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# Your ticket to the Pro League of dentistry.

The flagship machine with  
maximum flexibility for practice and lab



■ HIGH END CLASS

# It couldn't be more convenient.

Intuitive technology for the ultimate user experience.

## When we say all-rounder, we mean all-rounder

Dry milling, wet milling or wet grinding? Everything is possible with the R5 from our **HIGH END CLASS**. The 5-axis machine mills and grinds the toughest materials on the market, including all titanium and CoCr alloys. For example, glass ceramic can be wet ground or titanium wet milled. Materials such as cobalt-chrome alloys, zirconia or PMMA are dry milled.

## Process simply everything, non-stop

With the R5, you advance to a new league of productivity: non-stop milling and grinding with a sheer unlimited material variety. Single-handed loading of the material changer saves you valuable time thanks to the patent-pending **directdisc** Technology. The changer can be conveniently preloaded with up to ten discs, 60 blocks or 60 abutments.

But that's not all: Switch quickly and effortlessly between wet and dry processing with **directclean** Technology. An ingenious package of ionizer, self-cleaning and drying makes it possible to produce first-class restorations around the clock.

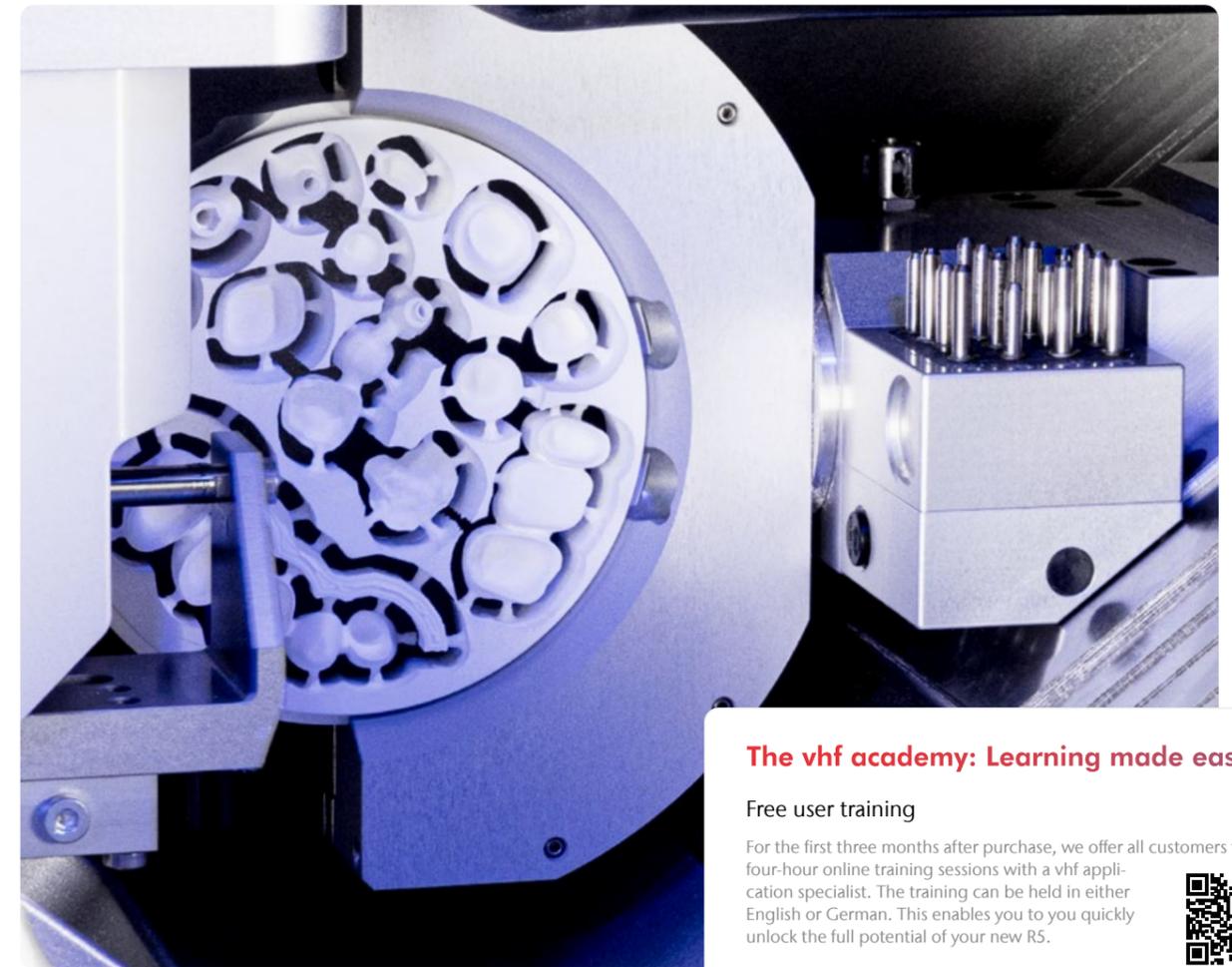
This means that the R5 can process all materials for you independently – whether wet or dry – without interruption. And in any order, even overnight if so desired.

