Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40% RC Qualification Material Property Data Report

NCAMP Project Number: NPN 012401

NCAMP Test Report Number: CAM-RP-2025-023 Rev A

Report Date: September 17, 2026

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Distribution Statement A. Approved for public release; distribution is unlimited.

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REVISIONS:

Rev	By	Date	Pages Revised or Added
–	Evelyn Lian	9/29/2025	Document Initial Release
A	Evelyn Lian	9/17/2026	- Updated NIAR and NCAMP logo on cover page. - Section 1: Updated document revision • NCP-RP-2025-011: Rev – to Rev A • NTP3801Q1: Rev C to Rev E - Table 1-2: Added Batch 4 and 5 on WC CTD condition and IPS CTD, RTD, ETD1, ETW1 and ETW2 conditions. Revised Note 2 and added Note 5. - Table 1-3: Added Batch 4 and 5 on UNT1 ETW1 and ETW2 conditions, UNT3 RTD condition, OHT2 CTD and RTD conditions. Added Note 7. - Section 1.5.1: Added Batch 4 and 5 into Figure 1-2. - Section 1.5.8: Updated average as measured CPT of the qualification panels to include Batch 4 and 5 panels from 0.008755 inches to 0.008744 inches. - Added Batch 4 and 5 test data on selected test properties are listed below; affected section also updated. • Lamina Level Test Summary (Section 2.1), • Laminate Level Test Summary (Section 2.2), • DMA Test Summary (Section 2.4.1, 9.1, 9.2), • WC CTD condition (Section 2.5.3, 3.3, 4.3), • IPS CTD, RTD, ETD1, ETW1 and ETW2 conditions (Section 2.5.5, 3.5, 4.5) • UNT1 ETW1 and ETW2 conditions (Section 2.5.7, 3.7, 4.7), • UNT3 RTD condition (Section 2.5.9, 3.9, 4.9), • OHT2 CTD and RTD condition (Section 2.5.14, 3.14, 4.14), - Section 8.1: Updated moisture conditioning chart for IPS test panel to include Batch 4 panel. - Added Section 11: Composite Material Data Collection, to document the dates manufacture of fiber lot, resin lot, prepreg lot, composite, testing and data submittal.

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1. Introduction

1.1 Scope

The test methods and results described in this document are intended to provide basic composite properties essential to most methods of analysis and are consistent with CMH-17 Volume 1 – Composite Materials Handbook for Polymer Matrix Composites. This report contains material property data of common usefulness to wide range of projects. The lamina and laminate material property data have been generated with NCAMP oversight in accordance with NSP 100 NCAMP Standard Operating Procedures; the test panels and test specimens have been inspected by NCAMP Authorized Inspection Representatives (AIR) and the testing has been witnessed by NCAMP Authorized Engineering Representatives (AER). However, the data may not fulfill all the needs of any specific company's program; specific properties, environments, laminate architecture, and loading situations may require additional testing.

The use of NCAMP material and process specifications does not guarantee material or structural performance. Material users should be actively involved in evaluating material performance and quality including, but not limited to, performing regular purchaser quality control tests, performing periodic equivalency/additional testing, participating in material change management activities, conducting statistical process control, and conducting regular supplier audits.

The applicability of NCAMP material property data, material allowables, and specifications must be evaluated on a case-by-case basis by aircraft companies and certifying agencies. NCAMP assumes no liability whatsoever, expressed or implied, related to the use of the material property data, material allowables, and specifications.

This report contains material property data only. Statistical analysis of the data including the calculations of b-basis values is given in a separate report, Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40% RC Material Allowables Statistical Analysis Report NCP-RP-2025-011 Rev A. The qualification material was procured to NCAMP Material Specification NMS 380/2 Rev – dated May 2, 2024. The qualification test panels were cured in accordance with NCAMP Process Specification NPS 83800 Rev B dated October 22, 2024 using baseline cure cycle “C”. The NCAMP Test Plan NTP 3801Q1 Rev E was used for this qualification program.

Part fabricators that wish to utilize the material property data, allowables, and specifications may be able to do so by demonstrating the capability to reproduce the original material properties; a process known as equivalency. More information about this equivalency process including the test statistics and its limitations can be found in Section 6 of DOT/FAA/AR-03/19 and Section 8.4.1 of CMH-17 Volume 1. The applicability of equivalency process must be evaluated on program-by-program basis by the applicant and certifying agency. The applicant and certifying agency must agree that the equivalency test plan along with the equivalency process described in Section 6 of DOT/FAA/AR-03/19 and Section 8.4.1 of CMH-17 Volume 1 are adequate for the given

program.

Aircraft companies should not use the data published in this report without specifying NCAMP Material Specification NMS 380/2. NMS 380/2 may have additional requirements that are listed in its prepreg process control document (PCD), fiber specification, fiber PCD, and other raw material specifications and PCDs which impose essential quality controls on the raw materials and raw material manufacturing equipment and processes. *Aircraft companies and certifying agencies should assume that the material property data published in this report is not applicable when the material is not procured to NMS 380/2.* NMS 380/2 is a free, publicly available, non-proprietary aerospace industry material specification.

The data in this report is intended for general distribution to the public, either freely or at a price that does not exceed the cost of reproduction (e.g. printing) and distribution (e.g. postage).

1.2 Symbols Used

ν_{12}^{t}	major Poisson's ratio, tension
$\mu\varepsilon$	micro-strain
E_1^{c}	compressive modulus, longitudinal / warp direction
E_1^{t}	tensile modulus, longitudinal / warp direction
E_2^{c}	compressive modulus, transverse / fill direction
E_2^{t}	tensile modulus, transverse / fill direction
F_1^{cu}	ultimate compressive strength, longitudinal / warp direction
F_1^{tu}	ultimate tensile strength, longitudinal / warp direction
F_2^{cu}	ultimate compressive strength, transverse / fill direction
F_2^{tu}	ultimate tensile strength, transverse / fill direction
$F_{12}^{s5\% \text{ strain}}$	in-plane shear strength at 5% strain
$F_{12}^{s0.2\%}$	in-plane shear strength at 0.2% offset
G_{12}^{s}	in-plane shear modulus

Superscripts

c	compression
cu	compression ultimate
s	shear
t	tension
tu	tension ultimate

Subscripts

1	axis; longitudinal / warp direction (parallel to warp direction of reinforcement)
2	axis; transverse / fill direction (parallel to fill direction of reinforcement)
12	in-plane

Acronyms and Definitions

ASTM	American Society for Testing and Materials
B – Basis	95% lower confidence limit on the tenth population percentile
CV	Coefficient of Variation
CTD	Cold Temperature Dry
CPT	Cured Ply Thickness
ETD	Elevated Temperature Dry
ETW	Elevated Temperature Wet
Gr/Ep	Graphite/Epoxy
norm	normalized
RTD	Room Temperature Dry
SACMA	Suppliers of Advanced Composite Materials Association
SRM	SACMA Recommended Method
Tply	thickness divided by the number of plies provides the thickness average per specimen
wet	specimen with an “equilibrium” moisture content
T, RH	Temperature, Relative Humidity

1.3 NIAR–Specimen Naming Format

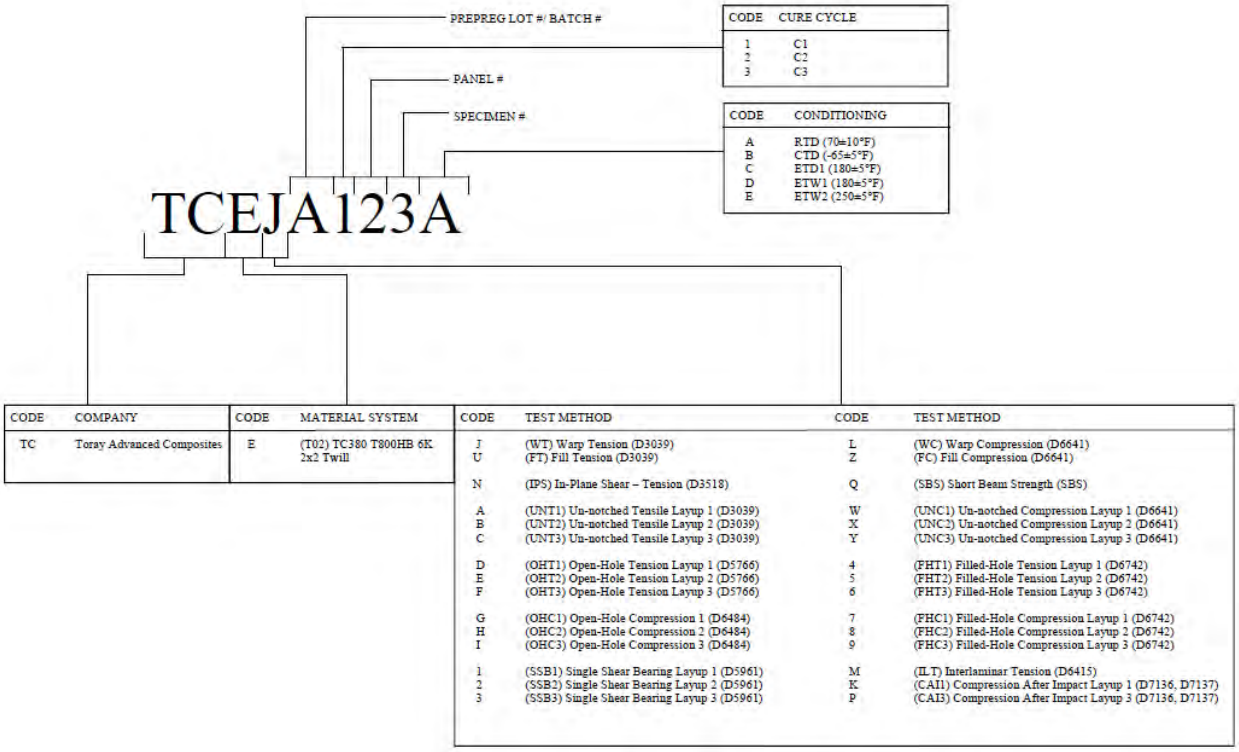


Figure 1-1: Naming Format

1.4 Test Method References

All testing was in accordance with nationally recognized standards, methods and procedures. Specific mechanical property test methods applicable to the test program in this document include:

Cured Laminate Physical Testing:

- ASTM D792-20 – Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement
- ASTM D2734-16 – Standard Test Methods for Void Content of Reinforced Plastics
- ASTM D3171-22 – Standard Test Methods for Constituent Content of Composite Materials
- ASTM D7028-07(2024) – Standard Test Method for Glass Transition Temperature (DMA Tg) of Polymer Matrix Composites by Dynamic Mechanical Analysis (DMA)
- ASTM E2580-24 – Standard Practice for Ultrasonic Testing of Flat Panel Composites and Sandwich Core Materials Used in Aerospace Applications

Lamina/Laminate Level Mechanical Testing and Fluid Sensitivity Testing:

- ASTM D2344/D2344M-22 – Standard Test Method for Short-Beam Strength of Polymer Matrix Composite Materials and Their Laminates
- ASTM D3039/D3039M-17 – Standard Test Method for Tensile Properties of Polymer Matrix Composite Materials
- ASTM D3518/D3518M-18 – Standard Test Method for In-Plane Shear Response of Polymer Matrix Composite Materials by Tensile Test of a ± 45º Laminate
- ASTM D5766/D5766M-23 – Standard Test Method for Open Hole Tensile Strength of Polymer Matrix Composite Laminates
- ASTM D5961/D5961M-23 – Standard Test Method for Bearing Response of Polymer Matrix Composite Laminates
- ASTM D6415/D6415M-22 – Standard Test Method for Measuring the Curved Beam Strength of a Fiber-Reinforced Polymer-Matrix Composite
- ASTM D6484/D6484M-23 – Standard Test Method for Open-Hole Compressive Strength of Polymer Matrix Composite Laminates
- ASTM D6641/D6641M-23 – Standard Test Method for Compressive Properties of Polymer Matrix Composite Laminates Using a Combined Loading Compression (CLC) Test Fixture
- ASTM D6742/D6742M-23 – Standard Practice for Filled-Hole Tension and Compression Testing of Polymer Matrix Composite Laminates

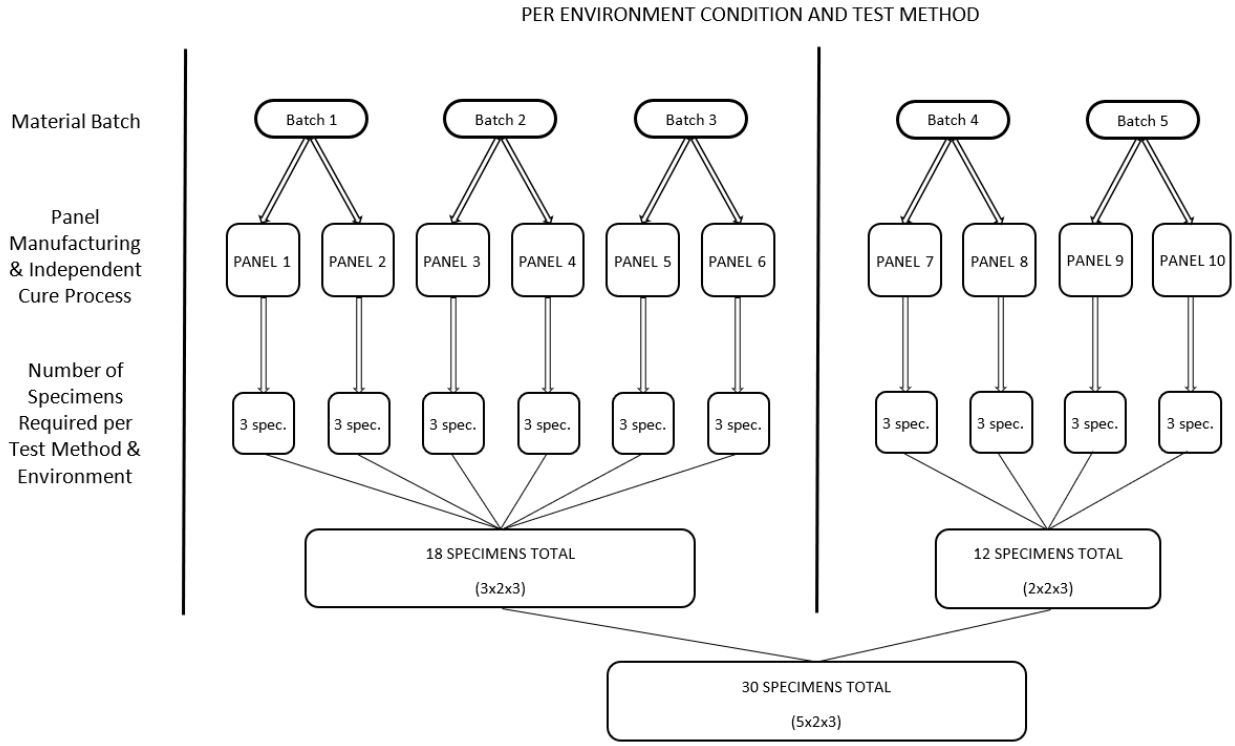
- ASTM D7136/D7136M-20 – Standard Test Method for Measuring the Damage Resistance of a Fiber-Reinforced Polymer Matrix Composite to a Drop-Weight Impact Event
- ASTM D7137/D7137M-23 – Standard Test Method for Compressive Residual Strength Properties of Damaged Polymer Matrix Composite Plates
- ASTM D910-21 – Standard Specification for Leaded Aviation Gasolines
- ASTM D1141-98(2021) – Standard Practice for Preparation of Substitute Ocean Water

1.5 Methodology

1.5.1 Process Definition

For each combination of test, batch and condition, the specimens were selected from minimum two separate panels cured separately as shown in Figure 1-2 unless otherwise specified. Panels 1, 3, and 5 were cured in a single cure cycle. Panels 2, 4, and 6 were cured in a single cure cycle separate from panels 1, 3, and 5.

The term "cure cycle" means a single run through the autoclave or oven, with same processing parameters. The specimen selection methodology in Figure 1-2 are presented in “Number of Batches x Number of Cure Process x Number of Specimens” format throughout this document. Specifically, Figure 1-2 depicts a 3x2x3 specimen selection methodology.



Note: Batch 4 and 5 are applicable to selected properties only.

Figure 1-2: Specimen Selection Methodology

All panels were fabricated in accordance with NCAMP Process Specification NPS 83800 using baseline cure cycle “C”.

In order to facilitate individual specimen trace ability, individual specimen numbering and/or skewed lines were written or drawn across each sub-panel as shown in Figure 1-3.

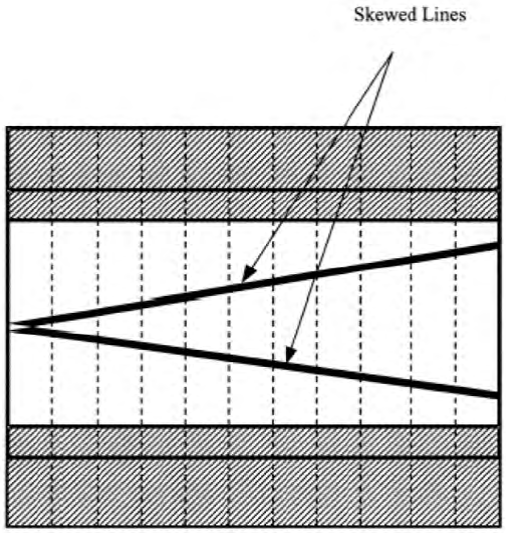


Figure 1-3: Specimen Traceability Line

1.5.2 Specimen & Testing Details

1.5.2.1 Tabbing

No tabs were used for this program.

1.5.2.2 Specimen Dimensions & Test Configuration

For SBS specimens, a span of 4T was used where T was the average thickness of the qualification panels. The same T was used to compute the width and length of the specimen.

For filled-hole tension specimens, the fasteners were installed at a torque of 85±5 in-lb beyond the prevailing torque of the fastener. For filled-hole compression and bearing specimens, the fasteners were installed 30±5 in-lb beyond the prevailing torque of the fastener. For moisture conditioned specimens, fasteners were installed after moisture conditioning.

Unless otherwise specified, a tolerance of ±5°F applied to all temperature conditions specified in this document.

For filled-hole and bearing specimens, the hole diameter was 0.25 in -0.000 +0.003 in. The fasteners used for filled-hole and bearing testing are listed in Table 1-1:

Test Method	Bolt	Countersink Washer (Head-Side)	Flat Washer (Nut-Side)	Nut
FHT1	NASM21297-04004	MS21206-C4	MS21206-4	MS21084L04
FHT2				
FHT3				
FHC1	NASM21297-04004	MS21206-C4	MS21206-4	MS21084L04
FHC2				
FHC3				
SSB1	NASM21297-04016	MS21206-C4	MS21206-4	MS21084L04
SSB2				
SSB3				

Table 1-1: Fastener Identifications

1.5.2.3 Specimen Strain Device Used

Corresponding Gage ID can be obtained from Appendix 1 of NTP 3801Q1 Rev E.

Uniaxial gages were used on:

All of CTD Tension specimens except Warp Tension specimens.
All conditions of combined loading compression specimens.
Two RTD Tension specimens except Warp Tension for obtaining full stress strain curves.
Two RTD Open Hole Compression specimens for detecting buckling.
One CAI unimpacted specimen for balancing.

Biaxial gages were used on:

All conditions of IPS specimens.
All of CTD Warp Tension specimens.
Two RTD Warp Tension specimens for obtaining full stress strain curves.

Uniaxial extensometers were used on:

All of RTD, ETD1, ETW1 and ETW2 Tension specimens except Warp Tension specimens.

Biaxial extensometers were used on:

All of RTD, ETD1, ETW1 and ETW2 Warp Tension specimens.

1.5.3 Test Matrix

The tables below show the lay-ups and test matrices used for lamina and laminate level testing.

Layup	Test Code	Test Type and Direction	Property	Number of Batches x Number of Panels x Number of Test Specimens[5]				
				Test Temperature/Moisture Condition				
				CTD (-65°F)	RTD (70°F)	ETD1 (180°F)	ETW1 (180°F)	ETW2 (250°F)
$[0]_{12}$	WT	ASTM D3039 0° Warp Tension	Strength, Modulus and Poisson's Ratio	3x2x3	3x2x3[3]	3x2x3	3x2x3	3x2x3
$[0]_{12}$	WC	ASTM D6641 0° Warp Compression	Strength and Modulus	5x2x3[5]	3x2x3[1&3]	3x2x3	3x2x3	3x2x3
$[90]_{12}$	FT	ASTM D3039 90° Fill Tension	Strength and Modulus	3x2x3	3x2x3[3]	3x2x3	3x2x3	3x2x3
$[90]_{12}$	FC	ASTM D6641 90° Fill Compression	Strength and Modulus	3x2x3	3x2x3[1&3]	3x2x3	3x2x3	3x2x3
$[45/-45]_{2S}$	IPS	ASTM D3518 In-Plane Shear[2]	0.2% Offset Strength, 5% Strength and Modulus	5x2x3[5]	5x2x3[3&5]	5x2x3[5]	5x2x3[5]	5x2x3[5]
$[0]_{22}$	SBS	ASTM D2344 Short Beam Shear	Strength	3x2x3	3x2x3	1x2x3[4]	3x2x3	3x2x3

Notes:

1. Back-to-back strain gages are needed on the first two specimens. If no buckling is observed, the remaining specimens will require a strain gage on one side of the specimens only.
2. Gripped (tab) length is 1.5 to 2.5 inches on each end of the 10 inches long specimen. Once the samples have reached the 5% strain level, the actuator/crosshead displacement rate can be increased by four times the initial rate. Continue testing at the higher strain rate until ultimate failure is observed.
3. At least two specimens must be gaged to obtain full stress-strain curve to failure. An appropriate extensometer may be used in place of the strain gage for the remaining specimens.
4. Specimens were machined from Batch A panels.
5. Two additional batches are added on selected properties due to batch to batch variability within the first three batches.

Table 1-2: Lamina Level Test Matrix

Table 1-3 below summarizes the laminate level tests carried out. The layup angles 0º, 45º, -45º, and 90º refer to the orientation of the warp fiber direction. The laminate stacking sequences in this program are not specific to any design. Therefore, careful consideration should be given to the validity of properties derived from this program based on the design specific laminates in a structure to be certified.

Table 1-3 also emphasizes those properties and test condition combinations believed to constitute the worst case, which in general is cold dry for tension and hot wet for compression and other matrix dominated properties.

(%0°/%±45°/%90°) Test Type Code	Test Type and Layup[2]	Property	Number of Batches x Number of Panels x Number of Test Specimens[7]				
			Test Temperature/Moisture Condition				
			CTD (-65°F)	RTD (70°F)	ETD1 (180°F)	ETW1 (180°F)	ETW2 (250°F)
(25/50/25 - QI) UNT1	ASTM D3039 Un-notched Tension $[45/0/-45/90]_S$	Strength & Modulus	3x2x3	3x2x3[3]		5x2x3[7]	5x2x3[7]
(10/80/10 - SF) UNT2	ASTM D3039 Un-notched Tension $[45/-45/90/45/-45]_S$	Strength & Modulus	1x2x3[5]	1x2x3[3&5]		3x2x3	3x2x3
(40/20/40 - HD) UNT3	ASTM D3039 Un-notched Tension $[0/90/-45/0/90]_S$	Strength & Modulus	3x2x3	5x2x3[3&7]		3x2x3	3x2x3
(25/50/25 - QI) UNC1	ASTM D6641 Un-notched Compression $[45/0/-45/90]_{2S}$	Strength & Modulus	1x2x3[5]	3x2x3[1&3]		3x2x3	3x2x3
(10/80/10 - SF) UNC2	ASTM D6641 Un-notched Compression $[45/-45/90/45/-45]_S$	Strength & Modulus	1x2x3[5]	3x2x3[1&3]		3x2x3	3x2x3
(40/20/40 - HD) UNC3	ASTM D6641 Un-notched Compression $[0/90/-45/0/90]_S$	Strength & Modulus	1x2x3[5]	3x2x3[1&3]		3x2x3	3x2x3
(25/50/25 - QI) OHT1	ASTM D5766 Open-Hole Tension $[45/0/-45/90]_{2S}$	Strength	3x2x3	3x2x3	3x2x3	3x2x3	3x2x3
(10/80/10 - SF) OHT2	ASTM D5766 Open-Hole Tension $[45/-45/90/45/-45]_S$	Strength	5x2x3[7]	5x2x3[7]	1x2x3[5]	3x2x3	3x2x3
(40/20/40 - HD OHT3	ASTM D5766 Open-Hole Tension $[0/90/-45/0/90]_S$	Strength	3x2x3	3x2x3	1x2x3[5]	3x2x3	3x2x3
(25/50/25 - QI) FHT1	ASTM D6742 Filled-Hole Tension $[45/0/-45/90]_{2S}$	Strength	3x2x3	3x2x3		3x2x3	3x2x3
(10/80/10 - SF) FHT2	ASTM D6742 Filled-Hole Tension $[45/-45/90/45/-45]_S$	Strength	3x2x3	3x2x3		3x2x3	3x2x3
(40/20/40 - HD) FHT3	ASTM D6742 Filled-Hole Tension $[0/90/-45/0/90]_S$	Strength	3x2x3	3x2x3		3x2x3	3x2x3
(25/50/25 - QI) OHC1	ASTM D6484 Open-Hole Compression $[45/0/-45/90]_{2S}$	Strength	3x2x3	3x2x3[1]	3x2x3	3x2x3	3x2x3
(10/80/10 - SF) OHC2	ASTM D6484 Open-Hole Compression $[45/-45/90/45/-45]_{2S}$	Strength	3x2x3	3x2x3[1]	1x2x3[5]	3x2x3	3x2x3
(40/20/40 - HD) OHC3	ASTM D6484 Open-Hole Compression $[0/90/-45/0/90]_{2S}$	Strength	3x2x3	3x2x3[1]	1x2x3[5]	3x2x3	3x2x3
(25/50/25 - QI) FHC1	ASTM D6742 Filled-Hole Compression $[45/0/-45/90]_{2S}$	Strength	1x2x3[5]	3x2x3		3x2x3	3x2x3
(10/80/10 - SF) FHC2	ASTM D6742 Filled-Hole Compression $[45/-45/90/45/-45]_{2S}$	Strength	1x2x3[5]	3x2x3		3x2x3	3x2x3
(40/20/40 - HD) FHC3	ASTM D6742 Filled-Hole Compression $[0/90/-45/0/90]_{2S}$	Strength	2x2x3[6]	2x2x3[6]		3x2x3	3x2x3
(25/50/25 - QI) SSB1	ASTM D5961 Proc.C Single Shear Bearing $[45/0/-45/90]_{2S}$	2% Offset Strength, Ultimate Strength & Chord Stiffness		3x2x3		3x2x3	3x2x3
(10/80/10 - SF) SSB2	ASTM D5961 Proc.C Single Shear Bearing $[45/-45/90/45/-45]_{2S}$	2% Offset Strength, Ultimate Strength & Chord Stiffness		3x2x3		3x2x3	3x2x3
(40/20/40 - HD) SSB3	ASTM D5961 Proc.C Single Shear Bearing $[0/90/-45/0/90]_{2S}$	2% Offset Strength, Ultimate Strength & Chord Stiffness		3x2x3		3x2x3	3x2x3
(50/0/50) ILT	ASTM D6415 Interlaminar Tension Strength $[0]_{20}$ (note: curved panel)	Strength	1x2x3[5]	1x2x3[5]		1x2x3[5]	
(25/50/25 - QI) CAI1	ASTM D7136 & D7137 Compression After Impact (1500 in.lb/in)[4] $[45/0/-45/90]_{3S}$	Strength	3x2x3	3x2x3			

(%0°/%±45°/%90°) Test Type Code	Test Type and Layup[2]	Property	Number of Batches x Number of Panels x Number of Test Specimens[7]				
			Test Temperature/Moisture Condition				
			CTD (-65°F)	RTD (70°F)	ETD1 (180°F)	ETW1 (180°F)	ETW2 (250°F)
(40/20/40 - HD) CAI3	ASTM D7136 & D7137 Compression After Impact (1500 in.lb/in)[4] $[0/90/-45/0/90]_{2S}$	Strength		1x2x3[5]			

Notes:

1. Back-to-back strain gages are needed on the first two specimens. If no buckling is observed, the remaining specimens will require a strain gage on one side of the specimens only.
2. Loading direction is generally along the 0° direction. Layups are balanced at mid-plane per NPS 83800 Section 4.2.1 Figure 1.
3. At least two specimens must be gaged to obtain full stress-strain curve to failure. An appropriate extensometer may be used in place of the strain gage for the remaining specimens.
4. Back-to-back strain gages on two locations (a total of four strain gages) are needed on the first specimen. The specimen should be equivalent to the test specimens in terms of material, layup and geometry, shall be un-damaged. Alternatively, an instrumented metallic plate, equivalent in thickness to the test specimens to within ±0.25mm [±.010 in.], may be used.
5. Specimens were machined from Batch A panels.
6. Specimens were machined from Batch A and Batch B panels.
7. Two additional batches are added on selected properties due to batch to batch variability within the first three batches.

