HPVA LABORATORIES

1825 Michael Faraday Drive, Reston, VA 20190-5350 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 World Industries, Inc. Innovation Center

Lancaster, PA

TEST NUMBER: T-15161

Armstrong Homogeneous Sheet Flooring (Medintone)

Date of Issue:
4/13/2016

ACCREDITED
TL - 224

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; "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 flamespread 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 flamespread 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 flamespread classification system is based on the premise that the higher the flamespread 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 flamespread. At least once a year 10-minute tests with unfinished select grade red oak flooring provided for the 100 reference for flamespread and smoke developed as noted in Section III.

A. FLAMESPREAD

The flamespread 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 flamespread distance is plotted over time. The total area under the flamespread distance-time curve is determined; flame front recessions are ignored. The flamespread is then calculated as a function of the area under the curve relative to the standard red oak curve area. The value for flamespread 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 flamespread 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 432mm 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 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-15161	Test End Date:	04/06/16

Report Prepared For:	**Armstrong World Industries, Inc. Innovation Center Lancaster, PA**
Material Tested:	**Armstrong Homogeneous Sheet Flooring (Medintone)**

Sample Information:

Detailed Product Description:	Armstrong Homogeneous Sheet Flooring. Product Lines with Similar Construction: Medintech, Medintech Plus. Exact Product Tested: Pattern FPH5307271 (Rock Dust Light), Roll 1505060054, 2015 Production Material with DOTP. Product Source: Wujiang, China.
Mounting Method:	The material was adhered to a 1/4" cement board backer using Armstrong S-599 adhesive. Samples were selected and prepared by Armstrong.

Sample Selection:	Client	**Test Start Date:**	4/6/2016
Number of Samples Per Test:	6	**Conditioning Days:**	9
Surface Exposed:	Face Side Exposed	**Sample Color:**	Grey
Average Thickness (in.):	0.332	**Average Weight (lbs):**	14.10

Test Data

	Run 1	Run 2	Run 3
Preheat Time (min):	2:00	2:00	2:00
Starting Temp. (°F):	105	108	109
Ignition Time (sec):	72	76	62
Burn Length (feet):	11	24	3.5
Time to Max Burn Length (min):	10:00	9:44	2:00

Test Results

	Run 1	Run 2	Run 3
Flame spread Value:	**13**	**16**	**16**
Smoke Developed Value:	**85**	**101**	**80**

