



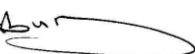
# TEST REPORT

## FL60 Composite Cover BS EN124 A15 Test

Document reference number - FIB-FL60-A15-20-12-16

### Report by:

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Senior Technician

M. A. Salisbury 

### Date test carried out:

20<sup>th</sup> December 2016

### Customer name:

Fibrelite Composites Ltd.  
Snaygill Industrial Estate,  
Keighley Road,  
Skipton,  
North Yorkshire  
BD23 2QR

## Clarifying Statements:

1. The results reported have been performed in accordance with the test requirements agreed by the customer (Fibrelite Ltd.) and laid down in the new draft FprEN 124-1 2014 standard along with the composite section FprEN 124-5.
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 composite cover supplied is a square FL60 complete with aluminium frame. (Photo.1)

**Cover No. : 17467**

**Frame No. : 99216**



Photo. 1

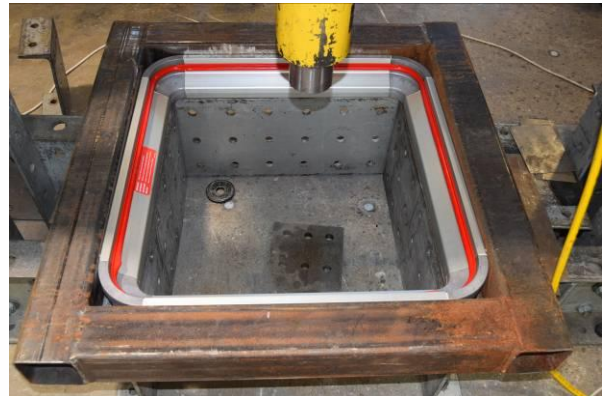


Photo.2

## Test Rig

The test rig consists of a 'giant mecano' frame bolted to the floor and supporting the Enerpac 50 ton hydraulic cylinder.

The cover was seated on steel channels with steel shims to pack and level.

A steel frame made from 100mm x 100mm steel box section was placed round the frame to act as a support. (Photo.2)

In accordance with the draft FprEN124-1:2014 standard the load cell and test rig complies with EN ISO 7500-1:2004 minimum Class 3.

Test Rig ID: EG100TF

Load Cell ID

Instron Calibration Certificate No. E225112816155035

System Class: 1



Photo.3

## **Test**

The tests were carried out in accordance with the FprEN 124:2014 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  $30_{-0}^{+2}$  seconds.

## Results

### Permanent set test

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

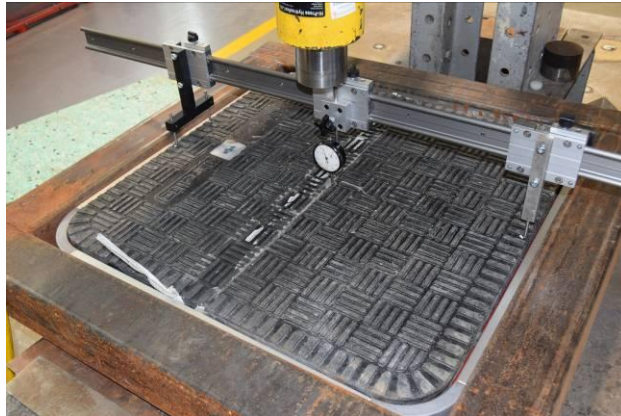


Photo.4

Initial Reading	0.00mm
Reading after 5 cycles	0.15mm
<b>Permanent Set</b>	<b>0.15mm</b>

Permissible permanent set for an A15 test is  $\frac{CO}{100} = \frac{600}{100} = 6.00\text{mm}$

