



April 08, 2020

Erico International Corp
34600 Solon Rd
Solon, OH 44139-2631
United States

Our Reference: File SV19142 / Project 4789402518

Subject: UL Standard 2043, Fourth Edition, including revisions through July 13, 2018
"Fire Test for Heat and Visible Smoke Release for Discrete Products and Their
Accessories Installed in Air-Handling Spaces".
CAN/ULC S142, First Edition, dated September 1st, 2016.
"Fire Test for Heat and Visible Smoke Release For Discrete Products".

Dear Ward Judson:

This Report summarizes the data developed on the samples you provided which were subjected to the flame test described in UL Standard 2043, Fourth Edition, including revisions through July 13, 2018. Testing was conducted at UL LLC (UL) on March 09, 2020 through April 03, 2020 at our Northbrook testing facility.

The purpose of this test is to determine the rate of heat release and the rate of smoke release of the burning product samples as they relate to the requirements for the fire-resistant and low smoke producing characteristics in accordance with the provisions of the following codes: National electric Code, NFPA 70; International Mechanical Code, NFPA 5000; Standard for the installation of Air Conditioning and Ventilating Systems, NFPA 90A.

GENERAL:

It should be understood that these results apply only to the particular sample submitted for testing. The test results indicated in this Report are not intended to imply plenum rating, Listing, Classification or Recognition of any product or materials.

It is important to understand that authorities having jurisdiction may require that products such as covered by this report, intended for installation in a building plenum, be listed and labeled for such use in accordance with UL2043, based on current model building and electrical codes. Accordingly, you may wish to consider undergoing a Listing program with UL on your product(s) to address this possible need.

The Classification Marking or Listing Mark of UL on the product is the only method provided by UL to identify products that have been produced under its Classification or Listing and Follow-Up Service.

In no event shall UL be responsible to anyone for whatever use or nonuse is made of the information contained in this Report and in no event shall UL, its employees, or its agents incur any obligation or liability for damages, including, but not limited to, consequential damages, arising out of or in connection with the use, or inability to use, the information contained in this Report.

TEST RECORD

SAMPLES:

The product evaluated is described in Table 1. UL did not witness the production of the test sample nor were we provided with information relative to the formulation or identification of component materials used in the manufacture of the test samples.

Table 1 - Sample Description

Sample Reference	Description
A	ESGFP - 20 samples per test
	ESGFP - 10 samples per test

METHOD:

The tests were conducted in accordance with the requirements in UL 2043, Standard for Fire Test for Heat and Visible Smoke Release for Discrete Products and Their Accessories Installed in Air-Handling Spaces. This test method is used to determine the heat and smoke release rates as well as the smoke optical density of the samples. The test samples were positioned and installed in the test enclosure as described in Appendix A.

ACCEPTANCE CRITERIA:

Per the requirements of UL 2043, each product specimen shall have the following properties when tested as described herein:

- a) The peak rate of heat release measured during each test shall be 100 kilowatts or less, HRRs.
- b) The peak smoke release rate measured during each test shall be 0.21 m²/s or less, SRRs.
- c) The total smoke released (10 minute test duration) shall be 75 m² or less, TSR.

Note: The above criteria do not include the contribution of the propane ignition burner.

RESULTS:

The summary of test results is tabulated in Table 2 below. Graphs of heat release rate, smoke release rate, and normalized optical density are given in Appendix B. Pre and post-test photographs for each test are given in Appendix A. In addition, a videotape of each test can be made and provided upon your request.

Table 2 - Test Results

Sample - Test Ref.	Peak Heat Release Rate (kW)	Peak Normalized Optical Density	Average Normalized Optical Density	Peak Smoke Release Rate (m²/s)	Total Smoke Released (m²)
*A-1	46	0.21	0.01	0.09	3.9
*A-2	70	0.50	0.01	0.21	4.7
*A-3	71	0.53	0.01	0.22	4.2
*A-4	31	0.14	< 0.01	0.06	2.4

Please note that the values in Table 2 above as well as the graphs in Appendix B omit the heat and smoke contribution from the propane ignition burner.

* Samples A-1 to A-3 were tested with 20 individual samples of the ESGFP per test; sample A-4 included 10 samples per test.

CONCLUSION:

The product, identified by the test sponsor as shown in Table 1 - Sample Description, in the form it was submitted to UL LLC, was evaluated in accordance with the requirements of the standard UL2043. Based on an engineering review of the test results and the product's construction, the evaluation was found compliant with the standard's requirements when limited to a maximum of 10 ESGFP specimens installed in a 10ft x 2ft surface area.

COMPLETION OF INVESTIGATION

Since this completes the anticipated work, we have instructed our Accounting Department to terminate the investigation and invoice you for the charges incurred to date.

If you have any questions, please do not hesitate to contact the undersigned.

Very truly yours

Reviewed by:

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APPENDIX A

TEST NOTES:

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TEST A-1

03092003

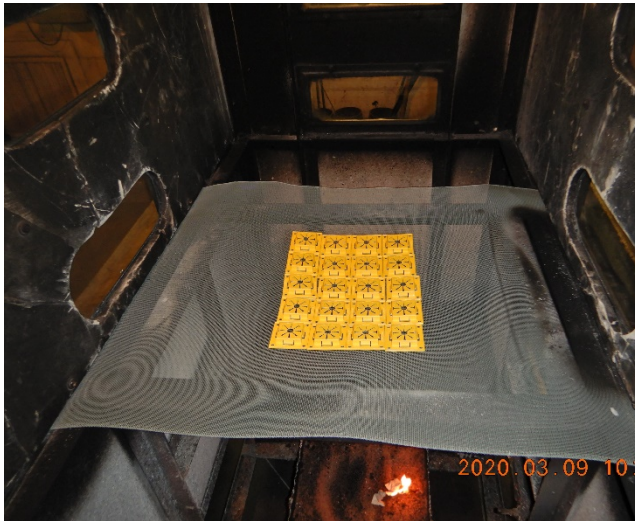
Sample Description: ESGFP - 20 samples per test

Test Notes: The sample was positioned on fine wire mesh and situated above the center of the test burner. The sample was placed face up.

Post Test Observations: The sample was not still burning with wispy smoke at the conclusion of the test.

Photos:

Pre-Test



Post-Test



TEST A-2

03092004

Sample Description: ESGFP - 20 samples per test

Test Notes: The sample was positioned on fine wire mesh and situated above the center of the test burner. The sample was placed face down.

Post Test Observations: The sample was not still burning with wispy smoke at the conclusion of the test.

Photos:

Pre-Test



Post-Test



TEST A-3

03092005

Sample Description: ESGFP - 20 samples per test

Test Notes: The sample was positioned on fine wire mesh and situated above the center of the test burner. The sample was placed face down.

