

OUT OF THE SWAMP –
REPLACES COOLING LUBRICANTS AND
MINIMUM QUANTITY LUBRICATION

[Mediumverteiler]
Frästechnik der Zukunft

THE FOCUS IS ON THE CUTTING EDGE

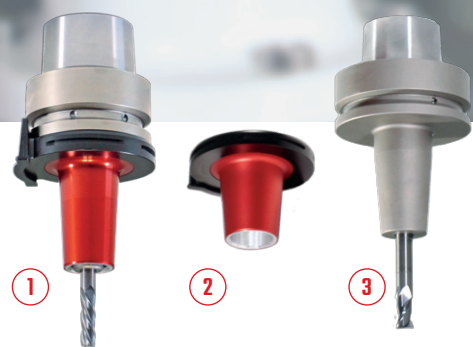
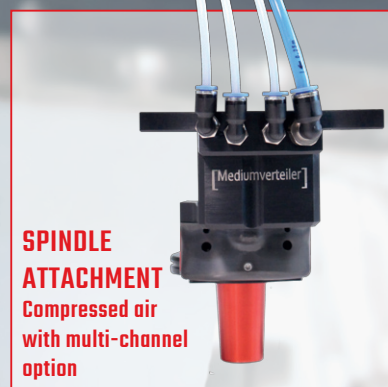
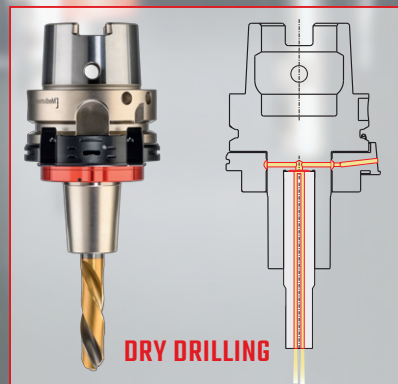
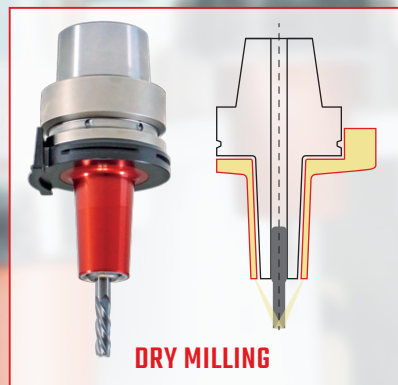
- reduction of friction pressure keeps machining temperatures low
- sharp cutting edges, higher cutting performance, less energy consumption
- optimum conditions for all tool cutting edges
- extended tool life, reduced set-up times
- cutting of all materials
- efficient, cost-effective, sustainable

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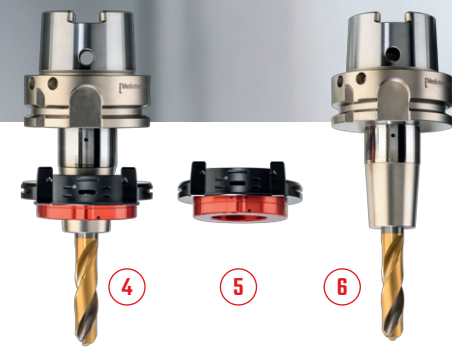
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[Mediumverteiler]

Frästechnik der Zukunft



- 4 THE COMPLETE IKM MEDIUMVERTEILER IS PLACED IN THE TOOL CHANGER
5 IKM NOZZLE BODY
6 IKM TOOL HOLDER



DRY MILLING

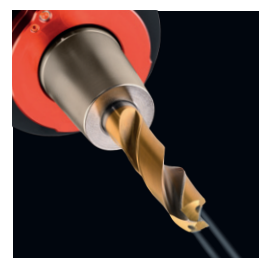
The linchpin of the novel dry milling technology is the reduction of friction pressure:



a nozzle body, the patented **red sleeve**, encloses the tool. However, the nozzle body is geometrically separated from the holder and **does not rotate itself**. The nozzle body is supplied with compressed air via the spindle attachment (Mediumverteiler

interface). The air acts directly on all tool cutting edges, along which an air jacket is formed all the way to the workpiece. This cools the cutting edges and the workpiece and at the same time, the compressed air reliably blows away all chips. No more chips are run over.

If lubrication is required depending on the material, this is done by adding medium in aerosol quality to the compressed air via a microspray pump. The consumption is 2 to max. 20 ml/h. Due to the addition via the stationary nozzle, there is no segregation, so that every lubricant particle arrives. In this way, lubrication is technically and physically completely different, more effective and much cleaner than with emulsion (KSS), minimum quantity lubrication (MQL) or an internal coolant supply through spindle.



