POSTER EXPOSITION

Poster 12

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Additive manufacturing and characterisation of topologically designed porous 316L stainless steels

Shuyi Li

AUTHOR OF POSTER:
Shuyi Li

INSTITUTION:
University of Birmingham

OTHER AUTHORS:
Dr Julan Wu, Cooksongold
Dr Parastoo Jamshidi, Cooksongold
Dr Selassie Dorvlo, Cooksongold
Dr Biao Cai, University of Birmingham

ABSTRACT:
Porous metals are multifunctional materials, widely used in catalysis, biomedical implants, and filtration due to their unique properties. Additive manufacturing (AM), particularly Laser Powder Bed Fusion (LPBF), provides precise control over the design and fabrication of porous metals. In this study, by using topological design principles, we designed, and additive manufactured Triply Periodic Minimal Surface (TPMS) porous structures out of 316L stainless steel. These porous structures, known for their high interconnectivity and favourable mechanical properties, were optimised for enhanced performance. To evaluate printed porous 316L components, advanced characterisations including electron microscopes and X-ray computed tomography were employed, providing essential data such as porosity, surface area, wall thickness distribution, and internal structural integrity. The results highlight the advantages of using AM to produce topology optimisation porous materials.

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