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Sliding Glass Door Protection

Sliding glass doors (patio doors), while wonderful for views and openness, expose houses to risk. The problem is that unless sliding glass doors were specifically designed for high wind, they typically are not very resistant to being pushed into a house by wind. When that happens wind driven rain will flood in and more dramatically it is possible that doors and windows on the other side of the house will get blown out. When this happens, wind and water blow through the house, furniture gets drenched and damage can be extensive.



The failure of French doors at the front of this house resulted in the sliding glass doors being blown out of their tracks. Note one of the tempered glass panels did not break.

(click image for larger version)

Newer sliding glass doors use tempered glass, which is about twice as stronger as regular window glass. (If it is tempered glass, a label indicating this will be etched in one of the corners.) However, even if a door has tempered glass it is still very vulnerable to getting pushed out of its tracks and head piece or being shattered by large debris. The tracks and head pieces on non-wind rated doors have simply not been designed to hold the doors in place in strong winds. When you look at what holds your door in place, do not be deceived by noticing that there is an inch or two of overlap of the top head piece over the door. Many older doors have very little ability to resist bowing and they can bow so much that the door can pop out of the head piece. This has been witnessed time after time. The loss of one of these doors creates a large opening for wind and water to enter, which was often seen in areas affected by the highest winds from the 2004 hurricanes.

Shuttering the doors is one of the most effective ways to protect them from flying debris, and should help reduce water intrusion. Using a non-porous shutter system will also help prevent the house from getting pressurized if a sliding glass door fails during a hurricane. However, because most shutter systems, even those that are considered non-porous in terms of pressurizing your house, allow pressure to build up behind the shutter on the sliding glass door. That pressure can cause the door to pop out or the glass to break. In some cases, the tracks for the doors may not be all that well attached to the walls of the house. You should check inside the framing to check the condition of the screws, the number of screws, and the distance between the screws.



A screen product protecting an entire porch area keeps water away from doors.

(click image for larger version)

There are lots of shutter products available for protecting sliding glass doors. Have a look at [HRG_Shutter_Matrix.pdf](#) to get an idea of the variety of products available or visit [Do-It-Yourself Shutters](#) or [Commercial Shutters](#) to look at more details about specific options. If the doors open onto a porch or lanai, installing code approved impact resistant screen products or accordion shutters around the perimeter may be the most cost effective ways to protect all the openings to that area from flying debris and also reduce water intrusion around the doors. Make sure that the roof of the porch or lanai is well anchored to the floor slab or foundation, which it probably is not. Click on [Porch Roofs](#) for ideas about improving the anchorage of porches and lanais.

Inspecting Your Sliding Glass Door. Is it Strong Enough?

1. Before you check your sliding glass doors, it is a good idea to make a trip to your local home improvement store or building supplier and take a good look at sliding glass doors that have a Design Pressure (DP) rating of 30 or 40. (This means they are rated to resist a pressure of 30 or 40 pounds per square foot.) Pay particular attention to the frames around the glass and to depth and stiffness of the tracks.
2. Now, check your sliding glass doors and look at the relative size of the frame around your glass and at the tracks. Are they as hefty as those you saw in the store for the same size sliding glass doors?
3. Check the corners of the glass to see if the glass is tempered. If it is tempered, it will be labeled as tempered.
4. Look at the bottom track for the door. If you don't trip over the track, it will not keep water out in a hurricane.
5. Check the number of screws and maximum spacing between screws holding the track in place - both on the sides and along the top and bottom.
6. Do the doors fit snugly into the jamb? Is there air space between the door and the jamb? Is it easy to get the door into the right position to lock it?
7. Can you see an air gap between doors when they meet in the center? Is there a gap between the overlapping posts if you have more than two doors in the track?
8. Does the track of the door have a piece of metal that comes up on the inside (water dam) at least 3 to 4 inches?
9. Are the track and the jamb of the doorway caulked together effectively or at all? You may have to clear out debris, dust, cob webs, or mud to determine if the caulk is effective.

