

\*\*\*\*\*  
USACE / NAVFAC / AFCEA / NASA                      UFGS-08 81 00.00 40 (April 2006)  
-----  
Preparing Activity:    NASA                              Superseding  
    NASA-08805S (December 2005)

## UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are NOT in agreement with UMRL dated 01 April 2006

Revised throughout - changes not indicated by CHG tags

\*\*\*\*\*

### SECTION TABLE OF CONTENTS

#### DIVISION 08 - OPENINGS

#### SECTION 08 81 00.00 40

#### GLASS AND GLAZING

04/06

#### PART 1    GENERAL

- 1.1    REFERENCES
- 1.2    SUBMITTALS
- 1.3    DELIVERY, STORAGE AND HANDLING

#### PART 2    PRODUCTS

- 2.1    GLASS MATERIALS
  - 2.1.1    Clear Glass
  - 2.1.2    Heat-Absorbing Glass
  - 2.1.3    Tinted Glass
  - 2.1.4    Safety-Rated Tempered Glass
  - 2.1.5    Clear Sheet Glass
  - 2.1.6    Tinted Sheet Glass
  - 2.1.7    Figured Glass
  - 2.1.8    Fire-Rated Wired Glass
  - 2.1.9    Double-Glazing Units
- 2.2    GLAZING MATERIALS
  - 2.2.1    Elastic Glazing Compound
  - 2.2.2    Thermoplastic Sealing Compound
  - 2.2.3    Glazing Tape
  - 2.2.4    Elastomeric Sealing Compound
  - 2.2.5    Wood-Sash Putty
  - 2.2.6    Solvents and Cleaning Agents
  - 2.2.7    Glazing Clips
  - 2.2.8    Resilient Setting Blocks and Spacers

#### PART 3    EXECUTION

- 3.1    GENERAL
- 3.2    TEMPERATURE AND ATMOSPHERIC CONDITIONS
- 3.3    GLAZED OPENINGS PREPARATION
- 3.4    CLEARANCES AND POSITIONING GLASS

- 3.5 APPLICATION OF GLAZING COMPOUNDS
- 3.6 SINGLE GLASS IN METAL SASH WITH FACE GLAZING
- 3.7 SINGLE GLASS IN METAL SASH WITH CHANNEL GLAZING
- 3.8 DOUBLE UNITS IN METAL SASH WITH CHANNEL GLAZING
- 3.9 SINGLE GLASS IN WOOD SASH WITH CHANNEL GLAZING
- 3.10 SINGLE GLASS IN ALUMINUM DOORS WITH FLUSH GLAZING
- 3.11 GLASS PROTECTION
- 3.12 CLEANING

-- End of Section Table of Contents --

\*\*\*\*\*  
USACE / NAVFAC / AFCEA / NASA                      UFGS-08 81 00.00 40 (April 2006)  
-----  
Preparing Activity:    NASA                              Superseding  
    NASA-08805S (December 2005)

## UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are NOT in agreement with UMRL dated 01 April 2006

Revised throughout - changes not indicated by CHG tags

\*\*\*\*\*

### SECTION 08 81 00.00 40

#### GLASS AND GLAZING 04/06

\*\*\*\*\*

NOTE: Delete, revise, or add to the text in this section to cover project requirements. Notes are for designer information and will not appear in the final project specification.

This section covers single-glass lights set in metal or wood sash and double-glazing units set in metal sash.

Drawings must indicate the following:

Location of openings to be glazed and sash material

Location of each glass type and nominal thickness

Location of metal sash with face glazing, if required

Location of metal sash with channel glazing, if required

Glass shelving and all-glass doors for wood cabinets are specified in Section 06 20 00 FINISH CARPENTRY.

Glazing beads or stops for glazed openings in doors, frames, and windows are specified in the applicable door or window sections.

Mirrors for washroom equipment and framed mirrors in washrooms and toilets are specified in Section 10 28 00.00 40 TOILET ACCESSORIES.

Glass and glazing for prefabricated metal buildings are specified in Section 13 34 00.00 40 PRE-ENGINEERED BUILDINGS.

