

**SECTION 08 80 00**  
**GLAZING**

**PART 1 - GENERAL****1.1 DESCRIPTION**

This section specifies glass, plastic, related glazing materials and accessories. Glazing products specified apply to factory or field glazed items.

**1.2 RELATED WORK**

- A. Factory glazed by manufacturer in following units:
  - 1. Sound resistant doors: Section 08 11 13, HOLLOW METAL DOORS AND FRAMES, and Section 08 14 00, WOOD DOORS.
  - 2. Mirrors: Section 10 28 00, TOILET, BATH, AND LAUNDRY ACCESSORIES.
  - 3. Section 08 51 13, ALUMINUM WINDOWS (Double Hung).

**1.3 LABELS**

- A. Temporary labels:
  - 1. Provide temporary label on each light of glass identifying manufacturer or brand and glass type, quality and nominal thickness.
  - 2. Label in accordance with NFRC (National Fenestration Rating Council) label requirements.
  - 3. Temporary labels shall remain intact until glass is approved by the COR.
- B. Permanent labels:
  - 1. Locate in corner for each pane.
  - 2. Label in accordance with ANSI Z97.1 and SGCC (Safety Glass Certification Council) label requirements.
    - a. Tempered glass.
    - b. Organic coated glass.

**1.4 PERFORMANCE REQUIREMENTS**

- A. Building Enclosure Vapor Retarder and Air Barrier:
  - 1. Utilize the inner pane of multiple pane sealed units for the continuity of the air barrier and vapor retarder seal.
  - 2. Maintain a continuous air barrier and vapor retarder throughout the glazed assembly from glass pane to heel bead of glazing sealant.
- B. Glass Thickness:
  - 1. Select thickness of exterior glass to withstand dead loads and wind loads acting normal to plane of glass at design pressures calculated in accordance with applicable code.
  - 2. Test in accordance with ASTM E 1300.

3. Thicknesses listed are minimum. Coordinate thicknesses with framing system manufacturers.

#### **1.5 SUBMITTALS**

- A. In accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Manufacturer's Certificates:
  1. Certificates stating that wire glass, meets requirements for safety glazing material as specified in ANSI Z97.1.
  2. Certificate on shading coefficient.
  3. Certificate on "R" value when value is specified.
  4. Certificate test reports confirming compliance's with specified bullet resistive rating.
  5. Certificate that blast resistant glass meets the requirements of UFC4-010-01.
- C. Warranty: Submit written guaranty, conforming to General Condition requirements, and to "Warranty of Construction" Article in this Section.
- D. Manufacturer's Literature and Data:
  1. Glass, each kind required.
  2. Insulating glass units.
  3. Elastic compound for metal sash glazing.
  4. Putty, for wood sash glazing.
  5. Glazing cushion.
  6. Sealing compound.
  7. Plastic glazing material, each type required.
- E. Samples:
  1. Size: 150 mm by 150 mm (6 inches by 6 inches).
  2. Tinted glass.
  3. Reflective glass.
- F. Preconstruction Adhesion and Compatibility Test Report: Submit glazing sealant manufacturer's test report indicating glazing sealants were tested for adhesion to glass and glazing channel substrates and for compatibility with glass and other glazing materials.

#### **1.6 DELIVERY, STORAGE AND HANDLING**

- A. Delivery: Schedule delivery to coincide with glazing schedules so minimum handling of crates is required. Do not open crates except as required for inspection for shipping damage.

- B. Storage: Store cases according to printed instructions on case, in areas least subject to traffic or falling objects. Keep storage area clean and dry.
- C. Handling: Unpack cases following printed instructions on case. Stack individual windows on edge leaned slightly against upright supports with separators between each.

**1.7 PROJECT CONDITIONS**

Field Measurements: Field measure openings before ordering tempered glass products. Be responsible for proper fit of field measured products.

**1.8 WARRANTY**

- A. Warranty: Conform to terms of "Warranty of Construction", FAR clause 52.246-21, except extend warranty period for the following:
  - 1. Bullet resistive plastic material to remain visibly clear without discoloration for 10 years.
  - 2. Insulating glass units to remain sealed for 10 years.
  - 3. Laminated glass units to remain laminated for 5 years.
  - 4. Polycarbonate to remain clear and ultraviolet light stabilized for 5 years.
  - 5. Insulating plastic to not have more than 6 percent decrease in light transmission and be ultraviolet light stabilized for 10 years.

