

AWTA PRODUCT TESTING

Australian Wool Testing Authority Ltd – trading as AWTA Product Testing
A.B.N. 43 006 014 106
1st Floor, 191 Racecourse Road, Flemington, Victoria 3031
P.O. Box 240, North Melbourne, Victoria 3051
Phone (03) 9371 2400 Fax (03) 9371 2499

TEST REPORT

CLIENT : VPI BUILDING PRODUCTS
PO BOX 485
KATOOMBA NSW 2780

TEST NUMBER : 7-577329-CN
ISSUE DATE : 02/03/2011
PRINT DATE : 02/03/2011

SAMPLE DESCRIPTION Six Board Samples Submitted
A: Excell Boards Colour: White B: Everlast D5I20 Board
Colour: Beige C: Everlast D5I25 Board Colour: Beige
D: Everlast D5I15 Board Colour: Beige
E: Everlast D5I10 Board Colour: Beige
F: Armour Board Colour: White G: 90mm deep drywall frame

ISO 8302-1991 Thermal Insulation (Guarded Hot Plate Test)

Test conditions:
Sample A

Mean Heat Flux(W/m2) 4.632
Mean Rct (m2K/W) 0.273

SEE SPREADSHEET FOR FURTHER RESULTS

ISO 8302-1991 Thermal Insulation (Guarded Hot Plate Test)

Test conditions:
Sample B

Mean Heat Flux(W/m2) 2.489
Mean Rct (m2K/W) 0.631

SEE SPREADSHEET FOR FURTHER RESULTS

ISO 8302-1991 Thermal Insulation (Guarded Hot Plate Test)

Test conditions:
Sample C

Mean Heat Flux(W/m2) 2.302
Mean Rct (m2K/W) 0.698

SEE SPREADSHEET FOR FURTHER RESULTS

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PAGE 1

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Samples, and their identifying descriptions have been provided by the client unless otherwise stated. AWTA Ltd makes no warranty, implied or otherwise, as to the source of the tested samples. The above test results relate only to the sample or samples tested. The above test results are designed to provide THE CLIENT WITH GUIDANCE INFORMATION ONLY.

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ISO 8302-1991 Thermal Insulation (Guarded Hot Plate Test)

Test conditions:
Sample D

Mean Heat Flux(W/m2) 2.836
Mean Rct (m2K/W) 0.559

SEE SPREADSHEET FOR FURTHER RESULTS

ISO 8302-1991 Thermal Insulation (Guarded Hot Plate Test)

Test conditions:
Sample E

Mean Heat Flux(W/m2) 3.899
Mean Rct (m2K/W) 0.342

SEE SPREADSHEET FOR FURTHER RESULTS

ISO 8302-1991 Thermal Insulation (Guarded Hot Plate Test)

Test conditions:
Sample F

Mean Heat Flux(W/m2) 4.765
Mean Rct (m2K/W) 0.256

SEE SPREADSHEET FOR FURTHER RESULTS

ISO 8302-1991 Thermal Insulation (Guarded Hot Plate Test)

Test conditions:
Sample G

Mean Heat Flux(W/m2) 5.90
Mean Rct (m2K/W) 0.242

SEE SPREADSHEET FOR FURTHER RESULTS

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TEST NUMBER : 7-577329-CN
ISSUE DATE : 02/03/2011
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The thermal resistance values contained in this report are determined by testing in accordance with ISO 8302 and specifically describe the steady state thermal properties of the tested product associated with that method of test

Results contained in this report do not infer thermal information where the product is used under conditions differing from those under which the product was tested

It should be noted that whilst sufficient time has been allowed prior to testing for the product to recover from compression during transit it has been tested at the thickness nominated in the report. This may differ from the client's expectations of nominated thickness at the point of manufacture, we have therefore included the additional calculated measure of the thermal resistance at the client's nominated thickness

The results contained in the report are those which have been requested and do not necessarily denote compliance in entirety to ASNZS 4859.1

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(END OF REPORT)

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APPROVED SIGNATORY

MICHAEL A. JACKSON B.Sc.(Hons)
MANAGING DIRECTOR

AWTA PRODUCT TESTING

AS/NZS 4859.1:2002 - Materials for the thermal Insulation of buildings. Part 1: General criteria and technical provisions (Section 2.3) - (Thermal Resistance)