Table 1-3: Laminate Level Test Matrix

1.5.4 Cured Laminate Physical Testing

The properties in Table 1-4 were determined for each panel used for test coupons with the exception of Tg by DMA which were conducted on one laminate per batch from each cure cycle conducted where that batch is present. The tests were performed by the National Institute for Aviation Research (NIAR) Composites Laboratory under the supervision of NCAMP.

Property	Condition/Method[1]	Min Replicates per Panel
Cured Ply Thickness	ASTM D3171-22 Section 14.3.6	Every test panel and mechanical test specimens
Laminate Density	ASTM D792-20	3
Fiber Volume, % by Volume	ASTM D3171-22[2]	3
Resin Content, % by Weight	ASTM D3171-22[2]	3
Void Content, % by Volume	ASTM D2734-16	3 Per[5]
Ultrasonic Through Transmission, C-Scan	ASTM E2580-24[3]	1
Glass Transition Temperature, Tg by DMA Flexural Loading	Dry and Wet ASTM D7028-07(2024)	1 Dry, 1 Wet[4]

Notes:

1. Where the applicable standard allows variations in specimen form or test method, the specific parameters to be used will be specified in the test work instructions and reported in the final test report.
2. Method II.
3. Five MHz is preferred for solid laminates. Panels with anomaly should be segregated. Microscopy images may be taken from questionable areas. NCAMP must be involved in the review of all C-scans.
4. DRY: minimum 24 dry DMA per batch. One DMA specimen is to be machined from a panel, these specimens are to be machined from Lamina and Laminate panels.
   WET: minimum 24 dry DMA per batch. One DMA specimen is to be machined from a panel, these specimens are to be machined from Lamina and Laminate panels.
5. Required on panels that appear voidy in C-scan or visually only via ASTM D3171 Method I.

Table 1-4: Physical Testing Matrix

1.5.5 Environmental Conditioning

The following tests were performed by the NIAR Composites Laboratory under the supervision of NCAMP.

Specimen dimensions were taken before moisture conditioning.

Test environments are defined as:

CTD = -65°F±5°F, dry (drying per section 1.5.5)
RTD = 70°F±10°F, dry (drying per section 1.5.5)
ETD1 = 180°F±5°F, dry (drying per section 1.5.5)
ETW1 = 180°F±5°F, wet (equilibrium moisture content per section 1.5.5)
ETW2 = 250°F±5°F, wet (equilibrium moisture content per section 1.5.5)

Within each test method and test environment, the failure mode was evaluated immediately after each test by an NCAMP staff engineer or NCAMP AER. Obvious improper failure modes was logged. If a second improper failure mode occurs, testing was cease until the test setup and test data was reviewed by NCAMP. Retain the samples until data review was completed and the test report was finalized. All tested specimens were digitally photographed after each test in order to pictorially document failure modes.

For dry testing, specimens were dried at 250°F±5°F for 24 hours minimum. After drying, specimens were kept in a desiccator until mechanical testing. Alternatively, the specimens were left at ambient laboratory condition for a maximum of 14 days until mechanical testing (no drying was required if the specimens were tested within 14 days from the date they were cured). The specimens shall be re-dried if the specimens were not tested within 14 days period after drying.

Ambient laboratory condition is defined as 70°F±10°F. Since moisture absorption and desorption rate is very slow at ambient temperature, there was no requirement to maintain relative humidity levels.

For wet conditioning, specimens were dried 250°F±5°F for 24 hours minimum before being conditioned to equilibrium at 160°F±5°F and 85%±5%RH. Effective moisture equilibrium is achieved when the average moisture content of the traveler specimen changes by less than 0.02% for two consecutive determinations which are 7±0.5 days apart and may be expressed by:

$$\frac{W_i - W_{i-1}}{W_b} < 0.0002$$

Where:

W_i = weight at current time
W_{i-1} = weight at previous time
W_b = baseline weight prior to conditioning

When representative specimens could not be measured to determine the moisture content (due to size, fastener and tab effects), traveler coupons of at least 1” by 1” by specimen thickness and weighing at least 15 grams were used to establish weight gain measurements. If the specimens or traveler coupons pass the criteria for two consecutive readings which are 7 ±0.5 days apart, the specimens were kept in the environmental chamber for up to an additional 60 days. Alternatively, the specimens may have been removed from the environmental chamber and placed in a sealed plastic bag along with a moist cotton towel for a maximum of 14 days until mechanical testing. Strain-gaged specimens were removed from the controlled environment for a maximum of 2 hours for application of gages in ambient laboratory conditions.

1.5.6 Non-ambient Testing

The chamber was of adequate size so that all test fixtures and load frame grips were contained within the chamber.

For elevated temperature testing, the temperature chamber, test fixture, and grips were preheated to the specified temperature. Each specimen was heated to the required test temperature as verified by a thermocouple in direct contact with and taped to the specimen gage section. The heat-up time of the specimen did not exceed 5 minutes, unless otherwise specified in individual test summary sheets. The test was started 5^{+1}_{-0} minutes after the specimen reached the test temperature. During the test, the temperature, as measured on the specimen, was within ±5°F of the required test temperature.

For subzero temperature testing, each specimen was cooled to the required test temperature as verified by a thermocouple in direct contact with and taped to the specimen gage section. The test started 5^{+1}_{-0} minutes after the specimen reached the test temperature. During the test, the temperature, as measured on the specimen, was within ±5°F of the required test temperature.

For wet specimens, the moisture loss was determined by subjecting representative specimens to the same amount of time required to heat-up and fail the specimens. For filled-hole or bearing specimens, fasteners were removed prior to conducting moisture loss measurements. For tabbed specimens, representative coupons without tabs and having the same number of plies were used to conduct the moisture loss measurements. A minimum of one specimen or representative coupon was used to measure the moisture loss for every combination of test temperature and stacking sequence.

1.5.7 Fluid Sensitivity Screening

Table 1-5 lists the requirements for fluid sensitivity screening, which requires ASTM D2344 Short Beam Strength testing on $[0]_{22}$ per Table 1-5. Specimens were dried at 250°F±5°F for 24 hours minimum before being subjected to the conditions indicated, five replicates per fluid and one cure cycle.

Specimens were cleaned with a dry towel prior to the tests. In addition to short beam strength, load versus displacement curves were plotted to aid in the identification of matrix/resin softening. Since load versus displacement curves are influenced by test machine and fixture compliance, all the tests were performed with the identical machine and fixture, through a single setup. It was intended that the fluid resistance testing be performed on a limited number of reinforcement types and that engineering judgment be used to determine the necessity of repetition for other reinforcement configurations.

Experience suggested that for the vast majority of epoxy resins, water is the fluid with the most deleterious effect on properties. Should screening tests for fluid sensitivity indicate this to be the case, further testing of this type would be unnecessary since exposure to water moisture to equilibrium level is an inherent part of the multi batch allowables test program. Users must evaluate the applicability of the exposure conditions and time on case-by-case basis. For example, the exposure condition for jet fuel may not fully represent the condition of integral fuel tanks.

	Exposure	Test Condition	Code
Extended Contact:			
100 Low Lead Aviation Fuel (ASTM D910)	90 days min. @ 70°F±10°F	70°F	SBSFS11RT
	90 days min. @ 70°F±10°F	250°F	SBSFS11ET2
ASTM D1655 Jet A Fuel	90 days min. @ 70°F±10°F	70°F	SBSFS12RT
	90 days min. @ 70°F±10°F	250°F	SBSFS12ET2
MIL-PRF-5606 Hydraulic Oil	90 days min. @ 70°F±10°F	70°F	SBSFS13RT
	90 days min. @ 70°F±10°F	250°F	SBSFS13ET2
MIL-PRF-83282 Hydraulic Oil	90 days min. @ 70°F±10°F	70°F	SBSFS14RT
	90 days min. @ 70°F±10°F	250°F	SBSFS14ET2
MIL-PRF-7808 Engine Oil	90 days min. @ 70°F±10°F	70°F	SBSFS15RT
	90 days min. @ 70°F±10°F	250°F	SBSFS15ET2
MIL-PRF-23699, Class STD Engine Oil	90 days min. @ 70°F±10°F	70°F	SBSFS16RT
	90 days min. @ 70°F±10°F	250°F	SBSFS16ET2
Sea Water (ASTM D1141 or equiv.)	90 days min. @ 70°F±10°F	70°F	SBSFS17RT
	90 days min. @ 70°F±10°F	250°F	SBSFS17ET2
Skydrol LD-4, (SAE AS1241, Type IV, Class 1)	90 days min. @ 70°F±10°F	70°F	SBSFS18RT
	90 days min. @ 70°F±10°F	250°F	SBSFS18ET2
50% Water with 50% Skydrol LD-4, (SAE AS1241, Type IV, Class 1)	90 days min. @ 70°F±10°F	70°F	SBSFS19RT
	90 days min. @ 70°F±10°F	250°F	SBSFS19ET2
Short Duration Contact:			
MEK washing fluid. ASTM D740	90 minutes min. @ 70°F±10°F	70°F	SBSFS31RT
	90 minutes min. @ 70°F±10°F	250°F	SBSFS31ET2
Polypropylene Glycol Deicer (Type I) SAE AMS 1424	90 minutes min. @ 70°F±10°F	70°F	SBSFS32RT
	90 minutes min. @ 70°F±10°F	250°F	SBSFS32ET2
Isopropyl Alcohol Deicing Agent (TT-I-735)	48±4 hours @70°F±10°F	70°F	SBSFS33RT
	48±4 hours @70°F±10°F	250°F	SBSFS33ET2
Control Tests:			
Distilled Water	90 days min. at 70°F±10°F	70°F	SBSFS41RT
	90 days min. at 70°F±10°F	250°F	SBSFS41ET2
Dry	Per section 6.1 Test Plan NTP 3801Q1	70°F	SBSFS42RT
	Per section 6.1 Test Plan NTP 3801Q1.	250°F	SBSFS42ET2
85% Relative Humidity	Per section 6.1 Test Plan NTP 3801Q1	70°F	SBSFS43RT
	Per section 6.1 Test Plan NTP 3801Q1	250°F	SBSFS43ET2

Notes:
1. Specimens were machined from Batch A panels.

Table 1-5: SBS Fluid Sensitivity Screening Matrix

1.5.8 Normalization Procedures

Most lamina level tension and compression strength and modulus properties, and all laminate level properties were normalized according to nominal cured ply thickness. Lamina level properties that were not normalized include:

- In-plane shear strength and modulus
- SBS
- Poisson's ratio
- ILT

After normalizing, data scatter reduced or remained the same. If data scatter increased significantly after normalizing, the reason was investigated. Wherever properties are normalized, both measured and normalized data were reported.

The theoretically calculated cured ply thickness of 0.008800 inches has been used as the nominal cured ply thickness (CPT) for normalization purpose. This has been done at the request of the material supplier. The following normalization formula was used:

Normalized Value = Measured Value x Measured CPT / Nominal CPT.

For Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40% RC prepreg material the defined CPT was 0.008800 inches. The average as measured CPT of the qualification panels was 0.008744 inches. The lowest and highest CPT measured were 0.008308 inches and 0.009247 inches respectively.

1.5.9 Inspection Verification

The 3-batch qualification panels have been fabricated according to the requirements of the test plan and conformed by an NCAMP AIR. The test specimens and test setup have also been conformed by an NCAMP AIR.

Testing was witnessed by NCAMP. Test setup and witnessing was delegated to an NCAMP AER. Mechanical testing was carried out at the National Institute for Aviation Research, Wichita State University. The inspection documentation with required approval signatures are stored in hard copy as well as electronically.

1.5.10 Material Pedigree Information

The PMC Data Collection Template includes the material pedigree information required, such as material and batch information, as well as panel fabrication record, environmental conditioning, test equipment, and test procedures. This template in Microsoft Excel file format.

2. Test Results

2.1 Lamina Level Test Summary

Prepreg Material: Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Material Specification: NMS 380/2
Process Specification: NPS 83800
Fabric: T800HB 6K 40B **Resin:** TC380

Tg(dry): 404.84°F **Tg(wet):** 332.24°F **Tg METHOD:** ASTM D7028

Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg Lamina Properties Summary

LAMINA MECHANICAL PROPERTY SUMMARY
Data reported as: Normalized & Measured
(Normalized by CPT=0.008800 inch)

Properties	CTD (-65°F) Mean		RTD (70°F) Mean		ETD1 (180°F) Mean		ETW1 (180°F) Mean		ETW2 (250°F) Mean	
	Normalized	Measured	Normalized	Measured	Normalized	Measured	Normalized	Measured	Normalized	Measured
F_1^{tu} [ksi]	157.3	159.0	156.7	165.8	160.9	171.2	161.3	164.2	160.9	160.5
E_1^t [Msi]	10.32	10.43	10.10	10.73	10.26	10.92	10.24	10.42	10.27	10.25
ν_{12}^t		0.04598		0.04224		0.04034		0.03954		0.03778
F_2^{tu} [ksi]	152.4	153.6	148.0	154.0	154.8	157.3	148.0	150.4	141.5	142.4
E_2^t [Msi]	10.21	10.29	9.909	10.32	9.909	10.07	10.05	10.21	10.02	10.09
F_1^{cu} [ksi]	104.9	109.5	95.20	101.1	82.57	83.09	69.42	71.03	57.10	59.08
E_1^c [Msi]	9.424	9.847	9.235	9.865	9.586	9.566	9.655	9.872	9.698	10.05
F_2^{cu} [ksi]	103.8	104.5	90.20	90.31	78.75	79.32	69.58	69.97	58.49	59.03
E_2^c [Msi]	9.242	9.305	9.155	9.162	9.401	9.482	9.457	9.505	9.305	9.395
$F_{12}^{s0.2\%}$ [ksi]		7.799		6.146		5.221		4.158		3.018
$F_{12}^{s5\%strain}$ [ksi]		15.36		11.88		9.990		8.079		6.175
G_{12}^s [Msi]		0.6134		0.5463		0.4900		0.4206		0.3049
SBS [ksi]		14.14		11.23		9.057		7.623		5.829

WC (CTD), IPS (CTD, RTD, ETD1, ETW1, ETW2) and DMA (Dry, Wet): Two additional batches (4 and 5) were included.

Table 2-1: Lamina Summary Data

2.2 Laminate Level Test Summary

Prepreg Material: Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Material Specification: NMS 380/2
Process Specification: NPS 83800
Fabric: T800HB 6K 40B **Resin:** TC380

Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg Laminate Properties Summary

Tg(dry): 404.84°F **Tg(wet):** 332.24°F **Tg METHOD:** ASTM D7028

LAMINATE MECHANICAL PROPERTY SUMMARY
Data reported as: Normalized & Measured
(Normalized by CPT=0.008800 inch)

Properties	Layup	25/50/25 (Quasi)		10/80/10 (Soft)		40/20/40 (Hard)	
	Test Condition	Normalized	Measured	Normalized	Measured	Normalized	Measured
OHT Strength [ksi]	CTD (-65°F)	58.29	56.71	51.05	50.18	71.10	70.32
	RTD (70°F)	59.26	59.16	44.71	44.63	72.93	72.90
	ETD1 (180°F)	59.18	59.10	41.24	40.97	76.71	77.71
	ETW1 (180°F)	58.75	57.31	38.24	37.94	74.42	74.87
	ETW2 (250°F)	58.35	56.86	36.61	35.81	73.85	73.07
OHC Strength [ksi]	CTD (-65°F)	48.81	47.79	45.92	44.97	50.61	49.48
	RTD (70°F)	40.54	40.63	37.93	37.96	41.26	41.31
	ETD1 (180°F)	36.46	36.55	33.72	33.74	37.85	37.76
	ETW1 (180°F)	32.88	32.31	30.04	29.90	34.39	34.34
	ETW2 (250°F)	27.91	27.31	25.18	24.57	30.20	29.58
UNT Strength [ksi]	CTD (-65°F)	118.5	119.2	69.75	70.34	139.4	138.8
	RTD (70°F)	116.6	123.0	65.52	68.89	134.1	141.4
	ETW1 (180°F)	110.2	115.2	59.16	61.68	138.9	145.1
	ETW2 (250°F)	104.0	101.7	55.06	54.24	137.2	133.6
UNT Modulus [Msi]	CTD (-65°F)	7.326	7.367	4.565	4.603	9.311	9.277
	RTD (70°F)	7.001	7.385	4.334	4.558	8.979	9.472
	ETW1 (180°F)	6.968	7.283	4.101	4.277	9.040	9.450
	ETW2 (250°F)	6.707	6.558	3.888	3.831	8.999	8.763
UNC Strength [ksi]	CTD (-65°F)	88.61	91.22	60.72	62.34	93.64	96.66
	RTD (70°F)	78.45	84.00	51.25	54.60	83.27	89.40
	ETW1 (180°F)	62.81	64.20	38.71	39.32	66.02	67.75
	ETW2 (250°F)	52.40	52.61	32.03	32.00	57.69	57.99
UNC Modulus [Msi]	CTD (-65°F)	6.679	6.875	4.355	4.470	8.500	8.772
	RTD (70°F)	6.498	6.957	4.083	4.350	8.267	8.892
	ETW1 (180°F)	6.551	6.698	3.953	4.019	8.524	8.699
	ETW2 (250°F)	6.490	6.516	3.733	3.731	8.544	8.593
FHT Strength [ksi]	CTD (-65°F)	60.91	59.66	58.59	57.21	74.12	73.13
	RTD (70°F)	60.51	60.69	50.66	50.71	72.17	71.99
	ETW1 (180°F)	61.46	61.34	42.65	42.49	72.54	72.55
	ETW2 (250°F)	59.95	59.08	39.90	39.06	70.17	69.90
FHC Strength [ksi]	CTD (-65°F)	90.69**	89.09	65.39**	63.74**	96.96**	94.07
	RTD (70°F)	75.87	75.75	54.63**	54.71**	78.50	78.07
	ETW1 (180°F)	59.19	59.77	43.02**	43.26**	63.22	63.62
	ETW2 (250°F)	51.19	50.37	36.05**	35.25**	52.84	51.91
SSB Proc. C 2% Offset Strength [ksi]	RTD (70°F)	103.6	110.8	100.3	106.1	92.29	97.69
	ETW1 (180°F)	91.87	97.94	86.09	90.32	82.14	86.75
	ETW2 (250°F)	87.55	85.38	79.86	77.96	74.76	73.04
SSB Proc. C Ultimate Strength [ksi]	RTD (70°F)	125.0	133.7	123.0	130.1	116.5	123.4
	ETW1 (180°F)	107.7	114.9	104.9	110.1	100.8	106.6
	ETW2 (250°F)	100.8	98.33	97.32	94.99	92.21	90.10
SSB Proc. C Chord Stiffness [Msi]	RTD (70°F)	1.502	1.607	1.044	1.104	1.343	1.423
	ETW1 (180°F)	1.489	1.589	1.044	1.095	1.335	1.412
	ETW2 (250°F)	1.462	1.426	0.9953	0.9716	1.293	1.263
CBS* [lb]	CTD (-65°F)		558.0				
	RTD (70°F)		459.8				
	ETW1 (180°F)		308.0				
ILT* [ksi]	CTD (-65°F)		15.78				
	RTD (70°F)		13.20				
	ETW1 (180°F)		8.404				
CAI Strength [ksi]	CTD (-65°F)	51.12	50.80				
	RTD (70°F)	43.34	43.79			41.52	41.87

UNT1 (ETW1, ETW2), UNT3 (RTD), OHT2 (CTD, RTD) and DMA (Dry, Wet): Two additional batches (4 and 5) were included.
*** The actual layup for ILT is [0]20, (50/0/50).**
**** In some cases of FHC>UNC, UNC data is recommended for design. The FHC data is for informational purposes only and is not appropriate to be used for design.**

Table 2-2: Laminate Summary Data

2.3 Fluid Sensitivity Test Summary

2.3.1 Short Beam Strength Fluid Sensitivity Test (SBSFS)

Fluid Sensitivity Screening
Short Beam Strength Properties (SBSFS)--RT(70°F) Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

Exposure	Type of Fluid	Fluid Code	Average Strength [ksi]
90 days min @ 70°F±10°F	100 Low lead Fuel	SBSFS11RT	10.95
	Jet A Fuel	SBSFS12RT	11.03
	MIL-PRF-5606 Hydraulic Oil	SBSFS13RT	10.99
	MIL-PRF-83282 Hydraulic Oil	SBSFS14RT	11.00
	MIL-PRF-7808 Engine Oil	SBSFS15RT	10.88
	MIL-PRF-23699 Engine Oil	SBSFS16RT	10.72
	Sea Water	SBSFS17RT	10.26
	Skydrol LD-4	SBSFS18RT	10.78
	50% Water with 50% Skydrol LD-4	SBSFS19RT	10.10
	Distilled Water	SBSFS41RT	10.30
90 mins @ 70°F±10°F	MEK washing fluid	SBSFS31RT	10.62
	Polypropylene Glycol Deicer (Type I) SAE AMS 1424	SBSFS32RT* (Isopropyl Glycol Deicer)	10.89
48±4 hrs @ 70°F±10°F	Isopropyl Alcohol Deicing (TT-I-735)	SBSFS33RT** (Polypropylene Glycol Deicer)	10.92
Per section 6.1 Test Plan NTP 3801Q1	Dry	SBSFS42RT	10.87
Per section 6.1 Test Plan NTP 3801Q1	85% Relative Humidity	SBSFS43RT	10.14

*SBSFS32RT - Deviated from test plan NTP 3801Q1 Rev E, specimens were soaked in Isopropyl Alcohol Deicing for 48 hours.

**SBSFS33RT - Deviated from test plan NTP 3801Q1 Rev E, specimens were soaked in Polypropylene Glycol Deicer for 90 minutes.

Table 2-3: SBS Fluid Sensitivity Summary Data – RT(70°F)

Fluid Sensitivity Screening
Short Beam Strength Properties (SBSFS)--ET2(250°F) Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

Exposure	Type of Fluid	Fluid Code	Average Strength [ksi]
90 days min @ 70°F±10°F	100 Low lead Fuel	SBSFS11ET2	7.494
	Jet A Fuel	SBSFS12ET2	7.615
	MIL-PRF-5606 Hydraulic Oil	SBSFS13ET2	7.468
	MIL-PRF-83282 Hydraulic Oil	SBSFS14ET2	7.530
	MIL-PRF-7808 Engine Oil	SBSFS15ET2	7.178
	MIL-PRF-23699 Engine Oil	SBSFS16ET2	7.325
	Sea Water	SBSFS17ET2	5.863
	Skydrol LD-4	SBSFS18ET2	7.353
	50% Water with 50% Skydrol LD-4	SBSFS19ET2	6.113
	Distilled Water	SBSFS41ET2	5.823
90 mins @ 70°F±10°F	MEK washing fluid	SBSFS31ET2	7.616
	Polypropylene Glycol Deicer (Type I) SAE AMS 1424	SBSFS32ET2	7.621
48±4 hrs @ 70°F±10°F	Isopropyl Alcohol Deicing (TT-I-735)	SBSFS33ET2	7.636
Per section 6.1 Test Plan NTP 3801Q1	Dry	SBSFS42ET2	7.607
Per section 6.1 Test Plan NTP 3801Q1	85% Relative Humidity	SBSFS43ET2	5.753

Table 2-4: SBS Fluid Sensitivity Summary Data – ET2(250°F)

2.4 Cured Laminate Physical Test Summary

2.4.1 DMA

DMA Results Summary
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill Qualification

Test Temperature	Mean			
	Onset Storage Modulus		Peak of Tangent Delta	
	T_g [°C]	T_g [°F]	T_g [°C]	T_g [°F]
DMA Tg (Dry)	207.13	404.84	216.81	422.26
DMA Tg (Wet)	166.80	332.24	184.68	364.42

DMA (Dry, Wet): Reported DMA data is from 5 batches.

