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42777 Trade West Drive, Sterling, VA 20166 703-435-2900

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

Surface Burning Characteristics of Flooring, Floor Coverings, and
Miscellaneous Materials and Assemblies

As Determined By

CAN/ULC S102.2 Test Method

Prepared For:

Armstrong Flooring, Inc.

Lancaster, PA

Parallel 12 Luxury Vinyl Tile/Plank

Test Number: T-15639

Date of Issue:

01/18/2018



ACCREDITED®

Testing
Laboratory

TL - 224



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1825 Michael Faraday Drive, Reston, VA 20190-5350 703-435-2900

I. SCOPE

This report contains the reference to the test method, purpose, test procedure, rounding procedures, preparation and conditioning of specimens, description of materials, test and post test observation data, and test results.

II. TEST METHOD

The test was conducted in accordance with CAN/ULC S102.2-10; "Standard Method of Test For Surface Burning Characteristics of Flooring, Floor Coverings, and Miscellaneous Materials and Assemblies."

III. PURPOSE

The purpose of the test is to determine the relative surface burning characteristics of the test material under specific test conditions. Results are given for flame spread and smoke developed indicies. The values obtained from burning the test material represent a comparison with that of 6mm inorganic reinforced cement board expressed as zero and red oak flooring expressed as 100.

The flame spread results of these tests are frequently used by building code officials and regulatory agencies in the acceptance of interior finish material for various applications. This flame spread classification system is based on the premise that the higher the flame spread numbers, the greater the fire spread potential. The actual relationship between the numbers developed under this test and life safety from fire has not been adequately established.

IV. TEST PROCEDURE NOTES

The furnace was preheated to a minimum of 85°C as measured by an 18 AWG thermocouple embedded in cement 3mm" below the wall surface of the chamber, 7090mm from the centerline of the ignition burners. The furnace was then cooled to 40°C (+/- 3°C) as measured by a thermocouple embedded 3mm below the wall surface of the test chamber 4000mm from the fire end. Prior 10-minute tests with 6mm inorganic reinforced cement board provided the zero reference for flame spread. At least once a year 10-minute tests with unfinished select grade red oak flooring provided for the 100 reference for flame spread and smoke developed as noted in Section III.

A. FLAME SPREAD

The flame spread distance is observed and recorded at least every 15 seconds or every 2 feet of progression. The peak distance is noted at the time of occurrence. The flame spread distance is plotted over time. The total area under the flame spread distance-time curve is determined; flame front recessions are ignored. The flame spread is then calculated as a function of the area under the curve relative to the standard red oak curve area. The value for flame spread classification for the tested material may be compared with that of inorganic reinforced cement board and select grade red oak flooring.

B. SMOKE DEVELOPED

The smoke developed during the test is determined by the reduction in output of a photoelectric cell. A light beam vertically orientated across the furnace outlet duct is attenuated by the smoke passing through the duct. The output of the photoelectric cell is related to the obscuration of the light source through the duct caused by the smoke. A curve is developed by plotting photoelectric cell output against time. The value of smoke developed is derived by calculating the net area under the curve for the test material and comparing this area with the net area under the curve for unfinished select grade 18mm red oak flooring.

V. FLAME SPREAD RATING AND SMOKE DEVELOPED CLASSIFICATION

Single test calculated flame spread and smoke developed values are averaged and rounded to the nearest multiple of 5 and reported as the Flame Spread Rating and Smoke Developed Classification. Actual test values are available on request.

VI. PREPARATION AND CONDITIONING OF TEST SAMPLES

Three or four sections are generally used in the preparation of a complete test specimen which is 432 mm - 444 mm wide and 7315mm long. Materials 2438mm in length may be tested by using three sections 432mm wide by 2438 long for a total specimen length of 7315mm. A 350mm length of uncoated 16 gauge steel sheet is used to make up the remainder of the test specimen; it is placed at the fire end of the test chamber. Prior to testing, three 2438mm long sections of 6mm inorganic reinforced cement board with a density of 1445 +/- 160kg/m³ are placed on the upper ledges of the tunnel to protect the furnace lid assembly. Test specimens are conditioned at a controlled temperature of 23°C (+/- 3°C) and a controlled relative humidity of 50 +/- 5 percent.



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Test Number: T-15639

Test End Date: 01/17/2018

Report Prepared For:	Armstrong Flooring, Inc. Lancaster, PA
Material Tested:	Parallel 12 Luxury Vinyl Tile/Plank

Sample Information:

Detailed Product Description: Parallel 12 Luxury Vinyl Tile/Plank, Pattern J6126. Production Date: March 12, 2017. Lot Number: 118-170028. Composition: Unfilled vinyl wear layer on a filled vinyl backing. Comparable Products: Natural Living LVT, Natural Personality LVT.

