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EVALUATION OF "WFR2" FOAM EXPANSION JOINT MATERIAL FOR STEADY STATE THERMAL TRANSMISSION PROPERTIES BY MEANS OF A HEAT FLOW METER IN ACCORDANCE WITH ASTM C518 – 04

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1.0 INTRODUCTION

At the request of Emseal Corporation, Exova was retained to evaluate a sample of foam expansion joint material for thermal transmission properties, in accordance with ASTM C518 – 04 "Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat *Flow Meter Apparatus". The details of the proposed service are provided in Proposal No. 09-006-5687*

Upon receipt, the sample was assigned the following Exova Sample No.:

Client Sample Identification	Exova Sample No.
"Emseal WFR2" Foam Expansion Joint Material	09-06-M0374-D

The material was evaluated in its condensed state. The material was held in a wooden cavity with outside dimensions of 300 mm x 300 mm. The frame height was less than that of the sample so that contact was ensured between the sample and the measurement plates.

2.0 PROCEDURE

The sample was evaluated in accordance with the following standard test method:

Test Description	Test Method
Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus	ASTM C518 – 04

Sample	300 mm x 300 mm by 100 mm (nominal)
Conditioning:	> 40 hrs at 23^0C and 50% RH Conditioning Room 3028, MII# A11354
Test Conditions:	24^0C mean temperature 22^0C delta T across the sample
Apparatus:	LaserComp Fox 314 Heat Flow Meter (MII # A14505)
Orientation:	Top and Bottom Faces Horizontal Heat Flow Vertical (Through Faces)
Test Date:	2009-11-11

3.0 RESULTS

A summary of results is presented below. In all cases, SI units are the primary units of measure.

Table 1 – Thermal Transmission Properties
ASTM C 518 – 04
Exova Sample No.: 09-06-M0374-D

Description	Result	
Units:	*Metric*	*British*
Specimen Thickness mm [in.]	94.86	[3.734]
Upper Surface Temperature ^{0}C [^{0}F]	13.02	[55.44]
Lower Surface Temperature ^{0}C [^{0}F]	35.02	[95.04]
Temperature Differential ^{0}C [^{0}F]	22.00	[39.60]
Mean Temperature ^{0}C [^{0}F]	24.02	[75.24]
Rate of Heat Flux W/m^2 [Btu/h.ft^2]	32.86	[10.42]
Thermal Conductance W/m^{2}K [Btu/h.ft^2.^{0}F]	1.49	[0.26]
Thermal Resistance K.m^2/W [^{0}F.ft^2.h/Btu]	0.67	[3.80]
Thermal Conductivity W/m.K [Btu.in./h.ft^2.^{0}F]	0.1417	[0.9824]
Thermal Resistivity K.m/W [^{0}F.ft^2.h/Btu.in.]	7.06	[1.018]

4.0 CONCLUSION

The foam expansion joint material submitted by Emseal Corporation has a thermal resistance of 0.7 K◦m^2/W (R-3.8), at test thickness of 94.9 mm (3.7 inches).

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