Siding Removal and Wall Insulation Techniques

TAM05N
In-Field Short Course

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8:00 am – 12 noon

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AFFORDABLE COMFORT CONFERENCE

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Have you ever driven around an area for the first time and were able to pick out the homes that had been weatherized by a local agency or contractor? You know the ones; they have sidewall plugs that can be seen a block away (or holes where the plugs used to be). It makes you wonder what the installers were thinking, permanently compromising the exterior of someone's home with polka-dots.

And what about the density of the sidewall insulation? Chances are, if the installers were not concerned about how they left the exterior of the walls, they probably weren't too concerned with what they put in the walls either.

The following article is based upon the Affordable Comfort 2000 Selected Readings article: *High Density Tubing Tips and Techniques*, and should prove helpful to beginning and novice insulation installers.

Working "Lead-Safe"

Concern over possible poisoning from disturbing lead-based paint has dictated that weatherization staff across the country take appropriate precautions to ensure the safety of both themselves and the occupants of the home. Because the dust and chips from lead-based paint are dangerous when touched, swallowed, or inhaled, precautionary measures must be taken when lead-based paint is suspected. Although this primarily affects homes built before 1978, the probability that a home built around 1960 has lead paint is about 50%. This number increases to 98% for homes built before 1940. With regards to installing insulation, care should be taken when breaking through painted surfaces of the interior or exterior sheathing.

Staff should wear protective clothing and be fitted for respirators using HEPA filters, and utilize a high-efficiency, particulate air filter equipped (HEPA) vacuum cleaner to clean up the work site. Spray bottles should be used to wet surfaces in order to keep dust from spreading.

A protective ground cover (6-mil polyethylene plastic sheeting or tarp) should be used to keep paint chips from contaminating the interior or exterior of the home, as well as the surrounding area. Additional information can be found on page 20 of this handout.

Sidewall Tubing

What is it and why does it work ?

Sidewall Tubing is the installation of insulation into sidewalls (and key junctures) by means of a "tube". This tube comes off the end of the blowing hose, which is attached to the insulation machine. The fill tube is inserted into the sidewall cavity, eliminating the need for vertical probing of the cavities. When the installer inserts the tube into the cavity, he/she knows exactly where the insulation is going. Use of the tube allows for insulation to be installed at a higher density (3.25 to 4.0 $lbs./ft.^3$, hence the phrase: "**dense-pack insulation**") and with complete coverage. This high density also acts to greatly minimize, if not completely eliminate, unwanted air movement, thereby providing both an air-sealing benefit as well as a thermal benefit.

Since the inside diameter (I.D.) of the sidewall tube is larger than the inside diameter of the nozzle traditionally used in the "2-hole method" (1 1/4" vs. 3/4"), more insulation can be installed faster by using the sidewall tube. Also, because tubing installs the insulation vertically, it fills the wall cavity completely.

Concerns with the 2-hole Method

The two-hole method attempts to fill a vertical cavity by blowing the insulation into the wall horizontally. All of the blowing pressure is aimed directly at the back-side of the interior wall, located approximately 3 1/2" away. Consequently, the insulation hits the wall sheathing and loses its ability to move easily up or down the wall cavity. Gravity and the remaining air pressure push the insulation down the cavity, however upward movement is solely dependent upon what little air pressure remains. The ability of the air pressure to push a continuously expanding plug of cellulose in an upward direction diminishes as the plug grows. The end result is that the cellulose blown into the bottom hole only moves up the wall about 18" (or less) from the access hole. The cellulose that is blown into the upper hole does fall down the wall cavity and usually meets the insulation installed from below, but obstructions in the cavity (such as wires, electrical boxes, plaster keys, etc.) may significantly reduce the probability of consistent thermal coverage within the cavity. Voids that occur within the installed insulation as a result of obstructions may increase the likelihood of settling. Likewise, the ability to achieve a high dense-pack (3.25-3.75 $lbs./ft.^3$) is also diminished.

So, what if you have a heavy-duty insulation machine that is capable of forcing that plug of cellulose further up the wall cavity? Well, think about it for a second, the air pressure is still aimed directly at the backside of the interior sheathing. In order for your machine to have enough blowing force to move the insulation up the wall, the pressure would blow the interior sheathing off the wall studs first. Now this is where a directional nozzle comes in handy. Directional nozzles have a "spoon" at the end, which steers the insulation in the direction intended. But two holes per cavity (per floor) are still necessary to obtain full coverage and sufficient density.

