

CLIENT: Crane Composites
8015 Dixon Drive
Florence, KY 41042

Test Report Number : TJ6076-1	Date: April 2, 2019
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SAMPLE ID: The client identified the following test material as:
LMNC .090

SAMPLING DETAIL: Test Samples were submitted to the Laboratory directly by the client. No sampling or sample preparation were observed by QAI staff.

DATE OF RECEIPT: Samples were received at QAI facilities on: March 11, 2019

TESTING PERIOD: Friday, March 15, 2019

AUTHORIZATION: Testing was authorized by Michelle Bauer for proposal 19DN030101 signed March 6, 2019.

TEST REQUESTED: Perform standard flame spread and smoke density developed classification tests on the sample supplied by the Client in accordance with ASTM E84 - 17 "Standard Method of Test for Surface Burning Characteristics of Building Materials". The foregoing test procedure is comparable to UL 723, ANSI/NFPA No. 255, and UBC No. 8-1..

TEST RESULTS:	<u>Flame Spread</u>	<u>Smoke Developed</u>
	125	150

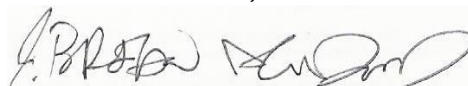
CONCLUSION: When tested in accordance to ASTM E84-17 the tested material resulted in a Class 'C'. Detailed test results are presented in the subsequent pages of this report

Prepared By



Daniel Barnett
Fire Technician

**Signed for and on behalf of
QAI Laboratories, Inc.**



Brian McDonald
Operations Manager



SCOPE: This fire-test-response standard is used for the comparative surface burning behavior of building materials is applicable to exposed surfaces such as walls, ceilings and others. The test is conducted with the specimen in the ceiling position with the surface to be evaluated exposed face down to the ignition source. The material, product, or assembly shall be capable of being mounted in the test position during the test. Thus, the specimen shall either be self-supporting by its own structural quality, held in place by added supports along the test surface, or secured from the back side. 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.

USE: The use of supporting materials on the underside of the test specimen has the ability to lower the flame spread index from those which might be obtained if the specimen could be tested without such support. These test results do not necessarily relate to indices obtained by testing materials without such support.

Testing of materials that melt, drip, or delaminate to such a degree that the continuity of the flame front is destroyed, results in low flame spread indices that do not relate directly to indices obtained by testing materials that remain in place.

This standard is used to measure and describe the response of materials, products, or assemblies to heat and flame under controlled conditions, but does not by itself incorporate all factors required for fire-hazard or fire-risk assessment of the materials, products, or assemblies under actual fire conditions.

PROCEDURE: A brief overview of the method is as follows: The test specimen, a material between 20 and 24 inches in width by 24 feet +/- 12 inches in length is loaded onto the water cooled ledge of the fire test chamber when tested to ASTM E84 or CAN/ULC-S102. If tested to CAN/ULC-S102.2 the specimen is tested on the chamber floor. The inside dimensions are 17 3/4 inches +/- 1/4" wide by 12 inches +/- 1/2" deep by 25 feet long. The fire test chamber is a rectangular horizontal duct with a removable lid. The sides and base of the chamber are lined with an insulated firebrick with pressure tight observation windows down one side for a technician to observe flame progression during the duration of the 10-minute test period. The chamber lid is lowered into test position with non combustible concrete board placed between the specimen and chamber lid. A draft of 240 feet per minute which is maintained inside the test chamber throughout the test period by the means of an electronic fan afterburner and an electronically controlled damper door system located downstream of the test chamber in the exhaust ducting. The test is started when the test flame is ignited at the front of the test chamber. An electronic photocell system located in the exhaust system downstream from the test chamber is used to plot the smoke developed for use in calculating the smoke developed index while a technician plots the flame spread distance used in determining the flame spread index. The test is run for the 10 minute duration in accordance to the method.

(See Diagrams in the Appendix of this report.)



