

RETROFIT Improvements

Making Homes Safer & More Resilient in Disaster-Prone Areas

Impact Resistant Doors



SCOPE

This document provides homeowners with an overview of impact resistant doors for existing homes in hurricane-prone regions and windborne debris regions.

PURPOSE

Impact resistant entry doors and sliding glass doors protect openings from being breached by windborne debris during hurricanes and other extreme storms.

BENEFITS

- Minimizes the risk of breaking doors and door glass and the associated risks of water damage and structural damage
- Helps to protect occupants and household contents
- Allows quicker egress from the house compared to doors with hurricane shutters installed.
- May help to qualify for homeowners insurance policy/discount or home equity mortgage
- May add value to the property

RETROFIT OPPORTUNITY

Can be installed or replaced anytime or when replacing external doors.

HAZARD AND RISK

During a hurricane or other extreme storm, strong winds can pick up objects, such as building materials, tree limbs, trash cans, and patio furniture. This windborne debris can easily break standard doors with unprotected glass, allowing wind and water into the building. In addition to damaging household contents, the wind can break the house apart from the inside by blowing off the roof and the water can lead to significant deterioration of the structural elements of the house.

SOLUTION

As an alternative to installing hurricane shutters on doors, impact resistant entry doors and sliding glass doors can be installed to protect against windborne debris. Many options are available for glazed and non-glazed impact resistant doors. Impact resistant doors must be third-party tested/rated and commonly include reinforced frames, tighter weather stripping, and energy efficient glass.

Does my home need impact resistant doors? Building codes require impact-resistant glass, shutters, or panels for new homes located in “Windborne Debris Regions” (see Figure 1). Generally, opening protection is recommended where the design wind speed V is 130 mph or greater. Ask the local building department if your house is in a windborne debris region or if local requirements exceed those of the national code.

Wind Region Terminology

Hurricane-Prone Regions: Areas along the Atlantic and Gulf coasts where design wind speed $V > 115$ mph, and Hawaii, Puerto Rico, Guam, Virgin Islands, and American Samoa.

Windborne Debris Regions: Areas within Hurricane-Prone Regions where $V \geq 140$ mph or $V \geq 130$ mph within 1 mile of the coast.

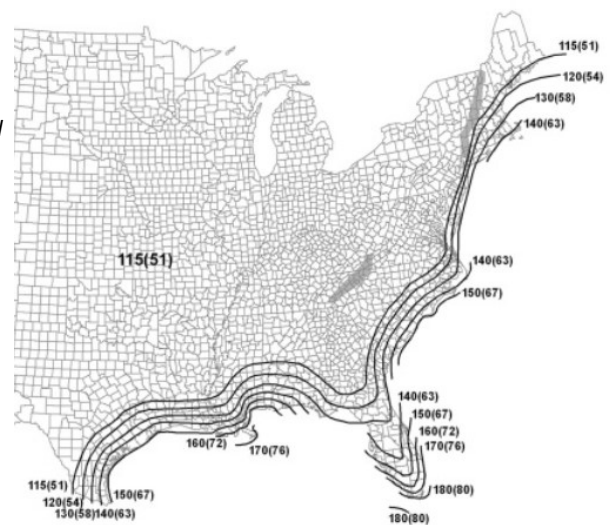


FIGURE 1. Wind Regions. Source: Figure R301.2(5)A Excerpted from the 2018 International Residential Code; Copyright 2017; Washington, D.C.: International Code Council. Reproduced with permission. All rights reserved. www.ICCSAFE.org

