

## Air Flows along Perforated Metal Plates with the Heat Transfer

**Authors :** Karel Frana, Sylvio Simon

**Abstract :** The objective of the paper is a numerical study of heat transfer between perforated metal plates and the surrounding air flows. Different perforation structures can nowadays be found in various industrial products. Besides improving the mechanical properties, the perforations can intensify the heat transfer as well. The heat transfer coefficient depends on a wide range of parameters such as type of perforation, size, shape, flow properties of the surrounding air etc. The paper was focused on three different perforation structures which have been investigated from the point of the view of the production in the previous studies. To determine the heat coefficients and the Nusselt numbers, the numerical simulation approach was adopted. The calculations were performed using the OpenFOAM software. The three-dimensional, unstable, turbulent and incompressible air flow around the perforated surface metal plate was considered.

**Keywords :** perforations, convective heat transfers, turbulent flows, numerical simulations

**Conference Title :** ICAMAME 2015 : International Conference on Aerospace, Mechanical, Automotive and Materials Engineering

**Conference Location :** Venice, Italy

**Conference Dates :** August 13-14, 2015