

# ResCom®

MULTI PURPOSE AIR BARRIER



# INTRODUCTION:

ResCom® ridged air barrier products are designed for use with ResCom® or similar pressure equalized cladding systems to produce effective weather-resistant façades.

Key components of pressure equalized systems are:

- cladding or rain screen
- drained and ventilated cavity
- an air barrier.

ResCom® building products offer a number of innovative nonloadbearing external wall cladding systems that are suitable for use as part of a pressure equalized façade system.

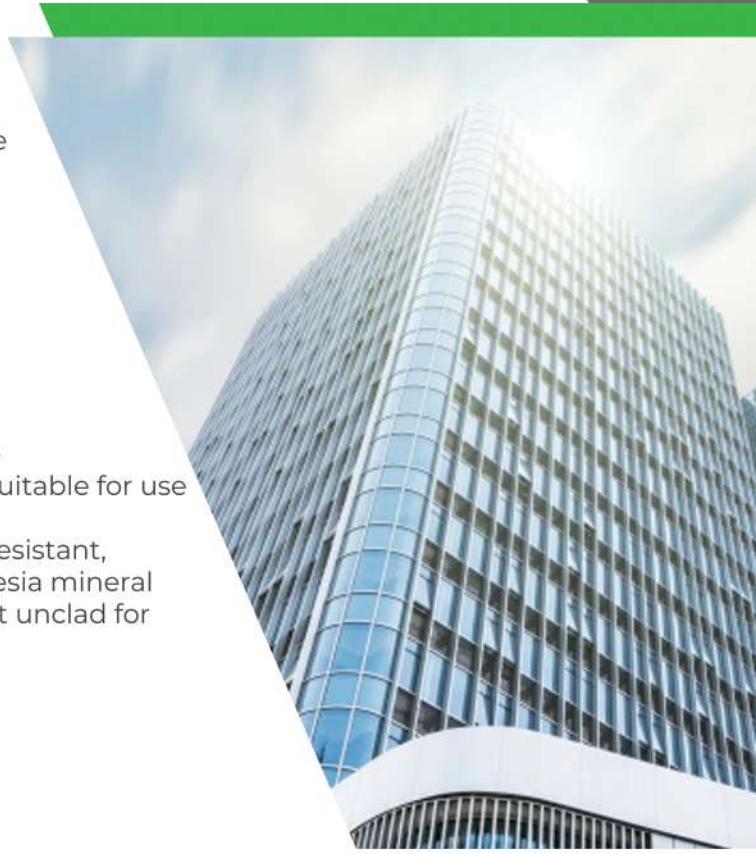
ResCom® rigid air barrier boards are a pre sealed, water resistant, nontoxic, inert, high performance, fiber reinforced magnesia mineral based panel that is suitable for use in projects that are left unclad for extended periods of time.

Standard Specifications of ResCom Air Barrier Board:

- 1200mm x 2700mm (Sqr Edge)
- 1200mm x 3000mm (Sqr Edge)

Thicknesses: 6mm, 8mm, 10mm

\*Custom size and thicknesses are available on request subject to minimum standing order quantities



ResCom® ridged air barrier board delivers several performance options that can eliminate the use of soft air barrier wraps from a project. Or if preferred by the designers and engineers ResCom® boards can be utilized in combination with traditional soft air barrier wraps and systems such as Bradford Enviroseal™ soft wall vapor permeable wrap, Bradford Thermoseal™ Reflective Foil non-permeable wrap, Fletchers Tyvek Home Wrap products.

In combination, ResCom® ridged air barrier boards greatly assist in the management of the defusing of air and moisture throughout a wall or cavity system as well as deliver a superior level of protection from wind, rain, impact and fire.

The ResCom® technical installation guide has been prepared by ResCom® Building Products as a general scope for designer / architects / engineers and end user with attention to our companies duty of care responsibilities within the building and construction industry.

An assumption has been applied over and above that of the information within the technical installation guide, that the designer / architects / engineers / installers have prior knowledge of the state or territory building design and construction codes requirements for the fit for purpose applications and installation of ridged air barrier systems.

Installation of ResCom® air barrier boards is to be carried out by installers that are suitably licensed

and registered under the local, state or territory building authorities to carry out such works.

In no way does the information held within the technical installation guide replace the services of the building professionals required to engineer and design the performance criteria for a project, nor is it an exhaustive guide of all possible applications and scenarios that ResCom® products can be utilized within the built environment.

# KNOWLEDGE IS POWERFUL

In order to design and build safe, healthy, durable, comfortable and economical buildings, airflow must be controlled.

Airflow carries moisture that impacts a materials long-term performance, integrity and durability, behavior in fire (spread of smoke), indoor air quality (distribution of pollutants and location of microbial reservoirs) and thermal energy.

A key strategy to overcome a lot of the issues caused by moisture in the built environment is to control airflow by installing high performance, nontoxic, mold proof and water resistant air barriers boards.



## WHAT IS AN AIR BARRIER?

Air barriers are systems of materials designed and constructed to control airflow between a conditioned (indoor) space and an unconditioned (outdoor) space. Air barriers can be mechanically fastened building wraps, adhesive membranes, fluid-applied materials, insulating board stock, non-insulating board, spray polyurethane foam, poured concrete, metal, glass, and a host of other materials. But no matter what material you choose, all air barriers should be:

- impermeable to air flow;
- continuous over the entire building enclosure or continuous over the enclosure of any given unit;
- able to withstand the forces that may act on them during and after construction;
- durable over the expected lifetime of the building.

There are two kinds of air barriers: interior and exterior

While both serve similar purposes, each complements and/or enhances the effectiveness of the other. Interior air barriers control leakage of a home's interior air into the wall cavity and attic, limit the ability of moist indoor air to enter the wall cavity during the heating season, and limit convection losses within walls. Exterior air barriers control infiltration of exterior air into the wall cavity and through the roof, limit the ability of moist outdoor air to enter the wall cavity during the cooling season, and prevent wind-washing of wall insulation (i.e. even though a house tests tight on the interior, it could have a leaky exterior wall and top plate that cause big energy losses). It's a good idea to install both types of air barrier so as not to negate the benefits of one by neglecting the other.

