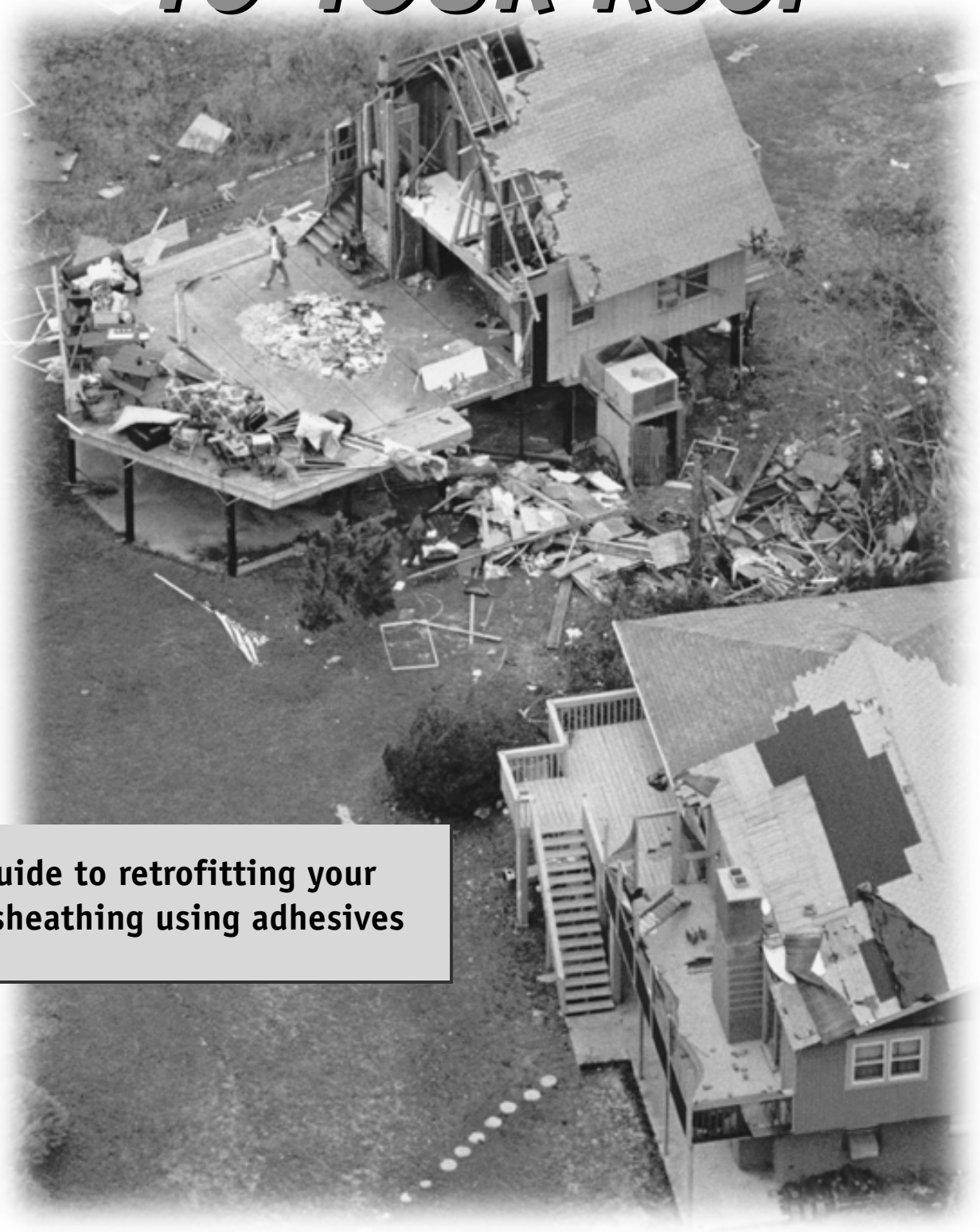
HOLDING ON TO YOUR ROOF



A guide to retrofitting your roof sheathing using adhesives

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HOLDING ON TO YOUR ROOF

A guide to retrofitting your roof sheathing using adhesives

Introduction

Hurricanes and tornadoes regularly tear roofing materials from homes. Shingles and other roof coverings, followed by roof sheathing and windows, are probably the most vulnerable elements of a home to wind damage. Roof covering and roof sheathing, the layer between the rafters and shingles, act together to protect the home's contents. When portions of the roof covering are lost, some water may enter the home; however, when sheathing is lost, large amounts of water enter the building, dramatically increasing damage. Teams investigating damage in South Florida after Hurricane Andrew noted that builders commonly used too few nails to attach the roof sheathing to the structural members. The result was roof sheathing attached with inadequate capacity to withstand the upward-pulling forces generated by hurricane winds.

Adhesive applied at roof sheathing to roof truss connection.

Builders generally attach the sheathing with smooth shank nails at spacing recommended by local building codes. In some coastal areas the latest building codes take into account vulnerability to hurricanes, but many areas have not yet revised roof sheathing attachment requirements. If you have an older home, chances are the sheathing was attached using the older standards that do not provide adequate resistance for hurricane winds. If you are not certain that the sheathing is fastened according to updated wind-resistant recommendations, you should consider reinforcing the connection.

