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Evaluating the Condition of Your Tile Roof

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Tiles are brittle, and can easily be chipped or broken by wind-borne debris. In fact, the tiles themselves are likely to become wind-borne at wind speeds starting at 120 to 130 mph. You can have a more secure roof by making sure that all tiles, and particularly those on the ridges and edges, are fastened down tightly and by replacing the ones that are missing or loose.



Tile roof repairs should be done by a professional roofer familiar with tile roofs. Hiring a roofing professional to evaluate your tile roof covering is a good idea for most homeowners.

The smartest thing to do is to make sure that you have adequate protection for all your glass window and doors. Tile from your own roof can break your windows, but it is more common that the danger will come from your neighbor's roof. Replacing a tile roof is an expensive proposition, even in the best of times, and costs have skyrocketed in recent years because of the heavy demand for repairs following the hurricanes of 2004 and 2005.



Windows broken by windborne debris

(click image for larger version)

Tiles Most Likely to be Lifted Off First:

The most vulnerable parts of a tile roof are the ridge and edge tiles located where flat planes of the roof intersect. Older installations typically used mortar to attach the ridge and edge tiles, and they are the first ones to blow off as wind gusts begin to exceed about 80 to 90 mph. The new building code requirements (at least in Florida) and industry recommendations call for attaching the ridge and edge tiles to a wood or metal ridge/edge board or cap using screws or nails and possibly clips.



Failure of ridge tiles

(click image for larger version)



Close-up of ridge tile showing anchorage at edges using mortar - hollow cavity

(click image for larger version)



Ridge tile not anchored with screw to metal hat and adhesive on top of hat section never made contact with the bottom of the ridge tile

(click image for larger version)

Tiles along the eaves also tend to be very vulnerable to being lifted up in strong winds. Widespread damage of the first row of tiles at the eaves tends to occur as wind gusts climb above 100 mph.



Eave tile failures

(click image for larger version)

As you read through the information on roofs, some of the terms used may not be familiar to you. You can click on [Roofing Concepts and Terms](#) to access a list of definitions that may be helpful.

Inspecting Your Tile Roof: By walking around your house and looking at the

ridge and edge tiles, you can get an idea of how they are attached. Look to see if there is mortar visible and whether it seems to fill up the cavity under the tiles or whether the space under the tiles is empty. Look for cracked mortar. A lot of installations only have a bead of concrete along the edge of the tiles where they contact the tiles that cover the flat portions of the roof. Also look for any signs of clips (metal connectors) holding down the ends of the tiles along the eaves.

Besides focusing on how ridge and edge tiles are attached, it is useful to try to determine how your tiles are attached on the flat portions of your roof. The main systems that have been used include:

- Mortar set tile: Where the tiles are set in paddies of mortar that "glue" the tiles to the underlayment.
- Adhesive set tile: Where the tiles are set in paddies of foam adhesive that glue the tiles to the underlayment.
- Mechanically attached tile: Where the tiles are attached to the deck using nails or screws that are installed near the top of the tile through holes that are cast into the tile when they are manufactured. You could have one or two nails or screws at the top of the tile (depending on the design wind speed, the shape of the tile and the height of the roof).



Mortar set files rely on adhesion of file to mortar and mortar to underlayment

(click image for larger version)



Mechanically attached tile - most of the tile failure was probably caused by impact of tile from a neighbor's house, but in some cases there were indications that the tile worked its way off the head of the fastener

(click image for larger version)

If the tiles are mechanically attached, you should be able to tell by looking in your attic. From inside your attic, scan the deck between the trusses or rafters. You will probably see the tips of nails that were used to anchor the underlayment felt (unless it was a self adhesive membrane). These nails will tend to be in straight lines every 3' and more randomly spaced (usually 12" or more spacing between the lines). These nails may be either short roofing nails or short ring-shank nails. If you find a second type of nail (usually slightly larger) or screws in straight lines about every 12", these are probably the mechanical anchors for the tile. You can determine how many nails or

screws are used to attach each tile by comparing the horizontal spacing of these fasteners with the width of the tiles. In some older installations, every other tile or every other row of tiles is attached so look for signs that all the tiles are not attached.