TIPS

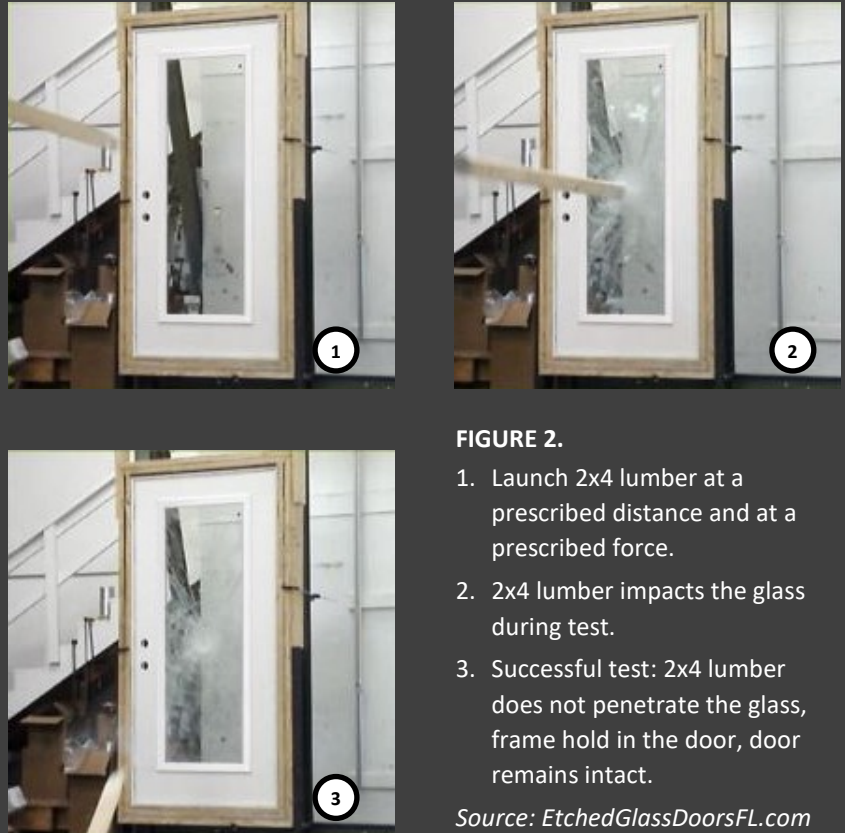
- It is recommended that doors be professionally installed to ensure structural integrity.
- Doors must be installed in accordance with all manufacturer's instructions; door frames may need to be reinforced.
- Inspect exterior doors and hardware periodically to ensure those remain in good working order.
- Windows should also be protected using impact resistant glass, shutters, or panels.
- Opening protection for skylights is not available, so skylights should be impact and pressure rated.
- If you don't have impact resistant doors and a storm is imminent, wood structural panels (i.e., plywood) can be installed but must be attached in accordance with specific code requirements.

COST

Costs can vary considerably depending on the size and type of door, the manufacturer, and local labor rates. The costs below are estimated ranges for a professionally installed door:

- Impact rated glazed entry door: \$1,000-1,500, representing a \$300-500 premium over a standard door
- Impact rated 6 ft. sliding glass door: \$2,400-2,600, versus \$1,200-1,400 for a slider with tempered glass

Testing Glass Door Inserts for Hurricane Impact Approval



Selection Considerations. Entry doors should be outward-swinging to prevent strong winds from blowing the doors open (required in some areas). Compared to standard doors protected using hurricane shutters or panels, impact resistant doors allow for quick egress and of course do not require closing shutters or installing panels when a storm approaches.

Code Considerations. A building permit may be required—check with your local building department. Impact resistant doors must be rated and labeled in accordance with ASTM E 1996 and ASTM E 1886 or AAMA 506. Local jurisdictions may require specific product approval for impact doors, e.g., doors must be tested and labeled in accordance with TAS 201, 202, and 203 in Florida's High Velocity Hurricane Zone (Broward and Miami-Dade Counties).

ADDITIONAL RESOURCES

1. FEMA: Home Builder's Guide to Coastal Construction
https://www.fema.gov/media-library-data/20130726-1538-20490-2983/fema499web_2.pdf
2. Insurance Institute for Business & Home Safety (IBHS): How to Protect Your Home From Hurricanes
<https://disastersafety.org/hurricane/how-to-protect-your-home-from-hurricanes/>
3. IBHS: Opening Protection, IBHS Selection Guide for Shutters & Other Protective Barriers
<https://disastersafety.org/wp-content/uploads/2019/03/IBHS-Selection-Guide-for-Shutters-Other-Protective-Barriers.pdf>

