



**Malvern
Panalytical**
a spectris company

Omega / Theta

Panalytical X-ray technology

Maximum precision, maximum versatility



Omega / Theta for ultra-fast crystal orientation and rocking curve measurements

Determination of crystal orientation in under 10 seconds

The Omega/Theta XRD delivers the ultimate in combined precision and speed for determining the crystal lattice orientation. With results returned in as few as ten seconds, the Omega/Theta XRD features many process accessories from bar code readers to crystal stacking frames and can accommodate a range of samples of up to 30 kg in weight and 450 mm in length. It is a reliable partner to transfer the measured orientation to your processing tool.

Precise: <math><0.003^\circ / <0.03^\circ</math> precision (1 σ) on off-cut magnitude and in-plane direction

- Determination of crystal orientation in under 10 seconds
- Automatic evaluation of the complete lattice orientation in 3D

For research and production quality control

- Azimuthal setting and marking of crystal orientation
- Many accessories for orientation transfer to other process steps
- Goniometer scan for unknown materials and orientations
- Rocking curves for crystal quality measurements



User friendly and cost effective

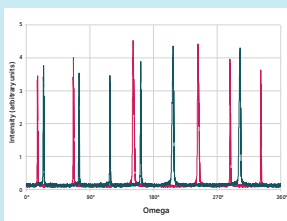
- Convenient sample handling and easy to operate
- Advanced user friendly software
- Low energy consumption and operating costs

Modular design and flexibility

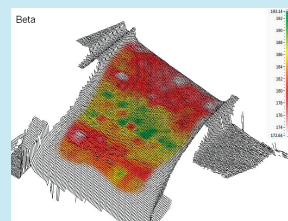
- Future proof with various upgrade options
- Customized solutions for special application based on customers' request
- Optical recognition of flat and notch

Modular design and flexibility

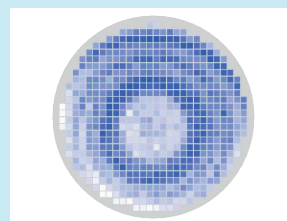
- Ultra-fast crystal orientation measurement
- Fully automated complete lattice orientation measurement of single crystals
- Automated rocking-curve measurement after orientation determination or automatic reflection search
- Angular resolution of the diffractometer: 0.1 arc sec.
- Sample size up to 450 mm
- Appropriate for research and production quality control



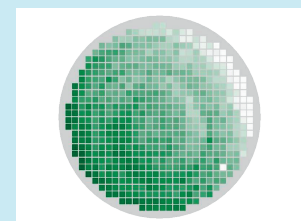
Azimuthal-scan diagram (SiC)



Stress mapping of Turbine blade - Ni super alloy



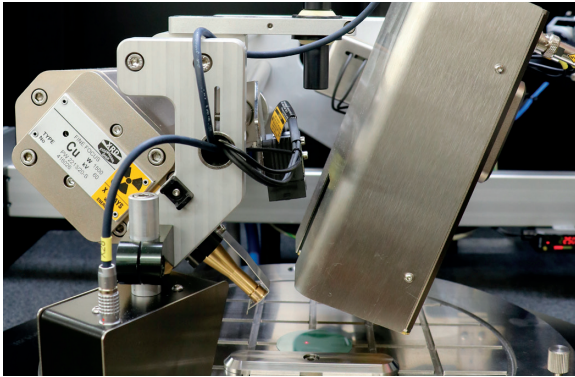
(Si, Ge) wafer, orientation map



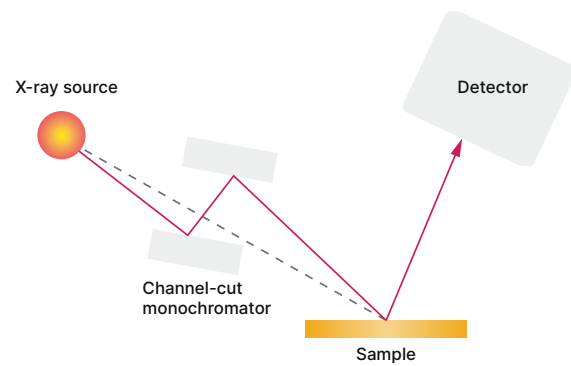
Lattice parameter map

Azimuthal method

All crystal orientation parameters are captured within 10 seconds.



