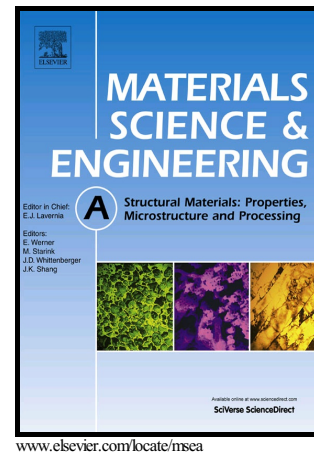


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Characterisation and constitutive model of tensile properties of selective laser melted Ti-6Al-4V struts for microlattice structures

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Abstract

Predicting the mechanical performance of selective laser melted (SLM) microlattice structures requires the constitutive data of the parent solid material in the struts. This work first characterised the cross-sectional features of individual SLM Ti-6Al-4V struts. The direct examination revealed the non-linear relation between the equivalent diameter and the Feret diameter of a strut, which was quantified by an empirical equation. The equation considering surface roughness effects allowed the non-destructive determination of the equivalent diameter using the directly measured Feret diameter prior to tension testing. Uniaxial tension experiments were then performed to accurately measure the constitutive behaviour of SLM Ti-6Al-4V struts, with the strain history tracked and recorded using high resolution imaging. It was

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