## Reliability meets precision

The R5 boasts German engineering technology at its best – with an impressive weight of 150 kilograms and a minimal footprint. The result: machine rigidity that meets the highest standards. The  $\pm 3 \mu\text{m}$  repetition accuracy of the linear axes offers the best conditions for maximum precision in ultra HD and low-vibration operation. Spindle speeds of up to 80,000 rpm mean that your jobs can be machined ultra quickly. A powerful 800 watts of power gives you plenty of reserves.

## Sustainability by thoughtful design

Thanks to **purewater** Technology, no grinding additives are required, except for titanium milling – that's called user-friendly sustainability from vhf. For you, that means environmentally friendly manufacturing and no complicated disposal.



## The vhf academy: Learning made easy

### Free user training

For the first three months after purchase, we offer all customers free, four-hour online training sessions with a vhf application specialist. The training can be held in either English or German. This enables you to quickly unlock the full potential of your new R5.



Talking about precision and speed, this milling machine is truly unparalleled.



Dr. Miguel Stanley  
Founder and CEO of White Clinic,  
Lisbon, Portugal

## Passion for Perfection

The **HIGH END CLASS**  
in routine use



All those who always strive for the best should watch our video series "Passion for Perfection". In this exclusive web series, Dr. Michael DiTolla asks six of the most respected dentists what role their vhf machines play.

Thanks to **directdisc** Technology, the automatic material changer can be conveniently loaded in seconds – single-handedly and without tools. This saves you valuable time.

# Compelling arguments? Lots of them!

The key features of the R5.

## Fast & precise

Mills the hardest materials on the market – including CoCr – in ultra HD

Premium spindle with 4-fold ball bearing made of hybrid ceramic for maximum concentricity

Ultra-high rotational speeds of up to 80,000 rpm with 800 W of power

3 µm repetition accuracy

Machine bed made of a solid cast body for the lowest vibrations

100% developed and manufactured in Germany

## Independent

Sheer unlimited material variety in 98 mm disc format, 50+ machinable block materials and 800+ prefabricated titanium and CoCr abutment blanks

Maximum indication versatility thanks to  $\pm 35^\circ$  rotating angle in the 5<sup>th</sup> axis and blanks up to 40 mm thick

Comprehensive sensor system for monitoring all vital system functions

## Cost-effective

Revolutionary disk fixation with **directdisc** Technology

Automatic changer holds up to 10 discs, 60 blocks or 60 prefabricated abutments

Milling screw-access channels – saves costs for meso blocks

**directclean** Technology for wet and dry processing on the fly

Ultra-easy operation with **dentalcam** and its open interface to CAD software and materials



The R5 tilts the spindle (B-axis) by up to  $\pm 35^\circ$ . This means that the blank holder only needs one moving axis (A-axis), thereby making the entire system more stable.



During wet processing, the R5 grinds with clear water – better for your materials and without annoying disposal. And thanks to **directclean** Technology, even when quickly switching to dry processing.



