COGSDILL TOOL PRODUCTS, INC.

FlipCUT™

For back-spotfacing and back- or front-chamfering operations — from one side, in one set-up.

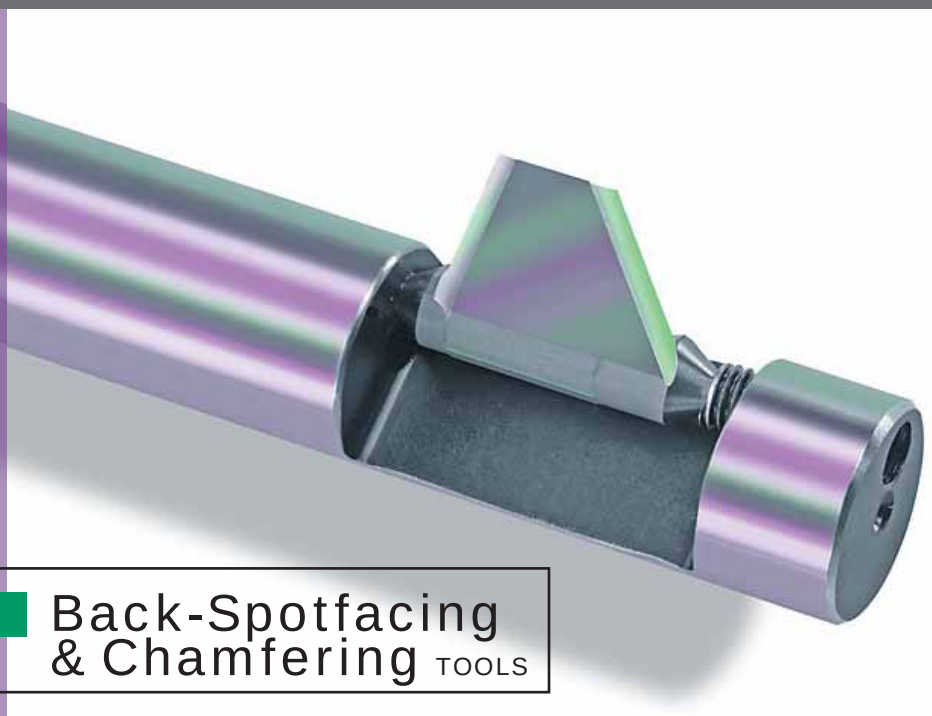
Back-Spotfacing & Chamfering TOOLS

Back-Spotfacing

Available from stock for inch hole sizes from .281 to 1.344, and metric hole sizes from 7.00 to 34.00mm.

FlipCUT™

COGSDILL TOOL PRODUCTS, INC.



Back-Spotfacing & Chamfering TOOLS

Above: FlipCUT™ with cutter extended.
Right: FlipCUT™ with cutter retracted.

- Cutter flips open to machine back spotface or back chamfer; flips back to closed position for tool withdrawal. Can also be used for cutting front chamfers. No refixturing or repositioning of workpiece required.
- Right-hand rotation opens cutter; left-hand rotation (spindle reversal) closes cutter.
- Unique tool design: over-center cam action initiates positive mechanical closure of the cutter, aided by centrifugal force, for superior tool performance.
- Solid carbide cutter construction, with increased mass, ensures better centrifugal cutter movement. Cutter is rigidly supported for enhanced accuracy and long tool life.
- Both cutter and arbor are designed for rugged use and long life.
- Shear angle on cutter directs chips away from arbor pocket for controlled chip evacuation.
- Standard tools in the inch program are available in .031 inch increments, with nominal sizes from .281 to 1.344 inches. Standard tools in the metric program are available in 0.5mm increments for hole sizes from 7.00 to 10.00mm, and in 1mm increments in hole sizes from 10.00 to 34.00mm.
- Standard cutter options include a cutter designed for back-spotfacing and front-chamfering operations, and a cutter for back- and front-chamfering operations. Standard program is easily modified to suit other applications.

Flip*CUT*™ design features and options

Left: Standard cutter designed for back-spotfacing and front-chamfering.
Right: Standard cutter designed for back- and front-chamfering.

The FlipCUT™ tool is designed to perform back-spotfacing or back-chamfering operations in one set-up. The cutter extends, with right-hand rotation of the tool, to cut the back spotface or back chamfer. Left-hand spindle rotation initiates positive mechanical closure of the cutter; the closing action is assisted by centrifugal force. When the cutter is fully enclosed within the arbor pocket, the tool can be easily withdrawn from the bore.

The FlipCUT™ tool is designed for rugged use on all types of plant equipment and in all kinds of manufacturing environments. Tools for hole sizes from .312 inch and above (inch program) and tools for hole sizes from 8.00mm and above (metric program) have internal coolant capability.

FlipCUT™ cutters are made from solid carbide. Steel cutters absorb heat; the solid carbide FlipCUT™ cutter dissipates heat, thereby eliminating thermal expansion and variances so that proper cutter retraction is ensured. Carbide is also heavier than steel, and non-magnetic, for better centrifugal cutter movement to assist mechanical closure.

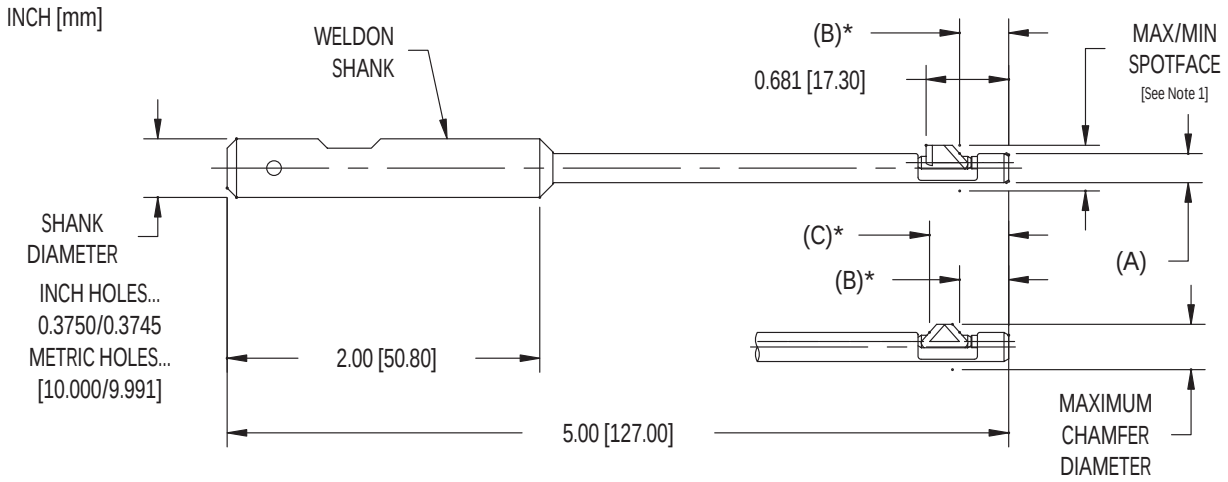
Two standard cutters are available from stock:

- Cutter designed for back-spotfacing and front-chamfering operations.
- Cutter designed for back- and front-chamfering operations.

Other cutter designs are available upon request to suit other applications; contact our sales department and request a quotation.

Specifications

Flip*CUT*™



* "B" AND "C" DIMENSIONS AT MAXIMUM CHAMFER DIAMETER.

		90º CUTTER		45º CUTTER			
HOLE DIAMETER	ARBOR DIA "A"	MAXIMUM SPOTFACE DIAMETER	MINIMUM SPOTFACE DIAMETER	45º CHAMFER CUTTER	MAXIMUM CHAMFER DIAMETER	FRONT CHAMFER "B" REF	REAR CHAMFER "C" REF
Inch program							
0.281	0.279	0.541	0.414	FW2-45	0.519	0.357	0.649
0.312	0.310	0.634	0.447		0.552	0.355	0.651
0.344	0.342	0.695	0.464		0.568	0.362	0.643
Metric program							
7.00	6.97	13.36	10.52	FW2-45	13.18	9.02	16.54
7.50	7.44	13.74	10.52			9.22	16.33
8.00	7.95	16.10	11.35		14.02	9.07	16.48
8.50	8.46	16.48	11.79		14.42	9.09	16.43
9.00	8.94	17.65	11.79			9.32	16.23

Ordering examples

90º BACK SPOTFACING **F C** – * * * * – * * * *

SPECIFY HOLE DIAMETER [CHART SIZES ONLY] See Note 2

IE: INCH 0.281 = 0281
IE: METRIC 7.00mm = 070M

SPECIFY SPOTFACE DIAMETER [CHART SIZES BETWEEN MAX & MIN ONLY] See Note 2

IE: INCH 0.541 = 0541
IE: METRIC 13.36mm = 1336

45º CHAMFERING **F C** – * * * * – * – **4 5**

SPECIFY HOLE DIAMETER AS ABOVE [CHART SIZES ONLY] See Note 2

SPECIFY CHAMFER CUTTER SIZE [CHART SIZE ONLY] See Note 2

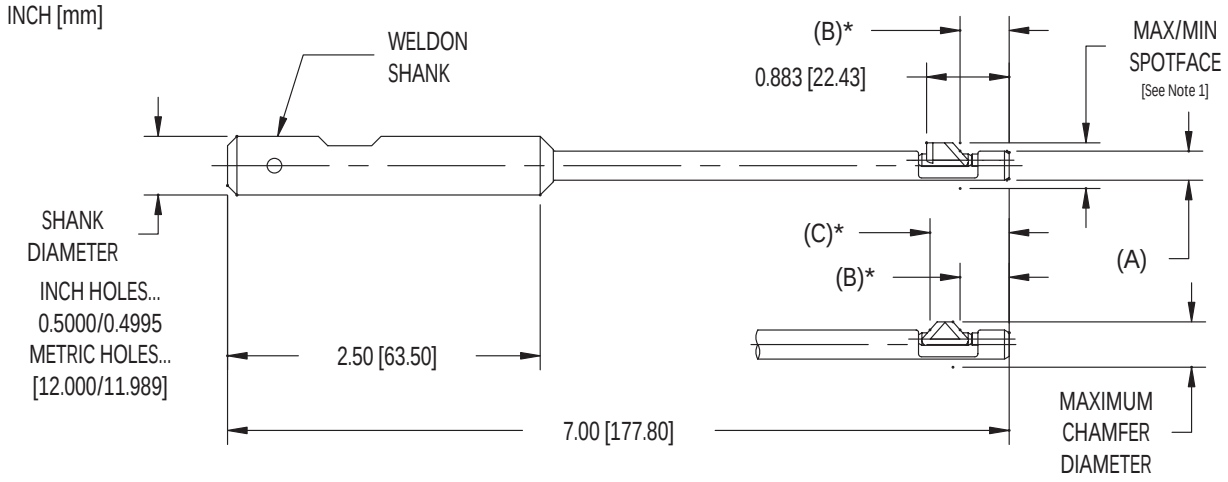
IE: FW2-45 = 2

Note 1 Maximum front chamfer diameter equals spotface diameter

Note 2 For all other sizes please contact Cogsdill Tool Products

For operating guidelines see pages 9-10

For hardware see page 8



* "B" AND "C" DIMENSIONS AT MAXIMUM CHAMFER DIAMETER.

