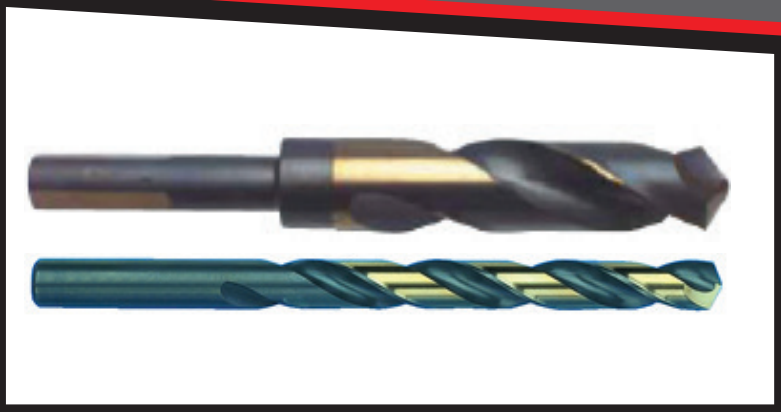
TUFFY SOLUTIONS

2016 CATALOGUE



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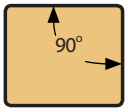
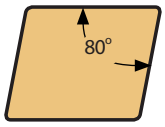
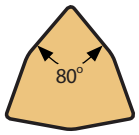
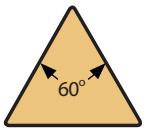
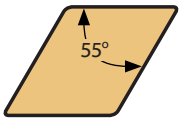
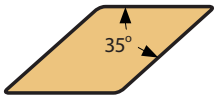
INSERT SELECTION GUIDE

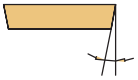
SHAPE | APPLICATION CONTITIONS | CONSIDERATIONS

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 tool-holder 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).

EXAMPLE 1

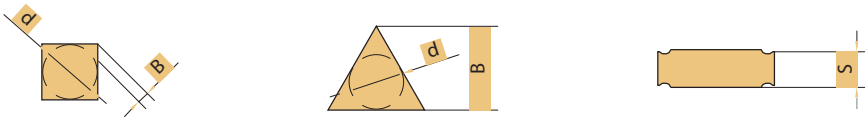
C	N	M	G	4	3	2		–	QM
1	2	3	4	5	6	7	8		9

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

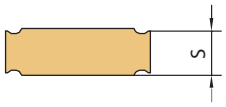
Tolerance Class M, inch				
d	tolerance on 'd'	tolerance on 'B'		
	All Shapes	C, S, T, W Shapes	D Shape	V Shape
7/32	± .002	± .003	± .004	N/A
1/4	± .002	± .003	± .004	± .007
3/8	± .002	± .003	± .004	± .007
1/2	± .003	± .005	± .006	± .010
5/8	± .004	± .006	± .007	N/A
3/4	± .004	± .006	± .007	N/A

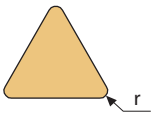
EXAMPLE 2

V	C	G	T	3	3	1		–	GP
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

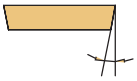
9
Chipbreaker Designation
Indicates the machining properties or chipbreaker features Manufacturer-specific

CODE KEY-ISO DESIGNATION

EXAMPLE 1

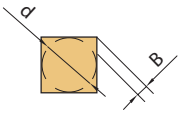
C	N	M	G	12	04	08		–	QM
1	2	3	4	5	6	7	8		9

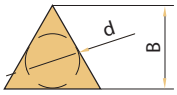
1		
Insert Shape		
C	80⁰ Diamond	
D	55⁰ Diamond	
S	Square	
T	Triangle	
V	35⁰ Diamond	
W	80⁰ Corner Trigon	

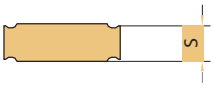
2	
Clearance Angle	
	
B	5⁰ Positive Rake
C	7⁰ Positive Rake
N	0⁰ Negative Rake
P	11⁰ Positive Rake

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

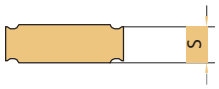
CODE KEY-ISO DESIGNATION

EXAMPLE 2

V	C	G	T	16	04	04		–	GP
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

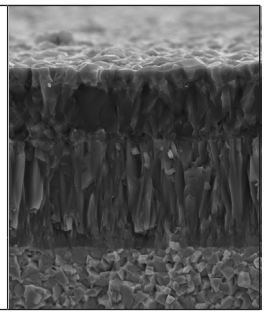
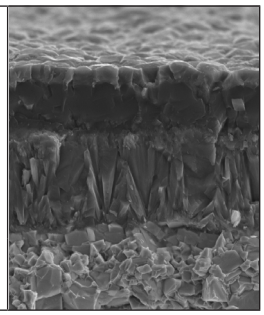
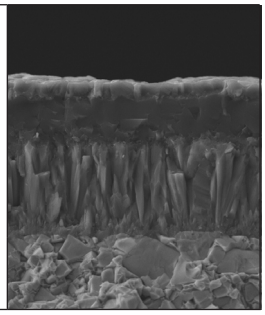
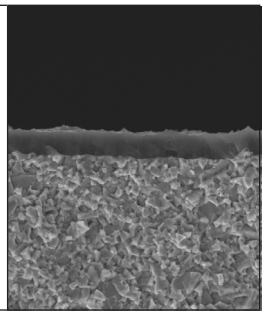
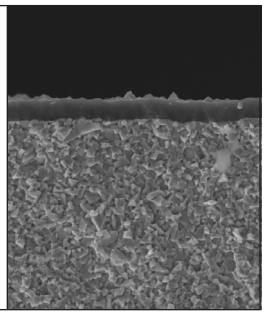
CVD COATING COMPETITORS COMPARISON GRADE CHART

Material	Code	TUFFY	SANDVIK	TAEGU Tec	WALTER	TUNGALOY	MITSUBISHI	ISCAR	KENNAMETAL	SUMITOMO	KYOCERA	DIJET	HITACHI	KORLOY	SECO	ZCC.CT
P	P01		GC4005 GC4205	TT8115	WPP01 WPP05	T9105	UE6105	IC9150 IC8150	KCP05 KCP10	AC810P	CA5505	JC110V	HG8010	NC3010	TP0500 TP1500	
	P10	GP1115	GC4015 GC4215	TT8115 TT8125	WPP01 WPP05 WPP10 WAK20	T9105 T9115	UE6105 UE6110	IC9150 IC8150 IC428 IC5005	KCP10 TN7005 TN7010	AC810P AC820P	CA5505 CA5515 CA5525	JC110V JC215V	HG8010 GM8020	NC3010 NC3220	TP0500 TP1500 TP2500	YBC152 YBC151
	P20	GP1125 GP1225	GC4015 GC4225 GC4025 GC4215 LC25	TT8125 TT5100	WPP10 WPP20	T9115 T9125 T9015	UE6110 UE6010 UE6020	IC9250 IC8250 IC9150 IC8150	KCP25 TN7015	AC820P AC830P	CA5515 CA5525 CA5025 CR9025	JC110V JC215V	HG8025 GM8020	NC3220 NC3120 NC5330	TP1500 TP2500 TP200 TP2000	YBC251 YBC252
	P30	GP1225 GP1135	GC4225 GC4235 GC4025 GC4035 GC2135	TT8125 TT8135 TT5100 TT7100	WPP20 WPP30	T9125 T9135 T9025	UE6020 UE6035 UH6400	IC8350 IC9350 IC656	KCP30 TN7025	AC820P AC830P	CA5525 CA5535 CR9025	JC215V JC325V	HG8025 GM8020 GM25 GM8035	NC3220 NC3030 NC5330 NC500H	TP2500 TP3500 TP300 TP3000	YBC252 YBC351
	P40	GP1135	GC4235 GC4035 GC235	TT8135 TT7100	WPP30 WAK30	T9135	UE6035 UH6400	IC9350 IC635	KCP40	AC830P	CA5535	JC325V	GM8035 GX30	NC5330 NC500H	TP3500 TP40	YBC351
M	M10		GC2015	TT9215		T9115	MC7015 US7020	IC6015 IC8150	KCM15 TN7010	AC610M	CA6515	JC110V	HG8025		TM2000	
	M20	GM1125	GC2015 GC2025	TT9215 TT9225		T6120 T9125 T6020	MC7015 MC7025 US7020	IC6015 IC6025 IC8250	KCM15 KCM25 TN7015	AC610M AC630M	CA6525 CA6515	JC110V JC605X	HG8025 GM25 GM8035		TM2000 TM4000	YBM151 YBM153
	M30		GC2135 GC235	TT9225 TT9235		T6130 T6030	MC7025 US735	IC6025 IC8350	KCM25 KCM35 TN8025	AC630M AC830P	CA6525	JC525X	GM25 GM8035 GX30	NC9025	TM4000 TP40	YBM151 YBC251
	M40		GC235	TT9235			US735	IC656 IC635	KCM35			JC525X	GX30	NC9025	TM4000 TP40	YBM253
K	K01		GC3205 GC3210	TT7005	WAK10	T5105	UC5105 MC5005	IC5005 IC8150	KCP05 KCP10 KCK05	AC405K ACK410	CA4010 CA4505	JC105V	GX3505	NC6205	TK1001 TH1500 TK1000	YBD052
	K10	GK1115	GC3205 GC3210 GC3015	TT7015 TT7005	WAK10 WPP05	T5105 T5115	UC5105 UC5115 MC5005 MC5015	IC5005 IC5010	KCK15 TN5015	AC415K AC415K ACK410 ACK420	CA4505 CA4515 CA4010 AC4115 CA4120	JC110V	HX3505 HX3515	NC6025 NC6210	TK1001 TK2001 TK2000 TP0500 TP1500	YBD102 YBD151
	K20	GK1115 GK1125	GC3215	TT7015 TT7310	WAK10 WAK20 WPP10	T5115 T5125	UC5115 MC5015	IC5010	KCK20 KCP25	AC415K AC420K	CA4515 CA4115 CA4120	JC215V	HX3515 HG8010 GM8020	NC6210 NC315K	TK2001 TP2500	YBD152 YBD252
	K30	GK1125 GK1125			WAK20 WAK30 WPP20	T5125	MC5015			AK420K AC820P	CA4120		GM8020 HG8025	NC5330	TP3500 TP200	

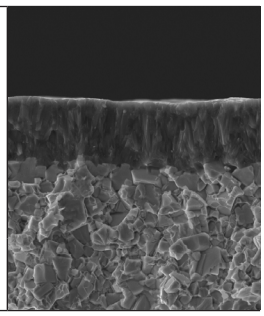
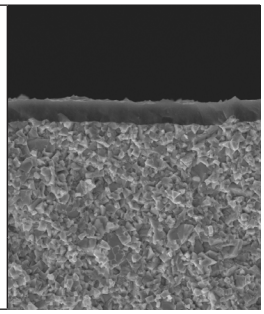
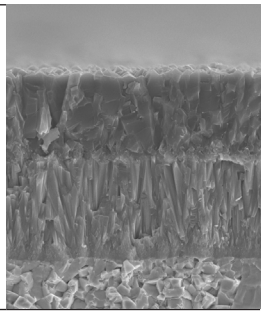
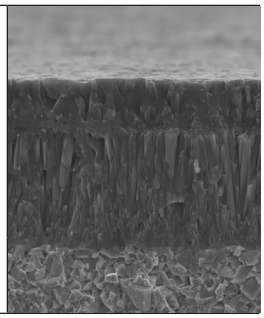
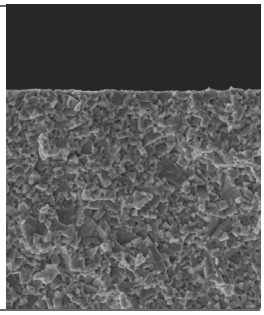
WORKPIECE MATERIAL	ANSI	ISO	Coating Type: CVD	Coating Type: PVD
P Steel	C8	01	GP1115	
	C7	10	GP1225	
	C6	20	GP1135	
		30		
		40		
M Stainless Steel	–	01	GM1125	GS3115
	–	10		
	–	20		GM3125
	–	30		
K Cast Iron	C4	01	GK1115	
	C3	10	GK1125	
	C2	20		
	C1	30		
S Heat-Resistant Super Alloys	–	01		GS3115
	–	10		
	–	20		
	–	30		

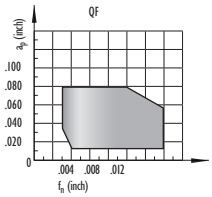
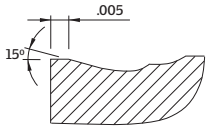
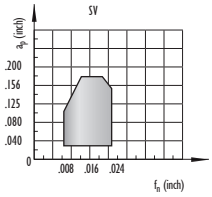
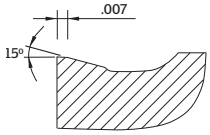
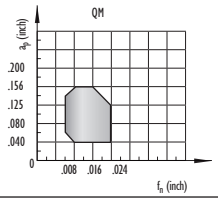
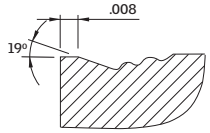
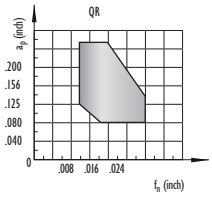
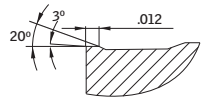
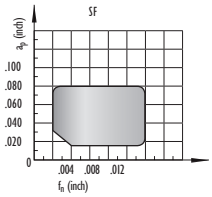
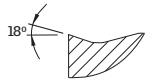
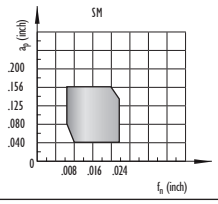
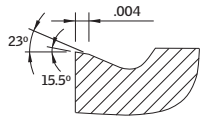
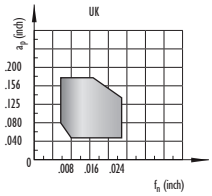
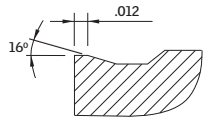
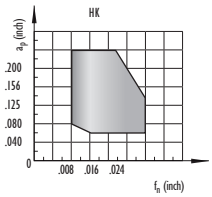
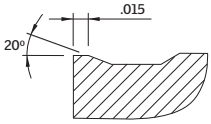
wear resistance ↔ toughness

GRADE APPLICATIONS

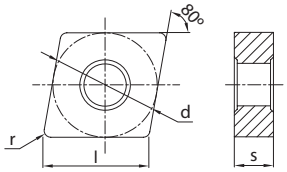
Grade / Application Area	Description	Microstructure
GP1115 Finishing and Semi-finishing P STEEL	*"First Choice"* for Finishing Applications in Steel (ISO P Materials). Triple-Coated MT-CVD Grade with Superfine TiCN, Thick Al_2O_3, and Ultra-Smooth TiN. Gradient-sintered high performance cemented carbide substrate with very high wear resistance. Performs extremely well in continuous cutting conditions and stable set-ups.	
GP1225 Semi-finishing to Light Roughing P STEEL	*"First Choice"* for Medium Turning Applications in Steel (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.	
GP1135 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.	
GP3125 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.	
GS3115 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 APPLICATIONS

Grade / Application Area	Description	Microstructure
GM1125 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.	
GM3125 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.	
GK1115 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.	
GK1125 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.	
GN9125 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.	

Chipbreaker	Description	Chipbreaker Range	Design
QF P STEEL	• Butterfly geometry directs chip flow • Variable Rake Angle • Curved Edgeline • Excellent chip control at small depths of cut • High quality surface finish		
SV 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		
QM 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		
QR 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		
SF 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		
SM M STAINLESS STEEL	• Double-positive chipbreaker design • Strengthened positive land • Micro-edge geometry for Stainless Steel • Reduced workhardening effect • Wide application range / medium turning		
UK 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		
HK 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-QF



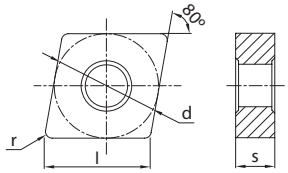
Most popular shape / style of insert. All-purpose turning, facing and boring.

QF: 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	GP1115	GP1225		
								EDP#			
CNMG 321-QF	CNMG 090304-QF	3/8	.381	1/8	1/64	.010 - .062	.003 - .010	705488	705152		
CNMG 322-QF	CNMG 090308-QF	3/8	.381	1/8	1/32	.016 - .080	.004 - .014	705492	705154		
CNMG 431-QF	CNMG 120404-QF	1/2	.508	3/16	1/64	.010 - .062	.003 - .010	705358	705157		
CNMG 432-QF	CNMG 120408-QF	1/2	.508	3/16	1/32	.016 - .080	.004 - .014	705456	705161		

Ordering Example: 20 pcs CNMG 432-QF GP1115

CNMG-SV



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

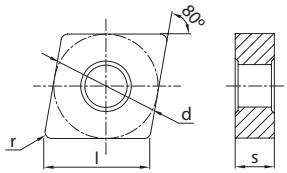
SV: Sharp Edge Geometry for shaft turning, boring and unstable workpieces. Performs well in a wide range of depths of cut.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP1225			
								EDP#			
CNMG 432R-SV	CNMG 120408R-SV	1/2	.508	3/16	1/32	.031 - .187	.004 - .018	705500			
CNMG 432L-SV	CNMG 120408L-SV	1/2	.508	3/16	1/32	.031 - .187	.004 - .018	705499			

Ordering Example: 20 pcs CNMG 432L-SV GP1225

NOTE: SV 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.

CNMG-QM



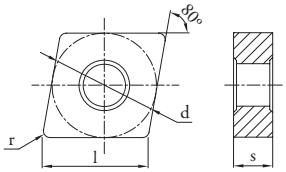
Most popular shape / style of insert. All-purpose turning, facing and boring.

QM: 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	GP1115	GP1225		
								EDP#			
CNMG 321-QM	CNMG 090304-QM	3/8	.381	1/8	1/64	.031 - .094	.004 - .016	705489	705490		
CNMG 322-QM	CNMG 090308-QM	3/8	.381	1/8	1/32	.031 - .125	.004 - .016	705493	705494		
CNMG 431-QM	CNMG 120404-QM	1/2	.508	3/16	1/64	.031 - .125	.004 - .016	705495	705496		
CNMG 432-QM	CNMG 120408-QM	1/2	.508	3/16	1/32	.031 - .156	.004 - .016	705457	705458		
CNMG 433-QM	CNMG 120412-QM	1/2	.508	3/16	3/64	.031 - .156	.004 - .016	705504	705505		
CNMG 434-QM	CNMG 120416-QM	1/2	.508	3/16	1/16	.040 - .187	.004 - .016		705506		
CNMG 542-QM	CNMG 160608-QM	5/8	.635	1/4	1/32	.031 - .156	.004 - .016	705508	705509		
CNMG 543-QM	CNMG 160612-QM	5/8	.635	1/4	3/64	.031 - .156	.004 - .016	705511	705512		
CNMG 642-QM	CNMG 190608-QM	3/4	.762	1/4	1/32	.031 - .156	.004 - .016	705515	705516		
CNMG 643-QM	CNMG 190612-QM	3/4	.762	1/4	3/64	.031 - .156	.004 - .016	705518	705519		
CNMG 644-QM	CNMG 190616-QM	3/4	.762	1/4	1/16	.062 - .187	.006 - .018		705521		

Ordering Example: 20 pcs CNMG 644-QM GP1225

CNMG-QR



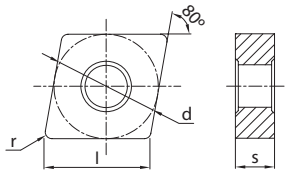
Most popular shape / style of insert. All-purpose turning, facing and boring.

QR: 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	GP1225	GP1135		
								EDP#			
CNMG 432-QR	CNMG 120408-QR	1/2	.508	3/16	1/32	.028 - .219	.007 - .020	**705159**	**705802**		
CNMG 433-QR	CNMG 120412-QR	1/2	.508	3/16	3/64	.040 - .219	.008 - .022	**705164**	**705803**		
CNMG 543-QR	CNMG 160612-QR	5/8	.635	1/4	3/64	.040 - .266	.008 - .022	**705173**	**705804**		
CNMG 544-QR	CNMG 160616-QR	5/8	.635	1/4	1/16	.055 - .266	.009 - .026		**705805**		
CNMG 643-QR	CNMG 190612-QR	3/4	.762	1/4	3/64	.040 - .328	.008 - .022	**705180**	**705806**		
CNMG 644-QR	CNMG 190616-QR	3/4	.762	1/4	1/16	.055 - .328	.009 - .026		**705807**		

Ordering Example: 20 pcs CNMG 644-QR GP1135

CNMG-SM



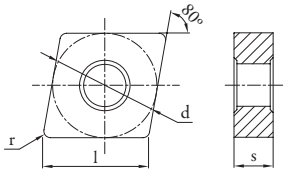
Most popular shape / style of insert. All-purpose turning, facing and boring.

SM: 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	GM1125	GM3125		
								EDP#			
CNMG 321-SM	CNMG 090304-SM	3/8	.381	1/8	1/64	.016 - .094	.004 - .012	705153	705491		
CNMG 322-SM	CNMG 090308-SM	3/8	.381	1/8	1/32	.031 - .125	.005 - .016	705155	705156		
CNMG 431-SM	CNMG 120404-SM	1/2	.508	3/16	1/64	.016 - .094	.004 - .012	705158	705497		
CNMG 432-SM	CNMG 120408-SM	1/2	.508	3/16	1/32	.031 - .125	.005 - .016	705162	705163		
CNMG 433-SM	CNMG 120412-SM	1/2	.508	3/16	3/64	.031 - .156	.006 - .020	705166	705167		
CNMG 434-SM	CNMG 120416-SM	1/2	.508	3/16	1/16	.047 - .156	.007 - .026	705507	705169		
CNMG 542-SM	CNMG 160608-SM	5/8	.635	1/4	1/32	.031 - .187	.005 - .016	705172	705510		
CNMG 543-SM	CNMG 160612-SM	5/8	.635	1/4	3/64	.031 - .219	.006 - .020	705513	705175		
CNMG 544-SM	CNMG 160616-SM	5/8	.635	1/4	1/16	.062 - .219	.007 - .026	705514	705178		
CNMG 642-SM	CNMG 190608-SM	3/4	.762	1/4	1/32	.031 - .219	.005 - .016	705517	705179		
CNMG 643-SM	CNMG 190612-SM	3/4	.762	1/4	3/64	.031 - .250	.006 - .020	705520	705182		
CNMG 644-SM	CNMG 190616-SM	3/4	.762	1/4	1/16	.062 - .250	.007 - .026	705522	705185		

Ordering Example: 20 pcs CNMG 644-SM GM1125

CNMG-SF



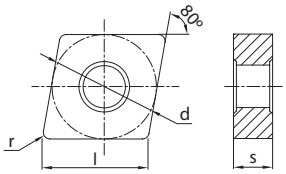
Most popular shape / style of insert. All-purpose turning, facing and boring.

SF: 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	GS3115			
								EDP#			
CNMG 431-SF	CNMG 120404-SF	1/2	.508	3/16	1/64	.004 - .062	.003 - .012	**705785**			
CNMG 432-SF	CNMG 120408-SF	1/2	.508	3/16	1/32	.004 - .062	.004 - .016	**705786**			

Ordering Example: 20 pcs CNMG 432-SF GS3115 NOTE: The primary application area for grade GS3115 is in stainless steel workpiece materials. GS3115 is also suitable for use with iron-based, cobalt-based and nickel-based Heat Resistant Super Alloys.

CNMG-UK



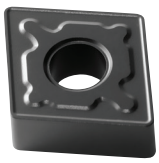
Most popular shape / style of insert. All-purpose turning, facing and boring.

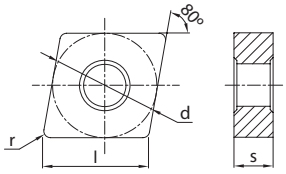
UK: Lower cutting force geometry for Cast Iron.
Edge geometry reduces cutting forces in moderate conditions / lighter cuts.

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	GK1115	GK1125		
								EDP#			
CNMG 431-UK	CNMG 120404-UK	1/2	.508	3/16	1/64	.020 - .156	.003 - .016	705359	705498		
CNMG 432-UK	CNMG 120408-UK	1/2	.508	3/16	1/32	.031 - .156	.004 - .016	705501	705502		

Ordering Example: 20 pcs CNMG 432-UK GK1115

CNMG-HK





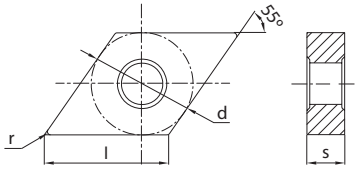
Most popular shape / style of insert. All-purpose turning, facing and boring.

HK: 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	GK1115	GK1125		
								EDP#			
CNMG 432-HK	CNMG 120408-HK	1/2	.508	3/16	1/32	.031 - .187	.004 - .016	705362	705160		
CNMG 433-HK	CNMG 120412-HK	1/2	.508	3/16	3/64	.031 - .187	.006 - .020	705503	705165		
CNMG 543-HK	CNMG 160612-HK	5/8	.635	1/4	3/64	.047 - .219	.006 - .020	705370	705174		
CNMG 544-HK	CNMG 160616-HK	5/8	.635	1/4	1/16	.062 - .219	.008 - .026		705177		
CNMG 643-HK	CNMG 190612-HK	3/4	.762	1/4	3/64	.062 - .250	.006 - .020	705372	705181		
CNMG 644-HK	CNMG 190616-HK	3/4	.762	1/4	1/16	.087 - .250	.008 - .026		705184		

Ordering Example: 20 pcs CNMG 644-HK GK1125

DNMG-QF



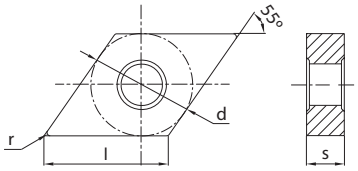
Use for profile turning, copy turning, and semi-finishing. Can turn more complex shapes due to 55° included angle.

QF: 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	GP1115	GP1225		
								EPD#			
DNMG 331-QF	DNMG 110404-QF	3/8	.458	3/16	1/64	.010 - .062	.003 - .010	705553	705186		
DNMG 332-QF	DNMG 110408-QF	3/8	.458	3/16	1/32	.016 - .080	.004 - .014	705557	705187		
DNMG 431-QF	DNMG 150404-QF	1/2	.610	3/16	1/64	.010 - .062	.003 - .010	705563	705191		
DNMG 432-QF	DNMG 150408-QF	1/2	.610	3/16	1/32	.016 - .080	.004 - .014	705569	705195		

Ordering Example: 20 pcs DNMG 432-QF GP1115

DNMG-QM



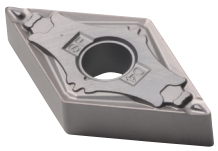
Use for profile turning, copy turning, and semi-finishing. Can turn more complex shapes due to 55° included angle.

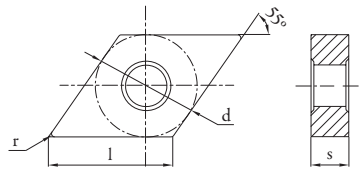
QM: First Choice Geometry for medium to semi-roughing applications in all types of Steel.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP1115	GP1225		
								EDP#			
DNMG 331-QM	DNMG 110404-QM	3/8	.458	3/16	1/64	.031 - .094	.004 - .016	705554	705555		
DNMG 332-QM	DNMG 110408-QM	3/8	.458	3/16	1/32	.031 - .125	.004 - .016	705558	705559		
DNMG 333-QM	DNMG 110412-QM	3/8	.458	3/16	3/64	.031 - .125	.004 - .016	705560	705561		
DNMG 431-QM	DNMG 150404-QM	1/2	.610	3/16	1/64	.031 - .125	.004 - .016	705564	705565		
DNMG 432-QM	DNMG 150408-QM	1/2	.610	3/16	1/32	.031 - .156	.004 - .016	705570	705571		
DNMG 433-QM	DNMG 150412-QM	1/2	.610	3/16	3/64	.031 - .156	.004 - .016	705575	705576		

Ordering Example: 20 pcs DNMG 433-QM GP1115

DNMG-SF





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

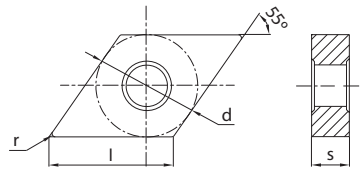
SF: Ultra-sharp cutting edge geometry for finishing in Stainless Steels. Low cutting forces and superior workpiece surface finish without burrs.

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	GS3115			
								EDP#			
DNMG 431-SF	DNMG 150404-SF	1/2	.610	3/16	1/64	.004 - .062	.003 - .012	**705823**			
DNMG 432-SF	DNMG 150408-SF	1/2	.610	3/16	1/32	.004 - .062	.004 - .016	**705824**			

Ordering Example: 20 pcs DNMG 432-SF GS3115

NOTE: The primary application area for grade GS3115 is in stainless steel workpiece materials. GS3115 is also suitable for use with iron-based, cobalt-based and nickel-based Heat Resistant Super Alloys.

DNMG-SM



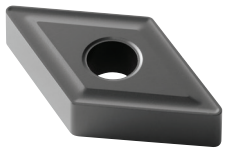
Use for profile turning, copy turning, and semi-finishing. Can turn more complex shapes due to 55° included angle.

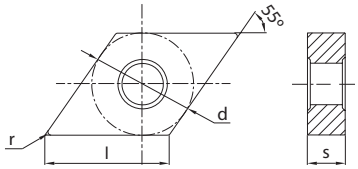
SM: Keen edge geometry especially for Stainless Steel. Unique edgeline reduces work hardening. Semi-finishing to rough machining.

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	GM1125	GM3125		
								EDP#			
DNMG 331-SM	DNMG 110404-SM	3/8	.458	3/16	1/64	.016 - .094	.004 - .012	705556			
DNMG 332-SM	DNMG 110408-SM	3/8	.458	3/16	1/32	.031 - .125	.005 - .016	705188	705189		
DNMG 333-SM	DNMG 110412-SM	3/8	.458	3/16	3/64	.031 - .156	.006 - .020	705562	705190		
DNMG 431-SM	DNMG 150404-SM	1/2	.610	3/16	1/64	.016 - .094	.004 - .012	705192	705566		
DNMG 432-SM	DNMG 150408-SM	1/2	.610	3/16	1/32	.031 - .125	.005 - .016	705196	705197		
DNMG 433-SM	DNMG 150412-SM	1/2	.610	3/16	3/64	.031 - .156	.006 - .020	705577	705200		

Ordering Example: 20 pcs DNMG 433-SM GM1125

DNMG-UK





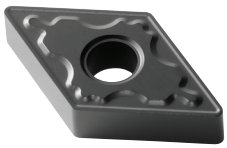
Use for profile turning, copy turning, and semi-finishing. Can turn more complex shapes due to 55° included angle.

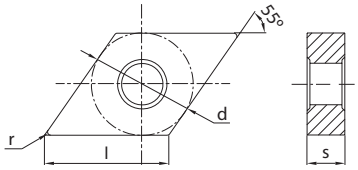
UK: Lower cutting force geometry for Cast Iron.
Edge geometry reduces cutting forces in moderate conditions / lighter cuts.

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	GK1115	GK1125		
								EDP#			
DNMG 431-UK	DNMG 150404-UK	1/2	.610	3/16	1/64	.020 - .156	.003 - .016	705567	705568		
DNMG 432-UK	DNMG 150408-UK	1/2	.610	3/16	1/32	.031 - .156	.004 - .016	705572	705573		

Ordering Example: 20 pcs DNMG 432-UK GK1115

DNMG-HK





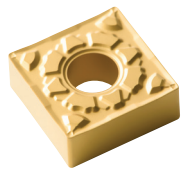
Use for profile turning, copy turning, and semi-finishing. Can turn more complex shapes due to 55° included angle.

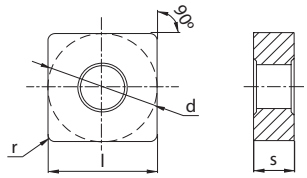
HK: Exceptionally broad application range geometry primarily for Cast Iron. Strong cutting edge, excellent durability. Semi-finishing to roughing.

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	GK1115	GK1125		
								EDP#			
DNMG 432-HK	DNMG 150408-HK	1/2	.610	3/16	1/32	.031 - .187	.004 - .016	705441	705194		
DNMG 433-HK	DNMG 150412-HK	1/2	.610	3/16	3/64	.031 - .187	.006 - .020	705574	705199		

Ordering Example: 20 pcs DNMG 433-HK GK1115

SNMG-QF





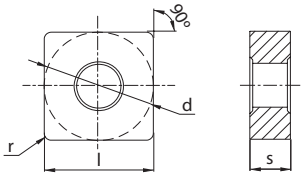
Excellent economy due to 8 cutting edges. Strong insert shape. Mainly for rough facing and chamfering (not turning to a shoulder).

QF: 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	GP1115	GP1125		
								EDP#			
SNMG 321-QF	SNMG 090304-QF	3/8	.375	1/8	1/64	.010 - .062	.003 - .010	705585	705586		
SNMG 322-QF	SNMG 090308-QF	3/8	.375	1/8	1/32	.016 - .080	.004 - .014	705590	705591		
SNMG 431-QF	SNMG 120404-QF	1/2	.500	3/16	1/64	.010 - .062	.003 - .010	705594	705595		
SNMG 432-QF	SNMG 120408-QF	1/2	.500	3/16	1/32	.016 - .080	.004 - .014	705600	705601		

Ordering Example: 20 pcs SNMG 432-QF GP1115

SNMG-SV



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

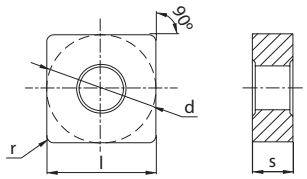
SV: Sharp Edge Geometry for turning and facing unstable workpieces. Can handle a wide range of depths of cut.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP1225			
								EDP#			
SNMG 432R-SV	SNMG 120408R-SV	1/2	.500	3/16	1/32	.031 - .187	.004 - .018	705604			
SNMG 432L-SV	SNMG 120408L-SV	1/2	.500	3/16	1/32	.031 - .187	.004 - .018	705599			

Ordering Example: 20 pcs SNMG 432L-SV GP1225

NOTE: SV 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.

SNMG-QM



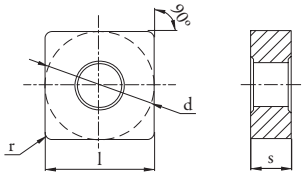
Excellent economy due to 8 cutting edges. Strong insert shape. Mainly for rough facing and chamfering (not turning to a shoulder).

QM: 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	GP1115	GP1225		
								EDP#			
SNMG 321-QM	SNMG 090304-QM	3/8	.375	1/8	1/64	.031 - .094	.004 - .016	705587	705588		
SNMG 322-QM	SNMG 090308-QM	3/8	.375	1/8	1/32	.031 - .125	.004 - .016	705592	705593		
SNMG 431-QM	SNMG 120404-QM	1/2	.500	3/16	1/64	.031 - .125	.004 - .016	705596	705597		
SNMG 432-QM	SNMG 120408-QM	1/2	.500	3/16	1/32	.031 - .156	.004 - .016	705602	705603		
SNMG 433-QM	SNMG 120412-QM	1/2	.500	3/16	3/64	.031 - .156	.004 - .016	705606	705607		
SNMG 434-QM	SNMG 120416-QM	1/2	.500	3/16	1/16	.040 - .187	.004 - .018		705609		
SNMG 542-QM	SNMG 150608-QM	5/8	.625	1/4	1/32	.031 - .156	.004 - .016	705611	705612		
SNMG 543-QM	SNMG 150612-QM	5/8	.625	1/4	3/64	.031 - .156	.004 - .016	705616	705617		
SNMG 643-QM	SNMG 190612-QM	3/4	.750	1/4	3/64	.031 - .156	.004 - .016	705624	705625		

Ordering Example: 20 pcs SNMG 643-QM GP1115

SNMG-QR



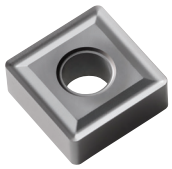
Excellent economy due to 8 cutting edges. Strong insert shape. Mainly for rough facing and chamfering (not turning to a shoulder).