If you do not see any signs of mechanical fasteners for the tiles protruding through the deck and you can safely climb a ladder, climb up and look under the tile. If it is mortar set or adhesive set, you should be able to catch a glimpse of the paddies by looking under the edge of the tile. You may also be able to see some indication of mechanical fasteners if they were used to attach the tile. Also, check to see whether any clips were used to hold down the bottom edges of the tiles at the eaves. Note that eave clips are not a requirement, just an indication of an extra measure of resistance. The eave tile anchorage can also be enhanced if there is a second mechanical fastener at the top of this row of tiles or if a larger paddy of foam adhesive was used to set these tiles.

Assessment Observations: The tile uplift resistance of mortar and adhesive set systems depends on the installer placing a large enough paddy of the mortar or adhesive in the proper position under the tile. It also depends on the bond between the mortar or adhesive and the underlayment along the bottom of the paddy and between the mortar or adhesive and the tile along the top of the paddy. The head size, number of fasteners and type of fasteners tend to be the critical elements for the mechanically attached systems. Investigations of hurricane damage suggest that the mortar set systems perform the worst, while the other systems perform better as long as the manufacturers installation recommendations for high wind installations are followed carefully, the ridge and edge tiles are attached to ridge boards, the bottom edge of tiles at the eaves have enhanced anchorage, and the roofs are not impacted by windborne debris.

Inspect the tiles: Print out and use the [Checklist for Tile Roof Evaluation](#).



If you don't have a license to climb a ladder or your spouse or friends have told you that you have no business on a ladder, you can try binoculars or skip to [Get an Expert Opinion](#). There are reasons why roofers have extremely high workers compensation rates (see [Ladder Safety Tips](#)).

From the ladder at the edge of your roof: Look for cracks in the tiles, broken tiles, and loose tiles (especially along the ridges, edges, and eaves). These signs of damage to the tiles or anchorage are indicators that you are likely to lose tiles during a hurricane. Try to determine how the edge and ridge tiles are attached to the roof. Are they attached using mortar along the edges? Are they set in a full bed of mortar? Are they attached to a ridge board? Also inspect the eave tiles noting the distance the tiles extend beyond the fascia board, whether there are clips holding down the edge of the tiles or whether there are adhesive paddies under the eave tiles.



Warning: Do not walk on your tile roof. You can break the bond if the tiles are set in mortar, or you can crack or break the tiles themselves.

From inside your attic: Go up to your attic and use a flashlight to inspect for stains caused by leaks. Look at the roof sheathing, rafters or trusses, and drywall. Look especially carefully around chimneys (including the area above the chimney where triangular diverters - crickets - are mounted above the chimney to divert water away from the chimney), and wherever the roof changes shape or slope. Also look for evidence of water on the walls and in the insulation around gable end vents. These signs that water probably entered during a thunderstorm are a good hint that water will enter during a hurricane.

Inside your house: look for cracked paint, discolored gypsum board, and peeling wallpaper as signs of damaged roof areas. However, be aware that another cause of stains on a ceiling can come from air conditioning ducts that sweat, i.e. drops of water from condensation that forms on the ducts in a hot humid attic.

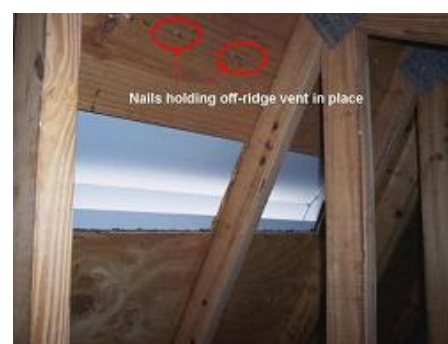
Also check the anchorage of roof vents::

From inside your attic: In order to avoid walking on your tile roof, try to check your off-ridge vents from inside your attic. Determine the spacing and size (length - do they go all the way through the roof deck?) of nails or screws used to hold down off-ridge attic vents, turbines, and any kitchen or bathroom vents that protrude through the roof. If long nails were used and they stick far enough through the roof deck, you can improve the anchorage by clinching (bending over) the nails from inside your attic. **Do not try to bend screws - they are much more brittle and will likely just break off.**



Off-ridge vents on tile roof house. The covered vent broke loose and allowed a tremendous amount of water to enter the house

(click image for larger version)



Off-ridge vent viewed from inside attic. Note the nails used to attach the vent to the roof deck

(click image for larger version)

Get an Expert Opinion: If you are not able to make the inspection yourself, get a reputable roofer or home inspector to evaluate your roof. (Check

with neighbors and friends for referrals and check with the Better Business Bureau).

[Checklist for Tile Roof Evaluation](#)

[What can I do about my tile roof?](#)

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