



TEST REPORT

Report No.: F0833.01-121-24
Test Date: September 4, 2015

Rendered to:

ARMADILLO NV
New Bedford, Massachusetts

PRODUCT TYPE: FRR Phenolic
SERIES/MODEL: Armatherm

TEST METHOD: ASTM E 84-15a, *Standard Test Method for Surface Burning Characteristics of Building Materials*

| Summary of ASTM E 84 Test Results | |
|--|------------------------------|
| Flame Spread Index | Smoke Developed Index |
| 25 | 50 |

This report contains in its entirety:

Cover Page: 1 page
Report Body: 6 pages
Graphs: 1 page
Photographs: 1 page

Reference must be made to Architectural Testing, Inc. Report No. F0833.01-121-24 for complete test specimen descriptions.

1.0 Report Issued To: Armadillo NV
419 Sawyer Street
New Bedford, Massachusetts 02746

2.0 Test laboratory: Architectural Testing, Inc.
130 Derry Court
York, Pennsylvania 17406-8405
717-764-7700

3.0 Introduction:

The Steiner Tunnel test apparatus is used to evaluate the surface burning characteristics and smoke development of building materials. The tunnel is considered to be under calibrated conditions when the flame front reaches the end of the tunnel within 5 minutes and 30 seconds (plus or minus 15 seconds) during a red oak test. An initial preheat of the tunnel is performed and the test specimen is installed when the tunnel temperature drops to 105°F. When the test is initiated, the 88 KW dual burner and 240 feet per minute air current creates a flame that extends 4.5 feet down the tunnel. The flame progression is tracked from this point to the exhaust end of the tunnel which is 19.5 feet downstream. An observer simultaneously notes any test specimen anomalies such as melting, dripping, sagging, delamination, fall-out, etc. The smoke that is generated during the test is measured by a photometer. The flame spread and smoke developed data are automatically logged and graphed versus time by a data acquisition and computer system. The Flame Spread Index (FSI) and the Smoke Developed Index (SDI) are based on an area under the curve calculation and the red oak flooring calibration data.

4.0 Project Summary:

4.1 Product Type: FRR Phenolic

4.2 Series/Model: Armatherm

4.3 Compliance Statement: Results obtained are tested values and were secured by using the designated test method(s). The specimen(s) were tested to evaluate the flame spread and smoke developed properties. A summary of the results is listed in the Test Results section and the complete graphical test data is included in Appendix A of this report.

4.4 Test Date: 9/4/2015

4.5 Test Location: Intertek-ATI, test facility in York, Pennsylvania.

4.6 Test Sample Source: The test specimen was provided by the client. Representative samples of the test specimen will be retained by Architectural Testing for a minimum of four years from the test completion date.

4.0 Project Summary: (Continued)

4.7 List of Official Observers:

| <u>Name</u> | <u>Company</u> |
|---------------|-----------------------------|
| Robert George | Architectural Testing, Inc. |
| Ben Green | Architectural Testing, Inc. |

5.0 Test Method(s), Practices and/or Classifications:

ASTM E 84-15a, *Standard Test Method for Surface Burning Characteristics of Building Materials*

6.0 Test Specimen Description:

| | |
|--------------------|---|
| Date Tested: | 9/4/2015 |
| Manufacturer*: | Armadillo NV |
| Product Type: | FRR Phenolic |
| Series/Model: | Armatherm |
| Composition*: | Phenolic resin reinforced with linen |
| Conditioning Time: | 72+ hrs. |
| Specimen Size: | 24-1/2 inch wide x 48-1/4 inch long |
| Thickness: | 1 inch |
| Specimen Sections: | 6 |
| Total Weight: | 57.5 lbs. |
| Color: | Amber/Brown |
| Side to Flame*: | Flat surface |
| Support Used*: | Self-supporting |
| Substrate Used*: | N/A |
| Cement Board: | The fiber cement board was placed on top of the sample. |

*From the client's material description and/or instructions

Note: Specimens were conditioned as per the requirements of Section 6.4 of ASTM E84-15a *Standard Test Method for Surface Burning Characteristics of Building Materials*

