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TEST REPORT

BM6045 Composite Cover & Aluminium Frame
EN124:2015 B125 Load Bearing Test
(BIF 65464)

Document reference number - SSC-BM6045-LBT-65464-01-10-18

Report by:

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Date test carried out:

1st October 2018

Customer name:

Structural Science Composites Ltd.
Unit 8 James Freel Court,
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LA14 2NG

Clarifying Statements:

1. The results reported have been performed in accordance with the test requirements agreed by the customer (Structural Science Composites Ltd.) and laid down in the new EN 124-1: 2015 standard.

2. This report does not include or imply any expert opinions as to the serviceability of the sample tested or their suitability for a specific purpose.

3. The submitter disclaims any liability of any kind for any damage whatsoever resulting from the use of either data in the files or the attached values of the test results reported.

4. The report may not be reproduced other than in full, except with the prior written consent of the Engineering Dept., Lancaster University.

5. All testing has been carried out in within the Engineering Department, Gillow Ave., Lancaster University, Bailrigg, Lancaster LA1 4YW.

6. This report applies only to those items and/or materials that have been tested and reported on herein. No inference shall be made to similar test items or materials/ samples.

Cover

The cover supplied is a rectangular BM6045 composite cover (Photo. 1)
Cover No. – 65464

An aluminium frame was also supplied with a clear opening of 600mm x 450mm.

Photo. 1

Test Rig

The test rig consists of a 'giant mecanno' frame bolted to the floor and supporting an Enerpac 50 ton hydraulic cylinder. (Photo 2)

Calibration Sticker (Photo.3)

Photo.2

The frame sat on steel channels with shims to pack and level.

In accordance with the EN124-1:2015 standard the load cell and test rig complies with EN ISO 7500-1:2004 minimum Class 3.

Test Rig ID: EG100TF (Photo.3)
Load Cell ID: 440/3243
Instron Calibration Certificate No. E225112816155035
System Class: 2

Photo.3

Test

The tests were carried out in accordance with the EN 124:2015 standard for:

- Permanent Set – Clause 8.2
- Load Bearing Capacity – Clause 8.3

The load was applied to the cover through a 250mm diameter by 45mm thick steel block with a 250mm diameter by 10mm rubber pad between the block and cover.

Permanent Set Test

Measurement of permanent set shall be made on the upper-side of the cover in the same place as the applied load at the longest dimension which can be inscribed within the cover through the centre point of the load application. The measurement device shall be positioned as close as possible to the centre point of the load application and the seating of the measuring device support as close as possible to the edge of the cover but not exceeding 10mm from the edge.

An initial reading is to be taken at the geometric centre of the cover before the first load or any preloading has taken place.

The load is then to be applied at a rate of 1kN/s to 5kN/s up to 2/3 of the test load. This procedure is to be carried out five times without significant disruption.

A final deflection reading shall then be taken and the permanent set determined as the difference of the measured readings between the first and fifth readings.

Load Bearing Capacity

Immediately after the permanent set test the cover shall be loaded up to the test load at a rate of 1kN/s to 5kN/s.

The test load shall then be maintained for 30^{+2}_{-0} seconds.

Permanent set test

Photograph 4 below shows the initial reading being taken for the permanent set test.

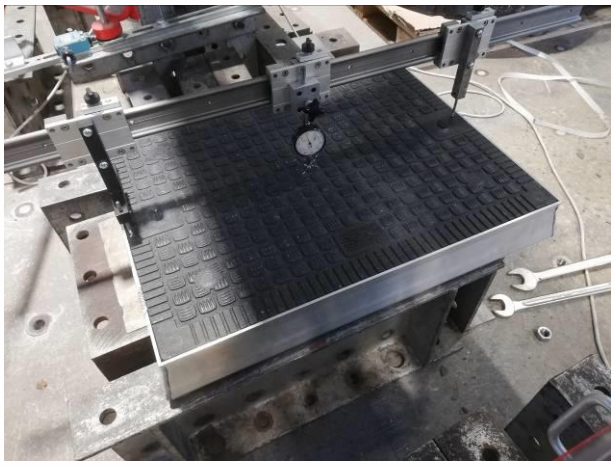


Photo.4

Initial Reading	0.00mm
Reading after 5 cycles	0.68mm
Permanent Set	**0.68mm**

Permissible permanent set for a B125 test is $\frac{CO}{100}$ = 600/100 = 6.00mm

Therefore cover passes the permanent set test.