## WHAT IS A VAPOR BARRIER?

Vapor barriers are materials used to slow or reduce the movement of water vapor through a material. Vapor barrier materials are installed on the warm side of the insulation in a building assembly, as determined by climatic conditions. In warm climates, it will be on the exterior and in cold climates, it will be on the interior. A vapor barrier can be a mechanically fastened sheet-material, adhesive membranes (depending on composition), fluid-applied materials, insulating board or medium density spray polyurethane foam. The thickness of the material will impact whether it is a vapor barrier or not. In high-performance buildings, air barriers and vapor barriers, as well as water-resistive barriers, can be combined.

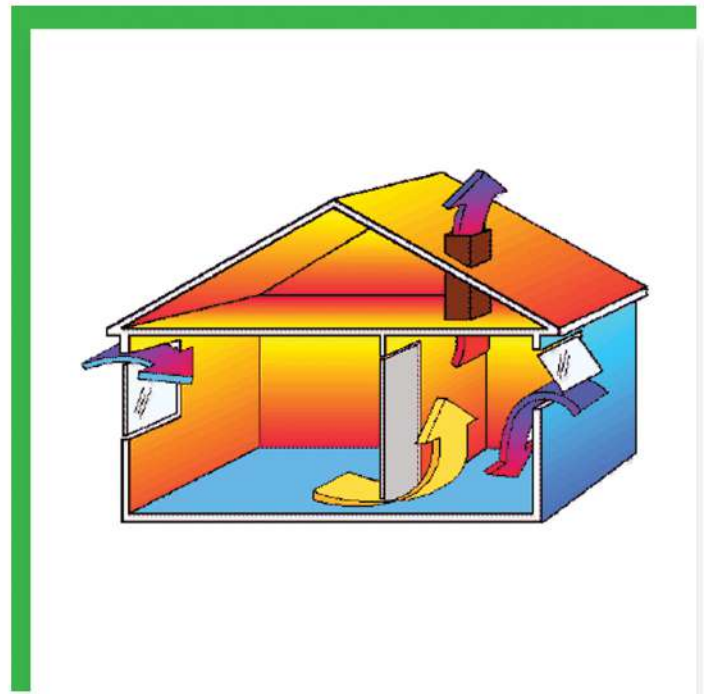
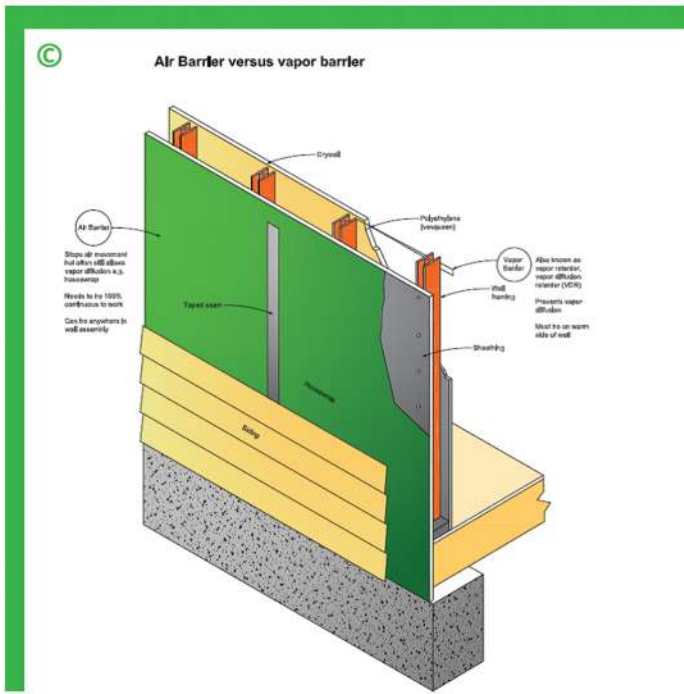
There are also vapor permeable air barriers, and there are water resistive barriers which are not air barriers. So it's important to understand the separate functions and then determine whether the material provides more than one function. As an example, you can have two, three or even four air barrier materials in a wall assembly, but its effectiveness will depend on which material you have chosen and how you have connected the air barrier materials together. In high-performance buildings, air barriers and vapor barriers, as well as water-resistive barriers, can be combined. There are also vapor permeable air barriers, and there are water resistive barriers which are not air barriers. So it's important to understand the separate functions and then determine whether the material provides more than one function. As an example, you can have two, three or even four air barrier materials in a wall assembly, but its effectiveness will depend on which material you have chosen and how you have connected the air barrier materials together.

# DO AIR BARRIER & VAPOR BARRIER SYSTEMS REALLY MATTER?

That's a question being asked by many architects, contractors, engineers and building owner-developers, and the answers are varied. For one, air and moisture control in buildings has become a very important element to constructing durable and energy efficient structures. Air leaks can cause havoc because air not only short circuits insulation, but air is a "carrier" for unwanted elements inside a home (i.e. noise, dust, vapor and heat/cold). When there is uncontrolled air movement from outside to inside (and visa versa), there is an increased risk for building failure or poor performance.

Moisture in all three states (vapor, liquid, solid) are a hazard to the built environment of a building.

The International Energy Conservation Code (IECC) and many state / government energy codes around the world now require the use of air barriers. In addition, a growing number of municipal authorities having jurisdiction (AHJs) and green-building trade groups are calling for their use.



## MORE SUSTAINABLE, HEALTHIER AND SAFER BUILDINGS

In order to design and build safe, healthy, durable, comfortable and economical buildings airflow must be controlled. Airflow carries moisture that impacts a materials long-term performance, integrity and durability, behaviour in fire (spread of smoke), indoor air quality (distribution of pollutants and location of microbial reservoirs) and thermal energy. One of the key strategies in the control of airflow is the use of air barriers.

By essentially "wrapping" the building shell you are ensuring that the building is protected from the effects of airflow and air leakage. By doing this the building will deliver the following performance advantages when utilising ResCom® Air Barrier Boards:

## 1: LOWER UTILITY BILLS:

Maintaining conditioned air means less energy is needed to recondition the air. Less energy means lower utility bills. And since all building systems must perform well together to optimize the energy efficiency of a home, the savings can add up.

