Eco Run

High Performance Cutting Tools

From

CALIBER
INDUSTRIAL SUPPLY

INDEXABLE TOOLING CATALOGUE 2022


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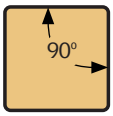
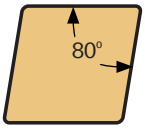
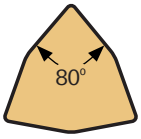
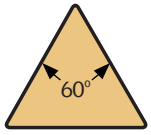
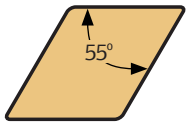
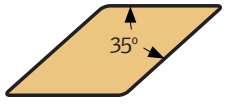
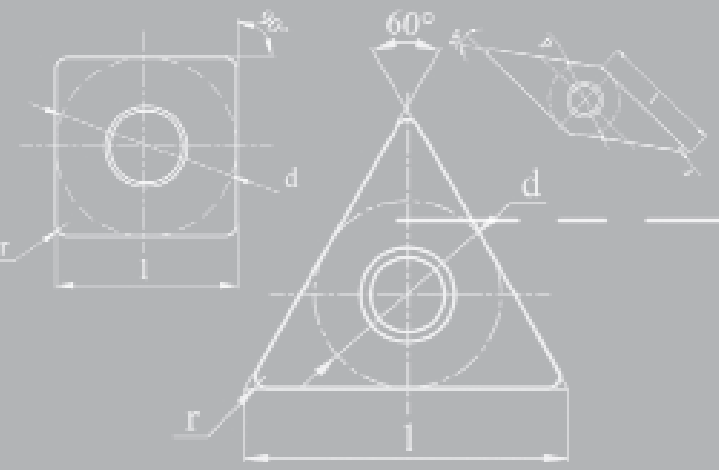
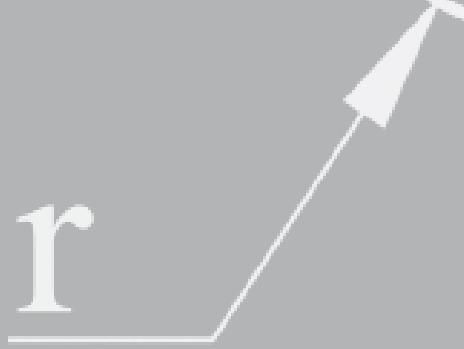
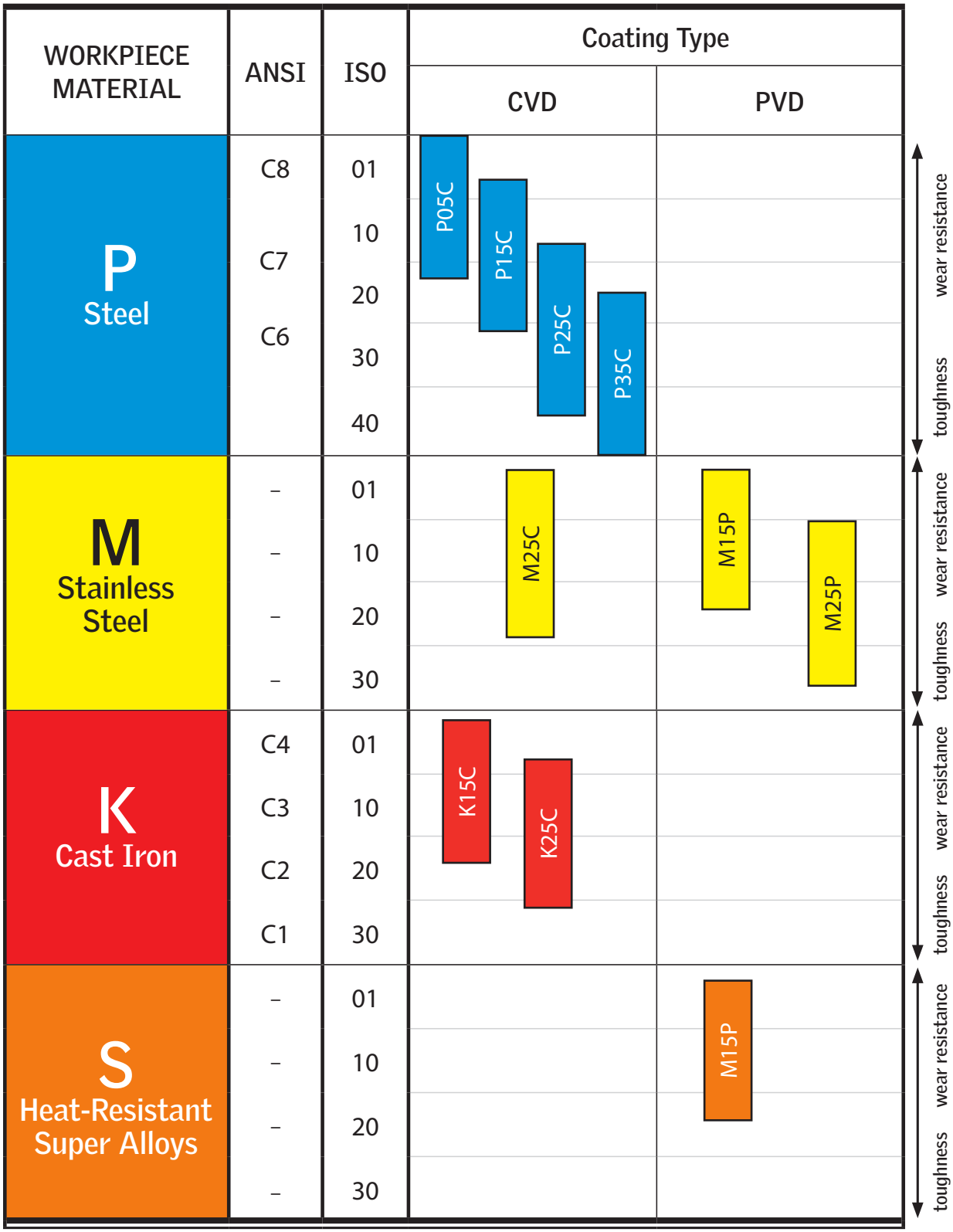
Insert Shape	Application Conditions (+)	Considerations (-)
 S - Square	• Very strong 90° corner with excellent economy (8 edges on double-sided inserts). • Most often used for rough facing operations – especially on castings, forgings and rough-sawed blanks.	• Unable to turn or face up to a shoulder (must be used in a toolholder with minimum 5° lead angle). • High radial forces push against the workpiece when used for turning. • Should always be used in a stable set-up.
 C - 80° Diamond	• The most popular insert shape due to high versatility. • Strong cutting edge with secure seating in the insert pocket. • 80° corner can be used for both turning and facing operations. • Opposite 100° corners can be used for general roughing applications (especially facing), providing maximum economy of 8 total cutting edges.	• With only 5° of clearance between the trailing side of the insert and the workpiece, chip jamming can occur when boring.
 W - 80° Corner Trigon	• Six-corner 80° diamond shape that can increase economy compared to CNMG-style inserts. • Generally used on more moderate depths of cut and feedrates than CNMG-style inserts.	• Seating of insert in pocket is not as stable as CNMG-style inserts. • Cannot take as deep a depth of cut as similar sized CNMG-type inserts.
 T - Triangle	• Very versatile insert shape – can be used for turning, facing, boring, copy turning and basic profiling. • Good economy with up to 6 cutting edges. • Excellent choice for general boring due to very stable seating of the insert in the boring bar pocket, and extra side clearance between the insert and the workpiece bore (greatly reducing the risk of chip jamming).	• Edge is measurably weaker than 80° diamond shaped inserts. • Be sure not to use a triangle insert that is "too large" for the application, as the cost per edge can increase. For example, a 3/8" iC (Inscribed Circle) triangle insert (TNMG-33x) can manage up to .375" depth of cut in most situations with nearly the same insert strength – but a much lower cost - than a 1/2" iC triangle insert (TNMG-43x).
 D - 55° Diamond	• Generally the first choice for profile / copy turning applications. • Able to "In-Copy" (plunge turn into a smaller diameter) at an angle of 30°. • Commonly used when machining close to the tailstock / live center.	• Somewhat weaker edge strength than a triangle insert. • Cost per edge is higher than most other turning inserts (except 35° diamond shape).
 V - 35° Diamond	• First choice for intricate shape copy turning. • Can "In-Copy" (plunge turn into a smaller diameter) at an angle up to 49°. • Can work extremely close to the tailstock / live center.	• The weakest turning insert shape / corner – depths of cut and feedrates must be lighter. • Highest cost per edge. • Negative style (VNMG) should mainly be used for external applications. • Positive style (VCMT) can be used for external and internal applications, and in many cases improved performance outweighs the increased cost per edge (2 edges vs. the 4 edges of a negative 35° diamond VNMG).

TURNING INSERTS | NEGATIVE RAKE

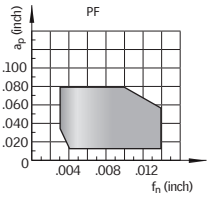
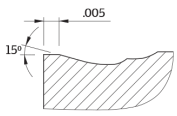
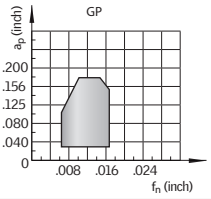
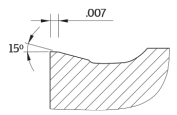
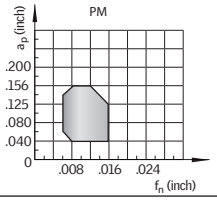
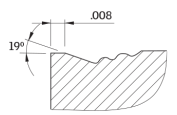
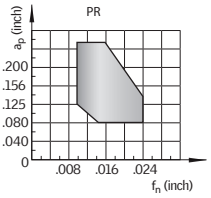
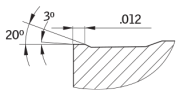
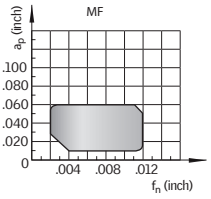
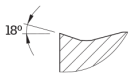
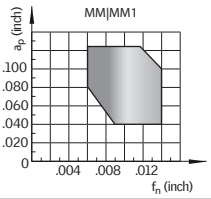
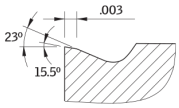
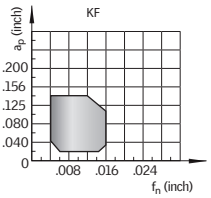
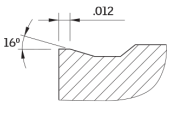
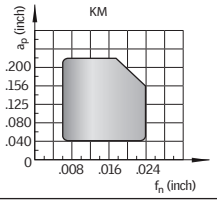
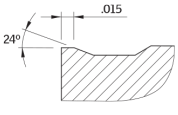
ANSI / ISO STANDARD INSERTS
FOR MOST EXTERNAL TURNING AND
INTERNAL MACHINING OPERATIONS



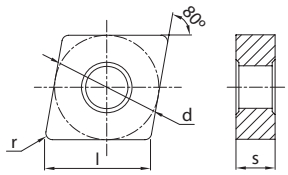




See pages 68 and 69 for more information on grades for turning.

Chipbreaker	Description	Chipbreaker Range	Design
PF P STEEL	• Butterfly geometry directs chip flow • Variable Rake Angle • Curved Edgeline • Excellent chip control at small depths of cut • High quality surface finish		
GP P STEEL	• Super-wide Chipgroove • High positive cutting action • Unique cutting edge treatment • Extremely long edgeline • Good for unstable set-ups • Able to handle varying depths of cut		
PM P STEEL	• Smooth chip formation • Variable Land balances sharpness & strength • Strengthening ribs extend tool life • Wide application range • Low cutting forces with high edge strength • Excellent all-around performance		
PR P STEEL	• High performance steel roughing chipbreaker • Strong cutting edge • Well suited for unstable application conditions • First choice for medium to heavy interruptions • Excellent chip evacuation and chip control • Smooth chip removal throughout feed range		
MF M STAINLESS STEEL	• Ultra-sharp cutting edge • Low cutting forces • Excellent chip control at small depths of cut • Top land design protects against edge hammering • Smooth cutting action without burrs • Excellent workpiece surface finish		
MM|MM1 M STAINLESS STEEL	• Double-positive chipbreaker design • Strengthened positive land • Micro-edge geometry for Stainless Steel • Reduced workhardening effect • Wide application range / medium turning		
KF K CAST IRON	• Lower cutting force geometry for Cast Iron • Strengthened edgeline with open chipformer • Designed for light to moderate applications • Good choice in unstable set-ups • Problem solver for boring Cast Iron		
KM K CAST IRON	• Outstanding performance in Cast Iron • Strong edge with free cutting action • Extremely broad application range • Replaces traditional – NMA flat-top inserts • Precision lapped support surface		

CNMG-PF



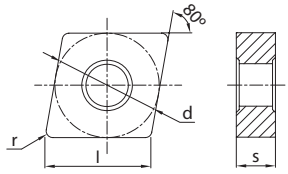
Most popular shape / style of insert. All-purpose turning, facing and boring.

PF: First Choice Geometry for finishing and semi-finishing applications in all types of Steel.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	P05C	P15C	P25C	
CNMG 321-PF	CNMG 090304-PF	3/8	.381	1/8	1/64	.010 - .062	.003 - .010		★	★	
CNMG 322-PF	CNMG 090308-PF	3/8	.381	1/8	1/32	.016 - .080	.004 - .014		★	★	
CNMG 431-PF	CNMG 120404-PF	1/2	.508	3/16	1/64	.010 - .062	.003 - .010	★	★	★	
CNMG 432-PF	CNMG 120408-PF	1/2	.508	3/16	1/32	.016 - .080	.004 - .014	★	★	★	

Ordering Example: 20 pcs CNMG 432-PF P25C

CNMG-GP



Most popular shape / style of insert. All-purpose turning, facing and boring.

GP: Sharp Edge Geometry for shaft turning, boring and unstable workpieces. Performs well in a wide range of depths of cut.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	P25C			
CNMG 432R-GP	CNMG 120408R-GP	1/2	.508	3/16	1/32	.031 - .187	.006 - .016	★			
CNMG 432L-GP	CNMG 120408L-GP	1/2	.508	3/16	1/32	.031 - .187	.006 - .016	★			

Ordering Example: 20 pcs CNMG 432L-GP P25C

NOTE: GP geometry inserts are available in both R (Right-hand) and L (Left-hand) styles. Right-hand style is shown above.
Normal External Turning applications require Right-hand (R) inserts in Right-hand holders, and Left-hand (L) inserts in Left-hand holders.
For Internal / Boring applications, Left-hand (L) inserts are used in Right-hand bars, and Right-hand (R) inserts are used in Left-hand bars.

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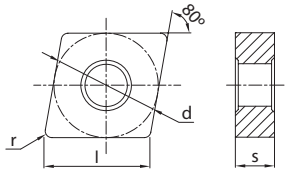
CNMG-PM



Most popular shape / style of insert. All-purpose turning, facing and boring.

PM: First Choice Geometry for medium to semi-roughing applications in all types of Steel.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	P05C	P15C	P25C	
CNMG 321-PM	CNMG 090304-PM	3/8	.381	1/8	1/64	.016 - .141	.005 - .014		★	★	
CNMG 322-PM	CNMG 090308-PM	3/8	.381	1/8	1/32	.020 - .141	.006 - .016		★	★	
CNMG 431-PM	CNMG 120404-PM	1/2	.508	3/16	1/64	.016 - .187	.005 - .014	★	★	★	
CNMG 432-PM	CNMG 120408-PM	1/2	.508	3/16	1/32	.020 - .187	.006 - .016	★	★	★	
CNMG 433-PM	CNMG 120412-PM	1/2	.508	3/16	3/64	.031 - .187	.007 - .018	★	★	★	
CNMG 434-PM	CNMG 120416-PM	1/2	.508	3/16	1/16	.040 - .187	.008 - .020			★	
CNMG 542-PM	CNMG 160608-PM	5/8	.635	1/4	1/32	.020 - .219	.006 - .016	★	★	★	
CNMG 543-PM	CNMG 160612-PM	5/8	.635	1/4	3/64	.031 - .219	.007 - .018	★	★	★	
CNMG 642-PM	CNMG 190608-PM	3/4	.762	1/4	1/32	.020 - .266	.006 - .016		★	★	
CNMG 643-PM	CNMG 190612-PM	3/4	.762	1/4	3/64	.031 - .266	.007 - .018	★	★	★	
CNMG 644-PM	CNMG 190616-PM	3/4	.762	1/4	1/16	.040 - .266	.008 - .020			★	

Ordering Example: 20 pcs CNMG 644-PM P25C

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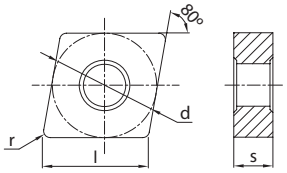
CNMG-PR



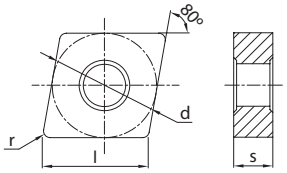
Most popular shape / style of insert. All-purpose turning, facing and boring.

PR: Strong cutting edge geometry for roughing applications in all types of Steel. Well suited for unstable conditions and interrupted cuts.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	P05C	P15C	P25C	P35C
CNMG 432-PR	CNMG 120408-PR	1/2	.508	3/16	1/32	.028 - .219	.007 - .020	★	★	★	★
CNMG 433-PR	CNMG 120412-PR	1/2	.508	3/16	3/64	.040 - .219	.008 - .022	★	★	★	★
CNMG 543-PR	CNMG 160612-PR	5/8	.635	1/4	3/64	.040 - .266	.008 - .022	★	★	★	★
CNMG 544-PR	CNMG 160616-PR	5/8	.635	1/4	1/16	.055 - .266	.009 - .026	★	★		★
CNMG 643-PR	CNMG 190612-PR	3/4	.762	1/4	3/64	.040 - .328	.008 - .022	★	★	★	★
CNMG 644-PR	CNMG 190616-PR	3/4	.762	1/4	1/16	.055 - .328	.009 - .026	★	★		★

Ordering Example: 20 pcs CNMG 644-PR P35C

CNMG-MF



Most popular shape / style of insert. All-purpose turning, facing and boring.

MF: Ultra-sharp cutting edge geometry for finishing in Stainless Steels. Low cutting forces and superior workpiece surface finish without burrs.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STAINLESS STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	M15P			
CNMG 431-MF	CNMG 120404-MF	1/2	.508	3/16	1/64	.004 - .060	.002 - .012	★			
CNMG 432-MF	CNMG 120408-MF	1/2	.508	3/16	1/32	.004 - .060	.002 - .012	★			

Ordering Example: 20 pcs CNMG 432-MF M15P

NOTE: The primary application area for grade M15P is in stainless steel workpiece materials. M15P is also suitable for use with iron-based, cobalt-based and nickel-based Heat Resistant Super Alloys.

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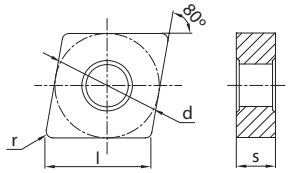
CNMG-MM|MM1



Most popular shape / style of insert. All-purpose turning, facing and boring.

MM|MM1: Keen edge geometry especially for Stainless Steel. Unique edgeline reduces work hardening. Semi-finishing to rough machining.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STAINLESS STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	M25C	M15P	M25P	
CNMG 321-MM	CNMG 090304-MM	3/8	.381	1/8	1/64	.016 - .125	.006 - .011	★		★	
CNMG 322-MM	CNMG 090308-MM	3/8	.381	1/8	1/32	.020 - .125	.006 - .012	★		★	
CNMG 431-MM	CNMG 120404-MM	1/2	.508	3/16	1/64	.016 - .156	.006 - .011	★		★	
CNMG 432-MM	CNMG 120408-MM	1/2	.508	3/16	1/32	.020 - .156	.006 - .012	★		★	
CNMG 433-MM	CNMG 120412-MM	1/2	.508	3/16	3/64	.031 - .156	.007 - .013	★		★	
CNMG 434-MM	CNMG 120416-MM	1/2	.508	3/16	1/16	.040 - .156	.008 - .014	★		★	
CNMG 542-MM	CNMG 160608-MM	5/8	.635	1/4	1/32	.020 - .187	.006 - .012	★		★	
CNMG 543-MM	CNMG 160612-MM	5/8	.635	1/4	3/64	.031 - .187	.007 - .013	★		★	
CNMG 544-MM	CNMG 160616-MM	5/8	.635	1/4	1/16	.040 - .187	.008 - .014	★		★	
CNMG 642-MM	CNMG 190608-MM	3/4	.762	1/4	1/32	.020 - .234	.006 - .012	★		★	
CNMG 643-MM	CNMG 190612-MM	3/4	.762	1/4	3/64	.031 - .234	.007 - .013	★		★	
CNMG 644-MM	CNMG 190616-MM	3/4	.762	1/4	1/16	.040 - .234	.008 - .014	★		★	
CNMG 431-MM1	CNMG 120404-MM1	1/2	.508	3/16	1/64	.016 - .156	.006 - .011	★		★	
CNMG 432-MM1	CNMG 120408-MM1	1/2	.508	3/16	1/32	.020 - .156	.006 - .012	★	★	★	
CNMG 433-MM1	CNMG 120412-MM1	1/2	.508	3/16	3/64	.031 - .156	.007 - .013	★	★	★	

Ordering Example: 20 pcs CNMG 644-MM M25C

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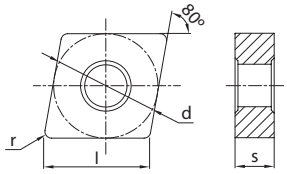
CNMG-KF



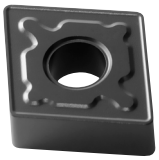
Most popular shape / style of insert. All-purpose turning, facing and boring.

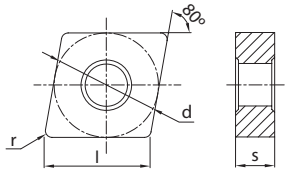
KF: Lower cutting force geometry for Cast Iron. Edge geometry reduces cutting forces in moderate conditions / lighter cuts.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		CAST IRON			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	K15C	K25C		
CNMG 431-KF	CNMG 120404-KF	1/2	.508	3/16	1/64	.012 - .203	.003 - .012	★	★		
CNMG 432-KF	CNMG 120408-KF	1/2	.508	3/16	1/32	.016 - .203	.004 - .014	★	★		

Ordering Example: 20 pcs CNMG 432-KF K15C

CNMG-KM





Most popular shape / style of insert. All-purpose turning, facing and boring.

KM: Exceptionally broad application range geometry primarily for Cast Iron. Strong cutting edge, excellent durability. Semi-finishing to roughing.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		CAST IRON			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	K15C	K25C		
CNMG 432-KM	CNMG 120408-KM	1/2	.508	3/16	1/32	.020 - .219	.004 - .016	★	★		
CNMG 433-KM	CNMG 120412-KM	1/2	.508	3/16	3/64	.031 - .219	.006 - .020	★	★		
CNMG 543-KM	CNMG 160612-KM	5/8	.635	1/4	3/64	.031 - .297	.006 - .020	★	★		
CNMG 544-KM	CNMG 160616-KM	5/8	.635	1/4	1/16	.040 - .297	.008 - .026		★		
CNMG 643-KM	CNMG 190612-KM	3/4	.762	1/4	3/64	.031 - .359	.006 - .020	★	★		
CNMG 644-KM	CNMG 190616-KM	3/4	.762	1/4	1/16	.040 - .359	.008 - .026		★		

Ordering Example: 20 pcs CNMG 644-KM K25C

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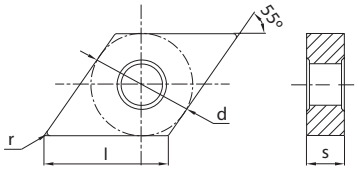
DNMG-PF



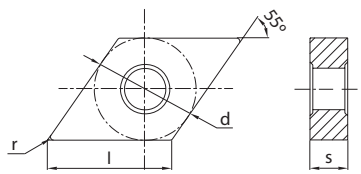
Use for profile turning, copy turning, and semi-finishing. Can turn more complex shapes due to 55° included angle.

