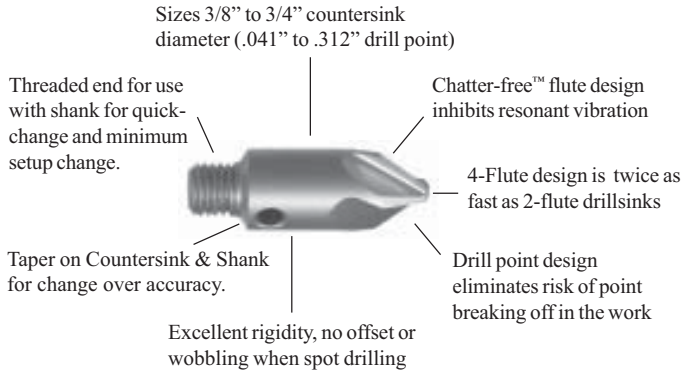


# 3N1-QC™ Quick Change Countersink System

Patent Pending

## Benefits of a 3N1-QC™ Drill Point Countersink



Save steps, setup, production time, and lower scrap rates with a Severance 3N1-QC™ Spotting tool. Specifically designed to give a true start spot and an accurate countersink chamfer on your part.

## Quick Change Countersink System


Severance Tool introduces the new 3N1-QC™ Quick Change Countersink System. Featuring standard shanks in 4", 6", and 8" over all lengths, this system is designed to allow quick change of the countersink head for fast tool changes while maintaining dimensional integrity. The quick-change head has a positive lock up on a 60° seat angle and with a threaded lock, tool changes are fast and simple. All 3N1-QC™ threaded countersinks are factory resharpenable.

### High Speed Steel

Head Dia.	Overall Length	Drill Point Dia.	Thread Size	Centerline Angle					
				30°	41°	45°	50°	60°	
				Included Angle 60°	82°	90°	100°	120°	
Severance Name	Order Number	Order Number	Order Number	Order Number	Order Number				
3/8"	1-5/32"	.141"	1/4"-28	3N1-QC-3/8	01800	01810	01820	01830	01840
7/16"	1-5/32"	.188"	1/4"-28	3N1-QC-7/16	01801	01811	01821	01831	01841
1/2"	1-5/32"	.219"	1/4"-28	3N1-QC-1/2	01802	01812	01822	01832	01842
5/8"	1-5/32"	.25"	1/4"-28	3N1-QC-5/8	01803	01813	01823	01833	01843
3/4"	1-13/16"	.313"	3/8"-24	3N1-QC-3/4	01804	01814	01824	01834	01844

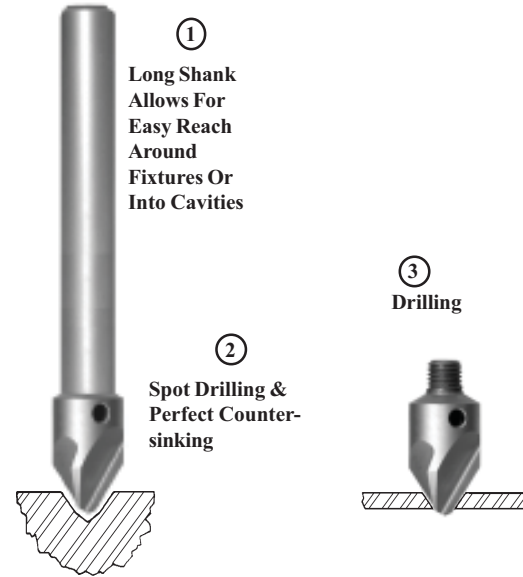
Note: When Ordering 3N1-QC™ Make Sure To Specify Angle, Example (3N1-QC-3/8-45)

## Shanks for 3N1-QC™ Cutters



Thread Size	Shank		Overall Length	Shoulder Dia.	Severance Shank Name	EDP Order Number
	Frac.	Dia. Dec.				
1/4"-28	1/4"	.250	4"	7/16"	FM-2 Shank	34235
1/4"-28	1/2"	.500	6"	1/2"	FM-2x6 Shank	34239
1/4"-28	1/2"	.500	8"	1/2"	FM-2x8 Shank	34240
3/8"-24	1/4"	.250	4"	9/16"	FM-3 Shank	34236
3/8"-24	5/8"	.625	6"	5/8"	FM-3x6 Shank	34241
3/8"-24	5/8"	.625	8"	5/8"	FM-3x8 Shank	34242

See pages 78-80 for other available shank styles and sizes.

