



# RESCOM® CMC INSTALLATION MANUAL

**Internal, External Cladding, Lining and  
Flooring Products**

ResCom: Edition 7  
ISO: 8336 Certified and Compliant NCC2019



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

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**RESCOM® BUILDING PRODUCTS  
ARE A COMPONENT OR  
ELEMENT WHICH ARE A PART  
OF A BUILDING. RESCOM®  
PRODUCTS HAVE BEEN TESTED  
IN LINE WITH BCA VOLUME 1  
AND 2 UNDER CLAUSE A2.3:**

The wall frame is to be appropriately designed in accordance with the requirement of the BCA, NZBC or ICC-ES and as required by the projects structural engineer.

Installation of ResCom® products must strictly comply with the requirements of the National Construction Code to ensure compliant buildings.

Disclaimer: ResCom Global Building Products does not give any REPRESENTATION or WARRANTY to the consumer as to the completeness, accuracy or fit for purpose suitability or performance of third party materials such as but not limited to substrate framing, finishing products, fixtures and fittings that may be required to be used during installation of the ResCom® products.

ResCom Global Building Products waives all responsibility regarding third party materials and advised the consumer to seek confirmation from the supplier / manufacture of those materials as to the suitability for use in the proposed applications.

It is the whole responsibility of the manufacture / supplier of third party materials to warrant to the consumer those products they recommend as suitably fit for purpose to be used in conjunction with ResCom® building products. All consumer protection rights are reserved under the guidelines of the ACCC.





# INTRODUCTION

ResCom Global Building Products was founded in 2010 and became the first company to gain CodeMark accreditation for the ResCom® internal and external sheathing, flooring and ceiling products under Australia, New Zealand and America building codes.

ResCom® Boards are a machine-made sheet composed of naturally occurring mineral components, alpha cellulose material and water that is mixed to our associated companies patented pending formulation. ResCom products do not contain any organic solvents, oils or toxic substances, nor does it contain any metal salts.

ResCom® products have been tested and meet the requirements LEED v4 Building Design and Construction Addenda with the below test standard at the level of  $\leq 0.5 \frac{mg}{m^3}$  or less. ResCom® Board was tested by Intertek Laboratories under CA 01350 Standards for VOC's assuring our products have no formaldehyde or asbestos contaminants.

ResCom® products also have extensive testing that has been carried out by ALS Global Laboratories as well as passed all tests by Australian, American and UK boarder security agencies.

ResCom® has two listed HPD's (Health Product Declarations) which can deliver LEED Credits to projects.

ResCom® Board is used as an internal lining and external wall board to provide smooth, strong, long lasting walls and ceilings for homes, offices, hospitals, hostels for the ages, schools, shops and factories.

Its durable surface will accept most types of decorative finishing, including paint, wallpaper and texture compounds.



**ResCom® Boards are fire and moisture resistant, tested and passed under ASTM, AS/NZ, BS/EN and ISO testing standards.**

## MEETING COMPLIANCE

When Installing ResCom® Board into BCA and NZBC code compliant applications ResCom® products must be installed as per the installation guidelines of this manual to assure installation complies with the conformity certification terms and conditions and the requirements of the National Construction Code (NCC).

## DEEMED TO COMPLY APPLICATIONS (DTS)

ResCom® can be installed into Dts Systems as traditional requirements for drywall / plasterboard / FC Sheet under the BCA and NZBC. As long as the application and fit for purpose use of the ResCom® product has been assessed and independently signed off to be suitable for the proposed application under the relevant building codes and local statutory authorities building codes guidelines.

Eg: BCA Vol 1: Part 2A

## GREEN CREDENTIALS (LEED & HPD)

Although no one product can guarantee a LEED point, the following are opportunities for points based on the use of ResCom® Wall and Floor Boards and submitting the required documentation. LEED v4 For Building Design & Construction (Updated January 27th 2017)

MR CREDIT: Building products Disclosure and Optimization – Material Ingredients: HPD

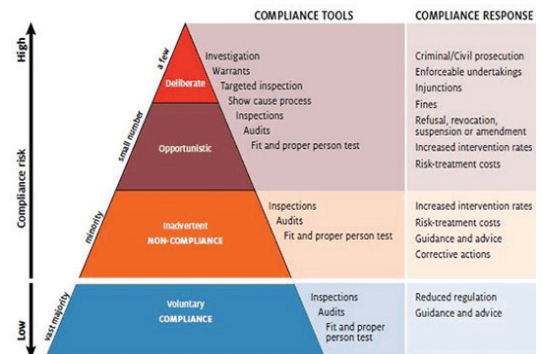
ResCom® building products have 2 published HPDs with the HPD Collaborative and is committed to transparency in our materials of which we report no hazardous chemicals in our ResCom® products. EQ CREDIT: Low-Emitting Materials

ResCom building products have been tested and determined compliant in accordance with CDPH Standards Method v1.1-2010, using the private offices exposure scenario. ResCom board has a TVOC concentration of <0.5mg/m<sup>3</sup>

# CERTIFICATE

Engineering Evaluation Certificate

No.6405 101R00



MgO Corp America LLC  
ID #1547708464225603

This guide provides detailed installation information for the installation of ResCom® Products. For additional information or assistance with ResCom® Board installation, please contact Magnesium Oxide Board Corporation's agent in your region.

## APPLICATIONS

The ResCom® Board range of products consist of ResCom® Board interior and exterior wall, ceiling, and flooring panels which provide smooth, strong, long lasting walls, ceilings and floors for homes, offices, hospitals, schools, shops, factories, etc.

ResCom® Boards are fire and moisture resistant. When used in 'wet areas', installation is in accordance with the 'wet area installation' section of this guide. When used in fire risk areas, installation is in accordance with the 'general installation' section of this guide.

## Features and Advantages

- ResCom® Board significantly reduces installation costs. Depending on the application, ResCom® Board offers savings of up to 67% on materials and labour to that of traditional fire separation and party walls.
- ResCom® Boards provide superior moisture resistance in high humidity areas and combats the growth of mould and mildew.
- ResCom® Board is water resistant. It will not disintegrate when immersed in water or exposed to freeze/thaw cycles for prolonged periods of time.
- ResCom® Board is manufactured from a combination of magnesium oxide and magnesium chloride and includes fibrous reinforcement.
- ResCom® Board is colour coded fit for purpose boards. HMR (High Moisture Resistant) ResCom® Boards are green in colour, CHSB (Common High Strength) ResCom® Boards are blue in colour, HI (High Impact) ResCom® Boards are red in colour and Structural Flooring ResCom® Boards are brown in colour. Standard production material is very smooth on one side and sand textured on the other.
- Standard edges are square, recessed, shiplap and tongue and groove.
- ResCom® Board may be cut, trimmed or shaped using ordinary power or hand tools.
- Every ResCom® Board product is clearly labelled with the ResCom® logo and batch number at all times.  
(Products ordered without the direct consent of Magnesium Oxide Board Corporation Pty Ltd are not certified or approved for use or distribution in Australia or New Zealand. Contact Magnesium Oxide Board Corporation on 1300 721 279.)

## Properties and Performance

ResCom® Board is approved for fire resistance wall systems, providing an unprecedented degree of safety and security. When using ResCom® Board a single layer is required which expedites job completion, saving time and money. ResCom® Board has a flame spread and smoke propagation rating of 0 per AS1530.3, ASTM E84 and BS:476.

## ResCom® Board in Wet Areas

AS3740 Waterproofing of wet areas within residential buildings.

## Delivery and Storage of Materials

All materials shall be delivered and stored in an enclosed shelter providing protection from damage and exposure to the elements. Damaged or deteriorated materials shall be removed from the premises.

## FIRE PERFORMANCE

Where the Building Code of Australia (BCA) specifies the need for a fire separation system, a level of fire separation needs to be determined according to the type of structure and the uses on either side of the wall, floor or ceiling structure.

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 AS1530.4.
- The second number being Integrity, in relation to an FRL, means the ability to resist the passage of flames and hot gases specified in AS1530.4.
- 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 limit specified in AS1530.4.





**ResCom® board is approved for use in fire applications as follows:**

ResCom® Thickness	Single Panel Either Side of Stud: System Excl Acoustic Requirements
10mm	Non-loadbearing wall -/60/60 Loadbearing wall 60/60/60 (Thermal Insulation Required in Cavity)
10mm	Non-loadbearing wall -/90/90 Loadbearing wall 90/90/90 (Thermal Insulation Required in Cavity)
12mm	Non-loadbearing wall -/120/120 Loadbearing wall 120/120/120 (Thermal Insulation Required in Cavity)
14mm	Non-loadbearing wall -/180/180 Loadbearing wall 180/180/180 (Thermal Insulation Required in Cavity)
15mm	Non-loadbearing wall -/240/240 Loadbearing wall 240/240/240 (Thermal Insulation Required in Cavity)


All joints and junction in fire rated structures must be filled with appropriate FRL tested caulking or sealant. All installation that occurs must meet the required local authorities building codes.



# FRL CONFIGURATION

ResCom Thickness FRL	Timber Wall FRL	Steel Wall FRL	Wall System Single Sheet Each Sid
<b>10mm</b> 	-/60/60	60/60/60	60/60/60
<p><b>ResCom Thickness:</b> 10mm  <b>Framing:</b> 75mm Light gage steel joists  <b>Insulation:</b> 50kg/m3 Rockwool  <b>Stud spacing:</b> 600mm maximum centres  <b>Screws:</b> Class 3 to 5 (Non-Corrosive) min No. 8x40 self-drilling countersunk type fixed at max 300mm centres, and will finish at approximately 0.5mm below the surface. MgO Corp recommends, in highly corrosive areas, to use min grade 316 stainless steel non-corrosive fixtures.  <b>Screw Spacing:</b> On sheet corners, keep the first screw 50mm from the edge to avoid breakage of the sheet. Fasteners at 12-15mm from sheet perimeter edges.  <b>Jointing:</b> Gaps covered by fire resistant tape and glue</p>			
<b>10mm</b> 	-/90/90	90/90/90	90/90/90
<p><b>ResCom Thickness:</b> 10mm  <b>Framing:</b> 75mm Light gage steel joists  <b>Insulation:</b> 50kg/m3 Rockwool  <b>Stud spacing:</b> 600mm maximum centres  <b>Screws:</b> Class 3 to 5 (Non-Corrosive) min No. 8x40 self-drilling countersunk type fixed at max 300mm centres, and will finish at approximately 0.5mm below the surface. MgO Corp recommends, in highly corrosive areas, to use min grade 316 stainless steel non-corrosive fixtures.  <b>Screw Spacing:</b> On sheet corners, keep the first screw 50mm from the edge to avoid breakage of the sheet. Fasteners at 12-15mm from sheet perimeter edges.  <b>Jointing:</b> Gaps covered by fire resistant tape and glue</p>			
<b>10mm</b> 	-/120/120	120/120/120	120/120/120
<p><b>ResCom® thickness:</b> 10mm  <b>Framing:</b> 18 gage steel joists  <b>Insulation:</b> 6lb mineral wool  <b>Stud spacing:</b> 600mm maximum centres  <b>Screws:</b> Class 3 to 5 (Non-Corrosive) min No. 8x40 self-drilling countersunk type fixed at max 300mm centres, and will finish at approximately 0.5mm below the surface. MgO Corp recommends, in highly corrosive areas, to use min grade 316 stainless steel non-corrosive fixtures.  <b>Jointing:</b> Joints placed over the stud. Joints and screws covered by Firestop Caulking compound.</p>			
<b>12mm</b> 	-/120/120	120/120/120	120/120/120
<p><b>ResCom Thickness:</b> 12mm  <b>Framing:</b> 46mm galvanised steel joist  <b>Insulation:</b> 94kg/m3 Luyangwool 72 mullite crystal fibre blanket insulation  <b>Stud spacing:</b> 610mm maximum centres</p> <p><b>Screws:</b> Class 3 to 5 (Non-Corrosive) min No. 8x40 self-drilling countersunk type fixed at max 300mm centres, and will finish at approximately 0.5mm below the surface. MgO Corp recommends, in highly corrosive areas, to use min grade 316 stainless steel non-corrosive fixtures.  <b>Screw Spacing:</b> On sheet corners, keep the first screw 50mm from the edge to avoid breakage of the sheet. Fasteners at 12-15mm from sheet perimeter edges.  <b>Jointing:</b> Gaps covered by fire resistant tape and glue</p>			



12mm 	-/120/120	120/120/120	120/120/120		
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**Suspended Ceiling Configuration**

**ResCom Thickness:** 12mm


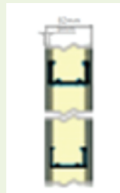

**Framing:** 50mm x 30xx x 0.6mm thick galvanized steel channels

**Stud spacing:** 610mm maximum centres

**Screws:** Class 3 to 5 (Non-Corrosive) min No. 8x40 self-drilling countersunk type fixed at max 300mm centres, and will finish at approximately 0.5mm below the surface. MgO Corp recommends, in highly corrosive areas, to use min grade 316 stainless steel non-corrosive fixtures.

**Screw Spacing:** On sheet corners, keep the first screw 50mm from the edge to avoid breakage of the sheet. Fasteners at 12-15mm from sheet perimeter edges.

**Jointing:** Gaps covered by fire resistant tape and glue

12mm 	-/180/180	180/180/180	180/180/180		
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**ResCom Thickness:** 12mm

**Framing:** 75mm Light weight steel stud to frame

**Insulation:** 180kg/m3 Rockwool or similar fire and acoustic bulk insulation


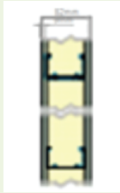

**Studs:** 2 x 0.75 x 38. Double stud to back of all joints.

**Stud spacing:** 600mm maximum centres

**Screws:** Class 3 to 5 (Non-Corrosive) min No. 8x40 self-drilling countersunk type fixed at max 300mm centres, and will finish at approximately 0.5mm below the surface. MgO Corp recommends, in highly corrosive areas, to use min grade 316 stainless steel non-corrosive fixtures.

**Screw spacing:** 200mm c/c maximum. 50mm in from the corners.

**Jointing:** Joints and Junctions to be caulked with 3M Fire barrier sealant.

14mm 	-/180/180	180/180/180	180/180/180		
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**ResCom Thickness:** 14mm

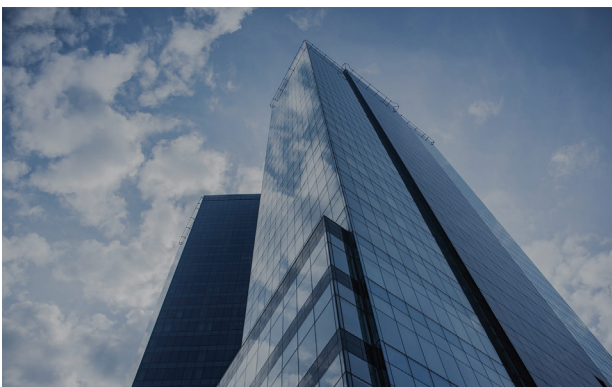
**Framing:** 2 x 4 Steel Studs








**Insulation:** R13 Insulation

**Stud spacing:** 406mm maximum centres

**Screws:** Class 3 to 5 (Non-Corrosive) min No. 8x40 self-drilling countersunk type fixed at max 300mm centres, and will finish at approximately 0.5mm below the surface. MgO Corp recommends, in highly corrosive areas, to use min grade 316 stainless steel non-corrosive fixtures.

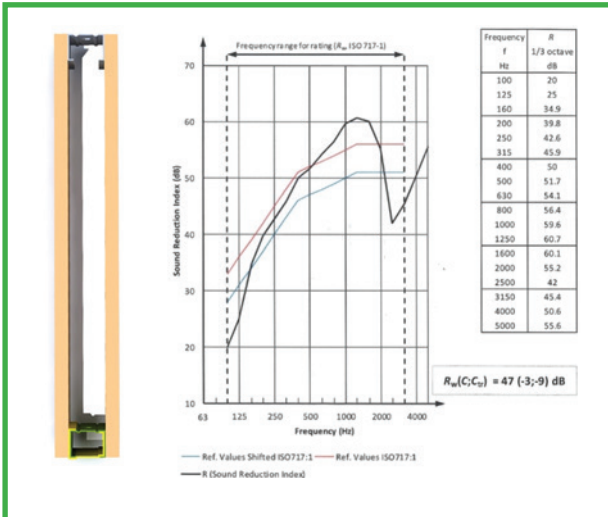
**Jointing:** Gaps covered by fire resistant tape and glue



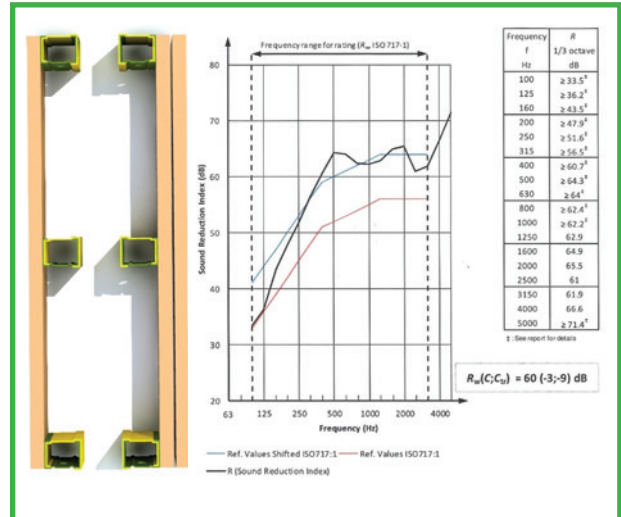
<p><b>14mm</b></p> 	<p>-/240/240</p>	<p>240/240/240</p>	<p>240/240/240</p>		
<p><b>ResCom® thickness:</b> 14mm  <b>Framing:</b> 100mm Lightweight steel stud to frame  <b>Insulation:</b> 8pcf Rockwool  <b>Stud spacing:</b> 16" o.c. (400mm)  <b>Screws:</b> Class 3 to 5 (Non-Corrosive) min No. 8x40 self-drilling countersunk type fixed at max 300mm centres, and will finish at approximately 0.5mm below the surface. MgO Corp recommends, in highly corrosive areas, to use min grade 316 stainless steel non-corrosive fixtures.  <b>Jointing:</b> 3M 25+WB fire rated caulk. Both surfaces painted with 12 mils ECO FireFlex intumescent coating</p>					
<p><b>16mm</b></p> 	<p>-/240/240</p>	<p>240/240/240</p>	<p>240/240/240</p>		
<p><b>ResCom® thickness:</b> 16mm  <b>Framing:</b> 18 gage steel studs  <b>Insulation:</b> 6lb mineral wool  <b>Stud spacing:</b>  <b>Screws:</b> Class 3 to 5 (Non-Corrosive) min No. 8x40 self-drilling countersunk type fixed at max 300mm centres, and will finish at approximately 0.5mm below the surface. MgO Corp recommends, in highly corrosive areas, to use min grade 316 stainless steel non-corrosive fixtures.  <b>Jointing:</b> Joint placed over the stud. Joints and screws covered with FireStop caulking compound.</p>					
<p><b>18mm</b></p> 	<p>-120/120</p>	<p>120/120/120</p>	<p>120/120/120</p>		
<p><b>Flooring Configuration</b>  <b>18mm ResCom Thickness:</b> 18mm Structural Flooring. Long dimension of panels to be perpendicular to joists with end joints staggered a minimum of 4ft and centred over the joists.  <b>Framing:</b> The proprietary joists are channel shaped, min 10 inch deep. Minimum 16 MSG Galvanized Steel Joists spaced max 24 inch. At joist rim splices bearing on supports, joists rims are connected using an overlapping section of 12 inch long splice plate with ¾ inch long No. 10 self-drilling steel TEK screws to each rim piece.  <b>Insulation:</b> 89mm thick giber glass batt insulation draped over the resilient channels or suspension system grid. Any glass fiber batt insulation bearing the UL classification marking for surface burning characteristics with a flame spread index of 25 or less and smoke development index of 50 or less must be used.  <b>Resilient Channels:</b> Formed of No. 25 MSG galvanised steel, ¾ inch deep, spaced at maximum 12 inches. Channel splices located beneath joists and overlapped 4 inches. Two channels spaced 6 inches oriented opposite each 10mm ResCom board end joint. Additional channels shall extend minimum 6 inches beyond each edge of board.  <b>10mm ResCom Board:</b> Base Layer installed with long dimension perpendicular to resilient channels or cross tees with joints offset 24 inches from base layer. Butt joints of 18mm face layer boards secured to 10mm base layer boards with butt joints located between resilient channels. Butt joints of face board staggered a minimum of 12 inches from butt joints of base board.  <b>Stud spacing:</b> 600mm maximum centres  <b>Screws:</b> Class 3 to 5 (Non-Corrosive) min No. 8x40 self-drilling countersunk type fixed at max 300mm centres, and will finish at approximately 0.5mm below the surface. MgO Corp recommends, in highly corrosive areas, to use min grade 316 stainless steel non-corrosive fixtures.  <b>Screw spacing:</b> 304mm c/c maximum. 50mm in from the corners.  <b>Jointing:</b> Gaps covered by fire resistant tape and glue</p>					

## THERMAL AND ACOUSTIC INSULATION

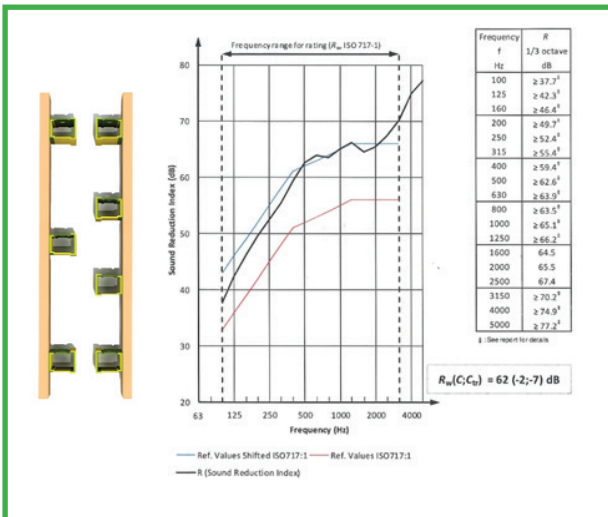
Cavity insulation has no bearing on the fire performance of the individual ResCom® product FRL ratings. Bulk insulation is required in the wall cavity for loadbearing FRL systems as noted above in the ResCom® FRL ratings. Bulk insulation may be required to achieve specified acoustic Rw + Ctr and R values in the building system. For specific performances seek direct advice from the appropriate fire and acoustic engineers.



