



Test Results | THERMORY® Red Oak Fire Rating

Fire Rating

TESTED

► The rate of fire spread and smoke production in THERMORY® Red Oak.

RESULTS

► Class B was achieved with our Thermally Modified Red Oak, in comparison to kiln-dried Red Oak which results show to be a Class C.



THERMORY®
LEAVE A LASTING IMPACT

► DECKING ► CLADDING ► PORCH FLOORING

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TEST REPORT

FOR

Thermory USA, LLC

1213 Wilmette Avenue
Wilmette, IL 60091

**Standard Test Method for
Surface Burning Characteristics of Building Materials
ASTM E84 – 21a**

Test Report No: FH-3027


Assignment No: H-1581

Test Date: 08/10/2022

Report Date: 08/18/2022

Subject Material: Benchmark Red Oak Thermally Modified Cladding

Prepared by: _____


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TEST REPORT REVISION HISTORY:

DATE	SUMMARY
August 18, 2022	Original issue date. Original NGCTS report FH-3027.

INTRODUCTION:

This report presents the results of a specimen tested in accordance with the requirements of ASTM E84-21a, Standard Test Method for Surface Burning Characteristics of Building Materials. This test method is also published under the designation UL 723.

The purpose of this test method is to determine the relative behavior of the material by observing the flame spread along the specimen. Flame spread and smoke developed indexes are reported. However, there is not necessarily a relationship between these two measurements.

This standard is used to measure and describe the response of materials, products, or assemblies to heat and flame under controlled laboratory conditions. It should not alone be used for fire hazard or fire risk assessment of the materials, products, or assemblies under actual fire conditions.

TEST SPECIMEN:

Thermally modified wood cladding boards were submitted for testing, directly to NGC Testing Services (NGCTS), by the client. The test specimen, which was received by NGCTS on August 3, 2022, was identified by the client as:

Benchmark Red Oak Thermally Modified Cladding

The submitted test specimen consisted of multiple tongue and groove red oak cladding boards (brown color) with a smooth texture. Each board measured nominally 13/16 in. thick by 5-3/16 wide by 106 in. long. Upon receipt, the submitted cladding boards were placed in a conditioning room, with an atmosphere of $73.4 \pm 5^{\circ}\text{F}$ and $50 \pm 5\%$ relative humidity, to condition to equilibrium for five seven prior to testing.

From the cladding boards submitted, NGCTS personnel constructed three test specimen decks per Standard Practice ASTM E2579. The constructed test specimen decks were each one board long and four boards wide. The decks were then trimmed in length resulting in deck sizes of nominally 13/16 in. thick by 20 in. wide by 96 in. long.

Three trimmed sections from the test specimen decks were taken, and the average moisture content was determined using the secondary oven-drying method (method B) in ASTM D4442, Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Base Materials. The calculated average moisture content of the test specimen was determined to be 3%.

MOUNTING METHOD:

The (3) constructed decks of the sectioned test specimen were placed directly on the tunnel ledges and butted tightly together, achieving the required specimen size. No additional support was required.

Non-combustible, fiber-reinforced cement board (1/4 in. thick) was placed over the back (i.e., unexposed) side of the test specimen decks as lid protection.

TEST RESULTS:

The test results, computed based on observed flame front advancement and electronic smoke density measurements, are presented in the tables below.

The reported flame spread and smoke developed indexes are the computed comparison to the standard calibration materials – mineral fiber-reinforced cement board, select grade red oak flooring and HPLC grade liquid heptane. The mineral fiber-reinforced cement board is used to establish relative 0 values for flame spread and smoke developed; the select grade red oak flooring is used to establish relative 100 value for flame spread; and the heptane is used to establish the area for calculation of smoke-developed index.

Test Specimen	Flame Spread Index (FSI)	Smoke Developed Index (SDI)
Benchmark Red Oak Thermally Modified Cladding	70	75

TEST NO.	MATERIAL TESTED	SIDE EXPOSED	SUPPORT	CALCULATED FLAME SPREAD	CALCULATED SMOKE DEVELOPED
1	Benchmark Red Oak Thermally Modified Cladding	Symmetrical	Self-Supporting	71.03	75.16
	MATERIAL TESTED	SIDE EXPOSED	SUPPORT	FLAME SPREAD INDEX (FSI)*	SMOKE DEVELOPED INDEX (SDI)*
	RED OAK FLOORING / HEPTANE	FINISHED / N/A	SELF-SUPPORTING	100	100
	REINFORCED CEMENT BOARD	SYMMETRICAL	SELF-SUPPORTING	0	0
1	Benchmark Red Oak Thermally Modified Cladding	Symmetrical	Self-Supporting	70	75
				CLASSIFICATION	FSI
				CLASS A	0 - 25
				CLASS B	26 - 75
				CLASS C	76 - 200
					SDI
					0 - 450
					0 - 450
					0 - 450

