The classic for dry milling.

Your top performer in the laboratory for dry processing of blocks and discs.

PERFORMANCE CLASS

vhf
CREATING PERFECTION

Powerful machine, great range of indications.

The rock-solid dry milling machine for practically all applications.

Ideal for zirconia processing

From the vhf **PERFORMANCE** CLASS, the K5 is our classic in the field of 5-axis dry milling. It has become indispensable in dental laboratories, especially in the field of demanding zirconia processing.

It truly stands out with its rock-solid construction with a solid cast body, the large rotational angle of its B-axis of up to ± 35 degrees and the ability to machine discs with a thickness of up to 40 mm. This means that you not only benefit from first-class machining quality with smooth surfaces, but also from great indication versatility.

In other words, with the K5, you get a highly reliable machine that will mill your demanding laboratory objects to a high quality.

Keeping it all together

The practical accessory drawer keeps tools and material blanks neatly organized and ready to hand. An Administrated Tool Board for milling tools is also integrated into the drawer. Its 30 slots are managed by the dental**cam** software, giving you full control over the tool parameters and wear status of the tools used there as well.

Dry milling with a plus: K5+

Have you met my big sister?

Alongside its rock-solid K5 construction, the K5+ offers you added features such as simplified blank clamping with direct**disc** Technology and an integrated ionizer for neutralizing the static charge of plastic chips. In addition, its spindle performance runs on a powerful 820 W instead of 500 W.

Learn more about the K5+

What I love about my K5 is its effectiveness and precision.

Dr. Michael Scherer
Sonora, California/USA

Especially in the field of demanding zirconia processing, the K5 lets its strengths come to play. You can look forward to the best results!

Compelling arguments? Lots of them!

The key features of the K5.

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

Powerful 500 W, 60,000 rpm spindle

3 µm repetition accuracy

Solid cast body for the lowest vibrations

Industrial-grade quality made in Germany

Independent

Sheer unlimited choice of materials in 98 mm disc format, separate block and abutment holders additionally available

Maximum indication versatility thanks to a ± 35° rotating angle in the fifth axis

Blanks up to 40 mm thick (metals up to 18 mm); ideal for monolithic dentures

Cost-effective

Automatic changer for 16 tools

Ethernet interface for a stable connection

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

Excellent price-performance ratio

With the right holders, you can also effortlessly manufacture a variety of block materials.

The integrated drawer contains an Administrated Tool Board for your tools and various accessories.

The K5 allows fixation of blanks with a thickness of up to 40 mm: You get the benefit of the highest indication versatility.

Material, manufacturer, indication.

Enjoy the freedom of choice.*

- Crown | Bridge
- Inlay | Onlay
- Veneer
- Occlusal splint
- Full denture
- Denture-framework
- Implant bar
- Abutment
- Screw-retained crown
- Screw-retained bridge
- Surgery guide
- Primary crown
- Secondary crown
- Model plate
- Model tooth die

