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**SECTION 08 80 00****GLAZING****PART 1 GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. Section Includes:
  - 1. Glass products.
  - 2. Insulating glass.
  - 3. Glazing sealants.
  - 4. Glazing tapes.
  - 5. Miscellaneous glazing materials.
  - 6. Speak thrus.

**1.3 RELATED REQUIREMENTS:**

- A. Section 08 11 13 - Hollow Metal Doors and Frames.
- B. Section 08 56 53 - Security Windows.
- C. Section 09 21 16 - Gypsum Board Assemblies.

**1.4 DEFINITIONS**

- A. Glass Manufacturers: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.
- B. Glass Thicknesses: Indicated by thickness designations in millimeters in accordance with ASTM C1036.
- C. IBC: International Building Code.
- D. Interspace: Space between lites of an insulating-glass unit.

**1.5 COORDINATION**

- A. Coordinate glazing channel dimensions to:
  - 1. Provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.
  - 2. Achieve proper safety margins for glazing retention under each design load case, load case combination, and service condition.

**1.6 PREINSTALLATION MEETINGS**

- A. Preinstallation Conference: Conduct conference at project site.
  - 1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  - 2. Review temporary protection requirements for glazing during and after installation.

**1.7 ACTION SUBMITTALS**

- A. Product Data: For each type of product.
- B. Sustainable Design Submittals:
  - 1. Product Data: For sealants, indicating VOC content.

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2. Laboratory Test Reports: For sealants, indicating compliance with requirements for low-emitting materials.
  3. Environmental Product Declaration: For each product.
  - C. Glass Samples: 12 inches (300 mm) square for each type of glass product other than clear monolithic vision glass to include the following products as they pertain to the project:
    1. Tinted glass.
    2. Coated glass.
    3. Laminated glass.
    4. Insulating glass.
    5. Translucent films on glass.
  - D. Glazing Accessory Samples: For sealants and colored spacers, in 12-inch (300-mm) lengths. Install sealant Samples between two strips of material representative in color of adjoining framing system.
  - E. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.
  - F. Delegated-Design Submittal: For glass indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by qualified professional engineer responsible for their preparation.

#### **1.8 INFORMATIONAL SUBMITTALS**

- A. Qualification Data: For Installer manufacturers of fabricated glass units.
- B. Product Test Reports: For fabricated glass and glazing sealants, for tests performed by a qualified testing agency.
  1. For glazing sealants, provide test reports based on testing current sealant formulations within previous 36-month period.
- C. Preconstruction adhesion and compatibility test report.
- D. Sample Warranties: For special warranties.

#### **1.9 QUALITY ASSURANCE**

- A. Fabricated-Glass Manufacturer Qualifications: A qualified manufacturer of fabricated glass units who is approved and certified by primary glass manufacturer.
- B. Preferred Installer Qualifications: A qualified glazing contractor for this Project who is certified under the North American Contractor Certification Program (NACC) for Architectural Glass & Metal (AG&M) contractors [ and who employs glazing technicians certified under the Architectural Glass and Metal Technician (AGMT) certification program].
- C. Glass Testing Agency Qualifications: A qualified independent testing agency accredited in accordance with the NFRC CAP Certification Agency Program.
- D. Sealant Testing Agency Qualifications: An independent testing agency qualified in accordance with ASTM C1021 to conduct the testing indicated.

#### **1.10 PRECONSTRUCTION TESTING**

- A. Preconstruction Adhesion and Compatibility Testing: Use only materials with reliable aesthetic and functional compatibility over the design service life of the application. Test each glass product, tape sealant, gasket, glazing accessory, and glass-framing member for adhesion to and compatibility with elastomeric glazing sealants.

1. Testing is not required if data are submitted based on previous testing of current sealant products and glazing materials matching those submitted.
2. Use ASTM C1087 to determine whether priming and other specific joint-preparation techniques are required to obtain rapid, optimum adhesion of glazing sealants to glass, tape sealants, gaskets, and glazing channel substrates.
3. Test no fewer than [eight] [Insert number] Samples of each type of material, including joint substrates, shims, sealant backings, secondary seals, and miscellaneous materials.
4. Schedule enough time for testing and analyzing results to prevent delaying the Work.
5. For materials failing tests, submit sealant manufacturer's written instructions for corrective measures including use of specially formulated primers.

