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NORTEM CORPORATION
TEST REPORT

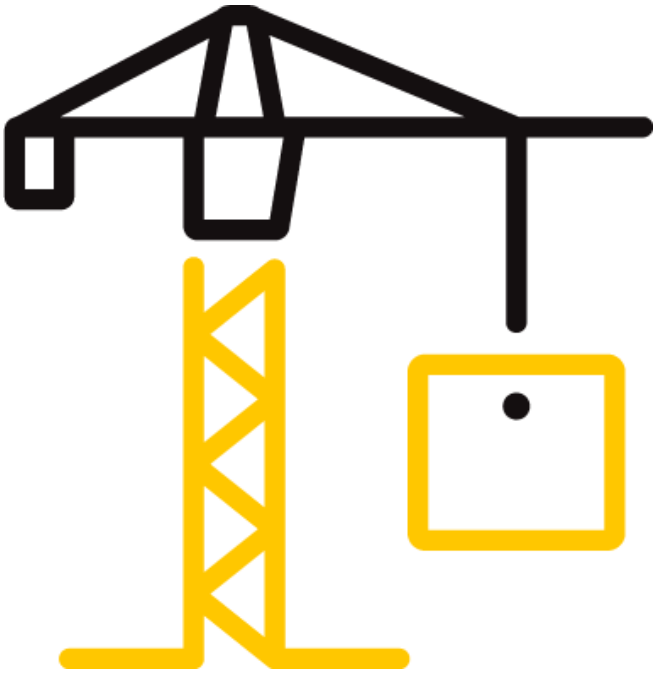
SCOPE OF WORK
REPORT OF TESTING NOMINAL 1 IN. BY 5 IN. NORTWOOD COMPOSITE PANELS FOR COMPLIANCE WITH THE APPLICABLE REQUIREMENTS OF THE FOLLOWING CRITERIA: ASTM E84-21A STANDARD TEST METHOD FOR SURFACE BURNING CHARACTERISTICS OF BUILDING MATERIALS.

REPORT NUMBER
104738033COQ-003 R0
TEST DATE(S)
11/01/21 - 11/02/21

ISSUE DATE
11/03/21

PAGES
12

DOCUMENT CONTROL NUMBER
GFT-OP-10C (09/29/20)



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TEST REPORT FOR NORTEM CORPORATION
Report No.: 104738033COQ-003 R0
Date: 11/03/21

REPORT ISSUED TO
NORTEM CORORATION
UNIT 1 - 178 PENNSYLVANIA AVENUE
CONCORD, ON L4K 4B1 CAN

SECTION 1
SCOPE

Intertek Building & Construction (B&C) was contracted by Nortem Corporation Unit 1 - 178 Pennsylvania Avenue Concord, ON, CAN. to perform testing in accordance with ASTM E84-21a Standard Test Method for Surface Burning Characteristics of Building Materials on their 1 in. by 5 in. Nortwood Composite Panels. Results obtained are tested values and were secured by using the designated test method(s). Testing was conducted at Intertek Testing Services NA Ltd. (Intertek) test facility in Coquitlam, BC Canada.

Unless differently required, Intertek reports apply the "Simple Acceptance" rule also called “Shared Risk approach,” of ILAC-G8:09/2019, Guidelines on Decision Rules and Statements of Conformity.

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 (where required by Certification or Accreditation bodies), or other pertinent project documentation, will be retained for the entire test record retention period.

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SECTION 2
SUMMARY OF TEST RESULTS

The samples of 1 in. by 5 in. Nortwood Composite Panels submitted by Nortem Corporation were tested in accordance with ASTM E84-21a Standard Test Method for Surface Burning Characteristics of Building Materials.

The product test results are presented in Section 10 of this report.

