



# RESCOM® PERFORMANCE GUIDE

**Internal, External Cladding, Lining  
and Flooring Materials and System**  
ResCom: Edition 7



# RESCOM PERFORMANCE CHARTS

Screw Pull Out Table: Class 3 to 5 (non-corrosive) self-tapering coarse thread screw. Test Standard to ASTM E386

Screw Diameter (mm)	Area	Co-efficient N/mm	N	lbs	Result
3	7.068583471	76.5	504.7466355	121.3921018	Pass
4	12.56637061	76.5	961.327352	215.8081811	Pass
5	19.63495408	76.5	1502.073987	337.2002829	Pass
6	28.27433388	76.5	2162.986542	485.5684074	Pass
7	38.48451001	76.5	2944.065015	660.9125545	Pass
8	50.26548246	76.5	3845.309408	863.2327242	Pass

## GENERAL PHYSICAL CHARACTERISTICS

<b>Flexural modulus</b>	1.093 × 106psi
<b>Flexural strength</b>	1295psi
<b>Compressive strength</b>	3000psi
<b>Shear strength</b>	391psi
<b>Flame spread</b>	0
<b>Smoke developed</b>	0
<b>Combustibility</b>	0
<b>Moisture content</b>	<6%
<b>Impact resistance</b>	1.65 ft/lb-in of notch
<b>Punch Through</b>	1.75"pin @ 1,133kg
<b>Thermal Conductivity 12mm (W/mK)</b>	0.44
<b>Thermal Resistance 12mm (m<sup>2</sup>.K/W)</b>	0.027
<b>Fungus/mould</b>	Non-nutrient

**WARNING:** The above information is ONLY relevant to ResCom® Board products. These results are not a reflection of the performances of other common MgO products. ALL ALTERNATE MgO PRODUCTS SHOULD BE INDEPENDENTLY ACCESSED

### DESIGN RECOMENDATIONS

Panel	L/305 (300mm)	L/305 (400mm)	L/305 (600mm)	L/240 (300mm)	L/240 (400mm)	L/240 (600mm)
<b>12mm</b>	458.94ksm	195.29ksm	58.59ksm	693.30ksm	292.94ksm	92.76ksm
<b>14mm</b>	1225.49ksm	1517.53ksm	156.24ksm	1845.56ksm	781.19ksm	229.47ksm

### LOAD FOR MAXIMUM ALLOWABLE STRESS

Panel	300mm oc	400mm oc	600mm oc
<b>12mm</b>	6669.39ksm	3666.70ksm	1640.49ksm
<b>14mm</b>	12738.25ksm	7177.17ksm	3193.11ksm

Above recommendations based on a maximum allowable flexural stress of 1000 psi

### PANEL SHEAR

<b>12mm panel</b>	140.51/meter
<b>16mm panel</b>	196.90/meter

Above recommendations based on a safety factor of 4.

The use of a T-shaped spline 12,7mm high with 25.4mm wings on both sides is recommended for panels 16mm thick, or heavier, used for subflooring.

### CYCLIC WATER PRESSURE TEST RESULTS (AS/NZS 4284:2008) REP #T0369

Test Pressure (Pa)	Duration (mins)	Comments
<b>227 – 455</b>	5	No Water Penetration
<b>303 – 606</b>	5	No Water Penetration
<b>455 - 910</b>	5	No Water Penetration

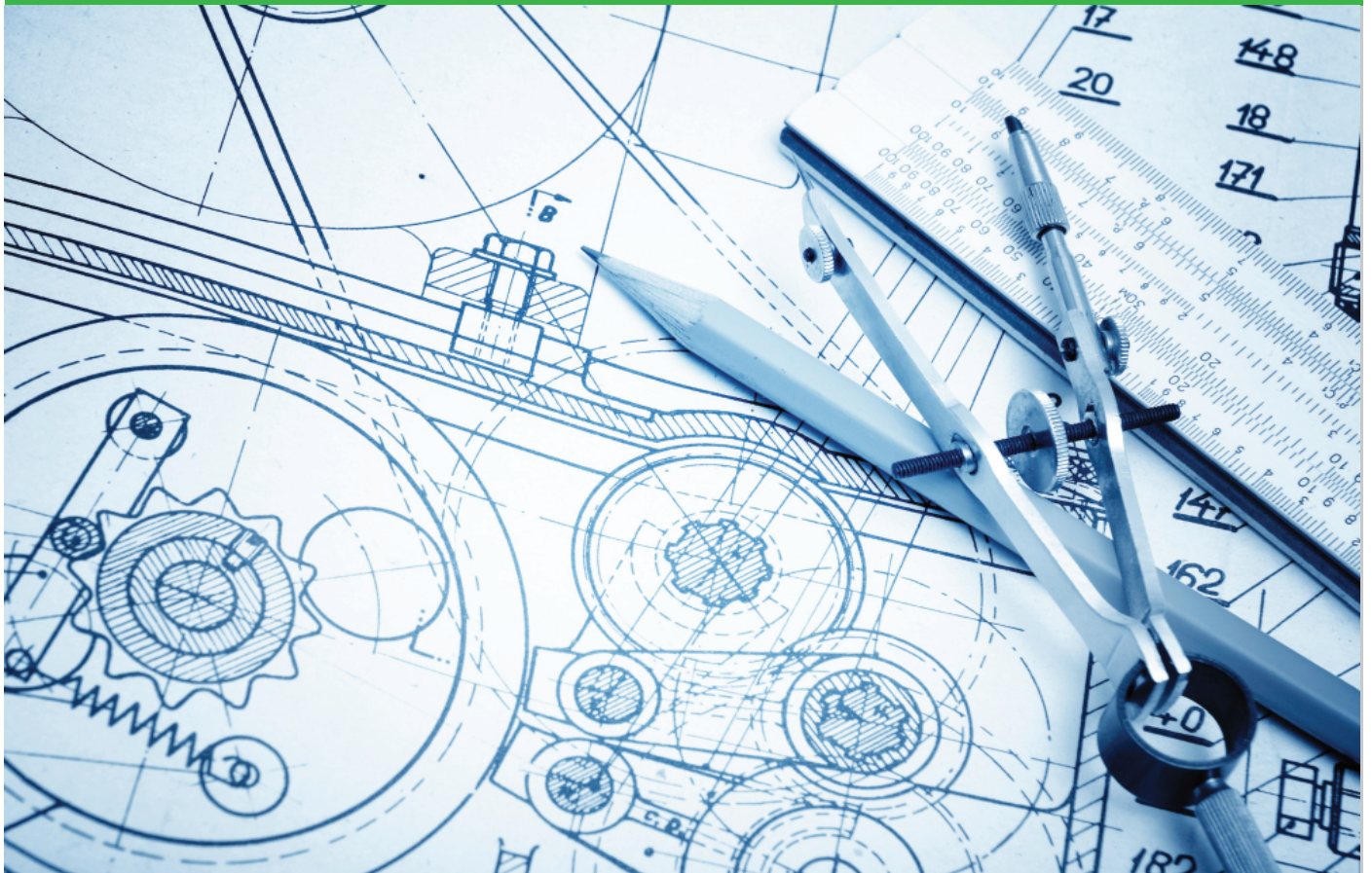
### STATIC PRESSURE WATER PENETRATION TEST RESULTS (AS/NZS 4284:2008)

<b>Test Pressure (Pa)</b>	455 Pa
<b>Test Duration</b>	15 minutes

A series of static and cyclic pressure water penetration tests were carried out on extra high wind zone serviceability pressure of 1515 Pa. No water penetration was observed on the cladding sample during the testing.







## Independent Engineering & Certification

---



[www.rescombp.com](http://www.rescombp.com)



# Product Technical Statement



<b>Company;</b>	<b>ResCom® Building Products Pty Ltd, ResCom® Building Products LLC</b>	
<b>Product Name;</b>	ResCom® (CMC) Wall, Ceiling & Flooring Board	
<b>Type and/or use of product;</b>	Cellulose Magnesia Cement (CMC) Board used for Internal & External Wall Linings	
<b>Description of product;</b>	8mm, 10mm, 12mm, 14mm, 16mm, 18mm 20mm Cellulose Magnesia Cement Board Used in construction as an internal or external wall, ceiling lining & Flooring board	
<b>Fibre-Cement Flat Sheet Performance Requirements to ISO:8336 Standards;</b>	EN 12467:2012+A1:2016 (E); EN 317:1993 EN 12467:2012+A1:2016 EN 12467:2012+A1:2016 EN 12467:2012+A1:2016 (E) EN 12467:2012+A1:2016	(E) Sections 5.4.4 and 7.3.2 (E) Sections 5.5.2 and 7.4.1 (E) Sections 5.5.3 and 7.4.2 (E) Sections 5.4.5 and 7.3.3 (E) Sections 7.3.3
<b>Ref Documents: NCC:2022 BBA:2022, IRC and IBC 2021</b>	NCC 2022: Volume One - Complies with AS/NZS 2908.2 or ISO:8336 1993E	NCC 2022: Volume Two – Complies with AS/NZS 2908.2 or ISO:8336 1993E

## Limitations and Conditions

<b>1</b>	With regards to structural integrity of the required materials for the manufacture and assembly of cabinetry. This Product Technical Statement limits compliance with the relevant Australian, New Zealand and other International Standards as listed below to the following extent;						
	<table border="1"> <tr> <td>EN 12467:2012 + A1:2016 (E)</td> <td>Fiber-Cement Flat Sheets – Product Specification and Test Methods</td> </tr> <tr> <td>EN 317:1993</td> <td>Particleboards and Fiberboards – Determinations of Swelling in Thickness After Immersion in Water</td> </tr> <tr> <td>EN 12467:2012 + A1:2016</td> <td>Fiber-Cement Flat Sheets – Product Specification and Test Methods</td> </tr> </table>	EN 12467:2012 + A1:2016 (E)	Fiber-Cement Flat Sheets – Product Specification and Test Methods	EN 317:1993	Particleboards and Fiberboards – Determinations of Swelling in Thickness After Immersion in Water	EN 12467:2012 + A1:2016	Fiber-Cement Flat Sheets – Product Specification and Test Methods
EN 12467:2012 + A1:2016 (E)	Fiber-Cement Flat Sheets – Product Specification and Test Methods						
EN 317:1993	Particleboards and Fiberboards – Determinations of Swelling in Thickness After Immersion in Water						
EN 12467:2012 + A1:2016	Fiber-Cement Flat Sheets – Product Specification and Test Methods						
<b>2</b>	Products manufactured using the product listed within the Product Technical Statement fulfil all relevant requirements of the European and International Standards as listed above in compliance with ISO:8336.						
<b>3</b>	When installing ResCom® (CMC) products, they must be installed in accordance with all relevant parts of the relevant Building Code to the satisfaction of the Appropriate Authority based on relevant Class of Building.						
<b>4</b>	For the purposes of this Supplier Statement, the term Appropriate Authority has the meaning defined in the National Construction Code.						
<b>5</b>	For Exterior Cladding, Exterior Render Board, Eaves/ Soffits, Under Roof Lining, Interior Ceilings and Walls, Wet Area Board, Tile Backing Board, Flooring Overlay, Window and Door Reveals, Inter Tenancy Walls, Shaft Linings for Lifts, Protection Structural Columns and Beams, Impact Resistant Walls, Commercial Joinery, Decorative and Acoustic Paneling the Product Technical Statement only applies to the Product Technical Statement holders. ResCom®'s (CMC) Board products are appropriately identified by the consumers proof of purchase (receipt).						
<b>6</b>	Information contained herein or related hereto is intended only for evaluation by technically skilled persons, with any use thereof to be at their independent discretion and risk. Nothing in this document should be construed as a warranty or guarantee by PCME Certifications, and the only applicable warranties will be those provided by the Product Technical Statement Holder.						
<b>7</b>	This Product Technical Statement is issued based on the evidence of compliance as detailed herein. Any deviation from the specifications contained in this Product Technical Statement is outside of this document's scope and the installation of the certified product/ system will not be covered by this PCME Supplier Statement. This may result in product being classified as a non-conforming building product/ system.						

Issue Date: 30<sup>th</sup> March 2023

Expiry Date: 31<sup>st</sup> March 2026

Product Technical Statement Number: 100108

# Product Technical Statement



## Product Technical Data

<b>Building Classification/s;</b>	N/A
<b>Type and intended use of a product;</b>	As per Page 1 "ResCom®" Wall & Flooring Product Technical Statement
<b>Description of product;</b>	For Exterior Cladding, Exterior Render Board, Eaves/ Soffits, Under Roof Lining, Interior Ceilings and Walls, Wet Area Board, Tile Backing Board, Flooring Overlay, Window and Door Reveals, Inter Tenancy Walls, Shaft Linings for Lifts, Protection Structural Columns and Beams, Impact Resistant Walls, Commercial Joinery, Decorative and Acoustic Paneling
<b>Product specification;</b>	

### ResCom® Board (10mm, 12mm, 14mm, 16mm, 18mm, 20mm) Cellulose Magnesia Cement(CMC) Board;

1. ResCom® (CMC) Board Internal & External Wall & Floor Linings manufactured & distributed by MgO Corp Asia, ResCom Building Products Pty Ltd & ResCom Building Products LLC meets or exceeds the requirements of; ISO:8336 Standards for Fibre-Cement Flat Sheets.

## ResCom-WallBoard

INTERNAL & EXTERNAL WALL LININGS

PHYSICAL PROPERTY	CONDITION	CONDITION	STANDARD
Average Bending Strength F <sup>L</sup>	Wet	>14MPa	ASTM C1185-08 (2012)
Average Bending Strength Wall	Wet	>12MPa	EN 12467:2012 Sec 5.4.4 & 7.3.2
Density in kg/m <sup>3</sup>	1000		ASTM C1185-08 (2012)
Water tightness		Passes	ASTM C1185-08 (2012)
Water absorption	13.2%		ASTM C1185-08 (2012)
EQ Moisture content		<5%	ASTM C1185-08 (2012)
Moisture movement 30-90% relative humidity*		0.064	ASTM C1185-08 (2012)
Humidified deflection (mm) 32c,40%RH, 48hrs	2.18		ASTM C473-12
Dimensional conformance		Passes	ASTM C1185-08 (2012)
Water Impermeability Category A		Pass	EN 12467:2012
Vapour Permeability Category D		u=80	EN 12467:2012 Sec 5.4.6 & 7.3.4
Freeze-Thaw Category A		Pass	EN 12467:2012 Sec 5.5.2 & 7.4.1
Heat Rain Category A		Pass	EN 12467:2012 Sec 5.5.3 & 7.4.2
Soak-Dry Category A		Pass	EN 12467:2012 Sec 5.5.5 & 7.3.6
Swelling & Thickness	Wet	<0.2%	EN 317:1993
TVOC, Formaldehyde	0	Pass	ISO 16000-3, 6,9 & 11: 2006 & 2011
Calorific Value		0.1092 to 0.2554	UNE-EN ISO1716 & 1182:2011
Thermal Resistance m <sup>2</sup> .K/W		0.027 & 0.045	ASTM C518-10
Thermal Conductivity W/mk		0.44	ASTM C518-10
Fire classification building		Class A1 <sub>FL</sub>	EN 13501-1:2007+A1:2009
Flame Spread & Combustibility	0 / 0 / 0	Class A1 / Class 1	ASTM E84
Flame Spread & Combustibility	0 / 0 / 0	Class A1 / Class 1	AS1530.1
FRL Performance	>120min		ASTM E119
FRL Performance	Exterior Facade	Pass	AS 5113
FRL Performance	Exterior & Interior Wall	Pass	AS 1530.4
FRL Performance	Exterior & Interior Wall	Pass	BS 476 p22
FR Performance	Exterior & Interior Wall		BS 476 p4, 5, 6, 7 & 11
Freeze thaw		Passed	ASTM C1185-08 (2012)
Nail-Head pull through (N)	789		ASTM D1037-12 (Section 15)
Lateral nail resistance (N)	2278		ASTM D1037-12 (Section 13)
Falling ball impact	Unbroken @ 3mtr heights	Passed	ASTM D1037-12 (section 21)
Diaphragm capacity		Passed	ASTM E455-11 & AS/NZS2908.2:2000

### ResCom® (CMC) Board Internal and External Wall Linings Products Composition and Ingredients;

#### Composition

Magnesia Cement(MgO)  
 Magnesium Chloride Solution (MgCl<sub>2</sub>) (included NaCl<sub>2</sub> ≤ 1.5%, KCl ≤ 0.7%)  
 Alpha Cellulose Material  
 Perlite  
 Glass Fibre Mesh and Non Woven Fabric

Issue Date: 30<sup>th</sup> March 2023

Expiry Date: 31<sup>st</sup> March 2026

Product Technical Statement Number: 100108

# Product Technical Statement



## Ingredients

MgO (Magnesium Oxide)  
Mgc12 (Magnesium Chloride)  
Perlite (SiO<sub>2</sub>)  
Alpha Cellulose Material  
Filler (Comprising of glass fibre mesh and non woven fabric)

## ResCom® (CMC) Wall & Floor Internal and External Products Physical and chemical properties

It is commonly colour coded for ease of recognition as the brand and material onsite by the end consumer as being ResCom (CMC) material. Lining Boards typically come in colours Green, Gray, in appearance depending on type of application, each with varying tensile strengths according to type of product application;

- Odour: Very mild
- Physical State: Not relevant
- Vapour pressure: Not relevant
- Specific Gravity: Not relevant
- Flammability Limits: Not relevant
- Boiling Point: Not relevant
- Melting Points: Not relevant
- Flash Point: Not relevant
- Auto-ignition Temperature: Not relevant
- Volatility: Not relevant
- Solubility in Water: Not relevant
- Evaporation rate: Not applicable
- NFPA Ratings (Scale 0-4)
- Health = 1
- Flammability = 0
- Reactivity = 0
- Personal Protection = E

Toxicological and epidemiological data shows any health hazards associated with these products have been evaluated on the basis of the individual ingredients and these hazards should be assumed to be additive. These hazards have been evaluated based on a threshold

## Installation requirements;

Installations of these products are outside the scope of this Product Technical Statement and must installed in accordance to ResCom®'s (CMC) "How to Install Guides". It is recommended that this product be installed by a competent DIY person or a suitably qualified tradesperson.

1. ResCom® Installation Manual  
<https://ResCom@bp.com/technical-manuals/>
2. ResCom® Multipurpose Air Barrier  
<https://ResCom@bp.com/wp-content/uploads/2020/02/Rainscreen.pdf>
3. ResCom® Shaft Liner Systems Engineering Report  
<https://ResCom@bp.com/technical-manuals/>
4. ResCom® Fire and Acoustic Systems Manual  
<https://ResCom@bp.com/technical-manuals/>
5. InsulCore Mineral Wool Insulation Manual  
<https://tinyurl.com/2p85ynwn>
6. Product Storage and Handling  
<https://tinyurl.com/mufd8xsu>
7. Limited Liability Warranty  
<https://tinyurl.com/4n9kh9s3>
8. ResCom® MSDS  
<https://tinyurl.com/f55yuxkb>

Issue Date: 30<sup>th</sup> March 2023

Expiry Date: 31<sup>st</sup> March 2026

Product Technical Statement Number: 100108



# Product Technical Statement



## Evaluation Statements

### Evaluation methods;

PCME Certifications has followed the following procedures for compiling of RGBP WHANUA TRUST, ResCom Building Products Pty Ltd & ResCom Building Products LLC ResCom® (CMC) Wall, Ceiling & Flooring Board Product Technical Statement;

- Assessment of ResCom® Building Products Technical Documentation; And
- Reviewing testing reports of samples supplied to ascertain whether the product meets the performance requirements specified on this Technical Statement; And
- Conducting Desktop audits of the processes used to verify compliance of the ResCom® Wall Board Products manufacturing processes

**Note;** The Product Technical Statement Holder has chosen not to make the above evidence of compliance publicly available, due to the documents being considered commercial confidence. For validation of the mentioned test reports Building Authority must contact the Product Technical Statement Holder directly. Email: [rescombp@rescombp.com](mailto:rescombp@rescombp.com)

## Reports;

A) Intertek JasAnz Accredited: Report Number 161230003SHF-BP-1  
Evaluation Centre; Intertek Testing Services Ltd, Shanghai.  
Plant 7. No. 6958 Daye Rd Fengxian District Shanghai China;  
Product evaluated: ResCom® Cold Form Ceramic Magnesia Cement Board  
Model: ResCom® HMR Board  
- (14mm thickness) Bending Strength (MOR)  
EN 12467:2012+A1:2016 (E);  
(E) Sections 5.4.4 and 7.3.2  
Date: 2017-04-10  
Result: PASS

B) Intertek JasAnz Accredited: Report Number 161230004SHF-BP-1  
Evaluation Centre; Intertek Testing Services Ltd, Shanghai.  
Plant 7. No. 6958 Daye Rd Fengxian District Shanghai China;  
Product evaluated: ResCom® Cold Form Ceramic Magnesia Cement Board  
- (20mm thickness) Swelling in thickness  
EN 317:1993  
Date: 2017-02-08  
Result: PASS

C) Intertek JasAnz Accredited: Report Number 161230005SHF-BP-1  
Evaluation Centre; Intertek Testing Services Ltd, Shanghai.  
Plant 7. No. 6958 Daye Rd Fengxian District Shanghai China;  
Product evaluated: ResCom® Cold Form Ceramic Magnesia Cement Board  
Model: ResCom® HMR Board  
- (10mm, 12mm, 14mm) Bending Strength (MOR)  
EN12467:2012+A1:2016(E);  
(E) Sections 5.4.4 and 7.3.2  
Date: 2017-04-17  
Result: PASS

D) Intertek JasAnz Accredited: Report Number 161230005SHF-BP-1  
Evaluation Centre; Intertek Testing Services Ltd, Shanghai.  
Plant 7. No. 6958 Daye Rd Fengxian District Shanghai China;  
Product evaluated: ResCom® Cold Form Ceramic Board  
Model: ResCom® HMR Board  
- (10mm) Freeze Thaw for Categories A  
EN 12467:2012+A1:2016  
(E) Sections 5.5.2 and 7.4.1  
Date: 2017-04-17  
Result: PASS

Issue Date: 30<sup>th</sup> March 2023

Expiry Date: 31<sup>st</sup> March 2026

Product Technical Statement Number: 100108

# Product Technical Statement



E) Intertek JasAnz Accredited: Report Number 161230005SHF-BP-1  
Evaluation Centre; Intertek Testing Services Ltd, Shanghai.  
Plant 7. No. 6958 Daye Rd Fengxian District Shanghai China;  
Product evaluated: ResCom® Cold Form Ceramic Magnesia Cement Board  
Model: ResCom® HMR Board  
- (10mm) Heat Rain for Categories A  
EN 12467:2012+A1:2016  
(E) Sections 5.5.3 and 7.4.2  
Date: 20.17-04-17  
Result: PASS

F) Intertek JasAnz Accredited: Report Number 161230005SHF-BP-1  
Evaluation Centre; Intertek Testing Services Ltd, Shanghai.  
Plant 7. No. 6958 Daye Rd Fengxian District Shanghai China;  
Product evaluated: ResCom® Cold Form Ceramic Magnesia Cement Board  
Model: ResCom® HMR Board  
- (12mm) Bending Strength (MOR)  
EN 12467:2012+A1:2016 (E)  
(E) Sections 5.4.4 and 7.3.2  
Date: 2017-04-17  
Result: PASS

G) Intertek JasAnz Accredited: Report Number 161230005SHF-BP-1  
Evaluation Centre; Intertek Testing Services Ltd, Shanghai.  
Plant 7. No. 6958 Daye Rd Fengxian District Shanghai China;  
Product evaluated: ResCom® Cold Form Ceramic Magnesia Cement Board  
Model: ResCom® HMR Board  
- (12mm) Heat Freeze Thaw for Categories A  
EN 12467:2012+A1:2016  
(E) Sections 5.5.2 and 7.4.1  
Date: 20.17-04-17  
Result: PASS

H) Intertek JasAnz Accredited: Report Number 161230005SHF-BP-1  
Evaluation Centre; Intertek Testing Services Ltd, Shanghai.  
Plant 7. No. 6958 Daye Rd Fengxian District Shanghai China;  
Product evaluated: ResCom® Cold Form Ceramic Magnesia Cement Board  
Model: ResCom® HMR Board  
- (14mm) Bending Strength (MOR)  
EN 12467:2012+A1:2016 (E)  
(E) Sections 5.4.4 and 7.3.2  
Date: 2017-04-17  
Result: PASS

I) Intertek JasAnz Accredited: Report Number 161230005SHF-BP-1  
Evaluation Centre; Intertek Testing Services Ltd, Shanghai.  
Plant 7. No. 6958 Daye Rd Fengxian District Shanghai China;  
Product evaluated: ResCom® Cold Form Ceramic Magnesia Cement Board  
Model: ResCom® HMR Board  
- (14mm) Heat Freeze Thaw for Categories A  
EN 12467:2012+A1:2016  
(E) Sections 5.5.2 and 7.4.1  
Date: 20.17-04-17  
Result: PASS

J) Intertek JasAnz Accredited: Report Number 161230005SHF-BP-1  
Evaluation Centre; Intertek Testing Services Ltd, Shanghai.  
Plant 7. No. 6958 Daye Rd Fengxian District Shanghai China;  
Product evaluated: ResCom® Cold Form Ceramic Magnesia Cement Board  
Model: ResCom® HMR Board  
- (14mm) Water Impermeability for Categories A  
EN 12467:2012+A1:2016 (E)

Issue Date: 30<sup>th</sup> March 2023

Expiry Date: 31<sup>st</sup> March 2026

Product Technical Statement Number: 100108

# Product Technical Statement



(E)Sections 5.4.5 and 7.3.3

Date: 2017-04-17

Result: PASS

K) Intertek JasAnz Accredited: Report Number 170519002SHF-BP-1  
Evaluation Centre; Intertek Testing Services Ltd, Shanghai.  
Plant 7. No. 6958 Daye Rd Fengxian District Shanghai China;  
Product evaluated: ResCom® Cold Form Ceramic Magnesia Cement Board  
Model: ResCom® HMR Board  
- (10mm) Water Impermeability for Categories A  
EN 12467:2012+A1:2016  
(E) Sections 7.3.3  
Date: 2017-06-02  
Result: PASS

L) Intertek JasAnz Accredited: Report Number 170519002SHF-BP-2  
Evaluation Centre; Intertek Testing Services Ltd, Shanghai.  
Plant 7. No. 6958 Daye Rd Fengxian District Shanghai China;  
Product evaluated: ResCom® Cold Form Ceramic Magnesia Cement Board  
Model: ResCom® HMR Board  
- (12mm) Water Impermeability for Categories A  
EN 12467:2012+A1:2016 (E)  
(E)Sections 5.4.5 and 7.3.3  
Date: 2017-04-17  
Result: PASS

*Stefan Ossenberg*

**Representative Name**

**Signature**

**Certification Company Name: PCME Certifications**

**ABN: 15 818 404 064**

**Address: PO Box 4721 Sunshine Coast MC 4560**

**Phone: +61 422 220 192**

**Email: [stefan@randrsolutions.com.au](mailto:stefan@randrsolutions.com.au)**

**Website: [www.pcmecertifications.com](http://www.pcmecertifications.com)**

Issue Date: 30<sup>th</sup> March 2023

Expiry Date: 31<sup>st</sup> March 2026

Product Technical Statement Number: 100108



## **Declaration of Conformity is ISO 17050:2018 Compliant**

### **ResCom® (CMC) Internal and External wall Linings ResCom® (CMC) Structural Flooring**

#### **Content Inventory**

Product Threshold  
1000 ppm

#### **Product Specification**

ResCom® (CMC) Panels can be a substitution for the following product categories:

- 07 Division, Cementious Board
- 09 Division, Drywall & MDF
- 06 Division Wood & Composite Panels
- 06 Division Sheathing

This Declaration of Conformity is for ResCom® Internal & External Wall Linings in 4mm, 6mm, 8mm, 10mm,12mm,14mm,16mm Panels and ResCom® Structural Flooring 18mm and 20mm Panel thicknesses with an approximate density of 0.95 to 1.40g/cm<sup>3</sup>. ResCom® Wall Panels and Flooring Panels are approved for residential, commercial, and industrial building and construction; partition walls; internal and external sheathing; common finishes; decorative finishes, suspended and acoustical ceilings; XPS/EPS sandwich panels; barge boards; structural load bearing flooring and fire separation panels. The standard production finish is smooth on one side, with a backer or sand finish on the other. This declaration excludes any decorative finishes applied to the panels as manufactured or otherwise. Such excluded finishes include wood veneer, wood grain paper veneer, plastic film or PVC, adhesives, or any applied coatings used to treat the panels for water impermeability or UV resistance.

