

Ircon[®] System Solutions – Glass

Tempered Glass

Customer

Flat Glass Tempering

SIC code

3211

Customer Needs

To temper glass, it is placed into an oven, which can be electrically or hot air heated to 621°C (1150°F).

After heating, the glass is quickly rolled into a chamber that blasts the glass with cold air. The process of heating the glass and then cooling it rapidly puts the inside of the glass in compression and the outside in tension. This combination of stresses causes the glass to shatter into the small pieces when struck. For purposes of insurance the supplier has to prove the glass is tempered.

The operator of the oven has several problems that need to be solved. If the glass is too hot in the oven it will sag. If it is too cool when it enters the chill area it will shatter. The solution is to measure the glass inside of the oven with an infrared thermometer and when it reaches the right temperature move it into the chill area.

The operator controls the temperature using a thermocouple or a timer. How does he know the time to keep the glass in the oven? He has to make test runs and breaks some glass to see if it is tempered. This is a costly method of temperature control. A less costly method is to use an infrared thermometer and record the cooling curve in the cooling chamber. If the cooling follows a specific curve the customer can be sure it is a good piece of tempered glass. He did not break it and he has a record to show his customer.

The plant may produce Low E glass. Low E glass is the coated glass used in buildings to keep the sunlight out of the rooms. This type of glass has a metallic coating on the top of the glass; the emissivity of this coating is 0.05% and is not measurable. The coating is usually on the top of the glass so that the rollers do not scratch the coating as the glass moves through the oven. The only way to measure this glass temperature is to look up through the bottom of the oven. This may cause a problem in that if the glass breaks inside of the oven it will fall into the lens. The best solution is to use a metal mirror. This can be cleaned easily and will not break if glass falls on it.

To measure the temperature of the glass in the oven Ircon suggests using the Javelin 5 micron series or the Modline 7, 77 series. Both of these instruments can look directly inside of the oven and not be bothered with reflections. Be sure to include an air purge to keep the lens clean.

Features/Benefits to address

Product

- Ircon provides a full range of products (If customer is cost sensitive sell Javelin, if looking for premium product sell Modline 4 or Modline 7, 77 series).

Application

- Cost savings with less broken glass and less rejected product.
- Good solution for low E glass.
- Provides documentation for end user that glass was properly tempered.

Who to talk to?

1. Quality Control Manager
2. Production Manager

What to take?

1. Modline 4 Demo and Sales Brochure
2. Javelin Demo and Sales Brochure

Application



Glass Tempering Oven

Names of customer

In every major city in the world there are companies that do tempering for the glass installation industry. Bigger manufacturers are PPG, Inc. and AFG, Inc.