Numerical investigation of the thermal properties of irregular foam structures

Abstract:

The thermal properties of irregular open-cell and closed-cell metal foams are investigated via numerical simulation. The influence of relative density and cell irregularity on the thermal conductivity and thermal expansion of the foam structure is determined. It is concluded that the effective thermal conductivity of the foam structure depends linearly on the relative density, whereas no dependence on the degree of irregularity is observed. The effective thermal expansion coefficient of the foam structure is constant for the range of parameters considered.