QUALITY TECH TOOL

For Quality Performance Cutting Tools, Contact Quality Tech Tool!

Quality Tech Tool has been making quality performance cutting tools for years to many well known industries such as aircraft, automotive, medical and defense.

QTT has the equipment, the knowledge and expertise to provide you with equal or better industrial carbide tooling as our competitors. Every tool designed at QTT uses the combined skills of our technicians and cutting edge equipment to create superior high performance cutting tools.

We are well versed in the exacting requirements that are placed on providing a full line of carbide tooling.

When your company needs the finest high performance cutting tools, contact Quality Tech Tool!

Premium Class Drills

TOOL SPECIFICATIONS									MATERIAL GROUP												
									Non Ferrous		Iron	Steel							Specialty Alloy		Non Metal
Series	Page	Shank Style	Helix	Point Angle	Length	Coolant Fed	Coating	Speeds & Feeds Page	Aluminum	Copper	Cast Iron	Low and Medium Carbon Steel	High Carbon Steel	Alloys Steel	Die Steel	Austenitic Stainless Steel	Precipitation Hardened	Hardened Steel	High Nickel Alloy	Titanium Alloy	Glass, Plastics, Composite Materials
PC243	9	Common	26°-30°	140°	3 x D	None	TiAlN	81-82	x		x	x	x	x	x	x	x	x	x	x	
PC245	10	Common	26°-30°	140°	5 x D	None	TiAlN	83-84	x		x	x	x	x	x	x	x	x	x	x	
PC253	11	Common	26°-30°	140°	3 x D	Thru	TiAlN	85-86	x		x	x	x	x	x	x	x	x	x	x	
PC255	12	Common	26°-30°	140°	5 x D	Thru	TiAlN	87-88	x		x	x	x	x	x	x	x	x	x	x	
PC258	13	Common	26°-30°	140°	8 x D	Thru	TiAlN	89-90	x		x	x	x	x	x	x	x	x	x	x	

General Purpose Drills, NC Spotting Drills, Center Drills and Reamers

TOOL SPECIFICATIONS							MATERIAL GROUP												
							Non Ferrous		Iron	Steel							Specialty Alloy		Non Metal
Series	Page	Tool Type	Helix	Point Angle	Length	Speeds & Feeds Page	Aluminum	Copper	Cast Iron	Low and Medium Carbon Steel	High Carbon Steel	Alloys Steel	Die Steel	Austenitic Stainless Steel	Precipitation Hardened	Hardened Steel	High Nickel Alloy	Titanium Alloy	Glass, Plastics, Composite Materials
MD135	33	Miniature Drill	35°	130°	Standard	123-128	x	x	x	x	x	x	x	x	x	x	x	x	x
MD136	34	Extended MD	35°	130°	Standard	123-128	x	x	x	x	x	x	x	x	x	x	x	x	x
MD137	34	Miniature Drill	35°	130°	Standard	123-128	x	x	x	x	x	x	x	x	x	x	x	x	x
DR200	35-36	Str. Fl	0°	140°	Screw Machine	129-130	x	x	x	x	x	x	x	x	x	x	x	x	
DR215	37-38	Slow Sp	15°	135°	Screw Machine	131-132	x	x	x	x	x	x	x	x	x	x	x	x	
DR220	39-40	Jobbers	20°	118°	Jobber	133	x	x	x	x	x	x						x	x
SD221-90	41	NC Spot	20°	90°	Short	134	x	x	x	x	x	x	x	x	x	x	x	x	x
SD221-120	41	NC Spot	20°	120°	Short	134	x	x	x	x	x	x	x	x	x	x	x	x	x
DR235	42	Center Drill	0°	118°	Short	134	x	x	x	x	x	x	x	x	x	x	x	x	x
RM300	43-44	Reamer	0°	Chamfer	Standard	135	x	x	x	x	x	x	x	x	x	x	x	x	
CS700	45	Countersink	0°	60°,82°,90°	Standard	136-137	x	x	x	x	x	x	x				x	x	x
CS701	45	Countersink	0°	60°,82°,90°	Standard	136-137								x	x	x			
CS706	46	Countersink	30°	60°,82°,90°	Standard	136-137	x	x	x	x	x	x	x				x	x	x

Premium Class End Mills

TOOL SPECIFICATIONS									MATERIAL GROUP												
									Non Ferrous		Iron	Steel							Specialty Alloy		Non Metal
Series	Page	Flutes	Helix	End Style	Length	Neck Reach	Coating	Speeds & Feeds Page	Aluminum	Copper	Cast Iron	Low and Medium Carbon Steel	High Carbon Steel	Alloys Steel	Die Steel	Austenitic Stainless Steel	Precipitation Hardened	Hardened Steel	High Nickel Alloy	Titanium Alloy	Glass, Plastics, Composite Materials
PC400	15	4	30°	Square	Std	-	AlCrN	91-93	x		x	x		x	x	x	x	x			
PC401	15	4-6	45°	Square	Std	-	AlCrN	91-93	x		x	x		x	x	x	x	x			
PC410	16	2	30°	Square	Short	Neck	TiAlN	94		x		x		x	x	x	x	x			
PC411	16	4	30°	Square	Short	Lg. Neck	TiAlN	94				x		x	x	x	x	x			
PC413	17	2	30°	Ball	Short	Neck	TiAlN	95			x	x	x	x	x			x			
PC416	17	2	30°	Ball	Std	-	TiAlN	96-97			x	x	x	x					x	x	
PC418	18	2	30°	Ball	Short	Taper	TiAlN	98			x	x	x	x	x			x			
PC419	18	2	30°	Ball	Short	Neck	TiAlN	95, 97			x	x	x	x	x			x			
PC420	19	2	30°	Square	Std	-	Diamond	99	x	x											x
PC420BN	19	2	30°	Ball	Std	-	Diamond	99	x	x											x
PC421	20	2	35°	Square	Std	-	TiAlN	100-101			x	x	x	x		x	x	x	x	x	
PC421BN	20	2	35°	Ball	Std	-	TiAlN	102-103			x	x	x	x		x	x	x	x	x	
PC424	19	4	30°	Square	Std	-	Diamond	99	x	x											x
PC424BN	19	4	30°	Ball	Std	-	Diamond	99	x	x											x
PC432	21	2	30°	Radius	Std	-	TiAlN	104-105			x	x	x	x	x			x			
PC433	22	2	30°	Radius	Std	Neck	TiAlN	104-105			x	x	x	x	x			x			
PC434	21	4	30°	Radius	Std	-	TiAlN	105-106			x	x	x	x	x			x			
PC435	23	4	30°	Radius	Std	Neck	TiAlN	105-106			x	x	x	x	x			x			
PC440	24	2	40°	Square	Std	Neck	TiCN	107	x	x											
PC441	25	4	35°	Square	Std	-	TiAlN	101, 108			x	x	x	x		x	x	x	x	x	
PC441BN	25	4	35°	Ball	Std	-	TiAlN	102-103			x	x	x	x		x	x	x	x	x	
PC450	26	4-8	50°	Square	Std	-	AlCrN	109			x	x	x	x	x	x	x	x	x	x	
PC451	26	4	50°	Square	Long	-	AlCrN	110			x	x	x	x	x	x	x	x			
PC453	27	4	50°	Square	Std	Neck	AlCrN	110			x	x	x	x	x	x	x	x			
PC455	27	5	45°	Square	Std	-	AlCrN	111			x	x	x	x	x	x	x	x	x	x	
PC456	28	4	50°	Square	Std	Neck	AlCrN	110			x	x	x	x	x	x	x	x			
PC460	28	3	60°	Square	Std	-	TiAlN	112			x	x	x	x		x	x	x	x		
PC470	29	2	30°	Square	Std	-	ZrN	113-115	x	x											
PC471	29	2	30°	Square	Long	-	ZrN	113-115	x	x											
PC475	30	3	45°	Square	Std	-	ZrN	116-118	x	x											
PC476	30	3	45°	Square	Long	-	ZrN	116-118	x	x											
PC497	31	2	15°	Ball	Short	-	TiAlN	119			x	x	x	x	x	x	x	x	x	x	
VH439	31	4	Variable	Square	Std	-	AlCrN	120-122			x	x	x	x	x	x	x	x	x	x	
VHR439	31	4	Variable	Radius	Std	-	AlCrN	120-122			x	x	x	x	x	x	x	x	x	x	

Burs **Series BR801 - BR920** Pages 64-75
Double Cut, Medium Right Hand Spiral, Aluminum Cut

Aircraft Pages 77-79
Countersinks, Reamers, Routers and Drills

General Purpose End Mills

TOOL SPECIFICATIONS									MATERIAL GROUP												
									Non Ferrous		Iron	Steel							Specialty Alloy		Non Metal
Series	Page	Flutes	Helix	End Style	Length	Neck Reach	Coating	Speeds & Feeds Page	Aluminum	Copper	Cast Iron	Low and Medium Carbon Steel	High Carbon Steel	Alloys Steel	Die Steel	Austenitic Stainless Steel	Precipitation Hardened	Hardened Steel	High Nickel Alloy	Titanium Alloy	Glass, Plastics, Composite Materials
EM400	48	4	30°	Square	Std	-	-	138-140	x	x	x	x	x	x	x	x	x	x	x		
EM401	48	4-6	45°	Square	Std	-	-	138-140	x	x	x	x	x	x	x	x	x	x	x		
EM402	49	2	30°	Square	Std	-	-	141-142	x	x	x	x	x	x	x	x	x	x			
EM402BN	50	2	30°	Ball	Std	-	-	143	x	x	x	x	x	x	x	x	x	x			
EM403	49	3	30°	Square	Std	-	-	141-142	x	x	x	x	x	x	x	x	x	x			
EM403BN	50	3	30°	Ball	Std	-	-	143	x	x	x	x	x	x	x	x	x	x			
EM404	49	4	30°	Square	Std	-	-	144-145	x	x	x	x	x	x	x	x	x	x			
EM404BN	50	4	30°	Ball	Std	-	-	146	x	x	x	x	x	x	x	x	x	x			
EM432	51	2	30°	Radius	Std	-	-	104-105			x	x	x	x	x			x			
EM434	52	4	30°	Radius	Std	-	-	105-106			x	x	x	x	x			x			
EM440	53	2	40°	Square	Std	-	-	147	x	x											
EM445	53	4	45°	Square	Std	-	-	147-148	x	x	x	x	x	x	x	x	x	x			
EM447	54	4	30°	Square	Std	-	-	144	x	x	x	x	x	x	x	x	x	x			
EM455	54	5	45°	Square	Std	-	-	111	x	x	x	x	x	x	x	x	x	x			
EM460	55	3	60°	Square	Std	-	-	149								x	x	x		x	
EM461	55	6	30°	Square	Std	-	-	144-145					x	x		x	x	x	x		
EM462	56	2	30°	Square	Long	-	-	141-142	x	x	x	x	x	x	x	x	x	x			
EM462BN	56	2	30°	Ball	Long	-	-	143	x	x	x	x	x	x	x	x	x	x			
EM464	56	4	30°	Square	Long	-	-	144-145	x	x	x	x	x	x	x	x	x	x			
EM464BN	56	4	30°	Ball	Long	-	-	146	x	x	x	x	x	x	x	x	x	x			
EM470	57	2	30°	Square	Std	-	-	113-115	x	x											
EM471	57	2	30°	Square	Std	-	-	113-115	x	x											
EM475	58	3	45°	Square	Std	-	-	116-118	x	x											
EM476	58	3	45°	Square	Std	-	-	116-118	x	x											
EM482	59	2	30°	Square	X-Long	-	-	141-142	x	x	x	x	x	x	x	x	x	x			
EM482BN	59	2	30°	Ball	X-Long	-	-	143	x	x	x	x	x	x	x	x	x	x			
EM484	59	4	30°	Square	X-Long	-	-	144-145	x	x	x	x	x	x	x	x	x	x			
EM484BN	59	4	30°	Ball	X-Long	-	-	146	x	x	x	x	x	x	x	x	x	x			
EM497	60	2	15°	Ball	Short	-	-	148	x	x	x	x	x	x	x	x	x	x			
RD500	61	2	Straight	Plunge Cut	Std	-	-	150	x	x											
RD501	61	2	30°	Plunge Cut	Std	-	-	150	x	x											
RD502	61	3	Straight	Plunge Cut	Std	-	-	150	x	x											
RD503	61	3	30°	Plunge Cut	Std	-	-	150	x	x											
FR640	62	Multi	30°	Various	Std	-	-	151													x

AlCrN, TiAlN, TiCN

Alcrona AlCrN (Aluminium Chromium Nitride)

Alcrona (AlCrN),produced in the INNOVA, is a Titanium free coating for broad application in machining and forming operations. Alcrona has remarkable wear resistance at lower speeds and feeds and under high mechanical loads. At higher speeds, where hot hardness and oxidation resistance are important, Alcrona excels, compared to Titanium based coatings, with an operating temperature up to 1,012°F. Alcrona is applicable to HSS and carbide tooling and for forming and forging operations, as well as cutting operations.

Alcrona has shown great results in machining a wide variety of hardened steels up to 70 HRC both with and without coolant as well as low alloy steels and high tensile steels.

Applications and Benefits
- Low alloy steels and high tensile steels
- Hardened steels up to 70 HRC
- Forming/punching/blanking and hot forging

Improved Performance with
- High speed machining
- Dry or MQL machining
- Higher productivity

- Color Blue - Grey
- Coating Thickness 4 µm
- Microhardness 3200 HV
- Coeff of Friction vs Steel 0.35
- Thermal Stability up to 1,100°C

Futura Nano TiAlN (Titanium Aluminium Nitride)

Futura Nano (TiAlN), produced in the INNOVA, is a great all round coating for both HSS and carbide tools, especially in applications where there is a high thermal load. TiAlN has a nanolayered structure which was engineered to give an optimum balance between hardness and internal stress. High internal compressive stresses help to reduce the propagation of cracks through a coating therefore delaying the onset of failure. TiAlN also has improved sliding properties.

Applications and Benefits
- Abrasive materials - cast iron and heat treated steel
- Difficult to machine materials, such as stainless steel
- Higher speeds and feeds
- Reduces or eliminates use of coolants

Improved Performance with
- Higher speed and feed machining
- Dry or MQL machining
- Machining of harder materials

- Color Violet - Grey
- Coating Thickness 4 µm
- Microhardness 3300HV
- Thermal Stability up to 900ºC
- Coefficient of Friction vs Steel 0.3 - 0.35

TiCN (Titanium Carbonitride)

TiCN has a fine grain dense structure that provides excellent toughness and high hardness. TiCN is harder and tougher than TiN, consequently it exhibits a high resistance to edge chipping.

This coating is a good choice for milling, forming and punching tools that encounter high mechanical stresses. TiCN is also recommended for applications cutting highly abrasive and/or gummy materials such as cast iron, brass and some cast aluminium alloys. LVEB TiCN is extremely smooth.

Applications and Benefits
- High performance applications
- Difficult to machine materials
- Abrasive materials - cast iron and aluminium alloys
- Adhesive materials - copper and copper based alloys
- Higher speeds and feeds possible for enhanced machine productivity compared to TiN
- Wear resistance and toughness superior to TiN

Improved performance with
- Higher speed conventional milling
- Gear cutting tools
- Heavy duty stamping
- Plastic moulds and extrusion tools for plastics containing >30% glass fillers (abrasion resistance)
- Deep drawing tools

- Color Blue - Grey
- Coating Thickness 2 - 4 µm
- Microhardness 3000 HV
- Coefficient of Friction vs Steel 0.4
- Thermal Stability up to 400ºC

AlTiN, TiN, ZrN

TiN (Titanium Nitride)
TiN was the first PVD wear resistant film coating introduced at Surface Technology Coatings, using the world's leading low voltage electron beam technology by Balzers of Switzerland. TiN is the standard general purpose coating for protecting a wide variety of tools and parts from wear. TiN is a good choice for the machining of iron based materials, die casting and plastic mould tooling.

TiN is also a good coating for wear part applications demanding resistance to abrasive and adhesive wear. TiN is also an attractive gold colour. LVEB TiN is extremely smooth.

Applications and Benefits
- General purpose use
- 3 to 8 times longer tool life
- Wide range of materials
- Higher tool speeds and feeds than uncoated tools

Improved performance with
- Wide range of cutting tools in both HSS and Carbide
- Plastic moulds and moulding machine parts
- Slitting knives for the plastic and paper industries
- Wear parts
- Medical and dental instruments
- Forming tools

- Color Gold - Yellow
- Coating Thickness 1- 3 µm
- Microhardness 2300 HV
- Coefficient of Friction vs Steel 0.4
- Thermal Stability up to 600ºC

AlTiN (Aluminum Titanium Nitride)

AlTiN has very similar features to TiAlN. It is ideal for high temperature cutting operations in the same materials as TiAlN and has the same oxidation effect. AlTiN has a higher aluminum content which makes it much harder and smoother than TiAlN. It is ideal for smaller depths of cut and excels in high speed and dry machining applications and when machining hardened steel.

Applications and Benefits
- Used for nickel based alloys, stainless steel, hardened steels, and titanium.
- Extremely heat resistant

- Maximum Working Temperature = 800° C/1470° F
- Coating Thickness (microns) = 1-2
- Coefficient of Friction Against Steel (Dry) = 0.4
- Microhardness (HV 0.05) = 3500

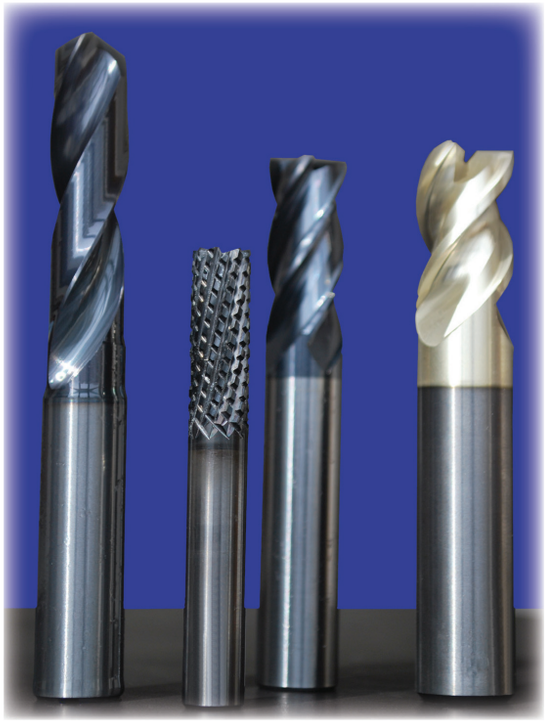
ZrN

Zirconium Nitride (ZrN): The next generation of coating developed specifically for machining aluminum yet excellent when machining all non-ferrous materials. ZrN is also, highly recommended for machining fiberglass, nylon and most polymer materials.

Applications and Benefits
- Used for aluminum alloys, cast iron, high temperature alloys, stainless steels, and non-ferrous metals
- Very effective in glass filled plastics and wood

Improved performance with
- Maximum Working Temperature = 600° C/1110° F
- Coating Thickness (microns) = 1-2
- Coefficient of Friction Against Steel (Dry) = 0.55
- Microhardness (HV 0.05) = 3000

MADE TO ORDER TOOLS

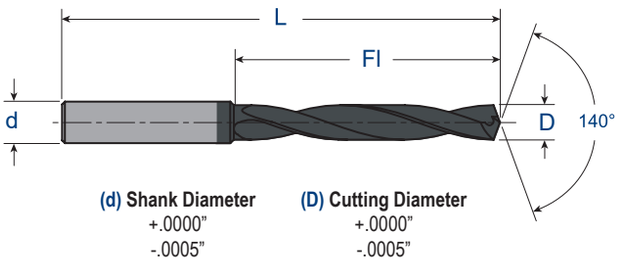


PREMIUM CLASS DRILLS

PC243 WITH TiAlN COATING

2 Flute - 3 x D Drilling Capability - 30° Helix

CARBIDE | SHRINK to FIT | SPEEDS & FEEDS | TiAlN



PC243 2 flute	D cutting dia.	Fl flute length	d shank dia.	L overall length
PC243-1250	1/8	3/4	1/4	2-1/2
PC243-1406	9/64	3/4	1/4	2-1/2
PC243-1562	5/32	1	1/4	2-1/2
PC243-1719	11/64	1	1/4	2-1/2
PC243-1875	3/16	1	1/4	2-1/2
PC243-2188	7/32	1	1/4	2-1/2
PC243-2344	15/64	1	1/4	2-1/2
PC243-2500	1/4	1-1/8	1/4	2-1/2
PC243-2656	17/64	1-5/8	5/16	3
PC243-2812	9/32	1-5/8	5/16	3
PC243-2969	19/64	1-5/8	5/16	3
PC243-3125	5/16	1-5/8	5/16	3
PC243-3281	21/64	1-7/8	3/8	3-1/2
PC243-3438	11/32	1-7/8	3/8	3-1/2
PC243-3594	23/64	1-7/8	3/8	3-1/2

PC243 2 flute	D cutting dia.	Fl flute length	d shank dia.	L overall length
PC243-3750	3/8	1-7/8	3/8	3-1/2
PC243-3906	25/64	2-3/16	1/2	4
PC243-4062	13/32	2-3/16	1/2	4
PC243-4219	27/64	2-3/16	1/2	4
PC243-4375	7/16	2-3/16	1/2	4
PC243-4531	29/64	2-3/16	1/2	4
PC243-4688	15/32	2-3/16	1/2	4
PC243-4844	31/64	2-5/16	1/2	4
PC243-5000	1/2	2-5/16	1/2	4
PC243-5156	33/64	2-1/2	5/8	4-1/2
PC243-5312	17/32	2-1/2	5/8	4-1/2
PC243-5469	35/64	2-1/2	5/8	4-1/2
PC243-5625	9/16	2-1/2	5/8	4-1/2
PC243-5781	37/64	2-1/2	5/8	4-1/2
PC243-5938	19/32	2-1/2	5/8	4-1/2
PC243-6094	39/64	2-1/2	5/8	4-1/2
PC243-6250	5/8	2-1/2	5/8	4-1/2
PC243-6406	41/64	3	3/4	5
PC243-6562	21/32	3	3/4	5
PC243-6719	43/64	3	3/4	5
PC243-6875	11/16	3	3/4	5
PC243-7031	45/64	3	3/4	5
PC243-7188	23/32	3	3/4	5
PC243-7344	47/64	3	3/4	5
PC243-7500	3/4	3	3/4	5

Special sizes and flats available upon request.

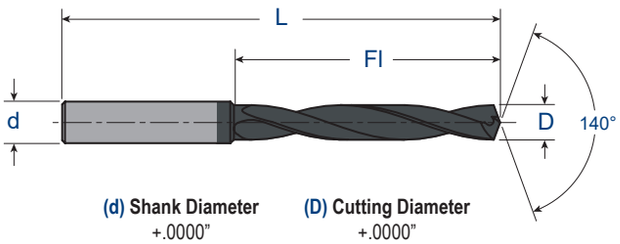
For speeds and feeds, refer to pages 81-82.

QUALITY TECH TOOL

PC245 WITH TiAlN COATING

2 Flute - 5 x D Drilling Capability - 30° Helix

CARBIDE | SHRINK to FIT | SPEEDS & FEEDS | TIAIN



(d) Shank Diameter
+.0000"
-.0005"

(D) Cutting Diameter
+.0000"
-.0005"

PC245 2 flute	D cutting dia.	Fl flute length	d shank dia.	L overall length
PC245-1250	1/8	1-1/8	1/4	2-1/2
PC245-1406	9/64	1-1/8	1/4	2-1/2
PC245-1562	5/32	1-1/8	1/4	2-1/2
PC245-1719	11/64	1-1/8	1/4	2-1/2
PC245-1875	3/16	1-1/4	1/4	2-1/2
PC245-2188	7/32	1-1/4	1/4	2-1/2
PC245-2344	15/64	1-1/4	1/4	2-1/2
PC245-2500	1/4	1-1/4	1/4	2-1/2
PC245-2656	17/64	1-3/4	5/16	3-1/4
PC245-2812	9/32	1-3/4	5/16	3-1/4
PC245-2969	19/64	1-3/4	5/16	3-1/4
PC245-3125	5/16	1-3/4	5/16	3-1/4
PC245-3281	21/64	2	3/8	3-1/2
PC245-3438	11/32	2	3/8	3-1/2
PC245-3594	23/64	2	3/8	3-1/2

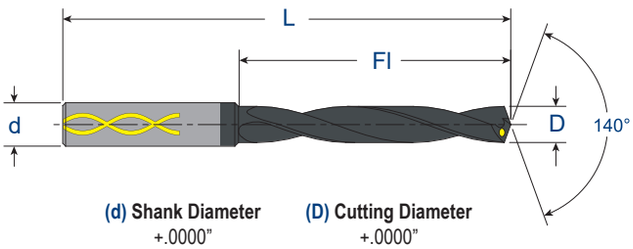
PC245 2 flute	D cutting dia.	Fl flute length	d shank dia.	L overall length
PC245-3750	3/8	2	3/8	3-1/2
PC245-3906	25/64	3	1/2	5
PC245-4062	13/32	3	1/2	5
PC245-4219	27/64	3	1/2	5
PC245-4375	7/16	3	1/2	5
PC245-4531	29/64	3	1/2	5
PC245-4688	15/32	3	1/2	5
PC245-4844	31/64	3	1/2	5
PC245-5000	1/2	3	1/2	5
PC245-5156	33/64	3-5/8	5/8	5-1/4
PC245-5312	17/32	3-5/8	5/8	5-1/4
PC245-5469	35/64	3-5/8	5/8	5-1/4
PC245-5625	9/16	3-5/8	5/8	5-1/4
PC245-5781	37/64	3-5/8	5/8	5-1/4
PC245-5938	19/32	3-5/8	5/8	5-1/4
PC245-6094	39/64	3-5/8	5/8	5-1/4
PC245-6250	5/8	3-5/8	5/8	5-1/4
PC245-6406	41/64	4	3/4	6
PC245-6562	21/32	4	3/4	6
PC245-6719	43/64	4	3/4	6
PC245-6875	11/16	4	3/4	6
PC245-7031	45/64	4	3/4	6
PC245-7188	23/32	4	3/4	6
PC245-7344	47/64	4	3/4	6
PC245-7500	3/4	4	3/4	6

Special sizes and flats available upon request.

For speeds and feeds, refer to pages 83-84.

PC253 WITH TiAlN COATING

2 Flute - 3 x D Drilling Capability - 25°-30° Helix - Coolant Fed



(d) Shank Diameter
+.0000"
-.0005"

(D) Cutting Diameter
+.0000"
-.0005"

PC253 2 flute	D cutting dia.	Fl flute length	d shank dia.	L overall length
PC253-1250	1/8	3/4	1/4	2-1/2
PC253-1406	9/64	3/4	1/4	2-1/2
PC253-1562	5/32	1	1/4	2-1/2
PC253-1719	11/64	1	1/4	2-1/2
PC253-1875	3/16	1	1/4	2-1/2
PC253-2188	7/32	1	1/4	2-1/2
PC253-2344	15/64	1	1/4	2-1/2
PC253-2500	1/4	1-1/8	1/4	2-1/2
PC253-2656	17/64	1-5/8	5/16	3
PC253-2812	9/32	1-5/8	5/16	3
PC253-2969	19/64	1-5/8	5/16	3
PC253-3125	5/16	1-5/8	5/16	3
PC253-3281	21/64	1-7/8	3/8	3-1/2
PC253-3438	11/32	1-7/8	3/8	3-1/2
PC253-3594	23/64	1-7/8	3/8	3-1/2

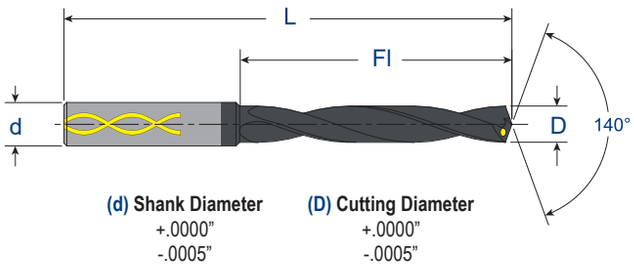
PC253 2 flute	D cutting dia.	Fl flute length	d shank dia.	L overall length
PC253-3750	3/8	1-7/8	3/8	3-1/2
PC253-3906	25/64	2-3/16	1/2	4
PC253-4062	13/32	2-3/16	1/2	4
PC253-4219	27/64	2-3/16	1/2	4
PC253-4375	7/16	2-3/16	1/2	4
PC253-4531	29/64	2-3/16	1/2	4
PC253-4688	15/32	2-3/16	1/2	4
PC253-4844	31/64	2-5/16	1/2	4
PC253-5000	1/2	2-5/16	1/2	4
PC253-5156	33/64	2-1/2	5/8	4-1/2
PC253-5312	17/32	2-1/2	5/8	4-1/2
PC253-5469	35/64	2-1/2	5/8	4-1/2
PC253-5625	9/16	2-1/2	5/8	4-1/2
PC253-5781	37/64	2-1/2	5/8	4-1/2
PC253-5938	19/32	2-1/2	5/8	4-1/2
PC253-6094	39/64	2-1/2	5/8	4-1/2
PC253-6250	5/8	2-1/2	5/8	4-1/2
PC253-6406	41/64	3	3/4	5
PC253-6562	21/32	3	3/4	5
PC253-6719	43/64	3	3/4	5
PC253-6875	11/16	3	3/4	5
PC253-7031	45/64	3	3/4	5
PC253-7188	23/32	3	3/4	5
PC253-7344	47/64	3	3/4	5
PC253-7500	3/4	3	3/4	5

Special sizes and flats available upon request.

For speeds and feeds, refer to pages 85-86.

PC255 WITH TiAlN COATING

2 Flute - 5 x D Drilling Capability - 25°-30° Helix - Coolant Fed



PC255 2 flute	D cutting dia.	Fl flute length	d shank dia.	L overall length
PC255-1250	1/8	1-1/8	1/4	2-1/2
PC255-1406	9/64	1-1/8	1/4	2-1/2
PC255-1562	5/32	1-1/8	1/4	2-1/2
PC255-1719	11/64	1-1/8	1/4	2-1/2
PC255-1875	3/16	1-1/4	1/4	2-1/2
PC255-2188	7/32	1-1/4	1/4	2-1/2
PC255-2344	15/64	1-1/4	1/4	2-1/2
PC255-2500	1/4	1-1/4	1/4	2-1/2
PC255-2656	17/64	1-3/4	5/16	3-1/4
PC255-2812	9/32	1-3/4	5/16	3-1/4
PC255-2969	19/64	1-3/4	5/16	3-1/4
PC255-3125	5/16	1-3/4	5/16	3-1/4
PC255-3281	21/64	2	3/8	3-1/2
PC255-3438	11/32	2	3/8	3-1/2
PC255-3594	23/64	2	3/8	3-1/2

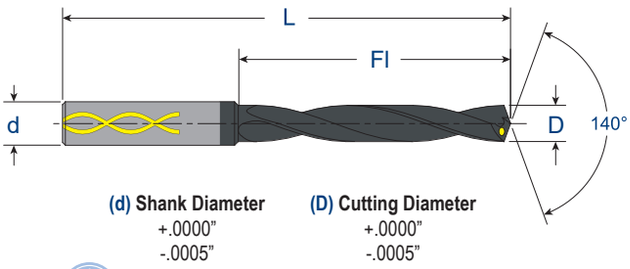
PC255 2 flute	D cutting dia.	Fl flute length	d shank dia.	L overall length
PC255-3750	3/8	2	3/8	3-1/2
PC255-3906	25/64	3	1/2	5
PC255-4062	13/32	3	1/2	5
PC255-4219	27/64	3	1/2	5
PC255-4375	7/16	3	1/2	5
PC255-4531	29/64	3	1/2	5
PC255-4688	15/32	3	1/2	5
PC255-4844	31/64	3	1/2	5
PC255-5000	1/2	3	1/2	5
PC255-5156	33/64	3-5/8	5/8	5-1/4
PC255-5312	17/32	3-5/8	5/8	5-1/4
PC255-5469	35/64	3-5/8	5/8	5-1/4
PC255-5625	9/16	3-5/8	5/8	5-1/4
PC255-5781	37/64	3-5/8	5/8	5-1/4
PC255-5938	19/32	3-5/8	5/8	5-1/4
PC255-6094	39/64	3-5/8	5/8	5-1/4
PC255-6250	5/8	3-5/8	5/8	5-1/4
PC255-6406	41/64	4	3/4	6
PC255-6562	21/32	4	3/4	6
PC255-6719	43/64	4	3/4	6
PC255-6875	11/16	4	3/4	6
PC255-7031	45/64	4	3/4	6
PC255-7188	23/32	4	3/4	6
PC255-7344	47/64	4	3/4	6
PC255-7500	3/4	4	3/4	6

Special sizes and flats available upon request.

For speeds and feeds, refer to pages 87-88.

PC258 WITH TiAlN COATING

2 Flute - 8 x D Drilling Capability - 25°-30° Helix - Coolant Fed



PC258 2 flute	D cutting dia.	Fl flute length	d shank dia.	L overall length
PC258-1250	1/8	1	1/4	2-1/2
PC258-1406	9/64	1-1/8	1/4	3
PC258-1562	5/32	1-1/4	1/4	3
PC258-1719	11/64	1-1/4	1/4	3
PC258-1875	3/16	1-1/2	1/4	3
PC258-2188	7/32	1-1/2	1/4	3
PC258-2344	15/64	1-1/2	1/4	3
PC258-2500	1/4	1-1/2	1/4	3
PC258-2656	17/64	3	5/16	4-1/2
PC258-2812	9/32	3	5/16	4-1/2
PC258-2969	19/64	3	5/16	4-1/2
PC258-3125	5/16	3	5/16	4-1/2
PC258-3281	21/64	3-1/2	3/8	5
PC258-3438	11/32	3-1/2	3/8	5
PC258-3594	23/64	3-1/2	3/8	5

PC258 2 flute	D cutting dia.	Fl flute length	d shank dia.	L overall length
PC258-3750	3/8	3-1/2	3/8	5
PC258-3906	25/64	3-3/4	1/2	5-1/2
PC258-4062	13/32	3-3/4	1/2	5-1/2
PC258-4219	27/64	3-3/4	1/2	5-1/2
PC258-4375	7/16	3-3/4	1/2	5-1/2
PC258-4531	29/64	4-1/2	1/2	6-7/16
PC258-4688	15/32	4-1/2	1/2	6-7/16
PC258-4844	31/64	4-1/2	1/2	6-7/16
PC258-5000	1/2	4-1/2	1/2	6-7/16
PC258-5156	33/64	5-1/4	5/8	7-3/16
PC258-5312	17/32	5-1/4	5/8	7-3/16
PC258-5469	35/64	5-1/4	5/8	7-3/16
PC258-5625	9/16	5-1/4	5/8	7-3/16
PC258-5781	37/64	6	5/8	8
PC258-5938	19/32	6	5/8	8
PC258-6094	39/64	6	5/8	8
PC258-6250	5/8	6	5/8	8
PC258-6406	41/64	6-3/4	3/4	9-3/16
PC258-6562	21/32	6-3/4	3/4	9-3/16
PC258-6719	43/64	6-3/4	3/4	9-3/16
PC258-6875	11/16	6-3/4	3/4	9-3/16
PC258-7031	45/64	6-3/4	3/4	9-3/16
PC258-7188	23/32	7-1/2	3/4	9-5/8
PC258-7344	47/64	7-1/2	3/4	9-5/8
PC258-7500	3/4	7-1/2	3/4	9-5/8

Special sizes and flats available upon request.

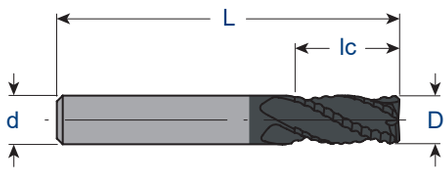
For speeds and feeds, refer to pages 89-90.

PREMIUM CLASS END MILLS

PC400 WITH AlCrN COATING

4 Flute - Rough Style - 30° Helix

CARBIDE | 30° | ROUGH | SPEEDS &FEEDS | AlCrN



(d) Shank Diameter
+.0000"
-.0003"

(D) Cutting Diameter
+.0000"
-.0015"

PC400 4 flute	D mill dia.	lc length of cut	d shank dia.	L overall length
PC400-2500	1/4	3/4	1/4	2-1/2
PC400-3125	5/16	3/4	5/16	2-1/2
PC400-3750	3/8	1	3/8	2-1/2
PC400-5000	1/2	1-1/4	1/2	3
PC400-6250	5/8	1-5/8	5/8	3-1/2
PC400-7500	3/4	1-5/8	3/4	4
PC400-1000	1	1-3/4	1	4

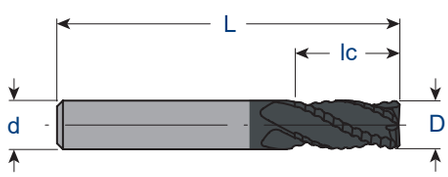
Special sizes and flats available upon request.

For speeds and feeds, refer to pages 91-93.

PC401 WITH AlCrN COATING

4-6 Flute - Rough Style - 45° Helix

CARBIDE | 45° | ROUGH | SPEEDS &FEEDS | AlCrN



(d) Shank Diameter
+.0000"
-.0003"

(D) Cutting Diameter
+.0000"
-.0015"

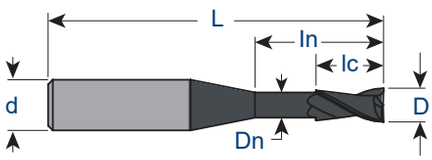
PC401 4-6 flute	D mill dia.	lc length of cut	d shank dia.	L overall length	f no. of flutes
PC401-2500	1/4	3/4	1/4	2-1/2	4
PC401-3125	5/16	3/4	5/16	2-1/2	4
PC401-3750	3/8	1	3/8	2-1/2	4
PC401-5000	1/2	1-1/4	1/2	3	4
PC401-6250	5/8	1-5/8	5/8	3-1/2	5
PC401-7500	3/4	1-5/8	3/4	4	6
PC401-1000	1	1-3/4	1	4	6

Special sizes and flats available upon request.

For speeds and feeds, refer to pages 91-93.

PC410 WITH TiAlN COATING

2 Flute - Square End - Necked Design - Standard Length



(d) Shank Diameter
+.0000"
-.0003"

(D) Cutting Diameter
+.0000"
-.0015"

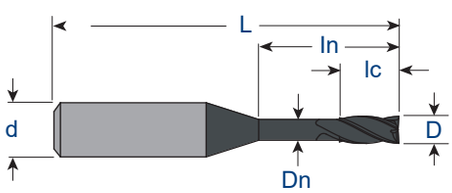
PC410 2 flute	D mill dia.	lc length of cut	ln neck length	Dn neck dia.	d shank dia.	L overall length
PC410-0312	1/32	3/64	5/16	0.029	1/4	2-1/2
PC410-0625	1/16	3/32	5/8	0.060	1/4	2-1/2
PC410-0938	3/32	9/64	15/16	0.091	1/4	2-1/2
PC410-1250	1/8	3/16	1-1/4	0.123	1/4	3
PC410-1875	3/16	9/32	1-7/8	0.183	1/4	4

Special sizes, flats and radius available upon request.

For speeds and feeds, refer to page 94.

PC411 WITH TiAlN COATING

4 Flute - Square End - Short Length - Long Reach



(d) Shank Diameter
+.0000"
-.0003"

(D) Cutting Diameter
+.0000"
-.0015"

PC410 4 flute	D mill dia.	lc length of cut	ln neck length	Dn neck dia	d shank dia.	L overall length
PC411-1250	1/8	3/16	5/8	0.119	1/4	3
PC411-1875	3/16	9/32	15/16	0.182	1/4	3
PC411-2500	1/4	3/8	1-1/4	0.244	1/4	4

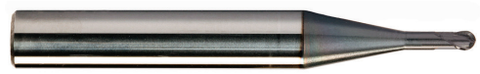
Special sizes, flats and radius available upon request.

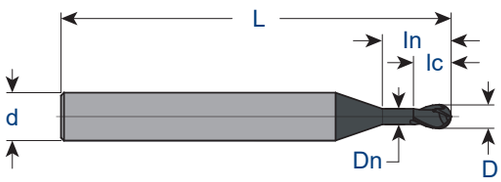
For speeds and feeds, refer to page 94.

PC413 WITH TiAlN COATING

2 Flute - Ball Nose - Necked Design - Short Length

CARBIDE | 30° | SPEEDS &FEEDS | TiAlN





(d) Shank Diameter
+.0000"
-.0003"

(D) Cutting Diameter
+.0000"
-.0015"

PC413 2 flute	D mill dia.	lc length of cut	In neck length	Dn neck dia.	d shank dia.	L overall length
PC413-0312	1/32	1/32	5/32	0.029	1/4	2-1/2
PC413-0625	1/16	1/16	5/16	0.060	1/4	2-1/2
PC413-0938	3/32	3/32	15/32	0.091	1/4	2-1/2
PC413-1250	1/8	1/8	5/8	0.123	1/4	3
PC413-1875	3/16	3/16	15/16	0.183	1/4	4

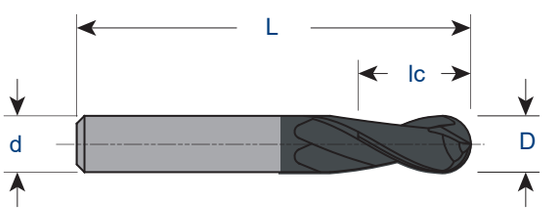
Special sizes and flats available upon request.

For speeds and feeds, refer to pages 95.

PC416 WITH TiAlN COATING

2 Flute - Ball Nose - Standard Length

CARBIDE | 30° | SPEEDS &FEEDS | TiAlN



(d) Shank Diameter
+.0000"
-.0003"

(D) Cutting Diameter
+.0000"
-.0015"

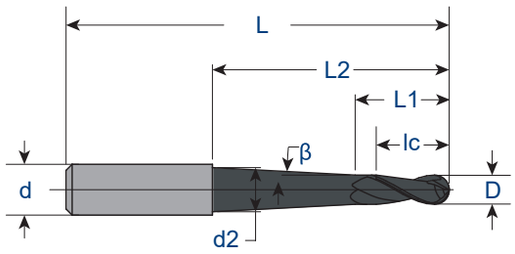
PC416 2 flute	D mill dia.	lc length of cut	d shank dia.	L overall length
PC416-0312	1/32	1/16	1/4	2-1/2
PC416-0625	1/16	1/8	1/4	2-1/2
PC416-0938	3/32	3/16	1/4	2-1/2
PC416-1250	1/8	1/4	1/4	3
PC416-1875	3/16	3/8	1/4	3
PC416-2500	1/4	1/2	1/4	3
PC416-3125	5/16	5/8	5/16	4
PC416-3750	3/8	3/4	3/8	4
PC416-5000	1/2	1	1/2	4

Special sizes and flats available upon request.

For speeds and feeds, refer to pages 96-97.

PC418 WITH TiAlN COATING

2 Flute - Ball Nose - Tapered Pencil Neck



(d) Shank Diameter
+.0000"
-.0003"

(D) Cutting Diameter
+.0000"
-.0015"

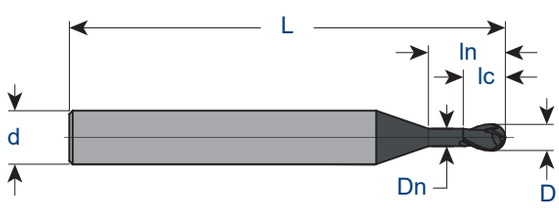
PC418 2 flute	D mill dia.	lc length of cut	L2 non-taper neck length	L1 neck length	d2 max. neck dia.	ß neck incline	d shank dia.	L overall length
PC418-0938	3/32	0.160	0.200	1.60	0.240	3°	1/4	3
PC418-1250	1/8	0.225	0.270	1.60	0.217	2°	1/4	3
PC418-1875	3/16	0.312	0.390	1.90	0.3125	2°	5/16	3-1/2
PC418-2500	1/4	0.400	0.500	2-1/4	0.375	2°	3/8	4
PC418-3750	3/8	0.600	0.750	2-1/4	0.500	2°	1/2	4

Special sizes and flats available upon request.

For speeds and feeds, refer to page 98.

PC419 WITH TiAlN COATING

2 Flute - Ball Nose - Necked Design - Standard Reach



(d) Shank Diameter
+.0000"
-.0003"

(D) Cutting Diameter
+.0000"
-.0015"

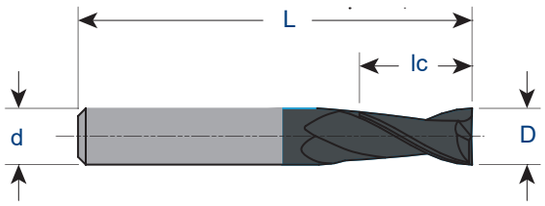
PC419 2 flute	D mill dia.	lc length of cut	ln neck length	Dn neck dia.	d shank dia.	L overall length
PC419-0312	1/32	1/32	5/16	0.029	1/4	2-1/2
PC419-0625	1/16	1/16	5/8	0.060	1/4	2-1/2
PC419-0938	3/32	3/32	15/16	0.091	1/4	2-1/2
PC419-1250	1/8	1/8	1-1/4	0.123	1/4	3
PC419-1875	3/16	3/16	1-7/8	0.183	1/4	4

Special sizes and flats available upon request.

For speeds and feeds, refer to pages 95 and 97.

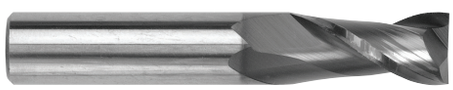
PC420 AND PC424 WITH DIAMOND COATING

2 and 4 Flute - Square End - Stub Length



(d) Shank Diameter
+.0000"
-.0003"

(D) Cutting Diameter
+.0000"
-.0015"



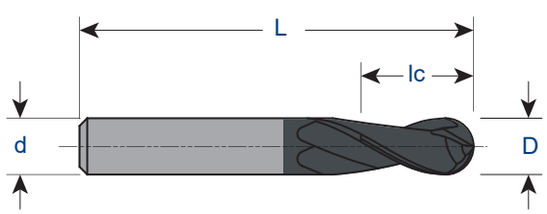
PC422 2 flute	PC424 4 flute	D mill dia.	lc length of cut	d shank dia.	L overall length
PC420-0312	PC424-0312	1/32	3/32	1/8	1-3/4
PC420-0469	PC424-0469	3/64	3/16	1/8	1-3/4
PC420-0625	PC424-0625	1/16	3/16	1/8	1-3/4
PC420-0781	PC424-0781	5/64	1/4	1/8	1-3/4
PC420-0938	PC424-0938	3/32	3/8	1/8	1-3/4
PC420-1250	PC424-1250	1/8	1/2	1/8	1-3/4
PC420-1562	PC424-1562	5/32	9/16	5/32	2
PC420-1875	PC424-1875	3/16	3/4	3/16	2
PC420-2500	PC424-2500	1/4	3/4	1/4	2-1/2
PC420-3125	PC424-3125	5/16	13/16	5/16	2-1/2
PC420-3750	PC424-3750	3/8	7/8	3/8	2-1/2
PC420-5000	PC424-5000	1/2	1	1/2	3

Special sizes, flats and radius available upon request.

For speeds and feeds, refer to page 99.

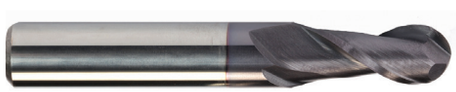
PC420BN AND PC424BN WITH DIAMOND COATING

2 and 4 Flute - Ball Nose - Stub Length



(d) Shank Diameter
+.0000"
-.0003"

(D) Cutting Diameter
+.0000"
-.0015"



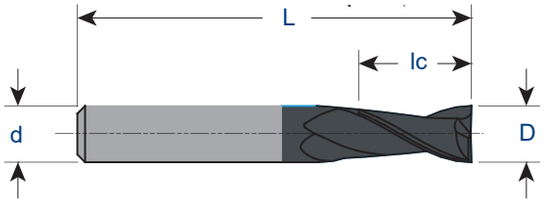
PC422BN 2 flute	PC424BN 4 flute	D mill dia.	lc length of cut	d shank dia.	L overall length
PC420-0312BN	PC424-0312BN	1/32	3/32	1/8	1-3/4
PC420-0469BN	PC424-0469BN	3/64	3/16	1/8	1-3/4
PC420-0625BN	PC424-0625BN	1/16	3/16	1/8	1-3/4
PC420-0781BN	PC424-0781BN	5/64	1/4	1/8	1-3/4
PC420-0938BN	PC424-0938BN	3/32	3/8	1/8	1-3/4
PC420-1250BN	PC424-1250BN	1/8	1/2	1/8	1-3/4
PC420-1562BN	PC424-1562BN	5/32	9/16	5/32	2
PC420-1875BN	PC424-1875BN	3/16	3/4	3/16	2
PC420-2500BN	PC424-2500BN	1/4	3/4	1/4	2-1/2
PC420-3125BN	PC424-3125BN	5/16	13/16	5/16	2-1/2
PC420-3750BN	PC424-3750BN	3/8	7/8	3/8	2-1/2
PC420-5000BN	PC424-5000BN	1/2	1	1/2	3

Special sizes, flats and radius available upon request.

For speeds and feeds, refer to page 99.

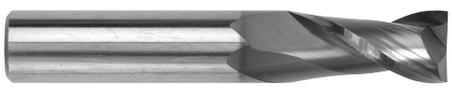
PC421 WITH TiAlN COATING

2 Flute - Single End - Square End



(d) Shank Diameter
+.0000"
-.0003"

(D) Cutting Diameter
+.0000"
-.0015"

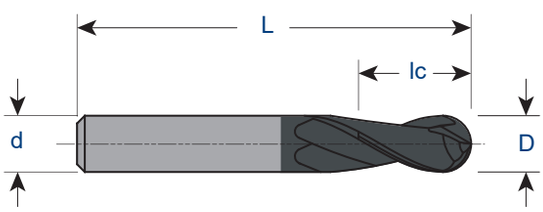


PC421 2 flute	PC421BN 2 flute	D mill dia.	lc length of cut	d shank dia.	L overall length
PC421-0469	PC421-0469-BN	3/64	9/64	1/8	1-1/2
PC421-0625	PC421-0625-BN	1/16	3/16	1/8	1-1/2
PC421-0781	PC421-0781-BN	5/64	1/4	1/8	1-1/2
PC421-0938	PC421-0938-BN	3/32	5/16	1/8	1-1/2
PC421-1094	PC421-1094-BN	7/64	3/8	1/8	1-1/2
PC421-1250	PC421-1250-BN	1/8	1/2	1/8	1-1/2
PC421-1406	PC421-1406-BN	9/64	1/2	3/16	2
PC421-1562	PC421-1562-BN	5/32	9/16	3/16	2
PC421-1719	PC421-1719-BN	11/64	9/16	3/16	2
PC421-1875	PC421-1875-BN	3/16	5/8	3/16	2
PC421-2031	PC421-2031-BN	13/64	5/8	1/4	2-1/2
PC421-2188	PC421-2188-BN	7/32	5/8	1/4	2-1/2
PC421-2500	PC421-2500-BN	1/4	3/4	1/4	2-1/2
PC421-2812	PC421-2812-BN	9/32	3/4	5/16	2-1/2
PC421-3125	PC421-3125-BN	5/16	13/16	5/16	2-1/2
PC421-3438	PC421-3438-BN	11/32	7/8	3/8	2-1/2
PC421-3750	PC421-3750-BN	3/8	1	3/8	2-1/2
PC421-4062	PC421-4062-BN	13/32	1	7/16	2-3/4
PC421-4375	PC421-4375-BN	7/16	1	7/16	2-3/4
PC421-5000	PC421-5000-BN	1/2	1	1/2	3
PC421-5625	PC421-5625-BN	9/16	1-1/8	9/16	3-1/2
PC421-6250	PC421-6250-BN	5/8	1-1/4	5/8	3-1/2
PC421-6875	PC421-6875-BN	11/16	1-3/8	3/4	4
PC421-7500	PC421-7500-BN	3/4	1-1/2	3/4	4
PC421-8750	PC421-8750-BN	7/8	1-1/2	7/8	4
PC421-1000	PC421-1000-BN	1	1-1/2	1	4

Special sizes, flats and radius available upon request.

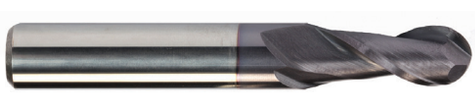
PC421BN WITH TiAlN COATING

2 Flute - Ball Nose



(d) Shank Diameter
+.0000"
-.0003"

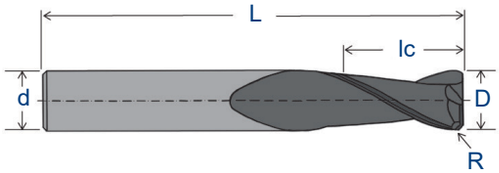
(D) Cutting Diameter
+.0000"
-.0015"



For speeds and feeds, refer to pages 102-103

PC432 WITH TiAlN COATING

2 Flute - Corner Radius



(d) Shank Diameter
+.0000”
-.0003”

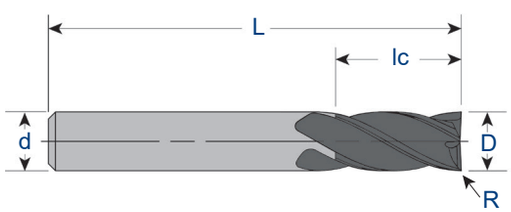
(D) Cutting Diameter
+.0000”
-.0015”

Special sizes and flats available upon request.

PC432 2 flute	PC434 4 flute	D mill dia.	R corner radius	lc length of cut	d shank dia.	L overall length
PC432-1251	PC434-1251	1/8	0.015	1/2	1/8	1-1/2
PC432-1872	PC434-1872	3/16	0.020	5/8	3/16	2
PC432-2502	PC434-2502	1/4	0.020	3/4	1/4	2-1/2
PC432-2503	PC434-2503	1/4	0.030	3/4	1/4	2-1/2
PC432-3122	PC434-3122	5/16	0.020	13/16	5/16	2-1/2
PC432-3123	PC434-3123	5/16	0.030	13/16	5/16	2-1/2
PC432-3752	PC434-3752	3/8	0.020	1	3/8	2-1/2
PC432-3753	PC434-3753	3/8	0.030	1	3/8	2-1/2
PC432-5002	PC434-5002	1/2	0.020	1	1/2	3
PC432-5003	PC434-5003	1/2	0.030	1	1/2	3
PC432-5006	PC434-5006	1/2	0.060	1	1/2	3
PC432-6253	PC434-6253	5/8	0.030	1-1/4	5/8	3-1/2
PC432-6256	PC434-6256	5/8	0.060	1-1/4	5/8	3-1/2
PC432-6259	PC434-6259	5/8	0.090	1-1/4	5/8	3-1/2
PC432-7506	PC434-7506	3/4	0.060	1-1/2	3/4	4
PC432-7509	PC434-7509	3/4	0.090	1-1/2	3/4	4
PC432-7512	PC434-7512	3/4	0.125	1-1/2	3/4	4
PC432-1006	PC434-1006	1	0.060	1-1/2	1	4
PC432-1009	PC434-1009	1	0.090	1-1/2	1	4
PC432-1012	PC434-1012	1	0.125	1-1/2	1	4

PC434 WITH TiAlN COATING

4 Flute - Corner Radius



(d) Shank Diameter
+.0000”
-.0003”

(D) Cutting Diameter
+.0000”
-.0015”

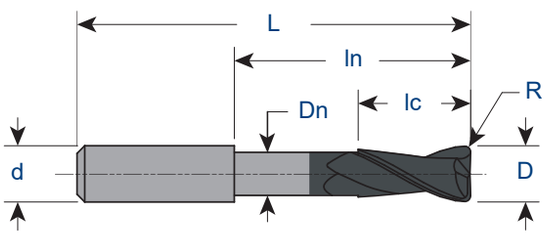
Special sizes and flats available upon request.

For speeds and feeds, refer to pages 105-106

PC433 WITH TiAlN COATING

2 Flute - Corner Radius - Necked Design

CARBIDE | 30° | SPEEDS & FEEDS | TiAlN



(d) Shank Diameter
+.0000"
-.0003"

(D) Cutting Diameter
+.0000"
-.0015"

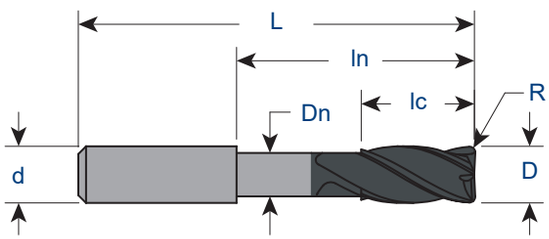
PC433 2 flute	D mill dia.	dec. equiv.	R radius radius	lc length of cut	ln reach length	Dn neck dia.	d shank dia.	L overall length
PC433-1251	1/8	.1250	.0100	3/16	9/16	.100	1/4	2-1/2
PC433-1252	1/8	.1250	.0150	3/16	9/16	.100	1/4	2-1/2
PC433-1562	5/32	.1562	.0100	1/4	1	.140	1/4	2-3/4
PC433-1563	5/32	.1562	.0150	1/4	1	.140	1/4	2-3/4
PC433-1564	5/32	.1562	.0300	1/4	1	.140	1/4	2-3/4
PC433-1875	3/16	.1875	.0100	5/16	1-3/16	.156	1/4	3
PC433-1876	3/16	.1875	.0150	5/16	1-3/16	.156	1/4	3
PC433-1877	3/16	.1875	.0300	5/16	1-3/16	.156	1/4	3
PC433-2500	1/4	.2500	.0100	3/8	1-3/8	.230	1/4	3
PC433-2501	1/4	.2500	.0150	3/8	1-3/8	.230	1/4	3
PC433-2502	1/4	.2500	.0200	3/8	1-3/8	.230	1/4	3
PC433-2503	1/4	.2500	.0250	3/8	1-3/8	.230	1/4	3
PC433-2504	1/4	.2500	.0300	3/8	1-3/8	.230	1/4	3
PC433-3125	5/16	.3125	.0150	1/2	1-9/16	.290	5/16	3-1/2
PC433-3126	5/16	.3125	.0300	1/2	1-9/16	.290	5/16	3-1/2
PC433-3127	5/16	.3125	.0600	1/2	1-9/16	.290	5/16	3-1/2
PC433-3128	5/16	.3125	.0900	1/2	1-9/16	.290	5/16	3-1/2
PC433-3750	3/8	.3750	.0200	9/16	1-3/4	.345	3/8	4
PC433-3751	3/8	.3750	.0300	9/16	1-3/4	.345	3/8	4
PC433-3752	3/8	.3750	.0450	9/16	1-3/4	.345	3/8	4
PC433-3753	3/8	.3750	.0600	9/16	1-3/4	.345	3/8	4
PC433-3754	3/8	.3750	.0900	9/16	1-3/4	.345	3/8	4
PC433-5000	1/2	.5000	.0300	3/4	2	.470	1/2	4-1/2
PC433-5001	1/2	.5000	.0450	3/4	2	.470	1/2	4-1/2
PC433-5002	1/2	.5000	.0600	3/4	2	.470	1/2	4-1/2
PC433-5003	1/2	.5000	.0900	3/4	2	.470	1/2	4-1/2
PC433-5004	1/2	.5000	.1250	3/4	2	.470	1/2	4-1/2

For speeds and feeds, refer to pages 104-105.

PC435 WITH TiAlN COATING

4 Flute - Corner Radius - Necked Design

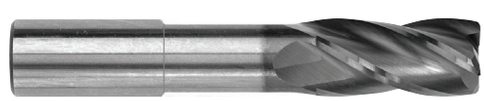
CARBIDE | 30° | SPEEDS & FEEDS | TiAlN



(d) Shank Diameter
+.0000"
-.0003"

(D) Cutting Diameter
+.0000"
-.0015"

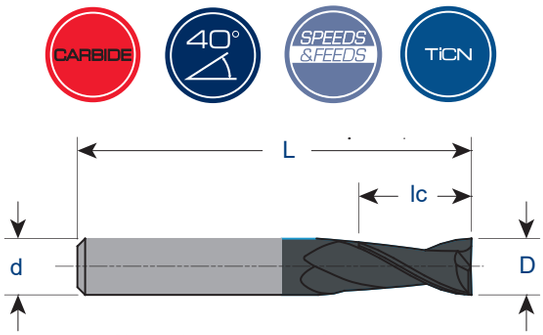
PC435 4 flute	D mill dia.	dec. equiv.	R radius radius	lc length of cut	ln reach length	Dn neck dia.	d shank dia.	L overall length
PC435-1251	1/8	.1250	.0100	3/16	9/16	.100	1/4	2-1/2
PC435-1252	1/8	.1250	.0150	3/16	9/16	.100	1/4	2-1/2
PC435-1562	5/32	.1562	.0100	1/4	1	.140	1/4	2-3/4
PC435-1563	5/32	.1562	.0150	1/4	1	.140	1/4	2-3/4
PC435-1564	5/32	.1562	.0300	1/4	1	.140	1/4	2-3/4
PC435-1875	3/16	.1875	.0100	5/16	1-3/16	.156	1/4	3
PC435-1876	3/16	.1875	.0150	5/16	1-3/16	.156	1/4	3
PC435-1877	3/16	.1875	.0300	5/16	1-3/16	.156	1/4	3
PC435-2500	1/4	.2500	.0100	3/8	1-3/8	.230	1/4	3
PC435-2501	1/4	.2500	.0150	3/8	1-3/8	.230	1/4	3
PC435-2502	1/4	.2500	.0200	3/8	1-3/8	.230	1/4	3
PC435-2503	1/4	.2500	.0250	3/8	1-3/8	.230	1/4	3
PC435-2504	1/4	.2500	.0300	3/8	1-3/8	.230	1/4	3
PC435-3125	5/16	.3125	.0150	1/2	1-9/16	.290	5/16	3-1/2
PC435-3126	5/16	.3125	.0300	1/2	1-9/16	.290	5/16	3-1/2
PC435-3127	5/16	.3125	.0600	1/2	1-9/16	.290	5/16	3-1/2
PC435-3128	5/16	.3125	.0900	1/2	1-9/16	.290	5/16	3-1/2
PC435-3750	3/8	.3750	.0200	9/16	1-3/4	.345	3/8	4
PC435-3751	3/8	.3750	.0300	9/16	1-3/4	.345	3/8	4
PC435-3752	3/8	.3750	.0450	9/16	1-3/4	.345	3/8	4
PC435-3753	3/8	.3750	.0600	9/16	1-3/4	.345	3/8	4
PC435-3754	3/8	.3750	.0900	9/16	1-3/4	.345	3/8	4
PC435-5000	1/2	.5000	.0300	3/4	2	.470	1/2	4-1/2
PC435-5001	1/2	.5000	.0450	3/4	2	.470	1/2	4-1/2
PC435-5002	1/2	.5000	.0600	3/4	2	.470	1/2	4-1/2
PC435-5003	1/2	.5000	.0900	3/4	2	.470	1/2	4-1/2
PC435-5004	1/2	.5000	.1250	3/4	2	.470	1/2	4-1/2



For speeds and feeds, refer to pages 105-106.