Table 2-5: DMA Summary Data

2.5 Individual Test Summaries

2.5.1 Warp Tension Properties (WT)

Material: Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

Resin content: 36.68 %wt **Comp. density:** 1.507 g/cc
Fiber volume: 53.04 %vol
Ply count: 12

Test method: ASTM D3039-17 **Modulus calculation:** 1000-3000 microstrain

Normalized by: 0.008800 in. CPT

Tension, 1-axis
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
[0]12

		CTD		RTD		ETD1		ETW1		ETW2	
Test Temperature [°F]		-65		70		180		180		250	
Moisture Conditioning		Dry		Dry		Dry		Equilibrium		Equilibrium	
Equilibrium at T, RH								160F,85%		160F,85%	
Source code		TCEJX XXXB		TCEJX XXXA		TCEJX XXXC		TCEJX XXXD		TCEJX XXXE	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
	Mean	157.3	159.0	156.7	165.8	160.9	171.2	161.3	164.2	160.9	160.5
	Minimum	146.5	145.4	146.4	151.1	149.2	156.1	156.3	156.9	151.1	150.2
	Maximum	164.2	166.5	165.3	182.4	171.2	186.7	165.8	171.8	166.8	168.4
F_1^{tu} [ksi]	**C.V.(%)**	3.414	4.045	3.375	5.228	4.201	4.540	1.778	2.753	2.392	3.220
	No. Specimens	18		22		20		19		19	
	No. Prepreg Lots	3		3		3		3		3	
	Mean	10.32	10.43	10.10	10.73	10.26	10.92	10.24	10.42	10.27	10.25
	Minimum	10.04	10.05	9.881	10.09	10.14	10.47	10.08	9.961	10.11	9.827
	Maximum	10.72	10.83	10.29	11.49	10.37	11.59	10.35	10.92	10.42	10.72
E_1^t [Msi]	**C.V.(%)**	1.484	2.078	1.154	3.645	0.5462	3.042	0.7336	2.723	0.8041	2.248
	No. Specimens	18		20		20		19		19	
	No. Prepreg Lots	3		3		3		3		3	
	Mean		0.04598		0.04224		0.04034		0.03954		0.03778
	Minimum		0.01885		0.03229		0.02954		0.03157		0.02792
	Maximum		0.07542		0.05049		0.08036		0.05066		0.04426
ν_{12}^t	**C.V.(%)**		27.74		15.14		28.63		16.48		13.23
	No. Specimens	18		20		20		19		19	
	No. Prepreg Lots	3		3		3		3		3	

2.5.2 Fill Tension Properties (FT)

Material:	Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg									**Tension, 2-axis** Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg [90]12	
Resin content:	35.46 %wt	**Comp. density:** 1.511 g/cc									
Fiber volume:	54.18 %vol										
Ply count:	12										
Test method:	ASTM D3039-17	**Modulus calculation:** 1000-3000 microstrain									
Normalized by:	0.008800	in. CPT									
		CTD		**RTD**		**ETD1**		**ETW1**		**ETW2**	
Test Temperature [°F]		-65		70		180		180		250	
Moisture Conditioning		Dry		Dry		Dry		Equilibrium		Equilibrium	
Equilibrium at T, RH								160F,85%		160F,85%	
Source code		TCEUX XXXB		TCEUX XXXA		TCEUX XXXC		TCEUX XXXD		TCEUX XXXE	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
	Mean	152.4	153.6	148.0	154.0	154.8	157.3	148.0	150.4	141.5	142.4
	Minimum	133.8	135.4	137.3	142.7	144.7	147.7	139.9	142.2	125.1	125.6
	Maximum	164.7	166.7	161.8	165.2	162.8	164.9	152.0	155.4	149.3	150.9
F_2^{tu} [ksi]	**C.V.(%)**	5.794	5.595	4.576	4.102	2.548	2.464	2.278	2.403	3.929	3.826
	No. Specimens	18		19		21		23		19	
	No. Prepreg Lots	3		3		3		3		3	
	Mean	10.21	10.29	9.909	10.32	9.909	10.07	10.05	10.21	10.02	10.09
	Minimum	9.817	9.879	9.377	9.535	9.687	9.811	9.498	9.576	9.583	9.624
	Maximum	10.45	10.55	10.47	11.01	10.32	10.49	10.90	11.01	11.22	11.40
E_2^t [Msi]	**C.V.(%)**	1.733	1.826	2.741	4.610	1.534	1.594	3.378	3.493	3.474	3.972
	No. Specimens	18		19		21		23		19	
	No. Prepreg Lots	3		3		3		3		3	

2.5.3 Warp Compression Properties (WC)

Material: Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

Resin content: 38.83 %wt **Comp. density:** 1.487 g/cc
Fiber volume: 50.54 %vol
Ply count: 12

Test method: ASTM D6641-23 **Modulus calculation:** 1000-3000 microstrain

Normalized by: 0.008800 in. CPT

Compression, 1-axis
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
[0]12

		CTD		RTD		ETD1		ETW1		ETW2	
Test Temperature [°F]		-65		70		180		180		250	
Moisture Conditioning		Dry		Dry		Dry		Equilibrium		Equilibrium	
Equilibrium at T, RH								160F,85%		160F,85%	
Source code		TCELX XXXB		TCELX XXXA		TCELX XXXC		TCELX XXXD		TCELX XXXE	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
	Mean	104.9	109.5	95.20	101.1	82.57	83.09	69.42	71.03	57.10	59.08
	Minimum	89.34	92.09	87.10	88.94	74.70	73.30	61.15	62.19	48.72	51.66
	Maximum	119.6	119.7	101.5	110.1	89.76	93.24	77.50	77.59	64.27	64.83
F_1^{cu} **[ksi]**	**C.V.(%)**	7.785	6.374	4.538	5.807	5.122	5.894	5.599	5.432	7.765	6.651
	No. Specimens	30		21		21		21		18	
	No. Prepreg Lots	5		3		3		3		3	
	Mean	9.424	9.847	9.235	9.865	9.586	9.566	9.655	9.872	9.698	10.05
	Minimum	9.193	9.104	8.807	9.444	9.443	9.340	9.197	9.473	9.347	9.391
	Maximum	9.700	10.83	9.778	10.44	9.947	9.925	10.03	10.27	9.944	10.90
E_1^c **[Msi]**	**C.V.(%)**	1.587	4.209	2.707	3.078	1.331	1.757	2.088	2.513	1.831	4.806
	No. Specimens	30		18		18		18		18	
	No. Prepreg Lots	5		3		3		3		3	

WC (CTD): Two additional batches (4 and 5) were included.

2.5.4 Fill Compression Properties (FC)

Material:	Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg									**Compression, 2-axis** Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg [90]12	
Resin content:	38.62 %wt	**Comp. density:** 1.494 g/cc									
Fiber volume:	50.98 %vol										
Ply count:	12										
Test method:	ASTM D6641-23	**Modulus calculation:** 1000-3000 microstrain									
Normalized by:	0.008800	in. CPT									
		CTD		**RTD**		**ETD1**		**ETW1**		**ETW2**	
Test Temperature [°F]		-65		70		180		180		250	
Moisture Conditioning		Dry		Dry		Dry		Equilibrium		Equilibrium	
Equilibrium at T, RH								160F,85%		160F,85%	
Source code		TCEZX XXXB		TCEZX XXXA		TCEZX XXXC		TCEZX XXXD		TCEZX XXXE	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
	Mean	103.8	104.5	90.20	90.31	78.75	79.32	69.58	69.97	58.49	59.03
	Minimum	89.81	88.81	83.44	83.09	70.52	69.51	58.19	58.33	50.02	50.02
	Maximum	114.7	115.7	97.61	96.36	85.20	84.54	77.48	78.00	62.97	63.45
F_2^{cu} [ksi]	**C.V.(%)**	6.206	6.416	5.050	4.719	4.411	4.207	5.988	5.750	5.097	5.317
	No. Specimens	18		20		23		20		19	
	No. Prepreg Lots	3		3		3		3		3	
	Mean	9.242	9.305	9.155	9.162	9.401	9.482	9.457	9.505	9.305	9.395
	Minimum	8.949	9.027	8.678	8.699	8.988	8.854	9.212	9.247	8.967	9.007
	Maximum	9.524	9.470	9.483	9.633	9.865	9.951	9.726	9.817	9.780	9.963
E_2^c [Msi]	**C.V.(%)**	1.687	1.425	2.168	2.517	2.804	3.395	1.479	1.878	2.550	2.833
	No. Specimens	19		18		18		18		18	
	No. Prepreg Lots	3		3		3		3		3	

2.5.5 In-Plane Shear Properties (IPS)

Material:	Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg		**In-Plane Shear** Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg [45/-45]2S
Resin content:	36.34 %wt	**Comp. density:** 1.502 g/cc	
Fiber volume:	53.13 %vol		
Ply count:	8		
Test method:	ASTM D3518-18	**Modulus calculation:** 2000-6000 microstrain	
Normalized by:	NA		

		CTD		RTD		ETD1		ETW1		ETW2	
Test Temperature [°F]		-65		70		180		180		250	
Moisture Conditioning		Dry		Dry		Dry		Equilibrium		Equilibrium	
Equilibrium at T, RH								160F,85%		160F,85%	
Source code		TCENX XXXB		TCENX XXXA		TCENX XXXC		TCENX XXXD		TCENX XXXE	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
$F_{12}^{s0.2\%}$ [ksi]	**Mean**		7.799		6.146		5.221		4.158		3.018
	Minimum		7.283		5.766		4.809		3.817		2.682
	Maximum		8.868		6.732		6.313		5.008		3.673
	C.V.(%)		4.587		3.531		6.591		6.721		6.847
	No. Specimens	36		36		39		40		40	
	No. Prepreg Lots	5		5		5		5		5	
$F_{12}^{s5\% strain}$ [ksi]	**Mean**		15.36		11.88		9.990		8.079		6.175
	Minimum		14.51		11.24		8.910		7.187		5.277
	Maximum		17.48		12.94		13.37		10.48		8.527
	C.V.(%)		4.704		3.565		11.41		10.49		11.11
	No. Specimens	36		36		39		40		40	
	No. Prepreg Lots	5		5		5		5		5	
G_{12}^{s} [Msi]	**Mean**		0.6134		0.5463		0.4900		0.4206		0.3049
	Minimum		0.5728		0.5022		0.4485		0.3811		0.2747
	Maximum		0.6665		0.6048		0.5903		0.5133		0.3594
	C.V.(%)		4.449		4.162		6.361		7.029		5.925
	No. Specimens	36		36		38		40		40	
	No. Prepreg Lots	5		5		5		5		5	

IPS (CTD, RTD, ETD1, ETW1, ETW2): Two additional batches (4 and 5) were included.

2.5.6 Lamina Short-Beam Strength Properties (SBS)

Material:	Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Resin content:	39.25 %wt
Fiber volume:	50.32 %vol
Ply count:	22
Test method:	ASTM D2344-22
Normalized by:	NA
Comp. density:	1.491 g/cc

Short-Beam Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
[0]22

		CTD		RTD		ETD1		ETW1		ETW2	
Test Temperature [°F]		-65		70		180		180		250	
Moisture Conditioning		Dry		Dry		Dry		Equilibrium		Equilibrium	
Equilibrium at T, RH								160F,85%		160F,85%	
Source code		TCEQX XXXB		TCEQX XXXA		TCEQX XXXC		TCEQX XXXD		TCEQX XXXE	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
SBS [ksi]	**Mean**		14.14		11.23		9.057		7.623		5.829
	Minimum		13.28		10.43		8.759		7.216		5.637
	Maximum		14.65		11.73		9.337		7.991		6.153
	C.V.(%)		2.260		3.593		2.844		2.947		2.110
	No. Specimens	18		18		6		18		18	
	No. Prepreg Lots	3		3		1		3		3	

2.5.7 "25/50/25" Unnotched Tension 1 Properties (UNT1)

Material:	Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg		**Unnotched Tension 1** Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg [45/0/-45/90]S
Resin content:	38.87 %wt	**Comp. density:** 1.487 g/cc	
Fiber volume:	50.52 %vol		
Ply count:	8		
Test method:	ASTM D3039-17	**Modulus calculation:** 1000-3000 microstrain	
Normalized by:	0.008800	in. CPT	

		CTD		RTD		ETW1		ETW2	
Test Temperature [°F]		-65		70		180		250	
Moisture Conditioning		Dry		Dry		Equilibrium		Equilibrium	
Equilibrium at T, RH						160F,85%		160F,85%	
Source code		TCEAX XXXB		TCEAX XXXA		TCEAX XXXD		TCEAX XXXE	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
UNT1 Strength [ksi]	**Mean**	118.5	119.2	116.6	123.0	110.2	115.2	104.0	101.7
	Minimum	108.1	109.5	108.8	111.7	96.86	96.29	92.93	91.18
	Maximum	127.1	129.6	120.2	134.3	117.9	129.8	112.0	111.1
	C.V.(%)	3.887	4.282	2.771	5.377	4.405	6.586	4.564	4.924
	No. Specimens	18		18		32		30	
	No. Prepreg Lots	3		3		5		5	
UNT1 Modulus [Msi]	**Mean**	7.326	7.367	7.001	7.385	6.968	7.283	6.707	6.558
	Minimum	7.133	7.018	6.853	7.003	6.642	6.752	6.494	6.255
	Maximum	7.620	7.687	7.198	8.030	7.169	7.936	6.903	6.880
	C.V.(%)	1.744	2.569	1.569	4.624	1.724	4.167	1.592	2.164
	No. Specimens	18		18		32		30	
	No. Prepreg Lots	3		3		5		5	

UNT1 (ETW1, ETW2): Two additional batches (4 and 5) were included.

2.5.8 "10/80/10" Unnotched Tension 2 Properties (UNT2)

Material:	Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg					**Unnotched Tension 2** Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg [45/-45/90/45/-45]S			
Resin content:	37.91 %wt	**Comp. density:**	1.499 g/cc						
Fiber volume:	51.71 %vol								
Ply count:	10								
Test method:	ASTM D3039-17	**Modulus calculation:**	1000-3000 microstrain						
Normalized by:	0.008800	in. CPT							
		CTD		**RTD**		**ETW1**		**ETW2**	
Test Temperature [°F]		-65		70		180		250	
Moisture Conditioning		Dry		Dry		Equilibrium		Equilibrium	
Equilibrium at T, RH						160F,85%		160F,85%	
Source code		TCEBX XXXB		TCEBX XXXA		TCEBX XXXD		TCEBX XXXE	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
UNT2 Strength [ksi]	**Mean**	69.75	70.34	65.52	68.89	59.16	61.68	55.06	54.24
	Minimum	68.22	68.51	64.55	66.40	55.85	58.92	53.89	52.25
	Maximum	70.83	71.68	66.73	70.65	60.84	65.10	57.08	56.42
	C.V.(%)	1.364	1.645	1.348	2.503	1.988	2.960	1.561	2.407
	No. Specimens	6		6		18		18	
	No. Prepreg Lots	1		1		3		3	
UNT2 Modulus [Msi]	**Mean**	4.565	4.603	4.334	4.558	4.101	4.277	3.888	3.831
	Minimum	4.390	4.387	4.290	4.356	3.952	3.994	3.678	3.622
	Maximum	4.690	4.737	4.367	4.751	4.231	4.551	4.210	4.192
	C.V.(%)	2.494	2.964	0.6691	3.428	1.871	3.733	3.691	4.592
	No. Specimens	6		6		18		18	
	No. Prepreg Lots	1		1		3		3	

2.5.9 "40/20/40" Unnotched Tension 3 Properties (UNT3)

Material:	Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg		**Unnotched Tension 3** Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg [0/90/-45/0/90]S
Resin content:	38.74 %wt	**Comp. density:** 1.488 g/cc	
Fiber volume:	50.67 %vol		
Ply count:	10		
Test method:	ASTM D3039-17	**Modulus calculation:** 1000-3000 microstrain	
Normalized by:	0.008800	in. CPT	

		CTD		RTD		ETW1		ETW2	
Test Temperature [°F]		-65		70		180		250	
Moisture Conditioning		Dry		Dry		Equilibrium		Equilibrium	
Equilibrium at T, RH						160F,85%		160F,85%	
Source code		TCECX XXXB		TCECX XXXA		TCECX XXXD		TCECX XXXE	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
UNT3 Strength [ksi]	**Mean**	139.4	138.8	134.1	141.4	138.9	145.1	137.2	133.6
	Minimum	132.8	132.7	126.0	130.0	129.4	136.1	122.7	120.9
	Maximum	148.1	145.7	148.0	155.6	146.2	156.5	147.7	143.0
	C.V.(%)	2.794	2.378	3.928	4.737	3.399	4.148	4.230	3.854
	No. Specimens	18		30		18		18	
	No. Prepreg Lots	3		5		3		3	
UNT3 Modulus [Msi]	**Mean**	9.311	9.277	8.979	9.472	9.040	9.450	8.999	8.763
	Minimum	8.955	8.711	8.779	8.799	8.889	8.996	8.708	8.393
	Maximum	9.723	9.699	9.245	10.03	9.349	9.796	9.247	9.091
	C.V.(%)	1.718	3.147	1.343	3.659	1.166	2.951	1.311	2.095
	No. Specimens	18		30		18		18	
	No. Prepreg Lots	3		5		3		3	

UNT3 (RTD): Two additional batches (4 and 5) were included.

2.5.10 "25/50/25" Unnotched Compression 1 Properties (UNC1)

Material:	Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg							**Unnotched Compression 1** Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg [45/0/-45/90]2S		
Resin content:	38.56 %wt	**Comp. den:**	1.494 g/cc							
Fiber volume:	51.01 %vol									
Ply count:	16									
Test method:	ASTM D6641-23	**Modulus calculation:**	1000-3000 microstrain							
Normalized by:	0.008800	in. CPT								

		CTD		RTD		ETW1		ETW2	
Test Temperature [°F]		-65		70		180		250	
Moisture Conditioning		Dry		Dry		Equilibrium		Equilibrium	
Equilibrium at T, RH						160F,85%		160F,85%	
Source code		TCEWX XXXB		TCEWX XXXA		TCEWX XXXD		TCEWX XXXE	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
UNC1 Strength [ksi]	**Mean**	88.61	91.22	78.45	84.00	62.81	64.20	52.40	52.61
	Minimum	85.29	87.32	71.08	76.76	58.82	58.66	46.85	47.56
	Maximum	93.89	96.43	84.03	93.42	65.74	68.94	57.22	56.83
	C.V.(%)	4.072	4.385	4.830	5.504	2.804	4.673	5.946	5.799
	No. Specimens	6		18		18		18	
	No. Prepreg Lots	1		3		3		3	
UNC1 Modulus [Msi]	**Mean**	6.679	6.875	6.498	6.957	6.551	6.698	6.490	6.516
	Minimum	6.609	6.769	6.093	6.402	6.341	6.255	6.331	6.350
	Maximum	6.788	6.948	6.870	7.419	6.800	7.403	6.648	6.763
	C.V.(%)	1.043	0.8854	3.423	4.054	1.889	5.127	1.290	1.574
	No. Specimens	6		18		18		18	
	No. Prepreg Lots	1		3		3		3	

2.5.11 "10/80/10" Unnotched Compression 2 Properties (UNC2)

Material:	Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg							**Unnotched Compression 2** Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg [45/-45/90/45/-45]S		
Resin content:	38.70 %wt	**Comp. density:**	1.493 g/cc							
Fiber volume:	50.86 %vol									
Ply count:	10									
Test method:	ASTM D6641-23	**Modulus calculation:**	1000-3000 microstrain							
Normalized by:	0.008800	in. CPT								
		CTD		**RTD**		**ETW1**		**ETW2**		
Test Temperature [°F]		-65		70		180		250		
Moisture Conditioning		Dry		Dry		Equilibrium		Equilibrium		
Equilibrium at T, RH						160F,85%		160F,85%		
Source code		TCEXX XXXB		TCEXX XXXA		TCEXX XXXD		TCEXX XXXE		
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	
UNC2 Strength [ksi]	**Mean**	60.72	62.34	51.25	54.60	38.71	39.32	32.03	32.00	
	Minimum	56.34	57.39	48.19	49.78	36.52	36.02	28.35	28.74	
	Maximum	65.39	67.59	54.42	60.27	40.12	43.94	34.05	33.64	
	C.V.(%)	5.454	6.120	3.347	5.071	3.014	5.646	3.700	3.387	
	No. Specimens	6		18		18		18		
	No. Prepreg Lots	1		3		3		3		
UNC2 Modulus [Msi]	**Mean**	4.355	4.470	4.083	4.350	3.953	4.019	3.733	3.731	
	Minimum	4.223	4.398	3.841	3.911	3.754	3.694	3.580	3.573	
	Maximum	4.448	4.602	4.314	4.734	4.112	4.485	3.853	3.891	
	C.V.(%)	1.893	1.646	3.306	5.546	2.300	6.658	2.309	2.724	
	No. Specimens	6		18		18		18		
	No. Prepreg Lots	1		3		3		3		

2.5.12 "40/20/40" Unnotched Compression 3 Properties (UNC3)

Material:	Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg					**Unnotched Compression 3** Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg [0/90/-45/0/90]S			
Resin content:	38.74 %wt	**Comp. density:**	1.499 g/cc						
Fiber volume:	51.03 %vol								
Ply count:	10								
Test method:	ASTM D6641-23	**Modulus calculation:**	1000-3000 microstrain						
Normalized by:	0.008800	in. CPT							
		CTD		**RTD**		**ETW1**		**ETW2**	
Test Temperature [°F]		-65		70		180		250	
Moisture Conditioning		Dry		Dry		Equilibrium		Equilibrium	
Equilibrium at T, RH						160F,85%		160F,85%	
Source code		TCEYX XXXB		TCEYX XXXA		TCEYX XXXD		TCEYX XXXE	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
UNC3 Strength [ksi]	**Mean**	93.64	96.66	83.27	89.40	66.02	67.75	57.69	57.99
	Minimum	87.14	89.81	76.35	80.78	59.61	59.23	54.36	54.91
	Maximum	99.72	104.1	90.81	99.27	71.31	74.77	63.91	63.76
	C.V.(%)	4.853	5.354	4.829	5.561	4.668	6.322	4.085	3.538
	No. Specimens	6		19		19		18	
	No. Prepreg Lots	1		3		3		3	
UNC3 Modulus [Msi]	**Mean**	8.500	8.772	8.267	8.892	8.524	8.699	8.544	8.593
	Minimum	8.231	8.531	7.763	8.493	8.317	8.176	8.248	8.208
	Maximum	8.802	9.186	8.611	9.440	8.756	9.375	8.898	9.129
	C.V.(%)	2.571	2.842	3.035	2.998	1.453	4.200	2.093	3.007
	No. Specimens	6		18		18		18	
	No. Prepreg Lots	1		3		3		3	

2.5.13 "25/50/25" Open-Hole Tension 1 Properties (OHT1)

Material: Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

Resin content: 37.19 %wt **Comp. density:** 1.506 g/cc
Fiber volume: 52.57 %vol
Ply count: 16

Test method: ASTM D5766-23

Normalized by: 0.008800 in. CPT

Open-Hole Tension 1
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
[45/0/-45/90]2S

		CTD		RTD		ETD1		ETW1		ETW2	
Test Temperature [°F]		-65		70		180		180		250	
Moisture Conditioning		Dry		Dry		Dry		Equilibrium		Equilibrium	
Equilibrium at T, RH								160F,85%		160F,85%	
Source code		TCEDX XXXB		TCEDX XXXA		TCEDX XXXC		TCEDX XXXD		TCEDX XXXE	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
OHT1 Strength [ksi]	**Mean**	58.29	56.71	59.26	59.16	59.18	59.10	58.75	57.31	58.35	56.86
	Minimum	55.44	53.49	57.58	56.35	57.62	55.82	57.03	55.07	55.39	53.37
	Maximum	60.57	60.14	61.51	63.07	61.95	62.14	61.11	59.25	62.54	62.03
	C.V.(%)	2.200	2.710	2.188	3.337	1.980	3.248	1.946	2.061	3.145	3.586
	No. Specimens	18		18		18		18		18	
	No. Prepreg Lots	3		3		3		3		3	

2.5.14 "10/80/10" Open-Hole Tension 2 Properties (OHT2)

Material: Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

Resin content: 37.28 %wt **Comp. density:** 1.498 g/cc
Fiber volume: 52.21 %vol
Ply count: 10

Test method: ASTM D5766-23

Normalized by: 0.008800 in. CPT

Open-Hole Tension 2
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
[45/-45/90/45/-45]S

		CTD		RTD		ETD1		ETW1		ETW2	
Test Temperature [°F]		-65		70		180		180		250	
Moisture Conditioning		Dry		Dry		Dry		Equilibrium		Equilibrium	
Equilibrium at T, RH								160F,85%		160F,85%	
Source code		TCEEX XXXB		TCEEX XXXA		TCEEX XXXC		TCEEX XXXD		TCEEX XXXE	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
OHT2 Strength [ksi]	**Mean**	51.05	50.18	44.71	44.63	41.24	40.97	38.24	37.94	36.61	35.81
	Minimum	48.96	47.31	41.66	41.40	40.33	39.11	36.87	35.65	34.67	33.77
	Maximum	53.41	53.60	49.99	49.25	42.30	43.23	39.92	40.21	40.54	39.78
	C.V.(%)	2.711	3.374	4.096	4.871	1.758	3.910	2.757	3.537	4.094	4.402
	No. Specimens	30		30		6		18		18	
	No. Prepreg Lots	5		5		1		3		3	

OHT2 (CTD, RTD): Two additional batches (4 and 5) were included.

2.5.15 "40/20/40" Open-Hole Tension 3 Properties (OHT3)

Material:	Toray Advanced Composites TC380 T800HB 6K 2X2 Twill 200gsm with 40%RC prepreg									**Open-Hole Tension 3** Toray Advanced Composites TC380 T800HB 6K 2X2 Twill 200gsm with 40%RC prepreg [0/90/-45/0/90]S	
Resin content:	36.45 %wt	**Comp. density:** 1.510 g/cc									
Fiber volume:	53.32 %vol										
Ply count:	10										
Test method:	ASTM D5766-23										
Normalized by:	0.008800	in. CPT									
		CTD		**RTD**		**ETD1**		**ETW1**		**ETW2**	
Test Temperature [°F]		-65		70		180		180		250	
Moisture Conditioning		Dry		Dry		Dry		Equilibrium		Equilibrium	
Equilibrium at T, RH								160F,85%		160F,85%	
Source code		TCEFX XXXB		TCEFX XXXA		TCEFX XXXC		TCEFX XXXD		TCEFX XXXE	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
OHT3 Strength [ksi]	**Mean**	71.10	70.32	72.93	72.90	76.71	77.71	74.42	74.87	73.85	73.07
	Minimum	64.42	64.14	70.42	68.01	71.30	71.89	72.26	71.00	69.49	69.85
	Maximum	76.41	76.11	75.05	79.31	81.24	82.56	78.09	78.69	76.53	75.91
	C.V.(%)	4.478	4.457	2.271	4.072	4.772	4.980	2.233	3.191	2.656	2.543
	No. Specimens	18		18		6		18		18	
	No. Prepreg Lots	3		3		1		3		3	

2.5.16 "25/50/25" Filled-Hole Tension 1 Properties (FHT1)

Material:	Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg					**Filled-Hole Tension 1** Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg [45/0/-45/90]2S			
Resin content:	36.79 %wt	**Comp. density:** 1.509 g/cc							
Fiber volume:	53.00 %vol								
Ply count:	16								
Test method:	ASTM D6742-23								
Normalized by:	0.008800	in. CPT							
		CTD		**RTD**		**ETW1**		**ETW2**	
Test Temperature [°F]		-65		70		180		250	
Moisture Conditioning		Dry		Dry		Equilibrium		Equilibrium	
Equilibrium at T, RH						160F,85%		160F,85%	
Source code		TCE4X XXXB		TCE4X XXXA		TCE4X XXXD		TCE4X XXXE	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
FHT1 Strength [ksi]	**Mean**	60.91	59.66	60.51	60.69	61.46	61.34	59.95	59.08
	Minimum	57.94	56.24	58.64	57.38	59.50	57.83	58.49	57.09
	Maximum	63.56	62.47	63.51	64.50	63.69	65.29	63.00	63.87
	C.V.(%)	2.764	3.184	2.001	3.528	1.859	3.378	1.845	2.986
	No. Specimens	18		18		18		18	
	No. Prepreg Lots	3		3		3		3	

2.5.17 "10/80/10" Filled-Hole Tension 2 Properties (FHT2)

Material:	Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg		**Filled-Hole Tension 2** Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg [45/-45/90/45/-45]S
Resin content:	36.63 %wt	**Comp. density:** 1.506 g/cc	
Fiber volume:	53.03 %vol		
Ply count:	10		
Test method:	ASTM D6742-23		
Normalized by:	0.008800	in. CPT	

		CTD		RTD		ETW1		ETW2	
Test Temperature [°F]		-65		70		180		250	
Moisture Conditioning		Dry		Dry		Equilibrium		Equilibrium	
Equilibrium at T, RH						160F,85%		160F,85%	
Source code		TCE5X XXXB		TCE5X XXXA		TCE5X XXXD		TCE5X XXXE	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
FHT2 Strength [ksi]	**Mean**	58.59	57.21	50.66	50.71	42.65	42.49	39.90	39.06
	Minimum	55.85	54.17	48.41	46.91	40.99	39.18	37.48	37.08
	Maximum	60.27	59.57	54.86	56.94	44.68	45.92	43.87	43.97
	C.V.(%)	2.075	2.743	3.663	5.460	2.539	4.643	3.638	4.379
	No. Specimens	18		18		18		18	
	No. Prepreg Lots	3		3		3		3	

2.5.18 "40/20/40" Filled-Hole Tension 3 Properties (FHT3)

Material:	Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg		**Filled-Hole Tension 3** Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg [0/90/-45/0/90]S
Resin content:	36.41 %wt	**Comp. density:** 1.508 g/cc	
Fiber volume:	53.30 %vol		
Ply count:	10		
Test method:	ASTM D6742-23		
Normalized by:	0.008800	in. CPT	

