

# TEST REPORT

COPY No 1



ISSUED BY **British Board of Agrément**

DATE OF ISSUE **31 January 2007**

SERIAL NUMBER **BC 0388**

PAGE 1 OF 2 PAGES

APPROVED SIGNATORY

*J M Denyer*  
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JOB No: T1/41140



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CLIENT: Nudura Corporation  
27 Hooper Road  
Unit 10, Barrie  
Ontario L4N 9S3  
Canada

## 1 SPECIMEN

The test specimen was supplied by the client and described as a light green Type II expanded polystyrene insulation, batch number PVB-260-5385. The test specimen was assigned the BBA designation number S1/40414/12A.

## 2 METHOD

Heat Flow Meter Method of ISO 8301 : 1991 and BS EN 12667 : 2001 using the BBA single specimen symmetric test facility designated K4.

## 3 SPECIMEN PREPARATION

The material was stated by the client to have been manufactured on 27 July 2006. It was delivered in the form of a 2' 6" by 2' board with two 2' 6" by 3" make up pieces to form an assembly 2' 6" by 2' 6" by 2½" thick on 17 September 2006. The specimen was then stored in a well-ventilated position in an air-conditioned room at  $23 \pm 2^\circ\text{C}$ ,  $50 \pm 5\%$  rh until it was tested.

Specimen thickness was measured in accordance with BS EN 12667. Edge guarding is provided by an independently heated zone at the perimeter of each plate. Thermal insulation with a resistance in excess of  $3.0 \text{ m}^2\text{KW}^{-1}$  was provided to specimen edges during the test.

## 4 MEASURED THERMAL CONDUCTIVITY

Measured thermal conductivity ( $\text{Wm}^{-1}\text{K}^{-1}$ )	Test density ( $\text{kgm}^{-3}$ )	Mean temperature ( $^\circ\text{C}$ )
$0.0366 \pm 2.5\%$	21.4	9.9

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor  $k=2$ , providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

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# TEST REPORT

SERIAL NUMBER  
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PAGE 2 OF 2 PAGES

UKAS ACCREDITED TESTING LABORATORY No 0357

## 5 RESULTS

Test details	Specimen
Relative mass change during conditioning	0.045
Density of specimen at start of test ( $\text{kgm}^{-3}$ )	21.4
Cold face temperatures ( $^{\circ}\text{C}$ )	-0.23
Hot face temperatures ( $^{\circ}\text{C}$ )	19.97
Average temperature difference across specimen during test (K)	20.2
Relative mass change during test	0.0012
Average imposed specimen thickness (m)	0.0632
Mean heat flux ( $\text{Wm}^{-2}$ )	11.6
Direction of heat flux	Upwards
Interface medium	None
Applied load (kPa)	$\geq 2.5$
Cold face emissivity	0.89
Hot face emissivity	0.89
Ambient temperature ( $^{\circ}\text{C}$ )	23 to 24
Ambient relative humidity (%)	46 to 60
Duration of test	4 hours and 59 minutes
Duration of steady state	1 hour
Date of test completion	17 October 2006
<b>Calibration details</b>	
Date of Calibration	4 August 2006
Certified reference material	IRMM-440

## 6 CE MARKING

If the test specimen has been taken from the same sample as described in BS EN ISO 13163, within the context of 89/106/EEC Construction Products Directive, this data can contribute to the Attestation of Conformity requirements for CE Marking, as the BBA has been notified as an approved testing laboratory (notification number 0836).

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor  $k=2$ , providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

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## 1 SPECIMEN

The test specimen was supplied by the client and described as a light green Type II expanded polystyrene insulation, batch number PVB-274-5399. The test specimen was assigned the BBA designation number S1/40414/13A.

## 2 METHOD

Heat Flow Meter Method of ISO 8301 : 1991 and BS EN 12667 : 2001 using the BBA single specimen symmetric test facility designated K4.