Rocking-curve measurement



Configuration options

- Laser scanner for sample shape measurement
- Photographic camera and image processing for flat and notch determination
- Further sample rotation axis for 3D mapping
- Distance adjustable detector arm
- Equipment for sample adjustment
- Automatic stage for orientation mapping

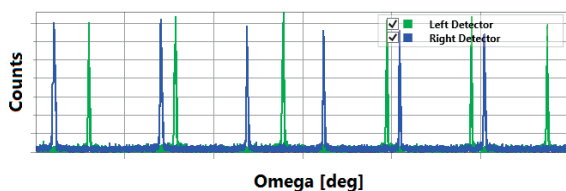
Special applications

- Orientation mapping of turbine blades (single crystalline Ni based super alloys)
- Determination of lattice parameters, for example in (Si,Ge) solid solutions

XRDSudio

User-friendly and advanced operating software with:

- Different modes of operation
 - Operator mode: for fixed measurement parameters and a safe workflow
 - Administrator mode: to modify/create new recipes and to adapt to new materials
- Guided user interface allows flawless workflow
- Pre-defined and customized recipes
- Automatic display of measurement results and the correction values to adjust crystal orientation
- Mapping options
- Export and import functions



Technical specifications

Specifications	
X-ray source	standard X-ray tube, Cu anode
Detector	scintillation counter (single or double)
Sample holder	precise turntable (accuracy 0.01°), mounting plate and tools for sample adjustment
Crystal collimator	primary Ge or Si channel-cut monochromator, measurable minimal broadening: < 10 arc sec
Mapping	Automatic table, lateral resolution 0.1 mm
Software	XRDSudio
Water cooling	flow – 4l/min, max. pressure 8 bar, T ≤ 30°C
PC workstation	Windows 7 or latest, .NET Framework update
Dimensions	H 1950 mm × D 820 mm × W 1200 mm
Weight	ca. 650 kg
Power requirements	208-240 V, 16 A single phase, 50-60 Hz
Certification	manufactured under ISO 9001 guidelines, CE conform



About Malvern Panalytical

Malvern Panalytical is a global leader in the analytics of material and life sciences. We unleash the power of small things to make big things happen for our customers.

Our vision is to make the world cleaner, healthier, and more productive.

We partner with our customers to make their solutions possible through the power of precision measurements, our expertise, trusted data, and insights.

Our people are partners in discovery. We collaborate with our customers and with each other to discover new possibilities and achieve breakthroughs.

Our culture is a healthy, high-performance culture shaped by our values: Own it, Aim High and Be True.

We're committed to Net Zero in our own operations by 2030 and in our total value chain by 2040.

With over 2300 employees across the globe, we are part of Spectris plc, the world-leading precision measurement group.

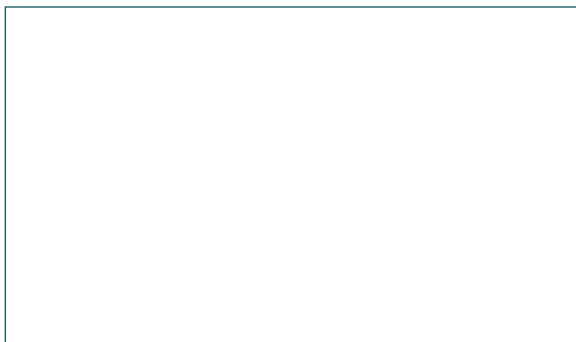
Malvern Panalytical. We're big on small™

Service & Support

Malvern Panalytical provides the global training, service and support you need to continuously drive your analytical processes at the highest level. We help you increase the return on your investment, and ensure that as your analytical requirements grow, we're there to support you.

Our worldwide team of specialists adds value to your business processes by ensuring applications expertise, rapid response, and maximum instrument uptime.

- Proactive local and remote support
- Full and flexible range of service agreements
- Compliance and validation support
- Onsite or classroom-based training courses
- e-Learning training courses and web seminars
- Digital services, including MyStore and My Customer Support Portal
- Sample analysis, method development, and applications consultancy



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