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**PART 1        GENERAL**

**1.1            REFERENCES**

- .1     ASTM International
  - .1     ASTM C542-(2011), Standard Specification for Lock-Strip Gaskets.
  - .2     ASTM D2240-15, Standard Test Method for Rubber Property - Durometer Hardness.
- .2     Canadian General Standards Board (CGSB)
  - .1     CAN/CGSB-12.1-M90, Tempered or Laminated Safety Glass.
  - .2     CAN/CGSB-12.8-97, Insulating Glass Units.
- .3     Glass Association of North American (GANA)
  - .1     GANA Glazing Manual.
  - .2     GANA Laminated Glazing Reference Manual.

**1.2            ACTION AND INFORMATIONAL SUBMITTALS**

- .1     Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2     Product Data:
  - .1     Submit manufacturer's instructions, printed product literature and data sheets for glass, sealants, and glazing accessories and include product characteristics, performance criteria, physical size, finish and limitations.
- .3     Samples:
  - .1     Submit for review and acceptance of each unit.
  - .2     Submit 150 mm size samples of glazing.

**1.3            CLOSEOUT SUBMITTALS**

- .1     Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2     Operation and Maintenance Data: submit operation and maintenance data for glazing for incorporation into manual.

**1.4            DELIVERY, STORAGE AND HANDLING**

- .1     Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2     Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3     Storage and Handling Requirements:
  - .1     Store materials off ground in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2     Store and protect glazing and frames from nicks, scratches, and blemishes.

- .3 Protect prefinished aluminum surfaces with strippable coating.
- .4 Replace defective or damaged materials with new.

## **1.5 WARRANTY**

- .1 Provide ten (10) year warranty for glazing units.

## **PART 2 PRODUCTS**

### **2.1 MATERIALS**

- .1 Flat Glass:
  - .1 Safety glass: to CAN/CGSB-12.1, transparent, 6 mm thick.
    - .1 Type 1-laminated.
    - .2 Class B-float.
    - .3 Category 11.
  - .2 Insulating Glass Units:
    - .1 Insulating glass units (doors and windows): to CAN/CGSB-12.8, double unit, 25 mm overall thickness.
      - .1 Glass: Safety glass to CAN/CGSB-12.1.
      - .2 Glass thickness:
        - .1 Exterior lite: 6 mm tempered safety glass.
        - .2 Interior lite: 8 mm laminated safety glass, 4 mm clear glass/0.030 PVC interlayer/4 mm clear glass
      - .3 Inter-cavity space thickness: 13 mm with low conductivity spacers.
      - .4 Glass coating: surface number 3 low "E".
      - .5 Inert gas fill: argon.
      - .6 Glass tint: Solargray tinted glass on exterior lite.
    - .2 Fire rated insulating glass units: to CAN/CGSB 12.8:
      - .1 Nominal thickness: 25 mm.
      - .2 Glass-vision units: two lites, one fire-rated and one laminated safety.
        - .1 Exterior lite: 6 mm tempered safety glass.
        - .2 Interior lite: 5 mm clear Fire Rated Glazing with Obscure surface finish.
      - .3 Air space: 13 mm.
      - .4 Sealing system: dual seal, polyisobutylene primary seal, polysulfide secondary seal.
      - .5 Spacer: manufacturer's standard stainless steel:
      - .6 Desiccant: manufacturer's standard.
- .3 Fire Rated Glazing:
  - .1 Properties:
    - .1 Thickness: 5 mm

- .2 Film: fire-rated surface film as approved by manufacturer.
- .3 Weight: 11.72 Kg/m<sup>2</sup>.
- .4 Approximate visible transmission: 88 percent.
- .5 Approximate visible reflection: 9 percent.
- .6 Hardness (Vicker's Scale): 700.
- .7 Fire-rating: as indicated on Door/Frame Schedule.
- .8 Impact safety resistance: ANSI Z97.1 and CPSC 16 CFR1201 (Cat. I and II).
- .9 Positive pressure test: UL 10C, UBC 7-2 and 7-4; passes.
- .10 Surface finish:
  - .1 Premium grade-ground and polished on both sides.
  - .2 Obscure-pattern surface where fire-rated translucent glass is indicated on drawings and schedules.
- .2 Labeling: permanently label each piece of fire rated glazing with UL logo and fire rating.
- .3 Fire rating: fire rating listed and labeled by UL for fire rating scheduled at opening locations on drawings, when tested in accordance with ULC Standards CAN4 S-104 and CAN4 S-106.
- .4 Sealant: in accordance with Section 07 92 00 - Joint Sealants.

