

# AT HOME IN TWO WORLDS.

The 5-axis milling machine  
for dry and wet machining.



# S5<sup>m</sup>

**5**  
Axes

**1**  
Disc

**3**  
Blocks

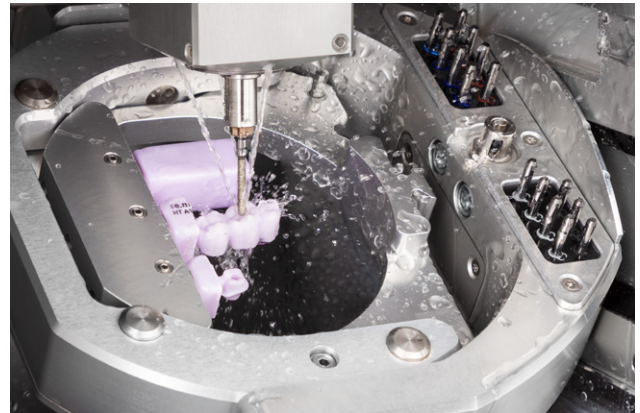
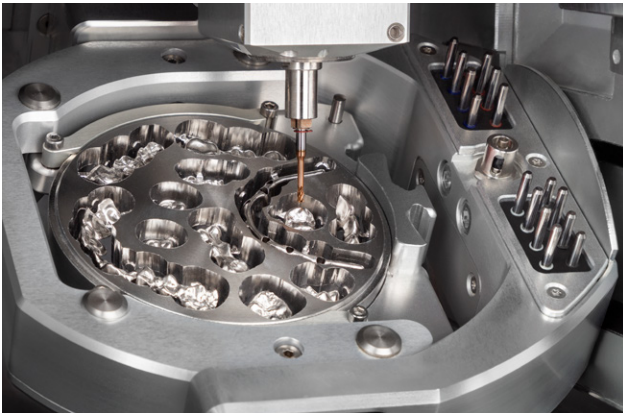
**16**  
Tools

Dry  
Wet

Mill  
Grind

CAM  
Software  
incl.

## NO MATTER IF DRY OR WET – MILLING AND GRINDING WITH S5m.



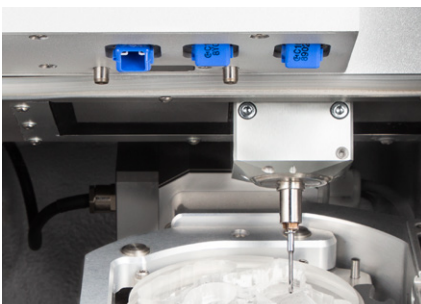
### Variety that pays off

With the S5m you can machine a particularly wide range of materials and indications (blanks up to 30 mm in height). The repetition accuracy of 3  $\mu\text{m}$  ensures first-class results for every workpiece, and the second rotary axis (B axis) with its tilt angle of up to  $\pm 30$  degrees also enables the precise milling of undercuts. Thanks to the

high machine rigidity as well as the powerful spindle, you can process metals. With the wet grinding option, the S5m is also suitable for wet machining of glass ceramics or titanium. Due to its many innovative features, it works extremely economically and efficiently. Your advantage: maximum variety of indications at a fair price.

### Wet grinding option

The S5m is prepared for the connection to an external wet grinding module. For this purpose, liquid nozzles are already attached to the spindle to cool the tool during grinding. In the separate module, an air circulation system separates the mixture of air and liquid into two circuits. Therefore, the wet grinding option can be operated with a dry suction unit.



