



SciAps

a powerful  
combination

# 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: $<0.003^\circ$ / $<0.03^\circ$ precision ( $1\sigma$ ) on off-cut magnitude and in-plane direction

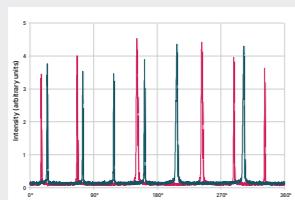
- Determination of crystal orientation in under 10 seconds
- Automatic evaluation of the complete lattice orientation in 3D

### For research and production quality control

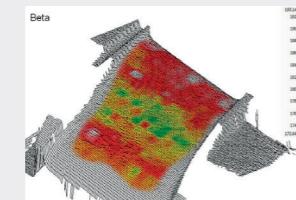
- Azimuthal setting and marking of crystal orientation
- Many accessories for orientation transfer to other process steps
- Goniometer scan for unknown materials and orientations
- Rocking curves for crystal quality measurements

### Modular design and flexibility

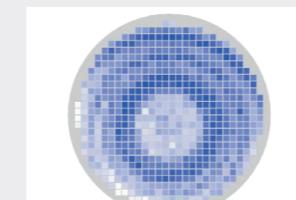
- Ultra-fast crystal orientation measurement
- Fully automated complete lattice orientation measurement of single crystals
- Automated rocking-curve measurement after orientation determination or automatic reflection search
- Angular resolution of the diffractometer: 0.1 arc sec.
- Sample size up to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



Azimuthal-scan diagram (SiC)



Stress mapping of Turbine blade - Ni super alloy



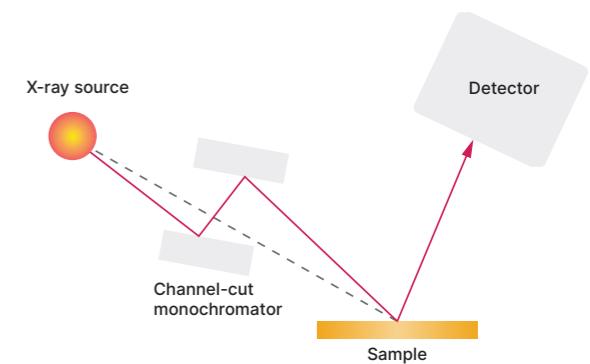
(Si, Ge) wafer, orientation map

### 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

### XRDStudio

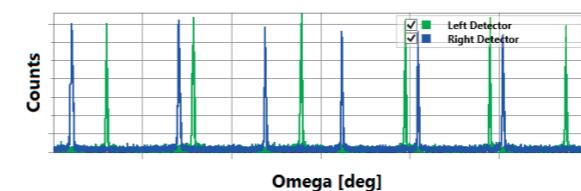
User-friendly and advanced operating software with:

- 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	XRDStudio
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



a powerful combination



SciAps

## About Malvern Panalytical

Malvern Panalytical, Micromeritics and SciAps; a powerful and highly complementary combination of market leading technologies.

We are the toolmakers for the world's most innovative companies, academic institutions, and government laboratories. Customers see the difference when they use our instruments and feel the difference when they deal with our people.

Malvern Panalytical instruments analyze the chemical, physical and structural nature of materials, from proteins to polymers and semiconductors to minerals. Our leading technologies measure particle size, shape, concentration and zeta potential, biomolecular interactions and stability, elemental concentrations and crystallographic structure.

As a powerful combination our customers have access to technology leadership and an unwavering commitment to

customer support with a 1:1 ratio of sales to applications engineers, our customers' analysis is our priority – global expertise with local support tailored to their needs and access to an extended product portfolio.

With Micromeritics, customers can also measure surface area, porosity, density, adsorption and particle activity. With SciAps, our Center of Excellence for handheld instruments, customers can also access portable X-ray fluorescence (XRF), laser-based (LIBS), and near-infrared (NIR) analyzers to measure any element in any environment.

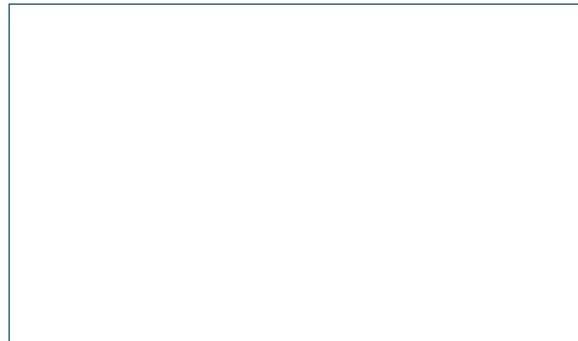
We have a global footprint with R&D and manufacturing sites in North America, Europe, and Asia. We are more than 2,500 employees in a customer-focused organization with sales and service offices in 20 countries, all committed to delivering expert and responsive customer support.

## 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



[www.malvernpanalytical.com](http://www.malvernpanalytical.com)

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