Engineering | Lancaster University

TEST REPORT

FL140 Composite Cover
BS EN124 C250 Test

Document reference number - FIB-FL140-21-06-16

Report by:

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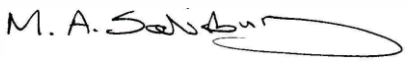


Date test carried out:

21st February 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 Composites Ltd.) and laid down in the BS EN124 1994 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 composite cover supplied for load testing is a rectangular FL140 complete with frame. (Photo.1)
Cover No. - No number

Photo. 1

An aluminium frame was supplied with the cover.
Frame No. - No number

Test Rig

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

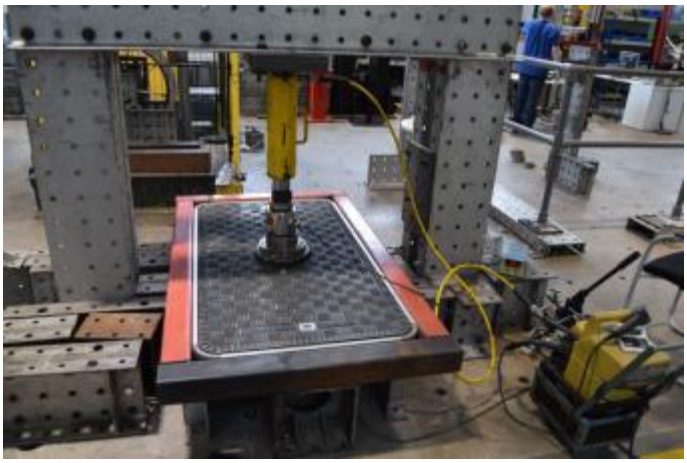


Photo. 2

The cover and frame were sat on steel channels and plates with steel shims to pack and level. The frame also sat in a steel framework made of 100mm x 100mm steel box section; this was to give support to the aluminium frame and for safety during testing.

Test

The test was carried out in accordance with BS EN 124, Class C250.

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.

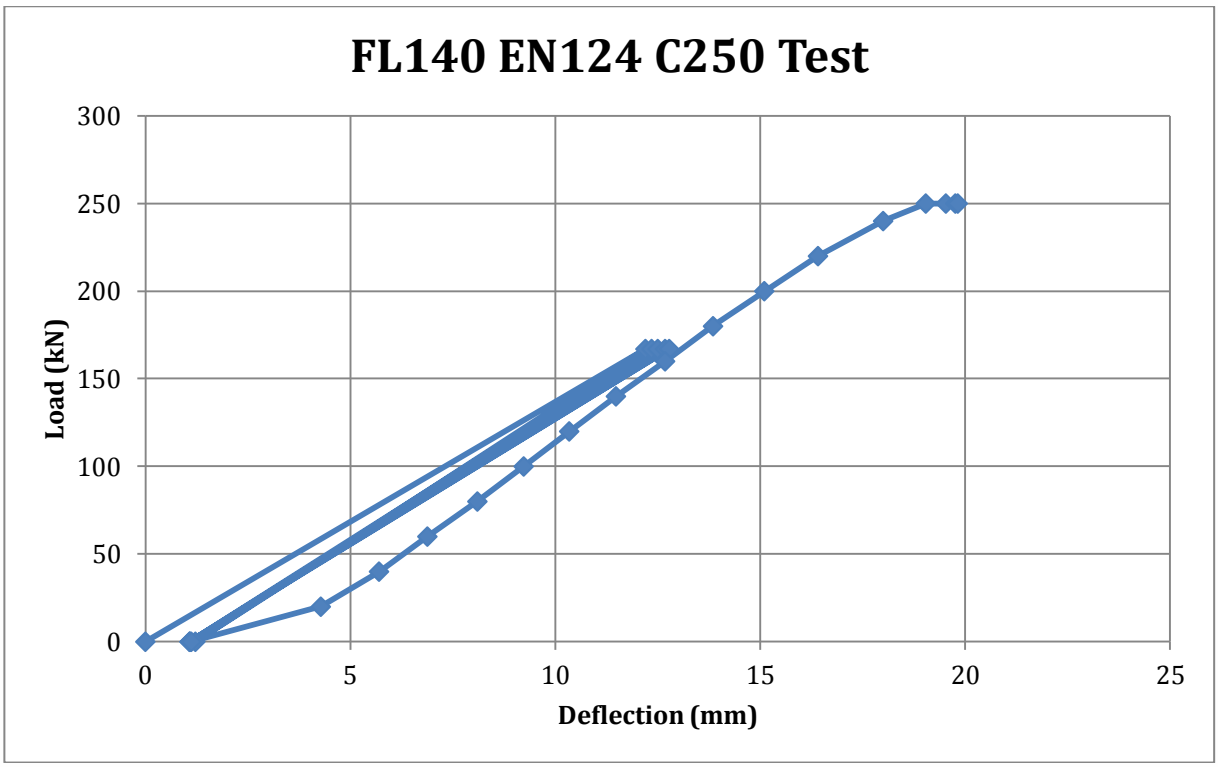
The load was measured using a 1000kN load cell (serial no. 3243N) and digital load indicator (serial no. D.I.B.1).

