Power package with loads of features.

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

PERFORMANCE CLASS

vhf
CREATING PERFECTION

Top performance for your dental laboratory.

Benefit from the powerful features of our best seller.

Ideal for hard materials

The five-axis K5+ from vhf's **PERFORMANCE** CLASS gives you extra power for all dry milling work in the dental laboratory. Its powerful 820 W spindle lets you always go all out when milling, while making it much easier to machine tough materials like cobalt-chrome.

The K5+ is also ideal for manufacturing monolithic full dentures thanks to its ability to process blanks with a thickness of up to 40 mm. It scores high marks in milling precision and reliability when used on a continuous daily basis. The very stable machine bed structure is made from a solid cast body that generates less vibrations. Paired with the precision spindle, the machine delivers first-class surface quality.

That means you can produce restorations with an even better fit and smoother surfaces that are particularly advantageous in preventing plaque accumulation on the denture material.

Power package with loads of features

With the K5+, many innovative technologies make your work easier: Two particularly useful features are the direct**disc** Technology for single-handed, tool-free disc fixation and the integrated ionizer that neutralizes most of the static charge of plastic chips – practically eliminating your cleaning work.

Our N4+ specialist for wet processing of blocks and titanium abutments is the optimal addition to the K5+. Combined, these two machines can handle almost any laboratory indication.

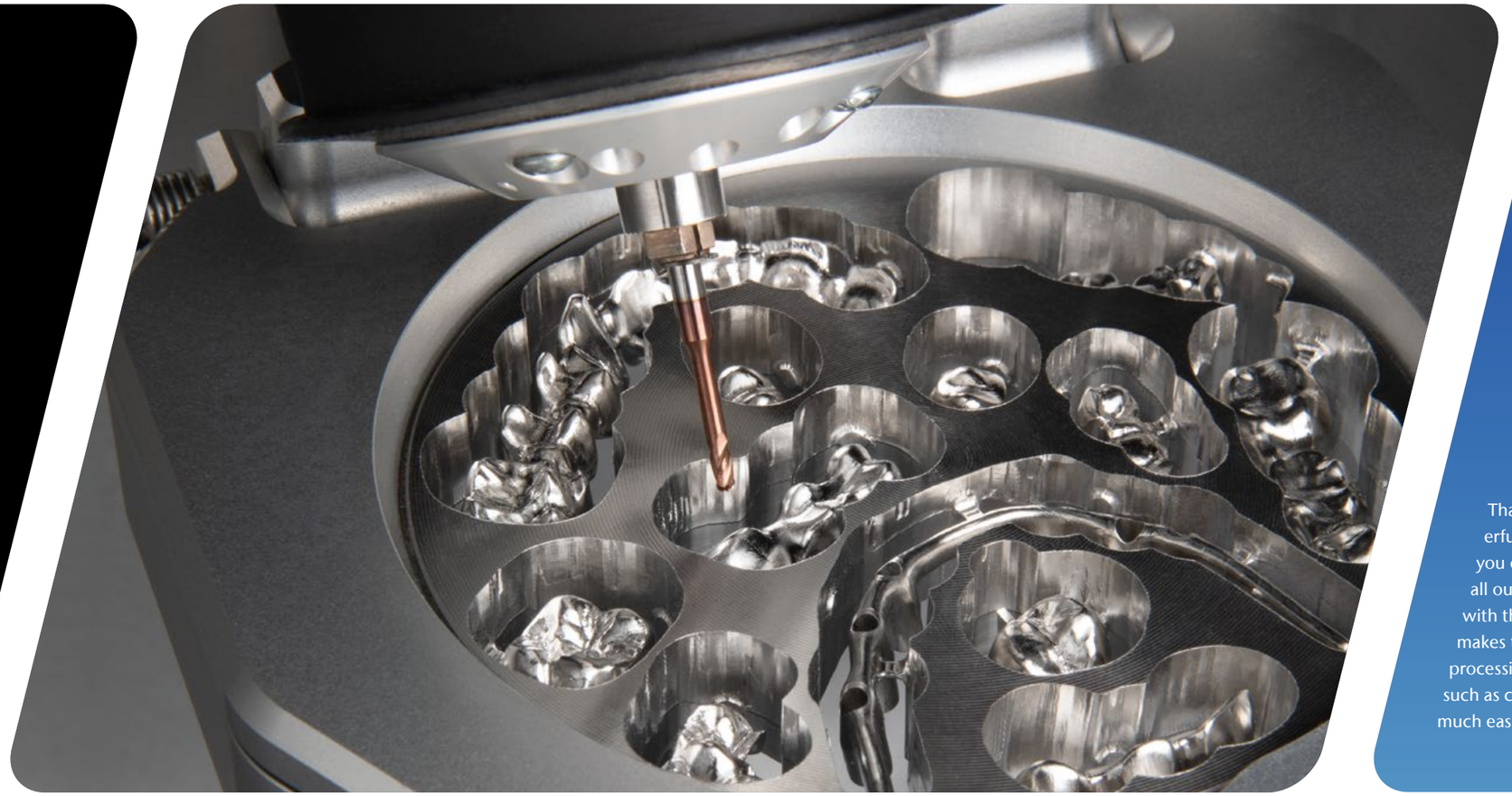
Keeping it all together

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.

