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Details: The Wind-Resistant Openings Tech Set

Impact-Resistant Doors

Impact-resistant doors have been tested and labeled for their ability to withstand wind-born projectiles. They often include impact resistant glass, although the method of attachment also affects a door's impact-resistance. Make sure to look for appropriate labels designating the tested characteristics of an impact-resistant door.

Sliding glass doors are larger and more vulnerable to wind and debris than most doors and windows. Use impact-resistant glazing where possible, or at the very least install hurricane shutters.

Reinforced Garage Doors or Single-Car Openings

Often, due to its large size and the relatively weak materials of its construction and hardware, the weakest opening point in a home is a garage door. Garage doors can now be constructed, tested, and rated for impact and wind resistance. The marginal cost of a rated garage door is only \$200 to \$300 over a door without wind-resistant features.

A retrofit kit to strengthen an existing two-car garage door will cost about \$300. A kit usually consists of a vertical post that is placed between the roof and the concrete floor, although other systems also exist.

Single-car openings are more resistant to strong winds than two-car garage doors.

Hurricane Shutters or Impact-Resistant Glass

Shutters can be made of many materials like wood sheathing, acrylic, or steel panels, which have passed the appropriate tests and are properly fastened to structural frames.

Metal hurricane shutters are easily installed on most existing homes. In some designs, [hurricane shutters](#) can be electrically rolled down to protect the home.

Impact-resistant glass is optimal for windows not easily fitted with hurricane shutters or those that are hard to reach. Impact-resistant windows are made from glass laminated with composites that provide enough strength to allow windows to withstand high winds, projectiles, or even bullets. This impact-resistant glazing can reduce the risk of window failure and personal injury or property loss during tornadoes, hurricanes, and explosions. When struck, laminated glass may crack or shatter, but the glass fragments tend to adhere to a plastic layer and stay in place.

Cost Comparison of Impact-Resistant Materials: Based on Figures Compiled by [FLASH](#)

	2,250 sq. ft Home
Plywood Shutters	\$743
Temporary Panel Shutters	\$4,084
Accordion Shutters	\$5,940
Swinging Shutters	\$16,707
Electric Roll-up Shutters	\$22,275
Impact Resistant Glass	\$14,850

Results from the [Interactive Shutter Tool](#).

Windows with High-Performance Glass

Special glazings can be used to both make windows impact resistant (as mentioned above) and more energy efficient. Low-E and [solar control low-E](#) (also called spectrally selective) coatings can be used to boost the energy efficiency of windows. Low-E double pane windows, most common in cold and moderate climates, are more energy efficient than clear windows because the low-E coating reduces heat loss through the window.

Solar control glass, also called Low E2, is a good glass for hot climates because, in addition to improving the insulating ability of windows, it also limits solar heat gain by blocking passage of infrared and some ultraviolet rays. Solar control glass allows a higher level of visible light to pass through a window with less solar heat gain reduction than tinted window coatings.

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