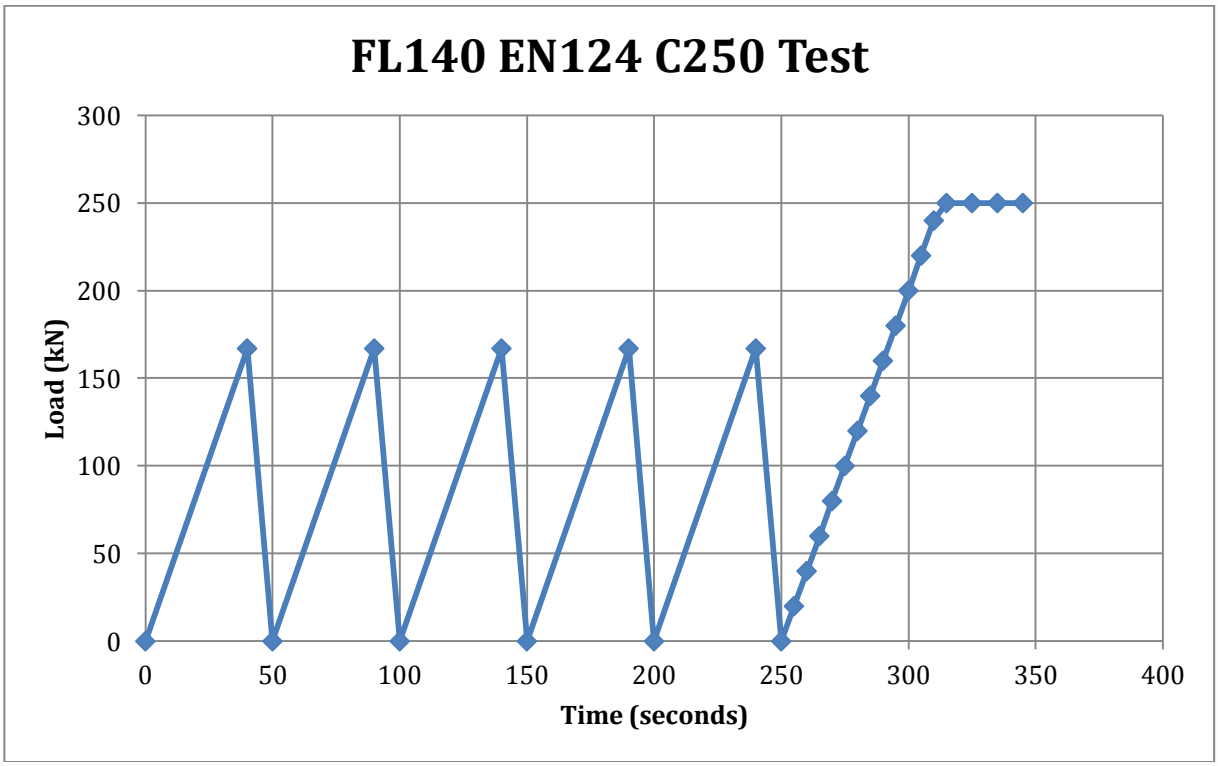
The deflection was measured at the centre on the underside of the cover using a dial indicator (serial no.)