#### **Declaration**

This Declaration of Conformity is ISO 17050:2018 compliant. All materials were screened, and their relevant GreenScreen Score has been applied, either the List Translator Score or the actual GreenScreen assessment results. Every effort was made to provide the best information possible, and any errors shall be listed as human errors. All product contents were disclosed to 0.01% or 100 ppm. Ranges larger than 10% were added to disguise intellectual property.

Any questions can be directed to the contact provided at the end of the document. Any changes in formulas will trigger a change in this declaration; therefore, the declaration shall be considered valid as published.

CAS RN	Ingredient Name	% Composition	GreenScreen Score	Role
1309-48-4	Magnesium oxide	45-65	BM-3dg	Binder
Undisclosed	Undisclosed	20-40	LT-P1	Flame retardant
Undisclosed	Undisclosed	6-20	LT-UNK	Tensile strength additive
Undisclosed	Undisclosed	4-18	LT-UNK	Filler
Undisclosed	Undisclosed	2-10	LT-UNK	Water resistance
Undisclosed	Undisclosed	0.01-1	LT-UNK	Film former
Undisclosed	Undisclosed	0.01-1	BM-4	Diluent
Undisclosed	Undisclosed	0.01-1	LT-UNK	Filler
Undisclosed	Undisclosed	0.01-1	LT-P1	Flame retardant

## Screening Notes

This content inventory is based on primary information from ResCom<sup>®</sup>. Ranges were used to cover the contents as the formulations also vary as ResCom<sup>®</sup> considers the exact percentage of composition to be intellectual property. All information is disclosed as the “worst case” scenario and shall be viewed for informational purposes only. Exact composition is known only through extensive testing.

This declaration shall fulfill the *LEED v4.1, MR Credit: Building Product Disclosure and Optimization – Material Ingredients, Option 1*.

Respectfully,

**Denice Viktoria Staaf**

LEED AP BD+C, Fitwel Ambassador, EPD & HPD Approved Preparer,  
ESG Consultant and Circularity Expert

Email: [dstaaf@labelingsustainability.com](mailto:dstaaf@labelingsustainability.com)

Mobile: +1 (310) 210-5247

Address: Labeling Sustainability, Los Angeles, CA, USA

[www.labelingsustainability.com](http://www.labelingsustainability.com)

## Contact

Name: Dr :Stephin-John: :Marskell.

Email: [rescombp@rescombp.com](mailto:rescombp@rescombp.com)

Title: Technical Director

Signature: 

Address: P O Box 816 Moffat Beach Queensland AUSTRALIA 4551

Phone: +61411658283

Website: [www.rescombp.com](http://www.rescombp.com)

# Product Evaluation Report for



Report Reference: RES-PEVR2023

## Scope & Summary of Report

Assessment to the products suitability for use in building and construction under the 2018 IBC and 2018 IRC requirements, the BS/EN and the AS/NZ National Construction Codes:

ResCom® Cellulose Sorel Cement (CSC) products have been independently audited and certified under ISO:8336 Standards as that of a Cellulose Fibre Cement Flat Sheet products and is compliant and fit for purpose use throughout global building and construction codes and standards equivalent to:

- AS/NZS 2908.2 or ISO:8336
- ASTM:1186/85 or ISO:8336
- BS/EN: 12467 or ISO:8336
  
- ResCom® Cellulose Sorel Cement (CSC) board are a patented magnesium oxide cold ceramic mineral base sheeting.
- ResCom® Cellulose Sorel Cement (CSC) board are a construction, insulation and decoration panels that can be used in interior and exterior surfaces of all buildings.
- ResCom® Cellulose Sorel Cement (CSC) board can be shaped to suit various configurations can be joined and can be joined using normal building practices.
- ResCom® Cellulose Sorel Cement (CSC) board can be used to obtain construction elements for differing purposes by combining with various insulation materials to deliver protection from: fire, mould, water, sound, impact and vermin.
- ResCom® Cellulose Sorel Cement (CSC) can be used with insulating materials such as ESP, XPS, Rockwool, Fibreglass and polyurethane foam that provide high heat, sound, and fire insulation for partition walls and sandwich panels.

## Product Use:

ResCom® Cellulose Sorel Cement (CSC) boards are used on interior surfaces, as defined in IBC Section 2502, as substrate sheets suitable for decoration with paint, wallpaper, ceramic tile, natural stone or dimension stone on walls in interior dry areas, and on walls and ceilings, as permitted in IBC Section 2509.2 and IRC Section 702.4.2.

ResCom® Cellulose Sorel Cement (CSC) board can be used as structural sheathing applied to interior and exterior wood or metal framed walls, to resist uniform transverse loads and racking shear loads.

The boards are suitable for use in all construction types under the IBC and in buildings constructed under the IRC, BBA2021 and NCC:2019 when installed into building systems as per the minimum recommendation of the jurisdiction building codes and that of the manufacturers recommendations.





RGBP Whanau Trust ITF  
ResCom Building Products  
P.O.Box 816  
Moffat Beach Queensland  
Australia 4551  
PH: +61 7 54329890  
Web: [www.rescombp.com](http://www.rescombp.com)  
Email: [admin@rescombp.com](mailto:admin@rescombp.com)

ResCom® Cellulose Sorel Cement (CSC) board has been independently assessed as being fit for purpose use in building and construction when installed as per the requirements of the ResCom® Technical Installation Manual 2019 and applied as detailed in the related evidence-based testing reports as referenced in this Product Technical Statement Report #100108

### **Evaluation Scope:**

Compliance with the following codes:

- International Building Code (IBC) 2021
- International Residential Code (IRC) 2021
- International Fire Code (IFC) 2021
- National Construction Code (NCC) 2022

### **Properties evaluated:**

- Structural
- Durability
- Construction Types I-IV
- Surface-burning characteristics

### **Evidence Submitted**

- Data in accordance with the ICC-ES Acceptance Criteria for Fibre-reinforced Magnesium-oxide-based Sheets (AC386) dated October 2007.
- Data in accordance with the ICC-ES Acceptance Criteria for Reinforced Cementitious Sheets Used as Wall and Ceiling Sheathing and Floor Underlayment (AC376), dated February 2009.
- Data in accordance with the ICC-ES Acceptance Criteria for Racking Shear Evaluation of Proprietary Sheathing
- Materials Attached to Light-framed Walls with Proprietary Fasteners (AC269), dated October 2009.
- Data in accordance with the ICC-ES Acceptance Criteria for Fibre-cement Interior Substrate Sheets Used in Wet and
- Dry Areas (AC378), dated August 2012.

### **Evaluation Report Opinion Extract**

Subject to the following Conditions & Limitations:

- The product must be installed in accordance with report holders published manual.
- Sound resistance varies with board thickness, consult manufacturers specifications for STC ratings
- Full technical information is available at [www.rescombp.com](http://www.rescombp.com) or upon request.



## **PRODUCT DESCRIPTION**

- ResCom Cellulose Sorel Cement (CSC) board range in thickness from .16" (4mm) to 2" (50mm) which are magnesium-oxide sheets, reinforced with fiberglass mesh on both faces, available in standard 4ft (1220mm) width and lengths of either 8ft (2440mm), 9ft (2745mm) and 10ft (3050mm).
- Special sizes can be manufactured to meet a projects needs on request.
- The boards exhibit a maximum deflection of .06"(1.6 mm) in humidified deflection testing in accordance with ASTM C1396.
- ResCom Cellulose Sorel Cement (CSC) board has a flame spread index of 10 or less and a smoke-developed index of 5 or less, when tested in accordance with ASTM E84. ResCom boards are classified as non-combustible building materials in accordance with ASTM E136.
- ResCom Cellulose Sorel Cement (CSC) board is a lightweight and integrated insulating, cladding and finishing systems for new residential and commercial constructions.
- ResCom Cellulose Sorel Cement (CSC) sheeting is suitable for a wide range of general building uses and for applications that require fire resistance, mould and mildew control, as well as sound control applications and many other benefits.
- As an environmentally friendly building material, has strength and resistance due to strong bonds between magnesium and oxygen atoms that form the magnesium oxide molecules.

ResCom® Cellulose Sorel Cement (CSC) sheeting can be used in place of traditional gypsum drywall as wall and ceiling covering material and sheathing. It may also be used as flooring and a number of other construction applications such as:

- Fascia's
- Soffit
- Tile backer
- Flooring overlay
- Shaft-liner
- Electrical cable tray liner
- Electrical barge boards
- Façade cladding
- Rapid Air Barrier
- Substrates for coatings and insulated systems such as finish systems, EIFS, and some types of stucco.

## **Benefits**

ResCom® Cellulose Sorel Cement (CSC) board provide the following benefits:

- Can be used as interior and exterior facing in all kinds of construction.
- Can be used in the place of traditional drywall or cement boards. No special tools required.
- For places where high level of sound insulation is required (for thickness of 8mm and above).
- Used as roof sheathing panels .40" to .63" (10mm, 12mm, 14mm, & 16mm).
- Resistant to impact.
- Lightweight, can be carried easily.
- Made completely of natural materials and is environment and nature friendly.
- Does not include any materials such as asbestos, toxic materials and heavy metals that are hazardous to human health.
- Is not affected by ultraviolet rays.
- Does not need special treatment.
- Is not affected by insect pests.



- Can be painted or coated with any render / stucco / lime wash / traditional coating.
- Can be easily processed and assembled with convenient hand tools.
- Provides material and labour savings in painting, side coating, insulation and thin putty up to 50 to 60%.
- Is highly resistant against chemicals.
- Is a breathing material.
- Is accommodated to various insulation materials.
- Can be used as sandwich panels for various purposes.
- Hard non-absorbent surface – no paper.
- Can be used in applications to replace Portland Cement-based FC and OSB siding.
- Available in colours. Gray, Brown, Light Blue, Pink and Creamy White.

### **Ratings and Testing:**

- Fire-resistant (UL 055 and ASTM-Tested and A-Rated, AS/NZ and BS/EN Group 1).
- Standard test method of Surface burning Characteristics of building materials ASTM E84-12a or equivalent
- Standard test method for fire wall protection under ASTM 119 from 60 to 180min FRL or equivalent
- Waterproof (Freeze/Thaw-Tested for 36 months) ASTM 1185/1186c or equivalent
- Mold / fungus / bug free (non-nutritious to mold, fungus, insects ASTM G-21). or equivalent
- Impact-resistant (ASTM D-5628) or equivalent
- NYC Approved (MEA # 359-02-M). or equivalent
- Silica / Asbestos / Formaldehyde free.
- CHPD/EHLB/Standard Method V1.1,2010 Emissions Test California specifications 01350: ISO16000-3 & 6:2011 ISO16000-9 & 11:2006
- STC-Rated 53 to 62. or equivalent

### **Design & Installation**

Transverse Load Resistance: When installed in accordance with Section 4.2 of this report, ResCom Cellulose Sorel Cement (CSC) board sheathed walls resist a maximum transverse load of 40 psf (1915 Pa).

Racking Shear Resistance: When installed in accordance with Section 4.2 of this report, "ResCom" sheathed walls have a maximum racking shear resistance of 140 plf (2043 N/m), a maximum wall height of 8ft (2.44m) and a shear wall height-to-length aspect ratio of 1-to-1.

Use of ResCom® Cellulose Sorel Cement (CSC) board as shear wall sheathing is limited to resisting wind loads and seismic loads in Seismic Design Categories A, B and C.

### **Installation:**

- ResCom® Cellulose Sorel Cement (CSC) board must be installed on wood framing members spaced not more than 16" (406 mm) on centre on minimum 2-by-4 studs.
- The framing members must have a minimum specific gravity of 0.42 for transverse load resistance and 0.50 for racking shear resistance.
- The panel joints must occur over framing. The boards must be installed using corrosion-resistant, 1.5" No. 8, self-drilling screws at a maximum spacing of 6" (152 mm) on centre around the perimeter and 12" (305 mm) on centre in the field. When installing the board in corrosive environments / zones the installer must use high-grade stainless-steel fixtures and fittings



### **Protection of Materials when Applied as Exterior and Wet area Lining**

- ResCom® Cellulose Sorel Cement (CSC) panels are to be treated with a water impermeable and UV resistant sealer.
- This treatment is to be maintained over the life of the product as stipulated by the coatings manufacturer.
- Impermeable protection is required to be applied to the panels prior to installation as an external sheeting / cladding or as a wet area lining.
- Applicators must avail themselves of the technical data and MSDS of the materials supplied by the coatings company prior to handling and installation.

### **Primer, Coatings and Finishes:**

ResCom® Cellulose Sorel Cement (CSC) boards are compatible with commercially available paint or render systems.

ResCom Building Products advises it is best to seek professional opinion by your preferred coatings specialist to the best products suitable for your application.

### **Partition Wall Construction:**

- In general terms construction that is prepared using C, U, galvanised or box profiles. ResCom® Cellulose Sorel Cement (CSC) are fixed on both surfaces using countersunk head screws, rock wool or fibre glass depending on the FRL and STC performance requirements of the wall systems using as standard .31", .40", .50", & .63" (8mm, 10mm, 12mm, 14mm & 16mm) panels.
- Refer to the technical installation manual or contact ResCom Building products for guidance on bidirectional and single directional fire protection FRL configurations.

### **Roof Application:**

As per the installation manual .50", .47" & .63" (12mm, 14mm & 16mm) ResCom® Cellulose Sorel Cement (CSC) is used instead of wood-based plates.

### **Suspended Ceilings:**

ResCom® Cellulose Sorel Cement (CSC) board are fixed to construction prepared by using C, U or M galvanised profile, or iron profile by using either pointed or self-screwing screws. In ceilings .24", .31" & .40" (6mm, 8mm & 10mm) ResCom® Cellulose Sorel Cement (CSC) panels are used.

### **Raised Floor System:**

- ResCom® Cellulose Sorel Cement (CSC) board used in raised floor construction use structural panels utilising 16mm to 20mm thickness in structural load bearing panels.
- Recommended adhesives for flooring use include ceramic adhesive mortar, flexmortel, polyurethane foam and acrylic mastic.
- ResCom® Cellulose Sorel Cement (CSC) boards can be fixed to either timber or a lightweight metal frame subfloor systems. Such framing must be constructed in accordance with relevant state requirements.
- The frame must comply with the local building regulations and the requirements of the applied loads as per engineering compliance and specifications.





- Maximum frame centres for fixing sheets to the frame is 23.62" (600mm) centre to centre (Consult technical manual and engineering to assure performance criteria of live and point loads.
- It is a requirement of construction that in order to provide sufficient support for screws or nails, a minimum stud width of 1.65" (42mm) (for timber) or 1.4" (36mm) (for a metal frame) is required.
- Where this is not possible, an additional stud will be required to ensure fasteners can be fixed at a minimum distance of .50" (12mm) from the sheet edge.
- When installing ResCom board to metal frames it is a requirement to place a moisture separation of water-resistant silicon or similar to the face of the steel member before installing the board.

### **Board Layout:**

- ResCom® Cellulose Sorel Cement (CSC) can be fixed to framing vertically or horizontally.
- Planning the sheet layout before fixing is important in order to minimize the number of sheet joints.
- It is recommended that wherever possible the installer should avoid horizontal sheet configuration.
- Horizontal sheet layout is only recommended where the maximum depth of cladding is 4ft (1220mm) or 2ft - 11" (900mm) (one sheet width).
- Horizontal sheet installation is more suitable for applications such as fascia's, spandrels, parapets etc.

### **Board installation:**

- When installing ResCom® Cellulose Sorel Cement (CSC) board the fasteners must be fixed at minimum of .50" (12mm) from the sheet edges and 1.96" (50mm) from the sheet corners.
- Fasteners must be fixed along the edge of the sheet and the distance between the centres of the fasteners must not exceed 7.9" (200mm).

### **Framing & Fixing:**

- All studs and noggins must be checked with a log straight edge for line and face accuracy, to ensure the stud wall has a true and accurate outside face as any warping will be visible after paint or texture.
- The recommended tolerance should be less than .08" (2mm) per 19.7" (500mm).

### **Timber Framing:**

- Timber framing used in conjunction with ResCom® board must comply with "Residential Timber Framed Construction". The timber used for house construction must have the level of durability appropriate for the relevant climate and expected service life and condition.
- Timber frame thickness (stud width) at sheet joints must have a minimum of 1.65" (42mm).
- Timber with less than 1.65" (42mm) wide must not be used at any sheet joint because of insufficient sheet landing width, and should provide double studs at sheet joints.
- In the case of a supporting frame in the middle of the sheet, the fasteners should be fixed in the body of the sheet, and the distance between the centres of the fasteners must not exceed 11.8" (300mm).
- Control joints should be installed where there is a significant structural moment expected.
- If a continuous run of sheeting exceeds at 18ft (5.4mtrs) at flooring level, it must be broken with control joint.



### **Vertical control joints:**

- Any vertical control joint must be installed in any wall run that exceeds 18ft (5.4mtrs).
- The control joint will require a .50" gap between sheets and the joint must be supported by double studs.
- Back blocking to vertical joints mid span using a min 5.9" (150mm) rip of matching panel which is then glued using an appropriate structural polyurethane adhesive and screwed using non-corrosive fixings.

### **Horizontal control joints:**

- Any horizontal joints must be located in walls at 12ft (3.6mtrs) maximum centres.
- They are also required at floor joint level and at garble ends.
- Back blocking to horizontal joints mid span using a min 5.9" (150mm) rip of matching panel which is then glued using an appropriate structural polyurethane adhesive and screwed non-corrosive fixings.

### **Metal Framing:**

- ResCom® Cellulose Sorel Cement (CSC) boards can be fixed directly to lightweight metal frame which complies with AS3623;
- The metal frame must have a minimum flange width of 1.4" (36mm) per sheet joints, as this is deemed provide adequate support for fixing two sheet edges.
- Where narrow sections are used, double studs at the sheet joints must be incorporated.
- When fixing ResCom® board to a rigid framing, it is required that the frame be batten out using either timber battens or light steel top hats sections prior to fixing.
- Any battens supporting the sheet joints must have a minimum face width of 1.77" (45mm).
- Hot rolled steel structural sections must be battened out with timber or steel top hat battens before sheets are fastened.

### **Conditions of Use:**

ResCom® Cellulose Sorel Cement (CSC) boards as described in this report complies with, and is a suitable alternative to what is specified in the codes listed in this Product Evaluation Report, subject to the following conditions:

- Panels must be installed in accordance with this report and the manufacturer's published installation instructions.
- In the event of a conflict between this report and the manufacturer's published installation instructions, this report governs.
- When used as a component of shear walls (racking shear), the panels are recognized for use in Seismic Design Categories A, B and C under the IBC and IRC or equivalent.
- The support framing must be designed for a maximum allowable deflection of L/360 under seismic or wind loads for exterior or interior areas.
- Use of ResCom® Cellulose Sorel Cement (CSC) board as floor sheathing or floor underlayment is outside of the scope of this Evaluation Report.
- Installation of a vapor retarder in exterior walls must be in accordance with code requirements.
- ResCom® Cellulose Sorel Cement (CSC) board must not be exposed to the weather and must not be used in wet areas as defined in IBC Section unless coated with an appropriate water proofing system or equivalent
- Use of the panels in horizontal diaphragms is outside of the scope of this Evaluation Report.
- ResCom® Cellulose Sorel Cement (CSC) board is covered by this Product Evaluation Report only when manufactured by a factory under a quality control program with independent QA inspections undertaken by PCME, IGNIS FIRE ENGINEERING or INTERTEK LCC.



- Under the IRC, the substrate sheets must not be used in wet areas unless sealed with appropriate waterproof binder sealer and then treated with a suitable waterproofing membrane that is installed by a qualified applicator as per the requirements of the relevant building code for waterproofing of wet areas or equivalent

<b>Cyclic Water Pressure Test Results (AS/NZS 4284:2008) Rep #T0369</b>		
<b>Test Pressure (Pa)</b>	<b>Duration (mins)</b>	<b>Comments</b>
227 - 455	5	No Water Penetration
303 - 606	5	No Water Penetration
455 - 910	5	No Water Penetration
<b>Static Pressure Water Penetration Test Results (AS/NZ 4284:2008)</b>		
Test Pressure (Pa)	455 Pa	
Test Duration	15 minutes	

A series of static and cyclic pressure water penetration tests were carried out on Extra High Wind Zone serviceability pressure of 1515 Pa. No water penetration was observed on the cladding sample during the testing

## **Product Identification**

ResCom products are colour coded to assure visual identification and they clearly bear the:

- ResCom® logo,
- Product brand name,
- Quality control batch number
- Independent 3<sup>rd</sup> Party QA inspection brand and number (PCME / IGNIS / INTERTEK)

## **Foundation of The Product Evaluation Report**

The Product Evaluation Report has been issued as per international ISO 9001, ISO14001 and ISO1720 protocol and the following aspects have been evaluated during this process:

- Manufacturing and quality control procedures.
- Product recall policies and procedures.
- Installation procedures.
- Physical Properties.
- Independent Review of Full-Scale Test Reports carried out by ILAC accredited and licensed testing facilities
- Review and confirmation of independent fire and structural engineering reports
- Review and confirmation of Independent 3<sup>rd</sup> party quality assurance programs in place with NAMI and Intertek
- Cross evaluation of international testing results under ASTM/UL, BS/EN, ISO and AS/NZ Standards
- Review of performance testing and reports to meet the requirements of the IBC 2021.
- Review of performance testing and reports to meet the requirements of the IRC 2021.
- Review of performance testing and reports to meet the requirements under the NCC 2022.



## Bibliography

The following documents and inspections were used in carrying out the Evaluation Report:

- Manufacturers and Installation Information:
- ResCom® Building Products Technical Installation Manual
- Technical Construction drawings supplied by RGBP and available on the RGBP website: [www.rescombp.com](http://www.rescombp.com)
- Technical data sheets and PCME / IGNIS / INTERTEK / ILAC laboratory test results issued by accredited testing facilities
- Licensed engineering reports.
- Manufacturers QA and in house laboratory results
- Onsite compliance inspections of product installation and applications
- Manufacturing inspection and audit of operations

## Test Reports:

PHYSICAL PROPERTY	CONDITION	RESULT	STANDARD
Average Bending Strength F <sup>L</sup>	Wet	>14MPa	ASTM C1185-08 (2012)
Average Bending Strength Wall	Wet	>12MPa	EN 12467:2012 Sec 5.4.4 & 7.3.2
Density in kg/m <sup>3</sup>	1000		ASTM C1185-08 (2012)
Water tightness		Passes	ASTM C1185-08 (2012)
Water absorption	13.2%		ASTM C1185-08 (2012)
EQ Moisture content		<5%	ASTM C1185-08 (2012)
Moisture movement 30-90% relative humidity*		0.064	ASTM C1185-08 (2012)
Humidified deflection (mm) 32c,40%RH, 48hrs	2.18		ASTM C473-12
Dimensional conformance		Passes	ASTM C1185-08 (2012)
Water Impermeability Category A		Pass	EN 12467:2012
Vapour Permeability Category D		u=80	EN 12467:2012 Sec 5.4.6 & 7.3.4
Freeze-Thaw Category A		Pass	EN 12467:2012 Sec 5.5.2 & 7.4.1
Heat Rain Category A		Pass	EN 12467:2012 Sec 5.5.3 & 7.4.2
Soak-Dry Category A		Pass	EN 12467:2012 Sec 5.5.5 & 7.3.6
Swelling & Thickness	Wet	<0.2%	EN 317:1993
TVOC, Formaldehyde	0	Pass	ISO 16000-3, 6,9 & 11: 2006 & 2011
Calorific Value		0.1092 to 0.2554	UNE-EN ISO1716 & 1182:2011
Thermal Resistance m <sup>2</sup> .K/W		0.027 & 0.045	ASTM C518-10
Thermal Conductivity W/mk		0.44	ASTM C518-10
Fire classification building		Class A1 <sub>FL</sub>	EN 13501-1:2007+A1:2009
Flame Spread & Combustibility	0 / 0 / 0	Class A1 / Class 1	ASTM E84-12a
Flame Spread & Combustibility	0 Flame / 5 Smoke Development		ASTM E2768-11
Flame Spread & Combustibility	0 / 0 / 0	Class A1 / Class 1	AS1530.1
FRL Performance	>120min		ASTM E119
FRL Performance	Exterior Facade	Pass	AS 5113
FRL Performance	Exterior & Interior Wall Lining	Pass	AS 1530.4
FRL Performance	Exterior & Interior Wall	Pass	BS 476 p22
FR Performance	Exterior & Interior Wall		BS 476 p4, 5, 6, 7 & 11
Freeze thaw		Passed	ASTM C1185-08 (2012)
Nail-Head pull through (N)	789		ASTM D1037-12 (Section 15)
Lateral nail resistance (N)	2278		ASTM D1037-12 (Section 13)
Falling ball impact	Unbroken @ 3mtr heights	Passed	ASTM D1037-12 (section 21)
Diaphragm capacity		Passed	ASTM E455-11 & AS/NZS2908.2:2000





## **Additional Supporting Evidence:**

- Fenestration Test Reports ASTM E72, ASTM E330-02, TAS 201-94, TAS 202-94 & TAS 203-94.
- FAB Test Reports ASTM E455-11.
- FAB Test Report ASTM E386.
- USQ Test Report ASTM E72.
- BRANZ Test Report ASTM C518-10.
- SGS Test Report EN13501-1:2007 Class A1.
- SGS Test Report EN13501-1:2007 Class A1FL.
- SGS Test Report ISO 5660-1:2002.
- Warrington's Laboratories (UK) BS:476.22
- IGNIS Fire Laboratories AS:1530.1
- IGNIS Fire Laboratories AS:1530.3
- IGNIS Fire Laboratories AS:5113
- IGNIS Fire Laboratories AS:1530.4
- SGS Test Report AS/NZS 1530.4:2005.
- SGS Test Report AS/NZS 3837:1998.
- FAB Test Reports AS/NZS 2908.2-2000.
- University Auckland Test reports AS/NZS4063.1:2010.
- APL Test Reports AS/NZS 4284:2008 and NZS 4211:2008 / E2 VM1.
- CSIRO Fire test report.
- CSIRO Report to AS1530.4.
- CSIRO Report Magnesium Oxide Board Lined framed wall system.
- ALS Group VOC Test Report.
- NRC Test Report GB/T 10295-2008.
- Killargo Test Report ISO10140 Airborne Sound.

