

# SOUTHWEST RESEARCH INSTITUTE®

6220 CULEBRA RD. 78238-5166 • P.O. DRAWER 28510 78228-0510 • SAN ANTONIO, TEXAS, USA • (210) 684-5111 • WWW.SWRI.ORG

CHEMISTRY AND CHEMICAL ENGINEERING DIVISION  
FIRE TECHNOLOGY DEPARTMENT  
[WWW.FIRE.SWRI.ORG](http://WWW.FIRE.SWRI.ORG)  
FAX (210) 522-3377



**INVESTIGATION OF THE SURFACE BURNING  
CHARACTERISTICS OF A NOMINAL 4.0-IN.  
THICK (IRREGULAR FOAM SURFACE) POLY-  
RETHANE FOAM INSULATION, SPRAY APPLIED  
TO 0.25-IN. THICK CEMENT BOARD  
MATERIAL ID: BURTIN 0.5# SPF 4"**

## **FINAL REPORT**

**Consisting of 5 Pages**

**SwRI® Project No.: 01.13931.01.001b**

**Test Date: March 18, 2008**

**Report Date: April 11, 2008**

**Prepared for:**

**BURTIN POLYMER LABORATORIES  
100 ENTERPRISE  
CARTERSVILLE, GA 30120**

Prepared by:

Handwritten signature of Anthony L. Saucedo in black ink.

Anthony L. Saucedo  
Group Leader  
Material Flammability Section

Approved by:

Handwritten signature of Gladys M. Miller in black ink.

Gladys M. Miller, M.S., M.B.A.  
Assistant Director  
Fire Technology Department

Reviewed by:

4/17/08  
Handwritten signature of Barry L. Badders, Jr. in black ink.

Barry L. Badders, Jr., P.E.  
No. 61907, Florida

This report is for the information of the client. It may be used in its entirety for the purpose of securing product acceptance from duly constituted approval authorities. This report shall not be reproduced except in full, without the written approval of SwRI. Neither this report nor the name of the Institute shall be used in publicity or advertising.



## INTRODUCTION

This report presents the test results for a specimen submitted by Burtin Polymer Laboratories, located in Cartersville, GA, and tested at Southwest Research Institute's (SwRI's) Fire Technology Department, located in San Antonio, Texas. The test is conducted in accordance with the procedure outlined in ASTM E 84 - 07, *Standard Test Method for Surface Burning Characteristics of Building Materials* (NFPA 255, ANSI/UL 723 and UBC 8-1).

This test method 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 test is conducted with the material in the ceiling position.

The purpose of this test method is to determine the relative burning behavior of the material by observing the flame spread along the specimen. Flame Spread and Smoke Developed index are reported. However, there is not necessarily a relationship between these two measurements.

**This standard should be used to measure and describe the response of materials, products, or assemblies to heat and flame under controlled 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 the test may be used as elements of a fire-hazard assessment or a fire-risk assessment which takes into account all of the factors which are pertinent to an assessment of the fire hazard or fire risk of a particular end use.**

Test specimens are conditioned as appropriate in an atmosphere maintained between 68 and 78 °F and 45 to 55% relative humidity. Immediately prior to the test, the specimen is mounted in the furnace with the side to be tested facing the test flame. Cement board is placed on the unexposed side of the specimen to protect the furnace lid assembly. Sometimes, because of the nature of the material undergoing testing, additional support (e.g. wire, wire and rods, rods, and/or bars) is used to ensure that the specimen will remain in position during the test. 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, and the test results do not necessarily relate to indices obtained by testing materials without such support.

The flame front position and light obscuration are recorded throughout the 10-minute test and used to calculate the Flame Spread and Smoke Developed indices. The temperature at 23 ft is also recorded. The Flame Spread and Smoke Developed indices reported herein are relative to the results obtained for mineral fiber-reinforced cement board and select grade red oak (moisture content between 6 and 8%). The mineral fiber-reinforced cement board is the calibration material used to obtain 0 values for Flame Spread and Smoke; red oak decks are used to obtain 100 values for Flame Spread and Smoke.

The results apply specifically to the specimens tested, in the manner tested, and not to the entire production of these or similar materials, nor to the performance when used in combination with other materials.

Two model building codes (2003 International Building Code<sup>®</sup>, Chapter 8 *Interior Finishes*, Section 803 *Wall and Ceiling Finishes*; NFPA 5000, Chapter 10 *Interior Finish*, Section 10.3 *Interior Wall or Ceiling Finish Testing and Classification*) classify materials based on the Flame Spread and Smoke Developed indices. For reference purposes, the classification criteria are listed below:

Classification	Flame Spread Index	Smoke Developed Index
A	0 – 25	0 – 450
B	26 – 75	0 – 450
C	76 – 200	0 – 450

## ASTM E 84 - 07 REPORT

CLIENT: BURTIN POLYMER LABORATORIES  
SWRI PROJECT NO.: 01.13931.01.001b  
TEST DATE: MARCH 18, 2008  
DAILY TEST NO.: 3

### DESCRIPTION OF SPECIMEN

DATE RECEIVED: January 24, 2008 (received ready-to-test)

MATERIAL ID:\* Burtin 0.5# SPF 4"

