



Static and Dynamic Testing of 0.5-in Monostrand Post-Tensioning Anchorages

AC303 Testing of SC1 Splice Coupler



September 14, 2025

WJE No. 2025.3912

PREPARED FOR:

Post-Tensioned Products, Inc.
P.O. Box 1969
Callahan, Florida 32011

PREPARED BY:

Wiss, Janney, Elstner Associates, Inc.
330 Pfingsten Road
Northbrook, Illinois 60062
847.272.7400 tel



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Post-Tensioned Products, Inc.

A handwritten signature in black ink, reading "John Pearson".

John Pearson
Project Manager

A handwritten signature in black ink, reading "Brian Easton".

Brian Easton
Project Engineer

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INTRODUCTION

At the request of Post-Tensioned Products, Inc. (PTP), the firm of Wiss, Janney, Elstner Associates, Inc. (WJE) conducted testing services following the procedures outlined in the International Code Council-Evaluation Services (ICC-ES) Acceptance Criteria AC303, *Acceptance Criteria for Post-Tensioning Anchorages and Couplers of Prestressed Concrete*. Testing summarized in this report was performed using a coupler configuration of a SC1 Splice Coupler for 0.5-in diameter 7-wire strand.

Scope of Work

The scope of work consisted of performing tests by WJE in accordance with AC303 for the SC1 Splice Coupler. All testing utilized Grade 270 low relaxation 7-wire strand. The following tasks were performed as part of the scope of work:

- Random sampling of the strand anchorages to be tested from the manufacturer's provided supply (AC303 Section 2.4)
- Performing static tensile tests to determine the breaking strength of the strand (AC303 Section 3.1)
- Performing static load tests of strand with the use of anchorages (AC303 Sections 3.2 and 4.1)
- Performing fatigue load tests of strand with the use of anchorages (AC303 Sections 3.3 and 4.2)

Test results were compared to the requirements stated in AC303 as well as the requirements of American Concrete Institute (ACI) ACI 318-25, Section 25.8.1, ACI 423.7-14, Section 9.4 and Section 9.5, and Post-Tensioning Institute (PTI) PTI M10.2-24, Section 2.5.

BASIC PRODUCT INFORMATION

Product Description

The SC1 Splice Coupler and 0.5-in. diameter strand consist of a steel coupler and three-piece wedge that grips the strand (Figure 1). The SC1 Splice Coupler can be used for connecting 0.5-in, 7-wire strand ends. Appendix A contains a drawing for the coupler used for testing the SC1 Splice Coupler.

Product Sampling

All of the products for the testing program were sampled by WJE from samples sent to WJE by PTP. The test sample dimensions were measured and compared to available drawings. The measured dimensions agreed with the provided drawings (Appendix A).

TEST METHODS AND REQUIREMENTS

All static and fatigue testing of the strand and coupler were conducted by WJE personnel at our structural laboratory in Northbrook, Illinois. Test machine calibration records are included in Appendix B. All testing protocols were in compliance with WJE's Quality Manual. All couplers tested were assembled from components shipped to WJE. WJE personnel assembled each anchorage from production components prior to testing.

Strand Control Test

Representative strands were chosen from the samples provided to determine the actual breaking strength of the strand used for the tests. Tests were conducted in accordance with ASTM A1061, *Standard Test Methods for Testing Multi-Wire Steel Strand* and results were compared to ASTM A416 *Standard Specification for Steel Strand, Uncoated Seven-Wire for Prestressed Concrete* requirements. Data were recorded and are included in Appendix C for the strand used for testing. A total of three strands were tested and averaged, and the results were used to determine the actual breaking strength to be used for comparison of the anchorage static tests.

Static Load Tests

Three static load tests were performed using a SC1 Splice Coupler connecting two 0.5-in, 7-wire strand ends to comprise a test sample. Each test resulted in testing one coupler for a total of three tests. The static load tests were performed in accordance with AC303 Section 4.1.

The strands used for the tests had a length of at least 42 in. on either end of the coupler. The actual distance between the strand gripped end of the test machine and coupler was measured prior to loading the samples. A baseline gage length, a minimum of 3 in. from the ends of the coupler, was measured and recorded prior to loading. At the conclusion of each test, the gage length was re-measured and recorded to determine the actual elongation. Load and elongation data were recorded for each test.

The strand was inserted into either end of the coupler, and the opposite ends were gripped by the top and bottom test machine grips designed to prevent strand wire stress risers.

In accordance with AC303, Section 3.2.2, each test assembly was considered to pass when the maximum test load of the strand exceeded 95 percent of the actual breaking strength of the strand, as determined from the strand control test, and the strand elongation at failure was at least 2 percent.

Fatigue Load Tests

Fatigue load tests were performed using a SC1 Splice Coupler connecting two 0.5-in, 7-wire strand ends. Tests were performed in general accordance with AC303 Section 4.2. One end of the test sample was connected to a fixture consisting of steel plates separated by threaded rods bolted to a hydraulic actuator (Figure 2). The strand passed through the structural floor opening with an anchorage bearing on the underside of the floor.

Each test sample used a SC1 Splice Coupler connecting two 0.5-in, 7-wire strand ends. The test sample was first subjected to 500,000 cycles between 60 and 66 percent of the strand's minimum specified breaking strength. At the conclusion of the 500,000 cycles, the sample was subjected to 50 cycles between 40 and 85 percent of the specified minimum breaking strength.

The first fatigue load test consisted of 500,000 cycles with a cycle frequency of 6 Hz. The load range of cycling was at least between 60 and 66 percent of the strand's minimum specified breaking strength of 41,300 lbf (24,780 lbf to 27,260 lbf). The hydraulic actuator limits were set between 24,700 lbf and 27,400 lbf to ensure the specified load range was achieved. Data for the 500,000-cycle fatigue test were recorded on a per cycle basis. Recorded data included maximum force and minimum force per cycle.

At the completion of the 500,000 cycles, 50 cycles with a cycle frequency of 1 Hz were performed with a load range of cycling between 40 and 85 percent of the strand's minimum specified breaking strength of 41,300 lbf (16,520 lbf to 35,105 lbf). The hydraulic actuator limits were set between 16,400 lbf and 35,200 lbf to ensure the specified load range was achieved. Recorded data included applied maximum and minimum force for each cycle.

At the conclusion of the testing, the coupler configuration was considered to pass if neither the strand nor coupler failed during any part of the fatigue tests.

TEST DATA AND RESULTS

The strand used for testing the anchorages meets the minimum ultimate tensile capacity requirements listed in ASTM A416. Table 1 summarizes the strand control test results.

Table 1. Summary of 7-Wire Strand Control Tests

Test Number	Weight (g)	Length (in.)	Area (in ²)	Load at 1% Elongation (lbf)	Ultimate Load (lbf)	Elongation at Maximum Load (%)
05-1	224.0	11.667	0.148	37,920	43,080	6.20
05-2	224.0	11.667	0.148	37,880	43,040	6.02
05-3	224.0	11.667	0.148	37,890	42,980	6.54
Average				37,897	43,033	6.25

The results from the static load tests and fatigue load tests are tabulated in Tables 2 and 3, respectively. Included in each table is the testing summary for each test. The load-elongation plots for the static testing and the load-cycle plots for fatigue testing are included in Appendix D and Appendix E, respectively.

The anchorage assemblies' static test results exceeded 95 percent of the actual strand tensile strength. The anchorage assemblies successfully completed the fatigue test requirements. The SC1 Splice Coupler configuration listed in Table 2 and Table 3 passed the requirements outlined in AC303 Sections 3.2.2 and 3.3.2.

Test results were also compared to the requirements stated in ACI 318-25, Section 25.8.1, ACI 423.7-14, Section 9.4 and Section 9.5, and Post-Tensioning Institute (PTI) PTI M10.2-24, Section 2.5. The SC1 Splice Coupler configuration listed in Table 2 and Table 3 passed the requirements of ACI 318-25, ACI 423.7-14, and PTI M10.2-24.

Table 2. Summary of SC1 Splice Coupler Static Load Tests

Test Number	Anchorage Material	Total Elongation (%)	Ultimate Load (lbf)	95% of Control Strand Ultimate Load (lbf)	Pass/Fail
SC1 Splice Coupler 05 - 1	SC1 Splice Coupler	3.44	42,160	40,880	Pass
SC1 Splice Coupler 05 - 2	SC1 Splice Coupler	3.49	42,410	40,880	Pass
SC1 Splice Coupler 05 - 3	SC1 Splice Coupler	2.84	41,920	40,880	Pass

Source: Anchorage static test results

Table 3. Summary of SC1 Splice Coupler Fatigue Load Tests

Test Number	Anchorage Material	Load Test Cycles	Start Length (in.)	Final Length (in.)	Load Range		Pass/Fail
					Min Load (lbf)	Max Load (lbf)	
080825	SC1 Splice Coupler	500,000	60	60	24,700	27,400	Pass
080825	SC1 Splice Coupler	50	60	60	16,400	35,200	Pass
081025	SC1 Splice Coupler	500,000	60	60	24,700	27,400	Pass
081025	SC1 Splice Coupler	50	60	60	16,400	35,200	Pass

Source: Anchorage fatigue load test results



Figure 1. SC1 Splice Coupler showing one end with strand and spring used to hold wedges in place.



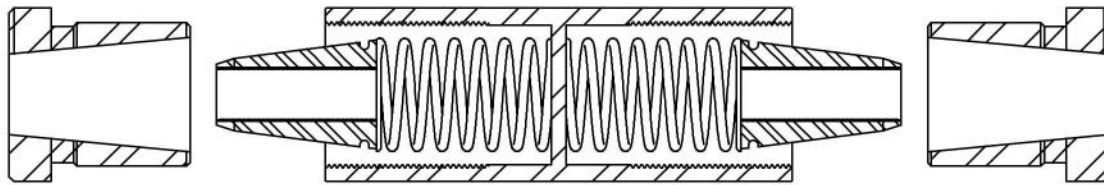
Figure 2. SC1 Splice Coupler fatigue sample with top end anchored to hydraulic actuator and bottom end bearing on structural floor soffit below.