### **Notice:**

The above information forms part of the international intellectual property of ResCom Global Building Products remains in the ownership of RGBP Whanau Trust ITF ResCom Building Products and protected to the full extent of international copyright laws. No duplication, copying or sharing with third parties nor use of the information to apply into building and construction is allowed without the expressed written permission and signed authority of the Trustee for the RGBP Whanau Trust.

**ResCom Global Building Products**  
Build with Confidence - Not with Regret  
**Non Combustible - Robust - Impact & Water Resistant**

- Full Scale Fire Tested to AS/NZS, ASTM, BS/EN
- FRL Bi-Directional Systems to - (240/240)
- FRL Single Directional Systems to - (120/120)
- Wildfire / BAL FZ Certified
- Replace Shaft Liner
- Replace Multi-Layer Inter-Tenancy Walls
- Protection of Structural Elements
- Exterior Cladding
- Zero Boundary Fire Wall Protection
- Suitable for All Residential & Commercial Applications

For More Information: [www.rescom.com](http://www.rescom.com)  
24/7 Global Hotline: +61 7 5432 9890  
Email: [rescombp@rescombp.com](mailto:rescombp@rescombp.com)

CONFIDENTIAL



## Structural Engineering Evaluation Report (Under AS/NZ) Building Codes

<b>Report for:</b> Magnesium Oxide Board Corporation Pty Ltd MgO Corp Asia Shandong Science and Technology Office: 3 Allen Street, Moffat Beach Qld 4551	<b>Report carried out by:</b> Adam Winter ABN 42911462509 (Sole Trader) Registered Professional Engineer of Queensland (Reg No: 09104) 102 Bamboo Ave, Benowa, Qld 4217  Date of Report: 19 <sup>th</sup> Dec 2017.
--	--

To Whom It may Concern;

Adam Winter, Civil Engineer has been commissioned by Magnesium Oxide Board Corporation Pty Ltd and MgO Corp Asia Shandong Science and Technology to carry out the following structural engineering evaluation review over testing data and technical information as noted herein as evidence to the suitability and compliance of ResCom flooring board against AS/NZS 1170.0: 2002 & AS/NZS 1170.1: 2002.

### Test Specifications:

AS/NZS 1170.0 : 2002, Appendix B (Use of Test Data for Design). The sheeting was tested by application of proof testing as per AS/NZS 2908.2 – 2000, followed by Structural Analysis Computer Aided Software Modelling the load cases in accordance with AS/NZS 1170.0 :2002 and AS/NZS 1170.1 :2002.

### Products covered by this Certification

The following products are covered under this certification:

Product Reference: ResCom<sup>(R)</sup> Structural Flooring Board  
Product Description: Fibreglass Reinforced Composite Cold Form Ceramic Magnesium Oxide Board  
Finish: Smooth face with Sanded back  
Colour: Brown, Dark Green and Dark Gray  
Edging: Square / ShipLap / T&G  
\*Thicknesses: 16mm, 18mm and 20mm

\*Note that the test data referred to below covers a wider range of board thicknesses which are not currently stocked by the MGO Corporation and are therefore not required to be certified at present.

### Objective of Testing Procedures

The objective of the initial testing was to determine the Bending Strength (Modulus of Rupture) and Youngs Modulus in accordance with AS/NZS 2908.2 – 2000 Cellulose Cement Products – Part 2 Flat Sheets.

With the data obtained from the above proof testing it was possible to carry out finite element analysis of all test specimens to obtain the deflection limits as required to prove that the sheeting materials comply with relevant Limit State Design criteria as set out in AS/NZS 1170.0 :2002 and AS/NZS 1170.1 :2002.

The test results were obtained specifically in relation to the sheeting being tested for structural adequacy and serviceability when being used as a floor sheeting within buildings.

**CONFIDENTIAL**

Evidence Base Testing Reviewed

The following reports provide the data that supports the subject certification:

- Intertek Reports: 161230003SFH-BP-1, 161230004SHF-BP-1, 161230005SHF-BP-1, 161230005SHF-BP-9, 161230005SHF-BP-10, 161230005SHF-BP-11.
- SGS Reports: SHCCM141002093 & SHCCM150200417.
- MgO Corp Asia Quality Control Reports: 150724, 20171211, BSWA20SF, RESCOMFOC060217.
- FAB Report 1305200001.
- Other Evidence Base Reports: Infinite Analysis Reports using calibrated test equipment and testing protocols under AS/NZS 2908.2-2000 Cellulose-Cement Products. Sampling was taken from MgO Corp Pty Ltd warehouse #1 Allen Street Moffat Beach Queensland and testing was carried out under controlled environment at 18B Wirraway Drive, Rothwell QLD. Test equipment was calibrated and quality controlled as required under the testing standards requirements and protocols.

Results of Testing

(a) Serviceability

In accordance with Table C1 – Suggested Serviceability Limit State Criteria AS/NZS 1170.0:2002:

Magnesium Oxide Board – Midspan Deflection (sag) – Maximum Deflection allowable is span/250.

Referring to the FAB Report #1305200001, p.2 "Results Summary" - for the 16mm sample:  
 $\text{span} / 250 = 400 / 250 = 1.6\text{mm}$  max allowable sag at midspan.  $0.73\text{mm} < 1.6\text{mm}$  therefore okay.  
 Using the same calculation as above it is found that all samples in the summary table comply with the applicable serviceability criteria.

(b) Imposed Floor Actions – Referencing Table 3.1 AS/NZS1170.1:2002

Using the below excerpt of results obtained from FAB Report #1305200001, it is possible to design the subject floor using the sheeting by considering the type of activity/occupancy for part of the building or structure. The maximum uniformly distributed actions and concentrated actions that each sheet is structurally adequate for are specified below, once the specific activity type is know, the corresponding board thickness can be chosen.

Thickness	Spacings	1.5kPa/1.8kN	2.0kPa/2.5kN	3.0kPa/3.7kN	5.0kPa/6.7kN
16mm	400mm	✓			
18mm	400mm	✓	✓		
18mm	450mm	✓	✓		
19mm	450mm	✓	✓		
20mm	450mm	✓	✓	✓	
20mm	600mm	✓	✓	✓	
25mm	450mm	✓	✓	✓	✓
25mm	600mm	✓	✓	✓	
40mm	900mm	✓	✓	✓	✓
50mm	1200mm	✓	✓	✓	✓



*[Handwritten signature]*

CONFIDENTIAL

Conclusion:

This is to certify that the Magnesium Oxide Boards Tested, ie, 16, 18, 20mm thick ResCom<sup>(R)</sup> Structural Flooring Sheet pass and meet the concentrated load criteria for floors as specified in Table 3.1, AS 1170.1:2002, and the maximum suggested deflection for Serviceability Limit State Criteria as specified in Table C1 (AS/NZS1170.0:2002).

MGO Corp floor sheeting is suitable to use as applicable to AS/NZS 1170.1: 2002 Table 3.1.

Regards,

~~AW~~ 21/12/17

Adam Winter  
Civil Engineer  
RPEQ (09104), MIE Aust, NPER, CPEng  
Mobile +61 479 142 450







Atech Civil & Structural Pty Ltd  
ABN 15007073109  
27A McKenzie Street,  
Doncaster East 3109  
Tel: 03 8821 5762  
Mobile: 0418 330 882  
Fax: 03 8692 9972  
Email: [info@atech7.com.au](mailto:info@atech7.com.au)  
Web: [www.atech7.com.au](http://www.atech7.com.au)

## TECHNICAL REPORT

Report No	201909-A			
Job Address	Non-Specific			
Client	Centurion Framing Systems Pty Ltd			
Report Date:	22.01.19	Inspection Date: N/A	Weather Conditions: N/A	Temperature: N/A
Subject	STRUCTURAL ADEQUACEY OF RESCOM BOARD ASSEMBLY			

### SCOPE OF PROFESSIONAL SERVICES

#### **Special Note:**

**This office has been further engaged to examine additional evidence towards a full-size test specimen(3.0mx3.0m), in order to satisfy various building regulatory bodies within Australia.**

**Further Pilot test results were provided by Centurion Framing Systems which have been carried out by Shanghai Test Facilities. Please refer to tables 2-4 and Ignis Solutions revised report dated 13.12.2018.**

**Tables 2 - 4 have been added showing the results of fire tests and the relevant temperatures for 3.0mx3.0mx12mm Rescom boards.**

In our previous assessment it was indicated that, this office;

At the request of the client, this office has been engaged to provide the Structural adequacy for wall framing having a ResCom board of 16mm thickness and steel Cold formed C section studs (90x40mm with 0.75 BMT). The battens used were 25mmx 0.75mm steel. The ResCom board was affixed to the steel frame via 20mm Hex Head screws with a R2.0 Knauf Earthwool Insulation. Reference must be made to clause 1.2 "Specimen" of Ignis Solutions, for full description of the specimen.

1. The specimen under consideration was fire tested by Ignis Chartered Professional Safety Engineers (Hereinafter called IGNIS). Due to dependency of this technical report's findings, a comprehensive reference must be made to IGNIS's report

No IGNS-6259 I01 R00, Revised on 13.12.2018.

**It is noted that the testing was undertaken in accordance with BCA Clause A2.2(a)(v) and (a)(vi), and Clause A2.3, BCA Specification A2.3 as well as AS 1530.4:2014.**

## PRELIMINARY ASSESSMENT

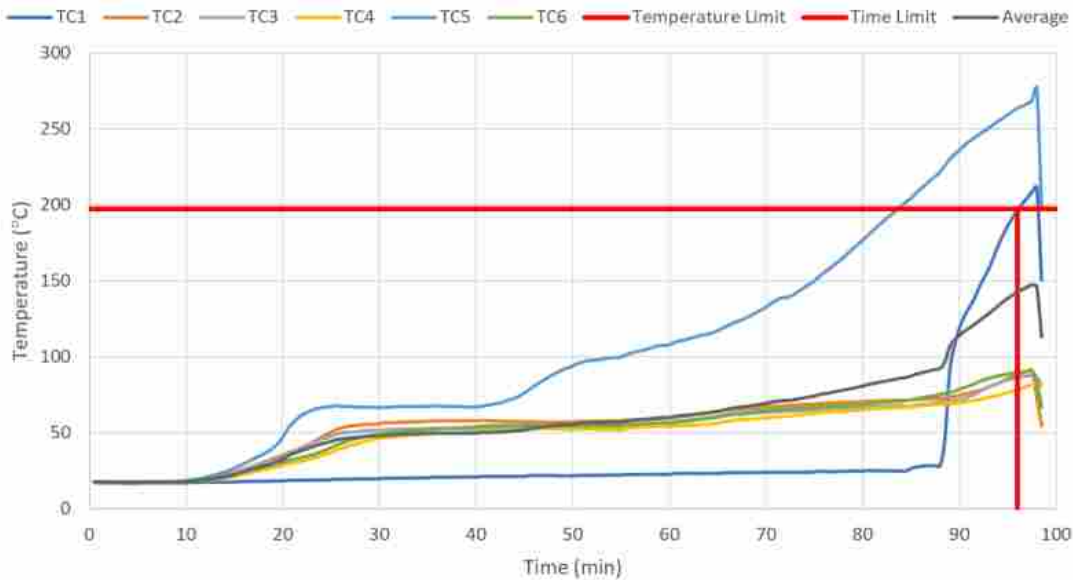
### Specimen

The wall panel specimen as detailed above, was fire tested by IGNIS, in September 2018 which comprised a non-loadbearing, steel frame MgO and plasterboard lined external wall system. The overall dimensions of the wall were 900mm high x 900mm wide by 131mm thick. Please refer to photo No 1.



Photo 1

By referring to Time vs Temperature chart, IGNIS has assessed that the average temperature reached on the non-fire side of the specimen, the average temperature reached was recorded to be 150 (°C), please refer to the diag.1 attached.



Diag.1

### YIELD STRENGTH/MODULUS OF ELASTICITY ASSESSMENT OF STEEL

By referring to AS 4100, Clause 12.4 stipulate that the formula given below, there will be a reduction in steel yield strength and modulus of elasticity.

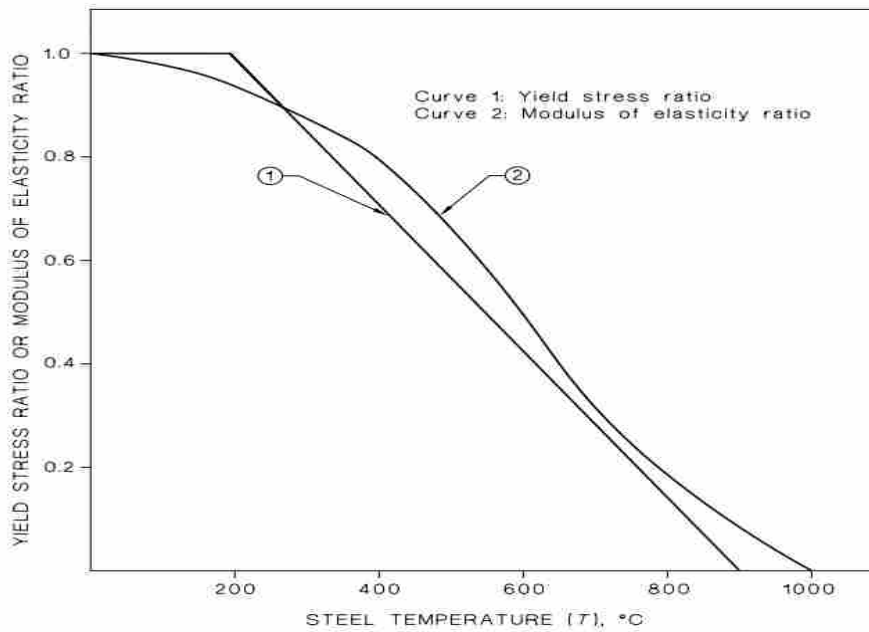
i) Yield Strength:

$$\frac{f_y(T)}{f_y(20)} = 1.0 \quad \text{when } 0^\circ\text{C} < T \leq 215^\circ\text{C}; \text{ and}$$

ii) Modulus of elasticity:

$$\frac{E(T)}{E(20)} = 1.0 + \left[ \frac{T}{2000 \left[ \ln\left(\frac{T}{1100}\right) \right]} \right] \quad \text{when } 0^\circ\text{C} < T \leq 600^\circ\text{C}.$$

The graph 1 below (Extract form AS 4100-Steel Structures), illustrates the relationship, for Yield Strength and Modulus of elasticity



Graph 1

Both table 1(Extract from QUT study on cold form sections) and Graph No 2 Extract from (University of Coimbra), are indicative of similar findings with the research carried out on cold formed sections.

Table 3.6 Yield Strength Reduction Factors ( $f_{yT}/f_{y20}$ ) based on Various Strain Levels

Temperature (°C)	0.60 mm G550 steel				0.60 mm G250 steel			
	0.2%	0.5%	1.5%	2.0%	0.2%	0.5%	1.5%	2.0%
20	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
100	0.970	0.968	1.000	1.000	0.937	0.935	0.958	0.978
200	0.956	0.947	0.996	0.994	0.922	0.901	0.938	0.965
350	0.838	0.814	0.897	0.896	0.526	0.539	0.711	0.758
500	0.403	0.402	0.461	0.471	0.323	0.338	0.398	0.413
600*	0.118							
650	0.097	0.099	0.105	0.107	0.163	0.166	0.179	0.183
800	0.030	0.030	0.031	0.031	0.036	0.036	0.37	0.037
Temperature (°C)	0.80 mm G550 steel				0.80 mm G250 steel			
	0.2%	0.5%	1.5%	2.0%	0.2%	0.5%	1.5%	2.0%
20	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
100	1.000	1.000	0.990	0.990	0.960	0.958	0.968	0.965
200	0.992	1.004	0.978	0.980	0.918	0.922	0.947	0.943
350	0.876	0.870	0.899	0.901	0.586	0.629	0.786	0.844
500	0.429	0.425	0.464	0.469	0.360	0.383	0.443	0.455
600*	0.123							
650	0.093	0.102	0.111	0.114	0.180	0.187	0.200	0.202
800	0.051	0.050	0.055	0.056	0.081	0.082	0.085	0.086
Temperature (°C)	0.95 mm G550 steel				0.95 mm G250 steel			
	0.2%	0.5%	1.5%	2.0%	0.2%	0.5%	1.5%	2.0%
20	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
100	0.976	0.976	0.985	0.988	0.906	0.906	0.910	0.921
200	0.963	0.963	0.970	0.977	0.823	0.865	0.855	0.930
350	0.877	0.861	0.944	0.953	0.510	0.565	0.715	0.774
500	0.471	0.450	0.537	0.541	0.327	0.355	0.411	0.427
600*	0.113							
650	0.082	0.089	0.105	0.108	0.164	0.175	0.185	0.189
800	0.044	0.045	0.055	0.056	0.059	0.061	0.067	0.067

Note: 0.60, 0.80 and 0.95 mm are nominal thicknesses and \* indicates that limited tests were undertaken to obtain the yield strength of G550 steel.

Table 1



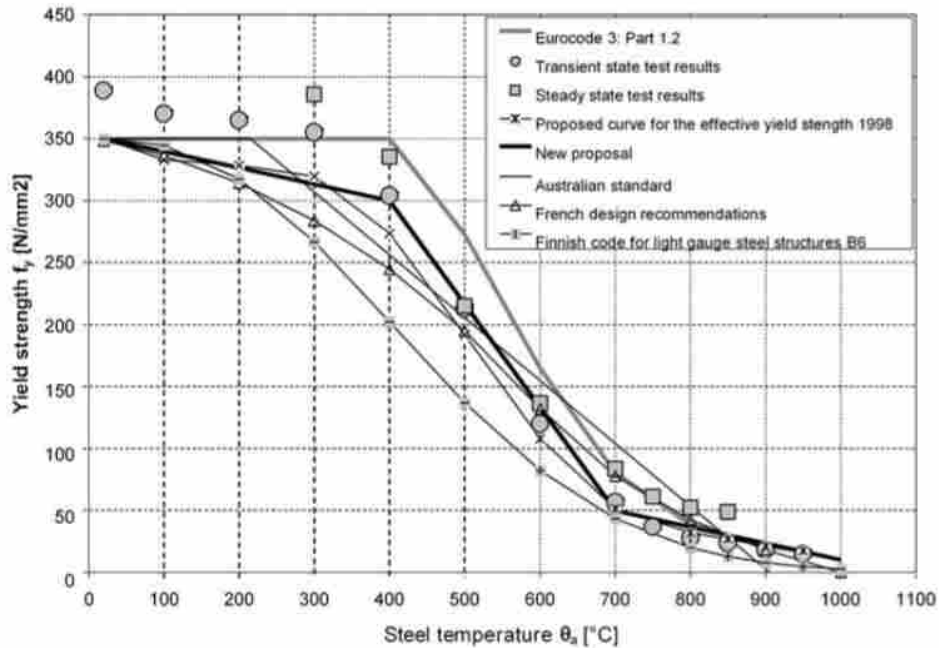


Figure 2.3. Yield strength of structural steel S350GD+Z and comparison with different design codes (Outinen et al., 2000)

Graph 2

Therefore, from i) the yield strength at 150 °C will be: less than 1% (Approx.) reduced and, from ii), Modulus of elasticity will be reduced by 4% ( Approx.), at 150 °C.

Given the factor of safety outlined in AS Codes, and in particular AS4100, AS4600, in structure design of steel members a reduction of up to 10% may be allowable, depending on design parameters and building types.

## CONSIDERATIONS

The following items are deemed to be necessary in the application of ResCom boards:

1. All connections and details must be adhered to as per ResCom instruction manuals.
2. All connection screws must be well insulated by applying the Fire rated approved silicon or similar.
3. Screws must be of minimum of class 3 to 4 no corrosion or stainless steel screws in accordance with the ResCom Technical Installation Manual.
4. All joints must be sealed and fireproofed, as per ResCom installation manual.



**CONFIDENTIAL**

**UNEXPOSED SURFACE TEMPERATURES (°C)**

Time (min)	TC#8 (°C)	TC#9 (°C)	TC#10 (°C)	TC#11 (°C)	TC#12 (°C)	TC#13 (°C)	Average (°C)
0	13	13	13	12	11	12	12
1	13	13	13	12	12	12	12
2	13	13	13	12	12	12	12
3	13	13	13	12	12	12	12
4	13	13	13	12	11	12	12
5	13	13	13	12	12	12	12
6	13	13	13	12	12	12	13
7	13	13	13	12	13	12	13
8	13	13	13	12	23	12	16
9	14	13	13	13	42	12	22
10	20	13	13	15	58	12	27
11	27	14	15	19	69	12	33
12	33	19	17	24	76	13	36
13	39	26	20	30	80	13	43
14	43	34	22	36	82	13	47
15	47	43	25	43	83	14	51
16	49	50	28	48	84	15	54
17	51	56	30	53	85	15	57
18	53	61	32	56	85	16	60
19	55	65	34	60	86	17	62
20	56	68	35	62	86	18	64
21	57	70	37	65	87	19	65
22	59	72	39	68	87	20	67
23	60	73	41	69	87	20	69
24	61	74	43	71	87	21	70
25	61	74	45	72	87	22	71
26	62	74	47	73	87	23	72
27	62	74	49	73	87	24	73
28	62	74	51	74	87	25	73
29	62	74	53	74	86	26	73
30	62	74	55	74	86	27	74
31	62	74	56	74	85	27	74
32	62	74	58	73	85	28	74
33	62	74	59	73	84	29	74
34	62	74	60	73	83	29	74
35	61	73	61	73	83	30	74
36	61	73	62	73	82	31	74
37	61	72	63	72	81	31	74
38	61	72	64	72	80	32	75
39	61	72	64	72	80	32	75
40	60	71	64	72	79	33	75

Table 2



**CONFIDENTIAL**

**UNEXPOSED SURFACE TEMPERATURES (°C)**

Time (min)	TC#8 (°C)	TC#9 (°C)	TC#10 (°C)	TC#11 (°C)	TC#12 (°C)	TC#13 (°C)	Average (°C)
41	60	71	65	72	79	33	76
42	60	71	65	73	79	34	76
43	60	70	65	73	78	35	77
44	60	70	65	73	78	35	77
45	59	69	65	74	78	36	78
46	59	69	64	74	78	37	78
47	59	69	64	75	78	37	79
48	59	68	64	75	78	38	80
49	59	68	63	76	78	39	81
50	59	68	63	76	79	39	82
51	59	67	63	77	79	40	83
52	59	67	62	77	80	41	84
53	59	67	62	78	80	42	85
54	59	67	62	78	81	42	86
55	58	67	61	77	81	43	87
56	58	67	61	77	82	44	88
57	58	67	61	78	83	45	89
58	59	67	61	78	84	46	90
59	59	68	61	79	85	47	91
60	59	68	61	80	87	48	92
61	59	68	61	80	88	49	94
62	59	69	61	81	89	50	95
63	60	69	62	83	90	50	96
64	60	70	62	84	91	51	97
65	60	71	63	85	92	52	98
66	61	71	64	87	93	53	99
67	61	72	64	88	94	54	101
68	62	73	65	90	96	55	102
69	62	74	66	92	98	56	103
70	63	75	67	93	100	56	104
71	63	76	68	95	103	57	106
72	64	77	69	97	105	58	107
73	64	79	70	99	108	59	108
74	65	81	71	101	111	60	110
75	66	82	72	103	113	62	111
76	66	84	74	105	116	63	112
77	67	86	75	106	118	64	114
78	67	88	76	108	121	65	115
79	68	90	77	110	123	68	116
80	69	92	79	111	126	68	118

Table 3



**UNEXPOSED SURFACE TEMPERATURES (°C)**



Time (min)	TC#8 (°C)	TC#9 (°C)	TC#10 (°C)	TC#11 (°C)	TC#12 (°C)	TC#13 (°C)	Average (°C)
81	70	95	80	113	128	69	119
82	70	97	81	115	129	71	120
83	71	99	83	118	131	72	122
84	72	101	84	121	133	74	123
85	73	104	85	126	134	76	125
86	74	106	86	126	136	78	126
87	75	108	88	140	137	80	129
88	76	110	89	153	138	82	131
89	77	112	90	146	140	85	132
90	78	115	91	140	141	87	132
91	80	116	93	137	142	89	134
92	81	118	94	140	144	91	135
93	82	120	95	141	145	94	137
94	84	122	96	142	146	96	138
95	85	124	98	141	147	98	140
96	86	126	99	141	148	100	141
97	88	126	100	141	150	102	142
98	89	128	101	142	151	104	144
99	91	129	102	143	152	103	145
100	92	131	103	144	153	104	147
101	94	132	104	146	154	105	148
102	95	133	105	148	155	107	150
103	97	133	106	149	157	108	151
104	98	134	108	151	158	110	153
105	100	135	109	152	159	112	155
106	101	136	110	154	161	114	156
107	102	136	111	156	162	115	158
108	104	137	112	158	164	117	160
109	105	138	113	160	166	118	162
110	107	139	114	163	168	120	164
111	108	139	115	165	170	121	166
112	109	140	116	168	172	122	168
113	111	141	116	171	174	123	170
114	112	142	117	175	177	124	172
115	113	143	118	179	179	125	174
116	114	144	119	184	182	126	177
117	116	144	120	190	185	127	179
118	117	145	121	195	188	128	182
119	118	146	121	201	191	129	185
120	120	147	122	207	195	129	187

Table 4

## FINDINGS

**In our opinion and Given the testing and technical information supplied by IGNIS Fire Engineering, ResCom Building Products the evidence reviewed supports that the CENTURION Steel frame system will achieve a combined FRL of 90/90/90 when installed as per the prototype tested. Furthermore, the Structural adequacy of the specimen under consideration with reference to NCC, BCA and AS4100, AS4600, is 90 minutes.**

**This observation has been reinforced by referring to table 4 which indicates that at 90 minute interval the maximum temperature reached was 132 °c, with perceived reduction of steel being less than 10%.**

### NOTE:

It should be noted that any significant variation with respect to size, construction details, loads, stresses, strains, edge and end support conditions, other than those allowed under the field of the relevant test method, (Including Shanghai Testing Facility, but not limited to) is outside of the scope of this report and Atech Civil and Structural Pty Ltd, will not be held liable for any such changes and variations.

