

Curing Silicone with Model 4069 Clamshell Heaters

Application

A manufacturer of hoses preheating and curing silicone.

Problem

Slow Line Speed - The line speed was limited to 25 feet (7.6 meters) per minute with the existing resistance-type heaters that were used to preheat the raw, braided silicone.

Slow Heat Up Rates - The high thermal mass of the existing resistance-type heaters prevented them from reaching operating temperature in an acceptable amount of time.

Slow Cool Down Rates - Their high thermal mass also prevented the resistance-type heaters from cooling down quickly, which frequently resulted in fires when the line was suddenly shut down.

Excessive Scrap - The uneven heating and poor control of the resistance-type heaters produced unacceptable amounts of bubbled hose that had to be scrapped.

Solution

Heat - Six Model 4069-12-25 Clamshell Heaters were used to apply heat to the silicone. Two of the heaters preheated the raw, braided silicone and four of them cured it after it had been extruded.

Power Control - A Model 664 Phase Angle SCR Power Controller controlled the power to each Clamshell Heater.

Process Management - A PLC and Color touchscreen were used to manage the four-zone cascade loop of the four heaters used to cure the silicone.

Instant On/Off - The Clamshell Heaters heated up and cooled down instantly in response to signals received from the SCR Power Controllers.

Benefits

Increased Line Speed - By preheating and curing the silicone with the Model 4069 Clamshell Heaters, the manufacturer was able to increase line speeds by 220% to 80 feet (24.4 meters) per minute.

Fast Heat Up Rates - The instant on/off capabilities Clamshell Heaters reduced start-up time for the line to seconds.

Fast Cool Down Rates - The instant on/off capabilities of the Clamshell Heaters also enabled the line to stop instantly without causing fires.

Reduced Scrap - The even heating provided by the Clamshell Heaters, combined with the precise control provided by the SCR Power Controllers and PLC Control produced a better surface finish on the hose and significantly reduced the manufacturer's scrap rate.