INSULATING GLASS SEALANT VISUAL CHARACTERISTICS

VIRACON TECH TALK

Insulating glass units remain a key element in energy efficient buildings. Glazing systems require insulating glass units to be accommodating, both structurally and visually.

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INSULATING GLASS FABRICATION

Typical insulating units are constructed with two glass plies, a spacer, a primary seal and a secondary seal. The spacer can be made of metal or non-metal material such as thermoplastic. Metal spacers are cut to size, the corners are bent to 90° at the corners and the ends are connected with a straight key. Polyisobutylene (PIB) is simultaneously extruded onto both sides of the spacer with as much precision as possible. The amount of PIB, as well as the actual location of the PIB placement on the spacer, may vary slightly along the edge of the spacer. The glass and spacer are then pressed together with regulated pressure to achieve the desired overall thickness. Since the PIB is wet, the pressing causes the round bead of extruded PIB to flatten out and widen between the glass plies (Figures 1 and 2).

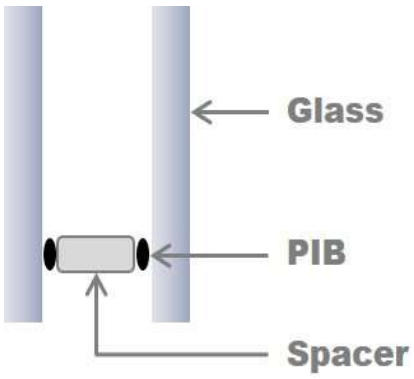

FIGURE 1: PRIOR TO PRESSING

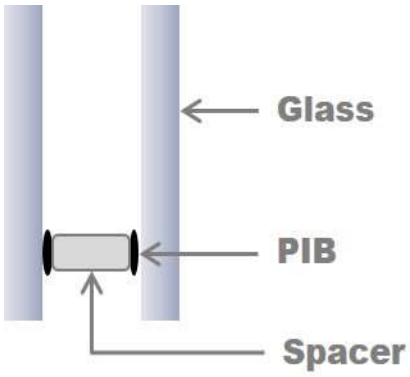

FIGURE 2: AFTER PRESSING

Viracon Thermal Spacer (VTS™) is an example of a non-metal thermoplastic spacer. The black thermoplastic has integrated desiccant and PIB. It is extruded directly onto the glass surface and chemically bonds to the glass.

SIGHTLINE TOLERANCE

Viracon's as-fabricated sightline tolerance, which includes spacer placement in relation to the glass edge is +/-1/8" (3mm). This tolerance is consistent with the National Glass Association's guideline (NGA FB27-11)

When metal spacers are selected, PIB may extend into the vision area of the insulating glass unit or may leave portions of the spacer edge visible. Viracon has tested insulating units with PIB extending into the vision area. These units have performed comparably to units without PIB in the vision area; the integrity of the insulating glass seal is not compromised and the standard warranty applies.

AESTHETICS

In years past, insulating glass edge appearance was largely unnoticed because of dark or highly reflective glass. Today, the most popular glass types are clear with high light transmitting coatings, making insulating glass sealants and spacers more visible.

The glazing system also plays a role in the ability to see the insulating glass edge. A conventionally glazed system, when properly designed, will hide the insulating glass edges. A structurally glazed framing system typically leaves the insulating glass sealants, spacer joinery and edge deletion more visible, especially on the building exterior. If the insulating glass unit's sightline is greater than the interior framework coverage, the edge may also be visible from the interior of the building (Figure 3).

FIGURE 3: PIB IN THE VIEWING AREA

In these situations, it is especially important to consider the amount of glass edge covered by the framing system and the potential sealant and spacer visibility from inside the building. Utilizing a black metal spacer instead of silver mill finish may reduce the spacer visibility for occupants. VTS is also black and can, additionally, eliminate metal spacer aesthetic attributes that are typically undesirable such as shine, connection splices and top profile perforations.

GLAZING SYSTEMS

Insulating glass units installed with metal stops, pressure plates or snap-on covers generally utilize rubber gaskets or a combination of gaskets and sealants to protect the glass from glass-to-metal contact and to form a watertight barrier. Dry glazing systems or compression gasket systems rely upon clamping pressure to provide a barrier against air and water infiltration.

Since gaskets can take a set and lose their resiliency over time, their effectiveness will depend on the pressure applied during the original installation. If pressure glazed systems are tightened to the maximum amount, it could result in visible PIB creep after installation. To prevent excess pressure, the edge pressure should be 4 to 10 pounds per lineal inch (GANA 2008).

Gaskets come in many types, profiles and materials. In the past, most were 1/8" to 3/16" higher than the aluminum stop or framework itself so the edge of the insulating glass unit and spacer were beneath this gasket and not visible. Today, lower profile gaskets may be flush with the edge of the insulating glass unit spacer making this area highly visible from the building interior.

RECOMMENDATIONS

1. Evaluate the glazing system design and insulating glass unit fabrication tolerances to provide adequate coverage of the insulating glass unit perimeter from the interior of the building. If the framing system does not provide adequate coverage, the spacer and sealants will be visible and the appearance of these should be taken into consideration.
2. If a flush appearance is desired, make sure the gasket design will accommodate insulating glass unit fabrication tolerances.
3. Maintain color consistency for all gaskets and sealants.
4. Use VTS or black metal spacers instead of mill finish spacers.

REFERENCES

GANA. 2008. GANA Glazing Manual 50th Anniversary Edition. Glass Association of North America.

NGA FB27-11, 2015, Glass Technical Paper, “Guidelines for the Appearance of Insulating Glass Unit Edges in Commercial Applications at the Time of Installation” National Glass Association with GANA, www.glass.org.

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