



Dominator/Smooth Shank Test Analysis Report

Prepared for:

Bissett Fasteners
63 Fawcett Rd
Coquitlam, BC V3K 6V2
604.540.0200

Prepared by:

LATERA ENGINEERING INC.
Unit 18 – 62 Fawcett Rd
Coquitlam, BC V3K 6V5
604.492.3304
info@latera.ca | www.latera.ca

Report Author:

Reviewed By:

Per: Kassim Khaku, EIT

Per: Cameron Robinson, P. Eng.

April 17, 2023

Latera File: L23-023



TABLE OF CONTENTS

| <u>ITEM</u> | <u>PAGE</u> |
|--------------------------|-------------|
| TABLE OF CONTENTS..... | i |
| LIST OF TABLES..... | i |
| LIST OF APPENDICES | i |
| 1 Objective..... | 1 |
| 2 Process..... | 1 |
| 3 Results..... | 2 |
| 4 Conclusion..... | 4 |

LIST OF TABLES

| <u>ITEM</u> | <u>PAGE</u> |
|--|-------------|
| Table 1: Dominator Nail Test Specifications..... | 1 |
| Table 2: Smooth Shank Nail Test Specifications..... | 1 |
| Table 3: Dominator Nail Analysis Data..... | 2 |
| Table 4: Smooth Shank Nail Analysis Data..... | 3 |
| Table 5: Dominator and Smooth Shank Tolerance Limit..... | 3 |

LIST OF APPENDICES

| <u>ITEM</u> | <u># OF PAGES</u> |
|---|-------------------|
| APPENDIX A – Intertek Report | 33 |
| APPENDIX B – Dominator Load-Deformation Graphs..... | 10 |
| APPENDIX C – Smooth Shank Load-Deformation Graphs | 10 |



1 OBJECTIVE

Latera Engineering was contracted by Bissett Fasteners Limited to analyze test data of lateral resistance on various fastener products performed by Intertek Building & Construction. See Appendix A for the test data. Analysis of the given data was done in accordance with ASTM D2915 – 17.

2 PROCESS

The analysis of the provided test data for lateral load tests into SPF was completed in accordance with ASTM D2915 – 17. The yield load and deflection for each test specimen was found using the intersection of the 5% nail diameter offset on the Load-Deflection curve for each test specimen. The tolerance limit of 95% content with 75% confidence for the fasteners was found in accordance with ASTM D2915 – 17 clause 4.4.3.2.

Table 1 below shows the details of the testing on the Dominator Nail.

Table 1: Dominator Nail Test Specifications

| | |
|----------------------------|---------------------------|
| Product: | Dominator 3" x 0.120 Nail |
| Substrate Material: | 14/32 OSB - 2x4 SPF |
| Method: | ASTM D1761-20 |

Table 2 below shows the details of the testing on the Smooth Shank Nail.

Table 2: Smooth Shank Nail Test Specifications

| | |
|----------------------------|------------------------------|
| Product: | Smooth Shank 3" x 0.148 Nail |
| Substrate Material: | 14/32 OSB - 2x4 SPF |
| Method: | ASTM D1761-20 |



3 RESULTS

Table 3 below shows the yield load, deformation, and stiffness based on the 5% offset for the 10 Dominator Nail Specimens.

Table 3: Dominator Nail Analysis Data

| Dominator Nail | | | |
|----------------|------------|-------------------|-----------|
| Specimen | Yield Load | Yield Deformation | Stiffness |
| | (N) | (mm) | (N/mm) |
| 1 | 613 | 5.13 | 119 |
| 2 | 617 | 5.99 | 103 |
| 3 | 745 | 4.90 | 152 |
| 4 | 919 | 5.72 | 161 |
| 5 | 538 | 3.56 | 151 |
| 6 | 780 | 5.31 | 147 |
| 7 | 557 | 3.96 | 141 |
| 8 | 604 | 2.97 | 203 |
| 9 | 662 | 4.62 | 143 |
| 10 | 551 | 4.75 | 116 |
| Mean: | 659 | 4.69 | 144 |
| StdDev: | 121.7 | 0.95 | 27.9 |
| COV: | 18% | 20% | 19% |

See Appendix B for the Load-Deflection graphs with 5% offset for all specimens of Dominator Nail.



Table 4 below shows the yield load, deformation, and stiffness based on the 5% offset for the 10 Smooth Shank Nail Specimens.

Table 4: Smooth Shank Nail Analysis Data

| Smooth Shank | | | |
|--------------|------------|-------------------|-----------|
| Specimen | Yield Load | Yield Deformation | Stiffness |
| | (N) | (mm) | (N/mm) |
| 1 | 697 | 4.73 | 147 |
| 2 | 595 | 3.74 | 159 |
| 3 | 738 | 6.84 | 108 |
| 4 | 1158 | 8.14 | 142 |
| 5 | 783 | 8.11 | 97 |
| 6 | 691 | 11.16 | 62 |
| 7 | 567 | 10.42 | 54 |
| 8 | 977 | 10.58 | 92 |
| 9 | 1193 | 4.71 | 253 |
| 10 | 951 | 10.68 | 89 |
| Mean: | 835 | 7.91 | 120 |
| StdDev: | 222.9 | 2.80 | 58.3 |
| COV: | 27% | 35% | 48% |

See Appendix C for the Load-Deflection graphs with 5% offset for all specimens of Smooth Shank Nail.

Table 5 below shows the calculated tolerance limit of 95% content with a 75% confidence and the standard error of each nail based on the average of all 10 specimens.

Table 5: Dominator and Smooth Shank Comparison

| | Dominator Nail | Smooth Shank |
|--|----------------|--------------|
| Average Max Load, (N) | 1542 | 1407 |
| Tolerance Limit (5%), (N) | 403 | 366 |
| Standard Error (SE), (N) | 72 | 131 |
| Average Apparent Stiffness (N/mm) | 144 | 120 |

As seen above, the Dominator Nail has a higher tolerance limit and a lower standard error than the Smooth Shank Nail. The Dominator Nail also has a higher average maximum load and average apparent stiffness than the Smooth Shank Nail.



4 CONCLUSION

Based on the analysis, the Dominator Nail has a higher tolerance limit than the Smooth Shank Nail. While the Dominator had a lower average yield load, the results were more consistent than the Smooth Shank resulting in a higher tolerance limit. The Dominator Nail also had a lower average yield deformation, higher average apparent stiffness, and higher average maximum load.



APPENDIX A

Intertek Report

BISSETT FASTENERS LIMITED TEST REPORT

SCOPE OF WORK

REPORT OF BISSETT FASTENERS TESTED IN ACCORDANCE WITH ASTM D1761-20, *STANDARD TEST METHODS FOR MECHANICAL FASTENERS IN WOOD AND WOOD-BASED MATERIALS*

REPORT NUMBER

104757760COQ-001

TEST DATE

08/17/21 - 08/20/21

ISSUE DATE [REVISED DATE]

08/27/21 10/19/22

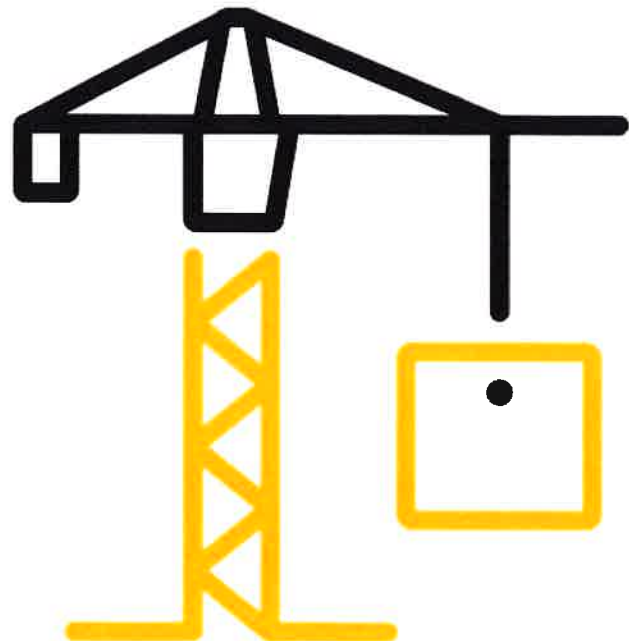
PAGES

33

DOCUMENT CONTROL NUMBER

GFT-OP-10c (09/29/20)

© 2020 INTERTEK



TEST REPORT FOR BISSETT FASTENERS LIMITED

Report No.: 104757760COQ-001

Date: 10/19/22

REPORT ISSUED TO BISSETT FASTENERS LIMITED.


63 Fawcett Road
Coquitlam, BC, V3K 6V2
Canada


SECTION 1 SCOPE

Intertek Building & Construction (B&C) was contracted by Bissett Fasteners Limited, 63 Fawcett Road, Coquitlam, BC, V3K 6V2, Canada, to perform testing in accordance with ASTM D1761-20, *Standard Test Methods for Mechanical Fasteners in Wood and Wood-Based Materials*, on their various fastener products. Results obtained are tested values and were secured by using the designated test method. Testing was conducted at the Intertek test facility in Coquitlam, BC, Canada.

Unless differently required, Intertek reports apply the "Simple Acceptance" rule also called "Shared Risk approach," of ILAC-G8:09/2019, Guidelines on Decision Rules and Statements of Conformity.

For INTERTEK B&C:

| | |
|----------------------|---|
| COMPLETED BY: | Frank Gadea-Lopez Tech. |
| TITLE: | – Building & Construction |
| SIGNATURE: |  |
| DATE: | 10/19/22 |

| | |
|---------------------|---|
| REVIEWED BY: | Baldeep Sandhu Manager |
| TITLE: | – Building & Construction |
| SIGNATURE: |  |
| DATE: | 10/19/22 |

This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample(s) tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.

TEST REPORT FOR BISSETT FASTENERS LIMITED

Report No.: 104757760COQ-001

Date: 10/19/22

SECTION 2

SUMMARY OF TEST RESULTS

| PROPERTY | DESCRIPTION | SUBSTRATE | AVG TEST RESULTS |
|--------------------------------|---|---------------------------------|------------------|
| Fastener Withdrawal | Bissett 3 in. x 0.148 in. smooth shank, 15° angle coil nails | 19/32 in. OSB – 2x4 Douglas FIR | 473 lbs |
| | Bissett 3 in. x 0.148 in. smooth shank, 15° angle coil nails | 19/32 in. OSB – 2x4 SPF | 425 lbs |
| | Bissett 3 in. x 0.120 in. spiral shank, seismic, 15° angle coil nails (Dominator) | 19/32 in. OSB – 2x4 Douglas FIR | 686 lbs |
| | Bissett 3 in. x 0.120 in. spiral shank, seismic, 15° angle coil nails (Dominator) | 19/32 in. OSB – 2x4 SPF | 636 lbs |
| | Bissett 2-1/4 in. x 0.099 in. spiral shank, 15° angle coil nails | 19/32 in. OSB – 2x4 SPF | 323 lbs |
| | Bissett 2 in. x 0.099 in. spiral shank, 15° angle coil nails (Dominator) | 19/32 in. OSB – 2x4 SPF | 352 lbs |
| Fastener Lateral Resistance | Bissett 3 in. x 0.120 in. spiral shank, seismic, 15° angle coil nails (Dominator) | 19/32 in. OSB – 2x4 Douglas FIR | 384 lbs |
| | Bissett 3 in. x 0.120 in. spiral shank, seismic, 15° angle coil nails (Dominator) | 19/32 in. OSB – 2x4 SPF | 347 lbs |
| | Bissett 3 in. x 0.148 in. smooth shank, 15° angle coil nails | 19/32 in. OSB – 2x4 Douglas FIR | 362 lbs |
| | Bissett 3 in. x 0.148 in. smooth shank, 15° angle coil nails | 19/32 in. OSB – 2x4 SPF | 316 lbs |

This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample(s) tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.

TEST REPORT FOR BISSETT FASTENERS LIMITED

Report No.: 104757760COQ-001

Date: 10/19/22

SECTION 3

TEST METHOD

The specimens were evaluated in accordance with the following:

ASTM D1761-20, *Standard Test Methods for Mechanical Fasteners in Wood and Wood-Based Materials*

SECTION 4

MATERIAL SOURCE/INSTALLATION

The client submitted the fasteners to the Evaluation Center on July 28, 2021 (Coquitlam ID# VAN2108251121-001). Samples were not independently selected for testing.

SECTION 5

EQUIPMENT

| ASSET # | DESCRIPTION | MODEL | CAL DUE DATE |
|---------|-------------------------------------|---------|--------------|
| P60553 | Instron Universal Testing Machine | 3382 | 07/06/22 |
| P60554 | T&D Temperature and Humidity Logger | TR-72Ui | 09/10/21 |
| P60359 | Thermotron Environmental Chamber | SM-32C | N/A |
| P60582 | Graphtec MIDI Logger | GL220 | 02/02/22 |
| P60557 | Graphtec MIDI Logger | GL220 | 11/30/21 |
| 9-0418 | Setra Digital Scale | 12000C | 02/04/22 |
| P60005 | Mitutoyo Digital Caliper | CD-8 | 06/08/22 |
| 9-0477 | Lochhead Haggerty Oven | A-1 | N/A |

SECTION 6

LIST OF OFFICIAL OBSERVERS

| NAME | COMPANY |
|-------------------|--------------|
| Frank Gadea-Lopez | Intertek B&C |
| Chris Chang | Intertek B&C |

TEST REPORT FOR BISSETT FASTENERS LIMITED

Report No.: 104757760COQ-001

Date: 10/19/22

CONDITIONING

Before testing, fastener specimens were held in standard laboratory conditions for at least 24 hours at a temperature of $23 \pm 2^{\circ}\text{C}$ and relative humidity of $50 \pm 5\%$. The wood substrates were stored in a conditioning chamber at $20 \pm 3^{\circ}\text{C}$ ($68 \pm 6^{\circ}\text{F}$) and $65 \pm 3\%$ relative humidity until equilibrium was attained.

FASTENER WITHDRAWAL

Fastener withdrawal was conducted in accordance with ASTM D1761-20. Ten (10) assemblies were prepared for testing using the client-supplied fastener with 19/32 in. thick OSB wood and either nominal 2 in. x 4 in. Spruce Pine Fir or Douglas Fir lumber. The fasteners were screwed into the wood substrates at a right angle to the face of the wood members so there was full penetration of the threaded portion. Approximately 1/4 in. of the nail remained above the surface. Prepared specimens were placed into an Instron Universal Testing Machine and the fasteners were withdrawn at a rate of 0.10 in./min. until failure. The maximum load for each test sample was recorded and the average load reported.

FASTENER LATERAL RESISTANCE

Fastener lateral resistance was conducted in accordance with Section 14 of ASTM D1761-20. Ten (10) assemblies per fastener were prepared for testing using the client-supplied fastener with 19/32 in. thick OSB wood and either nominal 2 in. x 4 in. Spruce Pine Fir or Douglas Fir lumber. Each test assembly consisted of one (1) piece of 203 mm (8 in.) long 2x4 dimensional lumber and one (1) piece of 203 mm (8 in.) long 19/32 in. thick OSB with the supplied fastener. The two (2) pieces of substrate were fastened at the ends with a 102 mm (4 in.) overlap; the fastener was positioned at 51 mm (2 in.) from the edge. Prepared specimens were placed into an Instron Universal Testing Machine. Samples were loaded at a rate of 0.10 in./min. until failure. The maximum load for each test sample was recorded and the average load reported.

TEST REPORT FOR BISSETT FASTENERS LIMITED

Report No.: 104757760COQ-001

Date: 10/19/22

SECTION 8**TEST SPECIMEN DESCRIPTION**

The products were identified as follows:

- Bissett 3 in. x 0.120 in. spiral shank, seismic, 15° angle coil nails (Dominator)
- Bissett 3 in. x 0.148 in. smooth shank, 15° angle coil nails
- Bissett 2 in. x 0.099 in. spiral shank, 15° angle coil nails (Dominator)
- Bissett 2-1/4 in. x 0.099 in. spiral shank, 15° angle coil nails

The substrate used for testing was nominal 2 in. x 4 in. Spruce pine fir, 2 in. x 4 in. Douglas Fir and 19/32 in. OSB. Specific gravity and moisture content were measured for each test and can be found in Appendix C.

SECTION 9**TEST RESULTS**

A summary of the test results is presented in Section 2 of this test report. See Appendices for a full set of test data.

SECTION 10**CONCLUSION**

The Bissett Fasteners Limited fastener products identified and evaluated in this report have been tested in accordance with ASTM D1761-20, *Standard Test Methods for Mechanical Fasteners in Wood and Wood-Based Materials*.



Total Quality. Assured.

1500 Brigantine Drive
Coquitlam, BC, V3K7C1

Telephone: 604-520-3321
Facsimile: 604-524-9186
www.intertek.com/building

TEST REPORT FOR BISSETT FASTENERS LIMITED

Report No.: 104757760COQ-001

Date: 10/19/22

SECTION 11

APPENDIX A – FASTENER WITHDRAWAL TEST DATA (7 PAGES)



Total Quality. Assured.

| | | | |
|--------------|--|----------------|--------------------|
| Company | Bissett Fasteners Limited | Technician(s) | Frank Gadea-Lopez |
| Project No | G104757760 | Reviewer | Baldeep Sandhu |
| Models | Various Fasteners | Start/End Date | August 19-20, 2021 |
| Product Name | Same as above | Sample ID | VAN2108251121-001 |
| Standard | ASTM D1761-20, <i>Standard Test Methods for Mechanical Fasteners in Wood</i> | | |

Test Data Package

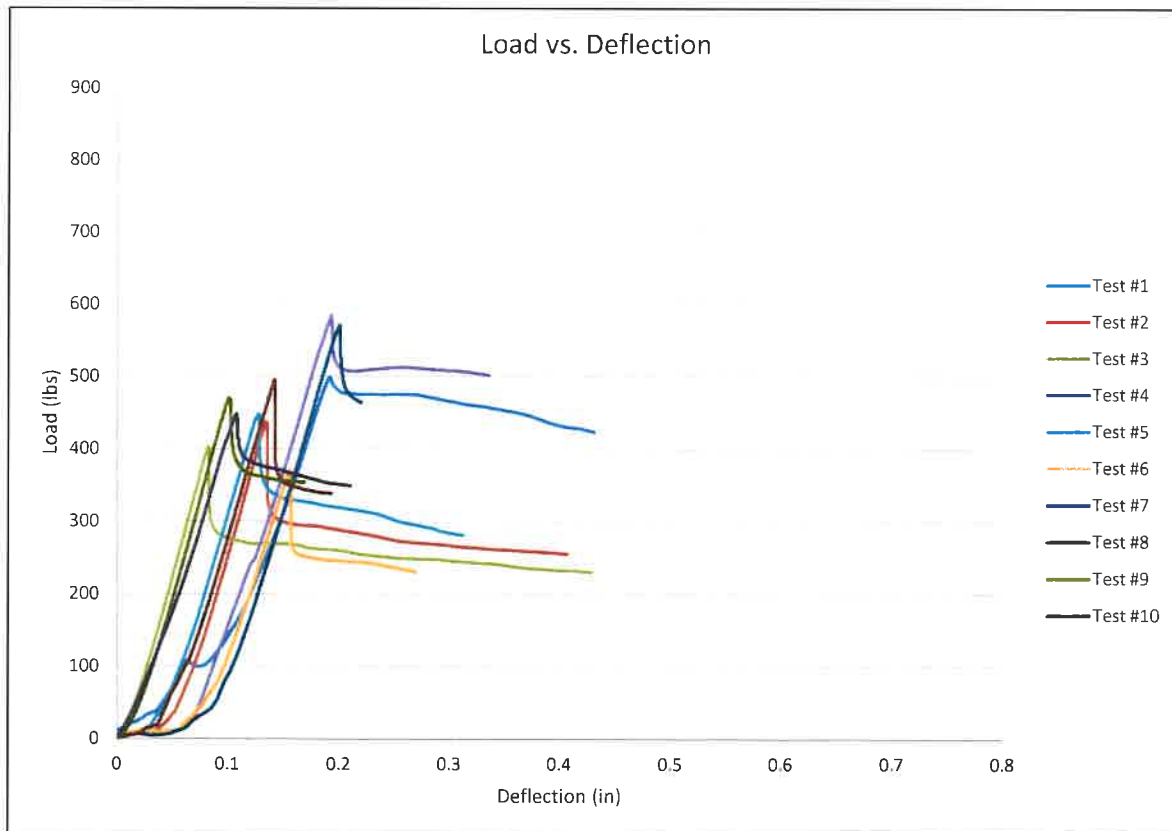
Table of Contents

| Sheet | Page |
|--------------------------------|------|
| Table of Contents (This Sheet) | 1 |
| Fastener Withdrawal #1 | 2 |
| Fastener Withdrawal #2 | 3 |
| Fastener Withdrawal #3 | 4 |
| Fastener Withdrawal #4 | 5 |
| Fastener Withdrawal #5 | 6 |
| Fastener Withdrawal #6 | 7 |

