

THE WET MILLING POWERHOUSE.

The 4-axis milling machine for blocks and
abutments for laboratory and practice.



N4+

4
Axes

3
Blocks

8
Tools

Wet
Mill

Mill
Grind

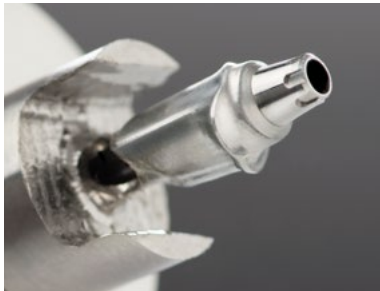
CAM
Software
incl.

OTHERS TALK ABOUT STANDARDS. WE SET THEM.

The essence of wet grinding

The N4+ is an efficient wet processing machine for grinding and milling blocks of glass ceramics, composites and zirconia as well as CoCr and titanium abutments. It impresses not only with its high precision and fast drives, but also with its very compact housing with a closed liquid circuit.

In addition, the N4+ has plenty of power: the machine's spindle offers a strong 800 watts of power at up to 80,000 rpm for efficient wet processing of up to three blocks or prefabricated abutments.



Scientists at the University of Washington confirm exceptional precision of $-10\ \mu\text{m}$ to $+26\ \mu\text{m}$ in milling of titanium custom abutments.

With its triple block holder, the N4+ is the ideal partner for the dental laboratory and practice lab. Other highlights of this four-axis machine are the integrated webcam for an easy remote support and the automatic changer for up to 8 tools. The tool magazine can be inserted quickly, effortlessly, and single-handedly.

The large cooling liquid tank can also be removed from the drawer conveniently.



FEATURES AND BENEFITS? LOTS OF THEM!



Exceptional precision

- Restorations in Ultra HD
- Premium spindle with 4-fold hybrid ceramic ball bearings for maximum running smoothness
- 3 µm repetition accuracy



Sophisticated design

- Eight liquid nozzles for steady tool cooling
- Highest rotational speeds of up to 80,000 rpm with 800 watts of power
- Heavy industrial quality



Highly economical

- **PUREWATER:** no grinding additives except for titanium processing
- Work on up to 3 blocks with 45 mm length at the same time
- Milling of screw channels – saves costs for ‘meso’ blocks
- Conveniently removable cooling liquid tank
- Automatic changer for 8 tools
- Webcam in working chamber for remote monitoring and service
- Ethernet interface for stable connection
- Very easy operation via DENTAL-CAM software with DIRECTMILL-Function – included in scope of delivery and without license fees



Absolute independence

- Around 40 block materials from a great variety of manufacturers – with upward tendency
- 1,300+ titanium and CoCr prefab abutment blanks from various manufacturers
- Ideal for labs and in-office labs



Outstanding reliability

- 100% developed and manufactured in Germany
- 24 months warranty

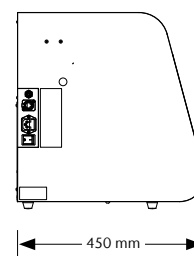
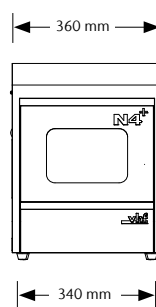
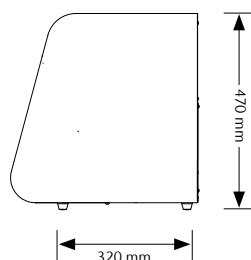
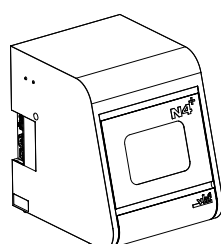
MATERIAL, MANUFACTURER, INDICATION. ENJOY THE FREEDOM OF CHOICE.

All common block materials up to 45 mm in 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

