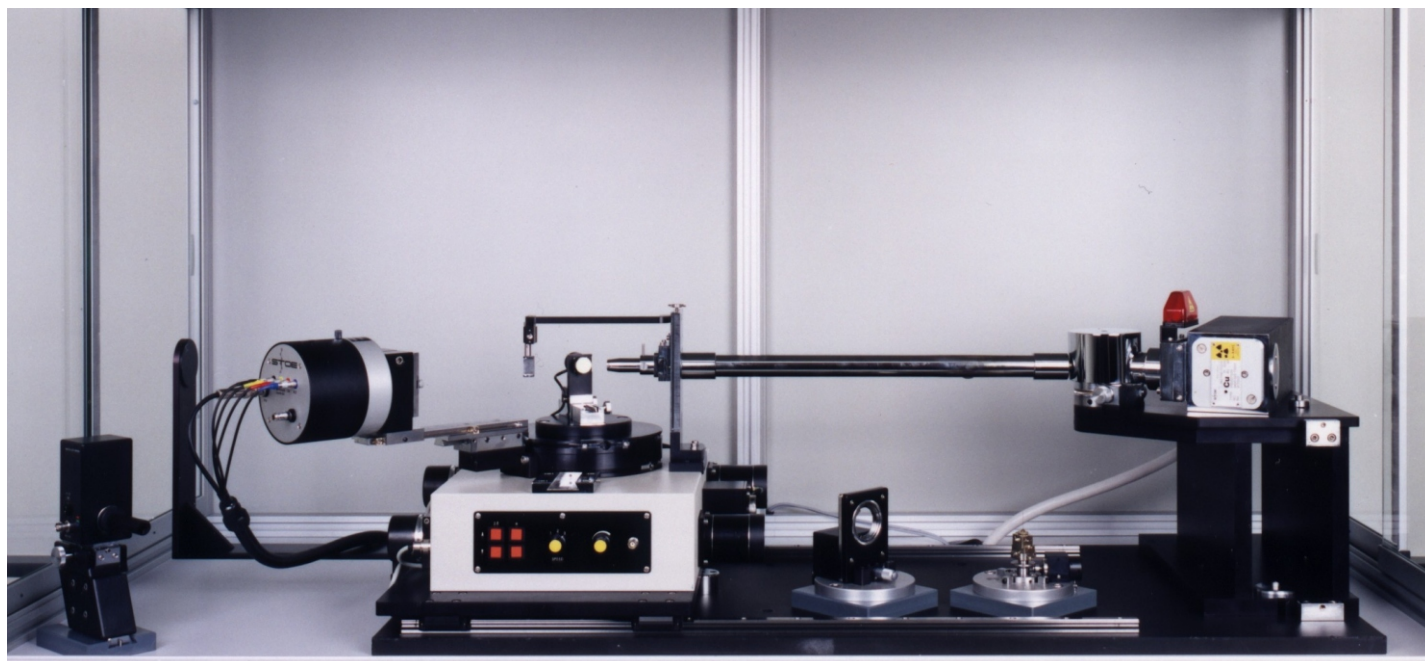


STOE STADI MP

MULTI-PURPOSE POWDER DIFFRACTOMETER SYSTEM

a professional tool in the field of X-ray powder diffraction and material science applications



The Bragg-Brentano high resolution mode with the linear PSD detector

1 Beam = 3 Geometries
(Flat Plate,
Debye-Scherrer
and Bragg-Brentano)

The STOE STADI MP is the ideal combination of the three most common diffractometer Configurations: Transmission/Debye-Scherrer, Bragg-Brentano and Micro-Focus - a true Multi-Purpose Diffractometer.

The STADI MP system is delivered with pre-aligned monochromator - tube configuration which remains unperturbed during all changes of the diffractometer geometry.

