Product Overview

- Advanced Analytical Solutions

X-RAY, MA, AFM, OES, SOM, CS/ONH

Innovation with Integrity

We Exceed Your Expectations

Professional Competence

Bruker is a worldwide market leader in providing advanced X-ray and optical emission systems and complete solutions for structure and elemental analysis using X-ray diffraction (XRD), X-ray fluorescence (XRF/OES) and crystallographic diffraction techniques. We also offer the world's largest selection of AFMs, stylus profilers, and 3D optical microscopes to enable nano- to macro-scale surface measurements for the widest range of scientific and industrial applications. Our microtomography desktop instruments even enable you to non-destructively acquire 3D images of your sample's morphology and internal microstructure with resolution down to the sub-micron level.

Our products fit the analytical requirements of customers in materials research, life science, quality control, and process analysis. They provide essential information about the molecular structure, material and structural parameters of thin film and bulk material as well as elemental composition of solids and liquids.

High Performance

Bruker X-ray systems emphasize modularity and flexibility, enabling an entry-level system to be reconfigured or upgraded to meet changing requirements. We offer the widest available variety of X-ray sources, optics, sample environments and detectors, along with expert advice on configuring the optimal system. All of our systems and solutions are easy to operate, robust and compact, with degrees of automation ranging from none to one-button operation. Professional training and worldwide service is in place to support the customer.

A History of Innovation Leadership

Bruker is constantly redefining the performance and quality standards in X-ray analysis. Breakthrough innovations and continual improvements upon established techniques provide our customers with analytical possibilities that were considered beyond reach only a short while ago. Examples include our revolutionary detection technologies, multilayer X-ray optics, and ability to perform XRF analysis of light or trace elements. Further accomplishments are highlighted at the bottom of this and the following pages.

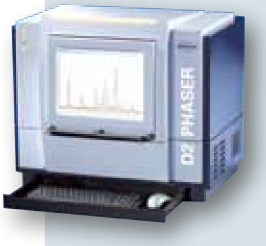
SUPER SPEED SOLUTIONS

Bruker breaks all records. The SUPER SPEED components ensure breathtaking speed at high-sensitivity resolution – without sacrificing reliability and flexibility. The X-ray diffraction SUPER SPEED SOLUTIONS enable an unprecedented throughput in research and development.

- High-brilliance TURBO X-RAY SOURCE
- VÅNTEC-1 detector – instant diffraction snapshots
- LYNXEYE^{TM} – rapid powder diffraction
- VÅNTEC-500 detector – the extra dimension of XRD^2
- VÅNTEC-2000 detector – ultra size XRD^2

X-ray Powder Diffraction (XRPD)

XRD Powder



D2 PHASER

D4 ENDEAVOR

D8 ADVANCE

X-ray diffraction expands analytical capabilities down to the nanometer range. Our highly accurate, reliable and fast diffraction solutions are accompanied by an intuitive and clearly laid-out user interface, easy handling, and individual data presentation, as well as perfect integration and communication capabilities.

Applications

- Crystalline phase identification
- Crystalline phase quantification
- % crystallinity
- Crystallite size determination
- Crystal structure analysis
- Crystal orientation
- Texture and preferred orientation
- Microstrain
- Residual stress
- Depth profiling
- Polymorph screening
- High temperature
- Low temperature
- Humidity
- Phase transition
- Nanoparticles

DAVINCI design

The D8 ADVANCE with DAVINCI design facilitates a pioneering diffractometer concept, which eliminates the problems of awkward configuration and adjustments once and for all. It is extremely easy to exchange all components and geometries, thanks to the multi-level design:

- DAVINCI.SNAP-LOCK: alignment- and tool-free optics change
- DAVINCI.MODE: real-time component recognition, configuration and conflict detection
- DIFFRAC.DAVINCI: graphical representation of the actual goniometer showing all beam path components including their status, enabling immediate measurements as well as the creation of measurement methods

X-ray Diffraction (XRD)

Quick-Change Artists without Limits

The capabilities provided by the D8 DISCOVER, laboratory X-ray diffraction enters new frontiers in the nano-world and materials research so that synchrotron measurement campaigns become obsolete in many cases.

