



# TEST REPORT

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**REPORT NUMBER:** 4186-26002 **PROJECT NUMBER:** 47720

**REPORT ISSUED:** April 24, 2026

**CLIENT:** **Monolith ICF** **Contact:** Kirk Tyler  
3969 South 500 West, Suite A **Contact:** Ben Snuffer  
Salt Lake City, UT 84123

**SUBJECT:** Physical Properties of Polypropylene Cross Ties

**CODE/STANDARD:** ICC-ES AC353 (24) Published April 2025 and ASTM E2634-18[2022]

**TEST DATE(S):** From February 18, 2025 to April 16, 2026

**CONCLUSION:** The Monolith ICF Polypropylene Cross Ties was tested for multiple physical properties in accordance with the referenced standards. The individual test results are shown in the tables below.

Prepared & Submitted By:

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Sanjay "Jay" Mishra  
Vice President of Building Product Testing

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*All testing and sample preparation for this report was performed under the continuous, direct supervision of IAPMO Institute of Building Technology (IBT), unless otherwise stated. The observations, test results and conclusions in this report apply only to the specific samples tested and are not indicative of the quality or performance of similar or identical products. The statement of compliance, if stated, is based on the test results compared to the standard specifications without considering measurement uncertainty. Only the Client shown above is authorized to copy or distribute the report, and then only in its entirety. Any use of the IAPMO IBT name for the sale or advertisement of the tested material, product or service must first be approved in writing by IAPMO IBT.*

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## APPENDIX

Universal Testing Machine (UTM) generated data sheets (17 pages)  
 IAPMO QCC Sample Selection Report (5 pages)  
 PRI Laboratories Ignition Properties, ASTM D1929 test report (2 pages)

## 1.0 Introduction

Tests listed in section 3 below were conducted on the Monolith ICF Polypropylene Cross Ties material in general accordance with ICC-ES AC353 (24) Published April 2025 and ASTM E2634-18 [R2022].

## 2.0 Test Specimens

The Monolith ICF Polypropylene Cross Ties and blocks were sampled by IAPMO Quality Control Consultants (QCC), Roswell, GA (ANAB/ ANSI ISO 17020:2012; Certificate #AI-2965. The sampling report can be found in the appendix.

Three boxes of Polypropylene Cross Ties were received at the IAPMO IBT test facility in Ontario, CA on January 20, 2026. All materials were received in good condition.

## 3.0 Test Program

### Referenced Standards

- ICC-ES AC353 (24) Published April 2025; *Acceptance Criteria for Stay-in-place, Foam Plastic Insulating Concrete Form (ICF) Systems for Solid Concrete Walls*
- ASTM E2634-18 [Reapproved 2022], *Standard Specification for Flat Wall Insulating Concrete Form (ICF) Systems*

<i>Test Description &amp; Standard</i>	<i>Results</i>	
Core Density, ASTM D1622	Tests on Monolith closed-cell polyurethane (PU) ICF material	
Heat Conditioning, 90 days @ 140 °F		
Thermal Resistance, ASTM C518. Post conditioned samples @ 75°F		
Compressive Strength, ASTM D1621		
Tensile Adhesion Properties of Rigid Cellular Plastics, ASTM D1623		
Dimensional Stability, ASTM D2126 [168 hours, 158 F, 97% RH]		
Dimensional Stability, ASTM D2126 [168 hours, -40 F, ambient RH]		
Breaking Load and Flexural Properties, ASTM C203		See IBT report 4186-26001
Water Vapor Permeability, ASTM E96, Desiccant Method		
Water Absorption of Core Materials, ASTM C272. 24-hour immersion		
Surface Burning Characteristics, ASTM E84		
Rate of Burning of Plastics, ASTM D635	Tests on Plastic ties	
Tensile Properties of Plastics, ASTM E2634 & ASTM D638		
Plastic cross tie shear strength, ASTM E2634 & ASTM D732		
Fasteners in Wood / Wood-Based Materials, ASTM D1761 [lateral]		This test report.
Fasteners in Wood / Wood-Based Materials, ASTM D1761 [withdrawal]		
Ignition Temperature of Plastics, ASTM D1929		

**Conditioning:** All samples were conditioned for a minimum of 40 hours at  $73.4 \pm 4$  °F ( $23 \pm 2$  °C) and  $50 \pm 5\%$  relative humidity unless otherwise specified in the individual standards. All tests were also conducted under the same environmental conditions unless the test method requirements differed from the environmental conditions noted above.

#### 4.0 Rate of Burning and/or Extent and Time of Burning, ASTM D635-22

Standard: ASTM D635-22; *Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position*

Samples: Ten (10) specimens 125 mm long x 13 mm wide. The samples were taken from the nailing flange of the plastic cross ties.

Equipment: Mitutoyo Caliper - 6" - with SPC output;

Environmental: The temperature and humidity at the time of testing was 73 °F and 48.5% relative humidity.

Calculation: Linear Burning Rate (V) = 60L / t where:  
 L = Burned length in millimeters  
 t = Time in seconds

Acceptance: When tested in the thickness intended for end use, the plastic shall have either a CC1 or CC2 classification, as defined in IBC Section 2606.4.

Definitions Class CC1: Plastic materials that have a burning extent of 1 inch (25 mm) or less where tested at a nominal thickness of 0.060 inch (1.5 mm), or in the thickness intended for use, in accordance with ASTM D635.

Class CC2: Plastic materials that have a burning rate of 2-1/2 inches per minute (1.06 mm/s) or less where tested at a nominal thickness of 0.060 inch (1.5 mm), or in the thickness intended for use, in accordance with ASTM D635.

Results: The average burning rate was 0.754 in/min. The material meets the CC2 classification of IBC Section 2606.4.

Sample No.	Thickness (mm)	Elapsed Time, t (seconds)	Burned Length, L (mm)	Linear Burning Rate (mm/min)	Linear Burning Rate (in/min)
1	5.05	230	75	19.57	0.770
2	5.15	250	75	18.00	0.709
3	5.10	203	75	22.17	0.873
4	4.85	266	75	16.92	0.666
5	5.28	318	75	14.15	0.557
6	5.07	247	75	18.22	0.717
7	5.42	188	75	23.94	0.942
8	5.36	186	75	24.19	0.952
9	5.09	265	75	16.98	0.669
10	4.98	259	75	17.37	0.684
Average	5.14	241	75	19.10	<b>0.754</b>

## 5.0 Tensile Properties of Plastics, ASTM E2634 & ASTM D638

- Standard: Modified ASTM D638-22, *Standard Test Method for Tensile Properties of Plastics*
- Samples: Ten [10] cross tie samples
- Setup: A tensile load was applied to the cross tie by holding each of the fasteneing flanges in a custom test fixture.
- Test Speed: 1 inch/min [25.4 mm/min]
- Equipment: Universal Testing Machine (SFM-150KN) equipped with an electronic load cell and data acquisition system.
- Requirement: The minimum tensile strength of the cross-tie assembly shall be equivalent to 675 psf (32.3 kN/m<sup>2</sup>) of wall surface.
- Calculations: The cross-ties are spaced 8-inches apart in each 12-inch high block. The tributary area of each cross tie is 8\*12=96 in<sup>2</sup> or 0.667 ft<sup>2</sup>. The peal load is divided by 0.667 to obtain the Wall Surface Equivalent, in psf.
- Compliance: The cross-tie tensile strength complies with this requirement.

<i>Specimen</i>	<i>Peak Load</i>	<i>Peak Load</i>	<i>Wall Surface Equivalent</i>
	<i>lbs.</i>	<i>N</i>	<i>psf</i>
1	630.4	2804.2	945.1
2	693.7	3085.7	1040.0
3	665.2	2958.8	997.3
4	653.7	2907.8	980.1
5	671.2	2985.7	1006.3
6	717.4	3191.2	1075.6
7	699.0	3109.3	1048.0
8	573.4	2550.5	859.7
9	645.4	2871.0	967.6
10	689.7	3068.1	1034.0
<b>Average</b>	<b>663.9</b>	<b>2953.2</b>	<b>995.4</b>
Standard Deviation	41.4	184.4	62.1

## 6.0 Withdrawal Resistance Test, ASTM D1761-20(2025)

Standard: ASTM D1761-20 Reapproved 2025, *Standard Test Methods for Mechanical Fasteners in Wood and Wood-Based Materials*, section 4

Specimens: Fifteen (15) samples per fasteners type

Embedment: ¾" embedment into fastening flange

Equipment: United Universal Testing Machine (UTM) (SFM-150KN) equipped with an electronic load cell and computerized data acquisition system, Digital Calipers -Mitutoyo, 0-6", United Calibration Electronic Load Cell, 500 lbs.

Fasteners:
 

1. #6 x 1-5/8" fine thread drywall screw
2. #6 x 1-5/8" coarse thread drywall screw
3. ¼" x 1-1/2" lag screw

Test Speed: 0.10 inches per minute [2.5 mm / minute] ± 25%.

Fabrication: The fasteners were inserted into the cross tie flange, avoiding the central web area.

Results: The average test values obtained are shown below. The Universal Testing Machine (UTM) generated data sheets and load vs. deflection curves are attached in the appendix.

Config #	UTM Test Report #	Fastener Type	Length, in.	Peak Load [lbf.]	Peak Load (N)	COV
1	3196	#6 fine screw	1-5/8"	135.3	601.9	6.32
2	3197	#6 coarse screw	1-5/8"	163.6	727.7	8.60
3	3201	¼" lag screw	1-1/2"	352.4	1567.5	10.96

## 7.0 Lateral Resistance, ASTM D1037 – 12 (Reapproved 2020)

Standard: ASTM D1037 – 12 (Reapproved 2020), *Standard Test Methods for Evaluating Properties of Wood-Base Fiber and Particle Panel Materials*, section 12.

Specimens: Fifteen (15) samples per fasteners type

Embedment: ½" edge distance into fastening flange

Equipment: United Universal Testing Machine (UTM) (SFM-150KN) equipped with an electronic load cell and computerized data acquisition system, Digital Calipers -Mitutoyo, 0-6", United Calibration Electronic Load Cell, 500 lbs.

Fasteners:
 

1. #6 x 1-5/8" fine thread drywall screw
2. #6 x 1-5/8" coarse thread drywall screw
3. ¼" x 1-1/2" lag screw

Fabrication: The fasteners were inserted into the cross tie flange, avoiding the central web area.