Comments and suggestions on this guide specification are welcome and should be directed to the technical proponent of the specification. A listing of technical proponents, including their organization

designation and telephone number, is on the Internet.

Recommended changes to a UFGS should be submitted as a Criteria Change Request (CCR).

Use of electronic communication is encouraged.

Brackets are used in the text to indicate designer choices or locations where text must be supplied by the designer.

\*\*\*\*\*

## PART 1 GENERAL

### 1.1 REFERENCES

\*\*\*\*\*

NOTE: This paragraph is used to list the publications cited in the text of the guide specification. The publications are referred to in the text by basic designation only and listed in this paragraph by organization, designation, date, and title.

Use the Reference Wizard's Check Reference feature when you add a RID outside of the Section's Reference Article to automatically place the reference in the Reference Article. Also use the Reference Wizard's Check Reference feature to update the issue dates.

References not used in the text will automatically be deleted from this section of the project specification when you choose to reconcile references in the publish print process.

\*\*\*\*\*

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

#### AMERICAN ARCHITECTURAL MANUFACTURERS ASSOCIATION (AAMA)

AAMA 800 (1992) Voluntary Specifications and Test Methods for Sealants

#### AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI Z97.1 (2004) Safety Glazing Material Used in Buildings - Safety Performance Specifications and Methods of Test

#### ASTM INTERNATIONAL (ASTM)

ASTM C 1036 (2001) Standard Specification for Flat Glass

ASTM C 669 (1995) Standard Specification for Glazing Compounds for Back Bedding and Face

Glazing of Metal Sash

ASTM C 920

(2005) Standard Specification for  
Elastomeric Joint Sealants

FLAT GLASS MARKETING ASSOCIATION (FGMA)

FGMA-01

(2001) Glazing Manual

U.S. GENERAL SERVICES ADMINISTRATION (GSA)

FS TT-P-00791

(Rev B; Am 2) Putty; Linseed-Oil Type,  
(For Wood-Sash-Glazing)

UNDERWRITERS LABORATORIES (UL)

UL Bld Mat Dir

(2005) Building Materials Directory

1.2 SUBMITTALS

\*\*\*\*\*

NOTE: Review Submittal Description (SD) definitions in Section 01 33 00 SUBMITTAL PROCEDURES and edit the following list to reflect only the submittals required for the project. Submittals should be kept to the minimum required for adequate quality control.

A "G" following a submittal item indicates that the submittal requires Government approval. Some submittals are already marked with a "G". Only delete an existing "G" if the submittal item is not complex and can be reviewed through the Contractor's Quality Control system. Only add a "G" if the submittal is sufficiently important or complex in context of the project.

For submittals requiring Government approval on Army projects, a code of up to three characters within the submittal tags may be used following the "G" designation to indicate the approving authority. Codes for Army projects using the Resident Management System (RMS) are: "AE" for Architect-Engineer; "DO" for District Office (Engineering Division or other organization in the District Office); "AO" for Area Office; "RO" for Resident Office; and "PO" for Project Office. Codes following the "G" typically are not used for Navy, Air Force, and NASA projects.

Choose the first bracketed item for Navy, Air Force and NASA projects, or choose the second bracketed item for Army projects.

\*\*\*\*\*

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are [for Contractor Quality Control approval.] [for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government.] Submit the following in accordance with Section 01 33 00

SUBMITTAL PROCEDURES:

SD-04 Samples

Contractor shall submit the following samples:

Not less than [2] [\_\_\_\_\_] different samples 250 by 300 millimeter 10 by 12 inches of each glass of the specified type, class, thickness, and finish shall be provide for inspection and approval by the Contracting Officer prior to delivery of material to site.

Color samples of each color and type of glazing and sealing compound to be used in the work, beads approximately 6 wide by 25 millimeter 1/4-inch wide by 1 inch long, to illustrate the glazing or sealing compound manufacturer's standard color range after setting or curing.

Clear Glass  
Heat Absorbing Glass  
Tinted Glass  
Safety Rated Tempered Glass  
Clear Sheet Glass  
Tinted Sheet Glass  
Figured Glass  
Double Glazing Units  
Fire-Rated Wired Glass  
Elastic Glazing Compound  
Elastomeric Sealing Compound

SD-07 Certificates

Certificates shall be submitted for the following items showing conformance with the referenced standards and tests contained in this section.