Test: Fastener Withdrawal
Date: 19-Aug-21
Client: Bissett Fasteners Limited
Product: Smooth Shank 3" x 0.148 OSB-DF
Method: ASTM D1761-20, *Standard Test Methods for Mechanical Fasteners in Wood*
Conditioning: Minimum 24 hours at a temperature of 20 ± 3°C and relative humidity of 65 ± 3%
Crosshead Speed: 0.1 in/min 2.54 mm/min
Equipment: Instron Universal Testing Machine with 100 kN Load Cell (Intertek ID# P60553, cal due July 6, 2022),
 BlueHill Version: 3.76.4926
 T&D Temperature and Humidity Indicator (Intertek ID# P60554, cal due September 10, 2021)
Time/Temp/RH: 8:40AM / 22.1°C / 51.0%

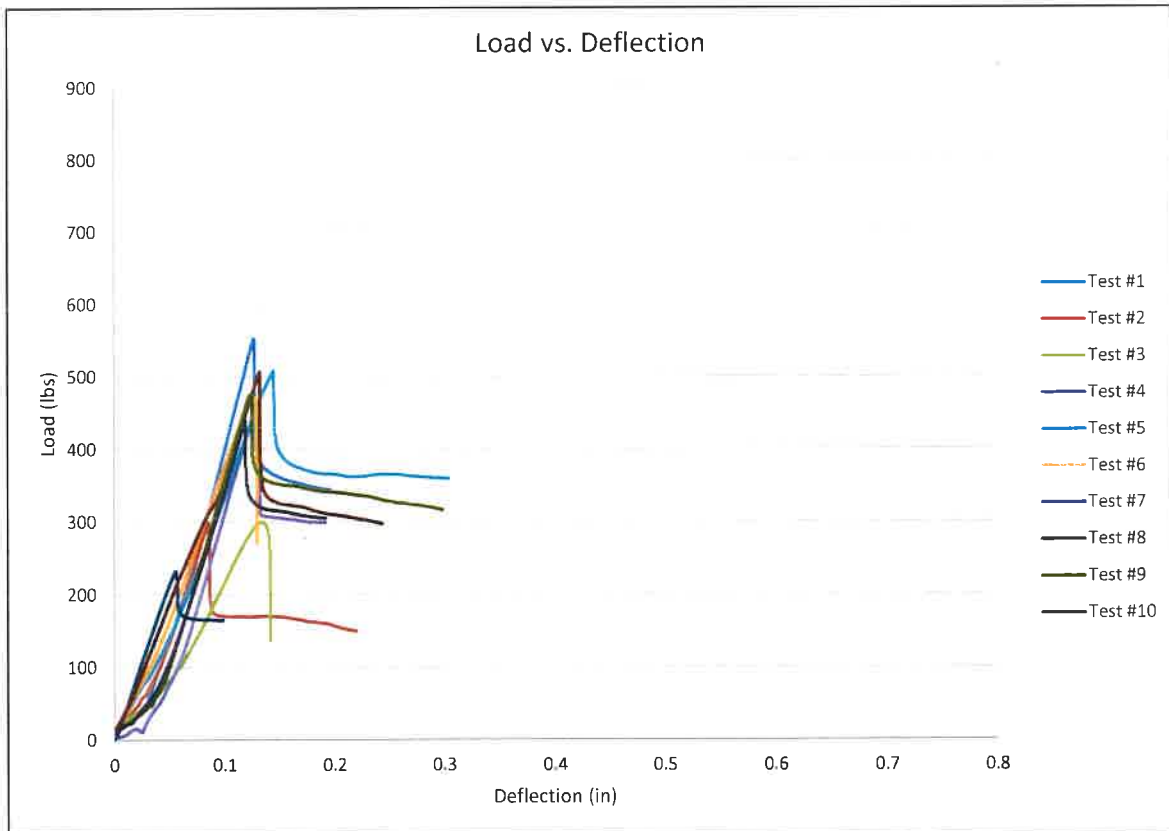
Project #: G104757760
Eng/Tech: Frank Gadea-Lopez
Reviewer: Baldeep Sandhu
Location: Coquitlam, BC, Canada

| Specimen | Maximum Load | |
|----------|--------------|-------|
| | (lbf) | (N) |
| 1 | 499 | 2219 |
| 2 | 437 | 1945 |
| 3 | 402 | 1789 |
| 4 | 584 | 2599 |
| 5 | 448 | 1991 |
| 6 | 371 | 1651 |
| 7 | 571 | 2541 |
| 8 | 495 | 2202 |
| 9 | 471 | 2094 |
| 10 | 448 | 1994 |
| Mean: | 473 | 2102 |
| StdDev: | 67.6 | 300.7 |
| COV: | 14.3% | 14.3% |



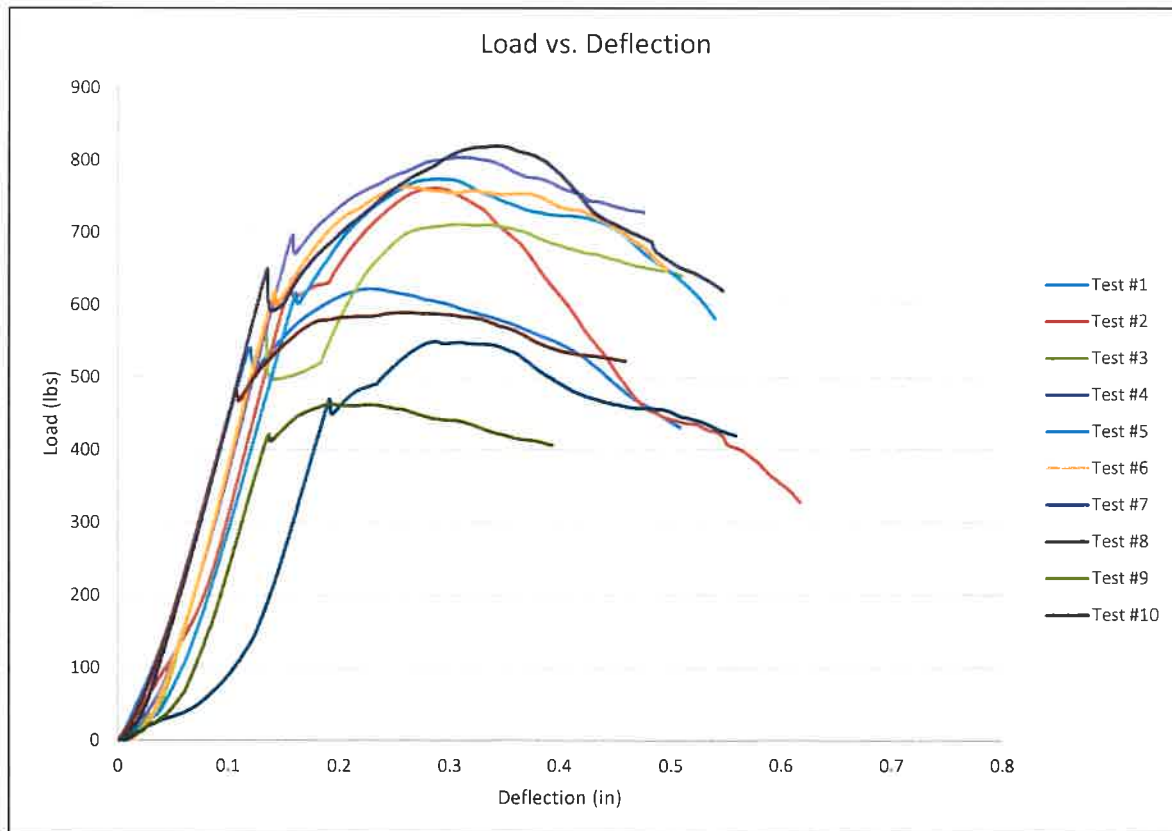
| | | | |
|------------------|---|-------------|-----------------------|
| Test: | Fastener Withdrawal | Project #: | G104757760 |
| Date: | 19-Aug-21 | Eng/Tech: | Frank Gadea-Lopez |
| Client: | Bissett Fasteners Limited | Reviewer: | Baldeep Sandhu |
| Product: | Smooth Shank 3" x 0.148 OSB-SPF | Location: | Coquitlam, BC, Canada |
| Method: | ASTM D1761-20, <i>Standard Test Methods for Mechanical Fasteners in Wood</i> | | |
| Conditioning: | Minimum 24 hours at a temperature of $20 \pm 3^\circ\text{C}$ and relative humidity of $65 \pm 3\%$ | | |
| Crosshead Speed: | 0.1 in/min | 2.54 mm/min | |
| Equipment: | Instron Universal Testing Machine with 100 kN Load Cell (Intertek ID# P60553, cal due July 6, 2022), BlueHill Version: 3.76.4926 | | |
| | T&D Temperature and Humidity Indicator (Intertek ID# P60554, cal due September 10, 2021) | | |
| Time/Temp/RH: | 10:30AM / 22.1°C / 52.0% | | |

| Specimen | Maximum Load | |
|----------|--------------|-------|
| | (lbf) | (N) |
| 1 | 552 | 2457 |
| 2 | 298 | 1328 |
| 3 | 300 | 1333 |
| 4 | 466 | 2074 |
| 5 | 508 | 2260 |
| 6 | 471 | 2094 |
| 7 | 232 | 1033 |
| 8 | 507 | 2253 |
| 9 | 475 | 2114 |
| 10 | 439 | 1954 |
| Mean: | 425 | 1890 |
| StdDev: | 108.1 | 480.8 |
| COV: | 25.4% | 25.4% |



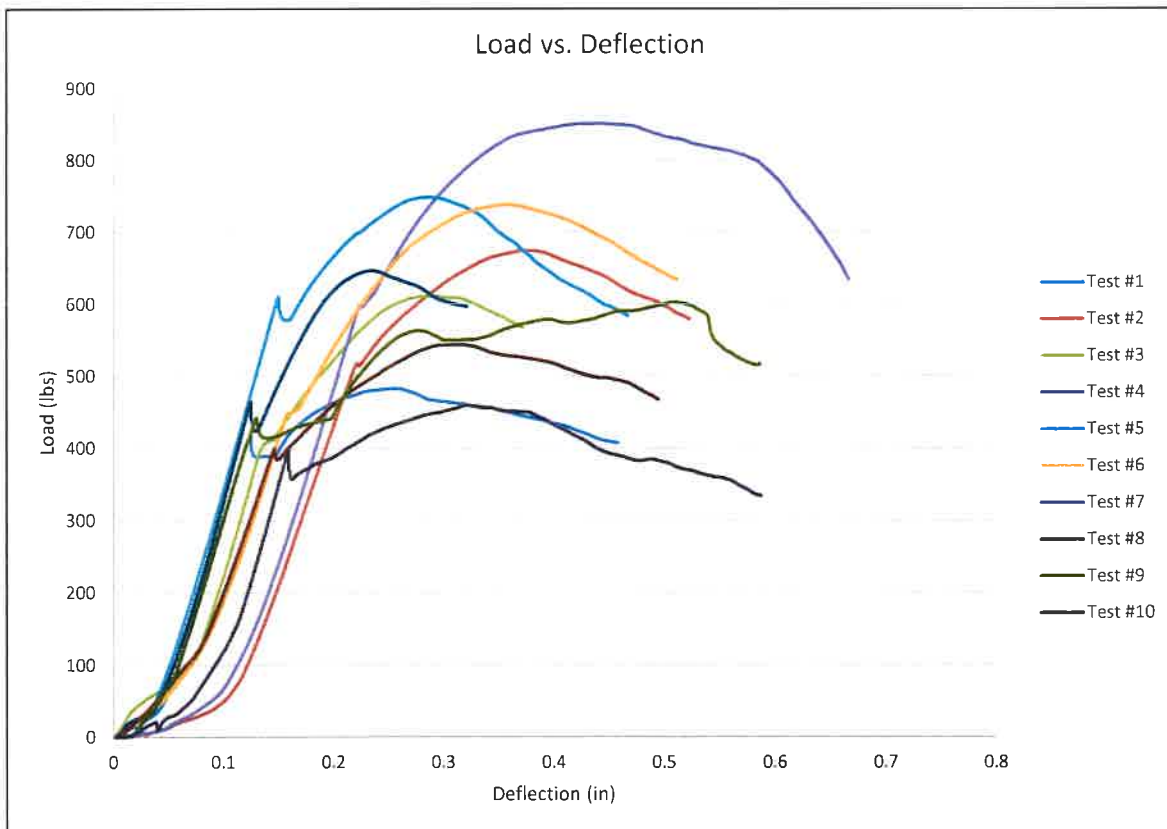
Test: **Fastener Withdrawal** Project #: G104757760
 Date: 19-Aug-21 Eng/Tech: Frank Gadea-Lopez
 Client: Bissett Fasteners Limited Reviewer: Baldeep Sandhu
 Product: Dominator 3" x 0.120 OSB-DF Location: Coquitlam, BC, Canada
 Method: ASTM D1761-20, *Standard Test Methods for Mechanical Fasteners in Wood*
 Conditioning: Minimum 24 hours at a temperature of $20 \pm 3^\circ\text{C}$ and relative humidity of $65 \pm 3\%$
 Crosshead Speed: in/min mm/min
 Equipment: Instron Universal Testing Machine with 100 kN Load Cell (Intertek ID# P60553, cal due July 6, 2022),
 BlueHill Version: 3.76.4926
 T&D Temperature and Humidity Indicator (Intertek ID# P60554, cal due September 10, 2021)
 Time/Temp/RH: 2:30PM / 22.1°C / 53.0%

| Specimen | Maximum Load | |
|----------|--------------|-------|
| | (lbf) | (N) |
| 1 | 622 | 2766 |
| 2 | 761 | 3385 |
| 3 | 711 | 3164 |
| 4 | 804 | 3576 |
| 5 | 774 | 3442 |
| 6 | 763 | 3394 |
| 7 | 549 | 2443 |
| 8 | 589 | 2621 |
| 9 | 463 | 2059 |
| 10 | 820 | 3646 |
| Mean: | 686 | 3050 |
| StdDev: | 121.9 | 542.1 |
| COV: | 17.8% | 17.8% |



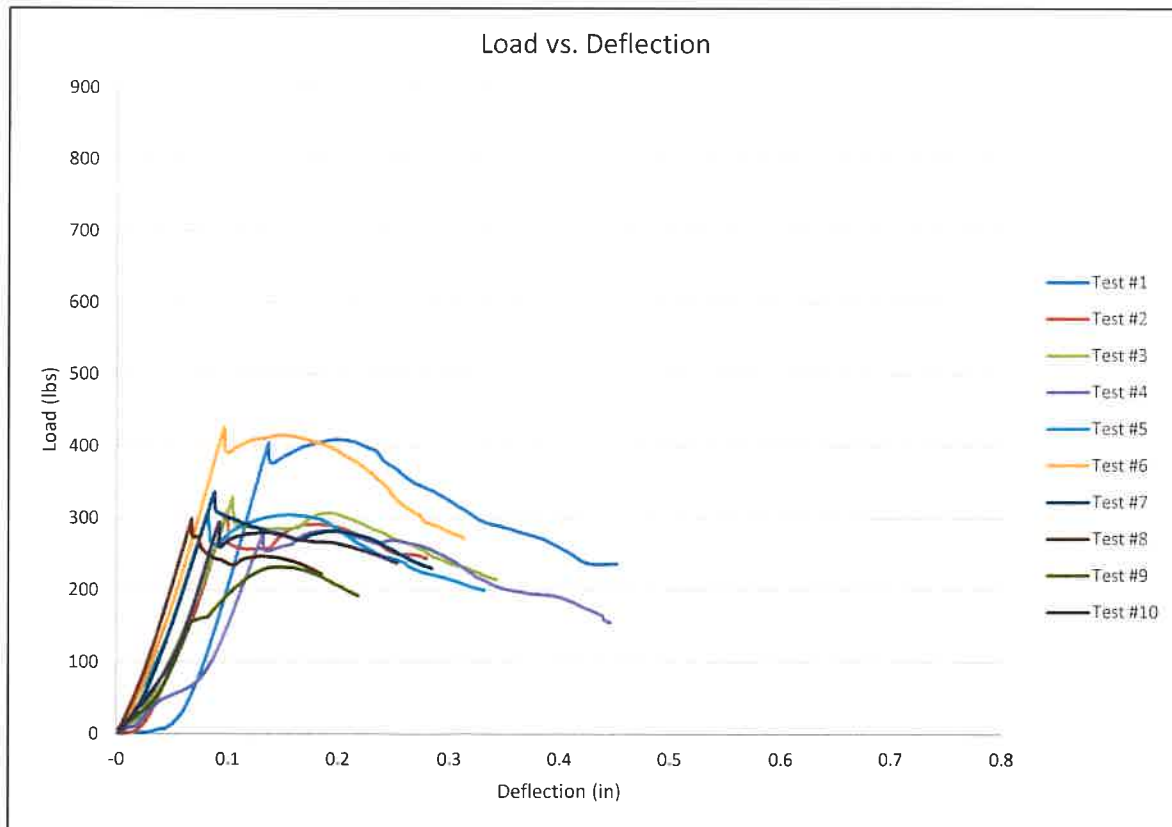
| | | | |
|------------------|---|-------------|-----------------------|
| Test: | Fastener Withdrawal | Project #: | G104757760 |
| Date: | 19-Aug-21 | Eng/Tech: | Frank Gadea-Lopez |
| Client: | Bissett Fasteners Limited | Reviewer: | Baldeep Sandhu |
| Product: | Dominator 3" x 0.120 OSB-SPF | Location: | Coquitlam, BC, Canada |
| Method: | ASTM D1761-20, <i>Standard Test Methods for Mechanical Fasteners in Wood</i> | | |
| Conditioning: | Minimum 24 hours at a temperature of 20 ± 3°C and relative humidity of 65 ± 3% | | |
| Crosshead Speed: | 0.1 in/min | 2.54 mm/min | |
| Equipment: | Instron Universal Testing Machine with 100 kN Load Cell (Intertek ID# P60553, cal due July 6, 2022), BlueHill Version: 3.76.4926 | | |
| | T&D Temperature and Humidity Indicator (Intertek ID# P60554, cal due September 10, 2021) | | |
| Time/Temp/RH: | 1:15PM / 22.1°C / 52.0% | | |

| Specimen | Maximum Load | |
|----------|--------------|-------|
| | (lbf) | (N) |
| 1 | 483 | 2147 |
| 2 | 674 | 2998 |
| 3 | 611 | 2717 |
| 4 | 851 | 3786 |
| 5 | 749 | 3330 |
| 6 | 738 | 3282 |
| 7 | 646 | 2875 |
| 8 | 543 | 2417 |
| 9 | 603 | 2680 |
| 10 | 459 | 2042 |
| Mean: | 636 | 2827 |
| StdDev: | 122.9 | 546.9 |
| COV: | 19.3% | 19.3% |



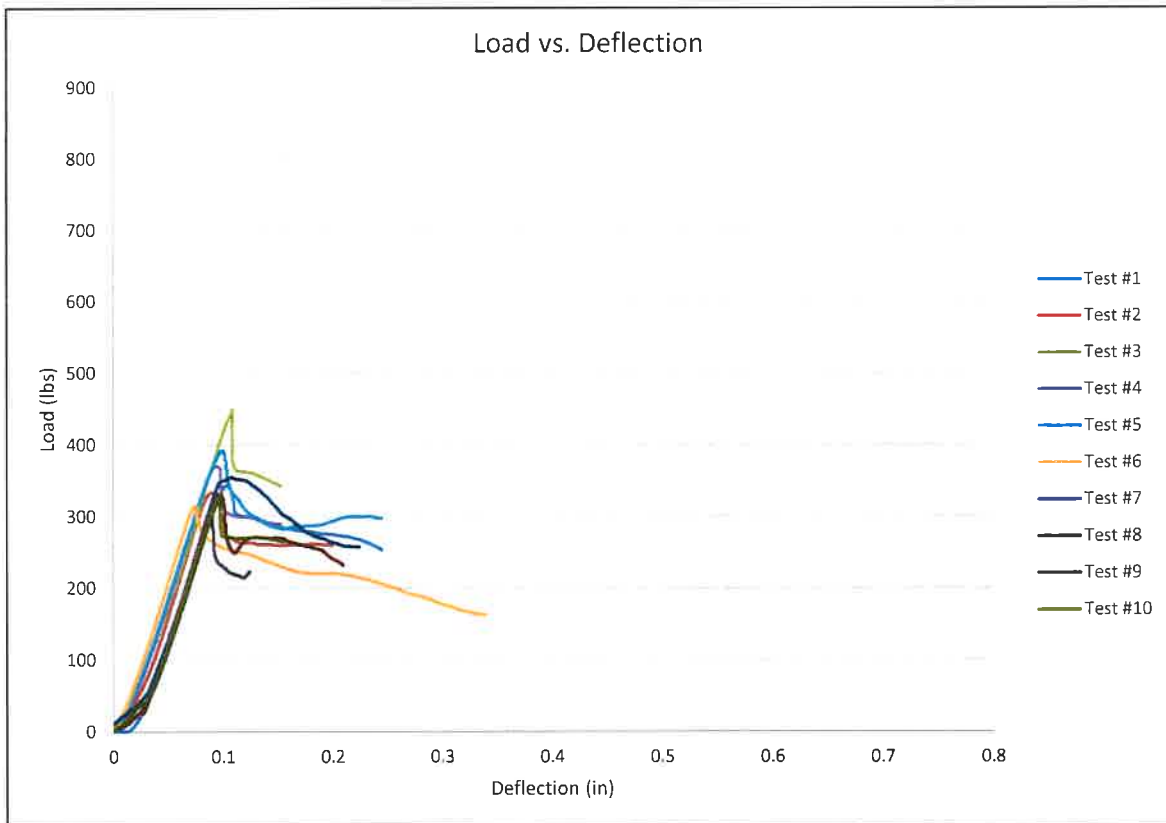
Test: **Fastener Withdrawal** Project #: G104757760
 Date: 20-Aug-21 Eng/Tech: Frank Gadea-Lopez
 Client: Bissett Fasteners Limited Reviewer: Baldeep Sandhu
 Product: Spiral Shank 2 1/4" x 0.099 Nail OSB-SPF Location: Coquitlam, BC, Canada
 Method: ASTM D1761-20, *Standard Test Methods for Mechanical Fasteners in Wood*
 Conditioning: Minimum 24 hours at a temperature of $20 \pm 3^\circ\text{C}$ and relative humidity of $65 \pm 3\%$
 Crosshead Speed: in/min mm/min
 Equipment: Instron Universal Testing Machine with 100 kN Load Cell (Intertek ID# P60553, cal due July 6, 2022),
 BlueHill Version: 3.76.4926
 T&D Temperature and Humidity Indicator (Intertek ID# P60554, cal due September 10, 2021)
 Time/Temp/RH: 1:30PM / 23.1°C / 52.0%

| Specimen | Maximum Load | |
|----------|--------------|-------|
| | (lbf) | (N) |
| 1 | 409 | 1820 |
| 2 | 311 | 1385 |
| 3 | 330 | 1466 |
| 4 | 282 | 1254 |
| 5 | 309 | 1374 |
| 6 | 427 | 1897 |
| 7 | 336 | 1495 |
| 8 | 298 | 1327 |
| 9 | 232 | 1034 |
| 10 | 294 | 1310 |
| Mean: | 323 | 1436 |
| StdDev: | 57.7 | 256.8 |
| COV: | 17.9% | 17.9% |