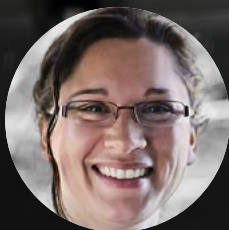
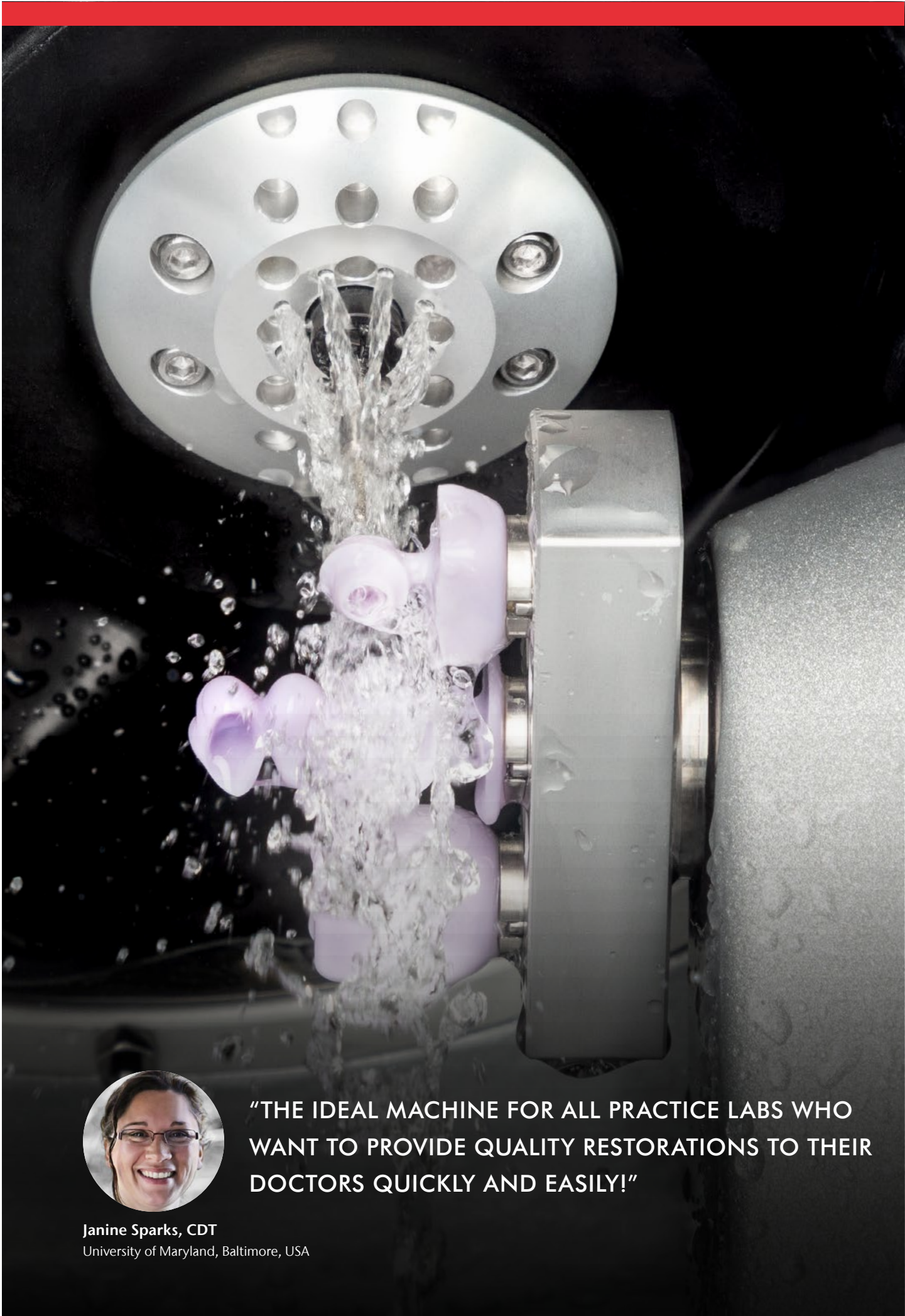
Crown Bridge	Inlay Onlay	Abutment	Telescopic crown	Model plate
Model cast	Occlusal splint	Model tooth	Implant bar	Veneer
Drilling template	Denture	Secondary crown	Screw-retained bridge	Protrusion splint



TECHNICAL DATA.