Applications

- Crystalline phase identification
- Crystalline phase quantification
- % crystallinity
- Crystallite size determination
- Crystal structure analysis
- Texture and preferred orientation
- Microstrain and relaxation
- Residual stress
- Layer thickness
- Layer roughness
- Lattice parameter
- Chemical composition
- Lateral structures
- Defects
- Depth profiling
- Real space mapping
- Microdiffraction
- Polymorph screening
- High temperature
- Low temperature
- Humidity
- Phase transition
- Nanoparticles

D8 DISCOVER

The D8 FABLINE is the only X-ray metrology instrument with various combined applications:

- High-Resolution X-Ray Diffraction (HRXRD)
- X-ray Reflectivity (XRR)
- Grazing Incidence Diffraction (GID)
- Micro-X-ray Fluorescence (µXRF)
- Grazing Incidence X-ray Fluorescence (GIXRF)

D8 FABLINE

High-Throughput Applications

Screening a large number of samples quickly and completely requires dedicated instrumentation and extensive knowledge of the analytical process. Extremely large amounts of data need to be handled, especially in catalyst development and pharmaceutical research. Unique applications from Bruker extract authoritative results from the most varied of sample characteristics, parameters and correlations, e.g.:

- Laser/Video system for precisely focused, automated alignment
- Eulerian cradles, 2D detectors, robotic wafer handling
- Powerful X-ray sources, innovative detectors
- Integrated Analytical Intelligence with POLYSNAP software

Nanostructure Analysis

NANOSTAR

MICROpix

XRD
Material Res.
SAXS

Enter the universe of nanostructure Analysis

The innovative Small Angle X-ray Scattering (SAXS) systems NANOSTAR and MICROpix are ideal tools for the non-destructive characterization of nanostructures on the order of 10 to 1000 Ångstrom, such as precipitates in bulk materials, proteins in solution, nano-particles attached to a surface.

The unique MICROcalix combines SAXS with micro-calorimetry to extract nano-structure information at any temperature in a calorimetric scan, from one and the same sample.

Applications

- Small Angle X-ray Scattering (SAXS)
- Wide Angle X-ray Scattering (WAXS)
- BioSAXS
- Grazing Incidence Small Angle X-ray Scattering (GISAXS)
- Nanography
- Particle size and shape
- Particle size distribution
- Orientation distribution
- Particle distances
- High and low temperature
- Micro-calorimetry

Göbel and MONTEL Mirror

The highest performance can only be achieved with the most modern instruments. With the invention of the Göbel Mirror, Bruker raised the standards for diffraction and SAXS. Göbel Mirrors are X-ray optics with incomparable precision. In particular in combination with high-brilliance micro focus X-ray sources (IµS) or rotating anode sources (TXS) a beam with high-flux on a small spot is generated.

- Maximum flux
- Perfect beam homogeneity
- Highest spectral purity
- Bragg-Brentano, parallel beam, or focusing geometries
- High-flux densities for µXRD applications

X-ray Fluorescence Analysis (XRF)

Defining the World of Elements in Seconds

X-ray fluorescence spectrometry is the most effective way to perform multi-elemental analysis determining concentrations in all forms of samples: solids, powders and liquids. Based on the renowned XFlash® silicon drift detector technology Bruker energy dispersive X-ray fluorescence (EDXRF) systems offer highest analytical precision and stability. The S2 PICOFOX allows the analysis of thin films as well as the analysis of traces down to 0.1 ppb using total reflection X-ray fluorescence (TXRF). The S2 RANGER with TouchControl™ provides you with instant answers for element concentrations from Na to U in unknown samples.

S2 PICOFOX

XFlash® Technology

XFlash® LE SDD Detector

S2 RANGER

Applications

- Fresh water, sea water
- Sewage, sludge
- Pharmaceuticals
- Blood, urine
- Proteins, macromolecules
- Food, dietary supplements
- Wine, beverages
- Nanoparticles
- Washcoats
- Contaminations
- Aerosols
- Thin films

Applications

- Petrochemicals
- Minerals and mining
- Slags
- Cement
- Geology
- Pharmaceuticals
- Metals and alloys
- Soil, sediments and waste

XFlash® LE SDD Detector

The XFlash® LE detector further expands the application range of Benchtop-EDXRF systems such as the S2 RANGER. Due to the ultrathin high transmission entrance window the XFlash® LE SDD with 50 W excitation power eliminates conventional limitations of EDXRF systems and significantly enhances the sensitivity for light elements, such as eight times more sensitivity for sodium and four times more sensitivity for magnesium. In addition the XFlash® LE achieves an excellent energy resolution of less than 129 eV for Mn Kα_1 at very high countrates due to the advanced MCA electronic enabling users to achieve excellent analytical precision.

Unrivalled Analytical Performance

Our wavelength dispersive X-ray fluorescence (WDXRF) systems provide you with excellent analytical results for elements from Be to U in your samples. They feature high accuracy and the best achievable precision for effective process and quality control. They are reliable and robust for all industrial applications, yet flexible and powerful for all non-routine applications in research and development.

S8 LION/S8 DRAGON
Simultaneous WDXRF

S8 TIGER
Sequential WDXRF

XRF
TXRF
EDXRF
WDXRF

Applications

- Petrochemicals
- Plastics and polymers
- Cement
- Geology
- Metals and alloys
- Precious metals
- Minerals and mining
- Glass and ceramics
- Chemicals and catalysts
- Pharmaceuticals
- Soil, sediments and waste
- Foods

TouchControl^{TM}

Reliable results and error-free instrument operation is the key to success. This is why Bruker developed the intuitive instrument operation with touch screen. With minimum training, even inexperienced operators can obtain optimum results. And your analytical data are safe due to the unique TouchControl^{TM} concept.