Test: **Fastener Withdrawal** Project #: G104757760
 Date: 20-Aug-21 Eng/Tech: Frank Gadea-Lopez
 Client: Bissett Fasteners Limited Reviewer: Baldeep Sandhu
 Product: Brite Spiral 2" x 0.099 Nail OSB-SPF Location: Coquitlam, BC, Canada
 Method: ASTM D1761-20, *Standard Test Methods for Mechanical Fasteners in Wood*
 Conditioning: Minimum 24 hours at a temperature of 20 ± 3°C and relative humidity of 65 ± 3%
 Crosshead Speed: 0.1 in/min 2.54 mm/min
 Equipment: Instron Universal Testing Machine with 100 kN Load Cell (Intertek ID# P60553, cal due July 6, 2022),
 BlueHill Version: 3.76.4926
 T&D Temperature and Humidity Indicator (Intertek ID# P60554, cal due September 10, 2021)
 Time/Temp/RH: 2:40PM / 22.1°C / 49.0%

| Specimen | Maximum Load | |
|----------|--------------|-------|
| | (lbf) | (N) |
| 1 | 343 | 1527 |
| 2 | 333 | 1483 |
| 3 | 450 | 2001 |
| 4 | 370 | 1645 |
| 5 | 392 | 1743 |
| 6 | 314 | 1398 |
| 7 | 355 | 1580 |
| 8 | 305 | 1358 |
| 9 | 331 | 1471 |
| 10 | 329 | 1464 |
| Mean: | 352 | 1567 |
| StdDev: | 42.8 | 190.3 |
| COV: | 12.1% | 12.1% |





Total Quality. Assured.

TEST REPORT FOR BISSETT FASTENERS LIMITED

Report No.: 104757760COQ-001

Date: 10/19/22

1500 Brigantine Drive
Coquitlam, BC, V3K7C1

Telephone: 604-520-3321
Facsimile: 604-524-9186
www.intertek.com/building

APPENDIX B – FASTENER LATERAL RESISTANCE TEST DATA (5 PAGES)



Total Quality. Assured.

Test Data Package Page 1 of 5

| | | | |
|--------------|--|----------------|---------------------------------|
| Company | Bissett Fasteners Limited | Technician(s) | Frank Gadea-Lopez / Chris Chang |
| Project No | G104757760 | Reviewer | Baldeep Sandhu |
| Models | Various Fasteners | Start/End Date | August 17-18, 2021 |
| Product Name | Same as above | Sample ID | VAN2108251121-001 |
| Standard | ASTM D1761-20, <i>Standard Test Methods for Mechanical Fasteners in Wood</i> | | |

Test Data Package

Table of Contents

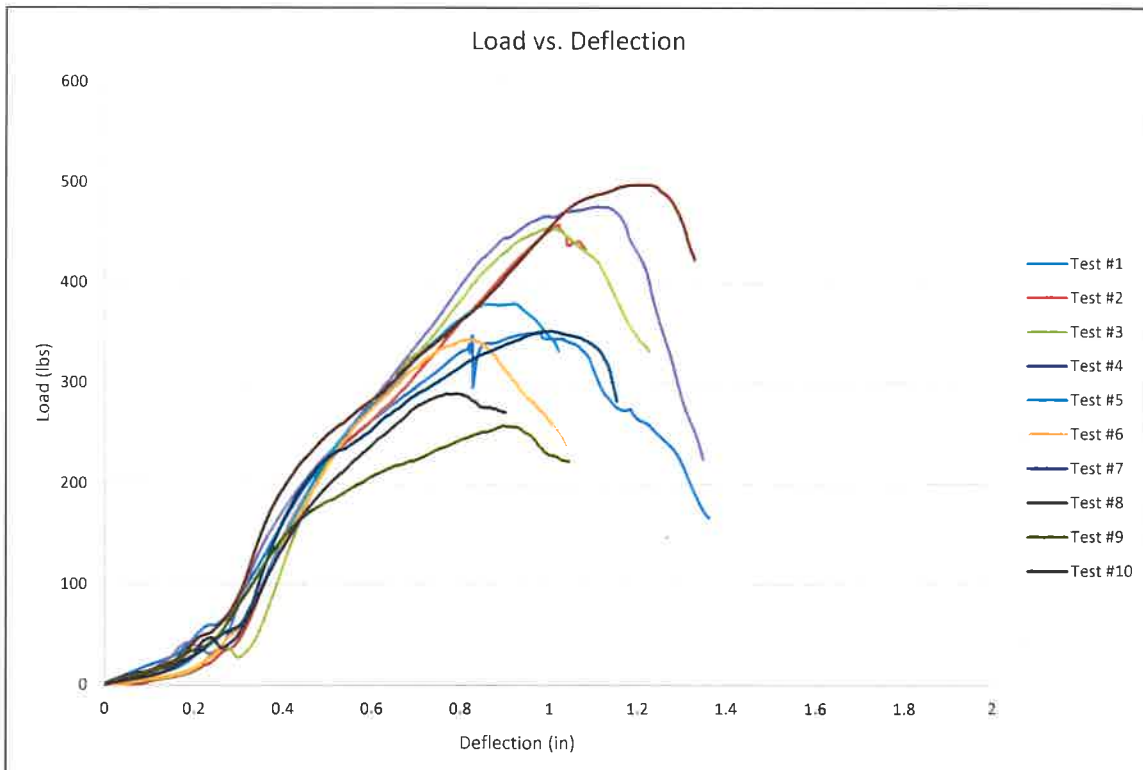
| Sheet | Page |
|--------------------------------|------|
| Table of Contents (This Sheet) | 1 |
| Fastener Lateral Resistance #1 | 2 |
| Fastener Lateral Resistance #2 | 3 |
| Fastener Lateral Resistance #3 | 4 |
| Fastener Lateral Resistance #4 | 5 |

Test: Fastener Lateral Resistance
Date: 18-Aug-21
Client: Bissett Fasteners Limited
Product: Dominator 3" x 0.120 Nail
Substrate Material: 14/32 OSB - 2x4 DF
Method: ASTM D1761-20, *Standard Test Methods for Mechanical Fasteners in Wood*
Conditioning: Minimum 24 hours at a temperature of $23 \pm 2^\circ \text{C}$ and relative humidity of $50 \pm 5\%$
Crosshead Speed: 0.25 in/min 6.4 mm/min
Equipment: Instron Universal Testing Machine with 100 kN Load Cell (Intertek ID# P60553, cal due July 6, 2022),
 BlueHill Version: 3.76.4926
 T&D Temperature and Humidity Indicator (Intertek ID# P60554, cal due September 10, 2021)
 Mitutoyo Digital Caliper (Intertek ID# P60005, cal due June 6, 2022)
Time/Temp/RH: 2:15PM / 22.8°C / 51.0%

Project #: G104757760
Eng/Tech: Frank Gadea-Lopez
Reviewer: Baldeep Sandhu
Location: Coquitlam, BC, Canada

Machine Direction

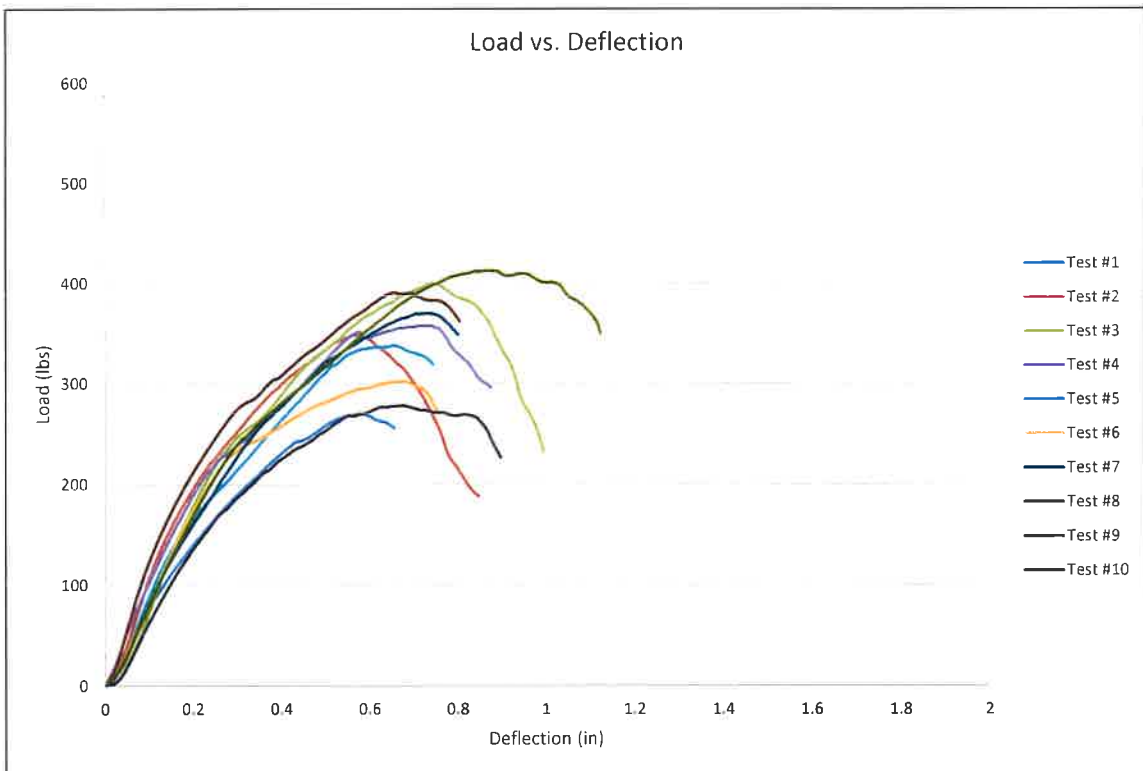
| Specimen | Panel Thickness | Maximum Load | |
|----------|-----------------|--------------|-------|
| | (in.) | (lbf) | (N) |
| 1 | 0.6250 | 350 | 1555 |
| 2 | 0.6130 | 457 | 2034 |
| 3 | 0.6225 | 455 | 2022 |
| 4 | 0.6140 | 458 | 2035 |
| 5 | 0.6155 | 379 | 1685 |
| 6 | 0.6250 | 343 | 1525 |
| 7 | 0.6120 | 352 | 1565 |
| 8 | 0.6260 | 497 | 2212 |
| 9 | 0.6265 | 258 | 1146 |
| 10 | 0.6290 | 289 | 1287 |
| Mean: | 0.6209 | 384 | 1707 |
| StdDev: | 0.1120 | 79.9 | 355.4 |
| COV: | 18.0% | 20.8% | 20.8% |



Test: **Fastener Lateral Resistance** Project #: G104757760
 Date: 17-Aug-21 Eng/Tech: Frank Gadea-Lopez
 Client: Bissett Fasteners Limited Reviewer: Baldeep Sandhu
 Product: Dominator 3" x 0.120 Nail Location: Coquitlam, BC, Canada
 Substrate Material: 14/32 OSB - 2x4 SPF
 Method: ASTM D1761-20, *Standard Test Methods for Mechanical Fasteners in Wood*
 Conditioning: Minimum 24 hours at a temperature of $23 \pm 2^\circ\text{C}$ and relative humidity of $50 \pm 5\%$
 Crosshead Speed: 0.25 in/min 6.4 mm/min
 Equipment: Instron Universal Testing Machine with 100 kN Load Cell (Intertek ID# P60553, cal due July 6, 2022),
 BlueHill Version: 3.76.4926
 T&D Temperature and Humidity Indicator (Intertek ID# P60554, cal due September 10, 2021)
 Mitutoyo Digital Caliper (Intertek ID# P60005, cal due June 6, 2022)
 Time/Temp/RH: 10:15AM / 22.3°C / 53.0%

Machine Direction

| Specimen | Panel Thickness | Maximum Load | |
|----------|-----------------|--------------|-------|
| | (in.) | (lbf) | (N) |
| 1 | 0.6275 | 270 | 1199 |
| 2 | 0.6350 | 348 | 1549 |
| 3 | 0.6140 | 399 | 1776 |
| 4 | 0.6170 | 358 | 1590 |
| 5 | 0.6155 | 338 | 1502 |
| 6 | 0.6295 | 302 | 1342 |
| 7 | 0.6175 | 370 | 1646 |
| 8 | 0.6230 | 391 | 1738 |
| 9 | 0.6310 | 413 | 1836 |
| 10 | 0.6125 | 278 | 1237 |
| Mean: | 0.6223 | 347 | 1542 |
| StdDev: | 0.1125 | 50.0 | 222.4 |
| COV: | 18.1% | 14.4% | 14.4% |

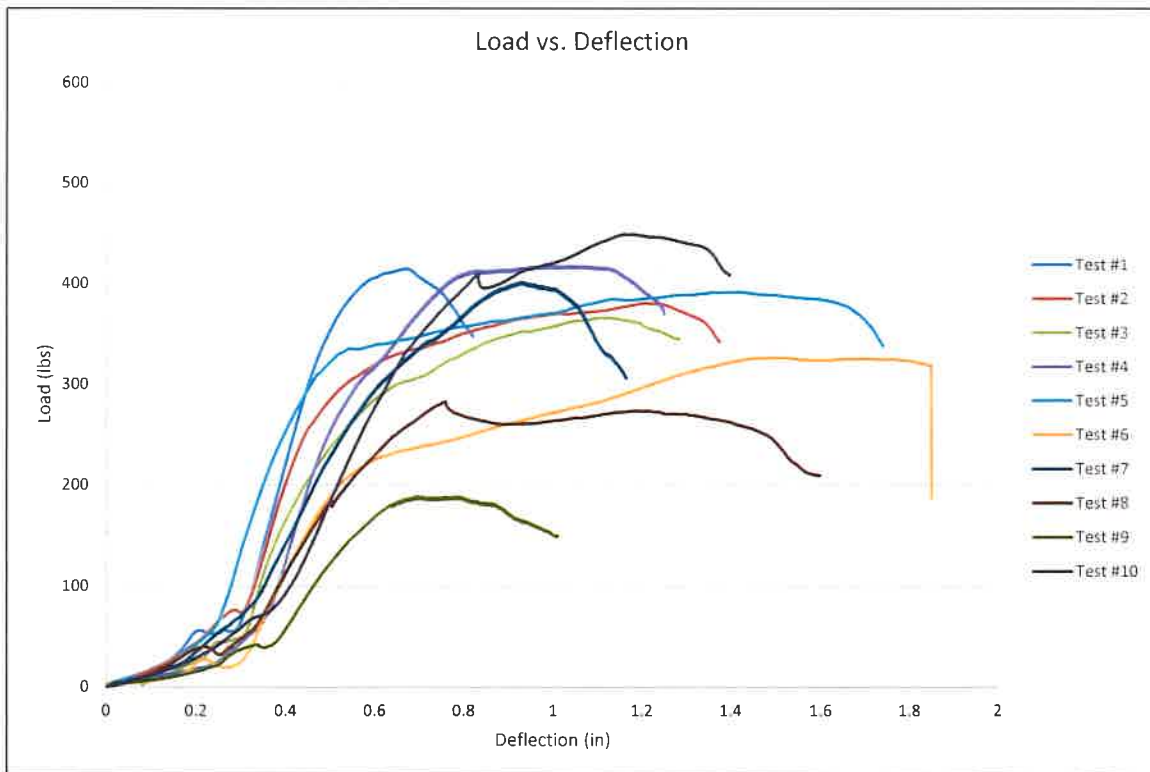


Test: Fastener Lateral Resistance
Date: 18-Aug-21
Client: Bissett Fasteners Limited
Product: Smooth Shank 3" x 0.148 Nail
Substrate Material: 14/32 OSB - 2x4 DF
Method: ASTM D1761-20, *Standard Test Methods for Mechanical Fasteners in Wood*
Conditioning: Minimum 24 hours at a temperature of $23 \pm 2^\circ \text{C}$ and relative humidity of $50 \pm 5\%$
Crosshead Speed: 0.25 in/min 6.4 mm/min
Equipment: Instron Universal Testing Machine with 100 kN Load Cell (Intertek ID# P60553, cal due July 6, 2022),
 BlueHill Version: 3.76.4926
 T&D Temperature and Humidity Indicator (Intertek ID# P60554, cal due September 10, 2021)
 Mitutoyo Digital Caliper (Intertek ID# P60005, cal due June 6, 2022)
Time/Temp/RH: 10:00AM / 22.1°C / 52.0%

Project #: G104757760
Eng/Tech: Frank Gadea-Lopez
Reviewer: Baldeep Sandhu
Location: Coquitlam, BC, Canada

Machine Direction

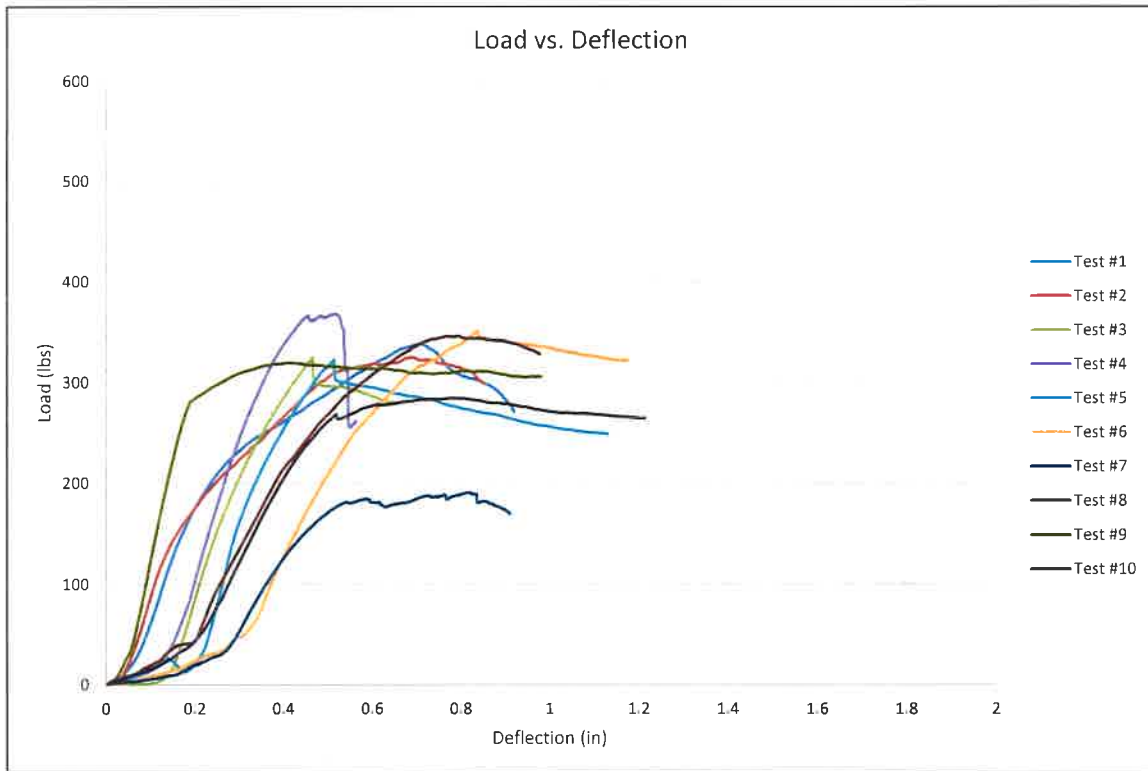
| Specimen | Panel Thickness | Maximum Load | |
|----------|-----------------|--------------|-------|
| | (in.) | (lbf) | (N) |
| 1 | 0.6228 | 414 | 1843 |
| 2 | 0.6238 | 380 | 1692 |
| 3 | 0.6241 | 366 | 1627 |
| 4 | 0.6205 | 417 | 1856 |
| 5 | 0.6310 | 392 | 1742 |
| 6 | 0.6280 | 326 | 1451 |
| 7 | 0.6135 | 401 | 1786 |
| 8 | 0.6385 | 282 | 1256 |
| 9 | 0.6465 | 189 | 840 |
| 10 | 0.6451 | 449 | 1998 |
| Mean: | 0.6294 | 362 | 1609 |
| StdDev: | 0.1149 | 77.3 | 343.9 |
| COV: | 18.2% | 21.4% | 21.4% |



| | | | |
|---------------------|---|------------|-----------------------|
| Test: | Fastener Lateral Resistance | Project #: | G104757760 |
| Date: | 17-Aug-21 | Eng/Tech: | Frank Gadea-Lopez |
| Client: | Bissett Fasteners Limited | Reviewer: | Baldeep Sandhu |
| Product: | Smooth Shank 3" x 0.148 Nail | Location: | Coquitlam, BC, Canada |
| Substrate Material: | 14/32 OSB - 2x4 SPF | | |
| Method: | ASTM D1761-20, <i>Standard Test Methods for Mechanical Fasteners in Wood</i> | | |
| Conditioning: | Minimum 24 hours at a temperature of $23 \pm 2^\circ \text{C}$ and relative humidity of $50 \pm 5\%$ | | |
| Crosshead Speed: | 0.25 in/min | 0.4 mm/min | |
| Equipment: | Instron Universal Testing Machine with 100 kN Load Cell (Intertek ID# P60553, cal due July 6, 2022), BlueHill Version: 3.76.4926 T&D Temperature and Humidity Indicator (Intertek ID# P60554, cal due September 10, 2021) Mitutoyo Digital Caliper (Intertek ID# P60005, cal due June 6, 2022) | | |
| Time/Temp/RH: | 2:30PM / 22.1°C / 55.0% | | |

