

Heat Transfer and Fluid Flow in Architected Open Cell Foams

Wilson K. S. Chiu, Ph.D.

Professor

Department of Mechanical Engineering

University of Connecticut

Storrs, Connecticut, USA

wchiu@enr.uconn.edu

Abstract

Open cell foams allow for the design of structures with locally tunable heat transfer performance compared to conventional porous materials. This new class of material has application to heat exchangers for heating, ventilation, air conditioning and refrigeration systems, heat sinks, electronic power dissipation, fire barriers, and thermal energy storage. This talk will present our studies on the heat transfer and fluid flow of architected open cell foams, including lattice, shellular and hybrid structures. We will conclude with a discussion on the potential use of novel additive manufacturing techniques such as 3-D printing to fabricate such structures.