Hydraulic Valve Body

Intelligent tooling solutions

Edition 1

Systematic optimisation in your production

Partnership

Good cooperation has more than one winner. We see our customers as partners because efficient and profitable production is the best basis for long-term success for our customers.

A different kind of supplier

As a supplier, our main job is to improve your competitiveness. We analyse and optimise your key processes so that together we can make sure that your production is as effective as possible.

We advise you on tool investments as well as on the introduction of new products.

Our service centres world-wide makes it possible to deliver at short notice and we are able to offer on-site service.

Hole Overview

HYDRAULIC VALVE BODY

Cutting tool solutions for hydraulic valve bodies

Hydraulic valve bodies in many varieties are one of the most widespread industrial components in cast iron. The majority of manufacturers of these components often face the same challenges in the machining process.

Our intensive research and development continuously improve the tooling solutions for the benefit of our customers keeping the unit costs at a minimum.

Call our consultants

We look forward to telling you more about the latest technological developments.

Call us on: +45 97 14 14 11

High-quality products

European Production

Our products are made in high-standard ISO 9001 and ISO 14001 certified production facilities around Europe.

We believe that we have a hugh responsability when it comes to protecting the enviroment by using the cleanest production methods and machines possible to reduce our carbon foot print and protecting the nature around us.

Making sure our working enviroment is at the very top is also important to us in order to keep and support our great employees making sure to keep the know-how in the company.

High-quality materials

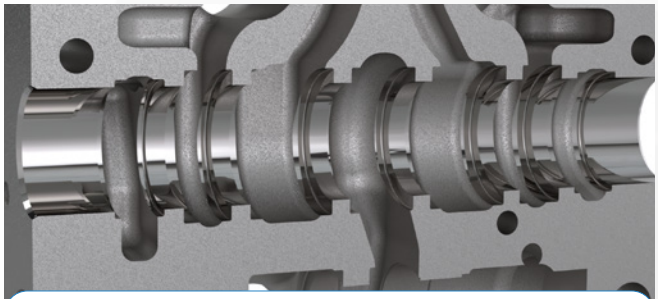
We only use the best materials possible for our products. Only that way can we make sure you get long lasting high quality products.

Component

The hydraulic valve body component is an amazing piece of engineering. It can be used in many combinations and places and has been used on many construction machines around the world.

The manufacturing process of the hydraulic valve body can however, be a demanding and difficult task if the right tools are not used.

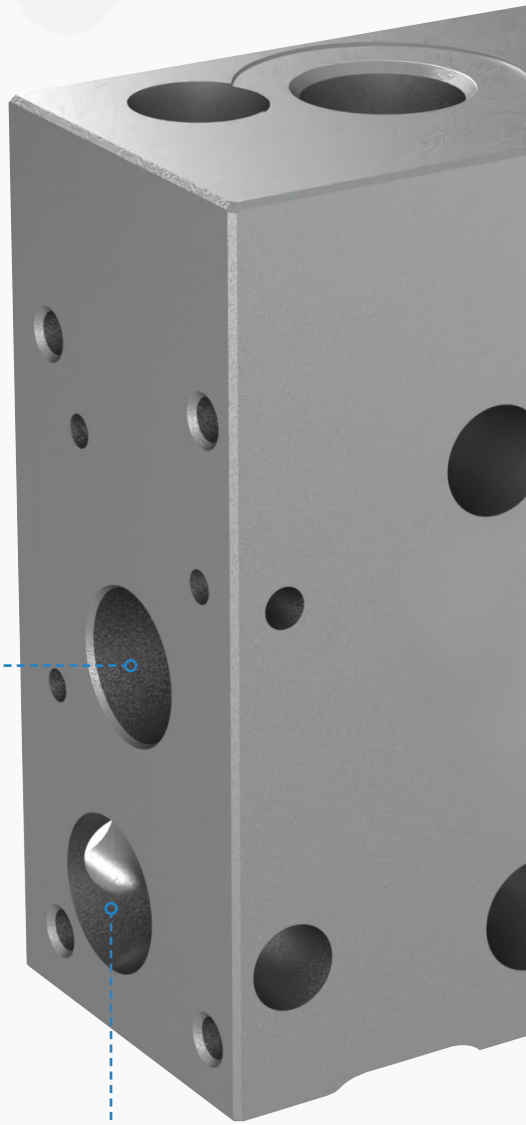
Hole Types

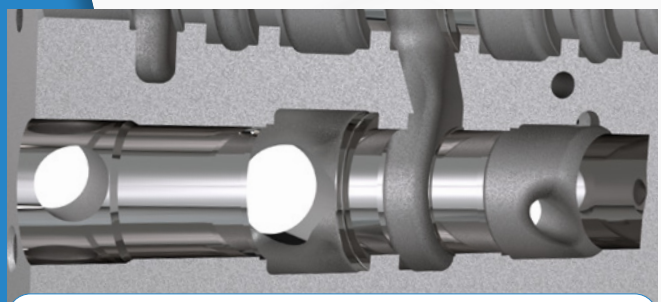


1. Spool Bore Hole

Challenges:

- The bore by the rough pass reamer creates rings that need to be removed manually
- This can be a very time consuming grooving operation





2. Compensator Hole

Challenges:

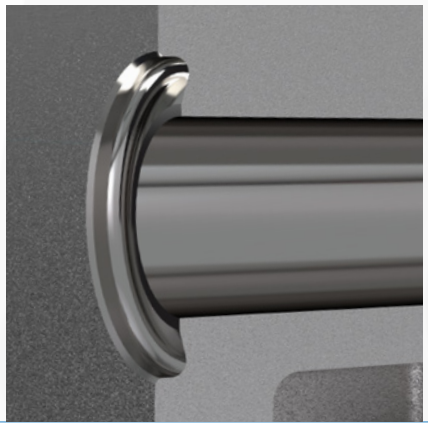
- The bore by the rough pass reamer creates rings that need to be removed manually

3. Relief Valve Hole

Challenges:

- Very strict surface demands
- The requirement for tight tolerances

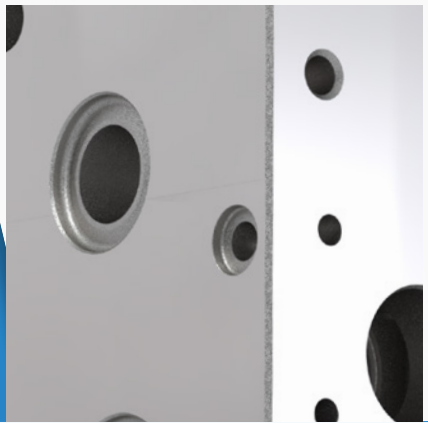
Hole types *(continued)*



4. O-ring Hole

Challenges:

- Profile out of tolerance
- Vibration marks on surface



5. Surface Milling

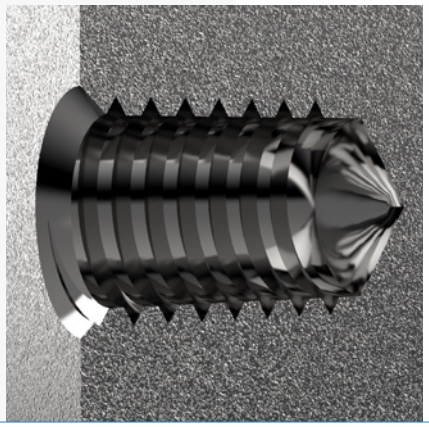
Challenges:

- The surface must be extremely smooth
- It can be a time consuming task

6. Port Hole

Challenges:

- Achieving surface finish
- Vibration marks on spot face



7. Thread Hole

Challenges:

- Combining right diameter and chamfering

1. Spool Bore Hole

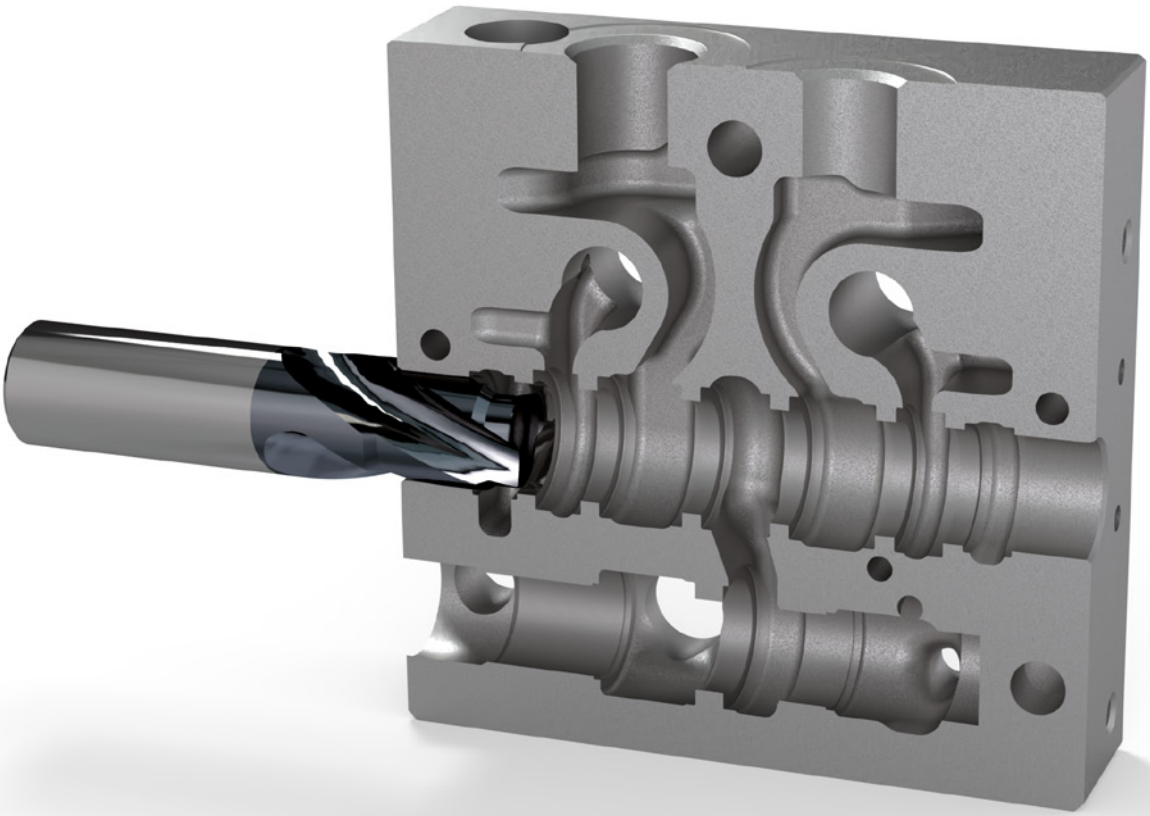
RING-FREE MACHINING

Machining spool bore holes in hydraulic valve bodies, hydraulic pumps etc. in cast iron often involves a number of challenges in the machining process.

Our self-developed 3-way solution which consists of pilot drill, ring-free reamer and UM grooving land tool has the following benefits:

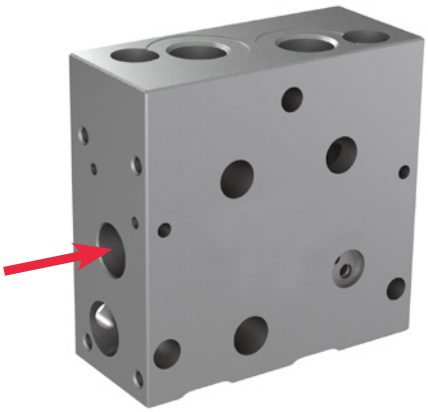
- A straight hole free of rings
- Excellent size consistency
- Huge cycle-time reduction normally up to 50%
- Optimised tolerances

Watch video



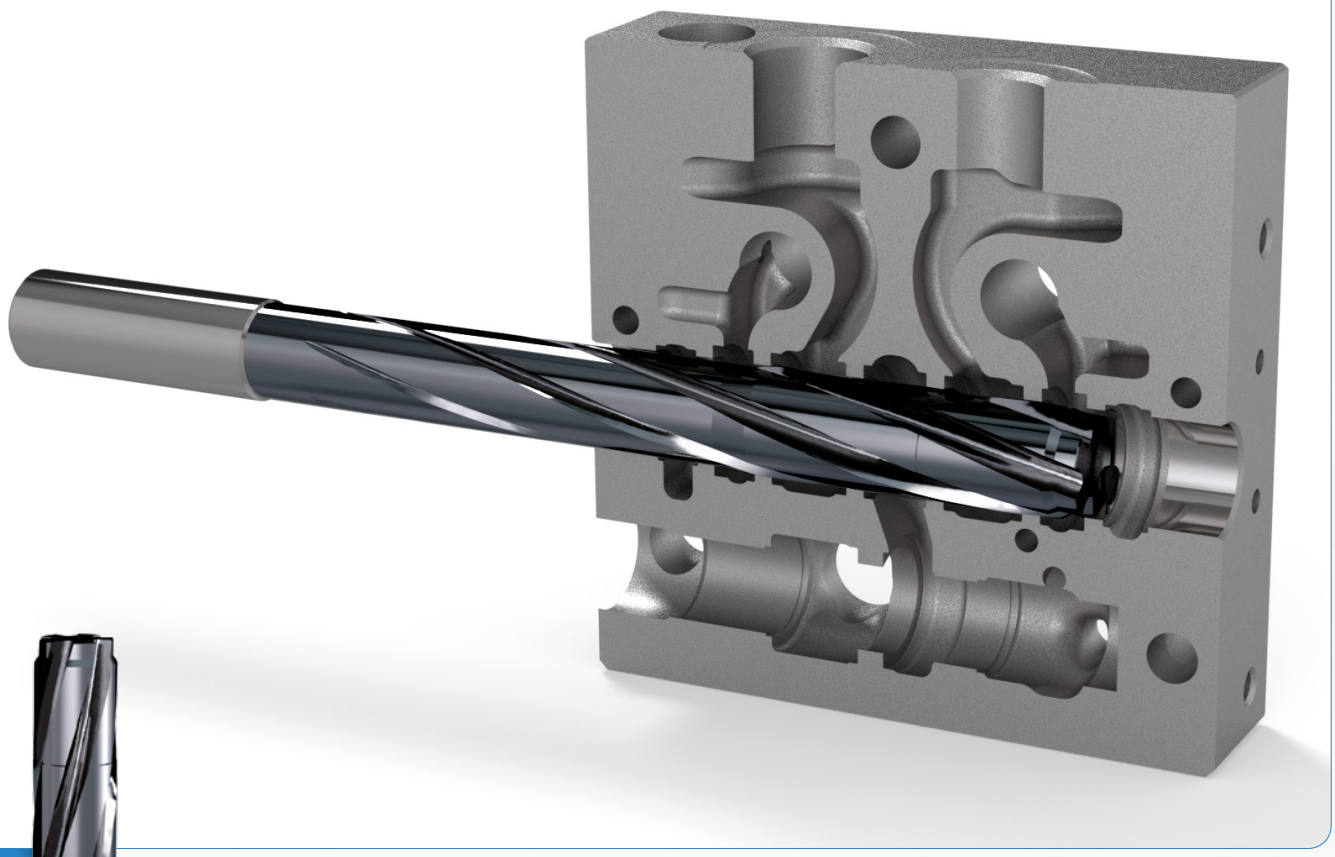
1. Pilot Drill

- Pre-machine for further precision
- Spotface can be added
- Different steps for threads possible to reduce the total machine time



