



February 26, 2019

Turf Design  
Mr. Dustin Headley  
2000 Fox Ln.  
Elgin, IL 60123

Our Reference: SV30854 / 4788546841

Subject: Report Of Surface Burning Characteristics Tests On Ceiling Panels As Submitted By Turf Design.

Dear Mr. Headley:

This is a Report summarizing the results of a test conducted under the Commercial Inspection and Testing Services (CITS) program of UL LLC (UL) identified as Assignment No. 4788546841.

**GENERAL:**

The results relate only to items tested.

**METHOD:**

Each test was conducted in accordance with Standard ANSI/UL723, Eleventh Edition, dated April 19, 2018, "Test for Surface Burning Characteristics of Building Materials", (ASTM E84).

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
5	Ceiling Panels 9mm Black Material test

Each test sample consisted of three 8 by 2 ft wide boards butted end-to-end to form the required 24 ft. long surface.

Due to the rigidity of the test samples, supplementary means of support was not required.

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: Flame Spread Summary

Test No.	Test Code	Sample Description	CFS Calculated Flame Spread (Ceiling)	FSI Flame Spread Index (Ceiling)+	CFS Calculated Flame Spread (Floor)	FSI Flame Spread Index (Floor)++
5	08211813	Ceiling Panels	14.74	15	244.95	245

+ - Flame Spread Index while material remained in the original test position.

++ - Ignition of molted residue on the furnace floor resulted in flame travel equivalent to calculated Flame Spread Index indicated.

Table 2: Smoke Developed Summary

Test No.	Test Code	Sample Description	CSD Calculated Smoke Developed (Prior to Floor Ignition)	SDI Smoke Developed Index (Prior to Floor Ignition)	CSD Calculated Smoke Developed (Entire Test Duration)	SDI Smoke Developed Index (Entire Test Duration)
5	08211813	Ceiling Panels	0.4	0	292.3	300

The Classification Marking of UL on the product is the only method provided by UL 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.

Should you have any questions, please contact the undersigned.

Very truly yours



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Reviewed by:



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Staff Engineering Associate  
Fire Protection Division

Project: 4788546841  
Tested by: ABRAN GARCIA

File: SV30854  
Engineer: JOHN WIESNER

TestCode: 08211813  
Date: 2018-08-21

TEST METHOD: The test was conducted in accordance with UL 723, Eleventh Edition (2018/04/19).

Client Name: Turf Design	Test No.: 5	Hot Test: Yes
Test Duration: 10 minutes	Test Type: Developmental	Burn-Out Required: Yes
Mounting: Rods & Wire		

**Test Sample:** Ceiling Panels  
9mm Black Material test

### FLAME SPREAD RESULTS

#### Ceiling Flame Spread Data

Distance (Feet)	Time (Sec)
Ignition	18
1	26
2	30
3	35

#### Floor Flame Spread Data

Distance (Feet)	Time (Sec)	Distance (Feet)	Time (Sec)
Ignition	36	11	59
1	45	12	61
2	46	13	62
3	47	14	67
4	48	15	68
5	50	16	80
6	51	17	84
7	52	18	87
8	53	19	110
9	55	19.5	111
10	57		

**Calculated Flame Spread (CFS):** 14.74  
**Flame Spread Index (FSI):** 15  
**Time to Ignition (sec):** 18  
**Maximum Flame Spread (ft):** 3.0  
**Area Under the Flame Spread Curve (ft.-min.):** 28.6  
**Time to Floor Ignition (sec):** 36  
**Maximum Floor Flame Spread (ft):** 19.5  
**Calculated Floor Flame Spread:** 244.95

### SMOKE RESULTS

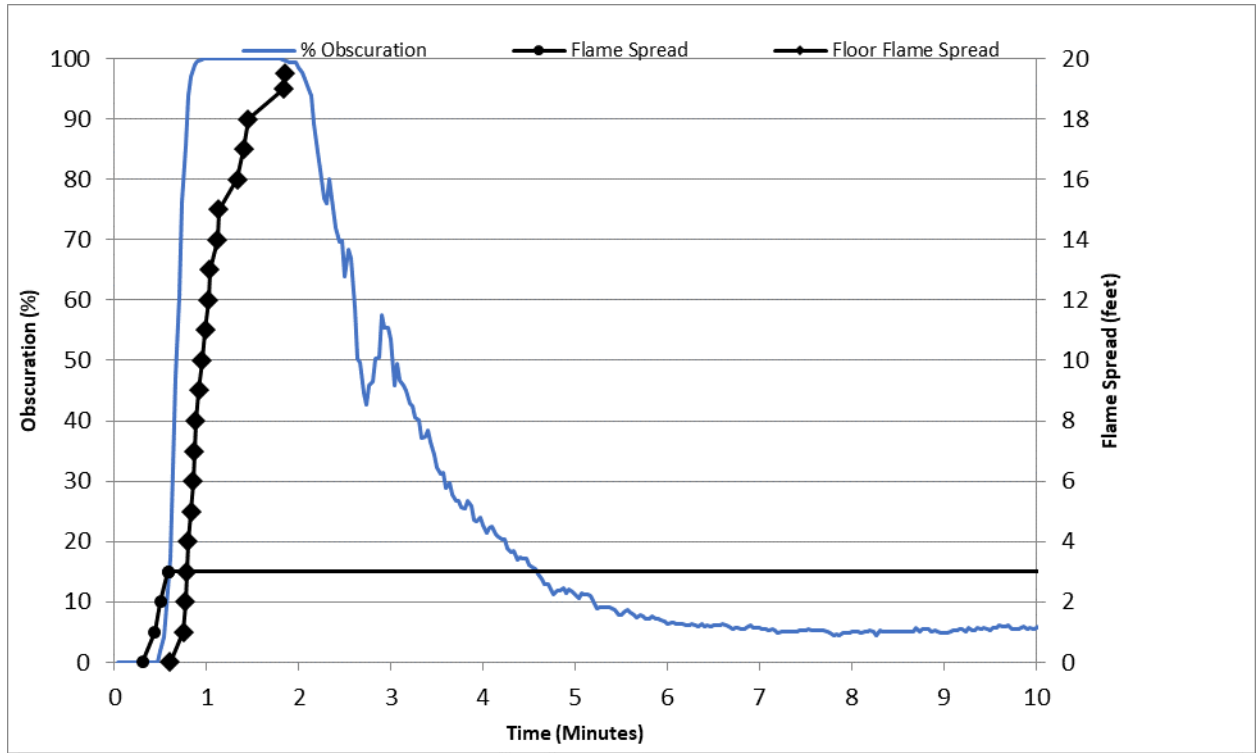
**Calculated Smoke Developed (CSD):** 292.3  
**Smoke Developed Index (SDI):** 300  
**Area Under the Smoke Curve (Obs.-min.):** 281.16  
**Area Under Heptane (Obs.-min.):** 96.18  
**Area Under the Smoke Curve Before Floor Ignition (Obs.-min.):** 0.36  
**Smoke Developed Prior to Floor Ignition:** 0.4

### Post-Test Observations

**Char (Feet From Burner):** 24

# Flame Spread / Smoke Results

## Turf Design Ceiling Panels



Test Num.: 5  
SV30854 / 4788546841  
08211813

Flame Spread Index: 15  
Smoke Developed Index: 300  
Max. Flame Spread (ft.): 3.0