Andrew Norman
European Space Agency

Topic

Development of New Advanced Alloys Designed for Additive Manufacturing

Advanced Manufacturing is a European Space Agency cross-cutting initiative which aims to capture new opportunities for manufacturing, materials, and related processes, thus creating a competitive advantage for the European Space Industry in the global market. One of the key technology pillars of the advanced manufacturing program is Additive Manufacturing (AM). The AM process allows a significant degree of freedom in the design of 3D objects that is very well suited for space applications. Many aspects of the AM process have now been studied in detail including the procurement of feedstock, design of parts, printing and post processing, non-destructive inspection, and testing.

One technology area which is now being addressed is the alloy chemistry and its impact on the properties of the printed parts. The result is the development of many new alloys across different families including aluminum and titanium. In this presentation the development of several new alloys shall be presented. The focus will be on the production of commercial and near commercial aluminum alloys, and the development of new titanium alloys for high strength structural applications. Some attention will also be paid to other alloy types such as high entropy alloys, bulk metallic glasses, and alloys with unusual crystal structures.

About the Speaker

Dr. Norman obtained his PhD in 1991 at the University of Surrey in the UK in the research field of advanced aluminum-lithium alloys. He has held research positions at the University of Cambridge and Manchester University, focusing on welding of aluminum alloys for aerospace applications. In 2003 he joined Corus Aluminum (now part of Novelis), leading the aerospace research team in the development of aluminum sheet and plate products for customers such as Airbus and Boeing. He joined the European Space Agency in The Netherlands in 2010 as a materials and process engineer with responsibility for welding technology in the European Space Industry. He is now part of the additive manufacturing team with special emphasis on alloy development. Recently he has taken on a new role in the agency of technology coordinator in the Mechanical Department.