

Insulating Glass Manufacturing Guidelines: Important Considerations

TB-1400-91(11)

**TECHNICAL
BULLETIN**

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Glass Safety Awareness: Proper Personal Protective Equipment (PPE) must be worn when processing or handling glass. A risk assessment should be conducted to determine the appropriate PPE for each step in the insulating glass manufacturing process.

1.0 GLASS (primarily coated glass)

- 1.1 Does glass used have a shelf life?
- 1.2 If glass is being stored, does it need to be stored in a controlled environment?
- 1.3 Do plant personnel have the appropriate safety equipment for handling glass?
- 1.4 Do plant personnel have the safety gloves for coated glass as recommended by the glass supplier?
- 1.5 Are the glass supplier instructions for the correct handling of glass and coated glass available to plant personnel and have they been trained to handle the glass correctly.
- 1.6 Are there any special cutting techniques in the glass involved?
- 1.7 Are the curing shell lubricants compatible with the glass (i.e.: coating)?
- 1.8 Do the edges need to be deleted?
- 1.9 Does the wash water need to be:
 - 1.9.1 Checked for pH?
 - 1.9.2 Contain detergent and if so, what kind?
 - 1.9.3 Deionized?
 - 1.9.4 A certain temperature range?
- 1.10 Is there a particular brush type needed in washing?
- 1.11 Does the glass require a pre-wash?
- 1.12 Is glass being handled to minimize damage?
- 1.13 Is surface orientation of coated glass being controlled during manufacturing and final application?
- 1.14 Are you recycling or meeting waste disposal regulations?

2.0 DESICCANT/DESICCATED MATRIX

2.1 Desiccant

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- 2.1.1 Is the desiccant compatible with:
 - 2.1.1.1 Sealant type?
 - 2.1.1.2 Method of manufacture?
 - 2.1.1.3 Medium (air or inert gas fill/blend)?
- 2.1.2 Is the desiccant being stored and handled properly?
- 2.1.3 Has the desiccant supplier provided the proper test kit and procedure.
- 2.1.4 Do you have an In-plant Quality Control program? Is it known and understood by plant personnel?
- 2.1.5 Do plant personnel know how to test the desiccant adsorption capacity and how often to do this?
- 2.1.6 Is the correct quantity of desiccant being loaded into the spacer frame?

2.2 Desiccated Matrix

- 2.2.1 Is the desiccated matrix selected compatible with the sealant?
- 2.2.2 Is the packaging checked for damage and if it has been damaged or the vapor seal is questionable, is the package rejected?
- 2.2.3 Do plant personnel know how to check the desiccated matrix for activity?
- 2.2.4 Is there a quality control process in place? Is it known and understood by plant personnel?

2.3 Are you recycling or meeting waste disposal regulations?

3.0 FRAMEWORK

- 3.1 Is spacer type (steel, aluminum, self-contained, fiber, etc.), finish (anodized, mill, etc.), and integrated spacer systems being stored according to manufacturers' recommendations?
- 3.2 Is profile type (rectangular, low profile, T-spacer, etc.) compatible with manufacturing method?
- 3.3 Has a cutback been established in accordance with recommendations by your sealant supplier that meets the minimum sealant depth? (Refer to IGMA TB-1201-89 (05), Sealant Manufacturers' Minimum Sealant Dimensions and Placement Survey)
- 3.4 Is a cutting lubricant (for cutting the spacer) used, and if so, is it compatible with coatings on glass and sealant?

- 3.5 Has the cutting lubricant been thoroughly removed? Is the glass clean?
- 3.6 Has cut spacer been cleaned of rough edges or fillings?
- 3.7 Is corner construction (nylon, zinc, bent, welded) compatible with manufacturing process and stored properly by type?
- 3.8 Are corner connectors and inline connectors sealed adequately?
- 3.9 Is the finished frame stored properly and assembled into the IG unit within a maximum "in process" time prior to sealing time established in conjunction with your desiccant / desiccated matrix supplier?
- 3.10 Are you recycling or meeting waste disposal regulations?

4.0 SEALANT

- 4.1 Are all IG" sealants compatible with:
 - 4.1.1 Desiccant?
 - 4.1.2 Spacer assembly?
 - 4.1.3 Glass coating?
- 4.1 Are sealant types (one part, two part, thermoplastic, thermosetting) suitable for manufacturing method?
- 4.2 Are sealant types:
 - 4.2.1 Mixed?
 - 4.2.1.1 If so, is ratio and mixture checked?
 - 4.2.2 Heat applied?
 - 4.2.2.1 If so, is temperature checked?
- 4.3 Are in-house Quality Control procedures being followed?
- 4.4 Has quantity of sealants and sealant placement been defined and recommended by sealant supplier and manufacturing method? (Refer to IGMA TB-1201-89(05), Sealant Manufacturers' Minimum Sealant Dimensions and Placement Survey)
- 4.5 Have you verified that the sealant is compatible with any glazing sealants that will be used in the final product?
- 4.6 Are you recycling or meeting waste disposal regulations?

5.0 GAS FILLING

- 5.1 Has percentage of gas content been established?
- 5.2 Has gas type been chosen?
- 5.3 Have shipping to elevation and temperature changes been accounted for?
- 5.4 Is gas filling method compatible with sealant system?
- 5.5 Do you have a regular schedule of maintenance for gas filling equipment?
- 5.6 Do you have a quality control process for gas filling? Is it known and understood by plant personnel?
- 5.7 Is there a verification method for post filling percentage content?
- 5.8 How often is production unit gas content verified?
- 5.9 Are records maintained for the appropriate time period?

6.0 QUALITY CONTROL (Refer to TM-4000-02(07), IG Manufacturing Quality Procedures)

- 6.1 Do you have a quality control procedures manual?
- 6.2 Are plant personnel trained on equipment and processes applicable for their area?
- 6.3 Are you evaluating workmanship?
- 6.4 Are you logging incoming raw materials?
- 6.5 Are you labeling for component trace ability?
- 6.6 Are you testing to industry standards?

7.0 PACKAGING AND SHIPPING OF FINISHED PRODUCTS

- 7.1 If crated, is glass blocked properly?
- 7.2 Has exposure to elements – particularly moisture – been eliminated?
- 7.3 Are there any special shipping requirements (labeling, altitude, etc.)?

8.0 CAPILLARY TUBES (Refer to TB-1601-95(07), Guidelines for use of Capillary Tubes)

- 8.1 If capillary tubes are used, have proper techniques been followed?
- 8.2 Are tubes consistent with unit design?
- 8.3 Are tubes to be left open or closed?
- 8.4 Have you given proper instruction to shippers and installers regarding tube orientation, glazing design and closing technique?

9.0 OTHER

- 9.1 Is unit being glazed according to standard glazing recommendations (Refer to TM-3000-90 (04), North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use.)?
- 9.2 Is glazing material checked for compatibility with IG edge sealant?
- 9.3 Are insulating glass units given a final inspection prior to packing and shipping?

10.0 **REFERENCES**

- 10.1 TM-3100-03, Preventing IG Failures
- 10.2 TM-4000-02 (07), IG Manufacturing Quality Procedures
- 10.3 TB-1601-95 (07), Guidelines for Capillary Tubes
- 10.4 TB-1201-89 (05), Sealant Manufacturers Minimum Sealant Dimensions and Placement Survey
- 10.5 TM-3000-90 (04), North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use
- 10.6 TB-2403-91, Guidelines for IG Manufacturers' Studies of Sealant Compatibility
- 10.7 TM-3100-09, Voluntary Guidelines for the Identification of Visual Obstructions in the Airspace of Insulating Glass Units