Advanced manufacturing gives AISI-Aerosud partnership welcome lift

In line with its vision of helping the local aeronautics and related sectors to improve their global competitiveness, the Aerospace Industry Support Initiative (AISI) and global aviation leader Aerosud are employing advanced manufacturing capabilities to drive down costs and weight of components.

The AISI is an initiative of the Department of Trade and Industry (**the dti**) and is hosted and managed by the Council for Scientific and Industrial Research.

Marié Botha, AISI Manager, says, “Continuous cost reduction while maintaining world-class quality and safety standards is of increasing importance to this sector. Our work with Aerosud involves exploring manufacturing technologies that will allow it to reduce costs on existing and future materials and processes. Cost and weight reduction to promote efficiency and ultimately achieve reduced cost is critical.”

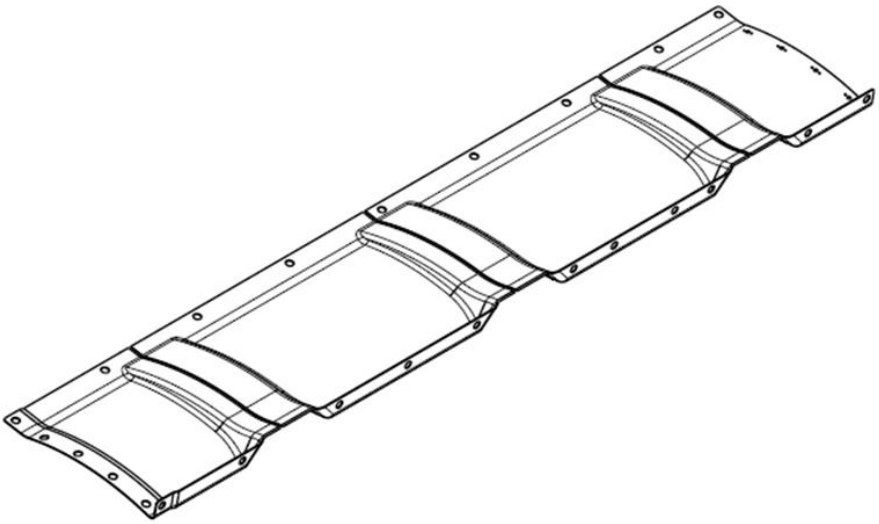
The project detailed below illustrates how advanced manufacturing is being industrialised in the South African aerospace industry.

Process design and validation of CFRTP overlap joining methods

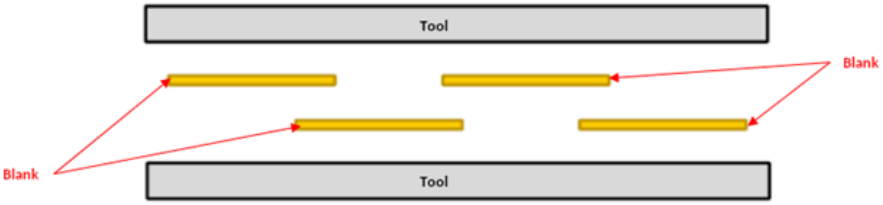
Aerosud’s current Airbus A400M cargo linings project requires the manufacture, qualification and delivery to the final assembly line of various CFRTP parts. One such CFRTP part, notably the lower connection units (LCUs), has large complex-geometry parts and has proved extremely difficult to manufacture from a single sheet of CFRTP material.

Two problems therefore must be addressed: high manufacturing scrap rates, and difficulties in achieving the correct geometry of the parts. It was proposed that the LCU parts be manufactured as per design definition, using small multiple sheets of CFRTP material. This, however, implies joining the individual blanks in the forming process of an LCU part – a new production process that has not yet been fully defined, industrialised and qualified.

This project aims to design, industrialise and validate the process of joining of multiple CFRTP blank parts to create a larger single-piece complex-geometry CFRTP part that will comply to Airbus requirements.



Proposed LCU with overlap joints



Proposed manufacturing concept – overlapping joints during forming process