- Easy-to-use – intuitive operation
- No mouse or keyboard needed
- Minimal training required
- Immediate results on the touch screen
- Compact all-in-one design

Micro-X-ray Fluorescence Analysis (MA)

M4 TORNADO

M1 MISTRAL/M1 ORA

ARTAX

µ-XRF is the method of choice for the elemental analysis of inhomogeneous or irregularly shaped samples as well as small samples or even inclusions. The M1 and M4 tabletop spectrometers offer maximum versatility for all applications, whether for routine analysis in quality control or for individual setups analyzing special samples.

The ARTAX is a unique, portable µ-XRF spectrometer designed to meet the requirements for a spectroscopic analysis of immobile and valuable objects on site, i.e. in archeometry and restoration. It can be used for both spot measurements and high-resolution 1D and 2D mapping.

Applications

M4 TORNADO

- Minerals
- Metals and alloys
- Electronic components (RoHS)
- Particles
- Forensics
- Layers
- Art conservation, archeology

M1 MISTRAL/M1 ORA

- Jewelry
- Metals and alloys
- Layers (M1 MISTRAL)

ARTAX

Non-destructive element analysis in

- Art conservation, archeology and archeometry
- Metals, alloys, sheet metal
- Thin layers

Speed and Spatial Resolution

Using polycapillary optics Bruker's µ-XRF spectrometers can illuminate areas down to 25 µm in diameter with maximum X-ray intensity. The integrated Peltier-cooled XFlash® Silicon Drift Detectors process highest count rates at optimal energy resolution. Short measurement times and fast sample stages lead to extremely quick results regarding the elemental composition of a sample.

- Spatially resolved analysis of arbitrarily shaped samples, including fine structures
- No cooling media or consumables required
- Non-destructive measurement without sample preparation
- Outstanding analytical flexibility

Handheld XRF Spectrometry

S1 TITAN^{LE}

TRACER III-V^{+}

Applications

- Analysis of metal alloys for Positive Material Identification (PMI)
- Non-destructive testing with grade ID and chemistry
- Light element capability: Mg, Al, Si, P
- Scrap metal recycling
- QA/QC in the manufacturing environment

Applications

- Art conservation, archaeology and archeometry
- Research and teaching tool for universities
- Research and development
- Selected by leading Museums like the Getty and MOMA

µXRF

HHXRF

XRF Elemental Analyzer

- Light element analysis – Mg, Al, Si, P, S and Cl without vacuum or He
- SDD provides rapid analysis and ID of alloys
- TÜV SÜD certification – trusted the world over!
- Joint Bruker/NASA patent, earned NASA's Space Seal for vacuum technology
- Tube-based XRF for handheld elemental analysis – no radioactive materials

The Bruker handheld XRF analyzers provide quick and easy non-destructive analysis. The S1 TITAN enables fast analysis and ID of most alloys. The TRACER III-V^{+} and III-SD tube based systems include the Bruker/NASA joint patented vacuum system and high-resolution detector allows for laboratory grade results of elements from Mg to U.

Optical Emission Spectrometry (OES)

High-End Elemental Analysis of Metals

Spark optical emission spectrometers (S-OES) are the ideal instruments for all types of metals. From pure metal trace analysis to high alloyed grades, spark OES covers the complete range from sub-ppm to percentage levels. All relevant elements can directly be analysed simultaneously.

Spark spectrometer instruments cover all types of metal applications. Our range of high-end instruments allows our customers to elevate their business into new levels of quality and process control.

Q2 ION (CCD)

Applications Q2 ION

- Iron and steel and alloys
- Aluminum and alloys
- Copper and alloys
- Nickel and alloys
- Cobalt and alloys
- Magnesium and alloys
- Zinc and alloys

Q4 TASMAN (CCD)

Applications Q4 TASMAN

- Iron and steel and alloys
- Aluminum and alloys
- Copper and alloys
- Nickel and alloys
- Cobalt and alloys
- Magnesium and alloys
- Lead and alloys
- Tin and alloys
- Titanium and alloys
- Zinc and alloys

Q4 MOBILE

Applications Q4 MOBILE

- Positive Material Identification of metals
- Sorting of metals
- Analysis of metals

New Freedom in Mobile OES – Q4 MOBILE is offering innovative solutions:

- Patented CCD optic
- Special power management
- Hybrid cable for more flexible probe cabling
- Ultra-light probe
- Arc/spark probe with quick adapter change

Spark Stand With Co-axial Argon Flow

The innovative co-axial Argon flow represents the culmination of our efforts to further improve performance:

- Extended cleaning intervals
- Low Argon consumption
- Better analytical quality
- Reduced operation costs

Q8 MAGELLAN

Q8 CORONADO

Applications

Elemental analysis of:

- Iron and steel alloys and traces
- Nitrogen in steel
- Aluminum alloys and traces
- Copper alloys and traces
- Oxygen in copper
- Nickel alloys and traces
- Cobalt alloys and traces
- Magnesium alloys and traces
- Tin alloys and traces
- Lead alloys and traces
- Titanium alloys and traces

Applications

- Process analysis of steels
- Process analysis of cast iron
- Process analysis of aluminum
- Process analysis of copper

High-end Photomultiplier Spectrometers

Q8 MAGELLAN feature the latest technology in photomultiplier detectors:

- Lowest dark current
- Large dynamic range
- Highest sensitivity
- Improved limits of detection
- Impressive stability and repeatability

Automation Control Software QMATION

The Q8 CORONADO is controlled by the powerful QMATION software:

- .Net framework technology
- Graphical user interface for providing system status

C, S, O, N, H – Analysis

CGA Combustion and Gas Analyzers – fast and accurate

Based on the know-how of many decades Bruker Elemental offers innovative solutions for rapid and precise elemental analysis.

The state-of-the-art technologies for fast and reliable determination of Carbon, Sulfur, Oxygen, Nitrogen and Hydrogen with simple and user-friendly operation provide highly accurate results for process and quality control as well as for materials research and development.

The clearly and simply structured Bruker "One-4-All" software interface for the CGA analyzers with intuitive operation via an external PC with Windows© software maximizes convenience and productivity.

Applications

- Iron, steel, cast iron
- Ferroalloys
- Aluminum and alloys
- Titanium, zirconium and alloys
- Ores, minerals
- Cement, lime, limestone, clays
- Coal, coke, fly ash
- Catalysts

CS Analysis

The G4 ICARUS HF combustion analyzer with high frequency induction furnace and infrared detection is the instrument of choice for rapid and precise, simultaneous of carbon and sulfur down to ppm levels in a large variety of solid materials.

By introducing key technology advances, the G4 ICARUS HF creates a new dimension of usability and productivity.

The innovative combustion zone design combined with a unique, fully automatic cleaning system with brush- and vacuum-free dust removal leads to significantly reduced maintenance, thus maximizing productivity, applicability and component lifetime.

G4 ICARUS HF

CS-Analysis

The G4 ICARUS HF analyzer is designed for simultaneous, fast and accurate determination of carbon and sulfur in a large variety of metallic and nonmetallic materials. G4 ICARUS features:

- Innovative design of the combustion zone with gas extraction nozzle (pat. pending) provides lance-free operation, reduced maintenance, higher productivity
- Fully automatic cleaning system with noiseless, brush- and vacuum-free dust removal into the used crucible
- Double dual range solid-state NDIR detector with two measuring ranges for CO_2 and SO_2 as standard
- Zero-flow mode saves oxygen during break periods, in stand-by mode additionally no reagent consumption

ONH Analysis

The high-end G8 GALILEO ONH analyzer is designed for rapid and automatic determination of oxygen, nitrogen and hydrogen in solid materials, based on the inert gas fusion (IGF) principle, which involves fusion of the sample material in a graphite crucible at high temperatures. When combined with an external, temperature-programmable infrared heated furnace, the G8 GALILEO can measure the diffusible hydrogen content in many sample materials, e.g. in welds according to ISO 3690 and AWS4 4.3 as well as in high strength steel.

The G4 PHOENIX DH carrier gas hot extraction analyzer is the right solution for accurate and rapid diffusible hydrogen measurement in a wide variety of matrices. The quartz tube diameter of 30 mm of the temperature-programmable infrared furnace enables the analysis of large samples such as steel sheet strips and weld coupons according to AWS A4.3 and ISO 3690.

Coupling a mass spectrometer to the analyzers leads to a substantially improved detection limit for the determination of ultra-low diffusible hydrogen concentrations e.g., in high strength steels by Thermal Desorption Mass Spectrometry (TDMS).

G8 GALILEO

Applications

- Iron, steel and alloys
- Copper and alloys
- Aluminum and alloys
- Titanium, zirconium and alloys
- Ores, minerals
- Ceramics, minerals
- Coal, coke, fly ash
- Catalysts

G4 PHOENIX with mass spectrometer

Applications

- Steel
- Aluminum
- Weld material
- Welds acc. to ISO 3690/AWS A4.3

ONH-Analysis

The G8 GALILEO is available in different configurations for simultaneous or single element determination. Besides total hydrogen by melt extraction it enables the analysis of diffusible hydrogen by hot extraction with the external tube furnace. G8 GALILEO features:

- Programmable temperature of the electrode furnace, contact-free optical sensor for temperature measurement and precise control
- High stability detection system with NDIR detector for CO and thermal conductivity cell for N_2 and H_2
- Optional automatic furnace cleaning with dust removal, automatic crucible changer and sample loader
- Optional quadrupole mass spectrometer enables the measurement of ultra-low diffusible hydrogen concentrations