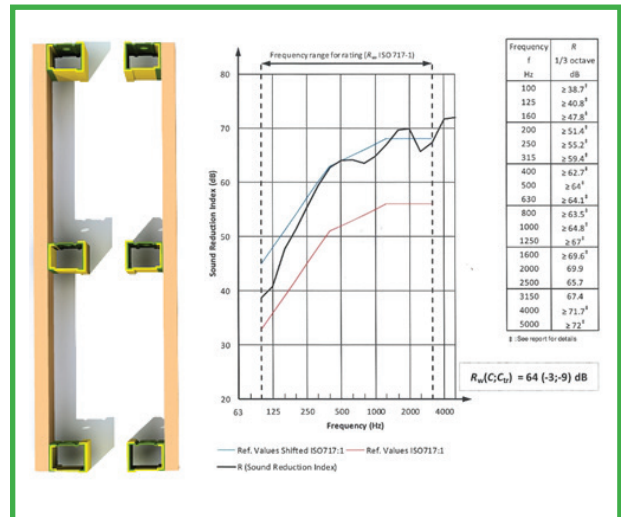
Single stud frame with 75mm (1mm thick) steel studs 600mm centres and noggings at 1208.5mm from ground. 12mm ResCom® board - 75mm steel studs filled with 24kg/m<sup>3</sup> glasswool insulation - 12mm ResCom® board.



Double stud frame with 75mm (1mm thick) steel studs 600mm centres and noggings at 1208.5mm from ground. 12mm ResCom® board - 75mm steel studs filled with 24kg/m<sup>3</sup> glasswool insulation - 20mm air gap - 75mm steel studs filled with 24kg/m<sup>3</sup> glasswool insulation - 2 layers of 12mm ResCom® board



Double stud frame with 75mm (1mm thick) steel studs 600mm centres and noggings at 1208.5mm from ground and 200mm (1.9mm thick) steel studs with 450mm centres. 12mm ResCom® board - 75mm steel studs filled with 24kg/m<sup>3</sup> glasswool insulation - 25mm air gap - 200mm steel studs - 18mm ResCom® board



Double stud frame with 75mm (1mm thick) steel studs 600mm centres and noggings at 1208.5mm from ground. 12mm ResCom® board - 75mm steel studs filled with 24kg/m<sup>3</sup> glasswool insulation - 20mm air gap - 200mm steel studs - 75mm steel studs filled with 24kg/m<sup>3</sup> glasswool insulation - 12mm ResCom® board

Normally the acoustic performance of the floor requires attention to material choices and method of installation. The floor design must exceed the 'Deemed to Satisfy' requirements of the BCA 'Sound Transmissions and Insulations, Class 2 or 3 Buildings. Floors under this requirement must have a Ln, w no higher than 62. The depth of the floor, type of floor joist, insulation type and thickness and floor finishing materials affect the acoustic performance. It is recommended to design a carpeted floor as per a hard floor, so that the acoustic performance is satisfactory in the future if the carpet is replaced with tiles or timber.

## WALL INSTALLATION

Two wall systems will be detailed – timber and steel. Timber frames are normally only suitable to a maximum of 120-minute fire rating. The building designer must ensure that load bearing walls have been designed:

- To resist all applied loads
- To be in accordance with AS4600, AS1684 and AS1720.2, 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.

## FRAMING

### Materials

ResCom® Board may be fixed to timber or metal framing and masonry materials which conform to standards specified by the appropriate government building authorities.

### Timber Framing

All timber framing shall be in accordance with AS1684 - residential timber framed construction or AS1720.1 timber structures. Timber used as a substrate for ResCom® Board shall be defined as being in one of the following categories:

#### Category 'A'

- Timber with a moisture content under 16% at the time of lining. Based on 90% of timber members being within the specified moisture content range with the remainder being within +2% of the specification. (Generally seasoned or kiln dried timbers would be in the category.)
- Timber with a moisture content above 16%, but a tangential shrinkage below 8%. (Examples of these timbers would include; cypress pine, Douglas fir (Oregon), hoop pine, slash pine, radiate pine, western hemlock, jarrah, red narrow-leaved ironbark, rose/flooded gum and spotted gum.

#### Category 'B'

- Includes all timbers with a moisture content above 16% at the time of lining, and which have a tangential shrinkage above 8%. (Examples of these timbers would include; alpine ash, Blackbutt, karri, mountain ash, messmate, river red gum, silver top ash, Sydney blue gum and tallowwood.

Tangential shrinkage at 12% moisture content is defined in AS1720.2. Metal framing shall be in accordance with AS1397, AS1538 or AS3623, as applicable.

### Metal Framing

ResCom® Board may be fixed direct to structural metal. 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 & moisture.

### Concrete, Brick or Masonry Surfaces

Concrete, brick or masonry surfaces which comply with AS3700 can be sheeted with ResCom® Board. Prior to fixing ResCom® Board to masonry walls, the substrate and back of ResCom® Board must be fully sealed with waterproofing compound to stop moisture absorption. Alternatively, these surfaces may have a furring system applied in accordance with AS1684. When using a furring system, you must also fully seal the back of the ResCom® Board.

# GENERAL INSTALLATION REQUIREMENTS

The following installation points are to be observed for every installation being on timber, steel, direct fix or via furring channels:

- 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.



## INSTALLATION OF RESCOM® PRODUCTS TO TIMBER FRAMING

Timber framing to be installed in accordance with AS1684. The maximum timber stud heights for applied loads of 15 kN/m and recommended stud spacing maximum 600mm on fire rated wall systems. Timber frames are normally only suitable to a maximum of 120-minute fire rating.

### The building 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 timber, it is due to the loss of section as the timber chars.
- The following are important points to observe:
- Sheets can be fixed using a combination of screws and appropriate structural adhesive.
- Where a double wall system is used, the gap between the walls should be from a minimum of 20mm to a maximum of 50mm.
- Control joints are to be used where specified, where dissimilar materials abut, or at least every 12 metres.

See figure 1.1 for installation details.

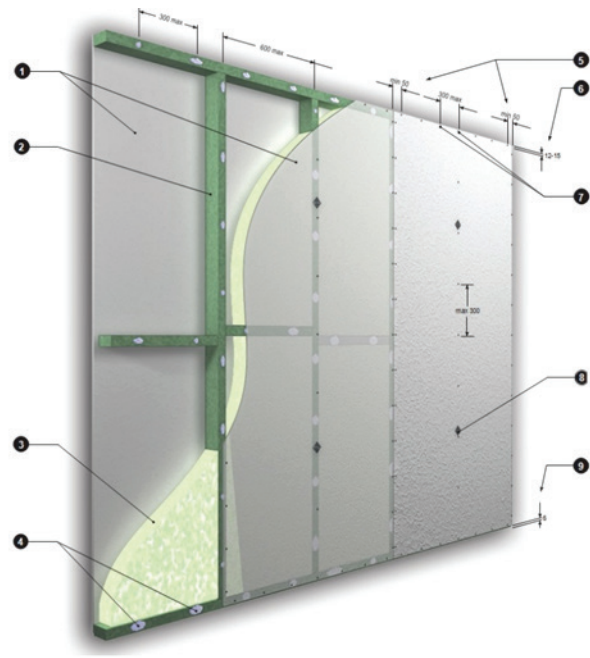


Figure 1.1 - Timber Fire Wall Installation Detail

## INSTALLATION OF RESCOM® PRODUCTS TO STEEL FRAMING

Metal framing to be installed in accordance with BCA Volume 2. The size of steel stud should be determined by a professional engineer.

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 & moisture.

### The building 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 form wall linings. Some wall systems will have their axial load capacities reduced. For steel, this is due to the steel weakening at temperature.

See figure 2.1 for installation details

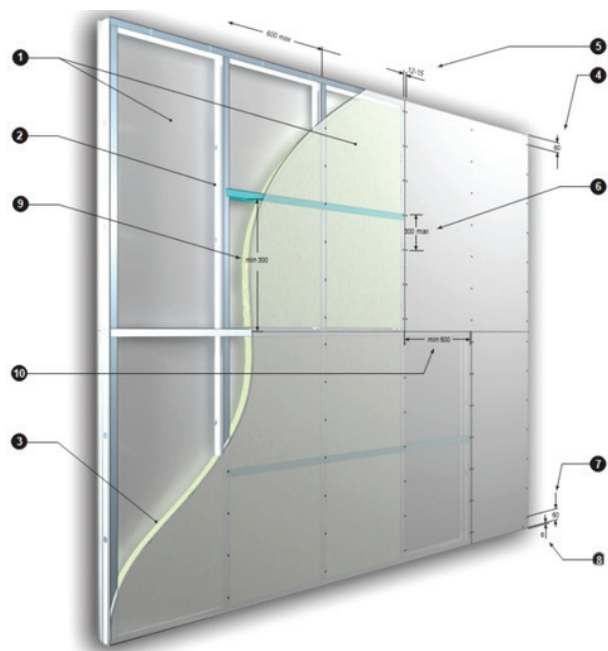


Figure 2.1 - Steel Fire Wall Installation Detail

## EXTERNAL AND ZERO LOT BOUNDARY FIRE RATED WALLS - TIMBER AND STEEL.

When ResCom® sheets are attached to the outside of the wall, the wall takes on the fire rating of the sheet. External cladding of fire rated walls require attention to sealing all gaps, especially at internal and external corners.

- Use an expandable fire sealant strip.
- MgO Corp recommends the use of back blocking to all joints with the same thickness of ResCom® Wall Board. By placing a 150mm width strip of ResCom® board glued with an appropriate fire rated or structural polyurethane adhesive. To be applied in full length minimum 4mm beads to all stud and noggins then screwed into place to allow adhesion. This will help eliminate any thermal breaches and give additional protection to the frame.
- Since all fibre batt insulation loses its effectiveness when wet, ensure drainage is provided to remove condensation from the cavity. It is good practice to install the cladding on battens so the air movement helps to prevent moisture build up. A breathable membrane is required by BCA on the outside of the studs.
- Due to indifferent metals such as screws and framework ResCom BP 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 & moisture.

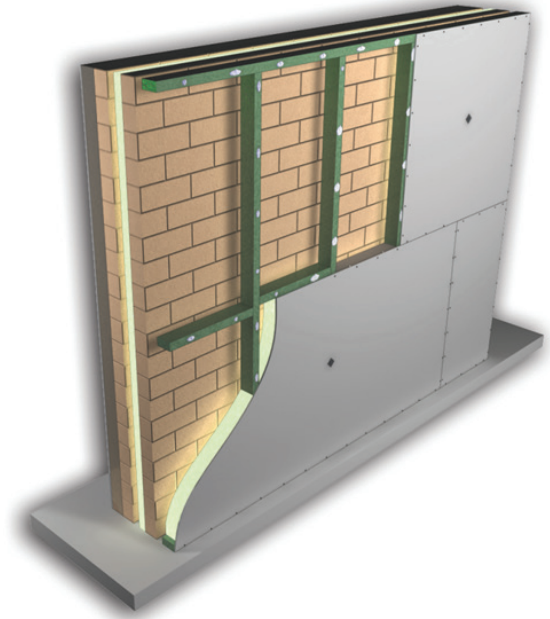


Figure 3.1 - Exterior Timber Wall Installation Details

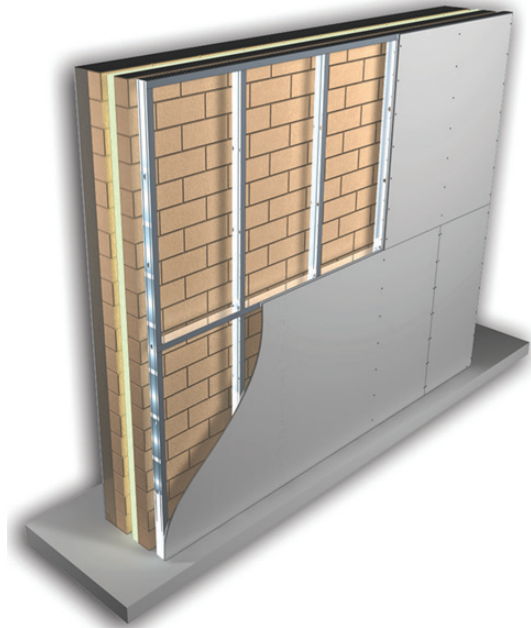


Figure 3.2 - Exterior Steel Wall Installation Details

## FLOOR INSTALLATION

ResCom® flooring sheets have the same impressive fire properties as the wall sheets. When combined with ResCom® ceiling sheets, the floor structure can be protected from the effects of fire. The normal floor sheet thicknesses start at 18mm, and can range up to 50mm for special applications. The floor joist frame is to be appropriately designed and must not be less than that of the tested system. Much like the wall system, the floor system is to include ResCom sheet on either side of the joists. A guide to the compliance is detailed below.

FRL Floor Rating	Floor Sheet	FRL Ceiling Rating	Ceiling
90 min	14mm	60 min	10mm
120 min	18mm	90 min	10mm
150 min	20mm	120 min	12mm
180 min	25mm	180 min	14mm

Ensure minimum class 3 to 5 non-corrosive fasteners are used for interior use. Exterior Application and wet areas use minimum SPAK 304 or 316 Stainless Steel fixings. For fire rated flooring systems all joints and junctions must be filled with appropriate FR/FRL rated caulking compounds. Immediately upon installation of the ResCom® Flooring it is a mandatory requirement to protect the flooring board from inclement weather and exposure to rain or water by way of sealing with LOXON® Concrete & Masonry Primer, Interior/Exterior Latex or similar or cover with waterproof tarps until weather clears. Dry with air blower if wet.

Fastener clearance, screw must adhere to the following guidelines:

- 12mm minimum from square edge joints
- 25mm minimum from T & G or shiplap joints
- 50mm minimum from all corners
- 200mm maximum centres along joists and blocking

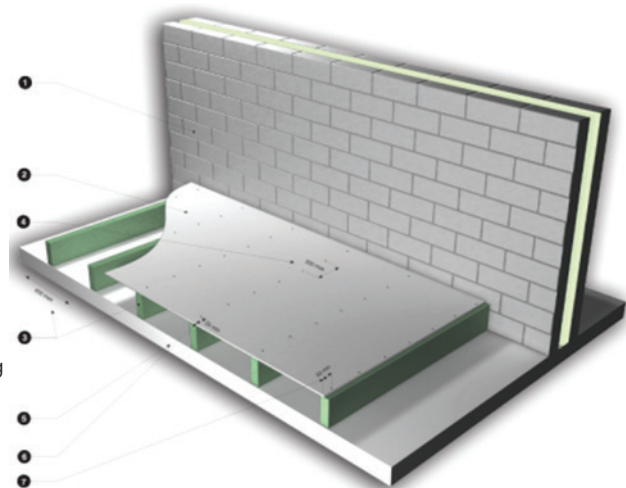


Figure 4

	Joist Centres	1.5kPa/ 1.8kN	2.0kPa/ 1.8kN	3.0kPa/ 2.7kN	5.0kPa/ 4.5kN
<b>16mm</b>	400mm	✓			
<b>18mm</b>	400mm	✓	✓		
<b>18mm</b>	450mm	✓	✓		
<b>19mm</b>	450mm	✓	✓		
<b>20mm</b>	450mm	✓	✓	✓	
<b>20mm</b>	600mm	✓	✓	✓	

1. Solid Wall
2. One layer on ResCom® Board
3. Floor joists at 600mm max centres
4. Screws will be No.8 x 40 self-drilling countersinking type fixed at max 200mm centres, and will not finish at approx. 0.5mm below surface
5. Floor concrete slab or on joists
6. Screws are 15mm from edge of shiplap joint
7. On sheet corners, keep the first screws 50mm from the edge to avoid breakage. Rest of fasteners at 12 to 15mm from sheet edges.
8. Support joints of board between spans with noggings
9. Assure at all times engineering has allowed for variation of joist spans for point and live loads



## SPAN & LOADING GUIDELINES

ResCom® flooring is suitable for Categories A or B Class 5 conditions. Tests undertaken in accordance with clause 8.2 of AS/NZS 2908.2:2000. When tested in accordance with AS/NZS 2908.2 2000 Sections 8.2.1 'Bending Strength' and 8.2.2 'Soak Dry' ResCom® flooring demonstrated no denotable decrease to its strength and performance.

NOTE: It is advised that the elements of flooring design and construction must comply with the requirements of the BCA and or any other applicable local authorities building and construction regulations and standards. The design engineers and certifiers are responsible to ensure that the details in this document are appropriate for the intended application. Flooring should on installation be immediately sealed and protected from the inclement weather. In the event of the threat of storm and rain before sealing. The board must be covered to protect from water. If the board gets wet dry using a blower and allow to thoroughly dry out before covering or tiling.

## CEILING INSTALLATION

ResCom® ceiling sheet thicknesses have been tabulated for 60 to 180 minute applications in the "Floors" section above. To minimise joint movement, and reduce the transfer of sound, it is recommended to always fix to metal ceiling battens. When additional acoustic isolation is required, resilient mounts are used to fix the battens.

ResCom® ceiling sheets are installed as per the wall sheets on fire separation walls. Refer to the section on "Walls" above.

Ceilings are often a cause of flanking noise between adjacent dwellings. Separation walls will often continue to the underside of the roof, with full acoustic insulation present to reduce flanking sound. Care should be taken to seal all gaps, especially where walls and ceilings meet. Use an approved fire rated polyurethane sealant.

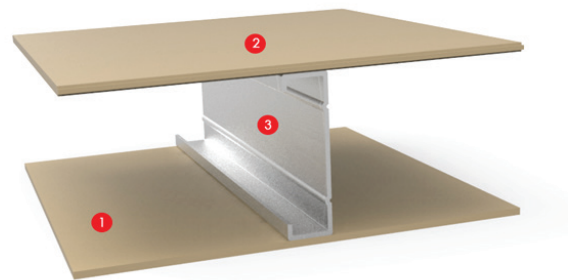
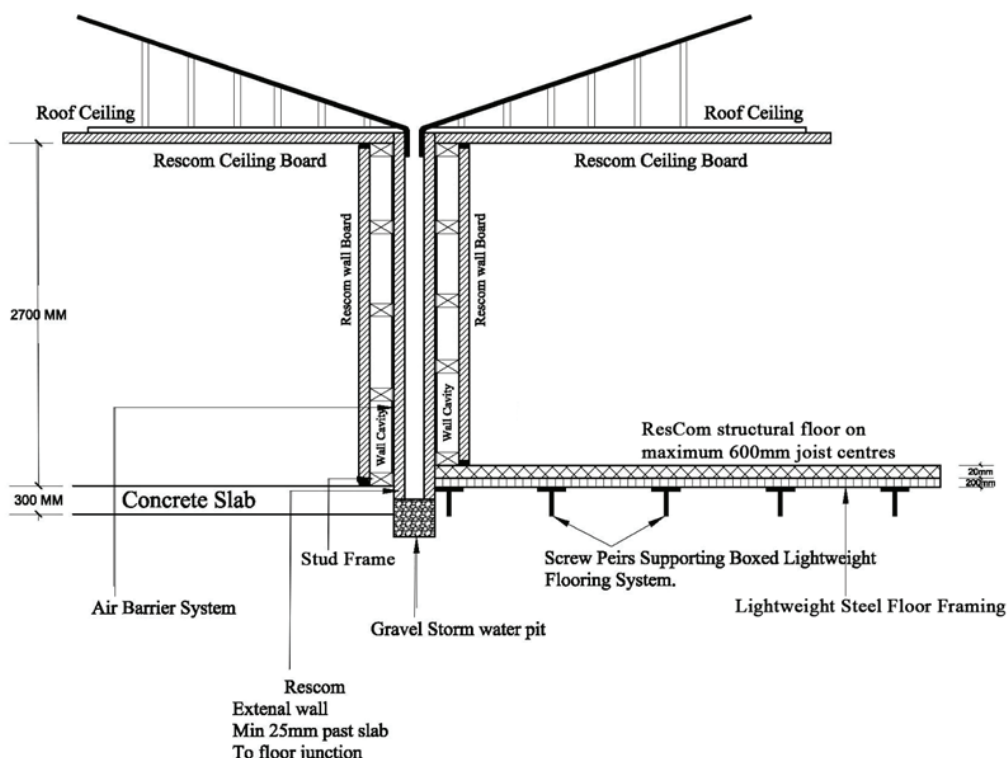


Figure 5-Floor & Ceiling Detail

## Example Floor, Ceiling and Wall Configuration

Figure 5 -

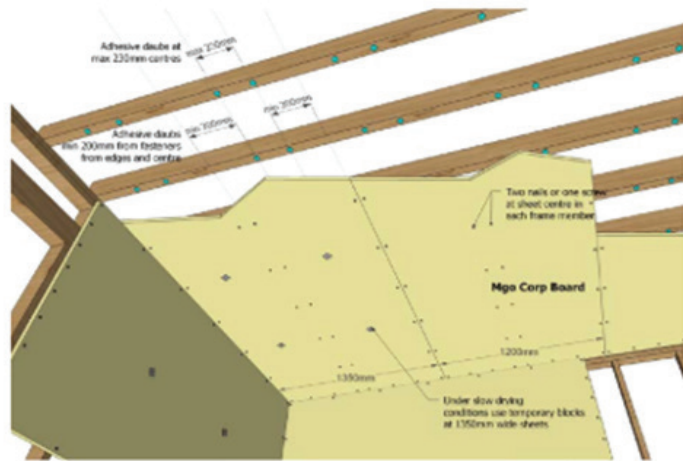
1. ResCom® Ceiling Board
2. ResCom® Floor Board
3. Metal or timber joist as specified



## Adhesive/Fastener Fixing To Timber Framed Ceilings

ResCom® Board is to be installed at right angles to the joists/main support members.

