

ASTM E84 Surface Burning Characteristics of Building Materials Test Results for CONVEX

Client:	Nordgrona Företagsvägen 29 Hus 5 Arlöv 232 37 Sweden
Attention:	Mr. Joris Oudendjik
Date:	December 12, 2018
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1. PROJECT DETAILS AND TEST WORK APPROVAL STATEMENT

Quotation Number	3585
Job Number	1829
DEKRA Facility	DEKRA Process Safety Safety Consulting Engineers, Inc., Designated Fire Laboratory: QAI
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Project Initiation Date*	November 19, 2018
Completion Date of Experimental Work	December 7, 2018

2. INTRODUCTION

In response to Nordgrona's request with signed quote #3585 dated October 12, 2018, DEKRA Process Safety submits this report of ASTM E84 test results. Testing was conducted by our designated QAI fire laboratory.

This report contains test information and results regarding the following standard test method:

ASTM E84: Surface Burning Characteristics of Building Materials

Perform standard flame spread and smoke density developed classification tests on the sample supplied by the Client in accordance with ASTM E84 - 18b "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.

The sample material tested is identified as follows:

- ***CONVEX - A high-class sound absorber made from natural, handpicked Scandinavian Reindeer Moss***

The material used in this assessment was supplied by Nordgrona.

The sample material was tested in accordance with the procedures outlined in:

ASTM E84 "Surface Burning Characteristics of Building Materials" standard

3. EXECUTIVE SUMMARY

Table 1

Flammability Test Results for Glass Sound Absorber Panels Test Method: ASTM E84 Surface Burning Characteristics of Building Materials

Material Tested/ID:	Sample Preparation	Test Method	Test Result
CONVEX - A high-class sound absorber made from natural, handpicked Scandinavian Reindeer Moss	"As Received"	ASTM E84	Class 'A' Material Flame Spread: 0 Smoke Developed: 75

4. FLAMMABILITY/FIRE TESTING PROGRAM – ASTM E84 TEST DESCRIPTION

Scope

The ASTM E84 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.

Samples Material and Sample Preparation

Test samples were submitted to our fire laboratory by Nordgrona and received on November 19, 2018 and was tested on December 07, 2018.

Test Procedure

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-in +/- 1/4-in wide by 12 in +/- 1/2-in deep by 25-ft 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-ft 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.

Performance Criteria

In order to obtain the Flame Spread Classification, the above results should be compared to the following Table 2:

Table 2
Performance Criteria

NFPA Class¹	IBC Class²	Flame Spread	Smoke Developed
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

5. SUMMARY OF TEST RESULTS

The test results for **CONVEX - A high-class sound absorber made from natural, handpicked Scandinavian Reindeer Moss** sample are summarized in Table 3. Photographs of the samples in the test apparatus appear in Section 7 Figures.

Table 3
Surface Burning Characteristics of Building Materials

Sample Material Tested: *CONVEX - A high-class sound absorber made from natural, handpicked Scandinavian Reindeer Moss*
Sample Method: ASTM E84
Test Date: December 7, 2018

Description	Test Results	
Sample Ignition	1:30	Minutes / Seconds
Max Flame Front	0.0	Feet
Time to Maximum Spread	00:00	Minutes / Seconds
Test Duration	10:00	Minutes / Seconds
Flame Spread	0	9 Unrounded
Smoke Developed	75	37 Unrounded
Observations	Brief surface ignition was observed. A flame front advance was not observed.	

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.

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.

6. CONCLUSIONS

When tested in accordance to ASTM E84-17 the for **CONVEX - A high-class sound absorber made from natural, handpicked Scandinavian Reindeer Moss** tested resulted in a **Class 'A' material**. Detailed test results are presented in Appendix 1 of this report.

If you have any questions on this report or require further assistance, please do not hesitate to contact us.