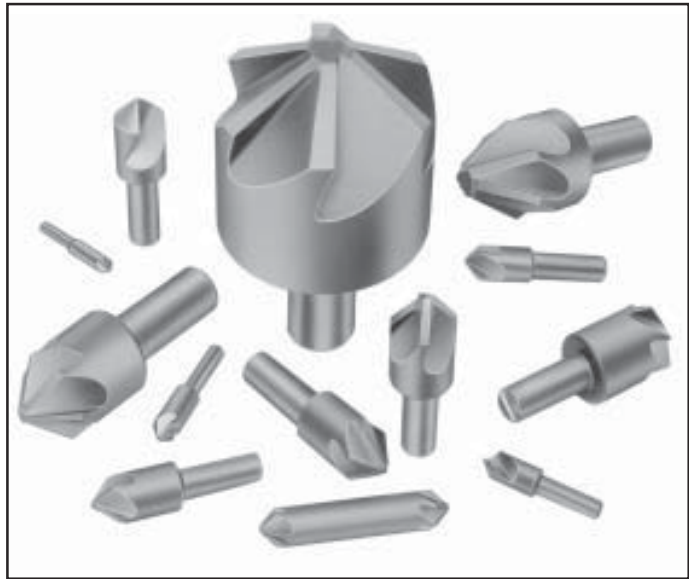


## How Does a 3N1-QC™ Work?

Severance has developed a unique tool, which combines the functions of a drill point starter and true countersink in a quick-change tool. A conventional thin-web drill point is blended into two flutes of a four-flute chatter-free™ countersink ... to perform two or all three of the steps in a spot-drill-countersink and edge chamfer operations. Once you have established a tool in a chuck, you can leave the shank in place and quickly change out the dull 3N1® head with a sharp 3N1®, fast change over. On thin material, such as above, drilling could be optional.

## A Countersink For Every Use

Severance Tools of Canada, Ltd. manufactures countersinks with one, four and six flutes, carbide and high speed steel, countersinks with pilots and drill points, heavy-duty tools and specials. Sizes range from 1/8" to 3", and almost any centerline angle can be specified. These standard tools will handle at least 99% of all countersinking applications ... and we can build specials to satisfy any other need.



### Carbide or Steel?

When machining hard or abrasive materials, carbide countersinks will often give 10 or more times the service life of high speed steel tools. As a rule of thumb, consider carbide for production operations with cast iron, alloy steel or glass-reinforced plastics. High speed steel is generally more economical in low carbon steel and nonferrous machining applications. In automated production operations, the cost of changing a tool can exceed the cost of the tool. Consider long-running carbide in such situations.

### 1, 4, or 6 Flutes?

In general, a six-fluted countersink will remove more material per revolution than will a four-flute or single-flute tool. While the single-flute countersink is slow cutting, it will work well in a non-rigid machining setup. Four flutes provide more chip clearance than six do. This is a consideration in machining stringy materials such as some plastics and nonferrous alloys. Other factors being equal, the six-flute countersink will give more service life than the four-flute tool because the cutting load is distributed over more edges.

### Chatterless™ Design

Resonant vibration is the cause of chatter in rotating cutting tools. Every tool/machine/workpiece system has natural frequencies at which such vibration will occur. Severance countersinks are designed with staggered cutting edges, which inhibit the occurrence of resonant, or harmonic vibration. Tools with symmetrical cutting edges tend to multiply the frequencies at which chatter occurs, and to reinforce the vibration. Chatterless™ design can't change the natural frequencies of the system, but it takes tool geometry out of the problem.

### Proprietary Countersinks for Special Jobs

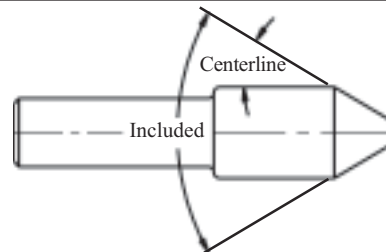
What makes the Severance line unique is the number of proprietary and special tools we can supply to fit some specific applications.

- **3N1® Drill Points** (see page 57 - 59) offer some cost-cutting opportunities to the creative tool engineer.
- **CNC-K™ Precision Countersinks** (pages 53 - 54) are used in numerical control and other preset tooling systems. Such applications exist in almost any modern production machining facility.
- **Stop Countersink Systems** (pages 64-67) are in wide use in the aircraft industry, where they are used with hand-held power tools to countersink rivet holes.
- **Special Tools** which combine countersinks with drills, steps, pilots, radii and other custom shapes are readily available from Severance. Just send in a sketch or description for quotation.

