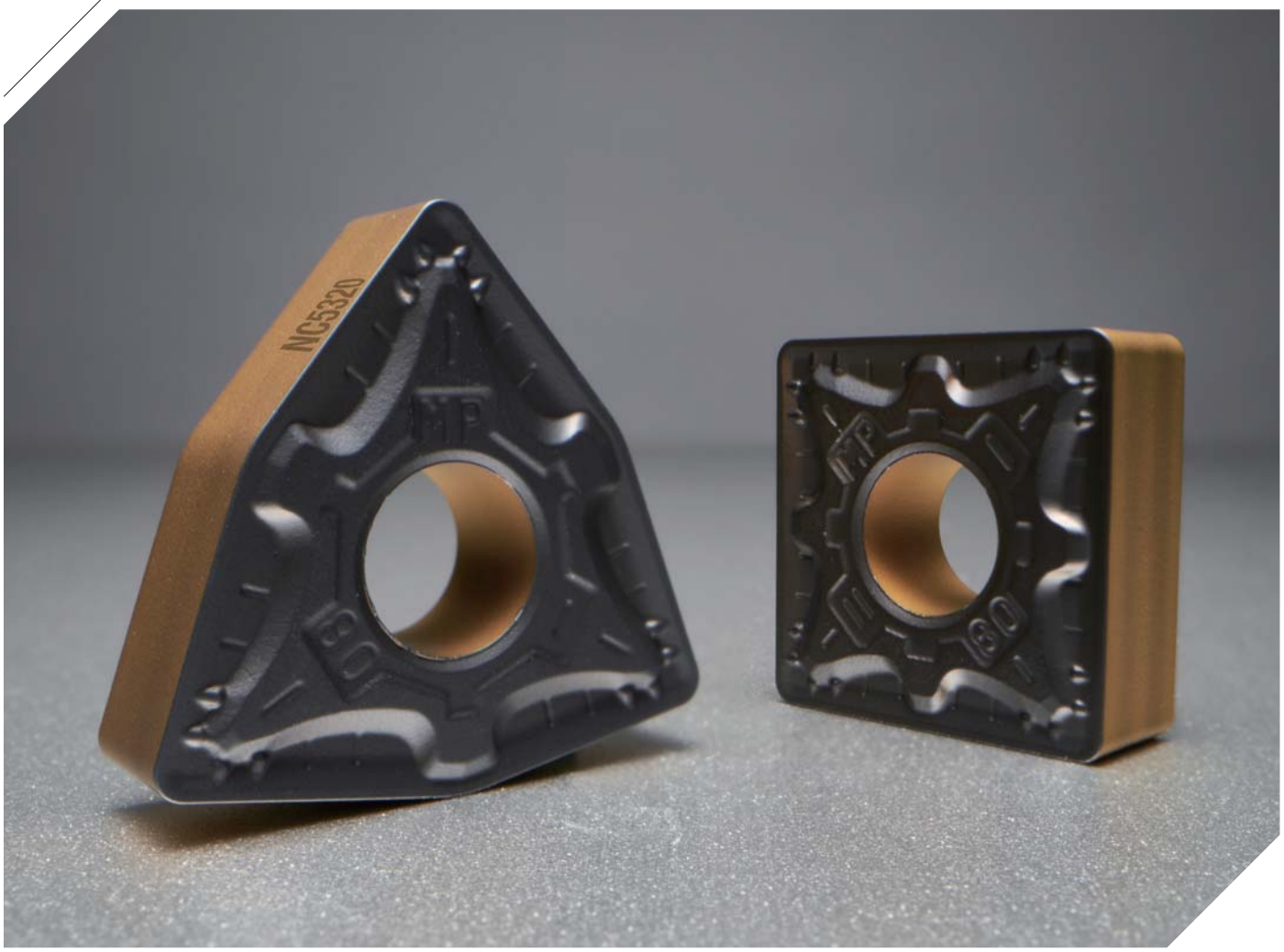
KORLOY TECH-NEWS

NC5320

Universal insert for Steel and Cast iron cutting

- Increased chipping resistance and stable tool life in Steel and Cast iron cutting
- Applying universal substrate with high adhesion and coating layer with good wear resistance and chipping resistance



KORLOY

Universal insert for Steel and Cast iron cutting

NC5320

In recent cutting industries, the demand on high speed machining for productivity improvement is steadily increasing because there are various shapes in workpieces and cutting time is reducing due to less machining allowance from the heat/cold forging technology development. Therefore, universal grade with wear resistance and chipping resistance is necessary for cutting various workpiece in high speed.

KORLOY launches CVD universal grade for Steel and Cast iron cutting for higher productivity according to those changes in market.

