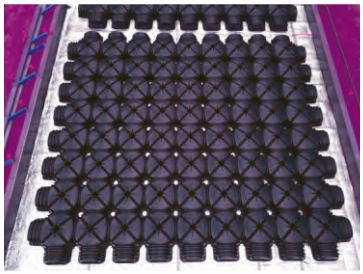
CUPOLEX®
THERMAL WRAP

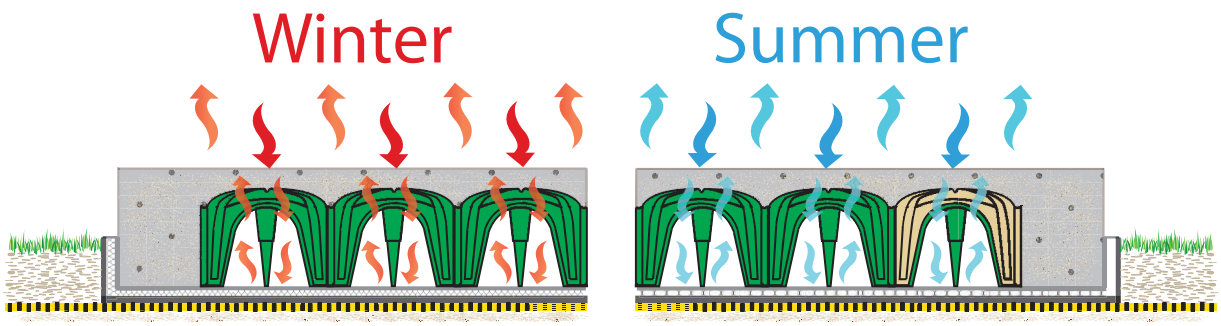
Slab Thermal Rating R Value, Up To 2.2








How it Works



- Anti Glare Foil
- Lime Resistant
- 4mm Thermo-cellular core
- Exceeds 0.3mm DPM
- AS2870-2011/NZ 3604 Compliant

AWARDS

Winner - GreenSmart "Project Home of the Year" 2018 Perth, Western Australia

Winner - HIA "Small Lot Housing" 2018 Sunshine Coast, Queensland

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Total R-value of Cupolex H260 & H350 system

All R-values are calculated by James M Fricker Pty Ltd based upon:

1. AS/NZS 4859.1: Thermal Insulation Materials for buildings. Part1: General criteria and technical provisions.
2. AS/NZS 4859.2: Thermal Insulation Materials for buildings. Part2: Design.
3. The Australian Institute of Refrigeration Air-conditioning & Heating(AIRAH) Handbook, and the ASHRAE Fundamentals Handbook.

Initial results report Total R for each thermal path. These results are combined by area weighting and isothermal planes method to deduce Overall Surface Total R.

Total R-values are based on product in-service conditions in accordance with AS/NZS 4859.2 including the alteration of insulation Material R for temperature, and Air Space R for temperature and infrared emittance.

Each calculation result is subject to any specific notes and assumptions listed on the calculation.

If a construction differs from the described system, the thermal resistance may be different.

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GI BUILDING SCIENCES

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Total R-value of Cupolex H350 &H260 system

(Ref: JMF Calc 428f0332 & 428f0331)

				WINTER R
Centre Post	Vertical element	t, mm	k	m².K/W
	60mm concrete	60	1.44	0.0417
	350mm concrete	350	1.44	0.2431
	2mm polypropylene	2	0.25	0.0080
	R0.14 PE Core vapour barrier	5	0.034	0.1400
	1000mm earth	1000	1.6	0.6250
2%	R sum between isothermal planes			1.0161
4 Corners	Vertical element	t, mm	k	m².K/W
	60mm concrete	60	1.44	0.0417
	350mm concrete	350	1.44	0.2431
	2mm polypropylene	2	0.25	0.0080
	R0.14 PE Core vapour barrier	5	0.034	0.1400
	1000mm earth	1000	1.6	0.6250
8%	R sum between isothermal planes			1.0161
Central Void	Vertical element	t, mm	k	m².K/W
	60mm concrete	60	1.44	0.0417
	0mm concrete	0	1.44	0.0000
	2mm polypropylene	2	0.25	0.0080
	350mm reflective air void	350	0.22	**1.6103**
	R0.14 PE Core vapour barrier	5	0.034	0.1400
	1000mm earth	1000	1.6	0.6250
30%	R sum between isothermal planes			2.3833
Outer Void	Vertical element	t, mm	k	m².K/W
	60mm concrete	60	1.44	0.0417
	40mm concrete	40	1.44	0.0278
	2mm polypropylene	2	0.25	0.0080
	310mm reflective air void	310	0.20	**1.5837**
	R0.14 PE Core vapour barrier	5	0.034	0.1400
	1000mm earth	1000	1.6	0.6250
60%	R sum between isothermal planes			2.3844
	Combined R between isothermal planes (= 1/(A%/Ra + B%/Rb + C%/Rc + D%/Rd)			**2.0989**

	winter
Cupolex H350 Thermal Resistance*, base R =	**R2.14**

*combined R with 1 metre earth plus top 60mm concrete

TOTAL R VALUES, Cupolex H350 + 1 metre earth	winter
bare floor	**R2.30**
with 6mm carpet and 15mm underlay	**R2.71**
with 25mm mountain ash floating timber overlay	**R2.46**

