



science, technology  
& innovation

Department:  
Science, Technology and Innovation  
REPUBLIC OF SOUTH AFRICA



## CSIR ADDITIVE MANUFACTURING

**A**dditive manufacturing is a relatively new manufacturing technology and is generally considered one of the key technologies that support the production of complex, high-value and low-volume parts for industry.

The technology allows the processing of difficult-to-machine materials and can produce parts with little material wastage. Research and development work is continuing globally to mature additive manufacturing as an accepted manufacturing technology.

Compared to conventional manufacturing technologies, which are often subtractive (i.e., materials are removed via cutting or milling processes), additive manufacturing relies on various energy-depositing

technologies to fuse materials into three-dimensional (3D), functional, near-net-shape parts.

Additive manufacturing accelerates the manufacturing cycle, reduces waste, minimises cost, reduces energy use and can reshape supply chains. This technology will allow the production of large geometrically complex items, typically focusing on parts that are prohibitively expensive or impossible to make using traditional methods.

### UNIQUE TECHNOLOGY PLATFORM, AEROSWIFT

An innovative way to address these limitations was demonstrated in 2009, which led to the establishment of the Aeroswift programme in 2011 to develop the Aeroswift High-speed Large Area Laser-based





Additive Manufacturing technology platform. Set to revolutionise additive manufacturing, this technology platform is unique in the world. It will be the biggest laser-based 3D printer of metal components for the manufacturing industry. The technology is focused on titanium metal, and the commercial aerospace manufacturing sector will be one of the primary industry sectors on which the consortium partners will focus.

The system allows the printing of components up to 2m long, 600 mm wide and 600 mm high. It will also utilise a hot and inert processing environment, which will ensure that the components produced comply with strict aerospace manufacturing standards. Aeroswift is based on the processes of selective laser melting, in which an object is produced from powder that is arranged in layers and fused by a high-power laser. In general, Aeroswift lends itself to the development of unique components from a range of materials.

### NATIONAL SUPPORT

At present, this development is being funded through a grant from the Department of Science and Innovation. The project was central to South Africa's national titanium beneficiation strategy, which aims to transform the country from an exporter of raw materials to an exporter of semi-finished or finished goods, which can be sold at a premium, compared to the material in its raw state.

Aeroswift will revolutionise additive manufacturing, in that it will be able to produce components in a cost-effective way, with minimal waste. New design approaches made possible by the design freedom that this technology offers, combined with the fact that material utilisation can be optimised, have the potential to dramatically cut component production costs.

### ENQUIRIES:

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