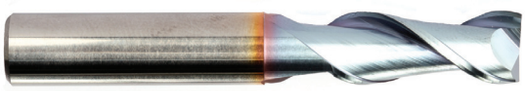
PC440 WITH TiCN COATING

2 Flute - Fast Cut - Standard and Long Length for Aluminum



(d) Shank Diameter
+.0000"
-.0003"

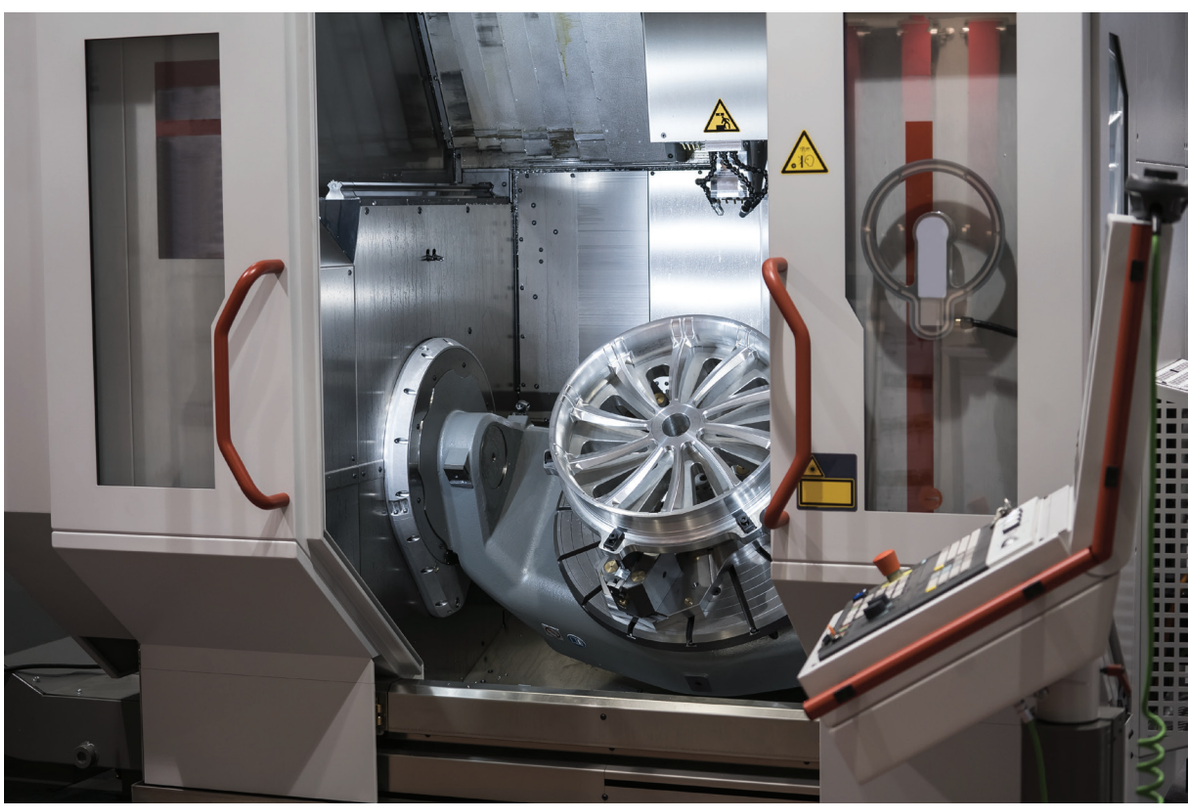
(D) Cutting Diameter
+.0000"
-.0015"



Special sizes, flats and radius available upon request.

PC440 2 flute	D mill dia.	lc length of cut	d shank dia.	L overall length
PC440-2500	1/4	3/4	1/4	2-1/2
PC440-2501	1/4	1-1/2	1/4	4
PC440-3125	5/16	13/16	5/16	2-1/2
PC440-3126	5/16	1-5/8	5/16	4
PC440-3750	3/8	1	3/8	2-1/2
PC440-3751	3/8	1-3/4	3/8	4
PC440-5000	1/2	1	1/2	3
PC440-5001	1/2	2	1/2	4
PC440-6250	5/8	1-1/4	5/8	3-1/2
PC440-6251	5/8	2-1/4	5/8	5
PC440-7500	3/4	1-1/2	3/4	4
PC440-7501	3/4	2-1/4	3/4	5
PC440-1000	1	2-1/4	1	5
PC440-1001	1	3	1	6

For speeds and feeds, refer to page 107.

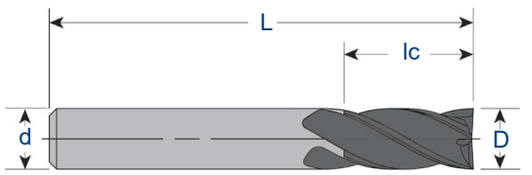


PC441 WITH TiAlN COATING

4 Flute - Single End - Standard Length

PC441 Series end mills offer longer tool life over conventional end mills. The unique geometry design coupled with hardness and toughness of the material increases tool life. TiAlN coating is added to reduces wear and increase heat dissipation.

CARBIDE | 35° | SPEEDS &FEEDS | TiAlN



(d) Shank Diameter
+.0000"
-.0003"

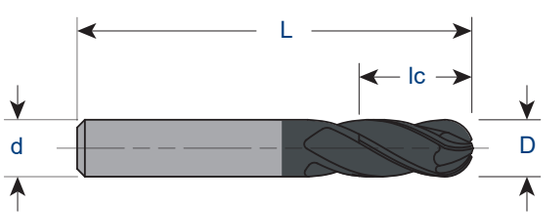
(D) Cutting Diameter
+.0000"
-.0015"

For speeds and feeds, refer to pages 101 and 108.

PC441BN WITH TiAlN COATING

4 Flute - Ball Nose

CARBIDE | 35° | SPEEDS &FEEDS | TiAlN



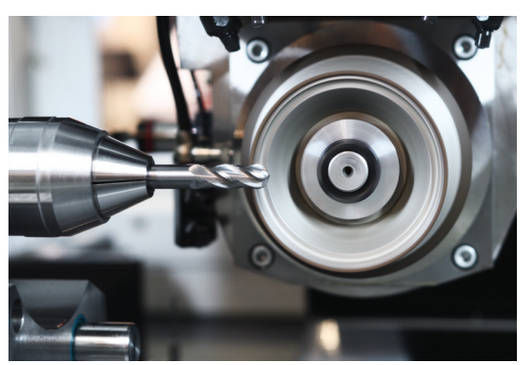
(d) Shank Diameter
+.0000"
-.0003"

(D) Cutting Diameter
+.0000"
-.0015"

For speeds and feeds, refer to pages 102-103.

PC441 4 flute	PC441BN 4 flute	D mill dia.	lc length of cut	d shank dia.	L overall length
PC441-0469	PC441-0469-BN	3/64	9/64	1/8	1-1/2
PC441-0625	PC441-0625-BN	1/16	3/16	1/8	1-1/2
PC441-0781	PC441-0781-BN	5/64	1/4	1/8	1-1/2
PC441-0938	PC441-0938-BN	3/32	5/16	1/8	1-1/2
PC441-1094	PC441-1094-BN	7/64	3/8	1/8	1-1/2
PC441-1250	PC441-1250-BN	1/8	1/2	1/8	1-1/2
PC441-1406	PC441-1406-BN	9/64	1/2	3/16	2
PC441-1562	PC441-1562-BN	5/32	9/16	3/16	2
PC441-1719	PC441-1719-BN	11/64	9/16	3/16	2
PC441-1875	PC441-1875-BN	3/16	5/8	3/16	2
PC441-2031	PC441-2031-BN	13/64	5/8	1/4	2-1/2
PC441-2188	PC441-2188-BN	7/32	5/8	1/4	2-1/2
PC441-2500	PC441-2500-BN	1/4	3/4	1/4	2-1/2
PC441-2812	PC441-2812-BN	9/32	3/4	5/16	2-1/2
PC441-3125	PC441-3125-BN	5/16	13/16	5/16	2-1/2
PC441-3438	PC441-3438-BN	11/32	7/8	3/8	2-1/2
PC441-3750	PC441-3750-BN	3/8	1	3/8	2-1/2
PC441-4062	PC441-4062-BN	13/32	1	7/16	2-3/4
PC441-4375	PC441-4375-BN	7/16	1	7/16	2-3/4
PC441-5000	PC441-5000-BN	1/2	1	1/2	3
PC441-5625	PC441-5625-BN	9/16	1-1/8	9/16	3-1/2
PC441-6250	PC441-6250-BN	5/8	1-1/4	5/8	3-1/2
PC441-6875	PC441-6875-BN	11/16	1-3/8	3/4	4
PC441-7500	PC441-7500-BN	3/4	1-1/2	3/4	4
PC441-8750	PC441-8750-BN	7/8	1-1/2	7/8	4
PC441-1000	PC441-1000-BN	1	1-1/2	1	4

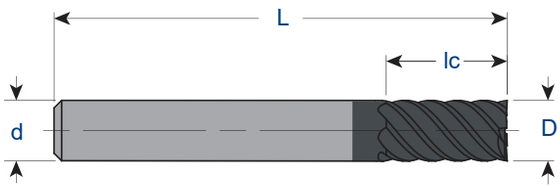
Special sizes and flats available upon request.



PC450 WITH AlCrN COATING

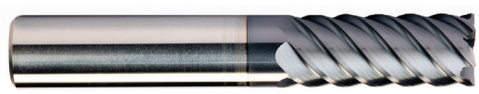
Multiple Flute - Standard Length

Hurricane Mills are a proven innovation to conventional end mills. The unique multi-flute geometry allows for an increase in tool RPM and feed rates while reducing vulnerabilities to chipping. AlCrN coating provides additional benefit with heat dissipation, improving performance and extending tool life.



(d) Shank Diameter
+.0000"
-.0003"

(D) Cutting Diameter
+.0000"
-.0015"



PC450 multi-flute	D mill dia.	lc length of cut	f no. of flutes	d shank dia.	L overall length
PC450-1250	1/8	1/2	4	1/8	1-1/2
PC450-1875	3/16	5/8	4	3/16	2
PC450-2500	1/4	3/4	6	1/4	2-1/2
PC450-3125	5/16	13/16	6	5/16	2-1/2
PC450-3750	3/8	1	6	3/8	2-1/2
PC450-4375	7/16	1	6	7/16	2-3/4
PC450-5000	1/2	1	6	1/2	3
PC450-5625	9/16	1-1/8	6	9/16	3-1/2
PC450-6250	5/8	1-1/4	6	5/8	3-1/2
PC450-7500	3/4	1-1/2	6	3/4	4
PC450-8750	7/8	1-1/2	6	7/8	4
PC450-1000*	1	1-1/2	8	1	4

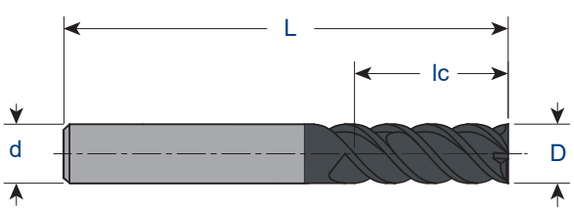
*Non stocking item. Available upon request.

Special sizes, flats and radius available upon request.

For speeds and feeds, refer to page 109.

PC451 WITH AlCrN COATING

4 Flute - Standard Length



(d) Shank Diameter
+.0000"
-.0003"

(D) Cutting Diameter
+.0000"
-.0015"

PC451 4 flute	D mill dia.	lc length of cut	d shank dia.	L overall length
PC451-1250	1/8	3/4	1/8	2-1/4
PC451-1875	3/16	3/4	3/16	2-1/4
PC451-2500	1/4	1-1/8	1/4	3
PC451-3125	5/16	1-1/8	5/16	3
PC451-3750	3/8	1-1/8	3/8	3
PC451-4375	7/16	2	7/16	4
PC451-5000	1/2	2	1/2	4
PC451-6250	5/8	2-1/4	5/8	5
PC451-7500	3/4	2-1/4	3/4	5
PC451-1000*	1	2-1/4	1	5

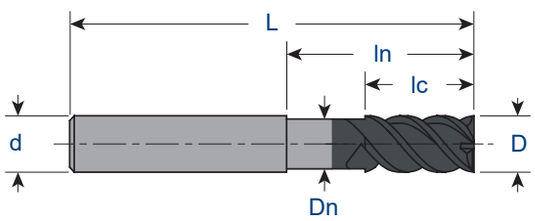
*Non stocking item. Available upon request.

Special sizes, flats and radius available upon request.

For speeds and feeds, refer to page 110.

PC453 WITH AlCrN COATING

4 Flute - Super Tough End Mill



(d) Shank Diameter
+.0000"
-.0003"

(D) Cutting Diameter
+.0000"
-.0015"

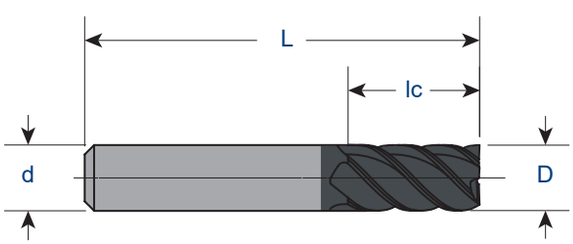
PC453 4 flute	D mill dia	ln neck length	Dn neck dia.	lc length of cut	d shank dia.	L overall length
PC453-1875	3/16	9/16	.1835	5/16	1/4	2-1/2
PC453-2500	1/4	3/4	.2460	3/8	1/4	2-1/2
PC453-3125	5/16	15/16	.3085	7/16	5/16	3
PC453-3750	3/8	1-1/8	.3710	9/16	3/8	3
PC453-4375	7/16	1-1/4	.4335	5/8	7/16	3
PC453-5000	1/2	1-1/2	.4960	3/4	1/2	4
PC453-6250	5/8	2	.6210	1	5/8	4.5

For speeds and feeds, refer to page 110.

PC455 WITH AlCrN COATING

5 Flute - Standard Length

PC455 Series end mills are designed for milling stainless steel, inconel, and titanium alloys. Heavy-duty construction allows for higher speeds and feeds, to increase production. A 45° helix angle promotes optimal shearing action, efficient chip removal with superior surface finish. AlCrN coating provides additional benefit with heat dissipation, improving performance and extending tool life.



(d) Shank Diameter
+.0000"
-.0003"

(D) Cutting Diameter
+.0000"
-.0015"

PC455 5 flute	D mill dia.	lc length of cut	d shank dia.	L overall length
PC455-1250	1/8	1/2	1/8	1-1/2
PC455-1562	5/32	9/16	3/16	2
PC455-1875	3/16	5/8	3/16	2
PC455-2188	7/32	5/8	1/4	2-1/2
PC455-2500	1/4	3/4	1/4	2-1/2
PC455-2812	9/32	3/4	5/16	2-1/2
PC455-3125	5/16	13/16	5/16	2-1/2
PC455-3750	3/8	1	3/8	2-1/2
PC455-4375	7/16	1	7/16	2-3/4
PC455-5000	1/2	1	1/2	3
PC455-5625	9/16	1-1/8	9/16	3-1/2
PC455-6250	5/8	1-1/4	5/8	3-1/2
PC455-7500	3/4	1-1/2	3/4	4
PC455-1000	1	1-1/2	1	4

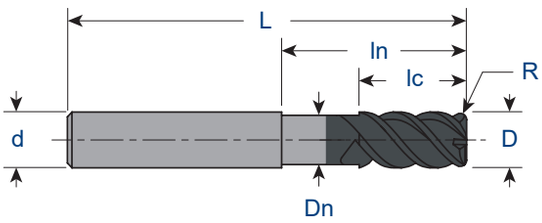
For speeds and feeds, refer to page 111.

QUALITY TECH TOOL

PC456 WITH AlCrN COATING

4 Flute - Radius - Super Tough End Mill

CARBIDE | 50° | SPEEDS & FEEDS | AlCrN



(d) Shank Diameter +.0000" -.0003"

(D) Cutting Diameter +.0000" -.0015"

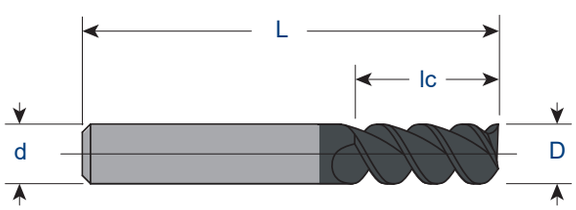
PC456 4 flute	D mill dia.	R corner radius	Dn neck dia.	ln neck length	lc length of cut	d shank dia.	L overall length
PC456-2501	1/4	.020	3/4	.2460	3/8	1/4	2-1/2
PC456-2502	1/4	.040	3/4	.2460	3/8	1/4	2-1/2
PC456-3126	5/16	.020	15/16	.3085	7/16	5/16	3
PC456-3127	5/16	.040	15/16	.3085	7/16	5/16	3
PC456-3751	3/8	.020	1-1/8	.3710	9/16	3/8	3
PC456-3752	3/8	.040	1-1/8	.3710	9/16	3/8	3
PC456-4376	7/16	.020	1-1/4	.4335	5/8	7/16	3
PC456-4377	7/16	.040	1-1/4	.4335	5/8	7/16	3
PC456-5001	1/2	.020	1-1/2	.4960	3/4	1/2	4
PC456-5002	1/2	.040	1-1/2	.4960	3/4	1/2	4
PC456-5003	1/2	.060	1-1/2	.4960	3/4	1/2	4

For speeds and feeds, refer to page 110.

PC460 WITH TiAlN COATING

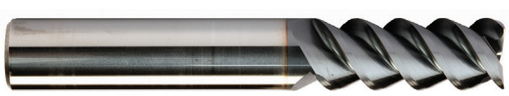
3 Flute - High Helix

CARBIDE | 60° | SPEEDS & FEEDS | TiAlN



(d) Shank Diameter +.0000" -.0003"

(D) Cutting Diameter +.0000" -.0015"

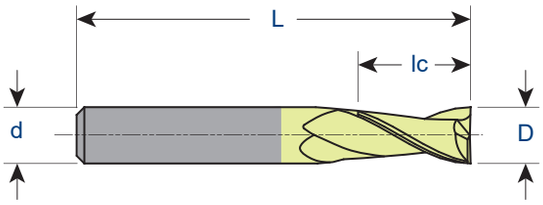


PC460 3 flute	D mill dia.	lc length of cut	d shank dia.	L overall length
PC460-1250	1/8	1/2	1/8	1-1/2
PC460-1875	3/16	5/8	3/16	2
PC460-2500	1/4	3/4	1/4	2-1/2
PC460-3125	5/16	13/16	5/16	2-1/2
PC460-3750	3/8	1	3/8	2-1/2
PC460-4375	7/16	1	7/16	2-3/4
PC460-5000	1/2	1	1/2	3
PC460-6250	5/8	1-1/4	5/8	3-1/2
PC460-7500	3/4	1-1/2	3/4	4
PC460-1000	1	1-1/2	1	4

For speeds and feeds, refer to page 112.

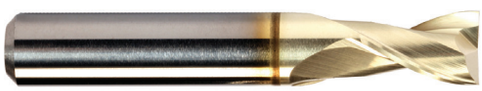
PC470 WITH ZrN COATING - STUB

2 Flute - Stub Length for Cutting Aluminum



(d) Shank Diameter
+.0000"
-.0003"

(D) Cutting Diameter
+.0000"
-.0015"



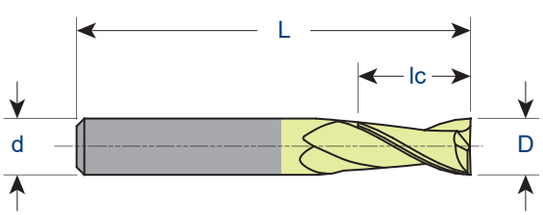
PC470 2 flute	D mill dia.	lc length of cut	d shank dia.	L overall length
PC470-1250	1/8	1/8	1/4	1-1/2
PC470-1875	3/16	3/16	5/16	2
PC470-2500	1/4	1/4	3/8	2-1/2
PC470-3125	5/16	5/16	7/16	2-1/2
PC470-3750	3/8	3/8	1/2	2-1/2
PC470-4375	7/16	7/16	9/16	2-3/4
PC470-5000	1/2	1/2	5/8	3
PC470-6250	5/8	5/8	3/4	3-1/2
PC470-7500	3/4	3/4	1	4
PC470-1000	1	1	1-1/4	4

Special sizes, flats and radius available upon request.

For speeds and feeds, refer to pages 113-115.

PC471 WITH ZrN COATING

2 Flute - Long Length for Cutting Aluminum



(d) Shank Diameter
+.0000"
-.0003"

(D) Cutting Diameter
+.0000"
-.0015"

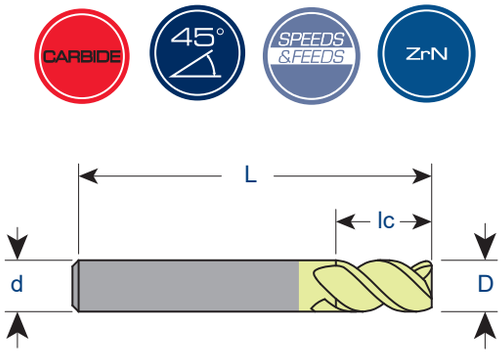
PC471 2 flute	D mill dia.	lc length of cut	d shank dia.	L overall length
PC471-1250	1/8	3/8	1/8	1-1/2
PC471-1875	3/16	9/16	3/16	2
PC471-2500	1/4	3/4	1/4	2-1/2
PC471-3125	5/16	13/16	5/16	2-1/2
PC471-3750	3/8	1	3/8	2-1/2
PC471-4375	7/16	1	7/16	2-3/4
PC471-5000	1/2	1-1/4	1/2	3
PC471-6250	5/8	1-5/8	5/8	3-1/2
PC471-7500	3/4	1-5/8	3/4	4
PC471-1000	1	2	1-1/4	4

Special sizes, flats and radius available upon request.

For speeds and feeds, refer to pages 113-115.

PC475 WITH ZrN COATING

3 Flute - Standard Length for Cutting Aluminum



(d) Shank Diameter
+.0000"
-.0003"

(D) Cutting Diameter
+.0000"
-.0015"

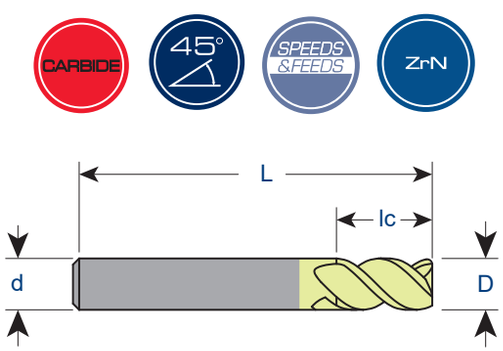
PC475 3 flute	D mill dia.	lc length of cut	d shank dia.	L overall length
PC475-1250	1/8	1/4	1/8	1-1/2
PC475-1875	3/16	5/16	3/16	2
PC475-2500	1/4	3/8	1/4	2-1/2
PC475-3125	5/16	7/16	5/16	2-1/2
PC475-3750	3/8	1/2	3/8	2-1/2
PC475-4375	7/16	9/16	7/16	2-3/4
PC475-5000	1/2	5/8	1/2	3
PC475-6250	5/8	3/4	5/8	3-1/2
PC475-7500	3/4	1	3/4	4
PC475-1000	1	1-1/4	1	4

Special sizes, flats and radius available upon request.

For speeds and feeds, refer to pages 116-118.

PC476 WITH ZrN COATING

3 Flute - Long Length for Cutting Aluminum



(d) Shank Diameter
+.0000"
-.0003"

(D) Cutting Diameter
+.0000"
-.0015"

PC476 3 flute	D mill dia.	lc length of cut	d shank dia.	L overall length
PC476-1250	1/8	3/8	1/8	1-1/2
PC476-1875	3/16	9/16	3/16	2
PC476-2500	1/4	5/8	1/4	2-1/2
PC476-3125	5/16	13/16	5/16	2-1/2
PC476-3750	3/8	1	3/8	2-1/2
PC476-4375	7/16	1-1/4	7/16	2-3/4
PC476-5000	1/2	1-1/4	1/2	3
PC476-6250	5/8	1-5/8	5/8	3-1/2
PC476-7500	3/4	1-5/8	3/4	4
PC476-1000	1	2	1	5

Special sizes, flats and radius available upon request.

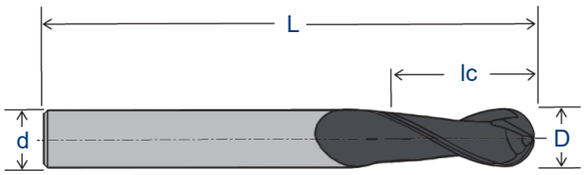
For speeds and feeds, refer to pages 116-118.

PC497 WITH TiAlN COATING

2 Flute - Ball Nose - Long Length

The PC497 Series are two flute ball nosed end mills designed specifically for mold work applications. Pairing a short flute length with a longer overall length offers a greater reach for milling deep pockets and cavities. TiAlN coated for extended tool life and improved tool performance.

CARBIDE | 15° | SPEEDS & FEEDS | TiAlN



(d) Shank Diameter +.0000" -.0003"

(D) Cutting Diameter +.0000" -.0015"

PC497 2 flute	D mill dia.	lc length of cut	d shank dia.	L overall length
PC497-1250	1/8	3/16	1/8	2-1/2
PC497-1875	3/16	9/32	3/16	4
PC497-2500	1/4	3/8	1/4	4
PC497-3125	5/16	15/32	5/16	4
PC497-3750	3/8	9/16	3/8	4
PC497-4375	7/16	21/32	7/16	5
PC497-5000	1/2	3/4	1/2	5
PC497-5625	9/16	27/32	9/16	5
PC497-6250	5/8	15/16	5/8	6
PC497-7500	3/4	1-1/8	3/4	6
PC497-1000*	1	1-1/2	1	6

* Non-stocking, avaialble upon request.
Special sizes and flats available upon request.

For speeds and feeds, refer to page 119.

VH439 WITH AlCrN COATING

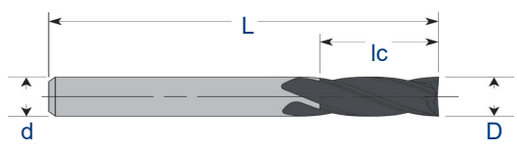
4 Flute - Variable Helix

CARBIDE | 35° | SPEEDS & FEEDS | AlCrN

VH439 4 flute	D mill dia.	lc length of cut	d shank dia.	L overall length
VH439-1250	1/8	1/2	1/8	1-1/2
VH439-1406	9/64	1/2	3/16	2
VH439-1562	5/32	9/16	3/16	2
VH439-1875	3/16	5/8	3/16	2
VH439-2500	1/4	3/4	1/4	2-1/2
VH439-2812	9/32	3/4	5/16	2-1/2
VH439-3125	5/16	13/16	5/16	2-1/2
VH439-3750	3/8	1	3/8	2-1/2
VH439-4375	7/16	1	7/16	2-3/4
VH439-5000	1/2	1	1/2	3
VH439-6250	5/8	1-1/8	5/8	3-1/2
VH439-7500	3/4	1-1/2	3/4	4
VH439-1000	1	1-1/2	1	4

VHR439 WITH AlCrN COATING

4 Flute - Variable Helix



(d) Shank Diameter +.0000" -.0003"

(D) Cutting Diameter +.0000" -.0015"

VHR439 4 flute	D mill dia.	R corner radius	lc length of cut	d shank dia.	L overall length
VHR439-1250	1/8	0.014	1/2	1/8	1-1/2
VHR439-1406	9/64	0.015	1/2	3/16	2
VHR439-1562	5/32	0.017	9/16	3/16	2
VHR439-1875	3/16	0.021	5/8	3/16	2
VHR439-2500	1/4	0.028	3/4	1/4	2-1/2
VHR439-2812	9/32	0.031	3/4	5/16	2-1/2
VHR439-3125	5/16	0.034	13/16	5/16	2-1/2
VHR439-3750	3/8	0.041	1	3/8	2-1/2
VHR439-4375	7/16	0.048	1	7/16	2-3/4
VHR439-5000	1/2	0.055	1	1/2	3
VHR439-6250	5/8	0.069	1-1/8	5/8	3-1/2
VHR439-7500	3/4	0.083	1-1/2	3/4	4
VHR439-1000	1	0.100	1-1/2	1	4

Special sizes, flats and radii available upon request.
For speeds and feeds, refer to pages 120-122.

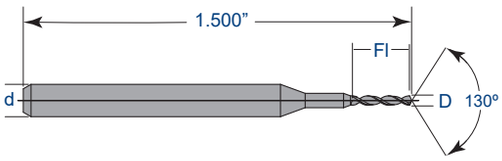
GENERAL PURPOSE DRILLS

QUALITY TECH TOOL

MD135 PREMIUM FINE GRAIN CARBIDE

130° 4 Facet Drill Point with 1/8″ Shank

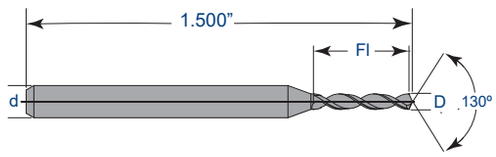
CARBIDE | 35° | SPEEDS & FEEDS | BRIGHT



(d) Shank Diameter
+.0000”
-.0005”

(D) Cutting Diameter
+.0000”
-.0005”

MD135 -Style 1 -Step Design
.0135 DIA to .0160 DIA



(d) Shank Diameter
+.0000”
-.0005”

(D) Cutting Diameter
+.0000”
-.0005”

MD135 -Style 2
.0177 DIA to .1250 DIA

Special sizes and coatings available upon request.

MD135 2 flute	D cutting dia.	decimal equiv.	Fl flute length	d shank dia.
MD135-0135	80	.0135	.220	1/8
MD135-0145	79	.0145	.220	1/8
MD135-0156	1/64	.0156	.220	1/8
MD135-0160	78	.0160	.220	1/8
MD135-0180	77	.0180	.250	1/8
MD135-0200	76	.0200	.250	1/8
MD135-0210	75	.0210	.250	1/8
MD135-0225	74	.0225	.250	1/8
MD135-0240	73	.0240	.312	1/8
MD135-0250	72	.0250	.312	1/8
MD135-0260	71	.0260	.312	1/8
MD135-0280	70	.0280	.420	1/8
MD135-0292	69	.0292	.420	1/8
MD135-0310	68	.0310	.420	1/8
MD135-0312	1/32	.0312	.420	1/8
MD135-0320	67	.0320	.420	1/8
MD135-0330	66	.0330	.420	1/8
MD135-0350	65	.0350	.420	1/8
MD135-0360	64	.0360	.420	1/8

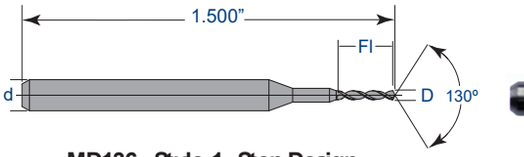
MD135 2 flute	D cutting dia.	decimal equiv.	Fl flute length	d shank dia.
MD135-0370	63	.0370	.420	1/8
MD135-0380	62	.0380	.420	1/8
MD135-0390	61	.0390	.420	1/8
MD135-0400	60	.0400	.420	1/8
MD135-0410	59	.0410	.420	1/8
MD135-0420	58	.0420	.420	1/8
MD135-0430	57	.0430	.420	1/8
MD135-0465	56	.0465	.420	1/8
MD135-0469	3/64	.0469	.420	1/8
MD135-0520	55	.0520	.420	1/8
MD135-0550	54	.0550	.420	1/8
MD135-0595	53	.0595	.420	1/8
MD135-0625	1/16	.0625	.480	1/8
MD135-0635	52	.0635	.480	1/8
MD135-0670	51	.0670	.480	1/8
MD135-0700	50	.0700	.480	1/8
MD135-0730	49	.0730	.480	1/8
MD135-0760	48	.0760	.480	1/8
MD135-0781	5/64	.0781	.480	1/8

MD135 2 flute	D cutting dia.	decimal equiv.	Fl flute length	d shank dia.
MD135-0785	47	.0785	.480	1/8
MD135-0810	46	.0810	.480	1/8
MD135-0820	45	.0820	.480	1/8
MD135-0860	44	.0860	.480	1/8
MD135-0890	43	.0890	.480	1/8
MD135-0935	42	.0935	.480	1/8
MD135-0938	3/32	.0938	.480	1/8
MD135-0960	41	.0960	.480	1/8
MD135-0980	40	.0980	.480	1/8
MD135-0995	39	.0995	.480	1/8
MD135-1015	38	.1015	.480	1/8
MD135-1040	37	.1040	.480	1/8
MD135-1065	36	.1065	.480	1/8
MD135-1094	7/64	.1094	.480	1/8
MD135-1100	35	.1100	.480	1/8
MD135-1110	34	.1110	.480	1/8
MD135-1130	33	.1130	.480	1/8
MD135-1160	32	.1160	.480	1/8
MD135-1200	31	.1200	.480	1/8
MD135-1250	1/8	.1250	.480	1/8

For speeds and feeds, refer to pages 123-128.

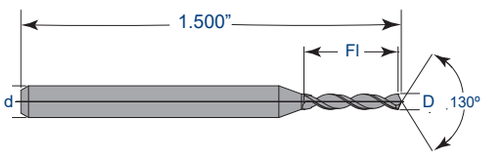
MD136 PREMIUM FINE GRAIN CARBIDE

130° 4 Facet Drill Point with 1/8″ Shank



MD136 -Style 1 -Step Design
.0135 DIA to .0160 DIA

Special sizes, coatings and flats available upon request.



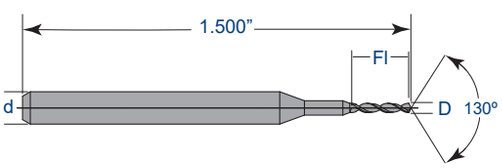
MD136 -Style 2
.0177 DIA to .1250 DIA

For speeds and feeds, refer to pages 123-128.

MD136 2 flute	D cutting dia.	decimal equiv.	Fl flute length	d shank dia.
MD136-0135	80	.0135	.280	1/8
MD136-0145	79	.0145	.280	1/8
MD136-0156	1/64	.0156	.300	1/8
MD136-0160	78	.0160	.300	1/8
MD136-0180	77	.0180	.312	1/8
MD136-0200	76	.0200	.312	1/8
MD136-0210	75	.0210	.312	1/8
MD136-0225	74	.0225	.312	1/8
MD136-0240	73	.0240	.375	1/8
MD136-0250	72	.0250	.375	1/8
MD136-0260	71	.0260	.375	1/8

MD137 PREMIUM FINE GRAIN CARBIDE

130° 4 Facet Drill Point with 1/8″ Shank



Sizes .004 to .0130

Special sizes, coatings and flats available upon request.

MD137 2 flute	D cutting dia.	decimal equiv.	Fl flute length	d shank dia.
MD137-0059	97	.0059	.100	1/8
MD137-0063	96	.0063	.100	1/8
MD137-0067	95	.0067	.100	1/8
MD137-0071	94	.0071	.100	1/8
MD137-0075	93	.0075	.100	1/8
MD137-0079	92	.0079	.125	1/8
MD137-0083	91	.0083	.125	1/8
MD137-0087	90	.0087	.125	1/8
MD137-0091	89	.0091	.125	1/8
MD137-0095	88	.0095	.125	1/8
MD137-0100	87	.0100	.150	1/8
MD137-0105	86	.0105	.150	1/8
MD137-0110	85	.0110	.150	1/8
MD137-0115	84	.0115	.150	1/8
MD137-0120	83	.0120	.220	1/8
MD137-0125	82	.0125	.220	1/8
MD137-0130	81	.0130	.220	1/8

For speeds and feeds, refer to pages 123-128.

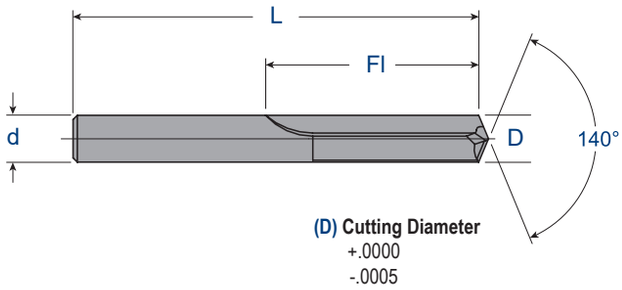
QUALITY TECH TOOL

DR200 HEAVY DUTY CONSTRUCTION

DR200 Series drills are designed for use on hardened, treated, and abrasive materials, stainless steel and cryogenic alloys.

2 Straight Flute - 140° Modified Split Point - Screw Machine Length

CARBIDE | 0° | SPEEDS &FEEDS | BRIGHT



Special sizes and flats available upon request.

DR200 2 flute	D cutting dia.	decimal equiv.	Fl flute length	L overall length
DR200-0465	56	.0465	1/2	1-1/2
DR200-0469	3/64	.0469	1/2	1-1/2
DR200-0520	55	.0520	1/2	1-1/2
DR200-0550	54	.0550	1/2	1-1/2
DR200-0595	53	.0595	1/2	1-1/2
DR200-0625	1/16	.0625	5/8	1-5/8
DR200-0635	52	.0635	11/16	1-11/16
DR200-0670	51	.0670	11/16	1-11/16
DR200-0700	50	.0700	11/16	1-11/16
DR200-0730	49	.0730	11/16	1-11/16
DR200-0760	48	.0760	11/16	1-11/16
DR200-0781	5/64	.0781	11/16	1-11/16
DR200-0785	47	.0785	3/4	1-3/4
DR200-0810	46	.0810	3/4	1-3/4
DR200-0820	45	.0820	3/4	1-3/4
DR200-0860	44	.0860	3/4	1-3/4
DR200-0890	43	.0890	3/4	1-3/4
DR200-0935	42	.0935	3/4	1-3/4
DR200-0938	3/32	.0938	3/4	1-3/4
DR200-0960	41	.0960	13/16	1-13/16
DR200-0980	40	.0980	13/16	1-13/16

DR200 2 flute	D cutting dia.	decimal equiv.	Fl flute length	L overall length
DR200-0995	39	.0995	13/16	1-13/16
DR200-1015	38	.1015	13/16	1-13/16
DR200-1040	37	.1040	13/16	1-13/16
DR200-1065	36	.1065	13/16	1-13/16
DR200-1094	7/64	.1094	13/16	1-13/16
DR200-1100	35	.1100	7/8	1-7/8
DR200-1110	34	.1110	7/8	1-7/8
DR200-1130	33	.1130	7/8	1-7/8
DR200-1160	32	.1160	7/8	1-7/8
DR200-1200	31	.1200	7/8	1-7/8
DR200-1250	1/8	.1250	7/8	1-7/8
DR200-1285	30	.1285	15/16	1-15-16
DR200-1360	29	.1360	15/16	1-15/16
DR200-1405	28	.1405	15/16	1-15/16
DR200-1406	9/64	.1406	15/16	1-15/16
DR200-1440	27	.1440	1	2-1/16
DR200-1470	26	.1470	1	2-1/16
DR200-1495	25	.1495	1	2-1/16
DR200-1520	24	.1520	1	2-1/16
DR200-1540	23	.1540	1	2-1/16
DR200-1562	5/32	1562	1	2-1/16
DR200-1570	22	.1570	1-1/16	2-1/8
DR200-1590	21	.1590	1-1/16	2-1/8
DR200-1610	20	.1610	1-1/16	2-1/8
DR200-1660	19	.1660	1-1/16	2-1/8
DR200-1695	18	.1695	1-1/16	2-1/8
DR200-1719	11/64	.1719	1-1/16	2-1/8
DR200-1730	17	.1730	1-1/8	2-3/16
DR200-1770	16	.1770	1-1/8	2-3/16
DR200-1800	15	.1800	1-1/8	2-3/16
DR200-1820	14	.1820	1-1/8	2-3/16
DR200-1850	13	.1850	1-1/8	2-3/16
DR200-1875	3/16	.1875	1-1/8	2-3/16
DR200-1890	12	.1890	1-3/16	2-1/4
DR200-1910	11	.1910	1-3/16	2-1/4
DR200-1935	10	.1935	1-3/16	2-1/4

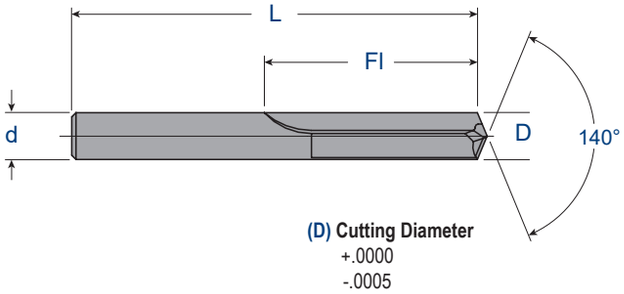
Additional sizes available upon request.
Coating available upon request.

For speeds and feeds, refer to pages 129-130.

DR200 HEAVY DUTY CONSTRUCTION

DR200 Series drills are designed for use on hardened, treated, and abrasive materials, stainless steel and cryogenic alloys.

2 Straight Flute - 140° Modified Split Point - Screw Machine Length



Special sizes and flats available upon request.

DR200 2 flute	D cutting dia.	decimal equiv.	Fl flute length	L overall length
DR200-1960	9	.1960	1-3/16	2-1/4
DR200-1990	8	.1990	1-3/16	2-1/4
DR200-2010	7	.2010	1-3/16	2-1/4
DR200-2031	13/64	.2031	1-3/16	2-1/4
DR200-2040	6	.2040	1-1/4	2-3/8
DR200-2055	5	.2055	1-1/4	2-3/8
DR200-2090	4	.2090	1-1/4	2-3/8
DR200-2130	3	.2130	1-1/4	2-3/8
DR200-2188	7/32	.2188	1-1/4	2-3/8
DR200-2210	2	.2210	1-5/16	2-7/16
DR200-2280	1	.2280	1-5/16	2-7/16
DR200-2340	A	.2340	1-5/16	2-7/16
DR200-2344	15/64	.2344	1-5/16	2-7/16
DR200-2380	B	.2380	1-3/8	2-1/2
DR200-2420	C	.2420	1-3/8	2-1/2
DR200-2460	D	.2460	1-3/8	2-1/2
DR200-2500	1/4	.2500	1-3/8	2-1/2
DR200-2500	E	.2500	1-3/8	2-1/2
DR200-2570	F	.2570	1-7/16	2-5/8
DR200-2610	G	2610	1-7/16	2-5/8
DR200-2656	17/64	2656	1-7/16	2-5/8

DR200 2 flute	D cutting dia.	decimal equiv.	Fl flute length	L overall length
DR200-2660	H	.2660	1-1/2	2-11/16
DR200-2720	I	.2720	1-1/2	2-11/16
DR200-2770	J	.2770	1-1/2	2-11/16
DR200-2810	K	.2810	1-1/2	2-11/16
DR200-2812	9/32	.2812	1-1/2	2-11/16
DR200-2900	L	.2900	1-9/16	2-3/4
DR200-2950	M	.2950	1-9/16	2-3/4
DR200-2969	19/64	.2969	1-9/16	2-3/4
DR200-3020	N	.3030	1-5/8	2-13/16
DR200-3125	5/16	.3125	1-5/8	2-13/16
DR200-3160	O	.3160	1-11/16	2-15/16
DR200-3230	P	.3230	1-11/16	2-15/16
DR200-3281	21/64	.3281	1-11/16	2-15/16
DR200-3320	Q	.3320	1-11/16	3
DR200-3390	R	.3390	1-11/16	3
DR200-3438	11/32	.3438	1-11/16	3
DR200-3480	S	.3480	1-3/4	3-1/16
DR200-3580	T	.3580	1-3/4	3-1/16
DR200-3594	23/64	.3594	1-3/4	3-1/16
DR200-3680	U	.3680	1-13/16	3-1/8
DR200-3750	3/8	.3750	1-13/16	3-1/8
DR200-3770	V	.3770	1-7/8	3-1/4
DR200-3860	W	.3860	1-7/8	3-1/4
DR200-3906	25/64	.3906	1-7/8	3-1/4
DR200-3970	X	.3970	1-15/16	3-5/16
DR200-4040	Y	.4040	1-15/16	3-5/16
DR200-4062	13/32	.4062	1-15/16	3-5/16
DR200-4130	Z	.4130	2	3-3/8
DR200-4219	27/64	.4219	2	3-3/8
DR200-4375	7/16	.4375	2-1/16	3-7/16
DR200-4531	29/64	.4531	2-1/8	3-9/16
DR200-4688	15/32	.4688	2-1/8	3-5/8
DR200-4844	31/64	.4844	2-3/16	3-11/16
DR200-5000	1/2	.5000	2-1/4	3-3/4

Additional sizes available upon request.
Coating available upon request.

For speeds and feeds, refer to pages 129-130.

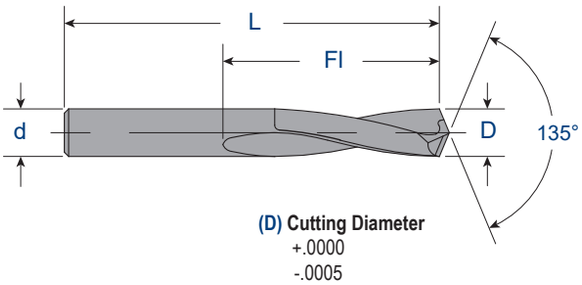
QUALITY TECH TOOL

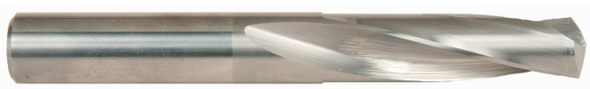
DR215 WITH 15° RIGHT HAND HELIX

DR215 Series drills are designed for use on work hardened and gummy materials, high temperature alloy steels, titanium, inconel, cast iron and stainless steel.

2 Flute - 135° Modified Split Point - Screw Machine Length

CARBIDE | 15° | SPEEDS & FEEDS | BRIGHT





Special sizes and flats available upon request.

DR215 2 flute	D cutting dia.	decimal equiv.	Fl flute length	L overall length
DR215-0465	56	.0465	1/2	1-1/2
DR215-0469	3/64	.0469	1/2	1-1/2
DR215-0520	55	.0520	1/2	1-1/2
DR215-0550	54	.0550	1/2	1-1/2
DR215-0595	53	.0595	1/2	1-1/2
DR215-0625	1/16	.0625	5/8	1-5/8
DR215-0635	52	.0635	11/16	1-11/16
DR215-0670	51	.0670	11/16	1-11/16
DR215-0700	50	.0700	11/16	1-11/16
DR215-0730	49	.0730	11/16	1-11/16
DR215-0760	48	.0760	11/16	1-11/16
DR215-0781	5/64	.0781	11/16	1-11/16
DR215-0785	47	.0785	3/4	1-3/4
DR215-0810	46	.0810	3/4	1-3/4
DR215-0820	45	.0820	3/4	1-3/4
DR215-0860	44	.0860	3/4	1-3/4
DR215-0890	43	.0890	3/4	1-3/4
DR215-0935	42	.0935	3/4	1-3/4
DR215-0938	3/32	.0938	3/4	1-3/4
DR215-0960	41	.0960	13/16	1-13/16
DR215-0980	40	.0980	13/16	1-13/16

DR215 2 flute	D cutting dia.	decimal equiv.	Fl flute length	L overall length
DR215-0995	39	.0995	13/16	1-13/16
DR215-1015	38	.1015	13/16	1-13/16
DR215-1040	37	.1040	13/16	1-13/16
DR215-1065	36	.1065	13/16	1-13/16
DR215-1094	7/64	.1094	13/16	1-13/16
DR215-1100	35	.1100	7/8	1-7/8
DR215-1110	34	.1110	7/8	1-7/8
DR215-1130	33	.1130	7/8	1-7/8
DR215-1160	32	.1160	7/8	1-7/8
DR215-1200	31	.1200	7/8	1-7/8
DR215-1250	1/8	.1250	7/8	1-7/8
DR215-1285	30	.1285	15/16	1-15-16
DR215-1360	29	.1360	15/16	1-15/16
DR215-1405	28	.1405	15/16	1-15/16
DR215-1406	9/64	.1406	15/16	1-15/16
DR215-1440	27	.1440	1	2-1/16
DR215-1470	26	.1470	1	2-1/16
DR215-1495	25	.1495	1	2-1/16
DR215-1520	24	.1520	1	2-1/16
DR215-1540	23	.1540	1	2-1/16
DR215-1562	5/32	1562	1	2-1/16
DR215-1570	22	.1570	1-1/16	2-1/8
DR215-1590	21	.1590	1-1/16	2-1/8
DR215-1610	20	.1610	1-1/16	2-1/8
DR215-1660	19	.1660	1-1/16	2-1/8
DR215-1695	18	.1695	1-1/16	2-1/8
DR215-1719	11/64	.1719	1-1/16	2-1/8
DR215-1730	17	.1730	1-1/8	2-3/16
DR215-1770	16	.1770	1-1/8	2-3/16
DR215-1800	15	.1800	1-1/8	2-3/16
DR215-1820	14	.1820	1-1/8	2-3/16
DR215-1850	13	.1850	1-1/8	2-3/16
DR215-1875	3/16	.1875	1-1/8	2-3/16
DR215-1890	12	.1890	1-3/16	2-1/4
DR215-1910	11	.1910	1-3/16	2-1/4
DR215-1935	10	.1935	1-3/16	2-1/4

Additional sizes available upon request.
Coating available upon request.

For speeds and feeds, refer to pages 131-132.

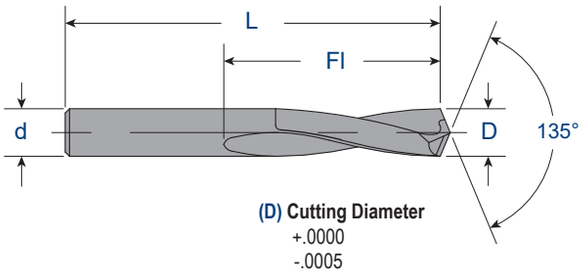
QUALITY TECH TOOL

DR215 WITH 15° RIGHT HAND HELIX

DR215 Series drills are designed for use on work hardened and gummy materials, high temperature alloy steels, titanium, inconel, cast iron and stainless steel.

2 Flute - 135° Modified Split Point - Screw Machine Length

CARBIDE | 15° | SPEEDS &FEEDS | BRIGHT



Special sizes and flats available upon request.

DR215 2 flute	D cutting dia.	decimal equiv.	Fl flute length	L overall length
DR215-1960	9	.1960	1-3/16	2-1/4
DR215-1990	8	.1990	1-3/16	2-1/4
DR215-2010	7	.2010	1-3/16	2-1/4
DR215-2031	13/64	.2031	1-3/16	2-1/4
DR215-2040	6	.2040	1-1/4	2-3/8
DR215-2055	5	.2055	1-1/4	2-3/8
DR215-2090	4	.2090	1-1/4	2-3/8
DR215-2130	3	.2130	1-1/4	2-3/8
DR215-2188	7/32	.2188	1-1/4	2-3/8
DR215-2210	2	.2210	1-5/16	2-7/16
DR215-2280	1	.2280	1-5/16	2-7/16
DR215-2340	A	.2340	1-5/16	2-7/16
DR215-2344	15/64	.2344	1-5/16	2-7/16
DR215-2380	B	.2380	1-3/8	2-1/2
DR215-2420	C	.2420	1-3/8	2-1/2
DR215-2460	D	.2460	1-3/8	2-1/2
DR215-2500	1/4	.2500	1-3/8	2-1/2
DR215-2500	E	.2500	1-3/8	2-1/2
DR215-2570	F	.2570	1-7/16	2-5/8
DR215-2610	G	2610	1-7/16	2-5/8

DR215 2 flute	D cutting dia.	decimal equiv.	Fl flute length	L overall length
DR215-2656	17/64	2656	1-7/16	2-5/8
DR215-2660	H	.2660	1-1/2	2-11/16
DR215-2720	I	.2720	1-1/2	2-11/16
DR215-2770	J	.2770	1-1/2	2-11/16
DR215-2810	K	.2810	1-1/2	2-11/16
DR215-2812	9/32	.2812	1-1/2	2-11/16
DR215-2900	L	.2900	1-9/16	2-3/4
DR215-2950	M	.2950	1-9/16	2-3/4
DR215-2969	19/64	.2969	1-9/16	2-3/4
DR215-3020	N	.3030	1-5/8	2-13/16
DR215-3125	5/16	.3125	1-5/8	2-13/16
DR215-3160	O	.3160	1-11/16	2-15/16
DR215-3230	P	.3230	1-11/16	2-15/16
DR215-3281	21/64	.3281	1-11/16	2-15/16
DR215-3320	Q	.3320	1-11/16	3
DR215-3390	R	.3390	1-11/16	3
DR215-3438	11/32	.3438	1-11/16	3
DR215-3480	S	.3480	1-3/4	3-1/16
DR215-3580	T	.3580	1-3/4	3-1/16
DR215-3594	23/64	.3594	1-3/4	3-1/16
DR215-3680	U	.3680	1-13/16	3-1/8
DR215-3750	3/8	.3750	1-13/16	3-1/8
DR215-3770	V	.3770	1-7/8	3-1/4
DR215-3860	W	.3860	1-7/8	3-1/4
DR215-3906	25/64	.3906	1-7/8	3-1/4
DR215-3970	X	.3970	1-15/16	3-5/16
DR215-4040	Y	.4040	1-15/16	3-5/16
DR215-4062	13/32	.4062	1-15/16	3-5/16
DR215-4130	Z	.4130	2	3-3/8
DR215-4219	27/64	.4219	2	3-3/8
DR215-4375	7/16	.4375	2-1/16	3-7/16
DR215-4531	29/64	.4531	2-1/8	3-9/16
DR215-4688	15/32	.4688	2-1/8	3-5/8
DR215-4844	31/64	.4844	2-3/16	3-11/16
DR215-5000	1/2	.5000	2-1/4	3-3/4

Additional sizes available upon request.
Coating available upon request.

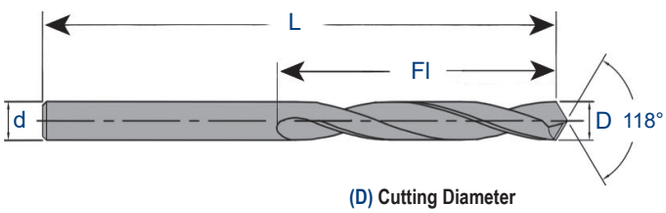
For speeds and feeds, refer to pages 131-132.

DR220 WITH 20° RIGHT HAND HELIX

2 Flute - 118° 4 Facet Point - Jobber Length

DR220 Series drills are designed for use on non-ferrous alloys, cast iron, plastics, aluminum and highly abrasive material.

CARBIDE | 20° | SPEEDS &FEEDS | BRIGHT



(D) Cutting Diameter
+.0000
-.0005

Special sizes and flats available upon request.

DR220 2 flute	D cutting dia.	decimal equiv.	Fl flute length	L overall length
DR220-0465	56	.0465	3/4	1-1/2
DR220-0469	3/64	.0469	3/4	1-1/2
DR220-0520	55	.0520	3/4	1-1/2
DR220-0550	54	.0550	3/4	1-1/2
DR220-0595	53	.0595	3/4	1-1/2
DR220-0625	1/16	.0625	3/4	1-1/2
DR220-0635	52	.0635	3/4	1-1/2
DR220-0670	51	.0670	3/4	1-1/2
DR220-0700	50	.0700	7/8	1-3/4
DR220-0730	49	.0730	7/8	1-3/4
DR220-0760	48	.0760	7/8	1-3/4
DR220-0781	5/64	.0781	7/8	1-3/4
DR220-0785	47	.0785	7/8	1-3/4
DR220-0810	46	.0810	7/8	1-3/4
DR220-0820	45	.0820	7/8	1-3/4
DR220-0860	44	.0860	1	2
DR220-0890	43	.0890	1	2
DR220-0935	42	.0935	1	2
DR220-0938	3/32	.0938	1	2
DR220-0960	41	.0960	1	2
DR220-0980	40	.0980	1	2

DR220 2 flute	D cutting dia.	decimal equiv.	Fl flute length	L overall length
DR220-0995	39	.0995	1-1/4	2-1/4
DR220-1015	38	.1015	1-1/4	2-1/4
DR220-1040	37	.1040	1-1/4	2-1/4
DR220-1065	36	.1065	1-1/4	2-1/4
DR220-1094	7/64	.1094	1-1/4	2-1/4
DR220-1100	35	.1100	1-1/4	2-1/4
DR220-1110	34	.1110	1-1/4	2-1/4
DR220-1130	33	.1130	1-1/4	2-1/4
DR220-1160	32	.1160	1-1/4	2-1/4
DR220-1200	31	.1200	1-1/4	2-1/4
DR220-1250	1/8	.1250	1-1/4	2-1/4
DR220-1285	30	.1285	1-1/4	2-1/4
DR220-1360	29	.1360	1-3/8	2-1/2
DR220-1405	28	.1405	1-3/8	2-1/2
DR220-1406	9/64	.1406	1-3/8	2-1/2
DR220-1440	27	.1440	1-3/8	2-1/2
DR220-1470	26	.1470	1-3/8	2-1/2
DR220-1495	25	.1495	1-3/8	2-1/2
DR220-1520	24	.1520	1-3/8	2-1/2
DR220-1540	23	.1540	1-3/8	2-1/2
DR220-1562	5/32	.1562	1-3/8	2-1/2
DR220-1570	22	.1570	1-3/8	2-1/2
DR220-1590	21	.1590	1-3/8	2-1/2
DR220-1610	20	.1610	1-3/8	2-1/2
DR220-1660	19	.1660	1-5/8	2-3/4
DR220-1695	18	.1695	1-5/8	2-3/4
DR220-1719	11/64	.1719	1-5/8	2-3/4
DR220-1730	17	.1730	1-5/8	2-3/4
DR220-1770	16	.1770	1-5/8	2-3/4
DR220-1800	15	.1800	1-5/8	2-3/4
DR220-1820	14	.1820	1-5/8	2-3/4
DR220-1850	13	.1850	1-5/8	2-3/4
DR220-1875	3/16	.1875	1-5/8	2-3/4
DR220-1890	12	.1890	1-5/8	2-3/4
DR220-1910	11	.1910	1-5/8	2-3/4
DR220-1935	10	.1935	1-5/8	2-3/4

Additional sizes available upon request.
Coating available upon request.

For speeds and feeds, refer to page 133.

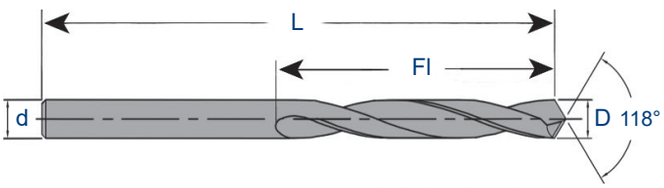
QUALITY TECH TOOL

DR220 WITH 20° RIGHT HAND HELIX

2 Flute - 118° 4 Facet Point - Jobber Length

DR220 Series drills are designed for use on non-ferrous alloys, cast iron, plastics, aluminum and highly abrasive material.

CARBIDE | 20° | SPEEDS &FEEDS | BRIGHT



(D) Cutting Diameter
+.0000
-.0005

Special sizes and flats available upon request.

DR220 2 flute	D cutting dia.	decimal equiv.	Fl flute length	L overall length
DR220-1960	9	.1960	1-3/4	3
DR220-1990	8	.1990	1-3/4	3
DR220-2010	7	.2010	1-3/4	3
DR220-2031	13/64	.2031	1-3/4	3
DR220-2040	6	.2040	1-3/4	3
DR220-2055	5	.2055	1-3/4	3
DR220-2090	4	.2090	1-3/4	3
DR220-2130	3	.2130	1-3/4	3
DR220-2188	7/32	.2188	1-3/4	3
DR220-2210	2	.2210	1-3/4	3
DR220-2280	1	.2280	1-3/4	3
DR220-2340	A	.2340	2	3-1/4
DR220-2344	15/64	.2344	2	3-1/4
DR220-2380	B	.2380	2	3-1/4
DR220-2420	C	.2420	2	3-1/4
DR220-2460	D	.2460	2	3-1/4
DR220-2500	1/4	.2500	2	3-1/4
DR220-2500	E	.2500	2	3-1/4
DR220-2570	F	.2570	2	3-1/4
DR220-2610	G	2610	2-1/8	3-1/2

DR220 2 flute	D cutting dia.	decimal equiv.	Fl flute length	L overall length
DR220-2656	17/64	2656	2-1/8	3-1/2
DR220-2660	H	.2660	2-1/8	3-1/2
DR220-2720	I	.2720	2-1/8	3-1/2
DR220-2770	J	.2770	2-1/8	3-1/2
DR220-2810	K	.2810	2-1/8	3-1/2
DR220-2812	9/32	.2812	2-1/8	3-1/2
DR220-2900	L	.2900	2-1/8	3-1/2
DR220-2950	M	.2950	2-3/8	3-3/4
DR220-2969	19/64	.2969	2-3/8	3-3/4
DR220-3020	N	.3030	2-3/8	3-3/4
DR220-3125	5/16	.3125	2-3/8	3-3/4
DR220-3160	O	.3160	2-3/8	3-3/4
DR220-3230	P	.3230	2-3/8	3-3/4
DR220-3281	21/64	.3281	2-1/2	4
DR220-3320	Q	.3320	2-1/2	4
DR220-3390	R	.3390	2-1/2	4
DR220-3438	11/32	.3438	2-1/2	4
DR220-3480	S	.3480	2-1/2	4
DR220-3580	T	.3580	2-1/2	4
DR220-3594	23/64	.3594	2-1/2	4
DR220-3680	U	.3680	2-3/4	4-1/4
DR220-3750	3/8	.3750	2-3/4	4-1/4
DR220-3770	V	.3770	2-3/4	4-1/4
DR220-3860	W	.3860	2-7/8	4-1/2
DR220-3906	25/64	.3906	2-7/8	4-1/2
DR220-3970	X	.3970	2-7/8	4-1/2
DR220-4040	Y	.4040	2-7/8	4-1/2
DR220-4062	13/32	.4062	2-7/8	4-1/2
DR220-4130	Z	.4130	2-7/8	4-1/2
DR220-4219	27/64	.4219	2-7/8	4-1/2
DR220-4375	7/16	.4375	2-7/8	4-1/2
DR220-4531	29/64	.4531	3	4-3/4
DR220-4688	15/32	.4688	3	4-3/4
DR220-4844	31/64	.4844	3	4-3/4
DR220-5000	1/2	.5000	3	4-3/4

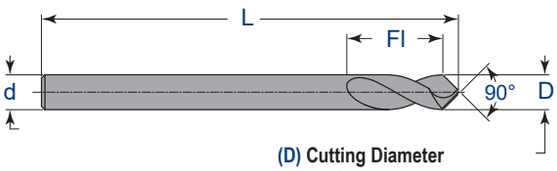
Additional sizes available upon request.
Coating available upon request.

For speeds and feeds, refer to page 133.

SD221 NC DRILL MICRO GRAIN CARBIDE

2 Flute - 90° Point

CARBIDE | 20° | SPEEDS &FEEDS | BRIGHT



(D) Cutting Diameter
+.0000
-.0005

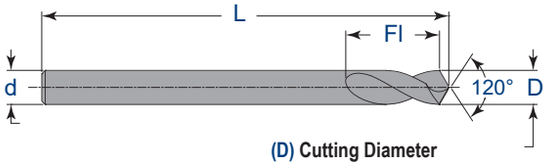
SD221 90°	D cutting dia.	decimal equiv.	Fl flute length	d shank dia.	L overall length
SD221-1875-90	3/16	.1875	1/2	3/16	2
SD221-2500-90	1/4	.2500	3/4	1/4	2-1/2
SD221-3125-90	5/16	.3125	1	5/16	3
SD221-3750-90	3/8	.3750	1-1/4	3/8	3
SD221-5000-90	1/2	.5000	1-1/2	1/2	4

For speeds and feeds, refer to page 134.

