

# SAME-DAY DENTISTRY. UNPARALLELED PERFECTION.

The 4-axis milling machine for wet machining  
for restorations in mere minutes.



# Z4

**4**  
Axes

**1**  
Block

**6**  
Tools

Wet

Mill  
Grind

CAM  
Software  
incl.

# TOMORROW'S LEADING TECHNOLOGY. AVAILABLE TODAY.

## The Z4: More than state of the art. Groundbreaking.

The digital workflow makes it happen: you and your patients can benefit from more relaxed treatments with first-class restorations in just one session. The Z4 is an investment that will pay off for you: high-quality

restorations with maximum independence. The number of machinable block materials constantly increases as well as the number of scanners and CAD software packages that are validated with the Z4.



Toolless block clamping in just two seconds. It couldn't be easier.

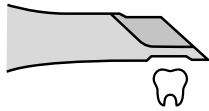


Perfect results. Mill and grind reliably with the Z4 in Ultra-HD.

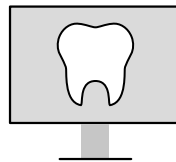
## EITHER WAY: THE Z4 FITS PERFECTLY INTO YOUR DIGITAL WORKFLOW.

### Integrated workflow with 3Shape, exocad

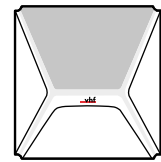
One user interface and everything in your practice: scanning, designing, milling.



1. SCAN



2. DESIGN



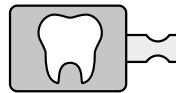
3. MILL

### Unlimited possibilities with open STL workflow

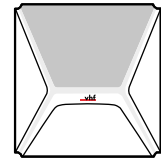
Design in your practice or your favourite laboratory for maximum indication and material freedom.



1. STL



2. NEST



3. MILL

### University of Washington



### Study confirms: Z4 drills screw-access channels in highest quality

A scientific study at the University of Washington proves that using the Z4, users can drill screw-access channels for hybrid implant restorations into ceramic blocks with no significant difference in flexural strength compared to factory-fabricated materials, known as "meso" blocks. These blocks are significantly more expensive, and the laboratory design method requires a more sophisticated CAD process. Thus, processing standard blocks with the Z4 means less cost for material, less material inventory necessary and easier nesting.

*Jack M. Keesler, DDS, MSD. Effect of milling screw-access channels on flexural strength of CAD/CAM ceramic materials. MSD Master's Thesis, University of Washington, 2019.*

# FEATURES AND BENEFITS? LOTS OF THEM!



## Highest precision

- Milling and grinding in Ultra HD
- Proven industrial quality
- 3 µm repetition accuracy



## Fastest production

- Restorations in under 10 minutes
- 2-second block insertion
- 100,000 rpm electrical high frequency spindle



## Absolute independence

- Around 40 block materials from a great variety of manufacturers
- 800+ prefab titanium abutment blanks from various manufacturers
- Validated with all established scanners and design software
- Fully integrated workflow with TRIOS Design Studio (3Shape) and exocad ChairsideCAD\*
- Integrated PC with touch screen and Wi-Fi – no laptop necessary
- Built-in compressed air – no compressor needed



## Highly economical

- **PUREWATER:** no grinding additives except for titanium processing
- Mill screw-access channels, to save costs for 'meso' blocks
- Automatic changer for 6 tools
- Self-opening working chamber door and drawer
- Easy to learn, easy to operate
- 24 months warranty
- Very easy operation via DENTAL-CAM software with DIRECTMILL Technology – included in scope of delivery and without license fees
- Tool starter set included

\* Material and indication availability may vary by CAD provider. Full range of indications and materials available in STL workflow.

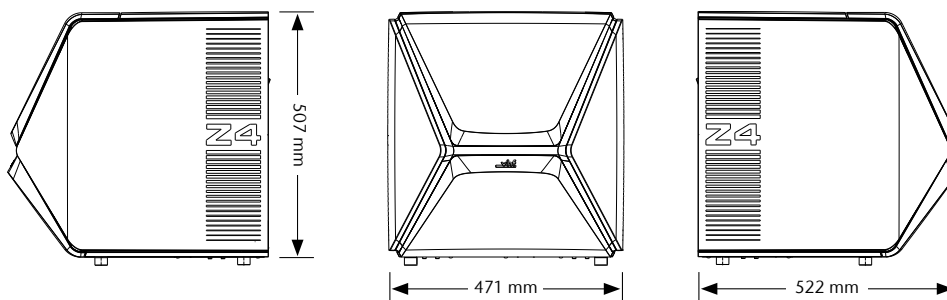
## MATERIAL, MANUFACTURER, INDICATION. ENJOY THE FREEDOM OF CHOICE.