Mounting Method: The flooring material was mounted to a 1/4" cement board backer by the manufacturer using Armstrong S-288 adhesive.

Sample Selection:	Manufacturer	Test Start Date:	01/17/2018
Number of Samples Per Test:	6	Conditioning Days:	9
Surface Exposed:	Face Side	Sample Color:	Brown
Average Thickness (in.):	0.331	Average Weight (lbs.):	84.5

Test Data

	Run 1	Run 2	Run 3
Preheat Time (min):	2:00	2:00	2:00
Starting Temp. (°F):	100	107	109
Ignition Time (sec):	48	49	60
Burn Length (feet):	1.50	2.17	N/A
Time to Max Burn Length (min):	3.90	5.04	N/A

Test Results

	Run 1	Run 2	Run 3
Flamespread Value:	6	8	1
Smoke Developed Value:	82	86	56
Flame Spread Rating:		5	
Smoke Developed Classification		75	

Observations:	Burn 1 - Charring to 4', Blistering to 6'. Burn 2 - Charring to 6', Blistering to 8'. Burn 3 - The material ignited but the flame did not progress to the 0' mark. Any flame spread values for Burn 3 that are greater than 0 can be attributed to signal noise.		
Remarks:	The sample for each burn consisted of six 17" x 47-15/16" panels butted end-to-end. Reported weights and thicknesses include the 1/4" cement board backer.		
Test Operator:	CK	Reader:	CP

Report Prepared By:

Manager of Fire Testing - Engineer

Report Reviewed By:

Date: 2018.01.17
17:53:51 -05'00'

Director of HPVA Laboratories

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 the materials and products when the description is provided by the client. This report is not a recommendation or a disapprobation by the HPVA of the material or product tested. While this report may be used for obtaining product acceptance, it may not be used in advertising.



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Test Method	Project #	Date	Time (Test Start)	Test No.
ULC S102.2	T15639	17 Jan 2018	10:28 AM	1

Specimen ID

Armstrong Flooring - Parallel 12 Luxury Vinyl Tile/Plank, Pattern J6126, adhered to cement board with S-288 adhesive

Specimen Description

Production Date: 03/12/17, Composition: Unfilled vinyl wear layer on a filled vinyl backing

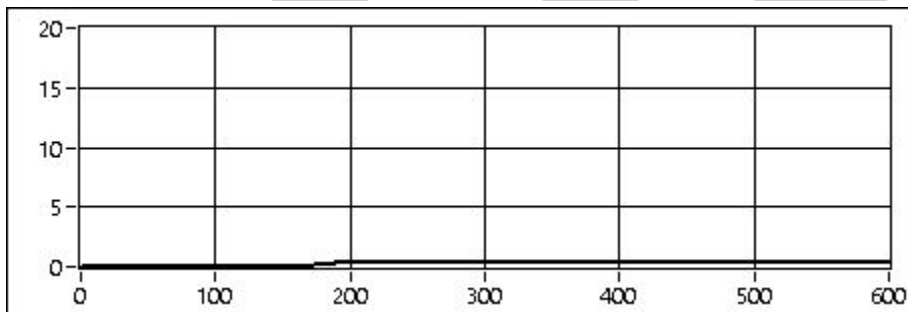
Mounting Procedure

Laid on Tunnel Floor

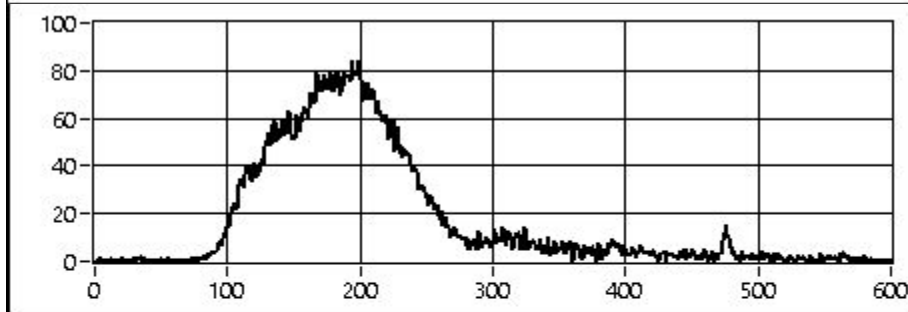
Fuel (CF)	Time to 980F (min)	Max Temp (F)	Time to Max Temp (min)
37.8	0	545.5	4.18