SD221 NC DRILL MICRO GRAIN CARBIDE

2 Flute - 120° Point

CARBIDE | 20° | SPEEDS &FEEDS | BRIGHT



(D) Cutting Diameter
+.0000
-.0005

SD221 120°	D cutting dia.	decimal equiv.	Fl flute length	d shank dia.	L overall length
SD221-1875-120	3/16	.1875	1/2	3/16	2
SD221-2500-120	1/4	.2500	3/4	1/4	2-1/2
SD221-3125-120	5/16	.3125	1	5/16	3
SD221-3750-120	3/8	.3750	1-1/4	3/8	3
SD221-5000-120	1/2	.5000	1-1/2	1/2	4

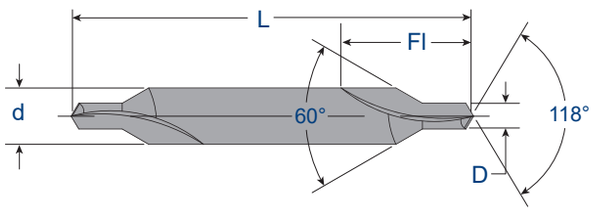
For speeds and feeds, refer to page 134.

DR235 COMBINATION DRILL COUNTERSINK

Straight Flute - 118° 4 Facet Point - 60° C'Sink Angle

DR235 Series is a combination drill and countersink. The straight flute construction provides strength making it ideal for working with difficult materials. A 60° included countersink angle is standard. Other countersink angles can be made to order by request.

CARBIDE | 0° | SPEEDS & FEEDS | BRIGHT

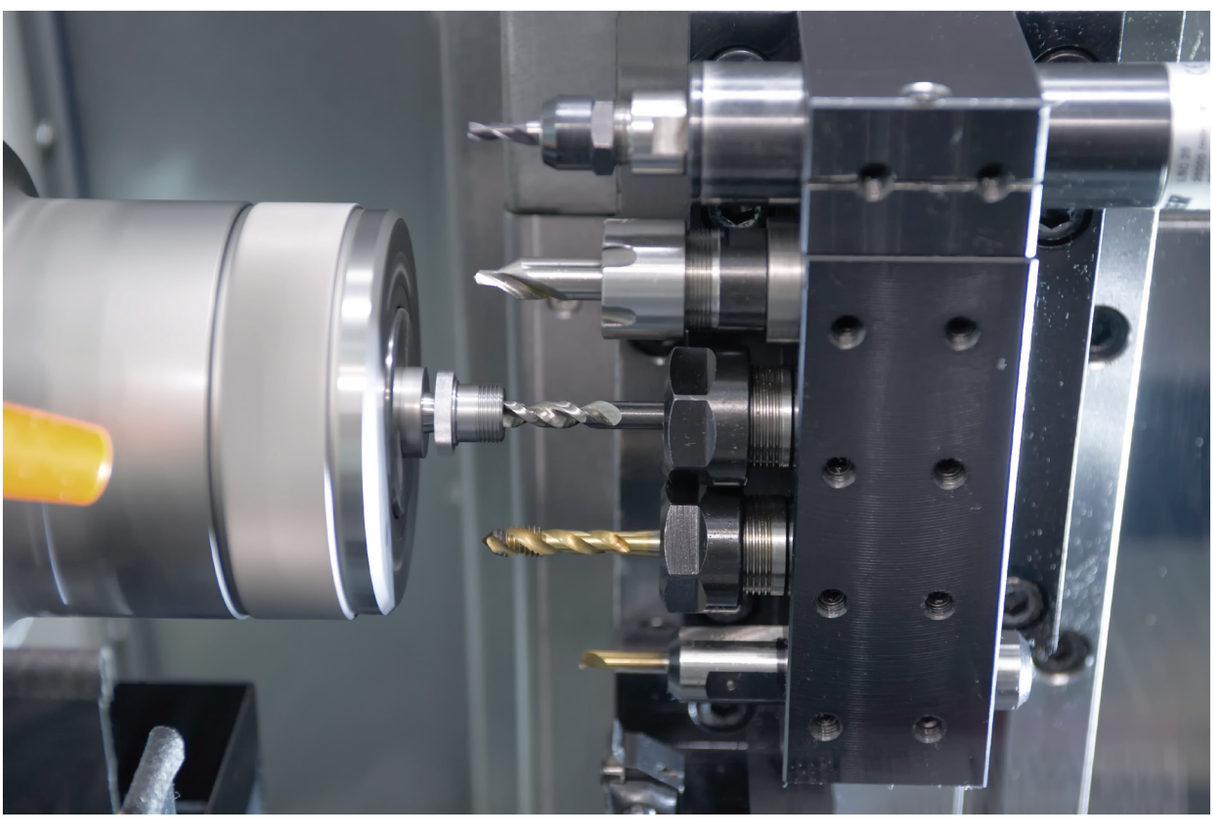


(d) Shank Diameter
+.0000"
-.0005"

(D) Cutting Diameter
+.0000"
-.0005"

DR235 straight flute	D cutting dia.	d shank dia.	Fl flute length	L overall length
DR235-0010	3/64	1/8	25/64	1-1/4
DR235-0020	5/64	3/16	5/8	1-7/8
DR235-0030	7/64	1/4	51/64	2
DR235-0040	1/8	5/16	51/64	2-1/8
DR235-0050	3/16	7/16	15/16	2-3/4
DR235-0060	7/32	1/2	15/16	3

Special sizes and flats available upon request.
Coating also available upon request.

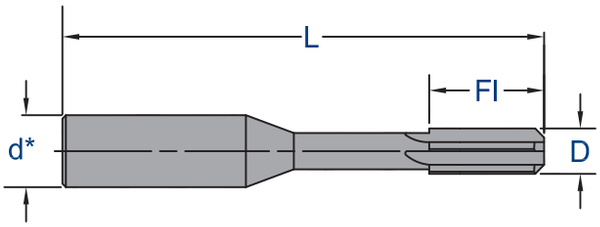


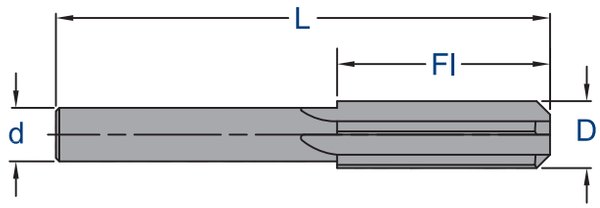
For speeds and feeds, refer to page 134.

RM300 STRAIGHT FLUTE

4 Flute - Right Hand Cutting

CARBIDE | 0° | SPEEDS & FEEDS | BRIGHT





Size	(d) Shank Diameter	(D) Cutting Diameter	(F) No. of Flutes
.0625-.2540	+.000/-.001	+.0001/+.0004	4
.2541-.5000	+.000/-.001	+.0001/+.0005	6

RM300 4 flute	D cutting dia.	dec equiv	Fl flute length	d shank dia.	L overall length
RM300-0625	1/16	.0625	3/8	.1250*	1-1/2
RM300-0635	52	.0635	3/8	.1250*	1-1/2
RM300-0670	51	.0670	1/2	.1250*	1-3/4
RM300-0700	50	.0700	1/2	.1250*	1-3/4
RM300-0730	49	.0730	1/2	.1250*	1-3/4
RM300-0760	48	.0760	1/2	.1250*	1-3/4
RM300-0781	5/64	.0781	1/2	.1250*	1-3/4
RM300-0785	47	.0785	1/2	.1250*	1-3/4
RM300-0810	46	.0810	1/2	.1250*	2
RM300-0820	45	.0820	1/2	.1250*	2
RM300-0860	44	.0860	1/2	.1250*	2
RM300-0890	43	.0890	1/2	.1250*	2
RM300-0935	42	.0935	1/2	.1250*	2
RM300-0938	3/32	.0938	1/2	.1250*	2
RM300-0960	41	.0960	5/8	.1250*	2-1/4
RM300-0980	40	.0980	5/8	.1250*	2-1/4
RM300-0995	39	.0995	5/8	.1250*	2-1/4
RM300-1015	38	.1015	5/8	.1250*	2-1/4
RM300-1040	37	.1040	5/8	.1250*	2-1/4
RM300-1065	36	.1065	5/8	.1250*	2-1/4
RM300-1094	7/64	.1094	5/8	.1250*	2-1/4
RM300-1100	35	.1100	5/8	.1250*	2-1/4
RM300-1110	34	.1110	5/8	.1250*	2-1/4
RM300-1130	33	.1130	5/8	.1250*	2-1/4
RM300-1160	32	.1160	5/8	.1250*	2-1/4
RM300-1200	31	.1200	5/8	.1250*	2-1/4

RM300 4 flute	D cutting dia.	dec equiv	Fl flute length	d shank dia.	L overall length
RM300-1250	1/8	.1250	5/8	.1250	2-1/4
RM300-1285	30	.1285	5/8	.1250	2-1/4
RM300-1360	29	.1360	3/4	.1250	2-1/2
RM300-1405	28	.1405	3/4	.1250	2-1/2
RM300-1406	9/64	.1406	3/4	.1250	2-1/2
RM300-1440	27	.1440	3/4	.1250	2-1/2
RM300-1470	26	.1470	3/4	.1406	2-1/2
RM300-1495	25	.1495	3/4	.1406	2-1/2
RM300-1520	24	.1520	3/4	.1406	2-1/2
RM300-1540	23	.1540	3/4	.1406	2-1/2
RM300-1562	5/32	.1562	3/4	.1406	2-1/2
RM300-1570	22	.1570	3/4	.1406	2-1/2
RM300-1590	21	.1590	3/4	.1406	2-1/2
RM300-1610	20	.1610	7/8	.1562	2-3/4
RM300-1660	19	.1660	7/8	.1562	2-3/4
RM300-1695	18	.1695	7/8	.1562	2-3/4
RM300-1719	11/64	.1719	7/8	.1562	2-3/4
RM300-1730	17	.1730	7/8	.1562	2-3/4
RM300-1770	16	.1770	7/8	.1719	2-3/4
RM300-1800	15	.1800	7/8	.1719	2-3/4
RM300-1820	14	.1820	7/8	.1719	2-3/4
RM300-1850	13	.1850	7/8	.1719	2-3/4
RM300-1875	3/16	.1875	7/8	.1719	2-3/4
RM300-1890	12	.1890	7/8	.1719	2-3/4
RM300-1910	11	.1910	7/8	.1875	2-3/4
RM300-1935	10	.1935	7/8	.1875	2-3/4

Special sizes and flats available upon request.

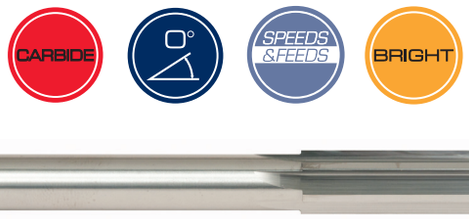
Right hand spiral and left hand spiral, available upon request.

For speeds and feeds, refer to page 135.

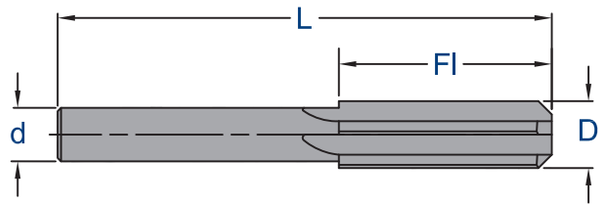
QUALITY TECH TOOL

RM300 STRAIGHT FLUTE

4 and 6 Flute - Right Hand Cutting



Special sizes and flats available upon request.



Size	(d) Shank Diameter	(D) Cutting Diameter	(F) No. of Flutes
.0625-.2540	+.000/-.001	+.0001/+.0004	4
.2541-.5000	+.000/-.001	+.0001/+.0005	6

RM300 4 & 6 flute	D cutting dia.	dec equiv	Fl flute length	d shank dia.	L overall length
RM300-1960	9	.1960	1	.1875	3
RM300-1990	8	.1990	1	.1875	3
RM300-2010	7	.2010	1	.1875	3
RM300-2031	13/64	.2031	1	.1875	3
RM300-2040	6	.2040	1	.1875	3
RM300-2055	5	.2055	1	.1875	3
RM300-2090	4	.2090	1	.1875	3
RM300-2130	3	.2130	1	1875	3
RM300-2188	7/32	.2188	1	.1875	3
RM300-2210	2	.2210	1	.1875	3
RM300-2280	1	.2280	1	.2188	3
RM300-2340	A	.2340	1	.2188	3
RM300-2344	15/64	.2344	1	.2188	3
RM300-2380	B	.2380	1	.2188	3
RM300-2420	C	.2420	1	.2188	3
RM300-2460	D	.2460	1	.2188	3
RM300-2500	1/4	.2500	1	.2188	3
RM300-2500	E	.2500	1	.2188	3
RM300-2570	F	.2570	1-1/8	.2500	3-1/4
RM300-2610	G	.2610	1-1/8	.2500	3-1/4
RM300-2656	17/64	.2656	1-1/8	.2500	3-1/4
RM300-2660	H	.2660	1-1/8	.2500	3-1/4
RM300-2720	I	.2720	1-1/8	.2500	3-1/4
RM300-2770	J	.2770	1-1/8	.2500	3-1/4
RM300-2810	K	.2810	1-1/8	.2500	3-1/4
RM300-2812	9/32	.2812	1-1/8	.2500	3-1/4
RM300-2900	L	.2900	1-1/8	.2812	3-1/4

Right hand spiral and left hand spiral, available upon request.

RM300 4 & 6 flute	D cutting dia.	dec equiv	Fl flute length	d shank dia.	L overall length
RM300-2950	M	.2950	1-1/8	.2812	3-1/4
RM300-2969	19/64	.2969	1-1/8	.2812	3-1/4
RM300-3020	N	.3030	1-1/8	.2812	3-1/4
RM300-3125	5/16	.3125	1-1/8	.2812	3-1/4
RM300-3160	O	.3160	1-1/8	.3125	3-1/4
RM300-3230	P	.3230	1-1/4	.3125	3-1/2
RM300-3281	21/64	.3281	1-1/4	.3125	3-1/2
RM300-3320	Q	.3320	1-1/4	.3125	3-1/2
RM300-3390	R	.3390	1-1/4	.3125	3-1/2
RM300-3438	11/32	.3438	1-1/4	.3125	3-1/2
RM300-3480	S	.3480	1-1/4	.3125	3-1/2
RM300-3580	T	.3580	1-1/4	.3125	3-1/2
RM300-3594	23/64	.3594	1-1/4	.3125	3-1/2
RM300-3680	U	.3680	1-1/4	.3594	3-1/2
RM300-3750	3/8	.3750	1-1/4	.3594	3-1/2
RM300-3770	V	.3770	1-1/4	.3594	3-1/2
RM300-3860	W	.3860	1-1/4	.3594	3-1/2
RM300-3906	25/64	.3906	1-1/4	.3750	3-1/2
RM300-3970	X	.3970	1-1/4	.3750	3-1/2
RM300-4040	Y	.4040	1-1/4	.3750	3-1/2
RM300-4062	13/32	.4062	1-1/4	.3750	3-1/2
RM300-4130	Z	.4130	1-1/4	.3750	3-1/2
RM300-4219	27/64	.4219	1-3/8	.3750	3-3/4
RM300-4375	7/16	.4375	1-3/8	.3750	3-3/4
RM300-4531	29/64	.4531	1-3/8	.4375	3-3/4
RM300-4688	15/32	.4688	1-3/8	.4375	3-3/4
RM300-4844	31/64	.4844	1-1/2	.4375	4
RM300-5000	1/2	.5000	1-1/2	.4375	4

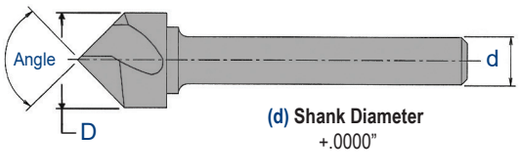
For speeds and feeds, refer to page 135.

CS700

CS700 Series countersinks are contructed for use on non-ferrous metals and soft steels.

Single Flute - Hardened Steel Shank

CARBIDE | SPEEDS &FEEDS | BRIGHT



(d) Shank Diameter
+.0000"
-.0010"

CS700 4 & 6 flute	D cutting dia.	d shank dia.	Angle overall degree
CS700-1250	1/8*	1/8	60
CS700-1251	1/8*	1/8	82
CS700-1252	1/8*	1/8	90
CS700-1870	3/16*	3/16	60
CS700-1871	3/16*	3/16	82
CS700-1872	3/16*	3/16	90
CS700-2500	1/4*	1/4	60
CS700-2501	1/4*	1/4	82
CS700-2502	1/4*	1/4	90

CS700 single flute	D cutting dia.	d shank dia.	Angle overall degree
CS700-3750	3/8	1/4	60
CS700-3751	3/8	1/4	82
CS700-3752	3/8	1/4	90
CS700-5000	1/2	1/4	60
CS700-5001	1/2	1/4	82
CS700-5002	1/2	1/4	90
CS700-6250	5/8	1/4	60
CS700-6251	5/8	1/4	82
CS700-6252	5/8	1/4	90
CS700-6253	5/8	3/8	60
CS700-6254	5/8	3/8	82
CS700-6255	5/8	3/8	90
CS700-7500	3/4	3/8	60
CS700-7501	3/4	3/8	82
CS700-7502	3/4	3/8	90
CS700-1000	1	1/2	60
CS700-1001	1	1/2	82
CS700-1002	1	1/2	90

Special sizes and flats available upon request.

For speeds and feeds, refer to pages 136-137.

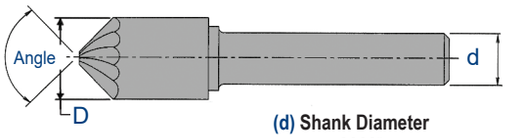
*** Indicates solid carbide, all others hardened steel shank**

CS701

CS701 Series countersinks are contructed for use on hardened steel up to 60 Rockwell "C".

Multiple Flute - Hardened Steel Shank

CARBIDE | SPEEDS &FEEDS | BRIGHT



(d) Shank Diameter
+.0000"
-.0010"

CS701 multi-flute	D cutting dia.	d shank dia.	Angle overall degree
CS701-2500	1/4*	1/4	60
CS701-2501	1/4*	1/4	82
CS701-2502	1/4*	1/4	90
CS701-3750	3/8	1/4	60
CS701-3751	3/8	1/4	82

CS701 multi-flute	D cutting dia.	d shank dia.	Angle overall degree
CS701-3752	3/8	1/4	90
CS701-5000	1/2	1/4	60
CS701-5001	1/2	1/4	82
CS701-5002	1/2	1/4	90
CS701-6250	5/8	3/8	60
CS701-6251	5/8	3/8	82
CS701-6252	5/8	3/8	90
CS701-7500	3/4	3/8	60
CS701-7501	3/4	3/8	82
CS701-7502	3/4	3/8	90
CS701-1000	1	1/2	60
CS701-1001	1	1/2	82
CS701-1002	1	1/2	90

Special sizes and flats available upon request.

For speeds and feeds, refer to pages 136-137.

*** Indicates solid carbide, all others hardened steel shank**

CS706

CS706 Series countersinks are designed for chatter-free operation. This contruction performs well on hardened steels, high temperature alloys and aluminum applications

6 Flute - Hardened Steel Shank

CARBIDE | 0° | SPEEDS &FEEDS | BRIGHT

(d) Shank Diameter
+.0000"
-.0010"

Special sizes and flats available upon request.

For speeds and feeds, refer to pages 136-137.

CS706 6 flute	D cutting dia.	d shank dia.	Angle overall degree
CS706-2500	1/4*	1/4	60
CS706-2501	1/4*	1/4	82
CS706-2502	1/4*	1/4	90
CS706-3750	3/8	1/4	60
CS706-3751	3/8	1/4	82
CS706-3752	3/8	1/4	90
CS706-5000	1/2	1/4	60
CS706-5001	1/2	1/4	82
CS706-5002	1/2	1/4	90
CS706-6250	5/8	3/8	60
CS706-6251	5/8	3/8	82
CS706-6252	5/8	3/8	90
CS706-7500	3/4	3/8	60
CS706-7501	3/4	3/8	82
CS706-7502	3/4	3/8	90
CS706-1000	1	1/2	60
CS706-1001	1	1/2	82
CS706-1002	1	1/2	90

*** Indicates solid carbide, all others hardened steel shank**

GENERAL PURPOSE END MILLS

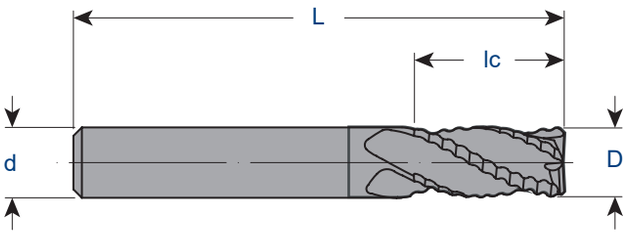
QUALITY TECH TOOL

EM400

4 Flute - Rough Style - 30° Helix

The ROUGHY MILL is designed for milling harder metals at higher feed rates. This design allows for chatter-free operation, chipbreakers are added to elimate bird nesting.

CARBIDE | 30° | SPEEDS &FEEDS | BRIGHT | ROUGH



(d) Shank Diameter +.0000" -.0003"

(D) Cutting Diameter +.0000" -.0015"

EM400 4 flute	D mill dia.	lc length of cut	d shank dia.	L overall length
EM400-2500	1/4	3/4	1/4	2-1/2
EM400-3125	5/16	13/16	5/16	2-1/2
EM400-3750	3/8	7/8	3/8	2-1/2
EM400-5000	1/2	1	1/2	3
EM400-6250	5/8	1-1/4	5/8	3-1/2
EM400-7500	3/4	1-1/2	3/4	4
EM400-1000	1	1-1/2	1	4

Special sizes, coatings, flats and radius available upon request.

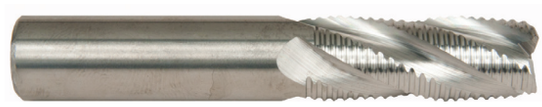
For speeds and feeds, refer to pages 138-140.

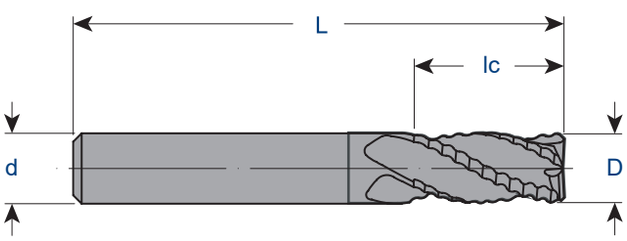
EM401

4-6 Flute - Rough Style - 45° Helix

The ROUGHY MILL is designed for milling harder metals at higher feed rates. This design allows for chatter-free operation, chipbreakers are added to elimate bird nesting.

CARBIDE | 45° | SPEEDS &FEEDS | BRIGHT | ROUGH





(d) Shank Diameter +.0000" -.0003"

(D) Cutting Diameter +.0000" -.0015"

EM401 4-6 flute	D mill dia.	lc length of cut	d shank dia.	L overall length	f no. of flutes
EM401-2500	1/4	3/4	1/4	2-1/2	4
EM401-3125	5/16	3/4	5/16	2-1/2	4
EM401-3750	3/8	1	3/8	2-1/2	4
EM401-5000	1/2	1-1/4	1/2	3	4
EM401-6250	5/8	1-5/8	5/8	3-1/2	5
EM401-7500	3/4	1-5/8	3/4	4	6
EM401-1000	1	1-3/4	1	4	6

Special sizes, coatings, flats and radius available upon request.

For speeds and feeds, refer to pages 138-140.

EM402 • EM403 • EM404

General Purpose End Mills - Sub-Micrograin Carbide

INCH

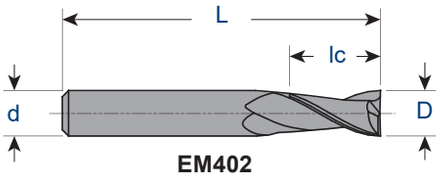
QUALITY TECH TOOL

STANDARD LENGTH • SINGLE END • SQUARE END

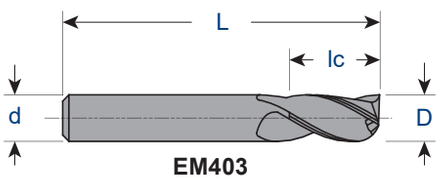
2, 3, and 4 Flute

A general purpose end mill with maximum chip clearance used for end milling, slotting and sinking. For use with cast iron, non-ferrous metals, plastics and abrasive type materials

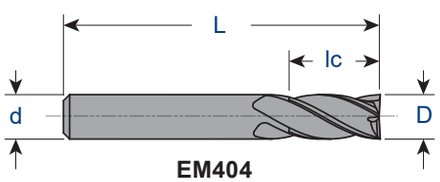
CARBIDE | 30° | SPEEDS & FEEDS | BRIGHT



EM402



EM403



EM404

EM402 2 flute	EM403 3 flute	EM404 4 flute	D mill dia.	lc length of cut	d shank dia.	L overall length
EM402-0156	EM403-0156	EM404-0156	1/64	1/64	1/8	1-1/2
EM402-0312	EM403-0312	EM404-0312	1/32	1/32	1/8	1-1/2
EM402-0469	EM403-0469	EM404-0469	3/64	9/64	1/8	1-1/2
EM402-0625	EM403-0625	EM404-0625	1/16	3/16	1/8	1-1/2
EM402-0781	EM403-0781	EM404-0781	5/64	1/4	1/8	1-1/2
EM402-0938	EM403-0938	EM404-0938	3/32	5/16	1/8	1-1/2
EM402-1094	EM403-1094	EM404-1094	7/64	3/8	1/8	1-1/2
EM402-1250	EM403-1250	EM404-1250	1/8	1/2	1/8	1-1/2
EM402-1406	EM403-1406	EM404-1406	9/64	1/2	3/16	2
EM402-1562	EM403-1562	EM404-1562	5/32	9/16	3/16	2
EM402-1719	EM403-1719	EM404-1719	11/64	9/16	3/16	2
EM402-1875	EM403-1875	EM404-1875	3/16	5/8	3/16	2
EM402-2031	EM403-2031	EM404-2031	13/64	5/8	1/4	2-1/2
EM402-2188	EM403-2188	EM404-2188	7/32	5/8	1/4	2-1/2
EM402-2344	EM403-2344	EM404-2344	15/64	3/4	1/4	2-1/2
EM402-2500	EM403-2500	EM404-2500	1/4	3/4	1/4	2-1/2
EM402-2656	EM403-2656	EM404-2656	17/64	3/4	5/16	2-1/2
EM402-2812	EM403-2812	EM404-2812	9/32	3/4	5/16	2-1/2
EM402-2969	EM403-2969	EM404-2969	19/64	13/16	5/16	2-1/2
EM402-3125	EM403-3125	EM404-3125	5/16	13/16	5/16	2-1/2
EM402-3281	EM403-3281*	EM404-3281	21/64	7/8	3/8	2-1/2
EM402-3438	EM403-3438*	EM404-3438	11/32	7/8	3/8	2-1/2
EM402-3594	EM403-3594*	EM404-3594	23/64	7/8	3/8	2-1/2
EM402-3750	EM403-3750	EM404-3750	3/8	7/8	3/8	2-1/2
EM402-3906	EM403-3906*	EM404-3906	25/64	1	7/16	2-3/4
EM402-4062	EM403-4062*	EM404-4062	13/32	1	7/16	2-3/4
EM402-4219	EM403-4219*	EM404-4219	27/64	1	7/16	2-3/4
EM402-4375	EM403-4375	EM404-4375	7/16	1	7/16	2-3/4
EM402-4531	EM403-4531*	EM404-4531	29/64	1	1/2	3
EM402-4844	EM403-4844*	EM404-4844	31/64	1	1/2	3
EM402-5000	EM403-5000	EM404-5000	1/2	1	1/2	3
EM402-5625	EM403-5625	EM404-5625	9/16	1-1/8	9/16	3-1/2
EM402-6250	EM403-6250	EM404-6250	5/8	1-1/4	5/8	3-1/2
EM402-6875	EM403-6875	EM404-6875	11/16	1-3/8	3/4	4
EM402-7500	EM403-7500	EM404-7500	3/4	1-1/2	3/4	4
EM402-8750	EM403-8750	EM404-8750	7/8	1-1/2	7/8	4
EM402-1000	EM403-1000	EM404-1000	1	1-1/2	1	4

(d) Shank Diameter
+.0000"
-.0003"

(D) Cutting Diameter
+.0000"
-.0015"

*Available upon request.
Special sizes, coatinds, flats and radius available upon request.

For speeds and feeds, refer to pages 141-142, 144-145.

EM402BN • EM403BN • EM404BN

General Purpose End Mills - Sub-Micrograin Carbide

INCH

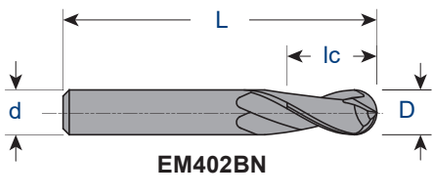
QUALITY TECH TOOL

STANDARD LENGTH • SINGLE END • BALL NOSE

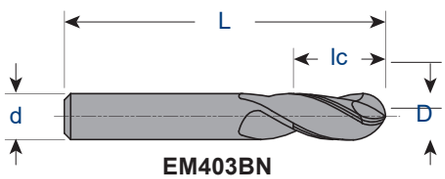
2, 3, and 4 Flute

A general purpose end mill with maximum chip clearance used for end milling, slotting and sinking. For use with cast iron, non-ferrous metals, plastics and abrasive type materials

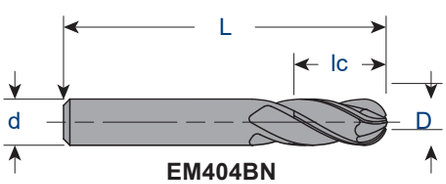
CARBIDE | 30° | SPEEDS & FEEDS | BRIGHT



EM402BN



EM403BN



EM404BN

(d) Shank Diameter
+.0000"
-.0003"

(D) Cutting Diameter
+.0000"
-.0015"

*Available upon request.
Special sizes, coatinds, flats and radius available upon request.

EM402BN 2 flute	EM403BN 3 flute	EM404BN 4 flute	D mill dia.	lc length of cut	d shank length	L overall length
EM402-0156-BN	-	-	1/64	1/64	1/8	1-1/2
EM402-0312-BN	EM403-0312-BN	EM404-0312-BN	1/32	1/32	1/8	1-1/2
EM402-0469-BN	EM403-0469-BN	EM404-0469-BN	3/64	9/64	1/8	1-1/2
EM402-0625-BN	EM403-0625-BN	EM404-0625-BN	1/16	3/16	1/8	1-1/2
EM402-0781-BN	EM403-0781-BN	EM404-0781-BN	5/64	1/4	1/8	1-1/2
EM402-0938-BN	EM403-0938-BN	EM404-0938-BN	3/32	5/16	1/8	1-1/2
EM402-1094-BN	EM403-1094-BN	EM404-1094-BN	7/64	3/8	1/8	1-1/2
EM402-1250-BN	EM403-1250-BN	EM404-1250-BN	1/8	1/2	1/8	1-1/2
EM402-1406-BN	EM403-1406-BN	EM404-1406-BN	9/64	1/2	3/16	2
EM402-1562-BN	EM403-1562-BN	EM404-1562-BN	5/32	9/16	3/16	2
EM402-1719-BN	EM403-1719-BN	EM404-1719-BN	11/64	9/16	3/16	2
EM402-1875-BN	EM403-1875-BN	EM404-1875-BN	3/16	5/8	3/16	2
EM402-2031-BN	EM403-2031-BN	EM404-2031-BN	13/64	5/8	1/4	2-1/2
EM402-2188-BN	EM403-2188-BN	EM404-2188-BN	7/32	5/8	1/4	2-1/2
EM402-2344-BN	EM403-2344-BN	EM404-2344-BN	15/64	3/4	1/4	2-1/2
EM402-2500-BN	EM403-2500-BN	EM404-2500-BN	1/4	3/4	1/4	2-1/2
EM402-2656-BN	EM403-2656-BN	EM404-2656-BN	17/64	3/4	5/16	2-1/2
EM402-2812-BN	EM403-2812-BN	EM404-2812-BN	9/32	3/4	5/16	2-1/2
EM402-2969-BN	EM403-2969-BN	EM404-2969-BN	19/64	13/16	5/16	2-1/2
EM402-3125-BN	EM403-3125-BN	EM404-3125-BN	5/16	13/16	5/16	2-1/2
EM402-3281-BN	EM403-3281-BN*	EM404-3281-BN	21/64	7/8	3/8	2-1/2
EM402-3438-BN	EM403-3438-BN*	EM404-3438-BN	11/32	7/8	3/8	2-1/2
EM402-3594-BN	EM403-3594-BN*	EM404-3594-BN	23/64	7/8	3/8	2-1/2
EM402-3750-BN	EM403-3750-BN	EM404-3750-BN	3/8	7/8	3/8	2-1/2
EM402-3906-BN	EM403-3906-BN*	EM404-3906-BN	25/64	1	7/16	2-3/4
EM402-4062-BN	EM403-4062-BN*	EM404-4062-BN	13/32	1	7/16	2-3/4
EM402-4219-BN	EM403-4219-BN*	EM404-4219-BN	27/64	1	7/16	2-3/4
EM402-4375-BN	EM403-4375-BN	EM404-4375-BN	7/16	1	7/16	2-3/4
EM402-4531-BN	EM403-4531-BN*	EM404-4531-BN	29/64	1	1/2	3
EM402-4844-BN	EM403-4844-BN*	EM404-4844-BN	31/64	1	1/2	3
EM402-5000-BN	EM403-5000-BN	EM404-5000-BN	1/2	1	1/2	3
EM402-5625-BN	EM403-5625-BN	EM404-5625-BN	9/16	1-1/8	9/16	3-1/2
EM402-6250-BN	EM403-6250-BN	EM404-6250-BN	5/8	1-1/4	5/8	3-1/2
EM402-6875-BN	EM403-6875-BN	EM404-6875-BN	11/16	1-3/8	3/4	4
EM402-7500-BN	EM403-7500-BN	EM404-7500-BN	3/4	1-1/2	3/4	4
EM402-8750-BN	EM403-8750-BN	EM404-8750-BN	7/8	1-1/2	7/8	4
EM402-1000-BN	EM403-1000-BN	EM404-1000-BN	1	1-1/2	1	4

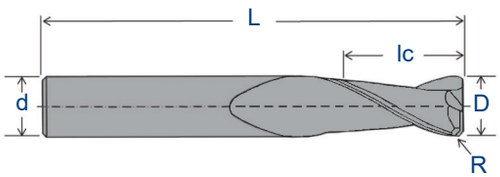
For speeds and feeds, refer to pages 143 and 146.

QUALITY TECH TOOL

EM432

2 Flute - Corner Radius

CARBIDE | 30° | SPEEDS &FEEDS | BRIGHT



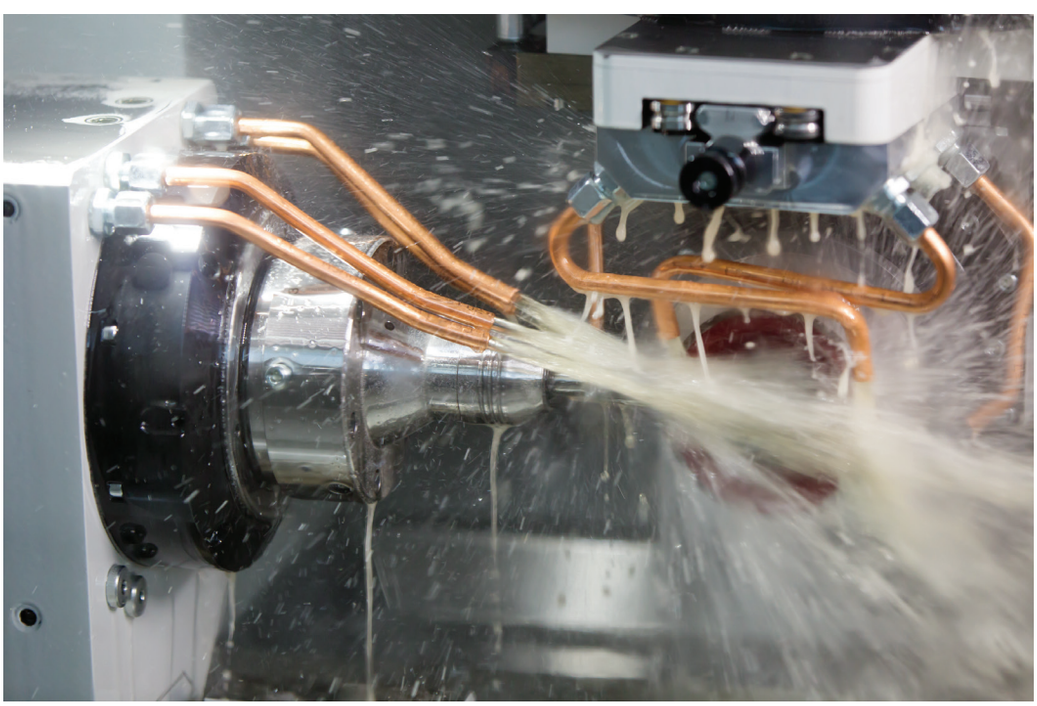
(d) Shank Diameter
+.0000”
-.0003”

(D) Cutting Diameter
+.0000”
-.0015”

Special sizes and flats available upon request.

For speeds and feeds, refer to pages 104-105.

EM432 2 flute	D mill dia.	R corner radius	lc length of cut	d shank dia.	L overall length
EM432-1251	1/8	0.015	1/2	1/8	1-1/2
EM432-1872	3/16	0.020	5/8	3/16	2
EM432-2502	1/4	0.020	3/4	1/4	2-1/2
EM432-2503	1/4	0.030	3/4	1/4	2-1/2
EM432-3122	5/16	0.020	13/16	5/16	2-1/2
EM432-3123	5/16	0.030	13/16	5/16	2-1/2
EM432-3752	3/8	0.020	1	3/8	2-1/2
EM432-3753	3/8	0.030	1	3/8	2-1/2
EM432-5002	1/2	0.020	1	1/2	3
EM432-5003	1/2	0.030	1	1/2	3
EM432-5006	1/2	0.060	1	1/2	3
EM432-6253	5/8	0.030	1-1/4	5/8	3-1/2
EM432-6256	5/8	0.060	1-1/4	5/8	3-1/2
EM432-6259	5/8	0.090	1-1/4	5/8	3-1/2
EM432-7506	3/4	0.060	1-1/2	3/4	4
EM432-7509	3/4	0.090	1-1/2	3/4	4
EM432-7512	3/4	0.125	1-1/2	3/4	4
EM432-1006	1	0.060	1-1/2	1	4
EM432-1009	1	0.090	1-1/2	1	4
EM432-1012	1	0.125	1-1/2	1	4

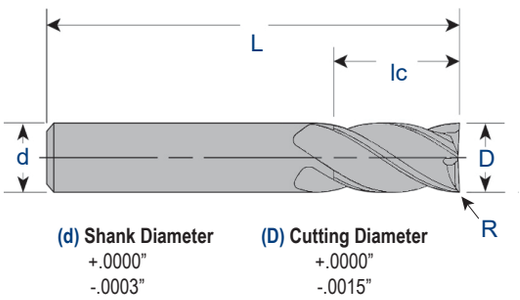


QUALITY TECH TOOL

EM434

4 Flute - Corner Radius

CARBIDE | 30° | SPEEDS & FEEDS | BRIGHT



Special sizes and flats available upon request.

For speeds and feeds, refer to pages 105-106.

EM434 4 flute	D mill dia.	R corner radius	lc length of cut	d shank dia.	L overall length
EM434-1251	1/8	0.015	1/2	1/8	1-1/2
EM434-1872	3/16	0.020	5/8	3/16	2
EM434-2502	1/4	0.020	3/4	1/4	2-1/2
EM434-2503	1/4	0.030	3/4	1/4	2-1/2
EM434-3122	5/16	0.020	13/16	5/16	2-1/2
EM434-3123	5/16	0.030	13/16	5/16	2-1/2
EM434-3752	3/8	0.020	1	3/8	2-1/2
EM434-3753	3/8	0.030	1	3/8	2-1/2
EM434-5002	1/2	0.020	1	1/2	3
EM434-5003	1/2	0.030	1	1/2	3
EM434-5006	1/2	0.060	1	1/2	3
EM434-6253	5/8	0.030	1-1/4	5/8	3-1/2
EM434-6256	5/8	0.060	1-1/4	5/8	3-1/2
EM434-6259	5/8	0.090	1-1/4	5/8	3-1/2
EM434-7506	3/4	0.060	1-1/2	3/4	4
EM434-7509	3/4	0.090	1-1/2	3/4	4
EM434-7512	3/4	0.125	1-1/2	3/4	4
EM434-1006	1	0.060	1-1/2	1	4
EM434-1009	1	0.090	1-1/2	1	4
EM434-1012	1	0.125	1-1/2	1	4

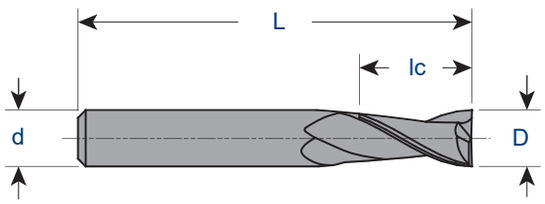
QUALITY TECH TOOL

EM440 FAST CUT

2 Flute - Standard and Long Length

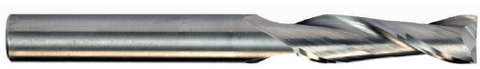
These FAST CUT end mills were designed specifically for milling aluminum and non-ferrous materials. The unique geometry permits higher speed and feed rates without loading. Spindle and feed rates can be increased by 50% for greater productivity without compromising finish

CARBIDE | 40° | SPEEDS &FEEDS | BRIGHT



(d) Shank Diameter +.0000" -.0003"

(D) Cutting Diameter +.0000" -.0015"



EM440 2 flute	D mill dia.	lc length of cut	d shank dia.	L overall length
EM440-2500	1/4	3/4	1/4	2-1/2
EM440-2501	1/4	1-1/2	1/4	4
EM440-3125	5/16	13/16	5/16	2-1/2
EM440-3126	5/16	1-5/8	5/16	4
EM440-3750	3/8	1	3/8	2-1/2
EM440-3751	3/8	1-3/4	3/8	4
EM440-5000	1/2	1	1/2	3
EM440-5001	1/2	2	1/2	4
EM440-6250	5/8	1-1/4	5/8	3-1/2
EM440-6251	5/8	2-1/4	5/8	5
EM440-7500	3/4	1-1/2	3/4	4
EM440-7501	3/4	2-1/4	3/4	5
EM440-1000	1	2-1/4	1	5
EM440-1001	1	3	1	6

Special sizes, coatings, flats and radius available upon request.

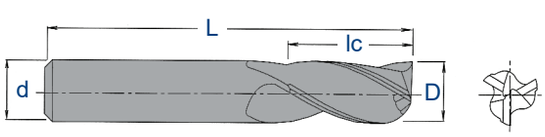
For speeds and feeds, refer to page 147.

EM445 - RHS/RHC

3 Flute - 45° Helix

The three flute 45° right hand helix is designed for higher speeds and feeds while providing a shearing action that produces improved finish. The addition of end center cutting geometry allows for plunge cutting.

CARBIDE | 45° | SPEEDS &FEEDS | BRIGHT



(d) Shank Diameter +.0000" -.0003"

(D) Cutting Diameter +.0000" -.0015"

EM445 3 flute	D mill dia.	lc length of cut	d shank dia.	L overall length
EM445-0625	1/16	3/16	1/8	1-1/2
EM445-0938	3/32	5/16	1/8	1-1/2
EM445-1250	1/8	1/2	1/8	1-1/2
EM445-1562	5/32	9/16	3/16	2
EM445-1875	3/16	5/8	3/16	2
EM445-2188	7/32	5/8	1/4	2-1/2
EM445-2500	1/4	3/4	1/4	2-1/2
EM445-2812	9/32	3/4	5/16	2-1/2
EM445-3125	5/16	13/16	5/16	2-1/2
EM445-3750	3/8	7/8	3/8	2-1/2
EM445-4375	7/16	1	7/16	2-3/4
EM445-5000	1/2	1	1/2	3
EM445-5625	9/16	1-1/8	9/16	3-1/2
EM445-6250	5/8	1-1/4	5/8	3-1/2
EM445-6875	11/16	1-3/8	3/4	4
EM445-7500	3/4	1-1/2	3/4	4
EM445-8750	7/8	1-1/2	7/8	4
EM445-1000	1	1-1/2	1	4

Special sizes, coatings, flats and radius available upon request.

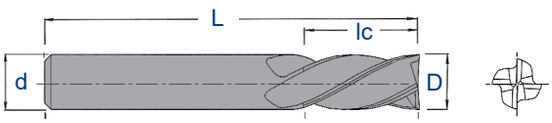
For speeds and feeds, refer to pages 147-148.

EM447

4 Flute - LHS/RHC - 30° Helix

A four flute end mill ideal for profile milling, particularly when working with thin material. The cutting forces are directed up to provide greater rigidity, therefore not suited for slotting applications. All tools in this series are right hand cut with center end cutting geometry.

CARBIDE | 30° | SPEEDS & FEEDS | BRIGHT



(d) Shank Diameter
+.0000"
-.0003"

(D) Cutting Diameter
+.0000"
-.0015"

EM447 4 flute	D mill dia.	lc length of cut	d shank dia.	L overall length
EM447-1250	1/8	1/2	1/8	1-1/2
EM447-1875	3/16	5/8	3/16	2
EM447-2500	1/4	3/4	1/4	2-1/2
EM447-3125	5/16	13/16	5/16	2-1/2
EM447-3750	3/8	7/8	3/8	2-1/2
EM447-4375	7/16	1	7/16	2-3/4
EM447-5000	1/2	1	1/2	3
EM447-5625	9/16	1-1/8	9/16	3-1/2
EM447-6250	5/8	1-1/4	5/8	3-1/2
EM447-7500	3/4	1-1/2	3/4	4
EM447-8750	7/8	1-1/2	7/8	4
EM447-1000	1	1-1/2	1	4

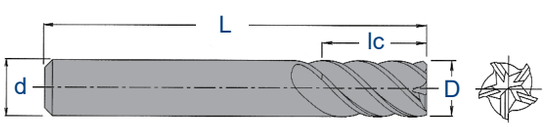
Special sizes, coatings, flats and radius available upon request.

For speeds and feeds, refer to page 144.

EM455

5 Flute - 45° Helix

CARBIDE | 45° | SPEEDS & FEEDS | BRIGHT



(d) Shank Diameter
+.0000"
-.0003"

(D) Cutting Diameter
+.0000"
-.0015"

EM455 5 flutes	D mill dia.	lc length of cut	d shank dia.	L overall length
EM455-1250	1/8	1/2	1/8	1-1/2
EM455-1562	5/32	9/16	3/16	2
EM455-1875	3/16	5/8	3/16	2
EM455-2188	7/32	5/8	1/4	2-1/2
EM455-2500	1/4	3/4	1/4	2-1/2
EM455-2812	9/32	3/4	5/16	2-1/2
EM455-3125	5/16	13/16	5/16	2-1/2
EM455-3750	3/8	1	3/8	2-1/2
EM455-4375	7/16	1	7/16	2-3/4
EM455-5000	1/2	1	1/2	3
EM455-5625	9/16	1-1/8	9/16	3-1/2
EM455-6250	5/8	1-1/4	5/8	3-1/2
EM455-7500	3/4	1-1/2	3/4	4
EM455-1000	1	1-1/2	1	4

Special sizes, coatings, flats and radius available upon request.

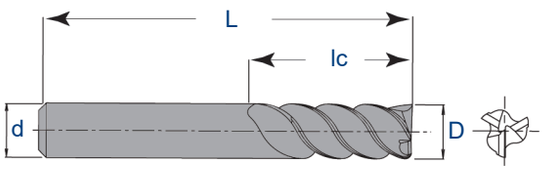
For speeds and feeds, refer to page 111.

QUALITY TECH TOOL

EM460
3 Flute - High Helix

Constructed to mill stainless steel, titanium, inconel and other similar metals where high cutting forces are generated. A high helix angle allows for and increased length in cutting edge engagement, reducing cutting load variations and prolonging tool life. Designed for excellent surface finish with high speed and feed capabilities

CARBIDE | 60° | SPEEDS & FEEDS | BRIGHT



(d) Shank Diameter
+.0000"
-.0003"

(D) Cutting Diameter
+.0000"
-.0015"

EM460 3 flutes	D mill dia.	lc length of cut	d shank dia.	L overall length
EM460-2500	1/4	3/4	1/4	2-1/2
EM460-3125	5/16	13/16	5/16	2-1/2
EM460-3750	3/8	7/8	3/8	2-1/2
EM460-4375	7/16	1	7/16	2-3/4
EM460-5000	1/2	1	1/2	3
EM460-6250	5/8	1-1/4	5/8	3-1/2
EM460-7500	3/4	1-1/2	3/4	4
EM460-1000	1	1-1/2	1	4

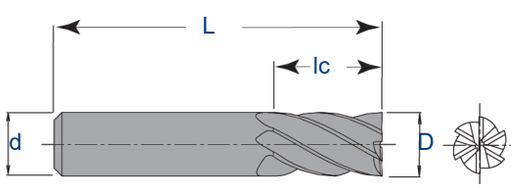
Special sizes, coatings, flats and radius available upon request.

For speeds and feeds, refer to page 149.

EM461 - RHS/RHC
6 Flute

Designed to provide an improved finish where lighter stock removal is permitted on stainless steel, stellite, inconel, titanium, alloys and similar materials. End mills have a 30° helix and are center end cutting.

CARBIDE | 30° | SPEEDS & FEEDS | BRIGHT



(d) Shank Diameter
+.0000"
-.0003"

(D) Cutting Diameter
+.0000"
-.0015"

EM461 6 flute	D mill dia.	lc length of cut	d shank dia.	L overall length
EM461-1250	1/8	1/2	1/8	1-1/2
EM461-1562	5/32	9/16	3/16	2
EM461-1875	3/16	5/8	3/16	2
EM461-2500	1/4	3/4	1/4	2-1/2
EM461-2812	9/32	3/4	5/16	2-1/2
EM461-3125	5/16	13/16	5/16	2-1/2
EM461-3750	3/8	7/8	3/8	2-1/2
EM461-4375	7/16	1	7/16	2-3/4
EM461-5000	1/2	1	1/2	3
EM461-5625	9/16	1-1/8	9/16	3-1/2
EM461-6250	5/8	1-1/4	5/8	3-1/2
EM461-6875	11/16	1-3/8	3/4	4
EM461-7500	3/4	1-1/2	3/4	4
EM461-1000	1	1-1/2	1	4

Special sizes, coatings, flats and radius available upon request.

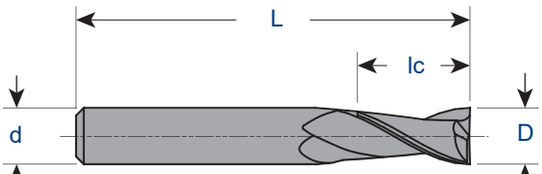
For speeds and feeds, refer to pages 144-145.

EM462 AND EM462BN LONG LENGTH

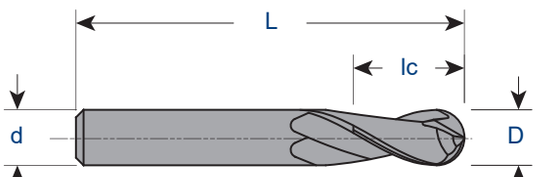
2 Flute - Single End - Square - Ball Nose

CARBIDE | 30° | SPEEDS &FEEDS | BRIGHT

Long length end mills combine added flute and overall length for greater reach when deep slotting or milling. These end mills have the capability to mill thicker cuts in a single pass, thereby eliminating the interrupted cut that may be present with regular length end mills.



(d) Shank Diameter +.0000" -.0003"
(D) Cutting Diameter +.0000" -.0015"



(d) Shank Diameter +.0000" -.0003"
(D) Cutting Diameter +.0000" -.0015"

EM462 2 flute	EM462BN 2 flute	D mill dia.	lc length of cut	d shank dia.	L overall length
EM462-1250	EM462-1250-BN	1/8	3/4	1/8	2-1/4
EM462-1875	EM462-1875-BN	3/16	3/4	3/16	2-1/4
EM462-2500	EM462-2500-BN	1/4	1-1/8	1/4	3
EM462-3125	EM462-3125-BN	5/16	1-1/8	5/16	3
EM462-3750	EM462-3750-BN	3/8	1-1/8	3/8	3
EM462-4375	EM462-4375-BN	7/16	2	7/16	4
EM462-5000	EM462-5000-BN	1/2	2	1/2	4
EM462-6250	EM462-6250-BN	5/8	2-1/4	5/8	5
EM462-7500	EM462-7500-BN	3/4	2-1/4	3/4	5
EM462-1000	EM462-1000-BN	1	2-1/4	1	5

Special sizes, coatings, flats and radius available upon request.

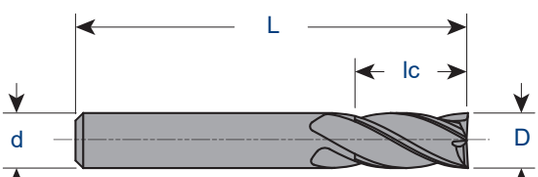
For speeds and feeds, refer to pages 141-143.

EM464 AND EM464BN LONG LENGTH

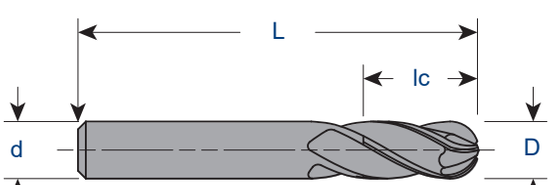
4 Flute - Single End - Square - Ball Nose

CARBIDE | 30° | SPEEDS &FEEDS | BRIGHT

Long length end mills combine added flute and overall length for greater reach when deep slotting or milling. These end mills have the capability to mill thicker cuts in a single pass, thereby eliminating the interrupted cut that may be present with regular length end mills.



(d) Shank Diameter +.0000" -.0003"
(D) Cutting Diameter +.0000" -.0015"



(d) Shank Diameter +.0000" -.0003"
(D) Cutting Diameter +.0000" -.0015"

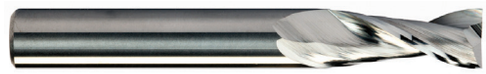
EM464 4 flute	EM464BN 4 flute	D mill dia.	lc length of cut	d shank dia.	L overall length
EM464-1250	EM464-1250-BN	1/8	3/4	1/8	2-1/4
EM464-1875	EM464-1875-BN	3/16	3/4	3/16	2-1/4
EM464-2500	EM464-2500-BN	1/4	1-1/8	1/4	3
EM464-3125	EM464-3125-BN	5/16	1-1/8	5/16	3
EM464-3750	EM464-3750-BN	3/8	1-1/8	3/8	3
EM464-4375	EM464-4375-BN	7/16	2	7/16	4
EM464-5000	EM464-5000-BN	1/2	2	1/2	4
EM464-6250	EM464-6250-BN	5/8	2-1/4	5/8	5
EM464-7500	EM464-7500-BN	3/4	2-1/4	3/4	5
EM464-1000	EM464-1000-BN	1	2-1/4	1	5

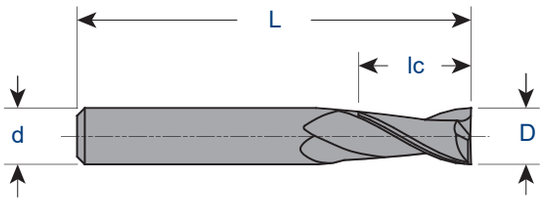
Special sizes, coatings, flats and radius available upon request.

For speeds and feeds, refer to pages 144-146.

EM470

2 Flute - Standard Length for Cutting Aluminum





(d) Shank Diameter
+.0000"
-.0003"

(D) Cutting Diameter
+.0000"
-.0015"

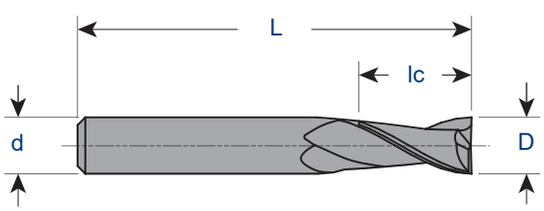
EM470 2 flute	D mill dia.	lc length of cut	d shank dia.	L overall length
EM470-1250	1/8	1/4	1/8	1-1/2
EM470-1875	3/16	5/16	3/16	2
EM470-2500	1/4	3/8	1/4	2-1/2
EM470-3125	5/16	7/16	5/16	2-1/2
EM470-3750	3/8	1/2	3/8	2-1/2
EM470-4375	7/16	9/16	7/16	2-3/4
EM470-5000	1/2	5/8	1/2	3
EM470-6250	5/8	3/4	5/8	3-1/2
EM470-7500	3/4	1	3/4	4
EM470-1000	1	1-1/4	1	4

Coatings and shank flats available upon request.

For speeds and feeds, refer to pages 113-115.

EM471

2 Flute - Long Length for Cutting Aluminum



(d) Shank Diameter
+.0000"
-.0003"

(D) Cutting Diameter
+.0000"
-.0015"

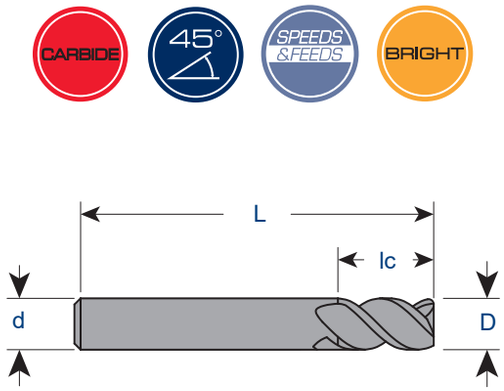
EM471 2 flute	D mill dia.	lc length of cut	d shank dia.	L overall length
EM471-1250	1/8	3/8	1/8	1-1/2
EM471-1875	3/16	9/16	3/16	2
EM471-2500	1/4	3/4	1/4	2-1/2
EM471-3125	5/16	13/16	5/16	2-1/2
EM471-3750	3/8	1	3/8	2-1/2
EM471-4375	7/16	1	7/16	2-3/4
EM471-5000	1/2	1-1/4	1/2	3
EM471-6250	5/8	1-5/8	5/8	3-1/2
EM471-7500	3/4	1-5/8	3/4	4
EM471-1000	1	2	1	5

Coatings and shank flats available upon request.

For speeds and feeds, refer to pages 113-115.

EM475

3 Flute - Standard Length for Cutting Aluminum



(d) Shank Diameter
+.0000"
-.0003"

(D) Cutting Diameter
+.0000"
-.0015"

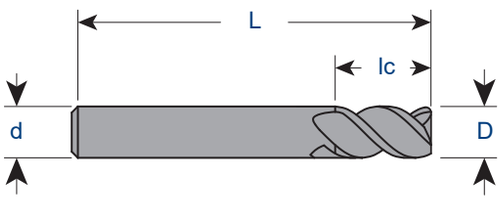
EM475 3 flutes	D mill dia.	lc length of cut	d shank dia.	L overall length
EM475-1250	1/8	1/4	1/8	1-1/2
EM475-1875	3/16	5/16	3/16	2
EM475-2500	1/4	3/8	1/4	2-1/2
EM475-3125	5/16	7/16	5/16	2-1/2
EM475-3750	3/8	1/2	3/8	2-1/2
EM475-4375	7/16	9/16	7/16	2-3/4
EM475-5000	1/2	5/8	1/2	3
EM475-6250	5/8	3/4	5/8	3-1/2
EM475-7500	3/4	1	3/4	4
EM475-1000	1	1-1/4	1	4

Coatings and shank flats available upon request.

For speeds and feeds, refer to pages 116-118.

EM476

3 Flute - Long Length for Cutting Aluminum



(d) Shank Diameter
+.0000"
-.0003"

(D) Cutting Diameter
+.0000"
-.0015"

EM476 3 flutes	D mill dia.	lc length of cut	d shank dia.	L overall length
EM476-1250	1/8	3/8	1/8	1-1/2
EM476-1875	3/16	9/16	3/16	2
EM476-2500	1/4	5/8	1/4	2-1/2
EM476-3125	5/16	13/16	5/16	2-1/2
EM476-3750	3/8	1	3/8	2-1/2
EM476-4375	7/16	1-1/4	7/16	2-3/4
EM476-5000	1/2	1-1/4	1/2	3
EM476-6250	5/8	1-5/8	5/8	3-1/2
EM476-7500	3/4	1-5/8	3/4	4
EM476-1000	1	2	1	5

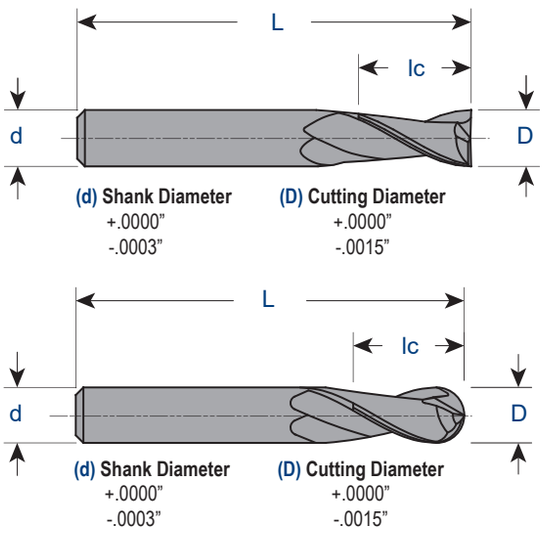
Coatings and shank flats available upon request.

For speeds and feeds, refer to pages 116-118.

EM482 AND EM482BN EXTRA LONG LENGTH

2 Flute - Single End - Square End - Ball Nose

CARBIDE | 30° | SPEEDS & FEEDS | BRIGHT



Extra long length end mills combine added flute and overall length for greater reach when deep slotting or milling. These end mills have the capability to mill thicker cuts in a single pass, thereby eliminating the interrupted cut that may be present with regular length end mills.

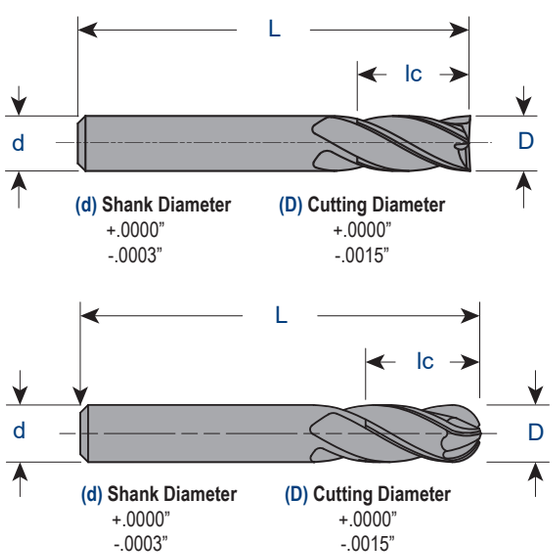
EM482 2 flute	EM482BN 2 flute	D mill dia.	lc length of cut	d shank dia.	L overall length
EM482-1250	EM482-1250-BN	1/8	1	1/8	3
EM482-1875	EM482-1875-BN	3/16	1-1/8	3/16	3
EM482-2500	EM482-2500-BN	1/4	1-1/2	1/4	4
EM482-3125	EM482-3125-BN	5/16	1-5/8	5/16	4
EM482-3750	EM482-3750-BN	3/8	1-3/4	3/8	4
EM482-4375	EM482-4375-BN	7/16	3	7/16	6
EM482-5000	EM482-5000-BN	1/2	3	1/2	6
EM482-6250	EM482-6250-BN	5/8	3	5/8	6
EM482-7500	EM482-7500-BN	3/4	3	3/4	6
EM482-1000	EM482-1000-BN	1	3	1	6

Special sizes, coatings, flats and radius available upon request.
For speeds and feeds, refer to pages 141-143.

