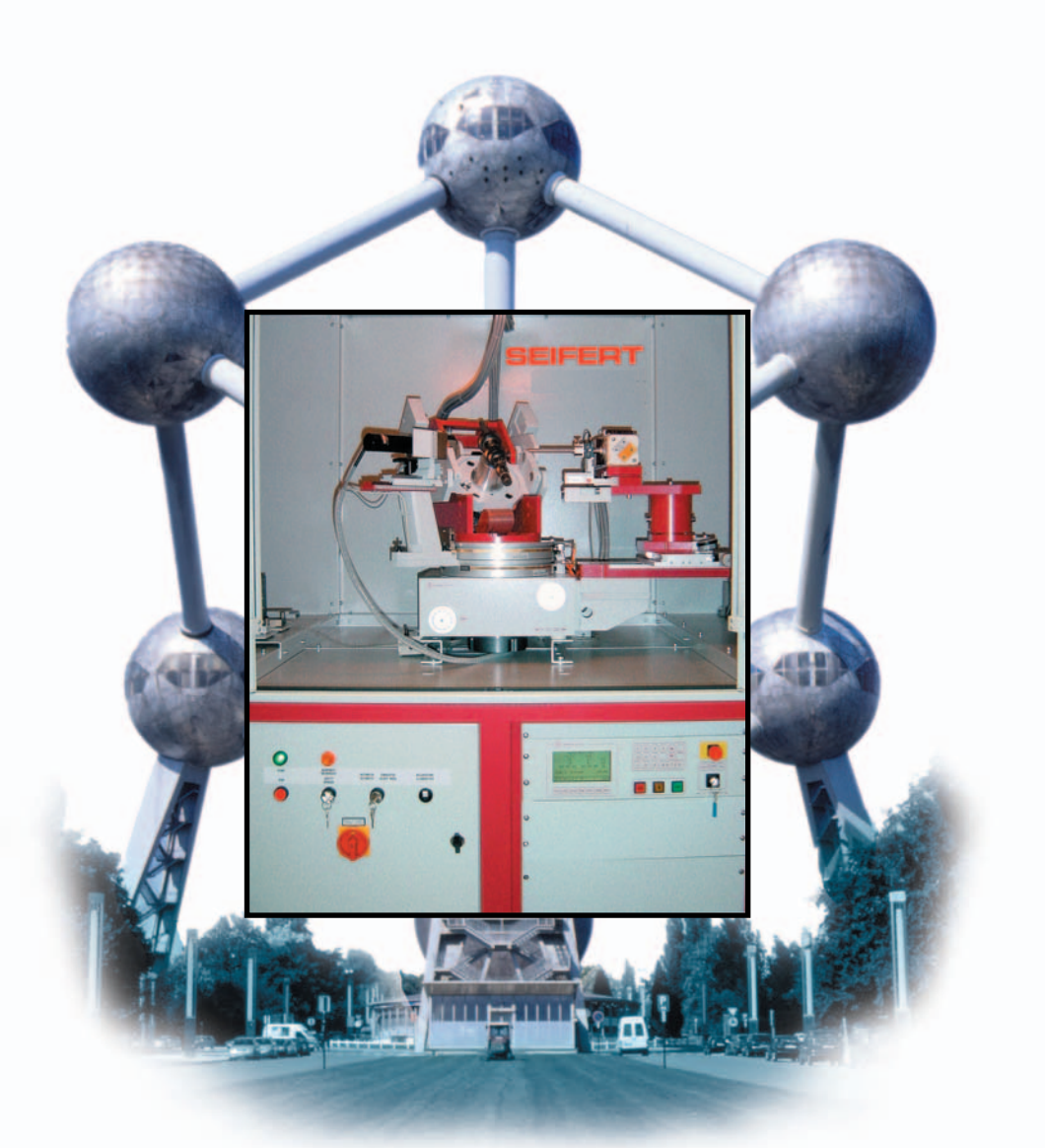
# SEIFERT XRD 3003 PTS

## Diffractometer System




For Phase, Texture, Stress and Thin Film Analysis
in MATERIAL RESEARCH

## Flexibility

An enhanced XRD system for material research must be able to handle whole component parts because cutting of samples for analysis may change material properties (like the stress state). And even small samples require space, since many applications need special attachments. With the XRD 3003 PTS you have the most flexible system to cope with even very heavy or large samples and attachments. For measurements of:

- Phase

Identification (qualitative phase analysis) and quantification (quantitative phase analysis, retained austenite) of the crystallographic phases which form the sample.

