

Backgrounder

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GKN Aerospace on the Airbus A350 XWB

- Designed, developed and is manufacturing the aircraft's 27m long composite rear wing spars. An automated fibre placement (AFP) process uses a robotic head to lay down 16 tows of material at a rate of around 7-10 kg of material an hour. This is the first spar produced with Automated Fibre Placement technology. The spar is manufactured in three sections using innovative, light-weight composite material and forms the structural heart of the A350 wing's fixed trailing edge.
- Designed and developed a state of the art automated facility that assembles the wing fixed trailing edge (FTE) parts to the rear spar. GKN Aerospace has created an innovative fully automated 'moving line' assembly process where automated guided vehicles move A350 XWB wing structures through dedicated work stations that carry out complex tasks including five axis machining, robotic drilling and laser scanning. GKN Aerospace then delivers the complete FTE to the Airbus facility at Broughton, North Wales (UK).
- Manufactures the composite outboard flaps. Outboard flaps are increasing the surface-area of the wing during take-off and landing. For the first time differential flap settings are applied, enabling the center of lift to be moved depending on the loading scenario. During serial production, GKN Fokker will produce 140 sets of flaps annually.
- Manufactures the composite components for the aircraft wing's inboard flaps
- Manufactures Rolls-Royce Trent XWB structures including thrust struts, inner core fairings and blisks.
- Designed, developed and is manufacturing the Rolls-Royce intermediate compressor case (intercase)
- Supplies the passenger cabin windows (PCW) which use the company's patented, industry-leading CrystalVue II coating technology. 114 PCW are supplied per ship set.

Innovative techniques and technologies have been introduced across every aspect of GKN Aerospace's development and production work for the A350XWB. These technologies are helping ensure the aircraft meets demanding requirements for manufacturing as well as exacting specifications covering aircraft weight, fuel consumption and emissions.

Engine structures for the Trent XWB engine:

- The engine thrust struts are manufactured in high temperature nickel alloy with chemical milling used to create a lighter, stronger structure.
- The blisks will also be manufactured using chemical machining to produce a component to very fine tolerances and an excellent surface finish.
- The inner core fairings incorporate proprietary all-welded titanium honeycomb technology which gives excellent sound suppression along with a lighter, more durable and more easily repaired structure. GKN Aerospace's ability to produce critical exotic metal structures is evidence of company's expertise across the highly skilled fabrication and forming processes that transform advanced, ultra-hard metals and into complex finished shapes and structures.

Intercase for the Trent XWB engine:

The Trent XWB engine ICC is an advanced structural engine casing that uses the latest lightweight fabrication technologies in its manufacture.

The intercase uses:

- A combination of titanium castings, forgings and sheet metal components. The material choice and form has been selected to optimise manufacturing processes and to achieve demanding strength, fatigue and thermal requirements.
- Advanced laser, TIG and plasma welding techniques.
- A combination of the latest laser metal deposition (LMD) techniques.

In addition, each weld has completed extensive validation testing which has optimised welding parameters, reduced defect rate, and ensured weld geometries to minimise air flow disruptions in engine gas paths and maximise engine performance.

Investment:

- GKN Aerospace has invested over £235 m to create a state of the art facility in Western Approach (UK) that is the base for the manufacture of the aircraft's rear wing spar and assembly of the fixed trailing edge.
- The company has also invested in its Munich facility where the inboard and outboard flaps (including skins, spars, ribs and leading edges) are manufactured using the advanced tape laying and forming processes.
- In Sweden, the company has invested more than £20m in its fabrication cell to support state of the art manufacturing of the engine intercase.
- Flaps are produced in Papendrecht in the Netherlands, GKN Fokker Aerostructures has invested more than €20m in the production hall for the A350.