

NATURES COMPOSITES FIRE TEST REPORT

SCOPE OF WORK

ASTM E84 TESTING ON NC TERRA

REPORT NUMBER

Q6265.02-121-24

TEST DATE

03/14/24

ISSUE DATE

03/15/24

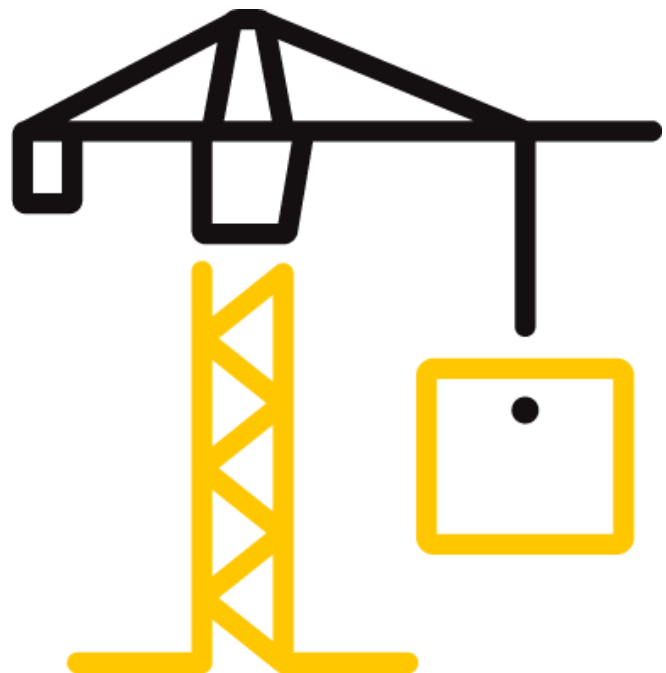
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TEST REPORT FOR NATURES COMPOSITES

Report No.: Q6265.02-121-24

Date: 03/15/24

REPORT ISSUED TO NATURES COMPOSITES

1302 Industrial Park Avenue
Torrington, WY 82240

SECTION 1 SCOPE

Architectural Testing, Inc. (an Intertek company), dba Intertek Building & Construction (B&C) was contracted by Natures Composites, Torrington, Wyoming to evaluate the flame spread and smoke developed properties of NC Terra. Testing was conducted at the Intertek B&C test facility in York, Pennsylvania. Results obtained are tested values and were secured by using the designated test method(s). A summary of test results and the complete graphical test data is reported herein.

This report does not constitute performance certification of this product nor an opinion or endorsement by this laboratory. Intertek B&C will service this report for the entire test record retention period. The test record retention period ends four years after the test date. Test records, such as detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation, will be retained for the entire test record retention period.

SECTION 2 SUMMARY OF TEST RESULTS

Specimen I.D.: NC Terra by Natures Composites

ASTM E84 Test Results

FLAME SPREAD INDEX	SMOKE DEVELOPED INDEX
75	300

*See Section 8 for additional information and commentary

For INTERTEK B&C:

COMPLETED BY:	Andrew Pritchard
TITLE:	Technician
SIGNATURE:	
DATE:	03/15/24

REVIEWED BY:	Ethan Grove
TITLE:	Sr. Regional Manager
SIGNATURE:	
DATE:	03/15/24

AJP:ddr

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SECTION 3

TEST METHOD

The specimens were evaluated in accordance with the following:

ASTM E84-23b, *Standard Test Method for Surface Burning Characteristics of Building Materials*

SECTION 4

MATERIAL SOURCE/INSTALLATION

The test specimen was submitted to Intertek directly from the client. Samples were not independently selected for testing. Intertek has not verified the composition, manufacturing techniques or quality assurance procedures.

