

Installing Housewrap

When properly detailed, high-tech wrappings can reduce the flow of air into outside walls while allowing moisture to escape

by Rick Arnold and Mike Guertin

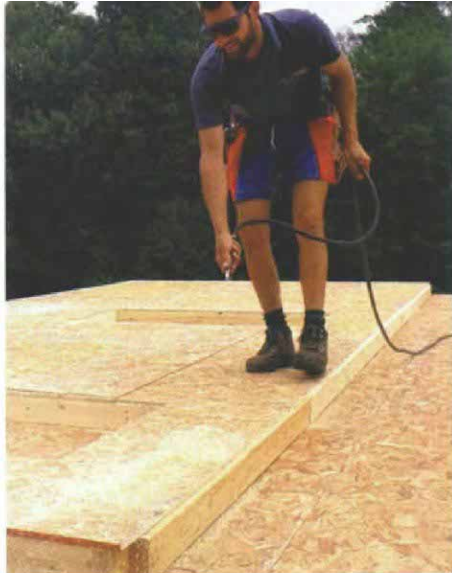


Tape completes the air barrier. Housewrap just stapled to the exterior sheathing does not create a complete air barrier. All seams and holes must be sealed with specialized tape before the siding goes on.

Build tight, ventilate right. A slogan with roots in energy-efficient building is gaining acceptance in mainstream construction. More builders are installing better insulation and sealing the warm side of walls and floors to keep vapor out of insulated spaces. They're installing ventilation systems to maintain healthful indoor-air quality. But from what we've seen, the same care isn't taken with air-infiltration retarders, also known as air barriers or housewraps.

There are usually a couple of ways to do something right and dozens of ways to do it wrong. Most of the housewrap installations we've seen in our area fall into the latter category. Sure, the walls might seem covered, but there are enough seams, gaps, tears and holes at critical spots to render the film ineffective (photo above). We asked some builders why they use air-infiltration retarders, and we got some interesting answers: "What's an air-infiltration retarder?"

"That's what's spec-ed on the plans." "It's better than tar paper." "I only use it because customers expect it." "It makes the house waterproof." "It dries in the building until the siding goes on." Because we know what housewraps are supposed to do, we apply the details that will make the barriers most effective. We've also learned how to coordinate installation with our framing habits to make installation easy. We've installed every major brand of housewrap and have



Compressed air is quicker than a broom. Where possible, the authors install housewrap on walls before the walls are raised. Compressed air is used to blow wood chips and other debris off a wall before the wrap is rolled out.



A two-man team makes the work go faster. Especially on windy days, it's good to have one person stapling housewrap while another unrolls the material.

Overlapping sheets create a good seal. When installing housewrap on a new wall, the authors fold up the bottom foot or so of housewrap to overlap the wrapped wall below.

found little or no difference in installation. Although Tyvek was specified for this project, we usually request Tyvar because its gray color is easier on the eyes than bright white housewraps.

Housewraps are an effective product when installed correctly—Air-infiltration retarders enhance the thermal efficiency of exterior walls by reducing air movement through walls and into wall cavities. A properly installed wrap slows or stops wind- or pressure-driven air from moving freely through gaps and holes in sheathing or around window frames and door jambs. Reducing drafts makes a house feel more comfortable and saves energy. At the same time, housewraps allow moisture vapor that enters the wall cavity to escape. Without this feature, moisture could build up, and rot could begin inside the wall.

Before housewraps entered the market, we used 15-lb. tar paper or red rosin paper beneath our siding. We surmise now that tar paper did a pretty good job of reducing air infiltration and was waterproof.

On occasion, tar paper caused us problems. Stains bled through wood siding, and dissolved tar leaked onto vinyl siding. During remodeling jobs, we sometimes find concealed rot caused by years of condensation behind tar paper.

Rosin paper probably helped to reduce some air infiltration and to let moisture escape. But it disintegrated if it got wet before siding was installed or if small leaks occurred around windows and along cornerboards. On remodeling





Tying up the loose end. At one end of the wall, the wrap is folded over the corner stud and stapled. After this wall is raised, sheathing from the adjoining wall will be nailed over the corner, holding the wrap in place.



Corners are the last to be wrapped. On the opposite end of the wall, housewrap that earlier had been rolled up on a furring strip is unrolled and fastened in place, which happens after the framing is tied together with the final pieces of sheathing.

jobs we have uncovered old rosin paper that had practically turned to dust.