Glass Materials  
Glazing Materials  
Safety Rated Tempered Glass  
Fire-Rated Wired Glass

1.3 DELIVERY, STORAGE AND HANDLING

Manufactured glass units shall be delivered and stored until installation in the manufacturer's container's and shall be clearly marked on the exterior as to type, and quantity of units.

When special moisture protection is required, glass shall be stored in accordance with the manufacturer's recommendations.

PART 2 PRODUCTS

2.1 GLASS MATERIALS

2.1.1 Clear Glass

\*\*\*\*\*

NOTE: Clear glass is recommended for exterior and interior glazed openings where image distortion would be objectionable or where the glass area

exceeds the limit for sheet glass.

\*\*\*\*\*

Glass shall be float type conforming to ASTM C 1036, Type I, Class 1, Quality q3.

Maximum allowable areas of glass subject to wind pressure shall conform to the glass manufacturer's recommendations.

#### 2.1.2 Heat-Absorbing Glass

\*\*\*\*\*

NOTE: Special attention must be given to the use of heat-absorbing glass because of its ability to absorb heat; partial shading, painted signs, large interior labels, tight draperies or blinds, heavy masonry construction, and heating-cooling outlets directing air against the heat-absorbing glass may increase edge tension stresses.

\*\*\*\*\*

Glass shall be float type conforming to ASTM C 1036, Type I, Class 2, Style [A] [B], Quality q3. Edges shall be [factory] [shop clean-cut].

Tint shall be [light green] [gray] [bronze].

Maximum allowable areas of glass subject to wind pressure shall conform to the glass manufacturer's recommendations.

#### 2.1.3 Tinted Glass

\*\*\*\*\*

NOTE: Tinted is a heat-absorbing and light-reducing glass that is not required to conform to the illuminant "C" transmission and solar transmission values specified in ASTM C 1036 for heat-absorbing glass. Special precautions for heat-absorbing glass also apply to tinted glass.

\*\*\*\*\*

Glass shall be float type conforming to ASTM C 1036, Type I, Class 3, Quality q3. Edges shall be factory or shop clean-cut.

\*\*\*\*\*

NOTE: Luminous transmittance value of tinted glass is governed by the glass tint and thickness.

\*\*\*\*\*

Tint shall be [light green] [gray] [bronze].

Maximum allowable areas of glass subject to wind pressure shall conform to the glass manufacturer's recommendations.

#### 2.1.4 Safety-Rated Tempered Glass

\*\*\*\*\*

NOTE: Safety-rated tempered glass is required for glazed entrances and other glazed openings subject to human impact.

\*\*\*\*\*

Glass shall conform to ANSI Z97.1 and shall bear the ANSI safety glass marking.

Glass before tempering shall be the float type conforming to ASTM C 1036, Type I, Class 1, Quality q3.

Glass shall be factory-cut to suit each opening. Edges shall be clean cut.

#### 2.1.5 Clear Sheet Glass

\*\*\*\*\*

NOTE: Clear sheet glass is recommended for exterior and interior glazed openings where a slight image distortion is not objectionable.

\*\*\*\*\*

Glass shall conform to ASTM C 1036, Type II, Class 1.

Maximum allowable areas of glass subject to wind pressure shall conform to the glass manufacturer's recommendations.

Clear sheet glass shall be double strength.

#### 2.1.6 Tinted Sheet Glass

Glass shall conform to ASTM C 1036, Type II, Class 3.

Maximum allowable areas of glass subject to wind pressure shall conform to the glass manufacturer's recommendations.

Luminous transmittance value shall be not less than [61] [56] [31] [14] percent.

#### 2.1.7 Figured Glass

\*\*\*\*\*

NOTE: Figured glass is recommended for exterior and interior glazed openings where transparent glass is objectionable, such as toilets and washrooms.

\*\*\*\*\*

Glass shall be rolled flat conforming to ASTM C 1036, Type II, Class 1, Form 3, Finish f1, Quality q8. Pattern shall be [\_\_\_\_\_].

Maximum allowable areas of glass subject to wind pressure shall conform to the glass manufacturer's recommendations.