#### **1.11 DELIVERY, STORAGE, AND HANDLING**

- A. Protect glazing materials in accordance with manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.
- B. Comply with insulating-glass manufacturer's written instructions for venting and sealing units to avoid hermetic seal ruptures due to altitude change.

#### **1.12 FIELD CONDITIONS**

- A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.
  1. Do not install glazing sealants when ambient and substrate temperature conditions are outside limits permitted by sealant manufacturer or are below 40 deg F (4.4 deg C).

#### **1.13 WARRANTY**

- A. Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer agrees to replace coated-glass units that deteriorate within specified warranty period. Deterioration of coated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in coating.
  1. Warranty Period: 10 years from date of Substantial Completion.
- B. Manufacturer's Special Warranty for Laminated Glass: Manufacturer agrees to replace laminated-glass units that deteriorate within specified warranty period. Deterioration of laminated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.
  1. Warranty Period: 10 years from date of Substantial Completion.
- C. Manufacturer's Special Warranty for Insulating Glass: Manufacturer agrees to replace insulating-glass units that deteriorate within specified warranty period. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is obstruction of vision by dust, moisture, or film on interior surfaces of glass.
  1. Warranty Period: 10 years from date of Substantial Completion.

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**PART 2 PRODUCTS****2.1 MANUFACTURERS**

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Guardian Glass, LLC; SunGuard Advanced Architectural Glass as processed by one of the following:
  - 1. JE Berkowitz, LP: [www.jeberkowitz.com](http://www.jeberkowitz.com).
  - 2. Trulite Glass & Aluminum Solutions, LLC: [www.trulite.com](http://www.trulite.com).
  - 3. Viracon, Inc: [www.viracon.com](http://www.viracon.com).
- B. Source Limitations for Glass: Obtain tinted float glass, coated float glass, laminated glass and insulating glass] from single source from single manufacturer.
- C. Source Limitations for Solar-Control Reflective and Low-E Coated Glass: Where solar-control reflective or low-E coated glass of a primary glass manufacturer with a certified fabricator program is specified, obtain glass in fabricated units from manufacturer certified by coated-glass manufacturer.
- D. Source Limitations for Glazing Accessories: For each product and installation method, obtain from single source from single manufacturer.

**2.2 PERFORMANCE REQUIREMENTS**

- A. General: Installed glazing systems shall withstand each applicable condition including:
    - 1. Movements in all directions, temperature-related scenarios, and other load situations including design load cases and load case combinations without failure, which includes:
      - a. Loss or glass breakage attributable to defective manufacture, fabrication, or installation
      - b. Failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.
  - B. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design glazing.
  - C. Structural Performance: Glazing shall withstand each applicable design load case and load case combination within limits and under conditions determined in accordance with the IBC and ASTM E1300, and as follows:
    - 1. Design Wind Pressures: As indicated on Drawings.
      - a. Wind Design Data: As indicated on Drawings.
      - b. Basic Wind Speed: Ultimate 120 mph/Nominal 93 mph.
      - c. Risk Category: IV.
      - d. Exposure Category: B.
    - 2. Design Snow Loads: As indicated on Drawings.
    - 3. Probability of Breakage for Sloped Glazing: For glass sloped more than 15 degrees from vertical, design glass for a probability of breakage not greater than 0.001.
    - 4. Maximum Lateral Deflection: For glass supported on all four edges, limit center-of-glass deflection at design wind pressure to not more than 1/50 times the short-side length or 1 inch (25 mm), whichever is less and keeps glazing retained in place with a suitable margin of safety under design conditions.
    - 5. Thermal Loads: Design glazing to resist thermal stress breakage induced by conditions including differential temperatures and limited air circulation.
  - D. Safety Glazing: Where safety glazing is indicated, provide glazing that complies with 16 CFR 1201, Category II.
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- E. Thermal and Optical Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published product data, based on procedures indicated below:
1. For monolithic-glass lites, properties are based on units with lites 1/4 inch, 6 mm thick.
  2. For laminated-glass lites, properties are based on products of construction indicated.
  3. For insulating-glass units, properties are based on units of thickness indicated for overall unit and for each lite.
  4. U-Factors: Center-of-glazing values, in accordance with NFRC 100 and based on most current non-BETA version of LBL's WINDOW computer program, expressed as Btu/sq. ft. x h x deg F (W/sq. m x K).
  5. SHGC and Visible Transmittance: Center-of-glazing values, in accordance with NFRC 200 and based on most current non-BETA version of LBL's WINDOW computer program.
  6. Visible Reflectance: Center-of-glazing values, in accordance with NFRC 300.