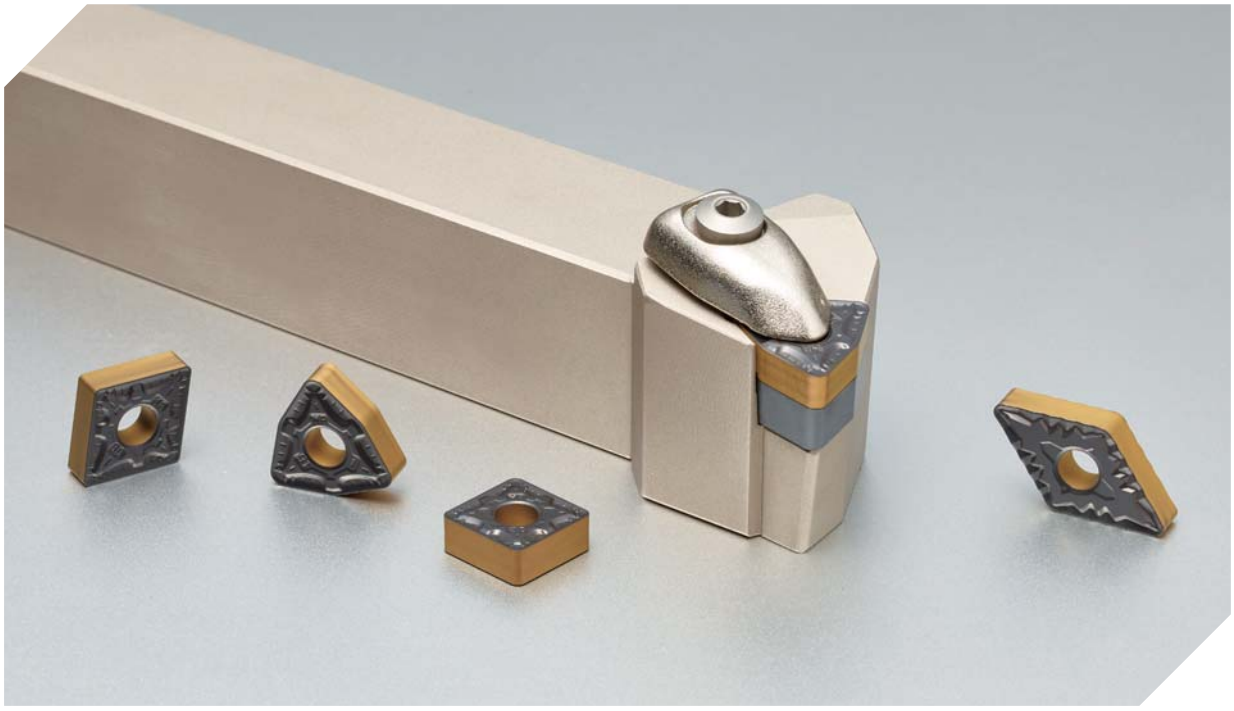
NC5320, with the New CVD coating technology application, provides higher productivity by ensuring stable machinability in high temperature due to high cutting speed and providing good surface finish. In addition, applying the exclusive substrate and post treatment ensure versatility with good wear resistance and chipping resistance.

NC5320 enhanced the wear resistance from the conventional grade in Steel and Cast iron Turning and it provides higher productivity and stable machining quality as a KORLOY's next generation grade in high cutting speed.

» Long tool life in high cutting speed
- Exclusive substrate with great wear resistance and New CVD coating

» Grade for general use
- Long tool life in Steel and Cast iron cutting

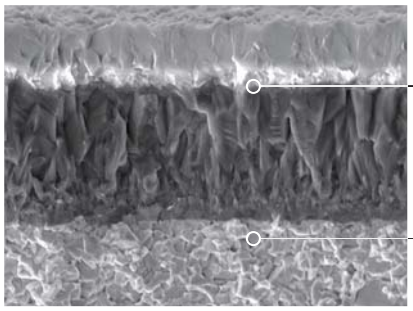
» Increased chipping resistance
- New CVD coating with improved adhesion
- Exclusive post treatment application



Features

- Applying exclusive substrate for Steel and Cast iron and New CVD coating with great wear resistance
- Applying New CVD coating technology with better BUE resistance and chipping resistance than existing grades

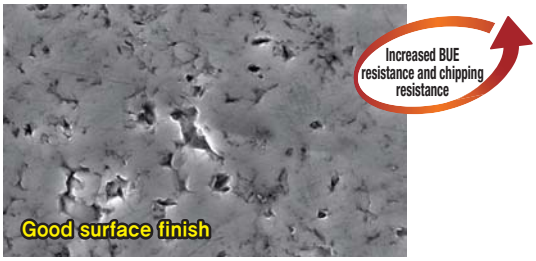
New CVD coating with increased wear resistance and chipping resistance