Atomic Force Microscopy (AFM)

Characterize & Measure Nanometer Size Surface Structures

Bruker's atomic force microscopes (AFMs) drive the world's leading-edge research in life science, materials science, semiconductor, electrochemistry, and many other applications. The Dimension FastScan^{TM} is the world's fastest and most productive AFM, offering unrivalled speed and resolution providing the highest levels of nanoscale performance for a wide variety of samples, including measuring biological dynamics with ease. The MultiMode® 8 with ScanAsyst® is the latest generation of the world's most widely used AFM, offering the highest resolution and the versatility to excel in applications ranging from materials research to life science. The BioScope Catalyst^{TM} has been specifically engineered to image biological samples and offers uncompromised AFM and optical resolution between AFMs and inverted optical microscopes.

The new Innova-IRIS AFM-Raman systems provide the industry's leading performance for TERS and co-localized Raman-AFM measurements, enabling comprehensive correlated property mapping and extending the boundaries of nanoscale spectroscopy.

Finally, the InSight 3DAFM^{TM} and Dimension AFP^{TM} Automated Atomic Force Profiler provide fully automated dimensional metrology for semiconductor, data storage and LED applications. The systems provide the industy's best measurement uncertainty for critical dimension, profilometry, yield impacting trench depth measurements, roughness and defect review.

InSight 3DAFM

Dimension FastScan

BioScope
Catalyst

Exclusive PeakForce Tapping Technology

Bruker's innovative Peak Force Tapping® technology enables unique new AFM imaging modes that deliver quantitative information and a leap forward for AFM ease of use. ScanAsyst uses self-optimizing algorithms to acquire high resolution images in both air and liquids. PeakForce QNM® enables nanoscale quantitative characterization of materials properties while PeakForce TUNA^{TM} and PeakForce KPFM™ provide the highest resolution quantitative nanoscale electrical characterization.

Stylus and Optical Metrology (SOM)

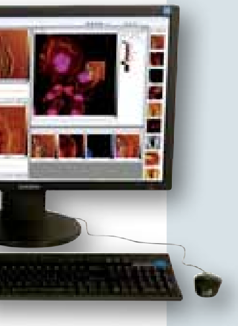
3D Optical Microscopes

Bruker's ContourGT^{TM} 3D Microscopes combine advanced 64-bit, multi-core operation analysis software, patented white light interferometric hardware, and unprecedented operator ease of use to deliver the most advanced 3D optical surface metrology ever developed. These systems provide fast, angstrom-to-millimeter vertical range metrology over large fields of view, with flexible sample setup and industry-leading repeatability for production, research and quality control applications.

ContourGT 3D Optical Microscopes

Ultimate Stylus Profiling Performance

The DektakXT^{TM} features a revolutionary design that enables unmatched, better than 5-angstrom repeatability. Through its combination of industry firsts, DektakXT delivers the ultimate in performance, ease of use and value to enable better process monitoring from R&D to QC. The technological breakthroughs incorporated in this 10th generation Dektak enable critical nanometer-level surface measurements for the microelectronics, semiconductor, solar, high-brightness LED, medical, scientific, and materials science industries.



DektakXT
Stylus Profiler

NPFLEX-LA 3D Optical
Microscope for Industrial
Fluid Seal Integrity

Innovations Customized for Your Application

Bruker provides patented metrology solutions that tailor decades of surface measurement experience specifically to your applications. For example, the NPFLEX-LA^{TM} 3D Optical Microscope is the first comprehensive, non-contact metrology solution that repeatably quantifies true lead angle and surface texture of dynamic sealing surfaces. Likewise, our R&D 100 Award winning AcuityXR^{TM} Enhanced-Resolution Microscopy Technology enables ContourGT systems to break the optical diffraction limit and deliver lateral resolutions previously considered unattainable with conventional optical microscopy techniques.

Tribology & Mechanical Testing (TMT)

Tribology Testing

Bruker's CETR-UMT uses servo motor control for increased accuracy and combines all common test schematics in one platform. The modular design enables measurements of numerous tribological and mechanical properties of any material on the same tester. By simply replacing components , within a matter of minutes the user can alternate between reciprocating and rotating motion, from pin-on-disk to block-on-ring or any of a number of ASTM, DIN or ISO standard tests. Unlike other instruments in this class, the CETR-UMT is capable of highly accurate loading and custom motion patterns through the use of precision servo-control.

Nano & Micro Scratch and Indentation

In semiconductor, solar and MEM's applications, understanding the properties of thin films and coatings is critically important. Bruker's CETR-Apex platform is optimized for scratch and indentation these materials. This modular platform allows the user to select either micro or nano-scale testing and to augment the mechanical testing with either AFM or SOM imaging for in line wear scar analysis. Advanced sensors such as acoustic emission or electrical contact resistance and the ability to program custom motion patterns, enable practical and repeatable in-situ testing of thin films and coatings.

