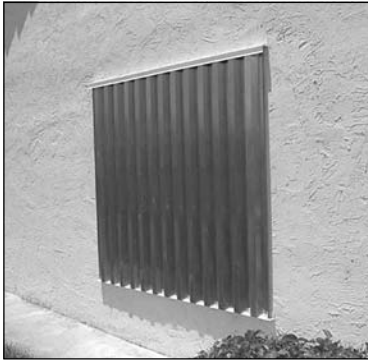


Tips on protecting the openings in your home

There are more and more companies in coastal areas that are in the business of selling and installing storm shutters. Just check your local yellow pages under the listings for “shutters” and “storm windows and doors”. Because these are relatively new products in the market place, consumers may not know how to evaluate these products and services in their comparison shopping. Here are a few tips for the consumer.

1. Storm shutters offer protection against wind pressure, debris impacts, or both. Know what kind of protection you are getting. If your shutters are only rated for debris impact, the windows and doors must be able to resist wind pressure. Typical sliding doors and double doors are vulnerable to failure from wind pressure acting on the doors.



2. Safeguard your windows and doors by securing lawn and patio furniture, garbage cans, flower pots, and so forth at your home and on surrounding property.

3. There are three debris-impact resistance standards: the Miami-Dade Building Code standard, the SBCCI Test Standard for Determining Impact Resistance from Windborne Debris (SSTD 12-97), and the ASTM Standard Specification for Performance of Exterior Windows, Glazed Curtain Walls, Doors and Storm Shutters Impacted by Windborne Debris in Hurricanes (ASTM E 1996-00). The Miami-Dade standard is a very tough standard developed for the extreme wind conditions found in south Florida. It is also appropriate for use along the southeast and gulf coasts on barrier islands, other highly exposed sites, or in locations with a particularly high potential for airborne debris. A listing of approved products can be found on the

Miami-Dade Building Code web site (see back). Shutters designed to a different standard may be sufficient for locations without these high risk factors and are more cost-effective.

4. Shutters should be attached to the structural framing of the house surrounding the window and door openings and not directly to the window or door frames. The frames may not be able withstand extreme pressures caused by severe winds. Pressure forces can act inward or outward.

5. Make sure all exposed metal fittings (including screws, embedded anchors, etc.) are weather (corrosion) resistant—galvanized or stainless steel.

6. For the do-it-yourselfers, design and installation guidelines for plywood storm shutters are available. These shutters provide protection and are typically the least expensive option. They also require a significant amount of time to mount; and the process can be difficult and even dangerous. Plywood shutters are heavy, probably require at least two people to install, and for upper story windows may require the use of a ladder—not where you want to be even in moderate winds. But try to shutter as many windows as possible.



7. You may also have some larger, difficult-to-shutter windows. In those cases you may consider the use of an impact-resistant glass product—the test standards are the same. Keep in mind, however, that these products are part of a window system, including the frame, which is tested as a unit and must be installed together. The impact-resistant products are often best suited for new construction or situations in which your window and frame need to be replaced.

Windows with these treatments may still suffer damage from the impact of debris and have to be replaced. For rental property, impact glass can be a great option—nobody has to put it up when a storm is coming.

While properly selected and installed storm shutters should add to the performance of a home in high winds, it is important to remember that **NOTHING IS HURRICANE PROOF**. The state-of-the-art in storm winds protection for homes and businesses is advancing. On-going scientific and engineering research may yield improved design and installation recommendations in the future.

Every home is unique and there are no general recommendation which are universally applicable to all homes. For specific advice about hazard retrofit recommendations for existing homes and small commercial structures, or hazard mitigation techniques for new construction, home and business owners are urged to contact a licensed consulting engineer in their area.

Not just windows...

Homeowners with garages, especially attached garages,

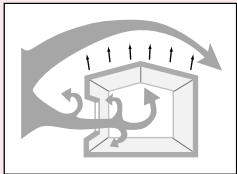


should also ask their shutter professional about retrofitting their garage doors for high winds. If a garage door fails due to high winds, it can cause the interior of the house to become pressurized and increase the chances of losing all or part of the roof. Garage doors designed for high winds have reinforced door panels and tracks. Garage door retrofit kits may also be available at your local building supply store.

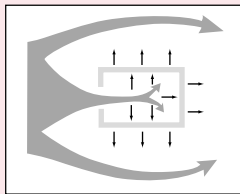
Why should I protect my windows and doors?

Once a building's "envelope"—the roof, windows and doors—is punctured, wind pressure from wind rushing into the structure sometimes more than doubles the uplift forces on the roof.

A hole as small as 1% of the wall surface can lead to this internal pressurization. Catastrophic building failure can result from the loss of a simple window or door.



Internal pressure adds to roof uplift.



Internal pressure increases loads on walls.

After Hurricane Hugo struck South Carolina in 1989, causing an unprecedented \$5 billion in damages, the South Carolina Sea Grant Consortium funded civil engineering professor Peter Sparks to study insured property losses in the state. Dr. Sparks' research showed that 80% of the insured property losses in South Carolina were caused by relatively minor wind damage to roofs, windows, and doors.

He also discovered that, despite the dramatic news photos of massive destruction on the beachfront, the real insurance disaster resulted from minor damage to ordinary homes located inland from the coast. Wind-blown water came through damaged roofs, windows and doors, damaging the building's interior and contents, magnifying costs.

For More Information

NOAA's Hurricane Shutters Page
www.aoml.noaa.gov/hrd/shutters/

The North American Laminated Glass Information Center
800-230-4527 • lgic.glass-info.com

APA - The Engineered Wood Association
Plywood shutter designs: \$1 each or \$5 / set.
PO Box 11700, Tacoma, WA 98411-0700
Phone: 206-565-6600. Fax: 206-565-7265.
The designs can be downloaded for free at:
www.apawood.org

The Institute for Business and Home Safety
617-292-2003 • www.ibhs.org

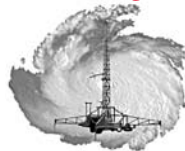
Miami-Dade Building Code
www.buildingcodeonline.com

113 Calhoun Street:
A Center for Sustainable Living
843-727-6497 • www.113calhoun.org

Look for these Impact-Resistant Test Standards

Miami-Dade Building Code
SSTD 12-97
ASTM E 1996-00

Wind Load Test Facility Reducing Wind Losses Through Research



Department of Civil Engineering
Clemson University
Phone: 864-656-1332

**S.C. SEA GRANT
EXTENSION
PROGRAM**



S.C. Sea Grant Consortium
Phone: 843-727-2078
Internet: www.scseagrant.org

Window and Door Protection



How Much is Enough?