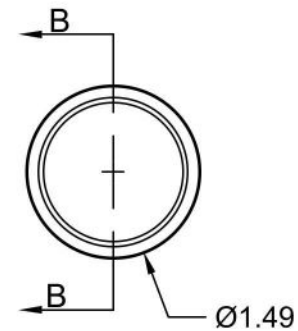
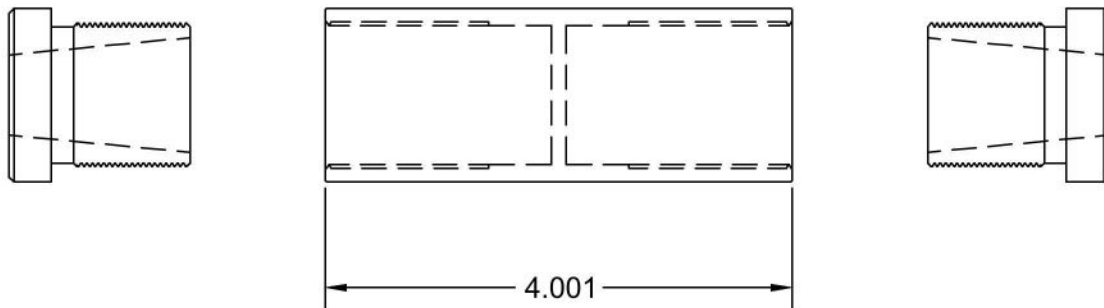
Static and Dynamic Testing of 0.5-in Monostrand Post-Tensioning Anchorages

AC303 Testing of SC1 Splice Coupler

APPENDIX A. PRODUCTION DRAWING



SECTION B-B



**POST-TENSION
PRODUCTS**

SC1

SPLICE COUPLER BARE STEEL, ½" CABLE

DRAWN	GLL
CHECKED	JW
SCALE	NTS

DATE: 08/12/25

DWG. NO.

SK-1

SHEET 1 OF 1



Static and Dynamic Testing of 0.5-in Monostrand Post-Tensioning Anchorages

AC303 Testing of SC1 Splice Coupler

APPENDIX B. TEST MACHINE AND EXTENSOMETER CALIBRATION CERTIFICATES



Static and Dynamic Testing of 0.5-in Monostrand Post-Tensioning Anchorages

AC303 Testing of SC1 Splice Coupler

Test Machines



Customer Address:
330 Pfingsten Road
Northbrook, IL 60062U
SA

MTS Field Service

MTS Systems Corporation
14000 Technology Drive
Eden Prairie, MN 55344-2290



Certificate of Calibration

Customer Name: Wiss, Janney, Elstner Associates, Inc. Page: 1 of 3
System ID: Seismic Frame MTS System No: Seismic Certificate Number: 2394-15646
Machine ID: Seismic Frame Location: Anchor Testing Lab Site: 508308
Country: SA

Equipment
Device Type: Force Model: 661.23A-01 Serial No.: 1194
Device ID: N/A
Conditioner Model: 494.26 DC A Serial No.: 1261214
Readout Device Model: COMPUTER Serial No.: Serial Channel: Port

MTS Field Service is accredited by the American Association for Laboratory Accreditation (A2LA Cert. No. 1145.01).
The basis for this accreditation is the international standard for calibration laboratories, ISO/IEC 17025
"General Requirements for the Competence of Testing and Calibration Laboratories".
Defined and documented measurement assurance techniques or uncertainty analyses are used to verify the adequacy of the measurement processes.

Calibrations are performed with standards whose values and measurements are traceable to the International System of Units (SI) through a National Metrology Institute (NMI).
MTS Reference Force Transducers are calibrated in compliance with ASTM E74.
The results of this calibration relate only to the items calibrated.
When parameter(s) are reported to be within specified tolerance(s), the measured value(s) shall fall within the appropriate specification limit and the uncertainty of the measured value(s) shall be stated.

CALIBRATION INFORMATION

As Found: In Tolerance Calibration Date: 07-Jan-2025
As Left: In Tolerance Calibration Due: 07-Jan-2026
Tolerance: +/-1.0% of Applied Force
Calibration Procedure: FS-CA 2122 ASTM E4-21
Full Scale Ranges: 55000 lbf
Note:

STANDARDS USED FOR CALIBRATION

<u>MTS Asset Number</u>	<u>Manufacturer</u>	<u>Model Number</u>	<u>Description</u>
19695	Interface Inc.	Interface	mV/V Indicator
26923	Rotronic	HL-20D	Temp and Humidity Meter
20980	Interface	50kip	Load Cell

Performed by: *Jim Rieder* Issued on: 7-Jan-25

ACS Version: 12.2.3

ACSRepRevBR



Calibration Report



Customer

Name: Wiss, Janney, Elstner Associates, Inc.
System ID: Seismic Frame MTS System No: Seismic
Machine ID: Seismic Frame Location: Anchor Testing Lab

Report Number: 2394-15646
Site: 508308
Country: SA

Equipment

Device Type: Force Model: 661.23A-01 Serial No.: 1194
Device ID: N/A
Conditioner Model: 494.26 DC A Serial No.: 1261214
Readout Device Model: COMPUTER Serial No.: Serial Channel: Port

Procedure

MTS Procedure: FS-CA 2122
Calibration has been performed in accordance with: ASTM E4-21
Method of Verification: Follow-the-Force Method using Elastic Calibration Devices
ACS Version: 12.2.3
See * note for decision rule applied.

Calibration Equipment Asset No.

Dead Weight Set: N/A Environmental Meter: 26923 Digital Indicator: 19695 DMM: N/A
DW Compensation: N/A Additional Equipment: N/A Standardizer: N/A
Standard Asset No.: 20980 Lower Limit: 1000 lbf Calibration Agency: ASTM E74

Conditions

Initial Temperature: 66 F Final Temperature: 67 F Bidirectional: N/A Cable Length: 50 Feet
Initial Humidity: 17 % Final Humidity: 17 % Polarity(+): Tension

In Tolerance	X	As Found:	X	Maximum Relative Error:	-0.59 %
Out of Tolerance		As Adjusted:		Tolerance: +/-1.0% of Applied Force	
				As Found System Condition:	Good

Conditioner Parameters

Polarity: Normal Total Gain: 378.68847 Fine zero: -0.02972 Shunt Cal (+): 31115.9 lbf.
Excitation: 10.0 Volts Pre-amp gain: 285.98
Post-amp gain: 1.32418

Calibration Data

Range: 1
Compression Resolution: 1 Full Scale: 55000
Report Units: lbf

Applied Percent of Full Scale Force	Series 1		Series 1 Errors				Series 2		Series 2 Errors				Repeatability Percent Error	
	Indicated Reading Ascending	Indicated Reading Descending	Indicated Error Asc	Percent Error Asc	Units Error Desc	Percent Error Desc	Indicated Reading Ascending	Indicated Reading Descending	Units Error Asc	Percent Error Asc	Units Error Desc	Percent Error Desc	Asc	Desc
0.	0.6	0.1	0.6	0.00	-	-	0.3	-0.1	0.3	0.00	-	-	-	-
-2.	-1097.1	-	-2.9	-0.26	-	-	-1098.1	-	-1.9	-0.17	-	-	0.09	-
-4.	-2193.6	-	-6.4	-0.29	-	-	-2193.0	-	-7.0	-0.32	-	-	0.03	-
-6.	-3285.8	-	-14.2	-0.43	-	-	-3288.6	-	-11.4	-0.35	-	-	0.08	-
-8.	-4381.3	-	-18.7	-0.43	-	-	-4381.2	-	-18.8	-0.43	-	-	0.00	-
-10.	-5475.6	-	-24.4	-0.44	-	-	-5479.0	-	-21.0	-0.38	-	-	0.06	-
-20.	-10953.0	-	-47.0	-0.43	-	-	-10957.0	-	-43.0	-0.39	-	-	0.04	-
-40.	-21897.0	-	-103.0	-0.47	-	-	-21900.0	-	-100.0	-0.45	-	-	0.01	-
-70.	-38308.0	-	-192.0	-0.50	-	-	-38312.0	-	-188.0	-0.49	-	-	0.01	-
-100.	-54677.0	-	-323.0	-0.59	-	-	-54679.0	-	-321.0	-0.58	-	-	0.00	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Range: 1

Tension

Applied Percent of Full Scale Force	Series 1		Series 1 Errors				Series 2		Series 2 Errors				Repeatability Percent Error	
	Indicated Reading Ascending	Indicated Reading Descending	Units Error Asc	Percent Error Asc	Units Error Desc	Percent Error Desc	Indicated Reading Ascending	Indicated Reading Descending	Units Error Asc	Percent Error Asc	Units Error Desc	Percent Error Desc	Asc	Desc
0.	-0.9	-0.3	-0.9	0.00	-	-	-0.9	0.8	-0.9	0.00	-	-	-	-
2.	1094.8	-	-5.2	-0.47	-	-	1097.3	-	-2.7	-0.25	-	-	0.23	-
4.	2193.1	-	-6.9	-0.31	-	-	2193.7	-	-6.3	-0.29	-	-	0.03	-
6.	3289.7	-	-10.3	-0.31	-	-	3291.0	-	-9.0	-0.27	-	-	0.04	-
8.	4386.6	-	-13.4	-0.30	-	-	4389.0	-	-11.0	-0.25	-	-	0.05	-
10.	5484.6	-	-15.4	-0.28	-	-	5483.7	-	-16.3	-0.30	-	-	0.02	-
20.	10977.0	-	-23.0	-0.21	-	-	10974.0	-	-26.0	-0.24	-	-	0.03	-
40.	21945.0	-	-55.0	-0.25	-	-	21945.0	-	-55.0	-0.25	-	-	0.00	-
70.	38402.0	-	-98.0	-0.25	-	-	38399.0	-	-101.0	-0.26	-	-	0.01	-
100.	54869.0	-	-131.0	-0.24	-	-	54884.0	-	-116.0	-0.21	-	-	0.03	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Errors at Zero are computed in % of Range.

