Plasti-Fab EPS PRODUCT SOLUTIONS
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Product Information Bulletin

Plasti-Fab EPS Product Solutions - 2012 OBC, MMA SB-10

Plasti-Fab manufactures expanded polystyrene (EPS) product solutions that meet energy efficiency requirements in the 2012 Ontario Building Code. This bulletin summarizes energy efficiency requirements applicable to buildings with residential occupancy as per 2012 OBC, Division B, Part 12, ***Resource Conservation and Environmental Integrity***.

2012 OBC, Division B, Sentence 12.2.1.2.(2) addresses energy efficiency design after December 31, 2016. The energy efficiency of all buildings ***except*** buildings of residential occupancy within the scope of 2012 OBC, Part 9 and buildings as per 2012 OBC, Sentence 12.2.1.2.(4) shall,

a) be designed to exceed by not less than 13% the energy efficiency levels required by Sentence 12.1.1.1.(2), or
b) conform to Division 1 and Division 3 or 5 of MMA Supplementary Standard SB-10, "Energy Efficiency Requirements.",

Except for buildings addressed by Sentence 12.2.1.2.(4), the energy efficiency of a building or part of a building of residential occupancy within the scope of 2012 OBC, Part 9 and is intended for occupancy on a continuing basis during the winter months shall,

a) be designed to exceed by not less than 5% the energy efficiency levels required by Sentence 12.1.1.1.(3), or
b) conform to Chapters 1 and 3 of MMA Supplementary Standard SB-12, "Energy Efficiency for Houses."

Note: See Plasti-Fab Product Information Bulletin no. 279 for additional information,

The options offered in MMA SB-10, Division 3 are energy efficiency levels attained by

a) 2013 ANSI/ASHRAE/IES 90.1 and Chapter 2,
b) 2015 NECB and Chapter 3, or
c) Section 7 "Energy Efficiency" of 2014 ANSI/ASHRAE/USGBC/IES 189.1.

This bulletin addresses Plasti-Fab EPS Solutions for conformance to modified requirements from 2015 NECB as per Table SB 3.2.2.2. from MMA SB-10, Division 3, Chapter 3 for Zones 5, 6, 7a, 7b and 8 as noted Table 1 below for opaque above grade wall and roof assemblies.

Table 1 – Overall Thermal Transmittance for Above-Ground Opaque Building Assemblies

Climate Zone	Zone 5		Zone 6		Zone 7a		Zone 7b		Zone 8	
	3,000 to 3,999		4,000 to 4,999		5,000 to 5,999		6,000 to 6,999		≥ 7,000	
Assembly	**Maximum Overall Thermal Transmittance - W/(m²•°C)**									
Walls	0.278		0.247		0.210		0.210		0.183	
Roofs	0.156		0.156		0.138		0.138		0.121	
Minimum Effective Thermal Resistance[1]										
Climate Zone	**Zone 5**		**Zone 6**		**Zone 7a**		**Zone 7b**		**Zone 8**	
Unit of Measure	**RSI_{eff}**	**R_{eff}**	**RSI_{eff}**	**R_{eff}**	**RSI_{eff}**	**R_{eff}**	**RSI_{eff}**	**R_{eff}**	**RSI_{eff}**	**R_{eff}**
Walls	3.60	20.4	4.05	23.0	4.76	27.0	4.76	27.0	5.46	31.0
Roofs	6.41	36.4	6.41	36.4	7.25	41.1	7.25	41.1	8.26	46.9

Table 1 Note: RSI_{eff} expressed in (m²•°C)/W and R_{eff} expressed in (ft²•hr•°F)/Btu.

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Prescriptive requirements for the thermal characteristics of above-ground building assemblies provided in NECB 2015, Division B, Section 3.2 are expressed as ***overall thermal transmittance*** (U-value). U-value is the rate, in W/(m^2·K), at which heat is transferred through a building assembly that is subject to a temperature difference and represents the amount of heat transferred through a unit area in a unit of time induced under steady-state conditions by a unit temperature difference between the environments on its two faces.

U-value is the inverse of ***effective thermal resistance*** (**RSI_{eff}**), in (m^2·K)/W, of a building assembly representing the resistance to heat transfer. RSI_{eff} calculated using the formula below provided for NBC 2010, Section 9.36, includes the effect of thermal bridging due to repetitive structural members such as wood framing members in walls.