EM484 AND EM484BN EXTRA LONG LENGTH

4 Flute - Single End - Square End - Ball Nose

CARBIDE | 30° | SPEEDS & FEEDS | BRIGHT



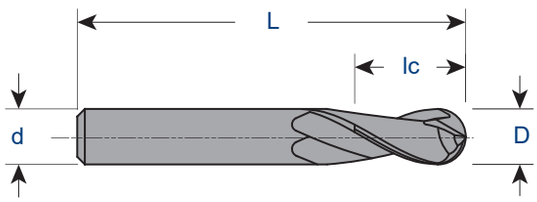
Extra long length end mills combine added flute and overall length for greater reach when deep slotting or milling. These end mills have the capability to mill thicker cuts in a single pass, thereby eliminating the interrupted cut that may be present with regular length end mills.

EM484 4 flute	EM484BN 4 flute	D mill dia.	lc length of cut	d shank dia.	L overall length
EM484-1250	EM484-1250-BN	1/8	1	1/8	3
EM484-1875	EM484-1875-BN	3/16	1-1/8	3/16	3
EM484-2500	EM484-2500-BN	1/4	1-1/2	1/4	4
EM484-3125	EM484-3125-BN	5/16	1-5/8	5/16	4
EM484-3750	EM484-3750-BN	3/8	1-3/4	3/8	4
EM484-4375	EM484-4375-BN	7/16	3	7/16	6
EM484-5000	EM484-5000-BN	1/2	3	1/2	6
EM484-6250	EM484-6250-BN	5/8	3	5/8	6
EM484-7500	EM484-7500-BN	3/4	3	3/4	6
EM484-1000	EM484-1000-BN	1	3	1	6

Special sizes, coatings, flats and radius available upon request.
For speeds and feeds, refer to pages 137-142.

EM497 EXTRA LONG LENGTH

2 Flute - Single End - Ball Nose



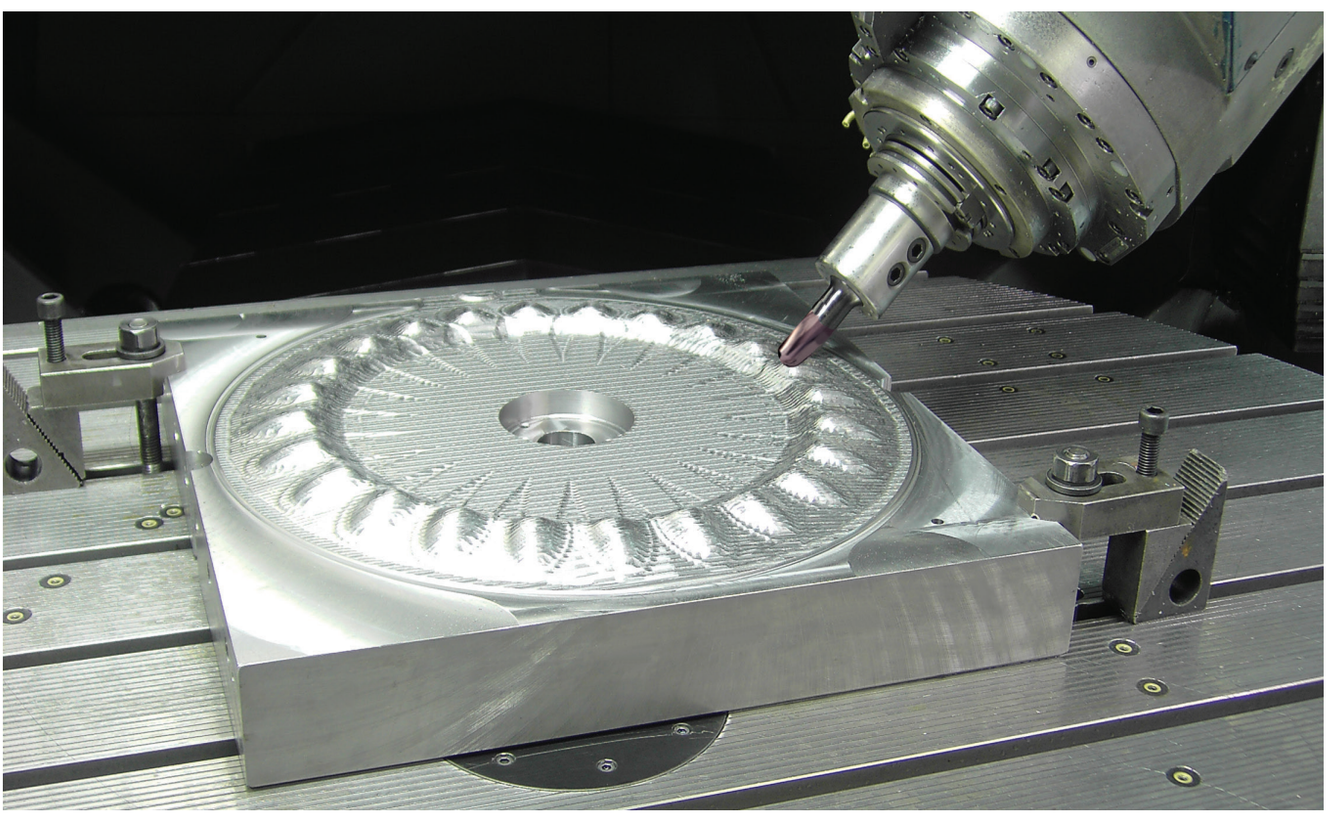
(d) Shank Diameter
+.0000”
-.0003”

(D) Cutting Diameter
+.0000”
-.0015”

EM497 2 flutes	D mill dia.	lc length of cut	d shank dia.	L overall length
EM497-1250	1/8	1/4	1/8	2-1/2
EM497-1875	3/16	3/8	3/16	4
EM497-2500	1/4	1/2	1/4	4
EM497-3125	5/16	5/8	5/16	4
EM497-3750	3/8	3/4	3/8	4
EM497-4375	7/16	7/8	7/16	5
EM497-5000	1/2	1	1/2	5
EM497-5625	9/16	1-1/8	9/16	5
EM497-6250	5/8	1-1/4	5/8	6
EM497-7500	3/4	1-1/2	3/4	6
EM497-1000	1	2	1	6

Special sizes, coatings and flats available upon request.

For speeds and feeds, refer to page 148.

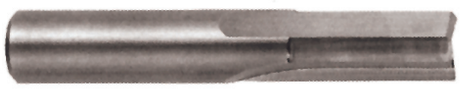


RD500, RD502

2 and 3 Flute - Straight

Routers provide clean and fast cutting action, smooth finishes and excellent tool life. Carbide routers have a high rake angle and a sharp cutting edge with added clearance geometry to ease shearing and chip expulsion. For use on aluminum, copper, magnesium, hardwood, plexiglass, plastics, formica and hard rubber.

CARBIDE | SPEEDS &FEEDS | BRIGHT



RD500 2 flute	RD502 3 flute	D mill dia.	lc length of cut	d shank dia.	L overall length
RD500-0938	RD502-0938	3/32	3/8	1/8	1-1/2
RD500-1250	RD502-1250	1/8	1/2	1/8	1-1/2
RD500-1875	RD502-1875	3/16	5/8	3/16	2
RD500-2500	RD502-2500	1/4	3/4	1/4	2-1/2
RD500-3125	RD502-3125	5/16	13/16	5/16	2-1/2
RD500-3750	RD502-3750	3/8	7/8	3/8	2-1/2
RD500-4375	RD502-4375	7/16	1	7/16	2-1/2
RD500-5000	RD502-5000	1/2	1	1/2	3

(d) Shank Diameter
+.0000"
-.0003"

(D) Cutting Diameter
+.0000"
-.0015"

Special sizes, coatings and flats available upon request.

For speeds and feeds, refer to page 150.

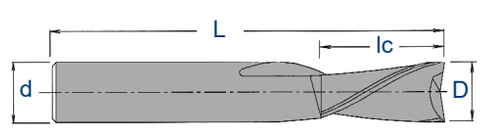
RD501, RD503

2 and 3 Flute - LHS/RHC

Routers provide clean and fast cutting action, smooth finishes and excellent tool life. Carbide routers have a high rake angle and a sharp cutting edge with added clearance geometry to ease shearing and chip expulsion. For use on aluminum, copper, magnesium, hardwood, plexiglass, plastics, formica and hard rubber.

CARBIDE | SPEEDS &FEEDS | BRIGHT

RD501 2 flute	RD503 3 flute	D mill dia.	lc length of cut	d shank dia.	L overall length
RD501-0938	RD503-0938	3/32	3/8	1/8	1-1/2
RD501-1250	RD503-1250	1/8	1/2	1/8	1-1/2
RD501-1875	RD503-1875	3/16	5/8	3/16	2
RD501-2500	RD503-2500	1/4	3/4	1/4	2-1/2
RD501-3125	RD503-3125	5/16	13/16	5/16	2-1/2
RD501-3750	RD503-3750	3/8	7/8	3/8	2-1/2
RD501-4375	RD503-4375	7/16	1	7/16	2-1/2
RD501-5000	RD503-5000	1/2	1	1/2	3



(d) Shank Diameter
+.0000"
-.0003"

(D) Cutting Diameter
+.0000"
-.0015"

Special sizes, coatings and flats available upon request.

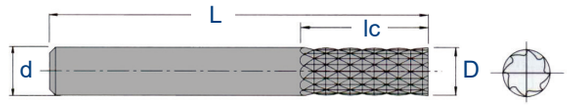
For speeds and feeds, refer to page 150.

FR640

Fiberglass Routers

FR640 series solid carbide routers are: multi-flute, 30° left hand helix, right hand cut, straight shank, single end tools and are available in four end cut styles. These routers are for use on phenolic epoxy parts, polyester glass reinforced products, graphite composite laminates and certain grades of kevlar material.

CARBIDE SPEEDS &FEEDS BRIGHT



(d) Shank Diameter
+.0000"
-.0003"

(D) Cutting Diameter
+.0000"
-.0015"

Type 1 - No End Cut

Type 3 - End Mill Cut

Type 2 - Bur End

Type 4 - Drill Point

FR640 multi-flute	Type	D cutting dia.	Lc length of cut	d shank dia.	L overall length
FR640-0621	1	1/16	3/16	1/8	1-1/2
FR640-0622	2	1/16	3/16	1/8	1-1/2
FR640-0623	3	1/16	3/16	1/8	1-1/2
FR640-0624	4	1/16	3/16	1/8	1-1/2
FR640-0931	1	3/32	5/16	1/8	1-1/2
FR640-0932	2	3/32	5/16	1/8	1-1/2
FR640-0933	3	3/32	5/16	1/8	1-1/2
FR640-0934	4	3/32	5/16	1/8	1-1/2
FR640-1251	1	1/8	7/16	1/8	1-1/2
FR640-1252	2	1/8	7/16	1/8	1-1/2
FR640-1253	3	1/8	7/16	1/8	1-1/2
FR640-1254	4	1/8	7/16	1/8	1-1/2
FR640-1871	1	3/16	5/8	3/16	2
FR640-1872	2	3/16	5/8	3/16	2
FR640-1873	3	3/16	5/8	3/16	2
FR640-1874	4	3/16	5/8	3/16	2
FR640-1881	1	3/16	5/8	1/4	2
FR640-1882	2	3/16	5/8	1/4	2
FR640-1883	3	3/16	5/8	1/4	2
FR640-1884	4	3/16	5/8	1/4	2

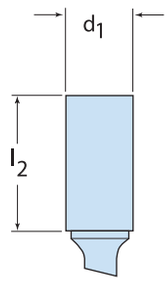
FR640 multi-flute	Type	D cutting dia.	Lc length of cut	d shank dia.	L overall length
FR640-2501	1	1/4	3/4	1/4	2
FR640-2502	2	1/4	3/4	1/4	2
FR640-2503	3	1/4	3/4	1/4	2
FR640-2504	4	1/4	3/4	1/4	2
FR640-2511	1	1/4	3/4	1/4	2-1/2
FR640-2512	2	1/4	3/4	1/4	2-1/2
FR640-2513	3	1/4	3/4	1/4	2-1/2
FR640-2514	4	1/4	3/4	1/4	2-1/2
FR640-3121	1	5/16	1	5/16	2-1/2
FR640-3122	2	5/16	1	5/16	2-1/2
FR640-3123	3	5/16	1	5/16	2-1/2
FR640-3124	4	5/16	1	5/16	2-1/2
FR640-3751	1	3/8	1	3/8	2-1/2
FR640-3752	2	3/8	1	3/8	2-1/2
FR640-3753	3	3/8	1	3/8	2-1/2
FR640-3754	4	3/8	1	3/8	2-1/2
FR640-5001	1	1/2	1	1/2	3
FR640-5002	2	1/2	1	1/2	3
FR640-5003	3	1/2	1	1/2	3
FR640-5004	4	1/2	1	1/2	3

Special sizes and flats available upon request.

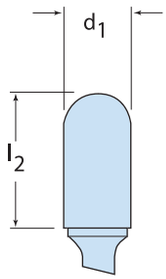
For speeds and feeds, refer to page 151.

SOLID CARBIDE BURS

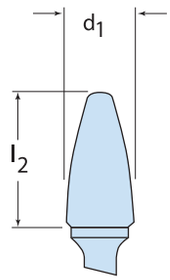
SHAPES & SCTI IDENTIFICATION



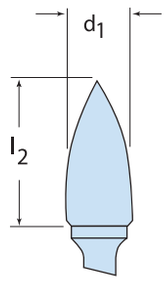
Series SA
Cylindrical



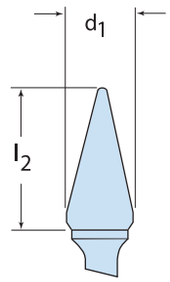
Series SC
Cylindrical Ball Nose



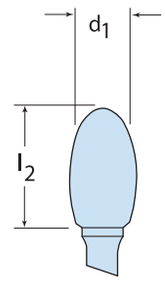
Series SF
Round Nose Tree



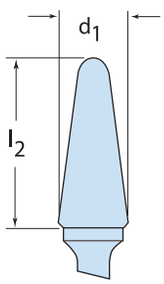
Series SG
Pointed Tree



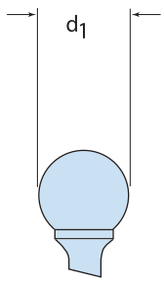
Series SM
Pointed Cone



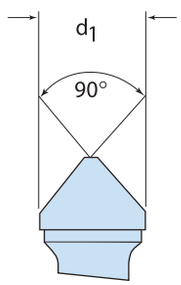
Series SE
Egg Shape



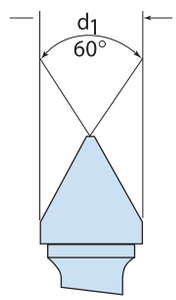
Series SL
14 Degree Included Angle



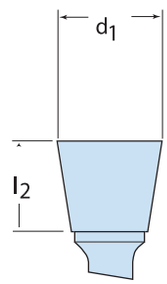
Series SD
Ball Shape



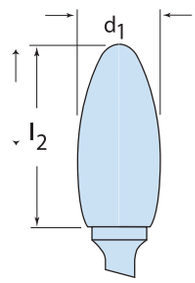
Series SK
90 Degree Included Angle



Series SJ
60 Degree Included Angle



Series SN
Inverted Taper



Series SH
Flame Shape

Styles of Cut

Double Cut

Engineered specifically for tough applications. Tough cut insures faster, splinter-free cutting in weld and alloy castings with increased tool life.

Medium Right Hand Spiral

General purpose, recommended where fair stock removal and smooth finish are required.

Aluminum Cut

Designed for use on aluminum, non-ferrous metals, soft steel, reinforced plastics, and other soft materials.

Coarse and Fine Cuts are available on request.

Recommended Cutting Speeds for Carbide Burs

Diameter	R.P.M	Maximum R.P.M.
1/16”	55,000 - 85,000	90,000
3/32”	50,000 - 60,000	85,000
1/8”	35,000 - 65,000	80,000
3/16”	30,000 - 55,000	75,000
1/4”	25,000 - 50,000	70,000
5/16”	18,000 - 38,000	65,000
3/8”	17,000 - 38,000	63,000
7/16”	13,000 - 37,000	55,000
1/2”	14,000 - 36,000	50,000
5/8”	11,000 - 23,000	40,000
3/4”	8,000 - 19,000	30,000
1”	7,000 - 18,000	25,000

NOTE: Use Lower Speeds when cutting harder ferrous materials and Higher Speeds for softer non-ferrous materials.

1/4" STEEL SHANK

BR801 Series
Cylindrical

Double Cut	Catalog Number	SCTI	Dia. (d_1)	Flute Length (l_2)
	BR801-1250*	SA-11	1/8	1/2
	BR801-1875*	SA-14	3/16	5/8
	BR801-2500*	SA-1	1/4	5/8
	BR801-3125	SA-2	5/16	3/4
	BR801-3750	SA-3	3/8	3/4
	BR801-4375	SA-4	7/16	1
	BR801-5001**	SA-5M	1/2	1/2
	BR801-5000	SA-5	1/2	1
	BR801-6250	SA-6	5/8	1
	BR801-7500**	SA-16	3/4	3/4
	BR801-7501	SA-7	3/4	1
	BR801-1000	SA-9	1	1

BR901 Series
Cylindrical

Medium Right Hand Spiral	Catalog Number	SCTI	Dia. (d_1)	Flute Length (l_2)
	BR901-1250*	SA-11	1/8	1/2
	BR901-1875*	SA-14	3/16	5/8
	BR901-2500*	SA-1	1/4	5/8
	BR901-3125	SA-2	5/16	3/4
	BR901-3750	SA-3	3/8	3/4
	BR901-4375	SA-4	7/16	1
	BR901-5001**	SA-5M	1/2	1/2
	BR901-5000	SA-5	1/2	1
	BR901-6250	SA-6	5/8	1
	BR901-7500**	SA-16	3/4	3/4
	BR901-7501	SA-7	3/4	1
	BR901-1000	SA-9	1	1

BR802 Series
Cylindrical Ball Nose

Double Cut	Catalog Number	SCTI	Dia. (d_1)	Flute Length (l_2)
	BR802-1250*	SC-11	1/8	1/2
	BR802-1875*	SC-14	3/16	5/8
	BR802-2500*	SC-1	1/4	5/8
	BR802-3125	SC-2	5/16	3/4
	BR802-3750	SC-3	3/8	3/4
	BR802-4375	SC-4	7/16	1
	BR802-5000	SC-5	1/2	1
	BR802-6250	SC-6	5/8	1
	BR802-7500	SC-7	3/4	1

BR902 Series
Cylindrical Ball Nose

Medium Right Hand Spiral	Catalog Number	SCTI	Dia. (d_1)	Flute Length (l_2)
	BR902-1250*	SC-11	1/8	1/2
	BR902-1875*	SC-14	3/16	5/8
	BR902-2500*	SC-1	1/4	5/8
	BR902-3125	SC-2	5/16	3/4
	BR902-3750	SC-3	3/8	3/4
	BR902-4375	SC-4	7/16	1
	BR902-5000	SC-5	1/2	1
	BR902-6250	SC-6	5/8	1
	BR902-7501	SC-7	3/4	1

BR803 Series
Round Nose Tree

Double Cut	Catalog Number	SCTI	Dia. (d_1)	Flute Length (l_2)
	BR803-2500*	SF-1	1/4	3/4
	BR803-3750	SF-3	3/8	3/4
	BR803-5001	SF-13	1/2	3/4
	BR803-5000	SF-5	1/2	1
	BR803-6250	SF-6	5/8	1
	BR803-7500	SF-7	3/4	1
	BR803-7501	SF-14	3/4	1-1/4
	BR803-7502	SF-15	3/4	1-1/2

BR903 Series
Round Nose Tree

Medium Right Hand Spiral	Catalog Number	SCTI	Dia. (d_1)	Flute Length (l_2)
	BR903-2500*	SF-1	1/4	3/4
	BR903-3750	SF-3	3/8	3/4
	BR903-5001	SF-13	1/2	3/4
	BR903-5000	SF-5	1/2	1
	BR903-6250	SF-6	5/8	1
	BR903-7500	SF-7	3/4	1
	BR903-7501	SF-14	3/4	1-1/4
	BR903-7502	SF-15	3/4	1-1/2

* Indicates 1/4" diameter × 2.00" overall length solid carbide, all others have 1/4" diameter hardened steel shank (3/8" diameter shanks available).

** Indicates non-stocked item, available upon request.

1/4" STEEL SHANK

BR804 Series
Pointed Tree

Double Cut	Catalog Number	SCTI	Dia. (d_1)	Flute Length (l_2)
	BR804-2500*	SG-1	1/4	5/8
	BR804-3125	SG-2	5/16	3/4
	BR804-3750	SG-3	3/8	3/4
	BR804-5001	SG-13	1/2	3/4
	BR804-5000	SG-5	1/2	1
	BR804-6250	SG-6	5/8	1
	BR804-7500	SG-7	3/4	1
	BR804-7501	SG-15	3/4	1-1/2

BR904 Series
Pointed Tree

Medium Right Hand Spiral	Catalog Number	SCTI	Dia. (d_1)	Flute Length (l_2)
	BR904-2500*	SG-1	1/4	5/8
	BR904-3125	SG-2	5/16	3/4
	BR904-3750	SG-3	3/8	3/4
	BR904-5001	SG-13	1/2	3/4
	BR904-5000	SG-5	1/2	1
	BR904-6250	SG-6	5/8	1
	BR904-7500	SG-7	3/4	1
	BR904-7501	SG-15	3/4	1-1/2

BR805 Series
Pointed Cone

Double Cut	Catalog Number	SCTI	Dia. (d_1)	Flute Length (l_2)	Incl. Ang. Deg.
	BR805-2500*	SM-1	1/4	1/2	22
	BR805-2501*	SM-2	1/4	3/4	14
	BR805-2502*	SM-3	1/4	1	10
	BR805-3750	SM-4	3/8	5/8	28
	BR805-5000	SM-5	1/2	7/8	28
	BR805-6250	SM-6	5/8	1	31

BR905 Series
Pointed Cone

Medium Right Hand Spiral	Catalog Number	SCTI	Dia. (d_1)	Flute Length (l_2)	Incl. Ang. Deg.
	BR905-2500*	SM-1	1/4	1/2	22
	BR905-2501*	SM-2	1/4	3/4	14
	BR905-2502*	SM-3	1/4	1	10
	BR905-3750	SM-4	3/8	5/8	28
	BR905-5000	SM-5	1/2	7/8	28
	BR905-6250	SM-6	5/8	1	31

BR806 Series
Egg Shape

Double Cut	Catalog Number	SCTI	Dia. (d_1)	Flute Length (l_2)
	BR806-2500*	SE-1	1/4	3/8
	BR806-3750	SE-3	3/8	5/8
	BR806-5000	SE-5	1/2	7/8
	BR806-6250	SE-6	5/8	1
	BR806-7500	SE-7	3/4	1

BR906 Series
Egg Shape

Medium Right Hand Spiral	Catalog Number	SCTI	Dia. (d_1)	Flute Length (l_2)
	BR906-2500*	SE-1	1/4	3/8
	BR906-3750	SE-3	3/8	5/8
	BR906-5000	SE-5	1/2	7/8
	BR906-6250	SE-6	5/8	1
	BR906-7500	SE-7	3/4	1

* Indicates 1/4" diameter × 2.00" overall length solid carbide, all others have 1/4" diameter hardened steel shank (3/8" diameter shanks available).

1/4" STEEL SHANK

BR807 Series

14° Included Angle

Double Cut	Catalog Number	SCTI	Dia. (d_1)	Flute Length (l_2)	Incl. Ang. Deg.
	BR807-2500	SL-1*	1/4	5/8	14
	BR807-3125	SL-2	5/16	7/8	14
	BR807-3750	SL-3	3/8	1-1/16	14
	BR807-5000	SL-4	1/2	1-1/8	14
	BR807-6250	SL-6	5/8	1-5/16	14
	BR807-7500	SL-7	3/4	1-1/2	14

BR907 Series

14° Included Angle

Medium Right Hand Spiral	Catalog Number	SCTI	Dia. (d_1)	Flute Length (l_2)	Incl. Ang. Deg.
	BR907-2500	SL-1*	1/4	5/8	14
	BR907-3125	SL-2	5/16	7/8	14
	BR907-3750	SL-3	3/8	1-1/16	14
	BR907-5000	SL-4	1/2	1-1/8	14
	BR907-6250	SL-6	5/8	1-5/16	14
	BR907-7500	SL-7	3/4	1-1/2	14

BR808 Series

Ball Shape

Double Cut	Catalog Number	SCTI	Dia. (d_1)
	BR808-1250*	SD-11	1/8
	BR808-1875*	SD-14	3/16
	BR808-2500*	SD-1	1/4
	BR808-3125	SD-2	5/16
	BR808-3750	SD-3	3/8
	BR808-5000	SD-5	1/2
	BR808-6250	SD-6	5/8
	BR808-7500	SD-7	3/4
	BR808-1000	SD-9	1

BR908 Series

Ball Shape

Medium Right Hand Spiral	Catalog Number	SCTI	Dia. (d_1)
	BR908-1250*	SD-11	1/8
	BR908-1875*	SD-14	3/16
	BR908-2500*	SD-1	1/4
	BR908-3125	SD-2	5/16
	BR908-3750	SD-3	3/8
	BR908-5000	SD-5	1/2
	BR908-6250	SD-6	5/8
	BR908-7500	SD-7	3/4
	BR908-1000	SD-9	1

BR849 Series

90° Cone

Double Cut	Catalog Number	SCTI	Dia. (d_1)	Incl. Ang. Deg.
	BR849-2500*	SK-1	1/4	90
	BR849-3750	SK-3	3/8	90
	BR849-5000	SK-5	1/2	90
	BR849-6250	SK-6	5/8	90
	BR849-7500	SK-7	3/4	90
	BR849-1000	SK-9	1	90

BR949 Series

90° Cone

Medium Right Hand Spiral	Catalog Number	SCTI	Dia. (d_1)	Incl. Ang. Deg.
	BR949-2500*	SK-1	1/4	90
	BR949-3750	SK-3	3/8	90
	BR949-5000	SK-5	1/2	90
	BR949-6250	SK-6	5/8	90
	BR949-7500	SK-7	3/4	90
	BR949-1000	SK-9	1	90

*Indicates 1/4" diameter × 2.00" overall length solid carbide, all others have 1/4" diameter hardened steel shank (3/8" diameter shanks available).

1/4" STEEL SHANK

BR850 Series

60º Cone

Double Cut	Catalog Number	SCTI	Dia. (d_1)	Incl. Ang. Deg.
	BR850-2500*	SJ-1	1/4	60
	BR850-3750	SJ-3	3/8	60
	BR850-5000	SJ-5	1/2	60
	BR850-6250	SJ-6	5/8	60
	BR850-7500	SJ-7	3/4	60
	BR850-1000	SJ-9	1	60

BR950 Series

60º Cone

Medium Right Hand Spiral	Catalog Number	SCTI	Dia. (d_1)	Incl. Ang. Deg.
	BR950-2500*	SJ-1	1/4	60
	BR950-3750	SJ-3	3/8	60
	BR950-5000	SJ-5	1/2	60
	BR950-6250	SJ-6	5/8	60
	BR950-7500	SJ-7	3/4	60
	BR950-1000	SJ-9	1	60

BR851 Series

Flame Shape

Double Cut	Catalog Number	SCTI	Dia. (d_1)	Flute Length (l_2)
	BR851-3125	SH-2	5/16	3/4
	BR851-5000	SH-5	1/2	1-1/4
	BR851-6250	SH-6	5/8	1-7/16
	BR851-7500	SH-7	3/4	1-5/8

BR951 Series

Flame Shape

Medium Right Hand Spiral	Catalog Number	SCTI	Dia. (d_1)	Flute Length (l_2)
	BR951-3125	SH-2	5/16	3/4
	BR951-5000	SH-5	1/2	1-1/4
	BR951-6250	SH-6	5/8	1-7/16
	BR951-7500	SH-7	3/4	1-5/8

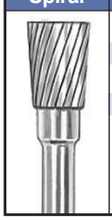
BR852 Series

Inverted Taper

Double Cut	Catalog Number	SCTI	Dia. (d_1)	Flute Length (l_2)	Incl. Ang. Deg.
	BR852-2500*	SN-1	1/4	5/16	10
	BR852-3750	SN-2	3/8	3/8	13
	BR852-5000	SN-4	1/2	1/2	28
	BR852-6250	SN-6	5/8	3/4	18
	BR852-7500	SN-7	3/4	5/8	30

BR952 Series

Inverted Taper



Medium Right Hand Spiral	Catalog Number	SCTI	Dia. (d_1)	Flute Length (l_2)	Incl. Ang. Deg.
	BR952-2500*	SN-1	1/4	5/16	10
	BR952-3750	SN-2	3/8	3/8	13
	BR952-5000	SN-4	1/2	1/2	28
	BR952-6250	SN-6	5/8	3/4	18
	BR952-7500	SN-7	3/4	5/8	30

*Indicates 1/4" diameter × 2.00" overall length solid carbide, all others have 1/4" diameter hardened steel shank (3/8" diameter shanks available).

1/4" x 6" LONG STEEL SHANK

BR861 Series
Cylindrical

Double Cut	Catalog Number	SCTI	Dia. (d_1)	Flute Length (l_2)
	BR861-3750	SA-3L6	3/8	3/4
	BR861-5000	SA-5L6	1/2	1

BR961 Series
Cylindrical

Medium Right Hand Spiral	Catalog Number	SCTI	Dia. (d_1)	Flute Length (l_2)
	BR961-3750	SA-3LC	3/8	3/4
	BR961-5000	SA-5LC	1/2	1

BR862 Series
Cylindrical Ball Nose

Double Cut	Catalog Number	Dia. (d_1)	SCTI	Flute Length (l_2)
	BR862-3750	3/8	SC-3L6	3/4
	BR862-5000	1/2	SC-5L6	1

BR962 Series
Cylindrical Ball Nose

Medium Right Hand Spiral	Catalog Number	SCTI	Dia. (d_1)	Flute Length (l_2)
	BR962-3750	SC-3L6	3/8	3/4
	BR962-5000	SC-5L6	1/2	1

BR863 Series
Round Nose Tree

Double Cut	Catalog Number	SCTI	Dia. (d_1)	Flute Length (l_2)
	BR863-3750	SF-3L6	3/8	3/4
	BR863-5000	SF-5L6	1/2	1

BR963 Series
Round Nose Tree

Medium Right Hand Spiral	Catalog Number	Dia. (d_1)	SCTI	Flute Length (l_2)
	BR963-3750	3/8	SF-3L6	3/4
	BR963-5000	1/2	SF-5L6	1

QTT 86 & 96 Series burs feature 1/4" diameter x 6.00" long shanks

1/4" x 6" LONG STEEL SHANK

BR867 Series

14° Included Angle

Double Cut	Catalog Number	SCTI	Dia. (d_1)	Flute Length (l_2)
	BR867-3750	SL-3L6	3/8	1-1/16
	BR867-5000	SL-4L6	1/2	1-1/8

BR967 Series

14° Included Angle

Medium Right Hand Spiral	Catalog Number	SCTI	Dia. (d_1)	Flute Length (l_2)
	BR967-3750	SL-3L6	3/8	1-1/16
	BR967-5000	SL-4L6	1/2	1-1/8

BR868 Series

Ball Shape

Double Cut	Catalog Number	SCTI	Dia. (d_1)
	BR868-3750	SD-3L6	3/8
	BR868-5000	SD-5L6	1/2

BR968 Series

Ball Shape

Medium Right Hand Spiral	Catalog Number	SCTI	Dia. (d_1)
	BR968-3750	SD-3L6	3/8
	BR968-5000	SD-5L6	1/2

QTT 86 & 96 Series burs feature 1/4" diameter x 6.00" long shanks

1/4" STEEL SHANK - ALUMINUM CUT

BR881 Series

Cylindrical

Alum. Cut	Catalog Number	SCTI	Dia. (d_1)	Flute Length (l_2)
	BR881-2500	SA-1NF	1/4	3/4
	BR881-3750	SA-3NF	3/8	3/4
	BR881-5000	SA-5NF	1/2	1
	BR881-6250	SA-6NF	5/8	1
	BR881-7500	SA-7NF	3/4	1

BR882 Series

Cylindrical Ball Nose

Alum. Cut	Catalog Number	SCTI	Dia. (d_1)	Flute Length (l_2)
	BR882-2500	SC-1NF	1/4	3/4
	BR882-3750	SC-3NF	3/8	3/4
	BR882-5000	SC-5NF	1/2	1
	BR882-6250	SC-6NF	5/8	1
	BR882-7500	SC-7NF	3/4	1

BR883 Series

Round Nose Tree

Alum. Cut	Catalog Number	SCTI	Dia. (d_1)	Flute Length (l_2)
	BR883-2500	SF-1NF	1/4	3/4
	BR883-3750	SF-3NF	3/8	3/4
	BR883-5000	SF-5NF	1/2	1
	BR883-6250	SF-6NF	5/8	1
	BR883-7500	SF-7NF	3/4	1-1/4

Aluminum Cut Burs are designed for use on:

- Aluminum
- Non-ferrous metals
- Soft Steel
- Reinforced plastics
- Other soft materials

Also provides excellent work finish with minimum loading when cutting soft, sticky materials.

1/4" STEEL SHANK - ALUMINUM CUT

BR885 Series

Flame Shape

Alum. Cut	Catalog Number	SCTI	Dia. (d_1)	Flute Length (l_2)
	BR885-5000**	SH-5NF	1/2	1-1/4
	BR885-6250**	SH-6NF	5/8	1-7/16
	BR885-7500**	SH-7NF	3/4	1-5/8

BR886 Series

Egg Shape

Alum. Cut	Catalog Number	SCTI	Dia. (d_1)	Flute Length (l_2)
	BR886-3750	SE-3NF	3/8	5/8
	BR886-5000	SE-5NF	1/2	7/8
	BR886-6250	SE-6NF	5/8	1
	BR886-7500	SE-7NF	3/4	1

BR887 Series

14° Included Angle

Alum. Cut	Catalog Number	SCTI	Dia. (d_1)	Flute Length (l_2)
	BR887-3750	SL-3NF	3/8	1-1/16
	BR887-5000	SL-4NF	1/2	1-1/8
	BR887-6250	SL-6NF	5/8	1-5-16
	BR887-7500	SL-7NF	3/4	1-1/2

BR888 Series

Ball Shape

Alum. Cut	Catalog Number	SCTI	Dia. (d_1)
	BR888-2500	SD-1NF	1/4
	BR888-3750	SD-3NF	3/8
	BR888-5000	SD-5NF	1/2
	BR888-6250	SD-6NF	5/8

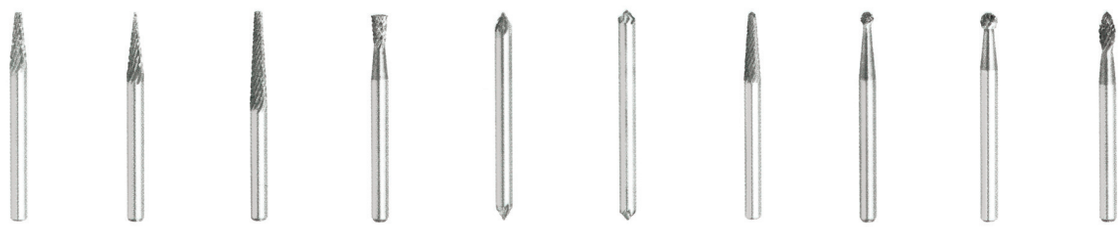
** Indicates non-stocked item, available upon request.

QUALITY TECH TOOL

1/8″ x 1-1/2″ SHANK

BR800 Series - Double Cut

Style:	**SA-42**	**SA-43**	**SB-43**	**SC-42**	**SG-44**	**SF-42**	**SC-41**	**SA-41**	**SB-ECO**	**SE-41**
Size:	3/32 x 7/16	1/8 x 9/16	1/8 x 9/16	1/8 x 9/16	1/8 x 1/2	1/8 x 1/2	3/32 x 7/16	1/16 x 1/4	1/8	1/8 x 7/32
Catalog Number:	**BR800-8001**	**BR800-8002**	**BR800-8003**	**BR800-8004**	**BR800-8005**	**BR800-8006**	**BR800-8007**	**BR800-8008**	**BR800-8009**	**BR800-8010**



Style:	**SM-41**	**SM-42**	**SM-43**	**SN-42**	**SJ-42**	**SK-42**	**SL-42**	**SD-41**	**SD-42**	**SH-41**
Size:	1/8 x 11/32	1/8 x 7/16	1/8 x 5/8	1/8 x 3/16	1/8 x 3/32	1/8 x 1/16	1/8 x 1/2	3/32	1/8	1/8 x 1/4
Taper Degrees	12	14	7	10 INVERTED	60	90	8			
Catalog Number:	**BR800-8011**	**BR800-8012**	**BR800-8013**	**BR800-8014**	**BR800-8015**	**BR800-8016**	**BR800-8017**	**BR800-8018**	**BR800-8019**	**BR800-8020**

BR900 Series - Medium Right Hand Spiral

Style:	**SA-42**	**SA-43**	**SB-43**	**SC-42**	**SG-44**	**SF-42**	**SC-41**	**SA-41**	**SB-ECO**	**SE-41**
Size:	3/32 x 7/16	1/8 x 9/16	1/8 x 9/16	1/8 x 9/16	1/8 x 1/2	1/8 x 1/2	3/32 x 7/16	1/16 x 1/4	1/8	1/8 x 7/32
Catalog Number:	**BR900-9001**	**BR900-9002**	**BR900-9003**	**BR900-9004**	**BR900-9005**	**BR900-9006**	**BR900-9007**	**BR900-9008**	**BR900-9009**	**BR900-9010**

Style:	**SM-41**	**SM-42**	**SM-43**	**SN-42**	**SJ-42**	**SK-42**	**SL-42**	**SD-41**	**SD-42**	**SH-41**
Size:	1/8 x 11/32	1/8 x 7/16	1/8 x 5/8	1/8 x 3/16	1/8 x 3/32	1/8 x 1/16	1/8 x 1/2	3/32	1/8	1/8 x 1/4
Taper Degrees	12	14	7	10 INVERTED	60	90	8			
Catalog Number:	**BR900-9011**	**BR900-9012**	**BR900-9013**	**BR900-9014**	**BR900-9015**	**BR900-9016**	**BR900-9017**	**BR900-9018**	**BR900-9019**	**BR900-9020**

1/4″ DIAMETER - 1/8″ x 1-1/2″ STEEL SHANK

BR815 Series - Double Cut

	Cylindrical	Cylindrical Ball Nose	Round Nose Tree	Pointed Tree	Pointed Cone	End Cut	Ball Shape	Egg Shape	Inverted Taper
Style:	SA-51	SC-51	SF-51	SG-51	SM-51	SB-51	SD-51	SE-51	SN-51
Size:	1/4 x 1/2	1/4 x 1/2	1/4 x 1/2	1/4 x 1/2	1/4 x 1/2	1/4 x 3/16	1/4	1/4 x 3/8	1/4 x 1/4
Taper Degrees					22				10 INVERTED
Catalog Number:	BR815-0001	BR815-0002	BR815-0003	BR815-0004	BR815-0005	BR815-0006	BR815-0007	BR815-0008	BR815-0009

BR915 Series - Medium Right Hand Spiral

	Cylindrical	Cylindrical Ball Nose	Round Nose Tree	Pointed Tree	Pointed Cone	End Cut	Ball Shape	Egg Shape	Inverted Taper
Style:	SA-51	SC-51	SF-51	SG-51	SM-51	SB-51	SD-51	SE-51	SN-51
Size:	1/4 x 1/2	1/4 x 1/2	1/4 x 1/2	1/4 x 1/2	1/4 x 1/2	1/4 x 3/16	1/4	1/4 x 3/8	1/4 x 1/4
Taper Degrees					22				10 INVERTED
Catalog Number:	BR915-0001	BR915-0002	BR915-0003	BR915-0004	BR915-0005	BR915-0006	BR915-0007	BR915-0008	BR915-0009

1/8″ x 1-1/2″ SHANK

BR820 Series - Double Cut, Solid Micrograin Carbide

Style:	SA-52	SA-53	SC-52	SC-53	SF-53	SG-53
Size:	5/32 x1/2	3/16 x 1/2	5/32 x 1/2	3/16 x 1/2	3/16 x 1/2	3/16 x 1/2
Catalog Number:	BR820-0001	BR820-0011	BR820-0002	BR820-0012	BR820-0003	BR820-0004

Style:	SM-53	SE-53	SL-53	SD-53	SH-53	SN-53
Size:	3/16 x 1/2	3/16 x 9/32	3/16 x 1/2	3/16	3/16 x 3/8	3/16 x 1/4
Taper Degrees	16		14			10 INVERTED
Catalog Number:	BR820-0005	BR820-0006	BR820-0007	BR820-0008	BR820-0009	BR820-0010

BR920 Series - Medium Right Hand Spiral, Solid Micrograin Carbide

Style:	SA-52	SA-53	SC-52	SC-53	SF-53	SG-53
Size:	5/32 x 1/2	3/16 x 1/2	5/32 x 1/2	3/16 x 1/2	3/16 x 1/2	3/16 x 1/2
Catalog Number:	BR920-0001	BR920-0011	BR920-0002	BR920-0012	BR920-0003	BR920-0004

Style:	SM-53	SE-53	SL-53	SD-53	SH-53	SN-53
Size:	3/16 x 1/2	3/16 x 9/32	3/16 x 1/2	3/16	3/16 x 3/8	3/16 x 1/4
Taper Degrees	16		14			10 INVERTED
Catalog Number:	BR920-0005	BR920-0006	BR920-0007	BR920-0008	BR920-0009	BR920-0010

AEROSPACE SPECIALS

AIRCRAFT TOOLS MADE TO ORDER

Nutplate Drill/Countersink
Carbide drill and countersink with 135 degree split point. External thread and 60 degree cone seat straight shank style with pin spanner wrench holes. Application: Nutplate and motors with nutplate pressure foot attachments.

2 & 3 Flute Piloted Countersink
Designed with a safe, integral piloted construction. The threaded shank style is an excellent choice for portable drill motors and its precision ground fluting geomertry generates a clean, bur free accurate seat for aircraft fasteners.

Integral Piloted PCD Countersink
The Integral Piloted PCD Countersink is designed for customer specific applications of machining as well as assembly. They are made with a controlled fillet radius.

Carbide Tapered Reamer
Our carbide tapered reamers are designed for finishing hole sizes in composite materials. The geometries incorporated into the design of these tools produce excellent results; flaking, tearing, and cracking in laminate materials are minimized.

Compression Router
This carbide router is designed primarily for use with composite and honeycomb materials. This design with opposing flutes compresses the material to produce an excellent finish on both sides of material being routed.

Diamond Cut Router
The carbide diamond cut router is used in a variety of materials including graphite composite materials. Available in a four styles of end cut, depending on the specific application.

Dagger Drill
This carbide drill is designed to produce holes in composite materials without delamination around the hole or fraying the composite material.

Threaded Shank Coolant Fed Straight Flute Drill
This coolant fed straight flute drill was used to drill through a combination of aluminum and composite materials. This stye of drill can also be adapted to take a PCD tip for extended tool life.

VT58
The VT58 offers fast feed and speed rates. This 1.5hp has an improved diameter tolerence with superior hole finish. No erosion of liquid shim or delamination in composite material.

VT68
The 2.5hp VT68 has a positive feed drill motor with interrupted cut feature. Our VT68 offers fast feed and speed rates and improved diameter tolerence with superior hole finish. No erosion of liquid shim or delamination in composite material.

AIRCRAFT TOOLS MADE TO ORDER

NAS 937 Jobbers Length Double Margin Step Drill
Carbide drill with 135 degree split point. Used for drilling close tolerance holes in low tensile strength materials. Can also be supplied in taper and screw machine lengths, or special lengths.

Threaded Hex Shank Adapter Drill
Carbide adapter drill manufactured to NAS 907 construction with 135 degree split points. Used for general to medium duty drilling in low tensile strength materials in confined areas.

Threaded Square Shank Adapter Drill
Carbide step adapter drills are manufactured similar to NAS 907 construction with 135 degree split points. Used for drilling hard, tough, high tensile strength materials in confined areas.

Kevlar Drill
Kevlar, and similar woven materials pose many problems with quality of exit hole quality. The unique brad and spur inspired point cuts a clean hole with elimination of fraying experienced with conventional drill points.

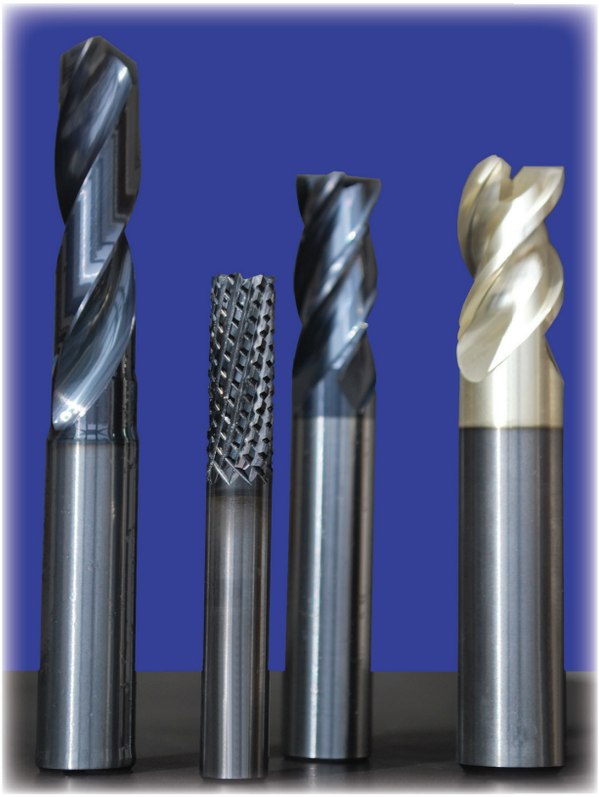
Threaded Shank PCD Reamer
This straight flute PCD “polycrystalline diamond” reamer is available with or without threaded shank and with or without a pilot diameter.

Spacematic Drill/Countersink
Carbide drill and countersink with internal thread and 60 degree cone seat straight shank style with pin spanner wrench holes or optional wrench flats for slotted type drill wrenches. Application: Spacematic Drill motors with 1” stroke.

Drivematic Drill/Countersink
Carbide drill and countersink with solid shank used in aerospace drivematic drill riveting machines.

PCD Straight Flute Router
This polycrystalline diamond straight flute router is used for machining as well as assembly operations. Available in a various number of flutes.

Herringbone Router
This carbide router is designed primarily for use with composite and honeycomb materials. This design with opposing flutes compresses the material to produce an excellent finish on both sides of material being routed.



AIRCRAFT MATERIALS

Drill Depth

Work Material		Graphite Composite		Epoxy Fiber		Acrylic Plastics		Graphite Composite Titanium Stack	
Speed (Feet/Minute)		210 SFM		210 SFM		161 SFM		16 SFM	
Drill Diameter Frac.	Dec. Equiv.	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
3/32	.0938	8,550	.0015	8,550	.0015	6,550	.0015	670	.0010
1/8	.1250	6,420	.0020	6,420	.0020	4,910	.0020	500	.0010
3/16	.1875	4,280	.0029	4,280	.0029	3,280	.0029	330	.0020
1/4	.2500	3,210	.0040	3,210	.0040	2,460	.0040	250	.0020
5/16	.3125	2,570	.0045	2,570	.0045	1,970	.0045	200	.0030
3/8	.3750	2,140	.0050	2,140	.0050	1,640	.0050	170	.0040
1/2	.5000	1,600	.0060	1,600	.0060	1,230	.0060	130	.0040

The chart above is for materials typically used in aircraft structures. Speeds may be less than optimal because of limitations in the portable machine tools utilized.

Hole Depth Diameter	Reduce Spindle Speed	Reduce Infeed Rate
3 x Dia.	10%	10%
4 x Dia.	20%	10%
5 x Dia.	30%	20%
6 x Dia.	35%	20%
8 x Dia.	40%	20%

When drilling deep holes, the recommended speeds and feeds should be reduced proportionately based on the hole depth. To the left are guidelines for reducing the speeds and feeds.

FORMULAS

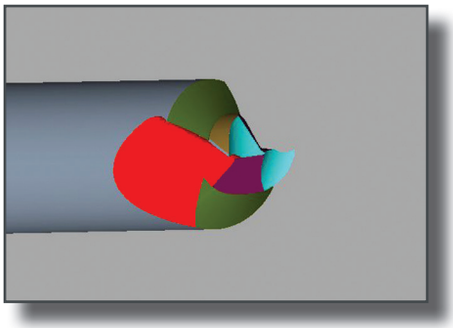
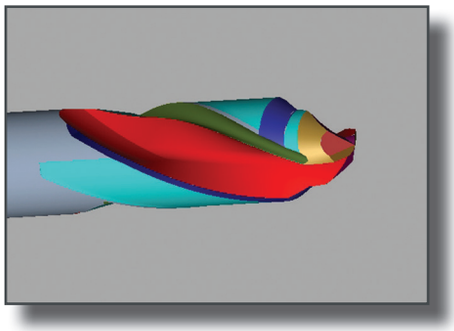
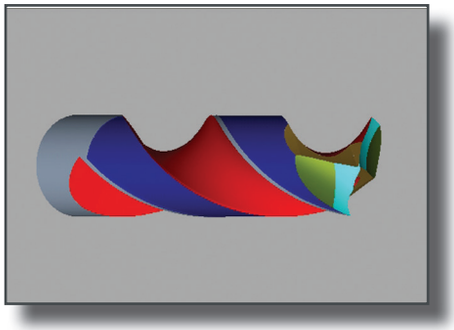
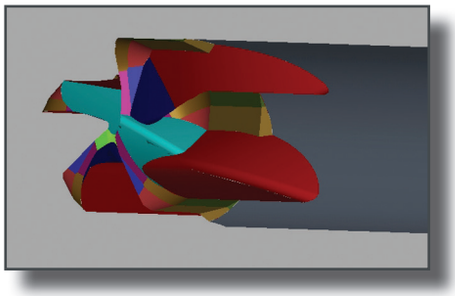
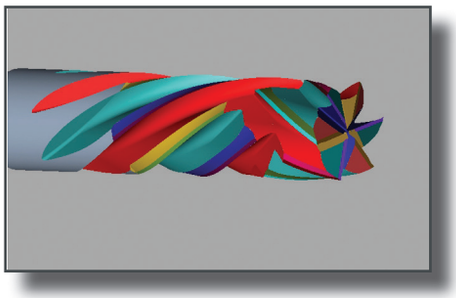
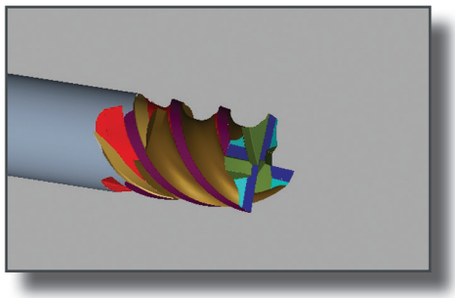
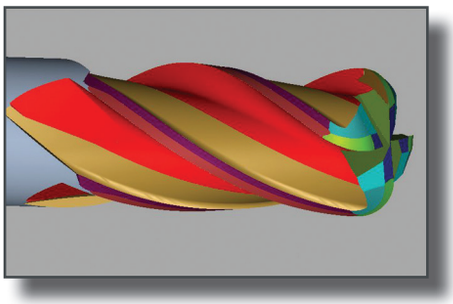
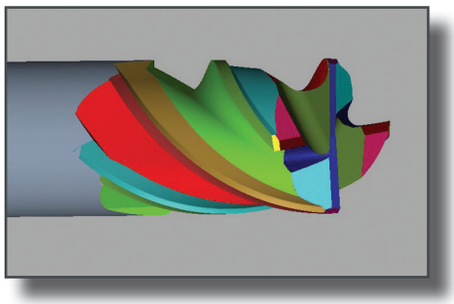
Metric
RPM = (SMM x 318.06)/Tool Diameter
mm/min = RPM x mm/rev

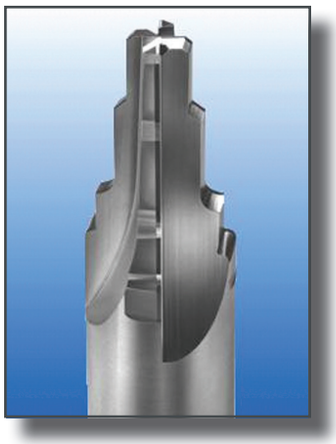
Inch
RPM = (SFM x 3.82)/Tool Diameter
in/min = RPM x in/rev

Conversions Metric to Inch
SMM to SFM = SMM/.3048
mm/min to in/min = (mm/min)/25.4

Conversions Inch to Metric
SFM to SMM = SFM x .3048
in/min to mm/min = (in/min) x 25.4

TOOLS MADE TO ORDER



QUALITY TECH TOOL

SERIES PC243 - 3 X D

Non-Coolant Fed

Work Material	Cast Irons				Steels					
	Gray Cast Iron A48 Class 20/G4000		Ductile Cast Iron A536/60-40-18		Low Carbon Steel		Alloy Steel (up to 35 Rc) 4140		Alloy Steel (36-45 Rc) 4140	
Cutting Speed	476 SFM		377 SFM		107 SFM		1107 SFM		312 SFM	
Nominal Diameter	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev
1/32	36,405	.0029	29,579	.0023	27,303	.0014	23,893	.0019	12,516	.0008
1/16	32,362	.0057	26,294	.0046	24,270	.0028	21,237	.0037	11,125	.0015
5/64	22,746	.0070	18,483	.0056	17,059	.0034	14,926	.0045	7,820	.0018
3/32	17,476	.0083	14,196	.0067	13,107	.0041	11,466	.0054	6,006	.0021
1/8	16,179	.0110	13,145	.0089	12,135	.0054	10,620	.0072	5,563	.0028
9/64	13,371	.0119	10,864	.0096	10,028	.0059	8,775	.0077	4,597	.0030
5/32	11,376	.0126	9,242	.0101	8,533	.0063	7,465	.0081	3,911	.0032
11/64	9,890	.0133	8,034	.0106	7,419	.0066	6,488	.0085	3,402	.0034
3/16	8,735	.0141	7,098	.0112	6,554	.0071	5,735	.0089	3,005	.0035
7/32	8,426	.0160	6,848	.0127	6,320	.0080	5,529	.0101	2,897	.0040
15/64	7,587	.0167	6,162	.0132	5,689	.0084	4,979	.0105	2,608	.0041
1/4	6,893	.0173	5,601	.0137	5,170	.0088	4,524	.0109	2,370	.0043
17/64	6,314	.0178	5,131	.0141	4,736	.0090	4,146	.0112	2,173	.0044
19/64	6,150	.0193	4,995	.0153	4,611	.0097	4,036	.0121	2,114	.0048
5/16	5,688	.0198	4,622	.0157	4,268	.0099	3,733	.0124	1,956	.0048
11/32	5,544	.0212	4,503	.0168	4,157	.0106	3,639	.0133	1,905	.0052
23/64	5,167	.0216	4,199	.0172	3,876	.0108	3,392	.0136	1,776	.0053
3/8	4,842	.0221	3,934	.0176	3,633	.0111	3,176	.0139	1,665	.0054
25/64	4,550	.0226	3,697	.0181	3,411	.0114	2,987	.0143	1,563	.0056
13/32	4,295	.0231	3,490	.0186	3,220	.0117	2,818	.0147	1,477	.0058
7/16	4,215	.0245	3,424	.0198	3,160	.0125	2,764	.0157	1,451	.0063
29/64	3,482	.0274	3,242	.0204	2,995	.0128	2,621	.0162	1,374	.0065
15/32	2,880	.0307	3,074	.0209	2,842	.0131	2,488	.0166	1,303	.0067
31/64	3,561	.0316	2,824	.0207	799	.0130	801	.0165	2,333	.0067
1/2	3,466	.0328	2,749	.0211	777	.0133	779	.0168	2,271	.0068
17/32	3,415	.0340	2,708	.0217	766	.0136	768	.0173	2,237	.0070
9/16	3,362	.0350	2,666	.0222	754	.0139	756	.0177	2,203	.0072
37/64	3,221	.0348	2,555	.0221	723	.0139	724	.0176	2,110	.0072
19/32	3,091	.0346	2,452	.0219	693	.0138	695	.0175	2,025	.0071
39/64	2,971	.0344	2,356	.0218	666	.0137	668	.0173	1,947	.0071
5/8	2,860	.0342	2,268	.0216	642	.0136	643	.0172	1,874	.0070
41/64	2,756	.0340	2,186	.0215	618	.0135	620	.0171	1,806	.0070
43/64	2,723	.0346	2,160	.0219	611	.0137	613	.0174	1,784	.0071
11/16	2,630	.0344	2,086	.0218	590	.0137	591	.0173	1,723	.0071
45/64	2,542	.0342	2,016	.0217	570	.0136	572	.0172	1,666	.0070
23/32	2,460	.0340	1,951	.0215	552	.0135	553	.0171	1,612	.0070
3/4	2,434	.0346	1,930	.0219	546	.0137	547	.0174	1,594	.0071
49/64	2,359	.0344	1,871	.0218	529	.0137	530	.0173	1,545	.0071
25/32	2,288	.0342	1,815	.0217	513	.0136	515	.0172	1,499	.0070

QUALITY TECH TOOL

SERIES PC243 - 3 x D

Non-Coolant Fed

Work Material	Austenitic Stainless		Precipitation Hardened Stainless Steel		Special Alloys				Hardened Steel		Aluminum	
	304/316		17-4 PH		Titanium 6AL-4V		High Temp Alloys Inconel,Hastelloy Waspelloy		>45Rc A2/52100		Aircraft Grade (6061, 7075)	
Cutting Speed	164 SFM		148 SFM		131 SFM		98 SFM		98 SFM		919 SFM	
Nominal Diameter	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev
1/32	12,516	.0012	11,377	.0012	10,241	.0008	7,965	.0007	7,965	.0006	70,534	.0023
1/16	11,125	.0022	10,111	.0022	9,102	.0015	7,077	.0013	7,077	.0011	62,699	.0046
5/64	7,820	.0027	7,111	.0027	6,397	.0018	4,977	.0016	4,977	.0014	44,072	.0056
3/32	6,006	.0033	5,461	.0033	4,917	.0021	3,823	.0020	3,823	.0017	33,858	.0067
1/8	5,563	.0043	5,058	.0043	4,553	.0028	3,539	.0026	3,539	.0022	31,347	.0089
9/64	4,597	.0047	4,178	.0047	3,761	.0030	2,925	.0029	2,925	.0023	25,906	.0096
5/32	3,911	.0050	3,554	.0050	3,202	.0032	2,487	.0030	2,487	.0024	22,043	.0101
11/64	3,402	.0053	3,091	.0053	2,782	.0034	2,162	.0032	2,162	.0025	19,159	.0106
3/16	3,005	.0057	2,731	.0057	2,456	.0035	1,912	.0034	1,912	.0027	16,927	.0112
7/32	2,897	.0064	2,633	.0064	2,370	.0040	1,842	.0039	1,842	.0030	16,324	.0127
15/64	2,608	.0068	2,372	.0068	2,134	.0041	1,661	.0041	1,661	.0031	14,696	.0132
1/4	2,370	.0071	2,154	.0071	1,939	.0043	1,508	.0043	1,508	.0032	13,356	.0137
17/64	2,173	.0072	1,974	.0072	1,778	.0044	1,384	.0045	1,384	.0033	12,235	.0141
19/64	2,114	.0078	1,924	.0078	1,728	.0048	1,344	.0049	1,344	.0036	11,914	.0153
5/16	1,956	.0080	1,777	.0080	1,598	.0048	1,246	.0051	1,246	.0038	11,019	.0157
11/32	1,905	.0085	1,734	.0085	1,558	.0052	1,211	.0055	1,211	.0041	10,740	.0168
23/64	1,776	.0087	1,616	.0087	1,457	.0053	1,132	.0057	1,132	.0042	10,014	.0172
3/8	1,665	.0089	1,512	.0089	1,363	.0054	1,061	.0058	1,061	.0043	9,381	.0176
25/64	1,563	.0091	1,425	.0091	1,282	.0056	996	.0061	996	.0045	8,818	.0181
13/32	1,477	.0094	1,341	.0094	1,208	.0058	938	.0064	938	.0046	8,320	.0186
7/16	1,451	.0100	1,318	.0100	1,187	.0063	923	.0069	923	.0049	8,161	.0198
29/64	1,374	.0102	1,248	.0102	1,122	.0065	874	.0072	874	.0050	7,733	.0204
15/32	1,304	.0105	1,184	.0105	1,068	.0067	831	.0075	831	.0051	7,350	.0209
31/64	1,228	.0103	1,105	.0103	982	.0067	737	.0074	734	.0051	6,877	.0207
1/2	1,195	.0105	1,076	.0105	956	.0068	717	.0076	714	.0052	6,692	.0212
17/32	1,177	.0108	1,060	.0108	942	.0070	706	.0078	703	.0053	6,594	.0217
9/16	1,159	.0111	1,043	.0111	927	.0072	696	.0080	693	.0054	6,492	.0223
37/64	1,111	.0110	1,000	.0110	889	.0071	666	.0079	664	.0054	6,220	.0221
19/32	1,066	.0109	959	.0109	853	.0071	640	.0079	637	.0053	5,969	.0220
39/64	1,025	.0108	922	.0108	820	.0070	615	.0078	612	.0053	5,737	.0218
5/8	986	.0108	888	.0108	789	.0070	592	.0078	589	.0053	5,523	.0217
41/64	950	.0107	855	.0107	760	.0069	570	.0077	568	.0052	5,323	.0215
43/64	939	.0109	845	.0109	751	.0071	563	.0079	561	.0053	5,259	.0219
11/16	907	.0108	816	.0108	725	.0070	544	.0078	542	.0053	5,078	.0218
45/64	877	.0108	789	.0108	701	.0070	526	.0078	524	.0053	4,909	.0217
23/32	848	.0107	763	.0107	679	.0070	509	.0077	507	.0052	4,750	.0216
3/4	839	.0109	755	.0109	671	.0071	504	.0079	501	.0053	4,700	.0219
49/64	813	.0108	732	.0108	651	.0070	488	.0078	486	.0053	4,555	.0218
25/32	789	.0108	710	.0108	631	.0070	473	.0078	471	.0053	4,418	.0217

