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THE PLYCEM COMPANY INC
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CARTAGO COSTA RICA

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The following material resulting from the investigation under the above numbers is enclosed.

Issue

<u>Date</u>	<u>Vol</u>	<u>Sec</u>	<u>Pages</u>	<u>Revised Date</u>
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NBK File

File Number: R15140
Project Number: 4787645380

April 26, 2017

REPORT

on

Mineral and Fiber Boards

Under the

CLASSIFICATION PROGRAM

THE PLYCEM COMPANY INC
CARTAGO COSTA RICA

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DESCRIPTION

PRODUCT COVERED:

The Product covered by this Report is a Mineral and Fiber Board.

The product is Classified by UL LLC (UL) as to Surface Burning Characteristics only.

USE

The product is intended for use as a building material as permitted by authorities having jurisdiction.

TEST RECORD NO. 1

GENERAL:

Test results relate only to the items tested.

EXAMINATION OF MATERIALS

The materials used in this investigation were produced under the observation of a representative of UL, in a ready-to-use form. The composition of the finished material is of proprietary nature. Data on the composition is on file at UL for use in the Follow-Up Service Program.

Various physical and chemical tests were conducted on the components and finished products. The results developed from these tests were employed in establishing specifications for use in the factory Follow-Up Service Program.

SURFACE BURNING CHARACTERISTICS:

SAMPLES

Each test sample consisted of three 8 ft by 2 ft wide boards butted end-to-end to form the required 24 ft. long surface.

Due to the rigidity of the test samples, supplementary means of support was not required.

For each test a piece of 1 ft long by 22 in. wide by 1/16 in. thick uncoated steel plate was placed at the fire end of the tunnel furnace "upstream" from the gas burners to complete the 25 ft chamber length.

The test samples were allowed to condition at a temperature of 73 ±4°F and a relative humidity of 50±5 percent prior to testing.

METHOD

The tests were conducted in accordance with Standard ANSI/UL723, Tenth Edition, dated September 10, 2008 with revisions through August 12, 2013, "Test for Surface Burning Characteristics of Building Materials", (ASTM E84).

RESULTS

Data on flame spread and smoke developed appears in the following tabulations. Graphs of flame spread versus time and smoke developed versus time are also provided as part of the Test Record.

Flame Spread Index

The maximum distance the flame spreads along the length of the sample from the end of the igniting flame is determined by observation.

The Flame Spread Index (FSI) of the material is determined by rounding the Calculated Flame Spread (CFS) as described in UL 723. The CFS is derived by calculating the area under the flame spread distance (ft) versus time (min) curve, ignoring any flame front recession, and using one of the calculation methods as described below.

1. If the total area (A_T) is less than or equal to 97.5 min-ft, the CFS shall be 0.515 times the total area ($FSI=0.515 A_T$).
2. If the total area (A_T) is greater than 97.5 min-ft, the CFS is to be 4900 divided by 195 minus the total area ($FSI=4900/(195-A_T)$).

Table 1: Flame Spread Summary

Test No.	Sample Description	Maximum Flame Spread (ft)	Time of Maximum Flame Spread (min:s)	Calculated Flame Spread (CFS)
1	Plyrock Flooring or Plycem Flooring	0	0:00	0
2	Plyrock Flooring or Plycem Flooring	0	0:00	0

Flame Spread Index	0
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Smoke Developed Index

The smoke Developed Index is determined by rounding the Calculated Smoke Developed (CSD) as described in UL 723. The CSD is determined by the output of a photoelectric circuit operating across the furnace flue pipe. A curve is developed by plotting values of light absorption (decrease in cell output) against time. The CSD is derived by expressing the net area under the curve for this material as a percentage of the net area under the curve for untreated red oak.

The CSD is expressed as:

$$\text{CSD} = (A_M / A_{R_o}) \times 100$$

Where:

CSD=Calculated Smoke Developed

A_M = The area under the curve for the test material

A_{R_o} = The area under the curve for untreated red oak

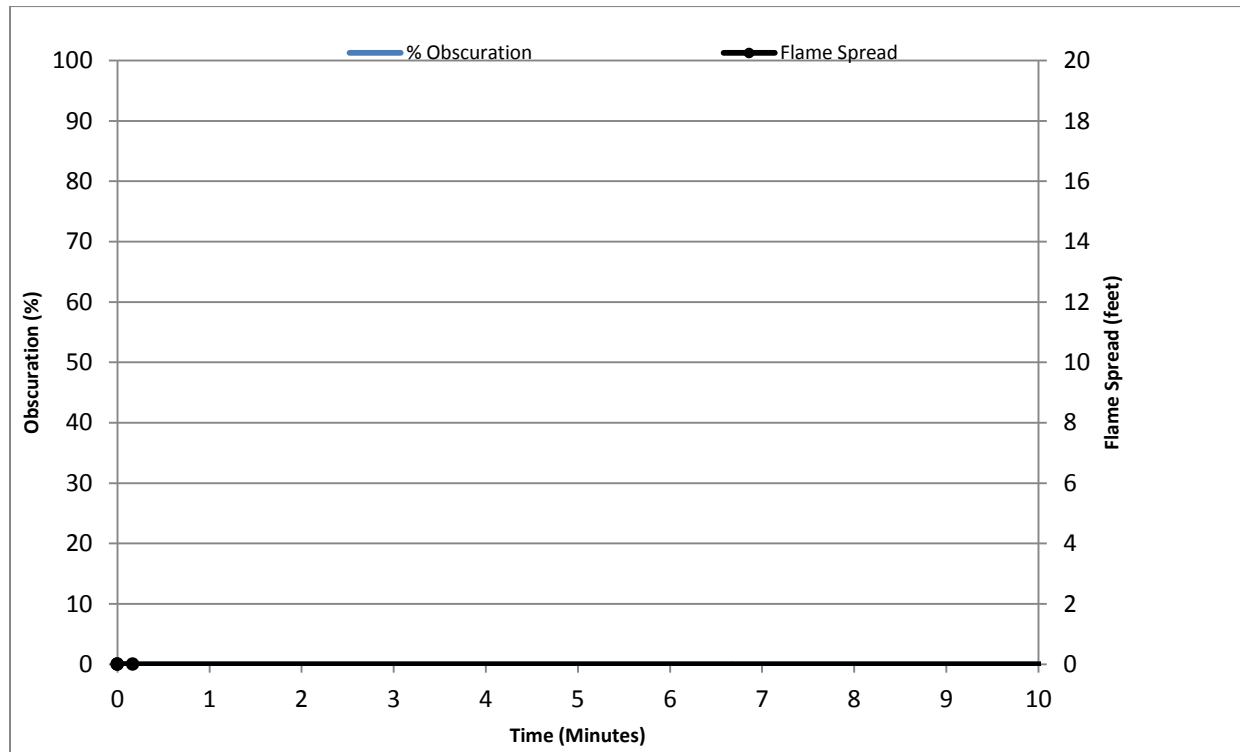
Table 2: Smoke Developed Summary

Test No.	Sample Description	CSD Calculated Smoke Developed
1	Plyrock Flooring or Plycem Flooring	0.0
2	Plyrock Flooring or Plycem Flooring	0.0

Smoke Developed Index	0
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Flame Spread / Smoke Results