Tubes

There are basically two sizes of tubes that are used to install dense-pack insulation into sidewalls; the 1" and 1 ¼" I.D. (inside diameter). At every opportunity, the installer should try to use the 1 ¼" ID tube because it installs more insulation, faster than the 1" ID tube, without an appreciable loss in density.

There are several different types of tubes that are used, depending upon outdoor temperature conditions. As the temperature changes throughout the day, the installer might need to use more than one type of tube. Winter tubes are the most flexible, or "softest", with the summer tube being slightly stiffer, the reinforced summer tube being stiffer still, and rigid tubing being the least flexible.

Experimentation by the field staff to find new types of tubes is strongly encouraged, since no one actually makes these tubes specifically for the purpose of installing insulation. Most sidewall tubes currently being used are primarily for agricultural or other uses involving water, chemical or gas movement (pools and spas, sprayers, and underground gas line for example). These tubes are made of such materials as clear PVC, polyurethane, polyethylene, or other chemical formulations. The "rigid" tubing mentioned in this article refers to 100 p.s.i. thin-wall ABS tubing, or natural gas line.

Tube Types	**Approximate Temperature Ranges**
Winter Tube	Below 40 F
Summer Tube	From 40 F to 65 F
Reinforced Summer Tube	From 60 F to 80 F
Rigid Tube	Above 80 F

Tube Tips

- The **bevel cut** on the end of the tube should be **with** the natural curve of the tube (See Figure 1). If the cut is made **against** the natural curve, the installer will be fighting the curve when trying to make the initial turn up the wall cavity. By twisting the tube when an obstruction is hit, the installer uses the bevel-cut to help feed it up the wall cavity.

Fig. 1

- **Soft tubes** are difficult to push up great lengths of wall (two stories)... it's like pushing a rope. **Rigid tubes** will be more likely to go up a balloon-framed two story wall, minimizing the amount of 2nd floor ladder work needed. Because of their stiffness, these tubes are less likely to hang-up, kink, and fold over inside the wall cavity.

- To be sure that the tube has pushed up the entire length of the wall, compare the wall height with the overall length of the tube and the amount of the tube not inside the wall. Another way to get feedback is to have a co-worker listen for the air pressure inside the cavity, at the top of the 2nd floor.

- Because of the rafter size of sloped ceilings (2" x 6" or 2" x 8"), rigid tubes are better for dense-packing these cavities. In order to assure that adequate density is achieved, cavities that are 16" on-center (OC) should be tubed twice/each, running the tube down the cavity just inside each rafter. Cavities that are 24" OC should be tubed three times each, once on the inside of each rafter and once down the center of the cavity. In some cases, it may be more cost-effective to fill the slope cavities with a fluff-pack of cellulose using the 3" hose first, and come back to dense-pack the cavity with the rigid tube afterwards.

- If you're experiencing difficulty inserting a rigid tube into the wall cavity, laying a tube on blacktop (in the sun) for 10-15 minutes will help to temporarily soften it. Once material starts to flow through the tube, the friction will cause it to warm up slightly, also increasing pliability. Depending upon the type of tube, soaking it in a tub of hot water will sometimes help to increase flexibility.

- When sidewall tubes are not in use, they should be stored with a length of PVC or copper pipe inserted inside them to ensure the tube doesn't get pinched or kinked. A kink in the tube will result in a restriction that can cause cellulose to clog at that point. The kink will also weaken the tube at that point, causing it to bend and fold back on itself once inserted into the wall.

- Get tubes as long as can be stored straight in the box of the truck. This allows for blowing of two story, balloon-framed houses from the ground.

- When purchasing tubes locally, make certain that you don't get the tube from the top or the bottom of the shipping spool. The tubing at each end of the spool tends to be oval, not round, making it difficult for the material to flow through it.

Drill & Drill Bit Tips

The driller should use a low-speed (400-600 rpm), ½" drill. The *½" Milwaukee Magnum Hole-Shooter* is a good tool and with annual maintenance will last a long time.
The ¾" *Milwaukee Hole-Hawg* is also a good tool, but heavier than the Hole-Shooter (10.5 lbs. vs. 4.75 lbs.). DeWalt, Porter-Cable, and other manufacturers also make quality equipment.

For interior drilling, a carbide-tipped holesaw bit should be used, since these bits make a good, clean cut (Relton and Lenox make good models). However, they are somewhat labor-intensive, as they have to be constantly unplugged. Size depends upon your ability to conceal the access hole with spackle, but they should be no smaller than 2 1/2" diameter to allow for easy tube insertion.