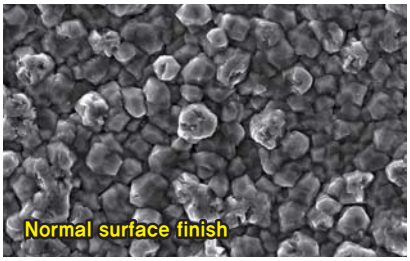
Applying α-phase alumina coating, optimal structured universal CVD coating

Optimal substrate for Steel and Cast iron cutting with good wear resistance

Increased surface finish due to applying New CVD coating

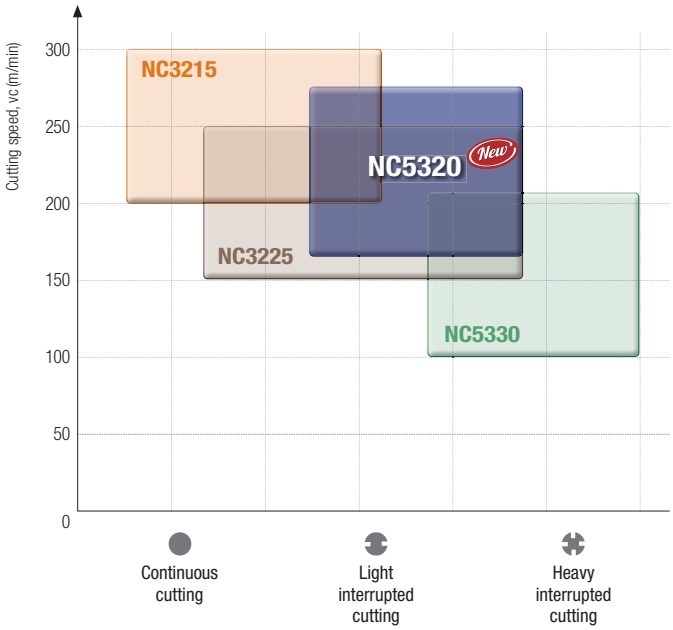


[NC5320]



[Existing grade]

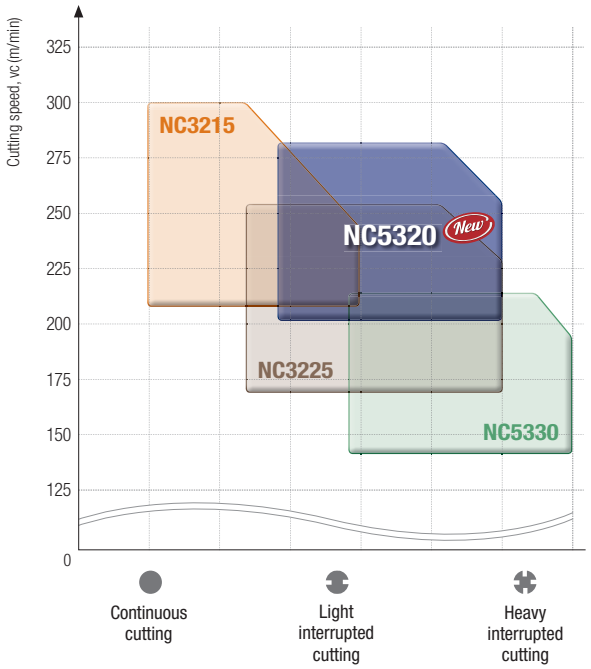
Application range



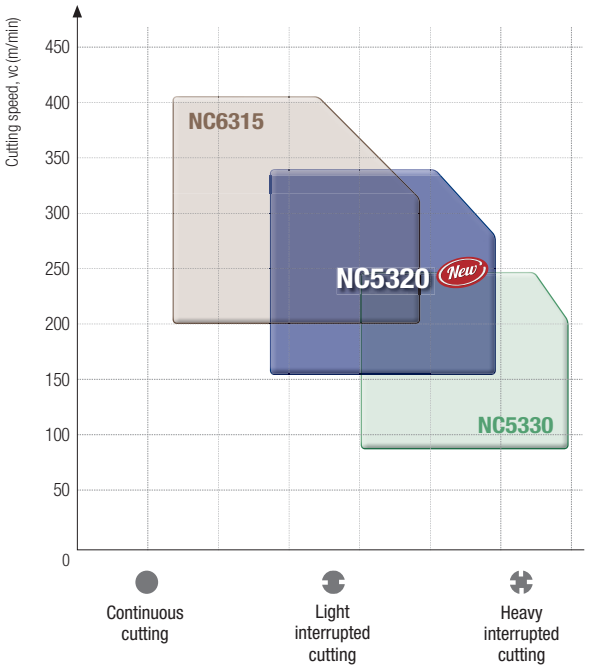
Cutting Range	Grade	vc (m/min)
Continuous, high speed	NC3215	200 ~ 300
Light interrupted, medium speed	NC3225	150 ~ 250
Interrupted, high speed	NC5320 New	160 ~ 280
Heavy interrupted, low speed	NC5330	100 ~ 200