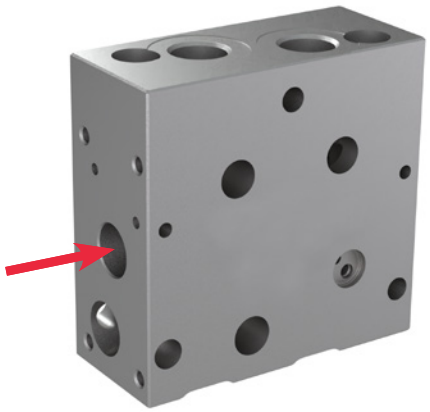
1. Spool Bore Hole (continued)

RING-FREE MACHINING



2. Ring-Free Reamer

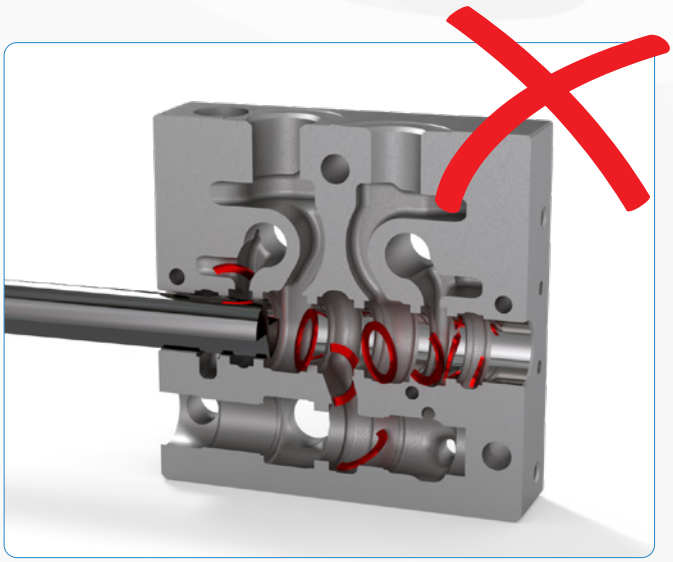
- Eliminates any rings during reaming, so no manual handling getting the rings out is neccesary which can be very time consuming/difficult work
- The tiny chips are flushed out at the end leaving the workpiece ready for the grooving land tool



Ring-Free Reamer

THE CHALLENGE OF THE RINGS

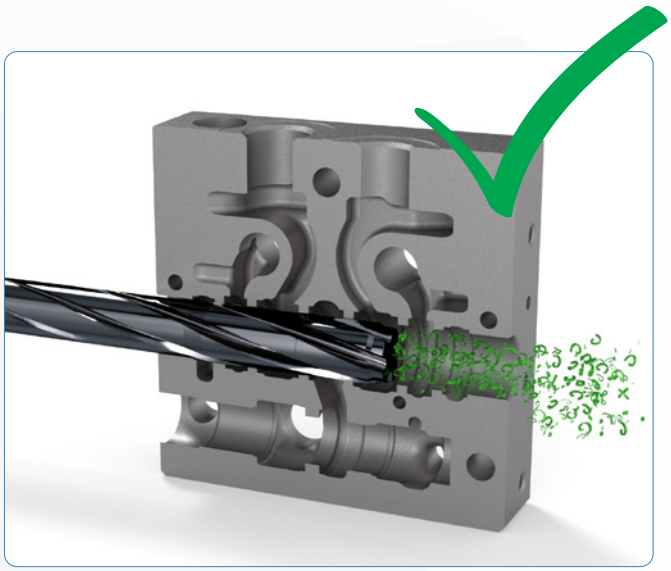
EXPLAINED



Straight fluted reamer

The conventional method

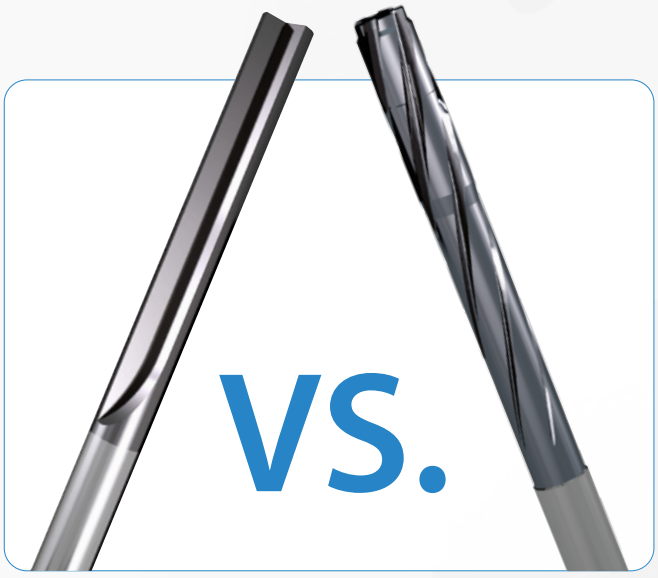
One of the most common problems when machining spool bore holes is that the bore by the rough pass reamer creates rings that get stuck in the component. The following manual removal of these rings prior to finishing/assembly is a time consuming and costly process.
Our patented process strategy and technology can help you eliminate the rings, thus resulting in considerable savings.

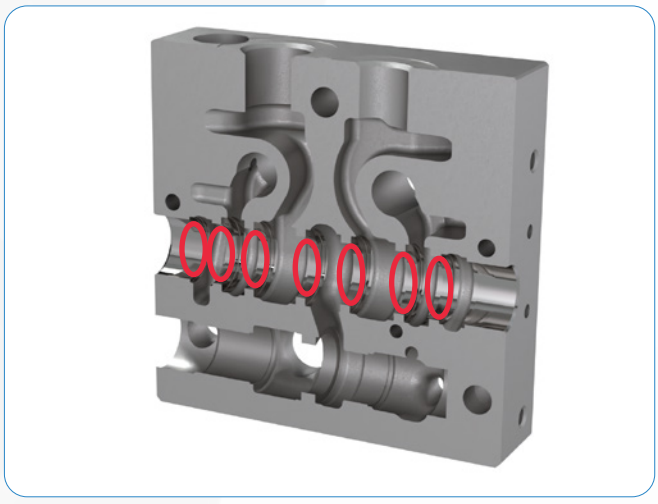


Ring-free reamer

Part of our self-developed 3- way process

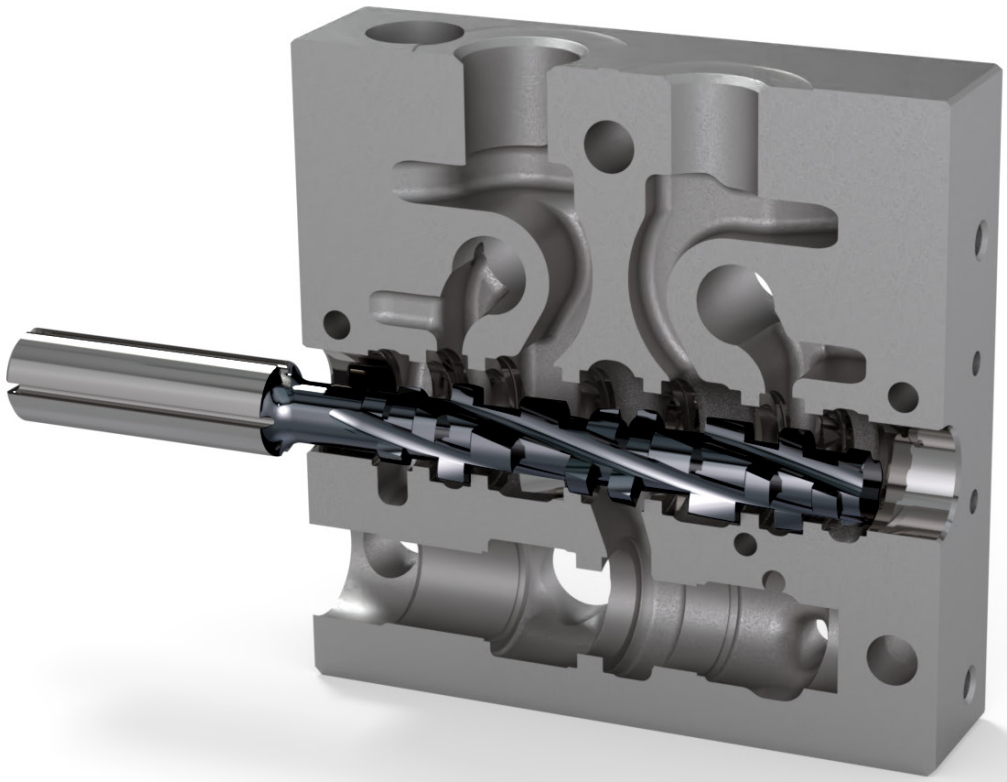
- Get rid of rings in the spool bore hole
- Avoid manually removal of the rings
- Save a lot of time and costs