### Regrinding Countersinks

Very few tool rooms or sharpening services are equipped to recondition worn chatterless™ countersinks. Our regrinding service is fast, competent and economical. Whenever you sell chatterless cutters, be sure to recommend Severance regrinding.

Please note when ordering Severance countersinks. We go by centerline angle not included.



Example: Severance CK-1/2-30° is 60° included.

## Recommended Countersink Speeds and Feeds

MATERIAL	FEED PER TOOTH (FPT)	H.S.S. SPEED (SFM)	CARBIDE SPEED (SFM)
ALUMINUM/ALUMINUM ALLOYS	.001-.002	150-250	300-500
BRASS/BRONZE	.001-.002	75-125	150-250
IRON - CAST (SOFT)	.001-.002	75-125	125-225
IRON - CAST (MEDIUM HARD)	.001-.002	50-100	100-175
IRON - MALLEABLE	.001-.002	80-90	90-150
MAGNESIUM/MAGNESIUM ALLOYS	.001-.002	125-250	250-400
HIGH NICKEL STEEL	.001-.002	30-50	50-75
PLASTIC, BAKELITE	.001-.002	100-250	250-400
STEEL - MILD	.001-.002	70-100	80-170
STEEL - TOOL	.001-.002	50-60	60-100
STEEL - FORGINGS	.001-.002	40-50	50-80
STEEL - ALLOY (300-400 BRINELL)	.001-.002	20-30	30-50
STEEL - HIGH TENSILE (35-45 RC)	.001-.002	25-40	35-60
STEEL - HIGH TENSILE (45-50 RC)	.001-.002	15-25	25-40
STEEL - HIGH TENSILE (50-55 RC)	.001-.002	7-15	15-20
STAINLESS STEEL (FREE MACHINING)	.001-.002	30-80	80-125
STAINLESS STEEL (WORK HARDENING)	.001-.002	15-50	50-75
INCONEL ALLOY, HASTELLOY WROUGHT	.001-.002	15-20	25-35
HASTELLOY (CAST)	.001-.002	5-7	7-15

**RPM = SFM x 3.82 ÷ CUTTER O.D.**  
**IPR = FPT x NUMBER OF TEETH**  
**IPM = IPR x RPM**

THE ABOVE SURFACE FEET PER MINUTE ARE TO BE USED AS A GUIDE.  
 USE OF GOOD QUALITY CUTTING FLUID IS RECOMMENDED.  
 FOR ADDITIONAL INFORMATION CALL (416) 661-3066

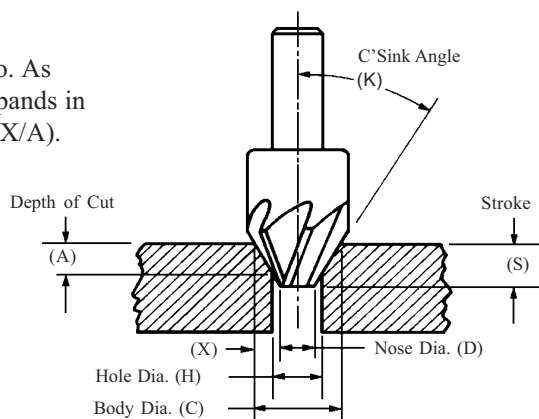
## CNC-K™ Precision Countersink Programming/Technical Information

Designed specifically for use in NC, CNC and preset machine tools, these precision countersinks feature Chatterless™ tooth geometry. Tight tolerances on angles, diameters and lengths assure setting accuracy. Available in 30°, 41°, 45°, 50°, 55° and 60° centerline angles. Other angles and sizes available upon request.

### Technical and Programming Information

NOTE: For any depth the Countersink diameter expands in a direct ratio. As you travel in the (A) direction along the axis of the Countersink (X) expands in a direct relationship to angle (K) (forming an angle with the tangent of X/A).

Since the angle expands on both sides of the drilled hole; you must use 2 times the tangent of the angle for your ratio (R).



