3M Commercial Graphics
3M Center
St. Paul, MN 55144-1000
General 1-800-374-6772

Product Flammability Information

The attached ASTM E-84 is for 3M™ Scotchcal™ Perforated Window Graphic Film 8171-114. Due to similar film construction, we expect 3M™ Scotchcal™ Perforated Window Graphic Film 8171 to have comparable results to 3M™ Scotchcal™ Perforated Window Graphic Film 8171-114.

After a material is subjected to the ASTM E-84 test, it is given a rating based on its performance during the test. Materials are classified into one of three groups based on their tested flame spread characteristics. These groups and their flame spread indexes are listed below:

Class Flame Spread Index
I (A) 0-25
II (B) 26-75
III (C) 76-200

Class I or (A) rating means it is the most fire resistant category that NFPA recognizes as necessary for interior wall and ceiling finish materials. It will be acceptable in any building in any locality that models its building code after NFPA 101 for wall or ceiling materials.

NFPA 101 is a code that provides minimum requirements for the design, operation and maintenance of building and structures for safety to life from fire and similar emergencies. The requirements differ depending on the type of building.

Many building codes require a smoke developed rating of 450 or less for building materials. The 3M™ Scotchcal™ Perforated Window Graphic Film 8171 meets the requirements of Class I (A) and the smoke developed rating of less than or equal to 450.

If you have any questions about the features or performance of this 3M product, please call Commercial Graphics Division Technical Service at 1-800-328-3908.

Sincerely,
3M Commercial Graphics Product Responsibility

ASTM E84-99

SURFACE BURNING CHARACTERISTICS

3M™ 8171-114 Perforated Window Marking Film

Report No. 15300 - 107060

July 12, 2000

Prepared For:

3M Company
Commercial Graphics Division
3M Center
Building 207-1W-22
St. Paul, MN 55422, U.S.A.

OMEGA POINT LABORATORIES

ACCREDITED

ABSTRACT

Test Material:	**3M™ 8171-114 Perforated Window Marking Film**		
Test Standard:	**ASTM E84-99 Standard Test Method for SURFACE BURNING CHARACTERISTICS OF BUILDING MATERIALS (ANSI 2.5, NFPA 255, UBC 8-1, UL 723)**		
Test Date:	**July 7, 2000**		
Test Sponsor:	**3M Company**		
Test Results:	**FLAME SPREAD INDEX**	=	**20**
	SMOKE DEVELOPED INDEX	=	**85**

The description of the test procedure and specimen evaluated, as well as the observations and results obtained, contained herein are true and accurate within the limits of sound engineering practice. These results are valid only for the specimen(s) tested and may not represent the performance of other specimens from the same or other production lots.

Guy A. Haby
Fire Test Technologist

Date: July 12, 2000

William E. Fitch, P.E. No. 55296
Executive Vice President

Date: July 12, 2000

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I. INTRODUCTION

This report describes the results of the ASTM E84 Standard Test Method for SURFACE BURNING CHARACTERISTICS OF BUILDING MATERIALS (1) , 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.

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(1) American Society for Testing and Materials (ASTM), Committee E-5 on Fire Standards

II. PURPOSE

The ASTM E84 (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 SPECIMENS

Specimen Identification:	3M™ 8171-114 Perforated Window Marking Film
Date Received:	6/14/2000
Date Prepared:	June 14, 2000
Conditioning (73°F & 50% R.H.):	23 days
Specimen Width (in):	24
Specimen Length (ft):	24
Specimen Thickness:	0.0055-in.
Material Weight:	N/A oz./sq. yd.
Total Specimen Weight:	2.38-lbs.
Adhesive or coating application rate:	N/A

Mounting Method:

The specimen was supported on 1/4" steel rods and 2" galavanized hexagonal wire mesh.

Specimen Description:

The specimen was described by the client as "3M™ 8171-114 Perforated Window Marking Film". The specimen consisted of a 24" wide x 24' long roll of white window marking film.

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	n/a	100
3M™ 8171-114 Perforated Window Marking Film	**20**	**85**

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 specimen began to melt at 0:05 (min:sec) and steady ignition began at 0:12. Flaming drops began to fall from the specimen at 0:40 and a floor flame began burning on the tunnel floor at 0:45. The test continued for the 10:00 duration.

After the test, the specimen was observed to be damaged as follows: The specimen was 100% consumed from 0-ft. - 9-ft. The specimen was charred from 9-ft. - 11-ft. and had a slight discoloration from 11-ft. -24-ft.

APPENDIX

DATA SHEETS

ASTM E84 DATASHEETS

Client: 3M COMMERCIAL GRAPHICS DIVISION
Date: 7/7/00
Time: 1:52 PM
Test Number: 1
Project Number: 15300-107060
Operator: E.H.
Specimen ID: "3M (TM) 8171-114 PERFORATED WINDOW MARKING FILM". THE SPECIMEN WAS TESTED ON RODS AND WIRE AS DESCRIBED BY THE TEST STANDARD.

TEST RESULTS

FLAMESPREAD INDEX: 20

SMOKE DEVELOPED INDEX: 85

SPECIMEN DATA . . .

