



TN620 PV720

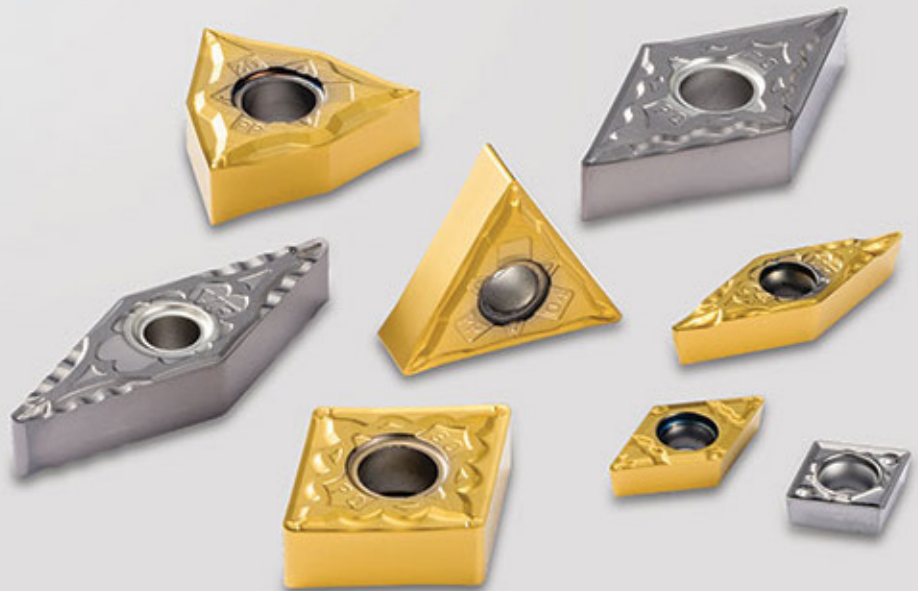
CERMET / MEGACOAT CERMET
FOR STEEL MACHINING

■ **TN620 CERMET**

Hybrid substrate technology for superior fracture and wear resistance, a perfect combination for consistent and stable steel machining.

■ **PV720 MEGACOAT NANO CERMET**

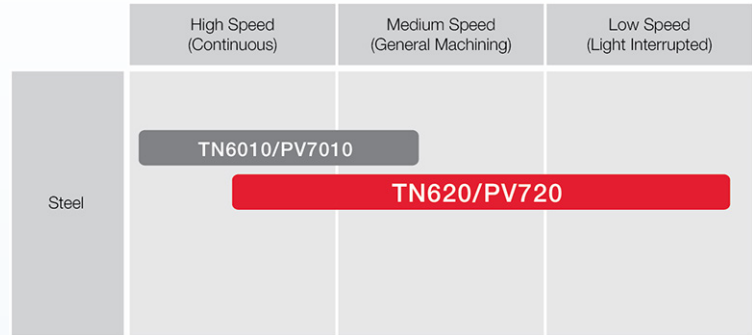
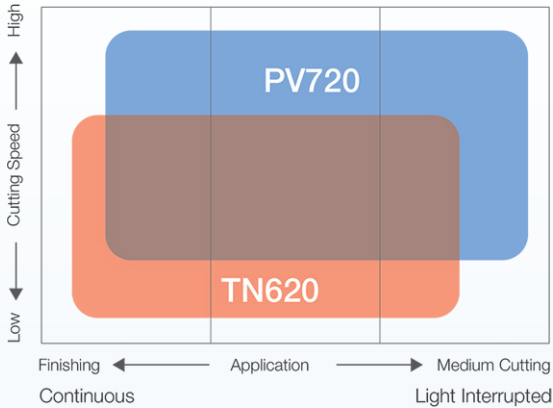
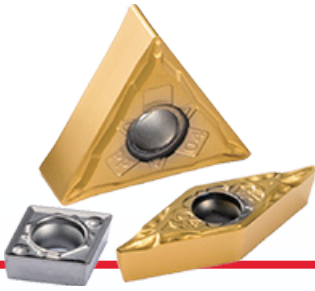
MEGACOAT NANO efficient machining with high quality surface finishes and superior wear and adhesion resistance. The special TiN coating on the outermost layer makes spotting the used cutting edge easy.



TN620 PV720

CERMET for Steel Machining

MEGACOAT NANO CERMET for Steel Machining

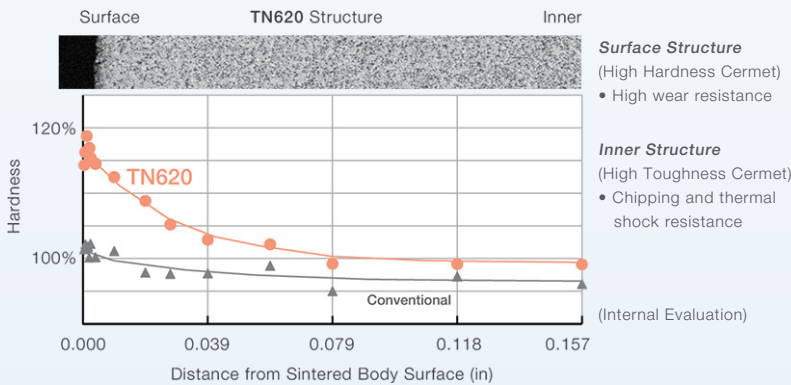


TN620 / PV720 - Wide Application Range

SURFACE HARDENED "HYBRID STRUCTURE"

Excellent fracture resistance with surface-hardened layer using gradient composition technology. Continuously-varied hardness provides wear and fracture resistance.

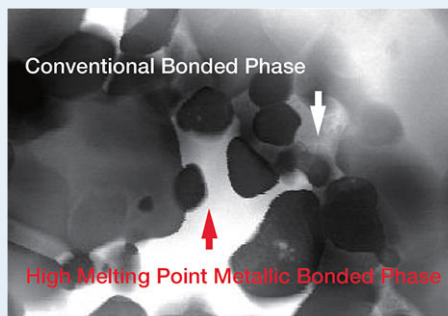
Surface-Hardened Hybrid Structure



TN620's inner structure has high toughness and chipping resistance along with thermal shock resistance. TN620 has a higher hardness and greater wear resistance than that of the conventional micro grain cermet.

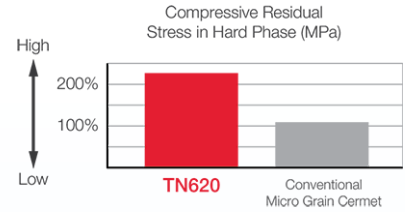
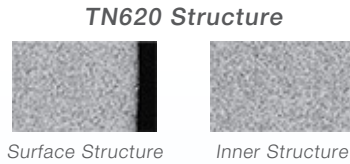
HIGH MELTING POINT "HYBRID BONDED PHASE"

Combining the conventional cermet bonded phase (nickel, cobalt) and the special high melting point metallic bonded phase improves adhesion resistance and provides a better surface finish with a higher thermal resistance of the bonded phase.