		CTD		RTD		ETW1		ETW2	
Test Temperature [°F]		-65		70		180		250	
Moisture Conditioning		Dry		Dry		Equilibrium		Equilibrium	
Equilibrium at T, RH						160F,85%		160F,85%	
Source code		TCE6X XXXB		TCE6X XXXA		TCE6X XXXD		TCE6X XXXE	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
FHT3 Strength [ksi]	**Mean**	74.12	73.13	72.17	71.99	72.54	72.55	70.17	69.90
	Minimum	68.65	66.68	65.34	64.98	67.17	66.63	67.08	66.47
	Maximum	79.00	77.43	76.53	80.21	76.02	79.42	75.55	74.45
	C.V.(%)	4.191	4.377	3.722	4.819	2.908	4.188	3.256	3.211
	No. Specimens	19		19		23		23	
	No. Prepreg Lots	3		3		3		3	

2.5.19 "25/50/25" Open-Hole Compression 1 Properties (OHC1)

Material: Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

Resin content: 36.78 %wt **Comp. density:** 1.507 g/cc
Fiber volume: 52.91 %vol
Ply count: 16

Test method: ASTM D6484-23

Normalized by: 0.008800 in. CPT

Open-Hole Compression 1
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
[45/0/-45/90]2S

		CTD		RTD		ETD1		ETW1		ETW2	
Test Temperature [°F]		-65		70		180		180		250	
Moisture Conditioning		Dry		Dry		Dry		Equilibrium		Equilibrium	
Equilibrium at T, RH								160F,85%		160F,85%	
Source code		TCEGX XXXB		TCEGX XXXA		TCEGX XXXC		TCEGX XXXD		TCEGX XXXE	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
OHC1 Strength [ksi]	**Mean**	48.81	47.79	40.54	40.63	36.46	36.55	32.88	32.31	27.91	27.31
	Minimum	46.27	44.53	38.65	38.12	33.74	33.29	30.93	30.80	25.89	25.25
	Maximum	51.40	50.72	42.66	43.37	38.44	38.58	34.22	34.25	29.30	29.33
	C.V.(%)	2.654	2.780	2.929	3.301	3.040	3.851	2.499	2.759	2.571	2.940
	No. Specimens	18		18		18		18		18	
	No. Prepreg Lots	3		3		3		3		3	

2.5.20 "10/80/10" Open-Hole Compression 2 Properties (OHC2)

Material: Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

Resin content: 38.15 %wt **Comp. density:** 1.501 g/cc
Fiber volume: 51.58 %vol
Ply count: 20

Test method: ASTM D6484-23

Normalized by: 0.008800 in. CPT

Open-Hole Compression 2
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
[45/-45/90/45/-45]2S

		CTD		RTD		ETD1		ETW1		ETW2	
Test Temperature [°F]		-65		70		180		180		250	
Moisture Conditioning		Dry		Dry		Dry		Equilibrium		Equilibrium	
Equilibrium at T, RH								160F,85%		160F,85%	
Source code		TCEHX XXXB		TCEHX XXXA		TCEHX XXXC		TCEHX XXXD		TCEHX XXXE	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
OHC2 Strength [ksi]	**Mean**	45.92	44.97	37.93	37.96	33.72	33.74	30.04	29.90	25.18	24.57
	Minimum	44.35	43.00	34.93	35.78	33.03	32.51	28.03	28.34	23.82	23.26
	Maximum	47.53	46.46	40.58	39.55	34.32	35.67	31.39	30.91	26.68	26.11
	C.V.(%)	1.821	1.761	3.102	2.705	1.384	3.392	3.168	2.071	3.134	3.273
	No. Specimens	18		18		6		18		18	
	No. Prepreg Lots	3		3		1		3		3	

2.5.21 "40/20/40" Open-Hole Compression 3 Properties (OHC3)

Material: Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

Resin content: 37.39 %wt **Comp. density:** 1.505 g/cc
Fiber volume: 52.36 %vol
Ply count: 20

Test method: ASTM D6484-23

Normalized by: 0.008800 in. CPT

Open-Hole Compression 3
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
[0/90/-45/0/90]2S

		CTD		RTD		ETD1		ETW1		ETW2	
Test Temperature [°F]		-65		70		180		180		250	
Moisture Conditioning		Dry		Dry		Dry		Equilibrium		Equilibrium	
Equilibrium at T, RH								160F,85%		160F,85%	
Source code		TCEIX XXXB		TCEIX XXXA		TCEIX XXXC		TCEIX XXXD		TCEIX XXXE	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
OHC3 Strength [ksi]	**Mean**	50.61	49.48	41.26	41.31	37.85	37.76	34.39	34.34	30.20	29.58
	Minimum	47.92	47.02	38.95	39.70	36.76	36.11	32.47	32.80	28.10	27.66
	Maximum	53.54	52.33	42.67	44.58	39.01	40.12	36.06	36.08	31.73	30.92
	C.V.(%)	2.763	2.381	2.556	2.925	1.893	4.372	2.862	2.557	3.401	3.268
	No. Specimens	18		18		6		18		18	
	No. Prepreg Lots	3		3		1		3		3	

2.5.22 "25/50/25" Filled-Hole Compression 1 Properties (FHC1)

Material:	Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg					**Filled-Hole Compression 1** Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg [45/0/-45/90]2S			
Resin content:	36.80 %wt	**Comp. density:** 1.508 g/cc							
Fiber volume:	52.96 %vol								
Ply count:	16								
Test method:	ASTM D6742-23								
Normalized by:	0.008800	in. CPT							
		CTD		**RTD**		**ETW1**		**ETW2**	
Test Temperature [°F]		-65		70		180		250	
Moisture Conditioning		Dry		Dry		Equilibrium		Equilibrium	
Equilibrium at T, RH						160F,85%		160F,85%	
Source code		TCE7X XXXB		TCE7X XXXA		TCE7X XXXD		TCE7X XXXE	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
FHC1 Strength [ksi]	**Mean**	90.69	89.09	75.87	75.75	59.19	59.77	51.19	50.37
	Minimum	84.15	82.78	70.64	71.48	50.82	52.87	43.91	42.66
	Maximum	93.04	91.18	80.89	80.47	66.24	65.17	56.43	56.30
	C.V.(%)	3.190	3.041	3.907	3.693	5.860	5.229	6.475	6.478
	No. Specimens	8		21		26		23	
	No. Prepreg Lots	1		3		3		3	

In some cases of FHC>UNC, UNC data is recommended for design. The FHC data is for informational purposes only and is not appropriate to be used for design. Shaded values indicated FHC1>UNC1.

2.5.23 "10/80/10" Filled-Hole Compression 2 Properties (FHC2)

Material: Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Resin content: 37.39 %wt **Comp. density:** 1.506 g/cc
Fiber volume: 52.38 %vol
Ply count: 20

Test method: ASTM D6742-23

Normalized by: 0.008800 in. CPT

Filled-Hole Compression 2
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
[45/-45/90/45/-45]2S

		CTD		RTD		ETW1		ETW2	
Test Temperature [°F]		-65		70		180		250	
Moisture Conditioning		Dry		Dry		Equilibrium		Equilibrium	
Equilibrium at T, RH						160F,85%		160F,85%	
Source code		TCE8X XXXB		TCE8X XXXA		TCE8X XXXD		TCE8X XXXE	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
FHC2 Strength [ksi]	**Mean**	65.39	63.74	54.63	54.71	43.02	43.26	36.05	35.25
	Minimum	63.04	61.52	52.97	52.48	39.42	40.86	34.41	33.42
	Maximum	68.30	67.00	55.98	58.27	45.12	45.71	38.55	38.06
	C.V.(%)	3.206	3.423	1.765	2.472	3.360	2.966	3.373	4.018
	No. Specimens	7		20		20		20	
	No. Prepreg Lots	1		3		3		3	

In some cases of FHC>UNC, UNC data is recommended for design. The FHC data is for informational purposes only and is not appropriate to be used for design. Shaded values indicated FHC2>UNC2.

2.5.24 "40/20/40" Filled-Hole Compression 3 Properties (FHC3)

Material: Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Resin content: 37.27 %wt **Comp. density:** 1.505 g/cc
Fiber volume: 52.46 %vol
Ply count: 20

Test method: ASTM D6742-23

Normalized by: 0.008800 in. CPT

Filled-Hole Compression 3
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
[0/90/-45/0/90]2S

		CTD		RTD		ETW1		ETW2	
Test Temperature [°F]		-65		70		180		250	
Moisture Conditioning		Dry		Dry		Equilibrium		Equilibrium	
Equilibrium at T, RH						160F,85%		160F,85%	
Source code		TCE9X XXXB		TCE9X XXXA		TCE9X XXXD		TCE9X XXXE	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
FHC3 Strength [ksi]	**Mean**	96.96	94.07	78.50	78.07	63.22	63.62	52.84	51.91
	Minimum	87.64	86.66	69.40	71.87	58.42	58.23	48.81	47.98
	Maximum	104.0	98.85	83.25	82.31	69.28	67.21	56.89	56.73
	C.V.(%)	4.416	3.555	4.994	3.769	5.135	4.246	4.557	4.862
	No. Specimens	15		14		19		21	
	No. Prepreg Lots	2		2		3		3	

In some cases of FHC>UNC, UNC data is recommended for design. The FHC data is for informational purposes only and is not appropriate to be used for design. Shaded values indicated FHC3>UNC3.

2.5.25 "25/50/25" Single-Shear Bearing 1 Properties (SSB1, Proc. C)

Material:	Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg							**Single-Shear Bearing 1 Proc. C** Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg [45/0/-45/90]2S	
Resin content:	40.60 %wt	**Comp. density:** 1.479 g/cc							
Fiber volume:	48.82 %vol								
Ply count:	16								
Test method:	ASTM D5961-23, Proc. C								
Normalized by:	0.008800	in. CPT							
		RTD		**ETW1**		**ETW2**			
Test Temperature [°F]		70		180		250			
Moisture Conditioning		Dry		Equilibrium		Equilibrium			
Equilibrium at T, RH				160F,85%		160F,85%			
Source code		TCE1X XXXA		TCE1X XXXD		TCE1X XXXE			
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**		
SSB1, Proc. C 2% Offset Strength [ksi]	**Mean**	103.6	110.8	91.87	97.94	87.55	85.38		
	Minimum	94.43	101.3	85.27	88.86	79.91	79.61		
	Maximum	114.7	119.7	100.1	104.5	94.68	91.36		
	C.V.(%)	4.808	4.515	4.802	4.128	3.998	3.363		
	No. Specimens	18		18		18			
	No. Prepreg Lots	3		3		3			
SSB1, Proc. C Ultimate Strength [ksi]	**Mean**	125.0	133.7	107.7	114.9	100.8	98.33		
	Minimum	117.9	127.8	100.7	105.2	93.28	92.33		
	Maximum	130.4	141.5	122.0	125.9	108.2	107.3		
	C.V.(%)	2.280	2.507	4.441	4.356	3.997	4.034		
	No. Specimens	18		18		18			
	No. Prepreg Lots	3		3		3			
SSB1, Proc. C Chord Stiffness [Msi]	**Mean**	1.502	1.607	1.489	1.589	1.462	1.426		
	Minimum	1.439	1.516	1.363	1.401	1.416	1.366		
	Maximum	1.575	1.735	1.544	1.714	1.493	1.487		
	C.V.(%)	2.452	3.565	2.988	4.534	1.555	2.546		
	No. Specimens	18		18		18			
	No. Prepreg Lots	3		3		3			

2.5.26 "10/80/10" Single-Shear Bearing 2 Properties (SSB2, Proc. C)

Material:	Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg							**Single-Shear Bearing 2 Proc. C** Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg [45/-45/90/45/-45]2S	
Resin content:	40.61 %wt	**Comp. density:**	1.481 g/cc						
Fiber volume:	48.87 %vol								
Ply count:	20								
Test method:	ASTM D5961-23, Proc. C								
Normalized by:	0.008800	in. CPT							
			RTD		**ETW1**		**ETW2**		
Test Temperature [°F]			70		180		250		
Moisture Conditioning			Dry		Equilibrium		Equilibrium		
Equilibrium at T, RH					160F,85%		160F,85%		
Source code			TCE2X XXXA		TCE2X XXXD		TCE2X XXXE		
			Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	
SSB2, Proc. C 2% Offset Strength [ksi]	**Mean**		100.3	106.1	86.09	90.32	79.86	77.96	
	Minimum		92.78	94.93	82.28	84.86	75.77	73.88	
	Maximum		108.6	113.0	90.45	96.05	83.73	82.81	
	C.V.(%)		4.511	4.246	2.935	3.674	3.328	3.798	
	No. Specimens		18		18		18		
	No. Prepreg Lots		3		3		3		
SSB2, Proc. C Ultimate Strength [ksi]	**Mean**		123.0	130.1	104.9	110.1	97.32	94.99	
	Minimum		116.0	123.7	98.90	104.3	93.95	92.23	
	Maximum		130.9	138.9	111.3	116.3	102.1	99.82	
	C.V.(%)		3.070	3.066	3.098	3.558	2.554	2.542	
	No. Specimens		18		18		18		
	No. Prepreg Lots		3		3		3		
SSB2, Proc. C Chord Stiffness [Msi]	**Mean**		1.044	1.104	1.044	1.095	0.9953	0.9716	
	Minimum		0.9685	0.9916	0.9921	1.005	0.9243	0.8888	
	Maximum		1.172	1.227	1.089	1.186	1.041	1.023	
	C.V.(%)		4.470	5.279	2.917	5.036	3.264	3.749	
	No. Specimens		18		18		18		
	No. Prepreg Lots		3		3		3		

2.5.27 "40/20/40" Single-Shear Bearing 3 Properties (SSB3, Proc. C)

Material:	Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg							**Single-Shear Bearing 3 Proc. C** Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg [0/90/-45/0/90]2S	
Resin content:	38.47 %wt	**Comp. density:**	1.496 g/cc						
Fiber volume:	51.15 %vol								
Ply count:	20								
Test method:	ASTM D5961-23, Proc. C								
Normalized by:	0.008800	in. CPT							
		RTD		**ETW1**		**ETW2**			
Test Temperature [°F]		70		180		250			
Moisture Conditioning		Dry		Equilibrium		Equilibrium			
Equilibrium at T, RH				160F,85%		160F,85%			
Source code		TCE3X XXXA		TCE3X XXXD		TCE3X XXXE			
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**		
SSB3, Proc. C 2% Offset Strength [ksi]	**Mean**	92.29	97.69	82.14	86.75	74.76	73.04		
	Minimum	83.35	91.42	71.36	78.69	66.59	64.28		
	Maximum	101.4	104.8	89.51	93.30	80.88	79.32		
	C.V.(%)	4.899	3.935	5.103	4.293	5.298	5.099		
	No. Specimens	18		18		18			
	No. Prepreg Lots	3		3		3			
SSB3, Proc. C Ultimate Strength [ksi]	**Mean**	116.5	123.4	100.8	106.6	92.21	90.10		
	Minimum	107.4	116.8	95.74	99.46	88.47	87.05		
	Maximum	124.8	129.8	104.3	112.3	96.80	94.93		
	C.V.(%)	4.472	3.264	2.432	3.348	2.148	2.148		
	No. Specimens	18		18		18			
	No. Prepreg Lots	3		3		3			
SSB3, Proc. C Chord Stiffness [Msi]	**Mean**	1.343	1.423	1.335	1.412	1.293	1.263		
	Minimum	1.258	1.339	1.259	1.256	1.202	1.169		
	Maximum	1.463	1.540	1.396	1.532	1.357	1.341		
	C.V.(%)	3.636	3.998	3.321	5.572	2.981	3.606		
	No. Specimens	18		18		18			
	No. Prepreg Lots	3		3		3			

2.5.28 “25/50/25” Compression After Impact 1 Properties (CAI1)

Material:	Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg					**Compression After Impact 1** Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg [45/0/-45/90]3S		
Resin content:	37.86 %wt	**Comp. density:**	1.502 g/cc					
Fiber volume:	51.87 %vol							
Ply count:	24							
Test method:	ASTM D7136-20/D7137-23							
Normalized by:	0.008800	in. CPT						
		CTD		**RTD**				
Test Temperature [°F]		-65		70				
Moisture Conditioning		Dry		Dry				
Equilibrium at T, RH								
Source code		TCEKX XXXB		TCEKX XXXA				
		Normalized	**Measured**	**Normalized**	**Measured**			
CAI1 Strength [ksi]	**Mean**	51.12	50.80	43.34	43.79			
	Minimum	48.81	48.27	40.87	40.87			
	Maximum	54.29	53.16	45.76	46.81			
	C.V.(%)	2.860	2.418	2.918	3.297			
	No. Specimens	18		18				
	No. Prepreg Lots	3		3				

2.5.29 "40/20/40" Compression After Impact 3 Properties (CAI3)

Material:	Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg						**Compression After Impact 3** Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg [0/90/-45/0/90]2S			
Resin content:	38.39 %wt	**Comp. density:**	1.503 g/cc							
Fiber volume:	51.43 %vol									
Ply count:	20									
Test method:	ASTM D7136-20/D7137-23									
Normalized by:	0.008800	in. CPT								
			RTD							
Test Temperature [°F]			70							
Moisture Conditioning			Dry							
Equilibrium at T, RH										
Source code			TCEPX XXXA							
			Normalized	**Measured**						
CAI3 Strength [ksi]	**Mean**		41.52	41.87						
	Minimum		40.56	40.76						
	Maximum		43.54	42.55						
	C.V.(%)		2.800	1.730						
	No. Specimens		6							
	No. Prepreg Lots		1							

2.5.30 “50/0/50” Interlaminar Tension Properties (ILT)

Material:	Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg								
Resin content:	40.18 %wt	**Comp. density:**	1.487 g/cc						
Fiber volume:	49.42 %vol								
Ply count:	20								
Test method:	ASTM D6415-22								
Normalized by:	NA								

Interlaminar Tension
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
[0]20

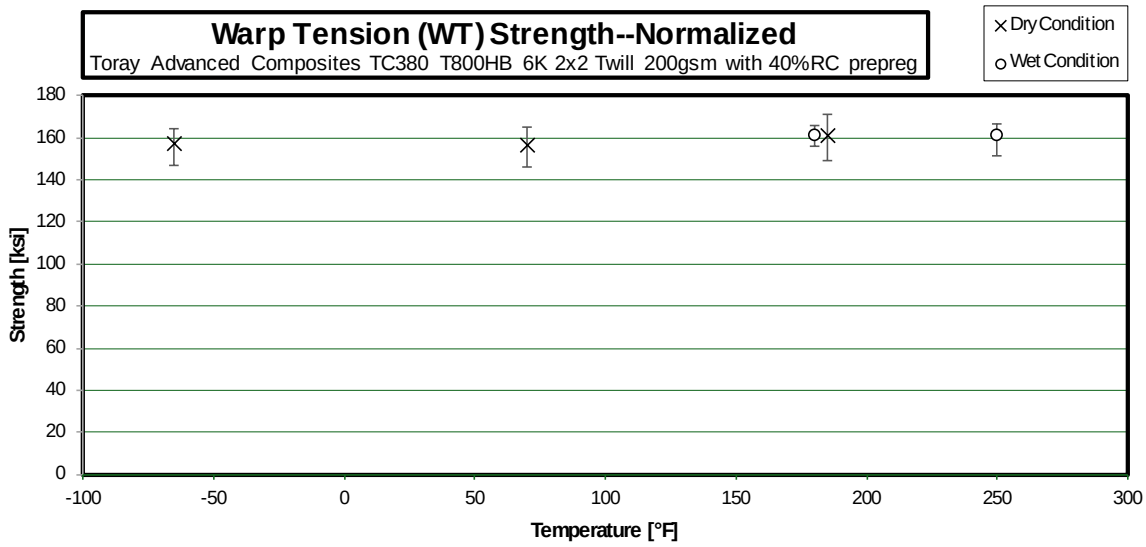
		CTD		RTD		ETW1			
Test Temperature [°F]		-65		70		180			
Moisture Conditioning		Dry		Dry		Equilibrium			
Equilibrium at T, RH						160F,85%			
Source code		TCEMX XXXB		TCEMX XXXA		TCEMX XXXD			
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**		
CBS [lb]	**Mean**		558.0		459.8		308.0		
	Minimum		536.7		437.2		273.1		
	Maximum		585.3		498.4		359.8		
	C.V.(%)		3.175		4.731		10.50		
	No. Specimens	6		6		7			
	No. Prepreg Lots	1		1		1			
ILT [ksi]	**Mean**		15.78		13.20		8.404		
	Minimum		15.28		12.65		7.663		
	Maximum		16.73		14.17		9.589		
	C.V.(%)		3.128		4.198		9.367		
	No. Specimens	6		6		7			
	No. Prepreg Lots	1		1		1			

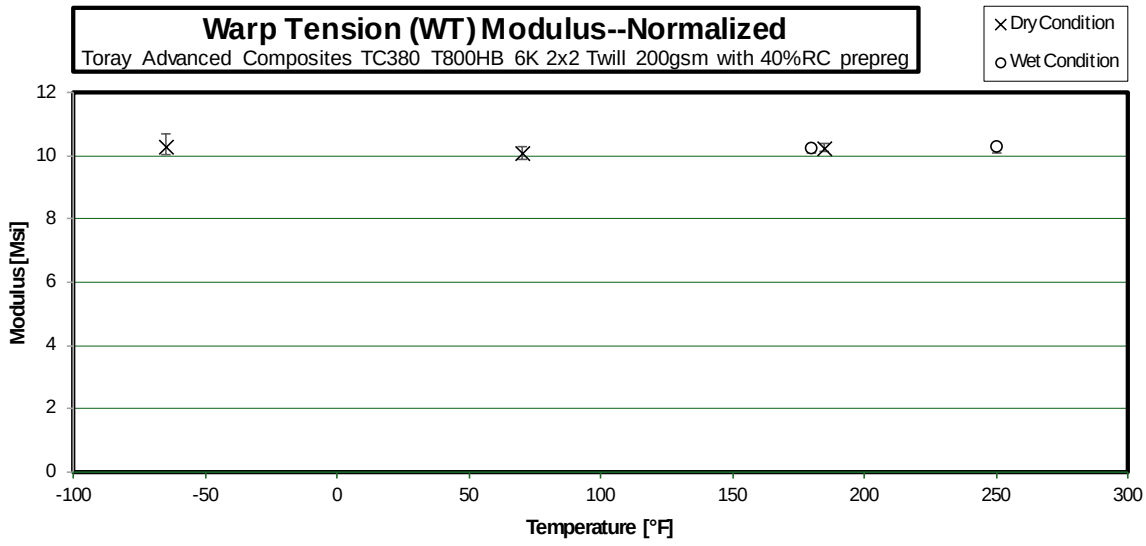
3. Individual Test Charts

The material property test charts display a combination of all three batches and both cure cycles for a particular property as a function of test temperature for dry and wet test conditions. The average is plotted for each material property and the minimum to maximum range is represented by vertical bars.

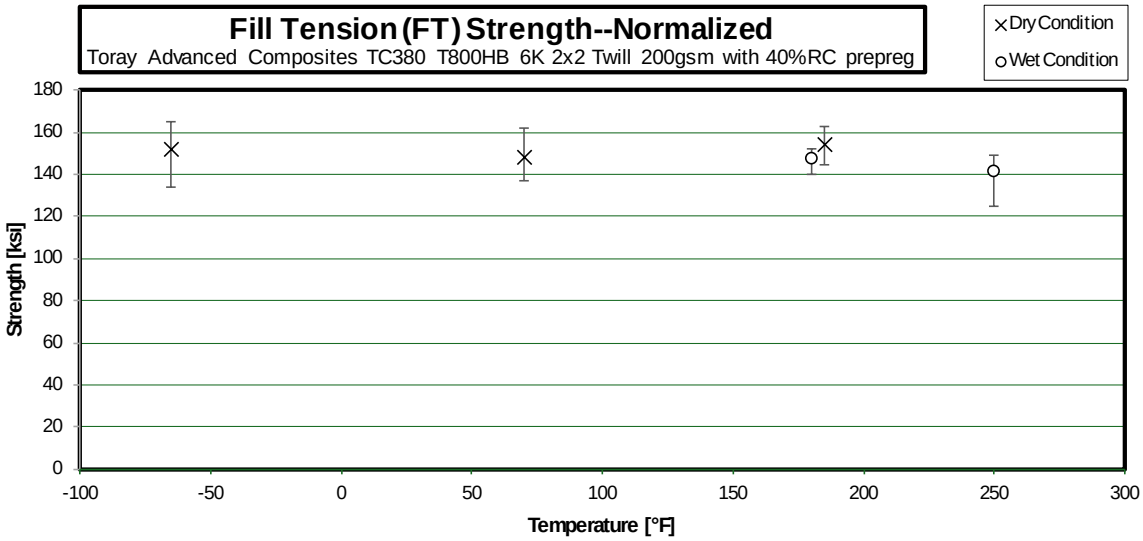
Plots have been offset for ETD1 to 185°F (from 180°F) to improve clarity and readability.

