Prepping for Spray Foam

Getting ready for a foam-insulation crew means doing a lot more than you'd think

BY MICHAEL CHANDLER

Spray-foam insulation is gaining popularity these days, and for good reason. Not only does it offer lots of R-value per inch, but it also air-seals the house. I've been building custom homes in North Carolina for more than 20 years, and I've been using spray-foam insulation for the past four. These days, all my projects get 8 in. to 12 in. of foam under the roof deck, and I often use foam to insulate walls and crawlspaces as well.

Prepping for the spray-foam crew is now just another part of the building process, but it took some time and a lot of stained shingles and concrete for me to figure out the learning curve. Along the way, I discovered that the first hurdle in using spray-foam insulation might just be working with the building inspector.

Venting, fire safety, and building officials

The first time I insulated an attic with spray foam, the building inspector asked me to supply a letter from my structural engineer stating that the roof framing was strong enough to support the weight of the foam. That might have been the most extreme case of an inspector being misinformed about the properties and benefits of spray-foam insulation, but it wasn't an isolated case.

Code officials in my area value ventilation in attics and crawlspaces so much that they have a hard time with the thought of sealing these areas with foam. So if I'm planning to spray the underside of a roof deck or a crawlspace, I talk to the building inspector during the permitting process to make sure he's OK with not venting either space.

The most common speed bump I run into during these conversations involves roof venting and shingle warranties. If the spray-foam insulation will void the shingle manufacturer's warranty, the inspector won't sign off on the foam. Most spray-foam manufacturers have letters (or can help you get a letter) from the shingle manufacturer to alleviate the inspector's concerns. Still, some inspectors allow spray foam under a roof only if the roof is vented. Venting a roof deck for spray-foam insulation means that baffles

Photo this page: Courtesy of Airtight Insulation. Drawing: Dan Thornton.

must cover the entire width and length of the rafter bay.

Fire safety is often the building official's next concern. In the Raleigh-Durham, N.C., area, we are not allowed to have attic-storage areas without a drywalled firewall and ceiling to act as a fire and air break between the storage area and the spray-foam insulation.

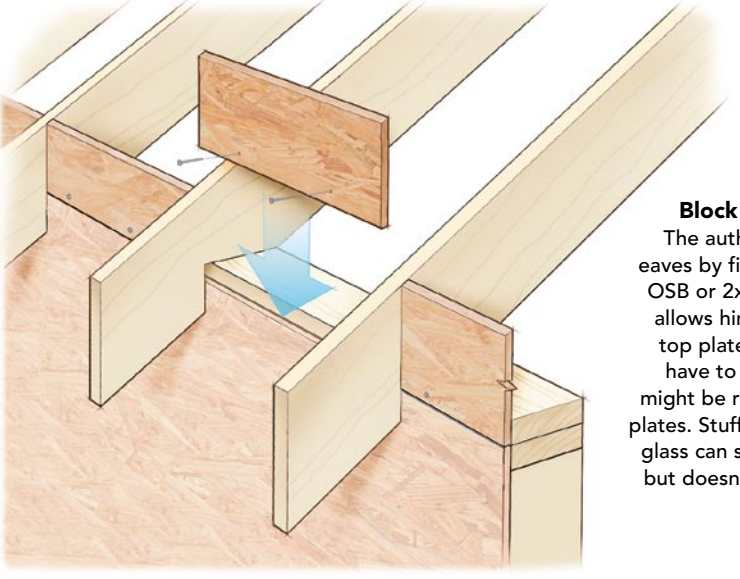
An ignition-barrier paint can be sprayed over the foam, but it can be expensive. Instead, I generally build a 10-ft. by 10-ft. storage room to fulfill the code requirement.