Date:	25-Feb-11		
Project Number:	186214 B		
Sample Description and orientation:	BEIGE EVERLAST D5I20 BOARD.		
	Sample 1	Sample 2	Mean
Test Plate Area:	6.58×10^{-2}	6.58×10^{-2}	6.58×10^{-2} m ²
Hot Surface Temperature:	24.000		24.000 °C
Cold surface Temperature:	22.274		22.274 °C
ΔT	1.726	0.000	1.726 °C
Mean Temperature	23.137	0.000	23.137 °C
Relative Humidity	65.000	65.000	65.000 %
Heat Flux:	2.49		2.489 W/m ²
Bare Plate Resistance	0.063	m ² K/W	
Total Thermal Resistance (R)	0.69		0.694 m ² K/W
Thermal Resistance [R]	0.631		0.631 m ² K/W
Tested Thickness	27.0	mm * #	Δ Thickness
Recovered Thickness		mm	N/A mm
Client Nominated Thickness		mm	N/A mm
Error and Uncertainty of Measurement U ₉₅	8.400%	* Calculated in accordance with ISO GUM.	
Coverage Factor	1.980	* Calculated in accordance with ISO GUM.	
Plate emissivity	0.810	*5	
Test Method:	ISO8302:1991 - Thermal insulation - Determination of steady-state thermal resistance and related properties - Guarded hot plate apparatus.		
Wind Velocity:			0.00 m/s
Mass Change:			
Mass ^{Initial}	638.10		638.10 g
Mass ^{Final}	638.10		638.10 g
Δ mass	0.00	0.00	0.00 %
Dimensions (Complete Specimen)			
Thickness	27.00	mm	0.027 m
Width	500.00	mm	0.500 m
Length	500.00	mm	0.500 m
Tested Volume	0.0068	m ³	
Density (ρ)	94.53	kg/m ³	
Transfer Factor (β)	0.0389	0.0000	0.0389 W/mK (Calculated) ^{*1}
Apparent Thermal Conductivity(λ k)	0.0428	#VALUE!	#VALUE! W/mK (Calculated) ^{*2}
U - Value	1.441	0.000	#NUM! W/(K.m ²) (Calculated) ^{*3}
Calculated R-Value for recovered thickness	N/A	m ² K/W	(Calculated) ^{*4}
Calculated R-Value for client nominated thickness	N/A	m ² K/W	(Calculated) ^{*4}

Tested on Guarded Hotplate Apparatus Model:10.5 S/N 306-401 Manufactured by: Measurement Technology Northwest System componentry includes Guarded Hotplate Assembly, Airflow Hood with variable speed fans, Ambient and Hotplate temperature sensors, RH and Windspeed sensors, Control and Logging System and Environmental Chamber. All Specimens are tested in a horizontal position.

Where applicable. The mass applied is 9.836 kg

Test plate dimension is 260mm x 260mm, Complete guarded apparatus dimension is 510mm x 510mm.

*1 Calculated in accordance with ISO8302:1991(E) Section 3.5.2

*2 Calculated in Accordance with ASTM C653-97 Section 3.2.1.

*3 Calculated as 1/R.

*4 Linear interpolation based on nominal thickness from measured R-Value

Kelvin units and measured Temperature (°C) units may be read as interchangeable where variations from absolute zero are not required.

*5 Plate emissivity was measured by CSIRO using a TASCO Osaka Model THI-300, S/N 826 041.

AWTA PRODUCT TESTING

AS/NZS 4859.1:2002 - Materials for the thermal Insulation of buildings. Part 1: General criteria and technical provisions (Section 2.3) - (Thermal Resistance)

