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Unvented Roof Assemblies Insulated with Genyk Boreal Nature Elite

Genyk 'Boreal Elite' is air impermeable. As such, the closed cell spray foam can be installed directly to the underside of roof sheathing. The foam must be installed in accordance with minimum code requirements governing thermal resistance.

Unvented roof assemblies eliminate ventilation openings and move the thermal, moisture and air control boundaries to the plane of the roof deck. Since 1995, more than a million unvented roof assemblies have been constructed with spray polyurethane foam. The advantages of an unvented roof assembly include –

- ✓ Health and Comfort – air leakage between the living space and the attic is often not well controlled. Air conditioning equipment, exhaust fans, ductwork, plumbing and electrical penetrations often create holes than connect the living space to the attic. Pressures created by mechanical equipment as well as wind and temperature difference cause air to move between spaces leading to energy waste and occupant discomfort. Uncontrolled movement of air also carries moisture to cold surfaces where it condenses. Typically, the condensation occurs on the roof sheathing. Contaminants resulting from premature building material degradation due to the uncontrolled movement of moisture laden air migrate from the attic into the living space.

Unvented roof assemblies move the thermal, moisture and air control boundaries to the roof deck so that the unvented space is at a similar condition to the living space. Air movement between the two spaces does not contribute to energy waste, occupant discomfort or contaminant problems.

- ✓ Energy Efficiency – convective air movement behind or within any insulation material substantially reduces the thermal resistance of the insulation. When spray foam is applied directly to the roof sheathing, the potential for convective looping is eliminated.

Given that 'Boreal Elite' is air impermeable, air movement through the insulation is eliminated. Thus, the insulation layer works at maximum efficiency.
When used in sloped ceilings, the significantly higher, per inch, thermal resistance values of 'Boreal Elite' allows the designer to add thermal resistance in the area most often restricted by depth restrictions. Additionally, the elimination of the space reserved for ventilation further augments the space available for a thermal resistive layer of insulation.

Unvented roof assemblies provide the potential for greater thermal resistance, and thus, are more energy efficient.

- ✓ Durability – Openings in the soffits, gables and ridge vents allow more than just air to enter attic areas. Snow is often blown in through these openings, accumulating, melting and causing damage to the ceiling or creating the potential premature structural failure. Wind driven rain can also be blown through these openings with similar results. In areas subject to wildfires, burning embers can be blown in through these openings. Finally, vermin entrance is significantly impaired when ventilation openings are eliminated and 'Boreal Elite' is installed.

  Unvented roof assemblies are not prone to moisture, fire or vermin entrance because the ventilation openings have been eliminated.

- ✓ Value – Many property owners see value in finished attics that can provide more living space and conditioned storage space. Additionally, designers are using increasingly complicated roof geometrics and providing spaces with high cathedral ceilings. These areas create problems for conventional ventilated roof assemblies because the geometry makes it impossible to ensure air tightness at the ceiling plane. Moreover, ventilation spaces in these areas become small and complex, making it difficult to ensure adequate flow rates or distribution of ventilation air within the assemblies.

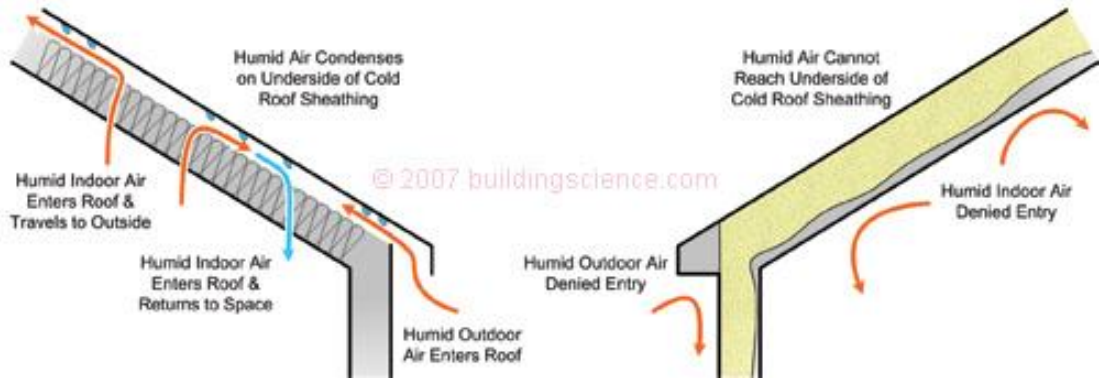
  Unvented roof assemblies allow the ventilation space to be eliminated and the construction greatly simplified.

