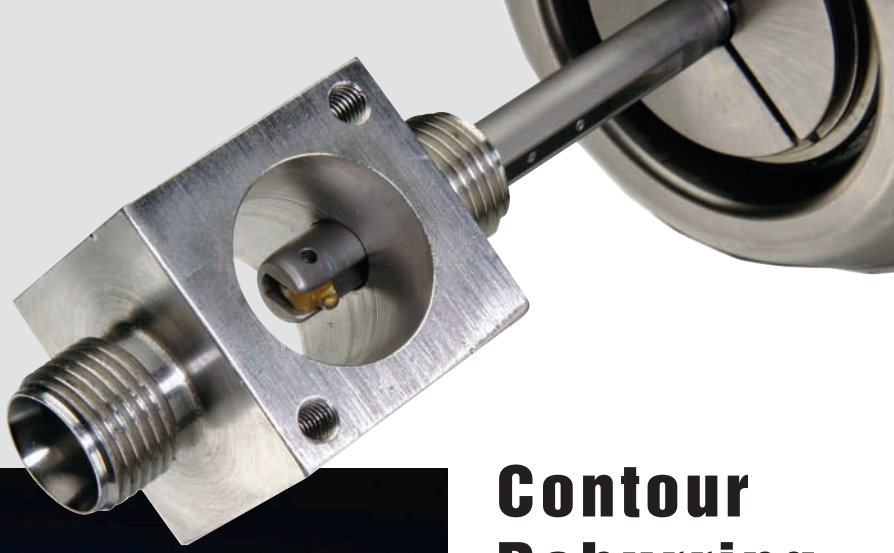
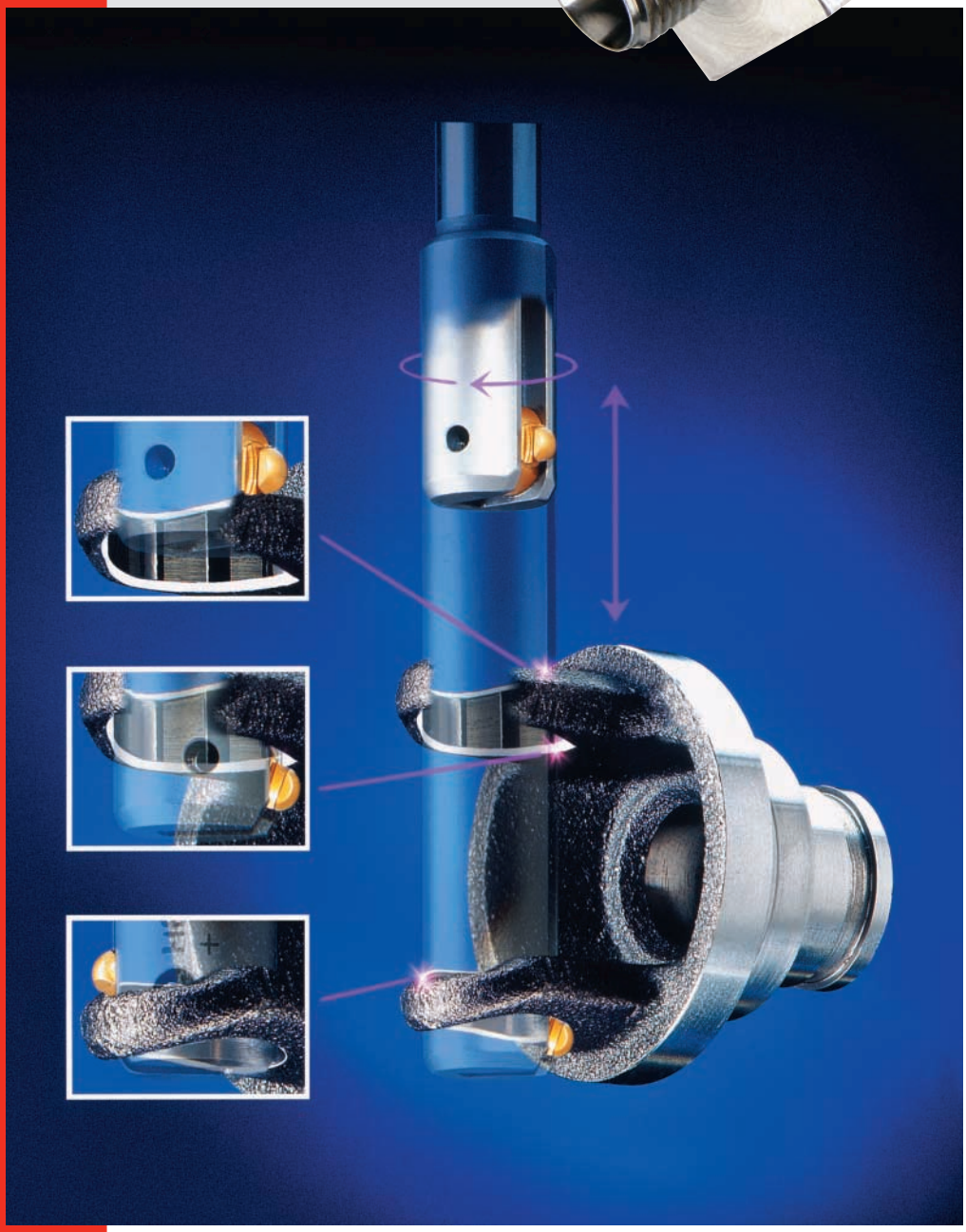
COFA





