
York University Building Standards

Note to the Designer/Architect/Engineer: These standards are basic minimum criteria to be met in preparing the final project specifications for this section, which is the responsibility of the Designer

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1.0 GENERAL

1.1 Conditions

- .1 This section defines relevant York University standards related to interior glazing applications

1.2 Sustainable Design Requirements

- .1 LEED MRc4: Recycled Content
Provide a statement from the manufacturers including recycled content percentage, by weight, and whether the recycled content is post-industrial or post-consumer.
- .2 LEED EQc8: Daylight and Views access to daylight and views makes for a more comfortable occupants and is likely to positively impact productivity
- .3 LEED EQc4: Low-Emitting Materials
Provide documentation from the manufacturer identifying the VOC and chemical compound limits for each sealant provided.

1.3 Scope of Work

This document defines minimum standards for glazing in wood and steel doors

as well as glass door and partition systems, specifically. This standard does not include, curtain wall, window, and aluminum exterior door glazing systems

1.4 Related York University Standards

- .1 Door Finishing Hardware Section 08 71 00
- .2 Proximity Card Access Section 08 74 00
- .3 Wood Doors and Frames Section 08 14 00
- .4 Steel Doors and Frames Section 08 11 00

1.5 References

- .1 Comply with all applicable municipal, provincial, federal and trade standards in this specification, unless more stringent requirements are given herein.
- .2 GANA (Glass Association of North America) - Glazing Manual (50th edition)
GANA International Protective Glazing Manual (2010)
GANA Engineering Standards Manual
GANA Laminated Glazing Reference Manual (2009)
GANA Sealant Manual (2008)
GANA Fully Tempered Heavy Glass Door and Entrance Systems Design Guide (1999)
CAN/CGSB 12.8-97 Insulating Glass Units
CAN/CGSB 12.1 - M90 Tempered or Laminated Safety Glass
CAN/CGSB 12.11-M90 Wired Safety Glass,
CAN/CGSB 12.2 – M91 Flat, Clear Sheet Glass
CAN/CGSB 12.3 - M91 Flat, Clear Float Glass
NFPA (National Fire Protection Association) 80 Standard for Fire Doors and Fire Windows
American Society for Testing and Materials (ASTM)
ASTM C1503-8 Standard Specification for Silvered Flat Glass Mirror
ASTM C509 Specification for Elastomeric Cellular Preformed Gasket and Sealing Material
ASTM C669 Specification for Glazing Compounds for Back Bedding and Face Glazing of Metal Sash
ASTM C1048-04 Standard Specification for heat-treated flat glass-Kind HS, Kind FT Coated and Uncoated glass
ASTM C1036-6 Standard Specification for Flat Glass
ASTM C920- 08 Standard Specification for Elastomeric Joint Sealants

1.6 Submittals

- .1 Submit manufacturer's product data sheet showing thermal performance, characteristics of coated, insulating glass unit, or heat mirror insulating glass

- .2 Submit manufacturer's product data sheet showing strength of performance characteristics of tempered or laminated glass
- .3 Submit manufacturer's product data sheet for any glazing proposed to be used for any interior wood or steel door glazing, glass doors or glass wall partitions.
- .4 Submit compatibility and adhesion test reports from sealant manufacturer indicating that the glazing materials were tested for compatibility and adhesion with glazing sealant as well as other glazing materials.
- .5 All submittals for proposed glazing shall demonstrate adherence to applicable GANA standards, Ontario Building Code, City of Toronto Fire and Safety Bylaws and any other applicable requirement.

1.7 Product samples (P.S.):

.1 Product Samples:

.1 Submit a 20.32 cm by 25.4 cm sample of each type, thickness, and colour of glass to be installed. Identify each sample with the manufacturer's name, product name, type of glass, thickness, colour design, and installation location. Protect sample edges for handler's safety.

.2 Submit a 25.4 cm sample of each type of glazing gasket, and type, and glazing compound, identified with the manufacturer's name, product name, product code or reference number, and type of material.

1.8 Quality Assurance:

- .1 Installer shall have a minimum of five (5) years experience in projects of similar size and complexity
- .2 Installer shall comply with GANA (Glass Association of North America) - Glazing Manual other relevant standards, guidelines, and the Ontario Building Code

Tempered glass:

- .1 Tempered and heat strengthened glass shall be horizontally treated; vertical treatment will not be acceptable. Fabrication and treatment shall be such that distortion lines (where they occur) run horizontally (parallel to sill and head) after installation.

