



Thermoforming

Temperature Control for Thermoforming Thick Multicolored Plastic Sheets

Q

Question

How can you control the temperature of thick plastic sheets so they can be easily thermoformed without scrap?

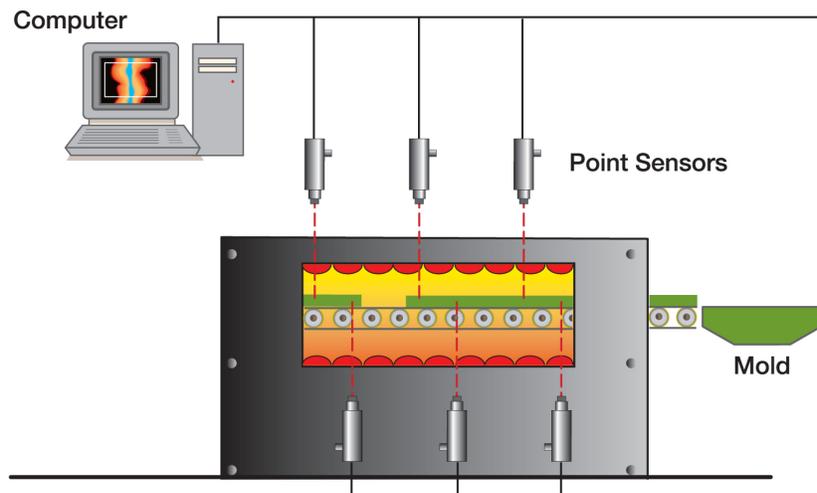
A

Answer

Situation Analysis

Thermoforming of products, such as hot tubs and small sailboat hulls, utilizes large sheets of thick plastic (6mm/.25in). The material can be any color desired by the buyer. When heating this type of plastic, the heating time depends on the thickness of the plastic and the color. Color is very critical because the light colors take longer time to heat up than dark colors. To determine the heating cycle, the manufacturer has to make trial runs and each time the material is not heated properly, that part is scrapped. The cost of this material is very high.

The plastic sheets are heated from both top and bottom, so temperature has to be controlled on both sides. If the temperature can be controlled properly every time without any testing, the amount of scrap is reduced considerably and high quality parts are produced every time.



A

Answer

Solution and Improvements

To control the temperature, IRCON Modline 4, series 44 sensors are installed to measure the plastic temperature while the sheet is inside of the heating area. Instruments are placed on both top and bottom to insure the sheet is heated properly on both sides. As many as 6-10 instruments are installed on the top and bottom depending on the number of critical heating zones for each product. The instruments are interfaced with a PC, which controls the heating. When all of the zones are at the proper temperature, the sheet is fed into the molding area and formed into the final shape (hot tub, sailboat, etc.). The 44 series is unique in that the change in colors does not affect the settings for emissivity. All colors have the same emissivity of 0.94. The use of the infrared sensors eliminates timers and having to make trial runs. Since the critical temperature for forming is known by the manufacturer, they have only to enter the set points into the PC and the sheet will be heated correctly every time.

Ircon Product

Modline 4, Model 44-06F-0-0-0 or
Model 44-03C-0-0-0

Accessories

- AA-3 AIR PURGE

Benefits

- Increased Productivity
- Reduced Scrap
- Improved Product Quality