Some inspectors don't allow cured foam to be thicker than the rafter depth so that the individual rafters can serve as firestops. Many foam companies now supply a "flame-spread letter" stating that their foam meets code-

Backing and blocking keep foam in its place

Some interior walls might need sheathing. *Spray foam is most often applied against plywood or OSB sheathing. In some cases, such as this laundry-room wall, which will be sprayed for sound-deadening, you need to install a substrate for the foam. Here, Thermo-ply, an inexpensive cardboardlike material, is nailed to the studs to carry the spray foam (www.covalencecoatedproducts.com). Later, drywall will be added over the Thermo-ply.*

Isolate conditioned space. *Tack OSB, Thermo-Sheath (www.fibreconverters.com), or Thermo-ply between trusses where they overhang an exterior wall. Canned spray foam is a good way to seal the sheathing in place.*



Block between the rafters
The author prefers to block the eaves by filling rafter cavities with OSB or 2x material. The blocking allows him to nail into the upper top plate and means he doesn't have to work around wires that might be running through the top plates. Stuffing the bays with fiberglass can serve the same purpose but doesn't allow the foam to air-seal the top plate.

As the foam is sprayed, small expanding droplets end up in the air. This stuff gets in your hair and on your skin and clothes. I once failed to warn a homeowner of the mess. He was excited to capture the spray-foam-insulation process with his video camera. **He never got to use the camera again.**

Protect everything. *Clear plastic sheeting and painter's tape protect water heaters and electrical boxes. Some foam installers do this prep work as part of their process, but sometimes, it's the builder's job to keep things foam-free. The author seals floor registers with scraps of OSB nailed to 2x4 blocks. This approach has the added benefit of keeping the foam installer's ankles safe.*

required flame-spread guidelines without an additional coating and at depths greater than the rafter depth. This letter is especially important when using a truss roof with 2x4 top chords.

Get the framing ready

Spray-foam insulation comes out of the gun like a thin, clear paint and expands many times its volume when it hits a surface; so wherever you want to insulate with spray foam, you need to have a supportive substrate. Roof decking and wall sheathing are obviously suitable and ready for foam. In most of the homes I build, however, there are still many areas where we need to add a backing surface for foam after the structural framing is complete. I like to get all this work done before the plumber and the electrician get to the job. It's much easier for them to drill through the blocking than it is for me to notch blocking around their work.

I pay particular attention to areas where trusses overhang an exterior wall to create a porch ceiling and other areas where conditioned space extends over unconditioned space. I often use a kind of high-tech cardboard called Thermo-ply for these areas (www.covalencecoatedproducts.com). It's easy to cut with a utility knife, and it can be folded and stapled in place. Many of the carpenters I've worked with think Thermo-ply is too floppy and prefer to stick with oriented strand board (OSB). OSB is a little cheaper than Thermo-ply, so I leave it up to them.

Installing blocking between the rafters above top plates is the most time-consuming prep task, though. The simplest approach I've found is to fill the space over the exterior sheathing (between the rafters and the underside of the roof deck) with strips of OSB or 2x6s. If the soffits will be boxed, we use OSB. If the rafter tails will be exposed, we use 2x6s; the added thickness makes for a good termination point for the siding. Nailing from the outside into the upper top plate means that we don't have to fight the installation from the inside if wiring is already in place. If we're using fiberglass insulation in the walls, I make sure that the top side of the top plate is sprayed with foam to air-seal all the wiring and piping penetrations.

Spray foam sticks to everything

As the foam is sprayed, small expanding droplets of foam end up in the air. This stuff gets in your hair, on your skin and clothes, and all over any building materials or tools inside the house. I once failed to warn a homeowner of the mess. He was excited to capture the spray-foam-insulation process with his video camera. He got only a small amount of footage and never got to use the camera again. The best bet is to get everybody who's not part of the foam crew out of the house. Have some helpers nearby to watch the installation, and be ready with drop cloths, tape, and caulk to stop or catch any drips that find their way to the exterior of the house.

