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# *Preface*

## *Evaluation Listings for Expanded Polystyrene Insulation Board*

2001-03-05

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### **Masterformat**

**Section: 07214.1**

### **Expanded Polystyrene Insulation**

Expanded polystyrene thermal insulation board is classified under two categories: extruded/expanded (XEPS) and moulded/expanded (EPS).

Extruded polystyrene insulation in board stock form is made by the continuous extrusion of expanded polystyrene resin crystal. Moulded polystyrene insulation is made by expanding a batch of polystyrene beads in a mould to form a large block, which is then cut into board stock.

For the extruded/expanded (XEPS) products listed here, testing has demonstrated that they meet the requirements of the product standard. Applicants provide evidence, through a quality assurance program, and attest that products manufactured at their plant are of a quality equal to or better than that claimed in the product standard.

The moulded/expanded polystyrene (EPS) insulation industry provides for quality assurance by listing with accredited certification organizations. As a convenience to subscribers of CCMC's Registry of Product Evaluations and at the request of the manufacturers, the following listings for moulded EPS are provided based solely on the certification listing by one of the accredited certification organizations. The organizations that currently provide these services for the products are Intertek Testing Services NA Ltd. and the Underwriters' Laboratories of Canada.

### **Evaluation to Codes and Standards**

Article 9.25.2.2. of the National Building Code of Canada (NBC) 1995 requires that this insulation conform to CAN/CGSB 51.20-M87, "Thermal Insulation, Polystyrene, Boards and Pipe Covering."

In the First Revision and Errata to the NBC 1995 issued in July 1998, the new standard CAN/ULC-S701-97, "Thermal Insulation Polystyrene, Boards and Pipe Covering," was officially recognized in Article 9.25.2.2. Table 1 of this Preface lists the material properties in this standard.

Products evaluated and listed by CCMC after this date are to the new ULC standard.

The evaluation listings referred to in this section are classified in accordance with their types as noted in Table 1.

**Table 1. Material Properties**

Property	Requirements			
	Type 1	Type 2	Type 3	Type 4
Thermal Resistance, min., (m <sup>2</sup> .°C/W) (for 25 mm thickness)	0.65	0.70	0.74	0.86
Water Vapour Permeance, max. (ng/Pa.s.m <sup>2</sup> )*	300	200	130	60
Dimensional Stability, max. (% linear change)	1.5	1.5	1.5	1.5
Flexural Strength, min. (kPa)	170	240	300	350
Water Absorption, max. (% by volume)	6	4	2	0.7
Compressive Strength, min. (kPa)	70	110	140	210
Limiting Oxygen Index, minimum %	24	24	24	24

\* Values quoted are maximum values for 25-mm-thick sample with facings intact. Lower values will result for thicker materials.

### Use and Limitations

Where required, the flame-spread classification of the material should be determined according to CAN4-S102.2-M. Expanded polystyrene thermal insulation board unrated with respect to a flame-spread classification shall only be used as limited by the local building code.

Products are available in the following categories of flame-spread classification and are suitable for the following intended uses:

#### Flame-Spread

<u>Classification</u>	<u>Example of Use</u>
< 500	<ul style="list-style-type: none"> <li>· cavity wall insulation</li> <li>· low temperature insulation applications</li> <li>· thermal sheathing</li> </ul>
Unrated	<ul style="list-style-type: none"> <li>· roof insulation</li> <li>· underground perimeter wall insulation</li> <li>· under floor insulation</li> <li>· NBC Part 9 construction with protective coating</li> </ul>

### In Roof Installations

As specified in NBC 1995, Sentence 3.1.5.11.(5), combustible insulation is permitted above roof decks although, under certain conditions, as per NBC 1995, Subsection 3.1.14., roof assemblies of which the insulation is but one component must be tested in accordance with CAN/ULC-S126-M.

### As Wall Sheathing

As specified in NBC 1995, Article 9.23.17.4., when expanded polystyrene thermal insulation is used as a wall sheathing with sealed, lapped or tongue and groove joints it may be considered a substitute for the two required layers of sheathing paper.

The CCMC listing may indicate the water vapour permeance of the tested material as information to building officials.

Expanded polystyrene thermal insulation shall not be considered a substitute for sheathing in terms of providing bracing. It can, however, be considered to provide backing for exterior cladding, where required, provided it is installed with a minimum thickness of 38 mm for Type 1

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or 2, and a 25 mm minimum thickness for Type 3 or 4, as specified in Table 9.23.16.2.A. of the NBC 1995.

When expanded polystyrene thermal insulation is used in an exposed building face, the construction must conform to Article 3.2.3.7. of the NBC 1995 for buildings outside the scope of Part 9 of the codes, and Article 9.10.14.11. for buildings regulated by Part 9. 'Cladding systems' incorporating expanded polystyrene are the subject of another CCMC evaluation. With respect to protection of interior spaces, the proper thermal barrier must be installed in accordance with Articles 3.1.5.11. or 9.10.16.10 of the NBC 1995.

### Identification

The product is identified by the following:

- CAN/CGSB 51.20-M87 and/or CAN/ULC-S701-97;
- type number;
- manufacturer's name or trademark;
- the CCMC evaluation listing number. (For moulded EPS it has been recommended that the CCMC number be incorporated in the certification mark);
- certification mark for moulded/expanded (EPS) products; and
- the following warning:  
"Caution: This product is combustible. A protective barrier or thermal barrier is required as specified in the appropriate building code."

### Installation

In all installations the product must be installed in accordance with the manufacturer's instructions and good construction practice.

For roofing applications, the recommended method of mechanical attachment should be used whenever possible. However, when mechanical fastening is not preferred or when it may not be practical, built-up roofs may be used.

When used as backing for exterior cladding, this insulation must be fastened to framing at not more than 150 mm on centre along its vertical edges and on a grid not more than 300 mm x 600 mm for the remainder of the sheet. Fasteners must have heads or washers at least 12.7 mm in diameter where the cladding is applied directly against the insulation, and at least 25.4 mm in diameter where an air space exists between the insulation and the cladding.