

Wire-woven cellular metals: the present and future

Abstract

Wire-woven metals are a type of cellular metal composed of uniform 3D truss-like cells, and fabricated using wires as the raw material. Wire-woven metals are practically the most common choice for lattice truss metals to achieve multi-layered structures with fine cells. Since the new millennium, a number of wire-woven metals have been developed. This lecture reviews various wire-woven metals and introduces their topologies and fabrication processes. In addition, their mechanical and thermal properties with analytic solutions, their variations, and applications are presented. Finally, the limits and prospects of wire-woven metals are discussed. The future of wire-woven metals seems promising due to the many options in the selection of the mother material, cell size, overall size, relative density, and cell geometry. Furthermore, their mechanical and thermo-hydraulic properties are superior to their competitors such as metal foams and they can be mass-produced at low cost.