

Automated Laminating

Airborne automated solutions | 2020



- Eliminates manual lay-up
- On-the-fly programming:
no engineer needed
- Seamless integration with
next production step

Airborne

Automating Laminating of thermoset plies

Manual layup of composites plies is a labor intensive process. The operator has to manually place and consolidate each individual material patch to produce the desired preform in line with detailed work instructions. Airborne's Automated Laminating solution is a multifunctional system that combines robotised tape laying, preform cutting, and pick-and-place to deliver a bespoke blank. On its own, or combined with other automated processes, it increases the productivity of the lamination team, ensures repeatable processing and enables a seamless transition from design to manufacturing via Airborne's automated workflow.

Why automate

Airborne's Automated Laminating solution ensures that laminate designs are transferred efficiently from the design board to the workshop.

The engineering work needed to transfer composites design into manufacturable laminates is reduced and the manufacturing process is made more efficient. Overall, this results in reduced lead time, faster product development, and an expanded design envelope. All so you can increase your competitiveness and capture new business opportunities.

- Upscale your production
- Reduce production and engineering costs
- Shorten your time to market
- Manufacture more diverse products
- Reduce material waste
- Reduce paperwork
- Become more competitive

How it works

The design is imported in Airborne's cloud-based or local automated programming platform. The robot paths are automatically generated, and the program is uploaded to the laminating solution. The layup process can then begin. Once all the plies are laid up, the machine automatically picks the cutting end effector to trim the preform and cut the required sections. The pick-and-place end effector is then picked and used to pick-and-place the pre-cut preform sections to create the bespoke preform with all the required reinforcements and pad-ups in place.



Specifications

Airborne's Automated Laminating solution is designed around a laminating, a pick-and-place and a cutting end effector with the following capabilities and performance parameters:

Pick-and-place end effector

- ± 0.5 mm accuracy
- 0.8 x 3.5 m preforms
- 100+ suction cups
- < 1 minute per operation

Laminating end effector

- 50 m²/h, depending on the design and material
- 9.0 x 2.5 m laminates
- 150 mm (6 in) unidirectional thermoset prepreg tapes

Cutting end effector

- Ultrasonic knife, 60 m per minute
- Cut through 4 mm of composite thickness

General information

- 50 seconds end effector change over time
- Footprint approx. 100 m²

The cell can be coupled to any of the other Airborne systems, including a buffer station for preform kitting and a forming station for preform shaping to the required geometry.

Airborne's Digital Automation Portfolio

Production volumes in the composites industry are increasing, while unit prices are reducing and cycle times are shrinking. Companies therefore look for ways to radically reduce touch labour and takt time, minimise footprint, improve material utilisation and reduce time to market of new, complex, engineered composites products. To meet these needs, Airborne developed a suite of digital manufacturing solutions for composites manufacturing. Automated Laminating is one of the building blocks in Airborne's digital offering.



Automated Honeycomb Potting

Our Honeycomb Potting solution enables easy manufacturing of locally reinforced honeycomb sandwich panels, while reducing work preparation, material waste and the cost of quality.



Automated Kitting

Our Kitting solution delivers fully sorted and sequenced composite ply kits to increase productivity, improve material utilisation and reduce work preparation.



Automated Preforming

Our Preforming solution is the solution to manufacture tailored blanks or preforms, 100% net-shape, and for all composite materials: thermoset prepreg, dry fibre or thermoplastic composites.

About Airborne

At Airborne we know that innovation in manufacturing through automation, digitalisation and advanced analytics is the catalyst for the significant increase in productivity that companies need to stay competitive. We understand the complexity and cost involved in producing composite products for demanding applications in highly regulated industries. Our legacy in advanced composites manufacturing makes us experts in developing and delivering automated solutions that enable our customers to achieve high production rates and radically low conversion costs.

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