Results: The average test values obtained are shown below. The Universal Testing Machine (UTM) generated data sheets and load vs. deflection curves are attached in the appendix.

Config #	UTM Test Report #	Fastener Type	Length, in.	Peak Load [lbf.]	Peak Load (N)	COV
1	3199	#6 fine screw	1-5/8"	267.2	1188.6	10.89
2	3200	#6 coarse screw	1-5/8"	253.1	1125.8	6.10
3	3209	¼" lag screw	1-1/2"	488.4	2172.5	13.60

## 8.0 Determining Ignition Temperature of Plastics, ASTM D1929-23

- Standard:** ASTM D1929-2023, *Standard Test Method for Determining Ignition Temperature of Plastics*
- Testing:** The test was conducted by PRI Construction Materials Technologies [dba Certerra Analytical – PRI] on samples provided by IAPMO IBT. The test results are reproduced below, and the PRI test report can be found in the appendix of this report.
- Laboratory:** PRI Construction Materials Technologies, LLC, 6412 Badger Drive, Tampa, Florida 33610. IAS International Accreditation Service Testing Laboratory TL-189
- Requirement:** The material shall have a self-ignition temperature of 662°F (350 °C) or greater when tested in accordance with ASTM D1929.
- Compliance:** The cross tie material complied with this requirement.

IAPMO - Construction Products Group  
 ASTM D1929 for  
 Monolith Polypropylene Web Spacer  
 Page 2 of 2

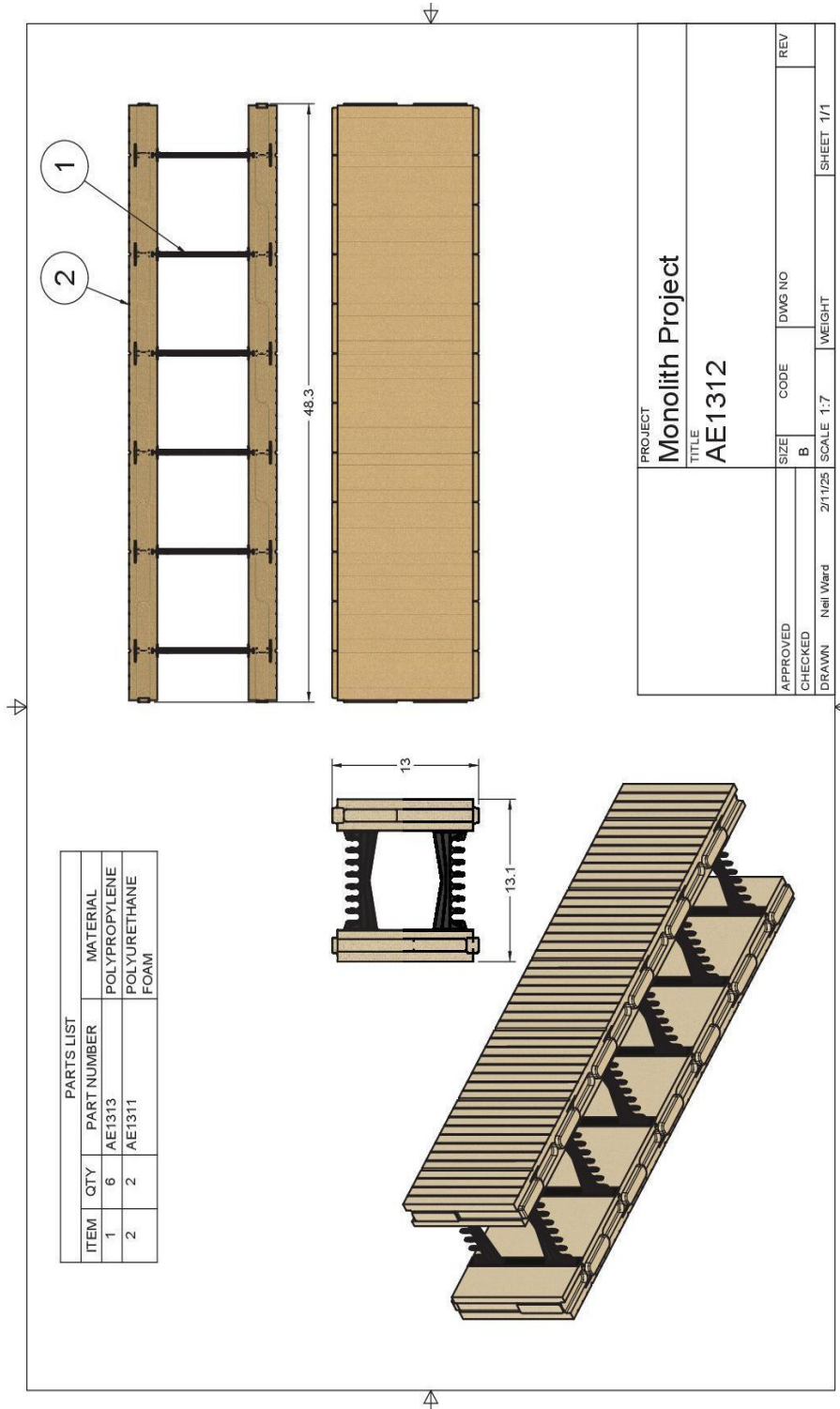
### Results:

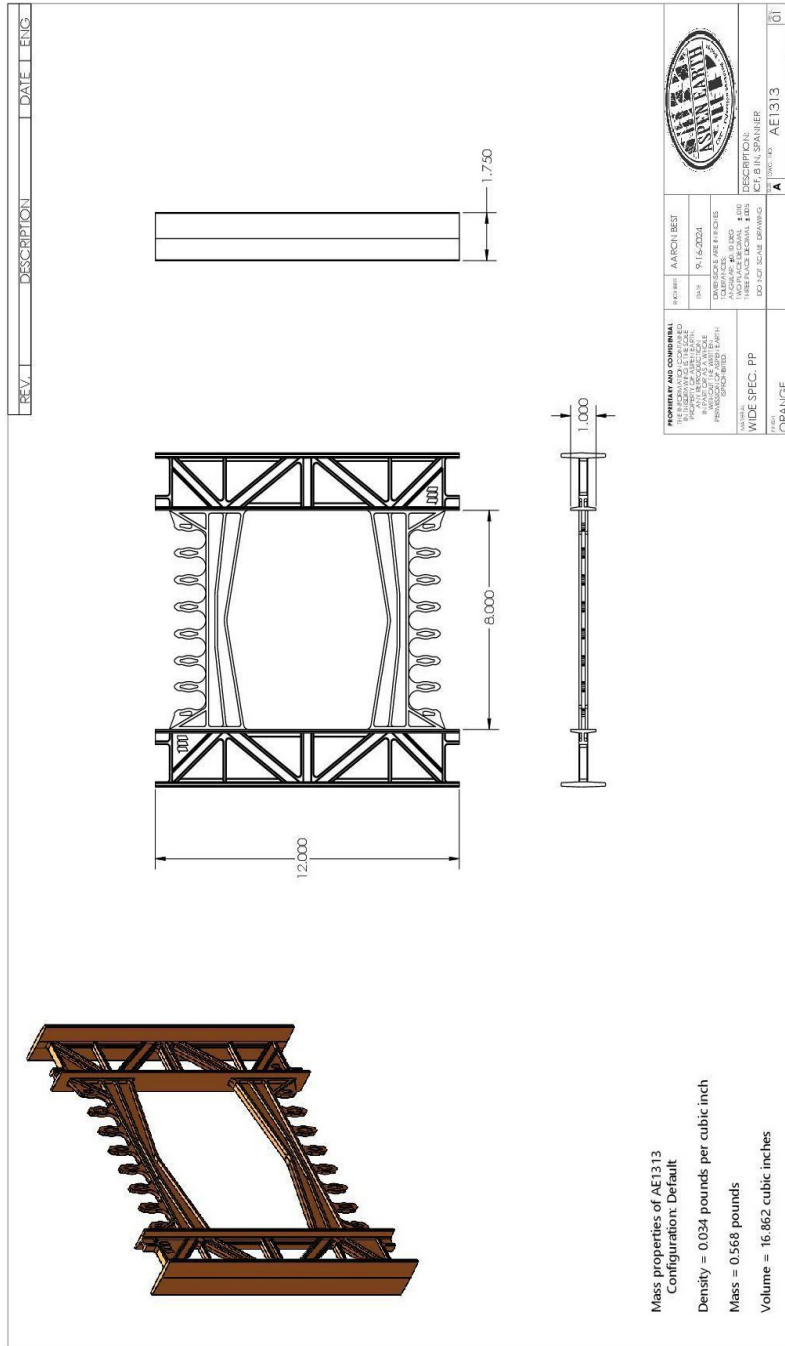
NOTE - These test results relate only to the behavior of the test specimens under the particular conditions of the test. They are not intended to be used, and shall not be used, to assess the potential fire hazards of a material in use.

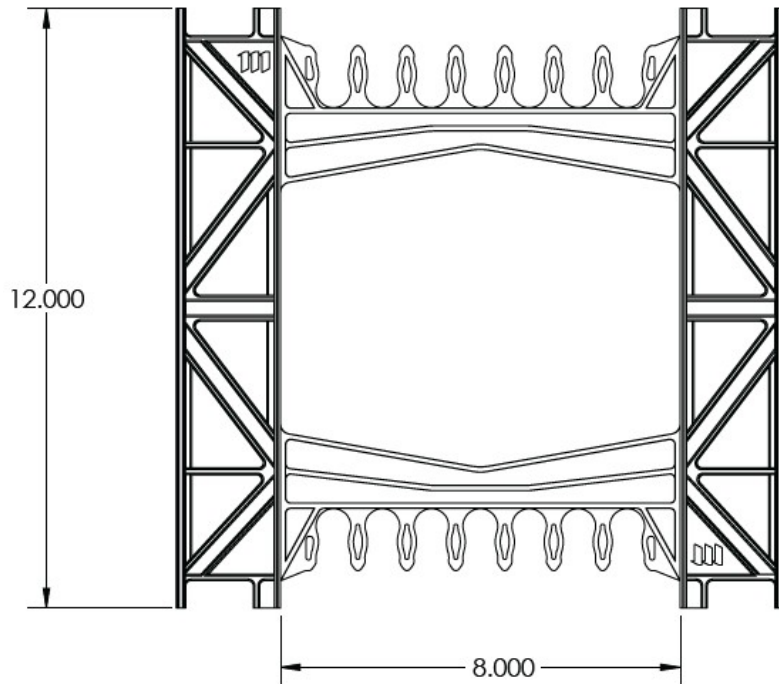
Property	Test Method	Result	Requirement <sup>1</sup>
Self-Ignition Temperature	ASTM D1929	736°F (391°C)	≥ 662°F (350°C)

Note(s): 1 – Requirement listed in ICC-ES AC353.