PF: First Choice Geometry for finishing and semi-finishing applications in all types of Steel.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	P05C	P15C	P25C	
DNMG 331-PF	DNMG 110404-PF	3/8	.458	3/16	1/64	.010 - .062	.003 - .010		★	★	
DNMG 332-PF	DNMG 110408-PF	3/8	.458	3/16	1/32	.016 - .080	.004 - .014		★	★	
DNMG 431-PF	DNMG 150404-PF	1/2	.610	3/16	1/64	.010 - .062	.003 - .010	★	★	★	
DNMG 432-PF	DNMG 150408-PF	1/2	.610	3/16	1/32	.016 - .080	.004 - .014	★	★	★	

Ordering Example: 20 pcs DNMG 432-PF P15C

DNMG-PM



Use for profile turning, copy turning, and semi-finishing. Can turn more complex shapes due to 55° included angle.

PM: First Choice Geometry for medium to semi-roughing applications in all types of Steel.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	P05C	P15C	P25C	
DNMG 331-PM	DNMG 110404-PM	3/8	.458	3/16	1/64	.016 - .156	.005 - .014		★	★	
DNMG 332-PM	DNMG 110408-PM	3/8	.458	3/16	1/32	.020 - .156	.006 - .016		★	★	
DNMG 333-PM	DNMG 110412-PM	3/8	.458	3/16	3/64	.031 - .156	.007 - .018		★	★	
DNMG 431-PM	DNMG 150404-PM	1/2	.610	3/16	1/64	.016 - .187	.005 - .014	★	★	★	
DNMG 432-PM	DNMG 150408-PM	1/2	.610	3/16	1/32	.020 - .187	.006 - .016	★	★	★	
DNMG 433-PM	DNMG 150412-PM	1/2	.610	3/16	3/64	.031 - .187	.007 - .018		★	★	

Ordering Example: 20 pcs DNMG 433-PM P15C

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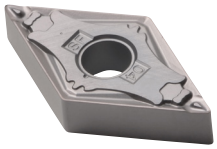
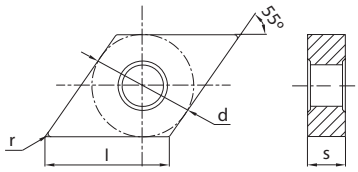
DNMG-MF





Use for profile turning, copy turning, and semi-finishing. Can turn more complex shapes due to 55° included angle.

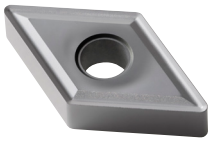
MF: Ultra-sharp cutting edge geometry for finishing in Stainless Steels. Low cutting forces and superior workpiece surface finish without burrs.

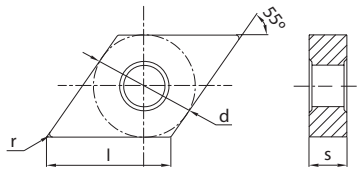
CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STAINLESS STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	M15P			
DNMG 431-MF	DNMG 150404-MF	1/2	.610	3/16	1/64	.004 - .060	.002 - .012	★			
DNMG 432-MF	DNMG 150408-MF	1/2	.610	3/16	1/32	.004 - .060	.002 - .012	★			

Ordering Example: 20 pcs DNMG 432-MF M15P

NOTE: The primary application area for grade M15P is in stainless steel workpiece materials. M15P is also suitable for use with iron-based, cobalt-based and nickel-based Heat Resistant Super Alloys.

DNMG-MM|MM1





Use for profile turning, copy turning, and semi-finishing. Can turn more complex shapes due to 55° included angle.

MM|MM1: Keen edge geometry especially for Stainless Steel. Unique edgeline reduces work hardening. Semi-finishing to rough machining.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STAINLESS STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	M25C	M15P	M25P	
DNMG 331-MM	DNMG 110404-MM	3/8	.458	3/16	1/64	.016 - .141	.006 - .011	★			
DNMG 332-MM	DNMG 110408-MM	3/8	.458	3/16	1/32	.020 - .141	.006 - .012	★		★	
DNMG 333-MM	DNMG 110412-MM	3/8	.458	3/16	3/64	.031 - .141	.007 - .013	★		★	
DNMG 431-MM	DNMG 150404-MM	1/2	.610	3/16	1/64	.016 - .172	.006 - .011	★		★	
DNMG 432-MM	DNMG 150408-MM	1/2	.610	3/16	1/32	.020 - .172	.006 - .012	★		★	
DNMG 433-MM	DNMG 150412-MM	1/2	.610	3/16	3/64	.031 - .172	.007 - .013	★		★	
DNMG 331-MM1	DNMG 110404-MM1	3/8	.458	3/16	1/64	.016 - .141	.006 - .011	★			
DNMG 332-MM1	DNMG 110408-MM1	3/8	.458	3/16	1/32	.020 - .141	.006 - .012	★	★	★	
DNMG 431-MM1	DNMG 150404-MM1	1/2	.610	3/16	1/64	.016 - .172	.006 - .011	★	★	★	
DNMG 432-MM1	DNMG 150408-MM1	1/2	.610	3/16	1/32	.020 - .172	.006 - .012	★	★	★	
DNMG 433-MM1	DNMG 150412-MM1	1/2	.610	3/16	3/64	.031 - .172	.007 - .013	★	★	★	

Ordering Example: 20 pcs DNMG 433-MM M25C

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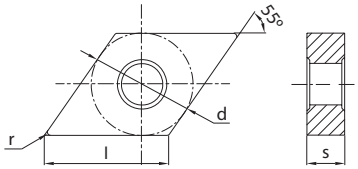
DNMG-KF



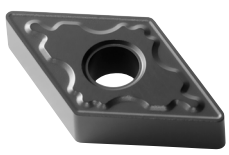
Use for profile turning, copy turning, and semi-finishing. Can turn more complex shapes due to 55° included angle.

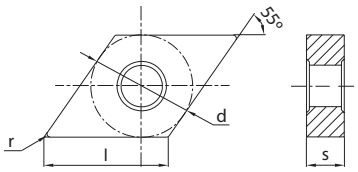
KF: Lower cutting force geometry for Cast Iron. Edge geometry reduces cutting forces in moderate conditions / lighter cuts.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		CAST IRON			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	K15C	K25C		
DNMG 431-KF	DNMG 150404-KF	1/2	.610	3/16	1/64	.012 - .203	.003 - .012	★	★		
DNMG 432-KF	DNMG 150408-KF	1/2	.610	3/16	1/32	.016 - .203	.004 - .014	★	★		

Ordering Example: 20 pcs DNMG 432-KF K15C

DNMG-KM





Use for profile turning, copy turning, and semi-finishing. Can turn more complex shapes due to 55° included angle.

KM: Exceptionally broad application range geometry primarily for Cast Iron. Strong cutting edge, excellent durability. Semi-finishing to roughing.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		CAST IRON			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	K15C	K25C		
DNMG 432-KM	DNMG 150408-KM	1/2	.610	3/16	1/32	.020 - .219	.004 - .016	★	★		
DNMG 433-KM	DNMG 150412-KM	1/2	.610	3/16	3/64	.031 - .219	.006 - .020	★	★		

Ordering Example: 20 pcs DNMG 433-KM K15C

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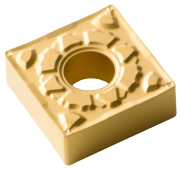
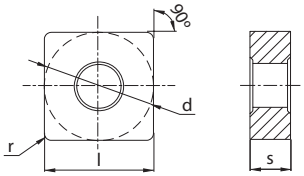
SNMG-PF





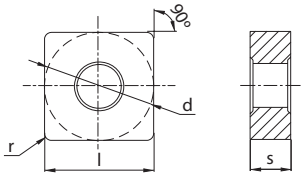
Excellent economy due to 8 cutting edges. Strong insert shape. Mainly for rough facing and chamfering (not turning to a shoulder).

PF: First Choice Geometry for finishing and semi-finishing applications in all types of Steel.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	P05C	P15C	P25C	
SNMG 321-PF	SNMG 090304-PF	3/8	.375	1/8	1/64	.010 - .062	.003 - .010		★	★	
SNMG 322-PF	SNMG 090308-PF	3/8	.375	1/8	1/32	.016 - .080	.004 - .014		★	★	
SNMG 431-PF	SNMG 120404-PF	1/2	.500	3/16	1/64	.010 - .062	.003 - .010	★	★	★	
SNMG 432-PF	SNMG 120408-PF	1/2	.500	3/16	1/32	.016 - .080	.004 - .014	★	★	★	

Ordering Example: 20 pcs SNMG 432-PF P05C

SNMG-GP



Excellent economy due to 8 cutting edges. Strong insert shape. Mainly for rough facing and chamfering (not turning to a shoulder).

GP: Sharp Edge Geometry for turning and facing unstable workpieces. Can handle a wide range of depths of cut.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	P25C			
SNMG 432R-GP	SNMG 120408R-GP	1/2	.500	3/16	1/32	.031 - .187	.006 - .016	★			
SNMG 432L-GP	SNMG 120408L-GP	1/2	.500	3/16	1/32	.031 - .187	.006 - .016	★			

Ordering Example: 20 pcs SNMG 432L-GP P25C

NOTE: GP geometry inserts are available in both R (Right-hand) and L (left-hand) styles. Right-hand style is shown above.
Normal External Turning applications require Right-hand (R) inserts in Right-hand holders, and Left-hand (L) inserts in Left-hand holders.
For Internal / Boring applications, Left-hand (L) inserts are used in Right-hand bars, and Right-hand (R) inserts are used in Left-hand bars.

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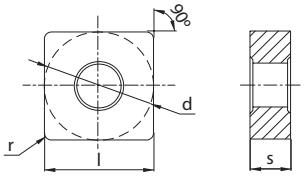
SNMG-PM



Excellent economy due to 8 cutting edges. Strong insert shape. Mainly for rough facing and chamfering (not turning to a shoulder).

PM: First Choice Geometry for medium to semi-roughing applications in all types of Steel.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	P05C	P15C	P25C	
SNMG 321-PM	SNMG 090304-PM	3/8	.375	1/8	1/64	.016 - .141	.005 - .014		★	★	
SNMG 322-PM	SNMG 090308-PM	3/8	.375	1/8	1/32	.020 - .141	.006 - .016		★	★	
SNMG 431-PM	SNMG 120404-PM	1/2	.500	3/16	1/64	.016 - .187	.005 - .014		★	★	
SNMG 432-PM	SNMG 120408-PM	1/2	.500	3/16	1/32	.020 - .187	.006 - .016	★	★	★	
SNMG 433-PM	SNMG 120412-PM	1/2	.500	3/16	3/64	.031 - .187	.007 - .018	★	★	★	
SNMG 434-PM	SNMG 120416-PM	1/2	.500	3/16	1/16	.040 - .187	.008 - .020			★	
SNMG 542-PM	SNMG 150608-PM	5/8	.625	1/4	1/32	.020 - .219	.006 - .016		★	★	
SNMG 543-PM	SNMG 150612-PM	5/8	.625	1/4	3/64	.031 - .219	.007 - .018	★	★	★	
SNMG 643-PM	SNMG 190612-PM	3/4	.750	1/4	3/64	.031 - .266	.007 - .018	★	★	★	

Ordering Example: 20 pcs SNMG 643-PM P15C

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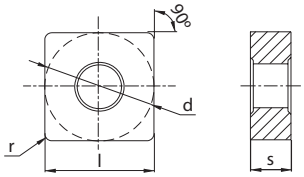
SNMG-PR



Excellent economy due to 8 cutting edges. Strong insert shape. Mainly for rough facing and chamfering (not turning to a shoulder).

PR: Strong cutting edge geometry for roughing applications in all types of Steel. Well suited for unstable conditions and interrupted cuts.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	P05C	P25C	P35C	
SNMG 432-PR	SNMG 120408-PR	1/2	.500	3/16	1/32	.028 - .219	.007 - .020	★	★	★	
SNMG 433-PR	SNMG 120412-PR	1/2	.500	3/16	3/64	.040 - .219	.008 - .022	★		★	
SNMG 543-PR	SNMG 150612-PR	5/8	.625	1/4	3/64	.040 - .266	.008 - .022	★	★	★	
SNMG 544-PR	SNMG 150616-PR	5/8	.625	1/4	1/16	.055 - .266	.009 - .026	★		★	
SNMG 643-PR	SNMG 190612-PR	3/4	.750	1/4	3/64	.040 - .328	.008 - .022	★	★	★	
SNMG 644-PR	SNMG 190616-PR	3/4	.750	1/4	1/16	.055 - .328	.009 - .026	★		★	

Ordering Example: 20 pcs SNMG 644-PR P35C

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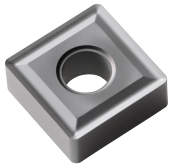
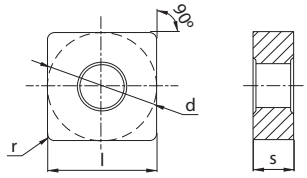
SNMG-MM|MM1





Excellent economy due to 8 cutting edges. Strong insert shape. Mainly for rough facing and chamfering (not turning to a shoulder).

MM|MM1: Keen edge geometry especially for Stainless Steel. Unique edgeline reduces work hardening. Semi-finishing to rough machining.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STAINLESS STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	M25C	M15P	M25P	
SNMG 321-MM	SNMG 090304-MM	3/8	.375	1/8	1/64	.016 - .125	.006 - .011	★		★	
SNMG 322-MM	SNMG 090308-MM	3/8	.375	1/8	1/32	.020 - .125	.006 - .012	★		★	
SNMG 431-MM	SNMG 120404-MM	1/2	.500	3/16	1/64	.016 - .156	.006 - .011	★		★	
SNMG 432-MM	SNMG 120408-MM	1/2	.500	3/16	1/32	.020 - .156	.006 - .012	★		★	
SNMG 433-MM	SNMG 120412-MM	1/2	.500	3/16	3/64	.031 - .156	.007 - .013	★		★	
SNMG 434-MM	SNMG 120416-MM	1/2	.500	3/16	1/16	.040 - .156	.008 - .014	★		★	
SNMG 542-MM	SNMG 150608-MM	5/8	.625	1/4	1/32	.020 - .187	.006 - .012	★		★	
SNMG 543-MM	SNMG 150612-MM	5/8	.625	1/4	3/64	.031 - .187	.007 - .013	★		★	
SNMG 544-MM	SNMG 150616-MM	5/8	.625	1/4	1/16	.040 - .187	.008 - .014	★		★	
SNMG 643-MM	SNMG 190612-MM	3/4	.750	1/4	3/64	.031 - .234	.007 - .013	★		★	
SNMG 644-MM	SNMG 190616-MM	3/4	.750	1/4	1/16	.040 - .234	.008 - .014	★		★	
SNMG 431-MM1	SNMG 120404-MM1	1/2	.500	3/16	1/64	.016 - .156	.006 - .011	★	★	★	
SNMG 432-MM1	SNMG 120408-MM1	1/2	.500	3/16	1/32	.020 - .156	.006 - .012	★	★	★	
SNMG 433-MM1	SNMG 120412-MM1	1/2	.500	3/16	3/64	.031 - .156	.007 - .013	★	★	★	

Ordering Example: 20 pcs SNMG 644-MM M25P

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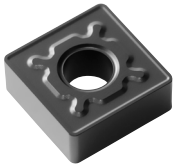
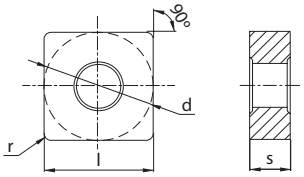
SNMG-KM





Excellent economy due to 8 cutting edges. Strong insert shape. Mainly for rough facing and chamfering (not turning to a shoulder).

KM: Exceptionally broad application range geometry primarily for Cast Iron. Strong cutting edge, excellent durability. Semi-finishing to roughing.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		CAST IRON			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	K15C	K25C		
SNMG 432-KM	SNMG 120408-KM	1/2	.500	3/16	1/32	.020 - .219	.004 - .016	★	★		
SNMG 433-KM	SNMG 120412-KM	1/2	.500	3/16	3/64	.031 - .219	.006 - .020	★	★		
SNMG 434-KM	SNMG 120416-KM	1/2	.500	3/16	1/16	.040 - .219	.008 - .026		★		
SNMG 543-KM	SNMG 150612-KM	5/8	.625	1/4	3/64	.031 - .297	.006 - .020	★	★		
SNMG 544-KM	SNMG 150616-KM	5/8	.625	1/4	1/16	.040 - .297	.008 - .026		★		
SNMG 643-KM	SNMG 190612-KM	3/4	.750	1/4	3/64	.031 - .359	.006 - .020	★	★		
SNMG 644-KM	SNMG 190616-KM	3/4	.750	1/4	1/16	.040 - .359	.008 - .026		★		

Ordering Example: 20 pcs SNMG 644-KM K25C

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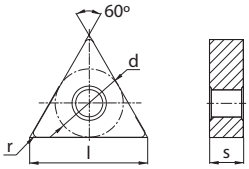
TNMG-PF



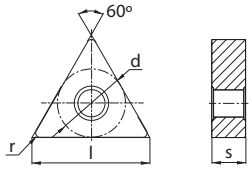
Economical insert, 6 cutting edges. General purpose turning, facing and boring. Extra long cutting edge useful when turning to shoulders

PF: First Choice Geometry for finishing and semi-finishing applications in all types of Steel.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	P05C	P15C	P25C	
TNMG 331-PF	TNMG 160404-PF	3/8	.650	3/16	1/64	.010 - .062	.003 - .010	★	★	★	
TNMG 332-PF	TNMG 160408-PF	3/8	.650	3/16	1/32	.016 - .080	.004 - .014	★	★	★	
TNMG 431-PF	TNMG 220404-PF	1/2	.866	3/16	1/64	.010 - .062	.003 - .010		★	★	
TNMG 432-PF	TNMG 220408-PF	1/2	.866	3/16	1/32	.016 - .080	.004 - .014		★	★	

Ordering Example: 20 pcs TNMG 432-PF P15C

TNMG-GP



Economical insert, 6 cutting edges. General purpose turning, facing and boring. Extra long cutting edge useful when turning to shoulders.

GP: Sharp Edge Geometry for shaft turning, boring and unstable workpieces. Can handle a wide range of depths of cut.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	P25C			
TNMG 331R-GP	TNMG 160404R-GP	3/8	.650	3/16	1/64	.024 - .187	.006 - .014	★			
TNMG 331L-GP	TNMG 160404L-GP	3/8	.650	3/16	1/64	.024 - .187	.006 - .014	★			
TNMG 332R-GP	TNMG 160408R-GP	3/8	.650	3/16	1/32	.031 - .187	.006 - .016	★			
TNMG 332L-GP	TNMG 160408L-GP	3/8	.650	3/16	1/32	.031 - .187	.006 - .016	★			

Ordering Example: 20 pcs TNMG 332L-GP P25C

NOTE: GP geometry inserts are available in both R (Right-hand) and L (left-hand) styles. Right-hand style is shown above.
Normal External Turning applications require Right-hand (R) inserts in Right-hand holders, and Left-hand (L) inserts in Left-hand holders.
For Internal / Boring applications, Left-hand (L) inserts are used in Right-hand bars, and Right-hand (R) inserts are used in Left-hand bars.

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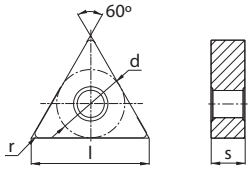
TNMG-PM



Economical insert, 6 cutting edges. General purpose turning, facing and boring. Extra long cutting edge useful when turning to shoulders.

PM: First Choice Geometry for medium to semi-roughing applications in all types of Steel.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	P05C	P15C	P25C	
TNMG 221-PM	TNMG 110304-PM	1/4	.433	1/8	1/64	.016 - .109	.004 - .012		★	★	
TNMG 222-PM	TNMG 110308-PM	1/4	.433	1/8	1/32	.020 - .109	.005 - .014		★	★	
TNMG 331-PM	TNMG 160404-PM	3/8	.650	3/16	1/64	.016 - .156	.005 - .014	★	★	★	
TNMG 332-PM	TNMG 160408-PM	3/8	.650	3/16	1/32	.020 - .156	.006 - .016	★	★	★	
TNMG 333-PM	TNMG 160412-PM	3/8	.650	3/16	3/64	.031 - .156	.007 - .018	★	★	★	
TNMG 432-PM	TNMG 220408-PM	1/2	.866	3/16	1/32	.020 - .187	.006 - .016		★	★	
TNMG 433-PM	TNMG 220412-PM	1/2	.866	3/16	3/64	.031 - .187	.007 - .018		★	★	
TNMG 434-PM	TNMG 220416-PM	1/2	.866	3/16	1/16	.040 - .187	.008 - .020			★	

Ordering Example: 20 pcs TNMG 434-PM P25C

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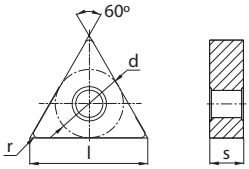
TNMG-PR



Economical insert, 6 cutting edges. General purpose turning, facing and boring. Extra long cutting edge useful when turning to shoulders.

PR: Strong cutting edge geometry for roughing applications in all types of Steel. Well suited for unstable conditions and interrupted cuts.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	P25C	P35C		
TNMG 433-PR	TNMG 220412-PR	1/2	.866	3/16	3/64	.040 - .219	.008 - .022	★	★		
TNMG 434-PR	TNMG 220416-PR	1/2	.866	3/16	1/16	.055 - .219	.009 - .026		★		
TNMG 543-PR	TNMG 270612-PR	5/8	1.083	1/4	3/64	.040 - .328	.008 - .022	★	★		
TNMG 544-PR	TNMG 270616-PR	5/8	1.083	1/4	1/16	.055 - .328	.009 - .026		★		

Ordering Example: 20 pcs TNMG 544-PR P35C

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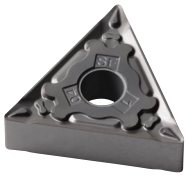
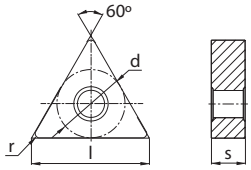
TNMG-MF





Economical insert, 6 cutting edges. General purpose turning, facing and boring. Extra long cutting edge useful when turning to shoulders.

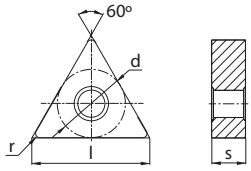
MF: Ultra-sharp cutting edge geometry for finishing in Stainless Steels. Low cutting forces and superior workpiece surface finish without burrs.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STAINLESS STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	M15P			
TNMG 331-MF	TNMG 160404-MF	3/8	.650	3/16	1/64	.004 - .060	.002 - .012	★			
TNMG 332-MF	TNMG 160408-MF	3/8	.650	3/16	1/32	.004 - .060	.002 - .012	★			

Ordering Example: 20 pcs TNMG 332-MF M15P

NOTE: The primary application area for grade M15P is in stainless steel workpiece materials. M15P is also suitable for use with iron-based, cobalt-based and nickel-based Heat Resistant Super Alloys.

TNMG-MM|MM1



Economical insert, 6 cutting edges. General purpose turning, facing and boring. Extra long cutting edge useful when turning to shoulders.

MM|MM1: Keen edge geometry especially for Stainless Steel. Unique edgeline reduces work hardening. Semi-finishing to rough machining.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STAINLESS STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	M25C	M15P	M25P	
TNMG 331-MM	TNMG 160404-MM	3/8	.650	3/16	1/64	.016 - .141	.006 - .011	★		★	
TNMG 332-MM	TNMG 160408-MM	3/8	.650	3/16	1/32	.020 - .141	.006 - .012	★		★	
TNMG 333-MM	TNMG 160412-MM	3/8	.650	3/16	3/64	.031 - .141	.007 - .013	★		★	
TNMG 432-MM	TNMG 220408-MM	1/2	.866	3/16	1/32	.020 - .172	.006 - .012	★		★	
TNMG 433-MM	TNMG 220412-MM	1/2	.866	3/16	3/64	.031 - .172	.007 - .013	★		★	
TNMG 434-MM	TNMG 220416-MM	1/2	.866	3/16	1/16	.040 - .172	.008 - .014	★		★	
TNMG 331-MM1	TNMG 160404-MM1	3/8	.650	3/16	1/64	.016 - .141	.006 - .011	★	★	★	
TNMG 332-MM1	TNMG 160408-MM1	3/8	.650	3/16	1/32	.020 - .141	.006 - .012	★	★	★	

Ordering Example: 20 pcs TNMG 434-MM M25C

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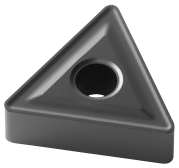
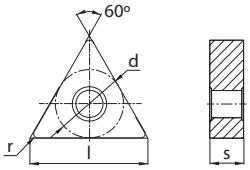
TNMG-KF





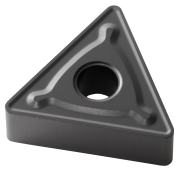
Economical insert, 6 cutting edges. General purpose turning, facing and boring. Extra long cutting edge useful when turning to shoulders.

