



PERFORMANCE TEST REPORT

Rendered to:

CONCRETEWORKS EAST
PRODUCT: Various Concrete Products
Concreteworks East

Report No.: G9301.01-106-31

Report Date: 05/23/17

Test Record Retention Date: 04/18/21



PERFORMANCE TEST REPORT

Rendered to:

CONCRETEWORKS EAST
349 Dunhams Corner Road
East Brunswick, New Jersey 08816

Report No.: G9301.01-106-31
Test Start Date: 04/13/17
Test Completion Date: 04/18/17
Report Date: 05/23/17
Test Record Retention Date: 04/18/21

Products: Various concrete products

Project Summary: Architectural Testing, Inc., an Intertek company ("Intertek-ATI"), was contracted by Concreteworks East to evaluate the physical properties of various concrete product samples. The product description, test procedure and test results are reported herein.

Test Methods: The test specimens were evaluated in accordance with the following methods.

ASTM D4541-09e1 - Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers

ASTM D7234-12 - Standard Test Method for Pull-Off Adhesion Strength of Coatings on Concrete Using Portable Pull-Off Adhesion Testers

ASTM E488/E488M-15 - Standard Test Methods for Strength of Anchors in Concrete and Masonry Elements

Product Descriptions: The various concrete products were prepared and submitted to Intertek-ATI by Concreteworks East and consisted of four 6" x 6" x product thickness GFRC specimens coated with Latapoxy, five 6" x 6" x product thickness DensShield specimens coated with Latapoxy, four 6" x 6" concrete blocks with embedded threaded rod and five 6" x 6" concrete blocks with embedded mechanical clips.

Test Procedures and Test Results: The testing procedures and results obtained from testing are reported as follows. All conditioning of test specimens and test conditions were at standard laboratory conditions unless otherwise reported. Refer to the test related photos in Appendix A.

ASTM D4541 - Pull-Off Strength

Three GFRC specimens, measuring nominally 6"x 6" x product thickness, prepared with Latapoxy coatings by Concreteworks East, were further prepared by securing a 1"x 1" loading fixtures with epoxy to the coating surface then allowed to cure for 7 days. Once fully cured, each specimen was scored and individually on the an Instron Model 3369 Universal Test Machine and loaded in tension at a computer controlled rate of 30.0 psi/s until failure was achieved. Results of these evaluations are detailed in the following tables.

ASTM D4541 - Tensile Results

Product Description	Latapoxy 310 with DensShield	
Specimen No.	Maximum Load (lbf)	Tensile Stress (psi)
1	622	622
2	553	553
3	1,240	1,240
4	949	949
Mean	840	840

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ASTM D7234 - Pull-Off Strength

Four DensShield specimens, measuring nominally 6"x 6" x product thickness, prepared with Latapoxy coatings by Concreteworks East, were prepared for testing by Intertek-ATI by securing 1" x 1" loading fixtures with epoxy to the coating surface and allowing them to cure for 7 days. Each specimen was individually loaded on an Instron Model 3369 Universal Test Machine in tension at a computer controlled rate of 150.0 psi/s until failure was achieved. Results of these evaluations are detailed in the following table.

ASTM D7234 - Tensile Results

Product Description	Latapoxy 310 with GFRC	
Specimen No.	Maximum Load (lbf)	Tensile Stress (psi)
1	550	550
2	382	382
3	373	373
Mean	435	435

Test Procedures and Test Results: (Continued)

ASTM E488 - Strength of Anchors in Concrete

Four concrete specimens, measuring nominally 8" x 8" x 3" thick, with an embedded threaded rod having a nominally 0.485" diameter, were evaluated for tensile properties in accordance with ASTM E488. Each specimen was individually loaded on a Satec Model 50UD universal machine in tension at a computer controlled rate of 0.1 in/min until failure was achieved. Results of these evaluations are detailed in the following table.

ASTM E488 - Tensile Results

Product Description	Embedded Threaded Rod	
	Maximum Load (lbf)	Mode of Failure
Specimen No.		
1	2,930	Concrete
2	907	Anchor Pull
3	1,560	Anchor Pull
4	1,080	Anchor Pull
Mean	1,620	

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ASTM E488 - Strength of Anchors in Concrete

Four GFRC cladding specimens, measuring nominally 9" x 9" x 1" thick, with an embedded mechanical clip were evaluated for shear properties in accordance with ASTM E488. Each specimen was individually loaded on a Satec Model 50UD universal machine in tension at a computer controlled rate of 0.5 in/min until failure was achieved. Results of these evaluations are detailed in the following table.

