

## **SECTION 08 81 00 – GLASS AND GLAZING**

### **PART 1 - GENERAL**

#### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

#### **1.2 SUMMARY**

- A. Section includes furnishing and installing glass and glazing at the following locations indicated on the Drawings.
  - 1. Vision lites of entrances and storefront system.
  - 2. Interior door vision lites and sidelights.
  - 3. Unframed mirrors.

#### **1.3 RELATED WORK**

- A. Related Work of Other Sections:
  - 1. Division 08 Section – Steel Doors and Frames.
  - 2. Division 08 Section – Aluminum Frames.
  - 3. Division 08 Section – Entrances and Storefronts.

#### **1.4 DEFINITIONS**

- A. Manufacturer: A firm that produces primary glass or fabricated glass as defined in referenced glazing publications.
- B. Interspace: Space between lites of an insulating-glass unit that contains dehydrated air or a specified gas.
- C. Deterioration of Coated Glass: Defects developed from normal use attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in metallic coating.
- D. Deterioration of Insulating Glass: Failure of the hermetic seal under normal use that is attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.
- E. Spectrally Selective Glazing: Insulating glass units are spectrally selective when they have a low-e coating on the second or third surface, as well as a 1.25 or higher light-to-solar-gain ratio ( $LSG = T_v / SHGC$ ). In addition, spectrally selective glazings are those that sharply cut off or reduce solar transmission beyond the visible range and have a total solar transmission in the visible range equal to an approximate value of no less than 40 percent.

## 1.5 DESIGN/PERFORMANCE REQUIREMENTS

- A. Design/Performance, General: Provide glazing systems that are capable of withstanding normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, and installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.
- B. Glass Design: Glass thicknesses indicated are minimums and are for detailing only. Confirm glass thicknesses by analyzing Project loads and in-service conditions. Provide glass lites for various size openings in nominal thicknesses indicated, but not less than thicknesses and strengths (annealed or heat treated) required to meet or exceed the following criteria:
1. Glass Thicknesses: Select minimum glass thickness to comply with ASTM E1300, according to the following requirements:
    - a. Design Wind Loads: Determine design wind loads applicable to Project from basic wind speed indicated in miles per hour (meters per second) at 33 feet (10 m) above grade, according to requirements of authorities having jurisdiction or ASCE 7, "Minimum Design Loads for Buildings and Other Structures": Section 6.5, "Method 2-Analytical Procedure," based on mean roof heights above grade indicated on Drawings, whichever are more stringent.
      - (1). Basic Wind Speed: 110 mph (49-meters per second).
      - (2). Importance Factor: 1.00
      - (3). Exposure Category: B.
      - (4). Internal Pressure Coefficient: Indicate in the design calculations the internal pressure coefficient used in the design of exterior cladding and components
  2. Probability of Breakage for Vertical Glazing: 8 lites per 1000 for lites set vertically or not more than 15-degrees from vertical, and under wind action and with a load duration of 60 seconds or less.
  3. Maximum Lateral Deflection: For the following types of glass specified in Part 2 - Products of this Section and supported on all four edges, provide the thickness required that limits center deflection at design wind pressure to 1/50 times the short side length or 1-inch (25-mm), whichever is less.
    - a. For monolithic glass heat-treated to resist wind loads.
    - b. For insulating glass.
    - c. For laminated glass lites.
  4. Minimum Glass Thickness for Exterior Lites: Not less than 1/4 inch.
  5. Thickness of Tinted and Heat-Absorbing Glass: Provide the same thickness for each tint color indicated throughout Project.

- C. Thermal Movements: Provide glazing that allows for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures acting on glass framing members and glazing components. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
  - 1. Temperature Change (Range): 120-degrees F, ambient; 180-degrees F, material surfaces.
- D. Thermal and Optical Performance Properties: Provide glass with performance properties specified based on manufacturer's published test data, as determined according to procedures indicated below:
  - 1. For monolithic-glass lites, properties are based on units with lites 1/4 inch thick.
  - 2. For laminated-glass lites, properties are based on products of construction indicated.
  - 3. For insulating-glass units, properties are based on units with lites 1/4 thick and a nominal 1/2-inch- wide interspace.
  - 4. Center-of-Glass U-Values: NFRC 100 methodology using LBL-35298 WINDOW 4.1 computer program, expressed as Btu/ sq. ft. x h x deg F.
  - 5. Center-of-Glass Solar Heat Gain Coefficient: NFRC 200 methodology using LBL-35298 WINDOW 4.1 computer program.
  - 6. Solar Optical Properties: NFRC 300.