Angle (K)	Ratio (R) = $2 \frac{X}{A}$
30°	1.15
41°	1.74
45°	2.00
50°	2.38
55°	2.86
60°	3.46

Calculations
$C = H + RA$
$A = \frac{C - H}{R}$
$S = \frac{C - D}{R}$
$X = \frac{C - H}{2}$

Angle (K) TANGENT =  $\frac{X}{A}$

**Example:**

.500 hole diameter, countersink to .875 cut diameter with 41° angle (use NCK-1"-41°)

$A = \frac{.875 - .500}{1.74} = .216$        $S = \frac{.875 - .203}{1.74} = .386$

# Hand Files are Great for Many Application

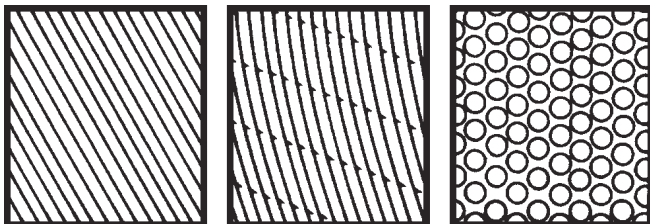
*Filing • Deburring • Shaping • Forming • Chamfering • Sharpening  
Smoothing • Beveling • De-Flashing • Trimming and De-Scaling*

## Severance Offers Four Types of Hand Files To Solve Virtually Every Application

**Carbide** – Severance Tool originated the Carbide Hand files which are ideal for use on hard materials, which quickly dull ordinary steel files. They are available in several sizes, styles, cuts and tooth patterns to meet almost any application requirement. Carbide files are stocked in coarse, medium and fine cuts, and in standard tooth pattern. Other cuts and patterns can be supplied promptly to order. **Severance Tool can regrind dull carbide files many times for a fraction of the new file cost.**

**Cubic Boron Nitride** – The CBN file segment has thousands of cubic boron nitride particles on its surface. Low heat generation makes it ideal for high speed rotary applications (such as working on a lathe or turning machinery) versus conventional files. Removes material quickly and easily without clogging or loading up. Ideal for use on High Speed Tool Steels, High Nickel Alloys, Hardened Structural Steels.

### Standard Tooth Patterns



Standard Tooth

Curved Tooth

Diamond Grid  
CBN Grid

### Tooth Patterns Available

**Standard Tooth**– Used in deburring and smoothing many different types of materials; M-2, M-42, Cold and Hot Roll Steels. Used with light pressure for smooth finishes or to sharpen cutting surfaces on Steel, Aluminum, Cast Iron, Bronze.

**Curved Tooth**– Used in removing and smoothing different types of surfaces: Flat, Curved, and Round. Used for fast material removal with less material loading up on file. Used in the Auto Industries for shaping Sheet Metals, also used in Aluminum, Cast Iron, Bronze, Lead Zinc, and Plastics.

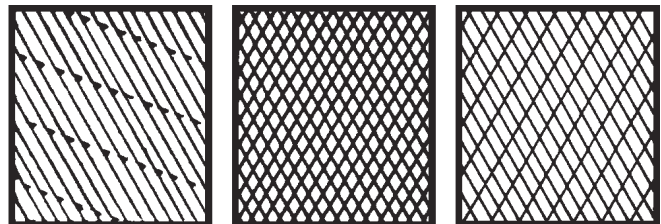
**Diamond Grid**– High stock removal rate makes jobs easier and faster. Deep recesses remove material quickly without clogging or loading up. Available in coarse or fine grits. Works on Carbide, Hardened Steel, Ceramics, Glass, Fiberglass, Composites, and more.

**CBN Grid (Cubic Boron Nitride)** – Used in high speed rotary applications because it will not generate heat. Removes material

**Diamond** – The diamond file segment has thousands of diamonds on its surface. Deep recesses remove material quickly and easily without clogging or loading up. High stock removal rate makes jobs faster and easier than conventional files. Very little pressure is used, thereby reducing worker fatigue and increasing output. Works on: Carbide, Glass, Fiberglass, Laminates, Graphite, Plexiglas, Hard Alloys, Hardened Dies, and more.

**Steel** – Tough, fatigue-resistant select grade of Molybdenum steel. Heat treated before final grinding to provide the optimum combination of properties for high performance. Steel Files will produce the same cutting action as our Carbide Files and are the ideal “medium” material where inexpensive files do not hold up and where chipping might occur using Carbide Files on an interrupted cut. Steel files may also

### Special Tooth Patterns



Chip Breaker

Rasp Tooth

Double Cut

NOTE: Standard tooth patterns will be supplied, unless specified.

easily without clogging or loading up. Available in coarse or fine grits. Works on High Speed Tool Steels, High Nickel Alloys and more.

**Chip Breaker** – Adding chip breakers will not reduce the finish but will make them cut a little better since no large shavings are produced.