Plycem Company Plyrock Flooring

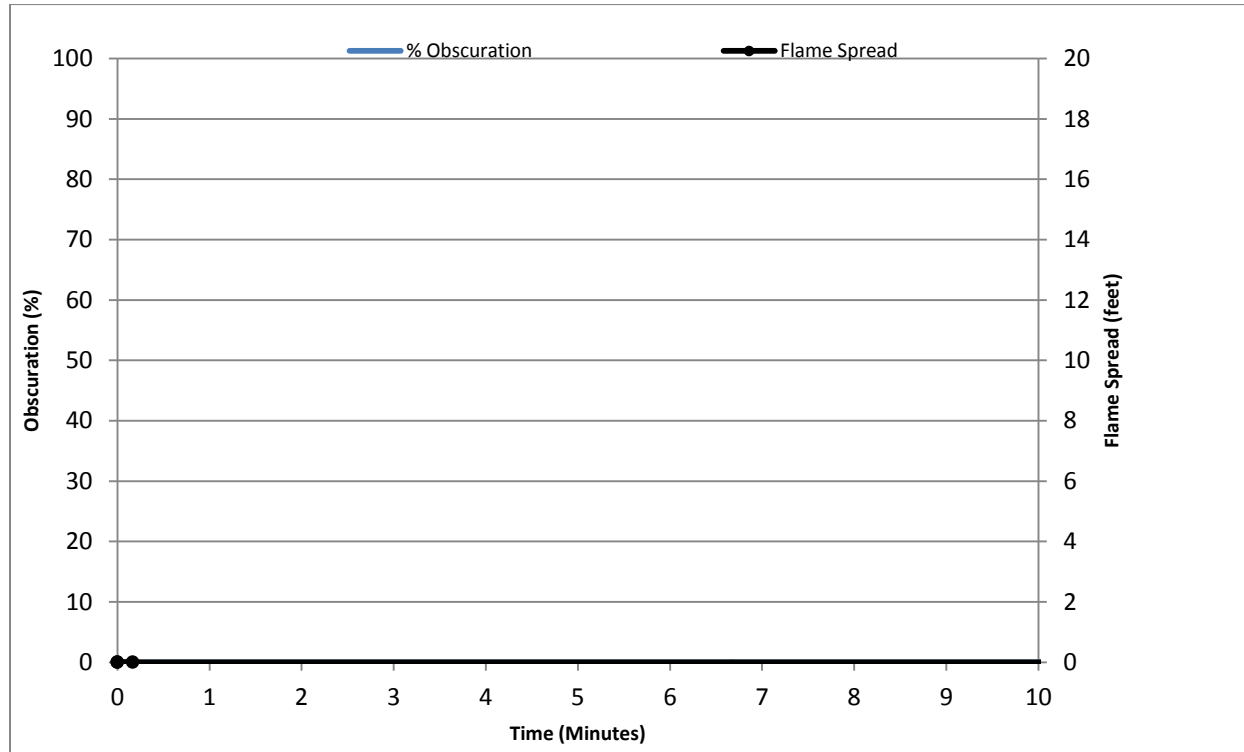


Test Num.: 1
R15140 / 4787645380
04251711

Flame Spread Index: 0
Smoke Developed Index: 0
Max. Flame Spread (ft.): 0.0

Flame Spread / Smoke Results

Plycem Company Plyrock Flooring



Test Num.: 2
R15140 / 4787645380
04251712

Flame Spread Index: 0
Smoke Developed Index: 0
Max. Flame Spread (ft.): 0.0

ASTM E136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C.

GENERAL:

Test results relate only to the items tested.

EXAMINATION OF MATERIALS

The materials used in this investigation were produced under the observation of a representative of UL, in a ready-to-use form. The composition of the finished material is of proprietary nature. Data on the composition is on file at UL for use in the Follow-Up Service Program.

Various physical and chemical tests were conducted on the components and finished products. The results developed from these tests were employed in establishing specifications for use in the factory Follow-Up Service Program.

PRODUCT COVERED

The sample identifications are given in Table 1.

Table 1 - Sample Identification

Sample ID
Plyrock Flooring or Plycem Flooring

NON-COMBUSTIBILITY TEST-ASTM E136-12

The tests were conducted in accordance with the test method outlined in ASTM E136-16 -*Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C.*

TEST SPECIMEN CONDITIONING

Prior to testing, the specimens were pre-dried for 24h at 60°C and then conditioned at an ambient temperature of 23±3°C and relative humidity of 50±5% until equilibrium (constant weight) was achieved.

RESULTS

The results are summarized in the following table. Based on the results obtained, the sample material did meet the requirements of the standard.

Sample Descriptio	Test #	Test Result	Pre Weight (g)	Post Weight (g)	Weight Loss (%)	Stabilized Temp (°C)	Max. Interior Temp (°C)	Max. Surface Temp (°C)	Rise Interior Temp (°C)	Rise Temp Surfac (°C)
Plyrock Flooring	1	Pass	83.89	63.84	20.05	750	697	768	0	6.7
Plyrock Flooring	2	Pass	85.95	65.09	20.86	750	701	764	0	3.9
Plyrock Flooring	3	Pass	86.58	66.50	20.08	750	689	764	0	3.5

CRITERIA

Sample material is considered as having passed the test if at least 3 of the 4 specimens tested meet the individual test specimen criteria detailed in ASTM E136-16.

If the weight loss of the specimen is 50% or less:

- 1) The recorded temperatures of the surface and interior thermocouples do not at any time during the test rise more than 30°C [54°F] above the stabilized temperature.
- 2) There is no flaming from the specimen after the first 30 seconds.

If the weight loss of the specimen is greater than 50%:

- 1) The recorded temperature of the surface and the interior thermocouples do not at any time during the test, rise above the stabilized furnace temperature measured at T_2 prior to the test.
- 2) No flaming from the test specimen is observed at any time during the test.

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.

Test Record Summary:

The results of this investigation, including construction review and testing, indicate that the products evaluated comply with the applicable requirements in the Standard for Surface Burning Characteristics for Building Materials, UL723, Tenth Edition (dated September 10, 2008 with revisions through August 12, 2013) and, therefore, such products are judged eligible to bear UL's Mark as described below and on the Conclusion Page of this Report.

Any information and documentation provided to you involving UL Mark services are provided on behalf of UL or any authorized licensee of UL.

Classification Marking:

The surface Burning Characteristics as shown below in the Classification Marking represent the judgment of UL based upon the results of the examination and tests presented in this Report.



Mineral and Fiber Boards
Issue No.
SURFACE BURNING CHARACTERISTICS

Flame Spread 0
Smoke Developed 0

"ALSO CLASSIFIED TO ASTM E136 STANDARD TEST METHOD FOR BEHAVIOR OF MATERIALS IN A VERTICAL TUBE FURNACE AT 750°C"

Test Record by:

Reviewed by:

Thomas Sias
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James Smith
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Conclusion

Samples of the product covered by this Report have been found to comply with the requirements covering the category and the products are found to comply with UL's applicable requirements. The description and test result in this Report are only applicable to the samples investigated by UL and does not signify UL certification or that the product described is covered under UL's Follow-Up Service Program. When covered under UL's Follow-Up Service Program, the manufacturer is authorized to use the UL Classification Mark on such products which comply with UL's Follow-Up Service Procedure and any other application requirements of UL. The Classification Mark of UL on the product, or the UL symbol on the product and the Classification Mark on the smallest unit container in which the product is packaged, is the only method to identify products investigated by UL to published requirements and manufactured under UL's Classification and Follow-Up Service.

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