

Comments Related to Safety Glazing

Comment 47 – Negative Effects: Safety

Two commenters are concerned that storm panels can impede emergency egress and create significant safety concerns. One of the commenters notes that most homeowners are not aware of the need for egress windows and simply requiring instructions is not sufficient to address this major concern. One of the commenters recommends that EPA do the following:

- a. Require that installed ENERGY STAR certified storm panels do not inhibit egress functionality of opening dimensions and/or operability of windows
- b. Require that installed ENERGY STAR certified storm panels comply with code-required hazardous location safety-glazing provisions
- c. Require that ENERGY STAR certified storm panels be North American Fenestration Standard (NAFS) certified and labeled to ensure consistent, quality products, and to ensure proper glass strength in accordance with ASTM E1300
- d. Establish a maximum air leakage criteria that aligns with NAFS, for both interior and exterior panels

EPA Response: EPA thanks the commenters for their concerns. EPA takes the safety of consumers very seriously, and believes that it is important that consumers and installers do not inhibit egress functionality when installing these products. The commenters recommended that EPA have requirements related to how the products are installed,

specifically with regard to egress functionality and hazardous location safety-glazing provisions. Storm panels are installed almost exclusively in existing homes where no code enforcement occurs during the project. Therefore, there would be no way to enforce requirements that apply to the conditions present in the existing construction. Instead, EPA has proposed to address safety concerns by requiring that manufacturers include information on the applicability of the storm panel operator type to primary window operator type, especially with regard to any egress requirements. Ultimately, it is the responsibility of the consumer and installer to install products in a safe manner.

With respect to the recommendation that EPA consider NAFS certification in accordance with ASTM E1300 as a requirement for the program, EPA does not wish to include product design requirements that do not directly affect the energy performance of the product. EPA believes that air leakage performance is directly related to energy performance and is working toward developing air leakage criteria that are appropriate to the program. EPA will consider NAFS air leakage requirements as part of the specification development process.

2015 IRC SECTION R308 GLAZING

R308.1 Identification. Except as indicated in Section R308.1.1 each pane of glazing installed in hazardous locations as defined in Section R308.4 shall be provided with a manufacturer's designation specifying who applied the designation, designating the type of glass and the safety glazing standard with which it complies, which is visible in the final installation. The designation shall be acid etched, sandblasted, ceramic-fired, laser etched, embossed, or be of a type that once applied cannot be removed without being destroyed. A

label shall be permitted in lieu of the manufacturer's designation.

R308.3 Human impact loads. Individual glazed areas, including glass mirrors in hazardous locations such as those indicated as defined in Section R308.4, shall pass the test requirements of Section R308.3.1.

Exceptions:

1. Louvered windows and jalousies shall comply with Section R308.2.
2. Mirrors and other glass panels mounted or hung on a surface that provides a continuous backing support.
3. Glass unit masonry complying with Section R607.

R308.3.1 Impact test. Where required by other sections of the code, glazing shall be tested in accordance with CPSC 16 CFR 1201. Glazing shall comply with the test criteria for Category II unless otherwise indicated in Table R308.3.1(1).

Exception: Glazing not in doors or enclosures for hot tubs, whirlpools, saunas, steam rooms, bathtubs and showers shall be permitted to be tested in accordance with ANSI Z97.1. Glazing shall comply with the test criteria for Class A unless indicated in Table R308.3.1(2).

R308.4 Hazardous locations. The locations specified in Sections R308.4.1 through R308.4.7 shall be considered to be specific hazardous locations for the purposes of glazing.

R308.4.1 Glazing in doors. Glazing in fixed and operable panels of swinging, sliding and bifold doors shall be considered to be a hazardous location.

Exceptions:

1. Glazed openings of a size through which a 3-inch-diameter (76 mm) sphere is unable to pass.
2. Decorative glazing.

R308.4.2 Glazing adjacent to doors. Glazing in an individual fixed or operable panel adjacent to a door shall be considered to be a hazardous location where the bottom exposed edge of the glazing is less than 60 inches (1524 mm) above the floor or walking surface and it meets either of the following conditions:

1. Where the glazing is within 24 inches (610 mm) of either side of the door in the plane of the door in a closed position.
2. Where the glazing is on a wall perpendicular to the plane of the door in a closed position and

within 24 inches (610 mm) of the hinge side of an in-swinging door.

Exceptions:

1. Decorative glazing.
2. Where there is an intervening wall or other permanent barrier between the door and the glazing.
3. Where access through the door is to a closet or storage area 3 feet (914 mm) or less in depth. Glazing in this application shall comply with Section R308.4.3.
4. Glazing that is adjacent to the fixed panel of patio doors.

R308.4.3 Glazing in windows. Glazing in an individual fixed or operable panel that meets all of the following conditions shall be considered to be a hazardous location:

1. The exposed area of an individual pane is larger than 9 square feet (0.836 m²),
2. The bottom edge of the glazing is less than 18 inches (457 mm) above the floor,
3. The top edge of the glazing is more than 36 inches (914 mm) above the floor; and
4. One or more walking surfaces are within 36 inches (914 mm), measured horizontally and in a straight line, of the glazing.

Exceptions:

1. Decorative glazing.
2. Where a horizontal rail is installed on the accessible side(s) of the glazing 34 to 38 inches (864 to 965 mm) above the walking surface. The rail shall be capable of withstanding a horizontal load of 50 pounds per linear foot (730 N/m) without contacting the glass and have a cross-sectional height of not less than 1 1/2 inches (38 mm).
3. Outboard panes in insulating glass units and other multiple glazed panels where the bottom edge of the glass is 25 feet (7620 mm) or more above grade, a roof, walking surfaces or other horizontal [within 45 degrees (0.79 rad) of horizontal] surface adjacent to the glass exterior.

