SECTION 08 80 00 (08800)

TRANSLUCENT GLAZING UNITS (TGU)

PART 1GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Glass-Based Light Diffusing Insulating Glazing Units (TGUs)

B. Related Sections:
   1. Section 08 41 00 (08400) - Entrances and Storefronts
   2. Section 08 50 00 (08500) - Windows
   3. Section 08 60 00 (08600) - Skylights
   4. Section 08 80 00 (08800) - Glazing
   5. Section 08 44 00 (08900) _ndash Glazed Curtainwall

1.02 SUBMITTALS

A. Product Data: Submit manufacturer's technical data for TGU materials, including installation and maintenance instructions.
B. Samples: Submit, for verification purposes, 12” X 12” samples of each type of TGU. TGU samples shall have manufacturer’s labels.
C. Spectrophotometer test results: Submit, for possible warranty claim purposes, spectrophotometer test results for TGU units shipped to site.

1.03 QUALITY ASSURANCE

A. [Glazing Standards: Comply with recommendations of Flat Glass Marketing Association (FGMA) "Glazing Manual" and "Sealant Manual" except where more stringent requirements are indicated. Refer to those publications for definitions of glass and glazing terms not otherwise defined in this section or other referenced standards.]
B. [Glazing Standards: Comply with recommendations of Insulating Glass Manufacturers Association (IGMA) except where more stringent requirements are indicated.]
C. Industry standards for glass: ASTM C 1036-01 “Standard Specification for Flat Glass”, ASTM C 1048-04 “Standard Specification Heated Flat Glass _ndash Kind HS, Kind FT Coated and Uncoated Glass” .
D. 16 CFR 1201 “Safety Standard for Architectural Glazing Materials”.
E. Single Source Responsibility for Glass: To ensure consistent quality of appearance and performance, provide glass produced by a single primary manufacturer for each kind and condition of glass indicated and composed of primary glass obtained from a single source for each type and class required.

1.04 MULLION/FRAMING DESIGN

A. Provide framing system with minimum ¼” diameter or slot design of 3/16” x 3/8” vent/drainage holes for each TGU.
B. Keep glazing rebate clear of protrusions except glass support setting blocks and spacer shims. Setting blocks shall be designed or positioned to allow water passage to weep or vent holes.
C. Provide glazing stops with plane, continuous and uniform supports for surfaces of TGU.
D. Frame joints shall be adequately sealed to prevent water and air infiltration from exterior and interior.

E. Glazing installation must ensure that intra-frame cavity is drained and vented to outside as per TGU manufacturer's recommendations.
F. Edge clamping pressure must be sufficient to achieve an air and watertight seal but should not exceed 10 lbs. per linear inch to avoid risk of unit damage.
G. Structurally design frame members to withstand wind loads and dead loads transferred by TGU. Frame members shall not deflect more than lesser of length/175 or ¾" at full design load. Support edges of TGU to resist wind and other loads. Minimum bite on glass edge shall be 13 mm (1/2") to firmly support TGU when exposed to static and dynamic loads.
H. Height of glass stops may vary depending on area of TGU, external forces and functions. Manufacturers of glass, framing, sealed units & sealants as well as architectural specification should be consulted. Many unit assembly sealants must be shielded from direct sunlight, depending upon glass specified. A stop height of approximately 19 mm (3/4") is commonly used. Minimum bite on glass edge shall be 13 mm (1/2") to firmly support insulating glass unit when exposed to static and dynamic loads.
I. Use structurally adequate thermally broken frames with Solera® TGU to minimize condensation on interior surfaces in cold weather. Thermal stress on TGU is reduced when thermally broken frames are used.
J. Seal Solera® TGU to interior to create complete air barrier and prevent migration of air and moisture from entering glazing cavity from building interior.
K. The 'intra-frame cavity', located between Solera® TGU and framing system must be vented and self-draining as per TGU manufacturer's recommendations.
L. Glazing clearances must be sufficient to accommodate manufacturing tolerances in TGU size and overall thickness and to ensure that TGU "floats" within retaining system as per TGU manufacturer's recommendations.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Protect TGU during delivery, storage and handling to comply with manufacturer's directions and as required to prevent edge damage to glass.

1.06 PROJECT CONDITIONS

A. Environmental Conditions: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturer or when joint substrates are wet due to rain, frost, condensation or other causes.

