

Technical Data	
Configurations	Vertical goniometer, Theta/Theta geometry
Measuring circle diameter	560 mm
Angular range (without accessories)	360°
Max. usable angular range (depending on accessories)	-110° < 2Theta ≤ 168°
Angle positioning	Stepper motors with optical encoders
Smallest addressable increment	0.0001°
Reproducibility	± 0.0001°
Accuracy	± 0.005°
Instrument alignment (at constant environmental conditions)	Equal or better than ± 0.01° 2Theta; NIST SRM 1976a always included
TWIN/TWIN	Push-button motorized switch between Bragg-Brentano and parallel beam geometry
DAVINCI.DESIGN	Real-time component recognition and configuration Real-time conflict detection
Resolution (FWHM) (depends on accessories)	0.028° 2Theta at ~ 30° 2Theta in Bragg-Brentano geometry
Maximum angular speed (depends on accessories)	20°/s
Detector	LYNXEYE, LYNXEYE XE
Detectors guaranteed without defective/dead strips	
Safety	Machinery directive 2006/42/EC Electrical equipment 2006/95/EC Electromagnetic Compatibility 2004/108/EC German type approval (PTB) for X-ray safety FDA 0880057, 088058
General space and infrastructure requirements:	
Exterior dimensions (h x w x d)	1,868 x 1,300 x 1,135 mm 73.5 x 51.2 x 44.7 inch
Weight (without optional electronics)	770 kg
Cooling water supply	Min. 4 l/min, pressure 4 bar to 7.5 bar, no pressure on outlet side, temperature: 10 °C to 20 °C
Power supply	Single phase: 208 to 240 V Three phases: 120 V, 230 V, 240 V 47 to 63 Hz
Maximum power consumption (without controllers for optional equipment)	6.5 kVA

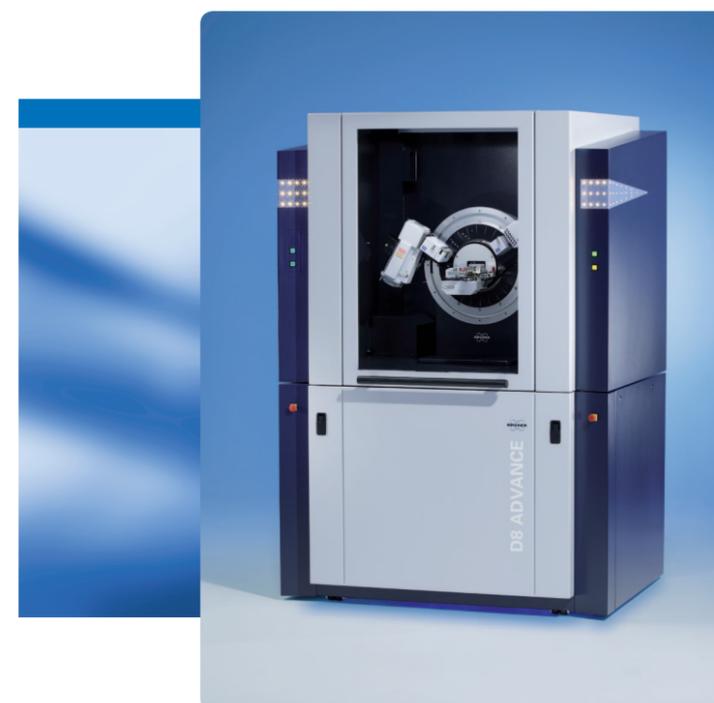
LYNXEYE turned 90°: EP 1 647 840 A2 patent; EP 1 510 811 B1 patent. Primary TWIN: US 6665372, DE 10141958. Secondary TWIN: Patent pending

● **Bruker AXS GmbH**
Karlsruhe · Germany
Phone +49 721 50997-0
Fax +49 721 50997-5654
info@bruker-axs.de

www.bruker.com/x-ray

● **Bruker AXS Inc.**
Madison, WI · USA
Phone +1 800 234-XRAY
Phone +1 608 276-3000
Fax +1 608 276-3006
info@bruker-axs.com

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TWIN/TWIN

- The Ingenious Beam Path Design in the D8 ADVANCE

X-ray Powder Diffraction with the D8 ADVANCE Automatic Geometry Selection with TWIN/TWIN

The D8 ADVANCE with TWIN/TWIN allows fully automatic switching between focusing Bragg-Brentano and parallel beam geometry.