The cover was to be loaded to 2/3 of the test load and then released. This was to be repeated five times. It then had to be loaded to try and achieve the test load of 250kN.

Results

LOAD (kN)	DEFLECTION (mm)	REMARKS
0	0.00	
167	12.20	
0	1.22	
167	12.35	
0	1.08	
167	12.50	
0	1.08	
167	12.68	
0	1.09	
167	12.78	
0	1.12	
20	4.28	
40	5.70	
60	6.88	
80	8.10	
100	9.23	
120	10.34	
140	11.48	
160	12.68	
180	13.85	
200	15.10	
220	16.41	
240	18.00	
250	19.04	
250 (10 seconds)	19.53	
250 (20 seconds)	19.76	
250 (30 seconds)	19.82	
0	2.42	
305	Dial gauge removed.	FAILURE - large crack on top face. Badly deformed around loading pad.


FL140 EN124 C250 Test
Load (kN)
300
250
200
150
100
50
0
0
5
10
15
20
25
Deflection (mm)


FL140 EN124 C250 Test
Load (kN)
300
250
200
150
100
50
0
0
50
100
150
200
250
300
350
400
Time (seconds)

The cover held the test load of 250kN for the required 30 seconds.

In accordance with EN124 Clause 8.3.1 the permanent set of the cover was 1.12mm which is within the permissible stated in Table 8 of the standard. (1/300 x 700 = 2.33mm).

The cover therefore passed the EN124 C250 test for both permanent set and load.

After the cover had passed the C250 load test the load was removed and the cover inspected. The dial gauge was removed to avoid damage and the cover then reloaded until failure occurred at 305kN.

Photograph 3 shows the cover still in the test rig at failure. (Crack)

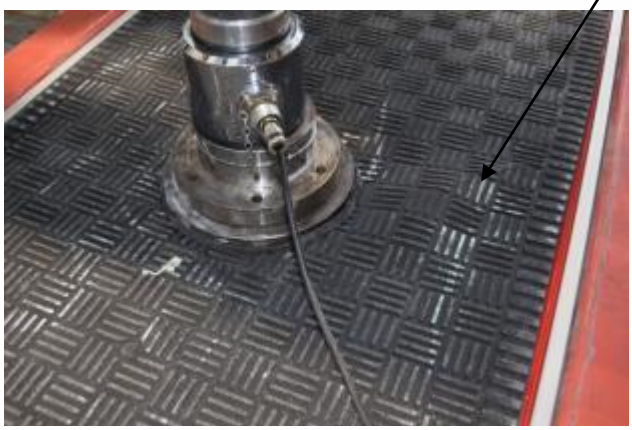


Photo.3

The following two photographs show the cracking and damage that occurred to the top face of the cover at the failure load of 305kN.

Buckled up Crack

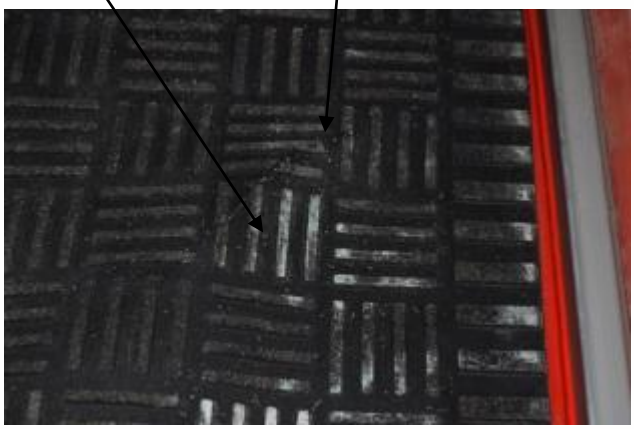


Photo.4

Cracking round edge of loading pad

Photo.5