

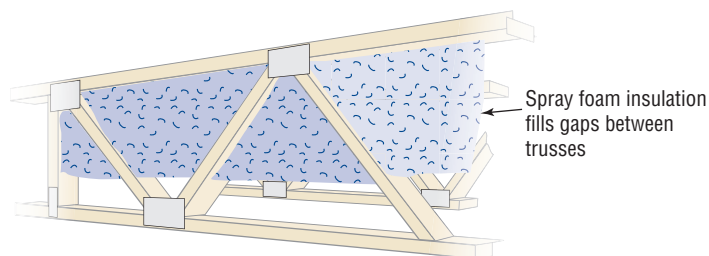
Floor Insulation R-values - 2012 International Energy Conservation Code

Recommended R-values for floor insulation is as shown for each climate zone.

Energy Code Climate Zone	1-2	3-4*	5-6	7-8
Floor R-value	13	19	30**	38**

*Except Marine 4 (treat Marine 4 as Climate Zone 5-6)

**Or insulation sufficient to fill floor framing cavity, min. R-19



Consider using a spray foam insulation approach with web truss floor systems since the trusses provide a complex “puzzle” for insulating with batts.

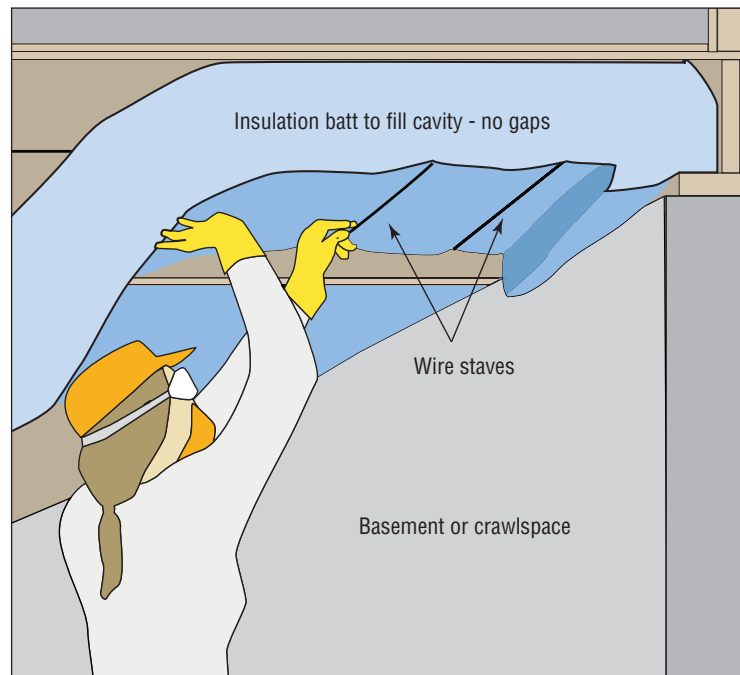
Spray-Applied Foam

The most effective underfloor insulation technique is spray-applied foam. Unfortunately this approach is the most expensive and does not easily lend itself to a do it yourself (DIY) project from the high cost of equipment and training required for installers. The major benefits of underfloor spray-applied foam is that it air seals and insulates in one application and should stay in place and be durable in terms of moisture. Besides the high installed cost, other disadvantages are that insulated sections cannot be easily removed and replaced and water piping below will need to be insulated for freeze protection. Spray-applied foam applications should be well ventilated and the homeowners may need to vacate the premises for 24-48 hours if they are sensitive to chemicals present in the foam.

Open-celled spray foam generally costs less per installed R-value and requires greater thickness to achieve a specified R-value compared to closed-cell. Generally 5-6” of open cell foam is required to achieve an R-19; often this is enough thickness to encapsulate (and offer freeze protection) for many water pipes. **Closed cell foam** offers higher R-value per inch (~3” yields an R-19) and acts as an enhanced vapor retarder due to its lower moisture permeability.

Insulation Batts

Batt insulation is the most common approach to underfloor insulation and can be done by most DIY-ers. The batts are usually fiberglass although other materials such as mineral wool, cotton and cellulose have been produced as batts. The most important detail is to obtain complete coverage with minimal compression and in complete contact with the underside of the subfloor decking. Another important detail is to install batts securely so they will remain in contact with the subfloor air barrier and not fall down.



Air seal first if not done already. Wear proper safety attire and light your workspace. Plan and stage your work to minimize trips and be sure to measure your joist spacing to ensure you have the right length wire staves.

Wire staves (sometimes known as “lightning rods” or “tiger teeth”) are the most common means of holding a batt up against the subfloor. Wire staves should be spaced no more than 18” apart and not excessively compress the batt. However, it is more critical for a successful install to be secure and lasting by placing extra wire staves, even if it results in more compression of the insulation. Insulation should be cut to fit and not overly compressed in any cavity. A batt that fills the frame floor cavity is ideal.

Batts typically come in unfaced or faced with an asphalt-impregnated kraft paper which serves as a vapor retarder. Follow the manufacturer’s suggestions about locating the paper face – generally it will be up against the subfloor, known as the “warm-in-winter” side. Vapor retarders for floor insulation are not code required in warmer regions but are more useful in colder climate zones.

Installing batts on open web floor truss systems should generally be avoided. Open web trusses require too much custom fitting of wire staves for batt insulation in order to be a viable option. Spray foam is a better method for insulating under an open web truss floor.