

**Technical  
Review**  
CMI-TR Ver:6.000



# Technical Review

issued to

## Dragonboard Technologies Limited

for

## Dragonboard

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## EXECUTIVE SUMMARY

CertMark™ International has been engaged by Dragonboard Technologies Limited to evaluate their Dragonboard Technologies Limited for compliance against the BCA Volume One and Two. CMI is to conduct an evaluation review on a case by case basis and ensure that any clause(s) of the BCA that relate to the Product are identified.

In accordance with Clause 2.6 of the CodeMark™ Scheme Rules detailed notes are to be made of the products compliance with the requirements of the BCA and be the basis for the evaluation report and decision on certification. The evaluation report is to summarise all aspects associated with the evaluation as identified in the evaluation plan and any nonconformities, recommendations and opportunities for improvement that the CMI has identified as part of the evaluation.

This evaluation report is to be reviewed and approved by person(s) involved in or satisfying Clause 2.2.2 of the CodeMark™ Scheme Rules appendix to ensure that the evaluation process and report adequately addresses the relevant requirements of the CodeMark™ Scheme Rules and BCA.

In accordance with ISO/IEC 17065:2013 clause 7.4 an evaluation of the product is to be undertaken with the following key points.

- The certification body is to have a plan for the evaluation activities to allow for the necessary arrangements to be managed.
- The certification body shall assign personnel to perform each evaluation task that it undertakes with its internal resources.
- All necessary information and/or documentation is to be made available for the evaluation.
- The product is to be evaluated against the requirements covered by the scope of certification.
- Any non-conformities are to be identified and provided to the client for resolution. Information regarding resolution of the non-conformities will be provided on a case by case basis. The evaluation is not to continue until the non-conformities are resolved.
- The results of the evaluation activities shall be documented prior to review.

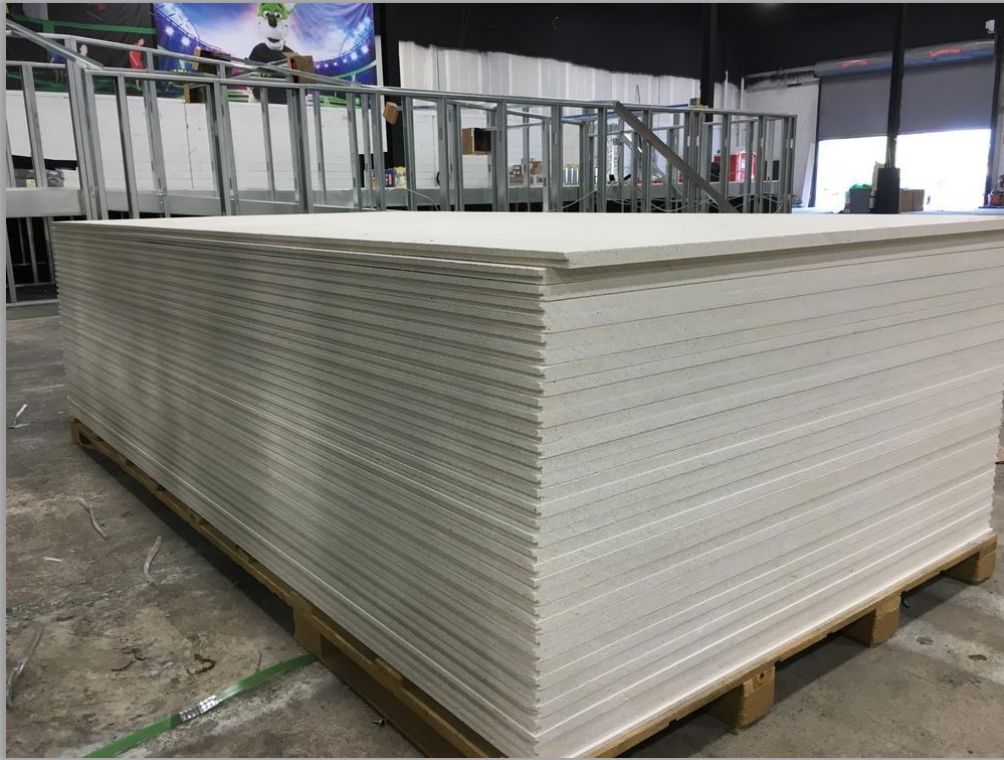
This report documents the evaluation of the product in accordance with Clause 2.6 of the CodeMark™ Scheme Rules as well as Clause 7.4 of ISO/IEC 17065:2013.