Application range

P Steel



K Cast iron

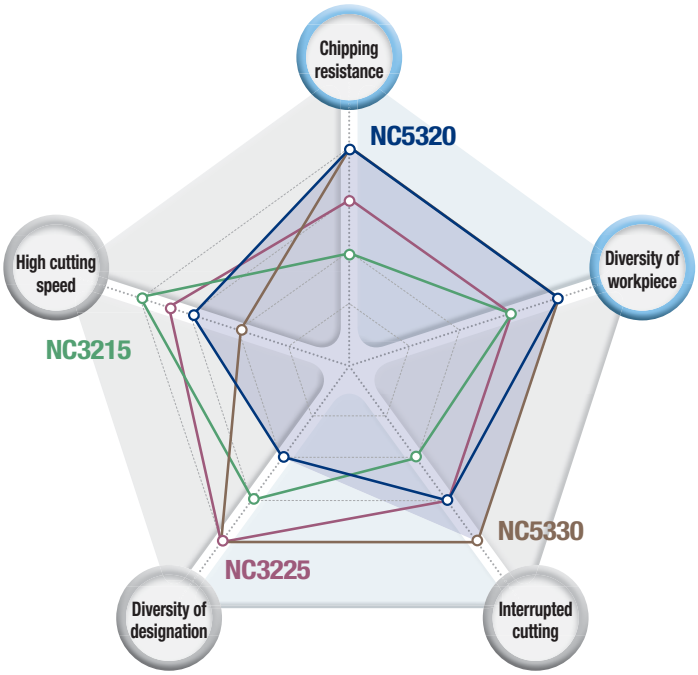


Recommenden cutting conditions

* Quenching + tempering heat treatment

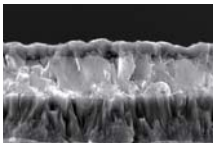
Workpiece					Specific cutting force (N/mm²)	Brinell hardness (HB)	Recommended cutting condition	
ISO	Workpiece material	ISO (DIN)	AISI				NC5320	NC5330
							vc (m/min)	
P	Low carbon steel	C15 C25 C35	1015 1025 1035		1500	120 ~ 210	280	245
							310	**275**
							310	275
	High carbon steel	C45 C53 C55	1045 1050 1055		1700 1820*	140 ~ 250 200 ~ 290*	270 (220*)	235 (190*)
							280 (230*)	**245 (200*)**
							280 (230*)	245 (200*)
	Low alloy steel	20Cr4 42CrMo4 21NiCrMo2	5120 4140 8615		1700 2000*	170 ~ 270 220 ~ 360*	140 (110*)	120 (95*)
							180 (140*)	**155 (120*)**
							210 (170*)	185 (150*)
	High alloy steel (Alloy tool steel)	(X100CrMoV5 1) X40CrMoV5-1 HS6-5-2	D2 H13 M2		1950 3100*	200 ~ 320 480 ~ 650*	160 (130*)	140 (110*)
							160 (130*)	**140 (110*)**
							180 (140*)	155 (120*)
K	Gray cast iron	150 250 350	No25B No35B No50B		900 1100 1300	≤ 212 ≤ 248 ≤ 277	230	200
							240	**215**
							280	250
	Ductile cast iron	500 600 700	80-55-06 - 100-70-03		1200 1440 1650	170 ~ 241 192 ~ 269 229 ~ 302	150	135
							200	**175**
							220	195

Grade selection guide



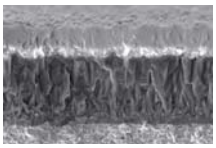
NC5320 New

- For interrupted cutting and good chipping resistance
- Universal grade



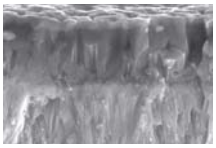
NC5330

- For interrupted cutting and good toughness
- Universal grade



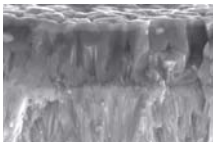
NC3215

- For continuous cutting, good wear resistance
- Exclusive grade for Steel cutting



NC3225

- For interrupted cutting and good wear resistance
- Exclusive grade for Steel cutting

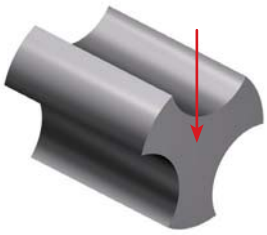


Grade	Chipping resistance	Diversity of workpiece	Interrupted cutting	Diversity of designation	High cutting speed
NC5320 New	★★★★	★★★★	★★★	★★	★★★
NC5330	★★★★	★★★★	★★★★	★★★★	★★
NC3215	★★	★★★	★★	★★★	★★★★
NC3225	★★★	★★★	★★★	★★★★	★★★☆