Contour Deburring Tools

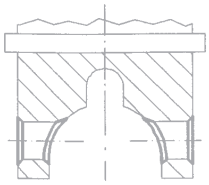
For All Purpose

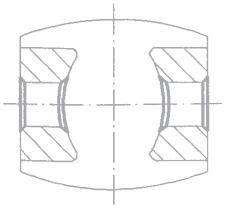
Front and Back

Deburring Of

Through Holes

In a Single Pass





HEULE

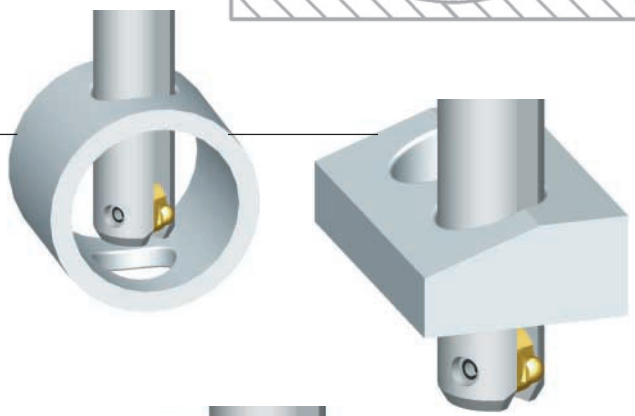
TOOL CORPORATION

COFA Deburring Tool

The HEULE COFA deburring tool removes burrs from the front and back of a drilled through hole in a single pass without stopping or reversing the spindle. Whether you are deburring a flat surface or irregular surface, the edge break is always consistent.

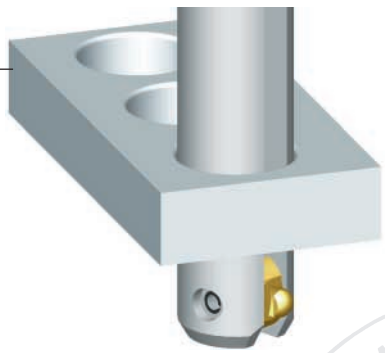
Deburr Elliptical Holes

The COFA tool will deburr the contours of an elliptical hole when two holes intersect or a hole is not perpendicular to the surface. The COFA with a standard blade can be used when the larger intersecting hole is two or more times the smaller or for surfaces up to 15°. Deburr more extreme contours by using the new 30° blade with extra clearance relief.



