

Problems with low density insulation: Blowing insulation through one or two small holes usually creates voids inside the wall cavity. This is because insulation won't reliably blow at an adequate density more than about one foot from the nozzle. Use tube-filling methods whenever possible, using a 1.5-inch hose inserted through a 2-inch or larger hole.

5.3.2 Retrofit Closed-Cavity Wall Insulation

SWS Detail: 4.0202.1 Dense Pack Insulation; 4.0201.3 Dense Pack Insulation

This section describes blowing walls with fibrous insulation using a fill tube from indoors or outdoors.

5.3.3 Accessing Wall Cavities

Mistakes are most common at the beginning of any job. For the sake of appearances, start on the least important part of the house — facing the backyard or another nearby building.

For frame walls with lap siding, remove a row that is between one and 2 feet above the bottom plate for both convenience and to avoid blowing both up and down. Be prepared to patch or

replace siding if necessary, depending on your evaluation of its current condition and its difficulty to remove.

Lath and Plaster or Drywall

If you drill indoors through lath and plaster, use a carbide tip hole saw at least 2 ½ inches in diameter. Assume lead paint if you're not testing, and follow lead-safe precautions carefully.

A butterfly patch, also known as a California patch is probably the best type of patch. The butterfly patch is a piece of drywall with the same size plug as the hole you drilled, surrounded by a larger piece of drywall paper.

Or, patch the hole with a stiff joint compound as a base and standard joint compound as finish. The stiff joint compounds are very difficult to sand, if their surface rises even $\frac{1}{32}$ inch above the surface of the finished wall, so keep the first layer well below the surface and top the patch off with standard sand-able joint compound.

You can also install a primed and painted trim board horizontally to cover all the holes.

The butterfly patch:

Drywall paper surrounds the circular drywall plug. The paper makes finishing the patch easier and faster. Make a supply of these before starting a job.



Wood Lap Siding

Wood siding can be difficult to remove and replace without damage, especially if it has several coats of intact paint. Old painted wood can be very brittle and its paint very fragile.

- ✓ Consider the possibility that you may break or split pieces of siding and may need some new siding to replace damaged pieces.
- ✓ Choose a piece of lap siding a comfortable height one or two feet above the bottom plate. To begin, cut your chosen piece of lap siding vertically at the vertical corner trim so that you can remove it after pulling the nails.
- ✓ Use a utility knife or a sharpened putty knife to cut completely through the paint at the bottom of your chosen piece of siding.
- ✓ Pull the nails on the bottom edge of your chosen piece. A ram type nail puller creates less damage to the wood compared to a bar-type nail puller. Or you can lift the siding slightly directly under each nail with a flat bar, and remove the nail.
- ✓ Use a nail punch to drive nails through the siding if you can't pull the nails.
- ✓ After blowing, line up the siding in its original position. Nail the siding back in place using a new hole close to the old one, in order to catch the stud. Don't use the old hole because it may be too large to hold the new nail. Drill holes if you must to avoid splitting the wood.
- ✓ Use galvanized nails, and fill the damage at the nail holes with exterior caulking. Afterwards prime and paint as necessary.



The last resort: When you can't find an easier way, cut horizontally the piece you want to remove. Re-install it after you insulate, and face-nail it in place.

Wood Shingle Siding

First, identify the stud layout in the wall so you know which shingles to remove.

- ✓ Cut the paint on each vertical side of the shingle.
- ✓ Pry the single loose, and pull it down to remove it.
- ✓ Or score the shingle and break it to drill a hole, then face-nail it back in place.
- ✓ Replace the single by pushing it up to the shingle above it, and face nail it with a galvanized box nail.



Score and break a shingle:

If the shingles are flexible, you may be able to remove nails. However, usually you must score and break the shingle, and then later face-nail it back in place.

Asbestos-Slate Siding

The individual slates of asbestos siding can be easy or difficult to remove depending on whether they are single-nailed or double-nailed and also on the amount of paint that covers them.

Be sure that you spray water on each slate, before trying to remove it. **The slate should be adequately wetted before you remove the slate, whole and intact.**

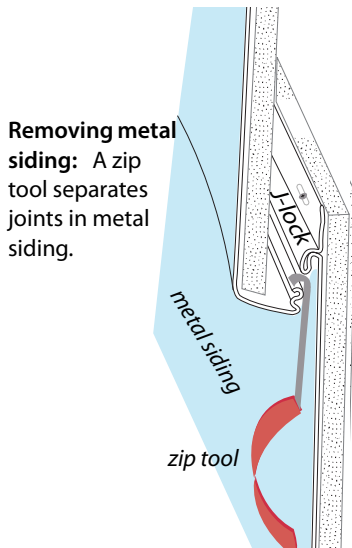
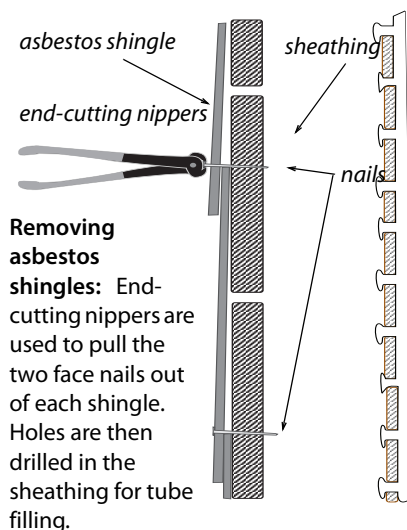
If the slate is only nailed at the bottom, you can pull the nails and slide it out. You may have to cut the paint around the slate with utility knife before removing it.