## REPORT LIMITATIONS

1. This report has been created on good faith, based on the information and data provided by ResCom panel sponsor, Centurion Framing Systems P/L.
2. The conclusions reached in this report are strictly based on the fire test carried out on ResCom panel by Ignis Solutions (Chartered Professional Fire Safety Engineers).
3. This assessment is valid under the existing Australian Standard Codes and NCC-2016(BCA), SECTION C, Fire Resistance and will expire in March 2019.
4. Atech Civil & Structural will not be held liable for loss or damage resulting from any defect of the building or materials and non-compliance with the Fire services or equipment with any legislative or operational requirements.
5. This report is entirely based on the prototype test specimens testing conditions and procedures adopted by IGNIS and test samples provided by ResCom Boards provided by Centurion Framing Systems P/L. Any defects in the test samples which may lead to structural failure of the supporting members are outside the scope of this report.
6. Full structural analysis of the test specimens is not within the scope of this report. For steel studs and battens design, the manufacturer's safe load tables must be utilised for various design load conditions.



Written and Authorised by

A handwritten signature in blue ink, appearing to read 'K. Nemat', with a long horizontal stroke extending to the right.

Kevin Nemat (BE Civil, Master Eng, NER, MIE Aust, EC-1363)  
Director

Copyright©

All rights reserved. No part of the content of this document may be reproduced, published, transmitted or adapted in any form or by any means without the written permission of Atech Civil & Structural Pty Ltd.

The information contained in this document is provided for the sole use of the Centurion Framing Systems Pty Ltd. In the event that the information is disclosed or furnished to any other person, Atech Civil & Structural Pty Ltd accepts no liability for any loss or damage incurred by that person whatsoever as a result of using the information.

## REFERENCES:

2. Steel Structures Code AS 4100-1998
3. Steel Structures Code AS 4600-2018 Cold formed Steel Structures
4. NCC(BCA), SECTION C, Fire Resistance
5. IGNIS SOLUTIONS (Chartered Professional Fire Safety Engineers)- Report IGNS-6259 I01 R00, Revised on 13.12.2018.
6. AS 1530.4:2014
7. ResCom Installation manual
8. Distortional Buckling Behaviour of Cold Formed Steel Compression Members at Elevated Temperatures (Queensland University of Technology)
9. Fire resistance of cold-formed steel columns (University of Coimbra)
10. ResCom Test Report # IGNS-6259
11. Pilot Fire-Resistance test by SGS conducted on 25 Sept 2018.

## IGNIS ADVISORY NOTE

Evaluation No. IGNS-7257 Issue 01 Revision 00 [2019]

### RESCOM WALL SYSTEM COMPLIANCE

Ignis Solution has been requested to provide a statement on the compliance of the ResCom wall system in accordance with the National Construction Code Volume Two Building Code of Australia 2019 (BCA) to be applied to a boundary wall system where under the BCA a boundary or separating wall is to achieve a Fire Resistance Level of at least 60/60/60.

The following wall systems are proposed for a single or two storey residential Class 1a Dwelling where the fire resistance level is provided from the exterior side only and should they be tested in accordance with the requirements of the BCA likely to achieve an FRL of at least -/60/60. The exterior lining can be 10mm, 12mm or 16mm ResCom Board. Where the 16mm ResCom board is applied, the internal lining can be substituted for standard grade plasterboard. The standard wall configuration is detailed below:

Exterior Lining:	10mm, 12mm, 16mm, ResCom Board
Vapour Barrier Wrap:	Flammability index $\leq 5$ and thickness $\leq 1$ mm.
Frame Size:	Timber or Metal Stud Frame Wall Min 90mm x 35mm / 0.75bmt x 75mm x 35mm (Structural performance as per structural engineers specifications to the NCC 2019)
Stud Spacing:	Max 600mm centres
Cavity Insulation:	Min R2.5 non-combustible insulation
Interior Wall Lining:	Min 13mm fire grade plasterboard; 12mm ResCom board; or Standard grade plasterboard where exterior lining is 16mm ResCom Board.

- The above wall configurations are likely to achieve a minimum Fire Resistance Level of at least -/60/60.
- To achieve a Fire Resistance Level of -/90/90 a minimum 10mm ResCom board is to be applied to the exterior and rockwool insulation is to be installed with a density of at least 80kg/m<sup>3</sup>.
- To achieve a Fire Resistance Level of -/180/180 a minimum 12mm ResCom board is to be applied to both the exterior and interior lining as well as rockwool insulation is to be installed with a density of at least 80kg/m<sup>3</sup>.

The basis of the above wall systems is on the following large scale tests which were undertaken on a 3m x 3m wall system by ILAC MRA testing facilities.

SGS is an international testing service. Their Shanghai test facility completed testing on the ResCom Board within a wall installation.

The test was undertaken on 03 June 2015 in report SHCCM150401181 with the wall set up being 10mm thick ResCom Board on either side of a 75mm light gauge steel joist and 50kg/m<sup>3</sup> mineral wool insulation. The following results were produced:

CONFIDENTIAL



Fire Resistance Level	
SGS SHCCM150401181 Structural adequacy Integrity Insulation	03 June 2015 - 90 minutes 67 minutes
-/90/60	

Testing undertaken by Intertek Shanghai testing facility to ASTM E119-16a where the equivalent standard fire curve was used in the boards evaluation.

The test was undertaken on 19 December 2016 in report 160929005SHF-BP-1 with the wall set up being 12mm thick ResCom Board on either side of a 75mm steel studs at nominally 600mm centres and 180kg/m<sup>3</sup> Rockwool insulation. The following results were produced:


Fire Resistance Level	
Intertek 160929005SHF-BP-1 Structural adequacy Integrity Insulation	19 December 2016 - 180 minutes 90 minutes
-/180/90	

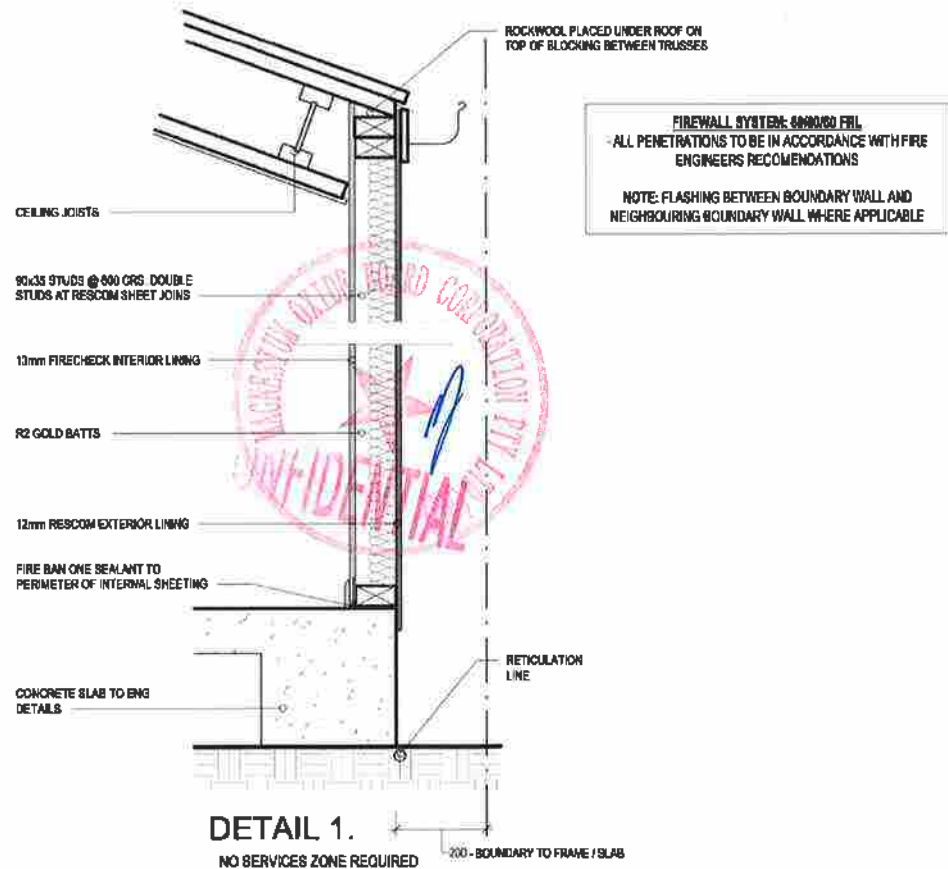
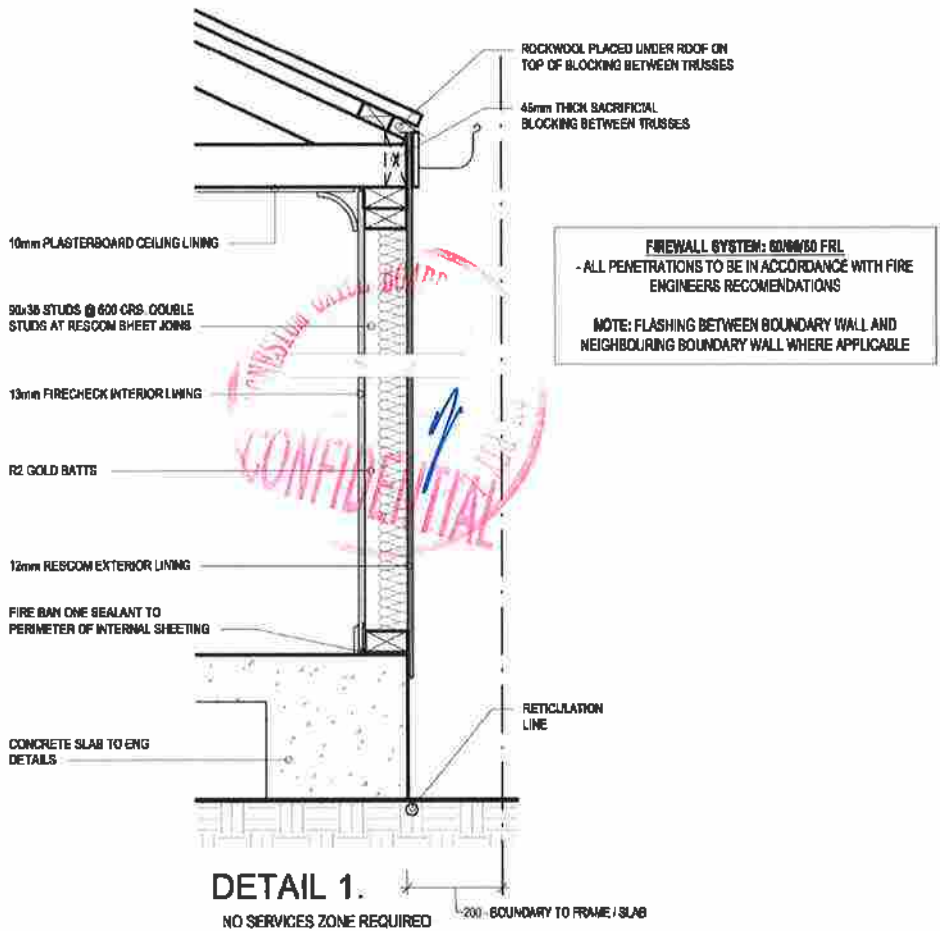
Testing undertaken by Research Engineering Development Façade Consultants Limited to BS 476 part 22 where the equivalent standard fire curve was used in the boards evaluation.

The test was undertaken on 18 May 2007 in report R07A15A with the wall set up being 12mm thick ResCom Board on either side of a 46mm galvanised steel joist at nominally 610mm centres and 94kg/m<sup>3</sup> Luyangwool 72 mullite crystal fibre blanket insulation. The following results were produced:

Fire Resistance Level	
RED R07A15A Structural adequacy Integrity Insulation	18 May 2007 - 150 minutes 132 minutes
-/120/120	

Based on the above detail and results, the ResCom wall systems are considered to satisfy the requirements of the Building Code of Australia with sufficient evidence of suitability on a large scale wall test should they be tested.

  
**Benjamin Hughes-Brown** FIEAust CPEng NER APEC Engineer IntPE(Aus) CMEngNZ  
 Chief Executive Officer  
 Chartered Professional Engineer  
 CPEng, NER (Fire Safety / Mech) 2590091, RPEQ 11498, BPB-C10-1875, EF-39394  
 MFireSafety (UWS), BEng (UTS), GradDipBushFire (UWS), DipEngPrac (UTS), DipEng (CIT)







CAPPING AND FLASHING

45mm THICK SACRIFICIAL SOLID TIMBER POLE PLATE

ROOF PURLINS

R2 GOLD BATTENS

WEATHER BARRIER

90x35 STUDS @ 600 CRS

12mm RESCOM EXTERIOR LINING

13mm FYRCHEK INTERIOR LINING

FIRE BAN ONE SEALANT TO PERIMETER OF INTERNAL SHEETING

45mm THICK TIMBER POLE PLATE

FLOOR JOISTS

NOGGING

10mm PLASTERBOARD CEILING LINING

90x35 STUDS @ 600 CRS

12mm RESCOM EXTERIOR LINING

13mm FIRECHECK INTERIOR LINING

FIRE BAN ONE SEALANT TO PERIMETER OF INTERNAL SHEETING

CONCRETE SLAB TO ENGINEERS DESIGN & DETAILS

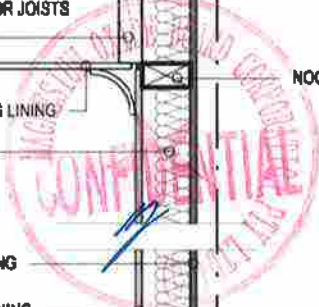
RETICULATION LINE

50 - BOUNDARY TO FRAME / SLAB

**DETAIL 1.**  
NO SERVICES ZONE REQUIRED

**FIREWALL SYSTEM: 60/60/60 FRL**  
- ALL PENETRATIONS TO BE IN ACCORDANCE WITH FIRE ENGINEERS RECOMENDATIONS

**NOTE: FLASHING BETWEEN BOUNDARY WALL AND NEIGHBOURING BOUNDARY WALL WHERE APPLICABLE**



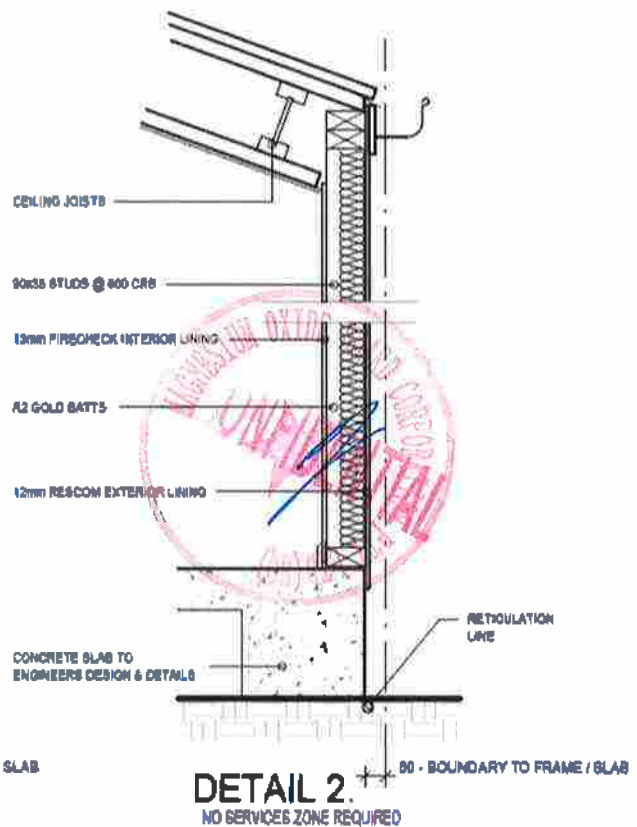
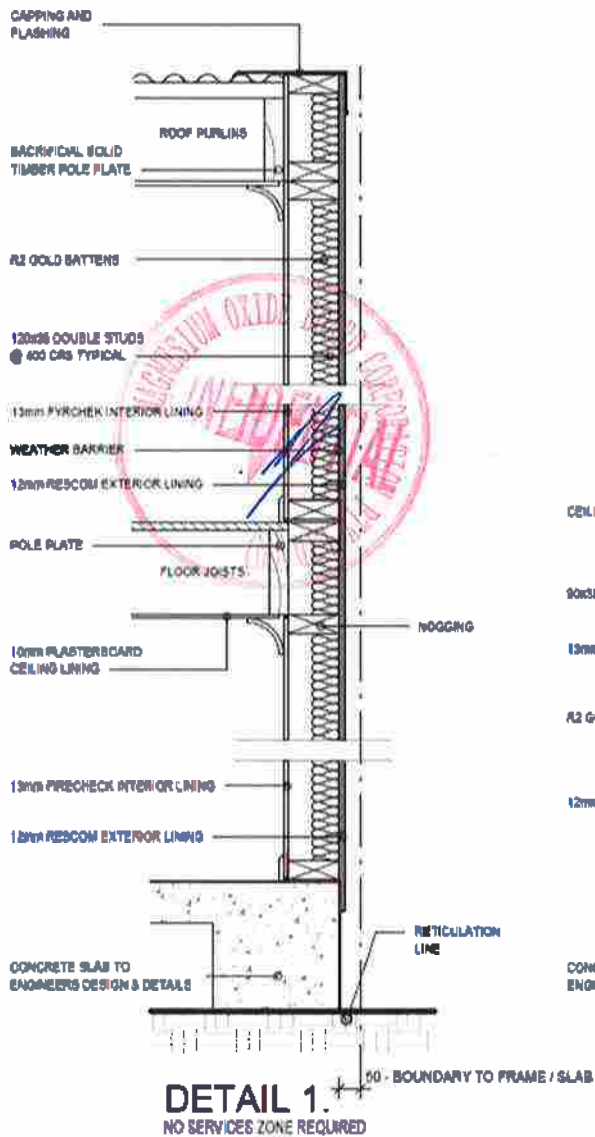
CONFIDENTIAL



## ResCom Boundary Wall: 60/60/60

**FIREWALL SYSTEM: 60/60/60 FRL**  
 - ALL PENETRATIONS TO BE IN ACCORDANCE WITH FIRE ENGINEERS RECOMMENDATIONS

**NOTE: FLASHING BETWEEN BOUNDARY WALL AND NEIGHBOURING BOUNDARY WALL WHERE APPLICABLE**



CONFIDENTIAL

## IGNIS ADVICE NOTICE

Evaluation No.5123  
Issue 01 Revision 00 [2017]

### ResCom Wall Installation Compliance

#### 1 Executive Summary

Ignis Solutions has been engaged to complete a desktop review and advice of the installation instructions for the ResCom board based on the products testing and compliance with the NCC as well as other relevant reference material.

#### 2 General Installation Instructions

The ResCom board is a Composite cold form ceramic magnesia base lining Board for use within building walls and other construction areas where a Fire Resistance Level is required. The ResCom Board is available in 4mm to 50mm in thickness, 300mm to 1220mm width and 2440mm to 3050mm lengths.

The level of fire separation is expressed by three numbers being Structural Adequacy, Integrity and Insulation. Fire Resistance Level (FRL) means the grading periods in minutes determined in accordance with Specification A2.3–

- The first number being **Structural adequacy**, in relation to an FRL, means the ability to maintain stability and adequate loadbearing capacity as determined by AS 1530.4.
- The second number being **Integrity**, in relation to an FRL, means the ability to resist the passage of flames and hot gases specified in AS 1530.4.
- The third number being **Insulation**, in relation to an FRL, means the ability to maintain a temperature on the surface not exposed to the furnace below the limits specified in AS 1530.4.

Within Australia the term Fire Resistance Level is used whilst in New Zealand Fire Resistance Rating is used. These are equivalent terms between the countries.

The building structural designer must ensure that load bearing walls have been designed:

- To resist all applied loads
- To be in accordance with AS4600, AS1684 and AS1720.1, the BCA and all relevant standards
- To assume no axial strength contribution from wall linings. Some wall systems will have their axial load capacities reduced. For steel, this is due to the steel weakening at temperature. For timber, it is due to the loss of section as the timber chars.

The following installation points are to be observed for every installation:

- The smooth surface is to face outwards
- ResCom® sheets can be laid vertical or horizontal.
- Stagger butt joints in adjacent sheets one stud minimum.
- It is important to install sheets from the corner outwards. Fix the sheet to the open side of the stud first to ensure misalignment of joints does not occur in vertical fixing applications.
- One layer ResCom® Board is to be provided to each side of the wall as per the tested system.
- The stud spacing is to be a maximum 600mm centres, floor joists at 450mm centres. Both systems are to be appropriately designed by a structural engineer or in accordance with relevant design standards listed within the respective building code.
- Sheets can be fixed using a combination of screws and appropriate structural adhesive but not exclusively structural adhesive.

- Due to indifferent metals, such as screws and frame work, MgO Corp recommends that a film of silicone, mastic tape or sarking is placed on the metal stud frame before fixing of the ResCom® board to eliminate corrosion and moisture.
- Control joints are used where specified, where dissimilar materials abut, or at least every 12 metres.
- Where a double wall system is used, the gap between the walls should be from a minimum of 20mm to a maximum of 50mm.
- Screws are to be non-corrosive class 3 to 5 No.8 x 40 self-drilling countersunk type, and to finish at approx. 0.5mm below the surface. MgO Corp recommends a minimum grade 304 SPAX or 316 stainless steel noncorrosive fixtures to be used in corrosive areas.
- On sheet corners, keep the first screw 50mm from the edge to avoid breakage of the sheet and 12-15mm from sheet perimeter edges.
- Keep sheet 6mm from floor. Fill gap between floor and ResCom Board as well as all joints with approved fire and acoustic sealant.
- Where horizontal joints are not backed by noggins, stagger all horizontal joints 300mm minimum.
- Sheets can be joined mid span between studs by back blocking using 150mm width ResCom® Board strips screwed.

### 3 Tested System

The BCA requires the claim to a building element to achieve an FRL to be identical to the tested wall/ceiling systems. The tested wall/ceiling systems are detailed below.

City of New York Department of Buildings MEA 84-05-M 25 April 2005

ASTM E119-00a – 4 hour endurance

- 2 layers 14mm ResCom board
- 20 Gage Galvalnised Steel 4 inches x 2 inches 16 inch centres
- Mineral wool insulation.
- 2 layers 14mm ResCom board
- Joints treated with 3M fire rated caulk
- Outer surface painted with intumescent fire resistive paint

Omega Point Laboratories 16866-123075 dated 31 December 2004

ASTM E119-00a – 4 hour endurance

- 2 layers 14mm ResCom board
- 20 Gage Galvalnised Steel 4 inches x 2 inches 16 inch centres
- Rockwool insulation
- 2 layers 14mm ResCom board
- Joints treated with 3M fire rated caulk
- Outer surface painted with intumescent fire resistive paint

VTEC Laboratories Inc 100-2295-2 9 November 2005

ASTM E119-00a – 4 hour endurance

- 1 layer 15mm ResCom board
- 18 Gage Galvalnised Steel 16 inch centres
- Mineral wool insulation
- 1 layer 15mm ResCom board
- Joints treated with firestop caulk
- Outer surface painted with intumescent fire resistive paint

**CONFIDENTIAL**

CONFIDENTIAL

City of New York Department of Buildings MEA 84-05-M 28 April 2005

ASTM E119-00a – 4 hour endurance

- 1 layer 14mm ResCom board
- 20 Gage Galvalnised Steel 4 inches x 2 inches 16 inch centres
- Mineral wool insulation.
- 1 layer 14mm ResCom board
- Joints treated with 3M fire rated caulk
- Outer surface painted with intumescent fire resistive paint

VTEC Laboratories Inc 100-2295-3 13 December 2005

ASTM E119-00a – 2 hour endurance

- 1 layer 10mm ResCom board
- 18 Gage Galvalnised Steel 16 inch centres
- Mineral wool insulation
- 1 layer 10mm ResCom board
- Joints treated with firestop caulk

SGS SHCCM150401181 03 June 2015

A 1530.4-2005 -/60/90

- 1 layer 10mm ResCom board
- C75 Lightgage Steel Joists
- Mineral wool insulation
- 1 layer 10mm ResCom board
- Joints treated with firestop caulk
- Self tapping screws

From the above tested systems the following FRL(FRR) are established:

FRL -/60/60, -/90/60

- 10mm thick ResCom Board on either side of studwork
- 75mm light gage steel joist
- 50kg/m<sup>3</sup> mineral wool insulation.

FRL -/90/90, -/180/90

- 12mm thick ResCom Board on either side of studwork
- 75mm steel studs
- 180kg/m<sup>3</sup> Rockwool insulation.