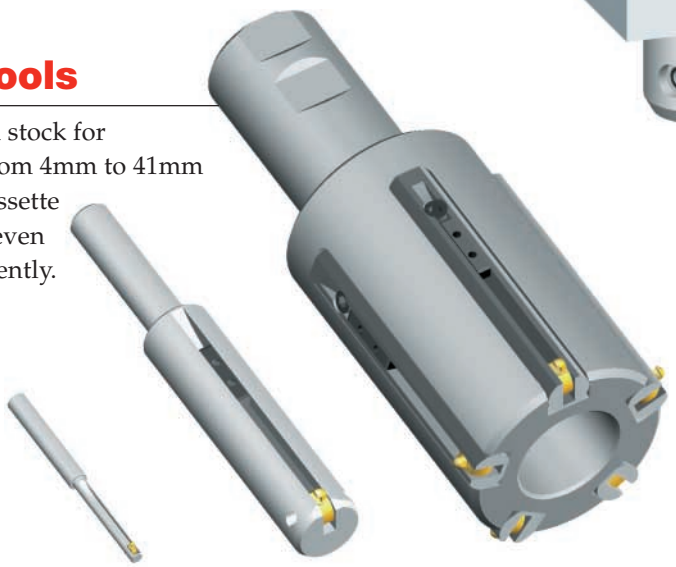
Radiused Edge Breaks on Flat Parts

Deburr the front and back of any through hole with a smooth tapered edge break to relieve stress points and sharp corners. Use the new blade with 10° clearance relief for better tool life when deburring flat parts.



Wide Range of Tools

COFA tools are available from stock for immediate delivery in sizes from 4mm to 41mm (.157" to 1.614"). The COFA cassette is also in stock for deburring even larger holes quickly and efficiently.

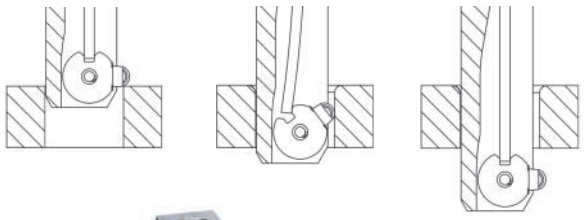


How Does The COFA Tool Work?

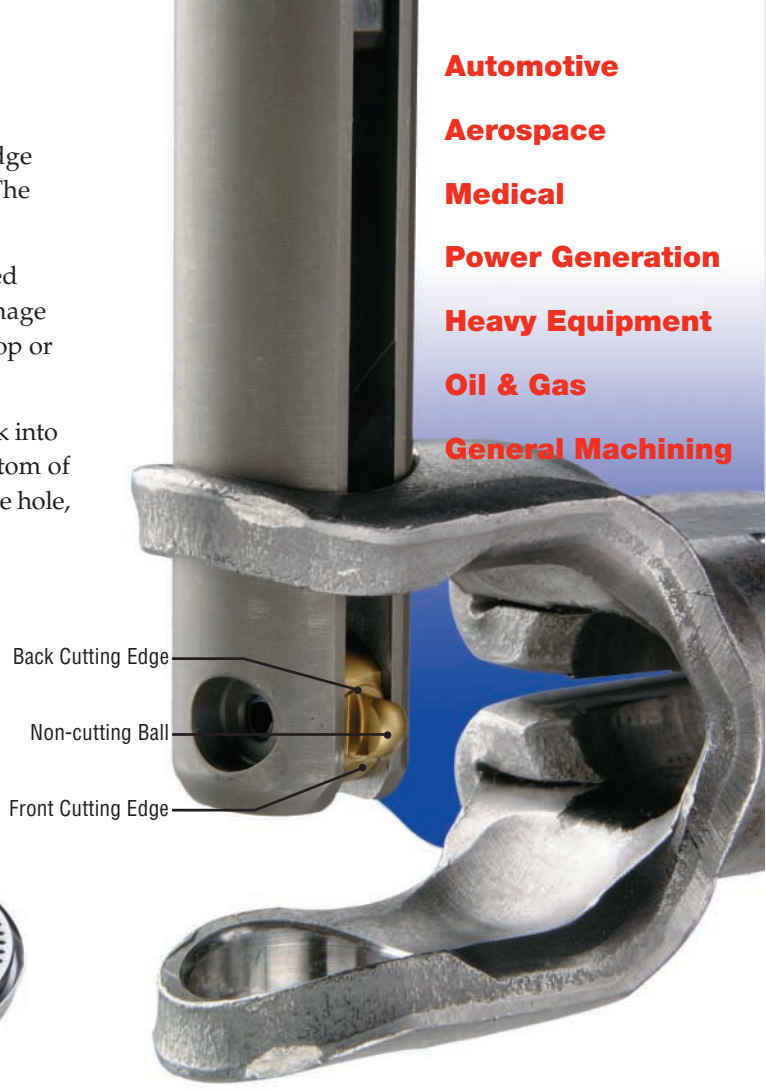
As the rotating tool is fed into the hole, the front cutting edge deburrs the top of the hole and the blade rocks upwards. The result is a tapered, radiused edge break.