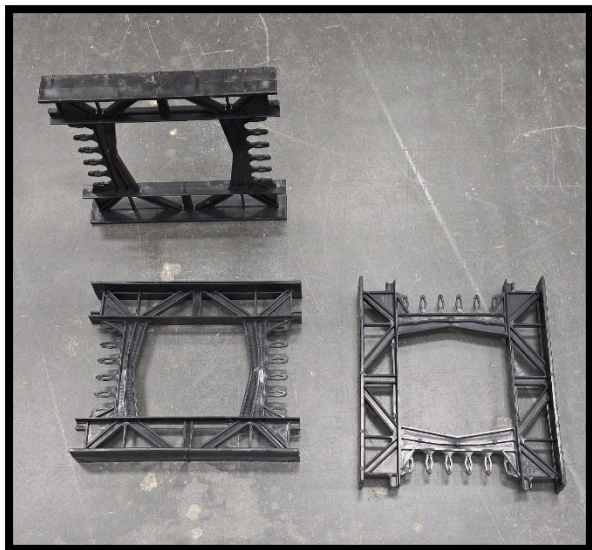
9.0 Product Details



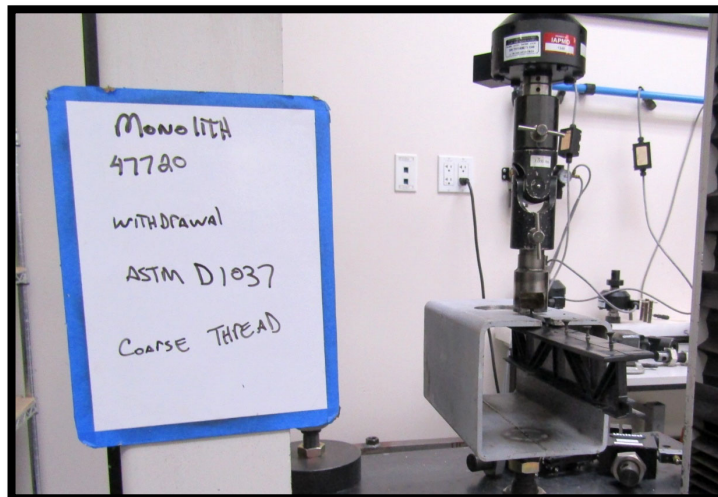




## 10.0 Photographs

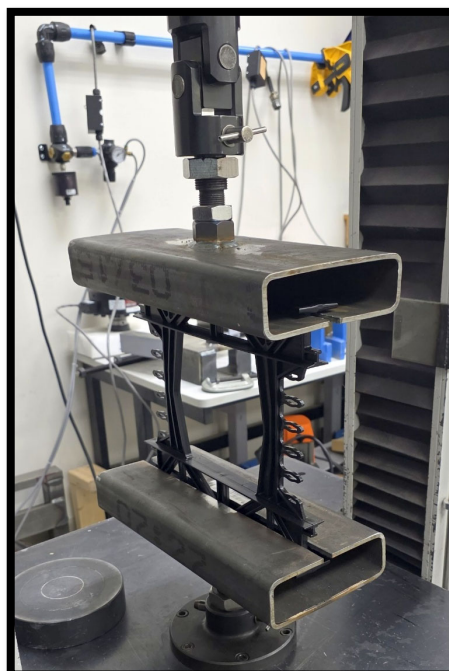


Polypropylene Cross Ties

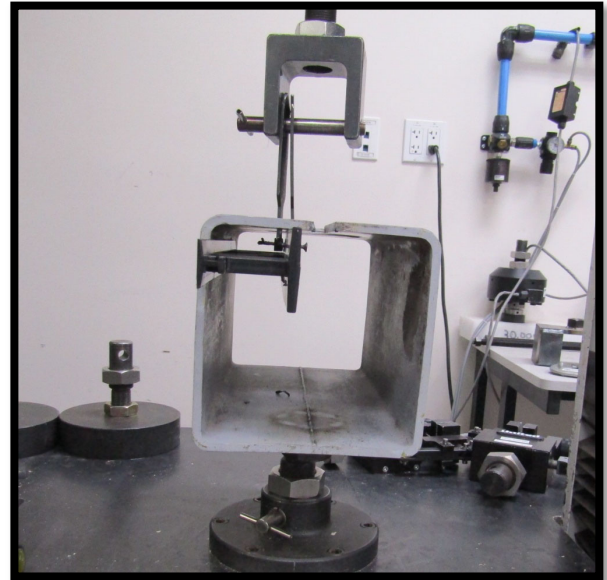
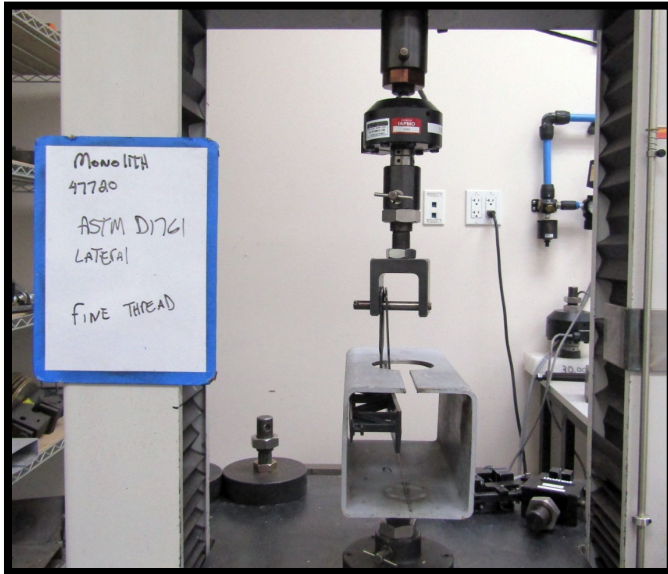


Withdrawal strength test

Tensile strength test -setup and close up view



*Lateral strength test -setup and close up view*



*ASTM D635, Rate of Burn Test*



**APPENDIX**

Universal Testing Machine (UTM) generated data sheets (17 pages)  
IAPMO QCC Sample Selection Report (5 pages)  
PRI Laboratories Ignition Properties, ASTM D1929 test report (2 pages)



Apr 17, 2026

**E2634 & D638, Modified Tensile Strength of ICF Tie**

**Report No. 3225**

Test Date 16-Apr-26 Testing Machine SFM-150KN 0615533

Customer Name Monolith ICF  
Operator Chad McLaughlin

Product Plastic ICF Tie  
Project No. 47720  
Tension or Shear Tension

Template No. 47  
Lab Temperature (F) 72.5

Lab Humidity (%) 49.5

Load Cell S/N (TV1123958), Units (LBS ) 3000 Crosshead Speed ( Inches / min ) or Rate 1  
Displacement Sensor XHD\_100 ( XHD100 ) Preload Value ( Lbs ) 5

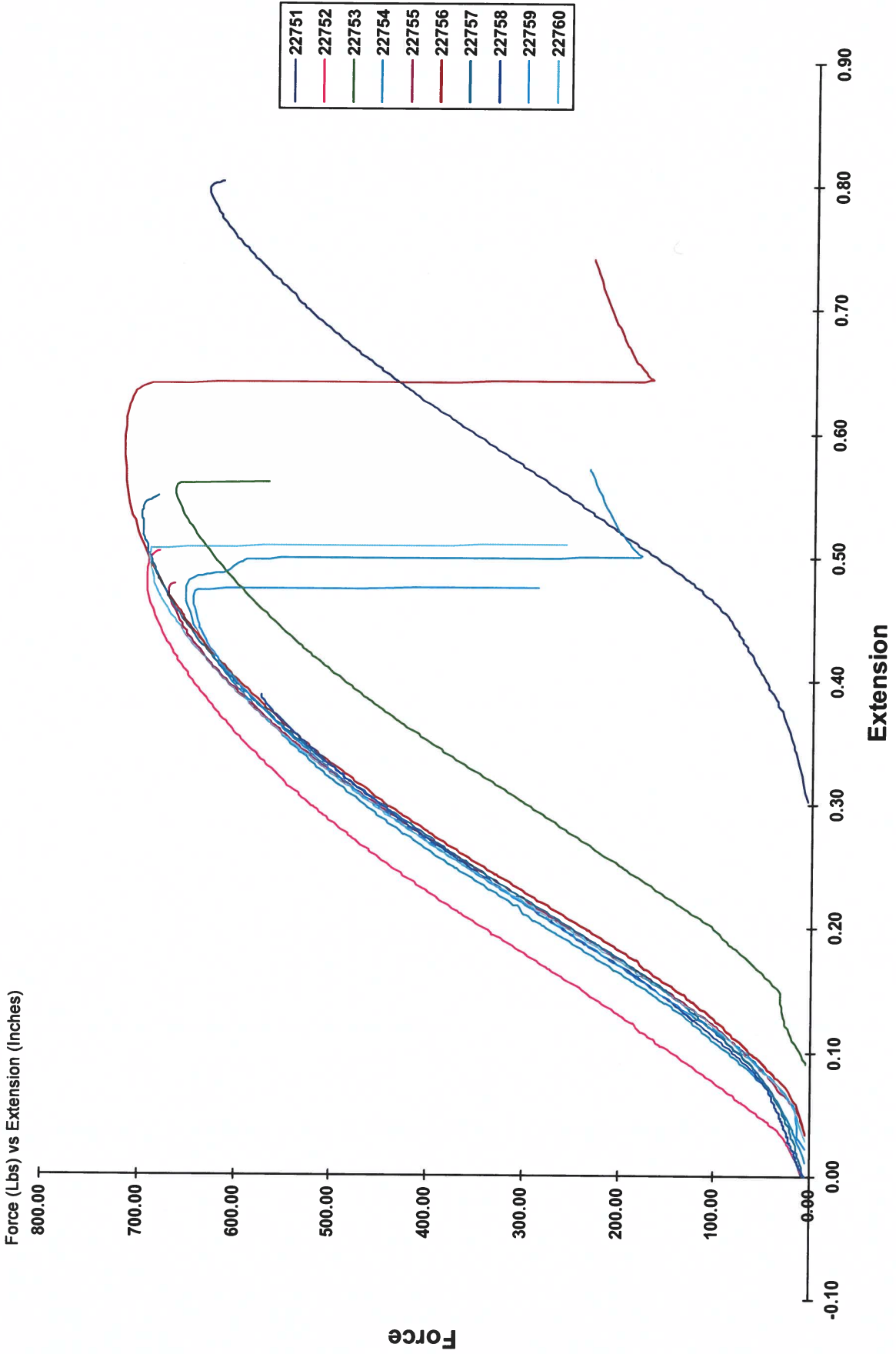
Test No	Specimen ID	Peak Load (lbs.)	Break Load (lbs.)	Elong @ Peak (in.)	Elong @ Break (in.)	Peak Load (N)	Time to Break (sec)
22751	1-1	630.4	616.5	0.795	0.803	2,804.2	67.0
22752	1-2	693.7	680.6	0.483	0.503	3,085.7	29.8
22753	1-3	665.2	566.6	0.554	0.560	2,958.8	39.7
22754	1-4	653.7	233.8	0.470	0.571	2,907.8	29.9
22755	1-5	671.2	664.4	0.471	0.477	2,985.7	31.4
22756	1-6	717.4	231.5	0.590	0.740	3,191.2	38.5
22757	1-7	699.0	681.3	0.531	0.548	3,109.3	32.8
22758	1-8	573.4	573.4	0.387	0.387	2,550.5	24.0
22759	1-9	645.4	286.5	0.463	0.475	2,871.0	30.1
22760	1-10	689.7	258.6	0.493	0.510	3,068.1	32.3
Mean		663.9	479.3	0.524	0.558	2,953.2	35.6
Median		665.2	566.6	0.483	0.510	2,958.8	31.4
Rel Std Dev %		6.24	41.64	21.07	22.48	6.24	33.51
Std Dev		41.5	199.6	0.110	0.125	184.4	11.9
Maximum		717.4	681.3	0.795	0.803	3,191.2	67.0
Minimum		573.4	231.5	0.387	0.387	2,550.5	24.0
Range		144.0	449.9	0.408	0.416	640.8	43.0

