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GMI COMPOSITES
Date: October 3, 2010
P.O. No.: 15515EB

Test Report For:

GMI COMPOSITES

Access Cover 3rd Party Test Witnessing

Three (3) GMI 26" glass fiber reinforced covers with GMI composite frame to EN 124

Oct-25-2010
6201057145

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DATE RECEIVED: 09/08/10
DATE TESTED: 09/24/10

DESCRIPTION OF SAMPLES:

Part Number:	GMI 2600
Material Submitted:	26" 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 1.13 mm (0.0445 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) = 24"

ACCESS COVER LOADING:

Date Received:	09/08/10
Date Tested:	09/24/10

Description of Samples:

Part Number:	GMI 2400
Material Submitted:	26" DIA access hole cover
Material Specification:	Fiber reinforced polymer Cover diameter: 26" 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 2/3 load for cover #2 did not reach 266.7kN (60,000 lbs) at first and second attempts. Load was released and a third load was applied to reach this value before the 5 times load application.

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 = 609.6 / 500 = 1.2192 mm (0.048")
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 Figure 1).

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	60.6	0.0325	Loaded 5 times, set after 60 seconds
	95.3	0.046	Load held for 30 seconds, set after 60 seconds
		0.0405	Set at 2 minutes
#2	58.0		Load held for <30 seconds, full load not reached deviation
	58.0		Load held for <30 seconds, full load not reached deviation
	60.5	0.0355	Loaded 5 times, set after 60 seconds
	94.9	0.0475	Load held for 30 seconds, set after 60 seconds
		0.042	Set at 2 minutes
#3	60.5	0.040	Loaded 5 times, set after 60 seconds
	95.1	0.054	Load held for 30 seconds, set after 60 seconds
		0.048	Set at 2 minutes
		0.0445	Set at 3 minutes

Permanent set was less than 1.13 mm (0.0445 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 26 inch load set-up.