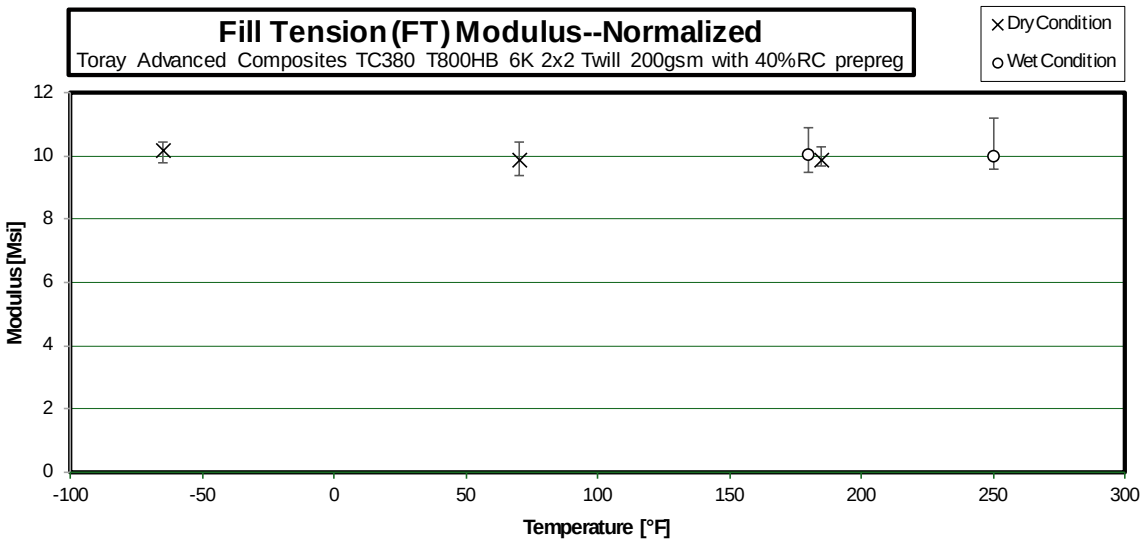
3.1 Warp Tension Properties (WT)



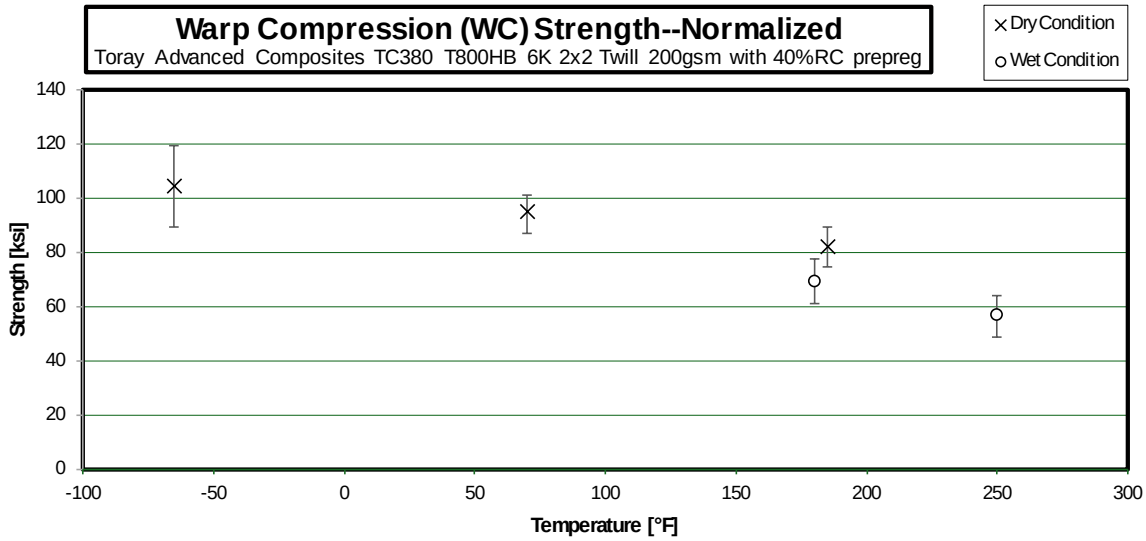


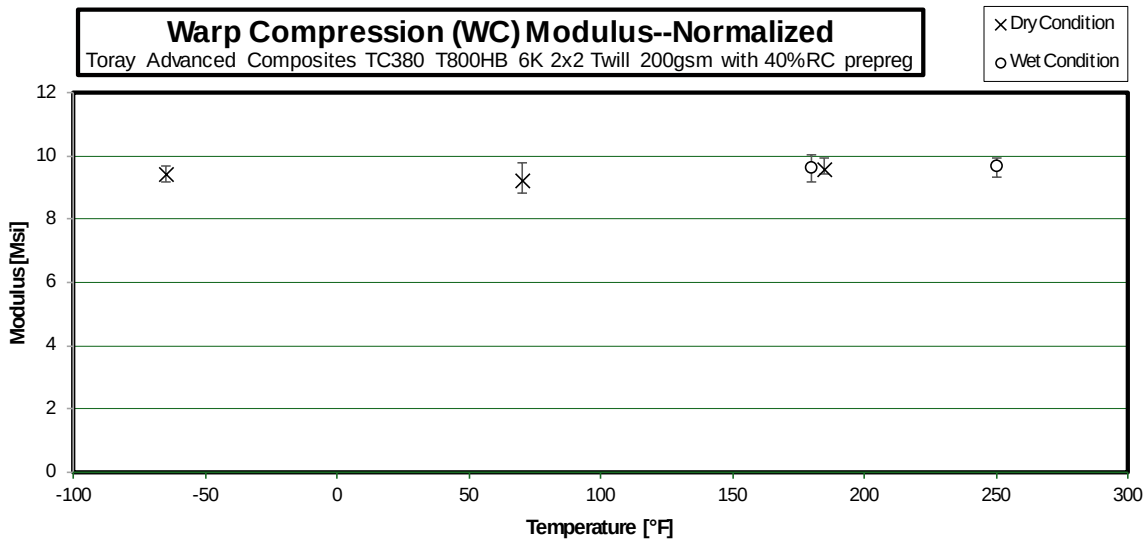
3.2 Fill Tension Properties (FT)



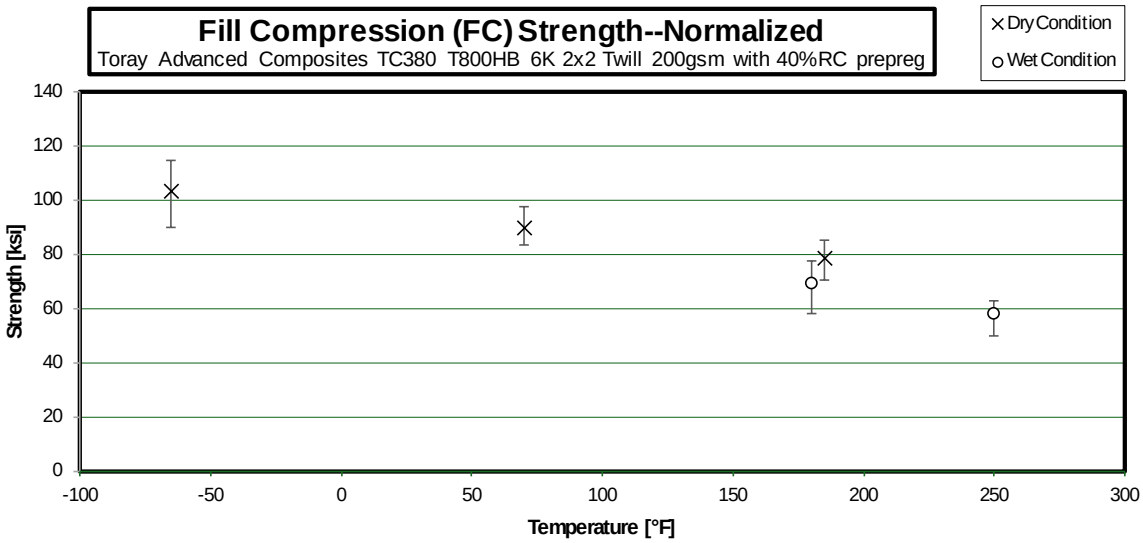


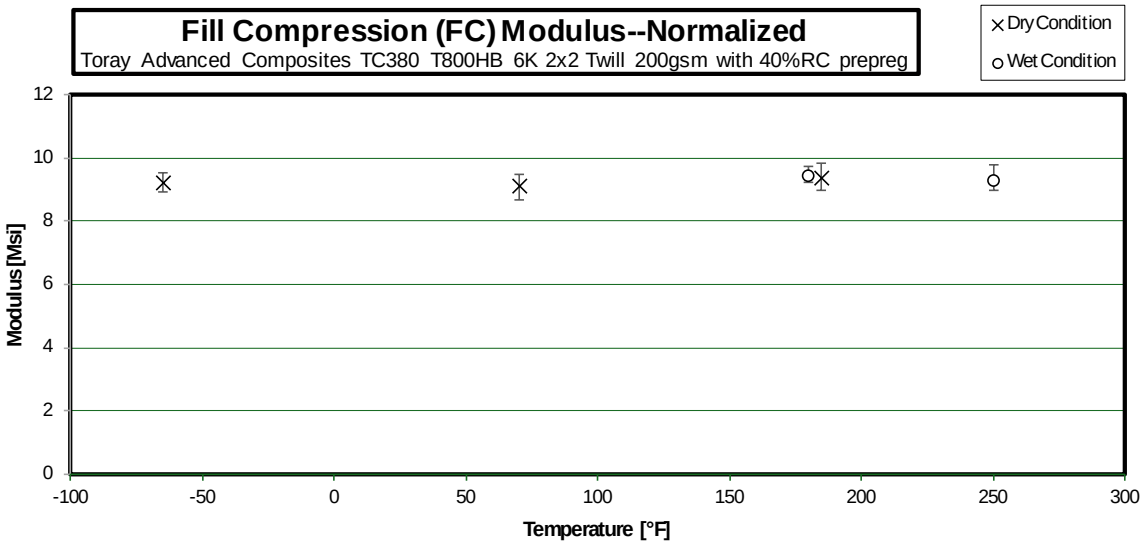
3.3 Warp Compression Properties (WC)



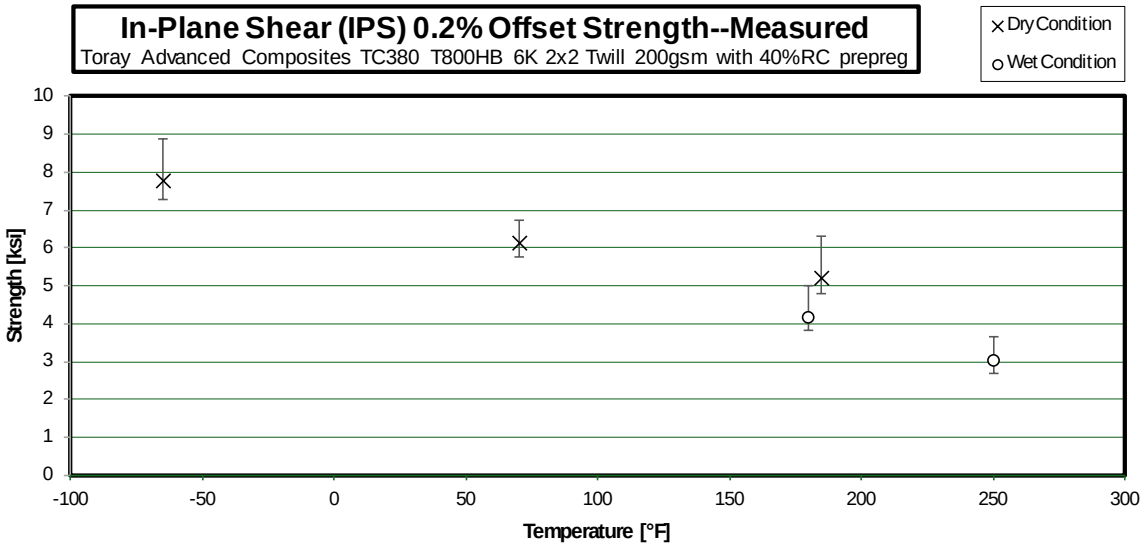


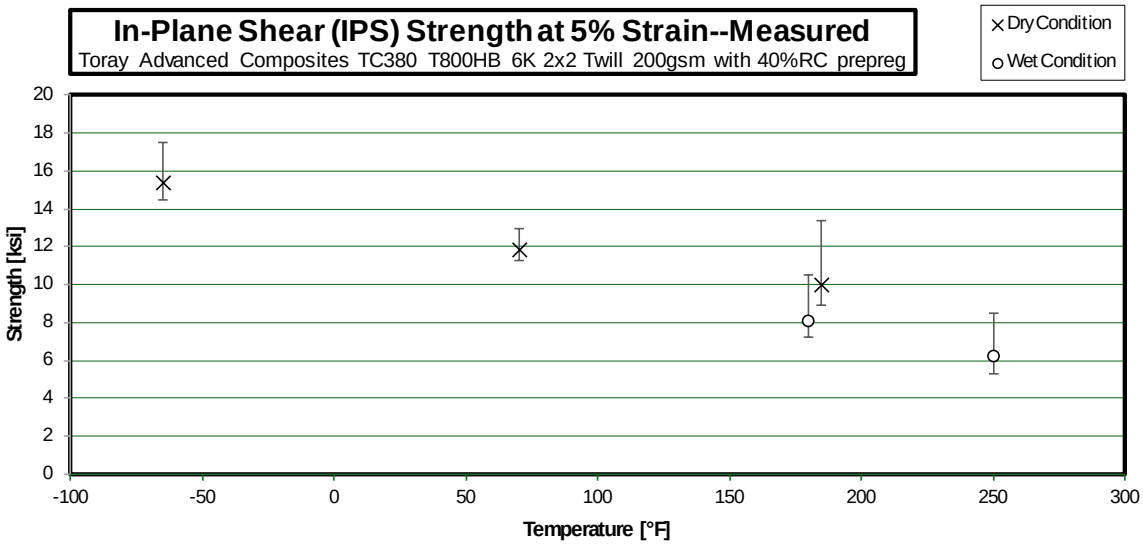
3.4 Fill Compression Properties (FC)

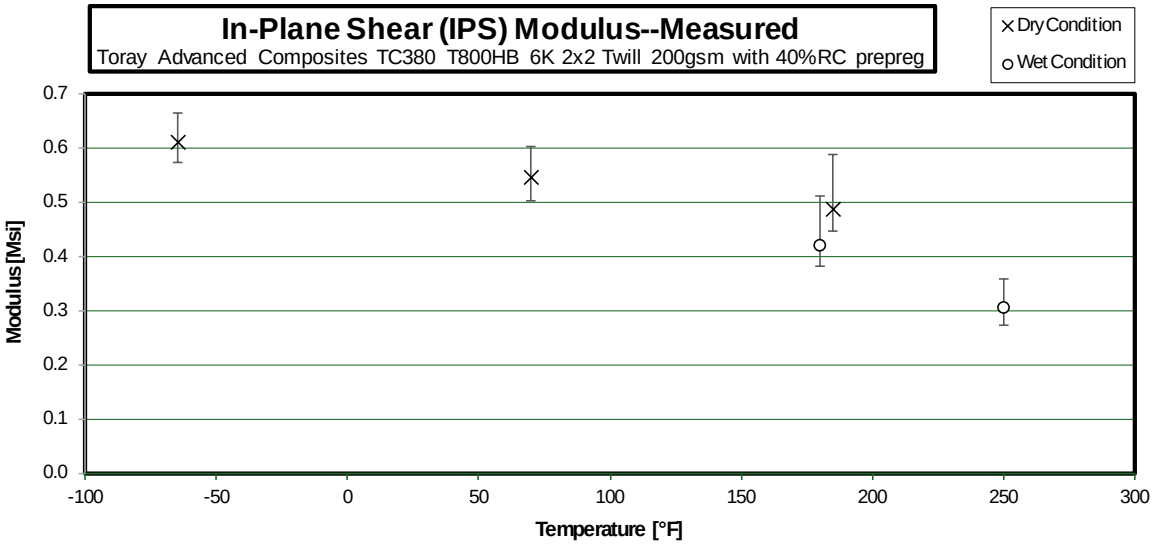




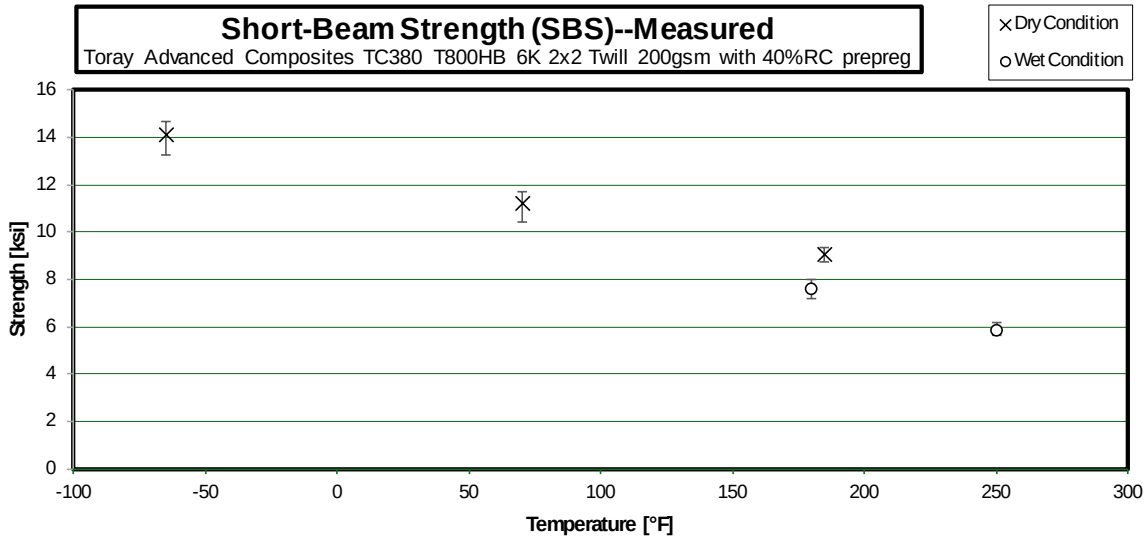
3.5 In-Plane Shear Properties (IPS)



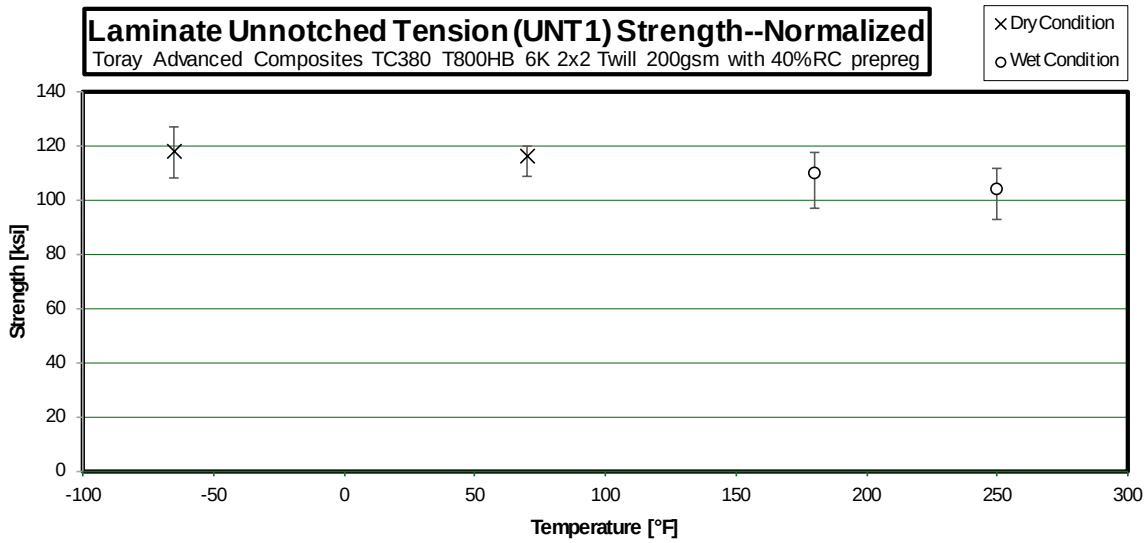


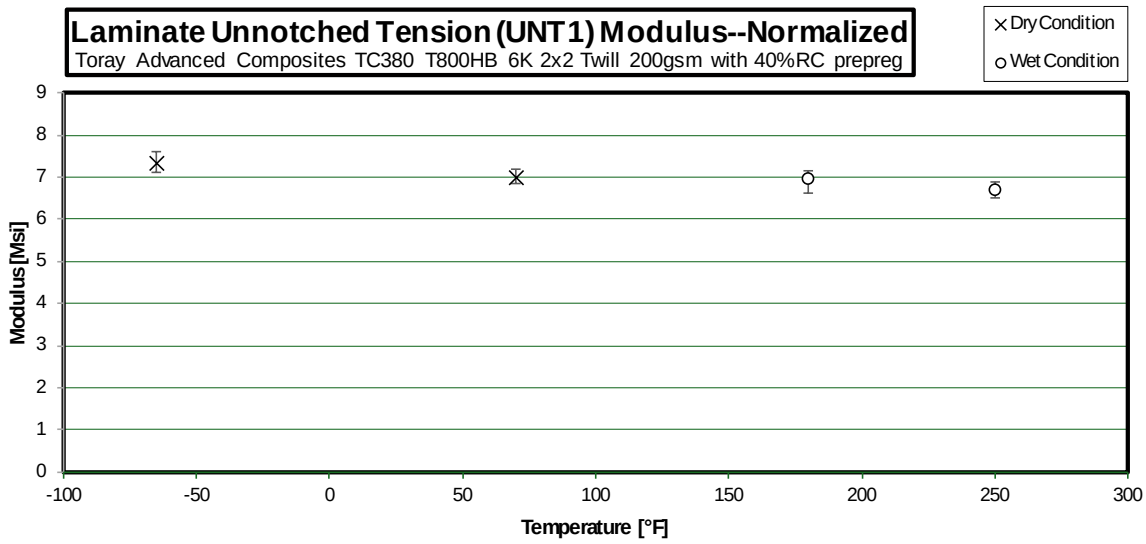


3.6 Lamina Short-Beam Strength Properties (SBS)

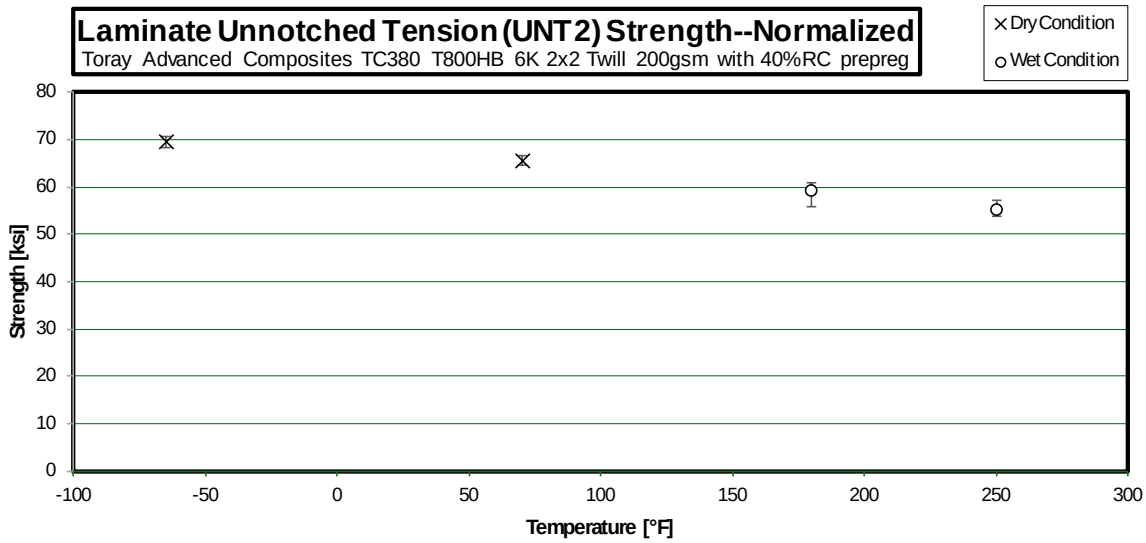


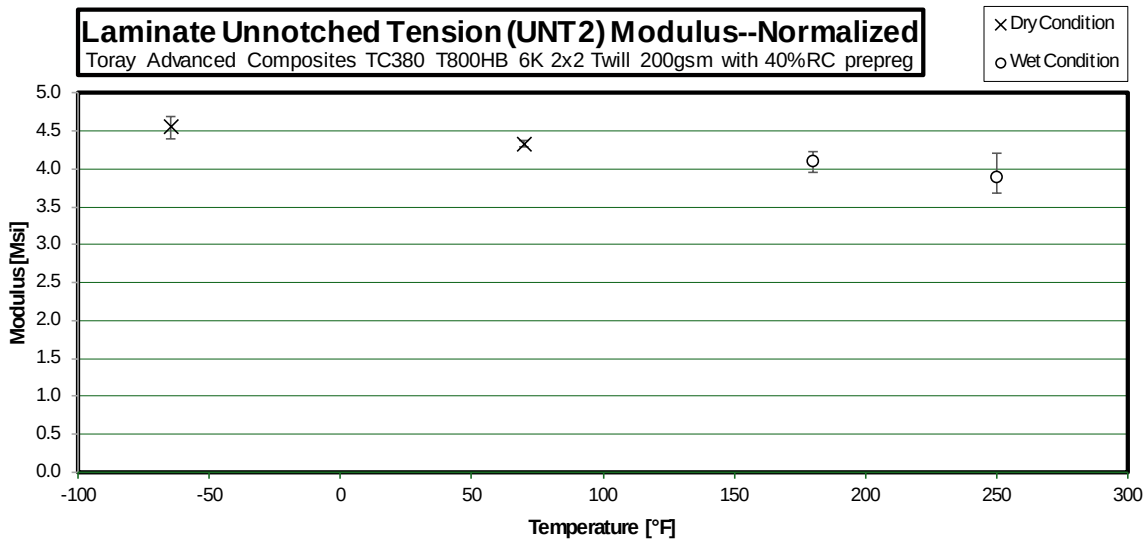
3.7 "25/50/25" Unnotched Tension 1 Properties (UNT1)



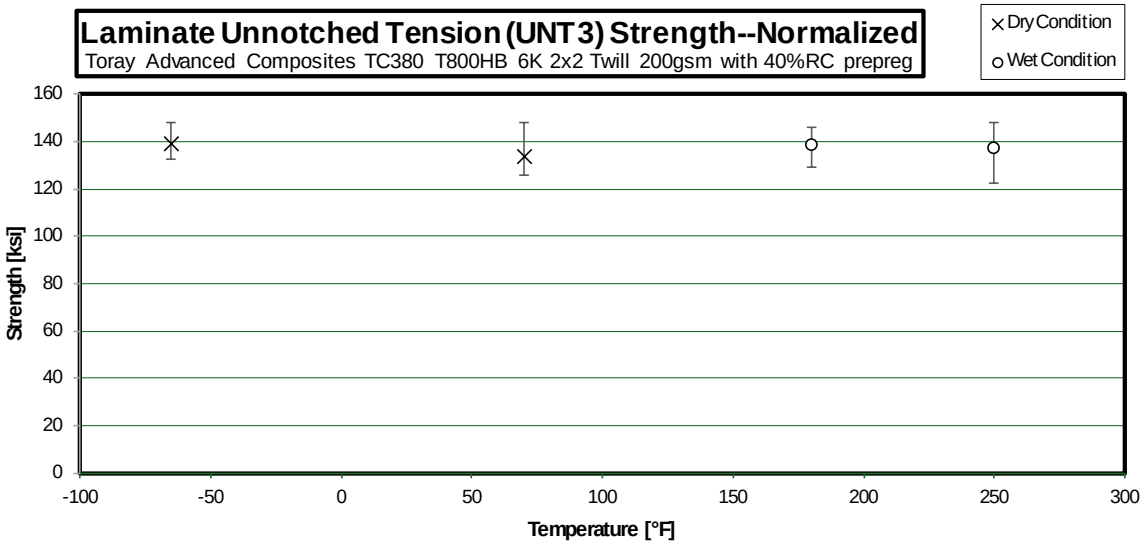


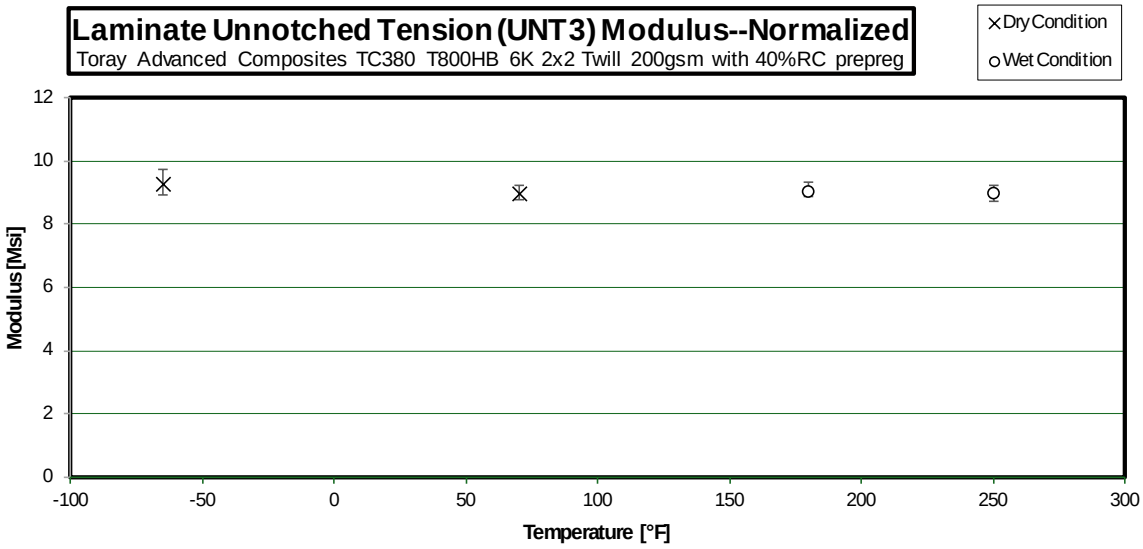
3.8 "10/80/10" Unnotched Tension 2 Properties (UNT2)



