

Heating Continuous Fiber Reinforced Thermoplastic Material with a Model E4 Quad Ellipse Chamber

Application

A research and development facility developing a method to heat, arrange and consolidate continuous fiber reinforced thermoplastic tape.

Problem

Temperature Requirement - Required tape temperatures varied and reached a maximum of 750°F (400°C).

Line Speed - Line speed varied and reached a maximum of 99 feet (30 meters) per minute was required.

Tape Burn - The tape burned easily if heat continued to be applied after the line stopped moving.

Solution

Heat - A Model E4-10 Quad Ellipse Chamber was installed on the line to heat the tape.

Instant On/Off - The Quad Ellipse Chamber heated up and cooled down instantly.

Protected Heat Source - An optional quartz tube liner was inserted in the Quad Ellipse Chamber.

Power Control - A Model 664F Phase Angle SCR Power Controller controlled the power to the Quad Ellipse Chamber.

Benefits

Temperature Requirement - The Quad Ellipse Chamber could achieve temperatures in excess of 2700°F (1482°C). By varying the power to the Quad Ellipse Chamber with the SCR Power Controller, the facility was able to adjust heat output to reach the various required tape temperatures.

Line Speed - Required temperatures could be reached in 0.5 seconds, enabling the facility to reach maximum required line speeds.

Consistent Quality - The instant on/off capabilities of the Quad Ellipse Chamber eliminated tape burn when the line stopped moving.

Protected Heat Source - The quartz tube liner kept contaminants from the reflectors in the Quad Ellipse Chamber, increasing the Chamber's efficiency and decreasing the need to clean the reflectors.