

Strengthening Existing Roof Systems With Adhesives: A Strategy for Home Owners

Hurricanes and high wind events have been showing trends of increasing in both frequency and intensity in recent years. During such storms, if a home's sheathing is ripped off, the opening created provides direct access for water to enter the home. Losing just one or two roof sheathing panels often results in major damage to the entire home. In the current market, insurance providers are increasing home insurance premiums and deductibles to handle the large claims often associated with extreme weather events. Many home owners are now being forced to look for ways to improve their home's roof strength to make the home tougher in the face of storms and a better risk to insurers.

Common construction adhesives applied to the underside of a roof deck can increase the strength and wind resistance of an existing home's roof system. And this project can often be done by the home owner. By applying adhesives at the truss-sheathing connection, a home's roof strength can be increased by as much as two to three times.

Adhesives can be applied onto an existing roof without the need to replace shingles, tiles, or other roofing material; this retrofit can take place at any time and does not require re-roofing. This is an important advantage, because many homes in high wind zones don't need new exterior coverings—the roofs just need to be strengthened.

The following overview is intended to provide home owners with a basic understanding on applying adhesives to improve their roof's strength and performance. Readers are cautioned that all home improvement projects require attention to safety, and that all manufacturer precautions as well as local building code requirements should be followed.

- **Selecting Adhesive:** Recommended construction adhesives include AFG-01 or ASTM D3498 designated construction adhesives. These are available at most local hardware and home improvement stores.
- **Accessing Attic:** Check to make sure you have access to all eaves and corners of your roof. You might need to create a walkway with boards laid across your trusses to reach all truss-sheathing connections. Do not step on top of insulation or ceiling drywall!
- **Applying Adhesive:** Use a caulk gun to apply an even bead 1/4 inch thick, at a minimum, down the entire length of the truss-sheathing connection for each truss. (See picture at right).

Make sure to apply the adhesive all the way to the end of the truss. The end-connections often bear the greatest wind pressures during storms.

- **Reaching Tight Areas:** Some areas of the roof underside may be difficult to access due to the roof pitch, the framing, or other factors. There are two main techniques used to reach these areas: constructing a power gun or using a short piece of quarter round.

The power gun tool involves building a longer nozzle for a pneumatically, air compressor, driven caulk gun. To learn how to construct an air powered caulk gun see the **Clemson** report referenced below.



Caulk gun and tubes of construction adhesives.

Key Terms

Truss: The wood support used in a roof system. Framing members may also be rafters, which serve the same purpose.

Roof Sheathing: The plywood, OSB, or wood planking on top of the trusses and under the roof shingles or tiles.

Truss-Sheathing Connection: The joint where the truss and roof sheathing meet.

Eaves: The overhang portion of the roof deck past the exterior walls (often where attic vents are located). This is the area where some of the highest wind pressures occur.



Applying adhesive on truss-sheathing connection using a standard caulk gun.

Another alternative to applying adhesives to hard to reach areas is to use lengths of quarter round molding (1/2 inch to 3/4 inch). The two flat faces of the quarter round are coated with adhesive, and then the wood strip is pushed into the truss-sheathing connection. Another strip of wood or a pole can be used to help force the molding into the truss-sheathing connection. This approach can work in tight areas as well as spots where the joint between the roof-truss connection is rough or has gaps too large for a bead of adhesive to fill.

Small blocks of wood, roughly 1/2 to 1 inch thick and 1 to 2 inches wide can be used in a similar manner. Apply one bead of caulk to the long side and another bead to the edge of the wood block. Then push the caulked edges of the block into the truss-sheathing connection.

TIPS

- Avoid stepping on insulation stuffed between trusses or on top of the ceiling drywall.
- Secure wood blocks and quarter rounds to the truss with tack nails while the adhesive is curing. Be careful not to nail upward through the roof deck. NOTE: The tack nail is only intended to hold the wood block in place until the adhesive cures, not to provide additional strength.
- Before you climb into the attic, it is a good idea to wear protective clothing. Handling insulation can temporarily irritate the skin, so keep your shirt sleeves rolled down. Wear gloves, goggles and a facemask rated for the insulation you will be working around. Do not disturb any insulation containing asbestos, such as vermiculite. (See www.epa.gov/asbestos/pubs/verm.html)
- Contact your home insurance provider about discounts offered for wind mitigation strategies, some companies offer premium discounts.



Pre-applying adhesive to quarter round on attic floor.



Placing quarter round into eave using the quarter round technique.

Additional Resources

To read more about strengthening roofs with adhesives or how to construct an air powered caulk gun, read **Clemson University's "Holding onto Your Roof"** report at: www.ascouncil.org/news/newsroom/HUDdocs/HoldingontoYourRoof.pdf

To learn about strategies to protect your home during extreme weather events visit the **U.S. Department of Housing and Urban Development's** home owner resource site at: www.pathnet.org

The Federal Alliance for Safe Homes has numerous resources on improving a home's performance in high wind and other extreme weather events at: www.flash.org

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Contact the Adhesive and Sealant Council by calling 301-986-9700 or visiting www.ascouncil.org