Without touching a single component of the instrument the pioneering TWIN/TWIN design alternates both the primary and the secondary optics accordingly.

The primary TWIN optic features a motorized divergence slit for Bragg-Brentano geometry and a Göbel mirror for the parallel beam geometry. The secondary TWIN optic implements both the appropriate motorized anti-scatter slit for Bragg-Brentano, and an equatorial Soller slit for parallel beam geometry. This allows for the optimization of the beam path with respect to the sample.

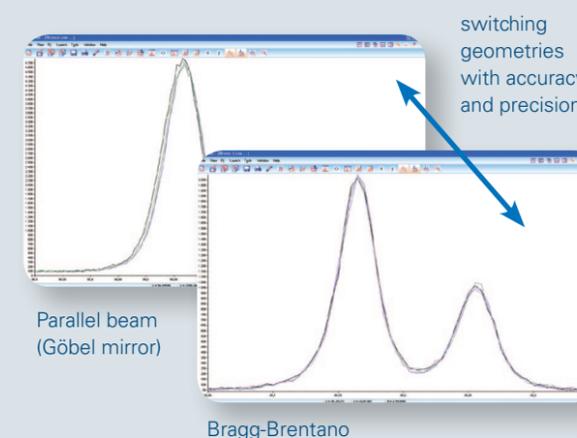
As a result, the innovative D8 ADVANCE with TWIN/TWIN setup offers the capability to investigate a wide variety of samples with varying properties. Additionally considering the ease-of-use, the D8 ADVANCE is the ideal tool for both beginners and experts, providing access to the full range of powder diffraction applications, without any need of awkward optic changes and alignments.



- Two fully automated beam path geometries integrated into a single setup for ultimate ease-of-use
- Software controlled motorized switch of both primary and secondary optic avoiding misuse and malfunction
- Alignment-free switch between Bragg-Brentano and parallel beam geometry for matching analytical requirements defined by the sample



Switching between geometries is achieved using the DIFFRAC.SUITE software – the unique virtual goniometer showing all mounted components plus their status in real-time. Just mouse-click on a TWIN optics and choose the geometry – that's all!



Stunning, unparalleled long-life stability and accuracy: Thanks to the unique TWIN/TWIN design, the optics return to perfect alignment within $< \pm 0.001^\circ 2\theta$ standard deviation, a precision which cannot be achieved by manual optics changes in principle. Additionally, there cannot be any wear and possible optics damage, as the optics change is done fully automatically.

TWIN-TWIN Setup

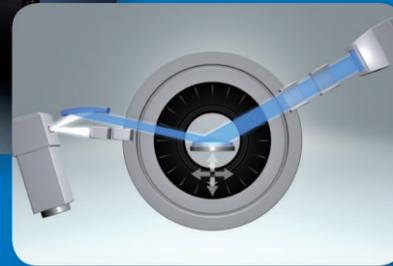
One Instrument for all Applications



TWIN/TWIN setup for Bragg-Brentano geometry



TWIN/TWIN setup for grazing incidence diffraction



TWIN/TWIN setup for reflectometry, LYNXEYE detector switched to 90° position



TWIN/TWIN setup for micro-diffraction



Switching between applications – without any instrument reconfiguration and alignment

The D8 ADVANCE with TWIN/TWIN setup is the most easy-to-use and most flexible instrument for X-ray powder diffraction analysis, delivering unparalleled intensity and resolution. Naturally, any sample can be measured using both the Bragg-Brentano and the parallel beam geometry. While the Bragg-Brentano geometry offers the best resolution, the parallel geometry is ideal for odd-shaped samples such as loose powders or bulky materials. For best data quality, inorganic samples can be measured in reflection mode, and organic samples in transmission mode.

The independent operation of the primary and secondary TWIN optics opens the path for a huge range of additional applications in combination with dedicated sample stages.

