

# Insulating Glass Condensation

This service bulletin describes condensation on glass surfaces:

- Airspace Condensation
- Indoor Condensation – Sweating on the #4 Room Side Pane Surface Perimeter
- Indoor Condensation – Condensation Rings on the #4 Room Side Pane Surface
- Outdoor Condensation

## AIRSPACE CONDENSATION

Glass units should be replaced when condensation is evident in the airspace. Insulating glass units experiencing condensation in the airspace are usually due to a failure of the insulating glass seal. This is first evident in the wintertime when the outdoor temperatures are low causing a lower glass temperature and the potential for condensation to form (Fig 01-1). Airspace condensation can also be caused by a small crack in the glass that is sometimes not immediately evident. The outdoor and indoor glass surfaces should be cleaned to make certain the condensation is in the airspace and not on the outdoor or indoor glass surfaces.



Fig 01-1: Airspace Condensation

## Indoor Condensation or Glass Sweating on the Room Side Glass Surface.

Glass units having indoor condensation or sweating caused by high room side humidity conditions should not be replaced. This phenomenon is usually seen in the winter at the bottom edge of the glass (Fig 01-2), around the glass periphery, or sometimes on the complete indoor glass surface. It is caused by high room side humidity conditions when the indoor glass temperature is below the dew point of the room side air.



Fig 01-2: Interior Glass Condensation

## Condensation Rings on the Indoor Glass Surface Condensation

Glass units having indoor center condensation rings should be evaluated. When insulating glass unit panes are touching in the center, wintertime indoor condensation rings can be seen in the center of the glass (Fig 01-3). These rings may be circular or elliptical depending on the window shape (square, rectangular, circle, top, etc.)



Fig 01-3: Condensation Ring

Condensation rings occur when the glass lites touch in the glass center because there is a reduced insulating value and the indoor glass temperatures are closer to the outdoor glass temperatures. This increases the potential for condensation on the room side pane and becomes evident when the room side glass temperatures fall below the dew point temperature of the room side air. The condensation only occurs in the center of the glass because the spacer keeps the edges of the glass apart maintaining the airspace's insulating properties.

It is suggested that the window or glass manufacturer be contacted to confirm that the glass is indeed touching in the center. Condensation at the center of the unit can also occur if the room side humidity levels are high. In addition, the use of bars and grilles in between the glass panes can result in the bars touching the glass and creating a cold surface, resulting in the formation of condensation where these bars are located in the IG unit (see TSB #IG08 "Use of Internal Grilles" for details). If the glass is touching in the center, repair or replacement of the glass may be required.

**Outdoor Condensation**

Glass units should not be replaced for complaints or concerns when outdoor condensation occurs. Condensation on the outdoor glass surface of an insulating unit is not an indication that the glass or insulating unit is defective. Under the right set of atmospheric conditions it is possible to get condensation on the outdoor surface of an insulating glass unit. Specifically, these conditions are as follows:

- Glass temperature below the dew point
- Clear night sky
- Still air
- High relative humidity
- Highly insulating IG units potentially using:
  - High performing Low E coatings
  - Multiple airspaces
  - Multiple Low E coatings

Exposed to the above conditions, the outdoor glass surface can radiate heat away to the night sky, and with good insulating glass products the outdoor glass temperature can fall below the dew point of the ambient air. When this occurs, moisture from the air will condense on the outdoor glass surface (fig 01-4). Similarities of this condensation on glass products can be drawn to moisture or dew on lawns or on automobiles when exposed to the above mentioned natural occurring phenomena.



Fig 01-4: Outdoor Condensation

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