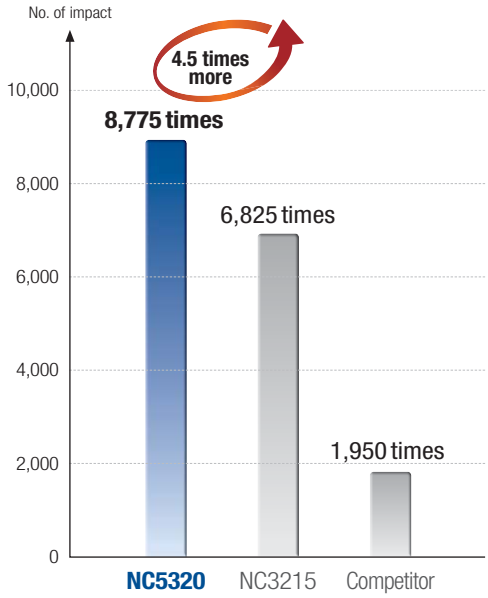
Performance evaluation

Fracture resistance

Workpiece	Low alloy steel (20Cr4)
Cutting condition	vc (m/min) = 300, fn (mm/rev) = 0.2, ap (mm) = 1.5, wet
Tool	**Insert** CNMG120408-MP (NC5320) **Holder** DCLNL2525-M12



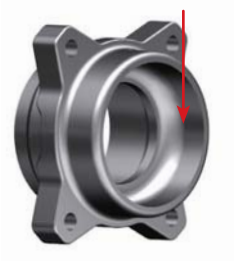
[NC5320] [NC3215] [Competitor]

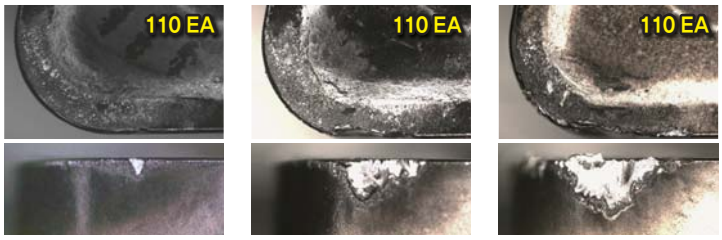


- Longer tool life than NC3215 and competitor
- Increased fracture resistance

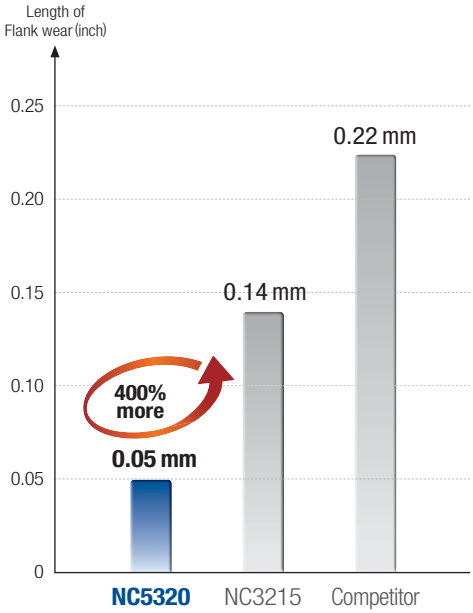
Chipping resistance

Workpiece	Bearing hub wheel (C55Cr)
Cutting condition	vc (m/min) = 120, fn (mm/rev) = 0.23~0.37, ap (mm) = 1.6, wet
Tool	**Insert** WNMG080412-MK (NC5320) **Holder** DWLNL2525-M08





[NC5320] [NC3215] [Competitor]

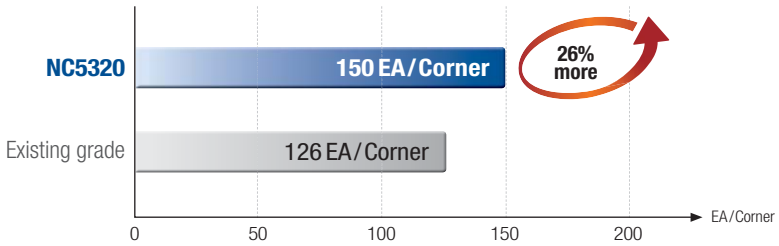


- Better state of cutting edge than NC3215 and competitor
- Improved chipping resistance

Application examples

High carbon steel (C55Cr)

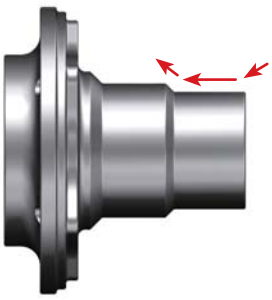
Workpiece use	Bearing hub (hub)
Cutting condition	vc (m/min) = 280, fn (mm/rev) = 0.3~0.42, ap (mm) = 1.5, dry (interruption cutting) + wet (continuous cutting)
Tool	Insert WNMG080416-MP (NC5320)