FRL -/120/120

- 12mm thick ResCom Board on either side of studwork
- 46mm galvanised steel joist
- 94kg/m<sup>3</sup> Luyangwool 72 mullite crystal fibre blanket insulation

FRL -/240/240

- 14mm thick ResCom Board on either side of studwork





- 18 Gage galvanised steel joist
- Mineral wool insulation

FRL -/240/240

- 15mm thick ResCom Board on either side of studwork
- 18 Gage galvanised steel joist
- Mineral wool insulation



#### 4 Reference Materials

- National Construction Code – 2016 – Volume One – Building Code of Australia Class 2 to 9 Buildings.
- Guide to the Building Code of Australia 2016 – Volume One, Class 2 to Class 9 Buildings', Australian Building Codes Board, 2016 (the Guide).
- Ignis Solutions I01 R00 ResCom Board Evaluation dated 08 March 2017.
- British Standards BS 476-4:1970 Fire test on building materials and structures – non-combustibility
- Standards Australia, AS 1530.4-2005 Fire-resistance tests on elements of construction – Methods for determination of the fire resistance of loadbearing elements of construction, 2005, Sydney.
- Standards Australia, AS/NZS 3837:1998 Method of test for heat and smoke release rates for materials and products using an oxygen consumption calorimeter, 1998, Sydney.
- SGS SHCCM150401181 test to AS1530.4 dated 3 June 2015.
- Research Engineering Development Façade Consultants Limited R07A15A to BS 476 part 22 dated 18 May 2007.
- Exova Warrington Victorian report 24158-00 dated 14/01/10.
- CSIRO North Ryde report FCO-2830/3940 dated 27 October 2010.
- Intertek report 160929005SHF-BP-1 dated 23 December 2016.
- Exova Warringtonfire 372077 dated 16 December 2016, United Kingdom.
- Ignis Solutions ResCom – MgO Board penetration evaluation 4099.3 I01 R00 dated 18 August 2016.
- Ignis Solutions ResCom – Professional Engineering Certificate 4099.1 I01R00 dated 11 July 2016.
- Kilargo report 05112013/ct/02 dated 05 November 2013.
- Kilargo report 06112013/ct/01 dated 06 November 2013.
- Kilargo report 05112013/ct/01 dated 05 November 2013.
- Kilargo report 06112013/ct/02 dated 06 November 2013.

#### 5 Conclusion

Based on the above desktop review of the system, the detail within section 2 and 3 are recommended to be included as a minimum basis within the CodeMark installation manual for fire safety compliance.

  
**Benjamin Hughes-Brown** FIEAust CPEng NER  
 Chartered Professional Engineer



**Ignis Engineering  
 Evaluation**

Evaluation No.4241  
 [2016]

**Technical Assessment and  
 performance solution of  
 products  
 for compliance under the  
 National Construction Code  
 of Australia**

**This evaluation report  
 serves as a certificate from  
 professional engineer in  
 accordance with Clause  
 A2.2 (a)(iii) and 1.2.2 (a)(iii) of  
 the National Construction  
 Code Volume One and Two  
 Building Code of Australia  
 2016**

**IGNIS  
 ENGINEERING  
 EVALUATION  
 No. 4241 I02R02  
 ResCom Board**

**Magnesium Oxide Board  
 Corporation Pty Ltd**  
 3 Allen Street Moffat Beach  
 QLD 4551  
[www.mgoboard.com.au](http://www.mgoboard.com.au)  
 +61 7 5491 1688  
 admin@mgoboard.com.au

26 September 2017

Date of Issue

30 April 2019

**Ignis Solutions**

ABN: 24 160 047 325  
 PO Box 674

Civic Square ACT 2608  
 t: (02) 6100 3900

[mail@ignissolutions.com.au](mailto:mail@ignissolutions.com.au)  
[www.ignissolutions.com.au](http://www.ignissolutions.com.au)

© Benjamin Hughes-Brown 2017

**1 Product**

- 1.1 The ResCom board is a Composite cold form ceramic magnesia base lining Board for use within building walls and other construction areas where a Fire Resistance Level is required,
- 1.2 The ResCom board satisfies the Building Code of Australia requirements for non-combustibility, fire hazard properties and select Fire Resistance Levels under set wall and floor designs. Where an FRL is required for the Wall or Floor, the equivalent FRL design or better must be replicated to the tested system.
- 1.3 **Product Name:** ResCom Board.
- 1.4 **Product Size:** 4mm to 50mm in thickness, 300mm to 1220mm width and 2440mm to 3050mm lengths.

**2 Scope of Use**

- 2.1 The ResCom Board is permitted to be used within building walls or floor in accordance with manufacturers instructions for buildings of Type A, B or C construction, Class 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10 Occupancies and of any height or rise in storeys.
- 2.2 The ResCom Board is suitable to be penetrated as per the requirements of section F, used for slab infill as per the requirements of section G and be provided as an additional fire protective covering to existing wall systems as per the requirements of section H.
- 2.3 The ResCom Board is to be installed in accordance with the MgO Corp Board Fire and Acoustic Walls, Ceiling and Floors Installation Manual (FIM-Edition 6-2016).

**3 National Construction Code 2016**

**Volume One – Building Code of Australia**

- 3.1 **Clause A0.2** (b) complying with the Deemed-to-Satisfy Solution.
- 3.2 **Clause A1.1** Definitions – Non-combustible
- 3.3 **Clause A2.2** sub-clause (a)(iii) as evidence to support that the ResCom Board meets the nominated Performance Requirements under an Engineering Certificate.
- 3.4 **Deemed-to-Satisfy Clause A2.3 - Specification A2.3 – Fire-Resistance of Building Elements** – Where the wall system A, B, C and D is applied.
- 3.5 **Deemed-to-Satisfy Clause C1.1 and Specification C1.1 Type of Construction** – where FRL's of up to -/60/90 and -/240/240 as established in accordance with Specification A2.3.
- 3.6 **Deemed-to-Satisfy Clause F5.5(a) and (b)** – where walls system F, G H as detailed in the introduction below is applied.
- 3.7 **Deemed-to-Satisfy Clause F5.5(c)** – where walls system E, F, G H as detailed in the introduction below is applied.
- 3.8 **Clause G5.2 Construction in Bushfire Prone Areas** – where an FRL of -/30/30 satisfies use in Bushfire Prone Areas requiring BAL 12.5 to Flame Zone (FZ).
- 3.9 **Deemed-to-Satisfy Clause C1.10 (a)(ii), (c)(xv) and Specification C1.10 Clause 4 Fire Hazard Properties**  
 AS/NZS 3837:1998  
 Group 1  
 Average Specific Extinction Area 24.7 (m<sup>2</sup>/kg).

**Volume Two – Building Code of Australia**

- 3.10 **Clause 1.0.2** (b) complying with the Deemed-to-Satisfy Solution.
- 3.11 **Clause 1.2.2** sub-clause (a)(iii) as evidence to support that the ResCom Board meets the nominated Performance Requirements under an Engineering Certificate.
- 3.12 **Part 3.7.1 Fire Separation and Part 3.7.4 Bushfire Areas** – The ResCom Board in the tested wall systems achieves an FRL of at least -/60/60 and can be used as the exterior wall or separating wall between Class 1 and/or 10 buildings within 900mm of a boundary or Bushfire Areas of BAL 12.5 to FZ.

**4 State and Territory Variations**

State/Territory	Application
-----------------	-------------



**Throughout Australia**

- 4.1 The ResCom Board can be used in all States and Territories within Australia and complies with all relevant State and Territory variations related to the products use and the BCA Clauses above.

**5 Conditions and Limitations**

- 5.1 This certificate is limited to the details within this evaluation report including the above compliance elements, product description and scope. This evaluation report is to be read, considered and used as a whole document being 7 pages.
- 5.2 Fixing of the board is to be via Non-corrosive 304 minimum stainless steel or galvanised hex head screws of 10-12 gauge at 300mm centres and 450mm centrally within the board no greater than 50mm from the edge.
- 5.3 The ResCom Board is to be installed in accordance with the MgO Corp Board Fire and Acoustic Walls, Ceiling and Floors Installation Manual (FIM-Edition 6-2016).

## A. Introduction

The purpose of this assessment is to evaluate a performance solution of the ResCom Board to satisfy the performance requirements of the National Construction Code Volume 1 and 2 – Building Code of Australia 2016 (BCA).

This assessment evaluates the product as a non-combustible fire resistant board within a wall system achieving various Fire Resistance Levels as well as Acoustics. The various wall systems are detailed below.

- A. The result for compliance under the BCA for a wall of -/90/60 require the following construction:  
10mm thick ResCom Board on either side of a 75mm lightgauge steel joist and 50kg/m<sup>3</sup> mineral wool insulation.
- B. The result for compliance under the BCA for a wall of -/120/120 require the following construction:  
12mm thick ResCom Board on either side of a 46mm galvanised steel joist at nominally 610mm centres and 94kg/m<sup>3</sup> Luyangwool 72 mullite crystal fibre blanket insulation
- C. The result for compliance under the BCA for a wall of -/180/90 require the following construction:  
12mm thick ResCom Board on either side of a 75mm steel studs at nominally 600mm centres and 180kg/m<sup>3</sup> Rockwool insulation.
- D. The result for compliance under the BCA for a wall of 90/90/60 which includes an EPS core require the following construction:  
12mm thick ResCom Board bonded on either side to a closed cell polyurethane foam core.
- E. The result for compliance under the BCA for a wall of -/240/240 requires the following construction:  
15mm thick ResCom Board bonded on either side of 150mm 18 gauge steel studs at 600mm centres with 2.7kg mineral wool insulation.
- F. The result for compliance under the BCA for a wall to achieve an  $R_w(C,C_{tr})$  of 47 (-3,-9) dB require the following construction:  
12mm thick ResCom Board on either side of a 75mm steel studs with nominally 600mm centres and 24kg/m<sup>3</sup> glasswool R2.0 insulation.
- G. The result for compliance under the BCA for a wall to achieve an  $R_w(C,C_{tr})$  of 60 (-3,-9) dB require the following construction:  
12mm thick ResCom Board on either side of a 75mm steel studs on nominally 600mm centres filled with 24kg/m<sup>3</sup> glasswool R2.0 insulation, a 20mm air gap and additional 75mm steel studs on nominally 600mm centres filled with 24kg/m<sup>3</sup> glasswool R2.0 insulation
- H. The result for compliance under the BCA for a wall to achieve an  $R_w(C,C_{tr})$  of 62 (-3,-9) dB require the following construction:  
12mm thick ResCom Board on the side of a 75mm steel studs on nominally 600mm centres filled with 24kg/m<sup>3</sup> glasswool R2.0 insulation, a 25mm air gap and additional 200mm steel studs on nominally 450mm centres filled with 24kg/m<sup>3</sup> glasswool R2.0 insulation and 18mm ResCom Board.
- I. The result for compliance under the BCA for a wall to achieve an  $R_w(C,C_{tr})$  of 64 (-3,-9) dB require the following construction:  
12mm thick ResCom Board on the side of a 75mm steel studs on nominally 600mm centres filled with 24kg/m<sup>3</sup> glasswool R2.0 insulation, a 25mm air gap and additional 200mm steel studs on nominally 600mm centres filled with 24kg/m<sup>3</sup> glasswool R2.0 insulation and 2 layers of 12mm ResCom Board.

The above systems can be used in a wall or floor situation provided the above tested system or better is installed.

## B. Technical Specification

### Product

The ResCom Board is a composite cold form ceramic magnesia base lining for use within building walls and other construction areas where a Fire Resistance Level is required.

Ignis Solutions Pty Ltd

The ResCom Board can be fixed within and external wall system.

The ResCom Board can be penetrated by materials and building services without the requirement for additional protection measures. This does not apply to any fire resisting element of the wall or building on which the board is attached to. These elements will require compliant penetration protection in accordance with Clause C3.15 of the BCA.

### Product Identification

The ResCom Board can be identified by the ResCom stamp on each board.

### Panel Fixing and Installation

The ResCom Board can be mechanically fixed directly to the wall structure be it a timber, steel, concrete/masonry wall structure or be connected via a top hat to the sub-frame to create a fire resistant wall or to enhance the Fire Resistance Level of an existing wall. The stud or fixing is to be a maximum of 600mm (typically 450mm) depending on structural design. Non-corrosive 304 minimum stainless steel screws of 10-12 gauge at 300mm centres on the edge and 450mm centres centrally within the board at no greater than 50mm from the edge. The installation is to be in accordance with the MgO Corp Board Fire and Acoustic Walls, Ceiling and Floors Installation Manual (FIM-Edition 5-2015).

## C. Relevant Technical Literature

### The National Construction Code.

The National Construction Code (NCC) is an initiative of the Council of Australian Governments developed to incorporate all on-site construction requirements into a single code. The Building Code of Australia (BCA) is Volume One and Volume Two of the NCC.

The BCA is produced and maintained by the Australian Building Codes Board (ABCB) on behalf of the Australian Government and each State and Territory government.

The BCA is a uniform set of technical provisions for the design and construction of buildings and other structures throughout Australia whilst allowing for variations in climate and geological or geographic conditions.

### BS 476-4:1970 Fire test on building materials and structures – non-combustibility.

This British Standard specifies a method of test for determining whether building materials are non-combustible within the meaning of the definition. Materials used in the construction and finishing of buildings or structures are classified 'non-combustible' or 'combustible' according to their behaviour in the 'non-combustible' test. This test is intended for building materials, whether coated or not, but it is not intended to apply to the coating alone.

The primary difference between the BS 476-4 and AS 1530.1 is that AS 1530.1 sets the sample to be a 45mm diameter disc whilst BS 476-4 sets a width and breadth of 40mm.

The test deemed non-combustibility if, during the test, non of the three specimens either:

1. Causes the temperature reading from either of the two thermocouples to rise by 50°C or more above the initial furnace temperature; or
2. Is observed to flame continuously for 10s or more inside the furnace.

Within AS1530.1, the criteria to deem a material to be combustible occurs when:

1. The mean duration of sustained flaming is other than 0 for the mean for the summation of all the individual durations of flaming for 5s or longer and divided by 5.
2. The mean furnace thermocouple temperature rise exceeds 50°C
3. The mean specimen surface thermocouple temperature rise exceeds 50°C.



**AS 1530.4 – Fire-resistance tests on elements of construction – Methods for determination of the fire resistance of loadbearing elements of construction.**

Each test is a full scale fire-resistance tests of elements of building construction following the standard fire curve. In most cases, a single test, carried out in accordance with either of these standards, establishes the fire-resistance for the element of construction concerned. The test subjects the material to a furnace where it is heated to the standard time/temperature rise curve. The size of the tested element under the standard test is to be 3m.

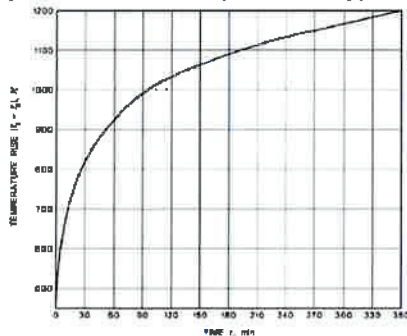
The BCA sets the principle requirements for fire hazard properties of building materials within Part A2 Clause A2.3 for where building elements are to achieve a Fire Resistance Level. Clause A2.4 requires compliance in accordance with Specification A2.4.

Specification A2.3 – Fire Resistance of Building Elements sets the scope for determining the fire resistance of building elements to be tested to standard fire test. The term standard fire test is defined within the BCA as the Fire-resistance Tests of Elements of Building Construction as described in AS 1530.4. AS 1530.4 describes one of test elements for the building element is to be subjected to a furnace where the temperature curve follows the standard fire curve.

The standard fire curve is detailed in figure 2.3 of AS 1530.4 and provided below. The standard time-temperature curve is widely accepted and used by most of the standards and testing agencies. It is based on the maximum induction of the severity of a fire completely burning out an ordinary brick, wood-joisted building loaded with combustible contents. The use of this curve, together with information on the fire loading, is used to estimate the severity of a fire.

**FIGURE 1:**

**STANDARD FIRE CURVE AS1530.4**



**AS/NZS 3837:1998 – Method of test for heat and smoke release rates for materials and products using an oxygen consumption calorimeter.**

This Standard specifies a test method for measuring the response of materials exposed to controlled levels of radiant heating with or without an external igniter. The test method is used to determine the ignitability, heat release rates, mass loss rates, effective heat of combustion, and smoke release of materials and products.

The cone calorimeter is a small-scale oxygen consumption calorimeter. Specimens, 100 mm square are supported horizontally on a load cell and exposed to a set external radiant heat flux in ambient air conditions. The radiant heat source is a conically shaped radiator that can be set to impose any heat flux in the range 0-100 kW/m<sup>2</sup> on the specimen surface. Ignition is promoted using a spark igniter. Combustion gases are extracted in an exhaust duct where instrumentation measures exhaust gas flow, temperature, O<sub>2</sub>, CO and CO<sub>2</sub> concentrations and smoke optical density. From these measurements quantities such as heat release rate, mass loss rate, effective heat of combustion and smoke production can be calculated. Time to ignition at set heat flux exposures is determined by observation. The cone calorimeter apparatus and procedure are described in ISO 5660, AS/NZS 3837 and ASTM E 1354.

**D. ResCom MgO Product Fire Testing**

The ResCom Board has been tested to local and equivalent fire standard. This includes:

1. BS 476-4:1970 Fire test on building materials and structures – non-combustibility
2. AS 1530.4:2005 Fire-resistance tests on elements of construction – Methods for determination of the fire resistance of loadbearing elements of construction.
3. AS 3837:1998 Method of test for heat and smoke release rates

**BS 476-4:1970 Fire test on building materials and structures – non-combustibility.**

Combustibility tests are essentially used to determine if materials are combustible or non-combustible. Various standard test methods exist around the world including (ISO 1182, BS 476 part 4, ASTM E136, ASTM E2652, AS 1530.1) however they are all fairly similar.

Small specimens are exposed to high temperatures of typically 750 °C or 835 °C within a small conical tube furnace. Criteria for non-combustibility are typically.

- No sustained flaming (typically > 5 s)
- Mean furnace temperature rise must not typically exceed 50 °C
- Mean specimen surface temperature must not typically exceed 50 °C
- Criteria for limited specimen mass loss may also be applied.

Many building codes around the world deem materials such as gypsum plaster to be non-combustible as they don't necessarily meet the above test criteria for items such as mass loss.

External wall assemblies constructed entirely of non-combustible materials do not generally pose any hazard relating to fire spread.

The ResCom Board was tested by Intertek within their Shanghai test facility and documented in their test report 160204003SHF-BP-4 dated 18 March 2016.

The following test results were recorded.

Description	Specimen 1	Specimen 2	Specimen 3	Requirements
Time of continuous flaming (s)	0	0	0	<10
Temperature rise of furnace (°C)	2	3	1	<50
Temperature rise of sample (°C)	0	0	0	<50
Classification	Non-combustible	Non-combustible	Non-combustible	

Based on the test results when subjected to the criteria under both BS 476-4 and AS 1530.1 the product is deemed non-combustible.

The BCA sets the criteria for non-combustibility through Clause A1.1 definitions. Specification C1.1 Clause 3.1(b) and 4.1(b) requires external and common walls to be non-combustible. The ResCom Board can be used in these situations.

**AS/NZS 3837:1998 Method of test for heat and smoke release rates for materials and products using an oxygen consumption calorimeter.**

SGS tested the ResCom Board to a rate of 50 kW/m<sup>2</sup> in their test report SHCCM150902768 dated 18 September 2015 to AS/NZS 3837:1998.

The test produced the following results:

Regulatory Indices:	
Group Number	1
Average specific extinction area	24.7kW/m <sup>2</sup>

AS 5637.1 details group numbers as follows:

1. A Group 1 material is one that does not reach flashover when exposed to 100kW for 600 seconds followed by exposure to 300kW for 600 seconds.
2. A Group 2 material is one that reaches flashover following exposure to 300kW within 600 seconds after not reaching flashover when exposed to 100kW for 600 seconds.

- 3. A Group 3 material is one that reaches flashover in more than 120 seconds but with a 600 seconds when exposed 100kW.
- 4. A Group 4 material is one that reaches flashover within 120 seconds when exposed to 100kW.

The test results demonstrate a group 1 is achieved, meaning the material does not reach flashover.

**AS 1530.4-2006 Fire-resistance tests on elements of construction – Methods for determination of the fire resistance of loadbearing elements of construction.**

Australian Standard AS 1530.4:2005 sets out test procedures and criteria for the determination of fire-resistance of elements of building construction via a large scale (3m x 3m) furnace test. AS1530.4 sets results in relation to Structural adequacy, integrity and Insulation.

SGS is an international testing service. Their Shanghai test facility completed testing on the ResCom Board within a wall installation. The test was undertaken on 03 June 2015 in report SHCCM150401181 with the wall set up being **10mm thick ResCom Board on either side of a 75mm lightgauge steel joist and 50kg/m<sup>3</sup> mineral wool insulation.** The following results were produced:

Regulatory Indices:	
Structural adequacy	-
Integrity	90 minutes
Insulation	67 minutes

The result for compliance under the BCA are limited to **-/90/60**.

Testing undertaken by Research Engineering Development Façade Consultants Limited to BS 476 part 22 where the equivalent standard fire curve was used in the boards evaluation.

The test was undertaken on 18 May 2007 in report R07A15A with the wall set up being **12mm thick ResCom Board on either side of a 46mm galvanised steel joist at nominally 610mm centres and 94kg/m<sup>3</sup> Luyangwool 72 mullite crystal fibre blanket insulation.** The following results were produced:

Regulatory Indices:	
Structural adequacy	-
Integrity	150 minutes
Insulation	132 minutes

The result for compliance under the BCA are limited to **-/120/120**.

Testing undertaken by Intertek Shanghai testing facility to ASTM E119-16a where the equivalent standard fire curve was used in the boards evaluation.

The test was undertaken on 19 December 2016 in report 160929005SHF-BP-1 with the wall set up being **12mm thick ResCom Board on either side of a 75mm steel studs at nominally 600mm centres and 180kg/m<sup>3</sup> Rockwool insulation.** The following results were produced:

Regulatory Indices:	
Structural adequacy	-
Integrity	180 minutes
Insulation	90 minutes

The result for compliance under the BCA are limited to **-/180/90**.

Testing undertaken by Exova Warrington to BS 476 part 21 where the equivalent standard fire curve was used in the boards evaluation.

The test was undertaken on 28 September 2016 in report 372077 with the wall set up being **12mm thick ResCom Board bonded on either side to a closed cell polyurethane foam core.** The following results were produced:

Regulatory Indices:	
Structural adequacy	90 minutes
Integrity	90 minutes
Insulation	60 minutes

The result for compliance under the BCA are limited to **90/90/60**.

Testing undertaken by VTEC Laboratories Inc. testing facility to ASTM E119 where the equivalent standard fire curve was used in the boards evaluation.

The test was undertaken on 9 November 2005 in report VTEC#100-2295-2 with the wall set up being **15mm thick ResCom Board on either side of a 150mm 18 guage steel studs at nominally 600mm centres and 2.6kg mineral wool insulation.** The following results were produced:

Regulatory Indices:	
Structural adequacy	-
Integrity	240 minutes
Insulation	240 minutes

The result for compliance under the BCA are limited to **-/240/240**.

The ResCom Board has been evaluated by the Exova Warrington Victorian team in their report 24158-00 dated 14/01/10. The Exova Warrington report reviewed and validated the above tests in the wall achieving an FRL of **-/60/60** minutes for the 10mm board and **-/120/120** minutes for the 12mm board when installed to the minimum wall design. Exova Warrington confirmed the relevance of the tests and equivalence to AS 1530.4. This Ignis Solutions evaluation extends the Exova Warrington report, considering the two relevant fire tests in accordance with the Building Code of Australia 2016.

The ResCom Board has been evaluated by the CSIRO North Ryde team in their report FCO-2830/3940 dated 27 October 2010. The CSIRO report reviewed and validated the above tests in the wall achieving an FRL of **-/60/60** minutes for the 10mm board and **-/120/120** minutes for the 12mm board when installed to the minimum wall design. The CSIRO confirmed the relevance of the tests and equivalence to AS 1530.4. This Ignis Solutions evaluation extends the CSIRO report, considering the two relevant fire tests in accordance with the Building Code of Australia 2016.

## E. Incipient Spread of Fire

### Introduction

The compliance of the ResCom Board to the incipient spread of fire has been reviewed inline with the SGS AS 1530.4 testing as per the requirements of the BCA as well as that established by AS 1530.4:2014.

A number of documents were reviewed within this engineering certificate. This includes:

- The National Construction Code – Volume One – Building Code of Australia 2016
- Standards Australia AS 1530.4:2014 Methods for fire tests on building materials, components and structures Part 4: Fire-resistance tests of elements of building construction
- SGS test report SHCCM150401181 dated 03 June 2015.

SGS has undertaken testing of the 10mm product in accordance with AS 1530.4 in their report SHCCM150401181. The specimen was installed into a prepared masonry wall with the opening size 3010mm width by 3010mm height. C75 light gage steel joists were fixed to masonry wall by expansion bolts. The exposed and unexposed face testing panels were fixed to C75 light gage steel joists by self-tapping screw (spaced about 10mm). Gaps between the sample panels as



well as gaps around the specimen and masonry wall were covered by a fire resistance bolting and glue. The specimen had a single layer of 10mm ResCom board on either side of the C75 light gage steel joists with mineral wool (50kg/m<sup>3</sup>) within the wall cavity. In accordance with Clause A1.1 of the BCA, SGS is considered a Registered Testing Authority based on its International Laboratory Accreditation Cooperation Mutual Recognition Agreement recognised by the National Association of Testing Authorities (NATA).

**Documentation of Decision Making**

The National Construction Code (NCC) is an initiative of the Council of Australian Governments developed to incorporate all on-site construction requirements into a single code. The Building Code of Australia (BCA) is Volume One and Volume Two of the NCC.

The BCA is produced and maintained by the Australian Building Codes Board (ABCB) on behalf of the Australian Government and each State and Territory government.

The BCA is a uniform set of technical provisions for the design and construction of buildings and other structures throughout Australia whilst allowing for variations in climate and geological or geographic conditions.

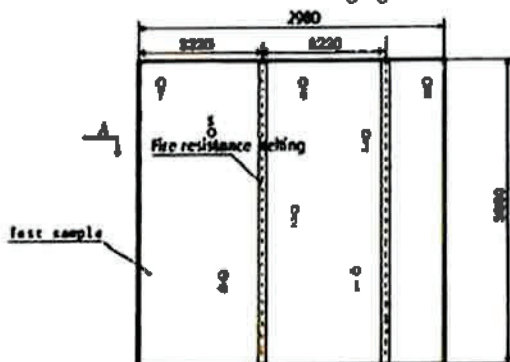
Clause A2.5 details the requirements for Resistance to the incipient spread of fire. A ceiling is deemed to have the resistance to the incipient spread of fire to the space above itself if-

- (a) It is identical with a prototype that has been submitted to the Standard Fire Test and the resistance to the incipient spread of fire achieved by the prototype is confirmed in a report from a Registered Testing Authority which-
  - (i) describes the method and conditions of the test and form of construction of the tested prototype in full; and
  - (ii) certifies that the application of restraint to the prototype complies with the Standard Fire Test.