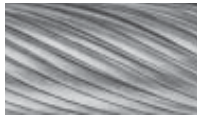
**Rasp Tooth** – Ideal for fast material removal on relatively soft materials. Used with heavy pressure for rough finishes, shaping or sharpening cutting surfaces on Steel, Aluminum, Cast Iron, Bronze, Wood and other soft material. Rasp tooth pattern will produce a rougher finish than other tooth patterns.

**Double Cut** – Used with medium pressure for medium finishes, shaping or sharpening cutting surface on Steel, Aluminum, Cast Iron, and Bronze.

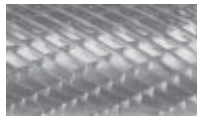
## Midget Mill® Classifications



**H.S.S. Midget Mills® - Right hand spiral** tooth pattern with a **light chipbreaker** originated by Severance Tool. These tools can take more shock than carbide. Mainly used on non-work hardening materials. Materials applications can include M2, M42, cold and hot roll steels, aluminum, cast iron and bronze.



**Carbide Midget Mills® - Right hand spiral** tooth pattern invented by Rollin Severance, mainly intended for machine applications because of its deep radial flutes. Able to take a substantial amount of material off in an environment where the tool is not allowed to bounce or chatter out of control. Works best with materials applications using carbon steels, cast steels, gray irons, some stainless steel, tungsten, and nickel alloys.



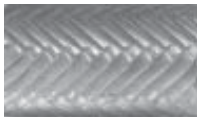
**Carbo -Mills™** - Features a **double cut** tooth pattern, first introduced by Severance Tool. Intended for applications where there is substantial stock removal and a rough to medium finish is required. Works best with ferrous, non-work hardening materials. Materials applications can include steels, aluminum, cast iron, and bronze.



**Sever-Cuts™** - Developed by Severance Tool, these tools feature a **super coarse** cut designed with very course deep positive flutes with a large flute radius to remove material without loading up. Works best with nonferrous materials including aluminum, copper, bronze, nickel, and magnesium. Can be used with either hand or machine operations.

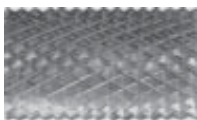


**Tangent Mills™** - Are **left hand spiral**, right hand cutting, and are especially designed to control tool wandering on curved surfaces. Ideal for finishing holes in tubing. Works best with Ferrous, non-work hardening materials. Material applications can include M2, M42, cold & hot rolled steels, aluminum, cast iron, and bronze. See catalog page 16 for example.



**d-burrs™** - Feature the **Herringbone™** cut invented by Severance Tool for fine finishing of plastic, aluminum, steel, and similar materials. The Herringbone™ Cut features alternating right hand and left hand flutes to give a fine finish on difficult deburring problems. See page 28 for standard shapes and sizes.

**Other tooth patterns available as a special cut upon request. Here are a few other examples.**



Rasp or Diamond Cut



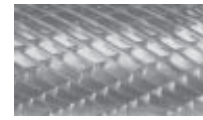
Straight Cut



Chatterless Chamfer Cut™



Curve Tooth Cut



Tuff-Cut

## Pitches and their Cut Numbers

The pitches of teeth ground on Severance Midget Mills® are illustrated on page 6, in full scale. The chart at the right relates cut numbers to tool diameters for Fine, Standard, Coarse and Super Coarse pitches. Standard pitch will always be supplied unless otherwise specified. If an unlisted pitch is required, order by cut number.

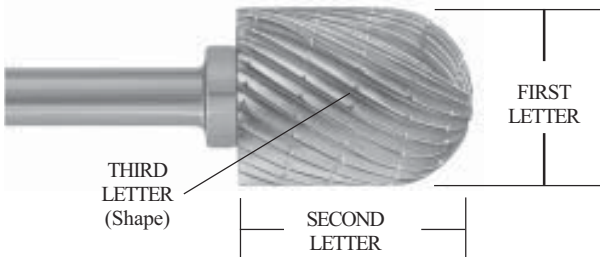
This cut numbering system applies to Severance Midget Mills®, Junior Mills®, Carbo-Mills™, etc., and to hand files. Sever-Cut™ tools all have “super coarse” teeth.

Dia.	Fine	Std.	Coarse	Super Coarse*	Dia.	Fine	Std.	Coarse	Super Coarse*
	Cut #	Cut #	Cut #	(Teeth)		Cut #	Cut #	Cut #	Cut #
3/32"	2	3	5	Per	9/16"	5	7	9	
1/8"	3	4	5	Tool)	5/8"	5	7	9	10
3/16"	3	5	6		3/4"	6	8	10	12
1/4"	4	5	7	4	7/8"	6	8	10	
5/16"	4	6	7		1"	6	8	10	16
3/8"	4	6	8	6	1-1/8"	6	9	11	
7/16"	5	6	8		1-1/4"	6	9	11	
1/2"	5	7	9	8	1-1/2"	7	9	12	

\*Super Coarse Cuts are recommended for use on aluminum and other nonferrous materials for heavy, fast, stock removal.

