



Element Materials
Technology

2475 Speers Road,
Oakville, ON
Canada, L6L 2X9

P: 1 905 822 4111

info.toronto.industrials@element.com
m
element.com

**EVALUATION OF “QUICK SHIELD”
MEDIUM – DENSITY CLOSED CELL POLYURETHANE FOAM
FOR PHYSICAL PROPERTIES
IN ACCORDANCE WITH ABAA TEST SPECIFICATION**

Report to: **SWD Urethane**
540 S Drew St. Mesa,
Arizona 85210
USA

Attention: **Yaroslav Barchyshyn,**
Director, Technology and R&D

Telephone: 216 253-8356
Email: Yaroslav.Barchyshyn@swdurethane.com

Proposal No.: 25-006-665694

Report No.: 25-06-P0044
5 Pages, 4 Appendices

Date: February 26, 2026



1.0 INTRODUCTION

At the request of *SWD Urethane*, Element was retained to evaluate a sprayed polyurethane foam material in accordance with ABAA test specification, Section 5.6 for physical properties, described in Procedure Section 2.0 of this report.

Upon receipt, the sample was assigned the following Element Sample No.:

Client Sample Identification ¹	Element Sample No.
Quick-Shield Medium- Density Closed Cell Polyurethane Foam	25-06-P0044

2.0 PROCEDURE

The **ABAA, Section 5.6**, "Standards for Medium Density Spray Polyurethane foam materials." were used to evaluate the material:

Test Description	Test Method ²
Air Permeance	Section 5.6 referencing ASTM E2178-21a ¹
Flame Spread Characteristics	Section 5.6 referencing ASTM E-84-24 ¹
Water Vapor Transmission	Section 5.6 referencing E96/E96M-24a
Thermal Transmission Properties	Section 5.6 referencing ASTM C518-21
Compressive Strength	Section 5.6 referencing ASTM D1621-16(2012) ¹
Density	Section 5.6 referencing ASTM D1622-20 ¹
Tensile Strength	Section 5.6 referencing ASTM D1623-17(2023) ¹
Dimensional Stability	Section 5.6, referencing ASTM D2126-20 ¹
Water Absorption	Section 5.6, referencing ASTM D2842-25
Open Cell Content	Section 5.6 referencing ASTM D6226-21 ¹
Pull Adhesion	Section 5.6 referencing ASTM D4541-22 ¹
Crack Bridging	Section 5.6 referencing ASTM C1305/C1305M-25
Fungi Resistance	ASTM C1338-25 ³
Hydrostatic Pressure Test	AATCC TM 127(Modified)- added request from client

Notes:

1. Sample Information or data provided by the client can affect the validity if the results
2. This test method is included in the Element Toronto ISO 17025 Scope of Accreditation under A2LA Certificate. No. 6524.02, revised on 01/16/2025
3. This test Method is included in the MicroStar Lab Scope of Accreditation, testing certificate #2832.01



3.0 RESULTS

A summary of the test results is presented in Table 1, below.. Details of the test procedures and results are outlined in the corresponding appendices. SI units are the primary unit of measurement.

Table 1 - Physical Properties Summary <i>Element Sample No: 25-06-P0044 – Quick Shield Medium SPF</i> ABAA: Section 5.6			
Properties	Requirements	Results	Comments
Air Permeance	Max. 0.02 L.s.m ² at 75 Pa pressure differential [Max 0.004 cfm/ft ² at a Pressure differential of 75 Pa [1.57 psf]]	0.0105 L.s./m ² [0.0021(cfm/ft ²)]	See Appendix B1. Passed
Flame Spread	Maximum 75	15	See Appendix C. Passed
Water Vapor Transmission Water Method: Desiccant Method:	Report US perm of material at 1 inch thick	Water Method: 85 ng/Pa.sm ² (1.5 US Perm) Desiccant Method: 61 ng/Pa.sm ² (1.1 US Perm)	See Appendix B2. Passed
Thermal Resistance (R),	2.30 m ² .K/W at 52mm thickness 13.06 °F.ft ² .h/Btu at 2.05inch thickness		See Appendix B3
Compressive Strength	Minimum 104 kPa 15 psi	239 kPa (34.7psi)	See Appendix B4. Passed
Density	Minimum 28 kg/m ³ [1.75 lb/ft ³]	41.38 kg/m ³ [2.58 lb/ft ³]	See Appendix B5. Passed
Tensile Strength	Minimum 138 kPa [20 psi]	323 kPa [46.8 psi]	See Appendix B6. Passed



Table 1 continued:

Properties	Requirements	Results	Comments
Dimensional Stability -20°C, Ambient RH 70°C, 97±3% RH 80°C	Maximum -4% +8% +15	-1.8% 0.5% -11.3	See Appendix B7. Passed
Water Absorption Procedure A	Maximum 4%	1.24 %	See Appendix B8. Passed
Open cell Content	Maximum 10%	2.6%	See Appendix B9. Passed
Pull Adhesion	Cement Board 700 psi Dry wall 463 psi OSB 295 psi	Min 110 kPa Min 16psi	See Appendix B10 Passed
Crack Bridging	-26C [-15°F]	Passed (No Cracks)	See Appendix B11
Fungi Resistance	No growth	No growth	See Appendix D. Passed
Hydrostatic Pressure	No Leakage after 5 hours at 55cm water head	No Leakage after 5 hours at 55cm water head	Passed See Appendix B12



4.0 CONCLUSION

The medium density closed cell SPF material submitted by SWD Urethane, identified as "Quick Shield", meets the "Pass" requirement for Air Barrier Association of America Medium density closed cell Sprayed Polyurethane Foam, when tested as described in this report.

5.0 REVISION HISTORY

Date:	Revision:	Comments:
2026-02-26	Original Document	N/A

Reported by:

Handwritten signature of Joy Obande in blue ink.

Joy Obande,
P. +1 (289)- 633-7044
Lead Technologist
Building Products Testing

Approved by:

Handwritten signature of Rubaiyat Khondker in blue ink.

Rubaiyat Khondker, P.Eng.
P. +1 (289)-633-2580
Technical Manager
Building Science

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APPENDIX A

(9 Pages)

Sampling Report



Element Materials Technology
2475 Speers Road,
Oakville, ON
Canada, L6L 2X9

P: 1 905 822 4111
info.toronto.industrials@element.com
element.com



"QUICK-SHIELD" Medium-Density Closed Cell Polyurethane Foam Spraying Report

SWD URETHANE
540 S Drew St. Mesa,
Arizona 85210
USA

Report No.: 24-06-P0044 (spraying)
Date: 2025-10-13
Proposal No.: 25-006-665694

Report to: **Paul Warren**, Building Science and Technology Manager
Tel: +1 800 828 1394 ext 221
E-mail: paul.warren@swdurethane.com

Cc: Yaroslav Barchyshyn
Tel: +1 216 235 8356
Yaroslav.Barchyshyn@swdurethane.com

The ISO and Resin drums used for the "Quick-Shield" medium-density closed cell polyurethane foam product spraying was shipped to Element facility and sprayed on appropriate substrates for CAN/ULC S711.1-2019 (R2023) test specimens preparation.

