



Insulated Floors Over Concrete

Q. We are looking for a detail for laying a wood floor over a previously uninsulated slab. What's the best way to go about this?

A. Howard Brickman responds: The best way I've found is to build a floating plywood floor over foam, then apply strip flooring over this (see "Laying Wood Floors Over Concrete Slabs," 10/94). Depending on how much foam you use, you will raise the floor level several inches.

Under any floor on a slab, I first lay down a double 6-mil poly vapor barrier, taping the seams at the overlaps and extending the edges up the walls. Next I lay down the foam, keeping it as flat and firmly supported as possible.

Cut the foam about 1/4 inch shy of the wall and seal the gap with a squirt of spray foam. If you prevent the foam from moving, you'll avoid squeaks in the finished floor later. The concrete should be flat with no variation greater than 1/4 inch over 10 feet when checked with a straightedge. This means that if you're retrofitting an old garage into new living space, you'll have to deal with the slope in the floor, preferably before installing the vapor barrier. Pouring a thin layer of concrete to fill in the low spots is probably the best way.

Also, use a compression-grade extruded polystyrene foam that will support the weight of the floor, furniture, and occupants. One type of compression-grade foam is Styrofoam "greyboard." Tape the joints between the tongue-and-groove foam panels to minimize any movement or shifting that could cause noise.

When you have a stable foam base, place a layer of 1/2-inch plywood parallel to the long dimension of the room. Space the panels about 1/4 inch apart, and leave at least a 1/2-inch space around the perimeter (see illustration at right). Do not glue the ply-

wood to the foam. Then lay a second layer of 1/2-inch plywood over the first, orienting the panels 45 degrees to the first layer. Space this layer the same distance apart as the first layer, and screw or staple the two layers together.

Over this floating wood "slab" and the usual layer of 15-pound building felt, you can lay down your strip flooring.

Howard Brickman is a hardwood flooring contractor in Norwell, Mass.

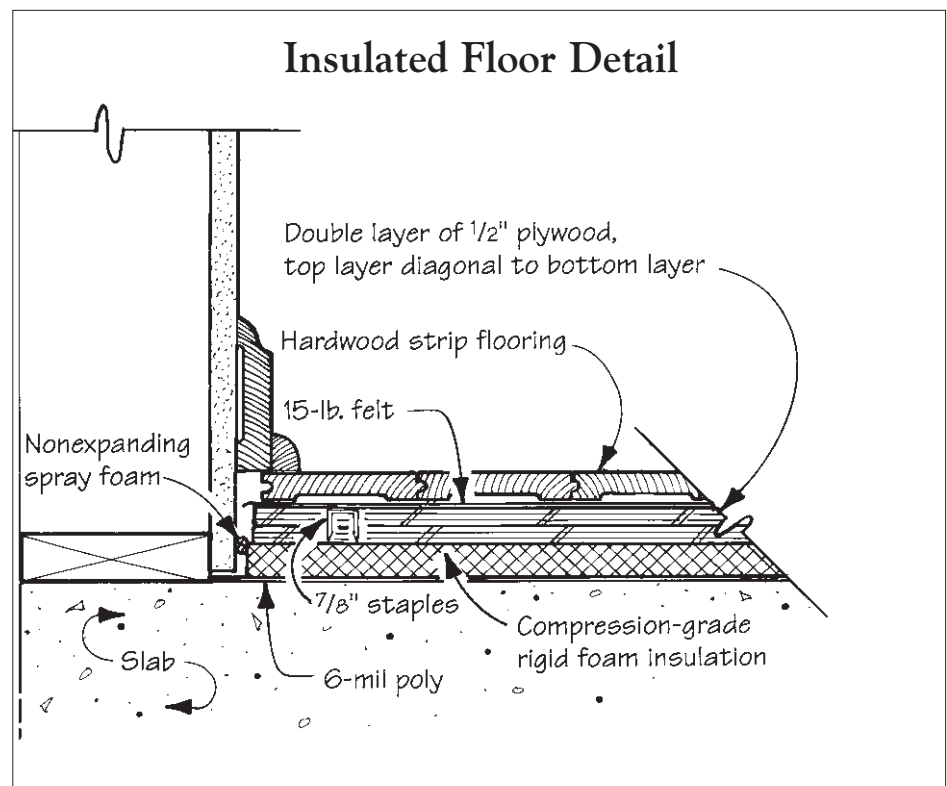
Health Effects of Foam

Q. We typically build energy-efficient houses with 1-inch foil-faced polyisocyanurate foam on the interior of our walls. But more than one customer has questioned us about the potential health effects of the foam. Their concerns seem to stem

from the outgassing of chemicals, more than the potential for the foam to burn. Are such concerns founded? What possible chemical hazards are present, and is there any evidence that these chemicals outgas at any substantial levels?