- Texture

Study of preferred crystallites orientation, qualitative and quantitative texture analysis.

- Stress

Determination of the lattice deformation of the sample (results of stress analysis are given in MPa).

- Reflectometry

Determination of roughness, thickness (<400 nm) and mass density of thin films and multilayers.

## Enhanced Tilting Features

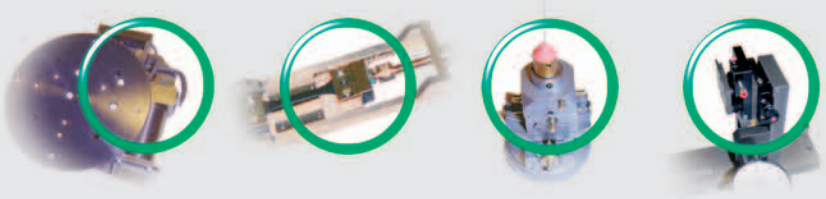
Tilting of the sample in is needed "to look into the sample" in different directions, e.g. for studying of stress and texture. Conventional systems use Eulerian cradles, which limit sample weight and sample space, range, precision and flexibility.

The XRD 3003 PTS system solves these flexibility and quality problems with its proven TS-3 goniometer. Its design is unique worldwide. Strong lever arms moving in opposite directions give a precise χ movement. The electrical controller uses the latest microcontroller technology. Stepper motors with optical encoders run in a closed-loop mode. These features guarantee highest precision, speed and stability.

**It doesn´t matter what kind of sample you have...**

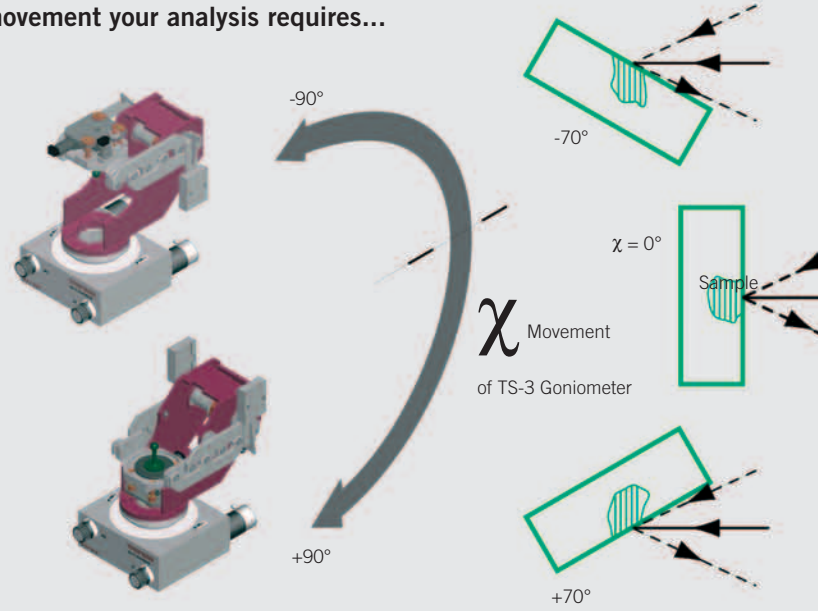
Heavy Sample | Large Sample | Flat Sample