Post Test Observations: The sample was not still burning with wispy smoke at the conclusion of the test.

Photos:

Pre-Test



Post-Test



TEST A-4

04032003

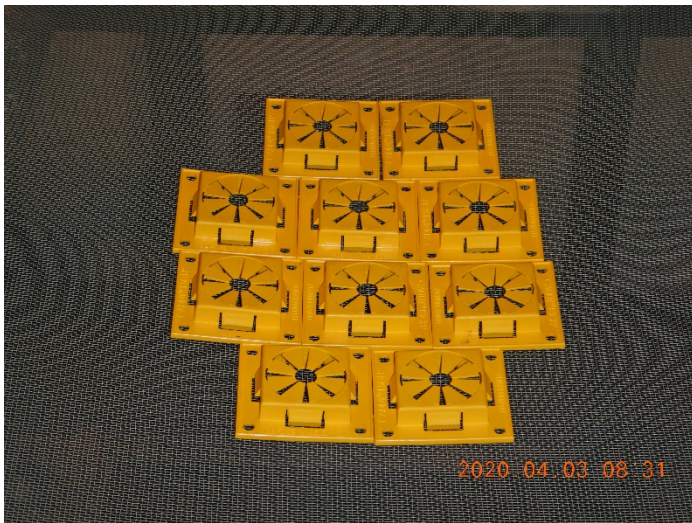
Sample Description: ESGFP - 10 samples per test

Test Notes: The sample was positioned on fine wire mesh and situated above the center of the test burner. The sample was placed Flat on screen.

Post Test Observations: The sample was not still burning with wispy smoke at the conclusion of the test.

Photos:

Pre-Test



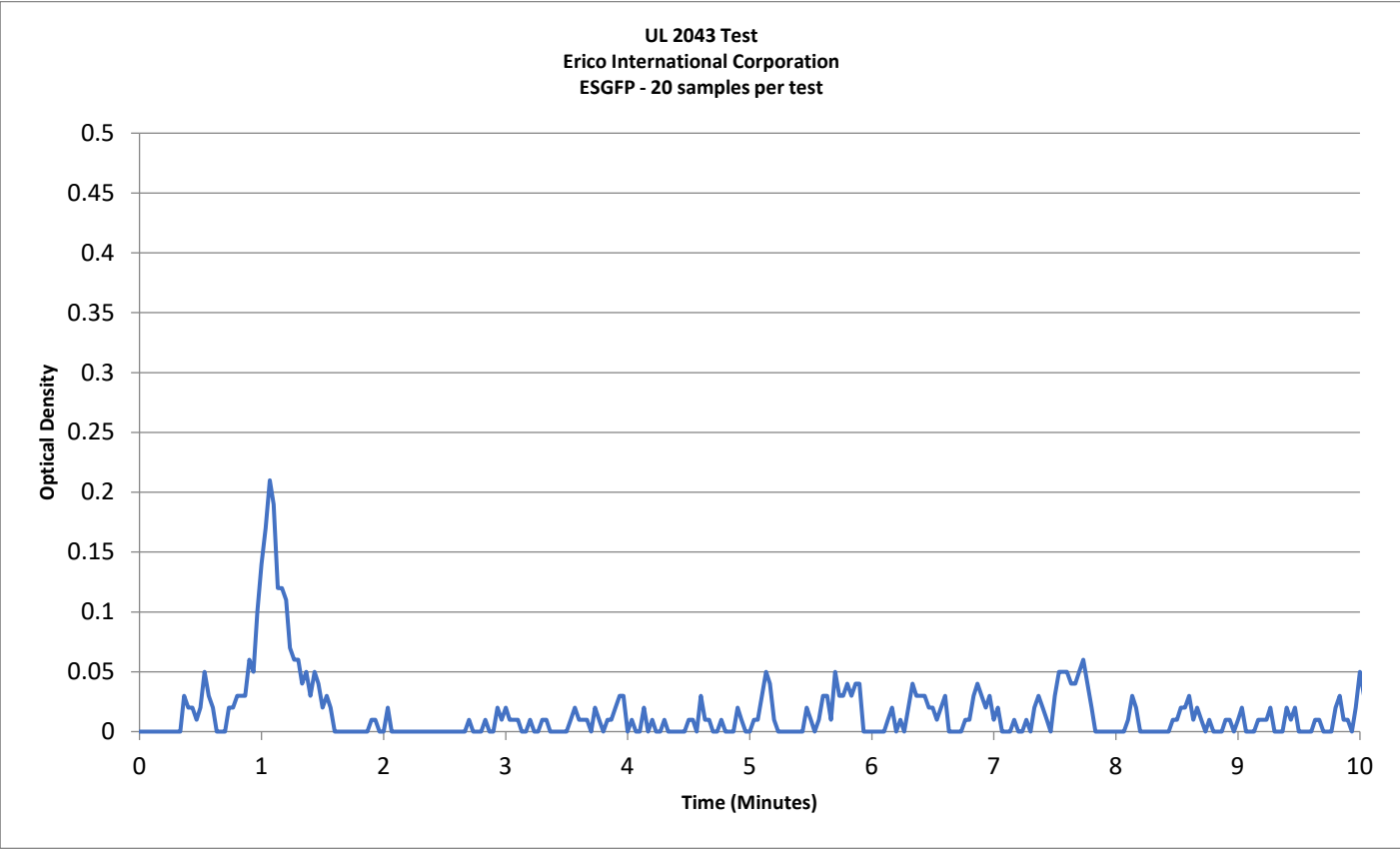
Post-Test



APPENDIX B

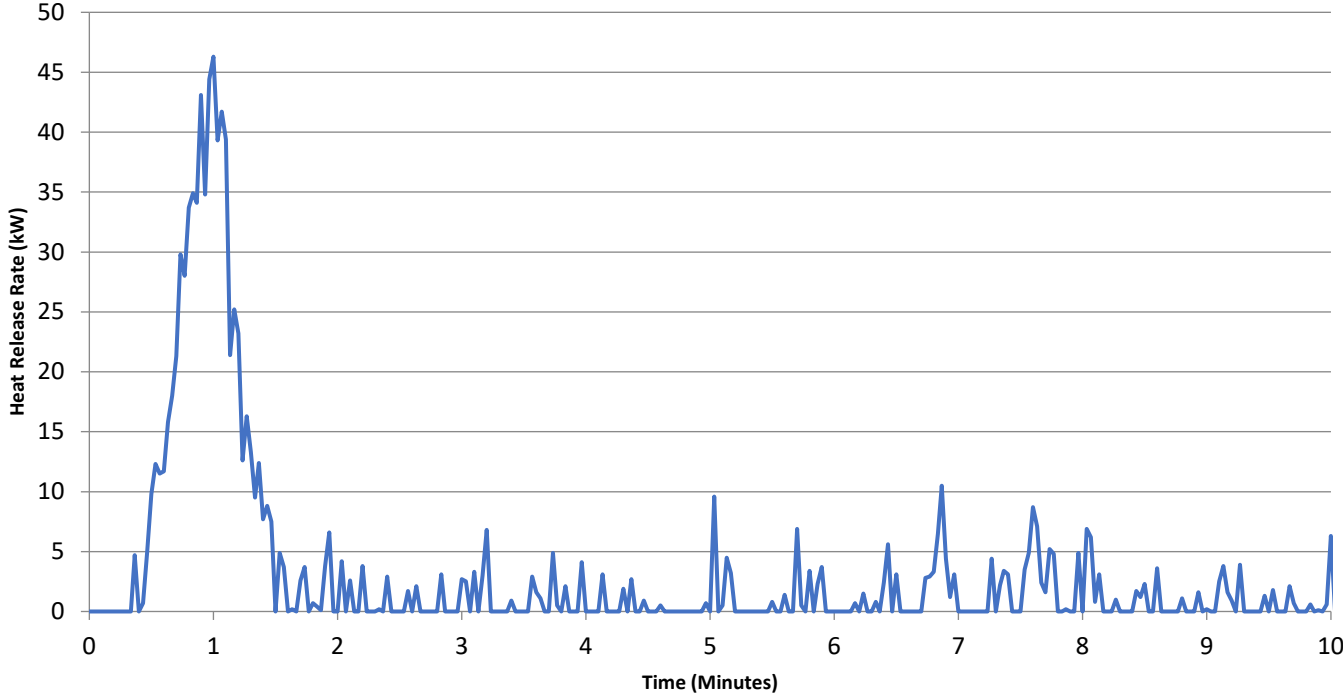
GRAPHICAL DATA

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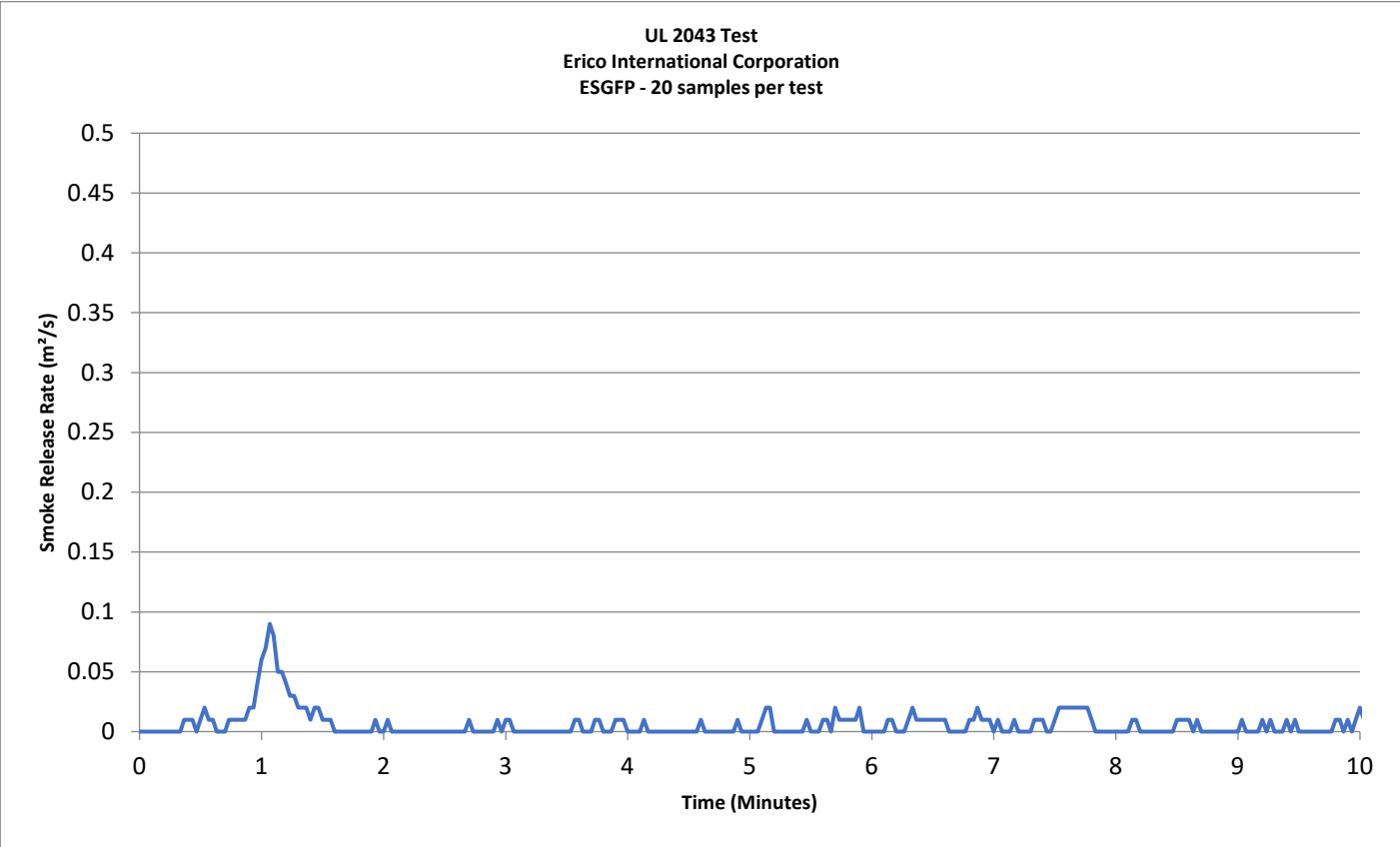


Test Number	Test Code	Description	Peak Normalized Optical Density	Average Normalized Optical Density
A-1	03092003	ESGFP - 20 samples per test	0.21	0.01