- Apply minimum 4mm Full length bead of structural polyurethane adhesive to the framing members. Beads are to be spaced at 230mm maximum centres, and a minimum of 200mm from fastener positions. Omit beads at all fastening points, at butt joints on frame members, and at cornice line.
- Apply ResCom® Board and fasten one recessed edge at each framing member.
- Press the sheet firmly against the framing, then fasten along the second recessed edge at each stud.
- Apply intermediate fasteners at each framing member.
- Where butt joints on framing members are permitted, screw at 200mm maximum centres.
- Fasten around service openings with nails at 150mm max. centres or screws at 200mm max. centres.
- Fasten ends of sheets at a maximum 300mm centres for a cornice finish, or at a maximum 150mm centres for a set finish.
- Under slow drying conditions, hold sheets against the framing members with temporary fasteners driven through ResCom® Board blocks as detailed, for at least 48 hours.
- Rockwall or similar insulation in wall, ceiling and floor cavities may be used as needed to achieve required Rw and R-Values. The use of bulk insulation does not affect the minimum FR standalone performances of ResCom® products, system performances need to be in accordance with pages 8, 9 & 10.



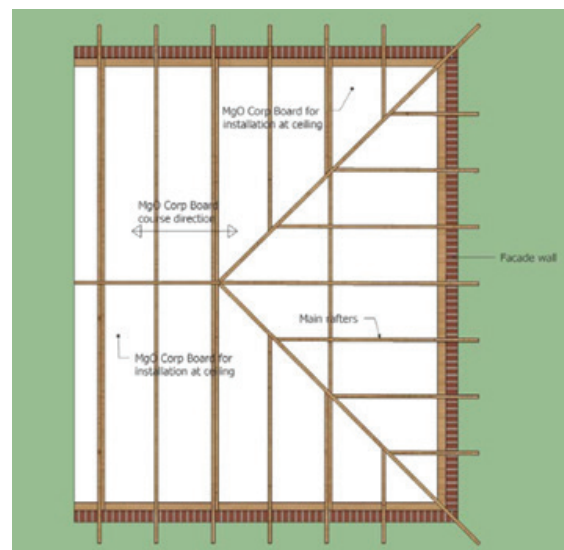
## Garage Ceilings

Ceilings in garages are subjected to different environmental conditions to those in habitable rooms. The following conditions may occur:

- Wind loads can disrupt uncured adhesive and prevent an effective adhesive bond from ever forming.
- Door operation may induce vibration in ceiling framing, adversely affecting nailed joints and disrupting adhesive bond.
- Framing that changes direction in the garage may result in insufficient perimeter support for the ResCom® Board.
- Moisture and high humidity in the garage can result in poor joint performance.
- The above issues can also result in the poor performance of any installed cornice.

While the performance expectations for garage ceilings remain the same as for internal ceilings, additional details are required to ensure this performance is achieved.

- Use the 1/3 spacing method of fixing ResCom® Board, as detailed in this manual.
- Use class 3 to 5 Non-Corrosive screws not nails to fix ceilings.
- Use trimmers across the sheet width for support.
- Back-block all joints in garage ceilings.
- Use a good quality wallboard sealer primer and min two coats of paint applied by high quality roller system



## BACK BLOCKING JOINTS

Back-blocking is a reinforcing system where pieces of ResCom® Board are fixed to the back of the sheets behind joints. Back-blocking is to be used on all butt joints formed between framing members and on recessed joints. Where mid-span butt or end joints are not required but are used to minimise ResCom® Board wastage, these joints must also be back-blocked. All mid-span joints must be positioned within 50mm of the mid-span point between the framing members. Fix back-blocks with cornice fibre cement applied with a notched spreader to form beads 6mm x 6mm at approximately 20mm centres over the entire face of the back-block.

### Back-Blocking of Recessed Joints on Ceilings

**Back-blocking is required in Level 4 and 5 Finishes where three or more recessed joints occur in a continuous ceiling area.**

- Cut back-blocks of at least 200mm width and long enough to fit loosely between the framing members.
- Fix with nematic nails or joint compound to the backblocks with a notched spreader to form 6mm x 6mm beads at approximately 20mm centres at right angles to the joint, over the entire face of the back-block.
- Apply ResCom® Board sheets with the long edges at right angles to joists or battens. Place back-blocks along the full length of the sheet edge. As soon as all the blocks are in position, install the adjoining sheet.
- Back-blocks must be adhered in position before the joints are finished. Back-blocks may also be applied by working above the ceiling after the sheets have been fixed.

### Back-Blocking of Butt Joints on Walls

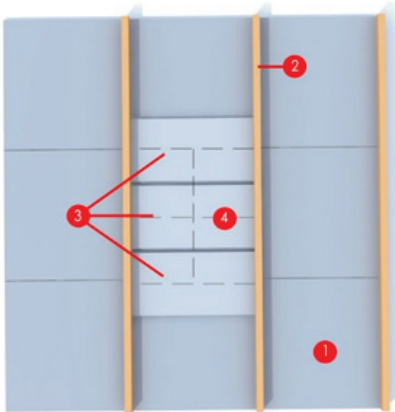


Figure 4.1

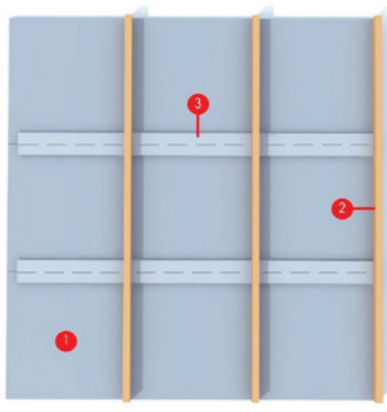


Figure 4.2

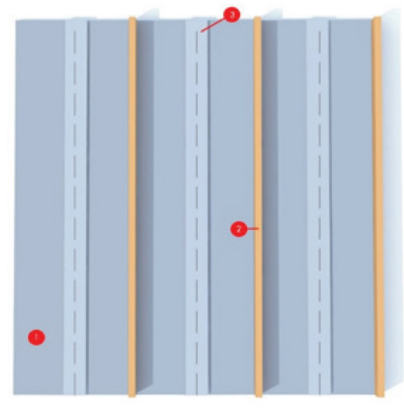
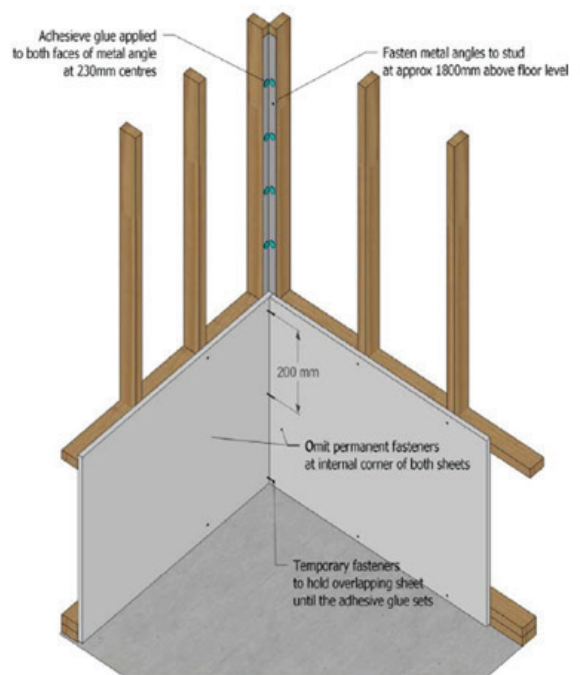
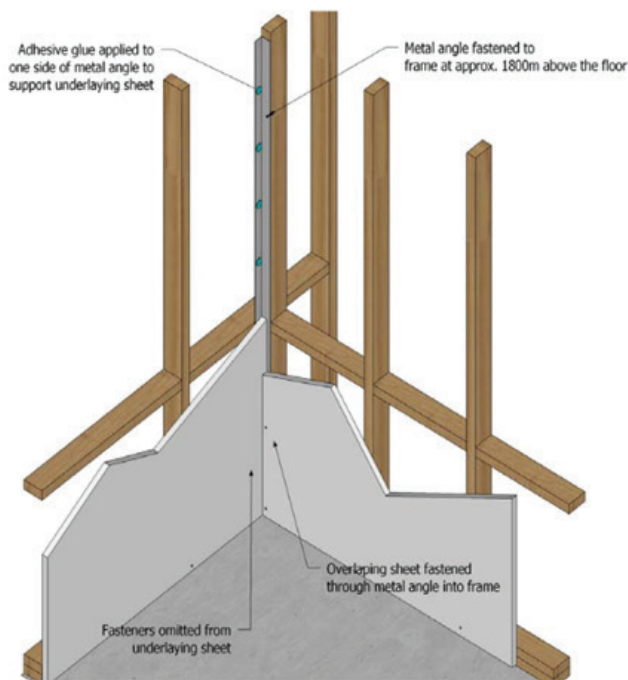


Figure 4.3

#### Figure 4.1, 4.2, 4.3: Wall Lining Back Blocking Options

1. ResCom® Board
  2. Framing or batons
  3. ResCom® Board back blocking at least 150mm width centred over joints
  4. Butt joint centred between framing member
  5. All joints and junction in fire rated structures must be filled with appropriate FRL tested caulking or sealant. All installation that occurs must meet the required local authorities building codes.
- Sheet ends should be neatly cut and butted together within 50mm of the centre line between the studs.
  - Cut back-blocking to fit neatly between the studs and fix by skew or nailing
  - Apply structural adhesive to back-blocks as described previously, prior to screwing or nailing.
  - Fix ResCom® Board wall sheets in place.
  - Allow the adhesive to set for a minimum of 24 hours before removing the temporary screws or nails.



## INTERNAL CORNERS

Four alternative methods of forming internal corners may be used. The appropriate method should be fixed as illustrated.

Where category 'B' timber framing is used, sheets are not to be nail/screw fastened both sides. One of the other systems detailed must be used.

### Internal Corner Fixed One Side Only (Double Stud)

Where two framing members occur, fasteners can be omitted from the underlying sheet. The overlapping sheet is butted firmly against the underlying sheet and fastened at 300mm centres.

### Internal Corner - Fixed One Side Only (Single Stud)

Where only one framing member occurs at a wall junction as illustrated, tack-fix a minimum 35 x 35mm galvanised angle to the stud with a single fastener at approximately 1800mm above floor level. The length of the steel angle should be approximately 200mm less than the corner to be supported.

Apply beads of adhesive to one flange of the angle at 200mm spacing's. Apply the underlying sheet to the prepared flange and fix the remainder of the sheet in the appropriate method.

Omit all fasteners from the sheet edge at the internal corner. Apply abutting corner sheet and fasten through steel angle at 300mm centres.

### Internal Corner - Full Floating

Where two framing members occur at a wall junction as illustrated, tack-fix a minimum 35 x 35mm galvanised angle to the stud with a single fastener at approximately 1800mm above floor level. The length of the steel angle should be approximately 200mm less than the corner to be supported. Apply beads of adhesive to both flanges of the angle at 200mm spacing's.

Apply the underlying sheet to the prepared flange and fix the remainder of the sheet in the appropriate method. Omit all fasteners from the sheet edge at the internal corner. Butt the overlapping sheet firmly against the underlying sheet and fix remainder of sheet. Hold edge of overlapping sheet in place with temporary fasteners into stud for a minimum 24 hours.



# CONTROL JOINTS

It is recommended that ResCom® Board surfaces be isolated from structural elements, except the floor, using control joints or other means where:

- A ResCom® Board surface abuts any structural element or dissimilar wall or ceiling assembly.
- The construction changes within the plane of the partition, wall or ceiling lining.

Control joints incorporated in a building to permit movement in the structure must be carried through all areas lined with ResCom® Board.

The control joint is located between the sheets and set over. When the compound is dry, the filament tape is removed leaving a clean, well-formed joint.

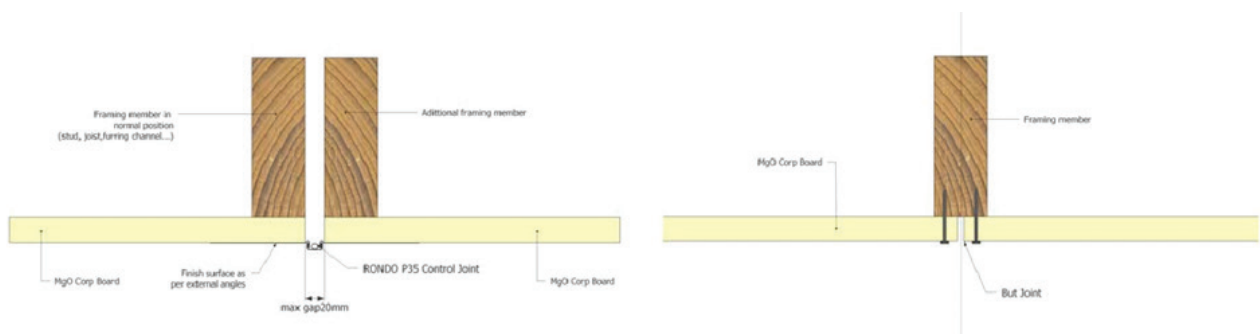
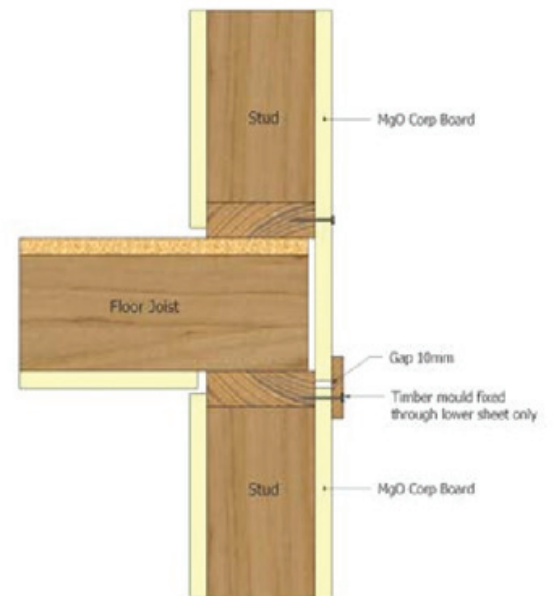
Door frames extending from floor to ceiling constitute control joints. For doors less than ceiling height, control joints extending from both corners of the frame to ceiling may be used.

## Control joints are to be installed:

In long partition or wall runs, at no more than 12m centres. To coincide with control joints in the supporting frame. The continuity of ResCom® Board and support framework should be broken at control joints. In continuous ceiling areas, spaced at no more than 12m centres in both directions. Control joints may be positioned to intersect light fixtures, heating vents and air diffusers. Between floor levels, e.g. in stairwells.

## Installation of Control Joint

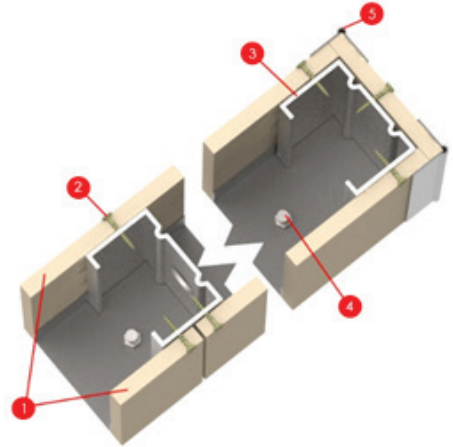
- Allow a 15mm maximum gap between ends of ResCom® Board sheets.
- Locate control joint, centrally in gap. Fasten flanges and ResCom® Board sheets to frame at a maximum of 300mm centres.
- Set over bead as for normal joint application using centre channel ribs as screeding guides.
- Finish the joint in the normal manner. When the joint is dry, remove the filament tape.



# JUNCTIONS

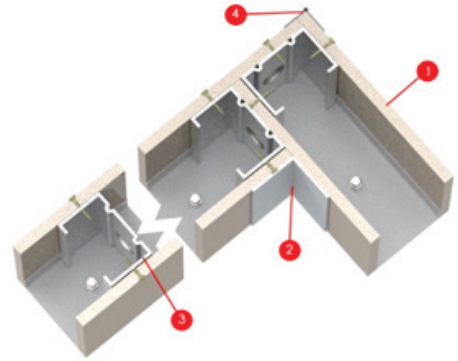
## Door/Window Opening End Cap

1. ResCom® wall board
  2. Screws will be non-corrosive class 3 to 5 No. 8 x 40 self-drilling counter-sunk type or minimum grade 316 stainless steel non-corrosive nails.
  3. Metal studs maximum 600mm centres
  4. Bottom track fastened to floor
  5. External angle bead and compound
- Mastic tape or silicone bead is recommended for use on steel beams to prevent moisture build up between substrates.



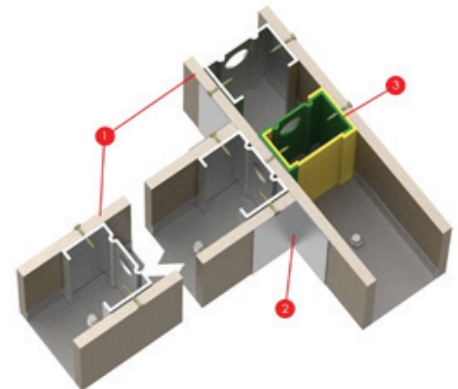
## Corner Junction

1. ResCom® Wall Board
  2. Fabric tape and compound to set corner as required
  3. Metal studs maximum 600mm centres
  4. External angle bead and compound
- Mastic tape or silicone bead is recommended for use on steel beams to prevent moisture build up between substrates.
  - Metal framing as per manufacturers specifications for installation.
  - 100mm maximum to first track fixing
  - Set over bead as for normal joint application using centre channel ribs as screeding guides.
  - Finish the joint in the normal manner. When the joint is dry, remove the filament tape.



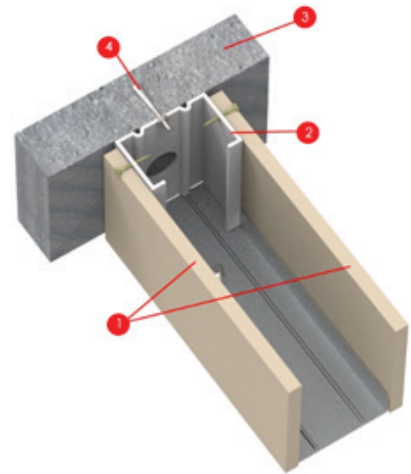
## T-junction

1. ResCom® Wall Board
  2. Fabric tape and compound to set corner as required
  3. Boxed stud at wall intersection
- Mastic tape or silicone bead is recommended for use on steel beams to prevent moisture build up between substrates.



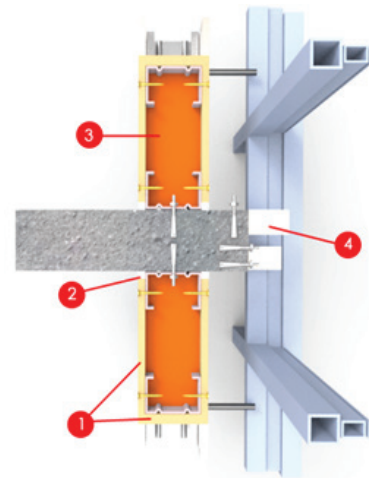
## Concrete Wall Connection

1. ResCom® Wall Board
  2. Metal studs maximum 600mm centres
  3. Concrete wall or slab
  4. Anchor bolt
- Mastic tape or silicone bead is recommended for use on steel beams to prevent moisture build up between substrates.