### **2.3 GLASS PRODUCTS, GENERAL**

- A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below unless more stringent requirements are indicated. See these publications for glazing terms not otherwise defined in this Section or in referenced standards.
1. NGA Publications: "Glazing Manual" and "Laminated Glazing Reference Manual".
  2. FGIA/AAMA Publications: AAMA GDSG-1, "Glass Design for Sloped Glazing," and AAMA TIR A7, "Sloped Glazing Guidelines."
  3. FGIA/IGMA Publication for Sloped Glazing: IGMA TB-3001, "Guidelines for Sloped Glazing."
  4. FGIA/IGMA Publication for Insulating Glass: IGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."
- B. Safety Glazing Labeling: Where safety glazing is indicated, permanently mark glazing with certification label of the SGCC, the SGCC or another certification agency acceptable to authorities having jurisdiction or manufacturer. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.
- C. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of the IGCC.
- D. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass that complies with performance requirements and is not less than thickness indicated.
1. Minimum Glass Thickness for Exterior Lites: 1/4 inch, 6 mm.
  2. Thickness of Tinted Glass: Provide same thickness for each tint color indicated throughout Project.
- E. Strength: Do not substitute relative to designations of annealed, heat-strengthened, and fully tempered glass.

### **2.4 GLASS PRODUCTS**

- A. Clear Annealed Float Glass: ASTM C1036, Type I, Class 1 (clear), Quality-Q3.
1. Basis-of-Design Product: Subject to compliance with requirements, provide Guardian Glass, LLC; See Schedule or comparable product by one of the following:
    - a. AGC Glass Company North America, Inc.
    - b. Pilkington North America.
    - c. Vitro Architectural Glass.
- B. Tinted Float Glass: ASTM C1036, Type I, Class 2 (tinted), Quality-Q3.

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1. Basis-of-Design Product: Subject to compliance with requirements, provide Guardian Glass, LLC; Gray or comparable product by one of the following:
    - a. AGC Glass Company North America, Inc.
    - b. Pilkington North America.
    - c. Vitro Architectural Glass.
  - C. Fully Tempered Float Glass: ASTM C1048, Kind FT (fully tempered), Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.
    1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion horizontally oriented upon installation unless otherwise indicated.
  - D. Heat-Strengthened Float Glass: ASTM C1048, Kind HS (heat strengthened), Type I, Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.
    1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion horizontally oriented upon installation unless otherwise indicated.
  - E. Low-E Coated Vision Glass: ASTM C1376, coated by vacuum deposition (sputter-coating) process, and complying with other requirements specified.
    1. Basis-of-Design Product: Subject to compliance with requirements, provide Guardian Glass, LLC; SunGuard SN 68 or comparable product by one of the following:
      - a. Pilkington North America.
      - b. Viracon, Inc.
      - c. Vitro Architectural Glass.

## **2.5 INSULATING GLASS**

- A. Insulating-Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified in accordance with ASTM E2190.
  1. Sealing System: Dual seal, with manufacturer's standard sealants.
  2. Perimeter Spacer: Manufacturer's standard spacer material and construction.
    - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      - 1) Technoform.
      - 2) Thermix; a brand of Ensinger USA.
  3. Desiccant: Molecular sieve or silica gel, or a blend of both.