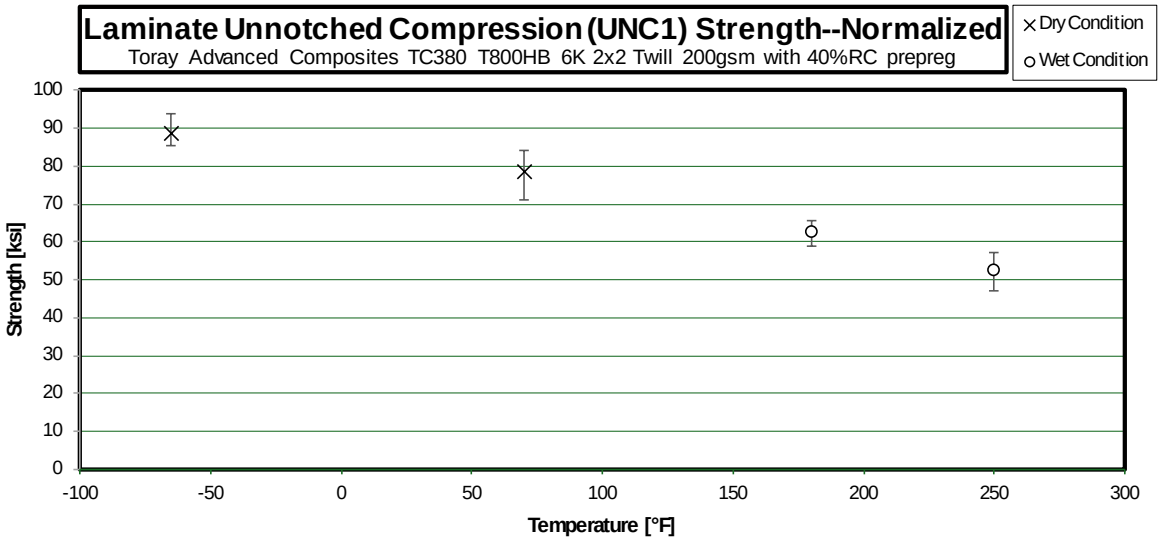


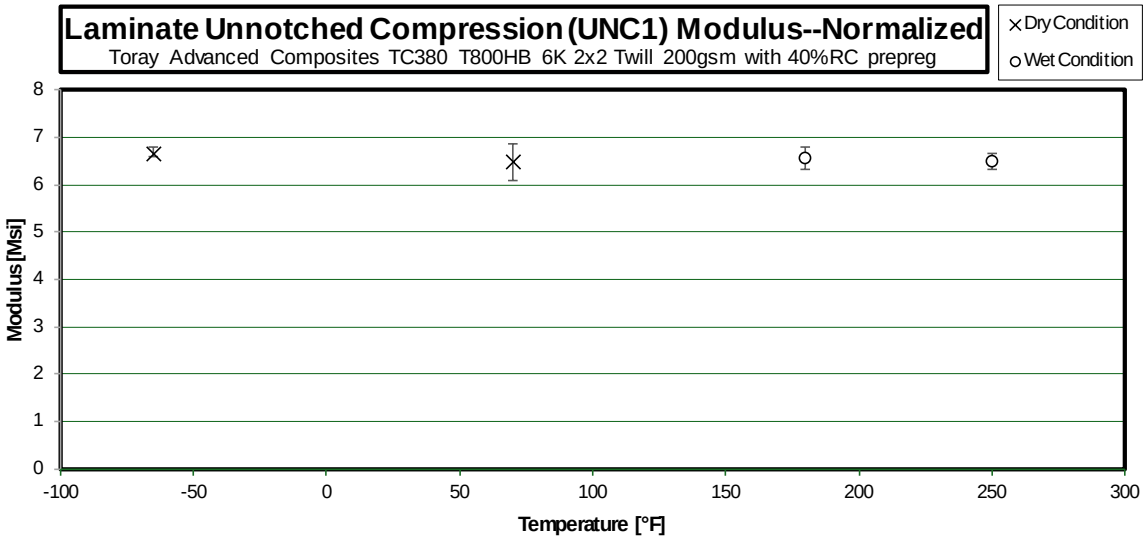
3.9 "40/20/40" Unnotched Tension 3 Properties (UNT3)



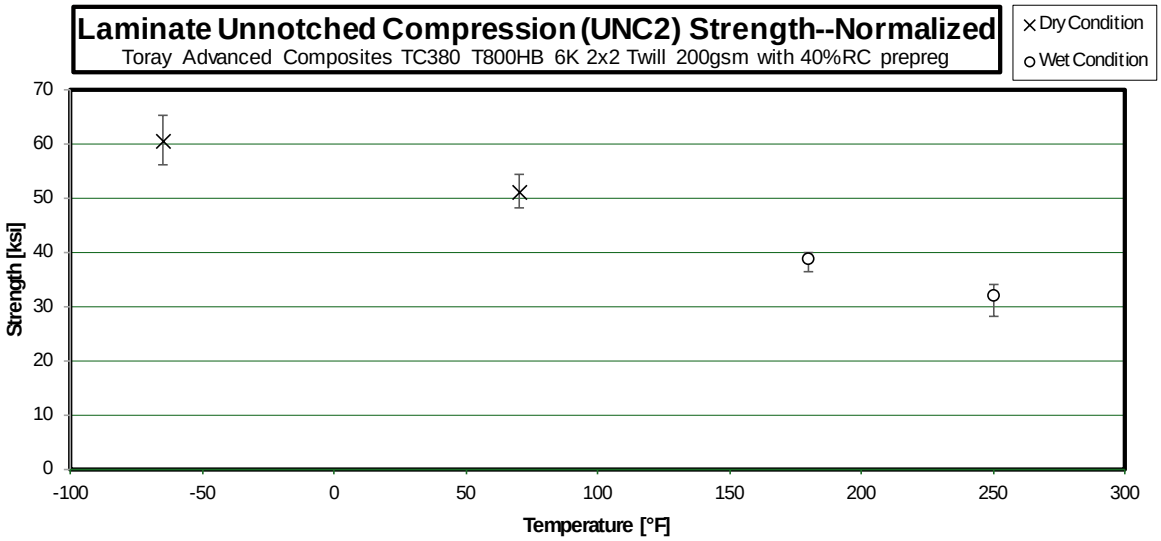


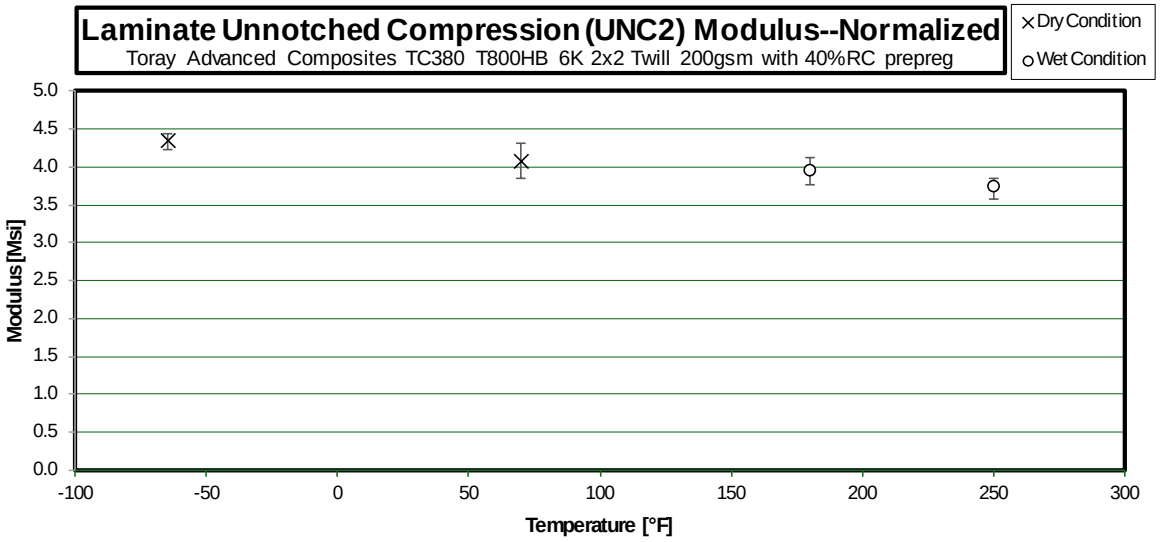
3.10 "25/50/25" Unnotched Compression 1 Properties (UNC1)



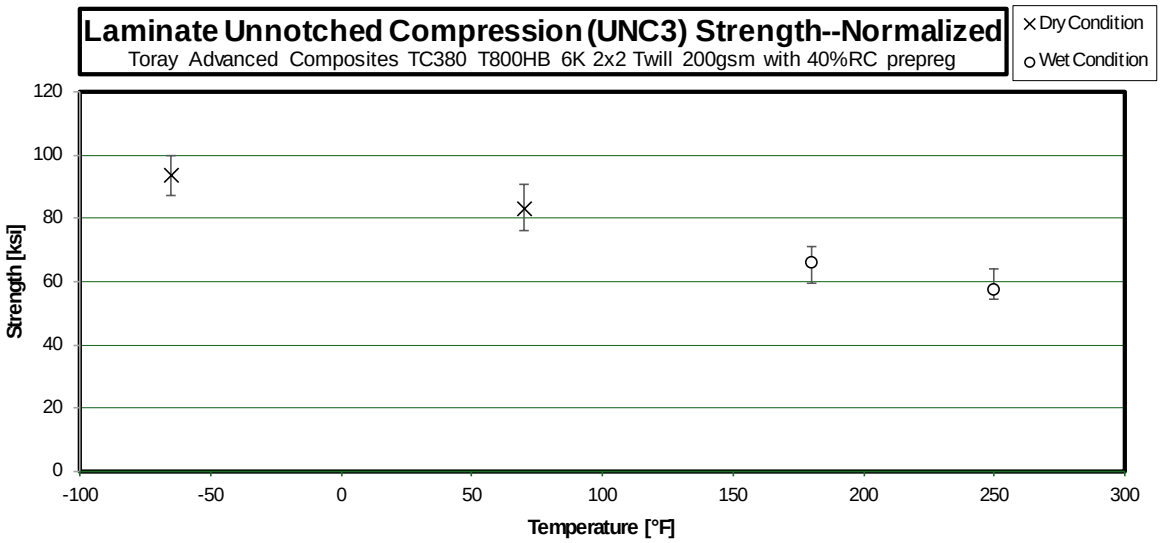


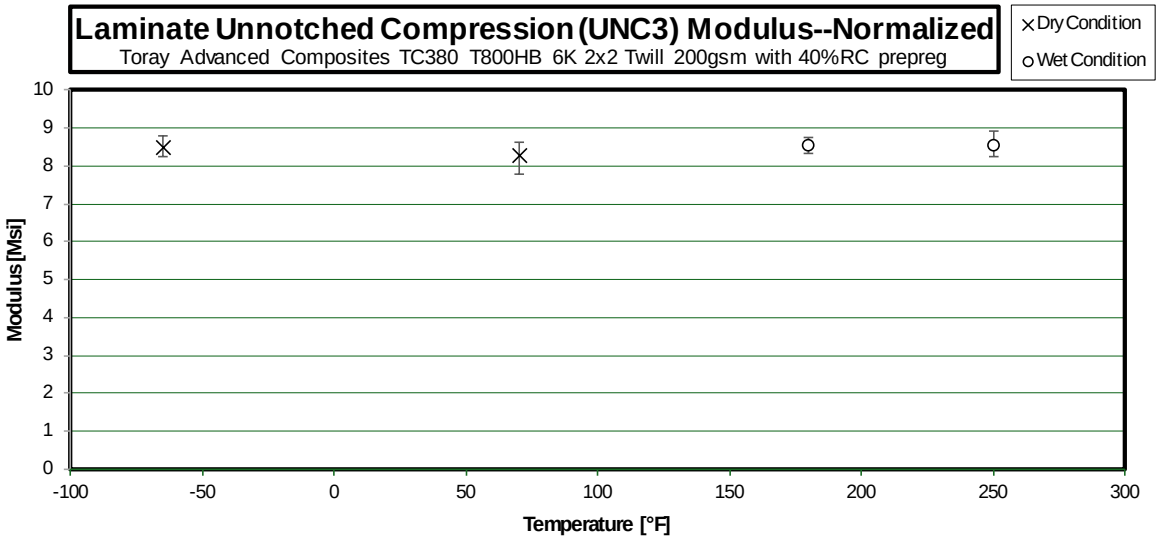
3.11 "10/80/10" Unnotched Compression 2 Properties (UNC2)



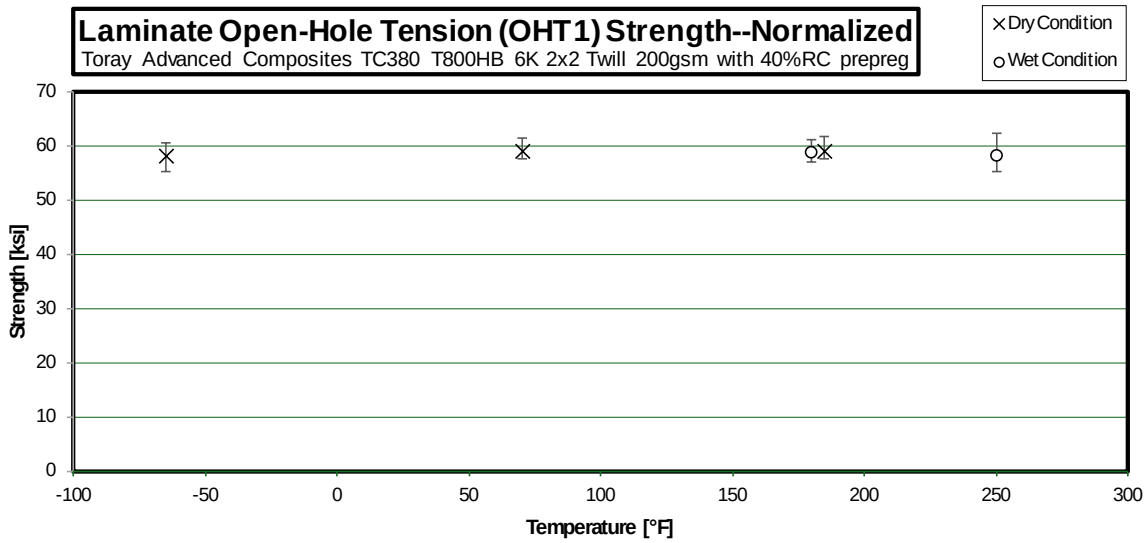


3.12 "40/20/40" Unnotched Compression 3 Properties (UNC3)

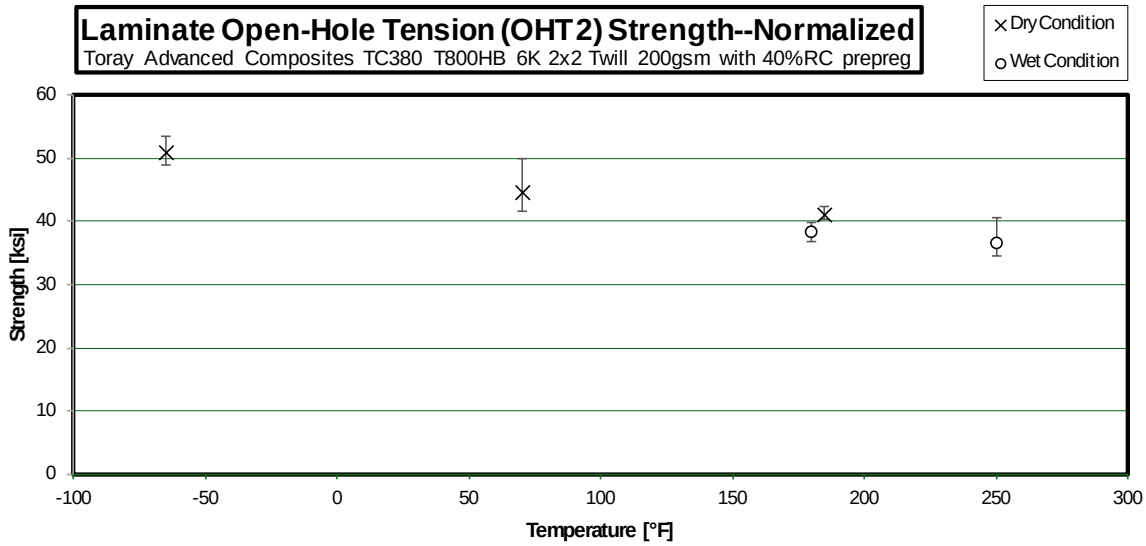




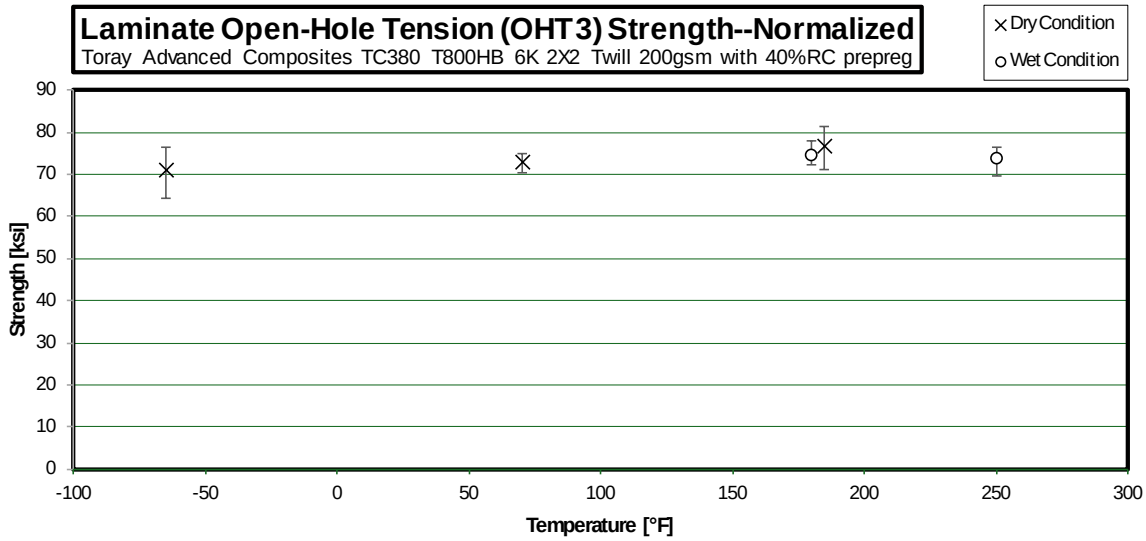
3.13 “25/50/25” Open-Hole Tension 1 Properties (OHT1)



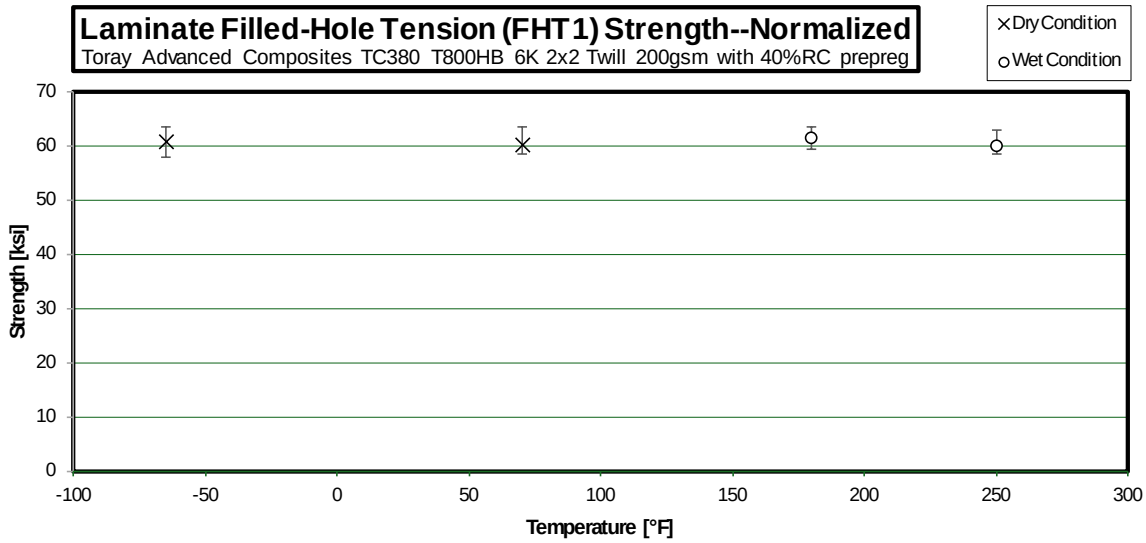
3.14 “10/80/10” Open-Hole Tension 2 Properties (OHT2)



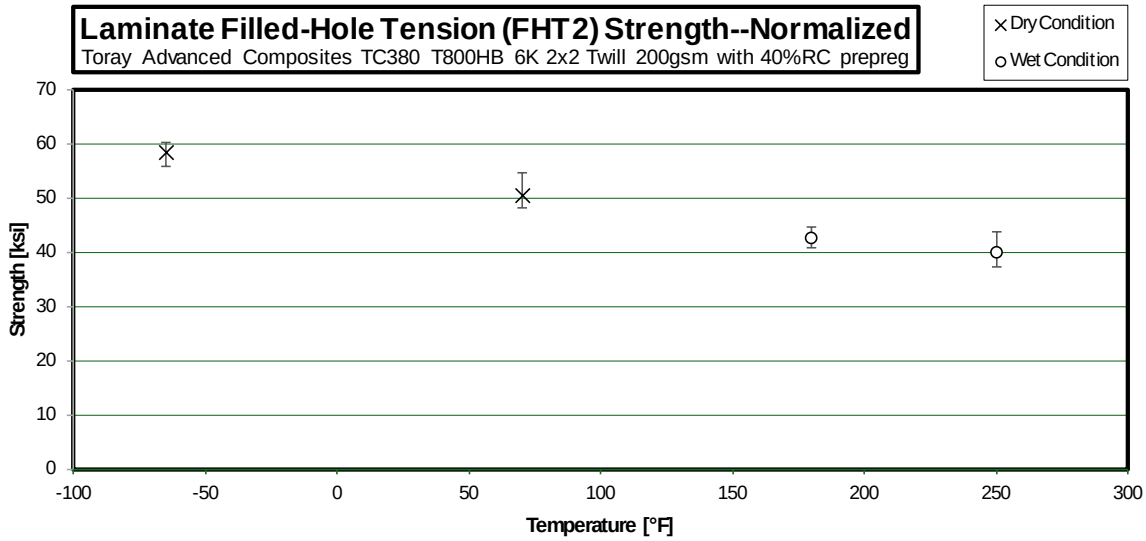
3.15 "40/20/40" Open-Hole Tension 3 Properties (OHT3)



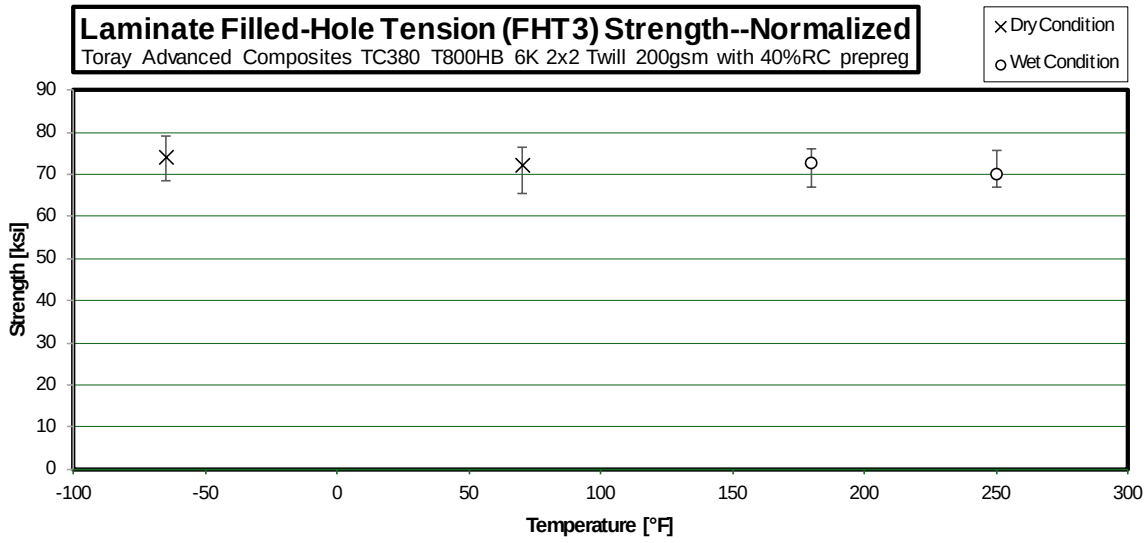
3.16 "25/50/25" Filled-Hole Tension 1 Properties (FHT1)



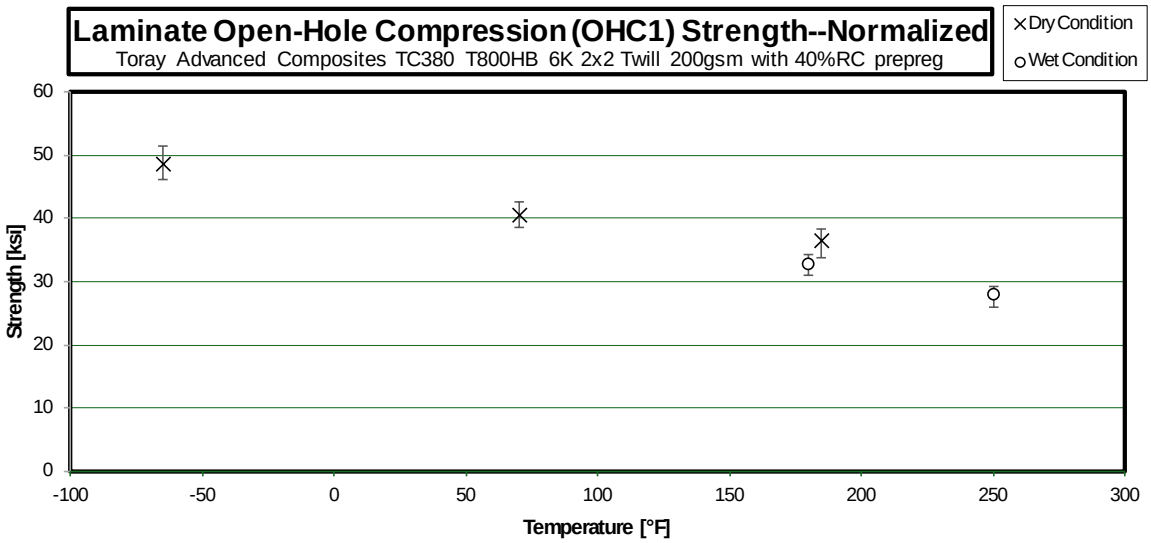
3.17 "10/80/10" Filled-Hole Tension 2 Properties (FHT2)



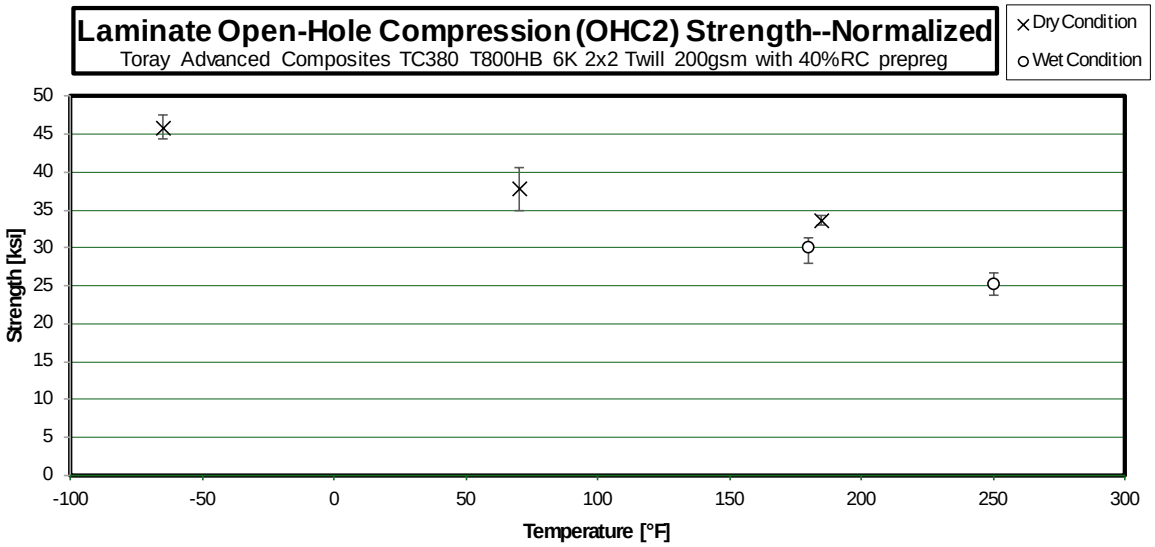
3.18 "40/20/40" Filled-Hole Tension 3 Properties (FHT3)



