

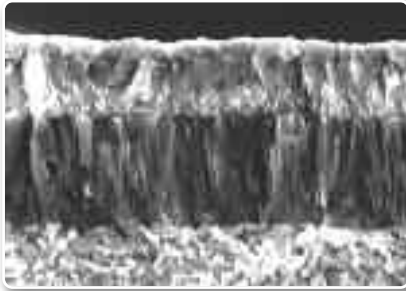
NC3220

For Steel Turning New CVD grade (P20)

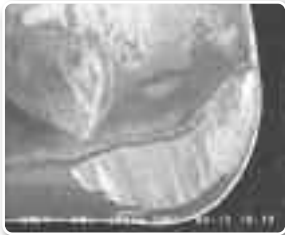
- Coating with good surface roughness and welding resistance.
- Coating with oxidation resistance at high temperature and plastic deformation resistance.
- Coating with excellent chipping resistance due to improved adhesion.

NC3220

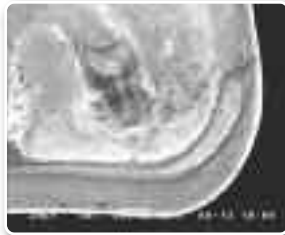
Features of NC3220 [New coating layer with oxidation resistance and adhesion]



- 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.

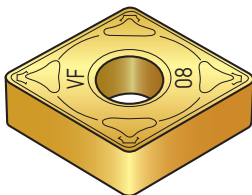


[Current grade]

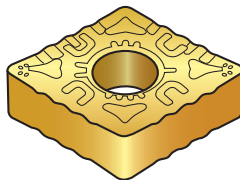


[New grade (NC3220)]

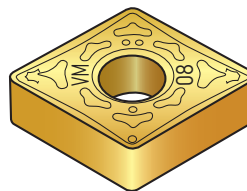
- Coating with oxidation resistance at high temperature and plastic deformation resistance.
 - ... Improved wear resistance on the rake surface of insert
- Exclusive substrate material for coating improving wear resistance.
 - ... Improved wear resistance on the flank surface of insert



[For Finishing]



[For medium-finishing]



[For medium machining]

Superior surface finish



[Current grade]

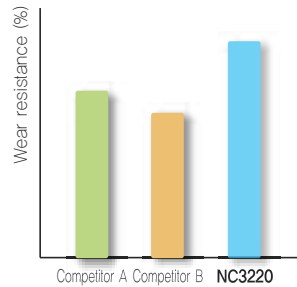


[New grade (NC3220)]

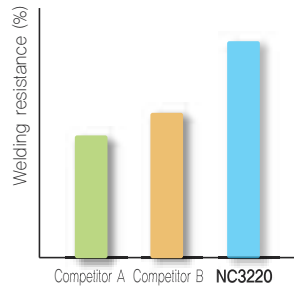
- Improved adhesion and surface finish
 - ... Stable machining and increased welding resistance and wear resistance

Increased wear resistance, welding resistance, and chipping resistance

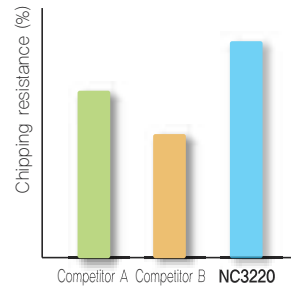
• Wear resistance



• Welding resistance

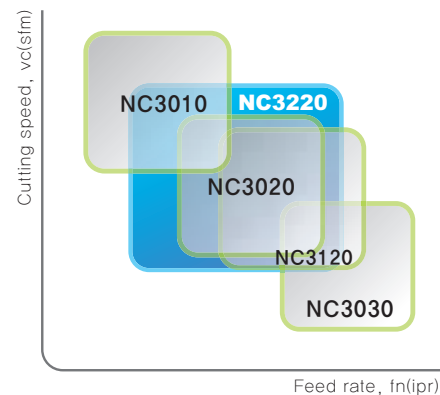


• Chipping resistance



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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NC3220

Recommended cutting

Workpiece		Recommended grade	vc(sfm)	ISO	Application range
P Steel	Continuous cutting	NC3010	984(656~1,312)	P01	
		NC3220	918(590~1,246)	P10	
		NC3120	820(492~1,148)	P15	
	Interrupted cutting	NC3030	656(492~820)	P20	
		NC5330	623(328~754)	P20	
		NC500H	328(164~492)	P30	
				P35	
				P40	