Machine Direction

| Specimen | Panel Thickness | Maximum Load | |
|----------|-----------------|--------------|-------|
| | (in.) | (lbf) | (N) |
| 1 | 0.6055 | 337 | 1500 |
| 2 | 0.6200 | 324 | 1442 |
| 3 | 0.6515 | 325 | 1444 |
| 4 | 0.6215 | 367 | 1634 |
| 5 | 0.6230 | 322 | 1433 |
| 6 | 0.6210 | 350 | 1558 |
| 7 | 0.6310 | 190 | 846 |
| 8 | 0.6235 | 345 | 1537 |
| 9 | 0.6310 | 319 | 1419 |
| 10 | 0.6250 | 284 | 1262 |
| Mean: | 0.6253 | 316 | 1407 |
| StdDev: | 0.1137 | 49.7 | 220.9 |
| COV: | 18.2% | 15.7% | 15.7% |





Total Quality. Assured.

1500 Brigantine Drive
Coquitlam, BC, V3K7C1

Telephone: 604-520-3321
Facsimile: 604-524-9186
www.intertek.com/building

TEST REPORT FOR BISSETT FASTENERS LIMITED

Report No.: 104757760COQ-001

Date: 10/19/22

APPENDIX C – MOISTURE CONTENT AND SPECIFIC GRAVITY TEST DATA (11 PAGES)



Total Quality. Assured.

| | | | |
|--------------|---|----------------|---------------------------------|
| Company | Bissett Fasteners Limited | Technician(s) | Chris Chang / Frank Gadea-Lopez |
| Project No | G104757760 | Reviewer | Baldeep Sandhu |
| Models | Various fasteners | Start/End Date | August 17 - 20, 2021 |
| Product Name | Same as above | Sample ID | VAN2108251121-001 |
| Standard | ASTM D1761-20, Standard Test Methods for Mechanical Fasteners in Wood and Wood-Based Materials | | |

Test Data Package

Table of Contents

| Sheet | Page |
|---|------|
| Table of Contents (This Sheet) | 1 |
| Specific Gravity & Moisture Content #1 | 2 |
| Specific Gravity & Moisture Content #2 | 3 |
| Specific Gravity & Moisture Content #3 | 4 |
| Specific Gravity & Moisture Content #4 | 5 |
| Specific Gravity & Moisture Content #5 | 6 |
| Specific Gravity & Moisture Content #6 | 7 |
| Specific Gravity & Moisture Content #7 | 8 |
| Specific Gravity & Moisture Content #8 | 9 |
| Specific Gravity & Moisture Content #9 | 10 |
| Specific Gravity & Moisture Content #10 | 11 |

Test: Specific Gravity - Lateral Resistance
Date: 18-Aug-21
Client: Bissett Fasteners Limited
Product: Bissett 3" x 0.120 in. Spiral Shank, Seismic, 15° Angle Coil Nails (Dominator)
Substrate Material: 2" x 4" SPF Lumber, 19/32 in. OSB
Test Method: ASTM D2395-17, *Standard Test Methods for Density and Specific Gravity (Relative Density) of Wood and Wood-Based Materials*
 ASTM D4442-20, *Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials*
Conditioning: Minimum 24 hours at a temperature of 23 ± 2°C and relative humidity of 50 ± 5%
Equipment: Setra Scale (Intertek ID# 9-0418, cal due February 4, 2022)
 Mitutoyo 8 in. Digital Caliper (Intertek ID# P60005, cal due June 8, 2022)
 Graphtec GL220 Temperature Data Logger (Intertek ID# P60557, cal due November 30, 2021)
 Shell Lab Oven (Intertek ID# P60613)
Time/Temp/RH: 8:52AM / 22.5°C / 51.0%

Project No: G104757760
Eng/Tech: Chris Chang
 Frank Gadea-Lopez
Reviewer: Baldeep Sandhu
Location: Coquitlam, BC

| Sample | Width (in) | Length (in) | Depth (in) | Volume | Initial Mass | Dry Mass | Moisture Content | Specific Gravity |
|---------|------------|-------------|------------|-----------------|--------------|----------|------------------|------------------|
| | W1 | L1 | D1 | in ³ | g | g | % | |
| SPF #1 | 5.6380 | 7.8405 | 1.4830 | 65.6 | 437.4 | 386.2 | 13 | 0.36 |
| SPF #2 | 3.4880 | 7.8715 | 1.4875 | 40.8 | 334.8 | 299.6 | 12 | 0.45 |
| SPF #3 | 5.4910 | 7.8925 | 1.4945 | 64.8 | 464.1 | 415.6 | 12 | 0.39 |
| SPF #4 | 5.4310 | 7.8690 | 1.5110 | 64.6 | 451.8 | 403.1 | 12 | 0.38 |
| SPF #5 | 5.6330 | 7.7955 | 1.4735 | 64.7 | 442.8 | 394.4 | 12 | 0.37 |
| SPF #6 | 5.6270 | 7.8380 | 1.5040 | 66.3 | 425.8 | 375.0 | 14 | 0.34 |
| SPF #7 | 5.4370 | 7.8675 | 1.4985 | 64.1 | 446.9 | 399.8 | 12 | 0.38 |
| SPF #8 | 5.4350 | 7.8140 | 1.4890 | 63.2 | 448.7 | 393.9 | 14 | 0.38 |
| SPF #9 | 5.4555 | 7.8140 | 1.4765 | 62.9 | 470.0 | 419.6 | 12 | 0.41 |
| SPF #10 | 5.4425 | 7.8330 | 1.4845 | 63.3 | 475.3 | 424.1 | 12 | 0.41 |
| OSB #1 | 4.1940 | 7.8495 | 0.6170 | 20.3 | 186.7 | 172.6 | 8 | 0.52 |
| OSB #2 | 4.0645 | 7.8785 | 0.6170 | 19.8 | 186.2 | 171.8 | 8 | 0.53 |
| OSB #3 | 4.1035 | 7.8735 | 0.6260 | 20.2 | 197.9 | 182.8 | 8 | 0.55 |
| OSB #4 | 4.1285 | 7.8485 | 0.6205 | 20.1 | 193.0 | 178.5 | 8 | 0.54 |
| OSB #5 | 4.1300 | 7.8775 | 0.6120 | 19.9 | 185.2 | 170.9 | 8 | 0.52 |
| OSB #6 | 4.1605 | 8.2875 | 0.6330 | 21.8 | 210.8 | 194.8 | 8 | 0.54 |
| OSB #7 | 4.0845 | 7.8465 | 0.6230 | 20.0 | 192.9 | 178.0 | 8 | 0.54 |
| OSB #8 | 4.1295 | 7.8665 | 0.6270 | 20.4 | 196.5 | 182.2 | 8 | 0.55 |
| OSB #9 | 4.1095 | 8.3395 | 0.6340 | 21.7 | 209.1 | 192.9 | 8 | 0.54 |
| OSB #10 | 4.1175 | 7.8730 | 0.6140 | 19.9 | 182.2 | 168.0 | 8 | 0.52 |

Test: Specific Gravity - Lateral Resistance
Date: 18-Aug-21
Client: Bissett Fasteners Limited
Product: Bissett 3" x 0.148 in. Smooth Shank, 15° Angle Coil Nails
Substrate Material: 2" x 4" SPF Lumber, 19/32 in. OSB
Test Method: ASTM D2395-17, *Standard Test Methods for Density and Specific Gravity (Relative Density) of Wood and Wood-Based Materials*
 ASTM D4442-20, *Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials*
Conditioning: Minimum 24 hours at a temperature of 23 ± 2°C and relative humidity of 50 ± 5%
Equipment: Setra Scale (Intertek ID# 9-0418, cal due February 4, 2022)
 Mitutoyo 8 in. Digital Caliper (Intertek ID# P60005, cal due June 8, 2022)
 Graphtec GL220 Temperature Data Logger (Intertek ID# P60557, cal due November 30, 2021)
 Shell Lab Oven (Intertek ID# P60613)
Time/Temp/RH: 10:42AM / 22.7°C / 51.0%

Project No: G104757760
Eng/Tech: Chris Chang
 Frank Gadea-Lopez
Reviewer: Baldeep Sandhu
Location: Coquitlam, BC

| Sample | Width (in) | Length (in) | Depth (in) | Volume | Initial Mass | Dry Mass | Moisture Content | Specific Gravity |
|---------|------------|-------------|------------|-----------------|--------------|----------|------------------|------------------|
| | W1 | L1 | D1 | in ³ | g | g | % | |
| SPF #1 | 3.4720 | 7.7455 | 1.5120 | 40.7 | 285.8 | 257.8 | 11 | 0.39 |
| SPF #2 | 3.4940 | 7.8020 | 1.5140 | 41.3 | 303.3 | 271.9 | 12 | 0.40 |
| SPF #3 | 3.4560 | 7.8280 | 1.4930 | 40.4 | 277.9 | 247.7 | 12 | 0.37 |
| SPF #4 | 3.4930 | 7.7885 | 1.5055 | 41.0 | 340.0 | 305.1 | 11 | 0.45 |
| SPF #5 | 3.4825 | 7.7930 | 1.5035 | 40.8 | 287.4 | 256.9 | 12 | 0.38 |
| SPF #6 | 3.4795 | 7.7445 | 1.4890 | 40.1 | 289.0 | 258.9 | 12 | 0.39 |
| SPF #7 | 3.4920 | 7.8110 | 1.5120 | 41.2 | 297.9 | 266.7 | 12 | 0.39 |
| SPF #8 | 3.4875 | 7.8345 | 1.4895 | 40.7 | 284.6 | 254.2 | 12 | 0.38 |
| SPF #9 | 3.4635 | 7.7750 | 1.4800 | 39.9 | 291.7 | 260.6 | 12 | 0.40 |
| SPF #10 | 3.4645 | 7.7685 | 1.4815 | 39.9 | 279.8 | 249.9 | 12 | 0.38 |
| OSB #1 | 4.1895 | 7.7620 | 0.6120 | 19.9 | 189.4 | 175.4 | 8 | 0.54 |
| OSB #2 | 4.0695 | 7.9325 | 0.6290 | 20.3 | 184.2 | 170.5 | 8 | 0.51 |
| OSB #3 | 3.9985 | 8.2440 | 0.6415 | 21.1 | 200.6 | 185.5 | 8 | 0.54 |
| OSB #4 | 3.1930 | 7.8825 | 0.6250 | 15.7 | 162.2 | 150.0 | 8 | 0.58 |
| OSB #5 | 4.0455 | 7.8530 | 0.6190 | 19.7 | 189.2 | 175.4 | 8 | 0.54 |
| OSB #6 | 3.2095 | 7.8175 | 0.6175 | 15.5 | 142.5 | 131.4 | 8 | 0.52 |
| OSB #7 | 4.0830 | 7.8580 | 0.6265 | 20.1 | 186.5 | 172.8 | 8 | 0.52 |
| OSB #8 | 4.0870 | 8.3975 | 0.6140 | 21.1 | 198.2 | 183.6 | 8 | 0.53 |
| OSB #9 | 4.0810 | 7.8445 | 0.6750 | 21.6 | 194.1 | 180.2 | 8 | 0.51 |
| OSB #10 | 4.0425 | 7.8680 | 0.6185 | 19.7 | 179.6 | 166.1 | 8 | 0.52 |

Test: Specific Gravity - Lateral Resistance
Date: 18-Aug-21
Client: Bissett Fasteners Limited
Product: Bissett 3" x 0.148 in. Smooth Shank, 15° Angle Coil Nails
Substrate Material: 2" x 4" Douglas Fir Lumber, 19/32 in. OSB
Test Method: ASTM D2395-17, *Standard Test Methods for Density and Specific Gravity (Relative Density) of Wood and Wood-Based Materials*
 ASTM D4442-20, *Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials*
Conditioning: Minimum 24 hours at a temperature of 23 ± 2°C and relative humidity of 50 ± 5%
Equipment: Setra Scale (Intertek ID# 9-0418, cal due February 4, 2022)
 Mitutoyo 8 in. Digital Caliper (Intertek ID# P60005, cal due June 8, 2022)
 Graphtec GL220 Temperature Data Logger (Intertek ID# P60557, cal due November 30, 2021)
 Shell Lab Oven (Intertek ID# P60613)
Time/Temp/RH: 1:30PM / 22.5°C / 53.0%

Project No: G104757760
Eng/Tech: Chris Chang
 Frank Gadea-Lopez
Reviewer: Baldeep Sandhu
Location: Coquitlam, BC

| Sample | Width (in) | Length (in) | Depth (in) | Volume | Initial Mass | Dry Mass | Moisture Content | Specific Gravity |
|---------|------------|-------------|------------|-----------------|--------------|----------|------------------|------------------|
| | W1 | L1 | D1 | in ³ | g | g | % | |
| Fir #1 | 3.4655 | 7.7855 | 1.5010 | 40.5 | 357.7 | 311.3 | 15 | 0.47 |
| Fir #2 | 3.4155 | 7.8250 | 1.4705 | 39.3 | 308.6 | 265.2 | 16 | 0.41 |
| Fir #3 | 3.4050 | 7.8080 | 1.4705 | 39.1 | 319.8 | 274.9 | 16 | 0.43 |
| Fir #4 | 3.4655 | 7.8390 | 1.4935 | 40.6 | 369.8 | 321.0 | 15 | 0.48 |
| Fir #5 | 3.4605 | 7.7820 | 1.4740 | 39.7 | 349.3 | 304.5 | 15 | 0.47 |
| Fir #6 | 3.4115 | 7.7820 | 1.4810 | 39.3 | 316.3 | 270.8 | 17 | 0.42 |
| Fir #7 | 3.4695 | 7.8160 | 1.4965 | 40.6 | 395.4 | 346.1 | 14 | 0.52 |
| Fir #8 | 3.4540 | 9.3970 | 1.4620 | 47.5 | 419.6 | 367.0 | 14 | 0.47 |
| Fir #9 | 3.3885 | 7.7705 | 1.4635 | 38.5 | 311.0 | 268.1 | 16 | 0.42 |
| Fir #10 | 3.4665 | 7.7790 | 1.4910 | 40.2 | 377.3 | 326.9 | 15 | 0.50 |
| OSB #1 | 4.1065 | 8.4025 | 0.6220 | 21.5 | 202.3 | 187.6 | 8 | 0.53 |
| OSB #2 | 4.0975 | 7.8765 | 0.6250 | 20.2 | 197.1 | 183.5 | 7 | 0.56 |
| OSB #3 | 4.0726 | 7.8510 | 0.6345 | 20.3 | 199.8 | 185.6 | 8 | 0.56 |
| OSB #4 | 4.0815 | 7.8345 | 0.6300 | 20.1 | 189.4 | 175.4 | 8 | 0.53 |
| OSB #5 | 4.0955 | 7.8195 | 0.6230 | 20.0 | 192.5 | 178.4 | 8 | 0.55 |
| OSB #6 | 4.0735 | 7.8870 | 0.6305 | 20.3 | 186.1 | 172.1 | 8 | 0.52 |
| OSB #7 | 3.9840 | 7.8285 | 0.6105 | 19.0 | 189.8 | 176.0 | 8 | 0.56 |
| OSB #8 | 4.1145 | 7.8165 | 0.6210 | 20.0 | 184.4 | 170.3 | 8 | 0.52 |
| OSB #9 | 4.0650 | 7.9125 | 0.6460 | 20.8 | 191.3 | 176.5 | 8 | 0.52 |
| OSB #10 | 4.0785 | 8.4690 | 0.6360 | 22.0 | 217.9 | 202.3 | 8 | 0.56 |

Test: Specific Gravity - Lateral Resistance
Date: 19-Aug-21
Client: Bissett Fasteners Limited
Product: Bissett 3" x 0.120 in. Spiral Shank, Seismic, 15° Angle Coil Nails (Dominator)
Substrate Material: 2" x 4" Douglas Fir lumber, 19/32 in. OSB
Test Method: ASTM D2395-17, *Standard Test Methods for Density and Specific Gravity (Relative Density) of Wood and Wood-Based Materials*
 ASTM D4442-20, *Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials*
Conditioning: Minimum 24 hours at a temperature of 23 ± 2°C and relative humidity of 50 ± 5%
Equipment: Setra Scale (Intertek ID# 9-0418, cal due February 4, 2022)
 Mitutoyo 8 in. Digital Caliper (Intertek ID# P60005, cal due June 8, 2022)
 Graphtec GL220 Temperature Data Logger (Intertek ID# P60557, cal due November 30, 2021)
 Shell Lab Oven (Intertek ID# P60613)
Time/Temp/RH: 10:00AM / 22.8°C / 51.0%

Project No: G104757760
Eng/Tech: Chris Chang
 Frank Gadea-Lopez
Reviewer: Baldeep Sandhu
Location: Coquitlam, BC

| Sample | Width (in) | Length (in) | Depth (in) | Volume | Initial Mass | Dry Mass | Moisture Content | Specific Gravity |
|---------|------------|-------------|------------|-----------------|--------------|----------|------------------|------------------|
| | W1 | L1 | D1 | in ³ | g | g | % | |
| Fir #1 | 3.3870 | 7.7705 | 1.4730 | 38.8 | 301.2 | 259.6 | 16 | 0.41 |
| Fir #2 | 3.4715 | 7.8150 | 1.5005 | 40.7 | 374.0 | 324.9 | 15 | 0.49 |
| Fir #3 | 3.4800 | 7.7790 | 1.5045 | 40.7 | 376.1 | 327.7 | 15 | 0.49 |
| Fir #4 | 3.4565 | 7.7685 | 1.4815 | 39.8 | 350.1 | 305.0 | 15 | 0.47 |
| Fir #5 | 3.4695 | 7.8760 | 1.4945 | 40.8 | 363.6 | 316.8 | 15 | 0.47 |
| Fir #6 | 3.4635 | 7.7510 | 1.5045 | 40.4 | 358.9 | 312.4 | 15 | 0.47 |
| Fir #7 | 3.3985 | 7.7970 | 1.4695 | 38.9 | 308.6 | 266.0 | 16 | 0.42 |
| Fir #8 | 3.3895 | 7.7870 | 1.4755 | 38.9 | 316.8 | 274.5 | 15 | 0.43 |
| Fir #9 | 3.3910 | 7.8355 | 1.4715 | 39.1 | 304.5 | 263.1 | 16 | 0.41 |
| Fir #10 | 3.4545 | 7.7805 | 1.4495 | 39.0 | 380.5 | 332.3 | 15 | 0.52 |
| OSB #1 | 4.1020 | 7.8850 | 0.6260 | 20.2 | 199.4 | 184.4 | 8 | 0.56 |
| OSB #2 | 4.0850 | 8.1485 | 0.6095 | 20.3 | 194.5 | 179.6 | 8 | 0.54 |
| OSB #3 | 4.0970 | 7.8325 | 0.6200 | 19.9 | 201.7 | 186.4 | 8 | 0.57 |
| OSB #4 | 4.1095 | 7.8205 | 0.6160 | 19.8 | 208.5 | 193.0 | 8 | 0.59 |
| OSB #5 | 4.1355 | 7.8370 | 0.6185 | 20.0 | 199.6 | 184.5 | 8 | 0.56 |
| OSB #6 | 4.1065 | 7.7700 | 0.6285 | 20.1 | 192.8 | 178.7 | 8 | 0.54 |
| OSB #7 | 4.1285 | 7.8535 | 0.6145 | 19.9 | 185.5 | 172.1 | 8 | 0.53 |
| OSB #8 | 4.1025 | 7.7805 | 0.6235 | 19.9 | 184.9 | 173.7 | 6 | 0.53 |
| OSB #9 | 4.1120 | 7.8475 | 0.6240 | 20.1 | 187.8 | 174.9 | 7 | 0.53 |
| OSB #10 | 4.0945 | 7.8610 | 0.6285 | 20.2 | 199.9 | 185.2 | 8 | 0.56 |