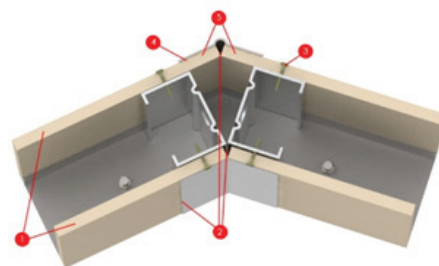
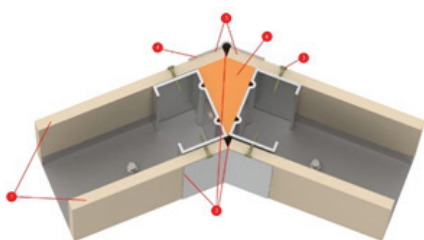
## Metal Frame System to Concrete Wall

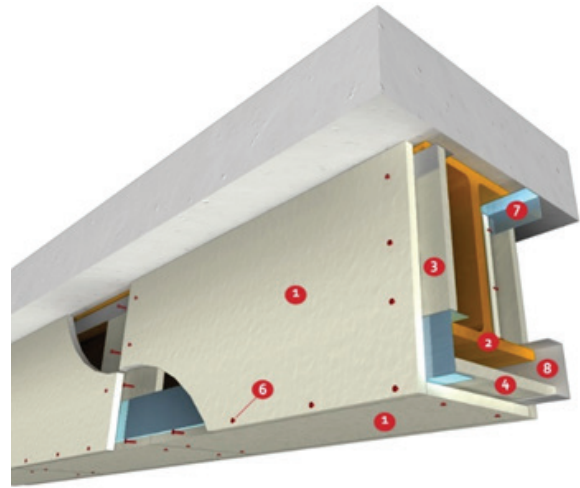
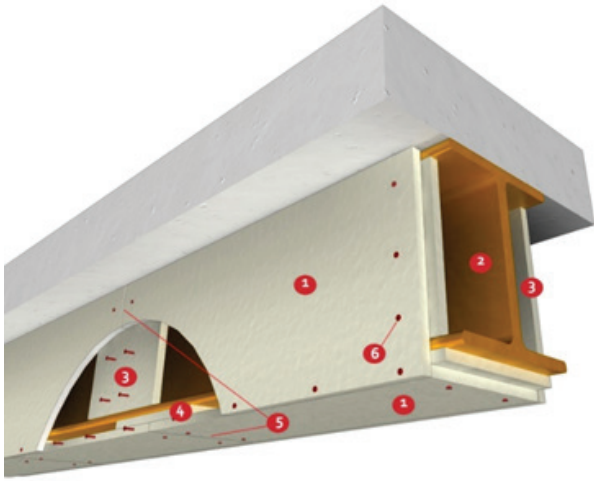
1. ResCom® Board
  2. Metal studs maximum 600mm centres
  3. Concrete wall or slab
  4. Anchor bolt
- Mastic tape or silicone bead is recommended for use on steel beams to prevent moisture build up between substrates.



## Angle Wall Junction

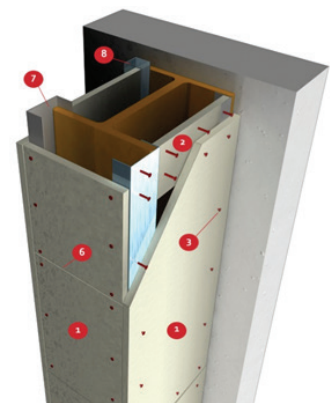
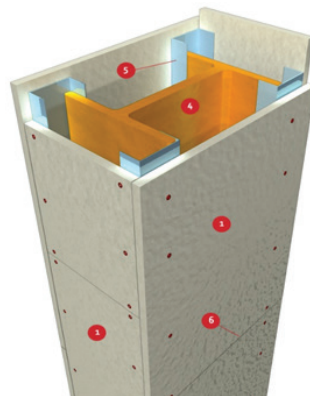
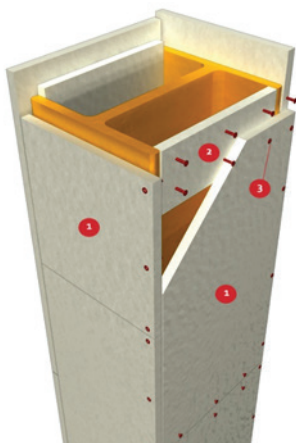
1. ResCom® Board
  2. Fill corner void with fire and acoustic acrylic sealant. Set corner with internal angle bead tape and compound.
  3. Screws will be non-corrosive class 3 to 5 No.8 x 40 self-drilling countersunk type or minimum grade 316 stainless steel non-corrosive nails.
  4. External angle bead and compound
  5. Allow full height shear support when wall angle is more than 250
- Mastic tape or silicone bead is recommended for use on steel beams to prevent moisture build up between substrates.





## Beam Cladding

1. ResCom® Board
2. Structural Steel Beam
3. ResCom® soldiers the same thickness as board used, 100mm wide wedged into steel at butt joints.
4. ResCom® cover strips, 100mm wide laid over joints.
5. Staggered joints.
6. Non-corrosive class 3 to 5 No.8 x 40 self-drilling countersunk type screws or minimum grade 316 stainless steel non-corrosive nails.
7. Non-corrosive steel angle
8. Non-corrosive steel channel
9. Fire Rated Mastic or silicones are recommended for use on steel beams to prevent moisture build up between substrates.



## Column Cladding

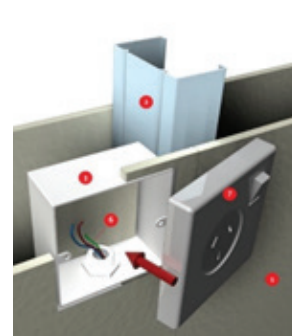
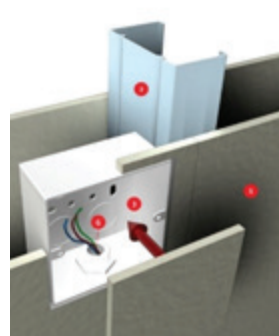
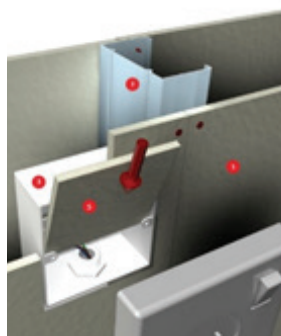
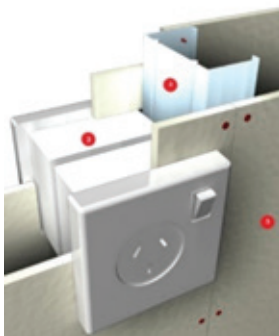
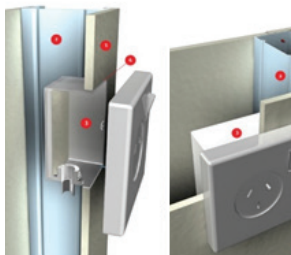
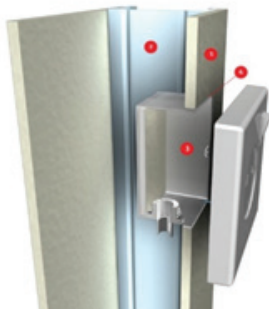
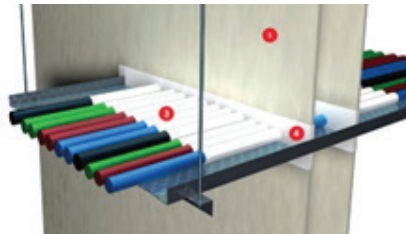
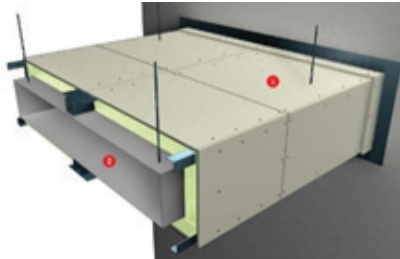
1. ResCom® Board
2. ResCom® soldiers the same thickness as board used, 100mm wide wedged into steel at butt joints.
3. Non-corrosive class 3 to 5 No.8 x 40 self-drilling countersunk type screws or minimum grade 316 stainless steel non-corrosive nails.
4. Structural Steel Column.
5. Non-corrosive Steel Channel.
6. Horizontal Butt Joint
7. Non-corrosive steel channel
8. Non-corrosive steel angle
9. Mastic tape or silicone bead is recommended for use on steel beams to prevent moisture build up between substrates. Use of Rockwool or similar bulk insulation maybe used in the voids of the columns to reduce build-up of thermal heat and add protection to the substructure from thermal transmission.



## Penetrations

(Refer to Ignis Report No. 4099.3 I01R00)

ResCom® Board complies with the BCA through Performance Requirement CP6, Clause C3.15 as detailed in the independent fire engineer's evaluation report #4099.3 101R00



## Duct and Electrical Wire Installation

1. ResCom® Board
  2. Ventilation duct
  3. Electrical cables
  4. Acrylic sealant
- Fire Rated Mastics or silicones are recommended for use on steel beams to prevent moisture build up between substrates and add additional thermal protection.

## Power Point Installation

1. ResCom® Board
2. Non-corrosive steel stud
3. Fire resistant switch box
4. Fire mastic/sealant
5. Fire resistant switch box
6. Electrical wiring
7. Fire Rated Mastics or silicones are recommended for use on steel beams to prevent moisture build up between substrates and add additional thermal protection.

## Sheet Layout

The following installation information should be read in conjunction with Table 2, 3 and 4, to determine the requirements applicable to the chosen level of finish. ResCom® Board should be installed after the installation of plumbing and electrical services. Provide adequate ventilation in all structures to minimise air humidity.

**Generally, ResCom® Board should be applied to ceilings first and then to walls. Horizontal application of ResCom® Board on walls is recommended because it:**

- Reduces joints by up to 25%.
- Provides a stronger wall.
- Reduces the possibility of unacceptable light reflections
- Joints are at a more convenient height for finishing.
- Nogging is not required behind recessed edge joints in horizontal applications.
- Horizontal sheeting is a requirement in all timber and metal frame applications where the intended Level of Finish is 3, 4 or 5, except that a single sheet may be fixed vertically where it covers the whole wall.

## Joint Location

Where possible it is recommended that full length sheets are used to minimise butt joints at sheet ends. Sheets should be butted firmly together, but not forced. Where butt joints at sheet ends are unavoidable and where jointing between framing members is not required, as per Table 2, 3 and 4, butt joints may be formed on a framing member, provided that the framing member has a bearing face equal to or greater than 35mm width for nail fixing or 32mm width for screw fixing.

Where butt joints are permitted on framing members, butt sheet ends together centrally over the framing member. Butt joints on walls are not to coincide with the edge of openings (e.g. doorways or windows). Sheets are to be laid so that any vertical butt joint falls a minimum of 200mm from the edge of an opening. Avoid butt joints over single doorways and cavity sliding doors wherever possible.



Where a butt joint in a wall is less than 400mm long and is located more than 2 metres from the floor, then back-blocking may be omitted. Butt joints in adjacent sheets on the same side of a wall, and in adjacent sheets on opposite sides of the same wall, are to be staggered and located on/between different framing members.

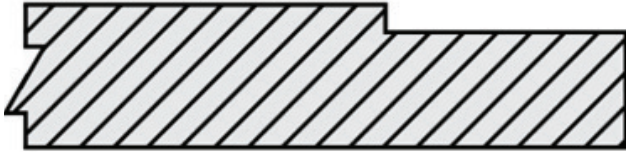
## ResCom® Board Cutting

ResCom® Board can be cut by scoring the face with a knife and snapping the ResCom® Board back away from the scored face. The ResCom® Board can then be cut from the back towards the front. Alternatively, a saw may be used from the front face.

Cut edges are to be smoothed as required to permit neat joints. A metal T-square will assist in creating a clean, straight cut. All cut-outs for pipes, electrical installations, fixtures etc. are to be scored on both faces before removal, or are to be cut out with a suitable tool. The use of an impact tool such as a hammer is not an acceptable method of producing cut-outs. If the ResCom® Board adhesive is not properly cured, hold the sheet in place with temporary blocks on adjacent studs or joists while making cut-outs.

## ResCom® Board Edges

### Type 1 Edge



#### ResCom® Board Recessed Edge

- 1.5mm recess on the long face side allows joint reinforcement
- Provides a smooth even and continuous surface once jointed.



### Square Edge

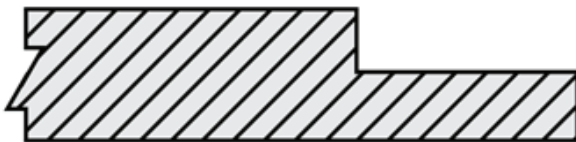


#### ResCom® Board Square Edge

- Square edge finishing
- The square edge allows sheets to be butted together neatly.
- These joints may be covered with aluminium, vinyl or timber mouldings.



### Shiplap (Flooring)



#### ResCom® Board Shiplap Edge



## STORAGE AND HANDLING INFORMATION

All materials must be kept dry, preferably by being stored inside the building. Care should be taken to avoid sagging or damage to edges, ends and surfaces. All ResCom® Board should be stacked flat, properly supported on a level platform or on support members which extend the full width of the sheets and which are spaced at maximum 600mm centres. If stored outside, sheets are to be stored off the ground, stacked as previously details and protected from the weather.

## INTERNAL MECHANICAL FIXINGS (EXCLUDING WET AREAS)





The fixing systems detailed in this brochure are suitable for all Levels of Finish using timber or steel framing in Australia Regions A and B up to and including wind category N4 as defined in AS4055. These installation methods are based on a differential pressure of 0.5kPa.

Generally, the recommended fixing method is a combination of adhesive and permanent fasteners. The use of fastener only fixing method should be restricted to applications where adhesive cannot be used, such as in fire rated installations, tiled wet areas and over existing linings or vapour barriers.

## FASTENERS





The following fasteners are used with timber and steel framing to accommodate most installation applications. When fixing to timber that has been CCA treated, class 3 to 5 non-corrosive screws. MgO Corp require a minimum grade 304 SPAX or 316 stainless steel non-corrosive fixtures when installing in exterior and wet areas or in corrosive air locations.

Drywall / Plasterboard screws are not acceptable for installation of ResCom® Board Products.

Internal and External Mechanical Fixings (Excluding wet areas)	
 <p><b>Nails</b></p> <p>NON-CORROSIVE minimum Class 3 to 5</p> <p>Hardwood 25 x 2.8mm</p> <p>Softwood 30 x 2.8mm</p>	 <p><b>Self-Counter Sinking Screws</b></p> <p>NON-CORROSIVE minimum Class 3 to 5</p> <p>Minimum 10 Gage self-tapering</p> <p>For timber framing</p>
 <p><b>N°6 Type 'S' Needle Point</b></p> <p>NON-CORROSIVE minimum Class 3 to 5</p> <p>Minimum 10 Gage self-tapering</p> <p>For lightweight steel studs and furring channel up to 0.8mm thickness.</p>	 <p><b>N°6 Type 'S' Drill Point</b></p> <p>NON-CORROSIVE minimum Class 3 to 5</p> <p>Minimum 10 Gage self-tapering</p> <p>For steel framing 0.8mm to 1.2mm thickness.</p>
<p><b>SPAX products available at order from MgO Corp distribution agents.</b></p>	

### Exterior and Wet Area Mechanical Fixings

MgO Corp require a minimum grade 304 SPAX or 316 stainless steel non-corrosive fixtures when installing in exterior and wet areas or in corrosive air locations.

Wet Area and External Mechanical Fixing	
 <p><b>Nails</b></p> <p>Stainless Steel minimum 304 SPAX or 316</p> <p>Hardwood 25 x 2.8mm</p> <p>Softwood 30 x 2.8mm</p>	 <p><b>Self-Counter Sinking Screws</b></p> <p>Stainless Steel 304 SPAX or 316</p> <p>Minimum 10 Gage self-tapering</p> <p>For timber framing</p>
 <p><b>N°6 Type 'S' Needle Point</b></p> <p>Stainless Steel 304 SPAX or 316</p> <p>Minimum 10 Gage self-tapering</p> <p>For lightweight steel studs and furring channel up to 0.8mm thickness.</p>	 <p><b>N°6 Type 'S' Drill Point</b></p> <p>Stainless Steel 304 SPAX or 316</p> <p>Minimum 10 Gage self-tapering</p> <p>For steel framing 0.8mm to 1.2mm thickness.</p>
<p><b>SPAX products available at order from MgO Corp distribution agents.</b></p>	

**Disclaimer:** ResCom Global Building Products waives all responsibility regarding third party materials and advised the consumer to seek confirmation from the supplier / manufacture of those materials as to the suitability for use in the proposed applications.



## JOINTING INSTALLATION METHODS

Jointing and finishing of ResCom® Board installation is to be carried out in accordance with this brochure, and the following details, so as to provide a smooth surface for decorating. Where stopping and external corner beads are required, these are to be applied to all edges subject to damage.

A Level 4 Finish is generally the accepted level of finish for domestic construction (as detailed in AS2859.1:1997 Clause 6.6) and requires a three-coat system, consisting of:

- Tape (or base) coat
- Second coat, and
- Finish (or topping) coat.

### Jointing Compounds

ResCom BP recommends elastomeric jointing compounds and coatings that are classified as either setting type or drying type. Setting type compounds produce stronger joints and reduce installation compounds. They are recommended for experienced trades people and have a defined setting time e.g. 40-60 minutes.

Additional coats may be applied over setting type compounds once they have gone hard (set), usually 40 minutes to an hour. A drying type compound must be used as a finish coat and must be completely dry before sanding. This may take up to 24 hours.

Drying type compounds will shrink and harden with evaporation of water. The joints must be allowed to set and appear completely dry before re-coating or sanding. Actual drying times will be extended in low temperature and high humidity conditions. Do not use a setting type compound over a drying type compound.

All compounds can be applied by hand or with mechanical jointing tools.





### Jointing Tape

Perforated Paper Tape enable the preparation of strong joints and should be used on all butt and recess joints.

### Site Mixing of Compounds

The first step to achieving good jointing is proper mixing of the compound.

- Always use clean containers and mixing equipment.
- Always use clean water of drinking quality.
- Never mix different compounds together or mix old batches with new ones.
- Follow mixing instructions printed on each bag.
- Use compounds before the printed 'Best By' date printed on the packaging.



## IMPORTANT

When setting type compounds are used during hot, dry conditions, rapid evaporation of water and increased absorption by the lining surface can prevent the compound from setting correctly. This will result in the compound being soft and weak.

If jointing must be carried out under severe drying conditions, only small quantities of compound should be mixed. The compound should then be left standing for approximately 15 minutes to ensure that it sets soon after application to the joints. Additionally, depending on the severity of the drying conditions, the surface of the area to be jointed may require wetting with a brush before applying the compound.

Drying-type compounds should not be used when the interior temperature is less than 10°C.

## Jointing System Selection

Tape Coat	Second Coat	Finish Coat
Any of the following	Any of the following	Any of the following
BASE COAT 45	BASE COAT 45	JOINT MASTER TOPPING COAT
BASE COAT 60	BASE COAT 60	PRO-LITE TOPPING COMPOUND
WET AREA BASE COAT	WET AREA BASE	TOTAL COAT-LITE TAPE AND TOPPING EASY FINISH
TOTAL COAT-LITE TAPE & TOPPING	TOTAL COAT-LITE TAPE & TOPPING	

### Approximate Quantities Per 100m<sup>2</sup> ResCom Board (Horizontal Sheeting)

Tape & Second Coat	Coat Approximate QTY	Finish Coat	Coat Approximate QTY
BASE COAT 45/60	16kg	JOINT MASTER TOPPING COAT	8kg
WET AREA BASE COAT	15kg	PRO-LITE TOPPING COMPOUND (PREMIXED)	7kg
TOTAL COAT LITE (PREMIXED)	16kg	TOTAL COAT LITE (PREMIXED)	6kg
TOTAL COAT LITE	13kg	TOTAL COAT LITE	5kg
TAPE AND TOPPING	15kg	TAPE AND TOPPING EASY FINISH	10kg/8kg

\* Allow 20% more jointing material for vertical sheeting

## RECESSED JOINTS

ResCom BP recommends the use of curved trowels when setting recessed joints. Under normal pressure, a curved trowel defects enabling the preparation of a more consistent joint. A 200mm curved trowel is recommended for second coat application, while a 275mm curved trowel is recommended for the finish coat.

### Tape Coat

- Fill recess in ResCom® Board evenly and fully with compound using a 150mm broad knife.
- Bed in PAPER TAPE centrally over the joint and cover lightly with compound.
- Cover all fastener heads and fill any surface damage with compound.
- Allow setting-type compounds (BASE COAT) to set for at least one hour, and drying type compounds to harden for 24 hours.

### Second Coat

- When the tape coat is dry, apply a second coat, about 180mm wide, finishing slightly above the board surface, and feather joint edges.
- Cover fastener heads with a second coat of compound, laid in a different direction, and extending beyond the first coat by about 25mm.
- Allow setting-type compounds to set for at least one hour, and drying type compounds to harden for 24 hours.





## Finish Coat

- When the second coat is dry, apply a thin finish coat of topping compound centrally over the previous coat, about 270mm wide. It may be useful to soften the outer edges of the newly trowelled compound with a damp water brush or sponge before feathering the edges with the trowel.
- Cover previously stopped fastener heads with a third coat of compound, laid in a different direction, extending beyond the previous coat by about 25mm. Ensure that the edges of the compound are neatly feathered and that there are no trowel edge marks left in the final stopping.