1	2	3	4	5	6	7
.016 pitch 62 teeth/in.	.020 pitch 50 teeth/in.	.025 pitch 40 teeth/in.	.032 pitch 31 teeth/in.	.040 pitch 25 teeth/in.	.050 pitch 20 teeth/in.	.062 pitch 16 teeth/in.
8	9	10	11	12	13	14
.076 pitch 13 teeth/in.	.092 pitch 11 teeth/in.	.111 pitch 9 teeth/in.	.125 pitch 8 teeth/in.	.143 pitch 7 teeth/in.	.166 pitch 6 teeth/in.	.200 pitch 5 teeth/in.

## Midget Mills® Identification System



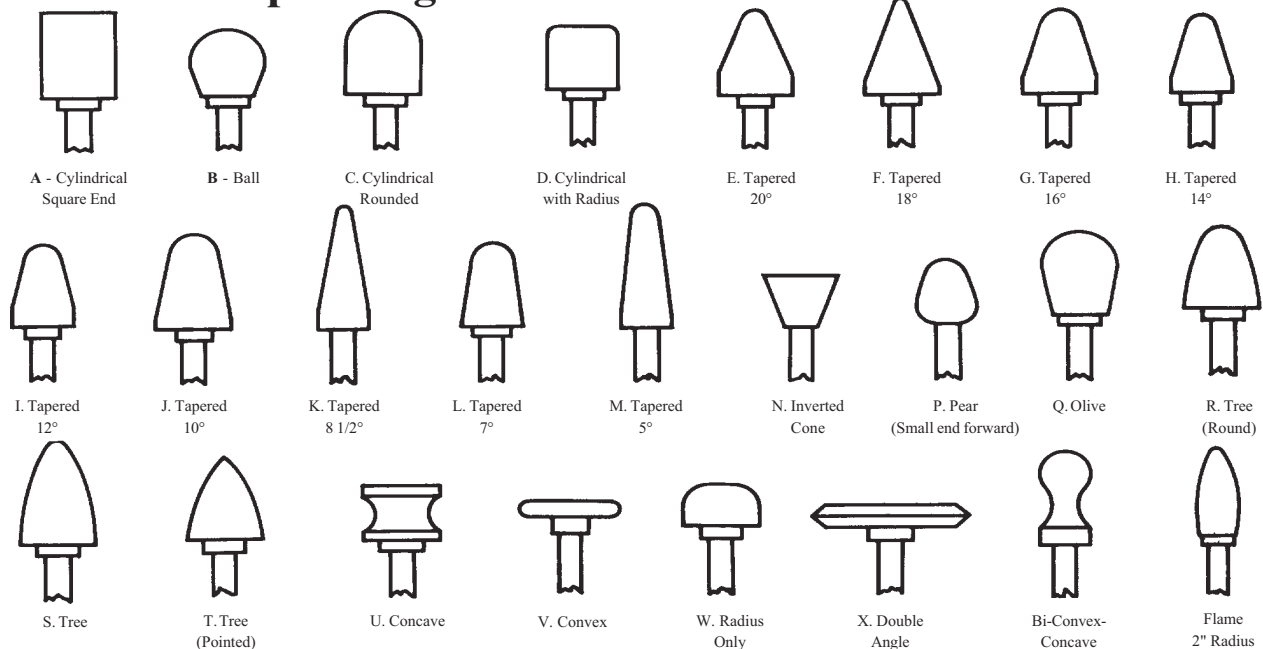
The third letter is the shape of the tool. In some cases, additional descriptive information is also part of the tool number . . . EC for End Cutting, 45 for a 45° angle, etc. All carbide tools carry the suffix, -W.

The First letter designates the largest diameter.  
The Second letter designates the length of cutting portion.  
The Third letter designates the general shape as illustrated.

A-1/8"	G-1/2"	M-1-1/8"	S-2"	Y-4-1/2"
B-3/16"	H-9/16"	N-1-1/4"	T-2-1/4"	Z-5"
C-1/4"	I-5/8"	O-1-3/8"	U-2-1/2"	
D-5/16"	J-3/4"	P-1-1/2"	V-3"	
E-3/8"	K-7/8"	Q-1-5/8"	W-3-1/2"	
F-7/16"	L-1"	R-1-3/4"	X-4"	

Midget Mills® are identified by a three-letter "tool number."  
The first and second letters specify cutting diameter and length.

