

IRCON System Solutions – Plastic

Thermoforming of Plastics

Customer Needs

Plastic tubs, hot tubs, sailboats, refrigerator inner shells and thousands of parts are all made of plastic that are thermoformed. The part starts as a sheet of plastic and is heated until it becomes very pliable. The sheet is then moved over a mold and allowed to sag down over the mold, forming the part or the mold is designed to actually have a vacuum and the plastic is drawn down over the mold. The temperature of the plastic is very critical. If the plastic is too hot it will stretch too thin and cause breaks or cracks. It may even destroy the color of the part. If the plastic is too cool it will not form around the mold properly. Often the operator does not know the part temperature, he controls the temperature by using a timer. This means he has to test several parts to determine the correct cycle time and this leads to scrapped parts.

Most of these processes are static heating. The plastic sheet is placed in an oven that is usually heated with infrared heaters on the top and the bottom of the sheet. When the plastic is the right temperature the sheet is moved from the oven to the mold and there it is molded into the finished part. The best place to measure the plastic temperature is during the heating. If the plastic is thick enough, such as 2-3 mils or greater than the best instrument to use is the Javelin 8-14 micron. At this wavelength the emissivity of the plastic is about 0.94 and color does not change this value. In addition the reflection from the heaters will only cause an error of 2-3° F. The typical temperature is 300-400°F.

For some large molds that require special temperatures in specific zones, multiple instruments can be used. Often a better solution is to use either the Stinger with Mold Inspector software or the ScanIR to provide a thermal image of the entire part. Some ovens have a grid of over 100 heaters and it is difficult to adjust these heaters without an image of the target. For these applications the instruments are placed at the exit of the oven and the temperature is measured as the sheet leaves the oven to the mold.

Features/Benefits

Product

- Sell Ircon as a full line supplier with spot, line scanning and thermal imaging technology.

Application

- Less scrap plastic
- Properly formed parts
- Faster startup

Product?

1. Depends on application.

Application



A thermoformed part coming out of the mold