

2001
Building Code

CHAPTER 24 GLASS AND GLAZING

SECTION 2401 GENERAL

2401.1 Scope. Provisions of this chapter shall govern the types, use, support, structural adequacy and safety provisions for glass in buildings and structures.

Exception: Buildings and structures located within the High Velocity Hurricane Zone shall comply with the provisions of 2410 through 2415.

SECTION 2402 DEFINITIONS

For definitions, see Chapter 2.

SECTION 2403 LABELING

2403.1 Labels. Each light shall bear the manufacturer's label designating the type and thickness of glass. When approved by the building official, labels may be omitted from other than tempered glazing materials, providing an affidavit is furnished by the glazing contractor certifying that each light is glazed in accordance with the approved plans and specifications.

2403.2 Identification. Each unit of tempered glass shall be permanently identified by the manufacturer. The identification shall be etched or ceramic fired on the glass and be visible when the unit is glazed. Tempered spandrel glass is exempted from permanent labeling. This type of glass shall be identified with a removable paper label by the manufacturer.

SECTION 2404 LOUVERED WINDOWS OR JALOUSIES

Regular float, wired or patterned glass in jalousies and louvered windows shall be no thinner than nominal $\frac{3}{16}$ inch (5 mm) and no longer than 48 inches (1219 mm). When other glass types are used, design shall be submitted to the building official for approval. Exposed glass edges shall be smooth. Wired glass with wire exposed on longitudinal edges shall not be used in jalousies or louvered windows.

SECTION 2405 IMPACT, WIND, AND OTHER LOADS

2405.1 General. Individual glazed areas including glass mirrors in hazardous locations such as those indicated in 2405.2 shall pass the test requirements of CPSC 16-CFR, Part 1201 or by comparative test shall be proven to produce at least equivalent performances.

Exceptions:

1. Polished wire glass installed in fire doors, fire windows and view panels in fire resistant walls and hazardous locations in 2405.2.1(3) and 2405.2.1 (4) shall comply with ANSI Z97.1.
2. Approved plastic materials used as glazing in hazardous locations shall comply with ANSI Z97.1.

2405.2 Hazardous locations

2405.2.1 The following shall be considered specific hazardous locations for the purposes of glazing:

1. Glazing in swinging doors and fixed and sliding panels of sliding (patio) door assemblies.
2. Glazing in doors and walls of enclosures for hot tubs, whirlpools, saunas, steam rooms, bathtubs, showers and other such facilities where such glazing is located 36 inches (914 mm) or less, measured horizontally, from a standing or walking surface within the enclosure and where the bottom edge of the exposed glazing is less than 60 inches (1524 mm), measured vertically, above such standing or walking surfaces.
3. Glazing in an individual fixed or operable panel adjacent to a door where the nearest vertical edge is within a 24-inch (610 mm) radius of the door in a closed position and whose bottom edge is less than 60 inches (1524 mm) above the floor or walking surface.

Exception: Glazing in walls perpendicular to the plane of the door in a closed position in Group R3 or within dwelling units in Group R2 shall be subject to 2405.2.1(4).

4. Glazing in an individual fixed or operable panel, other than those locations described in items 2 and 3 above, that meets all of the following conditions:
 - 4.1. Exposed area of an individual pane greater than 9 sq ft (0.84 m²).
 - 4.2. Bottom edge less than 18 inches (457 mm) above the floor.
 - 4.3. Top edge greater than 36 inches (914 mm) above the floor.

- 4.4. One or more walking surfaces within 36 inches (914 mm) horizontally of the plane of the glazing.
5. All glazing in railings regardless of area or height above a walking surface including structural baluster panels and nonstructural in-fill panels.
6. Glazing in walls and fences enclosing indoor and outdoor swimming pools and spas where the bottom exposed edge of the glazing is: (1) less than 60 inches (1525 mm) above the walking surface on the pool side of the glazing, and (2) the glazing is within 60 inches (1525 mm) horizontally of the water's edge of a swimming pool or spa. This shall apply to single glazing and all panes in multiple glazing.