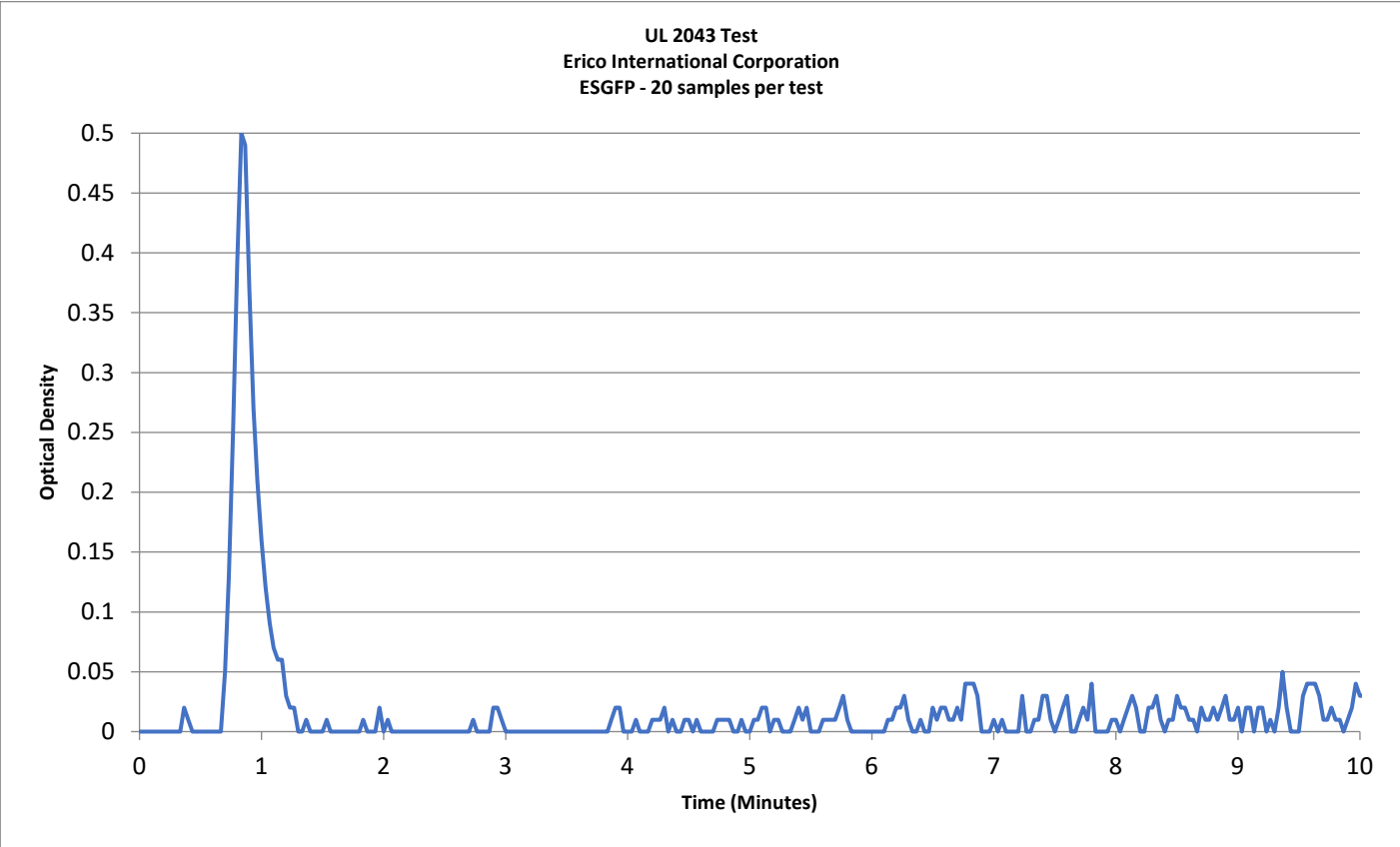
UL 2043 Test
Erico International Corporation
ESGFP - 20 samples per test



Test Number	Test Code	Description	Peak Heat Release Rate (kW)
A-1	03092003	ESGFP - 20 samples per test	46

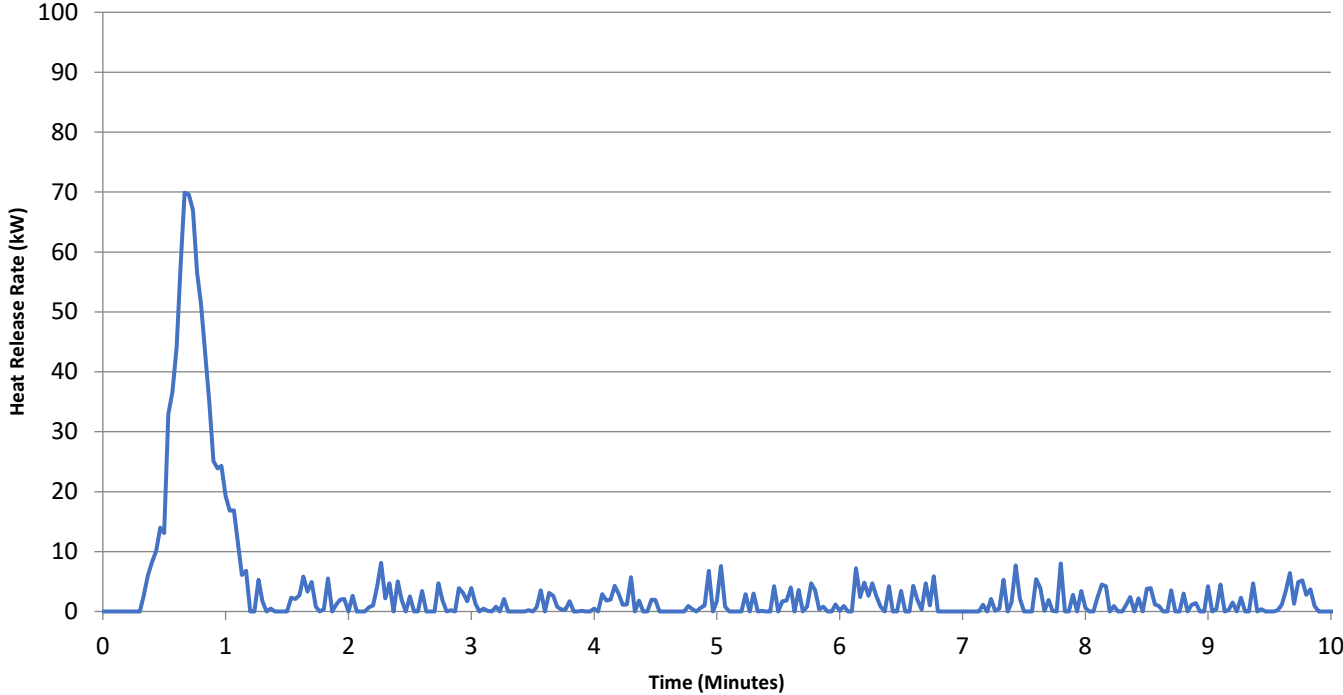


Test Number	Test Code	Description	Peak Smoke Release Rate (m²/s)	Total Smoke Released (m²)
A-1	03092003	ESGFP - 20 samples per test	0.09	3.9

