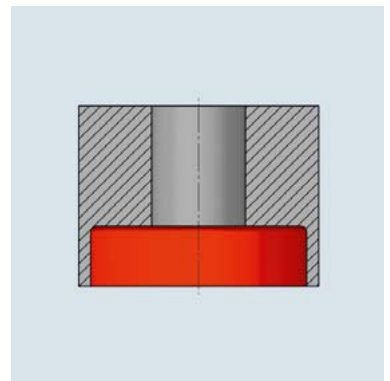
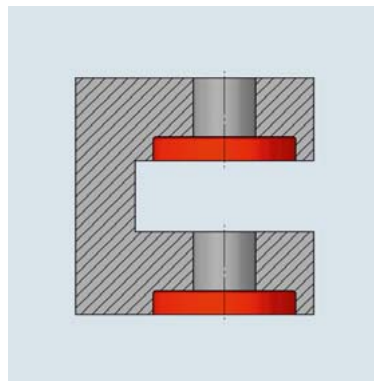


BSF

Competitive back spotfacing and counterboring tool
for counterbores up to $2.3 \times d$.



Index of contents

1	Tool description	Page 2
2	Range of use	Page 2
3	Function	Page 3
4	Requirement machine	Page 3
5	Programming	Page 4
6	Cutting data	Page 5
7	Blade change	Page 5
8	Maintenance	Page 5
9	Application form for inquiry	Page 6

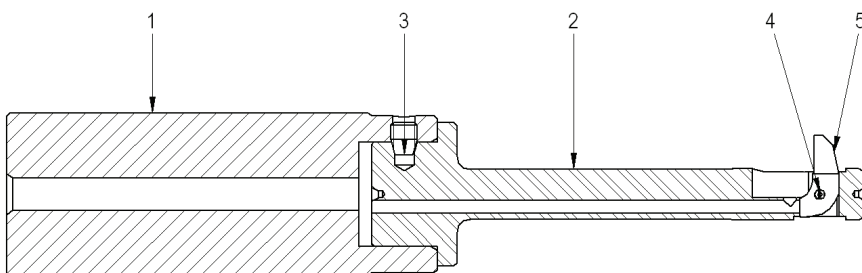
1 Tool description

BSF (Back Spot Facer) is an economical backwards counter boring tool. It allows to machine spot faces and counter bores, for example for screw heads, without turning the work piece. This means that the machining is made from the same side as the bore is drilled. It is easy to machine spot faces or counter bores between the forks of yokes. The BSF is designed for CNC machining especially and immediately ready for operation.

The BSF tool functions without anti-rotation device, change of spindle or contact mechanism. The blade expands by activating the spindle on an initial speed. It pops out by centrifugal force of its own weight. The blade retracts by coolant pressure.

Chip guiding and chip removing have been focused especially during the development period. The tool and the blade have special coolant pipes and chip guiding geometries. They flush the blade room, the blade window and the blade with coolant continuously. This keeps the whole sections clean and takes care for an optimal chip discharge.

The tool is built very easy and robust. The carbide blades are coated depending on the application. The blade is easy exchangeable when using the included assembly pin.

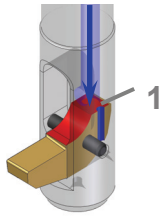


- 1 Shank
- 2 Blade housing
- 3 Clamping screw
- 4 Split pin
- 5 Blade

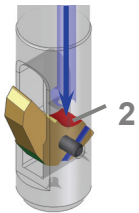
2 Range of use

Bore diameter	min $\varnothing 6$, max $\varnothing 20$
Counter bore diameter	min $1.5x d$, max $2.3x d$
Counter bore depth	max $2x d$
Working length	max $5x d$
Counter bore tolerance	Diameter ± 0.1
	Parallelism ± 0.05
Material	Up to 800N/mm^2

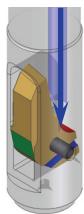
3 Function



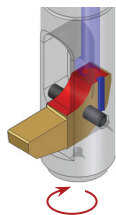
The blade starts to retract while the coolant jet is directed at the thrust face (1) through the main coolant bore



The thrust face (1) is turning away while the blade is retracting and the coolant jet is directed at the blade curve (2).



