

Vinyl Glazing Case Study

Some example photos and
commentary

Testing, Case Study 1

- **ABB performed several air and water infiltration tests, reviewed shop drawings, conducted visual observations of interiors, and reviewed previous reports.**
- **ABB also had ASTM E1105.01 and ASTM E783.02 window tests completed.**
- **Since the windows immediately failed the water and air tests due to glazing seal related failure, we isolated the glazing failures and performed tests for other failures.**



Glazing Failures

- **Several windows tested leaked at glass-to-glazing bead junctures.**
- **The windows are interior glazed and have a poor quality acrylic adhesive closed-cell foam glazing tape. These seals have failed in all windows where the glazing was tested.**
- **Water Test Failure:**
 - Windows were tested at 3.5 psf, 2/3^{rds} of the Manufacturer's stated performance standards.
 - Of the three windows that were tested without isolating the glazing, all three failed to pass. This is a 100% failure rate.



Glazing Failures And Resultant Leak.



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Glazing Failure Analysis

- **The design of the windows caused premature failure of the glazing seals at the window-to-frame transition, and causes the windows to fail to perform. Design factors causing these failures are:**
 - Glazing is installed from the interior, which causes the glazing tape to be the primary line of defense against water intrusion. The tape is susceptible to UV and heat degradation, is of inferior quality, and is not a long-term solution to this condition.
 - The window frame is designed with a horizontal flat surface at the frame-to-glass joint, so water sits in contact with the glazing tape, causing premature Insulated Glass Unit (IGU) failure.
 - Current glazing tape is an acrylic adhesive closed-cell foam tape that is compressed with glazing stops at the interior. In our testing, we observed that the tape did not make uniform contact with the glass thereby allowing water to bypass the tape altogether.
 - When the glazing seal fails, water flows into the sill tracks of each piece of glass. This is sometimes the upper lites that have a drained horizontal mullion, and sometimes it is the lower sill track that has no method of managing water that enters the frame at that location.

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Glass Being Removed



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Glazing Tape Is Discolored And Stained From Dirt And Water

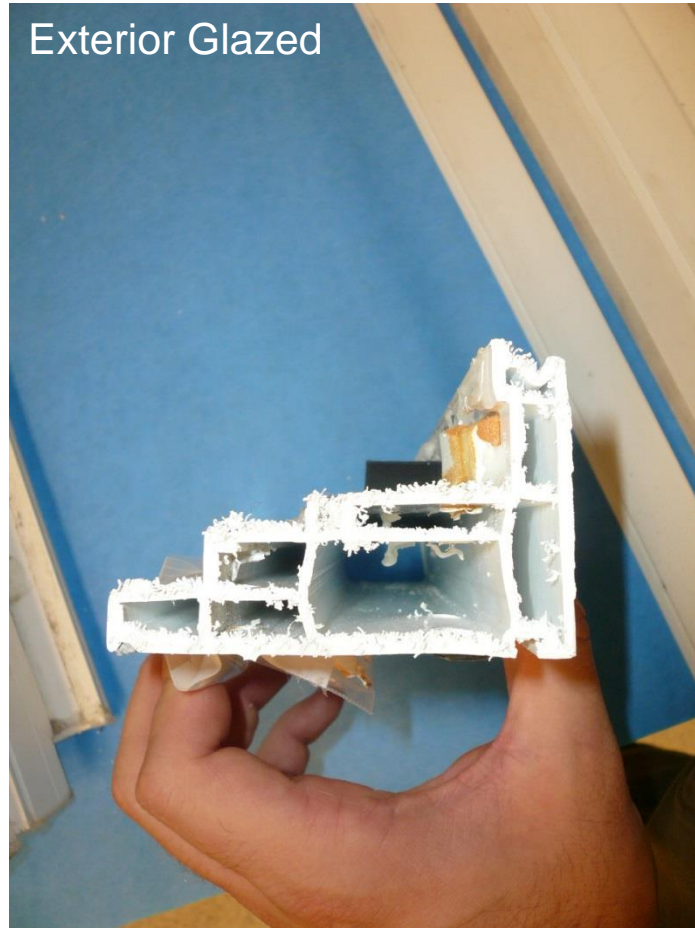


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Glazing Gaskets

- Often the windows are internally glazed, exposing the foam gaskets to UV and water exposure



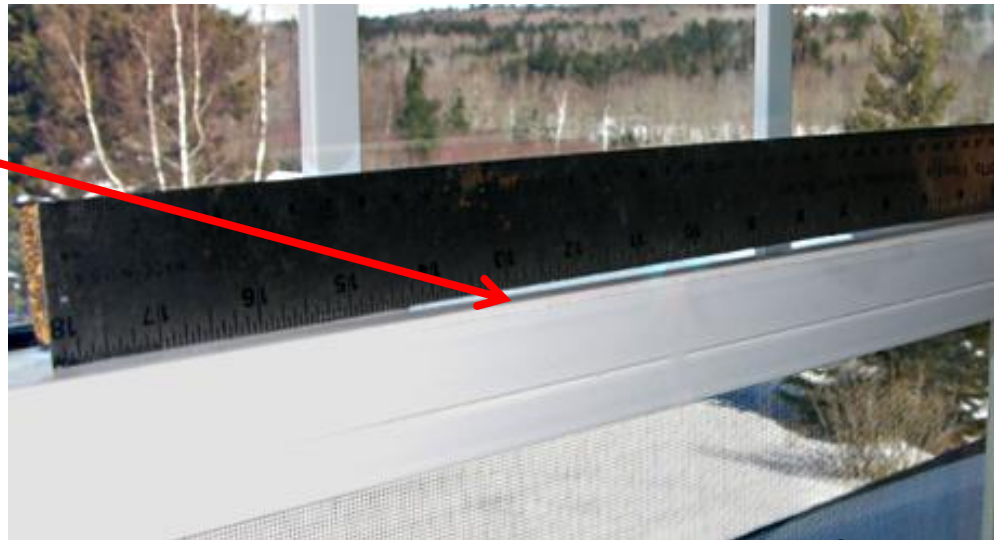
Laboratory Testing For Air Tightness

- **Glazing tape failure also causes Air-Leakage test failure:**
 - Due to failed glazing seals, windows tested (ASTM E 283-91) did not meet project specified air leakage performance standards.
 - Of the seven windows tested for air leakage all seven failed to meet the air leakage standards in Manufacturer's shop drawings. This is a 100% failure rate.



Bowing and Bending of Frame

- Due to the inherent flexibility of vinyl, framing members are often reinforced with steel.
- Framing members with long spans should be designed to limit excessive bending.
- Such bending will often result in reduced performance and the misalignment can make the weather-seals and glazing gaskets non-effective causing excessive condensation, air infiltration, and water infiltration.



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