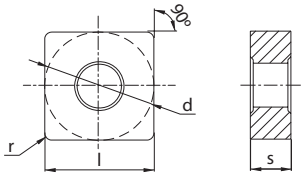
QR: Strong cutting edge geometry for roughing applications in all types of Steel. Well suited for unstable conditions and interrupted cuts.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP1225	GP1135		
								EDP#			
SNMG 432-QR	SNMG 120408-QR	1/2	.500	3/16	1/32	.028 - .219	.007 - .020	**705247**	**705808**		
SNMG 433-QR	SNMG 120412-QR	1/2	.500	3/16	3/64	.040 - .219	.008 - .022		**705809**		
SNMG 543-QR	SNMG 150612-QR	5/8	.625	1/4	3/64	.040 - .266	.008 - .022	**705259**	**705810**		
SNMG 544-QR	SNMG 150616-QR	5/8	.625	1/4	1/16	.055 - .266	.009 - .026		**705811**		
SNMG 643-QR	SNMG 190612-QR	3/4	.750	1/4	3/64	.040 - .328	.008 - .022	**705261**	**705812**		
SNMG 644-QR	SNMG 190616-QR	3/4	.750	1/4	1/16	.055 - .328	.009 - .026		**705813**		

Ordering Example: 20 pcs SNMG 644-QR GP1135

SNMG-SM





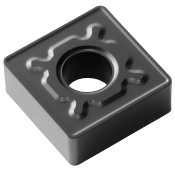
Excellent economy due to 8 cutting edges. Strong insert shape. Mainly for rough facing and chamfering (not turning to a shoulder).

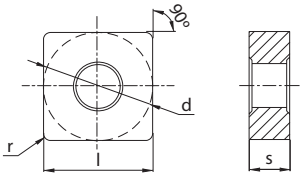
SM: Keen edge geometry especially for Stainless Steel. Unique edgeline reduces work hardening. Semi-finishing to rough machining.

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	GM1125	GM3125		
								EDP#			
SNMG 321-SM	SNMG 090304-SM	3/8	.375	1/8	1/64	.016 - .094	.004 - .012	705243	705589		
SNMG 322-SM	SNMG 090308-SM	3/8	.375	1/8	1/32	.031 - .125	.005 - .016	705244	705245		
SNMG 431-SM	SNMG 120404-SM	1/2	.500	3/16	1/64	.016 - .125	.004 - .012	705246	705598		
SNMG 432-SM	SNMG 120408-SM	1/2	.500	3/16	1/32	.031 - .156	.005 - .016	705249	705250		
SNMG 433-SM	SNMG 120412-SM	1/2	.500	3/16	3/64	.031 - .156	.006 - .020	705608	705253		
SNMG 434-SM	SNMG 120416-SM	1/2	.500	3/16	1/16	.047 - .187	.007 - .026	705610	705256		
SNMG 542-SM	SNMG 150608-SM	5/8	.625	1/4	1/32	.031 - .187	.005 - .016	705613	705614		
SNMG 543-SM	SNMG 150612-SM	5/8	.625	1/4	3/64	.031 - .219	.006 - .022	705618	705619		
SNMG 544-SM	SNMG 150616-SM	5/8	.625	1/4	1/16	.047 - .219	.007 - .026	705621	705622		
SNMG 643-SM	SNMG 190612-SM	3/4	.750	1/4	3/64	.031 - .250	.006 - .022	705626	705627		
SNMG 644-SM	SNMG 190616-SM	3/4	.750	1/4	1/16	.047 - .250	.007 - .026	705628	705629		

Ordering Example: 20 pcs SNMG 644-SM GM1125

SNMG-HK





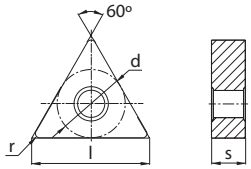
Excellent economy due to 8 cutting edges. Strong insert shape. Mainly for rough facing and chamfering (not turning to a shoulder).

HK: 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	GK1115	GK1125		
								EDP#			
SNMG 432-HK	SNMG 120408-HK	1/2	.500	3/16	1/32	.031 - .187	.004 - .016	705444	705248		
SNMG 433-HK	SNMG 120412-HK	1/2	.500	3/16	3/64	.031 - .187	.006 - .020	705605	705252		
SNMG 434-HK	SNMG 120416-HK	1/2	.500	3/16	1/16	.062 - .219	.006 - .026		705255		
SNMG 543-HK	SNMG 150612-HK	5/8	.625	1/4	3/64	.047 - .219	.006 - .020	705615	705260		
SNMG 544-HK	SNMG 150616-HK	5/8	.625	1/4	1/16	.062 - .219	.006 - .026		705620		
SNMG 643-HK	SNMG 190612-HK	3/4	.750	1/4	3/64	.062 - .250	.006 - .020	705623	705262		
SNMG 644-HK	SNMG 190616-HK	3/4	.750	1/4	1/16	.087 - .250	.006 - .026		705264		

Ordering Example: 20 pcs SNMG 644-HK GK1125

TNMG-QF



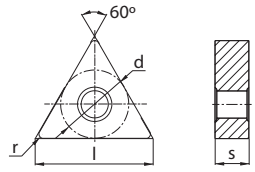
Economical insert, 6 cutting edges. General purpose turning, facing and boring. Extra long cutting edge useful when turning to shoulders

QF: 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	GP1115	GP1225		
								EDP#			
TNMG 331-QF	TNMG 160404-QF	3/8	.650	3/16	1/64	.010 - .062	.003 - .010	705655	705301		
TNMG 332-QF	TNMG 160408-QF	3/8	.650	3/16	1/32	.016 - .080	.004 - .014	705663	705303		
TNMG 431-QF	TNMG 220404-QF	1/2	.866	3/16	1/64	.010 - .062	.003 - .010	705674	705307		
TNMG 432-QF	TNMG 220408-QF	1/2	.866	3/16	1/32	.016 - .080	.004 - .014	705676	705310		

Ordering Example: 20 pcs TNMG 432-QF GP1115

TNMG-SV



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

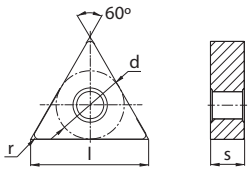
SV: Sharp Edge Geometry for shaft turning, boring and unstable workpieces. Can handle a wide range of depths of cut.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP1225			
								EDP#			
TNMG 331R-SV	TNMG 160404R-SV	3/8	.650	3/16	1/64	.031 - .156	.004 - .016	705658			
TNMG 331L-SV	TNMG 160404L-SV	3/8	.650	3/16	1/64	.031 - .156	.004 - .016	705654			
TNMG 332R-SV	TNMG 160408R-SV	3/8	.650	3/16	1/32	.031 - .187	.004 - .018	705666			
TNMG 332L-SV	TNMG 160408L-SV	3/8	.650	3/16	1/32	.031 - .187	.004 - .018	705662			

Ordering Example: 20 pcs TNMG 332L-SV GP1225

NOTE: SV 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.

TNMG-QM



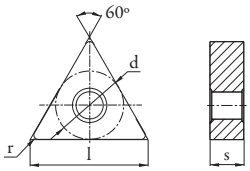
Economical insert, 6 cutting edges. General purpose turning, facing and boring. Extra long cutting edge useful when turning to shoulders.

QM: 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	GP1115	GP1225		
								EDP#			
TNMG 221-QM	TNMG 110304-QM	1/4	.433	1/8	1/64	.031 - .094	.004 - .014	705650	705651		
TNMG 222-QM	TNMG 110308-QM	1/4	.433	1/8	1/32	.031 - .094	.004 - .014	705652	705653		
TNMG 331-QM	TNMG 160404-QM	3/8	.650	3/16	1/64	.031 - .094	.004 - .016	705656	705657		
TNMG 332-QM	TNMG 160408-QM	3/8	.650	3/16	1/32	.031 - .125	.004 - .016	705664	705665		
TNMG 333-QM	TNMG 160412-QM	3/8	.650	3/16	3/64	.031 - .156	.004 - .016	705671	705672		
TNMG 432-QM	TNMG 220408-QM	1/2	.866	3/16	1/32	.031 - .156	.004 - .016	705677	705678		
TNMG 433-QM	TNMG 220412-QM	1/2	.866	3/16	3/64	.031 - .156	.004 - .016	705680	705681		
TNMG 434-QM	TNMG 220416-QM	1/2	.866	3/16	1/16	.040 - .187	.004 - .018		705683		

Ordering Example: 20 pcs TNMG 434-QM GP1225

TNMG-QR



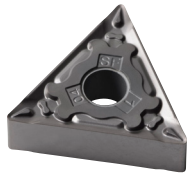
Economical insert, 6 cutting edges. General purpose turning, facing and boring. Extra long cutting edge useful when turning to shoulders.

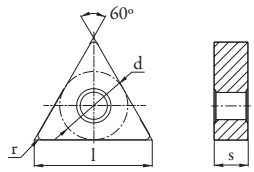
QR: Strong cutting edge geometry for roughing applications in all types of Steel. Well suited for unstable conditions and interrupted cuts.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP1225	GP1135		
								EDP#			
TNMG 433-QR	TNMG 220412-QR	1/2	.866	3/16	3/64	.040 - .219	.008 - .022	705313	705814		
TNMG 434-QR	TNMG 220416-QR	1/2	.866	3/16	1/16	.055 - .219	.009 - .026		705815		
TNMG 543-QR	TNMG 270612-QR	5/8	1.083	1/4	3/64	.040 - .328	.008 - .022	705817	705816		
TNMG 544-QR	TNMG 270616-QR	5/8	1.083	1/4	1/16	.055 - .328	.009 - .026		705818		

Ordering Example: 20 pcs TNMG 544-QR GP1135

TNMG-SF





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

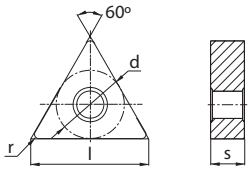
SF: Ultra-sharp cutting edge geometry for finishing in Stainless Steels. Low cutting forces and superior workpiece surface finish without burrs.

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	GS3115			
								EDP#			
TNMG 331-SF	TNMG 160404-SF	3/8	.650	3/16	1/64	.004 - .062	.003 - .012	**705825**			
TNMG 332-SF	TNMG 160408-SF	3/8	.650	3/16	1/32	.004 - .062	.004 - .016	**705826**			

Ordering Example: 20 pcs TNMG 332-SF GS3115

NOTE: The primary application area for grade GS3115 is in stainless steel workpiece materials. GS3115 is also suitable for use with iron-based, cobalt-based and nickel-based Heat Resistant Super Alloys.

TNMG-SM



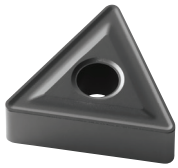
Economical insert, 6 cutting edges. General purpose turning, facing and boring. Extra long cutting edge useful when turning to shoulders.

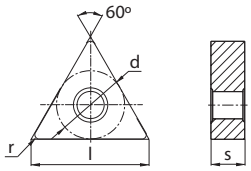
SM: Keen edge geometry especially for Stainless Steel. Unique edgeline reduces work hardening. Semi-finishing to rough machining.

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	GM1125	GM3125		
								EDP#			
TNMG 331-SM	TNMG 160404-SM	3/8	.650	3/16	1/64	.016 - .094	.004 - .012	705302	705124		
TNMG 332-SM	TNMG 160408-SM	3/8	.650	3/16	1/32	.031 - .125	.005 - .016	705304	705305		
TNMG 333-SM	TNMG 160412-SM	3/8	.650	3/16	3/64	.031 - .156	.006 - .020	705673	705306		
TNMG 432-SM	TNMG 220408-SM	1/2	.866	3/16	1/32	.031 - .125	.005 - .016	705311	705312		
TNMG 433-SM	TNMG 220412-SM	1/2	.866	3/16	3/64	.031 - .187	.006 - .020	705315	705316		
TNMG 434-SM	TNMG 220416-SM	1/2	.866	3/16	1/16	.047 - .219	.007 - .026	705684	705318		

Ordering Example: 20 pcs TNMG 434-SM GM1125

TNMG-UK





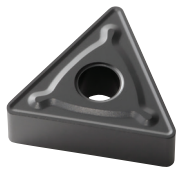
Economical insert, 6 cutting edges. General purpose turning, facing and boring. Extra long cutting edge useful when turning to shoulders.

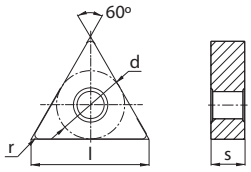
UK: Lower cutting force geometry for Cast Iron.
Edge geometry reduces cutting forces in moderate conditions / lighter cuts.

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	GK1115	GK1125		
								EDP#			
TNMG 331-UK	TNMG 160404-UK	3/8	.650	3/16	1/64	.020 - .156	.003 - .016	705659	705660		
TNMG 332-UK	TNMG 160408-UK	3/8	.650	3/16	1/32	.031 - .156	.004 - .016	705667	705668		

Ordering Example: 20 pcs TNMG 332-UK GK1115

TNMG-HK





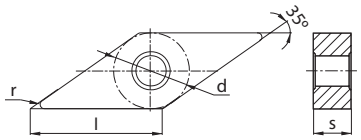
Economical insert, 6 cutting edges. General purpose turning, facing and boring. Extra long cutting edge useful when turning to shoulders.

HK: 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	GK1115	GK1125		
								EDP#			
TNMG 332-HK	TNMG 160408-HK	3/8	.650	3/16	1/32	.031 - .187	.004 - .016	705436	705661		
TNMG 333-HK	TNMG 160412-HK	3/8	.650	3/16	3/64	.031 - .187	.006 - .020	705669	705670		
TNMG 432-HK	TNMG 220408-HK	1/2	.866	3/16	1/32	.031 - .187	.004 - .016	705675	705309		
TNMG 433-HK	TNMG 220412-HK	1/2	.866	3/16	3/64	.031 - .187	.006 - .020	705679	705314		
TNMG 434-HK	TNMG 220416-HK	1/2	.866	3/16	1/16	.062 - .219	.008 - .026		705682		
TNMG 543-HK	TNMG 270612-HK	5/8	1.083	1/4	3/64	.062 - .219	.008 - .020	705685	705686		
TNMG 544-HK	TNMG 270616-HK	5/8	1.083	1/4	1/16	.094 - .219	.008 - .026		705687		

Ordering Example: 20 pcs TNMG 544-HK GK1125

VNMG-QF



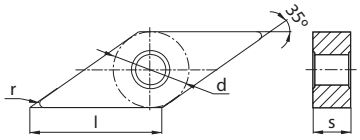
Double-sided 35° diamond. Profiling and copy turning. Not recommended for boring operations due to high negative rake of boring bar pocket.

QF: 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	GP1115	GP1225		
								EDP#			
VNMG 331-QF	VNMG 160404-QF	3/8	.654	3/16	1/64	.010 - .062	.003 - .010	705702	705703		
VNMG 332-QF	VNMG 160408-QF	3/8	.654	3/16	1/32	.016 - .080	.004 - .014	705709	705710		
VNMG 431-QF	VNMG 220404-QF	1/2	.872	3/16	1/64	.010 - .062	.003 - .010	705716	705717		
VNMG 432-QF	VNMG 220408-QF	1/2	.872	3/16	1/32	.016 - .080	.004 - .014	705718	705719		

Ordering Example: 20 pcs VNMG 432-QF GP1115

VNMG-QM



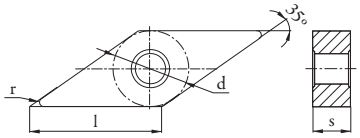
Double-sided 35° diamond. Profiling and copy turning. Not recommended for boring operations due to high negative rake of boring bar pocket.

QM: 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	GP1115	GP1225		
								EDP#			
VNMG 331-QM	VNMG 160404-QM	3/8	.654	3/16	1/64	.031 - .094	.004 - .016	705704	705705		
VNMG 332-QM	VNMG 160408-QM	3/8	.654	3/16	1/32	.031 - .125	.004 - .016	705711	705712		
VNMG 333-QM	VNMG 160412-QM	3/8	.654	3/16	3/64	.031 - .156	.004 - .016	705714	705715		

Ordering Example: 20 pcs VNMG 333-QM GP1115

VNMG-SF



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

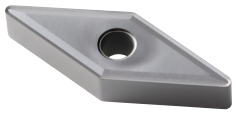
SF: Ultra-sharp cutting edge geometry for finishing in Stainless Steels. Low cutting forces and superior workpiece surface finish without burrs.

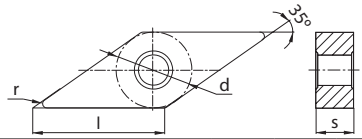
CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STAINLESS STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GS3115			
								EDP#			
VNMG 331-SF	VNMG 160404-SF	3/8	.654	3/16	1/64	.004 - .062	.003 - .012	**705827**			
VNMG 332-SF	VNMG 160408-SF	3/8	.654	3/16	1/32	.004 - .062	.004 - .016	**705828**			

Ordering Example: 20 pcs VNMG 332-SF GS3115

NOTE: The primary application area for grade GS3115 is in stainless steel workpiece materials. GS3115 is also suitable for use with iron-based, cobalt-based and nickel-based Heat Resistant Super Alloys.

VNMG-SM





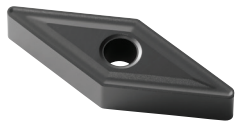
Double-sided 35° diamond. Profiling and copy turning. Not recommended for boring operations due to high negative rake of boring bar pocket.

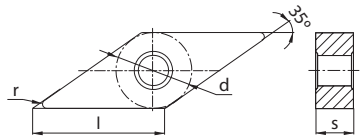
SM: Keen edge geometry especially for Stainless Steel. Unique edgeline reduces work hardening. Semi-finishing to rough machining.

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	GM1125	GM3125		
								EDP#			
VNMG 331-SM	VNMG 160404-SM	3/8	.654	3/16	1/64	.016 - .094	.004 - .012	705327	705706		
VNMG 332-SM	VNMG 160408-SM	3/8	.654	3/16	1/32	.031 - .125	.005 - .016	705328	705329		

Ordering Example: 20 pcs VNMG 332-SM GM1125

VNMG-UK





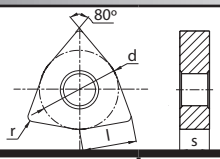
Double-sided 35° diamond. Profiling and copy turning. Not recommended for boring operations due to high negative rake of boring bar pocket.

UK: 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	GK1115	GK1125		
								EDP#			
VNMG 331-UK	VNMG 160404-UK	3/8	.654	3/16	1/64	.020 - .156	.003 - .016	705707	705708		
VNMG 332-UK	VNMG 160408-UK	3/8	.654	3/16	1/32	.031 - .156	.004 - .016	705450	705713		

Ordering Example: 20 pcs VNMG 332-UK GK1115

WNMG-QF



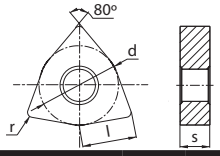
General purpose turning, facing and boring. 80° corner with 6 cutting edges. Maximum economy. Good choice for general turning.

QF: 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	GP1115	GP1225		
								EDP#			
WNMG 331-QF	WNMG 060404-QF	3/8	.257	3/16	1/64	.010 - .062	.003 - .010	705724	705330		
WNMG 332-QF	WNMG 060408-QF	3/8	.257	3/16	1/32	.016 - .080	.004 - .014	705728	705332		
WNMG 431-QF	WNMG 080404-QF	1/2	.342	3/16	1/64	.010 - .062	.003 - .010	705459	705336		
WNMG 432-QF	WNMG 080408-QF	1/2	.342	3/16	1/32	.016 - .080	.004 - .014	705735	705340		

Ordering Example: 20 pcs WNMG 432-QF GP1115

WNMG-QM



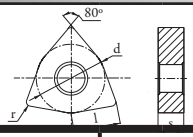
General purpose turning, facing and boring. 80° corner with 6 cutting edges. Maximum economy. Good choice for general turning.

QM: 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	GP1115	GP1225		
								EDP#			
WNMG 331-QM	WNMG 060404-QM	3/8	.257	3/16	1/64	.031 - .094	.004 - .016	705725	705726		
WNMG 332-QM	WNMG 060408-QM	3/8	.257	3/16	1/32	.031 - .125	.004 - .016	705729	705730		
WNMG 431-QM	WNMG 080404-QM	1/2	.342	3/16	1/64	.031 - .094	.004 - .016	705417	705418		
WNMG 432-QM	WNMG 080408-QM	1/2	.342	3/16	1/32	.031 - .125	.004 - .016	705460	705420		
WNMG 433-QM	WNMG 080412-QM	1/2	.342	3/16	3/64	.031 - .156	.004 - .016	705738	705423		
WNMG 434-QM	WNMG 080416-QM	1/2	.342	3/16	1/16	.040 - .156	.004 - .018		705740		

Ordering Example: 20 pcs WNMG 434-QM GP1225

WNMG-QR



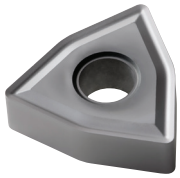
General purpose turning, facing and boring. 80° corner with 6 cutting edges. Maximum economy. Good choice for general turning.

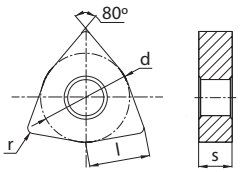
QR: Strong cutting edge geometry for roughing applications in all types of Steel. Well suited for unstable conditions and interrupted cuts.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP1225	GP1135		
								EDP#			
WNMG 432-QR	WNMG 080408-QR	1/2	.342	3/16	1/32	.028 - .172	.007 - .020	705338	705819		
WNMG 433-QR	WNMG 080412-QR	1/2	.342	3/16	3/64	.040 - .172	.008 - .022	705821	705820		
WNMG 434-QR	WNMG 080416-QR	1/2	.342	3/16	1/16	.055 - .172	.009 - .026		705822		

Ordering Example: 20 pcs WNMG 434-QR GP1135

WNMG-SM





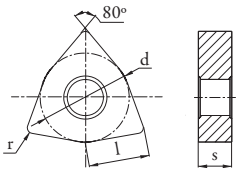
General purpose turning, facing and boring. 80° corner with 6 cutting edges. Maximum economy. Good choice for general turning.

SM: 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	GM1125	GM3125		
								EDP#			
WNMG 331-SM	WNMG 060404-SM	3/8	.257	3/16	1/64	.016 - .094	.004 - .012	705331	705727		
WNMG 332-SM	WNMG 060408-SM	3/8	.257	3/16	1/32	.031 - .125	.005 - .014	705333	705334		
WNMG 333-SM	WNMG 060412-SM	3/8	.257	3/16	3/64	.031 - .125	.006 - .020	705731	705335		
WNMG 431-SM	WNMG 080404-SM	1/2	.342	3/16	1/64	.016 - .094	.004 - .012	705337	705732		
WNMG 432-SM	WNMG 080408-SM	1/2	.342	3/16	1/32	.031 - .125	.005 - .016	705341	705342		
WNMG 433-SM	WNMG 080412-SM	1/2	.342	3/16	3/64	.031 - .156	.006 - .020	705739	705345		

Ordering Example: 20 pcs WNMG 433-SM GM1125

WNMG-SF



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

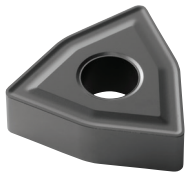
SF: Ultra-sharp cutting edge geometry for finishing in Stainless Steels. Low cutting forces and superior workpiece surface finish without burrs.

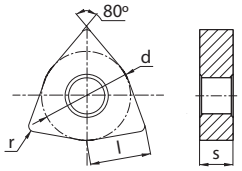
CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STAINLESS STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GS3115			
								EDP#			
WNMG 431-SF	WNMG 080404-SF	1/2	.342	3/16	1/64	.004 - .062	.003 - .012	705829			
WNMG 432-SF	WNMG 080408-SF	1/2	.342	3/16	1/32	.004 - .062	.004 - .016	705830			

Ordering Example: 20 pcs WNMG 432-SF GS3115

NOTE: The primary application area for grade GS3115 is in stainless steel workpiece materials. GS3115 is also suitable for use with iron-based, cobalt-based and nickel-based Heat Resistant Super Alloys.

WNMG-UK





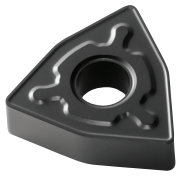
General purpose turning, facing and boring. 80° corner with 6 cutting edges. Maximum economy. Good choice for general turning.

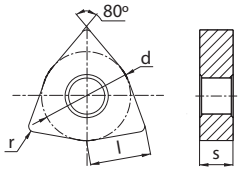
UK: Lower cutting force geometry for Cast Iron.
Edge geometry reduces cutting forces in moderate conditions / lighter cuts.

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	GK1115	GK1125		
								EDP#			
WNMG 431-UK	WNMG 080404-UK	1/2	.342	3/16	1/64	.020 - .156	.003 - .016	705733	705734		
WNMG 432-UK	WNMG 080408-UK	1/2	.342	3/16	1/32	.031 - .156	.004 - .016	705736	705737		

Ordering Example: 20 pcs WNMG 432-UK GK1115

WNMG-HK





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

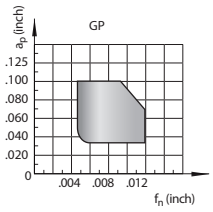
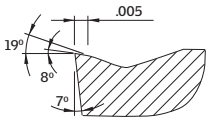
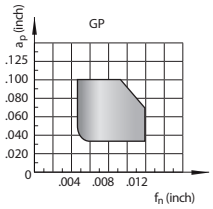
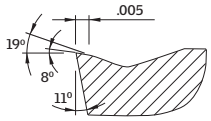
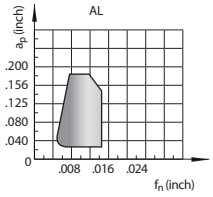
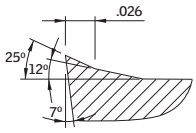
HK: Exceptionally broad application range geometry primarily for Cast Iron. Strong cutting edge, excellent durability. Semi-finishing through to roughing.

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	GK1115	GK1125		
								EDP#			
WNMG 432-HK	WNMG 080408-HK	1/2	.342	3/16	1/32	.031 - .187	.004 - .016	705451	705339		
WNMG 433-HK	WNMG 080412-HK	1/2	.342	3/16	3/64	.031 - .187	.006 - .020	705452	705344		

Ordering Example: 20 pcs WNMG 433-HK GK1115

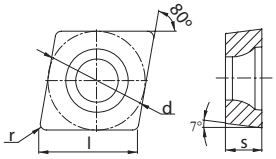
WORKPIECE MATERIAL	ANSI	ISO	Coating Type: CVD	Coating Type: PVD	Coating Type: Uncoated
P Steel	C8	01			
	C7	10	GP1225	GP3125	
	C6	20			
		30			
		40			
M Stainless Steel	–	01		GP3125	
	–	10			
	–	20			
	–	30			
K Cast Iron	C4	01	GK1115	GP3125	
	C3	10			
	C2	20			
	C1	30			
N Non-Ferrous Materials	C4	01			GN9125
	C3	10			
	C2	20			
	C1	30			

wear resistance
toughness

Chipbreaker	Description	Chipbreaker Range	Design
GP 7° Clearance Angle P M K	• Double-positive chipformer design • Reduced top land for feedrates < .004″ • Good All-Round geometry for Positive Inserts • Works in a broad range of materials		
GP 11° Clearance Angle P M K	• Double-positive chipformer design • Reduced top land for feedrates < .004″ • Good All-Round geometry for Positive Inserts • Works in a broad range of materials • 11° Style inserts primarily used for boring		
AL N NON-FERROUS	• Ultra-sharp edge with polished rake face • Super Positive (25°) top rake • Free cutting and smooth chip flow • Ultra-low cutting forces • Resistant to Built-up-Edge		

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

CCMT-GP



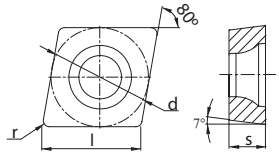
80° diamond inserts for turning and facing or boring and facing. Positive rake, screw-down inserts.

GP: 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	GP1225		GK1115	
								EDP#			
CCMT 2(1.5)1-GP	CCMT 060204-GP	1/4	.254	3/32	1/64	.020 - .047	.003 - .008	705476		705475	
CCMT 2(1.5)2-GP	CCMT 060208-GP	1/4	.254	3/32	1/32	.031 - .062	.004 - .010	705478		705477	
CCMT 3(2.5)0.5-GP	CCMT 09T302-GP	3/8	.381	5/32	.008	.012 - .039	.003 - .006	705425		705351	
CCMT 3(2.5)1-GP	CCMT 09T304-GP	3/8	.381	5/32	1/64	.020 - .062	.004 - .008	705353		705437	
CCMT 3(2.5)2-GP	CCMT 09T308-GP	3/8	.381	5/32	1/32	.031 - .080	.005 - .010	705484		705427	
CCMT 431-GP	CCMT 120404-GP	1/2	.508	3/16	1/64	.020 - .062	.004 - .008	705355		705485	
CCMT 432-GP	CCMT 120408-GP	1/2	.508	3/16	1/32	.031 - .080	.005 - .010	705357		705428	
CCMT 433-GP	CCMT 120412-GP	1/2	.508	3/16	3/64	.047 - .125	.006 - .012	705487		705486	

Ordering Example: 20 pcs CCMT 433-GP GP1225

CCGT-GP



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

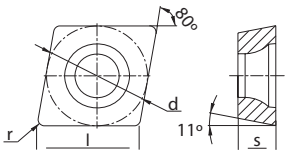
GP: All-round positive rake geometry. Wide application area. Excellent for boring in most materials.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP3125			
								EDP#			
CCGT 2(1.5)1-GP	CCGT 060204-GP	1/4	.254	3/32	1/64	.020 - .047	.003 - .008	705463			
CCGT 2(1.5)2-GP	CCGT 060208-GP	1/4	.254	3/32	1/32	.031 - .062	.004 - .010	705464			
CCGT 3(2.5)0.5-GP	CCGT 09T302-GP	3/8	.381	5/32	.008	.010 - .031	.003 - .006	705465			
CCGT 3(2.5)1-GP	CCGT 09T304-GP	3/8	.381	5/32	1/64	.020 - .062	.004 - .008	705466			
CCGT 3(2.5)2-GP	CCGT 09T308-GP	3/8	.381	5/32	1/32	.031 - .080	.005 - .010	705467			
CCGT 431-GP	CCGT 120404-GP	1/2	.508	3/16	1/64	.020 - .062	.004 - .008	705468			
CCGT 432-GP	CCGT 120408-GP	1/2	.508	3/16	1/32	.031 - .080	.005 - .010	705469			

Ordering Example: 20 pcs CCGT 432-GP GP3125

NOTE: The primary application area for grade GP3125 is in steel workpiece materials. GP3125 is also suitable for use with stainless steel and cast iron components.

CPGT-GP



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.

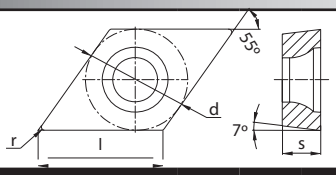
GP: All-round positive rake geometry. Wide application area. Excellent for boring in most materials.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP3125			
								EDP#			
CPGT 2(1.5)1-GP	CPGT 060204-GP	1/4	.254	3/32	1/64	.020 - .047	.003 - .008	705082			
CPGT 2(1.5)2-GP	CPGT 060208-GP	1/4	.254	3/32	1/32	.031 - .062	.004 - .010	705091			
CPGT 3(2.5)0.5-GP	CPGT 09T302-GP	3/8	.381	5/32	.008	.010 - .031	.003 - .006	705130			
CPGT 3(2.5)1-GP	CPGT 09T304-GP	3/8	.381	5/32	1/64	.020 - .062	.004 - .008	705083			
CPGT 3(2.5)2-GP	CPGT 09T308-GP	3/8	.381	5/32	1/32	.031 - .080	.005 - .010	705094			
CPGT 431-GP	CPGT 120404-GP	1/2	.508	3/16	1/64	.020 - .062	.004 - .008	705096			
CPGT 432-GP	CPGT 120408-GP	1/2	.508	3/16	1/32	.031 - .080	.005 - .010	705099			

Ordering Example: 20 pcs CPGT 432-GP GP3125

NOTE: The primary application area for grade GP3125 is in steel workpiece materials. GP3125 is also suitable for use with stainless steel and cast iron components.

DCMT-GP



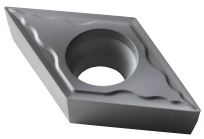
55° diamond inserts for profile turning and finishing. Positive rake screw-down inserts. Good choice for small diameter and slender workpieces.

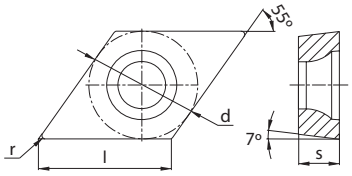
GP: All-round positive rake geometry. Wide application area. Excellent for boring in most materials.

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	GP1225		GK1115	
								EDP#			
DCMT 2(1.5)1-GP	DCMT 070204-GP	1/4	.305	3/32	1/64	.020 - .047	.003 - .008	705539		705538	
DCMT 2(1.5)2-GP	DCMT 070208-GP	1/4	.305	3/32	1/32	.031 - .062	.004 - .010	705381		705540	
DCMT 3(2.5)0.5-GP	DCMT 11T302-GP	3/8	.458	5/32	.008	.010 - .031	.003 - .006	705382		705542	
DCMT 3(2.5)1-GP	DCMT 11T304-GP	3/8	.458	5/32	1/64	.020 - .062	.004 - .008	705383		705544	
DCMT 3(2.5)2-GP	DCMT 11T308-GP	3/8	.458	5/32	1/32	.031 - .080	.005 - .010	705384		705440	
DCMT 431-GP	DCMT 150404-GP	1/2	.610	3/16	1/64	.020 - .062	.004 - .008	705549		705548	
DCMT 432-GP	DCMT 150408-GP	1/2	.610	3/16	1/32	.031 - .080	.005 - .010	705385		705550	
DCMT 433-GP	DCMT 150412-GP	1/2	.610	3/16	3/64	.047 - .125	.006 - .010	705552		705551	

Ordering Example: 20 pcs DCMT 433-GP GP1225

DCGT-GP





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

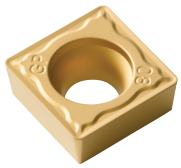
GP: All-round positive rake geometry. Wide application area. Excellent for boring in most materials.

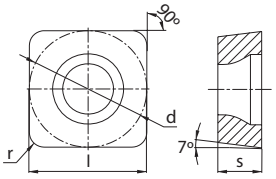
CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP3125			
								EDP#			
DCGT 2(1.5)0.5-GP	DCGT 070202-GP	1/4	.305	3/32	.008	.010 - .031	.003 - .006	705528			
DCGT 2(1.5)1-GP	DCGT 070204-GP	1/4	.305	3/32	1/64	.020 - .047	.003 - .008	705374			
DCGT 2(1.5)2-GP	DCGT 070208-GP	1/4	.305	3/32	1/32	.031 - .062	.004 - .010	705530			
DCGT 3(2.5)0.5-GP	DCGT 11T302-GP	3/8	.458	5/32	.008	.010 - .031	.003 - .006	705375			
DCGT 3(2.5)1-GP	DCGT 11T304-GP	3/8	.458	5/32	1/64	.020 - .062	.004 - .008	705532			
DCGT 3(2.5)2-GP	DCGT 11T308-GP	3/8	.458	5/32	1/32	.031 - .080	.005 - .010	705533			

Ordering Example: 20 pcs DCGT 3(2.5)2-GP GP3125

NOTE: The primary application area for grade GP3125 is in steel workpiece materials. GP3125 is also suitable for use with stainless steel and cast iron components.

SCMT-GP





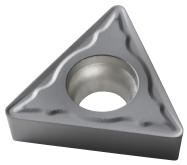
Mainly for roughing operations: turning, facing or boring. Positive rake screw-down style inserts. Good economy with 4 cutting edges.

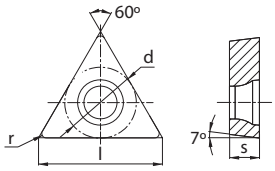
GP: All-round positive rake geometry. Wide application area. Excellent for boring in most materials.

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	GP1225		GK1115	
								EDP#			
SCMT 3(2.5)1-GP	SCMT 09T304-GP	3/8	.375	5/32	1/64	.020 - .062	.004 - .008	705393		705580	
SCMT 3(2.5)2-GP	SCMT 09T308-GP	3/8	.375	5/32	1/32	.031 - .080	.005 - .010	705454		705442	
SCMT 431-GP	SCMT 120404-GP	1/2	.500	3/16	1/64	.020 - .062	.004 - .008	705395		705394	
SCMT 432-GP	SCMT 120408-GP	1/2	.500	3/16	1/32	.031 - .080	.006 - .011	705396		705584	

Ordering Example: 20 pcs SCMT 432-GP GP1225

TCMT-GP





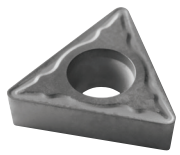
Popular for small diameter boring. Good economy and stable seating of insert. Positive rake screw-down inserts.