# Material, manufacturer, indication.

Enjoy the freedom of choice.\*

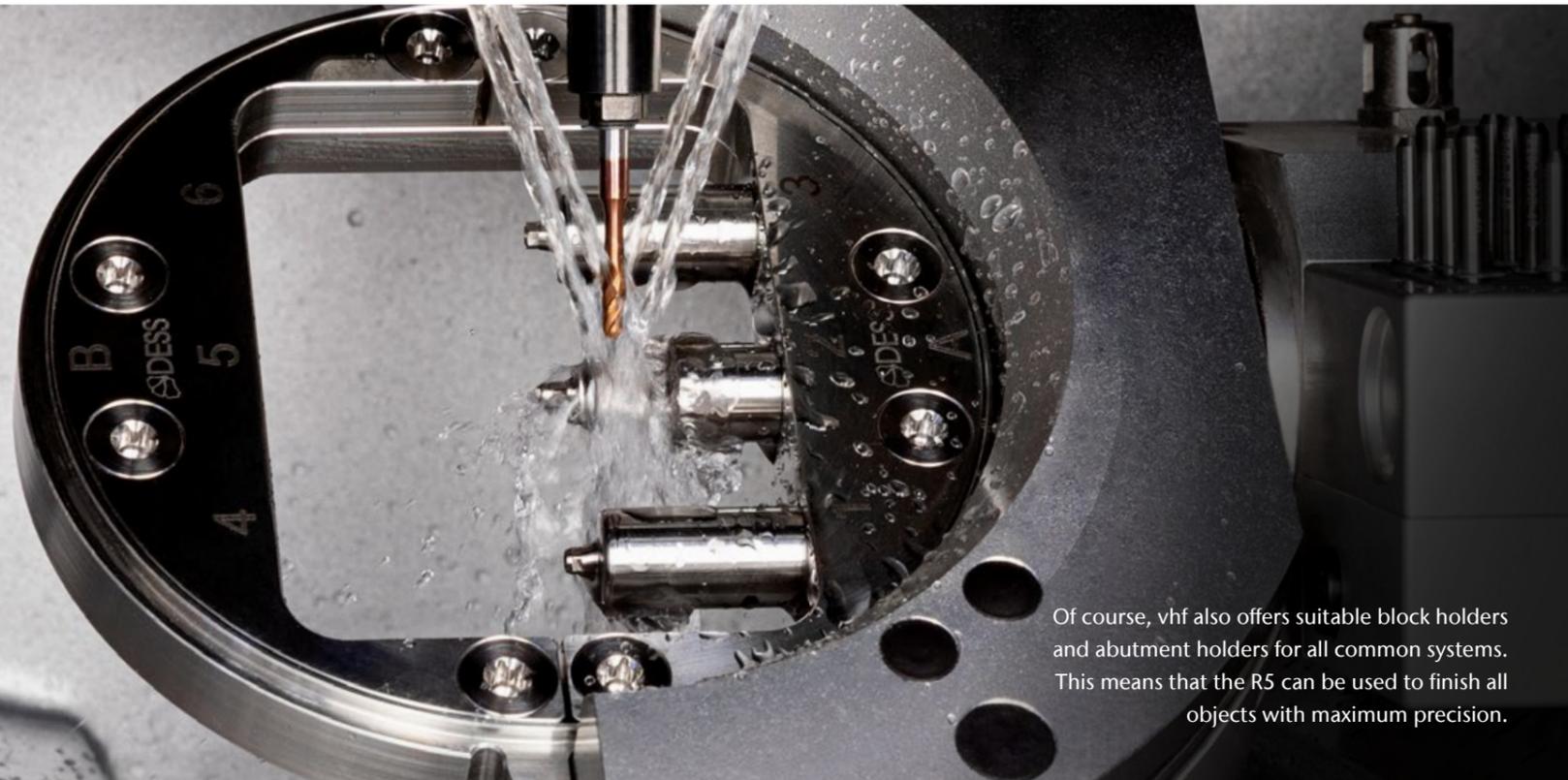
Crown   Bridge	Inlay   Onlay	Veneer	Composites
Occlusal splint	Full denture	Denture-framework	Plastics Wax
Implant bar	Abutment	Screw-retained crown	Glass ceramics
Screw-retained bridge	Surgery guide	Primary crown	Zirconia
Secondary crown	Model plate	Model tooth die	Titanium
			CoCr

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

Many refinements make routine work easier: We are thrilled that the machine cleans and dries itself after wet grinding and then immediately starts a drying job automatically.



Marko Haesler  
Dentallabor Schlegel



Of course, vhf also offers suitable block holders and abutment holders for all common systems. This means that the R5 can be used to finish all objects with maximum precision.

## Technical data

### General

**Fields of application:** Dry and wet machining

**Materials:** Plastic materials, wax, zirconia, composites, CoCr, model plaster, glass ceramics, titanium

- Discs: Height 10–40 mm (metals up to 18 mm), diameter 98.5 mm
- Blocks up to 40 × 20 × 20 mm

**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.

**Warranty:** 24 months/2,000 hours of operation (whichever comes first)

### Base system

**Construction:** Machine bed made of solid cast aluminum body

**Housing:** Sheet steel, white high-gloss lacquer finish with working chamber door and flap combination for blank changer/cooling liquid tank

**Number of axes:** 5

**Linear axes (X-/Y-/Z-axis):** Precision ball screws · motors with resolution < 1 µm · ground precision guides made of high-alloy steel · repetition accuracy ± 0.003 mm

**Rotary axis (A-axis):** Backlash-free Harmonic-Drive® with highest concentricity · rotation angle: 360°, infinite

**Rotary axis (B-axis):** Precision ball screw with rotary transmission · rotation angle: ± 35° · axis arrangement in the tool

**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 dedicated 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, electronic gate detection · Ethernet and USB interface

**Lighting:** RGB LED lighting with status display (3 × working chamber / 1 × blank changer)

**Camera system:** Integrated in the working chamber for easy remote support and possibility of internal recording

### Spindle

**General:** High-frequency spindle, synchronous with pneumatic tool clamping · sealing air to prevent debris from entering · automatic cone cleaning