The coolant jet keeps the blade in the retracted position independent of speeding up in axial direction (Z-axis).



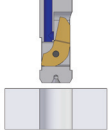
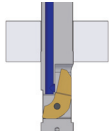
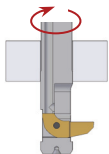
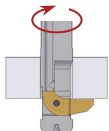
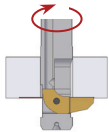
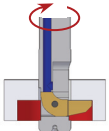
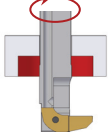
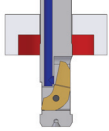
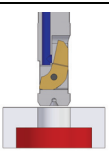
The blade expands immediately after turning on the spindle on initial speed.

4 Requirement machine

Machine	Clamping device cylindrical or weldon
	Clamping device without coolant pressure loss
	CNC controlled axis and spindle
	Speed min 2'000rpm programmable
Coolant	Internal coolant through spindle, min 25bar
	Coolant supply on/off programmable
	Clean, filtered coolant water
	Coolant type water-in-oil emulsion
Clamping system for work piece	<p>It is important to discharge the chips out of the work piece clamping system. The flush mechanism of the BSF can be used for support.</p> <p>Use interrupted feed while machining long chipping material to receive short chips.</p>

5 Programming

Examples for Mori Seiki NV 5000, thickness of work piece 10mm

	G0 Z2 M5 M88 G4X1	Drive the tool 2mm in front of the work piece after tool change. Stop the spindle (speed 0). Turn on the internal coolant. Take 1s dwell time. The blade is retracted now.
	G0Z-27	Go with rapid feed through the bore to position X while spindle is stopped and internal coolant is tuned on.
	M89 S2000M3 G4X1	Turn off internal coolant. Turn on the spindle at the initial speed (2'000rpm). Take 1s dwell time. The blade is expanded now.
	S1000M3 M8 G1Z-17F2000	Reduce the spindle speed to working speed. Turn on external coolant. Go with rapid feed 0.1mm in front of the bore edge.
	G1-Z-16.75F50	Machine the work piece backwards with working speed and working feed until the blade is in full cut for approx. 0.1-0.2mm (no interrupted cut anymore) while internal coolant is turned off and external coolant is turned on.
	G1Z-12M88	Turn on internal coolant. Machine the counter bore backwards to the final dimension while using working speed and working feed.
	M89 G1Z-27F2000	Turn off internal coolant when reaching the depth of the counter bore. Go out with rapid feed to the position X.
	M9 M5 M88 G4X1	Turn off external coolant. Stop the spindle. Turn on internal coolant. Take 1s dwell time. The blade is retracted now.
	G0Z2 M89	Go with rapid feed out of the work piece while spindle is stopped and internal coolant is turned on. Turn off internal coolant

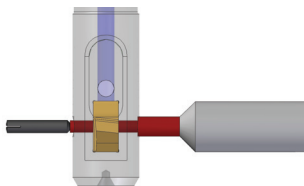
6 Cutting data

	Cutting Speed	Feed rate
Iron up to 600N/mm ²	50-70m/min	0.03mm/rev
Iron over 600N/mm ²	20-30m/min	0.02mm/rev
Aluminum	80-90m/min	0.05mm/rev

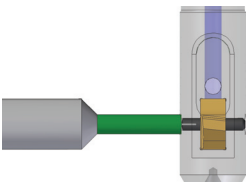
7 Blade change



The assembly pin is added to each tool. The assembly pin has to be used for assembling and disassembling the split pin and the blade. The side with step is used for disassembling the split pin.



The split pin must be disassembled for removing the blade. Place the assembly pin to the solid part of the split pin. Drive the assembly pin into the pin bore until it strikes against the blade housing. The split pin is now disassembled and the blade can be removed.