### All common block materials up to 45 mm length and even abutments

Composites	Plastics   Wax	Glass ceramics	Zirconia	Titanium	CoCr
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### High-precision milling and grinding for all common indications

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



# TECHNICAL DATA.

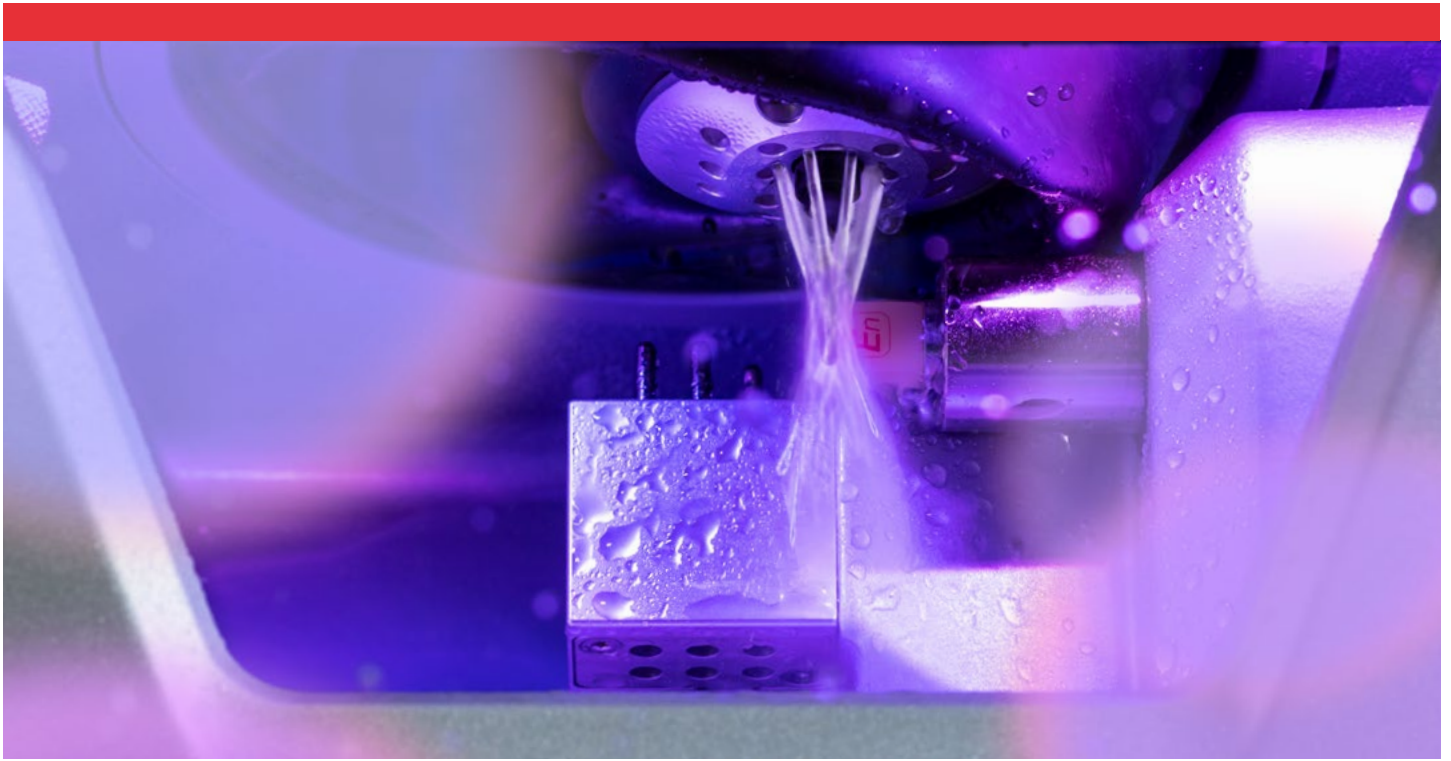
GENERAL	
Fields of application	Wet machining
Materials	Glass ceramics, titanium, zirconia, composites, plastic materials - Blocks up to 45 × 20 × 20 mm
Indications	Crowns, bridges, fully anatomical crowns and bridges, inlays, onlays, abutments, veneers, table tops
BASE SYSTEM	
Construction	Machine bed made of solid cast aluminum body
Housing	Thick-walled TSG injection moulding, white high-gloss lacquer finish with workspace flap and combined drawer for cooling liquid/tool inserts
Number of axes	4
Linear axes X-/Y-/Z-axis	Precision ball screws, rolled version · motors with resolution < 1 µm · ground precision steel guides · repetition accuracy ± 0.003 mm
Rotary axis A-axis	Rotary axis with high concentricity · Angle of rotation: 200°
Control unit	4-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
Compressed air generation	Internal compressed air supply with integrated sound insulation
Lighting	RGB LED lighting with status display
Camera system	Integrated in the working chamber for easy remote support and possibility of internal recording
PC (integrated)	Intel® Atom™ E3950, 4 cores, 1.60 - 2.00 GHz, 8 GB RAM · additional HDMI display interface · Wi-Fi
Display	Capacitive 5-inch touchscreen display fully integrated into the front flap for local operation of the machine.
SPINDLE	
General	High-frequency spindle, asynchronous with pneumatic tool clamping · sealing air to prevent debris from entering · automatic cone cleaning
Speed	Up to 100,000 rpm
Power	Peak power (Pmax): 340 watts · nominal power (S6): 220 watts · continuous power (S1): 170 watts
Bearing	Hybrid ceramic ball bearing · concentricity deviation at inner cone < 2 µm
Collet	Stainless steel collet with ceramic coating for tools with a shank diameter of 3 mm and max. 35 mm total length
AUTOMATION	
Tool change	Tool magazine for 6 tools, removable and material-coded · Length measurement and tool monitoring control via precision measuring key
