TECHNICAL BULLETIN
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HALO EXTERRA™ VS XPS - PERMEANCE

Exterra™ is a rigid insulation foam board made of Type 1 Neopor® Plus EPS, and coated with a clear polypropylene film that is perforated. The perforations allow Exterra™ to maintain a higher air and vapour permeance, which makes it suitable for use as exterior continuous insulation, and as a weather barrier. The higher air and vapour permeance of Exterra™ lets moisture vapour escape the wall assembly and dry towards the outside.

In comparison, a comparable leading XPS rigid insulation product exhibits properties of low air and vapour permeance. This XPS product is a vapour barrier by code[1] (less than 60 ng/Pa-m^2-s), and because a vapour barrier on the warm side of the wall assembly is still required by code, a double vapour barrier wall assembly is created when this XPS product is used on the exterior. This can result in more moisture trapped within the wall assembly, and hinder the rate of drying to the exterior.

As shown in the table below, this XPS product has a vapour permeance less than 60 ng/Pa-m^2-s and an air leakage rate less than 0.1 L/s-m^2 @ 75 Pa, which according to the National Building Code of Canada 2010 (NBCC) is considered a low permeance material[2].

The NBCC requires low permeance materials to be placed on the warm side of the wall assembly – the interior side of the wall. However, this XPS product does not comply with this requirement. Therefore, in accordance with the NBCC, wall assemblies using this XPS product on the exterior must then show compliance by determining the outboard to inboard ratio of the wall assembly.

Because Exterra™ is not a low permeance material, Exterra™ as exterior insulation is readily code compliant, and does not require outboard to inboard calculations. (The controlling air and vapour barrier, or low permeance material, in an Exterra™ wall assembly is the polyethylene vapour barrier located on the warm side of the wall assembly, as required by code).

1. NBCC 2010, Section 9.25.4.2, defines a vapour barrier to have a permeance not greater than 60 ng/Pa-s-m^2.
2. NBCC 2010, Section 9.25.5.1, defines low permeance materials and requirements.

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		Thickness, in			Vapour Barrier	Air Barrier
		1	1.5	1.625		
Comparable leading XPS product 20 psi (140 kPa), Type 3, R-5/in	R-value	5	7.5	n/a	Y	Y
	Vapour perm[2] (ng/Pa-m^2-s)	45	30	n/a		
	Air leakage (L/s-m^2 @ 75Pa)	< 0.01	< 0.01	n/a		
Exterra 15 psi (100 kPa), Type 1, R-4.7/in	R-value	4.7	7.1	7.6	N	N
	Vapour perm[1] (ng/Pa-m^2-s)	82	77	75		
	Air leakage (L/s-m^2 @ 75Pa)	> 0.1	> 0.1	> 0.1		

1. Based on independent testing.
2. Source: Available data from leading XPS product.

The low permeance properties of this XPS product can have a negative affect on the overall health of the wall assembly when used as exterior insulation. Exterra™ was designed to have higher air and vapour permeance to allow for a more breathable, healthier wall assembly.

Comparable Leading XPS Product Wall Assembly	Exterra Wall Assembly
Creates a double vapour barrier wall assembly, which can trap more moisture within the wall assembly, and hinder the drying rate to the exterior.	Perforated to be more breathable allowing moisture in the wall assembly to dry properly to the exterior.
Not readily code compliant. Must meet outboard to inboard ratio requirements, and will only apply to specific climate zones.	Readily code compliant. Controlling air and vapour barrier is the polyethylene vapour barrier placed on the warm side of the wall assembly, per code. Can apply to all climate zones.

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