**what attachment you need to use or...**

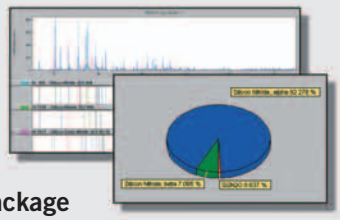


X/Y Stage | Attachment for Stress | Goniometer Head | Knife Edge

**what movement your analysis requires...**



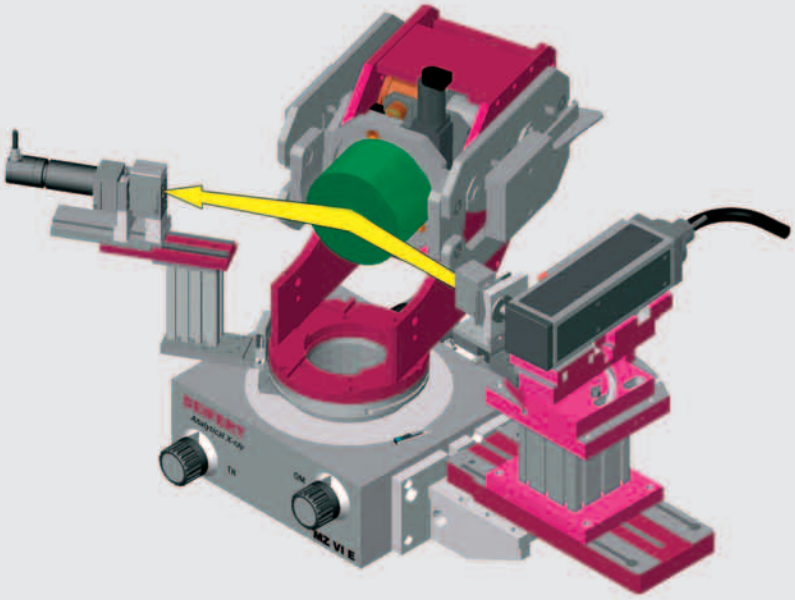

**the XRD 3003 PTS will tell you the full story**

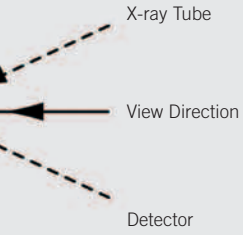


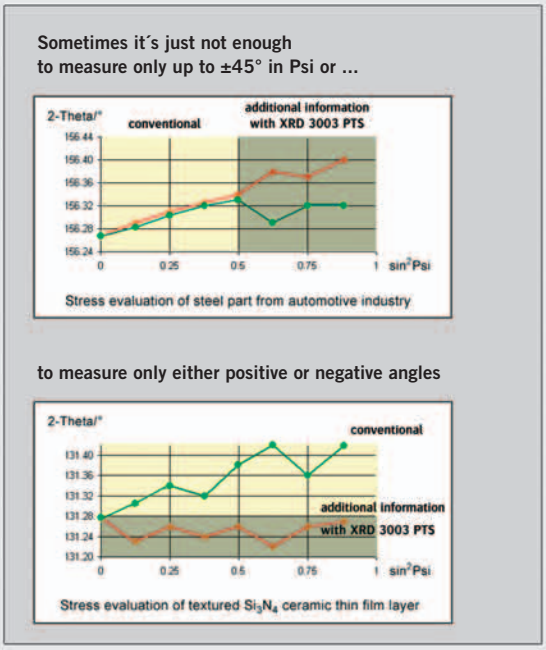
**RayfleX**

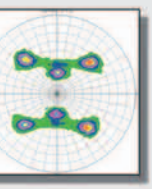
**Powerful Evaluation Software Package**

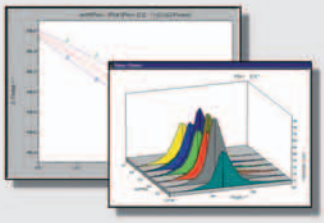
**Phase**

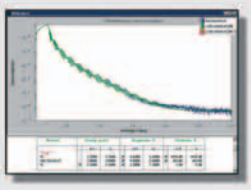








**Texture** **Stress** **Reflectometry**

## Ease of Use

The optimum X-ray beam depends on the sample, the application, and the required precision. We designed the XRD 3003 PTS to be very easy to use and adjust. The X-ray optics can be interchanged with only minor manipulations and without realignment. Sample alignment is assisted by laser and CCD camera. Intelligent measurement strategies - even for critical sample shapes - are implemented in the software.

