



CONSULTANT'S ADVICE		FIRE ENGINEERING	
<b>Project Name</b>	Dragonboard (Magnesium Oxide Board)	<b>Consultant's Advice No.</b>	CA01
<b>Project Number</b>	FCC.181207.CA01	<b>Dated</b>	07/12/18
<b>Client</b>	Lester Haycock	<b>Issued for</b>	Information
<b>Client Reference</b>	Email dated 06/11/2018	<b>Page</b>	1 to 4
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<b>To</b>	Lester Haycock	O: Global Procurement Supplies Ltd	E: lester@ljmarketing.co.nz
<b>Subject: Fire Resistance Rating of 12 mm Dragonboard – Advice thereof</b>			

## 1. Introduction

Fire Check Consultants Pty Ltd has been appointed by 'Global Procurement Supplies Ltd' to evaluate the Fire Resistance Rating (FRR) of Dragonboard developed by 'Forerunner Building Products of Taishan Limited (China). Dragonboard is comprising of magnesium oxide (MgO), Magnesium Chloride, sawdust, chemical additives, water and glass fabric and intended for both internal and external use.

Global Procurement Supplies Ltd has provided following test reports for assigned Classification in conformity with the European and Australian Standards -

**Table 1. Test reports**

No.	Standard	Testing Authority	Test Report No. and Date	Dragonboard Sample/Result
1.	BS 476: Part 4:1970 – Non-combustibility for materials	RED Fire and Facade Consultants	R07A15 Dated 18/05/07	40mm x 40mm x 50mm (thick) Non-combustible
2.	BS 476: Part 6:1989 – Fire propagation for products	PSB Corporation	54S071115/2/OKH Dated 19/04/07	225mm x 225mm x 12mm (thick) Fire propagation index – 0.0
3.	BS 476: Part 7:1997 – Classification of surface spread of flame	PSB Corporation	54S071115/1/OKH Dated 19/04/07	885mm x 270mm x 12mm (thick) Class One
4.	BS 476: Part 22:1987 – Fire resistance test	RED Fire and Facade Consultants	R07A15A Dated 18/05/07	3025mm x 3050mm x 70mm (thick) Insulation: <b>132</b> minutes Integrity: <b>150</b> minutes (no failure)
5.	AS 1530.1 – Combustibility test for materials	Intertek, China	180423003SHF-BP-1 dated 24/05/18	Cylinder with a dia of 45mm and a height 50mm Non-combustible

## 2. Legislative Review

The NZBC 1992 sets out the Deemed to Satisfy (DtS) requirements in relation to the Fire Resistance Rating of building elements in C/AS1 to C/AS7. The Acceptable Solutions separate the requirements for the necessary fire rating into two:

1. Life rating – used to determine the protection required for the fire separations that protect occupants while they are escaping.
2. Property rating – used for any fire separation whose purpose is to protect other property. It is also used for parts of the structure that prevent the building or parts of it collapsing, whether or not the collapse could cause damage to other people’s property. It also applies to escape stairs and exitways in buildings with over 10 m escape height.

The rating for a building element is established by standard test methods. The methods referenced by the Acceptable Solutions are AS 1530.4:2014 (Methods for fire tests on building materials, components and structures – Fire resistance tests for elements of construction) and BS 476-21:1987 (Fire tests on building materials and structures – Methods for determination of the fire resistance of loadbearing elements of construction). Typically, a sample of the building element is tested in a furnace until failure occurs.

Table below outlines life and property ratings and Acceptable Solutions for sprinklered and unsprinklered parts.

**Figure 1. Life and property ratings and Acceptable Solutions**

LIFE	PROPERTY	ACCEPTABLE SOLUTIONS	
		Unsprinklered	Sprinklered
30	30	C/AS1	C/AS1, C/AS2, C/AS7
30	60		C/AS4, C/AS5
30	90		C/AS5 (where storage is higher than 3 m and within 15 m of boundary)
60	60	C/AS2, C/AS7	C/AS3
60	120	C/AS4, C/AS5	
60	180	C/AS5 (where storage is higher than 3 m and within 15 m of boundary)	C/AS6

### 3. Test Specimen

The test report R07A15A' dated 18/05/07 conforming with the BS 476: Part 22:1987 states that a specimen of partition system with overall dimensions of 3,025 mm wide by 3,050 mm high by 70 mm thick had been subjected to a test in accordance with the BS 476: Part 22:1987, Section 5, to determine its fire resistance performance. It was comprised of a layer of 12 mm thick 'Dragonboard' fire resistance magnesium oxide board mounted on each side of galvanized steel frame and a layer of 46 mm thick 'Luyangwool' mullite crystal fibre blanket with density of 94 kg/m<sup>3</sup> was sandwiched in between the boards. The framework consisted of vertical studs and head and bottom runners of overall sizes 40 mm by 40 mm by 1.2 mm thick, covered with 3 mm thick Dragonboard fillets. The specimen was mounted within a concrete lined specimen holder. The unexposed surfaces of the specimen before and after the test are shown in Figures 2 and 3.

**Figure 2. The specimen before the test**



**Figure 3. The specimen after the test**



#### 4. Test Results

As given in report 'R07A15A', dated 18/05/07 by RED Fire and Facade Consultants, the specimen satisfied the performance required for the following periods:

**Insulation:** 132 minutes  
**Integrity:** 150 minutes (no failure).

#### 5. Conclusion

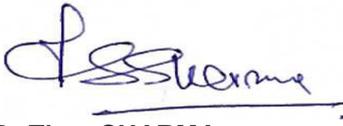
In reference to the report 'R07A15A', dated 18/05/07 by RED Fire and Facade Consultants, prescribes the fire resistance level assigned to the product, 'Dragonboard Insulated Partition System', in accordance with BS 476: Part 22:1987. The FRR assigned to the product is -/132/150.

Under NZBC, the products tested in conformity with BS 476: Part 22: 1987 are considered appropriate for use of building elements under Acceptable Solutions C/AS1 to C/AS7. The above test result demonstrates that the 12 mm Dragon board, when installed in a wall system identical to the tested prototype as stated above, will achieve a Fire Resistance Rating of -/132/150.

For and on behalf of

**FIRE CHECK CONSULTANTS PTY LTD**

Yours faithfully,



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