## Standard Shape Designations



## Numerical Index

EDP Numbers	Tool Name	Page No.	EDP Numbers	Tool Name	Page No.
00245-00249	Ball Nose Deburring Cutters, HSS	27			
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00270-00377	Single Flute Countersinks, HSS	62	19720-19758	CBN -Boron Hand Files	71 thru 76
00420-00535	Single Flute Countersinks, Carbide	62	19770-19894	Carbide Hand Files	71 thru 76
00536-00583	Single Flute Double Ended Countersinks, HSS	61	19970-20026	Diamond Hand Files	71 thru 76
00600-00648	Single Flute Double Ended Countersinks, Carbide	61	20070-20194	Steel Hand Files	71 thru 76
00970-01095	Econo-Sinks® (4 Flute Chatter-Free®), HSS	60	20470-20528	Inside Chamfering Mills, HSS	35
01120-01203	Econo-Sinks® (4 Flute Chatter-Free®), Carbide	60	20470-20528	Multi-Flute Countersinks, HSS	56
01204-01251	Econo-Sinks® Double Ended (4 Flute Chatter-Free®), HSS	61	20620-20710	Inside Deburring Cutters, Carbide	33
01252-01299	Econo-Sinks® Double Ended (4 Flute Chatter-Free®), Carbide	61	20770-20828	Inside Deburring Cutters, HSS	32
01470-01554	3N1® Drill Point Countersink, HSS	58	21120-21129	Micro-Mills™, Carbide	29
01585-01642	3N1® Drill Point Double Ended Countersink, HSS	57	21220-21223	Micrometer Stop-Countersink Units	64
01650-01717	3N1® Drill Point Double Ended Countersink, Carbide	57	21220-21223	Micrometer Stop-Countersink Units	64
01903-02013	3N1® Drill Point Countersink, Carbide	58	21720-21742	Ecarno-Mills™ - 3/32" Shank, Carbide	24
02370-02487	Six Flute Chatterless-Countersinks™, HSS	50	21770-21798	Ecarno-Mills™ - 1/8" Shank, Carbide	23
02520-02635	Six Flute Chatterless-Countersinks™, Carbide	50	21920-21937	Ecarno-Mills™ - 3/16" Shank, Carbide	22
02670-02752	Six Flute Double Ended Chatterless-Countersinks™, HSS	51	22150-22157	Di-Car Mills™, Carbide	30
02820-02902	Six Flute Double Ended Chatterless-Countersinks™, Carbide	51	22149-22164	d-burr™, Carbide	28
02970-03026	CNC-K™ Precision Chatterless-Countersinks™, HSS	53	22180-22198	Carbo-Mills™ - 3/32" Shank, Carbide	24
03120-03176	CNC-K™ Precision Chatterless-Countersinks™, Carbide	54	22230-22249	Carbo-Mills™ - 1/8" Shank, Carbide	23
03177-03224	CNC-K™ Precision Double Ended Chatterless-Countersinks™, HSS	53	22280-22298	Carbo-Mills™ - 3/16" Shank, Carbide	22
03423-03470	CNC-K™ Precision Double Ended Chatterless-Countersinks™, Carbide	54	22380-22592	Carbo-Mills™ - 1/4" Shank, Carbide	4 thru 21
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15340-15993	Stop-Countersink Cutters, HSS	65, 66	22930-23237	Midget Mills®, HSS	4 thru 21
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			25430-25470	Outside Deburring Cutters, HSS	33
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			34310-34327	Extra Length Lab Mills®, HSS	27
			34960-34982	Tube End Chamfering Mills, HSS	37
			35060-35078	Tube End Deburring Cutters, HSS	34
			35160-35170	Tube End Deburring Cutters, Carbide	34
			35460-35559	Tube End Forming Cutters, HSS	38 thru 40
			35579-35585	Tube End Forming Cutters - EMT, HSS	40
			35660-35671	Tube Hole Deburring Cutters, HSS	16, 40
			36180-36195	End Mills, Carbide	68
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## Tube Specialty Tools



Just as there are different reasons for finishing the cut ends of pipe or tubing, there are different tools and methods for doing the job.