		90º CUTTER		45º CUTTER			
HOLE DIAMETER	ARBOR DIA "A"	MAXIMUM SPOTFACE DIAMETER	MINIMUM SPOTFACE DIAMETER	45º CHAMFER CUTTER	MAXIMUM CHAMFER DIAMETER	FRONT CHAMFER "B" REF	REAR CHAMFER "C" REF
Inch program							
0.375	0.372	0.694	0.542	FW3-45	0.711	0.477	0.837
0.406	0.403	0.835	0.572		0.741	0.447	0.836
0.438	0.435	0.866	0.572			0.461	0.822
0.469	0.466	0.960	0.693	FW4-45	0.887	0.550	0.978
0.500	0.497	0.989	0.693			0.564	0.964
0.531	0.528	1.111	0.743			0.555	0.973
0.562	0.559	1.141	0.743		0.937	0.569	0.959
Metric program							
9.50	9.42	17.62	13.77	FW3-45	18.06	11.33	21.26
10.00	9.93	19.81	14.53		18.82	11.23	21.36
11.00	10.92	21.21	14.53			11.66	20.63
12.00	11.91	24.38	17.60	FW4-45	22.53	14.00	24.82
13.00	12.93	25.12	18.87			14.45	24.36
14.00	13.92	28.22	18.87		23.80	14.33	24.49

Ordering examples

90º BACK SPOTFACING **F C** – * * * * – * * * *

SPECIFY HOLE DIAMETER [CHART SIZES ONLY] See Note 2

IE: INCH 0.375 = 0375
IE: METRIC 9.50mm = 095M

SPECIFY SPOTFACE DIAMETER [CHART SIZES BETWEEN MAX & MIN ONLY] See Note 2

IE: INCH 0.694 = 0694
IE: METRIC 17.62mm = 1762

45º CHAMFERING **F C** – * * * * – * – **4 5**

SPECIFY HOLE DIAMETER AS ABOVE [CHART SIZES ONLY] See Note 2

SPECIFY CHAMFER CUTTER SIZE [CHART SIZES ONLY] See Note 2

IE: FW3-45 = 3

Note 1 Maximum front chamfer diameter equals spotface diameter

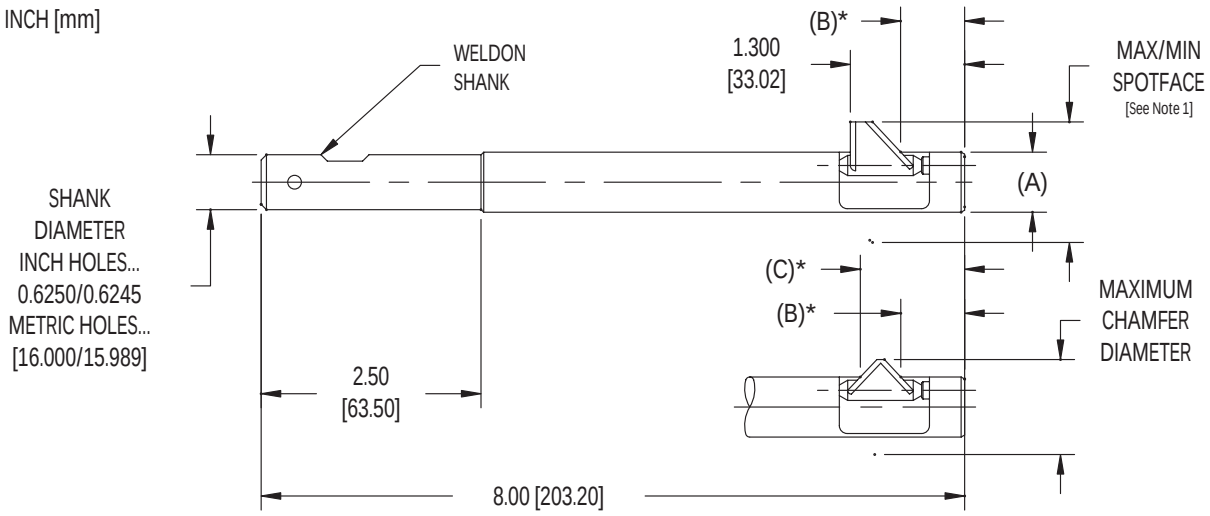
Note 2 For all other sizes please contact Cogsdill Tool Products

For operating guidelines see pages 9-10

For hardware see page 8

Specifications

Flip*CUT*™



* "B" AND "C" DIMENSIONS AT MAXIMUM CHAMFER DIAMETER.

		90º CUTTER		45º CUTTER			
HOLE DIAMETER	ARBOR DIA "A"	MAXIMUM SPOTFACE DIAMETER	MINIMUM SPOTFACE DIAMETER	45º CHAMFER CUTTER	MAXIMUM CHAMFER DIAMETER	FRONT CHAMFER "B" REF	REAR CHAMFER "C" REF
Inch program							
0.594	0.589	1.205	0.855	FW5-45	1.112	0.699	1.215
0.625	0.620	1.237	0.855			0.713	1.201
0.656	0.651	1.359	0.904		1.161	0.711	1.201
0.688	0.683	1.390	0.904			0.726	1.186
Metric program							
15.00	14.88	30.00	21.72	FW5-45	28.24	17.73	30.89
16.00	15.88	31.42	21.72			18.16	30.45
17.00	16.87	34.51	22.96		29.49	18.21	30.35