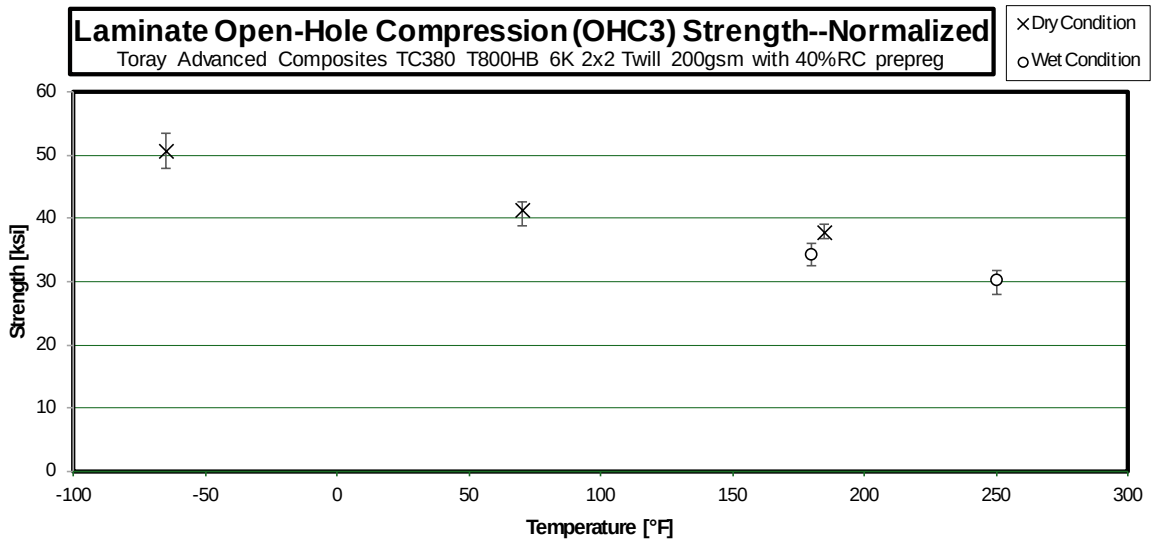
3.19 "25/50/25" Open-Hole Compression 1 Properties (OHC1)



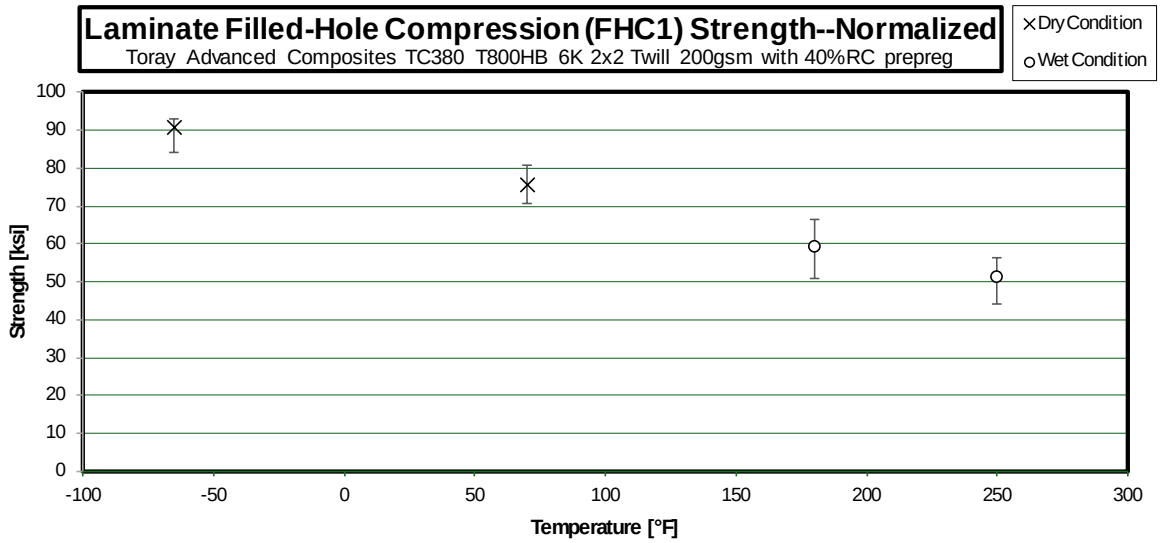
3.20 "10/80/10" Open-Hole Compression 2 Properties (OHC2)



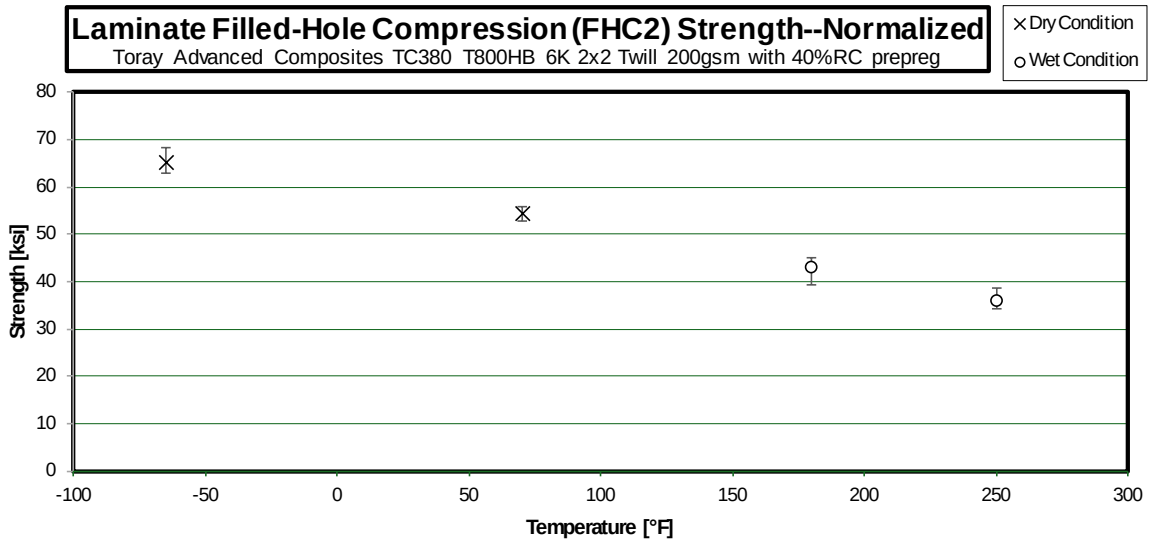
3.21 "40/20/40" Open-Hole Compression 3 Properties (OHC3)



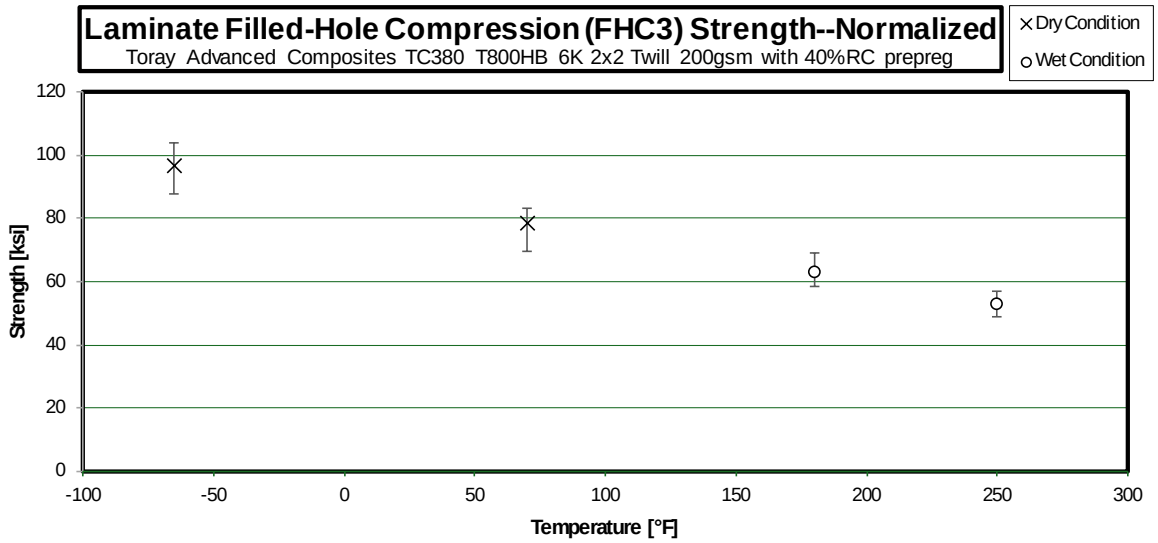
3.22 "25/50/25" Filled-Hole Compression 1 Properties (FHC1)



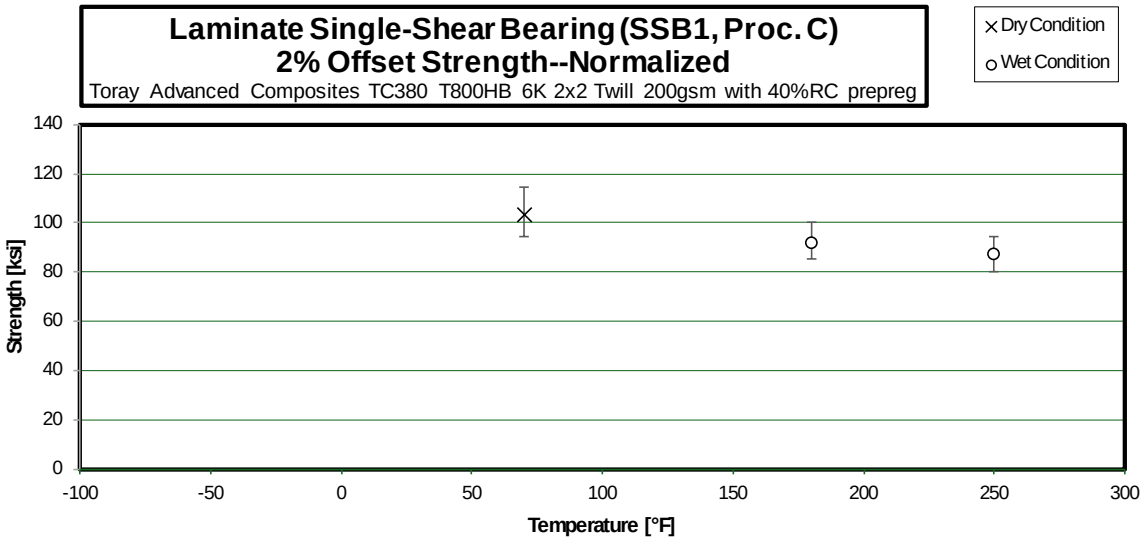
3.23 "10/80/10" Filled-Hole Compression 2 Properties (FHC2)

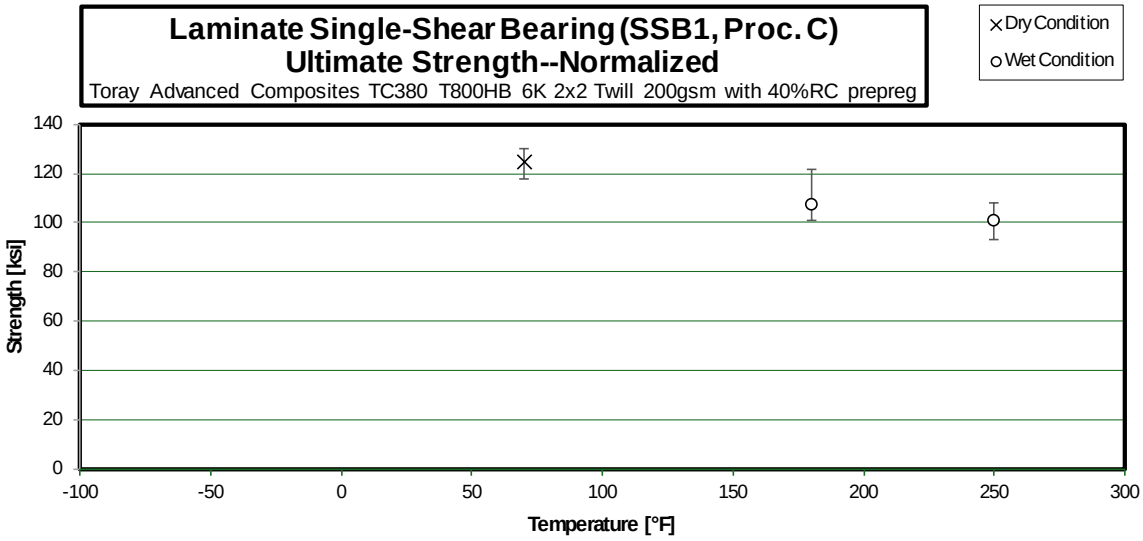


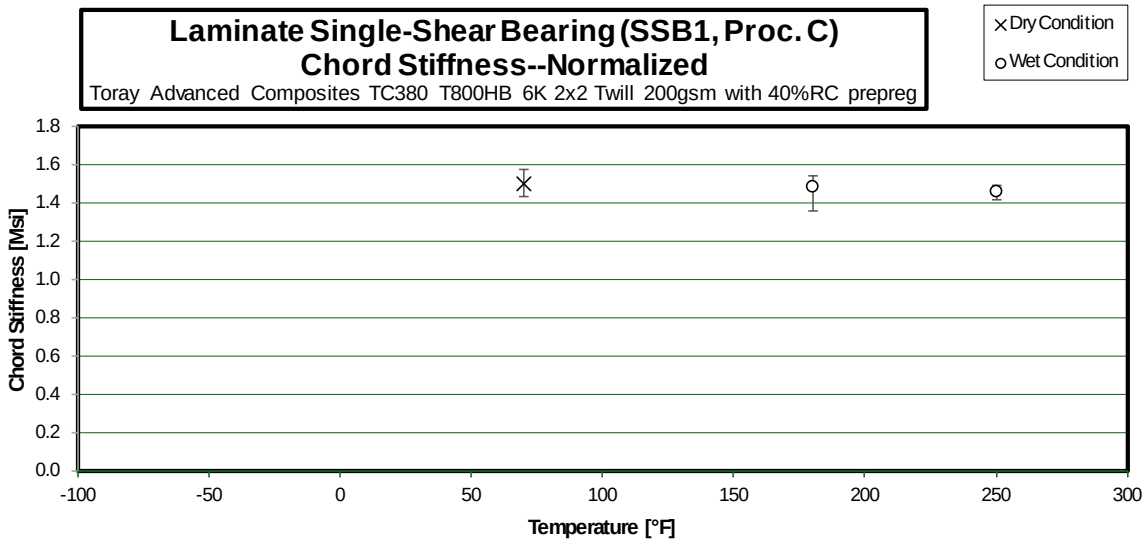
3.24 "40/20/40" Filled-Hole Compression 3 Properties (FHC3)



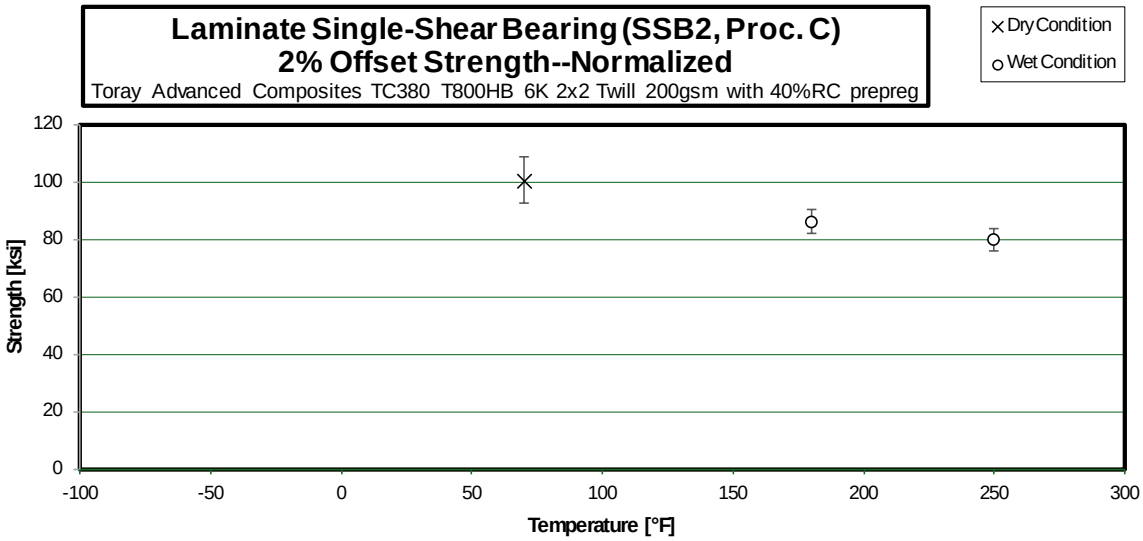
3.25 "25/50/25" Single-Shear Bearing 1 Properties (SSB1, Proc. C)

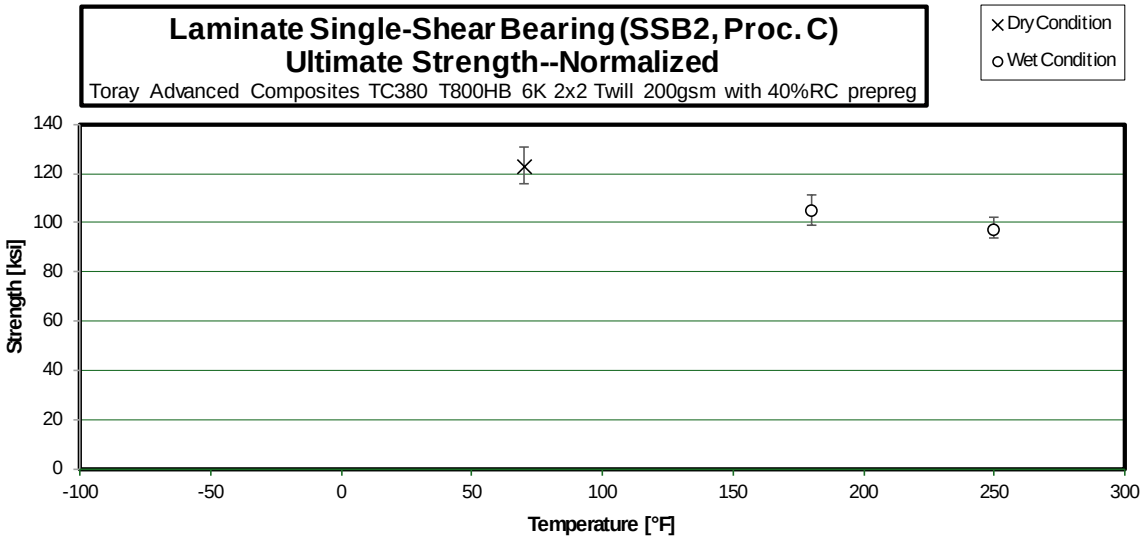


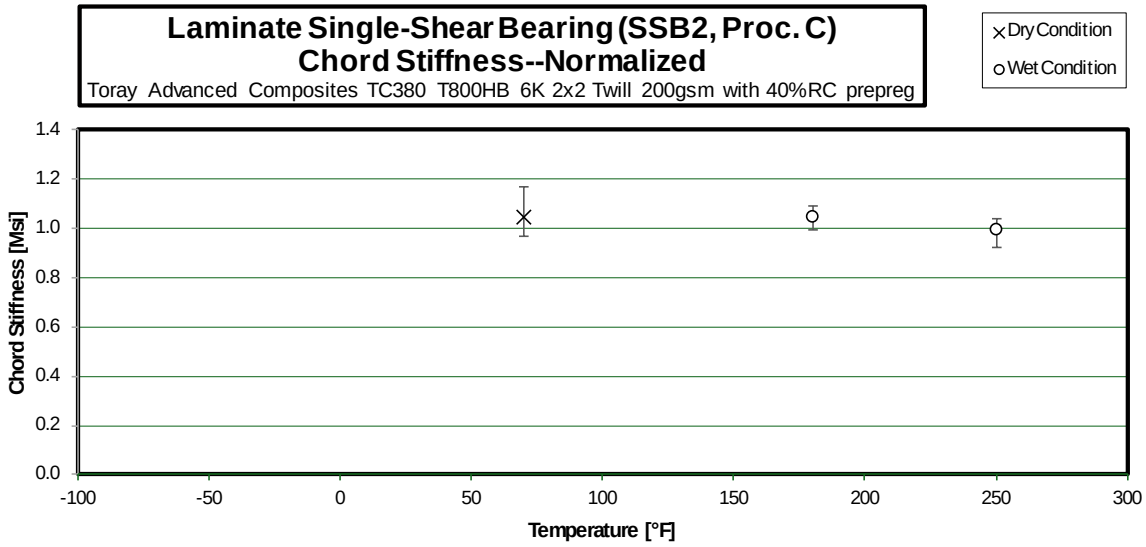



Laminate Single-Shear Bearing (SSB1, Proc. C)
Chord Stiffness--Normalized
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Dry Condition
Wet Condition
Chord Stiffness [Msi]
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
-100
-50
0
50
100
150
200
250
300
Temperature [°F]

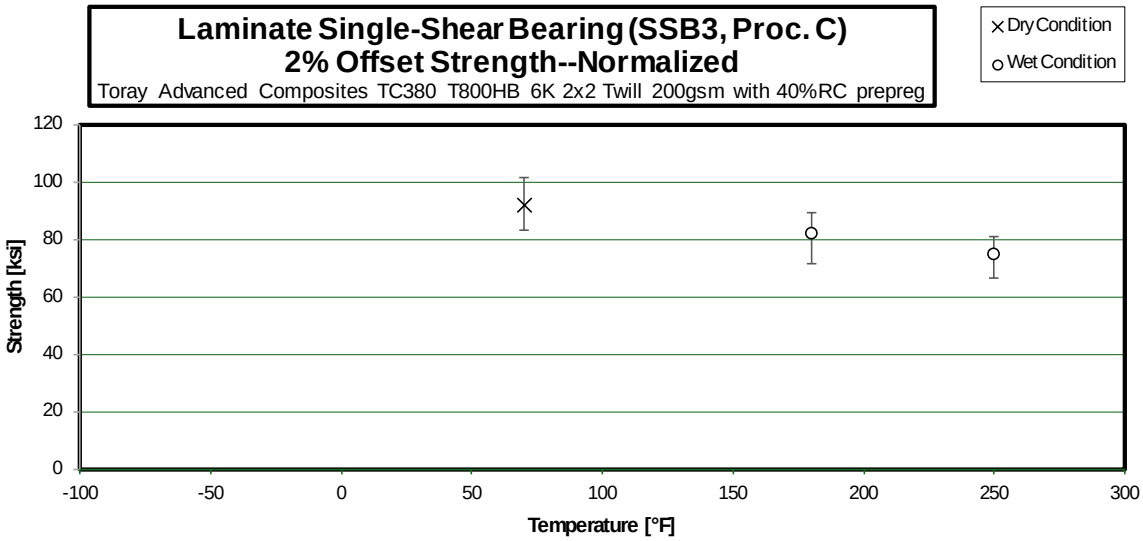
3.26 "10/80/10" Single-Shear Bearing 2 Properties (SSB2, Proc. C)

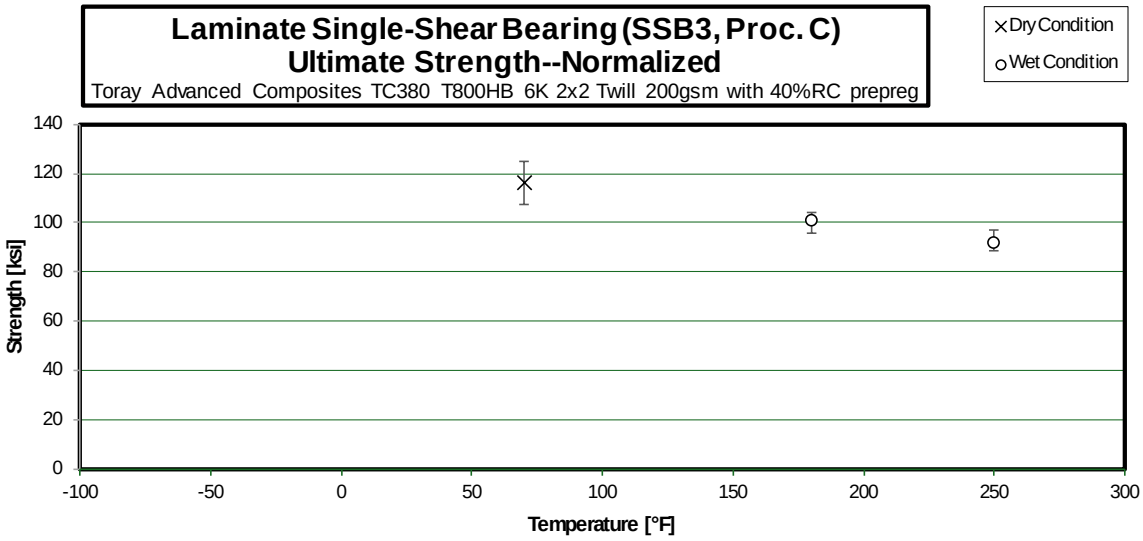


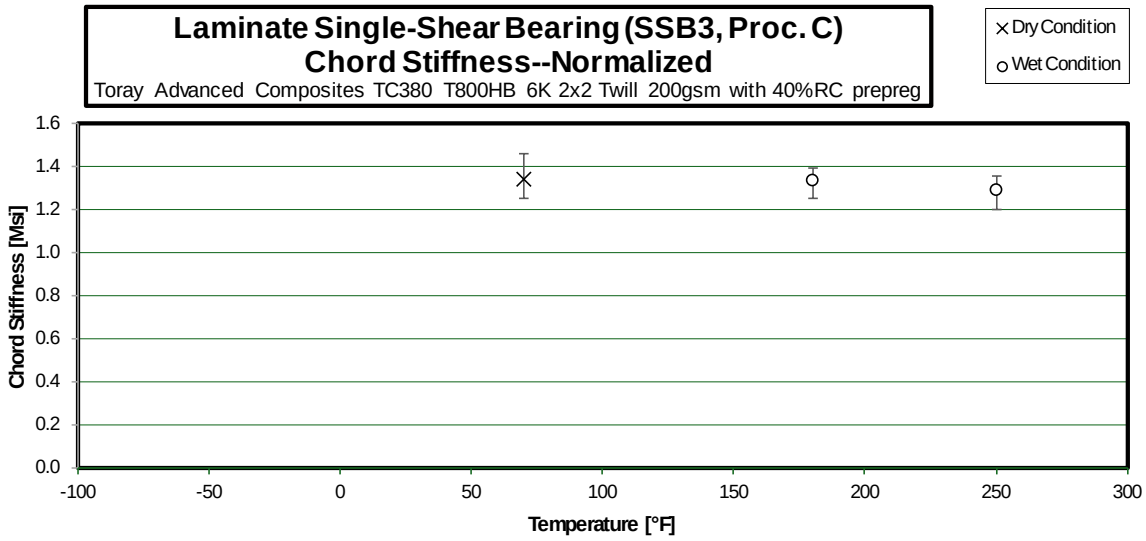



Laminate Single-Shear Bearing (SSB2, Proc. C)
Chord Stiffness--Normalized
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Dry Condition
Wet Condition
Chord Stiffness [Msi]
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
-100
-50
0
50
100
150
200
250
300
Temperature [°F]

