

Applegate Insulation

Naturally better insulation.

Thank you for your interest in premium Applegate Insulation®! Applegate manufactures the finest quality cellulose insulation available – it has helped millions of homeowners enjoy safer, quieter, more comfortable, and more energy efficient homes.

The purpose of this letter is to discuss our recommendations regarding the use of vapor retarders with Applegate Insulation®. We recommend installing our product without a vapor retarder. This is based on our personal experience with this type of application over the last 20 years as well as a large body of technical support.

For many years, cellulose manufacturers and contractors have advised against vapor retarders. The overwhelming body of evidence reveals that vapor retarders are usually not necessary with any insulation. They are certainly inappropriate for spray-applied cellulose insulation.

Most building codes give building officials broad authority with regard to interpreting and enforcing code requirements. Inspectors who are familiar with the research findings of the last five or six years understand the relationship between air movement and moisture movement. These knowledgeable officials will normally approve any wall design that effectively restricts air exfiltration. Applegate cellulose insulation does this. Walls in which this insulation system are properly installed should be approved without unnecessary polyethylene.

I hope that I have answered any questions about our recommendations regarding vapor retarders. If you have questions or comments or if I may be of further assistance, please call me at 800-627-7536.

Warm Regards,

Enclosures:

Installer's Guide, *Do Not Use Vapor Retarders In Sidewall Applications with Applegate Insulation®*, Aaron Applegate .
Correspondance regarding Vapor Barriers, Daniel Lea, Executive Director of Cellulose Insulation Manufacturers Association.
Diffusion vs. Air Leakage, Insulation Manufacturing Builder's Guide, Joseph Lstiburek, P. Eng.
Cellulose Insulation Journal, *Vapor Retarders: How they work. Or don't.*, Terry Applegate.
"Ordinary Paint as Replacement for Poly Vapor Retarder," *Energy Design Update*.
EC30-99, 1999 ICC Final Action Agenda.
EC51-99, 1999 ICC Final Action Agenda.
"Demystifying the Use of Vapor Barriers," *Energy Design Update*.

Blessed is the nation whose God is the Lord. Psalms 33:12

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INSTALLER'S GUIDE:

DO NOT USE VAPOR RETARDERS IN SIDEWALL APPLICATIONS WITH APPLGATE INSULATION®

Applegate Insulation® should be installed in sidewalls of residential buildings without the addition of vapor retarders. Installations where vapor retarders are used void our warranty. Any and all liabilities that arise from such misapplications become the responsibility of the installer and/or the specifying authority.

1. We began this recommendation 20 years ago, when the Department of Energy released a publication that said it was not necessary to use a vapor retarder except in “Zone 1” (this is a region with an extremely cold climate that is confined mainly to Canada).
2. Building research and science confirms our recommendation.
 - a. In an Oregon Department of Energy study entitled A Field Study of Moisture Damage in Walls Insulated Without a Vapor Barrier:

“The fact that virtually no incidence of high moisture content, moisture damage, or decay fungi was found inside the walls of homes opened during this field study strongly suggests that there is no such problem . . . Cellulose reduced air leakage the most and mineral wool the least.”

- b. Another field study (this time in Spokane, Washington), prepared for the Bonneville Power Administration, concludes that:

“. . . the addition of wall insulation without a vapor barrier does not cause moisture problems”

- c. And in the Canadian Building Digest, J.K. Latta reports:

“Air leakage is now considered the prime cause of most condensation problems in walls and roof spaces. If, therefore, a building can be made tight against air leakage it may not need a vapor barrier, as defined.”

3. For fiberglass batts, the National Association of Home Builders recommends “the paper flanges should overlap each other on the studs”¹ [and how often are fiberglass batts face-stapled?].
4. ASTM E 96 “Standard Test Methods for Water Vapor Transmission of Materials” defines the testing procedures used to determine water vapor permeance, or “perm” ratings. This ASTM test method explains that kraft-paper (and other materials such as polyethylene) are tested by being tightly sealed with tape at the edges. This raises the question of how applicable the test results are to real buildings — where fiberglass batts are never installed with taped edges and seams. (And come to think of it, have you ever seen polyethylene taped at the seams?)
5. The National Institute of Standards and Technology has found “that the perm rating of kraft paper changes with humidity and that, when exposed to high humidity, kraft paper stops functioning as a vapor retarder.”²²
6. Regarding polyethylene, many people are surprised to learn of its origins. According to Cliff Shirliff, research scientist at the National Research Council Canada:

“During the 1950’s, a few unscrupulous building contractors or their employees found that they could get double mileage from batts by peeling off the facers, installing the ‘unfaced’ batts in one house and just the kraft facers in another house. To put an end to the scam, builders were asked to use only unfaced batts with clear polyethylene over them so that inspectors could see the insulation in the walls.”³

Isn’t it ironic that a product used to stop cheating by fiberglass installers is sometimes prescribed for homes with cellulose — which doesn’t need it at all!

7. For inspectors who still believe that vapor retarders are needed, many vapor retarder paints are now available. They have been put through rigorous tests and proven to have a perm rating of less than 1.0 (and presumably do not lose their perm rating as humidity increases). A researcher working on a recent study for ASHRAE has stated that even “ordinary latex paint is adequate”.⁴
8. The same recent ASHRAE study concludes “that the cost of home construction can be reduced by eliminating the poly vapor retarder”.⁵
9. The Cellulose Insulation Manufacturers Association (which represents all the major cellulose insulation manufacturers in the country) says the following:

“prescriptive use of vapor retarders is a bad idea...[we are] opposed to prescriptively slapping polyethylene in every residential wall. Building science supports this view. It’s now generally recognized that prescriptive use of vapor retarders is a mistake.”

“Poly is not necessary with any cellulose insulation.”

“The theory behind vapor retarders is predicated on the idea that moisture in the air wicks or diffuses into walls, and that polyethylene stops this process. Research has shown that diffusion is actually a very minor factor in moisture movement. Air exfiltration is by far the major transport mechanism.”

“Cellulose wall cavity spray is very effective at greatly reducing the exfiltration of moisture-laden air from inside the building into walls. By doing this they eliminate, or greatly reduce, the movement of moisture into insulated wall and ceiling assemblies. The poly is redundant.”

You may be interested to know that Applegate began as an insulation contracting company. Since the 1970’s, we have recommended against using vapor retarders and have insulated thousands of homes without them. And we are not alone — Tom Ward, president of American Environmental Products reports that “contractors have been installing cellulose with no vapor retarder for 17 years and have never had a reported moisture problem!”⁶

These homes were insulated with cellulose insulation - not fiberglass, which brings me to my final point. There may be differences in the necessity for vapor retarders depending on the type of insulation that is used. If fiberglass batts are used, the fiberglass manufacturers recommend using a vapor barrier (We defer to other manufacturers for recommendations regarding their products. Our recommendations apply only to our products.)

Vapor retarders may be necessary for fiberglass insulation:

1. Fiberglass consists of solid fibers that can act as excellent substrates for moisture condensation. Cellulose insulation is made of hollow organic fibers that can buffer excessive moisture conditions by holding the vapor in suspension instead of allowing it

to condense. Unlike glass fibers, the ability of wood fibers to absorb and de-sorb moisture prevents condensation of free water.

2. There is now a consensus that the main transport mechanism for moisture movement is not diffusion as was formerly believed. Rather, it is now widely agreed that the main mechanism is mass air movement. The moisture piggy-backs its way into the wall cavity. Cellulose insulation, with its much higher density and its resultant much greater resistance to air leakage, effectively short-circuits this cause of condensation problems that seem to occur frequently with fiberglass insulations that don't have a secure vapor retarder.

Please also note the attached section from Standard Practice for Installing Cellulose Building Insulation. In paragraph 8.3.1, it states that “vapor retarders of any type should not be used with spray-applied cellulose.”

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Warm Regards,
Aaron Applegate

¹ National Association of Home Builders, “Controlling Moisture in Homes”, Nation’s Building News.

² Energy Design Update, “Kraft-Face Batts — The Sometimes Vapor Retarder”.

³ Energy Design Update, “This Month’s ‘Say It Ain’t So’ Award — The Mysterious Origins of the Polyethylene Vapor Retarder”.

⁴ Energy Design Update, “Ordinary Paint as Replacement for Poly Vapor Retarder”.

⁵ Ibid.

⁶ Ibid.