# Acronem Consulting Australia Pty Ltd

## CALCULATION OF THERMAL PERFORMANCE

## REGEN BUILDING SOLUTIONS - Framed Structaclad 75 Wall

**System Description:** **Structaclad 75 Cladding (12mm Megaboard 920kg/m3, 57mm core of M Grade EPS, 6mm Megaboard 920kg/m3), 25mm Non-reflective Air Space, Reflective Sarking(0.9/0.03), 90mm Reflective Air Space, 10mm Plasterboard Lining**

### INSULATION PATH

Calculation: **W170109a W** (Evaluation for Winter 12℃ ambient temperature, 1 8℃ inside temperature)

| Element Description | WINTER R ($m^2$K/W) | ℃ out | ℃ in | Mean ℃ | Δ-T | Assumed Airspace Properties e1 | e2 | mm | Heat Flow | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| Outdoor Air Film | 0.040 | 12.00 | 12.08 | 12.04 | 0.08 | | | | | 1 |
| Structaclad 75 Cladding | 1.740 | 12.08 | 15.56 | 13.82 | 3.48 | | | | | 2,4 |
| 25mm Non-reflective Air Space | 0.185 | 15.56 | 15.93 | 15.74 | 0.37 | 0.9 | 0.9 | 25 | Horiz | 3 |
| Reflective Sarking | 0.000 | 15.93 | 15.93 | 15.93 | 0.00 | | | | | 4 |
| 90mm Reflective Air Space | 0.858 | 15.93 | 17.64 | 16.78 | 1.72 | 0.9 | 0.03 | 90 | Horiz | 3 |
| 10mm Plasterboard Lining | 0.059 | 17.64 | 17.76 | 17.70 | 0.12 | | | | | 2 |
| Indoor Air-Film | 0.120 | 17.76 | 18.00 | 17.88 | 0.24 | | | | | 5 |
| **TOTAL R VALUE** | **3.0** | **($m^2$.K/W)** | | | 6.00 | | | | | |

Calculation: **W170109a S** (Evaluation for Summer 36℃ ambient temperature, 2 4℃ inside temperature)

| Element Description | SUMMER R ($m^2$K/W) | ℃ out | ℃ in | Mean ℃ | Δ-T | Assumed Airspace Properties e1 | e2 | mm | Heat Flow | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| Outdoor Air Film | 0.040 | 36.00 | 35.83 | 35.91 | 0.17 | | | | | 1 |
| Structaclad 75 Cladding | 1.619 | 35.83 | 28.78 | 32.30 | 7.04 | | | | | 2,4 |
| 25mm Non-reflective Air Space | 0.166 | 28.78 | 28.06 | 28.42 | 0.72 | 0.9 | 0.9 | 25 | Horiz | 3 |
| Reflective Sarking | 0.000 | 28.78 | 28.78 | 28.78 | 0.00 | | | | | 4 |
| 90mm Reflective Air Space | 0.755 | 28.78 | 25.50 | 27.14 | 3.28 | 0.9 | 0.03 | 90 | Horiz | 3 |
| 10mm Plasterboard Lining | 0.059 | 25.50 | 25.24 | 25.37 | 0.26 | | | | | 2 |
| Indoor Air-Film | 0.120 | 25.24 | 24.72 | 24.98 | 0.52 | | | | | 5 |
| **TOTAL R VALUE** | **2.8** | **($m^2$.K/W)** | | | 12.00 | | | | | |

Notes:
1. AS/NZS 4859.1:2002, Amdt.1 2006, Cl. K5(a) - Air Films.
2. AIRAH Technical Handbook, Edition 5 2013, pp. 62-73 - Thermal Properties of Building and Insulating Material.
3. Robinson and Powlitch (1954), assuming still air space and horizontal heat flow.
4. Material R-value in accordance with AS/NZS 4859.1.
5. AS/NZS 4859.1:2002, Amdt.1 2006, Table K1 - Thermal Resistance of Air Films.

- This calculation does not consider thermal bridging as thermal resistance is calculated on the path of the insulation only.
- This calculation is not compliant for the purposes of labelling in accordance with AS/NZS 4859.1 without the endorsement of a recognised laboratory as per Section 4.3 of AS/NZS 4859.1.
- This report may not be produced except in full. Results may not be quoted without reference to the assumptions.

The Total R values of the above system for Winter and Summer conditions have been determined in accordance with the requirements of AS/NZS 4859.1:2002 Amdt 1 (Dec 2006).

**Total R value** $R_T$ **(WINTER)** **3.0** **($m^2$.K/W)**

$R_T$ **(SUMMER)** **2.8** **($m^2$.K/W)**

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