For exterior drilling, Milwaukee Self-Feed bits work well (Lenox and DeWalt also make self-feed bits). As with any high-quality product, this style of bit has been copied by other manufacturers, so beware of cheap imitations. Milwaukee makes several sizes, but there is a drastic price jump from 2 9/16" to the next size, 3" (almost double the cost). Consequently, the 2 9/16" bit is a good choice.

Helpful Hints for High Density Sidewall Success

- Since best results depend on the continuity of the thermal insulation, Site decisions must be made to assure complete coverage of areas above and below windows, at the band-joist area between floors, and around fire-stops, etc. Probing of the vertical cavities is accomplished by the sidewall tube, while horizontal probing can be done with a non-conductive material (part of a plastic coat hanger, or a piece of Romex with the end taped-off).

- Prior to blowing insulation, the installer should check to ensure that the machine is blowing at the manufacturer's recommended pressure (both with and without the agitator running). Also, to minimize pressure loss, ensure that all hose joints are sealed, including those under the blowing machine.

- Adjust the air setting on your blowing machine to provide maximum pressure, after making certain that the wall can withstand a dense-pack. In order to avoid causing damage to the interior wall sheathing, the installer should visually inspect and press against the sheathing for weak spots prior to tubing the walls. If the interior sheathing is weak, there are some options: install additional screws/nails to the sheathing, refrain from vigorously rodding the cavities, reduce the blowing pressure, and/or temporarily support the sheathing by having a co-worker place a section of 1" thick, foil-faced foam insulation board against the interior sheathing and lean against it while blowing operations are underway. While this last method is somewhat labor-intensive, it does allow for the wall to be insulated, and it sure beats replacing wallboard and vacuuming up cellulose.

- Set the material feed at a level slightly higher than if you were using the two-hole method. Too low an air pressure setting or too high a material feed setting will result in a clogged tube, a common occurrence when first learning how to tube sidewalls. With minimal experience, the installer will become comfortable with the procedure and will be able to increase the material feed to a level that will provide maximum material at proper density. Performing the manual density calculations will ensure that the right amount of material is going into the wall (a blank Density Calculation Form is included at the end of this handout). Remember, on balloon-framed homes it's not uncommon to install 5-10% more material than the density calculations call for, since the critical framing junctures get filled with cellulose, as well as the sidewalls (see Fig. 2).

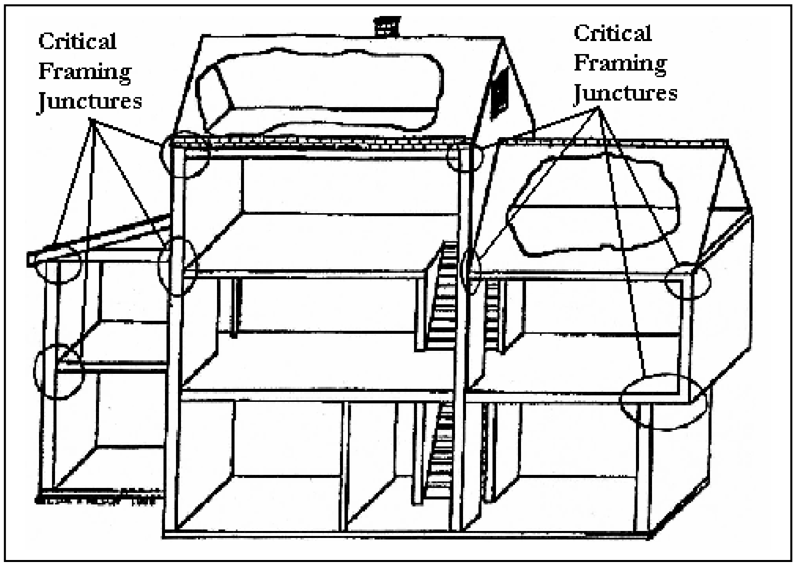

Fig. 2

- Always try to tube down exterior walls that are open from the attic (no top plate). This greatly reduces the amount of siding that needs to be pulled and the number of access holes drilled, saving considerable labor time.

- When tubing up the walls (interior or exterior access), try to access wall bays as close to the bottom of the 1st floor stud cavity as possible (just above the sill plate). This will help eliminate having to tube down the cavities. Unless the exterior siding cannot be removed, exterior access to the wall bays should be gained by removing the siding and drilling the sub-sheathing. This eliminates the labor time of using plugs, and leaves no unsightly access holes behind.