If your roof covering—the shingles, tiles, metal panels, or other material on the roof's surface—is more than 15 years old or damaged, you should plan to re-roof and improve the sheathing attachment at that time. Recommendations for re-roofing are discussed in Appendix A.

If your roof covering is in good condition and you have access to the attic you may be able to reinforce your sheathing connection using adhesives, as we describe in this booklet. Adhesives can increase the uplift resistance of the roof sheathing by five times over the strength of the standard nail connection used in older homes. As a result, using adhesives can more than double the wind speed required to cause failure of the sheathing. For most houses, this means that it would be unlikely that roof sheathing would be lost to wind in a moderate to strong hurricane or in a weak to moderate tornado.

Typical roof sheathing loss.

Reinforcing your roof sheathing connection can be a simple process if you have access through your attic to the bottom surface of the sheathing. Several methods of reinforcing have been developed. One approach involves simply applying a quarter inch bead of construction adhesive to both sides of the rafter or truss where it meets the roof sheathing. Step-by-step instructions in this booklet tell how to select an adhesive, apply it properly, build a caulking gun extension, if needed, and provide extra reinforcement at the gable end.

Getting started

First, take a survey of your attic to get a sense of the working conditions. Answer the following questions to determine what you need to start your project. Lights and a tape measure will help you.

1. Can you get the tip of a caulking gun out to the edges of the roof?

☐ YES ☐ NO

2. Do you have a steep-pitched* roof (greater than 5:12)?

☐ YES ☐ NO

To be most effective, adhesive should be applied all the way to the eaves and in the corners of the roof. If your roof pitch is low, you will have a hard time placing the adhesive. If you answered no to questions 1 or 2, you will need to build a caulking gun extension, as described in Appendix B.

3. Is there a floor in the attic to allow you to work?

☐ YES ☐ NO

If no, you will need a stable and safe work platform. You can simply buy two six-foot pieces of 2x10 framing lumber—stand on one and move the other as you walk around the attic.

4. What is the square footage of the roof surface?

_____ ÷ ***64*** = _____

Measure along the rafter from the edge of the eve to the top of the roof and back down. Multiply this number by the length of your home to determine your total roof square footage. Divide your total roof square footage by 64 to determine the number of 30 oz. tubes of adhesive you will need to complete the job.

5. What is the condition of the roof sheathing?

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

If you see any dark or rotted sheathing in your attic, your roof has suffered water damage. You may want to consider re-roofing, replacing the damaged sheathing and adding fasteners to reinforce the sheathing connection instead of using adhesives. See Appendix A for details.

6. Does insulation obscure the roof sheathing connection to the rafter or truss?

☐ YES ☐ NO

Insulation above the ceiling may block access to the sheathing connection at the eaves. If this is the case, you may need to pull or rake the insulation back from the eaves. Reinstall the insulation after the adhesive hardens. If the insulation is installed under the roof sheathing between the rafters or trusses you need to decide whether it is practical to remove and replace the insulation to perform this retrofit. Note that you will probably have to replace the insulation with new material since the backing material usually gets very brittle in an attic environment.

* See glossary for undefined technical terms.

Collect materials

Local hardware stores and home centers carry AFG-01 approved adhesives. The AFG-01 approval assures that the adhesive meets stringent requirements for strength in adverse conditions such as heat, humidity, freezing temperatures and moisture. If an adhesive meets AFG-01 requirements, the approval will be written on the tube or a logo will be displayed on the tube. Appendix C provides information on capacities of different types of adhesives, which actually have been tested, while Appendix D lists AFG-01 approved adhesives.

AFG-01 Approval.

You will need to apply a lot of adhesive in this project. Consequently, an **air-powered caulking gun** will make the task much easier. For this project, the caulking gun should have the capacity to hold 30 oz. tubes of adhesive. Typical air-powered caulking guns cost between $90 and $180.

> **Warning:** Do not build an extension for a caulking gun powered by a drill. These drill powered products work well for a standard adhesive tube, but if you add the extension described in Appendix B, the adhesive will seep around the backplate of the adhesive tube and create a real mess.

An **air compressor** powers the caulking gun recommended for this application. If you do not own a compressor, you can borrow, rent or buy one. Be sure the compressor has a regulator so that you can control the amount of air pressure that goes to the gun. If you want to purchase a compressor for this project, you can buy a small one for between $100 and $200.

Air powered caulking gun sources

Grainger
Phone: 864 288 0110 Web: www.grainger.com

McMaster Carr
Phone: 404 346 7000 Web: www.mcmaster.com

MSC
Phone: 800 645 7270 Web: www.mscdirect.com

Tool Crib of the North
Phone: 800 358 3096 Web: www.toolcrib.amazon.com

Caulkmaster
Phone: 800 447 6326 Web: www.caulkmaster.com

Tools-Plus
Phone: 800 222 6133 Web: www.tools-plus.com

Materials needed

1. *____ 30 oz. tubes of AFG-01 adhesive
2. Air powered caulking gun
3. Air compressor
4. Utility knife
5. Screwdriver
6. Gloves
7. Rags
8. Two 6' pieces of 2x10 framing lumber**
9. Lights
10. Paint thinner

* See question #4 on page 2 to determine number of tubes.
** If no floor in the attic.