## 1.6 SUBMITTALS

- A. Product Data: For each glass product and glazing material indicated.
- B. Samples: For the following products, in the form of 12-inch- square Samples for glass and of 12-inch- long Samples for sealants. Install sealant Samples between two strips of material representative in color of the adjoining framing system.
  - 1. Each color of tinted float glass.
  - 2. Coated vision glass.
  - 3. Insulating glass for each designation indicated.
  - 4. Ceramic-coated spandrel glass.
  - 5. Each type of laminated glass with colored interlayer.
  - 6. Each pattern and color of ceramic-coated vision glass.
  - 7. For each color (except black) of exposed glazing sealant indicated.
- C. Glazing Schedule: Use same designations indicated on Drawings for glazed openings in preparing a schedule listing glass types and thicknesses for each size opening and location.
- D. Product Certificates: Signed by manufacturers of glass and glazing products certifying that products furnished comply with requirements.
- E. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

- F. Preconstruction Adhesion and Compatibility Test Report: From glazing sealant manufacturer indicating glazing sealants were tested for adhesion to glass and glazing channel substrates and for compatibility with glass and other glazing materials.
- G. Product Test Reports: From a qualified testing agency indicating the following products comply with requirements, based on comprehensive testing of current products:
1. Coated float glass.
  2. Insulating glass.
  3. Glazing sealants.
  4. Glazing gaskets.
  5. Sealant Material Test Reports: For exterior flush structural glazing system, submit the following sealant manufacturer's data and information for review:
    - a. Adhesion test data of sealant bond to actual production samples of finished metal and glass that will be used in the Work. Perform adhesion tests in accordance with ASTM C 794.
    - b. Compatibility statement that the materials in contact with the sealant, such as gaskets, spacers, setting blocks, are compatible with the sealant after 21 days exposure to 2,000 to 4,000 microwatts of ultraviolet radiation.
    - c. Statement that sealant stress (detail dimensions) is less than 20 psi when exposed to 30-psf (1.4-KPa) wind load (5:1 Safety Factor).
    - d. Certification from sealant manufacturer that the sealant manufacturer has reviewed all sealant details and finds same suitable for the purpose intended and compatible with the surfaces with which they are in contact.
- H. Warranties: Special warranties specified in this Section.

## 1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has completed glazing similar in material, design, and extent to that indicated for this Project; whose work has resulted in glass installations with a record of successful in-service performance.
- B. Source Limitations for Glass: Obtain the following through one source from a single manufacturer for each glass type.
- C. Source Limitations for Glazing Accessories: Obtain glazing accessories through one source from a single manufacturer for each product and installation method indicated.
- D. Elastomeric Glazing Sealant Product Testing: Obtain sealant test results for product test reports in "Submittals" Article from a qualified testing agency based on testing current sealant formulations within a 36-month period.
1. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated, as documented according to ASTM E 548.
  2. Test elastomeric glazing sealants for compliance with requirements specified by reference to ASTM C 920, and where applicable, to other standard test methods.

