Product Information Bulletin

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Quebec Construction Code (amended NBC 2010)
Plasti-Fab EPS Product Solutions

Plasti-Fab® manufactures expanded polystyrene (EPS) product solutions that meet energy efficiency requirements required by Quebec Construction Code, Chapter I – Building, and National Building Code of Canada 2010 (amended). This bulletin summarizes Plasti-Fab EPS product solutions as options for use in building assemblies that would comply with buildings with residential occupancy per Quebec Construction Code, Part 11.

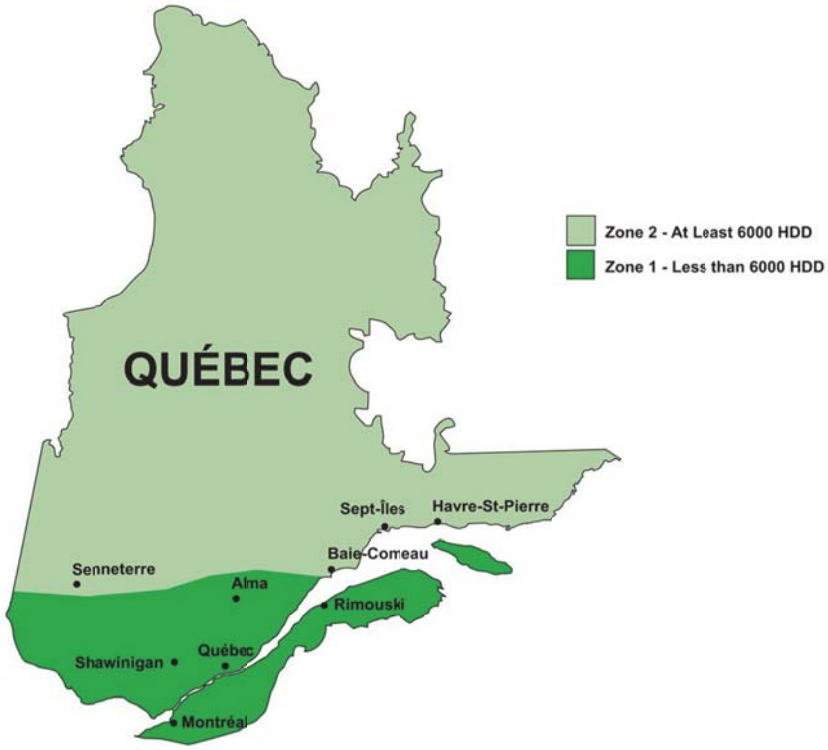

Figure 1: 2012 Quebec Climate Zone Map

Table 1 – Quebec Construction Code, Division B, Appendix C, Climate Data

Less Than 6,000 Heating Degree Days (HDD)				At Least 6,000 Heating Degree Days (HDDs)			
Location	HDD	Location	HDD	Location	HDD	Location	HDD
Montréal	4,200	Rivière-du-Loup	5,380	Rouyn	6,050	Sept-Îles	6,200
Shawinigan	5,050	Gaspé	5,500	Baie-Comeau	6,020	Val-d'Or	6,180
Québec	5,080	Alma	5,800	Dolbeau	6,250	Amos	6,160
Rimouski	5,300	Roberval	5,750	Havre-St-Pierre	6,100	Senneterre	6,180

Table 2 provides minimum total thermal resistance – RSI_T (R_T) – from the Quebec Construction Code for above grade wall applications. RSI_T (R_T) of a separation is defined in Article 1.4.1.2. of the Quebec Construction Code as the sum of the thermal resistance of all material layers in a component along a line crossing the insulated portion of the separation (including the interior and exterior surface air film of the envelope).

Table 2 – Quebec Construction Code – RSI_T (R_T) for Above Grade Walls

Reference Table	Climate Zone	RSI_T	R_T
Table 11.2.2.1.A.	Less Than 6,000 HDD (<6,000 HDD)	4.31	24.5
Table 11.2.2.1.B.	At Least 6,000 HDD (≥6,000 HDD)	5.11	29.0

In addition, Quebec Construction Code, Sentence 11.2.3.1.(1) requires that wood framing members spaced less than 600 mm (24") on center in building components constituting a thermal bridge shall be covered with insulating material having a thermal resistance of at least RSI-0.7 (R-4.0). Table 3 below provides examples of Plasti-Fab EPS product solutions that can be used to meet Quebec Construction Code requirements for above grade wall applications.

