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Author: Mr. Sumant Hemant Jadhav
Cranfield University, Cranfield UK, United Kingdom, sumantjadhav24@gmail.com

Ms. Krishna Bulchandani
University of Mumbai, India, krishna.bulchandani@ymail.com

WIRE-ARC ADDITIVE MANUFACTURING (WAAM) FOR SPACE APPLICATION

Abstract

Now a days we have established additive manufacturing (AM) technique for manufacturing aerospace components in order to reduce its "buy-to-fly" ratio. Due to its just-in-time production with less complexity, direct tooling, higher customer satisfaction, and significant cost reductions including interior design, AM technologies are now also being used in major parts of an aircraft like fuel nozzles, turbofan blades, compressor-turbine blades, suspension wishbone, air ducts, etc. Large metallic components can be produced using the wire arc additive manufacturing (WAAM) method, one of the AM methods, with a little reduction in lead time. By minimizing equipment and feedstock costs as well as material waste, the WAAM method may produce nearly net-shape parts at high material deposition rates and efficiency. For medium-to-large scale engineering components of medium complexity, WAAM has a great potential for cost and lead time reduction. A thoughtful WAAM design can offer some topological optimization, and a thoughtful wire feedstock selection can enable additional material optimization and multi-material components. A machining platform and additive manufacturing can be used to produce some previously impractical shapes. This procedure, which is used in the aerospace sector, can shorten the time it takes products to reach the market while also wasting less time and material. In this paper we are planning to take advantage of this technology for space application such as in-space production of components, repairs and overcome challenges such as porosity residual stress, anisotropic behavior and oxidation, etc. Also, explore future research direction in the field.