

## Heat Transfer Enhancement Using Copper Metallic Foam during Convective Boiling in a Plate Heat Exchanger

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**Abstract :** The present work deals with the study of the heat transfer in a rectangular channel equipped with a metallic foam. The tested metallic foam sample is made from copper with 20 PPI (Pore per Inch Linear) and 93% of porosity and the working fluid used is the n-pentane. In the present work the independent variables are the velocity in the range from 0.02 to 0.06 m/s and a boiling heat flux rate varying between 30 and 70 kW/m<sup>2</sup>. The heat transfer coefficient is presented versus boiling heat flux, vapor quality and superheat  $\Delta T_{sat}$ . The thermal results are compared to those found for a plain tube for the same conditions. The comparison with the plain tube shows that the insert of a metallic foam enhances the heat transfer coefficient by a factor between 1.3 and 3.

**Keywords :** boiling, metallic foam, heat transfer, plate heat exchanger

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

**Conference Location :** Istanbul, Turkey

**Conference Dates :** December 21-22, 2015