1.07 WARRANTY

A. Submit TGU manufacturer's warranty against defects and workmanship for a period of ten (10) years from date of purchase, including:
    1. Discoloration of veil material by more than 2.0 ΔE (ASTM D 2244-02e1 (Reapproved 2005));
    2. Loss of light transmittance greater than 3%, determined according to manufacturer's technical data;
    3. Seal leakage;
    4. Substantial deterioration of insulating insert;
    5. Crushing or corrosion of spacer;
    6. Buildup of visible internal moisture.

PART 2PRODUCTS

2.01 ACCEPTABLE TRANSLUCENT GLAZING UNIT MANUFACTURERS

Advanced Glazings Limited, P.O. Box 1460 Station “A” , Sydney, N.S. Canada, B1P 6R7, phone (902)794-2899, email info@advancedglazings.com

2.02 TRANSLUCENT GLAZING UNITS (TGU)

A. TGU Design and Appearance:

1. The Translucent Glazing Unit shall be of a design such as to present a monolithic glass section without visible internal framing, support or other solid member inside of the perimeter spacer. The ability to use nearly any type or manufacture of architectural flat glass shall enable the visual integration of translucent surfaces with those of nearby vision glass as well as ensuring that the appearance of the translucent glazing surfaces does not deteriorate over the life of the building. The employment of separate technologies for thermal insulation and light diffusion shall be such as to ensure that different thermal insulation specifications do not affect light transmission.

B. TGU Description:

1. Air filled preassembled units consisting of:
   a. Two lites of glass;
   b. Honeycomb transparent insulation core aligned perpendicular to glazing, filled with Aerogel, for TGU thermal insulation;
   c. Translucent, non-woven veils permanently bonded to internal glass surfaces;
   d. Continuous perimeter metal spacer bar separated from glass surfaces with foam thermal break;
   e. Glass lites connected together with spacer bar using structural silicone sealant.
   f. Airspace within TGU filled with air pressure equalized to atmospheric pressure with stainless steel capillary pressure equalization (vent) tube.
   g. Glazing unit shall not contain in excess of .01 parts per million by weight each of Volatile Organic Compounds, asbestos, resorcinol-formaldehyde, pheono-resorcinol formaldehyde, urea formaldehyde, CFC, HFC, HCFC, Halon, Benzene, Cadmium (and compounds, Carbon tetrachloride, Cyanide (and compounds) Toluene, Xylenes, Lead. 1,1,1,Trichlorethane, Trichlorethylene, MEK, and MIK

2. Overall thickness and size:
   a. Thickness: 1.75” plus glass lites.
   b. Maximum overall size, edge of glass: 60” x 144” (1524mm X 3658mm)

3. Frame Compatibility: Solera "T R9 + Aerogel" .
4. TGU performance
   a. Thermal insulation (U-value): 0.11 (Btu/hr·ft²·°F)
   b. Daylight transmittance: 30 %
   c. Light Diffusion Power (LDP): excellent
   d. Daylight to solar heat gain ratio: LSG=1.08
   e. Solar heat gain coefficient (no shade): SHGC=0.28
   f. Sound transmittance class (STC) (ASTM E 70-97): 35
   g. Maximum color shift: [2 Δ E] over 5 years.
   h. Flame spread (ASTM E 84-05e1): 5.
   i. Smoke developed (ASTM E 84-054e1): 10.

j. Spacer resistance to crushing: 500 lbs/lineal Ft.

C. Glass:
1. Outboard lite: 6mm tempered Clear
as manufactured by:
a.
b.
c.
2. Inboard lite: 6mm tempered Clear
as manufactured by:
a.
b.
c.

D. Veil set:
1. AGL401 exterior, AGL545 interior

E. Spacer bar:
1.Solera-T R9 + Aerogel

F. Foam thermal break: minimum 1/32"(0.8mm).

G. Capillary pressure equalization (vent) tube: stainless steel, diameter to allow for pressure equalization while also preventing uptake of particulate matter.

H. Daylighting study: Visible light transmittance shall be as agreed upon between the Architect and the manufacturer and will be based on "Radiance" studies as provided by the manufacturer as a part of this work. Studies will demonstrate the improvement of light distribution and light levels from the use of diffuse light from translucent glazings. Study will include modelling results of light levels throughout the space to be analyzed. (Radiance is a program developed by Lawrence Berkeley National Laboratory.)