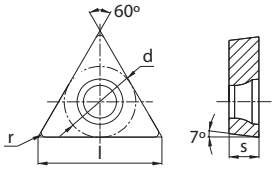
GP: All-round positive rake geometry. Wide application area. Excellent for boring in most materials.

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	GP1225		GK1115	
								EDP#			
TCMT 2(1.5)1-GP	TCMT 110204-GP	1/4	.433	3/32	1/64	.020 - .047	.003 - .008	705402		705641	
TCMT 2(1.5)2-GP	TCMT 110208-GP	1/4	.433	3/32	1/32	.031 - .062	.004 - .010	705644		705643	
TCMT 3(2.5)1-GP	TCMT 16T304-GP	3/8	.650	5/32	1/64	.020 - .047	.004 - .008	705646		705446	
TCMT 3(2.5)2-GP	TCMT 16T308-GP	3/8	.650	5/32	1/32	.031 - .080	.005 - .010	705648		705403	
TCMT 432-GP	TCMT 220408-GP	1/2	.866	3/16	1/32	.031 - .094	.006 - .012	705404		705649	

Ordering Example: 20 pcs TCMT 432-GP GP1225

TCGT-GP





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

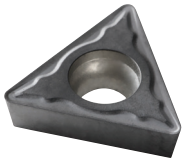
GP: All-round positive rake geometry. Wide application area. Excellent for boring in most materials.

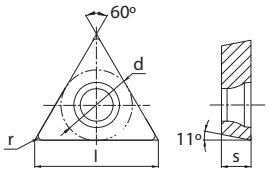
CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP3125			
								EDP#			
TCGT 1.8(1.5)1-GP	TCGT 090204-GP	7/32	.379	3/32	1/64	.020 - .062	.003 - .006	705630			
TCGT 2(1.5)0.5-GP	TCGT 110202-GP	1/4	.433	3/32	.008	.010 - .031	.003 - .006	705631			
TCGT 2(1.5)1-GP	TCGT 110204-GP	1/4	.433	3/32	1/64	.020 - .047	.003 - .008	705632			
TCGT 2(1.5)2-GP	TCGT 110208-GP	1/4	.433	3/32	1/32	.031 - .062	.004 - .010	705633			
TCGT 3(2.5)1-GP	TCGT 16T304-GP	3/8	.650	5/32	1/64	.020 - .047	.004 - .008	705634			
TCGT 3(2.5)2-GP	TCGT 16T308-GP	3/8	.650	5/32	1/32	.031 - .080	.005 - .010	705635			

Ordering Example: 20 pcs TCGT 3(2.5)2-GP GP3125

NOTE: The primary application area for grade GP3125 is in steel workpiece materials. GP3125 is also suitable for use with stainless steel and cast iron components.

TPGT-GP





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.

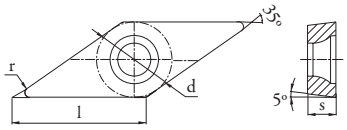
GP: All-round positive rake geometry. Wide application area. Excellent for boring in most materials.

CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP3125			
								EDP#			
TPGT 2(1.5)1-GP	TPGT 110204-GP	1/4	.433	3/32	1/64	.020 - .047	.003 - .008	705688			
TPGT 2(1.5)2-GP	TPGT 110208-GP	1/4	.433	3/32	1/32	.031 - .062	.004 - .010	705689			
TPGT 3(2.5)1-GP	TPGT 16T304-GP	3/8	.650	5/32	1/64	.020 - .047	.004 - .008	705690			
TPGT 3(2.5)2-GP	TPGT 16T308-GP	3/8	.650	5/32	1/32	.031 - .080	.005 - .010	705691			

Ordering Example: 20 pcs TPGT 3(2.5)2-GP GP3125

NOTE: The primary application area for grade GP3125 is in steel workpiece materials. GP3125 is also suitable for use with stainless steel and cast iron components.

VBMT-GP



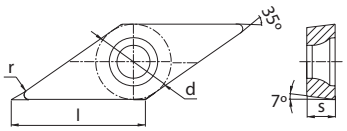
First choice for 35° diamond external profile turning.
5° clearance angle provides more secure insert clamping than VCMT style.

GP: 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	GP1225		GK1115	
								EDP#			
VBMT 331-GP	VBMT 160404-GP	3/8	.654	3/16	1/64	.020 - .062	.004 - .008	705832		705831	
VBMT 332-GP	VBMT 160408-GP	3/8	.654	3/16	1/32	.031 - .080	.005 - .010	705834		705833	

Ordering Example: 20 pcs VBMT 332-GP GP1225

VCMT-GP



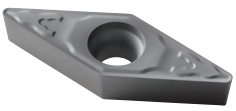
First choice shape for 35° diamond profile turning and boring. Positive cutting action provides for a more secure cutting edge than VNMG style.

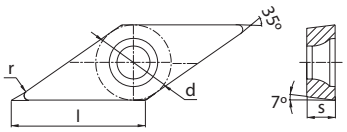
GP: All-round positive rake geometry. Wide application area. Excellent for boring in most materials.

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	GP1225		GK1115	
								EDP#			
VCMT 221-GP	VCMT 110304-GP	1/4	.436	1/8	1/64	.020 - .047	.003 - .008	705697		705696	
VCMT 331-GP	VCMT 160404-GP	3/8	.654	3/16	1/64	.020 - .062	.004 - .008	705699		705698	
VCMT 332-GP	VCMT 160408-GP	3/8	.654	3/16	1/32	.031 - .080	.005 - .010	705701		705700	

Ordering Example: 20 pcs VCMT 332-GP GP1225

VCGT-GP





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.

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

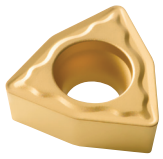
CATALOG NUMBER	ISO DESIGNATION	DIMENSIONS (INCH)				CUTTING DATA (INCH)		STEEL			
		d	l	s	r	depth of cut, a_p	feed per rev, f_n	GP3125			
								EDP#			
VCGT 221-GP	VCGT 110304-GP	1/4	.436	1/8	1/64	.020 - .047	.003 - .008	705692			
VCGT 331-GP	VCGT 160404-GP	3/8	.654	3/16	1/64	.020 - .062	.004 - .008	705693			
VCGT 332-GP	VCGT 160408-GP	3/8	.654	3/16	1/32	.031 - .080	.005 - .010	705411			

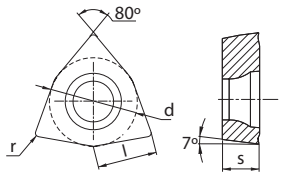
Ordering Example: 20 pcs VCGT 332-GP GP3125

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

NOTE: The primary application area for grade GP3125 is in steel workpiece materials. GP3125 is also suitable for use with stainless steel and cast iron components.

WCMT-GP





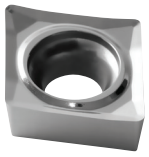
80° corner Trigon inserts for turning, facing and boring. Positive rake screw-down inserts. Extra economy due to 3 cutting edges.

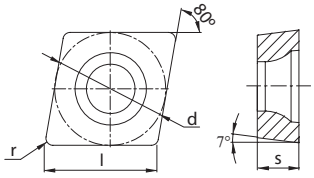
GP: All-round positive rake geometry. Wide application area. Excellent for boring in most materials.

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	GP1225		GK1115	
								EDP#			
WCMT 3(2.5)1-GP	WCMT 06T304-GP	3/8	.257	5/32	1/64	.020 - .062	.003 - .008	705721		705720	
WCMT 3(2.5)2-GP	WCMT 06T308-GP	3/8	.257	5/32	1/32	.031 - .080	.005 - .010	705723		705722	

Ordering Example: 20 pcs WCMT 3(2.5)2-GP GP1225

CCGX-AL





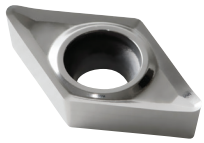
Precision Ground, High Positive, polished 80° diamond inserts for turning, boring and facing of Aluminum, non-ferrous materials and non-metallics.

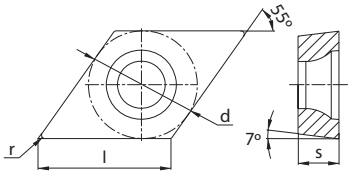
AL: Extremely high 25° positive rake geometry. Super sharp edgeline with polished face for smooth chip flow.

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	GN9125			
								EDP#			
CCGX 2(1.5)1-AL	CCGX 060204-AL	1/4	.254	3/32	1/64	.016 - .062	.004 - .010	705755			
CCGX 2(1.5)2-AL	CCGX 060208-AL	1/4	.254	3/32	1/32	.020 - .062	.006 - .020	705756			
CCGX 3(2.5)1-AL	CCGX 09T304-AL	3/8	.381	5/32	1/64	.016 - .125	.004 - .010	705757			
CCGX 3(2.5)2-AL	CCGX 09T308-AL	3/8	.381	5/32	1/32	.020 - .125	.006 - .020	705758			
CCGX 431-AL	CCGX 120404-AL	1/2	.508	3/16	1/64	.016 - .187	.004 - .010	705759			
CCGX 432-AL	CCGX 120408-AL	1/2	.508	3/16	1/32	.020 - .187	.006 - .020	705760			

Ordering Example: 20 pcs CCGX 432-AL GN9125

DCGX-AL





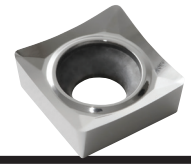
Precision Ground, High Positive, polished 55° diamond inserts for profiling of Aluminum, non-ferrous materials and non-metallics.

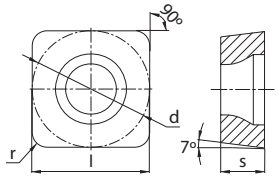
AL: Extremely high 25° positive rake geometry. Super sharp edgeline with polished face for smooth chip flow.

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	GN9125			
								EDP#			
DCGX 2(1.5)1-AL	DCGX 070204-AL	1/4	.305	3/32	1/64	.020 - .094	.004 - .010	705761			
DCGX 2(1.5)2-AL	DCGX 070208-AL	1/4	.305	3/32	1/32	.020 - .094	.006 - .020	705762			
DCGX 3(2.5)1-AL	DCGX 11T304-AL	3/8	.458	5/32	1/64	.016 - .094	.004 - .010	705378			
DCGX 3(2.5)2-AL	DCGX 11T308-AL	3/8	.458	5/32	1/32	.020 - .125	.006 - .020	705764			

Ordering Example: 20 pcs DCGX 3(2.5)2-AL GN9125

SCGX-AL





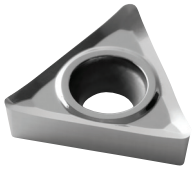
Precision Ground, High Positive, polished square inserts for turning, facing and boring of Aluminum, non-ferrous materials and non-metallics.

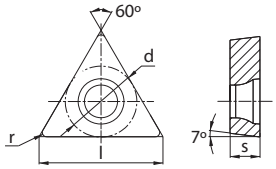
AL: Extremely high 25° positive rake geometry. Super sharp edgeline with polished face for smooth chip flow.

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	GN9125			
								EDP#			
SCGX 3(2.5)1-AL	SCGX 09T304-AL	3/8	.375	5/32	1/64	.016 - .094	.004 - .010	705765			
SCGX 3(2.5)2-AL	SCGX 09T308-AL	3/8	.375	5/32	1/32	.020 - .125	.006 - .020	705766			
SCGX 431-AL	SCGX 120404-AL	1/2	.500	3/16	1/64	.016 - .156	.004 - .010	705767			
SCGX 432-AL	SCGX 120408-AL	1/2	.500	3/16	1/32	.020 - .156	.006 - .020	705768			

Ordering Example: 20 pcs SCGX 432-AL GN9125

TCGX-AL





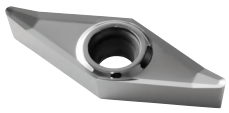
Precision Ground, High Positive, polished triangular inserts for turning and boring of Aluminum, non-ferrous materials and non-metallics.

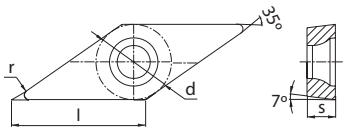
AL: Extremely high 25° positive rake geometry. Super sharp edgeline with polished face for smooth chip flow.

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	GN9125			
								EDP#			
TCGX 1.8(1.5)1-AL	TCGX 090204-AL	7/32	.379	3/32	1/64	.016 - .094	.004 - .008	705769			
TCGX 2(1.5)1-AL	TCGX 110204-AL	1/4	.433	3/32	1/64	.016 - .094	.004 - .010	705770			
TCGX 2(1.5)2-AL	TCGX 110208-AL	1/4	.433	3/32	1/32	.020 - .125	.006 - .020	705771			
TCGX 3(2.5)1-AL	TCGX 16T304-AL	3/8	.650	5/32	1/64	.016 - .156	.004 - .010	705772			
TCGX 3(2.5)2-AL	TCGX 16T308-AL	3/8	.650	5/32	1/32	.020 - .156	.006 - .020	705773			

Ordering Example: 20 pcs TCGX 3(2.5)2-AL GN9125

VCGX-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	GN9125			
								EDP#			
VCGX 221-AL	VCGX 110304-AL	1/4	.436	1/8	1/64	.016 - .087	.004 - .010	705777			
VCGX 222-AL	VCGX 110308-AL	1/4	.436	1/8	1/32	.020 - .087	.006 - .020	705778			
VCGX 331-AL	VCGX 160404-AL	3/8	.654	3/16	1/64	.016 - .125	.004 - .010	705779			
VCGX 332-AL	VCGX 160408-AL	3/8	.654	3/16	1/32	.020 - .156	.006 - .020	705780			
VCGX 333-AL	VCGX 160412-AL	3/8	.654	3/16	3/64	.020 - .156	.006 - .031	705782			
VCGX 220512-AL	VCGX 220512-AL	1/2	.872	7/32	3/64	.020 - .187	.006 - .031	705774			
VCGX 220516-AL	VCGX 220516-AL	1/2	.872	7/32	1/16	.020 - .187	.006 - .031	705775			
VCGX 220530-AL	VCGX 220530-AL	1/2	.872	7/32	.118	.020 - .187	.010 - .040	705754			

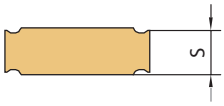
Ordering Example: 20 pcs VCGX 220530-AL GN9125

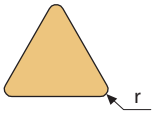
EXAMPLE 2

V	C	G	T	3	3	1		–	GP
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

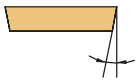
8	
Hand of Insert (optional)	
R	Right-hand
L	Left-hand

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

EXAMPLE 1

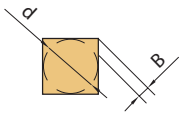
C	N	M	G	12	04	08		–	QM
1	2	3	4	5	6	7	8		9

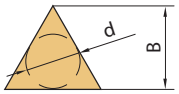
1		
Insert Shape		
C	80^0 Diamond	
D	55^0 Diamond	
S	Square	
T	Triangle	
V	35^0 Diamond	
W	80^0 Corner Trigon	

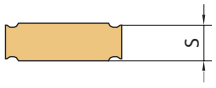
2	
Clearance Angle	
	
B	5^0 Positive Rake
C	7^0 Positive Rake
N	0^0 Negative Rake
P	11^0 Positive Rake

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

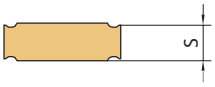
CODE KEY-ISO DESIGNATION

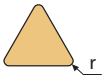
EXAMPLE 2

V	C	G	T	16	04	04		–	GP
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)

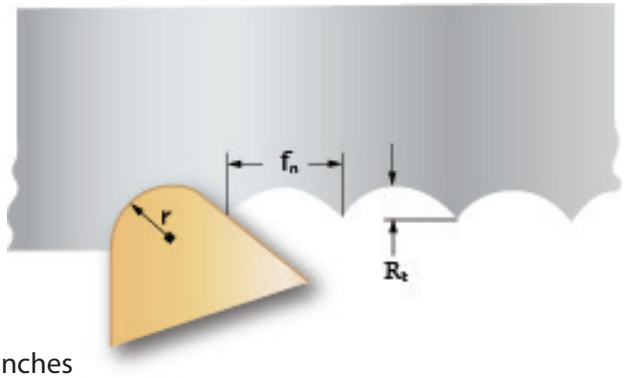
$$Q = v_c \times a_p \times f_n \times 12$$

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.

RECOMMENDED STARTING CUTTING SPEEDS

ISO	Material Group	Workpiece Material	Brinell Hardness HB	Rockwell Hardness HRC	Tensile Strength MPa	Recommended Starting Speeds v_c (ft/min)								
						GP1115			GP1225			GP3125		
						f_n (inch/rev)			f_n (inch/rev)			f_n (inch/rev)		
						.004	.008	.012	.004	.008	.016	.004	.008	.012
P Steel	PO	Low-Carbon Steels, Long Chipping (C < .25%) Ex. A36, 1008, 1010, 1018, 1108, 1117	<125		<530	1640	1445	1280	1400	1245	855	655	525	400
	P1	Low-Carbon Steels, Short Chipping, Free Machining (C < .25%) Ex. 10L18, 1200 Series, 1213, 12L14	<125		<530	1400	1245	1050	1180	1015	655	600	475	360
	P2	Medium- and High-Carbon Steels (C > .25%) Ex. 1035, 1045, 10L45, 1080, 1137, 1144, 1525, 1572	<220	<25	>530	1050	985	885	920	855	625	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	<330	<35	600-850	950	790	655	790	720	490	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	340-450	35-48	850-1400	790	655	525	590	525	330	310	245	180
	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	985	820	655	885	720	560	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	340-450	35-48	900-1350	590	490	330	425	360	300	250	190	150

ISO	Material Group	Workpiece Material	Brinell Hardness HB	Rockwell Hardness HRC	Tensile Strength MPa	Recommended Starting Speeds v_c (ft/min)								
						GM1125			GM3125			GP3125		
						f_n (inch/rev)			f_n (inch/rev)			f_n (inch/rev)		
						.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	690	560	755	600	475	390	310	240
	M2	High-Strength Austenitic Stainless and Cast Stainless Steels Ex. 310, 316, 316L, 321, 347, 384	150-230	<25	600-800	690	590	460	625	490	400	330	260	210
	M3	Duplex Stainless Steels Ex. 323, 329, F55, 2205	135-275	<30	<800	625	460	360	525	400	300	300	210	160

RECCOMMENDED STARTING CUTTING SPEEDS

ISO	Material Group	Workpiece Material	Brinell Hardness HB	Rockwell Hardness HRC	Tensile Strength MPa	Recommended Starting Speeds v_c (ft/min)											
						GK1115			GK1125			GP3125					
						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)											
						GN9125											
						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)											
						GS3115											
						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	-	-	-									

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

CVD COATING COMPETITORS COMPARISON GRADE CHART

Material	Code	TUFFY	SANDVIK	TAEGU Tec	WALTER	TUNGALOY	MITSUBISHI	ISCAR	KENNAMETAL	SUMITOMO	KYOCERA	DIJET	HITACHI	KORLOY	SECO	ZCC.CT
P	P01		GC4005 GC4205	TT8115	WPP01 WPP05	T9105	UE6105	IC9150 IC8150	KCP05 KCP10	AC810P	CA5505	JC110V	HG8010	NC3010	TP0500 TP1500	
	P10	GP1115	GC4015 GC4215	TT8115 TT8125	WPP01 WPP05 WPP10 WAK20	T9105 T9115	UE6105 UE6110	IC9150 IC8150 IC428 IC5005	KCP10 TN7005 TN7010	AC810P AC820P	CA5505 CA5515 CA5525	JC110V JC215V	HG8010 GM8020	NC3010 NC3220	TP0500 TP1500 TP2500	YBC152 YBC151
	P20	GP1125 GP1225	GC4015 GC4225 GC4025 GC4215 LC25	TT8125 TT5100	WPP10 WPP20	T9115 T9125 T9015	UE6110 UE6010 UE6020	IC9250 IC8250 IC9150 IC8150	KCP25 TN7015	AC820P AC830P	CA5515 CA5525 CA5025 CR9025	JC110V JC215V	HG8025 GM8020	NC3220 NC3120 NC5330	TP1500 TP2500 TP200 TP2000	YBC251 YBC252
	P30	GP1225 GP1135	GC4225 GC4235 GC4025 GC4035 GC2135	TT8125 TT8135 TT5100 TT7100	WPP20 WPP30	T9125 T9135 T9025	UE6020 UE6035 UH6400	IC8350 IC9350 IC656	KCP30 TN7025	AC820P AC830P	CA5525 CA5535 CR9025	JC215V JC325V	HG8025 GM8020 GM25 GM8035	NC3220 NC3030 NC5330 NC500H	TP2500 TP3500 TP300 TP3000	YBC252 YBC351
	P40	GP1135	GC4235 GC4035 GC235	TT8135 TT7100	WPP30 WAK30	T9135	UE6035 UH6400	IC9350 IC635	KCP40	AC830P	CA5535	JC325V	GM8035 GX30	NC5330 NC500H	TP3500 TP40	YBC351
M	M10		GC2015	TT9215		T9115	MC7015 US7020	IC6015 IC8150	KCM15 TN7010	AC610M	CA6515	JC110V	HG8025		TM2000	
	M20	GM1125	GC2015 GC2025	TT9215 TT9225		T6120 T9125 T6020	MC7015 MC7025 US7020	IC6015 IC6025 IC8250	KCM15 KCM25 TN7015	AC610M AC630M	CA6525 CA6515	JC110V JC605X	HG8025 GM25 GM8035		TM2000 TM4000	YBM151 YBM153
	M30		GC2135 GC235	TT9225 TT9235		T6130 T6030	MC7025 US735	IC6025 IC8350	KCM25 KCM35 TN8025	AC630M AC830P	CA6525	JC525X	GM25 GM8035 GX30	NC9025	TM4000 TP40	YBM151 YBC251
	M40		GC235	TT9235			US735	IC656 IC635	KCM35			JC525X	GX30	NC9025	TM4000 TP40	YBM253
K	K01		GC3205 GC3210	TT7005	WAK10	T5105	UC5105 MC5005	IC5005 IC8150	KCP05 KCP10 KCK05	AC405K ACK410	CA4010 CA4505	JC105V	GX3505	NC6205	TK1001 TH1500 TK1000	YBD052
	K10	GK1115	GC3205 GC3210 GC3015	TT7015 TT7005	WAK10 WPP05	T5105 T5115	UC5105 UC5115 MC5005 MC5015	IC5005 IC5010	KCK15 TN5015	AC415K AC415K ACK410 ACK420	CA4505 CA4515 CA4010 AC4115 CA4120	JC110V	HX3505 HX3515	NC6025 NC6210	TK1001 TK2001 TK2000 TP0500 TP1500	YBD102 YBD151
	K20	GK1115 GK1125	GC3215	TT7015 TT7310	WAK10 WAK20 WPP10	T5115 T5125	UC5115 MC5015	IC5010	KCK20 KCP25	AC415K AC420K	CA4515 CA4115 CA4120	JC215V	HX3515 HG8010 GM8020	NC6210 NC315K	TK2001 TP2500	YBD152 YBD252
	K30	GK1125 GK1125			WAK20 WAK30 WPP20	T5125	MC5015			AK420K AC820P	CA4120		GM8020 HG8025	NC5330	TP3500 TP200	

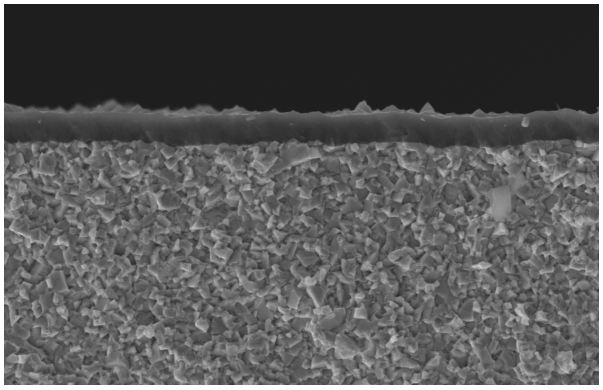
Superior Milling Performance in a Wide Range of Applications

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

GA4230 - 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



GA4230 - Next Generation Coating Technology

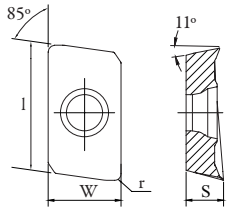
- New TiAlN+ Advanced PVD Coating
- Outstanding wear resistance properties and long tool life through improved microstructure and surface treatment
- Increased adhesion strength to substrate provides predictable tool life and reliable performance
- Effective in HRSA's and other difficult-to-machine materials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

WORKPIECE MATERIAL	ANSI	ISO	Coating Type: PVD
P Steel	C8, C7, C6	01, 10, 20, 30, 40	GA4230
M Stainless Steel	–	01, 10, 20, 30	GA4230
K Cast Iron	C4, C3, C2, C1	01, 10, 20, 30	GA4230
S Heat-Resistant Super Alloys	–	01, 10, 20, 30	GA4230

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.

PL: Light cutting with lowest cutting forces
PM: Medium machining with broad application range
PR: 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 GA4230
LIGHT		APMT 160408PDER-PL	.640	.364	.187	.031	max .591	.002 - .006	705846
MEDIUM		APMT 160408PDER-PM	.640	.364	.187	.031	max .591	.003 - .008	705461
HEAVY		APMT 160408PDER-PR	.640	.364	.187	.031	max .591	.006 - .012	705847

Ordering Example: 20 pcs APMT 160408PDER-PR GA4230

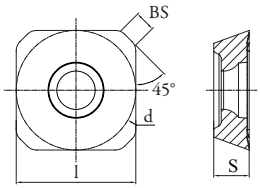
INSERT COMPATIBILITY

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

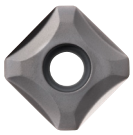
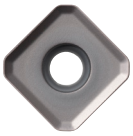
45° FACEMILLING

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.

PL: Light cutting with lowest cutting forces
PM: Medium machining with broad application range
PH: 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 GA4230
LIGHT		SEET 13T3AGEN-PL	.528	.528	.156	.067	max .240	.003 - .008	705836
MEDIUM		SEET 13T3AGEN-PM	.528	.528	.156	.047	max .240	.004 - .012	705837
HEAVY		SEET 13T3AGSN-PH	.528	.528	.156	.047	max .240	.006 - .016	705835

Ordering Example: 20 pcs SEET 13T3AGSN-PH GA4230

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

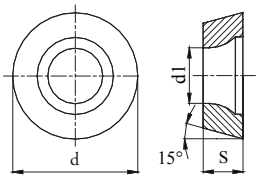
INSERT COMPATIBILITY

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

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.

BL: *Light cutting with lowest cutting forces*
GM: *Medium machining with broad application range*
T-BM, T: *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 GA4230			
LIGHT		RDET 1204M0-BL	12mm	.173	.187	max .236	.004 - .008	705838			
		RDET 1604M0-BL	16mm	.217	.187	max .315	.004 - .008	705839			
MEDIUM		RDET 1204M0-GM	12mm	.173	.187	max .236	.006 - .012	705842			
		RDET 1604M0-GM	16mm	.217	.187	max .315	.006 - .012	705843			
HEAVY		RDMW 1204M0T-BM	12mm	.173	.187	max .236	.008 - .016	705840			
HEAVY		RDMW 1604M0T	16mm	.217	.187	max .315	.008 - .016	705844			

Ordering Example: 20 pcs RDMW 1604M0T GA4230

*NOTE: Proper feedrates for round inserts are dependent on the depth of cut. Feed per insert (f_z) values shown include a multiplier to compensate for chip thinning. Recommended feed values provided are for one-half the maximum depth of cut for each insert. For larger depths of cut decrease the feed; for smaller depths of cut increase the feed.

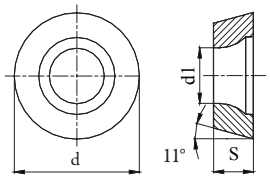
INSERT COMPATIBILITY

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

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.

GL: Light cutting with lowest cutting forces
GM: Medium machining with broad application range
T: 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 GA4230
LIGHT		RPET 1204M0-GL	12mm	.173	.187	max .236	.004 - .008	705841
MEDIUM		RPET 1204M0-GM	12mm	.173	.187	max .236	.006 - .012	705848
HEAVY		RPMW 1204M0T	12mm	.173	.187	max .236	.008 - .016	705845

Ordering Example: 20 pcs RPMW 1204M0T GA4230

*NOTE: Proper feedrates for round inserts are dependent on the depth of cut. Feed per insert (f_z) values shown include a multiplier to compensate for chip thinning. Recommended feed values provided are for one-half the maximum depth of cut for each insert. 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:

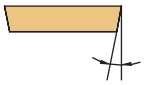
RPCT	RPCW	RPEW	RPEX	RPHT	RPMT

CODE KEY- CATALOG NUMBERS

EXAMPLE 1

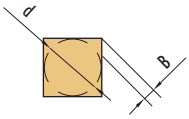
A	P	M	T	16	04	08	P	D	E	R	–	PL
1	2	3	4	5	6	7	8	9	10	11		12

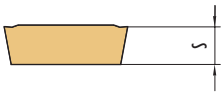
1		
Insert Shape		
A	85⁰ Parallelogram	
R	Round	
S	Square	

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

3

Tolerances, inch





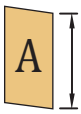
Tolerance Class	tolerance on 'd'	tolerance on 'B'	tolerance on 's'
E	± .001	± .001	± .001
M	see table	see table	± .005

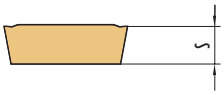
Tolerance Class M, inch		
d	tolerance on 'd'	tolerance on 'B'
3/8 (10mm)	± .002	± .003
1/2 (12mm)	± .003	± .005
5/8 (16mm)	± .004	± .006

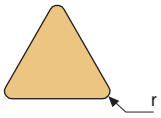
4		
Insert Type		
T	Screw-Down Clamping, Single-sided with Chipformer	
W	Screw-Down Clamping, Single-sided without Chipformer	
X	Manufacturer-Specific Design	——

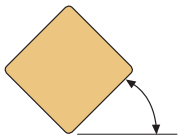
EXAMPLE 2

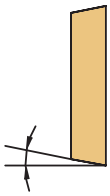
R	D	M	W	12	04	M0	T	–	BM
1	2	3	4	5	6	8	10		12

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

8	
Cutting Edge Angle	
	
A	45°
P	90°
M0	round, metric sizes

9	
Secondary Cutting Edge Clearance Angle	
	
D	15°
G	30°

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

RECCOMMENDED STARTING CUTTING SPEEDS

ISO	Material Group	Workpiece Material	Brinell Hardness HB	Rockwell Hardness HRC	Tensile Strength MPa	Recommended Starting Speeds v_c (ft/min)								
						GA4230								
						f_z (inch)								
						.004	.008	.012						
P Steel	P0	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)								
						GA4230								
						f_z (inch)								
						.004	.008	.012						
M Stainless Steel	M1	Austenitic Stainless Steels Ex. 200 Series, 301, 302, 304, 304L, 309	130-200		< 600	590	525	460						
	M2	High-Strength Austenitic Stainless and Cast Stainless Steels Ex. 310, 316, 316L, 321, 347, 384	150-230	< 25	600-800	525	390	330						
	M3	Duplex Stainless Steels Ex. 323, 329, F55, 2205	135-275	< 30	< 800	560	490	425						

RECCOMMENDED STARTING CUTTING SPEEDS

ISO	Material Group	Workpiece Material	Brinell Hardness HB	Rockwell Hardness HRC	Tensile Strength MPa	Recommended Starting Speeds v_c (ft/min)								
						GA4230								
						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)								
						GA4230								
						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	-						

MILLING FORMULAS AND NOMENCLATURE

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	

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

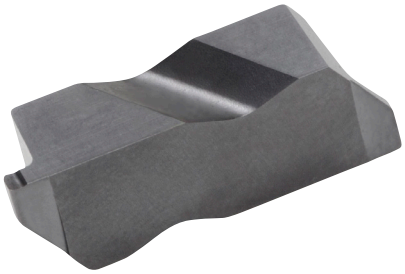
TENSILE STRENGTH	HARDNESS		
MPa	Brinell HB	Vickers HV	Rockwell HRC
1485	437	460	46.1
1520	447	470	46.9
1555	456	480	47.7
1595	466	490	48.4
1630	475	500	49.1
1665	485	510	49.8
1700	494	520	50.5
1740	504	530	51.1
1775	513	540	51.7
1810	523	550	52.3
1845	532	560	53.0
1880	542	570	53.6
1920	551	580	54.1
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

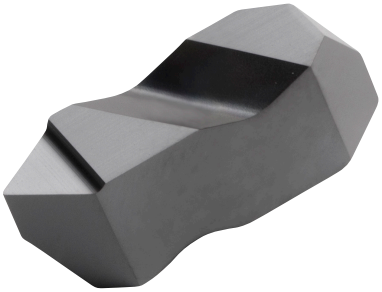
STANDARD NOTCH INSERTS

Precision ground for high performance and accurate indexing

Specialized edge treatment for extended tool life

5° positive rake - reduced cutting forces





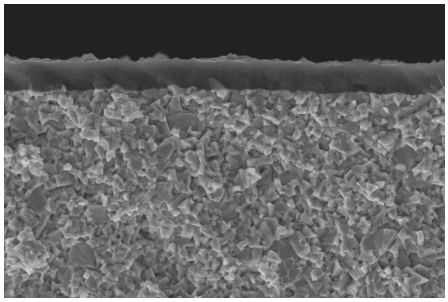
Two cutting edges per insert for economy

General purpose grooving, O-ring grooves, Circlip grooves

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

GM3125

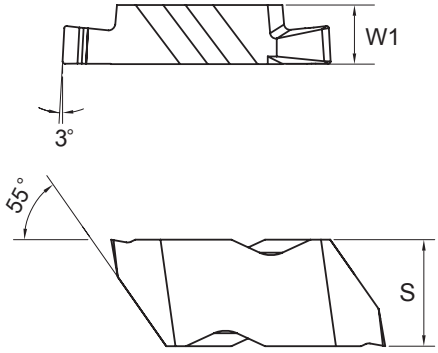
TiAlN Nano-Structure PVD Coated Grade



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-NOTCH GROOVING/THREADING INSERTS

CODE KEY

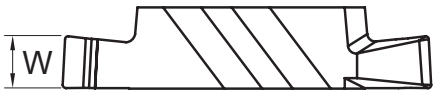
G	N	G	P	2	0	4	7	R
1		2	3	4	5			6

G	N	T	P	2	R
1		2	3	4	6

1	
Insert Type	
GN	G-NOTCH Grooving System

3	
Insert Characteristics	
P	Positive Rake

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

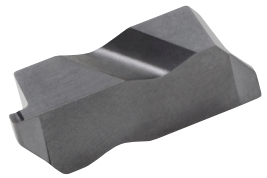
2	
Insert Style	
G	Grooving
T	Threading - 60° V-form

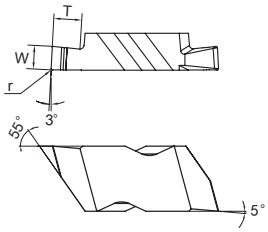
4	
Insert Size	
2	Notch size 2
3	Notch size 3

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

GROOVING

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 GM3125		
GNGP 2047R	GNGP 2047L	2	.047	.050	.004	max .050	.001-.005	705206	705204	
GNGP 2062R	GNGP 2062L	2	.062	.110	.008	max .110	.001-.006	705210	705208	
GNGP 2078R	GNGP 2078L	2	.078	.110	.008	max .110	.002-.008	705799	705798	
GNGP 2094R	GNGP 2094L	2	.094	.110	.008	max .110	.002-.008	705214	705212	
GNGP 2125R	GNGP 2125L	2	.125	.110	.008	max .110	.003-.010	705218	705216	
GNGP 3047R	GNGP 3047L	3	.047	.075	.008	max .075	.001-.006	705222	705220	
GNGP 3062R	GNGP 3062L	3	.062	.094	.008	max .094	.001-.006	705226	705224	
GNGP 3078R	GNGP 3078L	3	.078	.094	.008	max .094	.002-.008	705801	705800	
GNGP 3094R	GNGP 3094L	3	.094	.150	.008	max .150	.002-.008	705230	705228	
GNGP 3125R	GNGP 3125L	3	.125	.150	.008	max .150	.003-.010	705234	705232	

Ordering Example: 20 pcs GNGP 3125R GM3125

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

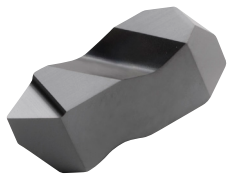
INSERT COMPATIBILITY

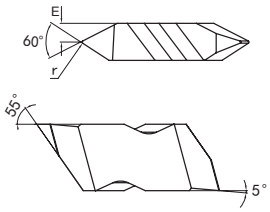
G-Notch GNGP grooving inserts are interchangeable with other Notch grooving inserts, and also fit tools using the following insert types:

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

THREADING

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 GM3125		
RIGHT HAND	LEFT HAND		E	r	EXTERNAL	INTERNAL	EXTERNAL	INTERNAL			
GNTP 2R	GNTP 2L	2	.075	.004	8 - 36	7 - 20	0.70 - 3.00	1.25 - 3.50	705240	705239	
GNTP 3R	GNTP 3L	3	.098	.007	6 - 20	5 - 12	1.25 - 4.00	2.00 - 5.00	705242	705241	

Ordering Example: 20 pcs GNTP 3R GM3125

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

G-NOTCH GROOVING/THREADING INSERTS

RECOMMENDED STARTING CUTTING SPEEDS

ISO	Material Group	Workpiece Material	Brinell Hardness HB	Rockwell Hardness HRC	Tensile Strength MPa	Recommended Starting Speeds v_c (ft/min)								
						GM3125								
						f_n (inch/rev)								
						.003	.006	.010						
P Steel	P0	Low-Carbon Steels, Long Chipping (C < .25%) Ex. A36, 1008, 1010, 1018, 1108, 1117	< 125		< 530	525	440	360						
	P1	Low-Carbon Steels, Short Chipping, Free Machining (C < .25%) Ex. 10L18, 1200 Series, 1213, 12L14	< 125		< 530	460	410	345						
	P2	Medium- and High-Carbon Steels (C > .25%) Ex. 1035, 1045, 10L45, 1080, 1137, 1144, 1525, 1572	< 220	< 25	> 530	400	360	300						
	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	345	310	230						
	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	330	280						
	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	460	400	330						
	M2	High-Strength Austenitic Stainless and Cast Stainless Steels Ex. 310, 316, 316L, 321, 347, 384	150-230	< 25	600-800	400	330	280						
	M3	Duplex Stainless Steels Ex. 323, 329, F55, 2205	135-275	< 30	< 800	430	350	300						
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	920	720	560						
	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	690	540	425						
	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	490	360	260						

TUFFY SOLID CARBIDE JOBBER DRILLS

TiALN COATED

Application:

Recommended for drilling cast iron, non ferrous alloys, plastics, aluminum and other easily machined materials and offers excellent hardness, wear resistance and heat resistance for higher cutting speeds and longer tool life.