**Speed:** Up to 80,000 rpm

**Power:** Peak power ( $P_{max}$ ): 800 watts · nominal power (S6): 600 watts · continuous power (S1): 440 watts

**Bearing:** 4-fold hybrid ceramic ball bearing · concentricity deviation at inner cone < 3 µm

**Collet:** Stainless steel collet with ceramic coating for tools with a shank diameter of 3 mm and max. 40 mm total length

### Automation

**Tool change:** Tool magazine for 16 tools, removable · length measurement and tool breakage monitoring via precision measuring key

**Workpiece change:** Integrated blank changer for up to 10 blanks, block holders or abutment holders · design in directdisc Technology · robot arm with pneumatic gripper · monitored end positions

**Access to working chamber:** Motorized opening and closing of the working chamber door, movement parallel to the chassis

**Access to combination chamber:** Access to the multi-purpose compartment containing the blank changer and cooling liquid tank via an electric flap

### Processing modes

**Dry:** Air nozzles on the spindle · hose connection for external suction unit on the side of the housing · underpressure sensor for monitoring the suction unit · 24 V switch output for controlling suction units · powerful ionizer with 2 ion nozzles

**Wet:** Liquid nozzles on the spindle · integrated cooling liquid tank (3 liters) for cooling liquid with active carbon filter system · flow-sensor for monitoring the liquid supply · purewater Technology: no grinding additives except for titanium processing

### Connection requirements

**Compressed air:** 6 bar – 8 bar (120 l/min) · air purity according to ISO 8573-1:2010

**Power supply:** 100 – 240 volts · 50/60 Hz, 750 watts

**Extraction System:** Filter class M, 3,500 l/min extraction capacity at 220 hPa

**Data:** 10/100/1000 MBit/s BaseT port (auto-sensing) Ethernet via RJ-45 socket

### Environmental conditions

**Operating temperature:** Between 10 °C and 35 °C

**Air moisture:** Max. 80 % (relative), non-condensing

### Approvals

**All models:** CE, VDE

**North America model:** UL, FCC (according to ANSI/UL 61010-1)

### Dimensions & weights

**Dimensions (W/D/H):** 580 × 600 × 700 mm · 580 × 720 × 880 mm with open flaps

**Footprint (W/D):** 490 × 294 mm

**Weight:** 150 kg

### Scope of delivery & accessories

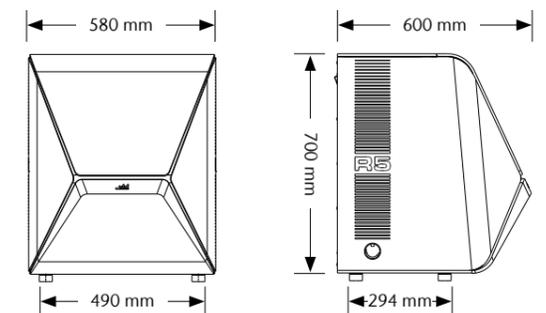
**CAM Software:** vhf dentalcam

**Holder systems:** Abutment holders for various systems (optional) · Ivotion<sup>1</sup> accessory kit (optional)

**Accessories:** Spindle service set · calibration set incl. micrometer · brush for nozzle plate · cleaning brush · microfiber cloth · spare filters · active carbon pellets · Tec Powder (3 bags) · spare wiper for viewing window · tool magazine inserts (1 piece) · torque wrench · 2 Allen wrenches · drill bit (tool positions) · measuring pin · power cable · Ethernet network cable · carrying aid for transporting the machine · operating instructions

<sup>1</sup> Ivotion is a brand of Ivoclar Vivadent

Subject to changes and errors.



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# The HIGH END CLASS at a glance.

For the ultimate user experience.

The two **HIGH END CLASS** machines are our highly automated top-of-the-line models that give you the ultimate user experience!

The **Z4** is the smart practice solution for chairside fabrication of restorations from block materials and prefabricated abutments within an integrated workflow.

The **R5** is the vhf flagship machine, featuring the greatest possible flexibility for practice and lab in the hybrid workflow thanks to an automated switch between wet and dry processing and its material changer for discs, blocks and abutments.



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## CREATING PERFECTION.

**vhf – synonymous with innovation and perfection since 1988.**

With over 35 years of experience in mechanical engineering, vhf is one of the leading manufacturers of dental milling machines. As a full-service CAM provider, vhf carefully develops and produces every single milling machine as well as the perfectly matched tools and software completely in-house. Everything from a single source. Made in Germany.

**Service. A matter close to our hearts.**

Despite their short maintenance intervals and particularly long service lives, servicing your machines is very important to us. We support you with our user-friendly dental **portal**, numerous online tutorials and personal support through our international service network.



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