## Sanding

- Allow the finish coat of compound to dry, for at least 24 hours. Sand smooth with 150 grit paper or cloth, or with 220 grit sanding mesh. Avoid any heavy pressure which might scuff the heads of the fixings and ResCom® Board.
- Caution: If previous coats of drying type compounds are not thoroughly dry before application of subsequent coats, imperfections can result from delayed shrinkage of the compound.

# BUTT JOINTS

## Tape Coat

- Apply a thin layer of elastomeric compound over the joint, (filling any recess created by back-blocking methods).
- Bed PAPER TAPE and apply a thin coat of compound over the top of the tape. The compound must be spread approximately 150mm each side of the joint.

## Second Coat

- When the tape coat is dry, apply a second coat of compound about 200mm wide to each side of the joint. This should have a gradual convex camber over the joint surface.

## Finish Coat

- When the second coat is dry, apply a finish coat of topping compound centrally over the previous coat to form an even camber over the joint about 250mm each side of the joint. Soften the outer edges of the compound with a damp water brush or sponge before feathering the edges with the trowel.

## Sanding

- Allow the finish coat of compound to dry for at least 24 hours. Sand smooth with 150 grit paper or cloth, or with 220 grit sanding mesh.
- Finished joints should have an even and slightly convex camber from edge-to-edge as shown.

# INTERNAL CORNERS

- Apply a tape coat to both sides of the corner, and bed in the tape centrally over joint.
- When the tape coat is dry, apply a thin coat of finishing compound over the tape coat ensuring that the edges are well feathered.
- When dry, sand smooth with 150 grit paper or cloth, or with 150/180/220 grit sanding mesh.

# EXTERNAL CORNERS AND ARCH BEADS

- Position external angle bead over the corner and sight it to ensure straightness before fastening both flanges at 300mm centres.
- External corners and arch beads are finished with a three-coat compound system applied to the same specifications as for joints.
- When compound is dry, sand smooth with 150 grit paper or cloth, or with 150/180/220 grit sanding mesh.





## Jointing with Mechanical Tools

The use of mechanical tools to ResCom® Board is becoming more popular, and used correctly, these tools can significantly increase productivity by cutting the amount of time taken to finish a job.

Premixed compounds should be used directly from the bucket, but can, if necessary, be thinned down with water, used sparingly. Follow the instructions provided on the packaging.

## Methods

ResCom® Board may be scored and snapped, cut, trimmed, drilled or shaped using ordinary power or hand tools. ResCom® Board panels may be fastened to supporting joists using self-drilling, self-counter sinking corrosion protected screws. ResCom BP recommends a minimum class 3 to 5 non-corrosive screws/nails for internal wall and ceiling installation (excluding wet areas). For external and wet area installations, it is recommended to use 304 SPAX or 316 stainless steel non-corrosive screws.

Fasteners should be spaced at 12" (305mm) intervals along edges. Spacing may be increased to 18" (475mm) at intermediate joists. The smooth side of the ResCom® Board is suitable for painting or wallpapering with no further preparation and the rough side must apply a prime coat of acrylic-siloxane waterproofing sealer, followed by oil based paint.

Where ResCom® Board is to be used as a mounting surface for ceramic tile, such as in a bathroom or shower enclosure, solvent based tile mastic is recommended.

ResCom® Board recommended assemblies consist of wall, interior wall, shaft wall, steel column, staircase, ceiling, floors and roofing.

## Precautions

- Avoid handling ResCom® Board panels when wet.
- Allow to dry before applying joint finishing materials.
- ResCom® Board does not contain any known cancer causing materials.
- Use of a dust mask is recommended during cutting and sanding operations.
- Use of gloves is suggested to reduce the possibility of abrasion injuries.
- Fasteners should not be closer than 2" (51mm) from a corner, with the adjoining screw not less than 4" (102mm) from the same corner.
- Do not install screws on a 45-degree angle at corners.
- Board ends must be supported by joists
- Fasteners must always be installed over supporting structure suitable for application of ceramic tile.
- Do not install surface coverings by driving screw fasteners, except over supporting structure.
- Cantilever overhangs are not recommended.
- Fasteners should not be closer than 3/4" (19.1mm) from any edge.
- Do not fasten coverings directly to ResCom® Board with mechanical fasteners (nails, screws, staples, etc.)

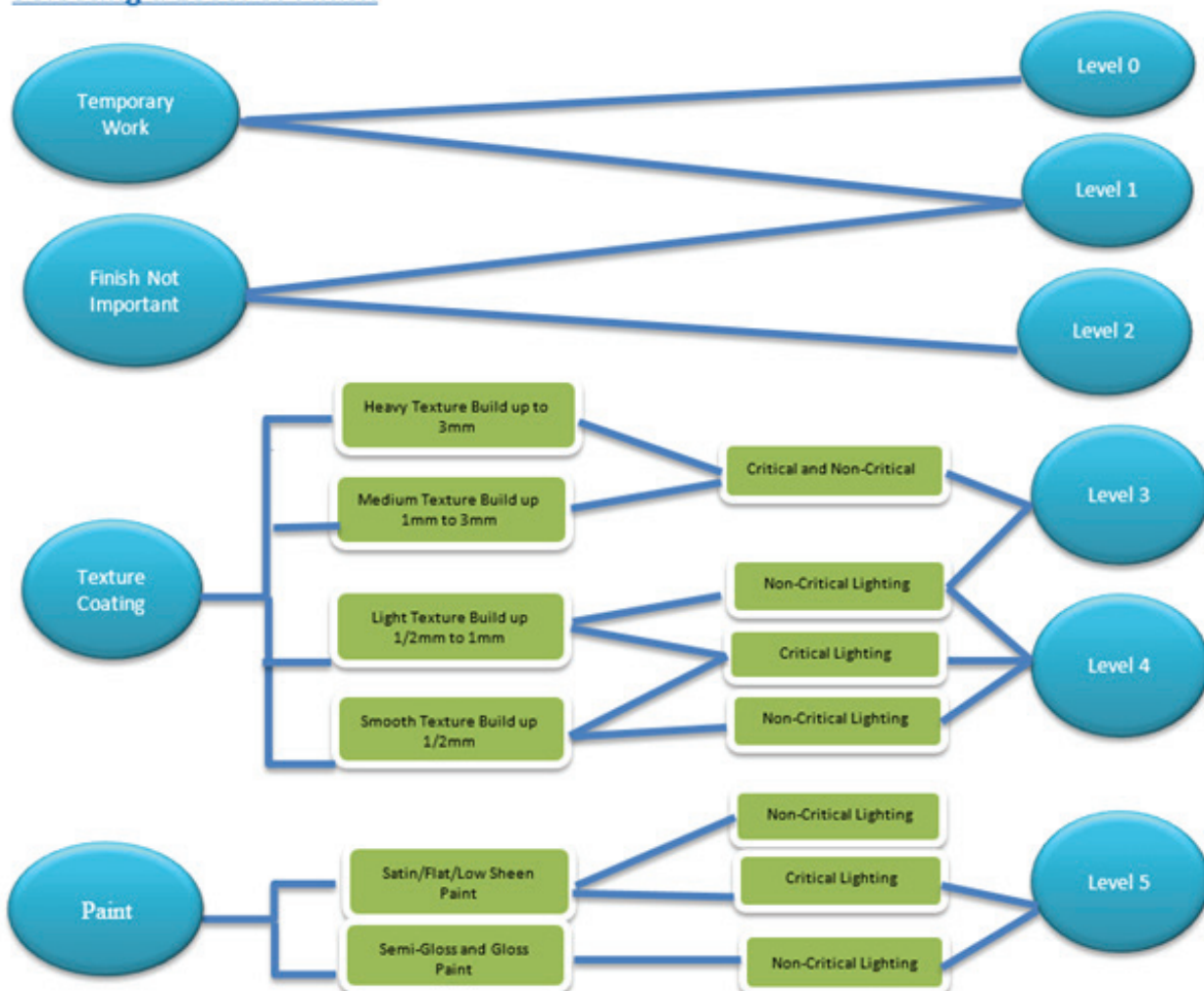
## FINISHING

ResCom® Board is a cold form composite product that the surface may, at times, incur superficial pitting to the face. In the event of pitting to the face of the board it is best to apply a skim coat finish to the affected areas, allow to dry, and sand smooth prior to application of the finish coatings. Finished coatings are to be applied:

1. Primer sealer, to be roller applied and allowed to dry (Second coat may be required to gain the required level of finish)
2. Apply first coat of finishing by roller, allow to dry
3. Final coats

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### Selecting a Level of Finish





#### Level 0

This level may be useful in temporary construction. No stopping, taping, finishing or accessories are required.



#### Level 1

For use in plenum areas above ceilings, in areas where work would generally be concealed, or in building service corridors and other areas not normally open to public view. Tool marks and ridges are generally acceptable.



#### Level 2

For use in warehouse, storage or other similar areas where surface finish is not of primary concern. Surfaces should be free of excess joint compound. Some minor tool marks and visible edges are generally acceptable.



#### Level 3

For use in areas which are to receive heavy or medium texture (spray or hand applied) finishes before final painting, or where heavy grade wall coverings are to be applied as a final decoration. All joint compound is to be finished smooth. (Generally, this is achieved by scraping of nibs and ridges and the like, with the edge of a trowel.)



#### Level 4

This is generally the accepted level of finish for domestic construction. All joint compound should be sanded to a smooth finish free of tool marks and ridges.



#### Level 5

This level of finish should be used wherever gloss or semi-gloss paints are to be used, and where critical lighting conditions occur with painted surfaces such as large flat wall and ceiling areas, where severe glancing light will occur from large window openings or skylights, or where artificial silhouette and spot lighting is to be used. All joint compound should be sanded to a smooth finish free tool of marks and ridges. This should be followed by the application of proprietary surface preparations such as board sealers, and/or in the most critical areas, skim coating to remove differential surface textures and porosity.

Note: skim coating is a term used to describe a thin finish coat, towelled or airless sprayed and then possibly sanded, to achieve a smooth and even finish. It is normally less than 1mm in thickness and is applied over the entire surface to fill imperfections in the joint work, smooth the paper texture and provide a uniform surface for decorating.

## Summary of Level of Finish Dependent on Installation Requirements

It should be noted that domestic application should be prepared to a minimum level 4 finish unless specifically a higher level of finish is agreed by all contracting parties.

### ResCom Board Installation Requirements for Category A Timber Frames

Joint between frame and back block											Joint & Finishing
Length of Finish	Max. Frame Alignment Deviation (mm)	Horizontal Wall Sheet Fixing	Ceilings		Walls		Adhesive & Fastener Fixing	Screw Only Fixing	Approved Internal Corner Fixing System	Stopping & External Corner Metal	Butt & Recess Joints Internal & External Corners
			Butt	Recess	Butt	Recess					
0	^	^	^	^	^	^	*	*	^	^	NIL
1	6	^	^	^	^	^	*	*	*	^	Tape Coat
2	6	^	^	^	^	^	*	*	*	^	Tape Coat & Second Coat
3	5	*	^	^	^	^	*	*	*	^	Tape Coat & Second Coat
4	4	*	*	#	^	^	*	*	*	*	Tape Coat, Second Coat & Finish Coat
5	3	*	*	*	*	^	*	/	*	*	Tape Coat, Second Coat, Finish Coat & Skim Coat to entire surface

### ResCom Board Installation Requirements for Category B Timber Frames

3	5	*	^	^	^	^	*	/	*	^	Tape Coat & Second Coat
4	5	*	*	#	^	^	*	/	*	*	Tape Coat, Second Coat & Finish Coat
5	3	^	*	*	^	^	*	/	*	*	Tape Coat, Second Coat, Finish Coat & Skim Coat to entire surface

Key to Symbols:

^ Not Applicable

\* Mandatory

Other Symbols see notes

**Level 4: # Back blocking required where three or more recessed joints occur in a continuous ceiling area.**

**Level 5: / Screw only fixing may be used when a fastening to metal furring system is used. Where butt joint in a wall is less than 400mm long and is located more than 2 metres from the floor, there may be no need to provide back blocking.**

## ResCom Board Installation Requirements for A Category Steel Frames

Joint Between Frame & Back Block											Joint & Finishing
Length of Finish	Max. Frame Alignment Deviation (mm)	Horizontal Wall Sheet Fixing	Ceilings		Walls		Adhesive & Fastener Fixing	Screw Only Fixing	Approved Internal Corner Fixing System	Stopping & External Corner Metal	Butt & Recess Joints Internal & External Corners
			Butt	Recess	Butt	Recess					
0	^	^	^	^	^	^	*	*	^	^	NIL
1	6	^	^	^	^	^	*	*	*	^	Tape Coat
2	6	^	^	^	^	^	*	*	*	^	Tape Coat & Second Coat
3	5	*	^	^	^	^	*	*	*	^	Tape Coat & Second Coat
4	4	*	*	#	^	^	*	*	*	*	Tape Coat, Second Coat & Finish Coat
5	3	*	*	*	*	^	*	*	*	*	Tape Coat, Second Coat, Finish Coat & Skim Coat to entire surface
<b>Key to Symbols:</b>		^ Not Applicable			* Mandatory			Other Symbols see notes			
<b>Level 4: # Back blocking required where three or more recessed joints occur in a continuous ceiling area. Where a butt joint in a wall is less than 400mm long and is located more than 2 metres from the floor there may be no need to provide back blocking.</b>											





## COATING and FINISHING SYSTEM SELECTION

Any of the Following

### ROCKCOTE

Step 1	Step 2	Step 3	Step 4
ROCKCOTE PATCH & PREP & ROCKCOTE MESH (Trowel or Spatula)	ROCKCOTE KEYCOTE (Trowel)	ROCKCOTE ACRYLIC TEXTURE COARSE/MEDIUM/SMOOTH (Trowel)	ROCKCOTE ARMOUR LOW SHEEN X 2 COATS (Roller or as per supplier's specifications)
ROCKCOTE SMOOTH SET & MESH TO JOINTS (Trowel)	SMOOTH SET X 1 COAT (Trowel)	ROCKCOTE ECOSTYLE SEALER/UNDERCOAT (Brush or roller or as per supplier's specifications)	ECOSTYLE LOW SHEEN X 2 COATS (Brush or roller or as per supplier's specifications)
ROCKCOTE PATCH & PREP & ROCKCOTE MESH (Trowel or Spatula)	ROCKCOTE KEYCOTE (Trowel)	ROCKCOTE TEXPRIME (Trowel)	ROCKCOTE SANDCOTE (Roller or as per supplier's specifications)

### TAUBMANS – EXTERIOR

Step 1	Step 2	Step 3	Step 4
RENDER FINISH – TAUBMANS PREPRIGHT TRADITIONAL UNDERCOAT (D862) (Brush or Roller)	ARMAWALL POLYMER RENDER (D0238) (Brush or Roller)	ARMAWALL ARMASHEILD (D0245) (Brush or Roller)	ARMAWALL ARMASHEILD (D0245) (Brush or Roller)
PAINT FINISH – TAUBMANS PREPRIGHT TRADITIONAL UNDERCOAT (D862) (Brush or Roller)	ARMAWALL ARMASHEILD (D0245) (Brush or Roller)	ARMAWALL ARMASHEILD (D0245) (Brush or Roller)	

### TAUBMANS – INTERIOR

PAINT FINISH – TAUBMANS PREPRIGHT TRADITIONAL UNDERCOAT (D862) (Brush or Roller)	TAUBMANS ENDURE INTERIOR LOW SHEEN (D172) (Brush or Roller)	TAUBMANS ENDURE INTERIOR LOW SHEEN (D172) (Brush or Roller)	
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**\* DISCLAIMER – ResCom waives all responsibility regarding their party materials and advises the consumer to seek confirmation from the supplier/manufacturer of those materials as to the suitability for use in the proposed application.**

# 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

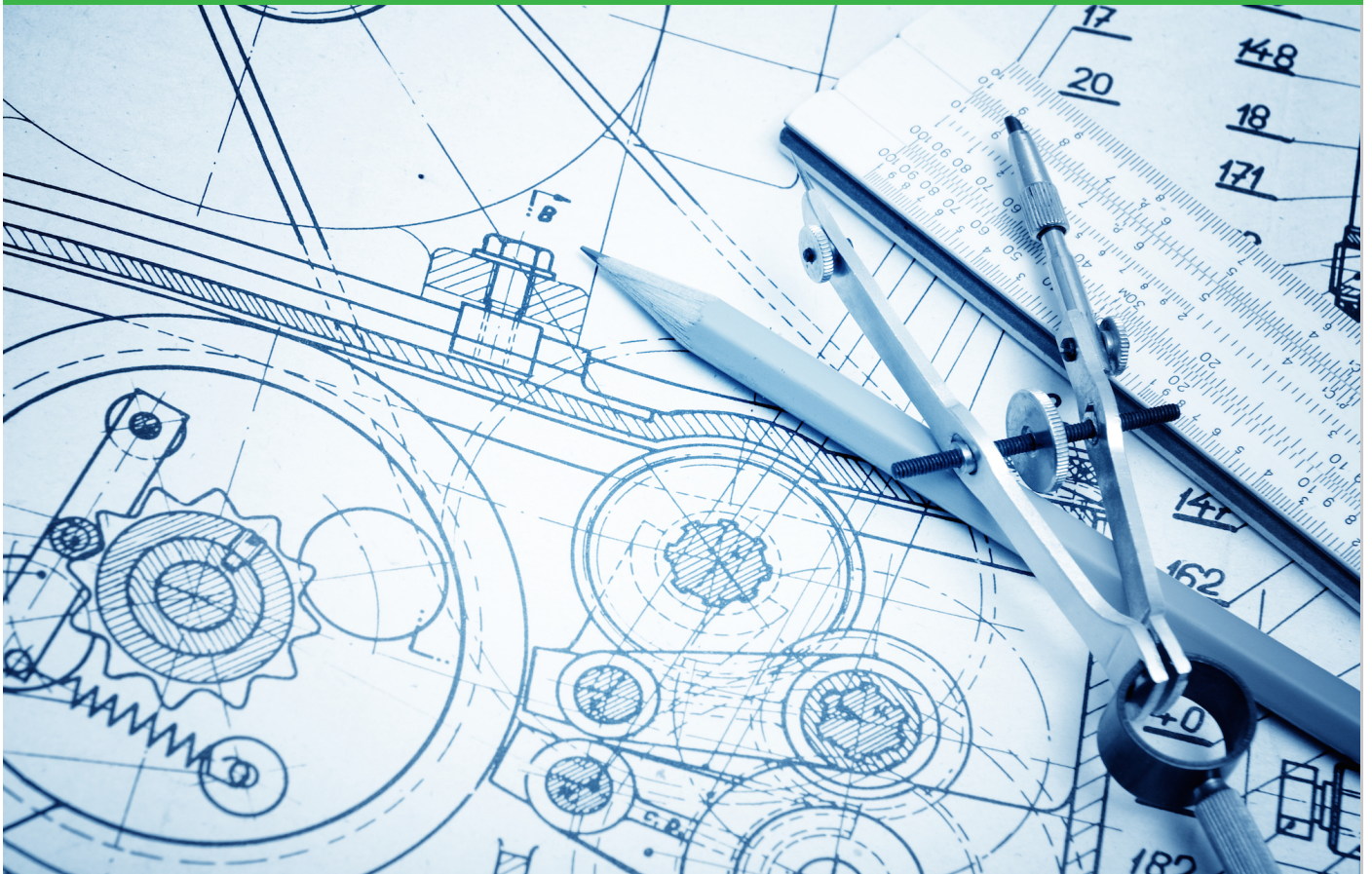
Test Pressure (Pa)	Duration (mins)	Comments
<b>227 – 455</b>	5	No Water Penetration
<b>303 – 606</b>	5	No Water Penetration
<b>455 - 910</b>	5	No Water Penetration

### 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.





**NCC:2019**

**CERTIFICATION & COMPLIANCE  
UNDER ASSESMENT METHOD A2.2:**

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**INDEPENDENT**

**EXPERT JUDGEMENT  
EVIDENCE OF SUITABILITY**



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

# Product Technical Statement



<b>Company;</b>	<b>ResCom® Global Building Products, ResCom® Building Products LLC</b>	
<b>Product Name;</b>	ResCom® (CMC) Wall & Floor 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>	10mm, 12mm, 14mm, 16mm, 18mm 20mm Cellulose Magnesia Cement (CMC) Board Used in construction as an internal or external wall lining & Flooring board	
<b>Performance Requirements; ISO 8336: 2017 Fibre Cement Flat Sheet</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>BCA (2019);BBA; IRC &amp;IBC</b>	Volume One (Amdt 1) - N/A	Volume Two – N/A

## 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;	
	EN 12467:2012 + A1:2016 (E)	Fibre Cement Flat Sheets – Product Specification and Test Methods
	EN 317:1993	Particleboards and Fibreboards – Determinations of Swelling in Thickness After Immersion in Water
	EN 12467:2012 + A1:2016	Fibre-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 British Standards listed above.	
<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 Panelling 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 documents 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: 12<sup>th</sup> March 2021

Expiry Date: 30<sup>th</sup> March 2022

Product Technical Statement Number: 100108

# Product Technical Statement

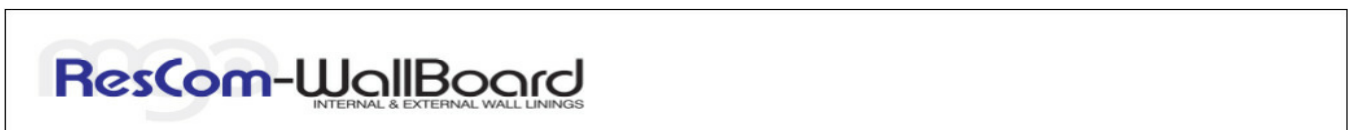


## Product Technical Data

<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 Panelling
<b>Product specification;</b>	

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

1. ResCom® 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;



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

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# 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

<b>Installation requirements;</b>	<p>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.</p> <ol style="list-style-type: none"><li>1. ResCom® Installation Manual <a href="https://ResCom@bp.com/technical-manuals/">https://ResCom@bp.com/technical-manuals/</a></li><li>2. ResCom® Multipurpose Air Barrier <a href="https://ResCom@bp.com/wp-content/uploads/2020/02/Rainscreen.pdf">https://ResCom@bp.com/wp-content/uploads/2020/02/Rainscreen.pdf</a></li><li>3. ResCom® Shaft Liner Systems Engineering Report <a href="https://ResCom@bp.com/technical-manuals/">https://ResCom@bp.com/technical-manuals/</a></li><li>4. ResCom® Fire and Acoustic Systems Manual <a href="https://ResCom@bp.com/technical-manuals/">https://ResCom@bp.com/technical-manuals/</a></li><li>5. InsulCore Mineral Wool Insulation Manual <a href="https://ResCom@bp.com/wp-content/uploads/2020/02/InsulCore%20Brouchure%202019_compressed.pdf">https://ResCom@bp.com/wp-content/uploads/2020/02/InsulCore%20Brouchure%202019_compressed.pdf</a></li><li>6. Product Storage and Handling <a href="https://ResCom@bp.com/product-storage-handling/">https://ResCom@bp.com/product-storage-handling/</a></li><li>7. Limited Liability Warranty <a href="https://ResCom@bp.com/product-storage-handling/">https://ResCom@bp.com/product-storage-handling/</a></li><li>8. ResCom® MSDS <a href="https://ResCom@bp.com/product-storage-handling/">https://ResCom@bp.com/product-storage-handling/</a></li></ol>
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Issue Date: 12<sup>th</sup> March 2021

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# Product Technical Statement



## Evaluation Statements

### Evaluation methods;

PCME Certifications has followed the following procedures for compiling of ResCom Global Building Products & ResCom Building Products LLC- ResCom® Wall & Floor 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.*

## 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: 12<sup>th</sup> March 2021

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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: 12<sup>th</sup> March 2021

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(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

Issue Date: 12<sup>th</sup> March 2021

Expiry Date: 30<sup>th</sup> March 2022

Product Technical Statement Number: 100108



# Product Technical Statement



## Scope of Supplier Technical Statement:

The PCME (Product Compliance Made Easy) Product Technical Statement is to confirm that the relevant requirements of the European Standards as claimed have been met. The responsibility for the product performance and its fitness for the intended use remain with the Supplier Technical Statement Holder. PCME Certification ensures all requirements to be classed as "Product Technical Statement", for demonstrating compliance are fulfilled.