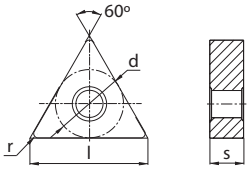
KF: Lower cutting force geometry for Cast Iron. Edge geometry reduces cutting forces in moderate conditions / lighter cuts.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		CAST IRON			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	K15C	K25C		
TNMG 331-KF	TNMG 160404-KF	3/8	.650	3/16	1/64	.012 - .187	.003 - .012	★	★		
TNMG 332-KF	TNMG 160408-KF	3/8	.650	3/16	1/32	.016 - .187	.004 - .014	★	★		

Ordering Example: 20 pcs TNMG 332-KF K15C

TNMG-KM





Economical insert, 6 cutting edges. General purpose turning, facing and boring. Extra long cutting edge useful when turning to shoulders.

KM: Exceptionally broad application range geometry primarily for Cast Iron. Strong cutting edge, excellent durability. Semi-finishing to roughing.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		CAST IRON			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	K15C	K25C		
TNMG 332-KM	TNMG 160408-KM	3/8	.650	3/16	1/32	.020 - .203	.004 - .016	★	★		
TNMG 333-KM	TNMG 160412-KM	3/8	.650	3/16	3/64	.031 - .203	.006 - .020	★	★		
TNMG 432-KM	TNMG 220408-KM	1/2	.866	3/16	1/32	.020 - .219	.004 - .016	★	★		
TNMG 433-KM	TNMG 220412-KM	1/2	.866	3/16	3/64	.031 - .219	.006 - .020	★	★		
TNMG 434-KM	TNMG 220416-KM	1/2	.866	3/16	1/16	.040 - .219	.008 - .026		★		
TNMG 543-KM	TNMG 270612-KM	5/8	1.083	1/4	3/64	.031 - .297	.006 - .020	★	★		
TNMG 544-KM	TNMG 270616-KM	5/8	1.083	1/4	1/16	.040 - .297	.008 - .026		★		

Ordering Example: 20 pcs TNMG 544-KM K25C

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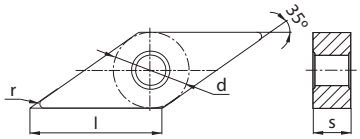
VNMG-PF



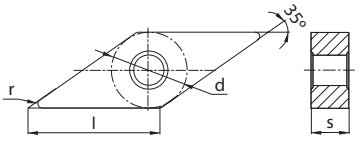
Double-sided 35° diamond. Profiling and copy turning. Not recommended for boring operations due to high negative rake of boring bar pocket.

PF: First Choice Geometry for finishing and semi-finishing applications in all types of Steel.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	P05C	P15C	P25C	
VNMG 331-PF	VNMG 160404-PF	3/8	.654	3/16	1/64	.010 - .062	.003 - .010	★	★	★	
VNMG 332-PF	VNMG 160408-PF	3/8	.654	3/16	1/32	.016 - .080	.004 - .014	★	★	★	
VNMG 431-PF	VNMG 220404-PF	1/2	.872	3/16	1/64	.010 - .062	.003 - .010		★		
VNMG 432-PF	VNMG 220408-PF	1/2	.872	3/16	1/32	.016 - .080	.004 - .014		★		

Ordering Example: 20 pcs VNMG 432-PF P15C

VNMG-PM



Double-sided 35° diamond. Profiling and copy turning. Not recommended for boring operations due to high negative rake of boring bar pocket.

PM: First Choice Geometry for medium to semi-roughing applications in all types of Steel.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	P05C	P15C	P25C	
VNMG 331-PM	VNMG 160404-PM	3/8	.654	3/16	1/64	.016 - .141	.005 - .014	★	★	★	
VNMG 332-PM	VNMG 160408-PM	3/8	.654	3/16	1/32	.020 - .141	.006 - .016	★	★	★	
VNMG 333-PM	VNMG 160412-PM	3/8	.654	3/16	3/64	.031 - .141	.007 - .018		★	★	

Ordering Example: 20 pcs VNMG 333-PM P15C

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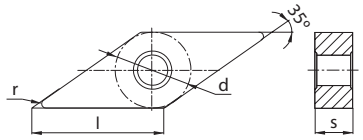
VNMG-MF



Double sided 35° diamond. Profiling and copy turning. Not recommended for boring operations due to high negative rake of boring bar pocket.

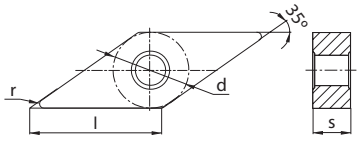
MF: Ultra-sharp cutting edge geometry for finishing in Stainless Steels. Low cutting forces and superior workpiece surface finish without burrs.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STAINLESS STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	M15P			
VNMG 331-MF	VNMG 160404-MF	3/8	.654	3/16	1/64	.004 - .060	.002 - .012	★			
VNMG 332-MF	VNMG 160408-MF	3/8	.654	3/16	1/32	.004 - .060	.002 - .012	★			

Ordering Example: 20 pcs VNMG 332-MF M15P

NOTE: The primary application area for grade M15P is in stainless steel workpiece materials. M15P is also suitable for use with iron-based, cobalt-based and nickel-based Heat Resistant Super Alloys.

VNMG-MM|MM1



Double-sided 35° diamond. Profiling and copy turning. Not recommended for boring operations due to high negative rake of boring bar pocket.

MM|MM1: Keen edge geometry especially for Stainless Steel. Unique edgeline reduces work hardening. Semi-finishing to rough machining.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STAINLESS STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	M25C	M15P	M25P	
VNMG 331-MM	VNMG 160404-MM	3/8	.654	3/16	1/64	.016 - .125	.006 - .011	★		★	
VNMG 332-MM	VNMG 160408-MM	3/8	.654	3/16	1/32	.020 - .125	.006 - .012	★		★	
VNMG 331-MM1	VNMG 160404-MM1	3/8	.654	3/16	1/64	.016 - .125	.006 - .011	★	★	★	
VNMG 332-MM1	VNMG 160408-MM1	3/8	.654	3/16	1/32	.020 - .125	.006 - .012	★	★	★	

Ordering Example: 20 pcs VNMG 332-MM M25C

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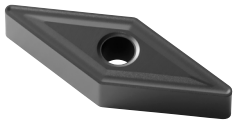
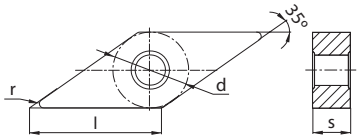
VNMG-KF





Double-sided 35° diamond. Profiling and copy turning. Not recommended for boring operations due to high negative rake of boring bar pocket.

KF: Lower cutting force geometry for Cast Iron. Edge geometry reduces cutting forces in moderate conditions / lighter cuts.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		CAST IRON			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	K15C	K25C		
VNMG 331-KF	VNMG 160404-KF	3/8	.654	3/16	1/64	.012 - .156	.003 - .012	★	★		
VNMG 332-KF	VNMG 160408-KF	3/8	.654	3/16	1/32	.016 - .156	.004 - .014	★	★		

Ordering Example: 20 pcs VNMG 332-KF K15C

REFERENCE PAGES					
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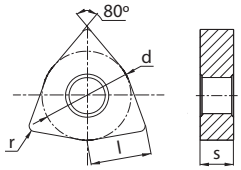
WNMG-PF



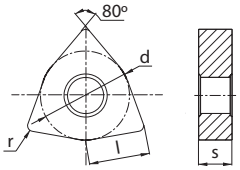
General purpose turning, facing and boring. 80° corner with 6 cutting edges. Maximum economy. Good choice for general turning.

PF: First Choice Geometry for finishing and semi-finishing applications in all types of Steel.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	P05C	P15C	P25C	
WNMG 331-PF	WNMG 060404-PF	3/8	.257	3/16	1/64	.010 - .062	.003 - .010		★	★	
WNMG 332-PF	WNMG 060408-PF	3/8	.257	3/16	1/32	.016 - .080	.004 - .014		★	★	
WNMG 431-PF	WNMG 080404-PF	1/2	.342	3/16	1/64	.010 - .062	.003 - .010	★	★	★	
WNMG 432-PF	WNMG 080408-PF	1/2	.342	3/16	1/32	.016 - .080	.004 - .014	★	★	★	

Ordering Example: 20 pcs WNMG 432-PF P15C

WNMG-PM



General purpose turning, facing and boring. 80° corner with 6 cutting edges. Maximum economy. Good choice for general turning.

PM: First Choice Geometry for medium to semi-roughing applications in all types of Steel.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	P05C	P15C	P25C	
WNMG 331-PM	WNMG 060404-PM	3/8	.257	3/16	1/64	.016 - .109	.005 - .014		★	★	
WNMG 332-PM	WNMG 060408-PM	3/8	.257	3/16	1/32	.020 - .109	.006 - .016		★	★	
WNMG 431-PM	WNMG 080404-PM	1/2	.342	3/16	1/64	.016 - .141	.005 - .014	★	★	★	
WNMG 432-PM	WNMG 080408-PM	1/2	.342	3/16	1/32	.020 - .141	.006 - .016	★	★	★	
WNMG 433-PM	WNMG 080412-PM	1/2	.342	3/16	3/64	.031 - .141	.007 - .018	★	★	★	
WNMG 434-PM	WNMG 080416-PM	1/2	.342	3/16	1/16	.040 - .141	.008 - .020			★	

Ordering Example: 20 pcs WNMG 434-PM P25C

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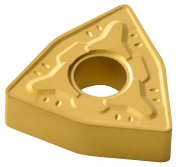
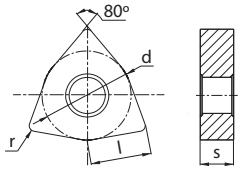
WNMG-PR





General purpose turning, facing and boring. 80° corner with 6 cutting edges. Maximum economy. Good choice for general turning.

PR: Strong cutting edge geometry for roughing applications in all types of Steel. Well suited for unstable conditions and interrupted cuts.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	P05C	P15C	P25C	P35C
WNMG 432-PR	WNMG 080408-PR	1/2	.342	3/16	1/32	.028 - .172	.007 - .020	★	★	★	★
WNMG 433-PR	WNMG 080412-PR	1/2	.342	3/16	3/64	.040 - .172	.008 - .022	★	★	★	★
WNMG 434-PR	WNMG 080416-PR	1/2	.342	3/16	1/16	.055 - .172	.009 - .026		★		★

Ordering Example: 20 pcs WNMG 434-PR P35C

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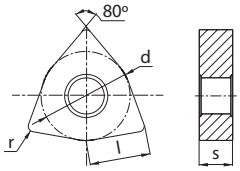
WNMG-MF



General purpose turning, facing and boring. 80° corner with 6 cutting edges. Maximum economy. Good choice for general turning.

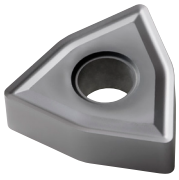
MF: Ultra-sharp cutting edge geometry for finishing in Stainless Steels. Low cutting forces and superior workpiece surface finish without burrs.

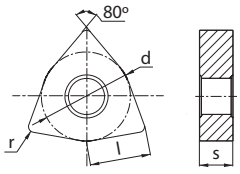
CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STAINLESS STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	M15P			
WNMG 431-MF	WNMG 080404-MF	1/2	.342	3/16	1/64	.004 - .060	.002 - .012	★			
WNMG 432-MF	WNMG 080408-MF	1/2	.342	3/16	1/32	.004 - .060	.002 - .012	★			

Ordering Example: 20 pcs WNMG 432-MF M15P

NOTE: The primary application area for grade M15P is in stainless steel workpiece materials. M15P is also suitable for use with iron-based, cobalt-based and nickel-based Heat Resistant Super Alloys.

WNMG-MM|MM1





General purpose turning, facing and boring. 80° corner with 6 cutting edges. Maximum economy. Good choice for general turning.

MM|MM1: Keen edge geometry especially for Stainless Steel. Unique edgeline reduces work hardening. Semi-finishing to rough machining.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STAINLESS STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	M25C	M15P	M25P	
WNMG 331-MM	WNMG 060404-MM	3/8	.257	3/16	1/64	.016 - .109	.006 - .011	★		★	
WNMG 332-MM	WNMG 060408-MM	3/8	.257	3/16	1/32	.020 - .109	.006 - .012	★		★	
WNMG 333-MM	WNMG 060412-MM	3/8	.257	3/16	3/64	.031 - .109	.007 - .013	★		★	
WNMG 431-MM	WNMG 080404-MM	1/2	.342	3/16	1/64	.016 - .125	.006 - .011	★		★	
WNMG 432-MM	WNMG 080408-MM	1/2	.342	3/16	1/32	.020 - .125	.006 - .012	★		★	
WNMG 433-MM	WNMG 080412-MM	1/2	.342	3/16	3/64	.031 - .125	.007 - .013	★		★	
WNMG 331-MM1	WNMG 060404-MM1	3/8	.257	3/16	1/64	.016 - .109	.006 - .011	★	★	★	
WNMG 332-MM1	WNMG 060408-MM1	3/8	.257	3/16	1/32	.020 - .109	.006 - .012	★	★	★	
WNMG 431-MM1	WNMG 080404-MM1	1/2	.342	3/16	1/64	.016 - .125	.006 - .011	★	★	★	
WNMG 432-MM1	WNMG 080408-MM1	1/2	.342	3/16	1/32	.020 - .125	.006 - .012	★	★	★	
WNMG 433-MM1	WNMG 080412-MM1	1/2	.342	3/16	3/64	.031 - .125	.007 - .013	★	★	★	

Ordering Example: 20 pcs WNMG 433-MM M25C

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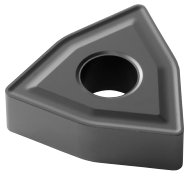
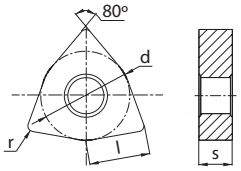
WNMG-KF





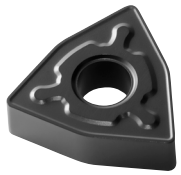
General purpose turning, facing and boring. 80° corner with 6 cutting edges. Maximum economy. Good choice for general turning.

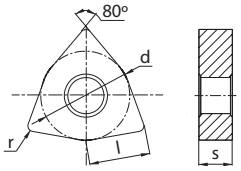
KF: Lower cutting force geometry for Cast Iron. Edge geometry reduces cutting forces in moderate conditions / lighter cuts.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		CAST IRON			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	K15C	K25C		
WNMG 431-KF	WNMG 080404-KF	1/2	.342	3/16	1/64	.012 - .156	.003 - .012	★	★		
WNMG 432-KF	WNMG 080408-KF	1/2	.342	3/16	1/32	.016 - .156	.004 - .014	★	★		

Ordering Example: 20 pcs WNMG 432-KF K15C

WNMG-KM





General purpose turning, facing and boring. 80° corner with 6 cutting edges. Maximum economy. Good choice for general turning.

KM: Exceptionally broad application range geometry primarily for Cast Iron. Strong cutting edge, excellent durability. Semi-finishing through to roughing.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		CAST IRON			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	K15C	K25C		
WNMG 432-KM	WNMG 080408-KM	1/2	.342	3/16	1/32	.020 - .172	.004 - .016	★	★		
WNMG 433-KM	WNMG 080412-KM	1/2	.342	3/16	3/64	.031 - .172	.006 - .020	★	★		

Ordering Example: 20 pcs WNMG 433-KM K15C

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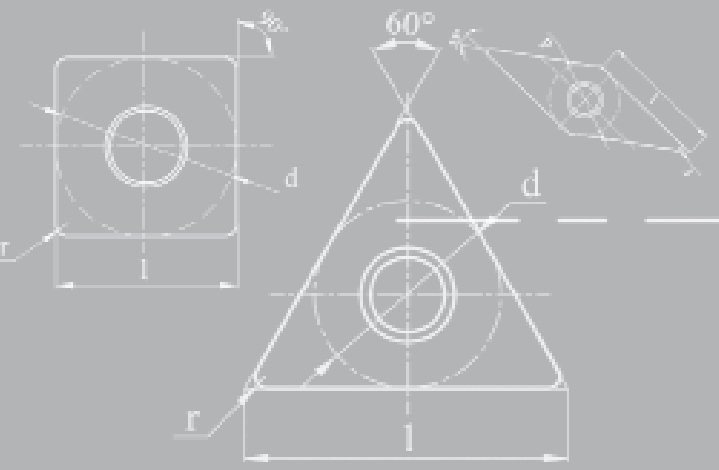
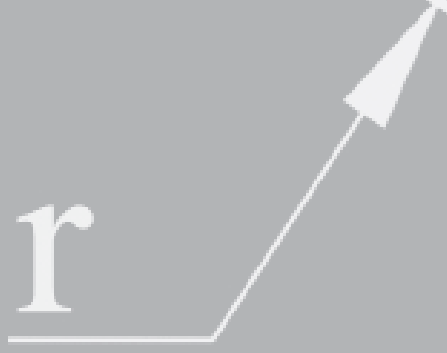
TURNING INSERTS | POSITIVE RAKE

ANSI / ISO STANDARD INSERTS
FOR EXTERNAL TURNING AND
INTERNAL MACHINING OPERATIONS
WITH LOW CUTTING FORCES

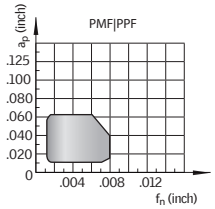
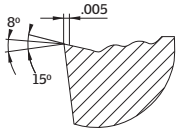
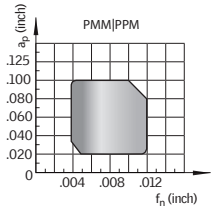
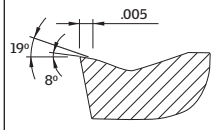
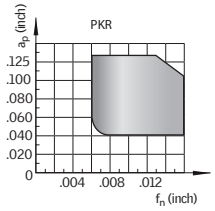
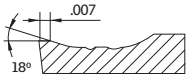


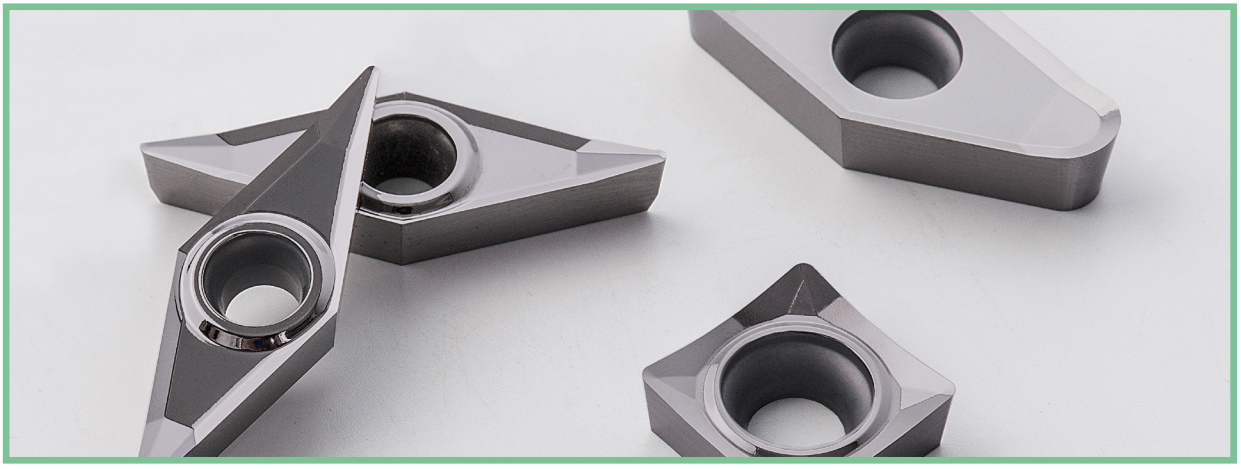


WORKPIECE MATERIAL	ANSI	ISO	Coating Type: CVD	Coating Type: PVD	Coating Type: Uncoated
P Steel	C8	01	P05C		
		10	P15C		
	C7	20	P25C	P25P	
		30			
	C6	40			
M Stainless Steel	–	01	M25C	M15P	
	–	10		M25P	
	–	20			
	–	30			
K Cast Iron	C4	01	K15C		
	C3	10			
	C2	20			
	C1	30			
N Non-Ferrous Materials	C4	01			N15U
	C3	10			
	C2	20			
	C1	30			
S Heat-Resistant Super Alloys	–	01		M15P	
	–	10			
	–	20			
	–	30			

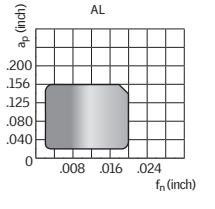
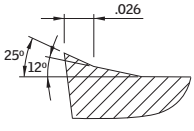
wear resistance ↕ toughness

See pages 68 and 69 for more information on grades for turning.

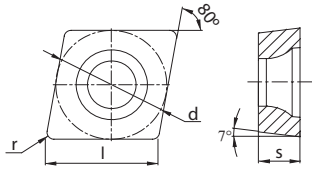
Chipbreaker	Description	Chipbreaker Range	Design
PMF|PPF P M	• High performance finishing chipbreaker • Double-positive chipformer design • Exceptionally sharp cutting edge • Low cutting forces • Superior workpiece surface finish		
PMM|PPM P M K	• Good All-Round geometry for Positive Inserts • Works in a broad range of materials • Double-positive chipformer design • Reduced top land for feedrates < .004" • 11º Style inserts primarily used for boring		
PKR P K	• Roughing chipbreaker - tough and strong • High fracture resistance • Variable land cutting edge design • Smooth cutting action and chip flow • Exceptional performance in steel and cast iron		



AL chipbreaker inserts, for aluminum and other non-ferrous materials

AL N NON-FERROUS	• Ultra-sharp edge with polished rake face • Super Positive (25º) top rake • Free cutting and smooth chip flow • Ultra-low cutting forces • Resistant to Built-up-Edge		

CCMT-PPF|PMF



80° diamond inserts for turning and facing or boring and facing. Positive rake, screw-down inserts.

PPF|PMF: Ultra-sharp cutting edge geometry for finishing and semi-finishing operations. Low cutting forces and superior workpiece surface finish.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			STAINLESS	
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	P05C	P15C	P25C	M15P	M25C
CCMT 2(1.5)0.5-PPF	CCMT 060202-PPF	1/4	.254	3/32	.008	.004 - .031	.002 - .005		★	★		
CCMT 2(1.5)1-PPF	CCMT 060204-PPF	1/4	.254	3/32	1/64	.004 - .047	.002 - .006	★	★	★		
CCMT 3(2.5)0.5-PPF	CCMT 09T302-PPF	3/8	.381	5/32	.008	.004 - .031	.002 - .005		★	★		
CCMT 3(2.5)1-PPF	CCMT 09T304-PPF	3/8	.381	5/32	1/64	.004 - .062	.002 - .006	★	★	★		
CCMT 3(2.5)2-PPF	CCMT 09T308-PPF	3/8	.381	5/32	1/32	.004 - .062	.003 - .008	★	★	★		
CCMT 2(1.5)0.5-PMF	CCMT 060202-PMF	1/4	.254	3/32	.008	.004 - .031	.002 - .005				★	★
CCMT 2(1.5)1-PMF	CCMT 060204-PMF	1/4	.254	3/32	1/64	.004 - .047	.002 - .006				★	★
CCMT 3(2.5)0.5-PMF	CCMT 09T302-PMF	3/8	.381	5/32	.008	.004 - .031	.002 - .005				★	★
CCMT 3(2.5)1-PMF	CCMT 09T304-PMF	3/8	.381	5/32	1/64	.004 - .062	.002 - .006				★	★
CCMT 3(2.5)2-PMF	CCMT 09T308-PMF	3/8	.381	5/32	1/32	.004 - .062	.003 - .008				★	★

Ordering Example: 20 pcs CCMT 3(2.5)2-PMF M25C

NOTE: The primary application area for grade M15P is in stainless steel workpiece materials. M15P is also suitable for use with iron-based, cobalt-based and nickel-based Heat Resistant Super Alloys.

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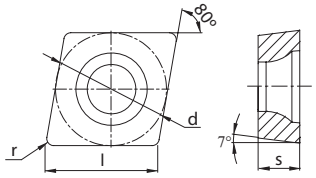
CCMT-PPM|PKM



80° diamond inserts for turning and facing or boring and facing. Positive rake, screw-down inserts.