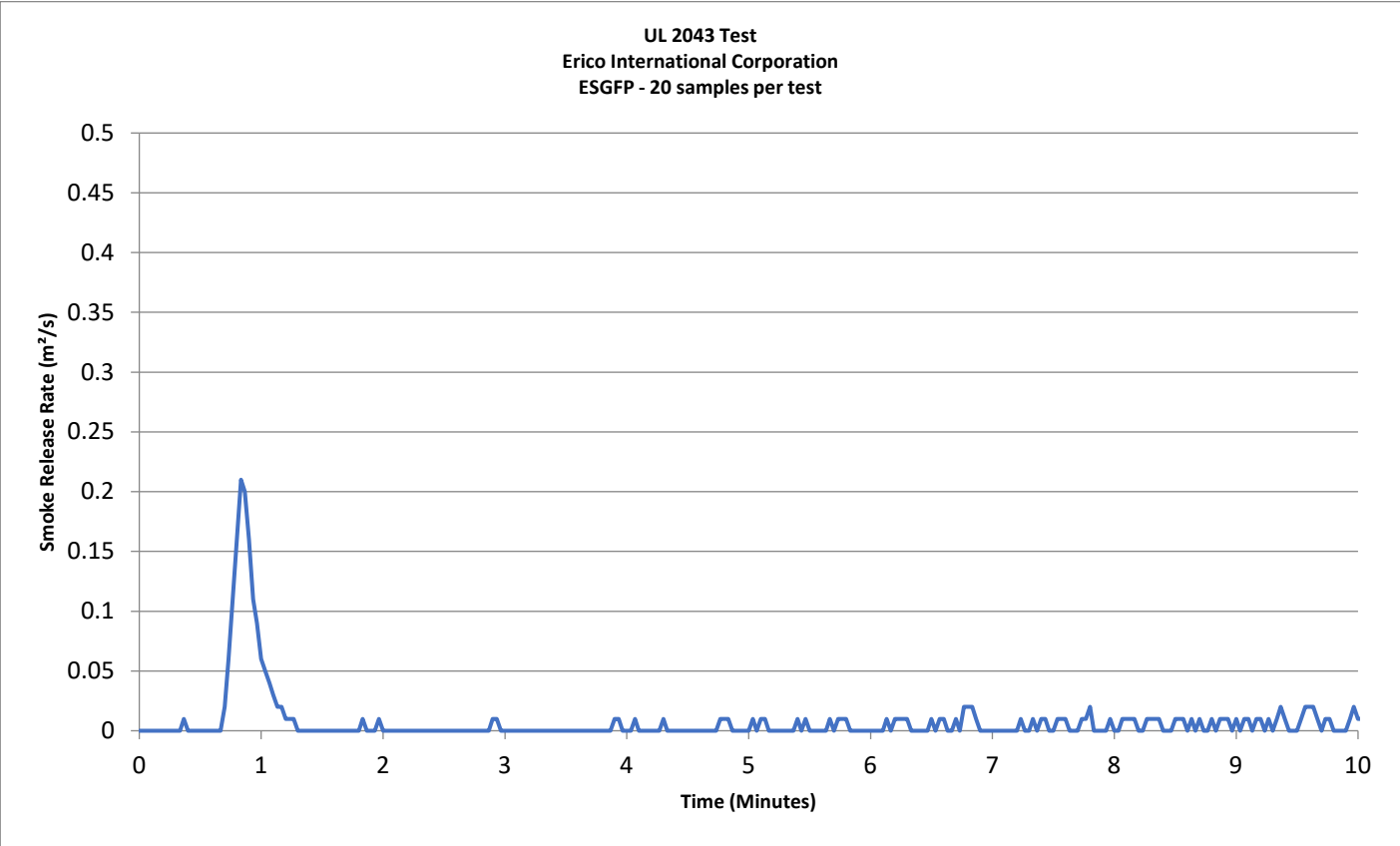


Test Number	Test Code	Description	Peak Normalized Optical Density	Average Normalized Optical Density
A-2	03092004	ESGFP - 20 samples per test	0.50	0.01

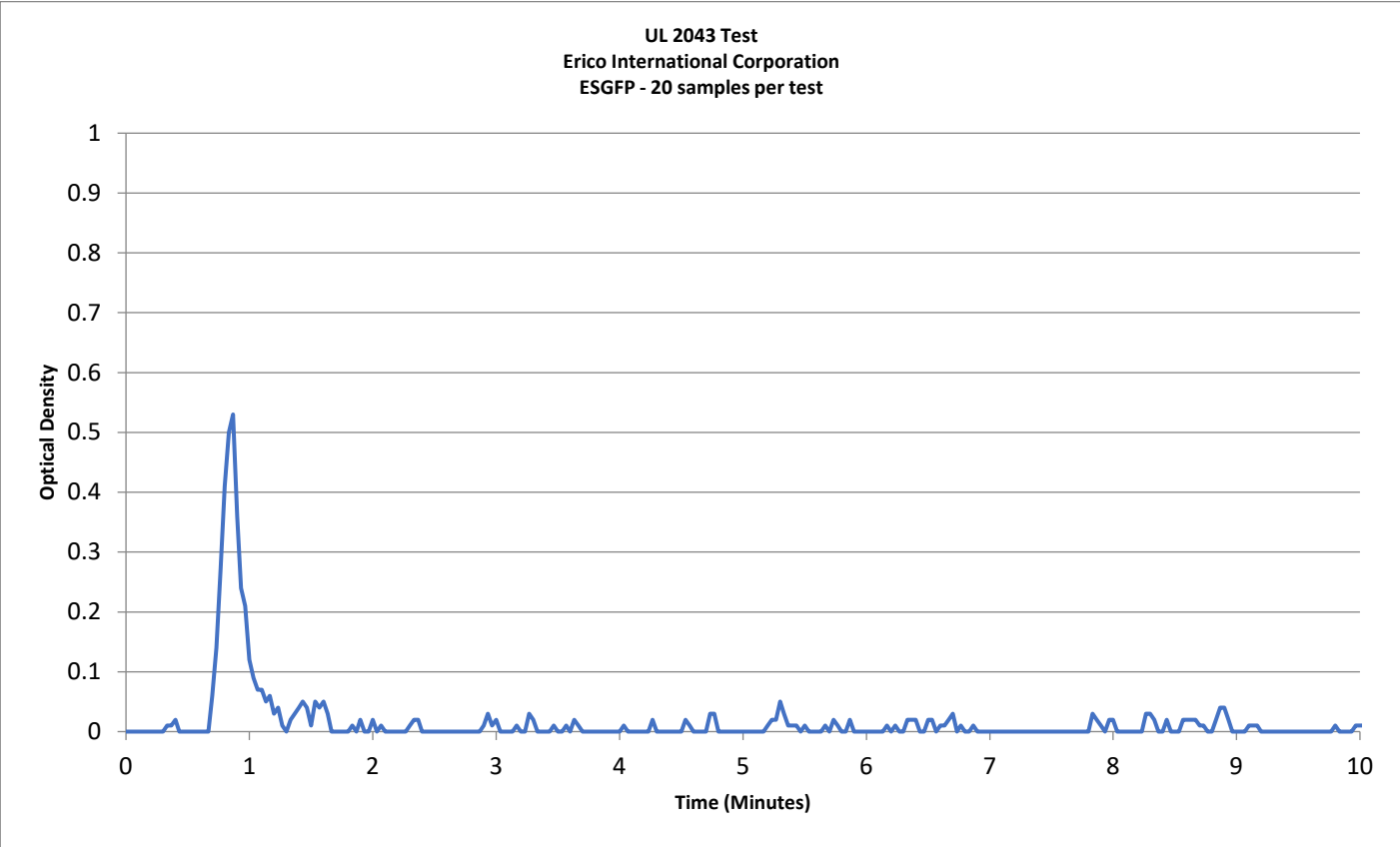
UL 2043 Test
Erico International Corporation
ESGFP - 20 samples per test