The drums were witnessed and selected by UL representative under the **Project number: G106198537**, dated May 13, 2025. The above referenced UL report is attached at the end of this Element spraying report.

SWD Urethane authorized personnel sprayed the "Quick-Shield" material at Element Oakville facility on July 08, 2025

The received drums, spraying activity and prepared test specimens photos are shown in photos 1-12 in this report.

Table 1 – Detailed Information – Resin (B component)	
Element Sample No.: 25-06-P0044	
Client Sample Name	Quick-Shield Yeti (Low GWP Spray Foam)
Manufacturing Date	May 07, 2025
Color	Clear with slight yellow tint
Part number	6741200-55-490
Batch / Lot #	32776
Type of Material	
Weight	490 lbs
Markings	See photo 1 and 2



Table 2 – Detailed Information – ISO (A component) Element Sample No.: 24-06-B0080	
Client Sample Name	Quick-Shield 500 LB (Isocyanate for Polyurethane Systems)
Manufacturing Date	October 22, 2024
Color	
Part number	3945000-55-500
Batch / Lot #	0224101778
Type of Material	
Weight	500 lbss
Markings	See photo 3 and 4

Element Witness

Witnessing Information	
Contact	<p>Paul Warren, Building Science and Technology Manager Tel: +1 800 828 1394 ext 221 E-mail: paul.warren@swdurethane.com</p> <p>Cc: Yaroslav Barchyshyn Tel: +1 216 235 8356 Yaroslav.Barchyshyn@swdurethane.com</p>
Location of Spraying	<p>Element Materials Technology 2475 Speers Road., Oakville, Ontario, L6L 2X9, Canada</p>
Element Technical Representative (spraying)	<p>Mark Balonzo C.E.T. Lead Technologist Building Products Product Testing Group, Building Science Element Materials Technology Tel: +1 4168958996 E-mail: mark.balonzo@element.com</p> <p>Joy Obande Lead Technologist Building Products Product Testing Group, Building Science Element Materials Technology Tel: + 289 6337044 E-mail: joy.obande@element.com</p> <p>Jacob Willock Building System Test Technologist Building System Group, Building Science Element Materials Technology Tel: +1 289 633 6489 E-mail: Jacob.willock@element.com</p>
Element Signature	



Photo 1: Resin – drum – Part B – identified as Quick-Shield Yeti (Low GWP Spray Foam)



Photo 2 - Part B – identified as Quick-Shield Yeti was selected by Intertek Representative



Photo 3: Resin – drum – Part B – Quick-Shield 500 LB (Isocyanate for Polyurethane Systems)

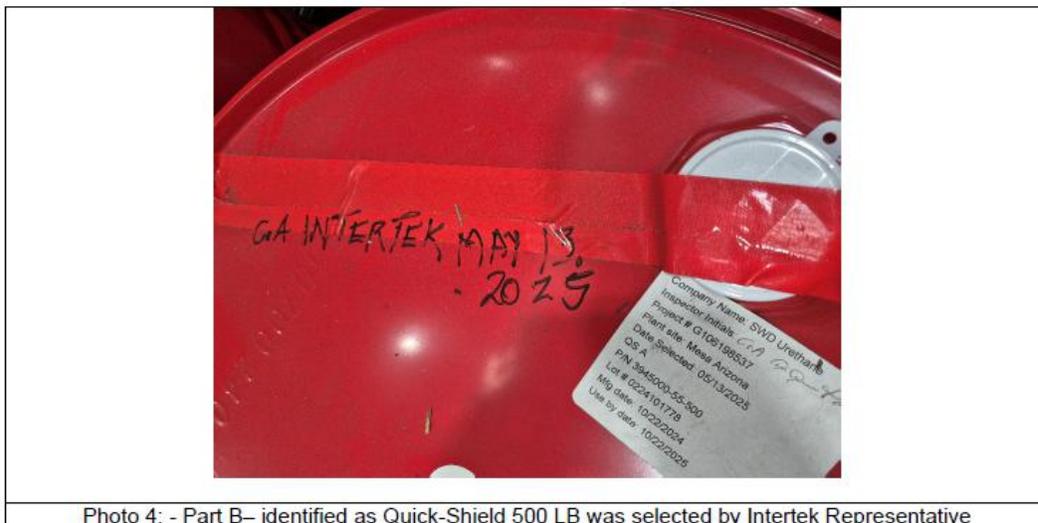


Photo 4: - Part B– identified as Quick-Shield 500 LB was selected by Intertek Representative





Photo 7: Sprayed sample for Air permeance (July 08, 2025)

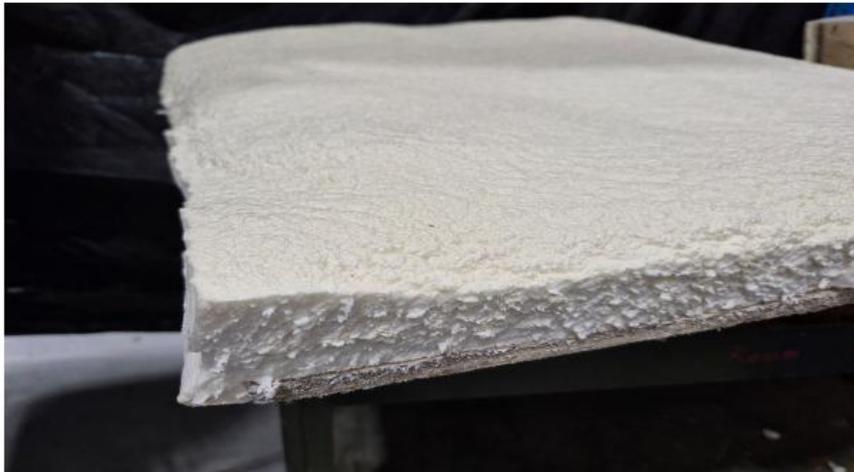


Photo 8: Sprayed sample on top of concrete block for Tensile (July 08, 2025)



Photo 9: Sprayed sample on top of concrete block for Tensile (July 08, 2025)



Photo 10: Sprayed sample on cement board for fire testing (July 8, 2025)



Photo 11: Spray truck to prepare and mix the drum (July 08, 2025)



Photo 10: Parameters during the mixing

APPENDIX B

Detailed Test Procedure and Results

(11 Pages)



B1 Air Permeance

Test Description	Test Method
Standard Test Method for Determining Air Leakage Rate and Calculation of Air Permeance of Building Materials	ASTM E2178-21a

Test Equipment: Fluke Multimeter MII# B07906
 Micrometer, MII# B16974
 Manometer MII# P00209
 Mass Flow Meter MII# P00108

Air Permeance Test Results in Accordance with ASTM E2178-21a Element Sample No.: 25-06-P0044-AP1 Measured Thickness: 50.8mm		
Differential Pressure	Calculated Air Flow	Calculated Air Flow
Pa	(L/s·m ²)	(cfm/ft ²)
25	0.0034	0.0007
50	0.0054	0.0011
75	0.0070	0.0014
100	0.0085	0.0017
150	0.0112	0.0022
300	0.0178	0.0036
100	0.0090	0.0018
75	0.0074	0.0015
50	0.0057	0.0011



