

ABSTRACT

Additive Manufacturing for Propulsion Applications Technical Interchange Meeting / JANNAF
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Applying Additive Manufacturing to a New Liquid Oxygen Turbopump Design

A liquid oxygen turbopump has been designed at Marshall Space Flight Center as part of the in-house, Advanced Manufacturing Demonstrator Engine (AMDE) project. Additive manufacturing, specifically direct metal laser sintering (DMLS) of Inconel 718, is used for 77% of the parts by mass. These parts include the impeller, turbine components, and housings. The near-net shape DMLS parts have been delivered and final machining is underway. Fabrication of the traditionally manufactured hardware is also proceeding. Testing in liquid oxygen is planned for Q2 of FY2017. This topic explores the design of the turbopump along with fabrication and material testing of the DMLS hardware.