Ideally, you should have a supply of asbestos slates, in case you break a slate. The standard slate size is 12 by 24 inches, and you

can buy them in 18-slate bundles online, if you can't find them locally. The slates come in several different designs.

Removing or Cutting the Nails: Open a pair of end nippers a little wider than the head of the nail. Center the nail between the jaws of the nipper and press lightly. Hopefully, pressing the slate moves the slate inward allowing the nipper blades to squeeze under the nail head. Pull on the nail, but don't use the slate for leverage. Try turning the nail clockwise and counterclockwise with the end nippers. Don't move the nail back-and-forth because this might break the fragile slate. If the nail won't come out, try cutting the head off with the end nippers.

Cutting Slates: Only If Necessary: Never cut asbestos slates with a saw. Dampen the area of the slate that you'll cut. While the slate sits on a solid surface, score the it with a scoring knife on both sides. Then, align the scored line with the straight edge of the supporting surface, and carefully break the slate along the scored line.



Metal Lap Siding

Metal siding can be easy or difficult to remove. Steel siding is typically more difficult than aluminum siding. Sometimes you're lucky and a zip tool separates the upper piece of siding from the J lock of the siding piece below it.

- ✓ Start at a corner or a joint, and pry the end of the J lock apart. Start there to unzip the two pieces of siding with the zip tool.
- ✓ Failing that, some installers use a piece of vinyl clothesline with a knot in the end. They insert the clothesline in the space between the siding and the J-lock at one end, and pull the clothesline toward the other end to unzip the joint.
- ✓ Still other installers, use a putty knife and a small flat bar to separate the joint. Others use a hook to separate the J-lock joint at an end or where two pieces of siding join one another.
- ✓ If you can't separate the joint through any of these methods, you can cut the lower piece of siding horizontally and

remove it or bend it downward to drill your holes for the fill tube.

Pop the corner loose:

Use a homemade tool, like this one, or a zip tool.



Lift the upper piece:

Remove the nails that you expose from the piece below the one you unzipped.



Remove the lower piece: Then drill holes for the insulation.

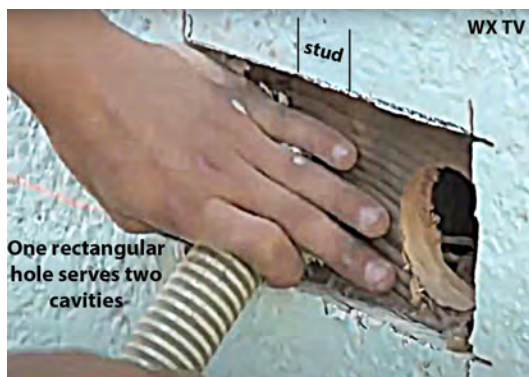
Vinyl Lap Siding

Vinyl siding is usually the easiest type of siding to remove. On most jobs, an installer simply unzips the joint with a zip tool. Start unzipping at a corner or a joint between two pieces.

Stucco Siding

First, identify the stud layout in the wall accurately so you know where to cut a hole in the stucco.

- ✓ Cut a 4-inch by 8-inch rectangular hole centered on a stud. This hole gives you access to two stud cavities and leaves you with half as many holes to patch.
- ✓ Pry wire lath open with side nippers or pliers, and remove it.
- ✓ After blowing the wall, stuff the hole with the tuft of fiber-glass batt.
- ✓ Place tar-paper patches over the holes you drilled. Then install a rectangular piece of new lath.
- ✓ Apply two coats of stucco. Match the texture with the brush or sponge.



One hole fills two cavities: Use a pattern to mark the rectangular hole.

Masonite Lap Siding

Masonite lap siding is fragile and difficult to pry off its nails.

1. Instead just drive nail heads through the siding with the nail punch to remove it.
2. Fill the nail holes with a paintable caulk or spackle after you insulate.

5.3.4 Blowing Walls with a Fill-Tube

Install dense-pack wall insulation using a blower equipped with separate controls for air and material feed.

Select insulation that has a flame spread and smoke development index of 25/450 or less.

About Fill Tubes

Use a clear vinyl with $\frac{1}{8}$ inch wall thickness, 1 $\frac{1}{4}$ inch ID with a 2-inch x 1 $\frac{1}{4}$ -inch reducer.

Cut a 45° angle at the tip to steer the tube around obstacles. The angle of the tip should align with the natural curvature of the tube.

Insulation suppliers provide tubes for summer blowing and winter blowing. The summer blowing tubes are stiffer, and the winter blowing tubes are more flexible. The ideal is flexible enough to avoid obstacles and stiff enough so you can push the tube up to the top of the wall.

Straighten the tube with a heat gun if it's too curvy.