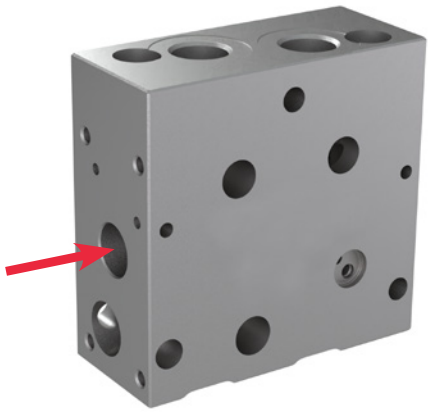
1. Spool Bore Hole (continued)

RING-FREE MACHINING



3. UM Grooving Land Tool

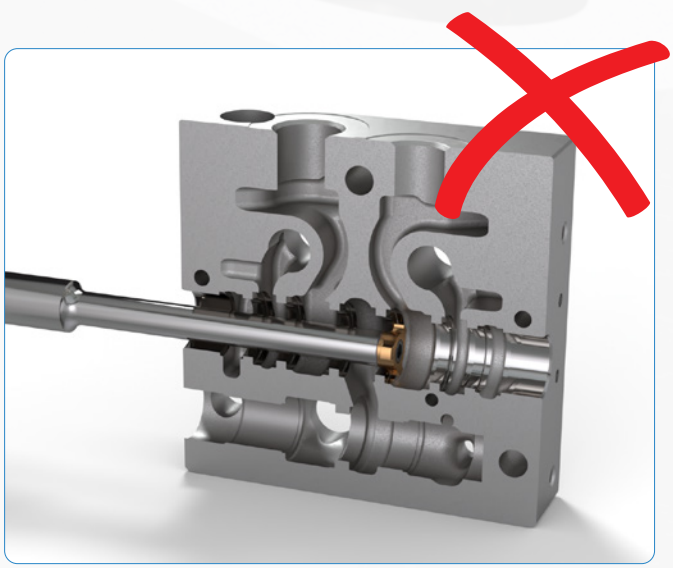
- One-shot solution which can reduce the machine time by as much as 70%
- Tight tolerances are built into the tool for more precise machining
- Designed to avoid vibrations, making it more reliable
- Can be used in cast iron, aluminium and steel materials



UM Grooving Land Tool

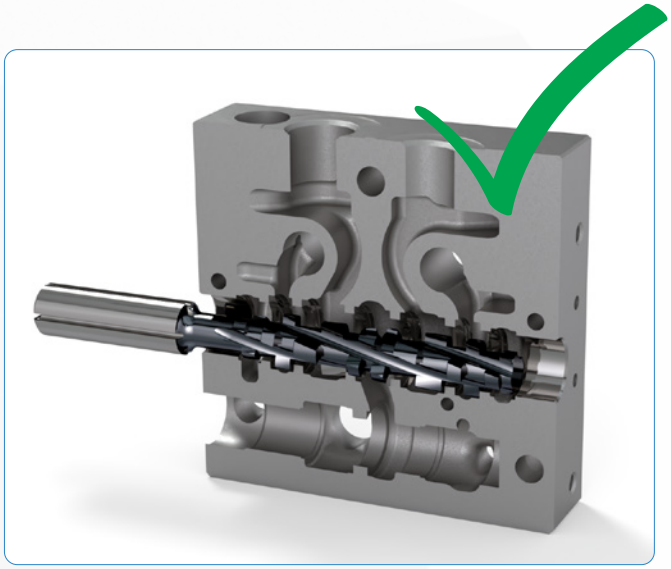
THE FAST ONE-SHOT SOLUTION

EXPLAINED



Standard Groove Mill

The conventional method

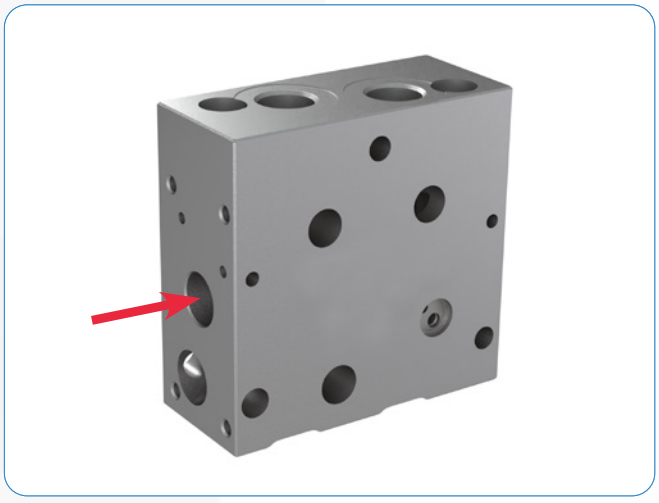


UM Grooving Land Tool

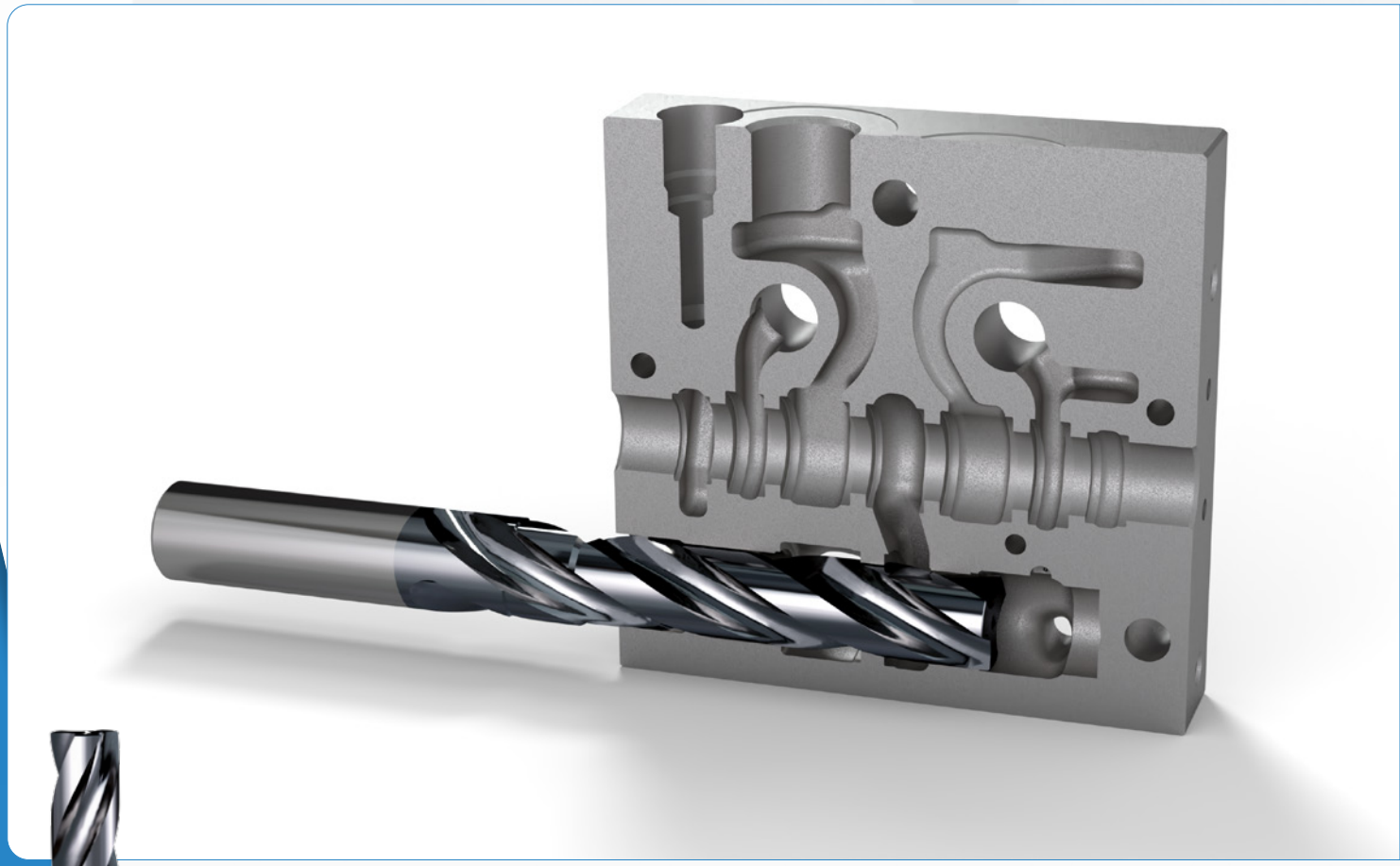
Part of our self-developed 3- way process

