20		
		A40			H10F	TTR	K2S	TU40			VC28		M40		
	K	H01	H1		IC4	THM	K68	TH03	HTi10T	WH05	VC3		K10		
		H05		IC20	H10P	THR	K8735	TH10	HTi20T	W10	VC2		K20		
		G10	G10E	IC28	H10F			KS20		WH20	VC1		K20M		
			KW10H										K30		

CVD coated

ISO	KORLOY	SUMITOMO	KYOCERA	ISCAR	SANDVIK	SECO	KENAMETAL	TOSHIBA	mitsubishi	HITACHI	VALENITE	WALTER	TAEGUTEC	NTK	DIJET	
Turning	P	AC805P	CA5505			TP0500	KCP05	T9105	UE6105				TT8105			
		NC3215*	AC810P	CA510		GC4305	KCP05B						TT8105			
			AC700G	CA515	IC8150	GC4205	TP0501		T9115	UE6110	HG8010	VP5515	WPP10S	LC215P		
			AC900G	VP5115		GC4215	TP1500	KCP10		MY5015			WKP13S	TT8115		
		NC3225*	AC820P	CA525		TP2500	KCP25	T9125	MC6025	HG8025	VP5525	WPP20S	TT8120		JC110V	
		NC3120	AC2000	VP5125	IC8250	TP2501	KCP25B		UE6020			WKP23S	LC225P	CP5	JC215V	
			AC8025P	CA525		TGP35							TT8125			
			NC3030	CA530		GC4335	TP3500	KCP30	T9135	MC6035	GM8035	VP5535	WPP30S	TT5100		JC325V
			NC5330	CA530	IC8350	GC4235	TGP45	KCP30B		UE6035		WKP33S	TT8135		JC450	
								KCP40					TT7100			
							KCP40B		UH6400							
	M	NC9115*	AC610M	CA6515	IC6015	S05F	KCM15	T6120	MC7015		VP8515	WAM10	TT9215			
		NC9125*			IC6025	GC2015	KCM15M		MC7025	GM25	VP8525	WMP20S	TT9225			
			AC630M	CA6525		GC2220	KCM25		US7020	GX30		WAM20	TT9235			
		NC9135*	AC6030M			GC2025	KCM25B	T6130	US735			WAM30				
			AC6030M				KCM35									
							KCM35B									
							KCK05									
							KCK05B									
	K	NC6310*	AC405K	CA4505	IC5005	GC3205	KCK15	T5105	MC5005	HG3505	VP1505	WKK10S	TT7005	CP2	JC105V	
						GC3210	KCK15B		UC5105		VP1510	WKK20S	TT7505	CP5	JC110V	
		NC6315	AC415K	CA4010		TK2001	KCK15B	T5115	MC5015	HG3515	VP1515		TT7310		JC215V	
				CA4515	IC5015	GC3215			UC5115				TT7015			
			AC420K	CA4120		GC3225	KCK20	T5125				WAK30	TT6300			
							KCK20B									

PVD coated

ISO	KORLOY	SUMITOMO	KYOCERA	ISCAR	SANDVIK	SECO	KENAMETAL	TOSHIBA	mitsubishi	HITACHI	VALENITE	WALTER	TAEGUTEC	NTK	DIJET
Turning	P	PC8105*						AH710			VC907				
		PC8110		PR1005	IC507		CP200	KU10T			VC927				JC5003
				PR915	IC808		CP250	KU25T							JC5015
			PR1115	IC830	GC1025				AH330	IP2000	VC905	WTA43			
			PR930	IC908					AH740	IP3000		WTA41	TT5030		
			PR1025	IC3028					AH120						
			PR630	IC3028	GC4125		CP500		AH330	VP15TF					
			PR660	IC330					AH120	VP20MF					
									AH630						
									AH630						
	M	PC8105*	AC510U	PR915	IC808	GC1005	KC5010	AH330	MP9005	IP50S	VC929	WSM10S			
		PC8110	EH510Z	PR930	IC907	GC1105	KC5510	GH330	VP10RT	IP100S	VC927	WSM20S		ZM3	JC5003
		PC8115*	AC520U			GC1020		AH120			VC902	WSM30S		QM3	
		PC5300*	EH520Z	PR1125	IC3028	GC1025	KC5025	GH730	VP15TF		VC901	WSM40S	TT5030	VM1	JC5015
			AC530U	PR630	IC830	GC4125	KC5525	AH140	VP20MF		VC905			TAS	
				PR660				AH630							
					IC330	GC2035			MP7035				TT8020		
	K	PC5300	EH510Z		IC5100					CY110H	VC929				
			EH520Z		IC810			AH110			VC903				
					IC220			GH110			VC927				
					IC908	CP200		AH120			VC902				
					IC228	CP500					VC901				
											VC907				
	S	PC8105	AC510U	PR915	IC808	TS2000	KC5010	AH110	VP05RT			WSM10			
		PC8110	AC520U	PR660	IC907	CP500	KC5025	AH120	VP10RT			WSM20	TT5030		
		PC8115*		PR1325	IC3028	TS2500			VP15TF			WSM30			
		PC5300*			IC328				MP7035						
		PC5400*			IC328	GC2035									

CERMET

ISO	KORLOY	SUMITOMO	KYOCERA	ISCAR	SANDVIK	SECO	KENAMETAL	TOSHIBA	mitsubishi	HITACHI	VALENITE	WALTER	TAEGUTEC	NTK	DIJET
Turning	P	CC1500*	T110A	PV30*				NS520	NX2525	CH350			PV3010*	T3N	LN10
		CN1500*	T2000Z*	TN30	IC20N	CT5015	CM	HT2	GT530*	NX3035	CZ25*		CT3000	T15	CX50
			T1500A		IC520N		C15M	HT5	NS530	UP35N*	CH530	VC83	WTA43*	N20	CX75
							HT175	NS9530	AP25N*	CH550	WTA41*		C30	CX90	
							KT195M	GT9530*	NX335	CH570			N40	CX99	
								NS540	MP3025*						
								NS730							
	M														
	K	CN1500*	T110A						NX2525				CT3000	T15	LN10
		CN2500*													CX75

★ : PVD Coating cermet ★ : New Grade