- When drilling the wall, use a T-handle on the drill and brace it against your hip (see Fig. 3). **DO NOT hold the tool at arm's length !** This will help minimize fatigue for the driller, as well as reducing the risk of injury if the drill bit hits something in the wall. **ALWAYS** use the appropriate Personal Protective Equipment when drilling and blowing.

Fig.3

- In order to minimize the amount of effort required to get the fill-tube started up the wall, drill the access hole at an *up-angle* into the wall (see Fig. 4). This will remove the inside upper lip of the wall sub-sheathing. The thicker the wall sheathing (multiple sub-sidings), the steeper the angle on the access hole should be. Also, making an access hole as big as possible will allow for easier tube insertion (if the hole will be covered by the siding, what does it matter how big it is ?).

Fig. 4

- When first putting the tube into the access hole, it's helpful to utilize the bevel cut on the end of the tube. Insert the tube in the access hole until it hits the backside of the inside wall. Lift the tube up slightly and then down quickly, shoving it up the wall at the same time. This motion allows the bevel cut to direct the tube up the wall.

- When first running the tube up the wall, try turning on just the air. This will cause the bevel-cut end of the tube to flop around, getting it past most obstructions inside the wall cavity. Also, twisting the tube allows the bevel cut on the end of the tube to slide by most obstructions found inside the cavity. Once the tube is inserted into the wall as far as it will go, and before turning on the material feed, the installer should wrap a cloth or piece of fiberglass batting around the tube where it goes into the wall. Another option is to slide the tube through the sleeve of an old sweatshirt. All these options will minimize the amount of cellulose blow-back from the access hole. Once the material starts to flow, it spills out the end of the tube and falls to the bottom of the cavity. The wall cavity fills from the bottom up, with the material fountaining down around the tube, loosely filling the entire cavity (including around objects inside the cavity, such as wires and switch/outlet boxes).
  The material then compresses to a higher density as the hose is backed out of the wall cavity. That's why it seems to take a little while for the cavity to fill and the blowing machine to start "winding out". From that point forward, the installer should be backing the hose out of the cavity in 8" to 12" increments, and "rodding" (or pushing the tube back into the cavity) after each withdrawal. Remember, it's important that the integrity of the interior and exterior wall sheathings is verified before beginning sidewall insulation operations. Rodding the wall puts the finishing touches on the density of the insulation being installed. Using a tube that is too soft will limit the installer's ability to rod the wall.

- When finishing up the wall cavity, it's best to try to end the blowing operation with an empty hose. This can be accomplished by marking the end of the tube with a wrap of duct tape or magic marker, about 12" back from the bevel-cut end, and shutting the material feed off when the tape-marker pops out of the access hole. Finishing with an empty hose will allow the installer to start with an empty hose. When finished filling the hole with cellulose, remove the tube and insert a tuft of fiberglass batting into the hole. This provides a moisture break on the cold side of the cellulose.

- With experience, the installer will be able to run the blower (air) continuously, never shutting it off, but leaving it on from hole to hole while shutting off only the material feed. This will greatly speed up blowing operations. Also, it's a good idea to listen to the sound of your blowing machine (such as the sound of the machine winding out when packing the wall), and learn to watch the material flow through the supply hose as an indicator of what's happening inside the wall cavity (putting the hose in direct sunlight is a "plus" here).

Accessing Cavities Over/Under Windows

If the walls are platform-framed, the installer will have to determine the most cost-effective approach to insulating the areas above the 2nd floor windows, and between the 1st and 2nd floor windows. Options for accomplishing this include: removing exterior siding, drilling access holes in the upper and lower sash pockets, or drilling access holes through the interior sheathing.

Insulating Walls That Have Existing Insulation

The decision to add insulation to walls that have existing insulation is a matter of cost-effectiveness. The installer needs to determine, usually by analysis and experimentation, how much insulation can be added to the cavities and the amount of labor required to do so. Generally, it is only cost-effective to tube these areas if they are accessible from the attic or basement (balloon-framed).

Tubing Kneewalls

In some instances, the walls of kneewall attics can be insulated with the tubing method. Installation of dense-pack cellulose will help reduce unwanted air movement between the ventilated kneewall area and the heated living space. This is a distinct advantage over the traditional method of insulating these cavities with fiberglass batts.