By using our UM grooving land tool instead of a conventional groving mill you will see considerable reduction in machine time by up to 70%.
You will also be able to machine with much tighter tolerances since all the cutting edges are built into one tool while still keeping the vibrations to a minimum.

- Experience a one-shot solution that can reduce the machine time by up to 70%
- Tight tolerances in the tool makes it possible to make high quality products in no time

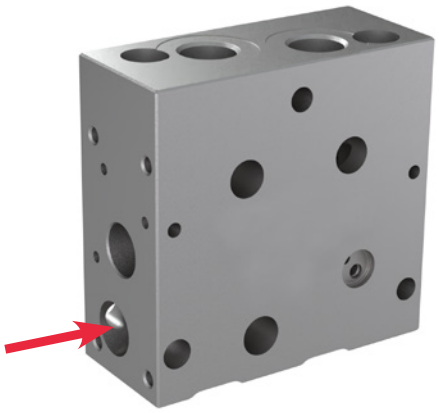


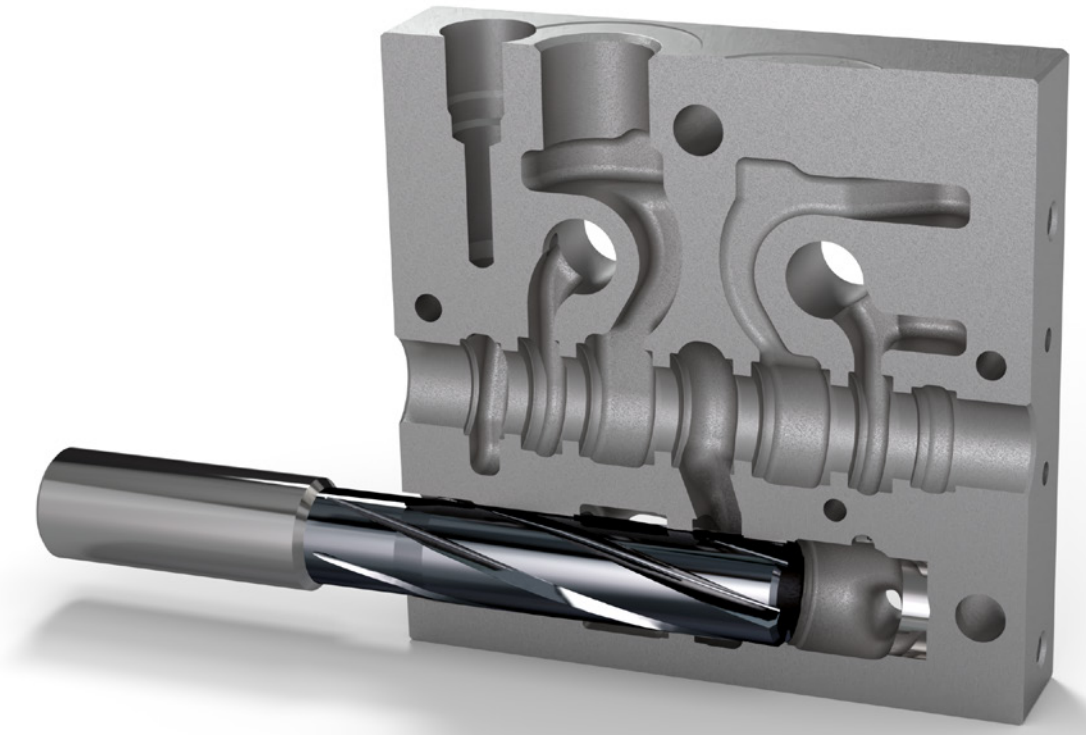
2. Compensator Hole



Step Drill

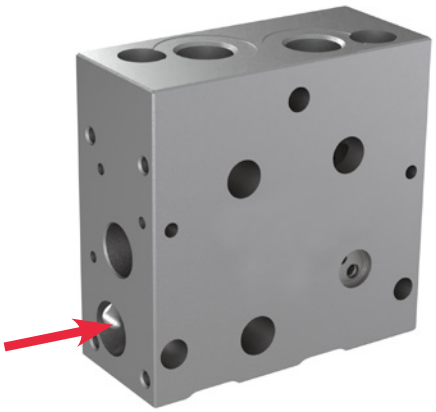
- 2/3 fluted step drill
- For correct and precise premachining for reamer and grooving tool



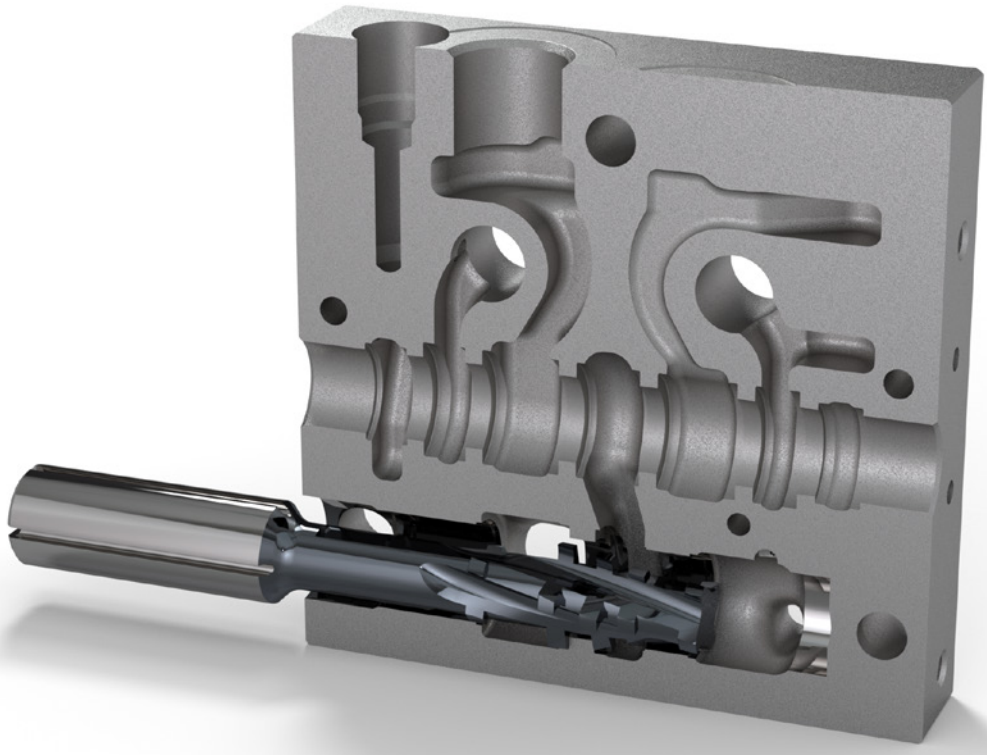


Reamer

- Machines highly precise finished surfaces and diameters so the compensator hole is ready for the grooving land tool



