

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Glass and glazing for defection hollow metal frames, detention hollow metal doors, and detention equipment.
- B. Glass and glazing for aluminum entrance doors and storefront sidelights.
- C. Glass and glazing for detention windows, type as indicated.

1.02 RELATED SECTIONS

- A. Division 8 Section – “Rolled Steel Detention Windows”: Security windows requiring glazing under this section.
- B. Division 8 Section- “steel Detention Windows”: Security windows requiring glazing under this section.
- D. Division 8 Section – “Detention Doors and Frames”: for frames for security glazing.
- E. Division 11 Section – “Detention Equipment”: Supply and installation of detention doors, frames and other equipment requiring glass and glazing, except as otherwise specified.

1.03 REFERENCES

- A. American National Standards Institute (ANSI)
 - 1. ANSI Z97.1 – Performance Specifications and Methods of Test for Safety glazing Material used in Building.
- B. American Society for Testing and Materials (ASTM)
 - 1. ASTM C1036 – Flat Glass
 - 2. ASTM C1048 – Heat Treated Flat Glass – Kind HS, Kind FT, coated and uncoated glass.
 - 3. ASTM E773 – Test Method for seal Durability of Sealed Insulating Glass Units.
 - 4. ASTM E838 – Cracking, Blistering, crazing and Color Changes.
 - 5. ASTM C1422-99 – Standard Specifications for Chemically Strengthened Flat Glass.
 - 6. ASTM C1349 – 96 Standard Specification for Architectural Flat Glass Clad Polycarbonate
 - 7. ASTM F1915-03 – Standard Specification for Test Methods for the Glazing of Detention Facilities. (Previous versions not acceptable).
- C. Consumer Product Safety Commission (CPSC)
 - 1. CPSC 16CFR 1201 – Safety Standards for Glazing Materials
- D. Underwriter’s Laboratories
 - 1. UL – 752 Bullet Resisting Equipment
- E. Federal Specifications (FS)
 - 1. FS TT-S230A – Sealing Compound, synthetic rubber base, single component, chemically curing for caulking, sealing and glazing in building construction.

2. FS TT-S-0023003 – Sealing compound, Elastomeric type, single component (for caulking, sealing, and glazing in buildings and other structures).
3. FS MIL-P46144 – Polycarbonate and plastic sheet standards.

F. Flat Glass Marketing Association (FGMA)

1. FGMA – Glazing Manual
2. FGMA – Sealant Manual

1.04 SUBMITTALS

- A. General: Submit the following according to Conditions of Contract and Division 1 specifications Sections.
- B. Product Data: Submit Manufacturer's descriptive literature and technical data including:
 1. Instructions for handling, storing, installation, and recommended procedures for cleaning of each type of glass and glazing material.
 2. Provide structural, physical and environmental characteristics and size limitations of each type of glass and glazing material.
 3. Provide chemical, functional, environmental characteristics, limitations and special application requirements.
 4. Available colors.
- C. Samples: Submit in accordance to division 1, prior to delivery of materials, samples of each of the following:
 1. Minimum, one 12 inch x 12 inch piece of each type of glass, in required thickness. Mock up recommended, portraying actual usage conditions.
 2. One bead, approximately ¼" wide by 3 inch long, of each sealant to be used, indicating color or cured materials.
- D. Certification by manufacturer that products supplied comply with performance requirements specified.
- E. Maintenance data covering cleaning and protection requirements.
- F. Security Glazing Substitutions: All requests and submittal for approval as security glazing must be made to the architect 30 days prior to original bid date.

1.05 QUALITY ASSURANCE

- A. Manufacturer qualifications: Company specializing in the manufacture of Security glass, types as specified, with minimum documented (5) year experience.
- B. Installer qualifications: Company specializing in the installation of security Glass products, similar types as specified, with minimum documented (5) year experience.
- C. Security Glazing Forced Entry Tests- Glazing manufacture must provide current test reports showing products are tested to specified security grade, test must be conducted at an industry accepted laboratory having at least a minimum of 10 years of testing security glazing.

1.06 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Delivery

1. Deliver all glass with manufacturer's permanent trademark, and removable product labels intact.
2. Provide product labels for each type of glass indicating:

- a. Manufacturer's name and product number.
 - b. Mark number in accordance with the drawings.
 - c. Size and thickness of the glass.
 - 3. Deliver glazing components and sealants in manufacturer's unopened, labeled container.
- B. Storage and Handling
- 1. Store glass in designated area, away from traffic and construction, in original packaging.
 - 2. Support glass vertically on setting material capable of holding the glass and distributing the weight evenly over the glass unit.
 - 3. Do not remove levels until glass has been installed.
 - 4. Storage conditions shall protect glazing materials from:
 - a. U-V exposure, humidity, rain, and adverse temperatures.
 - b. Scratching, marring, chipping and warpage.