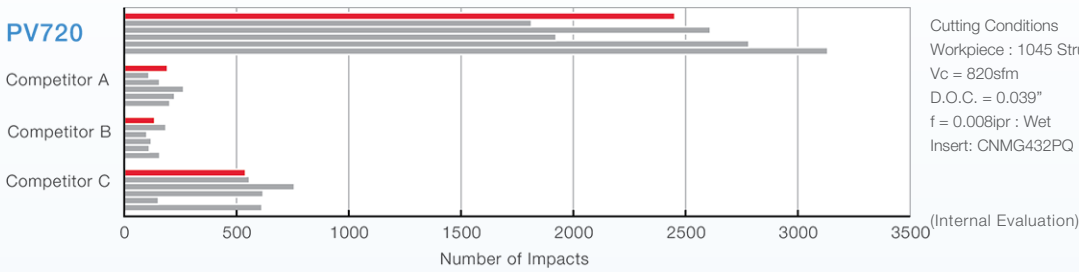
MICRO GRAIN "HYBRID HARD PHASE"

Improved strength with uniform micro grain hard phase and superior compressive stress with high melting point bonded phase. This combination yields greater fracture resistance.



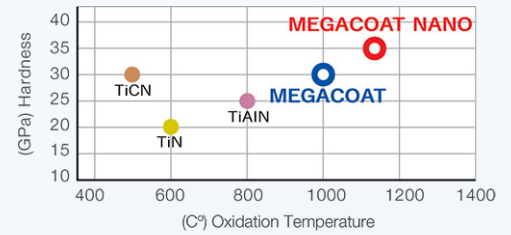
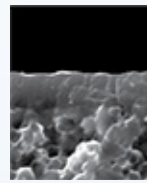
(Internal Evaluation)

Fracture Resistance Comparison

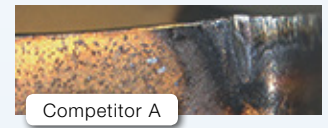
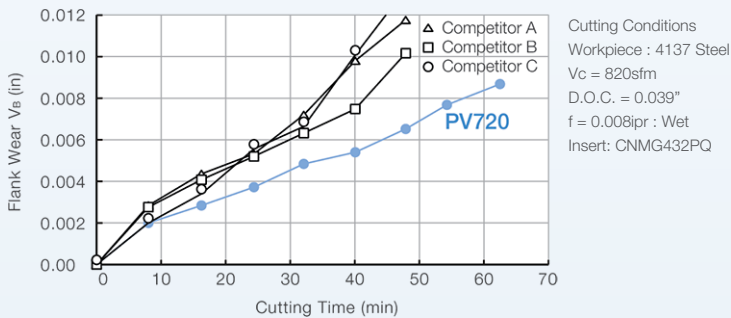


EASY TO VIEW CUTTING EDGE WEAR

PV720 improves performance by adopting composite lamination of MEGACOAT NANO and special TiN to combine high adhesion resistance and great visibility of the used cutting edge even in dim light.



Wear Resistance Comparison

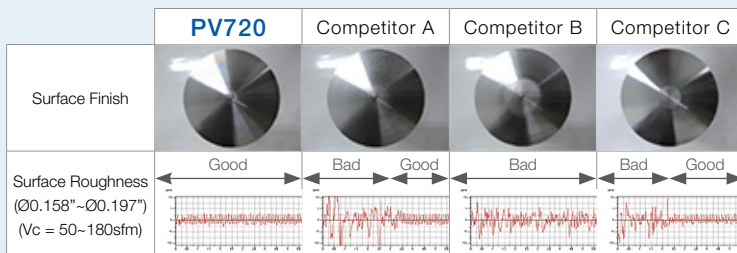
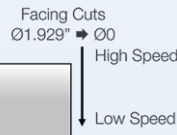


Flank wear condition after machining 48 minutes.

(Internal Evaluation)

EXCELLENT SURFACE FINISH

Surface Finish Comparison



Cutting Conditions
Workpiece : 1010 Steel
Vc = 590 ~ 0sfm (Constant Rate)
D.O.C. = 0.020"
f = 0.004ipr : Wet
Insert: CNMG431

(Internal Evaluation)

Cutting Speed (sfm)

	Low Carbon Steel Low Carbon Alloy Steel	Medium Carbon Steel Medium Carbon Alloy Steel	High Carbon Alloy Steel
TN620	150HB 330 ~ 660 ~ 980	250HB 330 ~ 590 ~ 820	300HB 330 ~ 660 ~ 920
PV720	150HB 330 ~ 820 ~ 1150	250HB 330 ~ 660 ~ 920	300HB 330 ~ 660 ~ 920

Finishing

PP CHIPBREAKER

POSITIVE



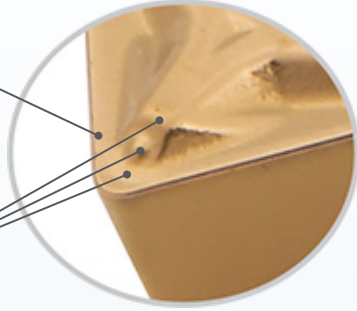
FEATURES

- Stable chip control when finishing steel.
- Special edge designed for sharpness and improved strength for stable tool life during high feed machining operations.

Cutting Edge Designed for Optimal Stability

Edge shape controls stress and heat generation.

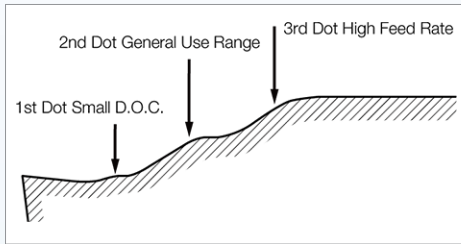
Stable performance with superior edge strength.



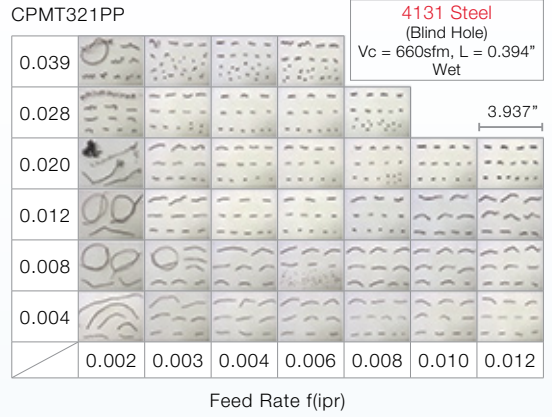
Composite-Dot Chipbreaker

Multi-dot design with different functions control chip curling and flow direction when cutting conditions and workpiece material vary.

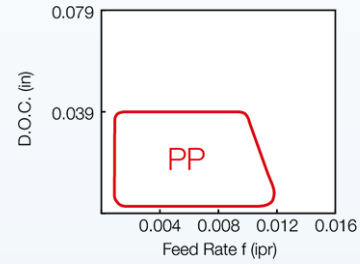
Stable chip control regardless of feed rate and workpiece materials.



