# Guardian Glass, LLC November 2020

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GUARDIAN SELECT® ELITE OPTICAL QUALITY SPECIFICATION

The following abridged glass specification provides recommended language for the architect or specification writer to insert in a written architectural glass specification, “Section 088000 - Glazing”. The specification language is recommended by Guardian in order to establish requirements for fabricated glass optical quality.

Please note that this information is provided as a convenience and is not to be construed as an assumption of responsibility or liability for design and application choices, which remain the responsibility of the design professional of record.

SECTION 088000 – GLAZING

1. GENERAL
   * + 1. ACTION SUBMITTALS
          1. Product Data.

Include principal center-of-glass performance metrics for each exterior glazing unit type.

* + - 1. INFORMATIONAL SUBMITTALS
         1. Qualification Data: For Installer and manufacturer of insulating glass units with sputter-coated, low-E coatings.
         2. Source Quality Control Reports: When requested by Architect. [Include letter certifying color tolerance compliance].
      2. QUALITY ASSURANCE
         1. Manufacturer Qualifications for Insulating Glass Units with Sputter-Coated, Low-E Coatings: A qualified commercial insulating glass fabricator who is certified by coated glass manufacturer.

1. PRODUCTS
   * + 1. MANUFACTURERS
          1. Source Limitations for Glass: Obtain from single source from single manufacturer for each glass type.
          2. Source Limitations for Glazing Accessories: Obtain from single manufacturer and single source location for each product.
       2. APPROVED FABRICATORS

Specifier: Modify paragraph below if accepting products of other coated glass manufacturers; consult product representatives for acceptable certified regional glass fabricators.

* + - * 1. Provide products of one of the following Independent Select Fabricators, certified by Guardian to Elite Optical Quality Standard specified in this Section:

<**Insert fabricator name**>.

<**Insert fabricator name**>.

* + - 1. GLASS PRODUCTS

Specifier: Fully tempered glass should be limited to use in locations where necessary for safety glazing, thermal stress management, design load resistance, or attainment of other specific application requirements. Heat-strengthened glass should be otherwise implemented where heat-treatment is warranted for thermal stress management. Please choose the method of heat-treatment in the following section.

* + - * 1. Heat Treatment: [**Tempered Float Glass, ASTM C 1048, Kind FT; CPSC 16CFR-1201; ANSI Z 97.1**] [**Heat-Strengthened Float Glass, ASTM C 1048, Kind HS**], Condition A (uncoated) unless otherwise indicated, ASTM C 1036 Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.

Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.

Provide heat soak testing data for fully tempered product. Testing should be in accordance with EN 14179-1 or EN 14179-2.

Specifier: If "Optical Distortion Limits" listed below are instead measured in millidiopters, modify below to indicate that 95 percent of the glass surface is not to exceed + or – 100 millidiopters. Limit described below applies only to 1/4 inch (6 mm) to 3/8 inch (10 mm) thick float glass without ceramic frit or ink.

Optical Distortion Limits:

Maximum peak-to-valley roll wave 0.003 inch (0.08 mm) in the central area of the glass lite, and 0.008 inch (0.20 mm) within 12 inches (305 mm) of the leading and trailing edge of the lite, measured in accordance with ASTM C 1651.

Maximum center-kink of 0.001 inch (0.025 mm) when roll wave is measured over the surface of the glass perpendicular to the direction of travel through the heat treatment furnace.

Maximum localized and overall bow (warp) per lite shall each be one-half of maximum allowed by ASTM C 1048.

Measure glass lites for optical distortion using Osprey® (version 7 or higher, by Lite Sentry) online distortion measurement system (or equivalent approved in writing by industrial coated glass supplier). Retain test reports for three years following substantial completion. Submit test reports upon Architect's request.

* + - 1. INSULATING GLASS
         1. Insulating Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified according to ASTM E 2190. Provide insulating glass units free of skips or voids in the primary or secondary seals. Utilize an automated vertical insulating line for insulating glass unit assembly, sealing, and curing processes.

Sealing System: Dual seal, with polyisobutylene primary and silicone secondary sealants.

If retaining a specific spacer material, coordinate with manufacturers and products. Retain one of two "Spacer" paragraphs below, and edit options to meet Project requirements.

**Metallic Spacer**: [**Manufacturer's standard spacer material and construction**] [**Aluminum with clear anodic finish**] [**Thermally broken aluminum**] [**Stainless steel**], with desiccant consisting of molecular sieve or silica gel, or a blend of both.

**Non-Metallic Warm Edge Spacer**: Low-conductivity, high wind load-resistant structural silicone spacer, with integrally incorporated desiccant and narrow sightline profile.

Edge Deletion: Delete low-E coating at perimeter of coated lite prior to fabrication of insulating glass units according to coated glass manufacturer’s instructions.

* + - 1. SOURCE QUALITY CONTROL

Specifier: Retain all quality control tests below when specifying insulating glass units.

* + - * 1. Sealant Uniformity: Perform IGMA Sealant Uniformity of Mix Test not less than once per shift. Submit test reports upon Architect's request.
        2. Residual Moisture Content: Perform IGMA Residual Moisture Content by Head of Absorption Test. Perform test in accordance with desiccant manufacturer’s written recommendations. Submit test reports upon Architect's request.
        3. Anisotropy (Iridescence): Perform anisotropy (iridescence) scan utilizing detection system approved by glass manufacturer. Perform test in accordance with detection system manufacturer’s written instructions. Continuously monitor production and record results. Maintain results for a period of not less than 10 years.
        4. Color Variation of Glass Coatings: Provide vacuum deposition coatings on glass complying with color variation limits specified in ASTM C 1376. Perform color monitoring utilizing spectrophotometer equipment approved by glass manufacturer. Perform test in accordance with manufacturer’s approved procedure. Test finished insulated glass units in accordance with reflected color specifications and in comparison, to approved mockup control sample. Statistically monitor production and record results. Maintain results for a period of not less than 10 years.

1. EXECUTION

END OF SECTION 088000