ABSTRACT

Test Specimen: **einsulation.com**

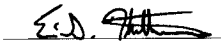
Test Standard: **ASTM E84-03**

Test Date: **July 15, 2004**

Test Sponsor: **Insultec, Inc.**

Test Results:

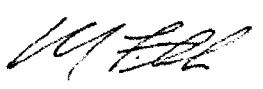
FLAME SPREAD INDEX	=	20
SMOKE DEVELOPED INDEX	=	10



Eric G. Hutchinson
E84 Operator

July 27, 2004

Reviewed and approved:



William E Fitch PE No. 55296

July 27, 2004

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 sur-face (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 den-sity 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:	einsulation.com
Date Received:	7/8/2004
Date Prepared:	7/8/2004
Conditioning (73°F & 50% R.H.):	7 days
Specimen Width (in):	24
Specimen Length (ft):	24
Specimen Thickness:	0.8585-in.
Material Weight:	N/A oz./sq. yd
Total Specimen Weight:	38.20-lbs.
Adhesive or coating application rate:	N/A

Mounting Method:

The specimen was self-supporting and was placed directly on the inner ledges of the tunnel.

Specimen Description:

The Test specimen was described by the client as the "Mineral Fiber Pipe Section." The specimen consisted of (6) 47-in. long x 24-in. wide x 0.8585-in. thick, yellow fiberglass insulation panels with an ASJ facer glued and stapled to the fiberglass. The ASJ facer was 0.0065-in. thick, and was white in color. The composition of the specimen was (White Paper / Scrim / Foil / Fiberglass.

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	90	100
einsulation.com	**20**	**10**

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 ASJ facer ignited at 0:06 (min:sec.). Minute pieces of the ASJ facer began to flake off at 0:15 (min:sec.). The scrim began to hang down at 0:22 (min:sec.). The test continued for the 10:00 duration.

After the test the specimen was observed to be damaged as follows:
The ASJ facer was consumed was consumed from 0-ft. - 13-ft. The fiberglass showed signs of white discoloration from 0-ft. - 4-ft. Black discoloration was observed to the fiberglass from 5-ft. - 12-ft. Brown discoloration was observed to the white ASJ facer from 14-ft. - 24-ft.

APPENDIX

E84 Data Sheets

ASTM E84 DATASHEETS

Client:	INSULTEC, INC.
Date:	7/15/04
Time:	10:17 AM
Test Number:	1
Project Number:	16653-120002
Operator:	EH/ADT
Specimen ID:	"EINSULATION.COM, FIBER GLASS PIPE SECTIONS". THE SPECIMEN WAS SELF-SUPPORTING. THE TEST WAS WITNESSED BY VICE PRESIDENT ANAND VERMA FROM INSULTEC, INC. THE SAMPLES ARE AS PER ASTM E 2231.

TEST RESULTS

FLAMESPREAD INDEX:	**20**
SMOKE DEVELOPED INDEX:	**10**

SPECIMEN DATA . . .

Time to Ignition (sec):	6
Time to Max FS (sec):	17
Maximum FS (feet):	4.4
Time to 980 °F (sec):	Never Reached
Max Temperature (°F):	592
Time to Max Temperature (sec):	574
Total Fuel Burned (cubic feet):	17.34

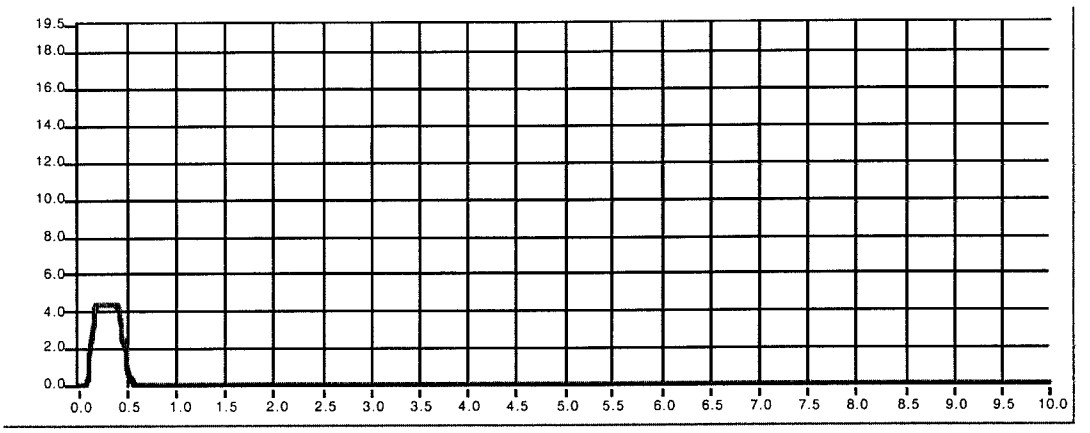
FS*Time Area (ft*min):	43.0
Smoke Area (%A*min):	11.7
Fuel Area (°F*min):	5506.0
Fuel Contributed Value:	15
Unrounded FSI:	22.2