Buildings which have a properly installed ResCom® Air Barrier system can operate properly with a smaller HVAC system as the mechanical engineer does not have to compensate for a leaky building.

In some cases, the reduction in mechanical equipment size and cost can also offset the cost of the air barrier system in addition to lowering utility bills. ResCom® Air Barrier boards calorific value of 0.1 to 0.25 MJ/m<sup>2</sup> assures superior coefficient and protective performances in the reduction of thermal heat and cold transfer to that of FC and similar products.

## 2: PREVENTING MOISTURE:

Wherever air moves, water vapor can follow.

Proper air sealing reduces the risk of water vapor moving into the wall system where. Prolonged exposure can result in moisture issues such as wood rotting and mould, which can cause expensive structural or health problems.

Air leakage has the ability to transport exponentially more moisture into and through the building enclosure than occurs through vapor diffusion alone.

## 3: INDOOR AIR QUALITY:

ResCom® Air barrier systems help keep out pollutants such as suspended particulates, dust, allergens, insects, odours, noise and more out of the wall system. This leads to a healthier indoor air quality. ResCom® products are inert and free of allergenic or toxic materials and carry independent certified Health Product Declarations.

## 4: PREVENTING THE LOSS OF CONDITIONED AIR:

In summer, buildings are normally cooled by dehumidifying the air to a lower temperature than that of the exterior environment.

In winter, a building is typically heated and the air is humidified to a higher temperature and humidity than the exterior air temperature.

Controlling interior temperature is paramount to comfort.

The Department of Energy reports that over 30 to 40 percent of the cost of heating and cooling of a building is lost due to uncontrolled air leakage.

This can hamper the performance of other building systems such as insulation and HVAC.

Proper air sealing helps reduce uncomfortable temperature fluctuations and often allows for smaller, more efficient HVAC equipment.

## 5: FIRE PROTECTION:

ResCom® Air barrier boards have been tested by independent ILAC accredited laboratories under the following international standards: AS:1530.1 to 4 - AS:5113 - AS/NZ3837 - ISO:5660.1 - EN:13501.1 - ASTM:E84 Extended - ASTM:119 - BS:476.1 to 11 & 22

ResCom® Boards have a flame spread and smoke propagation rating of:

- zero flame spread
- zero smoke development
- zero combustibility

ResCom® Air Barrier boards are a multipurpose engineered exterior and interior lining that greatly enhances the protection of buildings from the events of exterior or interior fire. All products are certified as non-combustible and approved for use in BAL-Flame Zones and Boundary Wall systems for fire protection. (Consult ResCom® technical support of FR and FRL systems and solutions) [www.recombp.com.au](http://www.recombp.com.au)

## 6: WEATHER AND MOISTURE PROTECTION:

ResCom® Air barrier boards are engineered to deliver more than one level of performance and are very adaptable to be used as both a vapor permeable air barrier with the use of breathable sealers and moisture barrier membranes, and as a water resistive barrier when fully sealing with acrylic water proof binder sealer or by utilizing the ResCom® factory pre-sealed (PS) range of barrier boards. All ResCom® barrier boards have been independently tested and approved for exterior use under the following standards for weather resistance:

- EN:12467:2012
- EN 12467:2012 Sec 5.4.6 & 7.3.4
- EN 12467:2012 Sec 5.5.2 & 7.4.1
- EN 12467:2012 Sec 5.5.3 & 7.4.2
- EN 12467:2012 Sec 5.5.5 & 7.3.6
- EN 317:1993
- ASTM:C1185-08
- ASTM:C473-12
- ASTM:C518-10
- ASTM:D1037-12
- ASTM:E455-11



## The best cladding combination to control rain?

The best cladding system is one that is back-vented with a rain screen to decouple bulk water from the main building structure and enhance drying when system gets wet. When it comes to building the perfect wall, surfaces behind the cladding should be water resistant and shed ALL water down and out ... this includes flashing at windows and doors, and through wall penetrations such as plumbing and electrical.



# HOW TO TREAT PRE-FAB WALLS AND JOINTS?

Off-site construction is increasing in demand and popularity, and it's important to understand that the weak link in a pre-fab wall or panel system is their joints, where the leakage of air can occur. Joints must be air-sealed to prevent premature failure. Joint treatment is best when redundancy is used to treat seams, gasket/sealant between panels, then tape/sealant on surface of panels. Utilizing ResCom® ShipLap edge profile boards and or back blocking the full length of the joints with ResCom® Furring strips can, in many instances, remove the need for taping of joints with sealer tapes. (Consult ResCom® technical support for further information) [www.recombp.com.au](http://www.recombp.com.au)

## DETERMINING WHETHER RESCOM® RIDGED AIR BARRIERS

It is important to address the buildings design elements when considering the application of the use of ResCom® ridge air barrier. Given this it is the responsibility of the building designer / architectural designers to ensure that the design conforms to NCC and or state building code requirements and other relevant building standards that may exist for that location.

The ResCom® Air Barrier Technical Manual should be read in conjunction with the NCC 2016. In the event that the information in the technical installation manual is in conflict with the NCC and or state building code requirements then the NCC / State Code requirements takes precedents over the ResCom® Technical Installation Manual.

During installation it is a requirement to use the appropriate air barrier fasteners and that structural framing is designed and specified as required to resist relevant wind loads within the proposed location of the building.

It is recommended that the responsibility for the structural performances of the façade design is assigned by the building designer / project architect to the qualified structural engineer to assure accordance with AS1170.2 Structural Design Actions Part 2: Wind Actions. On confirmation from the engineers of the implied wind loads and issuing of the span tables, the building designer / architects can then apply the specification for the fastener spacing's, wall wrap and panel fixing details.

It is also important that consideration and specification is detailed by the building designer / architects to the risks associated with corrosive zones / environments as per AS4312, as well as the extent amount of exposure to the elements of impact, rain and ultra violet rays that the ResCom® air barrier board may encounter prior to external cladding being installed.

## ATTENTION TO JOINTS:

### Vertical Control Joints

When installing ResCom® rigid air barrier, the vertical control joints should be aligned with the vertical movement control joints provided in the framing and at junctions of different framing materials.

