SECTION 08800 - GLASS AND GLAZING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 DESCRIPTION OF WORK

A. Definition: "Glass" includes both primary and fabricated glass products as described in FGMA"Glazing Manual". "Glazing" includes glass installation and materials used to install glass.

B. Extent of glass and glazing work is indicated on drawings and schedules.

C. Types of work in this section include glass and glazing for:

1. Aluminum Windows.
2. Hollow metal doors and frames.
3. Storefront framing system including doors.

D. Comply with provisions of Section 01028 - Modification Requirements.

1.03 SYSTEM PERFORMANCES

A. Provide glass and glazing that has been produced, fabricated and installed to withstand normal temperature changes, wind loading, impact loading(where applicable), without failure including loss or breakage of glass, failure of sealants or gaskets to remain water-tight and airtight, deterioration of glass and glazing materials, and other defects in the work.

1.04 QUALITY ASSURANCE

A. Glazing Standards: Comply with recommendations of Flat Glass Marketing Association (FGMA) "Glazing Manual" and "Sealant Manual" except where more stringent requirements are indicated. Refer to those publications for definitions of glass and glazing terms not otherwise defined in this section or other referenced standards.

B. Safety Glazing Standard: Where safety glass is indicated provide type of products indicated which comply with ANSI Z97.1 and testing requirements of 16 CFR Part 1201 for category 11 materials.

C. Fire-Resistance-Rated Wire Glass: Provide wire glass products that are identical to those tested per ASTM E 163 (UL 9) and are labeled and listed by UL or other testing and inspecting agency acceptable to authorities having jurisdiction.
D. Single Source Responsibility: Provide materials obtained from one source for each type of glass and glazing product indicated.

1.05 SUBMITTALS

A. Product Data: Submit manufacturer's technical data for each glazing material and fabricated glass product required, including installation and maintenance instructions.

B. Samples: Submit, for verification purposes, 12" square sample of insulated glass.

C. Certificate: Submit certificates from respective manufacturers attesting that glass and glazing materials furnished for project comply with requirements.

1.06 DELIVERY. STORAGE AND HANDLING

A. Protect glass and glazing materials during delivery, storage and handling to comply with manufacturer's directions and as required to prevent edge damage to glass, and damage to glass and glazing materials from effects of moisture including condensation, of temperature changes, of direct exposure to sun, and from other causes.

B. Comply with pertinent provisions of Section 01620.

1.07 PROJECT CONDITIONS

A. Environmental Conditions: Do not proceed with glazing when ambient and substrate temperature conditions are outside the limits permitted by glazing material manufacturer or when joint substrates are wet due to rain, frost, condensation or other causes. Install glazing only when temperatures are in middle third of manufacturer's recommended installation temperature range.

   1. Install liquid sealants at ambient and substrate temperatures above 40°F.

1.08 SPECIFIED PRODUCT WARRANTY

A. Manufacturer's Warranty on Insulating Glass: Provide written warranty signed by manufacturer of laminated glass agreeing to furnish f.o.b. point of manufacture, freight allowed project site, within specified warranty period indicated below, insulating glass units which develop manufacturing defects. Manufacturing defects are defined as failure of hermetic seal of air space (beyond that due to glass breakage) as evidenced by intrusion of dirt or moisture, internal condensation or fogging at temperature above -20°F (29°C), deterioration of protected internal glass coatings, if any, and other visual indications of seal failure or performance; provided the manufacturer's instructions for handling, installation, protecting and maintaining units have been complied with during the warranty period.

   1. Warranty Period: Manufacturer's standard but not less than 10 years after date of substantial completion.
PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Manufacturer: Subject to compliance with requirements, provide products of one of the following:

1. Manufacturers of Float Glass:
   a. Pilkington.
   b. AFG Industries, Inc.
   d. Guardian Industries Corp.
   e. Libbey-Owens-Ford Co.
   f. PPG Industries, Inc.

2. Manufacturers of Wire Glass:
   a. AFG Industries, Inc.
   b. Guardian Industries, Inc.
   c. Hordis Brothers, Inc.
   d. Pilkington Sales (North America) Limited.

2.02 GLASS PRODUCTS. GENERAL

A. Primary Glass Standard: Provide primary glass which complies with FSDD-G451 requirements, including those indicated by reference to type, class, quality, and form.