1.07 ENVIRONMENTAL REQUIREMENTS

- A. Perform glazing only when ambient temperature is above 40 degrees F.
- B. When circumstances require glazing below 45 degrees F, steps shall be taken to assure dry and frost-free surface, as approved by the architect.

1.08 WARRANTY

- A. Provide manufacturer's written warranty for a period of not less than (5) years from date of shipment.
- B. Provide a written warranty executed by manufacturer, agreeing to furnish F.O.B project site, within 45 working days after receipt of notice from owner for replacement of units which develop manufacturing defects. The warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contract under requirements of the Contract Documents.
- C. Definitions: Manufacturing defects are defined as edge separation, seal failure, delamination, and core cracking.

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Security Type Glass Manufactures:
 - 1. GE Advanced Materials - Specialty Film & Sheet/Piedmont Plastics (800) 277-7898
- B. Glazing Materials:
 - 1. Tremco, Cleveland, OH or equal as approved by Architect

2.02 FLAT GLASS CLAD POLYCARBONATE – LAMINATED COMPOSITION “SECURITY “ TYPES

- A. General: All laminated composition security glass units, whether specifically shown or specified, shall conform to manufacturer’s standards as to maximum size for each type of glass.
- B. Forced-Entry Resistant Performance: Provide products identical to those tested for compliance with requirements indicated per test specified for specific glazing types.
 - 1. TYPE SG-4 – Glass Clad Polycarbonate – Insulgard Series CDW. ICGCP916 Clear – 9/16” Nominal thickness. Tested to ASTM F-1915-03 Security Level 4.
 - 2. TYPE SG-3 - Glass Clad Polycarbonate _ Insulgard Series CDW. ICGCP1216 Clear – ¾” Nominal thickness. Tested to ASTM F-1915-03 Security Level 3.
 - 3. TYPE SG-2 - Glass Clad Polycarbonate _ Insulgard Series CDW. ICGCP1516 Clear – ” Nominal thickness. Tested to ASTM F-1915-03 Security Level 2.
 - 4. TYPE SG-1 - Glass Clad Polycarbonate _ Insulgard Series CDW. ICGCP2416 Clear –1-1/4” Nominal thickness. Tested to ASTM F-1915-03 Security Level 1.
 - 5. TYPE SG-4 – FIRE RATED - Wire Glass Clad Polycarbonate – Insulgard Series ICGCP916WW. HP White Level 1 Forced Entry- 45 Minute Fire Rated UL No. KCMZ.R20515

2.03 FLAT MONOLITHIC AND LAMINATED POLYCARBONATE COMPOSITIONS “SECURITY” TYPES

- A. General: All laminated composition security glass units, whether specifically shown or specified, shall conform to manufacturer’s standards as to maximum size for each type of glass.
- B. Forced-Entry Resistant Performance: Provide products identical to those tested for compliance with requirements indicated per test specified for specific glazing types. All polycarbonate products in this section shall have a mar resistant coating on all exposed surfaces. 10 year coating warranty.
 - 1. TYPE MP-1 – Monolithic Polycarbonate with abrasion resistant coating. Product Type MR-10. 3/8” Nominal Thickness. ASTM 1915-03 Security Level 4.
 - 2. TYPE MP-2 – Monolithic Polycarbonate with abrasion resistant coating. Product Type MR-10. ½” Nominal Thickness. ASTM 1915-03 Security Level 3.
 - 3. TYPE LP-1 – Laminated Polycarbonate – Product Type MPC375. 3/8” Nominal Thickness. ASTM 1915-03 Security Level 3.
 - 4. TYPE LP-2 – Laminated Polycarbonate – Product Type MPC500. 1/2” Nominal Thickness. ASTM 1915-03 Security Level 2.
 - 5. TYPE LP-3 – Laminated Polycarbonate – Product Type RC750. 3/4” Nominal Thickness. ASTM 1915-03 Security Level 1.
 - 6. TYPE LP-4 – Laminated Polycarbonate – Product Type SP1250. 1.25” Nominal Thickness. ASTM 1915-03 Security Level 1, UL 752 Level 3.

2.04 FLAT BULLET RESISTANT TYPES OF GLASS.

- A. General: All laminated composition security glass units, whether specifically shown or specified, shall conform to manufacturer’s standards as to maximum size for each type of glass.
- B. Forced-Entry Resistant Performance: Provide products identical to those tested for compliance with requirements indicated per test specified for specific glazing types. All exposed

polycarbonate products in this section shall have a mar resistant coating on all exposed surfaces. 10 year coating warranty.

1. TYPE BR-1 – GEAM Specialty Film & Sheet Type BALULN25 – 1.05” Nominal Thickness. Clear. Laminated Glass with exposed polycarbonate. UL Listed Level III – 3 shots .44 magnum.
2. TYPE BR-2 – GEAM Specialty Film & Sheet Type BALULN31 – 1.20” Nominal Thickness. Clear. Laminated Glass with exposed polycarbonate. UL Listed Level IV – 1 shot 30.06
3. TYPE BR-3 – GEAM Specialty Film & Sheet Type BALULN55 – 2-1/16” Nominal Thickness. Clear. Laminated Glass with exposed polycarbonate. UL Listed Level VIII. – 5 Shots M80 Ball.