SERIES PC245 - 5 x D

Non-Coolant Fed

Work Material	Cast Irons				Steels					
	Gray Cast Iron A48 Class 20/G4000		Ductile Cast Iron A536/60-40-18		Low Carbon Steel		Alloy Steel (up to 35 Rc) 4140		Alloy Steel (36-45 Rc) 4140	
Cutting Speed	394 SFM		328 SFM		295 SFM		262 SFM		131 SFM	
Nominal Diameter	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev
1/32	30,337	.0027	24,649	.0021	22,753	.0013	19,910	.0017	10,430	.0007
1/16	26,967	.0052	21,912	.0042	20,225	.0025	17,696	.0033	9,271	.0013
5/64	18,955	.0064	15,403	.0051	14,216	.0031	12,438	.0041	6,517	.0016
3/32	14,563	.0076	11,830	.0061	10,923	.0037	9,555	.0049	5,004	.0020
1/8	13,482	.0100	10,954	.0081	10,112	.0049	8,851	.0065	4,636	.0026
9/64	11,142	.0108	9,054	.0087	8,357	.0053	7,312	.0070	3,830	.0028
5/32	9,480	.0115	7,702	.0092	7,110	.0057	6,221	.0073	3,259	.0029
11/64	8,242	.0121	6,695	.0097	6,182	.0060	5,407	.0078	2,834	.0031
3/16	7,280	.0128	5,915	.0102	5,462	.0064	4,780	.0081	2,504	.0032
7/32	7,022	.0145	5,707	.0115	5,268	.0073	4,608	.0092	2,414	.0036
15/64	6,322	.0152	5,135	.0120	4,741	.0077	4,149	.0096	2,173	.0038
1/4	5,744	.0158	4,668	.0125	4,308	.0080	3,770	.0099	1,974	.0039
17/64	5,262	.0162	4,275	.0128	3,947	.0082	3,455	.0102	1,811	.0040
19/64	5,124	.0175	4,163	.0139	3,842	.0088	3,363	.0110	1,761	.0043
5/16	4,741	.0180	3,851	.0142	3,557	.0090	3,111	.0113	1,630	.0044
11/32	4,619	.0193	3,753	.0153	3,463	.0097	3,032	.0121	1,587	.0047
23/64	4,306	.0197	3,499	.0156	3,230	.0099	2,826	.0123	1,480	.0048
3/8	4,035	.0201	3,279	.0159	3,027	.0101	2,647	.0126	1,388	.0049
25/64	3,791	.0205	3,081	.0164	2,842	.0104	2,489	.0130	1,303	.0051
13/32	3,579	.0211	2,908	.0169	2,683	.0106	2,348	.0134	1,232	.0053
7/16	3,512	.0223	2,853	.0181	2,633	.0113	2,303	.0143	1,208	.0057
29/64	3,326	.0228	2,702	.0185	2,496	.0116	2,185	.0147	1,145	.0059
15/32	3,159	.0233	2,568	.0190	2,371	.0120	2,073	.0151	1,087	.0061
31/64	2,947	.0230	2,456	.0188	2,210	.0118	1,965	.0149	982	.0060
1/2	2,868	.0234	2,390	.0192	2,151	.0121	1,912	.0152	956	.0062
17/32	2,826	.0241	2,355	.0197	2,119	.0124	1,884	.0156	942	.0063
9/16	2,782	.0246	2,319	.0202	2,087	.0127	1,855	.0160	927	.0065
37/64	2,666	.0245	2,221	.0201	1,999	.0126	1,777	.0159	889	.0065
19/32	2,558	.0243	2,132	.0199	1,919	.0125	1,706	.0158	853	.0064
39/64	2,459	.0241	2,049	.0198	1,844	.0125	1,639	.0157	820	.0064
5/8	2,367	.0240	1,972	.0197	1,775	.0124	1,578	.0156	789	.0063
41/64	2,281	.0238	1,901	.0196	1,711	.0123	1,521	.0155	760	.0063
43/64	2,254	.0243	1,878	.0199	1,690	.0125	1,503	.0158	751	.0064
11/16	2,176	.0241	1,814	.0198	1,632	.0125	1,451	.0157	725	.0064
45/64	2,104	.0240	1,753	.0197	1,578	.0124	1,403	.0156	701	.0063
23/32	2,036	.0239	1,697	.0196	1,527	.0123	1,357	.0155	679	.0063
3/4	2,014	.0242	1,678	.0199	1,511	.0125	1,343	.0157	671	.0064
49/64	1,952	.0241	1,627	.0198	1,464	.0124	1,301	.0157	651	.0064
25/32	1,893	.0240	1,578	.0197	1,420	.0124	1,262	.0156	631	.0063

SERIES PC245 - 5 x D

Non-Coolant Fed

Work Material	Austenitic Stainless		Precipitation Hardened Stainless Steel		Special Alloys				Hardened Steel		Aluminum	
	304/316		17-4 PH		Titanium 6AL-4V		High Temp Alloys Inconel,Hastelloy Waspelloy		>45Rc A2/52100		Aircraft Grade (6061, 7075)	
Cutting Speed	131 SFM		131 SFM		115 SFM		82 SFM		82 SFM		771 SFM	
Nominal Diameter	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev
1/32	10,430	.0010	9,481	.0010	8,534	.0007	6,638	.0006	6,638	.0005	58,778	.0021
1/16	9,271	.0020	8,425	.0020	7,584	.0013	5,898	.0012	5,898	.0010	52,249	.0042
5/64	6,517	.0025	5,925	.0025	5,330	.0016	4,147	.0015	4,147	.0012	36,727	.0051
3/32	5,004	.0030	4,551	.0030	4,097	.0020	3,186	.0018	3,186	.0015	28,214	.0061
1/8	4,636	.0040	4,215	.0040	3,794	.0026	2,949	.0024	2,949	.0020	26,123	.0081
9/64	3,830	.0043	3,482	.0043	3,134	.0028	2,438	.0026	2,438	.0021	21,589	.0087
5/32	3,259	.0046	2,962	.0046	2,668	.0029	2,073	.0027	2,073	.0022	18,369	.0092
11/64	2,834	.0049	2,576	.0049	2,318	.0031	1,801	.0029	1,801	.0023	15,966	.0097
3/16	2,504	.0051	2,276	.0051	2,047	.0032	1,594	.0031	1,594	.0024	14,106	.0102
7/32	2,414	.0059	2,194	.0059	1,974	.0036	1,535	.0035	1,535	.0027	13,604	.0115
15/64	2,173	.0062	1,976	.0062	1,779	.0038	1,384	.0038	1,384	.0028	12,246	.0120
1/4	1,974	.0064	1,796	.0064	1,616	.0039	1,256	.0039	1,256	.0029	11,130	.0125
17/64	1,811	.0066	1,644	.0066	1,482	.0040	1,153	.0041	1,153	.0030	10,195	.0128
19/64	1,761	.0071	1,603	.0071	1,441	.0043	1,120	.0045	1,120	.0033	9,928	.0139
5/16	1,630	.0073	1,481	.0073	1,333	.0044	1,038	.0046	1,038	.0034	9,183	.0142
11/32	1,587	.0078	1,444	.0078	1,299	.0047	1,010	.0050	1,010	.0037	8,949	.0153
23/64	1,480	.0079	1,347	.0079	1,213	.0048	943	.0052	943	.0038	8,346	.0156
3/8	1,388	.0081	1,259	.0081	1,136	.0049	883	.0053	883	.0039	7,817	.0159
25/64	1,303	.0083	1,187	.0083	1,068	.0051	829	.0055	829	.0041	7,348	.0164
13/32	1,232	.0085	1,117	.0085	1,006	.0053	781	.0058	781	.0042	6,933	.0169
7/16	1,208	.0091	1,099	.0091	989	.0057	769	.0063	769	.0045	6,800	.0181
29/64	1,145	.0093	1,040	.0093	935	.0059	729	.0065	729	.0046	6,444	.0185
15/32	1,087	.0095	986	.0095	889	.0061	693	.0068	693	.0046	6,125	.0190
31/64	982	.0094	982	.0094	860	.0060	614	.0068	614	.0046	5,771	.0188
1/2	956	.0096	956	.0096	837	.0062	598	.0069	598	.0047	5,617	.0192
17/32	942	.0099	942	.0099	824	.0063	589	.0071	589	.0048	5,534	.0197
9/16	927	.0101	927	.0101	811	.0065	580	.0073	580	.0049	5,449	.0202
37/64	889	.0100	889	.0100	777	.0065	555	.0072	555	.0049	5,220	.0201
19/32	853	.0100	853	.0100	746	.0064	533	.0072	533	.0048	5,010	.0199
39/64	820	.0099	820	.0099	717	.0064	512	.0072	512	.0048	4,815	.0198
5/8	789	.0098	789	.0098	690	.0063	493	.0071	493	.0048	4,635	.0197
41/64	760	.0098	760	.0098	665	.0063	475	.0071	475	.0047	4,467	.0196
43/64	751	.0100	751	.0100	657	.0064	470	.0072	470	.0048	4,414	.0199
11/16	725	.0099	725	.0099	635	.0064	453	.0071	453	.0048	4,262	.0198
45/64	701	.0098	701	.0098	614	.0063	438	.0071	438	.0048	4,120	.0197
23/32	679	.0098	679	.0098	594	.0063	424	.0071	424	.0047	3,987	.0196
3/4	671	.0099	671	.0099	587	.0064	420	.0072	420	.0048	3,944	.0199
49/64	651	.0099	651	.0099	569	.0064	407	.0071	407	.0048	3,823	.0198
25/32	631	.0098	631	.0098	552	.0063	394	.0071	394	.0048	3,708	.0197

SERIES PC253 - 3 x D

Coolant Fed

Work Material	Cast Irons				Steels					
	Gray Cast Iron A48 Class 20/G4000		Ductile Cast Iron A536/60-40-18		Low Carbon Steel		Alloy Steel (up to 35 Rc) 4140		Alloy Steel (36-45 Rc) 4140	
Cutting Speed	623 SFM		509 SFM		476 SFM		410 SFM		213 SFM	
Nominal Diameter	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev
1/32	48,539	.0029	39,438	.0023	36,405	.0014	31,856	.0019	16,688	.0008
1/16	43,148	.0057	35,058	.0046	32,360	.0028	28,315	.0037	14,834	.0015
5/64	30,327	.0070	24,644	.0056	22,746	.0034	19,901	.0045	10,427	.0018
3/32	23,300	.0083	18,928	.0067	17,476	.0041	15,288	.0054	8,007	.0021
1/8	21,571	.0110	17,526	.0089	16,180	.0054	14,161	.0072	7,417	.0028
9/64	17,828	.0119	14,485	.0096	13,371	.0059	11,699	.0077	6,128	.0030
5/32	15,169	.0126	12,323	.0101	11,376	.0063	9,954	.0081	5,215	.0032
11/64	13,186	.0133	10,712	.0106	9,891	.0066	8,651	.0085	4,535	.0034
3/16	11,647	.0141	9,464	.0112	8,738	.0071	7,647	.0089	4,006	.0035
7/32	11,234	.0160	9,131	.0127	8,427	.0080	7,372	.0101	3,862	.0040
15/64	10,115	.0167	8,216	.0132	7,585	.0084	6,638	.0105	3,477	.0041
1/4	9,191	.0173	7,468	.0137	6,893	.0088	6,032	.0109	3,159	.0043
17/64	8,419	.0178	6,841	.0141	6,314	.0090	5,528	.0112	2,897	.0044
19/64	8,199	.0193	6,660	.0153	6,148	.0097	5,381	.0121	2,817	.0048
5/16	7,584	.0198	6,161	.0157	5,691	.0099	4,977	.0124	2,607	.0048
11/32	7,391	.0212	6,004	.0168	5,542	.0106	4,851	.0133	2,540	.0052
23/64	6,889	.0216	5,599	.0172	5,167	.0108	4,522	.0136	2,367	.0053
3/8	6,455	.0221	5,246	.0176	4,843	.0111	4,235	.0139	2,220	.0054
25/64	6,066	.0226	4,929	.0181	4,548	.0114	3,982	.0143	2,083	.0056
13/32	5,726	.0231	4,653	.0186	4,293	.0117	3,756	.0147	1,970	.0058
7/16	5,619	.0245	4,564	.0198	4,213	.0125	3,685	.0157	1,934	.0063
29/64	5,320	.0251	4,323	.0204	3,993	.0128	3,495	.0162	1,831	.0065
15/32	5,055	.0256	4,108	.0209	3,793	.0131	3,316	.0166	1,738	.0067
31/64	4,666	.0253	3,807	.0207	3,561	.0130	3,070	.0164	1,596	.0067
1/2	4,541	.0257	3,705	.0212	3,466	.0132	2,988	.0168	1,554	.0068
17/32	4,474	.0264	3,650	.0217	3,415	.0136	2,944	.0172	1,531	.0070
9/16	4,405	.0270	3,594	.0223	3,362	.0139	2,898	.0176	1,507	.0072
37/64	4,221	.0268	3,443	.0221	3,221	.0138	2,777	.0175	1,444	.0071
19/32	4,051	.0267	3,304	.0220	3,091	.0137	2,665	.0174	1,386	.0071
39/64	3,893	.0265	3,176	.0218	2,971	.0136	2,561	.0173	1,332	.0070
5/8	3,747	.0263	3,057	.0217	2,860	.0136	2,465	.0172	1,282	.0070
41/64	3,612	.0262	2,947	.0215	2,756	.0135	2,376	.0171	1,236	.0069
43/64	3,569	.0266	2,911	.0219	2,723	.0137	2,348	.0174	1,221	.0071
11/16	3,446	.0265	2,811	.0218	2,630	.0136	2,267	.0173	1,179	.0070
45/64	3,331	.0263	2,717	.0217	2,542	.0136	2,191	.0172	1,140	.0070
23/32	3,224	.0262	2,630	.0216	2,460	.0135	2,121	.0171	1,103	.0070
3/4	3,189	.0266	2,602	.0219	2,434	.0137	2,098	.0174	1,091	.0071
49/64	3,091	.0265	2,521	.0218	2,359	.0136	2,033	.0173	1,057	.0070
25/32	2,998	.0263	2,446	.0217	2,288	.0136	1,972	.0172	1,026	.0070

SERIES PC253 - 3 x D

Coolant Fed

Work Material	Austenitic Stainless		Precipitation Hardened Stainless Steel		Special Alloys				Hardened Steel		Aluminum	
	304/316		17-4 PH		Titanium 6AL-4V		High Temp Alloys Inconel,Hastelloy Waspelloy		>45Rc A2/52100		Aircraft Grade (6061, 7075)	
Cutting Speed	213 SFM		197 SFM		180 SFM		131 SFM		131 SFM		1214 SFM	
Nominal Diameter	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev
1/32	16,688	.0012	15,169	.0012	13,654	.0008	10,620	.0007	10,620	.0006	94,045	.0023
1/16	14,834	.0022	13,481	.0022	12,135	.0015	9,436	.0013	9,436	.0011	83,598	.0046
5/64	10,427	.0027	9,480	.0027	8,528	.0018	6,636	.0016	6,636	.0014	58,762	.0056
3/32	8,007	.0033	7,281	.0033	6,555	.0021	5,098	.0020	5,098	.0017	45,143	.0067
1/8	7,417	.0043	6,744	.0043	6,071	.0028	4,718	.0026	4,718	.0022	41,796	.0089
9/64	6,128	.0047	5,571	.0047	5,014	.0030	3,900	.0029	3,900	.0023	34,541	.0096
5/32	5,215	.0050	4,739	.0050	4,268	.0032	3,316	.0030	3,316	.0024	29,391	.0101
11/64	4,535	.0053	4,122	.0053	3,708	.0034	2,882	.0032	2,882	.0025	25,546	.0106
3/16	4,006	.0057	3,640	.0057	3,275	.0035	2,549	.0034	2,549	.0027	22,569	.0112
7/32	3,862	.0064	3,510	.0064	3,159	.0040	2,455	.0039	2,455	.0030	21,765	.0127
15/64	3,477	.0068	3,161	.0068	2,846	.0041	2,215	.0041	2,215	.0031	19,594	.0132
1/4	3,159	.0071	2,872	.0071	2,585	.0043	2,011	.0043	2,011	.0032	17,807	.0137
17/64	2,897	.0072	2,631	.0072	2,371	.0044	1,845	.0045	1,845	.0033	16,312	.0141
19/64	2,817	.0078	2,564	.0078	2,305	.0048	1,792	.0049	1,792	.0036	15,885	.0153
5/16	2,607	.0080	2,369	.0080	2,131	.0048	1,661	.0051	1,661	.0038	14,692	.0157
11/32	2,540	.0085	2,312	.0085	2,077	.0052	1,615	.0055	1,615	.0041	14,319	.0168
23/64	2,367	.0087	2,154	.0087	1,941	.0053	1,509	.0057	1,509	.0042	13,352	.0172
3/8	2,220	.0089	2,015	.0089	1,817	.0054	1,414	.0058	1,414	.0043	12,507	.0176
25/64	2,083	.0091	1,899	.0091	1,708	.0056	1,327	.0061	1,327	.0045	11,757	.0181
13/32	1,970	.0094	1,787	.0094	1,610	.0058	1,250	.0064	1,250	.0046	11,093	.0186
7/16	1,934	.0100	1,758	.0100	1,582	.0063	1,230	.0069	1,230	.0049	10,880	.0198
29/64	1,831	.0102	1,663	.0102	1,495	.0065	1,165	.0072	1,165	.0050	10,310	.0204
15/32	1,738	.0105	1,578	.0105	1,423	.0067	1,107	.0075	1,107	.0051	9,800	.0209
31/64	1,596	.0103	1,474	.0103	1,351	.0067	982	.0074	982	.0051	9,087	.0207
1/2	1,554	.0105	1,434	.0105	1,315	.0068	956	.0076	956	.0052	8,844	.0212
17/32	1,531	.0108	1,413	.0108	1,295	.0070	942	.0078	942	.0053	8,713	.0217
9/16	1,507	.0111	1,391	.0111	1,275	.0072	927	.0080	927	.0054	8,578	.0223
37/64	1,444	.0110	1,333	.0110	1,222	.0071	889	.0079	889	.0054	8,219	.0221
19/32	1,386	.0109	1,279	.0109	1,173	.0071	853	.0079	853	.0053	7,888	.0220
39/64	1,332	.0108	1,229	.0108	1,127	.0070	820	.0078	820	.0053	7,582	.0218
5/8	1,282	.0108	1,183	.0108	1,085	.0070	789	.0078	789	.0053	7,298	.0217
41/64	1,236	.0107	1,141	.0107	1,046	.0069	760	.0077	760	.0052	7,034	.0215
43/64	1,221	.0109	1,127	.0109	1,033	.0071	751	.0079	751	.0053	6,949	.0219
11/16	1,179	.0108	1,088	.0108	997	.0070	725	.0078	725	.0053	6,710	.0218
45/64	1,140	.0108	1,052	.0108	964	.0070	701	.0078	701	.0053	6,487	.0217
23/32	1,103	.0107	1,018	.0107	933	.0070	679	.0077	679	.0052	6,277	.0216
3/4	1,091	.0109	1,007	.0109	923	.0071	671	.0079	671	.0053	6,210	.0219
49/64	1,057	.0108	976	.0108	895	.0070	651	.0078	651	.0053	6,019	.0218
25/32	1,026	.0108	947	.0108	868	.0070	631	.0078	631	.0053	5,838	.0217

SERIES PC255 - 5 x D

Coolant Fed

Work Material	Cast Irons				Steels					
	Gray Cast Iron A48 Class 20/G4000		Ductile Cast Iron A536/60-40-18		Low Carbon Steel		Alloy Steel (up to 35 Rc) 4140		Alloy Steel (36-45 Rc) 4140	
Cutting Speed	525 SFM		427 SFM		394 SFM		345 SFM		180 SFM	
Nominal Diameter	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev
1/32	40,450	.0027	32,865	.0021	30,337	.0013	26,547	.0017	13,907	.0007
1/16	35,957	.0052	29,215	.0042	26,966	.0025	23,596	.0033	12,361	.0013
5/64	25,273	.0064	20,537	.0051	18,955	.0031	16,584	.0041	8,689	.0016
3/32	19,417	.0076	15,773	.0061	14,564	.0037	12,740	.0049	6,672	.0020
1/8	17,976	.0100	14,605	.0081	13,483	.0049	11,800	.0065	6,181	.0026
9/64	14,856	.0108	12,071	.0087	11,142	.0053	9,749	.0070	5,107	.0028
5/32	12,640	.0115	10,269	.0092	9,480	.0057	8,295	.0073	4,346	.0029
11/64	10,988	.0121	8,927	.0097	8,243	.0060	7,209	.0078	3,779	.0031
3/16	9,706	.0128	7,887	.0102	7,282	.0064	6,372	.0081	3,339	.0032
7/32	9,362	.0145	7,609	.0115	7,023	.0073	6,144	.0092	3,218	.0036
15/64	8,430	.0152	6,847	.0120	6,321	.0077	5,532	.0096	2,897	.0038
1/4	7,659	.0158	6,223	.0125	5,744	.0080	5,026	.0099	2,633	.0039
17/64	7,016	.0162	5,701	.0128	5,262	.0082	4,607	.0102	2,414	.0040
19/64	6,832	.0175	5,550	.0139	5,123	.0088	4,485	.0110	2,348	.0043
5/16	6,320	.0180	5,135	.0142	4,743	.0090	4,147	.0113	2,173	.0044
11/32	6,159	.0193	5,003	.0153	4,618	.0097	4,043	.0121	2,116	.0047
23/64	5,741	.0197	4,666	.0156	4,306	.0099	3,768	.0123	1,973	.0048
3/8	5,379	.0201	4,371	.0159	4,036	.0101	3,529	.0126	1,850	.0049
25/64	5,055	.0205	4,107	.0164	3,790	.0104	3,319	.0130	1,736	.0051
13/32	4,772	.0211	3,877	.0169	3,578	.0106	3,130	.0134	1,641	.0053
7/16	4,682	.0223	3,804	.0181	3,511	.0113	3,071	.0143	1,611	.0057
29/64	4,433	.0228	3,603	.0185	3,328	.0116	2,912	.0147	1,526	.0059
15/32	4,212	.0233	3,423	.0190	3,160	.0120	2,764	.0151	1,449	.0061
31/64	3,929	.0230	3,193	.0188	2,947	.0118	2,579	.0149	1,351	.0060
1/2	3,824	.0234	3,107	.0192	2,868	.0121	2,510	.0152	1,315	.0062
17/32	3,768	.0241	3,061	.0197	2,826	.0124	2,473	.0156	1,295	.0063
9/16	3,710	.0246	3,014	.0202	2,782	.0127	2,434	.0160	1,275	.0065
37/64	3,554	.0245	2,888	.0201	2,666	.0126	2,332	.0159	1,222	.0065
19/32	3,411	.0243	2,771	.0199	2,558	.0125	2,238	.0158	1,173	.0064
39/64	3,279	.0241	2,664	.0198	2,459	.0125	2,152	.0157	1,127	.0064
5/8	3,156	.0240	2,564	.0197	2,367	.0124	2,071	.0156	1,085	.0063
41/64	3,042	.0238	2,471	.0196	2,281	.0123	1,996	.0155	1,046	.0063
43/64	3,005	.0243	2,442	.0199	2,254	.0125	1,972	.0158	1,033	.0064
11/16	2,902	.0241	2,358	.0198	2,176	.0125	1,904	.0157	997	.0064
45/64	2,805	.0240	2,279	.0197	2,104	.0124	1,841	.0156	964	.0063
23/32	2,715	.0239	2,206	.0196	2,036	.0123	1,781	.0155	933	.0063
3/4	2,685	.0242	2,182	.0199	2,014	.0125	1,762	.0157	923	.0064
49/64	2,603	.0241	2,115	.0198	1,952	.0124	1,708	.0157	895	.0064
25/32	2,525	.0240	2,051	.0197	1,893	.0124	1,657	.0156	868	.0063

QUALITY TECH TOOL

SERIES PC255 - 5 x D

Coolant Fed

Work Material	Austenitic Stainless		Precipitation Hardened Stainless Steel		Special Alloys				Hardened Steel		Aluminum	
	304/316		17-4 PH		Titanium 6AL-4V		High Temp Alloys Inconel,Hastelloy Waspelloy		>45Rc A2/52100		Aircraft Grade (6061, 7075)	
Cutting Speed	180 SFM		164 SFM		148 SFM		115 SFM		115 SFM		1017 SFM	
Nominal Diameter	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev
1/32	13,907	.0010	12,640	.0010	11,378	.0007	8,850	.0006	8,850	.0005	78,371	.0021
1/16	12,361	.0020	11,234	.0020	10,112	.0013	7,863	.0012	7,863	.0010	69,665	.0042
5/64	8,689	.0025	7,900	.0025	7,107	.0016	5,530	.0015	5,530	.0012	48,969	.0051
3/32	6,672	.0030	6,067	.0030	5,463	.0020	4,248	.0018	4,248	.0015	37,619	.0061
1/8	6,181	.0040	5,620	.0040	5,059	.0026	3,932	.0024	3,932	.0020	34,830	.0081
9/64	5,107	.0043	4,643	.0043	4,178	.0028	3,250	.0026	3,250	.0021	28,784	.0087
5/32	4,346	.0046	3,949	.0046	3,557	.0029	2,763	.0027	2,763	.0022	24,492	.0092
11/64	3,779	.0049	3,435	.0049	3,090	.0031	2,401	.0029	2,401	.0023	21,288	.0097
3/16	3,339	.0051	3,034	.0051	2,729	.0032	2,124	.0031	2,124	.0024	18,807	.0102
7/32	3,218	.0059	2,925	.0059	2,632	.0036	2,046	.0035	2,046	.0027	18,138	.0115
15/64	2,897	.0062	2,635	.0062	2,372	.0038	1,846	.0038	1,846	.0028	16,328	.0120
1/4	2,633	.0064	2,393	.0064	2,154	.0039	1,675	.0039	1,675	.0029	14,839	.0125
17/64	2,414	.0066	2,193	.0066	1,976	.0040	1,537	.0041	1,537	.0030	13,594	.0128
19/64	2,348	.0071	2,137	.0071	1,921	.0043	1,493	.0045	1,493	.0033	13,237	.0139
5/16	2,173	.0073	1,974	.0073	1,776	.0044	1,384	.0046	1,384	.0034	12,244	.0142
11/32	2,116	.0078	1,926	.0078	1,731	.0047	1,346	.0050	1,346	.0037	11,933	.0153
23/64	1,973	.0079	1,795	.0079	1,618	.0048	1,258	.0052	1,258	.0038	11,127	.0156
3/8	1,850	.0081	1,679	.0081	1,514	.0049	1,178	.0053	1,178	.0039	10,422	.0159
25/64	1,736	.0083	1,582	.0083	1,424	.0051	1,106	.0055	1,106	.0041	9,797	.0164
13/32	1,641	.0085	1,489	.0085	1,342	.0053	1,042	.0058	1,042	.0042	9,244	.0169
7/16	1,611	.0091	1,465	.0091	1,318	.0057	1,025	.0063	1,025	.0045	9,067	.0181
29/64	1,526	.0093	1,386	.0093	1,246	.0059	971	.0065	971	.0046	8,592	.0185
15/32	1,449	.0095	1,315	.0095	1,186	.0061	923	.0068	923	.0046	8,167	.0190
31/64	1,351	.0094	1,228	.0094	1,105	.0060	860	.0068	860	.0046	7,613	.0188
1/2	1,315	.0096	1,195	.0096	1,076	.0062	837	.0069	837	.0047	7,409	.0192
17/32	1,295	.0099	1,177	.0099	1,060	.0063	824	.0071	824	.0048	7,300	.0197
9/16	1,275	.0101	1,159	.0101	1,043	.0065	811	.0073	811	.0049	7,187	.0202
37/64	1,222	.0100	1,111	.0100	1,000	.0065	777	.0072	777	.0049	6,886	.0201
19/32	1,173	.0100	1,066	.0100	959	.0064	746	.0072	746	.0048	6,609	.0199
39/64	1,127	.0099	1,025	.0099	922	.0064	717	.0072	717	.0048	6,352	.0198
5/8	1,085	.0098	986	.0098	888	.0063	690	.0071	690	.0048	6,114	.0197
41/64	1,046	.0098	950	.0098	855	.0063	665	.0071	665	.0047	5,893	.0196
43/64	1,033	.0100	939	.0100	845	.0064	657	.0072	657	.0048	5,822	.0199
11/16	997	.0099	907	.0099	816	.0064	635	.0071	635	.0048	5,622	.0198
45/64	964	.0098	877	.0098	789	.0063	614	.0071	614	.0048	5,435	.0197
23/32	933	.0098	848	.0098	763	.0063	594	.0071	594	.0047	5,259	.0196
3/4	923	.0099	839	.0099	755	.0064	587	.0072	587	.0048	5,203	.0199
49/64	895	.0099	813	.0099	732	.0064	569	.0071	569	.0048	5,043	.0198
25/32	868	.0098	789	.0098	710	.0063	552	.0071	552	.0048	4,891	.0197

SERIES PC258 - 8 x D

Coolant Fed

Work Material	Cast Irons				Steels					
	Gray Cast Iron A48 Class 20/G4000		Ductile Cast Iron A536/60-40-18		Low Carbon Steel		Alloy Steel (up to 35 Rc) 4140		Alloy Steel (36-45 Rc) 4140	
Cutting Speed	476 SFM		377 SFM		361 SFM		312 SFM		164 SFM	
Nominal Diameter	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev
1/32	36,405	.0027	29,579	.0021	27,303	.0013	23,893	.0017	12,516	.0007
1/16	32,362	.0052	26,294	.0042	24,270	.0025	21,237	.0033	11,125	.0013
5/64	22,746	.0064	18,483	.0051	17,059	.0031	14,926	.0041	7,820	.0016
3/32	17,476	.0076	14,196	.0061	13,107	.0037	11,466	.0049	6,006	.0020
1/8	16,179	.0100	13,145	.0081	12,135	.0049	10,620	.0065	5,563	.0026
9/64	13,371	.0108	10,864	.0087	10,028	.0053	8,775	.0070	4,597	.0028
5/32	11,376	.0115	9,242	.0092	8,533	.0057	7,465	.0073	3,911	.0029
11/64	9,890	.0121	8,034	.0097	7,419	.0060	6,488	.0078	3,402	.0031
3/16	8,735	.0128	7,098	.0102	6,554	.0064	5,735	.0081	3,005	.0032
7/32	8,426	.0145	6,848	.0115	6,320	.0073	5,529	.0092	2,897	.0036
15/64	7,587	.0152	6,162	.0120	5,689	.0077	4,979	.0096	2,608	.0038
1/4	6,893	.0158	5,601	.0125	5,170	.0080	4,524	.0099	2,370	.0039
17/64	6,314	.0162	5,131	.0128	4,736	.0082	4,146	.0102	2,173	.0040
19/64	6,150	.0175	4,995	.0139	4,611	.0088	4,036	.0110	2,114	.0043
5/16	5,688	.0180	4,622	.0142	4,268	.0090	3,733	.0113	1,956	.0044
11/32	5,544	.0193	4,503	.0153	4,157	.0097	3,639	.0121	1,905	.0047
23/64	5,167	.0197	4,199	.0156	3,876	.0099	3,392	.0123	1,776	.0048
3/8	4,842	.0201	3,934	.0159	3,633	.0101	3,176	.0126	1,665	.0049
25/64	4,550	.0205	3,697	.0164	3,411	.0104	2,987	.0130	1,563	.0051
13/32	4,295	.0211	3,490	.0169	3,220	.0106	2,818	.0134	1,477	.0053
7/16	4,215	.0223	3,424	.0181	3,160	.0113	2,764	.0143	1,451	.0057
29/64	3,990	.0228	3,242	.0185	2,995	.0116	2,621	.0147	1,374	.0059
15/32	3,792	.0233	3,081	.0190	2,845	.0120	2,488	.0151	1,304	.0061
31/64	3,561	.0230	2,824	.0188	2,702	.0118	2,333	.0149	1,228	.0060
1/2	3,466	.0234	2,749	.0192	2,629	.0121	2,271	.0152	1,195	.0062
17/32	3,415	.0241	2,708	.0197	2,590	.0124	2,237	.0156	1,177	.0063
9/16	3,362	.0246	2,666	.0202	2,550	.0127	2,203	.0160	1,159	.0065
37/64	3,221	.0245	2,555	.0201	2,444	.0126	2,110	.0159	1,111	.0065
19/32	3,091	.0243	2,452	.0199	2,345	.0125	2,025	.0158	1,066	.0064
39/64	2,971	.0241	2,356	.0198	2,254	.0125	1,947	.0157	1,025	.0064
5/8	2,860	.0240	2,268	.0197	2,170	.0124	1,874	.0156	986	.0063
41/64	2,756	.0238	2,186	.0196	2,091	.0123	1,806	.0155	950	.0063
43/64	2,723	.0243	2,160	.0199	2,066	.0125	1,784	.0158	939	.0064
11/16	2,630	.0241	2,086	.0198	1,995	.0125	1,723	.0157	907	.0064
45/64	2,542	.0240	2,016	.0197	1,929	.0124	1,666	.0156	877	.0063
23/32	2,460	.0239	1,951	.0196	1,866	.0123	1,612	.0155	848	.0063
3/4	2,434	.0242	1,930	.0199	1,846	.0125	1,594	.0157	839	.0064
49/64	2,359	.0241	1,871	.0198	1,789	.0124	1,545	.0157	813	.0064
25/32	2,288	.0240	1,815	.0197	1,736	.0124	1,499	.0156	789	.0063

QUALITY TECH TOOL

SERIES PC258 - 8 x D

Coolant Fed

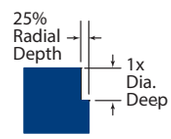
Work Material	Austenitic Stainless		Precipitation Hardened Stainless Steel		Special Alloys				Hardened Steel		Aluminum	
	304/316		17-4 PH		Titanium 6AL-4V		High Temp Alloys Inconel,Hastelloy Waspelloy		>45Rc A2/52100		Aircraft Grade (6061, 7075)	
Cutting Speed	164 SFM		148 SFM		131 SFM		98 SFM		98 SFM		919 SFM	
Nominal Diameter	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev
1/32	12,516	.0010	11,377	.0010	10,241	.0007	7,965	.0006	7,965	.0005	70,534	.0021
1/16	11,125	.0020	10,111	.0020	9,102	.0013	7,077	.0012	7,077	.0010	62,699	.0042
5/64	7,820	.0025	7,111	.0025	6,397	.0016	4,977	.0015	4,977	.0012	44,072	.0051
3/32	6,006	.0030	5,461	.0030	4,917	.0020	3,823	.0018	3,823	.0015	33,858	.0061
1/8	5,563	.0040	5,058	.0040	4,553	.0026	3,539	.0024	3,539	.0020	31,347	.0081
9/64	4,597	.0043	4,178	.0043	3,761	.0028	2,925	.0026	2,925	.0021	25,906	.0087
5/32	3,911	.0046	3,554	.0046	3,202	.0029	2,487	.0027	2,487	.0022	22,043	.0092
11/64	3,402	.0049	3,091	.0049	2,782	.0031	2,162	.0029	2,162	.0023	19,159	.0097
3/16	3,005	.0051	2,731	.0051	2,456	.0032	1,912	.0031	1,912	.0024	16,927	.0102
7/32	2,897	.0059	2,633	.0059	2,370	.0036	1,842	.0035	1,842	.0027	16,324	.0115
15/64	2,608	.0062	2,372	.0062	2,134	.0038	1,661	.0038	1,661	.0028	14,696	.0120
1/4	2,370	.0064	2,154	.0064	1,939	.0039	1,508	.0039	1,508	.0029	13,356	.0125
17/64	2,173	.0066	1,974	.0066	1,778	.0040	1,384	.0041	1,384	.0030	12,235	.0128
19/64	2,114	.0071	1,924	.0071	1,728	.0043	1,344	.0045	1,344	.0033	11,914	.0139
5/16	1,956	.0073	1,777	.0073	1,598	.0044	1,246	.0046	1,246	.0034	11,019	.0142
11/32	1,905	.0078	1,734	.0078	1,558	.0047	1,211	.0050	1,211	.0037	10,740	.0153
23/64	1,776	.0079	1,616	.0079	1,457	.0048	1,132	.0052	1,132	.0038	10,014	.0156
3/8	1,665	.0081	1,512	.0081	1,363	.0049	1,061	.0053	1,061	.0039	9,381	.0159
25/64	1,563	.0083	1,425	.0083	1,282	.0051	996	.0055	996	.0041	8,818	.0164
13/32	1,477	.0085	1,341	.0085	1,208	.0053	938	.0058	938	.0042	8,320	.0169
7/16	1,451	.0091	1,318	.0091	1,187	.0057	923	.0063	923	.0045	8,161	.0181
29/64	1,374	.0093	1,248	.0093	1,122	.0059	874	.0065	874	.0046	7,733	.0185
15/32	1,304	.0095	1,184	.0095	1,068	.0061	831	.0068	831	.0046	7,350	.0190
31/64	1,228	.0094	1,105	.0094	982	.0060	737	.0068	737	.0046	6,877	.0188
1/2	1,195	.0096	1,076	.0096	956	.0062	717	.0069	717	.0047	6,692	.0192
17/32	1,177	.0099	1,060	.0099	942	.0063	706	.0071	706	.0048	6,594	.0197
9/16	1,159	.0101	1,043	.0101	927	.0065	696	.0073	696	.0049	6,492	.0202
37/64	1,111	.0100	1,000	.0100	889	.0065	666	.0072	666	.0049	6,220	.0201
19/32	1,066	.0100	959	.0100	853	.0064	640	.0072	640	.0048	5,969	.0199
39/64	1,025	.0099	922	.0099	820	.0064	615	.0072	615	.0048	5,737	.0198
5/8	986	.0098	888	.0098	789	.0063	592	.0071	592	.0048	5,523	.0197
41/64	950	.0098	855	.0098	760	.0063	570	.0071	570	.0047	5,323	.0196
43/64	939	.0100	845	.0100	751	.0064	563	.0072	563	.0048	5,259	.0199
11/16	907	.0099	816	.0099	725	.0064	544	.0071	544	.0048	5,078	.0198
45/64	877	.0098	789	.0098	701	.0063	526	.0071	526	.0048	4,909	.0197
23/32	848	.0098	763	.0098	679	.0063	509	.0071	509	.0047	4,750	.0196
3/4	839	.0099	755	.0099	671	.0064	504	.0072	504	.0048	4,700	.0199
49/64	813	.0099	732	.0099	651	.0064	488	.0071	488	.0048	4,555	.0198
25/32	789	.0098	710	.0098	631	.0063	473	.0071	473	.0048	4,418	.0197

QUALITY TECH TOOL

SERIES PC400, PC401

4-6 Flute - Rough End Mills - Medium Profile Milling

Hardness	≤88 HRB		>88 HRB, ≤26 HRC		≤26 HRC		≤26 HRC		≤91 HRB		≤32 HRC		≤32 HRC	
Work Material	Steels								Cast Iron					
	Carbon Steel				Alloy Steel		Tool Steel		Gray		Ductile		Malleable	
Cutting Speed	518 SFM		425 SFM		375 SFM		356 SFM		500 SFM		112 SFM		212 SFM	
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/4	7,985	31.2	6,586	20.2	5,833	17.8	5,511	16.8	7,854	36.5	1,769	5.4	3,299	10.0
5/16	6,328	29.6	5,216	19.2	4,623	17.0	4,370	16.0	6,227	34.8	1,402	5.2	2,614	9.6
3/8	5,309	28.6	4,381	18.6	3,879	16.6	3,667	15.6	5,219	33.6	1,178	5.0	2,187	9.4
1/2	3,991	41.6	3,299	27.5	2,917	24.3	2,761	22.9	3,931	48.7	886	7.3	1,648	13.6
5/8	3,158	39.2	2,614	25.9	2,311	22.9	2,185	21.7	3,107	46.1	707	6.9	1,301	12.8
3/4	2,648	37.8	2,187	24.9	1,935	22.1	1,829	20.9	2,608	44.7	595	6.7	1,097	12.4
1	1,969	59.1	1,624	39.2	1,440	34.6	1,366	32.9	1,944	69.8	443	10.7	812	19.6



Depth of Cut

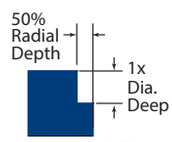
Hardness	≤88 HRB		>88 HRB, ≤26 HRC		≤26 HRC		≤26 HRC		≤91 HRB		≤32 HRC	
Work Material	Stainless Steels						Special Alloys				Aluminum	
	300 Series		400 Series		PH Steels		Titanium Alloys		Hi Temp Alloys		6061, 7075	
Cutting Speed	288 SFM		438 SFM		138 SFM		205 SFM		73 SFM		1,400 SFM	
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/4	4,434	13.7	6,777	20.7	4,052	12.4	3,168	12.4	1,077	3.4	21,732	169.7
5/16	3,511	13.1	5,368	19.7	3,208	11.8	2,513	11.8	859	3.2	17,227	160.5
3/8	2,951	12.7	4,502	19.3	2,698	11.6	2,106	11.4	717	3.0	14,448	154.7
1/2	2,222	18.5	3,395	28.2	2,031	16.8	1,588	16.5	538	4.4	10,866	225.0
5/8	1,756	17.5	2,690	26.6	1,604	16.0	1,251	15.5	429	4.2	8,614	214.0
3/4	1,471	16.7	2,253	25.6	1,349	15.4	1,056	15.1	358	4.0	7,219	207.0
1	1,095	26.4	1,673	40.2	997	24.0	787	23.7	271	6.5	5,364	321.9

QUALITY TECH TOOL

SERIES PC400, PC401

4-6 Flute - Rough End Mills - Heavy Profile Milling

Hardness	≤88 HRB		>88 HRB, ≤26 HRC		≤26 HRC		≤26 HRC		≤91 HRB		≤32 HRC		≤32 HRC	
Work Material	Steels								Cast Iron					
	Carbon Steel				Alloy Steel		Tool Steel		Gray		Ductile		Malleable	
Cutting Speed	470 SFM		388 SFM		886 SFM		850 SFM		1,200 SFM		270 SFM		515 SFM	
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/4	7,220	21.2	6,024	13.9	5,259	12.2	5,008	11.7	7,099	25.0	1,588	3.6	3,037	7.1
5/16	5,721	20.2	4,774	13.3	4,168	11.8	3,966	11.1	5,621	23.7	1,251	3.5	2,412	6.9
3/8	4,805	19.4	4,001	13.1	3,496	11.4	3,325	10.9	4,714	22.9	1,056	3.4	2,025	6.7
1/2	3,611	28.2	3,012	18.7	2,630	16.3	2,499	15.6	3,551	32.9	790	4.9	1,518	9.5
5/8	2,867	26.6	2,387	17.8	2,084	15.5	1,983	14.8	2,816	31.5	631	4.7	1,200	8.9
3/4	2,399	25.6	2,000	17.2	1,748	14.9	1,667	14.2	2,359	30.4	530	4.5	1,006	8.7
1	1,784	40.0	1,489	27.1	1,304	23.7	1,243	22.5	1,747	47.0	394	7.3	751	13.6



Depth of Cut

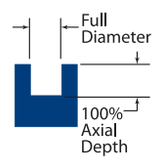
Hardness	≤88 HRB		>88 HRB, ≤26 HRC		≤26 HRC		≤26 HRC		≤91 HRB		≤32 HRC	
Work Material	Stainless Steels						Special Alloys				Aluminum	
	300 Series		400 Series		PH Steels		Titanium Alloys		Hi Temp Alloys		6061, 7075	
Cutting Speed	690 SFM		1,050 SFM		640 SFM		475 SFM		174 SFM		3,315 SFM	
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/4	4,052	9.5	6,205	14.4	3,742	8.8	2,786	8.3	1,017	2.4	19,520	114.2
5/16	3,208	9.1	4,925	13.8	2,968	8.4	2,210	7.9	808	2.2	15,472	107.8
3/8	2,698	8.7	4,132	13.4	2,490	8.2	1,854	7.5	676	2.2	12,977	103.8
1/2	2,031	12.6	3,108	19.2	1,865	11.4	1,397	10.9	503	3.2	9,754	151.0
5/8	1,604	11.8	2,463	18.2	1,478	10.8	1,099	10.1	404	3.0	7,730	143.7
3/4	1,349	11.6	2,066	17.6	1,243	10.6	925	9.9	333	2.8	6,487	139.3
1	997	18.2	1,538	28.1	923	16.7	689	15.5	246	4.4	4,823	217.5

QUALITY TECH TOOL

SERIES PC400, PC401

4-6 Flute - Rough End Mills - Slot Milling

Hardness	≤88 HRB		>88 HRB, ≤26 HRC		≤26 HRC		≤26 HRC		≤91 HRB		≤32 HRC		≤32 HRC	
Work Material	Steels								Cast Iron					
	Carbon Steel				Alloy Steel		Tool Steel		Gray		Ductile		Malleable	
Cutting Speed	302 SFM		250 SFM		220 SFM		206 SFM		295 SFM		150 SFM		128 SFM	
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/4	4,667	8.9	3,805	6.0	3,394	5.4	3,193	5.0	4,562	10.6	2,333	3.7	1,979	3.1
5/16	3,698	7.5	3,011	5.7	2,688	5.1	2,526	4.7	3,617	10.2	1,849	3.5	1,566	3.0
3/8	3,103	6.7	2,530	5.4	2,256	4.8	2,119	4.6	3,031	9.9	1,548	3.4	1,314	2.8
1/2	2,333	9.5	1,903	7.8	1,701	7.0	1,597	6.5	2,285	14.2	1,166	4.7	986	4.1
5/8	1,849	9.1	1,506	7.5	1,344	6.7	1,263	6.3	1,809	13.4	920	4.5	788	3.9
3/4	1,548	8.8	1,261	7.2	1,132	6.5	1,059	6.0	1,516	12.9	773	4.4	658	3.8
1	1,152	14.0	935	11.2	837	10.1	787	9.5	1,132	20.3	581	7.0	492	6.0



Depth of Cut

Hardness	≤88 HRB		>88 HRB, ≤26 HRC		≤26 HRC		≤26 HRC		≤91 HRB		≤32 HRC	
Work Material	Stainless Steels						Special Alloys				Aluminum	
	300 Series		400 Series		PH Steels		Titanium Alloys		Hi Temp Alloys		6061, 7075	
Cutting Speed	170 SFM		260 SFM		150 SFM		115 SFM		43 SFM		825 SFM	
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/4	2,639	4.3	4,006	6.4	2,333	3.7	1,778	3.5	660	1.0	12,727	49.8
5/16	2,092	3.9	3,173	5.9	1,849	3.5	1,405	3.4	525	1.0	10,084	47.3
3/8	1,750	3.8	2,660	5.8	1,548	3.4	1,177	3.2	436	1.0	8,455	45.7
1/2	1,319	5.4	1,999	8.2	1,166	4.7	890	4.7	326	1.4	6,360	66.1
5/8	1,041	5.1	1,586	7.9	920	4.5	707	4.3	263	1.4	5,042	62.5
3/4	878	5.0	1,334	7.6	773	4.4	593	4.3	222	1.2	4,228	60.3
1	650	7.8	994	12.0	581	7.0	443	6.8	167	1.9	3,140	94.2

SERIES PC410

Slot Milling

Hardness	Tensile Strength: Up to 750N/mm2		Up to 30 HRC		30 to 38 HRC		38 to 45 HRC		45 to 55 HRC		55 to 60 HRC	
Work Material	Mild Steel Carbon Steel		Alloy Steel Tool Steel Ti Alloys *Annealed*		Hardened Steel Prehardened Steel Ti Alloys *Solution Treated & Aged*		Hardened Steel Prehardened Steel Stainless Steel Inconel Ni Based Alloys		Hardened Steel		Hardened Steel	
Cutting Speed	315 SFM		255 SFM		217 SFM		197 SFM		118 SFM		59 SFM	
Depth of Cut			a_a D<1/16: 0.05D 1/16≤D: 0.1D				a_a=0.02D					
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/32	43,484	21.5	37,404	18.7	30,648	13.7	26,551	11.0	16,086	4.3	8,865	1.6
1/16	23,063	32.7	18,475	27.2	15,242	21.7	13,221	13.8	8,373	4.3	4,415	1.6
3/32	15,704	32.7	12,759	29.3	10,712	23.8	9,166	16.8	5,718	7.9	3,012	2.6
1/8	12,381	30.3	10,198	29.7	8,415	24.3	6,650	18.8	5,859	15.3	3,055	5.2
3/16	11,191	23.3	9,196	19.1	7,759	12.5	3,982	6.4	10,436	27.1	5,353	11.2

For Side Milling, increase feeds 20% - 50%.

SERIES PC411

Slot Milling

Hardness	Tensile Strength: Up to 750N/mm2		Up to 30 HRC		30 to 38 HRC		38 to 45 HRC		45 to 55 HRC		55 to 60 HRC	
Work Material	Mild Steel Carbon Steel		Alloy Steel Tool Steel Ti Alloys *Annealed*		Hardened Steel Prehardened Steel Ti Alloys *Solution Treated & Aged*		Hardened Steel Prehardened Steel Stainless Steel Inconel Ni Based Alloys		Hardened Steel		Hardened Steel	
Cutting Speed	328 SFM		262 SFM		223 SFM		184 SFM		118 SFM		82 SFM	
Depth of Cut	a_a=0.1D						a_a=0.02D					
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/8	11,750	54.3	9,504	38.2	7,802	27.2	6,725	21.7	4,226	8.3	2,779	2.8
3/16	7,771	54.3	6,291	38.2	5,265	27.2	4,508	21.7	2,784	8.3	1,890	2.8
1/4	6,257	50.9	5,033	36.5	4,201	26.0	3,251	19.7	2,880	13.6	1,797	5.2

QUALITY TECH TOOL

SERIES PC413, PC419

High Speed Light Milling

Hardness	Tensile Strength: Up to 750N/mm2		Up to 30 HRC		30 to 38 HRC		38 to 45 HRC		45 to 55 HRC		55 to 60 HRC	
Work Material	Mild Steel Carbon Steel		Alloy Steel Tool Steel Ti Alloys *Annealed*		Hardened Steel Prehardened Steel Ti Alloys *Solution Treated & Aged*		Hardened Steel Prehardened Steel Stainless Steel Inconel Ni Based Alloys		Hardened Steel		Hardened Steel	
Cutting Speed	950 SFM		820 SFM		720 SFM		575 SFM		575 SFM		394 SFM	
Depth of Cut	a_a=0.02D a_r=0.05D											
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/32	52,990	48.7	52,990	48.7	52,990	38.5	52,990	22.8	52,990	18.1	40,074	13.0
1/16	26,770	37.6	21,504	31.1	17,657	24.9	15,064	15.9	10,463	6.9	6,606	3.7
3/32	33,550	61.0	27,236	49.6	22,481	40.5	18,103	26.3	15,909	19.2	13,713	13.9
1/8	23,590	61.0	19,137	49.6	16,054	40.9	12,887	27.1	11,291	20.4	9,683	14.7
3/16	18,091	157.1	16,709	152.9	15,082	109.1	11,952	86.1	10,894	79.0	8,408	45.2

	a_a	a_r
D<8	0.02D	0.05D
8<R	0.32mm	0.05D

Reduce Speeds and Feeds by 10% - 25% for Series PC419.

SERIES PC413, PC419

Profile Milling

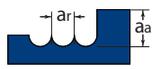
Hardness		Tensile Strength Up to 750N/mm2		Up to 30 HRC		30 to 38 HRC		38 to 45 HRC		45 to 55 HRC		55 to 60 HRC	
Work Material	Cast Iron		Mild Steel Carbon Steel		Alloy Steel Tool Steel Ti Alloy *Annealed*		Hardened Steel Prehardened Steel Ti Alloy *Solution Treated and Aged*		Hardened Steel Prehardened Steel Stainless Steel Inconel Ni Based Alloy		Hardened Steel		Hardened Steel	
Cutting Speed	690 SFM		550 SFM		453 SFM		354 SFM		315 SFM		276 SFM		197 SFM	
Depth of Cut	a_a=0.1D a_r=0.2D										a_a=0.05D a_r=0.1D			
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/32	52,990	49	52,990	49	52,990	38	52,990	23	52,990	18	40,074	13	29,342	9
1/16	26,770	38	21,504	31	17,657	25	15,064	16	10,463	7	6,606	4	16,618	9
3/32	33,550	61	27,236	50	22,481	40	18,103	26	15,909	19	13,713	14	10,294	9
1/8	23,590	61	19,137	50	16,054	41	12,887	27	11,291	20	9,683	15	7,234	10
3/16	16,253	67	13,110	54	10,957	42	8,719	29	7,661	24	6,547	18	4,901	11

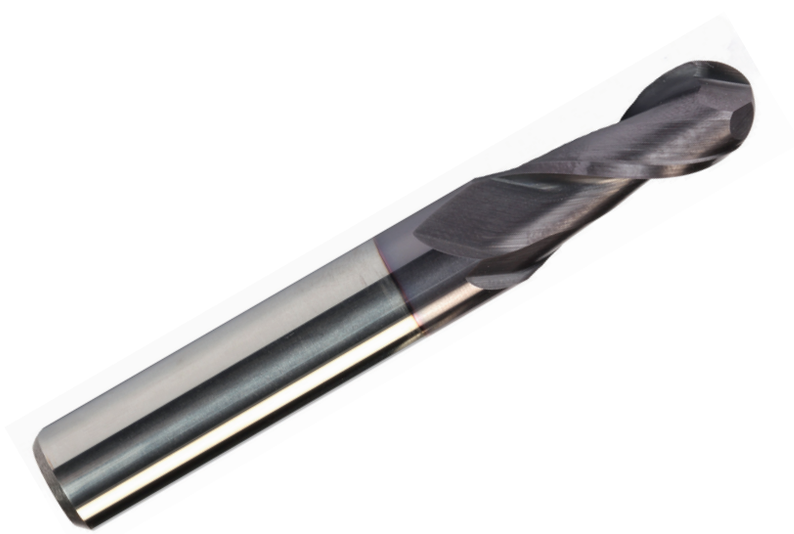
Reduce Speeds and Feeds by 10% - 25% for Series PC419.

QUALITY TECH TOOL

SERIES PC416

High Speed Light Milling

Hardness	Tensile Strength: Up to 750N/mm2		Up to 30 HRC		30 to 38 HRC		38 to 45 HRC		45 to 55 HRC		55 to 60 HRC	
Work Material	Mild Steel Carbon Steel		Alloy Steel Tool Steel Ti Alloys *Annealed*		Hardened Steel Prehardened Steel Ti Alloys *Solution Treated & Aged*		Hardened Steel Prehardened Steel Stainless Steel Inconel Ni Based Alloys		Hardened Steel		Hardened Steel	
Cutting Speed	985 SFM		850 SFM		740 SFM		590 SFM		590 SFM		410 SFM	
Depth of Cut	a_a=0.02D a_r=0.05D									aa / ar D<7/16: 0.02D / 0.05D 7/16<D: .012in / 0.05D		
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/32	52,990	48.7	52,990	48.7	52,990	38.5	52,990	22.8	52,990	18.1	40,074	13.0
1/16	26,320	54.5	21,047	44.6	18,101	37.7	16,191	29.2	10,694	15.8	6,365	9.2
3/32	31,594	158.4	25,217	128.4	24,647	114.0	23,632	102.4	17,080	70.9	12,691	45.4
1/8	23,069	161.1	18,609	135.0	18,039	116.5	17,100	104.5	12,650	75.0	9,530	46.3
3/16	18,459	181.9	17,179	177.2	16,030	128.5	13,135	105.2	11,697	93.4	8,693	52.8
1/4	15,980	200.6	14,252	178.9	12,302	114.9	10,066	93.8	10,066	93.8	6,988	48.3
5/16	13,440	167.8	11,720	147.3	10,453	96.8	8,367	78.2	8,367	78.2	5,797	40.5
3/8	11,281	140.4	9,798	121.7	8,558	79.9	6,828	63.8	6,828	63.8	4,736	33.3
7/16	9,544	118.5	8,262	102.1	7,161	66.7	5,708	52.9	5,708	52.9	3,958	27.6
1/2	8,360	103.8	7,224	89.1	6,266	58.0	4,993	46.1	4,993	46.1	3,457	24.0
9/16	7,658	95.5	6,621	81.3	5,734	53.0	4,568	42.5	4,568	42.5	3,155	22.1
5/8	6,955	87.3	6,018	73.4	5,202	48.0	4,143	38.9	4,143	38.9	2,854	20.2
3/4	5,924	73.7	5,116	63.5	4,428	41.3	3,538	33.2	3,538	33.2	2,434	17.1
7/8	5,033	62.5	4,356	54.3	3,768	35.3	3,000	28.2	3,000	28.2	2,061	14.4
1	4,232	52.7	3,681	45.7	3,179	29.8	2,510	23.6	2,510	23.6	1,723	12.0



QUALITY TECH TOOL

SERIES PC416, PC419

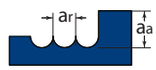
Profile Milling

Hardness			Tensile Strength Up to 750N/mm2		Up to 30 HRC		30 to 38 HRC		38 to 45 HRC		45 to 55 HRC		55 to 60 HRC	
Work Material	Cast Iron		Mild Steel Carbon Steel		Alloy Steel Tool Steel Ti Alloy *Annealed*		Hardened Steel Prehardened Steel Ti Alloy *Solution Treated and Aged*		Hardened Steel Prehardened Steel Stainless Steel Inconel Ni Based Alloy		Hardened Steel		Hardened Steel	
Cutting Speed	690 SFM		550 SFM		450 SFM		375 SFM		315 SFM		275 SFM		197 SFM	
Depth of Cut	a_a=0.1D a_r=0.2D										a_a=0.05D a_r=0.1D			
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/32	52,990	48.7	52,990	48.7	52,990	38.5	52,990	22.8	52,990	18.1	40,074	13.0	29,342	8.7
1/16	26,772	37.6	21,504	31.1	17,657	24.9	15,064	15.9	10,463	6.9	6,606	3.7	16,618	9.1
3/32	33,556	61.0	27,236	49.6	22,481	40.5	18,107	26.3	15,909	19.2	13,713	13.9	10,294	9.2
1/8	23,590	61.0	19,139	49.6	16,054	40.9	12,897	27.1	11,293	20.4	9,683	14.7	7,234	9.7
3/16	16,253	66.7	13,112	54.1	10,957	41.5	8,721	29.0	7,671	24.0	6,547	18.2	4,901	11.3
1/4	12,128	73.5	9,683	59.6	8,069	46.0	6,399	31.9	5,623	26.6	4,796	19.9	3,572	12.5
5/16	10,033	83.8	8,016	67.4	6,656	51.0	5,303	35.7	4,639	29.4	3,963	20.8	2,945	13.7
3/8	8,196	78.8	6,547	62.9	5,441	48.5	4,322	34.3	3,792	28.3	3,251	21.5	2,409	13.5
7/16	6,855	73.4	5,465	58.4	4,563	46.1	3,624	32.5	3,173	27.3	2,712	20.6	2,005	12.9
1/2	5,994	70.1	4,770	55.7	3,993	44.4	3,176	31.4	2,770	26.4	2,357	19.3	1,754	12.5
9/16	5,482	69.3	4,361	55.2	3,635	43.3	2,894	31.3	2,520	25.6	2,147	18.6	1,627	12.1
5/8	4,970	68.6	3,952	54.8	3,278	42.2	2,612	31.1	2,270	24.9	1,937	17.8	1,500	11.8
3/4	4,236	63.7	3,394	51.4	2,793	38.8	2,239	29.9	1,953	24.2	1,691	16.5	1,277	11.2
7/8	3,606	56.9	2,883	47.2	2,379	34.3	1,908	26.7	1,678	21.7	1,451	14.9	1,081	10.1
1	3,041	49.6	2,412	42.6	2,008	29.5	1,604	22.9	1,427	18.6	1,221	13.2	906	8.9

QUALITY TECH TOOL

SERIES PC418

High Speed Light Milling

Hardness			Tensile Strength Up to 750N/mm2		Up to 30 HRC		30 to 38 HRC		38 to 45 HRC		45 to 55 HRC	
Work Material	Mild Steel Carbon Steel		Alloy Steel Tool Steel Ti Alloys *Annealed*		Hardened Steel Prehardened Steel Ti Alloys *Solution Treated & Aged*		Hardened Steel Prehardened Steel Stainless Steel Inconel Ni Based Alloys		Hardened Steel		Hardened Steel	
Cutting Speed	856 SFM		740 SFM		643 SFM		515 SFM		515 SFM		358 SFM	
Depth of Cut	a_a=0.02D a_r=0.05D											
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
3/32	27,468	138	21,936	112	21,436	99	20,552	89	14,849	62	11,035	40
1/8	20,052	140	16,188	117	15,688	101	14,872	91	11,000	65	8,282	40
3/16	16,044	158	14,933	154	13,937	112	11,417	92	10,177	81	7,556	46
1/4	13,894	174	12,394	155	10,697	100	8,755	82	8,755	82	6,081	42
3/8	9,808	122	8,514	106	7,444	69	5,939	55	5,939	55	4,116	29

	a_a	a_r
D<8	0.02D	0.05D
8<D	0.32mm	0.05D

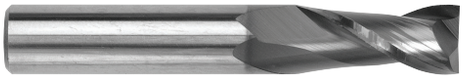
SERIES PC418

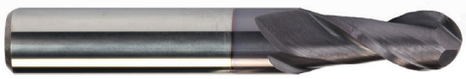
Profile Milling

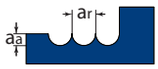
Hardness			Tensile Strength Up to 750N/mm2		Up to 30 HRC		30 to 38 HRC		38 to 45 HRC		45 to 55 HRC		55 to 60 HRC	
Work Material	Cast Iron		Mild Steel Carbon Steel		Alloy Steel Tool Steel Ti Alloy *Annealed*		Hardened Steel Prehardened Steel Ti Alloy *Solution Treated and Aged*		Hardened Steel Prehardened Steel Stainless Steel Inconel Ni Based Alloy		Hardened Steel		Hardened Steel	
Cutting Speed	600 SFM		480 SFM		394 SFM		325 SFM		272 SFM		240 SFM		171 SFM	
Depth of Cut	a_a=0.1D a_r=0.2D										a_a=0.05D a_r=0.1D			
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
3/32	37,719	39.3	35,878	37.2	34,117	29.9	27,536	19.4	22,942	11.6	18,690	7.9	18,309	7.9
1/8	20,510	53.1	16,640	43.3	13,961	35.8	11,210	23.6	9,819	17.6	8,420	12.7	6,290	8.5
3/16	14,132	58.0	11,408	47.2	9,532	36.1	7,583	25.2	6,667	20.9	5,698	15.9	4,260	9.8
1/4	10,539	63.8	8,420	51.9	7,011	39.9	5,570	27.9	4,891	23.3	4,171	17.1	3,109	10.8
3/8	7,125	68.4	5,698	54.9	4,734	42.4	3,757	29.6	3,299	24.7	2,833	18.4	2,098	11.5

SERIES PC420, PC420BN, PC424, PC424BN

Profile Milling





Work Material	Aluminum Alloys		Graphite	
Cutting Speed	160-8,000 SFM		160-3,000 SFM	
Depth of Cut			a_a / a_r D≤1/8: 0.02D / 0.05D 1/8<D: 0.1D / 0.2D	
Mill Diameter	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev
1/32	52,990	.0007	52,990	.0008
3/64	42,493	.0009	46,000	.0010
1/16	35,794	.0015	46,000	.0015
5/64	31,230	.0015	46,000	.0015
3/32	29,735	.0015	46,000	.0015
1/8	26,795	.0015	46,000	.0015
5/32	23,144	.0015	46,000	.0015
3/16	19,493	.0015	46,000	.0015
1/4	13,298	.0019	40,595	.0030
5/16	11,020	.0029	36,944	.0030
3/8	9,611	.0037	33,293	.0037
1/2	6,900	.0049	23,815	.0049

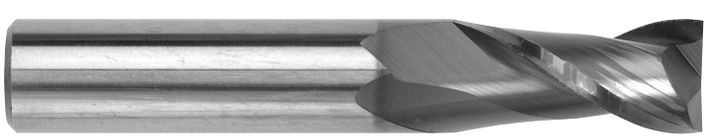
QUALITY TECH TOOL

SERIES PC421

Slot Milling

Hardness			Tensile Strength Up to 750N/mm2		Up to 30 HRC		30 to 38 HRC		38 to 45 HRC		45 to 55 HRC		55 to 60 HRC	
Work Material	Cast Iron		Mild Steel Carbon Steel		Alloy Steel Tool Steel Ti Alloy *Annealed*		Hardened Steel Prehardened Steel Ti Alloy *Solution Treated and Aged*		Hardened Steel Prehardened Steel Stainless Steel Inconel Ni Based Alloy		Hardened Steel		Hardened Steel	
Cutting Speed	425 SFM		394 SFM		312 SFM		262 SFM		212 SFM		130 SFM		98 SFM	
Depth of Cut			Dia / aa D<1/8 / 0.3D 1/8 ≤ D / 0.5D								Dia / aa D<3/64 / 0.02D 3/64 ≤ D / 0.05D		Dia / aa D<1/8 / 0.02D 1/8 ≤ D / 0.05D	
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
3/64	32,569	9.1	29,608	8.7	22,085	8.3	18,963	5.9	16,752	4.4	10,627	2.1	7,634	1.6
1/16	26,426	9.3	24,024	8.7	18,076	8.3	15,348	5.9	13,696	4.6	8,623	2.4	6,122	1.6
5/64	20,282	9.4	18,440	8.7	14,068	8.3	11,732	5.9	10,640	4.7	6,619	2.7	4,610	1.6
3/32	17,550	11.4	15,944	10.3	12,618	8.9	10,519	6.1	9,319	4.9	5,781	2.9	4,077	1.7
7/64	14,959	13.4	13,575	12.0	11,272	9.5	9,403	6.2	8,069	5.0	4,992	3.1	3,585	1.9
1/8	13,043	15.0	11,830	13.4	10,098	10.3	8,477	6.6	7,095	5.3	4,391	3.1	3,181	2.0
9/64	11,983	15.9	10,878	14.3	9,142	11.2	7,791	7.4	6,472	5.6	4,030	3.1	2,887	2.0
5/32	10,923	16.9	9,925	15.3	8,185	12.1	7,104	8.2	5,849	5.9	3,668	3.1	2,593	2.0
11/64	10,405	19.1	9,459	17.2	7,748	13.4	6,622	8.4	5,526	6.0	3,461	3.3	2,395	2.0
3/16	9,933	21.4	9,034	19.3	7,355	14.6	6,158	8.6	5,228	6.2	3,266	3.4	2,204	2.0
13/64	9,405	22.7	8,555	20.4	6,935	15.4	5,722	8.7	4,905	6.3	3,058	3.5	2,034	1.9
7/32	8,793	22.4	7,996	20.3	6,475	15.4	5,329	8.7	4,544	6.3	2,827	3.5	1,895	1.7
1/4	7,743	21.9	7,036	19.9	5,699	15.4	4,671	8.6	3,967	6.3	2,453	3.5	1,667	1.6
9/32	6,909	21.6	6,278	19.6	5,108	15.4	4,175	8.4	3,574	6.3	2,187	3.3	1,500	1.6
5/16	6,076	21.3	5,520	19.3	4,517	15.4	3,679	8.3	3,181	6.3	1,921	3.2	1,333	1.6
11/32	5,579	20.8	5,069	18.9	4,137	15.2	3,369	8.3	2,905	6.3	1,783	3.1	1,221	1.6
3/8	5,110	20.4	4,644	18.4	3,776	15.1	3,076	8.3	2,639	6.3	1,656	3.1	1,114	1.6
13/32	4,699	20.1	4,270	18.1	3,468	15.0	2,820	8.3	2,415	6.3	1,539	3.1	1,023	1.5
7/16	4,374	20.1	3,973	18.1	3,237	15.0	2,622	8.3	2,252	6.3	1,435	3.1	955	1.4
1/2	3,835	19.6	3,481	17.9	2,851	14.6	2,299	7.9	1,984	6.2	1,262	3.0	840	1.2
9/16	3,438	18.5	3,120	17.4	2,557	13.8	2,068	7.1	1,790	5.8	1,131	2.7	748	1.2
5/8	3,041	17.4	2,758	17.0	2,263	13.1	1,838	6.4	1,595	5.5	1,000	2.4	657	1.2
11/16	2,776	16.5	2,518	15.6	2,057	12.0	1,692	5.9	1,463	5.1	917	2.2	602	1.0
3/4	2,522	15.5	2,288	14.2	1,859	10.9	1,553	5.4	1,336	4.6	838	2.1	551	0.9
7/8	2,165	13.6	1,968	12.2	1,602	9.5	1,341	4.8	1,149	4.0	719	1.6	476	0.8
1	1,880	11.6	1,713	10.5	1,408	8.5	1,161	4.3	994	3.5	620	1.2	413	0.8

For Side Milling, increase Feeds 20% - 50%.



