

**SECTION 08 80 00  
GLAZING****PART 1 - GENERAL****1.1 DESCRIPTION:**

A. This section specifies the following:

1. Glass.
2. Glazing materials and accessories for both factory and field glazed assemblies.

**1.2 RELATED WORK:**

B. 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.

**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 label requirements.
3. Temporary labels are to remain intact until glass is approved by Contracting Officer Representative (COR).

B. Permanent labels:

1. Locate in corner for each pane.
2. Label in accordance with ANSI Z97.1 and SGCC label requirements.
  - a. Tempered glass.
  - b. Laminated glass or have certificate for panes without permanent label.
3. Fire rated glazing assemblies: Mark in accordance with IBC.

**1.4 PERFORMANCE REQUIREMENTS:**

A. General: Design glazing system consistent with guidance and practices presented in the GANA Glazing Manual, GANA Laminated Glazing Manual, and GANA Sealant Manual, as applicable to project. Installed glazing is to withstand applied loads, thermal stresses, thermal movements, building movements, permitted tolerances, and combinations of these conditions without failure, including loss or glass breakage

attributable to defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; unsafe engagement of the framing system; deflections beyond specified limits; or other defects in construction.

B. Glazing Unit Design: Design glass, including engineering analysis meeting requirements of authorities having jurisdiction. Thicknesses listed are minimum. Coordinate thicknesses with framing system manufacturers.

1. Design glass in accordance with ASTM E1300, and for conditions beyond the scope of ASTM E1300, by a properly substantiated structural analysis.

#### 1.5 SUBMITTALS:

A. In accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

BE. Manufacturer's Certificates:

1. Certificate stating that fire-protection and fire-resistive glazing units meet code requirements for fire-resistance-rated assembly and applicable safety glazing requirements.

CD. Manufacturer Warranty.

DE. Manufacturer's Literature and Data:

1. Glass, each kind required.
2. Insulating glass units.
3. Glazing cushion.
4. Sealing compound.

EF. Samples:

1. Size: 305 mm by 305 mm (12 inches by 12 inches).

FG. 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 to assume for proper fit of field measured products.

**1.8 WARRANTY:**

- A. Construction Warranty: Comply with the FAR clause 52.246-21 "Warranty of Construction".
- B. Manufacturer Warranty: Manufacturer shall warranty their glazing from the date of installation and final acceptance by the Government as follows. Submit manufacturer warranty.
  - 1. Warrant electrochromic laminated products against lamination defects, such as edge separation or delamination, that materially obstruct vision through the glass for a period of five (5) years.
  - 2. Warrant electrochromic controls against defects in material or workmanship for a period of five (5) 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 Architectural Manufacturers Association (AAMA):
  - 800.....Test Methods for Sealants
  - 810.1-77.....Expanded Cellular Glazing Tape
- C. American National Standards Institute (ANSI):
  - Z97.1-14.....Safety Glazing Material Used in  
Building - Safety Performance Specifications  
and Methods of Test
- D. American Society of Civil Engineers (ASCE):
  - 7-10.....Wind Load Provisions
- E. ASTM International (ASTM):
  - C542-05(R2011).....Lock-Strip Gaskets
  - C716-06.....Installing Lock-Strip Gaskets and Infill  
Glazing Materials
  - C794-10.....Adhesion-in-Peel of Elastomeric Joint Sealants

C864-05(R2011).....Dense Elastomeric Compression Seal Gaskets,  
Setting Blocks, and Spacers

C920-14a.....Elastomeric Joint Sealants

C964-07(R2012).....Standard Guide for Lock-Strip Gasket Glazing

C1036-11(R2012).....Flat Glass

C1048-12.....Heat-Treated Flat Glass-Kind HS, Kind FT Coated  
and Uncoated Glass.

C1172-14.....Laminated Architectural Flat Glass

C1349-10.....Standard Specification for Architectural Flat  
Glass Clad Polycarbonate

C1376-10.....Pyrolytic and Vacuum Deposition Coatings on  
Flat Glass

D635-10.....Rate of Burning and/or Extent and Time of  
Burning of Self-Supporting Plastic in a  
Horizontal Position

D4802-10.....Poly (Methyl Methacrylate) Acrylic Plastic  
Sheet

E84-14.....Surface Burning Characteristics of Building  
Materials

E119-14.....Standard Test Methods for Fire Test of Building  
Construction and Material

E1300-12a.....Load Resistance of Glass in Buildings

E1886-13a.....Standard Test Method for Performance of  
Exterior Windows, Curtain Walls, Doors, and  
Impact Protective Systems Impacted by  
Missile(s) and Exposed to Cyclic Pressure  
Differentials