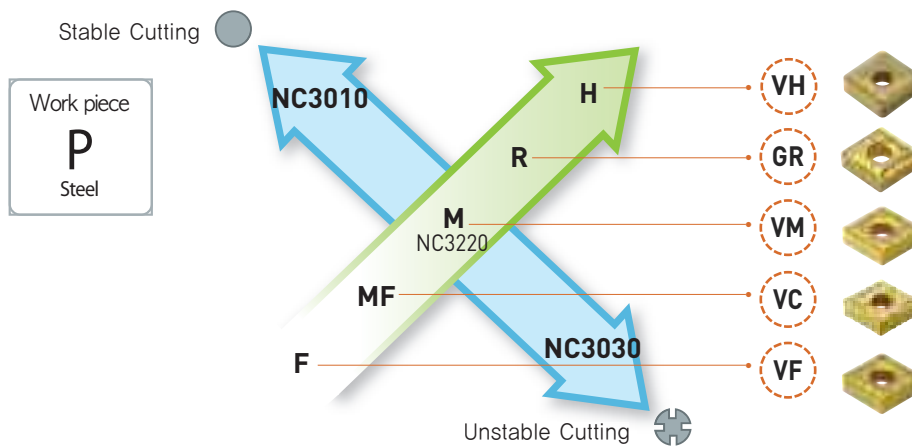
NC3220

Comparison of grade(P20)

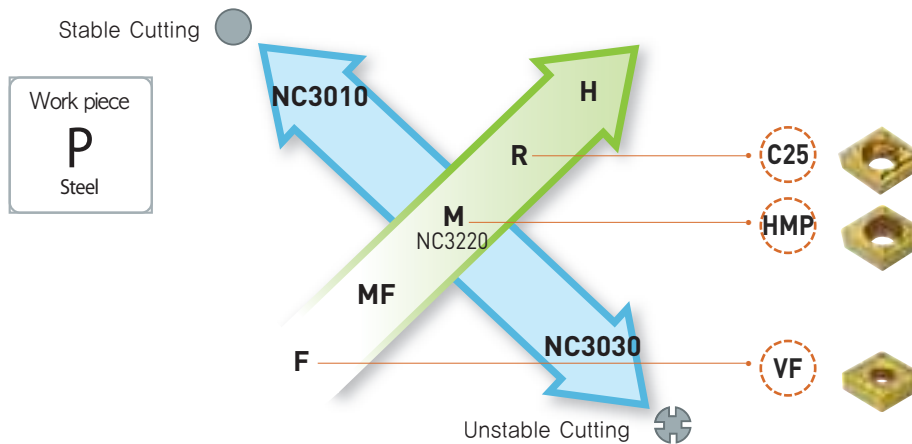
ISO	KORLOY	MITSUBISHI	SANDVIK	SUMITOMO	KYOCERA	TAEGUTEC	TUNGALOY	KENAMETAL	ISCAR	SECO
P20	NC3220	UE6020	GC4225	AC820P AC2000	CA5525	TT8125	T9125	KCP25 KC9125	IC8250 IC9250	TP2500

Application of chip breakers

• Negative type insert



• Positive type insert



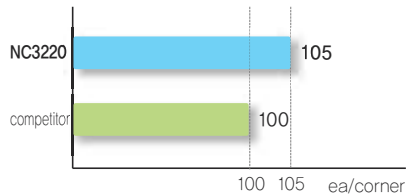
04

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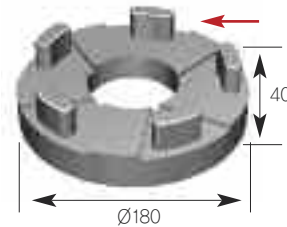
NC3220

Test examples

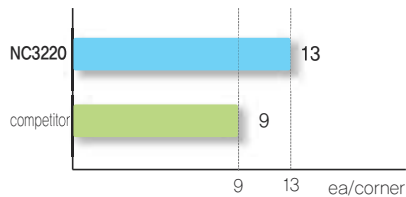
• Alloy steel(SCR Cold forging)



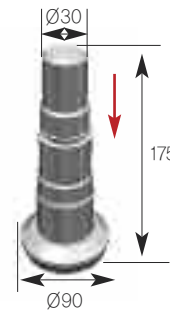
- Cutting condition
 - : $vc(sfm) = 1,030$
 - $fn(ipr) = 0.010$
 - (external/facing)
 - $ap(inch) = 0.04$
 - wet
- Tool : Insert CNMG432-VM