When switching between the operation modes, only the goniometer is moved on its translation stage parallel to the strictly monochromatic $K_{\alpha 1}$ X-ray beam and is fixed at the specific diffraction position. NO realignment necessary !

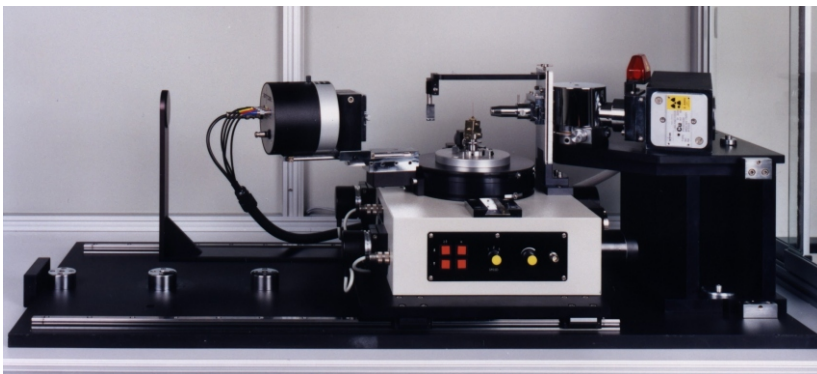
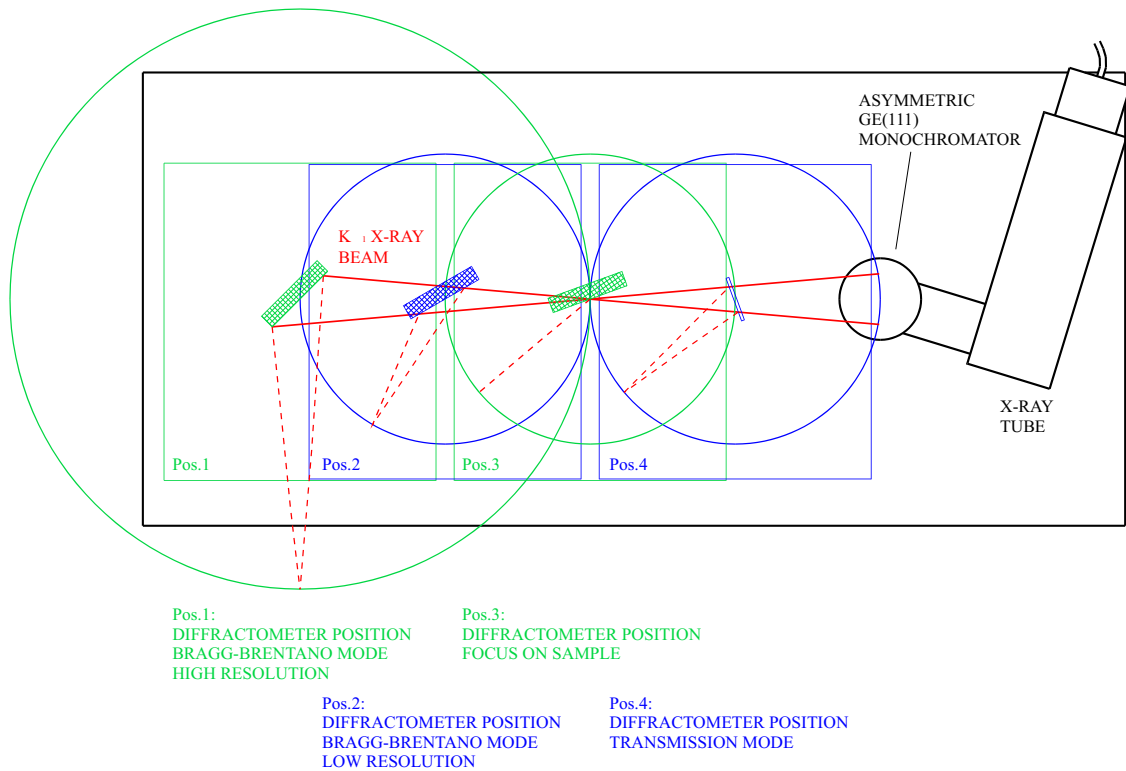
The easy interchange of all STOE sample stages - e.g. Eulerian cradle, capillary or transmission holder - combined with a flexible sample-detector distance makes this system a true advantage for every laboratory providing every solution for every question in the field of X-ray diffraction.