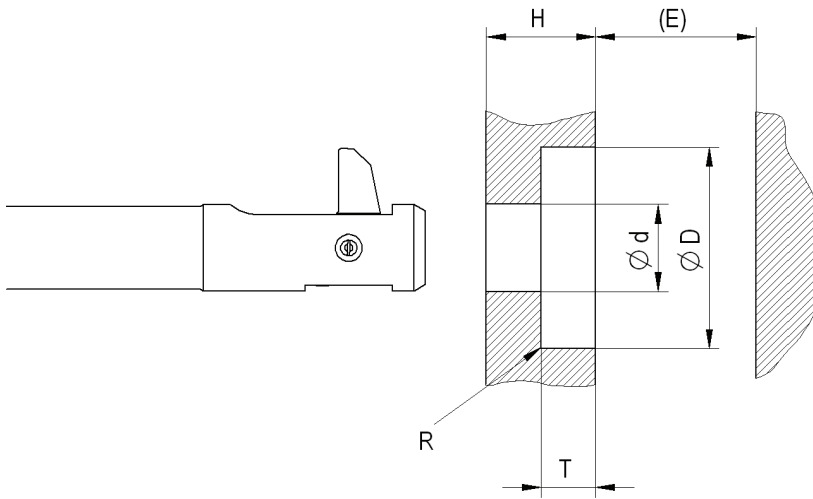
Place the new blade into the blade window. Put the split pin (solid part in front) into the pin bore. Place the second side of the assembly pin (without step) onto the split part of the split pin. Drive the assembly pin in until it strikes against the blade housing.

8 Maintenance

The blade has to expand independent (by own weight) when turning the tool upside down. Please disassemble the blade if this not happens. Check the blade and the blade window for pollution and damage.

Check the blade for free movement after longer stoppage. It is possible that the blade is sticking in the blade housing because of dried oil, coolant or other dirt.

9 Application form for inquiry



Work piece	Drawing	
	Material	
Bore	Diameter / Tolerance	d =
	Depth	H =
Counter bore	Diameter / Tolerance	D =
	Depth	T =
	Radius	R =
Clash condition	E =	
Tool holder		
Notes	<hr/> <hr/> <hr/> <hr/> <hr/>	
Customer data	Name	
	Address	
	Contact person	
	Telephone	
	Mail	
Agent data	Name	
	Contact person	

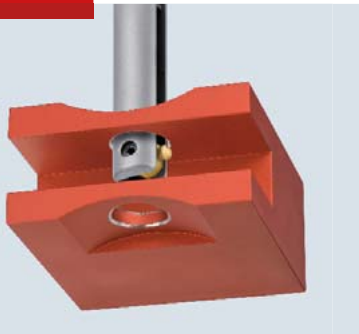


One Operation.

HEULE tools for front and back machining of bore edges in one single pass.

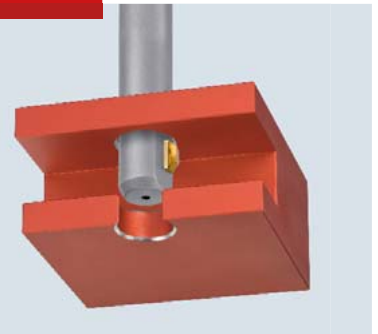
Deburring

- COFA
- SNAP



Chamfering

- SNAP
- GH-S
- DEFA



Countersinking

- SOLO
- GH-Z/E
- GH-K



Drilling

- VEX-P
- VEX-S



HEULE+
PRECISION TOOLS

HEULE WERKZEUG AG
Wegenstrasse 11/Postfach
9436 Balgach
Switzerland

Telefon +41 71 7263838
Telefax +41 71 7263839
info@heule.com
www.heule.com

HEULE TOOL CORPORATION
4722 A Interstate Drive
Cincinnati, Ohio 45246
USA

Phone +1 513 8609900
Fax +1 513 8609992
info@heuletool.com
www.heuletool.com

HEULE WERKZEUG AG
China Rep. Office
Room 1711, Gelunbu Plaza
No. 291 Guangyi Road
214000 Wuxi, Jiangsu
China

Phone +86 510 88882266
Fax +86 510 82797040
china@heule.com
www.heule.com