


# Product Information Bulletin

## DuroFoam® Insulation - NBC 2010 Insulating Sheathing Installation Requirements

**DuroFoam®** insulation board is a moulded expanded polystyrene (EPS) insulation that meets or exceeds CAN/ULC-S701, **Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering**. The addition of a laminated film to the top and bottom surfaces of **DuroFoam** insulation board provides a more durable product that is less susceptible to handling damage.

**Table 1 – DuroFoam Insulation Material Properties**

Material Property <sup>1</sup>	Test Method	Units	Type 1	DuroFoam® Exterior Insulating Sheathing
<b>Thermal Resistance</b> <i>Minimum RSI per 25 mm (R per inch)</i>	ASTM C518	m <sup>2</sup> ·°C/W (Ft <sup>2</sup> ·hr·°F/BTU)	0.65 (3.75)	
<b>Compressive Resistance</b> <i>Minimum @ 10% Deformation</i>	ASTM D1621	kPa (psi)	70 (10)	
<b>Flexural Strength</b> <i>Minimum</i>	ASTM C203	kPa (psi)	170 (25)	
<b>Water Vapour Permeance<sup>2</sup></b> <i>Maximum</i>	ASTM E96	ng/Pa·s·m <sup>2</sup> (perm)	30 (0.5)	
<b>Water Absorption<sup>3</sup></b> <i>Maximum</i>	ASTM D2842	% By volume	6.0	
<b>Dimensional Stability</b> <i>Maximum, 7 Days @ 70 ± 2°C (158 ± 4°F)</i>	ASTM D2126	% Linear Change	1.5	
<b>Limiting Oxygen Index</b> <i>Minimum</i>	ASTM D2863	%	24	

The reflective facer on **DuroFoam** insulation contains a thin layer of foil embedded within the film. The reflective facer does not increase nominal R-value of **DuroFoam** insulation (for additional information see Plasti-Fab PIB 253 - **Facts About Thermal Resistance of Reflective Insulation**). The green face of **DuroFoam** insulation exposed to the exterior provides markings to assist in cutting the insulation and locating fasteners into interior framing as required.

1. **DuroFoam** insulation properties are third party certified to CAN/ULC-S701 under a quality listing program administered by Intertek Testing Services. DuroFoam insulation is listed by the Canadian Construction Materials Centre under CCMC Evaluation Listing 12424-L.
2. **Maximum** vapour permeance value for 25-mm (1-inch) thick EPS insulation meeting CAN/ULC-S701, Type 1 is 300 ng/Pa·s·m<sup>2</sup> (5.2 perms). The vapour permeance value provided above for **DuroFoam** insulation is significantly lower as a result of laminated films. Where water vapour permeance is a design issue, contact Plasti-Fab technical services for additional information.
3. Water absorption % by volume is determined using ASTM D2842 which involves complete submersion under a head of water for 96 hours. The value provided in the table above is the **maximum** for CAN/ULC-S701, type 1 EPS insulation without facers.

The following specification provides general material and installation requirements for **DuroFoam** insulating sheathing board in conformance with the National Building Code of Canada (NBC) 2010.

1. Scope:

- 1.1. Article 9.23.10.2. – Bracing and Lateral Support
- 1.2. Subsection 9.23.13 – Bracing to Resist Lateral Loads Due to Wind and Earthquake
- 1.3. Subsection 9.23.17. – Wall Sheathing
- 1.4. Article 9.27.3.4. – Insulating Sheathing in Lieu of Sheathing Membrane
- 1.5. Article 9.27.3.5. – Sheathing Membranes in lieu of Sheathing
- 1.6. Article 9.27.5.1. – Attachment of Cladding
- 1.7. Article 9.27.5.4. – Penetration of Fastener
- 1.8. Article 9.27.5.7. – Penetration of Fasteners