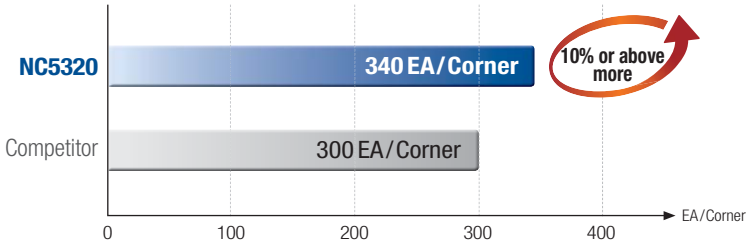


» 26% more cutting than existing grade

High carbon steel (C55Cr)

Workpiece use	Bearing hub (hub)
Cutting condition	vc (m/min) = 250, fn (mm/rev) = 0.28, ap (mm) = 0.3, wet
Tool	Insert WNMG080408-CP (NC5320)

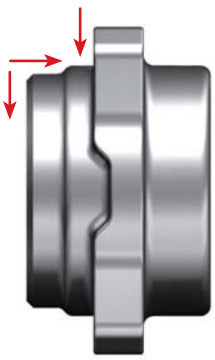


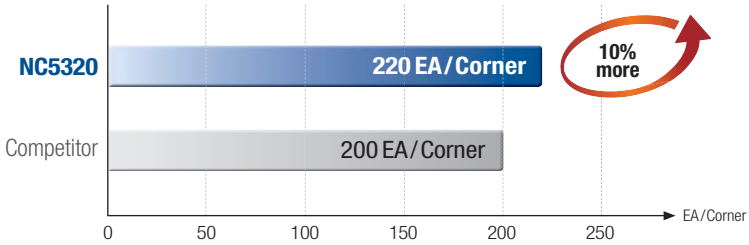


» 10% or above more cutting than competitor

High carbon steel (C55Cr)

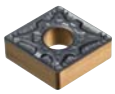
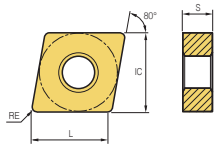
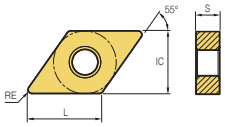
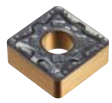
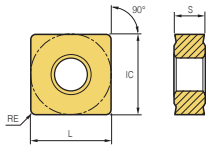
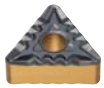
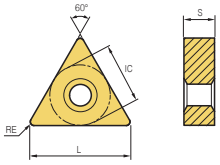
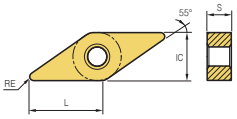
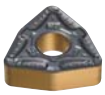
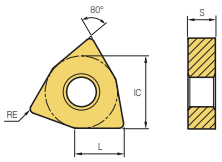
Workpiece use	Bearing hub (wheel)
Cutting condition	vc (m/min) = 180, fn (mm/rev) = 0.38, ap (mm) = 2.0~3.0, dry (interruption cutting) + wet (continuous cutting)
Tool	Insert CNMG120416-MP (NC5320)