## **2.6 GLAZING SEALANTS**

- A. General:
    1. Compatibility: Compatible with one another and with other materials they contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
    2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
    3. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range of industry colors.
    4. Glazing Sealants: Provide one of the following as required for intended application of glazing installation and as recommended and approved by framing system manufacturer for which glazing panels shall be placed into.
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- B. Neutral-Curing Silicone Glazing Sealant, Class 100/50: Complying with ASTM C920, Type S, Grade NS, Use NT.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. GE Construction Sealants; Momentive Performance Materials Inc.
    - b. May National Associates, Inc.; a subsidiary of Sika Corporation.
    - c. Pecora Corporation.
    - d. Sika Corporation.
    - e. The Dow Chemical Company.
    - f. Tremco Incorporated.
- C. Neutral-Curing Silicone Glazing Sealant, Class 50: Complying with ASTM C920, Type S, Grade NS, Use NT.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Adfast.
    - b. GE Construction Sealants; Momentive Performance Materials Inc.
    - c. May National Associates, Inc.; a subsidiary of Sika Corporation.
    - d. Pecora Corporation.
    - e. Polymeric Systems, Inc.
    - f. Sika Corporation.
    - g. The Dow Chemical Company.
    - h. Tremco Incorporated.
- D. Neutral-Curing Silicone Glazing Sealant, Class 25: Complying with ASTM C920, Type S, Grade NS, Use NT.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Bostik, Inc.
    - b. GE Construction Sealants; Momentive Performance Materials Inc.
    - c. May National Associates, Inc.; a subsidiary of Sika Corporation.
    - d. Pecora Corporation.
    - e. Permthane®/Acryl-R®; ITW Polymers Sealants North America.
    - f. Polymeric Systems, Inc.
    - g. Sika Corporation.
    - h. The Dow Chemical Company.
    - i. Tremco Incorporated.
- E. Acid-Curing Silicone Glazing Sealant, Class 25: Complying with ASTM C920, Type S, Grade NS, Use NT.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Adfast.
    - b. Bostik, Inc.
    - c. GE Construction Sealants; Momentive Performance Materials Inc.
    - d. May National Associates, Inc.; a subsidiary of Sika Corporation.
    - e. Pecora Corporation.
    - f. Permthane®/Acryl-R®; ITW Polymers Sealants North America.
    - g. Polymeric Systems, Inc.
    - h. Sika Corporation.
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- i. The Dow Chemical Company.
- j. Tremco Incorporated.

## **2.7 GLAZING TAPES**

- A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C1281 and AAMA 800 for products indicated below:
  1. AAMA 804.3 tape, where indicated.
  2. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
  3. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.
- B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:
  1. AAMA 810.1, Type 1, for glazing applications in which tape acts as primary sealant.
  2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

## **2.8 MISCELLANEOUS GLAZING MATERIALS**

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, recommended in writing by manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- C. Setting Blocks:
  1. EPDM, Silicone, Neoprene or Santoprene with Shore A durometer hardness of 85, plus or minus 5.
  2. Type recommended in writing by sealant or glass manufacturer.
- D. Spacers:
  1. Neoprene blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
  2. Type recommended in writing by sealant or glass manufacturer.
- E. Edge Blocks:
  1. EPDM, Silicone, Neoprene or Santoprene with Shore A durometer hardness per manufacturer's written instructions.
  2. Type recommended in writing by sealant or glass manufacturer.
- F. Cylindrical Glazing Sealant Backing: ASTM C1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

## **2.9 SPEAK THRU**

- A. Provide C.R. Laurence Architectural Products, Speak-Thru Model No. 834A in satin anodized aluminum finish for use in Type GL1 glass where indicated on drawings; or equal.

## **2.10 FABRICATION OF GLAZING UNITS**

- A. Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.