FS Area	Maximum FS	MAX FS Time (min)
3.164	0.45	3.9

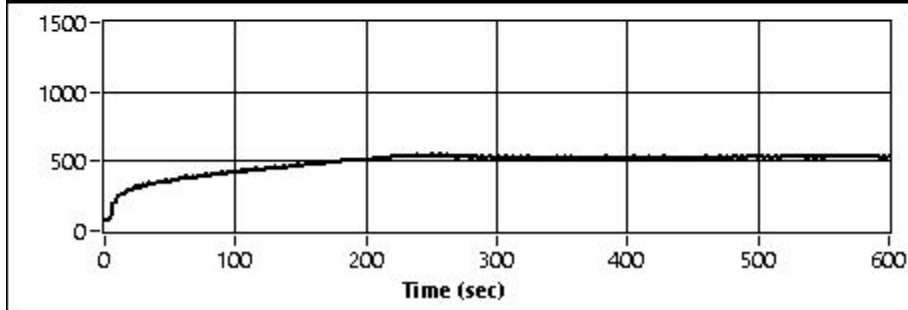
Smoke Area (%A min)	RO Smk Area	Raw SD	Raw FSI
169.7	205.7	82.5	5.853



FI Spread



Smoke (%A)



23 ft Temp

Final FSI	Final SD
6	82

Flame Spread values on this page are reported in meters.



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Test Method	Project #	Date	Time (Test Start)	Test No.
ULC S102.2	T15639	17 Jan 2018	11:27 AM	2

Specimen ID

Armstrong Flooring - Parallel 12 Luxury Vinyl Tile/Plank, Pattern J6126, adhered to cement board with S-288 adhesive

Specimen Description

Production Date: 03/12/17, Composition: Unfilled vinyl wear layer on a filled vinyl backing

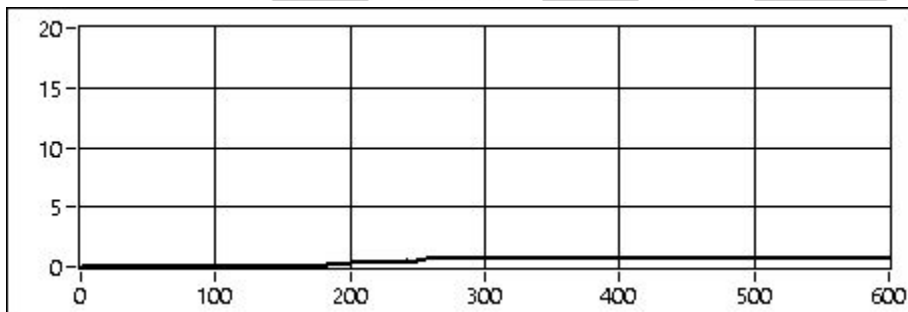
Mounting Procedure

Laid on Tunnel Floor

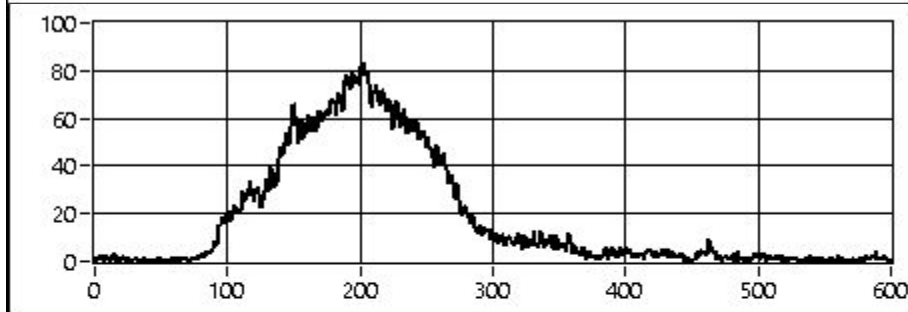
Fuel (CF)	Time to 980F (min)	Max Temp (F)	Time to Max Temp (min)
37.9	0	548.6	4.685

FS Area	Maximum FS	MAX FS Time (min)
4.27	0.66	5.04

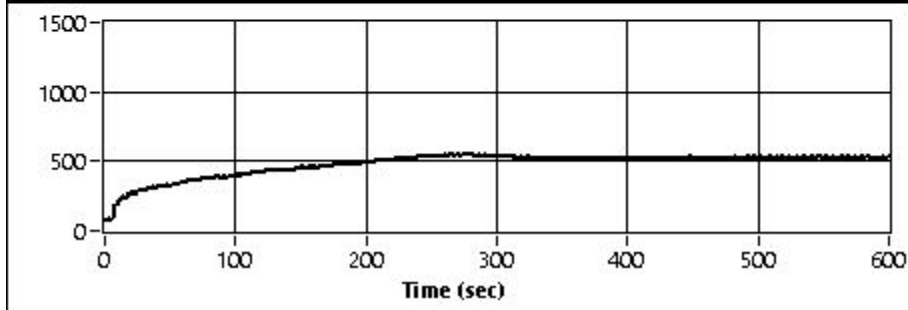
Smoke Area (%A min)	RO Smk Area	Raw SD	Raw FSI
176.2	205.7	85.7	7.9



