

**ASTM E84-89a
SURFACE BURNING
CHARACTERISTICS**

**K-901101-3 FRP
Fiber Glass Reinforced Building Panels**

Report No. 9013 - 90856

November 9, 1990

Prepared For:

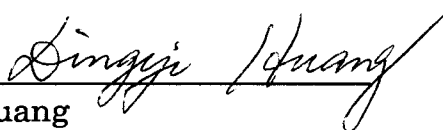
Crane-Kemlite Company
4050 Channahon Rd.
Joliet, IL 60436



ABSTRACT

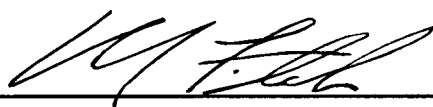
Test Material:	K-901101-3 FRP Fiber Glass Reinforced Building Panels
Test Standard:	ASTM E84-89a Standard Test Method for SURFACE BURNING CHARACTERISTICS OF BUILDING MATERIALS (ANSI 2.5, NFPA 255, UBC 42-1, UL 723)
Test Date:	November 9, 1990
Test Sponsor:	Crane-Kemlite Company
Test Results:	FLAME SPREAD INDEX = 195 SMOKE DEVELOPED INDEX = 225

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.



Dingyi Huang
Test Enginner

Date: November 9, 1990



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

Date: November 9, 1990



I. INTRODUCTION

This report describes the results of the ASTM E84-89a 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 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.

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



II. PURPOSE

The ASTM E84-87 (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, while the red oak flooring flame spread and smoke developed ratings are set as 100.

III. DESCRIPTION OF TEST SPECIMENS

Specimen Identification: K-901101-3 FRP
Fiber Glass Reinforced Building
Panels

Date Received: November 8, 1990

Date Prepared: November 8, 1990

Conditioning (73°F & 50% R.H.): 1 days

Specimen Width (in): 24

Specimen Length (ft): 24

Specimen Thickness: 0.1"

Fabric Weight: oz./sq. yd.

Entire Specimen Weight: 24lb 7oz

Adhesive or coating application rate: n/a

Mounting Method:

Panels were placed over 1/4" steel rods spaced 24" o.c. with the textured surface towards the test flame.

Specimen Description:

Specimens consisted of 3 pieces 0.1" thick, 2' wide by 8' long, fairly rigid plastic panels. They were textured (finished side) on one surface and smooth on the other. All were white.



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
K-901101-3 FRP Fiber Glass Reinforced Building Panels	195	225

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

Steady ignition occurred on the face of the first panel at 0:45 (min:sec) and reached a maximum of 19.5' at 1:48. The specimen began to blister at 0:34, fiberglass exposed at 3:44. The flaming extinguished immediately when the test was over.

After cooling and removing from the furnace, the specimen was observed as follows: all resin in the first panel baked out to 4.5', the panels were completely charred to 7', lost strength to 8', fiberglass loosened to 3', exposed to 14', surface discolored and charred to 24'.



APPENDIX

DATA SHEETS



ASTM E84

DATA SHEET

Client: Crane Kemlite
 Date: 15:53:43 11-09-1990
 Test Number: 7
 Project Number: 9010-90856
 Operator: DH/HS
 Material ID:

K-901101-3 FRP fiberglass panels 3 @ 2'x8'x0.1"

TEST RESULTS:

FLAMESPREAD INDEX = 195
 SMOKE DEVELOPED INDEX = 225

SPECIMEN DATA . . .

Time to Ignition = 00:45 (Min:Sec)
 Time to Max FS = 01:48 (Min:Sec)
 Maximum FS = 19.5 (Feet)
 Time To 980 F = 980 F Not Reached
 Max Temp = 975 (deg F)
 Time To Max Temp = 04:12 (Min:Sec)
 Total Fuel Burned = 50.28 (cubic feet)

FS*Time Area = 170.0 (Ft*Min)
 Smoke Area = 248.7 (%T*Min)
 Fuel Area = 5983.1 (F*Min)
 Unrounded FSI = 196.14

CALIBRATION DATA . . .

Time to Ignition of Last Red Oak = 00:52 (Min:Sec)
 Red Oak Smoke Area = 109.50 (%T*Min)
 Red Oak Fuel Area = 7860 (F*Min)
 Glass Fiber Board Fuel Area = 4209 (F*Min)

CLIENT: Crane Kemlite
PROJECT NO: 9013-90856

Time & Date: 15:53:43 11-09-1990

