

NC3220

For Steel Turning New CVD grade (P20)

- Coating with good surface roughness and welding resistance.
- Coating with oxidation resistance at high temperature and plastic deformation resistance.
- Coating with excellent chipping resistance due to improved adhesion.

NC3220

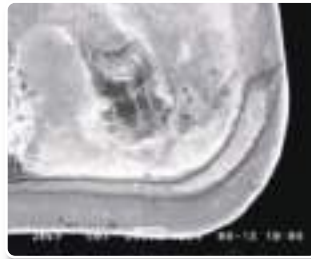
Features of NC3220 [New coating layer with oxidation resistance and adhesion]



- Coating with good surface roughness and welding resistance.
- Coating with oxidation resistance at high temperature and plastic deformation resistance.
- Coating with excellent chipping resistance due to improved adhesion.
- Fine coating layer with toughness and wear resistance.
- Exclusive substrate material for coating improving wear resistance.

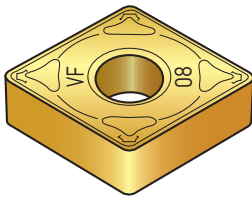


[Current grade]

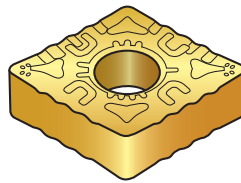


[New grade (NC3220)]

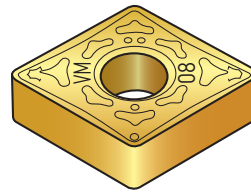
- **Coating with oxidation resistance at high temperature and plastic deformation resistance.**
 - Improved wear resistance on the rake surface of insert
- **Exclusive substrate material for coating improving wear resistance.**
 - Improved wear resistance on the flank surface of insert



[For Finishing]



[For medium-finishing]

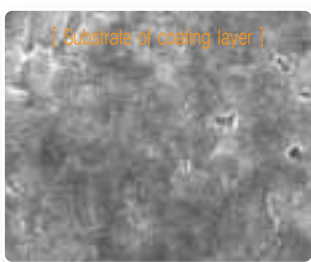


[For medium machining]

Superior surface finish



[Current grade]

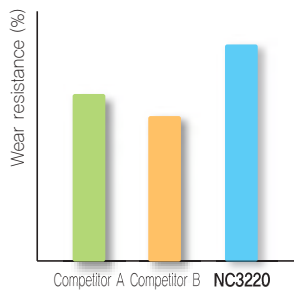


[New grade (NC3220)]

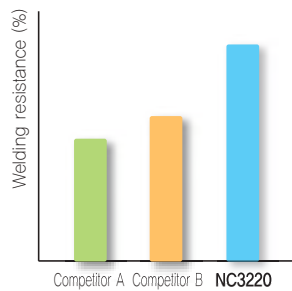
- **Improved adhesion and surface finish**
 - Stable machining and increased welding resistance and wear resistance

Increased wear resistance, welding resistance, and chipping resistance

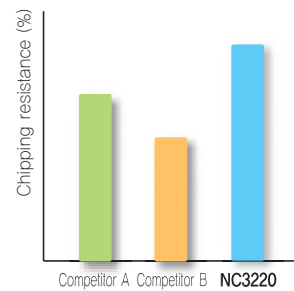
• Wear resistance



• Welding resistance

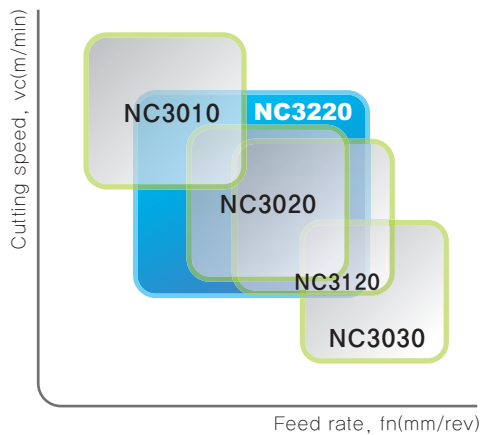


• Chipping resistance



Application and Features

• Application



• Features

- General grade for all kinds of steel(carbon steel, alloy steel, rolled steel, tool steel, mild steel, bearing steel, etc.) in both continuous and interrupted machining
- Longer tool life in high speed machining due to improved wear resistance and plastic deformation resistance
- Improved coating layer with superior adhesion improves chipping resistance and stability of machining.
- Fine finished coating surface provides welding resistance, superior lubrication and lower cutting load.

