

Development and integration of AM lattice structures to reliable technological solutions

Main Article Content

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Additive manufacturing is allowing since several years the fabrication of metal lattice structures with high resolution, especially thanks to the increasing performances of DMLS (direct metal laser sintering) processes. The mechanical behavior of lattice structures depends primarily to the parent material, however it can be significantly modified or adjusted by means of the design of single cell and the 3D cells stacking. The most known advantages associated to engineered cellular structures are lightweight and thermal exchange, although advanced functionalities are appearing in the fields of materials joints and energy absorption. The applications of these properties are wide and include biomechanics/bioengineering, micromechanics, human-machines interfaces (HMI), sport and traditional mechanics (machines, vehicles, plants, etc.) The most recent projects released by the “Smart Structures and Systems” Lab. include the AM processes optimization for qualified and repeatable production of lattices at industrial quality level, the design methodologies linked to reduced-order modeling, the testing for reliability, and the development of patented technologies exploiting metal AM lattice structures.