Time to Ignition (sec): 12
Time to Max FS (sec): 24
Maximum FS (feet): 4.2
Time to 980 °F (sec): Never Reached
Max Temperature (°F): 516
Time to Max Temperature (sec): 587
Total Fuel Burned (cubic feet): 45.87

FS*Time Area (ft*min): 41.0
Smoke Area (%A*min): 86.3
Fuel Area (°F*min): 4603.9
Fuel Contributed Value: 0
Unrounded FSI: 21.1

CALIBRATION DATA . . .

Time to Ignition of Last Red Oak (sec): 56
Red Oak Smoke Area (%A*min): 101.90
Red Oak Fuel Area (°F*min): 9191
Glass Fiber Board Fuel Area (°F*min): 5185

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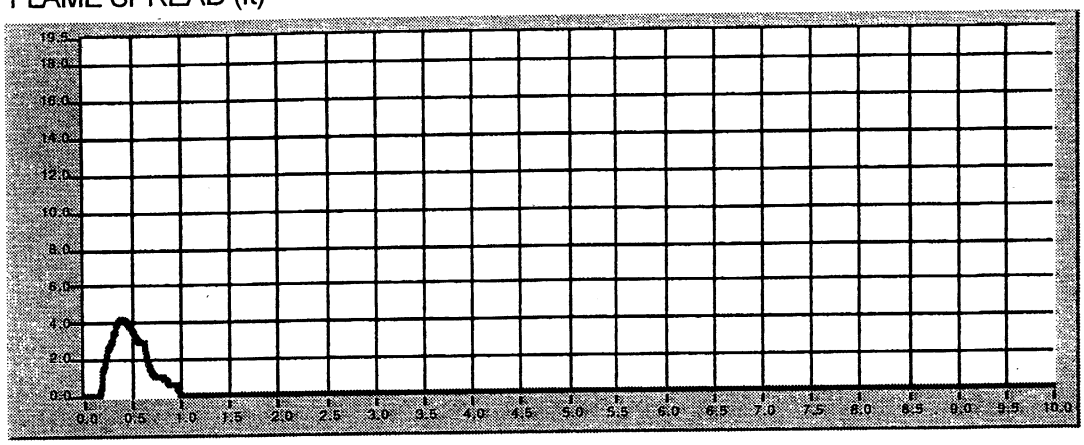
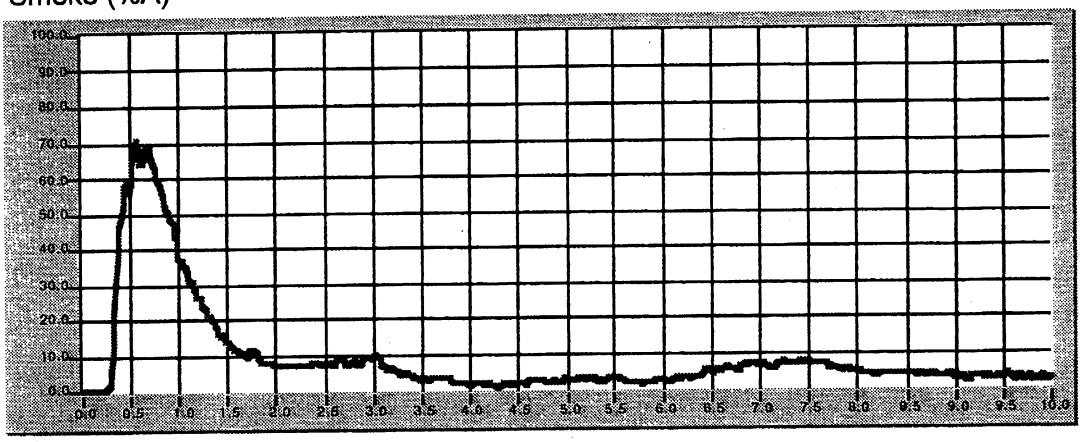
Project No: 15300-107060

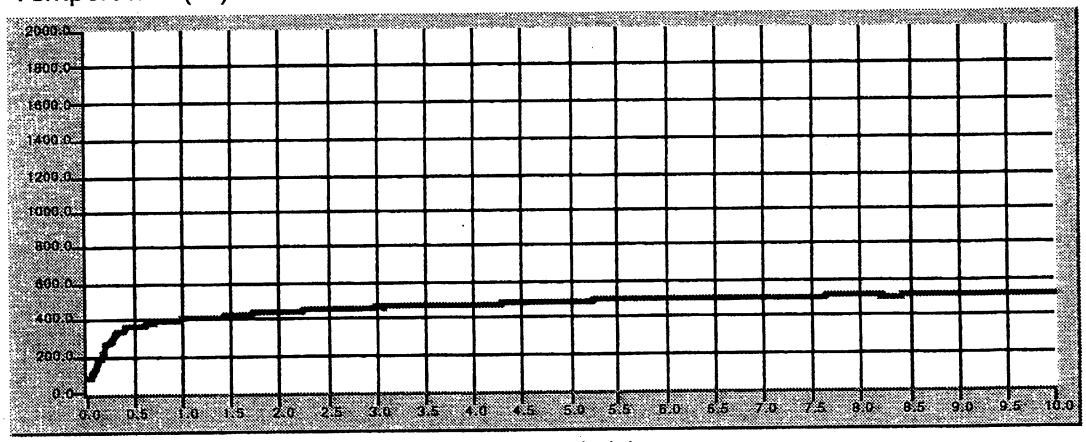
FLAME SPREAD (ft)



Smoke (%A)



Temperature (°F)



Time (min)

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