

ASK THE INSPECTOR COLUMN FOR SEPTEMBER 21,2016
HEADLINE: UNWRAPPING THE AIR BARRIER QUESTION

I have had a number of inquiries about air and vapour barriers over the past weeks and months from frustrated readers who comment they get different answers when they ask a contractor or the salesperson at a lumber store. This subject has been surveyed, discussed, argued and has downright confused some of the pros, who should have the answers. In fact, there is no one single answer, so I'll try and put some basics together.

A vapour barrier is designed to prevent the moisture in the outside air from reaching the buildings interior space, working in conjunction with your insulation. This barrier is very important, as it, not only slows down any external moisture, it also helps reduce that condensation from settling in the walls; condensation that can and does rot and allow mould in a home. Numerous studies have shown that it is nearly impossible to totally eliminate this air movement, however, which is why we now refer to a vapor barrier as a vapor diffusion retarder (VDR).

There are many kinds of VDRs. The most widely known is the 6mil polyethylene plastic sheeting that is used in new construction today. Before the drywall is put up, this plastic barrier is installed inside the home on all external surfaces, ceilings and walls. When we first started using plastic sheeting, we stapled it to the walls, did not separate the interior partitions, cut around the electrical boxes and overlapped the seams and thought we had this moisture issue licked. How wrong we were! We now know that these areas leak occurs where the plastic is not sealed. I have seen 25 year old homes opened up and you would be surprised at the moisture damage in those exact areas. Today, the VDR is fitted before the partitions go in. All joints are tuck taped and all openings are either caulked, sealed, tuck taped or covered in a self adhesive wrap. This wrap is commonly done around doors and windows. All external wall openings, such as electrical boxes and HVAC vent holes, are taped, foamed, caulked or sealed with air tight boxes for installing your electrical boxes.

VDRs are classified in two groups; flexible or coatings. Flexible retarders are products like metal foils, treated paper and, of course, 6 mil plastic. Coatings are paints and some semi-fluid mastic. These materials are all permeability rated, with a rating of one or less as the standard. The rating for 6mil plastic is .06 and aluminum foil is actually lower at .05. Plastic coated insulated foam sheathing has a number of different ratings ranging from 1.2 to .04. If you have an older home and know you don't have any continuous VDR, recent studies have shown that adding layers of paint is reasonably effective. Some paint companies actually advertise their "vapor barrier" values. If your paint does not state this, look at the formula on the label. The higher the solids level, the greater the VDR value.

Air barriers are a different product. They are designed to reduce the infiltration of outside air from entering the building and reduce the air exchange of the home. You often see these on new homes. It's the white or cream colored plastic type wrap around the exterior of the home. The original house wrap was invented by DuPont in the late 70's. It was called Tyvek and this term is generic today for many trades, something like snowmobile and skidoo. These air barriers are made of a spun polyolefin and woven polypropylene blend. They are quite serviceable and tough, they don't tear easily. One point that is often not considered is that most manufacturers do not recommend leaving this wrap exposed to the elements for more than a month, as the sun's ultraviolet rays damage its air permeability. As well, cedar shingles or stucco should not be applied directly over house wrap. The moisture or oil in the cedar will damage the wrap. In fact, other than vinyl, I would not attach any siding directly over any of the house wraps. Strapping the walls allowing for some air movement is preferable.

The other option is rigid foam board. Most of these act as air barriers, provided they are taped at the seams. This foam board is rapidly becoming the norm for new homes, as well as large renovations, especially if the siding is being replaced. One of the more popular foam boards is called "Polyiso" and it's rated at R6. It also helps the issue of thermal bridging. Another area where insulation values can be improved.

The thing that all air barriers and VDR's are designed to do is reduce the amount of moisture or water vapor entering and leaving your home. Air movement accounts for 98% of all moisture movement. Air naturally moves from a higher pressure area to a lower one by the easiest path and if that path is a crack or a hole in the walls or an opening around your doors and windows then it will find it. This is why caulking is so important as the last step in your effort to seal up your home from damaging moisture.

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