By:  Date: 4-17-26

Test Performed in Accordance with ASTM E2634 / D638, Rev. 2022



# Report No 3225 E2634 & D638, Modified Tensile Strength of ICF Tie





Apr 24, 2026

**Withdrawal Strength of Fasteners, ASTM D1037**

**Report No. 3196**

Test Date 24-Mar-26 Testing Machine SFM-150KN 0615533

Customer Name Monolith  
 Operator Chad McLaughlin  
 Comment Embedment 3/4"  
 Sheathing ICF flange

Fastener #6 -1-5/8" fine  
 Project No. 47720

Template No. 186

Lab Temperature (F) 73.5

Lab Humidity (%) 50.5

Load Cell S/N (TVI114085), Units (LBS )

500

Crosshead Speed ( Inches / min ) or Rate

0.06

Displacement Sensor

XHD\_100 ( XHD100 )

Preload Value ( Lbs )

2

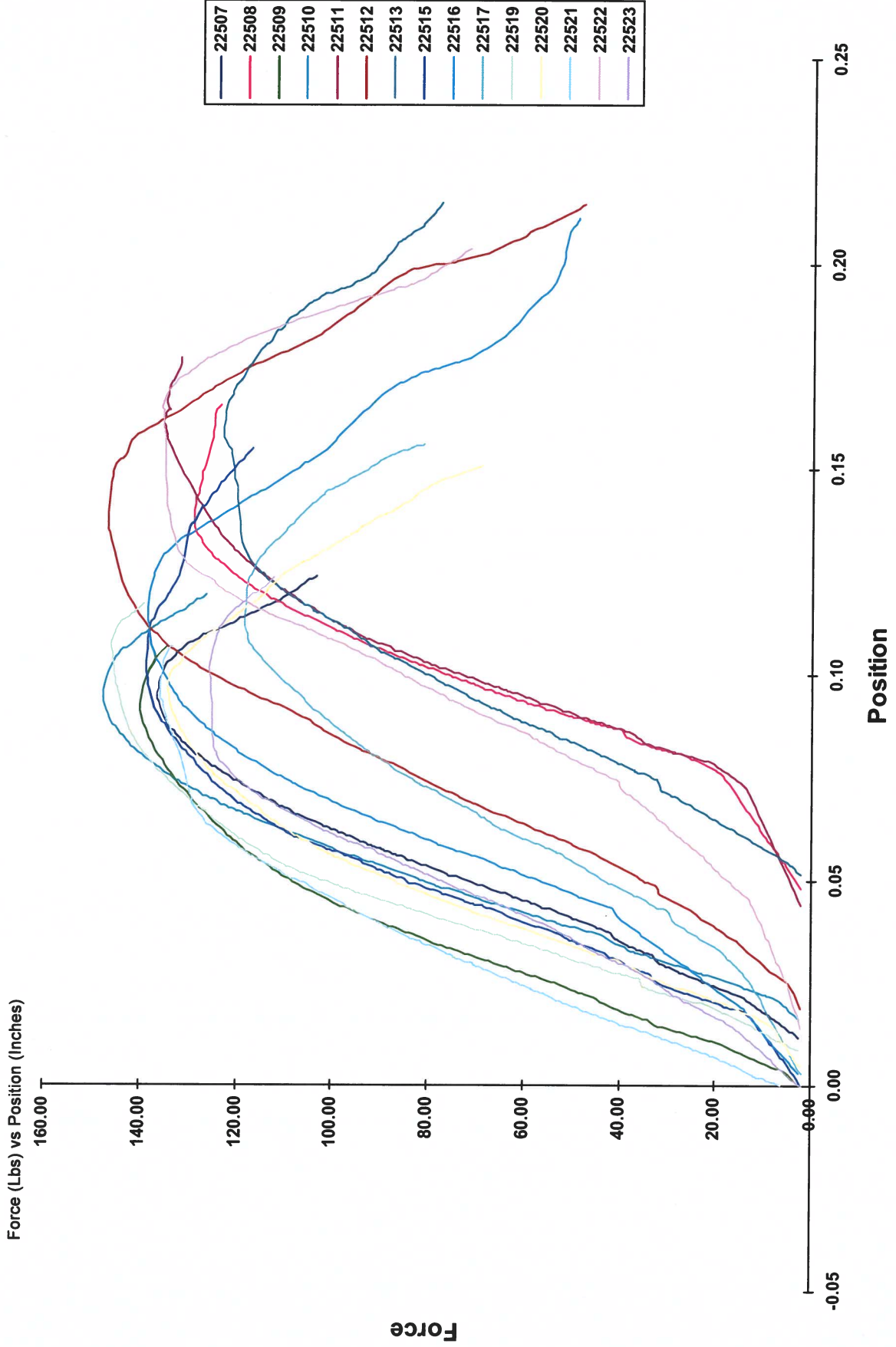
Test No	Specimen ID	Peak Load (lbs.)	Break Load (lbs.)	Elong @ Break (in.)	Time to Break (sec)	Moisture Content (%)	Peak Load (N)	Specific Gravity (SG)
22507	1-2	136.5	103.4	0.124	113.9	1.0	607.3	1.00
22508	1-3	128.9	123.4	0.166	123.4	1.0	573.4	1.00
22509	1-4	140.0	134.6	0.107	107.3	1.0	622.8	1.00
22510	1-5	147.5	126.1	0.119	105.0	1.0	656.1	1.00
22511	1-6	135.3	131.5	0.177	138.4	1.0	601.7	1.00
22512	1-7	146.7	47.9	0.214	198.3	1.0	652.7	1.00
22513	1-8	122.8	77.6	0.215	169.9	1.0	546.2	1.00
22515	1-10	138.7	116.6	0.155	155.9	1.0	617.0	1.00
22516	1-11	138.2	49.0	0.211	208.4	1.0	614.8	1.00
22517	1-12	118.2	80.8	0.156	153.6	1.0	525.8	1.00
22519	1-14	146.0	139.4	0.117	109.7	1.0	649.3	1.00
22520	1-15	134.2	69.0	0.151	146.9	1.0	597.1	1.00
22521	1-16	135.8	133.3	0.107	107.6	1.0	604.2	1.00
22522	1-17	135.3	71.4	0.204	191.7	1.0	602.0	1.00
22523	1-18	125.5	112.1	0.124	124.5	1.0	558.4	1.00
Mean		135.3	101.1	0.156	143.6	1.0	601.9	1.00
Median		135.8	112.1	0.155	138.4	1.0	604.2	1.00
Rel Std Dev %		6.32	31.80	25.64	24.54	0.00	6.32	0.00
Std Dev		8.5	32.1	0.040	35.2	0.0	38.0	0.00
Maximum		147.5	139.4	0.215	208.4	1.0	656.1	1.00
Minimum		118.2	47.9	0.107	105.0	1.0	525.8	1.00
Range		29.3	91.5	0.108	103.4	0.0	130.3	0.00

By:  Date: 4-24-26

Test Performed in Accordance with ASTM D1037, Rev. 2006



# Report No 3196 Withdrawal Strength of Fasteners, ASTM D1037





Apr 24, 2026

**Withdrawal Strength of Fasteners, ASTM D1037**

**Report No. 3197**

Test Date 24-Mar-26 Testing Machine SFM-150KN 0615533

Customer Name Monolith  
 Operator Chad McLaughlin  
 Comment Embedment 3/4"  
 Sheathing ICF flange

Fastener #6-1-5/8" Coarse  
 Project No. 47720

Template No. 186  
 Lab Temperature (F) 73.5

Lab Humidity (%) 50.5

Load Cell S/N (TVI114085), Units (LBS) 500 Crosshead Speed ( Inches / min ) or Rate 0.06  
 Displacement Sensor XHD\_100 ( XHD100 ) Preload Value ( Lbs ) 2