*The three integrated ionizers considerably reduce the cleaning effort of the S5m, as they neutralize the static charge of acrylic chips such as PMMA to the greatest possible extent. This is supported by air nozzles which distribute the ionized air in the working chamber.*

# FEATURES AND BENEFITS? LOTS OF THEM!



## Tremendous stability

- Processes all types of materials, including CoCr, titanium and glass-ceramics
- Solid cast-body for minimum vibrations



## Maximum variety

- Almost unlimited material variety in 98 mm disc format as well as around 40 block materials and > 800 prefabricated titanium and CoCr abutment blanks
- Large indication diversity due to a  $\pm 30^\circ$  rotation angle in the 5<sup>th</sup> axis, and up to 30 mm blanks
- Optional wet-grinding module converts the S5m into a wet-processing machine



## Highest precision

- Restorations in Ultra HD
- Premium spindle with precision bearing, powerful 600 watts and 60,000 rpm
- 3  $\mu\text{m}$  repetition accuracy



## Outstanding reliability

- 100% engineered and manufactured in Germany
- Sophisticated sealing air concept to protect mechanics, electronics, and spindle
- 24 months warranty



## Highly economical

- Automatic changer for 16 tools
- 3 ionizers neutralize the static charge of acrylic chips – for a clean working chamber
- Ethernet interface for stable connection
- Very easy operation via DENTAL-CAM software with DIRECTMILL Technology – included in scope of delivery and without license fees

# MATERIAL, MANUFACTURER, INDICATION. ENJOY THE FREEDOM OF CHOICE.

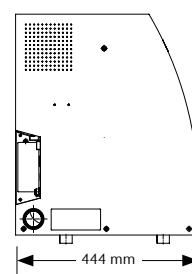
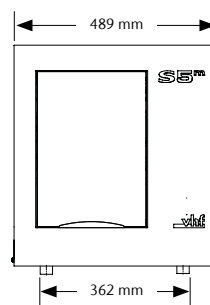
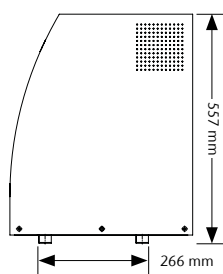
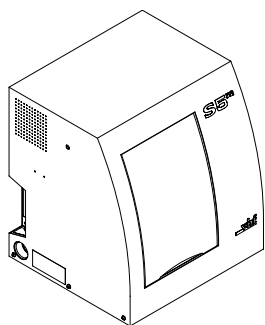
## Anything goes: blanks, blocks and abutments

Composites	Plastics   Wax	Glass ceramics	Zirconia	Titanium	CoCr
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## Maximum freedom of indication

Crown   Bridge	Inlay   Onlay	Abutment	Telescopic crown	Model plate
Model cast	Occlusal splint	Model tooth die	Implant bar	Veneer
Surgery guide	Denture	Secondary crown	Screw-retained bridge	Protrusion splint

