

# X-Ray General Purpose Diffractometer

## XRD 3700 Series



LABS / EPC / PRODUCTS / APPLICATION / SOFTWARE / ACCESSORIES / CONSUMABLES / SERVICES

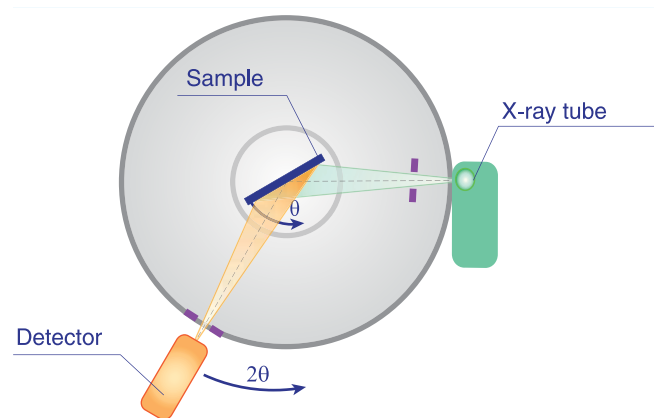
**Analytical Technologies Limited**

An ISO 9001 Certified Company

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X-ray diffraction is the dactyloscopy in material science , a reliable non-destructive technique of identification of crystalline matter

- Horizontal two-circle  $2\theta$ - $\theta$  goniometer
- High reliability and user-friendly operation
- Flexible design and wide range of options
- high automation for setting and measurements

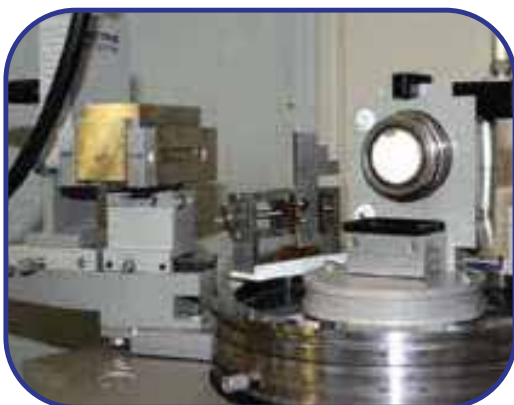


## ►► Basic configuration

- Protective cabinet
- Two-circle goniometer
- High voltage power supply
- Sealed X-ray tube in a protective housing
- Electronic control unit
- Scintillation NaI (TI) detector
- Sample holder with rotation
- Collimation system
- Beta-filter for Cu-radiation
- Standard powder sample of quartz
- DataCol software for control and data collection
- Accessories and spare parts

►► **Advance Option :**

- X-ray registration system base on linear position –sensitive stripped detector.
- High-temperature oven –chamber (uo to 1200°C)
- One-dimensional parabolic mirror for parallel beam geometry
- Attachment for texture and stress analyses, and for determination of crystal orientation
- Peltier-cooled energy-dispersive solid state Si (Li) detector
- Unear position-sensitive stripped detector
- Flexible monochromator holders for primary and diffracted beams
- Crystals-monochromators of different types
- Rigid holder for bulk samples
- Holder for Cylindrical samples (capillaries)
- Housing for foreign sealed X-ray tubes
- Sealed X-ray tubes with various focus sizes and target materials
- $\beta$ -fihers for different radiations.
- Closed cooling systems for X-ray tube
- Sample carriers (cuvetts)