CETR-UMT Tribology Tester

CETR-UMT drive modules can be swapped easily in minutes:

- Lower linear fast reciprocation with upper linear motion
- Lower high-precision linear with upper linear motion
- Lower rotation (vertical axis) with upper linear or rotary motion
- Lower rotation (horizontal axis) with upper linear or rotary motion

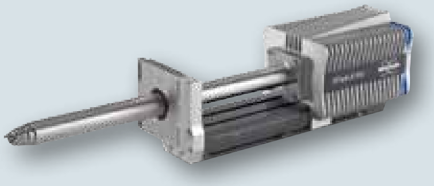
The Most Flexible Solution Without Compromise

When it comes to tribology testing or nano/micro scale mechanical testing, there are many standards and test protocols. Only the Bruker CETR-UMT and CETR-Apex allow rapid changeover of configuration on a single, high-precision test platform, eliminating the need tot acquire and maintain multiple instruments. From lubricants to cosmetics formulation, semiconductor to LCD coatings, orthopedic to automotive materials testing, no other instrument offers as much flexibility without compromising accuracy and repeatability.

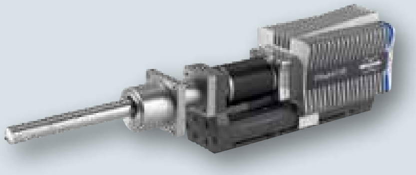
Microanalysis (EDS) and Electron Backscatter Diffraction (EBSD)

Rough surfaces, particles, thin layers, bulk samples … The new generation of QUANTAX EDS features slim-line technology and a wide range of active areas for the XFlash® 6 detector series combined with the new enhanced hybrid pulse processor. It covers the majority of applications and tackles even your toughest challenges with unprecedented speed, accuracy and ease of use.

The QUANTAX EDS works in conjunction with Scanning Electron Microscopes as well as Transmission Electron Microscopes (TEM). The innovative SDDs designed for TEM (XFlash® 6T I 30 and 6T I 60) offer minimum mechanical and electromagnetic interference. They provide optimum take-off angle and avoid the necessity of sample tilt. In addition QUANTAX also provides the option of EBSD analysis with the fully integrated QUANTAX CrystAlign.



XFlash® 6 I 100
for SEM



XFlash® 6T I 60
for TEM

e^{-}*Flash*$^{1000+}$
for EBSD

Applications

- Metals and alloys
- Semiconductors
- Layers and coatings
- Thin films
- Minerals
- Glasses
- Nano-materials
- Plastics and organic solids
- Biological samples
- Forensics

QUANTAX EDS for Nano-Analysis

- With worldwide leading technology
- For SEM and TEM
- High collecting efficiency
- Unmatched energy resolution
- Superb light element performance

QUANTAX CrystAlign for Fast and Easy to Use EBSD

- e^{-}*Flash* EBSD detectors with in-situ vertical screen positioning for best available EBSD signal
- Colored images for better grain differentiation using the ARGUS™ FSE/BSE imaging system
- Seamless integration with ESPRIT EDS software

Crystallography at the Forefront of Science

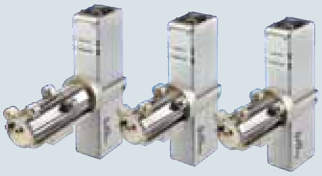
D8 QUEST with PHOTON 100 CMOS detector

Great Science deserves great tools

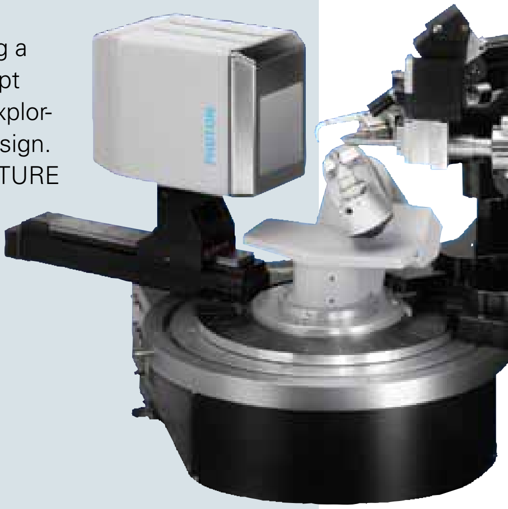
Single Crystal X-ray diffraction (SC-XRD) is the method of choice for determining the 3-dimensional structure of any kind of chemical compound. The method provides accurate and precise measurements of molecular dimensions in a way that no other investigative technique can begin to approach.

To get the maximum benefit out of this technique, scientists need the latest analytical tools. This was the driving vision of our development team for the D8 Crystallography Solutions: to provide your cutting-edge research with the superior tools it deserves!