In order to tube the stud cavities, sheathing must be present on the cold-side of the wall studs, as well as on the warm side. Conventional, house wrap infiltration barrier (Tyvek or Typar) can be used to sheath these cavities. The housewrap is secured to the framing members with staples and furring strips. An “X” is cut into the housewrap, as an access hole for sidewall tube. Once the cavity is blown full, the access hole is then covered with a patch of like-material and secured with outward-clinching staples.

Another material that can be used to sheath the cold side of the studs is ½”, 4’ x 8’ foil-faced, foam insulation board; polyisocyanurate (see Fig.5). The foil facing strengthens the foam board so that it bends rather than breaks under the pressure of the dense-pack. The ½” thick material is cut with a standard utility knife and secured to the studs with either roofer's cap-nails or roofer's disks and screws. The installer should leave a small gap between the foam board and the bottom plate. This prevents the foam board from becoming a vapor barrier. Before applying the foam board to the studs, a piece of fiberglass should be inserted into the bottom of the stud bay to prevent cellulose blow-back. An access hole is cut into the foam board and the cavity tubed. The hole is then covered with a patch of foil tape.

Fig. 5

<u>??? PROBLEMS ???</u>

If you're having problems tubing sidewalls, chances are that the problem lies with the equipment rather than the technique (poor blowing pressure, improper drill bit, or improper tube for the temperature conditions). Examine the problem and work on a solution.

SIDING REMOVAL

Wood Lap Siding

Tools Needed
Utility Knife
Fein Tool
Slim Pry Bar
Large Pry Bar
Hammer
Caulking Gun
Power Drill
Self-feed Bit

Materials Needed
Appropriate Replacement Siding
Appropriate Replacement Nails
Caulk
Unfaced Fiberglass
Ground Cover

Steps
A determination should be made as to how the siding will be removed; either by removing two sets of nails per course of siding, or by cutting the top edge of the clapboard at the shadow-line and removing the nails at the bottom edge.

Determine ahead of time which rows of siding will be used for access. Before cutting or scoring any siding, take the necessary steps to work "lead-safe".

Score the top and bottom of the board to be removed. Thinner types of clapboard, such as 4” siding, may be scored with a utility knife at the top. Thicker types of siding, such as the 6” Southern yellow pine boards, must be cut with some type of saw (such as a vibrating blade tool like the Fein Tool seen in Fig. 6, or a circular saw, as seen in Fig. 7.) Run the saw along the shadow line of the board to be removed, below the bottom lip of the board above it.

Fig. 6

Fig. 7

Use a thin pry bar or other appropriate tool to remove nails from the bottom of the row scored, thus removing the siding from the wall.

Set the pieces of siding in a safe place where they will not be damaged, so that each may be re-hung in the same spot once the insulation retrofit has been completed. The siding may be re-hung by nailing it to the studs. Use a paintable, exterior caulk to fill the gaps left by the saw kerf.

Figure 8 shows the rectangular cavities that are used to access the sidewalls. After the tube is inserted into the cavity, a piece of fiberglass is also pushed into the cavity, to prevent cellulose blow-back.

Fig. 8

Wood Shingle Siding

Tools Needed	Materials Needed
Utility Knife	Appropriate Replacement Siding
Caulking Gun	Appropriate Replacement Nails
Hammer	Unfaced Fiberglass
Power Drill	Caulk
Self-feed Bit	Ground Cover

Steps

Take the appropriate precautions if lead paint is suspected to be present. Determine ahead of time which rows of siding will be used for access. Before cutting or scoring any siding, take the necessary steps to work lead safe.

Most wood shingles are easily scored with a utility knife having a sharp blade (see Fig. 9). Scoring the shingle should take place as far up in the shadow line as possible. Depending on the thickness at the point of the scoring, the knife blade may have to be run through the scored area more than once. The shingle can then be "snapped off" at the score line (see Fig. 10).

Fig. 9

Fig. 10

After the cellulose is installed, use a tuft of fiberglass to plug the access hole (see Fig. 11).

Set the pieces of siding in a safe place where they will not be damaged. The siding piece can also be slipped under another shingle until they're ready to be reinstalled.

After the insulation is installed, the shingles are then renailed. A paintable, exterior caulk can be used to fill the gap or gaps left by the knife blade.

