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December 19, 2001

Alain Leger, P.Eng.
AIM Building Products
P.O. Box 189
Long Sault, ON
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Dear Mr. Alain:

Re: Thermal Resistance Calculations of Nudura Insulated Concrete Form
Report No. 01-06-M0379-2

As requested, we have performed a calculation to determine the thermal resistance (R-value) of a typical installation of a Nudura wall system.

The calculations were performed in accordance with Chapters 23 and 25 of the 2001 ASHRAE Fundamentals Handbook. The Nudura insulated concrete form system consists of two panels of expanded polystyrene connected together with hinging polypropylene webs at 200 mm (8") on center. The 61 mm (2 3/8") insulation panels have rows of dovetailed keys having an average thickness of 12.5 mm (1/2") and depth of 6 mm (1/4"). The resulting effective thickness of each panel is 63 mm. The assumed density of the panels is 21 kg/m³ (1.3 pcf) with a corresponding thermal resistance of 0.28 m².K/W per centimeter (4 Btu/(ft².hr.°F) per inch). The effective thickness of the concrete core is 163 mm (6 7/16") and the thermal resistance was assumed to be 0.006 m².K/W per centimeter (0.09 Btu/(ft².hr.°F) per inch.

The webs connecting the insulating panels are high density polypropylene and are spaced every 200 mm (8"). These webs penetrate the concrete in the finished system. Due to the small cross-section and the thermal properties of the plastic, the thermal effect of the webs is not significant and was excluded from the calculation.

Table 1, below, summarizes the thermal calculations.

Component	Thermal Resistance.	
	m ² .K/W	Btu/(ft ² .hr.°F)
Outdoor film (winter condition)	0.029	0.17
Siding (hollow backed vinyl/steel)	0.107	0.61
Outer insulation panel	1.750	9.94
Concrete core	0.102	0.58
Inner insulation panel	1.750	9.94
Gypsum Wallboard	0.080	0.45
Indoor Film	0.120	0.68
Total RSI / R-Value	3.94	22.4

Table 1 – Thermal resistance calculations for Nudura wall system.

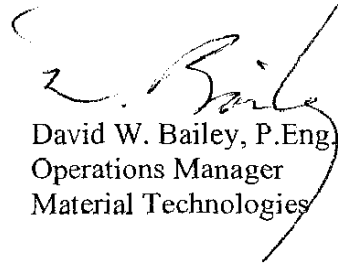
The total thermal resistance values can be increased if exterior cladding materials of greater thermal resistance are used (eg. 19 mm x 250 mm beveled wood siding would have a thermal resistance of 0.185 m².K/W thus increasing the overall resistance to 4.02 m².K/W).

We trust that this presents the information you require.

Sincerely,



Paul Chisholm, M.A.Sc., P.Eng.
Project Engineer
Building Performance, Material Technologies



David W. Bailey, P.Eng.
Operations Manager
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