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New X-ray developments to characterize ceramic materials

An overview of new X-Ray analytical developments to characterize ceramic materials will be given and illustrated on a broad variety on applications. The Empa laboratory for X-ray analytics is dedicated to utilize and continuously improve X-ray based analysis methods to support material research. The development of new ceramics and the materials property enhancement is strongly connected to the possibilities for a comprehensive analysis of their properties. However, analytical methods do not only provide knowledge about the materials, but also support understanding of the production process of these materials. This in turn is the basis for a specific synthesis of new materials for industrial applications. The presentation concentrates on novel techniques that have demonstrated great potential for non-destructive testing (NDT) and non-destructive evaluation (NDE). On one side Imaging techniques like X-ray Phase Contrast Imaging (XPCI) and Scatter Dark Field Imaging (SDFI) as well as diffraction techniques such as HRXRD will be evaluated for ceramic materials for applications such as hard coatings, semiconductors or medtech. How can X-ray analytical methods support the detection failure modes ? Subtle changes in the microstructure of ceramic materials and their impact on aging processes will be discussed.

Biography

Alex Dommann is heading the Department of Materials meet Life at Empa. He received his PhD in Solid State Physics in 1988 from ETHZ in Switzerland. His research concentrates on the surface analysis, bio surface interactions, structuring, coating and characterization of thin films. He is member of different national and international committees and teaches Biomaterials, Crystallography and MEMS technology at different Swiss Universities and has published more than 130 papers. He is a member of the Swiss Academy of Engineering Sciences (SATW) and Adjunct Professor at the University of Berne.

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