With the D8 QUEST and the D8 VENTURE we are introducing a pioneering diffractometer concept with flexibility and modularity exploring the principles of DAVINCI design. The D8 QUEST and the D8 VENTURE can be perfectly configured for the demands of any imaginable application in single-crystal X-ray diffraction.



IμS for Cu-, Mo- and Ag-radiation



D8 VENTURE dual source configuration with Mo IμS and Cu IμS

Applications

- Structure determination of new molecules and minerals
- Absolute structure determination on molybdenum and copper radiation
- Integrated treatment of up to eight-fold twinned samples
- Comprehensive treatment of absorption effects by intuitive correction methods
- Electron charge-density studies by high-angle diffraction
- Structural investigation of high pressure phases and modulated structures
- Diffuse scattering

Riding the Perfect Wave

Matching the right wavelength to your sample can significantly improve the quality of the experiment. Molybdenum (Mo) radiation is most often the wavelength of choice for chemical crystallography. Copper (Cu) radiation's stronger interaction with the sample leads to stronger diffracted intensities and is typically applied for organic samples and proteins. Silver (Ag) radiation has minimal absorption and extinction effects and allows data collection to higher resolution.

- Sealed tube spot focus with flat graphite or TRIUMPH monochromator
- IμS microfocus source
- TURBO X-RAY SOURCE (TXS) with HELIOS optics

When Details Matter – Biological Crystallography

Biological crystallography's rapid evolution has seen structural biologists tackling projects of ever-greater ambition. At the same time, modern structural genomics and drug discovery initiatives are striving for ever-greater productivity and efficiency. This is placing significantly greater demands on researchers and instrumentation. Latest technology achievements used in the D8 QUEST and D8 VENTURE help the researcher to address the even most challenging samples.

D8 VENTURE with microfocus TXS

Brighten-up your Home Lab – TURBO X-RAY SOURCE, IμS and HELIOS MX

A successful diffraction experiment starts with an excellent X-ray source. Whether you choose the high-flux TURBO X-RAY SOURCE (TXS) microfocus rotating anode generator or the outstanding IμS microfocus source, you always get the best-in-class for all of your applications. The new TXS and IμS now deliver beam intensities comparable to those of typical bending-magnet beamlines. For example, a 10-second exposure from the TXS or 70 seconds from the IμS can produce the same diffracted intensity as a 1-second exposure at these beamlines. Our high intensity, superior beam profiles, unmatched beam stability, and instant access makes home-lab crystallography with Bruker solutions more productive than ever before.

Applications

- Substrate binding
- Membrane proteins
- Molecular replacement
- Protein microcrystals
- Multi-protein complexes
- High-resolution protein structures
- SAD-phasing
- Molecular motors
- Twinned protein samples
- Protein-DNA complexes
- Long unit cell axes
- Structural enzymology

Pioneering CMOS Technology

D8 QUEST and D8 VENTURE feature revolutionary CMOS technology:

- Large 100-cm^2 sensor for fast and efficient data collection
- Low-power-consumption sensor for high reliability backed by our unique three year detector warranty
- Air-cooled for low maintenance
- No glass fiber taper for superior spatial accuracy and high sensitivity
- Optimized pixel size and point-spread function for superior signal
- Large pixel volumes for best light conversion
- Fast readout for fast data collection
- No frame correlation needed
- No blooming or streaking
- Perfect match of the pixel size and the point spread of the high-resolution scintillator screens

Automated Crystal-Structure Analysis

3D Structures at the Touch of a Button

Bruker's SMART X2S is the first benchtop X-ray crystallography system for fully automated 3D chemical structure determination. It is designed for use by chemists and does not require special training in crystallography. The SMART X2S takes small molecule structure determination to the next level of convenience by automating the previously difficult aspects of X-ray structure determination, from sample loading through data collection all the way to report generation and data archiving. Its compact design, low maintenance, low cost of ownership and easy and intuitive operation through a touch screen graphical interface are truly groundbreaking.

SMART X2S

Features

- Provides you with the 3D structure of a molecule at a bench of your synthesis laboratory
- Crystal-in, structure-out automation
- Answers your structural chemical questions unambiguously

AUTOSTRUCTURE^{TM}

AUTOSTRUCTURE is the comprehensive program for fully automatic determination of 3D crystal structures of organic and inorganic molecules from X-ray data. It allows solving and refining structural parameters routinely, providing the crucial tool to make accurate chemical X-ray structure determination quick and easy.

- Fast, reliable, intuitive-to-use, fully-automated
- Results verified using IUCr standard structure checkers
- Cascades through Patterson, direct- and dual-space methods to increase structure solution success

X-ray Micro Computed Tomography (Micro-CT)

Bruker microtomography is available in a range of easy-to-use desktop instruments, which generate 3D images of your sample's morphology and internal microstructure with resolution down to the sub-micron level. Each system includes advanced software for visualization and analysis in 3D.