Date:	25-Feb-11		
Project Number:	186214 C		
Sample Description and orientation:	BEIGE EVERLAST D5I25 BOARD		
	Sample 1	Sample 2	Mean
Test Plate Area:	6.58×10^{-2}	6.58×10^{-2}	6.58×10^{-2} m ²
Hot Surface Temperature:	24.000		24.000 °C
Cold surface Temperature:	0.761	22.251	0.761 °C
ΔT	23.239	0.000	23.239 °C
Mean Temperature	12.381	0.000	12.381 °C
Relative Humidity	65.000	65.000	65.000 %
Heat Flux:	2.30		2.302 W/m ²
Bare Plate Resistance	0.063	m ² K/W	
Total Thermal Resistance (R)	0.76		0.761 m ² K/W
Thermal Resistance [R]	0.698		0.698 m ² K/W
Tested Thickness	26.0	mm * #	Δ Thickness
Recovered Thickness		mm	N/A mm
Client Nominated Thickness		mm	N/A mm
Error and Uncertainty of Measurement U ₉₅	8.400%	* Calculated in accordance with ISO GUM.	
Coverage Factor	1.980	* Calculated in accordance with ISO GUM.	
Plate emissivity	0.810	*5	
Test Method:	ISO8302:1991 - Thermal insulation - Determination of steady-state thermal resistance and related properties - Guarded hot plate apparatus.		
Wind Velocity:			0.00 m/s
Mass Change:			
Mass ^{Initial}	694.70		694.70 g
Mass ^{Final}	694.70		694.70 g
Δ mass	0.00	0.00	0.00 %
Dimensions (Complete Specimen)			
Thickness	26.00	mm	0.026 m
Width	503.00	mm	0.503 m
Length	501.00	mm	0.501 m
Tested Volume	0.0066	m ³	
Density (ρ)	106.03	kg/m ³	
Transfer Factor (β)	0.0026	0.0000	0.0026 W/mK (Calculated) ^{*1}
Apparent Thermal Conductivity(λ k)	0.0372	#VALUE!	#VALUE! W/mK (Calculated) ^{*2}
U - Value	1.314	0.000	#NUM! W/(K.m ²) (Calculated) ^{*3}
Calculated R-Value for recovered thickness	N/A	m ² K/W	(Calculated) ^{*4}
Calculated R-Value for client nominated thickness	N/A	m ² K/W	(Calculated) ^{*4}

Tested on Guarded Hotplate Apparatus Model:10.5 S/N 306-401 Manufactured by: Measurement Technology Northwest System componentry includes Guarded Hotplate Assembly, Airflow Hood with variable speed fans, Ambient and Hotplate temperature sensors, RH and Windspeed sensors, Control and Logging System and Environmental Chamber. All Specimens are tested in a horizontal position.

Where applicable. The mass applied is 9.836 kg

Test plate dimension is 260mm x 260mm, Complete guarded apparatus dimension is 510mm x 510mm.

*1 Calculated in accordance with ISO8302:1991(E) Section 3.5.2

*2 Calculated in Accordance with ASTM C653-97 Section 3.2.1.

*3 Calculated as 1/R.

*4 Linear interpolation based on nominal thickness from measured R-Value

Kelvin units and measured Temperature (°C) units may be read as interchangeable where variations from absolute zero are not required.

*5 Plate emissivity was measured by CSIRO using a TASCOS Osaka Model THI-300, S/N 826 041.

AWTA PRODUCT TESTING

AS/NZS 4859.1:2002 - Materials for the thermal Insulation of buildings. Part 1: General criteria and technical provisions (Section 2.3) - (Thermal Resistance)

Date:	25-Feb-11		
Project Number:	186214 D		
Sample Description and orientation:	BEIGE EVERLAST D5I15 BOARD.		
	Sample 1	Sample 2	Mean
Test Plate Area:	6.58×10^{-2}	6.58×10^{-2}	6.58×10^{-2} m ²
Hot Surface Temperature:	24.000		24.000 °C
Cold surface Temperature:	22.311		22.311 °C
ΔT	1.689	0.000	1.689 °C
Mean Temperature	23.156	0.000	23.156 °C
Relative Humidity	65.000	65.000	65.000 %
Heat Flux:	2.84		2.836 W/m ²
Bare Plate Resistance	0.063	m ² K/W	
Total Thermal Resistance (R)	0.62		0.622 m ² K/W
Thermal Resistance [R]	0.559		0.559 m ² K/W
Tested Thickness	20.0	mm * #	Δ Thickness
Recovered Thickness		mm	N/A mm
Client Nominated Thickness		mm	N/A mm
Error and Uncertainty of Measurement U ₉₅	8.400%	* Calculated in accordance with ISO GUM.	
Coverage Factor	1.980	* Calculated in accordance with ISO GUM.	
Plate emissivity	0.810	*5	
Test Method:	ISO8302:1991 - Thermal insulation - Determination of steady-state thermal resistance and related properties - Guarded hot plate apparatus.		
Wind Velocity:			0.00 m/s
Mass Change:			
Mass ^{Initial}	626.90		626.90 g
Mass ^{Final}	626.90		626.90 g
Δ mass	0.00	0.00	0.00 %
Dimensions (Complete Specimen)			
Thickness	20.00	mm	0.020 m
Width	500.00	mm	0.500 m
Length	502.00	mm	0.502 m
Tested Volume	0.0050	m ³	
Density (ρ)	124.88	kg/m ³	
Transfer Factor (γ)	0.0336	0.0000	0.0336 W/mK (Calculated) ^{*1}
Apparent Thermal Conductivity(λ k)	0.0358	#VALUE!	#VALUE! W/mK (Calculated) ^{*2}
U - Value	1.608	0.000	#NUM! W/(K.m ²) (Calculated) ^{*3}
Calculated R-Value for recovered thickness	N/A	m ² K/W	(Calculated) ^{*4}
Calculated R-Value for client nominated thickness	N/A	m ² K/W	(Calculated) ^{*4}