Titanium Aluminum Nitride (TiALN) Coating increases surface hardness, wear resistance, heat resistance, chip flow and resists chip welding.

DIA	FLUTE LENGTH	OAL	EDP#	PART#	DIA	FLUTE LENGTH	OAL	EDP#	PART#
1/16″	3/4″	1-1/2″	400005	NAJD004	5/16″	2-3/8″	3-3/4″	400085	NAJD020
5/64″	7/8″	1-3/4″	400010	NAJD005	21/64″	2-1/2″	4″	400090	NAJD021
3/32″	1″	2″	400015	NAJD006	11/32″	2-1/2″	4″	400095	NAJD022
7/64″	1-1/4″	2-1/4″	400020	NAJD007	23/64″	2-3/4″	4-1/4″	400100	NAJD023
1/8″	1-1/4″	2-1/4″	400025	NAJD008	3/8″	2-3/4″	4-1/4″	400105	NAJD024
9/64″	1-3/8″	2-1/2″	400030	NAJD009	25/64″	2-7/8″	4-1/2″	400110	NAJD025
5/32″	1-3/8″	2-1/2″	400035	NAJD010	13/32″	2-7/8″	4-1/2″	400115	NAJD026
11/64″	1-5/8″	2-3/4″	400040	NAJD011	27/64″	2-7/8″	4-1/2″	400120	NAJD027
3/16″	1-5/8″	2-3/4″	400045	NAJD012	7/16″	2-7/8″	4-1/2″	400125	NAJD028
13/64″	1-3/4″	3″	400050	NAJD013	29/64″	3″	4-3/4″	400130	NAJD029
7/32″	1-3/4″	3″	400055	NAJD014	15/32″	3″	4-3/4″	400135	NAJD030
15/64″	2″	3-1/4″	400060	NAJD015	31/64″	3″	4-3/4″	400140	NAJD031
1/4″	2″	3-1/4″	400065	NAJD016	1/2″	3″	4-3/4″	400145	NAJD032
17/64″	2-1/8″	3-1/2″	400070	NAJD017	* 9/16″	3-1/4″	5″	400150	NAJD036
9/32″	2-1/8″	3-1/2″	400075	NAJD018	* 5/8″	4-1/4″	6″	400155	NAJD040
19/64″	2-3/8″	3-3/4″	400080	NAJD019	* 3/4″	4-1/4″	6″	400160	NAJD048

* NON STOCK STANDARD
QUOTE ON REQUEST

TUFFY HEAVY DUTY JOBBER DRILLS

BLACK & GOLD FINISH

DESCRIPTION

- Straight Shank
- High Speed Steel
- 135° Split Point
- Heavy Duty

135° Self-centering split point eliminates "walking" and reduces thrust. Recommended for a wide variety of low to medium tensile strength materials.

STANDARD PACKAGE:

Fractional Sizes:
1/16 to 3/8" - 12ea.
25/64 to 1/2" - 6 ea.

Letter Sizes:
A to V - 12ea.
W to Z - 6ea.

FRACTIONAL SIZES

SIZE	DECIMAL EQUIV	FLUTE LENGTH	OAL	USA PRODUCT#	VALUE IMPORT#
1/16	.0625	7/8	1-7/8	620005	610005
5/64	.0781	1	2	620010	610010
3/32	.0938	1-1/4	2-1/4	620015	610015
7/64	.1094	1-1/2	2-5/8	620020	610020
1/8	.1250	1-5/8	2-3/4	620025	610025
9/64	.1406	1-3/4	2-7/8	620030	610030
5/32	.1562	2	3-1/8	620035	610035
11/64	.1719	2-1/8	3-1/4	620040	610040
3/16	.1875	2-5/16	3-1/2	620045	610045
13/64	.2031	2-7/16	3-5/8	620050	610050
7/32	.2188	2-1/2	3-3/4	620055	610055
15/64	.2344	2-5/8	3-7/8	620060	610060
1/4-E	.2500	2-3/4	4	620065	610065
17/64	.2656	2-7/8	4-1/8	620070	610070
9/32	.2812	2-15/16	4-1/4	620075	610075
19/64	.2969	3-1/16	4-3/8	620080	610080
5/16	.3125	3-3/16	4-1/2	620085	610085
21/64	.3281	3-5/16	4-5/8	620090	610090
11/32	.3438	3-7/16	4-3/4	620095	610095
23/64	.3594	3-1/2	4-7/8	620100	610100
3/8	.3750	3-5/8	5	620105	610105
25/64	.3906	3-3/4	5-1/8	620110	610110
13/32	.4062	3-7/8	5-1/4	620115	610115
27/64	.4219	3-15/16	5-3/8	620120	610120
7/16	.4375	4-1/16	5-1/2	620125	610125
29/64	.4531	4-3/16	5-5/8	620130	610130
15/32	.4688	4-5/16	5-3/4	620135	610135
31/64	.4844	4-3/8	5-7/8	620140	610140
1/2	.5000	4-1/2	6	620145	610145

LETTER SIZES

SIZE	DECIMAL EQUIV	FLUTE LENGTH	OAL	USA PRODUCT#
A	.2340	2-5/8	3-7/8	620150
B	.2380	2-3/4	4	620155
C	.2420	2-3/4	4	620160
D	.2460	2-3/4	4	620165
F	.2570	2-7/8	4-1/8	620175
G	.2610	2-7/8	4-1/8	620180
H	.2660	2-7/8	4-1/8	620185
I	.2720	2-7/8	4-1/8	620190
J	.2770	2-7/8	4-1/8	620195
K	.2810	2-15/16	4-1/4	620200
L	.2900	2-15/16	4-1/4	620205
M	.2950	3-1/16	4-3/8	620210
N	.3020	3-1/16	4-3/8	620215
O	.3160	3-3/16	4-1/2	620220
P	.3230	3-5/16	4-5/8	620225
Q	.3320	3-7/16	4-3/4	620230
R	.3390	3-7/16	4-3/4	620235
S	.3480	3-1/2	4-7/8	620240
T	.3580	3-1/2	4-7/8	620245
U	.3680	3-5/8	5	620250
V	.3770	3-5/8	5	620255
W	.3860	3-3/4	5-1/8	620260
X	.3970	3-3/4	5-1/8	620265
Y	.4040	3-7/8	5-1/4	620270
Z	.4130	3-7/8	5-1/4	620275

TUFFY HEAVY DUTY JOBBER DRILLS

BLACK & GOLD FINISH

DESCRIPTION

- Straight Shank
- High Speed Steel
- 135° Split Point
- Heavy Duty

135° Self-centering split point eliminates "walking" and reduces thrust. Recommended for a wide variety of low to medium tensile strength materials.

STANDARD PACKAGE:

Wire Gage Sizes:
#1 to #60 - 12ea.

WIRE GAGE SIZES

SIZE	DECIMAL EQUIV	FLUTE LENGTH	OAL	USA PRODUCT#	VALUE IMPORT#
1	.2280	2-5/8	3-7/8	620280	610280
2	.2210	2-5/8	3-7/8	620285	610285
3	.2130	2-1/2	3-3/4	620290	610290
4	.2090	2-1/2	3-3/4	620295	610295
5	.2055	2-1/2	3-3/4	620300	610300
6	.2040	2-1/2	3-3/4	620305	610305
7	.2010	2-7/16	3-5/8	620310	610310
8	.1990	2-7/16	3-5/8	620315	610315
9	.1960	2-7/16	3-5/8	620320	610320
10	.1935	2-7/16	3-5/8	620325	610325
11	.1910	2-5/16	3-1/2	620330	610330
12	.1890	2-5/16	3-1/2	620335	610335
13	.1850	2-5/16	3-1/2	620340	610340
14	.1820	2-3/16	3-3/8	620345	610345
15	.1800	2-3/16	3-3/8	620350	610350
16	.1770	2-3/16	3-3/8	620355	610355
17	.1730	2-3/16	3-3/8	620360	610360
18	.1695	2-1/8	3-1/4	620365	610365
19	.1660	2-1/8	3-1/4	620370	610370
20	.1610	2-1/8	3-1/4	620375	610375
21	.1590	2-1/8	3-1/4	620380	610380
22	.1570	2	3-1/8	620385	610385
23	.1540	2	3-1/8	620390	610390
24	.1520	2	3-1/8	620395	610395
25	.1495	1-7/8	3	620400	610400
26	.1470	1-7/8	3	620405	610405
27	.1440	1-7/8	3	620410	610410
28	.1405	1-3/4	2-7/8	620415	610415
29	.1360	1-3/4	2-7/8	620420	610420
30	.1285	1-5/8	2-3/4	620425	610425

WIRE GAGE SIZES

SIZE	DECIMAL EQUIV	FLUTE LENGTH	OAL	USA PRODUCT#	VALUE IMPORT#
31	.1200	1-5/8	2-3/4	620430	610430
32	.1160	1-5/8	2-3/4	620435	610435
33	.1130	1-1/2	2-5/8	620440	610440
34	.1110	1-1/2	2-5/8	620445	610445
35	.1100	1-1/2	2-5/8	620450	610450
36	.1065	1-7/16	2-1/2	620455	610455
37	.1040	1-7/16	2-1/2	620460	610460
38	.1015	1-7/16	2-1/2	620465	610465
39	.0995	1-3/8	2-3/8	620470	610470
40	.0980	1-3/8	2-3/8	620475	610475
41	.0960	1-3/8	2-3/8	620480	610480
42	.0935	1-1/4	2-1/4	620485	610485
43	.0890	1-1/4	2-1/4	620490	610490
44	.0860	1-1/8	2-1/8	620495	610495
45	.0820	1-1/8	2-1/8	620500	610500
46	.0810	1-1/8	2-1/8	620505	610505
47	.0785	1	2	620510	610510
48	.0760	1	2	620515	610515
49	.0730	1	2	620520	610520
50	.0700	1	2	620525	610525
51	.0670	1	2	620530	610530
52	.0635	7/8	1-7/8	620535	610535
53	.0595	7/8	1-7/8	620540	610540
54	.0550	7/8	1-7/8	620545	610545
55	.0520	7/8	1-7/8	620550	610550
56	.0465	3/4	1-3/4	620555	610555
57	.0430	3/4	1-3/4	620560	610560
58	.0420	11/16	1-5/8	620565	610565
59	.0410	11/16	1-5/8	620570	610570
60	.0400	11/16	1-5/8	620575	610575

Sizes #53 and smaller furnished with 135° regular point

TUFFY HEAVY DUTY METRIC JOBBER DRILLS

COBALT (M42)

DESCRIPTION

- Straight Shank
- High Speed Steel
- 135° Split Point
- Heavy Duty

135° Self-centering split point eliminates "walking" and reduces thrust. Recommended for a wide variety of low to medium tensile strength materials.

STANDARD PACKAGE:

Metric Sizes:
1.00mm to 9.5mm - 12ea.
10mm to 13.0mm - 6ea.

METRIC SIZES

SIZE MM	DECIMAL EQUIV	FLUTE LENGTH		OAL		USA PRODUCT#
		MM	IN.	MM	IN.	
1.00	.0394	12	15/32	34	1-21/64	651005
1.50	.0591	18	45/65	40	1-9/16	651010
2.00	.0787	24	15/16	49	1-59/64	651025
2.50	.0984	30	1-11/64	57	2-15/64	651050
3.00	.1181	33	1-19/64	61	2-25/64	651065
3.50	.1378	39	1-17/32	70	2-3/4	651090
4.00	.1575	43	1-11/16	75	2-61/64	651095
4.50	.1772	47	1-27/32	80	3-9/64	651110
5.00	.1969	52	2-3/64	86	3-3/8	651120
5.50	.2165	57	2-15/64	93	3-21/32	651135
6.00	.2362	57	2-15/64	93	3-21/32	651140
6.50	.2559	63	2-15/32	101	3-31/32	651150
7.00	.2756	69	2-23/32	109	4-9/32	651165

METRIC SIZES

SIZE MM	DECIMAL EQUIV	FLUTE LENGTH		OAL		USA PRODUCT#
		MM	IN.	MM	IN.	
7.50	.2953	69	2-23/32	109	4-9/32	651170
8.00	.3150	75	2-61/64	117	4-19/32	651175
8.50	.3346	75	2-61/64	117	4-19/32	651180
9.00	.3543	81	3-3/16	125	4-59/64	651185
9.50	.3740	81	3-3/16	125	4-59/64	651190
10.00	.3937	87	3-27/64	133	5-15/64	651195
10.50	.4134	87	3-27/64	133	5-15/64	651205
11.00	.4331	94	3-45/64	142	5-37/64	651210
11.50	.4528	94	3-45/64	142	5-37/64	651215
12.00	.4724	101	3-31/32	151	5-15/16	651220
12.50	.4921	101	3-31/32	151	5-15/16	651225
13.00	.5118	101	3-31/32	151	5-15/16	651230

Sizes 1.5mm and smaller furnished with 135° regular point

TUFFY 1/2" REDUCED SHANK PRENTICE DRILLS

BLACK & GOLD FINISH

DESCRIPTION

- 118° Split Point
- High Speed Steel
- 3-Flat Shank

Expand the size range capacity of 1/2" drill chucks. Recommended for drilling a wide range of materials of low to medium tensile strength

3-Flat Shank for positive hold

118° Self-centering split point reduces "wandering" and thrust.

3-FLAT SHANKS - 118° SPLIT POINT

SIZE	DECIMAL EQUIV	FLUTE LENGTH	OAL	USA PRODUCT#	VALUE IMPORT#
33/64	.5156	3-1/8	6	630005	631005
17/32	.5312	3-1/8	6	630010	631010
35/64	.5469	3-1/8	6	630015	631015
9/16	.5625	3-1/8	6	630020	631020
37/64	.5781	3-1/8	6	630025	631025
19/32	.5938	3-1/8	6	630030	631030
39/64	.6094	3-1/8	6	630035	631035
5/8	.6250	3-1/8	6	630040	631040
41/64	.6406	3-1/8	6	630045	631045
21/32	.6562	3-1/8	6	630050	631050
43/64	.6719	3-1/8	6	630055	631055
11/16	.6875	3-1/8	6	630060	631060
45/64	.7031	3-1/8	6	630065	631065
23/32	.7188	3-1/8	6	630070	631070
47/64	.7344	3-1/8	6	630075	631075
3/4	.7500	3-1/8	6	630080	631080
49/64	.7656	3-1/8	6	630085	631085
25/32	.7812	3-1/8	6	630090	631090
51/64	.7969	3-1/8	6	630095	631095
13/16	.8125	3-1/8	6	630100	631100
53/64	.8281	3-1/8	6	630105	631105
27/32	.8438	3-1/8	6	630110	631110

3-FLAT SHANKS - 118° SPLIT POINT

SIZE	DECIMAL EQUIV	FLUTE LENGTH	OAL	USA PRODUCT#	VALUE IMPORT#
55/64	.8594	3-1/8	6	630115	631115
7/8	.8750	3-1/8	6	630120	631120
57/64	.8902	3-1/8	6	630125	631125
29/32	.9062	3-1/8	6	630130	631130
59/64	.9219	3-1/8	6	630135	631135
15/16	.9375	3-1/8	6	630140	631140
61/64	.9531	3-1/8	6	630145	631145
31/32	.9688	3-1/8	6	630150	631150
63/64	.9844	3-1/8	6	630155	631155
1	1.0000	3-1/8	6	630160	631160
1-1/32	1.0312	3-1/8	6	630165	631165
1-1/16	1.0625	3-1/8	6	630170	631170
1-3/32	1.0937	3-1/8	6	630175	631175
1-1/8	1.1250	3-1/8	6	630180	631180
1-5/32	1.1562	3-1/8	6	630185	631185
1-3/16	1.1875	3-1/8	6	630190	631190
1-7/32	1.2188	3-1/8	6	630195	631195
1-1/4	1.2500	3-1/8	6	630200	631200
1-5/16	1.3125	3-1/8	6	630205	631205
1-3/8	1.3750	3-1/8	6	630210	631210
1-7/16	1.4375	3-1/8	6	630215	631215
1-1/2	1.5000	3-1/8	6	630220	631220

SPIRAL POINT PLUG TAPS

DESCRIPTION

- Manufactured To Table 302A Standards
- M2 High Speed Steel
- TiCN Coated

Titanium
Carbonitride
Coating
increases wear resistance, reduces friction and galling, reduces tapping torque, improves thread quality and allows increased cutting speeds for greatly increased productivity and tool life.

Reduce Neck Design and Shorter Thread Length
Ideal for increased coolant flow to the cutting edge, enhanced chip evacuation and reduced contact between tap and workpiece. For general purpose tapping in a wide variety of materials up to 45Rc hardness.

CNC Reduced Neck Design

Designed for tapping through holes.
The spiral point forces the chips ahead of the tap.

Fractional & Machine Screw

SIZE	THREAD TYPE	PITCH DIA. LIMIT	NO. OF FLUTES	THREAD LENGTH	NECK LENGTH	OAL	EDP NO.
4-40	NC	H2	2	.313	.250	1-7/8	200100
6-32	NC	H3	2	.375	.313	2	200103
8-32	NC	H3	2	.375	.375	2-1/8	200106
10-24	NC	H3	2	.500	.375	2-3/8	200112
10-32	NF	H3	2	.500	.375	2-3/8	200118
12-24	NC	H3	3	.500	.375	2-3/8	200124
12-28	NF	H3	3	.500	.375	2-3/8	200127
1/4-20	NC	H3	3	.625	.375	2-1/2	200130
1/4-28	NF	H3	3	.625	.375	2-1/2	200139
5/16-18	NC	H3	3	.688	.438	2-23/32	200142
5/16-24	NF	H3	3	.688	.438	2-23/32	200145
3/8-16	NC	H3	3	.750	.500	2-15/16	200148
3/8-24	NF	H3	3	.750	.500	2-15/16	200151
7/16-14	NC	H3	3	.875	.563	3-5/32	200154
7/16-20	NF	H3	3	.875	.563	3-5/32	200157
1/2-13	NC	H3	3	.938	.719	3-3/8	200160
1/2-20	NF	H3	3	.938	.719	3-3/8	200163
9/16-12	NC	H3	4	1.000	.673	3-19/32	200166
9/16-18	NF	H3	4	1.000	.673	3-19/32	200169
5/8-11	NC	H3	4	1.125	.673	3-13/16	200172
5/8-18	NF	H3	4	1.125	.673	3-13/16	200175
3/4-10	NC	H3	4	1.219	.766	4-1/4	200178
3/4-16	NF	H3	4	1.219	.766	4-1/4	200181
7/8-9	NC	H4	4	1.344	.875	4-11/16	200184
7/8-14	NF	H4	4	1.344	.875	4-11/16	200187
1-8	NC	H4	4	1.500	1.000	5-1/8	200190
1-12	NF	H4	4	1.500	1.000	5-1/8	200193

Metric

SIZE	PITCH	PITCH DIA. LIMIT	NO. OF FLUTES	THREAD LENGTH	NECK LENGTH	OAL	EDP NO.
M2	0.4	D3	2	.313	.313	1-15/16	200220
M2.5	0.45	D3	2	.313	.313	1-15/16	200223
M3	0.5	D3	2	.313	.313	1-15/16	200226
M3.5	0.6	D4	2	.375	.313	2	200229
M4	0.7	D4	3	.375	.375	2-1/8	200232
M5	0.8	D4	3	.500	.375	2-3/8	200235
M6	1	D5	3	.625	.375	2-1/2	200238
M7	1	D5	3	.688	.438	2-23/32	200241
M8	1	D5	3	.688	.438	2-23/32	200244
M8	1.25	D5	3	.688	.438	2-23/32	200247
M10	1.25	D5	3	.750	.500	2-15/16	200250
M10	1.5	D6	3	.750	.500	2-15/16	200253
M12	1.25	D5	3	.938	.719	3-3/8	200256
M12	1.75	D6	3	.938	.719	3-3/8	200259
M14	1.5	D6	4	1.000	.673	3-19/32	200262
M14	2	D7	4	1.000	.673	3-19/32	200265
M16	1.5	D6	4	1.125	.673	3-13/16	200268
M16	2	D7	4	1.125	.673	3-13/16	200271
M18	1.5	D6	4	1.125	.719	4-1/32	200274
M18	2.5	D7	4	1.125	.719	4-1/32	200277
M20	1.5	D6	4	1.188	.812	4-15/32	200280
M20	2.5	D7	4	1.188	.812	4-15/32	200283
M22	1.5	D6	4	1.188	1.031	4-11/16	200286
M22	2.5	D7	4	1.188	1.031	4-11/16	200289
M24	1.5	D7	4	1.422	.797	4-29/32	200292
M24	3	D8	4	1.422	.797	4-29/32	200295

SPIRAL FLUTE SEMI-BOTTOMING TAPS

DESCRIPTION

- Manufactured To Table 302A Standards
- M2 High Speed Steel
- TiCN Coated

Titanium
Carbonitride
Coating
increases wear resistance, reduces friction and galling, reduces tapping torque, improves thread quality and allows increased cutting speeds for greatly increased productivity and tool life.

Reduce Neck Design and Shorter Thread Length
Ideal for increased coolant flow to the cutting edge, enhanced chip evacuation and reduced contact between tap and workpiece. For general purpose tapping in a wide variety of materials up to 45Rc hardness.

CNC Reduced Neck Design

Designed for tapping blind holes. The spiral flutes draw the chips out of the hole.

Fractional & Machine Screw

SIZE	THREAD TYPE	PITCH DIA. LIMIT	NO. OF FLUTES	THREAD LENGTH	NECK LENGTH	OAL	EDP NO.
4-40	NC	H2	3	.236	.327	1-7/8	200300
6-32	NC	H3	3	.236	.452	2	200303
8-32	NC	H3	3	.236	.514	2-1/8	200306
10-24	NC	H3	3	.354	.521	2-3/8	200309
10-32	NF	H3	3	.354	.521	2-3/8	200312
12-24	NC	H3	3	.354	.521	2-3/8	200315
12-28	NF	H3	3	.354	.521	2-3/8	200318
1/4-20	NC	H3	3	.433	.567	2-1/2	200321
1/4-28	NF	H3	3	.433	.567	2-1/2	200324
5/16-18	NC	H3	3	.472	.653	2-23/32	200327
5/16-24	NF	H3	3	.472	.653	2-23/32	200330
3/8-16	NC	H3	3	.551	.699	2-15/16	200333
3/8-24	NF	H3	3	.551	.699	2-15/16	200336
7/16-14	NC	H3	3	.591	.847	3-5/32	200339
7/16-20	NF	H3	3	.591	.847	3-5/32	200342
1/2-13	NC	H3	3	.630	1.026	3-3/8	200345
1/2-20	NF	H3	3	.630	1.026	3-3/8	200348
9/16-12	NC	H3	3	.690	.983	3-19/32	200351
9/16-18	NF	H3	3	.690	.983	3-19/32	200354
5/8-11	NC	H3	3	.745	1.052	3-13/16	200357
5/8-18	NF	H3	3	.745	1.052	3-13/16	200360
3/4-10	NC	H3	4	.820	1.165	4-1/4	200363
3/4-16	NF	H3	4	.820	1.165	4-1/4	200366
7/8-9	NC	H4	4	.911	1.308	4-11/16	200369
7/8-14	NF	H4	4	.911	1.308	4-11/16	200372
1-8	NC	H4	4	1.025	1.475	5-1/8	200375
1-12	NF	H4	4	1.025	1.475	5-1/8	200378

Metric

SIZE	PITCH	PITCH DIA. LIMIT	NO. OF FLUTES	THREAD LENGTH	NECK LENGTH	OAL	EDP NO.
M3	0.5	D3	3	.236	.389	1-15/16	200405
M3.5	0.6	D4	3	.236	.452	2	200408
M4	0.7	D4	3	.236	.514	2-1/8	200411
M5	0.8	D4	3	.354	.521	2-3/8	200414
M6	1	D5	3	.433	.567	2-1/2	200417
M7	1	D5	3	.472	.653	2-23/32	200420
M8	1	D5	3	.472	.653	2-23/32	200423
M8	1.25	D5	3	.472	.653	2-23/32	200426
M10	1.25	D5	3	.551	.699	2-15/16	200429
M10	1.5	D6	3	.551	.699	2-15/16	200432
M12	1.25	D5	3	.630	1.026	3-3/8	200435
M12	1.75	D6	3	.630	1.026	3-3/8	200438
M14	1.5	D6	3	.690	.983	3-19/32	200441
M14	2	D7	3	.690	.983	3-19/32	200444
M16	1.5	D6	3	.745	1.052	3-13/16	200447
M16	2	D7	3	.745	1.052	3-13/16	200450
M18	1.5	D6	4	.813	.983	4-1/32	200453
M18	2.5	D7	4	.813	.983	4-1/32	200456
M20	1.5	D6	4	.790	1.210	4-15/32	200459
M20	2.5	D7	4	.790	1.210	4-15/32	200462
M22	1.5	D6	4	.790	1.428	4-11/16	200465
M22	2.5	D7	4	.790	1.428	4-11/16	200468
M24	1.5	D7	4	.940	1.279	4-29/32	200471
M24	3	D8	4	.940	1.279	4-29/32	200474

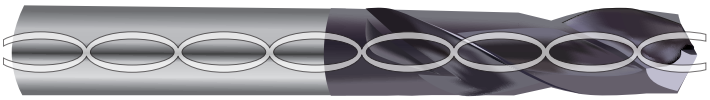
TUFFY SOLID CARBIDE PERFORMANCE DRILLS

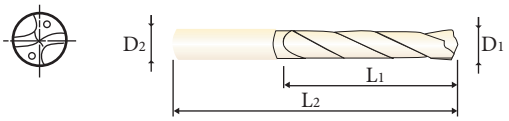
SHORT THRU COOLANT - 3 X DIAMETER

DESCRIPTION

Application:
Steel, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

Advantages: Self centering - center drilling is not required
Excellent positioning - bushing is not necessary
Special Design - reaming is not required
- good chip removal
- powerful drilling





SPECS:

Helix Angle: 30°
Point Angle: 140°
Shank TOL ø2d: -.0001 - .0005
Plain Shank: DIN6535-HA
Coating: TiAlN

IMPERIAL

Part No.	EDP#	Diameter		Shank Dia.	Flute Length	Overall Length
		Fractional	Decimal			
TiAlN		D1		D2	L1	L2
SCD-1250-3D-TC	401005	1/8	0.1250	15/64	1.102	2.992
SCD-1719-3D-TC	401010	11/64	0.1719	15/64	1.417	3.386
SCD-1875-3D-TC	401015	3/16	0.1875	15/64	1.575	3.543
SCD-2031-3D-TC	401020	13/64	0.2031	15/64	1.082	3.228
SCD-2188-3D-TC	401025	7/32	0.2188	15/64	1.181	3.228
SCD-2344-3D-TC	401030	15/64	0.2344	15/64	1.181	3.228
SCD-2500-3D-TC	401035	1/4	0.2500	17/64	1.279	3.465
SCD-2570-3D-TC	401040	F	0.2570	17/64	1.279	3.465
SCD-2656-3D-TC	401045	17/64	0.2656	17/64	1.378	3.465
SCD-2720-3D-TC	401050	I	0.2720	0.2720	1.378	3.465
SCD-2812-3D-TC	401055	9/32	0.2812	5/16	1.476	3.701
SCD-2969-3D-TC	401060	19/64	0.2969	5/16	1.476	3.701
SCD-3125-3D-TC	401065	5/16	0.3125	5/16	1.575	3.701
SCD-3281-3D-TC	401070	21/64	0.3281	11/32	1.673	3.937
SCD-3320-3D-TC	401075	Q	0.3320	11/32	1.673	3.937
SCD-3438-3D-TC	401080	11/32	0.3438	11/32	1.772	3.937
SCD-3495-3D-TC	401085	23/64	0.3594	25/64	1.870	4.174
SCD-3680-3D-TC	401090	U	0.3680	25/64	1.870	4.174

3 X D

Part No.	EDP#	Diameter		Shank Dia.	Flute Length	Overall Length
		Fractional	Decimal			
TiAlN		D1		D2	L1	L2
SCD-3750-3D-TC	401095	3/8	0.3750	25/64	1.969	4.174
SCD-3905-3D-TC	401100	25/64	0.3906	25/64	1.969	4.174
SCD-4062-3D-TC	401105	13/32	0.4062	27/64	2.067	4.567
SCD-4219-3D-TC	401110	27/64	0.4219	27/64	2.165	4.567
SCD-4375-3D-TC	401115	7/16	0.4375	15/32	2.264	4.803
SCD-4531-3D-TC	401120	29/64	0.4531	15/32	2.264	4.803
SCD-4688-3D-TC	401125	15/32	0.4688	15/32	2.362	4.803
SCD-4844-3D-TC	401130	31/64	0.4844	1/2	2.461	5.039
SCD-5000-3D-TC	401135	1/2	0.5000	1/2	2.559	5.039
SCD-5156-3D-TC	401140	33/64	0.5156	35/64	2.657	5.276
SCD-5312-3D-TC	401145	17/32	0.5312	35/64	2.756	5.276
SCD-5469-3D-TC	401150	35/64	0.5469	35/64	2.756	5.276
SCD-5625-3D-TC	401155	9/16	0.5625	37/64	2.854	5.512
SCD-57813D-TC	401160	37/64	0.5781	37/64	2.953	5.512
SCD-5937-3D-TC	401165	19/32	0.5937	5/8	3.051	5.709
SCD-6094-3D-TC	401170	39/64	0.6094	5/8	3.051	5.709
SCD-6250-3D-TC	401175	5/8	0.6250	5/8	3.150	5.709

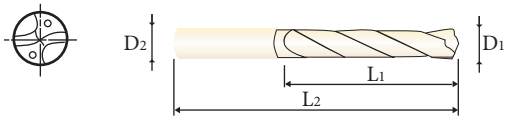
TUFFY SOLID CARBIDE PERFORMANCE DRILLS

SHORT THRU COOLANT - 3 X DIAMETER

DESCRIPTION

Application:
Steel, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

Advantages: Self centering - center drilling is not required
Excellent positioning - bushing is not necessary
Special Design - reaming is not required
- good chip removal
- powerful drilling



SPECS:

Helix Angle: 30°
Point Angle: 140°
Shank TOL ø2d: h6 =+.0/-.0003
Plain Shank: DIN6535-HA
Coating: TiAlN

METRIC

3 X D

Part No.	EDP#	Diameter Metric	Diameter Inch	Shank Dia	Flute Length	Overall Length
TiAlN		D1		D2	L1	L2
SCD-1181-3D-TC	401180	3.0	0.1181	6	20	62
SCD-1220-3D-TC	401185	3.1	0.1220	6	20	62
SCD-1260-3D-TC	401190	3.2	0.1260	6	20	62
SCD-1299-3D-TC	401195	3.3	0.1299	6	20	62
SCD-1399-3D-TC	401200	3.4	0.1339	6	20	62
SCD-1378-3D-TC	401205	3.5	0.1378	6	20	62
SCD-1417-3D-TC	401210	3.6	0.1417	6	20	62
SCD-1457-3D-TC	401215	3.7	0.1457	6	20	62
SCD-1496-3D-TC	401220	3.8	0.1496	6	24	66
SCD-1535-3D-TC	401225	3.9	0.1535	6	24	66
SCD-1575-3D-TC	401230	4.0	0.1575	6	24	66
SCD-1614-3D-TC	401235	4.1	0.1614	6	24	66
SCD-1654-3D-TC	401240	4.2	0.1654	6	24	66
SCD-1693-3D-TC	401245	4.3	0.1693	6	24	66
SCD-1732-3D-TC	401250	4.4	0.1732	6	24	66
SCD-1772-3D-TC	401255	4.5	0.1772	6	24	66
SCD-1811-3D-TC	401260	4.6	0.1811	6	24	66
SCD-1850-3D-TC	401265	4.7	0.1850	6	24	66
SCD-1890-3D-TC	401270	4.8	0.1890	6	28	66
SCD-1929-3D-TC	401275	4.9	0.1929	6	28	66
SCD-1969-3D-TC	401280	5.0	0.1969	6	28	66
SCD-2008-3D-TC	401285	5.1	0.2008	6	28	66
SCD-2047-3D-TC	401290	5.2	0.2047	6	28	66
SCD-2087-3D-TC	401295	5.3	0.2087	6	28	66
SCD-2126-3D-TC	401300	5.4	0.2126	6	28	66
SCD-2165-3D-TC	401305	5.5	0.2165	6	28	66
SCD-2205-3D-TC	401310	5.6	0.2205	6	28	66

Part No.	EDP#	Diameter Metric	Diameter Inch	Shank Dia	Flute Length	Overall Length
TiAlN		D1		D2	L1	L2
SCD-2244-3D-TC	401315	5.7	0.2244	6	28	66
SCD-2283-3D-TC	401320	5.8	0.2283	6	28	66
SCD-2323-3D-TC	401325	5.9	0.2323	6	28	66
SCD-2362-3D-TC	401330	6.0	0.2362	6	28	66
SCD-2402-3D-TC	401335	6.1	0.2402	8	34	79
SCD-2441-3D-TC	401340	6.2	0.2441	8	34	79
SCD-2480-3D-TC	401345	6.3	0.2480	8	34	79
SCD-2520-3D-TC	401350	6.4	0.2520	8	34	79
SCD-2559-3D-TC	401355	6.5	0.2559	8	34	79
SCD-2598-3D-TC	401360	6.6	0.2598	8	34	79
SCD-2638-3D-TC	401365	6.7	0.2638	8	34	79
SCD-2677-3D-TC	401370	6.8	0.2677	8	34	79
SCD-2717-3D-TC	401375	6.9	0.2717	8	34	79
SCD-2756-3D-TC	401380	7.0	0.2756	8	34	79
SCD-2795-3D-TC	401385	7.1	0.2795	8	41	79
SCD-2835-3D-TC	401390	7.2	0.2835	8	41	79
SCD-2874-3D-TC	401395	7.3	0.2874	8	41	79
SCD-2913-3D-TC	401400	7.4	0.2913	8	41	79
SCD-2953-3D-TC	401405	7.5	0.2953	8	41	79
SCD-2992-3D-TC	401410	7.6	0.2992	8	41	79
SCD-3031-3D-TC	401415	7.7	0.3031	8	41	79
SCD-3071-3D-TC	401420	7.8	0.3071	8	41	79
SCD-3110-3D-TC	401425	7.9	0.3110	8	41	79
SCD-3150-3D-TC	401430	8.0	0.3150	8	41	79
SCD-3189-3D-TC	401435	8.1	0.3189	10	47	89
SCD-3228-3D-TC	401440	8.2	0.3228	10	47	89
SCD-3268-3D-TC	401445	8.3	0.3268	10	47	89