Test: Specific Gravity - Withdrawal
Date: 20-Aug-21
Client: Bissett Fasteners Limited
Product: Bissett 3" x 0.120 in. Spiral Shank, Seismic, 15° Angle Coil Nails (Dominator)
Substrate Material: 2" x 4" SPF lumber, 19/32 in. OSB
Test Method: ASTM D2395-17, *Standard Test Methods for Density and Specific Gravity (Relative Density) of Wood and Wood-Based Materials*
 ASTM D4442-20, *Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials*
Conditioning: Minimum 24 hours at a temperature of 23 ± 2°C and relative humidity of 50 ± 5%
Equipment: Setra Scale (Intertek ID# 9-0418, cal due February 4, 2022)
 Mitutoyo 8 in. Digital Caliper (Intertek ID# P60005, cal due June 8, 2022)
 Graphtec GL220 Temperature Data Logger (Intertek ID# P60557, cal due November 30, 2021)
 Shell Lab Oven (Intertek ID# P60613)
Time/Temp/RH: 10:30AM / 22.5°C / 53.0%

Project No: G104757760
Eng/Tech: Chris Chang
 Frank Gadea-Lopez
Reviewer: Baldeep Sandhu
Location: Coquitlam, BC

| Sample | Width (in) | Length (in) | Depth (in) | Volume | Initial Mass | Dry Mass | Moisture Content | Specific Gravity |
|---------|------------|-------------|------------|-----------------|--------------|----------|------------------|------------------|
| | W1 | L1 | D1 | in ³ | g | g | % | |
| SPF #1 | 3.5005 | 4.0085 | 1.5095 | 21.2 | 169.6 | 151.0 | 12 | 0.43 |
| SPF #2 | 3.4995 | 3.9955 | 1.4900 | 20.8 | 179.6 | 160.0 | 12 | 0.47 |
| SPF #3 | 3.4930 | 3.9645 | 1.5215 | 21.1 | 174.6 | 155.2 | 13 | 0.45 |
| SPF #4 | 3.4815 | 4.0690 | 1.5115 | 21.4 | 182.4 | 162.5 | 12 | 0.46 |
| SPF #5 | 3.4900 | 4.0650 | 1.4925 | 21.2 | 182.5 | 162.9 | 12 | 0.47 |
| SPF #6 | 3.4570 | 3.9485 | 1.4860 | 20.3 | 171.7 | 152.9 | 12 | 0.46 |
| SPF #7 | 3.4865 | 4.0490 | 1.4925 | 21.1 | 168.8 | 150.4 | 12 | 0.44 |
| SPF #8 | 3.9665 | 4.1645 | 1.4840 | 24.5 | 174.4 | 155.1 | 12 | 0.39 |
| SPF #9 | 3.4855 | 3.9805 | 1.4865 | 20.6 | 170.6 | 152.3 | 12 | 0.45 |
| SPF #10 | 3.5250 | 9.5700 | 1.4950 | 50.4 | 416.2 | 377.0 | 10 | 0.46 |
| OSB #1 | 4.1070 | 4.0135 | 0.6275 | 10.3 | 101.2 | 93.6 | 8 | 0.55 |
| OSB #2 | 4.0620 | 4.0980 | 0.6300 | 10.5 | 105.7 | 97.7 | 8 | 0.57 |
| OSB #3 | 4.1020 | 4.1330 | 0.6285 | 10.7 | 105.7 | 97.7 | 8 | 0.56 |
| OSB #4 | 4.0385 | 4.0770 | 0.6355 | 10.5 | 106.2 | 98.4 | 8 | 0.57 |
| OSB #5 | 4.0415 | 4.1015 | 0.6360 | 10.5 | 106.7 | 98.9 | 8 | 0.57 |
| OSB #6 | 4.0360 | 4.0835 | 0.6340 | 10.4 | 105.9 | 97.9 | 8 | 0.57 |
| OSB #7 | 4.0515 | 4.0135 | 0.6260 | 10.2 | 97.6 | 90.2 | 8 | 0.54 |
| OSB #8 | 4.1310 | 4.0530 | 0.6535 | 10.9 | 109.5 | 101.3 | 8 | 0.56 |
| OSB #9 | 4.1425 | 4.0570 | 0.6505 | 10.9 | 107.2 | 99.0 | 8 | 0.55 |
| OSB #10 | 3.2350 | 9.8310 | 0.6135 | 19.5 | 185.6 | 174.8 | 6 | 0.55 |

Test: Specific Gravity - Withdrawal
Date: 20-Aug-21
Client: Bissett Fasteners Limited
Product: Bissett 3" x 0.120 in. Spiral Shank, Seismic, 15° Angle Coil Nails (Dominator)
Substrate Material: 2" x 4" Douglas Fir Lumber, 19/32 in. OSB
Test Method: ASTM D2395-17, *Standard Test Methods for Density and Specific Gravity (Relative Density) of Wood and Wood-Based Materials*
 ASTM D4442-20, *Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials*
Conditioning: Minimum 24 hours at a temperature of 23 ± 2°C and relative humidity of 50 ± 5%
Equipment: Setra Scale (Intertek ID# 9-0418, cal due February 4, 2022)
 Mitutoyo 8 in. Digital Caliper (Intertek ID# P60005, cal due June 8, 2022)
 Graphtec GL220 Temperature Data Logger (Intertek ID# P60557, cal due November 30, 2021)
 Shell Lab Oven (Intertek ID# P60613)
Time/Temp/RH: 10:40AM / 22.5°C / 53.0%

Project No: G104757760
Eng/Tech: Chris Chang
 Frank Gadea-Lopez
Reviewer: Baldeep Sandhu
Location: Coquitlam, BC

| Sample | Width (in) | Length (in) | Depth (in) | Volume | Initial Mass | Dry Mass | Moisture Content | Specific Gravity |
|---------|------------|-------------|------------|-----------------|--------------|----------|------------------|------------------|
| | W1 | L1 | D1 | in ³ | g | g | % | |
| Fir #1 | 3.3960 | 3.9490 | 1.4655 | 19.7 | 174.5 | 151.6 | 15 | 0.47 |
| Fir #2 | 3.4390 | 3.9888 | 1.4705 | 20.2 | 201.0 | 174.7 | 15 | 0.53 |
| Fir #3 | 3.4360 | 3.9825 | 1.4675 | 20.1 | 193.1 | 167.1 | 16 | 0.51 |
| Fir #4 | 3.4500 | 3.9620 | 1.4645 | 20.0 | 194.2 | 168.1 | 15 | 0.51 |
| Fir #5 | 3.4500 | 3.9260 | 1.4785 | 20.0 | 183.0 | 158.7 | 15 | 0.48 |
| Fir #6 | 3.4580 | 3.8230 | 1.4695 | 19.4 | 181.0 | 157.7 | 15 | 0.50 |
| Fir #7 | 3.4515 | 3.9300 | 1.4765 | 20.0 | 184.9 | 160.3 | 15 | 0.49 |
| Fir #8 | 3.4530 | 3.9385 | 1.4745 | 20.1 | 183.4 | 159.2 | 15 | 0.48 |
| Fir #9 | 3.4525 | 3.9650 | 1.4615 | 20.0 | 210.0 | 182.3 | 15 | 0.56 |
| Fir #10 | 3.4590 | 3.9060 | 1.4685 | 19.8 | 198.9 | 172.8 | 15 | 0.53 |
| OSB #1 | 4.0150 | 4.1175 | 0.6300 | 10.4 | 97.0 | 89.9 | 8 | 0.53 |
| OSB #2 | 4.1295 | 4.0260 | 0.6350 | 10.6 | 102.6 | 94.9 | 8 | 0.55 |
| OSB #3 | 4.0425 | 4.1250 | 0.6440 | 10.7 | 105.3 | 97.4 | 8 | 0.55 |
| OSB #4 | 4.0200 | 4.1260 | 0.6415 | 10.6 | 101.2 | 93.4 | 8 | 0.54 |
| OSB #5 | 4.1000 | 4.0230 | 0.6390 | 10.5 | 97.6 | 90.1 | 8 | 0.52 |
| OSB #6 | 4.0210 | 4.1255 | 0.6415 | 10.6 | 102.3 | 94.5 | 8 | 0.54 |
| OSB #7 | 4.0895 | 4.0195 | 0.6300 | 10.4 | 100.4 | 92.9 | 8 | 0.55 |
| OSB #8 | 4.1240 | 4.0380 | 0.6335 | 10.5 | 101.8 | 94.2 | 8 | 0.54 |
| OSB #9 | 4.0875 | 4.0405 | 0.6315 | 10.4 | 96.8 | 89.4 | 8 | 0.52 |
| OSB #10 | 4.1315 | 4.0505 | 0.6370 | 10.7 | 108.5 | 100.4 | 8 | 0.57 |

Test: Specific Gravity - Withdrawal
Date: 20-Aug-21
Client: Bissett Fasteners Limited
Product: Bissett 3" x 0.148 in. Smooth Shank, 15° Angle Coil Nails
Substrate Material: 2" x 4" Douglas Fir Lumber, 19/32 in. OSB
Test Method: ASTM D2395-17, *Standard Test Methods for Density and Specific Gravity (Relative Density) of Wood and Wood-Based Materials*
 ASTM D4442-20, *Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials*
Conditioning: Minimum 24 hours at a temperature of 23 ± 2°C and relative humidity of 50 ± 5%
Equipment: Setra Scale (Intertek ID# 9-0418, cal due February 4, 2022)
 Mitutoyo 8 in. Digital Caliper (Intertek ID# P60005, cal due June 8, 2022)
 Graphtec GL220 Temperature Data Logger (Intertek ID# P60557, cal due November 30, 2021)
 Shell Lab Oven (Intertek ID# P60613)
Time/Temp/RH: 11:15AM / 22.3°C / 52.0%

Project No: G104757760
Eng/Tech: Chris Chang
 Frank Gadea-Lopez
Reviewer: Baldeep Sandhu
Location: Coquitlam, BC

| Sample | Width (in) | Length (in) | Depth (in) | Volume | Initial Mass | Dry Mass | Moisture Content | Specific Gravity |
|---------|------------|-------------|------------|-----------------|--------------|----------|------------------|------------------|
| | W1 | L1 | D1 | in ³ | g | g | % | |
| Fir #1 | 3.4370 | 3.7985 | 1.4695 | 19.2 | 194.6 | 168.7 | 15 | 0.54 |
| Fir #2 | 3.4455 | 3.9365 | 1.4645 | 19.9 | 202.9 | 177.0 | 15 | 0.54 |
| Fir #3 | 3.4480 | 4.0020 | 1.4675 | 20.2 | 203.5 | 176.4 | 15 | 0.53 |
| Fir #4 | 3.4475 | 3.9660 | 1.4735 | 20.1 | 210.9 | 182.7 | 15 | 0.55 |
| Fir #5 | 3.4150 | 3.9820 | 1.4765 | 20.1 | 157.6 | 136.7 | 15 | 0.42 |
| Fir #6 | 3.4440 | 4.0125 | 1.4560 | 20.1 | 205.4 | 178.4 | 15 | 0.54 |
| Fir #7 | 3.4125 | 3.6830 | 1.4610 | 18.4 | 172.0 | 152.8 | 13 | 0.51 |
| Fir #8 | 3.4400 | 3.9825 | 1.4775 | 20.2 | 201.5 | 174.4 | 16 | 0.53 |
| Fir #9 | 3.4270 | 5.4685 | 1.4175 | 26.6 | 207.8 | 182.8 | 14 | 0.42 |
| Fir #10 | 3.4015 | 3.9960 | 1.4830 | 20.2 | 152.8 | 132.9 | 15 | 0.40 |
| OSB #1 | 3.9160 | 4.0800 | 0.6270 | 10.0 | 102.7 | 95.1 | 8 | 0.58 |
| OSB #2 | 3.9860 | 4.0910 | 0.6270 | 10.2 | 98.7 | 91.2 | 8 | 0.54 |
| OSB #3 | 3.9545 | 4.0930 | 0.6285 | 10.2 | 106.0 | 98.2 | 8 | 0.59 |
| OSB #4 | 3.9910 | 4.0905 | 0.6285 | 10.3 | 100.9 | 93.2 | 8 | 0.55 |
| OSB #5 | 3.9685 | 4.0885 | 0.6200 | 10.1 | 98.7 | 91.3 | 8 | 0.55 |
| OSB #6 | 3.9670 | 4.0980 | 0.6340 | 10.3 | 102.1 | 94.3 | 8 | 0.56 |
| OSB #7 | 4.0850 | 4.0585 | 0.6335 | 10.5 | 103.9 | 96.1 | 8 | 0.56 |
| OSB #8 | 3.9325 | 4.0745 | 0.6335 | 10.2 | 101.4 | 93.8 | 8 | 0.56 |
| OSB #9 | 3.9830 | 4.1325 | 0.6475 | 10.7 | 107.3 | 98.9 | 8 | 0.57 |
| OSB #10 | 4.0915 | 4.0020 | 0.6285 | 10.3 | 98.4 | 90.8 | 8 | 0.54 |

Test: Specific Gravity - Withdrawal
Date: 20-Aug-21
Client: Bissett Fasteners Limited
Product: Bissett 3" x 0.148 in. Smooth Shank, 15° Angle Coil Nails
Substrate Material: 2" x 4" SPF lumber, 19/32 in. OSB
Test Method: ASTM D2395-17, *Standard Test Methods for Density and Specific Gravity (Relative Density) of Wood and Wood-Based Materials*
 ASTM D4442-20, *Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials*
Conditioning: Minimum 24 hours at a temperature of 23 ± 2°C and relative humidity of 50 ± 5%
Equipment: Setra Scale (Intertek ID# 9-0418, cal due February 4, 2022)
 Mitutoyo 8 in. Digital Caliper (Intertek ID# P60005, cal due June 8, 2022)
 Graphtec GL220 Temperature Data Logger (Intertek ID# P60557, cal due November 30, 2021)
 Shell Lab Oven (Intertek ID# P60613)
Time/Temp/RH: 2:20PM / 22.5°C / 55.0%

Project No: G104757760
Eng/Tech: Chris Chang
 Frank Gadea-Lopez
Reviewer: Baldeep Sandhu
Location: Coquitlam, BC

| Sample | Width (in) | Length (in) | Depth (in) | Volume | Initial Mass | Dry Mass | Moisture Content | Specific Gravity |
|---------|------------|-------------|------------|-----------------|--------------|----------|------------------|------------------|
| | W1 | L1 | D1 | in ³ | g | g | % | |
| SPF #1 | 3.4960 | 3.9610 | 1.4985 | 20.8 | 177.9 | 157.9 | 13 | 0.46 |
| SPF #2 | 3.4905 | 4.0610 | 1.4965 | 21.2 | 183.3 | 162.7 | 13 | 0.47 |
| SPF #3 | 3.4930 | 4.0125 | 1.5135 | 21.2 | 178.6 | 158.5 | 13 | 0.46 |
| SPF #4 | 3.4755 | 3.9470 | 1.4870 | 20.4 | 142.3 | 126.4 | 13 | 0.38 |
| SPF #5 | 3.4920 | 4.0375 | 1.5140 | 21.3 | 174.5 | 155.1 | 13 | 0.44 |
| SPF #6 | 3.4975 | 4.6435 | 1.5095 | 24.5 | 200.7 | 179.1 | 12 | 0.45 |
| SPF #7 | 3.4840 | 4.0205 | 1.5275 | 21.4 | 173.6 | 154.0 | 13 | 0.44 |
| SPF #8 | 3.4915 | 3.9960 | 1.5015 | 20.9 | 178.6 | 158.6 | 13 | 0.46 |
| SPF #9 | 3.4770 | 3.9405 | 1.5010 | 20.6 | 167.2 | 148.3 | 13 | 0.44 |
| SPF #10 | 3.4875 | 3.9590 | 1.5145 | 20.9 | 173.5 | 154.0 | 13 | 0.45 |
| OSB #1 | 4.0515 | 3.9760 | 0.6310 | 10.2 | 98.0 | 90.6 | 8 | 0.54 |
| OSB #2 | 4.1255 | 3.9640 | 0.6240 | 10.2 | 98.5 | 91.0 | 8 | 0.54 |
| OSB #3 | 4.0045 | 4.0920 | 0.6280 | 10.3 | 102.4 | 94.6 | 8 | 0.56 |
| OSB #4 | 4.0515 | 4.0895 | 0.6430 | 10.7 | 103.0 | 94.7 | 9 | 0.54 |
| OSB #5 | 4.1155 | 3.9755 | 0.6390 | 10.5 | 98.0 | 90.1 | 9 | 0.53 |
| OSB #6 | 4.1335 | 3.9850 | 0.6375 | 10.5 | 98.4 | 90.8 | 8 | 0.53 |
| OSB #7 | 4.0870 | 4.0520 | 0.6330 | 10.5 | 100.5 | 92.8 | 8 | 0.54 |
| OSB #8 | 4.0005 | 4.0695 | 0.6315 | 10.3 | 102.3 | 94.5 | 8 | 0.56 |
| OSB #9 | 4.1215 | 3.9955 | 0.6335 | 10.4 | 108.0 | 99.7 | 8 | 0.58 |
| OSB #10 | 4.0900 | 4.1365 | 0.6350 | 10.7 | 102.2 | 94.3 | 8 | 0.54 |

Test: Specific Gravity - Withdrawal
Date: 20-Aug-21
Client: Bissett Fasteners Limited
Product: Bissett 2-1/4" x 0.099 in. Spiral Shank, 15° Angle Coil Nails
Substrate Material: 2" x 4" SPF Lumber, 19/32 in. OSB
Test Method: ASTM D2395-17, *Standard Test Methods for Density and Specific Gravity (Relative Density) of Wood and Wood-Based Materials*
 ASTM D4442-20, *Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials*
Conditioning: Minimum 24 hours at a temperature of 23 ± 2°C and relative humidity of 50 ± 5%
Equipment: Setra Scale (Intertek ID# 9-0418, cal due February 4, 2022)
 Mitutoyo 8 in. Digital Caliper (Intertek ID# P60005, cal due June 8, 2022)
 Graphtec GL220 Temperature Data Logger (Intertek ID# P60557, cal due November 30, 2021)
 Shell Lab Oven (Intertek ID# P60613)
Time/Temp/RH: 2:40PM / 22.9°C / 54.0%