Test Number	Test Code	Description	Peak Heat Release Rate (kW)
A-2	03092004	ESGFP - 20 samples per test	70

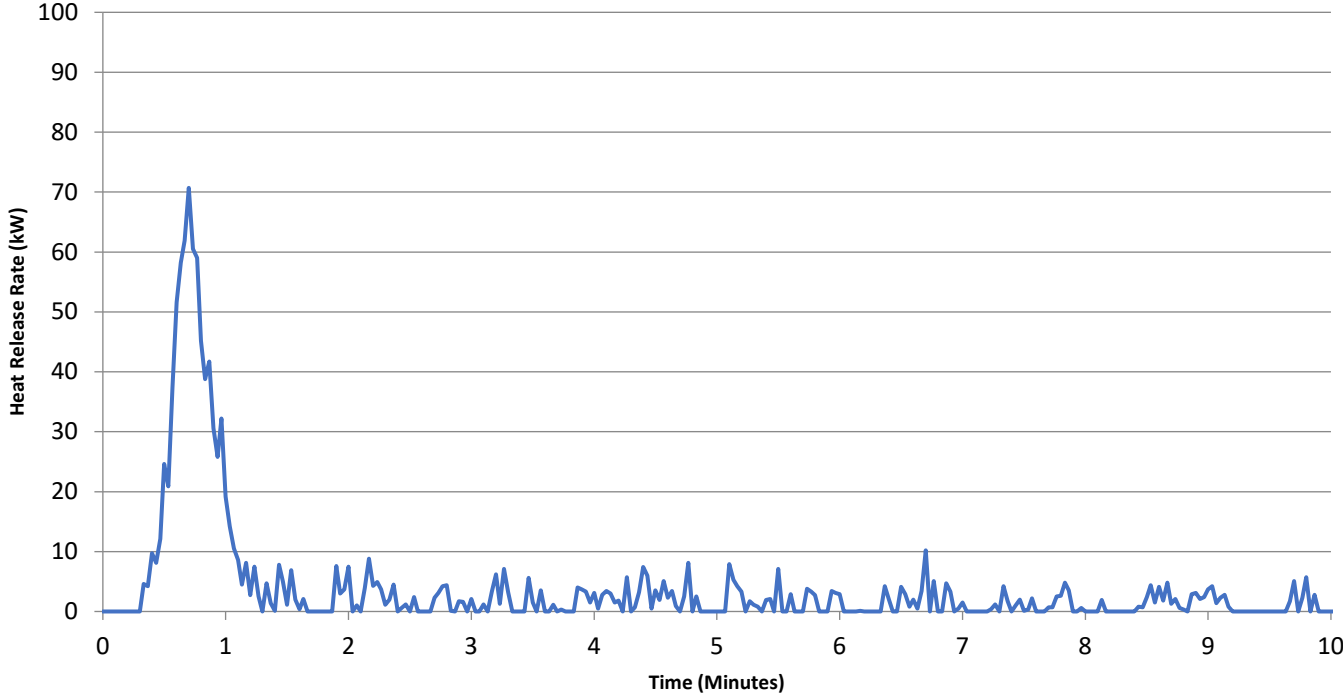


Test Number	Test Code	Description	Peak Smoke Release Rate (m²/s)	Total Smoke Released (m²)
A-2	03092004	ESGFP - 20 samples per test	0.21	4.7