Uncertainty of the data supplied is equal to or less than 0.25% of reading for a coverage factor of k=2 and an approximate confidence level of 95%.

This report shall not be reproduced except in full, without the written approval of the laboratory.

MTS Reference Force Transducers are temperature compensated over the range of use.

American Association of Laboratory Accreditation Certificate Number: 1145.01

* **Decision Rule:** Where the calibration decision rule is not inherent in the calibration method/standard, the decision rule used is Simple Acceptance as defined in ILAC G8 with the best TUR (Test Uncertainty Ratio) possible (typically 4:1). Although measurement uncertainty was accounted for during the TUR determination, it is the user's responsibility to assess the risk of acceptance with consideration of the stated measurement uncertainty.

Zero Values:

Where a zero value is reported as an offset or "nulling value" (i.e., a mechanical or electrical zero), its associated measurement uncertainty cannot be calculated. For that reason, the zero is not metrologically traceable and is therefore NOT an accredited measurement.

Table entries with a (-) are left intentionally blank.

Out of Tolerance in % column

Performed By: Jim Rieder

Field Service Engineer

Date: 7-Jan-25

Signature: *Jim Rieder*

Next Customer Agreed Upon Calibration Date: 7-Jan-26

ACSRepRevBR

Page: 3 of 3

Report Number: 2394-15646

Site: 508308

Country: SA

Customer

Name: Wiss, Janney, Elstner Associates, Inc.

System ID: Seismic Frame

MTS System No: Seismic

Machine ID: Seismic Frame

Location: Anchor Testing Lab

Equipment

Device Type: Force

Model: 661.23A-01

Serial No.: 1194

Device ID: N/A

Conditioner Model: 494.26 DC A

Readout Device Model: COMPUTER

Serial No.: 1261214

Serial No.: Serial

Channel: Port

Range:

1

Full Scale: 55000

Units: lbf

Linearization Table

As Found:

X

As Adjusted:

Standard

Conditioner

[illegible]



Certificate Of Calibration

Equipment Calibration was performed at the address below for

WISS, JANNEY, ELSTNER ASSOC.

330 PFINGSTEN ROAD

NORTHBROOK, IL 60062



Certificate # 866.01
Calibration

Issue Date:

03/28/2025

Date of Calibration

Monday, March 17, 2025

Manufacturer: RIEHLE

Capacity: 500000

Next Cal: 17-Mar-2026

Model: 500FH

Serial #: 47247

Customer #: 691

Language LBS

Force Calibration Results

Accuracy: 1.0 %

Range	Verified Range Force	Uncertainty %	Maximum Error %
500000	50000 - 500000	0.29	0.30
250000	25000 - 250000	0.29	0.85
100000	10000 - 100000	0.29	0.36
20000	2000 - 20000	0.29	-0.48

Cal-Rite Corporation has calibrated the testing equipment described above in accordance with ISO/IEC 17025:2017, ANSI/NCSL Z540-1-1994 and 10-CFR-21. All elastic verification devices have been calibrated in accordance with ASTM E74 practices and are traceable to the International System of Units (SI) through NIST.

Computed forces have been temperature corrected as necessary.

The uncertainty of the calibration process was estimated approximately at the 95% confidence level (k=2).

When a decision rule is stated in the governing specification, the prescribed decision rule was used in the pass/fail determination unless otherwise noted. In all other cases where a statement of conformance is made, the determination of conformance is made solely on the measurements falling in or out of the applied tolerance.

Measurement uncertainty is stated, but not used to determine pass/fail status.

This certificate relates only to the item calibrated.

The equipment listed above has met all applicable clauses of the governing specification unless noted below:

☐ 11.1 Lower Limit below 200X Resolution

☐ 11.5 Does not return to zero in 30 seconds

Specification: ASTM E 4-24

QMS Revision: 3.01

Service Comments: Verified proper operation of machine. Calibrated force in accordance with ASTM standards. All readings found and left within tolerance and repeatable. Adjustments were made to the 20k range to improve the accuracy. The machine is in good condition and functioning properly at this time.

As Found Condition: In Tolerance

Calibration Procedure: CR100 Rev 17

Calibration Method: Follow the Force

Software Version: N/A

Service Order #: 21043 - 34

NATHAN HATHAWAY

SERVICE ENGINEER

As a mutual protection to the purchaser, the public, and ourselves, all Cal-Rite calibration reports are submitted as the confidential property of the purchaser, and any authorization for publication of statements, conclusions, or extractions from or regarding our reports is reserved pending our prior written approval.



Certificate # 866.01
Calibration

WISS, JANNEY, ELSTNER ASSOC.
330 PFINGSTEN ROAD
NORTHBROOK, IL 60062

Calibration Date: 17-Mar-2025
Next Calibration: 17-Mar-2026
Customer #: 691
Temp/Humidity: 68.5 F/27.2%

Manufacture: RIEHLE
Model: 500FH
Indicator: DIGITAL

Capacity: 500000
Serial #: 47247
Shunt #: N/A

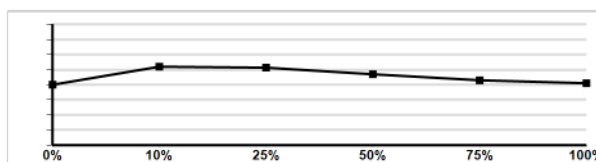
Test Direction: COMPRESSION
External Cell: N/A
Temp Variance: 0.5

Range: 500000 LBS Resolution: 100 Accuracy +/- 1.0%

FS %	Reading	As Found	As Adj.	As Left	Repeat %	Max Error	Error %	Uncert
0.00	0	0	0	0	0.000	0.000	0.000	0.29
10.00	50000	49,851	0	49,961	-0.221	148.900	0.299	0.29
25.00	125000	124,648	0	125,007	-0.288	352.000	0.282	0.29
50.00	250000	249,568	0	249,906	-0.135	431.900	0.173	0.29
75.00	375000	374,723	0	374,891	-0.045	277.300	0.074	0.29
100.00	500000	499,875	0	500,082	-0.041	124.800	0.025	0.29

Zero 0.00% 0.00% 0.00% 0.00%

Linearity Profile (Percent Full Scale)

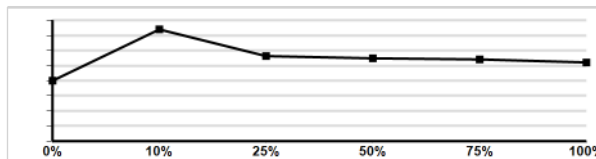


Range: 250000 LBS Resolution: 100 Accuracy +/- 1.0%

FS %	Reading	As Found	As Adj.	As Left	Repeat %	Max Error	Error %	Uncert
0.00	0	0	0	0	0.000	0.000	0.000	0.29
10.00	25000	24,823	0	24,789	0.134	210.600	0.850	0.29
25.00	62500	62,256	0	62,246	0.016	253.700	0.408	0.29
50.00	125000	124,538	0	124,578	-0.032	462.100	0.371	0.29
75.00	187500	186,840	0	186,958	-0.063	659.900	0.353	0.29
100.00	250000	249,344	0	249,244	0.040	755.700	0.303	0.29

Zero 0.00% 0.00% 0.00% 0.00%

Linearity Profile (Percent Full Scale)

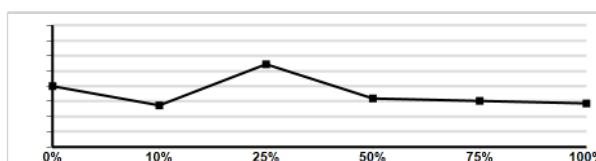


Range: 100000 LBS Resolution: 100 Accuracy +/- 1.0%

FS %	Reading	As Found	As Adj.	As Left	Repeat %	Max Error	Error %	Uncert
0.00	0	0	0	0	0.000	0.000	0.000	0.29
10.00	10000	10,032	0	10,012	0.198	-31.600	-0.315	0.29
25.00	25000	24,910	0	24,918	-0.031	90.100	0.362	0.29
50.00	50000	50,078	0	50,101	-0.046	-101.300	-0.202	0.29
75.00	75000	75,112	0	75,182	-0.094	-182.200	-0.242	0.29
100.00	100000	100,268	0	100,283	-0.016	-283.400	-0.283	0.29

Zero 0.00% 0.00% 0.00% 0.00%

Linearity Profile (Percent Full Scale)

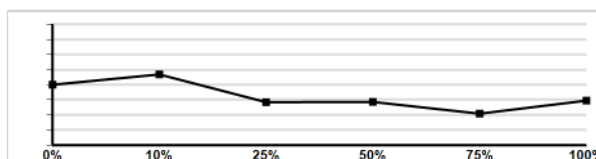


Range: 20000 LBS Resolution: 10 Accuracy +/- 1.0%

FS %	Reading	As Found	As Adj.	As Left	Repeat %	Max Error	Error %	Uncert
0.00	0	0	0	0	0.000	0.000	0.000	0.29
10.00	2000	2,019	1,998	1,997	0.070	3.400	0.170	0.29
25.00	5000	5,039	5,015	5,012	0.054	-14.500	-0.289	0.29
50.00	10000	10,061	10,029	10,024	0.051	-28.600	-0.285	0.29
75.00	15000	15,075	15,047	15,072	-0.167	-72.200	-0.479	0.29
100.00	20000	20,087	20,053	20,050	0.015	-52.800	-0.263	0.29

Zero 0.00% 0.00% 0.00% 0.00%

Linearity Profile (Percent Full Scale)



Calibrating Apparatus Used

Manufacture	Serial Number	Capacity	Class A	Dir	Cal Date	Cal Due	Calibrated By
STRAINSENSE	101209	600000	13396.3	C	9/20/2024	9/20/2026	TOVEY
TOVEY	119937A	60000	1200	C	10/16/2023	10/16/2025	CAL-RITE
MOREHOUSE	17062448	4.4	0	C	2/26/2025	6/26/2025	CAL-RITE

☐ 7.3 Interchangeability Established

☐ REPAIRED:

☒ ADJUSTED:

Specification: ASTM E 4-24

☒ SPECIFICATION COMPLIANT

CONDITION: Good

Calibration Procedure: CR100 Rev 17

Service Order #: 21043 - 34

NATHAN HATHAWAY

SERVICE ENGINEER

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Static and Dynamic Testing of 0.5-in Monostrand Post-Tensioning Anchorages

AC303 Testing of SC1 Splice Coupler

Extensometer



Certificate Of Calibration

Equipment Calibration was performed at the address below for



WISS, JANNEY, ELSTNER ASSOC.