1. Allow for thermal movements from ambient and surface temperature changes acting on glass framing members and glazing components.
  - a. Temperature Change: [120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces] [Insert temperature change].
- B. Clean-cut or flat-grind vertical edges of butt-glazed monolithic lites to produce square edges with slight chamfers at junctions of edges and faces.
- C. Grind smooth and polish exposed glass edges and corners.

### **PART 3 EXECUTION**

#### **3.1 EXAMINATION**

- A. Examine framing, glazing channels, and stops, with Installer present, for compliance with the following:
  1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
  2. Presence and functioning of weep systems.
  3. Minimum required face and edge clearances.
  4. Effective sealing between joints of glass-framing members.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

#### **3.2 PREPARATION**

- A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.
- B. Examine glazing units to locate exterior and interior surfaces. Label or mark units as needed so that exterior and interior surfaces are readily identifiable. Do not use materials that leave visible marks in the completed Work.

#### **3.3 GLAZING, GENERAL**

- A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.
- B. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass includes glass with edge damage or other imperfections that, when installed, could weaken glass, impair performance, or impair appearance.
- C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.
- D. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
- E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- F. Provide spacers for glass lites where length plus width is larger than 50 inches (1270 mm).
  1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
  2. Provide 1/8-inch- (3-mm-) minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.

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- G. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and in accordance with requirements in referenced glazing publications.
  - H. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.
  - I. Set glass lites with proper orientation so that coatings face exterior or interior as specified.
  - J. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.
  - K. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended in writing by gasket manufacturer.

### **3.4 TAPE GLAZING**

- A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.
- B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
- C. Cover vertical framing joints by applying tapes to heads and sills first, then to jambs. Cover horizontal framing joints by applying tapes to jambs, then to heads and sills.
- D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
- E. Do not remove release paper from tape until right before each glazing unit is installed.
- F. Apply heel bead of elastomeric sealant.
- G. Center glass lites in openings on setting blocks, and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.
- H. Apply cap bead of elastomeric sealant over exposed edge of tape.

### **3.5 GASKET GLAZING (DRY)**

- A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.
- B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.
- C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended in writing by gasket manufacturer.
- D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks, and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended in writing by gasket manufacturer.
- E. Install gaskets so they protrude past face of glazing stops.

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**3.6 SEALANT GLAZING (WET)**

- A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.
- B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.
- C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

**3.7 CLEANING AND PROTECTION**

- A. Immediately after installation, remove nonpermanent labels and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains.
  - 1. If, despite such protection, contaminating substances do contact with glass, remove substances immediately as recommended in writing by glass manufacturer. Remove and replace glass that cannot be cleaned without damage to coatings.
- C. Remove and replace glass that is damaged during construction period.
- D. Wash glass on both exposed surfaces not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended in writing by glass manufacturer.

**3.8 MONOLITHIC GLASS SCHEDULE**

- A. Clear Glass Type GL1: Fully tempered float glass.
  - 1. Basis-of-Design Product: Guardian Glass, LLC; Clear Float Glass.
  - 2. Minimum Thickness: 1/4 inch (6 mm).
  - 3. Safety glazing required.

**3.9 INSULATING GLASS SCHEDULE**

- A. Low-E-Coated, Tinted Insulating Vision Glass Type IGL1:
  - 1. Basis-of-Design Product: Guardian Glass, LLC; SunGuard SN 68 on Gray.
  - 2. Overall Unit Thickness: 1 inch (25 mm).
  - 3. Minimum Thickness of Each Glass Lite: 6 mm.
  - 4. Outboard Lite: Guardian Gray float glass.
    - a. Coating on Surface No. 2: Guardian SunGuard SN 68.
    - b. Heat Treatment: Fully tempered.
  - 5. Interspace Content: Air.
  - 6. Indoor Lite: Guardian Clear float glass.
    - a. Heat Treatment: Fully tempered float glass.
  - 7. Visible Light Transmittance: 34 percent minimum.
  - 8. SGHC: 0.25 maximum.
  - 9. Winter Nighttime U-Factor: 0.29 maximum.

10. Summer Daytime U-Factor: 0.28 maximum.

**END OF SECTION 08 80 00 08 80 00**