Air Permeance Test Results in Accordance with ASTM E2178-21a Element Sample No.: 25-06-P0044-AP2 Measured Thickness: 53.2 mm		
Differential Pressure	Calculated Air Flow	Calculated Air Flow
Pa	(L/s·m ²)	(cfm/ft ²)
25	0.0041	0.0008
50	0.0062	0.0012
75	0.0078	0.0016
100	0.0092	0.0018
150	0.0116	0.0023
300	0.0173	0.0035
100	0.0095	0.0019
75	0.0077	0.0016
50	0.0058	0.0012

Air Permeance Test Results in Accordance with ASTM E2178-21a Element Sample No.: 25-06-P0044-AP3 Measured Thickness: 60.9 mm		
Differential Pressure	Calculated Air Flow	Calculated Air Flow
Pa	(L/s·m ²)	(cfm/ft ²)
25	0.0054	0.0011
50	0.0080	0.0016
75	0.0101	0.0020
100	0.0118	0.0024
150	0.0148	0.0030
300	0.0218	0.0044
100	0.0123	0.0025
75	0.0108	0.0022
50	0.0090	0.0018

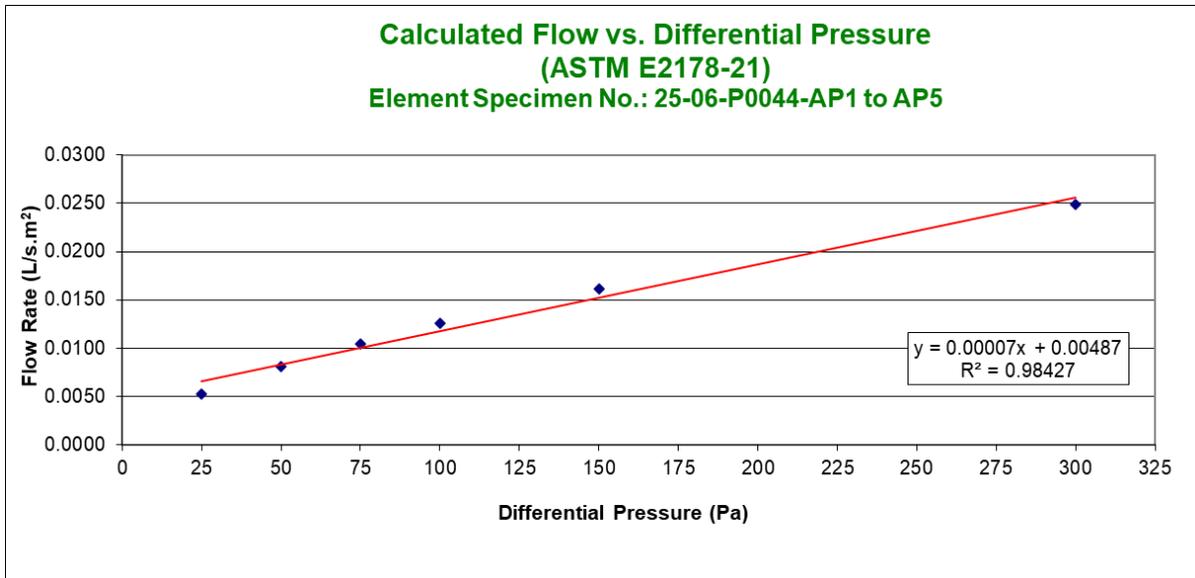


Air Permeance Test Results in Accordance with ASTM E2178-21a Element Sample No.: 25-06-P0044-AP4 Measured Thickness: 58.4 mm		
Differential Pressure	Calculated Air Flow	Calculated Air Flow
Pa	(L/s·m ²)	(cfm/ft ²)
25	0.0049	0.0010
50	0.0073	0.0015
75	0.0091	0.0018
100	0.0107	0.0021
150	0.0134	0.0027
300	0.0196	0.0039
100	0.0107	0.0021
75	0.0091	0.0018
50	0.0073	0.0015

Air Permeance Test Results in Accordance with ASTM E2178-21a Element Sample No.: 25-06-P0044-AP5 Measured Thickness: 62.23mm		
Differential Pressure	Calculated Air Flow	Calculated Air Flow
Pa	(L/s·m ²)	(cfm/ft ²)
25	0.0087	0.0017
50	0.0140	0.0028
75	0.0185	0.0037
100	0.0225	0.0045
150	0.0297	0.0060
300	0.0478	0.0096
100	0.0217	0.0044
75	0.0183	0.0037
50	0.0143	0.0029



Air Permeance Test Result in Accordance with ASTM E2178-21a Element Sample No.: 25-06-P0044-(average of 5 specimens) Average Thickness: 57.12 mm		
Differential Pressure	Calculated Air Flow	Calculated Air Flow
Pa	(L/s·m ²)	(cfm/ft ²)
25	0.0053	0.0011
50	0.0082	0.0016
75	0.0105	0.0021
100	0.0125	0.0025
150	0.0161	0.0032
300	0.0249	0.0050
100	0.0126	0.0025
75	0.0107	0.0021
50	0.0084	0.0017





B 2 Water Vapor Permeance

Test Description	Test Method
Standard Test Methods for Water Vapor Transmission of Materials	ASTM E96/E96M-24a

B2.1 Method: **Water**
 Sealant: 60% Microcrystalline Wax; 40% Refined Crystalline Paraffin Wax
 Tray Type: Stainless Steel
 Test Area: 0.0645 m²
 Pre-Conditioning: >88 hours at 23 ± 2°C; 50 ± 5% RH
 Test Conditions: 23 ± 2°C; 50 ± 2% Relative Humidity

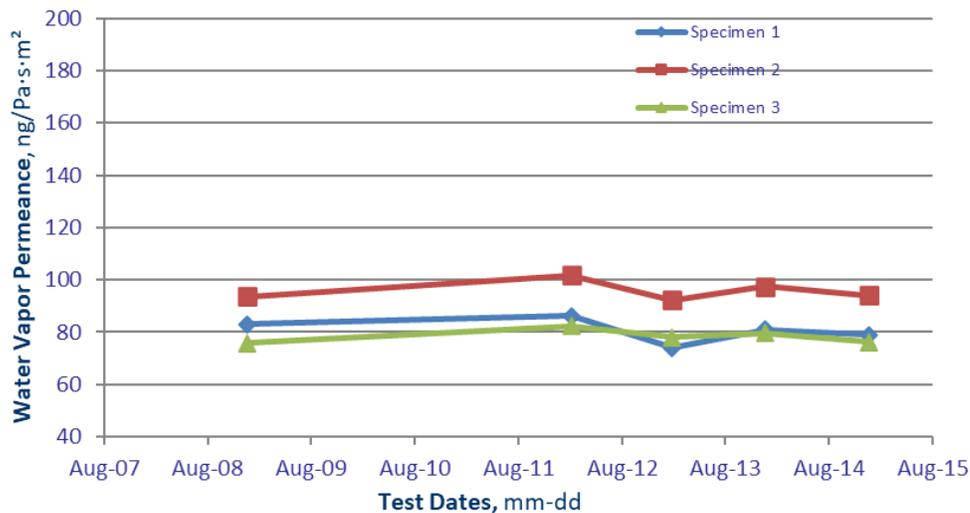
Equipment: Digital Balance, MII# B17286
 Digital Callipers, MII# B10643
 Environmental Controller MII# P00209