High and low temperature devices, either for transmission or reflection geometry, are available for this system.

All these features make the STADI MP a professional tool for a wide range of analytical applications - scientific as well as industrial - in the unsurpassed quality and reliability which have become STOE's trademark throughout 110 years.

Principle:

Over the first part of the setup the beam is convergent. The diffractometer placed in this region (Pos.4) will be used for capillary and transmission measurements of excellent resolution. When the diffractometer axis is placed on the beam focus (Pos.3), a maximum of flux is concentrated on a minimum of sample area thus making it the ideal position for microdiffraction and tasks like texture- and residual stress analysis. Putting the diffractometer behind the beam focus turns it into a Bragg-Brentano system. From a theoretically unlimited number of positions, a low-resolution (Pos.2) and high-resolution

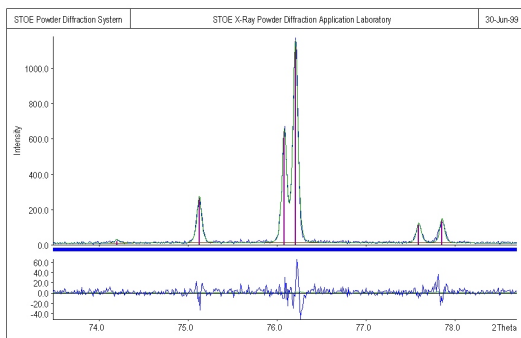


Transmission / Debye Scherrer mode equipped with STOE's linear Position Sensitive Detector (PSD)

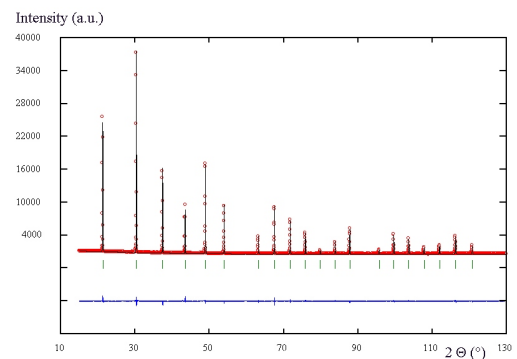


High resolution focusing texture diffractometer with open Eulerian cradle for automated and rotation as well as x and y translation. The detector system is a scintillation counter with crossed Soller slits.

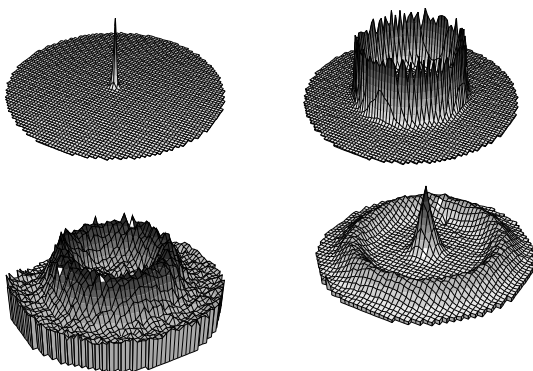
The user benefits from the possibility to adjust the system according to the sample requirements, not vice versa. Changing from one diffraction geometry to another is easy, precise and reproducible; data sets of either bulk- or powder samples in reflection as well as air sensitive samples in glass capillaries reveal high accuracy and resolution. Stress & texture measurements with pure $K_{\alpha 1}$ overcome the drawbacks of conventional texture diffractometers like overlapped peaks due to large beam divergence and spurious substrate peaks caused by Bremsstrahlung or K_{α} radiation. Suitable collimation and dedicated scan modes ensure that only useful data are collected. Easily adaptable high and low temperature devices and sample changers together with a variety of detectors complement the system's Possibilities.