#### 2.1.8 Fire-Rated Wired Glass

\*\*\*\*\*

NOTE: Fire-rated wired glass is required for glazed openings in fire-rated doors and frames.

\*\*\*\*\*

Glass shall be UL approved for fire windows and doors, shall be listed in the UL Bld Mat Dir, Guide Designation KCMZ, and shall bear the UL listing and marking.



\*\*\*\*\*  
 NOTE: Hexagonal mesh is available from only one manufacturer. Square, rectangular, and parallel-strand mesh wired glass bearing the UL label is not available.  
 \*\*\*\*\*

Polished wire glass shall conform to **ASTM C 1036**, Type II, Class 1, Form 1, Mesh m1.

Figured fire-rated glass shall conform to **ASTM C 1036**, Type II, Class 1, Form 2, Mesh m1 or m2. Pattern shall be [\_\_\_\_].

#### 2.1.9 Double-Glazing Units

Units shall be factory fabricated, shall be two panels of flat glass separated by a hermetically sealed, dehydrated air space.

Maximum allowable areas of glass subject to wind pressure shall conform to the glass manufacturer's recommendations.

Clear double-glazing units shall be as follows:

\*\*\*\*\*  
 NOTE: Specify **13 millimeter 1/2-inch** air space instead of **6 millimeter 1/4-inch** for metal-edge double-glazing units when required.  
 \*\*\*\*\*

<u>OUTER PANE GLASS, THICKNESS</u>	<u>INNER PANE GLASS, THICKNESS</u>	<u>AIR SPACE WIDTH</u>	<u>EDGE SEAL</u>
Clear sheet, A quality, double strength	Same as outer pane	5 millimeter	[Glass] [____]
Clear float 3 millimeter thick	Same as outer pane	6 millimeter	[Glass] [____]
Clear sheet 5 millimeter thick	Same as outer pane	6 millimeter	[Glass] [____]
Clear float 3 millimeter thick	Same as outer pane	6 millimeter	[Glass] [____]
<u>OUTER PANE GLASS, THICKNESS</u>	<u>INNER PANE GLASS, THICKNESS</u>	<u>AIR SPACE WIDTH</u>	<u>EDGE SEAL</u>
Clear sheet, A quality, double strength	Same as outer pane	3/16 inch	[Glass] [____]
Clear float 1/8 inch thick	Same as outer pane	1/4 inch	[Glass] [____]
Clear sheet 3/16 inch thick	Same as outer pane	1/4 inch	[Glass] [____]

<u>OUTER PANE</u> <u>GLASS, THICKNESS</u>	<u>INNER PANE</u> <u>GLASS, THICKNESS</u>	<u>AIR SPACE</u> <u>WIDTH</u>	<u>EDGE</u> <u>SEAL</u>
Clear float 1/4 inch thick	Same as outer pane	1/4 inch	[Glass] [_____]

Tinted double-glazing units shall be as follows:

\*\*\*\*\*  
NOTE: Specify 13 millimeter 1/2 inch air space  
instead of 6 millimeter 1/4 inch for metal-edge  
double-glazing units when required.  
\*\*\*\*\*

<u>OUTER PANE</u> <u>GLASS, THICKNESS</u>	<u>INNER PANE</u> <u>GLASS, THICKNESS</u>	<u>AIR SPACE</u> <u>WIDTH</u>	<u>EDGE</u> <u>SEAL</u>
Tinted sheet, luminous trans- mittance value minimum 70 percent, 3 millimeter thick	Same as outer pane	5 millimeter	[Glass] [_____]
Tinted sheet, luminous trans- mittance value minimum 31 percent, 3 millimeter thick	Clear sheet, A quality, double strength	6 millimeter	[Glass] [_____]
Tinted sheet, luminous trans- mittance value minimum 61 percent, 5 millimeter thick	Clear sheet, A quality, 5 millimeter thick	6 millimeter	[Glass] [_____]
Tinted sheet, luminous trans- mittance value minimum 56 percent, 6 millimeter thick	Clear sheet, A quality, 5 millimeter thick	6 millimeter	[Glass] [_____]
Tinted sheet, luminous trans- mittance value minimum 14 percent, 6 millimeter thick	Clear sheet, A quality, 5 millimeter thick	6 millimeter	[Glass] [_____]
Tinted light tint, 3 millimeter thick	Clear float 3 millimeter thick	6 millimeter	[Glass] [_____]
Tinted light green tint, 6 millimeter thick	Clear float 6 millimeter thick	6 millimeter	[Glass] [_____]
Tinted gray tint, 6 millimeter thick	Clear float 6 millimeter thick	6 millimeter	[Glass] [_____]

