October 28, 2009

Mr. Chris Eschenburg
Crane Composites Inc.
23525 W. Eames St.
Channahon, IL 60410

Our Reference: SV18041/09CA48646

Subject: Report Of Surface Burning Characteristics Tests On Samples As Submitted By Crane Composites Inc.

Dear Mr. Eschenburg,

This is a Report summarizing the results of a test conducted under the Commercial Inspection and Testing Services (CITS) program identified as Assignment No. 09CA48646.

GENERAL:

The results relate only to items tested.

METHOD:

Each test was conducted in accordance with Standard ANSI/UL723, Tenth Edition, dated September 10, 2008, "Test for Surface Burning Characteristics of Building Materials", (ASTM E84-08).

The test determines the Surface Burning Characteristics of the material, specifically the flame spread and smoke developed indices when exposed to fire.

The maximum distance the flame travels along the length of the sample from the end of the igniting flame is determined by observation. The Flame Spread Index of the material is derived by plotting the progression of the flame front on a time-distance basis, ignoring any flame front recession, and using the equations described below:

A. $CFS = 0.515\ A_T$ when A_T is less than or equal to 97.5 minute-foot.

B. $CFS = 4900/(195-A_T)$ when A_T is greater than 97.5 minute-foot.

Where A_T = total area under the time distance curve expressed in minute-foot.

The Smoke Developed Index (SDI) is determined by rounding the Calculated Smoke Developed (CSD) as described in UL 723. The CSD is

determined by the output of photoelectric equipment operating across the furnace flue pipe. A curve is developed by plotting the values of light absorption (decrease in cell output) against time. The CSD is derived by expressing the net area under the curve for the material tested as a percentage of the area under the curve for untreated red oak.

The CSD is expressed as:

$$CSD = (A_m/A_{ro}) \times 100$$

Where:

CSD = Calculated Smoke Developed
A_m = The area under the curve for the test material.
A_{ro} = The area under the curve for untreated red oak.

SAMPLES:

The samples utilized in this investigation were neither prepared nor selected by a Laboratories' representative such that no verification of composition can be provided.

Sample Description

Test No.	System
1	8 oz. ISO-Tuff (xxxIF)

Each test sample was supported with 1/4 in. diameter uncoated steel rods and placed at 2 ft intervals.

RESULTS:

The results are tabulated below are considered applicable only to the specific samples tested.

Data sheets and graphical plots of flame travel versus time and smoke developed versus time are also enclosed.

Table 1: Test Summary

Test No.	Test Code	Sample Description	CFS Calculated Flame Spread	FSI Flame Spread Index	CSD Calculated Smoke Developed	SDI Smoke Developed Index
1	10260922	8 oz. ISO-Tuff (xxxIF)	11.14	10	397.4	400

The Classification Marking of Underwriters Laboratories Inc. on the product is the only method provided by Underwriters Laboratories Inc. to identify products which have been produced under its Classification and Follow-Up Service. No use of a Classification Marking has been authorized as a result of this investigation.

Since the anticipated work has been completed, we have instructed our Accounting Department to terminate the investigation and invoice you for the charges incurred to date.

Should you have any questions, please contact the undersigned.

Very truly yours

David Weinstein (ext. 41281)
Lead Engineering Associate
Fire Protection Division

Reviewed by:

James Smith (ext. 42666)
Staff Engineering Associate
Fire Protection Division

Underwriters Laboratories Inc.

Project:	09CA48646	File:	SV18041	Test Code:	10260922
Tested by:	PASTOR	Engineer:	Weinstein	Date:	2009/26/10

TEST METHOD: The test was conducted in accordance with UL 723 Tenth Edition

Client Name:	Crane Composites Inc				
Test Duration	10 Minutes	Test No.:	1	Hot Test:	No
Mounting:	Rods	Test Type:	CITS	Burn-Out Required:	No

Test Sample: 8 oz. ISO-Tuff (xxxIF)

FLAME SPREAD RESULTS

Flame Spread Data

Distance (Feet)		Time (Sec)
Ignition		28
0.5		48
1		76
1.5		98
2		106
2.5		124

Calculated Flame Spread (CFS): 11.14
Flame Spread Index (FSI): 10

Time to Ignition (sec): 28
Maximum Flame Spread (ft): 2.5
Area Under the Flame Spread Curve (ft.-min): 21.6

