Aluminum Alloys for Additive Manufacturing
ID# 2016-0918

Electron micrographs of aluminum alloys

Technology Summary

The present invention pertains to an aluminum alloy that is applicable for additive manufacturing. While the alloy is comprised primarily of aluminum, the alloy also contains traces of copper, silver, magnesium, titanium and/or zirconium. These metals aid in providing the alloy with beneficial characteristics for additive manufacturing including: high resistance to solidification and post solidification cracking, ability to produce sound material (minimization of gas porosity and voids within the additive manufacturing build), capacity to develop relatively high strength either in the as-build or post process heat treated conditions, and the capability to produce good surface finish and high feature definition. The powder may be blended to achieve its composition or pre-alloyed to produce a billet, followed by atomization of the billet material to produce powder.

Application & Market Utility

This technology provides for an alloy that possesses a high level of insensitivity to solidification cracking. The alloys can be used in additive manufacturing to produce products including aerospace components that may be used for general aircraft construction, such as brackets, housings, etc., as well as major structural components, such as bulkheads, stiffened plates, etc.

Next Steps

Seeking research collaboration and licensing opportunities.

TECHNOLOGY READINESS LEVEL 4-7

Seeking
Licensing  |  Research

Keywords
- additive manufacturing
- aluminum alloy

Researchers
Rich Martukanitz
Director of Center for Innovative Materials Processing
Online Bio

Office of Technology Management Contact
Rokita, Joseph
jjr152@psu.edu
814-863-6336

Penn State is an equal opportunity, affirmative action employer, and is committed to providing employment opportunities to all qualified applicants without regard to race, color, religion, age, sex, sexual orientation, gender identity, national origin, disability or protected veteran status.