Thickness: 28.93 mm (average of four specimens)

Test Dates: 2025-08-07 to 2025-08-14

Summary of Water Vapor Permeance Results					
ASTM E 96/E 96M – 24a- Water Method					
Element Sample No: 25-06-P0044- Water Method					
Specimen No.	Initial Mass, (g)	Final Mass, (g)	Mass Gain, (g)	Water Vapor Permeance, (ng/Pa·s·m ²)	Water Vapor Permeance, (grain/h·ft ² ·inchHg)
1	2862.89	2867.35	4.46	81	1.4
2	2686.42	2691.64	5.22	96	1.7
3	2244.59	2248.84	4.25	78	1.4
Average	2597.97	2602.61	4.64	85	1.5

ASTM E96/E96M "Water Vapor Permeance"





B2.2 Method: **Desiccant** (granulated CaCl₂)
 Sealant: 60% Microcrystalline Wax; 40% Refined Crystalline Paraffin Wax
 Tray Type: Stainless Steel
 Test Area: 0.0645 m²
 Pre-Conditioning: >88 hours at 23 ± 2°C; 50 ± 5% RH
 Test Conditions: 23 ± 2°C; 50 ± 2% Relative Humidity

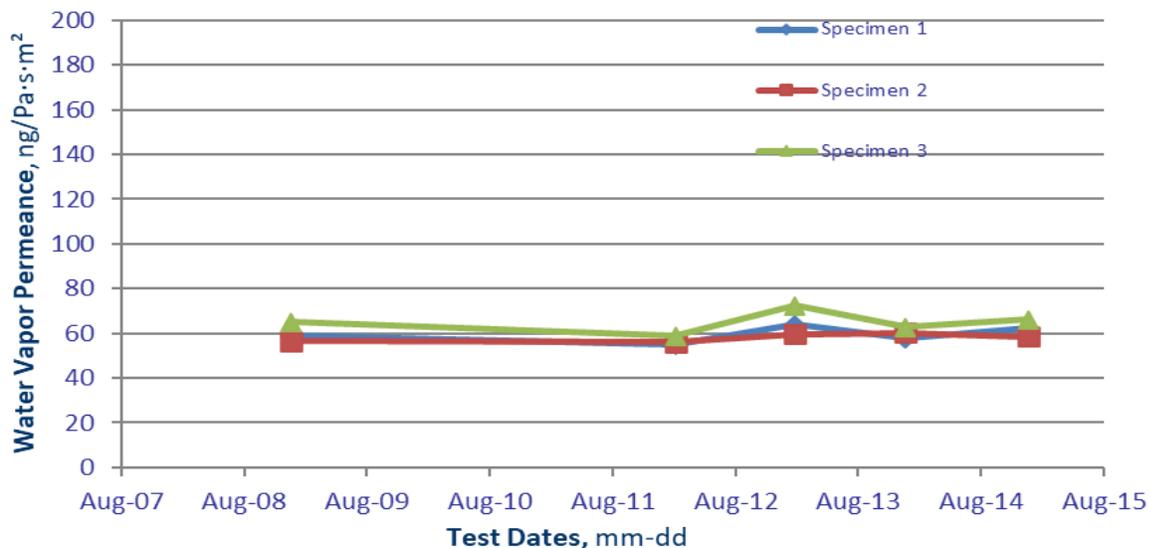
Equipment: Digital Balance, MII# B17286
 Digital Callipers, MII# B10643
 Environmental Controller MII# P00209

Thickness: 28.61 mm (average of four specimens)

Test Dates: 2025-08-07 to 2025-08-15

Summary of Water Vapor Permeance Results ASTM E 96/E 96M – 24a- Desiccant Method Element Sample No: 25-06-P0044- Desiccant Method					
Specimen No.	Initial Mass, (g)	Final Mass, (g)	Mass Gain, (g)	Water Vapor Permeance, (ng/Pa·s·m ²)	Water Vapor Permeance, (grain/h·ft ² ·inch Hg)
1	3633.34	3636.59	3.25	60	1.0
2	3818.91	3822.07	3.16	58	1.0
3	3795.90	3799.46	3.56	65	1.1
Average	3749.38	3752.71	3.32	61	1.1

ASTM E96/E96M "Water Vapor Permeance"





B3 Thermal Resistance

Conditioning: > 40 hours at 23°C and 50% RH

Equipment: Laser Comp Fox 314 Heat Flow Meter, MII B13096
Measuring Tape, MII# B13813
Digital Balance (0.01g), MII# B04630
Environmental Controller, MII# P00209

Test Conditions: Mean temperature 24°C
 $\Delta T = 22^\circ\text{C}$ across the sample

Test Date: 2025-07-16

Thermal Transmission Properties Applicable Standard: ASTM C518 – 21 Element Sample No.: 25-06-P0044 – Average of 3 runs				
Description	Results			
	Value	SI Units	Value	Imperial Units
Measured Length	297.70	mm	11.72	in
Measured Width	299.65	mm	11.80	in
Test Thickness	52.09	mm	2.05	in
Measured Mass	193.45	g	0.43	lb
Density	41.63	kg/m ³	2.60	lb/ft ³
Upper Surface Temperature	13.00	°C	55.4	°F
Lower Surface Temperature	35.00	°C	95.0	°F
Temperature Differential	22.00	°C	39.60	°F
Avg. Temperature Gradient	0.42	°C/mm	19.33	°F/in
Mean Temperature	24.00	°C	75.20	°F
Rate of Heat Flux	13.51	W/m ²	4.28	BTU/h·ft ²
Thermal Conductance	0.61	W/m ² ·K	0.11	BTU/h·ft ² ·°F
Thermal Resistance	2.30	K·m ² /W	13.06	°F·ft ² ·h/BTU
Thermal Conductivity	0.023	W/m·K	0.157	BTU·in/h·ft ² ·°F
Thermal Resistivity	44.13	K·m/W	6.37	°F·ft ² ·h/BTU·in



B.4 Compressive Strength

Project: 25-06-P0044
Client: SWD Urethane

ASTM D1621: Standard Test Method for Compressive Properties of Rigid Cellular Plastics

Operator: Joy Obande
Date: 6/9/2025
Test Method: ASTM D1621-16(2023)
Test Condition: 23 ± 2°C and 50 ± 5% RH

Test Equipment:

Instron® Frame: MII#B16315
Instron® Load Cell: MII# B16313
Calipers: MII# B10643
Conditioning Room: MII # P00209
Test Speed 5.2mm/min

Sample Details:

Sample ID	Specimen No.	Anvil Height	Width (mm)	Length (mm)	Compressive Load at 10% Strain	Compressive Stress at 10% Strain	Modulus
					(N)	kPa	
25-06-P0024	1	53.1	100.40	102.2	2471	241	4769
	2	52.3	99.4	101.35	2442	242	4735
	3	53.6	103.5	101.64	2551	243	4823
	4	52.9	100.5	99.7	2377	237	4606
	5	52.0	100.9	101.6	2382	232	4440
Average		52.8	100.9	101.3	2445	239	4675
Standard Deviation		0.66	1.53	0.97	71.61	4.53	154

