

Insulation Properties Comparison

Features	Fiberglass	Cellulose	Closed-Cell Spray Urethane Foam
Air and vapor barrier approved (ABAA)	No	No	Yes
Air barrier on interior AND exterior surface	No	No	Yes
Perfect fit, expands to fill voids	No	No	Yes
Code listed as an air impermeable barrier for non-vented vaulted ceilings	No	No	Yes
Stops air convection in wall cavities	No	Yes	Yes
R-value is effected by wind movement	Yes	Yes	No
High R-value per inch	No	No	Yes
Won't absorb water	No	No	Yes
Airborne moisture in walls reduced	No	No	Yes
Reduces condensating surfaces	No	No	Yes
No food value for insects or mold	Yes	No	Yes
No drying time required	Yes	No	Yes
Add structural strength	No	No	Yes
Listed as FEMA approved flood resistant material	No	No	Yes
Low Initial Cost	Yes	Yes	No

Moisture Movement & Perm Ratings

Permeability is a measure of the amount of water vapor (moisture) that can pass through a specified material in a certain amount of time (one sq. ft. of material per hour). The measure and degree of permeability is expressed in units referred to as "perms". Materials with high perm levels will allow moisture or water vapor to pass through than those with lower perm values. Anything with a rating below 1.0 is considered a vapor retarder.

Vapor retarders serve an important role in preventing moisture problems in buildings. They are installed to prevent water vapor from entering the insulating cavity of an exterior wall assembly. They are often manufactured as a facing for the building insulation, or as a continuous sheet to be installed over framing members in a wall. The main function of facings is to act as a vapor barrier. While a vapor barrier may not necessarily be able to stop the flow of water vapor, it does minimize the rate and volume of the flow. This prevents moisture from accumulating within the insulation blanket and the structure, which translates into consistent thermal values and lower heating and cooling costs.

Most closed-cell spray foams, when applied at least 2" deep, are considered a vapor barrier. Unfaced fiberglass insulation in itself is not a vapor retarder. Spray foams can be tested and assigned a perm rating. Fiberglass will allow air and moisture to flow through the material, so it does not have a perm rating. Insulations like cotton batts and cellulose (newspaper) will absorb water freely. These insulation materials are tested and assigned a water absorption rate, rather than a perm rating. These materials do not stop water vapor from accumulating within the insulation materials itself.

Moisture or water vapor move in and out of a home with air currents, by diffusion through materials, and by heat transfer. Of these three, air movement accounts for more than 98% of all water vapor movements in building cavities. Air naturally moves from a high pressure area to a lower one by the easiest path possible – generally through any available hole or crack in the building envelope. With the exception of closed-cell spray foams, vapor barriers and air barriers are two different products, performing two different functions.