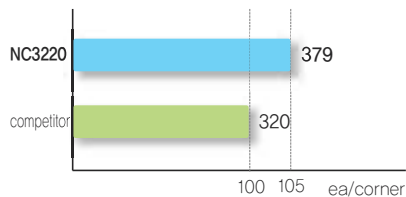
• Alloy steel(4130H Hot forging)



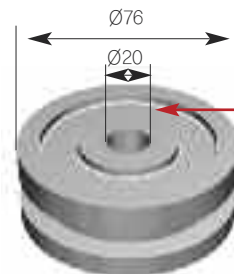
- Cutting condition
 - : $vc(sfm) = 262 \sim 1,640$
 - $fn(ipr) = 0.006 \sim 0.012$
 - (external/facing/grooving/taping)
 - $ap(inch) = 0.028 \sim 0.006$
 - wet
- Tool : Insert DNMG442-VC



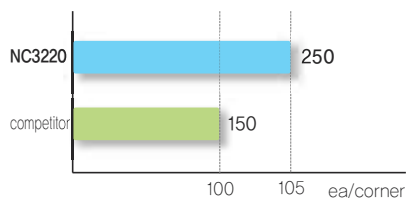
• Alloy steel(5120H Hot forging)



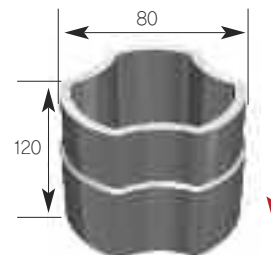
- Cutting condition
 - : $vc(sfm) = 1,180 \sim 1,410$
 - $fn(ipr) = 0.008$
 - $ap(inch) = 0.048 \sim 0.06$
 - (internal/facing), wet
- Tool : Insert CNMG432-VC



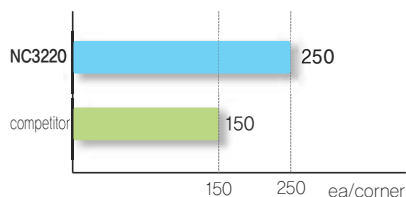
• Carbon steel(1049 Cold forging)



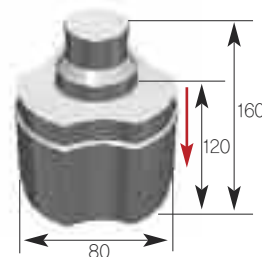
- Cutting condition
 - : $vc(sfm) = 918$
 - $fn(ipr) = 0.008 \sim 0.010$
 - $ap(inch) = 0.04$
 - dry
- Tool : Insert CNMG433-VC



• Carbon steel(1050/1053 Cold forging)



- Cutting condition
 - : $vc(sfm) = 918$
 - $fn(ipr) = 0.008 \sim 0.010$
 - (external/internal machining)
 - $ap(inch) = 0.04$
 - dry
- Tool : Insert DNMG442-VC



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STOCK ITEMS

Shape	Designation
	CCGT 21.51-VP1
	32.51-VP1
	CCMT 21.50.5-C25
	21.50.5-HMP
	21.51-C25
	21.51-HMP
	21.51-VF
	21.52-C25
	21.52-HMP
	322-C25
	32.50.5-HMP
	32.50.5-VF
	32.51-C25
	32.51-HMP
	32.51-VF
	32.52-C25
	32.52-HMP
	431-C25
	431-HMP
	431-VF
	432-C25
	432-HMP
	433-C25
	CNMG 321-HM
	321-VF
	321-VM
	322-HM
	322-VM

Shape	Designation
	CNMG 431-B25
	431-HM
	431-VB
	431-VC
	431-VL
	431-VM
	431-VP2
	432-B25
	432-GR
	432-HM
	432-VB
	432-VC
	432-VL
	432-VM
	432-VP2
	433-B25
	433-GR
	433-HM
	433-VC
	433-VM
	542-GR
	542-HM
	542-VM
	543-B25
	543-GR
	543-HM
	543-VM
	544-GR

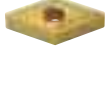
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STOCK ITEMS

Shape	Designation
	CNMG 641-B25
	642-B25
	642-GR
	643-GR
	643-HM
	644-B25
	644-GR
	CNMM 432-GH
	433-GH
	643-GH
	644-GH
	646-GH
	856-GH
	866-GH
	866-HH
	DCGT 21.51-VP1
	DCMT 21.50.5-HMP
	21.50.5-VF
	21.51-C25
	21.51-HMP
	21.51-VF
	21.52-C25
	21.52-HMP
	32.50.5-HMP
	32.50.5-VF
	32.51-C25
	32.51-HMP