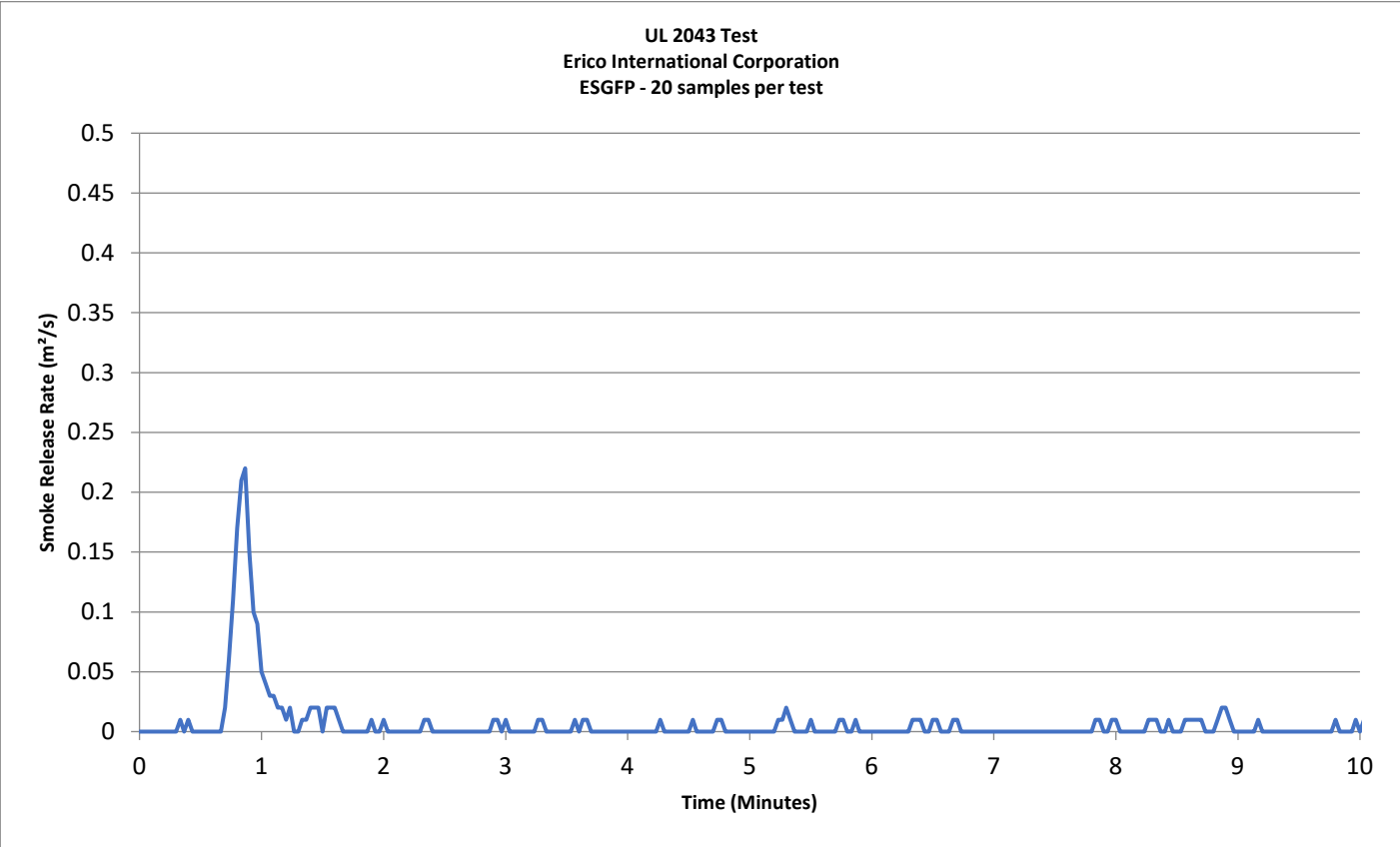


Test Number	Test Code	Description	Peak Normalized Optical Density	Average Normalized Optical Density
A-3	03092005	ESGFP - 20 samples per test	0.53	0.01

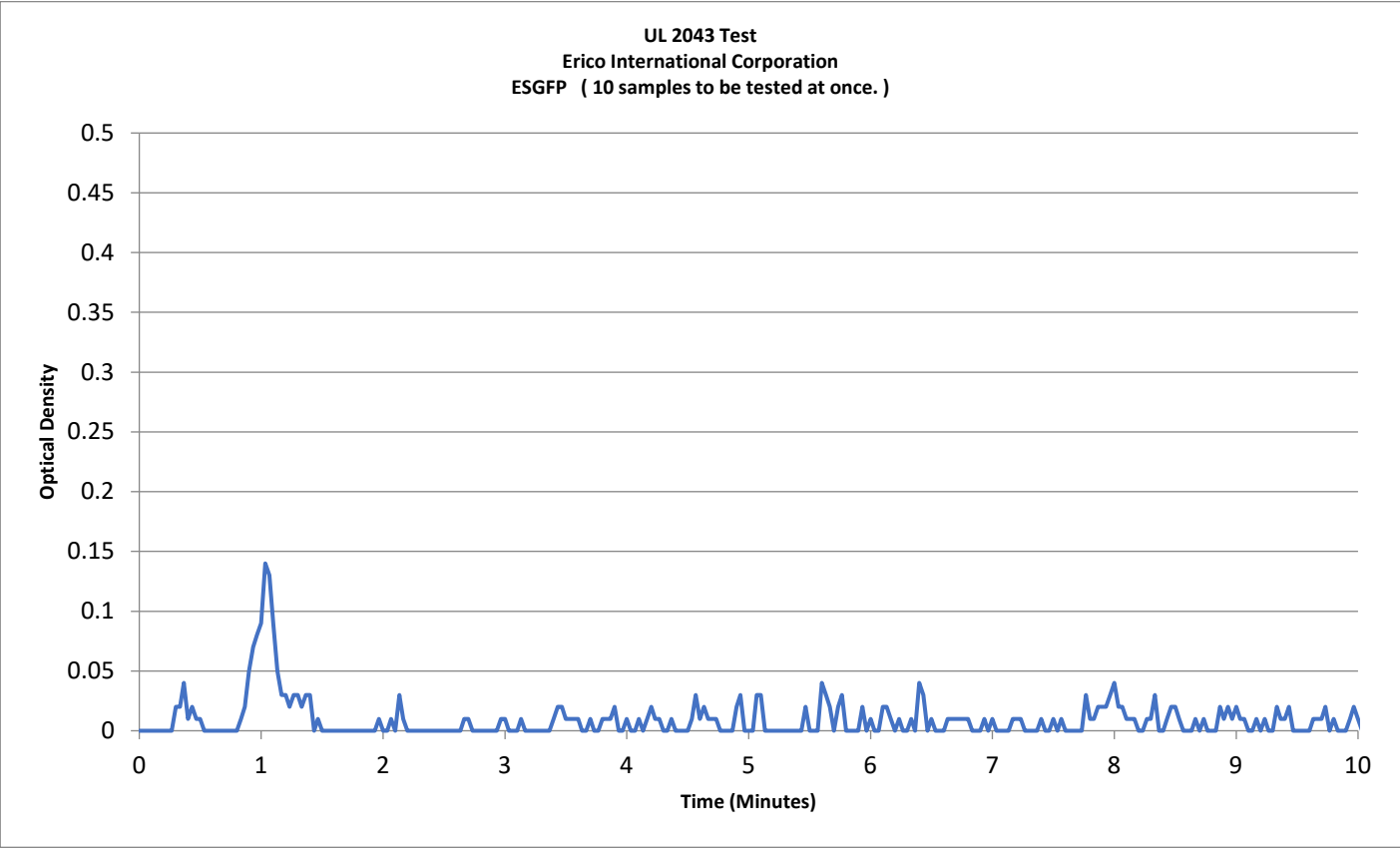
UL 2043 Test
Erico International Corporation
ESGFP - 20 samples per test



Test Number	Test Code	Description	Peak Heat Release Rate (kW)
A-3	03092005	ESGFP - 20 samples per test	71