B.5 Density

Dimensions

Dimensions: 100 mm (L) x 100 mm (W) x 50 mm (T) - nominal

Equipment: Digital Calipers, MII# B10643
Digital Balance, MII# B04639

Test Date: 2025-09-04

Mass & Density ASTM D1622-20 <i>Element Sample No: 25-06-P0044</i>					
Specimen No.	Mass, g	Length, mm	Width, mm	Thickness, mm	Density, kg/m ³
1	22.83	102.22	100.39	53.10	41.90
2	21.76	101.34	99.38	52.25	41.27
3	23.39	101.56	103.46	53.63	41.51
4	21.52	99.65	100.55	52.83	40.66
5	22.12	101.55	100.94	51.93	41.56
Average	22.32	101.26	100.95	52.88	41.38



B6 Tensile Strength

Project: 25-06-P0044
Client: SWD Urethane

**ASTM D1623: Standard Test Method for
Tensile and Tensile Adhesion Properties of Rigid Cellular**

Operator: Joy Obande
Date: 6/9/2025
Test Method: ASTM D1623-17(2023)
Test Condition: 23 ± 2°C and 50 ± 5% RH

Test Equipment:

Instron® Frame: MII#B16315
Instron® Load Cell: MII# B16313
Calipers: MII# B10643
Conditioning Room: MII # P00209
Test Speed 0.3 mm/min

Sample Details:

Sample ID	Specimen No.	Thickness (mm)	Width (mm)	Length (mm)	Maximum Load	Tensile Stress at Maximum Load	Elongation Maximum Load	Failure Mode
					(N)	kPa	%	
25-06-P0024	1	42.8	52.8	52.3	832	301	2.15	Failure of the foam core
	2	42.8	52.6	52.04	962	351	2.50	
	3	42.9	52.7	52.59	875	316	2.28	
Average		42.8	52.7	52.3	890	323	2.31	
Standard Deviation		0.06	0.08	0.28	66.2	25.7	0.2	



B7-Dimensional Stability

PROCEDURE

Five (5) specimens were tested per exposure condition. Sample prepared in mould.

Test Standard: ASTM D2126-25 (Sections 6.1, 6.2, 6.3, 6.4)

Specimen Dimensions: 305 mm x 305 mm x 61 mm (*nominal*)

No. of Specimens: Five (5)

Equipment: Mitutoyo Digital Calipers, MII# B10644
 Digital Balance, MII# B12518
 Freezer (reference only), MII# A11200
 Chamber (reference only), MII# A14219
 Thermocouple, MII# B13216
 Environmental Controller, MII# B14944

Pre-Conditioning: 23 ± 2°C; 50 ± 5% RH; 14 days

Pre-Conditioning Date: 2025-07-16 to 2025-07-30

Exposure: (1) -20°C for 28 days
 (2) 70 ± 2°C; 97 ± 3% RH; 28 days
 (3) 80 ± 2°C for 28 days

Test Dates: 2025-08-01 to 2025-08-29

RESULTS

A summary of the dimensional stability test results is shown in Tables below. The SI units are the primary unit of measure.

B7.1: Dimensional Stability (-20°C; Ambient Humidity)												
Applicable Standard: ASTM D2126-25												
Element Sample No.: 25-06-P0044												
Specimen	Length, mm		% Δ	Width, mm		% Δ	Thickness, mm		% Δ	Volume, cm ³		% Δ
	Initial	Final		Initial	Final		Initial	Final		Initial	Final	
1	101.88	102.13	0.25	102.19	102.61	0.40	50.07	50.21	0.28	521.3	526.1	0.9
2	103.24	103.56	0.23	102.56	102.74	0.17	49.19	49.03	-0.33	521.3	521.7	0.1
3	102.48	102.63	0.15	104.18	104.45	0.25	53.67	53.80	0.25	573.0	576.9	0.7
4	100.46	100.68	0.22	102.63	102.73	0.09	49.01	48.91	-0.21	505.3	505.8	0.1
5	102.12	102.20	0.08	102.00	102.12	0.12	48.11	48.31	0.43	501.1	504.2	0.6
Average	102.05	102.24	0.19	102.71	102.93	0.21	50.01	50.05	0.08	524.4	526.9	0.5
Std. Dev.	1.05	1.04	0.07	0.86	0.89	0.13	2.16	2.21	0.33	28.7	29.5	0.4



B 7.2: Dimensional Stability (70°C; 97 % Relative Humidity)

Applicable Standard: ASTM D2126-25

Element Sample No.: 25-06-P0044

Specimen	Length, mm		% Δ	Width, mm		% Δ	Thickness, mm		% Δ	Volume, cm ³		% Δ
	Initial	Final		Initial	Final		Initial	Final		Initial	Final	
1	103.94	96.49	-7.16	103.51	99.34	-4.02	49.22	49.10	-0.24	529.5	470.6	-11.1
2	104.11	95.18	-8.58	102.34	96.89	-5.33	48.52	49.39	1.79	517.0	455.5	-11.9
3	101.58	96.63	-4.87	102.11	96.03	-5.95	49.74	49.32	-0.84	515.9	457.7	-11.3
4	99.79	95.87	-3.93	103.29	97.62	-5.49	50.12	49.33	-1.58	516.6	461.6	-10.6
5	103.66	97.32	-6.12	102.24	96.53	-5.58	49.45	49.33	-0.25	524.1	463.4	-11.6
Average	102.62	96.30	-6.13	102.70	97.28	-5.28	49.41	49.29	-0.22	520.6	461.8	-11.3
Std. Dev.	1.88	0.81	1.84	0.65	1.29	0.74	0.60	0.11	1.25	6.0	5.9	0.5

B7.3: Dimensional Stability (80°C; Ambient Humidity)

Applicable Standard: ASTM D2126-25

Element Sample No.: 25-06-P0044

Specimen	Length, mm		% Δ	Width, mm		% Δ	Thickness, mm		% Δ	Volume, cm ³		% Δ
	Initial	Final		Initial	Final		Initial	Final		Initial	Final	
1	100.33	98.81	-1.52	100.65	96.89	-3.74	46.23	47.90	3.61	466.8	458.5	-1.8
2	99.18	97.55	-1.64	99.05	97.69	-1.37	46.83	47.28	0.95	460.1	450.5	-2.1
3	100.25	96.77	-3.47	100.50	98.73	-1.77	47.40	49.06	3.51	477.6	468.7	-1.9
4	98.75	97.31	-1.46	100.00	97.28	-2.72	46.80	47.91	2.36	462.2	453.6	-1.9
5	99.50	96.26	-3.26	99.00	97.79	-1.22	44.20	45.56	3.09	435.4	428.9	-1.5
	99.60	97.34	-2.27	99.84	97.67	-2.16	46.29	47.54	2.70	460.4	452.0	-1.80
	0.68	0.96	1.01	0.78	0.69	-1.05	1.24	1.28	1.09	15.5	14.7	0.2



B8 Water Absorption

The ASTM 2842, Procedure A, water absorption testing parameters summarized below were used.