PP



CPMT32 Type for Steel



Finishing

PP CHIPBREAKER

NEGATIVE

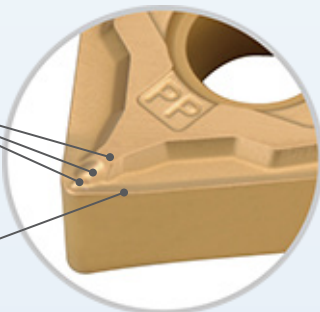


FEATURES

- 3-Step Smart Dot structure for a wide range of feed rates.
- Smooth taper cutting edge reduces cutting forces.
- Corner-R(re) 0.008" ~ 0.047"

3-Step Smart Dot Structure

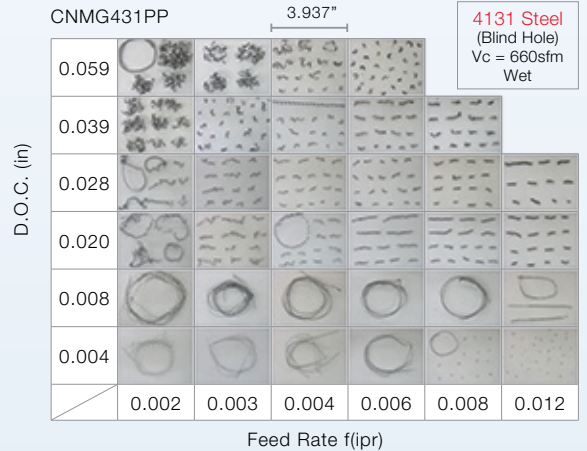
The 3 different dots provide smooth chip evacuation with a wide range feed rates



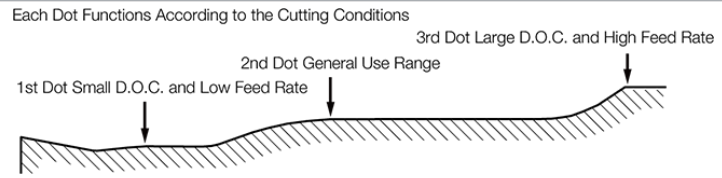
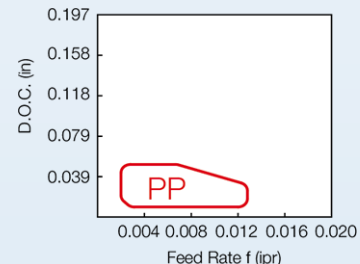
Smooth Taper Cutting Edge

Smooth taper cutting edge reduces cutting forces.

PP



Steel / CNMG43 Type



Finishing - Medium

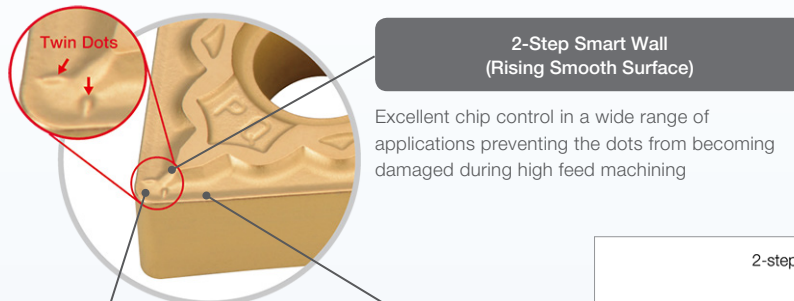
PQ CHIPBREAKER

NEGATIVE



FEATURES

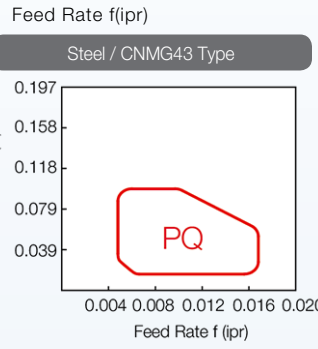
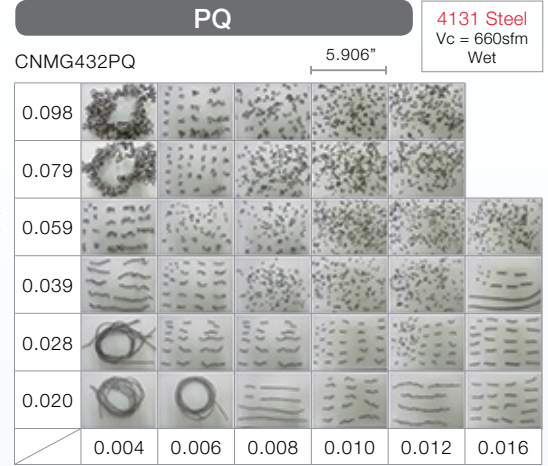
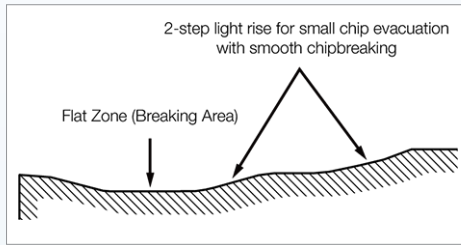
- Stable chip control in a wide range of medium-finishing applications with the newly developed “Flat Zone” (Breaking Area) and rising 2-step Smart Wall effect.
- Twin dots on the edge tip provide smooth chip control at smaller D.O.C. during high feed turning and facing.
- Continuous Variable Land (CVL) with well-balanced edge sharpness and toughness.



Flat Zone (Breaking Area)

2-Step Smart Wall (Rising Smooth Surface)

Specially designed positive land with well-balanced combination of sharpness and toughness.



Medium - Roughing

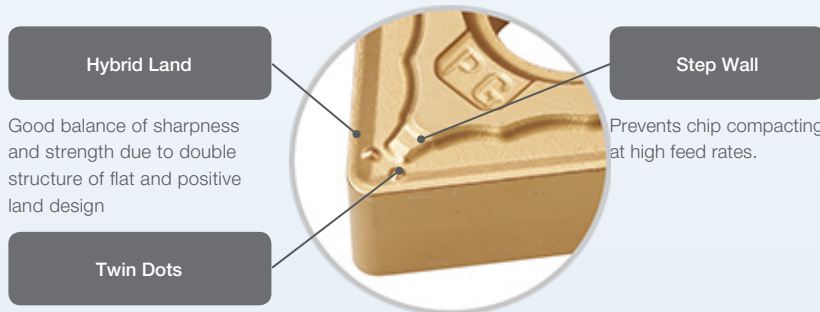
PG CHIPBREAKER

NEGATIVE



FEATURES

- Stable machining with good balance of edge sharpness and strength
- Prevents chip compacting at high feed rates with good chip control at low feed rates.



