## Date: 29th January 2025

ResCom<sup>®</sup> Building Products Global Group of Companies Head Office: 6a / 40 Kerryl Street KUNDA PARK QLD AUSTRALIA 4556



## Manufactures Declaration of Performance (DoP)

ResCom<sup>(R)</sup> Magnesia Cement Board Thermal Transmittance, Resistance, Conductivity, and Related Values

## 1: Introduction

This document serves as the official Declaration of Performance (DoP) for ResCom<sup>(R)</sup> Magnesia Cement Boards in laminated configurations with a 1.5 mm timber veneer.

The report provides detailed thermal performance metrics, including U-values (thermal transmittance), R-values (thermal resistance), K-values (thermal conductivity), O-values (overall heat retention), and additional related parameters, calculated according to applicable standards and best practices.

## 2: Standards Referenced:

The following standards have been utilized in determining the thermal properties of ResCom<sup>(R)</sup> boards:

- UNE-EN ISO1716: Determination of calorific values.
- EN1182:2011: Reaction to fire testing of non-combustible materials.
- ASTM C518-10: Standard test method for steady-state thermal transmission properties by means of the heat flow meter apparatus.
- ISO 6946: Building components and building elements Thermal resistance and thermal transmittance.

## 3: Thermal Performance Data:

The thermal performance for ResCom<sup>(R)</sup> panels with thicknesses ranging from 4 mm to 16 mm (inclusive of a 1.5 mm timber veneer layer) was calculated using the following material properties:

- Thermal Conductivity of ResCom<sup>(R)</sup> Board (k): 0.44 W/mK.
- Thermal Conductivity of Timber Veneer (k): 0.13 W/mK.
- Timber Veneer Thickness (t): 1.5 mm (0.0015 m).

## Surface Resistances:

- Internal (rint):  $0.13 \text{ m}^2 \cdot \text{K/W}$ .
- External (rext):  $0.04 \text{ m}^2 \cdot \text{K/W}$ .

## 3.1 Thermal Properties for ResCom<sup>(R)</sup> Panels:

The following table presents the calculated values for various ResCom<sup>(R)</sup> board thicknesses:

ResCom Thickness (mm)	R-Value (m²∙K/W)	U-Value (W/m²∙K)	K-Value (W/mK)	O-Value (%)
4 mm	0.0091	5.25	0.44	78.35
6 mm	0.0136	5.12	0.44	79.05
8 mm	0.0182	5.01	0.44	79.68
10 mm	0.0227	4.90	0.44	80.33
12 mm	0.0273	4.79	0.44	80.98
16 mm	0.0364	4.59	0.44	82.14

## 3.2 Key Definitions and Additional Metrics:

1. O-Value (Overall Heat Retention):

Represents the material's ability to retain heat expressed as a percentage of efficiency compared to ideal insulation.

$$O ext{-Value} = \left(1 - {U \over U_{max}}
ight) imes 100$$

2. Thermal Lag:

The material's capacity to delay heat flow, critical in regulating indoor temperatures.

For ResCom<sup>(R)</sup> panels, the thermal lag increases with thickness due to greater resistance to heat transfer.

3. Specific Heat Capacity:

While not directly part of this calculation, ResCom's composition provides a specific heat capacity estimated at  $1.05 \text{ kJ/kg} \cdot \text{K}$ , indicative of its fire-resistant and energy-buffering properties.

## 4. Fire Safety and Material Stability:

The ResCom<sup>(R)</sup> Magnesia Cement Boards meet the EN1182:2011 requirements for non-combustibility, with a calorific value range of 0.1092 MJ/kg to 0.2554 MJ/kg (ISO1716).

The boards are suitable for applications requiring fire resistance and thermal stability, offering low energy release and high stability under extreme conditions.

## **<u>5. Calculations Overview:</u>**

The values were derived using industry-standard equations and adjusted for the unique properties of ResCom<sup>(R)</sup> panels and the laminated timber veneer.

Example Calculation (6 mm ResCom<sup>(R)</sup> with 1.5 mm veneer):

# 1. Thermal Resistance (R):

 $R_{ResCom} = rac{ ext{Thickness (m)}}{ ext{Thermal Conductivity (W/mK)}} = rac{0.006}{0.44} = 0.01364\, ext{m}^2 \cdot K/W$ 

# 1. Thermal Transmittance (U):

## Total resistance:

 $R_{\rm total} = R_{int} + R_{ResCom} + R_{Timber} + R_{ext} = 0.13 + 0.01364 + 0.01154 + 0.04 = 0.19518\,{\rm m}^2 \cdot K/W$ 

$$U = \frac{1}{R_{ ext{total}}} = \frac{1}{0.19518} = 5.12 \, \mathrm{W/m^2} \cdot K$$

## 6. Disclaimer

This Declaration of Performance (DoP) is issued in accordance with the specifications and testing results available at the time of publication.