Method:	The sample mass and dimensions were measured before and then immersed for 96 hours under the water. After 96 hours the samples were measured underwater by using underwater jig fixture and attached to the balance.	
Equipment:	Digital Scale	MII# B17286
	Digital Caliper	MII# B10643

Test date: August 15-19, 2025

B8: Water Absorption ASTM D2842-25, Procedure A Element Sample No.: 25-06-P0044						
No.	Specimen Dimensions after 96 hr Immersion				Density, kg/m ³	Surface Area (A), cm ²
	Length, mm	Width, mm	Thick., mm	Volume (V1), cm ³		
1	152.57	153.35	49.92	1167.96	40.88	757.49
2	150.83	151.32	47.21	1077.50	40.97	727.97
3	152.62	151.79	50.24	1163.87	41.83	750.75
4	149.91	151.43	50.61	1148.89	40.87	740.73
Avg.	151.48	151.97	49.50	1139.55	41.14	744.24
Std. Dev	1.33	0.94	1.55	42.2	0.46	12.85

No.	Specimen Dimensions After 96 hr Immersion				Water Absorption	
	True Volume (V2) ¹ , cm ³	Empty Jig (W2), g	Buoyancy (W3), g	Cond. Mass (W1), g	Volume %	per Surface Area, g/cm ²
1	1125.03	3123	2062	47.55	1.46	0.02
2	1039.14	3123	2144	43.93	1.56	0.02
3	1110.02	3123	2064	48.35	0.24	0.00
4	1103.37	3123	2085	46.68	1.69	0.03
Avg.	1094.39	3123	2088.75	46.63	1.24	0.02
Std. Dev	37.93	0.00	38.72	1.92	0.67	0.01

B9 Open Cell Content

Project: 25-06-P0044
SWD Urethane
Standard Test Method for Open Cell Content of Rigid Cellular Plastics

Title:	Open Cell Content - Cutting
Method:	ASTM D6226-21
Client:	SWD Urethane (South West Distributing Co.)
Sample Name:	Quick Shield SPF
Lot #:	N/A
Conditioning Room	MII # P00209

Equipment :	Pycnometer :
Pycnometer :	MI# A10423
Pycnometer Calibration Ball	MI#P00142
Caliper :	MI# B10643
Balance:	MI# A08458

ASTM D6226 - 21 Open Cell Content

REQUIREMENTS

Cutting into 8 pieces/cube required
2 cubes (1" x 1" x 1") for each analysis
three sets of two cubes per sample

ASTM D6226 -21 Open Cell Content - Cutting into 8 pieces				
	Rep 1	Rep 2	Rep 3	Average
Geometric Volume (cc)	33.34	32.00	32.79	-
Measured Volume Before Cutting (cc)	30.6633	30.0063	30.8492	-
Measured Volume After Cutting (cc)	29.1856	28.7101	29.5978	-
Open cell content (%)	3.60	2.18	2.11	2.63

Prepared by Joy Obande

Date: 7/23/2025



B10 Pull Adhesion

Project: 24-06-P0044
Client: SWD Urethane

**Standard Test Method for Pull-Off Strength of Coatings Using
Portable Adhesion Testers**

Operator: Joy Obande
 Date: 17/09/2025
 Method : ASTM D4541-22
 Test Condition: 23 ± 2°C and 50 ± 5% RH
Test Equipment:
 Positest Adhesion Tester MII# P00231
 Calipers: MII# B10643
 Conditioning Room: MII # P00155
Sample Details
 Description: See tables below
 Standard Disk Size 50mm (Diameter)

Sample Identification	Specimen No.	Area	Tensile Stress at Maximum Load	Tensile Stress at Maximum Load
		mm ²	kPa	psi
25-06-P0044-Cement Board	1	1963	3448	500
	2	1963	5516	800
	3	1963	4827	700
	4	1963	5516	800
Average		1963	4827	700
Standard Deviation		0.00	975	141

Sample Identification	Specimen No.	Area	Tensile Stress at Maximum Load	Tensile Stress at Maximum Load
		mm ²	kPa	psi
25-06-P0044-Dry wall	1	1963	3448	500
	2	1963	3448	500
	3	1963	3103	450
	4	1963	2758	400
Average		1963	3189	463
Standard Deviation		0.00	330	47.9

Sample Identification	Specimen No.	Area	Tensile Stress at Maximum Load	Tensile Stress at Maximum Load
		mm ²	kPa	psi
25-06-P0044-OSB	1	1963	1379	200
	2	1963	1724	250
	3	1963	2069	300
	4	1963	3310	480
Average		1963	2120	308
Standard Deviation		0.00	841	122



B.11 Gap Bridging

Test Method: ABAA T0004-2021

Sample prepared as per Section 9 of ABAA T0004-21 on 100mm x 50mm sized 304 stainless steel test plates with a gap of 4 mm (Class 3.)

Tested temperature; -26C (Type B)

Test specimens were subjected to ten cycle gap movements.

No. of Specimens: Five (5)

Equipment: Applied Testing System, Inc. Series 520 Sealing Compound Tester, MII# A15025
Thermocouple, MII# B13216
Envirotronics environmental chamber, MII# B17286

Pre Conditioning: 70°C for 7 days

Test Temperature: -26 °C ± 2°C

Test Cycles: 10 cycles

Rate: Extension or compression of the two cement supports at a rate 3.2 mm/h

Test duration: 10 cycles in 24 hours

Test Date: 2026-02-02 to 2026-02-03

A summary of results is presented below in Table 1.

Table B11 – Summary of Crack Bridging Test ABAA T00004-2021 Element Sample No.: 25-06-P0044				
Sample ID	Number of Exposed Specimen	Test parameters	Observation	Comments
Quick Shield SPF	5	10 cycles at -26°C	Observed after completion of test cycles for visible cracking, blistering, pinhole or other defects	No visible cracks were observed (5/5)



B.12 Hydrostaic Water Head Test

Method: AATCC 127

Test Date: 2025-08-08
Test Condition: 23°C
Apparatus: Plastic pipe to hold water column
Height of water column: 55cm

Duration: 5 hours
Thickness: 50mm (nominal)

Table B12: Summary of Water Resistance Test Results

Applicable Standard: AATCC 127
Element Sample No: 25-06-P0044

No.	Visual Observation	Comments
1	Water leakage	None / Passed
2	Water leakage	None / Passed
3	Water leakage	None / Passed

APPENDIX C

Flame Spread
Applicable Standard: ASTM E84-24

(4 Pages)



Element Materials Technology
2475 Speers Road
Oakville, ON
Canada, L6L 2X9

P: 1 905 822 4111
info.toronto.fire@element.com
element.com



ASTM E84 Surface Burning Characteristics of "Medium density closed cell spf"

A Report To: **SWD Urethane (Southwest Distributing Co.)**
540 S. Drew St.
Mesa, Arizona, 85210
USA

Phone: +1 216 235 8356

Attention: Yaroslav Barchyshyn
E-mail: yaroslav.barchyshyn@swdurethane.com

Submitted by: Element Fire Testing

Report No. 26-002-056
4 Pages

Date: February 11, 2026



Test Report No.: 26-002-056

ASTM E84 Testing of "Medium density closed cell spf"

For: SWD Urethane (Southwest Distributing Co.)