Follow the directions and use common sense—The instructions supplied by housewrap manufacturers range from cursory to highly detailed. The one thing most companies include is a warning about securing ladders leaning against wrapped walls. The top of an unsecured ladder can slide sideways across the slick material. Our approach to installing air-infiltration retarders combines common sense and those recommended installation details that we believe are feasible.

Our system begins with a foam sill seal between the foundation and the mudsill. If every effort is being made to create a tight seal, we caulk the bottom edge of the wall sheathing to the mudsill to prevent infiltration at that point.

We once installed a 2-ft. strip of housewrap between the sill-seal foam and the mudsill, according to the instructions of one manufacturer. The idea was to lift this flap and wrap it over the band joist after we raised the exterior walls. We found this detail frustrating; the material blew around on all but the calmest of days. And we cringed as the flap was shredded by cords, tool-belts and hoses before the walls were up. In special cases, such as when we're building a wall with siding applied directly to the studs, we still might use this detail. However, most manufacturers' instructions say to staple the housewrap to the bottom edge of the sheathing and to cut the housewrap flush with the bottom of the sheathing. The first course of siding should hold the housewrap tight against the sheathing.

Start with a clean wall—As a rule, we lay out, frame and sheathe exterior walls before lifting them. So it makes sense for us to wrap them as much as possible before they are lifted.

First we sweep or blow off debris on the wall (photo left, p. 45). Anything we miss will leave lumps for the siding installers. One crew member positions the roll of housewrap on the already-sheathed wall. A second person holds the starting edge and staples the housewrap to the sheathing lining up the housewrap just by eye (photo top right, p. 45). Because the sheathing extends beyond the bottom plate to cover the band joist, we don't staple the lowest 12 in. of housewrap (bottom photo, p. 45). This allows us to lift the wrap and nail off the sheathing later without punching hundreds of holes in the wrap. Stapling high also makes it easier to fold up any housewrap from the wall or sill beneath.

We roll out about 10 ft. before stapling off the sheet. It's important to tack the first corner and then to pull the wrap tight in all directions. Once the first 10 ft. are well-tacked, we roll out 3 ft. to 4 ft. at a time, stapling along the edge of the roll



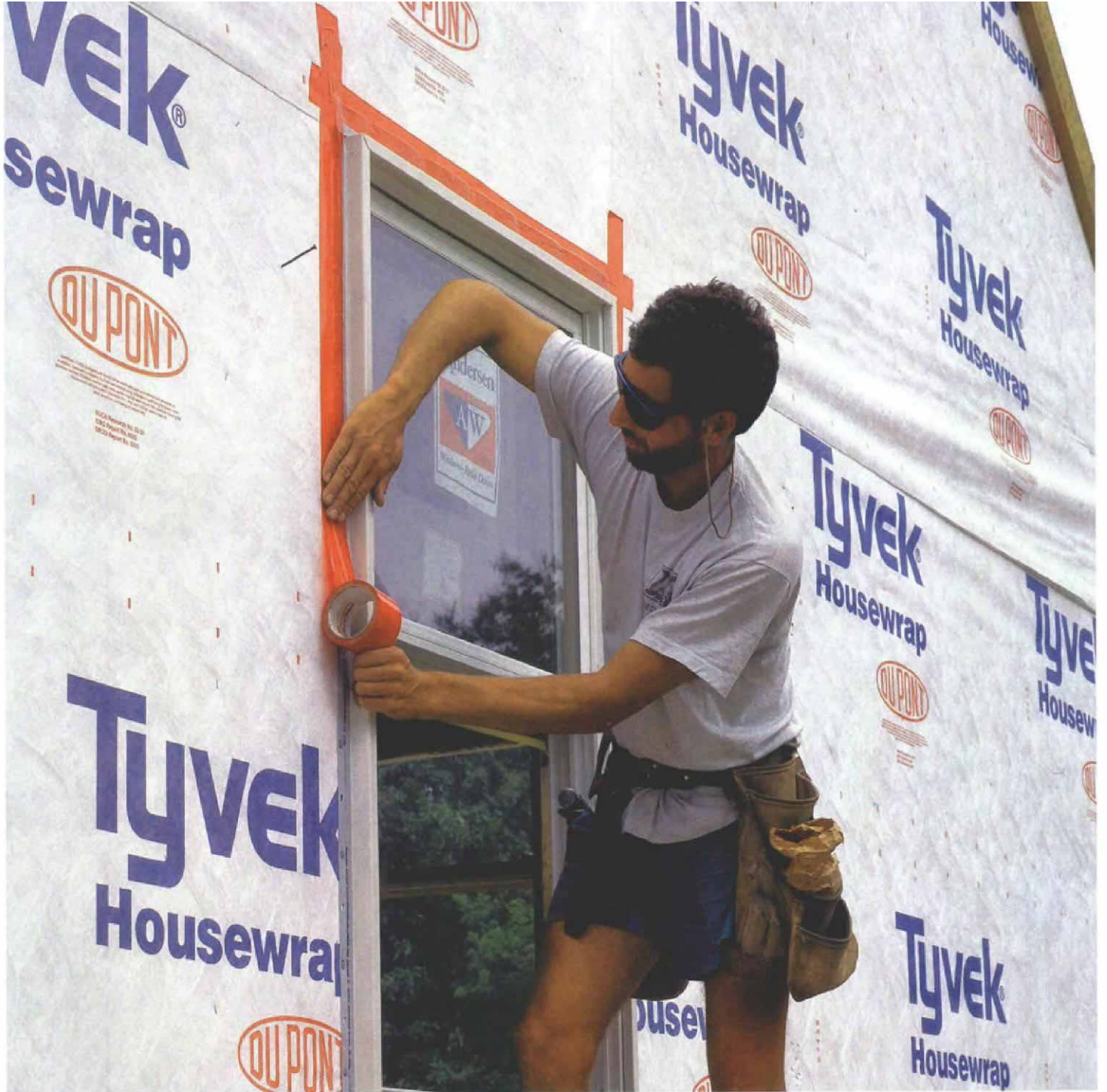
Housewrap is cut to fit framed window openings. Instead of the standard X-cut for a window opening, the housewrap is cut to cover just the framing to eliminate large flaps that are likely to tear in the wind.