Ordering examples

90º BACK SPOTFACING **F C** – * * * * – * * * *

SPECIFY HOLE DIAMETER
[CHART SIZES ONLY] See Note 2

IE: INCH 0.594 = 0594
IE: METRIC 15.00mm = 150M

SPECIFY SPOTFACE DIAMETER
[CHART SIZES BETWEEN MAX & MIN ONLY] See Note 2

IE: INCH 1.205 = 1205
IE: METRIC 30.00mm = 3000

45º CHAMFERING **F C** – * * * * – * – **4 5**

SPECIFY HOLE DIAMETER AS ABOVE
[CHART SIZES ONLY] See Note 2

SPECIFY CHAMFER CUTTER SIZE
[CHART SIZE ONLY] See Note 2

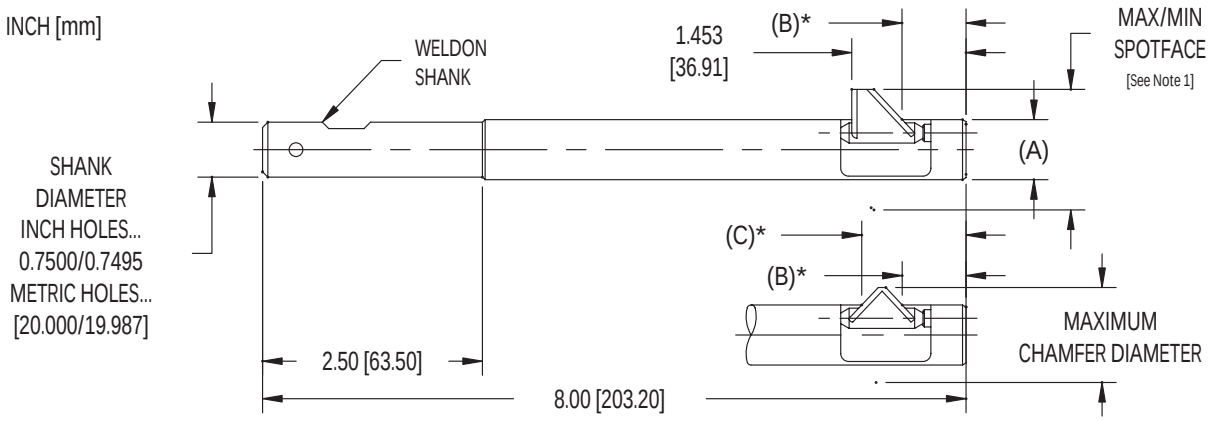
IE: FW5-45 = 5

Note 1 Maximum front chamfer diameter equals spotface diameter

Note 2 For all other sizes please contact Cogsdill Tool Products

For operating guidelines see pages 9-10

For hardware see page 8



* "B" AND "C" DIMENSIONS AT MAXIMUM CHAMFER DIAMETER.

		90º CUTTER		45º CUTTER			
HOLE DIAMETER	ARBOR DIA "A"	MAXIMUM SPOTFACE DIAMETER	MINIMUM SPOTFACE DIAMETER	45º CHAMFER CUTTER	MAXIMUM CHAMFER DIAMETER	FRONT CHAMFER "B" REF	REAR CHAMFER "C" REF
Inch program							
0.719	0.714	1.505	1.058	FW6-45	1.229	0.731	1.343
0.750	0.745	1.535	1.058			0.745	1.330
0.781	0.776	1.564	1.058			0.759	1.316
0.812	0.807	1.609	1.241	FW7-45	1.603	0.958	1.85
0.844	0.839	1.640	1.241			0.972	1.836
0.875	0.870	1.782	1.301		1.662	0.960	1.847
0.906	0.901	1.812	1.301			0.973	1.835
0.938	0.933	1.842	1.301			0.988	1.821
0.969	0.964	1.872	1.301			1.002	1.807
Metric program							
18.00	17.88	37.44	26.87	FW6-45	31.22	18.47	34.24
19.00	18.87	38.99	26.87			18.90	33.81
20.00	19.86	39.72	26.87			19.33	33.35
21.00	20.50	40.86	31.52	FW7-45	40.86	24.51	46.81
22.00	21.87	43.18	31.52		42.21	24.28	47.07
23.00	22.89	46.78	33.045			25.10	46.25
24.00	23.88	46.78	33.045			23.11	46.18
25.00	24.87	47.54	33.045			25.60	45.75

Ordering examples

90º BACK SPOTFACING **F C** – * * * * – * * * *

SPECIFY HOLE DIAMETER [CHART SIZES ONLY] See Note 2

IE: INCH 0.719 = 0719
IE: METRIC 18.00mm = 180M

SPECIFY SPOTFACE DIAMETER [CHART SIZES BETWEEN MAX & MIN ONLY] See Note 2

IE: INCH 1.505 = 1505
IE: METRIC 37.44mm = 3744

45º CHAMFERING **F C** – * * * * – * – **4 5**

SPECIFY HOLE DIAMETER AS ABOVE [CHART SIZES ONLY] See Note 2

SPECIFY CHAMFER CUTTER SIZE [CHART SIZE ONLY] See Note 2

IE: FW6-45 = 6

Note 1 Maximum front chamfer diameter equals spotface diameter

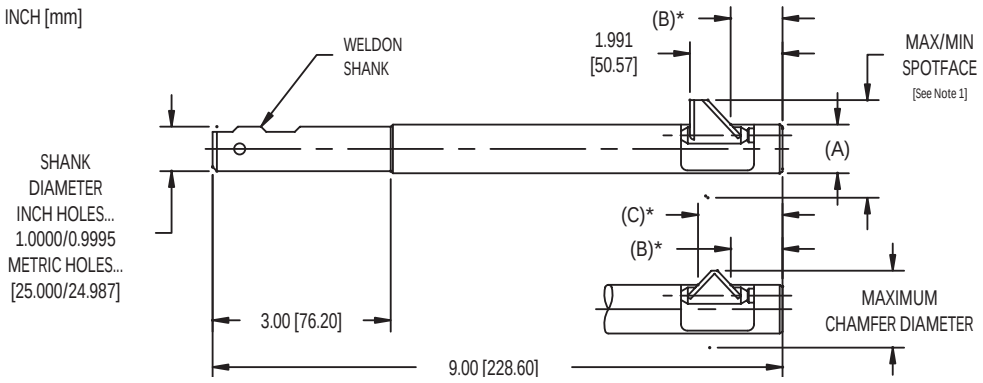
Note 2 For all other sizes please contact Cogsdill Tool Products

For operating guidelines see pages 9-10

For hardware see page 8

Specifications

Flip*CUT*™



* "B" AND "C" DIMENSIONS AT MAXIMUM CHAMFER DIAMETER.