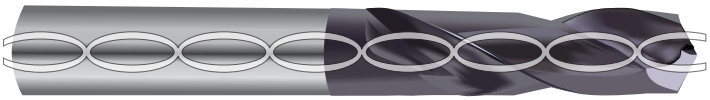
TUFFY SOLID CARBIDE PERFORMANCE DRILLS

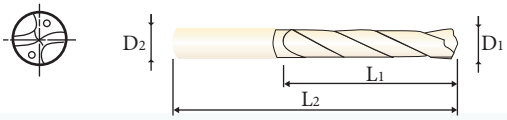
SHORT THRU COOLANT - 3 X DIAMETER

DESCRIPTION

Application:
Steel, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

Advantages: Self centering - center drilling is not required
Excellent positioning - bushing is not necessary
Special Design - reaming is not required
- good chip removal
- powerful drilling





SPECS:

Helix Angle: 30°
Point Angle: 140°
Shank TOL ø2d: h6 =+.0/-.0003
Plain Shank: DIN6535-HA
Coating: TiAlN

METRIC

Part No.	EDP#	Diameter		Shank Dia	Flute Length	Overall Length
		Metric	Inch			
TiAlN		D1		D2	L1	L2
SCD-3307-3D-TC	401450	8.4	0.3307	10	47	89
SCD-3346-3D-TC	401455	8.5	0.3346	10	47	89
SCD-3386-3D-TC	401460	8.6	0.3386	10	47	89
SCD-3425-3D-TC	401465	8.7	0.3425	10	47	89
SCD-3465-3D-TC	401470	8.8	0.3465	10	47	89
SCD-3504-3D-TC	401475	8.9	0.3504	10	47	89
SCD-3543-3D-TC	401480	9.0	0.3543	10	47	89
SCD-3583-3D-TC	401485	9.1	0.3583	10	47	89
SCD-3622-3D-TC	401490	9.2	0.3622	10	47	89
SCD-3661-3D-TC	401495	9.3	0.3661	10	47	89
SCD-3701-3D-TC	401500	9.4	0.3701	10	47	89
SCD-3740-3D-TC	401505	9.5	0.3740	10	47	89
SCD-3780-3D-TC	401510	9.6	0.3780	10	47	89
SCD-3819-3D-TC	401515	9.7	0.3819	10	47	89
SCD-3858-3D-TC	401520	9.8	0.3858	10	47	89
SCD-3898-3D-TC	401525	9.9	0.3898	10	47	89
SCD-3937-3D-TC	401530	10.0	0.3937	10	47	89
SCD-3976-3D-TC	401535	10.1	0.3976	12	55	102
SCD-4016-3D-TC	401540	10.2	0.4016	12	55	102
SCD-4055-3D-TC	401545	10.3	0.4055	12	55	102
SCD-4094-3D-TC	401550	10.4	0.4094	12	55	102
SCD-4134-3D-TC	401555	10.5	0.4134	12	55	102
SCD-4173-3D-TC	401560	10.6	0.4173	12	55	102
SCD-4212-3D-TC	401565	10.7	0.4212	12	55	102
SCD-4252-3D-TC	401570	10.8	0.4252	12	55	102
SCD-4291-3D-TC	401575	10.9	0.4291	12	55	102
SCD-4330-3D-TC	401580	11.0	0.4330	12	55	102

3 X D

Part No.	EDP#	Diameter		Shank Dia	Flute Length	Overall Length
		Metric	Inch			
TiAlN		D1		D2	L1	L2
SCD-4307-3D-TC	401585	11.1	0.4370	12	55	102
SCD-4409-3D-TC	401590	11.2	0.4409	12	55	102
SCD-4448-3D-TC	401595	11.3	0.4448	12	55	102
SCD-4488-3D-TC	401600	11.4	0.4488	12	55	102
SCD-4527-3D-TC	401605	11.5	0.4527	12	55	102
SCD-4566-3D-TC	401610	11.6	0.4566	12	55	102
SCD-4606-3D-TC	401615	11.7	0.4606	12	55	102
SCD-4645-3D-TC	401620	11.8	0.4645	12	55	102
SCD-4685-3D-TC	401625	11.9	0.4685	12	55	102
SCD-4724-3D-TC	401630	12.0	0.4724	12	55	102
SCD-4921-3D-TC	401635	12.5	0.4921	14	60	107
SCD-5118-3D-TC	401640	13.0	0.5118	14	60	107
SCD-5314-3D-TC	401645	13.5	0.5314	14	60	107
SCD-5512-3D-TC	401650	14.0	0.5512	14	60	107
SCD-5708-3D-TC	401655	14.5	0.5708	16	65	115
SCD-5905-3D-TC	401660	15.0	0.5905	16	65	115
SCD-6102-3D-TC	401665	15.5	0.6102	16	65	115
SCD-6299-3D-TC	401670	16.0	0.6299	16	65	115
SCD-6495-3D-TC	401675	16.5	0.6495	18	73	123
SCD-6692-3D-TC	401680	17.0	0.6692	18	73	123
SCD-6889-3D-TC	401685	17.5	0.6889	18	73	123
SCD-7087-3D-TC	401690	18.0	0.7087	18	73	123
SCD-7283-3D-TC	401695	18.5	0.7283	20	79	131
SCD-7480-3D-TC	401700	19.0	0.7480	20	79	131

TUFFY SOLID CARBIDE PERFORMANCE DRILLS

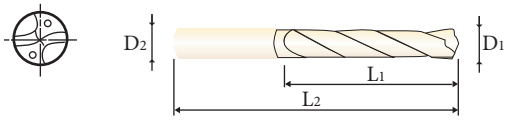
LONG THRU COOLANT - 5 X DIAMETER

DESCRIPTION

Application:
Steel, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

Advantages: Self centering
Excellent positioning
Special Design

- center drilling is not required
- bushing is not necessary
- reaming is not required
- good chip removal
- powerful drilling



SPECS:

Helix Angle: 30°
Point Angle: 140°
Shank TOL ø2d: -.0001 - .0005
Plain Shank: DIN6535-HA
Coating: TiAlN

Part No.	EDP#	Diameter		Shank Dia.	Flute Length	Overall Length
		Fractional	Decimal			
TiAlN		D1		D2	L1	L2
SCD-2031-5D-TC	401715	13/64	0.2031	15/64	1-3/4	3-15/16
SCD-2188-5D-TC	401720	7/32	0.2188	15/64	1-57/64	3-15/16
SCD-2344-5D-TC	401725	15/64	0.2344	15/64	1-57/64	3-15/16
SCD-2500-5D-TC	401730	1/4	0.2500	17/64	2-3/64	4-19/64
SCD-2570-5D-TC	401735	F	0.2570	17/64	2-13/64	4-19/64
SCD-2656-5D-TC	401740	17/64	0.2656	17/64	2-13/64	4-19/64
SCD-2720-5D-TC	401745	I	0.2720	0.2720	2-13/64	4-19/64
SCD-2812-5D-TC	401750	9/32	0.2812	5/16	2-23/64	4-41/64
SCD-2969-5D-TC	401755	19/64	0.2969	5/16	2-33/64	4-41/64
SCD-3125-5D-TC	401760	5/16	0.3125	5/16	2-33/64	4-41/64
SCD-3281-5D-TC	401765	21/64	0.3281	11/32	2-43/64	5
SCD-3320-5D-TC	401770	Q	0.3320	11/32	2-43/64	5

5 X D

Part No.	EDP#	Diameter		Shank Dia.	Flute Length	Overall Length
		Fractional	Decimal			
TiAlN		D1		D2	L1	L2
SCD-3438-5D-TC	401775	11/32	0.3438	11/32	2-27/32	5
SCD-3594-5D-TC	401780	23/64	0.3594	25/64	3	5-23/64
SCD-3680-5D-TC	401785	U	0.3680	25/64	3	5-23/64
SCD-3750-5D-TC	401790	3/8	0.3750	25/64	3-5/32	5-23/64
SCD-3906-5D-TC	401795	25/64	0.3906	25/64	3-5/32	5-23/64
SCD-4062-5D-TC	401800	13/32	0.4062	27/64	3-5/16	5-7/8
SCD-4219-5D-TC	401805	27/64	0.4219	27/64	3-15/32	5-7/8
SCD-4375-5D-TC	401810	7/16	0.4375	15/32	3-5/8	6-7/32
SCD-4531-5D-TC	401815	29/64	0.4531	15/32	3-25/32	6-7/32
SCD-4688-5D-TC	401820	15/32	0.4688	15/32	3-25/32	6-7/32
SCD-4844-5D-TC	401825	31/64	0.4844	1/2	3-15/16	6-37/64
SCD-5000-5D-TC	401830	1/2	0.5000	1/2	4-3/32	6-37/64

TUFFY SOLID CARBIDE PERFORMANCE DRILLS

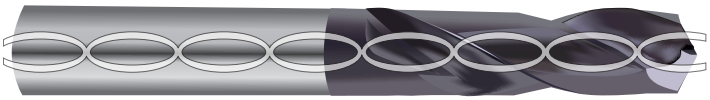
LONG THRU COOLANT - 5 X DIAMETER

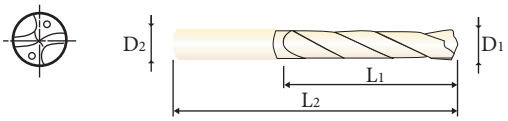
DESCRIPTION

Application:
Steel, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

Advantages:

Self centering	- center drilling is not requirec
Excellent positioning	- bushing is not necessary
Special Design	- reaming is not required
	- good chip removal
	- powerful drilling





SPECS:

Helix Angle:	30°
Point Angle:	140°
Shank TOL ø2d:	h6 =+.0/-.0003
Plain Shank:	DIN6535-HA
Coating:	TiAlN

5 X D

Part No.	EDP#	Diameter		Shank Dia	Flute Length	Overall Length
		Metric	Inch			
TiAlN		D1		D2	L1	L2
SCD-1496-5D-TC	401975	3.8	0.1496	6	36	74
SCD-1535-5D-TC	401980	3.9	0.1535	6	36	74
SCD-1575-5D-TC	401985	4.0	0.1575	6	36	74
SCD-1614-5D-TC	401990	4.1	0.1614	6	36	74
SCD-1693-5D-TC	401995	4.3	0.1693	6	36	74
SCD-1732-5D-TC	402000	4.4	0.1732	6	36	74
SCD-1772-5D-TC	402005	4.5	0.1772	6	36	74
SCD-1811-5D-TC	402010	4.6	0.1811	6	36	74
SCD-1850-5D-TC	402015	4.7	0.1850	6	36	74

Part No.	EDP#	Diameter		Shank Dia	Flute Length	Overall Length
		Metric	Inch			
TiAlN		D1		D2	L1	L2
SCD-1890-5D-TC	402020	4.8	0.1890	6	44	82
SCD-1929-5D-TC	402025	4.9	0.1929	6	44	82
SCD-1969-5D-TC	402030	5.0	0.1969	6	44	82
SCD-2008-5D-TC	402035	5.1	0.2008	6	44	82
SCD-2047-5D-TC	402040	5.2	0.2047	6	44	82
SCD-2087-5D-TC	402045	5.3	0.2087	6	44	82
SCD-2126-5D-TC	402050	5.4	0.2126	6	44	82
SCD-2165-5D-TC	402055	5.5	0.2165	6	44	82

TUFFY SOLID CARBIDE PERFORMANCE DRILLS

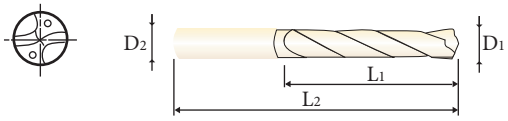
LONG THRU COOLANT - 5 X DIAMETER

DESCRIPTION

Application:
Steel, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

Advantages:

Self centering	- center drilling is not required
Excellent positioning	- bushing is not necessary
Special Design	- reaming is not required
	- good chip removal
	- powerful drilling



SPECS:

Helix Angle:	30°
Point Angle:	140°
Shank TOL ø2d:	-.0001 - .0005
Plain Shank:	DIN6535-HA
Coating:	TiAlN

5 X D

Part No.	EDP#	Diameter		Shank Dia	Flute Length	Overall Length
		Metric	Inch			
TiAlN		D1		D2	L1	L2
SCD-2205-5D-TC	402060	5.6	0.2205	6	44	82
SCD-2244-5D-TC	402065	5.7	0.2244	6	44	82
SCD-2283-5D-TC	402070	5.8	0.2283	6	44	82
SCD-2323-5D-TC	402075	5.9	0.2323	6	44	82
SCD-2362-5D-TC	402080	6.0	0.2362	6	44	82
SCD-2402-5D-TC	402085	6.1	0.2402	8	53	91
SCD-2441-5D-TC	402090	6.2	0.2441	8	53	91
SCD-2480-5D-TC	402095	6.3	0.2480	8	53	91
SCD-2520-5D-TC	402100	6.4	0.2520	8	53	91
SCD-2559-5D-TC	402105	6.5	0.2559	8	53	91
SCD-2598-5D-TC	402110	6.6	0.2598	8	53	91
SCD-2638-5D-TC	402115	6.7	0.2638	8	53	91
SCD-2677-5D-TC	402120	6.8	0.2677	8	53	91
SCD-2717-5D-TC	402125	6.9	0.2717	8	53	91
SCD-2756-5D-TC	402130	7.0	0.2756	8	53	91
SCD-2795-5D-TC	402135	7.1	0.2795	8	53	91
SCD-2835-5D-TC	402140	7.2	0.2835	8	53	91
SCD-2874-5D-TC	402145	7.3	0.2874	8	53	91
SCD-2913-5D-TC	402150	7.4	0.2913	8	53	91
SCD-2953-5D-TC	402155	7.5	0.2953	8	53	91
SCD-2992-5D-TC	402160	7.6	0.2992	8	53	91
SCD-3031-5D-TC	402165	7.7	0.3031	8	53	91
SCD-3071-5D-TC	402170	7.8	0.3071	8	53	91

Part No.	EDP#	Diameter		Shank Dia	Flute Length	Overall Length
		Metric	Inch			
TiAlN		D1		D2	L1	L2
SCD-3110-5D-TC	402175	7.9	0.3110	8	53	91
SCD-3150-5D-TC	402180	8.0	0.3150	8	53	91
SCD-3189-5D-TC	402185	8.1	0.3189	10	61	103
SCD-3228-5D-TC	402190	8.2	0.3228	10	61	103
SCD-3268-5D-TC	402195	8.3	0.3268	10	61	103
SCD-3307-5D-TC	402200	8.4	0.3307	10	61	103
SCD-3346-5D-TC	402205	8.5	0.3346	10	61	103
SCD-3386-5D-TC	402210	8.6	0.3386	10	61	103
SCD-3425-5D-TC	402215	8.7	0.3425	10	61	103
SCD-3465-5D-TC	402220	8.8	0.3465	10	61	103
SCD-3504-5D-TC	402225	8.9	0.3504	10	61	103
SCD-3543-5D-TC	402230	9.0	0.3543	10	61	103
SCD-3583-5D-TC	402235	9.1	0.3583	10	61	103
SCD-3622-5D-TC	402240	9.2	0.3622	10	61	103
SCD-3661-5D-TC	402245	9.3	0.3661	10	61	103
SCD-3701-5D-TC	402250	9.4	0.3701	10	61	103
SCD-3740-5D-TC	402255	9.5	0.3740	10	61	103
SCD-3780-5D-TC	402260	9.6	0.3780	10	61	103
SCD-3819-5D-TC	402265	9.7	0.3819	10	61	103
SCD-3858-5D-TC	402270	9.8	0.3858	10	61	103
SCD-3898-5D-TC	402275	9.9	0.3898	10	61	103
SCD-3937-5D-TC	402280	10.0	0.3937	10	61	103
SCD-3976-5D-TC	402285	10.1	0.3976	12	71	118

TUFFY SOLID CARBIDE PERFORMANCE DRILLS

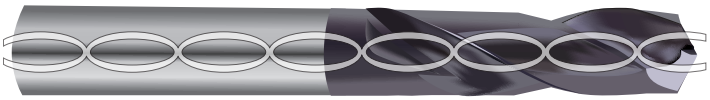
LONG THRU COOLANT - 5 X DIAMETER

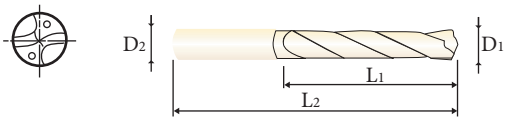
DESCRIPTION

Application:
Steel, cast steel, cast iron, chilled cast iron, malleable cast iron, non-ferrous heavy metal, non-ferrous light metal, abrasive plastic.

Advantages:

Self centering	- center drilling is not required
Excellent positioning	- bushing is not necessary
Special Design	- reaming is not required
	- good chip removal
	- powerful drilling





SPECS:

Helix Angle: 30°
Point Angle: 140°
Shank TOL ø2d: h6 =+.0/-.0003
Plain Shank: DIN6535-HA
Coating: TiAlN

5 X D

Part No.	EDP#	Diameter		Shank Dia	Flute Length	Overall Length
		Metric	Inch			
TiAlN		D1		D2	L1	L2
SCD-4016-5D-TC	402290	10.2	0.4016	12	71	118
SCD-4055-5D-TC	402295	10.3	0.4055	12	71	118
SCD-4094-5D-TC	402300	10.4	0.4094	12	71	118
SCD-4134-5D-TC	402305	10.5	0.4134	12	71	118
SCD-4173-5D-TC	402310	10.6	0.4173	12	71	118
SCD-4212-5D-TC	402315	10.7	0.4212	12	71	118
SCD-4252-5D-TC	402320	10.8	0.4252	12	71	118
SCD-4291-5D-TC	402325	10.9	0.4291	12	71	118
SCD-4330-5D-TC	402330	11.0	0.4330	12	71	118
SCD-4370-5D-TC	402335	11.1	0.4370	12	71	118
SCD-4409-5D-TC	402340	11.2	0.4409	12	71	118
SCD-4448-5D-TC	402345	11.3	0.4448	12	71	118
SCD-4488-5D-TC	402350	11.4	0.4488	12	71	118
SCD-4527-5D-TC	402355	11.5	0.4527	12	71	118
SCD-4566-5D-TC	402360	11.6	0.4566	12	71	118
SCD-4606-5D-TC	402365	11.7	0.4606	12	71	118
SCD-4645-5D-TC	402370	11.8	0.4645	12	71	118
SCD-4685-5D-TC	402375	11.9	0.4685	12	71	118

Part No.	EDP#	Diameter		Shank Dia	Flute Length	Overall Length
		Metric	Inch			
TiAlN		D1		D2	L1	L2
SCD-4724-5D-TC	402380	12.0	0.4724	12	71	118
SCD-4921-5D-TC	402385	12.5	0.4921	14	77	124
SCD-5118-5D-TC	402390	13.0	0.5118	14	77	124
SCD-5314-5D-TC	402395	13.5	0.5314	14	77	124
SCD-5512-5D-TC	402400	14.0	0.5512	14	77	124
SCD-5708-5D-TC	402405	14.5	0.5708	16	83	133
SCD-5905-5D-TC	402410	15.0	0.5905	16	83	133
SCD-6102-5D-TC	402415	15.5	0.6102	16	83	133
SCD-6299-5D-TC	402420	16.0	0.6299	16	83	133
SCD-6495-5D-TC	402425	16.5	0.6495	18	93	143
SCD-6692-5D-TC	402430	17.0	0.6692	18	93	143
SCD-6889-5D-TC	402435	17.5	0.6889	18	93	143
SCD-7087-5D-TC	402440	18.0	0.7087	18	93	143
SCD-7283-5D-TC	402445	18.5	0.7283	20	101	153
SCD-7480-5D-TC	402450	19.0	0.7480	20	101	153
SCD-7676-5D-TC	402455	19.5	0.7676	20	101	153
SCD-7874-5D-TC	402460	20.0	0.7874	20	101	153

SHORT THROUGH COOLANT 3 X D IMPERIAL
SHORT THROUGH COOLANT 5 X D

WORK MATERIAL	CAST IRON		CAST IRON		CARBON STEELS		ALLOY STEELS	
STRENGTH DIAMETER	< HRc24		> HRc24		< HRc30		HRc30 - 42	
	N	S	N	S	N	S	N	S
1/8 ~ 3/16	14870	0.006	9620	0.006	8750	0.006	7880	0.005
3/16 ~ 5/16	8200	0.008	6010	0.008	5470	0.008	4920	0.006
5/16 ~ 3/8	6760	0.011	4370	0.011	3980	0.011	3580	0.009
3/8 ~ 1/2	5310	0.014	3440	0.014	3120	0.014	2810	0.011
1/2 ~ 9/16	4370	0.016	2830	0.016	2570	0.016	2310	0.012
9/16 ~ 13/16	3380	0.018	2190	0.018	1990	0.018	1790	0.014

Recommended to reduce the feed rate as following
Feed 100% : SHORT IMPERIAL (3XD)
Feed 85% : SHORT IMPERIAL (5XD)

N = R.P.M.
S = Inch per Revolution (inch/rev.)

SHORT THROUGH COOLANT 3 X D METRIC
LONG THROUGH COOLANT 5 X D
EXTRA LONG THROUGH COOLANT 5 X D

WORK MATERIAL		NON-ALLOY STEELS		ALLOY STEELS		SOFT GREY CAST IRON		HARD GREY CAST IRON	
STRENGTH DIAMETER		< HRc20		> HRc20		< 240 BHN		<300 BHN	
METRIC	INCH	N	S	N	S	N	S	N	S
1.0	0.0394	13000	0.002	11250	0.002	21300	0.002	14200	0.002
2.0	0.0787	13000	0.002	11250	0.002	21300	0.002	14200	0.002
3.0	0.1181	13000	0.005	11000	0.005	21000	0.005	14000	0.005
4.0	0.1575	9500	0.006	8400	0.006	16000	0.006	10500	0.006
5.0	0.1969	7600	0.006	6700	0.006	13000	0.006	8300	0.006
6.0	0.2362	6400	0.007	5600	0.007	11000	0.007	6900	0.007
7.0	0.2756	5500	0.007	4800	0.007	9100	0.007	5900	0.007
8.0	0.3150	4800	0.008	4200	0.008	8000	0.008	5200	0.008
9.0	0.3543	4200	0.009	3700	0.009	7100	0.009	4600	0.009
10.0	0.3937	3800	0.010	3350	0.010	6400	0.010	4150	0.010
12.0	0.4724	3200	0.011	2800	0.011	5300	0.011	3450	0.011
14.0	0.5512	2750	0.011	2400	0.011	4550	0.011	3000	0.011
16.0	0.6299	2400	0.012	2100	0.012	4000	0.012	2600	0.012
18.0	0.7087	2100	0.013	1850	0.013	3550	0.013	2300	0.013
20.0	0.7874	1900	0.014	1650	0.014	3200	0.014	2100	0.014

Recommended to reduce the feed rate as following
Feed 100% : SHORT METRIC (3XD) Feed 85% : (5XD)
Feed 70% : EXTRA LONG (8XD)

N = R.P.M.
S = Inch per Revolution (inch/rev.)

TUFFY CARBIDE BURRS

CYLINDRICAL | TREE | OVAL

DESCRIPTION

MICROGRAIN carbide

Cylindrical - Square End - End Not Cut

Part#	Cutter Dia. (in.)	Length of Cut (in.)	Shank Dia. (in.)	Overall Length (in.)	EDP#
SA-41	1/16	1/4	1/8	1-1/2	300005
SA-42	3/32	7/16	1/8	1-1/2	300008
SA-43	1/8	9/16	1/8	1-1/2	300011
SA-12	1/8	1/2	1/4	2	300014
SA-14	3/16	5/8	1/4	2	300017
SA-1	1/4	5/8	1/4	2	300020
SA-51	1/4	1/2	1/8	2-1/4	300023
SA-2	5/16	3/4	1/4	2-1/2	300026
SA-3	3/8	3/4	1/4	2-1/2	300029
SA-4	7/16	1	1/4	2-3/4	300032
SA-5	1/2	1	1/4	2-3/4	300035
SA-6	5/8	1	1/4	2-3/4	300038
SA-16	3/4	3/4	1/4	2-1/2	300041
SA-7	3/4	1	1/4	2-3/4	300044
SA-9	1	1	1/4	2-3/4	300047

Tree -Pointed End

Part#	Cutter Dia. (in.)	Length of Cut (in.)	Shank Dia. (in.)	Overall Length (in.)	EDP#
SG-41	1/8	1/4	1/8	1-1/2	300050
SG-53	3/16	1/2	1/8	1-1/2	300053
SG-44	1/8	1/2	1/8	1-1/2	300056
SG-1	1/4	5/8	1/4	2	300059
SG-51	1/4	1/2	1/8	2	300062
SG-2	5/16	3/4	1/4	2-1/2	300065
SG-3	3/8	3/4	1/4	2-1/2	300068
SG-13	1/2	3/4	1/4	2-1/2	300071
SG-5	1/2	1	1/4	2-3/4	300074
SG-6	5/8	1	1/4	2-3/4	300077
SG-7	3/4	1	1/4	2-3/4	300080
SG-15	3/4	1-1/2	1/4	3-1/4	300083

Cylindrical - Radius End

Part#	Cutter Dia. (in.)	Length of Cut (in.)	Shank Dia. (in.)	Overall Length (in.)	EDP#
SC-41	3/32	7/16	1/8	1-1/2	300086
SC-42	1/8	9/16	1/8	1-1/2	300089
SC-12	1/8	1/2	1/4	2	300092
SC-14	3/16	5/8	1/4	2	300095
SC-1	1/4	5/8	1/4	2	300098
SC-51	1/4	1/2	1/8	2-15/16	300101
SC-2	5/16	3/4	1/4	2-1/2	300104
SC-3	3/8	3/4	1/4	2-1/2	300107
SC-4	7/16	1	1/4	2-3/4	300110
SC-5	1/2	1	1/4	2-3/4	300113
SC-6	5/8	1	1/4	2-3/4	300116
SC-7	3/4	1	1/4	2-3/4	300119

Oval Shape

Part#	Cutter Dia. (in.)	Length of Cut (in.)	Shank Dia. (in.)	Overall Length (in.)	EDP#
SE-41	1/8	7/32	1/8	1-1/2	300122
SE-1	1/4	3/8	1/4	2	300125
SE-51	1/4	3/8	1/8	1-3/4	300128
SE-3	3/8	5/8	1/4	2-3/8	300131
SE-5	1/2	7/8	1/4	2-5/8	300134
SE-6	5/8	1	1/4	2-3/4	300137
SE-7	3/4	1	1/4	2-3/4	300140

TUFFY CARBIDE BURRS

TREE | BALL SHAPE | TAPER | FLAME

DESCRIPTION

MICROGRAIN carbide

Tree - Radius End

Part#	Cutter Dia. (in.)	Length of Cut (in.)	Shank Dia. (in.)	Overall Length (in.)	EDP#
SF-42	1/8	1/2	1/8	1-1/2	300143
SF-41	1/8	1/4	1/8	1-1/2	300146
SF-12	1/8	1/2	1/4	2	300149
SF-1	1/4	5/8	1/4	2	300152
SF-51	1/4	1/2	1/8	2	300155
SF-3	3/8	3/4	1/4	2-1/2	300158
SF-4	7/16	1	1/4	2-3/4	300161
SF-5	1/2	1	1/4	2-3/4	300164
SF-6	5/8	1	1/4	2-3/4	300167
SF-7	3/4	1	1/4	2-3/4	300170
SF-14	3/4	1-1/4	1/4	3	300173
SF-15	3/4	1-1/2	1/4	3-1/4	300176

Ball Shape

Part#	Cutter Dia. (in.)	Length of Cut (in.)	Shank Dia. (in.)	Overall Length (in.)	EDP#
SD-41	3/32	—	1/8	1-1/2	300179
SD-42	1/8	—	1/8	1-1/2	300182
SD-12	1/8	—	1/4	2	300185
SD-14	3/16	—	1/4	2	300188
SD-53	3/16	—	1/8	2	300191
SD-1	1/4	—	1/4	2	300194
SD-51	1/4	—	1/8	2	300197
SD-2	5/16	—	1/4	2-1/16	300200
SD-3	3/8	—	1/4	2-1/8	300203
SD-5	1/2	—	1/4	2-1/4	300206
SD-6	5/8	—	1/4	2-3/8	300209
SD-7	3/4	—	1/4	2-1/2	300212
SD-9	1	—	1/4	2-3/4	300215

Taper 14º Included Taper with Radius End

Part#	Cutter Dia. (in.)	Length of Cut (in.)	Shank Dia. (in.)	Overall Length (in.)	EDP#
SL-41	1/8	3/8	1/8	1-1/2	300218
SL-42	1/8	1/2	1/8	1-1/2	300221
SL-1	1/4	5/8	1/4	2	300224
SL-2	5/16	7/8	1/4	2-5/8	300227
SL-3	3/8	1-1/16	1/4	2-13/16	300230
SL-4	1/2	1-1/8	1/4	2-7/8	300233
SL-6	5/8	1-5/16	1/4	3-1/16	300236
SL-7	3/4	1-1/2	1/4	3-1/4	300239

Flame

Part#	Cutter Dia. (in.)	Length of Cut (in.)	Shank Dia. (in.)	Overall Length (in.)	EDP#
SH-41	1/8	1/4	1/8	1-1/2	300242
SH-1	1/4	5/8	1/4	2	300245
SH-2	5/16	3/4	1/4	2-3/4	300248
SH-5	1/2	1-1/4	1/4	3-1/4	300251
SH-6	5/8	1-7/16	1/4	3-7/16	300254
SH-7	3/4	1-5/8	1/4	3-5/8	300257

TUFFY CARBIDE BURRS

CYLINDRICAL | CONE | INVERTED CONE | TAPER

DESCRIPTION

MICROGRAIN carbide

Cone

Part#	Cutter Dia. (in.)	Length of Cut (in.)	Shank Dia. (in.)	Overall Length (in.)	Double Included Angle	EDP#
SM-41	1/8	11/32	1/8	1-1/2	12°	300260
SM-42	1/8	7/16	1/8	1-1/2	14°	300263
SM-43	1/8	5/8	1/8	1-1/2	7°	300266
SM-1	1/4	1/2	1/4	2	22°	300269
SM-2	1/4	3/4	1/4	2	14°	300272
SM-3	1/4	1	1/4	2	10°	300275
SM-51	1/4	1/2	1/8	2-1/8	22°	300278
SM-4	3/8	5/8	1/4	2-3/8	28°	300281
SM-5	1/2	7/8	1/4	2-5/8	28°	300284
SM-6	5/8	1	1/4	2-3/4	31°	300287

Cylindrical - End Cut

Part#	Cutter Dia. (in.)	Length of Cut (in.)	Shank Dia. (in.)	Overall Length (in.)	EDP#
SB-41	1/16	1/4	1/8	1-1/2	300335
SB-42	3/32	7/16	1/8	1-1/2	300338
SB-43	1/8	9/16	1/8	1-1/2	300341
SB-12	1/8	5/8	1/4	2	300344
SB-14	3/16	5/8	1/4	2	300347
SB-1	1/4	5/8	1/4	2	300350
SB-2	5/16	3/4	1/4	2-1/2	300353
SB-3	3/8	3/4	1/4	2-1/2	300356
SB-4	7/16	1	1/4	2-3/4	300359
SB-5	1/2	1	1/4	2-3/4	300362
SB-6	5/8	1	1/4	2-3/4	300365
SB-16	3/4	3/4	1/4	2-1/2	300368
SB-7	3/4	1	1/4	2-3/4	300371
SB-9	1	1	1/4	2-3/4	300374

Inverted Cone-End Not Cut

Part#	Cutter Dia. (in.)	Length of Cut (in.)	Shank Dia. (in.)	Overall Length (in.)	Double Included Angle	EDP#
SN-41	3/32	1/8	1/8	1-1/2	10°	300290
SN-42	1/8	3/16	1/8	1-1/2	10°	300293
SN-1	1/4	5/16	1/4	2	10°	300296
SN-51	1/4	1/4	1/8	1-3/4	10°	300299
SN-4	1/2	1/2	1/4	2-1/4	16°	300302
SN-6	5/8	3/4	1/4	2-1/2	18°	300305
SN-7	3/4	5/8	1/4	2-3/4	30°	300308

90ºTaper

Part#	Cutter Dia. (in.)	Length of Cut (in.)	Shank Dia. (in.)	Overall Length (in.)	EDP#
SK-42	1/8	1/16	1/8	1-1/2	300311
SK-1	1/4	1/8	1/4	2	300314
SK-2	5/16	3/16	1/4	1-15/16	300317
SK-3	3/8	3/16	1/4	1-15/16	300320
SK-5	1/2	1/4	1/4	2	300323
SK-6	5/8	5/16	1/4	2-1/16	300326
SK-7	3/4	3/8	1/4	2-1/8	300329
SK-9	1	1/2	1/4	2-1/4	300332

60ºTaper

Part#	Cutter Dia. (in.)	Length of Cut (in.)	Shank Dia. (in.)	Overall Length (in.)	EDP#
SJ-42	1/8	3/32	1/8	1-1/2	300377
SJ-1	1/4	3/16	1/4	2	300380
SJ-2	5/16	5/16	1/4	2-1/16	300383
SJ-3	3/8	5/16	1/4	2-1/16	300386
SJ-5	1/2	7/16	1/4	2-3/16	300389
SJ-6	5/8	9/16	1/4	2-5/16	300392
SJ-7	3/4	11/16	1/4	2-7/16	300395
SJ-9	1	15/16	1/4	2-9/16	300398

MICROGRAIN carbide

DESCRIPTION

Alumacut Burrs-Cylindrical

Part#	Cutter Dia. (in.)	Length of Cut (in.)	Shank Dia. (in.)	Overall Length (in.)	EDP#
SA-1NF	1/4	5/8	1/4	2	300401
SA-3NF	3/8	3/4	1/4	2-1/2	300404
SA-5NF	1/2	1	1/4	2-3/4	300407
SA-6NF	5/8	1	1/4	2-3/4	300410
SA-7NF	3/4	1	1/4	2-3/4	300413

Alumacut Burrs - Egg

Part#	Cutter Dia. (in.)	Length of Cut (in.)	Shank Dia. (in.)	Overall Length (in.)	EDP#
SE-1NF	1/4	3/8	1/4	2	300416
SE-3NF	3/8	5/8	1/4	2-3/8	300419
SE-5NF	1/2	7/8	1/4	2-5/8	300422
SE-6NF	5/8	1	1/4	2-3/4	300425
SE-7NF	3/4	1	1/4	2-3/4	300428

Alumacut Burrs-Radius End

Part#	Cutter Dia. (in.)	Length of Cut (in.)	Shank Dia. (in.)	Overall Length (in.)	EDP#
SC-1NF	1/4	5/8	1/4	2	300431
SC-3NF	3/8	3/4	1/4	2-1/2	300434
SC-5NF	1/2	1	1/4	2-3/4	300437
SC-6NF	5/8	1	1/4	2-3/4	300440
SC-7NF	3/4	1	1/4	2-3/4	300443

Alumacut Burrs-14º Included Angle

Part#	Cutter Dia. (in.)	Length of Cut (in.)	Shank Dia. (in.)	Overall Length (in.)	EDP#
SL-3NF	3/8	1-1/16	1/4	2-13/16	300446
SL-4NF	1/2	1-1/8	1/4	2-7/8	300449
SL-6NF	5/8	1-5/16	1/4	3-1/16	300452
SL-7NF	3/4	1-1/2	1/4	3-1/4	300455

