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FIRE TECHNOLOGY DEPARTMENT
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**ASTM E 84 - 10
INVESTIGATION OF THE SURFACE BURNING
CHARACTERISTICS OF A NOMINAL 4-MM
THICK ALUMINUM COMPOSITE SANDWICH
PANEL WITH A 3 × 3 ANGLE IRON FRAME
MATERIAL ID: AATIS ALUMINUM COMPOSITE
(FR)**

**FINAL REPORT
Consisting of 5 Pages
SwRI® Project No.: 01.15677.01.004**

**Test Date: August 24, 2010
Report Date: September 15, 2010**

Prepared for:

**M N CHAI CORPORATION CO., LTD.
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Prepared by:

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Approved by:

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Acting Director
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INTRODUCTION

This report presents the test results for a specimen submitted by M N Chai Corporation Co., Ltd., located in Bangkok, Thailand, 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 - 10, *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 (2009 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

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CLIENT: M N CHAI CORPORATION CO., LTD.
SWRI PROJECT NO.: 01.15677.01.004
TEST DATE: AUGUST 24, 2010
DAILY TEST NO.: 1

DESCRIPTION OF SPECIMEN

DATE RECEIVED: August 19, 2010 (received ready-to-test)

MATERIAL ID:* AATIS aluminum composite (FR)

TRADE NAME:* Aluminum composite sandwich panel: 4.0 mm thickness

DESCRIPTION:* Aluminum composite panel, attached to an angle iron perimeter frame, consisting of:
Top and back: Aluminum 0.5 mm thickness
Core: Non-combustible material 3.0 mm thickness

COMPOSITION:* Aluminum skin and non-combustible core

THICKNESS: 4-mm aluminum panel (nominal)

UNIT WEIGHT: 110.8 lbs (nominal)

COLOR: Silver (*PVDF coating color)

SPECIMEN SIZE: Three panels, 20.375 in. wide × 96.375 in. long, bolted together at joints (PVDF coating color side to burner)

CONSTRUCTION: Panel attached to a 3 × 3 × 3/16 angle iron perimeter frame

CONDITIONING TIME: 1 day at 70 °F and 50% relative humidity

WITNESSED BY: Messrs. Pramoch Chai, Somporn Chantavaralak, representing M N Chai Corporation Co., Ltd.

* From Client's material description and/or instructions

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TEST RESULTS

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

TEST DATA

UNROUNDED FSI: 1.4
UNROUNDED SDI: 1.6
FS*TIME AREA (Ft*Min): 2.7
SMOKE AREA (%*Min): 4.8
FUEL AREA (°F*Min): 4527

OBSERVATIONS DURING TEST

IGNITION TIME (Min:Sec): 4:43
MAXIMUM FLAME FRONT ADVANCE (Ft.): 1.0
TIME TO MAXIMUM ADVANCE (Min:Sec): 9:24
MAXIMUM TEMP. AT EXPOSED TC (°F): 525
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): 0:12
AFTERFLAME FLOOR (Min:Sec): None
SAGGING (Min:Sec): None
DELAMINATION (Min:Sec): None
SHRINKAGE (Min:Sec): None
FALLOUT (Min:Sec): 3:20

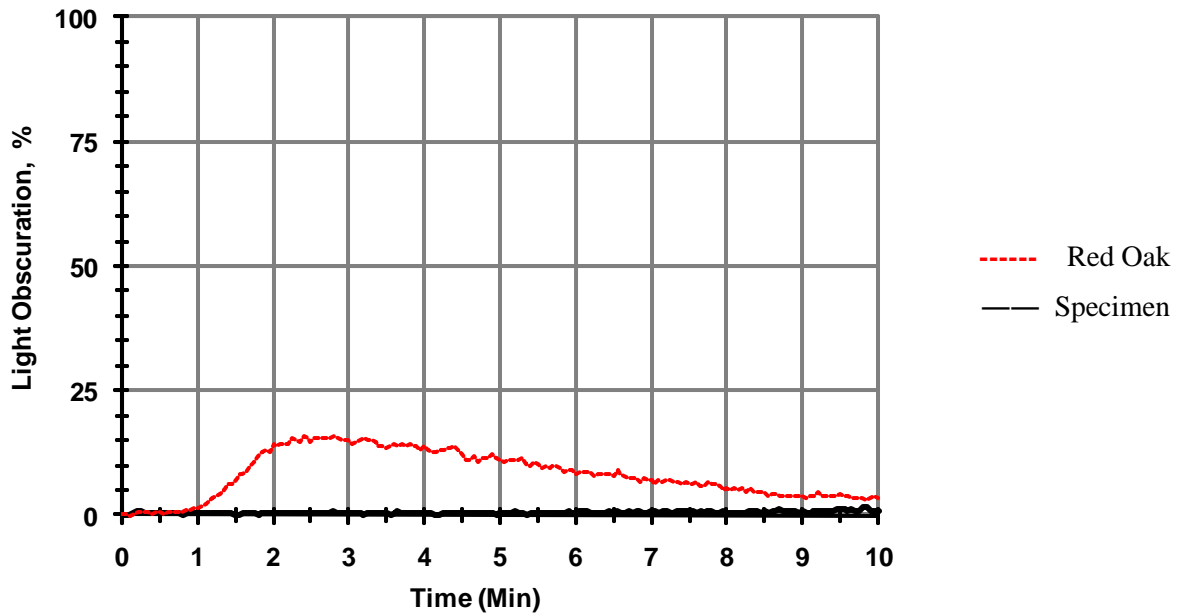
CALIBRATION DATA

RED OAK SMOKE AREA (%*Min): 66.5
RED OAK FUEL AREA (°F*Min): 8026
GRC BOARD FUEL AREA (°F*Min): 5044

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LIGHT OBSCURATION



FLAMESPREAD