B. Heat-Treated Glass Standard: Provide heat-treated glass which complies with FS DD-G-1403 requirements, including those indicated by reference to grade, style, type, quality, and class.

C. Insulating Glass Standard: Provide preassembled sealed insulating glass to comply with ASTM E774 requirements for classification designated below:
   1. Class A.

D. Sizes: Fabricate glass to sizes required for glazing openings indicated, with edge clearances and tolerances complying with recommendations of glass manufacturer. Provide thicknesses indicated or, not otherwise indicated, as recommended by glass manufacturer for application indicated.

2.03 PRIMARY GLASS PRODUCTS

A. Clear Float Glass: Type I, class 1 (transparent), quality q3 (glazing select), 1/4" thick unless indicated otherwise.

B. Wire Glass: Type II (rolled), class 1 (translucent), quality q8 (glazing); complying with ANSI Z97.1; 1/4" thick; of form and mesh pattern indicated below:
   1. Polished Wire Glass: Form 1 (wired, polished both sides), mesh m2 (square).
2.04 HEAT-TREATED GLASS PRODUCTS -

A. Manufacturing - Process: Manufacture heat-treated glass as follows:

1. By horizontal (roller hearth) process with roll wave distortion parallel with bottom edge of glass as installed, unless otherwise indicated.

B. Clear Tempered Float Glass: Grade B (fully tempered), style (uncoated surfaces), Type I (float), quality q (glazing quality). Class 1 (transparent); 1/4" thick unless otherwise indicated.
   1. Reference: Herculite tempered glass by PPG, or equal.

2.05 SEALED INSULATING GLASS UNITS

A. General: Provide preassembled units consisting of organically sealed panes of glass enclosing a hermetically sealed dehydrated air space; comply with requirements indicated for glass characteristics, air space, sealing system, sealant, spacer material, corner design, and desiccant.

B. Insulating Glass Units for exterior in all exterior windows. Provide manufacturer's standard 1" thick unit complying with the following requirements:

1. Outboard lite shall be ¼" thick annealed tinted solar bronze and inboard lite shall be ¼" thick annealed clear glass, with .548" hermetic sealed air space.

2. NON-INSULATING GLASS UNITS, EXTERIOR
   a. In exterior aluminum doors, ¼" thick tempered (by Code), tinted solar bronze, non-insulated, non-reflective.

2.06 GLAZING SEALANTS

A. All glazing gaskets, setting blocks, etc., for aluminum windows, and aluminum doors and storefront frames shall be furnished by the respective manufacturers.

B. Silicone Glazing Sealant: Single component elastomeric silicone sealant complying with FS TT-S-001543, Class A, nonsag: and with ASTM C 920,Type S. Grade NS, Class 25, Use G and, as applicable to use indicated, Uses A and O; and with the following requirements:

1. Low-Modulus Silicone Glazing Sealant: Manufacturer's standard low modulus non-acid curing sealant that can withstand an increase and decrease of 50% of joint width as measured at time of application when tested per ASTM C 719.
C. Preformed Butyl-Polyisobutylene Glazing Tape: Blend of butyl polyisobutylene rubber with a solids content of 100%, in extruded tape form, complying with MAMA 807.1, packaged on rolls with a release paper onside, with or without continuous spacer rod as recommended by manufacturers of tapes and glass for application indicated.

D. Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:

E. Products: Subject to compliance with requirements, provide one of the following:

1. Low-Modulus Silicone Glazing Sealants:
   g. Dow Corning 790; Dow Corning Corps
   h. Gesil N; General Electric.
   i. Silglaze; General Electric.
   j. Silpruf; General Electric.

2. Preformed Butyl-Polyisobutylene Glazing Tape:
   a. Tremco Polyshim Tape; Tremco.
   b. Tremco 440 Tape; Tremco.
   c. SST 800 Tape; Tremco.
   d. Chem-Tape 40; Woodmont Products, Inc.

2.07 MISCELLANEOUS GLAZING MATERIALS

A. Compatibility: Provide materials with proven record of compatibility with surfaces contacted in installation.

B. Cleaners, Primers and Sealers: Type recommended by sealant or gasket manufacturer.

C. Setting Blocks: Neoprene, EPDM or silicone blocks as required for compatibility with glazing sealants, 80 to 90 Shore A durometer hardness.

