



4700 Broadmoor SE, Suite 200  
Kentwood, MI 49512

Telephone: 616-656-7401  
Facsimile: 616-656-2022  
www.intertek-etlsemko.com

GMI COMPOSITES  
Date: June 5, 2009  
P.O. No.: 12275JK


Report No.: 3178532GRR-001a  
Reference No.: 09-0415-197166  
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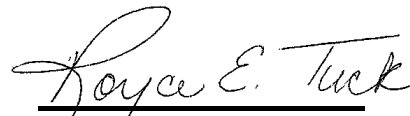
**Test Report For:**

**GMI COMPOSITES**

**Access Cover 3<sup>rd</sup> Party Test Witnessing**

**Three (3) GMI 2400 24" covers with  
Liber-T Lock feature to  
AASHTO M 306-05**

  
**Bradley E. Burch**  
**Department Manager**  
**Performance Testing**

  
**Royce Tuck**  
**Reviewer/cm**

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Attention: Jacquelyn Klopp  
GMI COMPOSITES  
1355 W Sherman Blvd  
Muskegon, MI 49441  
Phone: 231-755-1611 x125  
Fax: 231-755-1613  
email: [JKlopp@gmicomposites.com](mailto:JKlopp@gmicomposites.com)

**DATE RECEIVED:** 04/15/09  
**DATE TESTED:** 04/30/09

**DESCRIPTION OF SAMPLES:**

Part Number: GMI 2400  
Material Submitted: 24" DIA access hole cover with Liber-T lock  
Material Specification: Fiber reinforced polymer  
Condition of Test Sample: Production

**WORK REQUESTED / APPLICABLE DOCUMENTS:**

AASHTO (American Association of State Highway and Transportation Officials) M 306-05  
Section 5

Testing is to be performed as per client request and referencing Intertek Quotation No.:  
Q500147276 dated 04/14/09.

**CONCLUSIONS:**

Permanent set was less than 1.93 mm (0.076 inch). No cracks or damage were observed after application of 178 kN (40 klb) load for 1 minute. Additionally, no cracks or damage were observed after application of 222 kN (50 klb) load for 1 minute.

As observed, the samples tested met the stated requirements.

**GMI EQUIPMENT USED:**

Access Cover Tester (Large Hydraulic Press):	ID No. FM-03	Calibrated 7-15-08
Pressure gauge (reference only):	ID No. 1127061	Calibrated 11-27-06
Dial indicator:	ID No. DI-74	Calibrated 4-30-09
Access cover holding frame: supplied by GMI Composites, clear opening (CO) = 22.125"		

**ACCESS COVER LOADING:**

Date Received: 04/15/09  
Date Tested: 04/30/09

Description of Samples:

Part Number: GMI 2400  
Material Submitted: 24" DIA access hole cover with Liber-T lock  
Material Specification: Fiber reinforced polymer  
Cover diameter: 23.8125"

Test Procedure:

AASHTO (American Association of State Highway and Transportation Officials) M 306-05

- Section 5:
- 5.1 Proof-load testing 178 kN (40,000 lbs) on 9" x 9" area at center for 1 minute with measurement of permanent set of the cover or grating after the application of the test load. H-20 or HS-20 loading.
  - 5.2 Proof-load testing 222 kN (50,000 lbs) on 9" x 9" area at center for 1 minute with measurement of permanent set of the cover or grating after the application of the test load. H-25 or HS-25 loading.

Testing is to be performed as per client request and referencing Intertek Quotation No.: Q500147276 dated 04/14/09.

Number of Specimens Tested: Three (3)

Deviations:

The first cover tested was initially loaded to 50klb three times for ~3 seconds each prior to the 40klb and 50klb tests, due to equipment program malfunction.

Acceptance Criteria:

Permanent set shall be less than 3.2 mm (0.125 inch).  
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 1-3). All loading exposures were applied with a 229 mm x 229 mm (9 inch x 9 inch) steel plate, nominal 1 inch thick with a 1/4" rubber load distribution pad sandwiched between the steel plate and the test sample.

The permanent displacement measurement was determined via hydraulic press instrumentation by noting load change at first contact to loading disk, both before and after loading application. Load application rate was a nominal 3 kN / sec for the 178 kN test. (Highest load reached was 41 kN).