				WINTER R
Centre Post	Vertical element	t, mm	k	m².K/W
	60mm concrete	60	1.44	0.0417
	260mm concrete	260	1.44	0.1806
	2mm polypropylene	2	0.25	0.0080
	R0.14 PE Core vapour barrier	5	0.034	0.1400
	1000mm earth	1000	1.6	0.6250
2%	R sum between isothermal planes			0.9536
4 Corners	Vertical element	t, mm	k	m².K/W
	60mm concrete	60	1.44	0.0417
	260mm concrete	260	1.44	0.1806
	2mm polypropylene	2	0.25	0.0080
	R0.14 PE Core vapour barrier	5	0.034	0.1400
	1000mm earth	1000	1.6	0.6250
8%	R sum between isothermal planes			0.9536
Central Void	Vertical element	t, mm	k	m².K/W
	60mm concrete	60	1.44	0.0417
	0mm concrete	0	1.44	0.0000
	2mm polypropylene	2	0.25	0.0080
	260mm reflective air void	260	0.17	**1.5314**
	R0.14 PE Core vapour barrier	5	0.034	0.1400
	1000mm earth	1000	1.6	0.6250
30%	R sum between isothermal planes			2.3044
Outer Void	Vertical element	t, mm	k	m².K/W
	60mm concrete	60	1.44	0.0417
	40mm concrete	40	1.44	0.0278
	2mm polypropylene	2	0.25	0.0080
	220mm reflective air void	220	0.15	**1.5042**
	R0.14 PE Core vapour barrier	5	0.034	0.1400
	1000mm earth	1000	1.6	0.6250
60%	R sum between isothermal planes			2.3049
	Combined R between isothermal planes (= 1/(A%/Ra + B%/Rb + C%/Rc + D%/Rd)			**2.0164**

	winter
Cupolex H260 Thermal Resistance*, base R =	**R2.06**

*combined R with 1 metre earth plus top 60mm concrete

TOTAL R VALUES, Cupolex H260 + 1 metre earth	winter
bare floor	**R2.22**
with 6mm carpet and 15mm underlay	**R2.63**
with 25mm mountain ash floating timber overlay	**R2.38**

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AS/NZS 4859.1 & AS/NZS 4859.2 are widely used in building industry in Australia, as a thermal insulation standard developed by Australia Standard. Also, both are newly published on 19th of Nov, 2018.

In 1.3.7 clause on page 7 in AS/NZS 4859.1-2018.

1.3.7 Total thermal resistance (R_t)

A total resistance associated with a material, or a system or construction of materials, computed or measured over an area which is fully representative of the element of construction, and specified as a total-R value, including surface film resistances and thermal bridging. [Unit: $(m^2.K)/W$]

Note: According to the clause above, when calculating a total R-value, an air space must be considered as it is one of elements of construction.

In 6.1 clause on page 11 in AS/NZS 4859.2-2018.

6 CALCULATION OF THERMAL RESISTANCE OF AIRSPACES WITH PARALLEL BOUNDING SURFACES OF VARYING EMITTANCE

6.1 General

This Clause applies to airspaces in building components other than glazing.

NOTES:

1 This Clause is reproduced with modifications from ISO 6946:2007 with the permission of the International Organization for Standardization (ISO). ISO 6946:2007 can be obtained from any ISO member and from the Website of the ISO Central Secretariat at the following address: www.iso.org. Copyright remains with ISO. Modifications made to the content from ISO 6946:2007 are outlined in Appendix B.

2 The term 'airspace' includes both airspaces (which have a width and length both 10 times the thickness, with thickness measured perpendicular to the plane of the bounding surfaces) and air voids (which have a width or length comparable to the thickness).

3 If the thickness of the airspace varies, its average value should be used to calculate the thermal resistance.

The calculation method shall be used for the calculation of airspaces bounded by parallel planes with the following conditions:

(a) The use of this calculation method shall be limited to airspaces between 10 mm and 300 mm. For airspaces greater than 300 mm the R-Value of the airspace shall be determined in accordance with Clause 7. This calculation shall not be used for airspace less than 10 mm for material that have been assembled on site.

Note: According to the clause above, the ISO 6946:2007 is used to calculate a R-value of Airspaces between 10mm and 300mm. For the Cupolex, due to its airspace thickness, the ISO method has to be used.