A. Alex Wilson responds: Toxic chemicals are used in producing polyisocyanurate foam. But after curing, the foam is considered very stable and safe. The primary health concern with this type of insulation is exposure of factory workers to the isocyanurate resin.

The outgassing that does occur from polyiso foam is HCFC-141b, which is used as the foaming agent. This gas, trapped in the foam cells, provides the high R-value, but as it gradually leaks out the R-value drops. In the atmosphere, HCFCs (hydrofluorocarbons)



This detail shows one way to lay an insulated wood floor over an uninsulated concrete slab, using 1-inch (R-5) extruded polystyrene. More foam can be added for more insulating value. To prevent movement and possible floor squeaks, it's important to keep the foam flat and well supported.

contribute to the destruction of the ozone layer and to global warming, but they are not considered toxic to humans.

Healthy-house consultant John Bower reports having tested pieces of polyiso foam on several chemically sensitive individuals, with no noticeable effects.

Alex Wilson is editor and publisher of Environmental Building News, a bimonthly newsletter published in Brattleboro, Vt. (for subscription information, contact EBN, RR 1, Box 161, Brattleboro, VT 05301; 802/257-7300).

Protecting Floors

Q. *In our remodeling business, we often demolish plaster and drywall in old homes, and find that the dust and fine abrasives work through just about everything we put down on the floor. What method do you recommend for protecting floors? Also, do you have any recommendations for a shop vac that works for drywall dust?*

A. *Mel Hines responds:* My floor protection method is as follows. It applies to hardwood floors in excellent condition. If the floors are in fair to poor condition, I don't always go to these extremes.

First, I put down a 2-mil-thick plastic drop cloth. I butt the plastic right to the bottom of the shoe mold. I then tape it — half the tape on the mold, half on the plastic. I like to use 1½-inch Scotch-brand *Long Mask*. It does not stick to the mold when removed, and does not leave a residue. Next, I put down 4x8 sheets of wafer board. This eliminates dings from dropped tools and gouges from dropped and stepped on fastener heads. On this I put down butyl-backed drop cloths, available from Duron Paints (10406 Tucker St., Beltsville, MD 20705; 301/937-4600), and other fine paint stores. These drop cloths keep most dust from penetrating. Often, the wafer board and the drop cloths can be reversed. With the drops on top, however, I can fold them up and easily dump out the debris at the end of each day, making sure to shake out the cloths in an

appropriate location.

As for a shop vac, I have tried many models. The one I've been pleased with the most is the *Craftsman* from Sears. I use the 5 hp, 16-gallon model, which sells for about \$100. Considering the amount we use this vacuum, this is a great value. Drywall dust will occasionally (though not very often) clog the filter. When it does, I simply take it outside and tap it into the base container, dump, and resume the cleanup.

Mel Hines owns Atlanta Pro-Serve, a ceiling and wall repair service in Atlanta, Ga.

Building Up Headers

Q. *How much strength does plywood and construction adhesive add to the strength of a built-up header?*

A. *Robert Randall responds:* Not much. Plywood used in a built-up header adds little to the strength of the beam (see "Sizing Built-Up Wood Headers," 4/92). At best, if the plywood extends the length of the header in one piece, it only adds about 8% to the beams load-bearing capacity.

Construction adhesive, such as PL, adds nothing to the strength of a beam when the loads are vertical. In some cases, when significant lateral, or sideways, loads are anticipated, adhesives might be part of an engineer's design. However, since conditions on site make it difficult to control dirt, moisture, temperature, and other factors that affect an adhesive bond, I rarely depend on adhesives for any load-bearing applications.

A properly installed header should be well supported at each end by jack studs (with long spans, double jack studs may be required) and the plies should be well nailed. I recommend spiking headers together with a row of three 16d nails every 12 inches. ■

Robert Randall, P.E., is a structural engineer in Mohegan Lake, N.Y.

Got a question about a building or renovation project? Send it to On the House, JLC, RR 2, Box 146,