Flame Spread Rating:	15
Smoke Developed Classification	90

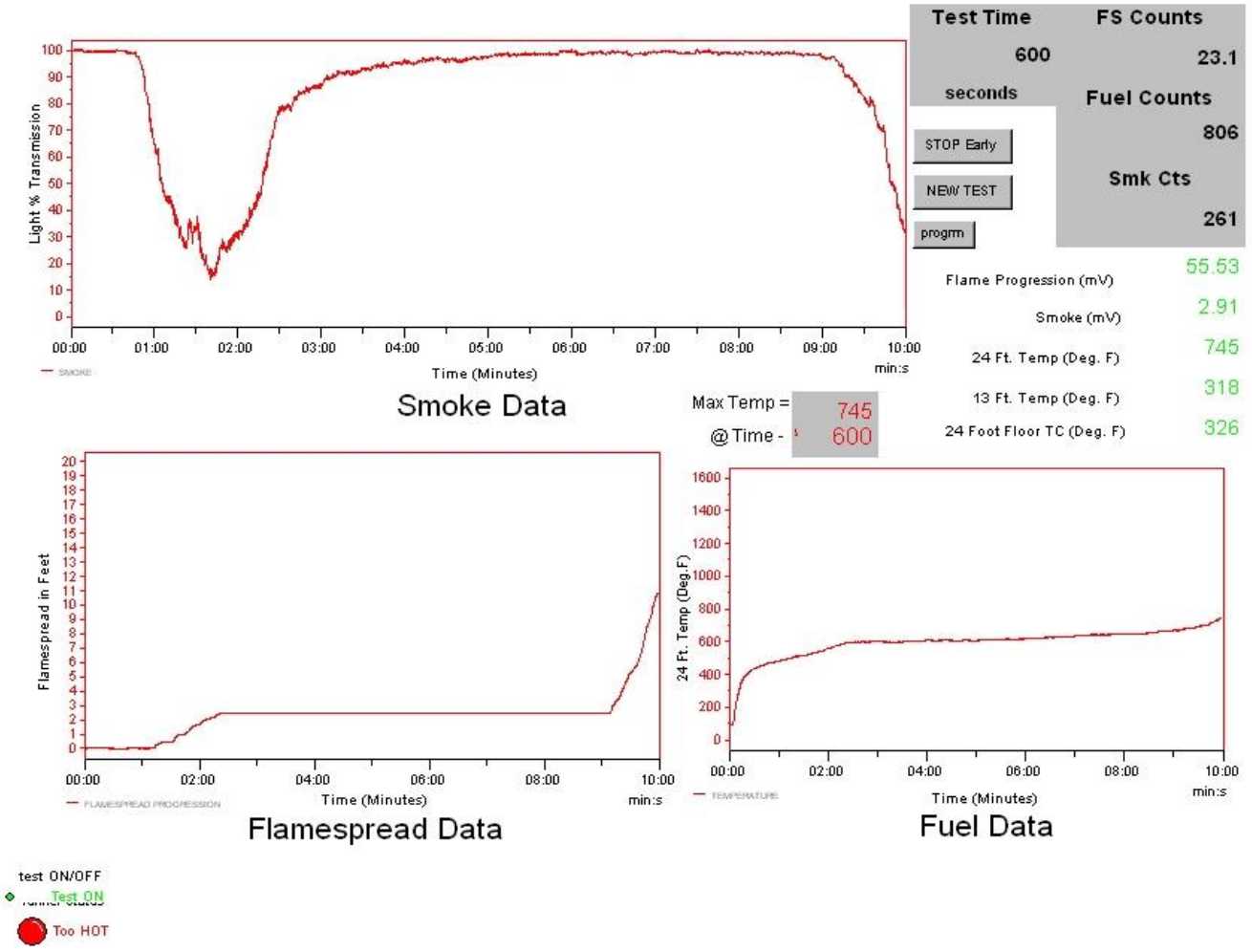
Observations:	T-15161-1: Cracking and charring to 14', discoloration to 24'. T-15161-2: Cracking and charring to 22', discoloration to 24'. T-15161-3: Cracking and charring to 6', discoloration to 24'.		
Remarks:	The test sample consisted of six 4' long panels laid end to end. Weights and thicknesses include the 1/4" cement board backer.		
Test Operator:	CK	**Reader:**	CP