The TWIN/TWIN setup is compatible with all sample stages available for the D8 ADVANCE diffractometer family, from single specimen sample stages up to the AUTO-CHANGER with an up to 90 specimen magazine, non-ambient chambers from MRI and ANTON PAAR, compact XYZ and Eulerian cradle, as well as the capillary stage. Thanks to the Theta/Theta goniometer the samples always stay horizontally – loose samples will never fall.

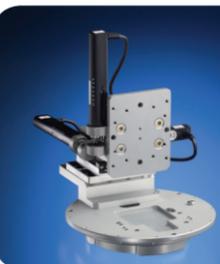
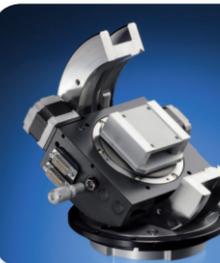
Mounting of different sample stages has never been so easy as child's play, thanks to DAVINCI.DESIGN. An ingenious adapter system allows mounting of all sample stages within seconds by everybody, without any need of realignment. The instrument will fully automatically recognize and configure your sample stages. Simply close the door of your instrument and you are ready to go.

Ultimate ease-of-use

- True plug & play operation for all components: tubes, optics, sample stages
- Alignment-free change of ambient and non-ambient sample stages
- Software-guided and -validated instrument configuration with real time status display and conflict detection
- Absolutely open design with maximum flexibility for future adaptations

Applications

- Phase identification and quantification
- Microstructure analysis (size-strain)
- Structure determination and refinement
- Micro-diffraction
- Residual stress analysis
- Texture analysis
- Reflectometry
- Small Angle X-ray Scattering



The Bruker AXS Guarantee – Absolute Safety is our Top Priority



Bruker AXS instruments always fully comply with all current EU directives, therefore establishing and guaranteeing the world's highest standards for analytical X-ray equipment including, but not limited to, machinery safety, X-ray safety, electrical safety, and electromagnetic compatibility. All instruments display an up-to-date CE marking, accompanied by a correct EC Declaration of Conformity as well as all required documentation.

Most specifically, the D8 ADVANCE has type approval granted by the German National Metrology Institute (PTB) with respect to X-ray safety. Compliance to the most stringent requirements by the PTB make the D8 ADVANCE the safest X-ray diffractometer on the market, and significantly minimizes efforts to obtain approval by national authorities. Irrespective of the instrument configuration, under measurement conditions, the radiation level is in the nano-Sievert range.

Full CE compliance

- Machinery Directive (2006/42/EC)
- Electrical Equipment (2006/95/EC)
- Electromagnetic compatibility (2004/108/EC)
- and more

- Ultimate X-ray, machine and electric safety in compliance with the latest EU directives
- Audit-proven quality management system

The Bruker AXS Guarantee – The Benchmark in X-ray Powder Diffraction Data Quality

Alignment guarantee

The D8 ADVANCE comes with a unique alignment guarantee as detailed in the "Instrument Verification Booklet": The accuracy of each peak position is equal or better than $\pm 0.01^\circ 2\theta$ over the whole angular range. Before delivery and at installation each instrument has to pass a strict test based on the internationally accepted Standard Reference Material SRM1976a by NIST. This standard is always included with each instrument, to additionally enabling the user to monitor instrument performance at any time.

The D8 ADVANCE thus delivers the most accurate measurement data of all instruments available on the market. No other manufacturer has ever been able to provide a similar guarantee even for their latest equipment.

Detector guarantee

The major break-through achieved by the Bruker AXS' new detector technologies relates to a most notable boost in manufacturing quality. In contrast to conventional 1-D solid state detectors available on the market, Bruker AXS guarantees absolutely faultless detectors, without any defective strips. This unique property of the LYNXEYE detector makes it particularly suited for fixed mode measurements (0-D) including detection of very weak signals.



- Solid and maintenance-free goniometer design for mechanical strength and long life
- Instrument performance verification with NIST corundum standard SRM 1976a
- Instrument alignment $\leq \pm 0.01^\circ 2\theta$ over the whole angular range
- LYNXEYE compound silicon strip detector with all channels fully functional