Hybrid Land

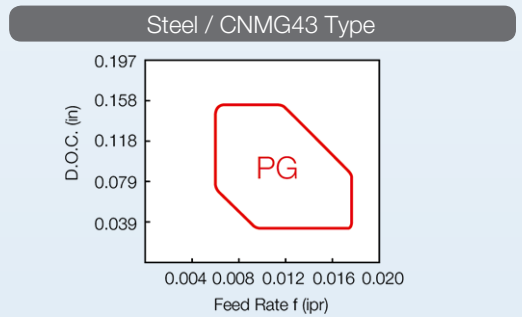
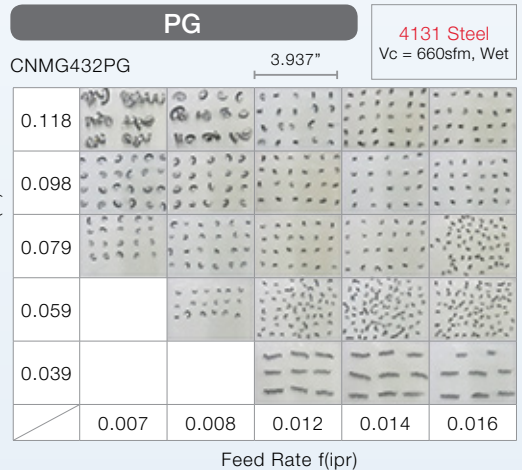
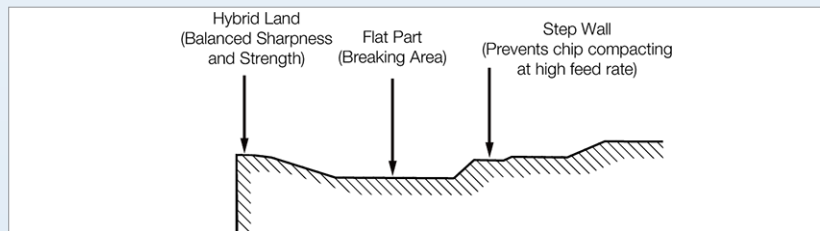
Step Wall

Good balance of sharpness and strength due to double structure of flat and positive land design

Prevents chip compacting at high feed rates.

Twin Dots

Improved chip control at low feed rates with controlled crater wear resistance.



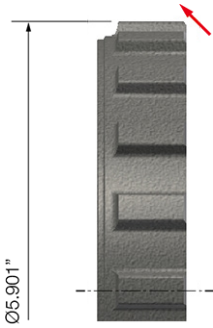
1020 Steel	
<p>Stem</p> <ul style="list-style-type: none"> • VC = 660sfm • D.O.C. = 0.012" • f = 0.004ipr • Wet • CCMT2151GK/HQ 	
TN620	550 pcs/edge
Competitor A (Cermet)	380~400 pcs/edge
<p>TN620 shows 1.4 times longer tool life compared to Competitor A's cermet.</p> <p>(Customer Evaluation)</p>	

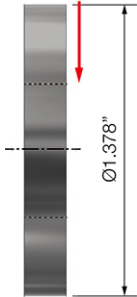
1030 Steel	
<p>Drum</p> <ul style="list-style-type: none"> • VC = 980sfm • D.O.C. = 0.020" • f = 0.008~0.012ipr • Wet • CNMG332HQ 	
TN620	800 pcs/edge
Competitor B (Cermet)	550~750 pcs/edge
<p>TN620 shows 1.1 to 1.4 times longer tool life compared to Competitor B's cermet.</p> <p>(Customer Evaluation)</p>	

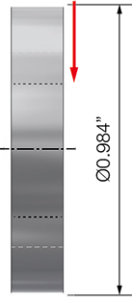
1045 Steel	
<p>Hexagon Head Bolt</p> <ul style="list-style-type: none"> • VC = 660sfm • D.O.C. = 0.008" • f = 0.005ipr • Wet • TNGG331R-S 	
TN620	700 pcs/edge
Competitor C (Cermet)	500 pcs/edge
<p>TN620 shows 1.4 times longer tool life compared to Competitor C's cermet.</p> <p>(Customer Evaluation)</p>	

1035 Steel	
<p>Yoke Pin</p> <ul style="list-style-type: none"> • VC = 250sfm • D.O.C. = 0.006" • f = 0.005ipr • Wet • CNMG332HQ 	
TN620	450 pcs/edge
Competitor D (Cermet)	300 pcs/edge
<p>TN620 shows 1.5 times longer tool life compared to Competitor D's cermet. Stable surface roughness and shiny finish. No Chipping and stable machining</p> <p>(Customer Evaluation)</p>	

Powdered Metal	
<p>Oil Pump</p> <ul style="list-style-type: none"> • Vc = 520sfm • D.O.C. = 0.008" • f = 0.079ipr • Wet • TPGH18151L 	
PV720	800 avg. pcs/edge
Competitor E (Cermet)	300 pcs/edge
<p>PV720 shows 2.7 times longer tool life compared to Competitor E's cermet.</p> <p>(Customer Evaluation)</p>	











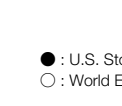
Special Alloy Steel	
<p>Ring Gear</p> <ul style="list-style-type: none"> • Vc = 980sfm • D.O.C. = 0.008" • f = 0.008-0.016ipr • Wet • WNMG431PP 	
PV720	10,000 avg. pcs/edge
Competitor F (Cermet)	3,000 pcs/edge
<p>PV720 shows 3.3 times longer tool life compared to Competitor F's cermet.</p> <p>(Customer Evaluation)</p>	

1045 Structural Steel	
<p>Washer</p> <ul style="list-style-type: none"> • Vc = 330-660sfm • D.O.C. = 0.006" • f = 0.003ipr • Wet • TNGG3305R-S 	
PV720	600 pcs/edge
Competitor G (Cermet)	400 pcs/edge
<p>PV720 shows 1.5 times longer tool life compared to Competitor G's cermet.</p> <p>(Customer Evaluation)</p>	

1035 Structural Steel	
<p>Sleeve</p> <ul style="list-style-type: none"> • Vc = 720sfm • D.O.C. = 0.020" • f = 0.004ipr • Wet • TNGG331R-S 	
PV720	2,000 pcs/edge
Competitor H (Cermet)	1,000 pcs/edge
<p>PV720 shows 2.0 times longer tool life compared to Competitor H's cermet.</p> <p>(Customer Evaluation)</p>	

