



HARDWOOD PLYWOOD & VENEER ASSOCIATION
LABORATORY AND TESTING SERVICE

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The test report attached verifies the fire performance for Armstrong Sheet Flooring. 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.

Report On
Smoke Density Characteristics
Determined By
ASTM E 662
Test Method

PREPARED FOR:
Armstrong World Industries, Inc
Innovation Center
Lancaster, Pennsylvania

TEST NUMBER S-1705

MATERIAL TESTED:
Lot # 251
Armstrong Natural Creations LVT

DATE OF ISSUE 02/23/05

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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 $2.2 \text{ BTU/ft}^2 \cdot \text{sec}$. (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 $2 \frac{9}{16}$ by $2 \frac{9}{16}$ 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 $3 \text{ by } 3 \pm .03$ 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 $140 \pm 5^{\circ}\text{F}$ ($60 \pm 3^{\circ}\text{C}$) and then conditioned to equilibrium (constant weight) at an ambient temperature of $73 \pm 5^{\circ}\text{F}$ ($23 \pm 3^{\circ}\text{C}$) and a relative humidity of 50 ± 5 percent.



TEST NUMBER S-1705

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DATE OF TEST 02/17/2005

I MATERIAL TESTED

Material Description: Lot # 251 = Armstrong Natural Creations LVT

Manufacturer: Armstrong World Industries, Inc.
Lancaster, Pennsylvania

SAMPLE PREPARATION:

Sample edges and back surface covered with aluminum foil and backed with 1/2" inorganic millboard. Samples adhered to 1/4" Inorganic Cement Board by the manufacturer with Armstrong S-240 Adhesive.

Preconditioning = 24 Hours @ 140 +/- 5 degrees F
Conditioning @ 73 +/- 5 degrees F and 50% +/- 5% RH For 36 Days
Type of Holder Used: Trough

NONFLAMING MODE BURN NUMBER	1	2	3	
Thickness in Inches	.396	.397	.396	.396
Weight in Grams	85.77	86.50	87.49	86.59
Chamber Pressure (in water)	0.9	0.8	0.8	
Chamber Temp. (degrees F)	93	95	93	94
Color Of Smoke	Gray			
FLAMING MODE BURN NUMBER	1	2	3	
Thickness in Inches	.395	.396	.398	.396
Weight in Grams	85.03	86.33	86.96	86.11
Chamber Pressure (in. water)	3.8	3.5	3.6	3.6
Chamber Temp. (degrees F)	95	94	93	94
Color Of Smoke	Gray/Black			

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

Charring and expansion toward the furnace.



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DATE OF TEST 02/17/2005
OPERATOR B. Sause

MATERIAL TESTED:

Lot # 251
Armstrong Natural Creations LVT

II. OPERATING CONDITIONS

Radiometer Reading	7.52 mV	Irradiance	2.5 watts/sq.cm
Furnace Temperature	1,186 degrees F		
NONFLAMING MODE BURN NUMBER	1	2	3
Ds @ 90 Seconds	1	1	1 1
Ds @ 4 Minutes	146	169	166
Max. Specific Optical Density Dm	373	374	355
Time to Max Dm (minutes)	11.8	12.5	11.9
Dm (Corrected)	363	367	349
FLAMING MODE BURN NUMBER	1	2	3
Ds @ 90 Seconds	69	77	67 71
Ds @ 4 Minutes	253	251	181
Max Specific Optical Density Dm	263	260	241
Time to Max Dm (minutes)	4.6	5.1	10.9
Dm (Corrected)	248	252	236

REMARKS: Weight and thickness measurements include flooring, adhesive, and 1/4" cement board.

REPORT PREPARED BY:

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REPORT REVIEWED BY:

RUSSELL L. CHAPMAN
DIRECTOR, PRODUCT EVALUATION & STANDARDS

Conformance to the test standard is verified by a registered professional engineer. This is a factual report of the results obtained from laboratory tests of sample products. The results may be applied only to the products tested and should not be construed as applicable to other similar products of the manufacturer. The HPVA does not verify the description of materials and products when the description is provided by the client. The report is not a recommendation or a disapprobation by the Hardwood Plywood & Veneer Association of the material or product tested. While this report may be used for obtaining product acceptance; it may not be used in advertising.