- E. Preconstruction Adhesion and Compatibility Testing: Submit to elastomeric glazing sealant manufacturers, for testing indicated below, samples of each glazing material type, tape sealant, gasket, glazing accessory, and glass-framing member that will contact or affect elastomeric glazing sealants:
1. Use ASTM C 1087 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.
  2. Submit not fewer than eight pieces of each type of material, including joint substrates, shims, joint-sealant backings, secondary seals, and miscellaneous materials.
  3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
  4. For materials failing tests, obtain sealant manufacturer's written instructions for corrective measures, including the use of specially formulated primers.
  5. Testing will not be required if elastomeric glazing sealant manufacturers submit data based on previous testing of current sealant products for adhesion to, and compatibility with, glazing materials matching those submitted.
- F. Glazing for Fire-Rated Door Assemblies: Glazing for assemblies that comply with NFPA 80 and that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire-protection ratings indicated, based on testing according to NFPA 252.
- G. Glazing for Fire-Rated Window Assemblies: Glazing for assemblies that comply with NFPA 80 and that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 257.
- H. Safety Glazing Products: Comply with testing requirements in 16 CFR 1201 and, for wired glass, ANSI Z97.1.
1. Subject to compliance with requirements, obtain safety glazing products permanently marked with certification label of the Safety Glazing Certification Council or another certification agency or manufacturer acceptable to authorities having jurisdiction.
  2. Where glazing units, including Kind FT glass and laminated glass, are specified in Part 2 articles for glazing lites more than 9 sq. ft. in area, provide glazing products that comply with Category II materials, and for lites 9 sq. ft. or less in area, provide glazing products that comply with Category I or II materials.
- I. Safety Glazing: Provide safety glazing as required by IBC 2006 for hazardous locations.
1. Glazing in swinging doors and sidelights.
  2. Glazing in sliding doors and sidelights.
  3. Glazing in an individual fixed or operable panel adjacent to a door where the nearest exposed edge of the glazing is within a 24-inch arc of either vertical edge of the door in a closed position and where the bottom exposed edge of the glazing is less than 60 inches above the walking surface.
- J. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.

1. GANA Publications: GANA Laminated Division's "Laminated Glass Design Guide" and GANA's "Glazing Manual."
  2. AAMA Publications: AAMA GDSG-1, "Glass Design for Sloped Glazing," and AAMA TIR-A7, "Sloped Glazing Guidelines."
  3. IGMA Publication for Sloped Glazing: IGMA TB-3001, "Sloped Glazing Guidelines."
  4. IGMA Publication for Insulating Glass: SIGMA TM-3000, "Glazing Guidelines for Sealed Insulating Glass Units."
- K. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of the following testing and inspecting agency:
1. Insulating Glass Certification Council.

### **1.8 DELIVERY, STORAGE AND HANDLING**

- A. Protect glazing materials according to manufacturer's written instructions and as needed to prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.
- B. For insulating-glass units that will be exposed to substantial altitude changes, comply with insulating-glass manufacturers written recommendations for venting and sealing to avoid hermetic seal ruptures.

### **1.9 PROJECT 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.

### **1.10 WARRANTY**

- A. Manufacturer's Special Warranty on Coated-Glass Products: Provide special project warranty as specified, made out to Owner and signed by coated-glass manufacturer agreeing to furnish replacements for those coated-glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site. Provide 10-year special project warranty period for coated glass products. See Conditions of the Contact for additional warranty provisions. Provide 10-year special project warranty period for coated glass products.
- B. Manufacturer's Special Warranty on Laminated Glass: Written warranty, made out to Owner and signed by laminated-glass manufacturer agreeing to furnish replacements for laminated-glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site. See Conditions of the Contact for additional warranty provisions.

- C. Manufacturer's Special Warranty on Insulating Glass: Written warranty, made out to Owner and signed by insulating-glass manufacturer agreeing to furnish replacements for insulating-glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site. See Conditions of the Contract for additional warranty provisions. Provide 10-year special project warranty period for insulated glass products.