When the blade is in the hole, only the ground and polished non-cutting ball touches the surface protecting it from damage while the tool is fed through the part. There is no need to stop or reverse the spindle.

When the blade reaches the bottom of the part, it springs back into cutting position and the back cutting edge deburrs the bottom of the hole as the tool is withdrawn. When the blade is inside the hole, the tool can be rapid fed out and on to the next hole.



Typical Parts



Automotive

Aerospace

Medical

Power Generation

Heavy Equipment

Oil & Gas

General Machining

Benefits: ***Reduced Cycle Time*** *- Carbide Coated blades run faster and longer.* ***Simple to use*** *- No operator adjustments necessary.* ***Availability*** *- All tooling is in stock, all tools in a series use a common blade.* ***Consistency*** *- Blades cannot over cut so edge breaks are consistent.* ***Quality*** *- Tapered, radiused edge break is superior to hand benching and other edge break methods.*

Before & After

This 4140 hardened steel component was drilled leaving a heavy burr and an end cap attached to most of the holes. Using a COFA12-502-Z tool the end caps were knocked off, the burr removed, and a 0.015" edge break was cut. With clean edges the part is ready for assembly.

Replaceable Blades

The Assembly Pin included with each tool is used to quickly remove the roll pin that retains the carbide cutting blade.

- Roll pins are reusable.
- Use the assembly pin to remove and install the cutting blade.
- Blades are carbide with TiN or TiCN coating for higher rpm's and longer life.

Common Drill Diameter	Min Hole Ød mm/inch	Approx. ØD Cutting	ORDER NUMBER
	Ød	**ØD**	**Series 4**
4.0mm	**4.0** *.157*	**4.5** *.177*	COFA4-4.0-☐
	4.1 *.161*	**4.6** *.181*	COFA4-4.1-☐
	4.2 *.165*	**4.7** *.185*	COFA4-4.2-☐
	4.3 *.169*	**4.8** *.189*	COFA4-4.3-☐
	4.4 *.173*	**4.9** *.193*	COFA4-4.4-☐
4.5mm	**4.5** *.177*	**5.0** *.197*	COFA4-4.5-☐
	4.6 *.181*	**5.1** *.201*	COFA4-4.6-☐
3/16"	**4.7** *.185*	**5.2** *.205*	COFA4-4.7-☐
	4.8 *.189*	**5.3** *.209*	COFA4-4.8-☐
	4.9 *.193*	**5.4** *.213*	COFA4-4.9-☐
	Ød	**ØD**	**Series 5**
5.0mm	**5.0** *.197*	**5.7** *.224*	COFA5-5.0-☐
	5.1 *.201*	**5.8** *.228*	COFA5-5.1-☐
	5.2 *.205*	**5.9** *.232*	COFA5-5.2-☐
	5.3 *.209*	**6.0** *.236*	COFA5-5.3-☐
	5.4 *.213*	**6.1** *.240*	COFA5-5.4-☐
5.5mm	**5.5** *.217*	**6.2** *.244*	COFA5-5.5-☐
	5.6 *.220*	**6.3** *.248*	COFA5-5.6-☐
	5.7 *.224*	**6.4** *.252*	COFA5-5.7-☐
	5.8 *.228*	**6.5** *.256*	COFA5-5.8-☐
	5.9 *.232*	**6.6** *.260*	COFA5-5.9-☐
	Ød	**ØD**	**Series 6**
6.0mm	**6.0** *.236*	**6.7** *.264*	COFA6-236-☐
1/4"	**6.2** *.244*	**6.9** *.272*	COFA6-244-☐
	6.4 *.252*	**7.1** *.279*	COFA6-252-☐
	6.6 *.260*	**7.3** *.287*	COFA6-260-☐
	6.8 *.268*	**7.5** *.295*	COFA6-268-☐
7.0mm	**7.0** *.276*	**7.7** *.303*	COFA6-276-☐
	7.2 *.284*	**7.9** *.311*	COFA6-284-☐
	7.4 *.291*	**8.1** *.319*	COFA6-291-☐
	7.6 *.299*	**8.3** *.327*	COFA6-299-☐
5/16"	**7.8** *.307*	**8.5** *.335*	COFA6-307-☐
	8.0 *.315*	**8.7** *.342*	COFA6-315-☐

How to Order:

Ordering is easy! For example, to deburr only the back of a Ø1/4" hole in Aluminum order the following:

COFA6 b —244—W

- W — *Spring Choice*
- 244 — *Minimum hole diameter Ød*
- b — *Cutting blade choice* (*here b means the back cutting only blade*)
- COFA6 — *Tool Series*

Spring Choice:

The cutting force of the COFA tool is controlled by a flat spring. Choose the proper spring for the material being machined.

