

Ask Jon Eakes

Good and bad techniques in insulating basement walls.

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The national building code requires a minimum level of insulation in a basement that reaches about two feet below the outside grade level. The objective is to make this storage space a heatable space. Hence some materials and techniques have developed that satisfy this minimum code requirement that really don't take into account the real use of a basement.

In the first photo you see what I call "wall-bag" insulation. I first spotted this material in Southern Ontario and generally ignored it because I couldn't imagine that it would come into general usage, or even be permitted across the country. Unfortunately it is spreading out from its roots. Why do I dislike this material so much?

As you can see it is simply fibreglass insulation in a plastic bag. The side to the wall has holes to avoid a double vapour barrier. The face to the room is a tough durable and fire resistant plastic -- good stuff. If you look at the close-up photo you can see that it is simply nailed to the wall. In this basement they even forgot to add the semi-rigid strip that is supposed to hold it tighter to the wall. In any case it never is air tight and moisture always sneaks behind and into the fibreglass. Here you see it simply dripping out in large quantities, something more common than uncommon. Imagine the mould inside the fibreglass. Also notice how at the top and the bottom there is no insulation at all -- R-0 on the wall. Then it slopes up to somewhere towards the centre where it finally gives you the R-12 or R-20 it claims, for a few inches. How it ever got accepted by building code officials I do not understand.

All of this is not too bad as long as your basement is only used for storage -- ignoring of course all the holes in the plastic caused by bikes and skis. The real problems begin when you decide to create a finished basement. I have never found a way to build a wall in front of this bag that will not cause problems. If you push the studs into the insulation, it reduces the insulation. If you build in front of it, you cut off some of the heat but none of the moisture from the room and during renovations I have seen walls opened up to discover thick mould growing healthily on that R-zero attachment strap. The only way to properly and safely finish this wall is to totally remove the bag insulation, perhaps salvage the fibreglass and throw the plastic away. That is a wasteful retrofit simply because someone found the cheapest way possible to get past the building code. Remember, the building code defines the worst house you can possibly make without breaking the law. It is a minimum code for minimum occupation. Have you gotten the message that I don't like "wall-bag insulation"?

Mike Holmes from Restovate in Toronto is showing his proper full height stud wall. (Yes this was before Mike started his own TV show.) Notice that the electrical boxes are sealed air tight with polypanes. The vapour barrier is sealed at all joints and edges. Every effort is made to prevent moist air from getting to the cold side of the insulation. What does manage to get in will migrate to the top and go out through the concrete. One other important note for basements. Contrary to some popular belief, there should be absolutely no air space behind the insulation. Even the space behind studs should be filled with insulation. An "air space" in the back will cause an air loop that will pump water to the top of the wall and cause rot in the floor joists. If the wall is or might get moist from the soil side, line the wall with plastic or building paper from "grade level down" to protect the insulation and direct any liquid leaks under the wall into the room, not into the hidden insulation where it could cause rot. Never cover the part of the concrete wall that is above grade level. This is where the wall will very slowly breath to discharge any moisture, such as that found in the lumber during construction.

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