Vapor Permeance Characteristics

The vapor permeance characteristic of the sheathing/cladding assembly is defined by the effective wet cup permeance of both the cladding and sheathing combined. Four categories are established:

- **Vapor impermeable**: 0.1 perm or less
- **Vapor semi-impermeable**: 1.0 perm or less and greater than 0.1 perm
- **Vapor semi-permeable**: 10 perms or less and greater than 1.0 perm
- **Vapor permeable**: greater than 10 perms

For example, an assembly using foil-faced isocyanurate rigid insulation is classed as vapor impermeable regardless of the cladding type installed external to the foil-faced isocyanurate.

OSB sheathing and plywood sheathing covered with a building paper or housewrap and vinyl siding are classed as vapor semi-permeable.

However, when the vinyl siding is replaced with a traditional three-coat hard-coat stucco the combined wet cup permeance of both stucco, building paper and OSB (or plywood) sheathing is below 1.0 perm and therefore, this assembly is classed as vapor semi-impermeable. The application of the stucco in this manner clearly affects the drying characteristics of the wall; the stucco is relatively "airtight" whereas the vinyl siding is "air leaky."

If, instead of being installed directly over building paper or housewrap, the traditional three-coat hard-coat stucco is "back vented" (i.e. installed over an airspace), the assembly is once again classed as vapor semi-permeable.

Wet cup permeances are used because it is the performance of the assembly under "wet conditions" that we are concerned with.