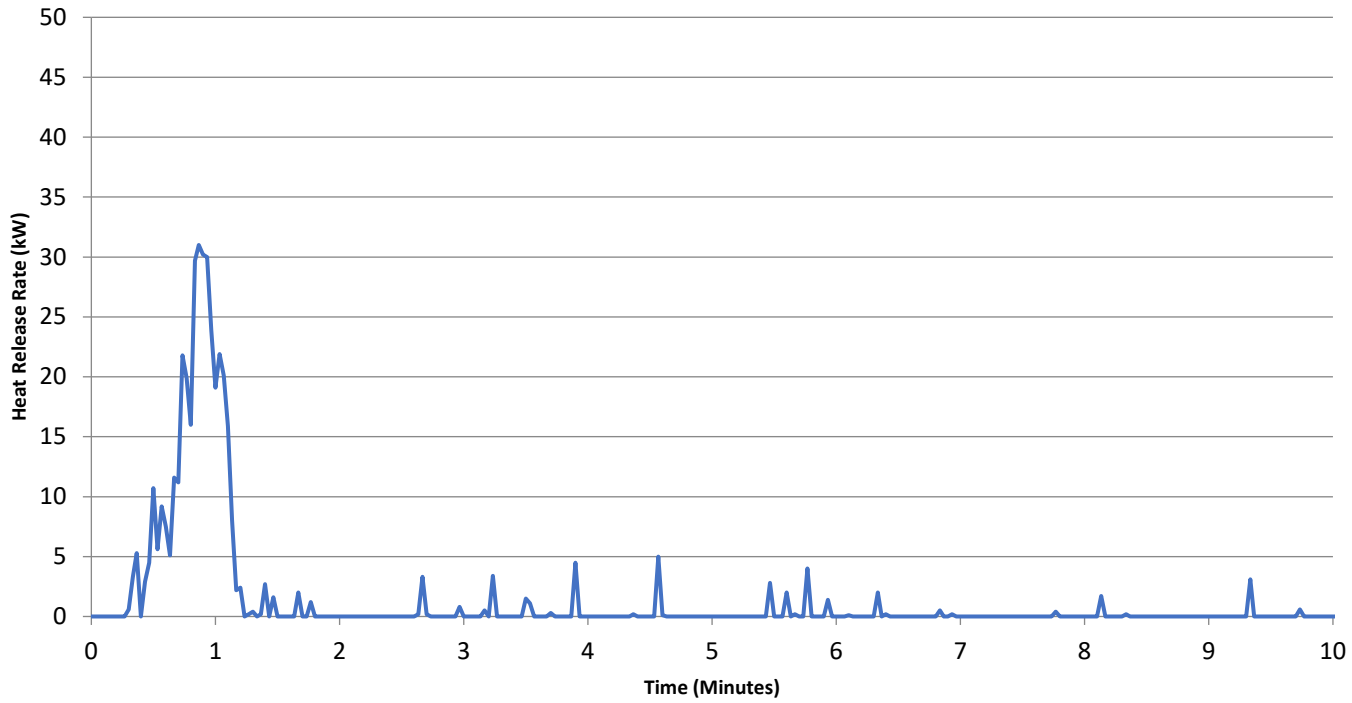


Test Number	Test Code	Description	Peak Smoke Release Rate (m²/s)	Total Smoke Released (m²)
A-3	03092005	ESGFP - 20 samples per test	0.22	4.2



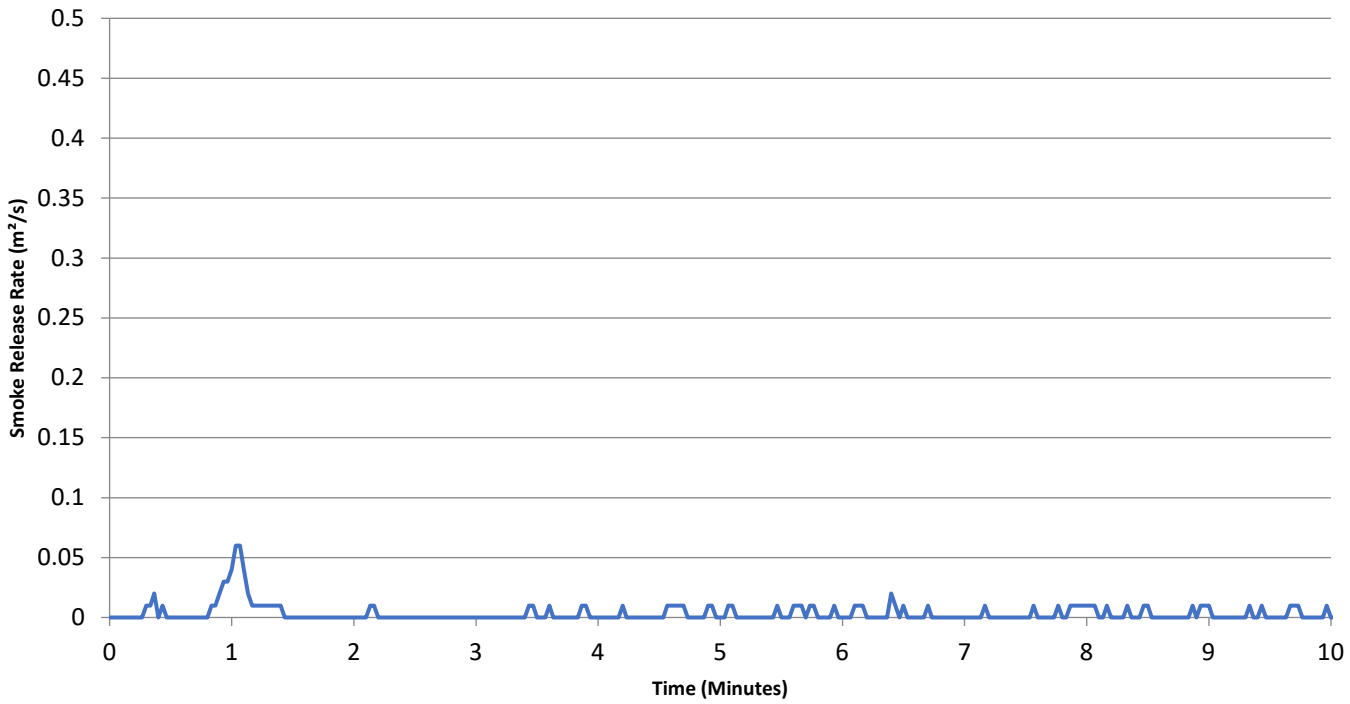
Test Number	Test Code	Description	Peak Normalized Optical Density	Average Normalized Optical Density
A-4	04032003	ESGFP - 10 samples per test	0.14	0.00

UL 2043 Test
Erico International Corporation
ESGFP (10 samples to be tested at once.)



Test Number	Test Code	Description	Peak Heat Release Rate (kW)
A-4	04032003	ESGFP - 10 samples per test	31

UL 2043 Test
Erico International Corporation
ESGFP (10 samples to be tested at once.)



Test Number	Test Code	Description	Peak Smoke Release Rate (m ² /s)	Total Smoke Released (m ²)
A-4	04032003	ESGFP - 10 samples per test	0.06	2.4