

RETROFIT Improvements

Making Homes Safer & More Resilient in Disaster-Prone Areas

Hurricane Shutters



SCOPE

This document provides homeowners with an overview of hurricane shutters and storm panels available for existing homes in coastal areas prone to hurricanes.

PURPOSE

Hurricane shutters protect window and door glass from damage by windborne debris during hurricanes and windstorms.

BENEFITS

- Minimizes the risk of breaking window and door glass and the associated risks of water damage and structural damage
- Helps to protect occupants and household contents
- Allows for fast protection on short notice by occupant without special training or tools
- 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 – Hurricane shutters are not contingent on window replacement or other improvements.

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 shatter unprotected window and door glass, exposing the building interior and allowing wind and water into the building. In addition to damaging household contents, the wind pressure can break the house apart from the inside by blowing off the roof and the water can lead to significant damage to the house.



FIGURE 1. Failure of Roof Structure Due to Window Failure During Hurricane.

Source: FEMA

SOLUTION

Several options are available to homeowners for protecting their windows and glass doors against windborne debris: impact-resistant glass, permanent hurricane shutters, and temporary storm panels. Shutters are always in place and ready to be closed. Panels have permanently installed hardware for quick installation and are normally installed and taken down as needed and stored in a garage or shed.

Does my home need hurricane shutters? Building codes require impact-resistant glass, shutters, or panels for new homes located in “Windborne Debris Regions” (see Figure 2). 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.

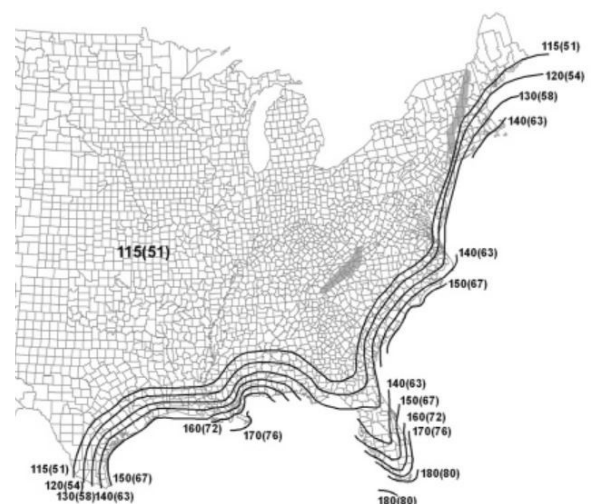


FIGURE 2. Wind Regions. Source: Figure R301.2(5)A Excerpted from the 2018 International Residential Code; Copyright 2017; Washington, D.C.: International Code Council. Reproduced with permission. All rights reserved. www.ICCSAFE.org

TIPS

- It is recommended that shutters/panels be professionally installed to ensure structural integrity.
- Opening protection for skylights is not available, so skylights should be impact and pressure rated.
- Any attic vents in gable end walls should be protected.
- Shutters and panels can also be useful to protect areas such as porches, lanais, and carports.
- Inspect shutters and panels annually – preferably before hurricane season. Practice installing panels and operating shutters to ensure those work and you have all the hardware.
- If you don't have shutters or panels and a storm is imminent, wood structural panels (WSPs), i.e., plywood, can be installed but must be attached in accordance with specific code requirements.

COST

Varies considerably depending on window area and type. Typical cost ranges are shown below for an average house with window area of 320 square feet (sf):

- Accordion: \$4,800-8,000 (\$15-25/sf)
- Bahama: \$4,800-9,600 (\$15-30/sf)
- Colonial: \$5,760-9,600 (\$18-30/sf)
- Rolldown: \$6,400-17,600 (\$20-55/sf)
- Panel, metal or polycarbonate: \$2,240-4,800 (\$7-15/sf)
- Fabric Panel: \$1,600-3,520 (\$5-11/sf)

Selection Considerations. The primary types of permanent shutters are rolldown, accordion, Bahama/Bermuda, and colonial shutters. Storm panels are commonly constructed of corrugated steel, aluminum, or polycarbonate, and attached using a combination of permanently installed tracks, bolts, and wingnuts. Examples of these styles are shown in Figure 3. Installing a combination of shutter/panel types may be a practical solution depending on budget and window/door type, size, and location. Consider shutters that can be operated from inside for hard to reach windows. Panels that are clear (polycarbonate) or translucent (many fabric panels) allow natural light and visibility. Panels should be labeled for quick installation.

Code Considerations. A building permit is likely required—check with your local building department. Shutters and panels must be rated and labeled as impact resistant in accordance with ASTM E 1996 and ASTM E 1886 or AAMA 506. Other local standards such as TAS 202 may be required for Broward and Miami-Dade Counties. Older “clamshell” awning-type shutters may not be rated for impact resistance. Shutters and panels must be attached to structural components of the walls. Panels must have permanently mounted, corrosion resistant hardware for quick installation.



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>