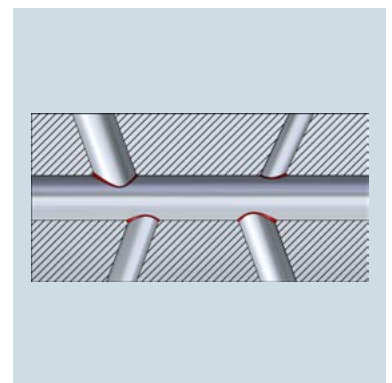
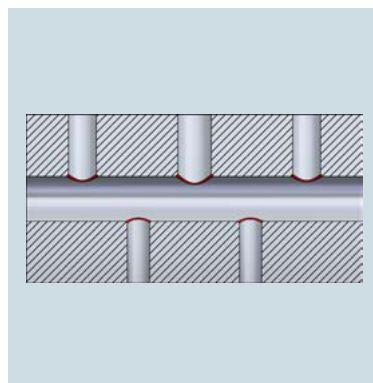
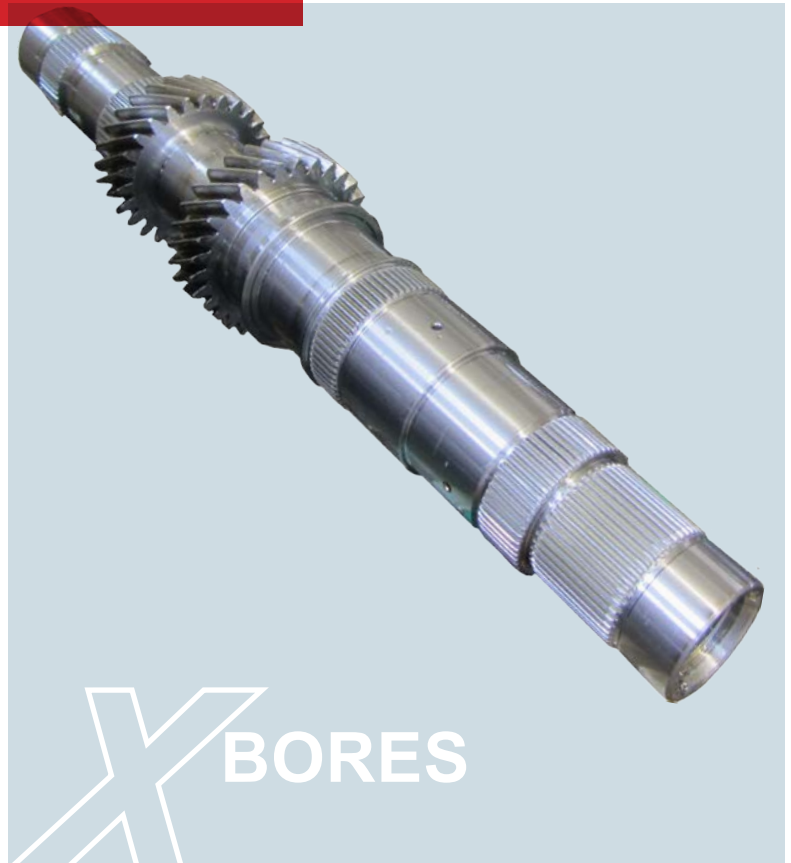
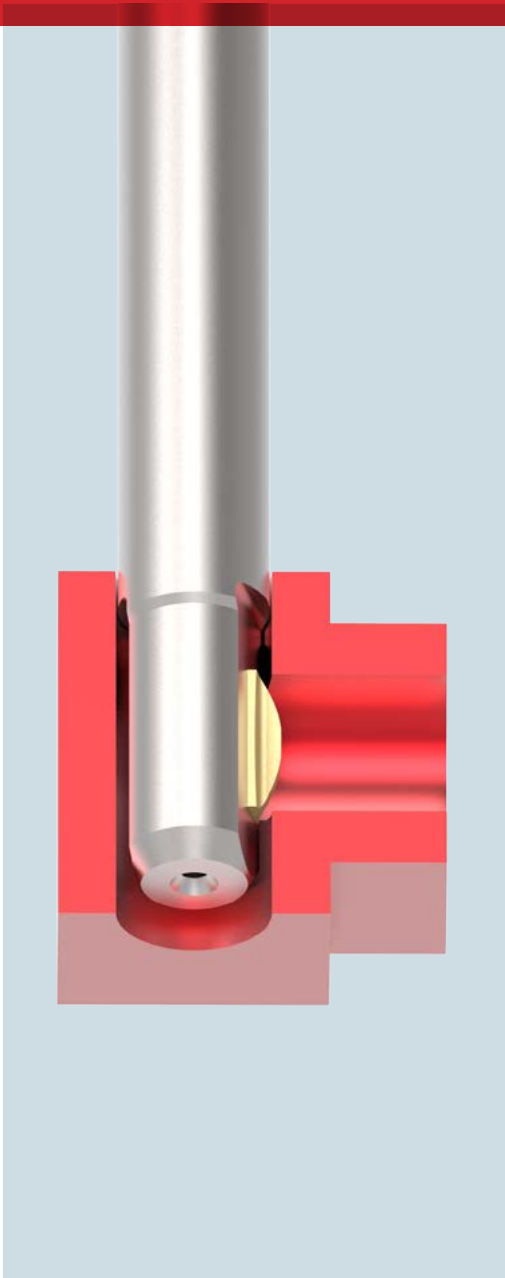