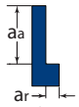
QUALITY TECH TOOL

SERIES PC421, PC441

High Speed Light Milling

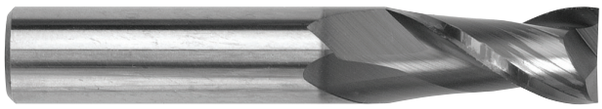
Hardness	Tensile Strength: Up to 750N/mm2		Up to 30 HRC		30 to 38 HRC		38 to 45 HRC		45 to 55 HRC	
Work Material	Mild Carbon Steel Mild Steel		Alloy Steel Tool Steel Ti Alloy *Annealed*		Hardened Steel Prehardened Steel Ti Alloy *Solution Treated and Aged*		Hardened Steel Prehardened Steel Stainless Steel Inconel, Ni Based Alloy		Hardened Steel	
Cutting Speed	1,310 SFM		1,150 SFM		820 SFM		490 SFM		260 SFM	
Depth of Cut										
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
3/64	107,032	52	105,288	58	82,815	46	49,672	25	26,474	15
1/16	90,443	54	85,067	61	64,650	48	38,766	26	20,651	16
5/64	73,853	56	64,846	63	46,485	50	27,859	27	14,829	16
3/32	63,905	70	55,918	70	39,937	53	23,945	28	12,740	16
7/64	54,229	84	47,453	77	33,865	55	20,318	29	10,803	16
1/8	46,676	92	40,849	81	29,144	57	17,483	30	9,297	17
9/64	41,815	94	36,607	83	26,135	59	15,654	31	8,336	18
5/32	36,953	96	32,364	84	23,127	61	13,824	31	7,376	19
11/64	33,901	112	29,675	88	21,208	62	12,693	32	6,755	19
3/16	31,004	130	27,120	93	19,383	63	11,621	33	6,164	20
13/64	28,454	136	24,903	97	17,758	64	10,687	34	5,654	20
7/32	26,422	124	23,193	97	16,432	66	9,957	35	5,265	20
1/4	23,044	111	20,272	97	14,327	67	8,738	36	4,618	19
9/32	20,536	111	17,986	96	12,914	67	7,825	36	4,138	19
5/16	18,028	111	15,700	95	11,501	66	6,912	36	3,658	19
11/32	16,565	112	14,471	95	10,567	66	6,335	36	3,349	19
3/8	15,192	113	13,332	95	9,674	66	5,788	36	3,056	19
13/32	14,003	113	12,330	95	8,893	66	5,313	36	2,807	19
7/16	13,091	112	11,532	95	8,278	66	4,948	36	2,624	19
1/2	11,557	109	10,176	94	7,258	65	4,339	35	2,308	18
9/16	10,394	106	9,125	91	6,503	63	3,882	34	2,054	18
5/8	9,232	102	8,073	88	5,749	61	3,426	32	1,800	17
11/16	8,467	100	7,401	87	5,270	60	3,138	31	1,656	17
3/4	7,737	97	6,762	85	4,813	59	2,864	30	1,521	16
7/8	6,637	87	5,819	77	4,131	54	2,473	28	1,311	15
1	5,719	76	5,040	67	3,563	47	2,156	25	1,132	12

	aa	ar
D<5/16	1.5D	0.01D
5/16≤D<5/8	1.5D	0.02D
5/8<D	1.5D	0.05D



	aa	ar
D≤5/8	1D	0.01D
5/8<D	1D	0.02D

Reduce Feeds 50% for PC421 High Speed Light Milling.



QUALITY TECH TOOL

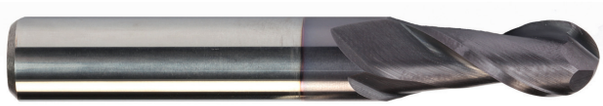
SERIES PC421BN, PC441BN

High Speed Light Milling

Hardness	Tensile Strength Up to 750N/mm2		Up to 30 HRC		Up to 38 HRC		38 to 45 HRC		45 to 55 HRC		55 to 60 HRC	
Work Material	Mild Steel Carbon Steel		Alloy Steel Tool Steel Ti Alloys *Annealed*		Hardened Steel Prehardened Steel Ti Alloys *Solution Treated & Aged*		Hardened Steel Prehardened Steel Stainless Steel Inconel Ni Based Alloys		Hardened Steel		Hardened Steel	
Cutting Speed	985 SFM		855 SFM		740 SFM		590 SFM		590 SFM		395 SFM	
Depth of Cut	a_a=0.02D a_r=0.05D											
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
3/64	53,506	133	52,103	127	51,995	113	49,443	102	33,561	67	26,051	45
1/16	45,192	145	40,868	127	40,533	113	38,664	102	26,818	68	20,431	45
5/64	36,877	157	29,632	127	29,071	113	27,884	102	20,075	70	14,811	45
3/32	31,594	159	25,217	129	24,647	114	23,632	103	17,080	71	12,691	46
7/64	26,434	160	21,082	130	20,512	115	19,648	103	14,239	72	10,715	46
1/8	23,069	161	18,609	135	18,039	117	17,100	105	12,650	75	9,530	47
9/64	21,977	164	18,244	144	17,674	120	16,373	108	12,650	80	9,347	48
5/32	20,886	167	17,879	152	17,309	124	15,647	110	12,650	85	9,164	49
11/64	19,678	174	17,528	165	16,680	126	14,413	108	12,193	89	8,931	51
3/16	18,459	182	17,179	177	16,030	129	13,135	105	11,697	94	8,693	53
13/64	17,540	190	16,626	185	15,173	129	12,062	103	11,247	96	8,343	53
7/32	17,068	198	15,769	185	14,010	124	11,296	100	10,866	97	7,827	52
1/4	15,980	201	14,252	179	12,302	115	10,066	94	10,066	94	6,988	48
9/32	14,710	184	12,986	163	11,378	106	9,216	86	9,216	86	6,392	45
5/16	13,440	168	11,720	147	10,453	97	8,367	78	8,367	78	5,797	41
11/32	12,353	154	10,746	134	9,506	88	7,594	71	7,594	71	5,264	37
3/8	11,281	141	9,798	122	8,558	80	6,828	64	6,828	64	4,736	33
13/32	10,326	128	8,953	111	7,753	72	6,180	58	6,180	58	4,288	30
7/16	9,544	118	8,262	102	7,161	67	5,708	53	5,708	53	3,958	28
1/2	8,360	104	7,224	89	6,266	58	4,993	46	4,993	46	3,457	24
9/16	7,658	96	6,621	81	5,734	53	4,568	42	4,568	42	3,155	22
5/8	6,955	87	6,018	74	5,202	48	4,143	39	4,143	39	2,854	20
11/16	6,432	80	5,561	69	4,809	45	3,836	36	3,836	36	2,640	19
3/4	5,924	74	5,116	64	4,428	42	3,538	33	3,538	33	2,434	17
7/8	5,033	63	4,356	54	3,768	36	3,000	28	3,000	28	2,061	14
1	4,232	53	3,681	46	3,179	30	2,510	24	2,510	24	1,723	12

	a_a	a_r
D≤5/16	0.02D	0.05D
5/16<D	0.32mm	0.05D

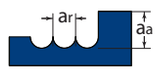
Increase Feeds 40% - 50% for PC441BN High Speed Light Milling.



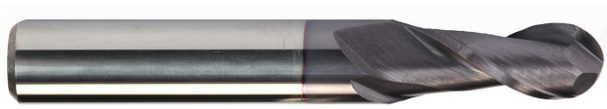
QUALITY TECH TOOL

SERIES PC421BN, PC441BN

Profile Milling

Hardness			Tensile Strength Up to 750N/mm2		Up to 30 HRC		30 to 38 HRC		38 to 45 HRC		45 to 55 HRC		55 to 60 HRC	
Work Material	Cast Iron		Mild Steel Carbon Steel		Alloy Steel Tool Steel Ti Alloy *Annealed*		Hardened Steel Prehardened Steel Ti Alloy *Solution Treated and Aged*		Hardened Steel Prehardened Steel Stainless Steel Inconel Ni Based Alloy		Hardened Steel		Hardened Steel	
Cutting Speed	690 SFM		550 SFM		450 SFM		375 SFM		315 SFM		275 SFM		197 SFM	
Depth of Cut	a_a=0.1D a_r=0.2D										a_a=0.05D a_r=0.1D			
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
3/64	50,348	52	48,951	50	47,189	40	37,515	26	33,010	19	28,507	14	21,051	9
1/16	44,847	56	40,541	50	36,838	40	29,427	26	25,890	19	22,360	14	16,618	9
5/64	39,347	61	32,131	50	26,488	40	21,338	26	18,770	19	16,212	14	12,185	9
3/32	33,556	61	27,236	50	22,481	40	18,107	26	15,909	19	13,713	14	10,294	9
7/64	27,754	61	22,486	50	18,735	41	15,075	27	13,222	20	11,364	14	8,508	9
1/8	23,590	61	19,139	50	16,054	41	12,897	27	11,293	20	9,683	15	7,234	10
9/64	21,502	61	17,571	50	14,724	41	11,802	28	10,325	22	8,849	16	6,606	10
5/32	19,414	61	16,003	50	13,395	41	10,706	29	9,356	24	8,016	17	5,979	11
11/64	17,813	64	14,553	52	12,171	41	9,710	29	8,509	24	7,277	18	5,436	11
3/16	16,253	67	13,112	54	10,957	42	8,721	29	7,671	24	6,547	18	4,901	11
13/64	14,885	69	11,899	56	9,935	42	7,893	29	6,958	24	5,930	19	4,441	12
7/32	13,801	70	11,026	57	9,201	43	7,301	30	6,430	25	5,481	19	4,096	12
1/4	12,128	74	9,683	60	8,069	46	6,399	32	5,623	27	4,796	20	3,572	12
9/32	11,080	79	8,849	64	7,362	48	5,851	34	5,131	28	4,380	20	3,258	13
5/16	10,033	84	8,016	67	6,656	51	5,303	36	4,639	29	3,963	21	2,945	14
11/32	9,109	82	7,277	65	6,044	50	4,810	35	4,212	29	3,605	21	2,675	14
3/8	8,196	79	6,547	63	5,441	48	4,322	34	3,792	28	3,251	21	2,409	13
13/32	7,422	76	5,925	61	4,932	47	3,914	33	3,435	28	2,946	21	2,180	13
7/16	6,855	73	5,465	58	4,563	46	3,624	33	3,173	27	2,712	21	2,005	13
1/2	5,994	70	4,770	56	3,993	44	3,176	31	2,770	26	2,357	19	1,754	12
9/16	5,482	69	4,361	55	3,635	43	2,894	31	2,520	26	2,147	19	1,627	12
5/8	4,970	69	3,952	55	3,278	42	2,612	31	2,270	25	1,937	18	1,500	12
11/16	4,597	66	3,668	53	3,031	41	2,422	31	2,107	25	1,810	17	1,388	12
3/4	4,236	64	3,394	51	2,793	39	2,239	30	1,953	24	1,691	17	1,277	11
7/8	3,606	57	2,883	47	2,379	34	1,908	27	1,678	22	1,451	15	1,081	10
1	3,041	50	2,412	43	2,008	29	1,604	23	1,427	19	1,221	13	906	9

Increase Feeds 40% - 50% for PC441BN High Speed Light Milling.



QUALITY TECH TOOL

SERIES PC432, EM432, PC433

Slot Milling

Hardness			Tensile Strength Up to 750N/mm2		Up to 30 HRC		30 to 38 HRC		38 to 45 HRC		45 to 55 HRC		55 to 60 HRC	
Work Material		Cast Iron		Mild Steel Carbon Steel		Alloy Steel Tool Steel Ti Alloy Annealed		Hardened Steel Prehardened Steel Ti Alloy *Solution Treated and Aged*		Hardened Steel Prehardened Steel Stainless Steel Inconel Ni Based Alloy		Hardened Steel		Hardened Steel	
Cutting Speed		426 SFM		394 SFM		312 SFM		262 SFM		214 SFM		130 SFM		98 SFM	
Depth of Cut															
Mill Dia.	Dec. Equiv.	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/8	.1250	14,298	15.4	12,965	13.8	11,134	10.4	9,292	6.7	7,800	5.4	4,815	3.3	3,503	2.1
3/16	.1875	9,192	21.8	8,363	19.5	6,782	14.6	5,601	8.3	4,810	6.0	3,000	3.4	1,991	1.9
1/4	.2500	8,583	23.3	7,800	21.3	6,308	16.3	5,175	9.2	4,382	6.7	2,720	3.8	1,842	1.7
5/16	.3125	5,963	21.1	5,417	19.1	4,435	15.2	3,612	8.2	3,125	6.3	1,885	3.1	1,310	1.6
3/8	.3750	4,601	19.1	4,181	17.3	3,391	14.3	2,762	7.9	2,362	6.0	1,505	3.0	1,000	1.5
1/2	.5000	4,244	21.3	3,852	19.2	3,154	15.8	2,540	8.8	2,191	6.7	1,397	3.3	931	1.3
5/8	.6250	3,352	16.8	3,043	15.1	2,491	12.5	2,006	6.9	1,730	5.3	1,103	2.6	736	1.0
3/4	.7500	2,987	15.0	2,712	13.5	2,220	11.1	1,788	6.2	1,542	4.7	983	2.3	656	0.9
1	1.0000	2,312	11.6	2,099	10.4	1,718	8.6	1,384	4.8	1,194	3.6	761	1.8	507	0.7

	aa
D	0.5D

For Side Milling, increase Feeds 20% - 50%.

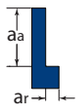
QUALITY TECH TOOL

SERIES PC432, EM432, PC433, PC434, EM434, PC435

High Speed Light Milling

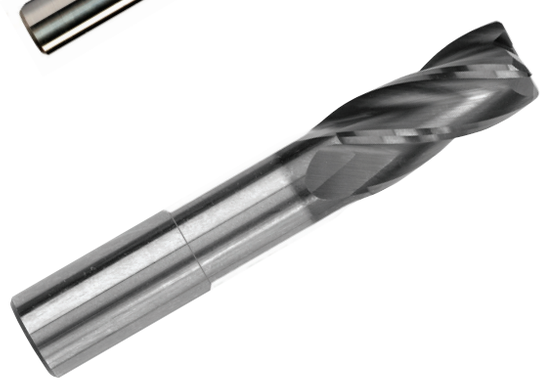
Hardness		Tensile Strength: Up to 750N/mm2		Up to 30 HRC		30 to 38 HRC		38 to 45 HRC		45 to 55 HRC	
Work Material		Mild Carbon Steel Mild Steel		Alloy Steel Tool Steel Ti Alloy *Annealed*		Hardened Steel Prehardened Steel Ti Alloy *Solution Treated and Aged*		Hardened Steel Prehardened Steel Stainless Steel Inconel Ni Based Alloy		Hardened Steel	
Cutting Speed		400 SFM		350 SFM		250 SFM		150 SFM		80 SFM	
Depth of Cut											
Mill Dia.	Dec. Equiv.	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/8	.1250	51,668	97	45,212	85	32,247	60	19,357	32	10,287	17
3/16	.1875	43,541	114	38,136	100	27,253	73	16,288	37	8,692	23
1/4	.2500	37,173	178	32,499	123	23,228	81	13,945	43	7,379	26
5/16	.3125	31,948	147	28,152	129	19,778	90	12,091	47	6,390	25
3/8	.3750	21,229	132	18,479	113	13,561	78	8,144	43	4,310	23
1/2	.5000	18,250	144	16,066	121	11,608	84	6,934	46	3,658	24
5/8	.6250	15,968	147	14,076	126	10,041	87	6,006	47	3,201	24
3/4	.7500	8,767	147	7,728	126	5,513	87	3,297	47	2,428	24
1	1.0000	5,702	147	5,027	126	3,586	87	2,145	47	2,783	24

	aa	ar
D≤3/8	1.5D	0.01D
3/8<D<5/8	1.5D	0.02D
D>5/8	1.5D	0.05D



	aa	ar
D≤3/8	1D	0.01D
D>3/8	1D	0.02D

Reduce Feeds 50% for PC432 and EM432 High Speed Light Milling.

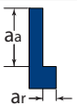


SERIES PC434, EM434, PC435

Side Milling

Hardness			Tensile Strength Up to 750N/mm2		Up to 30 HRC		30 to 38 HRC		38 to 45 HRC		45 to 55 HRC		55 to 60 HRC	
Work Material		Cast Iron		Mild Steel Carbon Steel		Alloy Steel Tool Steel Ti Alloy *Annealed*		Hardened Steel Prehardened Steel Ti Alloy *Solution Treated and Aged*		Hardened Steel Prehardened Steel Stainless Steel Inconel Ni Based Alloy		Hardened Steel		Hardened Steel	
Cutting Speed		472 SFM		394 SFM		315 SFM		256 SFM		214 SFM		138 SFM		98 SFM	
Depth of Cut												a_a=1D a_r=0.02D			
Mill Dia.	Dec. Equiv.	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/8	.1250	17,611	41.3	14,901	35.0	12,711	24.6	10,403	8.8	8,001	7.5	4,646	4.2	3,344	3.3
3/16	.1875	9,992	45.8	8,134	38.3	6,829	26.3	5,439	8.6	4,839	7.9	2,896	4.5	1,915	2.6
1/4	.2500	10,308	50.4	7,430	42.1	6,181	29.2	4,932	10.0	4,424	9.2	2,593	5.0	1,757	2.9
5/16	.3125	6,598	46.1	5,477	38.3	4,564	27.0	3,641	9.4	3,235	8.6	1,905	4.3	1,310	2.3
3/8	.3750	4,839	44.3	4,058	36.8	3,372	25.9	2,686	9.0	2,381	8.3	1,457	5.3	962	2.3
1/2	.5000	4,392	47.9	3,662	40.4	3,048	28.8	2,413	10.0	2,159	8.8	1,312	3.8	878	2.1
5/8	.6250	3,469	37.8	2,892	31.9	2,408	22.7	1,906	7.9	1,705	6.9	1,037	3.0	694	1.6
3/4	.7500	3,092	33.7	2,578	28.4	2,145	20.2	1,699	7.0	1,520	6.2	924	2.6	618	1.5
1	1.0000	2,393	26.1	1,995	22.0	1,661	15.7	1,315	5.4	1,176	4.8	715	2.0	479	1.1

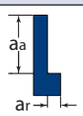
	a_a	a_r
D	0.5D	0.1D

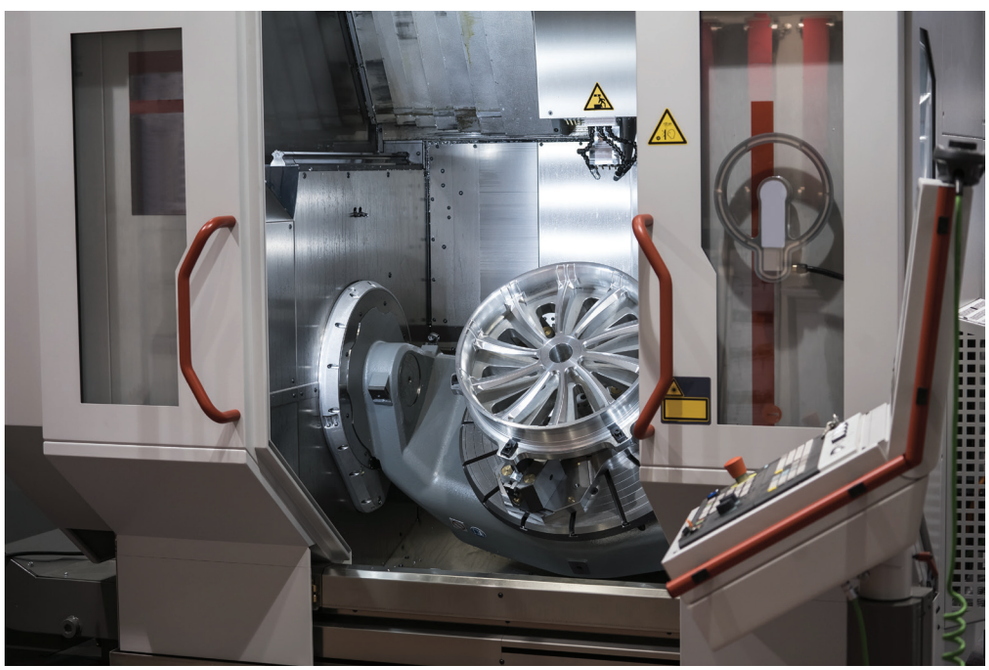


QUALITY TECH TOOL

SERIES PC440

Side and Slot Milling

Cutting Type	Side Milling		Slot Milling	
Work Material	Aluminum		Aluminum	
Cutting Speed	890 SFM		890 SFM	
Depth of Cut	a_a=1.5D a_r=0.1D 		a_a=0.5D	
Mill Diameter	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev
1/8	28,911	1,100	28,911	550
3/16	18,923	1,639	18,923	820
1/4	13,317	2,191	13,317	1,100
5/16	11,126	2,738	11,126	1,369
3/8	11,040	3,286	11,040	1,639
1/2	5,497	2,249	5,497	1,120
5/8	5,394	2,423	5,394	1,211
3/4	4,567	2,384	4,567	1,192
1	3,396	2,382	3,396	1,191



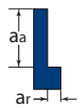
QUALITY TECH TOOL

SERIES PC441

Side Milling

Hardness			Tensile Strength Up to 750N/mm2		Up to 30 HRC		30 to 38 HRC		38 to 45 HRC		45 to 55 HRC		55 to 60 HRC	
Work Material	Cast Iron		Mild Steel Carbon Steel		Alloy Steel Tool Steel Ti Alloy *Annealed*		Hardened Steel Prehardened Steel Ti Alloy *Solution Treated and Aged*		Hardened Steel Prehardened Steel Stainless Steel Inconel Ni Based Alloy		Hardened Steel		Hardened Steel	
Cutting Speed	690 SFM		550 SFM		450 SFM		355 SFM		315 SFM		275 SFM		197 SFM	
Depth of Cut											a_a=1D a_r=0.02D			
Mill Diameter	RPM	Feed in/min	RPM	Feed in/min	RPM	Feed in/min	RPM	Feed in/min	RPM	Feed in/min	RPM	Feed in/min	RPM	Feed in/min
3/64	40,381	24.0	33,912	20.1	28,740	18.1	18,316	7.1	16,660	6.3	10,428	3.9	7,299	2.4
1/16	33,222	24.0	27,899	20.1	23,641	18.1	15,082	7.1	13,703	6.3	8,571	3.9	6,005	2.6
5/64	26,062	24.0	21,887	20.1	18,541	18.1	11,847	7.1	10,746	6.3	6,713	3.9	4,711	2.7
3/32	22,295	29.7	18,764	25.0	15,927	20.1	10,999	7.5	9,460	6.6	5,782	3.9	4,088	2.9
7/64	18,668	35.7	15,760	30.2	13,414	22.1	10,249	8.0	8,241	6.9	4,889	3.9	3,493	3.1
1/8	16,054	39.4	13,562	33.3	11,814	23.4	9,358	8.3	7,319	7.2	4,262	4.1	3,045	3.1
9/64	14,724	40.3	12,387	34.0	11,370	23.7	8,286	8.5	6,771	7.3	3,973	4.4	2,783	3.1
5/32	13,395	41.3	11,213	34.6	10,925	24.0	7,214	8.6	6,223	7.5	3,683	4.7	2,521	3.1
11/64	12,266	43.8	10,177	36.7	9,530	25.3	6,611	8.8	5,778	7.8	3,433	4.7	2,321	3.0
3/16	11,155	46.4	9,153	38.8	8,054	26.7	6,047	9.0	5,341	8.1	3,187	4.7	2,126	2.8
13/64	10,370	48.0	8,298	40.1	6,958	27.6	5,543	9.1	4,937	8.3	2,946	4.7	1,954	2.8
7/32	10,073	47.8	7,695	39.9	6,430	27.6	5,126	9.3	4,579	8.5	2,712	4.7	1,815	2.8
1/4	9,199	47.4	6,758	39.6	5,623	27.5	4,487	9.4	4,019	8.7	2,357	4.7	1,601	2.7
9/32	7,973	47.0	6,162	39.1	5,131	27.3	4,094	9.4	3,654	8.7	2,147	4.5	1,466	2.5
5/16	6,747	46.5	5,567	38.6	4,639	27.2	3,701	9.4	3,289	8.7	1,937	4.3	1,331	2.4
11/32	6,076	46.5	5,059	38.6	4,212	27.2	3,359	9.4	2,982	8.7	1,777	4.8	1,207	2.4
3/8	5,453	46.5	4,559	38.6	3,792	27.2	3,022	9.4	2,681	8.7	1,623	5.2	1,084	2.4
13/32	4,932	46.3	4,133	38.5	3,435	27.2	2,734	9.4	2,427	8.6	1,484	5.2	981	2.3
7/16	4,563	45.8	3,815	38.4	3,173	27.2	2,520	9.4	2,244	8.4	1,369	4.4	910	2.1
1/2	3,993	44.9	3,336	37.8	2,770	27.2	2,201	9.3	1,974	8.1	1,196	3.5	799	1.8
9/16	3,635	44.1	3,054	36.8	2,520	27.2	2,023	9.0	1,823	7.8	1,097	3.3	727	1.5
5/8	3,278	43.4	2,772	35.9	2,270	27.2	1,844	8.7	1,672	7.5	998	3.2	656	1.2
11/16	3,031	42.4	2,553	35.3	2,107	25.2	1,713	8.1	1,547	7.0	921	2.9	602	1.2
3/4	2,793	41.5	2,338	34.6	1,953	23.0	1,586	7.5	1,424	6.6	845	2.5	551	1.2
7/8	2,383	37.1	1,988	30.9	1,678	20.6	1,354	6.4	1,212	5.6	715	2.2	471	1.2
1	2,018	31.8	1,683	26.4	1,427	19.0	1,142	5.4	1,024	4.7	600	1.9	404	1.2

	a_a	a_r
D<1/8	1.5D	0.05D
1/8 ≤ D	1.5D	0.1D

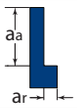


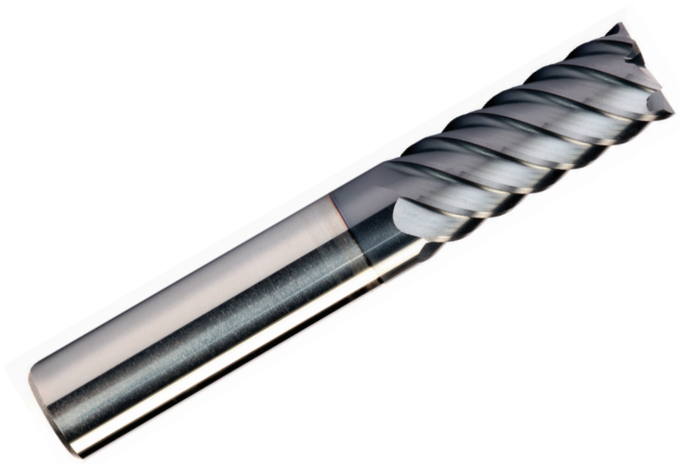
For Slot Milling, reduce Feeds 20% - 50%.

QUALITY TECH TOOL

SERIES PC450

Side Milling

Hardness	Up to 25 HRC		25 to 45 HRC		45 to 55 HRC		55 to 60 HRC		30 to 40 HRC		25 to 45 HRC	
Work Material	Mild Steel Carbon Steel Cast Iron		Alloy Steel		Hardened Steel		Hardened Steel		Titamium Alloy		Nickel Base	
Cutting Speed	430 SFM		235 SFM		128 SFM		72 SFM		215 SFM		65 SFM	
Depth of Cut	a_a=1.5D a_r=0.1D				a_a=1.5D a_r=0.05D							
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/8	12,555	81.5	6,997	21.7	3,609	9.1	2,524	5.5	5,559	38.7	1,846	2.5
3/16	8,362	73.1	4,681	21.7	2,613	11.6	1,857	5.5	3,680	40.9	1,206	3.8
1/4	6,997	139.4	3,832	46.1	2,114	16.1	1,455	8.6	2,779	48.8	926	4.7
5/16	5,576	130.7	3,070	46.1	1,677	16.1	1,162	8.3	2,232	48.8	728	4.7
3/8	4,681	118.0	2,613	46.1	1,401	15.5	975	8.3	1,890	44.6	590	4.7
7/16	4,186	114.2	2,330	43.7	1,198	15.4	837	7.6	1,601	42.0	506	4.5
1/2	3,832	109.4	2,114	39.9	1,053	14.7	742	6.8	1,389	40.5	451	4.3
9/16	3,451	98.6	1,895	35.9	946	13.3	679	6.2	1,250	39.4	407	4.1
5/8	3,070	87.9	1,677	31.8	838	11.9	615	5.6	1,111	38.3	363	3.9
3/4	2,613	74.4	1,393	26.4	700	9.4	511	4.9	948	34.0	299	3.9
7/8	2,142	68.2	1,190	25.3	598	9.2	422	4.5	869	30.2	267	3.6
1	1,693	64.3	1,024	25.6	512	9.7	345	4.3	817	26.7	246	3.1



QUALITY TECH TOOL

SERIES PC451, PC453, PC456

Side Milling

Hardness			Tensile Strength Up to 750N/mm^2		Up to 38 HRC		30 to 38 HRC		38 to 45 HRC			
Work Material	Cast Iron		Mild Steel Carbon Steel		Alloy Steel Tool Steel Ti Alloys *Annealed*		Hardened Steel Prehardened Steel Ti Alloy *Solution Treated & Aged*		Hardened Steel Prehardened Steel Stainless Steel Inconel Ni Based Alloys		Aluminum Alloy	
Cutting Speed	335 SFM		394 SFM		315 SFM		236 SFM		157 SFM		433 SFM	
Depth Of Cut	a_a=1.5D a_r=0.1D											
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/8	10,688	36	12,579	77	10,080	66	7,528	22	5,047	13	13,848	55
3/16	8,171	40	9,618	86	7,675	75	5,781	22	3,841	13	10,562	64
1/4	5,944	42	6,997	92	5,559	81	4,226	24	2,779	16	7,662	70
5/16	4,738	38	5,576	87	4,463	76	3,345	33	2,232	22	6,130	66
3/8	3,958	37	4,681	79	3,680	72	2,784	33	1,890	22	5,125	61
7/16	3,419	36	4,036	76	3,144	68	2,392	30	1,601	20	4,368	57
1/2	3,027	35	3,560	73	2,779	63	2,114	26	1,389	19	3,832	53
5/8	2,376	30	2,790	60	2,232	52	1,677	21	1,111	18	3,070	49
3/4	1,976	26	2,547	51	1,836	43	1,393	18	948	15	2,567	45
1	1,465	19	1,953	38	1,354	32	1,032	14	709	11	1,906	34

SERIES PC451, PC453, PC456

Slot Milling

Hardness			Tensile Strength Up to 750N/mm^2		Up to 30 HRC		30 to 38 HRC		38 to 45 HRC			
Work Material	Cast Iron		Mild Steel Carbon Steel		Alloy Steel Tool Steel Ti Alloys *Annealed*		Hardened Steel Prehardened Steel Ti Alloy *Solution Treated & Aged*		Hardened Steel Prehardened Steel Stainless Steel Inconel Ni Based Alloys		Aluminum Alloy	
Cutting Speed	335 SFM		394 SFM		315 SFM		235 SFM		157 SFM		433 SFM	
Depth of Cut	a_a=1D								a_a=0.5D			
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/8	5,635	349	12,673	691	10,557	492	7,038	318	4,220	183	11,959	984
3/16	3,841	467	8,674	923	7,228	715	4,838	427	2,891	264	8,854	1,293
1/4	2,779	501	6,331	993	5,279	858	3,560	470	2,114	320	7,662	1,368
5/16	2,232	462	5,022	913	4,183	802	2,790	470	1,677	320	6,130	1,312
3/8	1,890	422	4,230	849	3,507	686	2,341	440	1,393	297	5,125	1,257
7/16	1,606	404	3,616	813	3,004	633	1,976	413	1,193	284	4,368	1,162
1/2	1,397	446	3,165	776	2,639	676	1,718	383	1,053	275	3,832	1,077
5/8	1,111	652	2,506	664	2,092	930	1,393	303	838	251	3,070	974
3/4	948	599	2,061	599	1,757	559	1,167	262	700	204	2,567	863
1	709	457	1,520	457	1,307	346	866	197	520	150	1,906	654

QUALITY TECH TOOL

SERIES PC455, EM455

Side Milling

Hardness	Up to 30 HRC		30 to 38 HRC		38 to 45 HRC	
Work Material	Alloy Steel Tool Steel Ti Alloys (Annealed)		Hardened Steel Prehardened Steel Ti Alloys (Solution Treated and Aged)		Hardened Steel Prehardened Steel Stainless Steel Inconel, Ni Based Alloy	
Cutting Speed	158 SFM		140 SFM		118 SFM	
Depth of Cut	a_a=1.5D a_r=0.1D					
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/8	5,324	15.0	4,796	5.9	3,822	4.7
5/32	4,387	15.0	3,963	5.9	3,195	4.7
3/16	3,603	15.9	3,251	5.9	2,598	4.7
7/32	3,031	16.1	2,712	5.9	2,170	4.7
1/4	2,657	16.1	2,357	5.9	1,904	4.7
9/32	2,423	16.1	2,147	5.9	1,753	4.7
5/16	2,188	16.1	1,937	5.9	1,602	4.7
3/8	1,796	16.1	1,623	5.9	1,308	4.7
7/16	1,508	16.6	1,369	5.9	1,092	4.7
1/2	1,321	17.3	1,196	5.9	955	4.7
9/16	1,210	18.1	1,097	5.9	876	4.7
5/8	1,099	18.8	998	5.9	796	4.7
3/4	930	19.2	845	5.6	676	4.7
1	669	14.7	600	4.7	492	3.5

QUALITY TECH TOOL

SERIES PC460
Slot Milling

Hardness			Up to 35 HRC		35 to 45 HRC		45 to 55 HRC	
Work Material	Medium Steel Mild Steel		Prehardened Steel Stainless Steel Die and Alloy Steel		Prehardened Steel Stainless Steel Die and Alloy Steel		Hardened Steel	
Cutting Speed	138 SFM		102 SFM		66 SFM		52 SFM	
Depth of Cut					a_a=0.5D			
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/8	17,997	15.5	6,331	7.6	4,226	5.1	2,895	2.1
3/16	12,139	23.1	4,230	11.3	2,891	7.9	1,890	4.0
1/4	9,111	29.9	3,165	14.6	2,114	9.1	1,397	3.9
5/16	7,253	29.9	2,506	14.6	1,677	9.1	1,111	3.9
3/8	6,128	32.0	2,061	17.6	1,393	9.1	932	3.9
7/16	5,260	32.7	1,780	19.2	1,193	9.5	797	3.9
1/2	4,613	32.7	1,587	20.0	1,053	9.8	699	3.9
5/8	3,629	32.7	1,253	21.6	838	9.8	556	3.9
3/4	3,064	32.7	1,049	22.3	700	10.7	466	3.9
1	2,313	32.2	787	18.6	512	9.7	345	3.9

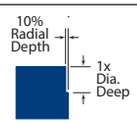
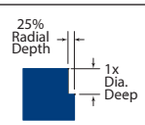
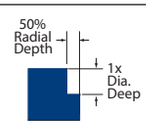
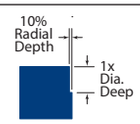
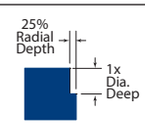
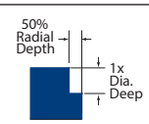
	a_a
D<1/2	1.5D
1/2≤D	0.1D

SERIES PC460
Side Milling

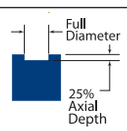
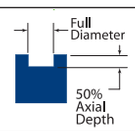
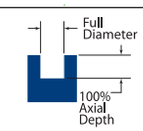
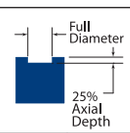
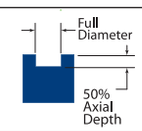
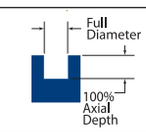
Hardness					Up to 35 HRC		35 to 45 HRC		45 to 55 HRC	
Work Material	Aluminum		Mild Carbon Steel Mild Steel		Prehardened Steel Stainless Steel Die & Alloy Steel		Prehardened Steel Stainless Steel Die & Alloy Steel		H ardened Steel	
Cutting Speed	590 SFM		203 SFM		138 SFM		69 SFM		69 SFM	
Depth of Cut	a_a=1.5D a_r=0.1D						a_a=1.5D a_r=0.1D			
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/8	17,997	15.5	6,331	7.6	4,226	5.1	2,895	2.1	2,114	0.9
3/16	12,139	23.1	4,230	11.3	2,891	7.9	1,890	4.0	1,447	1.2
1/4	9,111	29.9	3,165	14.6	2,114	9.1	1,397	3.9	1,053	1.6
5/16	7,253	29.9	2,506	14.6	1,677	9.1	1,111	3.9	838	1.6
3/8	6,128	32.0	2,061	17.6	1,393	9.1	932	3.9	700	1.6
7/16	5,260	32.7	1,780	19.2	1,193	9.5	797	3.9	599	1.6
1/2	4,613	32.7	1,587	20.0	1,053	9.8	699	3.9	526	1.6
5/8	3,629	32.7	1,253	21.6	838	9.8	556	3.9	414	1.6
3/4	3,064	32.7	1,049	22.3	700	10.7	466	3.9	349	1.6
1	2,313	32.2	787	18.6	512	9.7	345	3.9	256	1.6

SERIES PC470, PC471, EM470, EM471

2 Flute - Profile Milling for Aluminum

Work Material	Aluminum <10% Silicon						Aluminum >10% Silicon					
	Radial Depth of Cut at 1 X Diameter Axial Depth of Cut as %											
Cutting Speed	2,000 SFM		1,625 SFM		1,000 SFM		1,510 SFM		1,230 SFM		805 SFM	
Radial Depth of Cut	10% of Diameter		25% of Diameter		50% of Diameter		10% of Diameter		25% of Diameter		50% of Diameter	
												
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/8	61,840	151	50,184	141	30,924	136	46,637	114	38,021	107	24,834	109
3/16	41,104	142	33,359	132	20,552	127	30,999	107	25,268	100	16,506	102
1/4	30,924	162	25,092	151	15,463	145	23,314	122	19,010	114	12,421	117
5/16	24,503	155	19,885	145	12,256	139	18,480	117	15,065	110	9,842	112
3/8	20,552	146	16,676	136	10,277	132	15,499	110	12,638	103	8,253	106
7/16	17,603	142	14,283	132	8,799	127	13,273	107	10,823	100	7,067	102
1/2	15,463	143	12,546	134	7,727	129	11,656	108	9,504	101	6,207	103
5/8	12,256	157	9,943	147	6,123	141	9,235	118	7,528	111	4,921	113
3/4	10,277	160	8,338	149	5,137	144	7,752	120	6,314	113	4,130	116
1	7,638	153	6,201	143	3,819	137	5,758	115	4,695	108	3,071	111

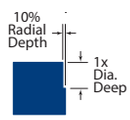
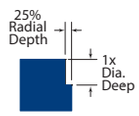
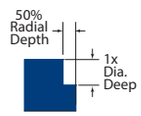
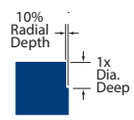
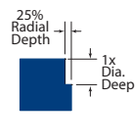
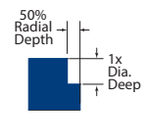
Slot Milling for Aluminum

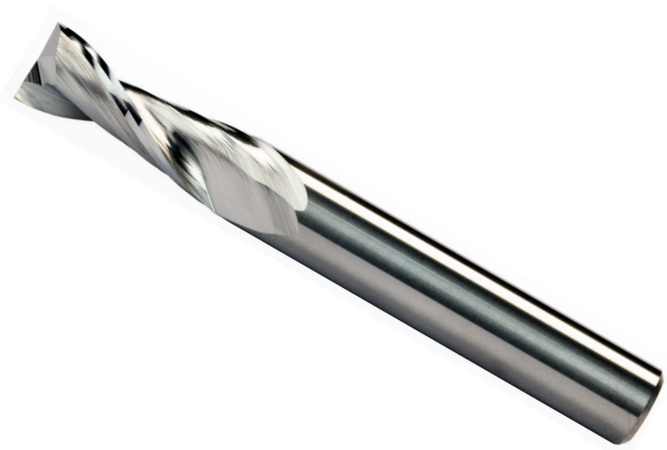
Work Material	Aluminum <10% Silicon						Aluminum >10% Silicon					
	Axial Depth of Cut at Full End Mill Diameter Slot Width											
Cutting Speed	2,000 SFM		1,625 SFM		1,000 SFM		1,510 SFM		1,230 SFM		805 SFM	
Axial Depth of Cut	25% Axial		50% Axial		100% Axial		25% Axial		50% Axial		100% Axial	
												
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/8	61,840	436	50,184	354	30,924	218	46,637	329	38,021	268	24,834	175
3/16	41,104	386	33,359	314	20,552	193	30,999	291	25,268	238	16,506	155
1/4	30,924	379	25,092	307	15,463	189	23,314	285	19,010	233	12,421	152
5/16	24,503	363	19,885	295	12,256	182	18,480	274	15,065	223	9,842	146
3/8	20,552	368	16,676	299	10,277	184	15,499	278	12,638	226	8,253	148
7/16	17,603	483	14,283	392	8,799	241	13,273	364	10,823	297	7,067	194
1/2	15,463	602	12,546	489	7,727	301	11,656	454	9,504	370	6,207	242
5/8	12,256	735	9,943	596	6,123	367	9,235	554	7,528	451	4,921	295
3/4	10,277	715	8,338	580	5,137	357	7,752	539	6,314	439	4,130	287
1	7,638	601	6,201	488	3,819	301	5,758	453	4,695	370	3,071	242

QUALITY TECH TOOL

SERIES PC470, PC471, EM470, EM471

2 Flute - Profile Milling for Brass and Plastic

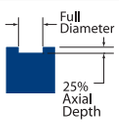
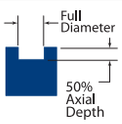
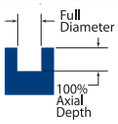
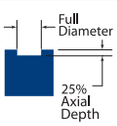
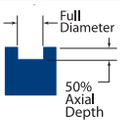
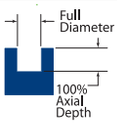
Work Material	Brass						Plastic					
	Radial Depth of Cut at 1 X Diameter Axial Depth of Cut as %											
Cutting Speed	2,950 SFM		755 SFM		510 SFM		1,200 SFM		1,050 SFM		805 SFM	
Axial Depth of Cut	10% of Diameter		25% of Diameter		50% of Diameter		10% of Diameter		25% of Diameter		50% of Diameter	
												
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/8	91,245	223	23,314	66	15,711	69	37,006	91	32,444	91	24,834	109
3/16	60,649	209	15,499	61	10,444	65	24,598	85	21,567	85	16,506	102
1/4	45,622	238	11,656	70	7,860	74	18,503	97	16,218	97	12,421	117
5/16	36,153	229	9,235	67	6,224	71	14,661	93	12,853	93	9,842	112
3/8	30,328	216	7,752	63	5,222	67	12,299	88	10,783	88	8,253	106
7/16	25,971	209	6,641	61	4,474	65	10,531	85	9,234	85	7,067	102
1/2	22,807	211	5,832	62	3,930	65	9,248	86	8,109	86	6,207	103
5/8	18,076	232	4,618	68	3,112	72	7,335	94	6,426	95	4,921	113
3/4	15,160	236	3,876	69	2,607	73	6,147	96	5,392	96	4,130	116
1	14,085	233	3,603	69	2,421	72	5,709	94	5,010	95	3,839	114

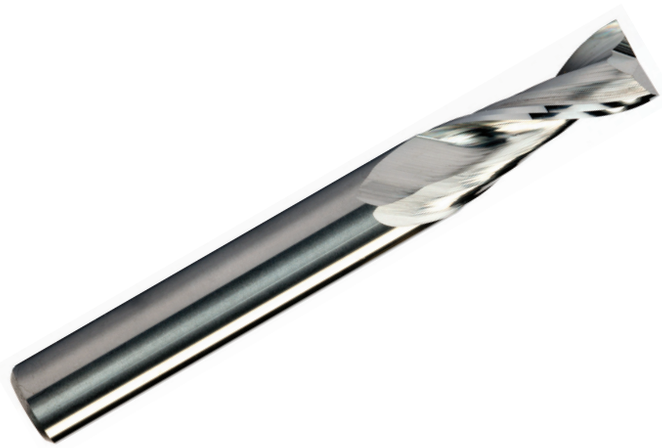


QUALITY TECH TOOL

SERIES PC470, PC471, EM470, EM471

Slot Milling for Brass and Plastic

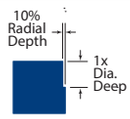
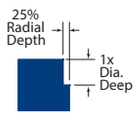
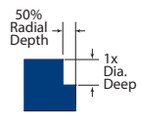
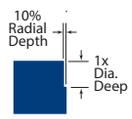
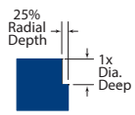
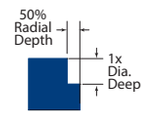
Work Material	Brass						Plastic					
	Axial Depth of Cut at Full End Mill Diameter Slot Width											
Cutting Speed	2,950 SFM		755 SFM		510 SFM		1,200 SFM		1,050 SFM		805 SFM	
Axial Depth of Cut	25% Axial		50% Axial		100% Axial		25% Axial		50% Axial		100% Axial	
												
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/8	91,245	643	23,314	164	15,711	111	37,006	261	32,444	229	24,834	175
3/16	60,649	570	15,499	146	10,444	98	24,598	231	21,567	203	16,506	155
1/4	45,622	559	11,656	143	7,860	96	18,503	227	16,218	199	12,421	152
5/16	36,153	536	9,235	137	6,224	92	14,661	217	12,853	191	9,842	146
3/8	30,328	543	7,752	139	5,222	94	12,299	220	10,783	193	8,253	148
7/16	25,971	712	6,641	182	4,474	123	10,531	289	9,234	253	7,067	194
1/2	22,807	888	5,832	227	3,930	153	9,248	360	8,109	316	6,207	242
5/8	18,076	1084	4,618	277	3,112	187	7,335	440	6,426	385	4,921	295
3/4	15,160	1054	3,876	269	2,607	181	6,147	427	5,392	375	4,130	287
1	11,270	887	2,884	227	1,939	153	4,567	360	4,006	315	3,071	242



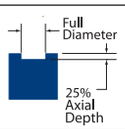
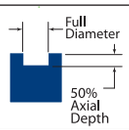
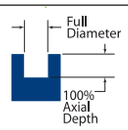
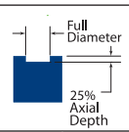
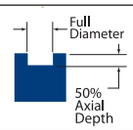
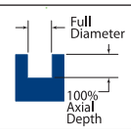
QUALITY TECH TOOL

SERIES PC475, PC476, EM475, EM476

3 Flute - Profile Milling for Aluminum

Work Material	Aluminum <10% Silicon						Aluminum >10% Silicon					
	Radial Depth of Cut at 1 X Diameter Axial Depth of Cut as %											
Cutting Speed	2,000 SFM		1,625 SFM		1,000 SFM		1,510 SFM		1,230 SFM		805 SFM	
Radial Depth of Cut	10% of Diameter		25% of Diameter		50% of Diameter		10% of Diameter		25% of Diameter		50% of Diameter	
												
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/8	61,840	227	50,184	212	30,924	204	46,637	171	38,021	161	24,834	164
3/16	41,104	212	33,359	198	20,552	191	30,999	160	25,268	150	16,506	154
1/4	30,924	242	25,092	226	15,463	218	23,314	183	19,010	171	12,421	175
5/16	24,503	232	19,885	217	12,256	209	18,480	175	15,065	164	9,842	168
3/8	20,552	219	16,676	205	10,277	197	15,499	165	12,638	155	8,253	159
7/16	17,603	212	14,283	198	8,799	191	13,273	160	10,823	150	7,067	154
1/2	15,463	215	12,546	200	7,727	193	11,656	162	9,504	152	6,207	155
5/8	12,256	236	9,943	220	6,123	212	9,235	178	7,528	166	4,921	170
3/4	10,277	240	8,338	224	5,137	216	7,752	181	6,314	169	4,130	173
1	7,638	229	6,201	214	3,819	206	5,758	173	4,695	162	3,071	166

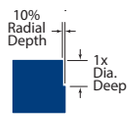
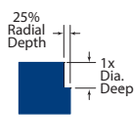
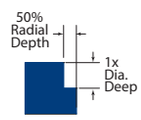
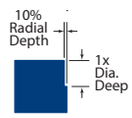
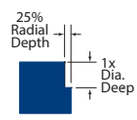
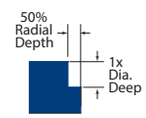
Slot Milling for Aluminum

Work Material	Aluminum <10% Silicon						Aluminum >10% Silicon					
	Radial Depth of Cut at 1 X Diameter Axial Depth of Cut as %											
Cutting Speed	2,000 SFM		1,625 SFM		1,000 SFM		1,510 SFM		1,230 SFM		805 SFM	
Axial Depth of Cut	25% Axial		50% Axial		100% Axial		25% Axial		50% Axial		100% Axial	
												
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/8	61,840	653	50,184	530	30,924	327	46,637	493	38,021	402	24,834	262
3/16	41,104	580	33,359	470	20,552	290	30,999	437	25,268	356	16,506	233
1/4	30,924	568	25,092	461	15,463	284	23,314	428	19,010	349	12,421	228
5/16	24,503	545	19,885	442	12,256	273	18,480	411	15,065	335	9,842	219
3/8	20,552	552	16,676	448	10,277	276	15,499	416	12,638	339	8,253	222
7/16	17,603	724	14,283	588	8,799	362	13,273	546	10,823	445	7,067	291
1/2	15,463	903	12,546	733	7,727	451	11,656	681	9,504	555	6,207	363
5/8	12,256	1,102	9,943	894	6,123	551	9,235	831	7,528	677	4,921	443
3/4	10,277	1,072	8,338	870	5,137	536	7,752	808	6,314	658	4,130	431
1	7,638	902	6,201	732	3,819	451	5,758	680	4,695	555	3,071	363

QUALITY TECH TOOL

SERIES PC475, PC476, EM475, EM476

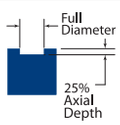
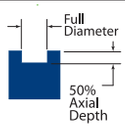
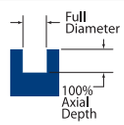
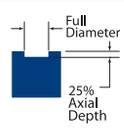
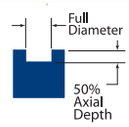
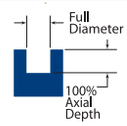
3 Flute - Profile Milling for Brass and Plastic

Work Material	Brass						Plastic					
	Axial Depth of Cut at Full End Mill Diameter Slot Width											
Cutting Speed	2,950 SFM		755 SFM		510 SFM		1,200 SFM		1,050 SFM		805 SFM	
Radial Depth of Cut	10% of Diameter		25% of Diameter		50% of Diameter		10% of Diameter		25% of Diameter		50% of Diameter	
												
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/8	91,245	335	23,314	98	15,711	104	37,006	136	32,444	137	24,834	164
3/16	60,649	313	15,499	92	10,444	97	24,598	127	21,567	128	16,506	154
1/4	45,622	357	11,656	105	7,860	111	18,503	145	16,218	146	12,421	175
5/16	36,153	343	9,235	101	6,224	106	14,661	139	12,853	140	9,842	168
3/8	30,328	324	7,752	95	5,222	100	12,299	131	10,783	132	8,253	159
7/16	25,971	313	6,641	92	4,474	97	10,531	127	9,234	128	7,067	154
1/2	22,807	317	5,832	93	3,930	98	9,248	128	8,109	129	6,207	155
5/8	18,076	347	4,618	102	3,112	108	7,335	141	6,426	142	4,921	170
3/4	15,160	353	3,876	104	2,607	109	6,147	143	5,392	145	4,130	173
1	11,270	338	2,884	99	1,939	105	4,567	137	4,006	138	3,071	166

QUALITY TECH TOOL

SERIES PC475, PC476, EM475, EM476

Slot Milling for Brass and Plastic

Work Material	Brass						Plastic					
	Axial Depth of Cut at Full End Mill Diameter Slot Width											
Cutting Speed	2,950 SFM		755 SFM		510 SFM		1,200 SFM		1,050 SFM		805 SFM	
Axial Depth of Cut	25% Axial		50% Axial		100% Axial		25% Axial		50% Axial		100% Axial	
												
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/8	91,245	964	23,314	246	15,711	166	37,006	391	32,444	343	24,834	262
3/16	60,649	855	15,499	219	10,444	147	24,598	347	21,567	304	16,506	233
1/4	45,622	838	11,656	214	7,860	144	18,503	340	16,218	298	12,421	228
5/16	36,153	804	9,235	205	6,224	138	14,661	326	12,853	286	9,842	219
3/8	30,328	815	7,752	208	5,222	140	12,299	330	10,783	290	8,253	222
7/16	25,971	1,068	6,641	273	4,474	184	10,531	433	9,234	380	7,067	291
1/2	22,807	1,332	5,832	341	3,930	230	9,248	540	8,109	474	6,207	363
5/8	18,076	1,626	4,618	415	3,112	280	7,335	660	6,426	578	4,921	443
3/4	15,160	1,581	3,876	404	2,607	272	6,147	641	5,392	562	4,130	431
1	11,270	1,331	2,884	341	1,939	229	4,567	539	4,006	473	3,071	363

QUALITY TECH TOOL

SERIES PC497

Profile Milling

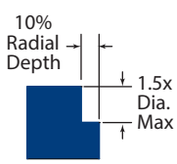
Hardness			Tensile Strength Up to 750N/mm2		Up to 30 HRC		30 to 38 HRC		38 to 45 HRC		45 to 55 HRC		55 to 60 HRC	
Work Material	Cast Iron		Mild Steel Carbon Steel		Alloy Steel Tool Steel Ti Alloy *Annealed*		Hardened Steel Prehardened Steel Ti Alloy *Solution Treated and Aged*		Hardened Steel Prehardened Steel Stainless Steel Inconel Ni Based Alloy		Hardened Steel		Hardened Steel	
Cutting Speed	650 SFM		650 SFM		530 SFM		433 SFM		315 SFM		275 SFM		235 SFM	
Depth of Cut	a_a=1.5D a_r=1.5D										a_a=1.5D a_r=1.5D			
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/8	19,522	56.6	19,522	47.6	17,174	39.8	13,776	26.7	10,367	20.0	8,812	14.7	7,669	12.8
3/16	16,370	59.1	16,370	47.6	13,761	39.8	11,013	29.2	8,264	22.9	7,026	16.6	6,113	14.7
1/4	12,242	59.4	12,242	48.0	10,282	39.8	8,189	31.4	6,117	23.5	5,201	17.1	4,531	15.2
5/16	10,662	59.4	10,662	49.5	8,837	39.8	7,007	32.6	5,331	24.8	4,527	18.1	3,943	16.1
3/8	8,579	48.0	8,579	40.9	7,133	33.2	5,694	26.7	4,286	19.7	3,646	14.2	3,173	12.8
7/16	6,754	37.9	6,754	31.6	5,608	26.7	4,471	21.1	3,330	15.3	2,829	11.0	2,462	9.8
1/2	5,480	31.0	5,480	24.9	4,539	21.7	3,607	17.2	2,675	12.4	2,268	9.0	1,973	7.9
9/16	4,753	27.3	4,753	21.6	3,948	18.3	3,147	15.2	2,345	11.2	1,990	8.1	1,731	7.1
5/8	4,027	23.5	4,027	18.4	3,357	14.8	2,686	13.2	2,016	9.9	1,712	7.2	1,489	6.4
3/4	3,345	19.3	3,345	15.4	2,807	13.4	2,269	10.6	1,670	8.6	1,423	6.2	1,234	5.4
1	2,441	14.3	2,441	11.2	2,116	9.7	1,634	8.1	1,240	6.6	1,053	4.7	915	3.9

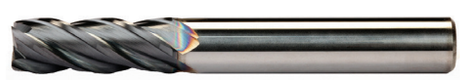
QUALITY TECH TOOL

SERIES VH439, VHR439

4 Flute - Variable Helix End Mills - Light Profile Cut

Hardness	≤88 HRB		≥88 HRB		<26 HRC		<26 HRC		<92 HRB		<30 HRC		<30 HRC	
Work Material	Steel								Cast Iron					
	Low Carbon Steel				Medium Alloy Steel		Mold & Die Steel		Gray		Ductile		Malleable	
Cutting Speed	695 SFM		570 SFM		460 SFM		230 SFM		600 SFM		305 SFM		190 SFM	
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/8	21,693	29.2	17,804	23.9	14,321	18.5	7,160	9.3	18,721	33.5	9,515	12.8	5,935	7.9
5/32	18,125	39.2	14,875	32.1	11,968	22.2	5,981	11.1	15,641	44.6	7,952	17.2	4,958	10.6
3/16	14,558	49.2	11,946	40.3	9,614	25.9	4,803	12.9	12,562	55.6	6,388	21.5	3,982	13.4
1/4	10,748	61.5	8,818	50.3	7,096	31.4	3,547	15.7	9,277	68.0	4,715	26.9	2,937	16.8
5/16	8,518	75.1	6,992	61.8	5,628	41.7	2,809	20.9	7,356	78.1	3,738	33.0	2,334	20.5
3/8	7,141	83.5	5,860	68.5	4,716	48.0	2,361	24.1	6,167	84.4	3,136	36.7	1,952	22.8
7/16	6,117	90.8	5,018	74.5	4,038	53.6	2,024	26.9	5,280	88.8	2,682	39.9	1,673	24.8
1/2	5,373	92.0	4,409	75.6	3,547	55.2	1,778	27.6	4,638	88.4	2,353	40.4	1,472	25.2
5/8	4,254	79.6	3,496	65.6	2,809	48.3	1,405	24.2	3,678	76.6	1,869	35.1	1,162	21.8
3/4	3,570	72.2	2,934	59.5	2,361	44.1	1,177	21.9	3,083	69.4	1,568	31.7	975	19.7
1	2,658	60.6	2,175	49.6	1,752	37.2	876	18.6	2,293	57.7	1,161	26.5	728	16.7





