

We Innovate Materials

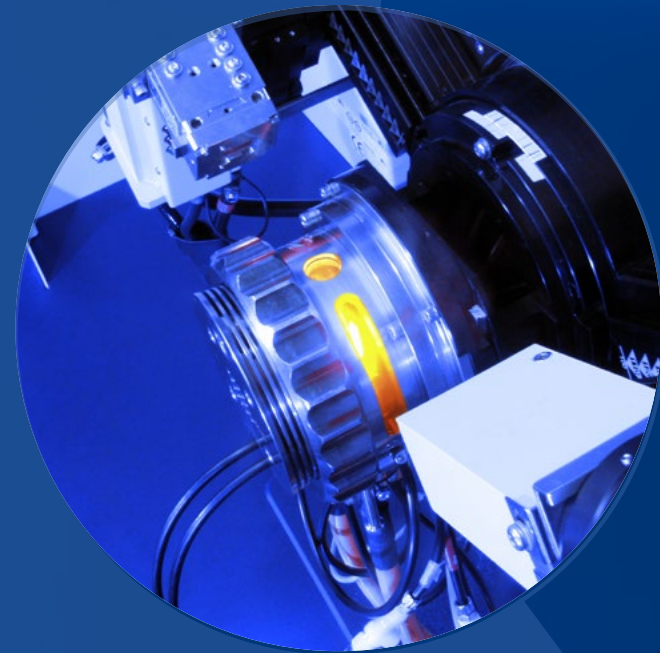
Qualitative and Quantitative Phase Analysis

High-Temperature Properties and Phase Transformations

(X-ray) Residual Stress Measurements

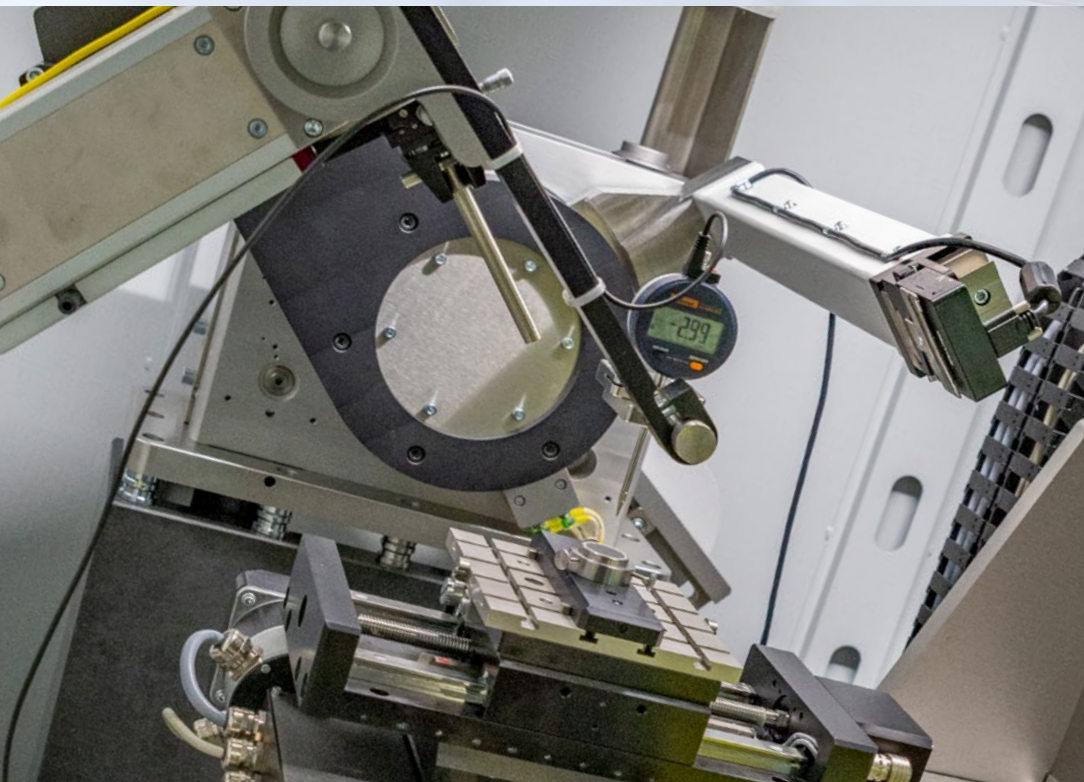
# Structure and Phase Analysis

## X-ray Diffraction



COMPETENCE & RELIABILITY

# Qualitative and Quantitative Phase Analysis



X-ray determination of phase structure and structural parameters  
at room temperature

*(partly within the scope of accreditation according to EN ISO 17025)*

Contact:



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Dr. Stefan Marsoner  
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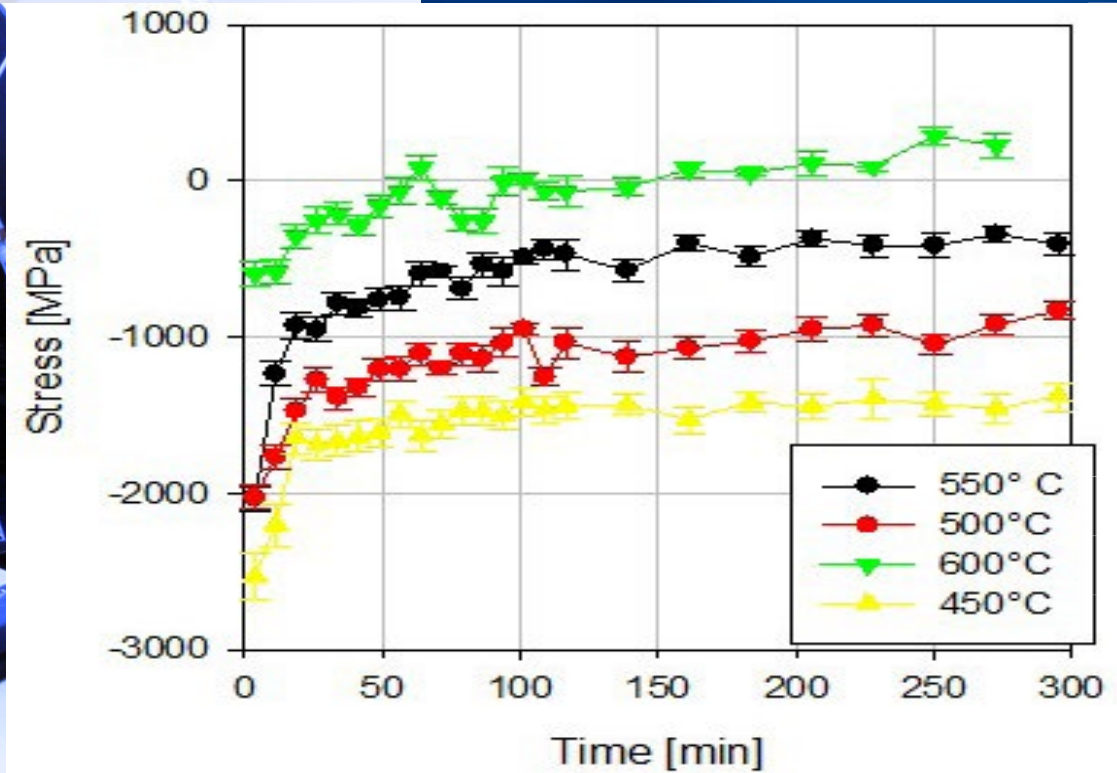
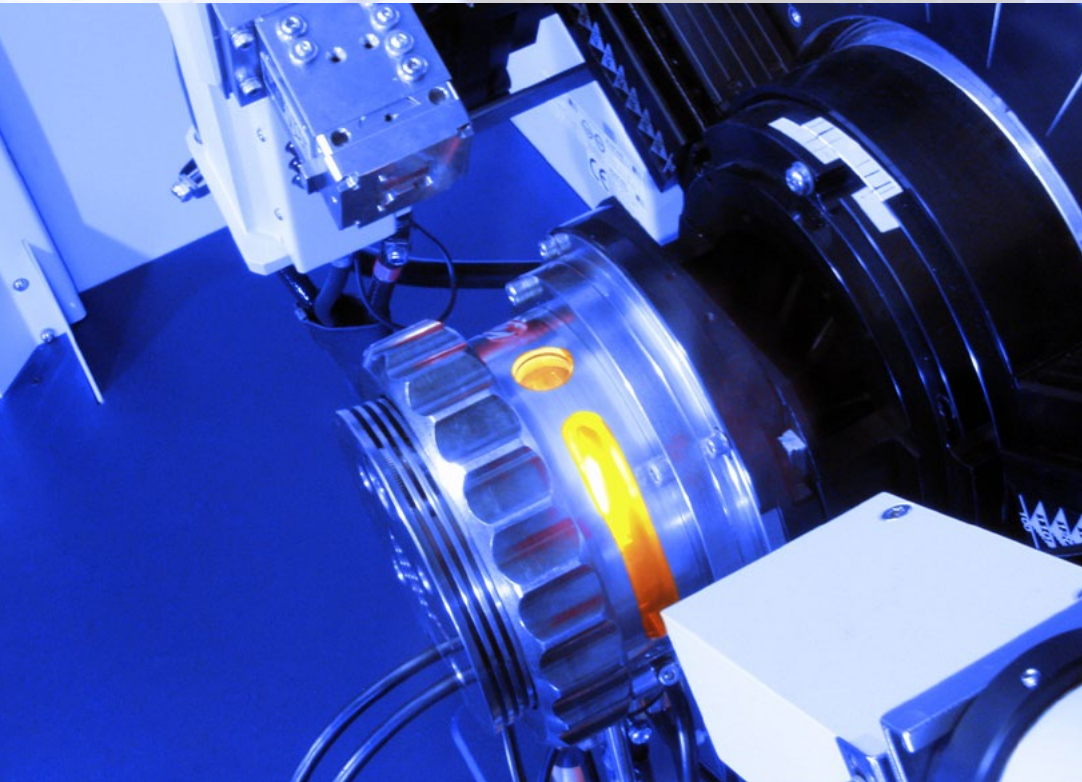
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## Our Focus / Competences:

- qualitative and quantitative phase analysis (incl. Rietveld method)
- determination of lattice parameters (lattice constants, defect density, crystallite size)
- determination of the retained austenite content according to ASTM E 975 (within the scope of the accreditation) or by means of the Rietveld method (laboratory and on-site)
- analysis of ripples, reflectometry e.g. on microelectronic components
- examination of metals, ceramics, coatings



# High Temperature Properties and Phase Transformations



Determination of phases, phase transformations, structural parameters and residual stresses at elevated temperatures as well as under different atmospheres.

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## Our Focus / Competences:

- determination of crystallographic structure parameters as a function of temperature
- determination of phase transformations such as magnetic and lattice transformations, melting, glass transition temperatures
- tracking of phase changes due to annealing processes
- detection of phase reactions (e.g. oxidation, decomposition)



# (X-ray) Residual Stress Measurements



X-ray determination of residual stresses  
(partly within the scope of accreditation according to EN ISO 17025)

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## Our Focus / Competences:

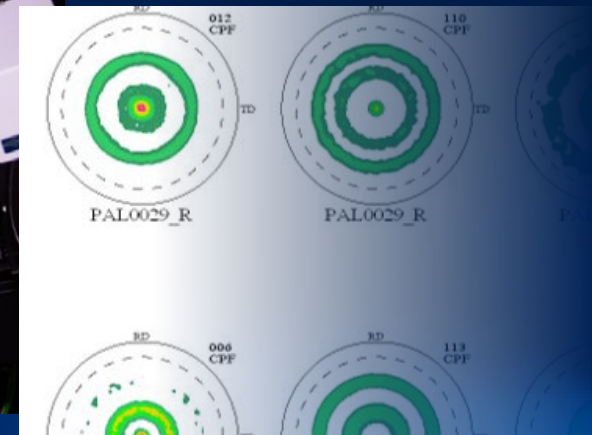
- X-ray determination of residual stresses, residual stress distributions and residual stress depth profiles on components in the laboratory or at the customer's site (according to EN 15305 within the scope of accreditation)
- residual stress development in layer/substrate composites at temperature-change
- determination of relaxation of residual stresses at elevated temperatures up to 900°C
- determination of residual stresses using the cut compliance method

## Service Offer

- qualitative and quantitative radiographic phase analysis (room temperature up to 1400°C)
- determination of lattice parameters (lattice constants, defect density, crystallite size) as f(T)
- determination of phase transformation temperatures
- X-ray phase and structure analysis of thin surface layers
- determination of fiber textures in layer systems
- determination of ripples, reflectometry on microelectronic components
- determination of residual stress depth profiles on specimens and components
- chemical analysis by XRF
- measurements in the laboratory or on-site on large parts, components or materials

### Tests offered as part of the accreditation:

- determination of the retained austenite content according to ASTM E975 (accredited) resp. Rietveld method
- X-ray determination of process-related residual stresses according to EN 15305 (accredited)



## COMPETENCE & RELIABILITY

### Equipment

- X-Ray diffractometer Bruker D8 Discover with ultra-precise Atlas goniometer and a wide range of anode materials, detectors and setups for various applications (e.g. high temperature chamber HTK2000 from Paar for detection of fast phase transformations in inert and oxidic atmospheres (25 to 1400°C))
- X-ray diffractometer Seifert Charon SXL (XRD Eigenmann GmbH): diffractometer for large components for high-precision measurements with a spot size of up to 50µm
- mobile X-ray diffractometer Stresstech Xstress 3000 (G2/ G3) with integrated depth measurement and automatic inspection table, also suitable for measurement of internal surfaces and insitu measurement on testing machines.
- mobile X-ray fluorescence analyzer S1TurboLE from Bruker (Handheld)







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