Page 2 of 4

1.0 ACCREDITATION

ISO/IEC 17025 for a defined Scope of Testing by the American Association for Laboratory Accreditation (A2LA),
Certificate Number: 6524.03.

2.0 SPECIFICATIONS OF ORDER

Determine the Flame Spread and Smoke Developed Indices based upon a single test conducted in accordance
with ASTM E84-24, as per Element Building Products Project No. 25-06-P0044, Element Work Order No.
006-10034 and Element Proposal No. 25-006-665694.

2.1 History of Revision

This is the original.

3.0 SAMPLE INFORMATION

Material Identification	"Medium density closed cell spf"
Supplied Material Description*	Polyurethane spray foam
Measured Material Thickness	4 inch (101.6 mm)
Date of Material Receipt	2025-07-09
Element Sample Identification No.	25-06-P0044
Test Date	2026-02-10

* The material description as supplied by the client. Element cannot always validate the accuracy of the description provided. If appreciable differences are observed between the material description and the specimen, test data may not be representative. Information or data supplied by the client can affect validity of results.

4.0 TEST PROCEDURE

The method, designated as ASTM E84-24 "Standard Method of Test for Surface Burning Characteristics of Building Materials", is designed to determine the relative surface burning characteristics of materials under specific test conditions, where the material under test is mounted so that it forms the ceiling of a horizontal fire tunnel. A specified airflow is introduced through the tunnel and a specified flame is applied to one end. Observations are then made regarding the rate of flame spread along the specimen. Results are expressed in terms of Flame Spread Index (FSI) and Smoke Developed Index (SDI). There is no established relationship between those two values.

Although the procedure is applicable to materials, products and assemblies used in building construction for development of comparative surface spread of flame data, the test results may not reflect the relative surface burning characteristics of tested materials under all building fire conditions.

5.0 SAMPLE PREPARATION

The material was applied (by client) to a cement board substrate at the Element facility. The test specimen consisted of a total of three prepared sections of a 2-component closed cell spray foam applied to a cement board, each measuring approximately 23 inches (584 mm) in width by 96 inches (2438 mm) in length. The sections were butted together end-to-end to create the total specimen length. Prior to testing, the specimen was conditioned to constant weight at a temperature of $73 \pm 5^\circ\text{F}$ ($23 \pm 3^\circ\text{C}$) and a relative humidity of $50 \pm 5\%$. At the time of test initiation, the specimen was self-supporting.

6.0 SUMMARY OF TEST PROCEDURE

The tunnel is preheated to $150 \pm 5^\circ\text{F}$ ($66 \pm 2.8^\circ\text{C}$), as measured by the floor-embedded thermocouple located 23.25 feet (7087 mm) downstream of the burner ports, and is allowed to cool to $105 \pm 5^\circ\text{F}$ ($40.5 \pm 2.8^\circ\text{C}$), as measured by the floor-embedded thermocouple located 13 feet (3962 mm) from the burners. The tunnel lid is then raised and the test specimen is placed along the ledges of the tunnel so as to form a continuous ceiling 24 feet (7315 mm) long,



Test Report No.: 26-002-056

ASTM E84 Testing of "Medium density closed cell spf"

For: SWD Urethane (Southwest Distributing Co.)

Page 3 of 4

approximately 12 inches (305 mm) above the floor. Three 96 inch (2438 mm) sections of 0.25 inch (6 mm) cement board are then placed on the back side of the specimen and the lid is then lowered into place. Upon ignition of the gas burners, the flame spread distance is observed and recorded every second. Flame spread distance versus time is plotted. Calculations ignore all flame front recessions and Flame Spread Index (FSI) is determined by calculating the total area under the curve for the test sample. If the area under the curve (A) is less than or equal to 97.5 min-ft, then $FSI = 0.515 \cdot A$; if greater, $FSI = 4900 / (195 - A)$. FSI is then rounded to the nearest multiple of 5.

Smoke Developed Index (SDI) is determined by dividing the total area under the obscuration curve by that established for liquid heptane, and multiplying by 100. SDI is then rounded to the nearest multiple of 5 if less than 200. SDI values over 200 are rounded to the nearest multiple of 50.

7.0 TEST RESULTS

SAMPLE: "Medium density closed cell spf"

Approx. Time to Ignition (s)	Maximum Flame Front Distance	Time to Maximum Flame Front (s)	Maximum Temperature (° F)	Flame Spread Index (FSI)	Smoke Developed Index (SDI)
5	(ft.): 3.0 (m): 0.91	88	487	15	450

7.1 Observations of Burning Characteristics

The material ignited approximately 5 seconds after exposure to the test burner flame.

8.0 INTERPRETATION OF RESULTS

Industry documents such as the International Building Code (IBC), NFPA 101 Life Safety Code, etc. refer to ASTM E84 (UL 723, NFPA 255) test results using the following material classification categories:

	Flame-Spread Index (FSI)	Smoke Developed Index (SDI)
Class 1 or Class A	0 - 25	450 Maximum
Class 2 or Class B	26 - 75	450 Maximum
Class 3 or Class C	76 - 200	450 Maximum
Tested Material Results Classification (if applicable):		Class 1 or Class A

Mateo Marra,
Technologist.

Ian Smith,
Technical Manager.

Notes: This report is related only to the sample identified and shall not be reproduced, except in full, without approval. It is covered under Element Materials Technology Canada Inc. Standard Terms and Conditions of Contract, which are accessible at www.element.com, or by calling 1-866-263-9268. ASTM E84 is a well-established test method that reports data in the form of indices. As such, MU cannot be calculated. In the reporting instructions, calculated values are rounded to the nearest multiple of 5 for FSI, and 5 or 50 for SDI, depending on the result. Since the rounding ranges establish precision and include potential uncertainty, by following the reporting instructions, the lab is considered to have satisfied the MU reporting requirements of ISO/IEC 17025.



Test Report No.: 26-002-056

ASTM E84 Testing of "Medium density closed cell spf"

For: SWD Urethane (Southwest Distributing Co.)