330 PFINGSTEN ROAD

NORTHBROOK, IL 60062



Certificate # 866.01
Calibration

Issue Date:

03/28/2025

Date of Calibration

Tuesday, March 18, 2025

Instrument Profile

Manufacturer:	EPSILON	Mach/Rec#:	47247	G.L. Measurement:	DIRECT
Model #:	3543-0400-400T-ST	Scaling #:	N/A	G.L. Measure(1/2):	23.9200/23.920
Serial #:	E101717-24	Customer #:	5389	G.L. Error (1/2):	0.33% / 0.33%

Instrument Calibration Results

Range Capacity in/in	Verified Range in/in	Uncertainty in	Maximum Error in/in	ASTM Class
0.05	0.01 - 0.05	0.00019	0.000190	B-2
Range Capacity in/in	Verified Range in/in	Uncertainty in	Maximum Error in/in	ISO Class
0.05	0.01 - 0.05	0.00019	0.000190	1

Calibration Apparatus Used

Inst.	Manufacturer	Serial Number	Model	Calib By	Cert Date	Date Due
101	MITUTOYO	511474	164-162	ICS	1/29/2025	1/29/2026
252	MITUTOYO	2	GAGE BLOCKS	Nationwide Gage	3/13/2024	3/13/2026
362	MITUTOYO	B17288093	CD-8"ASX	ICS	8/27/2024	8/27/2026

Cal-Rite Corporation has calibrated the testing equipment described above in accordance with ISO/IEC 17025:2017, ANSI/NCSL Z540-1-1994 and 10-CFR-21. All calibration measurements are traceable to the International System of Units (SI) through NIST. The accuracy of the calibrating apparatus meets or exceeds ISO 9513 Annex B.

The uncertainty of the calibration process was estimated approximately at the 95% confidence level (k=2).

When a decision rule is stated in the governing specification, the prescribed decision rule was used in the pass/fail determination unless otherwise noted. In all other cases where a statement of conformance is made, the determination of conformance is made solely on the measurements falling in or out of the applied tolerance. Measurement uncertainty is stated, but not used to determine pass/fail status.

This certificate relates only to the item calibrated.

Specification: ASTM E 83-23 / EN ISO 9513-13

QMS Revision: 3.01

Service Comments: Verified proper operation of extensometer. Calibrated instrument in accordance with ASTM and ISO standards. All readings found and left within tolerance and repeatable. No adjustments made. The extensometer is in fair condition and functioning properly at this time. Gain setting is 1177.

As Found Condition: In Tolerance

Service Order #: 21043 - 59

NATHAN HATHAWAY

SERVICE ENGINEER

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WISS, JANNEY, ELSTNER ASSOC.
 330 PFINGSTEN ROAD
 NORTHBROOK, IL 60062

Calibration Date: 3/18/2025

Next Calibration: 3/18/2026

Temp/Humidity: 70.3F/34%

ISO 9513 REPORT

Unit Under Test Full Travel		Unit Under		Nominal	#1 Gage Length		#2 Gage Length		Measurement
Strain	Displacement	Test Resolution		Gage Length	Error		Error		Uncertainty
(in/in)	(in)	(in/in)	(Class)	(in)	%	(Class)	%	(Class)	(in)
0.05	1.2	0.00004	1	24.0000	0.333	0.5	0.333	0.5	0.0018

AS FOUND

Nominal Strain	Nominal Displacement	As Found Strain	As Found Displacement	Bias Error - Absolute	Bias Error - Relative	ISO 9513
(in/in)	(in)	(in/in)	(in)	(in/in)	(% of Reading)	Class
0.000000	0.000000	0.000000	0.000000	0.00000	N/A	0.2
0.010000	0.240000	0.010010	0.240240	-0.00001	-0.10	0.5
0.020000	0.480000	0.019960	0.479040	0.00004	0.20	0.5
0.030000	0.720000	0.029950	0.718800	0.00005	0.17	0.5
0.040000	0.960000	0.039870	0.956880	0.00013	0.32	0.5
0.050000	1.200000	0.049880	1.197120	0.00012	0.24	0.5

AS LEFT

Nominal Strain	Nominal Displacement	As Left Strain	As Left Displacement	Bias Error - Absolute	Bias Error - Relative	Repeat	ISO 9513
(in/in)	(in)	(in/in)	(in)	(in/in)	(% of Reading)	%	Class
0.000000	0.000000	0.000000	0.000000	0.00000	N/A	0.00	0.2
0.010000	0.240000	0.009960	0.239040	0.00004	0.40	0.50	0.5
0.020000	0.480000	0.019920	0.478080	0.00008	0.40	0.20	0.5
0.030000	0.720000	0.029900	0.717600	0.00010	0.33	0.17	0.5
0.040000	0.960000	0.039840	0.956160	0.00016	0.40	0.08	0.5
0.050000	1.200000	0.049810	1.195440	0.00019	0.38	0.14	0.5

Calibration Procedure: CR101 Rev 17

NATHAN HATHAWAY

SERVICE ENGINEER

Service Order #: 21043 - 59

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WISS, JANNEY, ELSTNER ASSOC.
 330 PFINGSTEN ROAD
 NORTHBROOK, IL 60062

Calibration Date: 3/18/2025

Next Calibration: 3/18/2026

Temp/Humidity: 70.3F/34%

ASTM E83 REPORT

Unit Under Test Full Travel		Unit Under		Nominal	#1 Gage Length		#2 Gage Length		Measurement
Strain	Displacement	Test Resolution		Gage Length	Measurement		Measurement		Uncertainty
(in/in)	(in)	(in/in)	(Class)	(in)	(in)	(Class)	(in)	(Class)	(in)
0.05	1.2	0.00004	B-1	24.0000	23.9200	B-2	23.9200	B-2	0.0018

AS FOUND

Nominal Strain	Nominal Displacement	As Found Strain	As Found Displacement	Fixed Error	Relative Error	ASTM E-83
(in/in)	(in)	(in/in)	(in)	(in/in)	(% of Reading)	Class
0.000000	0.000000	0.000000	0.000000	0.00000	N/A	B-2
0.010000	0.240000	0.010010	0.240240	-0.00001	-0.10	B-2
0.020000	0.480000	0.019960	0.479040	0.00004	0.20	B-2
0.030000	0.720000	0.029950	0.718800	0.00005	0.17	B-2
0.040000	0.960000	0.039870	0.956880	0.00013	0.32	B-2
0.050000	1.200000	0.049880	1.197120	0.00012	0.24	B-2

AS LEFT

Nominal Strain	Nominal Displacement	As Left Strain	As Left Displacement	Fixed Error	Relative Error	Repeat	ASTM E-83
(in/in)	(in)	(in/in)	(in)	(in/in)	(% of Reading)	%	Class
0.000000	0.000000	0.000000	0.000000	0.00000	N/A	0.00	B-2
0.010000	0.240000	0.009960	0.239040	0.00004	0.40	0.50	B-2
0.020000	0.480000	0.019920	0.478080	0.00008	0.40	0.20	B-2
0.030000	0.720000	0.029900	0.717600	0.00010	0.33	0.17	B-2
0.040000	0.960000	0.039840	0.956160	0.00016	0.40	0.08	B-2
0.050000	1.200000	0.049810	1.195440	0.00019	0.38	0.14	B-2

Calibration Procedure: CR101 Rev 17

NATHAN HATHAWAY

SERVICE ENGINEER

Service Order #: 21043 - 59

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APPENDIX C. STRAND CONTROL TEST