In accordance with Provision A2.2, (a) evidence to support that the design meets the Performance Requirements may be in the form of (iii) a certificate from a professional engineer 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.

**TYPE AND/OR USE OF PRODUCT:**

For building of cavity wall, structural insulated panel, fire rated doors, non-combustible floor and roof underlayment, and composite floors. Installation is similar to the conventional cavity wall installation, for any specific fire rating requirement it has to follow the test report, for example, on a 3-hour wall you have to refer to UL- UO55 for the installation instruction.

**PRODUCT IMAGE**



Source: Dragonboard Technologies Limited

### DESCRIPTION OF PRODUCT:

Non-combustible construction panel. The Dragonboard is formed by using layers (varies from 2 to 5) of glass fabric on both sides of the board with the cementitious mix sandwiched by the glass fabric. The mix comprises of all the components to be formed on a PVC mold, waits for dry, then trimmed and sanded to the exact dimensions.

#### SIZES

- Panel size - 4' × 8' (1.2 × 2.4 m), 4' × 9' (1.2 × 2.7 m) and 4' × 10' (1.2 × 3.1 m).
- Thickness - 1/4", 7/16", 9/16" and 3/4" (6.4, 11.1, 14.3 and 19.1 mm).
- Hurricane panel thickness - 9/16" (14.3 mm) - Dade County Approved.

Note - Custom sizes and thicknesses are available in quantity. Contact Dragonboard Australia for more information.

COLOR: Dragonboard is light tan to cream in color.

### SCOPE OF CERTIFICATION

#### Volume One –

Specification A2.3 Clause 2(b) FRL - FRL -/120/120.

#### Volume Two –

Specification A2.3 Clause 2(b) FRL -/120/120 1.2.3 Fire resistance of building elements.

#### National Construction Code – Building Code of Australia Volume One

<b>Performance Requirement(s)</b>	N/A	N/A
<b>Deemed-to-Satisfy Provision(s):</b>		
<b>C1.10</b>		No evidence to meet requirements. Test standards AS/NZS 3837 and AS 1530.3 tests for internal validation within buildings. for C1.10
<b>Specification A2.3 Clause 2(b)</b>	Fire-resistance of building elements	Comply 12mm Dragon board is non-combustible and when installed in a wall system identical <b>FRL -/120/120</b> Structural Adequacy – Integrity 120 min Insulation 120 min
<b>State or territory variation(s):</b>	NSW C1.10	

#### National Construction Code – Building Code of Australia Volume Two

<b>Performance Requirement(s)</b>	N/A	N/A
<b>Deemed-to-Satisfy Provision(s):</b>		
<b>Part 3.5.3.3,</b>	3.5.3.3 Wall cladding boards Wall cladding boards must—	No evidence provided or not applicable

	(a) for 7.5 mm (minimum) thick fibre-cement — comply with AS/NZS 2908.2 or ISO 8336; and (b) for 9.5 mm (minimum) thick hardboard — comply with AS/NZS 1859.4; and (c) be fixed in accordance with Table 3.5.3.1 and Figure 3.5.3.1.	
<b>Part 3.5.3.4,</b>	Sheet wall cladding (a) Fibre-cement sheet wall cladding must— (i) comply with AS/NZS 2908.2 or ISO 8336; and (ii) be fixed in accordance with Table 3.5.3.2 and Figure 3.5.3.3; and (iii) where also acting as structural bracing, be installed using the lesser of the stud and fixing spacings for both applications.	No evidence provided or not applicable
<b>Part 3.5.3.5,</b>	3.5.3.5 Eaves and soffit linings External fibre-cement sheets and linings used as eaves and soffit linings must— (a) comply with AS/NZS 2908.2 or ISO 8336; and (b) be fixed in accordance with Table 3.5.3.5 and Figure 3.5.3.4 using— (i) 2.8×30 mm fibre-cement nails; or (ii) No. 8 wafer head screws (for 4.5 mm and 6 mm sheets only); or (iii) No. 8 self embedding head screws (for 6 mm sheets only).	No evidence provided or not applicable
<b>Part 3.7.1</b>	FIRE SEPARATION	No evidence
<b>1.2.3 Fire resistance of building elements          Specification A2.3 Clause 2(b)</b>	Specification A2.3 Clause 2(b)	FRL -/120/120 Structural Adequacy – Integrity 120 min Insulation 120 min
<b>State or territory variation(s):</b>	N/A	