DRY DRILLING

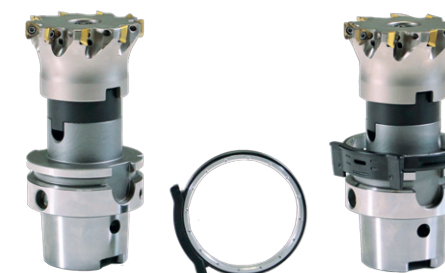
When drilling with the Mediumverteiler, the compressed air is fed via the spindle attachment into the IKM nozzle body (Internal-Cooling Mediumverteiler, in German: IKM-Mediumverteiler).

From there, the air, enriched with lubricant if required, passes through the ICZ tool directly to the machining point. There, it blows off all chips from the machining area at a high airflow velocity. This works for both shallow and deep hole drilling. Tool and component are cooled without water, only with air. There is **no ICZ** (no internal rotary union through the spindle) and accordingly **no air or coolant flow through the spindle**. This takes place via the spindle attachment, i.e. via the medium distributor interface.



All tool holders are prepared for Swing-Stop

- reduces vibrations
- improves surfaces
- increases tool life



THE ADVANTAGES – EVERYTHING AT A GLANCE

Money saved

- extended, in some cases multiplied tool life
- at least 20 % higher productivity due to higher feed rates and larger infeeds
- massive energy and CO₂ savings through the use of compressed air instead of cooling lubricants
- consumption with the Mediumverteiler: 1 kWh. In comparison: cooling lubricants or ICZ between 8 and 25 kWh
- elimination of costs and floor space for cooling lubricants including equipment (pumps and filters)
- lower spindle load, less spindle damage
- no spindle service costs due to elimination of rotary union

Clean machine and clean components due to air-cooling

- no rework, no cleaning
- higher dimensional and repeat accuracy
- better surfaces (polishing quality possible)
- massively less susceptibility to faults without wet management
- highest possible process reliability in automation due to cleanliness
- higher efficiency and technical availability of the machines
- process-safe measuring of components in the production line without cleaning

Protected tool cutting edges due to air flow technology

- reliable chip removal: from any position, even from deep cavities, pockets, grooves, etc.
- strong reduction of friction pressure on the cutting edges
- constant cooling prevents temperature rise on tool and component
- less set-up time, less micro-crack formation, less material stresses, less scrap
- quenching of the tool cutting edges is no longer necessary due to air cooling

Good for people and the environment

- Healthier working conditions due to fewer air pollutants
- Energy consumption and costs massively reduced
- CO₂ emissions minimized by up to 80 percent

MANAGING DIRECTOR JOCHEN DORLÖCHTER, WALTHER WOLF GMBH IN WENDELSTEIN, CONFIRMS:

» We were one of the first users to recognize the advantages of the Mediumverteiler and have been using the technology in our complete automation system since 2011. Among others, there are two Röders milling machines, nine external tool racks and over 300 tool places. At the same time, we also use the advantages of the Mediumverteiler on two Hermle machines.

In addition to the enormous improvement in quality (surfaces, dimensional and repeat accuracy), we have significantly increased the service life of the milling tools, which saves us over 70,000 euros annually in tool costs alone. And thanks to the clean working environment as well as the energy savings, our milling process sustainably protects health and the environment. <<

COSTS AND QUALITY – PRACTICAL EXAMPLES

COST COMPARISON:

	Costs so far	Savings	Costs new	
Tool costs per year	20,000 €	30 %	-6,000 €	14,000 €
Higher cutting capacities:				
Machine hours/year	2,000 hrs.			
at 60.- euro/hour				
at 250 working days/year	120,000 €	20 %	-24,000 €	96,000 €
Total price	140,000 €		-30,000 €	110,000 €
Savings				30,000 €

PROFIT CALCULATION:

Investment Mediumverteiler	38,000 €
Return on investment (ROI)	15 months
Savings on depreciation period of e.g. 10 years	262,000 €
Profit/hour with the medium distributor	15 €

DRY MILLING OF A POCKET IN POCKET

Material: 1.7225, 42CrMo4

Machine:
Hermle / C30 / five-axis / HSK 63

Tool:
End mill ø 12 mm
IKM-Drill Bit ø 6 mm

Conclusion:

Machining time halved while tool life doubled. Production limits increased by a total of 20 percent via an increase in cutting parameters by a factor of 1.75, whereby even the smallest corner radii in deep cavities were milled out cleanly. Total time savings: 25 percent



ALUMINIUM MILLING TEST

Material: Aluminium

Machine:
Röders RXP 600DSH linear drive / HSK 40

Tool: ø 6 mm

Quality workpiece surface:
Surface roughness Ra 0.02

Tool life: No wear detectable.

Conclusion:

Without reworking, a high-gloss surface of Ra 0.02 was achieved with the medium distributor. This corresponds to the quality during polishing



HERBERT MERZ, MANAGING DIRECTOR MHT GMBH:

» We want to show machinists a practical and effective way to implement quality specifications for surfaces, dimensional and repeat accuracy, quantities and cost efficiency, even under increasingly complex conditions, while at the same time integrating aspects of sustainability, occupational safety and environmental protection into production. <<

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