- .2 Tempered glass shall bear the manufacturer's identification as to thickness. Such identification for glazing shall be permanently etched so as to be visible after glass has been installed. Glass other than fully tempered (FT) glass shall not have etched labels.
- .3 Identification: Label each pane of glass and glass unit with type, thickness, quality, and colour of glass and with manufacturer's trade name
- .4 Glazing: Glazing compounds and methods shall conform with applicable requirements of GANA Glazing Manual

1.9 Installation instructions

- .1 Supply manufacturer's written instructions for proper installation

1.10 Maintenance and cleaning instructions (M.I.):

- .1 Provide maintenance and cleaning instructions, and manufacturer's instructions for each type of wood or steel door glazing application and interior glass panel.
- .2 Provide a maintenance document to York University maintenance staff regarding proper care, cleaning, and general maintenance.

1.11 Storage, Delivery and Handling

- .1 Suitably protect glass products to prevent damage from weather and breakage. Individually wrap accessory materials to protect them from damage.
- .2 Store glass vertically, off the ground, on "A" frames, braced or blocked to prevent racking, twisting, or sagging.
- .3 Take special care to protect edges of insulating glass units from damage but do not apply tape or other materials to edges.
- .4 Tape applied to edges of sealed units may impair performance of unit or window assembly.
- .5 Protect glass products from exposure to moisture or condensation prior to installation.

1.12 Standard Warranties and Extended Warranties (S.W. / E.W.)

- .1 Wood and Steel Door glazing and interior glass panels shall be guaranteed in writing against manufacturers defects for a minimum of 10 years from date of manufacturing – as a minimum manufacturer’s warranty shall cover the following:
 - .1 deterioration due to normal conditions of use, and not to handling, installing, protecting and maintaining practices contrary to the glass manufacturer’s published instructions.
 - .2 Replacement of glass units applied to wood or steel doors, glass doors or glass panels
 - .3 No dollar limit
 - .4 Non-prorated
 - .5 10-year warranty duration

2.0 PRODUCTS

2.1 Acceptable products:

Glass:

- .1 Where safety glass is indicated or where required by applicable laws and safety codes, laminated glass shall be employed for interior and exterior wood or steel door glazing, interior glass doors, and interior glass panels.
- .2 Glazing to be used for interior and exterior wood or steel door glazing, interior glass doors, and interior glass panels shall be heat treated to strengthen glass in bending to not less than 4.5 times annealed strength. Glass shall have minimal waviness or distortion and with all areas free of tong marks

Clear wired glass

- .1 Georgian Polished Wire glass, to CAN/CGSB 12.11-M90 Wired Safety Glass, Type 1, Style 3, 6 mm (1/4”) thick minimum clear. Glass for fire rated doors shall also comply with requirements of NFPA 80

Clear Tempered Glass

Clear tempered glass for indoor use such as glass panels shall conform to ASTM C1048, Kind FT, Condition A, Type I, Class 1, Quality q3

Heat strengthened Tempered Glass

Tinted or clear tempered glass for indoor use such as glass panels shall conform to CAN12.1 – M90 , 6 mm (1/4”) thick minimum - clear or of the tinted colour specified for the project.

Laminated Tempered Glass

Laminated tempered glass made up of a minimum of two panes of fully tempered (FT), shall conform to CAN/CGSB 12.1 – M90, laminated, glass layers shall have clear PVB interlayer of 1.52 mm (0.060’) minimum thickness. Glass layers minimum 3 mm and 9 mm thick unless otherwise scheduled or indicated

Laminated glass products shall be fabricated such that they are free of foreign substances and air or glass pockets in autoclave with heat plus pressure.