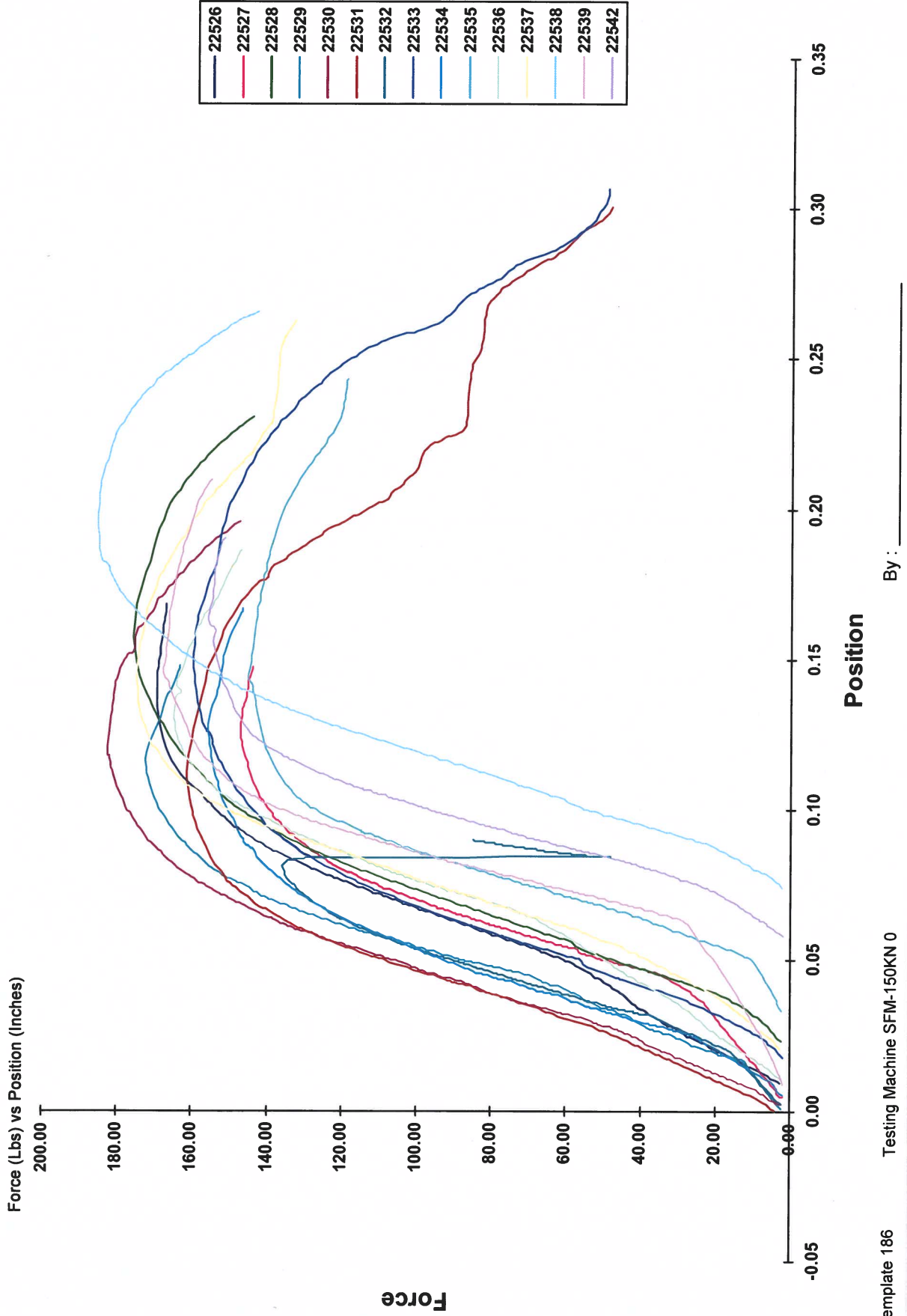
Test No	Specimen ID	Peak Load (lbs.)	Break Load (lbs.)	Elong @ Break (in.)	Time to Break (sec)	Moisture Content (%)	Peak Load (N)	Specific Gravity (SG)
22526	1-1	169.5	166.8	0.169	160.7	1.0	753.8	1.00
22527	1-2	147.2	143.7	0.147	143.6	1.0	654.6	1.00
22528	1-3	175.8	143.8	0.231	210.9	1.0	782.1	1.00
22529	1-4	172.5	163.2	0.148	147.8	1.0	767.5	1.00
22530	1-5	182.3	147.5	0.196	194.2	1.0	810.9	1.00
22531	1-6	161.5	48.5	0.301	301.7	1.0	718.3	1.00
22532	1-7	135.7	84.8	0.090	88.2	1.0	603.5	1.00
22533	1-8	159.9	49.4	0.306	291.3	1.0	711.2	1.00
22534	1-9	155.7	146.4	0.167	162.1	1.0	692.5	1.00
22535	1-10	145.1	118.7	0.243	214.1	1.0	645.2	1.00
22536	1-11	164.9	147.2	0.186	177.8	1.0	733.5	1.00
22537	1-12	175.0	132.6	0.263	244.5	1.0	778.3	1.00
22538	1-13	185.4	142.8	0.266	200.8	1.0	824.5	1.00
22539	1-14	167.9	155.0	0.210	202.5	1.0	746.7	1.00
22542	1-15	155.8	151.4	0.191	139.5	1.0	692.8	1.00
Mean		163.6	129.4	0.208	192.0	1.0	727.7	1.00
Median		164.9	143.8	0.196	194.2	1.0	733.5	1.00
Rel Std Dev %		8.60	29.39	29.26	29.72	0.00	8.60	0.00
Std Dev		14.1	38.0	0.061	57.1	0.0	62.6	0.00
Maximum		185.4	166.8	0.306	301.7	1.0	824.5	1.00
Minimum		135.7	48.5	0.090	88.2	1.0	603.5	1.00
Range		49.7	118.3	0.216	213.4	0.0	221.0	0.00

By:  Date: 4-24-26

Test Performed in Accordance with ASTM D1037, Rev. 2006



# Report No 3197 Withdrawal Strength of Fasteners, ASTM D1037



Template 186

Testing Machine SFM-150KN 0

By : \_\_\_\_\_

Mar 25, 2026

IAPMO IBT 4755 E. Philadelphia St. Ontario, CA 91761 TEL 909-472-4100 FAX



Apr 24, 2026

Withdrawal Strength of Fasteners, ASTM D1037

Report No. 3201

Test Date 02-Apr-26 Testing Machine SFM-150KN 0615533

Customer Name Monolith  
 Operator Chad McLaughlin  
 Comment Embedment 3/4"  
 Sheathing ICF flange

Fastener 1/4" -1-1/2" lag  
 Project No. 47720

Template No. 186  
 Lab Temperature (F) 73.5

Lab Humidity (%) 50.5

Load Cell S/N (TV114085), Units (LBS ) 500 Crosshead Speed ( Inches / min ) or Rate 0.06  
 Displacement Sensor XHD\_100 ( XHD100 ) Preload Value ( Lbs ) 2

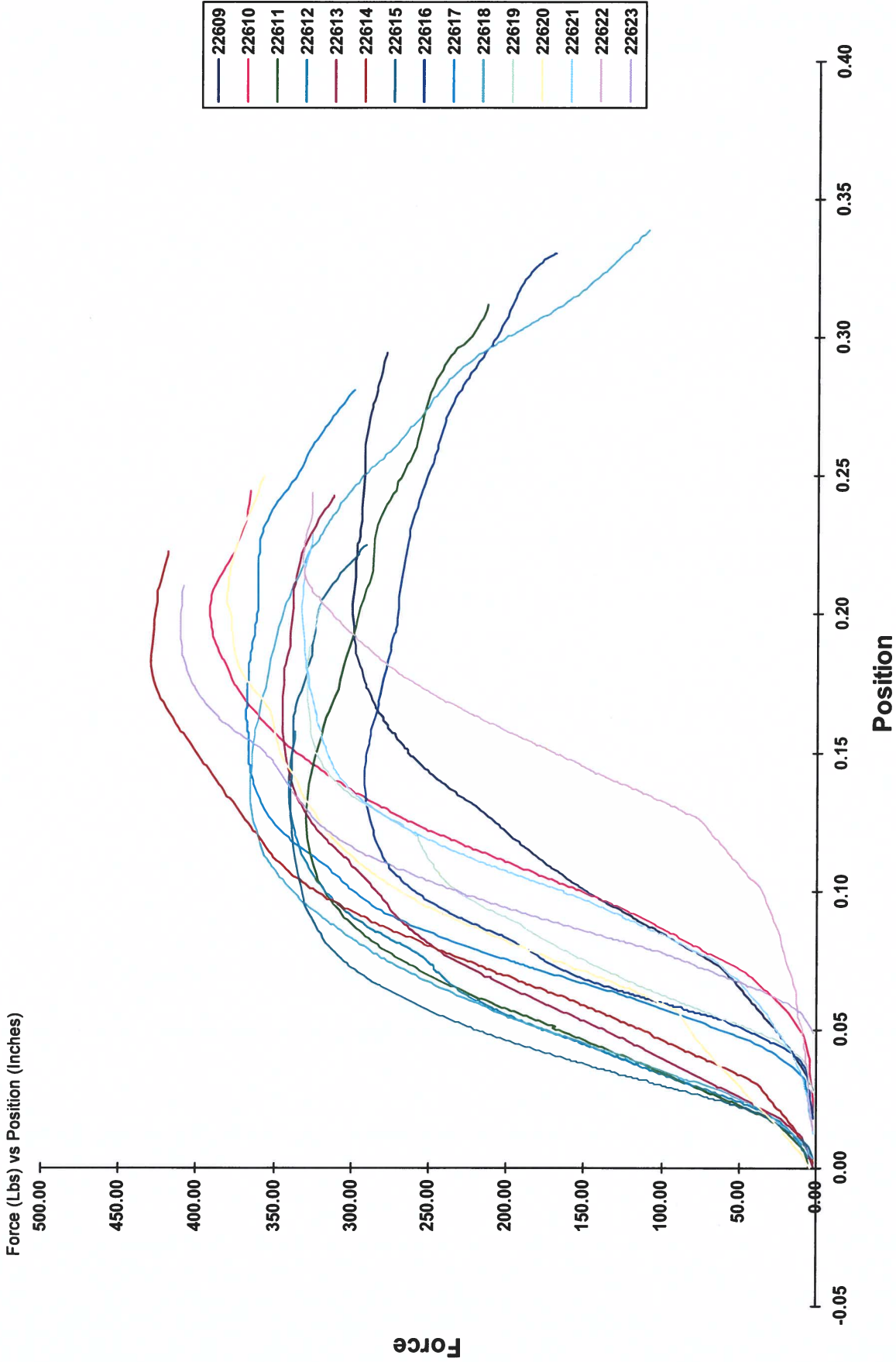
Test No	Specimen ID	Peak Load (lbs.)	Break Load (lbs.)	Elong @ Break (in.)	Time to Break (sec)	Moisture Content (%)	Peak Load (N)	Specific Gravity (SG)
22609	1-1	299.7	278.0	0.295	270.5	1.0	1,333.2	1.00
22610	1-2	391.7	365.9	0.245	227.0	1.0	1,742.6	1.00
22611	1-3	329.4	212.7	0.312	312.8	1.0	1,465.4	1.00
22612	1-4	340.8	336.6	0.157	155.8	1.0	1,515.8	1.00
22613	1-5	345.0	311.8	0.243	242.5	1.0	1,534.8	1.00
22614	1-6	429.7	418.1	0.223	221.9	1.0	1,911.6	1.00
22615	1-7	340.0	291.0	0.225	222.8	1.0	1,512.2	1.00
22616	1-8	291.5	169.5	0.330	315.3	1.0	1,296.6	1.00
22617	1-9	368.3	299.2	0.281	269.0	1.0	1,638.2	1.00
22618	1-10	365.6	110.0	0.339	336.5	1.0	1,626.4	1.00
22619	1-11	328.9	319.6	0.205	181.3	1.0	1,462.9	1.00
22620	1-12	380.3	356.4	0.250	251.3	1.0	1,691.5	1.00
22621	1-13	332.4	325.6	0.229	218.0	1.0	1,478.6	1.00
22622	1-14	331.8	325.3	0.244	232.2	1.0	1,475.8	1.00
22623	1-15	410.9	408.1	0.210	165.7	1.0	1,827.6	1.00
Mean		352.4	301.8	0.253	241.5	1.0	1,567.5	1.00
Median		340.8	319.6	0.244	232.2	1.0	1,515.8	1.00
Rel Std Dev %		10.96	27.66	19.83	22.01	0.00	10.96	0.00
Std Dev		38.6	83.5	0.050	53.2	0.0	171.8	0.00
Maximum		429.7	418.1	0.339	336.5	1.0	1,911.6	1.00
Minimum		291.5	110.0	0.157	155.8	1.0	1,296.6	1.00
Range		138.3	308.2	0.181	180.7	0.0	615.0	0.00

