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**INVESTIGATION OF THE SURFACE BURNING
CHARACTERISTICS OF A NOMINAL 0.053-MM
THICK ALUMINUM FOIL SANDWICHED BETWEEN
POLYESTER FILM MATERIALS (SUPPORTED OVER
WIRE AND RODS) TRANSPARENT SIDE TESTED
MATERIAL ID: ZERO PERM W25**

FINAL REPORT

Consisting of 5 Pages

SwRI® Project No.: 01.11810.01.161c

Test Date: May 17, 2006

Report Date: June 5, 2006

Prepared for:

**TAIPEI DUCT INDUSTRIES CORPORATION
NO. 5, YU 7 ROAD, YOUTH INDUSTRIAL PARK
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INTRODUCTION

This report presents the results of a specimen submitted by the Client, tested at Southwest Research Institute's (SwRI's) Department of Fire Technology, located in San Antonio, Texas. The test is conducted in accordance with the procedure outlined in ASTM International E 84-05, "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 INTERNATIONAL E 84-05 REPORT

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DAILY TEST NO.: 3

DESCRIPTION OF SPECIMEN

DATE RECEIVED: 12-May-2006 (received ready-to-test)

MATERIAL ID:* Zero Perm W25

DESCRIPTION:* Aluminum foil sandwiched between 1 layer of transparent polyester film and 1 layer of white polyester film material

COMPOSITION:* Transparent polyester film//aluminum foil//white polyester film

THICKNESS: 0.002 in. (0.05 mm) nominal

UNIT WEIGHT: 2.64 oz/yd²

COLOR:* Silver on one side and white on the other side

SPECIMEN SIZE: One section, 24.0 in. wide x 300.0 in. long (transparent side to burner flame)

CONDITIONING TIME: 2 days at 70°F and 50% relative humidity

SUPPORT USED:* 2.0 in. hexagonal wire mesh with 0.25 in. diameter steel rods every 24.0 in.

* From Client's material description and/or instructions

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TEST RESULTS (ROUNDED TO NEAREST 5)

FLAME SPREAD INDEX (FSI): 5
SMOKE DEVELOPED INDEX (SDI): 30

TEST DATA

UNROUNDED FSI: 4.3
UNROUNDED SDI: 29.0
FS*TIME AREA (Ft*Min): 8.4
SMOKE AREA (%*Min): 31.5
FUEL AREA (°F*Min): 3904.3

OBSERVATIONS DURING TEST

IGNITION TIME (Min:Sec): 0:21
MAXIMUM FLAME FRONT ADVANCE (Ft.): 1.0
TIME TO MAXIMUM ADVANCE (Min:Sec): 5:00
MAXIMUM TEMP. AT EXPOSED TC (°F): 461
TIME TO MAXIMUM TEMP. (Min:Sec): 10:00
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

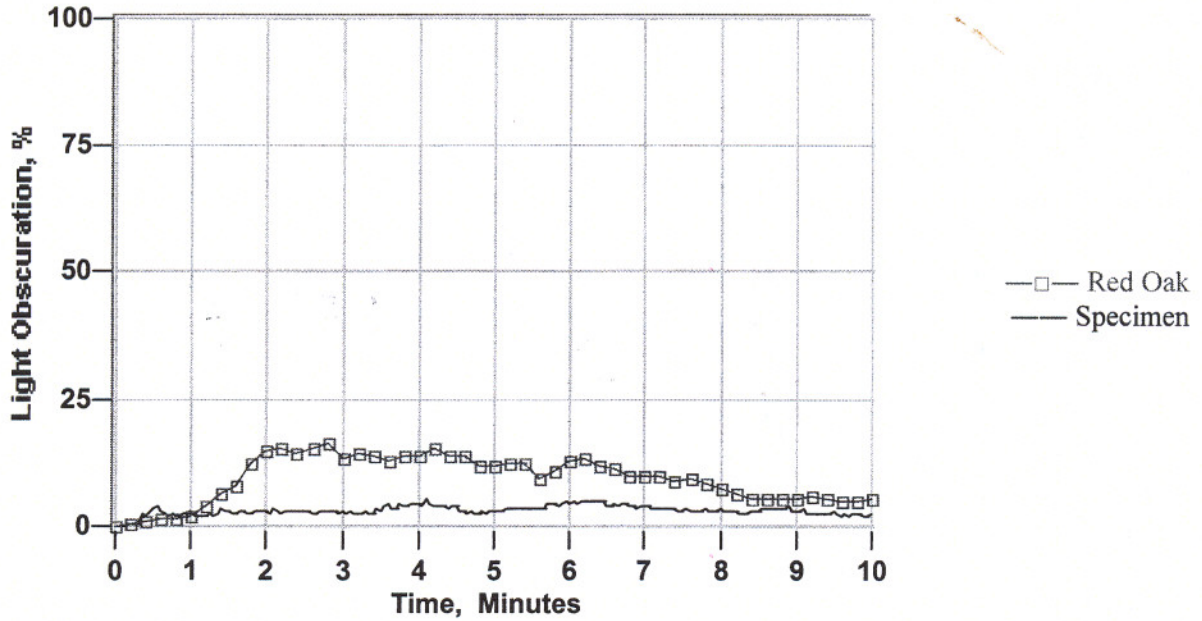
CALIBRATION DATA (LAST RED OAK)

RED OAK SMOKE AREA (%*Min): 100.6
RED OAK FUEL AREA (°F*Min): 8381.9
GRC BOARD FUEL AREA (°F*Min): 4924.9

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LIGHT OBSCURATION



FLAMESPREAD

