NCFI POLYURETHANES

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Mount Airy, NC

Missouri City, TX

November 13, 2025

Subject: ASTM E-84 Fire Testing of Polyurethane System 23-029

To Whom It May Concern:

Per test report RTL1059-13, issued July 17, 2025, it has been demonstrated that polyurethane system 23-029 (manufactured by NCFI Polyurethanes) realized a Flame Spread Index (FSI) of 5 and a Smoke Developed Index (SDI) of 300. Polyurethane system 23-029 is supplied to Blue Blox LLC, dba Monolith for the manufacture of insulated concrete forms (ICF).

Best Regards,

Todd Wishneski
Director of Product Development
Specialty Products

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ASTM E84-23d Fire Test Report

Issued to **NCFI Polyurethanes**

Product ID **B-23-029**

Scope of Evaluation

Fire Testing to ASTM E84-23d "Standard Method of Test for Surface Burning Characteristics of Building Materials".

Test Report Number
RTL1059-13

Date of Test
6/30/2025

Report Issued on
July 17, 2025

Record Kept until
July 16, 2029

Report Template Control Number
Test Report; V1.7_10-22-2021

Number of Pages in Report
8

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Report Issued To:
NCFI Polyurethanes
PO Box 1528, 1515 Carter Street
Mount Airy, NC 27030
USA

Proposal Number: SSP-02042025-04
Acceptance Date: Monday, March 3, 2025
Accepted By: Marcus Hunter

Product ID: B-23-029
as stated by client.

Witnesses of Test: Paulo Hernandez-RTL and Scott Parkhurst-RTL

Test Result:

Flame Spread Index (FSI)	Smoke Developed Index (SDI)
5	300

**See Details of Evaluation on the subsequent pages of this report.*

Classification: **A**

Prepared by

Name: **Paulo M. Hernandez**
Title: *Technician*
Date: July 17, 2025

Signed for and on the behalf of
Right Testing Laboratories, LLC.

Scott Parkhurst
Laboratory Manager
July 17, 2025

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Section 1: Product Details

1.1 Sampling Detail:

The Test Sample was delivered directly to Right Testing Labs by the client. No sample production or witness of construction was observed by RTL.

1.2 Sample Receiving Date: Friday, June 27, 2025

1.3 Sample Condition as Received: Good

Product ID: (as stated by client) B-23-029

Sample Type:	Spray Applied Polyurethane Boards	
Sample Received Width:	21	inches
Sample Received Length:	4	feet
Sample Received	2.4785	inches
# of Samples Received:	6	pieces

1.4 Sample Conditioning:

Average Temperature:	72	°F
Average Humidity:	68	%RH
Conditioning Time:	3	Days
Moisture Content	N/A	%

Note: Test specimen conditioning was done in accordance with §6.4 of ASTM E84.

1.5 Testing Preparation:

The Test samples consisted of (6) nominally 2.5-inch thick polyurethane foam boards. The samples were stacked end to end to meet the test specimen requirements of ASTM E84.

Section 2: Procedure / Evaluation Method

2.1 Scope of Test Method

This fire-test-response standard is used for the comparative surface burning behavior of building materials and 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.

2.1 Scope (Continued from previous page)

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. Right Testing Laboratories has obtained the tested values on the test specimen as received when assembled and tested as outlined in this report by using the designated test method(s) noted above. The results obtained only apply to the specimen tested in this report, which does not constitute that Right Testing Laboratories' endorses nor certifies the product tested under this evaluation.

2.2 Procedure

A test specimen of at least 20 inches in width by 24 feet in length is placed onto the support ledge of the fire test chamber in accordance to Section 5 of ASTM E84. The fire test chamber, a rectangular horizontal duct with a removable lid with inside dimensions, measures approximately 18 inches wide by 12 inches deep by approximately 25 feet long, which is used for comparative surface burning behavior of building materials to determine flame spread index (FSI) and a smoke developed index (SDI). The specimen is exposed to the test flame in the test chamber for a total of 10-minutes with observations recorded. The FSI and SDI of the test specimen are compared to that of the calibration media of ASTM E84 (Red Oak: Flame Spread, Concrete Board:0% Smoke and Heptane: 100%) and rounded according to ASTM E84 Section 9 Calculations.