<u>OUTER PANE GLASS, THICKNESS</u>	<u>INNER PANE GLASS, THICKNESS</u>	<u>AIR SPACE WIDTH</u>	<u>EDGE SEAL</u>
Tinted bronze tint, 6 millimeter thick	Clear float 6 millimeter thick	6 millimeter	[Glass] [_____]

<u>OUTER PANE GLASS, THICKNESS</u>	<u>INNER PANE GLASS, THICKNESS</u>	<u>AIR SPACE WIDTH</u>	<u>EDGE SEAL</u>
--	--	----------------------------	----------------------

Tinted sheet, luminous trans- mittance value minimum 70 percent, 1/8 inch thick	Same as outer pane	3/16 inch	[Glass] [_____]
---	-----------------------	-----------	-----------------

Tinted sheet, luminous trans- mittance value minimum 31 percent, 1/8 inch thick	Clear sheet, A quality, double strength	1/4 inch	[Glass] [_____]
---	--	----------	-----------------

Tinted sheet, luminous trans- mittance value minimum 61 percent, 3/16 inch thick	Clear sheet, A quality, 3/16 inch thick	1/4 inch	[Glass] [_____]
--	--	----------	-----------------

Tinted sheet, luminous trans- mittance value minimum 56 percent, 7/32 inch thick	Clear sheet, A quality, 3/16 inch thick	1/4 inch	[Glass] [_____]
--	--	----------	-----------------

Tinted sheet, luminous trans- mittance value minimum 14 percent, 7/32 inch thick	Clear sheet, A quality, 3/16 inch thick	1/4 inch	[Glass] [_____]
--	--	----------	-----------------

Tinted light green tint,	Clear float 1/8 inch thick	1/4 inch 1/8 inch thick	[Glass] [_____]
-----------------------------	-------------------------------	----------------------------	-----------------

Tinted light green tint,	Clear float 1/4 inch thick	1/4 inch 1/4 inch thick	[Glass] [_____]
-----------------------------	-------------------------------	----------------------------	-----------------

Tinted gray tint, 1/4 inch thick	Clear float, 1/4 inch thick	1/4 inch	[Glass] [_____]
-------------------------------------	--------------------------------	----------	-----------------

Tinted bronze tint, 1/4 inch thick	Clear float 1/4 inch thick	1/4 inch	[Glass] [_____]
---------------------------------------	-------------------------------	----------	-----------------

## 2.2 GLAZING MATERIALS

### 2.2.1 Elastic Glazing Compound

\*\*\*\*\*

NOTE: Elastic glazing compound is recommended for  
face glazing or back bedding in steel, aluminum, or

other metal sash and is suitable for both exterior and interior exposures. Elastic glazing compound is not intended for channel or applied stop glazing.

\*\*\*\*\*

Elastic glazing compound shall conform to ASTM C 669.

Color of the sealing compound shall match the color of the metal sash as closely as possible.

\*\*\*\*\*

NOTE: The following paragraph describes a product used by Johnson Space Center and must be included in specifications originating at that center.

\*\*\*\*\*

Unless otherwise specified, elastic glazing compound shall conform to ASTM C 920, Type [S] [\_\_\_\_\_] [NS], Class [25] [\_\_\_\_\_] , and shall be used for glazing-in metal. A glazing compound having a composition and color particularly adapted for aluminum and requiring no painting shall be used for glazing-in aluminum.