## **PART 2 - PRODUCTS**

### **2.1 PRODUCTS AND MANUFACTURERS**

- A. Provide clear float and tinted float glass required, produced by one of the following primary glass manufacturers.
1. AFG Industries, Inc., Kingsport, TN (800) 251-0441
  2. Ford Glass Div., Allen Park, MI, (800) 521-6346.
  3. Guardian Industries, Carleton, MI (800) 521-9040.
  4. Pilkington Libbey-Owens-Ford, Toledo, OH (800) 526-6557.
  5. PPG Industries, Inc., Pittsburgh, PA (800) 377-5267
- B. Provide each type of processed glass (coated, laminated, heat strengthened, fully tempered, or insulated glass) required, produced by one of the following:
1. Viracon, Inc., Owatonna, MN (800) 533-2080 (Basis of Design)
  2. Cesar Color, Inc., Burlington, CA (800) 275-7272
  3. Globe Amerada Glass Co., Elk Grove Village, IL (800) 521-9040.
  4. HGP & Affiliates, Inc., Dallas, TX (972) 663-3800.
  5. Glass Wholesalers, Inc., Houston, TX (713) 353-5800.
  6. PPG Industries, Inc., Pittsburgh, PA (800) 377-5267
  7. Pulp Studios, Los Angeles, CA (310) 815-4999.
  8. Southwall Technologies, Inc., Palo Alto, CA (800) 365-8794.
  9. Technical Glass Products, Kirkland, WA (800) 426-2079.
- C. Primary Float Glass Products: Provide lites of the following annealed primary glass types conforming to ASTM C 1036, including references to type, class, quality, and if applicable, form, finish, mesh and pattern. Provide heat strengthened or fully tempered glass complying with ASTM C 1048, including references to kind, condition, type, quality and class. Provide laminated glass complying with ASTM C 1172, including references to kind, condition, type, quality, and class.
1. Fully Tempered Clear Float Glass (Type GL-1): Condition A, Type I, Class 1, Quality q3, Kind FT, minimum 6-mm (0.23-inch) thick.
  2. Glass Type GL-2 Bronze Tinted Fully Tempered Insulating Vision Glass): Outer pane of 6-mm (0.23-inch) thick bronze tinted float glass enclosing a hermetically sealed dehydrated 13-mm (1/2-inch) air space and complying with ASTM E 774, Class A requirements and with manufacturer's standard 13-mm (1/2-inch) spacer, corner design, desiccant, sealant, and sealing system, and inner lite of annealed clear float glass. . Provide appearance and performance data equivalent to PPG Industries Solarban 60 (2) Solarbronze+Clear insulating glass units with outboard lite heat strengthened and inboard lite annealed, or equivalent by Viracon. Produce units under a certification program with inspection and testing conducted by the Insulating Glass Certification Council with a permanent label on each unit.
    - a. Visible Light Transmittance: 42 percent.

- b. Outdoor Visible Light Reflectance: 7 percent.
  - c. Light to Solar Gain Ratio (LSG): 1.56
  - d. ASHRAE U-Value - Winter Nighttime: 0.29.
  - e. ASHRAE U-Value – Summer Daytime: 0.27.
  - f. Shading Coefficient: 0.31.
- D. Mirror Glass: ASTM C 1503, Mirror Glazing quality, clear annealed float glass, 1/4-inch thick, with 2 coats of chemically applied silver with electrolytic copper coating (0.0002" thick), followed by 2 protective coats of clear varnish or shellac applied to silvered and coppered surface and to all mirror edges, followed by final coat of mirror backing paint.

## 2.2 GLAZING GASKETS

- A. Soft Compression Gaskets: Extruded or molded, closed-cell, integral-skinned gaskets of material indicated below; complying with ASTM C 509, Type II, black; and of profile and hardness required to maintain watertight seal.
- 1. Neoprene, ASTM C 864.
  - 2. EPDM, ASTM C 864.
  - 3. Silicone, ASTM C 1115.
  - 4. Thermoplastic polyolefin rubber, ASTM C 1115.
  - 5. Any material indicated above.
- B. Dense Compression Gaskets: Molded or extruded gaskets of material indicated below, complying with standards referenced with name of elastomer indicated below, and of profile and hardness required to maintain watertight seal.
- 1. Neoprene, ASTM C 864.
  - 2. EPDM, ASTM C 864.
  - 3. Silicone, ASTM C 1115.
  - 4. Thermoplastic polyolefin rubber, ASTM C 1115.
  - 5. Any material indicated above.

## 2.3 MISCELLANEOUS GLAZING MATERIALS

- A. Sealants, Tapes and Backup Materials: Provide sealants, tapes and backup materials of proven compatibility with other materials that they will 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. Comply with sealant and glass manufacturer's recommendations for selecting glazing sealants and tapes that are suitable for applications indicated and conditions existing at time of installation. Provide the following chemical curing, elastomeric sealants of the base polymer and movement capability indicated.
- 1. Non-Structural Silicone Glazing Sealant: One-part medium modulus silicone sealant with minimum  $\pm 50\%$  joint movement capability and conforming to ASTM C 920, Type S, Grade NS, Class 25, Use NT, G, A, and as applicable to use indicated, O. Acceptable manufacturer and product includes General Electric Company "Silglaze II," or Dow Corning "Dow Corning 795."