PPM|PKM: All-round positive rake geometry. Wide application area. Excellent for boring in most materials.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL		CAST IRON	
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	P25C		K15C	
CCMT 2(1.5)1-PPM	CCMT 060204-PPM	1/4	.254	3/32	1/64	.020 - .047	.003 - .008	★			
CCMT 2(1.5)2-PPM	CCMT 060208-PPM	1/4	.254	3/32	1/32	.031 - .062	.004 - .010	★			
CCMT 3(2.5)0.5-PPM	CCMT 09T302-PPM	3/8	.381	5/32	.008	.010 - .040	.003 - .006	★			
CCMT 3(2.5)1-PPM	CCMT 09T304-PPM	3/8	.381	5/32	1/64	.020 - .062	.004 - .008	★			
CCMT 3(2.5)2-PPM	CCMT 09T308-PPM	3/8	.381	5/32	1/32	.031 - .080	.005 - .010	★			
CCMT 431-PPM	CCMT 120404-PPM	1/2	.508	3/16	1/64	.020 - .062	.004 - .008	★			
CCMT 432-PPM	CCMT 120408-PPM	1/2	.508	3/16	1/32	.031 - .080	.005 - .010	★			
CCMT 433-PPM	CCMT 120412-PPM	1/2	.508	3/16	3/64	.040 - .100	.006 - .012	★			
CCMT 3(2.5)1-PKM	CCMT 09T304-PKM	3/8	.381	5/32	1/64	.020 - .062	.004 - .008			★	
CCMT 3(2.5)2-PKM	CCMT 09T308-PKM	3/8	.381	5/32	1/32	.031 - .080	.005 - .010			★	

Ordering Example: 20 pcs CCMT 433-PPM P25C

REFERENCE PAGES					
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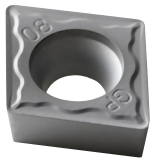
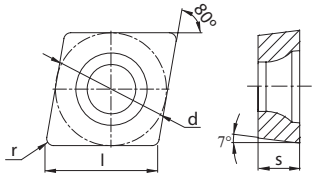
CCGT-PPM





80° diamond inserts for turning and facing or boring and facing. Precision tolerance, positive rake screw-down inserts.

PPM: All-round positive rake geometry. Wide application area. Excellent for boring in most materials.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		P	M	K
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	MULTI-MATERIAL P25P		
CCGT 2(1.5)0.5-PPM	CCGT 060202-PPM	1/4	.254	3/32	.008	.010 - .031	.003 - .006	★		
CCGT 2(1.5)1-PPM	CCGT 060204-PPM	1/4	.254	3/32	1/64	.020 - .047	.003 - .008	★		
CCGT 2(1.5)2-PPM	CCGT 060208-PPM	1/4	.254	3/32	1/32	.031 - .062	.004 - .010	★		
CCGT 3(2.5)0.5-PPM	CCGT 09T302-PPM	3/8	.381	5/32	.008	.010 - .040	.003 - .006	★		
CCGT 3(2.5)1-PPM	CCGT 09T304-PPM	3/8	.381	5/32	1/64	.020 - .062	.004 - .008	★		
CCGT 3(2.5)2-PPM	CCGT 09T308-PPM	3/8	.381	5/32	1/32	.031 - .080	.005 - .010	★		
CCGT 431-PPM	CCGT 120404-PPM	1/2	.508	3/16	1/64	.020 - .062	.004 - .008	★		
CCGT 432-PPM	CCGT 120408-PPM	1/2	.508	3/16	1/32	.031 - .080	.005 - .010	★		

Ordering Example: 20 pcs CCGT 432-PPM P25P

REFERENCE PAGES					
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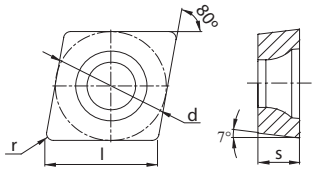
CCMT-PPR|PKR



80° diamond inserts for turning and facing or boring and facing. Positive rake, screw-down inserts.

PPR|PKR: Positive rake roughing geometry. Strong cutting edge with high fracture resistance. Excellent performance in steels and cast iron.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL		CAST IRON	
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	P25C		K15C	
CCMT 3(2.5)1-PPR	CCMT 09T304-PPR	3/8	.381	5/32	1/64	.040 - .094	.006 - .012	★			
CCMT 3(2.5)2-PPR	CCMT 09T308-PPR	3/8	.381	5/32	1/32	.040 - .109	.007 - .014	★			
CCMT 432-PPR	CCMT 120408-PPR	1/2	.508	3/16	1/32	.040 - .109	.007 - .014	★			
CCMT 433-PPR	CCMT 120412-PPR	1/2	.508	3/16	3/64	.047 - .125	.008 - .016	★			
CCMT 3(2.5)1-PKR	CCMT 09T304-PKR	3/8	.381	5/32	1/64	.040 - .094	.006 - .012			★	
CCMT 3(2.5)2-PKR	CCMT 09T308-PKR	3/8	.381	5/32	1/32	.040 - .109	.007 - .014			★	
CCMT 432-PKR	CCMT 120408-PKR	1/2	.508	3/16	1/32	.040 - .109	.007 - .014			★	

Ordering Example: 20 pcs CCMT 433-PPR P25C

REFERENCE PAGES					
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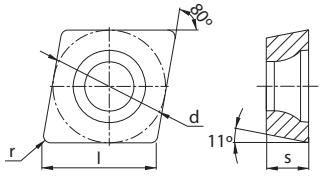
CPGT-PPM



80° diamond inserts for turning and facing or boring and facing. Precision tolerance, positive rake screw-down inserts. 11° side clearance is ideal for boring.

PPM: All-round positive rake geometry. Wide application area. Excellent for boring in most materials.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		P	M	K
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	MULTI-MATERIAL P25P		
CPGT 2(1.5)1-PPM	CPGT 060204-PPM	1/4	.254	3/32	1/64	.020 - .047	.003 - .008	★		
CPGT 2(1.5)2-PPM	CPGT 060208-PPM	1/4	.254	3/32	1/32	.031 - .062	.004 - .010	★		
CPGT 3(2.5)0.5-PPM	CPGT 09T302-PPM	3/8	.381	5/32	.008	.010 - .040	.003 - .006	★		
CPGT 3(2.5)1-PPM	CPGT 09T304-PPM	3/8	.381	5/32	1/64	.020 - .062	.004 - .008	★		
CPGT 3(2.5)2-PPM	CPGT 09T308-PPM	3/8	.381	5/32	1/32	.031 - .080	.005 - .010	★		
CPGT 431-PPM	CPGT 120404-PPM	1/2	.508	3/16	1/64	.020 - .062	.004 - .008	★		
CPGT 432-PPM	CPGT 120408-PPM	1/2	.508	3/16	1/32	.031 - .080	.005 - .010	★		

Ordering Example: 20 pcs CPGT 432-PPM P25P

REFERENCE PAGES					
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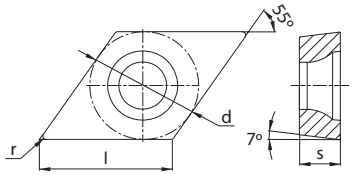
DCMT-PPF|PMF



55° diamond inserts for profile turning and finishing. Positive rake screw-down inserts. Good choice for small diameter and slender workpieces.

PPF|PMF: Ultra-sharp cutting edge geometry for finishing and semi-finishing operations. Low cutting forces and superior workpiece surface finish.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			STAINLESS	
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	P05C	P15C	P25C	M15P	M25C
DCMT 2(1.5)0.5-PPF	DCMT 070202-PPF	1/4	.305	3/32	.008	.004 - .031	.002 - .005		★	★		
DCMT 2(1.5)1-PPF	DCMT 070204-PPF	1/4	.305	3/32	1/64	.004 - .047	.002 - .006	★	★	★		
DCMT 3(2.5)0.5-PPF	DCMT 11T302-PPF	3/8	.458	5/32	.008	.004 - .031	.002 - .005		★	★		
DCMT 3(2.5)1-PPF	DCMT 11T304-PPF	3/8	.458	5/32	1/64	.004 - .062	.002 - .006	★	★	★		
DCMT 3(2.5)2-PPF	DCMT 11T308-PPF	3/8	.458	5/32	1/32	.004 - .062	.003 - .008	★	★	★		
DCMT 2(1.5)0.5-PMF	DCMT 070202-PMF	1/4	.305	3/32	.008	.004 - .031	.002 - .005				★	★
DCMT 2(1.5)1-PMF	DCMT 070204-PMF	1/4	.305	3/32	1/64	.004 - .047	.002 - .006				★	★
DCMT 2(1.5)2-PMF	DCMT 070208-PMF	1/4	.305	3/32	1/32	.004 - .062	.003 - .008				★	★
DCMT 3(2.5)0.5-PMF	DCMT 11T302-PMF	3/8	.458	5/32	.008	.004 - .031	.002 - .005				★	★
DCMT 3(2.5)1-PMF	DCMT 11T304-PMF	3/8	.458	5/32	1/64	.004 - .062	.002 - .006				★	★
DCMT 3(2.5)2-PMF	DCMT 11T308-PMF	3/8	.458	5/32	1/32	.004 - .062	.003 - .008				★	★

Ordering Example: 20 pcs DCMT 3(2.5)2-PPF M25C

NOTE: The primary application area for grade M15P is in stainless steel workpiece materials. M15P is also suitable for use with iron-based, cobalt-based and nickel-based Heat Resistant Super Alloys.

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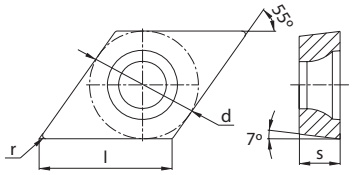
DCMT-PMM|PKM



55° diamond inserts for profile turning and finishing. Positive rake screw-down inserts. Good choice for small diameter and slender workpieces.

PMM|PKM: All-round positive rake geometry. Wide application area. Excellent for boring in most materials.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL		CAST IRON	
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	P25C		K15C	
DCMT 2(1.5)1-PMM	DCMT 070204-PMM	1/4	.305	3/32	1/64	.020 - .047	.003 - .008	★			
DCMT 2(1.5)2-PMM	DCMT 070208-PMM	1/4	.305	3/32	1/32	.031 - .062	.004 - .010	★			
DCMT 3(2.5)0.5-PMM	DCMT 11T302-PMM	3/8	.458	5/32	.008	.010 - .040	.003 - .006	★			
DCMT 3(2.5)1-PMM	DCMT 11T304-PMM	3/8	.458	5/32	1/64	.020 - .062	.004 - .008	★			
DCMT 3(2.5)2-PMM	DCMT 11T308-PMM	3/8	.458	5/32	1/32	.031 - .080	.005 - .010	★			
DCMT 431-PMM	DCMT 150404-PMM	1/2	.610	3/16	1/64	.020 - .062	.004 - .008	★			
DCMT 432-PMM	DCMT 150408-PMM	1/2	.610	3/16	1/32	.031 - .080	.005 - .010	★			
DCMT 433-PMM	DCMT 150412-PMM	1/2	.610	3/16	3/64	.040 - .100	.006 - .012	★			
DCMT 2(1.5)1-PKM	DCMT 070204-PKM	1/4	.305	3/32	1/64	.020 - .047	.003 - .008			★	
DCMT 2(1.5)2-PKM	DCMT 070208-PKM	1/4	.305	3/32	1/32	.031 - .062	.004 - .010			★	
DCMT 3(2.5)0.5-PKM	DCMT 11T302-PKM	3/8	.458	5/32	.008	.010 - .040	.003 - .006			★	
DCMT 3(2.5)1-PKM	DCMT 11T304-PKM	3/8	.458	5/32	1/64	.020 - .062	.004 - .008			★	
DCMT 3(2.5)2-PKM	DCMT 11T308-PKM	3/8	.458	5/32	1/32	.031 - .080	.005 - .010			★	
DCMT 431-PKM	DCMT 150404-PKM	1/2	.610	3/16	1/64	.020 - .062	.004 - .008			★	
DCMT 432-PKM	DCMT 150408-PKM	1/2	.610	3/16	1/32	.031 - .080	.005 - .010			★	

Ordering Example: 20 pcs DCMT 433-PMM P25C

REFERENCE PAGES					
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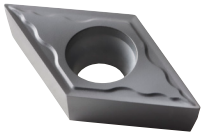
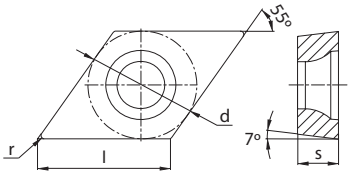
DCGT-PPM





55° diamond inserts for profile turning and finishing. Precision tolerance, positive rake screw-down inserts. Good choice for small diameter and slender workpieces.

PPM: All-round positive rake geometry. Wide application area. Excellent for boring in most materials.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		P	M	K
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	MULTI-MATERIAL P25P		
DCGT 2(1.5)0.5-PPM	DCGT 070202-PPM	1/4	.305	3/32	.008	.010 - .031	.003 - .006	★		
DCGT 2(1.5)1-PPM	DCGT 070204-PPM	1/4	.305	3/32	1/64	.020 - .047	.003 - .008	★		
DCGT 2(1.5)2-PPM	DCGT 070208-PPM	1/4	.305	3/32	1/32	.031 - .062	.004 - .010	★		
DCGT 3(2.5)0.5-PPM	DCGT 11T302-PPM	3/8	.458	5/32	.008	.010 - .040	.003 - .006	★		
DCGT 3(2.5)1-PPM	DCGT 11T304-PPM	3/8	.458	5/32	1/64	.020 - .062	.004 - .008	★		
DCGT 3(2.5)2-PPM	DCGT 11T308-PPM	3/8	.458	5/32	1/32	.031 - .080	.005 - .010	★		

Ordering Example: 20 pcs DCGT 3(2.5)2-PPM P25P

REFERENCE PAGES					
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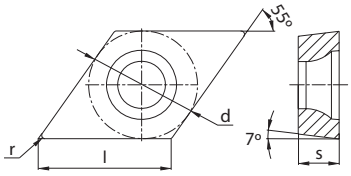
DCMT-PPR|PKR



55° diamond inserts for profile turning and finishing. Positive rake screw-down inserts. Good choice for small diameter and slender workpieces.

PPR|PKR: Positive rake roughing geometry. Strong cutting edge with high fracture resistance. Excellent performance in steels and cast iron.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL		CAST IRON	
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	P25C		K15C	
DCMT 3(2.5)1-PPR	DCMT 11T304-PPR	3/8	.458	5/32	1/64	.040 - .094	.006 - .012	★			
DCMT 3(2.5)2-PPR	DCMT 11T308-PPR	3/8	.458	5/32	1/32	.040 - .109	.007 - .014	★			
DCMT 3(2.5)1-PKR	DCMT 11T304-PKR	3/8	.458	5/32	1/64	.040 - .094	.006 - .012			★	
DCMT 3(2.5)2-PKR	DCMT 11T308-PKR	3/8	.458	5/32	1/32	.040 - .109	.007 - .014			★	

Ordering Example: 20 pcs DCMT 3(2.5)2-PPR P25C

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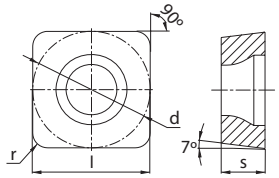
SCMT-PPF|PMF



Generally used for semi-finishing operations: turning, facing or boring. Positive rake screw-down style inserts. Good economy with 4 cutting edges.

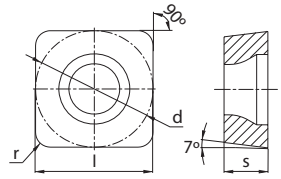
PPF|PMF: Ultra-sharp cutting edge geometry for finishing and semi-finishing operations. Low cutting forces and superior workpiece surface finish.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			STAINLESS	
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	P05C	P15C	P25C	M15P	M25C
SCMT 3(2.5)2-PPF	SCMT 09T308-PPF	3/8	.375	5/32	1/32	.004 - .062	.003 - .008	★	★	★		
SCMT 3(2.5)2-PMF	SCMT 09T308-PMF	3/8	.375	5/32	1/32	.004 - .062	.003 - .008				★	★

Ordering Example: 20 pcs SCMT 3(2.5)2-PMF M25C

NOTE: The primary application area for grade M15P is in stainless steel workpiece materials. M15P is also suitable for use with iron-based, cobalt-based and nickel-based Heat Resistant Super Alloys.

SCMT-PPM|PKM



Mainly for roughing operations: turning, facing or boring. Positive rake screw-down style inserts. Good economy with 4 cutting edges.

PPM|PKM: All-round positive rake geometry. Wide application area. Excellent for boring in most materials.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL		CAST IRON	
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	P25C		K15C	
SCMT 3(2.5)1-PPM	SCMT 09T304-PPM	3/8	.375	5/32	1/64	.020 - .062	.004 - .008	★			
SCMT 3(2.5)2-PPM	SCMT 09T308-PPM	3/8	.375	5/32	1/32	.031 - .080	.005 - .010	★			
SCMT 431-PPM	SCMT 120404-PPM	1/2	.500	3/16	1/64	.020 - .062	.004 - .008	★			
SCMT 432-PPM	SCMT 120408-PPM	1/2	.500	3/16	1/32	.031 - .080	.006 - .011	★			
SCMT 3(2.5)1-PKM	SCMT 09T304-PKM	3/8	.375	5/32	1/64	.020 - .062	.004 - .008			★	
SCMT 3(2.5)2-PKM	SCMT 09T308-PKM	3/8	.375	5/32	1/32	.031 - .080	.005 - .010			★	
SCMT 431-PKM	SCMT 120404-PKM	1/2	.500	3/16	1/64	.020 - .062	.004 - .008			★	
SCMT 432-PKM	SCMT 120408-PKM	1/2	.500	3/16	1/32	.031 - .080	.006 - .011			★	

Ordering Example: 20 pcs SCMT 432-PPM P25C

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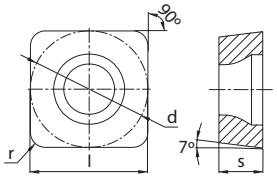
SCMT-PPR|PKR



Mainly for roughing operations: turning, facing or boring. Positive rake screw down style inserts Good economy with 4 cutting edges.

PPR|PKR: Positive rake roughing geometry. Strong cutting edge with high fracture resistance. Excellent performance in steels and cast iron.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL		CAST IRON	
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	P25C		K15C	
SCMT 3(2.5)2-PPR	SCMT 09T308-PPR	3/8	.375	5/32	1/32	.040 - .109	.007 - .014	★			
SCMT 432-PPR	SCMT 120408-PPR	1/2	.500	3/16	1/32	.040 - .109	.007 - .014	★			
SCMT 3(2.5)2-PKR	SCMT 09T308-PKR	3/8	.375	5/32	1/32	.040 - .109	.007 - .014			★	
SCMT 432-PKR	SCMT 120408-PKR	1/2	.500	3/16	1/32	.040 - .109	.007 - .014			★	

Ordering Example: 20 pcs SCMT 432-PPR P25C

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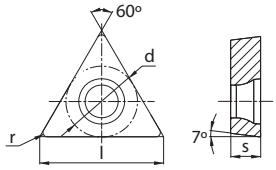
GRADE SELECTION GUIDE	34	TECHNICAL INFORMATION	59	**CUTTING SPEED RECOMMENDATIONS**	66

TCMT-PPF|PMF



Popular for small diameter boring. Good economy and stable seating of insert. Positive rake screw down inserts.

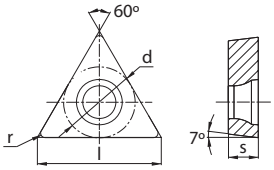
PPF|PMF: Ultra-sharp cutting edge geometry for finishing and semi-finishing operations. Low cutting forces and superior workpiece surface finish.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			STAINLESS	
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	P05C	P15C	P25C	M15P	M25C
TCMT 2(1.5)0.5-PPF	TCMT 110202-PPF	1/4	.433	3/32	.008	.004 - .031	.002 - .005		★	★	★	★
TCMT 2(1.5)1-PPF	TCMT 110204-PPF	1/4	.433	3/32	1/64	.004 - .047	.002 - .006	★	★	★	★	★
TCMT 2(1.5)0.5-PMF	TCMT 110202-PMF	1/4	.433	3/32	.008	.004 - .031	.002 - .005				★	★
TCMT 2(1.5)1-PMF	TCMT 110204-PMF	1/4	.433	3/32	1/64	.004 - .047	.002 - .006				★	★

Ordering Example: 20 pcs TCMT 2(1.5)1-PPF P25C

NOTE: The primary application area for grade M15P is in stainless steel workpiece materials. M15P is also suitable for use with iron-based, cobalt-based and nickel-based Heat Resistant Super Alloys.

TCMT-PPM|PKM



Popular for small diameter boring. Good economy and stable seating of insert. Positive rake screw-down inserts.

PPM|PKM: All-round positive rake geometry. Wide application area. Excellent for boring in most materials.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL		CAST IRON	
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	P25C		K15C	
TCMT 2(1.5)1-PPM	TCMT 110204-PPM	1/4	.433	3/32	1/64	.020 - .047	.003 - .008	★			
TCMT 2(1.5)2-PPM	TCMT 110208-PPM	1/4	.433	3/32	1/32	.031 - .062	.004 - .010	★			
TCMT 3(2.5)1-PPM	TCMT 16T304-PPM	3/8	.650	5/32	1/64	.020 - .062	.004 - .008	★			
TCMT 3(2.5)2-PPM	TCMT 16T308-PPM	3/8	.650	5/32	1/32	.031 - .080	.005 - .010	★			
TCMT 432-PPM	TCMT 220408-PPM	1/2	.866	3/16	1/32	.031 - .094	.006 - .012	★			
TCMT 2(1.5)1-PKM	TCMT 110204-PKM	1/4	.433	3/32	1/64	.020 - .047	.003 - .008			★	
TCMT 2(1.5)2-PKM	TCMT 110208-PKM	1/4	.433	3/32	1/32	.031 - .062	.004 - .010			★	
TCMT 3(2.5)1-PKM	TCMT 16T304-PKM	3/8	.650	5/32	1/64	.020 - .062	.004 - .008			★	
TCMT 3(2.5)2-PKM	TCMT 16T308-PKM	3/8	.650	5/32	1/32	.031 - .080	.005 - .010			★	
TCMT 432-PKM	TCMT 220408-PKM	1/2	.866	3/16	1/32	.031 - .094	.006 - .012			★	

Ordering Example: 20 pcs TCMT 432-PPM P25C

REFERENCE PAGES					
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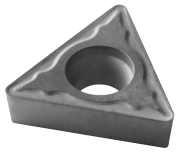
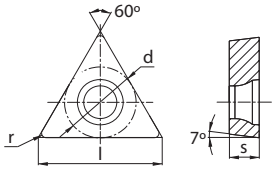
TCGT-PPM





Popular for small diameter boring. Good economy and stable seating of insert. Precision tolerance, positive rake screw-down inserts.

PPM: All-round positive rake geometry. Wide application area. Excellent for boring in most materials.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		P	M	K
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	MULTI-MATERIAL P25P		
TCGT 1.8(1.5)1-PPM	TCGT 090204-PPM	7/32	.379	3/32	1/64	.016 - .040	.002 - .005	★		
TCGT 2(1.5)0.5-PPM	TCGT 110202-PPM	1/4	.433	3/32	.008	.010 - .040	.003 - .006	★		
TCGT 2(1.5)1-PPM	TCGT 110204-PPM	1/4	.433	3/32	1/64	.020 - .047	.003 - .008	★		
TCGT 2(1.5)2-PPM	TCGT 110208-PPM	1/4	.433	3/32	1/32	.031 - .062	.004 - .010	★		
TCGT 3(2.5)1-PPM	TCGT 16T304-PPM	3/8	.650	5/32	1/64	.020 - .062	.004 - .008	★		
TCGT 3(2.5)2-PPM	TCGT 16T308-PPM	3/8	.650	5/32	1/32	.031 - .080	.005 - .010	★		

Ordering Example: 20 pcs TCGT 3(2.5)2-PPM P25P

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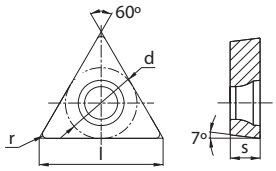
TCMT-PPR|PKR



Popular for small diameter boring. Good economy and stable seating of insert. Positive rake screw down inserts.