#### 2.2.2 Thermoplastic Sealing Compound

\*\*\*\*\*

NOTE: Acrylic solvent-release-curing thermoplastic sealing compound is recommended for clear glass channel or applied stop glazing when the wind pressure does not exceed 1450 pascal 30 pounds per square foot and the glass-light dimensions do not exceed 3810 united millimeter 150 united inches; and when wind pressure does not exceed 2150 pascal 45 pounds per square foot and the glass-light dimensions do not exceed 2540 united millimeter 100 united inches; for heat-absorbing and tinted glass channel or applied stop glazing when the glass-light dimensions do not exceed 2540 united millimeter 100 united inches. Term "united millimeter" "united inches" means the sum of one width and one height of the glass-light or panel, in millimeter inches.

Thermoplastic sealing compound may be used instead of wood-sash putty for channel or applied stop glazing in wood sash.

\*\*\*\*\*

Compound shall be one-component acrylic terpolymer base conforming to ASTM C 920. Compound shall match the color of the metal sash as closely as possible.

#### 2.2.3 Glazing Tape

\*\*\*\*\*

NOTE: Glazing tape is recommended for face glazing in combination with elastic glazing compound when the glass-light dimensions exceed 1250 millimeter 50 inches or the largest glass dimension exceeds 760 millimeter 30 inches and for channel glazing or applied stop glazing in combination with sealing

compound when the glass-light dimensions exceed 2540  
united millimeter 100 united inches or the largest  
glass dimension exceeds 1270 millimeter 50 inches.

\*\*\*\*\*

Tape shall be nonskinning, nonoily, reinforced class, butyl- or  
polyisobutylene-base resilient preformed compound conforming to AAMA 800.

#### 2.2.4 Elastomeric Sealing Compound

\*\*\*\*\*

NOTE: Elastomeric sealing compound is recommended  
for clear glass channel or applied stop glazing when  
the wind pressure exceeds 1450 pascal 30 pounds per  
square foot and the glass-light dimensions exceed  
3810 united millimeter 150 united inches and when  
the wind pressure exceeds 2150 pascal 45 pounds per  
square foot and the glass-light dimensions exceed  
2540 united millimeter 100 united inches, for  
heat-absorbing and tinted-glass channel or applied  
stop glazing when the glass-light dimensions exceed  
2540 united millimeter 100 united inches and for all  
double-glazing unit channel or applied stop glazing.  
Select one only of the following paragraphs as  
required by the subject.

\*\*\*\*\*

[Compound shall be the two-component, nonsag type, resistant to 50 percent  
total joint movement, conforming to ASTM C 920, Type [S] [\_\_\_\_\_] [NS],  
Class [25] [\_\_\_\_\_] .]

[Compound shall be the two-component, nonsag type, resistant to 25 percent  
total joint movement, conforming to ASTM C 920, Type [S] [\_\_\_\_\_] [NS],  
Class [25] [\_\_\_\_\_] .]

Compound shall match the color of the metal sash as closely as possible.

Primer for the compound shall be as recommended by the elastomeric sealing  
compound manufacturer.

#### 2.2.5 Wood-Sash Putty

\*\*\*\*\*

NOTE: Wood-sash putty is recommended for channel or  
applied stop glazing glass lights in wood sash.

\*\*\*\*\*

Putty shall be the pure linseed oil type conforming to FS TT-P-00791, Type  
I.

#### 2.2.6 Solvents and Cleaning Agents

Solvents, cleaning agents, and other cleaning materials shall be as  
recommended by the glazing-material manufacturer.

#### 2.2.7 Glazing Clips

\*\*\*\*\*

NOTE: Glazing clips are required to retain glass

lights in metal sash without stops or glazing beads  
and when glass lights are face glazed.

\*\*\*\*\*

Clips shall be zinc-coated or copper-clad spring-steel wire or nonferrous metal and shall be the type, sizes, and shapes suitable for the intended use.

#### 2.2.8 Resilient Setting Blocks and Spacers

\*\*\*\*\*

NOTE: These are recommended for positioning single  
clear glass-lights over 0.5 square meter 5 square  
feet and all sizes of other glass materials such as  
heat-absorbing glass, tinted glass, and  
double-glazing units.

\*\*\*\*\*

Blocks shall be solid chloroprene elastomeric extrusions having a Shore A durometer hardness between 70 and 90. Thickness shall be approximately the same as the glass-edge clearance dimension; the length shall be 100 millimeter 4 inches, minimum.