Negative Inserts

Shape	Part Number	Dimensions (Inch)				Grade	
		I.C.	Thickness	Hole	Corner-R (r _e)	TN620	PV720
 Finishing with Wiper Edge	CNMG 431WP	1/2	3/16	0.203	1/64	●	●
	432WP	1/2	3/16	0.203	1/32	●	●
 Finishing-Medium Wiper Edge	CNMG 431WQ	1/2	3/16	0.203	1/64	●	●
	432WQ	1/2	3/16	0.203	1/32	●	●
	433WQ	1/2	3/16	0.203	3/64	●	●
 Finishing	CNMG 4305PP	1/2	3/16	0.203	0.008	●	●
	431PP	1/2	3/16	0.203	1/64	●	●
	432PP	1/2	3/16	0.203	1/32	●	●
	433PP	1/2	3/16	0.203	3/64	●	●
 Finishing-Medium	CNMG 431PQ	1/2	3/16	0.203	1/64	●	●
	432PQ	1/2	3/16	0.203	1/32	●	●
	433PQ	1/2	3/16	0.203	3/64	●	●
 Finishing-Medium	CNMG 431HQ	1/2	3/16	0.203	1/64	○	○
	432HQ	1/2	3/16	0.203	1/32	○	○
 Finishing-Medium Up Facing	CNMG 431CQ	1/2	3/16	0.203	1/64	○	○
	432CQ	1/2	3/16	0.203	1/32	○	○
 Medium-Roughing	CNMG 431PG	1/2	3/16	0.203	1/64	●	●
	432PG	1/2	3/16	0.203	1/32	●	●
	433PG	1/2	3/16	0.203	3/64	●	●
 Roughing	CNMG 431	1/2	3/16	0.203	1/64	○	○
	432	1/2	3/16	0.203	1/32	○	○
 Low Carbon Steel Finishing / Small D.O.C.	CNMG 431XF	1/2	3/16	0.203	1/64	○	○
	432XF	1/2	3/16	0.203	1/32	○	○
 Low Carbon Steel Finishing	CNMG 431XP	1/2	3/16	0.203	1/64	●	●
	432XP	1/2	3/16	0.203	1/32	●	●
 Low Carbon Steel Medium Cutting	CNMG 431XQ	1/2	3/16	0.203	1/64	●	●
	432XQ	1/2	3/16	0.203	1/32	●	●

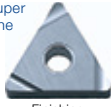











Shape	Part Number	Dimensions (Inch)				Grade	
		I.C.	Thickness	Hole	Corner-R (r _e)	TN620	PV720
 Low Carbon Steel Roughing	CNMG 432XS	1/2	3/16	0.203	1/32	○	○
 Medium Cutting	CNGG 431	1/2	3/16	0.203	1/64	○	○
 Finishing	DNMG 4305PP	1/2	3/16	0.203	0.008	●	●
	431PP	1/2	3/16	0.203	1/64	●	●
	432PP	1/2	3/16	0.203	1/32	●	●
	433PP	1/2	3/16	0.203	3/64	●	●
 Finishing	DNMG 4405PP	1/2	1/4	0.203	0.008	○	○
	441PP	1/2	1/4	0.203	1/64	○	○
	442PP	1/2	1/4	0.203	1/32	○	○
	443PP	1/2	1/4	0.203	3/64	○	○
 Finishing-Medium	DNMG 431PQ	1/2	3/16	0.203	1/64	●	●
	432PQ	1/2	3/16	0.203	1/32	●	●
	433PQ	1/2	3/16	0.203	3/64	●	●
	DNMG 441PQ	1/2	1/4	0.203	1/64	○	○
 Finishing-Medium	DNMG 442PQ	1/2	1/4	0.203	1/32	○	○
	443PQ	1/2	1/4	0.203	3/64	○	○
	DNMG 431HQ	1/2	3/16	0.203	1/64	○	○
	432HQ	1/2	3/16	0.203	1/32	○	○
 Finishing-Medium Up Facing	DNMG 431CQ	1/2	3/16	0.203	1/64	●	●
	432CQ	1/2	3/16	0.203	1/32	●	●
 Medium-Roughing	DNMG 431PG	1/2	3/16	0.203	1/64	●	●
	432PG	1/2	3/16	0.203	1/32	●	●
	433PG	1/2	3/16	0.203	3/64	●	●
	DNMG 441PG	1/2	1/4	0.203	1/64	○	○
 Medium-Roughing	DNMG 442PG	1/2	1/4	0.203	1/32	○	○
	443PG	1/2	1/4	0.203	3/64	○	○
 Roughing	DNMG 431	1/2	3/16	0.203	1/64	○	○
	432	1/2	3/16	0.203	1/32	○	○
 Low Carbon Steel Finishing / Small D.O.C.	DNMG 431XF	1/2	3/16	0.203	1/64	○	○
	432XF	1/2	3/16	0.203	1/32	○	○

● : U.S. Stock
○ : World Express (Shipping - 7-10 Business Days)
Ⓛ : World Express Left-Hand Only
Ⓡ : World Express Right-Hand Only

Shape	Part Number	Dimensions (Inch)				Grade		Shape	Part Number	Dimensions (Inch)				Grade	
		I.C.	Thickness	Hole	Corner-R (R)	TN620	PV720			I.C.	Thickness	Hole	Corner-R (R)	TN620	PV720
 Low Carbon Steel Finishing	DNMG 431XP	1/2	3/16	0.203	1/64	●	●	 Finishing	TNMG 3305PP	3/8	3/16	0.150	0.008	●	●
	432XP	1/2	3/16	0.203	1/32	●	●		331PP	3/8	3/16	0.150	1/64	●	●
 Low Carbon Steel Medium Cutting	DNMG 431XQ	1/2	3/16	0.203	1/64	●	●		332PP	3/8	3/16	0.150	1/32	●	●
	432XQ	1/2	3/16	0.203	1/32	●	●		333PP	3/8	3/16	0.150	3/64	●	●
 Low Carbon Steel Roughing	DNMG 432XS	1/2	3/16	0.203	1/32	○	○	 Finishing-Medium	TNMG 331PQ	3/8	3/16	0.150	1/64	●	●
	 Medium Cutting	DNGG 431%L	1/2	3/16	0.203	1/64	○		○	332PQ	3/8	3/16	0.150	1/32	●
432%L		1/2	3/16	0.203	1/32	○	○		333PQ	3/8	3/16	0.150	3/64	●	●
 Finishing-Medium	SNMG 431PQ	1/2	3/16	0.203	1/64	●	●	 Finishing-Medium	TNMG 331HQ	3/8	3/16	0.150	1/64	○	○
	432PQ	1/2	3/16	0.203	1/32	●	●		332HQ	3/8	3/16	0.150	1/32	○	○
 Finishing-Medium	SNMG 432HQ	1/2	3/16	0.203	1/32	○	○	 Finishing-Medium Up Facing	TNMG 331CQ	3/8	3/16	0.150	1/64	○	○
	 Medium-Roughing	SNMG 432PG	1/2	3/16	0.203	1/32	●		●	332CQ	3/8	3/16	0.150	1/32	○
433PG		1/2	3/16	0.203	3/64	●	●		333CQ	3/8	3/16	0.150	3/64	○	○
 Medium-Roughing	SNMG 434PG	1/2	3/16	0.203	1.600	●	●	 Medium-Roughing	TNMG 331PG	3/8	3/16	0.150	1/64	●	●
	 Roughing	SNMG 431	1/2	3/16	0.203	1/64	○		○	332PG	3/8	3/16	0.150	1/32	●
432		1/2	3/16	0.203	1/32	○	○		333PG	3/8	3/16	0.150	3/64	●	●
 Low Carbon Steel Finishing	SNMG 432XP	1/2	3/16	0.203	1/32	●	●	 Roughing	TNMG 331	3/8	3/16	0.150	1/64	○	○
	 Low Carbon Steel Medium Cutting	SNMG 432XQ	1/2	3/16	0.203	1/32	○		○	332	3/8	3/16	0.150	1/32	○
 Low Carbon Steel Roughing		SNMG 432XS	1/2	3/16	0.203	1/32	○	○	 Low Carbon Steel Finishing / Small D.O.C.	TNMG 331XF	3/8	3/16	0.150	1/64	●
	 Low Carbon Steel Medium Cutting	SNMG 432XQ	1/2	3/16	0.203	1/32	○	○		332XF	3/8	3/16	0.150	1/32	●
 Low Carbon Steel Finishing										SNMG 432XP	1/2	3/16	0.203	1/32	●
	332XP	3/8	3/16	0.150	1/32	●	●								
 Low Carbon Steel Medium Cutting	SNMG 432XQ	1/2	3/16	0.203	1/32	○	○	 Low Carbon Steel Medium Cutting	TNMG 331XQ	3/8	3/16	0.150	1/64	●	●
									332XQ	3/8	3/16	0.150	1/32	●	●
 Low Carbon Steel Roughing	SNMG 432XS	1/2	3/16	0.203	1/32	○	○	 Low Carbon Steel Roughing	TNMG 332XS	3/8	3/16	0.150	1/32	○	○
									 Medium-Roughing	TNGG 3302%L-S	3/8	3/16	0.150	0.004	○
3305%L-S	3/8	3/16	0.150	0.008	○	○									
331%L-S	3/8	3/16	0.150	1/64	○	○									
332%L-S	3/8	3/16	0.150	1/32	○	○									