Clause A1.1 provides a definition for the Resistance to the incipient spread of fire, in relation to a ceiling membrane, means the ability of the membrane to insulate the space between the ceiling and roof, or ceiling and floor above, so as to limit the temperature rise of materials in this space to a level which will not permit the rapid and general spread of fire throughout the space.

The BCA sets the requirement in a number of provisions for a ceiling to have a resistance to the incipient spread of fire.

AS 1530.4 provides details of establishing the incipient spread of fire through testing. An array of thermocouples were provided on the unexposed side of the panel in accordance with Clause 4.3.3(b) of AS 1530.4 and detailed in the following figure.

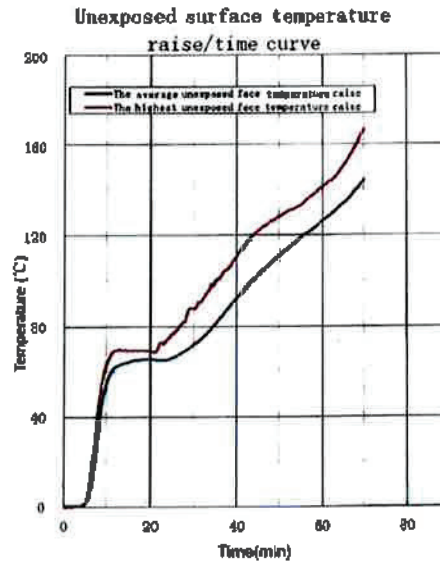


Clause 4.7.4 of AS 1530.4 details the criteria of failure for the incipient spread of fire being deemed to have occurred when the average temperature of the five thermocouples at any one of the locations has risen by more than 180K above the initial temperature.

Clause 4.8 of AS 1530.4 details the results shall be stated in terms of the time in whole minutes from the start of the test until failure has occurred under incipient spread of fire. It is noted that the incipient spread of fire is not taken into account in the determination of fire-resistance.

The ResCom 10mm board when tested achieved an FRL of -/60/90 minutes.

The temperature raise/time curve is detailed below. The temperature was measured for 65 minutes consecutively before being terminated. The rise in temperature did not exceed 180 K.



**Conclusion**

It is considered in the opinion of the author of this note that based on the testing undertaken by SGS and documented in their test report SHCCM150401181 that the ResCom board achieves a resistance to the incipient spread of fire of 70 minutes.

**F. Penetrations**

**Introduction**

Penetrations in a building element (being a floor, wall, ceiling or the like) is to comply with the requirements of Clause C3.15 of the BCA.

Clause C3.15 of the BCA permits three methods of compliance:

1. Tested Systems; or
2. Ventilation and air-conditioning; or
3. Compliance with Specification C3.15.

ResCom recommends penetrations comply with the requirements of BCA Specification C3.15.

Clause C3.15 of the BCA sets requirements for select penetration scenarios. These include:

- A. Metal Pipes,
- B. Sanitary plumbing (metal or UPVC),
- C. Wire or cables (individual or cluster),
- D. Electrical switch, outlet or the like.

The requirements under Clause C3.15 and Specification C3.15 of the BCA for each of the penetration scenarios is detailed below.

**Metal Pipes**

The metal pipe is permitted to penetrate the ResCom board provided;

- i. It does not contain a flammable or combustible liquid or gas; and
- ii. Comprised entirely of metal (excluding pipe seals or the like); and
- iii. If not normally filled with liquid the penetration through the ResCom MgO board must not be located within 100mm of any combustible building elements or where combustible elements may be located adjacent to the penetration. This includes any timber studs or beams supporting the ResCom MgO Board; and
- iv. The opening must be neatly formed, cut or drilled; and
- v. Be no closer than 200mm to any other service penetration; and
- vi. Accommodate only one pipe within the single penetration; and
- vii. The gap between the pipe and floor must be fire-stopped as follows:
  - a. Any lagging or thermal insulation through the penetration must be fire-stopping material of concrete, high-temperature mineral fibre, high-temperature ceramic fibre



or other material that does not flow at a temperature below 1120°C when tested in accordance with ISO 540;

- b. Any fire stopping material used must have been tested in accordance with AS 1530.4 and demonstrate to not impair the fire-resisting performance of the building element or fire-resisting performance of the test slab;
- c. If the penetration of the metal pipe is through a hollow wall or floor/ceiling system, the cavity must be framed and packed with fire-stopping material that is packed into the gap between the metal pipe to a thickness of 25mm all round the service for the full length of the penetration and compressed to the same degree as tested in accordance with AS 1530.4.

#### Sanitary plumbing (metal or UPVC)

- i. Is of metal or UPVC pipe; and
- ii. Where it penetrates floors be of a Class 5, 6, 7, 8 or 9b building only; and
- iii. If in a sanitary compartment separated from other parts of the building by walls with an FRL required by BCA Spec C1.1 for a stair shaft in the building and a self closing -/60/30 fire door; and
- iv. The opening be neatly formed and no larger than is necessary to accommodate the pipe or fitting; and
- v. The gap between the pipe and floor must be fire-stopped as follows:
  - a. Any lagging or thermal insulation through the penetration must be fire-stopping material of concrete, high-temperature mineral fibre, high-temperature ceramic fibre or other material that does not flow at a temperature below 1120°C when tested in accordance with ISO 540;
  - b. Any fire stopping material used must have been tested in accordance with AS 1530.4 and demonstrate to not impair the fire-resisting performance of the building element or fire-resisting performance of the test slab;
  - c. If the penetration of the pipe is through a hollow wall or floor/ceiling system, the cavity must be framed and packed with fire-stopping material that is packed into the gap between the pipe to a thickness of 25mm all round the service for the full length of the penetration and compressed to the same degree as tested in accordance with AS 1530.4.

#### Wire or cables (individual or cluster)

- i. The opening must be neatly formed, cut or drilled and no closer than 50mm to any other service; and
- ii. The opening must be no larger in cross-sectional area than
  - a. 2,000mm<sup>2</sup> if only a single cable is accommodated and the gap between the cable and wall, floor or ceiling is no wider than 15mm; or
  - b. 500mm<sup>2</sup> in any other case; and
- iii. The gap between the service and the ResCom MgO board must be fire-stopped as follows:
  - a. Any lagging or thermal insulation through the penetration must be fire-stopping material of concrete, high-temperature mineral fibre, high-temperature ceramic fibre or other material that does not flow at a temperature below 1120°C when tested in accordance with ISO 540.
  - b. Any fire stopping material used must have been tested in accordance with AS 1530.4 and demonstrate to not impair the fire-resisting performance of the building element or fire-resisting performance of the test slab.
  - c. If the penetration of the wires or cables is through a hollow wall or floor/ceiling system, the cavity must be framed and packed with fire-stopping material that is packed into the gap between the pipe to a thickness of 25mm all round the service for the full length of the penetration and compressed

to the same degree as tested in accordance with AS 1530.4.

#### Electrical switch, outlet or the like.

- i. If an electrical switch, outlet, socket or the like is accommodated in an opening or recess in a wall, floor or ceiling of ResCom MgO board, the opening or recess must not:
  - a. Be located opposite any point within 300mm horizontally or 600mm vertically of any opening or recess on the opposite side of the wall; or
  - b. Extend beyond half the thickness of the wall; and
- ii. The gap between the service and the ResCom MgO wall, floor or ceiling must be fire-stopped as follows:
  - a. Any lagging or thermal insulation through the penetration must be fire-stopping material of concrete, high-temperature mineral fibre, high-temperature ceramic fibre or other material that does not flow at a temperature below 1120°C when tested in accordance with ISO 540.
  - b. Any fire stopping material used must have been tested in accordance with AS 1530.4 and demonstrate to not impair the fire-resisting performance of the building element or fire-resisting performance of the test slab.
  - c. If the penetration is through a hollow wall or floor/ceiling system, the cavity must be framed and packed with fire-stopping material that is packed into the gap between the pipe to a thickness of 25mm all round the service for the full length of the penetration and compressed to the same degree as tested in accordance with AS 1530.4.

#### Conclusion

Penetrations of the materials detailed above, through the ResCom Board will comply with the BCA through Performance Requirement CP6, Clause C3.15 and Specification C3.15 if installed as detailed below.

#### G. Slab Infill

Should a floor slab which achieves a Fire Resistance Level (FRL) require infill to maintain its FRL, the ResCom board can be applied in an equivalent manner as the wall systems A, B, C and D as detailed in the introduction above. The framing and insulation of the system is to be at a minimum equivalent to that of the tested system. The slab infill system design is to be reviewed, approved and if necessary enhanced at the requirement of structural adequacy.

#### H. Fire Protective Covering

The ResCom board can be applied to an existing wall system that achieves a Fire Resistance Level. Should the application of the fire protective covering be equivalent to that of the tested system, the enhancement is considered to be equivalent to the wall systems A, B, C and D where the resultant FRL would be cumulative.

#### I. ResCom MgO Product Acoustic Testing

The ResCom Board has been tested to in accordance with ISO 10140 and the weighted sound reduction index ( $R_w$ ) calculated in accordance with AS/NZS ISO 717.1. The Tests were undertaken by Kilargo Acoustic Lab in Banyo QLD on 5 and 6 November 2013 in their reports 06112013/ct/02, 05112013/ct/01, 06112013/ct/01 and 05112013/ct/02. This includes:

- A. The result for compliance under the BCA for a wall to achieve an  $R_w(C,C_{tr})$  of 47 (-3,-9) dB require the following construction:  
12mm thick ResCom Board on either side of a 75mm steel studs



with nominally 600mm centres and 24kg/m<sup>3</sup> glasswool R2.0 insulation.

- B. The result for compliance under the BCA for a wall to achieve an  $R_w(C,C_{tr})$  of 60 (-3,-9) dB require the following construction: 12mm thick ResCom Board on either side of a 75mm steel studs on nominally 600mm centres filled with 24kg/m<sup>3</sup> glasswool R2.0 insulation, a 20mm air gap and additional 75mm steel studs on nominally 600mm centres filled with 24kg/m<sup>3</sup> glasswool R2.0 insulation
- C. The result for compliance under the BCA for a wall to achieve an  $R_w(C,C_{tr})$  of 62 (-3,-9) dB require the following construction: 12mm thick ResCom Board on the side of a 75mm steel studs on nominally 600mm centres filled with 24kg/m<sup>3</sup> glasswool R2.0 insulation, a 25mm air gap and additional 200mm steel studs on

nominally 450mm centres filled with 24kg/m<sup>3</sup> glasswool R2.0 insulation and 18mm ResCom Board.

- D. The result for compliance under the BCA for a wall to achieve an  $R_w(C,C_{tr})$  of 64 (-3,-9) dB require the following construction: 12mm thick ResCom Board on the side of a 75mm steel studs on nominally 600mm centres filled with 24kg/m<sup>3</sup> glasswool R2.0 insulation, a 25mm air gap and additional 200mm steel studs on nominally 600mm centres filled with 24kg/m<sup>3</sup> glasswool R2.0 insulation and 2 layers of 12mm ResCom Board.



## EVALUATION SUMMARY

The assessment has demonstrated that the ResCom Board when, in addition to the completed tests on the product, installed and fixed in accordance with the manufacturers instructions satisfies the BCA Deemed-to-Satisfy clauses as detailed in section 3 on page 1.

## Reference Documents

- National Construction Code – 2016 – Volume One – Building Code of Australia Class 2 to 9 Buildings.
- Guide to the Building Code of Australia 2016 – Volume One, Class 2 to Class 9 Buildings’, Australian Building Codes Board, 2016 (the Guide).
- British Standards BS 476-4:1970 Fire test on building materials and structures – non-combustibility
- Standards Australia, AS 1530.4-2005 Fire-resistance tests on elements of construction – Methods for determination of the fire resistance of loadbearing elements of construction, 2005, Sydney.
- Standards Australia, AS/NZS 3837:1998 Method of test for heat and smoke release rates for materials and products using an oxygen consumption calorimeter, 1998, Sydney
- SGS SHCCM150401181 test to AS1530.4 dated 3 June 2015.
- Research Engineering Development Façade Consultants Limited R07A15A to BS 476 part 22 dated 18 May 2007.
- Exova Warrington Victorian report 24158-00 dated 14/01/10
- CSIRO North Ryde report FCO-2830/3940 dated 27 October 2010.
- Intertek report 160929005SHF-BP-1 dated 23 December 2016.
- Exova Warringtonfire 372077 dated 16 December 2016, United Kingdom
- Ignis Solutions ResCom – MgO Board penetration evaluation 4099.3 I01 R00 dated 18 August 2016.
- Ignis Solutions ResCom – Professional Engineering Certificate 4099.1 I01R00 dated 11 July 2016.
- Kilargo report 05112013/ct/02 dated 05 November 2013.
- Kilargo report 06112013/ct/01 dated 06 November 2013.
- Kilargo report 05112013/ct/01 dated 05 November 2013.
- Kilargo report 06112013/ct/02 dated 06 November 2013.
- VTEC Laboratories VTEC #100-2295-2 dated 09 November 2005

In the opinion of Ignis Solutions, the ResCom Board is fit for purpose and will comply with the National Construction Code Volume One and Two – Building Code of Australia 2016 to the extent specified in this Evaluation Report provided it is used, designed, installed and maintained as set out in this Evaluation Report.

The Evaluation Report is issued only to MgO Corp and is valid until expiry, subject to the Conditions of Evaluation Report.

### Conditions of Evaluation Report

1. This Evaluation Report:
  1. relates only to the product as described herein;
  2. must be read, considered and used in full together with the technical literature;
  3. does not address any Legislation, Regulations, Codes or Standards, not specifically named herein;
  4. is copyright of Ignis Solutions Pty Ltd.
2. Ignis Solutions Pty Ltd makes no representation or warranty as to:
  1. the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
  2. the presence or absence of any patent or similar rights subsisting in the product or any other product;
  3. any guarantee or warranty offered by MgO Corp.
4. Any reference in this Evaluation Report to any other publication shall be read as a reference to the version of the publication specified in this Evaluation Report.
5. Ignis Solutions Pty Ltd provides no certification, guarantee, indemnity or warranty, to MgO Corp or any third party.

  
**Benjamin Hughes-Brown**  
 FIEAust CPEng NER  
 Chartered Professional Engineer  
 FPAA Professional Engineer

CPEng, NER (Fire Safety / Mech) 2590091, RPEQ 11498, BPB-C10-1875, EF-39394  
 MFireSafety (UWS), BEng (UTS), GradDipBushFire (UWS), DipEngPrac (UTS), DipEng (CIT)



## IGNIS ADVISORY NOTE

Evaluation No. IGNS-6459 Issue 02 Revision 00 [2018]

### ResCom Shaftliner System

Ignis Solutions has been engaged to provide guidance on the attached wall systems. The BCA through Specification A2.3 Clause 2 (b) requires the building element to be identical with a prototype that has been submitted to the standard fire test or an equivalent or more severe test.

Ignis Solutions has previously evaluated the ResCom wall systems in Ignis report 4241 I02R02 dated 26 September 2017. This engineering certificate should be read in conjunction with the above referenced Ignis report. This engineering certificate serves as a certificate from professional engineer in accordance with Clause A2.2 (a)(iii) of the National Construction Code Volume One Building Code of Australia.

The following large scale tests were undertaken on a 3m x 3m wall system. The subject pilot test has been undertaken to determine a variation to the large scale tests wall elements where a zero lot boundary wall system achieving an FRL from the exterior is established as well as substitution of the insulation from rockwool to an earthwool.

SGS is an international testing service. Their Shanghai test facility completed testing on the ResCom Board within a wall installation.

The test was undertaken on 03 June 2015 in report SHCCM150401181 with the wall set up being 10mm thick ResCom Board on either side of a 75mm lightgauge steel joist and 50kg/m<sup>3</sup> mineral wool insulation. The following results were produced:

Regulatory Indices:	
Structural adequacy	-
Integrity	90 minutes
Insulation	67 minutes

The result for compliance under the BCA are limited to -/90/60.

Testing undertaken by Intertek Shanghai testing facility to ASTM E119-16a where the equivalent standard fire curve was used in the boards evaluation.

The test was undertaken on 19 December 2016 in report 160929005SHF-BP-1 with the wall set up being 12mm thick ResCom Board on either side of a 75mm steel studs at nominally 600mm centres and 180kg/m<sup>3</sup> Rockwool insulation. The following results were produced:

Regulatory Indices:	
Structural adequacy	-
Integrity	180 minutes
Insulation	90 minutes

The result for compliance under the BCA are limited to -/180/90.

Additional pilot testing of the ResCom MgO system was undertaken by Ignis Solutions. The pilot wall system included a 900mm x 900mm wall specimen with a vertical centre joint. The system included from the non fire side:



- 10mm plasterboard
- 90mm steel stud wall with 0.75 BMT
- R2.0 Knauf Earthwool insulation
- Bradford vapour permeable wall wrap
- 25mm 0.75BMT Batten fixed with 12-14 x 20mm Hex Head Tek screws
- 16mm ResCom HMR Board fixed to batten with Non-corrosive min Class 3 to 5 Countersunk Min 10 Gauge screws with Fire rated adhesive over the batten and fire rated sealant over the screw. The fixings were at 450mm centres based on the size of the board and the test sample.

The above subject test specimen reflects an external wall system where the FRL is established from the exterior side only and the Rockwool insulation is substituted for Earthwool. Furthermore, a 16mm thick ResCom MgO board is used on the single side in lieu of the 10mm and 12mm on both sides of the studs.

Regulatory Indices:	
Structural adequacy	-
Integrity	90 minutes
Insulation	90 minutes

With respect to the ResCom tested wall systems the following relates to the selected systems.

The results of the fire test contained in the test report are directly applicable to similar constructions of the subject wall. Variations in building elements that are not minor will require re-testing. The pilot test demonstrates that the proposed variation from the original tested system maintains an appropriate FRL of at least -/90/90 and are suitable to be applied to a wall where the framing system complies with Section B of the BCA and does not exceed more than 12m in a continuous height.

A technical report by Atech in their report 201909 dated 26.11.18 has been undertaken to consider the structural adequacy component of the proposed wall system. Atech has determined that based on the pilot test results and the wall frame design that a structural adequacy of the wall of 90 minutes can be achieved and therefore the collective FRL for the wall system is 90/90/90.

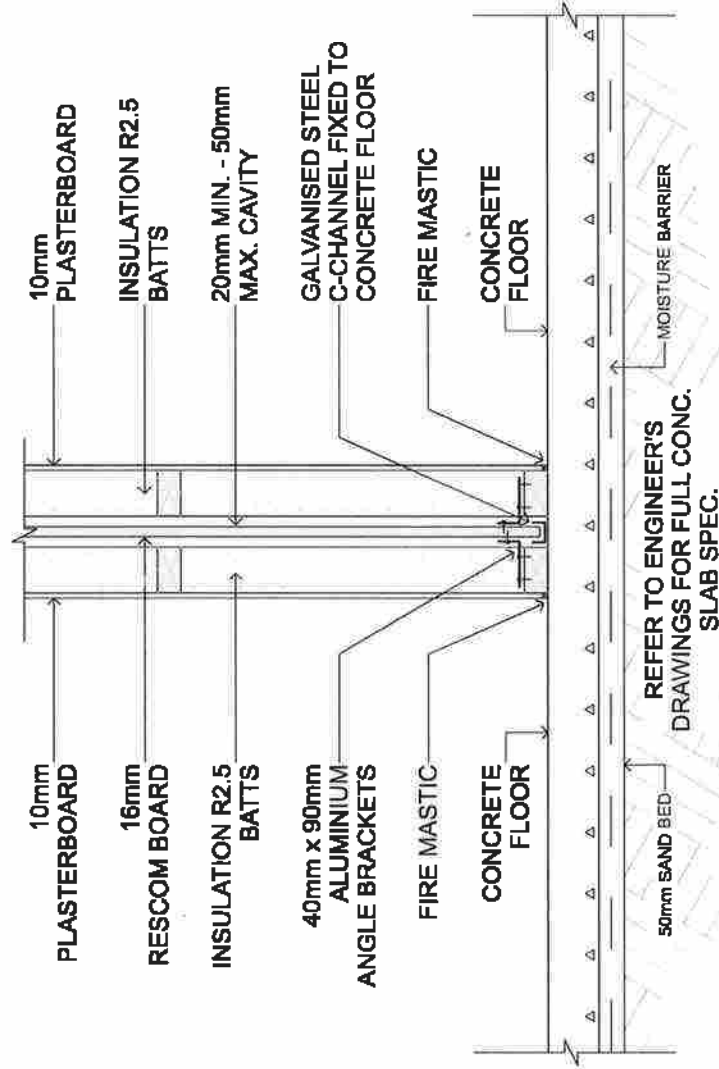
Regulatory Indices:	
Structural adequacy	90 minutes
Integrity	90 minutes
Insulation	90 minutes

The attached shaftliner plans are considered to maintain the required FRL with protection being achieved from either side of the wall. These plans include RSLA-1, RSLB-1, RSLC-1, RSLD-1 and RSL E-1.



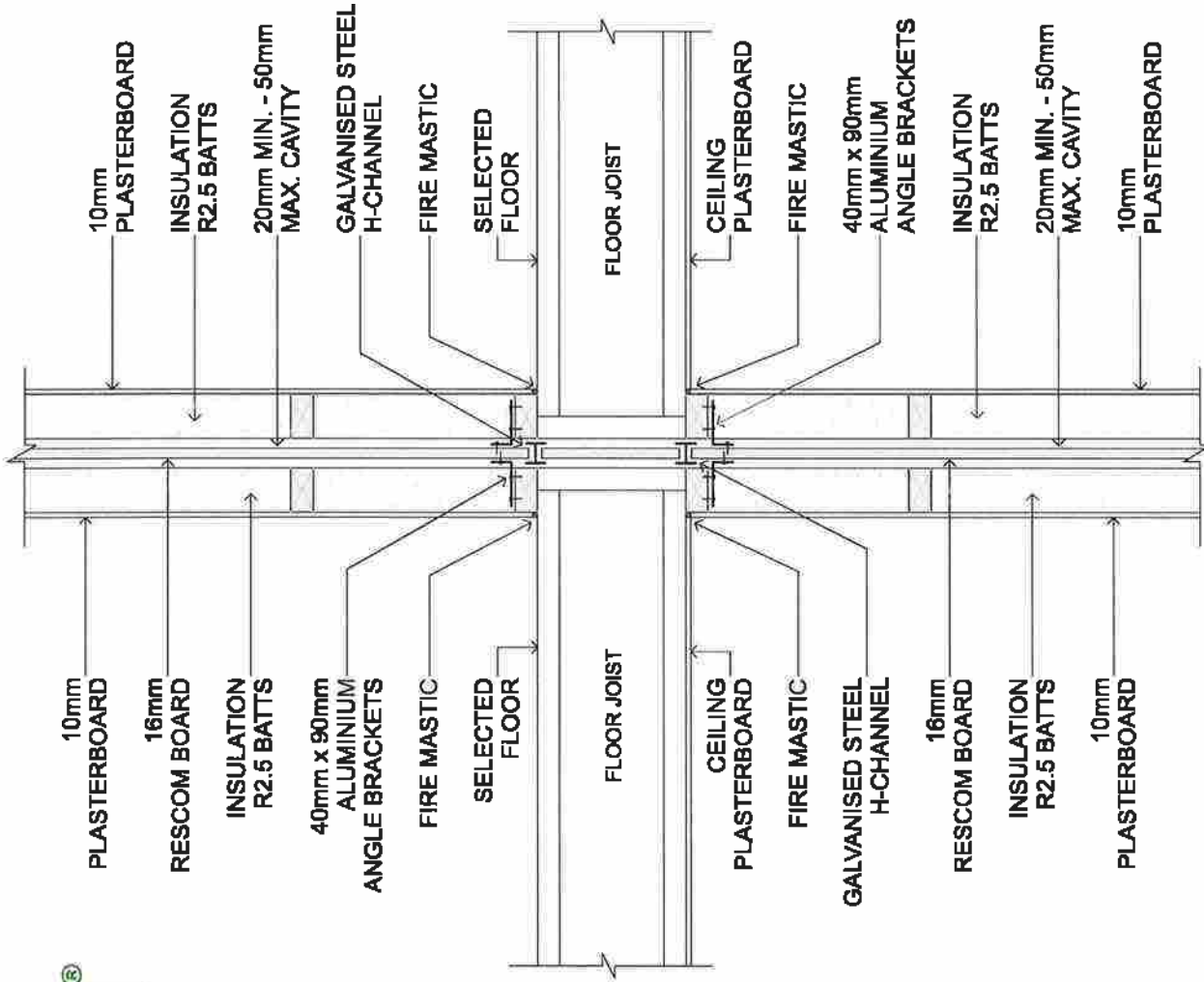
**Benjamin Hughes-Brown** FIEAust CPEng NER APEC Engineer IntPE(Aus)  
 Managing Director  
 Chartered Professional Engineer  
 CPEng, NER (Fire Safety / Mech) 2590091, RPEQ 11498, BPB-C10-1875, EF-39394  
 MFireSafety (UWS), BEng (UTS), GradDipBushFire (UWS), DipEngPrac (UTS), DipEng (CIT)