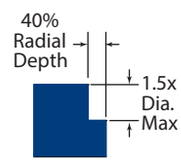
Hardness	<26 HRC		<82 HRB		<35 HRC		<82 HRB		<31 HRC	
Work Material	Stainless Steel						Titanium Alloy		High Temperature Alloy	
	300 Series Stainless		400 Series Stainless		Ph Series Stainless					
Cutting Speed	354 SFM		545 SFM		295 SFM		340 SFM		98 SFM	
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/8	11,049	14.9	16,984	30.1	9,207	10.4	10,644	14.8	3,069	3.6
5/32	9,232	20.0	14,190	37.8	7,695	14.0	8,894	18.7	2,565	4.1
3/16	7,414	25.1	11,396	45.5	6,182	17.6	7,144	22.5	2,061	4.6
1/4	5,478	29.9	8,415	53.2	4,562	21.0	5,269	26.1	1,520	5.1
5/16	4,335	30.7	6,669	55.4	3,617	20.9	4,173	26.4	1,203	5.9
3/8	3,642	31.3	5,594	56.9	3,031	20.7	3,505	26.5	1,007	6.4
7/16	3,117	33.0	4,791	59.7	2,599	22.5	3,004	27.8	867	6.9
1/2	2,736	33.9	4,208	60.6	2,285	23.4	2,639	28.1	765	7.2
5/8	2,172	32.2	3,334	56.3	1,809	20.6	2,092	25.3	606	6.9
3/4	1,822	31.2	2,797	53.6	1,516	18.8	1,750	23.5	509	6.6
1	1,348	26.0	2,077	44.2	1,132	16.3	1,299	19.2	374	5.0

QUALITY TECH TOOL

SERIES VH439, VHR439

4 Flute - Variable Helix End Mills - Heavy Profile Cut

Hardness	≤88 HRB		≥88 HRB		<26 HRC		<26 HRC		<92 HRB		<30 HRC		<30 HRC	
Work Material	Steel								Cast Iron					
	Low Carbon Steel				Medium Alloy Steel		Mold & Die Steel		Gray		Ductile		Malleable	
Cutting Speed	640 SFM		525 SFM		430 SFM		210 SFM		580 SFM		285 SFM		180 SFM	
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/8	19,946	17.7	16,367	14.5	13,404	10.5	6,552	5.1	18,113	20.2	8,897	8.0	5,626	5.0
5/32	16,664	22.8	13,676	18.7	11,197	12.5	5,473	6.2	15,132	25.9	7,433	10.3	4,701	6.4
3/16	13,382	27.8	10,985	22.8	8,990	14.5	4,393	7.2	12,152	31.6	5,968	12.5	3,777	7.8
1/4	9,887	34.1	8,109	28.0	6,637	17.6	3,241	8.7	8,971	38.4	4,409	15.3	2,792	9.7
5/16	7,831	41.3	6,426	33.8	5,264	23.6	2,567	11.5	7,113	44.6	3,496	18.4	2,213	11.7
3/8	6,568	45.6	5,392	37.4	4,417	27.1	2,159	13.3	5,965	48.5	2,934	20.3	1,855	12.9
7/16	5,627	49.8	4,617	40.8	3,781	30.1	1,851	14.8	5,107	51.1	2,514	22.2	1,589	14.1
1/2	4,944	50.7	4,055	41.5	3,318	30.9	1,625	15.1	4,485	50.9	2,209	22.6	1,395	14.3
5/8	3,920	44.0	3,213	36.0	2,627	27.1	1,283	13.3	3,557	44.5	1,748	19.6	1,102	12.3
3/4	3,285	39.8	2,692	32.7	2,204	24.9	1,079	12.1	2,979	40.5	1,463	17.7	922	11.2
1	2,441	33.1	2,008	27.1	1,644	20.9	797	10.1	2,215	33.9	1,093	14.7	689	9.3



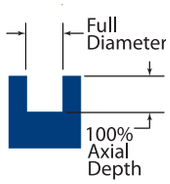
Hardness	<26 HRC		<82 HRB		<35 HRC		<82 HRB		<31 HRC	
Work Material	Stainless Steel						Titanium Alloy		High Temperature Alloy	
	300 Series Stainless		400 Series Stainless		Ph Series Stainless					
Cutting Speed	335 SFM		515 SFM		285 SFM		330 SFM		90 SFM	
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/8	10,432	9.2	16,067	15.8	8,897	9.3	10,335	10.7	2,760	2.4
5/32	8,718	11.9	13,424	20.7	7,433	11.1	8,632	12.8	2,308	2.7
3/16	7,003	14.6	10,781	25.5	5,968	12.9	6,929	14.9	1,855	3.1
1/4	5,174	17.3	7,956	30.4	4,409	14.8	5,117	17.2	1,367	3.4
5/16	4,102	17.9	6,305	31.5	3,496	15.7	4,062	18.3	1,081	3.7
3/8	3,435	18.2	5,287	32.1	2,934	16.3	3,402	19.1	910	4.0
7/16	2,940	19.0	4,528	33.6	2,514	17.6	2,915	20.5	782	4.5
1/2	2,583	19.3	3,978	34.1	2,209	18.1	2,563	20.9	689	4.7
5/8	2,051	18.3	3,153	31.8	1,748	16.0	2,031	18.6	546	4.3
3/4	1,717	17.7	2,647	30.3	1,463	14.7	1,705	17.2	456	4.2
1	1,280	14.9	1,969	25.2	1,093	12.2	1,260	14.1	335	3.5

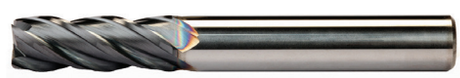
QUALITY TECH TOOL

SERIES VH439, VHR439

4 Flute - Variable Helix End Mills - Slot Milling

Hardness	≤88 HRB		≥88 HRB		<26 HRC		<26 HRC		<92 HRB		<30 HRC		<30 HRC	
Work Material	Steel								Cast Iron					
	Low Carbon Steel				Medium Alloy Steel		Mold & Die Steel		Gray		Ductile		Malleable	
Cutting Speed	535 SFM		440 SFM		370 SFM		190 SFM		500 SFM		256 SFM		161 SFM	
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/8	16,675	14.9	13,712	12.2	11,561	9.0	5,935	4.7	15,556	17.4	7,980	7.1	5,009	4.4
5/32	13,933	19.1	11,454	15.6	9,660	10.8	4,958	5.6	12,996	22.3	6,667	9.2	4,187	5.8
3/16	11,191	23.3	9,196	19.1	7,759	12.5	3,982	6.4	10,436	27.1	5,353	11.2	3,366	7.1
1/4	8,262	28.5	6,790	23.5	5,728	15.3	2,937	7.9	7,707	32.9	3,950	13.6	2,486	8.6
5/16	6,548	34.4	5,385	28.4	4,537	20.3	2,334	10.5	6,103	38.4	3,132	16.4	1,970	10.4
3/8	5,489	38.1	4,514	31.4	3,804	23.3	1,952	12.0	5,117	41.6	2,627	18.2	1,653	11.5
7/16	4,702	41.6	3,865	34.3	3,262	26.0	1,673	13.3	4,385	43.9	2,252	19.9	1,415	12.6
1/2	4,131	42.3	3,394	34.8	2,869	26.7	1,472	13.6	3,853	43.8	1,979	20.3	1,242	12.8
5/8	3,274	36.6	2,688	30.1	2,273	23.5	1,162	12.1	3,052	38.2	1,566	17.6	980	10.9
3/4	2,744	33.3	2,256	27.4	1,907	21.6	975	11.0	2,563	34.8	1,314	15.9	825	9.9
1	2,038	27.5	1,673	22.7	1,417	18.0	728	9.3	1,900	29.1	974	13.2	610	8.3





Hardness	<26 HRC		<82 HRB		<35 HRC		<82 HRB		<31 HRC	
Work Material	Stainless Steel						Titanium Alloy		High Temperature Alloy	
	300 Series Stainless		400 Series Stainless		Ph Series Stainless					
Cutting Speed	315 SFM		440 SFM		265 SFM		300 SFM		79 SFM	
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/8	9,824	8.8	13,712	13.5	8,289	8.6	9,312	9.7	2,452	2.0
5/32	8,209	11.2	11,454	17.7	6,924	10.3	7,780	11.5	2,051	2.3
3/16	6,593	13.7	9,196	21.8	5,559	11.9	6,248	13.4	1,650	2.7
1/4	4,868	16.1	6,790	26.0	4,103	13.8	4,610	15.4	1,214	3.0
5/16	3,860	16.9	5,385	26.7	3,253	14.7	3,658	16.5	960	3.3
3/8	3,233	17.2	4,514	27.4	2,732	15.2	3,063	17.1	805	3.5
7/16	2,766	17.9	3,865	28.8	2,341	16.4	2,623	18.4	693	3.9
1/2	2,430	18.1	3,394	29.2	2,056	16.9	2,305	18.8	612	4.1
5/8	1,930	17.4	2,688	27.1	1,627	14.8	1,829	16.8	485	3.9
3/4	1,620	16.7	2,256	25.9	1,366	13.7	1,536	15.5	404	3.8
1	1,201	14.0	1,673	21.3	1,014	11.4	1,142	12.8	305	3.1

QUALITY TECH TOOL

SERIES MD135, MD136, MD137

Micro/Miniature Twist Drills for Small Hole Drilling of both Ferrous and Non-Ferrous and Non-Metallic Materials

Material Group	Steel						Austenitic		Stainless Steel			
Work Material	Low Carbon Steel 1018		Alloy Steel (up to 35 Rc) 4140		Alloy Steel (36-45 Rc) 4140		304/316		Free Machining		Ferritic Martensitic	
Speed	295 SFM		230 SFM		198 SFM		198 SFM		180 SFM		98 SFM	
Drill Diameter	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev
97	80,000	.0001	80,000	.0001	80,000	.0001	80,000	.0001	80,000	.0001	63,673	.0001
96	80,000	.0002	80,000	.0002	80,000	.0002	80,000	.0001	80,000	.0001	59,630	.0002
95	80,000	.0002	80,000	.0002	80,000	.0002	80,000	.0001	80,000	.0001	56,070	.0002
94	80,000	.0002	80,000	.0002	80,000	.0002	80,000	.0001	80,000	.0001	52,911	.0002
93	80,000	.0002	80,000	.0002	80,000	.0002	80,000	.0001	80,000	.0001	50,089	.0002
92	80,000	.0002	80,000	.0002	79,952	.0002	79,952	.0001	79,868	.0001	47,584	.0002
91	80,000	.0002	80,000	.0002	79,206	.0002	79,206	.0002	77,830	.0002	45,646	.0002
90	80,000	.0003	80,000	.0003	78,460	.0003	78,460	.0002	75,791	.0002	43,707	.0003
89	80,000	.0003	80,000	.0003	77,714	.0003	77,714	.0002	73,753	.0002	41,768	.0003
88	80,000	.0004	80,000	.0004	76,969	.0004	76,969	.0003	71,715	.0003	39,830	.0004
87	79,636	.0004	79,432	.0004	75,719	.0004	75,719	.0003	69,410	.0003	37,865	.0004
86	78,480	.0004	77,631	.0004	73,781	.0004	73,781	.0003	67,633	.0003	36,895	.0004
85	77,325	.0004	75,829	.0004	71,842	.0004	71,842	.0003	65,856	.0003	35,925	.0004
84	76,169	.0004	74,027	.0004	69,904	.0004	69,904	.0003	64,079	.0003	34,955	.0004
83	75,013	.0004	72,225	.0004	67,965	.0004	67,965	.0003	62,302	.0003	33,985	.0004
82	73,858	.0004	70,423	.0004	66,027	.0004	66,027	.0003	60,525	.0003	33,016	.0004
81	72,702	.0004	68,621	.0004	64,088	.0004	64,088	.0003	58,748	.0003	32,046	.0004
80	71,546	.0004	66,819	.0004	62,150	.0004	62,150	.0003	56,971	.0003	31,076	.0004
79	69,235	.0004	63,216	.0004	58,273	.0004	58,273	.0003	53,417	.0003	29,137	.0004
1/64	66,692	.0004	59,251	.0004	54,008	.0004	54,008	.0003	49,508	.0003	27,003	.0004
78	65,768	.0004	57,810	.0004	52,457	.0004	52,457	.0003	48,087	.0003	26,227	.0004
77	61,145	.0004	50,602	.0004	44,703	.0004	44,703	.0003	40,979	.0003	22,348	.0004
76	56,677	.0004	44,085	.0004	37,788	.0004	37,788	.0003	34,640	.0003	18,889	.0004
75	54,860	.0004	42,671	.0004	36,576	.0004	36,576	.0003	33,529	.0003	18,284	.0004
74	52,133	.0005	40,550	.0005	34,757	.0005	34,757	.0004	31,863	.0004	17,376	.0005
73	49,406	.0005	38,429	.0005	32,938	.0005	32,938	.0004	30,197	.0004	16,468	.0005
72	47,589	.0006	37,015	.0006	31,726	.0006	31,726	.0004	29,086	.0004	15,863	.0006
71	45,771	.0006	35,601	.0006	30,514	.0006	30,514	.0005	27,975	.0005	15,257	.0006
70	42,135	.0007	32,773	.0007	28,089	.0007	28,089	.0005	25,754	.0005	14,046	.0007
69	39,954	.0007	31,076	.0007	26,634	.0007	26,634	.0005	24,421	.0005	13,320	.0007
68	36,682	.0008	28,531	.0008	24,451	.0008	24,451	.0006	22,421	.0006	12,230	.0008
1/32	36,136	.0008	28,107	.0008	24,088	.0008	24,088	.0006	22,088	.0006	12,049	.0008
67	35,322	.0008	27,474	.0008	23,545	.0008	23,545	.0006	21,590	.0006	11,777	.0008
66	34,414	.0008	26,766	.0008	22,939	.0008	22,939	.0006	21,033	.0006	11,474	.0008
65	32,598	.0009	25,351	.0009	21,727	.0009	21,727	.0007	19,921	.0007	10,866	.0009
64	31,690	.0009	24,644	.0009	21,122	.0009	21,122	.0007	19,365	.0007	10,563	.0009
63	30,782	.0009	23,937	.0009	20,516	.0009	20,516	.0007	18,808	.0007	10,259	.0009
62	29,874	.0010	23,229	.0010	19,910	.0010	19,910	.0008	18,252	.0008	9,956	.0010
61	28,966	.0010	22,522	.0010	19,304	.0010	19,304	.0008	17,696	.0008	9,652	.0010

QUALITY TECH TOOL

SERIES MD135, MD136, MD137

Micro/Miniature Twist Drills for Small Hole Drilling of both Ferrous and Non-Ferrous and Non-Metallic Materials

Material Group	Steel						Austenitic		Stainless Steel			
Work Material	Low Carbon Steel 1018		Alloy Steel (up to 35 Rc) 4140		Alloy Steel (36-45 Rc) 4140		304/316		Free Machining		Ferritic Martensitic	
Speed	295 SFM		230 SFM		198 SFM		198 SFM		180 SFM		98 SFM	
Drill Diameter	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev
60	28,263	.0010	21,975	.0010	18,836	.0010	18,836	.0008	17,266	.0008	9,418	.0010
59	27,681	.0011	21,523	.0011	18,449	.0011	18,449	.0008	16,910	.0008	9,224	.0011
58	27,099	.0011	21,071	.0011	18,062	.0011	18,062	.0008	16,555	.0008	9,030	.0011
57	26,517	.0011	20,619	.0011	17,675	.0011	17,675	.0009	16,199	.0009	8,836	.0011
56	24,479	.0013	19,036	.0013	16,320	.0013	16,320	.0009	14,955	.0009	8,156	.0013
3/64	24,246	.0013	18,856	.0013	16,165	.0013	16,165	.0009	14,812	.0009	8,079	.0013
55	21,818	.0014	16,969	.0014	14,548	.0014	14,548	.0010	13,330	.0010	7,270	.0014
54	20,654	.0015	16,064	.0015	13,771	.0015	13,771	.0011	12,620	.0011	6,883	.0015
53	18,957	.0015	14,744	.0015	12,638	.0015	12,638	.0012	11,585	.0012	6,319	.0015
1/16	18,128	.0015	14,098	.0015	12,083	.0015	12,083	.0012	11,079	.0012	6,042	.0015
52	17,852	.0015	13,883	.0015	11,898	.0015	11,898	.0012	10,910	.0012	5,949	.0015
51	16,884	.0015	13,129	.0015	11,251	.0015	11,251	.0012	10,320	.0012	5,625	.0015
50	16,130	.0015	12,542	.0015	10,748	.0015	10,748	.0012	9,860	.0012	5,374	.0015
49	15,506	.0015	12,057	.0015	10,333	.0015	10,333	.0012	9,479	.0012	5,167	.0015
48	14,881	.0015	11,573	.0015	9,919	.0015	9,919	.0012	9,098	.0012	4,959	.0015
5/64	14,443	.0015	11,233	.0015	9,628	.0015	9,628	.0012	8,831	.0012	4,814	.0015
47	14,360	.0015	11,169	.0015	9,573	.0015	9,573	.0012	8,781	.0012	4,787	.0015
46	13,945	.0015	10,848	.0015	9,297	.0015	9,297	.0012	8,525	.0012	4,648	.0015
45	13,783	.0015	10,723	.0015	9,189	.0015	9,189	.0012	8,425	.0012	4,594	.0015
44	13,137	.0015	10,223	.0015	8,758	.0015	8,758	.0012	8,027	.0012	4,379	.0015
43	12,666	.0015	9,858	.0015	8,444	.0015	8,444	.0012	7,737	.0012	4,222	.0015
42	12,086	.0015	9,405	.0015	8,055	.0015	8,055	.0012	7,385	.0012	4,030	.0015
3/32	12,047	.0015	9,375	.0015	8,029	.0015	8,029	.0012	7,362	.0012	4,017	.0015
41	11,763	.0015	9,154	.0015	7,839	.0015	7,839	.0012	7,190	.0012	3,923	.0015
40	11,505	.0015	8,953	.0015	7,667	.0015	7,667	.0012	7,033	.0012	3,838	.0015
39	11,336	.0015	8,822	.0015	7,555	.0015	7,555	.0012	6,930	.0012	3,782	.0015
38	11,125	.0015	8,657	.0015	7,414	.0015	7,414	.0012	6,800	.0012	3,711	.0015
37	10,861	.0015	8,451	.0015	7,239	.0015	7,239	.0012	6,638	.0012	3,622	.0015
36	10,597	.0015	8,245	.0015	7,064	.0015	7,064	.0012	6,475	.0012	3,533	.0015
7/64	10,310	.0015	8,022	.0015	6,873	.0015	6,873	.0012	6,299	.0012	3,437	.0015
35	10,257	.0015	7,980	.0015	6,838	.0015	6,838	.0012	6,267	.0012	3,419	.0015
34	10,168	.0015	7,911	.0015	6,779	.0015	6,779	.0012	6,213	.0012	3,389	.0015
33	9,992	.0015	7,773	.0015	6,661	.0015	6,661	.0012	6,105	.0012	3,331	.0015
32	9,727	.0015	7,566	.0015	6,484	.0015	6,484	.0012	5,944	.0012	3,242	.0015
31	9,522	.0015	7,406	.0015	6,348	.0015	6,348	.0012	5,819	.0012	3,174	.0015
1/8	9,474	.0015	7,369	.0015	6,316	.0015	6,316	.0012	5,790	.0012	3,158	.0015

QUALITY TECH TOOL

SERIES MD135, MD136, MD137

Micro/Miniature Twist Drills for Small Hole Drilling of both Ferrous and Non-Ferrous and Non-Metallic Materials

Work Group	Participation Hardened Steel		Cast Irons				Special Alloy			
Work Piece Material	17-4 PH		Gray Cast Irons A48 Class 20/G4000		Ductile Cast Irons A536/60-40-18		Titanium 6AL-4V		High Temp Alloys Inconel/Hastelloy Waspelloy Nickel Based	
Speed	82 SFM		394 SFM		360 SFM		66 SFM		50 SFM	
Drill Diameter	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev
97	53,063	.0001	80,000	.0001	80,000	.0001	42,453	.0001	31,830	.0001
96	49,694	.0002	80,000	.0002	80,000	.0002	39,758	.0001	29,809	.0001
95	46,727	.0002	80,000	.0002	80,000	.0002	37,384	.0001	28,029	.0001
94	44,094	.0002	80,000	.0002	80,000	.0002	35,278	.0001	26,450	.0001
93	41,743	.0002	80,000	.0002	80,000	.0002	33,396	.0001	25,039	.0001
92	39,655	.0002	80,000	.0002	80,000	.0002	31,726	.0001	23,787	.0001
91	38,040	.0002	80,000	.0002	80,000	.0002	30,432	.0002	22,818	.0002
90	36,424	.0003	80,000	.0003	80,000	.0003	29,137	.0002	21,849	.0002
89	34,809	.0003	80,000	.0003	80,000	.0003	27,843	.0002	20,879	.0002
88	33,193	.0004	80,000	.0004	80,000	.0004	26,548	.0003	19,910	.0003
87	31,555	.0004	79,941	.0004	79,840	.0004	25,236	.0003	18,927	.0003
86	30,747	.0004	79,755	.0004	79,330	.0004	24,590	.0003	18,443	.0003
85	29,939	.0004	79,568	.0004	78,820	.0004	23,944	.0003	17,958	.0003
84	29,131	.0004	79,382	.0004	78,311	.0004	23,298	.0003	17,473	.0003
83	28,323	.0004	79,196	.0004	77,801	.0004	22,652	.0003	16,989	.0003
82	27,514	.0004	79,009	.0004	77,292	.0004	22,006	.0003	16,504	.0003
81	26,706	.0004	78,823	.0004	76,782	.0004	21,359	.0003	16,020	.0003
80	25,898	.0004	78,636	.0004	76,273	.0004	20,713	.0003	15,535	.0003
79	24,281	.0004	78,263	.0004	75,254	.0004	19,421	.0003	14,566	.0003
1/64	22,503	.0004	77,853	.0004	74,133	.0004	17,999	.0003	13,499	.0003
78	21,857	.0004	77,704	.0004	73,725	.0004	17,482	.0003	13,112	.0003
77	18,624	.0004	76,958	.0004	71,687	.0004	14,898	.0003	11,173	.0003
76	15,741	.0004	75,567	.0004	69,270	.0004	12,593	.0003	9,445	.0003
75	15,236	.0004	73,144	.0004	67,049	.0004	12,189	.0003	9,141	.0003
74	14,480	.0005	69,509	.0005	63,716	.0005	11,583	.0004	8,687	.0004
73	13,723	.0005	65,874	.0005	60,384	.0005	10,977	.0004	8,232	.0004
72	13,218	.0006	63,451	.0006	58,162	.0006	10,574	.0004	7,929	.0004
71	12,713	.0006	61,028	.0006	55,940	.0006	10,170	.0005	7,626	.0005
70	11,704	.0007	56,182	.0007	51,497	.0007	9,362	.0005	7,020	.0005
69	11,099	.0007	53,274	.0007	48,831	.0007	8,877	.0005	6,656	.0005
68	10,190	.0008	48,912	.0008	44,832	.0008	8,150	.0006	6,110	.0006
1/32	10,039	.0008	48,185	.0008	44,166	.0008	8,029	.0006	6,019	.0006
67	9,813	.0008	47,099	.0008	43,171	.0008	7,848	.0006	5,884	.0006
66	9,560	.0008	45,888	.0008	42,061	.0008	7,646	.0006	5,733	.0006
65	9,054	.0009	43,465	.0009	39,841	.0009	7,242	.0007	5,430	.0007
64	8,802	.0009	42,253	.0009	38,731	.0009	7,041	.0007	5,279	.0007
63	8,549	.0009	41,042	.0009	37,621	.0009	6,839	.0007	5,128	.0007
62	8,296	.0010	39,830	.0010	36,511	.0010	6,637	.0008	4,977	.0008
61	8,044	.0010	38,618	.0010	35,401	.0010	6,435	.0008	4,826	.0008

QUALITY TECH TOOL

SERIES MD135, MD136, MD137

Micro/Miniature Twist Drills for Small Hole Drilling of both Ferrous and Non-Ferrous and Non-Metallic Materials

Work Group	Participation Hardened Steel		Cast Irons				Special Alloy			
Work Piece Material	17-4 PH		Gray Cast Irons A48 Class 20/G4000		Ductile Cast Irons A536/60-40-18		Titanium 6AL-4V		High Temp Alloys Inconel/Hastelloy Waspelloy Nickel Based	
Speed	82 SFM		394 SFM		360 SFM		66 SFM		50 SFM	
Drill Diameter	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev
60	7,848	.0010	37,681	.0010	34,542	.0010	6,279	.0008	4,709	.0008
59	7,687	.0011	36,905	.0011	33,831	.0011	6,150	.0008	4,613	.0008
58	7,525	.0011	36,129	.0011	33,120	.0011	6,021	.0008	4,516	.0008
57	7,364	.0011	35,352	.0011	32,408	.0011	5,892	.0009	4,420	.0009
56	6,798	.0013	32,636	.0013	29,919	.0013	5,440	.0009	4,082	.0009
3/64	6,734	.0013	32,325	.0013	29,635	.0013	5,388	.0009	4,043	.0009
55	6,060	.0014	29,089	.0014	26,667	.0014	4,849	.0010	3,639	.0010
54	5,737	.0015	27,537	.0015	25,244	.0015	4,590	.0011	3,444	.0011
53	5,266	.0015	25,276	.0015	23,169	.0015	4,212	.0012	3,160	.0012
1/16	5,034	.0015	24,170	.0015	22,155	.0015	4,027	.0012	3,023	.0012
52	4,957	.0015	23,801	.0015	21,816	.0015	3,965	.0012	2,977	.0012
51	4,687	.0015	22,510	.0015	20,632	.0015	3,748	.0012	2,817	.0012
50	4,477	.0015	21,504	.0015	19,710	.0015	3,580	.0012	2,692	.0012
49	4,307	.0015	20,672	.0015	18,948	.0015	3,442	.0012	2,588	.0012
48	4,136	.0015	19,840	.0015	18,186	.0015	3,305	.0012	2,485	.0012
5/64	4,016	.0015	19,258	.0015	17,653	.0015	3,209	.0012	2,412	.0012
47	3,994	.0015	19,147	.0015	17,551	.0015	3,191	.0012	2,398	.0012
46	3,877	.0015	18,593	.0015	17,045	.0015	3,100	.0012	2,328	.0012
45	3,831	.0015	18,378	.0015	16,847	.0015	3,064	.0012	2,301	.0012
44	3,648	.0015	17,516	.0015	16,059	.0015	2,922	.0012	2,191	.0012
43	3,515	.0015	16,888	.0015	15,484	.0015	2,818	.0012	2,111	.0012
42	3,355	.0015	16,116	.0015	14,771	.0015	2,685	.0012	2,015	.0012
3/32	3,344	.0015	16,064	.0015	14,723	.0015	2,676	.0012	2,009	.0012
41	3,266	.0015	15,686	.0015	14,374	.0015	2,611	.0012	1,962	.0012
40	3,195	.0015	15,343	.0015	14,057	.0015	2,553	.0012	1,919	.0012
39	3,148	.0015	15,118	.0015	13,851	.0015	2,515	.0012	1,890	.0012
38	3,089	.0015	14,836	.0015	13,593	.0015	2,468	.0012	1,854	.0012
37	3,016	.0015	14,483	.0015	13,271	.0015	2,410	.0012	1,808	.0012
36	2,942	.0015	14,130	.0015	12,948	.0015	2,351	.0012	1,762	.0012
7/64	2,862	.0000	13,747	.0015	12,598	.0015	2,288	.0012	1,714	.0012
35	2,848	.0015	13,676	.0015	12,533	.0015	2,277	.0012	1,705	.0012
34	2,823	.0015	13,558	.0015	12,426	.0015	2,257	.0012	1,691	.0012
33	2,775	.0015	13,322	.0015	12,210	.0015	2,219	.0012	1,663	.0012
32	2,701	.0015	12,969	.0015	11,887	.0015	2,161	.0012	1,620	.0012
31	2,645	.0015	12,696	.0015	11,638	.0015	2,116	.0012	1,587	.0012
1/8	2,632	.0015	12,632	.0015	11,580	.0015	2,105	.0012	1,579	.0012

QUALITY TECH TOOL

SERIES MD135, MD136, MD137

Micro/Miniature Twist Drills for Small Hole Drilling of both Ferrous and Non-Ferrous and Non-Metallic Materials

Work Group	Hardened Steels		Non-Ferrous							
Work Piece Material	45 Rc A2/52100		Aluminum (<10% Si)		Aluminum (<10% Si)		Plastics		Composites/Fiber Reinforced Materials Circuit Boards	
Speed	180 SFM		460 SFM		330 SFM		560 SFM		660 SFM	
Drill Diameter	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev
97	80,000	.0001	80,000	.0001	80,000	.0001	80,000	.0001	80,000	.0004
96	80,000	.0002	80,000	.0002	80,000	.0002	80,000	.0002	80,000	.0004
95	80,000	.0002	80,000	.0002	80,000	.0002	80,000	.0002	80,000	.0005
94	80,000	.0002	80,000	.0002	80,000	.0002	80,000	.0002	80,000	.0005
93	80,000	.0002	80,000	.0002	80,000	.0002	80,000	.0002	80,000	.0005
92	79,868	.0002	80,000	.0002	80,000	.0002	80,000	.0002	80,000	.0005
91	77,830	.0002	80,000	.0002	80,000	.0002	80,000	.0002	80,000	.0006
90	75,791	.0003	80,000	.0003	80,000	.0003	80,000	.0003	80,000	.0007
89	73,753	.0003	80,000	.0003	80,000	.0003	80,000	.0003	80,000	.0008
88	71,715	.0004	80,000	.0004	80,000	.0004	80,000	.0004	80,000	.0009
87	69,410	.0004	80,000	.0004	79,738	.0004	80,000	.0004	80,000	.0010
86	67,633	.0004	80,000	.0004	78,905	.0004	80,000	.0004	80,000	.0010
85	65,856	.0004	80,000	.0004	78,073	.0004	80,000	.0004	80,000	.0010
84	64,079	.0004	80,000	.0004	77,240	.0004	80,000	.0004	80,000	.0010
83	62,302	.0004	80,000	.0004	76,407	.0004	80,000	.0004	80,000	.0010
82	60,525	.0004	80,000	.0004	75,575	.0004	80,000	.0004	80,000	.0010
81	58,748	.0004	80,000	.0004	74,742	.0004	80,000	.0004	80,000	.0010
80	56,971	.0004	80,000	.0004	73,909	.0004	80,000	.0004	80,000	.0010
79	53,417	.0004	80,000	.0004	72,244	.0004	80,000	.0004	80,000	.0010
1/64	49,508	.0004	80,000	.0004	70,413	.0004	80,000	.0004	80,000	.0010
78	48,087	.0004	80,000	.0004	69,746	.0004	80,000	.0004	80,000	.0010
77	40,979	.0004	80,000	.0004	66,416	.0004	80,000	.0004	80,000	.0010
76	34,640	.0004	79,351	.0004	62,974	.0004	79,669	.0004	79,987	.0010
75	33,529	.0004	77,290	.0004	60,955	.0004	78,618	.0004	79,947	.0011
74	31,863	.0005	74,199	.0005	57,926	.0005	77,042	.0005	79,886	.0012
73	30,197	.0005	71,108	.0005	54,897	.0005	75,466	.0005	79,825	.0014
72	29,086	.0006	69,047	.0006	52,878	.0006	74,416	.0006	79,784	.0014
71	27,975	.0006	66,986	.0006	50,858	.0006	73,365	.0006	79,743	.0015
70	25,754	.0007	62,865	.0007	46,820	.0007	71,263	.0007	79,662	.0017
69	24,421	.0007	60,392	.0007	44,396	.0007	70,003	.0007	79,613	.0018
68	22,421	.0008	56,682	.0008	40,762	.0008	68,111	.0008	79,540	.0020
1/32	22,088	.0008	56,064	.0008	40,156	.0008	67,796	.0008	79,528	.0020
67	21,590	.0008	54,948	.0008	39,251	.0008	66,725	.0008	78,502	.0021
66	21,033	.0008	53,534	.0008	38,242	.0008	65,008	.0008	76,481	.0022
65	19,921	.0009	50,707	.0009	36,222	.0009	61,574	.0009	72,440	.0024
64	19,365	.0009	49,294	.0009	35,213	.0009	59,857	.0009	70,419	.0026
63	18,808	.0009	47,880	.0009	34,203	.0009	58,140	.0009	68,399	.0027
62	18,252	.0010	46,467	.0010	33,193	.0010	56,422	.0010	66,378	.0028
61	17,696	.0010	45,053	.0010	32,184	.0010	54,705	.0010	64,358	.0029

QUALITY TECH TOOL

SERIES MD135, MD136, MD137

Micro/Miniature Twist Drills for Small Hole Drilling of both Ferrous and Non-Ferrous and Non-Metallic Materials

Work Group	Hardened Steels		Non-Ferrous							
Work Piece Material	45 Rc A2/52100		Aluminum (<10% Si)		Aluminum (<10% Si)		Plastics		Composites/Fiber Reinforced Materials Circuit Boards	
Speed	180 SFM		460 SFM		330 SFM		560 SFM		660 SFM	
Drill Diameter	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev
60	17,266	.0010	43,960	.0010	31,402	.0010	53,378	.0010	62,796	.0031
59	16,910	.0011	43,055	.0011	30,755	.0011	52,280	.0011	61,504	.0032
58	16,555	.0011	42,149	.0011	30,108	.0011	51,182	.0011	60,211	.0033
57	16,199	.0011	41,244	.0011	29,461	.0011	50,083	.0011	58,919	.0034
56	14,955	.0013	38,076	.0013	27,196	.0013	46,239	.0013	54,396	.0037
3/64	14,812	.0013	37,713	.0013	26,937	.0013	45,800	.0013	53,879	.0038
55	13,330	.0014	33,941	.0014	24,239	.0014	41,218	.0014	48,488	.0043
54	12,620	.0015	32,133	.0015	22,947	.0015	39,021	.0015	45,904	.0046
53	11,585	.0015	29,498	.0015	21,063	.0015	35,817	.0015	42,136	.0050
1/16	11,079	.0015	28,203	.0015	20,140	.0015	34,248	.0015	40,289	.0050
52	10,910	.0015	27,771	.0015	19,832	.0015	33,724	.0015	39,673	.0050
51	10,320	.0015	26,259	.0015	18,754	.0015	31,893	.0015	37,518	.0050
50	9,860	.0015	25,084	.0015	17,916	.0015	30,468	.0015	35,842	.0050
49	9,479	.0015	24,115	.0015	17,224	.0015	29,291	.0015	34,458	.0050
48	9,098	.0015	23,145	.0015	16,532	.0015	28,115	.0015	33,074	.0050
5/64	8,831	.0015	22,467	.0015	16,048	.0015	27,291	.0015	32,105	.0050
47	8,781	.0015	22,338	.0015	15,955	.0015	27,134	.0015	31,921	.0050
46	8,525	.0015	21,693	.0015	15,496	.0015	26,349	.0015	30,997	.0050
45	8,425	.0015	21,442	.0015	15,317	.0015	26,043	.0015	30,638	.0050
44	8,027	.0015	20,438	.0015	14,602	.0015	24,820	.0015	29,199	.0050
43	7,737	.0015	19,706	.0015	14,080	.0015	23,928	.0015	28,150	.0050
42	7,385	.0015	18,801	.0015	13,431	.0015	22,831	.0015	26,856	.0050
3/32	7,362	.0015	18,740	.0015	13,387	.0015	22,758	.0015	26,770	.0050
41	7,190	.0015	18,298	.0015	13,070	.0015	22,221	.0015	26,137	.0050
40	7,033	.0015	17,896	.0015	12,781	.0015	21,734	.0015	25,562	.0050
39	6,930	.0015	17,633	.0015	12,594	.0015	21,415	.0015	25,188	.0050
38	6,800	.0015	17,304	.0015	12,361	.0015	21,015	.0015	24,718	.0050
37	6,638	.0015	16,892	.0015	12,069	.0015	20,514	.0015	24,132	.0050
36	6,475	.0015	16,481	.0015	11,777	.0015	20,014	.0015	23,545	.0050
7/64	6,299	.0015	16,035	.0000	11,458	.0000	19,471	.0015	22,908	.0050
35	6,267	.0015	15,952	.0015	11,399	.0015	19,371	.0015	22,790	.0050
34	6,213	.0015	15,815	.0015	11,301	.0015	19,205	.0015	22,594	.0050
33	6,105	.0015	15,541	.0015	11,104	.0015	18,871	.0015	22,202	.0050
32	5,944	.0015	15,129	.0015	10,808	.0015	18,372	.0015	21,614	.0050
31	5,819	.0015	14,812	.0015	10,580	.0015	17,986	.0015	21,160	.0050
1/8	5,790	.0015	14,738	.0000	10,527	.0015	17,896	.0015	21,054	.0050

SERIES DR200

Straight Flute Drills

Work Material	Aluminum		Steels						Austenitic Stainless		Precipitation Hardened Stainless Steel	
	Aircraft Grade (6061, 7075)		Low Carbon Steel		Alloy Steel (up to 35 Rc) 4140		Alloy Steel (36-45 Rc) 4140		304/316		17-4 PH	
Cutting Speed	180 SFM		148 SFM		98 SFM		131 SFM		66 SFM		82 SFM	
Drill Diameter	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev
3/64	15,294	.0003	12,513	.0003	8,341	.0003	11,122	.0003	5,560	.0003	6,953	.0003
1/16	11,169	.0003	9,555	.0003	6,370	.0003	8,495	.0003	4,245	.0003	5,310	.0003
5/64	8,851	.0006	9,557	.0003	6,370	.0006	8,493	.0006	4,247	.0006	5,310	.0006
3/32	7,647	.0011	7,736	.0006	5,156	.0011	6,873	.0011	3,438	.0011	4,298	.0011
7/64	6,488	.0015	5,840	.0011	3,892	.0014	5,187	.0014	2,596	.0014	3,244	.0014
1/8	5,585	.0018	4,571	.0015	3,046	.0018	4,060	.0018	2,032	.0018	2,539	.0018
9/64	5,005	.0021	4,097	.0018	2,730	.0020	3,639	.0020	1,822	.0020	2,275	.0020
5/32	4,426	.0023	3,622	.0021	2,415	.0020	3,218	.0020	1,612	.0020	2,011	.0020
11/64	4,060	.0026	3,439	.0023	2,564	.0020	2,953	.0020	2,992	.0020	2,544	.0020
3/16	3,713	.0035	3,280	.0026	2,752	.0031	2,701	.0031	4,508	.0031	3,145	.0031
13/64	3,505	.0044	3,134	.0035	2,713	.0043	2,550	.0043	4,755	.0043	3,201	.0043
7/32	3,505	.0047	3,007	.0044	2,334	.0046	2,550	.0046	3,112	.0046	2,443	.0046
15/64	3,505	.0040	2,880	.0047	1,955	.0036	2,550	.0036	1,469	.0036	1,685	.0036
1/4	3,275	.0034	2,712	.0040	1,889	.0026	2,383	.0026	1,644	.0026	1,699	.0026
17/64	3,058	.0039	2,561	.0034	1,849	.0033	2,225	.0033	1,906	.0033	1,757	.0033
9/32	2,753	.0045	2,365	.0039	1,841	.0039	2,004	.0039	2,482	.0039	1,935	.0039
19/64	2,492	.0054	2,191	.0045	1,818	.0051	1,814	.0051	2,900	.0051	2,053	.0051
5/16	2,231	.0061	2,017	.0054	1,794	.0060	1,625	.0060	3,319	.0060	2,171	.0060
21/64	2,190	.0069	1,957	.0061	1,691	.0068	1,595	.0068	2,952	.0068	1,990	.0068
11/32	2,190	.0066	1,917	.0069	1,572	.0064	1,595	.0064	2,438	.0064	1,753	.0064
23/64	2,190	.0061	1,877	.0066	1,454	.0057	1,595	.0057	1,924	.0057	1,516	.0057
3/8	2,190	.0056	1,838	.0061	1,336	.0050	1,595	.0050	1,410	.0050	1,279	.0050
25/64	2,190	.0051	1,798	.0056	1,218	.0043	1,595	.0043	896	.0043	1,042	.0043
13/32	2,074	.0046	1,695	.0051	1,131	.0036	1,510	.0036	753	.0036	942	.0036
27/64	1,929	.0047	1,577	.0046	1,052	.0039	1,404	.0039	700	.0039	877	.0039
7/16	1,784	.0050	1,459	.0047	973	.0044	1,297	.0044	648	.0044	811	.0044
29/64	1,639	.0053	1,341	.0050	893	.0049	1,191	.0049	595	.0049	746	.0049
15/32	1,494	.0056	1,223	.0053	814	.0054	1,085	.0054	542	.0054	680	.0054
31/64	1,494	.0059	1,223	.0056	814	.0059	1,085	.0059	542	.0059	680	.0059
1/2	1,494	.0059	1,223	.0059	814	.0059	1,085	.0059	542	.0059	680	.0059

QUALITY TECH TOOL

SERIES DR200

Straight Flute Drills

Work Material	Special Alloys				Hardened Steels		Non-Ferrous					
	Titanium 6AL-4V		High Temp Alloys Inconel, Hastelloy Waspelloy		>45Rc A2/52100		Plastic		Kevlar/Graphite		Glass/Ceramic	
Cutting Speed	82 SFM		82 SFM		66 SFM		295 SFM		377 SFM		82 SFM	
Drill Diameter	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev
3/64	6,953	.0003	6,953	.0003	5,560	.0007	19,110	.0003	31,975	.0003	6,953	.0007
1/16	5,310	.0003	5,310	.0003	4,245	.0007	19,110	.0003	31,975	.0003	5,310	.0007
5/64	5,310	.0006	5,310	.0006	4,247	.0009	19,110	.0006	31,975	.0006	5,310	.0009
3/32	4,298	.0011	4,298	.0011	3,438	.0008	15,467	.0011	19,765	.0011	4,298	.0008
7/64	3,244	.0014	3,244	.0014	2,596	.0008	11,675	.0014	14,919	.0014	3,244	.0008
1/8	2,539	.0018	2,539	.0018	2,032	.0009	9,137	.0018	11,675	.0018	2,539	.0009
9/64	2,275	.0020	2,275	.0020	1,822	.0010	8,188	.0020	11,675	.0020	2,275	.0010
5/32	2,011	.0020	2,011	.0020	1,612	.0009	7,240	.0020	9,250	.0020	2,011	.0009
11/64	2,544	.0020	4,058	.0020	3,807	.0009	7,660	.0020	7,691	.0020	3,379	.0009
3/16	3,145	.0031	6,302	.0022	6,208	.0015	8,198	.0039	6,101	.0028	4,888	.0012
13/64	3,201	.0043	6,681	.0024	6,630	.0021	8,076	.0039	5,497	.0028	5,121	.0012
7/32	2,443	.0046	4,280	.0025	4,102	.0023	6,971	.0039	6,360	.0028	3,457	.0012
15/64	1,685	.0036	1,879	.0025	1,574	.0016	5,866	.0039	7,223	.0028	1,792	.0012
1/4	1,699	.0026	2,152	.0025	1,888	.0010	5,664	.0039	6,607	.0028	1,949	.0012
17/64	1,757	.0033	2,551	.0027	2,333	.0014	5,539	.0039	5,975	.0028	2,196	.0012
9/32	1,935	.0039	3,416	.0028	3,279	.0017	5,503	.0039	4,977	.0028	2,753	.0012
19/64	2,053	.0051	4,048	.0031	3,975	.0024	5,423	.0039	4,163	.0028	3,155	.0012
5/16	2,171	.0060	4,680	.0033	4,670	.0029	5,343	.0039	3,348	.0028	3,557	.0012
21/64	1,990	.0068	4,147	.0035	4,114	.0034	5,038	.0039	3,447	.0028	3,181	.0012
11/32	1,753	.0064	3,396	.0035	3,323	.0031	4,692	.0039	3,717	.0028	2,660	.0012
23/64	1,516	.0057	2,645	.0035	2,532	.0028	4,346	.0039	3,987	.0028	2,139	.0012
3/8	1,279	.0050	1,894	.0035	1,741	.0024	3,999	.0039	4,257	.0028	1,618	.0012
25/64	1,042	.0043	1,143	.0035	951	.0020	3,653	.0039	4,527	.0028	1,098	.0012
13/32	942	.0036	942	.0035	753	.0016	3,395	.0039	4,336	.0028	942	.0012
27/64	877	.0039	877	.0039	700	.0016	3,157	.0039	4,033	.0028	877	.0012
7/16	811	.0044	811	.0044	648	.0017	2,920	.0039	3,729	.0028	811	.0012
29/64	746	.0049	746	.0049	595	.0018	2,683	.0039	3,425	.0028	746	.0012
15/32	680	.0054	680	.0054	542	.0018	2,446	.0039	3,122	.0028	680	.0012
31/64	680	.0059	680	.0059	542	.0019	2,446	.0039	3,122	.0028	680	.0012
1/2	680	.0059	680	.0059	542	.0019	2,446	.0039	3,122	.0028	680	.0012

SERIES DR215

Slow Spiral Drills

Work Material		Steels						Austenitic Stainless		Precipitation Hardened Stainless Steel	
		Low Carbon Steel		Alloy Steel (up to 35 Rc) 4140		Alloy Steel (36-45 Rc) 4140		304/316		17-4 PH	
Cutting Speed		180 SFM		148 SFM		115 SFM		148 SFM		66 SFM	
Drill Diameter	Dec. Equiv.	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev
3/64	.0469	15,294	.0014	12,513	.0014	9,732	.0014	12,513	.0014	5,560	.0003
1/16	.0625	11,169	.0020	9,555	.0020	7,430	.0020	9,555	.0020	4,245	.0006
5/64	.0781	8,851	.0020	9,557	.0020	7,432	.0020	9,557	.0020	4,247	.0011
3/32	.0938	7,647	.0024	7,736	.0024	6,015	.0024	7,736	.0024	3,438	.0014
7/64	.1094	6,488	.0028	5,840	.0028	4,540	.0028	5,840	.0028	2,596	.0018
1/8	.1250	5,585	.0032	4,571	.0032	3,552	.0032	4,571	.0032	2,032	.0020
9/64	.1406	5,005	.0036	4,097	.0036	3,183	.0036	4,097	.0036	1,822	.0020
5/32	.1563	4,426	.0040	3,622	.0040	2,814	.0040	3,622	.0040	1,612	.0020
11/64	.1719	4,060	.0044	3,322	.0044	2,582	.0044	3,322	.0044	1,478	.0022
3/16	.1875	3,713	.0047	3,036	.0047	2,362	.0047	3,036	.0047	1,351	.0024
13/64	.2031	3,412	.0051	2,789	.0051	2,171	.0051	2,789	.0051	1,241	.0026
7/32	.2188	3,180	.0055	2,601	.0055	2,024	.0055	2,601	.0055	1,155	.0028
15/64	.2344	2,947	.0059	2,412	.0059	1,877	.0059	2,412	.0059	1,070	.0030
1/4	.2500	2,792	.0062	2,285	.0062	1,779	.0062	2,285	.0062	1,014	.0031
17/64	.2656	2,657	.0064	2,174	.0064	1,693	.0064	2,174	.0064	965	.0032
9/32	.2813	2,503	.0066	2,047	.0066	1,594	.0066	2,047	.0066	908	.0033
19/64	.2969	2,358	.0068	1,928	.0068	1,502	.0068	1,928	.0068	856	.0034
5/16	.3125	2,213	.0070	1,809	.0070	1,410	.0070	1,809	.0070	803	.0035
21/64	.3281	2,116	.0072	1,731	.0072	1,348	.0072	1,731	.0072	768	.0036
11/32	.3438	2,029	.0074	1,660	.0074	1,293	.0074	1,660	.0074	737	.0037
23/64	.3594	1,942	.0076	1,590	.0076	1,237	.0076	1,590	.0076	705	.0038
3/8	.3750	1,855	.0078	1,519	.0078	1,182	.0078	1,519	.0078	673	.0039
25/64	.3906	1,767	.0080	1,449	.0080	1,126	.0080	1,449	.0080	641	.0040
13/32	.4063	1,704	.0083	1,397	.0083	1,086	.0083	1,397	.0083	618	.0043
27/64	.4219	1,646	.0087	1,349	.0087	1,049	.0087	1,349	.0087	597	.0047
7/16	.4375	1,589	.0091	1,302	.0091	1,012	.0091	1,302	.0091	577	.0051
29/64	.4531	1,531	.0095	1,254	.0095	975	.0095	1,254	.0095	556	.0055
15/32	.4688	1,474	.0099	1,206	.0099	939	.0099	1,206	.0099	535	.0059
31/64	.4844	1,650	.0099	1,405	.0099	1,110	.0099	1,305	.0099	641	.0059
1/2	.5000	1,899	.0099	1,681	.0099	1,347	.0099	1,450	.0099	786	.0059

SERIES DR215

Slow Spiral Drills

Work Material	Cast Irons				Special Alloys				Hardened Steels		Non-Ferrous	
	Gray Cast Iron A48 Class 20/G4000		Ductile Cast Iron A536/60-40-18		Titanium 6AL-4V		High Temp Alloys Inconel, Hastelloy Waspelloy		>45Rc A2/52100		Plastic	
Cutting Speed	180 SFM		180 SFM		82 SFM		66 SFM		50 SFM		295 SFM	
Drill Diameter	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev
3/64	15,294	.0014	15,294	.0014	6,953	.0010	5,560	.0006	4,172	.0001	25,022	.0001
1/16	11,169	.0020	11,169	.0020	5,310	.0006	4,245	.0006	3,185	.0001	19,110	.0001
5/64	8,851	.0020	8,851	.0020	5,310	.0011	4,247	.0011	3,187	.0001	19,110	.0001
3/32	7,647	.0024	7,647	.0024	4,298	.0014	3,438	.0014	2,580	.0001	15,467	.0001
7/64	6,488	.0028	6,488	.0028	3,244	.0018	2,596	.0018	1,948	.0001	11,675	.0001
1/8	5,585	.0032	5,585	.0032	2,539	.0020	2,032	.0020	1,525	.0001	9,137	.0001
9/64	5,005	.0036	5,005	.0036	2,275	.0020	1,822	.0020	1,366	.0001	8,188	.0001
5/32	4,426	.0040	4,426	.0040	2,011	.0020	1,612	.0020	1,208	.0001	7,240	.0001
11/64	4,060	.0044	4,060	.0044	1,846	.0022	1,478	.0022	1,107	.0001	6,642	.0001
3/16	3,713	.0047	3,713	.0047	1,689	.0024	1,351	.0024	1,012	.0001	6,075	.0001
13/64	3,412	.0051	3,412	.0051	1,552	.0026	1,241	.0026	930	.0001	5,583	.0001
7/32	3,180	.0055	3,180	.0055	1,445	.0028	1,155	.0028	866	.0001	5,204	.0001
15/64	2,947	.0059	2,947	.0059	1,338	.0030	1,070	.0030	803	.0001	4,825	.0001
1/4	2,792	.0062	2,792	.0062	1,267	.0031	1,014	.0031	760	.0001	4,571	.0001
17/64	2,657	.0064	2,657	.0064	1,206	.0032	965	.0032	723	.0001	4,350	.0001
9/32	2,503	.0066	2,503	.0066	1,136	.0033	908	.0033	681	.0001	4,097	.0001
19/64	2,358	.0068	2,358	.0068	1,071	.0034	856	.0034	641	.0001	3,859	.0001
5/16	2,213	.0070	2,213	.0070	1,005	.0035	803	.0035	601	.0001	3,622	.0001
21/64	2,116	.0072	2,116	.0072	962	.0036	768	.0036	576	.0001	3,465	.0001
11/32	2,029	.0074	2,029	.0074	922	.0037	737	.0037	553	.0001	3,322	.0001
23/64	1,942	.0076	1,942	.0076	882	.0038	705	.0038	530	.0001	3,179	.0001
3/8	1,855	.0078	1,855	.0078	843	.0039	673	.0039	507	.0001	3,036	.0001
25/64	1,767	.0080	1,767	.0080	803	.0040	641	.0040	484	.0001	2,893	.0001
13/32	1,704	.0083	1,704	.0083	774	.0043	618	.0043	467	.0001	2,789	.0001
27/64	1,646	.0087	1,646	.0087	748	.0047	597	.0047	451	.0001	2,695	.0001
7/16	1,589	.0091	1,589	.0091	723	.0051	577	.0051	436	.0001	2,601	.0001
29/64	1,531	.0095	1,531	.0095	697	.0055	556	.0055	420	.0001	2,507	.0001
15/32	1,474	.0099	1,474	.0099	671	.0059	535	.0059	404	.0001	2,412	.0001
31/64	1,477	.0099	1,461	.0099	759	.0059	691	.0059	492	.0001	2,346	.0001
1/2	1,500	.0099	1,462	.0099	883	.0059	903	.0059	612	.0001	2,289	.0001

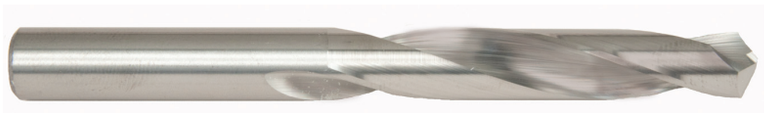
When drilling deep holes, the recommended speeds and feeds should be reduced proportionately based on the hole depth. To the right are guidelines for reducing the speeds and feeds.

Hole Depth Diameter	Reduce Spindle Speed	Reduce Infeed Rate
3 x Dia.	10%	10%
4 x Dia.	20%	10%
5 x Dia.	30%	20%
6 x Dia.	35%	20%
8 x Dia.	40%	20%

SERIES DR220

Twist Drills

Work Material		Steels				Austenitic Stainless		Cast Iron				Non-Ferrous					
		Low Carbon Steels		Alloy Steels (up to 35 Rc) 4140		304/316		Gray Cast Iron A48 Class 20/G4000		Ductile Cast Iron A536/60-40-18		Plastic		Kevlar Graphite		Aluminum	
Cutting Speed		180 SFM		165 SFM		148 SFM		130 SFM		279 SFM		180 SFM		394 SFM		394 SFM	
Drill Diameter	Dec. Equiv.	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev
3/64	.0469	15,294	.0014	13,901	.0014	12,513	.0014	11,122	.0014	23,634	.0014	15,294	.0014	33,363	.0003	33,363	.0003
1/16	.0625	11,169	.0020	10,615	.0020	9,555	.0020	8,495	.0020	17,260	.0020	11,169	.0020	25,480	.0006	25,480	.0006
5/64	.0781	8,851	.0020	10,617	.0020	9,557	.0020	8,493	.0020	13,676	.0020	8,851	.0020	25,480	.0011	25,480	.0011
3/32	.0938	7,647	.0024	8,594	.0024	7,736	.0024	6,873	.0024	11,816	.0024	7,647	.0024	20,623	.0014	20,623	.0014
7/64	.1094	6,488	.0028	6,488	.0028	5,840	.0028	5,187	.0028	10,026	.0028	6,488	.0028	15,567	.0018	15,567	.0018
1/8	.1250	5,585	.0032	5,077	.0032	4,571	.0032	4,060	.0032	8,630	.0032	5,585	.0032	12,183	.0020	12,183	.0020
9/64	.1406	5,005	.0036	4,549	.0036	4,097	.0036	3,639	.0036	7,735	.0036	5,005	.0036	10,919	.0020	10,919	.0020
5/32	.1563	4,426	.0040	4,022	.0040	3,622	.0040	3,218	.0040	6,840	.0040	4,426	.0040	9,655	.0020	9,655	.0020
11/64	.1719	4,060	.0044	3,689	.0044	3,322	.0044	2,953	.0044	6,275	.0044	4,060	.0044	8,857	.0022	8,857	.0022
3/16	.1875	3,713	.0047	3,374	.0047	3,036	.0047	2,701	.0047	5,737	.0047	3,713	.0047	8,099	.0024	8,099	.0024
13/64	.2031	3,412	.0051	3,101	.0051	2,789	.0051	2,482	.0051	5,271	.0051	3,412	.0051	7,442	.0026	7,442	.0026
7/32	.2188	3,180	.0055	2,890	.0055	2,601	.0055	2,314	.0055	4,912	.0055	3,180	.0055	6,936	.0028	6,936	.0028
15/64	.2344	2,947	.0059	2,680	.0059	2,412	.0059	2,145	.0059	4,552	.0059	2,947	.0059	6,430	.0030	6,430	.0030
1/4	.2500	2,792	.0062	2,539	.0062	2,285	.0062	2,032	.0062	4,313	.0062	2,792	.0062	6,092	.0031	6,092	.0031
17/64	.2656	2,657	.0064	2,416	.0064	2,174	.0064	1,934	.0064	4,105	.0064	2,657	.0064	5,797	.0032	5,797	.0032
9/32	.2813	2,503	.0066	2,275	.0066	2,047	.0066	1,822	.0066	3,867	.0066	2,503	.0066	5,461	.0033	5,461	.0033
19/64	.2969	2,358	.0068	2,143	.0068	1,928	.0068	1,717	.0068	3,643	.0068	2,358	.0068	5,145	.0034	5,145	.0034
5/16	.3125	2,213	.0070	2,011	.0070	1,809	.0070	1,612	.0070	3,420	.0070	2,213	.0070	4,830	.0035	4,830	.0035
21/64	.3281	2,116	.0072	1,924	.0072	1,731	.0072	1,542	.0072	3,271	.0072	2,116	.0072	4,620	.0036	4,620	.0036
11/32	.3438	2,029	.0074	1,846	.0074	1,660	.0074	1,478	.0074	3,136	.0074	2,029	.0074	4,429	.0037	4,429	.0037
23/64	.3594	1,942	.0076	1,767	.0076	1,590	.0076	1,415	.0076	3,001	.0076	1,942	.0076	4,239	.0038	4,239	.0038
3/8	.3750	1,855	.0078	1,689	.0078	1,519	.0078	1,351	.0078	2,867	.0078	1,855	.0078	4,048	.0039	4,048	.0039
25/64	.3906	1,767	.0080	1,610	.0080	1,449	.0080	1,288	.0080	2,732	.0080	1,767	.0080	3,858	.0040	3,858	.0040
13/32	.4063	1,704	.0083	1,552	.0083	1,397	.0083	1,241	.0083	2,633	.0083	1,704	.0083	3,719	.0043	3,719	.0043
27/64	.4219	1,646	.0087	1,498	.0087	1,349	.0087	1,198	.0087	2,544	.0087	1,646	.0087	3,593	.0047	3,593	.0047
7/16	.4375	1,589	.0091	1,445	.0091	1,302	.0091	1,155	.0091	2,455	.0091	1,589	.0091	3,467	.0051	3,467	.0051
29/64	.4531	1,531	.0095	1,391	.0095	1,254	.0095	1,113	.0095	2,365	.0095	1,531	.0095	3,341	.0055	3,341	.0055
15/32	.4688	1,474	.0099	1,338	.0099	1,206	.0099	1,070	.0099	2,276	.0099	1,474	.0099	3,215	.0059	3,215	.0059
31/64	.4844	1,650	.0103	1,525	.0103	1,355	.0103	1,180	.0103	2,235	.0103	1,477	.0103	3,055	.0063	3,088	.0063
1/2	.5000	1,899	.0108	1,788	.0108	1,565	.0108	1,338	.0108	2,209	.0108	1,500	.0108	2,885	.0068	2,962	.0068



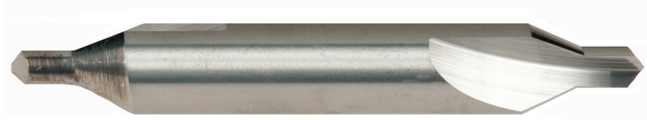
QUALITY TECH TOOL

SERIES SD221-90, SD221-120, DR235

90° and 120° Spotting Drills, Combination Drill Countersink

Material Group		Steels						Stainless Steels			
Work Piece Material		Low Carbon Steels 1018		Alloy Steels (up to 35 Rc) 4140		Alloy Steels (36-45 Rc) 4140		Austenitic 304/316		Ph Stainless 17-4 PH	
Speed		180 SFM		165 SFM		150 SFM		130 SFM		65 SFM	
Drill Dia.	Dec. Equiv.	Speed RPM	Feed IPR	Speed RPM	Feed IPR	Speed RPM	Feed IPR	Speed RPM	Feed IPR	Speed RPM	Feed IPR
3/64	.0469	13,990	.0007	12,720	.0007	11,450	.0007	10,180	.0007	5,090	.0007
5/64	.0781	8,750	.0010	7,950	.0010	7,160	.0010	6,360	.0010	3,180	.0010
7/64	.1094	7,000	.0012	6,360	.0012	5,730	.0012	5,090	.0012	2,540	.0012
1/8	.1250	5,550	.0015	5,050	.0015	4,540	.0015	4,040	.0015	2,020	.0015
3/16	.1875	3,500	.0025	3,180	.0025	2,860	.0025	2,540	.0025	1,270	.0025
7/32	.2188	2,920	.0030	2,650	.0030	2,390	.0030	2,120	.0030	1,060	.0030
1/4	.2500	2,780	.0031	2,520	.0031	2,270	.0031	2,020	.0031	1,010	.0031
5/16	.3125	2,190	.0035	1,990	.0035	1,790	.0035	1,590	.0035	800	.0035
1/2	.5000	1,460	.0048	1,330	.0048	1,190	.0048	1,060	.0048	530	.0048

Material Group		Cast Iron				Special Alloys				Hardened Steel	
Work Piece Material		Gray Cast Irons A48 Class 20/G4000		Ductile Cast Iron A536/60-40-18		Titanium 6AL-4V		High Temp Alloys Inconel/Hastelloy Waspelloy Nickel Based		45 Rc A2/52100	
Speed		280 SFM		180 SFM		82 SFM		33 SFM		50 SFM	
Drill Dia.	Dec. Equiv.	Speed RPM	Feed IPR	Speed RPM	Feed IPR	Speed RPM	Feed IPR	Speed RPM	Feed IPR	Speed RPM	Feed IPR
3/64	.0469	21,630	.0007	13,990	.0007	6,360	.0007	2,540	.0007	3,820	.0007
5/64	.0781	13,520	.0010	8,750	.0010	3,980	.0010	1,590	.0010	2,390	.0010
7/64	.1094	10,810	.0012	7,000	.0012	3,180	.0012	1,270	.0012	1,910	.0012
1/8	.1250	8,580	.0015	5,550	.0015	2,520	.0015	1,010	.0015	1,510	.0015
3/16	.1875	5,410	.0025	3,500	.0025	1,590	.0025	640	.0025	950	.0025
7/32	.2188	4,510	.0030	2,920	.0030	1,330	.0030	530	.0030	800	.0030
1/4	.2500	4,290	.0031	2,780	.0031	1,260	.0031	500	.0031	760	.0031
5/16	.3125	3,380	.0035	2,190	.0035	990	.0035	400	.0035	600	.0035
1/2	.5000	2,250	.0048	1,460	.0048	660	.0048	270	.0048	400	.0048



Note: When determining proper speed and feed for Series DR235, base the diameter on the cutting diameter “D”, not the shank diameter.

