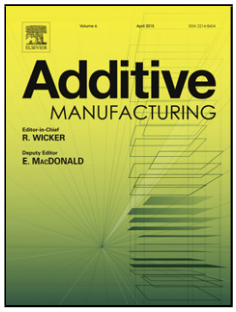

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PII: S2214-8604(17)30148-3
DOI: https://doi.org/10.1016/j.addma.2018.02.011
Reference: ADDMA 285

To appear in:

Received date: 2-4-2017
Revised date: 18-1-2018
Accepted date: 23-2-2018

Please cite this article as: Yu Sun, Mark Aindow, Rainer J.Hebert, Comparison of virgin Ti-6Al-4V powders for additive manufacturing (2010), https://doi.org/10.1016/j.addma.2018.02.011

Comparison of virgin Ti-6Al-4V powders for additive manufacturing

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Abstract

Ti-6Al-4V powders from six different vendors were compared with respect to their microstructures, size-distributions, chemistries, surface appearances, flow behavior, and packing densities. The analysis approaches followed closely ASTM F3049, the standard guide for characterization of additive manufacturing metal powders. Chemistries, including impurity content, agreed well with the standard requirements. Powder particle microstructures revealed acicular alpha prime for all vendors. Measurable differences were observed primarily in the size-distributions and the flow behavior.

Keywords: Powder, titanium alloy, size distribution, powder flow

1. Introduction

Additive manufacturers were initially constrained in the availability of powders and powder sources, but the extraordinary popularity of additive manufacturing has led many material producers to develop powder business units. The increasing choice of powder sources raises questions about the differences between the powders from the different sources. Related but different questions are what set of powder