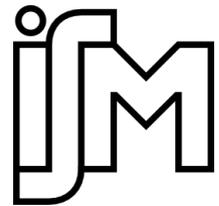




Vortrag



A multiphase flow of the foaming metallic melts

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Cellular metal structures are preferred in many applications because of the lower specific weight and favorable material properties (thermal and mechanical). There are several ways of the metallic foaming melts: injecting gas into the liquid metal from an external source, causing the precipitation of gas that had just been dissolved in the liquid, or causing an in-situ gas formation in the liquid by admixing gas-releasing blowing agents to the melt.

The talk deals with the idea of injecting gas into the liquid. To discover details of the foaming process, fluid behavior and gas deposition in melts, numerical simulations involving a multi-phase flow problem have been carried out using the OpenFOAM solver. The obtained numerical results found are compared with experiments as well. However, for safety reasons, water has been used as the working fluid in experimental studies. The flow visualization could predict the dynamics and shapes of the air bubbles created by injecting gas into the fluid. Furthermore, effects of fluid stabilization by viscosity, density and surface tension are examined for the case of aluminum melts. Preliminary results indicate that a higher fluid viscosity does not affect the foaming process and therefore contributes to foam stabilization.

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