Spacers shall be solid chloroprene elastomeric extrusions having a Shore A durometer hardness between 40 and 50. Spacers shall be 25 to 75 millimeter 2- to 3-inches long with thickness and height to suit the application.

### PART 3 EXECUTION

#### 3.1 GENERAL

Glass shall be installed in accordance with the manufacturer's printed instructions.

Field cutting, or nipping or grinding the edges of glass will not be permitted.

Sheet glass shall be installed with the wave horizontal.

Figured glass for exterior openings shall be installed with the smooth side to the exterior.

Operable sash shall move freely and properly in the frame of the unit prior to the start of glazing. Movable items shall be securely fixed or in a closed and locked position until the glazing material has set.

Sizes of glass shown on drawings are approximate. Sizes and proper edge clearances shall be determined by measuring the actual unit to receive glass. Except where specified otherwise, each piece of glass shall bear the manufacturer's label to identify its type as well as thickness and quality. Labels shall not be removed until final approval is obtained.

#### 3.2 TEMPERATURE AND ATMOSPHERIC CONDITIONS

Glazing materials shall not be installed when the ambient temperature is below 4 40 or above 38 degrees C 100 degrees F.

Exterior glazing shall not be performed in damp or rainy weather.

### 3.3 GLAZED OPENINGS PREPARATION

\*\*\*\*\*  
NOTE: Painting of metal and wood sash not having a shop applied finish is specified in Section 09 90 00.00 40 ARCHITECTURAL PAINTING. It is recommended that such painting be completed prior to the start of glazing.  
\*\*\*\*\*

Surface of rabbets shall be clean and dry prior to the start of glazing.

Surfaces in contact with glazing materials shall be clean and free of loose particles, surface dust, and other foreign matter.

[When elastomeric sealing compound is used, the surfaces shall be cleaned with a solvent that leaves no residue. Surfaces shall be wiped dry before the solvent has air dried.]

### 3.4 CLEARANCES AND POSITIONING GLASS

Face and edge clearances and positioning glass with setting blocks and spacers shall be as recommended in the [FGMA-01](#).

### 3.5 APPLICATION OF GLAZING COMPOUNDS

Glazing compounds shall be installed in accordance with the manufacturer's printed instructions and as follows:

[Elastic glazing compound shall be knife-applied as it comes from the container, without adulteration.]

[Thermoplastic sealing compound shall be warmed. Compound shall be gun-applied to fill the cavity without air pockets.]

[Glazing tape shall be compressed slightly to obtain a positive bond and neatly mitered or butted at corners. Backing paper shall be removed prior to installation of the glass.]

[Elastomeric sealing-compound components shall be mixed. Compound shall be gun-applied to fill the cavity without air pockets.]

[Wood-sash putty shall be knife-applied as it comes from the container, without adulteration.]

### 3.6 SINGLE GLASS IN METAL SASH WITH FACE GLAZING

\*\*\*\*\*  
NOTE: Face glazing is recommended for single-glass lights not exceeding [2540 united millimeter 100 united inches](#) in size or for single-glass lights not having any dimension exceeding [1270 millimeter 50 inches](#).  
\*\*\*\*\*

Single-glass lights up to [1270 united millimeter 50 united inches](#) in size, with the greatest dimension not exceeding [760 millimeter 30 inches](#), shall be set in metal sash with elastic glazing-compound back bed, heel bead, and front putty.

Single-glass lights between 1270 and 2540 united millimeter 50 and 100 united inches in size, with the greatest dimension between 760 and 1270 millimeter 30 and 50 inches,, shall be set in metal sash with a glazing-tape back bed, an elastic-glazing compound heel bead, and front putty.

Glass lights shall be secured with glazing clips placed at sill, head, and jambs 450 millimeter 18 inches on center, minimum. Each ventilator shall be provided with a minimum of four glazing clips.

Front of each glass light edge in the sash rabbet shall be face-puttied with elastic glazing compound to form a triangular fillet, stopping 2 millimeter 1/16 inch short of the sight line. Corners shall be mitered finish and excess compound shall be removed. Surplus back-bed material shall be stripped at an angle without undercutting.