Spring Code		Typical Materials *Large or heavy burrs may require a stronger spring*
W	Softer	Aluminum, Brass, Magnesium
H		Grey Cast Iron, Nodular Iron,
S		Carbon Steel, Free Machining Steel
Z		Long Chipping Steel, Stainless
Z1	Harder	Titanium, Hardened Steel, Nickel Alloy
Z2		Nickel Alloy, etc *(not avl. for series 4&5)*
Z3		Nickel Alloy, etc *(not avl. for series 4&5)*

Cutting Blade Choice:

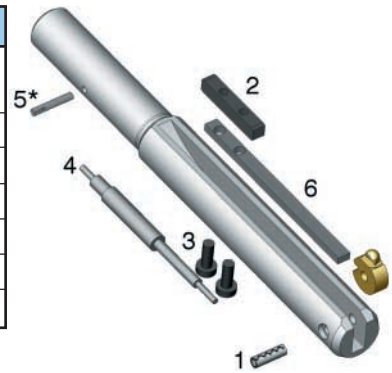
Blades are available as front and back cutting (fab) or back cutting only (bco).

Blade Code		Series	4	5	6	8	12
		Geo.	Blade Order Number: GH-C-M-				
	TiN 20° Standard	fab	-0504	-0505	-0002	-0003	-0007
b		bco	-0914	-0915	-0012	-0013	-0017
y	TiCN 10° Flat Surfaces	fab	-0744	-0745	-0442	-0443	-0447
yb		bco	-0854	-0855	-0452	-0453	-0457
x	TiN 30° Uneven Spec	fab	-0148	-0150	-0142	-0133	-0105
xb		bco	-0182	-0184	-0143	-0131	-0104

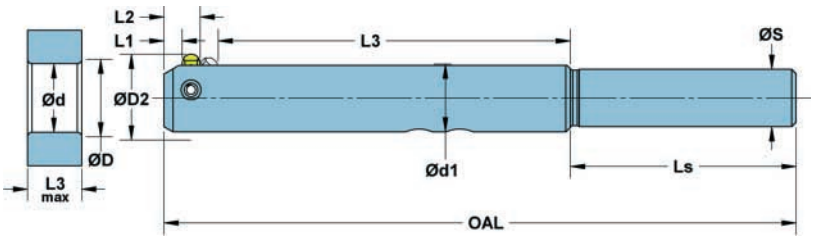
Use standard 20° blades for most applications.
Use 10° blades for flat surfaces for improved cutting edge strength.
Only use 30° for extremely uneven surfaces (from 15° to 30° slopes) because the cutting edge strength is reduced.

Spare Parts:

	1	2	3	4	5*	6						
	Roll Pin	Retainer Block	Screw	Assembly Pin	Retainer Pin	W	H	S	Z	Z1	Z2	Z3
	GH-C-E-	GH-C-E-	GH-H-S-	GH-C-V-	GH-H-S-	Spring GH-C-E-						
COFA4	-0819			-0206	-0902	-0342	-0343	-0344	-0345	-0346		
COFA5	-0820			-0211	-0902	-0352	-0353	-0354	-0355	-0356		
COFA6	-0811	-0812	-0803	-0126		-0321	-0322	-0323	-0324	-0325	-0326	-0327
COFA8	-0810	-0808	-0517	-0111		-0331	-0332	-0333	-0334	-0335	-0336	-0337
COFA12	-0801	-0800	-0530	-0100		-0361	-0362	-0363	-0364	-0365	-0366	-0367

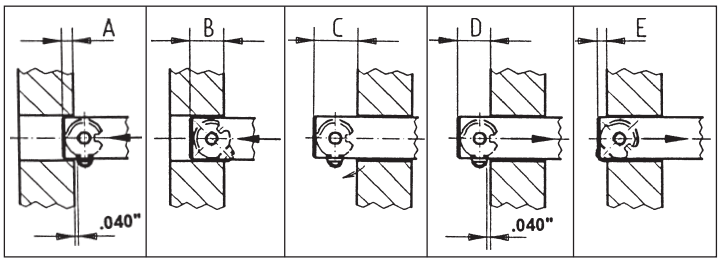


* The COFA4 and COFA5 tools use the retainer pin to secure the spring.