2. Glazing Tape: AAMA 806.3, 100% solids butyl tape with spacer rod; Tremco "Polyshim II" or PTI "PTI 303 Glazing Tape," except use glazing tape lite kits applicable to UL Listed (UBC 7-2 1997 and UL 10C) fire-rated glazing assembly time ratings as produced by Zero International, or equivalent and specified as part of Section 08700 - Finish Hardware work.
  3. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.
- B. Mirror Mastic: Spot-application type, for 25% maximum coverage, 1/8" to 1/2" thickness; Palmer Mirro-Mastic, or equivalent approved by Architect.
- C. Mirror Clips: AISI Type 302/304 stainless steel angle clips at mirror top and bottom edges, with No. 8 mirror polished finish.
- D. Miscellaneous Glazing Materials: Provide products of material, size and shape complying with the referenced glazing standard, requirements of manufacturers of glass and other glazing materials involved for glazing application indicated, and with proven record of compatibility with surfaces contacted in installation.
1. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
  2. Setting Blocks: Elastomeric material with a Shore A durometer hardness of 85, plus or minus 5.
  3. Spacers: Elastomeric blocks or continuous extrusions with a Shore A durometer hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
  4. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).

## **2.4 FABRICATION OF GLASS AND OTHER GLAZING PRODUCTS**

- A. Fabricate glass and other glazing products in sizes required to glaze 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 standard, to comply with system performance requirements.
- B. Exposed Glass Edges: Clean-cut or flat-grind vertical edges of butt-glazed monolithic lites in a manner that produces square edges with slight kerfs at junctions with indoor and outdoor faces. Grind smooth and polish exposed glass edges.
- C. Sizes, Clearances, Bite and Tolerances: Fabricate glass to the sizes required for glazed openings indicated, with edge and face clearances, bite and tolerances complying with recommendations of glass manufacturer and the referenced glazing standard, to comply with performance requirements.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine framing glazing, 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 system.
  3. Minimum required face or edge clearances.
  4. Effective sealing between joints of glass-framing members.
- B. Inspect each piece of glass immediately before installation, and remove lites that have observable edge damage or face imperfections from the Project Site.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2 GLAZING PREPARATION**

- A. Clean framing members to receive glass, immediately before glazing. Remove coatings that are not firmly bonded to the substrate.

### **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 is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.
- C. 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.
- D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction sealant-substrate testing.
- E. Center glass lites in each opening. Provide edge blocking to comply with requirements of referenced glazing standard, except where otherwise required by glass unit manufacturer.
- F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- G. Provide spacers for glass lites where the length plus width is larger than 50 inches as follows:
1. Provide 1/8-inch 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.
  2. 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.
- H. 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 according to requirements in referenced glazing publications.

- I. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.
- 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 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. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
  - 1. Where framing joints are vertical, cover these joints by applying tapes to heads and sills first and then to jambs. Where framing joints are horizontal, cover these joints by applying tapes to jambs and then to heads and sills.
  - 2. 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.
  - 3. Do not remove release paper from tape until just before each glazing unit is installed.
- B. Apply heel bead of elastomeric sealant.
- C. 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.
- D. Apply cap bead of elastomeric sealant over exposed edge of tape.

### **3.5 GASKET GLAZING**

- A. Fabricate compression gaskets in lengths recommended by gasket manufacturer to fit openings exactly, with stretch allowance 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. 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 by gasket manufacturer.
- D. Install gaskets so they protrude past face of glazing stops.

### **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 PROTECTION AND CLEANING**

- A. Protect exterior glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations, including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove them immediately as 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 than once a month, for build-up of dirt, scum, alkaline deposits, or stains; remove as recommended by glass manufacturer.
- D. Remove and replace glass that is broken, chipped, cracked, abraded, or damaged in any way, including natural causes, accidents, and vandalism, during construction period.
- E. Wash glass on both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended by glass manufacturer.

**END OF SECTION 08 81 00**