A **utility knife** will be used to cut the tube of caulk and a **screwdriver** will be used to puncture the seal of the caulking tube.

If you do not have a work platform in your attic (see question 3 of the survey), purchase the 2x10 lumber. Six foot **sections of 2x10 framing lumber** make excellent work platforms in your attic. Two pieces are a minimum—you can stand on one and move the other into the next work location. More lumber will make it easier to move around.

This job can get fairly messy—**gloves** and **rags** are essential. If a major spill occurs, **paint thinner** is a great helper. **Lights** help you see where the adhesive is going and improve the overall job conditions.

Applying the adhesive

Winter is the ideal time of year to retrofit your roof with adhesives, as the attic temperatures are generally cooler. Collect materials and head up to the attic.

Note: If you need to build the caulking gun extension described in Appendix B, do it before beginning work.

Once you are in the attic with your materials, lay the work platform boards down perpendicular to the direction of the ceiling joists (see photo below). Be careful to center the board between the joists. If the board is too far off to one side, it could be a seesaw ride that ends one floor below!

2x10 framing lumber work platfrom.

Using the standard air-powered gun

Cut the nozzle of the tube of adhesive at the point where a 1/4" bead of adhesive will be released. Use the screwdriver or wire on the caulking gun to puncture the plastic seal where the nozzle attaches to the caulk tube. Load the adhesive tube into the air powered caulking gun. The air powered caulking tool can empty a tube of caulk before you can say “reload” so be sure to have the air pressure turned down low at first so you can get a feel for the amount of caulk that is coming out of the gun. Sometimes, to get the adhesive started you need to increase the pressure to help get the caulk moving. **Be sure to turn the pressure back down after you have done this.**

The adhesive products should be applied in a well ventilated area. While some attic areas are reasonably well ventilated, you may want to wear protective gear or place a fan near the attic vents to promote air movement while you are working. Be sure to read the warning labels on the product.

Start at the peak of the roof and work down to the roof edges. Be sure that the adhesive gets on both the roof sheathing and the roof structural member (rafter). **Watch your head!** Often times the roofing nails protrude through the sheathing. It is easy to hit your head on a nail and cut or gouge your scalp. Wear a bicycle helmet if you have one.

Work down the rafter until you can’t reach any further. Apply adhesive to both sides of all of the rafters or trusses.

If you are fortunate enough to have a steep-pitched roof and can apply adhesive all the way to the corners of the roof, the job is complete. More commonly, you will have to build a caulking gun extension as described in Appendix B to get the adhesive to the critical corner edges of your roof.

If your home has a gabled roof with an overhang, further reinforcement may be necessary at the

Applying adhesive with standard air powered caulking gun.

gable end. A gable roof overhang is particularly vulnerable to wind damage because the wind pressure acts on the top and bottom surfaces of the overhang. Adhesives can be effectively used to reinforce this detail if the overhang is one foot or less. To reinforce this detail a 1/4" bead of adhesive is applied as before except a 3/4" wide quarter round trim piece is pressed into the uncured adhesive and held in place with finish nails.

Applying quarter round with adhesive and finishing nails.

Applying the adhesive with the extension

Before beginning this section, be sure you have built the necessary parts as described in Appendix B.

Short extension

Attach the 12" long 1/2" extension tip directly to the 11" long 3/4" extension. This will form a short extension, which will help apply adhesive farther towards the edge of the roof. Turn the pressure up on the air compressor and prime the extension. Hold the gun over an empty cardboard box and depress the trigger until the adhesive begins to flow. If there is adhesive coming out around the tee near the caulking gun body, remove the adhesive tube and apply more duct tape as a seal.

As soon as the adhesive begins to flow and before you begin to apply the adhesive, turn the pressure down on the compressor. Start applying the adhesive from the point where you stopped applying the adhesive with the standard gun. Continue until you can reach no further towards the edge of the roof with the short caulking extension.

Long extension

After you have applied as much adhesive as possible with the short extension, add the 48" extension. The 48" extension inserts between the 12" long 1/2" extension tip and 11" long 3/4" extension with the stiffening loop/caulking gun assembly. Prime the extension as before using a cardboard box to catch the adhesive as it exits the tip. Adjust the pressure as required and resume applying the adhesive where you left off. Continue until you complete the job.

Applying the adhesive with the short extension.

Applying adhesive with the long extension.

Appendix A

Recommendations for re-roofing

If your roof covering is nearing the end of its useful life and you plan to re-roof in the near future, the most economical option for strengthening roof sheathing attachment is to strip the roof covering down to the wood sheathing and refasten the sheathing using ring shank nails every four to six inches along each rafter or truss or install #8 screws every six to eight inches. A #8 screw two inches long gives five times the withdrawal capacity of a comparable size nail. There are now automatic feed screw guns available which allow you or your contractor to install the screws very quickly.

When the roof covering is off, the opportunity exists to create a second line of defense against water intrusion into your home if you lose your roof covering. Consider placing a four to six inch wide self adhesive bituminous strip on the joints between the roof sheathing. This bituminous strip is mainly used in window flashing applications and is sold under several brand names. Call the companies listed on this page for specific product information. Also consider extra fastening and overlap for the underlayment material.

