Advantage ICF PIB 222

Advantage ICF System - NBC 2010 Energy Efficiency Requirements

Advantage ICF System®
Product Information Bulletin

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Advantage ICF System - NBC 2010 Energy Efficiency Requirements

The ***Advantage ICF System***® is an energy efficient insulating concrete forming (ICF) system used consisting of a continuous layer of expanded polystyrene (EPS) insulation over the interior and exterior face of a solid concrete core. This bulletin provides examples of typical ***Advantage ICF System*** wall assemblies for above and below grade applications that meet the requirements of the National Building Code of Canada 2010 (NBC 2010).

Advantage ICF System walls do not use wood framing so the interior and exterior EPS insulation panels are continuous versus wood frame assemblies which are constructed with wood studs at 406 mm (16") to 610 mm (24") on center. Energy efficiency requirements in NBC 2010, Subsection 9.36.2. are based upon minimum ***effective thermal resistance (RSI_{eff}/R_{eff})*** of building assemblies which includes the effect of thermal bridging due to repetitive structural members such as wood framing in wall assemblies calculated using the formula below.

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

Since the ***Advantage ICF System*** consists of a monolithic concrete core with continuous insulation on the interior and exterior faces, there is no framing or cavity insulation calculation and the ***minimum effective thermal resistance*** need only include the calculation for the continuous layers. Table 1 provides ***RSI_{eff}*** (***R_{eff}***) for ***Advantage ICF System*** above-grade and below-grade wall applications.

Table 1 – RSI_{eff} (R_{eff}) for Advantage ICF Wall Assemblies

Above-Grade Wall Components	RSI_{eff}	Below-Grade Foundation Components	RSI_{eff}
Outside Air Film	0.03		
Metal Siding	0.11		
Type 2 EPS Insulation	***1.87***	***Type 2 EPS Insulation***	***1.87***
152-mm Concrete Wall	0.06	152-mm Concrete Wall	0.06
Type 2 EPS Insulation	***1.87***	***Type 2 EPS Insulation***	***1.87***
13-mm Gypsum Wall Board	0.08	13-mm Gypsum Wall Board	0.08
Inside Air Film	0.12	Inside Air Film	0.12
RSI_{eff} (R_{eff})	**4.14 (23.5)**	**RSI_{eff} (R_{eff})**	**4.00 (22.7)**

Table 2 provides ***minimum effective thermal resistance*** per NBC 2010, Tables 9.36.2.6.A. and 9.36.2.6.B. for above grade wall assemblies and Tables 9.36.2.8.A. and 9.36.2.8.B. for below-grade walls.

Table 2 - Minimum Effective Thermal Resistance for Wall Assemblies per NBC 2010

Climate Zones	Zone 4	Zone 5	Zone 6	Zone 7A	Zone 7B	Zone 8
Heating Degree-Days (HDD) Celsius Degree-Days	< 3,000	3,000 to 3,999	4,000 to 4,999	5,000 to 5,999	6,000 to 6,999	≥ 7,000
Above-Grade Walls						
Table 9.36.2.6.A. - Buildings Where a Heat Recovery Ventilator (HRV) is not Installed						
RSI_{eff} (R_{eff})	2.78 (15.8)	3.08 (17.5)	3.08 (17.5)	3.08 (17.5)	3.85 (21.9)	3.85 (21.9)
Table 9.36.2.6.B. - Buildings Where a Heat Recovery Ventilator (HRV) is Installed						
RSI_{eff} (R_{eff})	2.78 (15.8)	2.97 (16.9)	2.97 (16.9)	2.97 (16.9)	3.08 (17.5)	3.08 (17.5)
Below-Grade Foundations						
Table 9.36.2.8.A. - Buildings Where a Heat Recovery Ventilator (HRV) is not Installed						
RSI_{eff} (R_{eff})	1.99 (11.3)	2.98 (16.9)	2.98 (16.9)	3.46 (20.0)	3.46 (20.0)	3.97 (22.5)
Table 9.36.2.8.B. - Buildings Where a Heat Recovery Ventilator (HRV) is Installed						
RSI_{eff} (R_{eff})	1.99 (11.3)	2.98 (16.9)	2.98 (16.9)	2.98 (16.9)	2.98 (16.9)	2.98 (16.9)

The ***Advantage ICF System*** wall assemblies in Table 1 meet the ***minimum effective thermal resistance*** requirements per NBC 2010 for all climate zones for both above-grade wall and below-grade foundation applications.