Project No: G104757760
Eng/Tech: Chris Chang
 Frank Gadea-Lopez
Reviewer: Baldeep Sandhu
Location: Coquitlam, BC

| Sample | Width (in) | Length (in) | Depth (in) | Volume | Initial Mass | Dry Mass | Moisture Content | Specific Gravity |
|---------|------------|-------------|------------|-----------------|--------------|----------|------------------|------------------|
| | W1 | L1 | D1 | in ³ | g | g | % | |
| SPF #1 | 3.5045 | 4.0585 | 1.5245 | 21.7 | 184.6 | 164.3 | 12 | 0.46 |
| SPF #2 | 3.5060 | 3.9810 | 1.5150 | 21.1 | 176.2 | 156.5 | 13 | 0.45 |
| SPF #3 | 3.5025 | 4.0760 | 1.4955 | 21.4 | 188.5 | 167.3 | 13 | 0.48 |
| SPF #4 | 3.5110 | 4.0090 | 1.4945 | 21.0 | 171.1 | 151.6 | 13 | 0.44 |
| SPF #5 | 3.5070 | 4.5170 | 1.4975 | 23.7 | 169.7 | 150.7 | 13 | 0.39 |
| SPF #6 | 3.5010 | 3.9090 | 1.4965 | 20.5 | 173.8 | 154.3 | 13 | 0.46 |
| SPF #7 | 3.4965 | 4.0185 | 1.4975 | 21.0 | 177.1 | 157.1 | 13 | 0.46 |
| SPF #8 | 3.4775 | 4.0225 | 1.4795 | 20.7 | 172.0 | 152.6 | 13 | 0.45 |
| SPF #9 | 3.4865 | 4.0820 | 1.4800 | 21.1 | 170.1 | 150.9 | 13 | 0.44 |
| SPF #10 | 3.4680 | 4.0170 | 1.4840 | 20.7 | 169.5 | 150.4 | 13 | 0.44 |
| OSB #1 | 4.0000 | 4.1120 | 0.6310 | 10.4 | 97.9 | 89.9 | 9 | 0.53 |
| OSB #2 | 4.2080 | 4.0680 | 0.6375 | 10.9 | 97.7 | 89.5 | 9 | 0.50 |
| OSB #3 | 4.0795 | 3.9630 | 0.6400 | 10.3 | 101.0 | 93.0 | 9 | 0.55 |
| OSB #4 | 4.0020 | 3.9630 | 0.6260 | 9.9 | 90.2 | 82.8 | 9 | 0.51 |
| OSB #5 | 4.1460 | 3.9935 | 0.6270 | 10.4 | 101.5 | 93.5 | 9 | 0.55 |
| OSB #6 | 4.0850 | 3.9380 | 0.6370 | 10.2 | 102.2 | 94.8 | 8 | 0.56 |
| OSB #7 | 4.0895 | 3.9355 | 0.6345 | 10.2 | 99.1 | 91.4 | 8 | 0.55 |
| OSB #8 | 4.0145 | 3.9395 | 0.6325 | 10.0 | 98.6 | 90.9 | 8 | 0.55 |
| OSB #9 | 4.1030 | 3.9405 | 0.6270 | 10.1 | 97.9 | 90.0 | 9 | 0.54 |
| OSB #10 | 4.0395 | 3.9300 | 0.6285 | 10.0 | 99.9 | 92.1 | 8 | 0.56 |

| | | | |
|---------------------|--|-------------|-------------------|
| Test: | Specific Gravity - Withdrawal | Project No: | G104757760 |
| Date: | 20-Aug-21 | Eng/Tech: | Chris Chang |
| Client: | Bissett Fasteners Limited | | Frank Gadea-Lopez |
| Product: | Bissett 2" x 0.099 in. Spiral Shank, 15° Angle Coil Nails (Dominator) | Reviewer: | Baldeep Sandhu |
| Substrate Material: | 2" x 4" SPF Lumber, 19/32 in. OSB | Location: | Coquitlam, BC |
| Test Method: | ASTM D2395-17, <i>Standard Test Methods for Density and Specific Gravity (Relative Density) of Wood and Wood-Based Materials</i> ASTM D4442-20, <i>Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials</i> | | |
| Conditioning: | Minimum 24 hours at a temperature of 23 ± 2°C and relative humidity of 50 ± 5% | | |
| Equipment: | Setra Scale (Intertek ID# 9-0410, cal due February 4, 2022) Mitutoyo 8 in. Digital Caliper (Intertek ID# P60005, cal due June 8, 2022) Graphtec GL220 Temperature Data Logger (Intertek ID# P60557, cal due November 30, 2021) Shell Lab Oven (Intertek ID# P60613) | | |
| Time/Temp/RH: | 2:452PM / 23.0°C / 54.0% | | |

| Sample | Width (in) | Length (in) | Depth (in) | Volume | Initial Mass | Dry Mass | Moisture Content | Specific Gravity |
|---------|------------|-------------|------------|-----------------|--------------|----------|------------------|------------------|
| | W1 | L1 | D1 | in ³ | g | g | % | |
| SPF #1 | 3.5120 | 3.9850 | 1.5050 | 21.1 | 161.8 | 144.0 | 12 | 0.42 |
| SPF #2 | 3.4820 | 3.9850 | 1.4820 | 20.6 | 175.3 | 155.6 | 13 | 0.46 |
| SPF #3 | 3.4945 | 4.0870 | 1.4920 | 21.3 | 173.1 | 153.5 | 13 | 0.44 |
| SPF #4 | 3.4815 | 3.9670 | 1.5030 | 20.8 | 167.6 | 148.0 | 13 | 0.44 |
| SPF #5 | 3.5010 | 3.9875 | 1.5050 | 21.0 | 175.2 | 155.7 | 13 | 0.45 |
| SPF #6 | 3.4650 | 4.0880 | 1.4770 | 20.9 | 168.8 | 149.5 | 13 | 0.44 |
| SPF #7 | 3.4790 | 4.0965 | 1.4945 | 21.3 | 182.1 | 162.0 | 12 | 0.46 |
| SPF #8 | 3.4885 | 4.0390 | 1.4815 | 20.9 | 174.5 | 155.1 | 13 | 0.45 |
| SPF #9 | 3.4825 | 4.0230 | 1.4945 | 20.9 | 173.9 | 154.4 | 13 | 0.45 |
| SPF #10 | 3.4915 | 3.9655 | 1.5030 | 20.8 | 181.0 | 160.5 | 13 | 0.47 |
| OSB #1 | 4.0135 | 4.0990 | 0.6230 | 10.2 | 100.4 | 92.6 | 8 | 0.55 |
| OSB #2 | 4.1110 | 4.0150 | 0.6280 | 10.4 | 101.8 | 93.8 | 9 | 0.55 |
| OSB #3 | 4.1180 | 3.9820 | 0.6250 | 10.2 | 100.3 | 92.4 | 9 | 0.55 |
| OSB #4 | 4.0125 | 4.0975 | 0.6320 | 10.4 | 99.4 | 91.5 | 9 | 0.54 |
| OSB #5 | 4.0525 | 3.9655 | 0.6295 | 10.1 | 95.9 | 87.6 | 10 | 0.53 |
| OSB #6 | 4.1190 | 4.0180 | 0.6240 | 10.3 | 105.6 | 97.3 | 8 | 0.57 |
| OSB #7 | 4.1200 | 3.9790 | 0.6265 | 10.3 | 101.1 | 93.2 | 8 | 0.55 |
| OSB #8 | 4.0520 | 4.0920 | 0.6356 | 10.5 | 100.0 | 90.9 | 10 | 0.53 |
| OSB #9 | 3.9900 | 4.0855 | 0.6310 | 10.3 | 98.8 | 91.1 | 9 | 0.54 |
| OSB #10 | 3.9835 | 4.1200 | 0.6295 | 10.3 | 100.8 | 92.8 | 9 | 0.55 |



Total Quality. Assured.

1500 Brigantine Drive
Coquitlam, BC, V3K7C1

Telephone: 604-520-3321
Facsimile: 604-524-9186
www.intertek.com/building

TEST REPORT FOR BISSETT FASTENERS LIMITED

Report No.: 104757760COQ-001

Date: 10/19/22

SECTION 12

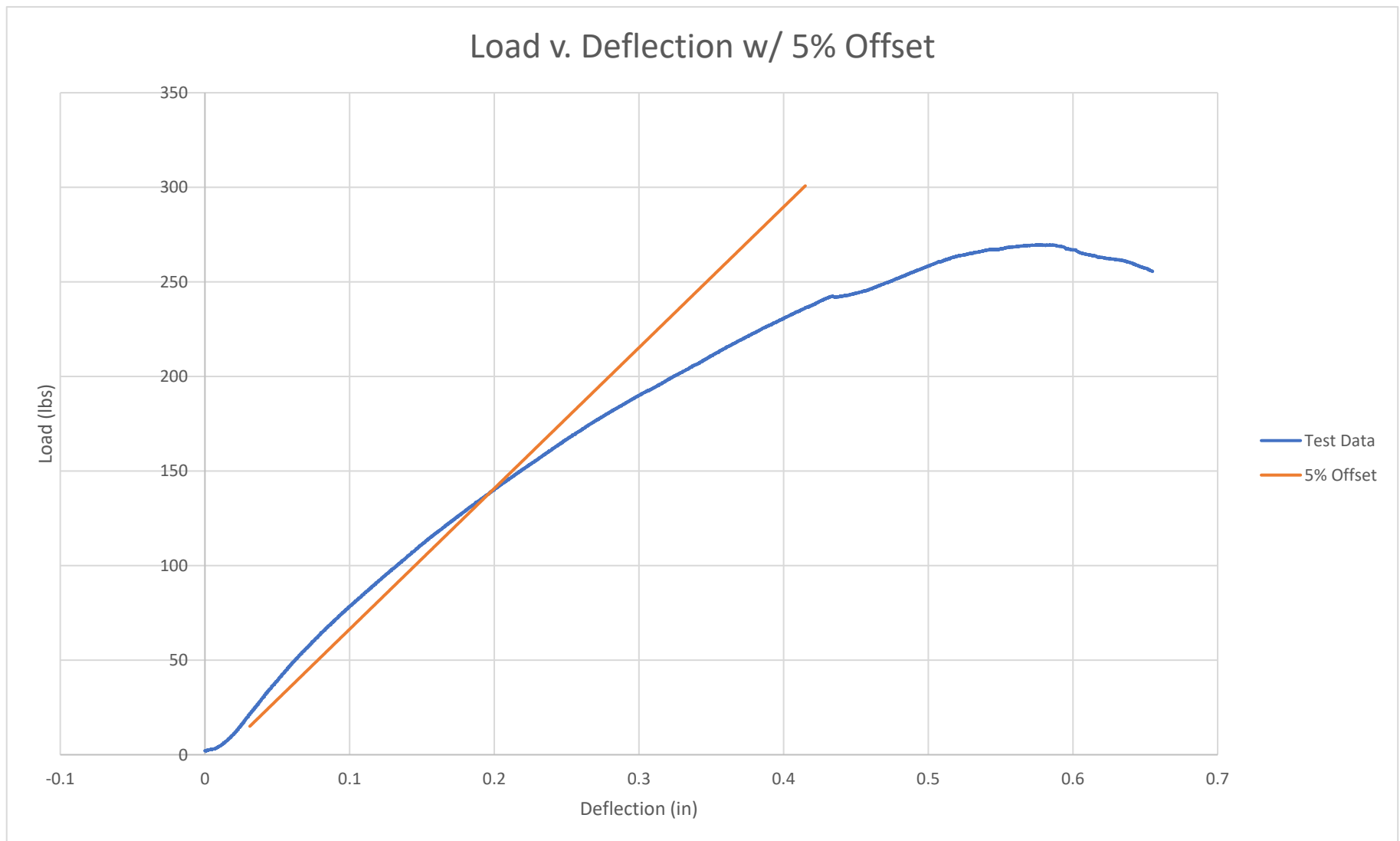
REVISION LOG

| REVISION # | DATE | PAGES | REVISION |
|------------|----------|------------------|--|
| 0 | 08/27/21 | N/A | Original Report Issue |
| 1 | 10/05/22 | Appendix A, B | Included load vs. deflection plots in test data sheets |
| | | 3 | Test result was corrected from 632 lbs to 636 lbs |
| 2 | 10/19/22 | Appendix A, B | Revised scale on load vs. deflection plots in test data sheets |