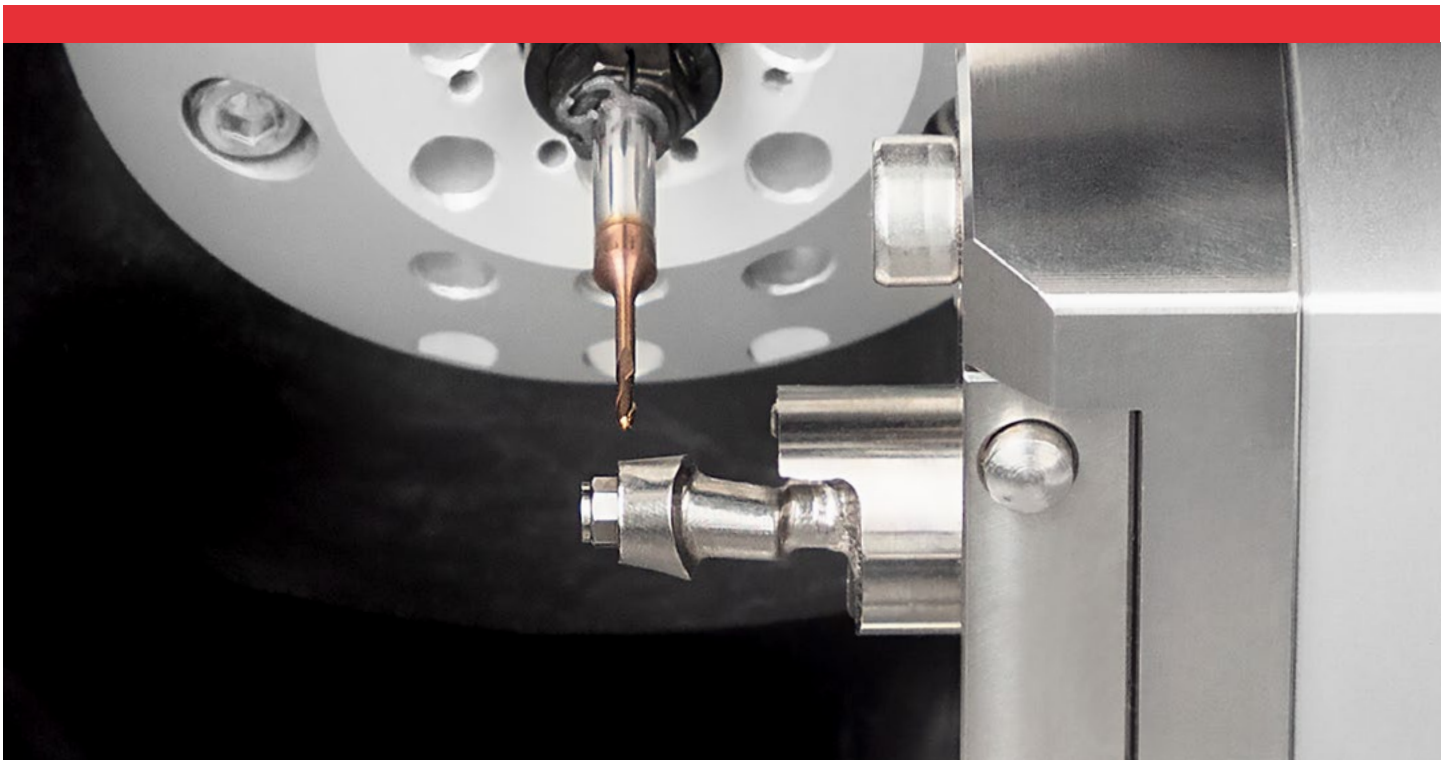
GENERAL	
Fields of application	Wet machining
Materials	Glass ceramics, titanium, zirconia, composites, plastic materials - Blocks up to 45 × 20 × 20 mm
Indications	Crowns, bridges, fully anatomical crowns and bridges, inlays, onlays, abutments, veneers, table tops
BASE SYSTEM	
Construction	Machine bed made of solid cast aluminum body
Housing	Sheet steel housing, white high-gloss lacquer finish with working chamber flap and cooling liquid tank drawer
Number of axes	4
Linear axes	Precision ball screws, rolled version · motors with resolution < 1 µm · ground precision guides made of steel · repetition accuracy
X-/Y-/Z-axis	± 0.003 mm
Rotary axis	Rotary axis with high run-out accuracy · angle of rotation: 200°
A-axis	
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
Lighting	RGB LED lighting with status display
Camera system	Integrated in the working chamber for easy remote support and possibility of internal recording
SPINDLE	
General	High-frequency spindle, asynchronous with pneumatic tool clamping · sealing air to prevent debris from entering · automatic cone cleaning
Speed	Up to 80,000 rpm
Power	Peak power (Pmax): 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 3 mm shank diameter and max. 35 mm total length
AUTOMATION	
Tool change	Tool magazine for 8 tools, removable · length measurement and tool breakage monitoring via precision measuring key
PROCESSING MODES	
Wet	Multiple fluid nozzles on the spindle · integrated cooling liquid tank (3.5 litres) with active carbon filter system · flow-sensor for monitoring the liquid supply · PUREWATER: no grinding additives except for titanium processing
CONNECTION REQUIREMENTS	
Compressed air	4 bar: 25 l/min up to 8 bar: 45 l/min · air purity according to ISO 8573-1:2010
Power	100 · 240 volts · 50/60 Hz, 640 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)	360 × 450 × 470 mm with closed flap and drawer 360 × 710 × 470 mm with open flap and drawer
Footprint (W/D)	340 × 320 mm
Weight	53 kg
SCOPE OF DELIVERY	
CAM Software	DENTALCAM software included
Holder systems	Abutment holders for various systems (optional)
Accessories	Spindle service set · calibration set incl. micrometer · Tec Liquid set · brush for nozzle plate · cleaning brush · spare fine filter · active carbon pellets · Tec Powder (3 bags) · tool magazine inserts (2 pieces) · spare screws blank holder · torque wrench · 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

Subject to changes and errors.



“THE IDEAL MACHINE FOR ALL PRACTICE LABS WHO WANT TO PROVIDE QUALITY RESTORATIONS TO THEIR DOCTORS QUICKLY AND EASILY!”

Janine Sparks, CDT
University of Maryland, Baltimore, USA



Precise milling of titanium abutments – an easy job for the N4+.



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 N4+.

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