**1.9 APPLICABLE PUBLICATIONS**

- A. Publications listed below form a part of this specification to extent referenced. Publications are referenced in text by basic designation only.
- B. American National Standards Institute (ANSI):
  - Z97.1-04.....Safety Glazing Material Used in Building - Safety Performance Specifications and Methods of Test.
- C. American Society for Testing and Materials (ASTM):
  - C1363-05.....Thermal Performance of Building Assemblies, by Means of A Hot Box Apparatus
  - C542-05.....Lock-Strip Gaskets.
  - C716-06.....Installing Lock-Strip Gaskets and Infill Glazing Materials.
  - C794-06.....Adhesion-in-Peel of Elastomeric Joint Sealants.
  - C864-05.....Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers.

- C920-08.....Elastomeric Joint Sealants.
- C964-07.....Standard Guide for Lock-Strip Gasket Glazing.
- C1036-06.....Flat Glass.
- C1048-04.....Heat-Treated Flat Glass-Kind HS, Kind FT Coated  
and Uncoated Glass.
- C1172-09.....Laminated Architectural Flat Glass.
- C1376-10.....Pyrolytic and Vacuum Deposition Coatings on  
Flat Glass.
- D635-06.....Rate of Burning and/or Extent and Time of  
Burning of Self-Supporting Plastic in a  
Horizontal Position.
- D4802-02.....Poly (Methyl Methacrylate) Acrylic Plastic  
Sheet.
- E84-09.....Surface Burning Characteristics of Building  
Materials.
- E1300-09.....Determining Load Resistance of Glass in  
Buildings.
- E2190-08.....Insulating Glass Unit
- D. Commercial Item Description (CID):
- A-A-59502.....Plastic Sheet, Polycarbonate
- E. Code of Federal Regulations (CFR):
- 16 CFR 1201 - Safety Standard for Architectural Glazing Materials;  
1977, with 1984 Revision.
- F. National Fire Protection Association (NFPA):
- 80-08.....Fire Doors and Windows.
- G. National Fenestration Rating Council (NFRC)
- H. Safety Glazing Certification Council (SGCC) 2009:  
Certified Products Directory (Issued Semi-Annually).
- I. Glass Association of North America (GANA):
- Glazing Manual (Latest Edition)  
Sealant Manual (2008)
- J. American Society of Civil Engineers (ASCE):
- ASCE 7-10.....Wind Load Provisions

## **PART 2 - PRODUCT**

### **2.1 GLASS**

- A. Use thickness stated unless specified otherwise in assemblies.
- B. Clear Glass:
1. ASTM C1036, Type I, Class 1, Quality q4.

2. Thickness, 6 mm (1/4 inch).

## 2.2 HEAT-TREATED GLASS

### A. Clear Tempered Glass:

1. ASTM C1048, Kind FT, Condition A, Type I, Class 1, Quality q3.
2. Thickness, 6 mm (1/4 inch).

## 2.3 COATED GLASS

### A. Spandrel Glass:

1. ASTM C1048, Kind HS, Condition B, Type I.
2. Thickness, as indicated.

### B. Low-E Tempered Glass:

1. ASTM C1048, Kind FT, Condition C, Type I, Class 1, Quality q3 with low emissivity pyrolytic coating having an E of 0.15.
2. Apply coating to third surface of insulating glass units.
3. Thickness, 4.8 mm (3/16 inch).

## 2.4 INSULATING GLASS UNITS

- ### A. Provide factory fabricated, hermetically sealed glass unit consisting of two panes of glass separated by a dehydrated air space and comply with ASTM E2190.

### B. Assemble units using glass types specified:

### C. Sealed Edge Units (SEU):

#### 1. Insulating Glass Unit Makeup

##### a. Outboard Lite

1. Glass type:
2. Glass Tint: Low-e
3. Nominal Thickness: 1/4-inch
4. Glass Strength: (Annealed, Heat-Strengthened, Tempered)
5. Coating Orientation: (Surface #2)

##### b. Spacer

1. Nominal Thickness: 1/2-inch
2. Gas Fill: (Air)

##### c. Inboard Lite

1. Glass Type:
2. Glass Tint: clear
3. Nominal Thickness: 1/4-inch
4. Glass Strength: (Annealed, Heat-Strengthened, Tempered)
5. Coating Orientation: (N/A)

#### 2. Performance Characteristics (Center of Glass)

- a. Visible Transmittance: 50%

- b. Visible Reflectance: 11%
  - c. Winter U-factor (U-value): .29
  - d. Shading Coefficient (SC): .29
  - e. Solar heat Gain Coefficient (SHGC): .25
3. Glass shall be annealed, heat strengthened or tempered as required by codes, or as required to meet thermal stress and wind loads.
  4. Glass heat-treated by horizontal (roller hearth) process with inherent roller wave distortion parallel to the bottom edge of the glass as installed when specified.

E. FEU Clear Glass.

1. Interior panes, ASTM C1036, Type I, Class 1, Quality q3, 3 mm (1/8 inch) thick.
2. Thickness, 11 mm (7/16 inch) minimum.