### 3.7 SINGLE GLASS IN METAL SASH WITH CHANNEL GLAZING

\*\*\*\*\*

NOTE: Channel glazing is recommended for single-glass lights exceeding 2540 united millimeter 100 united inches or for single-glass lights having any dimension exceeding 1270 millimeter 50 inches.

Refer to notes in the paragraphs specifying each sealing compound for its recommended uses.

\*\*\*\*\*

Single-glass lights up to 2540 united millimeter 100 united inches in size shall be set in metal sash with thermoplastic sealing-compound back bed, heel bead, and bedding of stop.

Single-glass lights shall be set in metal sash with glazing-tape back bed, elastomeric sealing-compound heel bead, glazing-tape bedding of stop, and elastomeric sealing-compound topping bead on both sides of the glass light. Glazing tape shall be kept down at least 3 millimeter 1/8-inch below the sight line.

Clear-glass lights between 2540 and 3810 united millimeter 100 and 150 united inches in size shall be set with glazing-tape back bed, thermoplastic sealing-compound heel bead, glazing-tape bedding of stop, and thermoplastic sealing-compound topping bead on both sides of the glass light. Glazing tape shall be kept down at least 3 millimeter 1/8-inch below the sight line.

Single-glass lights over 2540 united millimeter 100 united inches size shall be set with glazing tape-back bed, elastomeric sealing-compound heel bead, glazing-tape bedding of stop, and elastomeric sealing-compound topping bead on both sides of the glass light. Glazing tape shall be kept down at least 3 millimeter 1/8-inch below the sight line.

Heat-absorbing glass lights over 2540 united millimeter 100 united inches in size shall be set with glazing-tape back bed, elastomeric sealing-compound heel bead, glazing-tape bedding of stop, and elastomeric sealing-compound topping bead on both sides of the glass light. Glazing tape shall be kept down at least 3 millimeter 1/8-inch below the sight line.

Tinted-glass lights over 2540 united millimeter 100 united inches in size



shall be set with glazing-tape back bed, elastomeric sealing-compound heel bead, glazing-tape bedding of stop, and elastomeric sealing-compound topping bead on both sides of the glass light. Glazing tape shall be kept down at least 3 millimeter 1/8-inch below the sight line.

A void shall be provided at the head and jambs for clear-glass, wired-glass, and figured-glass lights over 2540 united millimeter 100 united inches in size and for all heat-absorbing glass and tinted-glass lights.

Excess sealing compound on the sash shall be removed with a glazing knife at a slight angle over the sight line.

### 3.8 DOUBLE UNITS IN METAL SASH WITH CHANNEL GLAZING

Double-glazing units shall be set in metal sash with channel glazing in accordance with the recommendations of the FGMA-01.

A void shall be provided at the head and jambs. Excess elastomeric glazing compound on the sash shall be removed with a glazing knife at a slight angle over the sight line.

### 3.9 SINGLE GLASS IN WOOD SASH WITH CHANNEL GLAZING

Single-glass lights shall be set in wood sash with wood-sash putty or thermoplastic sealing-compound back bed, heel bead, and bedding of stop.

Excess glazing compound or putty shall be removed without undercutting.

### 3.10 SINGLE GLASS IN ALUMINUM DOORS WITH FLUSH GLAZING

\*\*\*\*\*  
NOTE: Preformed glazing gaskets fabricated as  
required to suit the type of flush glazing and glass  
size to be used in the work are specified in Section  
08 11 16.00 40 ALUMINUM DOORS AND FRAMES.  
\*\*\*\*\*

Single-glass lights shall be secured in aluminum doors with the door and frame manufacturer's preformed glazing gaskets and installed in accordance with the manufacturer's printed instructions. Lights shall be positioned with resilient setting blocks as specified.

### 3.11 GLASS PROTECTION

Glazed openings shall be identified during the construction period by tapes or flags that are not in contact with the glass.

Temporary labels shall be removed immediately after the glass and glazing work has been approved.

### 3.12 CLEANING

Upon completion of work, glass surfaces shall be cleaned and shall be free of glazing- or sealing-compound, smears, and other defacement.

-- End of Section --