

Once again, The Word invites you to travel into the dark realm of terms that often are misused or misspelled in home inspection reports. The Word hopes you will find this trip informative and maybe a little entertaining.

The Word's words today are vapor barrier (more accurately called a vapor retarder) and its cousins, air barrier and moisture barrier. These words can be confusing because the materials that perform these functions may appear similar and because some materials can perform multiple functions.

A vapor retarder reduces the flow of water vapor contained in the air. A vapor retarder is required when warm, moisture-laden air may travel by convection into a cooler area such as the attic or a wall cavity. There, the water vapor may condense into liquid water and cause damage. Polyethylene sheeting is a common form of a Class I vapor retarder. Asphalt-saturated Kraft paper found on fiberglass batt insulation is a common form of a Class II vapor retarder. Latex and enamel paints are common forms of a Class III vapor retarder.

An air barrier reduces the flow of air. Air barriers improve a home's energy efficiency and they reduce the flow of moisture-laden air into areas where the water vapor can condense. Sealants such as caulk, foam pads that are sometimes placed around electrical outlets and under sill plates in modern wood framing, and most types of house wraps are common forms of air barriers.

A moisture barrier (also called a weather-resistant barrier) stops the flow of liquid water. Moisture barriers primarily are used to control the flow of liquid water from the exterior into the home's interior. Asphalt felt (often called 15# and 30# roofing felt), Grade D paper, and

some types of house wraps are common forms of moisture barriers.

Now, here is where things get interesting. Some materials perform multiple functions and don't perform others. Polyethylene sheeting and sealants such as caulk perform all three functions. Kraft paper is a vapor retarder and is an air barrier if correctly installed, but it is not a moisture barrier. Asphalt felt, Grade D paper and house wraps such as Tyvek® are moisture barriers and are air barriers if correctly installed, but they are not vapor retarders.

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The International Residential Code (IRC), beginning in 2006, requires a moisture barrier consisting of one layer of 15# asphalt felt or equivalent material behind most exterior wall coverings. The felt must be applied horizontally, with horizontal seams lapped at least two inches and vertical seams lapped at least six inches. The primary exception is for stucco and adhered veneer such as artificial stone. These wall coverings require two layers of Grade D paper or equivalent material. Note that asphalt felt and Grade D paper are not equivalent and may not be substituted for each other.

The IRC, beginning in 2009, has new requirements for vapor retarders on the conditioned side of exterior walls. A Class I or II vapor retarder is required in climate zones that cover the northern part of the country. A Class III vapor retarder may be substituted in most of the country when using ventilated exterior wall coverings such as brick and vinyl siding.

Installation of a vapor retarder in southern parts of the country depends on local conditions. For example, in hot and humid areas where solar heat may drive water vapor from the outside into the wall cavity, a vapor retarder may be advisable on the exterior side of the wall instead of on the interior side.

It is important that you correctly identify vapor, air and moisture barriers. Use of the wrong material can have serious consequences, including water damage and mold. There is a wealth of good information on this subject at [www.buildingscience.com](http://www.buildingscience.com).

Memo to the building science Gods and other authorities: The Word does not reside on Mt. Olympus and welcomes other viewpoints. Send your lightning bolts or e-mails to [inspectorbruce@cox.net](mailto:inspectorbruce@cox.net). Please cite the authoritative references that support your position. Note that all references are not considered authoritative. Unless you are fortunate enough to have a resident librarian, as The Word does, consult your local reference librarian. We will continue this discussion, if warranted. ■



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