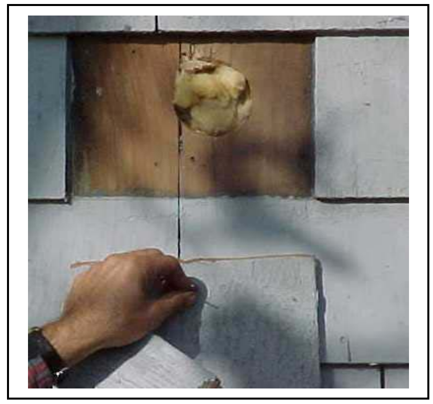

Fig. 11

Metal Lap Siding

Tools Needed
Flat, Angled Spackle Knife
Large Flat Pry Bar
Utility Knife
Fein Tool
Caulking Gun
Tin Snips
J-Tool
Power Drill
Self-feed Bit

Materials Needed
Appropriate Replacement Siding Nails
Unfaced Fiberglass
Small Disposable Paint Brush
Caulk

Steps
Determine ahead of time which rows of siding will be used for access. Before unzipping or cutting any siding, take the necessary steps to work lead safe.

Metal lap siding may be removed in two ways. The first method involves unzipping one row of siding from the rows above and below it. The second method is to cut the top of the chosen piece in the shadow line (using a vibrating blade, or a Fein Tool).

Unzipping the Siding
Unzipping metal lap siding may be performed using a small flat bar and an angled spackling tool. The edge of the spackling tool is inserted in the gap between the siding and the lip of the piece above it (see Fig. 12).

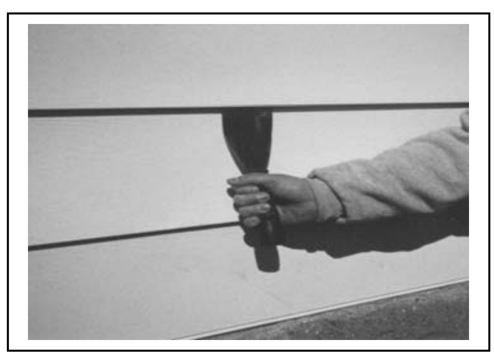

Fig. 12

The curved end of the flat bar is then placed between the spackling tool blade and the lip of the siding (see Fig. 13). The spackling tool blade is angled backward (handle pulled forward), and the flatbar is angled forward (handle pulled downward.) This separates the two pieces of siding (see Fig. 14). This motion is continued down the row.

Fig. 13

Fig. 14

Once the course has been unzipped, cut the top of the nail flange with the end of the flat bar to remove the piece from the wall. Be careful not to bend or crease the siding course when removing it from the wall (see Fig. 15 and 16).

Fig. 15

Fig. 16

Unzipped pieces must be re-nailed to the subsiding and re-zipped to the pieces above and below. This can be performed using a siding zipper.

Cutting the Siding

After the top of the chosen course has been cut (see Fig. 17), the top of that course is pulled away from the wall. The lock connecting it to the course below may be broken by tapping on the bottom of the u-channel from the backside, or from the inside of the cut course (again using the flat bar.)

Fig. 17

Once the course of siding is removed from the wall, it should be set aside in a safe place, to prevent damage. Be sure to mark the back side of each piece of siding, so that each may be re-hung in the same spot once the insulation retrofit has been completed.

Cut courses may be re-installed by snapping the lip of the bottom course back into the lock on the course below. The top of the course is then nailed in the shadow line area, ensuring that the nails are secured to the wall studs. Use a paintable, exterior caulk to fill the gap left by the saw kerf.

Vertical Metal Siding

Tools Needed
Fein Tool
Tin Snips
Long, wide pry bar (flat bar)
Cordless Drill and Sheet Metal Bits
Chalk Box
Power Drill
Self-feed Bit

Materials Needed
Unfaced Fiberglass
Sheet Metal Screws
Metal "Z-Channel"
Caulk

Steps
In conversation with the homeowner, the installer needs to determine a visually appealing horizontal line location for the cut and insertion of the "Z-channel". Once this elevation is determined, a chalk line is snapped and the siding is cut with the Fein Tool. Because the blade of the Fein Tool vibrates rather than rotates, the chance of binding the blade in the siding and backing it up is minimized. Additionally, there are little or no chips flying from the saw kerf.

The lower section of the siding is removed (see Fig. 18) by unscrewing it from the wall and/or drilling through the rivets. A long, wide flat bar may be needed to break the glue adhesion behind the siding.

The wall is then ready to be drilled and tubed. A tuft of fiberglass is stuffed into the hole to prevent moisture from wicking into the cellulose.

