Insulating your basement

INSULATING YOUR BASEMENT A UNIQUE GAME

Joist Insulation

Rigid foam placed between basement floor joists where they meet exterior walls. This system provides condensation-proof insulation when the gap around the rigid foam is fully sealed with
expanding polyurethane foam from a can.
Photo credit: Steve Maxwell

Subfloor overall

Insulated, drainable subfloor products make it easier to install almost any kind of flooring in a basement. The dimpled plastic surface faces down, providing an air space and drainage passage. The wood side faces up, providing a surface for finished floor installation.
Photo credit: Steve Maxwell

The moment you go underground, everything changes. At least as far as insulation goes, anyway. Trouble is, not many homeowners realize that insulating a basement is an entirely different challenge than working above ground. A good many contractors don't realize this, either. I know because readers send me emails that prove it.

Most of the messages read something like this: I've got half a dozen quotes for finishing my basement, and all the contractors recommend wooden studs and batt insulation with carpet on the floors. Is this really the best way to go?

The short answer is no, it's not. The special conditions found in a basement mean that construction methods that work okay above ground don't necessarily do so well below. There are several reasons why. Moisture (or at least the distinct possibility of moisture) is at the top of the list.

Unlike above ground walls, the inside surface of your basement walls can both leak (as water pooled outside seeps in) and sweat (as warm, moist air condenses against cool masonry). This is why you need to insulate with materials that are as moisture tolerant and impervious to air infiltration as can be. And this means foam – either one of two kinds.

Rigid sheets of foam have been around for decades, but it's not used as often as it should be in basements. I really don't know why, especially considering that basement-specific foam products are easy to use and ideal for this application. My favourite version is

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Wallmate. It includes grooves running along each edge of each sheet to position strips of framing lumber. Screw the lumber to the masonry wall and it does two things: it holds the foam against the wall, while also providing an interior nailing surface for drywall or paneling. You'll get best results if you fill the gaps between sheets of rigid foam with expanding polyurethane foam, just before you put the wood in place.

Then there's the option of using spray foam only. As the cost of contractor-applied spray foam drops and quality rises, it's become a very good way to insulate basements. Erect steel studs to hold wires and pipes, then fill the cavities between the studs with spray foam. It's more expensive than applying sheets of foam directly to walls, but it does an excellent job. It's also more practical to apply thicker layers of spray foam than rigid sheets, and the spray option seals every nook and cranny flawlessly. One area where this approach offers the greatest benefit is around the tricky spot where basement ceiling joists meet outside walls.

It's simply impossible to properly protect batt insulation in this area with a poly vapour barrier in the usual way because there's no way to seal around all those joists. The results, if you care to look, are all too common. Push your hand behind batt insulation and vapour barrier around the end of floor joists during cold weather and you're likely to find frost and condensation. It's caused by warm indoor air sneaking in and condensing against the cold exterior surfaces underneath the insulation. Spray foam solves this problem completely.

If you're not insulating the outside edge of your basement ceiling with spray foam, consider using 2-inch thick rigid foam instead. Cut pieces so there's a 3/4-inch gap all around each one, tack the foam than between the ends of the floor joists, then seal the gap with a hand-held can of expanding polyurethane foam.

Insulating basement floors is another area where innovation offers big gains. Ready-made subfloor products like DRIcore or Subflor are quite good, especially when you want to preserve a bit of drainage underneath the finished floor. If your basement is reliably dry, you can get more insulation value by laying down sheets of 1"-thick extruded polystyrene foam on the concrete with plywood on top.

Canadians love to finish their basements, and for good reason. Choose the right materials and strategies and you'll continue to love your cozy subterranean space for a long, long time.

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