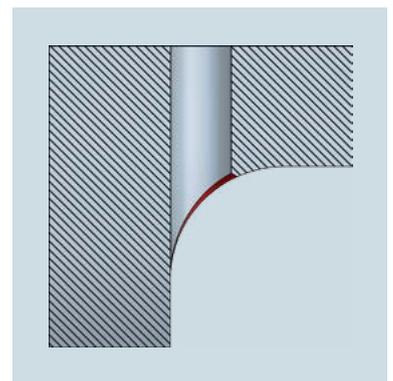
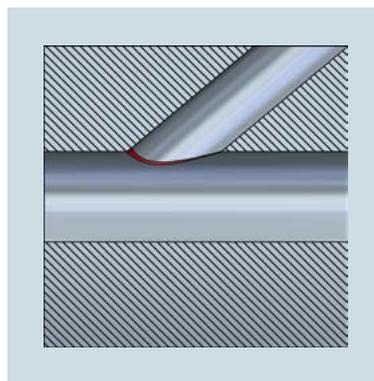
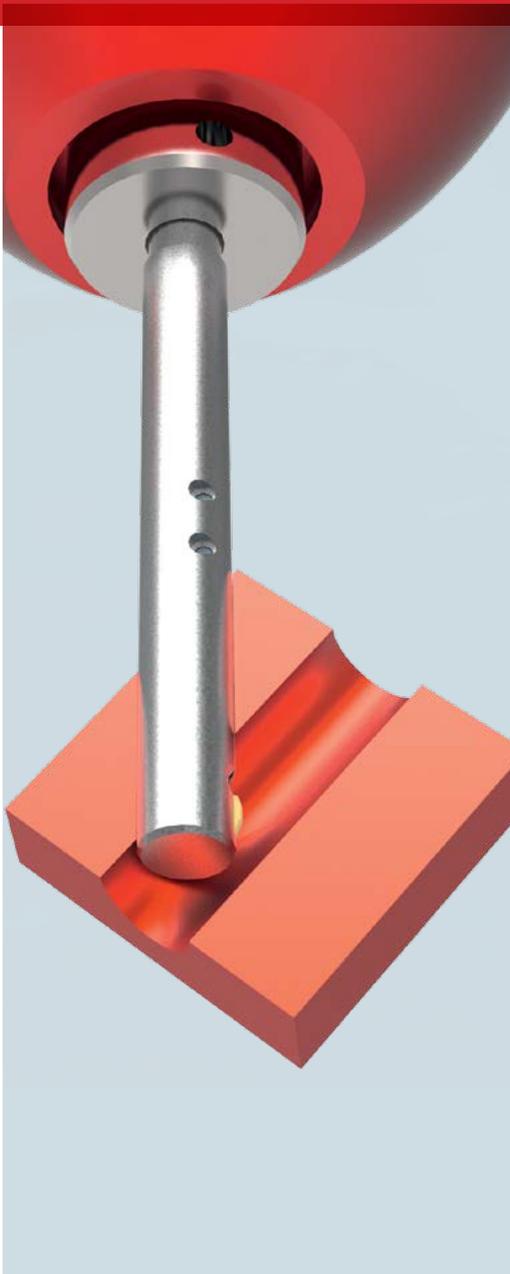


CBD

The unique deburring tool for oil bores
from $\varnothing 4.0$ bis $\varnothing 10.0$ mm.



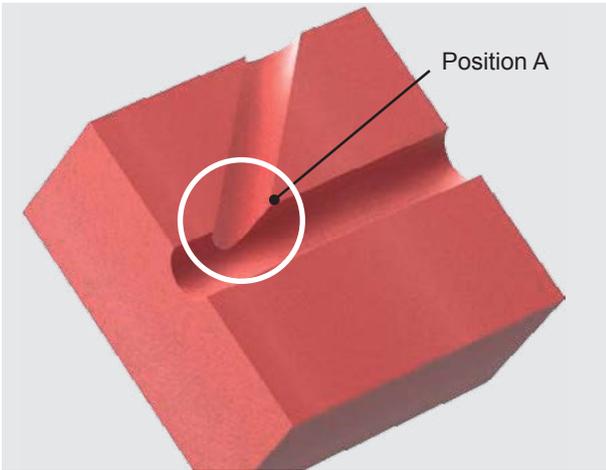


Image: Intersecting bores with minimal ratio of the main to the cross bore and flat penetration angle

The existing deburring tools are limited when it comes to deburr intersecting bores with a minimal ratio of the main to the cross bore or with a very flat penetration angle of the cross bore. They do not achieve a fully satisfying deburr result because of the shape of the intersection. In particular, the present systems regularly fail to remove the burr at position A thoroughly.

HEULE set the goal to close this gap and has developed the CBD **C**ross **B**ore **D**eburring tool. A new unique system that works 100% mechanically and that deburrs a 1:1 intersection by a chip making machining process. The defined cutting process ensures a complete edge break which results in a burr free bore edge.

Function principle of the CBD tool

Usually the rotation axis defines the working direction of a deburring tool whereas the longitudinal axis serves as feed direction (COFA principle). For the new concept (CBD principle), HEULE changed this working method. Now, the longitudinal axis serves as the working direction and the rotation axis works as an axial feed direction. The machining process is carried out through the cross bore into the main bore.