CALIBRATION DATA . . .

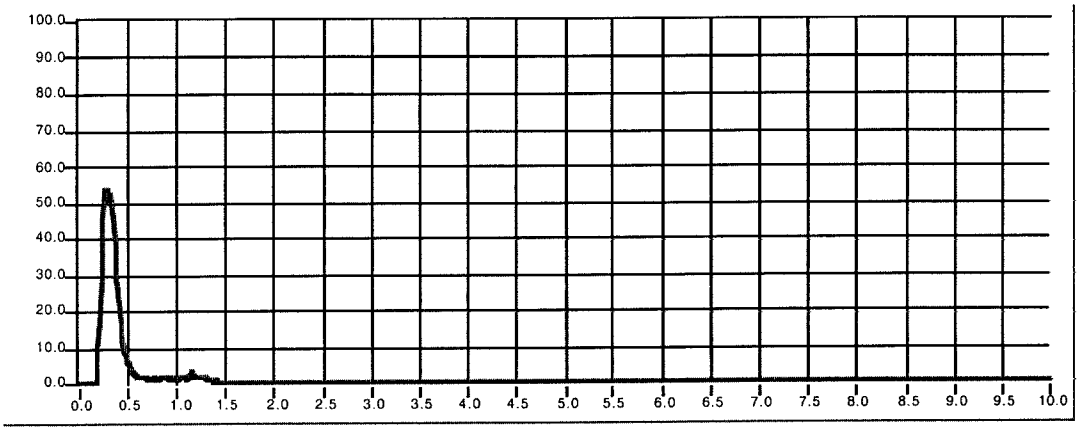
Time to Ignition of Last Red Oak (sec):	49
Red Oak Smoke Area (%A*min):	101.60
Red Oak Fuel Area (°F*min):	8153
Glass Fiber Board Fuel Area (°F*min):	5040

Project No: 16653-120002

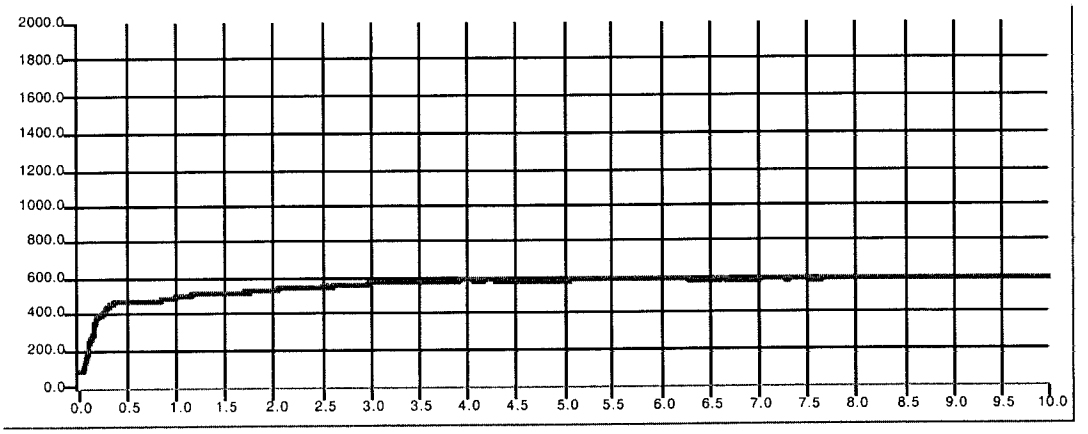
FLAME SPREAD (ft)



Smoke (%A)



Temperature (°F)



Time (min)