SECTION 5

LIST OF OBSERVERS

NAME	COMPANY
Andrew Pritchard	Intertek B&C
Tyee Markle	Intertek B&C

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TEST PROCEDURE

This report describes the results of testing conducted in accordance with ASTM E84-23b, Standard Test Method for Surface Burning Characteristics of Building Materials. The test method is for comparative surface burning behavior of building materials by determining a flame spread index (FSI) and a smoke developed index (SDI). This test is applicable to exposed surfaces, such as finish materials for ceilings or walls, and is conducted with the specimen in the ceiling position with the surface to be evaluated facing down toward the ignition source. The material or assembly of materials shall be capable of being mounted into the test position by its own self-supporting structural quality or the manner in which it is tested and intended for use, by using added supports along the test surface or by securement from the back side.

“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. These test results do not necessarily relate to those indices obtained by testing materials without such support.” – ASTM E84-23b Section 1.4

The purpose of the method is to determine the relative burning behavior of the material by observing flame spread along the test specimen. Flame Spread Index and Smoke Developed Index are reported, however, there is not necessarily a relationship between these two measurements.

It is the intent of the test method to provide measurement of surface flame spread of the tested material when subjected to a fire exposure that is calibrated with select grade red oak flooring and fiber-cement board. It is also the intent of the test method to provide the comparative measurement of smoke development of the tested material against smoke development measurements for a running average value of 295 ± 2 grams of Liquid Heptane (high-performance liquid chromatography [HPLC] Grade). The test method exposes a nominal 24-ft (7.32-m) long by 20-in. (508-mm) wide test specimen to a controlled air flow and flaming fire exposure adjusted to produce a specific flame spread distance vs time calibration using select grade red oak flooring.

The test method does not provide information regarding heat transmission through the tested surface, the effect of aggravated flame spread behavior resulting from the proximity of combustible walls and ceilings, or the classification or definition of materials as noncombustible using flame spread index alone.

This standard should be used to measure and describe the properties of materials, products, or assemblies in response to heat and flame under controlled laboratory 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 this test may be used as elements of a fire risk assessment which takes into account all of the factors which are pertinent to an assessment of the fire hazard of a particular end use.

There were no deviations from the requirements prescribed in ASTM E84-23b.

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TEST SPECIMEN DESCRIPTION

MANUFACTURER*	Natures Composites
PRODUCT TYPE*	Composite lumber fencing
SERIES/MODEL*	NC Terra
COMPOSITION*	Composites lumber (HDPE and wheat straw fiber)
CONDITIONING TIME	72+ hr.
SPECIMEN SIZE	3-1/2 in. wide x 96 in. long
THICKNESS	1-1/2 in.
SPECIMEN SECTIONS	18
TOTAL WEIGHT	19.2 lbs.
COLOR	Brown
SIDE TO FLAME*	Either
SUPPORT USED*	1/4 in. diameter steel rods spaced every 24 in. on center
MOUNTING METHOD	ASTM E84-23b Annexes A4.4, A4.6, A4.8 – A4.8.1
SUBSTRATE USED*	No substrate was utilized
NOTES/ADDITIONAL SAMPLE INFO	N/A
CEMENT BOARD	1/4 in. thick fiber cement board was placed on top of the sample.

*From the client's material description and/or instructions

Note: Specimens were conditioned as per the requirements of Section 6.4 of ASTM E84-23b.

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SECTION 8

TEST RESULTS

TEST RESULTS	
Test Date	03/14/24
Test Operator	Andrew Pritchard
Flame Spread Index (FSI)	75
Smoke Developed Index (SDI)	300

TEST DATA	
FSI (unrounded)	74.4
SDI (unrounded)	291.4
FS * Time Area (Ft * Min)	129.2
Smoke Area (% * Min)	176.3
Fuel Area (°F * Min)	8072.9

TEST OBSERVATIONS	
Ignition Time	00:52 (Min:Sec)
Max Flame Front Advance	19.5 Feet
Time to Max Flame Front	05:52 (Min:Sec)
Max Temp At Exposed T/C	1092.9°F
Time To Max Temp	09:59 (Min:Sec)
Dripping Observed	No
Flaming On Floor Observed	No
After Flame Top Observed	10:03 (Min:Sec)
After Flame Floor Observed	No
Sagging Observed	No
Delamination Observed	No
Shrinkage Observed	No
Fallout Observed	No
Cracking Observed	No
Falling Ash	No
Additional Observations	None

