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IGNIS ADVICE NOTICE

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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

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^3 mineral wool insulation.

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

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

FRL -/120/120

- 12mm thick ResCom Board on either side of studwork
- 46mm galvanised steel joist
- 94kg/m^3 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.

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