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9.0 TEST CHARTS

ASTM E84-24

Sample: "Medium density closed cell spf"

Chart 1. FLAME SPREAD

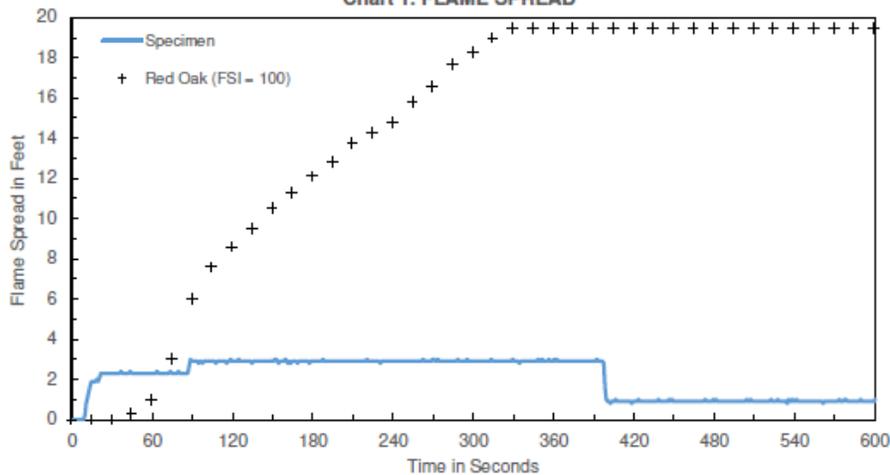
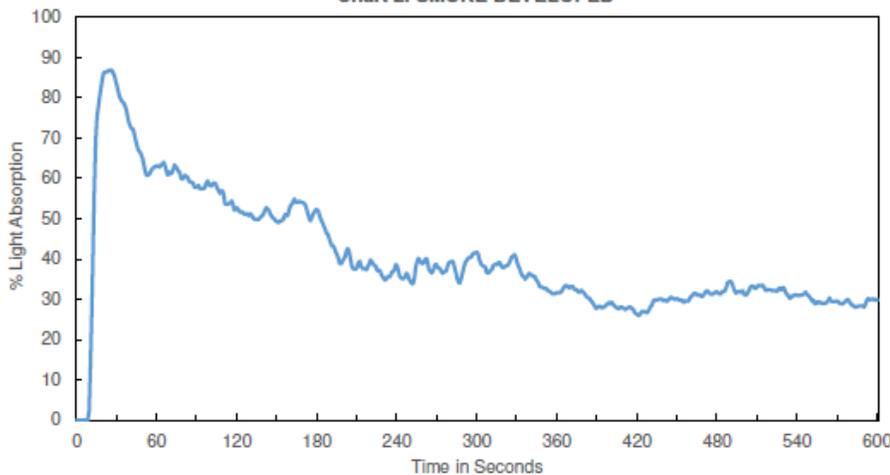


Chart 2. SMOKE DEVELOPED



Calculated Flame Spread (CFS)	Rounded Flame Spread Index (FSI)	Calculated Smoke Developed (CSD)	Rounded Smoke Developed Index (SDI)	Maximum 23' Air Temperature (°F)
14.7	15	448.2	450	487

APPENDIX D

Fungi Resistance

Applicable Standard: ASTM C1338-19 (2022)

(3 Pages)

ASTM C 1338-25

*Standard Test Method for Determining Fungi Resistance of
Insulation Materials and Facings*

FINAL REPORT: R2025-328

Prepared for:
Element Materials Technology
2475 Speers Road
Oakville, ON L6L 2X9, Canada

Accredited Testing Provided by:



130 Erick Street
Crystal Lake, IL 60014
815.526.0954
TESTING CERT: #2832.01

Testing Initiated: July 30, 2025
Testing Completed: August 27, 2025
Report Issued: September 4, 2025

Performed By: Agata Shulfer
Title: Senior Staff Scientist

Approved By: Debbie Koester
Title: Quality Manager



ASTM C1338
MICROSTAR LAB REPORT: R2025-328
ELEMENT MATERIALS TECHNOLOGY



Objective:

To determine the relative ability of one sample to resist fungal growth as seen in the ASTM C1338 – 25 fungal resistance test.

Test Sample Identification:

1. 25-06-P0044 – spray applied closed cell foam

Test Procedure Summary:

Test pieces are sprayed with a mixed spore suspension of five fungal strains. Inoculated samples were then placed into a chamber maintained at $30 \pm 2^\circ\text{C}$ and $95 \pm 4\%$ relative humidity for 28 days. At the end of the incubation period, samples were examined at 40X magnification.

Test Variables

Test Organisms:	<i>Aspergillus brasiliensis</i>	ATCC 9642
	<i>Talaromyces pinophilus</i>	ATCC 11797
	<i>Chaetomium globosum</i>	ATCC 6205
	<i>Aspergillus flavus</i>	ATCC 9643
	<i>Aspergillus versicolor</i>	ATCC 11730

Sample Description:	150mm x 150mm x 25mm foam pieces
Number of Replicates per Sample:	Five
Positive Growth Control:	Sterile Filter Paper White birch tongue depressor
Environmental Conditions:	$30 \pm 2^\circ\text{C}$; $95 \pm 4\%$ relative humidity
Incubation Duration:	28 days
Pass/Fail Criteria:	Growth or No Growth
Deviations from Standard Test Method:	Five replicates were tested



ASTM C1338
MICROSTAR LAB REPORT: R2025-328
ELEMENT MATERIALS TECHNOLOGY



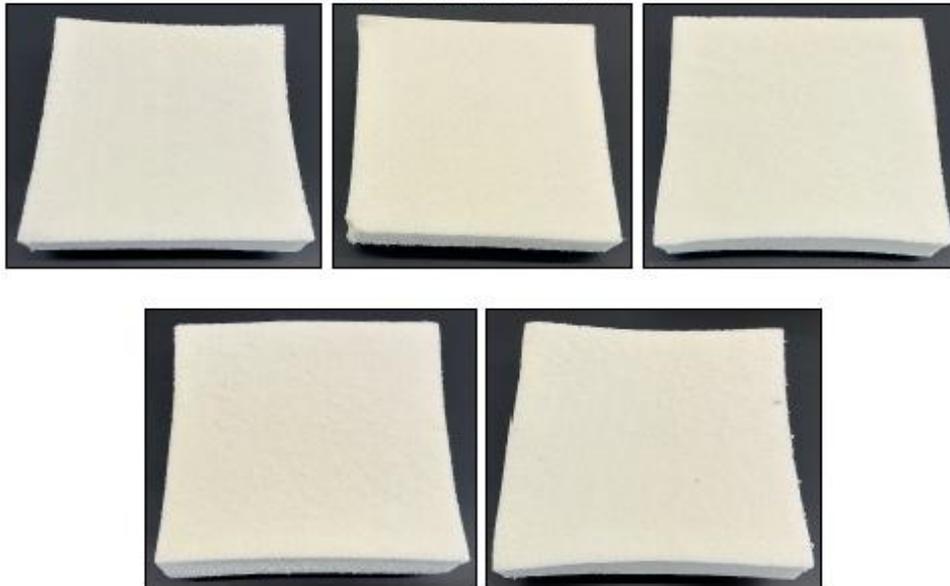
Results:

The results for the test pieces can be found in the data table below. Temperature and relative humidity were maintained for the duration of testing. The control test pieces performed as expected, confirming the validity of the test. These results pertain only to the samples tested.

The criterion used to determine Pass/Fail for this test was growth/no growth.

Sample	Rep	Results
25-06-P0044 – spray applied closed cell foam	1	Pass - No growth present - Confirmed at 40x magnification
	2	Pass - No growth present - Confirmed at 40x magnification
	3	Pass - No growth present - Confirmed at 40x magnification
	4	Pass - No growth present - Confirmed at 40x magnification
	5	Pass - No growth present - Confirmed at 40x magnification

Sample after removal from the test chamber



All replicates had no fungal growth that was confirmed at 40x magnification.