E1996-14a.....Standard Specification for Performance of  
Exterior Windows, Curtain Walls, Doors, and  
Impact Protective Systems Impacted by Windborne  
Debris in Hurricanes

E2141-12.....Test Methods for Assessing the Durability of  
Absorptive Electrochromic Coatings on Sealed  
Insulating Glass Units

E2190-10.....Insulating Glass Unit

E2240-06.....Test Method for Assessing the Current-Voltage  
Cycling Stability at 90 Degree C (194 Degree F)

- of Absorptive Electrochromic Coatings on Sealed  
Insulating Glass Units
- E2241-06.....Test Method for Assessing the Current-Voltage  
Cycling Stability at Room Temperature of  
Absorptive Electrochromic Coatings on Sealed  
Insulating Glass Units
- E2354-10.....Assessing the Durability of Absorptive  
Electrochromic Coatings within Sealed  
Insulating Glass Units
- E2355-10.....Test Method for Measuring the Visible Light  
Transmission Uniformity of an Absorptive  
Electrochromic Coating on a Glazing Surface
- F1233-08.....Standard Test Method for Security Glazing  
Materials and Systems
- F1642-12.....Test Method for Glazing and Glazing Systems  
Subject to Airblast Loadings
- E. Code of Federal Regulations (CFR):
- 16 CFR 1201-10.....Safety Standard for Architectural Glazing  
Materials
- F. Glass Association of North America (GANA):
- 2010 Edition.....GANA Glazing Manual
- 2008 Edition.....GANA Sealant Manual
- 2009 Edition.....GANA Laminated Glazing Reference Manual
- 2010 Edition.....GANA Protective Glazing Reference Manual
- G. International Code Council (ICC):
- IBC.....International Building Code
- H. Insulating Glass Certification Council (IGCC)
- I. Insulating Glass Manufacturer Alliance (IGMA):
- TB-3001-13.....Guidelines for Sloped Glazing
- TM-3000.....North American Glazing Guidelines for Sealed  
Insulating Glass Units for Commercial and  
Residential Use
- J. Intertek Testing Services - Warnock Hersey (ITS-WHI)
- K. National Fire Protection Association (NFPA):
- 80-13.....Fire Doors and Windows
- 252-12.....Fire Tests of Door Assemblies
- 257-12.....Standard on Fire Test for Window and Glass  
Block Assemblies

- L. National Fenestration Rating Council (NFRC)
- M. Safety Glazing Certification Council (SGCC) 2012:  
Certified Products Directory (Issued Semi-Annually).
- N. Underwriters Laboratories, Inc. (UL):  
9-08(R2009).....Fire Tests of Window Assemblies  
263-14.....Fire Tests of Building Construction and  
Materials  
752-11.....Bullet-Resisting Equipment.
- O. Unified Facilities Criteria (UFC):  
4-010-01-03(R2007).....DOD Minimum Antiterrorism Standards for  
Buildings
- P. U.S. Veterans Administration:  
Physical Security Design Manual for VA Facilities (VAPSDG); Life Safety  
Protected  
Physical Security Design Manual for VA Facilities (VAPSDG); Mission  
Critical Facilities  
Architectural Design Manual for VA Facilities (VASDM)
- Q. Environmental Protection Agency (EPA):  
40 CFR 59(2014).....National Volatile Organic Compound Emission  
Standards for Consumer and Commercial Products

## **PART 2 - PRODUCT**

### **2.1 GLASS:**

- A. Provide minimum thickness stated and as additionally required to meet performance requirements.
  - 1. Provide minimum 6 mm (1/4 inch) thick glass units unless otherwise indicated.
- B. Obtain glass units from single source from single manufacturer for each glass type.
- C. Clear Glass:
  - 1. ASTM C1036, Type I, Class 1, Quality q3.
- D. Ultra-clear-Low-Iron Float Glass:
  - 1. ASTM C1036, Type I, Class 1, Quality q3 and with visible light transmission of not less than 90 percent.
- E. Patterned and Wired Flat Glass:
  - 1. ASTM C1036, Type II, Class 1, Pattern P1, Finish F1, Quality Q5, Q6, Mesh m1.

**2.2 HEAT-TREATED GLASS:**

## A. Tempered Patterned Glass:

1. ASTM C1048, Kind FT, Type II, Class 1, Form 3, finish, pattern and quality as indicated in construction documents.

**2.3 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 are to have a finish that will not corrode or stain while in service. Fire rated glazing to be installed with glazing accessories in accordance with the manufacturer's installation instructions.

