



TEST REPORT

FL600/D400 Composite Cover and Frame BS EN124 D400 Test

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Report by:

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Date test carried out:

13th May 2015

Customer name:

Fibrelite Composites Ltd.
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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 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 is a round FL600/D400 complete with frame. (Photo.1)

Cover No. - 4935

Frame No. - 5619



Photo. 1

Test Rig

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



Photo. 2

Test

The test was carried out in accordance with BS EN 124, Class D400.

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.

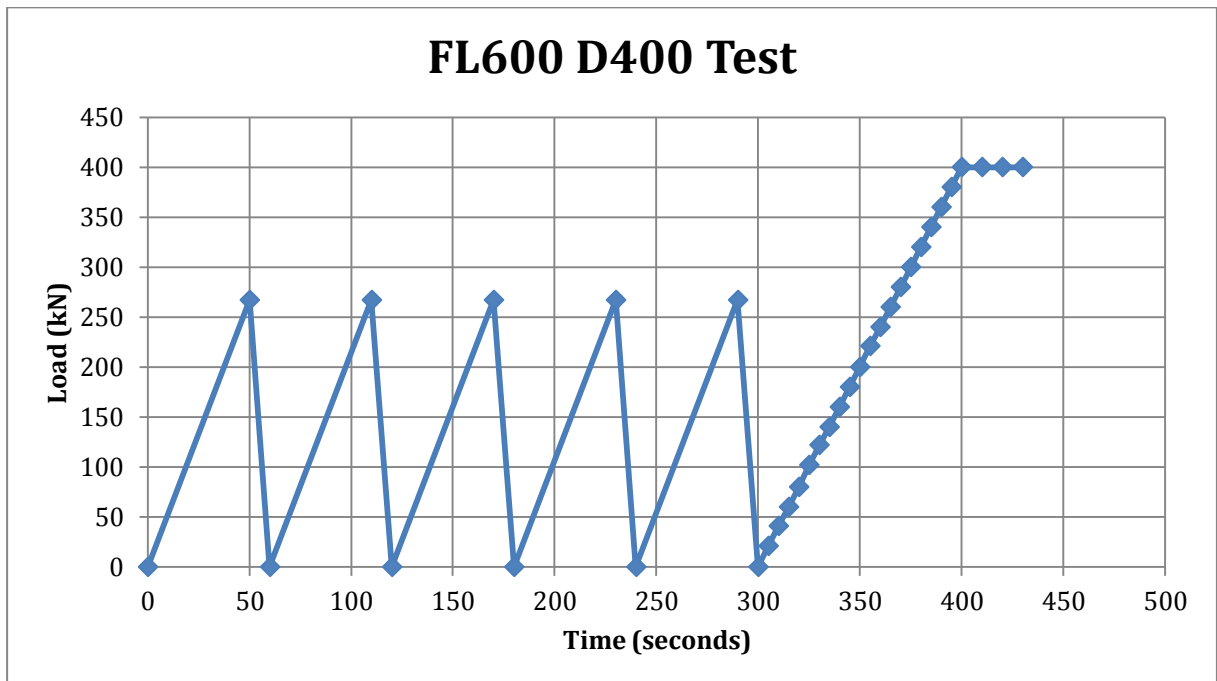
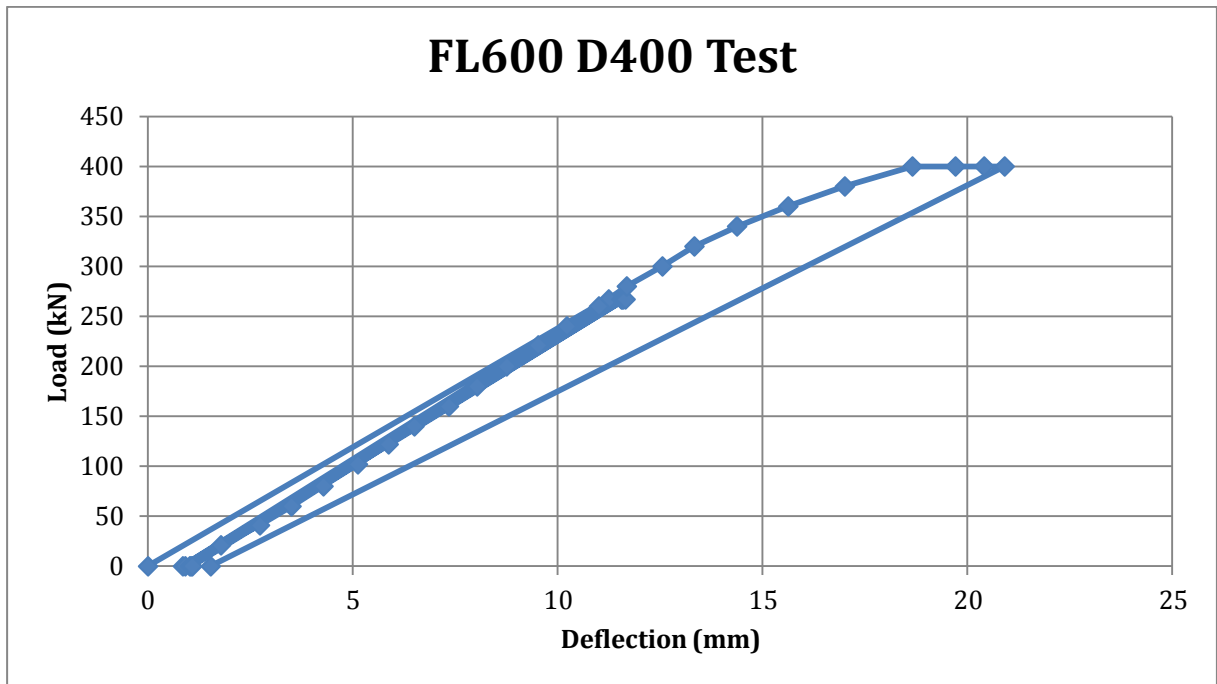
The load was measured using a 1000kN load cell (serial no. 3243N) and digital load indicator (serial no. D.I.B.1).

