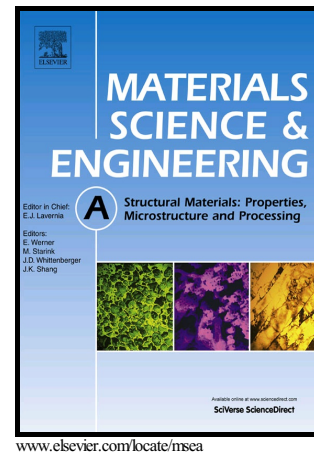


Author's Accepted Manuscript

Selective laser melting of high strength and toughness stainless steel parts: The roles of laser hatch style and part placement strategy

Dongdong Gu, Hongyu Chen



PII: S0921-5093(18)30544-6
DOI: <https://doi.org/10.1016/j.msea.2018.04.046>
Reference: MSA36366

To appear in: *Materials Science & Engineering A*

Received date: 30 December 2017
Revised date: 28 February 2018
Accepted date: 11 April 2018

Cite this article as: Dongdong Gu and Hongyu Chen, Selective laser melting of high strength and toughness stainless steel parts: The roles of laser hatch style and part placement strategy, *Materials Science & Engineering A*, <https://doi.org/10.1016/j.msea.2018.04.046>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Selective laser melting of high strength and toughness stainless steel parts: The roles of laser hatch style and part placement strategy

Dongdong Gu^{a,b,*}, Hongyu Chen^{a,b}

^a *College of Materials Science and Technology, Nanjing University of Aeronautics and Astronautics, Yudao Street 29, Nanjing 210016, Jiangsu Province, People's Republic of China;*

^b *Institute of Additive Manufacturing (3D Printing), Nanjing University of Aeronautics and Astronautics, Yudao Street 29, Nanjing 210016, Jiangsu Province, People's Republic of China*

*Corresponding author. Tel./fax: +86 25 52112626; E-mail: dongdonggu@nuaa.edu.cn (D. Gu).

Abstract

Laser hatch style and part placement strategy are acknowledged to have a considerable effect on processing quality and mechanical performance of selective laser melting (SLM) products. In an effort to obtain 316L stainless steel products with favorable properties, hatch style integration and part placement optimization were adopted in this study. The tensile property of SLM parts at different placement angle ψ was identified and the corresponding deformation behavior and failure mechanism were investigated. Interestingly, the part prepared by double stagger melt (DSM) style presented a strong $\langle 001 \rangle$ texture along the transverse direction (TD) rather than the growth orientation of the columnar grains (building direction, BD). This crystallographic variation imposed an immense effect on yield strength of SLM-processed parts by modifying the

Download English Version:

<https://daneshyari.com/en/article/7972358>

Download Persian Version:

<https://daneshyari.com/article/7972358>

[Daneshyari.com](https://daneshyari.com)