A second test was performed to 222 kN (50,000 lbs) for 1 minute. Load application rate was a nominal 3 – 4 kN / sec. (Highest load reached was 51 kN).

Cover	Load (klb)	Accumulated permanent set (inches)	Notes
#1	50.7	0.042	Load held ~3 seconds
	50	0.067	Load held ~3 seconds
	50	0.068	Load held ~3 seconds
	41	0.071	Load held 60 seconds
	50.8	0.076	Load held 60 seconds
#2	40.7	0.0395	Load held 60 seconds
	50.1	0.051	Load held 60 seconds
#3	40.6	0.039	Load held 60 seconds
	51	0.0525	Load held 60 seconds

Test Note: permanent set was recorded 1 minute after load removal.

Permanent set was less than 1.93 mm (0.076 inch). No cracks or damage were observed after application of 178 kN (40 klb) load for 1 minute. Additionally, no cracks or damage were observed after application of 222 kN (50 klb) load for 1 minute.

Disposition of Test Specimens/Samples:

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



Figure 1 - Test set-up.



Figure 2 - GMI 2400 AASHTO-2 samples.



Figure 3 - GMI 2400 AASHTO test set-up.

## TERMS AND CONDITIONS

### 1.0 INTRODUCTION

These Terms and Conditions are incorporated into the Intertek proposal made and submitted to you. The party executing this document ("Client") indicates acceptance of this proposal as a contract between Client and Intertek which governs the performance of the stated services and the rights and obligations of the parties and that Intertek may proceed with the work.

### 2.0 PROPOSAL TERM

Unless otherwise stated in the proposal, this offer shall remain valid until accepted, but in no event for a period longer than thirty days from the date of the proposal.

### 3.0 CLIENT INFORMATION

Client represents that the information supplied by it or its agents to Intertek is accurate and complete and samples are representative, and Client has informed Intertek concerning any dangerous or potentially dangerous characteristics of such samples which could cause injury during the performance of the work or in the transporting of such samples and Client also acknowledges that Intertek is relying upon such information and samples or data in the preparation of this proposal without further verification by Intertek as to its accuracy or completeness. The Client agrees to hold Intertek harmless and indemnify Intertek from any liability of whatever kind or nature, including but not limited to court costs and reasonable attorneys fees if information provided by the Client is inaccurate or incomplete or samples are not representative. Intertek agrees that information received from the Client shall remain the property of the Client and will be returned to the Client upon demand, except for that which is necessary as a basis for the Intertek Reports. Client may designate in writing any information provided by Client to Intertek as confidential and proprietary. If Client has done so, Intertek will not release to third parties any such information without the prior written consent of the Client or only in response to a proper court order or process. As to that information, Intertek may make and retain copies. Client shall designate in writing to Intertek if it does not wish to have Intertek transmit any information, including test data and Reports, via electronic means.

### 4.0 PROPOSAL, PRICE AND SCHEDULE

Intertek will work diligently to provide the services according to the costs and schedule stated in the referenced proposal. Client recognizes and agrees that the proposal is a good faith estimate of the costs for the services to be provided and times of completion, but such estimate is not a guarantee of the total costs or time that may be involved in completing the proposal. Intertek will not exceed the authorized estimate of costs without written authorization of Client. Samples will be shipped by Client to Intertek prepaid and will be returned collect or disposed of at Client's expense within thirty (30) days after testing is completed, unless alternative arrangements are made by Client. Additional fees will be charged for unanticipated assembly or preparation of samples. Test services will not be initiated until satisfactory credit has been established with Intertek's accounting department.

### 5.0 INVOICING

Invoices will generally be issued upon project completion. In certain instances, interim invoices may be issued. Invoices are due and payable to Intertek at its offices, within thirty (30) calendar days after receipt of invoice, and Client agrees to pay reasonable collection costs if necessary in the event of non-payment.

### 6.0 INSURANCE

Intertek declares that it maintains workers' compensation and employer's liability insurance on Intertek employees in a form and amount as required by applicable laws. This insurance does not cover any employees of Client or third parties who may be involved with the work to be performed, whether on property of Intertek, Client or third parties.