**2.5 FIRE RESISTANT GLASS WITHOUT WIRE MESH**

A. Fire resistant glass or glass assembly classified by UL in Building Materials Directory or other approved testing laboratory bearing permanent mark of classification.

B. Firelite.

1. UL listing R13377-1, 4.8 mm (3/16 inch) thick, unpolished.
2. Distributed by Technical Glass Products; Kirkland, WA 98033.

C. Pyrovue Commercial.

1. UL listing R10178(N), 41 mm (1-5/8 inch) thick.
2. Represented by Advanced Glass Systems Corporation, Trumbauersville, PA 18970-0051

**2.6 GLAZING ACCESSORIES**

A. As required to supplement the accessories provided with the items to be glazed and to provide a complete installation. Ferrous metal accessories exposed in the finished work shall have a finish that will not corrode or stain while in service.

B. Setting Blocks: ASTM C864:

1. Channel shape; having 6 mm (1/4 inch) internal depth.
2. Shore a hardness of 80 to 90 Durometer.
3. Block lengths: 50 mm (two inches) except 100 to 150 mm (four to six inches) for insulating glass.
4. Block width: Approximately 1.6 mm (1/16 inch) less than the full width of the rabbet.
5. Block thickness: Minimum 4.8 mm (3/16 inch). Thickness sized for rabbet depth as required.

- C. Spacers: ASTM C864:
1. Channel shape having a 6 mm (1/4 inch) internal depth.
  2. Flanges not less 2.4 mm (3/32 inch) thick and web 3 mm (1/8 inch) thick.
  3. Lengths: One to 25 to 76 mm (one to three inches).
  4. Shore a hardness of 40 to 50 Durometer.
- D. Sealing Tapes:
1. Semi-solid polymeric based material exhibiting pressure-sensitive adhesion and withstanding exposure to sunlight, moisture, heat, cold, and aging.
  2. Shape, size and degree of softness and strength suitable for use in glazing application to prevent water infiltration.
- E. Spring Steel Spacer: Galvanized steel wire or strip designed to position glazing in channel or rabbeted sash with stops.
- F. Glazing Gaskets: ASTM C864:
1. Firm dense wedge shape for locking in sash.
  2. Soft, closed cell with locking key for sash key.
  3. Flanges may terminate above the glazing-beads or terminate flush with top of beads.
- G. Lock-Strip Glazing Gaskets: ASTM C542, shape, size, and mounting as indicated.
- H. Glazing Sealants: ASTM C920, silicone neutral cure:
1. Type S.
  2. Class 25
  3. Grade NS.
  4. Shore A hardness of 25 to 30 Durometer.
- I. Color:
1. Color of glazing compounds, gaskets, and sealants used for aluminum color frames shall match color of the finished aluminum and be nonstaining.
  2. Color of other glazing compounds, gaskets, and sealants which will be exposed in the finished work and unpainted shall be black, gray, or neutral color.
- J. Smoke Removal Unit Targets: Adhesive targets affixed to glass to identify glass units intended for removal for smoke control. Comply with requirements of local Fire Department.

**PART 3 - EXECUTION****3.1 EXAMINATION**

- A. Verification of Conditions:
  - 1. Examine openings for glass and glazing units; determine they are proper size; plumb; square; and level before installation is started.
  - 2. Verify that glazing openings conform with details, dimensions and tolerances indicated on manufacturer's approved shop drawings.
- B. Advise Contractor of conditions which may adversely affect glass and glazing unit installation, prior to commencement of installation: Do not proceed with installation until unsatisfactory conditions have been corrected.
- C. Verify that wash down of adjacent masonry is completed prior to erection of glass and glazing units to prevent damage to glass and glazing units by cleaning materials.

**3.2 PREPARATION**

- A. For sealant glazing, prepare glazing surfaces in accordance with GANA-02 Sealant Manual.
- B. Determine glazing unit size and edge clearances by measuring the actual unit to receive the glazing.
- C. Shop fabricate and cut glass with smooth, straight edges of full size required by openings to provide GANA recommended edge clearances.
- D. Verify that components used are compatible.
- E. Clean and dry glazing surfaces.
- F. Prime surfaces scheduled to receive sealants, as determined by preconstruction sealant-substrate testing.

**3.3 INSTALLATION - GENERAL**

- A. Install in accordance with GANA-01 Glazing Manual and GANA-02 Sealant Manual unless specified otherwise.
- B. Glaze in accordance with recommendations of glazing and framing manufacturers, and as required to meet the Performance Test Requirements specified in other applicable sections of specifications.
- C. Set glazing without bending, twisting, or forcing of units.
- D. Do not allow glass to rest on or contact any framing member.
- E. Glaze doors and operable sash, in a securely fixed or closed and locked position, until sealant, glazing compound, or putty has thoroughly set.
- F. Tempered Glass: Install with roller distortions in horizontal position unless otherwise directed.