Workpiece change	The integrated <b>DIRECTBLOCK</b> Technology automatically takes over the clamping and releasing of the block or abutment holder to be machined
Access to the working chamber	Motorized opening and closing of the work chamber flap, movement parallel to the chassis
Access to combined drawer	Electric ejector for tool and cooling liquid tank drawer
PROCESSING MODES	
Wet	Multiple liquid nozzles on the spindle · Integrated cooling liquid (2 litres) with active carbon filter system · flow-sensor for monitoring the liquid supply · <b>PUREWATER</b> : no grinding additives except for titanium processing
CONNECTION REQUIREMENTS	
Compressed air	No compressed air required
Power	100 - 240 volts · 50/60 Hz, 750 watts
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)	471 × 522 × 507 mm with closed flap and drawer 471 × 737 × 608 mm with open flap and drawer
Footprint (W/D)	400 × 305 mm
Weight	66 kg
SCOPE OF DELIVERY	
CAM Software	DENTALCAM software included
Holder systems	Abutment holder devices for various systems (optional)
Accessories	Spindle service set · Calibration set incl. micrometer · Brush for nozzle plate · Cleaning brush · Microfibre cloth · Spare fine filter · Active carbon pellets · Tec Powder (3 bags) · Spare wiper for viewing window · Tool magazine inserts (5 pieces) · Torque wrench · 2 Allen wrenches · Drill bit (tool positions) · Measuring pin · Power cable · Ethernet network cable · Carrying aid for transporting the machine · Operating instructions



**"THE Z4 GIVES ME THE ACCURACY  
AND FLEXIBILITY IN MATERIALS  
I NEED."**

**Alan Jurim, DDS**

Director for Digital Dentistry at Touro Dental College, New York



Thanks to PUREWATER no grinding additives are needed, except for titanium processing.



## CREATING PERFECTION.

### For more than 30 years.

As CAM solution provider, vhf thoroughly develops and produces every single milling machine and the perfectly matching tools and CAM software. Everything from one source. Made in Germany.

### Support. A topic close to our hearts.

The service of your machine is important to us: We train our sales partners according to the highest requirements – so you receive first-class support for your Z4.

## GET IN TOUCH.

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CREATING PERFECTION