Tested on Guarded Hotplate Apparatus Model:10.5 S/N 306-401 Manufactured by: Measurement Technology Northwest System componentry includes Guarded Hotplate Assembly, Airflow Hood with variable speed fans, Ambient and Hotplate temperature sensors, RH and Windspeed sensors, Control and Logging System and Environmental Chamber. All Specimens are tested in a horizontal position.

Where applicable. The mass applied is 9.836 kg

Test plate dimension is 260mm x 260mm, Complete guarded apparatus dimension is 510mm x 510mm.

*1 Calculated in accordance with ISO8302:1991(E) Section 3.5.2

*2 Calculated in Accordance with ASTM C653-97 Section 3.2.1.

*3 Calculated as 1/R.

*4 Linear interpolation based on nominal thickness from measured R-Value

Kelvin units and measured Temperature (°C) units may be read as interchangeable where variations from absolute zero are not required.

*5 Plate emissivity was measured by CSIRO using a TASCO Osaka Model THI-300, S/N 826 041.

AWTA PRODUCT TESTING

AS/NZS 4859.1:2002 - Materials for the thermal Insulation of buildings. Part 1: General criteria and technical provisions (Section 2.3) - (Thermal Resistance)

Date:	25-Feb-11		
Project Number:	186214 E		
Sample Description and orientation:	BEIGE EVERLAST D5110 BOARD.		
	Sample 1	Sample 2	Mean
Test Plate Area:	6.58×10^{-2}	6.58×10^{-2}	6.58×10^{-2} m ²
Hot Surface Temperature:	24.000		24.000 °C
Cold surface Temperature:	22.421		22.421 °C
ΔT	1.579	0.000	1.579 °C
Mean Temperature	23.211	0.000	23.211 °C
Relative Humidity	65.000	65.000	65.000 %
Heat Flux:	3.90		3.899 W/m ²
Bare Plate Resistance	0.063	m ² K/W	
Total Thermal Resistance (R)	0.41		0.405 m ² K/W
Thermal Resistance [R]	0.342		0.342 m ² K/W
Tested Thickness	16.0	mm * #	Δ Thickness
Recovered Thickness		mm	N/A mm
Client Nominated Thickness		mm	N/A mm
Error and Uncertainty of Measurement U ₉₅	8.400%	* Calculated in accordance with ISO GUM.	
Coverage Factor	1.980	* Calculated in accordance with ISO GUM.	
Plate emissivity	0.810	*5	
Test Method:	ISO8302:1991 - Thermal insulation - Determination of steady-state thermal resistance and related properties - Guarded hot plate apparatus.		
Wind Velocity:			0.00 m/s
Mass Change:			
Mass ^{Initial}	562.60		562.60 g
Mass ^{Final}	562.60		562.60 g
Δ mass	0.00	0.00	0.00 %
Dimensions (Complete Specimen)			
Thickness	16.00	mm	0.016 m
Width	501.00	mm	0.501 m
Length	500.00	mm	0.500 m
Tested Volume	0.0040	m ³	
Density (ρ)	140.37	kg/m ³	
Transfer Factor (j)	0.0395	0.0000	0.0395 W/mK (Calculated) ^{*1}
Apparent Thermal Conductivity(λ k)	0.0468	#VALUE!	#VALUE! W/mK (Calculated) ^{*2}
U - Value	2.469	0.000	#NUM! W/(K.m ²) (Calculated) ^{*3}
Calculated R-Value for recovered thickness	N/A	m ² K/W (Calculated) ^{*4}	
Calculated R-Value for client nominated thickness	N/A	m ² K/W (Calculated) ^{*4}	