Fig. 18

Once the wall insulation is completed, the top edge of the Z-channel is inserted behind the bottom edge of the metal siding that is still attached to the wall. (See Fig. 19).

Fig. 19

The siding panels that were removed earlier are then re-attached to the wall, inserting the upper edge of the panels behind the bottom edge of the "Z-channel". It is important that the horizontal, center bar of the "Z-channel" be of sufficient depth to extend past the vertical projections on the vertical, metal siding panels. The end result is a finish that looks very much like an original installation (see Fig. 20).

Fig. 20

Asbestos Shingles

Tools Needed
Customized End Nippers
Wide, Angled Putty Knife
Slim Pry Bar
Caulking Gun
Power Drill
Self-feed Bit

Materials Needed
Appropriate Replacement Siding Nails
Unfaced Fiberglass
Caulk
Ground Cover

NOTE
Numerous research papers verify that there is minimal risk of Asbestosis when working with asbestos siding materials. This is because the asbestos fibers found in these materials are bound together by the cement in the siding. Asbestos siding is considered to be "non-friable", unless disturbed by such activities as grinding, drilling, cutting, and sanding.

Steps
The installer should decide ahead of time which rows of siding will be used for access. This is determined, to a large extent, by the anticipated ease of shingle removal. To help in this determination, the technician can apply gentle pressure to the shingle at the nail head, looking for shingles that have a small amount of "play" at this point.

The shingle is then sprayed lightly with a mist of water and a utility knife is used to score the paint at the edges of the shingle. Take the appropriate precautions if lead paint is suspected to be present.

Applying gentle pressure to the shingle at the nail head, the end nippers are clamped down over the nail head (see Fig. 21). In order to remove the nail from the wall, the technician should rotate the end nippers clockwise & counter clockwise while pulling on the nail (see Fig. 22).

Fig. 21

Fig. 22

If the nails won't pull out, the heads can be nipped off.

After ensuring that the shingle is no longer held in place by paint, it is carefully wiggled back and forth until it slips down from the wall.

Care should be taken however, as there is always the possibility that the siding may be "blind-nailed" (that is, nailed at the top of the shingle, behind the course overlap). If this is found to be the case, a long, thin pry bar/nail puller may be needed to encourage the nails to come loose.

Interior Drill

Tools Needed
Carbide-tipped Hole Saw: 2 1/2" to 3"
Spackle Knife
Utility Knife
Power Drill

Materials Needed
Spackle Compound
Unfaced Fiberglass
Foam Plugs
Trim Board
Finish Nails
Ground Cover

Steps

An interior drill is used when it is preferable over an exterior drill due to weather conditions, when the siding is too difficult to remove, or when the condition of the existing siding is poor.

A carbide-tipped, hole-saw bit is used in order to obtain a clean, sure cut (Relton makes some nice holesaw bits). Take the appropriate precautions if lead paint is suspected to be present.

If drilling a plaster & lath or sheetrock wall that is painted, the height of the access holes is at the discretion of the driller and tuber, however, it is usually preferable to pick a comfortable working height for the driller (waist high). Once the insulation is installed, the access holes are filled with tufts of unfaced fiberglass or foam plugs and then spackled.

If drilling a wall that is covered with paneling or wallpaper, consideration should be given to concealing the access holes behind a trim board. In this case, the height of the holes will be determined by conversation with the homeowner. The holes should be located on a horizontal line across the room, however.

In either case, because the wall is to be tubed, only one access hole per cavity is needed. Options to addressing the cavities under windows include: drilling down through the sill (1" hole), drilling through the interior sheathing, or by pulling the window sill face board or the floor baseboard.

T1-11 Wood Siding

Tools Needed
- Carbide-tipped Hole Saw: 2 1/2" to 3"
- Spackle Knife
- Utility Knife
- Power Drill
- Hammer

Materials Needed
- Spackle Compound
- Unfaced Fiberglass
- Foam Plugs
- Trim Board
- Finish Nails
- Ground Cover

Steps

Access is virtually the same as on an interior drill, except that the access holes art to be concealed behind an exterior trim board. Take the appropriate precautions if lead paint is suspected to be present. Determine ahead of time which areas will be used for access. Before cutting or scoring any siding, take the necessary steps to work lead safe.

The trim board should be primed, painted, or stained prior to installation. The top edge should be beveled and sealed with caulk, in order to shed water.

