# Synchrotron tomography on zinc and aluminium foams

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For the past years, computer tomography (CT) has proven to be a proper method for the non-destructive investigation of metal foams. Here, we focus on two materials: zinc as a new foaming metal and aluminium alloy foams with embedded silicon carbide (SiC) particles. For zinc we vary the size of the blowing agent's particles ($TiH_2$) as well as the foaming time in order to display the influence of those parameters on the foam characteristics. The aluminium alloy also includes, besides the blowing agent ($TiH_2$), particles of SiC in order to optimize the viscosity.

Due to the high spatial resolution (up to 1.6 $\mu m$), the high intensity and the possibility to vary the energy range of radiation (6 keV – 60 keV) the tomographic facility of the "Bundesanstalt für Materialforschung und -prüfung" (BAMline) at the BESSY-2 synchrotron was used.

Two zinc series were performed, where, for the blowing agent, particles with a diameter of smaller and larger 28 $\mu m$ were chosen. A comparison of both series displays a significant influence of the agent's dimensions on the pore size distribution. Additionally, it appears that the titan is decomposited during the foaming process.

The SiC particles have almost the same absorption coefficient as the aluminiun alloy matrix. Nevertheless, due to the high monochromatic radiation, it is possible to separate these two phases within the tomographic image. Therefore, it is possible to discuss the questions if and why the SiC particles increase the viscosity of the metal foam.

To emphasize the results derived from the CT, we compared our three-dimensional tomography images with two-dimensional pictures taken with classical light microscopy of samples prepared by cutting and polishing.