### 7.0 REPORTS

The Client agrees to waive any claim against Intertek and defend, indemnify, and hold Intertek harmless from any and all causes of action, lawsuit, proceedings or claims, including legal fees and expenses incurred by Intertek, allegedly arising as a result of unauthorized use of Intertek's Reports. The term Reports includes all reports, laboratory test data, calculations, estimates, notes and other documents prepared by Intertek in the course of providing services to the Client. All technical determinations of compliance arising from product, material or system evaluation shall not be considered final until issuance of a written report, reviewed and signed by an Intertek qualified Reviewer. All final decisions on product certification are made by the Certification Manager. Intertek retains any and all rights of ownership of Intertek's concepts, ideas, inventions, patents or copyrights used by Intertek in preparing Intertek's Reports and the provision of services to the Client. Only the Client is authorized to copy or distribute Intertek's Reports and then only in their entirety, and the Client shall not use the Reports in a misleading manner. Client further agrees and understands that reliance upon the Reports is limited to the representations made therein. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in

writing by Intertek. If Intertek becomes directly or indirectly involved in litigation as a result of misuse of its Reports, the Client agrees to compensate Intertek for its fees and expenses, including legal costs, in accordance with Intertek's prevailing fee schedule and expense reimbursement policy.

#### 8.0 LIMITED WARRANTY

Intertek warrants that if any of its completed services fail to conform to professional standard, Intertek will, at its own expense, perform corrective services of the type originally performed as may be reasonably required to correct such defects, of which Intertek is notified in writing within six months of the completion of services. No other representation, express or implied, and no warranty or guarantee is included or intended in this Agreement, or in any report, opinion, document or otherwise.

#### 9.0 LIMITS OF LIABILITY

Intertek's liability is limited as follows:

9.1 The Client agrees to limit Intertek's liability arising from Intertek's professional activity, errors, or omissions, such that the total aggregate liability of Intertek shall not exceed Intertek's total fee for the services rendered on the project in question, except in the case of a finding of gross negligence or willful misconduct on the part of Intertek by a court of competent jurisdiction.

9.2 Intertek shall be discharged from all liability to the Client for all claims for loss, damage or expense unless a claim is made within three (3) months of the date at which the damage, defect or alleged non-performance became apparent to the Client, and the process of law served no later than two (2) years from the provision of services by Intertek.

9.3 Intertek shall not be liable to the Client for any consequential damages incurred by Client due to the fault of Intertek, regardless of the nature of this fault, whether it was committed by Intertek, its employees, agents or subcontractors. Consequential damages include, but are not limited to, loss of use and loss of profit.

9.4 The Client agrees to extend any and all limitations, indemnifications, and waivers provided by the Client to Intertek to those individuals and organizations Intertek retains for proper execution of the work. These shall be deemed to include but are not necessarily limited to Intertek's officers and employees and their heirs and assigns, as well as Intertek's agents, subcontractors and their officers, employees, heirs and assigns.

9.5 Client acknowledges that testing, including sample preparation and transportation, may damage or destroy Client's product. Client agrees to hold Intertek harmless from any and all responsibility for such alteration.

9.6 The Client agrees Intertek shall not be responsible for any injuries to the Client's representatives while attending to or observing testing at Intertek's facility. If testing takes place at the Client's facility, Client agrees that Intertek will not operate and shall not be responsible for any of Client's equipment and that although Intertek agrees to abide by Client's safety procedures, Intertek shall not be responsible for injury to any of Client's personnel.

#### 10.0 GOVERNING LAW

This proposal, and any work performed pursuant to this proposal, shall be governed by the laws of the jurisdiction within which the Intertek facility making the proposal is located. Any action brought hereon shall be venued in said jurisdiction.

#### 11.0 SEVERABILITY

Any provision of this proposal that may be held invalid, void or unenforceable for any reason, shall not affect any other term or condition of this proposal, and such term or condition shall be replaced or interpreted to accomplish the intent of the parties.

#### 12.0 MODIFICATIONS

No modification, waiver or amendment of any of these terms and conditions, including any assignment of Client's rights and responsibilities hereunder, shall be binding upon Intertek unless agreed to in a writing signed by an agent of Intertek.