Tested on Guarded Hotplate Apparatus Model:10.5 S/N 306-401 Manufactured by: Measurement Technology Northwest System componentry includes Guarded Hotplate Assembly, Airflow Hood with variable speed fans, Ambient and Hotplate temperature sensors, RH and Windspeed sensors, Control and Logging System and Environmental Chamber. All Specimens are tested in a horizontal position.

Where applicable. The mass applied is 9.836 kg

Test plate dimension is 260mm x 260mm, Complete guarded apparatus dimension is 510mm x 510mm.

*1 Calculated in accordance with ISO8302:1991(E) Section 3.5.2

*2 Calculated in Accordance with ASTM C653-97 Section 3.2.1.

*3 Calculated as 1/R.

*4 Linear interpolation based on nominal thickness from measured R-Value

Kelvin units and measured Temperature (°C) units may be read as interchangeable where variations from absolute zero are not required.

*5 Plate emissivity was measured by CSIRO using a TASCO Osaka Model THI-300, S/N 826 041.

AWTA PRODUCT TESTING

AS/NZS 4859.1:2002 - Materials for the thermal insulation of buildings. Part 1: General criteria and technical provisions (Section 2.3) - (Thermal Resistance)

Date:	25-Feb-11		
Project Number:	186214 F		
Sample Description and orientation:	WHITE ARMOUR BOARD.		
	Sample 1	Sample 2	Mean
Test Plate Area:	6.58×10^{-2}	6.58×10^{-2}	6.58×10^{-2} m ²
Hot Surface Temperature:	24.000		24.000 °C
Cold surface Temperature:	22.482		22.482 °C
ΔT	1.518	0.000	1.518 °C
Mean Temperature	23.241	0.000	23.241 °C
Relative Humidity	65.000	65.000	65.000 %
Heat Flux:	4.77		4.765 W/m ²
Bare Plate Resistance	0.063	m ² K/W	
Total Thermal Resistance (R)	0.32		0.319 m ² K/W
Thermal Resistance [R]	0.256		0.256 m ² K/W
Tested Thickness	18.0	mm * #	Δ Thickness
Recovered Thickness		mm	N/A mm
Client Nominated Thickness		mm	N/A mm
Error and Uncertainty of Measurement U ₉₅	8.400%	* Calculated in accordance with ISO GUM.	
Coverage Factor	1.980	* Calculated in accordance with ISO GUM.	
Plate emissivity	0.810	*5	
Test Method:	ISO8302:1991 - Thermal insulation - Determination of steady-state thermal resistance and related properties - Guarded hot plate apparatus.		
Wind Velocity:			0.00 m/s
Mass Change:			
Mass ^{Initial}	1193.40		1193.40 g
Mass ^{Final}	1193.40		1193.40 g
Δ mass	0.00	0.00	0.00 %
Dimensions (Complete Specimen)			
Thickness	18.00	mm	0.018 m
Width	501.00	mm	0.501 m
Length	502.00	mm	0.502 m
Tested Volume	0.0045	m ³	
Density (ρ)	263.62	kg/m ³	
Transfer Factor (γ)	0.0565	0.0000	0.0565 W/mK (Calculated) ¹
Apparent Thermal Conductivity(λ k)	0.0703	#VALUE!	#VALUE! W/mK (Calculated) ²
U - Value	3.135	0.000	#NUM! W/(K.m ²) (Calculated) ³
Calculated R-Value for recovered thickness	N/A	m ² K/W	(Calculated) ⁴
Calculated R-Value for client nominated thickness	N/A	m ² K/W	(Calculated) ⁴

Tested on Guarded Hotplate Apparatus Model:10.5 S/N 306-401 Manufactured by: Measurement Technology Northwest System componentry includes Guarded Hotplate Assembly, Airflow Hood with variable speed fans, Ambient and Hotplate temperature sensors, RH and Windspeed sensors, Control and Logging System and Environmental Chamber. All Specimens are tested in a horizontal position.