PREPARATION AND CONDITIONING:

The Sample Sheet material was delivered to QAI in 24 inches wide X 4 feet long X 0.0625 inches thick Pieces. . Six of these Pieces were used for the test. (See Photos in Appendix of this report). The specimen was placed in the conditioning room (maintained at $70 \pm 5^\circ$ F and a relative humidity of $50 \pm 5\%$) for a minimum of 48 hours prior to testing.

MOUNTING METHOD:

The test ready sample consisting of Six pieces measuring 24 inches wide X 4 feet long and an overall test thickness of 0.0625 inches were supported with metal rods spaced at 24 inch intervals and 2 inch hexagonal mesh to fulfill the chamber requirements for testing. Prior to testing the samples were covered with 1/4 inch cement board as required in the test method.

ASTM E84 TEST RESULTS:

CLIENT NAME:	crane composites	TEST DATE:	3/15/2019
SAMPLE ID:	LMNC .090		
SAMPLE IGNITION:	01:00	Minutes / Seconds	
MAX FLAME FRONT:	18.8	Feet	
TIME TO MAXIMUM SPREAD:	02:02	Minutes / Seconds	
TEST DURATION:	10:00	Minutes / Seconds	
SUMMARY:	FLAME SPREAD:	125	<i>124 Unrounded</i>
	SMOKE DEVELOPED:	150	<i>151 Unrounded</i>

OBSERVATIONS:

Charring was observed at 0:31. The sample sustained ignition at 1:00. The maximum flame front was noted to be 18.8 feet at 2:02. No other characteristics were noted for the remainder of the test.



SUMMARY OF ASTM E84 / UL 723 RESULTS:

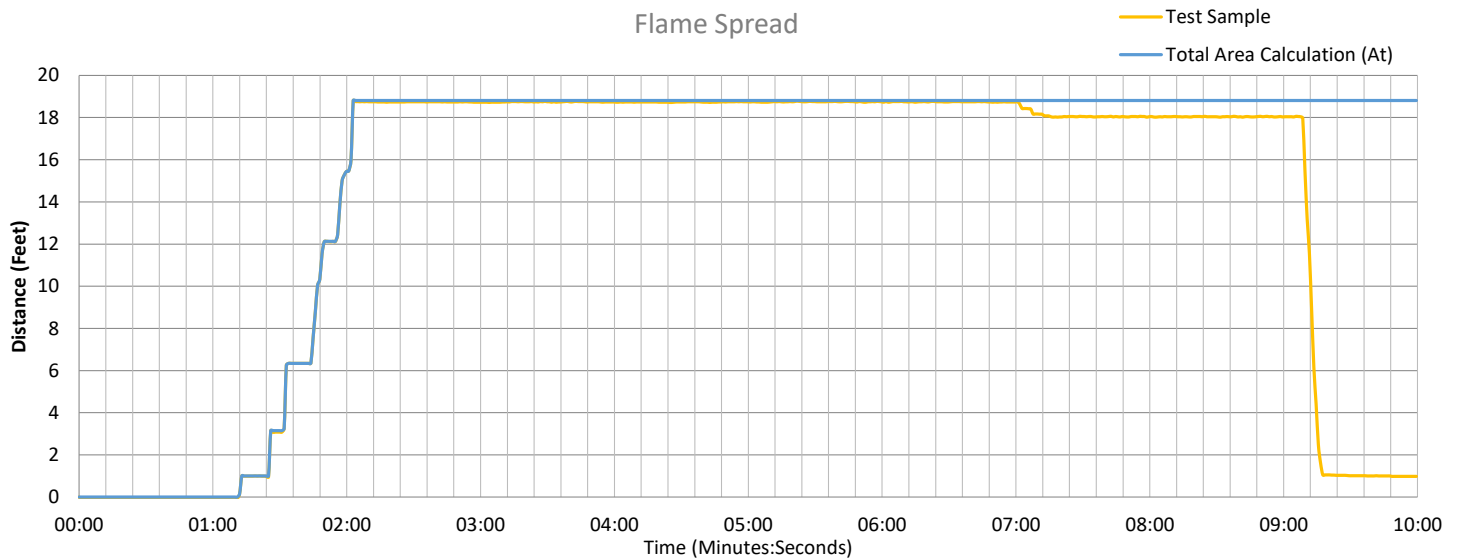
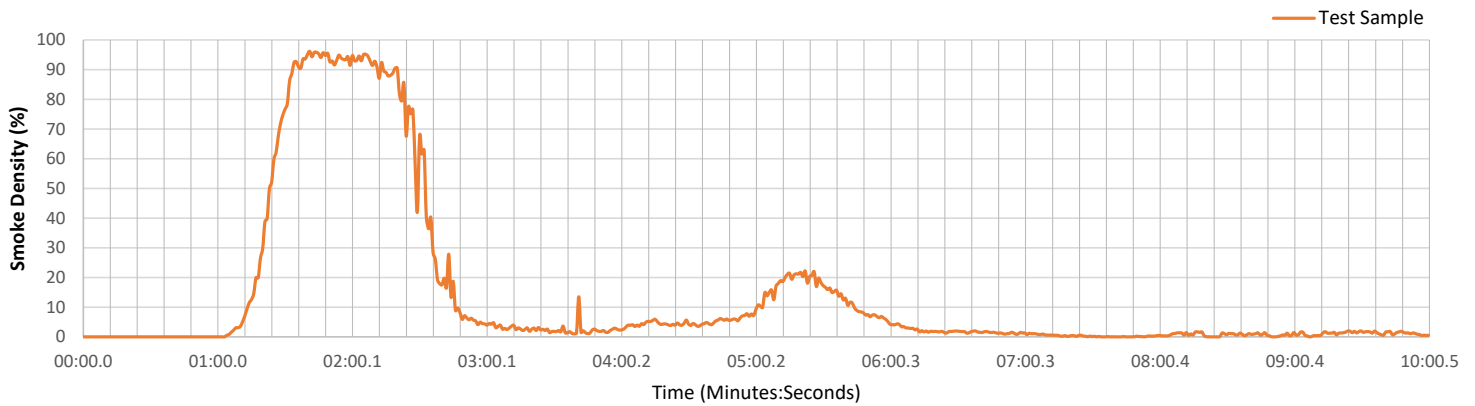
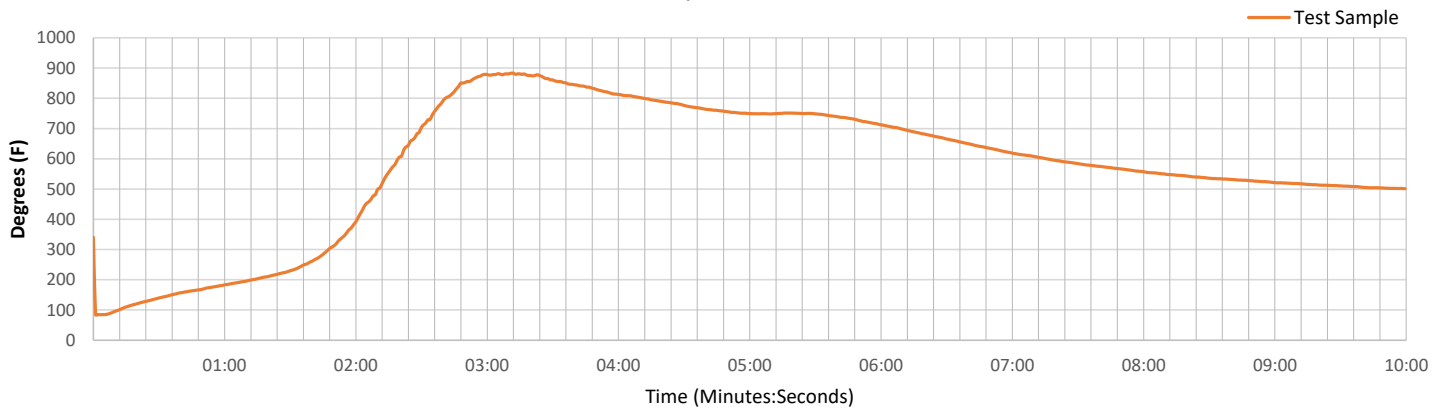
Because of the possible variations in reproducibility, the results are adjusted to the nearest figure divisible by 5.
Smoke Density values over 200 are rounded to the nearest figure divisible by 50.