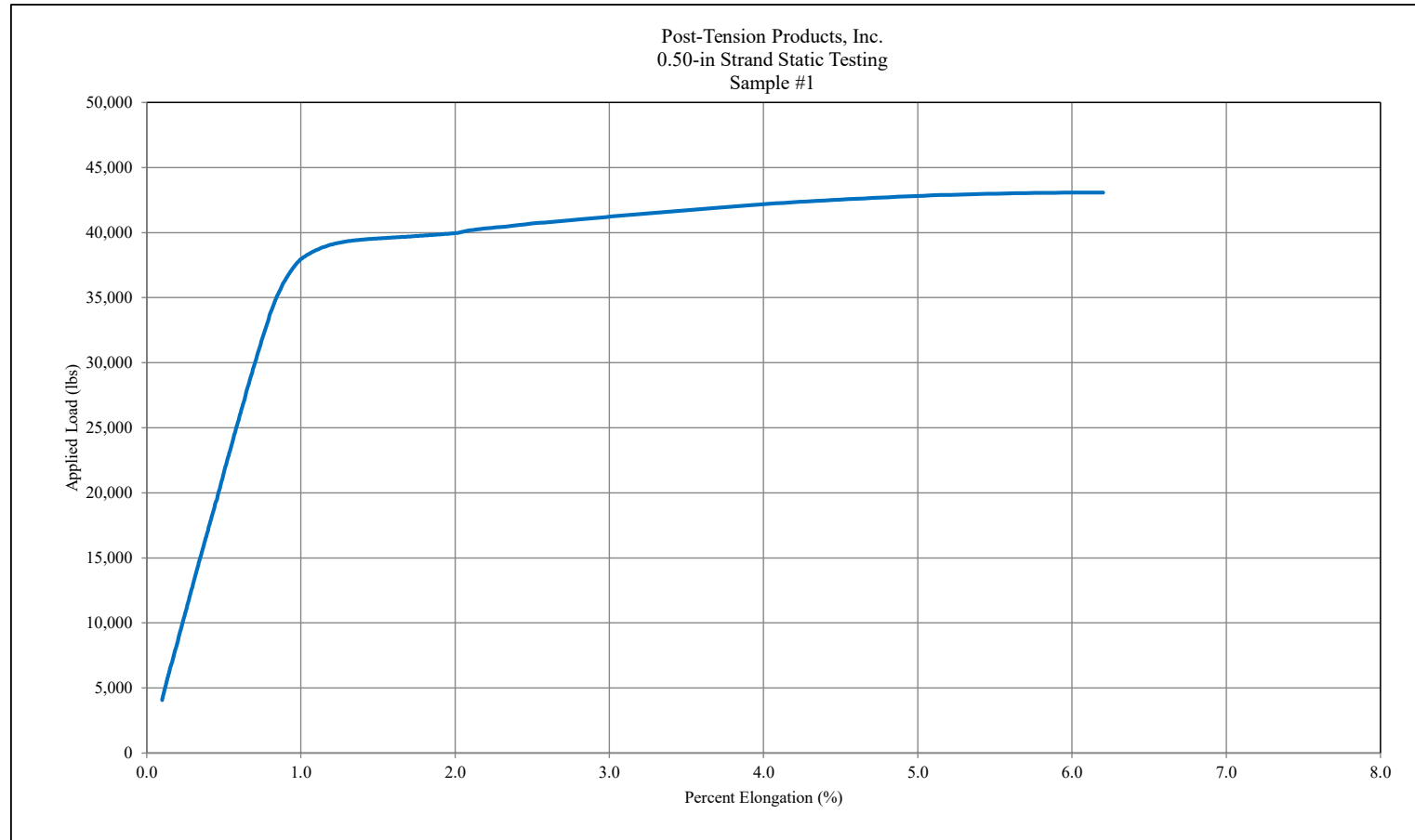


ENGINEERS
ARCHITECTS
MATERIALS SCIENTISTS

Wiss, Janney, Elstner Associates, Inc.
330 Pfingsten Road
Northbrook, Illinois 60062

Verified Dimensions	
Strand Diameter	0.500 in
Weight	224 grams
Length	11.667 in
Area	0.148 in ²

Measured Values		
Load at 1% Elongation	37,920	lbs
Ultimate Load	43,080	lbs
Elongation @ Ult Load	6.20	percent
Modulus of Elasticity	28,777	ksi



WJE Project Number	2025.3912
Client	Post-Tension Products, Inc.
Sample Tested	0.50-in, 270 ksi, 7-wire strand
Notes	0.50-in. Strand No. 1

Test Location	Northbrook, IL
Test Operator	B Easton
Test Date	8/11/2025
Test Methods	ASTM A1061, A416

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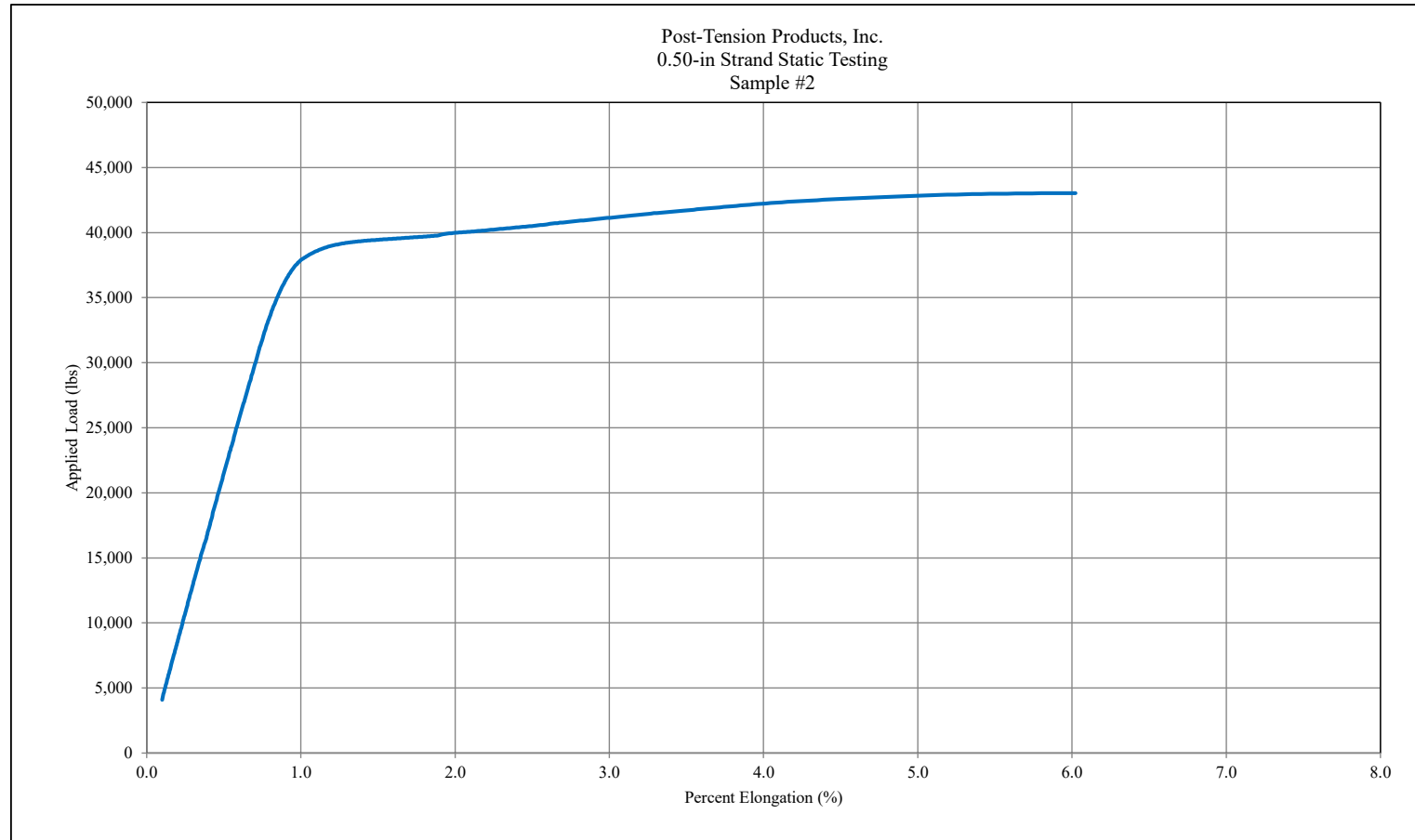


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MATERIALS SCIENTISTS

Wiss, Janney, Elstner Associates, Inc.
330 Pfingsten Road
Northbrook, Illinois 60062

Verified Dimensions	
Strand Diameter	0.500 in
Weight	224 grams
Length	11.667 in
Area	0.148 in ²

Measured Values		
Load at 1% Elongation	37,880	lbs
Ultimate Load	43,040	lbs
Elongation @ Ult Load	6.02	percent
Modulus of Elasticity	28,559	ksi



WJE Project Number	2025.3912
Client	Post-Tension Products, Inc.
Sample Tested	0.50-in, 270 ksi, 7-wire strand
Notes	0.50-in. Strand No. 2

Test Location	Northbrook, IL
Test Operator	B Easton
Test Date	8/11/2025
Test Methods	ASTM A1061, A416