PPR|PKR: Positive rake roughing geometry. Strong cutting edge with high fracture resistance. Excellent performance in steels and cast iron.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL		CAST IRON	
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	P25C		K15C	
TCMT 2(1.5)1-PPR	TCMT 110204-PPR	1/4	.433	3/32	1/64	.040 - .080	.006 - .010	★			
TCMT 3(2.5)1-PPR	TCMT 16T304-PPR	3/8	.650	5/32	1/64	.040 - .094	.006 - .012	★			
TCMT 3(2.5)2-PPR	TCMT 16T308-PPR	3/8	.650	5/32	1/32	.040 - .109	.007 - .014	★			
TCMT 2(1.5)1-PKR	TCMT 110204-PKR	1/4	.433	3/32	1/64	.040 - .080	.006 - .010			★	
TCMT 3(2.5)1-PKR	TCMT 16T304-PKR	3/8	.650	5/32	1/64	.040 - .094	.006 - .012			★	
TCMT 3(2.5)2-PKR	TCMT 16T308-PKR	3/8	.650	5/32	1/32	.040 - .109	.007 - .014			★	

Ordering Example: 20 pcs TCMT 3(2.5)2-PPR P25C

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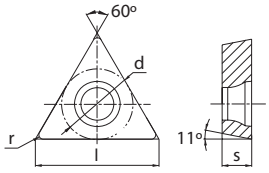
TPMT-PPF|PMF



Popular for small diameter boring. Good economy and stable seating of insert. Positive rake screw-down inserts. 11° side clearance is ideal for boring.

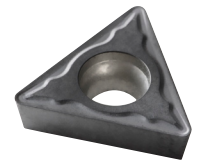
PPF|PMF: Ultra-sharp cutting edge geometry for finishing and semi-finishing operations. Low cutting forces and superior workpiece surface finish.

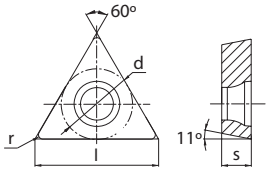
CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL		STAINLESS	
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	P15C	P25C	M15P	M25C
TPMT 2(1.5)0.5-PPF	TPMT 110202-PPF	1/4	.433	3/32	.008	.004 - .031	.002 - .005	★	★	★	★
TPMT 2(1.5)1-PPF	TPMT 110204-PPF	1/4	.433	3/32	1/64	.004 - .047	.002 - .006	★	★	★	★
TPMT 2(1.5)0.5-PMF	TPMT 110202-PMF	1/4	.433	3/32	.008	.004 - .031	.002 - .005			★	★
TPMT 2(1.5)1-PMF	TPMT 110204-PMF	1/4	.433	3/32	1/64	.004 - .047	.002 - .006			★	★

Ordering Example: 20 pcs TPMT 2(1.5)1-PMF M25C

NOTE: The primary application area for grade M15P is in stainless steel workpiece materials. M15P is also suitable for use with iron-based, cobalt-based and nickel-based Heat Resistant Super Alloys.

TPGT-PPM





Popular for small diameter boring. Good economy and stable seating of insert. Precision tolerance, positive rake screw-down inserts. 11° side clearance is ideal for boring.

PPM: All-round positive rake geometry. Wide application area. Excellent for boring in most materials.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		P	M	K
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	MULTI-MATERIAL P25P		
TPGT 2(1.5)1-PPM	TPGT 110204-PPM	1/4	.433	3/32	1/64	.020 - .047	.003 - .008	★		
TPGT 2(1.5)2-PPM	TPGT 110208-PPM	1/4	.433	3/32	1/32	.031 - .062	.004 - .010	★		
TPGT 3(2.5)1-PPM	TPGT 16T304-PPM	3/8	.650	5/32	1/64	.020 - .062	.004 - .008	★		
TPGT 3(2.5)2-PPM	TPGT 16T308-PPM	3/8	.650	5/32	1/32	.031 - .080	.005 - .010	★		

Ordering Example: 20 pcs TPGT 3(2.5)2-PPM P25P

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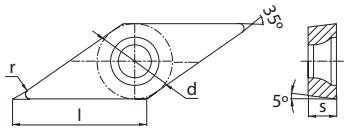
VBMT-PPF|PMF



First choice shape for 35° diamond profile turning and boring. Positive rake screw-down inserts with 5° side clearance.

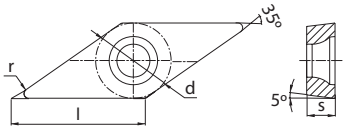
PPF|PMF: Ultra-sharp cutting edge geometry for finishing and semi-finishing operations. Low cutting forces and superior workpiece surface finish.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			STAINLESS	
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	P05C	P15C	P25C	M15P	M25C
VBMT 221-PPF	VBMT 110304-PPF	1/4	.436	1/8	1/64	.004 - .047	.002 - .006		★	★		
VBMT 331-PPF	VBMT 160404-PPF	3/8	.654	3/16	1/64	.004 - .062	.002 - .006	★	★	★		
VBMT 332-PPF	VBMT 160408-PPF	3/8	.654	3/16	1/32	.004 - .062	.003 - .008	★	★	★		
VBMT 221-PMF	VBMT 110304-PMF	1/4	.436	1/8	1/64	.004 - .047	.002 - .006				★	★
VBMT 331-PMF	VBMT 160404-PMF	3/8	.654	3/16	1/64	.004 - .062	.002 - .006				★	★
VBMT 332-PMF	VBMT 160408-PMF	3/8	.654	3/16	1/32	.004 - .062	.003 - .008				★	★

Ordering Example: 20 pcs VBMT 332-PMF M25C

NOTE: The primary application area for grade M15P is in stainless steel workpiece materials. M15P is also suitable for use with iron-based, cobalt-based and nickel-based Heat Resistant Super Alloys.

VBMT-PPM|PKM



First choice for 35° diamond external profile turning. 5° clearance angle provides more secure insert clamping than VCMT style.

PPM|PKM: All-round positive rake geometry with wide application area.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL		CAST IRON	
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	P25C		K15C	
VBMT 331-PPM	VBMT 160404-PPM	3/8	.654	3/16	1/64	.020 - .062	.004 - .008	★			
VBMT 332-PPM	VBMT 160408-PPM	3/8	.654	3/16	1/32	.031 - .080	.005 - .010	★			
VBMT 331-PKM	VBMT 160404-PKM	3/8	.654	3/16	1/64	.020 - .062	.004 - .008			★	
VBMT 332-PKM	VBMT 160408-PKM	3/8	.654	3/16	1/32	.031 - .080	.005 - .010			★	

Ordering Example: 20 pcs VBMT 332-PPM P25C

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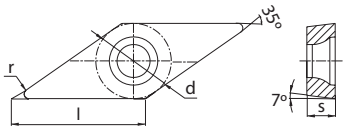
VCMT-PPM|PKM



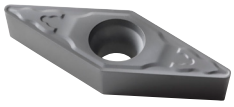
First choice shape for 35° diamond profile turning and boring. Positive cutting action provides for a more secure cutting edge than VNMG style.

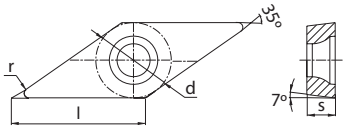
PPM|PKM: All-round positive rake geometry. Wide application area. Excellent for boring in most materials.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL		CAST IRON	
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	P25C		K15C	
VCMT 221-PPM	VCMT 110304-PPM	1/4	.436	1/8	1/64	.020 - .047	.003 - .008	★			
VCMT 331-PPM	VCMT 160404-PPM	3/8	.654	3/16	1/64	.020 - .062	.004 - .008	★			
VCMT 332-PPM	VCMT 160408-PPM	3/8	.654	3/16	1/32	.031 - .080	.005 - .010	★			
VCMT 221-PKM	VCMT 110304-PKM	1/4	.436	1/8	1/64	.020 - .047	.003 - .008			★	
VCMT 331-PKM	VCMT 160404-PKM	3/8	.654	3/16	1/64	.020 - .062	.004 - .008			★	
VCMT 332-PKM	VCMT 160408-PKM	3/8	.654	3/16	1/32	.031 - .080	.005 - .010			★	

Ordering Example: 20 pcs VCMT 332-PPM P25C

VCGT-PPM





First choice shape for 35° diamond profile turning and boring. Precision tolerance. Positive cutting action provides for a more secure cutting edge than VNMG style.

PPM: All-round positive rake geometry. Wide application area. Excellent for boring in most materials.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		P	M	K
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	MULTI-MATERIAL P25P		
VCGT 221-PPM	VCGT 110304-PPM	1/4	.436	1/8	1/64	.020 - .047	.003 - .008	★		
VCGT 331-PPM	VCGT 160404-PPM	3/8	.654	3/16	1/64	.020 - .062	.004 - .008	★		
VCGT 332-PPM	VCGT 160408-PPM	3/8	.654	3/16	1/32	.031 - .080	.005 - .010	★		

Ordering Example: 20 pcs VCGT 332-PPM P25P

NOTE: VCMT and VCGT inserts fit into and can be used with toolholders and boring bars made for VBMT-style inserts.

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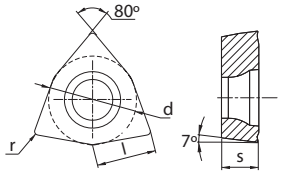
WCMT-PPM|PKM



80° corner Trigon inserts for turning, facing and boring. Positive rake screw-down inserts. Extra economy due to 3 cutting edges.

PPM|PKM: All-round positive rake geometry. Wide application area. Excellent for boring in most materials.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL		CAST IRON	
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	P25C		K15C	
WCMT 3(2.5)1-PPM	WCMT 06T304-PPM	3/8	.257	5/32	1/64	.020 - .062	.003 - .008	★			
WCMT 3(2.5)2-PPM	WCMT 06T308-PPM	3/8	.257	5/32	1/32	.031 - .080	.005 - .010	★			
WCMT 3(2.5)1-PKM	WCMT 06T304-PKM	3/8	.257	5/32	1/64	.020 - .062	.003 - .008			★	
WCMT 3(2.5)2-PKM	WCMT 06T308-PKM	3/8	.257	5/32	1/32	.031 - .080	.005 - .010			★	

Ordering Example: 20 pcs WCMT 3(2.5)2-PPM P25C

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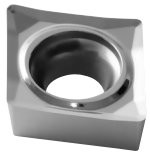
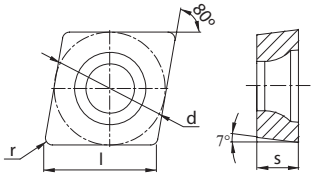
CCGT-AL





Precision Ground, High Positive, polished 80° diamond inserts for turning, boring and facing of Aluminum, non-ferrous materials and non-metallics.

AL: Extremely high 25° positive rake geometry. Super sharp edgeline with polished face for smooth chip flow.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		NON-FERROUS			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	N15U			
CCGT 2(1.5)0.5-AL	CCGT 060202-AL	1/4	.254	3/32	.008	.010 - .047	.002 - .008	★			
CCGT 2(1.5)1-AL	CCGT 060204-AL	1/4	.254	3/32	1/64	.016 - .062	.004 - .010	★			
CCGT 2(1.5)2-AL	CCGT 060208-AL	1/4	.254	3/32	1/32	.020 - .062	.006 - .020	★			
CCGT 3(2.5)0.5-AL	CCGT 09T302-AL	3/8	.381	5/32	.008	.010 - .094	.002 - .008	★			
CCGT 3(2.5)1-AL	CCGT 09T304-AL	3/8	.381	5/32	1/64	.016 - .125	.004 - .010	★			
CCGT 3(2.5)2-AL	CCGT 09T308-AL	3/8	.381	5/32	1/32	.020 - .125	.006 - .020	★			
CCGT 430.5-AL	CCGT 120402-AL	1/2	.508	3/16	.008	.010 - .125	.002 - .008	★			
CCGT 431-AL	CCGT 120404-AL	1/2	.508	3/16	1/64	.016 - .187	.004 - .010	★			
CCGT 432-AL	CCGT 120408-AL	1/2	.508	3/16	1/32	.020 - .187	.006 - .020	★			

Ordering Example: 20 pcs CCGT 432-AL N15U

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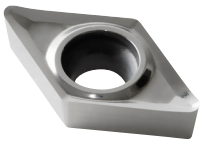
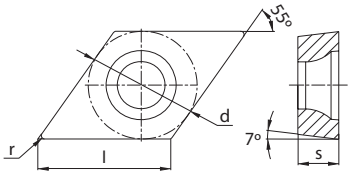
DCGT-AL





Precision Ground, High Positive, polished 55° diamond inserts for profiling of Aluminum, non-ferrous materials and non-metallics.

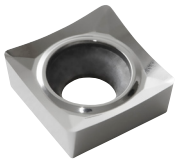
AL: Extremely high 25° positive rake geometry. Super sharp edgeline with polished face for smooth chip flow.

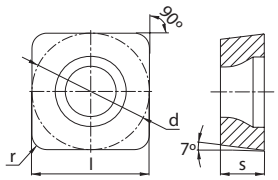
CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		NON-FERROUS			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	N15U			
DCGT 2(1.5)0.5-AL	DCGT 070202-AL	1/4	.305	3/32	.008	.010 - .062	.002 - .008	★			
DCGT 2(1.5)1-AL	DCGT 070204-AL	1/4	.305	3/32	1/64	.016 - .094	.004 - .010	★			
DCGT 2(1.5)2-AL	DCGT 070208-AL	1/4	.305	3/32	1/32	.020 - .094	.006 - .020	★			
DCGT 3(2.5)0.5-AL	DCGT 11T302-AL	3/8	.458	5/32	.008	.010 - .094	.002 - .008	★			
DCGT 3(2.5)1-AL	DCGT 11T304-AL	3/8	.458	5/32	1/64	.016 - .125	.004 - .010	★			
DCGT 3(2.5)2-AL	DCGT 11T308-AL	3/8	.458	5/32	1/32	.020 - .125	.006 - .020	★			

Ordering Example: 20 pcs DCGT 3(2.5)2-AL N15U

REFERENCE PAGES					
GRADE SELECTION GUIDE	34	TECHNICAL INFORMATION	59	**CUTTING SPEED RECOMMENDATIONS**	66

SCGT-AL





Precision Ground, High Positive, polished square inserts for turning, facing and boring of Aluminum, non-ferrous materials and non-metallics.

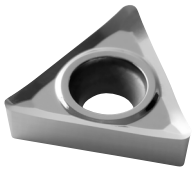
AL: Extremely high 25° positive rake geometry. Super sharp edgeline with polished face for smooth chip flow.

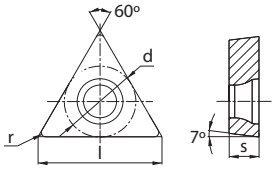
CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		NON-FERROUS			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	N15U			
SCGT 3(2.5)1-AL	SCGT 09T304-AL	3/8	.375	5/32	1/64	.016 - .125	.004 - .010	★			
SCGT 3(2.5)2-AL	SCGT 09T308-AL	3/8	.375	5/32	1/32	.020 - .125	.006 - .020	★			
SCGT 431-AL	SCGT 120404-AL	1/2	.500	3/16	1/64	.016 - .156	.004 - .010	★			
SCGT 432-AL	SCGT 120408-AL	1/2	.500	3/16	1/32	.020 - .156	.006 - .020	★			

Ordering Example: 20 pcs SCGT 432-AL N15U

REFERENCE PAGES					
GRADE SELECTION GUIDE	34	TECHNICAL INFORMATION	59	**CUTTING SPEED RECOMMENDATIONS**	66

TCGT-AL





Precision Ground, High Positive, polished triangular inserts for turning and boring of Aluminum, non-ferrous materials and non-metallics.

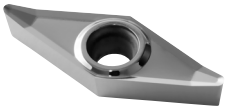
AL: Extremely high 25° positive rake geometry. Super sharp edgeline with polished face for smooth chip flow.

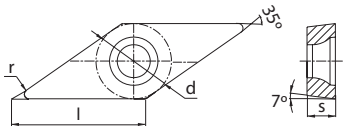
CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		NON-FERROUS			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	N15U			
TCGT 1.8(1.5)1-AL	TCGT 090204-AL	7/32	.379	3/32	1/64	.016 - .094	.004 - .008	★			
TCGT 2(1.5)0.5-AL	TCGT 110202-AL	1/4	.433	3/32	.008	.010 - .094	.002 - .008	★			
TCGT 2(1.5)1-AL	TCGT 110204-AL	1/4	.433	3/32	1/64	.016 - .125	.004 - .010	★			
TCGT 2(1.5)2-AL	TCGT 110208-AL	1/4	.433	3/32	1/32	.020 - .125	.006 - .020	★			
TCGT 3(2.5)0.5-AL	TCGT 16T302-AL	3/8	.650	5/32	.008	.010 - .125	.002 - .008	★			
TCGT 3(2.5)1-AL	TCGT 16T304-AL	3/8	.650	5/32	1/64	.016 - .156	.004 - .010	★			
TCGT 3(2.5)2-AL	TCGT 16T308-AL	3/8	.650	5/32	1/32	.020 - .156	.006 - .020	★			

Ordering Example: 20 pcs TCGT 3(2.5)2-AL N15U

REFERENCE PAGES					
GRADE SELECTION GUIDE	34	TECHNICAL INFORMATION	59	**CUTTING SPEED RECOMMENDATIONS**	66

VCGT-AL





Precision Ground, High Positive, polished 35° diamond inserts for intricate profiling of Aluminum, non-ferrous materials and non-metallics.

AL: Extremely high 25° positive rake geometry. Super sharp edgeline with polished face for smooth chip flow.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		NON-FERROUS			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	N15U			
VCGT 220.5-AL	VCGT 110302-AL	1/4	.436	1/8	.008	.010 - .062	.002 - .008	★			
VCGT 221-AL	VCGT 110304-AL	1/4	.436	1/8	1/64	.016 - .087	.004 - .010	★			
VCGT 222-AL	VCGT 110308-AL	1/4	.436	1/8	1/32	.020 - .087	.006 - .020	★			
VCGT 330.5-AL	VCGT 160402-AL	3/8	.654	3/16	.008	.010 - .125	.002 - .008	★			
VCGT 331-AL	VCGT 160404-AL	3/8	.654	3/16	1/64	.016 - .156	.004 - .010	★			
VCGT 332-AL	VCGT 160408-AL	3/8	.654	3/16	1/32	.020 - .156	.006 - .020	★			
VCGT 333-AL	VCGT 160412-AL	3/8	.654	3/16	3/64	.020 - .156	.006 - .031	★			
VCGT 220512-AL	VCGT 220512-AL	1/2	.872	7/32	3/64	.020 - .187	.006 - .031	★			
VCGT 220516-AL	VCGT 220516-AL	1/2	.872	7/32	1/16	.020 - .187	.006 - .031	★			
VCGT 220530-AL	VCGT 220530-AL	1/2	.872	7/32	.118	.020 - .187	.010 - .040	★			

Ordering Example: 20 pcs VCGT 220530-AL N15U

REFERENCE PAGES					
GRADE SELECTION GUIDE	34	TECHNICAL INFORMATION	59	**CUTTING SPEED RECOMMENDATIONS**	66

TECHNICAL INFORMATION TURNING

EXAMPLE 1

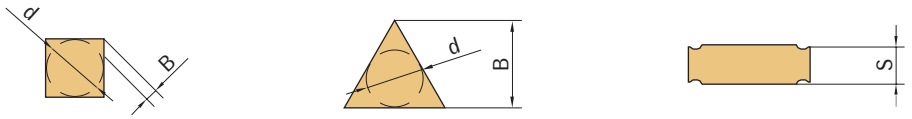
C	N	M	G	4	3	2		–	PM
1	2	3	4	5	6	7	8		9

1	
Insert Shape	
C	80⁰ Diamond
D	55⁰ Diamond
S	Square
T	Triangle
V	35⁰ Diamond
W	80⁰ Corner Trigon

2	
Clearance Angle	
B	5⁰ Positive Rake
C	7⁰ Positive Rake
N	0⁰ Negative Rake
P	11⁰ Positive Rake

3

Tolerances, inch



Tolerance Class	tolerance on 'd'	tolerance on 'B'	tolerance on 's'
G	± .001	± .001	± .005
M	see table below	see table below	± .005

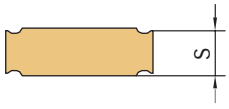
Tolerance Class M, inch				
d	tolerance on 'd'	tolerance on 'B'		
	All Shapes	C, S, T, W Shapes	D Shape	V Shape
7/32	± .002	± .003	± .004	N/A
1/4	± .002	± .003	± .004	± .007
3/8	± .002	± .003	± .004	± .007
1/2	± .003	± .005	± .006	± .010
5/8	± .004	± .006	± .007	N/A
3/4	± .004	± .006	± .007	N/A

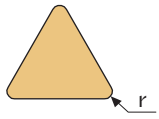
EXAMPLE 2

V	C	G	T	3	3	1		–	PPM
1	2	3	4	5	6	7	8		9

4		
Insert Type		
G	With hole, Pin / Top Clamp Double-sided	
T	With hole, Screw-down Clamping Single-sided	
X	Manufacturer-Specific Design	——

5	
Insert Size	
Inscribed Circle, d, inch	
	
Symbol indicates number of 1/8ths of an inch	
Symbol	d
1.8	7/32
2	1/4
3	3/8
4	1/2
5	5/8
6	3/4

6	
Thickness, inch	
	
Symbol indicates number of 1/16ths of an inch	
Symbol	s
1.5	3/32
2	1/8
2.5	5/32
3	3/16
4	1/4

7	
Nose Radius, inch	
	
Symbol indicates number of 1/64ths of an inch	
Symbol	r
0.5	.008
1	1/64
2	1/32
3	3/64
4	1/16

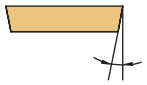
8	
Hand of Insert (optional)	
R	Right-hand
L	Left-hand

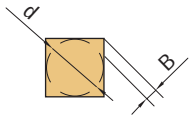
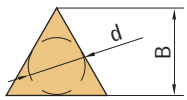
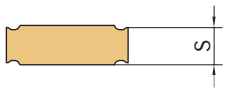
9
Chipbreaker Designation
Indicates the machining properties or chipbreaker features Manufacturer-specific

EXAMPLE 1

C	N	M	G	12	04	08		–	PM
1	2	3	4	5	6	7	8		9

1		
Insert Shape		
C	80⁰ Diamond	
D	55⁰ Diamond	
S	Square	
T	Triangle	
V	35⁰ Diamond	
W	80⁰ Corner Trigon	

2	
Clearance Angle	
	
B	5⁰ Positive Rake
C	7⁰ Positive Rake
N	0⁰ Negative Rake
P	11⁰ Positive Rake

3			
Tolerances, mm			
			
Tolerance Class	tolerance on 'd'	tolerance on 'B'	tolerance on 's'
G	± 0.025	± 0.025	± 0.13
M	see table below	see table below	± 0.13

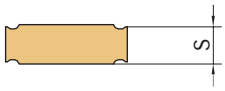
Tolerance Class M, mm				
d	tolerance on 'd'	tolerance on 'B'		
	All Shapes	C, S, T, W Shapes	D Shape	V Shape
5.556	± 0.05	± 0.08	± 0.10	N/A
6.350	± 0.05	± 0.08	± 0.10	± 0.18
9.525	± 0.05	± 0.08	± 0.10	± 0.18
12.700	± 0.08	± 0.13	± 0.15	± 0.25
15.875	± 0.10	± 0.15	± 0.18	N/A
19.050	± 0.10	± 0.15	± 0.18	N/A

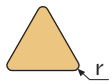
EXAMPLE 2

V	C	G	T	16	04	04		–	PPM
1	2	3	4	5	6	7	8		9

4		
Insert Type		
G	With hole, Pin / Top Clamp Double-sided	
T	With hole, Screw-down Clamping Single-sided	
X	Manufacturer-Specific Design	——

5						
Insert Size						
Cutting Edge Length, mm						
Symbol	C	D	S	T	V	W
06	6.5					6.5
07		7.8				
08						8.7
09	9.7		9.5	9.6		
11		11.6		11.0	11.1	
12	12.9		12.7			
15		15.5	15.9			
16	16.1			16.5	16.6	
19	19.4		19.1			
22				22.0	22.2	
27				27.5		

6	
Thickness, mm	
	
Symbol	s
02	2.38
03	3.18
T3	3.97
04	4.76
05	5.56
06	6.35

7	
Nose Radius, mm	
	
Symbol	r
02	0.2
04	0.4
08	0.8
12	1.2
16	1.6
30	3.0

8	
Hand of Insert (optional)	
R	Right-hand
L	Left-hand

9
Chipbreaker Designation
Indicates the machining properties or chipbreaker features Manufacturer-specific

Spindle speed, n (rpm)

$$n = \frac{3.82 \times v_c}{D}$$

Cutting speed, v_c (ft / min)

$$v_c = .262 \times D \times n$$

Feed rate, v_f (in / min)

$$v_f = n \times f_n$$

Machining time, t (min)

$$t = \frac{l_m}{v_f}$$

Metal removal rate, Q (in^3 / min)

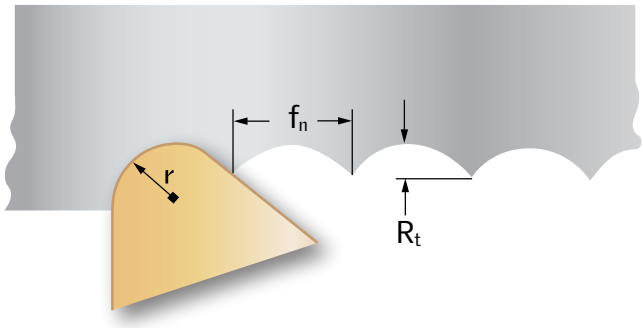
$$Q = v_c \times a_p \times f_n \times 12$$

a_p	depth of cut	inches
D	workpiece diameter	inches
f_n	feed per revolution	inches
l_m	machined length	inches
n	spindle speed	rev/min
Q	metal removal rate	$inches^3$/min
t	machining time	minutes
v_c	cutting speed	feet/min
v_f	feed rate	inches/min

The machined surface and tolerances achieved on components are directly affected by both the insert nose radius and the feed rate.

