BY TIM UHLER

Squeak-Free Floor Sheathing

My dad started building in the late 1970s, and for as long as I can remember, I've worked on the jobsite. As a teenager, I screwed down the subfloor right before carpet went in. Dad would always come in and try and find squeaks. He said that a squeaky floor sends a negative message about the quality of the builder. A squeak-free floor is not difficult to achieve, and it doesn't require a lot of thinking, just the right approach to putting down the subfloor (aka sheathing). Here is the process that has worked well for my framing partner and me for years.

Before you begin, check your floor framing. Whether you've framed the floor with I-joists or with dimensional lumber, be sure that all blocking between joists has been nailed well. Some framers use glue in addition to nails to secure the blocking. Also, joists need to be nailed tightly to any walls or girders that they extend over.

GLUE AND SCREW

The basic principle for creating a squeak-free floor boils down to using good glue and the right fasteners. Some glues have trouble bonding the sheathing to the joists if the lumber is wet or frozen. PL Premium is a great glue that I've had good luck with over the years, but the instructions specifically say that the gluing surface must be dry and free of frost.

Lately, we have come to rely on the latest generation of "foam-to-gel" glues, such as Dap Smartbond and AdvanTech Subfloor Adhesive. These glues go on as foam but quickly turn to an adhesive gel that forms a tenacious bond to just about any material in any condition **(2)**. I like to think of fasteners as clamps that hold the sheathing to the joist while the adhesive cures. The adhesive forms the primary bond. The foam-to-gel formulations dispense onto the joist surfaces faster, and they don't fall off wet or frozen wood. Also, a can of foam-to-gel adhesive goes a lot further than the old caulking-gun cartridges, so I have to reload only about one-sixth as often.

Regardless of the type of glue you use, dirt or dust on the joists will interfere with any glue's ability to properly bond the two surfaces. Get in the habit of knocking excess dirt off your shoes before you walk on the joists.

At right is a bird's eye view of the floor sheathing process. A crew of two works in harmony to sheathe this floor quickly and efficiently. The crew member on the right spreads glue on the joists while the crew member on the left takes sheets from the stack, drops them into place, and tacks them on layout. When the glue is spread for one course, the person gluing will take over dropping and tacking while his partner fastens the sheets with a screw gun.

Photos by Tim Uhler

Most of these adhesives have a working time of about 15 minutes, so apply only the amount of glue that you can cover with sheathing in that amount of time. Once you've spread the glue on the joists, it's important to put the sheathing down and fasten it as quickly as possible. Put glue on all framing members—including joists, beams, and blocking—except the rims. (You will fasten the rims later as you straighten them). Always drive fasteners wherever you have spread glue to hold the sheathing fast to the framing while the glue cures.

When it comes to fasteners, avoid using plain-shank nails to fasten sheathing. As joists dry out over time, plain-shank nails can loosen enough to allow the sheathing to move up and down slightly and squeak. If you choose to nail your floor sheathing, always use ring-shank nails **(3)**. Many manufacturers put a coating on their nails that helps keep them in place. In the past, I've had success with good-quality ring-shank nails to attach sheathing to I-joist floors.

That said, I think that screws are much better for fastening floor sheathing, and stand-up screw guns, such as the PamFast system, make for pretty painless fastening **(4)**. The screws for these guns (made by Pam Fastening, Simpson Quik Drive, Grabber, and Senco) are designed to drive quickly, and they hold well. With 3/4-inch-thick sheathing, we drive 1 3/4-inch screws specifically made for fastening subflooring.

While there are nail-gun options (like Scrail fasteners, which have a twisted-thread shank so they drive faster and hold better), we have found that sheathing a floor with a stand-up screw gun is just fast as using a nailer. It's true that a screw gun delivers a screw slower than a nailer fires a nail, but for a two-person crew, the work flow for the entire job turns out to be the same in the end.

Fasteners should be spaced 6 inches on-center along the edges of the sheathing and 12 inches on-center in the field. Many sheathing manufacturers print marks for spacing fasteners along the 4-foot edges **(5)**. They also print marks for aligning joists on the proper on-center layout, but I rely on actual measurement for putting the joists on the proper layout (more on that process later).

FINDING A RHYTHM

The procedure for sheathing a floor involves steps that are repeated continuously until the floor is done. The first step, which we call "packing the floor," is bringing sheets of sheathing to where they will be installed. The next step is spreading glue on the joists. The sheets then drop into place and are tacked into proper position, and finally, the sheets are fully attached.

