



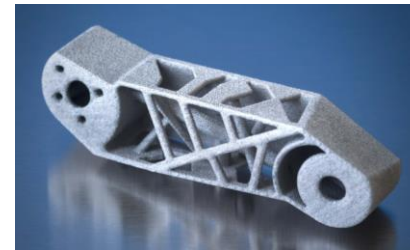
TECHNOLOGY DESCRIPTION

Additive Manufacturing (AM) is a technology used in the making of structural parts for space applications. The technology uses primarily metallic materials like Ti6Al4V or aluminum alloys. Due to the design freedom, there is an enormous potential for mass reduction compared with parts made using traditional processes such as turning or milling. For further mass reduction, however, the use of polymers is becoming more relevant. The main challenges with using polymers are low mechanical strength and the outgassing of water and monomers that occurs in space. Metallising these polymer parts by electroplating increases the mechanical strength via the so-called sandwich effect. A dense metallic layer can also mitigate the problem of outgassing.



INNOVATIVE ASPECTS

- Test ECSS-Q-ST-70-17C successfully passed
- Mechanical properties are significantly improved by the metallisation
- The modulus of elasticity for PEEK increases from 4.8 GPa (uncoated) to 20 GPa with a layer thickness of 150 µm nickel on the plastic. Similarly, for polyamide, the modulus of elasticity increases from 1.5 GPa to 12.5 GPa.



TECHNOLOGY READINESS (in space application)

TRL 7 (2024)

COUNTRY OF ORIGIN

Germany

LATEST UPDATE

06/2024

TAGS

#additive manuf.

#polymer

#metallisation

#electroplating

#no outgassing

#PEEK

APPLICATION AREAS

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Infrastructure & Smart Cities

Mechanical Engineering

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