## Disclaimer:

The scheme Owner, Scheme Administrator do not make any representations, warranties or guarantees, and accepts no legal liability whatsoever arising from or connected to, the accuracy, reliability, currency or completeness of any material contained within this certificate; the Scheme Owner, Scheme Administrator disclaim to the extent permitted by law, all liability (including negligence) for any claims of losses, expenses, damages and costs arising as a result of the use of the product(s) referred to in this Product Technical Statement.

**Note:** This Product Technical Statement is only valid when reproduced in its entirety.

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*Stefan Ossenberg*

A handwritten signature in blue ink, appearing to read 'Stefan Ossenberg', with a stylized, overlapping flourish.

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: 12<sup>th</sup> March 2021

Expiry Date: 30<sup>th</sup> March 2022

Product Technical Statement Number: 100108



# CERTIFICATE

## Engineering Evaluation Certificate

No.6405 I02R00

**ISSUED** 02 May 2019

**EXPIRY** 30 April 2023

### ResCom Magnesium Oxide Board

This engineering certificate serves as a certificate from a professional fire engineer in accordance with Clause A5.2 (1)(e) of the National Construction Code Volume One Building Code of Australia 2019

Ignis Solutions reserves the right to amend or withdraw this assessment if information becomes available which indicates the stated fire performance may not be achieved

#### PRESENTED TO

#### Magnesium Oxide Board Corporation Pty Ltd

8 Piper Street Caboolture Queensland Australia 4510

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

[admin@rescombp.com.au](mailto:admin@rescombp.com.au)

+61 7 5432 9890

#### ENGINEERING BODY

#### Ignis Solutions Pty Ltd

ABN 24 160 047 125

PO Box 5174

Braddon ACT 2612

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



#### Product Description

- The ResCom board is a Composite cold form ceramic magnesia base lining Board for building walls and other construction areas where a non-combustible material or a Fire Resistance Level is required,
- 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 Ceiling, Wall or Floor, the equivalent FRL design or better must be replicated to the tested system.
- Product Name: ResCom Board.
- Product Size: 4mm to 50mm in thickness, 1220mm x 2440mm, 2745mm and 3050mm

#### Scope of Use

- The ResCom Board is permitted to be used as an element of building ceiling, 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.
- The ResCom Board is suitable to be penetrated as per BCA Clause C3.15 by a tested system, be provided as an additional fire protective covering to existing wall systems.
- The ResCom Board is to be installed in accordance with the ResCom Technical Installation Manual Edition 6.
- 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.
- The ResCom board has been tested, evaluated and is suitable to be used based on testing for:
  - Single direction boundary walls to -/90/90
  - Duel direction walls up to -/240/240
  - Protection of steel columns
  - Intertenancy separation walls

#### National Construction Code – Volume One 2019

- Clause A2.0 (1) complying with the Governing Requirements of the NCC
- Schedule 3 Definitions – Non-combustible – Tested to AS 1530.1
- Clause A5.2 sub-clause (1)(e) as evidence to support that the ResCom Board meets the nominated Performance Requirements under an Engineering Certificate.
- Deemed-to-Satisfy Schedule 5 – Fire-Resistance of Building Elements – Where the wall system A, B, C and D is applied.
- 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 Schedule 5.
- 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).
- 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)

#### National Construction Code – Volume Two 2019

- Clause A2.0 (1) complying with the Governing Requirements of the NCC.
- Clause 5.2 sub-clause (1)(e) as evidence to support that the ResCom Board meets the nominated Performance Requirements under an Engineering Certificate.
- Part 3.7.2 Fire Separation and Part 3.10.5 Bushfire Areas – The 6mm 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.

**Benjamin Hughes-Brown**

FIEAust, CPEng, NER, APEC Engineer, IntPE (Aust)

Chartered Professional Engineer, FPAA Professional Engineer

CPEng, NER (Fire Safety, Mech) 2590091, RPEQ11498, BPB-C10-1875, EF-39394

MFireSafety (UWS), BEng (UTS), GradDipBushFire (UWS), DipEngPrac (UTS), DipEng (CIT)



CONFIDENTIAL

# IGNIS COMPLIANCE SCHEDULE

## 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 2019 (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 PUR 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 Rw(C<sub>r</sub>) 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 Rw(C<sub>r</sub>) 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 Rw(C<sub>r</sub>) 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 Rw(C<sub>r</sub>) 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.

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 ~~8-2017~~).

## 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 Schedule 5 for where building elements are to achieve a Fire Resistance Level. Clause A5.4 requires compliance in accordance with Schedule 5.

Schedule 5 – 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

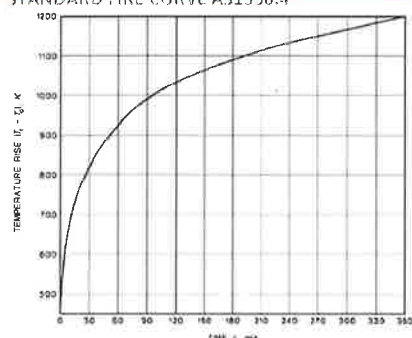


FIGURE 2.3 (STANDARD TIME vs TEMPERATURE RISE CURVE)

### 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 materials 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 1530.4-2005 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 gauge steel studs at nominally 600mm centres and 2.5kg 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

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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-

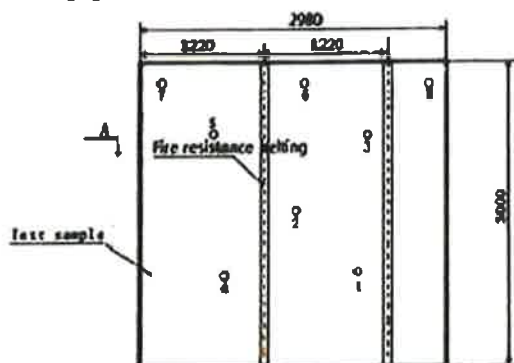
- It is identical with a prototype that has been submitted to the Standard Fire Test and the resistance to the incipient spread of fire achieved by the prototype is confirmed in a report from a Registered Testing Authority which-
  - describes the method and conditions of the test and form of construction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

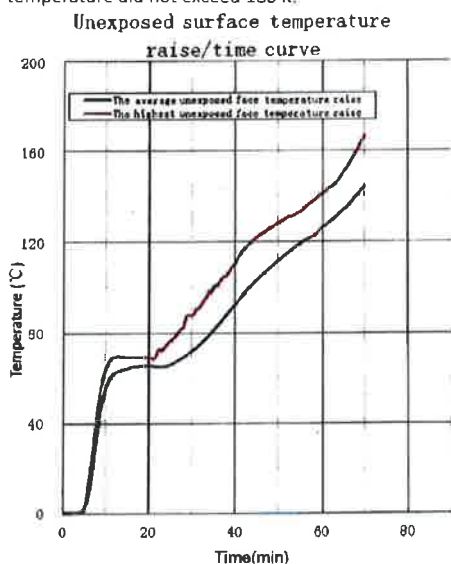


Clause 4.7.4 of AS 1530.4 details the criteria of failure for the incipient spread of fire being deemed to have occurred when the average temperature of the five thermocouples at any one of the locations has risen by more than 180K above the initial temperature.

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.

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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 large 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. Reference Documents

- National Construction Code – 2019 – Volume One – Building Code of Australia Class 2 to 9 Buildings.
- Guide to the Building Code of Australia 2019– Volume One, Class 2 to Class 9 Buildings’, Australian Building Codes Board, 2019 (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.

### J. Conclusion

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 2019 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.

### K. Conditions and Limitations

This certificate is limited to the details within this document including the above compliance elements, product description and scope. This report is to be read, considered and used as a whole document.

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.

The ResCom Board is to be installed in accordance with the ResCom Technical Installation Manual Edition 6.

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.
- 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.

Ignis Solutions Pty Ltd provides no certification, guarantee, indemnity or warranty, to **MgO Corp** or any third party

## 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

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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**

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**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**

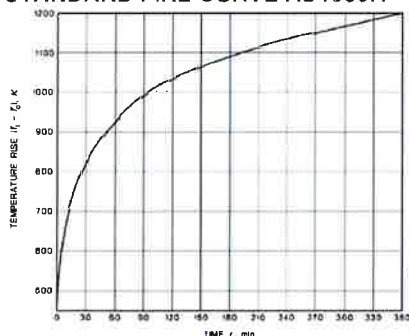


FIGURE 2.3 STANDARD TIME vs TEMPERATURE RISE CURVE

**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 1530.4-2005 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 2.5kg 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.

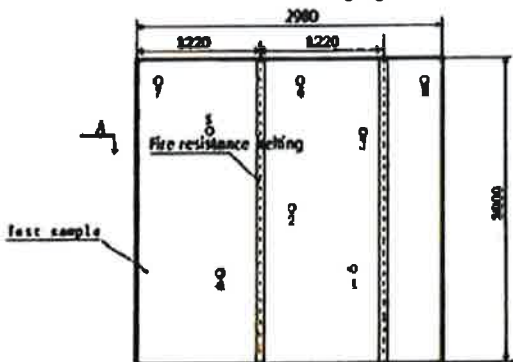
Clause A2.5 details the requirements for Resistance to the incipient spread of fire. A ceiling is deemed to have the resistance to the incipient spread of fire to the space above itself if-

- (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.

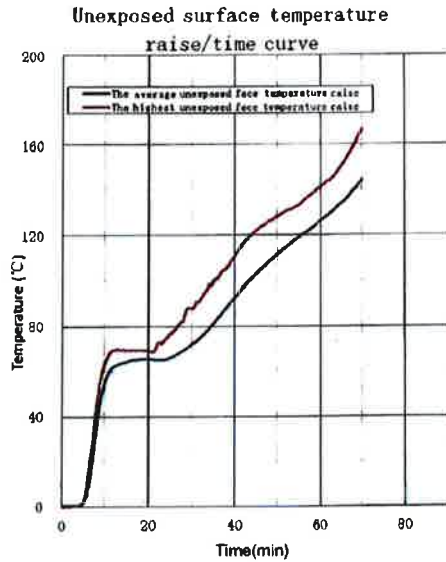


Clause 4.7.4 of AS 1530.4 details the criteria of failure for the incipient spread of fire being deemed to have occurred when the average temperature of the five thermocouples at any one of the locations has risen by more than 180K above the initial temperature.

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 large 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 wide 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  $R_w(C,C_{ir})$  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.

  
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FIEAust CPEng NER  
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MFireSafety (UWS), BEng (UTS), GradDipBushFire (UWS), DipEngPrac (UTS), DipEng (CIT)

## IGNIS Advisory Note

Evaluation No.5043  
Issue 01 Revision 01 [2017]

# RESCOM STRUCTURAL STEEL PROTECTION

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### 1 Introduction

Ignis Solutions has been engaged by Profire WA as well as MgO Corp to review and calculate the required thickness and protection of structural steel members by ResCom Boards for various FRL requirements. The calculations consider BHP steel data.

### 2 Background

The properties of steel can change when it is subjected to heat. This is considered to be particularly important when steel is used to provide structural support for buildings and their features.

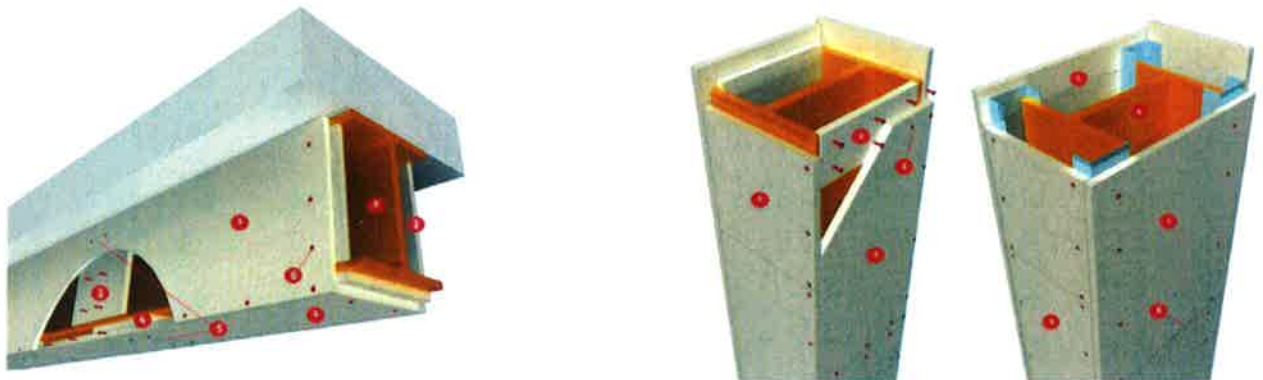
Therefore, it is imperative that the temperature of the steel is known so that adequate measures may be implemented, to the degree necessary, to ensure structural failure doesn't occur and/or affect life safety.

The calculations are based on internal first principle spread sheet based on Buchanan, A., "Structural Design for Fire Safety", John Wiley & Sons, England 2001.

The calculations consider three sided and four sided protection. The following images are extracted from the ResCom MgO General Installation Manual

FIGURE 1:

BEAM AND COLUMN PROTECTION EXAMPLE



### 3 Calculations

The rate at which the steel member heats up to reach its limiting temperature is dependent on the temperature of the fire. The calculations considers the standard ISO 834 time-temperature curve.

The presence of insulation causes steel to heat up more slowly than when steel is unprotected. The calculations considers the ResCom board to have a density of 1107 kg/m<sup>3</sup>, thermal conductivity of 0.44 W/mK and Specific Heat of 1200 J/kgK.

### 4 Summary

The following tables detail the required thickness of protection needed. The installation is to be in accordance with the ResCom General Installation Manual. Where the thickness exceeds the available single thickness, multiple layers can be applied to achieve the required thickness. I.e. 30mm can be made up of 1 layer 20mm plus 1 layer 10mm.

**Benjamin Hughes-Brown** FIEAust CPEng NER

Chartered Professional Engineer  
CPEng, NER (Fire Safety / Mech) 2590091 RPEQ 11498,  
BPB-C10-1875, EF-39394, TDJ-CC6504  
MFireSafety (UWS), BEng (UTS), GradDipBushFire  
(UWS), DipEngPrac (UTS), DipEng (CIT)



**ResCom Board Thickness of Hollow Protected Steel (mm)**

	60 mins		120 mins		180 mins		240 mins	
	3 Sided	4 Sided	3 Sided	4 Sided	3 Sided	4 Sided	3 Sided	4 Sided
	<b>Welded Beams</b>							
1000WB215	12	14	20	22	26	28	32	34
1000WB258	12	12	20	22	26	28	32	34
1000WB296	12	12	18	20	26	28	30	34
1000WB322	10	12	18	20	24	26	30	32
1200WB249	12	13	20	22	28	28	34	34
1200WB278	11	12	20	22	26	28	34	34
1200WB317	11	12	20	20	26	28	32	34
1200WB342	11	12	20	20	26	28	30	34
1200WB392	10	12	18	20	24	26	30	32
1200WB423	10	12	18	20	24	26	30	32
1200WB455	10	12	18	20	24	26	30	32
700WB115	12	14	20	22	26	28	32	34
700WB130	12	14	20	22	26	28	32	34
700WB150	12	14	20	22	26	28	32	34
700WB173	11	12	20	22	26	28	32	33
800WB122	14	14	22	22	28	30	34	36
800WB146	12	14	20	22	26	28	32	34
800WB168	12	14	20	22	26	28	32	34
800WB192	11	12	20	22	26	28	32	34
900WB175	12	14	20	22	26	28	32	34
900WB218	11	12	20	22	26	28	32	34
900WB257	11	12	18	20	26	28	30	34
900WB282	11	12	18	20	24	26	30	32
<b>Welded Columns</b>								
500WC440	10	10	14	16	18	22	22	28
500WC414	10	10	14	16	18	22	24	28
500WC383	10	10	14	16	20	22	24	28
500WC340	10	10	14	18	20	23	24	30
500WC290	10	10	16	18	20	24	26	30
500WC267	10	10	16	18	22	24	26	30
500WC228	10	12	16	18	22	26	26	30
400WC361	10	10	14	16	18	22	24	28
400WC328	10	10	14	16	20	22	24	28
400WC303	10	10	14	18	20	24	24	28
400WC270	10	10	14	18	20	24	24	30
400WC212	10	10	16	18	22	24	26	30
400WC181	10	12	16	20	22	26	26	30
400WC144	10	12	16	20	22	26	26	32
350WC280	10	10	14	16	20	22	24	28
350WC258	10	10	14	18	20	24	24	28
350WC230	10	10	14	18	20	24	24	28
350WC197	10	10	16	18	20	24	26	30



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ResCom Board Thickness of Hollow Protected Steel (mm)

	60 mins		120 mins		180 mins		240 mins	
	3 Sided	4 Sided	3 Sided	4 Sided	3 Sided	4 Sided	3 Sided	4 Sided
	<b>Universal Beams</b>							
610UB125	12	14	20	22	26	28	32	34
610UB113	12	14	20	22	26	28	32	34
610UB101	12	14	20	22	26	28	32	34
530UB92.4	12	14	20	22	26	28	32	34
530UB82.0	12	14	20	22	26	28	32	34
460UB82.1	12	14	20	22	26	28	32	34
460UB74.6	12	14	20	22	26	28	32	34
460UB67.1	12	14	20	22	26	28	32	34
410UB59.7	12	14	20	22	26	28	32	34
410UB53.7	13	14	20	22	26	28	32	34
360UB56.7	12	14	20	22	26	28	32	34
360UB50.7	12	14	20	22	26	28	32	34
360UB44.7	12	14	20	22	26	28	32	34
310UB46.2	12	14	20	22	26	28	30	34
310UB40.4	12	14	20	22	26	28	30	34
310UB32.0	13	14	20	22	26	28	32	34
250UB37.3	12	14	20	22	26	28	30	34
250UB31.4	12	14	20	22	26	28	30	34
250UB25.7	14	14	20	22	26	28	32	34
200UB29.8	12	14	20	22	26	28	30	34
200UB25.4	12	14	20	22	26	28	30	34
200UB22.3	12	14	20	22	26	28	30	34
200UB18.2	14	14	20	22	26	28	32	34
180UB22.2	12	14	20	22	26	28	30	34
180UB18.1	14	14	20	22	26	28	30	34
180UB16.1	14	14	20	22	26	28	30	34
150UB18.0	12	14	20	22	26	28	30	34
150UB14.0	14	14	20	22	26	28	30	34
<b>Universal Columns</b>								
310UC96.8	10	12	18	20	22	26	28	32
310UC158	10	11	16	18	22	26	26	30
310UC137	10	11	16	20	22	26	26	30
310UC118	10	11	16	20	22	26	26	32
250UC89.5	10	12	18	20	22	26	28	32
250UC72.9	10	12	18	20	22	26	28	32
200UC59.3	10	12	18	20	22	26	28	32
200UC52.2	10	12	18	20	24	26	28	32
200UC46.2	12	14	18	20	24	26	28	32
150UC37.2	12	14	18	20	24	26	28	32
150UC30.0	12	14	18	20	24	26	28	32
150UC23.4	12	14	18	22	24	28	28	32
100UC14.8	12	14	18	20	24	26	28	32