1. Often, the only reason for finishing the cut end is to get rid of burrs caused by the cutting process. In that case, Tube End Deburring Cutters may make quick work of the task.
2. To facilitate assembly with other components, tube ends may be chamfered, using Severance Tube End Chamfering Mills.
3. The third method, forming, is used when appearance is important, as in an exposed tube end. Forming may also be recommended when the cut end must be square with the tube axis. Forming is the only method that finishes the end as well as the corners.

### Tube End Deburring Cutters

Deburring cutters are identified as having smaller, more numerous cutting teeth than chamfering or forming tools. They can be operated over a wide speed range (slower is better in nonrigid setups) and take light cuts very quickly. Tube End Deburring Cutters are available from stock in sizes ranging from 1/8" to 2-1/4" OD. Each is adjustable for wall thickness. Standard cutters feature 30° and 45° centerline angles.

Inside, outside and tube end deburring cutters are available in carbide as well as HSS.

We also catalog the HR-Series radius deburring tools, which is usually sold with a handle for manual operation.

### Tube End Chamfering Mills

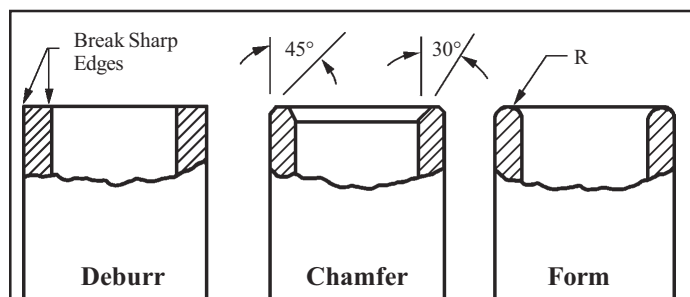
Severance Tube End Chamfering Mills have cutting edges designed to provide a shearing action, yielding a smoothly machined surface. The standard tool produces a 30° angle on the tube ID and 45° on the OD. Other angles may be ordered as specials. This series of tools is offered in a range of sizes to accommodate pipe and tubing from 3/16" to 2-1/2" outside diameters. All models are adjustable for different wall thicknesses.

Severance also manufactures separate chamfering mills for inside and outside cutting. Inside Chamfering Mills are stocked in 1/2" to 1-1/2" sizes, with 30° or 45° centerline angles. Outside Chamfering Mills, for working diameters from 1/8" to 3" are also stocked in 30° or 45° models.

### Tube End Forming Cutters

As the name implies, Severance Tube End Forming Cutters completely machine the cut ends of tubular products. They produce a smoothly rounded surface, which is both attractive and functional.

Because they are of solid construction, a specific tool is required for each different workpiece diameter and wall thickness. We also make many custom tube end forming cutters ... for nonstandard sizes and for machining profiles other than blended radii. Carbide is available on sizes of 3/8" OD and larger.



## Severance Tools of Canada, Ltd. Special Product Quotation Request

New Quote # \_\_\_\_\_

Old Quote # \_\_\_\_\_

Salesperson: \_\_\_\_\_

Computer #: \_\_\_\_\_

Date of Inquiry: \_\_\_\_\_

Complete Engineering: \_\_\_\_\_

Sales Response Date: \_\_\_\_\_

Follow-Up: \_\_\_\_\_

### Distributor Data:

Company: \_\_\_\_\_

Address: \_\_\_\_\_

City/ Prov/Postal Code: \_\_\_\_\_

Contact: \_\_\_\_\_

Phone: \_\_\_\_\_

E-mail: \_\_\_\_\_

Fax: \_\_\_\_\_

### Application:

Machine Held: \_\_\_\_\_

Hand Held: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

### Material to be Machined:

Stainless Steel: \_\_\_\_\_

Wood: \_\_\_\_\_

Plastic: \_\_\_\_\_

Aluminum: \_\_\_\_\_

Other: \_\_\_\_\_

\_\_\_\_\_

### Quantity & Description:

Quantity: 1 2 5 10 25 50 100 250 \_\_\_\_\_

Type of Tool: \_\_\_\_\_

Second Tool: \_\_\_\_\_

Third Tool: \_\_\_\_\_

Over All Length: \_\_\_\_\_

Length of Cut: \_\_\_\_\_

Number of Flutes: \_\_\_\_\_

Angle: \_\_\_\_\_ C/L or Included

Shank: \_\_\_\_\_

Straight: \_\_\_\_\_ Diameter: \_\_\_\_\_

Threaded: \_\_\_\_\_ Threads: \_\_\_\_\_

Tapered: \_\_\_\_\_ Taper: \_\_\_\_\_

Additional Information: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Drawing or Sketch: (fax larger drawings)
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