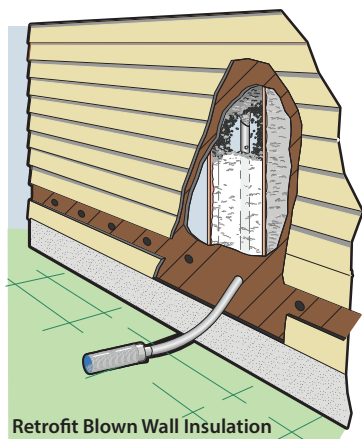


Accessories for dense-packing walls: Includes blower hose, 2 types of fill tubes, reducers, and clamps.

Use at least 50 feet of hose between the blowing machine and the fill tube. For example, connect 25 feet of 3-inch hose then a 3-to-2 $\frac{1}{2}$ -inch reducer. Next connect 15 feet of 2 $\frac{1}{2}$ -inch hose and a 2 $\frac{1}{2}$ -to-2-inch reducer. Next attach 10 feet of 2-inch hose and a 2-inch to 1 $\frac{1}{4}$ -inch reducer to attach the fill tube. This type of

stepped-down hose assembly conditions the insulation into a fast flowing aerated stream that distributes and packs the insulation but isn't likely to plug the hose.

Mark the tube with electricians tape or a black permanent marker, 12 inches from the tip of the angle and 8 feet from the tip of the angle. Those two marks tell you when the tube reaches the top of the cavity and when it approaches the bottom. You may be able to feel the tube hit the top plate, when you push it all the way in.



Tube-filling walls: perform this method indoors or outdoors. Tube-filling is the preferred wall-insulation method because it achieves a uniform coverage and density.

To prevent settling, blow dry cellulose insulation to 100% coverage and a density of at least 3.5 pounds per cubic foot (pcf). The fiberglass material must be designed for dense-pack installation and must reach at least 2.2 pcf.

Insulate walls using this procedure.

1. Drill 2-to-3-inch diameter holes to access the stud cavities.
2. Probe all wall cavities through these holes, before you begin insulating, to identify fire blocking, diagonal bracing, and other obstacles.

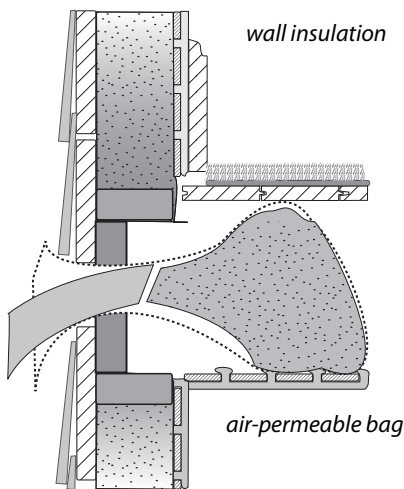
3. Start with several full-height, unobstructed wall cavities so you can measure the insulation density and adjust the blower. An 8-foot cavity (2-by-4 on 16-inch centers) should consume a minimum of 10 pounds of cellulose or 6 pounds of fiberglass.
4. Insert the hose all the way to the top of the cavity. Start the machine, and back the tube out slowly as the cavity fills.
5. Then fill the bottom of the cavity in the same way.
6. After probing and filling, drill whatever additional holes are necessary for complete coverage. For example: above windows or missed areas with fire blocking.
7. Use the blower's remote to control air and feed separately in order to achieve a dense pack near the hole while limiting spillage.
8. Plug the holes with tufts of fiberglass batt, repair the weather barrier at each hole, and re-install the siding.

Insulating the Wall-Floor Junction of Two-Story Walls

When insulating the perimeter of walls between the first and second floors, blow an insulation plug into the perimeter floor cavities for both thermal resistance and airflow resistance.

This method is effective for both balloon-framed and platform-framed walls. With platform-framed walls, the wall insulation is discontinuous at the floor cavity unless you drill and blow through the rim joist there. With balloon-framed walls, there is a gaping hole at the second floor and no rim joist

This dense-packed plug prevents the second-floor cavity from acting as a thermal bridge and an air-leakage pathway. Using a fill tube, blow the insulation into a air-permeable bag that expands inside the cavity. The bag limits the amount of insulation necessary to insulate the joist cavities at the floor perimeter.



Floor cavities: Floor cavities are difficult to fill in platform-framed homes. Blow a plug of insulation into the floor cavity to insulate this uninsulated area.



Video: Densepack retrofit insulation tools and procedures— Hoses, area prep, dense-packing from indoors and outdoors, area cleanup.

5.3.5 Open-Cavity Wall Insulation

SWS Details: 4.0201.2 Batt Insulation; 4.0201.3 Dense Pack Insulation

Fiberglass batts are the most common open-cavity wall insulation, but rock wool may have a quality advantage over fiberglass. Batts achieve their rated R-value only when installed carefully.

A variety of sprayed insulation products may out-perform batts with expert installation. However, these products are more expensive and have their own installation challenges.

This section describes ways of installing wall insulation.

1. Installing batts in an open wall cavity.
2. Spraying wet-spray fiberglass or cellulose into an open wall cavity.