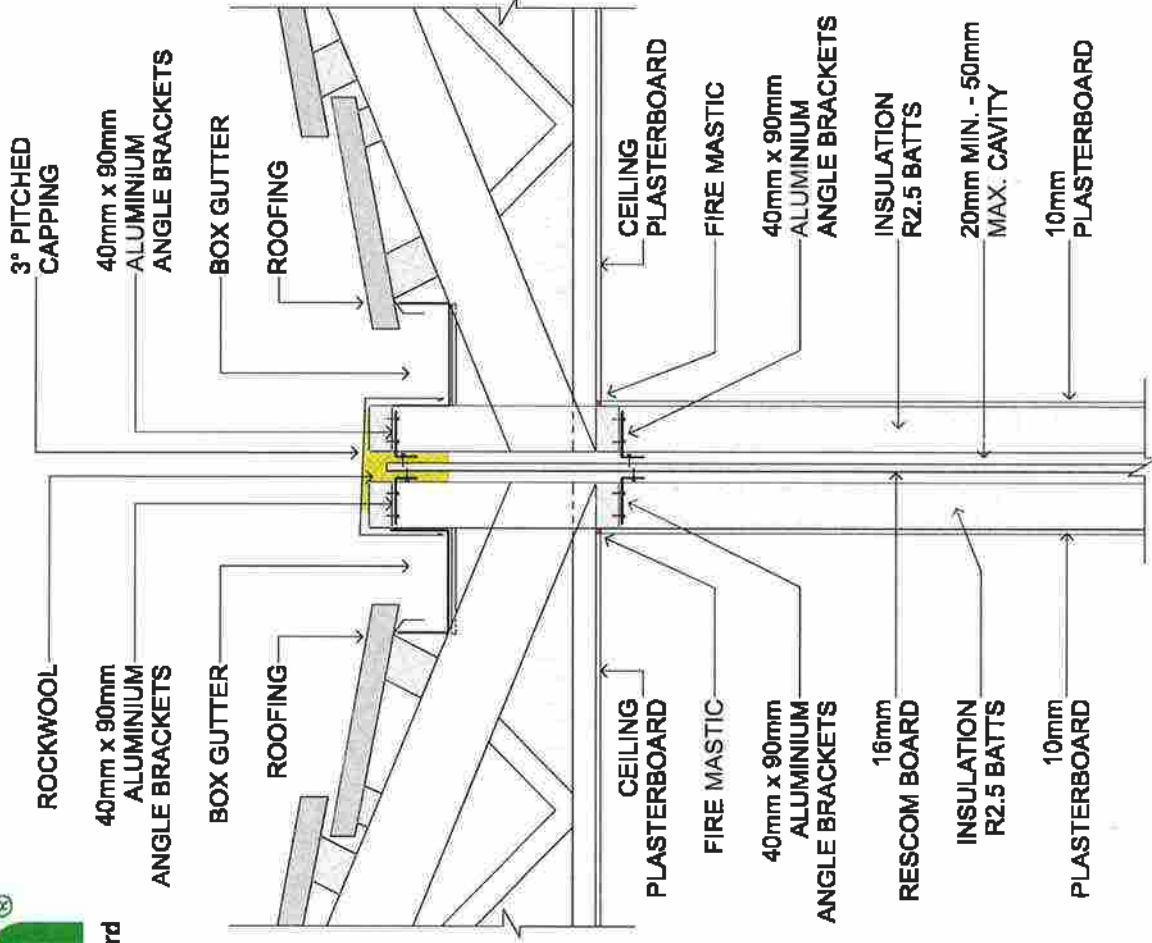
**PARTI-WALL DETAIL**  
SCALE 1:10

**CONFIDENTIAL**  
**APPROVED**

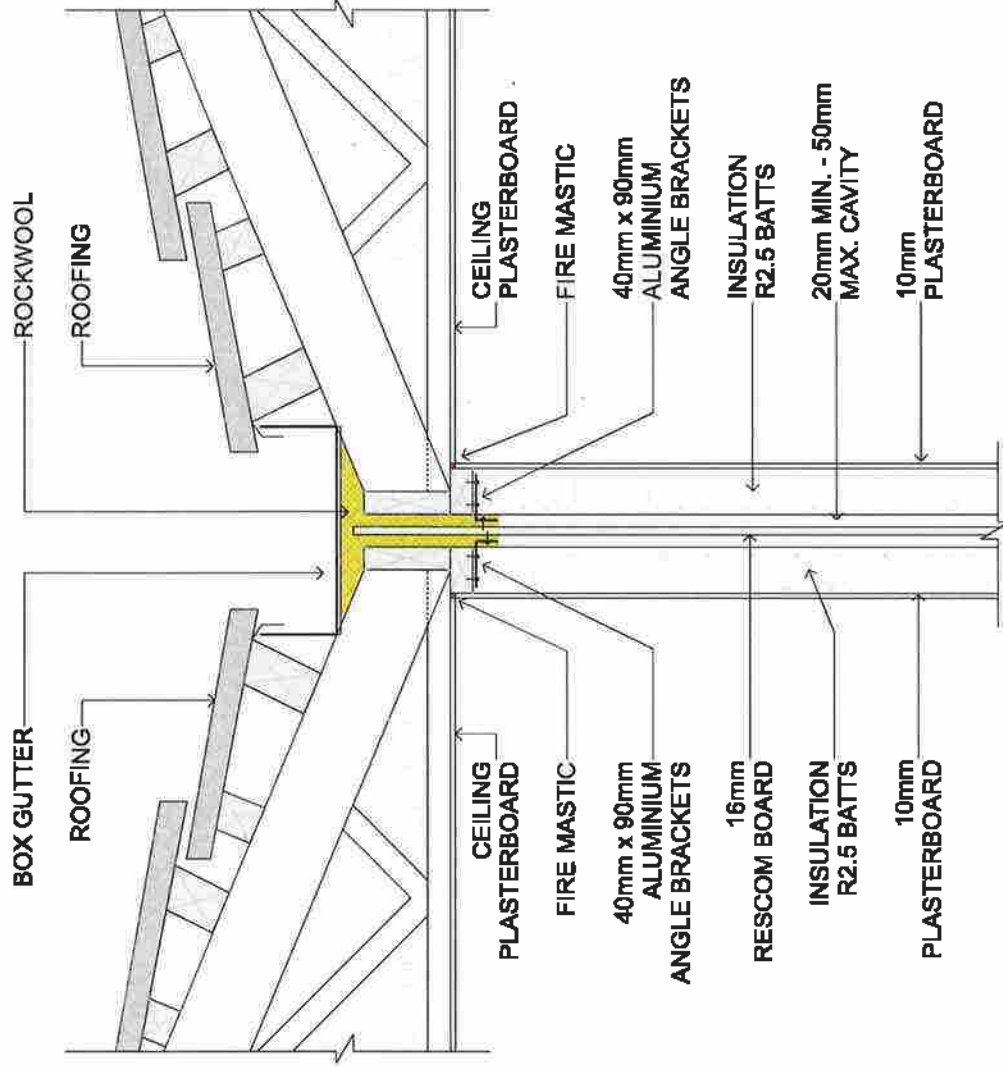


**PARTI-WALL DETAIL**  
SCALE 1:10

CONFIDENTIAL  
APPROVED

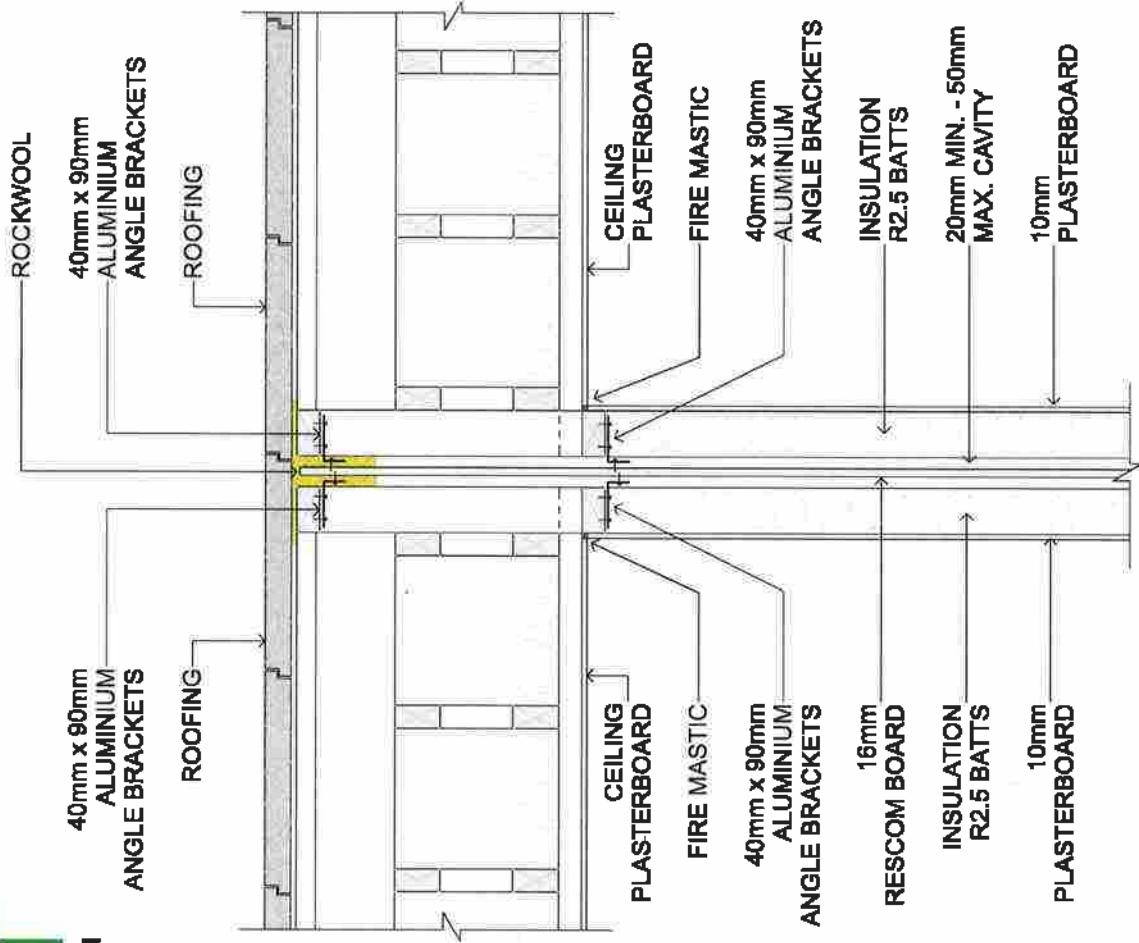


**PARTI-WALL TO ROOF DETAIL**  
SCALE 1:10



**PARTI-WALL TO ROOF DETAIL**  
 SCALE 1:10

**CONFIDENTIAL**  
**APPROVED**



**PARTI-WALL TO ROOF DETAIL**  
SCALE 1:10



# STORAGE AND HANDLING:

## INTENT OF THIS NOTICE

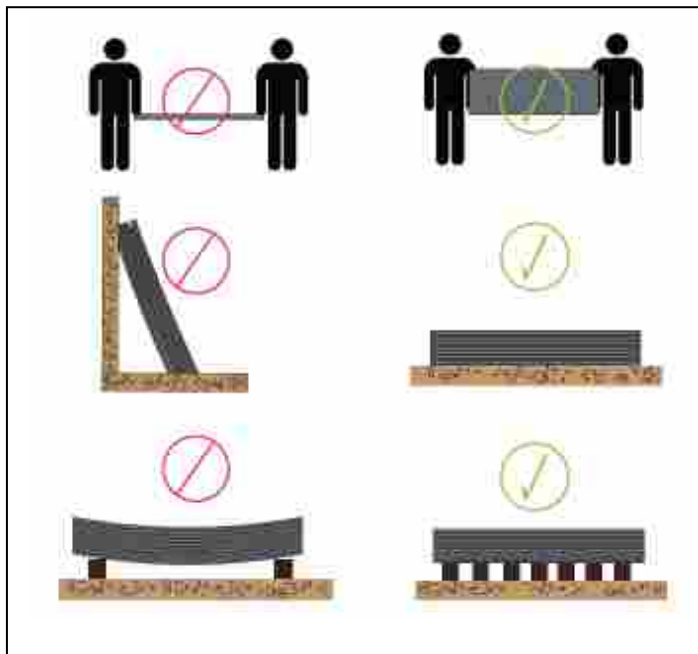
Is to define the instructions required to receive, store and handle ResCom® Building Products.

## GENERAL

ResCom® Building Products are a Composite Magnesia Cement flat sheet panel for use in the building and construction as internal and external linings. ResCom® products are Non-Toxic, Non-Flammable and Non-Combustible. For best results consumers should follow detailed construction practices when taking care, custody, and control of the building materials:

## PROCEDURE

- ResCom® Building Products must be stored inside a dry ventilated area and protected from damage by weather and direct sunlight.



- Stack flat on pallets or level dun-age – sufficiently support all edges and centre is required - do not allow material to bow, or to sit directly on the ground.
- Do not store up right or on edges.
- On receiving vertical packs these are to be rolled over and stored in flat horizontal position.
- Keep material dry prior to and during installation.
- Do not stack other materials on top of ResCom® Building Products.
- Always protect from job site dirt, oils, chemicals and solvents.
- Protect the products edges, ends and face from damage with protection cover.
- In the event requiring short term storage outside of enclosed building the goods always need to be fully wrapped and covered tightly by tarpaulin or equivalent coverings to completely protect the goods and pallets from rain and sunlight.

- In the event the goods get wet or are exposed to water they are to be individually removed from the packaging, wiped dry, and placed in flat level drying racks and allowed to fully dry before installation.
- In the event of prolonged external storage ResCom® panels are to be treated with a water impermeable and UV resistant sealer which is to be maintained over the life of the product. This protection is also required to be applied to the front, sides and rear of the panels prior to installation as external or wet area lining under NZBC B2.3.1 (a & b) the NCC 2022, the IRB, IRC 2021.
- ResCom panels need to be handled by minimum of two (2) persons when being lifted and carried vertically on their edge

## PRODUCT WARRANTY:

Failure to comply with the above storage and handling requirements will null and void any and all warranties be that verbal, written, statutory or offer by RGBP WHANUA TRUST ITF ResCom Building Products.

For the purposes of this warranty, a “defect” in respect of the Product warranty means a non-compliance with AS/NZS 2908.2 or ISO:8336 1993E and ICC-ES Standards for - Flat sheet cellulose-cement products.

## TECHNICAL SUPPORT

ResCom Building Products

Website: [www.rescombp.com](http://www.rescombp.com)

Email: [rescombp@rescombp.com](mailto:rescombp@rescombp.com)



# Material Safety Data Sheet (MSDS)

No.: ResCom (CMC)-March 2023

Presented By:

**ResCom Building Products**

**8 Piper Street**

**CABOOLTURE QLD 4510**

Contact Information:

Phone: +61 7 54309098

Email: rescombp@rescombp.com

Website: www.rescombp.com

Prepared Date: March 2023

## **Products Intended Uses:**

Exterior: sheathing, fascia, Soffit, ceiling board, drop ceiling, roofing substrate, siding, trim material.

Interior: wallboard, ceiling board, tile backing board, underlayment, flooring substrate. Structural Insulated Panels (SIPS) and Exterior Insulated Finish Systems (EIFS)

## **Product Compliances:**

BCA Volume 1 2022: Section C Fire Resistance (inclusive of all parts C1.1 to C1.7) 1.8 Light Weight Construction including walls, ceilings and floors, C1.10 Fire Hazard, including NSW State Variation, and C1.12 Non-Combustible materials. Load bearing timber frame 60/60/60 utilising 10mm ResCom™ sheathing. Load bearing metal frame 90/90/90 utilising 10mm ResCom™ sheathing, 120/120/120 utilising 12mm ResCom™ sheathing and 120/120/120 (18mm) ResCom™ flooring. Non-loadbearing walls and ceiling linings to FRL: -/20/20 (5mm) ResCom™ sheathing -/60/60 (10mm) ResCom™ sheathing -/90/90 (10mm) ResCom™ sheathing -/120/120 (12mm) ResCom™ sheathing -/180/180 (14mm) ResCom™ sheathing -/240/240 (15mm) ResCom™ sheathing.

BCA Volume 1 2022: Section C Part C3 Protection of Opening (inclusive of all parts C3.0 to 3.17)

BCA Volume 1 2022: Part F5 Sound Insulation to Rw 60+ctr

BCA Volume 2 2022: Part 3.5.3.3, fibre cement planks and weatherboard cladding

BCA Volume 2 2022: Part 3.5.3.4, fibre cement sheet wall cladding

BCA Volume 2 2022: Part 3.5.3.5, eaves and soffit linings

BCA Volume 2 2022: Part 3.7.1, fire separation for FRL to 60/60/60

BCA Volume 2 2022: Part 3.7.4, bush fire zones BAL-FZ including all state variations to Part 3.7.4.0 and 3.7.4.1, as tested under AS1530 Part 8.1 -2014 and AS1530 Part 8.2 - 2014 - including NSW state variation, SA state variation, TAS state variation

BCA Volume 22012: Part 3.8.6, Sound Insulation to Rw 60+ctr

## **SECTION 2: Performance Characters:**

- Density: Approx density of each thickness is 0.95-1. 10g/cm<sup>3</sup>, it can be adjusted in the production
- Fireproof characteristic: A grade not combustible
- Intensity of bending resistance when dry 18Mpa
- Intensity of bending resistance when moisture-saturated condition: 22Mpa
- The Rate of deformation when pick up the moisture: 0.26%
- The shrinking rate when heated: 1.0%
- Water permeability: There is no drop of water to emerge in the back
- Impact resistance: No crack, strip and run through
- Minimum Thermal resistance: 1.14m<sup>2</sup>k/w



- Sound insulation:  $\geq$  BCA V2 3.8.6  $>$ Rw54 (single sheet wall system)
- Security: 100% does not include the asbestos, formaldehyde, and benzene

#### Physical Characteristics:

- **Flexural Modulus:** Not less than  $0.93 \times 10^6$  psi when tested in accordance with ASTM D6109.
- **Flexural Strength:** Not less than 1295 psi when tested in accordance with ASTM D6109.
- **Shear Strength:** Not less than 391 psi when tested in accordance with ASTM D6109.
- **Fungus/Mould:** Non-nutrient when tested in accordance with ASTM G21.

#### Ingredients:

- **MgO (Magnesium Oxide)** (so called burnt magnesium) used in medicine for curing heartburn.
- **MgCl<sub>2</sub> (Magnesium Chloride)** It's contained in marine and rainwater and is the element of such material as Bishofit
- **Perlite (SiO<sub>2</sub>)** (volcanic glass) in the MgO Boards is used as the filling materials.
- **Alpha Cellulose Material**
- **Filler** Glass fibre mesh and non-woven fabric

#### MgO Composition Ingredient:

- Magnesium Oxide (MgO)
- Magnesium Chloride Solution (MgCl<sub>2</sub>) (included NaCl  $\leq$  1.5%, KCl  $\leq$  0.7%)
- Phosphoric Acid (H<sub>3</sub>PO<sub>4</sub>) **no**
- Iron Sulfate (FeSO<sub>4</sub>) **no**
- Polyvinyl Alcohol Glue **no**
- Aluminum Sulfate water solution (AlSO<sub>4</sub>) **no**
- Magnesium Sulfate **no**
- Alpha Cellulose Material
- Perlite
- Glass fibre mesh and non-woven fabric

### **SECTION 3: HAZARDS IDENTIFICATION**

#### Emergency Overview:

Non-toxic, nonexplosive and is not a fire hazard.

#### Primary Routes of Entry:

Eyes: Dust may irritate the eyes from mechanical abrasion causing watering and redness.

Skin: Dust may cause irritation of the skin from friction but cannot be absorbed through intact skin.

Ingestion: Unlikely under normal conditions of use but swallowing the dust from this product may result in irritation to the mouth and gastrointestinal tract.

Inhalation: Dust may cause irritation of the nose, throat, and airways, resulting in coughing and sneezing. Certain susceptible individuals may experience wheezing (spasms of the bronchial airways) on inhaling dust during sanding or sawing operations.

### **SECTION 4: FIRST AID MEASURES**

**EYES:** Remove contact lens. Flush with running water or saline for at least 15 minutes. Seek medical attention if redness persists or if visual changes occur.

**SKIN:** Wash with mild soap and water. Contact physician if irritation persists or later develops.

**INGESTION:** If ingested, dilute by drinking large amounts of water. Do not induce vomiting. Seek medical attention. If unconscious, loosen tight clothing and lay the person on his / her side. Give nothing by mouth to an individual who is not alert and conscious. Seek medical attention.

**INHALATION:** Remove to fresh air. If shortness of breath or wheezing develops, seek medical attention.

**NOTES TO PHYSICIAN OR FIRST AID PROVIDERS:** Treat symptomatically.



## **SECTION 5: FIRE-FIGHTING MEASURES**

MgO Corp Board's range of products are non-flammable, nonexplosive and non-combustible.

- Fire and Explosion Hazard: Not applicable
- Flash Point: Not applicable
- Auto-ignition: Not applicable
- Extinguishing Media: This material is non combustible
- Appropriate extinguishing media should be used for a surrounding fire
- Fire Fighting: Fire fighting personnel should wear normal protective equipment.

## **SECTION 6: ACCIDENTAL RELEASE MEASURES**

No special precautions are necessary to pick up product that has been dropped. The following applies only to spills or releases of dust generated during cutting or sanding ResCom (CMC) Board.

Precautions: Good housekeeping practices are necessary for cleaning up areas where dust has been produced. Take measures to either eliminate or minimize the creation of dust.

Wherever possible, practices likely to generate dust should be controlled with engineering controls such as local exhaust ventilation, dust suppression with water and containment, enclosure or covers.

Cleanup Methods: A fine water spray may be used to suppress dust when sweeping (dry sweeping is not recommended). Vacuuming with an industrial vacuum cleaner outfitted with a high-efficiency filter is recommended over sweeping. Waste may be disposed of by landfill in compliance with federal, provincial, state, territory and local requirements governing non-toxic mineral materials

Avoid using materials and products that are incompatible with this product. (Refer to section 10.)

## **SECTION 7: HANDLING AND STORAGE**

Handling and Storage Products in their intact state do not present a health hazard. The controls below apply to dust generated from the boards by cutting, drilling, routing, sawing, crushing, or otherwise abrading, and cleaning or moving sawdust.

### Other Precautions:

Even though ResCom (CMC) Board have been tested and deemed nontoxic, ResCom Building Products recommends that exposure to dust be kept as low as reasonably possible.

Respirable levels should not exceed those specified by OH&S and MSHA and identified in this MSDS.

Exposure to respirable (fine) dust depends on a variety of factors, including activity rate (i.e. cutting rate), method of handling (i.e. electric shears), environmental conditions (i.e. weather conditions, workstation orientation) and control measures used.

Wherever possible, practices likely to generate dust should be carried out in well ventilated areas (i.e. outside). The work practices and engineering controls set out in Section 8 should be followed as precautions to reduce dust exposures.

## **SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION**

### Engineering Controls Cutting Outdoors:

1. ResCom Building Products recommends positioning cutting station so that wind will blow dust away from user or others in working area and allow for ample dust dissipation.
2. Use one of the following methods based on the required cutting rate and jobsite conditions. Acceptable Practices:
  - Score and snap using carbide-tipped scoring knife or utility knife (Ability to use this method depends on thickness of ResCom (CMC) Board being installed)
  - Fibre cement board shears (electric or pneumatic).

### Preferred Practices

- Dust reducing circular saw equipped with appropriate blade and vacuum extraction.



#### Suitable Practices (for low to moderate cutting only - DIY projects)

- Dust reducing circular saw with appropriate saw blade. Always use correct tools when executing all cutting operations.

#### Ventilation:

Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limit.

#### Respiratory Protection:

Dust mask is recommended.

#### Eye Protection:

When cutting material, dust resistant safety goggles / glasses should be worn and used in compliance with the BCA and ASTM standards.

#### Skin Protection:

Loose comfortable clothing should be worn. ResCom Building Products recommends that direct skin contact with dust and debris be avoided, when possible, by wearing long sleeved shirts and long trousers, a cap or hat, and gloves.

#### Sanding / Drilling / Other Machining:

If sanding, drilling, or other machining is conducted, ResCom Building Products recommends workers always wear approved dust masks.

#### Important Notes:

1. For maximum protection (lowest respirable dust production), ResCom Building Products recommends always using "Best" level cutting methods where feasible.
2. Always use a circular saw blade that is appropriate for the specific operation being undertaken.
3. Dry sweeping is not the preferred clean up method ResCom Building Products suggests wet suppression methods or vacuum.
4. It is not recommended that a grinder or continuous rim diamond blade be used for cutting.
5. Always follow tool manufacturer's safety recommendations.

## **SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES**

### Appearance:

Is commonly white to beige in colours depending on application, each with varying tensile strengths according to product application.

- Odour: Very mild
- Physical State: Solid boards
- Vapour Pressure: Not relevant
- Specific Gravity: Not relevant
- Flammability Limits: Not relevant
- Boiling Point: Not relevant
- Melting Points: Not relevant
- Flash Point: Not relevant
- Auto-ignition Temperature: Not relevant
- Volatility: Not relevant
- Solubility in Water: Not relevant
- Evaporation rate: Not applicable
- NFPA Ratings (Scale 0 – 4)
- Health = 1
- Flammability = 0
- Reactivity = 0
- Personal Protection = E

## **SECTION 10: STABILITY AND REACTIVITY**

### Stability:





The ResCom (CMC) Board products identified in section 1 are stable under ordinary conditions.

Conditions to Avoid:

Excessive dust generation without proper dust mask protection.

Materials to Avoid:

Incompatibility: Hydrofluoric acid will dissolve Magnesium Oxide and can generate Magnesium Chloride fumes.

**SECTION 11: TOXICOLOGICAL INFORMATION**

products are nontoxic in their intact form. The following applies to dust that may be generated during cutting and sanding.

Chronic Effects: Inhaled:

Repeated and prolonged overexposures to dust may cause increased risk of bronchitis. It is possible that repeated inhalation exposure to ResCom (CMC) Board fibre dust over time may lead to inflammation of the lungs in humans. All necessary precautions should be taken to prevent inhalation of dust to prevent these problems.

**SECTION 12: ECOLOGICAL INFORMATION**

Because Magnesium Oxide is a naturally occurring mineral, releases that may occur into the environment are not expected to leave any hazardous material that could cause a significant adverse impact.

**SECTION 13: DISPOSAL CONSIDERATIONS**

Dispose of material, as an inert, inorganic mineral, in conformance with federal, provincial, state, territory and local regulations. ResCom (CMC) Board are not a hazardous waste.

**SECTION 14: TRANSPORT INFORMATION**

There are no special requirements for storage and transport of ResCom (CMC) Board.

UN No: None allocated

Dangerous Goods Class: None allocated

Hazchem Code: None allocated

Poisons Schedule: None allocated

Packing Group: Not applicable

Label: Not a DOT hazardous material

**SECTION 15: REGULATORY INFORMATION**

- DOT Hazard Classification: None
- Placard Requirement: Not a DOT hazardous material
- CERCLA Hazardous Substance (40 CFR Part 302)
- Listed substance: Not listed
- Substance: No Reportable Quantity (RQ)
- None Characteristic(s): Not applicable RCRA
- Waste Number: Not applicable

**SECTION 16: OTHER INFORMATION**

Preparation of Information and Disclaimer:

This form has been prepared to meet current Federal OH&S hazard communication regulations and is offered without any warranty or guarantee of any type. ResCom Building Products cannot control the use of its products, and therefore specifically disclaims liability and responsibility arising from the use, misuse, and alteration of its products.

The information contained in this MSDS was produced without independent scientific or medical studies analysing the effects of ResCom (CMC) Board dust upon human health.



The information contained herein is based upon scientific and other data ResCom Building Products believes is valid and reliable and provides the basis for this MSDS.

The information contained herein relates only to specific materials listed in the document.

It does not address the effects of ResCom (CMC) Board dust when used in combination with other materials or substances, or when used in other processes.

