

# SOUTHWEST RESEARCH INSTITUTE®

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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 TWO-PART EPOXY  
COATING, APPLIED TO 0.5-IN. THICK GYPSUM  
WALLBOARD AT A WET FILM THICKNESS OF  
3 MILS  
MATERIAL ID: LOTUS PERM-WHT 265**

## **FINAL REPORT**

**Consisting of 5 Pages**

**SwRI® Project No.: 01.14430.01.080a**

**Test Date: February 10, 2009**

**Report Date: February 19, 2009**

## **Prepared for:**

**LOTUS CHEMICALS CO., INC.  
111 S. 17TH STREET  
LAPORTE, TX 77571**

## **Prepared by:**

A handwritten signature in black ink, appearing to read 'A. L. Saucedo'.

**Anthony L. Saucedo  
Group Leader  
Material Flammability Section**

## **Approved by:**

A handwritten signature in black ink, appearing to read 'Gladys M. Miller'.

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

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## INTRODUCTION

This report presents the test results for a specimen submitted by Lotus Chemicals Co., Inc., located in LaPorte, TX, 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 - 08a, *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®, 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 – 08a REPORT

CLIENT: LOTUS CHEMICALS CO., INC.  
SWRI PROJECT NO.: 01.14430.01.080a  
TEST DATE: FEBRUARY 10, 2009  
DAILY TEST NO.: 5

### DESCRIPTION OF SPECIMEN

DATE RECEIVED:	January 15, 2009
MATERIAL ID:*	Lotus Perm-Wht 265
DESCRIPTION:*	Two-part epoxy coating
THICKNESS:	3 mils wft (coating) nominal
UNIT WEIGHT:*	11 lbs per gal
COLOR:	White
SUBSTRATE:*	0.5-in. thick gypsum wallboard
SPECIMEN SIZE:	Three boards, 24.0 in. wide × 96.0 in. long
CONSTRUCTION:	Coating was roller applied to 0.5-in. thick gypsum wallboard at a thickness of 3 mils wet by Dr. Victor Cholera (Lotus Chemicals Co., Inc.) on January 15, 2009
CONDITIONING TIME:	25 days at 70 °F and 50% relative humidity
SUPPORT USED:	None

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

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TEST DATE: FEBRUARY 10, 2009  
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### TEST RESULTS

FLAME SPREAD INDEX (FSI): 5  
SMOKE DEVELOPED INDEX (SDI): 0

### TEST DATA

UNROUNDED FSI: 6.9  
UNROUNDED SDI: 1.2  
FS\*TIME AREA (Ft\*Min): 13.5  
SMOKE AREA (%\*Min): 3.2  
FUEL AREA (°F\*Min): 4806.1

### OBSERVATIONS DURING TEST

IGNITION TIME (Min:Sec): 01:10  
MAXIMUM FLAME FRONT ADVANCE (Ft.): 1.5  
TIME TO MAXIMUM ADVANCE (Min:Sec): 1:18  
MAXIMUM TEMP. AT EXPOSED TC (°F): 545  
TIME TO MAXIMUM TEMP. (Min:Sec): 9:57  
TOTAL FUEL BURNED (Cu. Ft.): 53.0  
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): 05:00

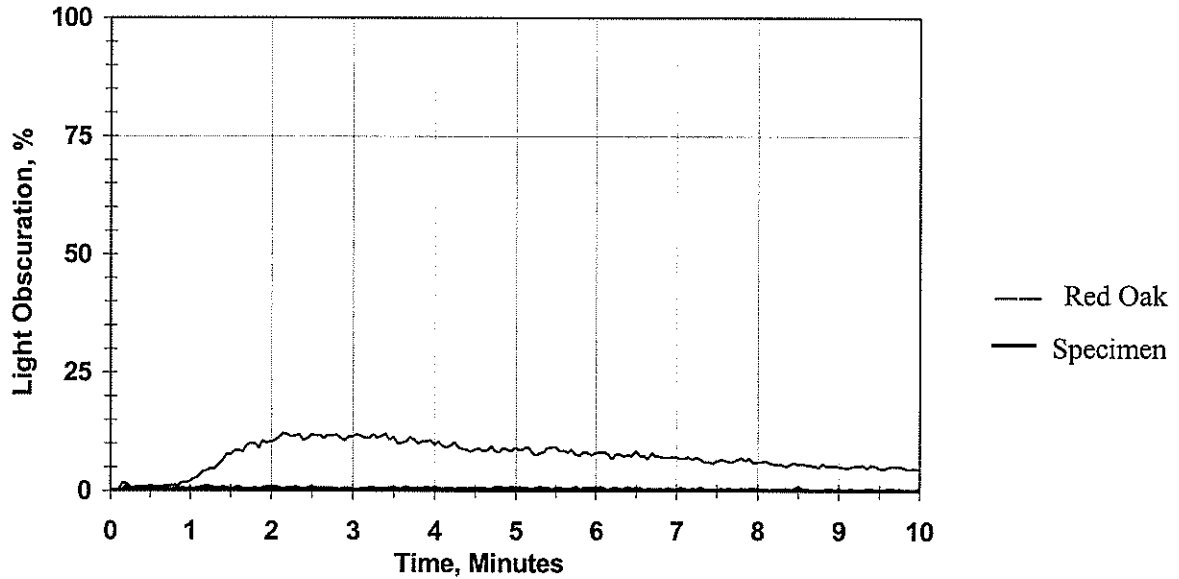
### CALIBRATION DATA

RED OAK SMOKE AREA (%\*Min): 65.8  
RED OAK FUEL AREA (°F\*Min): 7929  
GRC BOARD FUEL AREA (°F\*Min): 4996

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### LIGHT OBSCURATION



### FLAMESPREAD