In order to obtain the Flame Spread Classification, the above results should be compared to the following table:

<u>NFPA CLASS¹</u>	<u>IBC CLASS²</u>	<u>FLAME SPREAD</u>	<u>SMOKE DEVELOPED</u>
A	A	0 through 25	Less than or equal to 450
B	B	26 through 75	Less than or equal to 450
C	C	76 through 200	Less than or equal to 450

BUILDING CODES CITED:

1. National Fire Protection Association, ANSI/NFPA No. 101, "Life Safety Code"
2. International Building Code, Chapter 8, Interior Finishes, Section 803.

**RESULTS CONTINUED:****Flame Spread****Smoke Readings****Temperature**

APPENDIX

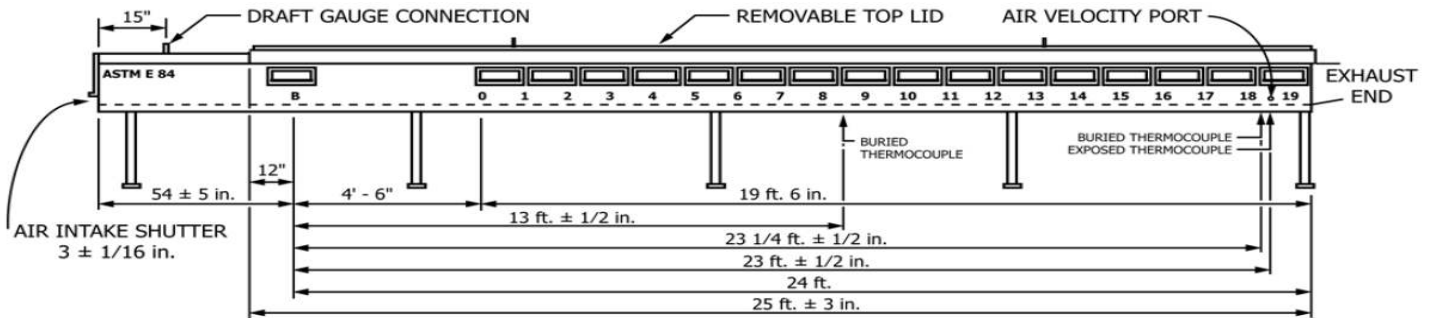


Diagram 1. Test Chamber side view showing critical dimensions.