Where applicable. The mass applied is 9.836 kg

Test plate dimension is 260mm x 260mm, Complete guarded apparatus dimension is 510mm x 510mm.

*1 Calculated in accordance with ISO8302:1991(E) Section 3.5.2

*2 Calculated in Accordance with ASTM C653-97 Section 3.2.1.

*3 Calculated as 1/R.

*4 Linear interpolation based on nominal thickness from measured R-Value

Kelvin units and measured Temperature (°C) units may be read as interchangeable where variations from absolute zero are not required.

*5 Plate emissivity was measured by CSIRO using a TASCOS Osaka Model THI-300, S/N 826 041.

AWTA PRODUCT TESTING

AS/NZS 4859.1:2002 - Materials for the thermal Insulation of buildings. Part 1: General criteria and technical provisions (Section 2.3) - (Thermal Resistance)

Date:	25-Feb-11		
Project Number:	186214 G		
Sample Description and orientation:	90mm DEEP DRYWALL FRAME.		
	Sample 1	Sample 2	Mean
Test Plate Area:	6.58×10^{-2}	6.58×10^{-2}	6.58×10^{-2} m ²
Hot Surface Temperature:	24.000		24.000 °C
Cold surface Temperature:	22.244		22.244 °C
ΔT	1.756	0.000	1.756 °C
Mean Temperature	23.122	0.000	23.122 °C
Relative Humidity	65.000	65.000	65.000 %
Heat Flux:	5.90		5.896 W/m ²
Bare Plate Resistance	0.063	m ² K/W	
Total Thermal Resistance (R)	0.31		0.305 m ² K/W
Thermal Resistance [R]	0.242		0.242 m ² K/W
Tested Thickness	102.0	mm * #	Δ Thickness
Recovered Thickness		mm	N/A mm
Client Nominated Thickness		mm	N/A mm
Error and Uncertainty of Measurement U ₉₅	8.400%	* Calculated in accordance with ISO GUM.	
Coverage Factor	1.980	* Calculated in accordance with ISO GUM.	
Plate emissivity	0.810	*5	
Test Method:	ISO8302:1991 - Thermal insulation - Determination of steady-state thermal resistance and related properties - Guarded hot plate apparatus.		
Wind Velocity:			0.00 m/s
Mass Change:			
Mass ^{Initial}	6110.40		6110.40 g
Mass ^{Final}	6110.40		6110.40 g
Δ mass	0.00	0.00	0.00 %
Dimensions (Complete Specimen)			
Thickness	102.00	mm	0.102 m
Width	502.00	mm	0.502 m
Length	504.00	mm	0.504 m
Tested Volume	0.0258	m ³	
Density (ρ)	236.77	kg/m ³	
Transfer Factor (γ)	0.3425	0.0000	0.3425 W/mK (Calculated) ^{*1}
Apparent Thermal Conductivity(λ k)	0.4215	#VALUE!	#VALUE! W/mK (Calculated) ^{*2}
U - Value	3.279	0.000	#NUM! W/(K.m ²) (Calculated) ^{*3}
Calculated R-Value for recovered thickness	N/A	m ² K/W	(Calculated) ^{*4}
Calculated R-Value for client nominated thickness	N/A	m ² K/W	(Calculated) ^{*4}

Tested on Guarded Hotplate Apparatus Model:10.5 S/N 306-401 Manufactured by: Measurement Technology Northwest System componentry includes Guarded Hotplate Assembly, Airflow Hood with variable speed fans, Ambient and Hotplate temperature sensors, RH and Windspeed sensors, Control and Logging System and Environmental Chamber. All Specimens are tested in a horizontal position.

Where applicable. The mass applied is 9.836 kg

Test plate dimension is 260mm x 260mm, Complete guarded apparatus dimension is 510mm x 510mm.

*1 Calculated in accordance with ISO8302:1991(E) Section 3.5.2

*2 Calculated in Accordance with ASTM C653-97 Section 3.2.1.

*3 Calculated as 1/R.

*4 Linear interpolation based on nominal thickness from measured R-Value

Kelvin units and measured Temperature (°C) units may be read as interchangeable where variations from absolute zero are not required.

*5 Plate emissivity was measured by CSIRO using a TASCOS Osaka Model THI-300, S/N 826 041.