Vertical joints between panels must to be supported by framing and the horizontal panel joints backed by noggins. AS/NZS1170.0 Table C1 suggests that support framing be designed for a maximum deflection of span / 250.

Areas of sheet bracing that have been assessed as suitable to perform as a rigid air barrier may be used in conjunction with ResCom® rigid air barrier boards. Care should be taken to ensure an effective seal is applied across the different materials within the overall system.

### Horizontal Control Joints

When installing ResCom® rigid air barrier, a horizontal control joint is required at the floor junction to accommodate deflection. The gage / extent of the required deflection is to be verified by the structural engineer.

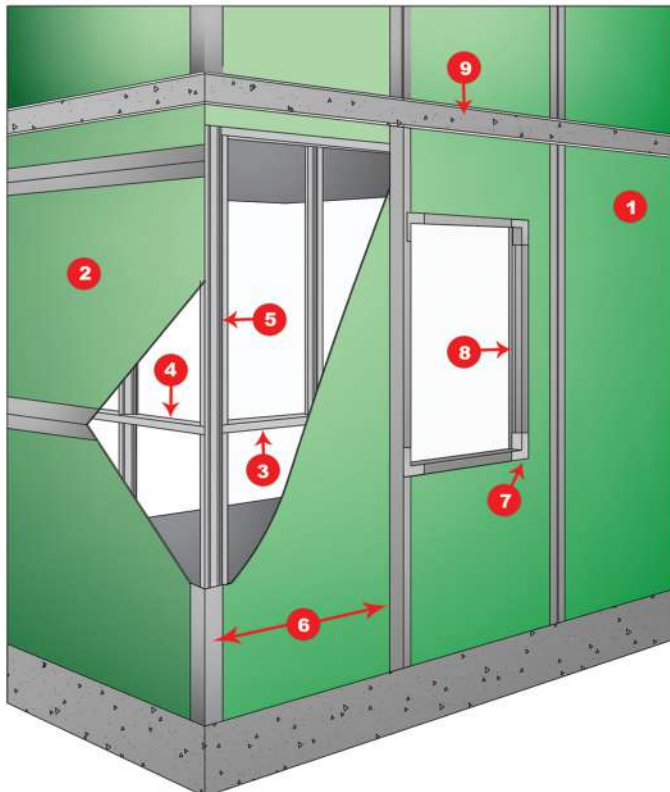
# BOARD LAYOUTS:

ResCom® air barrier board can be installed in a vertical or horizontal orientation as required onsite or as determined by the design engineers.

To reduce the risk of thermal / moisture or air breaches at the joints, it is important to assure that all joints are backed by framing or have a minimum 150mm width ResCom® furring back block applied to the full length behind the joint.

It is an important design aspect to always consider the depth of the cavity between the external façade, the depth of window and door reveals to assure that the correct thickness of air barrier is applied to the overall system.

Vertical and horizontal span tables provided in the technical installation manual.



## ResCom Air & Fire Barrier (RC-01)

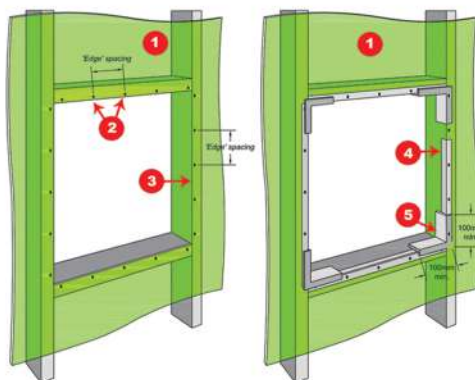
1. ResCom Rigid Air Barrier installed vertically
2. ResCom Rigid Air Barrier installed horizontally
3. Stud required behind vertical sheet joints. Optional - back blocking can be used if ResCom board is off stud min 150mm width back block to full length of the joint. Heavy caulk the back block and joint with Bostik Seal Flex 1/Advance.
4. Nogging or other similar framing required behind horizontal sheet joints. Back blocking can be used if ResCom board is off stud min 150mm width back block to full length of the joint. Heavy caulk the back block and joint with Bostik Seal n Flex 1/Advance.
5. Steel or timber framing
6. 3M-8067 Tape continuous at all joints and corners
7. Seal around corners of opening with 3M-8067
8. Seal around front edge of opening with 3M-8067
9. Bostik Seal n Flex sealant filled joint with backing rod

Installation with wind loads over 1.5kPa, ResCom Rigid Air Barrier should be used.

ResCom Board can be installed horizontally or vertically with a flexible tape applied across the joints continuously to limit air penetration.

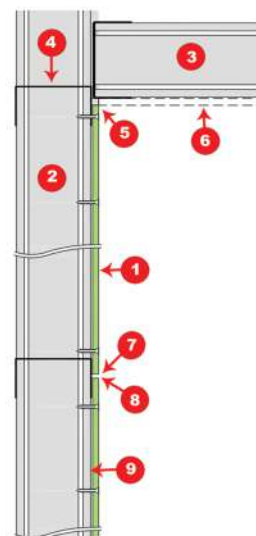
Flashings should be fixed over the top of the air barrier and taped.

3m All weather flashing tape (8067) or similar is to be fixed over the top of all vertical and horizontal joints, corners and junctions to limit air penetration.