		90º CUTTER		45º CUTTER			
HOLE DIAMETER	ARBOR DIA "A"	MAXIMUM SPOTFACE DIAMETER	MINIMUM SPOTFACE DIAMETER	45º CHAMFER CUTTER	MAXIMUM CHAMFER DIAMETER	FRONT CHAMFER "B" REF	REAR CHAMFER "C" REF
Inch program							
1.000	0.993	2.142	1.431	FW7-45	1.792	0.957	1.852
1.031	1.024	2.172	1.431			0.971	1.838
1.062	1.055	2.201	1.431			0.984	1.825
1.093	1.086	2.231	1.431			0.998	1.811
1.125	1.118	2.444	1.531		1.891	0.968	1.841
1.156	1.149	2.474	1.531			0.982	1.827
1.187	1.180	2.503	1.531			0.996	1.814
1.219	1.212	2.534	1.531			1.010	1.799
1.250	1.243	2.662	1.661		2.021	0.966	1.843
1.281	1.274		1.661			0.980	1.829
1.312	1.305		1.661			0.993	1.816
1.344	1.337		1.661			1.007	1.802
Metric program							
26.00	25.83	54.40	36.35	FW7-45	45.51	24.59	46.76
26.50	26.31	55.16	36.35			24.79	46.36
27.00	26.82	55.90	36.35			25.12	46.23
28.00	27.81	59.15	38.89		48.03	24.33	47.02
29.00	28.83	62.07	38.89			24.79	46.56
30.00	29.82	62.83	38.89			25.22	46.13
31.00	30.81	64.36	38.89			25.65	45.69
32.00	31.83	66.06	42.19		51.33	24.64	46.71
33.00	32.82		42.19			25.10	46.28
34.00	33.83		42.19			25.53	45.82

Ordering examples

90º BACK SPOTFACING **F C** – *** * * *** – *** * * ***

SPECIFY HOLE DIAMETER [CHART SIZES ONLY] See Note 2

IE: INCH 1.000 = 1000
IE: METRIC 26.00mm = 260M

SPECIFY SPOTFACE DIAMETER [CHART SIZES BETWEEN MAX & MIN ONLY] See Note 2

IE: INCH 2.142 = 2142
IE: METRIC 54.40mm = 5440

45º CHAMFERING **F C** – *** * * *** – ***** – **4 5**

SPECIFY HOLE DIAMETER AS ABOVE [CHART SIZES ONLY] See Note 2

SPECIFY CHAMFER CUTTER SIZE [CHART SIZE ONLY] See Note 2

IE: FW7-45 = 7

Note 1 Maximum front chamfer diameter equals spotface diameter

Note 2 For all other sizes please contact Cogsdill Tool Products

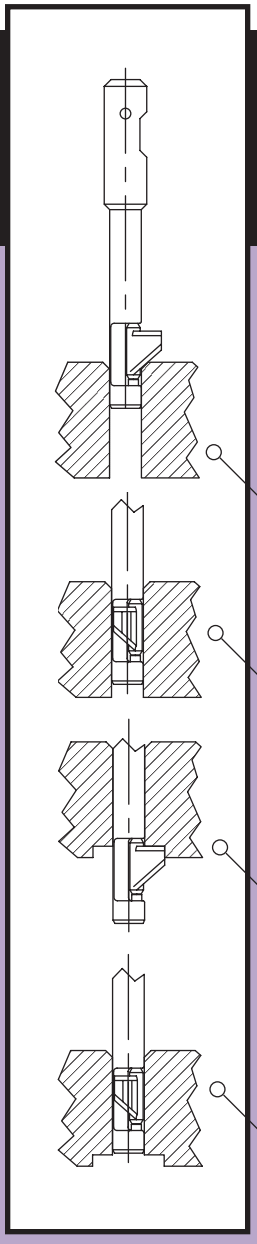
For operating guidelines see pages 9-10

For hardware see page 8

FlipCUT™ Hardware

HOLE SIZE IN (mm)	RETAINING SCREW	LOCKING SCREW*	PAD
0.281 - 0.344 (7.0 - 9.0)	FRS-2	M2.5x3LG	FP-2
0.375 - 0.438 (9.5 - 11.0)	FRS-3	M3x4LG	FP-3
0.469 - 0.562 (12.0 - 14.0)	FRS-4	M4x4LG	FP-4
0.594 - 0.688 (15.0 - 17.0)	FRS-5	M5x6LG	FP-5
0.719 - 0.781 (18.0 - 20.0)	FRS-6	M6x8LG	FP-6
0.812 - 1.344 (21.0 - 34.0)	FRS-7	M8x6LG	FP-7

*Standard metric flat point socket set screw



Operation

FlipCUT™

How it works

NOTE: The tool operation sequence shown depicts the tool with a standard cutter machining a back spotface and a front chamfer in one set-up. Tool operation is similar when using a standard cutter to machine back and front chamfers.

1. The front chamfer is machined upon entry into the bore, using right hand rotation (clockwise) of the machine spindle at the appropriate speed (refer to chart on page 10), and .002 IPR (0.05mm/rev).

2. Left hand rotation (counterclockwise) at a maximum of .008 IPR (0.20mm/rev) will effect mechanical closure of the cutter (aided by centrifugal force) so that the tool can feed through the bore.

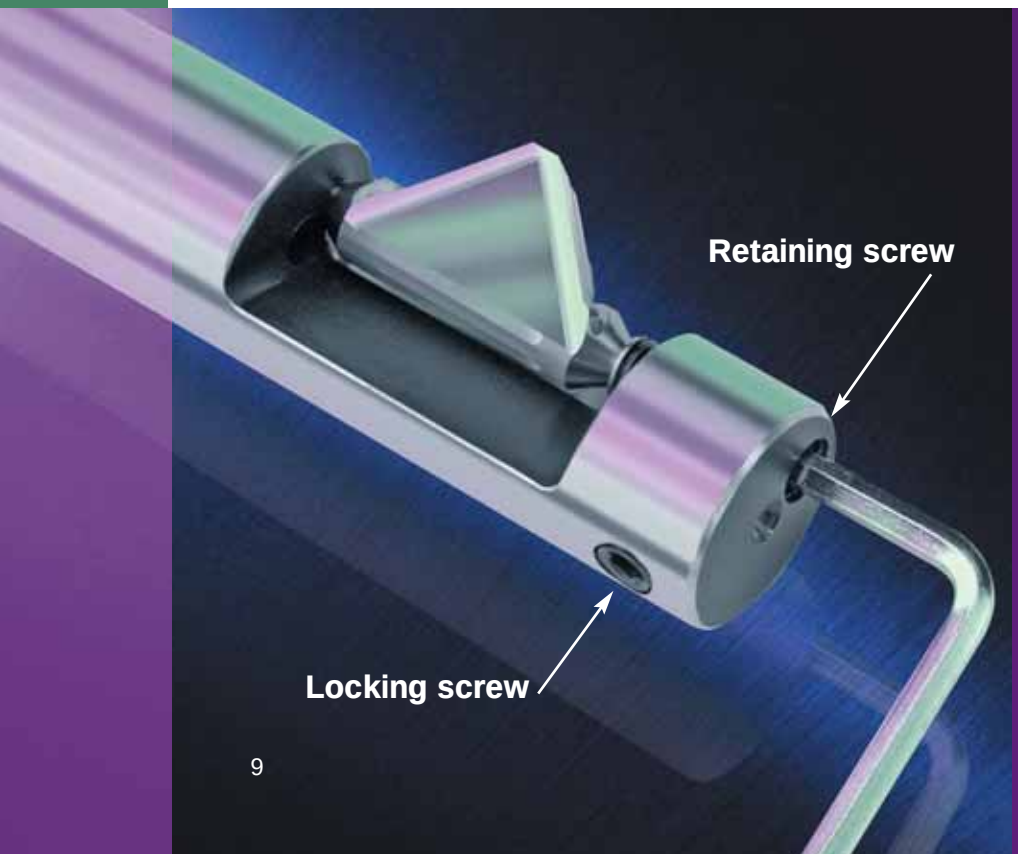
3. The back spotface is machined, using right hand rotation (clockwise) at the appropriate speed (refer to chart on page 10), and .002 IPR (0.05 mm/rev).