For INTERTEK B&C:

COMPLETED BY:	Sean Fewer	**REVIEWED BY:**	Greg Philp
TITLE:	Technician – B&C	**TITLE:**	Senior Technician – B&C
SIGNATURE:		**SIGNATURE:**	
DATE:	11/03/21	**DATE:**	11/03/21

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SECTION 3
TEST METHOD(S)

The specimens were evaluated in accordance with the following:

ASTM E84-21a Standard Test Method for Surface Burning Characteristics of Building Materials.

SECTION 4
MATERIAL SOURCE/INSTALLATION

Virtual sampling was conducted by Intertek representative Chinmoy Choudhury at the client's facility located at Unit 1 - 178 Pennsylvania Avenue Concord, ON, CAN on September 8th, 2021.

The product was selected in accordance with recognized independent sampling procedures and was received at the Evaluation Center on October 4th, 2021 (Coquitlam ID# VAN211004115-001).

SECTION 5
EQUIPMENT

ASSET #	DESCRIPTION	MODEL	CAL DUE DATE
WH 2189	Photocell	Huygen 856	11/06/21
WH 2190	Smoke Opacity Meter	Huygen	11/06/21
WH 1052	Data Logger	Phidgets DAQ 2020	11/06/21
	FS Tunnel (E84)	N/A	08/09/22

SECTION 6
LIST OF OFFICIAL OBSERVERS

NAME	COMPANY
Sean Fewer	Intertek B&C

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SECTION 7
TEST CALCULATIONS

The results of the tests are expressed by indexes, which compare the characteristics of the sample under tests relative to that of select grade red oak flooring and inorganic-cement board.

(A) Flame Spread Index:

This index relates to the rate of progression of a flame along a sample in the 25 foot tunnel. A natural gas flame is applied to the front of the sample at the start of the test and drawn along the sample by a draft kept constant for the duration of the test. An observer notes the progression of the flame front relative to time.

The test apparatus is calibrated such that the flame front for red oak flooring passes out the end of the tunnel in five minutes, thirty seconds (plus or minus 15 seconds).

(B) Smoke Developed:

A photocell is used to measure the amount of light, which is obscured by the smoke passing down the tunnel duct. When the smoke from a burning sample obscures the light beam, the output from the photocell decreases. This decrease with time is recorded and compared to the results obtained for heptane, which is defined to be 100.

SECTION 8
TEST SPECIMEN DESCRIPTION

Upon receipt of the samples at the Intertek Coquitlam laboratory they were placed in a conditioning room where they remained in an atmosphere of 23 $\pm$ 3°C (73.4 $\pm$ 5°F) and 50 $\pm$ 5% relative humidity.

The sample material was identified as " 1 in. thick by 5 in. wide by 12 ft. long Nortwood Composite Panels)".

For this trial run 5, nominal 5 in. wide by 12 ft. long pieces were screwed together to form 25 in. wide sample decks. Two decks were then butted together end to end to form the required 24 ft. sample length and placed on the upper ledge of the flame spread tunnel. A layer of 6 mm. reinforced cement board was placed over top of the samples, the tunnel lid was lowered into place, and the samples were then tested in accordance with ASTM E84-21a. Standard Test Method for Surface Burning Characteristics of Building Materials.

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SECTION 9
TEST RESULTS

(A) Flame Spread

The resultant flame spread Indexes are as follows:
(Indexes rounded to nearest 5)

1 in. by 5 in. Nortwood Composite Panels	Flame Spread	Flame Spread Index
Run 1	117	115
Run 2	98	100

(B) Smoke Developed

The areas beneath the smoke developed curve and the related indexes are as follows:
(For smoke developed indexes 200 or more, index is rounded to the nearest 50. For smoke developed indexes less than 200, index is rounded to nearest 5)

1 in. by 5 in. Nortwood Composite Panels	Smoke Developed	Smoked Developed Index
Run 1	751	750
Run 2	751	750

(C) Observations

During the test runs, surface ignition occurred between 59 and 72 seconds. The flame then began to progress along the sample length until it reached the maximum flame spread.

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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.