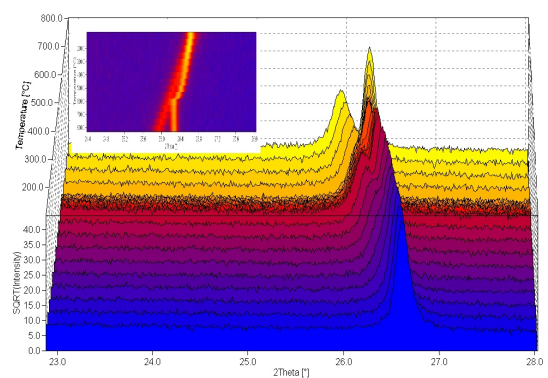
Section of the powder diagram of Calciumtungstate ($CaWO_4$) in the Transmission / Debye Scherrer mode



Rietveld analysis of LaB_6 data set measured in the high resolution Bragg Brentano mode



Polefigures of diamond on silicon substrate showing different fibre textures



High temperature diagram of a mixture of boron nitride and quartz. Upper left corner displays a calculated "Guinier film display" of this temperature range

The STADI MP realizes the concept of a diffractometer more flexible than any other existing system combined with high performance in all the diffractometer configurations. The user benefits from three different geometries, combined in a modular system set up with easily exchangeable sample holders, detectors and additional devices.

Instrument features	Transmission – Debye- Scherrer	Texture, Stress and Microdiffraction	Variable Bragg-Brentano
A strictly monochromatic K _α X-ray beam from a curved, asymmetric Ge(111)-monochromator passes along the direction of the translation stage for the goniometer.	pure K _α radiation	pure K _α radiation	Pure K _α radiation
The monochromator – tube configuration remains unchanged when changing beam geometry eliminating the need for realignment.	High-resolution powder work with symmetric shaped peaks	strictly monochromatic radiation eliminates accidental peak overlap	two diffractometer positions provided for standard and high resolution
Changing the beam geometry is done by simply moving the diffractometer along the beam path.	capillaries: structure determination from air-sensitive samples, samples affected by preferred orientation	extremely sharp textures tilt & twist evaluation	Linear position sensitive detector provides reasonable measuring times at the highest resolution
Transmission Position by placing the diffractometer in the region of the convergent beam, i. e. between monochromator and focus.	micro – samples in transmission mode	various scanning modes	Flexible detector –sample distance
Texture, Stress and Microdiffraction Position by placing the diffractometer axis on the beam focus, maximum concentration of flux on the sample.	thin foils: structure determination and – refinement	scintillation counter with crossed Soller slits	continuous sample spinning or automated phi-control
Putting the diffractometer behind the beam focus turns it into a variable Bragg-Brentano system.	pharmaceutical & fibres samples	micro-samples in reflection mode	high intensity and user radiation protection by evacuated beam paths
	Low- and High-temp. attachments combined with curved PSD offer fast data acquisition for kinetic investigations	Linear PSD for additional stress determination and diffuse scattering	

Weight	ca. 60 kg
Radius of measuring circle	160 , 320 mm respectively
2 θ - range	Appr. -140 to + 140°
Angular reproducibility	0.0005°
Minimum step size	0.0005°
Detectors	Linear and curved PSD, scintillation, solid state
Monochromator	Primary, Ge(111)
Weight (complete system)	Approx. 400 kg
Size (L * W * H)	1700 * 880 * 1900 mm
Radiation protection	fully interlocked system
Generator	4 kW, air-cooled
Computer system	PC with CD ROM for ICDD PD F2 and peripheral systems
Scan types	Step scan, continuous scan
Specifications without obligation and subject to change without notice	

