



# GLASSWERKS – TECHNICAL BULLETIN

## INSULATING GLASS SEALANT VISUAL CHARACTERISTICS

### TECHNICAL DOCUMENT: GW-TB-003

Insulating glass units (IGUs) are typically manufactured by assembling two or more glass plies separated by a spacer system and sealed with a dual seal configuration. Most conventional spacers are metallic, although non-metallic and thermoplastic spacer technologies are also used in the industry.

Metallic spacers are fabricated to size, bent at the corners, and joined with an internal connector or key. During production, a primary sealant—commonly polyisobutylene (PIB)—is applied to both sides of the spacer. Minor variations in the bead size and its exact location on the spacer perimeter should be expected due to normal production tolerances.

Once the spacer is positioned, the glass lites and spacer are pressed together under controlled pressure. Because PIB is applied in a malleable state, compression causes the bead to spread, creating a flattened seal between the glass plies. Some amount of bead widening or minor deviation along the sightline is inherent to the fabrication process.

Non-metallic spacer systems—such as extruded thermoplastic spacers that integrate desiccant and primary sealant—are also widely used. These systems are applied directly to the glass surface and form a continuous bond around the unit perimeter.

#### **SIGHTLINE TOLERANCES**

Industry-standard fabrication tolerances allow for modest variation in spacer placement relative to the glass edge. A typical as fabricated sightline tolerance is approximately **±1/8 inch (3 mm)**, which aligns with guidelines published by the National Glass Association (NGA). These tolerances account for normal shifts in spacer positioning and sealant placement during assembly.

#### **PRIMARY SEALANT VISIBILITY**

With metal spacer systems, the primary sealant may appear slightly within the viewing area or leave portions of the spacer visible. Industry testing has shown that limited PIB extension into the vision zone does not adversely affect IGU performance or the integrity of the dual seal system. Performance testing demonstrates that units with incidental PIB visibility perform equivalently to units where the sealant remains fully concealed behind the sightline.

#### **AESTHETIC CONSIDERATIONS**

In the past, differences in IGU edge appearance were less noticeable due to the common use of tinted or highly reflective glass. Current architectural trends favor clear substrates and high transmission coatings, making the edge construction of IGUs—including sealants, spacer geometry, corner joinery, and any edge deletion—more apparent.

The framing system also influences visibility of the IGU perimeter. Traditional captured framing typically conceals the unit's edge. Structural glazing, however, often leaves sealants and spacer details exposed, particularly on exterior elevations. When the IGU sightline exceeds interior cover dimensions, the perimeter may also become visible from inside the building.

To minimize visual distraction, darker spacer finishes—especially black, non-reflective materials—tend to reduce glare and improve uniformity compared to bright mill finish spacers.



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#### **GLAZING SYSTEM CONSIDERATIONS**

IGUs installed with mechanical retainers, snap on covers, or pressure plates rely on gaskets and/or sealants to cushion the glass and create a weather seal. Compression glazed systems depend on gasket pressure to control air and water infiltration. Excessive clamping pressure during installation can cause the primary sealant to migrate, creating visible PIB creep at the edge. As stated in industry guidance (GANA 2008), recommended edge pressure for these systems is **4 to 10 pounds per linear inch**.

Gasket design varies significantly. Historically, many gaskets extended above the metal stop, effectively concealing the IGU edge. Modern low-profile gaskets may sit closer to the height of the glass and spacer, making the edge more visually prominent when viewed from the interior.

#### **RECOMMENDATIONS**

**1. Review System Cover Dimensions**

Ensure the framing system provides sufficient edge coverage accounting for IGU fabrication tolerances. Insufficient cover may expose sealants, spacers, or edge deletion.

**2. Confirm Gasket Compatibility**

When a flush appearance is desired, verify that gasket profiles accommodate real world spacer and sightline variation.

**3. Maintain Color Consistency**

Use gaskets and sealants with coordinated, uniform colors to achieve a consistent sightline appearance.

**4. Consider Dark or Non-Reflective Spacer Options**

Dark, matte spacer materials typically offer improved aesthetics compared to reflective mill finish metals and reduce visibility of corner joinery or perforations.

#### **REFERENCES**

- GANA. GANA Glazing Manual, 50th Anniversary Edition (2008).
- NGA. Guidelines for the Appearance of Insulating Glass Unit Edges in Commercial Applications at the Time of Installation (NGA FB27 11, updated 2015).
- IGMA – Insulating Glass Manufacturers Alliance (TM-3100 Voluntary Guidelines for Identification of Visual Obstructions in the Air Space of Insulating Glass Units.)

#### **REFERENCES**

The information above is provided for general guidance regarding insulating glass fabrication and visual characteristics. Fabrication methods, materials, and performance attributes may vary by manufacturer. All technical data is subject to modification without notice.