



NO LIMITS FOR DESIGN

VAP® components

„Best performance
– even in the smallest details –
is my passion.“

Oliver Seiferheld, VAP® CFRP manufacturing





- ▲ The A350 combines passenger comfort, cutting edge technology, unique industrial process and environmental sustainability.

VAP® MANUFACTURING AT EFW

EFW uses VAP® (Vacuum Assisted Process) technology for manufacturing of carbon reinforced plastics for A350XWB.

VAP® combines all advantages of a composite manufacturing with great variety of 3D design solutions for single, small and mid-size volume manufacturing.

TURN-KEY-SOLUTIONS

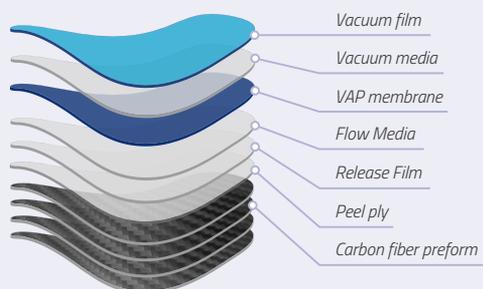
EFW covers the entire value-added chain in composite manufacturing:

- > engineering services & product certification
- > product documentation & in-service bulletins
- > in-house testing
- > automated production facilities in controlled environment (tape-layers, milling and drilling machines etc.)
- > surface treatment, tooling & in-house paint shop
- > assembly
- > first-class logistics
- > 24/7 after sales service
- > spares services



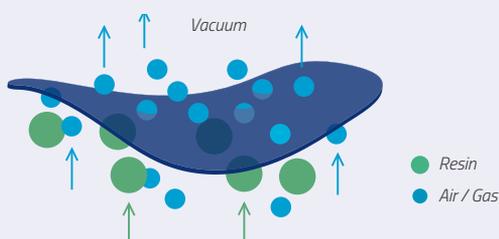
VAP® COMPONENTS

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NEXT GENERATION TECHNOLOGY

EFW's VAP® components are resin-infiltrated structural parts manufactured under vacuum conditions. Multi-directional lay-ups with up to 50 different oriented layers can be infiltrated within one production cycle.



Semi-permeable membranes allow air or gas evacuation from the reinforcement through microscopic pores, whereas resin is retained and stays in the mould.

This prevents resin loss and results in high quality laminates with defined, homogenous fibre volume contents.

OPERATING EFFICIENCY

GENERAL CHARACTERISTICS

- > great variety of design solutions
- > various applications: e. g. aviation, transportation, medical purposes
- > engineering and manufacturing services certified by EASA 21J and 21G

Major product features of A350 VAP® beam

- > maintenance free up to 12 years
- > successfully integrated in the A350 cabin layout: for maximum cabin layout flexibility
- > up to 50 % more cost efficient compared to same components made with Titanium alloys
- > impact tolerance up to 170 Joule
- > maximum part dimensions: 1440 mm × 500 mm × 100 mm



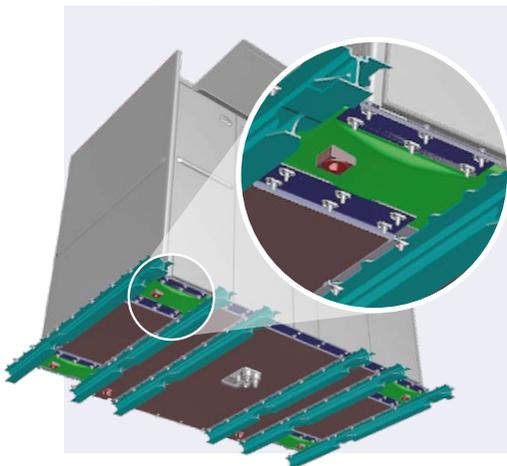


- ▶ Cleanroom conditions during the preparation of the infiltration process are key for high quality.

STATE-OF-THE-ART VAP® MANUFACTURING

- ▶ single unit manufacturing as well as serial manufacturing
- ▶ real time production monitoring during every step of the infiltration
- ▶ online monitoring of all key process indicators (vacuum, resin and tooling temperature etc.)
- ▶ automated weight controlled resin infusion ($\pm 5g$ per infusion)

VAP® technology is an aerospace industry-wide standard for highly stressed structural components. It gives engineers the necessary degrees of freedom to implement all kind of complex 3D geometries. Tooling costs are kept at a minimum by using flexible vacuum structures.



CABIN LAYOUT FLEXIBILITY

The classical aircraft floor concept allows the installation of monuments based on a defined grid only. However the customer wants the maximum of layout flexibility to arrange the interior.

Here is the solution.

VAP® CFRP ribs fit with the floor grid dimensions and enable an independent installation of the monument fix points.



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