2405.2.2 The following products, materials and uses are exempt from the above hazardous locations:

1. Openings in doors through which a 3-inch (76 mm) sphere is unable to pass.
2. Decorative glass including, but not limited to, assemblies of leaded glass, faceted glass or items of carved glass used for decorative purposes in swinging doors and locations described in 2405.2.1(3), or 2405.2.1(4).
3. Glazing materials used as curved glass panels in revolving doors.
4. Commercial refrigerated cabinet glazed doors.
5. Glass block panels where the minimum uniform face thickness of the block is 0.25 inch (6.4 mm).
6. Glazing in 2405.2.1(3) when there is an intervening wall or other permanent barrier between the door and the glazing.
7. Glazing in 2405.2.1(4) when a protective bar is installed on the accessible sides of the glazing 36 inches $\pm$ 2 inches (914 $\pm$ 51 mm) above the floor. The bar shall be capable of withstanding a horizontal load of 50 plf (730 N/m) without contacting the glass and be a minimum of 1 1/2 inches (38 mm) in height.
8. Outboard panes in insulating glass units and other multiple glazed panels in 2405.2.1(4) when the bottom edge of the glass is 25 ft (7620 mm) or more above grade, a roof, walking surface, or other horizontal or sloped (within 45 degrees (0.78 rad) of horizontal) surface adjacent to the glass exterior.
9. Louvered windows, and jalousie doors and jalousie windows, complying with the requirements of 2404.
10. Mirrors mounted on a solid wall or hung on a flush door or a panel door without a cutout for the glass.

2405.3 Wind, snow, and dead and impact loads

2405.3.1 Vertical glass. All glass within 15 degrees (0.26 rad) of vertical in windows, curtain walls, doors and other exterior applications shall be chosen to resist the wind loads for component and cladding. The allowable wind load shall be determined in accordance with 2405.3.1.1 and 2405.3.1.2.

2405.3.1.1 From Figure 2405.3 determine the maximum allowable equivalent load for the glass dimensions and applicable glass thickness. For laminated glass, the applicable glass thickness is the total glass thickness. For insulating glass units, it is the thickness of one pane. See footnotes to Tables 2405.3A and 2405.3B for other glass types.

2405.3.1.2 Multiply the value from 2405.3.1.1 by the appropriate factor from Table 2405.3A. This product is the maximum allowable wind load for the glass. The glass is in compliance if the maximum allowable wind load is at least as great as the design wind load determined from 1606.

2405.3.2 Sloped glazing. Glass sloped more than 15 degrees (0.26 rad) from vertical in skylights, sunspaces, sloped roofs and other exterior applications shall be chosen to resist the applicable loads for components and cladding. The allowable combined load for the glass shall be determined in accordance with 2405.3.2.1 through 2405.3.2.3.

2405.3.2.1 The design loads shall be combined as follows:

1. Negative wind load – dead load
2. Positive wind load + dead load
3. Dead load + 1/2 positive wind load

Wind loads shall be determined from 1606. The dead load for the glass in lb/sq ft shall be taken as the total thickness of the glass panes and plies in inches $\times$ 13. This applies for glass 30 degrees or less from horizontal. For other slopes the glass dead load is equal to this value times the cosine of its slope from horizontal.

2405.3.2.2 From Figure 2405.3 determine the maximum allowable equivalent load for the glass dimensions and applicable glass thickness. For laminated glass, the applicable glass thickness is the total glass thickness. For insulating glass, it is the thickness of one pane. See footnotes to Tables 2405.3A and 2405.3B for other glass types.

2405.3.2.3 If the largest combined load from 2405.3.2.1 is either number 1 or 2, multiply the value from 2405.3.2.2 by the appropriate factor from Table 2405.3A. If the largest combined load is number 3, multiply the value from 2405.3.2.2 by the applicable factor from Table 2405.3B. This product is the maximum allowable equivalent load for the glass. The glass is in compliance if the maximum allowable equivalent load is at least as great as the largest of the three combined loads listed in 2405.3.2.1.