



Figure 10: Air Impermeable Spray Foam Insulation

- In Climate Zones 5 or higher a Class II vapor retarder is required on the interior of the spray foam layer.
- If a high density foam is used in this assembly, a Class II vapor retarder is not required in Climate Zones 5 or higher as the high density foam itself qualifies as a Class II vapor retarder.
- A thermal barrier is required to separate spray foams from occupiable spaces due to the fire performance of spray foam insulations.

In Climate Zones 5 or higher (see Map 1) the air-impermeable insulation, including any covering adhered continuously to the bottom side should have a vapor permeance of 1 perm or less (i.e. have the characteristics of a Class II vapor retarder or lower – see sidebar). This can be achieved by applying a vapor retarder paint over the interior surface of the low density spray foam or by installing a material layer in contact with the foam that has a vapor permeance of 1 perm or less.

High density spray foam insulation due to its impermeability properties can be installed directly under roof decks in any climate zone without any additional provision for vapor diffusion resistance - including Climate Zones 5 or higher (see Map 1).

High density spray foam insulation – which is considered an “air impermeable insulation (air permeance of not more than 0.02 L/s-m² at 75 Pa pressure differential tested according to ASTM E 2178 or E 283 – identical to the definition of an air barrier material in the National Building Code of Canada) can be used in combination with other insulation systems that are not “air impermeable” (Figure 11). In this particular instance the high density foam insulation controls the access of interior moisture to the roof deck by air movement and by diffusion. This approach is similar