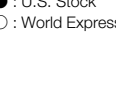
● : U.S. Stock ⊕ : World Express Left-Hand Only
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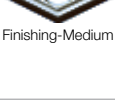





Negative Inserts (Cont.)

Shape	Part Number	Dimensions (Inch)				Grade	
		I.C.	Thickness	Hole	Corner-R (r)	TN620	PV720
 Finishing Sharp Edge Surface Finish Oriented	TNEG 3305 $\frac{1}{4}$ -SSF	3/8	3/16	0.150	0.008	○	○
	331 $\frac{1}{4}$ -SSF	3/8	3/16	0.150	1/64	○	○
	TNGG 3305 $\frac{1}{4}$ -B	3/8	3/16	0.150	0.008	○	○
	331 $\frac{1}{4}$ -B	3/8	3/16	0.150	1/64	○	○
	TNGG 3305 $\frac{1}{4}$ -C	3/8	3/16	0.150	0.008	○	○
 -B Finishing-Medium	331 $\frac{1}{4}$ -C	3/8	3/16	0.150	1/64	○	○
	332 $\frac{1}{4}$ -C	3/8	3/16	0.150	1/32	○	○
	TNGG 431 $\frac{1}{4}$ -C	1/2	3/16	0.203	1/64	○	○
 -C Medium-Roughing	432 $\frac{1}{4}$ -C	1/2	3/16	0.203	1/32	○	○
	TNMG 331 $\frac{1}{4}$ -C	3/8	3/16	0.150	1/64	○	○
	332 $\frac{1}{4}$ -C	3/8	3/16	0.150	1/32	○	○
	TNGG 331 $\frac{1}{4}$ -25R	3/8	3/16	0.150	1/64	○	○
 Medium-Roughing Low Cutting Resistance	332 $\frac{1}{4}$ -25R	3/8	3/16	0.150	1/32	○	○
	VNMG 3305PP	3/8	3/16	0.150	0.008	●	●
 Finishing	331PP	3/8	3/16	0.150	1/64	●	●
	332PP	3/8	3/16	0.150	1/32	●	●
	333PP	3/8	3/16	0.150	3/64	●	●
 Finishing-Medium	VNMG 331VF	3/8	3/16	0.150	1/64	●	●
	332VF	3/8	3/16	0.150	1/32	●	●
	333VF	3/8	3/16	0.150	3/64	●	●
 Finishing-Medium	VNMG 331PQ	3/8	3/16	0.150	1/64	●	●
	332PQ	3/8	3/16	0.150	1/32	●	●
	333PQ	3/8	3/16	0.150	3/64	●	●
 Finishing-Medium	VNMG 331HQ	3/8	3/16	0.150	1/64	○	○
	332HQ	3/8	3/16	0.150	1/32	○	○
	333HQ	3/8	3/16	0.150	3/64	○	○
 Roughing	VNMG 331	3/8	3/16	0.150	1/64	○	○
	332	3/8	3/16	0.150	1/32	○	○
 Medium Cutting	VNGG 3305 $\frac{1}{4}$	3/8	3/16	0.150	0.008	○	○
	331 $\frac{1}{4}$	3/8	3/16	0.150	1/64	○	○
	332 $\frac{1}{4}$	3/8	3/16	0.150	1/32	○	○

Shape	Part Number	Dimensions (Inch)				Grade	
		I.C.	Thickness	Hole	Corner-R (r)	TN620	PV720
 Finishing with Wiper Edge	WNMG 431WP	1/2	3/16	0.203	1/64	●	●
	432WP	1/2	3/16	0.203	1/32	●	●
 Finishing-Medium with Wiper Edge	WNMG 431WQ	1/2	3/16	0.203	1/64	●	●
	432WQ	1/2	3/16	0.203	1/32	●	●
	433WQ	1/2	3/16	0.203	3/64	●	●
 Finishing	WNMG 4305PP	1/2	3/16	0.203	0.008	●	●
	431PP	1/2	3/16	0.203	1/64	●	●
	432PP	1/2	3/16	0.203	1/32	●	●
 Finishing	433PP	1/2	3/16	0.203	3/64	●	●
	WNMG 431PQ	1/2	3/16	0.203	1/64	●	●
 Finishing-Medium	432PQ	1/2	3/16	0.203	1/32	●	●
	WNMG 431HQ	1/2	3/16	0.203	1/64	○	○
 Finishing-Medium	432HQ	1/2	3/16	0.203	1/32	○	○
	WNMG 431CQ	1/2	3/16	0.203	1/64	○	○
 Finishing-Medium Up Facing	432CQ	1/2	3/16	0.203	1/32	○	○
	433CQ	1/2	3/16	0.203	3/64	○	○
	WNMG 431PG	1/2	3/16	0.203	1/64	●	●
 Medium-Roughing	432PG	1/2	3/16	0.203	1/32	●	●
	WNMG 431XP	1/2	3/16	0.203	1/64	●	●
 Low Carbon Steel Finishing	432XP	1/2	3/16	0.203	1/32	●	●
	WNMG 431XQ	1/2	3/16	0.203	1/64	○	○
 Low Carbon Steel Medium Cutting	432XQ	1/2	3/16	0.203	1/32	○	○
	WNMG 432XS	1/2	3/16	0.203	1/32	○	○