Sealing the corners. The authors try to tape the corner seams of the housewrap as soon as possible after the wrap is installed to prevent any possible wind damage.



Extending your reach. For sections of housewrap that are hard to reach, such as between-floor seams, a hammer-stapler is taped to a furring strip to make fastening much easier.



Tape discourages air infiltration around door and window openings. On windows and doors with nailing flanges, tape is applied so that it seals the seam between the flange and the housewrap.

of housewrap. Staples are spaced every 16 in. along the edges and every 24 in. in the field.

On one end of the wall, we leave the air barrier about 4 in. long and then wrap it and staple it to the corner stud (top photo, p. 46). Later, when the walls are raised, this 4-in. overlap will be covered and held in place by the sheathing from the other wall that makes up that corner.

When framing walls, we typically leave off the last 16 in. to 48 in. of sheathing on one end so that once the walls have been raised, we can come back and tie together the outside corners. On this end of the wall, we roll out enough

housewrap to cover these unsheathed sections and to extend 1 ft. around the corner of the house. The loose wrap is rolled around an 8 ft. furring stick, which is then tacked to the wall. This keeps the housewrap from blowing in the wind and being torn off. After lifting the walls, we nail on the final pieces of corner sheathing, unroll the housewrap and staple it around the corner (bottom photo, p. 46).

While the walls are on the deck, we take care not to step onto a housewrap-covered door or window opening. You can't fall any farther than the thickness of the wall, but a step on a win-

dow opening will rip out the surrounding staples in the housewrap.

When we have to install housewrap after the walls are lifted, it's much tougher to keep the job straight and wrinkle-free because someone has to be holding up the roll, maintaining tension on the wrap and unrolling the wrap all at the same time. Inside corners also can be a challenge: You must be careful not to short-sheet the corner or not leave enough material to go all the way into the corner. Short-sheeting can be avoided by pressing the housewrap into the corner with a furring strip before it is stapled.

More than one way to handle openings—At door and window openings, manufacturers suggest that an X-shape be cut in the housewrap with the slashes beginning in each corner of a door or window. The problem with this approach, we've found, is that you're left with large triangular pieces flapping in the breeze.

To prevent this, we feel for the edges of the openings, staple them off and then cut a rectangular piece out of the opening, about 3 in. smaller than the opening itself. We save the large rectangular pieces we cut out to fill in here and there. Staples fastened about every 16 in. to 24 in. at openings prevent the wind from tearing off the wrap (top photo, p. 47). The housewrap photographed for this article survived tropical storm Bertha unscathed.

Second-floor wrap overhangs the first—Second-floor walls get the same basic treatment as first-floor walls. We make sure to leave enough housewrap overhanging the bottom edge of the sheathing to lap the first-floor housewrap by 6 in. to 8 in. We usually have to fill in a foot or two of housewrap at the top of the wall with strips from the roll or with the pieces we saved from the window cutouts.

