



REPORT NO.: 23 - 0588

Report Date: 18th October 2023
Client: Firecrunch Australasia Pty Ltd
Address: PO BOX 370, Pyrmont, NSW, 2009
Attention: Peter Jones
By Email: peter@firecrunch.com.au
Sample(s): 19mm MgO Board
Sampled By: Client
Lab Number(s): 23/A/4364
Client Reference: FCA TG19 KFLOOR 2700x600
BMRL NATA No.: 658
Date Received: 10th October 2023
Analysis / Project: Load testing of Fibre Boards.

Notes:

This laboratory was not involved with, consulted, or requested to undertake sampling of the specimens provided, and testing of those test specimens has been conducted as received in the laboratory.

Accordingly, no responsibility is taken for the integrity, authenticity, appropriateness, or representativeness, of any of the test specimens provided and this must be taken into account when reviewing, comparing or checking the test results published in this report.

Unless otherwise notified, all samples will be disposed of in three months from reporting date.

Yours faithfully,

Sharp and Howells Pty. Ltd.

Daniel Donehue
BSc, MRACI
Scientist

Sean Caspar
BSc. Adv. Research (Hons.), MRACI.
Scientist / Assistant Laboratory Manager

TESTING METHODOLOGY:

The following tests were conducted:

Test:	Method:
Point-Load Failure of MgO Board	In-House
Uniform Distributed Load Failure of MgO Board	In-House

Additional information:

Samples of 19mm thick MgO board were cut into 600x650 mm & 400x600 mm sections respectively.

Framing timber was attached at 400mm & 600mm centres using 30mm Countersunk Rub Head Timber screws at 200mm spacing.

A point load was applied using a 100x100 mm steel plate.

A Uniform-Distributed Load was applied using a 18mm MDF board cut to 50mm shorter than the centres and the full width to avoid any compressive moments over the supports.

RESULTS OF TESTING:

1. Point Load – 100x100mm (0.01m²):

Lab Number:	23/A/4364	
Date of Test:	18/10/2023	
Test Dimensions, mm:	400 x 400 x 19	
Deflection:	Breaking Load, kN:	
	Panel 1	Panel 2
Span/500 (0.8mm)	1.5	0.9
Span/350 (1.1mm)	1.7	1.1
Span/300 (1.3mm)	2.0	1.5
Span/250 (1.6mm)	2.2	1.7
Failure Deflection, mm:	11.7	14.7
Failure Load, kN:	6.1	6.2
Force Sustained, kN/m ² :	610	620

Lab Number:	23/A/4364	
Date of Test:	18/10/2023	
Test Dimensions, mm:	600 x 600 x 19	
Deflection:	Breaking Load, kN:	
	Panel 1	Panel 2
Span/500 (1.2mm)	0.4	0.5
Span/350 (1.7mm)	0.7	0.7
Span/300 (2.0mm)	0.8	0.8
Span/250 (2.4mm)	0.95	1.0
Failure Deflection, mm:	27.9	30.5
Failure Load, kN:	5.2	5.3
Force Sustained, kN/m ² :	520	530

RESULTS OF TESTING:

2. Uniformly Distributed Load (UDL):

Lab Number:	23/A/4364	
Date of Test:	18/10/2023	
Test Dimensions, mm:	400 x 400 x 19 (0.16m ²)	
Deflection:	Breaking Load, kN:	
	Panel 1	Panel 2
Span/500 (0.8mm)	0.7	0.7
Span/350 (1.1mm)	0.9	1.0
Span/300 (1.3mm)	1.1	1.5
Span/250 (1.6mm)	1.6	2.2
Failure Deflection, mm:	14.0	15.7
Failure Load, kN:	17.3	15.5
Force Sustained, kN/m ² :	108	96.9

Lab Number:	23/A/4364	
Date of Test:	18/10/2023	
Test Dimensions, mm:	600 x 600 x 19 (0.36m ²)	
Deflection:	Breaking Load, kN:	
	Panel 1	Panel 2
Span/500 (1.2mm)	0.7	0.5
Span/350 (1.7mm)	0.8	0.7
Span/300 (2.0mm)	1.0	0.8
Span/250 (2.4mm)	1.1	1.2
Failure Deflection, mm:	38.1	27.9
Failure Load, kN:	16.0	15.5
Force Sustained, kN/m ² :	44.4	43.0