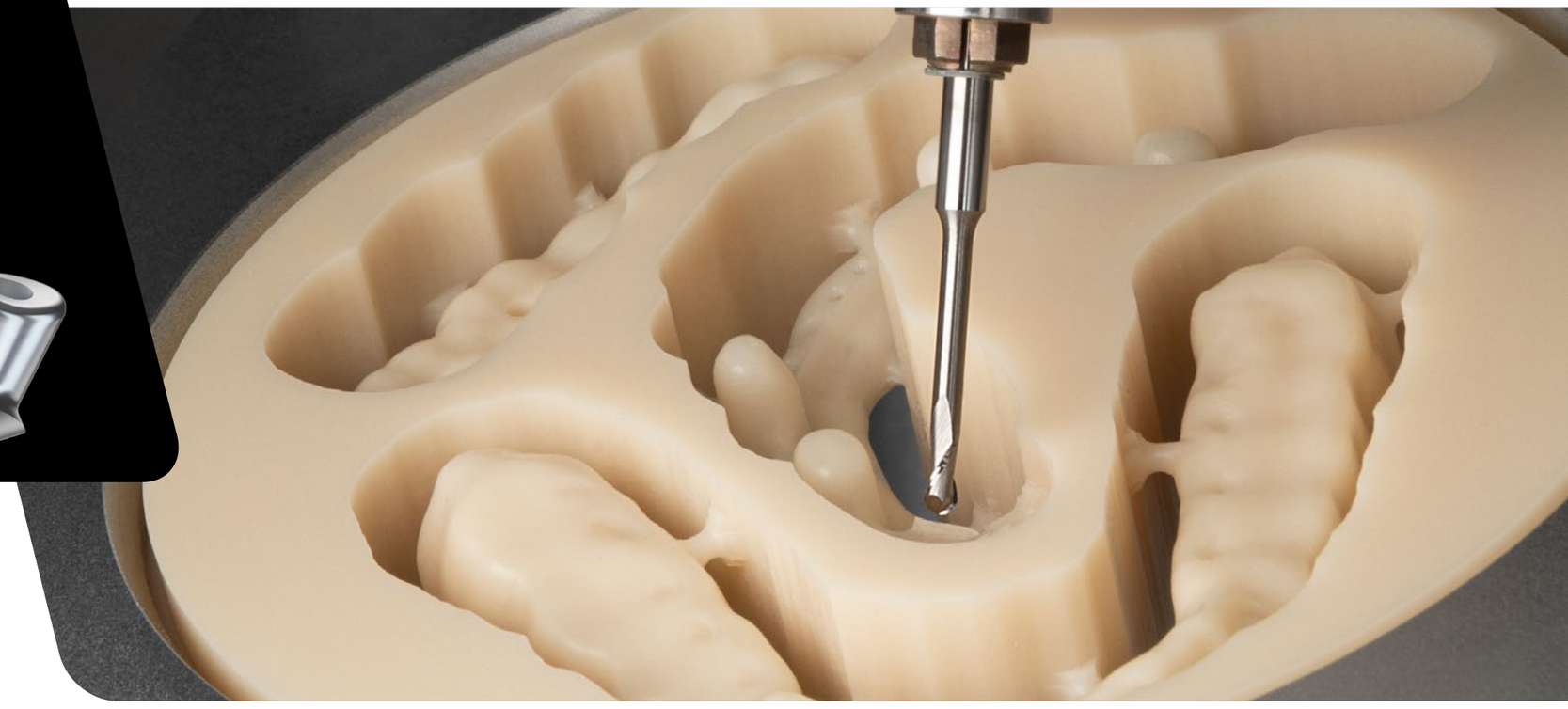
- Composites
- Plastics Wax
- Glass ceramics
- Zirconia
- Titanium
- CoCr

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

Did you know?

Spindle bearings have a major impact on milling quality.

For the milling spindle, vhf uses a high-quality 4-fold hybrid ceramic ball bearing – particularly advantageous for processing metals. For you, this means a significantly longer spindle service life, higher surface quality and noticeably better accuracy of fit of your milled objects.



Technical data

General

Fields of application: Dry machining

Materials: Plastic materials, wax, zirconia, composites, CoCr, model plaster

- discs, height 10-40 mm (metals up to 18 mm), diameter 98.5 mm
- Blocks up to 45 × 20 × 20 mm

Indications: Crowns, bridges, fully anatomical crowns and bridges, inlays, onlays, abutments, telescopic crowns, models, model castings, occlusal 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 housing, white high-gloss lacquer finish with working chamber flap and accessories drawer

Number of axes: 5

Linear axes (X-/Y-/Z-axis): Precision ball screws · motors with resolution < 1 µm · ground precision guides made of high-alloyed 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 workpiece

Control unit: 5-axis simultaneous control electronics with continuous path progression and dynamic pre-calculation · hardware-based real-time operating system with standardized instruction 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 in the working chamber

ATB: Integrated Administrated Tool Board (ATB) for 30 tools

Spindle

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_{max}): 500 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

Automation

Tool change: Tool magazine for 16 tools, removable · length measurement and tool breakage monitoring via precision measuring key · access via working chamber flap, safety-locked

Processing mode

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 switch output for controlling suction units · manual disc change

Connection requirements

Compressed air: 6 bar: 50 l/min to 8 bar: 64 l/min · air purity according to ISO 8573-1:2010

Power supply: 100-240 volts · 50/60 Hz, 640 watts

Extraction system: Filter class M, 2,500 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

