

Weather barriers, water-resistive barriers, air barriers, and vapor retarders – Are they not all the same?

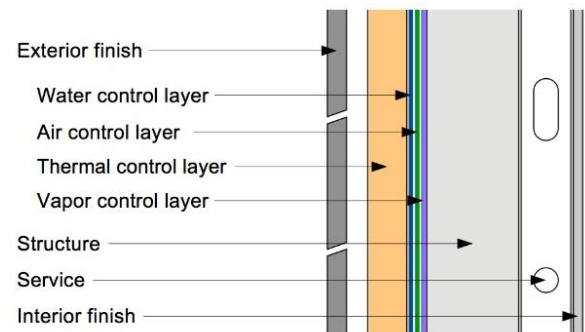
Part 1 - The Basics

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The terms weather barriers, water-resistive barriers, air barriers, vapor retarders (formerly called vapor barriers) are terms used to identify **different control layers** within the building enclosure. An additional control layer is thermal insulation, but that term is not used in the Code but uses the terms thermal isolation, thermal resistance-R value and thermal transmittance, U-Factor.

Control layers are not materials. Each control layer provides a different function in a building enclosure assembly and are **not specific to materials**. The Codes has performance requirements for a material to be used to provide that control function.

For a material to be used to provide a control layer function, the material must meet the material performance requirement, be designed in the building enclosure to provide the control function and then be installed in a manner that the material will work as the control layer.



Confused? Many people are and there is no easy answer to the question: Is a material a water resistive barrier or air barrier or a vapor retarder? Building science will tell you, "It depends"

Start with using the correct terminology.

Terms and definitions

(1) **weather barrier**

designated set of assemblies and fenestrations designed to resist the loads imposed by all elements of the weather, including solar, wind, air borne debris, heat, flooding, liquid water, and water vapor - commonly referred to as the **building enclosure**

(2) water resistive barrier

designed material behind an exterior wall covering that is intended to resist liquid water that has penetrated behind the exterior covering from further intruding into the exterior wall assembly

(3) air barrier

designated plane of material(s) to reduce airflow between different environments

(4) heat barrier (thermal insulation)

material of relatively low heat conductivity used to shield against loss or entrance of heat by radiation, convection, or conduction.

(5) vapor retarder

designated material or assembly designated to reduce the water vapor transmission rate through the material or building assembly

A material may be able to provide more than one function. For a single material to provide multiple control layer functions in a building enclosure assembly, it must meet the **performance requirements** for each control layer function it is acting as.

Keep in mind a **material** may be able to provide the function of more than one control layer

	Fluid applied	Self-adhered	Paper faced Gypsum	Mechanically Fastened	Insulating Board Stock	Closed Cell SPF
Water resistive barrier	Yes	Yes	No	Yes	Yes	Yes
Air barrier	Yes	Yes	Yes	Yes	Yes	Yes
Vapor retarder	Maybe	Maybe	Maybe	Maybe	Maybe	Yes
Thermal insulation	No	No	No	No	Yes	Yes

The table is to simply show how a single material can provide different control layer functions. This table is overly simplified as each material needs to meet the material performance requirement to function as a control layer. There are materials that will not provide all the functions or only provide the function under specific circumstances.

In the Codes, some of the performance requirements for a material are straight forward, others – not so straightforward. Part 2 will cover the Code requirements for these control layers. Part 3 will cover how the building enclosure needs to be designed with the different materials. Part 4 will point out some of the installation requirements that are needed for a material to provide the control layer.

For more information or questions, please reach out to a Certified Air Barrier Specialist near you or contact ABAA (www.airbarrier.org)