

Fluid Dynamics Seminar

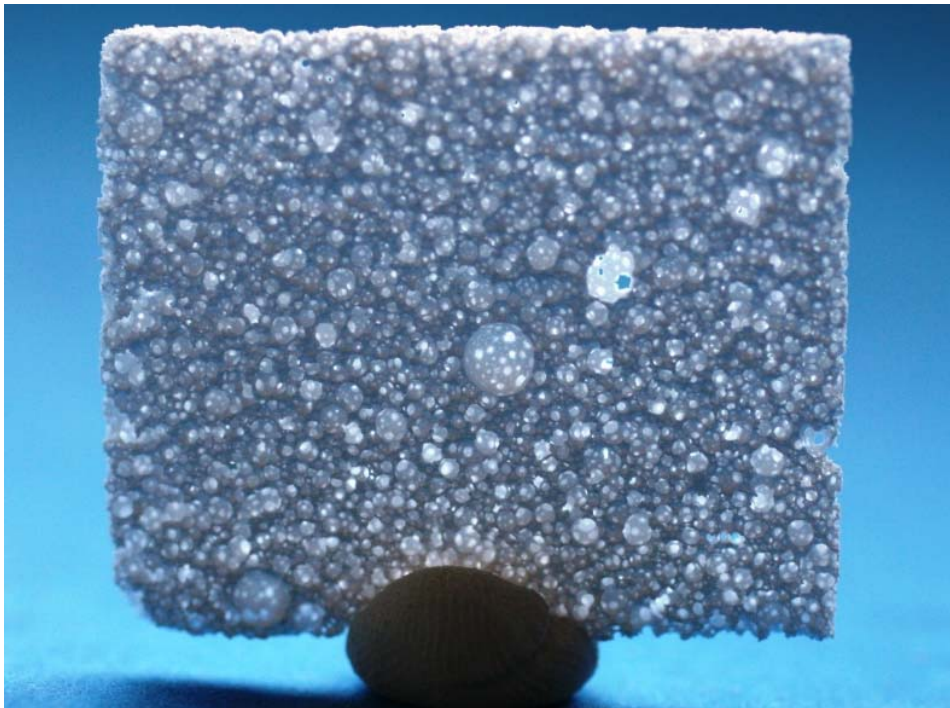
Date: Wednesday, November 16th 2016 at 13:00

Location: ZARM, Room 1730

Production of porous heat resistant ceramics with well-defined acoustic properties

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Alumina-Mullite Ceramic Foam Sample with highly interconnected Pores (Porosity 80 %, sample width: 2,5 cm)

Sound absorption in high temperature regimes, like gasturbine combustion chambers, requires heat and thermal shock resistant materials. Ceramics with their unique properties can fulfill these demands. During the last three years high porous alumina-mullite ceramic foams with interconnected spherical pores were developed at ZARM. They were fabricated by direct foaming, a simple method based on mechanical frothing of a ceramic slurry. Subsequent setting of the foams is achieved via self-consolidation, triggered by hydration and precipitation processes. Heat treatment so-called sintering of the foam leads to stable ceramic foam structures with open porosity. The overall pore volume fraction can be controlled by the incorporation of air during the foaming process. Air flow resistance, directly related to the porosity, which determines the sound absorbing behavior of the ceramic foams is therefore adjustable and ceramic foams with different properties have been manufactured.

The focus lies on the production process and the properties of the porous material, sometimes contrary to the properties of the dense material...