Table 3 - Plasti-Fab Product EPS Solutions for Above Grade Walls

Plasti-Fab Wall Option Description	Climate Zone	Required RSI_T (R_T)	Base Wall RSI (R)[1]	RSI (R) Plasti-Fab Solution
Wall Options with Plasti-Fab Continuous EPS Insulating Sheathing[2]				
Option A Base wall - 2 x 4 wood studs @ 406 mm (16") on center with RSI-2.29 (R-13) cavity insulation	<6,000 HDD	4.31 (24.5)	2.63 (15.0)	1.68 (9.5)
	≥6,000 HDD	5.11 (29.0)		1.95 (11.1)
Option B Base wall - 2 x 6 wood studs @ 406 mm (16") on center with RSI-3.34 (R-19) cavity insulation[3]	<6,000 HDD	4.31 (24.5)	3.68 (20.9)	0.70 (4.0)
	≥6,000 HDD	5.11 (29.0)		1.43 (8.1)
Wall Options with Plasti-Fab Building Systems				
Option C Advantage ICF System® insulating concrete form above grade wall (See Advantage ICF System PIB 222 for RSI_{eff}/R_{eff} calculation per note 4)	<6,000 HDD	4.31 (24.5)	NA	4.14 (23.5)
Option D Insulspan® SIP System – 6 ½" structural insulating panel wall (See Insulspan SIP System PIB 209 for RSI_{eff}/R_{eff} calculation per note 4)	<6,000 HDD	4.31 (24.5)	NA	3.42 (19.4)
Option E Insulspan® SIP System – 8 ¼" structural insulating panel wall (See Insulspan SIP System PIB 209 for RSI_{eff}/R_{eff} calculation per note 4)	≥6,000 HDD	5.11 (29.0)	NA	4.32 (24.5)

1. Base wall RSI_T (R_T) calculations include the contribution from cavity insulation plus continuous elements other than Plasti-Fab EPS insulation – i.e., outside air film, cladding, gypsum board and inside air film.
2. Table 7 provides thermal resistance (RSI/R) values for Plasti-Fab continuous EPS insulation options.
3. DuroFoam and DuroFoam Plus insulations are manufactured with a laminated film on each face and have a vapour permeance characteristic less than 60 ng/Pa•s•m^2. When applied as exterior insulating sheathing, DuroFoam and DuroFoam Plus insulation with a minimum RSI-0.92 (R-5.2) is recommended for building locations in climate zone locations with less than 6,000 HDD in order to meet minimum ratio of outboard to inboard insulation per Quebec Construction Code, Article 9.25.5.2.
4. The RSI (R) values provided above for Plasti-Fab building system solution options are RSI_{eff}/R_{eff} values. RSI_{eff}/R_{eff} (effective thermal resistance) of building assemblies is calculated as per NBC 2010, section 9.36.2 using the formula below which includes the effect of thermal bridging due to repetitive structural members such as wood framing members in walls.

$$\mathbf{RSI_{eff}\ (R_{eff})} = \frac{100\%}{\frac{\%\ \text{Area of Framing}}{RSI_F(R_F)} + \frac{\%\ \text{Area of Cavity}}{RSI_C(R_C)}} + \text{RSI(R) Continuous Material Layers}$$

Table 4 provides minimum RSI_T (R_T) from the Quebec Construction Code for below-grade foundation wall applications. Table 6 provides minimum RSIT (RT)

Table 4 – Quebec Construction Code RSI_T (R_T) of Below-Grade Foundation Walls

Reference Table	Climate Zone	RSI_T	R_T
Table 11.2.2.1.A.	Less Than 6,000 HDD (<6,000 HDD)	2.99	17.0
Table 11.2.2.1.B.	At Least 6,000 HDD (≥6,000 HDD)	2.99	17.0

Table 5 provides examples of Plasti-Fab EPS product solutions that can be used to meet Quebec Construction Code requirements for below-grade foundation wall applications.

Table 5 - Plasti-Fab EPS Product Solutions for Below-Grade Foundation Walls

Plasti-Fab Wall Option Description	Required RSI_T (R_T)	Base Wall RSI (R)[1]	RSI (R) Plasti-Fab Solution
Wall Option with Plasti-Fab Continuous EPS Interior or Exterior Insulation[2]			
2 x 3 wood framing @ 610 mm (24") on center on interior of concrete foundation wall with continuous Plasti-Fab EPS insulation applied over interior or exterior of foundation wall	2.99 (17.0)	0.35 (2.0)	3.11 (17.6)
Wall Option with Plasti-Fab Building System			
Advantage ICF System® insulating concrete form foundation wall (See Advantage ICF System PIB 222 for RSI_{eff}/R_{eff} calculation)	2.99 (17.0)	NA	4.00 (22.7)

1. Table 7 provides thermal resistance (RSI/R) values for Plasti-Fab continuous EPS insulation options.
2. RSI(R) in table 5 is RSI_{eff}/R_{eff} for wall system built with Advantage ICF System.

Table 6 provides minimum RSIT (RT) for slabs-on-ground which can be achieved using Plasti-Fab EPS insulation as per Table 7.

Table 6 – Thermal Resistance Insulation for Slabs-on-Ground

Code Reference	Application	Requirement	RSI_T	R_T
Clause 11.2.2.2.(1)(b)	Unheated slab-on-ground more than 600 mm below the adjacent ground level	Perimeter installed around the slab-on-ground for a width of at least 1.2 m	1.32	7.5
Clause 11.2.2.2.(1)(c)	Unheated slab-on-ground	Continuous insulation under entire slab-on-ground	1.76	10.0

Table 7 – RSI (R-value) Plasti-Fab Continuous EPS Insulation Options

Plasti-Fab Continuous EPS Insulation Option	RSI (R) Unit of Thickness
PlastiSpan® or DuroFoam® insulation	RSI-0.65 per 25 mm (R-3.75 per inch)
PlastiSpan HD or DuroFoam Plus insulation	RSI-0.70 per 25 mm (R-4.04 per inch)
EnerSpan® insulation	RSI-0.82 per 25 mm (R-4.7 per inch)