

Notes on Exterior Insulation from the National Building Code

Many industry professionals, homebuilders, and renovators are not aware of certain requirements of the 1995 National Building Code of Canada. The following important information is taken directly from the Code.

A-9.25.1.2 Location of Low Permeance Materials

Generally the location in a building assembly of a material with low air permeance is not critical; it can restrict outward movement of indoor air whether it is located near the outer surface of the assembly, near the inner surface, or at some intermediate location, and such restriction of air movement is generally beneficial, whether or not the particular material is designated as part of the air barrier system. However, if such a material also has the characteristics of a vapour barrier (i.e., low permeability to water vapour) and low thermal resistance, its location must be chosen more carefully in order to avoid moisture accumulation.

External vapour barriers can cause serious problems!

Vapour barriers must be located on the inside (warm face) of walls, to prevent water vapour from entering into the wall cavity, condensing and causing damage. If moisture does collect inside the wall cavity, drying must not be restricted by materials that would retard the passage of moisture to the outside (cold face) of the wall. When low vapour permeable insulations like extruded polystyrene (¹Styrofoam[®] or ²Celfort[®]) are used as exterior building sheathing, water vapour from indoor air that has found its way into walls will condense and accumulate if the temperature at the inside surface of the sheathing is lower than the dew point.

Section 9.25.1.2 of the 1995 National Building Code states first of all that *sheathing materials with vapour permeance rates of 60 ng/(Pa•s•m²) or less--like Styrofoam and Celfort--should be installed on the warm face of the assembly.* However, if it is required to use these products on a cold face, the Code shows how to calculate required sheathing thickness, using regional degree day data and RSI ratios of other components of a wall design. Failing the calculation, using these products for exterior sheathing can result in damage to buildings from moisture and decay.

So, which insulation can be used for exterior sheathing that will not cause problems?

Insulations that will breathe water vapour, like Beaver Plastic's **Terrafoam[®]**, **Durafast[®]**, and **Basewrap[®]** expanded polystyrene, can be used anywhere in the wall cavity, whether it is warm, cold, inside, outside, or anywhere in between, to any thickness. Our products will not create an external vapour barrier!

The National Building Code is written to guide construction specifiers in Canada, so that buildings will safely serve intended purposes without premature failure from improper design.

Beaver Plastics Ltd.

¹Styrofoam[®] is a registered trademark of Dow Chemical Co., and ²Celfort[®] is a registered trademark of Celfortec Inc.