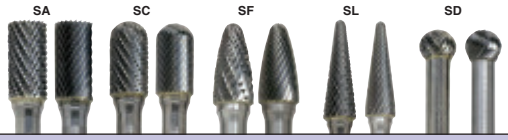
Alumacut Burrs-Ball

Part#	Cutter Dia. (in.)	Length of Cut (in.)	Shank Dia. (in.)	Overall Length (in.)	EDP#
SD-1NF	1/4	7/32	1/4	2	300458
SD-3NF	3/8	5/16	1/4	2-1/8	300461
SD-5NF	1/2	7/16	1/4	2-1/4	300464
SD-6NF	5/8	9/16	1/4	2-3/8	300467
SD-7NF	3/4	11/16	1/4	2-1/2	300470

Alumacut Burrs-Tree Radius

Part#	Cutter Dia. (in.)	Length of Cut (in.)	Shank Dia. (in.)	Overall Length (in.)	EDP#
SF-1NF	1/4	5/8	1/4	2	300473
SF-3NF	3/8	3/4	1/4	2-1/2	300476
SF-5NF	1/2	1	1/4	2-3/4	300479
SF-6NF	5/8	1	1/4	2-3/4	300482
SF-7NF	3/4	1-1/4	1/4	3	300485

6” O.A.L. Carbide Burrs



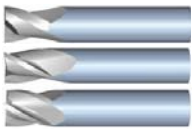
Part#	Cutter Dia. (in.)	Length of Cut (in.)	Shank Dia. (in.)	Overall Length (in.)	EDP#
SA-3L6	3/8	3/4	1/4	6”	300488
SA-5L6	1/2	1	1/4	6”	300491
SC-3L6	3/8	3/4	1/4	6”	300494
SC-5L6	1/2	1	1/4	6”	300497
SF-3L6	3/8	3/4	1/4	6”	300500
SF-5L6	1/2	1	1/4	6”	300503
SL-3L6	3/8	1-1/16	1/4	6”	300506
SL-5L6	1/2	1-1/8	1/4	6”	300509
SD-3L6	3/8	-	1/4	6”	300512
SD-5L6	1/2	-	1/4	6”	300515

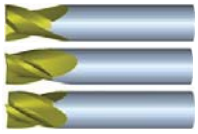
P	●	Steal
M	◒	Stainless Steel
K	●	Cast Iron
N	○	Non-Ferrous
S		High Temp. Alloys
H		Hardened Steel

● GOOD ◒ OK ○ NOT OPTIMAL

STANDARD PERFORMANCE

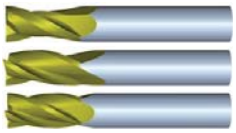
Standard Package: All Sizes - 1 Each





Square End, Standard Carbide, Stub Length, Single End

Cutter Diam. D	Shank Diam. d	Length Of Cut l_1	O.A.L. L	Uncoated 2 Flute Part#	Uncoated 3 Flute Part#	Uncoated 4 Flute Part#	Uncoated Price	TiN Coated 2 Flute Part#	TiN Coated 3 Flute Part#	TiN Coated 4 Flute Part#	TiN Coated Price	TiALN Coated 2 Flute Part#	TiALN Coated 3 Flute Part#	TiALN Coated 4 Flute Part#	TiALN Coated Price
1/32	1/8	1/16	1-1/2	5001-031-2	5001-031-3	5001-031-4		5002-031-2	5002-031-3	5002-031-4		5003-031-2	5003-031-3	5003-031-4	
3/64	1/8	3/32	1-1/2	5001-046-2	5001-046-3	5001-046-4		5002-046-2	5002-046-3	5002-046-4		5003-046-2	5003-046-3	5003-046-4	
1/16	1/8	1/8	1-1/2	5001-062-2	5001-062-3	5001-062-4		5002-062-2	5002-062-3	5002-062-4		5003-062-2	5003-062-3	5003-062-4	
3/32	1/8	3/16	1-1/2	5001-093-2	5001-093-3	5001-093-4		5002-093-2	5002-093-3	5002-093-4		5003-093-2	5003-093-3	5003-093-4	
1/8	1/8	1/4	1-1/2	5001-125-2	5001-125-3	5001-125-4		5002-125-2	5002-125-3	5002-125-4		5003-125-2	5003-125-3	5003-125-4	
5/32	3/16	5/16	2	5001-156-2	5001-156-3	5001-156-4		5002-156-2	5002-156-3	5002-156-4		5003-156-2	5003-156-3	5003-156-4	
3/16	3/16	3/8	2	5001-187-2	5001-187-3	5001-187-4		5002-187-2	5002-187-3	5002-187-4		5003-187-2	5003-187-3	5003-187-4	
7/32	1/4	7/16	2	5001-218-2	5001-218-3	5001-218-4		5002-218-2	5002-218-3	5002-218-4		5003-218-2	5003-218-3	5003-218-4	
1/4	1/4	1/2	2	5001-250-2	5001-250-3	5001-250-4		5002-250-2	5002-250-3	5002-250-4		5003-250-2	5003-250-3	5003-250-4	
5/16	3/8	1/2	2	5001-312-2	5001-312-3	5001-312-4		5002-312-2	5002-312-3	5002-312-4		5003-312-2	5003-312-3	5003-312-4	
3/8	3/8	5/8	2	5001-375-2	5001-375-3	5001-375-4		5002-375-2	5002-375-3	5002-375-4		5003-375-2	5003-375-3	5003-375-4	
7/16	7/16	5/8	2-1/2	5001-437-2	5001-437-3	5001-437-4		5002-437-2	5002-437-3	5002-437-4		5003-437-2	5003-437-3	5003-437-4	
1/2	1/2	5/8	2-1/2	5001-500-2	5001-500-3	5001-500-4		5002-500-2	5002-500-3	5002-500-4		5003-500-2	5003-500-3	5003-500-4	
5/8	5/8	3/4	3	5001-625-2	5001-625-3	5001-625-4		5002-625-2	5002-625-3	5002-625-4		5003-625-2	5003-625-3	5003-625-4	
3/4	3/4	1	3	5001-750-2	5001-750-3	5001-750-4		5002-750-2	5002-750-3	5002-750-4		5003-750-2	5003-750-3	5003-750-4	
1	1	1	3	5001-100-2	5001-100-3	5001-100-4		5002-100-2	5002-100-3	5002-100-4		5003-100-2	5003-100-3	5003-100-4	



Square End, Standard Carbide, Regular Length, Single End

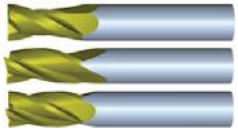
Cutter Diam. D	Shank Diam. d	Length Of Cut l_1	O.A.L. L	Uncoated 2 Flute Part#	Uncoated 3 Flute Part#	Uncoated 4 Flute Part#	Uncoated Price	TiN Coated 2 Flute Part#	TiN Coated 3 Flute Part#	TiN Coated 4 Flute Part#	TiN Coated Price	TiALN Coated 2 Flute Part#	TiALN Coated 3 Flute Part#	TiALN Coated 4 Flute Part#	TiALN Coated Price
1/64	1/8	1/16	1-1/2	5004-015-2	5004-015-3	5004-015-4		5005-015-2	5005-015-3	5005-015-4		5006-015-2	5006-015-3	5006-015-4	
1/32	1/8	3/32	1-1/2	5004-031-2	5004-031-3	5004-031-4		5005-031-2	5005-031-3	5005-031-4		5006-031-2	5006-031-3	5006-031-4	
3/64	1/8	1/8	1-1/2	5004-046-2	5004-046-3	5004-046-4		5005-046-2	5005-046-3	5005-046-4		5006-046-2	5006-046-3	5006-046-4	
1/16	1/8	3/16	1-1/2	5004-062-2	5004-062-3	5004-062-4		5005-062-2	5005-062-3	5005-062-4		5006-062-2	5006-062-3	5006-062-4	
5/64	1/8	1/4	1-1/2	5004-078-2	5004-078-3	5004-078-4		5005-078-2	5005-078-3	5005-078-4		5006-078-2	5006-078-3	5006-078-4	
3/32	1/8	3/8	1-1/2	5004-093-2	5004-093-3	5004-093-4		5005-093-2	5005-093-3	5005-093-4		5006-093-2	5006-093-3	5006-093-4	
7/64	1/8	3/8	1-1/2	5004-109-2	5004-109-3	5004-109-4		5005-109-2	5005-109-3	5005-109-4		5006-109-2	5006-109-3	5006-109-4	
1/8	1/8	1/2	1-1/2	5004-125-2	5004-125-3	5004-125-4		5005-125-2	5005-125-3	5005-125-4		5006-125-2	5006-125-3	5006-125-4	
9/64	3/16	9/16	2	5004-140-2	5004-140-3	5004-140-4		5005-140-2	5005-140-3	5005-140-4		5006-140-2	5006-140-3	5006-140-4	
5/32	3/16	9/16	2	5004-156-2	5004-156-3	5004-156-4		5005-156-2	5005-156-3	5005-156-4		5006-156-2	5006-156-3	5006-156-4	
11/64	3/16	9/16	2	5004-171-2	5004-171-3	5004-171-4		5005-171-2	5005-171-3	5005-171-4		5006-171-2	5006-171-3	5006-171-4	
3/16	3/16	5/8	2	5004-187-2	5004-187-3	5004-187-4		5005-187-2	5005-187-3	5005-187-4		5006-187-2	5006-187-3	5006-187-4	
13/64	1/4	5/8	2-1/2	5004-203-2	5004-203-3	5004-203-4		5005-203-2	5005-203-3	5005-203-4		5006-203-2	5006-203-3	5006-203-4	
7/32	1/4	5/8	2-1/2	5004-218-2	5004-218-3	5004-218-4		5005-218-2	5005-218-3	5005-218-4		5006-218-2	5006-218-3	5006-218-4	
15/64	1/4	3/4	2-1/2	5004-234-2	5004-234-3	5004-234-4		5005-234-2	5005-234-3	5005-234-4		5006-234-2	5006-234-3	5006-234-4	
1/4	1/4	3/4	2-1/2	5004-250-2	5004-250-3	5004-250-4		5005-250-2	5005-250-3	5005-250-4		5006-250-2	5006-250-3	5006-250-4	

P	●	Steal
M	◒	Stainless Steel
K	●	Cast Iron
N	○	Non-Ferrous
S		High Temp. Alloys
H		Hardened Steel

● GOOD ◒ OK ○ NOT OPTIMAL

STANDARD PERFORMANCE

Standard Package: All Sizes - 1 Each



Square End, Standard Carbide, Regular Length, Single End

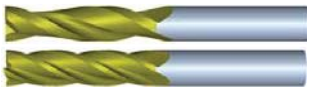
Cutter Diam. D	Shank Diam. d	Length Of Cut l_1	O.A.L. L	Uncoated 2 Flute Part#	Uncoated 3 Flute Part#	Uncoated 4 Flute Part#	Uncoated Price	TiN Coated 2 Flute Part#	TiN Coated 3 Flute Part#	TiN Coated 4 Flute Part#	TiN Coated Price	TiALN Coated 2 Flute Part#	TiALN Coated 3 Flute Part#	TiALN Coated 4 Flute Part#	TiALN Coated Price
17/64	5/16	7/8	2-1/2	5004-265-2	5004-265-3	5004-265-4		5005-265-2	5005-265-3	5005-265-4		5006-265-2	5006-265-3	5006-265-4	
9/32	5/16	7/8	2-1/2	5004-281-2	5004-281-3	5004-281-4		5005-281-2	5005-281-3	5005-281-4		5006-281-2	5006-281-3	5006-281-4	
19/64	5/16	7/8	2-1/2	5004-296-2	5004-296-3	5004-296-4		5005-296-2	5005-296-3	5005-296-4		5006-296-2	5006-296-3	5006-296-4	
5/16	5/16	7/8	2-1/2	5004-312-2	5004-312-3	5004-312-4		5005-312-2	5005-312-3	5005-312-4		5006-312-2	5006-312-3	5006-312-4	
21/64	3/8	7/8	2-1/2	5004-328-2	5004-328-3	5004-328-4		5005-328-2	5005-328-3	5005-328-4		5006-328-2	5006-328-3	5006-328-4	
11/32	3/8	7/8	2-1/2	5004-343-2	5004-343-3	5004-343-4		5005-343-2	5005-343-3	5005-343-4		5006-343-2	5006-343-3	5006-343-4	
23/64	3/8	7/8	2-1/2	5004-359-2	5004-359-3	5004-359-4		5005-359-2	5005-359-3	5005-359-4		5006-359-2	5006-359-3	5006-359-4	
3/8	3/8	1	2-1/2	5004-375-2	5004-375-3	5004-375-4		5005-375-2	5005-375-3	5005-375-4		5006-375-2	5006-375-3	5006-375-4	
25/64	7/16	1	2-1/2	5004-390-2	5004-390-3	5004-390-4		5005-390-2	5005-390-3	5005-390-4		5006-390-2	5006-390-3	5006-390-4	
13/32	7/16	1	2-1/2	5004-406-2	5004-406-3	5004-406-4		5005-406-2	5005-406-3	5005-406-4		5006-406-2	5006-406-3	5006-406-4	
27/64	7/16	1	2-1/2	5004-421-2	5004-421-3	5004-421-4		5005-421-2	5005-421-3	5005-421-4		5006-421-2	5006-421-3	5006-421-4	
7/16	7/16	1	2-1/2	5004-437-2	5004-437-3	5004-437-4		5005-437-2	5005-437-3	5005-437-4		5006-437-2	5006-437-3	5006-437-4	
29/64	1/2	1	3	5004-453-2	5004-453-3	5004-453-4		5005-453-2	5005-453-3	5005-453-4		5006-453-2	5006-453-3	5006-453-4	
15/32	1/2	1	3	5004-468-2	5004-468-3	5004-468-4		5005-468-2	5005-468-3	5005-468-4		5006-468-2	5006-468-3	5006-468-4	
31/64	1/2	1	3	5004-484-2	5004-484-3	5004-484-4		5005-484-2	5005-484-3	5005-484-4		5006-484-2	5006-484-3	5006-484-4	
1/2	1/2	1	3	5004-500-2	5004-500-3	5004-500-4		5005-500-2	5005-500-3	5005-500-4		5006-500-2	5006-500-3	5006-500-4	
33/64	9/16	1-1/4	3-1/2	5004-515-2	5004-515-3	5004-515-4		5005-515-2	5005-515-3	5005-515-4		5006-515-2	5006-515-3	5006-515-4	
17/32	9/16	1-1/4	3-1/2	5004-531-2	5004-531-3	5004-531-4		5005-531-2	5005-531-3	5005-531-4		5006-531-2	5006-531-3	5006-531-4	
35/64	9/16	1-1/4	3-1/2	5004-546-2	5004-546-3	5004-546-4		5005-546-2	5005-546-3	5005-546-4		5006-546-2	5006-546-3	5006-546-4	
9/16	9/16	1-1/4	3-1/2	5004-562-2	5004-562-3	5004-562-4		5005-562-2	5005-562-3	5005-562-4		5006-562-2	5006-562-3	5006-562-4	
37/64	5/8	1-1/4	3-1/2	5004-578-2	5004-578-3	5004-578-4		5005-578-2	5005-578-3	5005-578-4		5006-578-2	5006-578-3	5006-578-4	
19/32	5/8	1-1/4	3-1/2	5004-593-2	5004-593-3	5004-593-4		5005-593-2	5005-593-3	5005-593-4		5006-593-2	5006-593-3	5006-593-4	
39/64	5/8	1-1/4	3-1/2	5004-609-2	5004-609-3	5004-609-4		5005-609-2	5005-609-3	5005-609-4		5006-609-2	5006-609-3	5006-609-4	
5/8	5/8	1-1/4	3-1/2	5004-625-2	5004-625-3	5004-625-4		5005-625-2	5005-625-3	5005-625-4		5006-625-2	5006-625-3	5006-625-4	
41/64	3/4	1-1/2	4	5004-640-2	5004-640-3	5004-640-4		5005-640-2	5005-640-3	5005-640-4		5006-640-2	5006-640-3	5006-640-4	
21/32	3/4	1-1/2	4	5004-656-2	5004-656-3	5004-656-4		5005-656-2	5005-656-3	5005-656-4		5006-656-2	5006-656-3	5006-656-4	
43/64	3/4	1-1/2	4	5004-671-2	5004-671-3	5004-671-4		5005-671-2	5005-671-3	5005-671-4		5006-671-2	5006-671-3	5006-671-4	
11/16	3/4	1-1/2	4	5004-687-2	5004-687-3	5004-687-4		5005-687-2	5005-687-3	5005-687-4		5006-687-2	5006-687-3	5006-687-4	
45/64	3/4	1-1/2	4	5004-703-2	5004-703-3	5004-703-4		5005-703-2	5005-703-3	5005-703-4		5006-703-2	5006-703-3	5006-703-4	
23/32	3/4	1-1/2	4	5004-718-2	5004-718-3	5004-718-4		5005-718-2	5005-718-3	5005-718-4		5006-718-2	5006-718-3	5006-718-4	
47/64	3/4	1-1/2	4	5004-734-2	5004-734-3	5004-734-4		5005-734-2	5005-734-3	5005-734-4		5006-734-2	5006-734-3	5006-734-4	
3/4	3/4	1-1/2	4	5004-750-2	5004-750-3	5004-750-4		5005-750-2	5005-750-3	5005-750-4		5006-750-2	5006-750-3	5006-750-4	
49/64	7/8	1-1/2	4	5004-765-2	5004-765-3	5004-765-4		5005-765-2	5005-765-3	5005-765-4		5006-765-2	5006-765-3	5006-765-4	
25/32	7/8	1-1/2	4	5004-781-2	5004-781-3	5004-781-4		5005-781-2	5005-781-3	5005-781-4		5006-781-2	5006-781-3	5006-781-4	
51/64	7/8	1-1/2	4	5004-796-2	5004-796-3	5004-796-4		5005-796-2	5005-796-3	5005-796-4		5006-796-2	5006-796-3	5006-796-4	
13/16	7/8	1-1/2	4	5004-812-2	5004-812-3	5004-812-4		5005-812-2	5005-812-3	5005-812-4		5006-812-2	5006-812-3	5006-812-4	
53/64	7/8	1-1/2	4	5004-828-2	5004-828-3	5004-828-4		5005-828-2	5005-828-3	5005-828-4		5006-828-2	5006-828-3	5006-828-4	
27/32	7/8	1-1/2	4	5004-843-2	5004-843-3	5004-843-4		5005-843-2	5005-843-3	5005-843-4		5006-843-2	5006-843-3	5006-843-4	
55/64	7/8	1-1/2	4	5004-859-2	5004-859-3	5004-859-4		5005-859-2	5005-859-3	5005-859-4		5006-859-2	5006-859-3	5006-859-4	
7/8	7/8	1-1/2	4	5004-875-2	5004-875-3	5004-875-4		5005-875-2	5005-875-3	5005-875-4		5006-875-2	5006-875-3	5006-875-4	
57/64	1	1-1/2	4	5004-890-2	5004-890-3	5004-890-4		5005-890-2	5005-890-3	5005-890-4		5006-890-2	5006-890-3	5006-890-4	
29/32	1	1-1/2	4	5004-906-2	5004-906-3	5004-906-4		5005-906-2	5005-906-3	5005-906-4		5006-906-2	5006-906-3	5006-906-4	
59/64	1	1-1/2	4	5004-921-2	5004-921-3	5004-921-4		5005-921-2	5005-921-3	5005-921-4		5006-921-2	5006-921-3	5006-921-4	
15/16	1	1-1/2	4	5004-937-2	5004-937-3	5004-937-4		5005-937-2	5005-937-3	5005-937-4		5006-937-2	5006-937-3	5006-937-4	
61/64	1	1-1/2	4	5004-953-2	5004-953-3	5004-953-4		5005-953-2	5005-953-3	5005-953-4		5006-953-2	5006-953-3	5006-953-4	
31/32	1	1-1/2	4	5004-968-2	5004-968-3	5004-968-4		5005-968-2	5005-968-3	5005-968-4		5006-968-2	5006-968-3	5006-968-4	
63/64	1	1-1/2	4	5004-984-2	5004-954-3	5004-984-4		5005-984-2	5005-984-3	5005-984-4		5006-984-2	5006-984-3	5006-984-4	
1	1	1-1/2	4	5004-100-2	5004-100-3	5004-100-4		5005-100-2	5005-100-3	5005-100-4		5006-100-2	5006-100-3	5006-100-4	

P	●	Steal
M	◒	Stainless Steel
K	●	Cast Iron
N	○	Non-Ferrous
S		High Temp. Alloys
H		Hardened Steel

● GOOD ◒ OK ○ NOT OPTIMAL

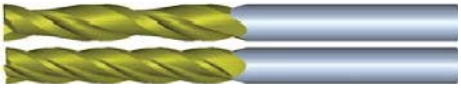
STANDARD PERFORMANCE

Standard Package: All Sizes - 1 Each



Square End, Standard Carbide, Long Length, Single End

Cutter Diam. D	Shank Diam. d	Length Of Cut l_1	O.A.L. L	Uncoated 2 Flute Part#	Uncoated 3 Flute Part#	Uncoated 4 Flute Part#	Uncoated Price	TiN Coated 2 Flute Part#	TiN Coated 3 Flute Part#	TiN Coated 4 Flute Part#	TiN Coated Price	TiALN Coated 2 Flute Part#	TiALN Coated 3 Flute Part#	TiALN Coated 4 Flute Part#	TiALN Coated Price
1/8	1/8	3/4	2-1/2	5007-125-2	--	5007-125-4		5008-125-2	--	5008-125-4		5009-125-2	--	5009-125-4	
3/16	3/16	3/4	2-1/2	5007-187-2	--	5007-187-4		5008-187-2	--	5008-187-4		5009-187-2	--	5009-187-4	
1/4	1/4	1-1/8	3	5007-250-2	--	5007-250-4		5008-250-2	--	5008-250-4		5009-250-2	--	5009-250-4	
5/16	5/16	1-1/8	3	5007-312-2	--	5007-312-4		5008-312-2	--	5008-312-4		5009-312-2	--	5009-312-4	
3/8	3/8	1-1/8	3	5007-375-2	--	5007-375-4		5008-375-2	--	5008-375-4		5009-375-2	--	5009-375-4	
7/16	7/16	2	4	5007-437-2	--	5007-437-4		5008-437-2	--	5008-437-4		5009-437-2	--	5009-437-4	
1/2	1/2	2	4	5007-500-2	--	5007-500-4		5008-500-2	--	5008-500-4		5009-500-2	--	5009-500-4	
5/8	5/8	2-1/4	5	5007-625-2	--	5007-625-4		5008-625-2	--	5008-625-4		5009-625-2	--	5009-625-4	
3/4	3/4	2-1/4	5	5007-750-2	--	5007-750-4		5008-750-2	--	5008-750-4		5009-750-2	--	5009-750-4	
1	1	2-1/4	5	5007-100-2	--	5007-100-4		5008-100-2	--	5008-100-4		5009-100-2	--	5009-100-4	



Square End, Standard Carbide, Extra Long Length, Single End

Cutter Diam. D	Shank Diam. d	Length Of Cut l_1	O.A.L. L	Uncoated 2 Flute Part#	Uncoated 3 Flute Part#	Uncoated 4 Flute Part#	Uncoated Price	TiN Coated 2 Flute Part#	TiN Coated 3 Flute Part#	TiN Coated 4 Flute Part#	TiN Coated Price	TiALN Coated 2 Flute Part#	TiALN Coated 3 Flute Part#	TiALN Coated 4 Flute Part#	TiALN Coated Price
1/8	1/8	1	3	5010-125-2	--	5010-125-4		5011-125-2	--	5011-125-4		5012-125-2	--	5012-125-4	
3/16	3/16	1-1/8	3	5010-187-2	--	5010-187-4		5011-187-2	--	5011-187-4		5012-187-2	--	5012-187-4	
1/4	1/4	1-1/2	4	5010-250-2	--	5010-250-4		5011-250-2	--	5011-250-4		5012-250-2	--	5012-250-4	
5/16	5/16	1-5/8	4	5010-312-2	--	5010-312-4		5011-312-2	--	5011-312-4		5012-312-2	--	5012-312-4	
3/8	3/8	1-3/4	4	5010-375-2	--	5010-375-4		5011-375-2	--	5011-375-4		5012-375-2	--	5012-375-4	
1/2	1/2	3	6	5010-500-2	--	5010-500-4		5011-500-2	--	5011-500-4		5012-500-2	--	5012-500-4	
5/8	5/8	3	6	5010-625-2	--	5010-625-4		5011-625-2	--	5011-625-4		5012-625-2	--	5012-625-4	
3/4	3/4	3	6	5010-750-2	--	5010-750-4		5011-750-2	--	5011-750-4		5012-750-2	--	5012-750-4	
1	1	3	6	5010-100-2	--	5010-100-4		011-100-2	--	5011-100-4		5012-100-2	--	5012-100-4	

P	●	Steal
M	◒	Stainless Steel
K	●	Cast Iron
N	○	Non-Ferrous
S		High Temp. Alloys
H		Hardened Steel

● GOOD ◒ OK ○ NOT OPTIMAL

STANDARD PERFORMANCE

Standard Package: All Sizes - 1 Each

METRIC - Square End, Standard Carbide, Regular Length, Single End

Cutter Diam. D	Shank Diam. d	Length Of Cut l_1	O.A.L. L	Uncoated 2 Flute Part#	Uncoated 3 Flute Part#	Uncoated 4 Flute Part#	Uncoated Price	TiN Coated 2 Flute Part#	TiN Coated 3 Flute Part#	TiN Coated 4 Flute Part#	TiN Coated Price	TiALN Coated 2 Flute Part#	TiALN Coated 3 Flute Part#	TiALN Coated 4 Flute Part#	TiALN Coated Price
1	1	3	38	5041-010-2	5041-010-3	5041-010-4		--	--	--		5042-010-2	5042-010-3	5042-010-4	
1.5	2	5	38	5041-015-2	5041-015-3	5041-015-4		--	--	--		5042-015-2	5042-015-3	5042-015-4	
2	2	6	38	5041-020-2	5041-020-3	5041-020-4		--	--	--		5042-020-2	5042-020-3	5042-020-4	
3	3	12	38	5041-030-2	5041-030-3	5041-030-4		--	--	--		5042-030-2	5042-030-3	5042-030-4	
3.5	4	12	50	5041-035-2	5041-035-3	5041-035-4		--	--	--		5042-035-2	5042-035-3	5042-035-4	
4	4	14	50	5041-040-2	5041-040-3	5041-040-4		--	--	--		5042-040-2	5042-040-3	5042-040-4	
4.5	5	14	50	5041-045-2	5041-045-3	5041-045-4		--	--	--		5042-045-2	5042-045-3	5042-045-4	
5	5	16	50	5041-050-2	5041-050-3	5041-050-4		--	--	--		5042-050-2	5042-050-3	5042-050-4	
6	6	19	63	5041-060-2	5041-060-3	5041-060-4		--	--	--		5042-060-2	5042-060-3	5042-060-4	
7	7	19	63	5041-070-2	5041-070-3	5041-070-4		--	--	--		5042-070-2	5042-070-3	5042-070-4	
8	8	19	63	5041-080-2	5041-080-3	5041-080-4		--	--	--		5042-080-2	5042-080-3	5042-080-4	
9	9	22	70	5041-090-2	5041-090-3	5041-090-4		--	--	--		5042-090-2	5042-090-3	5042-090-4	
10	10	22	70	5041-100-2	5041-100-3	5041-100-4		--	--	--		5042-100-2	5042-100-3	5042-100-4	
11	11	25	70	5041-110-2	5041-110-3	5041-110-4		--	--	--		5042-110-2	5042-110-3	5042-110-4	
12	12	25	75	5041-120-2	5041-120-3	5041-120-4		--	--	--		5042-120-2	5042-120-3	5042-120-4	
14	14	30	88	5041-140-2	5041-140-3	5041-140-4		--	--	--		5042-140-2	5042-140-3	5042-140-4	
16	16	32	88	5041-160-2	5041-160-3	5041-160-4		--	--	--		5042-160-2	5042-160-3	5042-160-4	
18	18	36	100	5041-180-2	5041-180-3	5041-180-4		--	--	--		5042-180-2	5042-180-3	5042-180-4	
20	20	38	100	5041-200-2	5041-200-3	5041-200-4		--	--	--		5042-200-2	5042-200-3	5042-200-4	
22	22	38	100	5041-220-2	5041-220-3	5041-220-4		--	--	--		5042-220-2	5042-220-3	5042-220-4	
25	25	38	100	5041-250-2	5041-250-3	5041-250-4		--	--	--		5042-250-2	5042-250-3	5042-250-4	

METRIC - Square End, Standard Carbide, Long Length, Single End

Cutter Diam. D	Shank Diam. d	Length Of Cut l_1	O.A.L. L	Uncoated 2 Flute Part#	Uncoated 3 Flute Part#	Uncoated 4 Flute Part#	Uncoated Price	TiN Coated 2 Flute Part#	TiN Coated 3 Flute Part#	TiN Coated 4 Flute Part#	TiN Coated Price	TiALN Coated 2 Flute Part#	TiALN Coated 3 Flute Part#	TiALN Coated 4 Flute Part#	TiALN Coated Price
3	3	25	75	5045-030-2	--	5045-030-4		--	--	--		5046-030-2	--	5046-030-4	
4	4	25	75	5045-040-2	--	5045-040-4		--	--	--		5046-040-2	--	5046-040-4	
5	5	25	75	5045-050-2	--	5045-050-4		--	--	--		5046-050-2	--	5046-050-4	
6	6	25	75	5045-060-2	--	5045-060-4		--	--	--		5046-060-2	--	5046-060-4	
8	8	30	100	5045-080-2	--	5045-080-4		--	--	--		5046-080-2	--	5046-080-4	
10	10	38	100	5045-100-2	--	5045-100-4		--	--	--		5046-100-2	--	5046-100-4	
12	12	50	100	5045-120-2	--	5045-120-4		--	--	--		5046-120-2	--	5046-120-4	
14	14	50	125	5045-140-2	--	5045-140-4		--	--	--		5046-140-2	--	5046-140-4	
16	16	75	150	5045-160-2	--	5045-160-4		--	--	--		5046-160-2	--	5046-160-4	
18	18	75	150	5045-180-2	--	5045-180-4		--	--	--		5046-180-2	--	5046-180-4	
20	20	75	150	5045-200-2	--	5045-400-4		--	--	--		5046-200-2	--	5046-400-4	
25	25	75	150	5045-250-2	--	5045-450-4		--	--	--		5046-250-2	--	5046-450-4	

METRIC - Square End, Standard Carbide, Extra-Long Length, Single End

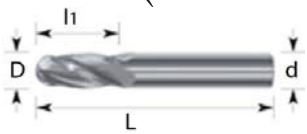
Cutter Diam. D	Shank Diam. d	Length Of Cut l_1	O.A.L. L	Uncoated 2 Flute Part#	Uncoated 3 Flute Part#	Uncoated 4 Flute Part#	Uncoated Price	TiN Coated 2 Flute Part#	TiN Coated 3 Flute Part#	TiN Coated 4 Flute Part#	TiN Coated Price	TiALN Coated 2 Flute Part#	TiALN Coated 3 Flute Part#	TiALN Coated 4 Flute Part#	TiALN Coated Price
3	3	25	100	5047-030-2	--	5047-030-4		--	--	--		5048-030-2	--	5048-030-4	
4	4	50	100	5047-040-2	--	5047-040-4		--	--	--		5048-040-2	--	5048-040-4	
5	5	30	100	5047-050-2	--	5047-050-4		--	--	--		5048-050-2	--	5048-050-4	
6	6	50	100	5047-060-2	--	5047-060-4		--	--	--		5048-060-2	--	5048-060-4	
8	8	50	150	5047-080-2	--	5047-080-4		--	--	--		5048-080-2	--	5048-080-4	
10	10	75	150	5047-100-2	--	5047-100-4		--	--	--		5048-100-2	--	5048-100-4	
12	12	75	150	5047-120-2	--	5047-120-4		--	--	--		5048-120-2	--	5048-120-4	
14	14	75	150	5047-140-2	--	5047-140-4		--	--	--		5048-140-2	--	5048-140-4	

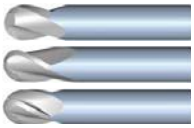
P	●	Steal
M	◒	Stainless Steel
K	●	Cast Iron
N	○	Non-Ferrous
S		High Temp. Alloys
H		Hardened Steel

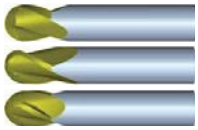
● GOOD ◒ OK ○ NOT OPTIMAL

STANDARD PERFORMANCE

Standard Package: All Sizes - 1 Each

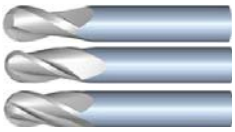


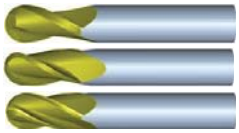




Ball Nose, Standard Carbide, Stub Length, Single End

Cutter Diam. D	Shank Diam. d	Length Of Cut l_1	O.A.L. L	Uncoated 2 Flute Part#	Uncoated 3 Flute Part#	Uncoated 4 Flute Part#	Uncoated Price	TiN Coated 2 Flute Part#	TiN Coated 3 Flute Part#	TiN Coated 4 Flute Part#	TiN Coated Price	TiALN Coated 2 Flute Part#	TiALN Coated 3 Flute Part#	TiALN Coated 4 Flute Part#	TiALN Coated Price
1/32	1/8	1/16	1-1/2	5013-031-2	5013-031-3	5013-031-4		5014-031-2	5014-031-3	5014-031-4		5015-031-2	5015-031-3	5015-031-4	
3/64	1/8	3/32	1-1/2	5013-046-2	5013-046-3	5013-046-4		5014-046-2	5014-046-3	5014-046-4		5015-046-2	5015-046-3	5015-046-4	
1/16	1/8	1/8	1-1/2	5013-062-2	5013-062-3	5013-062-4		5014-062-2	5014-062-3	5014-062-4		5015-062-2	5015-062-3	5015-062-4	
3/32	1/8	3/16	1-1/2	5013-093-2	5013-093-3	5013-093-4		5014-093-2	5014-093-3	5014-093-4		5015-093-2	5015-093-3	5015-093-4	
1/8	1/8	1/4	1-1/2	5013-125-2	5013-125-3	5013-125-4		5014-125-2	5014-125-3	5014-125-4		5015-125-2	5015-125-3	5015-125-4	
5/32	3/16	5/16	2	5013-156-2	5013-156-3	5013-156-4		5014-156-2	5014-156-3	5014-156-4		5015-156-2	5015-156-3	5015-156-4	
3/16	3/16	3/8	2	5013-187-2	5013-187-3	5013-187-4		5014-187-2	5014-187-3	5014-187-4		5015-187-2	5015-187-3	5015-187-4	
7/32	1/4	7/16	2	5013-218-2	5013-218-3	5013-218-4		5014-218-2	5014-218-3	5014-218-4		5015-218-2	5015-218-3	5015-218-4	
1/4	1/4	1/2	2	5013-250-2	5013-250-3	5013-250-4		5014-250-2	5014-250-3	5014-250-4		5015-250-2	5015-250-3	5015-250-4	
5/16	3/8	1/2	2	5013-312-2	5013-312-3	5013-312-4		5014-312-2	5014-312-3	5014-312-4		5015-312-2	5015-312-3	5015-312-4	
3/8	3/8	5/8	2	5013-375-2	5013-375-3	5013-375-4		5014-375-2	5014-375-3	5014-375-4		5015-375-2	5015-375-3	5015-375-4	
7/16	7/16	5/8	2-1/2	5013-437-2	5013-437-3	5013-437-4		5014-437-2	5014-437-3	5014-437-4		5015-437-2	5015-437-3	5015-437-4	
1/2	1/2	5/8	2-1/2	5013-500-2	5013-500-3	5013-500-4		5014-500-2	5014-500-3	5014-500-4		5015-500-2	5015-500-3	5015-500-4	
5/8	5/8	3/4	3	5013-625-2	5013-625-3	5013-625-4		5014-625-2	5014-625-3	5014-625-4		5015-625-2	5015-625-3	5015-625-4	
3/4	3/4	1	3	5013-750-2	5013-750-3	5013-750-4		5014-750-2	5014-750-3	5014-750-4		5015-750-2	5015-750-3	5015-750-4	
1	1	1	3	5013-100-2	5013-100-3	5013-100-4		5014-100-2	5014-100-3	5014-100-4		5015-100-2	5015-100-3	5015-100-4	