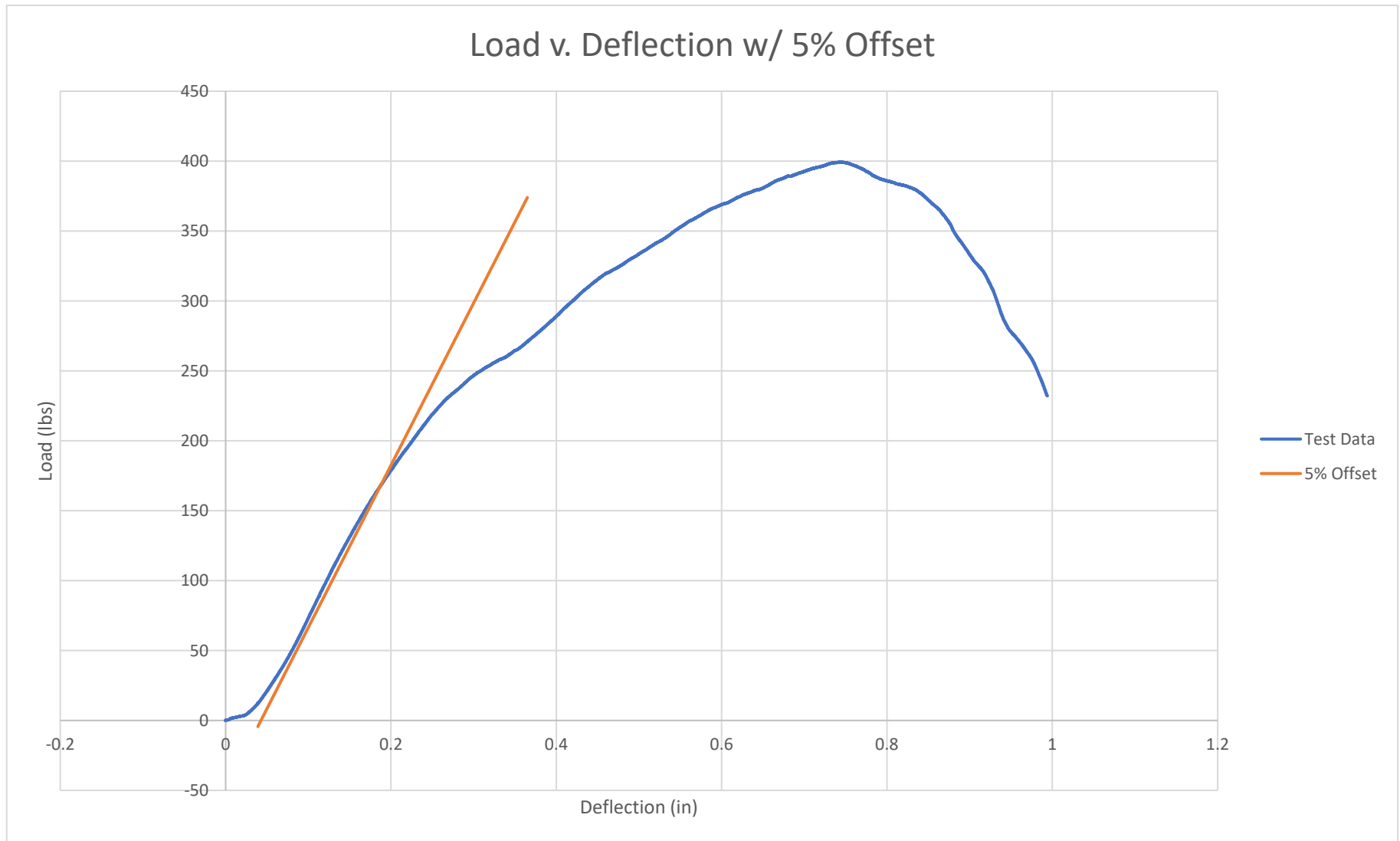


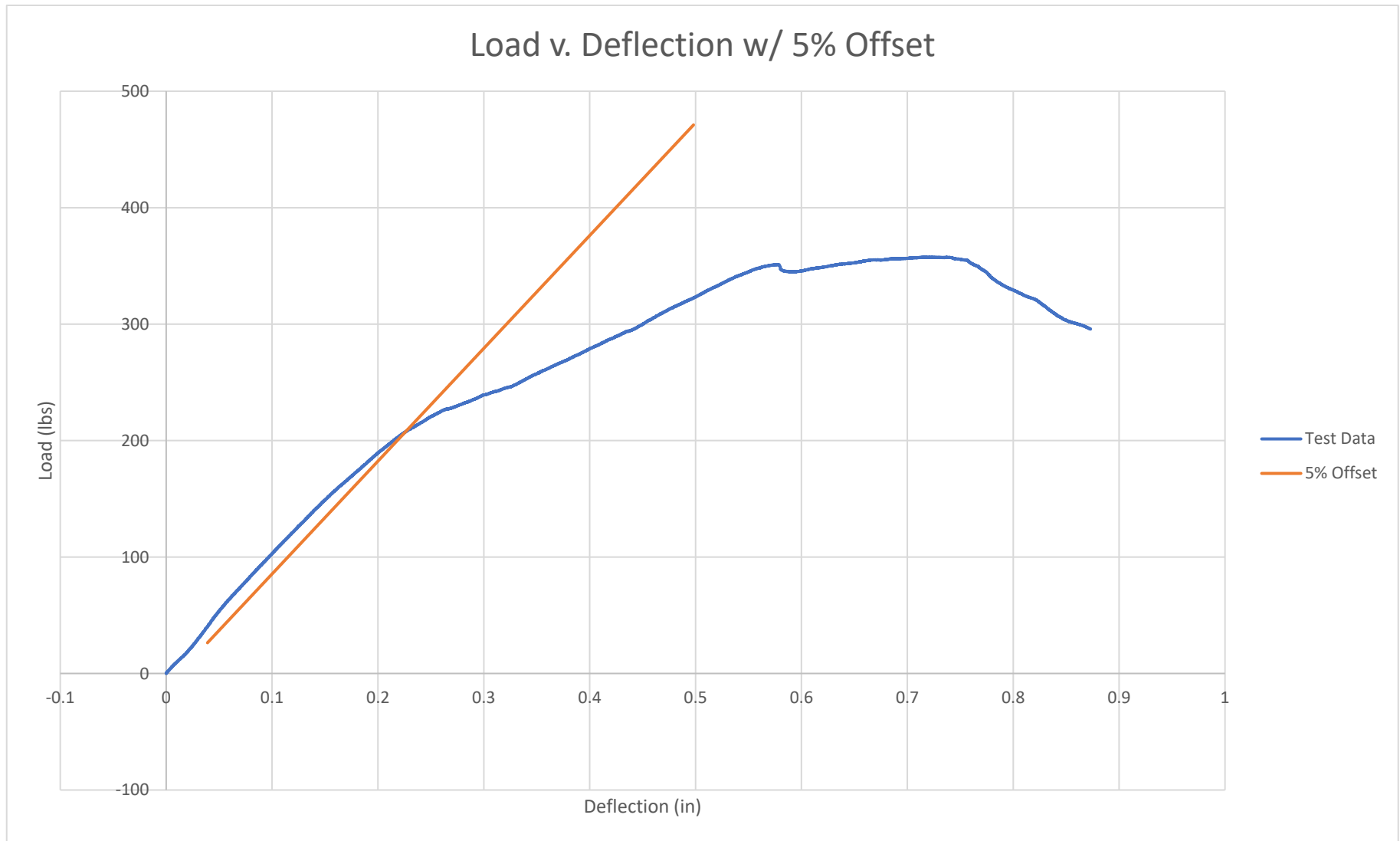
APPENDIX B

Dominator Load-Deformation Graphs

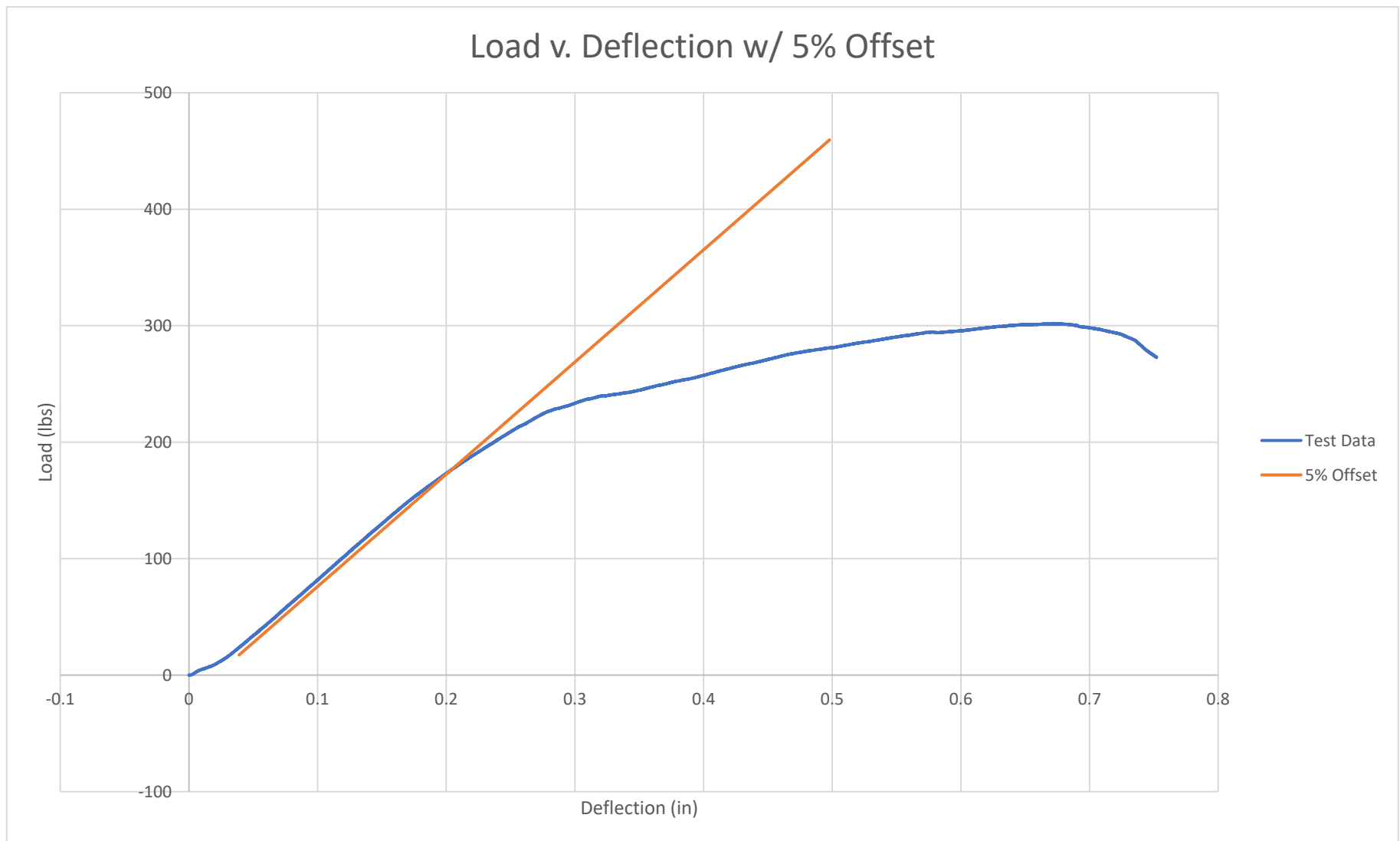


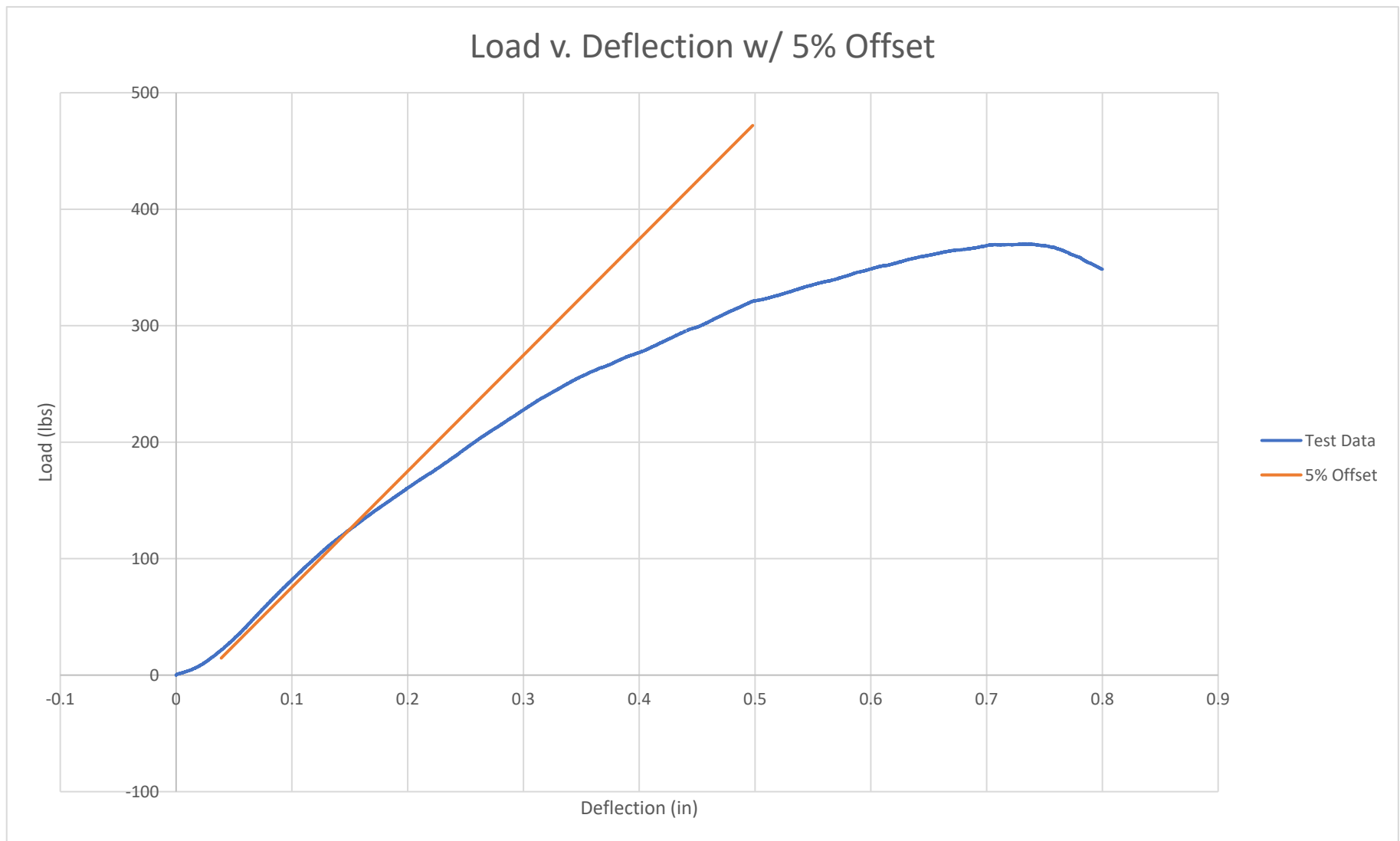


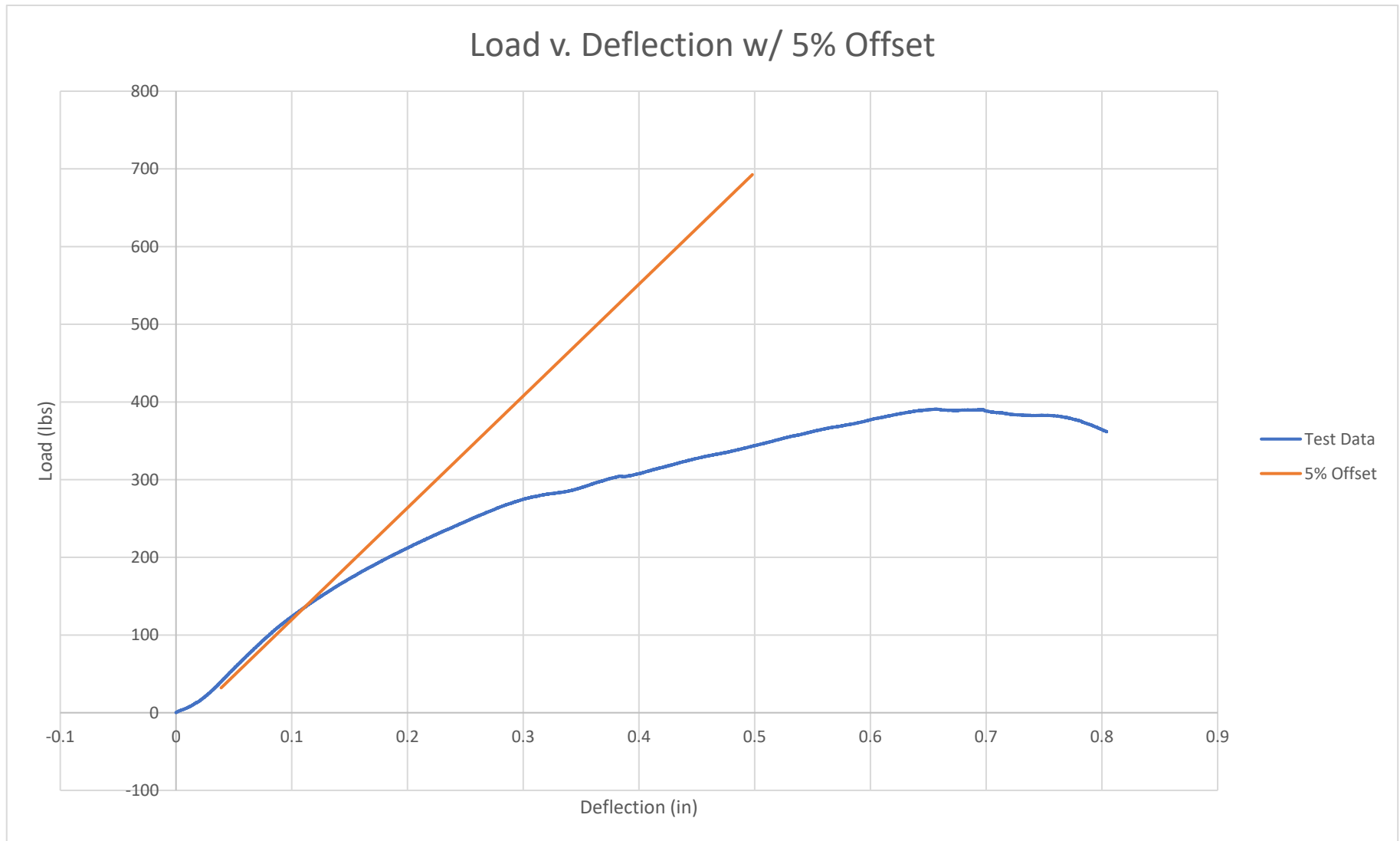


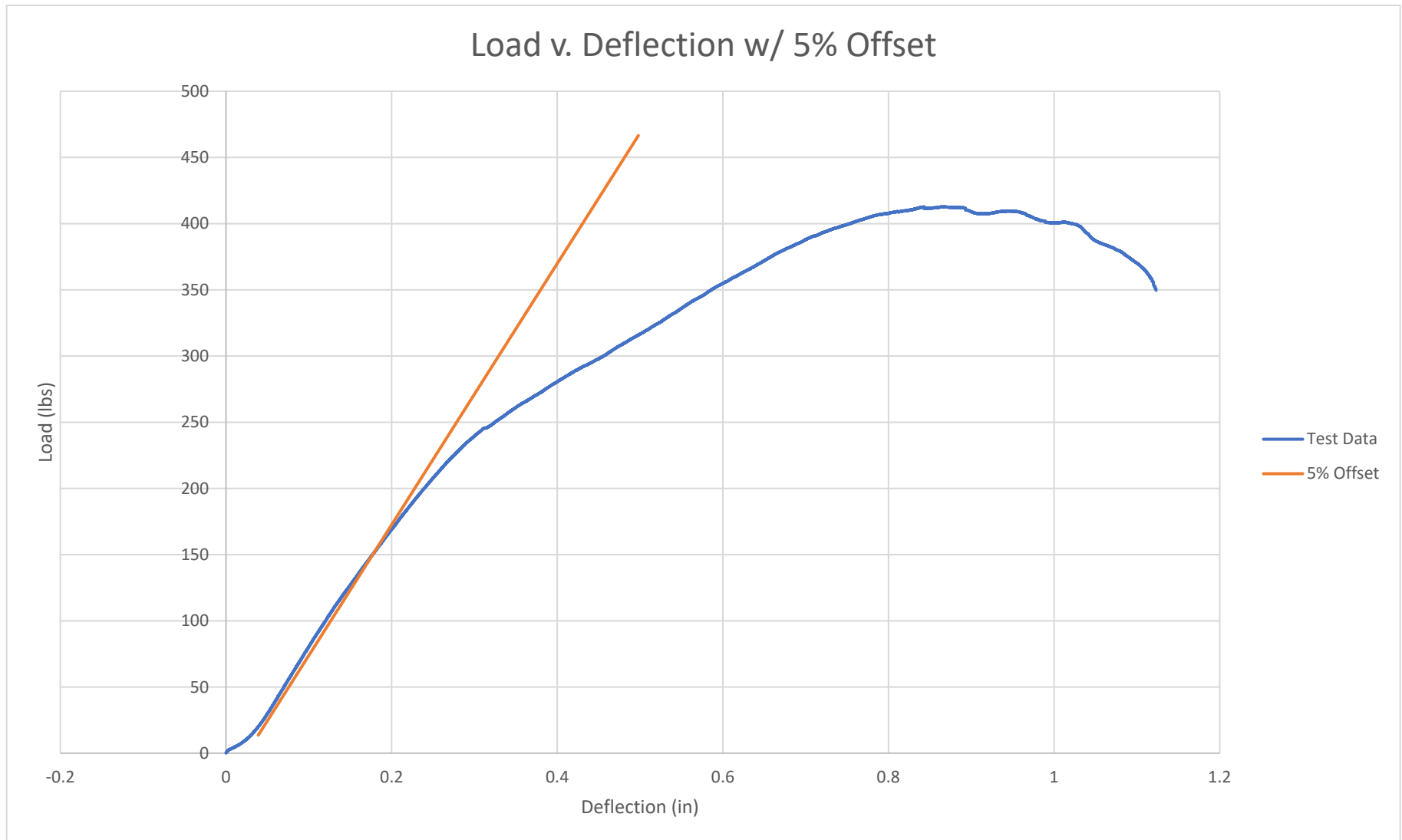




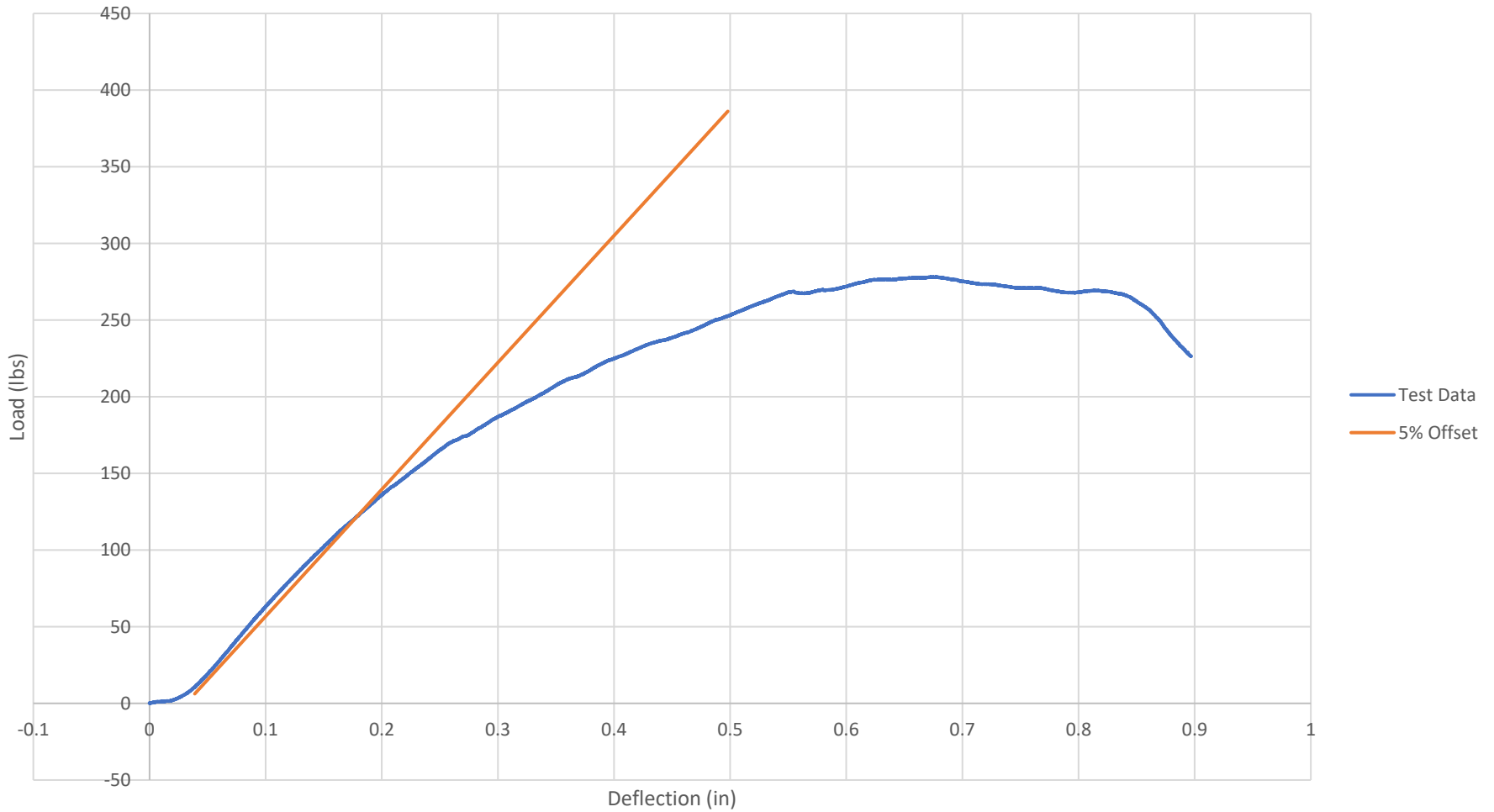








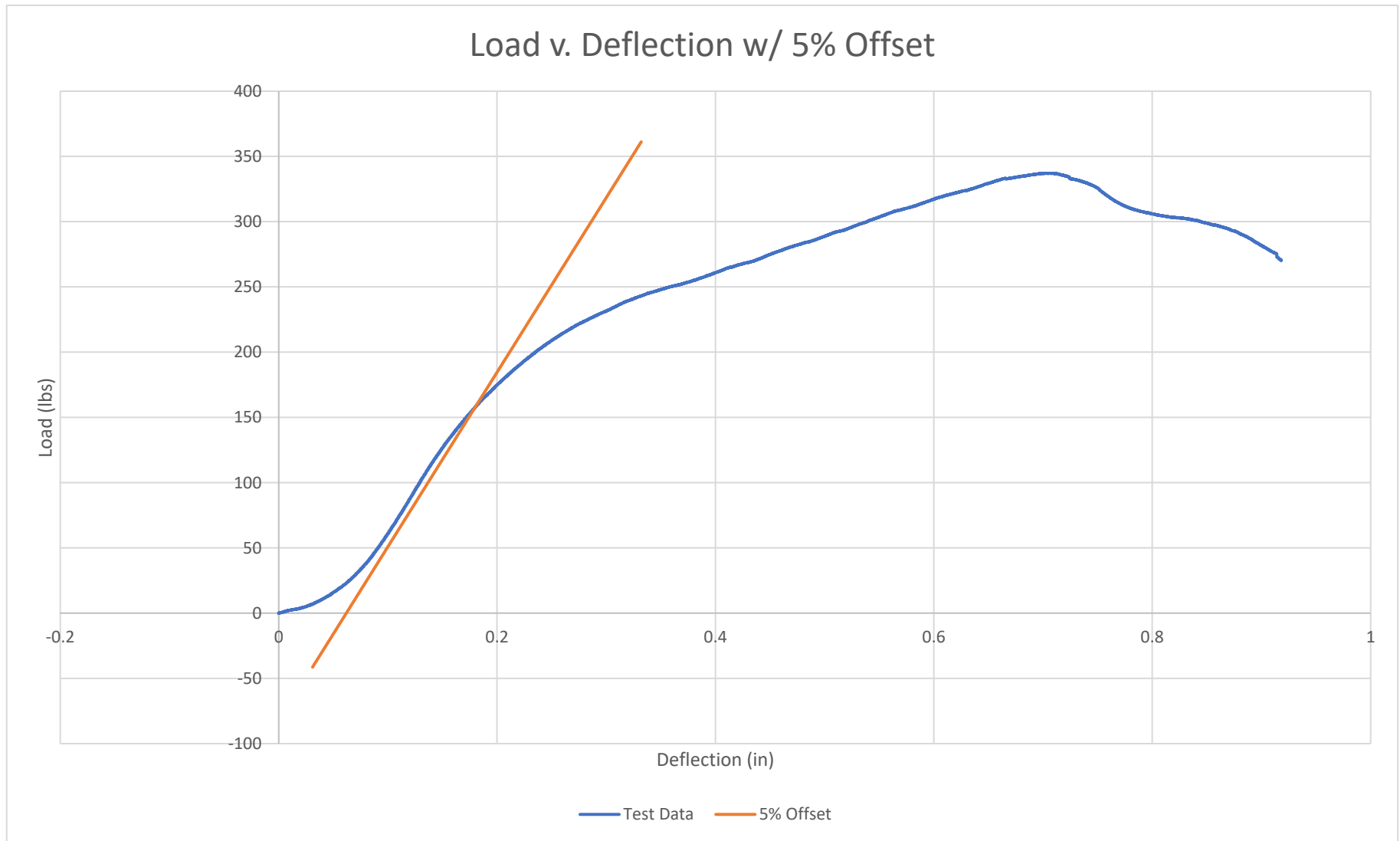