In selecting a roof covering, look for products that offer enhanced protection against wind and never place a second layer of shingles over an existing one if your house is located in an area subject to high winds or hurricanes.

If you are not ready to re-roof your home but have access to the underside of the roof sheathing through an attic space, the adhesive approaches described in this brochure may provide a solution.

Re-roofing source list

General information

Institute for Business and Home Safety
"Is Your Home Protected From Hurricane Disaster?: A Homeowner's Guide to Hurricane Retrofit"
617 292 2003 • www.ibhs.org

S.C. Sea Grant Extension Program
Coastal Hazards
843 727 6497 • www.113calhoun.org

Roofing materials

GAF Materials Corporation
800 ROOF 411• www.gaf.com

Certainteed Corporation
www.certainteed.com

Tamko Roofing Products
800 641 4691 • www.tamko.com

Screw fastening systems

Quik Drive Corporation
888 487 7845 • www.quikdrive.com

Pam Fastening Technology, Inc
800 699 2674

Grabber Construction Products
800 477 TURN • www.grabberman.com

Makita USA
800 462 5482 • www.makita.com

Stanley-Bostitch
401 884 2500• www.stanleyworks.com

Self adhesive bituminous strip

Bartech International
800 341 9917 • www.ridglass.com

MFM Building Products Corporation
800 882 ROOF • www.coshocton.com/mfm/

Protecto Wrap Co.
800 759 9727 • www.protectowrap.com

Building a caulking gun extension

You can build an extension for an air powered caulking gun using common plumbing pipe and fittings. The extension will help get the adhesive to the critical hard to reach areas at the eaves of the roof.

The extension is designed with connections that allow you to maneuver it easily in the attic. The loop from the extension to the caulking gun adds stiffness to the extension and provides an area to attach an adjustable handle to make it easier to use.

A list of materials needed for the six-foot extension is provided on page 9.

Instructions

1. Cut the 3/4" copper pipe to the specified lengths listed in the table below using a hacksaw or pipe cutter. If you use a hacksaw, clean up the rough edges with a metal file. Be careful when you are placing any of the copper pieces into a vise—too much pressure distorts the copper.

2. Use a vise and hacksaw to cut the tees so that they can be used for bracing. Place the tee about halfway into the vise with the long edge of the tee parallel to the jaws, as shown in photo 1. Place the hacksaw on top of the vise and use it as a guide to cut through the tee. Repeat this procedure for all four tees.

Lengths to cut 8' section of 3/4" copper pipe

1. 48"
2. 15"
3. 11"
4. 6"
5. 2-1/2"
6. 2"
7. Two, at 1-3/4"

Tools needed

1. Hack saw
2. Vise
3. Tubing cutter (opt.)
4. Pliers
5. Screwdriver

3. Bend two of the cut tees slightly to fit around the 3/4" copper pipe. Insert a short length of pipe in the free hole on the tee, insert the flat area of the tee, at the cut, in the vise and bend out both sides. (see photo 2)

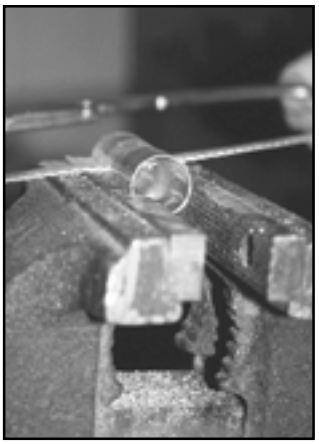


Photo 1. ***Cutting the tee***

You will use one of these and a 6" piece of 3/4" copper pipe to form a stiffening loop handle. The second tee attaches the stiffening loop to the extension tube.

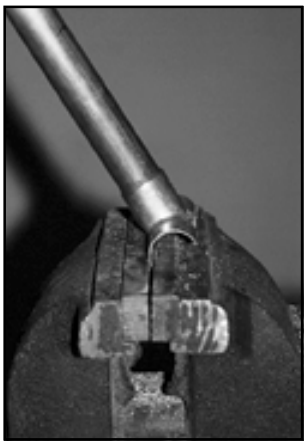


Photo 2. ***Bending the tee.***

4. Bend one of the two remaining tees to fit around the caulking gun body using the procedure outlined in step 3. You will bend the tee more than you did in step 3 as shown in photo 3.

5. The last tee forms the connection between the 30 oz. caulking tube, the caulking gun and the caulking gun extension. This tee needs to be bent almost flat in order to sit close to the caulking tube. Use the vise to flatten it out. You may need to try it out several times and trim some of the corners. This is the hardest piece to fit—it needs to be quite flat so the caulking gun closes with the tube of caulking and the flattened tee inside the canister. (see photo 4)

6. Locate the 12" length of 1/2" copper pipe. Cut a 45-degree angle using a hacksaw at one end of this pipe. This provides a good nozzle to direct the caulking to the intersection of the rafter and sheathing. You may want to mark the top of the tube so you will have a good reference to determine which direction the tip is pointing when

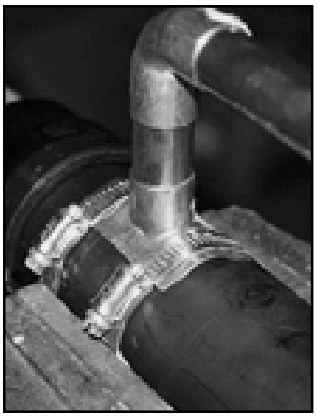


Photo 3. ***Tee around caulking gun.***

you are using the caulking extension.

