

Accepted Manuscript

Title: Density variation in binder jetting 3D-printed and sintered Ti-6Al-4V

Authors: Erica Stevens, Samantha Schloder, Eric Bono, David Schmidt, Markus Chmielus



PII: S2214-8604(18)30232-X
DOI: <https://doi.org/10.1016/j.addma.2018.06.017>
Reference: ADDMA 431

To appear in:

Received date: 5-4-2018
Revised date: 28-5-2018
Accepted date: 20-6-2018

Please cite this article as: Stevens E, Schloder S, Bono E, Schmidt D, Chmielus M, Density variation in binder jetting 3D-printed and sintered Ti-6Al-4V, *Additive Manufacturing* (2018), <https://doi.org/10.1016/j.addma.2018.06.017>

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 proof before it is published in its final 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.

Density variation in binder jetting 3D-printed and sintered Ti-6Al-4V

Erica Stevens^a, Samantha Schloder^a, Eric Bono^b, David Schmidt^a, Markus Chmielus^{a,*}

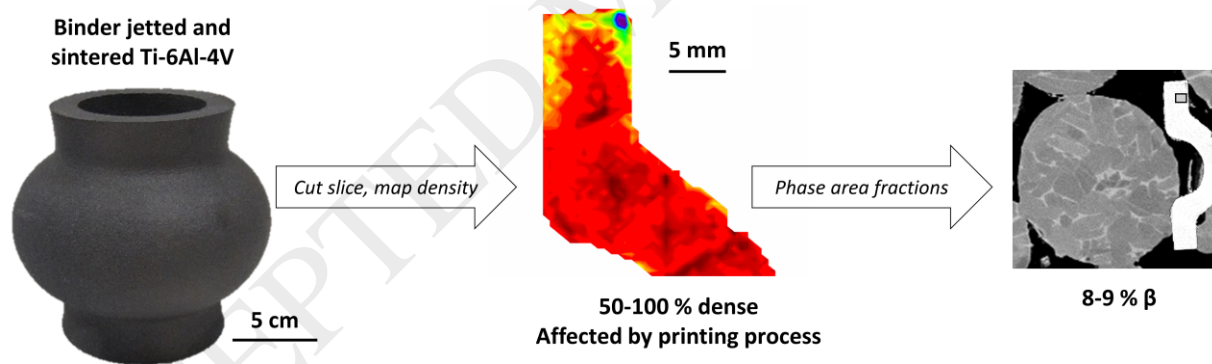
^a Department of Mechanical Engineering and Materials Science, Benedum Hall, 3700 O'Hara St., University of Pittsburgh, Pittsburgh, PA, 15260

^b Carpenter Technology Corporation, 1735 Market Street, 15th Fl., Philadelphia, PA, 19103

*Corresponding author: Markus Chmielus

Email addresses: Erica Stevens (ericastevens@pitt.edu), Markus Chmielus (chmielus@pitt.edu)

Graphical Abstract:



Abstract:

Binder jet printing is one additive manufacturing technique utilized in today's industry that uses an adhesive to bind powders together selectively in a bed. Post-printing processes are necessary for binder jet printed parts to increase key properties in materials such as density, but the full effects of this post-processing are not yet well understood. This study aims to enhance the understanding of how the process of sintering can affect the density evolution of a Ti-6Al-4V binder jet printed part. Results show that the density is lower at the edges of the part and higher in regions of significant topological curvature, likely due to variations originating from the printing process that are propagated. These printing process effects can be due to binder- or powder-related

Download English Version:

<https://daneshyari.com/en/article/7205811>

Download Persian Version:

<https://daneshyari.com/article/7205811>

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