7. APPENDIX 1: TEST RESULTS, CHAMBER DIAGRAMS, PHOTO

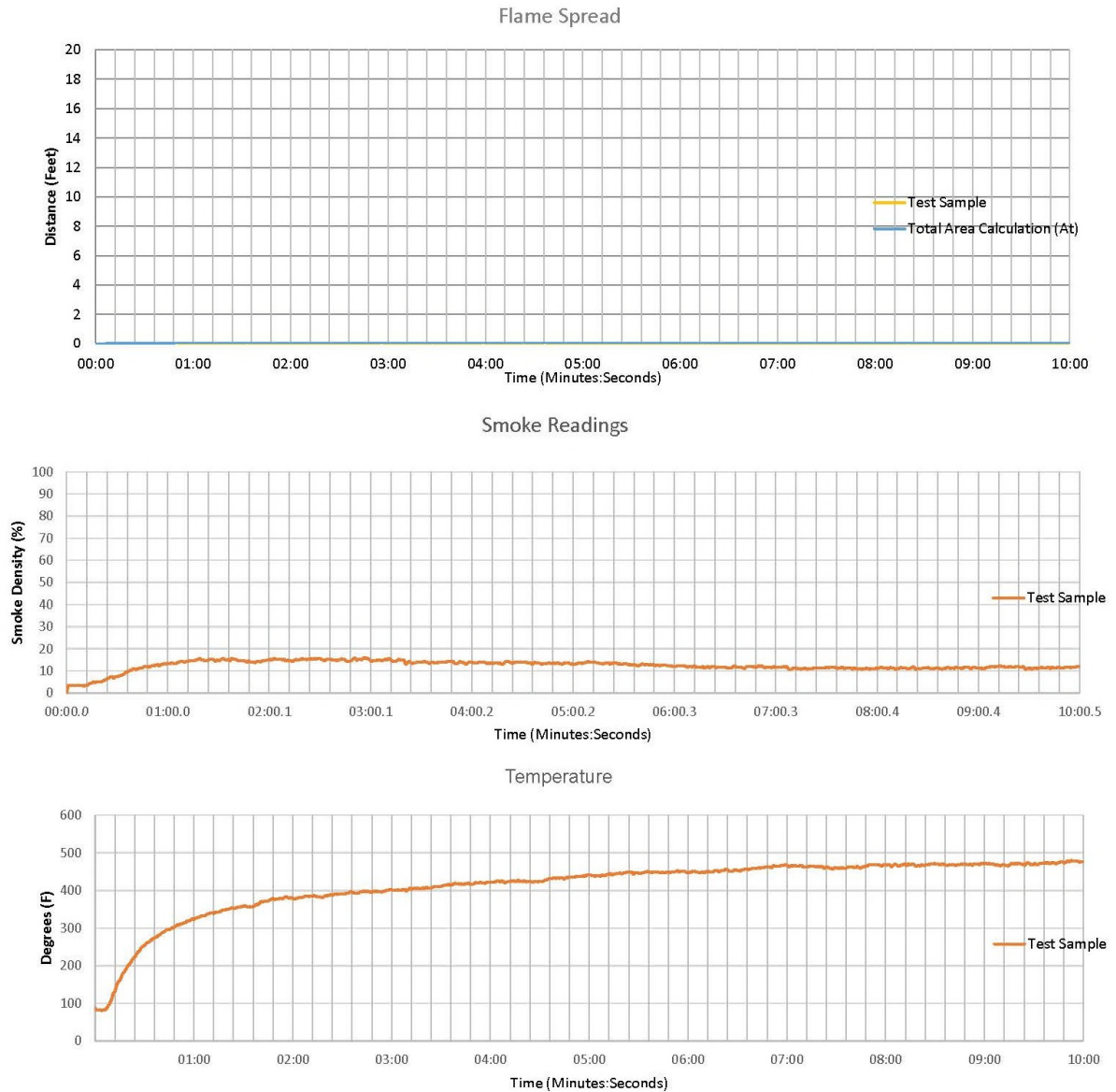


Figure 1. Test Results

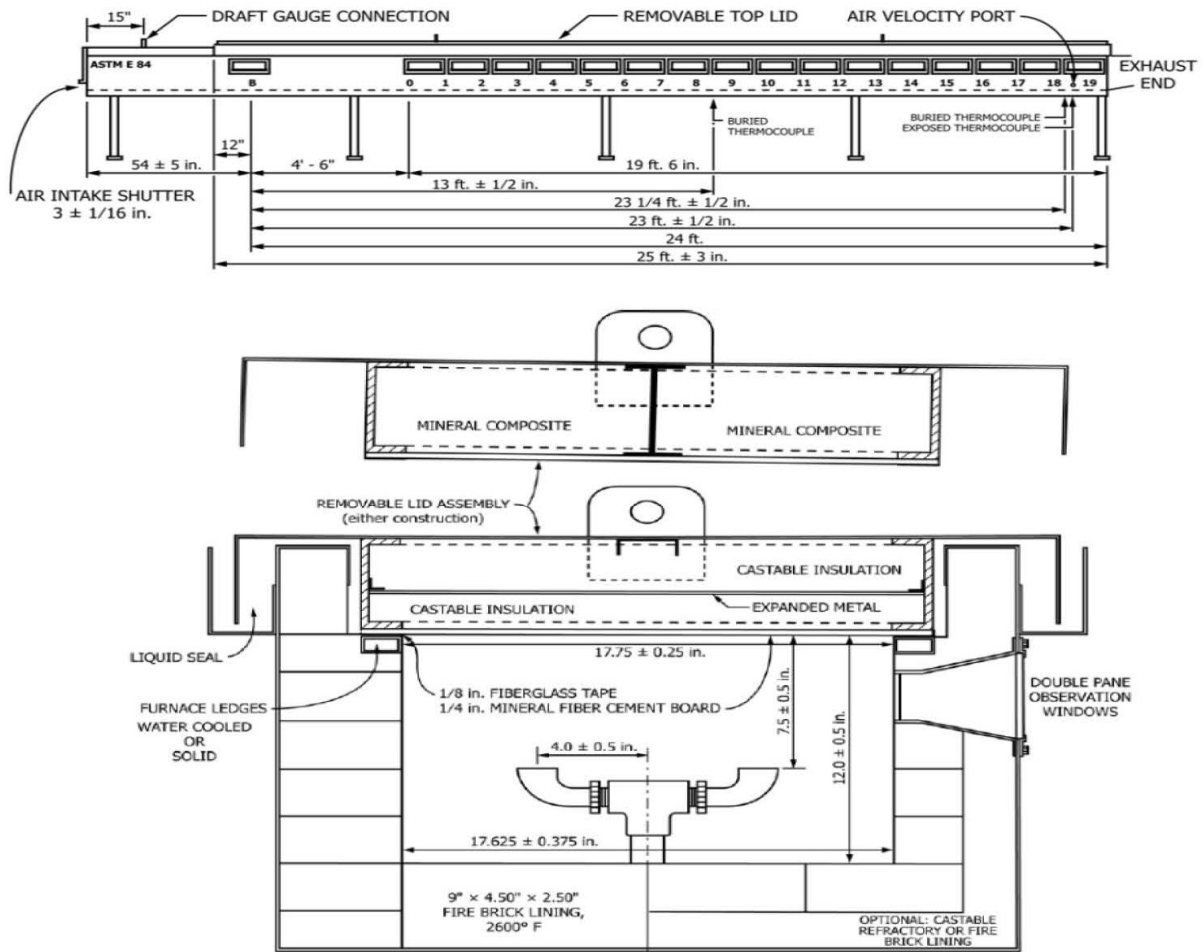


Figure 2. Test Chamber - Diagrams 1 and 2