SERIES RM300

4-6 Flute, Straight Flute Reamers

Hardness				Up to 30 HRC		Up to 30 HRC		30 to 38 HRC		38 to 45 HRC							
Work Material		Cast Iron		Mild Steel Carbon Steel		Alloy Tool Steel Tool Steel		Hardened Steel Prehardened Steel		Hardened Steel Prehardened Steel		Titanium Alloy Annealed		Inconel, Titanium Alloy Solution Treated and Aged		Aluminum	
Cutting Speed		200 SFM		215 SFM		175 SFM		145 SFM		110 SFM		82 SFM		48 SFM		420 SFM	
Mill Dia.	Dec. Equiv.	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev	Speed RPM	Feed in/rev
1/32	.0313	24,470	.0008	26,300	.0010	21,410	.0010	17,740	.0010	13,460	.0008	10,030	.0010	5,870	.0008	51,380	.0008
3/64	.0469	19,370	.0010	20,830	.0012	16,950	.0012	14,050	.0012	10,660	.0010	7,940	.0012	4,650	.0010	40,690	.0010
1/16	.0625	12,210	.0015	13,130	.0018	10,690	.0018	8,850	.0018	6,720	.0015	5,010	.0018	2,930	.0015	25,650	.0015
5/64	.0781	8,140	.0025	8,750	.0030	7,120	.0030	5,900	.0030	4,480	.0025	3,340	.0030	1,950	.0025	17,090	.0025
3/32	.0938	9,160	.0025	9,845	.0024	8,015	.0024	6,640	.0024	5,040	.0019	3,755	.0024	2,200	.0019	19,325	.0019
7/64	.1094	6,110	.0035	6,560	.0029	5,340	.0029	4,430	.0029	3,360	.0023	2,500	.0029	1,470	.0023	13,000	.0023
1/8	.1250	7,025	.0037	7,548	.0032	6,148	.0032	5,090	.0032	3,865	.0026	2,878	.0032	1,685	.0026	14,793	.0026
9/64	.1406	5,958	.0042	6,399	.0036	5,214	.0036	4,315	.0036	3,278	.0029	2,439	.0036	1,428	.0029	12,526	.0029
5/32	.1563	4,890	.0048	5,250	.0040	4,280	.0040	3,540	.0040	2,690	.0032	2,000	.0040	1,170	.0032	10,260	.0032
11/64	.1719	4,070	.0060	4,380	.0050	3,560	.0050	2,950	.0050	2,240	.0040	1,670	.0050	980	.0040	8,550	.0040
3/16	.1875	4,190	.0059	4,500	.0051	3,665	.0049	3,035	.0049	2,305	.0041	1,715	.0051	1,005	.0041	8,795	.0043
13/64	.2031	3,840	.0065	4,125	.0057	3,358	.0054	2,783	.0054	2,113	.0045	1,573	.0057	923	.0045	8,063	.0049
7/32	.2188	3,490	.0070	3,750	.0062	3,050	.0058	2,530	.0058	1,920	.0049	1,430	.0062	840	.0049	7,330	.0054
15/64	.2344	3,050	.0075	3,280	.0066	2,670	.0062	2,210	.0062	1,680	.0053	1,250	.0066	730	.0053	6,410	.0057
1/4	.2500	3,100	.0078	3,335	.0069	2,715	.0064	2,250	.0064	1,705	.0055	1,270	.0069	745	.0055	6,515	.0060
17/64	.2656	2,905	.0081	3,128	.0072	2,548	.0067	2,110	.0067	1,598	.0057	1,190	.0072	698	.0057	6,108	.0062
9/32	.2813	2,710	.0085	2,920	.0075	2,380	.0070	1,970	.0070	1,490	.0060	1,110	.0075	650	.0060	5,700	.0065
19/64	.2969	2,575	.0085	2,775	.0075	2,260	.0070	1,870	.0070	1,415	.0060	1,055	.0075	620	.0060	5,415	.0065
5/16	.3125	2,440	.0085	2,630	.0075	2,140	.0070	1,770	.0070	1,340	.0060	1,000	.0075	590	.0060	5,130	.0065
21/64	.3281	2,330	.0090	2,510	.0080	2,040	.0069	1,690	.0069	1,280	.0063	955	.0078	560	.0063	4,895	.0067
11/32	.3438	2,220	.0095	2,390	.0084	1,940	.0068	1,610	.0068	1,220	.0065	910	.0080	530	.0065	4,660	.0068
23/64	.3594	2,040	.0105	2,190	.0092	1,780	.0076	1,480	.0076	1,120	.0071	830	.0088	490	.0071	4,270	.0076
3/8	.3750	2,050	.0105	2,205	.0093	1,790	.0076	1,485	.0076	1,125	.0072	840	.0086	490	.0072	4,305	.0076
25/64	.3906	1,965	.0110	2,113	.0097	1,715	.0079	1,423	.0079	1,078	.0075	805	.0089	470	.0075	4,128	.0079
13/32	.4063	1,880	.0115	2,020	.0101	1,640	.0083	1,360	.0083	1,030	.0078	770	.0092	450	.0078	3,950	.0083
27/64	.4219	1,810	.0120	1,950	.0106	1,585	.0087	1,310	.0087	995	.0082	745	.0099	435	.0082	3,805	.0087
7/16	.4375	1,740	.0125	1,880	.0110	1,530	.0090	1,260	.0090	960	.0085	720	.0105	420	.0085	3,660	.0090
29/64	.4531	1,635	.0130	1,760	.0120	1,435	.0101	1,185	.0101	900	.0094	675	.0109	395	.0089	3,435	.0101
15/32	.4688	1,530	.0135	1,640	.0130	1,340	.0112	1,110	.0112	840	.0102	630	.0112	370	.0093	3,210	.0112
31/64	.4844	1,635	.0130	1,760	.0120	1,435	.0101	1,185	.0101	900	.0094	675	.0109	395	.0089	3,435	.0101
1/2	.5000	1,740	.0125	1,880	.0110	1,530	.0090	1,260	.0090	960	.0085	720	.0105	420	.0085	3,660	.0090

SERIES CS700, CS701, CS706

Countersinks

Hardness												.3% - .5% C		1.2% C	
Material Group		Non-Ferrous Materials				Irons				Non-Metallics		Steels		Tool Steels	
Work Material		Aluminum, Aluminum Alloys		Brass, Bronze		Cast Irons		Chilled and Malleable Irons		Plastics, Bakelite		Mild Steels		Tool Steels	
Cutting Speed		300 SFM	500 SFM	150 SFM	250 SFM	125 SFM	225 SFM	35 SFM	150 SFM	250 SFM	400 SFM	80 SFM	170 SFM	60 SFM	100 SFM
Recommend Series		CS700, 06		CS700, 06		CS700, 01, 06		CS701, 06		CS700, 06		CS700, 01, 06		CS701, 06	
Mill Diameter	Decimal Equivalent	Low Speed	High Speed	Low Speed	High Speed	Low Speed	High Speed	Low Speed	High Speed	Low Speed	High Speed	Low Speed	High Speed	Low Speed	High Speed
1/8	.1250	9,167	15,279	4,584	7,639	3,820	6,875	1,070	4,584	7,639	12,223	2,445	5,195	1,833	3,056
3/16	.1875	6,112	10,186	3,056	5,093	2,546	4,584	713	3,056	5,093	8,149	1,630	3,463	1,222	2,037
1/4	.2500	4,584	7,639	2,292	3,820	1,910	3,438	535	2,292	3,820	6,112	1,222	2,597	917	1,528
3/8	.3750	3,056	5,093	1,528	2,546	1,273	2,292	357	1,528	2,546	4,074	815	1,732	611	1,019
1/2	.5000	2,292	3,820	1,146	1,910	955	1,719	267	1,146	1,910	3,056	611	1,299	458	764
5/8	.6250	1,833	3,056	917	1,528	764	1,375	214	917	1,528	2,445	489	1,039	367	611
3/4	.7500	1,528	2,546	764	1,273	637	1,146	178	764	1,273	2,037	407	866	306	509
1	1.0000	1,146	1,910	573	955	477	859	134	573	955	1,528	306	649	229	382

Above charts are primarily for machine tool applications, and does not reflect infeed rates because of the variety of machines that are used with countersinking applications. CS700 Series Single Flute Countersinks should be used on non-ferrous, low hardness steels, non-metallic applications, and used with a lower in feed rate as it is a single flute countersink. If excessive chatter or jumping of the single flute countersink is encountered, we recommend the CS706 Chatterless Countersink be used. In many cases, the use of countersinks is done in off-hand grinding applications with portable air grinders, which run at much higher speeds than those shown. The CS701 Series Countersink is typical of a Bur type construction. We recommend that several steps be taken to reach full depth with retractions to clear out chips.

SERIES CS700, CS701, CS706

Countersinks

Hardness		300BHN to 400 BHN		35Rc - 50 Rc									
Work Material		Alloy Steels		High Tensile		Steels Stainless Steels				Titanium Alloys		Nickel Based Alloys Inconel Alloys	
Cutting Speed		30 SFM	50 SFM	25 SFM	60 SFM	80 SFM	125 SFM	50 SFM	75 SFM	60 SFM	90 SFM	25 SFM	35 SFM
Recommend Series		CS701, CS706		CS701, CS706		CS701, CS706		CS701, CS706		CS701, CS706		CS701, CS706	
Mill Diameter	Decimal Equivalent	Low Speed	High Speed	Low Speed	High Speed	Low Speed	High Speed	Low Speed	High Speed	Low Speed	High Speed	Low Speed	High Speed
1/8	.1250	917	1,528	764	1,833	2,445	3,820	1,528	2,292	1,833	2,750	764	1,070
3/16	.1875	611	1,019	509	1,222	1,630	2,546	1,019	1,528	1,222	1,833	509	713
1/4	.2500	458	764	382	917	1,222	1,910	764	1,146	917	1,375	382	535
3/8	.3750	306	509	255	611	815	1,273	509	764	611	917	255	357
1/2	.5000	229	382	191	458	611	955	382	573	458	688	191	267
5/8	.6250	183	306	153	367	489	764	306	458	367	550	153	214
3/4	.7500	153	255	127	306	407	637	255	382	306	458	127	178
1	1.0000	115	191	95	229	306	477	191	286	229	344	95	134

Above charts are primarily for machine tool applications, and does not reflect infeed rates because of the variety of machines that are used with countersinking applications. CS700 Series Single Flute Countersinks should be used on non-ferrous, low hardness steels, non-metallic applications, and used with a lower in feed rate as it is a single flute countersink. If excessive chatter or jumping of the single flute countersink is encountered, we recommend the CS706 Chatterless Countersink be used. In many cases, the use of countersinks is done in off-hand grinding applications with portable air grinders, which run at much higher speeds than those shown. The CS701 Series Countersink is typical of a Bur type construction. We recommend that several steps be taken to reach full depth with retractions to clear out chips.

SERIES EM400, EM401

Slot Milling

Hardness	≤ 88 HRB		> 88HRB, ≤26 HRC		≤26 HRC		≤ 26 HRC		≤ 91 HRB		≤ 32HRC		≤ 32HRC	
Work Material	Steels								Cast Iron					
	Carbon Steel				Alloy Steel		Tool Steel		Gray		Ductile		Malleable	
Cutting Speed	302 SFM		250 SFM		220 SFM		206 SFM		295 SFM		150 SFM		128 SFM	
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/mi
1/4	4,667	8.9	3,805	6.0	3,394	5.4	3,193	5.0	4,562	10.6	2,333	3.7	1,979	3.1
5/16	3,698	7.5	3,011	5.7	2,688	5.1	2,526	4.7	3,617	10.2	1,849	3.5	1,566	3.0
3/8	3,103	6.7	2,530	5.4	2,256	4.8	2,119	4.6	3,031	9.9	1,548	3.4	1,314	2.8
1/2	2,333	9.5	1,903	7.8	1,701	7.0	1,597	6.5	2,285	14.2	1,166	4.7	986	4.1
5/8	1,849	9.1	1,506	7.5	1,344	6.7	1,263	6.3	1,809	13.4	920	4.5	788	3.9
3/4	1,548	8.8	1,261	7.2	1,132	6.5	1,059	6.0	1,516	12.9	773	4.4	658	3.8
1	1,152	14.0	935	11.2	837	10.1	787	9.5	1,132	20.3	581	7.0	492	6.0

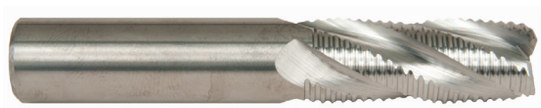
Hardness	≤ 88 HRB		> 88HRB, ≤26 HRC		≤ 26 HRC		≤ 26 HRC		≤ 91 HRB		≤ 32HRC	
Work Material	Stainless Steel						Special Alloy				Aluminum	
	300 Series		400 Series		PH Steels		Titanium Alloys		Hi Temp Alloys		6061, 7075	
Cutting Speed	170 SFM		260 SFM		150 SFM		115 SFM		43 SFM		825 SFM	
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/4	2,639	4.3	4,006	6.4	2,333	3.7	1,778	3.5	660	1.0	12,727	49.8
5/16	2,092	3.9	3,173	5.9	1,849	3.5	1,405	3.4	525	1.0	10,084	47.3
3/8	1,750	3.8	2,660	5.8	1,548	3.4	1,177	3.2	436	1.0	8,455	45.7
1/2	1,319	5.4	1,999	8.2	1,166	4.7	890	4.7	326	1.4	6,360	66.1
5/8	1,041	5.1	1,586	7.9	920	4.5	707	4.3	263	1.4	5,042	62.5
3/4	878	5.0	1,334	7.6	773	4.4	593	4.3	222	1.2	4,228	60.3
1	650	7.8	994	12.0	581	7.0	443	6.8	167	1.9	3,140	94.2

QUALITY TECH TOOL

SERIES EM400, EM401

Medium Profile Milling

Hardness	≤ 88 HRB		> 88HRB, ≤26 HRC		≤26 HRC		≤ 26 HRC		≤ 91 HRB		≤ 32HRC		≤ 32HRC	
Work Material	Steels								Cast Iron					
	Carbon Steel				Alloy Steel		Tool Steel		Gray		Ductile		Malleable	
Cutting Speed	415 SFM		340 SFM		300 SFM		285 SFM		400 SFM		90 SFM		170 SFM	
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/mi
1/4	6,388	24.9	5,269	16.2	4,667	14.2	4,409	13.4	6,283	29.2	1,415	4.3	2,639	8.0
5/16	5,062	23.7	4,173	15.4	3,698	13.6	3,496	12.8	4,981	27.8	1,122	4.1	2,092	7.7
3/8	4,248	22.9	3,505	14.9	3,103	13.3	2,934	12.5	4,175	26.9	942	4.0	1,750	7.5
1/2	3,193	33.2	2,639	22.0	2,333	19.4	2,209	18.3	3,145	38.9	709	5.8	1,319	10.9
5/8	2,526	31.4	2,092	20.7	1,849	18.4	1,748	17.4	2,486	36.9	566	5.5	1,041	10.3
3/4	2,119	30.2	1,750	19.9	1,548	17.7	1,463	16.7	2,086	35.8	476	5.4	878	9.9
1	1,575	47.3	1,299	31.4	1,152	27.7	1,093	26.4	1,555	55.8	354	8.5	650	15.7



Hardness	≤ 88 HRB		> 88HRB, ≤26 HRC		≤ 26 HRC		≤ 26 HRC		≤ 91 HRB		≤ 32HRC	
Work Material	Stainless Steel						Special Alloy				Aluminum	
	300 Series		400 Series		PH Steels		Titanium Alloys		Hi Temp Alloys		6061, 7075	
Cutting Speed	230 SFM		350 SFM		110 SFM		165 SFM		58 SFM		1,120 SFM	
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/4	3,547	10.9	5,422	16.6	3,241	9.9	2,535	9.9	862	2.7	17,386	135.8
5/16	2,809	10.5	4,294	15.8	2,567	9.5	2,011	9.5	687	2.6	13,782	128.4
3/8	2,361	10.1	3,602	15.4	2,159	9.3	1,685	9.1	573	2.4	11,558	123.8
1/2	1,778	14.8	2,716	22.6	1,625	13.4	1,271	13.2	431	3.5	8,693	180.0
5/8	1,405	14.0	2,152	21.3	1,283	12.8	1,001	12.4	343	3.4	6,891	171.2
3/4	1,177	13.4	1,802	20.5	1,079	12.3	845	12.1	287	3.2	5,775	165.6
1	876	21.1	1,339	32.2	797	19.2	630	19.0	217	5.2	4,292	257.5

QUALITY TECH TOOL

SERIES EM400, EM401

Heavy Profile Milling

Hardness	≤ 88 HRB		> 88HRB, ≤26 HRC		≤26 HRC		≤ 26 HRC		≤ 91 HRB		≤ 32HRC		≤ 32HRC	
Work Material	Steels								Cast Iron					
	Carbon Steel				Alloy Steel		Tool Steel		Gray		Ductile		Malleable	
Cutting Speed	374 SFM		310 SFM		270 SFM		260 SFM		365 SFM		82 SFM		157 SFM	
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/mi
1/4	5,776	17.0	4,820	11.1	4,208	9.8	4,006	9.3	5,679	20.0	1,271	2.9	2,430	5.7
5/16	4,577	16.2	3,819	10.6	3,334	9.5	3,173	8.9	4,497	18.9	1,001	2.8	1,930	5.5
3/8	3,844	15.5	3,201	10.5	2,797	9.1	2,660	8.7	3,771	18.3	845	2.8	1,620	5.4
1/2	2,889	22.6	2,410	15.0	2,104	13.1	1,999	12.5	2,841	26.3	632	3.9	1,214	7.6
5/8	2,293	21.3	1,910	14.2	1,667	12.4	1,586	11.8	2,253	25.2	505	3.7	960	7.1
3/4	1,919	20.5	1,600	13.7	1,398	12.0	1,334	11.4	1,887	24.3	424	3.6	805	6.9
1	1,427	32.0	1,191	21.7	1,043	19.0	994	18.0	1,398	37.6	315	5.8	600	10.9

Hardness	≤ 88 HRB		> 88HRB, ≤26 HRC		≤ 26 HRC		≤ 26 HRC		≤ 91 HRB		≤ 32HRC	
Work Material	Stainless Steel						Special Alloy				Aluminum	
	300 Series		400 Series		PH Steels		Titanium Alloys		Hi Temp Alloys		6061, 7075	
Cutting Speed	210 SFM		320 SFM		195 SFM		145 SFM		53 SFM		1,010 SFM	
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/4	3,241	7.6	4,964	11.5	2,994	7.0	2,229	6.6	813	1.9	15,616	91.4
5/16	2,567	7.3	3,940	11.0	2,374	6.7	1,768	6.3	647	1.8	12,378	86.2
3/8	2,159	7.0	3,305	10.7	1,992	6.5	1,483	6.0	541	1.8	10,382	83.0
1/2	1,625	10.1	2,486	15.4	1,492	9.1	1,118	8.7	403	2.5	7,803	120.8
5/8	1,283	9.5	1,970	14.6	1,182	8.7	879	8.1	323	2.4	6,184	115.0
3/4	1,079	9.3	1,653	14.1	995	8.5	740	7.9	267	2.2	5,190	111.5
1	797	14.5	1,230	22.5	738	13.4	551	12.4	197	3.5	3,858	174.0

QUALITY TECH TOOL

SERIES EM402, EM403, EM462, EM482

Slot Milling

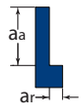
Hardness							Up to 30 HRC		30 to 40 HRC		40 to 45 HRC	
Work Material	Aluminum		Cast Iron		Mid Carbon Steel Mild Steel		Prehardened Steel Die & Alloy Steel		Prehardened Steel Die & Alloy Steel		Hardened Steel	
Cutting Speed	~330 SFM		100-150 SFM		100-130 SFM		65-100 SFM		65-82 SFM		~50 SFM	
Depth of Cut												
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/64	89,753	8.6	29,801	4.9	27,139	1.6	19,632	0.8	18,418	0.6	14,137	0.3
1/32	44,504	9.1	17,747	5.4	15,515	2.7	8,915	1.1	8,892	0.7	6,680	0.4
3/64	30,330	9.1	13,513	6.1	12,073	3.5	7,831	1.4	6,861	0.7	4,609	0.4
1/16	22,319	9.8	9,988	6.1	8,927	4.0	6,861	1.7	5,308	0.9	3,366	0.5
5/64	17,779	13.4	7,893	6.5	7,006	4.3	5,552	2.6	4,434	1.3	2,668	0.7
3/32	15,587	13.6	6,826	6.7	6,072	4.3	4,745	2.9	3,813	1.3	2,305	0.7
7/64	13,492	13.6	5,802	6.8	5,179	4.3	3,959	3.3	3,202	1.3	1,955	0.7
1/8	11,704	13.6	4,999	6.9	4,468	4.3	3,366	3.5	2,745	1.3	1,683	0.7
9/64	10,307	13.6	4,475	6.9	3,988	4.3	3,017	3.5	2,483	1.3	1,508	0.7
5/32	8,910	13.6	3,951	6.9	3,508	4.3	2,668	3.5	2,221	1.3	1,334	0.7
11/64	8,116	13.6	3,607	6.9	3,207	4.3	2,479	3.5	2,039	1.3	1,221	0.7
3/16	7,374	13.6	3,277	6.9	2,921	4.3	2,305	3.5	1,865	1.3	1,114	0.7
13/64	6,755	13.6	3,004	7.2	2,683	4.3	2,130	3.5	1,707	1.3	1,023	0.7
7/32	6,318	13.6	2,813	7.9	2,516	4.3	1,955	3.5	1,576	1.3	955	0.7
15/64	5,882	13.6	2,623	8.6	2,350	4.3	1,781	3.5	1,445	1.3	888	0.7
1/4	5,580	13.6	2,492	8.9	2,230	4.3	1,683	3.5	1,372	1.3	842	0.7
17/64	5,313	13.6	2,374	9.2	2,123	4.3	1,603	3.5	1,310	1.3	801	0.7
9/32	5,012	13.6	2,245	9.6	2,004	4.3	1,508	3.5	1,241	1.3	754	0.7
19/64	4,728	13.6	2,122	9.9	1,891	4.3	1,421	3.5	1,176	1.3	711	0.7
5/16	4,445	13.6	1,999	10.2	1,778	4.3	1,334	3.5	1,110	1.3	667	0.7
21/64	4,245	13.6	1,906	10.2	1,696	4.3	1,283	3.5	1,063	1.3	638	0.7
11/32	4,060	13.6	1,819	10.2	1,621	4.3	1,240	3.5	1,020	1.3	612	0.7
23/64	3,875	13.6	1,732	10.2	1,546	4.3	1,196	3.5	976	1.3	587	0.7
3/8	3,691	13.6	1,645	10.2	1,470	4.3	1,152	3.5	932	1.3	561	0.7
25/64	3,506	13.6	1,557	10.2	1,395	4.3	1,109	3.5	889	1.3	535	0.7
13/32	3,382	13.6	1,502	10.2	1,347	4.3	1,068	3.5	862	1.3	516	0.7
27/64	3,273	13.6	1,454	10.2	1,305	4.3	1,028	3.5	841	1.3	498	0.7
7/16	3,164	13.6	1,407	10.2	1,263	4.3	989	3.5	819	1.3	480	0.7
29/64	3,055	13.6	1,359	10.2	1,222	4.3	949	3.5	797	1.3	462	0.7
15/32	2,946	13.6	1,311	10.2	1,180	4.3	909	3.5	775	1.3	444	0.7
31/64	2,865	13.6	1,277	10.2	1,148	4.3	885	3.5	753	1.3	432	0.7
1/2	2,794	13.6	1,246	10.2	1,119	4.3	865	3.5	732	1.4	421	0.7
9/16	2,508	13.6	1,123	10.2	1,004	4.3	786	3.6	644	1.5	377	0.6
5/8	2,223	13.6	1,000	10.2	889	4.3	706	3.7	557	1.6	333	0.5
11/16	2,039	13.6	913	10.2	811	4.3	645	3.7	510	1.6	304	0.5
3/4	1,865	13.6	830	10.2	735	4.3	586	3.7	466	1.6	277	0.5
7/8	1,591	13.6	709	10.2	628	4.3	501	3.7	400	1.6	238	0.4
15/16	1,470	13.6	658	10.2	583	4.3	466	3.7	371	1.6	222	0.4
1	1,358	13.4	610	10.1	541	4.3	433	3.6	345	1.6	207	0.3

	a_a
D<1/32	0.25D
3/64≤D<5/64	0.50D
5/64<D	1D

QUALITY TECH TOOL

SERIES EM402, EM403, EM462, EM482

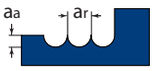
Side Milling

Hardness							Up to 30 HRC		30 to 40 HRC		40 to 45 HRC	
Work Material	Aluminum		Cast Iron		Mid Carbon Steel Mild Steel		Prehardened Steel Die & Alloy Steel		Prehardened Steel Die & Alloy Steel		Hardened Steel	
Cutting Speed	~330 SFM		100-150 SFM		100-130 SFM		65-100 SFM		65-82 SFM		~50 SFM	
Depth of Cut	a_a=1.5D a_r=0.1D											
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/64	89,753	8.2	29,801	4.9	28,738	2.4	22,705	1.4	22,705	0.7	14,137	0.4
1/32	44,504	8.2	17,747	5.4	15,583	2.6	11,138	1.5	11,138	0.8	6,680	0.4
3/64	30,330	8.3	13,513	7.6	10,632	3.7	7,668	2.6	7,710	1.5	4,609	0.6
1/16	22,319	8.3	9,988	8.2	7,865	3.7	5,580	2.6	5,671	1.5	3,366	0.6
5/64	17,779	8.3	7,893	10.7	6,119	3.7	4,445	2.6	4,448	1.5	2,668	0.6
3/32	16,132	8.4	6,826	11.7	5,631	4.8	4,213	3.6	4,045	1.7	2,305	0.8
7/64	14,604	8.4	5,802	12.5	5,194	5.9	4,019	4.6	3,676	1.9	1,955	1.0
1/8	13,173	8.4	4,999	13.0	4,768	6.7	3,737	5.2	3,318	2.0	1,683	1.1
9/64	11,863	8.4	4,475	13.0	4,355	7.1	3,344	5.2	2,972	2.0	1,508	1.1
5/32	10,553	8.4	3,951	13.0	3,943	7.6	2,951	5.2	2,627	2.0	1,334	1.1
11/64	9,646	8.4	3,607	13.0	3,607	8.0	2,704	5.3	2,414	2.0	1,221	1.1
3/16	8,773	8.5	3,277	13.0	3,277	8.4	2,470	5.4	2,211	2.0	1,114	1.1
13/64	8,040	8.5	3,004	13.0	3,004	8.7	2,257	5.4	2,037	2.0	1,023	1.1
7/32	7,516	8.5	2,813	13.0	2,813	8.7	2,074	5.4	1,906	2.0	955	1.1
15/64	6,992	8.5	2,623	13.0	2,623	8.7	1,892	5.4	1,775	2.0	888	1.1
1/4	6,633	8.5	2,492	13.0	2,492	8.7	1,797	5.4	1,680	2.0	842	1.1
17/64	6,315	8.5	2,374	13.0	2,374	8.7	1,718	5.4	1,595	2.0	801	1.1
9/32	5,958	8.5	2,245	13.0	2,245	8.7	1,630	5.4	1,497	2.0	754	1.1
19/64	5,620	8.5	2,122	13.0	2,122	8.7	1,546	5.4	1,406	2.0	711	1.1
5/16	5,283	8.5	1,999	13.0	1,999	8.7	1,463	5.4	1,314	2.0	667	1.1
21/64	5,046	8.5	1,906	13.1	1,906	8.8	1,403	5.4	1,258	2.0	638	1.1
11/32	4,828	8.6	1,819	13.2	1,819	9.1	1,348	5.4	1,209	2.0	612	1.1
23/64	4,610	8.6	1,732	13.4	1,732	9.3	1,292	5.4	1,159	2.0	587	1.1
3/8	4,391	8.6	1,645	13.5	1,645	9.5	1,237	5.4	1,109	2.0	561	1.1
25/64	4,173	8.6	1,557	13.6	1,557	9.7	1,181	5.4	1,060	2.0	535	1.1
13/32	4,025	8.6	1,502	13.7	1,502	9.8	1,133	5.4	1,023	2.0	516	1.1
27/64	3,894	8.6	1,454	13.7	1,454	9.8	1,088	5.4	989	2.0	498	1.1
7/16	3,763	8.6	1,407	13.7	1,407	9.8	1,042	5.4	955	2.0	480	1.1
29/64	3,632	8.6	1,359	13.7	1,359	9.8	996	5.4	922	2.0	462	1.1
15/32	3,501	8.6	1,311	13.7	1,311	9.8	951	5.4	888	2.0	444	1.1
31/64	3,404	8.6	1,277	13.9	1,277	9.8	925	5.5	863	2.0	432	1.1
1/2	3,318	8.6	1,246	14.1	1,246	9.9	905	5.5	842	2.0	421	1.1
9/16	2,972	8.6	1,123	15.1	1,123	10.4	826	5.8	754	2.0	377	1.1
5/8	2,627	8.7	1,000	16.2	1,000	10.8	746	6.0	667	2.0	333	1.1
11/16	2,414	8.7	913	16.3	913	10.8	682	6.2	609	2.0	304	1.1
3/4	2,211	8.7	830	16.3	830	10.8	618	6.4	553	2.0	277	1.1
7/8	1,894	8.7	709	16.3	709	10.8	531	6.3	471	1.8	238	1.0
15/16	1,755	8.7	658	16.3	658	10.8	496	6.2	436	1.6	222	0.9
1	1,624	8.6	610	16.0	610	10.7	463	6.0	404	1.5	207	0.9

QUALITY TECH TOOL

SERIES EM402BN, EM403BN, EM462BN, EM482BN

Profile Milling

Hardness							Up to 30 HRC		30 to 40 HRC		40 to 45 HRC	
Work Material	Aluminum		Cast Iron		Mid Carbon Steel Mild Steel		Prehardened Steel Die & Alloy Steel		Prehardened Steel Die & Alloy Steel		Hardened Steel	
Cutting Speed	~330 SFM		100-150 SFM		100-130 SFM		65-100 SFM		65-82 SFM		~50 SFM	
Depth of Cut	a_a=0.3D a_r=0.7D											
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/32	44,504	16.2	17,747	10.3	15,583	5.1	8,983	2.3	8,983	1.3	6,680	0.7
3/64	31,845	8.2	10,968	3.9	10,968	3.5	7,961	2.0	6,369	1.0	7,961	2.0
1/16	24,860	8.2	8,610	3.9	8,610	3.5	6,215	2.0	4,972	1.0	6,215	2.0
5/64	17,875	8.2	6,253	3.9	6,253	3.5	4,469	2.0	3,575	1.0	4,469	2.0
3/32	15,084	8.2	5,363	4.1	5,363	3.6	3,813	2.0	3,059	1.1	3,813	2.1
7/64	12,464	8.2	4,534	4.2	4,534	3.8	3,202	2.1	2,578	1.2	3,202	2.3
1/8	10,615	8.2	3,897	4.3	3,897	3.9	2,745	2.2	2,214	1.3	2,745	2.4
9/64	9,742	8.2	3,504	4.3	3,504	3.9	2,483	2.2	1,995	1.3	2,483	2.4
5/32	8,869	8.2	3,111	4.3	3,111	3.9	2,221	2.2	1,777	1.3	2,221	2.4
11/64	8,157	8.2	2,839	4.3	2,839	3.9	2,039	2.2	1,639	1.3	2,039	2.4
3/16	7,458	8.2	2,577	4.3	2,577	3.9	1,865	2.2	1,508	1.3	1,865	2.4
13/64	6,847	8.2	2,367	4.3	2,367	3.9	1,711	2.2	1,377	1.3	1,711	2.4
7/32	6,367	8.2	2,236	4.3	2,236	3.9	1,588	2.2	1,246	1.3	1,588	2.4
15/64	5,887	8.2	2,105	4.3	2,105	3.9	1,465	2.2	1,115	1.3	1,465	2.4
1/4	5,580	8.5	1,994	4.3	1,994	3.9	1,389	2.2	1,062	1.3	1,389	2.4
17/64	5,314	8.7	1,892	4.3	1,892	3.9	1,324	2.2	1,019	1.3	1,324	2.4
9/32	5,012	9.0	1,775	4.3	1,775	3.9	1,250	2.2	974	1.3	1,250	2.4
19/64	4,728	9.2	1,666	4.3	1,666	3.9	1,180	2.2	931	1.3	1,180	2.4
5/16	4,445	9.5	1,557	4.3	1,557	3.9	1,111	2.2	887	1.3	1,111	2.4
21/64	4,253	9.5	1,485	4.3	1,485	3.9	1,063	2.2	850	1.3	1,063	2.4
11/32	4,078	9.5	1,419	4.3	1,419	3.9	1,020	2.2	814	1.3	1,020	2.4
23/64	3,904	9.5	1,354	4.3	1,354	3.9	976	2.2	778	1.3	976	2.4
3/8	3,729	9.5	1,288	4.3	1,288	3.9	932	2.2	743	1.3	932	2.4
25/64	3,554	9.5	1,223	4.3	1,223	3.9	889	2.2	707	1.3	889	2.4
13/32	3,415	9.5	1,180	4.3	1,180	3.9	856	2.2	681	1.3	856	2.4
27/64	3,284	9.5	1,142	4.3	1,142	3.9	826	2.2	657	1.3	826	2.4
7/16	3,153	9.5	1,104	4.3	1,104	3.9	797	2.2	633	1.3	797	2.4
29/64	3,022	9.5	1,067	4.3	1,067	3.9	767	2.2	609	1.3	767	2.4
15/32	2,891	9.5	1,029	4.3	1,029	3.9	737	2.2	586	1.3	737	2.4
31/64	2,810	9.5	1,001	4.3	1,001	3.9	716	2.2	569	1.3	716	2.4
1/2	2,745	9.5	976	4.3	976	3.9	699	2.2	556	1.3	699	2.4
9/16	2,483	9.5	877	4.3	877	3.9	627	2.2	500	1.3	627	2.4
5/8	2,221	9.5	778	4.3	778	3.9	556	2.2	444	1.3	556	2.4
11/16	2,039	9.5	715	4.3	715	3.9	510	2.2	407	1.3	510	2.4
3/4	1,865	9.5	656	4.3	656	3.9	466	2.2	371	1.3	466	2.4
7/8	1,564	9.5	567	4.3	567	3.9	400	2.2	319	1.3	400	2.4
15/16	1,425	9.5	529	4.3	529	3.9	371	2.2	297	1.3	371	2.4
1	1,299	9.4	492	4.3	492	3.8	345	2.1	276	1.3	345	2.4

QUALITY TECH TOOL

SERIES EM404, EM447, EM461, EM464, EM484

Side Milling

Hardness							Up to 30 HRC		30 to 40 HRC		40 to 45 HRC	
Work Material	Aluminum		Cast Iron		Mid Carbon Steel Mild Steel		Prehardened Steel Die & Alloy Steel		Prehardened Steel Die & Alloy Steel		Hardened Steel	
Cutting Speed	~330 SFM		100-150 SFM		100-130 SFM		65-100 SFM		65-82 SFM		~50 SFM	
Depth of Cut	a_a=1.5D a_r=0.1D											
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/32	44,504	31.0	17,747	10.3	15,583	5.0	11,138	2.9	11,138	1.5	6,680	0.8
3/64	30,330	27.3	13,513	10.6	10,632	5.2	7,668	3.7	7,710	2.2	4,609	0.9
1/16	22,319	27.3	9,988	11.4	7,865	5.2	5,580	3.7	5,671	2.2	3,366	0.9
5/64	17,779	27.3	7,893	15.0	6,119	5.2	4,445	3.7	4,448	2.2	2,668	0.9
3/32	16,132	27.3	6,826	16.3	5,631	6.7	4,213	5.1	4,045	2.4	2,305	1.1
7/64	14,604	27.3	5,802	17.5	5,194	8.2	4,019	6.5	3,676	2.6	1,955	1.4
1/8	13,173	27.6	4,999	18.2	4,768	9.4	3,737	7.4	3,318	2.7	1,683	1.5
9/64	11,863	28.2	4,475	18.2	4,355	10.0	3,344	7.4	2,972	2.7	1,508	1.5
5/32	10,553	28.8	3,951	18.2	3,943	10.6	2,951	7.4	2,627	2.7	1,334	1.5
11/64	9,646	28.8	3,607	18.2	3,607	11.2	2,704	7.4	2,414	2.7	1,221	1.5
3/16	8,773	28.8	3,277	18.2	3,277	11.8	2,470	7.4	2,211	2.7	1,114	1.5
13/64	8,040	28.8	3,004	18.2	3,004	12.1	2,257	7.4	2,037	2.7	1,023	1.5
7/32	7,516	28.8	2,813	18.2	2,813	12.1	2,074	7.4	1,906	2.7	955	1.5
15/64	6,992	28.8	2,623	18.2	2,623	12.1	1,892	7.4	1,775	2.7	888	1.5
1/4	6,633	29.1	2,492	18.2	2,492	12.1	1,797	7.4	1,680	2.7	842	1.5
17/64	6,315	29.3	2,374	18.2	2,374	12.2	1,718	7.4	1,595	2.7	801	1.5
9/32	5,958	29.7	2,245	18.2	2,245	12.1	1,630	7.4	1,497	2.7	754	1.5
19/64	5,620	30.0	2,122	18.2	2,122	12.1	1,546	7.4	1,406	2.7	711	1.5
5/16	5,283	30.3	1,999	18.2	1,999	12.1	1,463	7.4	1,314	2.7	667	1.5
21/64	5,046	30.3	1,906	18.3	1,906	12.3	1,403	7.4	1,258	2.7	638	1.5
11/32	4,828	30.3	1,819	18.5	1,819	12.6	1,348	7.4	1,209	2.7	612	1.5
23/64	4,610	30.3	1,732	18.7	1,732	12.9	1,292	7.4	1,159	2.7	587	1.5
3/8	4,391	30.3	1,645	18.8	1,645	13.1	1,237	7.4	1,109	2.7	561	1.5
25/64	4,173	30.3	1,557	19.0	1,557	13.4	1,181	7.4	1,060	2.7	535	1.5
13/32	4,025	30.9	1,502	19.1	1,502	13.4	1,133	7.4	1,023	2.7	516	1.5
27/64	3,894	31.6	1,454	19.1	1,454	13.4	1,088	7.4	989	2.7	498	1.5
7/16	3,763	32.2	1,407	19.1	1,407	13.4	1,042	7.4	955	2.7	480	1.5
29/64	3,632	32.9	1,359	19.1	1,359	13.4	996	7.4	922	2.7	462	1.5
15/32	3,501	33.6	1,311	19.1	1,311	13.4	951	7.4	888	2.7	444	1.5
31/64	3,404	33.8	1,277	19.3	1,277	13.6	925	7.5	863	2.7	432	1.5
1/2	3,318	33.8	1,246	19.7	1,246	13.7	905	7.6	842	2.7	421	1.5
9/16	2,972	33.8	1,123	21.2	1,123	14.4	826	8.1	754	2.7	377	1.5
5/8	2,627	33.8	1,000	22.6	1,000	15.1	746	8.6	667	2.7	333	1.5
11/16	2,414	33.8	913	22.8	913	15.2	682	8.8	609	2.7	304	1.5
3/4	2,211	33.8	830	22.8	830	15.2	618	9.0	553	2.7	277	1.5
7/8	1,894	32.2	709	22.8	709	15.2	531	8.9	471	2.5	238	1.4
15/16	1,755	31.1	658	22.8	658	15.2	496	8.8	436	2.3	222	1.3
1	1,624	29.8	610	22.4	610	14.9	463	8.5	404	2.1	207	1.2

QUALITY TECH TOOL

SERIES EM404, EM447, EM461, EM464, EM484

Side Milling

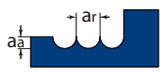
	aa
D<1/32	0.2D
1/32≤D≤5/64	0.3D
5/64<D	0.5D

Hardness							Up to 30 HRC		30 to 40 HRC		40 to 45 HRC	
Work Material	Aluminum		Cast Iron		Mid Carbon Steel Mild Steel		Prehardened Steel Die & Alloy Steel		Prehardened Steel Die & Alloy Steel		Hardened Steel	
Cutting Speed	~330 SFM		100-150 SFM		100-130 SFM		65-100 SFM		65-82 SFM		~50 SFM	
Depth of Cut												
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/32	44,504	16.2	17,747	10.3	15,583	5.1	8,983	2.3	8,983	1.3	6,680	0.7
3/64	30,330	12.1	13,513	8.7	12,073	4.9	7,831	1.9	6,861	1.0	4,609	0.5
1/16	22,319	13.2	9,988	8.7	8,927	5.5	6,861	2.4	5,308	1.3	3,366	0.7
5/64	17,779	18.0	7,893	9.1	7,006	6.0	5,552	3.7	4,434	1.8	2,668	0.9
3/32	15,587	18.2	6,826	9.3	6,072	6.1	4,745	4.1	3,813	1.8	2,305	0.9
7/64	13,492	18.2	5,802	9.6	5,179	6.1	3,959	4.5	3,202	1.8	1,955	0.9
1/8	11,704	18.2	4,999	9.8	4,468	6.1	3,366	4.8	2,745	1.8	1,683	0.9
9/64	10,307	18.2	4,475	9.8	3,988	6.1	3,017	4.8	2,483	1.8	1,508	0.9
5/32	8,910	18.2	3,951	9.8	3,508	6.1	2,668	4.8	2,221	1.8	1,334	0.9
11/64	8,116	18.2	3,607	9.8	3,207	6.1	2,479	4.8	2,039	1.8	1,221	0.9
3/16	7,374	18.2	3,277	9.8	2,921	6.1	2,305	4.8	1,865	1.8	1,114	0.9
13/64	6,755	18.2	3,004	10.1	2,683	6.1	2,130	4.8	1,707	1.8	1,023	0.9
7/32	6,318	18.2	2,813	11.1	2,516	6.1	1,955	4.8	1,576	1.8	955	0.9
15/64	5,882	18.2	2,623	12.0	2,350	6.1	1,781	4.8	1,445	1.8	888	0.9
1/4	5,580	18.2	2,492	12.5	2,230	6.1	1,683	4.8	1,372	1.8	842	0.9
17/64	5,313	18.2	2,374	12.9	2,123	6.1	1,603	4.8	1,310	1.8	801	0.9
9/32	5,012	18.2	2,245	13.4	2,004	6.1	1,508	4.8	1,241	1.8	754	0.9
19/64	4,728	18.2	2,122	13.8	1,891	6.1	1,421	4.8	1,176	1.8	711	0.9
5/16	4,445	18.2	1,999	14.2	1,778	6.1	1,334	4.8	1,110	1.8	667	0.9
21/64	4,245	18.2	1,906	14.3	1,696	6.1	1,283	4.8	1,063	1.8	638	0.9
11/32	4,060	18.2	1,819	14.3	1,621	6.1	1,240	4.8	1,020	1.8	612	0.9
23/64	3,875	18.2	1,732	14.3	1,546	6.1	1,196	4.8	976	1.8	587	0.9
3/8	3,691	18.2	1,645	14.3	1,470	6.1	1,152	4.8	932	1.8	561	0.9
25/64	3,506	18.2	1,557	14.3	1,395	6.1	1,109	4.8	889	1.8	535	0.9
13/32	3,382	18.2	1,502	14.3	1,347	6.1	1,068	4.8	862	1.8	516	0.9
27/64	3,273	18.2	1,454	14.3	1,305	6.1	1,028	4.8	841	1.8	498	0.9
7/16	3,164	18.2	1,407	14.3	1,263	6.1	989	4.8	819	1.8	480	0.9
29/64	3,055	18.2	1,359	14.3	1,222	6.1	949	4.8	797	1.8	462	0.9
15/32	2,946	18.2	1,311	14.3	1,180	6.1	909	4.8	775	1.8	444	0.9
31/64	2,865	18.2	1,277	14.3	1,148	6.1	885	4.8	753	1.8	432	0.9
1/2	2,794	18.2	1,246	14.3	1,119	6.1	865	4.8	732	1.9	421	0.9
9/16	2,508	18.2	1,123	14.3	1,004	6.1	786	5.0	644	2.0	377	0.8
5/8	2,223	18.2	1,000	14.3	889	6.1	706	5.2	557	2.2	333	0.8
11/16	2,039	18.2	913	14.3	811	6.1	645	5.2	510	2.2	304	0.7
3/4	1,865	18.2	830	14.3	735	6.1	586	5.2	466	2.2	277	0.6
7/8	1,591	18.2	709	14.3	628	6.1	501	5.2	400	2.2	238	0.5
15/16	1,470	18.2	658	14.3	583	6.1	466	5.2	371	2.2	222	0.5
1	1,358	17.9	610	14.1	541	6.0	433	5.1	345	2.1	207	0.5

QUALITY TECH TOOL

SERIES EM404BN, EM464BN, EM484BN

Profile Milling

Hardness							Up to 30 HRC		30 to 40 HRC		40 to 45 HRC	
Work Material	Aluminum		Cast Iron		Mid Carbon Steel Mild Steel		Prehardened Steel Die & Alloy Steel		Prehardened Steel Die & Alloy Steel		Hardened Steel	
Cutting Speed	~330 SFM		100-150 SFM		100-130 SFM		65-100 SFM		65-82 SFM		~50 SFM	
Depth of Cut	a_a=0.3D a_r=0.7D											
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/32	44,504	16.2	17,747	10.3	15,583	5.1	8,983	2.3	8,983	1.3	6,680	0.7
3/64	31,845	8.2	10,968	3.9	10,968	3.5	7,961	2.0	6,369	1.0	7,961	2.0
1/16	24,860	8.2	8,610	3.9	8,610	3.5	6,215	2.0	4,972	1.0	6,215	2.0
5/64	17,875	8.2	6,253	3.9	6,253	3.5	4,469	2.0	3,575	1.0	4,469	2.0
3/32	15,084	8.2	5,363	4.1	5,363	3.6	3,813	2.0	3,059	1.1	3,813	2.1
7/64	12,464	8.2	4,534	4.2	4,534	3.8	3,202	2.1	2,578	1.2	3,202	2.3
1/8	10,615	8.2	3,897	4.3	3,897	3.9	2,745	2.2	2,214	1.3	2,745	2.4
9/64	9,742	8.2	3,504	4.3	3,504	3.9	2,483	2.2	1,995	1.3	2,483	2.4
5/32	8,869	8.2	3,111	4.3	3,111	3.9	2,221	2.2	1,777	1.3	2,221	2.4
11/64	8,157	8.2	2,839	4.3	2,839	3.9	2,039	2.2	1,639	1.3	2,039	2.4
3/16	7,458	8.2	2,577	4.3	2,577	3.9	1,865	2.2	1,508	1.3	1,865	2.4
13/64	6,847	8.2	2,367	4.3	2,367	3.9	1,711	2.2	1,377	1.3	1,711	2.4
7/32	6,367	8.2	2,236	4.3	2,236	3.9	1,588	2.2	1,246	1.3	1,588	2.4
15/64	5,887	8.2	2,105	4.3	2,105	3.9	1,465	2.2	1,115	1.3	1,465	2.4
1/4	5,580	8.5	1,994	4.3	1,994	3.9	1,389	2.2	1,062	1.3	1,389	2.4
17/64	5,314	8.7	1,892	4.3	1,892	3.9	1,324	2.2	1,019	1.3	1,324	2.4
9/32	5,012	9.0	1,775	4.3	1,775	3.9	1,250	2.2	974	1.3	1,250	2.4
19/64	4,728	9.2	1,666	4.3	1,666	3.9	1,180	2.2	931	1.3	1,180	2.4
5/16	4,445	9.5	1,557	4.3	1,557	3.9	1,111	2.2	887	1.3	1,111	2.4
21/64	4,253	9.5	1,485	4.3	1,485	3.9	1,063	2.2	850	1.3	1,063	2.4
11/32	4,078	9.5	1,419	4.3	1,419	3.9	1,020	2.2	814	1.3	1,020	2.4
23/64	3,904	9.5	1,354	4.3	1,354	3.9	976	2.2	778	1.3	976	2.4
3/8	3,729	9.5	1,288	4.3	1,288	3.9	932	2.2	743	1.3	932	2.4
25/64	3,554	9.5	1,223	4.3	1,223	3.9	889	2.2	707	1.3	889	2.4
13/32	3,415	9.5	1,180	4.3	1,180	3.9	856	2.2	681	1.3	856	2.4
27/64	3,284	9.5	1,142	4.3	1,142	3.9	826	2.2	657	1.3	826	2.4
7/16	3,153	9.5	1,104	4.3	1,104	3.9	797	2.2	633	1.3	797	2.4
29/64	3,022	9.5	1,067	4.3	1,067	3.9	767	2.2	609	1.3	767	2.4
15/32	2,891	9.5	1,029	4.3	1,029	3.9	737	2.2	586	1.3	737	2.4
31/64	2,810	9.5	1,001	4.3	1,001	3.9	716	2.2	569	1.3	716	2.4
1/2	2,745	9.5	976	4.3	976	3.9	699	2.2	556	1.3	699	2.4
9/16	2,483	9.5	877	4.3	877	3.9	627	2.2	500	1.3	627	2.4
5/8	2,221	9.5	778	4.3	778	3.9	556	2.2	444	1.3	556	2.4
11/16	2,039	9.5	715	4.3	715	3.9	510	2.2	407	1.3	510	2.4
3/4	1,865	9.5	656	4.3	656	3.9	466	2.2	371	1.3	466	2.4
7/8	1,564	9.5	567	4.3	567	3.9	400	2.2	319	1.3	400	2.4
15/16	1,425	9.5	529	4.3	529	3.9	371	2.2	297	1.3	371	2.4
1	1,299	9.4	492	4.3	492	3.8	345	2.1	276	1.3	345	2.4

SERIES EM440

Side Milling

Cutting Type	Side Milling		Slot Milling	
Work Material	Aluminum		Aluminum	
Cutting Speed	606 SFM		606 SFM	
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/8	24,574	37	24,574	18
3/16	16,085	55	16,085	27
1/4	11,319	73	11,319	37
5/16	9,457	92	9,457	46
3/8	9,384	110	9,384	55
1/2	4,674	75	4,674	37
5/8	4,590	81	4,590	41
3/4	3,888	80	3,888	40
1	2,890	80	2,890	40

SERIES EM445

Side Milling

Hardness							Up to 30 HRC		30 to 40 HRC		40 to 45 HRC	
Work Material	Aluminum		Cast Iron		Mid Carbon Steel		Prehardened Steel Die & Alloy Steel		Prehardened Steel Die & Alloy Steel		Hardened Steel	
Cutting Speed	~410 SFM		125-190 SFM		125-160 SFM		80-125 SFM		80-105 SFM		~65 SFM	
Depth of Cut	a_a=1.5D a_r=0.1D											
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/16	27,899	10.4	12,485	10.2	9,831	4.6	6,975	3.2	7,088	1.9	4,208	0.7
3/32	20,165	10.5	8,533	14.6	7,038	6.0	5,266	4.5	5,057	2.1	2,881	1.0
1/8	16,466	10.5	6,249	16.2	5,960	8.4	4,671	6.5	4,147	2.5	2,104	1.4
5/32	13,191	10.5	4,939	16.2	4,928	9.5	3,689	6.5	3,284	2.5	1,667	1.4
3/16	10,966	10.6	4,096	16.2	4,096	10.5	3,088	6.7	2,764	2.5	1,393	1.4
7/32	9,395	10.6	3,516	16.2	3,516	10.8	2,593	6.8	2,383	2.5	1,194	1.4
1/4	8,291	10.6	3,114	16.2	3,114	10.8	2,246	6.8	2,099	2.5	1,052	1.4
9/32	7,447	10.7	2,807	16.2	2,807	10.8	2,037	6.8	1,871	2.5	943	1.4
5/16	6,604	10.7	2,499	16.2	2,499	10.8	1,829	6.8	1,643	2.5	834	1.4
3/8	5,489	10.7	2,056	16.9	2,056	11.9	1,546	6.8	1,387	2.5	701	1.4
7/16	4,704	10.8	1,758	17.1	1,758	12.2	1,303	6.8	1,194	2.5	600	1.4
1/2	4,147	10.8	1,557	17.6	1,557	12.4	1,131	6.9	1,052	2.5	526	1.4
9/16	3,716	10.8	1,403	18.9	1,403	13.0	1,032	7.2	943	2.5	471	1.4
5/8	3,284	10.8	1,250	20.2	1,250	13.5	933	7.6	834	2.5	417	1.4
11/16	3,017	10.8	1,142	20.3	1,142	13.5	852	7.8	761	2.5	381	1.4
3/4	2,764	10.9	1,037	20.3	1,037	13.5	773	8.0	692	2.5	346	1.4
7/8	2,368	10.9	886	20.3	886	13.5	664	7.9	589	2.2	297	1.2
1	2,030	10.8	763	20.0	763	13.3	578	7.5	504	1.9	258	1.1

QUALITY TECH TOOL

SERIES EM445

Slot Milling

Hardness							Up to 30 HRC		30 to 40 HRC		40 to 45 HRC	
Work Material	Aluminum		Cast Iron		Mid Carbon Steel Mild Steel		Prehardened Steel Die & Alloy Steel		Prehardened Steel Die & Alloy Steel		Hardened Steel	
Cutting Speed	100 SFM		30-45 SFM		30-40 SFM		20-30 SFM		20-25 SFM		15 SFM	
Depth of Cut												
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/16	27,899	12.3	12,485	7.7	11,158	5.0	8,577	2.2	6,634	1.2	4,208	0.6
3/32	19,484	17.0	8,533	8.3	7,590	5.4	5,931	3.7	4,766	1.6	2,881	0.9
1/8	14,630	17.0	6,249	8.7	5,585	5.4	4,208	4.3	3,431	1.6	2,104	0.9
5/32	11,138	17.0	4,939	8.7	4,385	5.4	3,334	4.3	2,776	1.6	1,667	0.9
3/16	9,218	17.0	4,096	8.7	3,651	5.4	2,881	4.3	2,331	1.6	1,393	0.9
7/32	7,898	17.0	3,516	9.9	3,145	5.4	2,444	4.3	1,971	1.6	1,194	0.9
1/4	6,975	17.0	3,114	11.2	2,788	5.4	2,104	4.3	1,715	1.6	1,052	0.9
9/32	6,265	17.0	2,807	12.0	2,505	5.4	1,885	4.3	1,552	1.6	943	0.9
5/16	5,556	17.0	2,499	12.7	2,222	5.4	1,667	4.3	1,388	1.6	834	0.9
3/8	4,614	17.0	2,056	12.8	1,838	5.4	1,440	4.3	1,165	1.6	701	0.9
7/16	3,955	17.0	1,758	12.8	1,579	5.4	1,236	4.3	1,024	1.6	600	0.9
1/2	3,493	17.0	1,557	12.8	1,399	5.4	1,081	4.4	914	1.7	526	0.8
9/16	3,135	17.0	1,403	12.8	1,255	5.4	982	4.5	805	1.8	471	0.7
5/8	2,778	17.0	1,250	12.8	1,111	5.4	883	4.6	696	2.0	417	0.6
11/16	2,549	17.0	1,142	12.8	1,013	5.4	806	4.6	637	2.0	381	0.6
3/4	2,331	17.0	1,037	12.8	919	5.4	732	4.6	583	2.0	346	0.6
7/8	1,989	17.0	886	12.8	785	5.4	626	4.6	500	2.0	297	0.5
1	1,698	16.7	763	12.6	677	5.3	541	4.6	431	2.0	258	0.4

	a_a
D<3/32	0.25D
1/8<D	1D

SERIES EM497 *Profile Milling*

Hardness		Tensile Strength Up to 750N/mm2		Up to 30 HRC		30 to 38 HRC		38 to 45 HRC		45 to 55 HRC		55 to 60 HRC	
Work Material	Cast Iron	Mild Steel Carbon Steel		Alloy Steel Tool Steel Ti Alloy Annealed		Hardened Steel Prehardened Steel Ti Alloy Solution Treated & Aged		Hardened Steel Prehardened Steel Stainless Steel Inconel, Ni Based Alloy		Hardened Steel		Hardened Steel	
Cutting Speed	550 SFM	550 SFM		450 SFM		365 SFM		268 SFM		234 SFM		200 SFM	
Depth of Cut	a_a=1.5D a_r=1.5D									a_a=1.5D a_r=1.5D			
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/8	16,593	48.1	16,593	40.5	14,598	33.8	11,709	22.7	8,812	17.0	7,490	12.5	6,518	10.9
3/16	13,915	50.2	13,915	40.5	11,697	33.8	9,361	24.8	7,024	19.4	5,972	14.1	5,196	12.5
1/4	10,405	50.5	10,405	40.8	8,739	33.8	6,961	26.7	5,199	20.0	4,421	14.6	3,851	12.9
5/16	9,063	50.5	9,063	42.1	7,511	33.8	5,956	27.7	4,531	21.0	3,848	15.4	3,352	13.7
3/8	7,292	40.8	7,292	34.8	6,063	28.2	4,840	22.7	3,643	16.7	3,099	12.1	2,697	10.9
7/16	5,741	32.2	5,741	26.9	4,766	22.7	3,801	17.9	2,831	13.0	2,405	9.4	2,092	8.4
1/2	4,658	26.4	4,658	21.2	3,858	18.5	3,066	14.6	2,274	10.6	1,927	7.7	1,677	6.7
9/16	4,040	23.2	4,040	18.4	3,356	15.5	2,675	12.9	1,994	9.5	1,691	6.9	1,471	6.1
5/8	3,423	20.0	3,423	15.6	2,853	12.6	2,283	11.2	1,714	8.4	1,455	6.1	1,266	5.4
3/4	2,843	16.4	2,843	13.1	2,386	11.4	1,928	9.0	1,419	7.3	1,210	5.3	1,049	4.6
1	2,075	12.2	2,075	9.6	1,799	8.2	1,389	6.9	1,054	5.6	895	4.0	778	3.3

QUALITY TECH TOOL

SERIES EM460

Side Milling

Hardness					Up to 35 HRC		35 to 45 HRC		45 to 55 HRC	
Work Material	Aluminum		Mild Carbon Steel Mild Steel		Prehardened Steel Stainless Steel Die & Alloy Steel		Prehardened Steel Stainless Steel Die & Alloy Steel		H ardened Steel	
Cutting Speed	500 SFM		172 SFM		117 SFM		59 SFM		59 SFM	
Depth of Cut	aa=1.5D ar=0.1D						aa=1.5D ar=0.1D			
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/8	15,297	13.2	5,382	6.4	3,592	4.3	2,461	1.8	1,797	0.7
3/16	10,318	19.6	3,596	9.6	2,457	6.7	1,606	3.4	1,230	1.0
1/4	7,744	25.4	2,690	12.4	1,797	7.7	1,187	3.3	895	1.3
5/16	6,165	25.4	2,130	12.4	1,426	7.7	945	3.3	713	1.3
3/8	5,209	27.2	1,752	14.9	1,184	7.7	792	3.3	595	1.3
7/16	4,471	27.8	1,513	16.3	1,014	8.1	677	3.3	509	1.3
1/2	3,921	27.8	1,349	17.0	895	8.4	594	3.3	447	1.3
5/8	3,084	27.8	1,065	18.4	713	8.4	472	3.3	352	1.3
3/4	2,604	27.8	892	18.9	595	9.1	396	3.3	297	1.3
1	1,966	27.3	669	15.8	435	8.2	293	3.3	218	1.3

SERIES EM460

Slot Milling

Hardness			Up to 35 HRC		35 to 45 HRC		45 to 55 HRC	
Work Material	Medium Steel Mild Steel		Prehardened Steel Stainless Steel Die and Alloy Steel		Prehardened Steel Stainless Steel Die and Alloy Steel		Hardened Steel	
Cutting Speed	117 SFM		87 SFM		56 SFM		44 SFM	
Depth of Cut		aa D<1/2 1.5D 1/2≤D 0.1D			aa=0.5D			
Mill Diameter	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
1/8	15,297	13.2	5,382	6.4	3,592	4.3	2,461	1.8
3/16	10,318	19.6	3,596	9.6	2,457	6.7	1,606	3.4
1/4	7,744	25.4	2,690	12.4	1,797	7.7	1,187	3.3
5/16	6,165	25.4	2,130	12.4	1,426	7.7	945	3.3
3/8	5,209	27.2	1,752	14.9	1,184	7.7	792	3.3
7/16	4,471	27.8	1,513	16.3	1,014	8.1	677	3.3
1/2	3,921	27.8	1,349	17.0	895	8.4	594	3.3
5/8	3,084	27.8	1,065	18.4	713	8.4	472	3.3
3/4	2,604	27.8	892	18.9	595	9.1	396	3.3
1	1,966	27.3	669	15.8	435	8.2	293	3.3

SERIES RD500, RD501, RD502, RD503

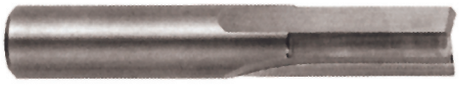
Profile Routing

Work Material		Hardwood		Softwood		Plywood		Aluminum		Plastic	
Cutting Speed		1,550 SFM		1,950 SFM		1,950 SFM		1,150 SFM		1,950 SFM	
Router Diameter	Decimal Equivalent	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
3/32	.0938	63,120	76	79,410	95	79,410	123	46,830	57	79,410	76
1/8	.1250	47,370	76	59,590	95	59,590	123	35,140	57	59,590	76
3/16	.1875	31,580	73	39,730	95	39,730	120	23,430	66	39,730	79
1/4	.2500	23,680	71	29,800	95	29,800	118	17,570	71	29,800	81
5/16	.3125	18,950	76	23,840	95	23,840	123	14,060	66	23,840	80
3/8	.3750	15,790	79	19,860	95	19,860	126	11,710	63	19,860	79
7/16	.4375	13,530	74	17,030	88	17,030	122	10,040	61	17,030	81
1/2	.5000	11,840	71	14,900	83	14,900	118	8,790	59	14,900	83

SERIES RD500, RD502 (RD501 and RD503 Not Recommended for Slotting)

Slot Routing

Work Material		Hardwood		Softwood		Plywood		Aluminum		Plastic	
Cutting Speed		1,550 SFM		1,950 SFM		1,950 SFM		1,150 SFM		1,950 SFM	
Router Diameter	Decimal Equivalent	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min	Speed RPM	Feed in/min
3/32	.0938	63,120	76	79,410	95	79,410	123	46,830	57	79,410	76
1/8	.1250	47,370	76	59,590	95	59,590	123	35,140	57	59,590	76
3/16	.1875	31,580	73	39,730	95	39,730	120	23,430	66	39,730	79
1/4	.2500	23,680	71	29,800	95	29,800	118	17,570	71	29,800	81
5/16	.3125	18,950	76	23,840	95	23,840	123	14,060	66	23,840	80
3/8	.3750	15,790	79	19,860	95	19,860	126	11,710	63	19,860	79
7/16	.4375	13,530	74	17,030	88	17,030	122	10,040	61	17,030	81
1/2	.5000	11,840	71	14,900	83	14,900	118	8,790	59	14,900	83



SERIES FR640

Profile Routing - Type 1 through Type 4

Work Material		Fiberglass	
Cutting Speed		1,280 SFM Average	
Router Diameter	Decimal Equivalent	Speed RPM	Feed in/min
1/16	.0625	45,000	60
3/32	.0938	30,000	70
1/8	.1250	25,000	70
3/16	.1875	24,000	65
1/4	.2500	24,000	65
5/16	.3125	22,000	63
3/8	.3750	20,000	60
1/2	.5000	15,000	50

Type 1 - No End Cut

Type 2 - Bur End

SERIES FR640

Slot Routing - Type 2 through Type 4

Work Material		Fiberglass	
Cutting Speed		1,000 SFM Average	
Router Diameter	Decimal Equivalent	Speed RPM	Feed in/min
1/16	.0625	40,000	40
3/32	.0938	25,000	45
1/8	.1250	20,000	45
3/16	.1875	20,000	35
1/4	.2500	20,000	35
5/16	.3125	17,500	33
3/8	.3750	15,000	30
1/2	.5000	10,000	20

Type 3 - End Mill Cut

Type 4 - Drill Point

Type 1 Routers should only be used for side cutting.

Type 2 Routers should also be used only for side cutting and for hand routing.

Type 3 Routers can be used for side routing and slot routing.

Type 4 Routers should be used only for side routing but have a drill point to facilitate entry into the material.

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Safety Precautions

Grinding or other use of tool may produce hazardous dust and fumes which may endanger health. To avoid adverse health effects, read product material safety data sheet. Utilize adequate ventilation and appropriate protection with cutting fluids. Cutting tools may shatter when broken, wearing eye protection is strongly advised.

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