



Infrared Heating helps to ensure quality of composite structures for airplanes

An infrared heating system is helping to ensure the high quality of composite aerospace structures manufactured at the new GKN Aerospace facility at Western Approach, near Bristol. The system, which is used to provide interim processing of the laid-up composite rear spar assembly of the Airbus 350 XWB to prevent subsequent wrinkling, was custom-designed and developed in close co-operation with GKN Aerospace engineers following initial tests at Heraeus' Application Centre.

GKN Aerospace is a world-leading, global first tier supplier of airframe and engine structures, components and assemblies. The new "Western Approach" site contains a state-of-the-art composites manufacturing operation, including a "moving line" assembly operation that uses automated, guided vehicles to move the wing structures through a series of semi-robotic work stations.

Each of the three rear wing spars for the Airbus A350 XWB is manufactured by laying up pre-preg carbon composite tape on a mandrel and then curing the assembly in an autoclave. However, such complex lay down operations can sometimes produce wrinkling of the final surface because of voids and excess resin between plies or laminates. One proven answer to this is de-bulking, which involves enclosing the composite structure in a vacuum bag at various stages in its manufacture and then squeezing out of air and volatiles between plies under moderate heat and vacuum to insure seating on the mandrel, to prevent wrinkles, and to promote adhesion.

GKN Aerospace's engineers decided that de-bulking could provide significant benefits and asked Heraeus to carry out initial trials using infrared emitters to provide the required heat. These were followed by on-site trials using a portable infrared system and these were so successful that a prototype system was supplied.

The prototype system was finally replaced by a scaled-up 465 kW production system which provides precise surface heating.



Features

- De-bulking of composite layers
- Vacuum and moderate heat
- high quality components for airplanes

Technical Data

- tailor made infrared heating system
- 465kW total power
- three heating sections with seven controllable zones each

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