SNAP X

Deburring tool for main bores



With SNAP-X HEULE advances into uncharted technical territory that has been out of reach so far. This special tool penetrates by the main bore and deburrs the entering cross bores. In close cooperation with the customer, our R&D team examines the feasibility and develops a tailor-cut tool for the specific application.

The mainbore solution is based on the proven SNAP system. SNAP-X has been conceived for NC operation and for large production runs. The exchange of the blades is extremely simple and can be carried out by hand in no time.



Image 1: Process capable for large production runs - as an example, drive shafts for a manual gearbox machined on a transferline by SNAP-X.

Function principle and possible Applications

Setup and Function Principle

The radially supported and spring-loaded SNAP-X blade penetrates the cross bore in work feed and deburrs it, no matter what the diameter of the cross bore is. The especially ground blade fulfills its work while moving forward as well as backward where the direction of the spindle rotation is reversed.

When leaving the cross bore, the guiding edge of the SNAP-X blade moves it back into the tool body in a controlled manner. A especially designed gliding section prevents the main bore from being hurt.

Process Description

The tool blade is positioned in rapid feed in front of the cross bore to be deburred. In work feed forward and with work speed the edges of the intersection are being machined. With clockwise rotation all intersecting bores are deburred now in one single pass. In order to assure the best possible deburr result, the spindle rotation is switched to anti-clockwise rotation and all crossbores are machined a second time on the tools way out of the mainbore.

The tool body shows a recess in the most important cutting direction (feed direction). This prevents the burrs from being pushed down or bent into the cross bore in advance.

In general, extra long tools are usually assembled (multi-piece construction) and require an adequate guidance in the mainbore direction as well as a generously dimensioned chamfer. It is strongly recommended not to activate the tool/spindle without guidance.

Blade Function

The blade is built with a clockwise and an anti-clockwise working cutting edge. Its form is convex and adapted to the crossbore. It enters the crossbore to the extent limited by the geometry/radius of

the blade edge and the blade length. Given by the constellation of the two circle segments (crossbore and blade) the blade is able to work its way out continuously and at the same time, it carries out the deburring in a skinning way of cutting.

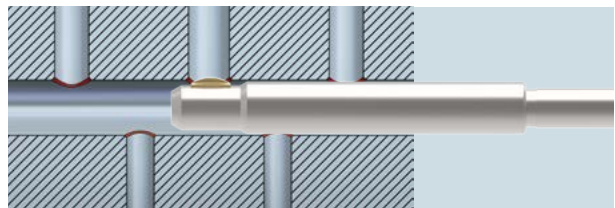


Image 2: Several cross bores are deburred in one single pass through the main bore.