D. Spacers: Neoprene, EPDM or silicone blocks, or continuous extrusions, as required for compatibility with glazing sealant, of size, shape and hardness recommended by glass and sealant manufacturers for application indicated.

E. Edge Blocks: Neoprene, EPDM or silicone blocks as required for compatibility with glazing sealant, of size and hardness required to limit lateral movement (side-walking) or glass.

F. Compressible Filler Rods: Closed-cell or waterproof jacketed rod stock of synthetic rubber or plastic foam, flexible and resilient, with 5-10 psi compression strength for 25% deflection.
PART 3 - EXECUTION

3.01 INSPECTION

A. Require Glazier to inspect work of glass framing erector for compliance with manufacturing and installation tolerances, including those for size, squareness, offsets at corners; for presence and functioning of weep system; for existence of minimum required face or edge clearances; and for effective sealing of joinery. Obtain Glazier's written report listing conditions detrimental to performance of glazing work. Do not allow glazing work to proceed until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Clean glazing channels and other framing members to receive glass, immediately before glazing. Remove coatings which are not firmly bonded to substrates. Remove lacquer from metal surfaces where elastomeric sealants are indicated for use.

3.03 GLAZING GENERAL

A. Comply with combined printed recommendations of glass manufacturers, of manufacturers of sealants, gaskets and other glazing materials, except where more stringent requirements are indicated, including those of referenced glazing standards.

B. Glazing channel dimensions as indicated in details are intended to provide for necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances. Adjust as required by job conditions at time of installation.

C. Protect glass from edge damage during handling and installation, use a rolling block in rotating glass units to prevent damage to glass corners. Do not impact glass with metal framing. Use suction cups to shift glass units within openings; do not raise or drift glass with a pry bar. Rotate glass with flares or bevels along one horizontal edge which would occur in vicinity of setting blocks so that these are located at top of opening. Remove from project and dispose of glass units with edge or other imperfections of kind that, when installed, weakens glass and impairs performance and appearance.

D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction sealant-substrate testing.

3.04 GLAZING

A. Install setting blocks of proper size in sill rabbet, located one quarter of glass width from each corner, but no closer than 6", unless otherwise required. Set blocks in thin course of sealant which is acceptable for heel bead use.
B. Provide spacers inside and out, of correct size and spacing to preserve required face clearances, for glass sizes larger than 50 united inches, except where gaskets or glazing tapes with continuous spacer rods are used for glazing. Provide 1/8" minimum bite of spacers on glass and use thickness equal to sealant width, except with sealant tape use thickness slightly less than final compressed thickness of tape.

C. Provide edge blocking to comply with requirements of referenced glazing standard, except where otherwise required by glass unit manufacturer.

D. Set units of glass in each series with uniformity of pattern, draw, bow and similar characteristics.

E. Provide compressible filler rods or equivalent back-up material, as recommended by sealant and glass manufacturers, to prevent sealant from extruding into glass channel weep systems and from adhering to joints back surface as well as to control depth of sealant for optimum performance, unless otherwise indicated.

F. Force sealants into glazing channels to eliminate voids and to ensure complete "wetting" or bond of sealant to glass and channel surfaces.

G. Tool exposed surfaces of sealants to provide a substantial "wash" way from glass install pressurized tapes and gaskets to protrude slightly out of channel, so as to eliminate dirt and moisture pockets.

H. Hollow metal or interior wood doors and frames may be glazed with silicone sealant or preformed glazing tape.

1. Exterior hollow metal doors and frames shall be glazed with silicone sealant.

3.05 PROTECTION AND CLEANING

A. Protect exterior glass from breakage immediately upon installation by use of crossed streamers attached to framing and held away from glass. Do not apply markers to surfaces of glass. Remove nonpermanent labels and clean surfaces.

B. Protect glass from contact with contaminating substances resulting from construction operations. If, despite such protection, contaminating substances do come into contact with glass, remove immediately by method 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 often than once a month, for build-up of dirt, scum, alkali deposits or staining. When examination reveals presence of these forms of residue, remove by method recommended by glass manufacturer.
D. Remove and replace glass which is broken, chipped, cracked, abraded or damaged in other ways during construction period, including natural causes, accidents and vandalism.

E. Wash glass on both faces not more than 4 days prior to date scheduled for inspections intended to establish date of substantial completion in each area of project. Wash glass by method recommended by glass manufacturer.

END OF SECTION