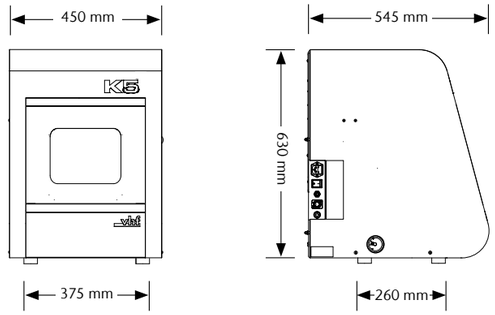
North America model: UL, FCC (according to ANSI/UL 61010-1)

Dimensions & weights

Dimensions (W/D/H): 450 × 545 × 630 mm · 450 × 695 × 680 mm with open flap and drawer

Footprint (W/D): 375 × 260 mm

Weight: 91 kg



Scope of delivery & accessories

CAM software: vhf dental**cam**

Holder systems: 3-fold block holder · Ivotion[1] accessory kit (optional)

Accessories: Spindle service set · calibration set incl. stirrup measuring screw · working area crevice nozzle · tool magazine inserts (2 pieces) · spare screws · tool magazine cover · Torx and Allen wrenches · emergency release key · drill bit (tool positions) · measuring pin · compressed air hose with pressure reducer · power cable · Ethernet network cable · carrying aid for transporting the machine · operating manual

[1] Ivotion is a brand of Ivoclar Vivadent

Subject to changes and errors.

Learn more about the K5

The **PERFORMANCE** CLASS at a glance.

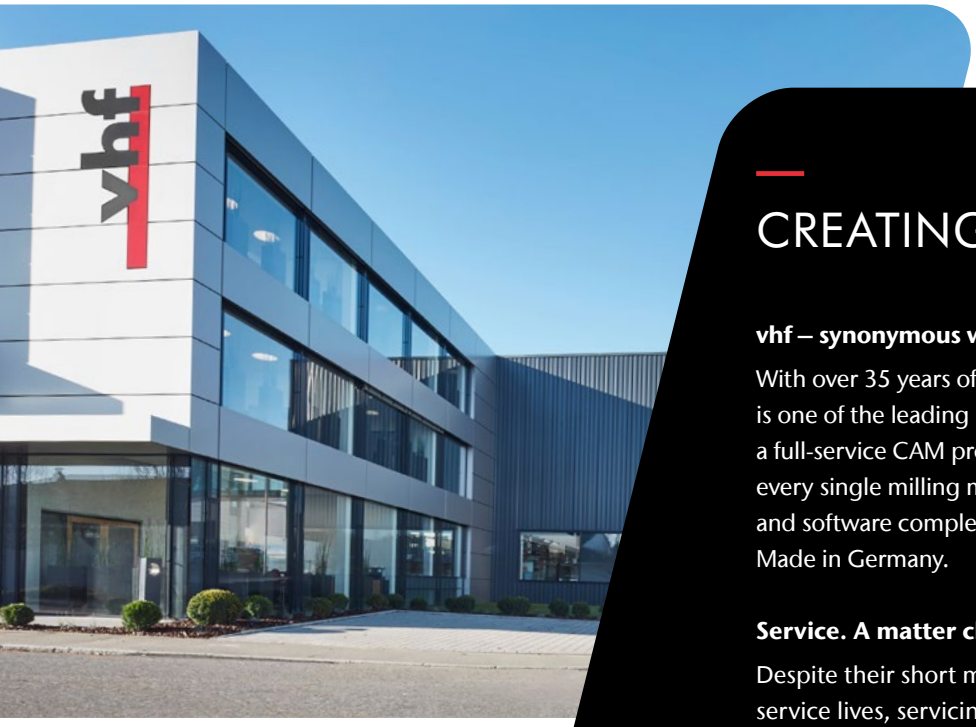
The top performers in the dental laboratory.

The **PERFORMANCE** CLASS machines are top performers in the dental laboratory, allowing you to work ultra-efficiently. Here we offer pure dry or wet processing machines as well as a combination thereof.

The **K5** is the compact and high-quality specialist for dry processing of discs. The **K5+** also offers a significant plus in comfort and spindle performance.

The **N4+** is the ideal addition to the K models for wet processing of blocks. Combined, the two machines can handle almost any indication.

The **S5** is a dry milling machine equipped with an eight-fold material changer. It also offers the option of grinding and milling glass ceramics or prefabricated abutments with an optional wet grinding module.



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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As of: 10/2025 · No. 269582 EN

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