

ASTM E84-03

SURFACE BURNING
CHARACTERISTICS

Report No. 9059 - 123167

Marlite Connections 440 Panel-Type FR

December 28, 2004

Prepared for:

Marlite

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ABSTRACT

Test Specimen: **Marlite Connections 440 Panel-Type FR**

Test Standard: **ASTM E84-03**

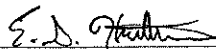
Test Date: **December 27, 2004**

Test Sponsor: **Marlite**

Test Results:

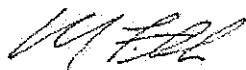
FLAME SPREAD INDEX = 20
SMOKE DEVELOPED INDEX = 110

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Eric G. Hutchinson
E84 Operator

Reviewed and approved:



William E Fitch PE No. 55296

December 28, 2004

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I INTRODUCTION

This report describes the results of the ASTM E84-03 Standard Test Method for SURFACE BURNING CHARACTERISTICS OF BUILDING MATERIALS , a method for determining the comparative surface burning behavior of building materials. This test is applicable to exposed surfaces, such as ceilings or walls, provided that the material or assembly of materials, by its own structural quality or the manner in which it is tested and intended for use, is capable of supporting itself in position or being supported during the test period.

The purpose of the method is to determine the relative burning behavior of the material by observing the flame spread along the specimen. Flame spread and smoke density developed are reported, however, there is not necessarily a relationship between these two measurements.

“The use of supporting materials on the underside of the test specimen may lower the flame spread index from that which might be obtained if the specimen could be tested without such support... This method may not be appropriate for obtaining comparative surface burning behavior of some cellular plastic materials... Testing of materials that melt, drip, or delaminate to such a degree that the continuity of the flame front is destroyed, results in low flame spread indices that do not relate directly to indices obtained by testing materials that remain in place.”

This test method is also published under the following designations:

ANSI 2.5
NFPA 255
UBC 8-1 (42-1)
UL 723

This standard should be used to measure and describe the properties of materials, products, or assemblies in response to heat and flame under controlled laboratory conditions and should not be used to describe or appraise the fire hazard or fire risk of materials, products, or assemblies under actual fire conditions. However, results of this test may be used as elements of a fire risk assessment which takes into account all of the factors which are pertinent to an assessment of the fire hazard of a particular end use.



II PURPOSE

The ASTM E84-03 (25 foot tunnel) test method is intended to compare the surface flame spread and smoke developed measurements to those obtained from tests of mineral fiber cement board and select grade red oak flooring. The test specimen surface (18 inches wide and 24 feet long) is exposed to a flaming fire exposure during the 10 minute test duration, while flame spread over its surface and density of the resulting smoke are measured and recorded. Test results are presented as the computed comparisons to the standard calibration materials.

The furnace is considered under calibration when a 10 minute test of red oak decking will pass flame out the end of the tunnel in five minutes, 30 seconds, plus or minus 15 seconds. Mineral fiber cement board forms the zero point for both flame spread and smoke developed indexes, while the red oak flooring smoke developed index is set as 100.

III DESCRIPTION OF TEST SPECIMEN

Specimen Identification: Marlite Connections 440 Panel-Type FR

Date Received:	12/15/2004
Date Prepared:	12/15/2004
Conditioning (73°F & 50% R.H.):	12 days
Specimen Width (in):	24
Specimen Length (ft):	24
Specimen Thickness:	0.4380-in.
Material Weight:	N/A oz./sq. yd
Total Specimen Weight:	95.00-lbs.
Adhesive or coating application rate:	N/A

Mounting Method:

The specimen was supported on 1/4 in steel rods and 2 inch galvanized hexagonal wire mesh.

Specimen Description:

The Test specimen was described by the client as the "Face Is .030 HPL FR Grade, Backer Is .017 Gatorply, Both Glue Lines Wilson Art Type II, Core Is 3/8" Fire Rated Particle Board (Duraflake)." The specimen consisted of (3) 8-ft. long x 24-in. wide x 0.4380-in. thick, white, laminated plastic facer adhered to a 3/8-in. thick, fire rated particle board (Duraflake) core.



IV TEST RESULTS

The test results, computed on the basis of observed flame front advance and electronic smoke density measurements are presented in the following table. In recognition of possible variations and limitations of the test method, the results are computed to the nearest number divisible by five, as outlined in the test method.

While no longer a part of this standard test method, the Fuel Contributed Value has been computed, and may be found on the computer printout sheet in the Appendix.

Test Specimen	Flame Spread Index	Smoke Developed Index
Mineral Fiber Cement Board	0	0
Red Oak Flooring	100	100
Marlite Connections 440 Panel-Type FR	20	110

The data sheets are included in the Appendix. These sheets are actual print-outs of the computerized data system which monitors the ASTM E84 apparatus, and contain all calibration and specimen data needed to calculate the test results.