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ResCom Board Thickness of Hollow Protected Steel (mm)

	60 mins		120 mins		180 mins		240 mins	
	3 Sided	4 Sided	3 Sided	4 Sided	3 Sided	4 Sided	3 Sided	4 Sided
	<b>Parallel Flange Channel</b>	10	10	10	10	10	10	10
380*100PFC	10	10	14	16	22	24	28	32
300*90PFC	10	10	16	18	22	26	28	34
250*90PFC	10	10	16	18	22	26	30	34
230*75PFC	10	10	18	20	24	28	30	36
200*75PFC	10	10	18	20	24	30	32	38
180*75PFC	10	10	18	22	24	30	32	38
150*75PFC	10	12	18	22	26	32	32	40
125*65PFC	10	12	20	24	26	34	34	42
100*50PFC	12	14	20	26	28	36	36	44
75*40PFC	12	16	22	28	30	38	36	48
<b>Taper Flange Beams</b>								
125*65TFB	10	12	20	24	26	34	34	42
100*45TFB	12	14	22	26	30	36	36	46
<b>Equal Angles</b>								
200EA26	10	10	12	14	16	22	22	30
200EA20	10	10	12	14	16	22	22	30
200EA18	10	10	12	14	16	22	22	30
200EA16	10	10	12	14	16	22	22	30
200EA13	10	10	12	14	16	22	22	30
150EA19	10	10	14	18	20	26	26	34
150EA16	10	10	14	18	20	26	26	34
150EA12	10	10	14	18	20	26	26	34
150EA10	10	10	14	18	20	26	26	34
125EA16	10	10	16	20	22	28	28	36
125EA12	10	10	16	20	22	28	28	36
125EA10	10	10	16	20	22	28	28	36
125EA8	10	10	16	20	22	28	28	36
100EA12	10	12	18	22	24	32	30	40
100EA10	10	12	18	22	24	32	30	40
100EA8	10	12	18	22	24	32	30	40
100EA6	10	12	18	22	24	32	30	40
90EA10	10	12	18	24	26	32	32	42
90EA8	10	12	18	24	26	32	32	42
90EA6	10	12	18	24	26	32	32	42
75EA10	10	14	20	26	26	36	32	44
75EA8	10	14	20	26	26	36	32	44
75EA6	10	14	20	26	26	36	32	44
75EA5	10	14	20	26	26	36	32	44
65EA10	12	14	20	26	28	36	34	46
65EA8	12	14	20	26	28	36	34	46
65EA6	12	14	20	26	28	36	34	46
65EA5	12	14	20	26	28	36	34	46
55EA6	12	16	22	28	30	38	36	48
55EA5	12	16	22	28	30	38	36	48



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ResCom Board Thickness of Hollow Protected Steel (mm)

60 mins		120 mins		180 mins		240 mins	
3 Sided	4 Sided	3 Sided	4 Sided	3 Sided	4 Sided	3 Sided	4 Sided

Equal Angles

50EA8	12	16	22	28	30	40	36	48
50EA6	12	16	22	28	30	40	36	48
50EA5	12	16	22	28	30	40	36	48
50EA3	12	16	22	28	30	40	36	48
45EA6	12	16	22	30	30	40	36	48
45EA5	12	16	22	30	30	40	36	48
45EA3	12	16	22	30	30	40	36	48
40EA6	14	18	24	30	30	40	38	50
40EA5	14	18	24	30	30	40	38	50
40EA3	14	18	24	30	30	40	38	50
30EA6	14	20	24	32	32	42	38	52
30EA5	14	20	24	32	32	42	38	52
30EA3	14	20	24	32	32	42	38	52
25EA6	16	20	24	32	32	44	40	52
25EA5	16	20	24	32	32	44	40	52
25EA3	16	20	24	32	32	44	40	52

Unequal Angles

150*100UA12	10	10	16	20	24	30	30	38
150*100UA10	10	10	16	20	24	30	30	38
150*90UA16	10	10	16	20	24	30	30	38
150*90UA12	10	10	16	20	24	30	30	38
150*90UA10	10	10	16	20	24	30	30	38
150*90UA8	10	10	16	20	24	30	30	38
125*75UA12	10	12	18	22	26	32	32	40
125*75UA10	10	12	18	22	26	32	32	40
125*75UA8	10	12	18	22	26	32	32	40
125*75UA10	10	12	18	22	26	32	32	40
100*75UA10	10	12	18	24	26	34	32	42
100*75UA8	10	12	18	24	26	34	32	42
100*75UA6	10	12	18	24	26	34	32	42
75*50UA8	12	14	22	28	28	38	36	46
75*50UA6	12	14	22	28	28	38	36	46
75*50UA5	12	14	22	28	28	38	36	46
65*50UA8	12	16	22	28	30	38	36	46
65*50UA6	12	16	22	28	30	38	36	46
65*50UA5	12	16	22	28	30	38	36	46

Rectangular Hollow Sections

250*150*9	10	10	12	16	18	22	24	30
250*150*6	10	10	12	16	18	22	24	30
250*150*5	10	10	12	16	18	22	24	30
200*100*9	10	10	16	18	22	28	28	36
200*100*6	10	10	16	18	22	28	28	36
200*100*5	10	10	16	18	22	28	28	36
200*100*4	10	10	16	18	22	28	28	36

ResCom Board Thickness of Hollow Protected Steel (mm)

60 mins		120 mins		180 mins		240 mins	
3 Sided	4 Sided	3 Sided	4 Sided	3 Sided	4 Sided	3 Sided	4 Sided

**Rectangular Hollow Sections**

150*100*6	10	10	16	20	24	30	30	38
150*100*5	10	10	16	20	24	30	30	38
150*100*4	10	10	16	20	24	30	30	38
150*50*5	12	12	20	24	28	34	34	42
150*50*4	12	12	20	24	28	34	34	42
150*50*3	12	12	20	24	28	34	34	42
125*75*6	10	12	18	22	26	32	32	40
125*75*5	10	12	18	22	26	32	32	40
125*75*4	10	12	18	22	26	32	32	40
125*75*3	10	12	18	22	26	32	32	40
100*50*6	12	14	20	26	28	36	36	44
100*50*5	12	14	20	26	28	36	36	44
100*50*4	12	14	20	26	28	36	36	44
100*50*3.5	12	14	20	26	28	36	36	44
100*50*3	12	14	20	26	28	36	36	44
75*50*6	12	14	22	28	28	38	36	46
75*50*5	12	14	22	28	28	38	36	46
75*50*4	12	14	22	28	28	38	36	46
75*50*3	12	14	22	28	28	38	36	46

**Square Hollow Sections**

250*250*9	10	10	10	12	14	18	20	26
250*250*6	10	10	10	12	14	18	20	26
200*200*9	10	10	12	14	16	22	22	30
200*200*6	10	10	12	14	16	22	22	30
200*200*5	10	10	12	14	16	22	22	30
150*150*9	10	10	14	18	20	26	26	34
150*150*6	10	10	14	18	20	26	26	34
150*150*5	10	10	14	18	20	26	26	34
125*125*9	10	10	16	20	22	28	28	36
125*125*6	10	10	16	20	22	28	28	36
125*125*5	10	10	16	20	22	28	28	36
125*125*4	10	10	16	20	22	28	28	36
100*100*9	10	12	18	22	24	32	30	40
100*100*6	10	12	18	22	24	32	30	40
100*100*5	10	12	18	22	24	32	30	40
100*100*4	10	12	18	22	24	32	30	40
100*100*3	10	12	18	22	24	32	30	40
89*89*6	10	12	18	24	26	34	32	42
89*89*5	10	12	18	24	26	34	32	42
89*89*3.5	10	12	18	24	26	34	32	42
75*75*6	10	14	20	26	26	36	34	44
75*75*5	10	14	20	26	26	36	34	44
75*75*4	10	14	20	26	26	36	34	44
75*75*3.5	10	14	20	26	26	36	34	44



CONFIDENTIAL



ResCom Board Thickness of Hollow Protected Steel (mm)							
60 mins		120 mins		180 mins		240 mins	
3 Sided	4 Sided	3 Sided	4 Sided	3 Sided	4 Sided	3 Sided	4 Sided

**Square Hollow Sections**

75*75*3	10	14	20	26	26	36	34	44
65*65*6	12	14	20	26	28	36	34	46
65*65*5	12	14	20	26	28	36	34	46
65*65*4	12	14	20	26	28	36	34	46
65*65*3	12	14	20	26	28	36	34	46
50*50*5	12	16	22	28	30	40	36	48
50*50*4	12	16	22	28	30	40	36	48
50*50*3	12	16	22	28	30	40	36	48
40*40*4	14	18	24	30	30	40	38	50
40*40*3	14	18	24	30	30	40	38	50
35*35*3	14	18	24	32	32	42	38	50
25*25*3	16	20	24	32	32	44	40	52



## Ignis Advice

Evaluation No.4099.3 [2016]

**Technical Desktop Review  
for compliance of penetrations  
through the ResCom MgO board**

## ResCom – MgO Board

### Penetrations

## IGNIS

### Advice

**No. 4099.3 I01R00**

  
**Benjamin Hughes-Brown**

FIEAust CPEng NER

Chartered Professional Engineer

FPAA Professional Engineer

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DipEng (CIT)

**18 August 2016**

**Date**

**Page 1 of 3**

To Whom It May Concern:

### Introduction

Ignis Solutions has been engaged by ResCom to evaluate the compliance of penetrations through their MgO board in accordance with the National Construction Code – Volume One – Building Code of Australia 2016 (BCA).

The ResCom MgO board is a Magnesium Oxide board available in a number of thickness, being 10mm, 12mm, 14mm, 15mm and 18mm. The following evaluation is based on compliance with the Deemed to Satisfy requirements of the BCA Clause A0.2(b) being a Deemed-to-Satisfy Solution where penetrations through the ResCom MgO Board where the board is used in a wall, floor or ceiling within a building.

### BCA Compliance

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.

### 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.

## A. Metal Pipes

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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.

## B. Sanitary plumbing (metal or UPVC)

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- 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 large 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.

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

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- 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 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 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.

### D. 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.



## Ignis Engineering Certificate

Evaluation No.4099.1 [2016]

**Technical Desktop Review  
for compliance of incipient spread of fire  
to the National Construction Code –  
Volume One – Building Code of  
Australia 2016**

## ResCom Board Incipient Spread of Fire

**IGNIS  
Professional  
Engineering  
Certificate  
No. 4099.1 I01R00**

**Resistance to the  
incipient spread of fire  
70 minutes**

11 July 2016

Date

Page 1 of 2

**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, TDJ-CC6504

MFireSafety (UWS), BEng (UTS),

GradDipBushFire (UWS), DipEngPrac (UTS),

## Introduction

Ignis Solutions has been engaged by ResCom to evaluate the test reports by SGS in establishing the products compliance in-line with the resistance to incipient spread of fire as established by the National Construction Code – Volume One – Building Code of Australia – 2016 (BCA).

Clause A2.2(a)(iii) of the BCA establishes that evidence to support that the use of a material, form of construction or design meets a Performance Requirement or a Deemed-to-Satisfy Provision may be in the form of a certificate from a professional engineer or other appropriately qualified person which –

- (A) Certifies that a material, design, or form of construction complies with the requirements of the BCA; and
- (B) Sets out the basis on which it is given and the extent to which relevant specifications, rules, codes of practice or other publications have been relied upon.

The BCA details the process of documentation of decisions made under the BCA should be fully documented, detail supporting documentation, details of tests and any standards or other information relied upon.

This document is a certificate from a professional engineering in accordance with Clause A2.2(a)(iii).

## Scope of Certification

This engineering certificate has reviewed the SGS AS 1530.4 testing inline with the requirements of the BCA as well as that established by AS 1530.4:2014. The evaluation of the reference documents is provided on the next page.

## Conclusion

It is considered in the opinion of the author 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 where the temperature rise of 180 K did not occur.

# Document Review

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.

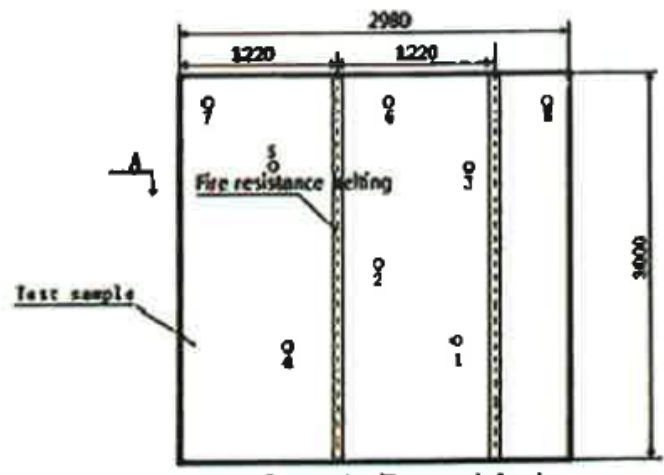
Clause A2.5 details the requirements for Resistance to the incipient spread of fire. A ceiling is deemed to have the resistance to the incipient spread of fire to the space above itself if-

- (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.

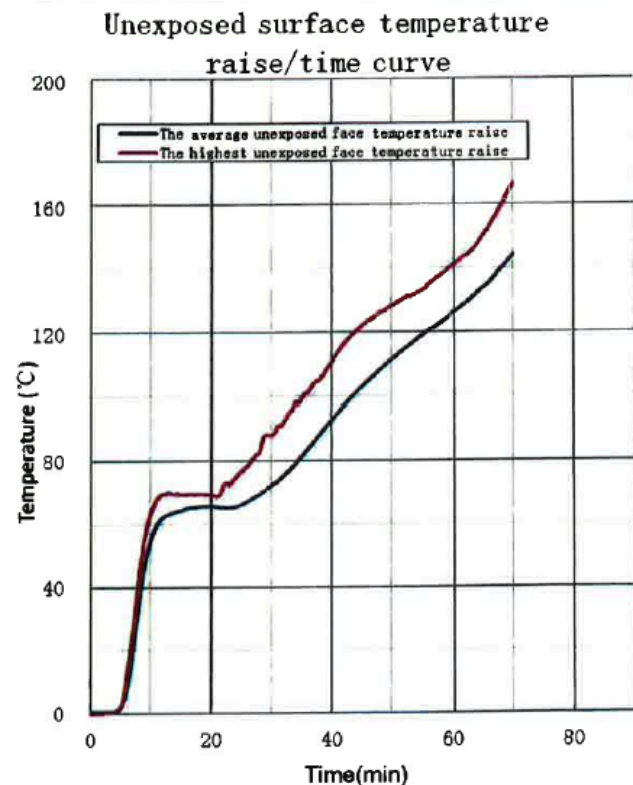


Clause 4.7.4 of AS 1530.4 details the criteria of failure for the incipient spread of fire being deemed to have occurred when the average temperature of the five thermocouples at any one of the locations has risen by more than 180K above the initial temperature.

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.

## 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

WATERPROOF OXIDE  
13/7/19

SGS SHCCM150401181 Structural adequacy Integrity Insulation -/90/60	Fire Resistance Level <b>CONFIDENTIAL</b>	03 June 2015 - 90 minutes 67 minutes
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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:


Intertek 160929005SHF-BP-1 Structural adequacy Integrity Insulation -/180/90	Fire Resistance Level <b>CONFIDENTIAL</b>	19 December 2016 - 180 minutes 90 minutes
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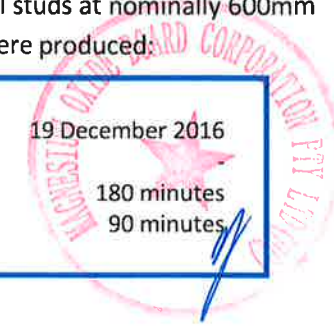
Testing undertaken by Research Engineering Development Façade Consultants Limited to BS 476 part 22 where the equivalent standard fire curve was used in the boards evaluation.

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:

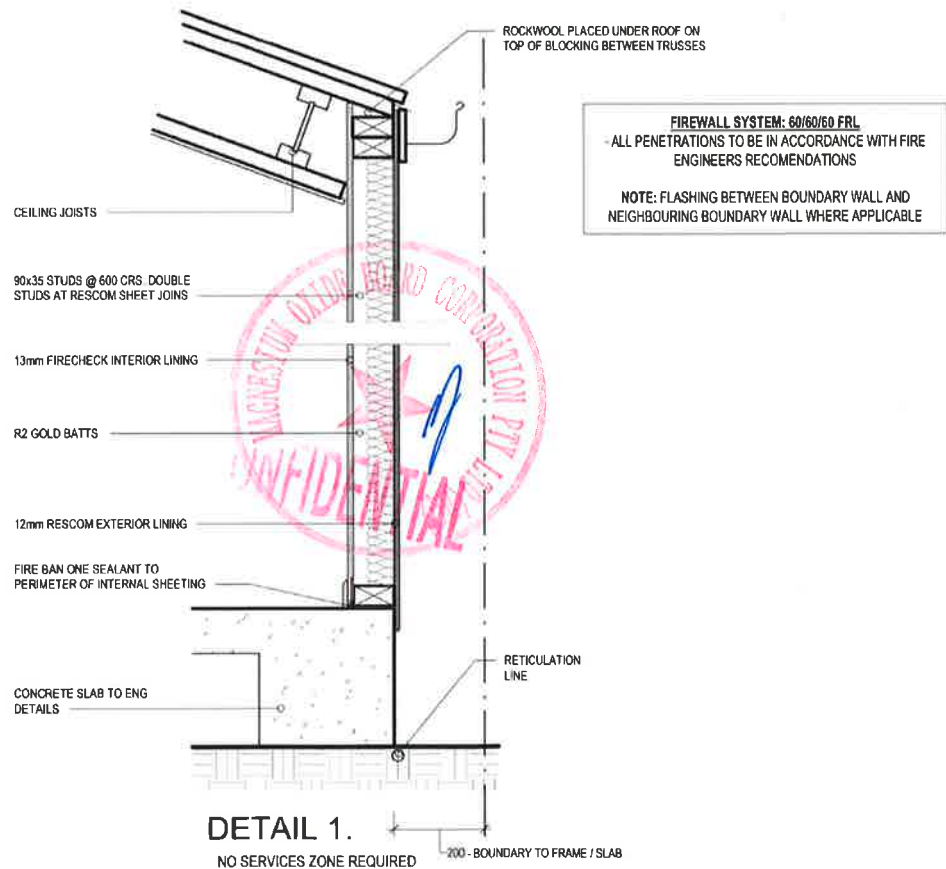
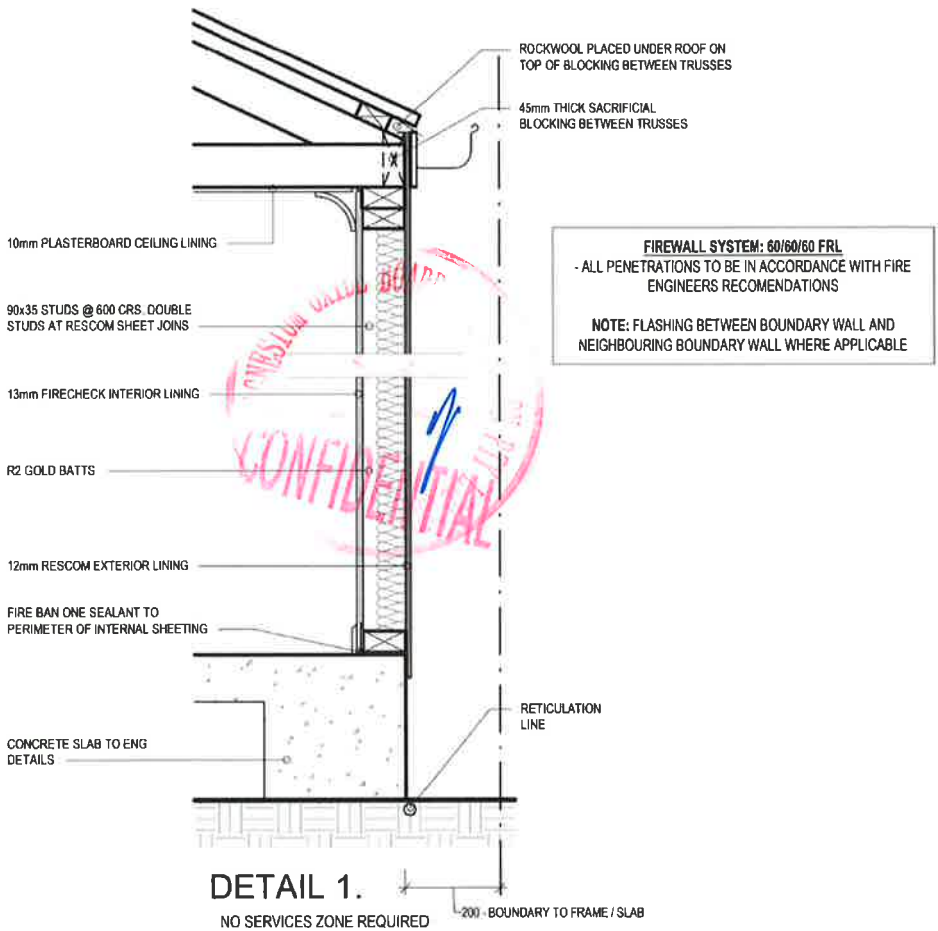
RED R07A15A Structural adequacy Integrity Insulation -/120/120	Fire Resistance Level <b>CONFIDENTIAL</b>	18 May 2007 - 150 minutes 132 minutes
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Based on the above detail and results, the ResCom wall systems are considered to satisfy the requirements 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