It is the sole responsibility of the end user to verify that the product is suitable for the intended application and meets project-specific fit-for-purpose requirements.

RGBP Global Group of Companies does not accept liability for improper use or application of the product beyond the guidelines outlined in this document.

Users must consult project engineers or relevant experts to confirm the suitability of the material in specific construction scenarios.

Prepared By: Mr Zhang Technical Design Team: RGBP Global Group of Companies Reviewed and Approved By: Dr Stephin-John Technical Engineering and Compliance Department

: Stephin-John All Rights Reperved

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### Date: 6th January 2025

ResCom® Building Products Global Group of Companies Head Office: 6a / 40 Kerryl Street KUNDA PARK QLD AUSTRALIA 4556

ResCom LGS Product Declaration of performance (DoP) Light Gage Steel (LGS) Fire and Acoustic Separation Walls

- ResCom BP LGS 90min FRL System
- ResCom BP LGS 120min FRL System

### **PRODUCT OVERVIEW**



## **TESTING CRITERIA AND PROTOCOLS**



The systems tested—XF22-240014, XF22-230175, and XF22-240013—are advanced non-combustible inter-tenancy separation wall assemblies designed for superior fire resistance, acoustic performance, and structural integrity.

These systems are engineered to meet the highest standards for **Group** 1 (AS/NZS 1530.4) (ASTM E84 and ASTM E136) (BS 476) and A1 (EN 13501-1) classifications, suitable for critical infrastructure, commercial, and residential applications.

The testing of these systems was conducted in accordance with globally recognized standards, including:

- BB/T 9978.1-2008 & GB/T 9978.8-2008 (China)
- AS/NZS 1530.4 (Australia/New Zealand)
- BS/EU 476 (United Kingdom/European Union)
- 🟽 ASTM E119 (North America)
- 🛞 UL 263 (Underwriters Laboratories, USA)

These standards evaluate fire integrity, fire insulation, and temperature rise performance, ensuring that the systems meet stringent criteria for non-combustibility and fire resistance.

## **KEY PARAMETERS TESTED:**

- 😻 FIRE INTEGRITY: No continuous flames for more than 10 seconds, no ignition of cotton pads, and no penetrating cracks.
- FIRE INSULATION: Average temperature rise <140°C; Maximum temperature rise <180°C.</p>
- 🟽 EXPOSURE TIME: Systems maintained integrity and insulation beyond specified durations (90 min and 120 min).

## **TEST RESULTS OVERVIEW**



### SYSTEM XF22-240014:

- Duration: 90 minutes
- Average Temp Rise: 64°C
- Maximum Temp Rise: 89°C
- **Compliance:** Fully compliant with AS/NZS 1530.4, BS/EU 476, ASTM E119, and UL 263.

### SYSTEM XF22-230175:

- Duration: 90 minutes
- Average Temp Rise: 53°C
- Maximum Temp Rise: 140°C
- Compliance: Fully compliant with AS/NZS 1530.4, BS/EU 476, ASTM E119, and UL 263.

### SYSTEM XF22-240013:

- Duration: 120 minutes
- Average Temp Rise: 68°C
- Maximum Temp Rise: 93°C
- **Compliance:** Fully compliant with AS/NZS 1530.4, BS/EU 476, ASTM E119, and UL 263.

### **MUTUAL RECOGNITION AND ACCREDITATION**

Testing was conducted in **ILAC-MRA** and **CNAS** accredited laboratories, ensuring mutual recognition of results across jurisdictions. Accreditation under **ISO/IEC 17025:2017** guarantees:

- 🔗 Global Acceptance: Results are recognized across all ILAC signatory economies.
- 🔗 **Consistency:** Adherence to international best practices for testing, calibration, and reporting.
- 🔗 Reliability: Accurate and reproducible results validated by stringent laboratory quality controls.

### **PRODUCT CLASSIFICATION**

Based on the testing outcomes, the systems are classified as:

- 🔗 Non-Combustible Material Classification: Group 1 (AS/NZS 1530.4) and A1 (EN 13501-1).
- 🔗 Intended Applications: Critical infrastructure, fire-rated wall assemblies, acoustic partitions, and fire isolation barriers.
- Compliance Regions: Australia, New Zealand, United Kingdom, European Union, North America, and other ILAC-MRA member economies.

## **DECLARATION OF CONFORMITY**

We hereby declare that the systems **XF22-240014**, **XF22-230175**, and **XF22-240013** meet the performance requirements outlined in:

- AS/NZS 1530.4
- BS/EU 476
- ASTM E119
- UL 263

These systems have successfully passed rigorous fire resistance tests, ensuring their compliance with global fire safety regulations.