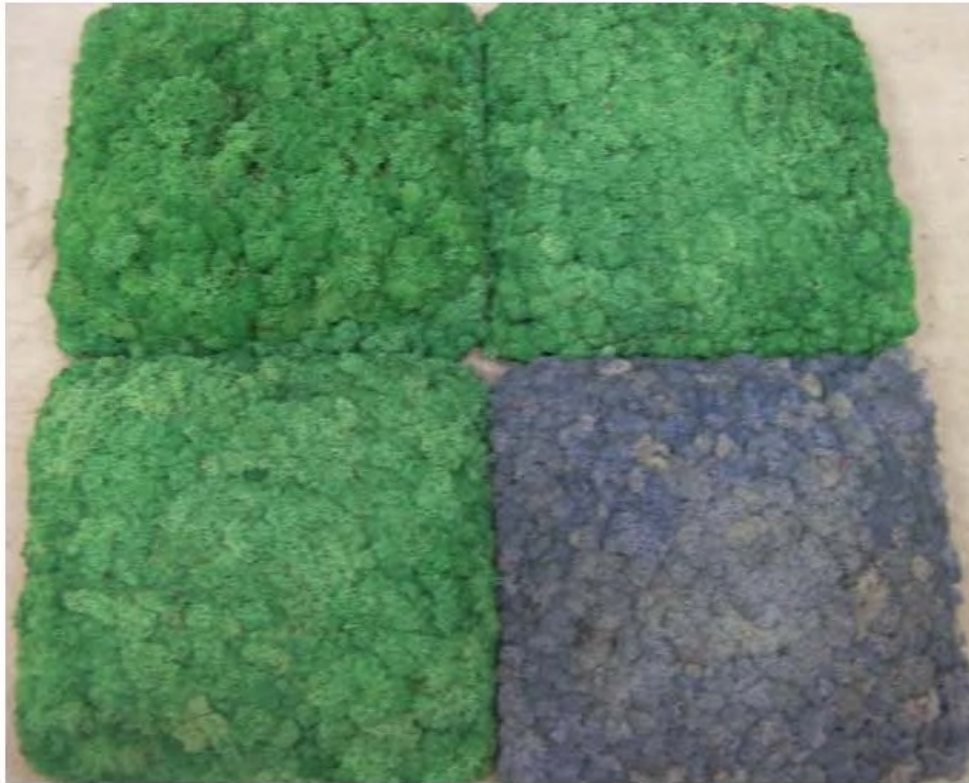


Figure 3. Surface of Specimen tested

8. APPENDIX 2: LEGAL DISCLAIMER AND LIABILITY

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