## 3 SPECIMEN PREPARATION

The material was stated by the client to have been manufactured on 27 July 2006. It was delivered in the form of a 2' 6" by 2' board with two 2' 6" by 3" make up pieces to form an assembly 2' 6" by 2' 6" by 2½" thick on 17 September 2006. The specimen was then stored in a well-ventilated position in an air-conditioned room at  $23 \pm 2^\circ\text{C}$ ,  $50 \pm 5\%$  rh until it was tested.

Specimen thickness was measured in accordance with BS EN 12667. Edge guarding is provided by an independently heated zone at the perimeter of each plate. Thermal insulation with a resistance in excess of  $3.0 \text{ m}^2\text{KW}^{-1}$  was provided to specimen edges during the test.

## 4 MEASURED THERMAL CONDUCTIVITY

Measured thermal conductivity ( $\text{Wm}^{-1}\text{K}^{-1}$ )	Test density ( $\text{kgm}^{-3}$ )	Mean temperature ( $^\circ\text{C}$ )
$0.0368 \pm 2.5\%$	20.1	9.9

**The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor  $k=2$ , providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.**

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PAGE 2 OF 2 PAGES

## 5 RESULTS

Test details	Specimen
Relative mass change during conditioning	0.065
Density of specimen at start of test ( $\text{kgm}^{-3}$ )	20.1
Cold face temperatures ( $^{\circ}\text{C}$ )	-0.23
Hot face temperatures ( $^{\circ}\text{C}$ )	19.97
Average temperature difference across specimen during test (K)	20.2
Relative mass change during test	0.0007
Average imposed specimen thickness (m)	0.0627
Mean heat flux ( $\text{Wm}^{-2}$ )	11.8
Direction of heat flux	Upwards
Interface medium	None
Applied load (kPa)	$\geq 2.5$
Cold face emissivity	0.89
Hot face emissivity	0.89
Ambient temperature ( $^{\circ}\text{C}$ )	23 to 24
Ambient relative humidity (%)	46 to 60
Duration of test	5 hours
Duration of steady state	1 hour
Date of test completion	17 October 2006
<b>Calibration details</b>	
Date of Calibration	4 August 2006
Certified reference material	IRMM-440

## 6 CE MARKING

If the test specimen has been taken from the same sample as described in BS EN ISO 13163, within the context of 89/106/EEC Construction Products Directive, this data can contribute to the Attestation of Conformity requirements for CE Marking, as the BBA has been notified as an approved testing laboratory (notification number 0836).

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JOB No: T1/41140

## 1 SPECIMEN

The test specimen was supplied by the client and described as a light green Type II expanded polystyrene insulation, batch number PVB-274-5399. The test specimen was assigned the BBA designation number S1/40414/15A.

## 2 METHOD

Heat Flow Meter Method of ISO 8301 : 1991 and BS EN 12667 : 2001 using the BBA single specimen symmetric test facility designated K4.

## 3 SPECIMEN PREPARATION

The material was stated by the client to have been manufactured on 28 July 2006. It was delivered in the form of a 2' 6" by 2' board with two 2' 6" by 3" make up pieces to form an assembly 2' 6" by 2' 6" by 2½" thick on 17 September 2006. The specimen was then stored in a well-ventilated position in an air-conditioned room at  $23 \pm 2^\circ\text{C}$ ,  $50 \pm 5\%$  rh until it was tested.

Specimen thickness was measured in accordance with BS EN 12667. Edge guarding is provided by an independently heated zone at the perimeter of each plate. Thermal insulation with a resistance in excess of  $3.0 \text{ m}^2\text{KW}^{-1}$  was provided to specimen edges during the test.