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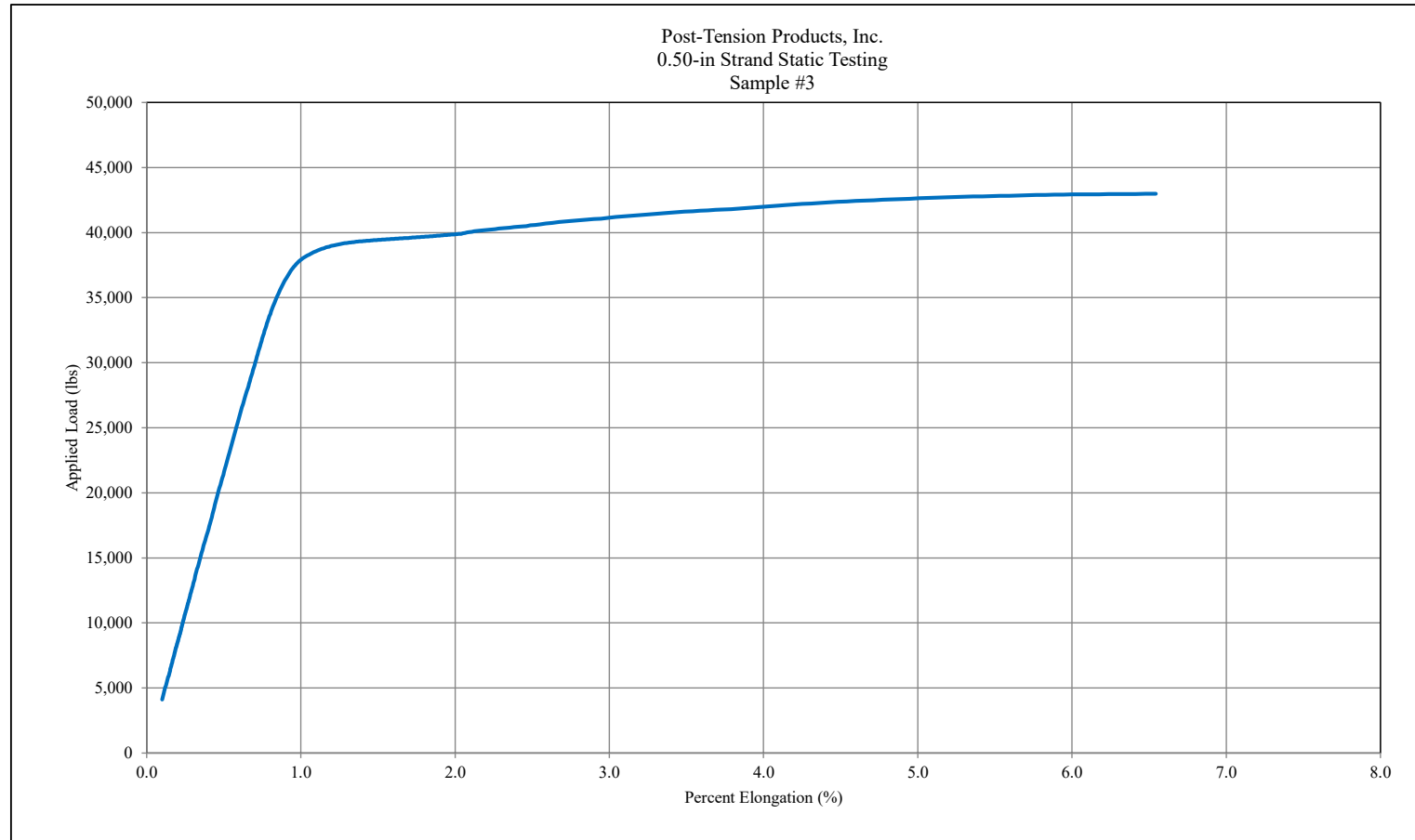


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MATERIALS SCIENTISTS

Wiss, Janney, Elstner Associates, Inc.
330 Pfingsten Road
Northbrook, Illinois 60062

Verified Dimensions	
Strand Diameter	0.500 in
Weight	224 grams
Length	11.667 in
Area	0.148 in ²

Measured Values		
Load at 1% Elongation	37,890	lbs
Ultimate Load	42,980	lbs
Elongation @ Ult Load	6.54	percent
Modulus of Elasticity	28,673	ksi



WJE Project Number	2025.3912
Client	Post-Tension Products, Inc.
Sample Tested	0.50-in, 270 ksi, 7-wire strand
Notes	0.50-in. Strand No. 3

Test Location	Northbrook, IL
Test Operator	B Easton
Test Date	8/11/2025
Test Methods	ASTM A1061, A416

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APPENDIX D. SC1 SPLICE COUPLER STATIC TESTS

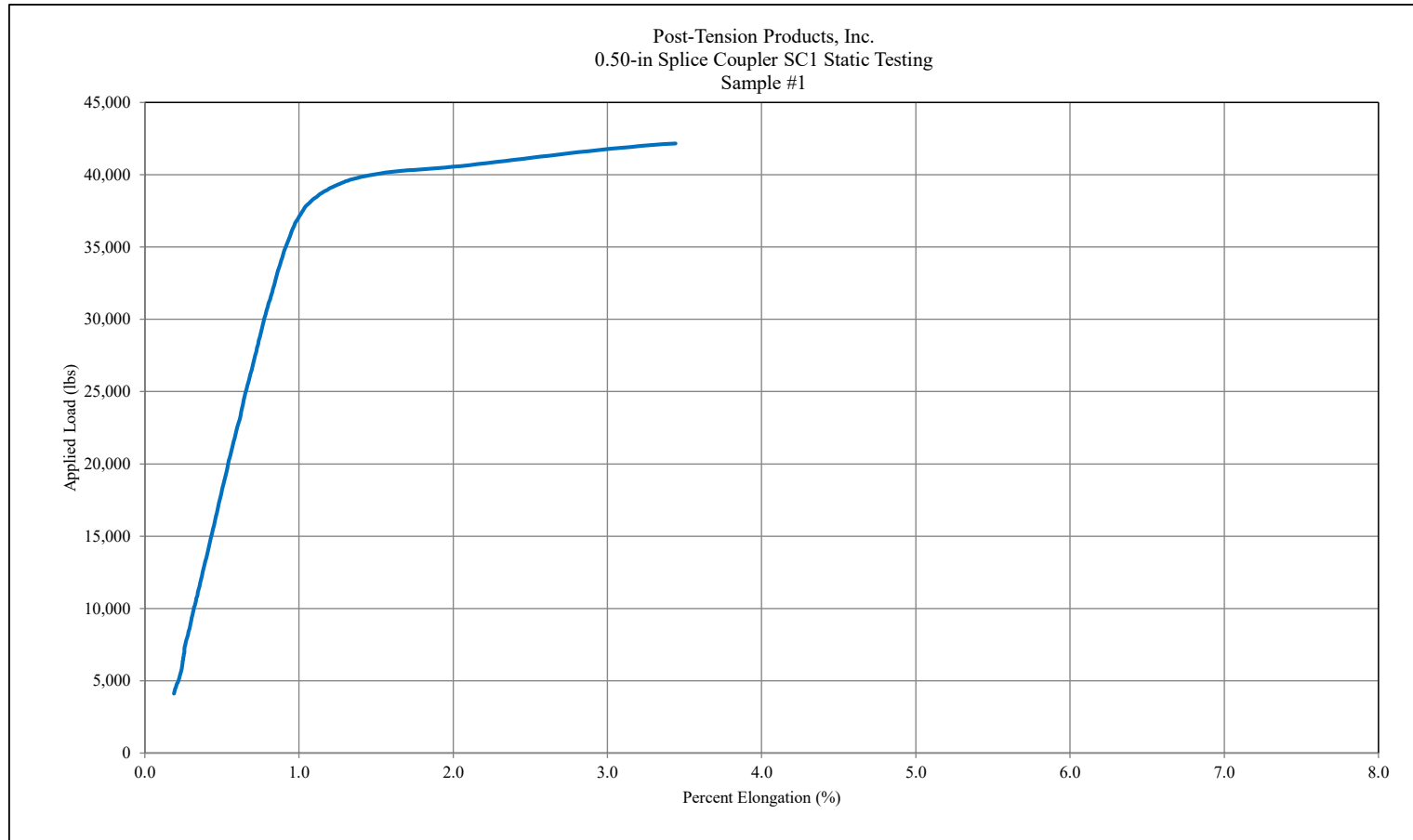


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MATERIALS SCIENTISTS

Wiss, Janney, Elstner Associates, Inc.
330 Pfingsten Road
Northbrook, Illinois 60062

Verified Dimensions	
Strand Diameter	0.500 in
Weight	224 grams
Length	11.667 in
Area	0.148 in ²

Measured Values		
Load at 1% Elongation	36,960	lbs
Ultimate Load	42,160	lbs
Elongation @ Ult Load	3.44	percent
Modulus of Elasticity	29,591	ksi



WJE Project Number	2025.3912
Client	Post-Tension Products, Inc.
Sample Tested	0.50-in, 270 ksi, 7-wire strand with anchor
Notes	0.50-in. Strand with Splice Coupler SC1 No. 1

Test Location	Northbrook, IL
Test Operator	B Easton
Test Date	6/20/2025
Test Methods	ASTM A1061, A416

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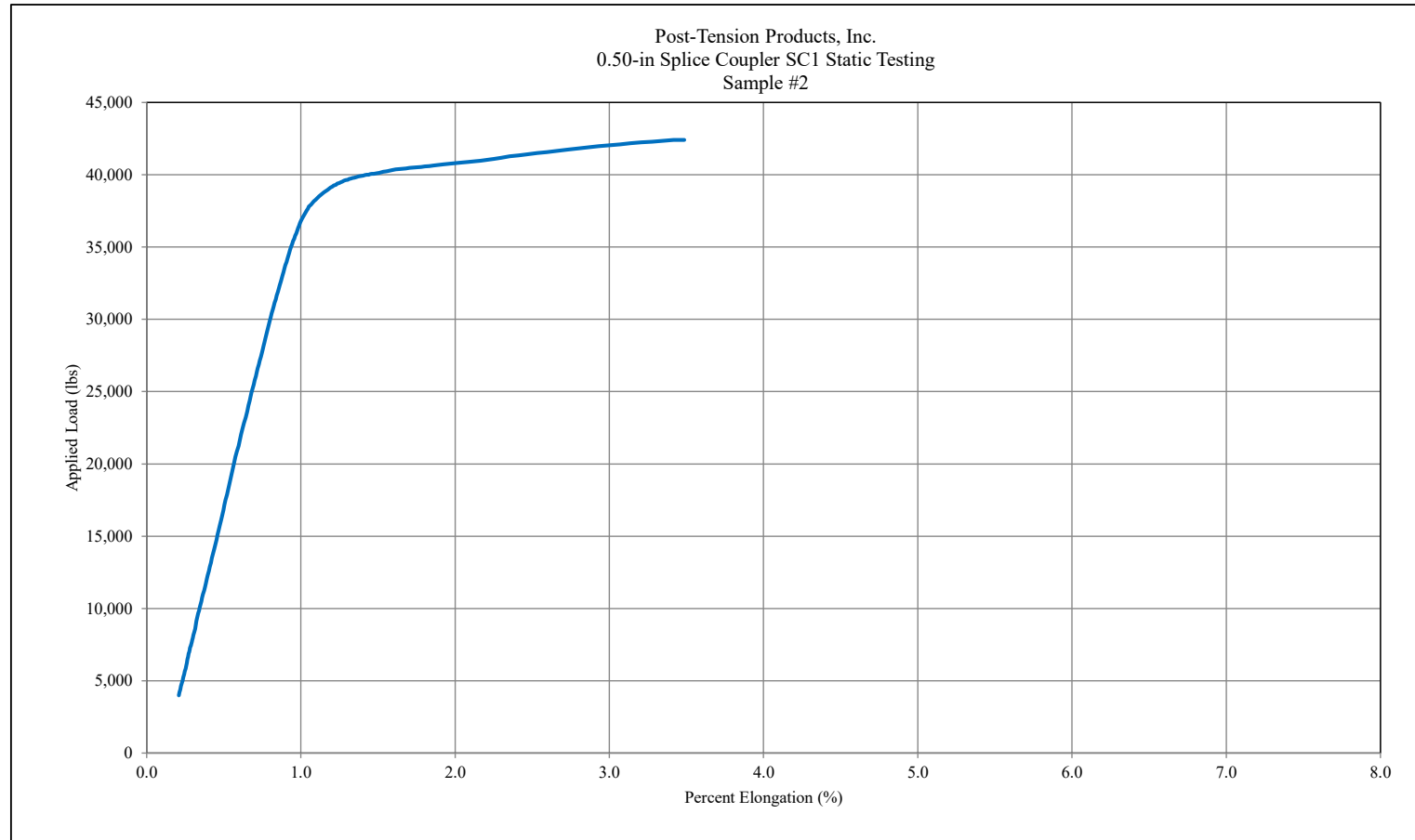