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Ⓛ : World Express Left-Hand Only
Ⓡ : World Express Right-Hand Only












Shape	Part Number	Dimensions (Inch)					Grade	
		I.C.	Thickness	Hole	Corner-R (r)	Relief Angle	TN620	PV720
 Finishing	CCMT 21505PP	1/4	3/32	0.110	0.008	7°	●	●
	2151PP	1/4	3/32	0.110	1/64	7°	●	●
	CCMT 32505PP	3/8	5/32	0.173	0.008	7°	●	●
	3251PP 3252PP	3/8	5/32	0.173	1/64 1/32	7°	●	●
 Finishing-Medium	CCMT 21505GK	1/4	3/32	0.110	0.008	7°	●	●
	2151GK	1/4	3/32	0.110	1/64	7°	●	●
	CCMT 32505GK	3/8	5/32	0.173	0.008	7°	●	●
	3251GK	3/8	5/32	0.173	1/64	7°	●	●
 Finishing-Medium	CCMT 431GK	1/2	3/16	0.217	1/64	7°	●	●
	432GK	1/2	3/16	0.217	1/32	7°	●	●
	CCMT 21505HQ	1/4	3/32	0.110	0.008	7°	○	○
	2151HQ	1/4	3/32	0.110	1/64	7°	○	○
 Medium Cutting	CCMT 32505HQ	3/8	5/32	0.173	0.008	7°	●	●
	3251HQ	3/8	5/32	0.173	1/64	7°	●	●
	3252HQ	3/8	5/32	0.173	1/32	7°	●	●
	CCGT 21502	1/4	3/32	0.110	0.004	7°	○	○
 Medium Cutting	21505	1/4	3/32	0.110	0.008	7°	○	○
	2151	1/4	3/32	0.110	1/64	7°	○	○
	CCGT 32502	3/8	5/32	0.173	0.004	7°	○	○
	32505	3/8	5/32	0.173	0.008	7°	○	○
 Medium Cutting	3251	3/8	5/32	0.173	1/64	7°	○	○
	CCMT 3252	3/8	5/32	0.173	1/32	7°	○	○
	CCET 110905M%-F	0.138	0.055	0.075	<0.008	7°	Ⓛ	Ⓛ
	11091M%-F	0.138	0.055	0.075	<1/64	7°	Ⓛ	Ⓛ
 Finishing Sharp Edge	CCET 141105M%-F	0.169	0.071	0.091	<0.008	7°	Ⓛ	Ⓛ
	14111M%-F	0.169	0.071	0.091	<1/64	7°	Ⓛ	Ⓛ
	CCET 21502MF%-U	1/4	3/32	0.110	<0.004	7°	○	○
	21505MF%-U	1/4	3/32	0.110	<0.008	7°	○	○
 Low Feed Sharp Edge	CCET 32502MF%-U	3/8	5/32	0.173	<0.004	7°	Ⓜ	Ⓜ
	32505MF%-U	3/8	5/32	0.173	<0.008	7°	Ⓜ	Ⓜ
	CCGT 21505E%-U	1/4	3/32	0.110	0.008	7°	○	○
	2151E%-U	1/4	3/32	0.110	1/64	7°	○	○
 Low Feed With Hone	CCGT 32505E%-U	3/8	5/32	0.173	0.008	7°	Ⓜ	Ⓜ
	3251E%-U	3/8	5/32	0.173	1/64	7°	Ⓜ	Ⓜ
	CPMT 251505PP	5/16	3/32	0.130	0.008	11°	●	●
	25151PP	5/16	3/32	0.130	1/64	11°	●	●
 Finishing	CPMT 3205PP	3/8	1/8	0.173	0.008	11°	●	●
	321PP	3/8	1/8	0.173	1/64	11°	●	●
	322PP	3/8	1/8	0.173	1/32	11°	●	●
	CPMH 25151HQ	5/16	3/32	0.138	1/64	11°	●	●
 Finishing-Medium	25152HQ	5/16	3/32	0.138	1/32	11°	●	●
	CPMH 321HQ	3/8	1/8	0.177	1/64	11°	●	●
	322HQ	3/8	1/8	0.177	1/32	11°	●	●
	CPMH 25151	5/16	3/32	0.138	1/64	11°	○	○
 Medium	25152	5/16	3/32	0.138	1/32	11°	○	○
	CPMH 321	3/8	1/8	0.177	1/64	11°	○	○
	322	3/8	1/8	0.177	1/32	11°	○	○

Shape	Part Number	Dimensions (Inch)					Grade	
		I.C.	Thickness	Hole	Corner-R (r)	Relief Angle	TN620	PV720
 Low Carbon Steel Finishing	CPMT 25151XP	5/16	3/32	0.130	1/64	11°	●	●
	CPMT 321XP	3/8	1/8	0.173	1/64	11°	●	●
	322XP	3/8	1/8	0.173	1/32	11°	●	●
 Low Carbon Steel Medium Cutting	CPMT 321XQ	3/8	1/8	0.173	1/64	11°	○	○
	322XQ	3/8	1/8	0.173	1/32	11°	○	○
 Finishing	DCMT 21505PP	1/4	3/32	0.110	0.008	7°	●	●
	2151PP	1/4	3/32	0.110	1/64	7°	●	●
	DCMT 32505PP	3/8	5/32	0.173	0.008	7°	●	●
	3251PP 3252PP	3/8	5/32	0.173	1/64 1/32	7°	●	●
 Finishing-Medium	DCMT 21505GK	1/4	3/32	0.110	0.008	7°	●	●
	2151GK	1/4	3/32	0.110	1/64	7°	●	●
	2152GK	1/4	3/32	0.110	1/32	7°	●	●
	DCMT 32505GK	3/8	5/32	0.173	0.008	7°	●	●
 Finishing-Medium	3251GK	3/8	5/32	0.173	1/64	7°	●	●
	3252GK	3/8	5/32	0.173	1/32	7°	●	●
	DCMT 21505HQ	1/4	3/32	0.110	0.008	7°	○	○
	2151HQ	1/4	3/32	0.110	1/64	7°	○	○
 Medium Cutting	2152HQ	1/4	3/32	0.110	1/32	7°	○	○
	DCMT 32505HQ	3/8	5/32	0.173	0.008	7°	●	●
	3251HQ	3/8	5/32	0.173	1/64	7°	●	●
	3252HQ	3/8	5/32	0.173	1/32	7°	●	●
 Medium Cutting	DCGT 21502	1/4	3/32	0.110	0.004	7°	○	○
	21505	1/4	3/32	0.110	0.008	7°	○	○
	2151	1/4	3/32	0.110	1/64	7°	○	○
	DCGT 32502	3/8	5/32	0.173	0.004	7°	○	○
 Low Carbon Steel Finishing	32505	3/8	5/32	0.173	0.008	7°	○	○
	3251	3/8	5/32	0.173	1/64	7°	○	○
	DCMT 3252	3/8	5/32	0.173	1/32	7°	○	○
	DCMT 2151XP	1/4	3/32	0.110	1/64	7°	●	●
 Low Carbon Steel Finishing-Medium	DCMT 32505XP	3/8	5/32	0.173	0.008	7°	●	●
	3251XP	3/8	5/32	0.173	1/64	7°	●	●
	3252XP	3/8	5/32	0.173	1/32	7°	●	●
	DCMT 3251XQ	3/8	5/32	0.173	1/64	7°	○	○
 Low Feed Sharp Edge	3252XQ	3/8	5/32	0.173	1/32	7°	○	○
	DCET 21505MF%-U	1/4	3/32	0.110	0.008	7°	○	○
	DCET 32505MF%-U	3/8	5/32	0.173	0.008	7°	○	○
	DCGT 2151E%-U	1/4	3/32	0.110	1/64	7°	○	○
 Low Feed Sharp Edge	DCGT 32505E%-U	3/8	5/32	0.173	0.008	7°	○	○
	3251E%-U	3/8	5/32	0.173	1/64	7°	○	○