#### CONDITIONS AND LIMITATION OF USE

- Use only for non-load bearing applications
- Where exposed to high-moisture conditions or water, panels must be sealed or painted to preclude water absorption or staining
- Align control joints with building structure control joints



## BUILDING CLASSIFICATION/S:

Class 1 to 10.

## PRODUCT SPECIFICATION

### SIZES

- Panel size - 4' × 8' (1.2 × 2.4 m), 4' × 9' (1.2 × 2.7 m) and 4' × 10' (1.2 × 3.1 m)
- Thickness - 1/4", 7/16", 9/16" and 3/4" (6.4, 11.1, 14.3 and 19.1 mm)
- Hurricane panel thickness - 9/16" (14.3 mm) - Dade County Approved

Note - Custom sizes and thicknesses are available in quantity. Contact Dragonboard Australia for more information.

COLOR: Dragonboard is light tan to cream in color.

### Surface Burning Characteristics (ASTM E84)

- Flamespread - 0
- Smoke developed - 0

SOUND PERFORMANCE: Sound Transmission Class (STC) ratings of 53 on a 2-hour UL assembly and 54 on a 3-hour UL assembly are available.

## MANUFACTURER AND MANUFACTURING PLANT(S)

Taishan DragonBoard Technologies Limited  
21 Dragonhill Industrial District, Duanfen  
Taishan City, Guangdong, PC529245 China

## INSTALLATION REQUIREMENTS

To be installed in accordance with the Dragonboard Technical Data and Safety Sheet V1.2 2016

### PRECAUTIONS

- Avoid handling DragonBoard panels when wet. Allow to dry before applying joint finishing materials.
- Use appropriate setting compounds during cold weather or when slow drying
- DragonBoard 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" (51 mm) from a corner, with the adjoining screw not less than 4" (102 mm) from the same corner
- Do not install screws on 45 degree angles at corners
- Board ends must be supported by joists
- Fasteners must always be installed over supporting structure

## OTHER RELEVANT TECHNICAL DATA

DragonBoard is a non-nutrient to mold or fungus per ASTM G21 and does not support insect life. It provides superior moisture resistance in high-humidity areas and combats the growth of mold and mildew.

- DragonBoard is completely waterproof. It will not disintegrate when immersed in water or exposed to freeze/thaw cycles for prolonged periods of time
- DragonBoard can be finished with any traditional drywall compounds



TABLE 1 PHYSICAL CHARACTERISTICS

Flexural modulus	0.93 x 10 <sup>6</sup> psi	ASTM D6109
Flexural strength	1295 psi	ASTM D6109
Compressive strength	3000 psi	ASTM C684
Shear strength	391 psi	ASTM D6109
Flamespread	0	ASTM E84
Smoke developed	0	ASTM E84
Smoke density	None	ASTM E662 not req.
Moisture content	8%	GB/T 160-1997 (China)
Impact resistance	1.65 ft/lb-in of notch	GB/T 7019-1997 (China)
Thermal insulation	R-value – 1.2/inch	GB/T 7019-1997 (China)
Fungus/mold	Non-nutrient	ASTM G21
Smoke	Nontoxic	ASTM E662

TABLE 2 IMPACT TESTING (ASTM D5628)

Drop height	Unclamped edges	Clamped edges
12" (305 mm)	Hairline cracking	Hairline cracking
6" (152 mm)	Superficial cracking	Superficial cracking