ASTM E488 - Shear Results

Product Description	Embedded Mechanical Clips	
	Maximum Load (lbf)	Mode of Failure
Specimen No		
1	772	Clip Shear
2	544	Clip Shear
3	889	Clip Shear
4	409	Clip Shear
5	671	Clip Shear
Mean	657	

Intertek-ATI will service this report for the entire test record retention period. Test records that are retained such as detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation will be retained by Intertek-ATI for the entire test record retention period.

Results obtained are tested values and were secured using the designated test methods. This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. It is the exclusive property of the client so named herein and relates only to the specimens tested. This report may not be reproduced, except in full, without the written approval of Intertek-ATI.

For INTERTEK-ATI:

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ES:jmb/kf

Attachments (pages) This report is complete only when all attachments listed are included.
Appendix A - Photographs (4)

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Revision Log

<u>Rev. #</u>	<u>Date</u>	<u>Page(s)</u>	<u>Revision(s)</u>
0	05/23/17	N/A	Original report issue

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APPENDIX A

Photographs

Concreteworks East



Photo No. 1
ASTM D7234 Pull-off Strength - Latapoxy 310 with GFRP
Test Set-Up

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Photo No. 2
ASTM D7234 Pull-off Strength - Latapoxy 310 with GFRP
Failure Mode



Photo No. 3
ASTM D4541 Pull-off Strength - Latapoxy 310 with DensShield
Test Set-Up

Concreteworks East



Photo No. 4
ASTM D4541 Pull-off Strength - Latapoxy 310 with DensShield
Test Set-Up

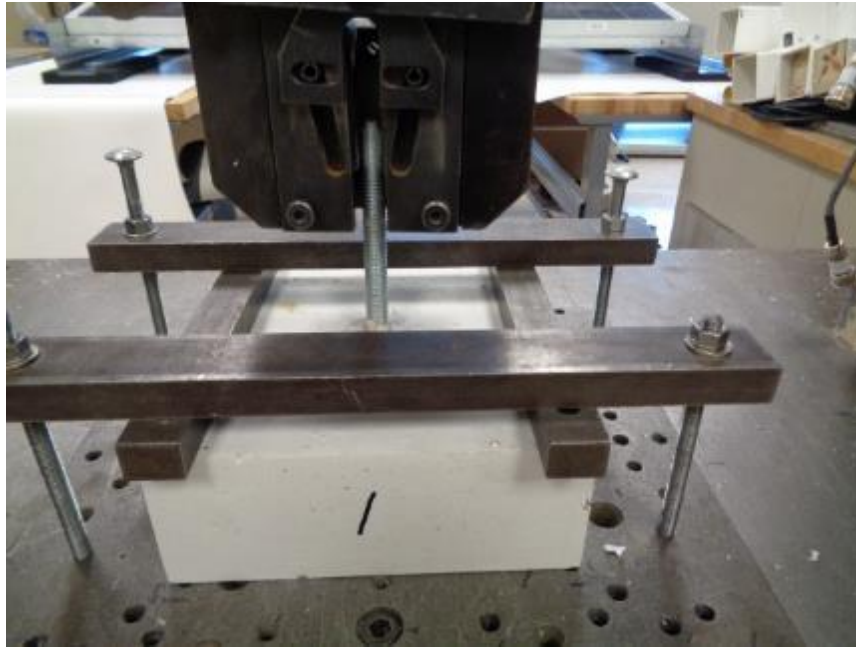


Photo No. 5
ASTM E488 Tensile Anchor Load - Embedded Threaded Rod
Test Set-Up

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Photo No. 6
ASTM E488 Tensile Anchor Load - Embedded Threaded Rod
Failure Mode



Photo No. 7
ASTM E488 Shear - Embedded Mechanical Clips
Test Set-Up

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Photo No. 8
ASTM E488 Shear - Embedded Mechanical Clips
Failure Mode