2.10 Mirrors:

- .1 Annealed glass, shall conform to ASTM C1503-8 Standard Specification for Silvered Flat Glass Mirror
- .2 Grade: Mirror Cut Size
- .3 Quality: Mirror Select Quality, except allowable distortion shall be $\geq 80^\circ$ vision interference angle to conform to ASTM C1036-6 Standard Specification for Flat Glass
- .4 Colour: Clear
- .5 Thickness: 6 mm (1/4”)
- .6 Exposed edges shall be chamfered, ground and polished
- .7 Provide unframed mirrors only

2.11 Bullet Resistant Plastic Glass

Monolithic or laminated polycarbonate sheets. Exterior shall be mar resistant. The assembly shall have a flexure strength of not less than 931 bars (13,500 psi) and must be in conformance with applicable ASTM standards, and have a minimum of 87 per cent light transmission

2.12 Glazing Compounds

- .1 Glazing Gaskets: Continuous, closed-cell, moulded or extruded neoprene or vinyl rubber of profile and hardness required to withstand seal, channel type, manufactured for glazing in type of metal doors and frames indicated, shall conform to applicable requirements of ASTM C509-06 (2011) Standard Specification for Elastomeric Cellular Performed Gasket and Sealing Material.

- .2 The Engineer or the University's project representative shall select the colour of glazing gasket from the manufacturer's standards. Gaskets shall be capable of being compressed 40 percent of their original size and shall have 100 percent recovery capability.
- .3 Glazing tape:
Synthetic rubber or polyurethane foam glazing tape, sheet or strip material reinforced and stabilized with fabric mesh in the centre and treated with a bonding agent on both contact surfaces

Alternatively,
 - .4 High density, closed cell, flexible, non-extruding tape, adhesive backed one side only: recommended by manufacturer for exterior applications with normal pressure in glazing channel
 - .5 Acceptable products recommended by glass manufacturer suitable for conditions of application and use.
 - .6 Spacers: Silicone material or continuous extrusions of hardness required by the glass manufacturer to maintain glass panes in place for installation indicated
 - .7 Glazing Adhesive Compounds:
 - .1 For face glazing: elastic glazing compound, manufactured for back bedding and face glazing of metal sash, in the colour to be selected by the Engineer or the university's project representative from the manufacturer's standard
 - .2 Include door manufacturer's glass retaining clips or brackets for face glazing
 - .3 Elastomeric Joint Sealant: sealant for glass to glass edge joints shall be silicone sealant black in colour and conforming to ASTM C920 Standard Specification for Elastomeric Joint Sealants
 - .8 Silicone glazing (Weatherseal) sealant – for exterior door use:
 - .1 Medium-modulus, neutral-curing silicone sealant' shall comply with ASTM C920- 08 Standard Specification for Elastomeric Joint Sealants, Type M or S, Grade NS, Class 25

- .9 Mirror Adhesive: Palmer Mirro-Mastic, complete with sealer as required
- .10 Trim for glass mounted on gypsum board: anodized aluminium, 20mm x 6mm X 1.5 mm L profile
 - .1 Aluminium trim to be anchored to the gypsum board with countersunk, stainless steel screws.

2.13 Fabrication

- .1 Factory sealed insulating glass for doors and curtain walls shall be fabricated in accordance with the requirements of CAN/CGSB 12.8-97 Insulating Glass Units

3.0 EXECUTION

3.5 Installation of Glazing

- .1 Obtain field dimensions for each opening that is to receive glass and cut each glass to provide the optimal fit on, and clearance from, the sash or frame.
- .2 Clean the surfaces that are to receive the glass and glazing materials. Surfaces shall be free of dirt, corrosion, residue, oils, and any other substance that may impair adhesion of glazing materials.
- .3 Clean contact surfaces with solvent and apply primers to surfaces to receive tapes and sealants in accordance with the glass manufacturer's written instructions.
- .4 Ensure all finishes are fully dry before installing the glazing.
- .5 Seal porous glazing channels or recesses with substrate compatible primer or sealer. Prime surfaces scheduled to receive glazing compound.
- .6 Do not perform glazing when ambient temperature is below 4 degrees Celsius
- .7 Ensure humidity level is low before installation.
- .8 Install glazing according to manufacturers' specifications.
- .9 Ensure space between double-glazing is perfectly clean before installing the second panel.