7.0 Test Results: The test results are tabulated as follows:

| Test Results | |
|--------------------------------|---------------|
| Flame Spread Index (FSI): | 25 |
| Smoke Developed Index (SDI): | 50 |
| Test Operator: | Robert George |
| Red Oak Calibration (% * Min): | 94.8 |

| Test Data | |
|----------------------------|--------|
| FSI (unrounded): | 24.8 |
| SDI (unrounded): | 48.2 |
| FS * Time Area (Ft * Min): | 48.2 |
| Smoke Area (% * Min): | 45.7 |
| Fuel Area (°F * Min): | 5466.5 |

| Observations | |
|------------------------------|-----------------|
| Ignition Time: | 01:45 (Min:Sec) |
| Max Flame Front Advance: | 10.1 Feet |
| Time to Max Flame Front: | 09:41 (Min:Sec) |
| Max Temp At Exposed T/C: | 673.1°F |
| Time To Max Temp: | 09:54 (Min:Sec) |
| Dripping Observed: | No |
| Flaming On Floor Observed: | No |
| After Flame Top Observed: | 10:03 (Min:Sec) |
| After Flame Floor Observed: | No |
| Sagging Observed: | No |
| Delamination Observed: | No |
| Shrinkage Observed: | No |
| Fallout Observed: | No |
| Cracking Observed: | No |
| Observations After the Test: | None |

Reference Appendix A for graphs.

7.0 Test Results: (Continued)

In Accordance with ASTM E 84-15a the use of supporting materials on the underside of the test specimen has the ability to lower the flame spread index from those which might be obtained if the specimen could be tested without such support. These test results do not necessarily relate to indices obtained by testing materials without such support (E84-15a, 1.3).

This standard is used to measure and describe the response of materials, products, or assemblies to heat and flame under controlled conditions, but does not by itself incorporate all factors required for fire-hazard or fire-risk assessment of the materials, products, or assemblies under actual fire conditions (E84-15a, 1.7).

This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the sole responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use (E84-15a, 1.8).

8.0 Codes and Regulations:

The 2009 International Building Code® (Chapter 8 Interior Finishes, Section 803 Wall and Ceiling Finishes) and NFPA 5000, (Chapter 10 Interior Wall or Ceiling Finish Testing and Classification) classify materials based on their Flame Spread and Smoke Developed indices. The classification criteria are listed below:

| Classification | Flame Spread Index | Smoke Developed Index |
|----------------|--------------------|-----------------------|
| A | 0-25 | 0-450 |
| B | 26-75 | 0-450 |
| C | 76-200 | 0-450 |



Test Report No.: F0833.01-121-24
Revision 1: 10/14/2015
Report Date: 9/15/2015
Test Record Retention End Date: 9/15/2019
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The service life of this report will expire on the stated Test Record Retention End Date, at which time such materials as drawings, data sheets, samples of test specimens, copies of this report, and any other pertinent project documentation, shall be discarded without notice.

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 specimen(s) tested. This report may not be reproduced, except in full, without the written approval of Architectural Testing, Inc.

For ARCHITECTURAL TESTING, Inc.

Robert George
Project Engineer – Fire Testing

Matthew Freeborn
Manager – Fire Testing

REG:ddr

Attachments (pages): This report is complete only when all attachments listed are included.

Appendix-A: Graphs (1)

Appendix-B: Photographs (1)

This report produced from controlled document template ATI 00537, revised 12/04/14.

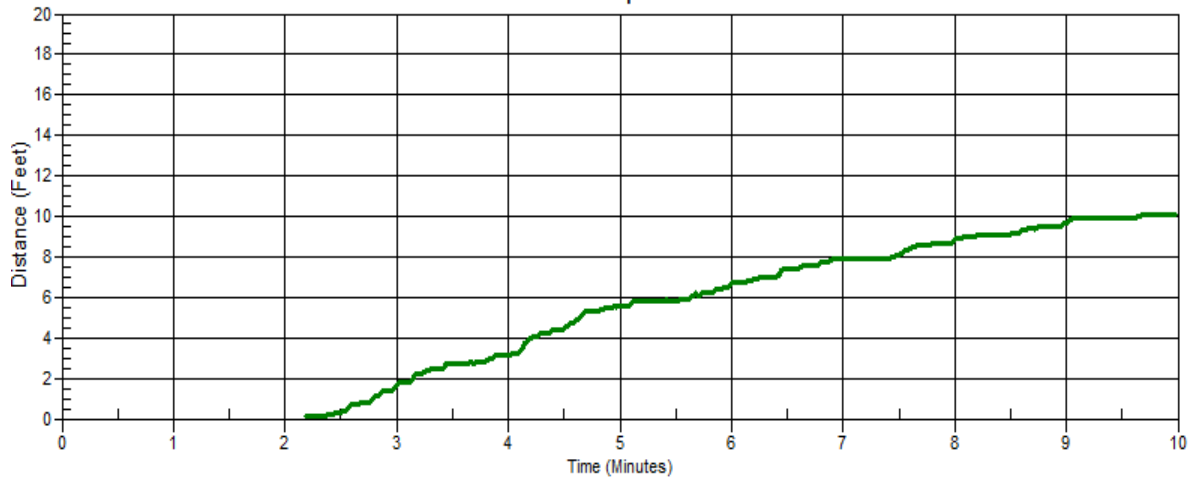
Revision Log

| <u>Rev. #</u> | <u>Date</u> | <u>Page(s)</u> | <u>Revision(s)</u> |
|---------------|-------------|--------------------------|------------------------------------|
| 0 | 9/15/2015 | N/A | Original Report Issue |
| 1 | 10/14/2015 | Cover Page, Page 1 and 2 | Removed foam from the product name |