When you're installing housewrap, it doesn't matter whether the writing is right side up or upside down, but air barriers do have an inside and an outside. Manufacturers don't tell you to install their wraps with the printed side facing out just for free advertising. (We've been waiting for some town to impose a fine either on the housewrap manufacturer or the builder for violating a local sign ordinance. We can't put a small sign in the yard to advertise our company, but Tyvek can turn a whole house into a billboard.) The material's performance may be diminished if it's installed inside out.

We handle the intersection of walls and roofs in a couple of different ways, depending on the soffit detail. On a house with a trussed roof, we cut the housewrap along the top of the second-floor top plate and nail a soffit nailer to the wall over the housewrap. The nailer ensures that the top edge of the wrap won't be caught by the wind and torn off the house.

On roofs with regular rafters, we usually don't use soffit nailers, so we wrap the air barrier over the wall and staple it to the top of the lower top plate. The second top plate holds the housewrap securely.

In winter we often get freezing rain that can encase our framing for days or weeks. When we're concerned that a top plate will become coated, we extend the housewrap up and over the top plate a few inches. After the walls are lifted, we staple the extra wrap inside the wall. We don't cut off the excess until we're ready to set roof rafters or trusses. This approach can save

a lot of time chipping and scraping ice off the top plate. Once the walls are up, we fill in the wing walls, dormers and other areas that are impractical to prewrap. For those hard-to-reach spots when stapling housewrap, we duct-tape our hammer-stapler to a 1x2 furring strip for an extra bit of reach (photo bottom right, p. 47).

Seam tape finishes the job—To get the best performance from housewraps, we seal the seams with seam tape (photo bottom left, p. 47). Seam tape adheres aggressively to housewraps but still needs to be pressed on by hand for best results. We tape what seams we can while walls are down. After the walls are lifted, we tape all the seams we can reach easily right away to lessen wind damage. We leave the second-floor overlap and other high seams for our siding installers to tape while they're on their staging, which is safer than working from a ladder.

Sealing windows and doors is easy when they have nailing flanges. We just tape the flanges (photo facing page). When we install windows with wood casings or brick mold, we first caulk the backside of the window between the casing and the jamb. Next we run a bead of caulk around the opening of the housewrap. We place the unit in the rough opening and press it in place. The caulk seals the unit to the housewrap.

Occasionally, flanged windows are installed before the housewrap goes on. That's no problem; we simply trim the wrap to the edge of the flange and then tape. We also tape any punctures or tears bigger than ½ in.

We've seen some crews lapping housewrap over window and door flanges and over step flashings in an effort to better waterproof their houses. But we never rely on housewrap for this. Most wraps will resist water during construction, but manufacturers note that their products aren't waterproof. Don't use them in place of standard flashing materials. There are materials and details that we use to make our homes more watertight (such as self-adhesive rubberized membranes and copper flashings), particularly those that are near the ocean.

We never bother lining up the 8 in. o. c. marks printed on some air barriers with the framing. We've found the marks to be consistently inconsistent. They commonly vary ½ in. or more in 8 ft. The marks could be useful, but we rarely get a roll that maintains proper spacing.

Be sure to wear sunglasses when working with any of the white wraps. The reflection on a sunny day can be blinding. □

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Skip the housewrap, tape the sheathing?

The whole point of using and properly installing an air barrier is stopping the uncontrolled flow of air into and through a house's wall cavities, and permitting moisture vapor within walls to escape. Because the homes we build are fully sheathed, the only places that air and moisture can enter wall cavities are through the seams between the sheathing, through holes in the sheathing and through the connections between framing and sheathing. With a new tapelike product called Gap Wrap (Benjamin Obdyke Inc., John Fitch Industrial Park, 65 Steamboat Drive, Warminster, Penn. 18974-4889; 800-523-5261), these areas can be sealed. Moisture that enters the wall cavity eventually will make its way out through the sheathing and siding. The issue then becomes whether housewrap is necessary.

A product such as Gap Wrap has some advantages and some limitations. It's cheaper than housewrap and requires less labor to install. The 4-in. tape can be applied by one person, regardless of wind conditions. Some additional caulking may be necessary in areas that don't lend themselves to being sealed with tape, such as wood-to-concrete or wood-to-metal connections, especially in cold weather.

Installing Gap Wrap on oriented strand board (OSB) can be tricky. We've found that the tape does not adhere as well to the coarser surface of some OSB panels as it does to plywood, but the company is working on a glue for OSB.

There are situations where a product such as Gap Wrap won't work. On buildings where siding or T-111 plywood is applied directly to the framing, for instance, properly installed housewrap will create a better air barrier.—R. A. and M. G.