2.03 ELASTOMERIC GLAZING SEALANTS AND PREFORMED GLAZING TAPES

A. General: Provide products of type indicated and complying with following requirements:
1. Glazing sealants and glazing tapes: to glazing frame manufacturer’s standards.
2. Compatibility: Select glazing sealants and tapes of proven compatibility with other materials with which they will come into contact, including glass products, seals of insulating glass units, and glazing channel substrates, under conditions of installation and service, as demonstrated by testing and field experience.
3. Suitability: Comply with recommendations of sealant and glass manufacturers for selection of glazing sealants and tapes which have performance characteristics suitable for applications indicated and conditions at time of installation.
4. Elastomeric Sealant Standard: Provide manufacturer's standard chemically curing, elastomeric sealant of base polymer indicated which complies with ASTM C 920-05 requirements, including those for Type, Grade, Class and Uses.
5. Colors: Provide color of exposed sealants indicated or, if not otherwise indicated, as selected by Owner’s Representative from manufacturer's standard colors.

2.04 MISCELLANEOUS GLAZING MATERIALS

A. Compatibility: Provide materials with proven record of compatibility with surfaces contacted in installation.
B. Cleaners, Primers and Sealers: Type recommended by sealant or gasket manufacturer.
C. Setting Blocks, Spacers: must be compatible with TGU sealant.

PART 3EXECUTION

3.01 EXAMINATION:

A. Require Glazier to inspect work of glass framing erector for compliance with manufacturing and installation tolerances, including those for size, squareness, offsets at corners; for presence and functioning of weep system; for existence of minimum required face or edge clearances; and for effective sealing of joinery. Obtain Glazier's written report, listing conditions detrimental to performance of glazing work. Do not allow glazing work to proceed until unsatisfactory conditions have been corrected.

3.02 PREPARATION:

A. Clean glazing channels and other framing members to receive glass, immediately before glazing. Remove coatings, which are not firmly bonded to substrates. Remove lacquer from metal surfaces where elastomeric sealants are indicated for use.

3.03 GLAZING, GENERAL

A. Comply with combined printed recommendations of glass manufacturers, of manufacturers of sealants, gaskets and other glazing materials, except where more stringent requirements are indicated, including those of referenced glazing standards.
B. Protect glass from edge damage during handling and installation; use a rolling block in rotating glass units to prevent damage to glass corners. Do not impact glass with metal framing. Use suction cups to shift TGU within openings; do not raise or drift glass with a pry bar. Rotate glass with flares or bevels along one horizontal edge that would occur in vicinity of setting blocks so that these are located at top of opening. Remove from project and dispose of glass units with edge damage or other imperfections of kind that, when installed, weakens glass and impairs performance and appearance.
C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction sealant-substrate testing.
D. Anchor components securely in place in manner indicated. Shim and allow for movement resulting from changes in thermal conditions. Provide separators and isolators to prevent corrosion, electrolytic deterioration, and "freeze-up" of moving joints.
E. Glazing: Inspect glass and framing for compliance with manufacturing and installation tolerances, including size, squareness, and offsets at corners; for existence of minimum face or edge clearances; and for effective sealing of joinery.
    1. Avoid point loading of glass. Do not proceed with glazing work until unsatisfactory conditions have been corrected. Do not field-cut glass.
    2. Field-Glazed Structural Silicone Glazing Work: Clean frames and glass surfaces with an approved solvent. Prime surfaces and apply structural sealant in accordance with manufacturer's recommendations. Clean excess structural sealant. Mechanically hold glass firmly in place until sealant is sufficiently cured. Install compressible backer rods in joint before applying weather seal sealant.

3.04 GLAZING

A. Install setting blocks of proper size in sill rabbet, located one quarter of glass width from each corner, but with edge nearest corner not closer than 6" from corner, unless otherwise required.
B. Provide spacers inside and out, of correct size and spacing to preserve required face clearances, for glass sizes larger than 50 united inches (length plus height), except where gaskets or glazing tapes with continuous spacer rods are used for glazing.

Provide 1/8" minimum bite of spacers on glass and use thickness equal to sealant width, except with sealant tape use thickness slightly less than final compressed thickness of tape.

C. Provide edge blocking to comply with requirements of referenced glazing standard, except where otherwise required by glass unit manufacturer. Set units of glass in each series with uniformity of pattern, draw, bow and similar characteristics.

3.05 PROTECTION AND CLEANING

A. Remove nonpermanent labels and clean surfaces.

B. Protect glass from contact with contaminating substances resulting from construction operations. If, despite such protection, contaminating substances do come into contact with glass, remove immediately by method recommended by glass manufacturer.

C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less often than once a month, for build-up of dirt, scum, alkali deposits or staining. When examination reveals presence of these forms of residue, remove by method recommended by glass manufacturer.

D. Remove and replace glass which is broken, chipped, cracked, abraded or damaged in other ways during construction period, including natural causes, accidents and vandalism.

END OF SECTION