2. Compensator Hole (continued)



UM Grooving Land Tool

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- Designed to avoid vibrations, making it more reliable
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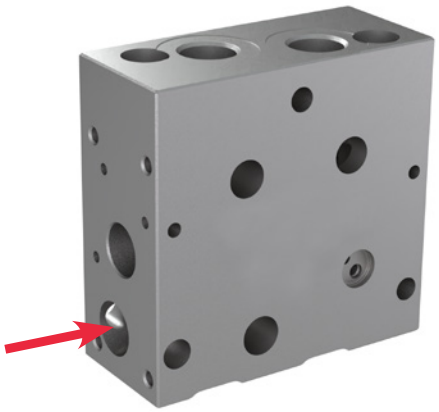
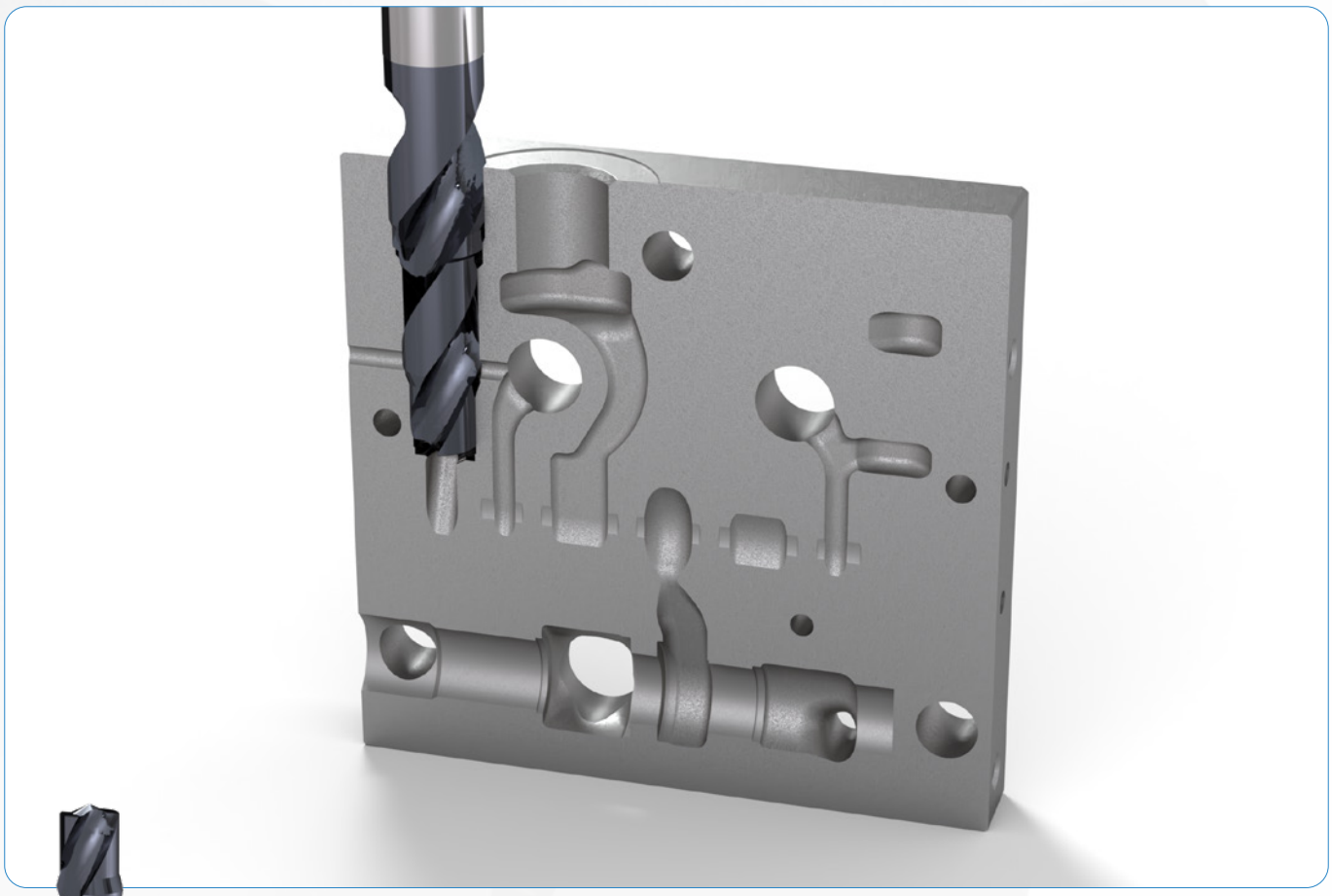
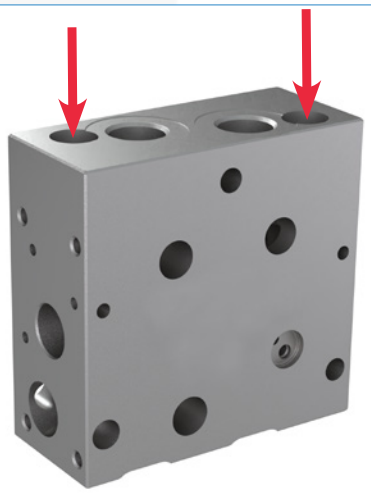


3. Relief Valve Hole

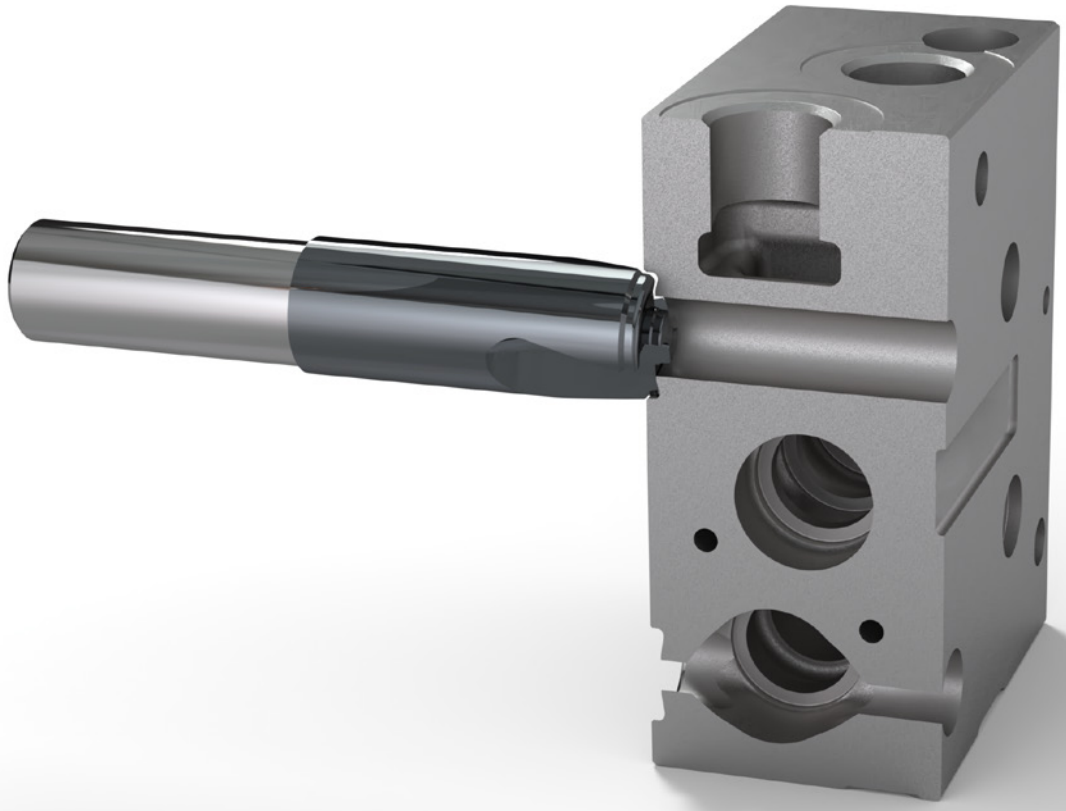


Core Drill

- Multistep tool
- One-shot solution, which guarantees good coaxiality and step lenghts
- Measuring report can be added

