**Heat transfer and fluid flow characteristics in open-cell porous metal structures**

Ji H. Jeong1,\*

1 School of Mechanical Engineering, Pusan National University, Busan, 46241, Korea,

Abstract

Porous metals, characterized by high surface area-to-volume ratios and intricate flow paths, offer significant potential for enhancing convective heat transfer in various applications, including electronic device cooling, fuel cell electrodes, and compact heat exchangers. With a history spanning over 150 years, diverse research areas in porous metals have paved the way for their utilization in multiple fields. This presentation delves into the thermo-fluidic characteristics of working fluids within porous metals, a crucial aspect for the tailored design of these materials for specific applications. Key parameters such as single and two-phase pressure loss coefficients, convective heat transfer coefficient, fin efficiency, and boiling and condensation heat transfer coefficients play pivotal roles in optimizing porous metal designs.

Over the past decade, our research group has undertaken an extensive exploration of open-cell porous metals, focusing on quantifying their thermo-fluidic performance. This includes in-depth studies on single-phase pressure drop, two-phase pressure drop, and the development of convective heat transfer models. The presentation aims to provide a concise overview of these research endeavours and share valuable insights and lessons learned from the outcomes.