Ball Nose, Standard Carbide, Regular Length, Single End

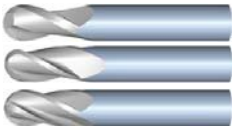
Cutter Diam. D	Shank Diam. d	Length Of Cut l_1	O.A.L. L	Uncoated 2 Flute Part#	Uncoated 3 Flute Part#	Uncoated 4 Flute Part#	Uncoated Price	TiN Coated 2 Flute Part#	TiN Coated 3 Flute Part#	TiN Coated 4 Flute Part#	TiN Coated Price	TiALN Coated 2 Flute Part#	TiALN Coated 3 Flute Part#	TiALN Coated 4 Flute Part#	TiALN Coated Price
1/64	1/8	1/16	1-1/2	5016-015-2	5016-015-3	5016-015-4		5017-015-2	5017-015-3	5017-015-4		5018-015-2	5018-015-3	5018-015-4	
1/32	1/8	3/32	1-1/2	5016-031-2	5016-031-3	5016-031-4		5017-031-2	5017-031-3	5017-031-4		5018-031-2	5018-031-3	5018-031-4	
3/64	1/8	1/8	1-1/2	5016-046-2	5016-046-3	5016-046-4		5017-046-2	5017-046-3	5017-046-4		5018-046-2	5018-046-3	5018-046-4	
1/16	1/8	3/16	1-1/2	5016-062-2	5016-062-3	5016-062-4		5017-062-2	5017-062-3	5017-062-4		5018-062-2	5018-062-3	5018-062-4	
5/64	1/8	1/4	1-1/2	5016-078-2	5016-078-3	5016-078-4		5017-078-2	5017-078-3	5017-078-4		5018-078-2	5018-078-3	5018-078-4	
3/32	1/8	3/8	1-1/2	5016-093-2	5016-093-3	5016-093-4		5017-093-2	5017-093-3	5017-093-4		5018-093-2	5018-093-3	5018-093-4	
7/64	1/8	3/8	1-1/2	5016-109-2	5016-109-3	5016-109-4		5017-109-2	5017-109-3	5017-109-4		5018-109-2	5018-109-3	5018-109-4	
1/8	1/8	1/2	1-1/2	5016-125-2	5016-125-3	5016-125-4		5017-125-2	5017-125-3	5017-125-4		5018-125-2	5018-125-3	5018-125-4	
9/64	3/16	9/16	2	5016-140-2	5016-140-3	5016-140-4		5017-140-2	5017-140-3	5017-140-4		5018-140-2	5018-140-3	5018-140-4	
5/32	3/16	9/16	2	5016-156-2	5016-156-3	5016-156-4		5017-156-2	5017-156-3	5017-156-4		5018-156-2	5018-156-3	5018-156-4	
11/64	3/16	9/16	2	5016-171-2	5016-171-3	5016-171-4		5017-171-2	5017-171-3	5017-171-4		5018-171-2	5018-171-3	5018-171-4	
3/16	3/16	5/8	2	5016-187-2	5016-187-3	5016-187-4		5017-187-2	5017-187-3	5017-187-4		5018-187-2	5018-187-3	5018-187-4	
13/64	1/4	5/8	2-1/2	5016-203-2	5016-203-3	5016-203-4		5017-203-2	5017-203-3	5017-203-4		5018-203-2	5018-203-3	5018-203-4	
7/32	1/4	5/8	2-1/2	5016-218-2	5016-218-3	5016-218-4		5017-218-2	5017-218-3	5017-218-4		5018-218-2	5018-218-3	5018-218-4	
15/64	1/4	3/4	2-1/2	5016-234-2	5016-234-3	5016-234-4		5017-234-2	5017-234-3	5017-234-4		5018-234-2	5018-234-3	5018-234-4	
1/4	1/4	3/4	2-1/2	5016-250-2	5016-250-3	5016-250-4		5017-250-2	5017-250-3	5017-250-4		5018-250-2	5018-250-3	5018-250-4	

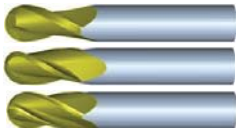
P	●	Steal
M	◒	Stainless Steel
K	●	Cast Iron
N	○	Non-Ferrous
S		High Temp. Alloys
H		Hardened Steel

● GOOD ◒ OK ○ NOT OPTIMAL

STANDARD PERFORMANCE

Standard Package: All Sizes - 1 Each





Ball Nose, Standard Carbide, Regular Length, Single End

Cutter Diam. D	Shank Diam. d	Length Of Cut l_1	O.A.L. L	Uncoated 2 Flute Part#	Uncoated 3 Flute Part#	Uncoated 4 Flute Part#	Uncoated Price	TiN Coated 2 Flute Part#	TiN Coated 3 Flute Part#	TiN Coated 4 Flute Part#	TiN Coated Price	TiALN Coated 2 Flute Part#	TiALN Coated 3 Flute Part#	TiALN Coated 4 Flute Part#	TiALN Coated Price
17/64	5/16	7/8	2-1/2	5016-265-2	5016-265-3	5016-265-4		5017-265-2	5017-265-3	5017-265-4		5018-265-2	5018-265-3	5018-265-4	
9/32	5/16	7/8	2-1/2	5016-281-2	5016-281-3	5016-281-4		5017-281-2	5017-281-3	5017-281-4		5018-281-2	5018-281-3	5018-281-4	
19/64	5/16	7/8	2-1/2	5016-296-2	5016-296-3	5016-296-4		5017-296-2	5017-296-3	5017-296-4		5018-296-2	5018-296-3	5018-296-4	
5/16	5/16	7/8	2-1/2	5016-312-2	5016-312-3	5016-312-4		5017-312-2	5017-312-3	5017-312-4		5018-312-2	5018-312-3	5018-312-4	
21/64	3/8	7/8	2-1/2	5016-328-2	5016-328-3	5016-328-4		5017-328-2	5017-328-3	5017-328-4		5018-328-2	5018-328-3	5018-328-4	
11/32	3/8	7/8	2-1/2	5016-343-2	5016-343-3	5016-343-4		5017-343-2	5017-343-3	5017-343-4		5018-343-2	5018-343-3	5018-343-4	
23/64	3/8	7/8	2-1/2	5016-359-2	5016-359-3	5016-359-4		5017-359-2	5017-359-3	5017-359-4		5018-359-2	5018-359-3	5018-359-4	
3/8	3/8	1	2-1/2	5016-375-2	5016-375-3	5016-375-4		5017-375-2	5017-375-3	5017-375-4		5018-375-2	5018-375-3	5018-375-4	
25/64	7/16	1	2-1/2	5016-390-2	5016-390-3	5016-390-4		5017-390-2	5017-390-3	5017-390-4		5018-390-2	5018-390-3	5018-390-4	
13/32	7/16	1	2-1/2	5016-406-2	5016-406-3	5016-406-4		5017-406-2	5017-406-3	5017-406-4		5018-406-2	5018-406-3	5018-406-4	
27/64	7/16	1	2-1/2	5016-421-2	5016-421-3	5016-421-4		5017-421-2	5017-421-3	5017-421-4		5018-421-2	5018-421-3	5018-421-4	
7/16	7/16	1	2-1/2	5016-437-2	5016-437-3	5016-437-4		5017-437-2	5017-437-3	5017-437-4		5018-437-2	5018-437-3	5018-437-4	
29/64	1/2	1	3	5016-453-2	5016-453-3	5016-453-4		5017-453-2	5017-453-3	5017-453-4		5018-453-2	5018-453-3	5018-453-4	
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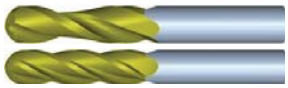
33/64	9/16	1-1/4	3-1/2	5016-515-2	5016-515-3	5016-515-4		5017-515-2	5017-515-3	5017-515-4		5018-515-2	5018-515-3	5018-515-4	
17/32	9/16	1-1/4	3-1/2	5016-531-2	5016-531-3	5016-531-4		5017-531-2	5017-531-3	5017-531-4		5018-531-2	5018-531-3	5018-531-4	
35/64	9/16	1-1/4	3-1/2	5016-546-2	5016-546-3	5016-546-4		5017-546-2	5017-546-3	5017-546-4		5018-546-2	5018-546-3	5018-546-4	
9/16	9/16	1-1/4	3-1/2	5016-562-2	5016-562-3	5016-562-4		5017-562-2	5017-562-3	5017-562-4		5018-562-2	5018-562-3	5018-562-4	
37/64	5/8	1-1/4	3-1/2	5016-578-2	5016-578-3	5016-578-4		5017-578-2	5017-578-3	5017-578-4		5018-578-2	5018-578-3	5018-578-4	
19/32	5/8	1-1/4	3-1/2	5016-593-2	5016-593-3	5016-593-4		5017-593-2	5017-593-3	5017-593-4		5018-593-2	5018-593-3	5018-593-4	
39/64	5/8	1-1/4	3-1/2	5016-609-2	5016-609-3	5016-609-4		5017-609-2	5017-609-3	5017-609-4		5018-609-2	5018-609-3	5018-609-4	
5/8	5/8	1-1/4	3-1/2	5016-625-2	5016-625-3	5016-625-4		5017-625-2	5017-625-3	5017-625-4		5018-625-2	5018-625-3	5018-625-4	
41/64	3/4	1-1/2	4	5016-640-2	5016-640-3	5016-640-4		5017-640-2	5017-640-3	5017-640-4		5018-640-2	5018-640-3	5018-640-4	
21/32	3/4	1-1/2	4	5016-656-2	5016-656-3	5016-656-4		5017-656-2	5017-656-3	5017-656-4		5018-656-2	5018-656-3	5018-656-4	
43/64	3/4	1-1/2	4	5016-671-2	5016-671-3	5016-671-4		5017-671-2	5017-671-3	5017-671-4		5018-671-2	5018-671-3	5018-671-4	
11/16	3/4	1-1/2	4	5016-687-2	5016-687-3	5016-687-4		5017-687-2	5017-687-3	5017-687-4		5018-687-2	5018-687-3	5018-687-4	
45/64	3/4	1-1/2	4	5016-703-2	5016-703-3	5016-703-4		5017-703-2	5017-703-3	5017-703-4		5018-703-2	5018-703-3	5018-703-4	
23/32	3/4	1-1/2	4	5016-718-2	5016-718-3	5016-718-4		5017-718-2	5017-718-3	5017-718-4		5018-718-2	5018-718-3	5018-718-4	
47/64	3/4	1-1/2	4	5016-734-2	5016-734-3	5016-734-4		5017-734-2	5017-734-3	5017-734-4		5018-734-2	5018-734-3	5018-734-4	
3/4	3/4	1-1/2	4	5016-750-2	5016-750-3	5016-750-4		5017-750-2	5017-750-3	5017-750-4		5018-750-2	5018-750-3	5018-750-4	
49/64	7/8	1-1/2	4	5016-765-2	5016-765-3	5016-765-4		5017-765-2	5017-765-3	5017-765-4		5018-765-2	5018-765-3	5018-765-4	
25/32	7/8	1-1/2	4	5016-781-2	5016-781-3	5016-781-4		5017-781-2	5017-781-3	5017-781-4		5018-781-2	5018-781-3	5018-781-4	
51/64	7/8	1-1/2	4	5016-796-2	5016-796-3	5016-796-4		5017-796-2	5017-796-3	5017-796-4		5018-796-2	5018-796-3	5018-796-4	
13/16	7/8	1-1/2	4	5016-812-2	5016-812-3	5016-812-4		5017-812-2	5017-812-3	5017-812-4		5018-812-2	5018-812-3	5018-812-4	
53/64	7/8	1-1/2	4	5016-828-2	5016-828-3	5016-828-4		5017-828-2	5017-828-3	5017-828-4		5018-828-2	5018-828-3	5018-828-4	
27/32	7/8	1-1/2	4	5016-843-2	5016-843-3	5016-843-4		5017-843-2	5017-843-3	5017-843-4		5018-843-2	5018-843-3	5018-843-4	
55/64	7/8	1-1/2	4	5016-859-2	5016-859-3	5016-859-4		5017-859-2	5017-859-3	5017-859-4		5018-859-2	5018-859-3	5018-859-4	
7/8	7/8	1-1/2	4	5016-875-2	5016-875-3	5016-875-4		5017-875-2	5017-875-3	5017-875-4		5018-875-2	5018-875-3	5018-875-4	
57/64	1	1-1/2	4	5016-890-2	5016-890-3	5016-890-4		5017-890-2	5017-890-3	5017-890-4		5018-890-2	5018-890-3	5018-890-4	
29/32	1	1-1/2	4	5016-906-2	5016-906-3	5016-906-4		5017-906-2	5017-906-3	5017-906-4		5018-906-2	5018-906-3	5018-906-4	
59/64	1	1-1/2	4	5016-921-2	5016-921-3	5016-921-4		5017-921-2	5017-921-3	5017-921-4		5018-921-2	5018-921-3	5018-921-4	
15/16	1	1-1/2	4	5016-937-2	5016-937-3	5016-937-4		5017-937-2	5017-937-3	5017-937-4		5018-937-2	5018-937-3	5018-937-4	
61/64	1	1-1/2	4	5016-953-2	5016-953-3	5016-953-4		5017-953-2	5017-953-3	5017-953-4		5018-953-2	5018-953-3	5018-953-4	
31/32	1	1-1/2	4	5016-968-2	5016-968-3	5016-968-4		5017-968-2	5017-968-3	5017-968-4		5018-968-2	5018-968-3	5018-968-4	
63/64	1	1-1/2	4	5016-984-2	5016-984-3	5016-984-4		5017-984-2	5017-984-3	5017-984-4		5018-984-2	5018-984-3	5018-984-4	
1	1	1-1/2	4	5016-100-2	5016-100-3	5016-100-4		5017-100-2	5017-100-3	5017-100-4		5018-100-2	5018-100-3	5018-100-4	

P	●	Steal
M	◒	Stainless Steel
K	●	Cast Iron
N	○	Non-Ferrous
S		High Temp. Alloys
H		Hardened Steel

● GOOD ◒ OK ○ NOT OPTIMAL

STANDARD PERFORMANCE

Standard Package: All Sizes - 1 Each



Ball Nose, Standard Carbide, Long Length, Single End

Cutter Diam. D	Shank Diam. d	Length Of Cut l1	O.A.L. L	Uncoated 2 Flute Part#	Uncoated 3 Flute Part#	Uncoated 4 Flute Part#	Uncoated Price	TiN Coated 2 Flute Part#	TiN Coated 3 Flute Part#	TiN Coated 4 Flute Part#	TiN Coated Price	TiALN Coated 2 Flute Part#	TiALN Coated 3 Flute Part#	TiALN Coated 4 Flute Part#	TiALN Coated Price
1/8	1/8	3/4	2-1/2	5019-125-2	--	5019-125-4		5020-125-2	--	5020-125-4		5021-125-2	--	5021-125-4	
3/16	3/16	3/4	2-1/2	5019-187-2	--	5019-187-4		5020-187-2	--	5020-187-4		5021-187-2	--	5021-187-4	
1/4	1/4	1-1/8	3	5019-250-2	--	5019-250-4		5020-250-2	--	5020-250-4		5021-250-2	--	5021-250-4	
5/16	5/16	1-1/8	3	5019-312-2	--	5019-312-4		5020-312-2	--	5020-312-4		5021-312-2	--	5021-312-4	
3/8	3/8	1-1/8	3	5019-375-2	--	5019-375-4		5020-375-2	--	5020-375-4		5021-375-2	--	5021-375-4	
7/16	7/16	2	4	5019-437-2	--	5019-437-4		5020-437-2	--	5020-437-4		5021-437-2	--	5021-437-4	
1/2	1/2	2	4	5019-500-2	--	5019-500-4		5020-500-2	--	5020-500-4		5021-500-2	--	5021-500-4	
5/8	5/8	2-1/4	5	5019-625-2	--	5019-625-4		5020-625-2	--	5020-625-4		5021-625-2	--	5021-625-4	
3/4	3/4	2-1/4	5	5019-750-2	--	5019-750-4		5020-750-2	--	5020-750-4		5021-750-2	--	5021-750-4	
1	1	2-1/4	5	5019-100-2	--	5019-100-4		5020-100-2	--	5020-100-4		5021-100-2	--	5021-100-4	

Ball Nose, Standard Carbide, Extra Long Length, Single End

Cutter Diam. D	Shank Diam. d	Length Of Cut l1	O.A.L. L	Uncoated 2 Flute Part#	Uncoated 3 Flute Part#	Uncoated 4 Flute Part#	Uncoated Price	TiN Coated 2 Flute Part#	TiN Coated 3 Flute Part#	TiN Coated 4 Flute Part#	TiN Coated Price	TiALN Coated 2 Flute Part#	TiALN Coated 3 Flute Part#	TiALN Coated 4 Flute Part#	TiALN Coated Price
1/8	1/8	1	3	5022-125-2	--	5022-125-4		5023-125-2	--	5023-125-4		5024-125-2	--	5024-125-4	
3/16	3/16	1-1/8	3	5022-187-2	--	5022-187-4		5023-187-2	--	5023-187-4		5024-187-2	--	5024-187-4	
1/4	1/4	1-1/2	4	5022-250-2	--	5022-250-4		5023-250-2	--	5023-250-4		5024-250-2	--	5024-250-4	
5/16	5/16	1-5/8	4	5022-312-2	--	5022-312-4		5023-312-2	--	5023-312-4		5024-312-2	--	5024-312-4	
3/8	3/8	1-3/4	4	5022-375-2	--	5022-375-4		5023-375-2	--	5023-375-4		5024-375-2	--	5024-375-4	
1/2	1/2	3	6	5022-500-2	--	5022-500-4		5023-500-2	--	5023-500-4		5024-500-2	--	5024-500-4	
5/8	5/8	3	6	5022-625-2	--	5022-625-4		5023-625-2	--	5023-625-4		5024-625-2	--	5024-625-4	
3/4	3/4	3	6	5022-750-2	--	5022-750-4		5023-750-2	--	5023-750-4		5024-750-2	--	5024-750-4	
1	1	3	6	5022-100-2	--	5022-100-4		5023-100-2	--	5023-100-4		5024-100-2	--	5024-100-4	

METRIC - Ball End, Standard Carbide, Regular Length, Single End

Cutter Diam. D	Shank Diam. d	Length Of Cut l1	O.A.L. L	Uncoated 2 Flute Part#	Uncoated 3 Flute Part#	Uncoated 4 Flute Part#	Uncoated Price	TiN Coated 2 Flute Part#	TiN Coated 3 Flute Part#	TiN Coated 4 Flute Part#	TiN Coated Price	TiALN Coated 2 Flute Part#	TiALN Coated 3 Flute Part#	TiALN Coated 4 Flute Part#	TiALN Coated Price
1	1	3	38	5043-010-2	5043-010-3	5043-010-4		--	--	--		5044-010-2	5044-010-3	5044-010-4	
1.5	2	5	38	5043-015-2	5043-015-3	5043-015-4		--	--	--		5044-015-2	5044-015-3	5044-015-4	
2	2	6	38	5043-020-2	5043-020-3	5043-020-4		--	--	--		5044-020-2	5044-020-3	5044-020-4	
3	3	12	38	5043-030-2	5043-030-3	5043-030-4		--	--	--		5044-030-2	5044-030-3	5044-030-4	
3.5	4	12	50	5043-035-2	5043-035-3	5043-035-4		--	--	--		5044-035-2	5044-035-3	5044-035-4	
4	4	14	50	5043-040-2	5043-040-3	5043-040-4		--	--	--		5044-040-2	5044-040-3	5044-040-4	
4.5	5	14	50	5043-045-2	5043-045-3	5043-045-4		--	--	--		5044-045-2	5044-045-3	5044-045-4	
5	5	16	50	5043-050-2	5043-050-3	5043-050-4		--	--	--		5044-050-2	5044-050-3	5044-050-4	
6	6	19	63	5043-060-2	5043-060-3	5043-060-4		--	--	--		5044-060-2	5044-060-3	5044-060-4	
7	7	19	63	5043-070-2	5043-070-3	5043-070-4		--	--	--		5044-070-2	5044-070-3	5044-070-4	
8	8	19	63	5043-080-2	5043-080-3	5043-080-4		--	--	--		5044-080-2	5044-080-3	5044-080-4	
9	9	22	70	5043-090-2	5043-090-3	5043-090-4		--	--	--		5044-090-2	5044-090-3	5044-090-4	
10	10	22	70	5043-100-2	5043-100-3	5043-100-4		--	--	--		5044-100-2	5044-100-3	5044-100-4	
11	11	25	70	5043-110-2	5043-110-3	5043-110-4		--	--	--		5044-110-2	5044-110-3	5044-110-4	
12	12	25	75	5043-120-2	5043-120-3	5043-120-4		--	--	--		5044-120-2	5044-120-3	5044-120-4	
14	14	30	88	5043-140-2	5043-140-3	5043-140-4		--	--	--		5044-140-2	5044-140-3	5044-140-4	
16	16	32	88	5043-160-2	5043-160-3	5043-160-4		--	--	--		5044-160-2	5044-160-3	5044-160-4	
18	18	36	100	5043-180-2	5043-180-3	5043-180-4		--	--	--		5044-180-2	5044-180-3	5044-180-4	
20	20	38	100	5043-200-2	5043-300-3	5043-400-4		--	--	--		5044-200-2	5044-300-3	5044-400-4	
22	22	38	100	5043-220-2	5043-320-3	5043-420-4		--	--	--		5044-220-2	5044-320-3	5044-420-4	
25	25	38	100	5043-250-2	5043-350-3	5043-450-4		--	--	--		5044-250-2	5044-350-3	5044-450-4	

P	●	Steal
M	◒	Stainless Steel
K	●	Cast Iron
N	○	Non-Ferrous
S		High Temp. Alloys
H		Hardened Steel

● GOOD ◒ OK ○ NOT OPTIMAL

STANDARD PERFORMANCE

Standard Package: All Sizes - 1 Each

Square End, Standard Carbide, Stub Length, Double End

Cutter Diam. D	Shank Diam. d	Length Of Cut l_1	O.A.L. L	Uncoated 2 Flute Part#	Uncoated 3 Flute Part#	Uncoated 4 Flute Part#	Uncoated Price	TiN Coated 2 Flute Part#	TiN Coated 3 Flute Part#	TiN Coated 4 Flute Part#	TiN Coated Price	TiALN Coated 2 Flute Part#	TiALN Coated 3 Flute Part#	TiALN Coated 4 Flute Part#	TiALN Coated Price
1/32	1/8	1/16	1-1/2	5025-031-2	--	5025-031-4		5026-031-2	--	5026-031-4		5027-031-2	--	5027-031-4	
3/64	1/8	3/32	1-1/2	5025-046-2	--	5025-046-4		5026-046-2	--	5026-046-4		5027-046-2	--	5027-046-4	
1/16	1/8	1/8	1-1/2	5025-062-2	--	5025-062-4		5026-062-2	--	5026-062-4		5027-062-2	--	5027-062-4	
3/32	1/8	3/16	1-1/2	5025-093-2	--	5025-093-4		5026-093-2	--	5026-093-4		5027-093-2	--	5027-093-4	
7/64	1/8	7/32	1-1/2	5025-109-2	--	5025-109-4		5026-109-2	--	5026-109-4		5027-109-2	--	5027-109-4	
1/8	1/8	1/4	1-1/2	5025-125-2	--	5025-125-4		5026-125-2	--	5026-125-4		5027-125-2	--	5027-125-4	
5/32	3/16	5/16	2	5025-156-2	--	5025-156-4		5026-156-2	--	5026-156-4		5027-156-2	--	5027-156-4	
3/16	3/8	5/16	2	5025-187-2	--	5025-187-4		5026-187-2	--	5026-187-4		5027-187-2	--	5027-187-4	
7/32	1/4	3/8	2-1/2	5025-218-2	--	5025-218-4		5026-218-2	--	5026-218-4		5027-218-2	--	5027-218-4	
1/4	1/4	1/2	2-1/2	5025-250-2	--	5025-250-4		5026-250-2	--	5026-250-4		5027-250-2	--	5027-250-4	
9/32	5/16	1/2	2-1/2	5025-281-2	--	5025-281-4		5026-281-2	--	5026-281-4		5027-281-2	--	5027-281-4	
5/16	5/16	1/2	2-1/2	5025-312-2	--	5025-312-4		5026-312-2	--	5026-312-4		5027-312-2	--	5027-312-4	
3/8	3/8	9/16	2-1/2	5025-375-2	--	5025-375-4		5026-375-2	--	5026-375-4		5027-375-2	--	5027-375-4	
7/16	1/2	9/16	2-3/4	5025-437-2	--	5025-437-4		5026-437-2	--	5026-437-4		5027-437-2	--	5027-437-4	
1/2	1/2	5/8	3	5025-500-2	--	5025-500-4		5026-500-2	--	5026-500-4		5027-500-2	--	5027-500-4	
9/16	5/8	11/16	3-1/2	5025-562-2	--	5025-562-4		5026-562-2	--	5026-562-4		5027-562-2	--	5027-562-4	
5/8	5/8	11/16	3-1/2	5025-625-2	--	5025-625-4		5026-625-2	--	5026-625-4		5027-625-2	--	5027-625-4	
3/4	3/4	7/8	4	5025-750-2	--	5025-750-4		5026-750-2	--	5026-750-4		5027-750-2	--	5027-750-4	

Square End, Standard Carbide, Regular Length, Double End

Cutter Diam. D	Shank Diam. d	Length Of Cut l_1	O.A.L. L	Uncoated 2 Flute Part#	Uncoated 3 Flute Part#	Uncoated 4 Flute Part#	Uncoated Price	TiN Coated 2 Flute Part#	TiN Coated 3 Flute Part#	TiN Coated 4 Flute Part#	TiN Coated Price	TiALN Coated 2 Flute Part#	TiALN Coated 3 Flute Part#	TiALN Coated 4 Flute Part#	TiALN Coated Price
3/32	3/8	5/16	3	5031-093-2	--	5031-093-4		--	--	--		5032-093-2	--	5032-093-4	
1/8	3/8	3/8	3-1/16	5031-125-2	--	5031-125-4		--	--	--		5032-125-2	--	5032-125-4	
5/32	3/8	7/16	3-1/8	5031-156-2	--	5031-156-4		--	--	--		5032-156-2	--	5032-156-4	
3/16	3/8	1/2	3-1/4	5031-187-2	--	5031-187-4		--	--	--		5032-187-2	--	5032-187-4	
7/32	3/8	9/16	3-1/2	5031-218-2	--	5031-218-4		--	--	--		5032-218-2	--	5032-218-4	
1/4	3/8	5/8	3-1/2	5031-250-2	--	5031-250-4		--	--	--		5032-250-2	--	5032-250-4	
5/16	3/8	3/4	3-1/2	5031-312-2	--	5031-312-4		--	--	--		5032-312-2	--	5032-312-4	
3/8	3/8	3/4	3-1/2	5031-375-2	--	5031-375-4		--	--	--		5032-375-2	--	5032-375-4	
7/16	1/2	7/8	4	5031-437-2	--	5031-437-4		--	--	--		5032-437-2	--	5032-437-4	
1/2	1/2	1	4	5031-500-2	--	5031-500-4		--	--	--		5032-500-2	--	5032-500-4	
5/8	5/8	1-1/2	6	5031-625-2	--	5031-625-4		--	--	--		5032-625-2	--	5032-625-4	
3/4	3/4	1-1/2	6	5031-750-2	--	5031-750-4		--	--	--		5032-750-2	--	5032-750-4	

P	●	Steal
M	◒	Stainless Steel
K	●	Cast Iron
N	○	Non-Ferrous
S		High Temp. Alloys
H		Hardened Steel

● GOOD ◒ OK ○ NOT OPTIMAL

STANDARD PERFORMANCE

Standard Package: All Sizes - 1 Each

Ball Nose, Standard Carbide, Stub Length, Double End

Cutter Diam. D	Shank Diam. d	Length Of Cut l_1	O.A.L. L	Uncoated 2 Flute Part#	Uncoated 3 Flute Part#	Uncoated 4 Flute Part#	Uncoated Price	TiN Coated 2 Flute Part#	TiN Coated 3 Flute Part#	TiN Coated 4 Flute Part#	TiN Coated Price	TiALN Coated 2 Flute Part#	TiALN Coated 3 Flute Part#	TiALN Coated 4 Flute Part#	TiALN Coated Price
1/32	1/8	1/16	1-1/2	5028-031-2	--	5028-031-4		5029-031-2	--	5029-031-4		5030-031-2	--	5030-031-4	
3/64	1/8	3/32	1-1/2	5028-046-2	--	5028-046-4		5029-046-2	--	5029-046-4		5030-046-2	--	5030-046-4	
1/16	1/8	1/8	1-1/2	5028-062-2	--	5028-062-4		5029-062-2	--	5029-062-4		5030-062-2	--	5030-062-4	
3/32	1/8	3/16	1-1/2	5028-093-2	--	5028-093-4		5029-093-2	--	5029-093-4		5030-093-2	--	5030-093-4	
7/64	1/8	7/32	1-1/2	5028-109-2	--	5028-109-4		5029-109-2	--	5029-109-4		5030-109-2	--	5030-109-4	
1/8	1/8	1/4	1-1/2	5028-125-2	--	5028-125-4		5029-125-2	--	5029-125-4		5030-125-2	--	5030-125-4	
5/32	3/16	5/16	2	5028-156-2	--	5028-156-4		5029-156-2	--	5029-156-4		5030-156-2	--	5030-156-4	
3/16	3/8	5/16	2	5028-187-2	--	5028-187-4		5029-187-2	--	5029-187-4		5030-187-2	--	5030-187-4	
7/32	1/4	3/8	2-1/2	5028-218-2	--	5028-218-4		5029-218-2	--	5029-218-4		5030-218-2	--	5030-218-4	
1/4	1/4	1/2	2-1/2	5028-250-2	--	5028-250-4		5029-250-2	--	5029-250-4		5030-250-2	--	5030-250-4	
9/32	5/16	1/2	2-1/2	5028-281-2	--	5028-281-4		5029-281-2	--	5029-281-4		5030-281-2	--	5030-281-4	
5/16	5/16	1/2	2-1/2	5028-312-2	--	5028-312-4		5029-312-2	--	5029-312-4		5030-312-2	--	5030-312-4	
3/8	3/8	9/16	2-1/2	5028-375-2	--	5028-375-4		5029-375-2	--	5029-375-4		5030-375-2	--	5030-375-4	
7/16	1/2	9/16	2-3/4	5028-437-2	--	5028-437-4		5029-437-2	--	5029-437-4		5030-437-2	--	5030-437-4	
1/2	1/2	5/8	3	5028-500-2	--	5028-500-4		5029-500-2	--	5029-500-4		5030-500-2	--	5030-500-4	
9/16	5/8	11/16	3-1/2	5028-562-2	--	5028-562-4		5029-562-2	--	5029-562-4		5030-562-2	--	5030-562-4	
5/8	5/8	11/16	3-1/2	5028-625-2	--	5028-625-4		5029-625-2	--	5029-625-4		5030-625-2	--	5030-625-4	
3/4	3/4	7/8	4	5028-750-2	--	5028-750-4		5029-750-2	--	5029-750-4		5030-750-2	--	5030-750-4	

Ball Nose, Standard Carbide, Regular Length, Double End

Cutter Diam. D	Shank Diam. d	Length Of Cut l_1	O.A.L. L	Uncoated 2 Flute Part#	Uncoated 3 Flute Part#	Uncoated 4 Flute Part#	Uncoated Price	TiN Coated 2 Flute Part#	TiN Coated 3 Flute Part#	TiN Coated 4 Flute Part#	TiN Coated Price	TiALN Coated 2 Flute Part#	TiALN Coated 3 Flute Part#	TiALN Coated 4 Flute Part#	TiALN Coated Price
3/32	3/8	5/16	3	5033-093-2	--	5033-093-4		--	--	--		5034-093-2	--	5034-093-4	
1/8	3/8	3/8	3-1/16	5033-125-2	--	5033-125-4		--	--	--		5034-125-2	--	5034-125-4	
5/32	3/8	7/16	3-1/8	5033-156-2	--	5033-156-4		--	--	--		5034-156-2	--	5034-156-4	
3/16	3/8	1/2	3-1/4	5033-187-2	--	5033-187-4		--	--	--		5034-187-2	--	5034-187-4	
7/32	3/8	9/16	3-1/2	5033-218-2	--	5033-218-4		--	--	--		5034-218-2	--	5034-218-4	
1/4	3/8	5/8	3-1/2	5033-250-2	--	5033-250-4		--	--	--		5034-250-2	--	5034-250-4	
5/16	3/8	3/4	3-1/2	5033-312-2	--	5033-312-4		--	--	--		5034-312-2	--	5034-312-4	
3/8	3/8	3/4	3-1/2	5033-375-2	--	5033-375-4		--	--	--		5034-375-2	--	5034-375-4	
7/16	1/2	7/8	4	5033-437-2	--	5033-437-4		--	--	--		5034-437-2	--	5034-437-4	
1/2	1/2	1	4	5033-500-2	--	5033-500-4		--	--	--		5034-500-2	--	5034-500-4	
5/8	5/8	1-1/2	6	5033-625-2	--	5033-625-4		--	--	--		5034-625-2	--	5034-625-4	
3/4	3/4	1-1/2	6	5033-750-2	--	5033-750-4		--	--	--		5034-750-2	--	5034-750-4	

P	●	Steal
M	◒	Stainless Steel
K	●	Cast Iron
N	○	Non-Ferrous
S	○	High Temp. Alloys
H		Hardened Steel

● BETTER ◒ OK ○ NOT OPTIMAL

HIGH PERFORMANCE

Standard Package: All Sizes - 1 Each

HIGH PERFORMANCE Variable Pitch Carbide, Regular Length, Single End

Cutter Diam. D	Shank Diam. d	Length Of Cut l_1	O.A.L. L	Corner Radius	TiALN Coated 4 Flute - ROUND Shank Part#	Price	TiALN Coated 4 Flute - WELDON Shank Part#	Price
3/16	3/16	5/8	2	SQ	5090-188-4		--	
3/16	3/16	5/8	2	.015CR	5090-188-4-015R		--	
1/4	1/4	3/4	2-1/2	SQ	5090-250-4		5091-250-4	
1/4	1/4	3/4	2-1/2	.020CR	5090-250-4-020R		5091-250-4-020R	
5/16	5/16	13/16	2-1/2	SQ	5090-312-4		5091-312-4	
5/16	5/16	13/16	2-1/2	.020CR	5090-312-4-020R		5091-312-4-020R	
3/8	3/8	7/8	2-1/2	SQ	5090-375-4		5091-375-4	
3/8	3/8	7/8	2-1/2	.020CR	5090-375-4-020R		5091-375-4-020R	
7/16	7/16	1	2-3/4	SQ	5090-437-4		5091-437-4	
1/2	1/2	1	3	SQ	5090-500-4		5091-500-4	
1/2	1/2	1	3	.015CR	5090-500-4-015R		5091-500-4-015R	
1/2	1/2	1	3	.030CR	5090-500-4-030R		5091-500-4-030R	
1/2	1/2	1	3	.060CR	5090-500-4-060R		5091-500-4-060R	
5/8	5/8	1-1/4	3-1/2	SQ	5090-625-4		5091-625-4	
5/8	5/8	1-1/4	3-1/2	.030CR	5090-625-4-030R		5091-625-4-030R	
5/8	5/8	1-1/4	3-1/2	.060CR	5090-625-4-060R		5091-625-4-060R	
5/8	5/8	1-1/4	3-1/2	.125CR	5090-625-4-125R		5091-625-4-125R	
3/4	3/4	1-1/2	4	SQ	5090-750-4		5091-750-4	
3/4	3/4	1-1/2	4	.030CR	5090-750-4-030R		5091-750-4-030R	
3/4	3/4	1-1/2	4	.060CR	5090-750-4-060R		5091-750-4-060R	
3/4	3/4	1-1/2	4	.125CR	5090-750-4-125R		5091-750-4-125R	
1	1	1-1/2	4	SQ	5090-100-4		5091-100-4	
1	1	1-1/2	4	.030CR	5090-100-4-030R		5091-100-4-030R	
1	1	1-1/2	4	.060CR	5090-100-4-060R		5091-100-4-060R	
1	1	1-1/2	4	.125CR	5090-100-4-125R		5091-100-4-125R	