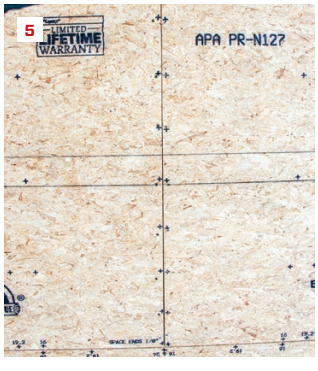
We usually work with a two-person crew in which crew member one has the primary responsibility of gluing and crew member two does most of the fastening. We begin by snapping a line for the first course of sheathing **(6)**. Then, while crew member one spreads glue for the first sheets, crew member two packs the sheets. (Our crew uses a telehandler to bring a pile of sheets to the edge of the foundation, which speeds up the packing process considerably).

Crew member two drops the sheets into place **(7)** and tacks them with a hand-nail at each corner. At this point, he also pulls a measurement and tacks the joists at the proper spacing along the long edge of the sheathing, usually at either 16 or 24 inches on-center. Special attention is paid to any joist or framing member that might not fall on the even spacing, such as around a stair opening. When the first few sheets are tacked in place, crew member two drives screws in the field to complete the fastening process while crew member one continues spreading glue and tacking in the last sheets.

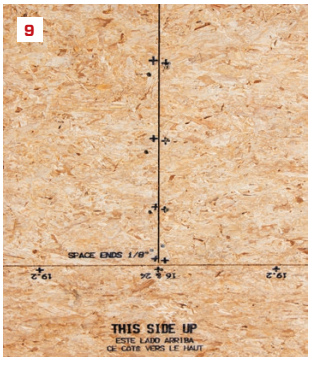
As the sheets go down for the next rows, the crew taps them against the previous row with a beater board and sledgehammer **(8)**, and tacks them in place as before. The process continues with packing, gluing, and fastening each row until the floor is finished. As you might expect, there is some overlap between the duties of the two crew members. A jammed glue gun can slow down the process, and likewise, if the gluer gets far enough ahead of the fastener, he may put down the glue gun and help pack sheets for the next row. That way, the rhythm and flow continue at an even pace until the entire floor is sheathed.

SHEET SPACING

Manufacturers of both plywood and OSB floor sheathing recommend that installers leave a 1/8-inch gap between sheets along the 4-foot edges to allow for swelling. Directions are often printed at the ends of every sheet **(9)**. Some framers use nails or strips of wood



Foam-to-gel glues work on wet or dry wood **(2)**. If fastening sheathing with a nail gun, be sure to use ring-shank or twist-shank nails **(3)**. A stand-up screw gun takes longer to drive each fastener, but is just as fast for the job overall **(4)**. Manufacturers often print the fastener layout on the sheets **(5)**.



The first course starts with a snapped line to keep the course straight **(6)**. A crew member drops a sheet into place, using one foot to keep it from sliding away **(7)**. A sledgehammer and block drive the sheets together **(8)**. Spacing instructions are printed on every sheet **(9)**.

for spacers, but after a while, it's pretty easy to just eyeball the gap. The 8-foot T&G edges are self-spacing, so we tap them tight as they go in. Also, we never put glue along the groove. Many sheathing manufacturers have designed their products to drain at that joint and glue would prevent draining.

Stagger the seams of the sheathing between rows. The starting piece for each row should alternate between a full sheet and a half sheet so that the end seams are staggered between rows. In other words, if you start the first row of sheathing with a full, 4x8 sheet, then the next row should start with a 4x4.

When placing the sheets for the first row, you should always face the tongue toward the perimeter of the building. That way, when you tap the second-row sheets against the first row, the beater block hits against the groove, which is less subject to damage than the tongue.

PREVENTING SQUEAKS

Squeaks can happen—even when you have done a good job installing the sheathing. Here are some tips to help reduce squeaks from other causes.

- Put glue in joist hangers prior to installing the joist, and toenail the top of the joist into the supporting member, such as a beam or girder.
- In this part of the country, we use a lot of top-flange joist hangers to hang joists inside concrete stem walls. Whenever possible, we add a treated 2x6 ledger under the joists after they're installed, pinning the ledger to the concrete with a split-drive fastener under each joist.
- When nailing down wall plates, always make sure the nails hit a solid joist or blocking. On an exterior perimeter wall parallel to the joists, I drive nails every 6 inches along the outside edge to hit the rim.
- When nailing interior walls that land between joists, put down a bead of glue prior to lifting the wall, and then nail the wall to the line.
- For I-joists 14 inches or larger that sit in hangers, spray in gap-filling foam (from a can or gun) on either side to act as a cushion and to prevent minute deflections of the I-joist web.
- Use gap-filling spray foam around pipes and ductwork that run through holes in the joists.

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For a more detailed discussion on installing squeak-free floor sheathing, go to **www.jlconline.com/training-the-trades/squeak-free-floor-sheathing**.