» 10% more cutting than competitor

Stock items

Picture	Designation		Coated NC5320	Dimension (mm) L	IC	S	RE	Cutting condition fn (mm/rev)	ap (mm)	Geometry
 CNMG-MP*	**CNMG**	120408-CP	●	12.8959	12.7	4.76	0.794	0.24 (0.40~0.08)	2.40 (0.80~4.00)	
		120408-MP	●	12.8959	12.7	4.76	0.794	0.30 (0.45~0.15)	2.50 (0.50~4.50)	
		120408-VB	●	12.8959	12.7	4.76	0.794	0.30 (0.45~0.15)	1.25 (0.50~2.00)	
		120408-VC	●	12.8959	12.7	4.76	0.794	0.25 (0.40~0.10)	1.50 (0.50~2.50)	
		120412-CP	●	12.8959	12.7	4.76	1.191	0.28 (0.45~0.10)	2.40 (0.80~4.00)	
		120412-MP	●	12.8959	12.7	4.76	1.191	0.33 (0.50~0.15)	2.90 (0.80~5.00)	
		120412-VB	●	12.8959	12.7	4.76	1.191	0.35 (0.50~0.20)	1.25 (0.50~2.00)	
		120412-VC	●	12.8959	12.7	4.76	1.191	0.29 (0.45~0.12)	2.00 (0.50~3.50)	
		120416-MP	●	12.8959	12.7	4.76	1.588	0.42 (0.55~0.28)	3.00 (1.00~5.00)	
DNMG-CP*	**DNMG**	150408-CP	●	15.5083	12.7	4.76	0.794	0.24 (0.35~0.12)	2.00 (0.50~3.50)	
		150408-MP	●	15.5083	12.7	4.76	0.794	0.30 (0.45~0.15)	2.50 (0.50~4.50)	
		150408-VB	●	15.5083	12.7	4.76	0.794	0.30 (0.45~0.15)	1.25 (0.50~2.00)	
		150408-VC	●	15.5083	12.7	4.76	0.794	0.28 (0.40~0.15)	1.75 (0.50~3.00)	
		150412-CP	●	15.5083	12.7	4.76	1.191	0.24 (0.35~0.13)	2.15 (0.80~3.50)	
		150412-MP	●	15.5083	12.7	4.76	1.191	0.33 (0.50~0.15)	2.90 (0.80~5.00)	
		150412-VB	●	15.5083	12.7	4.76	1.191	0.30 (0.45~0.15)	1.25 (0.50~2.00)	
		150412-VC	●	15.5083	12.7	4.76	1.191	0.30 (0.45~0.15)	1.75 (0.50~3.00)	
		150416-MP	●	15.5083	12.7	4.76	1.588	0.33 (0.50~0.15)	2.90 (0.80~5.00)	
		150608-CP	●	15.5083	12.7	6.35	1.588	0.24 (0.35~0.12)	2.00 (0.50~3.50)	
		150608-MP	●	15.5083	12.7	6.35	1.588	0.30 (0.45~0.15)	2.50 (0.50~4.50)	
		150608-VB	●	15.5083	12.7	6.35	1.588	0.30 (0.45~0.15)	1.25 (0.50~2.00)	
		150608-VC	●	15.5083	12.7	6.35	1.588	0.28 (0.40~0.15)	1.75 (0.50~3.00)	
		150612-CP	●	15.5083	12.7	6.35	1.191	0.24 (0.35~0.13)	2.15 (0.80~3.50)	
		150612-MP	●	15.5083	12.7	6.35	1.191	0.33 (0.50~0.15)	2.90 (0.80~5.00)	
		150612-VB	●	15.5083	12.7	6.35	1.191	0.35 (0.50~0.20)	1.50 (0.50~2.50)	
		150612-VC	●	15.5083	12.7	6.35	1.191	0.30 (0.45~0.15)	1.75 (0.50~3.00)	
		150616-MP	●	15.5083	12.7	6.35	1.588	0.33 (0.50~0.15)	2.90 (0.80~5.00)	
 SNMG-MP*	**SNMG**	120408-CP	●	12.7	12.7	4.76	0.794	0.24 (0.35~0.12)	2.00 (0.50~3.50)	
		120408-MP	●	12.7	12.7	4.76	0.794	0.30 (0.45~0.15)	2.50 (0.50~4.50)	
		120412-CP	●	12.7	12.7	4.76	0.794	0.24 (0.35~0.13)	2.15 (0.80~3.50)	
		120412-MP	●	12.7	12.7	4.76	0.794	0.33 (0.50~0.15)	2.90 (0.80~5.00)	
 TNMG-CP*	**TNMG**	160408-CP	●	16.498	9.525	4.76	0.794	0.20 (0.30~0.10)	1.75 (0.50~3.00)	
		160408-MP	●	16.498	9.525	4.76	0.794	0.30 (0.45~0.15)	2.25 (0.50~4.00)	
		160412-CP	●	16.498	9.525	4.76	1.191	0.21 (0.30~0.12)	1.90 (0.80~3.00)	
		160412-MP	●	16.498	9.525	4.76	1.191	0.33 (0.50~0.15)	2.65 (0.80~4.50)	
VNMG-CP*	**VNMG**	160404-CP	●	16.606	9.525	4.76	0.397	0.23 (0.35~0.10)	1.75 (0.50~3.00)	
		160404-MP	●	16.606	9.525	4.76	0.397	0.25 (0.40~0.10)	1.95 (0.40~3.50)	
		160404-VB	●	16.606	9.525	4.76	0.397	0.23 (0.35~0.10)	0.90 (0.30~1.50)	
		160404-VC	●	16.606	9.525	4.76	0.397	0.23 (0.35~0.10)	1.15 (0.30~2.00)	
		160408-CP	●	16.606	9.525	4.76	0.794	0.21 (0.30~0.12)	1.75 (0.50~3.00)	
		160408-MP	●	16.606	9.525	4.76	0.794	0.30 (0.45~0.15)	2.25 (0.50~4.00)	
		160408-VB	●	16.606	9.525	4.76	0.794	0.30 (0.45~0.15)	1.25 (0.50~2.00)	
		160408-VC	●	16.606	9.525	4.76	0.794	0.28 (0.40~0.15)	1.75 (0.50~3.00)	
 WNMG-MP*	**WNMG**	80408-CP	●	8.687	12.7	4.76	0.794	0.24 (0.35~0.12)	2.00 (0.50~3.50)	
		80408-MP	●	8.687	12.7	4.76	0.794	0.30 (0.45~0.15)	2.50 (0.50~4.50)	
		80408-VB	●	8.687	12.7	4.76	0.794	0.30 (0.45~0.15)	1.25 (0.50~2.00)	
		80408-VC	●	8.687	12.7	4.76	0.794	0.30 (0.45~0.15)	2.33 (0.15~4.50)	
		80412-CP	●	8.687	12.7	4.76	1.191	0.24 (0.35~0.13)	2.15 (0.80~3.50)	
		80412-MP	●	8.687	12.7	4.76	1.191	0.33 (0.50~0.15)	2.90 (0.80~5.00)	
		80412-VB	●	8.687	12.7	4.76	1.191	0.32 (0.45~0.18)	1.65 (0.80~2.50)	
		80412-VC	●	8.687	12.7	4.76	1.191	0.30 (0.45~0.15)	2.33 (0.15~4.50)	
		80416-CP	●	8.687	12.7	4.76	1.191	0.25 (0.35~0.14)	2.15 (0.80~3.50)	
		80416-MP	●	8.687	12.7	4.76	1.191	0.37 (0.55~0.18)	2.55 (0.10~5.00)	