**Therefore cover passes the permanent set test.**

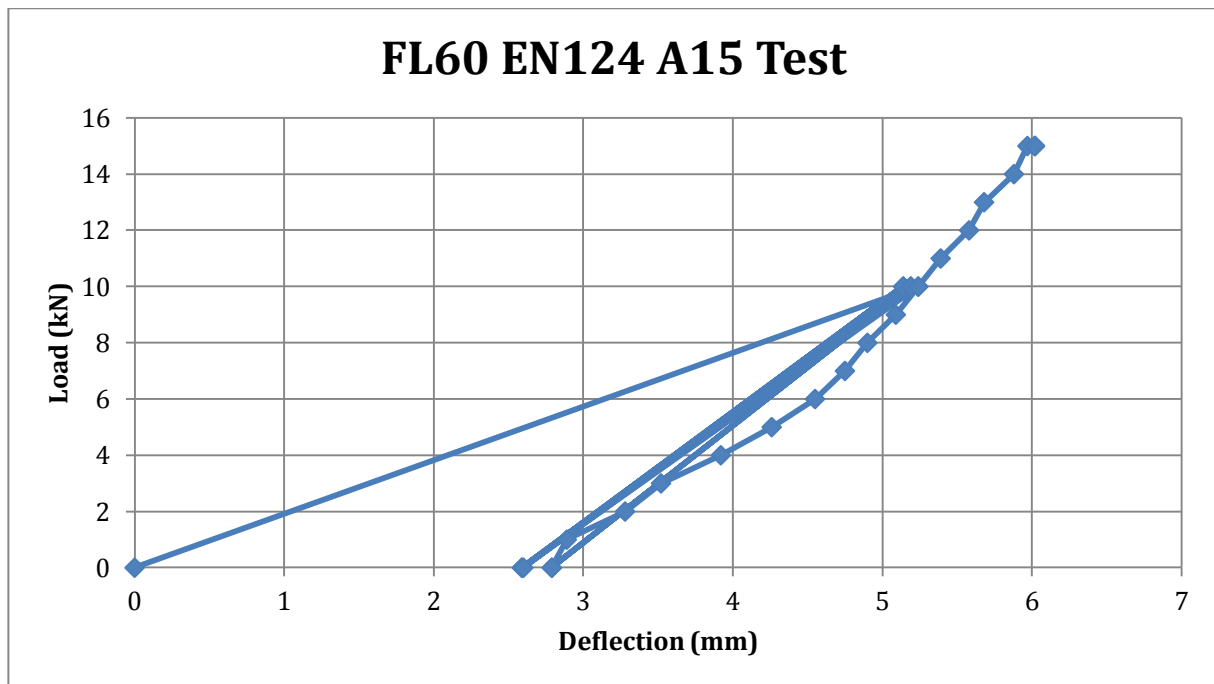
## Load Bearing Capacity Test

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 panel directly under the loading point and deflection readings taken every 10kN for the five cycles and 1kN intervals after that.

LOAD (kN)	DEFLECTION (mm)	REMARKS
0	0.00	
10	5.24	Large initial deflection as cover had not seated fully in frame before load was applied.
0	2.59	
10	5.14	
0	2.59	
10	5.14	
0	2.60	
10	5.19	
0	2.79	
10	5.19	
0	2.79	
1	2.89	
2	3.28	
3	3.52	
4	3.92	
5	4.26	
6	4.55	
7	4.75	
8	4.90	
9	5.09	
10	5.24	
11	5.39	
12	5.58	
13	5.68	
14	5.88	
15	5.97	
15 (10 seconds)	6.02	<b>PASS</b>
15 (20 seconds)	6.02	
15 (30 seconds)	6.02	
0	3.05	
86.4	Gauge removed	Ultimate failure

**The cover held the test load of 15kN for the required 30 seconds so therefore passed the load bearing test.**



Graph above shows a large initial deflection which was caused by the cover not being fully seated before the first load cycle was applied.

After the cover had passed the EN124 A15 load bearing test the linear potentiometer was removed from under the cover to avoid damage.

A larger capacity 1000kN load cell (SN. 3243N) replaced the 50kN one and the cover loaded further until ultimate failure occurred at 86.4kN.

Photograph 5 below shows the cover still in the test rig at failure and the top face badly deformed around the loading pad area.

On removal from the test rig the underside had a large crack running through the centre of the cover. (Photo.6)

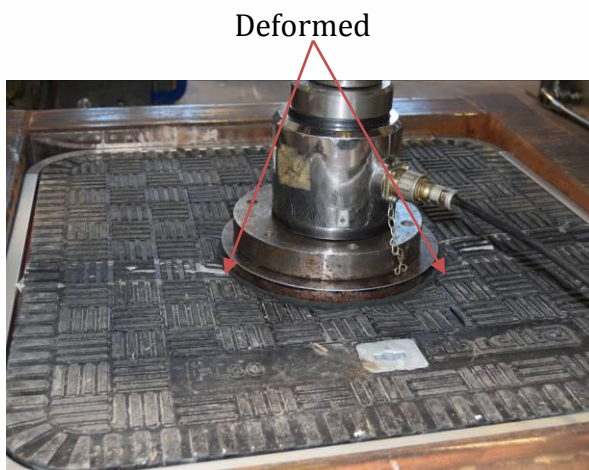


Photo.5

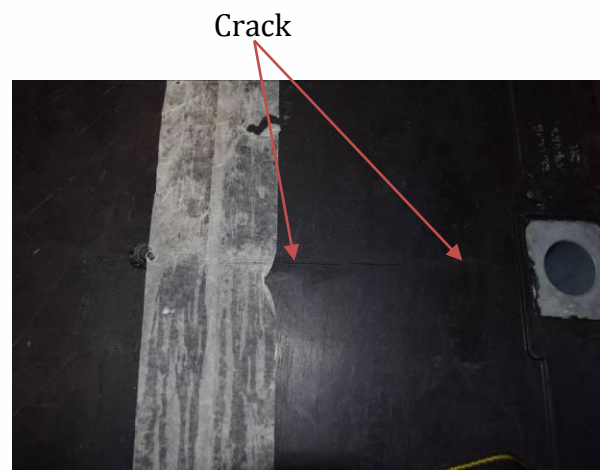


Photo.6