7. After all of the parts are collected and modified, you are ready to assemble the extension. Lay out all of the pieces in order and dry fit the pieces together. Be sure to check that the stiffening loop allows the extension tube to protrude in a straight line from the end of the gun. This is important because you may be using a slightly different caulking gun than the one we used.

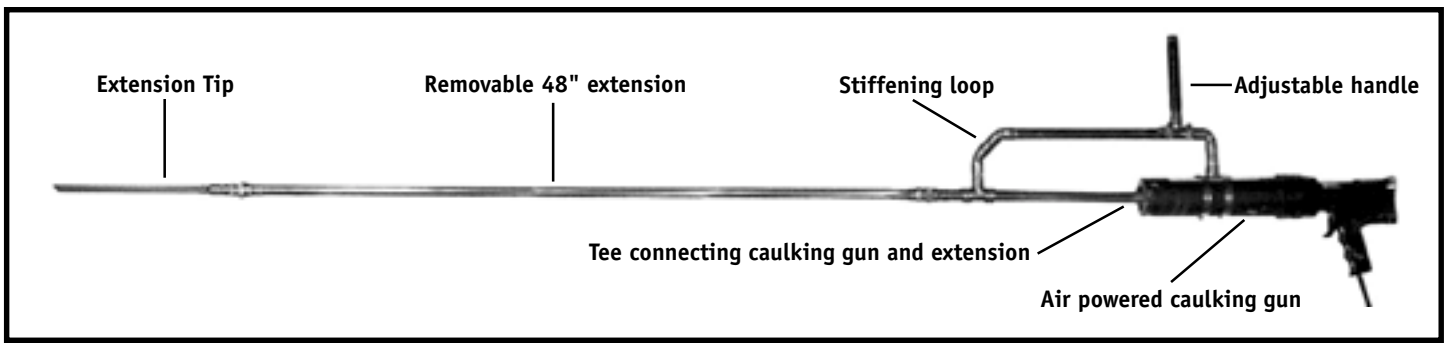
8. After you are confident all the parts fit together, disassemble and lay out the parts in order to begin. Be sure the two male and female threaded connections are facing the same direction. This will allow you to change the length of the extension. Use 5-minute epoxy to assemble the extension. Mix the epoxy thoroughly and apply it to clean pieces of copper with an acid brush.

Photo 4. ***Tee connecting caulking gun and extension.***

9. After the glue dries, you can assemble the caulking gun with the extension. Slip the caulking gun body over the first 11" section of the extension. The stiffening loop can now be installed using 3" hose clamps. Be sure not to over tighten the clamps or it will distort the shape of the caulking gun body. Next, attach the stiffening loop to the extension tube with the 1-1/4" hose clamps. Attach the handle to the stiffening loop using the other 1-1/4" hose clamps.

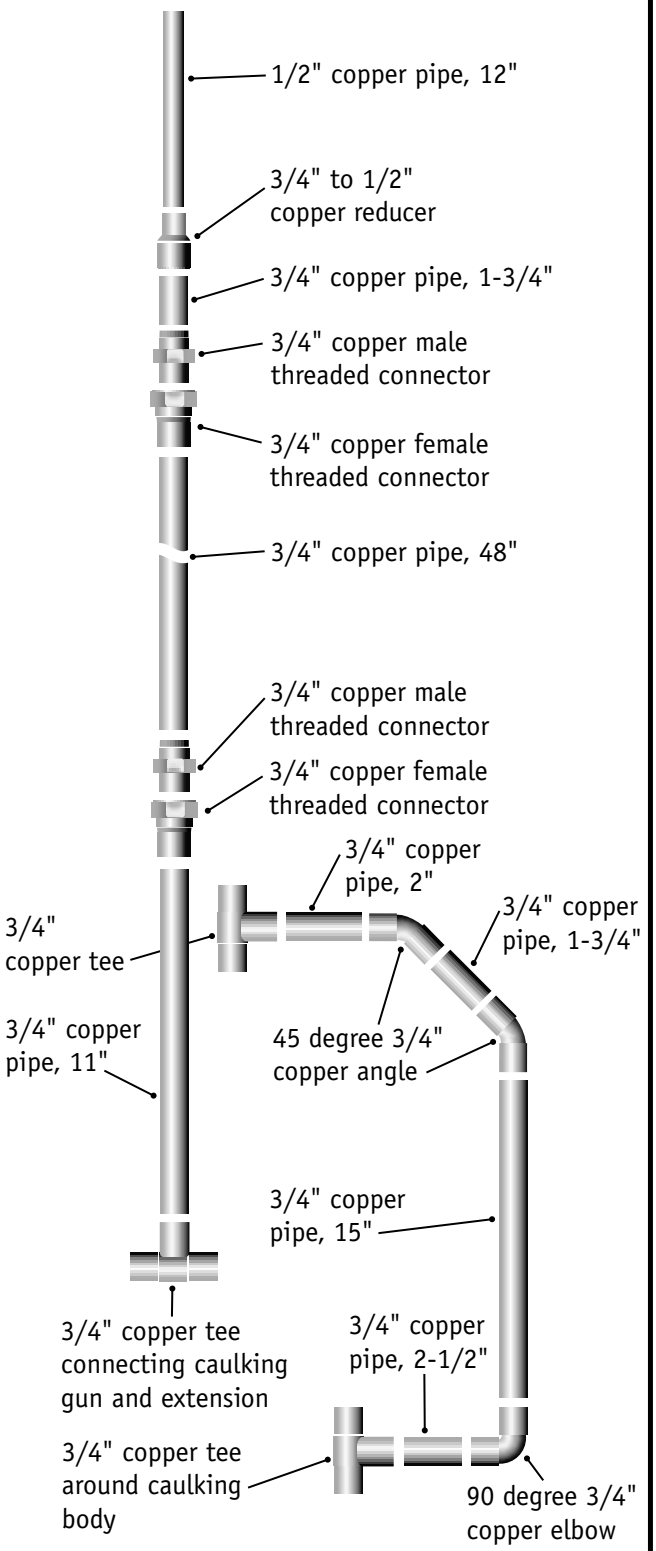
10. Once this assembly is completed, you are ready to install a tube of adhesive in the caulking gun with the extension. Cut the construction adhesive tube off at the thickest point and puncture the seal at the end of the tube. In order to avoid blowback of adhesive, the nozzle of the tube **must be wrapped with duct tape** to provide a seal between the copper pipe and the nozzle of the tube. If there is not a sufficient seal between the caulking gun tube and the extension nozzle, a tremendous amount of caulk will be lost.

