Case Study: Wing Profile  
*Stellar Project Demonstrator*

Selective Tape-Laying for Cost-Effective Manufacturing of Optimised Multi-Material Components

AFPT has proposed a wing profile as the demonstrator for the aerospace market. This part is selected specifically in order to demonstrate the processing developments of multiple robots co-operating to layup on complex curved surfaces.

For this purpose it is necessary to begin with a relatively large workspace in order to give some scenarios in which the robots can work without collisions. The wing profile shown is approximately 500 mm x 2000 mm.

AFPT designed two demonstrator moulds that cover the two main challenging curvature features of the component. These moulds offer the opportunity to prove the capabilities of AFPT’s tape placement equipment in applying local reinforcements on 3D curved surfaces. AFPT will test its latest developments by applying short local reinforcement under different angles.

Load cases and evaluation items:
- Accurate tape location with full (and consistent) consolidation over the entire tape length
- Automated attachment & bonding of the first layer directly to component
- Avoid post-treatment
- Increase tape-laying speed

The trials shall also aim to make a statement about the benefits of increased process efficiency and total cost impact of using multiple robots, and also the efficiency of using integrated planning tools such as those developed by CGTech.

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HBW Gubesch has introduced the skateboard deck as a concept intended to demonstrate both the thermoforming of waste optimised tailored laminates and the combination with flow compounds. The selection of a consumer product not related to the main business areas of the project partners also alleviates all issues relating to confidentiality and intellectual property. Meanwhile the size of the demonstrator and load cases proposed make the results relevant and transferable to other industries.

There are four main components used within the skateboard deck structure:

- Flow Compound (GMT)
- Upper UD-Tape reinforcement
- Organosheet
- Lower UD Tape Reinforcement.

Two loadcases have been derived from a source external to the project.*

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