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GMI COMPOSITES
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Test Report For:

GMI COMPOSITES

Access Cover 3rd Party Test Witnessing

Three (3) GMI 32" glass fiber reinforced
covers with GMI composite frame to
EN 124


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Department Manager
Performance Testing


Oct-25-2010
6201057145
Alexander J. Porter, PE
Reviewer / Chief Engineer

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DATE RECEIVED: 09/08/10
DATE TESTED: 09/30/10

DESCRIPTION OF SAMPLES:

Part Number: GMI 3200
Material Submitted: 32" DIA access hole cover
Material Specification: Fiber reinforced polymer
Condition of Test Sample: Production

WORK REQUESTED / APPLICABLE DOCUMENTS:

BS (British Standard) EN 124:1994 D 400 (400 kN load)
Section 8.3.1 – 2/3 test load five (5) times with permanent set measurement
Section 8.3.2 – Full load for 30 seconds
Class D 400

Testing is to be performed as per client request and referencing Intertek Quotation No.: Q500254995 dated 08/30/10.

CONCLUSIONS:

Permanent set was less than 1.46 mm (0.0575 inch). No cracks or damage were observed after application of 400 kN (90,000 lb) load for 30 seconds.

As observed, the samples tested met the stated requirements.

GMI EQUIPMENT USED:

Access Cover Tester (Large Hydraulic Press):	ID No. FM-03	Calibrated 4-21-10
Pressure gauge (reference only):	ID No. 1127061	Calibrated 3-19-10
Dial indicator (also verified with gauge blocks)	ID No. 01-100	Calibrated 9-27-10

Access cover holding frame: supplied by GMI Composites, clear opening (CO) = 30"

ACCESS COVER LOADING:

Date Received: 09/08/10
Date Tested: 09/30/10

Description of Samples:

Part Number: GMI 3200
Material Submitted: 32" DIA access hole cover
Material Specification: Fiber reinforced polymer
Cover diameter: 31.65" nominal

Test Procedure:

BS (British Standard) EN 124:1994 D 400 (400 kN load)
Section 8.3.1 – 2/3 test load five (5) times with permanent set measurement
Section 8.3.2 – Full load for 30 seconds
Class D 400

Testing is to be performed as per client request and referencing Intertek Quotation No.: Q500254995 dated 08/30/10.

Number of Specimens Tested: Three (3)

Deviations:

The full load for cover #1 did not reach 400kN (90,000 lbs) at first or second attempts. Load was released and a third load was applied to reach this value.

Acceptance Criteria:

Permanent set shall be less than $CO / 500$ when secured according to 7.8 b) a sufficient mass per unit area. $CO / 500 = 762 / 500 = 1.524 \text{ mm (0.060")}$
No cracks or detrimental permanent deformation are allowed.

Results:

Testing was performed by GMI Composites, and witnessed by Intertek. Test methods, procedures and verification of test equipment traceability to NIST were evaluated and confirmed to be acceptable for the testing performed.

Access cover was loaded within a frame (see Figures 1 – 2).

All loading exposures were applied with a 250 mm DIA steel disk plate, with a ¼" rubber load distribution pad sandwiched between the steel plate and the test sample.

The 2/3 load testing of 266.7 kN (60,000 lb) was performed first for five (5) times. The permanent displacement measurement was determined via dial indicator contacting the load block before and after loading application.

The full load test was performed second to 400 kN (90,000 lb) for 30 seconds.

Load application rate was a nominal 1 – 5 kN / sec.

The permanent displacement measurement was determined via dial indicator attached to a reference frame at the center of the access cover. Gauge was set to 0.000" initially, gauge fixture was removed, cover was loaded and then gauge fixture was re-installed to record a permanent set.

Cover ID	Highest Load (klb)	Accumulated permanent set (inches)	Notes
#1	60.3	0.053	Loaded 5 times, set after 60 seconds
	88.7		Load held for <30 seconds, full load not reached deviation
	89.0		Re-loaded. Load held for <30 seconds, full load not reached deviation
	94.2	0.0745	Re-loaded. Load held for 30 seconds, set after 60 seconds
		0.0685	Set at 2 minutes
		0.0655	Set at 3 minutes
		0.0630	Set at 4 minutes
		0.0615	Set at 5 minutes
		0.060	Set at 6 minutes
		0.0595	Set at 7 minutes
		0.0585	Set at 8 minutes
		0.0580	Set at 9 minutes
		0.0575	Set at 10 minutes
#3	60.2	0.0525	Loaded 5 times, set after 60 seconds
	94.8	0.069	Load held for 30 seconds, set after 60 seconds
		0.063	Set at 2 minutes
		0.060	Set at 3 minutes
		0.0580	Set at 4 minutes
		0.0565	Set at 5 minutes
#2	60.3	0.059	Loaded 5 times, set after 60 seconds
	94.8	0.0765	Load held for 30 seconds, set after 60 seconds
		0.0695	Set at 2 minutes
		0.0665	Set at 3 minutes
		0.0640	Set at 4 minutes
		0.0625	Set at 5 minutes
		0.0615	Set at 6 minutes
		0.0605	Set at 7 minutes
		0.0595	Set at 8 minutes

		0.0590	Set at 9 minutes
		0.0585	Set at 10 minutes
		0.0560	Set at 15 minutes

Permanent set was less than 1.46 mm (0.0575 inch). No cracks or damage were observed after application of 400 kN (90,000 lb) load for 30 seconds.

Disposition of Test Specimens/Samples:

Samples were tested and left at GMI Composites for storage or disposal.



Figure 1 - EN 32 inch #2.



Figure 2 - EN 32 inch zero displacement set.