FI Spread



Smoke (%A)



23 ft Temp

Final FSI	Final SD
8	86

Flame Spread values on this page are reported in meters.



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Test Method	Project #	Date	Time (Test Start)	Test No.
ULC S102.2	T15639	17 Jan 2018	2:26 PM	3

Specimen ID
 Armstrong Flooring - Parallel 12 Luxury Vinyl Tile/Plank, Pattern J6126, adhered to cement board with S-288 adhesive

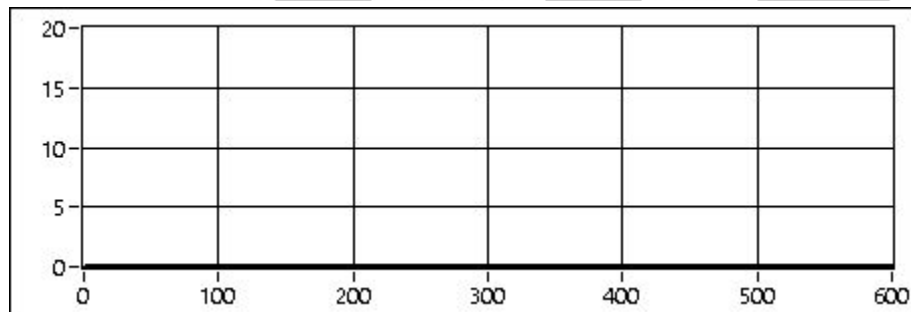
Specimen Description
 Production Date: 03/12/17, Composition: Unfilled vinyl wear layer on a filled vinyl backing

Mounting Procedure
 Laid on Tunnel Floor

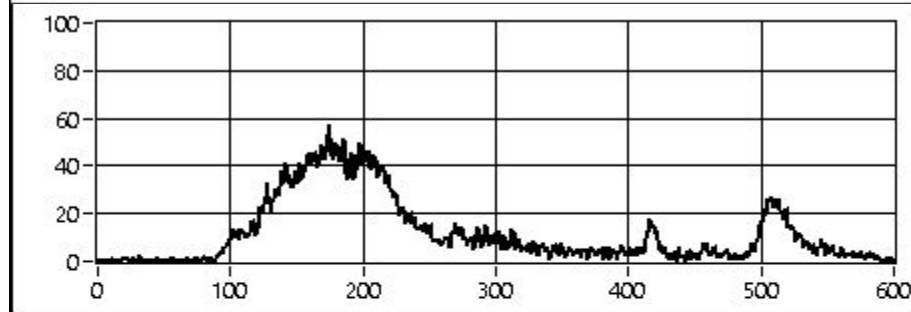
Fuel (CF) Time to 980F (min) Max Temp (F) Time to Max Temp (min)

FS Area Maximum FS MAX FS Time (min)

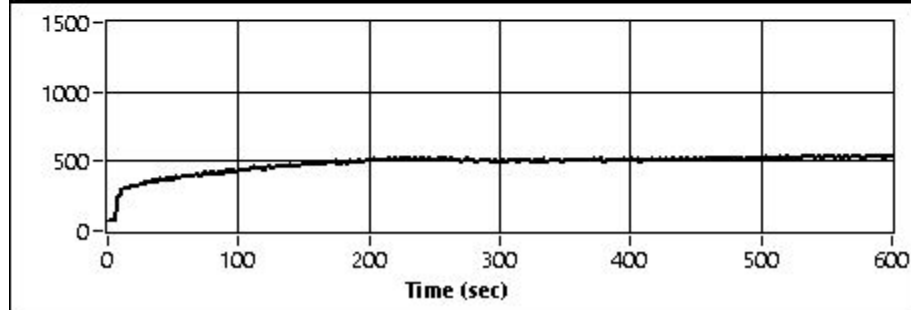
Smoke Area (%A min) RO Smk Area Raw SD Raw FSI



FI Spread



Smoke (%A)



23 ft Temp

Final FSI Final SD

Flame Spread values on this page are reported in meters.