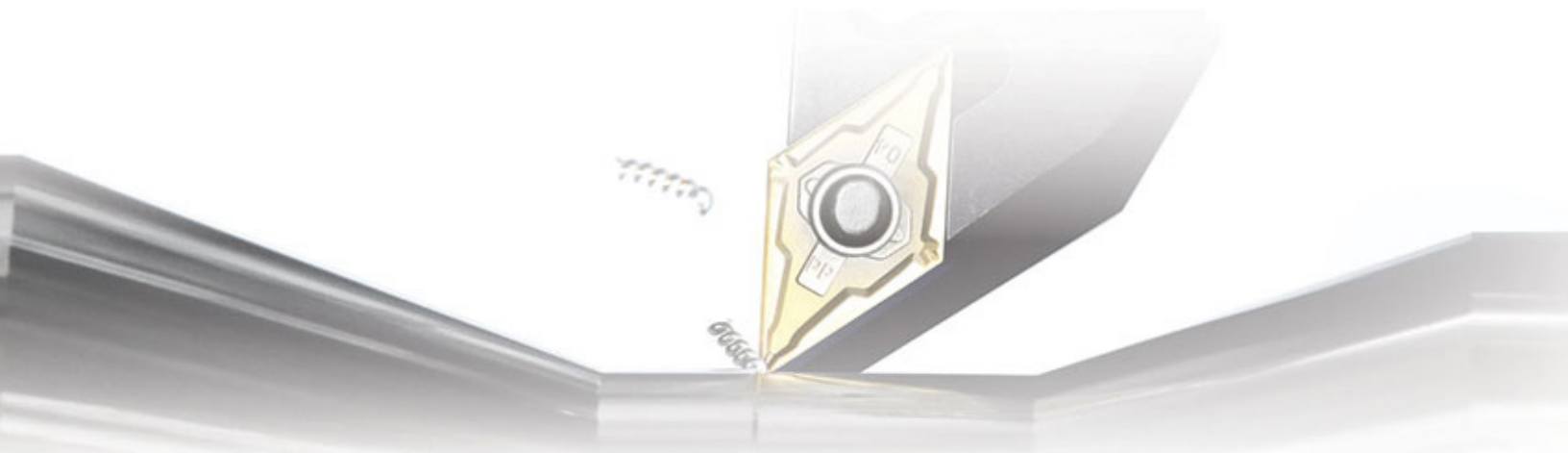
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Positive Inserts (Cont.)

Shape	Part Number	Dimensions (Inch)					Grade	
		I.C.	Thickness	Hole	Corner-R (r)	Relief Angle	TN620	PV720
	RCMX 1003M0	0.394	1/8	0.142	-	7°	○	○
	RCMX 1204M0	0.472	3/16	0.165	-	7°	○	○
	TBMT 12105DP	5/32	1/16	0.091	0.008	5°	○	○
	1211DP	5/32	1/16	0.091	1/64	5°	○	○
	TBGT 12105%	5/32	1/16	0.091	0.008	5°	Ⓛ	Ⓛ
	1211%	5/32	1/16	0.091	1/64	5°	Ⓛ	Ⓛ
	TCMT 181505HQ	7/32	3/32	0.098	0.008	7°	○	○
	18151HQ	7/32	3/32	0.098	1/64	7°	○	○
	TCMT 21505HQ	1/4	3/32	0.110	0.008	7°	○	○
	2151HQ	1/4	3/32	0.110	1/64	7°	○	○
	2152HQ	1/4	3/32	0.110	1/32	7°	○	○
	TPMT 181505PP	7/32	3/32	0.110	0.008	11°	●	●
	18151PP	7/32	3/32	0.110	1/64	11°	●	●
	TPMT 2205PP	1/4	1/8	0.130	0.008	11°	●	●
	221PP	1/4	1/8	0.130	1/64	11°	●	●
	222PP	1/4	1/8	0.130	1/32	11°	●	●

Shape	Part Number	Dimensions (Inch)					Grade	
		I.C.	Thickness	Hole	Corner-R (r)	Relief Angle	TN620	PV720
	TPMT 181505HQ	7/32	3/32	0.110	0.008	11°	○	○
	18151HQ	7/32	3/32	0.110	1/64	11°	○	○
	TPMT 2205HQ	1/4	1/8	0.130	0.008	11°	●	●
	221HQ	1/4	1/8	0.130	1/64	11°	●	●
	222HQ	1/4	1/8	0.130	1/32	11°	●	●
	TPMT 321HQ	3/8	1/8	0.173	1/64	11°	●	●
	322HQ	3/8	1/8	0.173	1/32	11°	●	●
	TPMT 18151XP	7/32	3/32	0.110	1/64	11°	●	●
	TPMT 221XP	1/4	1/8	0.130	1/64	11°	●	●
	TPMT 222XP	1/4	1/8	0.130	1/32	11°	●	●
	TPMT 321XP	3/8	1/8	0.173	1/64	11°	●	●
	322XP	3/8	1/8	0.173	1/32	11°	●	●
	TPMT 221XQ	1/4	1/8	0.130	1/64	11°	○	○
	222XQ	1/4	1/8	0.130	1/32	11°	○	○
	TPMT 321XQ	3/8	1/8	0.173	1/64	11°	○	○
	322XQ	3/8	1/8	0.173	1/32	11°	○	○
	TPGH 151505%	3/16	3/32	0.091	0.008	11°	○	○
	15151%	3/16	3/32	0.091	1/64	11°	○	○
	TPGH 181505%	7/32	3/32	0.118	0.008	11°	○	○
	18151%	7/32	3/32	0.118	1/64	11°	○	○
	TPGH 2205%	1/4	1/8	0.130	0.008	11°	○	○
	221%	1/4	1/8	0.130	1/64	11°	○	○
	222%	1/4	1/8	0.130	1/32	11°	Ⓛ	Ⓛ
	TPGH 321%	3/8	1/8	0.177	1/64	11°	○	○

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