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

The minimum RSI_{eff} (R_{eff}) values in Table 1 for roofs can be achieved using Plasti-Fab EPS insulation. Table 2 provides examples of roof assemblies using continuous Plasti-Fab EPS insulation above a steel roof deck to meet NECB 2011 minimum RSI_{eff} (R_{eff}) requirements.

Table 2 – Plasti-Fab EPS Product Solutions for Roof Assemblies

Roof Assembly		Zone 5 & 6 Roof System	Zone 7a & 7b Roof System	Zone 8 Roof System
Outside Air Film		0.03	0.03	0.03
Roof Membrane		Nil	Nil	Nil
Cover Board		0.03	0.03	0.03
Plasti-Fab EPS Insulation Solution		6.24	7.08	8.09
Vapour Barrier		Nil	Nil	Nil
Metal Roof Deck		Nil	Nil	Nil
Inside Air Film		0.11	0.11	0.11
RSI_{eff}	**$(m^2$•°C)/W**	**6.41**	**7.25**	**8.26**
R_{eff}	**$(ft^2$•hr•°F)/Btu**	**36.4**	**41.1**	**46.9**

Table 2 Notes:
1. RSI for component materials in above calculations are as per the NBC 2010, Division B, Table A-9.36.2.4.(1)-D.
2. To convert ***Plasti-Fab EPS Insulation Solution*** RSI in the table above, expressed in (m^2•°C)/W, to R-value, expressed in (ft^2•hr•°F)/Btu, multiply by 5.678263.
3. Table 6 provides thermal resistance (RSI/R) values for Plasti-Fab continuous EPS insulation options.

Table 3 provides Plasti-Fab EPS insulation solutions that can be used to meet minimum RSI_{eff} (R_{eff}) requirements in Table 2 for above grade wall assemblies built using wood frame construction.

Table 3 - Plasti-Fab EPS Product Solutions for Above Grade Wood-Frame Wall Assemblies

Wall Option Description	NECB Climate Zone	Minimum RSI_{eff} (R_{eff})	Base Wall[1] RSI_{eff} (R_{eff})	RSI (R) Plasti-Fab Insulation
Wall Options with Plasti-Fab Continuous EPS Insulation[2]				
Option A Base wall - 2 x 4 wood studs @ 406 mm (16") on center with RSI-2.29 (R-13) cavity insulation	5	3.60 (20.4)	1.90 (10.8)	1.70 (9.6)
	6	4.05 (23.0)		2.15 (12.2)
Option B Base wall - 2 x 6 wood studs @ 406 mm (16") on center with RSI-3.34 (R-19) cavity insulation	5	3.60 (20.4)	2.70 (15.3)	0.90 (5.1)
	6	4.05 (23.0)		1.35 (7.7)
	7a to 7b	4.76 (27.0)		2.06 (11.7)
	8	5.46 (31.0)		2.76 (15.7)

Table 3 Notes:
1. RSI_{eff} (R_{eff}) calculations for base wall include contribution from wood studs with 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 5 provides thermal resistance (RSI/R) values for Plasti-Fab continuous EPS insulation options.

Table 4 provides Plasti-Fab EPS insulation solutions that can be used to meet minimum RSI_{eff} (R_{eff}) requirements in Table 2 for above grade wall assemblies built using steel stud construction.

Table 4 - Plasti-Fab EPS Product Solutions for Above Grade Steel Stud Wall Assemblies

Wall Option Description	NECB 2011 Climate Zone	Minimum RSI_{eff} (R_{eff})	Base Wall[1] RSI_{eff} (R_{eff})	RSI (R) Plasti-Fab Insulation
Wall Options with Plasti-Fab Continuous EPS Insulation[2]				
Option A Base wall - 2 x 4 steel studs @ 406 mm (16") on center with RSI-2.47 (R-14) cavity insulation	5	3.60 (20.4)	1.55 (8.8)	2.05 (11.6)
	6	4.05 (23.0)		2.50 (14.2)
	7a to 7b	4.76 (27.0)		3.21 (18.2)
Option B Base wall - 2 x 6 steel studs @ 406 mm (16") on center with RSI-3.52 (R-20) cavity insulation	5	3.60 (20.4)	2.03 (11.5)	1.57 (8.9)
	6	4.05 (23.0)		2.02 (11.5)
	7a to 7b	4.76 (27.0)		2.73 (15.5)
	8	5.46 (31.0)		3.43 (19.5)

Table 4 Notes:
1. RSI_{eff} (R_{eff}) calculations for base wall include contribution from steel studs with 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 5 provides thermal resistance (RSI/R) values for Plasti-Fab continuous EPS insulation options.

Table 5 – 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)