## Treatment at Window/Door Openings - ResCom Air & Fire Barrier (RC-02)

1. ResCom Air Barrier Board
2. Fix ResCom Rigid Air Barrier at 50mm from corners and at edge spacing
3. Form opening in ResCom Rigid Air Barrier
4. Seal around front edge of opening with 3M-8067 tape
5. Seal around corners of opening with 3M-8067 tape



## Junctions at Soffit, Base and Horizontal Sheet Joint - ResCom Air & Fire Barrier (RC.03)

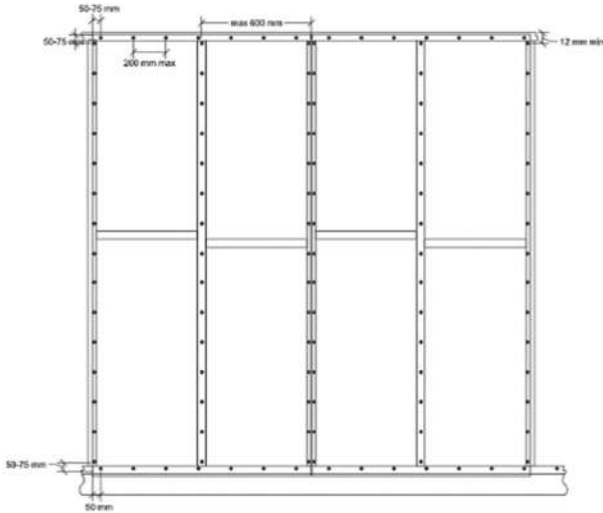
1. ResCom Air Barrier Board
2. Support framing
3. ResCom SIP or 8mm soffit framing
4. Nogging continuous or similar framing
5. 5-10mm Gap filled with continuous sealant
6. Soffit Lining
7. Horizontal Joint Between ResCom Air Barrier boards backed by nogging and sealed with 3M.8067 Tape
8. 1-3mm Maximum gap
9. ResCom Rigid Air Barrier fixed to studs



# SYSTEM ENGINEERING

©

## ResCom Air Barrier Vertical Span/Wind Loads and Fastener Spacing for Timber or Steel Framing

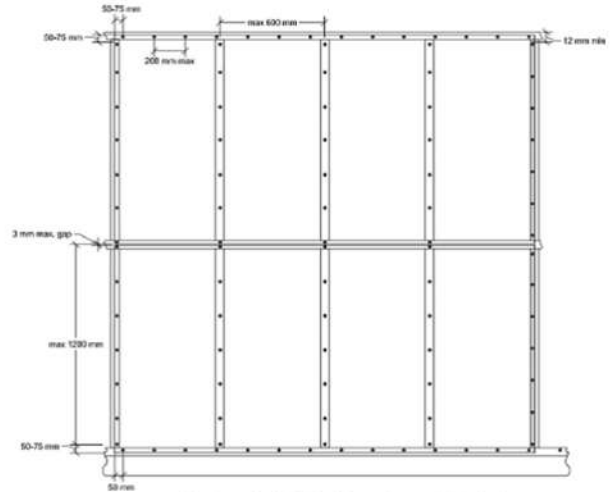


Span Tables for Class 2 to 9 Buildings

Wind Pressure (kPa)	Stud Centres (mm)	Fixing Centres (mm)	
		Edge	Field
1	600	400	300
3	400	400	150
5	400	250	100
7	300	225	100

©

## ResCom Air Barrier Horizontal Span/Wind Loads and Fastener Spacing for Timber or Steel Framing



\*Sheet must be installed with long edges parallel to the base.

Span Tables for Class 2 to 9 Buildings

Wind Pressure (kPa)	Stud Centres (mm)	Fixing Centres (mm)	
		Edge	Field
1	600	400	300
3	400	400	150
5	400	250	100
7	300	275	100

