



TEST REPORT

OPW 30 (FL76) Composite Cover BS EN124 C250 Test

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Report by:

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Date test carried out:

21st November 2018

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 Ltd.) and laid down in the new BS EN 124-1: 2015 standard along with the composite section EN 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 OPW 30 complete with aluminium frame. (Photo.1)

Cover No. : 19200

Frame No. : 18/1352



Photo. 1

A 100mm x 100mm steel box section frame was placed around the aluminium frame to add support and as an added safety feature incase of failure.

Test Rig

The test rig consists of a 'giant mecano' frame bolted to the floor and supporting the Enerpac 90 ton hydraulic cylinder. (Photo.2)

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

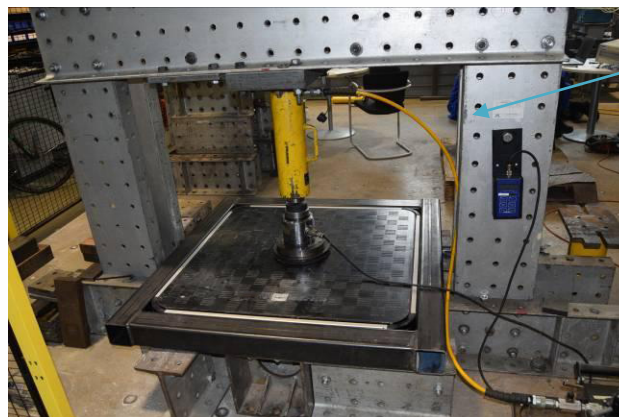
In accordance with the EN124-1:2015 standard the load cell and test rig complies with EN ISO 7500-1:2004 minimum Class 3.

Test Rig ID: EG100TF

Load Cell ID:

Instron Calibration Certificate No. E225112816155035

System Class: 2



Calibration cert.

Photo.2

Photograph 3 below shows the calibration certificate for the load cell and test rig.



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_{-0}^{+2} seconds.

Results

Permanent set test



Photo.4

Initial Reading	0.00mm
Reading after 5 cycles	0.66mm
Permanent Set	0.66mm

Permissible permanent set for a C250 test is $\frac{CO}{300} = \frac{760}{300} = 2.53\text{mm}$

Therefore cover passes the permanent set test.

Load Bearing Capacity Test

Load applied immediately after the permanent set test.

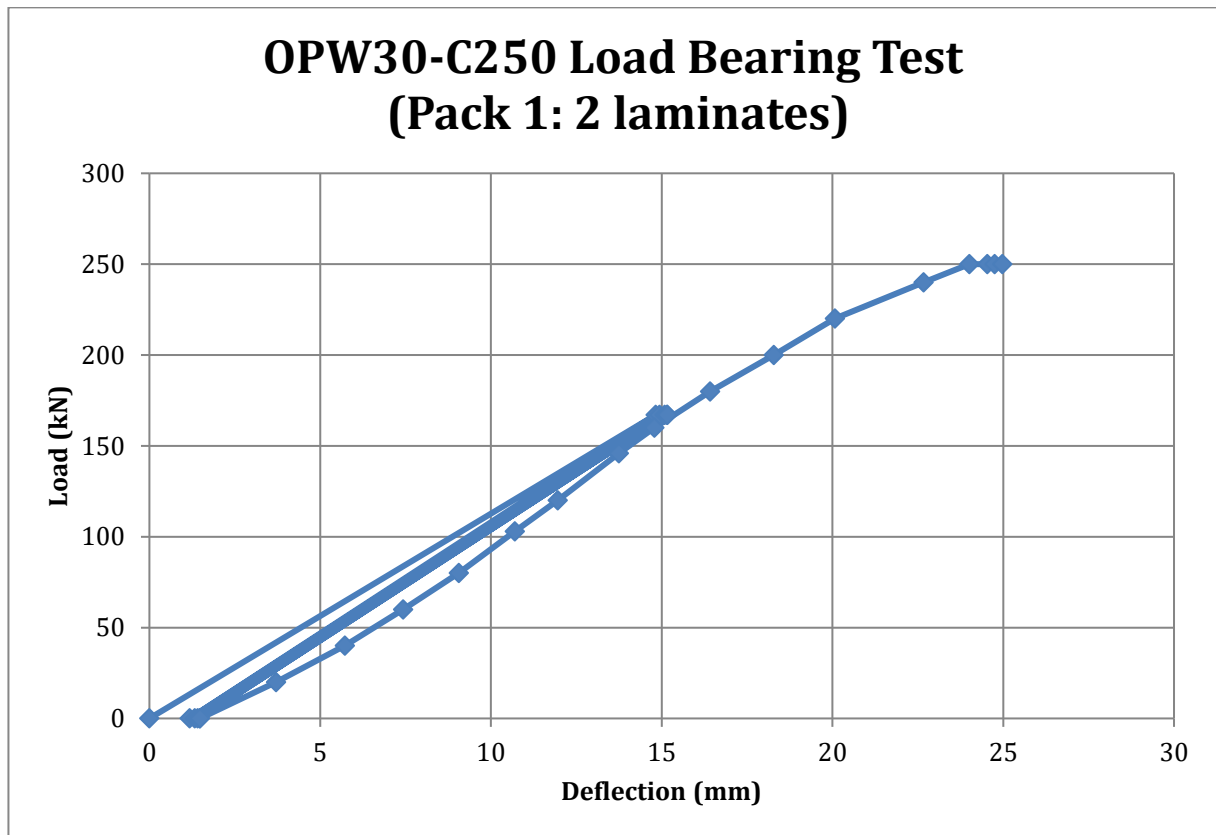
Although the standard does not require it for the load bearing test, a measuring device (linear potentiometer) was placed on the underside of the panel directly under the loading point and deflection readings taken every 167kN for the five cycles and 20kN intervals after that.

Results

LOAD (kN)	DEFLECTION (mm)	REMARKS
0	0.00	
167	14.82	
0	1.18	
167	14.94	
0	1.33	
167	15.09	
0	1.41	
167	15.16	
0	1.48	
167	15.16	
0	1.48	
20	3.71	
40	5.72	
60	7.43	
80	9.06	
103	10.70	
120	11.96	
146	13.75	
160	14.79	
180	16.42	
200	18.28	
220	20.07	
240	22.67	
250	24.01	
250 (10 seconds)	24.53	
250 (20 seconds)	24.75	
250 (30 seconds)	24.97	PASS

The cover reached the test load of 250kN and held that load for the required 30 seconds so therefore passed the EN 124 C250 Load Bearing test.

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.



There were no signs of any visible damage to the frame.