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Recommended cutting

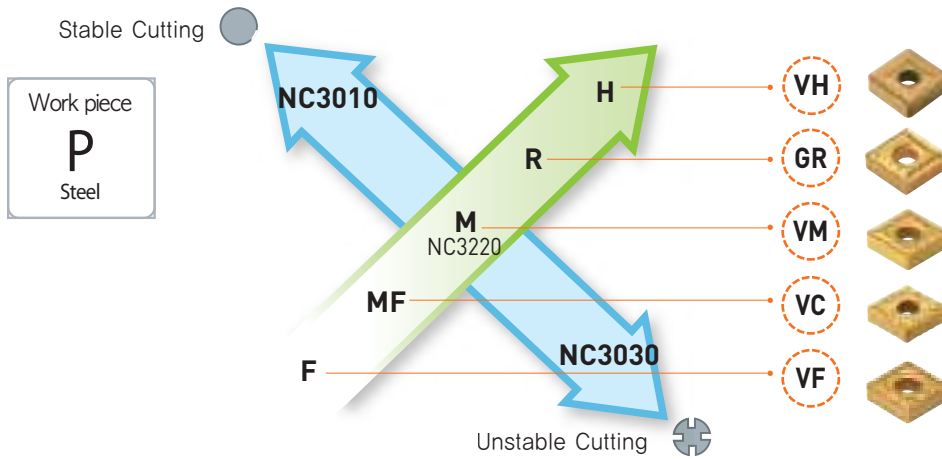
Workpiece	Reommended grade	vc(m/min)	ISO	Application range	
P Steel	Continuous cutting	NC3010	300(200~400)	P01	
		NC3220	280(180~380)	P10	
		NC3020	250(150~350)	P15	
	Interrupted cutting	NC3120	200(150~250)	P20	
		NC3030	190(100~230)	P20	
		NC5330	100(50~150)	P30	
		NC500H	100(50~150)	P35	
		NC500H	100(50~150)	P40	

Comparison of grade(P20)

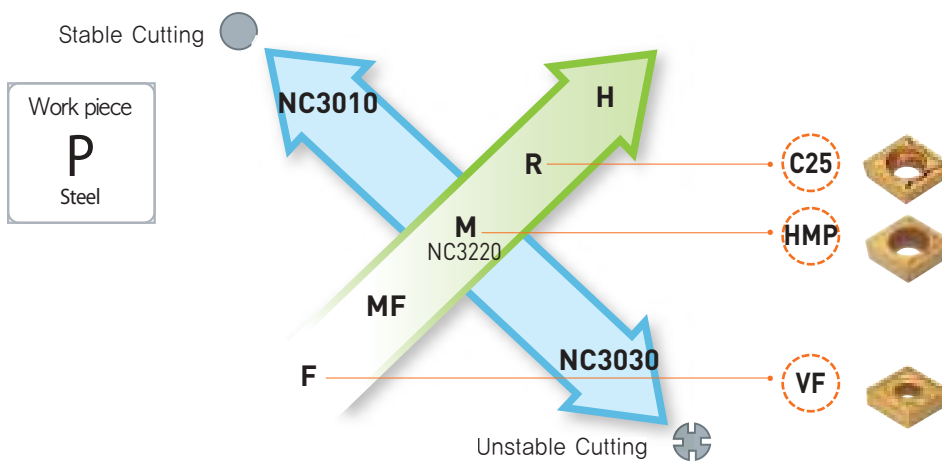
ISO	KORLOY	MITSUBISHI	SANDVIK	SUMITOMO	KYOCERA	TAEGUTEC	TUNGALOY	KENAMETAL	ISCAR	SECO
P20	NC3220	UE6020	GC4225	AC820P AC2000	CA5525	TT8125	T9125	KCP25 KC9125	IC8250 IC9250	TP2500

Application of chip breakers

• Negative type insert

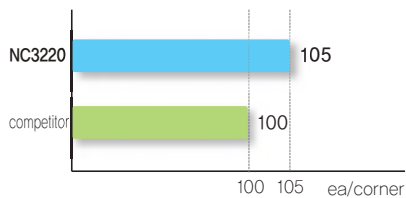


• Positive type insert

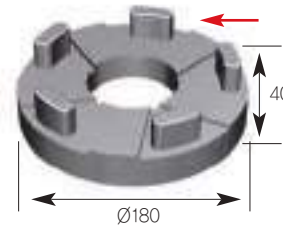


Test examples

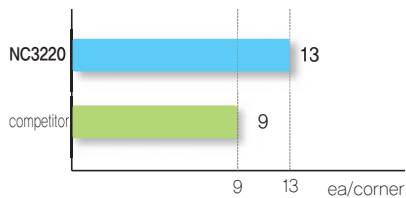
Alloy steel(SCR Cold forging)