©

## ResCom Air Barrier Vertical Span Table for Class 1 and 10 Buildings for Timber or Steel Framing

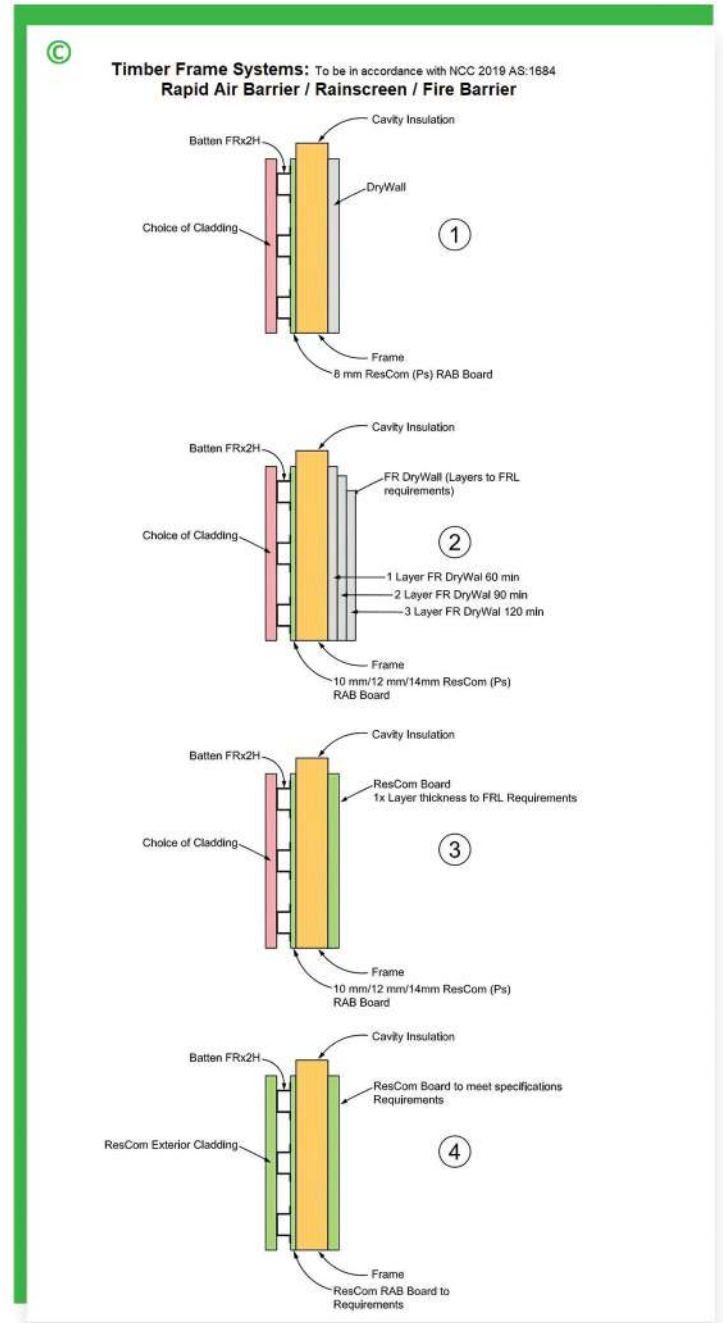
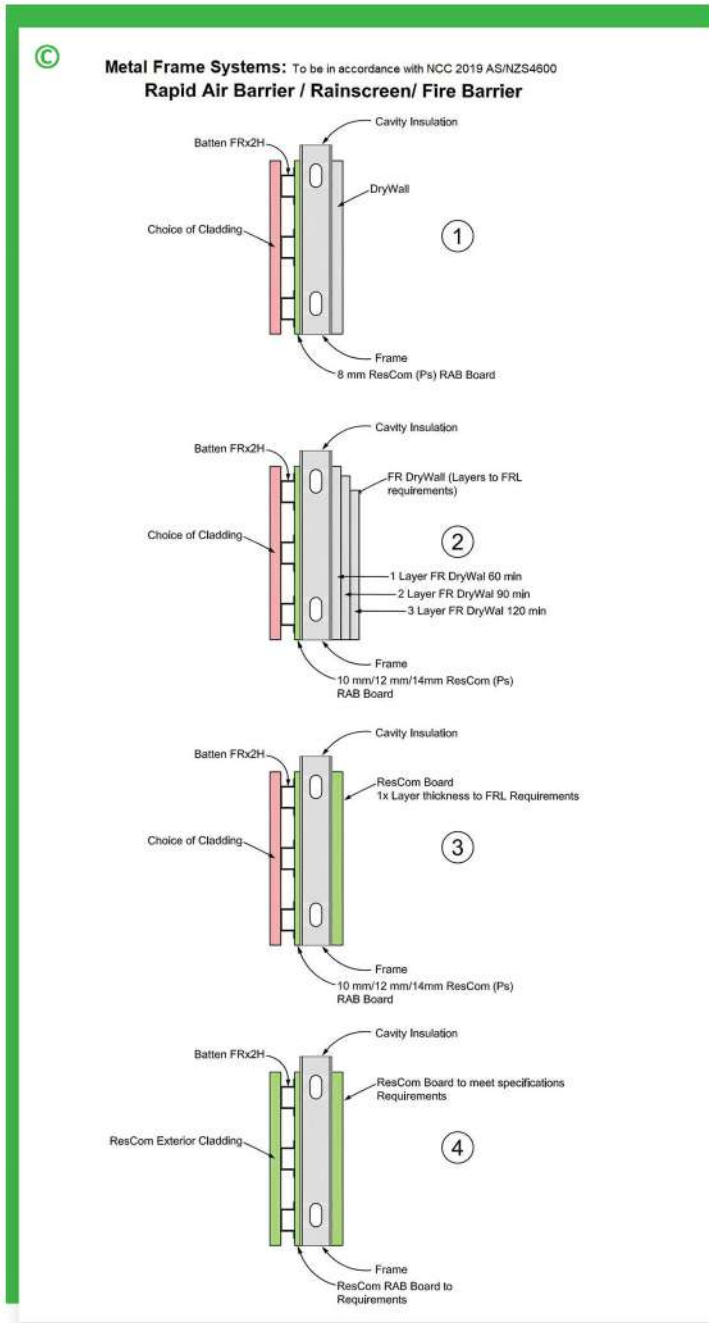
Wind Classification (AS4055)	Sheeting Areas (Wall areas greater than 1200mm from external building corner)			Corner Areas (Wall areas less than 1200mm from external building corner)		
	Stud Centres (mm)	Fixing Centres (mm)		Stud Centres (mm)	Fixing Centres (mm)	
		Edge	Field		Edge	Field
N1	600	300	300	600	300	300
N2	600	300	300	600	300	250
N3/C1	600	300	300	400	300	250
N4/C2	400	300	300	400	300	150
N5/C3	400	300	200	300	300	250
N6/C4	400	300	150	300	275	115

## ResCom Air Barrier Horizontal Span Table for Class 1 and 10 Buildings for Timber or Steel Framing

Wind Classification (AS4055)	Sheeting Areas (Wall areas greater than 1200mm from external building corner)			Corner Areas (Wall areas less than 1200mm from external building corner)		
	Stud Centres (mm)	Fixing Centres (mm)		Stud Centres (mm)	Fixing Centres (mm)	
		Edge	Field		Edge	Field
N1	600	300	300	600	300	300
N2	600	300	300	600	300	250
N3/C1	600	300	300	600	300	150
N4/C2	600	300	200	400	300	150
N5/C3	400	300	200	400	275	115
N6/C4	400	300	150	300	275	115



# RESCOM ARMOUR PROTECTION SYSTEM:



## DISCLOSURE NOTE:

Due to different grades of ferrous metals used in construction for the manufacture of screws and metal framing and the risks associated with the indifferent metals and corrosive air and moisture environments, MgO Corp recommends that a film of silicone, mastic tape or sarking is placed on the metal stud frame before fixing the ResCom board to eliminate the potential of rust, corrosion & moisture within the system.

## DISCLOSURE NOTE:

Structural components of the proposed TIMBER / METAL FRAME system must comply with the requirements of the local, state or national construction code and any other applicable local authorities, building and construction regulation and standards. The design engineers and certifiers are responsible to ensure that the details and recommendations within the document are appropriately intended for the application prior to installation.

# STRUCTURAL FRAMING:

Design of the structural substrates / framing shall be in accordance with the following standards:

- AS1684 - Residential Timber-Framed Construction
- AS/NZS4600 - Cold-Formed Steel Structures

# MOISTURE MANAGEMENT:

To ensure occupant comfort and protection of the building frame, the following factors should be considered during the selection of the correct air barrier.

# CONDENSATION RISK:

This is a complex problem and can occur under a variety of conditions (not just in cold and tropical climates), so selection of the right wall wrap needs to consider the local climate, building use and orientation, the material R-value of the insulation, as well as the degree and location of ventilation.