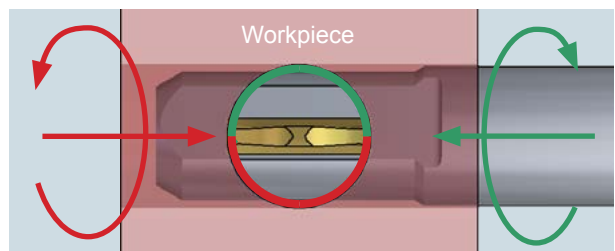
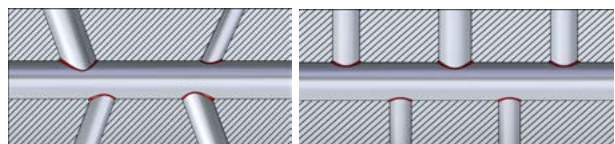


Image 3: The blade is conceived for forward and backward cutting. Before moving back out, the direction of the spindle rotation is changed to machine the bores a second time with the backward cutting side assuring the required process capability.

Scope of Applications

- Mainbores
- Intersecting bores in different diameters up to a ratio of close to 1:1
- Several crossbores lead into a mainbore in different angles and diameters.



The tool is characterised by its simple design. It consists of very few components with one screw only. The blade is kept movable in the tool body via a control bolt held under spring pressure. The blade has a special ramp-shaped recess where the control bolt engages in. While machining, the bolt glides up the ramp and increases the pressure on the blade. This brings the blade back to the starting position when exiting the bore again.

The blade can be exchanged by hand within no time and without any tools.

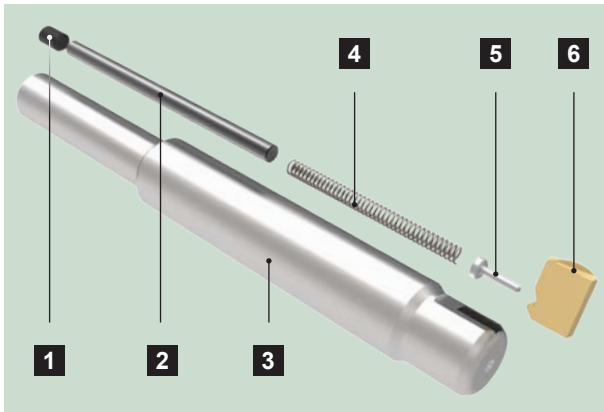
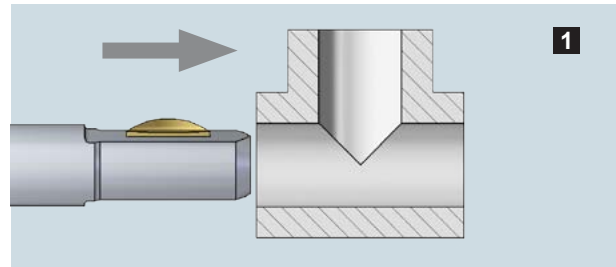


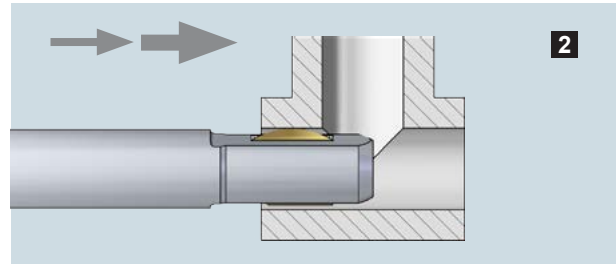
Image 4: 1-Set screw, 2-Distance pin, 3-Tool body, 4-Spring, 5-Control bolt, 6-Blade

Information / data required by HEULE for the feasibility study of your application:

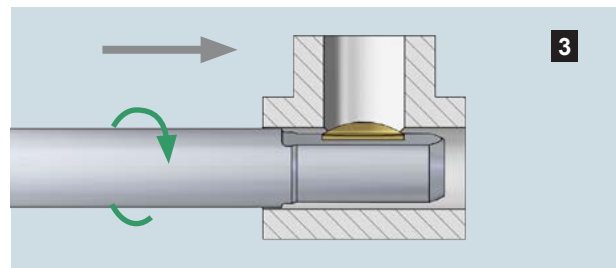
- Main bore-Ø including tolerance
- Cross bore-Ø including tolerance
- Position of the cross bore in relation to the main bore (drawing or model)
- Working length
- Material
- Shank-Ø (possibly with special shank length)
- Interfering edges (Drawing of machine situation and clamping situation)
- Required deburring quality (i.e.residual burr)
- Production volume per year
- Cycle time deburring
- Machine (NC / others / cooling)
- Particular requirements
- STEP drawing