PULL-OUT TEST REPORT

Report Number	LS21-1859-02 LT	Test Date	19/08/2021
Customer	Firecrunch Australasia Pty Ltd		
Customer Address	Suite 19, Level 44, 25 Martin Place, Sydney NSW 2000		
Requested By	Peter Jones	Purchase Order	COD
Issuing Laboratory	LMATS Sydney Laboratory		
Job Location	1C/137 Silverwater Rd, Silverwater NSW 2128 – LMATS Pty Ltd		
Job Description	Pull-out load test of 7.5 x 80mm masonry screws in composite panels		
Product Description (As Supplied by Client)	FireCrunch K-Floor TG 19mm thick high density magnesium oxide composite		
Identification	sheeting		
Material Specification	TG19HD		
Test Specification	TG19HD Firecrunch Magnesium oxide composite (MgSo4) 1.15g/cm3		
Test Method	Client's Specified Activities – Determine max pull-out load		
Equipment Data	As outlined in Technical Data		
Technical Data	Hilti DPG-100 Anchor Tester – L1584		
	2 off composite panels approximately 150 x 150mm in diameter		
	Load applied using a Ramset 7.5 x 80mm galvanised masonry screw		
	Test Set-up was completed as per Figure 2		
	Screw was tightened until max load was achieved		
Evaluation Data	Refer to Table 1		
Test Technician	Muhammed Sabah		
Remarks	Refer to Figure 3 for photographs of failure location		
Test Results	Refer to Table 1		

Table 1 Pull-out test data

Sample ID	Test Number	Screw Size	Max Load (kN)	Average Failure Load (kN)
TG19HD	1	7.5 x 80mm	2.3	2.2
	2	7.5 x 80mm	2.3	
	3	7.5 x 80mm	2.1	

The kilonewton (abbreviation: kN) is the unit of force in metric system (SI). The kilonewton is equal to the amount of force needed to accelerate a one thousand kilograms mass at a rate of one meter per second squared. 1 kilonewton (kN) = 0.101971621 ton-force (tf, metric ton-force) = 101.971621 kilogram-force (kgf) = 224.808943 pound-force (lbf)

2.2kN = 494.56 lbf = 1/4 tonne

Signature

B.Eng (Materials)



Muhammed Sabah
23/08/2021



Figure 1 Photograph of as-received panel



Figure 2 Photograph of test-setup



Figure 3 Photograph of Panel after testing

Notes

1. All test and inspection items will be discarded after 6 weeks, unless retrieved by the clients representative.
2. Samples, identification of samples and all job specific details were supplied by the client.
3. Any stated nominal pipe sizes and nominal thickness of the material were provided by the client.
4. Where applicable, the Measurement Uncertainty (MU) applies to the test results as per LMATS procedure. MU can be obtained by contacting one of the LMATS ISO 17025 accredited laboratory.
5. If this report does not specify acceptance criteria, then the test or inspection results should be referred to a competent authority for further action.
6. This report shall not be reproduced except in full without approval of the issuing laboratory to ensure that parts of a report are not taken out of context. The client or their representatives shall not edit this report.
7. LMATS or its professional indemnity insurance provider do not indemnify the contents within this report or the conformity of a tested product unless the invoice for the reported work is paid in full within the agreed credit terms. Reports will be revoked if the invoice for the completed work is not paid in full.