I can do 80%
of my dental work
with the K5+.

Sandra Braun

Master dental technician and owner of INDIVIDUALIS,
milling center for innovative dental technology,
Rottenburg, Germany



Thanks to its powerful 820 W spindle, you can always go all out when milling with the K5+. This makes the demanding processing of materials such as cobalt-chrome so much easier.

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 820 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

Ionizer for easy machine cleaning

directdisc Technology for tool-free disc fixation – in seconds

Automatic changer for 16 tools

Webcam in the working chamber for remote monitoring and service

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

With the right holders, you can also effortlessly manufacture prefabricated abutments from CoCr and block materials.

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

The patent-pending direct**disc** Technology for disc fixation in just seconds.

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.

The K5+ machines discs up to a thickness of 40 mm. Ideal for denture manufacturing.

Technical data

General

Fields of application: Dry machining

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

- Blanks, height 10-40 mm (CoCr 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

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

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}): 820 watts · nominal power (S6): 680 watts · continuous power (S1): 550 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 · 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 · ionizer with 2 ion nozzles · disc change in direct**disc** Technology

Connection requirements

Compressed air: 6 bar: 50 l/min to 8 bar: 64 l/min (without ionization) · 6 bar: 80 l/min to 8 bar: 102 l/min (with ionization) · 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) (pending)

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

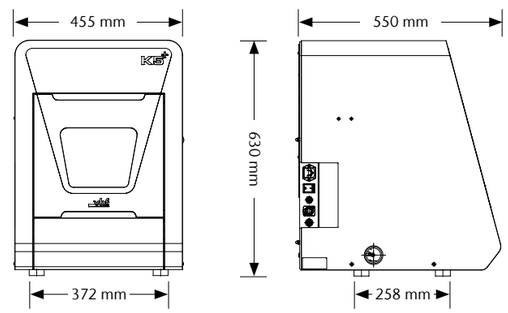
CAM software: vhf dental**cam**

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.



The **PERFORMANCE** CLASS at a glance.

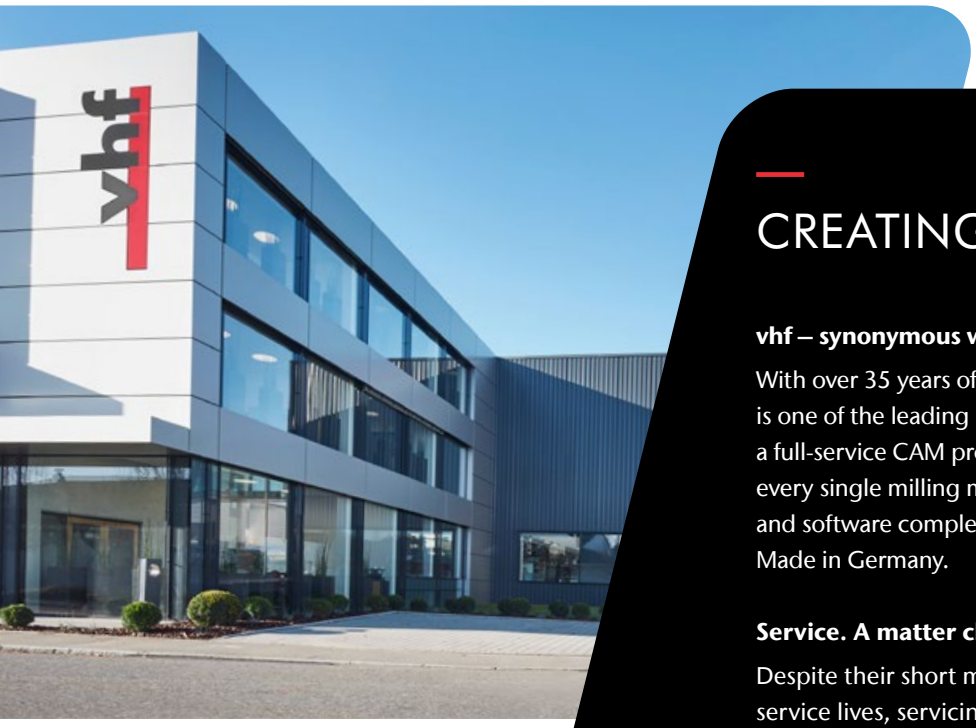
The top performers in the dental laboratory.

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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