Wrap stovepipes to maintain insulation clearances. *To create the clearance specified by the stovepipe manufacturer, wrap two bands of 12-in. aluminum flashing around the pipe. After installing the lower band, cut the upper band to the roof's pitch, and attach it to the rafters or truss with roofing nails. Aluminum tape holds the two together. Fireproof rock-wool insulation or fire caulk fills the remaining gaps.*

Seal penetrations with caulk. *Expanding spray-foam insulation will find its way through any crevices larger than ⅛ in. Caulk around pipe penetrations before the spray foam arrives to keep it from seeping onto the siding.*

Like polyurethane glues, spray-foam insulation is attracted to and bonds with anything damp. Siding, roof shingles, and concrete are especially vulnerable. If foam finds gaps in blocking, it can blow through and drip down the siding or foundation wall. I'm vigilant about covering decorative stained concrete, removing window screens, and protecting any surface not slated to be painted.

Dried-foam droplets can be swept from the subfloor easily enough, but getting them off an electrical service panel, a bathtub, windows, a gas fireplace, or a new tablesaw is not as easy. Remove or protect all building materials and tools beforehand.

I also cover all floor registers with OSB and fill HVAC returns and ceiling registers with blocks of rigid foam. Then I tape them shut to keep dust and goo out of the ductwork. I don't bother with plumbing stub-outs because they all are sanded after the house is painted, but some folks might see value in masking them as well.

Low-voltage wires are less rigid than Romex. If they aren't secured properly, foam can push them proud of the interior-wall plane as it expands. These wires then can be clipped when the cured foam is trimmed.

It's impossible to fish wire through foam to make repairs, so make sure that all the wires are stapled securely to studs, and mark the wires that need to be stubbed out of the wall with brightly colored tape so that they won't get trimmed.

Get the R-value you paid for

Spray-foam-insulation manufacturers will say that R-19 worth of spray foam has the equivalent R-value as R-38 of fiberglass batts. They're basing their numbers on worst-case, poorly executed fiberglass installations.

What they are saying is that in a well-ventilated attic, exposed fiberglass batts on the ceiling with a 5% gap margin at the sides of the trusses will perform at 50% of their stated R-value; thus, a badly installed R-38 fiberglass batt will perform at R-19. Because spray foam is not subject to the air infiltration and gaps that fiberglass often is, an R-38 job performs at R-38.

The guys who install spray-foam insulation for a living tend to believe the manufacturers' claims and often don't see the point in shooting more than 6 in. of foam, no matter where it's being sprayed. So when my contract calls for 8 in. or 12 in. in the roof, I like to be on site with an extra copy of the quote and to go over it with the installation crew. I also make a depth gauge with a landscaper's wire flag and blue painter's tape at the specified depth. Once they get started, I stab the foam in a few places to confirm that they are spraying the correct depth.

Check the foam depth before the crew leaves. *Once the spray foam expands, poke it in various areas with wire to measure how deep it is. A depth gauge made of wire and blue painter's tape confirms the foam depth. The wire is so thin that the hole it leaves will not affect the foam's performance.*

Sometimes, they hit the depth at the top of the roof but taper the depth as they approach the walls. I've seen it as thin as 3 in. in the area above the top plate. It all looks like a big cumulus cloud from below, especially if they're shooting deeper than the rafter or joist depth, so it's important to take a few measurements and to let the foam guys know that you're holding them to the contracted depth.

Have plenty of power on site

Spray-foam installers generally drive large box trucks or pull big trailers, so they need good access to job sites. The two chemicals that combine to make the foam have to be warmed up, so the installer will be running two and sometimes four electric drum warmers as well as a proportioning machine and pumps. You can't run all that off an 8kw job-site generator. If we're working in a remote or off-grid location, I rent a trailer-mounted generator for the day.

One final note: I recently gave the same plans and specifications to three spray-foam companies in my area. The bids came in at $6800, $7800, and $13,500, all for the same product package. Competition is getting tight, so it's worthwhile to get multiple bids if possible before signing a contract. □

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