## ►► X-Ray Diffractometer Crystal :

### ▲ Crystal Theta/Theta Version consists of the following :-

- Goniometer, 2 independent axes, radius 180-250mm, 0.002 deg minimum step size, <0.0001 deg resolution. Range  $-4$  to  $+155^{\circ}2\theta$ .
- 3 kW X-ray Generator, 60kV, high frequency, air cooled, stability 0.005% for full rated mains variation, ripple 0.03% to 0.75%. Temp. coeff. 50ppm/deg. C.
- Detector arm with a curved graphite monochromator and Xe proportional detector Part No. 95-0655-00.
- Tube Shield with shutter under software control.
- XRD tube (Cu) and HT cable. Water is needed for tube cooling only and requirement is 4 litre/min at  $15 - 20^{\circ}\text{C}$ .
- Cabinets are in vertical configuration 1100mm wide x 700mm deep x 900mm high. The beam-path is surrounded by 2mm steel and 12mm Pb-Acrylic (0.5mm Pb-equivalent). Elsewhere 2mm aluminium is used for reduced weight and portability.
- An optional floor-standing cabinet is available (not included).
- An integrated Fail-Safe X-rays-on warning lamp is included.
- Difftech 122 microprocessor controller with counting electronics is included. Scan speeds 0.14 deg/min to 60 deg/min. With Multi-pass Averaging, scan speeds 1000 x slower. Slew speed 300 deg/min.
- Software – Visual XRD and Tracesv6 included – 32 bit Software for Microsoft Windows operating system

## ►► Visual XRD Software Specifications :

- 32 bit application for operation of the crystal and collection of data files for analysis by Tracesv6 or other applications.
- Simple routine operation enter Start, End angles, Step size, Scan speed, Comment and click start button.
- File Save and recall Parameter sets.
- Software configuration for user Folder, Screen options.
- Hardware configuration for Tube Anode selection and Comms Protocol.
- Accessory configuration to select interchangeable options, Source, Optic, Stage, Detector, which each have their own Calibration angles.
- Manual control for computer-aided alignment, move axes anywhere, load sample open/close shutter, start/stop spinner – depending on options installed.
- Pulse Height Analysis used with Xe proportional detector, does a PHA scan, set Lower and upper discriminator, Amp. Gain, Detector HV.
- Data collection modes – Single pass, Multi pass, multi range, Theta/2Theta, Theta only, 2Theta only, Continuous scan, Residual Stress.

## ►► Tracesv6 Software Specifications :

- Traces V6.7: 32 bit XRD Scan Processing for Microsoft Windows<sup>TM</sup> operating system Process scans from Diffraction Technology, Siemens, Philips and Rigaku systems.
- Tool buttons with tool tips & menus make the software very user-friendly.
- Zooming, scrolling and on-screen graphical peak labelling.
- 16 million colours with graphical selection.
- Work with up to 50 scans on screen at once.
- 3D Graphics – perspective, trend lines, surface, tape, area, rotation, colour, printing.
- Attribute-based file finder for multi user environments.
- Automatic and manual background fit & strip (fitting cubic or linear functions) Save scans in a number of formats, or cut and paste to other applications.
- Automatic peak search and edit Scan manipulation , add, subtract, trim, and spike removal Smoothing, cubic, with no loss of high frequency data K $\alpha$ 2 stripping.
- Peak area, Peak area based quantitation.
- Logarithmic vertical scale, toggle on/off.
- Peak FWHM determined graphically.
- Particle Size by Scherrer method.
- Work with PDF-4, Search with logical operators between parameters.
- Retrieval of PDF1, 2 and 4 records displayed as line markers on the screen.
- Print preview mode with 2D and 3D scan display. Up to 50scans in Isometric mode with hidden-line removal for best presentation.
- Print PDF Cards from PDF-2 and PDF-4.
- Line widths and line-styles selectable.
- Powder Pattern Generator with user data or ICDD data Peak fitting and deconvolution – large no. of peaks, Least Squares or Genetic algorithm. Full Windows HELP system and manual included Main screen offsets for multiple scan display.
- Printing – allows PDF-stick figures and labels on isometric display.
- Common functions accessed by right mouse button click Angled label text for clearer presentation.
- Retained Austenite coupled with Vis XRD data collection.



## ▶▶ Regulatory compliances



## ▶▶ Corporate Social Responsibility

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