“The test report attached verifies the fire performance for Armstrong BioBased Tile®. The product tested is representative of, but may not be identical to the product you are purchasing. Changes in product formulation that occur for a variety of reasons may cause fluctuations in results. The above referenced data is representative of the current formulation of these products. Specifications and interpretation of fire test methods are subject to ongoing development. To assure that the information continues to be current, it is suggested that you request product certification for a specific project. The certification will reference the current applicable independent laboratory test reports.”

HARDWOOD PLYWOOD & VENEER ASSOCIATION
LABORATORY AND TESTING SERVICE
1825 Michael Faraday Drive, Reston, Virginia 20190 703-435-2900 FAX 703-435-2537

Report On

Smoke Density Characteristics

Determined By

ASTM E 662

Test Method

PREPARED FOR:

Armstrong World Industries, Inc.
Innovation Center
Lancaster, PA

TEST NUMBER S-1779

MATERIAL TESTED:

Lot #274 Armstrong Lot E199G, Armstrong Migrations T3509, Produced on 07/19/07

DATE OF ISSUE 10/17/07

INTRODUCTION

The following Scope, Summary of Test Method, Test Specimens, and Specimen Conditioning sections are abridged from the Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials ASTM E662.

II SCOPE

This fire-test response standard covers determination of the specific optical density of smoke generated by solid materials and assemblies mounted in the vertical position in thicknesses up to and including one inch. The test is based on the attenuation of a light beam by smoke accumulating within a closed chamber due to nonflaming pyrolytic decomposition and flaming combustion. Results are expressed in terms of specific optical density which is derived from a geometrical factor and the measured optical density, a measurement characteristic of the concentration of smoke.

The test is intended for use in research and development and not as a basis for ratings for regulatory purposes. At the present time, no means are provided for predicting the density of smoke which may be generated by the materials exposed to heat and flame under other fire conditions.

III SUMMARY OF TEST METHOD

This method employs an electrically-heated radiant energy source mounted within an insulated ceramic tube and positioned so as to produce an irradiance level of 2.2 BTU/ft^2 · sec. (2.5 W/cm^2) averaged over the central 1.5 inch diameter area of a vertically mounted specimen facing the radiant heater. The nominal 3 by 3 inch specimen is mounted within a holder which exposes an area measuring 2 9/16 by 2 9/16 inch. The holder can accommodate specimens up to one inch thick. This exposure provides the nonflaming condition of the test.

For the flaming condition, a six-tube burner is used to apply a row of air-propane flamelets across the lower edge of the exposed specimen area and into the specimen holder trough. The application of flame in addition to the specified irradiance level from the heating element constitutes the flaming combustion exposure.

The test specimens are exposed to the flaming and nonflaming conditions within a closed 18 ft^3 chamber. A photometric system with a 36 inch vertical light path measures the decrease in light transmission as smoke accumulates.

IV TEST SPECIMENS

The test specimens are 3 by 3 $\pm$ .03 inch by the intended installation thickness up to and including 1 inch thickness. Materials in thicknesses in excess of 1 inch are sliced to 1 inch and the original (uncut) surface tested. Multi-layer materials thicker than 1 inch with surface facings of different materials are sliced to 1 inch thickness, and each original (uncut) surface tested separately, if both surface facings are exposed to fire.

V. SPECIMEN CONDITIONING

Specimens are predried for 24 hours at 140 ± 5°F (60 ± 3°C) and then conditioned to equilibrium (constant weight) at an ambient temperature of 73 ± 5°F (23 ± 3°C) and a relative humidity of 50 ± 5 percent.

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I MATERIAL TESTED

Material Description: Lot #274 Armstrong Lot E199G, Armstrong Migrations T3509, Produced on 07/19/07

Manufacturer Armstrong World Industries, Inc
Lancaster, PA

SAMPLE PREPARATION:
Adhered to 1/4" cement board using Armstrong S-515 adhesive by the manufacturer.

Preconditioning = 24 Hours @ 140 +/- 5 degrees F
Conditioning @ 73 +/- 5 degrees F and 50% +/- 5% RH For Days
Type of Holder Used: Trough

NONFLAMING MODE BURN NUMBER	1	2	3	
Thickness in Inches	.379	.402	.388	390
Weight in Grams	87.44	88.37	88.79	88.20
Chamber Pressure (in water)	1.7	2.1	1.9	1.9
Chamber Temp (degrees F)	94	96	95	95
Color Of Smoke	Gray			

FLAMING MODE BURN NUMBER	1	2	3	
Thickness in Inches	.392	.399	.396	396
Weight in Grams	87.29	87.57	86.67	87.18
Chamber Pressure (in. water)	1.8	3.0	2.7	2.5
Chamber Temp. (degrees F)	94	97	98	96
Color Of Smoke	Gray			

Observations of the burning or smoldering characteristics of the specimen during test exposure, such as delamination, shrinkage, melting or collapse:

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TEST NUMBER S-1779 Page 5 of 5) DATE OF TEST 10/09/07
OPERATOR AP

MATERIAL TESTED

Lot #274 Armstrong Lot E199G, Armstrong
Migrations T3509, Produced on 07/19/07

II OPERATING CONDITIONS

Radiometer Reading 7.99 mV Irradiance 2.5 watts/sq.cm.
Furnace Temperature 1428 degrees F

NONFLAMING MODE BURN NUMBER	1	2	3	
Ds @ 90 Seconds	0	0	0	0
Ds @ 4 Minutes	6	9	7	7
Max. Specific Optical Density Dm	145	165	205	
Time to Max Dm (minutes)	18.4	18.0	15.1	
Dm (Corrected)	144	164	204	
FLAMING MODE BURN NUMBER	1	2	3	
Ds @ 90 Seconds	1	0	0	0
Ds @ 4 Minutes	17	17	13	16
Max. Specific Optical Density Dm	103	115	94	
Time to Max Dm (minutes)	17.7	16.5	18.6	
Dm (Corrected)	101	112	91	101

REMARKS: All NF samples melted down and re-hardened below the furnace level. All F samples maintained their shape and size but hardened.

REPORT PREPARED BY:

THOMAS A. WILSON
SENIOR FIRE TECHNOLOGIST

REPORT REVIEWED BY

BRIAN SAUSE
DIRECTOR - TESTING, CERTIFICATION & STANDARDS