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Wiss, Janney, Elstner Associates, Inc.
330 Pfingsten Road
Northbrook, Illinois 60062

Verified Dimensions	
Strand Diameter	0.500 in
Weight	224 grams
Length	11.667 in
Area	0.148 in ²

Measured Values		
Load at 1% Elongation	36,640	lbs
Ultimate Load	42,410	lbs
Elongation @ Ult Load	3.49	percent
Modulus of Elasticity	29,478	ksi



WJE Project Number	2025.3912
Client	Post-Tension Products, Inc.
Sample Tested	0.50-in, 270 ksi, 7-wire strand with anchor
Notes	0.50-in. Strand with Splice Coupler SC1 No. 2

Test Location	Northbrook, IL
Test Operator	B Easton
Test Date	6/20/2025
Test Methods	ASTM A1061, A416

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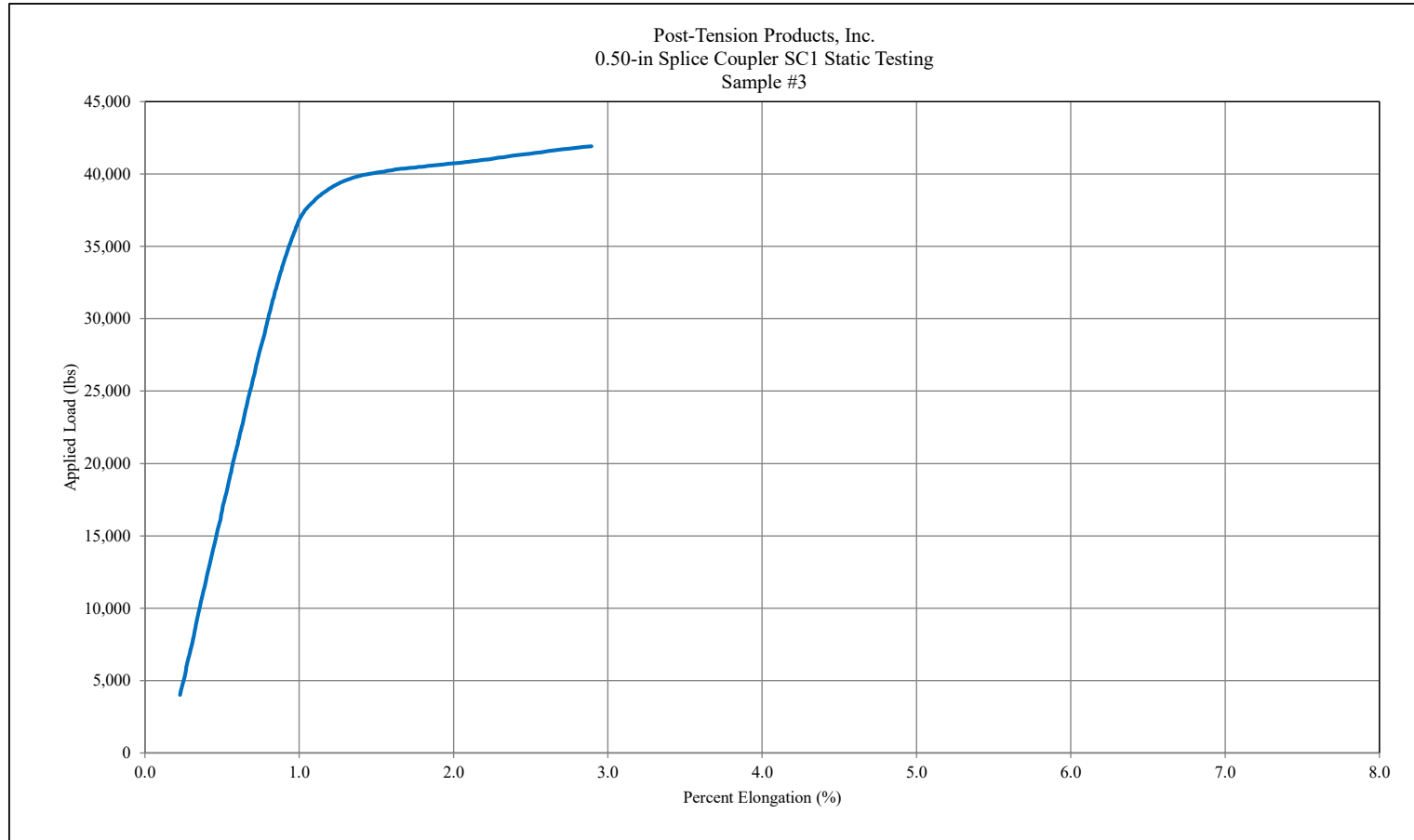


ENGINEERS
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MATERIALS SCIENTISTS

Wiss, Janney, Elstner Associates, Inc.
330 Pfingsten Road
Northbrook, Illinois 60062

Verified Dimensions	
Strand Diameter	0.500 in
Weight	224 grams
Length	11.667 in
Area	0.148 in ²

Measured Values		
Load at 1% Elongation	36,780	lbs
Ultimate Load	41,920	lbs
Elongation @ Ult Load	2.84	percent
Modulus of Elasticity	30,446	ksi



WJE Project Number	2025.3912
Client	Post-Tension Products, Inc.
Sample Tested	0.50-in, 270 ksi, 7-wire strand with anchor
Notes	0.50-in. Strand with Splice Coupler SC1 No. 3

Test Location	Northbrook, IL
Test Operator	B Easton
Test Date	6/20/2025
Test Methods	ASTM A1061, A416

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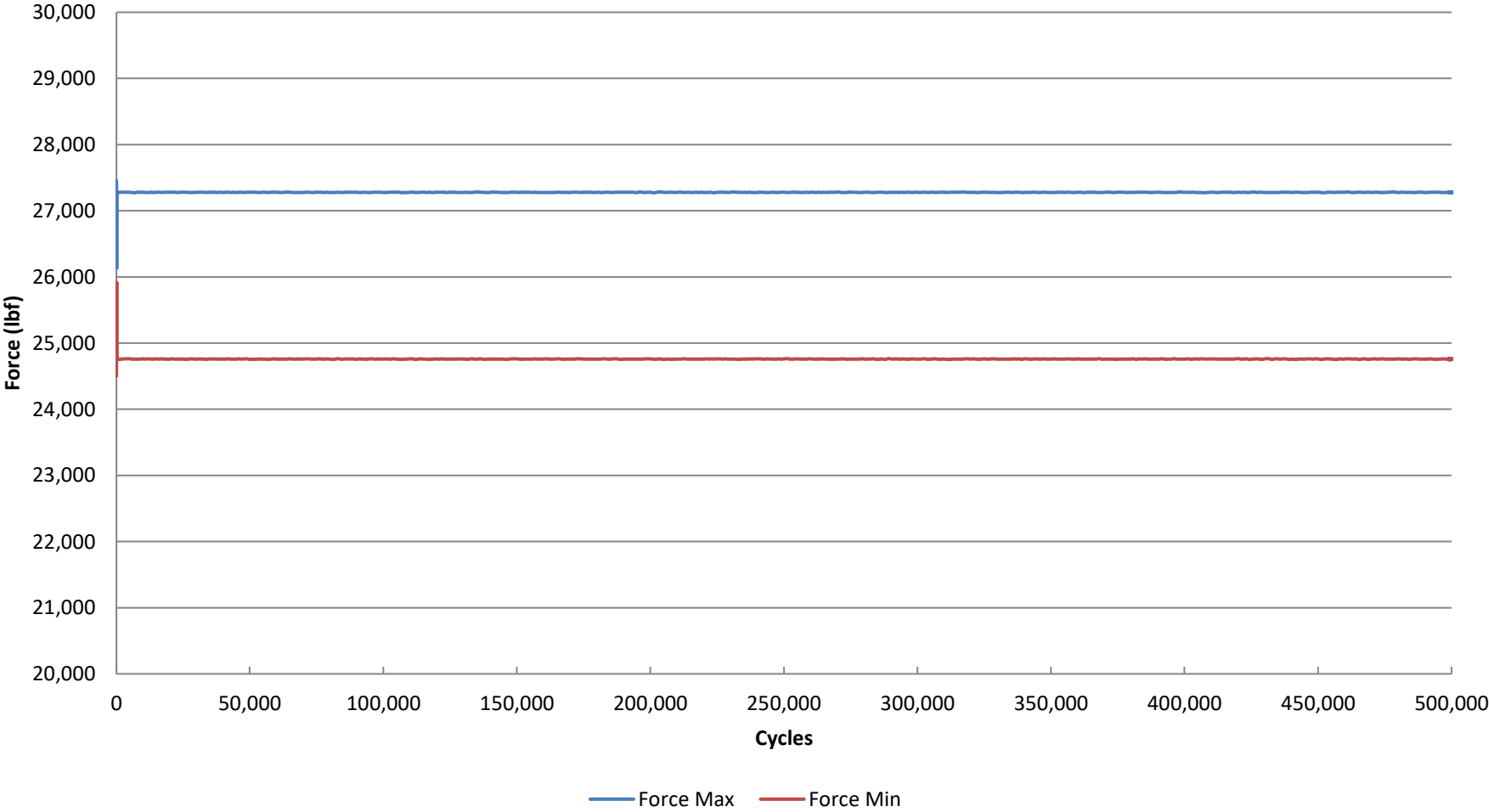
APPENDIX E. SC1 SPLICE COUPLER FATIGUE TESTS