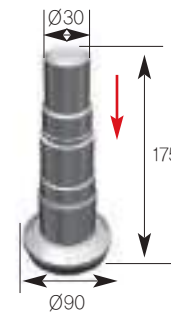
- Cutting condition
: vc(m/min) = 314
fn(mm/rev) = 0,25
(external/facing)
ap(mm) = 1
wet
- Tool : Insert CNMG120408-VM



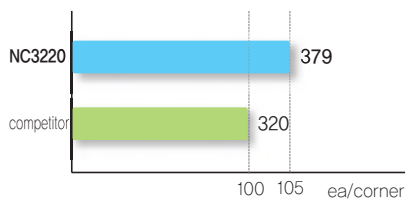
Alloy steel(SCM420H Hot forging)



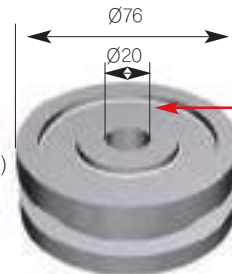
- Cutting condition
: vc(m/min) = 80~500
fn(mm/rev) = 0,15~0,3
(external/facing/grooving/taping)
ap(mm) = 0,7~1,5
wet
- Tool : Insert DNMG150608-VC



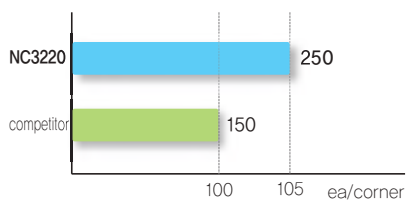
Alloy steel(SCR420H Hot forging)



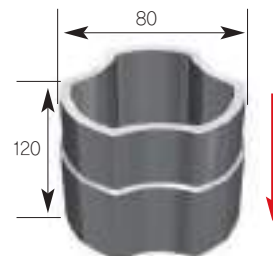
- Cutting condition
: vc(m/min) = 360~430
fn(mm/rev) = 0,2
ap(mm) = 1,2~1,5 (internal/facing)
wet
- Tool : Insert CNMG120408-VC



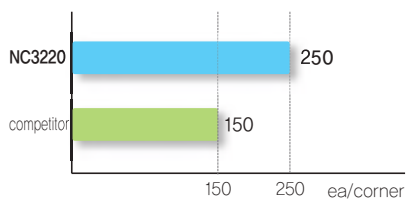
Carbon steel(SM48C Cold forging)



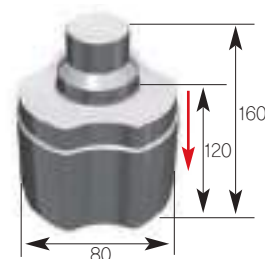
- Cutting condition
: vc(m/min) = 280
fn(mm/rev) = 0,2~0,25
ap(mm) = 1
dry
- Tool : Insert CNMG120412-VC





Carbon steel(SM53C Cold forging)



- Cutting condition
: vc(m/min) = 280
fn(mm/rev) = 0,2~0,25
(external/internal machining)
ap(mm) = 1
dry
- Tool : Insert DNMG150608-VC







STOCK ITEMS

Shape	Designation
	CCGT 060204-VP1
	09T304-VP1
	CCMT 060202-C25
	060202-HMP
	060204-C25
	060204-HMP
	060204-VF
	060208-C25
	060208-HMP
	080308-C25
	09T302-HMP
	09T302-VF
	09T304-C25
	09T304-HMP
	09T304-VF
	09T308-C25
	09T308-HMP
	120404-C25
	120404-HMP
	120404-VF
	CNMG 090304-HM
	090304-VF
	090304-VM
	090308-HM
	090308-VM




Shape	Designation
	CNMG 120404-B25
	120404-HM
	120404-VB
	120404-VC
	120404-VL
	120404-VM
	120404-VP2
	120408-B25
	120408-GR
	120408-HM
	120408-VB
	120408-VC
	120408-VL
	120408-VM
	120408-VP2
	120412-B25
	120412-GR
	120412-HM
120412-VC	
120412-VM	
160608-GR	
160608-HM	
160608-VM	
160612-B25	
160612-GR	
160612-HM	
160612-VM	
160616-GR	






STOCK ITEMS

Shape	Designation
	CNMG 190604-B25
	190608-B25
	190608-GR
	190612-GR
	190612-HM
	190616-B25
	190616-GR
	CNMM 120408-GH
	120412-GH
	190612-GH
	190616-GH
	190624-GH
	250724-GH
	250924-GH
	250924-HH
	DCGT 070204-VP1
	DCMT 070202-HMP
	070202-VF
	070204-C25
	070204-HMP
	070204-VF
	070208-C25
	070208-HMP
	11T302-HMP
	11T302-VF
	11T304-C25
	11T304-HMP

