

INDUSTRIAL CHALLENGES FOR RESIDUAL STRESS XRD APPLICATIONS

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In the automotive and aerospace industries, the highest standards of quality and safety must be demanded of supplied products to ensure the highest quality of final products. XRD measurements allow manufacturers and designers of new components to exploit the full potential of material properties and meet the requirements of quality control, in terms of product reliability, weight, performance, cost-effectiveness and operational lifetime.

Non-destructive testing of large and heavy components of complex geometry by X-ray diffraction is shown in various set-ups. A novel robotic X-ray analyzer "Charon XRD" was developed at MTU Aero Engines in a joint partnership project.

The understanding of stress especially in micromechanics becomes more and more significant. A microdiffraction system with precise mechanics and excellent spatial resolution, in the micron range, will be discussed.

For optimum throughput, a high level of automation of the sample measuring point or grid selection with data evaluation is required. Special X-ray optics and a new ultra-fast 1D-detector allow high-speed data acquisition with high accuracy.