HIGH PERFORMANCE Variable Pitch Carbide, Long Length, Single End

Cutter Diam. D	Shank Diam. d	Length Of Cut l_1	O.A.L. L	Corner Radius	TiALN Coated 4 Flute - ROUND Shank Part#	Price	TiALN Coated 4 Flute - WELDON Shank Part#	Price
3/16	3/16	3/4	2-1/2	SQ	5092-188-4		--	
3/16	3/16	3/4	2-1/2	.015CR	5092-188-4-015R		--	
1/4	1/4	1-1/8	3	SQ	5092-250-4		5093-250-4	
1/4	1/4	1-1/8	3	.020CR	5092-250-4-020R		5093-250-4-020R	
5/16	5/16	1-1/8	3	SQ	5092-312-4		5093-312-4	
5/16	5/16	1-1/8	3	.020CR	5092-312-4-020R		5093-312-4-020R	
3/8	3/8	1-1/8	3	SQ	5092-375-4		5093-375-4	
3/8	3/8	1-1/8	3	.020CR	5092-375-4-020R		5093-375-4-020R	
7/16	7/16	2	4	SQ	5092-437-4		5093-437-4	
1/2	1/2	2	4	SQ	5092-500-4		5093-500-4	
1/2	1/2	2	4	.015CR	5092-500-4-015R		5093-500-4-015R	
1/2	1/2	2	4	.030CR	5092-500-4-030R		5093-500-4-030R	
1/2	1/2	2	4	.060CR	5092-500-4-060R		5093-500-4-060R	
5/8	5/8	2-1/4	5	SQ	5092-625-4		5093-625-4	
5/8	5/8	2-1/4	5	.030CR	5092-625-4-030R		5093-625-4-030R	
5/8	5/8	2-1/4	5	.060CR	5092-625-4-060R		5093-625-4-060R	
5/8	5/8	2-1/4	5	.125CR	5092-625-4-125R		5093-625-4-125R	
3/4	3/4	2-1/4	5	SQ	5092-750-4		5093-750-4	
3/4	3/4	2-1/4	5	.030CR	5092-750-4-030R		5093-750-4-030R	
3/4	3/4	2-1/4	5	.060CR	5092-750-4-060R		5093-750-4-060R	
3/4	3/4	2-1/4	5	.125CR	5092-750-4-125R		5093-750-4-125R	
1	1	2-1/4	5	SQ	5092-100-4		5093-100-4	
1	1	2-1/4	5	.030CR	5092-100-4-030R		5093-100-4-030R	
1	1	2-1/4	5	.060CR	5092-100-4-060R		5093-100-4-060R	
1	1	2-1/4	5	.125CR	5092-100-4-125R		5093-100-4-125R	

P	●	Steal
M	◒	Stainless Steel
K	●	Cast Iron
N	○	Non-Ferrous
S	○	High Temp. Alloys
H		Hardened Steel

● BETTER ◒ OK ○ NOT OPTIMAL

HIGH PERFORMANCE

Standard Package: All Sizes - 1 Each

HIGH PERFORMANCE Variable Pitch Carbide, Ball Regular Length, Single End

Cutter Diam. D	Shank Diam. d	Length Of Cut l_1	O.A.L . L	TiALN Coated 4 Flute - ROUND Shank Part#	Price	TiALN Coated 4 Flute - WELDON Shank Part#	Price
3/16	3/16	5/8	2	5094-188-4		--	
1/4	1/4	3/4	2-1/2	5094-250-4		5095-250-4	
5/16	5/16	13/16	2-1/2	5094-312-4		5095-312-4	
3/8	3/8	7/8	2-1/2	5094-375-4		5095-375-4	
7/16	7/16	1	2-3/4	5094-437-4		5095-437-4	
1/2	1/2	1	3	5094-500-4		5095-500-4	
5/8	5/8	1-1/4	3-1/2	5094-625-4		5095-625-4	
3/4	3/4	1-1/2	4	5094-750-4		5095-750-4	
1	1	1-1/2	4	5094-100-4		5095-100-4	

HIGH PERFORMANCE Variable Pitch Carbide, Ball Long Length, Single End

Cutter Diam. D	Shank Diam. d	Length Of Cut l_1	O.A.L . L	TiALN Coated 4 Flute - ROUND Shank Part#	Price	TiALN Coated 4 Flute - WELDON Shank Part#	Price
3/16	3/16	3/4	2-1/2	5096-188-4		--	
1/4	1/4	1-1/8	3	5096-250-4		5097-250-4	
5/16	5/16	1-1/8	3	5096-312-4		5097-312-4	
3/8	3/8	1-1/8	3	5096-375-4		5097-375-4	
7/16	7/16	2	4	5096-437-4		5097-437-4	
1/2	1/2	2	4	5096-500-4		5097-500-4	
5/8	5/8	2-1/4	5	5096-625-4		5097-625-4	
3/4	3/4	2-1/4	5	5096-750-4		5097-750-4	
1	1	2-1/4	5	5096-100-4		5097-100-4	

P	●	Steal
M	◒	Stainless Steel
K	●	Cast Iron
N	○	Non-Ferrous
S	○	High Temp. Alloys
H		Hardened Steel

● BEST ◒ OK ○ NOT OPTIMAL

ULTRA HIGH PERFORMANCE

Standard Package: All Sizes - 1 Each

ULTRA HIGH PERFORMANCE Variable Pitch Carbide, Regular Length, Single End

Cutter Diam. D	Shank Diam. d	Length Of Cut l_1	O.A.L. L	Corner Radius	TiALN Coated 4 Flute - ROUND Shank Part#	Price	TiALN Coated 5 Flute - ROUND Shank Part#	Price	TiALN Coated 4 Flute - WELDON Shank Part#	Price
1/8	1/8	1/2	1-1/2	.010CR	5080-125-4-010R		--		--	
3/16	3/16	5/8	2	SQ	5080-188-4		--		--	
3/16	3/16	5/8	2	.015CR	5080-188-4-015R		--		--	
1/4	1/4	3/4	2-1/2	SQ	5080-250-4		5080-250-5		5081-250-4	
1/4	1/4	3/4	2-1/2	.020CR	5080-250-4-020R		5080-250-5-020R		5081-250-4-020R	
5/16	5/16	13/16	2-1/2	SQ	5080-312-4		5080-312-5		5081-312-4	
5/16	5/16	13/16	2-1/2	.020CR	5080-312-4-020R		5080-312-5-020R		5081-312-4-020R	
3/8	3/8	7/8	2-1/2	SQ	5080-375-4		5080-375-5		5081-375-4	
3/8	3/8	7/8	2-1/2	.020CR	5080-375-4-020R		5080-375-5-020R		5081-375-4-020R	
3/8	3/8	7/8	2-1/2	.030CR	5080-375-4-030R		5080-375-5-030R		5081-375-4-030R	
7/16	7/16	1	2-3/4	SQ	5080-437-4		--		5081-437-4	
1/2	1/2	1	3	SQ	5080-500-4		5080-500-5		5081-500-4	
1/2	1/2	1	3	.015CR	5080-500-4-015R		--		5081-500-4-015R	
1/2	1/2	1	3	.030CR	5080-500-4-030R		5080-500-5-030R		5081-500-4-030R	
1/2	1/2	1	3	.060CR	5080-500-4-060R		--		5081-500-4-060R	
5/8	5/8	1-1/4	3-1/2	SQ	5080-625-4		5080-625-5		5081-625-4	
5/8	5/8	1-1/4	3-1/2	.030CR	5080-625-4-030R		5080-625-5-030R		5081-625-4-030R	
5/8	5/8	1-1/4	3-1/2	.060CR	5080-625-4-060R		--		5081-625-4-060R	
5/8	5/8	1-1/4	3-1/2	.125CR	5080-625-4-125R		--		5081-625-4-125R	
3/4	3/4	1-1/2	4	SQ	5080-750-4		5080-750-5		5081-750-4	
3/4	3/4	1-1/2	4	.030CR	5080-750-4-030R		5080-750-5-030R		5081-750-4-030R	
3/4	3/4	1-1/2	4	.060CR	5080-750-4-060R		--		5081-750-4-060R	
3/4	3/4	1-1/2	4	.125CR	5080-750-4-125R		--		5081-750-4-125R	
1	1	1-1/2	4	SQ	5080-100-4		5080-100-5		5081-100-4	
1	1	1-1/2	4	.030CR	5080-100-4-030R		5080-100-5-030R		5081-100-4-030R	
1	1	1-1/2	4	.060CR	5080-100-4-060R		--		5081-100-4-060R	
1	1	1-1/2	4	.125CR	5080-100-4-125R		--		5081-100-4-125R	

P	●	Steal
M	◒	Stainless Steel
K	●	Cast Iron
N	○	Non-Ferrous
S	○	High Temp. Alloys
H		Hardened Steel

● BEST ◒ OK ○ NOT OPTIMAL

ULTRA HIGH PERFORMANCE

Standard Package: All Sizes - 1 Each

ULTRA HIGH PERFORMANCE Variable Pitch Carbide, Long Length, Single End

Cutter Diam. D	Shank Diam. d	Length Of Cut l_1	O.A.L. L	Corner Radius	TiALN Coated 4 Flute - ROUND Shank Part#	Price	TiALN Coated 4 Flute - WELDON Shank Part#	Price
3/16	3/16	3/4	2-1/2	SQ	5082-188-4		--	
3/16	3/16	3/4	2-1/2	.015CR	5082-188-4-015R		--	
1/4	1/4	1-1/8	3	SQ	5082-250-4		5083-250-4	
1/4	1/4	1-1/8	3	.020CR	5082-250-4-020R		5083-250-4-020R	
5/16	5/16	1-1/8	3	SQ	5082-312-4		5083-312-4	
5/16	5/16	1-1/8	3	.020CR	5082-312-4-020R		5083-312-4-020R	
3/8	3/8	1-1/8	3	SQ	5082-375-4		5083-375-4	
3/8	3/8	1-1/8	3	.020CR	5082-375-4-020R		5083-375-4-020R	
7/16	7/16	2	4	SQ	5082-437-4		5083-437-4	
1/2	1/2	2	4	SQ	5082-500-4		5083-500-4	
1/2	1/2	2	4	.015CR	5082-500-4-015R		5083-500-4-015R	
1/2	1/2	2	4	.030CR	5082-500-4-030R		5083-500-4-030R	
1/2	1/2	2	4	.060CR	5082-500-4-060R		5083-500-4-060R	
5/8	5/8	2-1/4	5	SQ	5082-625-4		5083-625-4	
5/8	5/8	2-1/4	5	.030CR	5082-625-4-030R		5083-625-4-030R	
5/8	5/8	2-1/4	5	.060CR	5082-625-4-060R		5083-625-4-060R	
5/8	5/8	2-1/4	5	.125CR	5082-625-4-125R		5083-625-4-125R	
3/4	3/4	2-1/4	5	SQ	5082-750-4		5083-750-4	
3/4	3/4	2-1/4	5	.030CR	5082-750-4-030R		5083-750-4-030R	
3/4	3/4	2-1/4	5	.060CR	5082-750-4-060R		5083-750-4-060R	
3/4	3/4	2-1/4	5	.125CR	5082-750-4-125R		5083-750-4-125R	
1	1	2-1/4	5	SQ	5082-100-4		5083-100-4	
1	1	2-1/4	5	.030CR	5082-100-4-030R		5083-100-4-030R	
1	1	2-1/4	5	.060CR	5082-100-4-060R		5083-100-4-060R	
1	1	2-1/4	5	.125CR	5082-100-4-125R		5083-100-4-125R	

ULTRA HIGH PERFORMANCE Variable Pitch Carbide,Extra Long Length, Single End

Cutter Diam. D	Shank Diam. d	Length Of Cut l_1	O.A.L. L	Corner Radius	TiALN Coated 4 Flute - ROUND Shank Part#	Price	TiALN Coated 4 Flute - WELDON Shank Part#	Price
3/16	3/16	1-1/8	3	SQ	5088-188-4		--	
1/4	1/4	1-1/2	4	SQ	5088-250-4		--	
5/16	5/16	1-5/8	4	SQ	5088-312-4		--	
3/8	3/8	1-3/4	4	SQ	5088-375-4		--	
1/2	1/2	3	6	SQ	5088-500-4		--	
5/8	5/8	3	6	SQ	5088-625-4		--	
3/4	3/4	3	6	SQ	5088-750-4		--	
1	1	3	6	SQ	5088-100-4		--	

P	●	Steal
M	◒	Stainless Steel
K	●	Cast Iron
N	○	Non-Ferrous
S	○	High Temp. Alloys
H		Hardened Steel

● BEST ◒ OK ○ NOT OPTIMAL

ULTRA HIGH PERFORMANCE

Standard Package: All Sizes - 1 Each

ULTRA HIGH PERFORMANCE Variable Pitch Carbide, Ball Regular Length, Single End

Cutter Diam. D	Shank Diam. d	Length Of Cut l_1	O.A.L. L	TiALN Coated 4 Flute - ROUND Shank Part#	Price	TiALN Coated 4 Flute - WELDON Shank Part#	Price
3/16	3/16	5/8	2	5084-188-4		--	
1/4	1/4	3/4	2-1/2	5084-250-4		5085-250-4	
5/16	5/16	13/16	2-1/2	5084-312-4		5085-312-4	
3/8	3/8	7/8	2-1/2	5084-375-4		5085-375-4	
7/16	7/16	1	2-3/4	5084-437-4		5085-437-4	
1/2	1/2	1	3	5084-500-4		5085-500-4	
5/8	5/8	1-1/4	3-1/2	5084-625-4		5085-625-4	
3/4	3/4	1-1/2	4	5084-750-4		5085-750-4	
1	1	1-1/2	4	5084-100-4		5085-100-4	

ULTRA HIGH PERFORMANCE Variable Pitch Carbide, Ball Long Length, Single End

Cutter Diam. D	Shank Diam. d	Length Of Cut l_1	O.A.L. L	TiALN Coated 4 Flute - ROUND Shank Part#	Price	TiALN Coated 4 Flute - WELDON Shank Part#	Price
3/16	3/16	3/4	2-1/2	5086-188-4		--	
1/4	1/4	1-1/8	3	5086-250-4		5087-250-4	
5/16	5/16	1-1/8	3	5086-312-4		5087-312-4	
3/8	3/8	1-1/8	3	5086-375-4		5087-375-4	
7/16	7/16	2	4	5086-437-4		5087-437-4	
1/2	1/2	2	4	5086-500-4		5087-500-4	
5/8	5/8	2-1/4	5	5086-625-4		5087-625-4	
3/4	3/4	2-1/4	5	5086-750-4		5087-750-4	
1	1	2-1/4	5	5086-100-4		5087-100-4	

ULTRA HIGH PERFORMANCE Variable Pitch Carbide, Ball Extra Long Length, Single End

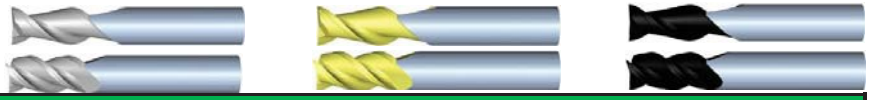
Cutter Diam. D	Shank Diam. d	Length Of Cut l_1	O.A.L. L	TiALN Coated 4 Flute - ROUND Shank Part#	Price	TiALN Coated 4 Flute - WELDON Shank Part#	Price
3/16	3/16	1-1/8	3	5089-188-4		--	
1/4	1/4	1-1/2	4	5089-250-4		--	
5/16	5/16	1-5/8	4	5089-312-4		--	
3/8	3/8	1-3/4	4	5089-375-4		--	
1/2	1/2	3	6	5089-500-4		--	
5/8	5/8	3	6	5089-625-4		--	
3/4	3/4	3	6	5089-750-4		--	
1	1	3	6	5089-100-4		--	

P		Steal
M		Stainless Steel
K		Cast Iron
N	●	Non-Ferrous
S		High Temp. Alloys
H		Hardened Steel

● BEST

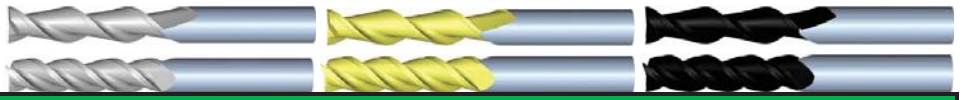
ULTRA HIGH PERFORMANCE

Standard Package: All Sizes - 1 Each



ULTRA HIGH PERFORMANCE Variable Pitch & Helix Carbide, Regular Length, Single End - ALUMINUM

Cutter Diam. D	Shank Diam. d	Length Of Cut l_1	O.A.L. L	Corner Radius	Uncoated 2 Flute Part#	Uncoated 3 Flute Part#	Uncoated Price	ZrN Coated 2 Flute Part#	ZrN Coated 3 Flute Part#	ZrN Coated Price	DLC Coated 2 Flute Part#	DLC Coated 3 Flute Part#	DLC Coated Price
1/8	1/8	1/2	1-1/2	SQ	5170-125-2	5170-125-3		--	--		--	--	
3/16	3/16	5/8	2	SQ	5170-188-2	5170-188-3		5070-188-2	5070-188-3		5270-188-2	5270-188-3	
1/4	1/4	3/4	2-1/2	SQ	5170-250-2	5170-250-3		5070-250-2	5070-250-3		5270-250-2	5270-250-3	
1/4	1/4	3/4	2-1/2	.020CR	5170-250-2-020R	5170-250-3-020R		5070-250-2-020R	5070-250-3-020R		5270-250-2-020R	5270-250-3-020R	
5/16	5/16	13/16	2-1/2	SQ	5170-312-2	5170-312-3		5070-312-2	5070-312-3		5270-312-2	5270-312-3	
5/16	5/16	13/16	2-1/2	.020CR	5170-312-2-020R	5170-312-3-020R		5070-312-2-020R	5070-312-3-020R		5270-312-2-020R	5270-312-3-020R	
3/8	3/8	1	2-1/2	SQ	5170-375-2	5170-375-3		5070-375-2	5070-375-3		5270-375-2	5270-375-3	
3/8	3/8	1	2-1/2	.020CR	5170-375-2-020R	5170-375-3-020R		5070-375-2-020R	5070-375-3-020R		5270-375-2-020R	5270-375-3-020R	
1/2	1/2	1-1/4	3	SQ	5170-500-2	5170-500-3		5070-500-2	5070-500-3		5270-500-2	5270-500-3	
1/2	1/2	1-1/4	3	.030CR	5170-500-2-030R	5170-500-3-030R		5070-500-2-030R	5070-500-3-030R		5270-500-2-030R	5270-500-3-030R	
5/8	5/8	1-1/4	3-1/2	SQ	5170-625-2	5170-625-3		5070-625-2	5070-625-3		5270-625-2	5270-625-3	
5/8	5/8	1-1/4	3-1/2	.030CR	5170-625-2-030R	5170-625-3-030R		5070-625-2-030R	5070-625-3-030R		5270-625-2-030R	5270-625-3-030R	
3/4	3/4	1-1/2	4	SQ	5170-750-2	5170-750-3		5070-750-2	5070-750-3		5270-750-2	5270-750-3	
3/4	3/4	1-1/2	4	.030CR	5170-750-2-030R	5170-750-3-030R		5070-750-2-030R	5070-750-3-030R		5270-750-2-030R	5270-750-3-030R	
1	1	1-1/2	4	SQ	5170-100-2	5170-100-3		5070-100-2	5070-100-3		5270-100-2	5270-100-3	
1	1	1-1/2	4	.030CR	5170-100-2-030R	5170-100-3-030R		5070-100-2-030R	5070-100-3-030R		5270-100-2-030R	5270-100-3-030R	



ULTRA HIGH PERFORMANCE Variable Pitch & Helix Carbide, Long Length, Single End - ALUMINUM

Cutter Diam. D	Shank Diam. d	Length Of Cut l_1	O.A.L. L	Corner Radius	Uncoated 2 Flute Part#	Uncoated 3 Flute Part#	Uncoated Price	ZrN Coated 2 Flute Part#	ZrN Coated 3 Flute Part#	ZrN Coated Price	DLC Coated 2 Flute Part#	DLC Coated 3 Flute Part#	DLC Coated Price
3/16	3/16	3/4	2-1/2	SQ	5172-188-2	5172-188-3		5072-188-2	5072-188-3		5272-188-2	5272-188-3	
1/4	1/4	1-1/8	3	SQ	5172-250-2	5172-250-3		5072-250-2	5072-250-3		5272-250-2	5272-250-3	
5/16	5/16	1-1/8	3	SQ	5172-312-2	5172-312-3		5072-312-2	5072-312-3		5272-312-2	5272-312-3	
3/8	3/8	1-1/8	3	SQ	5172-375-2	5172-375-3		5072-375-2	5072-375-3		5272-375-2	5272-375-3	
1/2	1/2	2	4	SQ	5172-500-2	5172-500-3		5072-500-2	5072-500-3		5272-500-2	5272-500-3	
5/8	5/8	2-1/4	5	SQ	5172-625-2	5172-625-3		5072-625-2	5072-625-3		5272-625-2	5272-625-3	
3/4	3/4	2-1/4	5	SQ	5172-750-2	5172-750-3		5072-750-2	5072-750-3		5272-750-2	5272-750-3	
1	1	2-1/4	5	SQ	5172-100-2	5172-100-3		5072-100-2	5072-100-3		5272-100-2	5272-100-3	

ULTRA HIGH PERFORMANCE Variable Pitch & Helix Carbide, Extra Long Length, Single End - ALUMINUM

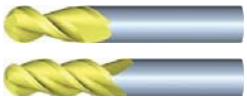
Cutter Diam. D	Shank Diam. d	Length Of Cut l_1	O.A.L. L	Corner Radius	Uncoated 2 Flute Part#	Uncoated 3 Flute Part#	Uncoated Price	ZrN Coated 2 Flute Part#	ZrN Coated 3 Flute Part#	ZrN Coated Price	DLC Coated 2 Flute Part#	DLC Coated 3 Flute Part#	DLC Coated Price
3/16	3/16	1-1/8	3	SQ	5178-188-2	5178-188-3		5078-188-2	5078-188-3		5278-188-2	5278-188-3	
1/4	1/4	1-1/2	4	SQ	5178-250-2	5178-250-3		5078-250-2	5078-250-3		5278-250-2	5278-250-3	
5/16	5/16	1-5/8	4	SQ	5178-312-2	5178-312-3		5078-312-2	5078-312-3		5278-312-2	5278-312-3	
3/8	3/8	1-3/4	4	SQ	5178-375-2	5178-375-3		5078-375-2	5078-375-3		5278-375-2	5278-375-3	
1/2	1/2	3	6	SQ	5178-500-2	5178-500-3		5078-500-2	5078-500-3		5278-500-2	5278-500-3	
5/8	5/8	3	6	SQ	5178-625-2	5178-625-3		5078-625-2	5078-625-3		5278-625-2	5278-625-3	
3/4	3/4	3	6	SQ	5178-750-2	5178-750-3		5078-750-2	5078-750-3		5278-750-2	5278-750-3	
1	1	3	6	SQ	5178-100-2	5178-100-3		5078-100-2	5078-100-3		5278-100-2	5278-100-3	

P		Steal
M		Stainless Steel
K		Cast Iron
N	●	Non-Ferrous
S		High Temp. Alloys
H		Hardened Steel

● BEST

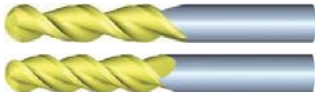
ULTRA HIGH PERFORMANCE

Standard Package: All Sizes - 1 Each



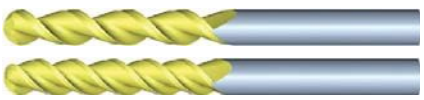
ULTRA HIGH PERFORMANCE Variable Pitch & Helix Carbide, Ball Regular Length, Single End - ALUMINUM

Cutter Diam. D	Shank Diam. d	Length Of Cut l_1	O.A.L. L	Corner Radius	Uncoated 2 Flute Part#	Uncoated 3 Flute Part#	Uncoated Price	ZrN Coated 2 Flute Part#	ZrN Coated 3 Flute Part#	ZrN Coated Price	DLC Coated 2 Flute Part#	DLC Coated 3 Flute Part#	DLC Coated Price
3/16	3/16	5/8	2	BN	5174-188-2	5174-188-3		5074-188-2	5074-188-3		5274-188-2	5274-188-3	
1/4	1/4	3/4	2-1/2	BN	5174-250-2	5174-250-3		5074-250-2	5074-250-3		5274-250-2	5274-250-3	
5/16	5/16	13/16	2-1/2	BN	5174-312-2	5174-312-3		5074-312-2	5074-312-3		5274-312-2	5274-312-3	
3/8	3/8	1	2-1/2	BN	5174-375-2	5174-375-3		5074-375-2	5074-375-3		5274-375-2	5274-375-3	
1/2	1/2	1-1/4	3	BN	5174-500-2	5174-500-3		5074-500-2	5074-500-3		5274-500-2	5274-500-3	
5/8	5/8	1-1/4	3-1/2	BN	5174-625-2	5174-625-3		5074-625-2	5074-625-3		5274-625-2	5274-625-3	
3/4	3/4	1-1/2	4	BN	5174-750-2	5174-750-3		5074-750-2	5074-750-3		5274-750-2	5274-750-3	
1	1	1-1/2	4	BN	5174-100-2	5174-100-3		5074-100-2	5074-100-3		5274-100-2	5274-100-3	



ULTRA HIGH PERFORMANCE Variable Pitch & Helix Carbide, Ball Long Length, Single End - ALUMINUM

Cutter Diam. D	Shank Diam. d	Length Of Cut l_1	O.A.L. L	Corner Radius	Uncoated 2 Flute Part#	Uncoated 3 Flute Part#	Uncoated Price	ZrN Coated 2 Flute Part#	ZrN Coated 3 Flute Part#	ZrN Coated Price	DLC Coated 2 Flute Part#	DLC Coated 3 Flute Part#	DLC Coated Price
3/16	3/16	3/4	2-1/2	BN	5176-188-2	5176-188-3		5076-188-2	5076-188-3		5276-188-2	5276-188-3	
1/4	1/4	1-1/8	3	BN	5176-250-2	5176-250-3		5076-250-2	5076-250-3		5276-250-2	5276-250-3	
5/16	5/16	1-1/8	3	BN	5176-312-2	5176-312-3		5076-312-2	5076-312-3		5276-312-2	5276-312-3	
3/8	3/8	1-1/8	3	BN	5176-375-2	5176-375-3		5076-375-2	5076-375-3		5276-375-2	5276-375-3	
1/2	1/2	2	4	BN	5176-500-2	5176-500-3		5076-500-2	5076-500-3		5276-500-2	5276-500-3	
5/8	5/8	2-1/4	5	BN	5176-625-2	5176-625-3		5076-625-2	5076-625-3		5276-625-2	5276-625-3	
3/4	3/4	2-1/4	5	BN	5176-750-2	5176-750-3		5076-750-2	5076-750-3		5276-750-2	5276-750-3	
1	1	2-1/4	5	BN	5176-100-2	5176-100-3		5076-100-2	5076-100-3		5276-100-2	5276-100-3	



ULTRA HIGH PERFORMANCE Variable Pitch & Helix Carbide, Ball Extra Long Length, Single End - ALUMINUM

Cutter Diam. D	Shank Diam. d	Length Of Cut l_1	O.A.L. L	Corner Radius	Uncoated 2 Flute Part#	Uncoated 3 Flute Part#	Uncoated Price	ZrN Coated 2 Flute Part#	ZrN Coated 3 Flute Part#	ZrN Coated Price	DLC Coated 2 Flute Part#	DLC Coated 3 Flute Part#	DLC Coated Price
3/16	3/16	1-1/8	3	BN	5179-188-2	5179-188-3		5079-188-2	5079-188-3		5279-188-2	5279-188-3	
1/4	1/4	1-1/2	4	BN	5179-250-2	5179-250-3		5079-250-2	5079-250-3		5279-250-2	5279-250-3	
5/16	5/16	1-5/8	4	BN	5179-312-2	5179-312-3		5079-312-2	5079-312-3		5279-312-2	5279-312-3	
3/8	3/8	1-3/4	4	BN	5179-375-2	5179-375-3		5079-375-2	5079-375-3		5279-375-2	5279-375-3	
1/2	1/2	3	6	BN	5179-500-2	5179-500-3		5079-500-2	5079-500-3		5279-500-2	5279-500-3	
5/8	5/8	3	6	BN	5179-625-2	5179-625-3		5079-625-2	5079-625-3		5279-625-2	5279-625-3	
3/4	3/4	3	6	BN	5179-750-2	5179-750-3		5079-750-2	5079-750-3		5279-750-2	5279-750-3	
1	1	3	6	BN	5179-100-2	5179-100-3		5079-100-2	5079-100-3		5279-100-2	5279-100-3	

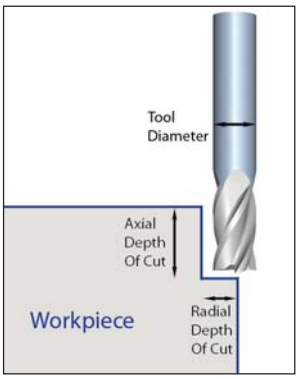
SPEED & FEED RECOMMENDATIONS

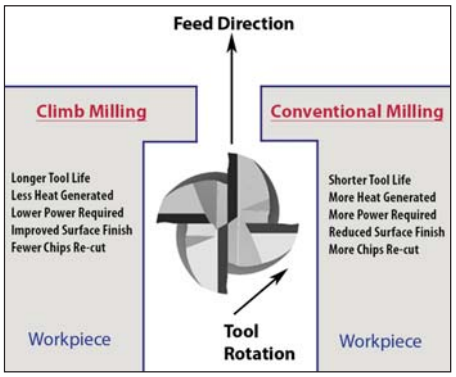
Material		Speed (SFM)		Feed Per Tooth By End Mill Diameter							
		Uncoated	TiALN Coated	1/4"	5/16"	3/8"	7/16"	1/2"	5/8"	3/4"	1"
Aluminum & Aluminum Alloys	N	600-1200	900-1800	.0020	.0025	.0030	.0035	.0040	.0050	.0060	.0080
Copper & Copper Alloys	N	350-850	525-1275	.0020	.0025	.0025	.0030	.0030	.0035	.0040	.0060
Brass & Bronze	N	250-400	375-600	.0020	.0025	.0025	.0030	.0030	.0035	.0040	.0050
Graphite	N	500-800	500-1200	.0030	.0035	.0025	.0030	.0030	.0040	.0050	.0070
Plastics	N	600-1100	600-1650	.0030	.0035	.0040	.0050	.0060	.0080	.0100	.0150
Iron, Cast (soft)	K	250-450	375-650	.0020	.0022	.0025	.0027	.0030	.0045	.0060	.0080
Iron, Cast (hard)	K	100-250	100-375	.0008	.0010	.0015	.0017	.0020	.0025	.0030	.0040
Iron, Ductile	K	80-400	100-600	.0010	.0012	.0015	.0017	.0020	.0030	.0040	.0060
Iron, Malleable	K	150-500	225-650	.0010	.0015	.0020	.0025	.0030	.0040	.0050	.0070
Carbon Steels, Low	P	200-400	300-600	.0010	.0015	.0020	.0025	.0030	.0040	.0050	.0070
Carbon Steels, Medium	P	100-250	150-375	.0015	.0016	.0017	.0018	.0020	.0030	.0040	.0050
Carbon Steels Hardened to 35 Rc	P	130-230	130-345	.0010	.0011	.0012	.0013	.0015	.0017	.0020	.0030
Carbon Steels Hardened to 50 Rc	P	70-130	70-160	.0007	.0007	.0008	.0009	.0010	.0015	.0020	.0030
Carbon Steels Hardened to 60 Rc	P	30-70	30-90	.0005	.0006	.0007	.0009	.0010	.0012	.0015	.0020
Steels, Mold	P	200-350	300-525	.0010	.0012	.0015	.0017	.0020	.0025	.0030	.0040
Steels, Tool	P	100-250	150-375	.0010	.0012	.0015	.0017	.0020	.0025	.0030	.0040
Stainless Steels, Soft	M	200-350	300-450	.0010	.0012	.0015	.0012	.0020	.0030	.0040	.0060
Stainless Steels, Hard	M	100-200	150-300	.0005	.0006	.0007	.0008	.0010	.0020	.0030	.0050
Monel & High Nickel Steel	S	75-175	75-200	.0010	.0012	.0015	.0017	.0020	.0025	.0030	.0040
Titanium, Soft	S	125-300	125-375	.0010	.0012	.0015	.0017	.0020	.0030	.0040	.0060
Titanium, Hard	S	50-150	50-175	.0005	.0006	.0007	.0008	.0010	.0015	.0020	.0020
Nickel Based High Temp Alloys	S	50-100	50-125	.0008	.0008	.0009	.0009	.0010	.0012	.0015	.0020

- Higher Feed Per Tooth should be used to start for radial depths of cut less than 25% of the tool diameter. Lower Feed Per Tooth should be used to start for radial depths of cut greater than 25% of the tool diameter.
- The above recommendations are for axial lengths of cut not to exceed 1 times the tool diameter for profiling and .5 times the diameter for full slotting.
- The above parameters are recommended starting points only. If the tool is working well, without vibrations or significant noise, increase the SFM and/or Feed Per Tooth in 5-10% increments.
- Optimum speeds & feeds will depend upon material, setup, machine conditions & tool deflection. Higher or lower parameters may be required to achieve optimum machining conditions.
- For Light Radial Depths of cut, make certain to increase the feed rate to compensate for Radial Chip Thinning Factor (RCTF). Consult a formula or app to calculate.
- Climb Milling is preferred to Conventional Milling

$$\text{RPM} = \frac{SFM}{(3.146 * \text{Cutter Diam.}) / 12}$$

$$\text{IPM} = RPM * \text{Feed Per Tooth} * \#\text{ of Teeth}$$





28"W X 28"D X 60"H-400lbs. Drawer Capacity
4 Different Drawer Heights (3",4",6",8")
Can custom build to order.

60" Cabinet

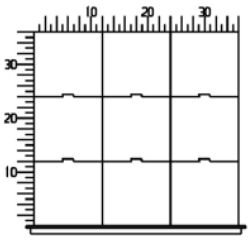
DRAWER HEIGHT / LAYOUT MODEL

3 - 24
3 - 20
3 - 11
3 - 20
4 - 21
4 - 16
4 - 66
4 - 99
6 - 129
6 - 129
6 - 129
8 - 1212

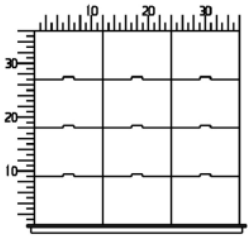
NP-C2828-54L-122-T
12 Drawers / Bin Boxes & Groove Trays
Dividers & Partitions

Drawer Options

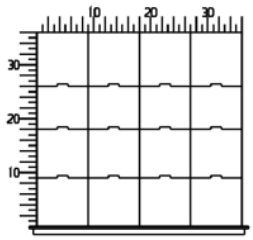
Drawer Interior Layouts: Dividers & Partitions



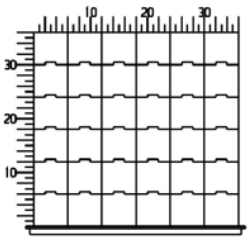
Layout 1212 / 9 Compartments of 8" x 8"



Layout 129 / 12 Compartments of 8" x 6"



Layout 99 / 16 Compartments of 6" x 6"

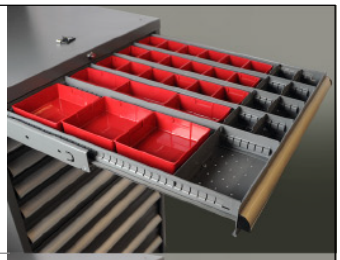


Layout 66 / 36 Compartments of 4"x4"

Sum of drawers must total 54"

Drawer Interior Layouts: Plastic Bin Boxes & Groove Trays

3-24
Layout 24 / 24 Bins of 6"x 6", 3"x 6" & 3"x 3"



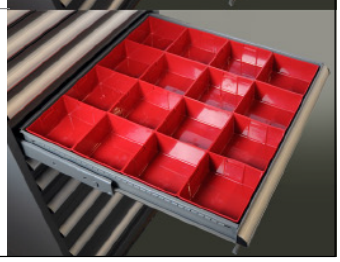
3-20
Layout 20 / 20 Bins of 6"x 6" & 3"x 3"

3-11
Layout 11 / 11 Groove Trays 4x 2.75"W, 3x 1.75"W & 4x 1.25"W

3-20
Layout 20 / 20 Bins of 6"x 6" & 3"x 3"

4-21
Layout 21 / 21 Bins of 6"x 6", 3"x 6" & 3"x 3"

4-16
Layout 16 / 16 Bins of 6"x 6"



NOTES

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TUFFY SOLUTIONS