**G. Insulating Glass Units:**

1. Glaze in compliance with glass manufacturer's written instructions.
2. When glazing gaskets are used, they shall be of sufficient size and depth to cover glass seal or metal channel frame completely.
3. Do not use putty or glazing compounds.
4. Do not grind, nip, cut, or otherwise alter edges and corners of fused glass units after shipping from factory.
5. Install with tape or gunnable sealant in wood sash.

**H. Fire Resistant Glass:**

1. Wire glass: Glaze in accordance with NFPA 80.
2. Other fire resistant glass: Glaze in accordance with UL design requirements.

**3.4 INSTALLATION - DRY METHOD (TAPE AND GASKET SPLINE GLAZING)**

- A. Cut glazing tape to length; install on glazing pane. Seal corners by butting and sealing junctions with butyl sealant.
- B. Place setting blocks at 1/3 points with edge block no more than 150 mm (6 inches) from corners.
- C. Rest glazing on setting blocks and push against fixed stop with sufficient pressure to attain full contact.
- D. Install removable stops without displacing glazing spline. Exert pressure for full continuous contact.
- E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- F. Trim protruding tape edge.

**3.5 INSTALLATION - WET/DRY METHOD (PREFORMED TAPE AND SEALANT)**

- A. Cut glazing tape to length and set against permanent stops, 5 mm (3/16 inch) below sight line. Seal corners by butting tape and dabbing with butyl sealant.
- B. Apply heel bead of butyl sealant along intersection of permanent stop with frame ensuring full perimeter seal between glass and frame to complete the continuity of the air and vapor seal.
- C. Place setting blocks at 1/3 points with edge block no more than 150 mm (6 inches) from corners.
- D. Rest glazing on setting blocks and push against tape and heel bead of sealant with sufficient pressure to achieve full contact at perimeter of pane or glass unit.

- E. Install removable stops, with spacer strips inserted between glazing and applied stops, 6 mm (1/4 inch) below sight line. Place glazing tape on glazing pane or unit with tape flush with sight line.
- F. Fill gap between glazing and stop with Class 50 Neutral-Curing Silicone Glazing Sealant type sealant to depth equal to bite of frame on glazing, but not more than 9 mm (3/8 inch) below sight line.
- G. Apply cap bead of Class 50 Neutral-Curing Silicone Glazing Sealant type sealant along void between the stop and the glazing, to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

### **3.6 INSTALLATION - REGLAZING HISTORIC FRAMING**

- A. Steel Windows: For glazing with glazing beads: ASTM C920.
- B. Wood Sash: For glazing with glazing beads: Tape or ASTM C920, gunnable sealant.
- C. Lock-strip Gaskets: Follow ASTM C716 for installation.

### **3.7 REPLACEMENT AND CLEANING**

- A. Clean new glass surfaces removing temporary labels, paint spots, and defacement after approval by the COR.
- B. Replace cracked, broken, and imperfect glass, or glass which has been installed improperly.
- C. Leave glass, putty, and other setting material in clean, whole, and acceptable condition.

### **3.8 PROTECTION**

Protect finished surfaces from damage during erection, and after completion of work. Strippable plastic coatings on colored anodized finish are not acceptable.

### **3.9 GLAZING SCHEDULE**

- A. Fire Resistant Glass:
  - 1. Install clear wire glass in interior fire rated or labeled doors and windows.
  - 2. Install clear wire glass in exterior windows and doors indicated to receive wire glass.
  - 3. Use Fire Resistant Glass without wire mesh as identified by glass types on Sheet AS-890.
- B. Tempered Glass:
  - 1. Install in full and half glazed doors unless indicated otherwise.
  - 2. Install in storefront, windows, and door sidelights adjacent to doors.
  - 3. Use clear tempered glass on interior side lights and doors.

4. Use SEU Low E tempered and clear glass, G-41, on storefront and sidelights.

5. Use clear tempered glass in exterior and interior panes unless specified otherwise at insulating glass units adjacent to door.

C. Clear Glass:

1. Interior observation windows not specified otherwise.

2. Interior pane of dual glazed windows not receiving tempered, laminated or organic coated glass, or other special glass indicated or specified.

D. Insulating Glass:

1. Install SEU clear tempered glass in windows, interior pane of dual glazed windows, storefronts, adjacent to entrances or walks.

2. Install SEU clear glass in windows, interior pane of dual glazed windows, storefronts, not adjacent to entrances or walks.

3. Install SEU tinted tempered and clear tempered glass in storefronts, adjacent to entrances or walks.

E. Spandrel Glass: Install specified spandrel glazing where indicated.

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