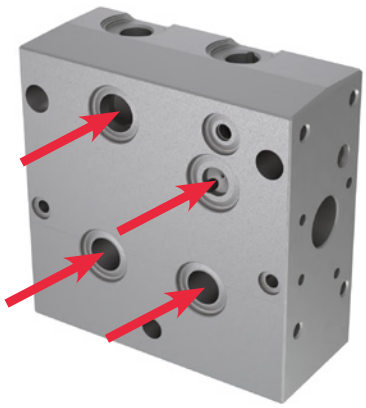


4. O-ring Holes



Straight Flute Drill

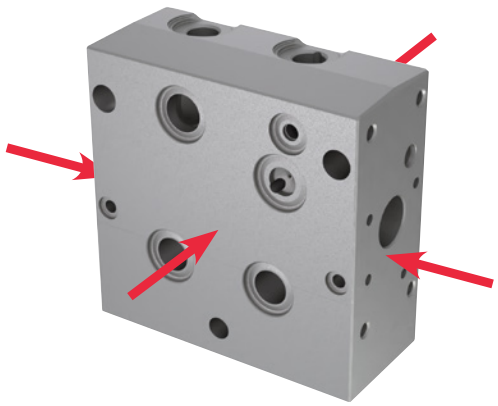
- Z2 for solid holes
- Z3 for precast holes
- Possibility to combine with standard drill for deep drilling and faster machining
- Reliable process
- Measuring reports follow the tools to make sure the machined holes are as precise as possible



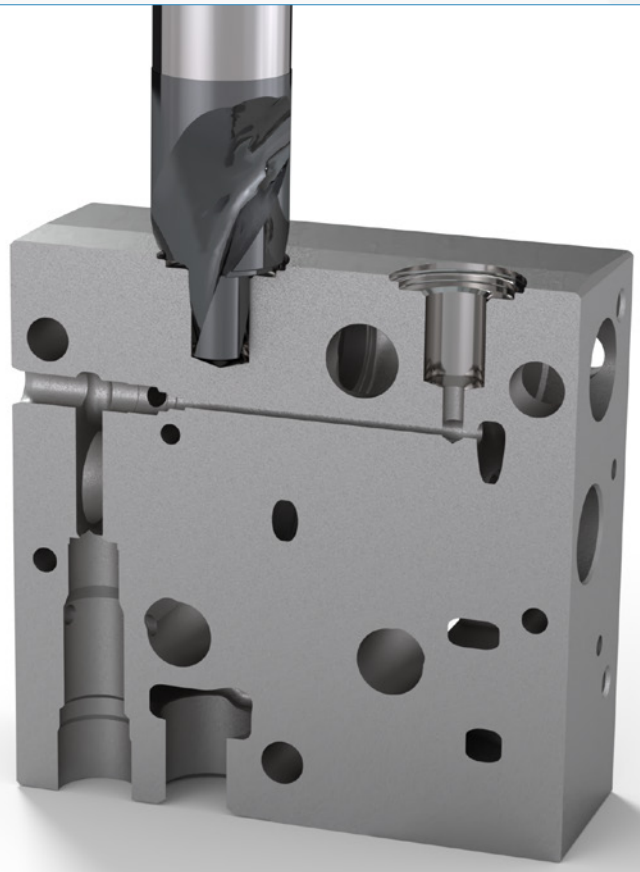
5. Surface Milling

MFF

- Possible to replace grinding process by machining
- Adjustable cutting edge height for improved usability
- Dimensions: Ø80 – 250 mm (All with 2 inserts)
- Ground Wiper insert design
- High feed rates: f = Max 5.0 mm/rev
- High-quality surface finish: Ra=0.5 µ/mm or less!