In accordance to ASTM E84, the results for FSI and SDI less than 200 are adjusted to the nearest figure divisible by 5.
SDI 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:

Classification	FSI	SDI
A	0 through 25	Less than or equal to 450
B	26 through 75	Less than or equal to 450
C	76 through 200	Less than or equal to 450

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2.3 Test Specimen Details

Sample as Tested Width:	21	inches
Sample as Tested Length:	4	foot
Sample as Tested Thickness:	2.4785	inches
# of Samples as Tested:	6	pieces
Testing Date:	6/30/2025	
Temperature at Test:	70	°F
Humidity at Test:	69	%RH
Chamber support Type:	Chamber Ledge	
Mounting Method:	#N/A	
Side of Specimen Tested:	Foam	
Color of Specimen	Yellow	
Cement Board	1/4-inch fiber cement board placed over specimen	
Substrate Material	N/A	
Total Fuel Consumed (ft³)	54.64	

Section 3: Test Results

3.1 Results

FSI (rounded)	**5**
SDI (rounded)	**300**
Classification	**A**

**See Appendix A for test data sheets.*

3.2 Test Data

Total Area (FT/Min)	**13.1**
FSI (unrounded)	**6.8**
SDI (unrounded)	**324.1**
Time of Ignition	**00:07**
Max Flame Distance 10-min Test (ft)	**1.3**
Time at Max Flame Distance 10-min (mm:ss)	**00:15**
Maximum Smoke Obscurity (%)	**87**
Time at Maximum Smoke (mm:ss)	**00:21**
Maximum Temperature Exposed Thermocouple (°F)	**651**
Time at Maximum Temperature (mm:ss)	**09:58**
Total Duration of Test	**10:00**

3.3 Observations

event	mm:ss	event	mm:ss	event	mm:ss
Discoloration	None	Splitting	None	Flaking	None
Bubbling	None	Peeling	None	Flaking Embers	None
Shrinking	None	Dripping	None	Flashing	None
Warping	None	Melting	None	Falling pieces	None
Blistering	None	Flaming Dripping	None	Crackling	None
Sagging	04:30	Floor Burning	None	Afterglow	10:00
Cracking	01:07	Charring	00:05	Afterburn	10:00
Other Observations:	Charring at 5-seconds. Material ignited and charred at 7-seconds. Cracking at 1-minutes and 7-seconds. Sagging at 4-minutes and 30-seconds. The test specimen remained in place the duration of the test. Afterglow and Afterburn observed at the conclusion of the test.				