* : Standard insert shape

● : Stock item

⚠ For the safe metalcutting

- Use safety supplies such as protective gloves to prevent possible injury while touching the edge of tools.
- Use safety glasess or safety cover to hedge possible dangers. Inappropriate usage or excessive cutting condition may lead tool's breakage or even the fragment's scattering.
- Clamp the workpiece tightly enough to prevent its movement while its machining.
- Properly manage the tool change phase because the inordinately used tool can be easily broken under the excessive cutting load or severe wear, and it may threat the operator's safety.
- Use safety cover because chips evacuated during cutting are hot and sharp and may cause burns and cuts. To remove chips safely, stop machining, put on protective gloves, and use a hook or other tools.
- Prepare for fire prevention measures as the use of the non-water soluble cutting oil may cause fire.
- Use safety cover and other safety supplies because the spare parts or the inserts can be pulled out due to centrifugal force while high speed machining.

KORLOY

Head Office: Holystar B/D, 326, Seocho-daero, Seocho-gu, Seoul, 06633, Republic of Korea
Tel: +82-2-522-3181 Fax: +82-2-522-3184, +82-2-3474-4744 Web: www.korloy.com E-mail: sales.khq@korloy.com

KORLOY AMERICA
620 Maple Avenue, Torrance, CA 90503, USA
Tel: +1-310-782-3800 Toll Free: +1-888-711-0001 Fax: +1-310-782-3885
E-mail: sales.kai@korloy.com

KORLOY INDIA
Plot No. 415, Sector 8, IMT Manesar, Gurgaon 122051, Haryana, India
Tel: +91-124-439-1790 Fax: +91-124-405-0032
E-mail: sales.kip@korloy.com

KORLOY TURKIYE
Serifali Mahallesi, Burhan Sokak NO: 34
Dudullu OSB/Umraniye/Istanbul, 34775, Turkiye
Tel: +90-216-415-8874 E-mail: sales.ktl@korloy.com

KORLOY RUSSIA
Premises 1/3, building 3, house 3, per Kapranova, vn.ter.g. municipal district Presnensky, 123242, Moscow, Russia
Tel: +7-495-280-1458 Fax: +7-495-280-1459 E-mail: sales.krc@korloy.com

KORLOY FACTORY INDIA
Plot No. 415, Sector 8, IMT Manesar, Gurgaon 122051, Haryana, India
Tel: +91-124-439-1818 Fax: +91-124-405-0032
E-mail: pro.kim@korloy.com

KORLOY EUROPE
Gablonzer Str. 25-27, 61440 Oberursel, Germany
Tel: +49-6171-27783-0 Fax: +49-6171-27783-59
E-mail: sales.keg@korloy.com

KORLOY BRASIL
Av. Aruana 280, conj.12, WLC, Alphaville, Barueri, CEP06460-010, SP, Brasil
Tel: +55-114-193-3810 Fax: +55-114-193-5837
E-mail: sales.kbl@korloy.com

KORLOY CHILE
Av. Providencia 1650, Office 910, 7500027
Providencia-Santiago, Chile
Tel: +56-229-295-490 E-mail: sales.kcs@korloy.com

KORLOY MEXICO
Avenida de las Ciencias, No. 3015, Interior 507, Juriquilla Santa Fe, C.P. 76230 Querétaro, Querétaro, Mexico
Tel: +52-442-193-3600 E-mail: sales.kml@korloy.com

PRINTED WITH SOY INK

TN112-EM-01 / 20230510