2. Materials:

2.1. Insulation Materials:

- 2.1.1. **DuroFoam** insulation is rigid expanded polystyrene (EPS) insulating sheathing board meeting the requirements of CAN/ULC-S701, Type 1 or Type 2.
- 2.1.2. **DuroFoam** insulating sheathing board does not provide bracing and lateral required in Article 9.23.10.2. Lateral bracing to resist lateral loads due to wind and earthquake shall be required as per Subsection 9.23.13.
- 2.1.3. **DuroFoam** (Type 1) insulation is listed with the Canadian Construction Materials Centre under CCMC evaluation listing 12424-L.
- 2.1.4. **DuroFoam HD** (Type 2) insulation is listed with the Canadian Construction Materials Centre under CCMC evaluation listing 12425-L.
- 2.1.5. If the exterior cladding requires solid backing per Sentence 9.23.17.1.(1), the minimum thickness of **DuroFoam** insulating sheathing meeting CAN/ULC-S701, Type 1 and 2 would be 38 mm (1 ½") as per Sentence 9.23.17.2.(1) and Table 9.23.17.2.A..
- 2.1.6. As stated in Sentence 9.23.17.3.(1), rigid insulating sheathing board shall not be used for the attachment of cladding materials.
- 2.1.7. Sentence 9.27.3.4.(1) states where non-wood-based rigid exterior insulating sheathing, or exterior insulating sheathing with an integral sheathing membrane is installed, a separate sheathing membrane is not required.
- 2.1.8. Sentence 9.27.3.4.(2) states that where insulating sheathing is used in lieu of a sheathing membrane, the joints of rigid insulating sheathing panels must be lapped or detailed to ensure drainage of water to the exterior of the wall or all joints must be sealed.
- 2.1.9. Sentence 9.27.3.5.(3) states that insulating sheathing not detailed as per section 2.1.8 above is permitted to be used in lieu of one layer of sheathing membrane.
- 2.1.10. Cladding over **DuroFoam** insulating sheathing cladding shall be fastened to the framing members or furring members, or to blocking between the framing members as per Sentence 9.23.5.1.(1).
- 2.1.11. As per Sentence 9.27.5.4.(1) nail or staple size and spacing for the attachment of cladding and trim shall conform to Table 9.27.5.4.

2.2. Other Materials:

- 2.2.1. Caulking adhesives used shall be compatible with polystyrene insulation conforming to CSGB 71-GP-24M, Adhesive, Flexible, for Bonding Cellular Polystyrene Insulation.

- 2.2.2. Construction tape used shall be any commercially available construction tape such as 3M, Venture or equivalent.
- 2.2.3. Foam-in-place polyurethane shall be commercially available material compatible with polystyrene insulation.
- 2.2.4. Fasteners must be minimum 3.2 mm (1/8") diameter with heads or washers at least 12.7 mm (1/2") in diameter, where the cladding is applied directly against the insulation, and at least 25.4 mm (1") diameter, where an air space between the insulation and the cladding exists.

3. Installation:

3.1. General:

- 3.1.1. Framing, cavity insulation, and vapour barrier on the inside of framing (warm side) are all to be installed following normal construction practices and in conformance with the applicable section of the Building Code.
- 3.1.2. Install **DuroFoam** insulating sheathing board on the exterior of wood stud construction with the horizontal joints tightly butted together (joints should be no larger than 1 mm). Vertical joints between boards shall be made over the studs.
- 3.1.3. Fasteners as per section 2.2.4 above for attaching **DuroFoam** insulating sheathing shall extend not less than 25 mm (1") into the framing.
- 3.1.4. When used as a backing for an exterior cladding, the **DuroFoam** insulating sheathing board shall be fastened to framing at not more than 150 mm (6 in) centers along its vertical edges.
- 3.1.5. Use a suitable material as per section 2.2.1, 2.2.2 or 2.2.3 above, to seal joints which have been damaged or cut. Typical locations where the joint may be cut include at corners or around windows and doors.
- 3.1.6. As stated in Sentence 9.27.5.1.(1), cladding material shall be nailed to the framing members, furring members or to blocking between the framing members.
- 3.1.7. Cladding materials attached over the exterior side of **DuroFoam** insulating sheathing are to be installed following normal construction practices with all fasteners penetrating through the **DuroFoam** insulating sheathing into framing members in conformance with the applicable section of the Building Code. Nail or staple size and spacing shall comply with Sentence 9.23.5.4.(1) with penetration of fasteners into attachment surfaces as per Article 9.23.5.7.

## DuroFoam Insulation - Frequently Asked Questions



### Should **DuroFoam** insulation be installed with the reflective face facing inwards or outwards in wall or floor assemblies?

The reflective facer on **DuroFoam** insulation contains a thin layer of foil embedded within the film. The reflective facer does not increase nominal R-value of **DuroFoam** insulation. See Plasti-Fab Product Information Bulletin No. 253 for additional information on reflective insulation.

### How does **DuroFoam** insulation compare to other insulation types?

**DuroFoam** insulation provides excellent durability and a very competitive cost per R-value when compared to other insulation materials.

### How is **DuroFoam** insulation attached to the wall structure?

**DuroFoam** insulation is attached to a wood frame walls using fasteners with minimum 3.2 mm (1/8") diameter heads or washers at least 12.7 mm (1/2") in diameter, where the cladding is applied directly against the insulation, and at least 25.4 mm (1") diameter, where an air space between the insulation and the cladding exists.

### Does a separate sheathing membrane need to be applied over **DuroFoam** insulation installed over the exterior of wood frame walls?

When **DuroFoam** insulation is installed with the joints sealed to ensure drainage of water to the exterior of the wall a separate sheathing membrane is not required.

### Are there installation instructions for **DuroFoam** insulation used in various applications available on line?

Typical installation instructions and how-to videos can be downloaded from the Plasti-Fab website at [www.plastifab.com](http://www.plastifab.com).