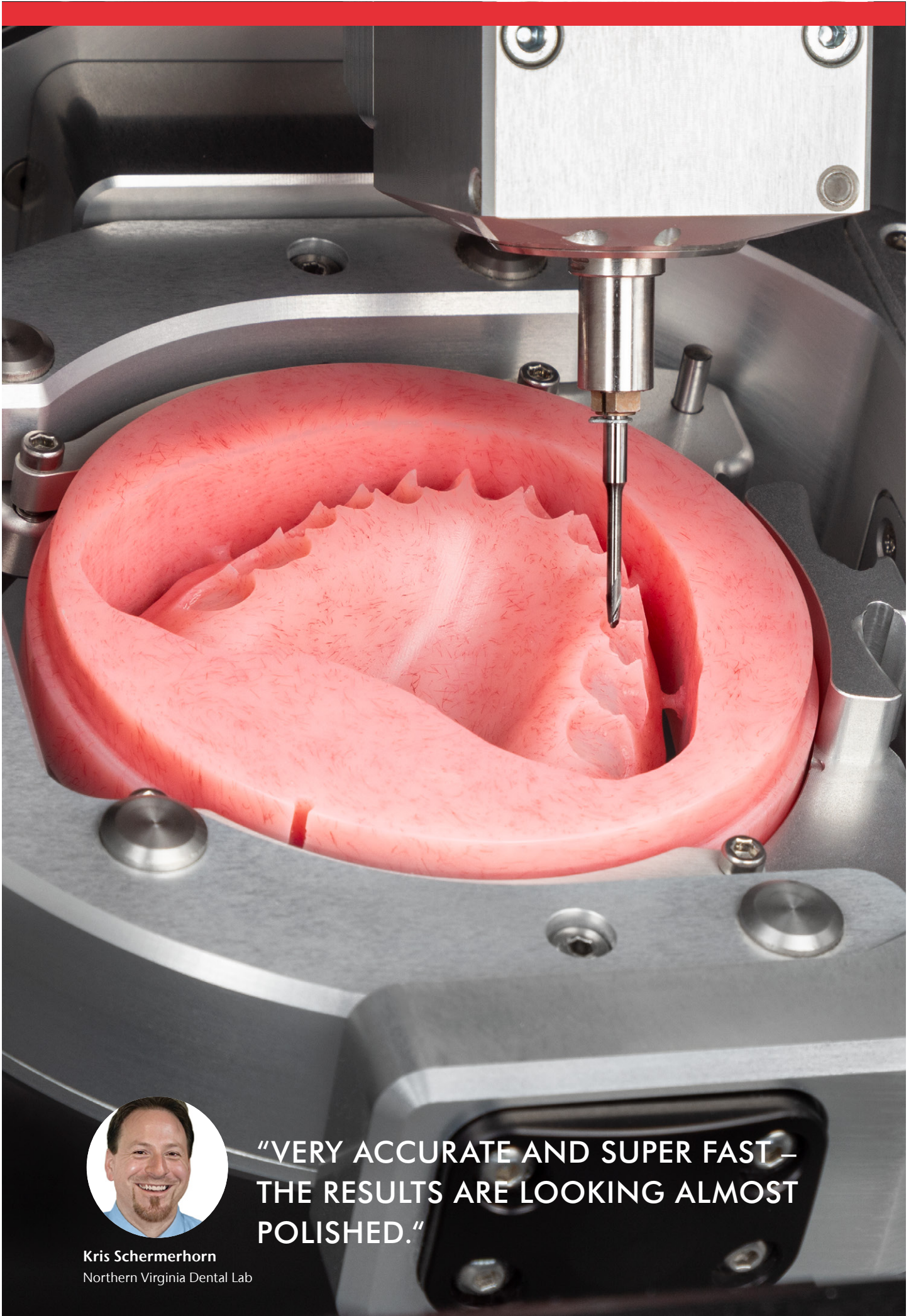
Be sure to review local and/or national regulations and/or regulations by other authorized organizations or entities (e.g. professional associations, health authorities).