The deflection was measured at the centre on the underside of the cover using a dial indicator.

The cover was loaded to $2/3$ of the test load and then released. This was repeated five times. It was then loaded to try and achieve the test load of 400kN.

Results

LOAD (kN)	DEFLECTION (mm)	REMARKS
0	0.00	
267	11.24	Some light cracking noises from about 110kN for first cycle. Creaking noises as cover pushes into frame.
0	0.85	
267	11.55	
0	0.91	
267	11.57	
0	1.05	
267	11.60	
0	1.02	
267	11.65	
0	1.08	
21	1.78	
41	2.73	
60	3.50	
80	4.28	
102	5.12	
122	5.87	
140	6.50	
160	7.34	
180	8.03	
200	8.75	
221	9.52	
240	10.22	
260	11.00	
280	11.68	
300	12.55	Loud creaking noises as cover pushes into frame.
320	13.33	
340	14.37	
360	15.62	
380	17.00	
400	18.65	
400 (10 seconds)	19.70	
400 (20 seconds)	20.40	
400 (30 seconds)	20.90	PASS
0	1.53	
400	Dial gauge removed	
410	-	Loud cracking /tearing noises
421	-	Ultimate failure.



In accordance with EN124 Clause 8.3.1 the permanent set of the cover was 1.39mm which is within the permissible stated in Table 8 of the standard. ($1/300 \times 600 = 2.00\text{mm}$).

The cover held the test load of 400kN for the required 30 seconds.

The cover therefore passed the EN124 D400 test for both permanent set and load.

After the cover had been loaded to the test load of 400kN and held for the required 30 seconds the load was released and a permanent set of 1.53mm recorded.

The dial gauge was then removed from under the cover to avoid damage.

The cover was then loaded further until ultimate failure occurred at 421kN.

Below photograph 3 shows the gap that appeared between the edge of the cover and frame by the two thirds test load of 267kN.

The gap was about 5mm at either side whilst photograph 4 shows no gap, this was at the front and back edge as you look at the test rig.



Photo.3



Photo.4

Photograph 5 now shows the cover and frame at the failure load of 421kN.

10mm gap and cover sunk in
15mm from top edge of frame

No gap



Photo.5

Photograph 6 shows a close up of the depressed cover.



Photo.6

The cover and frame were removed from the test rig and inspected for damage.

The cover had a number of large cracks down the outside edge. (Photos.7 and 8)



Photo.7



Photo.8

The frame also showed some damage with cracks on its inside edge and face. (Photos.9 and 10)



Photo.9



Photo.10

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