With the XRD 3003 PTS you will be able to

- handle heavy samples - up to 5 kg
- handle large samples of up to 220 mm (width) x 100 mm (depth) - and even larger with some $\chi$ / $\Phi$ limitations depending on actual sample dimensions
- work with the most flexible system on the market for mounting of different attachments
- work with highest precision and unlimited rotation
- make movements from -90° to +90° without shadowing of the X-ray beam

## Superior Measurement Functionality

For stress analysis the ability to move the $\chi$ angles in a very high positive or negative position is essential (see graphs at left). Only measurements in both $\chi$ directions give information about the real stress in the sample and the quality of sample and system alignment. Whoever is not able to measure in this way cannot be sure about his results. With its $\chi$ movement from -90° to + 90° the XRD 3003 PTS will tell you the real and full story of the sample.

## Powerful Evaluation

Last but not least, even the best measurement possibilities don´t help without the right evaluation software. We offer with the RayfleX Software a powerful evaluation tool which gives the best results for phase, texture, stress analysis and reflectometry.

## Technical Specifications

**Two-circle goniometer MZ VI E**

| | | |
|---|---|---|
| Minimum step size: | 0.0005° | (optional 0.0001°) |
| Reproducibility: | ±0.0003° | (optional ±0.0001°) |
| Ranges: | $-3° \leq \Omega \leq 182°$ and | $-3° \leq \Theta \leq 169°$ |

**TS-3 goniometer**

| | | |
|---|---|---|
| Maximum load: | | 5 kg |
| Maximum space for sample and attachment: | | 220 mm (width) x 100 mm (depth) |
| Tilt axis $\chi$: | - Minimum step size | 0.0005° |
| | - Reproducibility | ±0.0003° |
| | - Range | $-90° \leq \chi \leq +90°$ |
| Rotation axis $\Phi$: | - Minimum step size | 0.002° |
| | - Reproducibility | ±0.001° |
| | - Range | n x 360° |
| Translation axis Z: | - Minimum step size | 0.001 mm |
| | - Range | 25 mm |
| X/Y stage: | - Minimum step size | 0.01 mm |
| | - Range | 50 mm x 50 mm |
| | - Maximum load | 2.5 kg |

## Company and Applications

GE Inspection Technologies with its SEIFERT Analytical X-ray solutions stands for highest competence in X-ray diffraction technique since many years. Originally Rich. Seifert & Co., founded in 1892, we have been thoroughly involved in X-ray technology ever since the discovery of the X-rays. Many representatives are ready to help you all over the world.

The philosophy of GE Inspection Technologies is to serve exactly the customers needs to maximize customer safety and profitability. Superior research and development, electrical and mechanical engineering, production, and service is the basis for our market success. For a demonstration of the impressive XRD systems and all their capabilities, please visit the scientific application laboratory in Ahrensburg or ask for a customer reference.

The excellent quality of the GE Inspection Technologies products is well known worldwide. SEIFERT Analytical X-ray Systems are used for material characterization in research & development and for quality assurance at universities, research centers and in industry. Our product line includes X-ray diffraction systems for phase analysis, texture and stress investigations as well as for high resolution studies, reflectometry and single crystal structure determination. Additionally a variety of machines can be designed for special applications. Our Analytical X-ray Stress Analyzers play an important role in automotive industry, suitable for precise handling of even large and heavy work pieces. In semiconductor and supply industries our products are directly integrated in the production line for the orientation of single-crystalline materials. For aerospace applications the determination of the orientation of single-crystal materials is needed. For such applications, systems are supplied that operate in real-time mode using the Laue back-reflection technique.

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