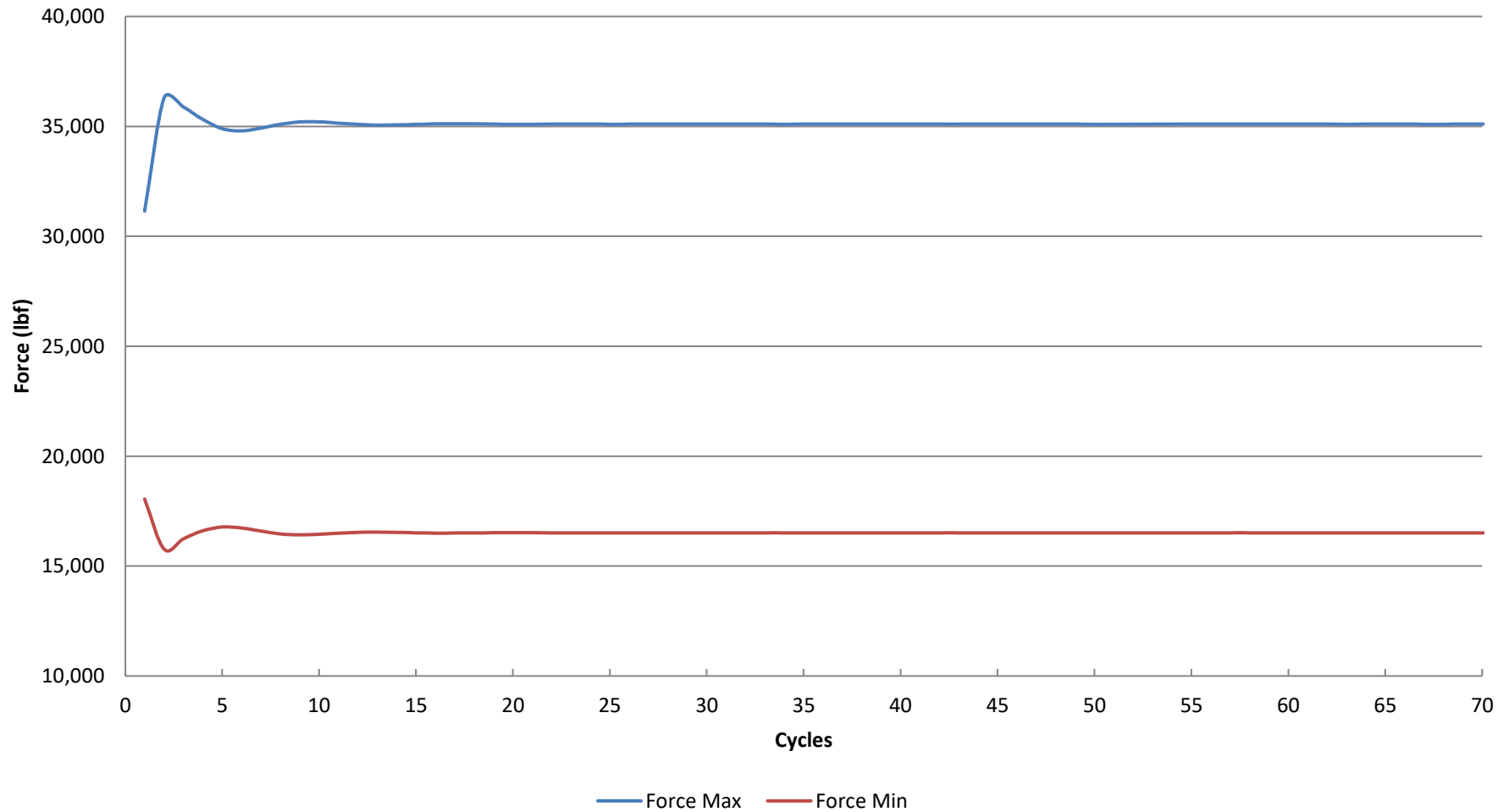
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330 Pfingsten Road
Northbrook, Illinois 60062

Post-Tensioned Products, Inc.
SC1 Splice Coupler Fatigue Testing
Test No. 080825 - Tendon #1 - 500,000 Cycles
WJE No. 2025.3912



Post-Tensioned Products, Inc.
SC1 Splice Coupler Fatigue Testing
Test No. 080825 - Tendon #1 - 50 Cycles
WJE No. 2025.3912

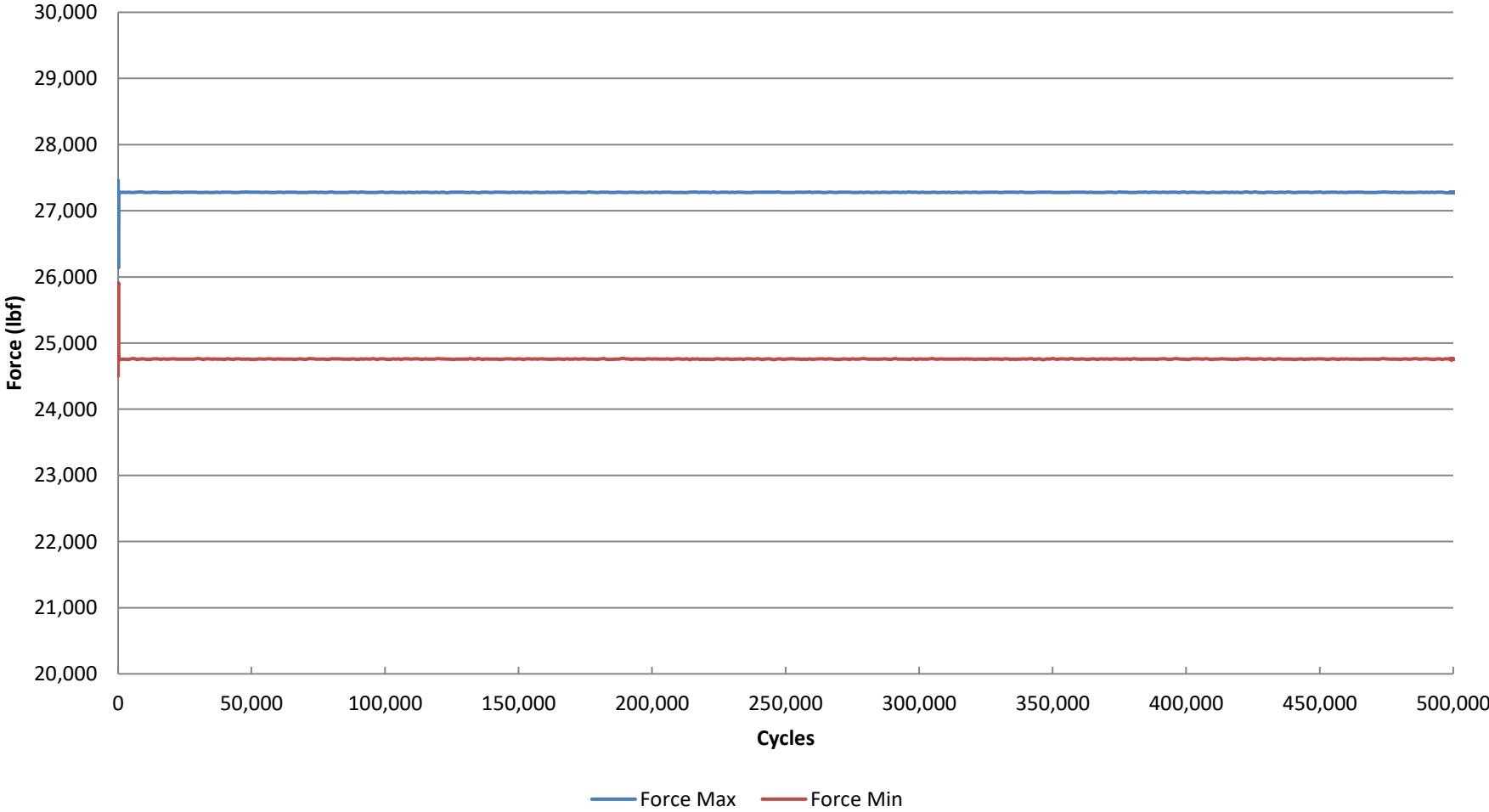




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Wiss, Janney, Elstner Associates, Inc.
330 Pfingsten Road
Northbrook, Illinois 60062

Post-Tensioned Products, Inc.
SC1 Splice Coupler Fatigue Testing
Test No. 081025 - Tendon #2 - 500,000 Cycles
WJE No. 2025.3912





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Wiss, Janney, Elstner Associates, Inc.
330 Pfingsten Road
Northbrook, Illinois 60062

Post-Tensioned Products, Inc.
SC1 Splice Coupler Fatigue Testing
Test No. 081025 - Tendon #2 - 50 Cycles
WJE No. 2025.3912

