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

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

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

Test Specifications:

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

Products covered by this Certification

The following products are covered under this certification:

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

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

Objective of Testing Procedures

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

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

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

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Evidence Base Testing Reviewed

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

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

Results of Testing

(a) Serviceability

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

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

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

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

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

Thickness	Joist Centres	1.5kPa/1.8kN	2.0kPa/1.8kN	3.0kPa/2.7kN	5.0kPa/4.5kN
16mm	400mm	✓			
18mm	400mm	✓	✓		
18mm	450mm	✓	✓		
19mm	450mm	✓	✓		
20mm	450mm	✓	✓	✓	
20mm	600mm	✓	✓	✓	
25mm	450mm	✓	✓	✓	✓
25mm	600mm	✓	✓	✓	
40mm	900mm	✓	✓	✓	✓
50mm	1200mm	✓	✓	✓	✓



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Conclusion:

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

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

Regards,

~~Signature~~ 21/12/17

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