

TRUE SUBMICRON RESOLUTION X-RAY MICROSCOPY OF SOFT MATERIALS

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Conventional X-ray microscopy and computed tomography have been used extensively to non-destructively visualize the internal structure of a wide range of advanced materials. However the routine analysis of soft materials such as foams, plastics, polymers and carbon based composites has traditionally been difficult due to limitations in obtainable contrast from conventional low power, high energy instrumentation. Under these conditions soft materials do not absorb X-rays well and often fail to show the high contrast desired for accurate quantitative materials characterization. This inherent contrast limitation, coupled with the need for true submicron resolution in the characterization of today's micro-engineered materials, represents a significant challenge in the development of the X-ray technology for this broad class of materials.

In this presentation we will discuss how to overcome many of the limitations of contrast and spatial resolution in the imaging of soft materials by reviewing the key features of the Rigaku nano3DX high-resolution, high-contrast 3D X-ray microscope. We will present various application examples that address both the difficulties in the measurement of soft materials and the experimental solutions provided by the nano3DX.