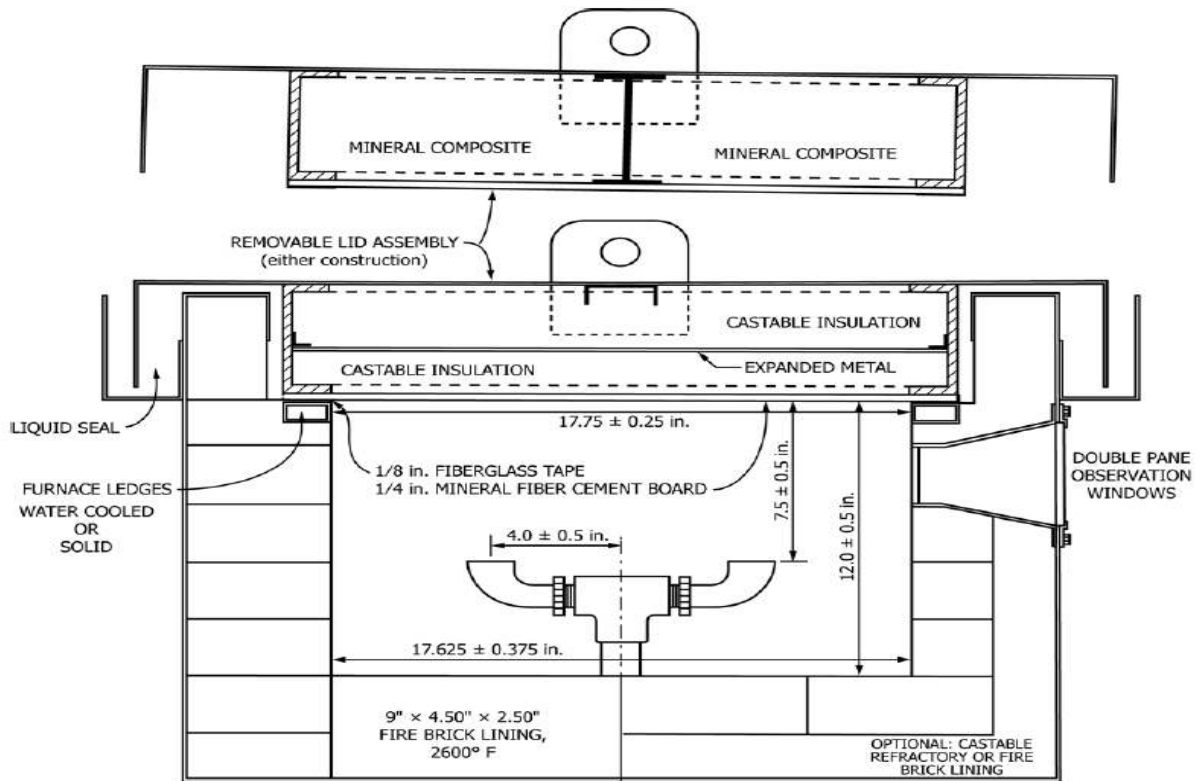


Diagram 2. Test Chamber looking down chamber showing critical dimensions.

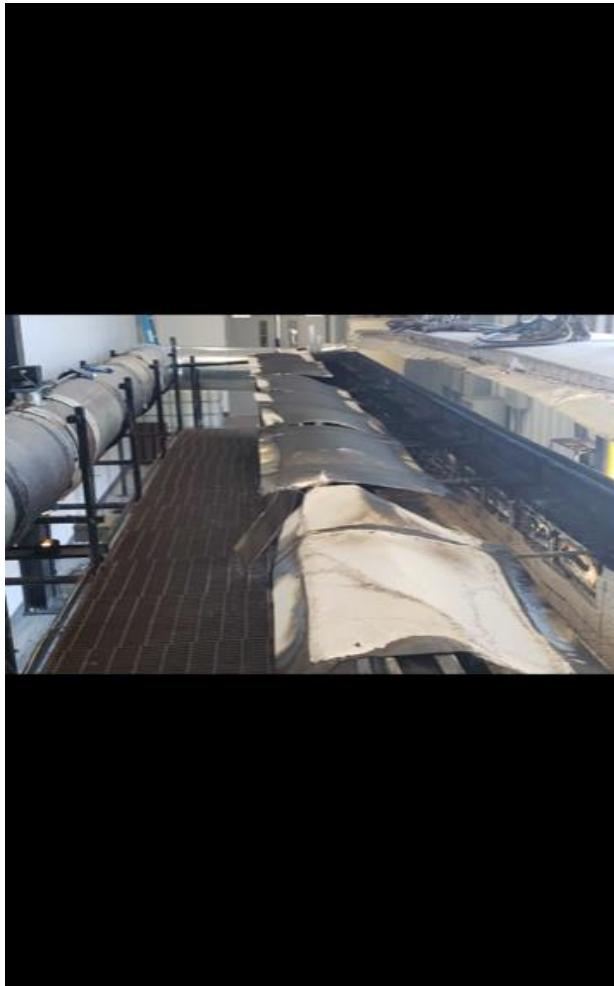
APPENDIX

Photo 1. Surface of Specimen Tested

<<END OF TEST REPORT>>