The best way to assure that the seal is sufficient is to use a small 2" long piece of 3/4"copper pipe for testing. First wrap the adhesive tube nozzle with a continuous wrap of duct tape. Then stick the end of the tube into the small piece of copper pipe to assure you have a tight fit. Once you are satisfied with the fit (by adding or removing duct tape), remove the small piece of pipe and insert the tube into the caulking gun with the extension and stiffening loop attached. With the additional tee in the caulking gun, assembly of the gun may not be easy. Be sure that the tee that connects the caulking gun body to the extension tube is flat and that the adhesive tube is fully inserted into the extension.



Assembled caulking gun with six foot extension.

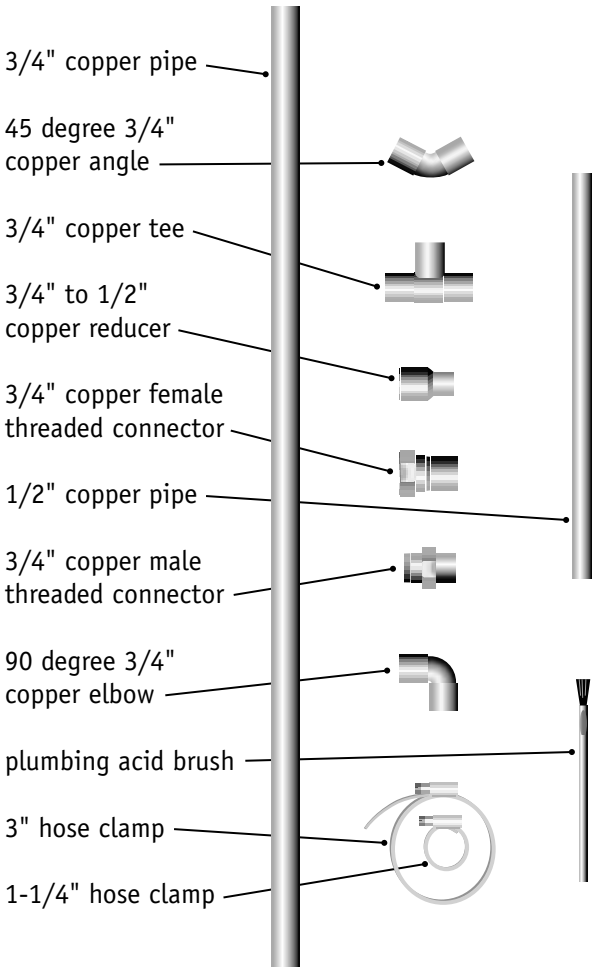
Layout of nozzle, stiffening loop, and extension



Materials needed for caulking gun extension

1. 8' section of 3/4" copper pipe
2. 12" section of 1/2" copper pipe
3. Two, 3/4" copper female threaded connections
4. Two, 3/4" copper male threaded connections
5. One, 90 degree 3/4" copper elbow
6. Two, 45 degree 3/4" copper angles
7. One, 3/4" to 1/2" copper reducer
8. Four, 3/4" copper tees
9. Two, 3" hose clamps
10. Two, 1-1/4" hose clamps
11. 5 minute epoxy
12. Plumbing acid brushes
13. Duct tape

Parts illustration



Appendix C

Tested adhesives:
Performance and cost

The adhesives used in this study were readily available from local suppliers such as Lowes, ACE Hardware, and Home Depot. The 3M Scotch-Grip Wood Adhesive 5230 was a special order item—but it could be ordered through the local home improvement center.

