



ASHRAE 1999 HVAC APPLICATIONS MANUAL STATES:

“Failure to install an effective vapor retarder will result in condensation forming in the structure and potentially serious damage.”

A vapor barrier must be installed in all natatorium environments to protect the room from moisture migrating from the warm side of the pool room into the walls and ceiling, where it can saturate these areas and cause damage to building materials and structural members.

VERI-DRY recommends a minimum of a 10-12 mil vapor barrier when it is feasible to do so. The closer to a “0” perm rating in a vapor barrier the better. Alumi-Seal Corporation has been recommended by many builders. TYVEK Wrap is NOT a vapor barrier for the pool room. Foil Faced batt is NOT a vapor barrier.

VERI-DRY recommends all lighting, electrical boxes, conduit for wiring, switching – should be surface mounted if placed on surfaces incorporating the vapor barrier. If some electrical boxes penetrate, ensure they are taped up tight when finished. To prevent moisture migration, use a suitable sealant material wherever any device (i.e. nail, screw or ductwork) penetrates the vapor barrier, and ensure Negative Pressure is established within the envelope.

- **VAPOR BARRIER AND PLACEMENT OF VAPOR BARRIER**

Warm, humid air inside a pool room naturally migrates to the cooler, drier air outdoors. As it does so, moisture condenses in the exterior wall cavity, causing mold, rot, and deterioration of the exterior wall materials. This effect is especially pronounced in colder climates, where the contrast between the humid indoor air and the dry exterior air is greater. Proper selection, placement, and installation of a suitable vapor barrier can minimize this unwanted moisture migration. If a vapor barrier can't be installed, then vapor barrier or waterproof paint should be used on all surfaces that come into contact with the pool room. If living spaces are open to the pool room, which is NOT recommended, then a vapor barrier must also be installed in all of these areas.

- **VAPOR BARRIER SELECTION**

Select and specify a vapor barrier with a permeance rating of 0.1* or less. The permeance rating (perms) measures the amount of moisture that can migrate through a particular vapor barrier. A vapor barrier with a permeance rating greater than 0.1 ... the kind typically used in standard construction ... will allow too much moisture through it and is not recommended for use in indoor pool enclosures. **Green board, Brown board, sheet rock, some spray-in -foam type insulations, DRI-VET, fiberglass batt with foil face, are NOT substitutions for vapor barriers.**

DXAIR INDOOR POOL DESIGN GUIDELINES VAPOR BARRIERS



- **EXAMPLE OF ACCEPTABLE VAPOR BARRIERS**
10 mil.-12 mil. Polyethylene Sheeting 0.090 perms
Zero-Perm by Alumi-seal Corp. 0.00 perms
- **NOT RECOMMENDED:**
Foil-Faced fiberglass bat insulation 0.50 perms
6 Mil Polyethylene Sheeting 0.113 perms

***Using ASTM-E-96-80 Procedure A**

PERMEANCE OF VAPOR RETARDERS-MATERIALS PERMS

Aluminum Foil 0.0 - 0.05
Polyethylene Film - 10 mil 0.03
Polyethylene Film - 8 mil 0.04
Cross-Laminated Poly Sheeting - 4 mil 0.04
Polyethylene Film - 6 mil 0.06
Vapor Retardant Paint, 1 coat 0.06 (Courtesy of ASHRAE)
Polyethylene Film - 4 mil 0.08
Expanded Polystyrene Board 1.2
Concrete (1:2:4: Mix) 3.2

Note: products and materials change in this industry; this information does not preclude your own research for proper materials and installation.

- **VAPOR BARRIER PLACEMENT**

Place the vapor barrier as close as possible to the inside finish surface of all exterior walls and ceiling. Exact placement of the vapor barrier is critical. All materials on the pool side of the vapor barrier are highly susceptible to moisture damage. Use only waterproof or highly moisture-resistant materials on the pool side of the vapor barrier.

- **ENSURE NEGATIVE PRESSURE IS ESTABLISHED WITHIN THE ENVELOPE**

Place the vapor barrier between the pool area (between insulation and drywall) and other areas (including ceiling) of the building. When adjacent areas without humidity control share interior walls with the pool enclosure, unwanted moisture may migrate to those areas and cause problems. Incorporate the vapor barrier into the pool side of the walls or ceilings separating those areas. Also, provide weather-tight passage doors between those areas.

- **VAPOR BARRIER INSTALLATION**

Install a **CONTINUOUS** vapor barrier. Envelope the entire building. **Seams, gaps, tears, punctures, or breaches will permit moisture migration and must be avoided. Overlap (recommend overlapping 12" walls/ceiling) the material and positively seal vapor barrier joints. Avoid penetrations of the vapor barrier. Design the building to avoid penetrations of the vapor barrier. Any puncturing of this vapor barrier now allows for moisture to migrate into those areas.**

For example, electrical boxes and conduit for wiring, switching, lighting fixtures should be surface mounted only if placed on surfaces that will incorporate a vapor barrier. The effectiveness of a



vapor retarder system may be greatly reduced if openings, even very small ones, exist in the barrier. Such openings may be caused by poor workmanship during application, poorly sealed joints and edges, insufficient coating thickness, improper caulking and flashing, and other factors. Air infiltration around a vapor retarder can carry considerable quantities of water vapor into the insulation, creating a condensation problem. The air finds passages through gaps in joints, tears in the barrier, or cracks where pipes or similar items penetrate the wall. Seal any necessary penetrations of the vapor barrier. To prevent moisture migration, use a suitable sealant/caulking material wherever any device (such as a nail, a screw, and ductwork) unavoidably penetrates the vapor barrier. Patching - repair all tears and punctures with oversized patches of retardant materials and tape before vapor barrier is covered.

If you are not using a vapor barrier due to construction design (i.e. concrete block), then a high grade vapor barrier paint must be used on the inside surface of walls and ceiling. Concrete block and other non-insulated type construction have little R-Value and are water permeable. If you are not using a Pool Cover, it will be imperative that you use some kind of vapor barrier paint if the vapor barrier cannot be installed between the insulation and finished wall.

This information was obtained through ASHRAE Fundamentals Handbook and other resources and is not expressly the opinion of E.P.S. A licensed professional should be contacted for your particular application, as there are many options available.

NOTE: THE AIR INFILTRATION RATE AROUND A STAPLED FIBERGLASS BATT IS SO SIGNIFICANT IN TERMS OF THE ACTUAL SPACE ITSELF BETWEEN THE BATT AND 2X4'S IT DOESN'T CREATE AN AIR TIGHT VAPOR BARRIER. THEREFORE, IF THERE IS ANY MOISTURE PENETRATION IT WOULD NOT RESULT IN TRAPPED CONDENSATION BETWEEN THE BATT & VAPOR BARRIER.

A SECONDARY PRECAUTION IN ALL POOL ROOMS THAT VERI-DRY RECOMMENDS IS A NEGATIVE PRESSURE FAN. THIS FAN DOES NOT PERMIT ANY MIGRATION EVEN IF THE VAPOR BARRIER WAS COMPROMISED (I.E. TOP HAT/ RECESSED CAN LIGHTING, ELECTRICAL BOX PENETRATION) AND WILL NEGATE THE POSSIBILITY OF ANY TRAPPED MOISTURE BETWEEN THE BATT AND VAPOR BARRIER.

For additional information, refer to ASHRAE Fundamentals Handbook 2001 or speak with a building professional.