



June 17, 2008

Mr. Dave Lall,  
Vice President,  
Demilec USA, L.L.C.  
2925 Galleria Drive,  
Arlington, TX 76011

Re: Water Absorption of Foam in Wall Assemblies

Dear Mr. Lall:

Building Science Corporation (BSC) and I have long been involved in the moisture and thermal performance of wall and roof assemblies. I wrote the original DOE Moisture Control Handbook and most recently authored the model code changes regarding vapor retarders in the last code cycle.

Where spray foam is applied directly to the cavity side of exterior sheathing in a wall assembly the water absorption of the spray foam is irrelevant. This is not strictly a spray foam issue. In fact, it is almost irrelevant regardless of cavity insulation type. Cellulose is very hygroscopic and makes for excellent cavity insulation as does blown and netted fiberglass.

Water absorption is important when insulation is in ground contact such as insulation systems applied on the exterior of concrete and masonry foundations. Water absorption is also important where spray insulation is applied on the exterior of exterior sheathing and this spray insulation is acting as a water control layer (i.e. "drainage plane").

Water absorption is not an important characteristic for spray-applied insulations on the cavity side of exterior sheathing. In fact, it could be argued that just the opposite characteristic is desirable in this location – some water absorption is in fact beneficial as it allows the material to act as a "hygric" buffer that allows some liquid phase water redistribution.

For example, in roofing applications, wood roof decks traditionally out perform steel decks from a condensation control perspective for this reason.

The key material and system characteristics for a cavity insulation are convection suppression, thermal resistance, air impermeability and vapor resistance not water absorption – with the vapor resistance being significant only in cold climates.

Please feel free to contact me at (978) 589-5100 with any questions.

Sincerely,

A handwritten signature in black ink, appearing to read "J. Lstiburek", with a long horizontal flourish extending to the right.

Joseph Lstiburek, Ph.D., P.Eng.

Building Science Corporation