## 4 MEASURED THERMAL CONDUCTIVITY

Measured thermal conductivity ( $\text{Wm}^{-1}\text{K}^{-1}$ )	Test density ( $\text{kgm}^{-3}$ )	Mean temperature ( $^\circ\text{C}$ )
$0.0361 \pm 2.5\%$	21.7	9.9

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor  $k=2$ , providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

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PAGE 2 OF 2 PAGES

## 5 RESULTS

Test details	Specimen
Relative mass change during conditioning	0.045
Density of specimen at start of test ( $\text{kgm}^{-3}$ )	20.68
Cold face temperatures ( $^{\circ}\text{C}$ )	-0.24
Hot face temperatures ( $^{\circ}\text{C}$ )	19.97
Average temperature difference across specimen during test (K)	20.21
Relative mass change during test	0.00008
Average imposed specimen thickness (m)	0.0628
Mean heat flux ( $\text{Wm}^{-2}$ )	11.79
Direction of heat flux	Upwards
Interface medium	None
Applied load (kPa)	$\geq 2.5$
Cold face emissivity	0.89
Hot face emissivity	0.89
Ambient temperature ( $^{\circ}\text{C}$ )	23 to 24
Ambient relative humidity (%)	52 to 63
Duration of test	6 hours and 5 minutes
Duration of steady state	1 hour
Date of test completion	18 October 2006
<b>Calibration details</b>	
Date of Calibration	4 August 2006
Certified reference material	IRMM-440

## 6 CE MARKING

If the test specimen has been taken from the same sample as described in BS EN ISO 13163, within the context of 89/106/EEC Construction Products Directive, this data can contribute to the Attestation of Conformity requirements for CE Marking, as the BBA has been notified as an approved testing laboratory (notification number 0836).

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## 1 SPECIMEN

The test specimen was supplied by the client and described as a light green Type II expanded polystyrene insulation, batch number PVB-3095434. The test specimen was assigned the BBA designation number S1/40414/14A.

## 2 METHOD

Heat Flow Meter Method of ISO 8301 : 1991 and BS EN 12667 : 2001 using the BBA single specimen symmetric test facility designated K4.

## 3 SPECIMEN PREPARATION

The material was stated by the client to have been manufactured on 28 July 2006. It was delivered in the form of a 2' 6" by 2' board with two 2' 6" by 3" make up pieces to form an assembly 2' 6" by 2' 6" by 2½" thick on 17 September 2006. The specimen was then stored in a well-ventilated position in an air-conditioned room at  $23 \pm 2^\circ\text{C}$ ,  $50 \pm 5\%$  rh until it was tested.

Specimen thickness was measured in accordance with BS EN 12667. Edge guarding is provided by an independently heated zone at the perimeter of each plate. Thermal insulation with a resistance in excess of  $3.0 \text{ m}^2\text{KW}^{-1}$  was provided to specimen edges during the test.

## 4 MEASURED THERMAL CONDUCTIVITY

Measured thermal conductivity ( $\text{Wm}^{-1}\text{K}^{-1}$ )	Test density ( $\text{kgm}^{-3}$ )	Mean temperature ( $^\circ\text{C}$ )
$0.0369 \pm 2.5\%$	20.5	9.9

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor  $k=2$ , providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

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PAGE 2 OF 2 PAGES

## 5 RESULTS

Test details	Specimen
Relative mass change during conditioning	0.023
Density of specimen at start of test ( $\text{kgm}^{-3}$ )	20.5
Cold face temperatures ( $^{\circ}\text{C}$ )	-0.24
Hot face temperatures ( $^{\circ}\text{C}$ )	19.96
Average temperature difference across specimen during test (K)	20.2
Relative mass change during test	0.00008
Average imposed specimen thickness (m)	0.0629
Mean heat flux ( $\text{Wm}^{-2}$ )	11.8
Direction of heat flux	Upwards
Interface medium	None
Applied load (kPa)	$\geq 2.5$
Cold face emissivity	0.89
Hot face emissivity	0.89
Ambient temperature ( $^{\circ}\text{C}$ )	22 to 23
Ambient relative humidity (%)	58 to 60
Duration of test	4 hours and 11 minutes
Duration of steady state	1 hour
Date of test completion	18 October 2006
<b>Calibration details</b>	
Date of Calibration	4 August 2006
Certified reference material	IRMM-440

## 6 CE MARKING

If the test specimen has been taken from the same sample as described in BS EN ISO 13163, within the context of 89/106/EEC Construction Products Directive, this data can contribute to the Attestation of Conformity requirements for CE Marking, as the BBA has been notified as an approved testing laboratory (notification number 0836).

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