Use of a Moisture Vapor Permeable Product in Warm, Humid Locations

This question comes up frequently – what about a Moisture Vapor permeable product in Warm, Humid climates? Is there a concern for moisture vapor to permeate through the Air Barrier Membrane and into the underlying surface? The short answer is no, but let's talk about it.

The Industry Standard test for measuring moisture vapor permeability is ASTM E96. It is a relatively simple gravimetric test evaluating moisture vapor permeability in two ways … the wet cup and the dry cup. The wet cup has the film being tested sealed to a cup with water in it, placed in a dry enviroment (so that there is a driving force), and you measure the weight loss. The dry cup uses a cup with a dessicant, the film being tested sealed to the cup, and placed in a moist environment. In this case we are looking for wet gain in the dry cup. These two methods can give different permeability (dry cup vs. wet cup) depending on the product chemisty, but the results are usually within a range of each other. E96 can provide data (with minor tolerance) for products from zero to around 100 Perms.

The Building Science Industry has come to understand that trapping water in the wall (in any location) is a bad thing, as it leads to rot, corrosion, mold, mildew, and a variety of other things. Allowing the water out, as moisture vapor, through a moisture vapor permeable Air Barrier, has proven to be a wonderful concept that is very well proven in our world.

Let's think about driving forces for a moment. When liquid water is trapped in a wall and it volitalizes (turns to vapor) you effectively have 100 % relative humidity in the wall. Generally speaking, the world wants to be in equilibrium, so if the relative humidity outside is 50 %, then there is a driving force for the humid air trapped in the wall to get outside … IF it can. It can ONLY if the materials involved are moisture vapor permeable.

Now, you ask, what about a nicely cooled and dehumidified home, or building in the gulf coast with an indoor temperature of 75 F and a relative humidity of 50 %, and yet the conditions outside are 90 F and 80 % relative humidity. Isn't the driving force, in this situation going to be into the wall? Yes, it is. A little bit, for that exact moment in time. However, remember that most moisture vapor permeable Air Barrier products on the market have a Perm rating of 10 to 20 Perms (US Perms), which is on the low end of the zero to 100 Perm range mentioned above. Additionally, many products have a higher wet cup perm than their dry cup perm. In the case of Aussie Shield™ 300-PLM it is 20.5 Perms wet, and 13.6 Perms dry. This means that the Air Barrier is significantly better at allowing water out of a wet wall than it is allowing moisture vapor into a dry wall. When the driver

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(incentive) exist, then it will happen, to some degree, but remember it is a pretty arduous path to get from the outside through the exterior façade, through the Exterior Insulation, and to the Air Barrier. Understanably the moisture has other, less difficult ways to move around, so the amount of moisture vapor allowed into the wall with high humidity outside and low humidity inside is relatively small.

Having said all of the above, the single biggest reason that this isn't a problem is the real world proven performance of STPE based moisture vapor permable Air Barrier product in Florida, Georgia, Alabama, Mississippi, Louisiana, Texas, and many other locations around the world. It works … plain and simple.

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