In this case, the bore intersection will be cut segment by segment by the blade. This offers the advantage that the blade can reach every point of the intersecting contour and that the burr will be removed including its root.

Blade function

When entering the cross bore the blade slides over the retract surface and moves into the tool body preloading the spring at the same time. When moving through the bore, the slide radius prevents the bore surface from being damaged. The tool overtravels the bore edge to be deburred and the blade is pushed back by the preloaded spring into its initial position.

During the reverse stroke the cutting edge of the blade removes a segment of the bore edge with the burr. The control surface is responsible that the blade slides back into the tool body. The tool body will then rotate by a defined angle (around its rotation axis) and the process will be repeated. This procedure continues until the complete circumference of the bore is free of burrs.

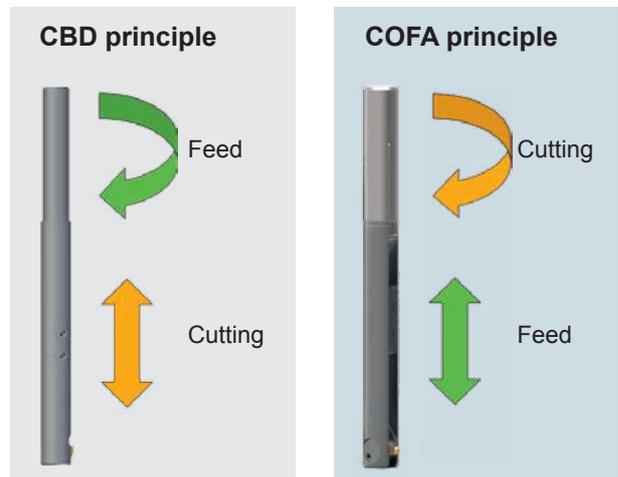
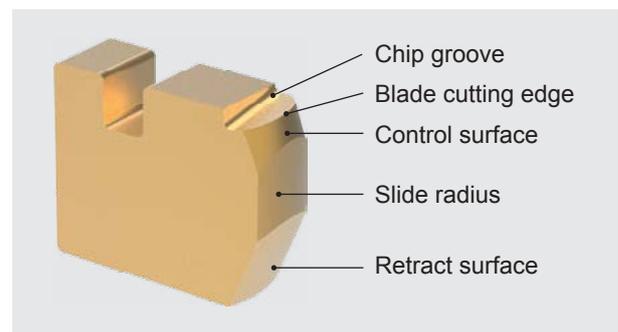


Image 1: - Stroke movement over the bore edge with the burr into the main bore 2 - Reverse stroke = cutting movement



Control unit

In order to achieve the necessary working speed and also to spare the machine tool itself, HEULE has designed a control unit. It generates the oscillating cutting movement as well as the rotating feed movement.

The stroke length and the feed are defined by the application. This means that each control unit is configured individually with standardized components according to the parameters of the application. An example: At a spindle speed of 600 rev/min the control unit generates 1200 strokes/min, respectively 20 strokes/sec and a feed of 10 rev/min.

The NC anti rotation device permits an automatic tool change. It has to be adapted to the machine tool herefor.

Tool

The tool is distinguished by its simple set-up. The spring is held loss protected in the tool body by two split pins. The spring controls the blade and pushes it back into the initial position while working.

The blade and the spring are applicable for different diameters. Only the tool body has to be chosen according to the bore diameter. For changing the blade the front split pin has to be removed to be able to swing out the spring.

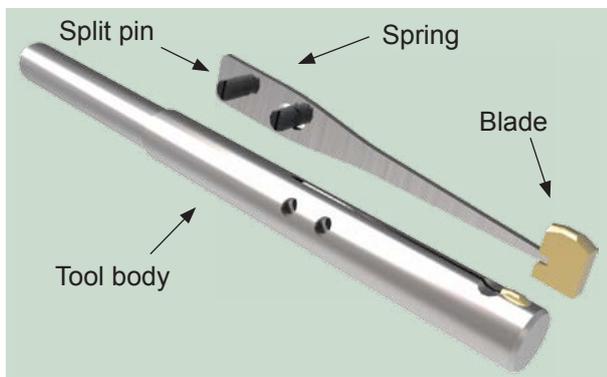


Image 2: - Replacing the carbide blade can be done manually and within no time.

Required application data by HEULE:

- Main bore-Ø including tolerance
- Cross bore-Ø including tolerance
- Bore depth
- Material
- Penetration angle
- Offset
- Distance anti rotation device
- Distance gauge line
- Production volume per year
- Cycle time
- Machine (NC / other)
- Applied solution today
- Particular requirements
- STEP drawing data



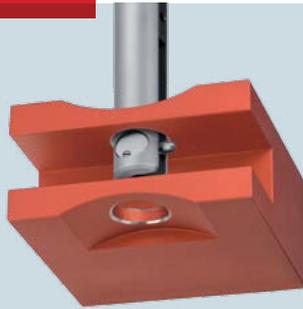


One Operation.

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

Deburring

- COFA
- SNAP



Chamfering

- SNAP
- GH-S
- DEFA



Countersinking

- BSF
- SOLO
- GH-Z/E



Drilling

- VEX-P
- VEX-S



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