4. Left hand rotation (counterclockwise) at a maximum of .008 IPR (0.20mm/rev) will close the cutter so that the tool can be retracted from the bore.

Operating guidelines

- Always ensure that the cutter rotates freely in the arbor and that no end float can be detected. This can be accomplished by adjusting the retaining screw (see photo below) until the cutter binds, then backing off approximately 5 degrees. Using the locking screw, lock the retaining screw at this position.
- Ensure that the spindle speed is sufficient to allow the cutter to open.
- After the cut has been completed, and the tool withdrawn from the hole, make sure that enough coolant is supplied to the end of the tool to flush away any remaining chips that might prevent the tool from opening and closing freely in subsequent operations.
- NEVER run the tool without coolant.
- The tool cannot be used in a lathe with a static turret, since it must be rotated in order for the cutter to extend and retract. The tool may only be used in a live spindle in lathe applicatlons.
- After completing the cut, always feed the tool off the part before stopping the spindle and reversing for withdrawal.

  NOTE: In some cases, the cutter may not close fully into the arbor when the spindle is reversed. This should be considered as normal; the cutter will close fully as it passes back through the bore on the return stroke. The retraction feed should be the same as the machining feed until the cutter is fully closed and sheltered by the arbor; then rapid feed may be introduced.



To ensure that the cutter rotates freely in the arbor, with no end float, adjust the retaining screw until the cutter binds, then back off approximately 5 degrees. Use the locking screw to lock the retaining screw at this position.

Speeds and feeds

HOLE SIZE IN (mm)	SPINDLE SPEED	FEED RATE*
0.344 (8.00)	600 rpm	0.002 in/rev (0.05mm/rev)
0.689 (17.50)	550 rpm	
0.813 (21.0)	350 rpm	
1.000 (25.50)	275 rpm	
1.344 (34.00)	250 rpm	

NOTE: For horizontal applications, the tool should be run at two times the recommended speed.

*Feed rate is the maximum value. When feeding the tool through the hole, prior to the back-spotfacing operation, use reverse spindle rotation and .008 IPR (0.20 mm/rev) maximum feed rate.

Coolant

Coolant flow is necessary and should be directed to the arbor pocket and cutting edge to lubricate and flush chips away. Straight cutting oil, water soluble, or synthetic coolant can be used. The coolant should be clean and have good lubricity.

Cycle

The tool must be able to rotate in both clockwise and counterclockwise directions. The tool should run in counterclockwise rotation at the recommended speed and should feed in and out of the bore at .008 IPR (0.20 mm/rev) maximum.

The cutter should be clear of the part when changing the direction of rotation.

Maintenance

The FlipCUT™ tool should be inspected periodically for cutter axial movement, and the retaining screw adjusted accordingly. The tool should also be inspected periodically for wear, and the cutter changed or sharpened when necessary. The retaining screw should be inspected closely for wear or damage and replaced if necessary.

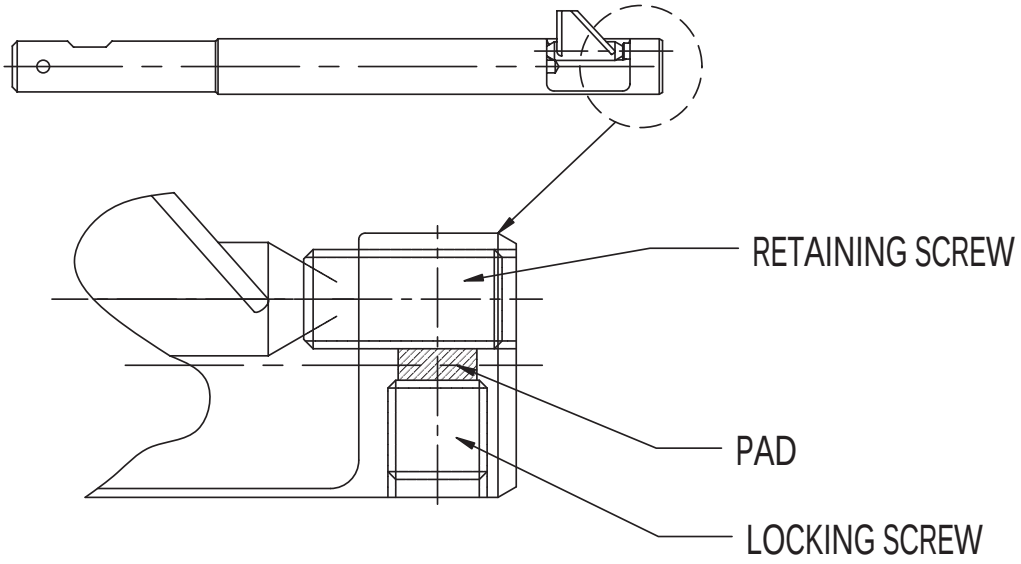
Cutter installation and setting

When the cutter is worn, loosen the locking screw (refer to the drawing below). Remove both locking screw and pad. Loosen the retaining screw and remove the worn cutter. The cutter may be reground (see page 12, “Cutter Regrinding”) or replaced.

