

Plastic/Vinyl Shrink Tubing for Brake Lines

Precise Control of Quartz Infrared

Fostoria Industries, Inc. was approached by a company that specializes in the fabrication of metallic and extruded tubing for the automotive market. This company had a need for an infrared oven to heat shrink tubing on automotive brake lines. This application presented Fostoria with several unique challenges:



- The brake lines were over 15 ft. long, and the shrink tubing could be located at any point along that length.
- The brake lines with shrink tubing must be unloaded from the forming machine and loaded onto the oven conveyor.
- Some of the shrink tubing is quite long . The infrared oven must have the ability to heat long pieces without trapping air between the heat shrink and the brake line.

Fostoria's lab testing capability allowed different oven configurations, power densities, and designs to be experimented with. Combining this with their extensive infrared background, Fostoria engineers were able to develop a design that exceeded all requirements.

The final design incorporated instant on & off T-3 quartz lamps. The oven requires little heat-up time, responds to process changes extremely fast, and can be de-energized instantly if needed. Customized controls and oven circuitry allow the heated footprint of the oven to be easily modified to match the location of the shrink tubing. To lower operating costs, the heat sources are de-energized at areas where shrink tubing is not located. The oven was also divided into multiple heat zones that utilized SCR power controllers. The infrared output of each zone is infinitely variable from 0 to 100% which allows the operator to match the heat output of the oven to the needs of the product.

To help eliminate air bubbles, Fostoria's engineers angled the infrared emitters so that the heating began at one end of the brake line and shrank the tubing continually up the line, creating a consistent bubble-free finish. A design was also developed that automatically loaded the brake line from the forming machine onto the infrared oven conveyor. These features resulted in an oven system which met all the customer's unique design requirements.