Vinyl Siding

Tools Needed
- J-Tool
- Power Drill
- Self-feed Bit

Materials Needed
- Appropriate Replacement Siding Nails
- Unfaced Fiberglass

Steps

Determine ahead of time which rows of siding will be used for access.

Use a siding zipper to separate the bottom of the chosen course of siding from the course beneath it. Care must be taken in colder temperatures not to crack the siding, which can become very brittle. Push the siding tool into the gap until the tool “grabs” the lip of the course. Gently, but firmly, pull the tool down and away from the wall. Once the course is unlocked, the siding should separate easily by pulling it apart.

The siding can then be propped up with short sticks to access the area.

After insulating is completed, the siding zipper is then used to re-attach the siding.

??? So Where Can I Get This Stuff ???

Sidewall Tubes, Drill Bits, Plugs, etc.

J&R Products
4695 East 200 North
Craigville, IN 46731
PH: (800) 343-4446
FX: (800) 518-4446
http://www.jrproductsinc.com

Applied Energy Products
3920 State St. N.W.
N. Canton, OH 44720
PH: (800) 255-7996
FX: (330) 494-7086

Drills and other Power Tools

Fein Power Tools Inc., USA
1030 Alcon St.
Pittsburgh, PA 15220
PH: (412) 922-8886
(800) 441-9878
FX: (412) 922-8767
http://feinus.com/multimaster/multimaster.htm

Milwaukee Electric Tool Corp.
13135 West Lisbon Rd.
Brookfield, WI 53005-2550
PH: (262) 781-3600
FX: (262) 783-8555
http://www.mil-electric-tool.com

Insulation Machines

Krendl Machine Co., Inc.
1201 Spencerville Ave.
Delphos, OH 45833
PH: (419) 692-3060
FX: (419) 695-9301
http://www.krendlmachine.com
e-mail: *krendl@krendlmachine.com*

Star Machine Ltd.
P.O. Box 510
Oxford, Nova Scotia
Canada BOM 1P0
PH: (902) 447-2461
FX: (902) 447-3260
http://www.starmachinelimited.com
e-mail: *starmach@NS.sympatico.ca*

Rigid Insulation Board

The Celotex Corp.
5301 W. Cypress St.
Suite 300
Tampa, FL 33607
PH: 800-CELOTEX
FX: (813) 873-4103
http://www.bpb-celotex.com
e-mail: *crc@celotex.com*

Homosote Company
Box 7240
W. Trenton, NJ 08628-0240
PH: (609) 883-3300
800-257-9491
FX: (609) 530-1584

Asbestos Information
Maryland Department of the Environment

http://www.mde.state.md.us/arma/Programs/Asbestos/factasb.html

Missouri Department of Natural Resources

http://www.dnr.state.mo.us/deq/apcp/faqasbt1.htm

University of Wisconsin Extension

http://www.uwex.edu/ces/flp/house/side/side_011.html

Oklahoma Department of Labor

http://www.state.ok.us/~okdol/asbestos/asbestos10.htm

Environmental Protection Agency

h*ttp://yosemite.epa.gov/r5/r5ard.nsf/2…/a37f2222296572e58625660200520576?*
OpenDocument

Lead Information
Brochure: *Lead Paint Safety… A Field Guide for Painting, Home Maintenance, and Renovation*, U.S. Dept. of Housing and Urban Development, Office of Lead Hazard Control.

This brochure can be ordered from the National Lead Information Center (1-800-424-5323), or it can be downloaded from the HUD Office of Lead Hazard Control (www.hud.gov/lea/leahome.html).

Sidewall Density Calculations

______________ft^2 X ______________ft = ___________________ft^3
Net Wall Area Cavity Depth Net Wall Volume

_______________ft^3 X _______________lbs/ft^3 = ________________lbs
Net Wall Volume Density Required Pounds of material

_______________lbs ÷ __________________lbs = ___________________
Pounds of material Pounds per bag Number of bags

When you want to know what your density is, use the following formula.

______________ X ________________lbs = ________________lbs
Number of bags Pounds per bag Pounds of material

______________lbs ÷ _______________ft^3 = ________________lbs/ft^3
Pounds of material Net Wall Volume Density Achieved

3 ½ inch cavity = .29 ft.
4 inch cavity = .33 ft.
4 ½ inch cavity = .37 ft.
5 inch cavity = .41 ft.
5 ½ inch cavity = .45 ft.
6 inch cavity = .50 ft.

Job Number:__________

Name:_______________

Address:_____________