From a strictly theoretical perspective, surface roughness can be calculated from the following formula:

$$R_t = \frac{f_n^2 \times 10^6}{8 \times r}$$



Where R_t = Theoretical Profile Depth, minches
f_n = feed / rev, inches
r = insert nose radius, inches

The following table presents feed values for common insert nose radius sizes and surface roughness requirements:

R_t, minch	feed f_n, inches / rev				
	r = 1/64"	r = 1/32"	r = 3/64"	r = 1/16"	r = 3/32"
16	.0015	.002	.0025	.003	.0035
32	.002	.003	.0035	.004	.005
63	.003	.004	.005	.0055	.007
125	.004	.0055	.007	.008	.010
250	.0055	.008	.010	.011	.014
500	.008	.011	.014	.016	.019

The maximum feed per rev can be determined from the table by selecting the nose radius and specified surface roughness requirement.

For example, Surface roughness requirement R_t = 63 minches

Insert nose radius r = 1/32"

Theoretical starting point for feed f_n => .004 inches / rev

When selecting the feed for finishing to a specified level of surface roughness, the feed values provided in the table should not be exceeded. In general the feed in a finishing operation should be kept low in order to produce an acceptable component finish.

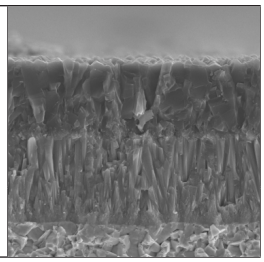
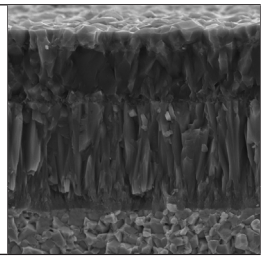
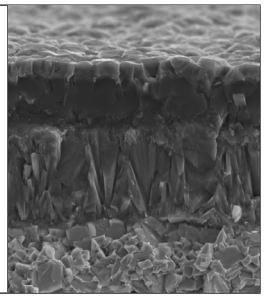
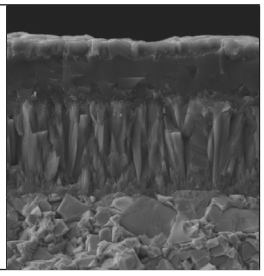
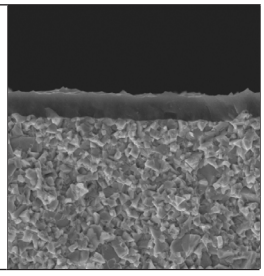
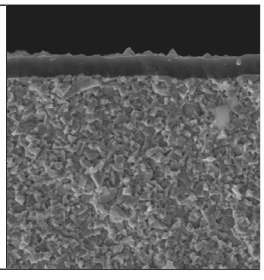
ISO	Material Group	Workpiece Material	Tensile Strength MPa	Recommended Starting Speeds v_c (ft/min)														
				P05C			P15C			P25C			P35C			P25P		
				f_n (inch/rev)			f_n (inch/rev)			f_n (inch/rev)			f_n (inch/rev)			f_n (inch/rev)		
				.004	.008	.012	.004	.008	.012	.004	.008	.016	.004	.016	.024	.004	.008	.012
P Steel	P0	Low-Carbon Steels, Long Chipping (C < .25%) Ex. A36, 1008, 1010, 1018, 1108, 1117 Brinell Hardness HB <125	<530	1760	1550	1370	1640	1445	1280	1400	1245	855	1215	790	655	655	525	400
	P1	Low-Carbon Steels, Short Chipping, Free Machining (C < .25%) Ex. 10L18, 1200 Series, 1213, 12L14 Brinell Hardness HB <125	<530	1500	1330	1120	1400	1245	1050	1180	1015	655	1015	590	525	600	475	360
	P2	Medium- and High-Carbon Steels (C > .25%) Ex. 1035, 1045, 10L45, 1080, 1137, 1144, 1525, 1572 Rockwell Hardness HRC <25	>530	1120	1050	950	1050	985	885	920	820	590	855	540	460	525	445	345
	P3	Alloy Steels and Tool Steels (C > .25%) Ex. P20, 1300, 2000, 3000, 4000, 5000, 8000, SAE A, D, H, O, S, M, T Rockwell Hardness HRC <35	600-850	1020	850	700	950	790	655	790	720	490	625	445	330	400	300	245
	P4	High-Strength Alloy Steels and Tool Steels (C > .25%) Ex. P20, 1300, 2000, 3000, 4000, 5000, 8000, SAE A, D, H, O, S, M, T Rockwell Hardness HRC 35 - 48	850-1400	850	700	560	790	655	525	590	525	330	460	300	230	310	245	180
	P5	Ferritic, Martensitic and PH Stainless Steels Ex. 13-8 PH, 15-5 PH, 17-4 PH, 400 and 500 Series Rockwell Hardness HRC <35	600-900	1050	880	700	985	820	655	855	720	560	625	460	330	420	320	260
	P6	High-Strength Ferritic, Martensitic and PH Stainless Steels Ex. 13-8 PH, 15-5 PH, 17-4 PH, 400 and 500 Series Rockwell Hardness HRC 35 - 48	900-1350	630	530	350	590	490	330	425	360	300	360	260	230	230	190	135

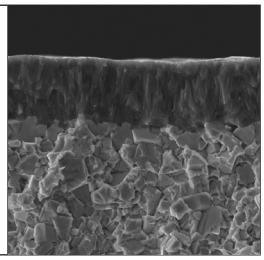
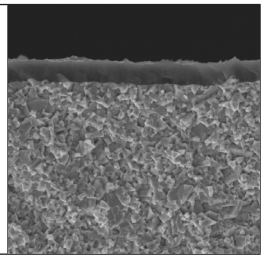
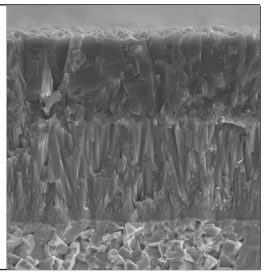
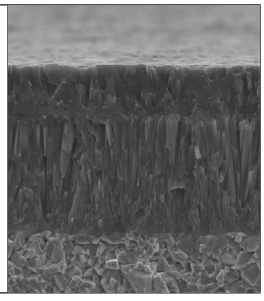
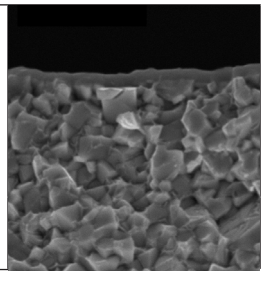
ISO	Material Group	Workpiece Material	Brinell Hardness HB	Rockwell Hardness HRC	Tensile Strength MPa	Recommended Starting Speeds v_c (ft/min)											
						M15P			M25C			M25P			P25P		
						f_n (inch/rev)			f_n (inch/rev)			f_n (inch/rev)			f_n (inch/rev)		
						.004	.008	.012	.004	.008	.012	.004	.008	.012	.004	.008	.012
M Stainless Steel	M1	Austenitic Stainless Steels Ex. 200 Series, 301, 302, 304, 304L, 309	130-200		<600	820	670	490	850	750	650	620	470	290	520	380	240
	M2	High-Strength Austenitic Stainless and Cast Stainless Steels Ex. 310, 316, 316L, 321, 347, 384	150-230	<25	600-800	740	600	440	760	670	580	560	420	260	470	340	220
	M3	Duplex Stainless Steels Ex. 323, 329, F55, 2205	135-275	<30	<800	655	535	390	670	600	520	495	375	230	420	310	200

ISO	Material Group	Workpiece Material	Brinell Hardness HB	Rockwell Hardness HRC	Tensile Strength MPa	Recommended Starting Speeds v_c (ft/min)											
						K15C			K25C			P25P					
						f_n (inch/rev)			f_n (inch/rev)			f_n (inch/rev)					
						.004	.008	.016	.004	.012	.020	.004	.008	.012			
K Cast Iron	K1	Gray Cast Iron Ex. Class 20, 25, 30, 35, 40, 45, 50, 55, 60, G1800, G3000, G3500, G4000	120-290	<32	125-500	1800	1180	885	1540	885	655	625	425	360			
	K2	Ductile Cast Irons (Nodular Irons) and Compacted Graphite Irons (CGI) Ex. 60-40-18, 65-45-12, 80-55-06, SAE J434: D4018, D4512, D5506	130-260	<28	<600	1215	885	690	885	655	490	525	380	330			
	K3	High-Strength Ductile Irons and Austempered Ductile Irons (ADI) Ex. ASTM A536: 100-70-03, 120-90-02, SAE J434: D7003	180-350	<43	>600	885	690	560	655	490	400	425	360	300			

ISO	Material Group	Workpiece Material	Brinell Hardness HB	Rockwell Hardness HRC	Tensile Strength MPa	Recommended Starting Speeds v_c (ft/min)											
						N15U											
						f_n (inch/rev)											
						.004	.008	.016									
N Non-Ferrous	N1	Wrought Aluminum Ex. 1000, 2017, 2025, 5050, 7050	60-90		<520	6900	5400	3600									
	N2	Low-Silicon Aluminum Alloys (Si < 12.2%) Ex. 2024, 6061, 7075	70-100		<350	1640	985	655									
	N3	High-Silicon Aluminum Alloys (Si > 12.2%)	60-120		200-320	985	655	400									
	N4	Copper and Copper Alloys Ex. C81500	60-200		200-650	1280	1050	885									

ISO	Material Group	Workpiece Material	Brinell Hardness HB	Rockwell Hardness HRC	Tensile Strength MPa	Recommended Starting Speeds v_c (ft/min)											
						M15P											
						f_n (inch/rev)											
						.004	.008	.012									
S High Temp Alloys	S1	Iron-Based Heat-Resistant Alloys Ex. A286, A608, INCOLOY 800 Series, N-155, Haynes 556, Discaloy	160-260	25-48	500-1200	330	280	230									
	S2	Cobalt-Based Heat-Resistant Alloys Ex. Haynes 25 (L605), Haynes 188, Stellite, MAR-M302, MAR-M509	250-450	25-48	1000-1450	260	215	165									
	S3	Nickel-Based Heat-Resistant Alloys Ex. Astroloy, Hastelloy X, INCONEL 600 and 700 Series, Waspalloy	160-450	<48	600-1700	200	150	115									
	S4	Titanium and Titanium Alloys Ex. Commercially Pure Ti, Ti-5Al-2.5Sn, Ti-6Al-4V, Ti-3Al-8V-6Cr-4Zr-4Mo	300-400	33-48	900-1600	-	-	-									

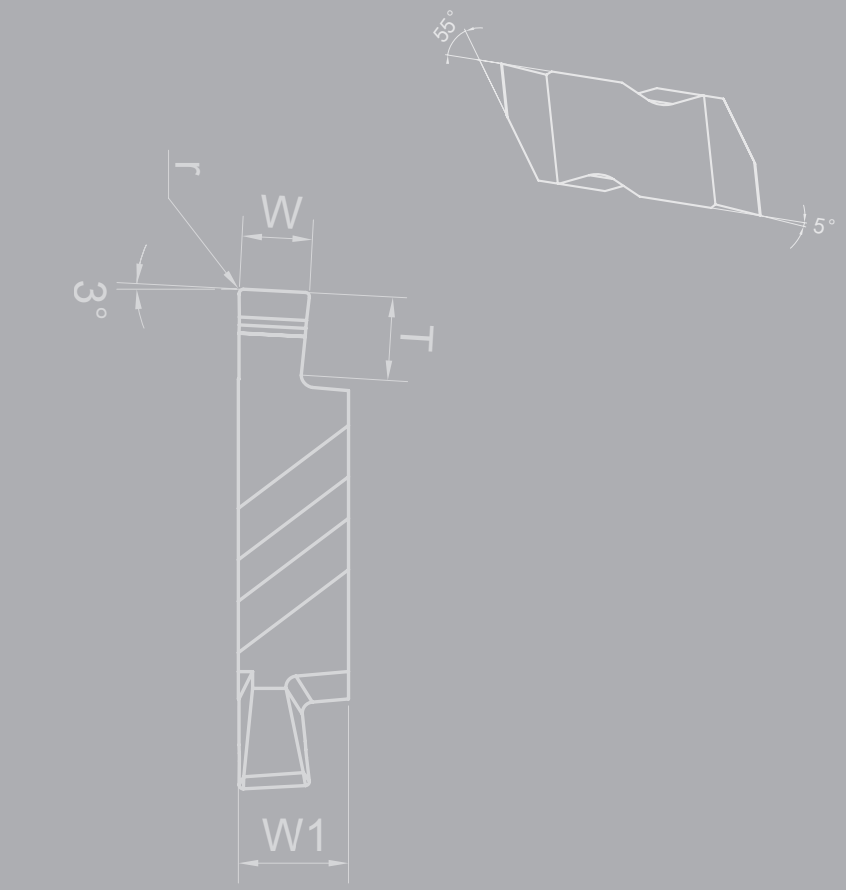
Grade / Application Area	Description	Microstructure
P05C Super-Finishing to Finishing **P** STEEL	"First Choice" for Super-Finishing Applications in Steel (ISO P Materials). Outstanding combination of deformation-resistance and insert edge strength. Gradient-sintered high-performance cemented carbide substrate with unsurpassed wear resistance. Double-Coated MT-CVD Grade with TiCN and Al_2O_3 layers. Exceptional coating adhesion properties. Withstands elevated operating temperatures.	
P15C Finishing and Semi-finishing **P** STEEL	*"First Choice"* for Finishing Applications in Steel (ISO P Materials). Triple-Coated MT-CVD Grade with Superfine TiCN, Thick Al_2O_3, and Ultra-Smooth TiN. Gradient-sintered high performance cemented carbide substrate with very high wear resistance. Performs extremely well in continuous cutting conditions and stable set-ups.	
P25C Semi-finishing to Light Roughing **P** STEEL	*"First Choice"* for Medium Turning Applications in Steel w(ISO P Materials). Triple-Coated MT-CVD Grade with Superthick TiCN, Optimized Al_2O_3, and Ultra-Smooth TiN. Gradient-sintered all-round performance cemented carbide substrate with excellent balance of wear resistance and toughness. Covers a wide application range, from semi-finishing to light roughing of Steels and continuous cutting to moderate interruptions. Also recommended for workpieces with scale.	
P35C Medium Machining to Roughing **P** STEEL	*"First Choice"* for difficult Roughing Applications in Steel (ISO P Materials). Superior fracture toughness and wear resistance. MT-CVD Triple-Layer Coating with smooth surface and excellent fracture resistance. Gradient-sintered high performance cemented carbide substrate with exceptional toughness properties. Well suited for medium to heavy interrupted cuts and other unstable application conditions.	
P25P Finishing to Light Roughing **P** **M** **K**	Universal Turning Grade. Primary application in Steel, with wide performance range in multiple materials. TiAlN Nano-Structure PVD Coated grade. Sub-Micron carbide substrate with outstanding combination of wear resistance and toughness behavior. Excellent Choice for All-Round grade that performs in an extremely wide variety of workpiece materials.	
M15P Super-Finishing to Finishing **M** STAINLESS STEEL	*"First Choice"* Grade for Finishing Applications in Stainless Steel (ISO M Materials). Also suitable for finish turning iron-based, cobalt-based and nickel-based Heat Resistant Super Alloys. PVD Advanced TiAlN Coated Grade with superior heat-resistance and oxidation-resistance properties. Extremely hard deformation-resistant micro-grain cemented carbide substrate with exceptional wear resistance characteristics.	

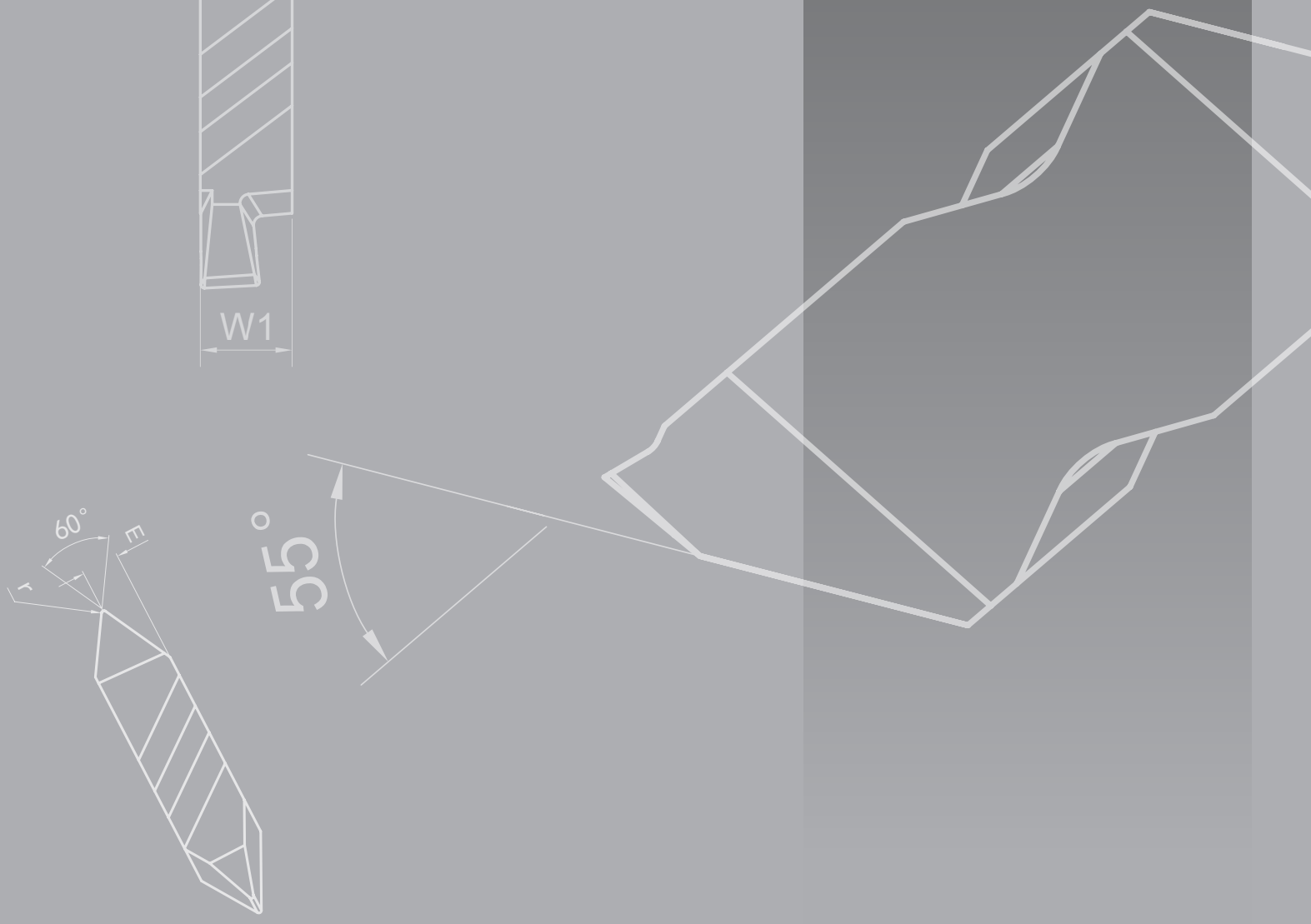
Grade / Application Area	Description	Microstructure
M25C Finishing to Medium Machining **M** STAINLESS STEEL	*"First Choice"* Grade for Stainless Steel (ISO M Materials). Double-Coated MT-CVD Grade with outstanding adhesion of Superthick TiCN and Ultra-Smooth TiN. Gradient-sintered tough cemented carbide substrate with excellent wear resistance - even at elevated cutting speeds. Optimized for Stainless Steel machining including light interruptions.	
M25P Semi-finishing to Roughing **M** STAINLESS STEEL	TiAlN Nano-Structure PVD Coated grade on Superfine Sub-Micron carbide substrate - exceptional resistance to thermal and mechanical shock with very good wear resistance. Excellent Choice for Stainless Steel applications at moderate cutting speeds, continuous cutting to moderate interruptions.	
K15C Finishing and Semi-finishing **K** CAST IRON	*"First Choice"* for Finishing Applications in Cast Iron (ISO K Materials). Double-Coated MT-CVD Grade, Thick TiCN and Superthick Al_2O_3 on gradient-sintered high performance cemented carbide substrate. Unique "post-coating treatment" provides smoother cutting zone interface for extremely high wear resistance. Performs very well in continuous cutting conditions and stable set-ups.	
K25C Semi-finishing to Roughing **K** CAST IRON	*"First Choice"* for Medium Turning Applications in Cast Iron (ISO K Materials). Double-Coated MT-CVD Grade, Superthick TiCN and Thick Al_2O_3 . Gradient-sintered cemented carbide substrate with high wear resistance and superior toughness behavior. Covers a wide application range, from semi-finishing to roughing of Cast Iron - and continuous cutting to heavy interruptions. Performs well in poor machining conditions / on demanding castings.	
N15U Semi-finishing to Roughing **N** NON-FERROUS	Uncoated Sub-Micron cemented carbide grade. High Hardness and Wear Resistance grade developed specifically for Aluminum Alloys and other non-ferrous materials within the ISO N Material range. Also suitable for non-metallics.	

WEAR MECHANISM / PROBLEM	REMEDY										
	Increase the cutting speed	Reduce the cutting speed	Increase the feed	Reduce the feed	Increase the depth of cut	Reduce the depth of cut	Ensure adequate coolant flow	Choose a tougher grade	Select a more wear resistant grade	Choose a positive geometry	Use a smaller nose radius
Excessive flank wear		■	■				■		■		
Chipping				■				■			
Plastic deformation		■		■		■	■		■		
Crater wear		■		■			■		■	■	
Built-up-edge (BUE)	■			■			■			■	
Thermal cracks	■			■				■			
Notch wear		■					■		■		
Insert Breakage				■		■		■			
Vibrations		■	■			■				■	■
Chip control / long, unbroken chips			■		■						■
	Increase the cutting speed	Reduce the cutting speed	Increase the feed	Reduce the feed	Increase the depth of cut	Reduce the depth of cut	Ensure adequate coolant flow	Choose a tougher grade	Select a more wear resistant grade	Choose a positive geometry	Use a smaller nose radius
	REMEDY										

GROOVING INSERTS | POSITIVE RAKE
THREADING INSERTS | POSITIVE RAKE

STANDARD NOTCH INSERTS
FOR GROOVING AND THREADING

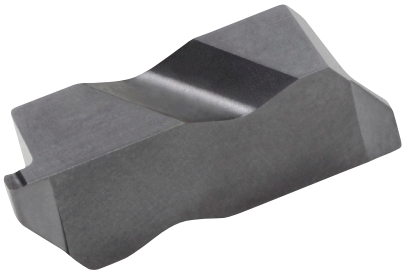




STANDARD NOTCH INSERTS

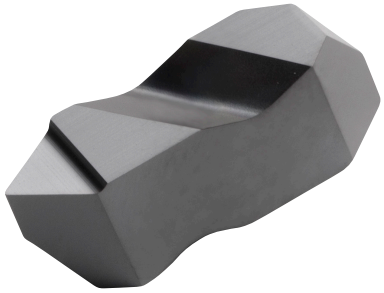
Precision ground for high performance and accurate indexing

5° positive rake - reduced cutting forces



General purpose grooving, O-ring grooves, Circlip grooves

Specialized edge treatment for extended tool life

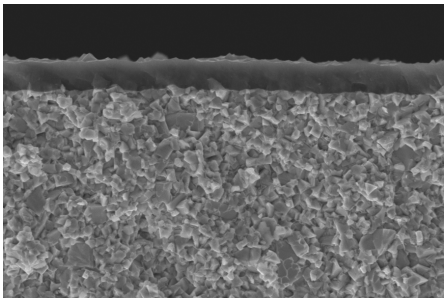


Two cutting edges per insert for economy

60° partial profile V-thread forms for a range of thread pitches

GG25P|GT25P

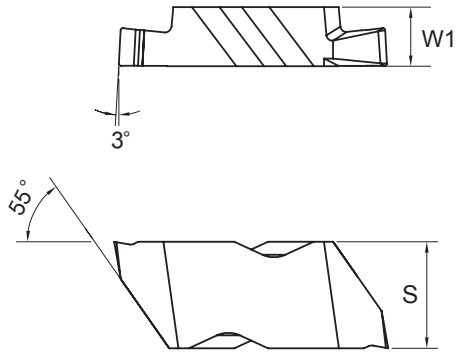
TiAlN Nano-Structure PVD Coated Grade



High resistance to thermal and mechanical shock, with exceptional wear resistance – provides superior performance in steel, stainless steel and cast iron materials.

