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TEST REPORT

Trench Panel
BS EN124 Class D400 Test
Span – 1200mm

BIF: 167479

Document reference number – SSC-TRENCHPANEL-167479-2-D400-24-07-23

Report by:

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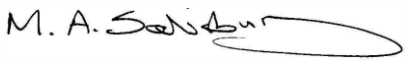


Date test carried out:

24th July 2023

Customer name:

Structural Science Composites Ltd.
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 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.

Panel

The composite trench panel supplied measures 1375mm x 605mm x 135mm overall.

The panel was supported at the ends giving a clear span of 1200mm.

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 panel through a 250mm x 150mm steel block with a 10mm rubber pad between the block and panel.

Permanent Set Test

Measurement of permanent set shall be made on the upper-side of the panel in the same place as the applied load at the longest dimension which can be inscribed within the panel 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 panel but not exceeding 10mm from the edge.

An initial reading is to be taken at the geometric centre of the panel 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 panel 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.

Test Rig

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

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. E187110722095216
Calibration date: November 2022
System Class: 2

Results

Permanent set test

Initial Reading	0.00mm
Reading after 5 cycles	0.39mm
Permanent Set	**0.39mm**

Permissible permanent set for a D400 test is $\frac{CO}{300}$ = 605/300 = 2.02mm

Therefore panel passes the permanent set test.

Load Bearing Capacity Test

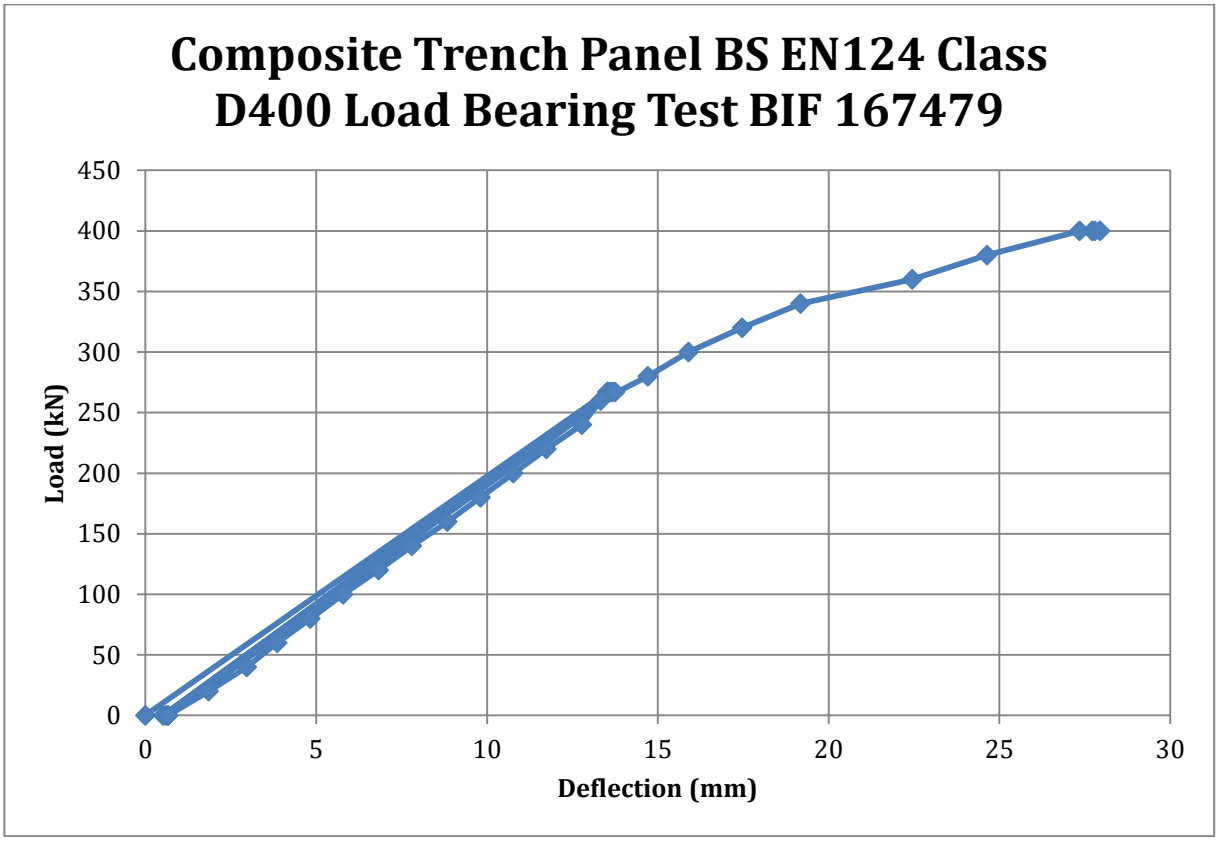
Load applied immediately after the permanent set test.

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 267kN for the five cycles and 20kN intervals after that.

Results

LOAD (kN)	DEFLECTION (mm)	REMARKS
0	0.00	
267	13.53	**Light cracking just for the 1st cycle.**
0	0.52	
267	13.53	
0	0.59	
267	13.60	
0	0.66	
267	13.67	
0	0.66	
267	13.75	
0	0.66	
20	1.85	
40	2.97	
60	3.86	
80	4.83	
100	5.79	
120	6.83	
140	7.80	
160	8.84	
180	9.81	
200	10.77	
220	11.74	
240	12.78	
260	13.33	
280	14.71	
300	15.90	
320	17.47	
340	19.18	
360	22.45	
380	24.64	
400	27.35	
400 (10 seconds)	27.72	
400 (20 seconds)	27.80	
400 (30 seconds)	27.95	**PASS**
0	2.52	
481	-	**Ultimate failure – Loud bang and major failure across panel.**

The panel held the test load of 400kN for the required 30 seconds with no visible signs of damage, so therefore the panel passed the BS EN124 Class D400 load bearing test.



After the panel had passed the test it was reloaded until ultimate failure occurred at 481kN.