Clean the arbor thoroughly. Oil and assemble the retaining screw in the arbor. Position the retaining screw so that the female center is sheltered approximately .100 inch (2.54mm) away from the arbor pocket. Install the brass pad in the locking-screw hole and insert the locking screw, but do not tighten it yet.

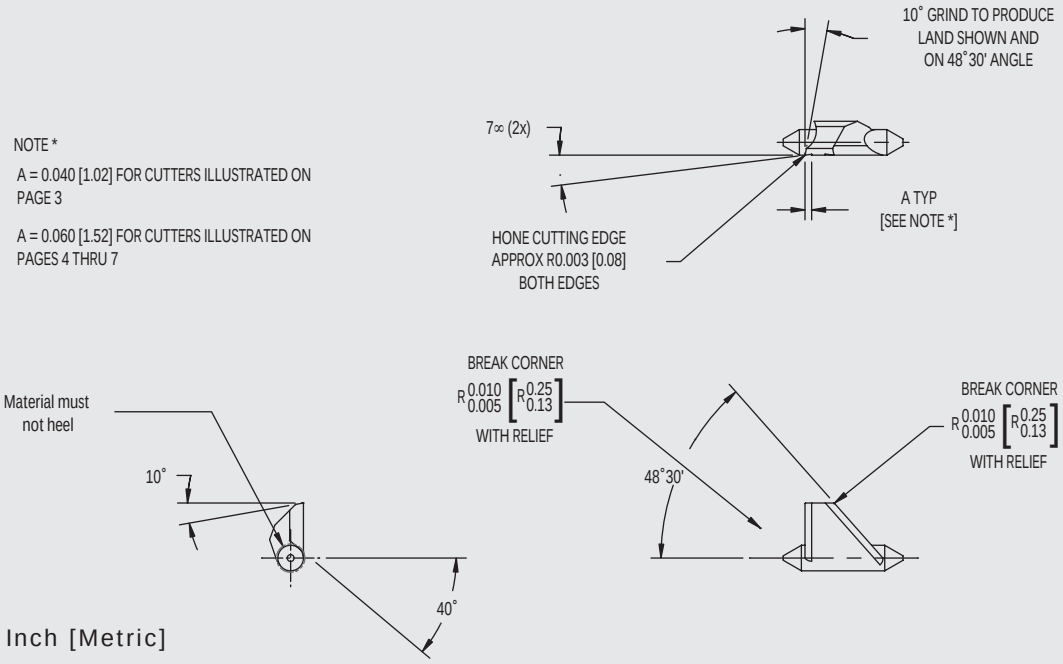
Ensure that the centers in the arbor and on the cutter are clean. Apply a light coat of lubricating oil to the cutter centers and assemble the cutter into position. Tighten the retaining screw until it makes contact with the cutter and until all of the axial play is taken up in the cutter; it should NOT pivot freely at this point.

Loosen the retaining screw approximately 5 degrees, and then tighten the locking screw. Now ensure that the cutter swings open fully and closes with no resistance, and has approximately .005-.010 inch (0.13-0.25mm) axial movement.



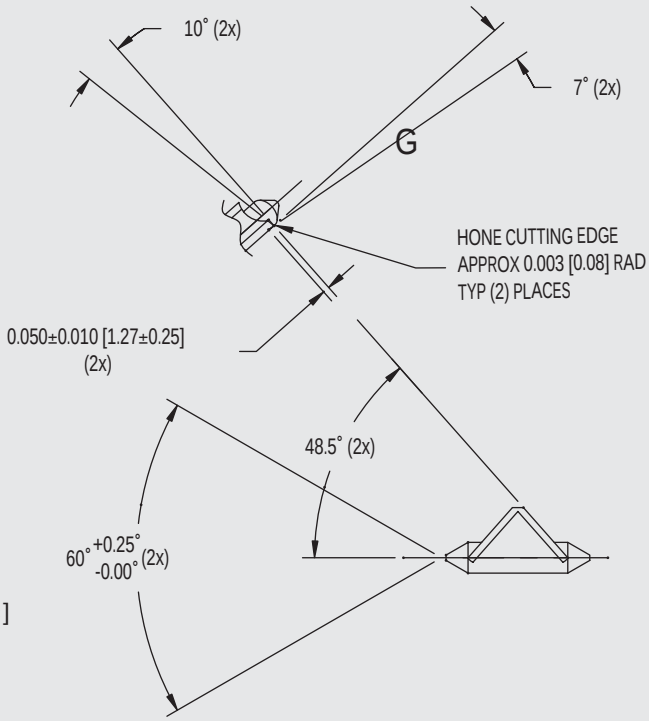
Cutter regrinding

Regrind procedure for standard cutter for machining back spotface and front chamfer



Inch [Metric]

Regrind procedure for standard cutter for machining back and front chamfers



Inch [Metric]