R308.4.5 Glazing and wet surfaces. Glazing in walls, enclosures or fences containing or facing hot tubs, spas, whirlpools, saunas, steam rooms, bathtubs, showers and indoor or outdoor swimming pools where the bottom exposed edge of the glazing is less than 60 inches (1524 mm) measured vertically above any standing or

walking surface shall be considered to be a hazardous location. This shall apply to single glazing and each pane in multiple glazing.

Exception: Glazing that is more than 60 inches (1524 mm), measured horizontally and in a straight line, from the water's edge of a bathtub, hot tub, spa, whirlpool or swimming pool or from the edge of a shower, sauna or steam room.

R308.4.6 Glazing adjacent to stairs and ramps. Glazing where the bottom exposed edge of the glazing is less than 36 inches (914 mm) above the plane of the adjacent walking surface of stairways, landings between flights of stairs and ramps shall be considered to be a hazardous location.

Exceptions:

1. Where a rail is installed on the accessible side(s) of the glazing 34 to 38 inches (864 to 965 mm) above the walking surface. The rail shall be capable of withstanding a horizontal load of 50 pounds per linear foot (730 N/m) without contacting the glass and have a cross-sectional height of not less than 1 1/2 inches (38 mm).

2. Glazing 36 inches (914 mm) or more measured horizontally from the walking surface.

R308.4.7 Glazing adjacent to the bottom stair landing.

Glazing adjacent to the landing at the bottom of a stairway where the glazing is less than 36 inches (914 mm) above the landing and within a 60-inch (1524 mm) horizontal arc less than 180 degrees from the bottom tread nosing shall be considered to be a hazardous location.

Exception: The glazing is protected by a *guard* complying with Section R312 and the plane of the glass is more than 18 inches (457 mm) from the *guard*.

Comments related to Egress:

Comment 26 – General: Flexible Frames

One commenter believes that flexible frames, which are created from silicone and/or polyurethane foam and are designed to fit into the window opening without the use of screws, nails, adhesives, etc., are important to the evolution of storm panels as they help overcome the need for storm panels to match the exact size of the window, as well as the difficulty

of installing storm panel in many window openings, particularly brick and sheet rock openings. The commenter recommends that EPA not require that the storm panel match the operator type of the primary window or that the storm panel be permanently installed in order to allow products with flexible frames to be ENERGY STAR certified.

EPA Response: EPA thanks the commenter for the input. EPA does not believe that the proposed specification framework would make products with flexible frames ineligible for certification. EPA has not proposed that storm panels be required to match the operator type of the primary window.

However, the proposal for installation instructions would require manufacturers to provide guidance on the applicability of the storm panel operator type to the primary window operator type, especially with respect to any egress requirements. EPA believes that guidance from the manufacturer is sufficient to address this issue.

EPA has not proposed that storm panels be permanently installed. In proposing an air leakage metric, EPA would require that product installation be robust enough to withstand the proposed air leakage test procedure. EPA encourages manufacturers to evaluate their flexible frame products for the performance metrics that are being considered.

Comment 29 – General: Operability

One commenter suggests that storm panels can be made operable, but it is not recommended for better energy savings in commercial applications.

EPA Response: EPA appreciates the commenter's input. As stated in the Framework Document, EPA is considering a

product specification only for storm panels intended for use in residential applications. In addition, EPA believes that it is important to allow the choice of operable products for the purposes of egress requirements, ventilation, and other customer preferences.

Comment 36 – Installation Instructions: Egress

Two commenters suggest including information about egress windows and recommend that the installed storm panel be of the same operator type as the primary window.

EPA Response: EPA thanks the commenters for the suggestion. EPA has proposed that installation instructions would require manufacturers to provide guidance on the applicability of the storm panel operator type to the primary window operator type, especially with respect to any egress requirements. Because EPA cannot certify individual product installations, EPA does not plan to require that installed storm panels be of the same operator type as the primary window.

IRC SECTION R310 EMERGENCY ESCAPE AND RESCUE OPENINGS

R310.1 Emergency escape and rescue opening required.

Basements, habitable attics and every sleeping room shall have not less than one operable emergency escape and rescue opening. Where *basements* contain one or more sleeping rooms, an emergency escape and rescue opening shall be required in each sleeping room. Emergency escape and rescue openings shall open directly into a public way, or to a *yard* or court that opens to a public way.

Exception: Storm shelters and *basements* used only to house mechanical *equipment* not

exceeding a total floor area of 200 square feet (18.58 m²).

R310.1.1 Operational constraints and opening control devices. Emergency escape and rescue openings shall be operational from the inside of the room without the use of keys, tools or special knowledge. Window opening control devices complying with ASTM F 2090 shall be permitted for use on windows serving as a required emergency escape and rescue opening.

R310.2 Emergency escape and rescue openings. Emergency escape and rescue openings shall have minimum dimensions as specified in this section.

R310.2.1 Minimum opening area. Emergency and escape rescue openings shall have a net clear opening of not less than 5.7 square feet (0.530 m²). The net clear opening dimensions required by this section shall be obtained by the normal operation of the emergency escape and rescue opening from the inside. The net clear height opening shall be not less than 24 inches (610 mm) and the net clear width shall be not less than 20 inches (508 mm).

Exception: *Grade* floor or below *grade* openings shall have a net clear opening of not less than 5 square feet (0.465 m²).

R310.2.2 Window sill height. Where a window is provided as the emergency escape and rescue opening, it shall have a sill height of not more than 44 inches (1118 mm) above the floor; where the sill height is below *grade*, it shall be provided with a window well in accordance with Section R310.2.3.