Because conditions of use are beyond Magnesium Oxide Board Corporation's control, the company makes no representations, guarantees, or warranties, either express or implied warranties as to the fitness of the product for use, and assume no liability related to the information contained above.

ResCom Building Products requires, as a condition of use of its products, that purchasers or applying agent complies in full with all applicable Federal, Provincial, State, Territory and Local health and safety laws, regulations, orders, requirements, and strictly adhere to all instructions and warnings which accompany the product.

For Technical Information first visit [www.rescombp.com](http://www.rescombp.com) or in the event of an emergency contact ResCom BP by email at [rescombp@rescombp.com](mailto:rescombp@rescombp.com) or call +61754309890

# AS 1530.1 -1994: Methods for fire tests on building materials, components and structures

## Part 1: Combustibility test for materials



Report No:

**IGNL-1006-01-04**

Report Sponsor:

**ResCom Building Products Pty Ltd**

**8 Piper Street**

**Caboolture QLD 4510**

Product Name

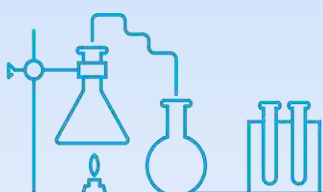
**HMR ResCom**

Test Date:

**15 June 2018**

Report Date:

**07 March 2019**



## DOCUMENT REVISION HISTORY

---

Issue	Revision	Date	Purpose of Issue	Prepared by	Reviewed by
01	00	07-Mar-2019	Issued to client	RP	BHB

---

Written by  
**Ram Prakash**  
Fire Safety Engineer  
MSc (TU Delft), MSc (KTH)

Reviewed and Authorised by  
**Benjamin Hughes-Brown**  
FIEAust CPEng NER  
Chartered Professional Engineer  
FPAA Professional Engineer  
CPEng, NER (Fire Safety / Mech) 2590091, RPEQ 11498, BPB-C10-1875, EF-39394  
MFireSafety (UWS), BEng (UTS), GradDipBushFire (UWS), DipEngPrac (UTS), DipEng (CIT)



### Copyright ©

All rights reserved. No part of the content of this document may be reproduced, published, transmitted or adapted in any form or by any means without the written permission of the Ignis Labs Pty Ltd. The report is to be reproduced in full without modifications.

### Disclaimer

The information contained in this document is provided for the sole use of the recipient and no reliance should be placed on the information by any other person. In the event that the information is disclosed or furnished to any other person, the Ignis Solutions Pty accepts no liability for any loss or damage incurred by that person whatsoever as a result of using the information.

# 1. TEST SUMMARY

	<h2 style="margin: 0;">AS/NZS 1530.1</h2> <p style="margin: 0;">Methods for fire tests on building materials, components and structures Part1: Combustibility test for materials</p> <p style="margin: 0; font-size: small;">3 Cooper Place, Queanbeyan, NSW 2620 PO Box 5174 Braddon ACT 2612 t: (02) 6111 2909   <a href="mailto:mail@ignislabs.com.au">mail@ignislabs.com.au</a>   <a href="http://www.ignislabs.com.au">www.ignislabs.com.au</a>   ABN: 36 620 256 617</p>		
References:	Standards Australia Committee. <i>Method for fire tests on building materials, components and structures Part1: Combustibility test for materials AS 1530.1-1994_R2016</i>		
Instructions:			
<b>Specimen Information</b>			
Specimen Name:	HMR ResCom	Sponsor:	ResCom Building Products Pty Ltd
Specimen Identification:		Sponsor Address:	8 Piper Street, Caboolture QLD 4510
Specimen Description:	White concrete board with light green face		
Construction of Specimen:	The test specimens are cylindrical and each has -		
	(a). Nominal diameter (mm):		44.8 ± 0.15
	(b). Nominal height (mm):		49.99 ± 0.18
	(c). Nominal volume (cm <sup>3</sup> ):		78.74 ± 0.53
	(d). Nominal mass (g):		80.8 ± 0.67
	(e). Colour:		White
Observations:	Five (5) samples were tested in accordance with Australian Standard 1530 Methods for fire tests on building materials, components and structures, Part 1- 1994: Combustibility Test for Materials.		
Test Date:	15/06/2018	Issue Date:	7/03/2019
Expiry Date:	14/06/2023	Project Number:	IGNL-1006-01-04 I01R00
<b>Result</b>			
Parameter	Symbol	Arithmetic	
Mean furnace thermocouple temperature rise:	ΔT <sub>f</sub>	6.47 °C	
Mean specimen centre thermocouple temperature rise:	ΔT <sub>c</sub>	198.94 °C	
Mean specimen surface thermocouple temperature rise:	ΔT <sub>s</sub>	4.57 °C	
Mean duration of sustained flaming:		0 s	
Mean mass loss:		46.91 %	
<b>Combustibility</b>			
The material is deemed NON-COMBUSTIBLE according to the test criteria specified in clause 3.4 of as 1530.1- 1994			
<b>Note:</b>			
These test results relate only to the behaviour of the test specimens of the material under the particular conditions of the test, and they are not intended to be the sole criterion for assessing the potential fire hazard of the material in use.			
Tested by:	Reviewed by:	Authorised by:	
Darren Laker	Ram Prakash	Benjamin Hughes-Brown FIEAust CPEng NER APEC Engineer IntPE (Aust)	

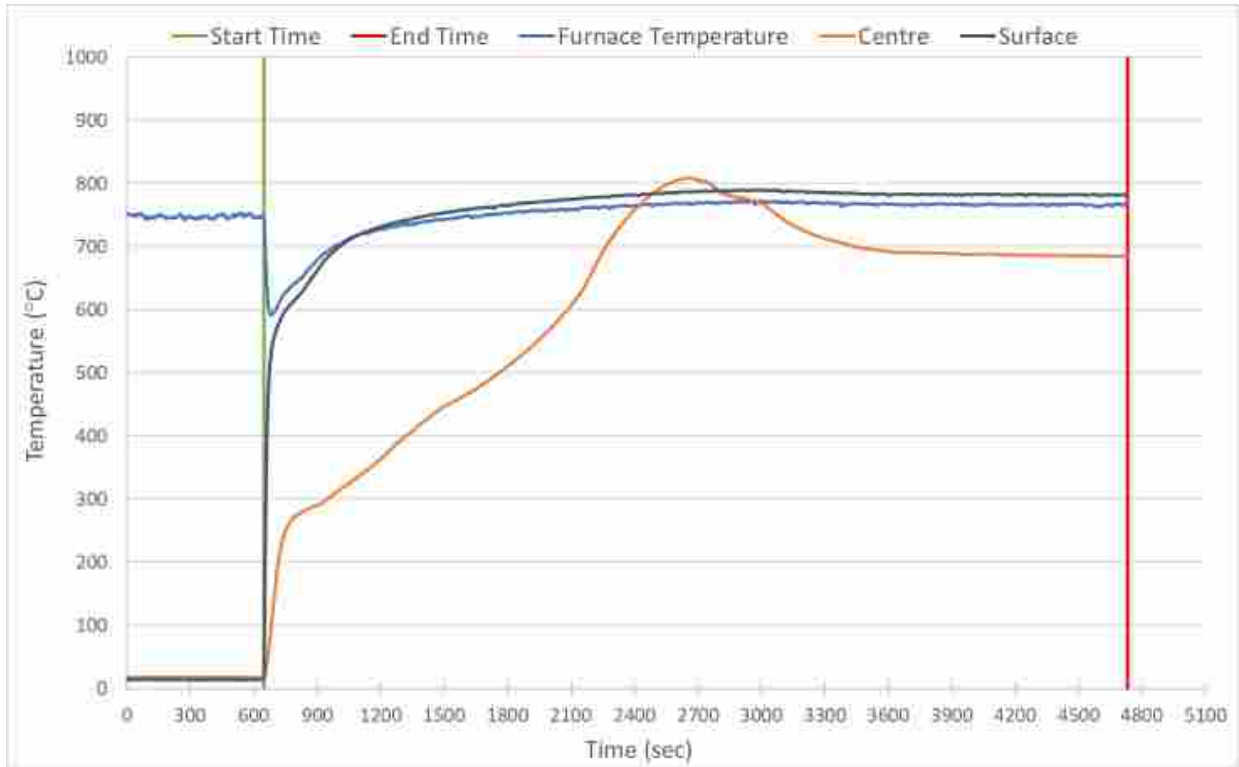


## 2. TEST CALCULATIONS

Parameter	Symbol or expression	Unit symbol	Results					Arithmetic (Mean)
			1	2	3	4	5	
Atmospheric temperature		°C	16.80	17.30	18.40	20.40	19.40	
Humidity		%RH	50.00	53.00	42.50	49.20	36.60	
Height	h	mm	49.99	49.74	50.05	50.24	49.91	49.99
Diameter	d	mm	44.98	44.74	44.89	44.58	44.79	44.60
Initial specimen volume	V	cm <sup>3</sup>	79.39	78.16	79.17	78.38	78.60	78.74
Initial specimen mass	msi	g	81.50	80.50	81.50	80.00	80.50	80.80
Density	r	kg/m <sup>3</sup>	1026.52	1029.98	1029.40	1020.68	1024.18	1026.15
Sample holder weight	w	g	15.00	15.00	15.00	15.00	15.00	15.00
Final specimen mass	msf	g	43.50	42.50	43.50	42.50	42.50	42.90
Mass loss	$\Delta m = (msi - msf) / msi * 100$	%	46.63	47.20	46.63	46.88	47.20	46.91
Total duration of sustained flaming	Cumulative total of duration of flaming*	s	0.00	0.00	0.00	0.00	0.00	0.00
Initial furnace thermocouple temperature	Tfi	°C	745.10	750.10	744.70	741.50	745.60	745.40
Maximum furnace thermocouple temperature	Tfm	°C	772.00	839.00	757.90	781.20	804.20	790.86
Final furnace thermocouple temperature	Tff	°C	766.95	838.34	734.74	778.69	803.24	784.39
Furnace thermocouple temperature rise	$\Delta T_f = T_{fm} - T_{ff}$	°C	5.05	0.66	23.16	2.51	0.96	6.47
Maximum specimen centre thermocouple temperature	Tcm	°C	808.60	1114.80	992.30	1028.10	994.50	987.66
Final specimen centre thermocouple temperature	Tcf	°C	685.00	796.15	700.92	917.19	844.34	788.72
Specimen centre thermocouple temperature rise	$\Delta T_c = T_{cm} - T_{cf}$	°C	123.60	318.65	291.38	110.91	150.16	198.94
Maximum specimen surface thermocouple temperature	Tsm	°C	789.80	849.10	763.10	796.70	808.50	801.44
Final specimen surface thermocouple temperature	Tsf	°C	781.82	848.14	751.83	796.25	806.31	796.87
Specimen surface thermocouple temperature rise	$\Delta T_s = T_{sm} - T_{sf}$	°C	7.98	0.96	11.27	0.45	2.19	4.57
Test duration	t	min	68.05	51.83	55.37	40.07	41.32	51.33

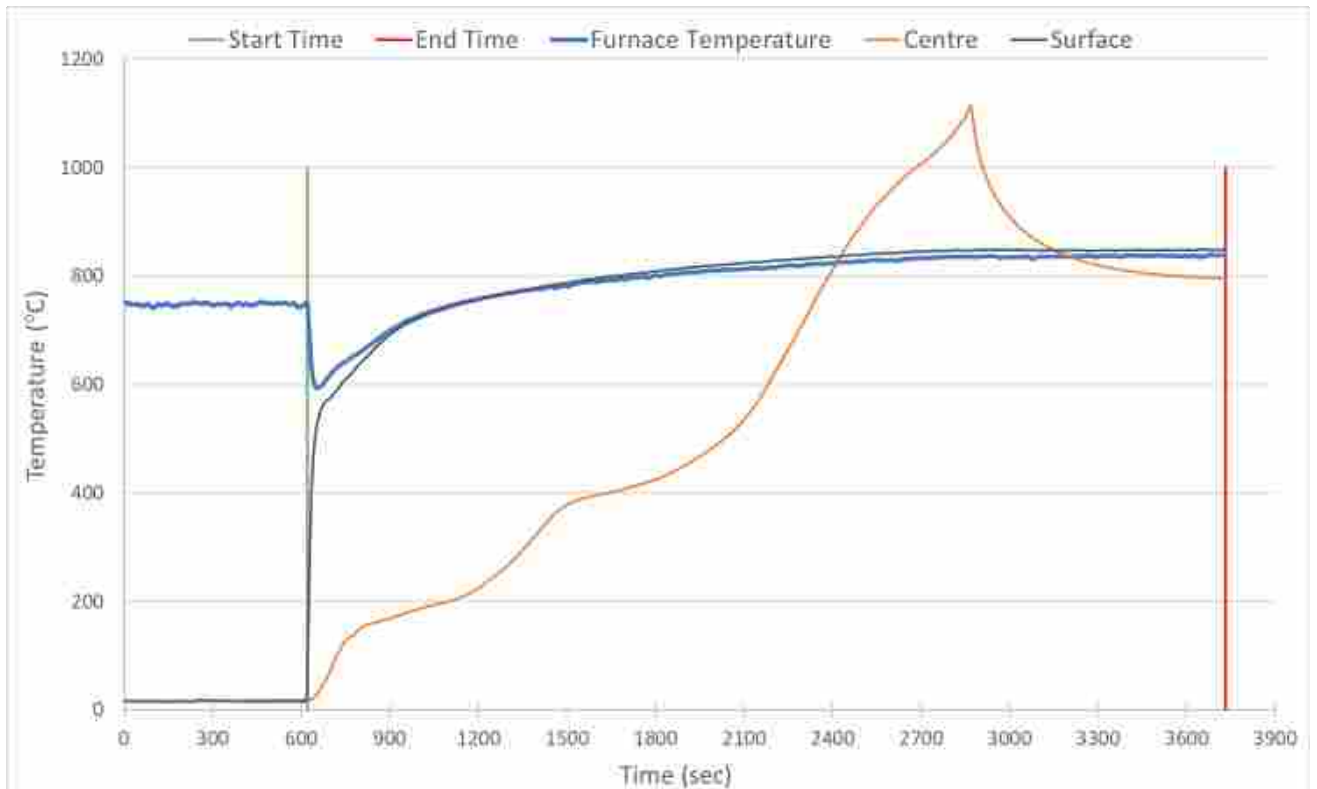
**FIGURE 1:**

Test 1



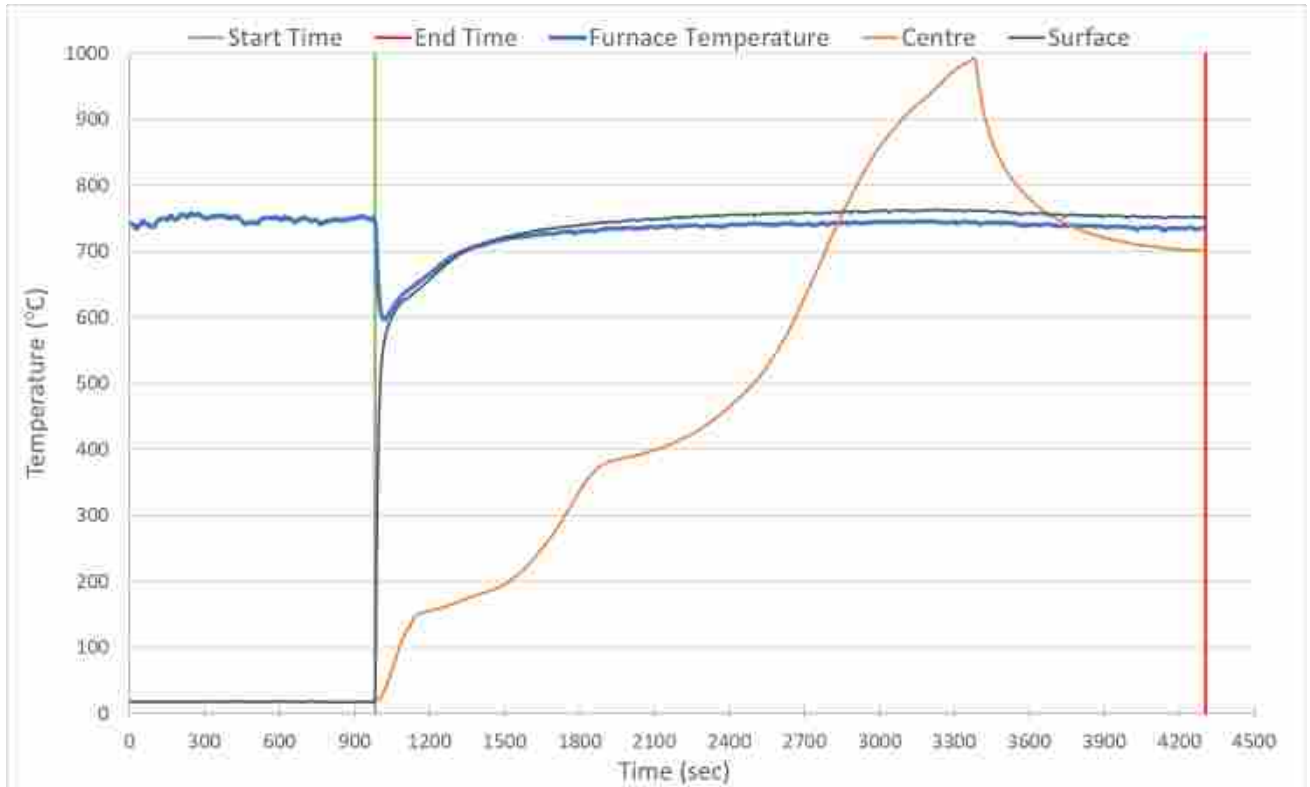
**FIGURE 2:**

Test 2



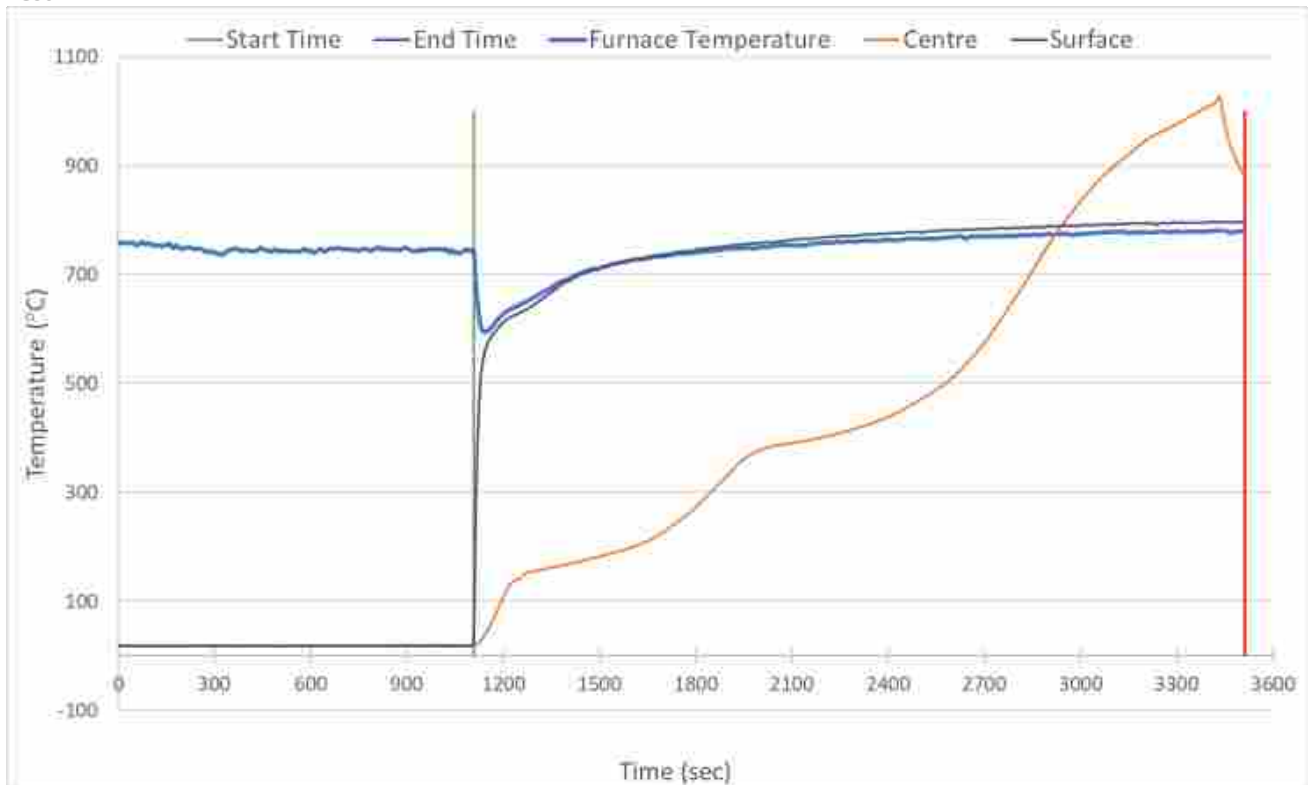
**FIGURE 3:**

Test 3



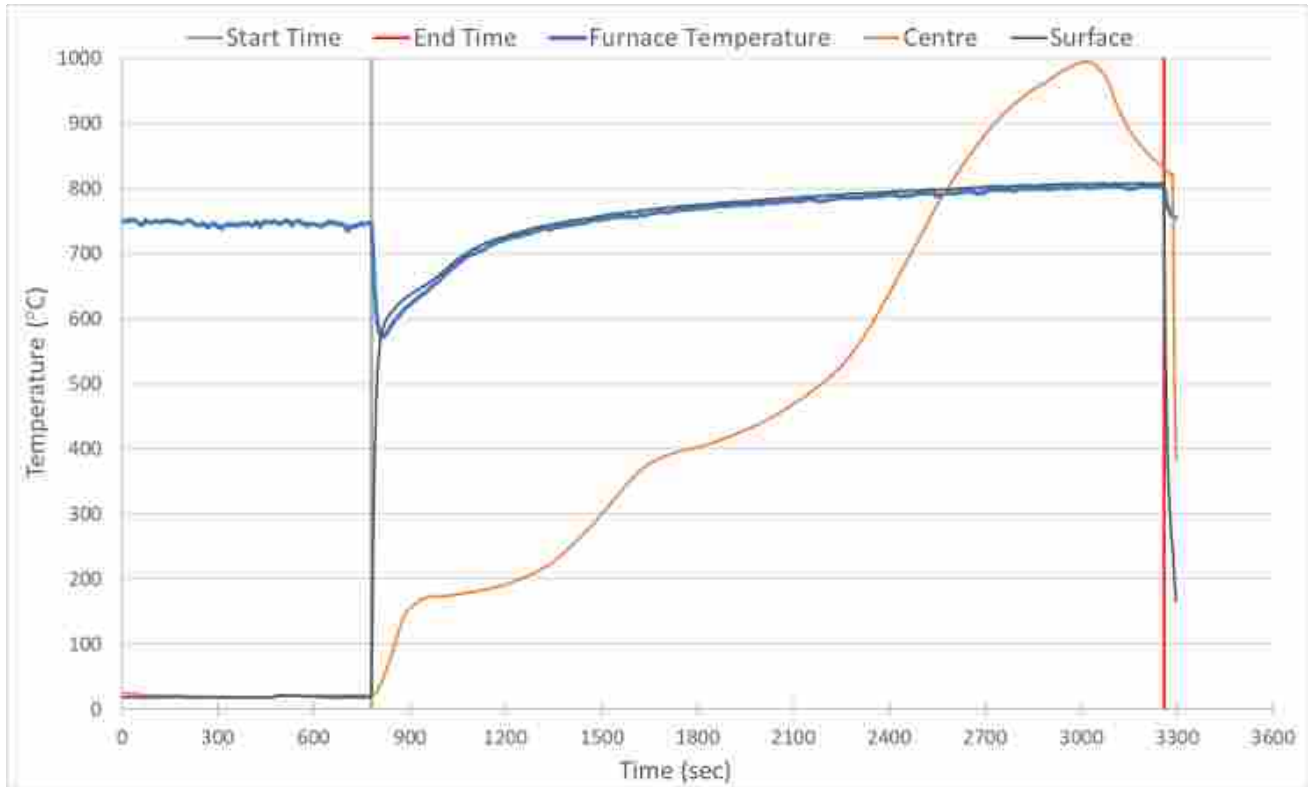
**FIGURE 4:**

Test 4



**FIGURE 5:**

Test 5



### 3. TEST PHOTOS

**FIGURE 6:**

SPECIMEN BEFORE AND AFTER THE TEST





This alternative solution report serves as a certificate from professional engineer in accordance with Clause A2.2(a)(iii) of the National Construction Code Volume One Building Code of Australia against Performance Requirement EP1.4 This alternative solution report serves as a certificate from professional engineer in accordance with Clause A2.2(a)(iii) of the National Construction Code Volume One Building Code of Australia against Performance Requirement EP1.4 This alternative solution report serves as a certificate from professional engineer in accordance with Clause A2.2(a)(iii) of the National Construction Code Volume One Building Code of Australia against Performance Requirement EP1.4

## **Ignis Labs Pty Ltd**

Laboratory reference No: 2072-00-01

T: (02) 6111 2909

Facsimile :

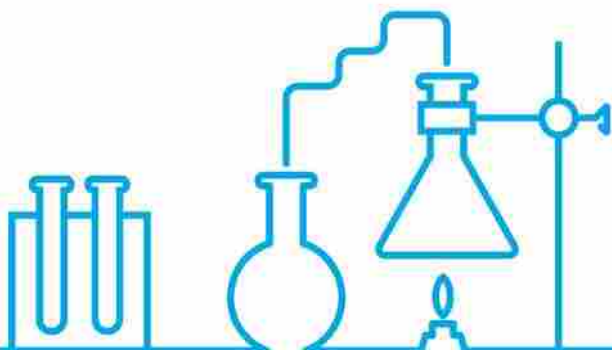
[mail@ignissolutions.com.au](mailto:mail@ignissolutions.com.au)

[www.ignissolutions.com.au](http://www.ignissolutions.com.au)

3 Cooper Place Queanbeyan East NSW 2620

PO Box 5174 Braddon ACT 2612

ABN: 36 620 256 617







**ResCom Global Building Products (RGBP)**  
8 Piper Street, Caboolture, QLD 4510  
P.O.Box 816 Moffat Beach Qld 4551

**Email:** [rescombp@rescombp.com](mailto:rescombp@rescombp.com)  
**Web:** [www.rescombp.com](http://www.rescombp.com)

# **RESCOM® PERFORMANCE GUIDE**

**Internal, External Cladding,  
Lining and Flooring Products**  
ResCom: Edition 7