Protecting the Door and Keeping Water Out:

Because sliding glass doors typically open into living space and sometimes

are as large and vulnerable as garage doors, protecting them is an important part of protecting your house. If you have old style sliding glass doors, i.e. ones that are not specifically designed for high wind pressures, you should seriously consider replacing the doors or protecting them with a shuttering system of some sort. If possible try to keep the shutters some distance away from the sliding glass doors. That will help keep water from building up against the doors and being driven through the gaps under the doors, between the door overlap and around the edges of the doors. Shuttering will cost less than replacing the doors, but won't give you all the benefits that you would get from new wind pressure and impact rated doors. If you install doors that are rated for pressure but not for impact, then you will still need to shutter them if you are going to provide protection from windborne debris. New doors will have better weather seals than regular doors so you will benefit every day from an energy perspective and it should reduce leaks if you are hit by the edge of a hurricane. It probably will not help much if you are hit by the strongest part of the hurricane. When you change doors you will want to consider using more energy efficient glass to save even more energy money in the long term. An advantage and comfort of replacing doors with pressure and impact rated units is that they will always in place to do their job. Pressure ratings for doors are based on the design wind speed for your location. The table below provides typical design pressure ratings for doors.

DP Ratings for Doors - Code Minimum Values Based on Design Wind Speed

Design Wind Speed (mph)	Door Near Corner (pounds per square foot)	Door Away From Corner (pounds per square foot)
110	30	25
120	35	30
130	40	35
140	45	40
150	50	45

It is not easy to make regular sliding glass doors strong enough to deal with wind because there are two problems, neither of which is easy to overcome. One issue is that non-pressure rated doors will frequently deflect quite a bit. Now this may not seem very plausible, but it is unfortunately a fact that doors can deflect (bow) so much that they pull out of the aluminum at the top that holds them in. This is true even if the head piece extends down the door an inch or so. At the bottom track, doors would come out even sooner if it were not for the weight of



A track anchorage failure for a set of sliding glass doors. Note the single fastener hole above the door panel.

(click image for larger version)

the doors. Sometimes metal reinforcing can be added to the sides of doors. Some homeowners have also installed braces across the doors at

mid-height that run from side to side. This bracing can be effective near the walls but it would take a pretty hefty beam to provide much support in the middle of the door. If you find that there are fewer than 4 screws along each of the vertical edges of the door frame or fewer than 2 screws along the bottom or top frame of each door segment, you should consider adding screws to improve the anchorage of the frame to the wall.

Wind driven rain in hurricanes travels nearly horizontally and the water will build up on the sliding glass doors and work its way through cracks on all sides of the doors. The best way to reduce the water penetration is to keep the water from building up on the doors. You can do this to some extent with non-porous shutters and this technique will be most effective if the shutters are located some distance away from the doors. The best technique that door manufacturers have found for keeping water from flowing into the house



One potential type of sealant for use in sealing plastic sheeting to the bottom track of a sliding glass door.

(click image for larger version)

under the door is to build a deep reservoir that the water has to fill before it overflows into the room. The height of the reservoir is the most critical element. From the table of design pressures presented above, a 130 mph wind can create a pressure of 35 pounds per square foot (psf) on a door in the middle of a wall. Each inch of water height exerts a pressure of 5.2 pounds per square foot at its base. Consequently, the 35 psf wind pressure equals the pressure applied by water 6.7 inches deep. Building a dam about 7 to 8 inches deep that can be sealed to the door frame on the inside of the door, in such a way that water doesn't leak under it, would greatly reduce the chances that much water would be blown in when winds approach 130 mph.

You may be able to use plastic sheeting taped to the edges of the wall opening for the door and sealed to the bottom track (you will need to remove dirt, dust and oil from the track) inside your house to keep water from spraying into the room through cracks or flowing in over the bottom track.

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