

عنوان مقاله:

Mesh Dependency and Parameter Study of GTN Model for a Lattice Structure Fabricated by SLM Considering Hollomom Hardening Using FEM

محل انتشار:

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خلاصه مقاله:

This paper investigates the effect material parameters variation of the Gurson-Tvergaard-Needleman (GTN) model. The effect of elastic modulus, calibration parameter of GTN model, isotropic hardening, fracture strain, and strut diameter on the force-displacement curve of a lattice structure fabricated by Selective Laser Melting (SLM) has been studied using Finite element method. The power law of Hollomom has been used to model the isotropic hardening behavior. The considered lattice structure is made from AISi10Mg alloy which has many applications in different industries. A 20 cm 20 cm 20 cm structure with 5 Body Centered Cubic (BCC) unit cells in x, y, and z directions has been considered. The results show that 250000 elements for one-quarter of the lattice structure are quite enough to obtain acceptable results. Also the effect of prescribed parameters on the force-displacement curve of the lattice structure has been studied. Based on the obtained results, diameter and hardening behavior have the most significant effect on maximum force- displacement curve among the considered parameters.

کلمات کلیدی:

Parameter Study - GTN model – Isotropic hardening - SLM

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