P	M	K

G-NOTCH Insert Dimensions



Insert Size	W1	s
2	.150	.219
3	.195	.344

G	N	G	P	2	0	4	7	R
1		2	3	4	5			6

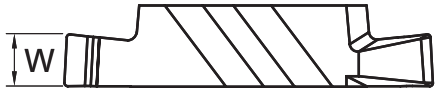
G	N	T	P	2	R
1		2	3	4	6

1	
Insert Type	
GN	G-NOTCH Grooving System

2	
Insert Style	
G	Grooving
T	Threading - 60° V-form

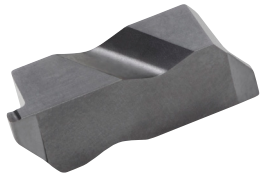
3	
Insert Characteristics	
P	Positive Rake

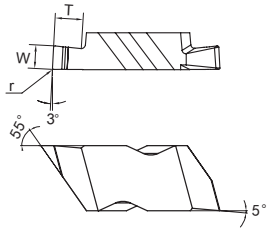
4	
Insert Size	
2	Notch size 2
3	Notch size 3

5	
Grooving Width	
	
Symbol indicates width W in thousandths of an inch	
Symbol	W (inch)
047	.047
062	.062
078	.078
094	.094
125	.125

6	
Hand of Insert	
R	Right-hand
L	Left-hand

GNGP





Precision ground, positive rake Notch inserts for a wide range of grooving applications.

5° positive rake for improved cutting action and reduced cutting forces.

CATALOG NUMBER		INSERT SIZE	DIMENSIONS (INCH)			CUTTING DATA (INCH)		P	M	K
RIGHT HAND	LEFT HAND		W	T	r	depth of cut, a_p	feed per rev, f_n	MULTI-MATERIAL GG25P		
GNGP 2047R	GNGP 2047L	2	.047	.050	.004	max .050	.001-.005	★		
GNGP 2062R	GNGP 2062L	2	.062	.110	.008	max .110	.001-.006	★		
GNGP 2078R	GNGP 2078L	2	.078	.110	.008	max .110	.002-.008	★		
GNGP 2094R	GNGP 2094L	2	.094	.110	.008	max .110	.002-.008	★		
GNGP 2125R	GNGP 2125L	2	.125	.110	.008	max .110	.003-.010	★		
GNGP 3047R	GNGP 3047L	3	.047	.075	.008	max .075	.001-.006	★		
GNGP 3062R	GNGP 3062L	3	.062	.094	.008	max .094	.001-.006	★		
GNGP 3078R	GNGP 3078L	3	.078	.094	.008	max .094	.002-.008	★		
GNGP 3094R	GNGP 3094L	3	.094	.150	.008	max .150	.002-.008	★		
GNGP 3125R	GNGP 3125L	3	.125	.150	.008	max .150	.003-.010	★		

Ordering Example: 20 pcs GNGP 3125R GG25P

NOTE: Right-hand insert shown; Left-hand mirror image.

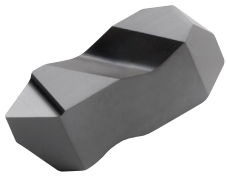
INSERT COMPATIBILITY

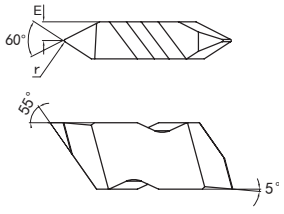
G-Notch GNGP grooving inserts are interchangeable with other Notch grooving inserts, and also fit tools using the following insert types:

NG, NGP, NG-K	FLG, FLGP, FLG-CB	TLG, TLGP

REFERENCE PAGES					
GRADE INFORMATION	72	TECHNICAL INFORMATION	72	**CUTTING SPEED RECOMMENDATIONS**	76

GNTP





Precision ground, positive rake Notch inserts for 60° partial profile (non-cresting) V-thread forms across a range of materials.

5° positive rake for improved cutting action and reduced cutting forces.

CATALOG NUMBER		INSERT SIZE	DIMENSIONS (INCH)		THREADS PER INCH		THREAD PITCH		P	M	K
					TPI		mm		MULTI-MATERIAL		
RIGHT HAND	LEFT HAND		E	r	EXTERNAL	INTERNAL	EXTERNAL	INTERNAL	GT25P		
GNTP 2R	GNTP 2L	2	.075	.004	36 - 8	20 - 7	0.70 - 3.00	1.25 - 3.50	★		
GNTP 3R	GNTP 3L	3	.098	.007	20 - 6	12 - 5	1.25 - 4.00	2.00 - 5.00	★		

Ordering Example: 20 pcs GNTP 3R GT25P

NOTE: Right-hand insert shown; Left-hand mirror image.

INSERT COMPATIBILITY

G-Notch GNTP threading inserts are interchangeable with other Notch threading inserts, and also fit tools using the following insert types:

NT, NTP, NT-K	FLT, FLTP, FLT-CB	TLT, TLTP

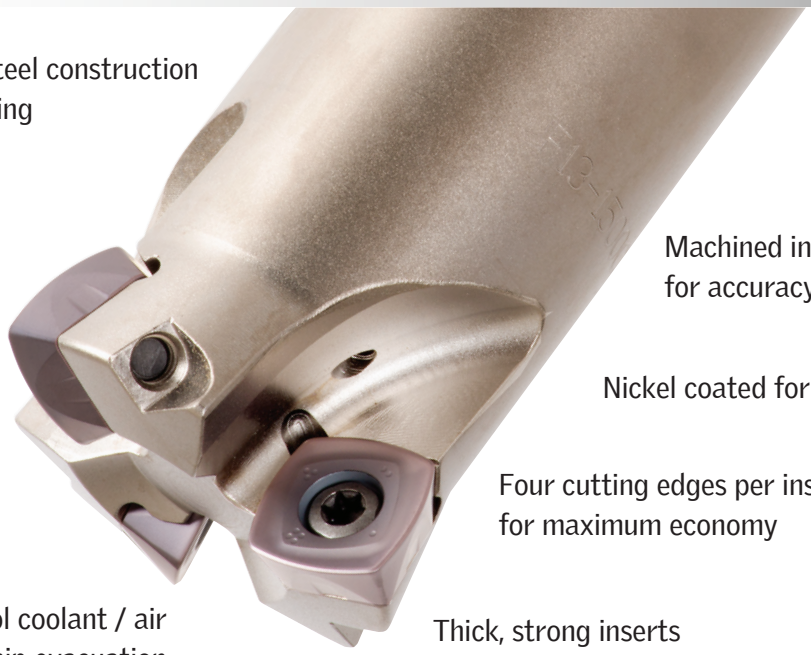
REFERENCE PAGES					
GRADE INFORMATION	72	TECHNICAL INFORMATION	72	CUTTING SPEED RECOMMENDATIONS	76

ISO	Material Group	Workpiece Material	Brinell Hardness HB	Rockwell Hardness HRC	Tensile Strength MPa	Recommended Starting Speeds v_c (ft/min)								
						GG25P|GT25P								
						f_n (inch/rev)								
						.003	.006	.010						
P Steel	PO	Low-Carbon Steels, Long Chipping (C < .25%) Ex. A36, 1008, 1010, 1018, 1108, 1117	<125		<530	600	510	420						
	P1	Low-Carbon Steels, Short Chipping, Free Machining (C < .25%) Ex. 10L18, 1200 Series, 1213, 12L14	<125		<530	520	450	390						
	P2	Medium- and High-Carbon Steels (C > .25%) Ex. 1035, 1045, 10L45, 1080, 1137, 1144, 1525, 1572	<220	<25	>530	440	390	330						
	P3	Alloy Steels and Tool Steels (C > .25%) Ex. P20, 1300, 2000, 3000, 4000, 5000, 8000, SAE A, D, H, O, S, M, T	<330	<35	600-850	350	300	250						
	P4	High-Strength Alloy Steels and Tool Steels (C > .25%) Ex. P20, 1300, 2000, 3000, 4000, 5000, 8000, SAE A, D, H, O, S, M, T	340-450	35-48	850-1400	300	250	200						
	P5	Ferritic, Martensitic and PH Stainless Steels Ex. 13-8 PH, 15-5 PH, 17-4 PH, 400 and 500 Series	<330	<35	600-900	360	310	260						
	P6	High-Strength Ferritic, Martensitic and PH Stainless Steels Ex. 13-8 PH, 15-5 PH, 17-4 PH, 400 and 500 Series	340-450	35-48	900-1350	280	230	200						
M Stainless Steel	M1	Austenitic Stainless Steels Ex. 200 Series, 301, 302, 304, 304L, 309	130-200		<600	400	330	260						
	M2	High-Strength Austenitic Stainless and Cast Stainless Steels Ex. 310, 316, 316L, 321, 347, 384	150-230	<25	600-800	360	300	230						
	M3	Duplex Stainless Steels Ex. 323, 329, F55, 2205	135-275	<30	<800	320	260	200						
K Cast Iron	K1	Gray Cast Iron Ex. Class 20, 25, 30, 35, 40, 45, 50, 55, 60, G1800, G3000, G3500, G4000	120-290	<32	125-500	630	510	390						
	K2	Ductile Cast Irons (Nodular Irons) and Compacted Graphite Irons (CGI) Ex. 60-40-18, 65-45-12, 80-55-06, SAE J434: D4018, D4512, D5506	130-260	<28	<600	470	380	290						
	K3	High-Strength Ductile Irons and Austempered Ductile Irons (ADI) Ex. ASTM A536: 100-70-03, 120-90-02, SAE J434: D7003	180-350	<43	>600	380	310	230						

MILLING

HIGH FEED MILLING SOLUTIONS

High quality alloy tool steel construction for strong and long-lasting cutter bodies



Machined in pre-hardened state for accuracy and low runout

High precision cutter bodies provide consistent performance and tool life

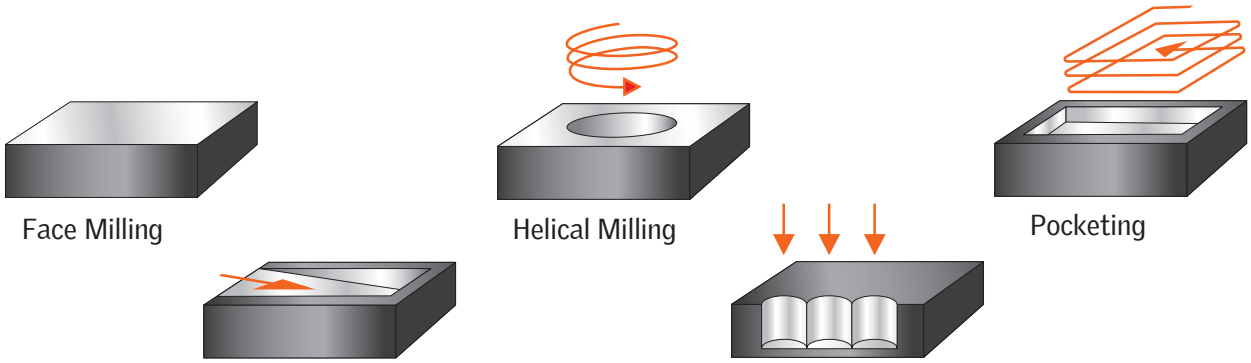
Nickel coated for durability

Four cutting edges per insert for maximum economy

Through-the-tool coolant / air capability for excellent chip evacuation

Thick, strong inserts for demanding applications

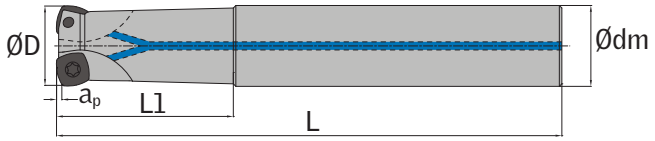
VERSATILITY | HIGH PERFORMANCE IN A VARIETY OF APPLICATIONS



SUITABLE FOR A BROAD RANGE OF MATERIALS

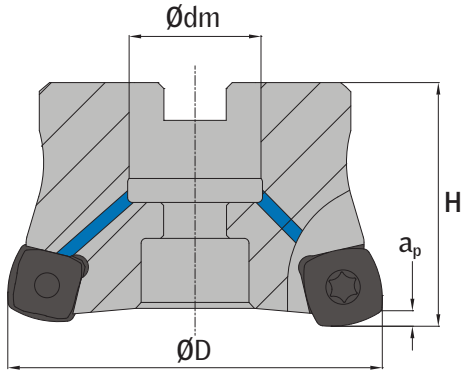
P	Steel
M	Stainless Steel
K	Cast Iron
S	High Temp Alloys
H	Hardened Steel

ENDMILLS - CYLINDRICAL SHANK



DIAMETER D	CATALOG NUMBER	NUMBER OF INSERTS z	SHANK DIAMETER dm	OVERALL LENGTH L	NECK LENGTH L1	MAX DEPTH OF CUT a_p	COOLANT THROUGH
1.250	HF12-D1.25-C1.25-12-2	2	1.250	10.00	2.50	.078	YES
1.500	HF12-D1.50-C1.25-12-3	3	1.250	10.00	-	.078	YES

FACEMILLS - ARBOR MOUNT

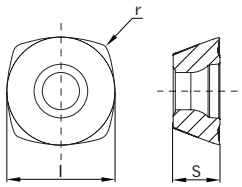


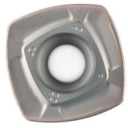
DIAMETER D	CATALOG NUMBER	NUMBER OF INSERTS z	MOUNTING BORE DIAMETER dm	HEIGHT H	MAX DEPTH OF CUT a_p	COOLANT THROUGH
2.000	HF12-D2.00-0.750-12-4	4	0.750	1.58	.078	YES
2.500	HF12-D2.50-0.750-12-5	5	0.750	1.58	.078	YES
3.000	HF12-D3.00-1.00-12-6	6	1.000	1.97	.078	YES
4.000	HF12-D4.00-1.25-12-8	8	1.250	1.97	.078	YES
5.000	HF12-D5.00-1.50-12-10	10	1.500	2.48	.078	YES

Ordering Example: 2 pcs HF12-D2.00-0.750-12-4

NOTE: All cutters are delivered with insert mounting screws and a wrench. Inserts are ordered separately - see page 81.
See page 86 for Spare Parts information.

HIGH FEED MILLING

SDMT		Versatile inserts for high feed facemilling, plunging, ramping and pocketing applications. Thick, strong inserts with four cutting edges for maximum economy. *M: Medium machining with lower cutting forces* *H: Roughing with highest edge security*

APPLICATION	ITEM	CATALOG NUMBER	DIMENSIONS (INCH)			MULTI-MATERIAL				P			
			l	s	r	PM25P	PM30P			PM15C			
MEDIUM		SDMT 120512-M	.500	.219	.047	★	★			★			
HEAVY		SDMT 120512-H	.500	.219	.047	★	★			★			

Ordering Example: 20 pcs SDMT 120512-GH GA4230

GRADE INFORMATION

PM30P

P M K S H

Universal, first-choice grade with broad application range. PVD TiAlN+ coating with excellent heat and oxidation resistance characteristics.

PM25P

P M K

Complementary grade for steel, stainless steel and cast iron materials. PVD AlCrN coating with high hardness substrate offers increased wear resistance.

PM15C

P

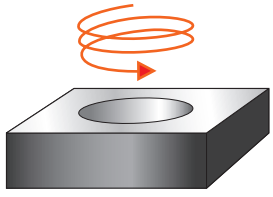
Best for steel machining with stable set-ups. MT-CVD dual layer TiCN and Al_2O_3 coating with extremely hard substrate offers high wear resistance.

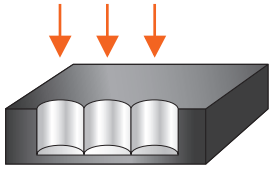
REFERENCE PAGES					
MILLING CUTTERS	80	FEED RECOMMENDATIONS	82	CUTTING SPEED RECOMMENDATIONS	83

ISO	Workpiece Material	Rockwell Hardness HRC	Recommended feed per insert f_z (inches) starting (range)	
			M (medium)	H (heavy)
P Steel	Low-Carbon Steel	<25	.045 (.030 - .060)	.060 (.040 - .080)
	Alloy Steel and Tool Steel	<35	.045 (.030 - .060)	.060 (.040 - .080)
	Alloy Steel and Tool Steel	35 - 45	.035 (.025 - .050)	.045 (.030 - .060)
M Stainless Steel	Stainless Steel	<35	.030 (.025 - .040)	.040 (.030 - .050)
K Cast Iron	Cast Iron	<35	.045 (.030 - .060)	.060 (.040 - .080)
S High-Temp Alloys	Heat-Resistant and Titanium Alloys	<35	.015 (.006 - .024)	.020 (.008 - .036)
H Hardened Steel	Alloy Steel and Tool Steel	45 - 55	.010 (.004 - .020)	.015 (.006 - .030)

RECOMMENDED STARTING FEED VALUES RELATIVE TO DEPTH OF CUT	depth of cut a_p (inches)			
	.020	.040	.060	.078
Recommended feed per insert f_z (inches) starting (range)	.070 (.060 - .080)	.060 (.040 - .070)	.040 (.025 - .060)	.030 (.015 - .040)

OTHER APPLICATIONS





See pages 85 and 86 for feed recommendations for ramping, helical milling and plunging applications.

ISO	Material Group	Workpiece Material	Brinell Hardness HB	Rockwell Hardness HRC	Tensile Strength MPa	Recommended Starting Speeds v_c (ft/min)											
						PM15C			PM25P			PM30P					
						f_z (inch)			f_z (inch)			f_z (inch)					
						.035	.050	.065	.035	.050	.065	.035	.050	.065			
P Steel	PO	Low-Carbon Steels, Long Chipping (C < .25%) Ex. A36, 1008, 1010, 1018, 1108, 1117	<125		<530	840	720	580	760	650	525	720	620	500			
	P1	Low-Carbon Steels, Short Chipping, Free Machining (C < .25%) Ex. 10L18, 1200 Series, 1213, 12L14	<125		<530	760	620	490	690	560	440	655	530	420			
	P2	Medium- and High-Carbon Steels (C > .25%) Ex. 1035, 1045, 10L45, 1080, 1137, 1144, 1525, 1572	<220	<25	>530	680	590	475	620	535	430	590	510	410			
	P3	Alloy Steels and Tool Steels (C > .25%) Ex. P20, 1300, 2000, 3000, 4000, 5000, 8000, SAE A, D, H, O, S, M, T	<330	<35	600-850	560	450	360	510	410	325	480	390	310			
	P4	High-Strength Alloy Steels and Tool Steels (C > .25%) Ex. P20, 1300, 2000, 3000, 4000, 5000, 8000, SAE A, D, H, O, S, M, T	340-450	35-48	850-1400	420	335	265	380	305	240	360	290	230			
	P5	Ferritic, Martensitic and PH Stainless Steels Ex. 13-8 PH, 15-5 PH, 17-4 PH, 400 and 500 Series	<330	<35	600-900				605	525	420	575	500	400			
	P6	High-Strength Ferritic, Martensitic and PH Stainless Steels Ex. 13-8 PH, 15-5 PH, 17-4 PH, 400 and 500 Series	340-450	35-48	900-1350				440	360	285	420	340	270			

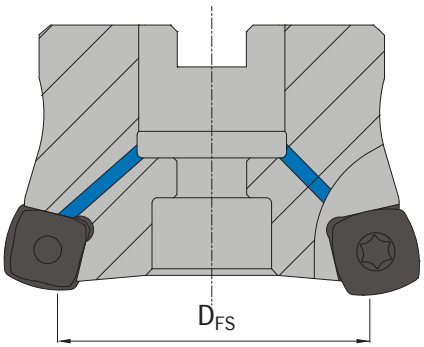
ISO	Material Group	Workpiece Material	Brinell Hardness HB	Rockwell Hardness HRC	Tensile Strength MPa	Recommended Starting Speeds v_c (ft/min)											
						PM25P			PM30P								
						f_z (inch)			f_z (inch)								
						.025	.035	.045	.025	.035	.045						
M Stainless Steel	M1	Austenitic Stainless Steels Ex. 200 Series, 301, 302, 304, 304L, 309	130-200		<600	560	450	340	530	430	325						
	M2	High-Strength Austenitic Stainless and Cast Stainless Steels Ex. 310, 316, 316L, 321, 347, 384	150-230	<25	600-800	510	410	310	480	390	295						
	M3	Duplex Stainless Steels Ex. 323, 329, F55, 2205	135-275	<30	<800	450	360	275	425	345	260						

ISO	Material Group	Workpiece Material	Brinell Hardness HB	Rockwell Hardness HRC	Tensile Strength MPa	Recommended Starting Speeds v_c (ft/min)								
						PM25P			PM30P					
						f_z (inch)			f_z (inch)					
						.035	.050	.065	.035	.050	.065			
K Cast Iron	K1	Gray Cast Iron Ex. Class 20, 25, 30, 35, 40, 45, 50, 55, 60, G1800, G3000, G3500, G4000	120-290	<32	125-500	690	560	440	655	530	420			
	K2	Ductile Cast Irons (Nodular Irons) and Compacted Graphite Irons (CGI) Ex. 60-40-18, 65-45-12, 80-55-06, SAE J434: D4018, D4512, D5506	130-260	<28	<600	620	520	390	590	490	370			
	K3	High-Strength Ductile Irons and Austempered Ductile Irons (ADI) Ex. ASTM A536: 100-70-03, 120-90-02, SAE J434: D7003	180-350	<43	>600	550	470	360	525	450	345			

ISO	Material Group	Workpiece Material	Brinell Hardness HB	Rockwell Hardness HRC	Tensile Strength MPa	Recommended Starting Speeds v_c (ft/min)								
						PM30P								
						f_z (inch)								
						.008	.016	.024						
S High Temp Alloys	S1	Iron-Based Heat-Resistant Alloys Ex. A286, A608, INCOLOY 800 Series, N-155, Haynes 556, Discaloy	160-260	25-48	500-1200	200	130	100						
	S2	Cobalt-Based Heat-Resistant Alloys Ex. Haynes 25 (L605), Haynes 188, Stellite, MAR-M302, MAR-M509	250-450	25-48	1000-1450	170	100	80						
	S3	Nickel-Based Heat-Resistant Alloys Ex. Astroloy, Hastelloy X, INCONEL 600 and 700 Series, Waspalloy	160-450	<48	600-1700	180	110	90						
	S4	Titanium and Titanium Alloys Ex. Commercially Pure Ti, Ti-5Al-2.5Sn, Ti-6Al-4V, Ti-3Al-8V-6Cr-4Zr-4Mo	300-400	33-48	900-1600	190	120	95						

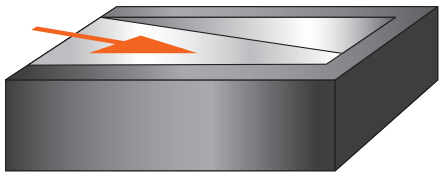
ISO	Material Group	Workpiece Material	Brinell Hardness HB	Rockwell Hardness HRC	Tensile Strength MPa	Recommended Starting Speeds v_c (ft/min)								
						PM30P								
						f_z (inch)								
						.006	.012	.020						
H Hardened Steels	H1	Hardened Alloy Steels and Tool Steels Ex. H13,D2, D3, 4340,P20		44-48		320	260	210						
	H2	Hardened Alloy Steels and Tool Steels Ex. H13,D2, D3, 4340,P20		48-55		260	210	165						
	H3	Hardened Alloy Steels and Tool Steels Ex. H13,D2, D3, 4340,P20		56-60										
	H4	Hardened Alloy Steels and Tool Steels Ex. H13,D2, D3, 4340,P20		>60										

WIDTH OF CUT FOR FLAT SURFACES



CUTTER DIAMETER	D_{FS}
1.250	0.53
1.500	0.78
2.000	1.28
2.500	1.78
3.000	2.28
4.000	3.28
5.000	4.28

RAMPING



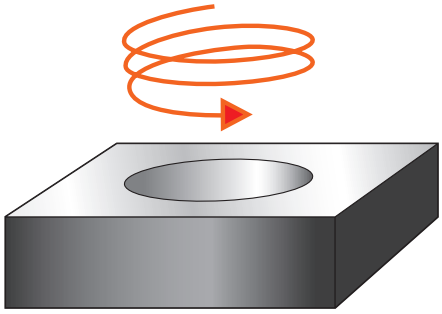
CUTTER DIAMETER	MAX RAMPING ANGLE
1.250	1.8°
1.500	1.5°
2.000	1.2°
2.500	0.9°
3.000	0.8°
4.000	0.6°
5.000	0.4°

FEED RECOMMENDATION
Reduce feed for ramping applications to 75% of normal value.