TABLE 3 DESIGN RECOMMENDATIONS

Panel	L/360 12" (305mm)	L/360 16" (406mm)	L/360 24" (610mm)	L/240 12" (305mm)	L/240 16" (406mm)	L/240 24" (610mm)
7/16" (11.1mm)	94 psf	40 psf	12 psf	142 psf	60 psf	19 psf
9/16" (14.3mm)	251 psf	106 psf	32 psf	378 psf	160 psf	47 psf

TABLE 4 LOAD FOR MAXIMUM ALLOWABLE STRESS

Panel	12" (305mm) oc	16" (406mm) oc	24" (610mm) oc
7/16" (11.1mm)	1366 psf	751 psf	336 psf
9/16" (14.3mm)	2609 psf	1470 psf	654 psf

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

TABLE 5 PANEL SHEAR

7/16" (11.1mm) panel	461/foot
9/16" (14.3mm) panel	646/foot

Above recommendations based on a safety factor of 4. The use of a T-shaped spline ½" (12.7mm) high with 1" (25.4mm) wings on both sides is recommended for panels 9/16" (14.3mm) thick, or heavier, used for subflooring. Contact Dragonboard US for suggested materials.

## EVALUATION METHODS

Fire Safety Provision A2.2 (a) (i) & (iii) and 1.2.2 (a) (i) & (iii). Reports from NATA accredited test laboratories and certificates from Professional Engineer.

## REPORTS

1. Exova Warringtonfire Report No. 24158-00 NATA accreditation 3277 The Fire Resistance Performance of Drywall Partition System.
2. Research Engineering Development Façade Consultants Ltd Test Report No. R07A15 Dated 18 May 2007 In accordance with BS 476.4.
3. TUV SUD PSB Corporation Pte Ltd Test Report No. 54S071115/2/OKH Dated 19 Apr 2007 In accordance with BS 476.6.
4. Research Engineering Development Façade Consultants Ltd Test Report No. R07A15A Dated 18 May 2007 In accordance with BS 476.22.

### DOCUMENT AUDIT

The below table provides a list of all reports provided to CMI for the purpose of this review:

Document Writer, Date & Number	Content (e.g. Testing to Standard)	BCA Descriptor	Performance Clause	Deem to Satisfy (DtS) Clause	Comments on Usability including Assessment Method/Evidence
16-1673-9-1	Global Product Testing Laboratories Nail pull out resistance testing Dated August 16, 2016	Structure	Structure	Structure	Nail pull out resistance testing. Force needed to extract the nail from the panel. The results were compared to the results of the plywood panel.
brochure	Reed Construction Data 2007 Construction Data	N/A	N/A	N/A	Product Brochure With tables Physical characteristic, Impact testing, Live Loads, Panel Shear
BS 476 Part 4	Research Engineering Development Façade Consultants Ltd Test Report No. R07A15 Dated 18 May 2007	BS 476 Part 4	N/A	C1.12 f	Fire test on building materials and structures- Non-Combustibility Test for Materials Non-combustible However, test is more than 7 years old, new revision or Fire Engineer Statement would be required
BS 476 Part 6	TUV SUD PSB Corporation Pte Ltd Test Report No. 54S071115/2/OKH Dated 19 Apr 2007	BS 476 Part 6	N/A	Fire	Fire propagation test on Forerunner Stone Panel Fire propagation index on 3 samples is 0
BS 476 Part 7	TUV SUD PSB Corporation Pte Ltd Test Report No. 54S071115/1/OKH Dated 19 Apr 2007	BS 476 Part 7	N/A	Fire	Research Engineering Development Façade Consultants Ltd