## 2.2 ACCESSORIES

- .1 Setting blocks: neoprene, 80-90 Shore A durometer hardness to ASTM D2240, to suit glazing method, glass light weight and area.
- .2 Spacer shims: neoprene, 50-60 Shore A durometer hardness to ASTM D2240, 75 mm long x one half height of glazing stop x thickness to suit application. Self adhesive on one face.
- .3 Glazing tape:
  - .1 Preformed butyl compound with integral resilient tube spacing device, 10-15 Shore A durometer hardness to ASTM D2240; coiled on release paper; black colour.
- .4 Glazing splines: resilient polyvinyl chloride, extruded shape to suit glazing channel retaining slot, colour as selected.
- .5 Glazing clips: manufacturer's standard type.
- .6 Lock-strip gaskets: to ASTM C542.

## 2.3 ACCESSORIES: FIRE RATED GLAZING

- .1 Glazing tape: closed cell polyvinyl chloride (PVC) foam, coiled on release paper over adhesive on two sides, maximum water absorption by volume of 2 percent. Glass panels that exceed 0.9 m<sup>2</sup> for 90-minute ratings must be glazed with fire rated glazing tape supplied by manufacturer.

- .2 Glazing compound: as recommended by manufacturer.
- .3 Silicone sealant: one part neutral curing silicone, medium modulus sealant, Type S; Grade NS; class 25 with additional movement capability of 50 percent in both extension and compression (total 100 percent); use (exposure) NT; uses (substrates) G, A and O as applicable.
- .4 Setting blocks: neoprene, EPDM, or silicone; tested for compatibility with glazing compound; of 70 to 90 Shore A hardness.
- .5 Cleaners, primers and sealers: type recommended by manufacturer of glass and gaskets.

## **2.4 ACCESSORIES: FIRE RATED INSULATING GLASS UNITS**

- .1 Glazing tape: closed cell polyvinyl chloride (PVC) foam, coiled on release paper over adhesive on two sides, maximum water absorption by volume of 2 per cent, 3 mm x 9 mm.
- .2 Polysulfide sealant.
- .3 Setting blocks: neoprene, EPDM, or silicone: tested for compatibility with glazing compound; of 70 to 90 shore A hardness.
- .4 Cleaners, primers and sealers: type recommended by manufacturer of glass and gaskets.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for glazing installation in accordance with manufacturer's written instructions.
  - .1 Verify that openings for glazing are correctly sized and within tolerance.
  - .2 Verify that surfaces of glazing channels or recesses are clean, free of obstructions, and ready to receive glazing.
  - .3 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
  - .4 Proceed with installation only after unacceptable conditions have been remedied.

### **3.2 PREPARATION**

- .1 Clean contact surfaces with solvent and wipe dry.
- .2 Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- .3 Prime surfaces scheduled to receive sealant.

**3.3            INSTALLATION: EXTERIOR WET/DRY METHOD (PREFORMED TAPE AND SEALANT)**

- .1      Perform work in accordance with GANA Glazing Manual and GANA Laminated Glazing Reference Manual for glazing installation methods.
- .2      Cut glazing tape to length and set against permanent stops, 6 mm below sight line. Seal corners by butting tape and dabbing with sealant.
- .3      Apply heel bead of sealant along intersection of permanent stop with frame ensuring full perimeter seal between glass and frame to complete continuity of air and vapour seal.
- .4      Place setting blocks at 1/4 points, with edge block maximum 150 mm from corners.
- .5      Rest glazing on setting blocks and push against tape with sufficient pressure to attain full contact at perimeter of light or glass unit.
- .6      Install removable stops with spacer strips inserted between glazing and applied stops 6 mm below sight line.
- .7      Fill gap between glazing and stop with sealant to depth equal to bite of frame on glazing, maximum 9 mm below sight line.
- .8      Apply cap head of sealant along void between stop and glazing, to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