EXAMPLE: If the calculated face milling feed rate is 200 inches/min, reduce the feed rate for ramping to:

200 inches/min x 75% = 150 inches/min

HELICAL MILLING



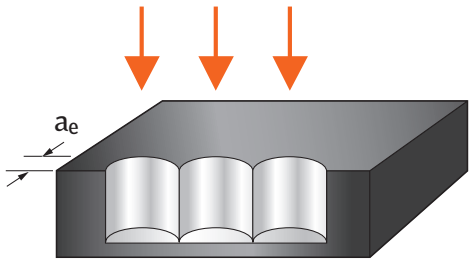
CUTTER DIAMETER	MINIMUM HOLE SIZE	MAXIMUM HOLE SIZE
1.250	1.71	2.42
1.500	2.21	2.92
2.000	3.21	3.92
2.500	4.21	4.92
3.000	5.21	5.92
4.000	7.21	7.92
5.000	9.21	9.92

FEED RECOMMENDATION
Reduce feed for helical milling applications to 30% - 50% of normal value.

EXAMPLE: If the calculated face milling feed rate is 200 inches/min, reduce the feed rate for helical milling to a range of:

200 inches/min x 30% = 60 inches/min
200 inches/min x 50% = 100 inches/min

PLUNGE MILLING

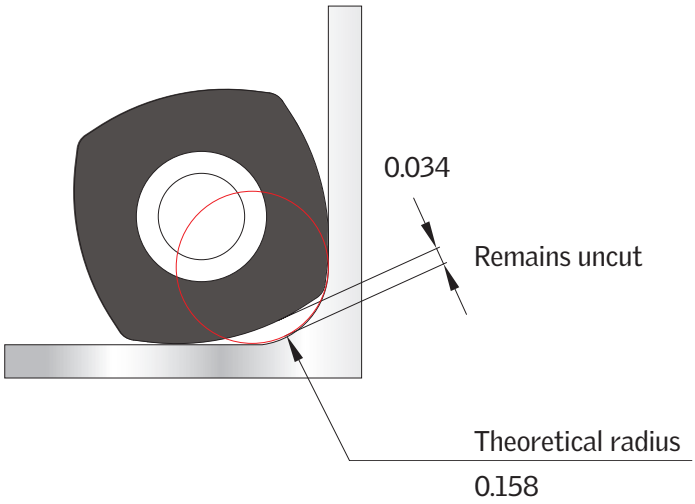


Maximum width of cut a_e = 0.330

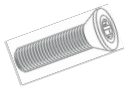
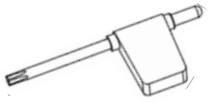
FEED RECOMMENDATION
Recommended starting feed per insert
f_z = .006 (.002-.010)

PROGRAMMING INFORMATION

CAD/CAM systems require a defined theoretical radius value when programming pocketing applications (cavity machining). The theoretical radius value is noted on the drawing to the right, as well as the approximate amount of material that will remain uncut.



SPARE PARTS

INSERT SCREW	WRENCH
	
NS521	FWT15

Spindle speed, n (rpm)

$$n = \frac{3.82 \times v_c}{D}$$

Cutting speed, v_c (ft / min)

$$v_c = .262 \times D \times n$$

Feed rate, v_f (in / min)

$$v_f = n \times f_z \times z$$

Feed per insert, f_z (in)

$$f_z = \frac{v_f}{n \times z}$$

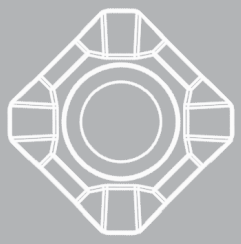
Metal removal rate, Q (in^3 / min)

$$Q = a_e \times a_p \times v_f$$

a_e	width of cut	inches
a_p	depth of cut	inches
D	cutter diameter	inches
f_z	feed per insert	inches
n	spindle speed	rev/min
Q	metal removal rate	$inches^3$/min
v_c	cutting speed	feet/min
v_f	feed rate	inches/min
z	number of inserts	

MILLING INSERTS

INDUSTRY STANDARD INSERTS
FOR SQUARE SHOULDER, FACEMILLING
AND PROFILE MILLING APPLICATIONS



Grade PM30P

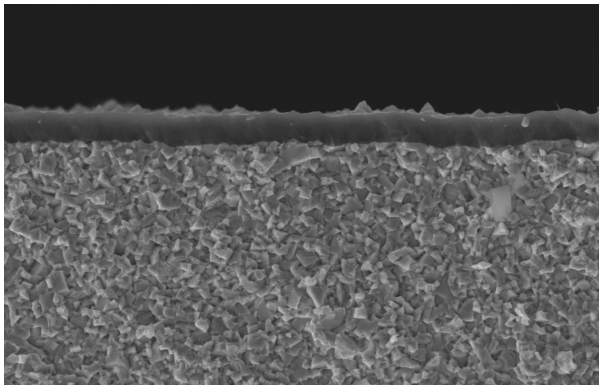
Superior Milling Performance in a Wide Range of Applications

Outstanding results in Steels, Stainless Steels, Cast Iron and Heat-Resistant Super Alloys

Withstands difficult cutting conditions – varying depths of cut, weak and unstable setups, vibrations

PM30P - Advanced Substrate Development

- Homogeneous submicron grain structure
- Specialized processing treatment provides exceptional fracture-resistant properties and superior wear resistance
- Stable performance under a wide range of machining conditions



PM30P - Next Generation Coating Technology

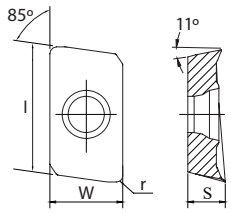
- New TiAlN+ Advanced PVD Coating
- Outstanding wear resistance properties and long tool life through improved microstructure and surface treatment
- Increased adhesion strength to substrate provides predictable tool life and reliable performance
- Effective in HRSA's and other difficult-to-machine materials due to high heat resistance and oxidation resistance characteristics

WORKPIECE MATERIAL	ANSI	ISO	Coating Type: PVD
P Steel	C8	01	
		10	
	C7	20	PM30P
	C6	30	
		40	
M Stainless Steel	–	01	
	–	10	
	–	20	PM30P
	–	30	
K Cast Iron	C4	01	
	C3	10	
	C2	20	PM30P
	C1	30	
S Heat-Resistant Super Alloys	–	01	
	–	10	
	–	20	PM30P
	–	30	

wear resistance ↕ toughness

SQUARE SHOULDER MILLING

APMT



Widely used inserts for square shoulder endmilling and facemilling applications. Two cutting edges with smooth free cutting action.

L: Light cutting with lowest cutting forces
M: Medium machining with broad application range
R: Roughing with highest edge security

APPLICATION	ITEM	CATALOG NUMBER	DIMENSIONS (INCH)				CUTTING DATA (INCH)		P	M	K	S
			l	W	s	r	depth of cut, a_p	feed per insert, f_z	MULTI-MATERIAL PM30P			
LIGHT		APMT 160408PDER-L	.640	.364	.187	.031	max .551	.002 - .006	★			
MEDIUM		APMT 160408PDER-M	.640	.364	.187	.031	max .551	.003 - .008	★			
MEDIUM		APMT 160416PDER-M	.640	.364	.187	.063	max .551	.003 - .008	★			
HEAVY		APMT 160408PDER-R	.640	.364	.187	.031	max .551	.006 - .012	★			

Ordering Example: 20 pcs APMT 160408PDER-R PM30P

INSERT COMPATIBILITY

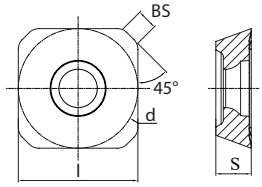
APMT 1604 milling inserts are interchangeable with other APMT 1604 inserts, and also fit tools using the following insert types:

APKT 1604	APKT 263	APKX 1604	APMW 1604	APMX 1604

REFERENCE PAGES					
GRADE INFORMATION	89	TECHNICAL INFORMATION	94	CUTTING SPEED RECOMMENDATIONS	97

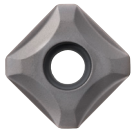
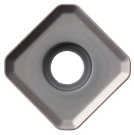
45° FACEMILLING

SEET



Very popular facemilling inserts, commonly used on low powered machines and smaller machining centers. High positive rake angles and geometries. Four cutting edges for economy.

L: Light cutting with lowest cutting forces
M: Medium machining with broad application range
H: Heavy cutting with highest edge security

APPLICATION	ITEM	CATALOG NUMBER	DIMENSIONS (INCH)				CUTTING DATA (INCH)		P	M	K	S
			d	l	s	BS	depth of cut, a_p	*feed per insert, f_z	MULTI-MATERIAL PM30P			
LIGHT		SEET 13T3AGEN-L	.528	.528	.156	.067	max .240	.003 - .008	★			
MEDIUM		SEET 13T3AGEN-M	.528	.528	.156	.047	max .240	.004 - .012	★			
HEAVY		SEET 13T3AGSN-H	.528	.528	.156	.047	max .240	.006 - .016	★			

Ordering Example: 20 pcs SEET 13T3AGSN-H PM30P

*NOTE: Feed per insert (f_z) values shown include feedrate multiplier to compensate for 45° lead angle chip thinning.

INSERT COMPATIBILITY

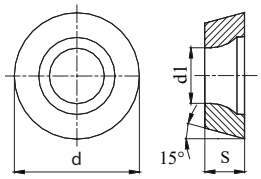
SEET 13T3 inserts are interchangeable with, and fit tools using, the following insert types:

R245-12T3 SEET 13T3 SEGT 13T3 SEHT 13T3 SEKT 13T3 SEMT 13T3 SEPT 13T3

REFERENCE PAGES					
GRADE INFORMATION	89	TECHNICAL INFORMATION	94	CUTTING SPEED RECOMMENDATIONS	97

PROFILE MILLING

RDET
RDMW



Industry standard profiling inserts with high performance grade and geometries. 15° clearance angle for wide variety of common industry cutters. Excellent value and economy.

L: Low cutting forces - Light cutting
M: Medium machining with broad application range
H: Roughing with highest edge security

APPLICATION	ITEM	CATALOG NUMBER	DIMENSIONS (INCH)			CUTTING DATA (INCH)		P	M	K	S
			d	d1	s	*depth of cut, a_p	*feed per insert, f_z	MULTI-MATERIAL PM30P			
LIGHT		RDET 1204M0-L	12mm	.173	.187	.118	.003 - .010	★			
		RDET 1604M0-L	16mm	.217	.187	.157	.004 - .010	★			
MEDIUM		RDET 1204M0-M	12mm	.173	.187	.118	.004 - .012	★			
		RDET 1604M0-M	16mm	.217	.187	.157	.004 - .014	★			
HEAVY		RDMW 1204M0T-H	12mm	.173	.187	.118	.005 - .015	★			
HEAVY		RDMW 1604M0T-H	16mm	.217	.187	.157	.006 - .018	★			

Ordering Example: 20 pcs RDMW 1604M0T-H PM30P

*NOTE: For general profiling applications the recommended maximum depth of cut noted is one-half the theoretical maximum depth of cut for the insert. Proper feedrates for round inserts are dependent on the depth of cut. The recommended feed values provided are for the depths of cut shown. For larger depths of cut decrease the feed; for smaller depths of cut increase the feed.

INSERT COMPATIBILITY

RDET and RDMW 1204 and 1604 inserts fit cutters using the same insert descriptions, and also fit tools using the following insert types:

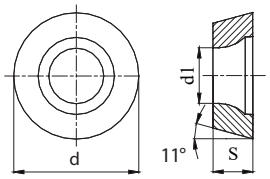
RDEW RDEX RDGT RDHT RDHW RDHX RDMT RDPX

REFERENCE PAGES

GRADE INFORMATION	89	TECHNICAL INFORMATION	94	CUTTING SPEED RECOMMENDATIONS	97

PROFILE MILLING

RPET
RPMW



Industry standard profiling inserts with high performance grade and geometries. 11° clearance angle for broad range of common industry cutters. Excellent value and economy.

L: Light cutting with lowest cutting forces
M: Medium machining with broad application range
H: Roughing with highest edge security

APPLICATION	ITEM	CATALOG NUMBER	DIMENSIONS (INCH)			CUTTING DATA (INCH)		P	M	K	S
			d	d1	s	*depth of cut, a_p	*feed per insert, f_z	MULTI-MATERIAL PM30P			
LIGHT		RPET 1204M0-L	12mm	.173	.187	.118	.003 - .010	★			
MEDIUM		RPET 1204M0-M	12mm	.173	.187	.118	.004 - .012	★			
HEAVY		RPMW 1204M0T-H	12mm	.173	.187	.118	.005 - .015	★			

Ordering Example: 20 pcs RPMW 1204M0T-H PM30P

*NOTE: For general profiling applications the recommended maximum depth of cut noted is one-half the theoretical maximum depth of cut for the insert. Proper feedrates for round inserts are dependent on the depth of cut. The recommended feed values provided are for the depths of cut shown. For larger depths of cut decrease the feed; for smaller depths of cut increase the feed.

INSERT COMPATIBILITY

RPET and RPMW 1204 inserts fit cutters using the same insert descriptions, and also fit tools using the following insert types:

RPCT	RPCW	RPEW	RPEX	RPHT	RPMT

REFERENCE PAGES					
GRADE INFORMATION	89	TECHNICAL INFORMATION	94	CUTTING SPEED RECOMMENDATIONS	97

TECHNICAL INFORMATION
MILLING

EXAMPLE 1

A	P	M	T	16	04	08	P	D	E	R	_	L
1	2	3	4	5	6	7	8	9	10	11		12

1	
Insert Shape	
A	85⁰ Parallelogram
R	Round
S	Square

2	
Clearance Angle	
D	15⁰ Positive Rake
E	20⁰ Positive Rake
P	11⁰ Positive Rake

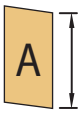
3			
Tolerances, inch			
Tolerance Class	tolerance on 'd'	tolerance on 'B'	tolerance on 's'
E	± .001	± .001	± .001
M	see table	see table	± .005

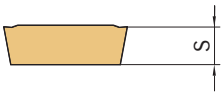
Tolerance Class M, inch		
d	tolerance on 'd'	tolerance on 'B'
3/8 (10mm)	± .002	± .003
1/2 (12mm)	± .003	± .005
5/8 (16mm)	± .004	± .006

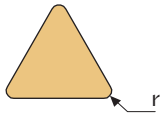
4		
Insert Type		
T	Screw-Down Clamping, Single-sided with Chipformer	
W	Screw-Down Clamping, Single-sided without Chipformer	
X	Manufacturer-Specific Design	

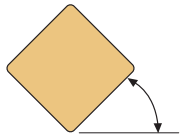
EXAMPLE 2

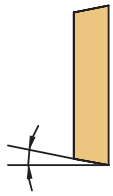
R	D	M	W	12	04	M0	T	–	M
1	2	3	4	5	6	8	10		12

5			
Insert Size			
Nominal Cutting Edge Length, mm			
Symbol			
12		12	
13			13.4
16	16.4	16	

6	
Thickness, inch	
	
Symbol	s
T3	5/32
04	3/16

7	
Corner Radius, inch	
	
Symbol	r
08	1/32
16	1/16

8	
Cutting Edge Angle	
	
A	45⁰
P	90⁰
M0	round, metric sizes

9	
Secondary Cutting Edge Clearance Angle	
	
D	15⁰
G	30⁰

10		
Cutting Edge Preparation		
E	Honed	
S	Honed T-land	
T	T-land	

11	
Hand of Insert	
R	Right-hand
L	Left-hand
N	Neutral

12
Insert Geometry Designation
Indicates the machining properties or chipformer features Manufacturer-specific

ISO	Material Group	Workpiece Material	Brinell Hardness HB	Rockwell Hardness HRC	Tensile Strength MPa	Recommended Starting Speeds v_c (ft/min)								
						PM30P								
						f_z (inch)								
						.004	.008	.012						
P Steel	PO	Low-Carbon Steels, Long Chipping (C < .25%) Ex. A36, 1008, 1010, 1018, 1108, 1117	<125		<530	920	720	590						
	P1	Low-Carbon Steels, Short Chipping, Free Machining (C < .25%) Ex. 10L18, 1200 Series, 1213, 12L14	<125		<530	820	655	490						
	P2	Medium- and High-Carbon Steels (C > .25%) Ex. 1035, 1045, 10L45, 1080, 1137, 1144, 1525, 1572	<220	<25	>530	720	590	480						
	P3	Alloy Steels and Tool Steels (C > .25%) Ex. P20, 1300, 2000, 3000, 4000, 5000, 8000, SAE A, D, H, O, S, M, T	<330	<35	600-850	655	560	460						
	P4	High-Strength Alloy Steels and Tool Steels (C > .25%) Ex. P20, 1300, 2000, 3000, 4000, 5000, 8000, SAE A, D, H, O, S, M, T	340-450	35-48	850-1400	590	490	390						
	P5	Ferritic, Martensitic and PH Stainless Steels Ex. 13-8 PH, 15-5 PH, 17-4 PH, 400 and 500 Series	<330	<35	600-900	680	575	470						
	P6	High-Strength Ferritic, Martensitic and PH Stainless Steels Ex. 13-8 PH, 15-5 PH, 17-4 PH, 400 and 500 Series	340-450	35-48	900-1350	525	460	390						

ISO	Material Group	Workpiece Material	Brinell Hardness HB	Rockwell Hardness HRC	Tensile Strength MPa	Recommended Starting Speeds v_c (ft/min)								
						PM30P								
						f_z (inch)								
						.004	.008	.012						
M Stainless Steel	M1	Austenitic Stainless Steels Ex. 200 Series, 301, 302, 304, 304L, 309	130-200		<600	640	530	425						
	M2	High-Strength Austenitic Stainless and Cast Stainless Steels Ex. 310, 316, 316L, 321, 347, 384	150-230	<25	600-800	575	480	380						
	M3	Duplex Stainless Steels Ex. 323, 329, F55, 2205	135-275	<30	<800	510	425	340						

ISO	Material Group	Workpiece Material	Brinell Hardness HB	Rockwell Hardness HRC	Tensile Strength MPa	Recommended Starting Speeds v_c (ft/min)								
						PM30P								
						f_z (inch)								
						.004	.008	.012						
K Cast Iron	K1	Gray Cast Iron Ex. Class 20, 25, 30, 35, 40, 45, 50, 55, 60, G1800, G3000, G3500, G4000	120-290	<32	125-500	790	655	490						
	K2	Ductile Cast Irons (Nodular Irons) and Compacted Graphite Irons (CGI) Ex. 60-40-18, 65-45-12, 80-55-06, SAE J434: D4018, D4512, D5506	130-260	<28	<600	720	590	460						
	K3	High-Strength Ductile Irons and Austempered Ductile Irons (ADI) Ex. ASTM A536: 100-70-03, 120-90-02, SAE J434: D7003	180-350	<43	>600	655	525	430						

ISO	Material Group	Workpiece Material	Brinell Hardness HB	Rockwell Hardness HRC	Tensile Strength MPa	Recommended Starting Speeds v_c (ft/min)								
						PM30P								
						f_z (inch)								
						.004	.008	.012						
S High Temp Alloys	S1	Iron-Based Heat-Resistant Alloys Ex. A286, A608, INCOLOY 800 Series, N-155, Haynes 556, Discaloy	160-260	25-48	500-1200	180	150	115						
	S2	Cobalt-Based Heat-Resistant Alloys Ex. Haynes 25 (L605), Haynes 188, Stellite, MAR-M302, MAR-M509	250-450	25-48	1000-1450	150	110	-						
	S3	Nickel-Based Heat-Resistant Alloys Ex. Astroloy, Hastelloy X, INCONEL 600 and 700 Series, Waspalloy	160-450	<48	600-1700	160	120	-						
	S4	Titanium and Titanium Alloys Ex. Commercially Pure Ti, Ti-5Al-2.5Sn, Ti-6Al-4V, Ti-3Al-8V-6Cr-4Zr-4Mo	300-400	33-48	900-1600	170	130	-						

HARDNESS COMPARISON TABLE

TENSILE STRENGTH	HARDNESS		
MPa	Brinell HB	Vickers HV	Rockwell HRC
530	156	165	
560	166	175	
595	176	185	
625	185	195	
660	195	205	
690	204	215	
720	214	225	
740	219	230	
755	223	235	
770	228	240	20.3
785	233	245	21.3
800	238	250	22.2
820	242	255	23.1
835	247	260	24.0
850	252	265	24.8
865	257	270	25.6
880	261	275	26.4
900	266	280	27.1
915	271	285	27.8
930	276	290	28.5
950	280	295	29.2
965	285	300	29.8
995	295	310	31.0
1030	304	320	32.2
1060	314	330	33.3
1095	323	340	34.4
1125	333	350	35.5
1155	342	360	36.6
1190	352	370	37.7
1220	361	380	38.8
1255	371	390	39.8
1290	380	400	40.8
1320	390	410	41.8
1350	399	420	42.7
1385	409	430	43.6
1420	418	440	44.5
1455	428	450	45.3

TENSILE STRENGTH	HARDNESS		
MPa	Brinell HB	Vickers HV	Rockwell HRC
1485	437	460	46.1
1520	447	470	46.9
1555	456	480	47.7
1595	466	490	48.4
1630	475	500	49.1
1665	485	510	49.8
1700	494	520	50.5
1740	504	530	51.1
1775	513	540	51.7
1810	523	550	52.3
1845	532	560	53.0
1880	542	570	53.6
1920	551	580	54.1
1955	561	590	54.7
1995	570	600	55.2
2030	580	610	55.7
2070	589	620	56.3
2105	599	630	56.8
2145	608	640	57.3
2180	618	650	57.8
		660	58.3
		670	58.8
		680	59.2
		690	59.7
		700	60.1
		720	61.0
		740	61.8
		760	62.5
		780	63.3
		800	64.0
		820	64.7
		840	65.3
		860	65.9
		880	66.4
		900	67.0
		920	67.5
		940	68.0

Metalcutting Safety

Read before using the tools in this catalog!

Projectile and Fragmentation Hazards:

Modern metalcutting operations involve high spindle and cutter speeds and high temperatures and cutting forces. Hot metal chips may fly off the workpiece during metalcutting. Although cutting tools are designed and manufactured to withstand high cutting forces and temperatures, they can sometimes fragment, particularly if they are subjected to over-stress, severe impact, or other abuse. Many variables affect machining operations. It is impossible to cover every specific situation. The technical information included in this catalog and recommendations on machining practices may not apply to your particular operation. As sold and under normal conditions of use, hardmetal products and tools do not present inhalation, ingestion or other chemical hazards. The health hazards relate only to hardmetal powder. Under normal conditions of use, operations involving hardmetal products and tools do not result in the release of hardmetal powder (either in the form of dusts or fumes) and do not present inhalation, ingestion or other chemical hazards.

To avoid injury:

- Always wear appropriate personal protective equipment, including safety goggles, when operating metalcutting machines or working nearby.
- Always make sure all machine guards are in place.

Breathing and Skin Contact Hazards:

Grinding carbide or other advanced cutting tool materials produces dust or mist containing metallic particles.

To avoid injury:

- If grinding, read the applicable Material Safety Data Sheet and consult General Industry Safety and Health Regulations, Part 1910, Title 29 of the Code of Federal Regulations. These safety instructions are general guidelines.

Although we have attempted to provide current and accurate information herein, we make no representations regarding the accuracy or the completeness of the information and assume no liability for any loss, damage, or injury of any kind which may result from or arise out of the use of or reliance on the information by any person.