DESCRIPTION:\* Green 0.5 pcf spray polyurethane foam insulation applied to 0.25-in. thick cement board

THICKNESS: 4.0 in. (irregular foam thickness) nominal

DENSITY:\* 0.5 pcf (nominal)

UNIT WEIGHT: 36.6 lbs per 96.0-in. board (nominal)

COLOR: Light green

SPECIMEN SIZE: Three boards, 24.0 in. wide × two at 96.0 in. and one at 109.5 in. long

CONDITIONING TIME: 53 days at 70 °F and 50% relative humidity

SUPPORT USED: None

WITNESSED BY: Messrs. Andrew Huber and Ted DeVit (DeVit Consulting), representing Burtin Polymer Laboratories and Mr. Barry L. Badders (Professional Engineer, License No. 61907, registered in the State of Florida) of Southwest Research Institute

COMMENTS: Test Notification Number from Miami-Dade County Florida for this test program is SWRI 08011

---

\* From Client's material description and/or instructions

## ASTM E 84 - 07 REPORT

CLIENT: BURTIN POLYMER LABORATORIES  
SWRI PROJECT NO.: 01.13931.01.001b  
TEST DATE: MARCH 18, 2008  
DAILY TEST NO.: 3

### TEST RESULTS

FLAME SPREAD INDEX (FSI): 25  
SMOKE DEVELOPED INDEX (SDI): 400

### TEST DATA

UNROUNDED FSI: 23.5  
UNROUNDED SDI: 418.9  
FS\*TIME AREA (Ft\*Min): 45.5  
SMOKE AREA (%\*Min): 371.8  
FUEL AREA (°F\*Min): 5291.9

### OBSERVATIONS DURING TEST

IGNITION TIME (Min:Sec): 00:05  
MAXIMUM FLAME FRONT ADVANCE (Ft.): 4.6  
TIME TO MAXIMUM ADVANCE (Min:Sec): 0:36  
MAXIMUM TEMP. AT EXPOSED TC (°F): 570  
TIME TO MAXIMUM TEMP. (Min:Sec): 4:27  
TOTAL FUEL BURNED (Cu. Ft.): 52.0  
DRIPPING (Min:Sec): None  
FLAMING ON FLOOR (Min:Sec): None  
AFTERFLAME TOP (Min:Sec): None  
AFTERFLAME FLOOR (Min:Sec): None  
SAGGING (Min:Sec): None  
DELAMINATION (Min:Sec): None  
SHRINKAGE (Min:Sec): None  
FALLOUT (Min:Sec): None

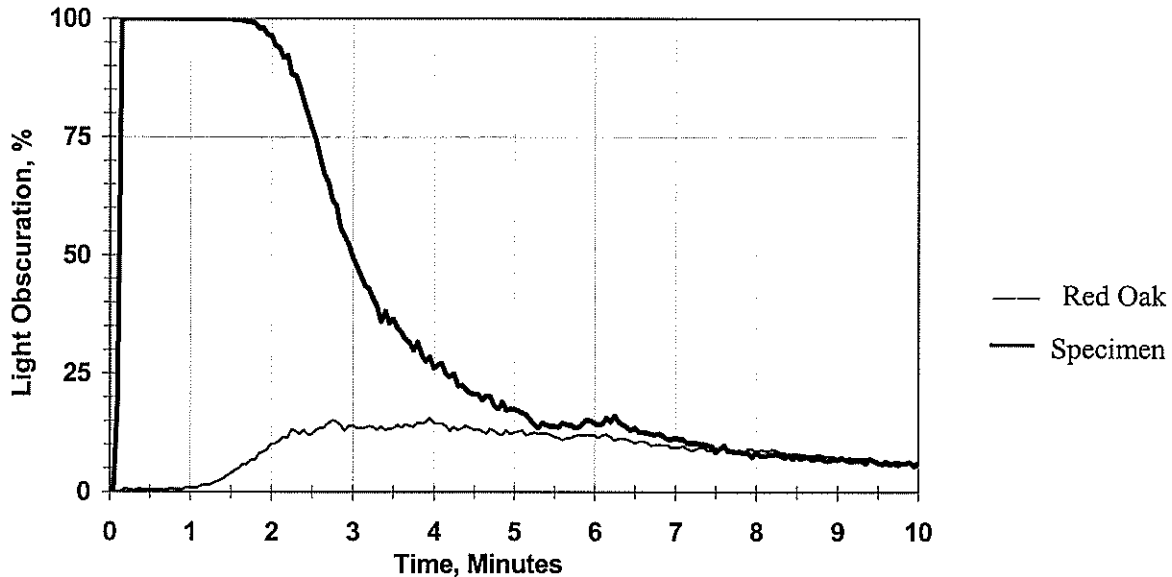
### CALIBRATION DATA

RED OAK SMOKE AREA (%\*Min): 87.7  
RED OAK FUEL AREA (°F\*Min): 7880  
GRC BOARD FUEL AREA (°F\*Min): 5067

# ASTM E 84 - 07 REPORT

CLIENT: BURTIN POLYMER LABORATORIES  
SWRI PROJECT NO.: 01.13931.01.001b  
TEST DATE: MARCH 18, 2008  
DAILY TEST NO.: 3

## LIGHT OBSCURATION



## FLAMESPREAD