**3.4            INSTALLATION: INTERIOR - DRY METHOD (TAPE AND TAPE)**

- .1      Perform work in accordance with GANA Glazing Manual for glazing installation methods.
- .2      Cut glazing tape to length and set against permanent stops, projecting 1.6 mm above sight line.
- .3      Place setting blocks at 1/4 points, with edge block maximum 150 mm from corners.
- .4      Rest glazing on setting blocks and push against tape for full contact at perimeter of light or unit.
- .5      Place glazing tape on free perimeter of glazing in same manner described.
- .6      Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.
- .7      Knife trim protruding tape..

**3.5            INSTALLATION: FIRE RATED GLAZING**

- .1      Comply with referenced FGMA standards and instructions of manufacturers of glass, glazing sealants, and glazing compounds.

- .2 Protect glass from edge damage during handling and installation. Inspect glass during installation and discard pieces with edge damage that could affect glass performance.
- .3 Set units of glass in each series with uniformity of pattern, draw, bow, and similar characteristics.
- .4 Cut glazing tape to length and set against permanent stops, flush with sight lines to fit openings exactly, with stretch allowance during installation.
- .5 Place setting blocks located at quarter points of glass with edge block no more than 150 mm from corners.
- .6 Glaze vertically into labeled fire rated metal frames or partition walls with same fire rating as glass and push against tape for full contact at perimeter of pane or unit.
- .7 Place glazing tape on free perimeter of glazing in same manner described above.
- .8 Install removable stop and secure without displacement of tape.
- .9 Use specified glazing compound, without adulteration; bed glazing material in glazing compound entirely fill all recess and spaces. Provide visible glazing compound with smooth and straight edges.
- .10 Install in vision panels in fire rated doors to requirements of NFPA 80.
- .11 Install so that UL markings remain permanently visible.

### **3.6 INSTALLATION: FIRE-RATED INSULATED GLASS UNITS.**

- .1 Comply with referenced FGMA standards and instructions of manufacturers of glass, glazing sealants, and glazing compounds.
- .2 Protect glass from edge damage during handling and installation. Inspect glass during installation and discard pieces with edge damage that could affect glass performance.
- .3 Crimp and seal breather tubes.
- .4 Set units of glass in each series with uniformity of pattern, draw, bow and similar characteristics.
- .5 Cut glazing tape to length and set against permanent stops, flush with sight lines to fit openings exactly, with stretch allowance during installation.
- .6 Place setting blocks located at quarter points of glass with edge block no more than 150 mm from corners.
- .7 Glaze vertically into labeled fire-rated metal frames with same fire rating as glass and push against tape for full contact at perimeter of pane or unit.
- .8 Place glazing tape on free perimeter of glazing in same manner described above.
- .9 Install removable stop and secure without displacement of tape.

- .10 Use specified glazing compound, without adulteration; bed glazing material in glazing compound; entirely fill all recesses and spaces. Provide visible glazing compound with smooth and straight edges.
- .11 Install in vision panels in fire-rated doors to requirements of NFPA 80.
- .12 Install so that appropriate UL markings remain permanently visible.

### **3.7 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
    - .1 Remove traces of primer, caulking.
    - .2 Remove glazing materials from finish surfaces.
    - .3 Remove labels.
    - .4 Clean glass using approved non-abrasive cleaner in accordance with manufacturer's instructions.
  - .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

### **3.8 PROTECTION**

- .1 Protect installed products and components from damage during construction.
- .2 After installation, mark each light with an "X" by using removable plastic tape or paste.
  - .1 Do not mark heat absorbing or reflective glass units.
- .3 Repair damage to adjacent materials caused by glazing installation.

**END OF SECTION**