BS476 Part 22	Research Engineering Development Façade Consultants Ltd Test Report No. R07A15A Dated 18 May 2007	Fire Resistance	N/A	Fire	Large scale surface spread of flame test Results: The sample tested has a Class One Surface Spread of Flame.
CCF27012013_0000	STROMA Certification Ltd Certificate No. STRO006401-PC-2013122200845 Dated 22/01/2013	N/A	N/A	N/A	Sustainable Homes - Certificate
Download_All_2006-03-13[1]	Lab Reports Package New Your Product Testing & Services Inc. Fairmount Distributors No. 02-107473 Omega Point Laboratories No.16866-123075 Dated 31/12/2004 VTEC Laboratories 100-2295-2 dated 09/11/2005	ASTM E119-00A (2 h rating) ASTM E84 ASTM D6109 (Modus of elasticity/Shear Strength/Shear Modulus/Tensile Strength ASTM E662 (Smoke Toxicity) ASTM D5628 (Impact testing) ASTM G21	N/A	Fire provision Smoke Density Structure	Lab Reports Package. Reports from Labs are accredited Fire provision Smoke Density Modulus of Elasticity / Shear Strength / Shear Modulus / Tensile Strength Impact Testing
Radon Report	Determination of Radon Emanation: Characteristic of an Environmental Green Material in small Chamber Test	N/A	N/A	Structure	Determination of Radon Emanation: Characteristic of an Environmental Green Material in Small Chamber Test Dr Daniel WT Chan & Dr Thomas Tung Chi Wah Radon emanation rate of EMG is 22 Bqm <sup>-2</sup> hr <sup>-1</sup>

Strength Test for Flooring Board	New York Product Testing & Services Inc. Dated February 15, 2006	N/A	N/A	Structure:	Structure: Strength Test for Flooring Board Flexural Modulus, Flexural strength, In Plane Shear & Punch Through Test Results
warrington accessment	Exova Warringtonfire The Fire Resistance Performance of Drywall Partition System Report No. 24158-00	BS 476:22	N/A	Fire provision A2.3 Clause 2(b) FRL - /120/120	The Fire Resistance Performance: Drywall partition performance Integrity 150 minutes Insulation 132 minutes  Ceiling performance: Integrity 120 minutes Insulation 28 minutes Comparison of the above fire reports to Australian requirements
5218 I01R00 Dragonboard advisory note 16072017	Ignis Solution Report advisory note	AS 1530.4 BS 476.22	N/A	A2.3 Clause 2(b) FRL - /120/120	12mm Dragon board is non-combustible and when installed in a wall system identical FRL -/120/120 Structural Adequacy – Integrity 120 min Insulation 120 min

## CONCLUSION

The evaluation indicates the Dragonboard Technologies Limited complies with the requirement of the BCA. This evaluation is valid for the use of Dragonboard Technologies Limited in accordance with the reference documentation only. Any change in the information referenced including product design as detailed in this report to suit future re-organisation or planning including the superseding of the reference documents will require further assessment to confirm compliance with the appropriate references.

This evaluation is prepared in good faith and with due care for information purposes only from the reference documents, and should not be relied upon as providing any warranty or guarantee on the products installation. In particular, attention is drawn to the nature of the inspection and investigations undertaken and the limitations these impose in determining with accuracy the state of the product, its services, equipment, installation control and associated quality assurance during the construction of a building.

From the above evaluation of the product, sufficient information has been provided to certify the product.


As Dragonboard Technologies Limited has not provided evidence of compliance to Standards AS/NZS 3837 and AS 1530.3 they are unable to claim for C1.10. As per Ignis Solution Report product satisfies fire provision A2.3 Clause 2(b) FRL -/120/120.

Requested clauses from Volume Two Part 3.5.3.3, Part 3.5.3.4 and Part 3.5.3.5 are DtS provisions.

For compliance with BCA Volume Two product can be certified against Performance solution clauses, as there is no DtS reference for MgO panels in BCA Volume Two.


## CONFIRMATION

I hereby declare that the information provided in this Report is true and correct, as observed by myself while completing the review.

	17/08/2017
Roni Bezic <b>CertMark™ International Pty Ltd</b>	<b>Date</b>

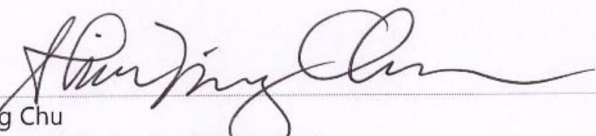
## AUTHORISATION

I hereby confirm that the information and findings provided in this report are true and correct, as completed by the above team member for CMI.

	17/08/2017
Katrina Thorpe <b>CertMark™ International Pty Ltd</b>	<b>Date</b>

## ACCEPTANCE OF REPORT

I hereby confirm and agree to the audit findings that are listed in this report.

	8-18-2017
Shiu Ming Chu Dragonboard Technologies Limited	Date

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