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TEST REPORT

CR106 Composite Cover & Frame
EN124:2015 C250 Load Bearing Test
(BIF 47475)

Document reference number - SSC-CR106-LBT-47475-04-10-18

Report by:

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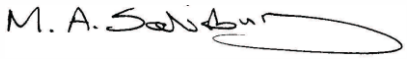


Date test carried out:

4th October 2018

Customer name:

Structural Science Composites Ltd.
Unit 8 James Freel Court,
James Freel Close,
Barrow in Furness
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 round CR106 composite cover (Photo. 1)
Cover No. – 47475

A composite frame was also supplied with a clear opening of 1060mm.
Frame No. - 81644

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 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

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 panels through a 250mm diameter by 45mm thick steel block with a 250mm diameter by 10mm rubber pad between the block and panel.

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	0.49mm
Permanent Set	**0.49mm**

Permissible permanent set for a C250 test is $\frac{CO}{300}$ = 1060/300 = 3.53mm

Therefore cover passes the permanent set test.

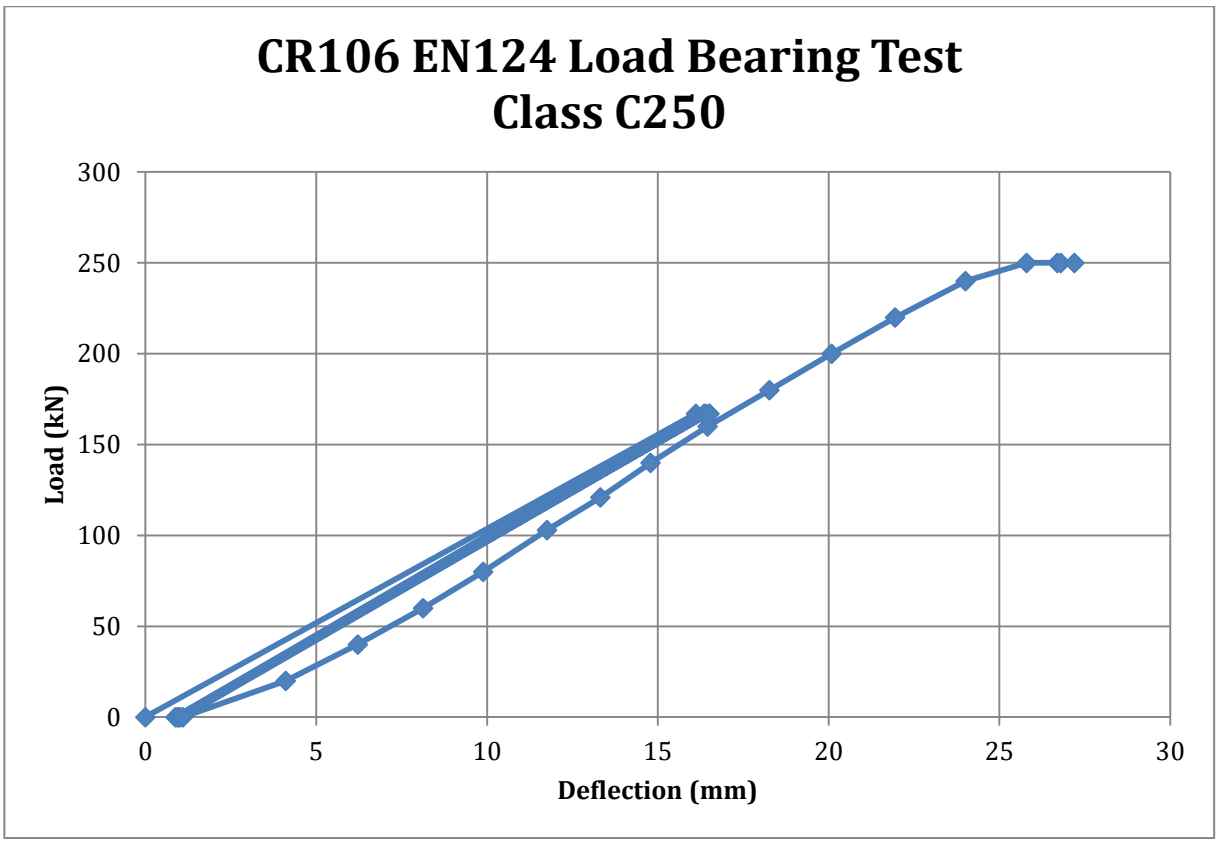
Load Bearing Capacity Test

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	
167	16.12	Light cracking noises just for the first cycle.
0	0.88	
167	16.41	
0	0.93	
167	16.36	
0	0.98	
167	16.51	
0	1.02	
167	16.51	
0	1.10	
20	4.11	
40	6.22	
60	8.13	
80	9.89	
103	11.76	
121	13.32	
140	14.79	
160	16.46	
180	18.27	
200	20.09	
220	21.95	
240	24.01	
250	25.80	
250 (10 seconds)	26.70	
250 (20 seconds)	26.80	
250 (30 seconds)	27.20	**PASS**
0	2.20	
277	Gauge removed	Ultimate failure



The cover held the test load for the required 30 seconds so therefore passed the EN124 C250 Load Bearing Test.

After passing the test the linear potentiometer was removed from under the cover to avoid possible damage and the cover loaded further, until ultimate failure occurred at 277kN.