Secondary Glass Operations

Glass Bending, Forming, Annealing and Tempering

Q
Question

How do you monitor critical temperatures to improve productivity and quality in secondary glass operations?

A
Answer

Situation Analysis

Referred to as “secondary glass operations”, bending, forming, annealing and tempering processes are extremely heat sensitive. Since temperature is the most critical variable affecting the productivity and quality of any secondary glass processing operation, knowing the temperature distribution of each glass part can improve the operating economy of virtually any secondary glass process.

Bending and forming are fairly obvious to define. Annealing is a process of slowly cooling glass to relieve internal stresses after it was formed. Toughened or tempered glass is a type of safety glass processed by controlled thermal treatments to increase its strength compared with normal glass. Due to the rigid and fragile nature of glass, temperature-related problems are critical to avoid. The results of temperature imbalances can be process shutdowns, cracks, internal stresses, and/or internal deformations.

Glass Tempering Oven, Photo courtesy Tamglass

IRCON®
Fluke Process Instruments

A

Answer

Solution and Improvements

The easy-to-use ScanIR®3 linescanner system for thermal analysis increases operating efficiency, product quality and uniformity. With that system, glass manufacturers can accurately and continuously monitor the temperature distribution of any heated glass part. The ScanIR3 linescanner measures the complete temperature distribution of each glass part exiting the heating process. The temperature information is then transmitted to a PC, where the ScanView Pro software translates the data into a thermal image for display on a PC monitor. Product specific configurations, data files and thermal images are easily stored and recalled.

ScanIR3 Linescanner

The ScanIR3 linescanner system allows subdivision of the thermal image into a selected number of squared zones corresponding to those in the furnace, and the software displays these zones as a grid superimposed on the thermal image. The software analyzes the temperature distribution in each zone to look for problems related to the forming/bending operations and the system can be used for closed-loop control of the power to each heating element. Operators can read zone temperatures immediately for each part and program automatic alarms for any zone. Early detection of heater problems or failed heating elements improves product quality, uniformity and provides added cost savings.

Processor Box with universal input / output capabilities

Product

- ScanIR3 S350 linescanner with ScanView Pro software

Accessories

- Rugged mounting base for ScanIR3 linescanner

Benefits

- Increased glass performance and quality
- Automated defect detection for reduced scrap
- Faster set-up
- Data logging and documentation for quality control (ISO 9000)