BSC Information

Sheet 312

Vapor Permeance

of Some Building Materials

Vinyl sidingApproximately 40 perms due to the air leakage of the siding jointsVapor permeableWood sidingApproximately 10 perms due to the air leakage of the siding jointsVapor permeableBrick veneerApproximately 40 perms due to air leakage from the "back venting" of the brick veneerVapor permeableBuilding paper/asphaltApproximately 30 permsVapor permeableHousewrapsRange between 5 perms and 50 permsVapor semi-permeableOSB sheathingApproximately 2 permsVapor semi-permeablePlywood sheathingApproximately 10 permsVapor semi-permeableOSB or plywood sheathingLess than 1 perm and greater than 0.1 permVapor semi-permeableExternal Insulation Finish System (EIFS) installed over 1-inch EPS and OSB or plywood sheathingGreater than 1 permVapor semi-permeableExtruded polystyrene insch in thickness and unfacedI perm or less and greater than 0.1 permVapor semi-impermeableExtruded polystyrene insulation (XPS); ly interve facingsLess than or equal to 0.1 permVapor semi-impermeableExtruded polystyrene insulation (XPS); ly interve facingsI perm or less and greater than 0.1 permVapor semi-impermeableExtruded polystyrene insulation (XPS); ly interve facingsI perm or less and greater than 0.1 permVapor semi-impermeableExtruded polystyrene insulation (XPS); ly inch or less in thickness and unfacedI perm or less and greater than 0.1 permVapor semi-impermeableExtruded polystyrene insulation (KPS); ly inch or less in thickness			
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	Expanded polystyrene insulation (EPS); any thickness and faced with polypropylene or foil facings	Less than or equal to 0.1 perm	Vapor impermeable

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. Three categories are established:

- Vapor impermeable: less than or equal to 0.1 perm
- Vapor semi-impermeable: less than or equal to 1 perm and greater than 0.1 perm
- Vapor semi-permeable: greater than 1 perm

For example, a 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 semiimpermeable.

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 semiimpermeable. 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 the traditional three-coat hard-coat stucco is subsequently "back vented" (i.e. installed over an airspace) the assembly is now classed as vapor semi-impermeable.

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

Coated/faced thin profile structural sheathing	1 perm or less and greater than 0.1 perm	Vapor semi-impermeable
Foil-faced isocyanurate; any thickness	Less than or equal to 0.1 perm	Vapor impermeable

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