PULL-OUT TEST REPORT

Report Number	LS21-2458-01 LT	Test Date	29/10/2021-01/11/2021
Customer	Firecrunch Australasia Pty Ltd		
Customer Address	Suite 19, Level 44, 25 Martin Place, Sydney NSW 2000		
Requested By	Peter Jones	Purchase Order	COD
Issuing Laboratory	LMATS Sydney Laboratory		
Job Location	1C/137 Silverwater Rd, Silverwater NSW 2128 – LMATS Pty Ltd		
Job Description	Pull-out load test of M12 blind bolt in composite panel		
Product Description (As Supplied by Client)	K FLOOR / SYDW-S-TG19HD 19MM 300X300		
Identification	TG19HD		
Material Specification	FIRECRUNCH (MgSO ₄) magnesium oxide sulphate composite, density 1.15g/cm ³		
Test Specification	Client's Specified Activities – Determine max pull-out load		
Test Method	As outlined in Technical Data		
Equipment Data	Hilti DPG-100 Anchor Tester – L1584		
Technical Data	<p>Composite panel 300 x 300mm</p> <p>M12 x 70mm Blind Bolt</p> <p>Single bolt Test Set-up was completed as per Figure 2</p> <p>Four bolt Test Set-up was completed as per Figure 4</p> <p>Nut was tightened until max load was achieved</p>		
Evaluation Data	Refer to Table 1		
Test Technician	Muhammed Sabah		
Remarks	Refer to Figures 6-7 for photographs of failure location		
Test Results	Refer to Table 1		

Signature

B.Eng (Materials)



Muhammed Sabah
3/11/2021

Table 1 Pull-out test data

Sample ID	Test Number	Screw Size	Max Load (kN)	Average Failure Load (kN)
TG19HD – Shiny side (Single Bolt)	1	M12 x 70mm	2.7	2.3
	2	M12 x 70mm	2.2	
	3	M12 x 70mm	2.2	
	4	M12 x 70mm	2.1	
TG19HD – Rough side (Single Bolt)	1	M12 x 70mm	3.2	3.1
	2	M12 x 70mm	3.1	
	3	M12 x 70mm	3.1	
TG19HD – Shiny side (Four Bolt)	1	4 off M12 x 70mm	7.3	7.3
TG19HD – Rough side (Four Bolt)	1	4 off M12 x 70mm	7.2	7.2

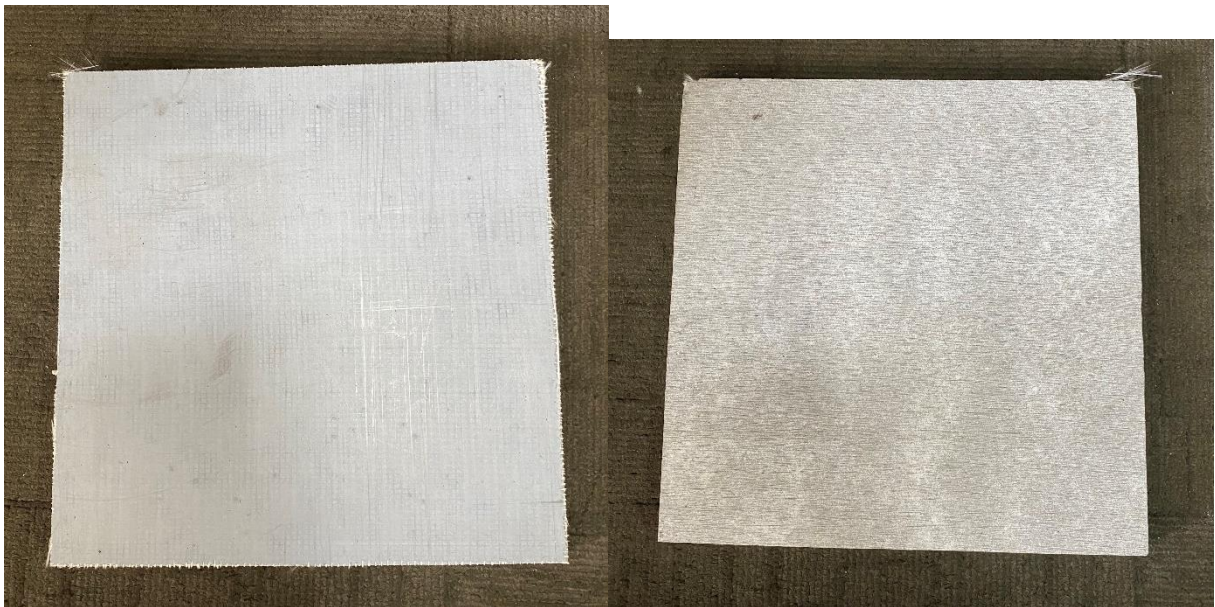


Figure 1 Photograph of as-received panel - Smooth (LHS) Rough (RHS)