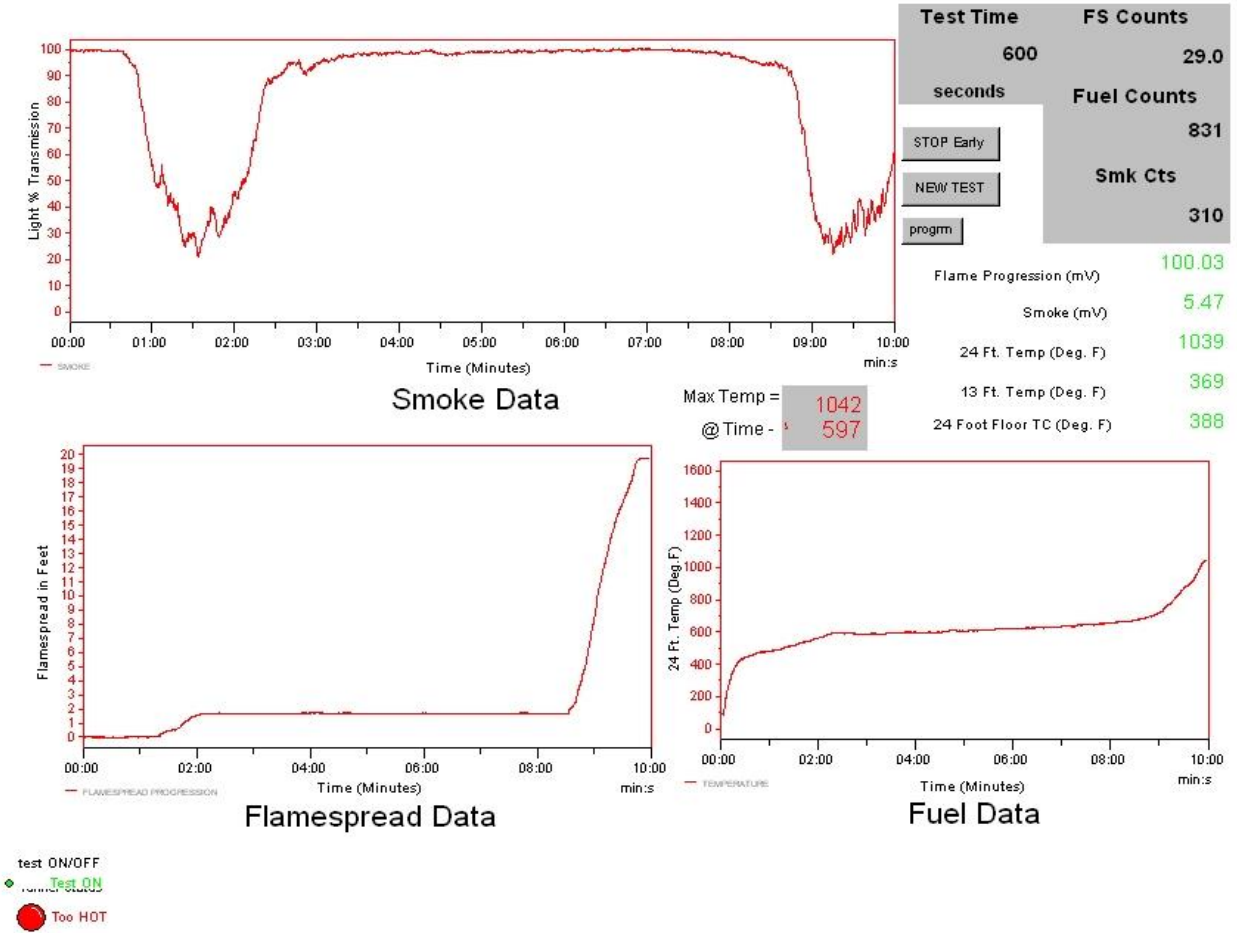
Report Prepared By:

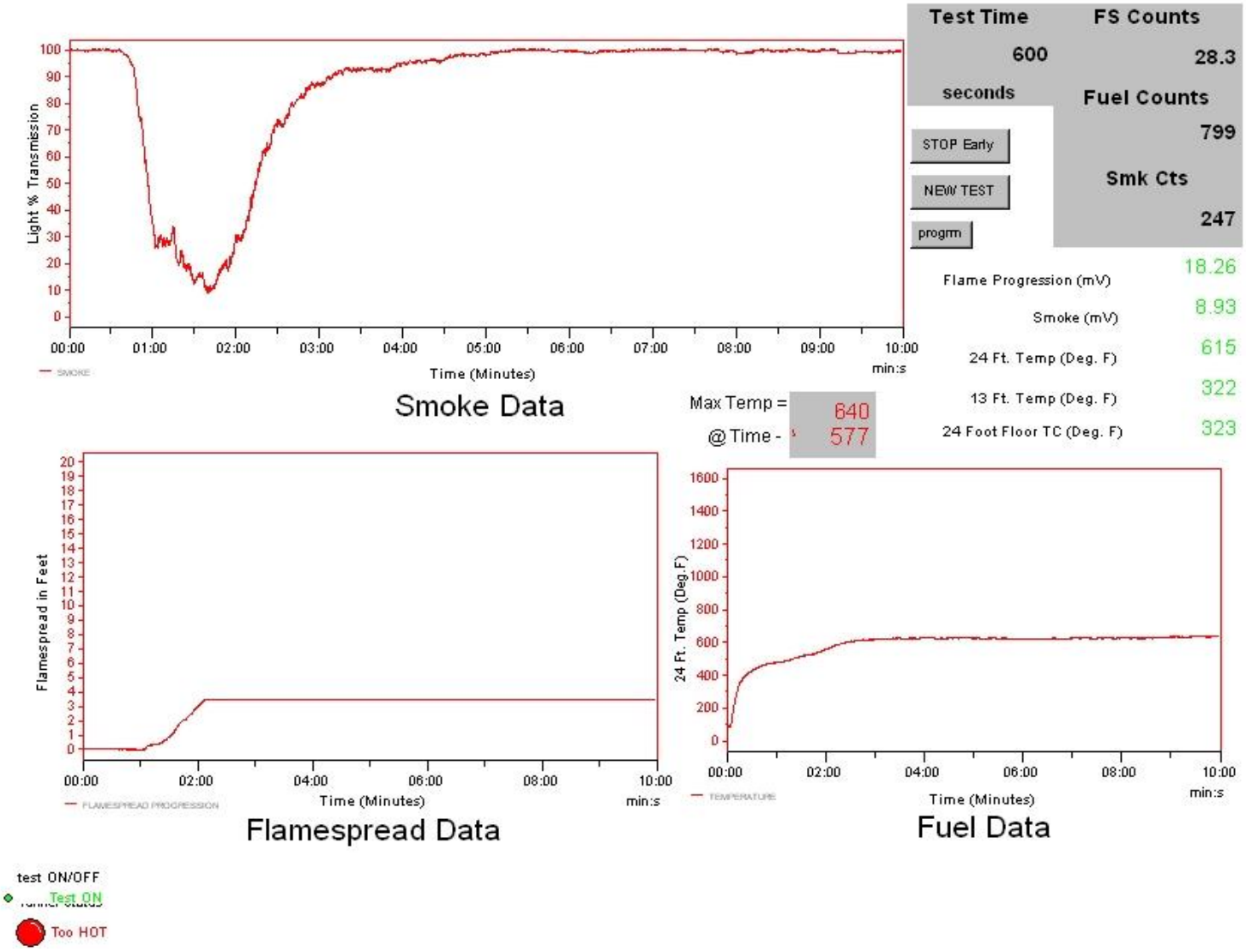
Manager of Fire Testing - Engineer

Report Reviewed By:

Director - HPVA Laboratories


Test Time
600
seconds
FS Counts
23.1
Fuel Counts
806
Smk Cts
261
STOP Early
NEW TEST
progrm
Flame Progression (mV)
55.53
Smoke (mV)
2.91
24 Ft. Temp (Deg. F)
745
13 Ft. Temp (Deg. F)
318
24 Foot Floor TC (Deg. F)
326
Light % Transmission
Time (Minutes)
min:s
Smoke Data
Max Temp =
745
@ Time -
600
Flamespread in Feet
Flamespread Data
24 Ft. Temp (Deg.F)
Fuel Data
test ON/OFF
Test ON
Too HOT


Test Time
600
seconds
FS Counts
29.0
Fuel Counts
831
Smk Cts
310
STOP Early
NEW TEST
progrm
Flame Progression (mV)
100.03
Smoke (mV)
5.47
24 Ft. Temp (Deg. F)
1039
13 Ft. Temp (Deg. F)
369
24 Foot Floor TC (Deg. F)
388
Light % Transmission
Time (Minutes)
min:s
Smoke Data
Max Temp =
1042
@ Time -
597
Flamespread in Feet
Time (Minutes)
min:s
Flamespread Data
24 Ft. Temp (Deg.F)
Time (Minutes)
min:s
Fuel Data
test ON/OFF
Test ON
Too HOT


Test Time
600
seconds
FS Counts
28.3
Fuel Counts
799
Smk Cts
247
STOP Early
NEW TEST
progrm
Flame Progression (mV)
18.26
Smoke (mV)
8.93
24 Ft. Temp (Deg. F)
615
13 Ft. Temp (Deg. F)
322
24 Foot Floor TC (Deg. F)
323
Light % Transmission
Time (Minutes)
min:s
Smoke Data
Max Temp =
640
@ Time -
577
Flamespread in Feet
Flamespread Data
24 Ft. Temp (Deg.F)
Fuel Data
test ON/OFF
Test ON
Too HOT