	COFA4	COFA5	COFA6	COFA8	COFA12
ØS	Ø6mm	Ø6mm	Ø1/4"	Ø 5/16"	Ø1/2"
OAL	**70** *2.756*	**75.5** *2.972*	**100** *3.937*	**120** *4.724*	**140** *5.512*
L1	**3.05** *.120*	**3.8** *.149*	**2** *.079*	**2.5** *.098*	**4** *.157*
L2	**4.35** *.171*	**5.4** *.213*	**4** *.157*	**5.5** *.217*	**8** *.315*
L3	**28** *1.102*	**32.6** *1.283*	**56** *2.205*	**74** *2.913*	**81** *3.189*
Ls	**36** *1.417*	**36** *1.417*	**38** *1.496*	**38** *1.496*	**47** *1.850*
ØD2	Ød+1.2	Ød+1.6	Ød+1.9	Ød+2.7	Ød+3.8
Ød1	Ød min-0.1 *(.004")*		Ød min-0.2 *(.008")*		

Programming Information



	COFA4	COFA5	COFA6	COFA8	COFA12
A	**2** *.079*	**2.8** *.110*	**1** *.039*	**1.5** *.059*	**3** *.118*
B	**5.5** *.217*	**7** *.276*	**5.5** *.217*	**7** *.276*	**10** *.394*
C	**5.5** *.217*	**6.9** *.272*	**6** *.236*	**8** *.315*	**12** *.472*
D	**5.3** *.209*	**6.4** *.252*	**5** *.197*	**6.5** *.256*	**9** *.354*
E	**1.8** *.071*	**2.2** *.087*	**0.5** *.020*	**0** *0*	**2** *.079*

Feed:	0.006"-0.014" IPR. Depending upon the material and machine rigidity, the feed rate can be increased

Speed:	Typical Material	bhn	Flat surface	Uneven surface
SFM	aluminum	30-180	160-400	120-200
	iron	180	90-260	50-130
	low carbon steel	100-200	190-340	120-160
	med carbon steel	125-250	120-240	90-130
	stainless steel	140-250	60-140	40-90
	Cast steel	200	110-240	90-150
	Titanium		20-80	20-35
	Nickel alloys	220-310	20-80	15-30

Use slower speeds as the part geometry becomes more uneven. COFA tools are not intended to be used on threaded holes or interrupted cuts. To change edge break size ØD choose a larger or smaller tool.