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

10mm PLASTERBOARD CEILING LINING

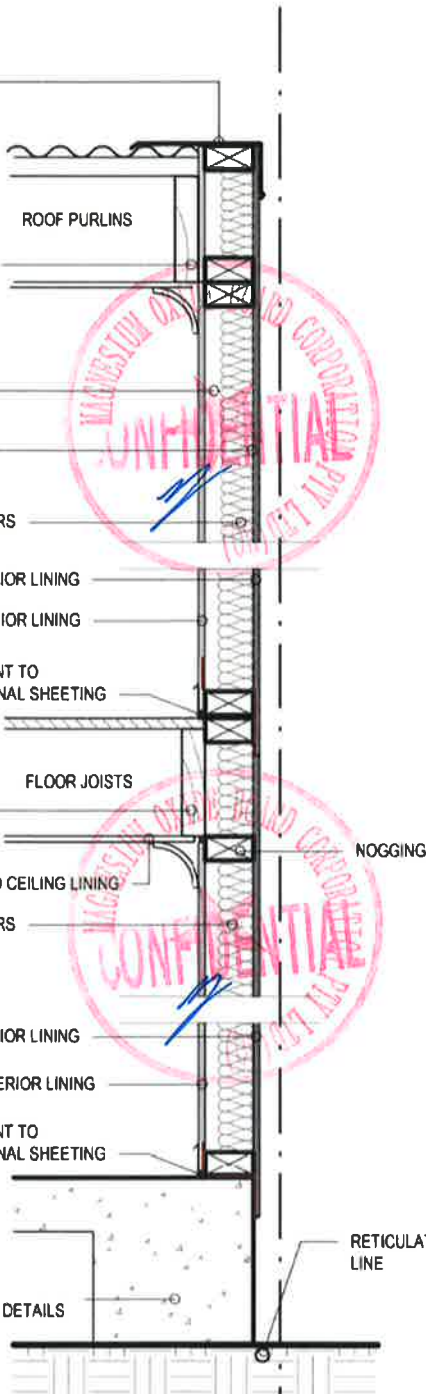
90x35 STUDS @ 600 CRS

12mm RESCOM EXTERIOR LINING

13mm FIRECHECK INTERIOR LINING

FIRE BAN ONE SEALANT TO PERIMETER OF INTERNAL SHEETING

CONCRETE SLAB TO ENGINEERS DESIGN & DETAILS

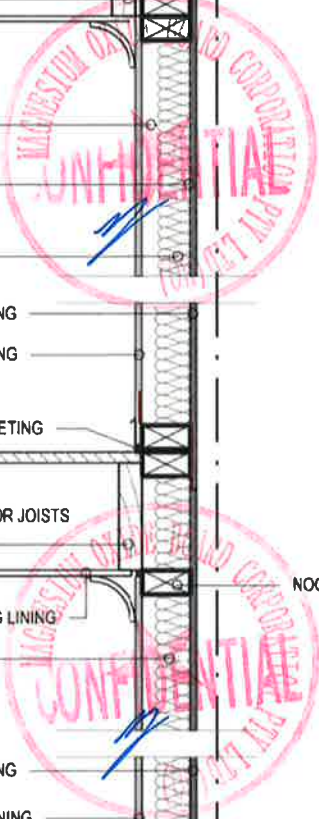


**FIREWALL SYSTEM: 60/60/60 FRL**  
- ALL PENETRATIONS TO BE IN ACCORDANCE WITH FIRE ENGINEERS RECOMENDATIONS

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

**DETAIL 1.**  
NO SERVICES ZONE REQUIRED

50 - BOUNDARY TO FRAME / SLAB

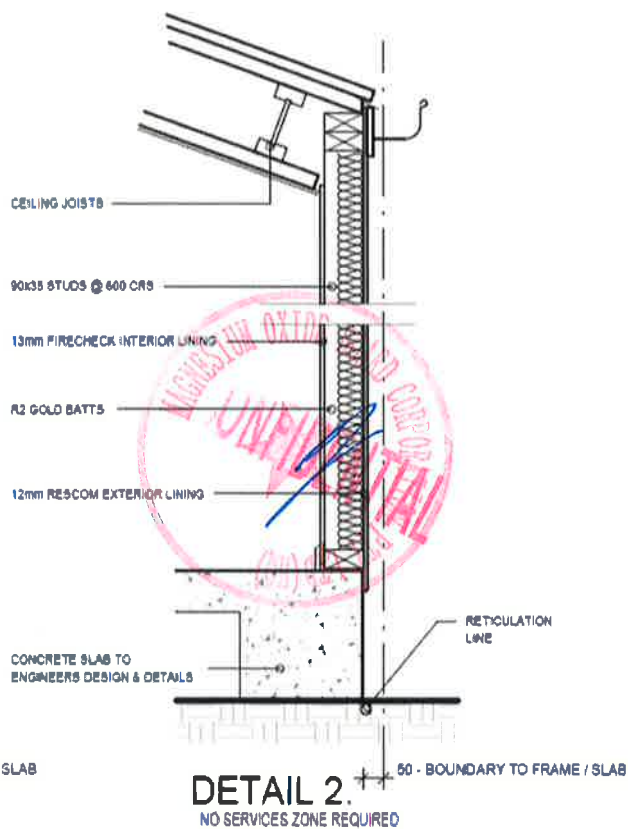
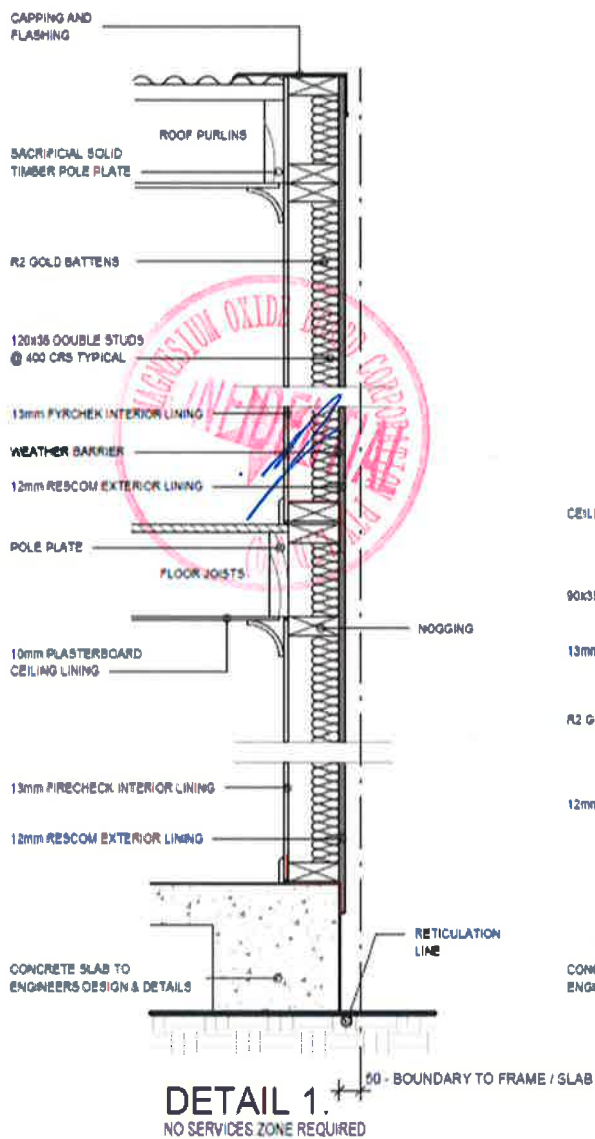


CONFIDENTIAL



## 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



NTIAL



## IGNIS ADVISORY NOTE

Evaluation No.IGNS-6290-01 Issue 00 Revision 00 [2018]

### ResCom System RC/TS 60 and RC/TS 90

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 RC/TS 60 wall system consists of 10mm ResCom Board on either side of a double stud designed wall system with a 50mm cavity.

The RC/TS 90 wall system consists of 12mm ResCom Board on either side of a double stud designed wall system with a 50mm cavity.

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

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 lightgage 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

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 RC/TS 60 wall system with 10mm ResCom Board on either side of a double stud designed wall system with a 50mm cavity with a minimum of 75mm steel studs with a 1.15 BMT and 50kg/m<sup>3</sup> mineral wool insulation will achieve an FRL of at least -/60/60.

The RC/TS 90 wall system with 12mm ResCom Board on either side of a double stud designed wall system with a 50mm cavity with a minimum of 75mm steel studs with a 1.15 BMT and 180kg/m<sup>3</sup> mineral wool insulation will achieve an FRL of at least -/90/90.

The structural elements providing structural adequacy provided the structural system is designed by an appropriately qualified structural engineer

**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)



# ResCom®

High Performance Board

## System RC/TS 60

Non Load Bearing / Double Stud  
Timber / Steel Wall Frame

FRL - / 60 / 60

Report by Ignis Solutions  
Certification No.

Acoustic Rating  $R_w$  61 Ctr 50  
Certification by Cogent Acoustics  
Project 18009 System 4

### SYSTEM COMPONENTS:

R2 Non - Combustible Batts  
10 mm ResCom Wall Board  
Fire Rated Sealant

### NOTES:

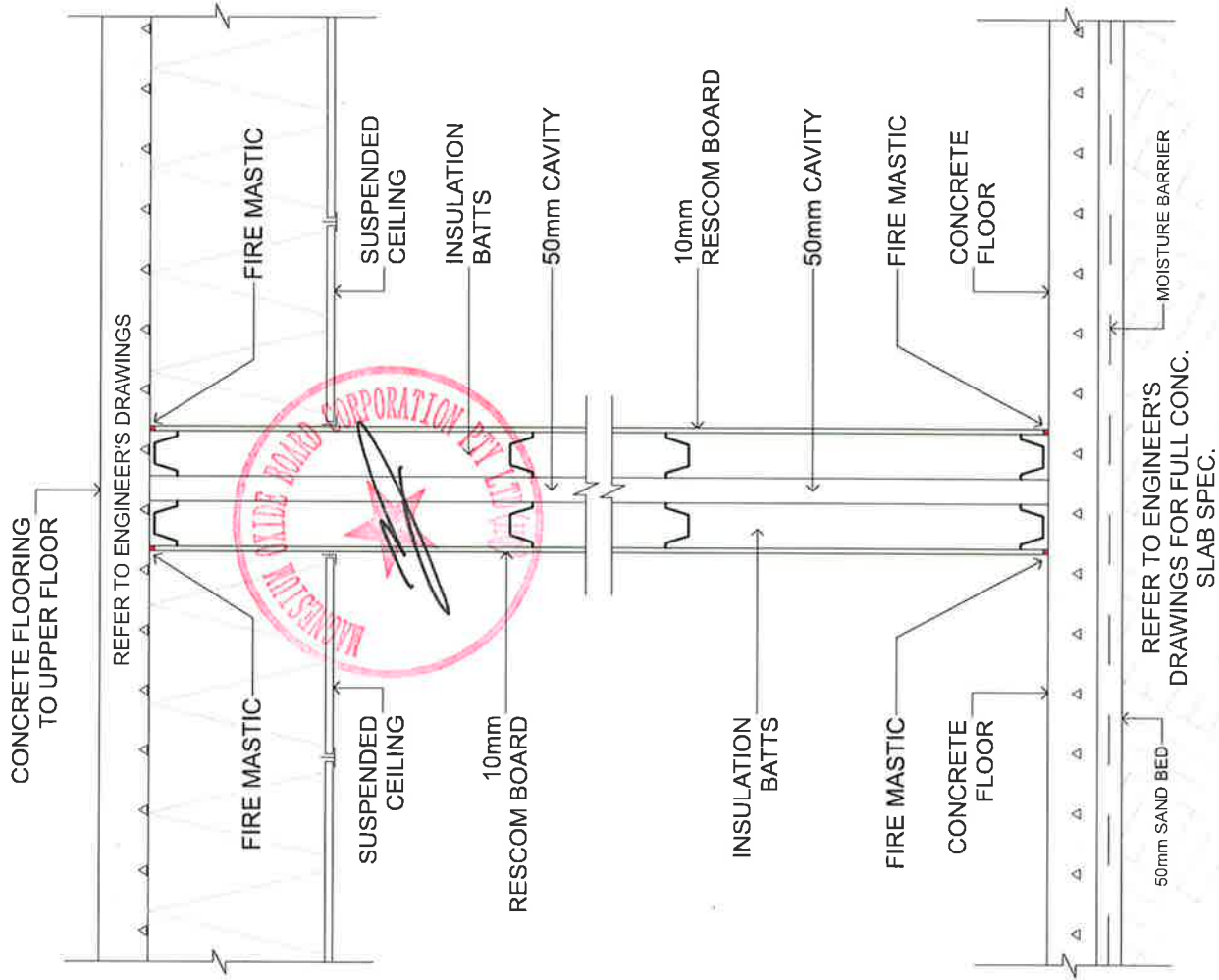
Metal framing to be installed in accordance with  
BCA Volume 2  
The size of steel stud should be determined by a  
professional engineer.  
To resist all applied loads

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

### INSTALLATION INSTRUCTION

- The cavity between frames is to be 50mm.
- R2 insulation batts are to be installed in both frames as per manufactures installation instructions.
- A 5mm bead of fire rated sealant is to be run down the frames before fixing the ResCom® wall board, ensuring the whole length of the studs, noggin's and plates are covered.
- When fixing the ResCom® wall board, a 10mm gap is to be left between:
  - a) the floor and the bottom of each board and
  - b) the ceiling and the top of each board.
 The gaps are to be filled with a fire rated sealant.
- ResCom® wall board is to be fixed to the outside of each frame using screws that are non-corrosive, class 3 to 5, 8 gauge x 40mm self-drilling countersunk type. Screws are to finish approximately 0.5mm below the surface of the board.
- Screws must be fixed at 300mm centres. On sheet corners, keep the first screw 50mm from the edge to avoid breakage of the sheet and then 12-15mm from sheet perimeter edges.
- All joints and screw holes are to be filled and finished with an approved jointing compound as per manufactures instructions.
- Where two sheets do not meet on a stud back blocking is a requirement. Back blocking can be a 150mm wide board of ResCom® wall board, the same thickness as the installed board, fixed with a full length bead of fire rated sealant and screws fixed as per wall instructions.

**IF UNSURE OF INSTALLATION INSTRUCTIONS  
REFER INSTALLATION MANUAL: REVISION 6**



**TENANCY SEPERATION DETAIL**

SCALE 1:10



### System RC/TS 90

Non Load Bearing / Double Stud  
Timber / Steel Wall Frame

FRL - / 90 / 90

Report by Ignis Solutions  
Certification No.

Acoustic Rating  $R_w$  61  $C_r$  50  
Certification by Cogent Acoustics  
Project 18009 System 4

#### SYSTEM COMPONENTS:

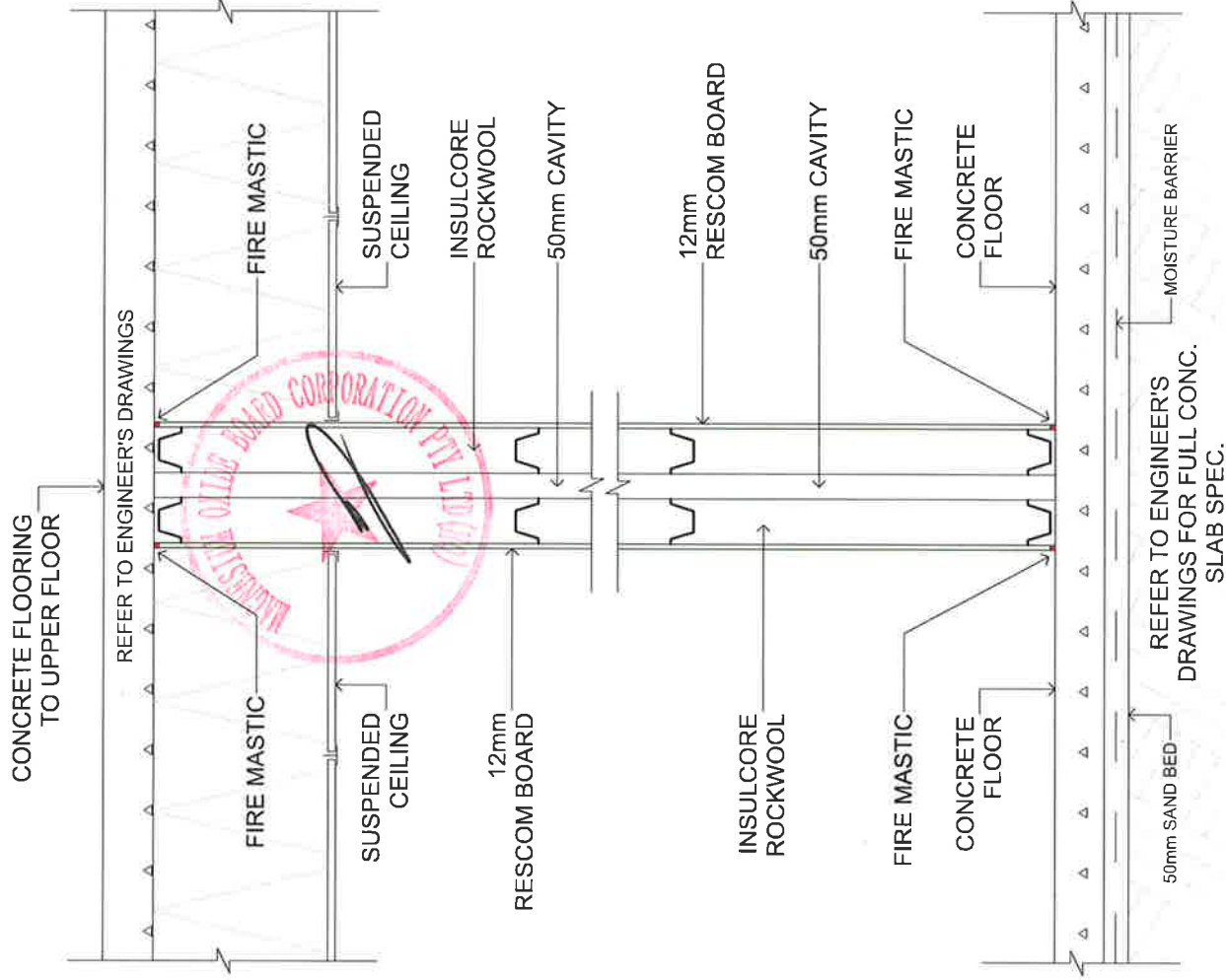
InsulCore Rockwool 80kg (supplied by ResCom)  
12 mm ResCom Wall Board  
Fire Rated Sealant

#### NOTES:

Metal framing to be installed in accordance with  
BCA Volume 2  
The size of steel stud should be determined by a  
professional engineer.  
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



TENANCY SEPERATION DETAIL

SCALE 1:10

#### INSTALLATION INSTRUCTION

1. The cavity between frames is to be 50mm.
2. R2 insulation batts are to be installed in both frames as per manufactures installation instructions.
3. A 5mm bead of fire rated sealant is to be run down the frames before fixing the ResCom® wall board, ensuring the whole length of the studs, noggings and plates are covered.
4. When fixing the ResCom® wall board, a 10mm gap is to be left between:
  - a) the floor and the bottom of each board and
  - b) the ceiling and the top of each board.
 The gaps are to be filled with a fire rated sealant.
5. ResCom® wall board is to be fixed to the outside of each frame using screws that are non-corrosive, class 3 to 5, 8 gauge x 40mm self-drilling countersunk type. Screws are to finish approximately 0.5mm below the surface of the board.
6. Screws must be fixed at 300mm centres. On sheet corners, keep the first screw 50mm from the edge to avoid breakage of the sheet and then 12-15mm from sheet perimeter edges.
7. All joints and screw holes are to be filled and finished with an approved jointing compound as per manufactures instructions.
8. Where two sheets do not meet on a stud back blocking is a requirement. Back blocking can be a 150mm wide board of ResCom® wall board, the same thickness as the installed board, fixed with a full length bead of fire rated sealant and screws fixed as per wall instructions.

IF UNSURE OF INSTALLATION INSTRUCTIONS  
REFER INSTALLATION MANUAL: REVISION 6



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**ResCom Global Building Products**

8 Piper Street, Caboolture, QLD 4510

# RESCOM® INSTALLATION MANUAL

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