Ordering

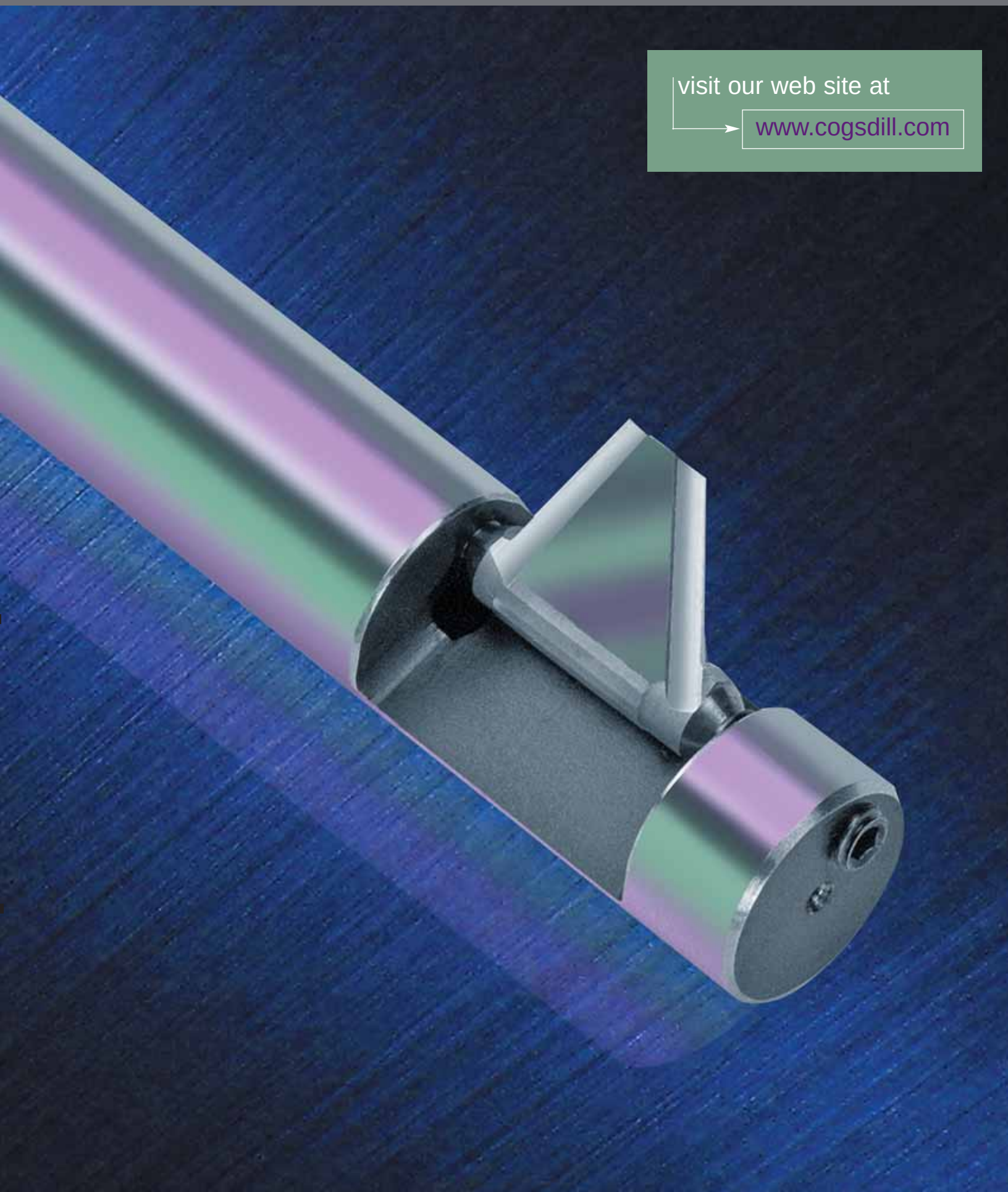
To order a FlipCUT™ tool, determine your tool number as shown under each tool specification chart (pages 3-7). The tools shown in the charts are standard, and available on a quick delivery basis.

Tools other than shown in the specification charts are special (e.g., intermediate sizes, longer or shorter work lengths, or special cutter geometries). Please contact Cogsdill Tool Products and request a quotation.

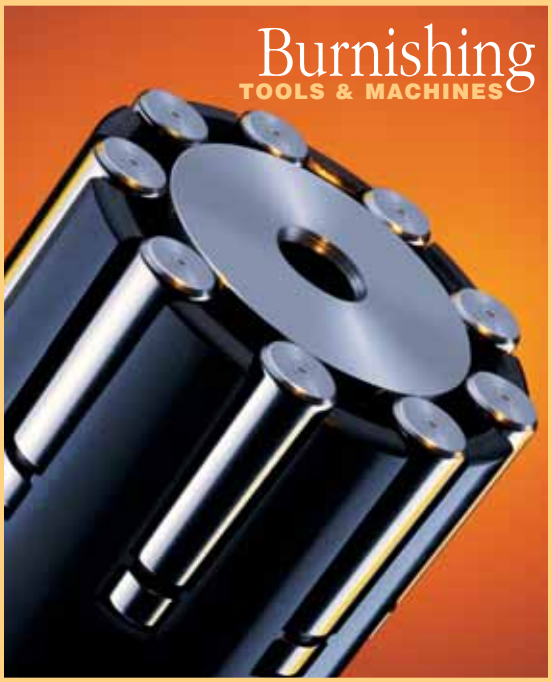
COGSDILL TOOL PRODUCTS, INC.

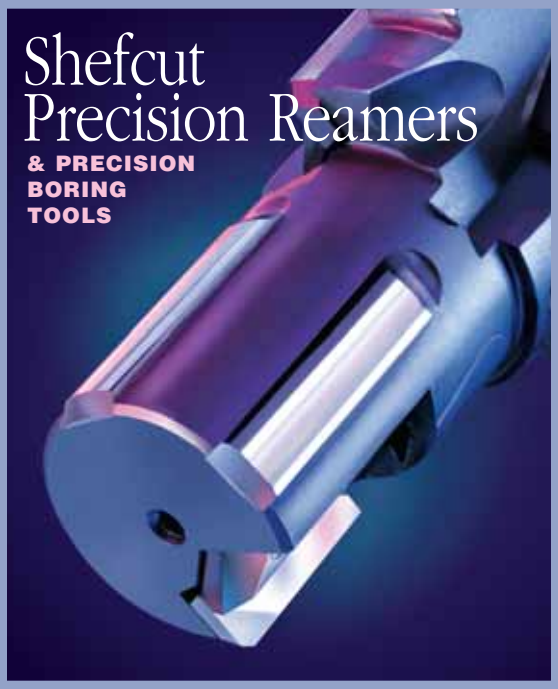
visit our web site at

www.cogsdill.com



OTHER PRODUCTS FROM COGSDILL TOOL PRODUCTS, INC.





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