* Flame Spread / Smoke Developed Index is the result (or the average of the results of multiple tests), rounded to the nearest multiple of 5. Smoke developed results in excess of 200 are rounded to the nearest multiple of 50.

TEST#: FH-3027 DATE: 8/10/2022

TEST METHOD: ASTM E84-21a

CLIENT: Thermory USA

PROJECT#: H-1581

SAMPLE: Benchmark Red Oak Thermally

Modified Cladding

MATERIAL: (3) 13/16" X 20" X 96" Decks

SUPPORT: Self-Supporting

REMARKS: Ignition Time: 0:37

Max Flame Front: 19.49 Ft. @ 8:30

ADC DRAFT (IN. H2O) 0.080

GAS PRESS. (IN. H2O) 0.280

GAS VOL (CF) 49.62

BTU/CF 1022

SHUTTER (IN.) 3.00

TEMP. 13" BURIED 107 F

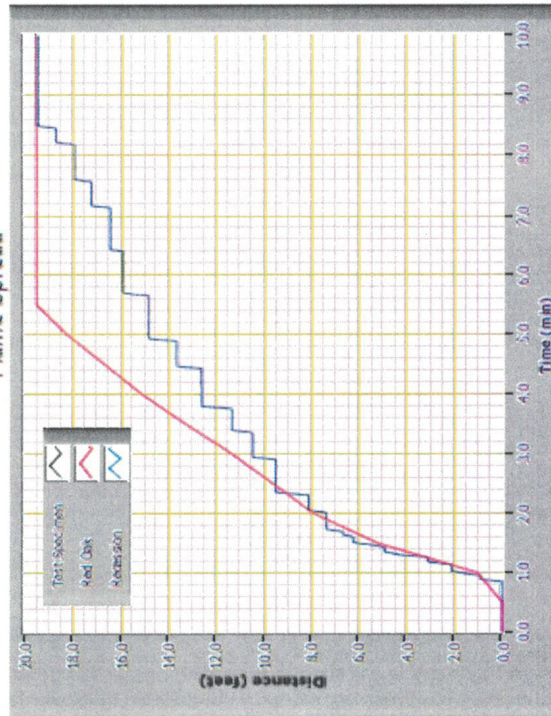
Flame Spread: 71.03

Area under Flame Curve (ft-min): 126.01

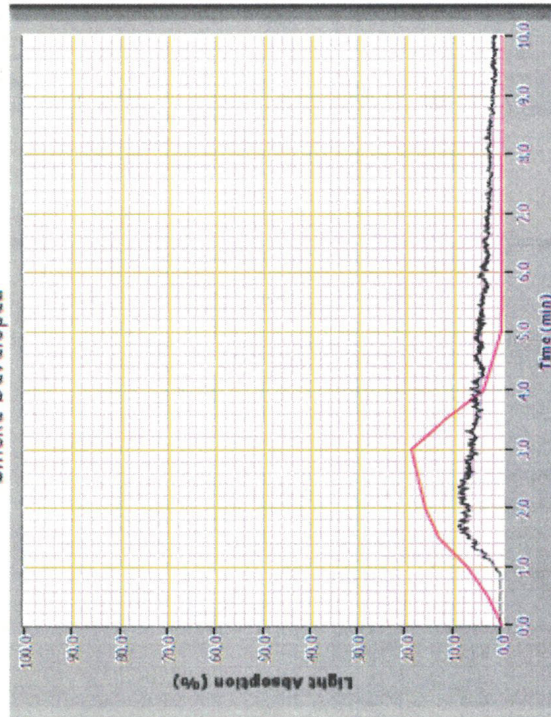
Smoke Developed: 76.16

Area under Smoke Curve (%A-min): 36.56

Flame Spread



Smoke Developed



The following data sheet is a printout from the data acquisition system which monitors the tunnel furnace. The data sheet contains all calibration and specimen data needed to calculate the test results.