In 5.1 clause on page 5 in AS/NZS 4859.2-2018.

5 STANDARD ASSUMPTIONS

5.1 Temperatures and temperature difference

For calculations of total thermal resistance of construction, the following temperatures, temperature differences and mean temperatures shall be used.

For Australia: Heat flow out: Indoors 18°C, outdoors 12°C, mean 15°C

In 5.1 clause on page 10 in AS/NZS 4859.2-2018.

5.3 Emittance of IR reflective surfaces

5.3.1 *General*

NOTE: Refer to Clauses 4.2, 4.4 and 4.5 for definitions of slightly ventilated, unventilated and well ventilated airspaces respectively.

The emittance values used in calculations for IR reflective products shall be—

(a) the hemispherical emittance value determined in accordance with ASTM C1371; or

(b) the normal emittance value included on product labels as determined in accordance with AS/NZS 4200.1 (ASTM E408) and adjusted in accordance with Clause 6.2 of this Standard.

For any material that has not been tested in accordance with the methods specified above, the assumed emittance of these materials shall be 0.9.

Note: According to the clause, an emittance of one side of air space would be 0.9

Based on the ISO method and all information above,

R-value of Air space at the specified condition are 2.016 at 260mm and 1.948 at 220mm respectively. (This is R-value of Air space only, not a total R-value)

Emittance	Heat Flow	Indoor ℃	Outdoor ℃	Mean ℃	Temp difference ℃	@260mm	@220mm
0.9/0.05	Out	18	12	15	6	2.016	1.948

As mentioned, R-value of Air space varies depending on a condition. However, the R-value above is acceptable as it is calculated based on the AS/NZS 4859.1 & 2-2018, at the specified condition mentioned in the standards.

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POLYMER TESTING LABORATORY

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29 June 2017

TECHNICAL REPORT

ESPRC REPORT No.: 084/17

FOR:
GI Building Sciences Pty. Ltd.
1/13 Meakin Road
MEADOWBROOK QLD 4131

The results contained in this report pertain to the samples as supplied.

MARITA KERSLAKE
Laboratory Manager
Polymer Testing Laboratory

POLYMER TESTING LABORATORY

Eugen Singer Plastics Resource Centre

TECHNICAL REPORT

CUSTOMER: GI BUILDING SCIENCES PTY. LTD.

ESPRC No.: 084/17

TEST:	Impact Resistance (Falling Dart Impact Test) Damp –proof courses and flashings
STANDARD:	AS 2870 Section 5.3.3.3 b with reference to AS/NZS 4347.6
PROCEDURE:	Method 6
DATE OF TEST:	29 June 2017
SAMPLE SOURCE:	GI Building Sciences Pty. Ltd.
SAMPLE IDENTIFICATION:	Cupolex Thermal Wrap Concrete Underlay 0.3 mm High Impact AU&S Group (silver side up)
MATERIAL BATCH NUMBER:	-
CLASS OF FILM:	High Impact Film - Cellular
PREVIOUS HISTORY:	Unknown
SAMPLE PREPARATION:	Specimens cut with scissors across the width of the roll 240 mm x 240 mm
WIDTH OF ROLL:	1.5 m
IMPACT LOAD USED (INCLUDING DART HEAD):	340 gram
DART FREE FALL HEIGHT:	660 mm
AVERAGE FILM THICKNESS:	White layer 0.13 mm* white/silver layer 0.13 mm* cellular thickness ~3 mm*
NUMBER OF TESTS:	Five (5)
NUMBER OF RECORDED PASSES:	Five (5)`
OVERALL TEST RESULT:	PASS
IMPACT TEST ON FOLD SPECIMEN:	N/A
IMPACT LOAD USED (INCLUDING DART HEAD):	310 gram
DART FREE FALL HEIGHT:	660 mm
OVERALL TEST RESULTS ON THE FOLD:	-

*specimen thickness taken at corner.

`one specimen at small split on the opposite side to test side along cellular perimeter.

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14th November, 2018

ATT: Tony Milone
c/ Cupolex Australia

Dear Tony,

Re: Back to Back Warranty of Material

Thank you for your inquiry regarding warranty of GI Building Sciences insulation manufactured for the application known as Thermal Wrap.

I can confirm that the material provided under agreement and branded exclusively for Cupolex Australia and Ausblox is manufactured and assessed in keeping with all relevant Australian Standards, including AS 4859.1:2002 (Amdt1 2006) Thermal Insulation Materials Standard. These include the thermal assessments provided by James Fricker and Associates.

GI Building Sciences provide the appropriate warranty under law as prescribed by Australian Consumer Law.

Should you require further information or test data relative to this submission, please don't hesitate in contacting me on 0490 158 456.

Yours sincerely

David Jordan BBus MGT, MBus ACC
National Sales Manager

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