

**SECTION 08 80 00  
GLAZING**

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

- A. This section specifies glass, 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. Section 08 11 13, HOLLOW METAL DOORS AND FRAMES.
  2. Section 08 41 13, ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS.
  3. Section 08 44 13, GLAZED ALUMINUM CURTAIN WALLS.

**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 Resident Engineer.
- 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. Laminated glass or have certificate for panes without permanent label.

**1.4 PERFORMANCE REQUIREMENTS**

- A. 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 ASCE 7 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. Certificate on shading coefficient.
  - 2. Certificate on "R" value when value is specified.
- 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. Sealing compound.
- E. Samples:
  - 1. Size: 150 mm by 150 mm (6 inches by 6 inches).
- 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**

- A. 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. Underwriters Laboratories, Inc. (UL):  
752-06.....Bullet-Resisting Equipment.
- J. Unified Facilities Criteria (UFC):  
4-010-01-2007.....DOD Minimum Antiterrorism Standards for  
Buildings
- K. Glass Association of North America (GANA):  
Glazing Manual (Latest Edition)  
Sealant Manual (2008)
- L. 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 q3.
  2. Thickness, as indicated.

### **2.2 HEAT-TREATED GLASS**

- A. Clear Heat Strengthened Glass:
1. ASTM C1048, Kind HS, Condition A, Type I, Class 1, Quality q3.
  2. Thickness, as indicated.

B. Clear Tempered Glass:

1. ASTM C1048, Kind FT, Condition A, Type I, Class 1, Quality q3.
2. Thickness, as indicated.

**2.3 LAMINATED GLASS**

A. Two or more lites of glass bonded with an interlayer material for use in building glazing

B. Colored Interlayer:

1. The interlayer assembly shall have uniform color presenting same appearance as tinted glass assembly.
2. Match Viracon Arctic Snow.

C. Use min. 0.75 mm (0.030 inch) thick interlayer for vertical glazing where 1.5 mm (0.060 inch) interlayer is not otherwise shown or required.

**2.4 LAMINATED GLAZING ASSEMBLIES**

A. Clear Glazing:

1. Both panes clear glass ASTM C1036, Type I, Class 1, Quality q3.
2. Thickness: Each pane, 1/4 inch.

B. Clear Tempered Glazing:

1. Both panes ASTM C1048, Kind FT, Condition A, Type I, Class 1, Quality q3.
2. Thickness: Each pane, 1/4 inch.

C. Clear Heat Strengthened Glazing:

1. Both panes, ASTM C1048, Kind HS, Condition A, Type I, Class 1, Quality q3.
2. Thickness: Each pane, 1/4 inch.

**2.5 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. 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.

D. 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.

E. 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.

F. 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.

**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. Laminated Glass:
  - 1. Tape edges to seal interlayer and protect from glazing sealants.
  - 2. Do not use putty or glazing compounds.

### **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 1/4 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 REPLACEMENT AND CLEANING**

- A. Clean new glass surfaces removing temporary labels, paint spots, and defacement after approval by Resident Engineer.
- 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.

### **3.6 PROTECTION**

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

### **3.7 GLAZING SCHEDULE**

- A. 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, and on exterior doors and sidelights unless otherwise indicated or specified.
- B. Glass Types:
  - 1. Type 1: Low-e-coated, Clear Insulating Glass
    - a. Overall Unit Thickness: 1 inch.
    - b. Thickness of each glass lite: 1/4 inch.
    - c. Outdoor lite: Clear Heat Strengthened Glass.
    - d. Interspace Content: Air.
    - e. Indoor lite: Clear glass.
    - f. Low-E Coating: **Pyrolytic on Second surface.**
    - g. **Winter Nighttime U-Factor: 0.30**
    - h. **Summer Daytime U-Factor: 0.27**
    - i. **Visible Light Transmittance: 53 percent**
    - j. **Solar Heat Gain Coefficient: 0.33**
    - k. **Shading Coefficient: 0.39(AMEND 1)**



2. Type 2: Low-e-coated, clear insulating laminated glass.
  - a. Overall Unit Thickness: 1 inch.
  - b. Outdoor lite: 1/4 inch thick, Clear Heat Strengthened Glass.
  - c. Interspace Content: Air.
  - d. Indoor lite: Clear laminated glass with two plies of heat strengthened glass.
    - 1) Thickness of each glass ply: 1/8 inch.
    - 2) Interlayer Thickness: Each layer 0.030 inch.
    - 3) Interlayer types: One each of clear PVB and cool white PVB.
  - e. Low-E Coating: **Pyrolytic on Second surface.**
  - f. **Winter Nighttime U-Factor: 0.30**
  - g. **Summer Daytime U-Factor: 0.29**
  - h. **Visible Light Transmittance: 37 percent**
  - i. **Solar Heat Gain Coefficient: 0.31**
  - j. **Shading Coefficient: 0.36(AMEND 1)**
3. Type 3: Clear laminated glass with two plies of heat strengthened glass.
  - a. Thickness of each glass ply: 1/4 inch.
  - b. Interlayer Thickness: Each layer 0.030 inch.
  - c. Interlayer types: One each of clear PVB and cool white PVB.
  - d. **Winter Nighttime U-Factor: 0.95**
  - e. **Summer Daytime U-Factor: 0.86**
  - f. **Visible Light Transmittance: 60 percent**
  - g. **Solar Heat Gain Coefficient: 0.60**
  - h. **Shading Coefficient: 0.69(AMEND 1)**

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