V OBSERVATIONS

During the test, the specimen was observed to behave in the following manner: The plastic laminate began to blister at 0:22 (min:sec.). The specimen ignited at 0:42 (min:sec.). The plastic laminate began to flake off at 4:42 (min:sec.). The test continued for the 10:00 duration. After the test burners were turned off, a 20 second afterflame was observed.

After the test the specimen was observed to be damaged as follows:

The plastic laminate was consumed from 0-ft. - 5-ft. The particle board was charred from 0-ft. - 7-ft. The plastic laminate was charred from 5.5-ft. - 14-ft. Brown discoloration was observed to the specimen from 15-ft. - 24-ft.



APPENDIX

E84 Data Sheets



ASTM E84 DATASHEETS

Client: MARLITE

Date: 12/27/04

Time: 05:58 PM

Test Number: 8

Project Number: 9059-123167

Operator: EH/TA

Specimen ID: "MARLITE CONNECTIONS 440 PANEL-TYPE FR, 3 PCS. 24X96, FACE IS .030 HPL FR GRADE, BACKER IS .017 GATORPLY, BOTH GLUE LINES WILSON ART TYPE II, CORE IS 3/8" FIRE RATED PARTICLE BOARD (DURAFLAKE)". THE SPECIMEN WAS SUPPORTED BY RODS & WIRE.

TEST RESULTS

FLAMESPREAD INDEX: 20

SMOKE DEVELOPED INDEX: 110

SPECIMEN DATA . . .

Time to Ignition (sec): 42

Time to Max FS (sec): 313

Maximum FS (feet): 5.2

Time to 980 °F (sec): Never Reached

Max Temperature (°F): 604

Time to Max Temperature (sec): 596

Total Fuel Burned (cubic feet): 51.68

FS*Time Area (ft*min): 43.5

Smoke Area (%A*min): 107.3

Fuel Area (°F*min): 5015.0

Fuel Contributed Value: 0

Unrounded FSI: 22.4

CALIBRATION DATA . . .

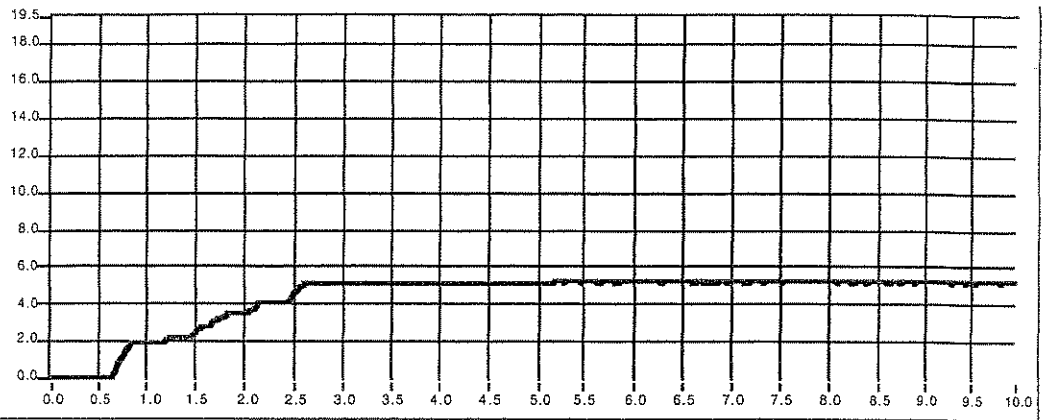
Time to Ignition of Last Red Oak (sec): 38

Red Oak Smoke Area (%A*min): 96.00

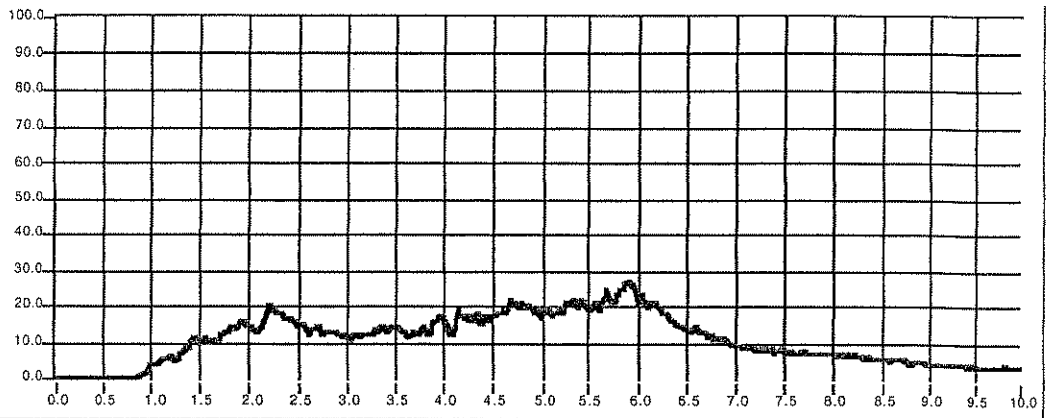
Red Oak Fuel Area (°F*min): 8587

Glass Fiber Board Fuel Area (°F*min): 5396

FLAME SPREAD (ft)



Smoke (%A)



Temperature (°F)