## B. Setting Blocks: ASTM C864:

1. Silicone type.
2. Channel shape; having 6 mm (1/4 inch) internal depth.
3. Shore A hardness of 80 to 90 Durometer.
4. Block lengths: 50 mm (2 inches) except 100 to 150 mm (4 to 6 inches) for insulating glass.
5. Block width: Approximately 1.6 mm (1/16 inch) less than the full width of the rabbet.
6. 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: 25 to 76 mm (1 to 3 inches).
4. Shore a hardness of 40 to 50 Durometer.

## D. Glazing Tapes:

1. Semi-solid polymeric based closed cell 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.
3. Complying with AAMA 800 for the following types:
  - a. AAMA 810.1, Type 1, for glazing applications in which tape acts as the primary sealant.
  - b. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

- E. Spring Steel Spacer: Galvanized steel wire or strip designed to position glazing in channel or rabbeted sash with stops.
- F. Glazing Clips: Galvanized steel spring wire designed to hold glass in position in rabbeted sash without stops.
- G. Glazing Points (Sprigs): Pure zinc stock, thin, flat, triangular or diamond shaped pieces, 6 mm (1/4 inch) minimum size.
- H. 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.
- I. Lock-Strip Glazing Gaskets: ASTM C542, shape, size, and mounting as indicated.
- J. Glazing Sealants: ASTM C920, silicone neutral cure:
  - 1. Type S.
  - 2. Class 25 or 50 as recommended by manufacturer for application.
  - 3. Grade NS.
  - 4. Shore A hardness of 25 to 30 Durometer.
  - 5. VOC Content: For sealants used inside the weatherproofing system, not more than 250 g/L or less when calculating according to 40 CFR 59, (EPA Method 24).
- K. Structural Sealant: ASTM C920, silicone acetoxycure:
  - 1. Type S.
  - 2. Class 25.
  - 3. Grade NS.
  - 4. Shore a hardness of 25 to 30 Durometer.
- L. Neoprene, EPDM, or Vinyl Glazing Gasket: ASTM C864.
  - 1. Channel shape; flanges may terminate above the glazing channel or flush with the top of the channel.
  - 2. Designed for dry glazing.
- M. Color:
  - 1. Color of glazing compounds, gaskets, and sealants used for aluminum color frames to 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 are to be black, gray, or neutral color.



- N. 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 is approved shop drawings.
- B. Review for 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.

**3.2 PREPARATION:**

- A. For sealant glazing, prepare glazing surfaces in accordance with GANA 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 Glazing Manual, GANA Sealant Manual, IGMA TB-3001, and IGMA TM-3000 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.

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

- A. Cut glazing tape spline 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 INSTALLATION - WET METHOD (SEALANT AND SEALANT):**

- A. Place setting blocks at 1/4 points and install glazing pane or unit.
- B. Install removable stops with glazing centered in space by inserting spacer shims both sides at 600 mm (24 inch) intervals, 6 mm (1/4 inch) below sight line.
- C. Fill gaps between glazing and stops with sealant to depth of bite on glazing, but not more than 9 mm (3/8 inch) below sight line to ensure full contact with glazing and continue the air and vapor seal.
- D. Apply sealant to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

**3.6 INSTALLATION - INTERIOR WET/DRY METHOD (TAPE AND SEALANT):**

- A. Cut glazing tape to length and install against permanent stops, projecting 1.6 mm (1/16 inch) above sight line.
- 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 tape to ensure full contact at perimeter of pane or unit.
- D. Install removable stops, spacer shims inserted between glazing and applied stops at 600 mm (24 inch) intervals, 6 mm (1/4 inch) below sight line.
- E. Fill gaps between pane and applied stop with sealant to depth equal to bite on glazing, to uniform and level line. Sealant type is to be compatible with glazing tape.
- F. Trim protruding tape edge.

**3.7 INSTALLATION - INTERIOR WET METHOD (COMPOUND AND COMPOUND):**

- A. Install glazing resting on setting blocks. Install applied stop and center pane by use of spacer shims at 600 mm (24 inch) centers, kept 6 mm (1/4 inch) below sight line.
- B. Locate and secure glazing pane using glazers' spring wire clips.
- C. Fill gaps between glazing and stops with glazing compound until flush with sight line. Tool surface to straight line.

**3.8 REPLACEMENT AND CLEANING:**

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

**3.9 PROTECTION:**

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

- - - E N D - - -