SECTION 10
CONCLUSION

The samples 1 in. by 5 in. Nortwood Composite Panels submitted by Nortem Corporation exhibited the following flame spread characteristics when tested in accordance with ASTM E84-21a Standard Test Method for Surface Burning Characteristics of Building Materials

1 in. by 5 in. Nortwood Composite Panels	Flame Spread Index	Smoked Developed Index
Run 1	115	750
Run 2	100	750

The conclusions of this test report may be used as part of the requirements for Intertek product certification. Authority to Mark must be issued for a product to become certified.

TEST DATA (4 PAGES)

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TEST REPORT FOR NORTEM CORPORATION
Report No.: 104738033COQ-003 R0
Date: 11/03/21

ASTM E84-21a DATA SHEETS

Standard: ASTM E84-21a/UL723

Lab ID: Intertek Coquitlam Fire Laboratory
Client: Nortem Corp.
Date: 01 Nov 2021
Project Number: 104738033
Test Number: 1
Operator: Sean Fewer

Specimen ID and Description:

Nortwood Panel

TEST RESULTS

FLAMESPREAD INDEX: 115.000
SMOKE DEVELOPED INDEX: 750.000

SPECIMEN DATA

Time to Ignition (sec): 58.740
Time to Max Flame Spread (min): 2.579
Maximum Flame Spread (ft): 19.500
Time to 527 C / 980 F (sec): 4.729
Max Temperature (deg F or C as per test standard): 1043.510
Time to Max Temperature (sec): 406.740
Total Fuel Burned (cubic feet): 49.354

Flame Spread*Time Area (M*min): 153.089
Smoke Area (%A*min): 477.371
Unrounded FSI: 116.916
Unrounded SDI: 750.761

CALIBRATION DATA

Time to Ignition of Last Red Oak (sec): 48

Calibrated Smoke Area (%A*min): 63.585

15 point Heptane average for E84-21a
5 point Red Oak average for S102

Tested by: SF

Reviewed by: qp

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TEST REPORT FOR NORTEM CORPORATION
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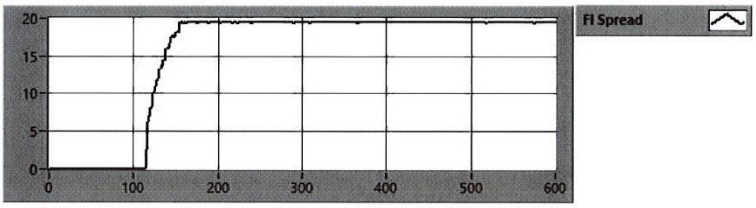
Date: 11/03/21

ASTM E84-21a DATA SHEETS

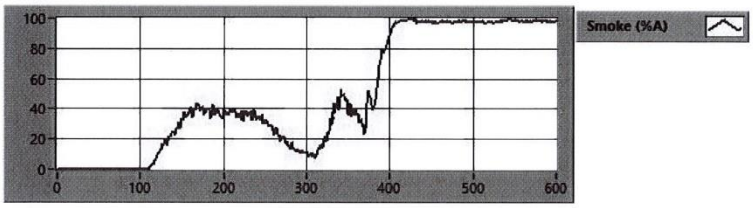
Client: Nortem Corp. Project Number: 104738033

Test Number: 1 Test Standard: ASTM E84-21a/UL723

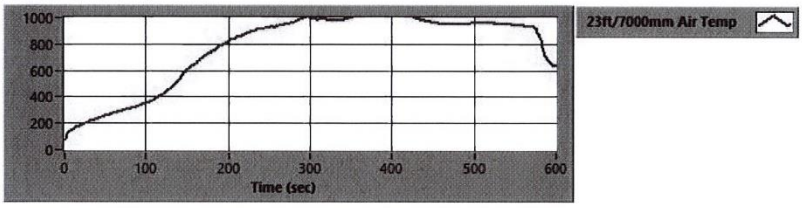
FLAME SPREAD



SMOKE (%A)