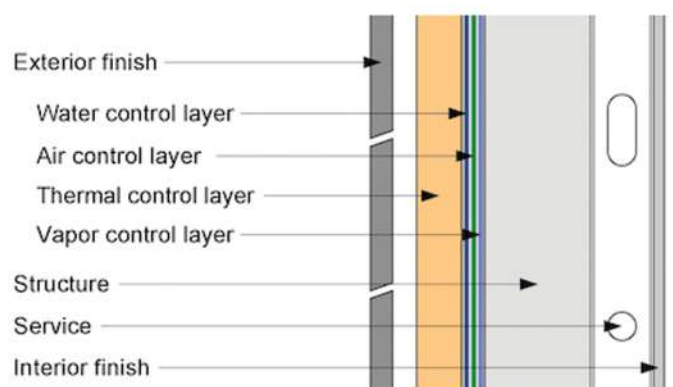
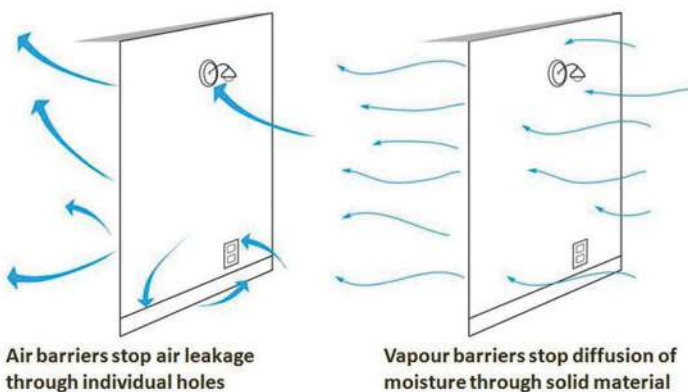
Careful selection of a wall wrap with the appropriate level of vapor permeability or vapor resistance is one key factor in reducing condensation risk.

Key selection characteristics for a suitable wall wrap to manage condensation are as follows:

- The wall wrap must have a “high” water barrier classification – an “unclassified” rating is not suitable.
- Wall wrap must meet the requirements of AS/NZ4200.1 Pliable building membranes and underlays – Installation requirements.

The external wall wrap must be sealed to maintain vapor performance and draught proofing effectiveness, as well as to ensure air barrier integrity.

There are a number of factors that need to be considered when assessing and managing condensation risk, it is recommended that building designers / architects seek professional guidance from moisture management experts such as TREMCO or similar management companies that undertake risk analysis prior to wall wrap selection as part of the building design.



# CLIMATE CONDITIONS:

Rust & Corrosion of all forms is the primary issue around the world due to a lot of varying environmental situations. These need to be addressed to minimize or remove potential risks (Corrosive zones are detailed in AS4312), Failure to adhere to the requirements as detailed under the NCC when installing in corrosive zones may void any or all products warranties.



# FIXTURES AND FITTINGS:

In C4 corrosive zones, fixtures and fittings must be not less than Class 4 or stainless steel. It is the responsibility of the building designer / architects to assess and specify the correct level of fixtures, fittings and installation guidelines required for the project in accordance with the ResCom® technical installation guidelines, local conditions and or the National Construction Code (NCC) within the designated country.

It is a requirement when installing by ResCom® air barrier board to use a minimum of Class 4 or stainless steel self-tapering screws, countersink the head of the screws approximately 0.05 to 1mm below the surface of the board, remove residual dust from the screw surface, cap or coat the screws with exterior caulking compound / waterproof binder sealer to protect the screws from the moisture and potential of corrosion.

# PRODUCT PERFORMANCE CHART<sup>©</sup>

PHYSICAL PROPERTY	CONDITION	PERFORMANCE	STANDARD
Average Bending Strength FL	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>			ASTM C1185-08 (2012)
Water tightness		Passes	ASTM C1185-08 (2012)
Water absorption	13.2%		ASTM C1185-08 (2012)
EQ Moisture content			ASTM C1185-08 (2012)
Moisture movement 30-90% relative humidity*		<5%	ASTM C1185-08 (2012)
Humidified deflection (mm) 32c,40%RH, 48hrs	2.18	0.064	ASTM C473-12
Dimensional conformance			ASTM C1185-08 (2012)
Water Impermeability Category A		Passes	EN 12467:2012
Vapor Permeability Category D		Pass	EN 12467:2012 Sec 5.4.6 & 7.3.4
Freeze-Thaw Category A		u=80	EN 12467:2012 Sec 5.4.6 & 7.3.4
Heat Rain Category A		Pass	EN 12467:2012 Sec 5.4.6 & 7.3.4
Soak-Dry Category A		Pass	EN 317:1993
Swelling & Thickness		Pass	ISO 16000-3, 6, 9 & 11: 2006 & 2011
TVOC, Formaldehyde	Wet	<0.2%	UNE-EN ISO1716 & 1182:2011
Calorific Value	0	Pass	ASTM C518-10
Thermal Resistance m <sup>2</sup> .K/W		0.1092 to 0.2554	ASTM C518-10
Thermal Conductivity W/mk		0.027 & 0.045	EN 13501-1:2007+A1:2009
Fire classification building		0.44	ASTM E84
Flame Spread & Combustibility	0 / 0 / 0	Class A1FL	AS1530.1
Flame Spread & Combustibility	0 / 0 / 0	Class A1 / Class 1	AS 5113
FRL Performance	Exterior Facade	Class A1 / Class 1	AS 1530.4
FRL Performance	Exterior & Interior Wall	Pass	BS 476 p22
FRL Performance	Exterior & Interior Wall	Pass	BS 476 p4, 5, 6, 7 & 11
FR Performance	Exterior & Interior Wall	Pass	ASTM C1185-08 (2012)
Freeze thaw			ASTM D1037-12 (Section 15)
Nail-Head pull through (N)	789	Passed	ASTM D1037-12 (Section 13)
Lateral nail resistance (N)	2278		ASTM D1037-12 (Section 13)
Falling ball impact Unbroken	Unbroken @ 3mtr heights	Passed	ASTM D1037-12 (Section 13)
Diaphragm capacity		Passed	ASTM D1037-12 (section 21)
			ASTM E455-11 & AS/NZS2908.2:2000