By:  Date: 4-24-26

Test Performed in Accordance with ASTM D1037, Rev. 2006



# Report No 3201 Withdrawal Strength of Fasteners, ASTM D1037





Apr 24, 2026

Lateral Nail Resistance, ASTM D1037

Report No. 3199

Test Date 25-Mar-26 Testing Machine SFM-150KN 0615533

Customer Name Monolith  
Operator Chad McLaughlin  
Sheathing ICF Flange

Fastener #6- 1-5/8" fine  
Project No. 47720


Comment Embedment 3/4"

Template No. 185  
Lab Temperature (F) 72

Lab Humidity (%) 50

Load Cell S/N (TVI123958), Units (LBS ) 3000 Crosshead Speed ( Inches / min ) or Rate 0.1  
Displacement Sensor XHD\_100 ( XHD100 ) Preload Value ( Lbs ) 5

Test No	Specimen ID	Peak Load (lbs.)	Break Load (lbs.)	Elong @ Break (in.)	Time to Break (sec)	Moisture Content (%)	Peak Load (N)
22566	1-1	275.4	270.8	0.433	106.1	1.0	1,224.9
22567	1-2	244.2	240.9	0.228	55.5	1.0	1,086.5
22568	1-3	238.8	172.8	0.499	120.8	1.0	1,062.3
22569	1-4	256.7	183.2	0.583	140.9	1.0	1,142.0
22570	1-5	276.9	253.0	0.475	115.2	1.0	1,231.8
22571	1-6	295.8	292.3	0.453	109.6	1.0	1,315.8
22572	1-7	266.9	255.4	0.353	85.7	1.0	1,187.0
22573	1-8	200.6	171.4	0.472	114.2	1.0	892.3
22574	1-9	287.6	188.7	0.628	151.9	1.0	1,279.5
22575	1-10	299.8	283.0	0.491	118.7	1.0	1,333.5
22576	1-11	266.2	237.0	0.481	116.7	1.0	1,184.0
22577	1-12	272.6	232.3	0.514	124.5	1.0	1,212.5
22578	1-13	238.6	230.4	0.390	94.7	1.0	1,061.2
22580	1-15	269.2	265.8	0.509	123.2	1.0	1,197.4
22581	1-16	318.8	295.8	0.412	99.8	1.0	1,417.9

By:  Date: 4-24-20  
Test performed in Accordance with ASTM D1037, Rev. 2006a

Test No	Specimen ID	Peak Load (lbs.)	Break Load (lbs.)	Elong @ Break (in.)	Time to Break (sec)	Moisture Content (%)	Peak Load (N)
	Mean	267.2	238.2	0.461	111.8	1.0	1,188.6
	Median	269.2	240.9	0.475	115.2	1.0	1,197.4
	Rel Std Dev %	10.89	17.71	20.51	20.32	0.00	10.89
	Std Dev	29.1	42.2	0.095	22.7	0.0	129.4
	Maximum	318.8	295.8	0.628	151.9	1.0	1,417.9
	Minimum	200.6	171.4	0.228	55.5	1.0	892.3
	Range	118.2	124.4	0.400	96.3	0.0	525.6

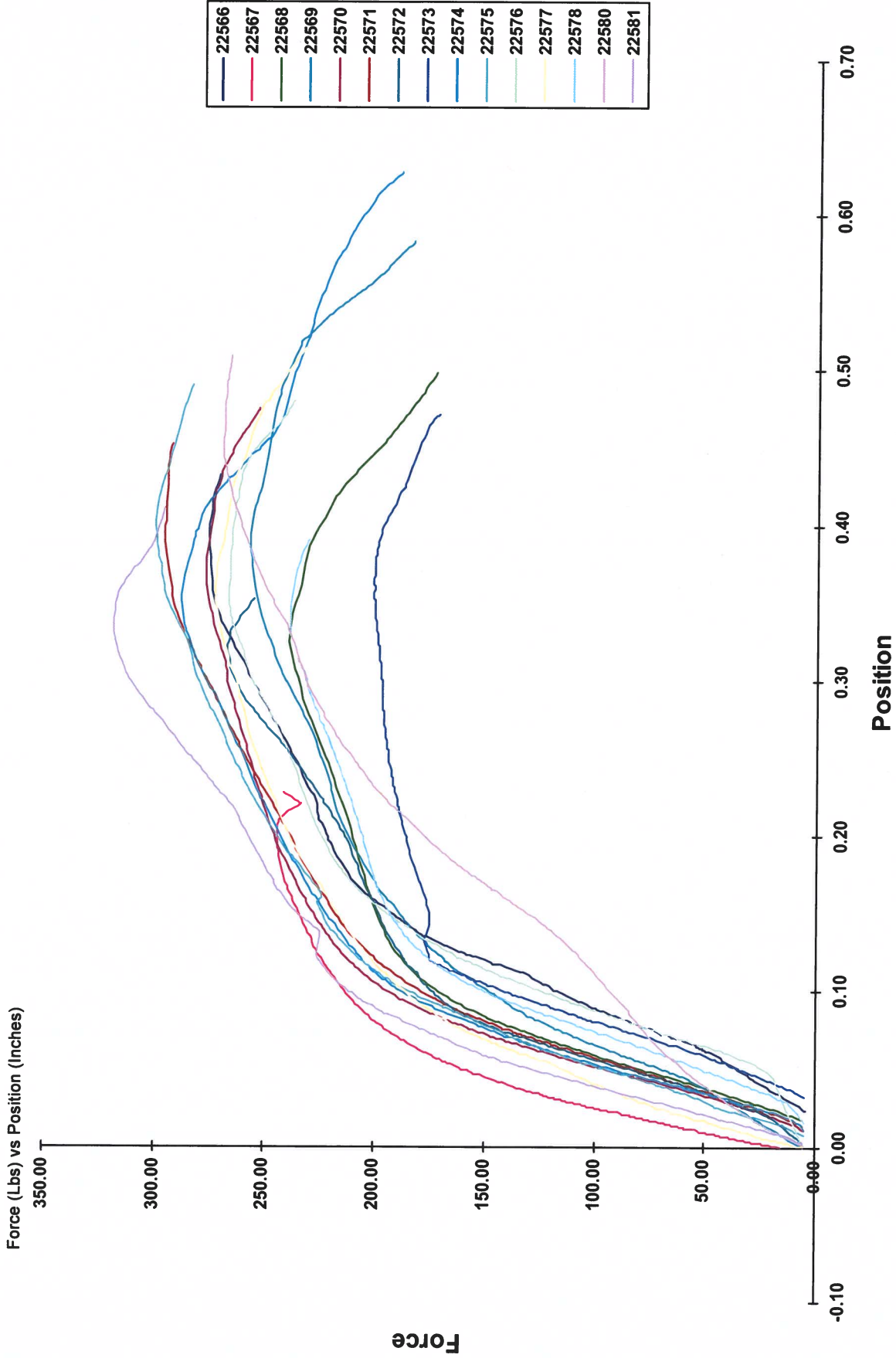
Test Performed in Accordance with ASTM D1037, Rev. 2006a

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Report 3199, Page 2



Report No 3199 Lateral Nail Resistance, ASTM D1037





Apr 24, 2026

Lateral Nail Resistance, ASTM D1037

Report No. 3200

Test Date 31-Mar-26 Testing Machine SFM-150KN 0615533

Customer Name Monolith
Operator Chad McLaughlin
Sheathing ICF Flange

Fastener #6- 1-5/8" Course
Project No. 47720

Comment Embedment 3/4"

Template No. 185
Lab Temperature (F) 72

Lab Humidity (%) 50

Load Cell S/N (TVI123958), Units (LBS) 3000
Displacement Sensor XHD\_100 (XHD100)
Crosshead Speed (Inches / min ) or Rate 0.1
Preload Value ( Lbs ) 5

Table with 8 columns: Test No, Specimen ID, Peak Load (lbs.), Break Load (lbs.), Elong @ Break (in.), Time to Break (sec), Moisture Content (%), Peak Load (N). Rows 22586-22600.