2.04 DESCRIPTION / FABRICATION

1. Glass: Refer to primary and chemically strengthened glass requirements as related to properties of coated and uncoated glass making up laminated compositional security glass.
2. Interlayer: provide glass manufacturer’s standard interlayer for laminating paned of glass a polycarbonate core, with a proven record of showing no tendency to bubble, discolor or loose physical or mechanical properties after laminating and installation,
3. Plastic core: Refer to appropriate product requirements relating to properties polycarbonate make up the laminated compositional security product.
4. Laminating Process: Fabricated laminated sheets using laminator’s standard process to produce units free from foreign substances and air bubbles.

2.05 GLAZING MATERIALS

- A. Compatibility: Select material with proven record of compatibility with surfaces contacted in each application.
- B. Sealant: Single component acrylic terpolymer, FS TT-S00230; “Tremco Mono”, color as later selected by Architect.
- C. Glazing Tape: Performed butyl, NAAMM #55-1B-6B, with integral resilient tube spacing device; 10-15 Shore A hardness; cooled on release paper; color as later selected by Architect.
- D. Setting Blocks: Neoprene, EPDM or silicone blocks, as required for Compatibility with glazing sealants, 70-90 Shore A durometer hardness, 4 inch long x 3/8 inch wide x ¼ inch thick.
- E. Spacers: Neoprene, EPDM or silicone blocks, or continuous extrusions, as required for compatibility with glazing sealants; 40-50 Shore A durometer hardness; of size and shape recommended by glass and sealant Mfg.
- F. Edge Blocks: Neoprene blocks as required for compatibility with glazing sealant, of size and hardness required to limit lateral movement of glass.
- G. Cleaners, Primers, and Sealants: Type recommended by sealant or gasket manufacturer, for each application.

PART 3 EXECUTION

3.01 INSPECTION

- A. Check that glazing channels are free from burrs, irregularities, and debris.
- B. Check that glass is free from edge damage or face imperfections.
- C. Do not proceed with installation until any unsatisfactory conditions are corrected.

3.02 PREPARATION

- A. Field Measurements:
 - 1. Cut glass accurately to size obtained from verified field measurements of frames.
 - 2. Allow for proper edge clearances.
- B. Preparation of surfaces:
 - 1. Remove any protective coatings or coverings from surface to be glazed.
 - 2. Clean glass and glazing surfaces to remove dust, oil, and contaminants. Then wipe dry.

3.03 INSTALLATION

- A. General Requirements: All materials shall be used in accordance with the manufacturer's printed instructions and recommended procedures.
- B. Positioning of glass:
 - 1. Orient pattern, and draw of glass in same direction.
 - 2. Place glass waves parallel to floor.
- C. Clearance requirements: Allow the following minimum nominal clearances, in accordance with glass manufacturer's recommendations; glass face to channel face, glass edge to frame member, and glass bite.

<u>Glass thickness</u>	<u>Face clearance</u>	<u>Edge clearance</u>	<u>Bite</u>
<u>Specified thickness</u>	1/8 inch	¼ inch	1 inch

3.04 EXTERIOR COMBINATION METHOD (tape and sealant)

- A. Cut glazing tape to proper lengths prior to application, install against permanent stop, 3/16" to ¼" below sight line.
- B. Do not lap the adjoining lengths of tape or rubber shim, as this will prevent full contact around perimeter of glass.
 - 1. Strips must be installed in 4 separate sections, not run continuously around corners.
- C. Place setting blocks at ¼ points.
- D. Rest glass on setting blocks and press against tape with sufficient pressure to ensure full contact and adhesion at perimeter.
- E. Sealant cavity pocket, formed by setting of the applied stop, shall then be filled to the sight line.
- F. Cap bead shall not exceed 1/16 inch above sight line onto glass surface.
- G. Tool or wipe cap bead with solvent for smooth appearance.

3.05 INTERIOR DRY METHOD (tape and tape)

- A. Cut glazing tape to length and install against permanent stop, shall then be filled to the sight line.

- B. Place setting blocks at ¼ points.
- C. Rest glass on setting blocks and press against tape with sufficient pressure to ensure full contact and adhesion at perimeter.
- D. Place glazing tape on free perimeter of glass in same manner described above.
- E. Install removable stop, avoid displacement of tape, exert pressure on tape for full continuous contact.
- F. Knife trim excess or protruding tape.

3.06 CLEANING AND PROTECTION

A. Cleaning

- 1. Remove excess glazing material from installed glass.
- 2. Remove labels from surface as soon as installed.
- 3. Remove debris from work site.

B. Protection

- 1. Attach crossed streamers away from glass face.
- 2. Do not apply markers to glass surface.
- 3. Replace damaged glass.

END OF SECTION