Table 1 provides a listing of the various adhesives used in the investigation. Test standards and certifications are also listed for each adhesive. Two of the adhesives evaluated did not carry any indication that they met any test standard or certification. Five carried the AFG-01 certification, six carried the ASTM C557 certification and four carried the FHA/HUD Bulletin 60 certification in addition to either the AFG-01 or ASTM C557 certification. Based on the test results obtained from this investigation, it appears that any wood adhesive product which carries the AFG-01 designation or the ASTM C557 designation should provide adequate reinforcement if applied as suggested. However, it is clear from the failure pressure data that the adhesives which carry the AFG-01 designation provided more consistent and higher performance, so we recommend them in the instructions. The OSI Pro Series SF 400 Subfloor and Construction Adhesive, the DAP 4000 Subfloor Adhesive and the TEC Sturdi Bond Subfloor and Exterior Construction Adhesive all provided cost effective alternatives with excellent reinforcement. The 3M Scotch-Grip 5230 was clearly the most expensive but it is unique in that it remains flexible while the other adhesives tend to become relatively hard as they cure.

For comparison purposes, the commercial product Foamseal (installed by a professional) resulted in average failure pressures of 200 pounds per square foot (psf) for an installation with the same materials used in developing Table 1 (4 ply 1/2" thick CDX plywood and Southern Yellow Pine rafters). The typical cost of the Foamseal installation (labor and materials) is $1.00 per square foot of roof surface ($32 per 4x8 ft. sheathing panel). The costs listed in Table 1 assume installation by the homeowner and only include the cost of the adhesive materials.

There are several points of caution which should be noted. First, while the APA -The Engineered Wood Association has endorsed the adhesive retrofit options described in this booklet for existing construction, they are adamant that adhesives should not be applied on roof sheathing to rafter or truss connections in new construction. In new construction, the moisture content of the sheathing and the roof trusses or rafters may be significantly different and components may move relative to each other as the moisture content changes to match ambient conditions. This may result in warping of the roof decking.

The APA has conducted tests of roof sheathing attached using the Scotch Grip 5320 and found that warping was not likely to be a problem for the retrofit of existing roof sheathing installations, where materials were likely to have reached similar moisture levels.

Second, it should be noted that the effects of the attic environmental conditions on the strength of adhesives is unknown, therefore adhesives should be considered an intermediate measure until re-roofing is necessary. At that time the guidelines discussed in Appendix A should be followed.

Finally, if you carry out one of the retrofit options for improving the attachment of the roof sheathing, you also should evaluate the type of connection used to attach the rafters or trusses to the outer walls of your house. If the rafters or trusses are simply attached using a toenail connection, your house also has a severe inherent weakness at this point. By fastening the roof sheathing more securely, you may create the potential for even greater loss if the whole roof lifts off the walls.

Table 1.

Adhesive performance and cost data based on 1/4" beads on both sides of the rafters or truss top chords

Type of adhesive	Avg. failure pres. psf	Certifications / Test standards passed	Typ. adhesive cost per 4x8 ft. sheathing panel
OSI Quickbond	150	none	$1.20
OSI Pro-Series SF 400 Sub-Floor and Construction Adhesive	280	AFG-01, ICBO ER 2769, FHA/HUD 60, ASTM E 84-76, ASTM D3498-76	$1.50
Liquid Nails Foam	70	none	$1.95
Liquid Nails for Projects and Construction	220	ASTM C-557	$1.95
Liquid Nails Heavy Duty Construction and Remodeling Adhesive	260, 300*	ASTM C-557	$2.25
DAP Beats the Nail Adhesive	200	ASTM C-557	$1.50
DAP 4000 Subfloor Adhesive	270	AFG-01, ASTM C-557, FHA/HUD 60	$1.80
ACE Construction Adhesive	240	ASTM C-557	$1.50
TEC Sturdi-Bond Subfloor and Exterior Construction Adhesive	300	AFG-01, ASTM C-557, FHA/HUD 60	$2.55
3M Scotch-Grip 5230 Wood Adhesive	370	AFG-01, FHA/HUD 60	$20.40
Liquid Nails for Subfloors and Decks	277*	AFG-01, ASTM D3498	$2.19

* Tested with 15/32" 3 ply 32/15 Span Rated Sheathing, Southern Yellow Pine Rafters.