Load v. Deflection w/ 5% Offset

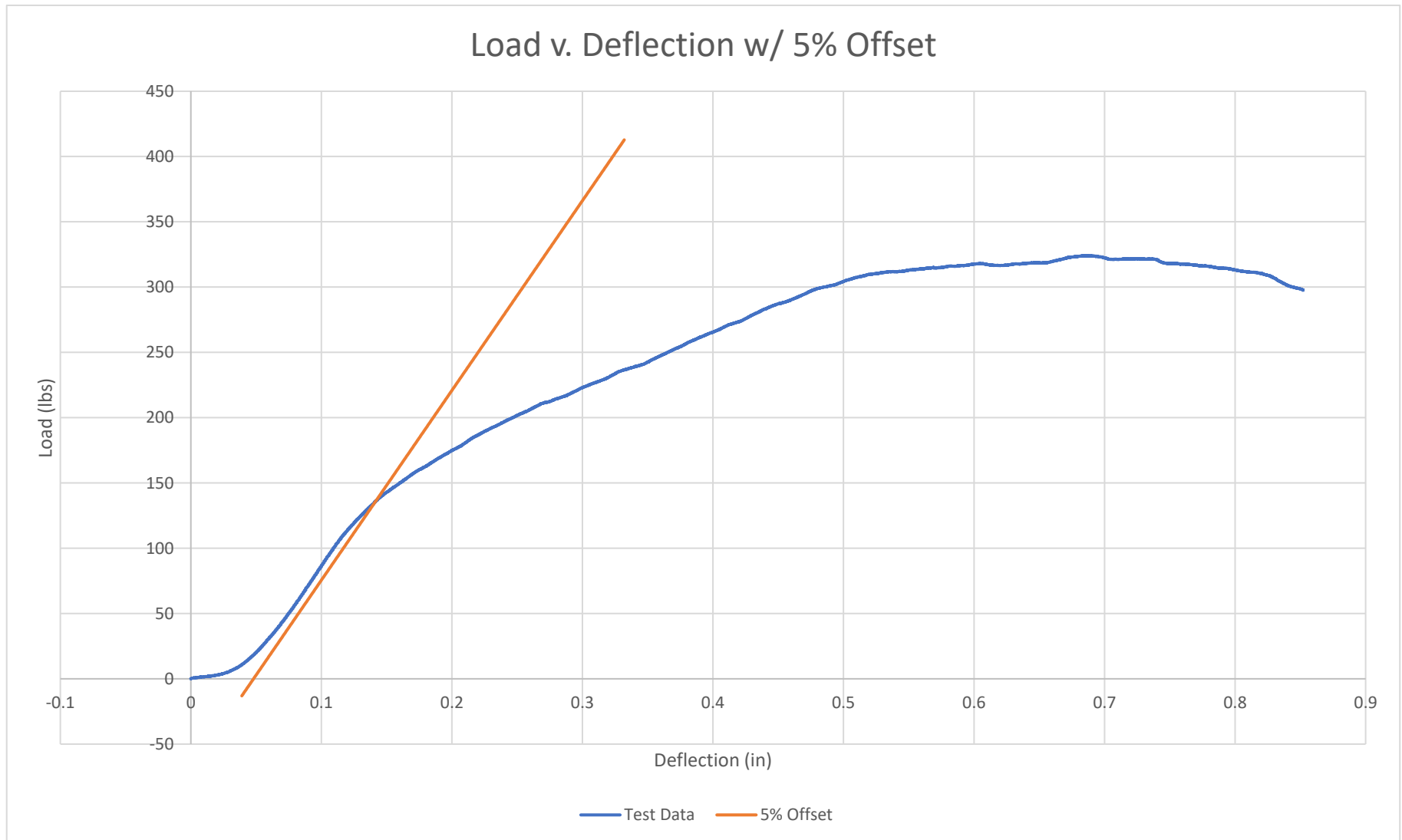


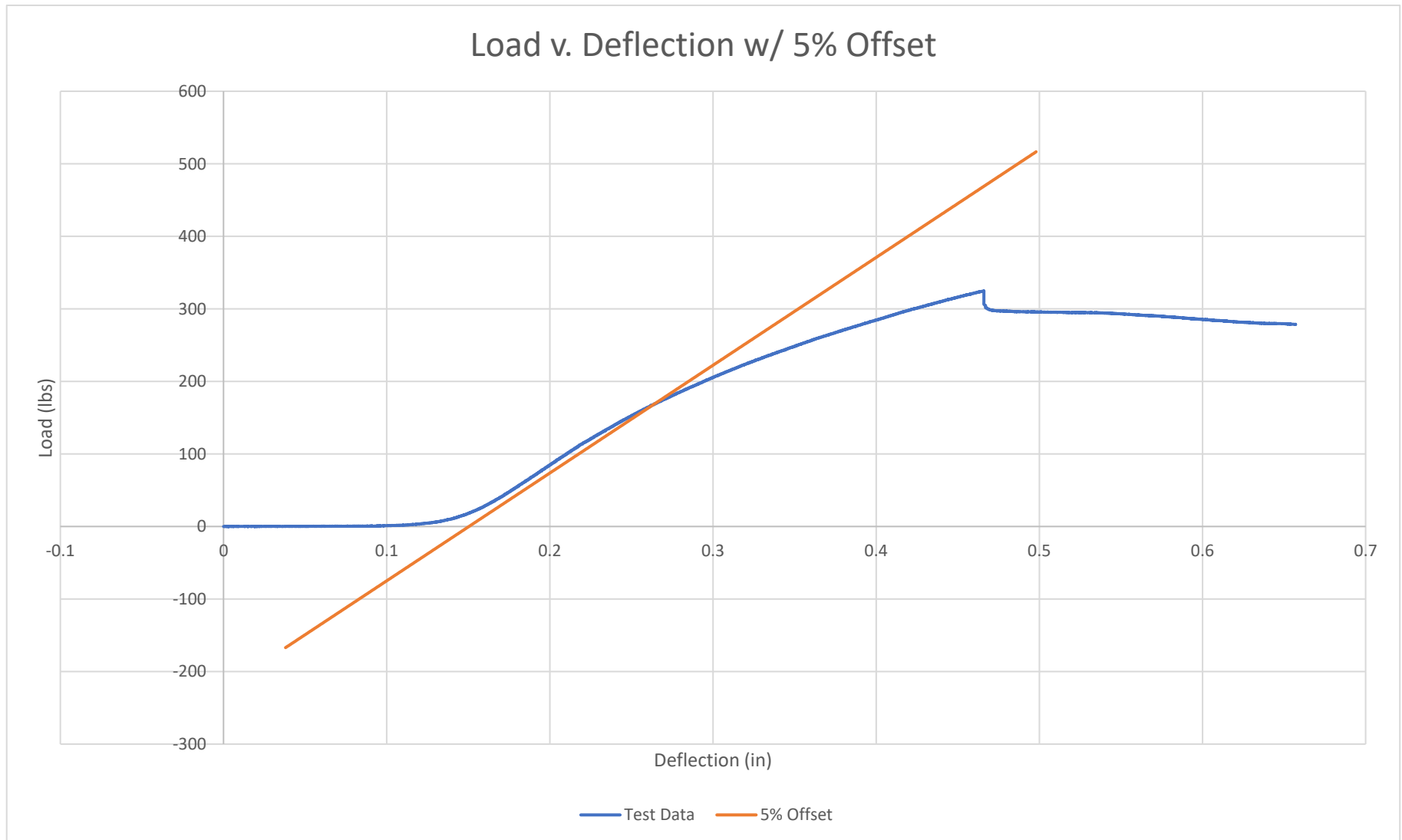


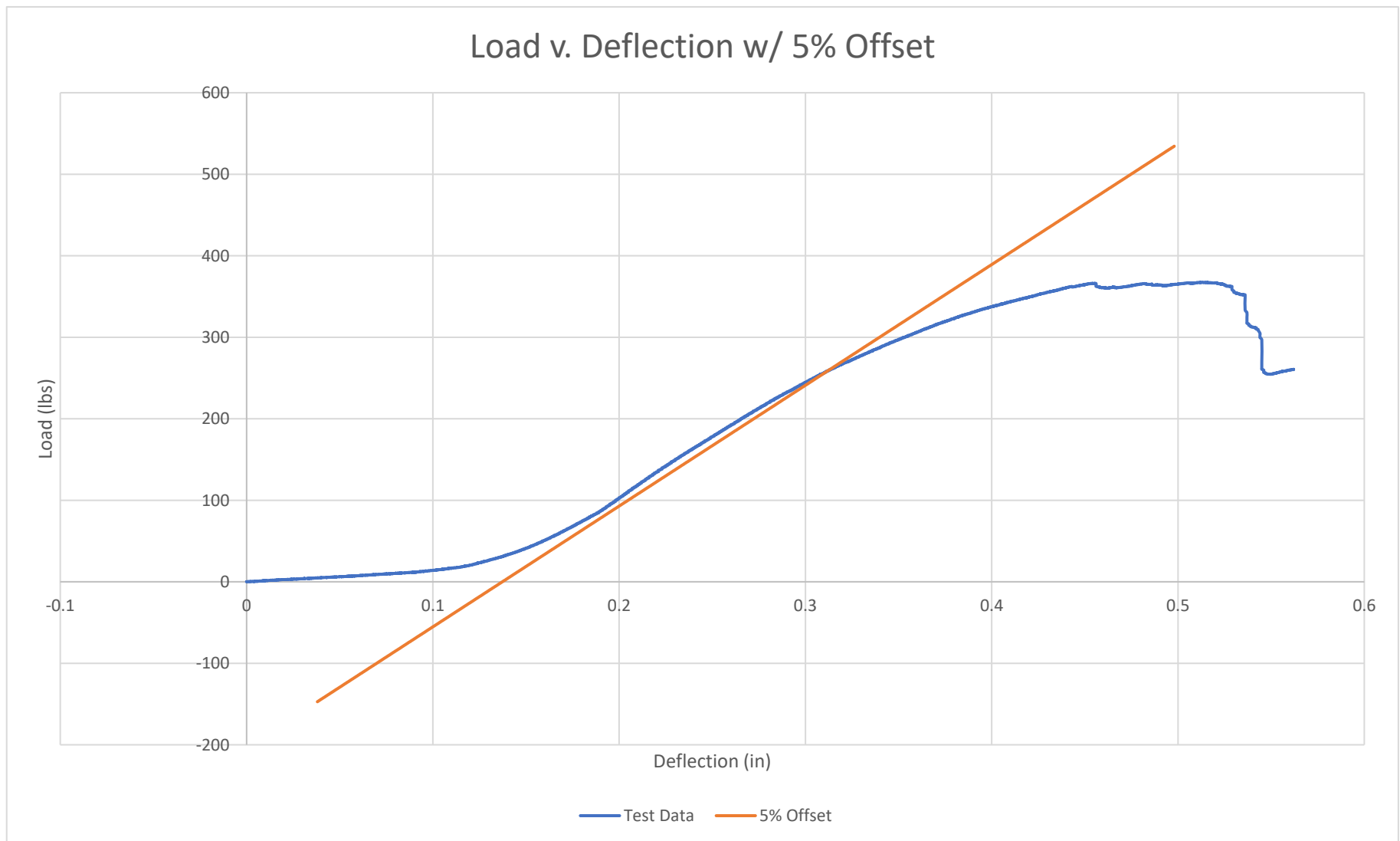
APPENDIX C

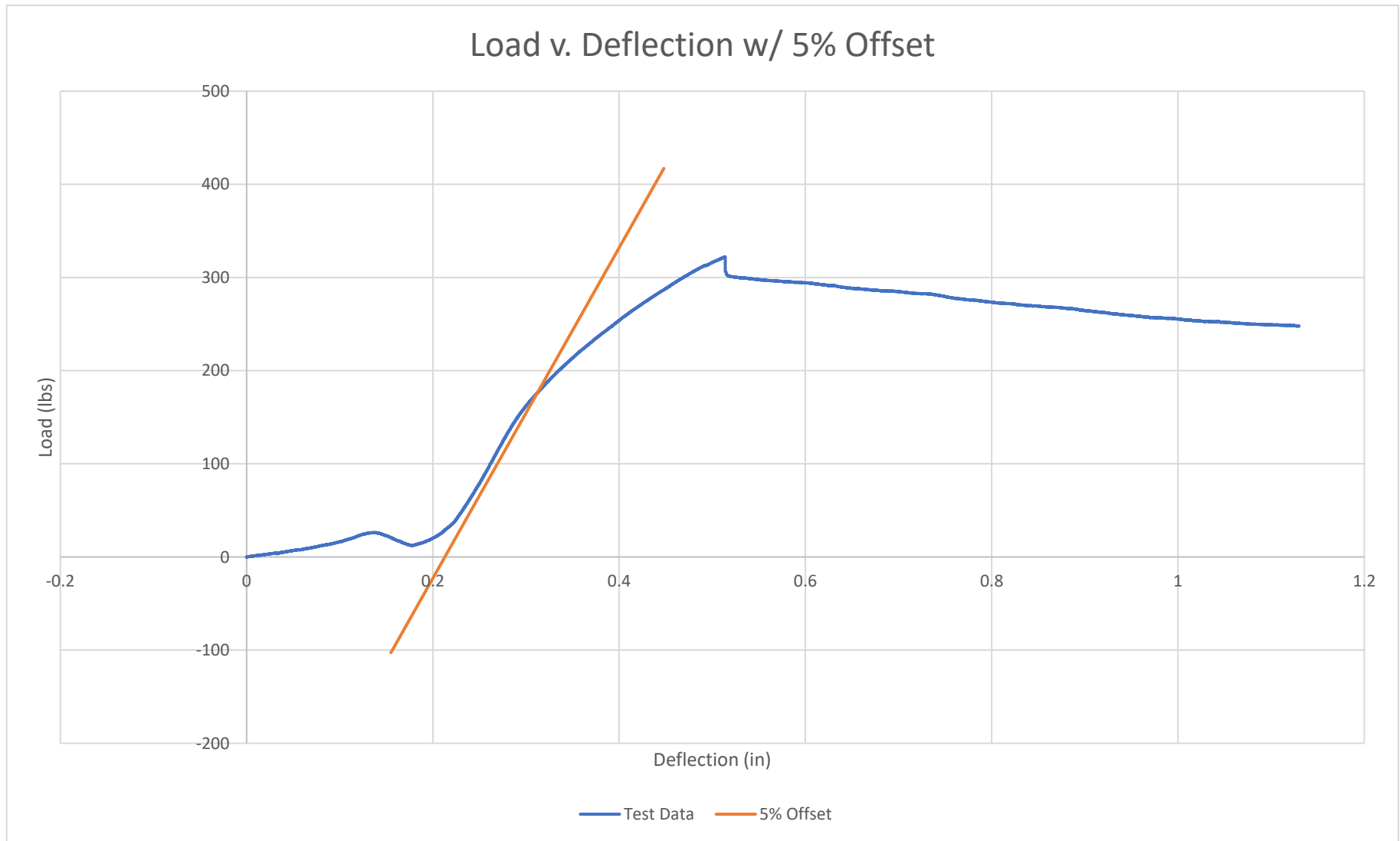
Smooth Shank Load-Deformation Graphs

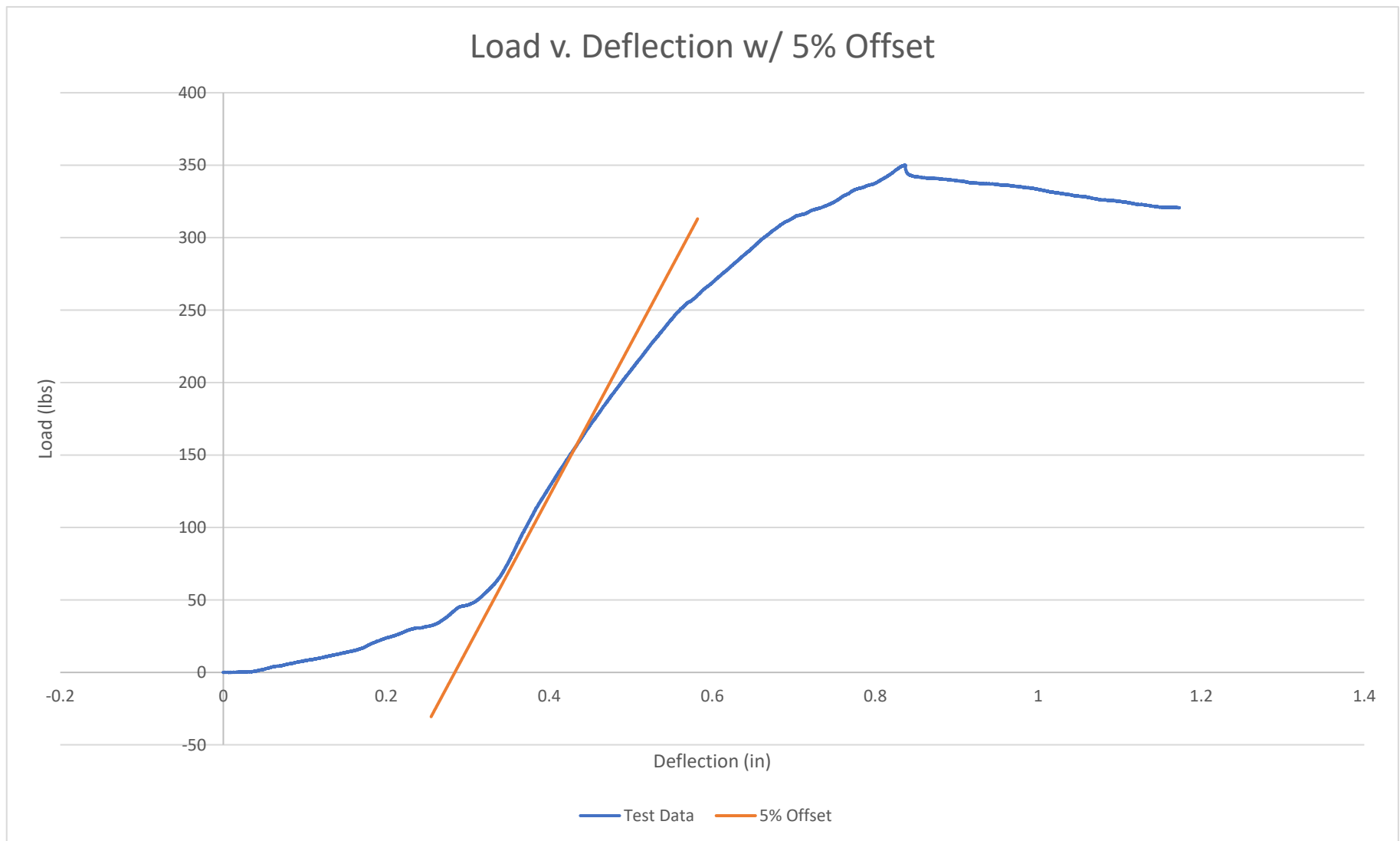


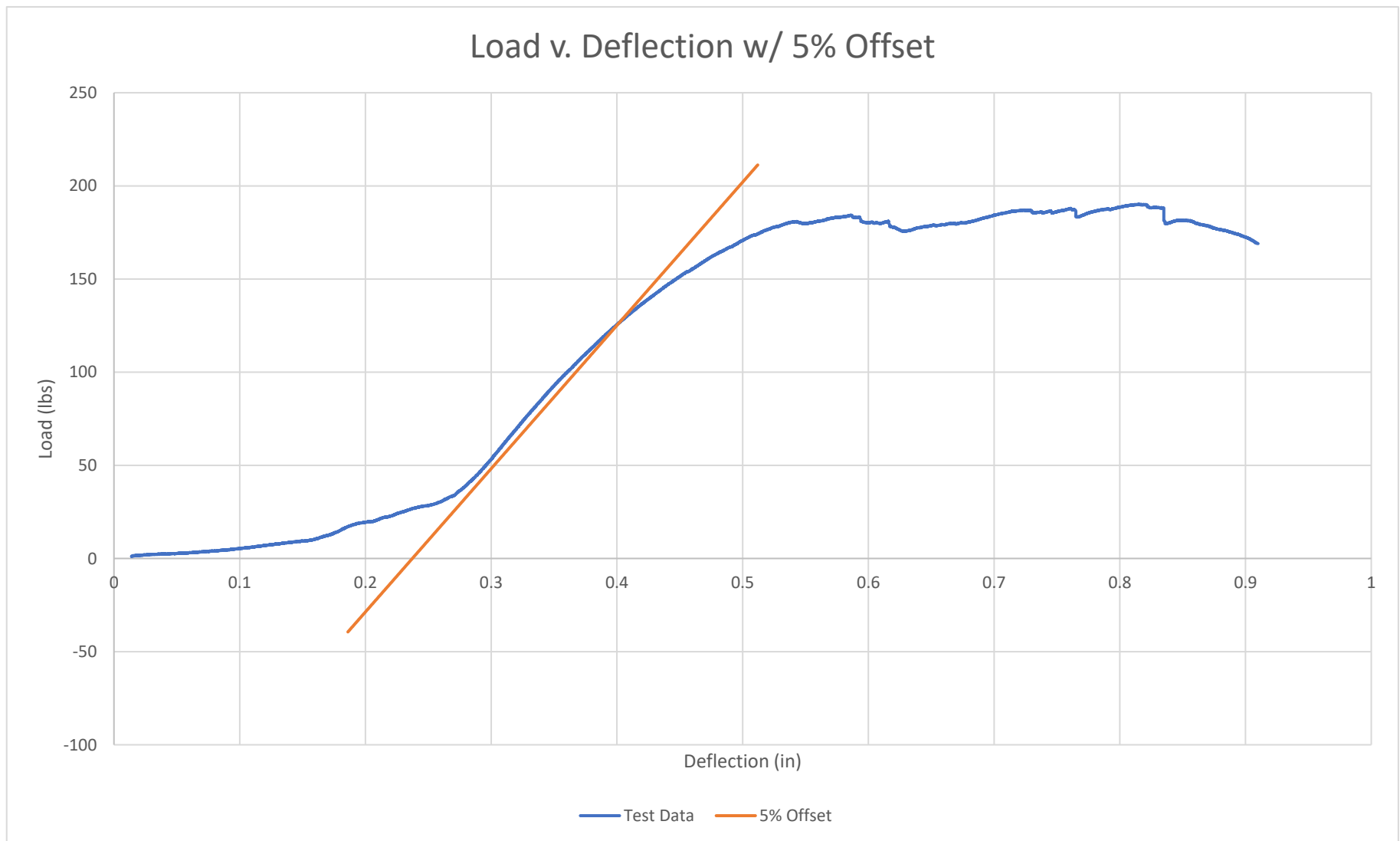












Load v. Deflection w/ 5% Offset