Common Drill Diameter	Min Hole Ød mm/inch	Approx. ØD Cutting	ORDER NUMBER
	Ød	**ØD**	**Series 8**
8.0mm	**8.0** *.315*	**9.0** *.354*	COFA8-315-□
	8.2 *.323*	**9.2** *.362*	COFA8-323-□
	8.4 *.331*	**9.4** *.370*	COFA8-331-□
11/32"	**8.6** *.339*	**9.6** *.378*	COFA8-339-□
	8.8 *.346*	**9.8** *.386*	COFA8-346-□
9.0mm	**9.0** *.354*	**10.0** *.394*	COFA8-354-□
	9.2 *.362*	**10.2** *.402*	COFA8-362-□
3/8"	**9.4** *.370*	**10.4** *.409*	COFA8-370-□
	9.6 *.378*	**10.6** *.417*	COFA8-378-□
	9.8 *.386*	**10.8** *.425*	COFA8-386-□
10.0mm	**10.0** *.394*	**11.0** *.433*	COFA8-394-□
	10.2 *.402*	**11.2** *.441*	COFA8-402-□
	10.4 *.409*	**11.4** *.449*	COFA8-409-□
	10.6 *.417*	**11.6** *.457*	COFA8-417-□
	10.8 *.425*	**11.8** *.465*	COFA8-425-□
7/16"	**11.0** *.433*	**12.0** *.473*	COFA8-433-□
	11.2 *.441*	**12.2** *.480*	COFA8-441-□
	11.4 *.449*	**12.4** *.488*	COFA8-449-□
	11.6 *.457*	**12.6** *.496*	COFA8-457-□
	11.8 *.465*	**12.8** *.504*	COFA8-465-□
12.0mm	**12.0** *.473*	**13.0** *.512*	COFA8-473-□
	12.2 *.480*	**13.2** *.520*	COFA8-480-□
	Ød	**ØD**	**Series 12**
1/2"	**12.4** *.488*	**13.8** *.543*	COFA12-488-□
	12.8 *.504*	**14.2** *.559*	COFA12-504-□
	13.2 *.520*	**14.6** *.575*	COFA12-520-□
	13.6 *.536*	**15.0** *.591*	COFA12-536-□
9/16"	**14.0** *.551*	**15.4** *.606*	COFA12-551-□
	14.4 *.567*	**15.8** *.622*	COFA12-567-□
15.0mm	**14.8** *.583*	**16.2** *.638*	COFA12-583-□
	15.2 *.599*	**16.6** *.654*	COFA12-599-□
5/8"	**15.6** *.614*	**17.0** *.669*	COFA12-614-□
	16.0 *.630*	**17.4** *.685*	COFA12-630-□
	16.4 *.646*	**17.8** *.701*	COFA12-646-□
	16.8 *.662*	**18.2** *.717*	COFA12-662-□
11/16"	**17.2** *.677*	**18.6** *.732*	COFA12-677-□
	17.6 *.693*	**19.0** *.748*	COFA12-693-□
18.0mm	**18.0** *.709*	**19.4** *.764*	COFA12-709-□
	18.4 *.725*	**19.8** *.780*	COFA12-725-□
3/4"	**18.8** *.740*	**20.2** *.795*	COFA12-740-□
	19.2 *.756*	**20.6** *.811*	COFA12-756-□
	19.6 *.772*	**21.0** *.827*	COFA12-772-□
20.0mm	**20.0** *.787*	**21.4** *.843*	COFA12-788-□

Tools from 21mm to 41mm are available from stock. Visit www.heuletool.com for details of these tools and the COFA cassette for even larger holes.

HEULE
HEULE
HEULE

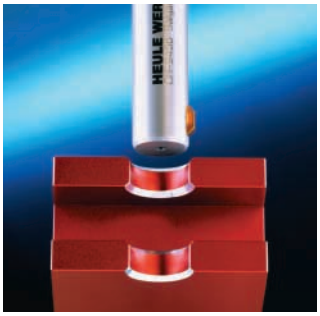
TOOL CORPORATION

Heule Tooling Systems

HEULE manufactures cutting tools of the highest quality and precision consistent with Swiss craftsmanship for use in the machine tools of some of the world's largest manufactures; and the smallest machine shops.

CŌFA

Universal deburring tool for even deburring on uneven surface



SNAP

Simple and economical front and back deburring tool

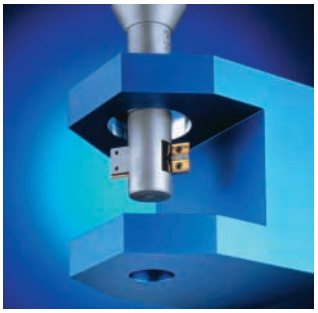
SOLO

Reliable automatic front and back counterboring and spotface tool

Combi

Combine the latest technology for producing holes with our deburring and chamfering system

P r o d u c t L i n e

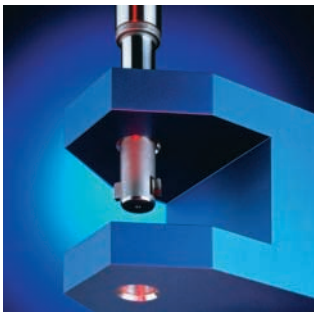


GH-Z/E

Automatic front and back spotfacing systems

GH-K

Precision, chatter-free countersinks



DĒFA

Adjustable front and back chamfering tool

Let Heule technology solve your finishing problems - call today.

Heule Tool Corporation
4722 A Interstate Drive
Cincinnati, Ohio 45246

Tel: (513) 860-9900
Fax: (513) 860-9992
Email: *info@heuletool.com*
www.heuletool.com