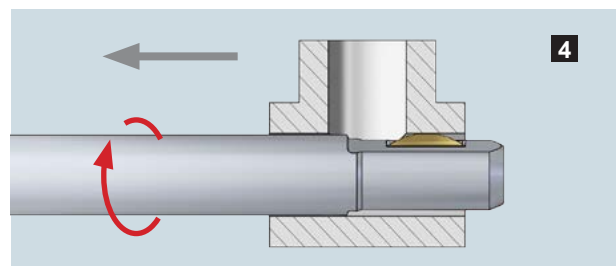
First, in rapid traverse and with the spindle stopped, move the tool head 0.5 mm ahead of the main bore entrance.



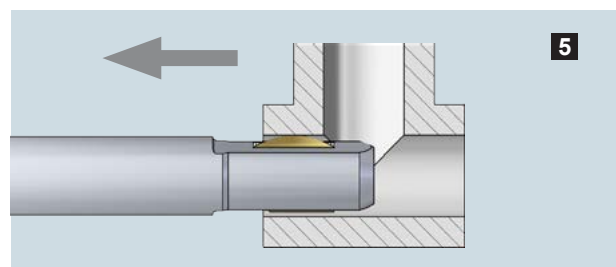
In working feed, insert the tool/blade into the main bore. Then, continue in rapid traverse to the first cross bore. Stop immediately ahead of the bore.



Machine the cross bore in working feed and the spindle rotating clockwise. Once finished, move in rapid traverse and the spindle still rotating to the next cross bore.



After the last cross bore, change the rotation direction of the spindle to anti-clockwise and repeat all operation procedures on the way back.



Once finished machining the last cross bore, stop the spindle rotation and move out of the main bore in rapid traverse.

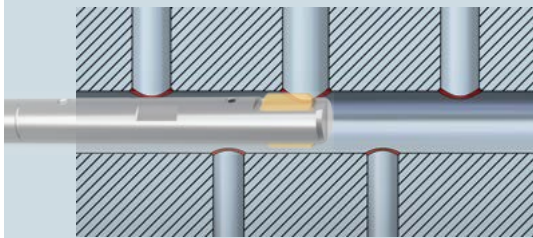


One Operation.

X-Bores – Deburring of Cross Bores

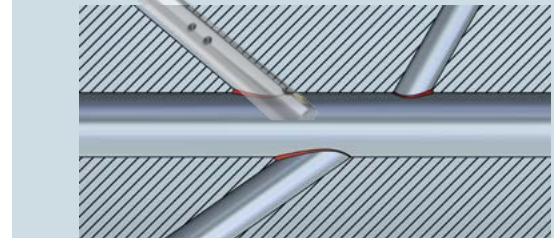
Main Bores

■ SNAP-X



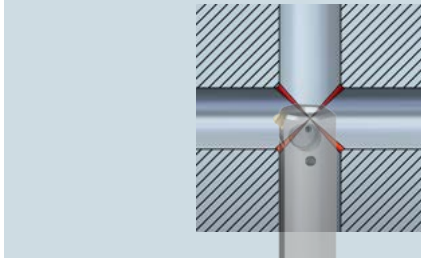
Oil Bores

■ CBD



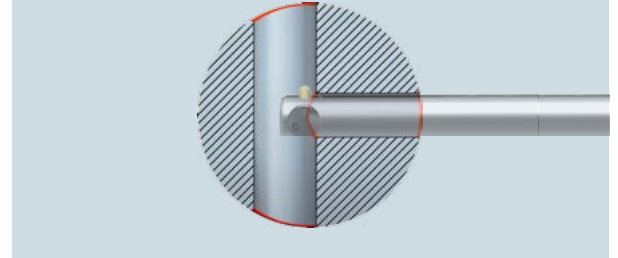
1:1 Bores

■ COFA-X



Sloped Bores

■ COFA



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