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SECTION 8 (Continued)**TEST RESULTS****COMMENTARY ON CLASSIFICATION**

Neither ASTM E84 nor UL 723 include classification criteria for the results obtained from testing. The International Building Code® (IBC), NFPA 101: Life Safety Code® (NFPA 101), and NFPA 5000: Building Construction and Safety Code® (NFPA 5000) all describe a set of classification criteria required for interior wall and ceiling finish materials based on Flame Spread Index and Smoke Developed Index when tested in accordance with ASTM E84 or UL 723. The classification criteria for all three model codes is the same:

Class	Flame Spread Index	Smoke Developed Index
A	0-25	0-450
B	26-75	0-450
C	76-200	0-450

Note that classification under this scheme for interior wall and ceiling finishes does not strictly apply to all products or materials tested in accordance with ASTM E84 or UL 723 because not all products or materials are recommended or suitable for use as interior wall or ceiling finish materials in buildings, regardless of the surface burning characteristics. Consult with the product manufacturer and the local authority having jurisdiction (AHJ) regarding specific applications of a given product or material.

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SECTION 9 PHOTOGRAPHS



Photo No. 1
Specimen Identification



Photo No. 2
Exposed Surface of the Test Specimen (Pre-test)

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SECTION 9 (Continued) PHOTOGRAPHS

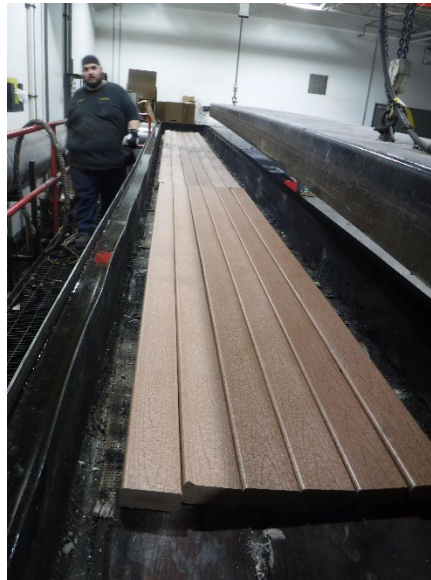


Photo No. 3

Unexposed Surface of the Test Specimen (Pre-test)



Photo No. 4

Unexposed Surface of the Test Specimen (Post-test)

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SECTION 9 (Continued)

PHOTOGRAPHS



Photo No. 5

Exposed Surface of the Test Specimen (Post-test)

