

Heating Plastic with Model 5194 Infrared Line Heaters

Application

A toy manufacturer bending plastic to produce three-sided toy barns.

Problem

Cost - One of the two bends in the plastic was produced when the part was molded. Cost requirements dictated that the second bend be produced after the part was molded.

Poor Quality - The existing method of heating the plastic with a heat knife prior to bending left stress marks in the finished toy barns.

Excessive Scrap - The poor quality of the bend resulted in an excessive number of the toy barns being scrapped.

Long Heating Time - Each plastic piece had to be heated for 10-15 seconds with the heat knife, limiting production output.

Extensive Training Required - With the existing process, operators required extensive training on how to heat and make the bend in the plastic.

Solution

Heat - Two Model 5194-16 Infrared Line Heaters were used to precisely heat the plastic from the top and bottom before it was bent.

Power Control - The power to the each Infrared Line Heater was controlled by a Model 5620 Phase Angle SCR Power Controller.

Automated Fixture - Placement of the part in the heating station closed a switch to automatically activate the SCR Power Controllers and apply power to the Infrared Line Heaters.

Timed Heating - The SCR Power Controllers timed the heating process and shut off the power to the Infrared Line Heaters when the heating cycle was complete.

Instant On/Off - The Infrared Line Heaters heated up and cooled down instantly based upon signals received from the SCR Power Controller.

Benefits

Improved Quality - The heating characteristics of the Infrared Line Heaters eliminated the stress marks in the bend area, significantly improving the quality of the finished toy barns.

Reduced Scrap - The improved quality of the bend virtually eliminated the need to scrap finished toy barns due to stress marks in the bend area.

Faster Heating Time - The heating time was reduced from 10-15 seconds to 3 seconds per bend with the Infrared Line Heaters.

Reduced Operator Training - Operators required less training to learn how to bend the plastic using the new heating method.

Reduced Energy Consumption - The instant on/off capabilities enabled to manufacturer to operate the Infrared Line Heaters only when they were required to heat the plastic, reducing overall energy consumption for the process.

Repeatable Heating Process - The timer function of the SCR Power Controllers, combined with the instant on/off and precise heating capabilities of the Infrared Line Heaters, made the heating process repeatable and consistent.

Cost Effective - Using the Infrared Line Heaters controlled by the SCR Power Controllers provided the manufacturer with a cost-effective method of producing the bend after the parts had been molded.