

## Backgrounder

September 2018

### GKN Aerospace on the Airbus A380

Involvement on the A380 includes:

- The wing trailing edge and assembly to the wing spar
- The mid-box structure for the A380 wing
- The composite flap track beams that are also structural wing components.
- Fibre Metal Laminate (FML) (GLARE) fuselage panels,
- Horizontal and vertical FML tail plane leading edges
- Thermoplastic wing leading edge,
- Electrical wiring systems for cockpit and pylon.

Work on these structures is carried out at company facilities in Bristol (UK), Alabama, (USA), Papendrecht and Hogeveen (NL), Lang Fang (China).

Engine Systems work on A380:

- Intermediate Compressor Case (ICC) Rolls-Royce Trent 900
- Low pressure turbine case on Engine Alliance GP7000
- **The wing trailing edge** is the complex structure that runs through the aircraft wing. The component represents the first-ever application of a process called resin film infusion. For the vast A380 aircraft, each trailing edge is almost 40 meters long and weighs 2.9 metric tonnes - and manufacture and assembly of this huge structure required the development and introduction of many innovative techniques and practices. The work package includes responsibility for management of the global supply chain for the wing trailing edge, manufacture of many WTE structures and assembly of the trailing edge to the wing spar. The assembly line has two separate production lines. Each line contains automated machinery which drills over 1000 holes and fettles over 100 surfaces for each trailing edge, carrying out this work to an accuracy of just 0.1mm over the entire 60 metre track.
- **Fibre Metal Laminate (FML) upper fuselage panels** (formerly known as Glare®), a sandwich material constructed from alternating layers of aluminium and Glass fiber with bond film. The material is developed by GKN Fokker, Delft University of Technology and the national Dutch Aerospace Centre and industrialized and produced by GKN Fokker. FML offers significant weight savings (15-30 percent) when compared to conventional aluminium alloys. Corrosion resistance is enhanced as the laminate's structure acts as a barrier to the penetration of moisture. The material also has outstanding fatigue resistance and impact properties. Every A380 has 27 FML panels with a total of 500M2 of FML on board saving approx. 30% weight reduction compared to traditional aluminium alloys.
- **Lightweight thermoplastic wing leading edge (J-Nose)** Thermoplastic composites components lead to considerable weight reduction. Thermoplastics when heated allow multiple transformations during a sequence of production procedures. They can also be welded in various ways, which is an efficient operation when compared to riveting and adhesive bonding. Because of this, large integrated components can be made from thermoplastic composites without adhesive bonding, and assembling mechanical joints is less complicated. No doubt the most important difference is that for thermoplastic part assembly no shims are required.