Appendix D

List of AFG-01 approved adhesives

203C2 Subfloor Adhesive
3C 202 Subfloor Adhesive
ABCO Subfloor & Construction Adhesive
Abitibi 700 Subfloor Construction Adhesive
ACE Heavy Duty Construction Adhesive
ACE Subfloor Adhesive
AF400 Subfloor & Construction Adhesive
AP Adhesive
BC 400 Subfloor & Construction Adhesive
Biddle's Construction Adhesive
Bullet Bond High Powered Subfloor & Deck Adhesive
Calgafast Adhesive
DAP 4000 Subfloor & Plywood Adhesive
DAP Big Stick Construction Adhesive
DAP Deck Weld and Treated Lumber Adhesive
DF2000
DF400
Do-It-Best Sub-Floor & Decking Adhesive
DP400
Eagle Grip (EG 400)
Elmer's Subfloor & Construction Adhesive
Equus Heavy Duty Adhesives
Fastener Subfloor Adhesive
Focal Point Adhesive
Franklin Subfloor Construction Adhesive
Franklin Titebond Construction Adhesive
FS-100 Construction Adhesive
FS-110 Flooring Deck Adhesive
GMC-400
Golden Spike Subfloor Adhesive
GSL 40 Subfloor Adhesive
H.P. Construction Adhesive
Hamilton All Purpose Subfloor and Construction Adhesive
HB 400
Hechinger Subfloor & Construction Adhesive
Henry No. 217 Subfloor and Construction Adhesive
Hilti Solvent Free Construction Adhesive (Hilti CA-3600)
HLC-400
IC -4000 Subfloor/Construction Adhesive
ITW SB-400 Adhesive
Leech F-26 Waterproof Construction Adhesive
LN-602 Liquid Nails Construction Adhesive
LN-902 Latex Liquid Nails Subfloor Adhesive
Lumber Lock
MD400 Construction Multi-Purpose Adhesive
MD400C Contractor's Grade Construction Adhesive
Nail Bond Subfloor Adhesive (NB-400)
Nail Power Nonflammable Subfloor Adhesive (NP-500)
Nail Power Subfloor Construction Adhesive (NP-400)
ORCO Subfloor Construction Adhesive
Parr Construction Adhesive 40
PL PRO/CFD-400
PL400 Subfloor Construction Adhesive
PL500 Deck & Treated Lumber Adhesive
Pliobond 5012
Plio-Nail Construction Adhesive
POLYSEAMSEAL Heavy Duty Construction Adhesive (195-152)
Pro-Series SF-400 Sub-Floor and Construction Adhesive
Pro-Series SF-450 Heavy Duty Sub-Floor and Construction Adhesive
Pro-Series SF-475 Non-Flammable Sub-Floor and Deck Adhesive
PS-800 Super Bonding Adhesive
QS400 Subfloor Construction Adhesive
Quickbond Heavy Duty Sub-Floor & Construction Adhesive
RL1168
SB-400 Construction Decking Adhesive
SB-8-10 The Reinforcer Adhesive
Scotch Grip 5230 Wood Adhesive
Servistar Premium Construction Adhesive
Servistar Subfloor Adhesive
SFA 66 Subfloor& Construction Adhesive
SFC 400 Subfloor & Construction Adhesive
Shur-Stik 96 Subfloor & Decking Adhesive
Solvent Free CA 40 Environmentally Safe Adhesive Adhesive
Solvent Free Subfloor Adhesive
Solvent Free Titebond Construction Adhesive
Spee-Dee Construction & Subfloor Adhesive
Spee-Dee Construction Adhesive
SS 400 Subfloor & Construction Adhesive
SS 4000 Structural Decking & Construction Adhesive
SS-2000A Construction Adhesive
SS400
SS4000
Stix 4 Construction and Subfloor Adhesive
Sub-Floor Adhesive CA-CG-3400
Sutherland Construction Adhesive
TA-175 Sturdi Bond Adhesive
Top 4000 Subfloor & Construction Adhesive
Tru Bond Sturdibond
Tru Bond Subfloor & Construction Adhesive (TB 175)
Ultra Bond
UR 88
Van Grip Construction Adhesive 7012
Wilhold Subfloor & Construction Adhesive
X-Pert Subfloor & Construction Adhesive

Glossary

Adhesive:
A substance capable of holding materials together by bonding to the surfaces.

Building codes:
A collection of rules and regulations—typically consisting of the minimum standards for architecture, structure and mechanical standards for sanitation, public health, welfare and safety—adopted by authorities with the jurisdiction to control design and construction of buildings, remodeling and repair, quality of materials, use, occupancy, and other related factors.

Fastener:
A mechanical device, weld or rivet for holding two or more parts together in a structure. Nails and screws are examples of fasteners.

Flashing or flashing tape:
A thin, impervious material used in construction to prevent water penetration; commonly used to seal contacts around window and doorframes.

Gable end:
A roof that slopes upward on two sides.

Gabled roof overhang:
The portion of the roof that overhangs the wall at the gable end of the house.

Rafters:
A series of inclined members to which roof coverings are attached or fixed. Also referred to as roof structural members.

Roof covering:
Top covering of roof surface, may include shingles, roof tiles, slate, or sheet metal.

Roof pitch:
The slope at which the roof is angled. The pitch is defined as the distance the roof rises in 12 inches horizontal. For example a 3:12 pitched roof has 3 inches of vertical rise in 12 inches of horizontal run.

Sheathing (or sheeting):
The covering (usually wood boards, plywood, OSB or wallboards) placed over the exterior studding or rafters of a building to provide a base for the application of wall coverings or roofing materials.

Toe nail connection:
A ninety degree connection of two pieces of wood that uses nails driven in at an angle.

Underlayment:
A felt-paper type material, commonly black and tar-impregnated, used in roofing systems to help prevent water penetration into underlying supporting structures.