3.7 General Glazing requirements:

- .1 Comply with the general provisions of GANA Glazing Manual and the Ontario Building Code for minimum glazing requirements, and ensure that minimum frame lap (minimum grip of glass) and edge clearances are provided as required for the size of openings. Provide for expansion and contraction of glass as required.
- .2 Conform with the manufacturers' latest published installation instructions and recommendations for glazing of tempered glass, wired glass, laminated glass, and insulating glass. Follow manufacturer's latest published instructions for protection of edges and sizing of glass.
- .3 Install glass in fire rated assemblies in accordance with NFPA 80.
- .4 Provide setting blocks at quarter points along the bottom of the glass pane. Blocks shall support the glass 1.5875 mm above the metal. Provide spacers to hold glass in centre between stops.
- .5 Provide spacers for glass panes where length plus width is greater than 1270 mm
 - .1 Locate spacers directly opposite each other on both inside and outside faces of the glass. Install correct size of spacers 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 3.2 mm minimum bite of spacers on glass and use thickness equal to sealant width.
- .6 Adjust glazing channel dimensions as required by conditions during installation to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.
- .7 Protect glass edges from damage during handling and installation. Remove damaged glass from project site and dispose in accordance with municipal waste management and recycling requirements. Glass is considered to be damaged if edge damage, or other imperfections that, when installed, could weaken the glass and impair performance and/or appearance.
- .8 Glazing of hollow metal doors and frames: glass shall be set around all edges with glazing gaskets hereinbefore specified.

Provide setting blocks and spacers blocks as required. Set gasket legs on both sides of glass. Gasket shall be continuous, notched only at top rail in the centre. Compress gasket at least 15 percent to form a tight seal.

- .9 For indoor glass panels: - set glass panes with proper orientation so that coating faces the correct specified direction
- .10 For Hollow Metal Doors: specified in Section 8 11 00. Install 6 mm fire rated glass unless indicated otherwise. Fixed stop bedding, glazing tape, removable stops, and glazing tape.

3.8 Tape Glazing:

- .1 Position tapes on fixed stops so that, when compressed by the glass, their exposed edges are flush with or protrude slightly above sightline of stops.
- .2 Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
- .3 Cover vertical framing joints by applying tapes to heads and sills first and then to jambs. Cover horizontal framing joints by applying tapes to jambs and then to heads and sills.
- .4 Follow tape glazing manufacturers documented instructions for application.

3.9 Gasket Glazing (Dry)

3.10 Installation of Mirrors

- .1 Mount unframed mirrors in true planes, free of distortions. Surfaces of butted mirrors shall be flush to ≤ 1 mm. Mirror installation shall be flat to within 1.5 mm in 1220 mm
- .2 Generally, joints in mirrors are acceptable only for locations where mirrors are longer than 3050 mm (10'). Provide butt joints with ground and polished edges. Apply 6 mm wide clear silicone at butt joints.
- .3 Mastic adhesive and bottom trim support installation:
 - .1 Mirror substrate shall be free of dust, clean and dry. On nonporous substrates, such as glass, tile, or metal, sealing is not necessary. On porous substrates, such as gypsum board or wood, use Mirro-Mastic Bond on the substrates and allow

it to dry.

- .2 Support mirror at the bottom aluminium trim and shim at $\frac{1}{4}$ points with concealed setting blocks
- .3 Apply mirror adhesive to the mirror or substrate in a minimum of 1 golf ball size mound for every 0.0929 m² of mirror. Do not apply mastic too close to the edge to prevent "squeeze out".
- .4 Place the mounds so space will be left between them when mirror is installed. Mastic adhesive shall be at room temperature (22C).
- .5 Press mirror firmly in place making good contact between the mirror, mastic, and substrate.
- .6 Mastic should spread to a pat approximately 114 mm in diameter. The mastic needs air circulation to cure properly.
- .7 Curing time will depend on temperature, humidity, type of substrate, and amount of air that can reach the mastic.

3.10 Finishing (Installation of Mirrors)

- .1 Immediately remove sealant and compound droppings from finished surfaces. Remove labels after work is completed.

3.11 Coordination

- .1 Coordinate with York University project representative, **door and frame manufacturers**

3.12 Cleaning and Replacement

- .1 Upon completion of glazing, remove paint spots, splatters, and other blemishes from glass
- .2 Assure that each light is identified as to type and grade of glass
- .3 Remove and replace glass panes that are cracked or broken and where distortion is evident and distracting, as determined by the Engineer or University project representative.
- .4 Remove paper labels, wash, and polish glass just before acceptance by Engineer or University project representative.
- .5 Protect glass against damage from subsequent construction

activities and vandalism.

End of Section 08 81 00