# STORAGE AND HANDLING: INTENT OF THIS NOTICE

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

## GENERAL

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

## PROCEDURE

- ResCom® Building Products must be stored inside a dry ventilated area and protected from damage by weather and direct sunlight.
- Stack flat on pallets or level dun-age – sufficient support to all edges and in the centre is required - do not allow material to bow, or to sit directly on the ground.
- Do not store up right or on edges.
- On receiving vertical packs these are to be rolled over and stored in flat horizontal position.
- Keep material dry prior to and during installation.
- Do not stack other materials on top of ResCom® Building Products.
- Always protect from job site dirt, oils, chemicals and solvents.
- Protect the products edges, ends and face from damage with protection cover.
- In the event requiring short term storage outside of enclosed building the goods always need to be fully wrapped and covered tightly by tarpaulin or equivalent coverings to completely protect the goods and pallets from rain and sunlight.
- In the event the goods get wet or are exposed to water they are to be individually removed from the packaging, wiped dry, and placed in flat level drying racks and allowed to fully dry before installation.
- In the event of prolonged external storage ResCom® panels are to be treated with a water impermeable and UV resistant sealer which is to be maintained over the life of the product. This protection is also required to be applied to the front, sides and rear of the panels prior to installation as external or wet area lining under NZBC B2.3.1 (a & b) the NCC 2019, the IRB, IRC 2019.
- ResCom panels need to be handled by minimum of two (2) persons when being lifted and carried vertically on their edge

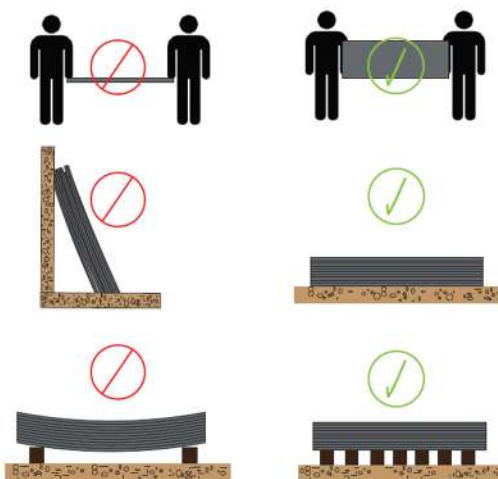
## PRODUCT WARRANTY:

Failure to comply with the above storage and handling requirements will null and void any and all warranties be that verbal, written, statutory or offered by Magnesium Oxide Board Corporation Pty Ltd.

For the purposes of this warranty, a “defect” in respect of the product warranty means a non-compliance with AS/NZS 2908.2:2000 and ICC-ES Standards for - Flat sheet cellulose-cement products

## TECHNICAL SUPPORT

Magnesium Oxide Board Corporation Pty Ltd  
Website: [www.mgoboard.com.au](http://www.mgoboard.com.au)  
Email: [admin@mgoboard.com.au](mailto:admin@mgoboard.com.au)



# 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)



# 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,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,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,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,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-~~6-2019~~).

## 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

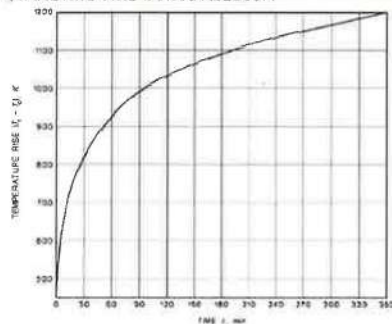


FIGURE 2.3 STANDARD TIME VS TEMPERATURE RISE CURVE

**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

www.ignissolutions.com.au





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

**Ignis Solutions Pty Ltd**

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.

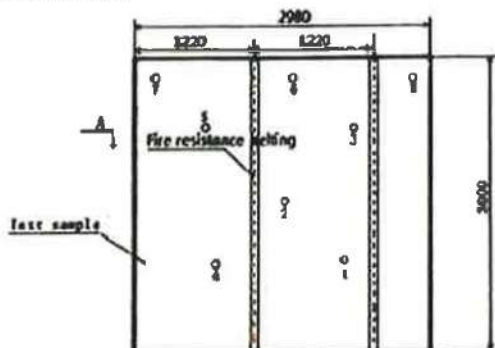
Clause A2.5 details the requirements for Resistance to the incipient spread of fire. A ceiling is deemed to have the resistance to the incipient spread of fire to the space above itself if-

- 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.

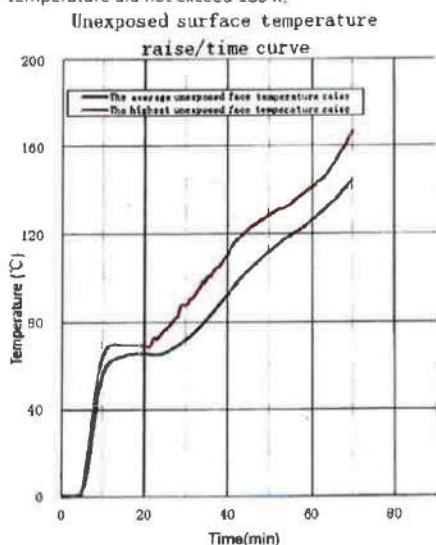


Clause 4.7.4 of AS 1530.4 details the criteria of failure for the incipient spread of fire being deemed to have occurred when the average temperature of the five thermocouples at any one of the locations has risen by more than 180K above the initial temperature.

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.

### Ignis Solutions Pty Ltd

Providing an alternative in performance based design

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.

www.ignissolutions.com.au

5  
CONFIDENTIAL

### 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.

**Ignis Solutions Pty Ltd**

Providing an alternative in performance based design

### 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

www.ignissolutions.com.au

Protect your most valuable assets.  
Choose ResCom Air & Fire Barrier Systems  
[www.rescombp.com.au](http://www.rescombp.com.au)



## ResCom Building Product

8 Piper street, Caboolture QLD 4510

Call us : +61 754 329 890 or email at : [admin@rescombp.com.au](mailto:admin@rescombp.com.au)

**Copyright©** 2009 – 2019 MgO Corp Pty Ltd or its affiliates **“All Rights Reserved”** The information document inclusive of all written wording, technical information, drawings and designs are protected under Australian and International Copyright Laws. Reproduction, duplication or distribution of the document or any part thereof its contents without written permission of the sponsor is prohibited.