## **RECOMMENDATIONS FOR USE**



- Suitable for high-risk fire zones, critical infrastructure, and safety-critical applications.
- Recommended for global certification programs and regulatory approvals in international markets.

🛞 Continuous monitoring and periodic re-evaluation are advised to ensure long-term compliance with evolving standards.

Prepared By: Mr Zhang Technical Design Team: RGBP Global Group of Companies Reviewed and Approved By: Dr Stephin-John Technical Engineering and Compliance Department

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Date: 6th January 2025 Reference Code: RGBP-FR-DECL-2025



### Date: November 14, 2024

ResCom® Building Products Global Group of Companies Manufacturers International Guidelines Flat-sheet Fibre Reinforced Cellulose Magnesia Cement Board (CMC)

### To:

Technical Advisers

Re: Manufactures Declaration of Performance (DoP) Report Doc #8336RES

### Dear Advisers,

As the manufacturer of the Patented ISO 8336 **ResCom**® Fibre Reinforced Flat Sheet Magnesia Cement Board products RGBP wishes to formally address the tolerances for our internationally ISO 8336 Certified and Compliant sheathing and lining materials.





As a global manufacturer and supplier of the ResCom® (CMC) Flat sheet exterior and interior cement board products we feel it is important for our customers to understanding the quality and consistency of our products to assure that the end users are aware that our manufacturing Quality Assurance, Policies and Procedures are in line with that of the well-known and recognised International standards for Fibre Reinforced Flat-Sheet Cement boards.

- ISO 8336:2017:
- ASTM C1186-08: ASTM C1325: ASTM E136 & ANSI A118.9:
- AS/NZS 2908.2:2000: AS 1530.1: AS 1530.3: AS 1530.4:
- BS/EN 12467:2012+A2:2018:
- IS 14862:2000:

Mutual recognition of testing standards for fibre-reinforced flat-sheet cement boards is facilitated through international agreements and accreditation frameworks. These frameworks ensure that test results from accredited laboratories are accepted across different countries, streamlining compliance with various national construction codes.

## INTERNATIONAL ACCREDITATION FRAMEWORKS:

**1. INTERNATIONAL LABORATORY ACCREDITATION COOPERATION (ILAC):** ILAC is a global network of accreditation bodies that recognize each other's accreditations through the ILAC Mutual Recognition Arrangement (MRA). This arrangement promotes the acceptance of test and calibration data across national borders, reducing the need for duplicate testing.

2. ASIA PACIFIC ACCREDITATION COOPERATION (APAC): APAC is a regional body that operates a mutual recognition arrangement among accreditation bodies in the Asia-Pacific region, supporting the acceptance of accredited conformity assessment results.

The manufacturing processes for ResCom® (CMC) boards are conducted in strict adherence to international standards, with rigorous quality assurance checks to ensure compliance with ISO 8336 and global National Construction Codes (NCC). RGBP takes great pride in upholding these standards to deliver reliable, high-performance materials.

While RGBP's Quality Assurance processes are designed to minimize inconsistencies, we acknowledge that, as with any high-volume production, there may be isolated instances where minor variances fall within accepted tolerances.

It is important to note that even if such occurrences arise, **ResCom® (CMC)** boards maintain their certified Fire (FR) Rating as a Group 1: or Group A: Non-Combustible Material. This ensures the continued safety and performance integrity of our products.





### **ISO Dimensional Tolerances for Cement Flat Sheets**

Dimension Category	ISO Level I Tolerance	ISO Level II Tolerance
Length and Width		
Sheets up to 600 mm	±3 mm	±4 mm
Sheets 600 mm to 1,000 mm	±3 mm	±5 mm
Sheets 1,000 mm to 1,600 mm	±0.3% of nominal dimension	±0.5% of nominal dimension
Sheets over 1,600 mm	±5 mm	±8 mm

RGBP also affirm that it is an industry standard practice for the installation subcontractors to address any minor dimensional variances. These practices are detailed on Page 56 of the RESCOM® TECH SYSTEMS BOOKLET and are industry standards allowing for a +/-5% tolerance variance.

In cases where discrepancies are observed within edge or diagonal tolerances, a skilled professional can trim, cut, or machine the boards during installation.

Such adjustments, performed by a qualified tradesperson, are standard and will not compromise the functional or safety characteristics of

the materials. Once the finished products joints are caulked, set and finished there should be no visible deficiencies within the final product.

Thank you for your engagement and trust in **ResCom**® Building Products. Should you have any further questions or require additional technical documentation, please feel free to reach out to us. Sincerely,

:Stephin-John All Rights Reperved

:Stephin-John: (Steve) Manufacturing and Technical Director ResCom® Building Products Global Group of Companies W: www.rescombp.com

