



Open Cell Spray Foam Insulation & “Vapor Barriers”

Moisture problems in walls and ceilings are caused by *air leakage*, which delivers a large quantity of water vapor through gaps in air barriers and through insulation to condense on a cold surface. Abundant literature has documented that condensation due to water vapor diffusion is the source of only 1% of moisture transfer, while airborne transfer usually accounts for 99% of moisture migration-and moisture problems.

Airborne Moisture Movement

½ pound Open Cell spray foam insulation has a low air permeance-low enough to be classed as an *air or near air barrier*. Therefore, there is *minimal to no moisture movement* through open cell foam by air transfer.

Moisture Movement by Diffusion

Moisture conveyed by diffusion is usually not a problem as it is so small that is measured in nanograms (billionths of an inch), and is typically overcome by normal storage/drying cycles of building materials.

Five inches of Open Cell foam has a vapor permeance of 10 perms. This property allows extremely low rates of moisture diffusion to occur, just enough to allow breathing of adjacent building materials, ***preventing moisture entrapment***. Such diffusion as does occur through Open Cell foams will pass through the insulation without condensing, provided that the substrate to which it is attached is equally, or more vapor permeable.

Practical Performance

Practical experience has been gained using Open Cell foams without a Vapor Barrier, for instance where it has been injected into renovated cavity walls. In this situation, no opportunity exists for the inclusion of a vapor barrier. Experience has also been gained where Open Cell spray foam insulation has been applied to the underside of steel-deck roofing without a vapor barrier.

This experience demonstrated that no moisture build-up occurs where Open Cell spray foam is used *without a vapor barrier*. In fact, only the following conditions require vapor barriers while using Open Cell spray foam insulation;

- Extreme conditions of humidity- i.e. indoor swimming pools, coolers, hockey arenas and greenhouses
- In extreme northern climates. The National Association of Homebuilders recommends vapor barriers in those climates with greater than 8,000 heating degree-days; Midcoast Maine has around 5000.

Bottom Line

In this general area of the Country, using a primer paint containing vapor barrier properties is more than enough protection against water vapor condensation forming within cavities sprayed with Open Cell Spray Foam Insulation.