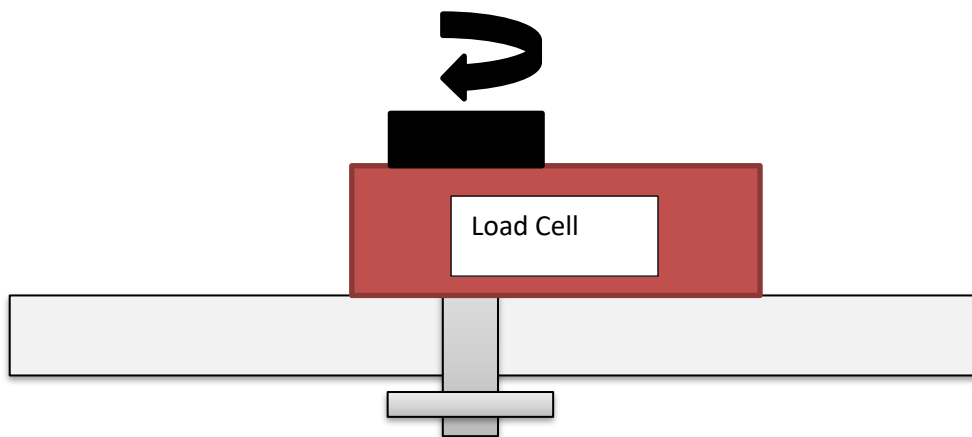


Figure 2 Diagram of test setup – Single Bolt



Figure 3 Photograph of test setup – Single Bolt

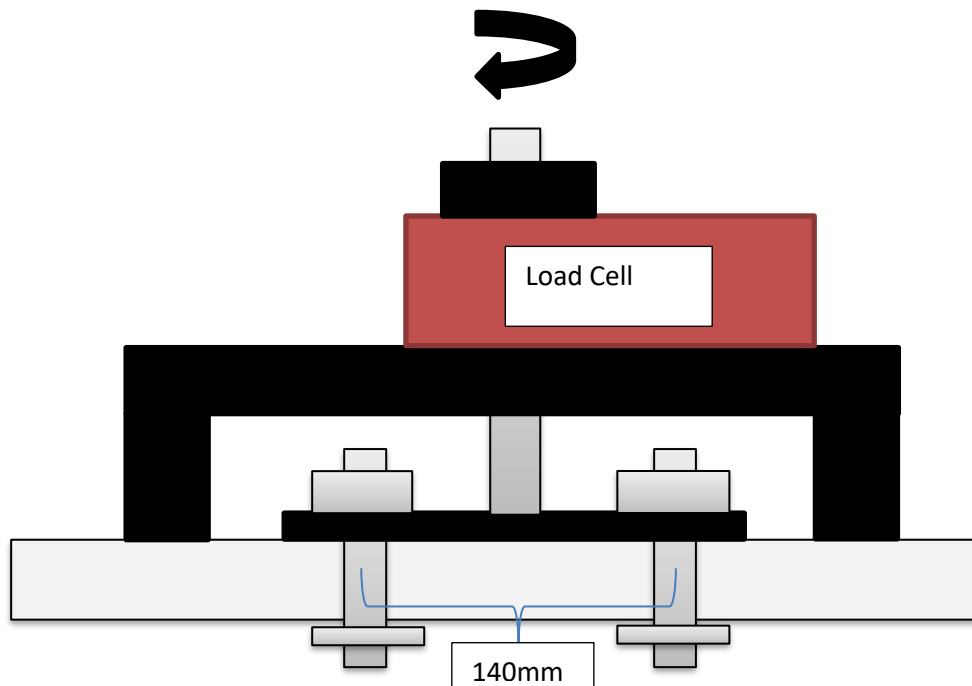


Figure 4 Photograph of test setup – Four Bolts



Figure 5 Photograph of test setup – Four Bolts



Figure 6 Typical failure of single bolt test



Figure 7 Typical failure of four bolt test (Rough Side up)

Notes

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