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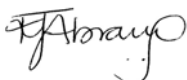
Client Eco Decking & Roof Systems Ltd, Fenton House, 10 Fenton Street, Lancaster, LA1 1TE

Thermal Resistance of New Tech EcoSlate – Conventional Roof System

- 1. Sample** New Tech EcoSlate – Conventional Roof System (supplied by client) + 25 mm air surface resistance layer. The nominal thickness of the system was 29mm minimum & 39mm maximum. Sample included horizontal overlap tile joints but did not include vertical joints.
Product Standard applicable to tested specimens - N/A
- 2. Method** Single specimen heat flow meter method. Heat flux direction – vertically upwards. Apparatus HFM1. The apparatus was calibrated against UKAS accredited EN 12667 guarded hot plate apparatus. Edge heat losses reduced by 125 mm edge insulation

3. Thermal Resistance Results

Air Temperature (°C)	Hot EcoSlate Surface Temperature (°C)	Cold EcoSlate Surface Temperature (°C)	Thermal Resistance of EcoSlate Conventional System + 25mm Air Surface Layer (m ² K/W)	Thermal Resistance of EcoSlate Conventional System (m ² K/W)
4.9	15.1	7.6	0.343 ± 3.5%	0.250 ± 3.5%



The Thermal Measurement Laboratory is a UKAS accredited laboratory for the measurement of thermal resistance to EN 12664 / 12667 and ISO 8302. We are not accredited for the calculations detailed in this report

4. Test Details

		Value For Specimen As-Tested
Initial specimen thickness (mean)	m	0.029 (minimum)
	m	0.039 (maximum)
Dimensions	m	0.320 x 0.320
Mass before test	g	3043.8
Mass after test	g	3042.0
Relative mass change during test	%	-0.06
Relative mass change during drying	%	N/A
Relative mass change during conditioning	%	-0.79
Density of conditioned tile as tested	kg/m ³	N/A
Temperature of Air	°C	4.9
Temperature of tile surface (hot)	°C	15.1
Temperature of tile surface (cold)	°C	7.6
Temperature drop across EcoSlate/air surface	K	10.17
Temperature drop across EcoSlate	K	7.43
Density of heat flow rate	W/m ²	29.7
Thermal Resistance of EcoSlate & Air-surface	m ² K/W	0.343
Thermal Resistance of EcoSlate	m ² K/W	0.250
Date of completion of the test		6 October, 2011
Duration of test	hrs	72
Ambient temperature surrounding the apparatus during the test	°C	23

5. Temperature Sensors

The temperature difference was determined by measuring the temperature of each surface with Chromel / Alumel (K type) thermocouples.

6. Thickness Measurement

The thickness of the sample was determined by measuring the maximum thickness at the tile overlaps as well as the minimum sections of the slate system with vernier calipers, before and after test.

7. Method and temperatures of conditioning

The specimen was conditioned for 20 days at 23°C and 50% RH to constant mass before testing.

8. Errors in measured property

The maximum expected error in the measured thermal resistance of tile/ air surface layer is within 3.5 %.

- 1) The measurement repeatability during the last 24 hours of thermal equilibrium was < 0.5%.
- 2) The spread in surface temperatures was 2.6% greater than the maximum specified in EN 12667. The large spread in temperature was due to temperature variations on the uneven cold face of the EcoSlate tile adjacent to the air surface layer, as measured at the maximum, minimum and intermediate height positions

9. The Experimental System

The EcoSlate system was supplied by the client. After conditioning, the tile was mounted with a wooden frame above it, and instrumented with thermocouples. The frame was 305mm square external dimensions containing a 250mm square aperture by 50mm deep. This was placed between the sample and the cold plate of the apparatus, resulting in a 50mm airspace above the tile. The internal plywood face of the sample was mounted on a matt black plate heat source, with an embedded thin calibrated heat flow meter. The external surface of the EcoSlate tile faced a matt black cold plate, positioned 50 mm above the tile. The air temperature was measured by thermocouples sited within the 50 mm air gap, at a distance of 25 mm from the tile surface. The temperature of the cold face of the EcoSlate tile was measured at the maximum, minimum and intermediate height positions.

10. Name of Test Operator/s

A. Simpson