Shape	Designation
	DCMT 11T304-VF
	11T308-C25
	11T308-HMP
	DNMG 110404-HM
	110404-VF
	110404-VM
	110408-HM
	110408-VM
	150404-HM
	150404-VF
	150404-VM
	150408-HM
	150408-GR
	150408-HM
	150408-VB
	150408-VF
	150408-VL
	150408-VM
	150604-B25
150604-HM	
150604-VC	
150604-VF	
150604-VL	
150604-VM	
150604-VP2	
150608-B25	
150608-GR	
150608-HM	
150608-VC	




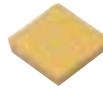

STOCK ITEMS

Shape	Designation
	DNMG 150608-VM
	150608-VP2
	150612-GR
	150612-HM
	150612-VF
	150612-VM
	150616-GR
	KNUX 160405L-11
	160405L-12
	160405R-11
	160405R-12
	160410L-11
	160410L-12
	160410R-11
	160410R-12
	MGMN 150-G
	200-G
	200-M
	250-G
	250-M
	300-M
	400-M
	500-M
	600-M
	MGMR 300-8D-PT

Shape	Designation
	MRMN 200-M
	300-M
	400-M
	500-M
	600-M
	800-M
	QCMT 050204-CM
	060204-CM
	070304-CM
	080304-CM
	10T304-CM
	RCMX 1003M0
	1204M0
	1606M0
	2006M0
	2507M0
	SCMT 09T304-C25
	09T304-HMP
	09T308-C25
	09T308-HMP
	120404-C25
	120408-C25
120408-HMP	
	SNMG 090304-HM
	090308-HM
	120404-B25
	120404-HM
	120404-VF
	120404-VM

STOCK ITEMS

Shape	Designation
	SNMG 120404-VP2
	120408-B25
	120408-GR
	120408-HM
	120408-VC
	120408-VF
	120408-VM
	120408-VP2
	120412-B25
	120412-GR
	120412-HM
	120412-VM
	150608-GR
	150612-B25
	150612-GR
	150616-B25
	190608-B25
	190608-GR
	190612-B25
	190612-GR
	190612-HM
	190616-B25
	190616-GR
250924-GR	
	SNMM 120408-GH
	120412-GH
	150612-GH
	190612-GH
	190616-GH


Shape	Designation
	SNMM 190624-GH
	250724-GH
	250724-HH
	250924-GH
	SP 200
	200R
	300
	300R
	400
	400R
	SPMR 090308-M
	120304-F
	120308-M
	SPUN 120308
	190412
	TCMT 090204-C25
	090208-C25
	110202-C25
	110204-C25
	110204-HMP
	110208-C25
	110208-HMP
	16T304-C25
16T304-HMP	
16T304-VF	
16T308-C25	







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NC3220

STOCK ITEMS

Shape	Designation
	TCMT 16T308-HMP
	TNMG 110308-HM
	160404-B25
	160404-HM
	160404-VC
	160404-VL
	160404-VM
	160404-VP2
	160408-B25
	160408-GR
	160408-GS
	160408-HM
	160408-VC
	160408-VL
	160408-VM
	160408-VP2
	160412-GR
	160412-HM
	160412-VF
	160412-VM
	220404-B25
	220404-HM
	220404-VF
	220404-VM
	220408-B25
	220408-GR
	220408-HM

Shape	Designation
	TNMG 220408-VB
	220408-VM
	220412-GR
	220412-HM
	220412-VM
	220416-GR
	270612-B25
	270612-GR
	330716-B25
	TNMM 220412-GH
	TNMX 160404L
	160404R
	160408L
	160408R
	TPGN 160304
	160308
	TPMR 110304-F
	110308-M
	160304-F
	160308-M
	220408-M
	TPMT 110304-VF
	110308-VF

STOCK ITEMS

Shape	Designation
	TPUN 160304
	160308
	220408
	VBMT 110204-HMP
	110304-HMP
	110308-HMP
	160404
	160404-HMP
	160408
	160408-HMP
	VCGT 110304-VP1
	VCMT 110304-VF
	160404-HMP
	160404-VF
	160408-HMP
	VNMG 160402-VF
	160404-HM
	160404-VB
	160404-VL
	160404-VM
	160408-HM
	160408-VL
	160408-VM
	160412-HM
	160412-VM

Shape	Designation
	WCMT 06T308-C20
	080408-C20
	WNMG 060404-HM
	060404-VM
	060408-HM
	060408-VF
	060408-VM
	080404-HM
	080404-VM
	080404-VP2
	080408-B25
	080408-GR
	080408-GS
	080408-HM
	080408-VC
	080408-VF
080408-VL	
080408-VM	
080408-VP2	
080412-GR	
080412-HM	
080412-VM	



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