

Title:

Characterization of High-Strength Aluminum Alloys Lattice Structures produced using Laser Powder Bed Fusion

Abstracts:

In this study, we investigate the behavior of LPBF-optimized high-strength aluminum alloy Al7075 lattice structures, focusing on the effects of porosity on strain concentration under compressive loading. While contour parameters for roughness improvement are commonly applied in LPBF alloys, their efficacy is alloy-dependent. Here, we successfully machine dense Al7075 lattice structures using optimized process parameters and a contour strategy. For the first time, Digital Volume Correlation (DVC) analysis is employed to assess the mechanical response of Al7075 Gyroid Lattice structures, providing novel insights into the strain distribution and the role of porosity in deformation behavior.

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Workshop name:

Additive Manufacturing Workshop

Location: VUB, Brussels, Belgium

Date: 09/09/2024