By: [Signature] Date: 4-24-26

Test Performed in Accordance with ASTM D1037, Rev. 2006a

Test No	Specimen ID	Peak Load (lbs.)	Break Load (lbs.)	Elong @ Break (in.)	Time to Break (sec)	Moisture Content (%)	Peak Load (N)
	Mean	253.1	181.4	0.557	134.7	1.0	1,125.8
	Median	255.7	179.2	0.534	129.3	1.0	1,137.2
	Rel Std Dev %	6.10	23.65	21.37	21.23	0.00	6.10
	Std Dev	15.4	42.9	0.119	28.6	0.0	68.7
	Maximum	280.2	260.6	0.766	185.0	1.0	1,246.2
	Minimum	232.0	104.6	0.389	94.4	1.0	1,032.1
	Range	48.1	156.0	0.377	90.6	0.0	214.1

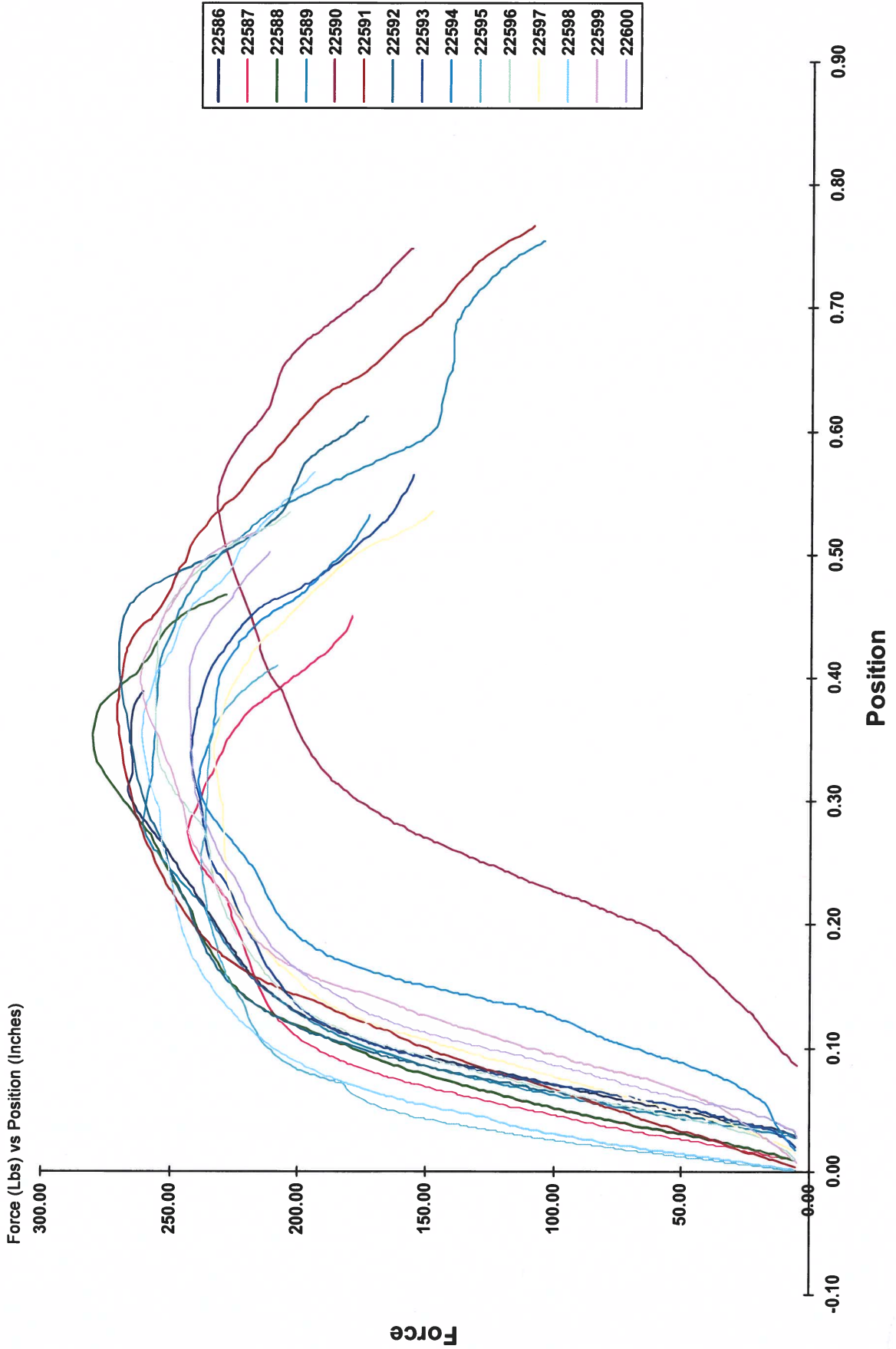
Test Performed in Accordance with ASTM D1037, Rev. 2006a

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Report 3200, Page 2



# Report No 3200 Lateral Nail Resistance, ASTM D1037



Template 185

Testing Machine SFM-150KN 0

By : \_\_\_\_\_

Mar 31, 2026

IAPMO IBT 4755 E. Philadelphia St. Ontario, CA 91761 TEL 909-472-4100 FAX



Apr 24, 2026

**Lateral Nail Resistance, ASTM D1037**

**Report No. 3209**

**Test Date** 02-Apr-26 Testing Machine SFM-150KN 0615533

**Customer Name** Monolith ICF  
**Operator** Chad McLaughlin  
**Sheathing** ICF Flange

**Fastener** 1/4" x -2-1/2" lag  
**Project No.** 47720

**Comment** Embedment 5/8"

**Template No.** 185

**Lab Temperature (F)** 72

**Lab Humidity (%)** 50

**Load Cell S/N (TVI123958), Units (LBS )**

3000


**Crosshead Speed ( Inches / min ) or Rate** 0.1

**Displacement Sensor**

XHD\_100 ( XHD100 )

**Preload Value ( Lbs )** 5

Test No	Specimen ID	Peak Load (lbs.)	Break Load (lbs.)	Elong @ Break (in.)	Time to Break (sec)	Moisture Content (%)	Peak Load (N)
22645	1-1	395.3	164.8	0.274	70.2	1.0	1,758.6
No lateral failure. Plastic flange broke at peak load. Strength of plastic is th							
22647	1-2	393.9	272.6	0.294	175.4	1.0	1,752.1
22648	1-3	450.0	450.0	0.381	224.7	1.0	2,001.8
22649	1-4	476.3	362.1	0.440	231.6	1.0	2,118.5
22650	1-5	510.3	25.6	0.567	338.4	1.0	2,269.8
22651	1-6	486.4	377.0	0.414	236.3	1.0	2,163.7
22652	1-7	570.3	37.2	0.486	290.1	1.0	2,536.7
22653	1-8	468.6	458.0	0.425	244.5	1.0	2,084.6
22654	1-9	466.5	466.1	0.331	199.6	1.0	2,075.1
22655	1-10	452.4	123.6	0.337	203.0	1.0	2,012.6
22656	1-11	594.3	507.2	0.616	370.6	1.0	2,643.6
22657	1-12	452.3	72.1	0.428	256.0	1.0	2,011.8
22658	1-13	613.1	608.1	0.652	392.5	1.0	2,727.3
22659	1-14	448.3	421.2	0.276	166.1	1.0	1,994.2
22660	1-15	548.0	547.5	0.545	328.1	1.0	2,437.7

By:  Date: 4-24-26

Test Performed in Accordance with ASTM D1037, Rev. 2006a

Test No	Specimen ID	Peak Load (lbs.)	Break Load (lbs.)	Elong @ Break (in.)	Time to Break (sec)	Moisture Content (%)	Peak Load (N)
	Mean	488.4	326.2	0.431	248.5	1.0	2,172.5
	Median	468.6	377.0	0.425	236.3	1.0	2,084.6
	Rel Std Dev %	13.60	59.91	28.19	34.23	0.00	13.60
	Std Dev	66.4	195.4	0.122	85.0	0.0	295.5
	Maximum	613.1	608.1	0.652	392.5	1.0	2,727.3
	Minimum	393.9	25.6	0.274	70.2	1.0	1,752.1
	Range	219.2	582.5	0.378	322.3	0.0	975.1

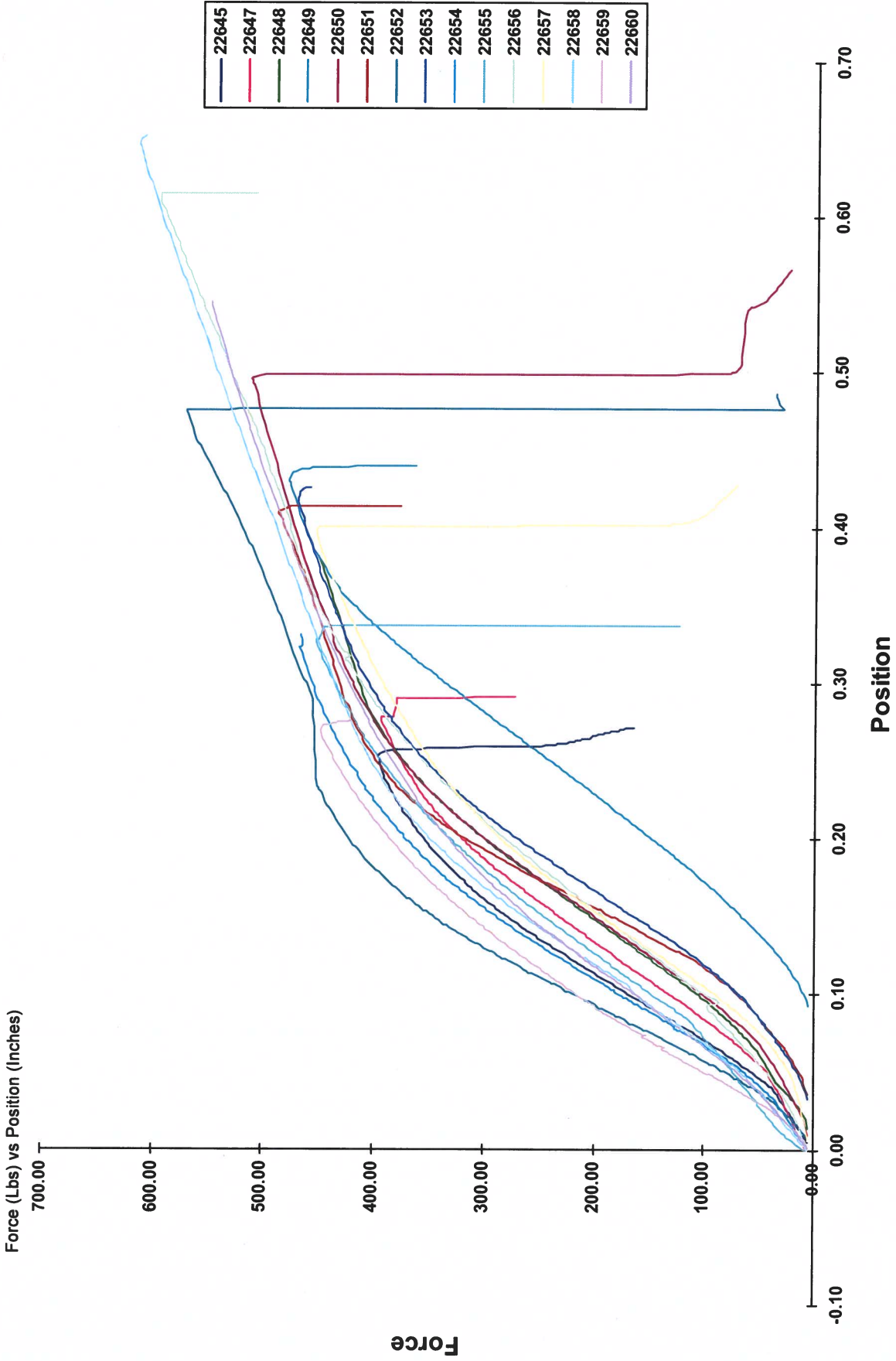
Test Performed in Accordance with ASTM D1037, Rev. 2006a