TEMPERATURE



Tested by: SF Reviewed by: gp

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TEST REPORT FOR NORTEM CORPORATION
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Date: 11/03/21

ASTM E84-21a DATA SHEETS

Standard: ASTM E84-21a/UL723

Lab ID: Intertek Coquitlam Fire Laboratory
Client: Nortem
Date: 02 Nov 2021
Project Number: 104738033
Test Number: 2
Operator: Sean Fewer

Specimen ID and Description:

Nortwood Panel

TEST RESULTS

FLAMESPREAD INDEX: 100.000
SMOKE DEVELOPED INDEX: 750.000

SPECIMEN DATA

Time to Ignition (sec): 70.916
Time to Max Flame Spread (min): 3.049
Maximum Flame Spread (ft): 19.500
Time to 527 C / 980 F (sec): 4.632
Max Temperature (deg F or C as per test standard): 1088.510
Time to Max Temperature (sec): 379.917
Total Fuel Burned (cubic feet): 49.586

Flame Spread*Time Area (M*min): 144.969
Smoke Area (%A*min): 477.460
Unrounded FSI: 97.939
Unrounded SDI: 750.901

CALIBRATION DATA

Time to Ignition of Last Red Oak (sec): 48

Calibrated Smoke Area (%A*min): 63.585

15 point Heptane average for E84-21a
5 point Red Oak average for S102

Tested by: SF

Reviewed by:

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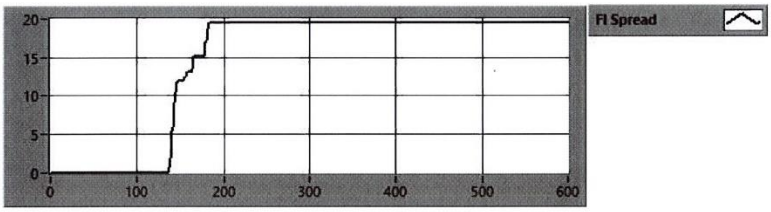
TEST REPORT FOR NORTEM CORPORATION
Report No.: 104738033COQ-003 R0
Date: 11/03/21

ASTM E84-21a DATA SHEETS

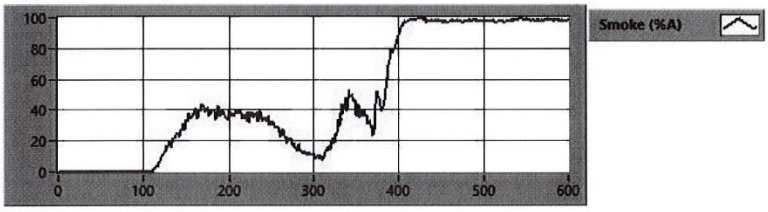
Client: Nortem | Project Number: 104738033

Test Number: 2 | Test Standard: ASTM E84-21a/UL723

FLAME SPREAD



SMOKE (%A)



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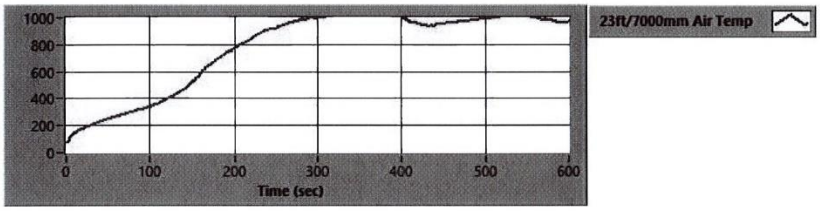

Tested by: SF Reviewed by:

SECTION 12
PHOTOGRAPHS

Photo No. 1
Pre Test

Photo No. 2
Post Test

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Date: 11/03/21

SECTION 13
REVISION LOG

REVISION #	DATE	PAGES	REVISION
0	11/03/21	N/A	Original Report Issue