# TECHNICAL DATA.

<b>GENERAL</b>	
Fields of application	Dry and wet machining
Materials	Plastic materials, wax, zirconia, composites, CoCr, model plaster, glass ceramics, titanium <ul style="list-style-type: none"> <li>• Discs, height 10–30 mm, diameter 98.5 mm</li> <li>• Blocks up to 45 × 20 × 20 mm</li> </ul>
Indications	Crowns, bridges, fully anatomical crowns and bridges, inlays, onlays, abutments, telescopic crowns, models, model castings, bite splints, implant bars, veneers, drilling templates, dentures, table tops etc.
<b>BASE SYSTEM</b>	
Construction	Machine bed made of solid cast aluminum body
Housing	Sheet steel housing, white high-gloss lacquer finish with working chamber flap and material changer flap
Number of axes	5
Linear axes	Precision ball screws, rolled version · motors with resolution < 1 µm · ground precision guides made of high-alloyed steel · repetition accuracy ± 0.003 mm
X-/Y-/Z-axis	
Rotary axis	Backlash-free Harmonic-Drive® with highest concentricity · rotation angle: 360°, infinite
A-axis	
Rotary axis	Backlash-free Harmonic-Drive® with highest concentricity · rotation angle: ± 30° · axis arrangement in the workpiece
B-axis	
Control unit	5-axis simultaneous control electronics with continuous path progression and dynamic pre-calculation · hardware-based real-time operating system with standardized command set · FPGA-integrated processor · updateable hardware · real-time path calculation via hardware engines in the FPGA · four-quadrant control of the motors for particularly smooth running · multiple analogue and digital I/Os for controlling the peripherals · integrated inverter for synchronous and asynchronous motors, gate detection · Ethernet and USB interface
Lighting	RGB LED lighting with status display in the working chamber and in the blank changer
<b>SPINDLE</b>	
General	High-frequency spindle, synchronous with pneumatic tool clamping · sealing air to prevent debris from entering · automatic cone cleaning
Speed	Up to 60,000 rpm
Power	Peak power (P <sub>max</sub> ): 600 watts · nominal power (S6): 450 watts · continuous power (S1): 300 watts
Bearing	4-fold hybrid ceramic ball bearing · concentricity deviation at inner cone < 3 µm
Collet	Stainless steel collet for tools with 3 mm shank diameter and max. 40 mm total length
<b>AUTOMATION</b>	
Tool change	Tool magazine for 16 tools · length measurement and tool breakage monitoring via precision measuring key · access via working chamber flap, safety-locked
<b>PROCESSING MODES</b>	
Dry	Air nozzles on the spindle · hose connection for external suction unit on the side of the housing · vacuum sensor for monitoring the suction unit · 24 V switching output for controlling suction units · ionizer with 3 ion nozzles
Wet	Liquid nozzles on the spindle · flow-sensor for monitoring the liquid supply · optional wet grinding module with optical level indication by permanent, non-contact ultrasonic measurement and air circulation system is not included and is required
<b>CONNECTION REQUIREMENTS</b>	
Compressed air	6 bar: 60 l/min up to 8 bar: 73 l/min · air purity according to ISO 8573-1:2010
Power	100–240 volts · 50/60 Hz, 850 watts
Extraction system	Filter class M, 3,000 l/min extraction capacity at 220 hPa
Data	USB connection
<b>ENVIRONMENTAL CONDITIONS</b>	
Operating temperature	Between 10 °C and 35 °C
Air moisture	Max. 80 % (relative), non-condensing
<b>APPROVALS</b>	
All models	CE, VDE
North America model	–
<b>DIMENSIONS &amp; WEIGHTS</b>	
Dimensions (W/D/H)	489 × 444 × 557 mm with closed flap 489 × 683 × 557 mm with open flap
Footprint (W/D)	362 × 266 mm
Weight	79 kg
<b>SCOPE OF DELIVERY</b>	
CAM Software	DENTALCAM software included
Holder systems	3-fold block holders · abutment holders for various systems (optional)
Accessories	Spindle service set · calibration set incl. stirrup measuring screw · working chamber crevice nozzle · tool magazine inserts (2 pieces) · spare screws for blank holder and tool magazine cover · Torx and Allen wrenches · emergency release key · drill bit (tool positions) · measuring pin · compressed air hose with pressure reducer · power cable · USB cable · carrying aid for transporting the machine · operating instructions

Subject to changes and errors.



**Kris Schermerhorn**  
Northern Virginia Dental Lab

**"VERY ACCURATE AND SUPER FAST –  
THE RESULTS ARE LOOKING ALMOST  
POLISHED."**



*Meets all requirements – from dry to wet, from discs to blocks, from abutments to wide bridges, from plastics to titanium.*



## CREATING PERFECTION.

With more than 30 years of experience, vhf is a leading manufacturer of dental milling machines. As a CAM full-service provider, vhf meticulously develops and produces each individual milling machine and the perfectly matched tools and software all in-house. Everything from a single source. Made in Germany.

### **Service. We are passionate about what we do.**

Our products are extremely low-maintenance and highly durable, but the servicing of your machine is important to us. We provide customer support with our user-friendly DentalPortal, numerous online tutorials and personal assistance through our international service network.

## GET IN TOUCH.

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