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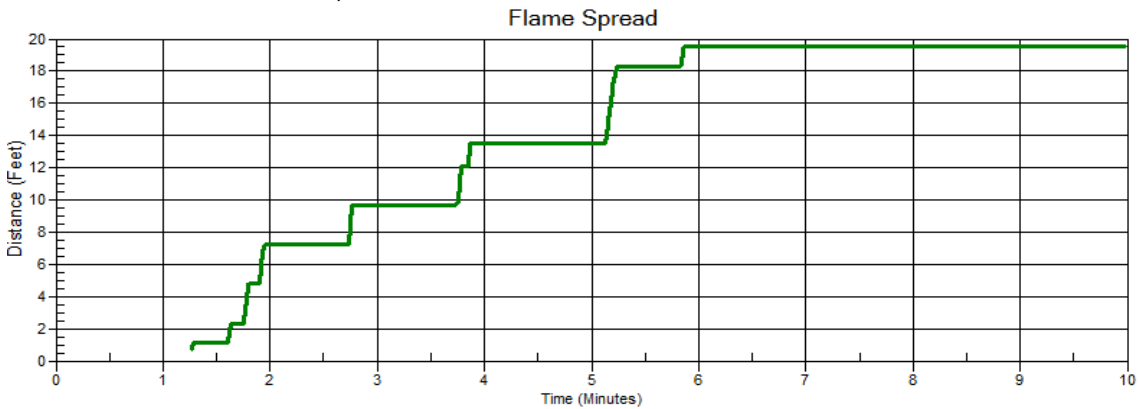
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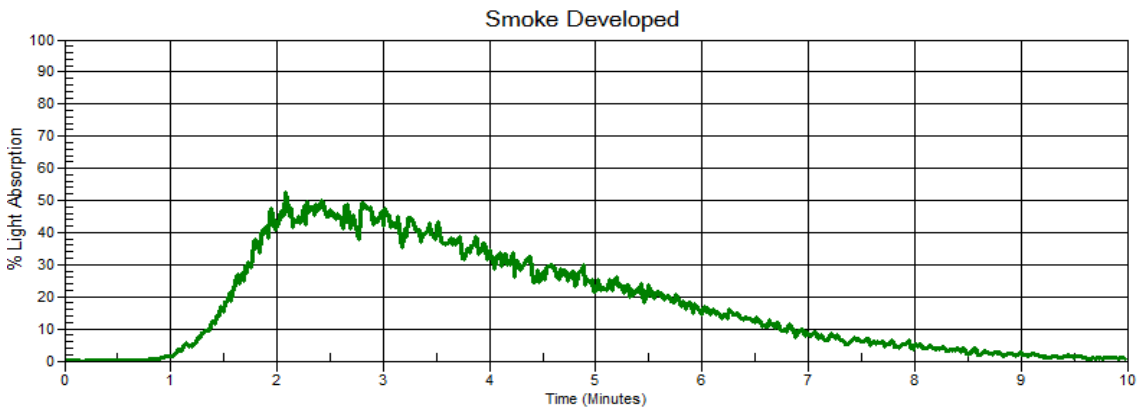
SECTION 10

GRAPHS

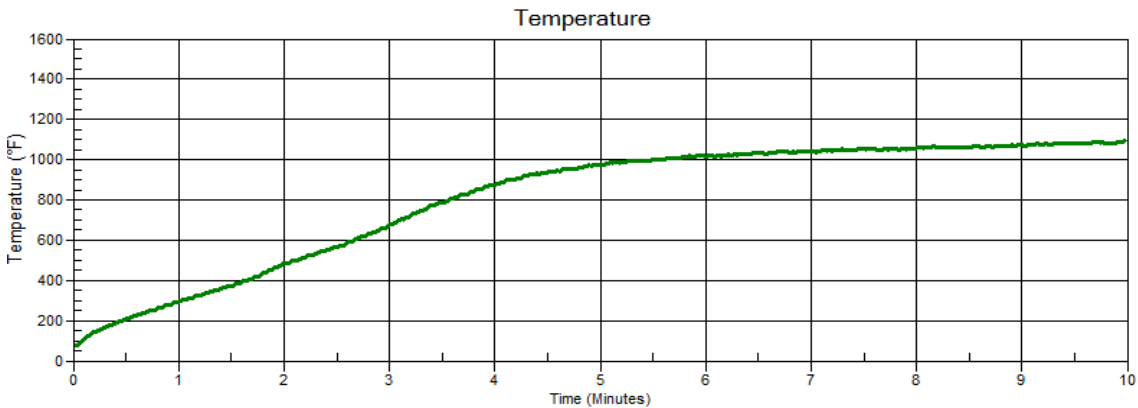
Per ASTM E84, 0.0 ft. is indicated at 4.5 ft. from the burner centerline



Graph No. 1 - Flame Spread Distance Versus Time



Graph No. 2 - Light Obscuration Versus Time



Graph No. 3 - Tunnel Air Temperature Versus Time



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SECTION 11

REVISION LOG

REVISION #	DATE	PAGES	REVISION
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