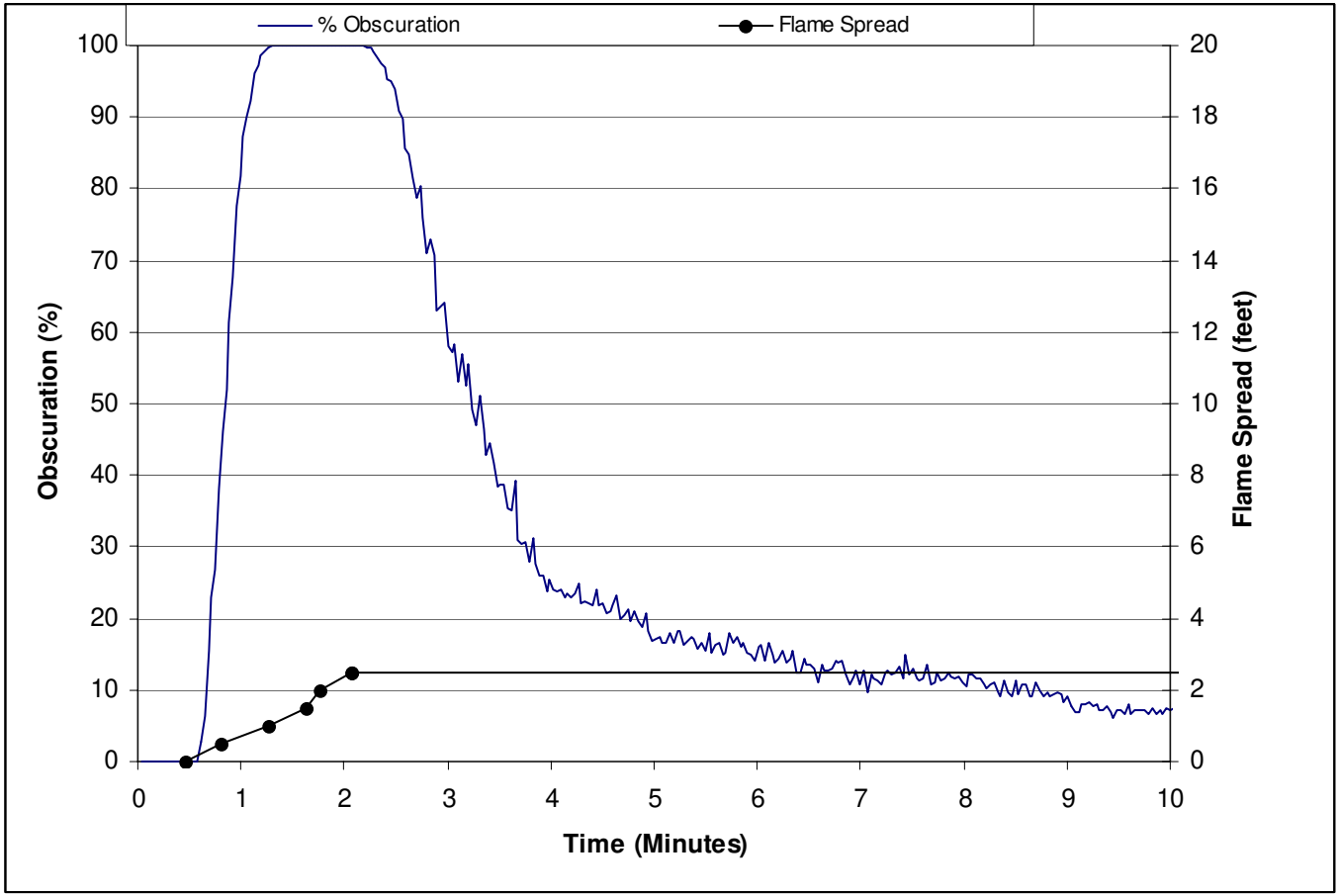
SMOKE RESULTS

Calculated Smoke Developed (CSD): 397.4
Smoke Developed Index (SDI): 400

Area Under the Smoke Curve (sq. in.): 318.89
Area Under Red Oak Curve (sq. in.): 80.25

Flame Spread / Smoke Results

Crane Composites Inc
8 oz. ISO-Tuff (xxxIF)



Test No. 1
09CA48646 / SV18041
10260922

Flame Spread Index: 10
Smoke Developed Index: 400
Max. Flame Spread: 2.5