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Heraeus Infra-Red Heaters Used In Thermoforming Research at National Composites Centre

A fast response, medium wave infra-red heating system is being used to assist in composite materials thermoforming research at the National Composites Centre (NCC), in Bristol. The system is acting to ensure controlled and precise pre-heating of thermoplastic carbon fibre laminates before forming in a press, designed and built by specialist press manufacturers, PJ Hare.

As a member of the government's High Value Manufacturing Catapult, the NCC is tasked with developing and driving the UK composites strategy. Thermoforming is one of the many composites processing technologies investigated at the Centre.

A current project involves research into thermoforming of continuous fibre reinforced composite materials to determine the complexity of geometries than can be produced using the process. This is carried out on the PJ Hare press, which uses the latest servo motors and drive technologies to ensure precise force, position and speed control during the forming, which is performed under heat supplied by in-built heating platens.

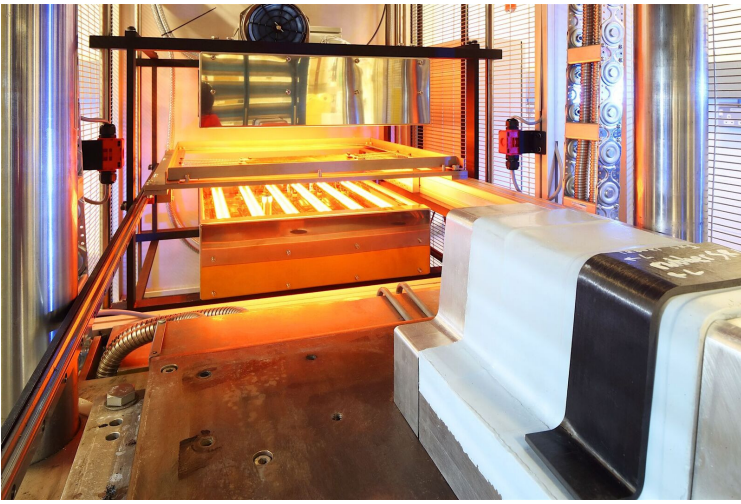
However, it is important that the blank sheet of composite material is at exactly the correct temperature when it is fed into the press. As a convection oven was considered inappropriate for this task, as it would take too long to achieve the desired result, which could cause degradation of the polymer, it was decided to investigate the application of fast, direct heating infra-red modules.

As a result, a fast response medium wave system from Heraeus was installed by PJ Hare immediately before their forming press. Blank composite sheet material is now loaded onto a purpose-built carrier and is first shuttled between two 18kW modules. It can then be heated, under plc control, to the required temperature. Heating can be continuous or ramped. Once the heating cycle is completed and the sheet has been held at temperature, it is transferred to the press and moulded to shape.

Heraeus specialises in the production and application of high quality energy sources covering the electro-magnetic spectrum from ultraviolet to infra-red. It has over 40 years experience in infra-red technology and offers the expertise, products and systems to provide efficient and effective solutions to drying, heating and curing problems throughout industry.

Reader Inquiries:

Ian Bartley
Heraeus Noblelight Ltd
Tel: 0151 353 2710
Fax: 0151 353 2719
E-mail: ian.bartley@heraeus.com



The Heraeus infra-red system on the PJ Hare press at the NCC