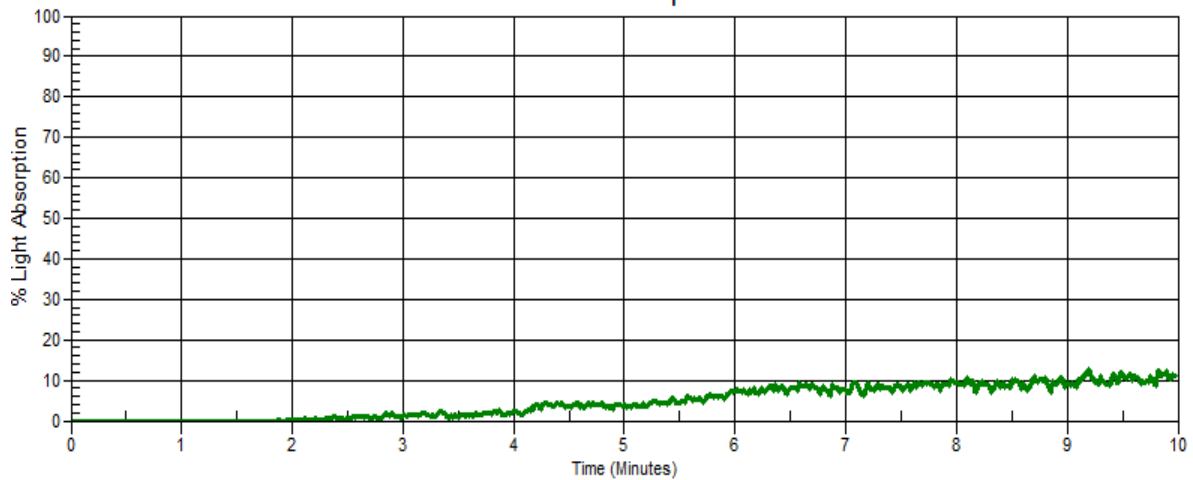
Appendix A

Graphs

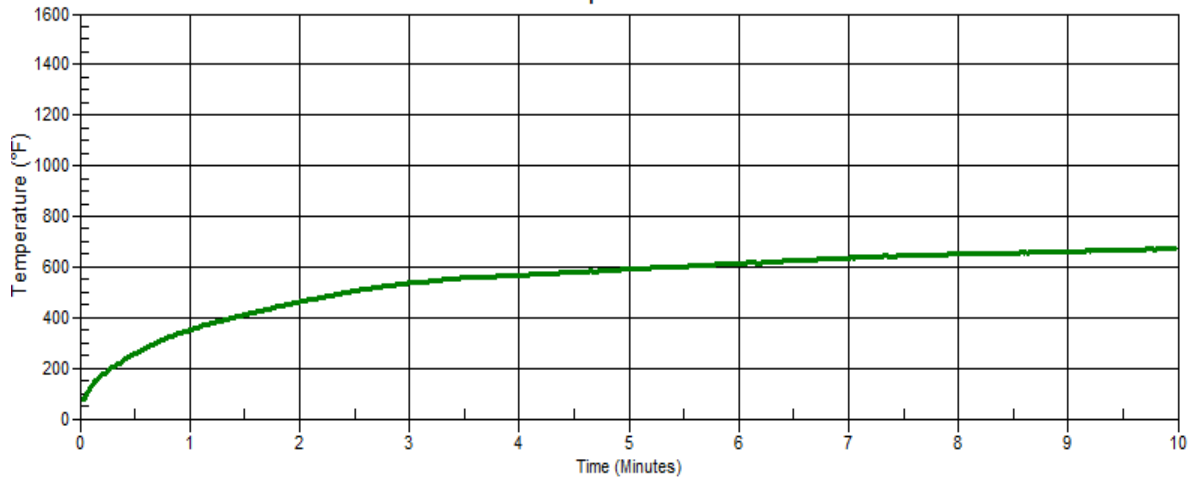
Flame Spread



Smoke Developed



Temperature



Appendix B
Photographs



**Photo No. 1
Specimen Mounted (Pre-test)**



**Photo No. 2
Exposed Surface (Post-test)**