Load Bearing Capacity Test

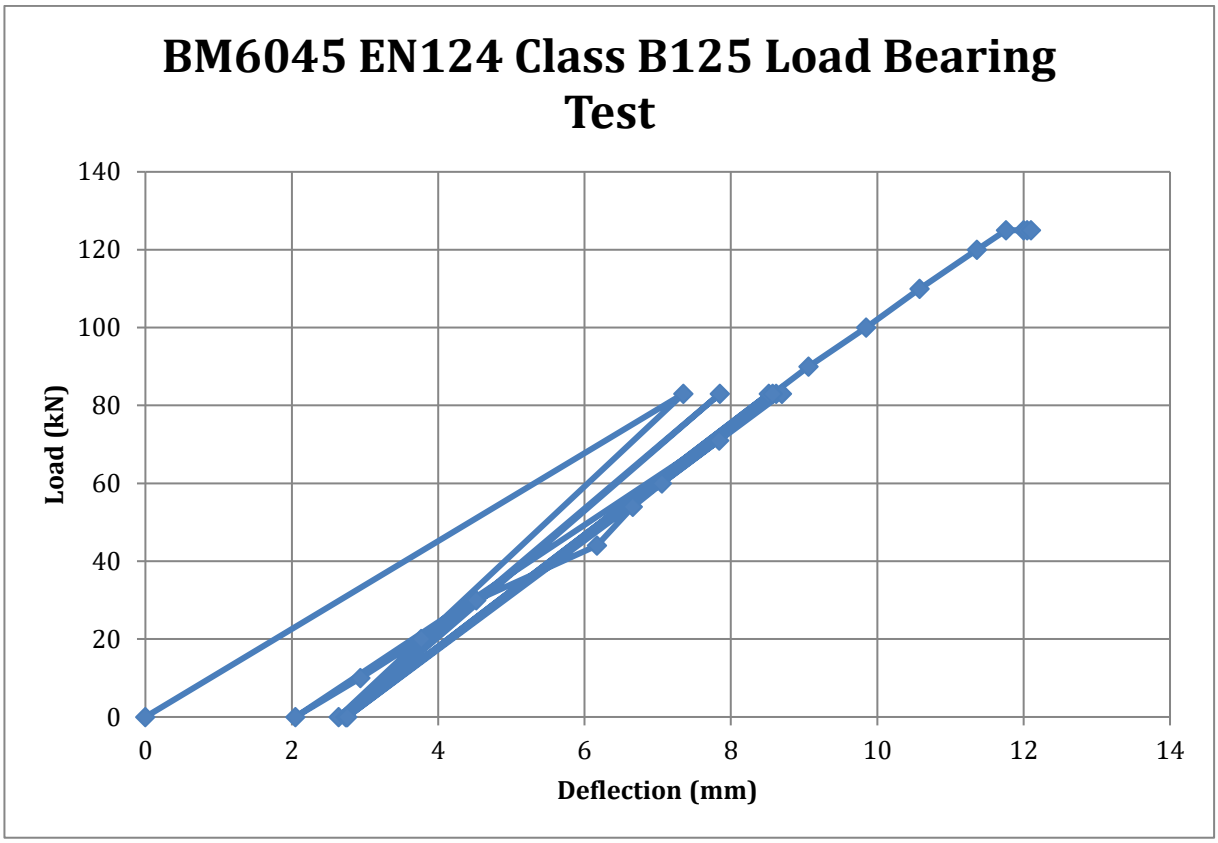
Load applied immediately after the permanent set test.

Although the standard does not require it for the load bearing test, a measuring device (linear potentiometer) was placed on the underside of the cover directly under the loading point. Deflection readings were taken throughout the test including the initial permanent set test and the results given in the following table.

Results

LOAD (kN)	DEFLECTION (mm)	REMARKS
0	0.00	
83	7.35	Light cracking noises just for the 1st cycle.
0	2.64	
83	7.85	
0	2.74	
83	8.52	
0	2.74	
83	8.62	
0	2.76	
83	8.70	
0	2.05	
10	2.94	
20	3.77	
30	4.52	
44	6.17	
54	6.66	
60	7.06	
71	7.84	
83	8.57	
90	9.06	
100	9.85	
110	10.58	
120	11.36	
125	11.76	
125 (10 seconds)	12.00	
125 (20 seconds)	12.05	
125 (30 seconds)	12.10	**PASS**
0	2.45	
192	Gauge removed	Ultimate failure

The slight difference noted between the true permanent set reading taken on the top face and that of the zero readings taken on the underside, can be explained by the fact that the underside readings show the result of the cover bedding into the frame and supports.



After the cover had passed the BS EN124 Class B125 Load Bearing Test the linear potentiometer was removed from under the cover to avoid damage.

The cover was then loaded further until ultimate failure occurred at 192kN.