ABOUT THIS DOCUMENT

This document identifies the relevant standards and examples of specification language with relevant submittals that can be used to address the visual quality, fabrication quality, and long-term durability of insulating glass units.

This specification identifies two separate insulating glass test standards recognized in the 2020 NBC and two certification programs. The specifier may choose to recognize both standards, as shown below, or to choose only one.

This document is not provided as design guidance and does not constitute professional advice. It does identify relevant performance, testing, and certification documents, and proposes thoughtful quality assurance measures that specifiers may wish to consider.

Part 1 General

1.1 References

The most recent version of these standards shall apply when no date is appended to the standard designation.

REFERENCE	REASON FOR INCLUSION IN THE SPECIFICATION
CAN/CGSB-12.8-97 - Insulating Glass Units	Both standards are referenced in the code for insulating glass unit (IGU) quality and durability. Testing to these standards is required to demonstrate conformance. Requiring IG units to be certified ensures greater quality assurance.
ASTM E2190-19 - Standard Specification for Insulating Glass Unit Performance and Evaluation	
ASTM E576-14(2020) - Standard Test Method for Frost/Dew Point of Sealed Insulating Glass Units in the Vertical Position	Test method to determine the frost point of both newly fabricated and in-service IG units and can be used to identify premature failure.
IGMA TM-3100-09 - Voluntary Guidelines for the Identification of Visual Obstructions in the Air Space of Insulating Glass Units	This industry document from the Insulating Glass Manufacturers Alliance (IGMA) provides guidelines for categorizing and qualifying unintended visual obstructions within insulating glass units. More information here. Order here.
IGMAC Certification Program for the CGSB 12.8 Standard	Certification program for IGUs tested to the CAN/CGSB-12.8 standard. More information here.
IGCC/IGMA Certification Program for the Harmonized Insulating Glass Standard (ASTM E2190)	Certification program for IGUs tested to the ASTM E2190 standard. More information here.

1.n Design and performance requirements

- Insulating glass coating, spacer and edge seal system shall conform to ASTM E2190 or CGSB 12.8 on the basis of independent laboratory testing. Testing shall include argon gas retention.
- Insulating glass units shall be certified under the IGCC/IGMA or IGMAC insulating glass certification programs for all mandatory requirements and for argon gas retention. Units shall bear markings conforming to the corresponding certification program's requirements.
- Newly constructed insulating glass units shall have a maximum frost point of -40°C when tested to ASTM E576.
- Aluminum spacers without an integral thermal break shall not be used.
- Hollow metal spacers must have bent corners and no more than one edge-to-edge butt joint per unit.

1.n Quality assurance

- Perform work in accordance with the visual quality requirements in IGMA TM-3100-09, Voluntary Guidelines for the Identification of Visual Obstructions in the Air Space of Insulating Glass Units.
- Insulating glass units with silicone secondary sealant shall be supported on setting blocks made of silicone. Non-silicone setting blocks shall not be used. Non-silicone setting blocks can result in premature failure of insulating glass units and/or discoloration and premature failure of structural silicone sealants bonding insulating glass units to the fenestration system.
- Insulating glass fabricator qualifications: fabricator to be enrolled in either the IGMA/IGCC or IGMAC certification program and have current certifications for the specific insulating glass unit construction complying with this section and incorporated into the fenestration products supplied under Section _____.
- Insulating glass fabricator shall permit unannounced inspection of insulating glass fabrication facility for independent verification of conformance to the requirements of this specification at the discretion of the Consultant.
- When triple-pane units are provided, spacers in the near and far cavities shall be closely aligned with respect to one another. Misalignment of spacers visible under the viewing conditions for visual defects in IGMA TM-3100-09 shall be considered a manufacturing defect.

- When edge deletion of low-e coatings is required, the edge deletion shall be complete, and no trace of the coating shall be visible on close visual inspection. Units showing visible traces of coating shall be rejected. The standard of acceptance shall be the three sample units submitted to and approved by the Consultant for visual quality inspection prior to insulating glass fabrication for the project

- Consultant shall test a minimum of 1% of insulating glass units to determine their frost point. Insulating glass units with internal frost point levels of -40°C or greater when tested to ASTM E576 shall be considered defective.

1.n Submittals

- Submit official certificate(s) as evidence of current IGCC/IGMA or IGMAC certification for each unique coating/gas fill/spacer/sealant system to be supplied under this section. Certifications must include testing for argon gas retention. Certificates must be dated and must identify the insulating glass fabricator registered with the certification program.

- Submit written confirmation from the insulating glass fabricator confirming the fabricator's intent to supply insulating glass units that conform to the insulating glass testing, certification, edge deletion and visual quality requirements of this specification prior to fabrication of insulating glass units.

- Submit a minimum of three sample units no larger than 12 in. x 18 in. for review by Consultant. Sample units shall represent the level of quality for close-range visual defect evaluation of edge deletion, continuity of primary and secondary seals, primary sealant migration into the line of sight, and alignment of spacers to one another in the case of triple-pane units. A larger specimen size may be proposed for consideration by the Consultant.

- All submittals to be made at one time together with project shop drawings. Reviewed shop drawings shall not be returned until insulating glass samples and certification requirements have been reviewed by the Consultant.

Part 2 Materials

2.n Setting blocks

- For insulating glass units with a silicone secondary seal, only silicone setting blocks shall be used. Alternate setting block materials shall not be used without the advance approval by the Consultant.

2.n Sealants

- For insulating glass units with a silicone secondary seal, only silicone sealants shall be in contact with the insulating unit's secondary seal.
- Sealants in contact with insulating glass edges shall be compatible with insulating glass edge sealants.
- Sealants in contact with setting blocks, glazing tapes, and other elastomeric or flexible glazing materials shall be compatible with those materials.

2.n Low-e coating

- Remove ceramic and/or low-e coating by edge deletion from all insulating glass units that require the coatings to be removed to conform to ASTM E2190 or CAN/CGSB 12.8:
    - Edge deletion must allow all of the secondary sealant and at least 25% of the width of the primary sealant to be bonded directly to glass.
    - Edge deletion shall be uniform in appearance, visually straight, and remove all visible traces of the coating.
    - Visual inspection of edge deletion quality shall be made at close range and with reference to the samples approved by the Consultant for close-range visual defect evaluation.

Part 3 Execution

3.n Fabrication

- Fabricate units in strict accordance with the IGMA/IGMAC or IGCC certification program requirements
- Fabricate units with the specific components identified in the CAN/CGSB 12.8 or ASTM E2190 certificates
- Fabricator to allow unrestricted access to Consultant to review the fabrication of units for this project, and to take samples of component materials for independent inspection, evaluation or testing.

3.n Plant and Field quality control

- Consultant shall select a minimum of 1% of insulating glass units of each separately certified construction for frost point testing to ASTM E576. Insulating glass units with internal frost point levels of -40°C or greater shall be considered defective.

- Each failed unit shall require the frost point testing of an additional three units.
- Failed units shall be replaced at no cost to the owner.
- Cost of initial 1% testing to be paid by the owner. Costs for additional testing and retesting shall be paid by the supplier of the fenestration products in which the units are installed.