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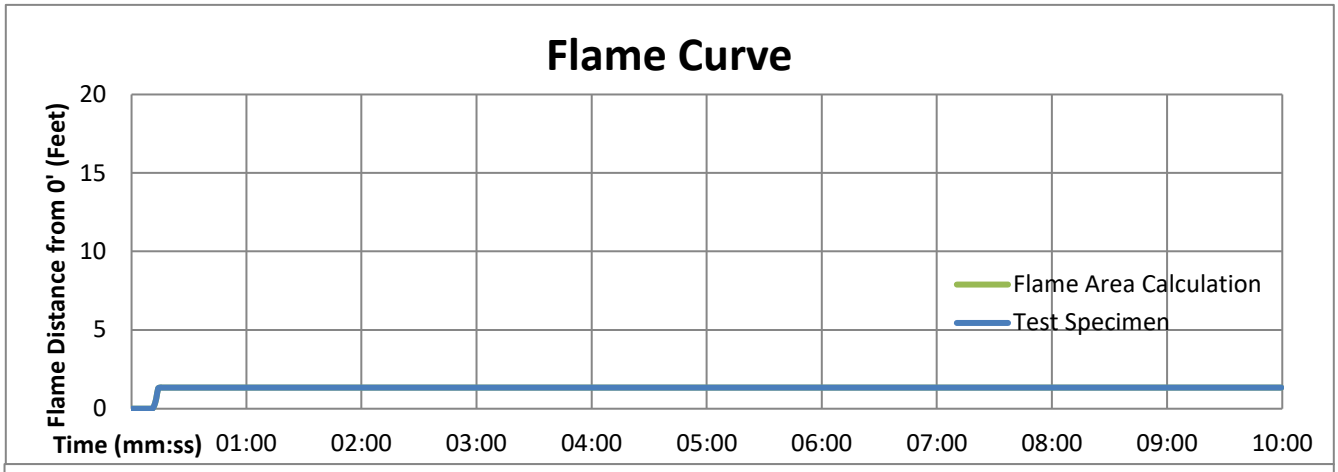
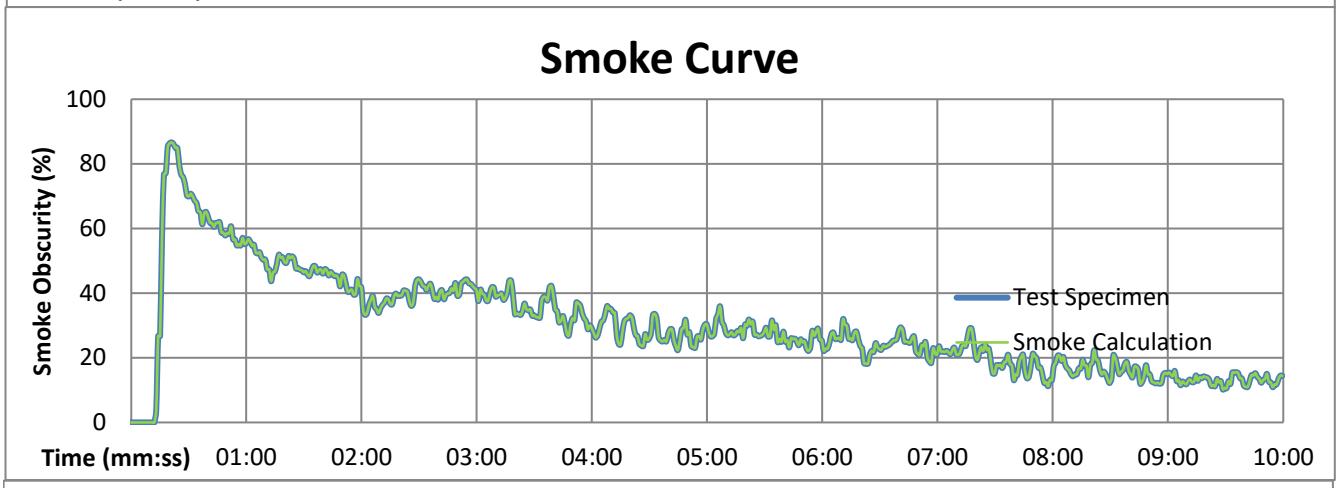
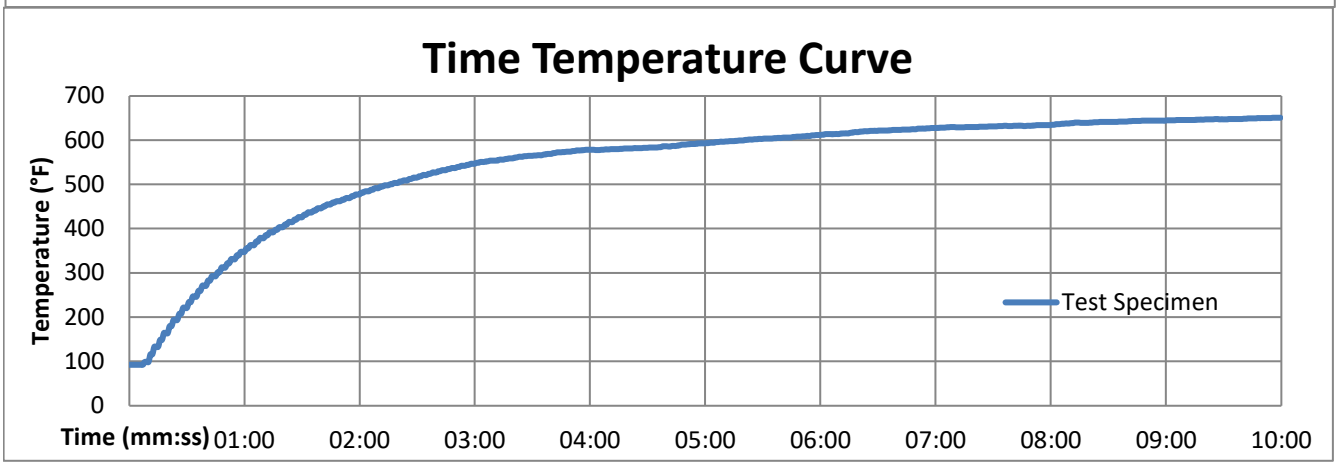
Appendix A - Test Data

Product ID **B-23-029**







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Appendix B - Photographs

Product ID **B-23-029**

Photograph No. 1: Test specimen prior to testing showing the entire 24-foot test specimen from the fire exposure chamber's burner end (left), and vent end (right).

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Appendix B - Photographs

Product ID **B-23-029**

Photograph No. 2: Test specimen from the test chambers burner end (left), and vent end (right) showing the post 10-minute test sample condition immediately after removal from the test chamber.

>>>END OF TEST EVALUATION>>>