Unvented roof assemblies installed with ‘Boreal Elite’ work well in all climate zones and serve important functions.

✓ Unvented roof assemblies control air flow.

‘Boreal Elite’ is air impermeable. The product adheres tenaciously to almost all construction surfaces and expands to fill voids. The installation of spray foam creates a complete air seal and eliminates air leakage.

Spray foam prevents warm, humid indoor air from condensing on the underside of the roof sheathing.

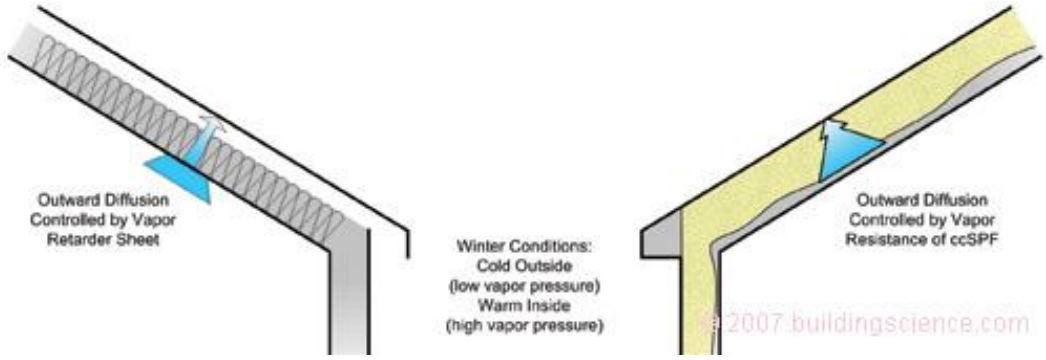


✓ Unvented roof assemblies control heat flow.

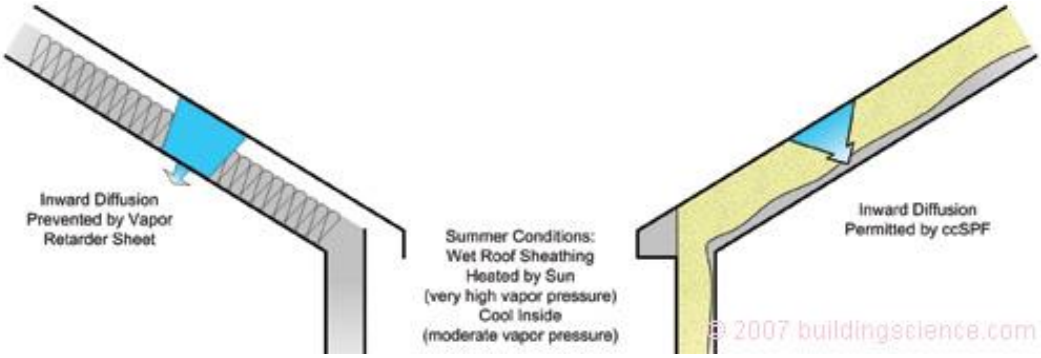
‘Boreal Elite’ has exceptional thermal resistance relative to other insulations. As such, spray foam can create a very compact roof assembly that meets or exceed the thermal performance requirements of the Building Code.

✓ ‘Boreal Elite’ controls vapour diffusion –

Closed-cell spray foam insulation controls the rate of vapour diffusion. Spray foam resists the diffusion of water vapour so that the amount of water vapour is reduced as it moves through the thickness of the foam. By the time the water vapour reaches the back of the roof sheathing, there is not enough moisture to cause condensation problems.



In colder temperatures, when spray foam has been installed at a sufficient thickness, the foam provides the first condensing plane.



In warmer temperatures, spray foam allows the assembly can still dry to the inside because the spray foam is a vapour retarder rather than a pure vapour barrier.

- ✓ 'Boreal Elite' controls rain leakage –

  Closed-cell spray foam has negligible water permeability, minimal water absorption and excellent adhesion to the substrate. Cumulatively, closed-cell spray foam acts as a secondary rainwater barrier that limits damage when the primary barrier fails. Water migration is severely limited due to the water repellent characteristics of the foam and damage is limited the area immediately adjacent to the point of water entry.

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