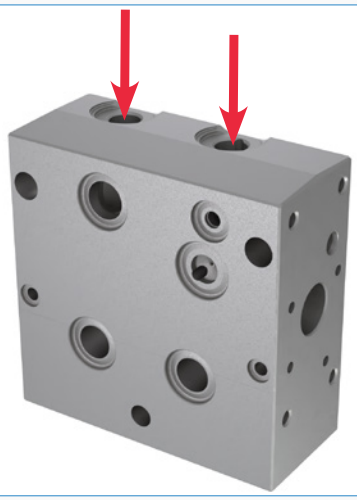


6. Port Holes

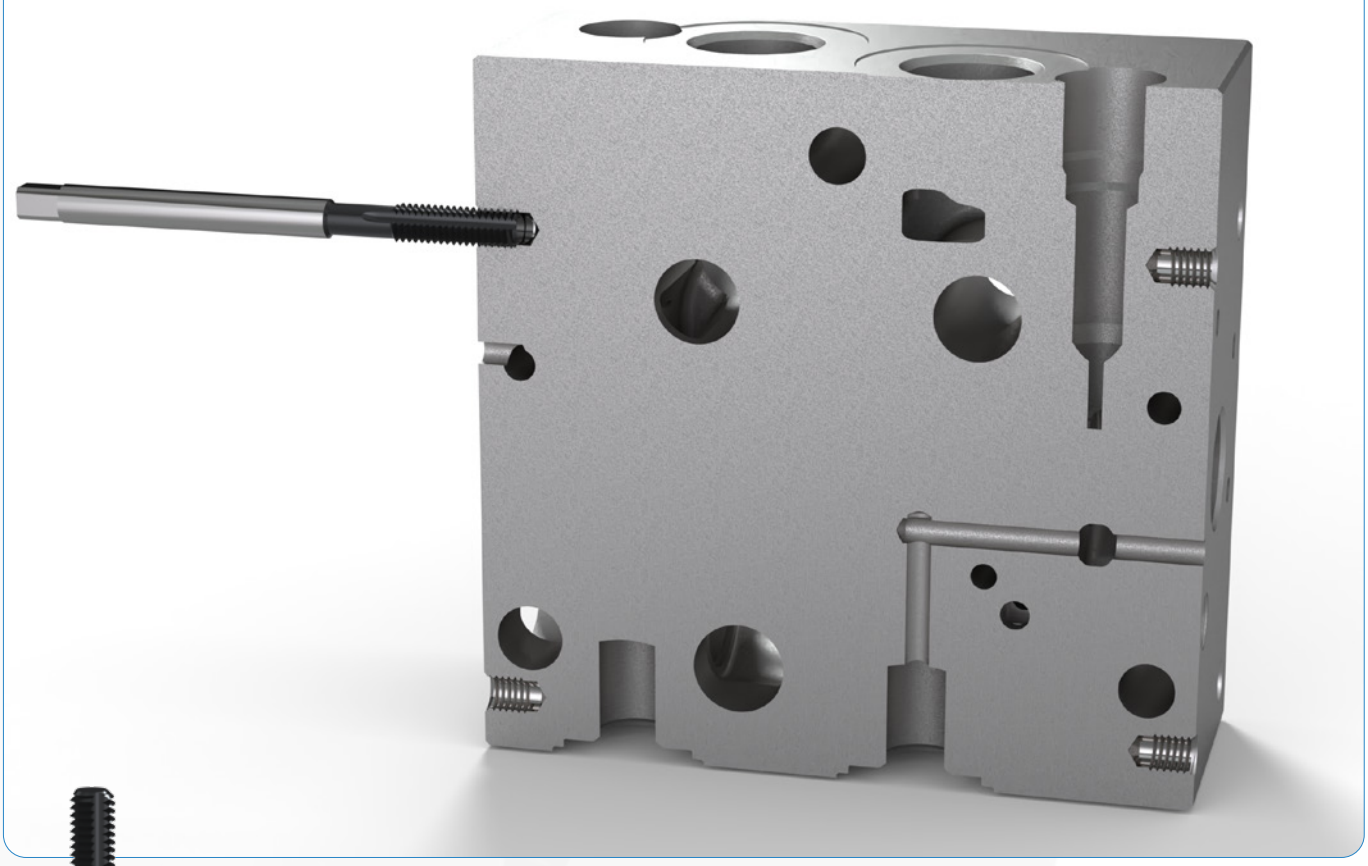


Step Drill

- Multiple options for various thread and port types
- Spotface can be included
- Can be designed for solid / precasted holes

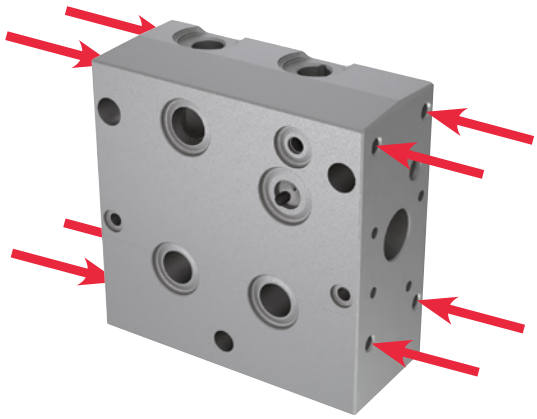


7. Thread Holes



Thread Tool

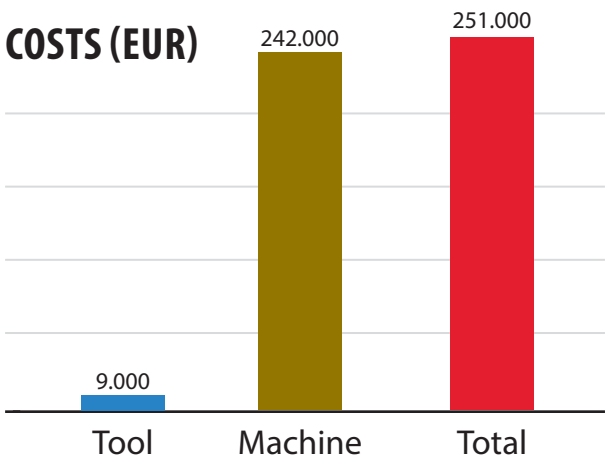
- We first predrill the thread holes with our step drill for correct dimensions of thread machining.
- Then we use our thread taps which are made from HSS or solid carbide
- Thread mills can also be supplied, made from solid carbide material



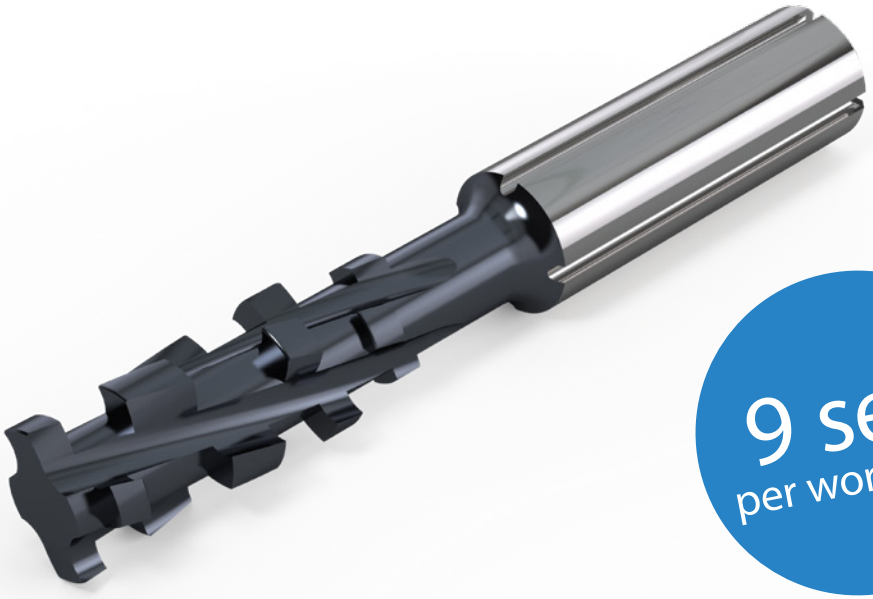
Actual customer case

OLD SOLUTION

Cost factor	80,00 EUR/hour
Production volume	400.000 pcs/year
Number of cutting profiles	1 (Z3)
Tool life, workpieces	6.000 pcs.
Tool costs per year	EUR 9.000,-
Processing time / workpiece	27 sec.
Machine costs per year	EUR 242.000,-
Total costs per year	**EUR 251.000,-**



NEW SOLUTION

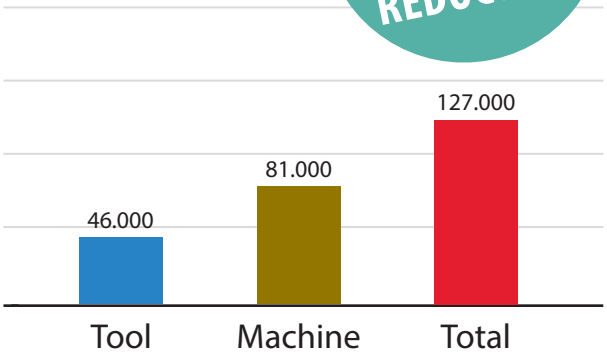


9 sec.
per workpiece

Cost factor	80,00 EUR/hour
Production volume	400.000 pcs/year
Number of cutting profiles	5 (Z3)
Tool life, workpieces	8.000 pcs.
Tool costs per year	EUR 46.000,-
Processing time / workpiece	9 sec.
Machine costs per year	EUR 81.000,-
Total costs per year	**EUR 127.000,-**

COSTS (EUR)

50% COST REDUCTION



Your Complete Tool Supplier

General Machining

- We have a large range of standard and semi-standard tools for machining in materials like cast iron
- Choose for example from a huge selection of inserts with or without various coatings made specifically for each material type and machining situation
- The possibilities are many so contact us for your specific needs and we will do everything we can to help you

Custom Made Tools

- Special tools are often the ideal solution. Often two to three processes can be combined in one step. This leads to a reduction in unit costs
- Our many years of experience in the manufacture of step drills and special milling cutters gives you the certainty of receiving first-class products with high performance

Your Prefered Supplier

- We want to be your preferred tooling supplier by first of all finding the best solutions for your process, so you can save time and minimise you production costs
- Our delivery times are extra short especially for custom made tools because we know that you cannot just sit and wait when a big project must be made

Contact us

- Our tooling solution experts are ready to guide you towards an optimised and faster machining process whatever your machining challenges might be
- Give us a call or send us an e-mail:

Tel.: +45 97 14 14 11

umdk@kyocera-unimerco.com

Industrial tooling solutions

Kyocera Unimerco is a global manufacturer and distributor, providing standard and customised cutting tool solutions as well as know-how and optimisation guidance for the manufacturing industry.

The company was founded in 1964 and has since expanded into 17 countries, with more than 700 employees.

Today the company is part of the Japan-based Kyocera Corporation.

KYOCERA

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