IAPMO IBT 4755 E. Philadelphia St. Ontario, CA 91761 TEL 909-472-4100 FAX

Report 3209, Page 2



Report No 3209 Lateral Nail Resistance, ASTM D1037



**TEST SAMPLE SELECTION REPORT**

Rendered to: **IAPMO Institute of Building Technology**  
4775 E. Philadelphia Street  
Ontario, CA 91761  
Attn: Jay Mishra

3rd Party Witnessing by:



IAPMO-Quality Control Consultants, LLC  
10710 Stroup Road  
Roswell, GA 30075  
(770) 998-2720

Sample Selection Date: 11/26/2025  
Report Date: 3/12/2026



# TEST SAMPLE SELECTION REPORT

Sample Selection Date: 11/26/2025

Report Date: 3/12/2026

**Report Holder:** Monolith  
2545 Decker Lake Lane  
West Valley City, UT 84119  
Attn: Ben Snuffer

**Manufacturer:** Monolith  
2545 Decker Lake Lane  
West Valley City, UT 84119  
Attn: Ben Snuffer

IAPMO-QCC was contracted by the Report Holder to witness the following:

### **Materials Witnessed:**

1. Insulated Concrete Forms - Polyurethane Foam
2. Polypropylene Spreaders
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

**Sampling Process:** The samples were witnessed on 11.26.25 and, verified and noted on the Chain of Custody Documents. Any CoA's, Batch Sheets, Production work orders and QA Testing documents are kept on file at IAPMO-QCC.

The sample(s) being collected were from: (check all that apply)

- inventory
- production
- combination of inventory and production

How was sample selection determined: (check all that apply)

- random selection during production - due to overproduction of material
- random selection of inventory - only if product has an evaluation report
- material produced during sampling - due to limited supply of material

The sample(s) are: (check all that apply)

- a continuous section
- component
- other \_\_\_\_\_
- roll/length
- individual pieces



**Description of why the sample was selected from the respective location or process:**

Samples were made from production and witnessed from incoming materials to finished product.

**Notes to Lab (if applicable):**

All samples should be marked with IAPMO/QCC, NW and 11.26.25

**Test Sample Description:** (photographs attached).

**Test Sample Markings and Shipping:** The samples were documented with Company Name, date, product name, IAPMO-QCC, initialed by inspector and testing facility (if known at the time), and Project #. Shipping to be provided by Monolith

**Product Witnessed by:** Neal Wilkinson

This report will be retained by IAPMO-QCC for a period of four years from the original report date. This report may not be reproduced, except in full, without the approval of IAPMO-QCC.

Reviewed by:



Ashley Wrigley, IAPMO-QCC Compliance Manager

Attachments (pages):

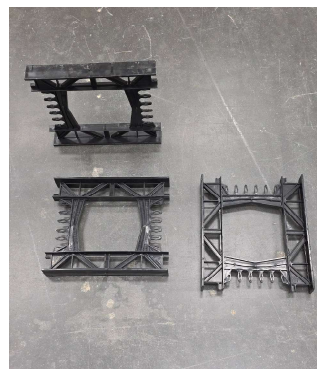
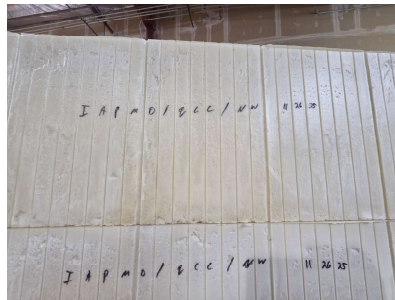
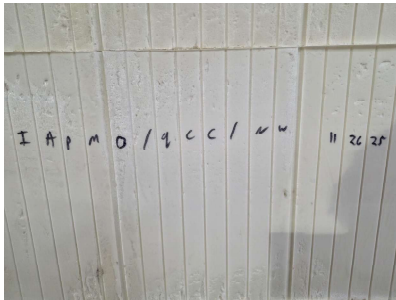
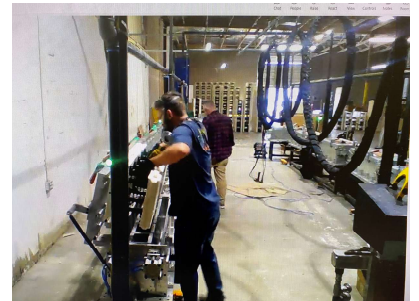
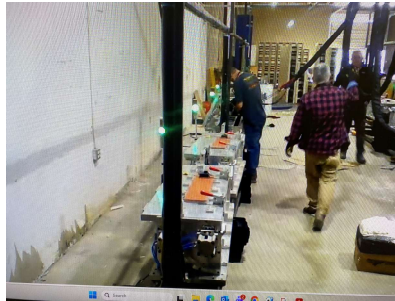
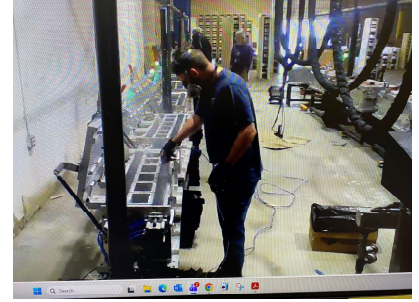
Appendix A: Photographs

**Revision Log**

Rev. #	Date	Page(s)	Revision(s)
1	4.6.26	2	Changed wording to Polypropylene



# Appendix A: Photographs



# Appendix A: Photographs





# PRI Construction Materials Technologies LLC

6412 Badger Drive  
Tampa, FL 33610  
813.621.5777  
<https://www.pri-group.com/>

## Laboratory Test Report

**Report for:** IAPMO - Construction Products Group  
4755 E. Philadelphia Street  
Ontario, CA 91761

**Product Name(s):** Monolith Polypropylene Web Spacer

**Project No.:** 1848T0018 (IBT Project: 47720)

**Date(s) Tested:** March 23<sup>rd</sup> – 26<sup>th</sup>, 2026

**Test Methods:** ASTM D1929

**Purpose:** Evaluate the self-ignition temperature of supplied material in accordance with ASTM D1929 Standard Test Method for Determining Ignition Temperature of Plastics.

**Test Methods:** Testing was conducted in accordance with ASTM D1929-23 Standard Test Method for Determining Ignition Temperature of Plastics. Test methods assigned or referenced include ICC-ES AC353 (24) Acceptance Criteria for Stay-In-Place, Foam Plastic Insulating Concrete Form (ICF) Systems for Solid Concrete Walls (Published April 2025)

**Testing Location:** Testing was conducted at PRI-CMT located in Tampa, FL. Verification of testing instrumentation was performed by an ISO accredited calibration laboratory or by a PRI-CMT representative in compliance with PRI-CMT's In-House quality control program governed by ISO/IEC 17025-17.

**Sampling:** The following material(s) were received by PRI.

<u>Product</u>	<u>Source</u>	<u>Date Received</u>	<u>Sampling</u>
Monolith Polypropylene Web Spacer	Ontario, CA	March 11 <sup>th</sup> , 2026	Client

1848T0018

The laboratory test results presented in this report are based on the material(s) supplied and tested. The results, and by extension any statements of conformity, opinions, or interpretations, apply the "simple acceptance" decision rule for measurement uncertainty accounting. This report is for the exclusive use of stated client. Only the client is authorized to permit copying or distribution of this report and then only in its entirety. PRI Construction Materials Technologies LLC assumes no responsibility nor makes a performance or warranty statement for this material or products and processes containing this material in connection with this report.

**Results:**

NOTE - These test results relate only to the behavior of the test specimens under the particular conditions of the test. They are not intended to be used, and shall not be used, to assess the potential fire hazards of a material in use.

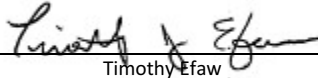
Property	Test Method	Result	Requirement <sup>1</sup>
Self-Ignition Temperature	ASTM D1929	736°F (391°C)	≥ 662°F (350°C)

Note(s): 1 – Requirement listed in ICC-ES AC353.

**Statement of Attestation:**

The laboratory test results presented in this report are representative of the material supplied. This report does not constitute certification of this product which may only be granted by the certification program administrator.

Signed: \_\_\_\_\_



Timothy Efaw  
Manager

**Report Issue History:**

Issue #	Date	Pages	Revision Description (if applicable)
Original	04/06/2026	2	NA

**END OF REPORT**

1848T0018

The laboratory test results presented in this report are based on the material(s) supplied and tested. The results, and by extension any statements of conformity, opinions, or interpretations, apply the "simple acceptance" decision rule for measurement uncertainty accounting. This report is for the exclusive use of stated client. Only the client is authorized to permit copying or distribution of this report and then only in its entirety. PRI Construction Materials Technologies LLC assumes no responsibility nor makes a performance or warranty statement for this material or products and processes containing this material in connection with this report.