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Investigation of the foaming process of metals by synchrotron-radiation imaging

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Abstract: Synchrotron-radiation imaging serves as a powerful tool for the non-destructive material characterisation of metallic foams. The foaming process is visualised in situ by real-time radiography in projection image sequences. The temporal evolution of foam expansion from early pore formation over pore growth up to the collapse of the foam structure are reported. Ex situ microtomography is applied to the study of statistical distribution properties at the early foaming stages.

Various image processing and analysis techniques yield quantitative results concerning pore nucleation and their early formation, film rupture and foam drainage. The similarities and differences of the metal foaming process with respect to the precursor material, its processing steps and process parameters are determinable.

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Author Keywords: metal foam; non-destructive testing; synchrotron radiation; in situ radiography; computerised tomography; 3d image processing and analysis

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Rack A, Helwig HM, Butow A, et al. [Early pore formation in aluminium foams studied by synchrotron-based microtomography and 3-D image analysis](#) ACTA MATERIALIA 57 16 4809-4821 SEP 2009

Myagotin A, Helfen L, Baumbach T [Coalescence measurements for evolving foams monitored by real-time projection imaging](#) MEASUREMENT SCIENCE & TECHNOLOGY 20 5 MAY 2009

Rack A, Helfen L, Baumbach T, et al. [Analysis of spatial cross-correlations in multi-constituent volume data](#) JOURNAL OF MICROSCOPY- OXFORD 232 2 282-292 NOV 2008

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