Shape	Designation
	DCMT 32.51-VF
	32.52-C25
	32.52-HMP
	DNMG 331-HM
	331-VF
	331-VM
	332-HM
	332-VM
	431-HM
	431-VF
	431-VM
	432-B25
	432-GR
	432-HM
	432-VB
	432-VF
	432-VL
	432-VM
	441-B25
	441-HM
	441-VC
	441-VF
	441-VL
	441-VM
	441-VP2
	442-B25
	442-GR
	442-HM
	442-VC

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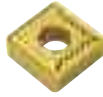
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STOCK ITEMS

Shape	Designation
	DNMG 442-VM
	442-VP2
	443-GR
	443-HM
	443-VF
	443-VM
	444-GR
	KNUX 160405L-11
	160405L-12
	160405R-11
	160405R-12
	160410L-11
	160410L-12
	160410R-11
	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 32.51-C25
	32.51-HMP
	32.52-C25
	32.52-HMP
	431-C25
	432-C25
	432-HMP
	SNMG 321-HM
	322-HM
	431-B25
	431-HM
	431-VF
	431-VM

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STOCK ITEMS

Shape	Designation
	SNMG 431-VP2
	432-B25
	432-GR
	432-HM
	432-VC
	432-VF
	432-VM
	432-VP2
	433-B25
	433-GR
	433-HM
	433-VM
	542-GR
	543-B25
	543-GR
	544-B25
	642-B25
	642-GR
	643-B25
	643-GR
	643-HM
	644-B25
	644-GR
	866-GR
	SNMM 432-GH
	433-GH
	543-GH
	643-GH
	644-GH

Shape	Designation
	SNMM 846-GH
	856-GH
	856-HH
	866-GH
	SP 200
	200R
	300
	300R
	400
	400R
	SPMR 322-M
	421-F
	422-M
	SPUN 422
	633
	TCMT 1.81.51-C25
	1.82.52-C25
	21.50.5-C25
	21.51-C25
	21.51-HMP
	21.52-C25
	21.52-HMP
	32.51-C25
	32.51-HMP
	32.51-VF
	32.52-C25

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STOCK ITEMS

Shape	Designation
	TCMT 32.52-HMP
	TNMG 222-HM
	331-B25
	331-HM
	331-VC
	331-VL
	331-VM
	331-VP2
	332-B25
	332-GR
	332-GS
	332-HM
	332-VC
	332-VL
	332-VM
	332-VP2
	333-GR
	333-HM
	333-VF
	333-VM
	431-B25
	431-HM
	431-VF
	431-VM
	432-B25
	432-GR
	432-HM

Shape	Designation
	TNMG 432-VB
	432-VM
	433-GR
	433-HM
	433-VM
	434-GR
	543-B25
	543-GR
	654-B25
	TNMM 433-GH
	TNMX 331L
	331R
	332L
	332R
	TPGN 321
	322
	TPMR 221-F
	222-M
	321-F
	322-M
	432-M
	TPMT 221-VF
	222-VF

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STOCK ITEMS

Shape	Designation
	TPUN 321
	322
	432
	VBMT 21.51-HMP
	221-HMP
	222-HMP
	331
	331-HMP
	332
	332-HMP
	VCGT 221-VP1
	VCMT 221-VF
	331-HMP
	331-VF
	332-HMP
	VNMG 330.5-VF
	331-HM
	331-VB
	331-VL
	331-VM
	332-HM
	332-VL
	332-VM
	333-HM
	333-VM

Shape	Designation
	WCMT 32.52-C20
	432-C20
	WNMG 331-HM
	331-VM
	332-HM
	332-VF
	332-VM
	431-HM
	431-VM
	431-VP2
	432-B25
	432-GR
	432-GS
	432-HM
	432-VC
	432-VF
	432-VL
	432-VM
	432-VP2
	433-GR
	433-HM
	433-VM



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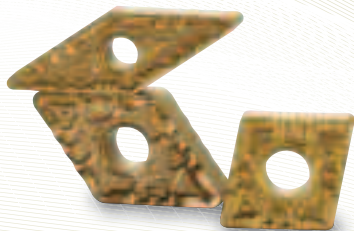
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