SkyScan 1172

Skyscan 1172 – high resolution micro-CT

Skyscan 1173 – high energy micro-CT

Skyscan 1174 – most compact micro-CT

Skyscan 2140 – combined micro-CT and micro-XRF

Skyscan 2011 – laboratory nano-CT

SkyScan 1173

SkyScan 1174

SkyScan 2011

SkyScan 2140

Non-destructive 3D imaging with X-rays

Micro computed tomography (Micro-CT) is X-ray imaging in 3D, by the same method used in hospital CT scans, but on a small scale with massively increased resolution. It really represents 3D microscopy, where very fine scale internal structure of objects is imaged non-destructively.

Lab and Process Automation

Bruker X-ray instruments are designed with high flexibility for future requirements. They can be upgraded to automatic operation. All Bruker X-ray solutions allow seamless and flexible integration into laboratory and total automation solutions.

D8 FABLINE – Dedicated solution for the semiconductor industry

- Full automation
- High-throughput
- Analytical flexibility
- Analysis of patterned wafers with automatic pattern recognition
- Up to 450 mm full wafer mapping
- Market leading wafer handler for automated alignment and transport
- Failsafe sample handling
- Wafer storage in cassettes or mini-environments
- Automatic wafer recognition
- SECS/GEM interface
- SEMI S2 and S8 compliance
- Clean room ISO Class 2

Automation Solution using D4 and S8

- Sample transportation
- Sample preparation
- Sample handling robotics
- Automation software
- Seamless integration into laboratories
- Total automation solutions e.g. for the cement, aluminum and semiconductor industry
- Container laboratories
- Flexible integration packages
- Upgrade packages
- Powerful Automation Control Software AXSLAB
- Interfacing to plant control system or LIMS (Laboratory Information Management System)

Automation Control Software AXSLAB

The laboratory automation is controlled by the powerful AXSLAB software. From any PC in the network, single jobs or batches can be started and the status can be easily checked. Intelligent sample management allows the highest sample throughput and immediate access to priority samples.

The Whole Spectrum with SPECTRA^{plus}

The fully IAI Integrated Analytical Intelligence in SPECTRA^{plus} is based on more than 50 years of experience in XRF analysis – for standardless XRF analysis for all types of materials. Corrections can be made automatically.

Contact Us for More Information

For more detailed information on specific Bruker products and systems, please complete and return this form. Check the box corresponding to the products that interest you and mail or fax the form back to us. On the back cover of this brochure, you will find the address and fax number of our nearest Bruker branch office. If you would like technical assistance, we will be happy to answer questions and suggest options that will successfully integrate Bruker X-ray solutions into your work process.

☐ AFM-Raman products
☐ ARTAX (µ-XRF)
☐ BioScope Catalyst (AFM)
☐ Catalyst-IRIS (AFM)
☐ ContourGT (SOM)
☐ D2 PHASER (XRD)
☐ D4 ENDEAVOR (XRD)
☐ D8 ADVANCE (XRD)
☐ D8 FABLINE (XRD)
☐ D8 DISCOVER (XRD)
☐ D8 DISCOVER (XRD^2)
☐ D8 QUEST (SC-XRD)
☐ D8 VENTURE (SC-XRD)
☐ DektakXT (SOM)
☐ Dimension Edge (AFM)
☐ Dimension FastScan (AFM)
☐ Dimension Icon (AFM)
☐ FastScan Bio (AFM)
☐ Icon-Raman (AFM)
☐ NANOSTAR (SAXS)
☐ G4 ICARUS HF (CA)
☐ G4 PHOENIX DH (GA)
☐ G8 GALILEO ONH (GA)
☐ Innova (AFM)
☐ Innova-IRIS (AFM)
☐ InSight 3DAFM (AFM)
☐ M1 MISTRAL / M1 ORA (µ-XRF)
☐ M4 TORNADO (µ-XRF)
☐ MICROpix/MICROcalix (XRD)
☐ MultiMode 8 (AFM)
☐ NEOS (AFM)
☐ NPFLEX (SOM)
☐ NPFLEX-LA (SOM)
☐ QUANTAX (EDS)
☐ QUANTAX CrystAlign (EBSD)
☐ Q2 ION (OES)
☐ Q4 MOBILE (OES)
☐ Q4 TASMAN (OES)
☐ Q8 MAGELLAN (OES)
☐ Q8 CORONADO (OES)
☐ S1 SORTER (HHXRF)
☐ S1 TITAN (HHXRF)
☐ S1 TURBO^{SD} (HHXRF)
☐ S2 PICOFOX (XRF)
☐ S2 RANGER (XRF)
☐ S8 TIGER (XRF)
☐ S8 LION (XRF)
☐ S8 DRAGON (XRF)
☐ SKYSCAN (CT)
☐ SMART X2S (SC-XRD)
☐ SP9900 (SOM)
☐ SUPER SPEED SOLUTIONS^{TM} (XRD)
☐ TRACER III-V (XRF)

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