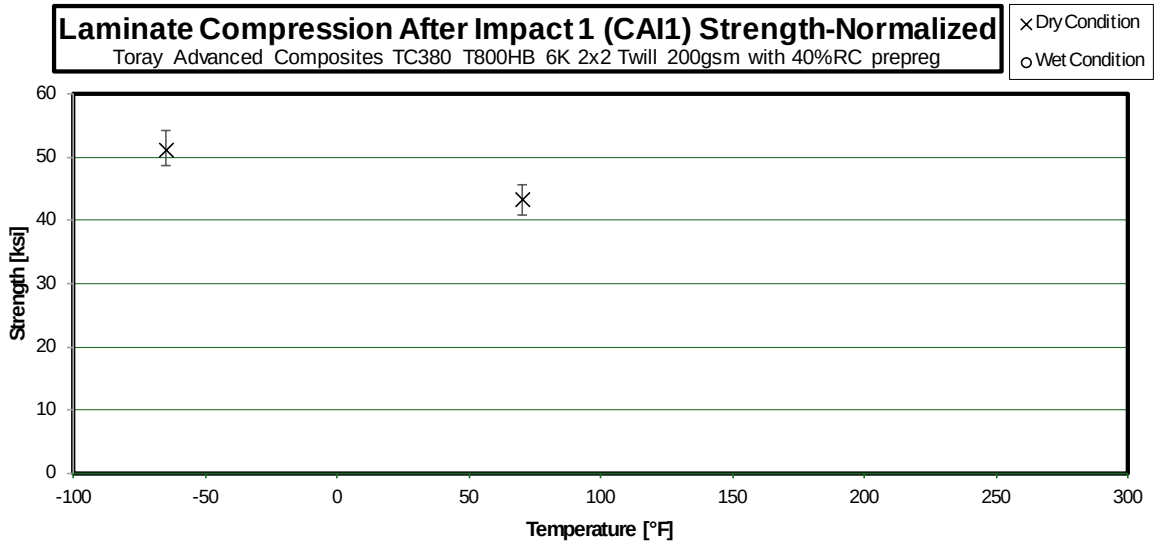
3.27 "40/20/40" Single-Shear Bearing 3 Properties (SSB3, Proc. C)



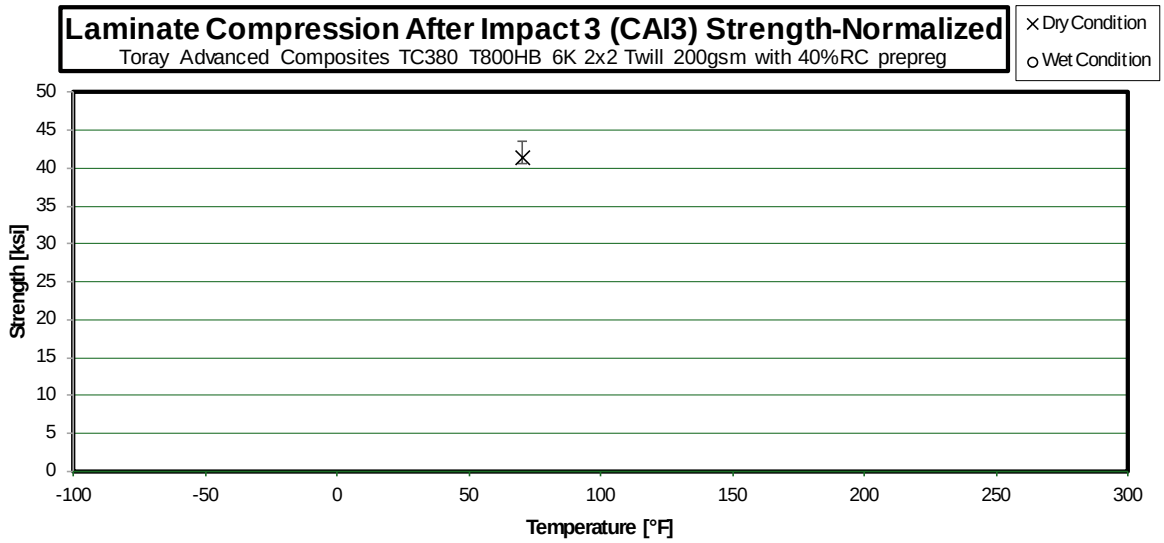



Laminate Single-Shear Bearing (SSB3, Proc. C)
Chord Stiffness--Normalized
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Dry Condition
Wet Condition
Chord Stiffness [Msi]
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
-100
-50
0
50
100
150
200
250
300
Temperature [°F]

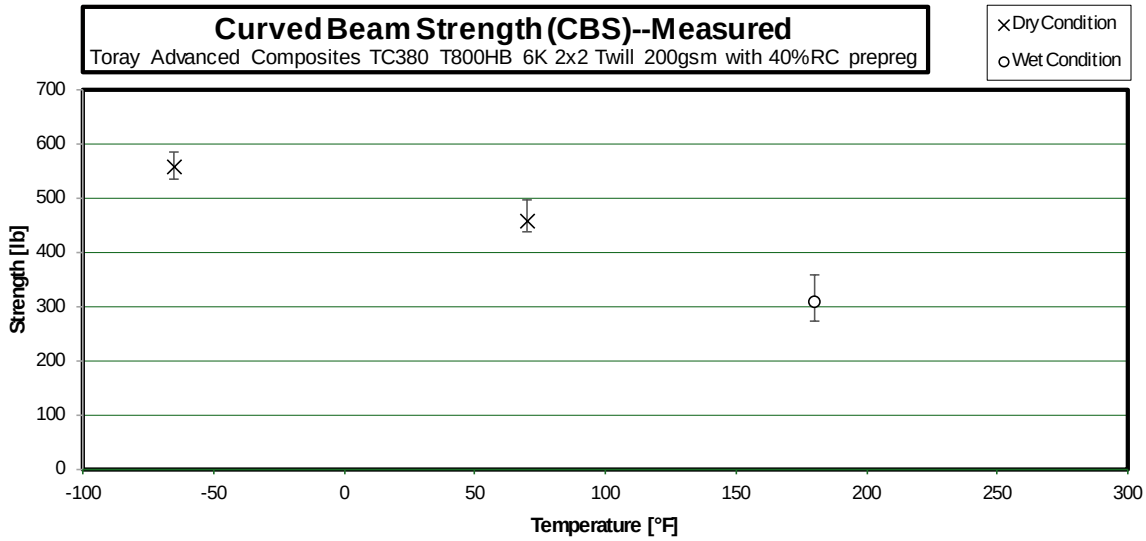
3.28 “25/50/25” Compression After Impact 1 Properties (CAI1)

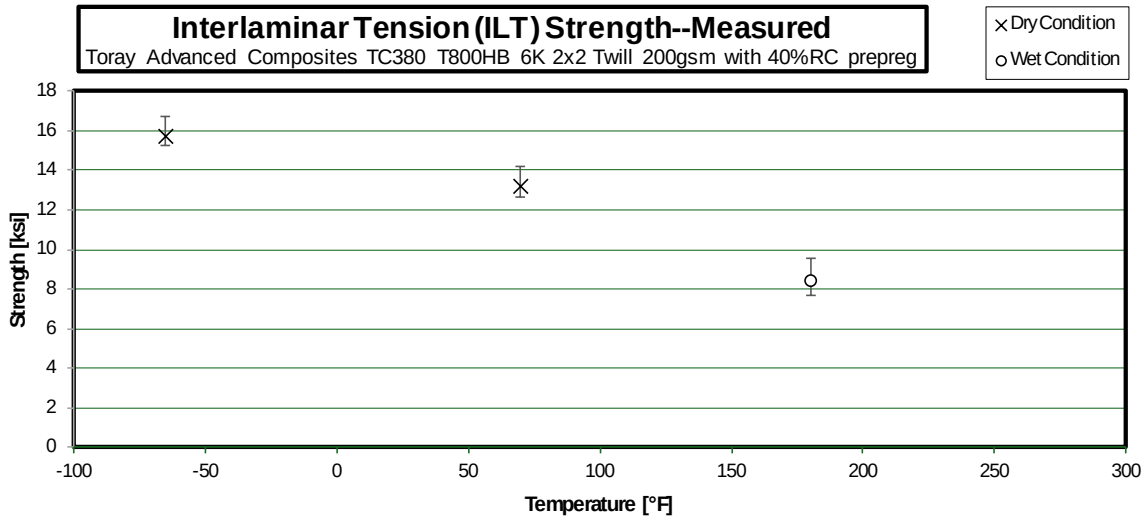


3.29 “40/20/40” Compression After Impact 3 Properties (CAI3)



3.30 "50/0/50" Interlaminar Tension Properties (ILT)





4. Raw Data

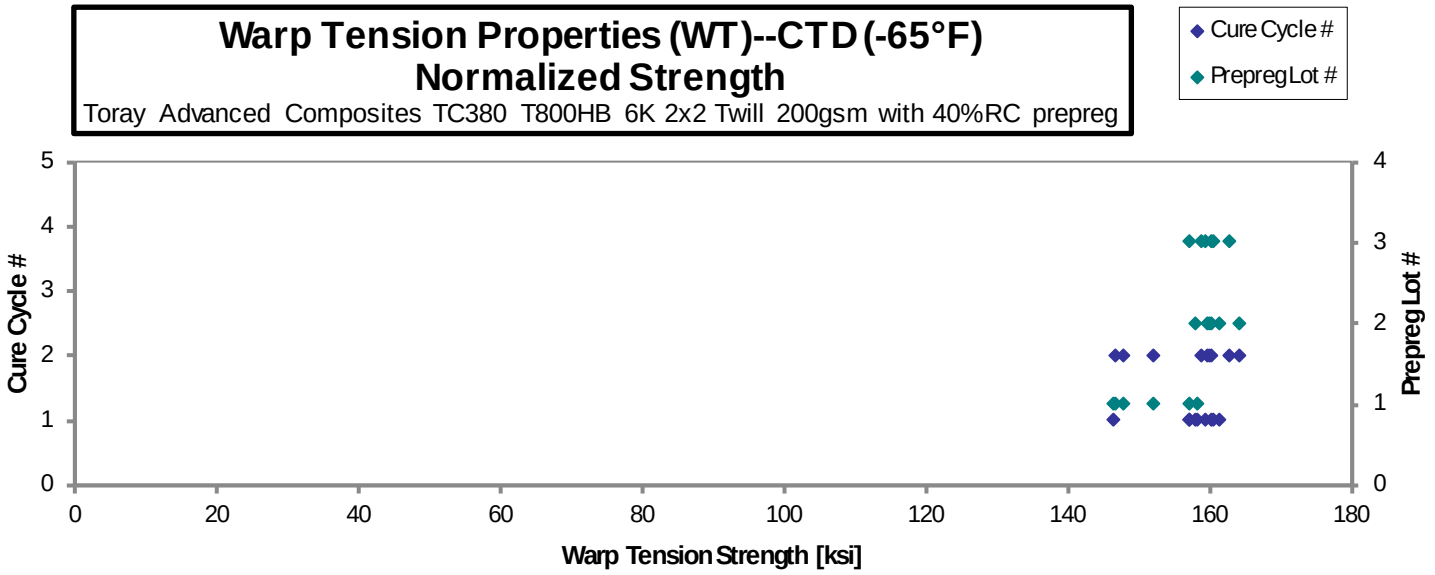
4.1 Warp Tension Properties (WT)

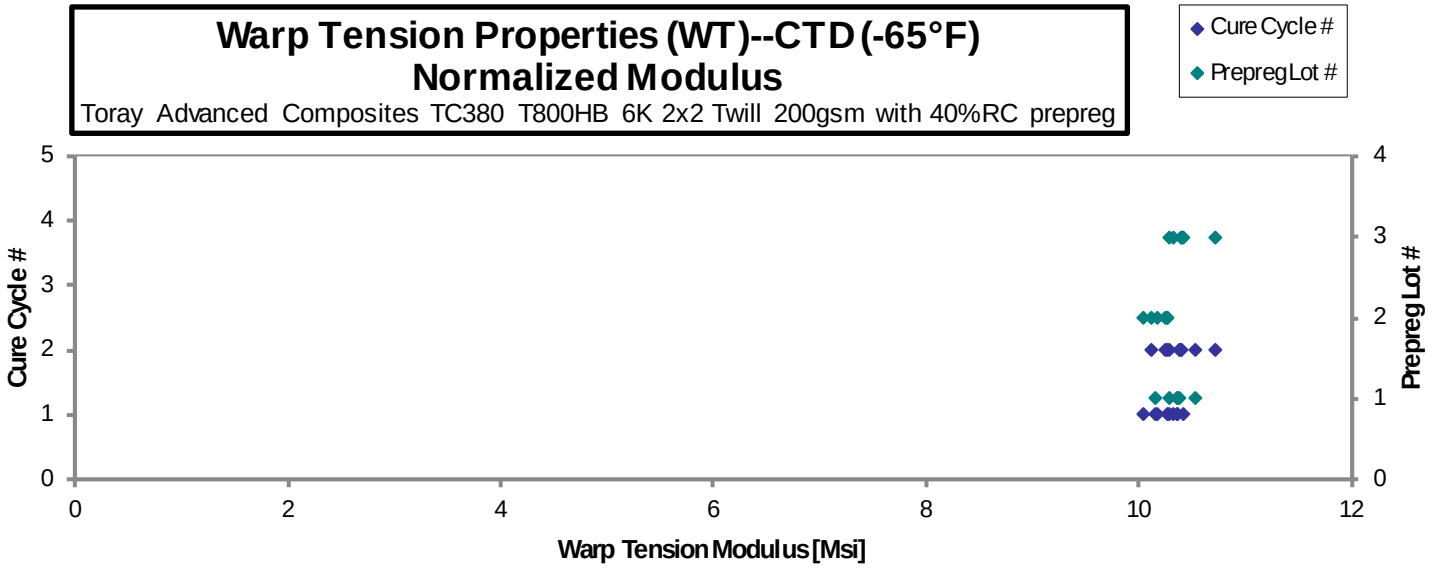
Warp Tension Properties (WT)--CTD (-65°F)
Strength & Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]: 0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Poisson's Ratio	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
TCEJA111B	A	C1	1	1	156.7	10.32	0.04996	0.1060	12	LAT, LAB	0.008833	157.2	10.36
TCEJA112B	A	C1	1	1	156.5	10.05	0.03827	0.1068	12	LAT	0.008900	158.3	10.16
TCEJA113B	A	C1	1	1	145.4	10.28	0.03726	0.1064	12	LAT	0.008869	146.5	10.36
TCEJA211B	A	C2	1	2	153.1	10.46	0.04982	0.1048	12	LAT	0.008733	152.0	10.38
TCEJA212B	A	C2	1	2	148.4	10.32	0.05145	0.1052	12	LAB	0.008768	147.9	10.28
TCEJA213B	A	C2	1	2	147.6	10.60	0.06085	0.1049	12	LAB	0.008739	146.6	10.53
TCEJB111B	B	C1	2	1	163.0	10.37	0.04268	0.1045	12	LAB	0.008711	161.3	10.26
TCEJB112B	B	C1	2	1	159.3	10.26	0.03244	0.1048	12	LAB	0.008733	158.1	10.18
TCEJB113B	B	C1	2	1	163.5	10.24	0.01885	0.1036	12	LAT, LAB	0.008632	160.4	10.04
TCEJB211B	B	C2	2	2	161.6	10.35	0.05985	0.1045	12	LAB	0.008710	159.9	10.25
TCEJB212B	B	C2	2	2	160.1	10.16	0.02876	0.1052	12	LAB	0.008769	159.6	10.13
TCEJB213B	B	C2	2	2	165.3	10.33	0.04867	0.1049	12	LAB	0.008744	164.2	10.26
TCEJC111B	C	C1	3	1	162.1	10.65	0.04503	0.1024	12	M(A,L)AT	0.008536	157.3	10.33
TCEJC112B	C	C1	3	1	166.5	10.81	0.04674	0.1018	12	M(A,L)AB	0.008481	160.4	10.42
TCEJC113B	C	C1	3	1	164.3	10.62	0.04188	0.1024	12	LAB	0.008533	159.3	10.30
TCEJC211B	C	C2	3	2	163.0	10.57	0.05163	0.1038	12	M(A,L)AB	0.008653	160.3	10.40
TCEJC212B	C	C2	3	2	164.9	10.53	0.04817	0.1043	12	M(A,L)WT, LAB	0.008688	162.8	10.40
TCEJC213B	C	C2	3	2	160.5	10.83	0.07542	0.1045	12	M(A,L)AT	0.008708	158.8	10.72

	Strength [ksi]	Modulus [Msi]	Poisson's Ratio		$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
Average	**159.0**	**10.43**	**0.04598**	**$Average_{norm}$**	**157.3**	**10.32**
Standard Dev.	**6.431**	**0.2168**	**0.01275**	**Standard $Dev._{norm}$**	**5.370**	**0.1532**
Coeff. of Var. [%]	**4.045**	**2.078**	**27.74**	**Coeff. of Var. $[\%]_{norm}$**	**3.414**	**1.484**
Min.	**145.4**	**10.05**	**0.01885**	**Min.**	**146.5**	**10.04**
Max.	**166.5**	**10.83**	**0.07542**	**Max.**	**164.2**	**10.72**
Number of Spec.	**18**	**18**	**18**	**Number of Spec.**	**18**	**18**


Warp Tension Properties (WT)--CTD (-65°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Warp Tension Strength [ksi]
0
20
40
60
80
100
120
140
160
180
0
1
2
3
4
5


Warp Tension Properties (WT)--CTD (-65°F)
Normalized Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Warp Tension Modulus [Msi]
0
2
4
6
8
10
12
0
1
2
3
4
5

Warp Tension Properties (WT)--RTD (70°F)
Strength & Modulus

Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

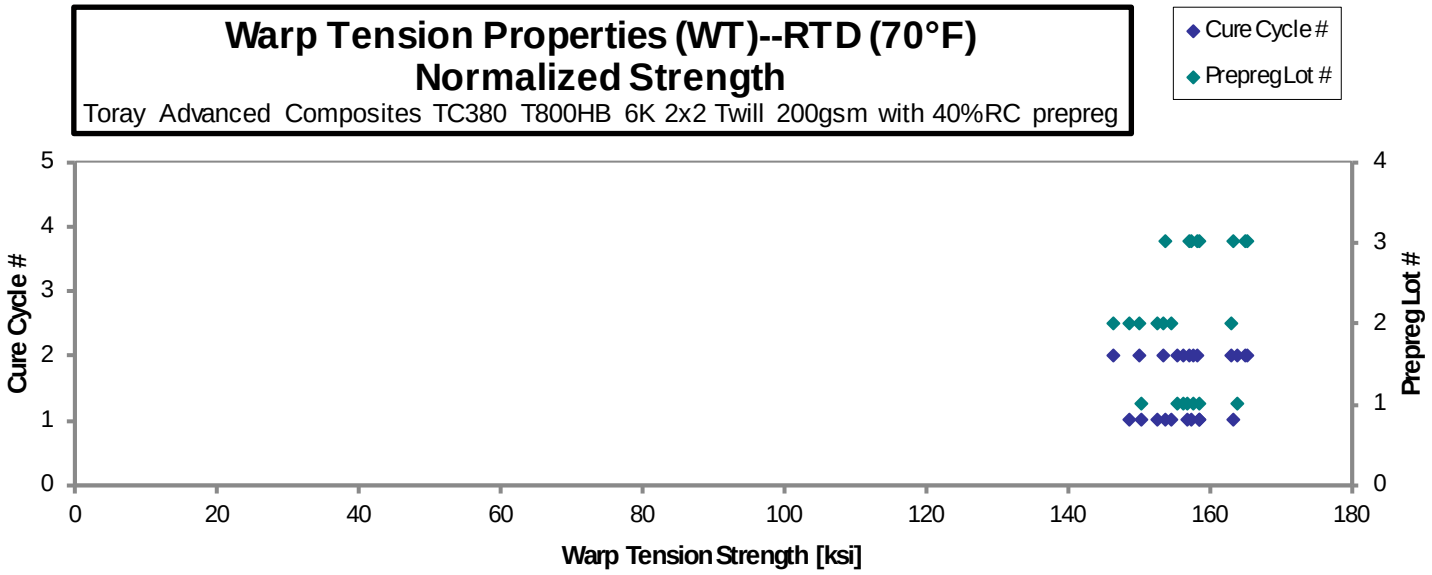
normalizing t_{ply} [in]
0.008800

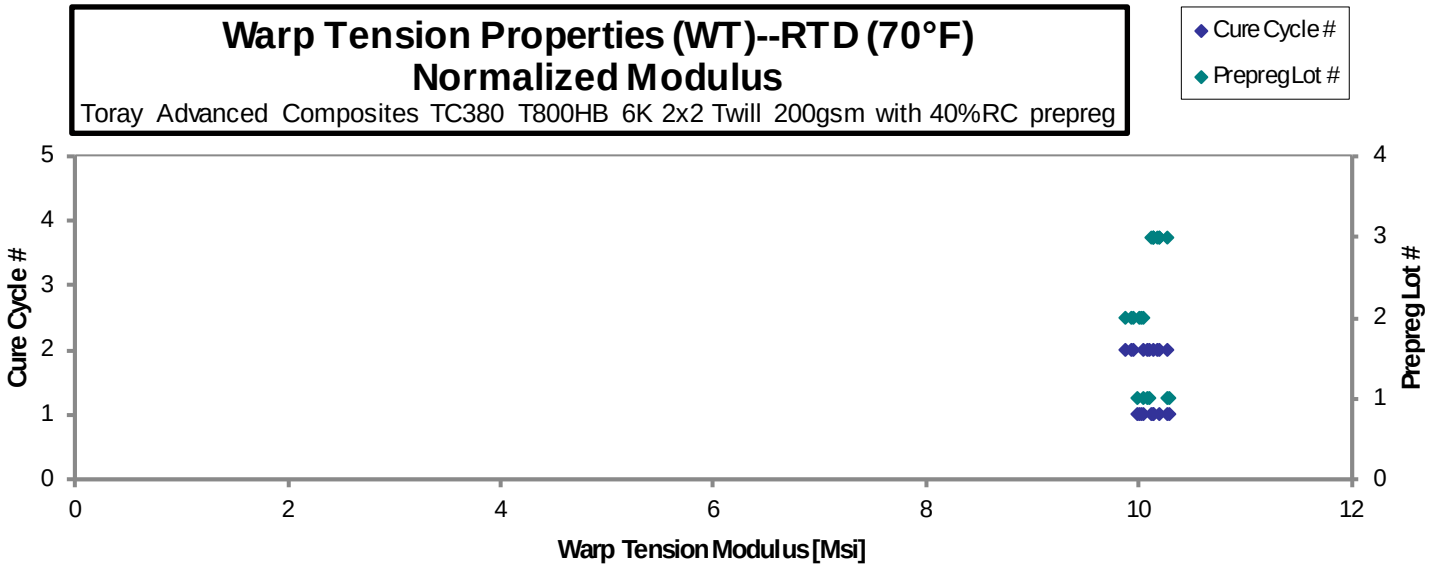
Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Poisson's Ratio	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
TCEJA111A	A	C1	1	1	168.2	11.49	0.03310	0.09442	12	LAB	0.007868	150.4	10.27
TCEJA112A	A	C1	1	1	168.2	10.92	0.04154	0.09948	12	LAB	0.008290	158.5	10.29
TCEJA113A	A	C1	1	1	161.4	10.27	0.03759	0.1027	12	LGT, LAB	0.008557	156.9	9.987
TCEJA211A	A	C2	1	2	181.8	11.18	0.05009	0.09522	12	LAB, LWT	0.007935	163.9	10.08
TCEJA212A	A	C2	1	2	169.0	10.76	0.04720	0.09852	12	LAT, LAB	0.008210	157.6	10.04
TCEJA213A	A	C2	1	2	161.1	10.47	0.04462	0.1019	12	LAT	0.008492	155.5	10.10
TCEJA214A*	A	C2	1	2	158.8			0.1039	12	LAB, LWT	0.008661	156.3	
TCEJB111A	B	C1	2	1	172.3	11.30	0.04764	0.09357	12	LAT, LWB	0.007797	152.6	10.02
TCEJB112A	B	C1	2	1	159.2	10.74	0.03927	0.09853	12	LWT, LAB	0.008211	148.6	10.02
TCEJB113A	B	C1	2	1	161.3	10.48	0.04750	0.1013	12	LWT, LAB	0.008440	154.7	10.05
TCEJB211A	B	C2	2	2	179.3	10.94	0.05000	0.09600	12	LWT, LAB	0.008000	163.0	9.942
TCEJB212A	B	C2	2	2	154.1	10.45	0.04840	0.1003	12	LAT	0.008357	146.4	9.922
TCEJB213A	B	C2	2	2	156.7	10.09	0.05049	0.1034	12	LAT	0.008614	153.4	9.881
TCEJB214A*	B	C2	2	2	151.1			0.1049	12	LAT	0.008744	150.1	
TCEJC111A	C	C1	3	1	182.4	11.39	0.03279	0.09450	12	M(A,L)AT, M(A,L)WB	0.007875	163.3	10.20
TCEJC112A	C	C1	3	1	170.3	10.89	0.03520	0.09827	12	LAT, LWB	0.008189	158.5	10.13
TCEJC113A	C	C1	3	1	164.5	10.57	0.03229	0.1012	12	LAT, LWB	0.008429	157.5	10.12
TCEJC114A	C	C1	3	1	157.8	10.41	0.03283	0.1028	12	LWT, LAB	0.008568	153.6	10.14
TCEJC211A	C	C2	3	2	175.2	10.88	0.04062	0.09960	12	M(A,L)WT, M(A,L)IB	0.008300	165.3	10.26
TCEJC212A	C	C2	3	2	164.1	10.64	0.04441	0.1011	12	LAT	0.008422	157.1	10.18
TCEJC213A	C	C2	3	2	168.7	10.42	0.04575	0.1033	12	M(A,L)WT, LAB	0.008608	165.1	10.19
TCEJC214A	C	C2	3	2	161.0	10.31	0.04340	0.1039	12	LAB	0.008654	158.3	10.14

* Specimen was not gaged, only strength is reported.

	Strength [ksi]	Modulus [Msi]	Poisson's Ratio
Average	**165.8**	**10.73**	**0.04224**
Standard Dev.	**8.665**	**0.3911**	**0.006395**
Coeff. of Var. [%]	**5.228**	**3.645**	**15.14**
Min.	**151.1**	**10.09**	**0.03229**
Max.	**182.4**	**11.49**	**0.05049**
Number of Spec.	**22**	**20**	**20**

	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
$Average_{norm}$	**0.008328**	**156.7**	**10.10**
Standard $Dev._{norm}$		**5.288**	**0.1165**
Coeff. of Var. $[\%]_{norm}$		**3.375**	**1.154**
Min.	**0.007797**	**146.4**	**9.881**
Max.	**0.008744**	**165.3**	**10.29**
Number of Spec.	**22**	**22**	**20**


Warp Tension Properties (WT)--RTD (70°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Warp Tension Strength [ksi]
0
20
40
60
80
100
120
140
160
180
0
1
2
3
4
5


Warp Tension Properties (WT)--RTD (70°F)
Normalized Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Warp Tension Modulus [Msi]
0
2
4
6
8
10
12
0
1
2
3
4
5

Warp Tension Properties (WT)--ETD1 (180°F)
Strength & Modulus

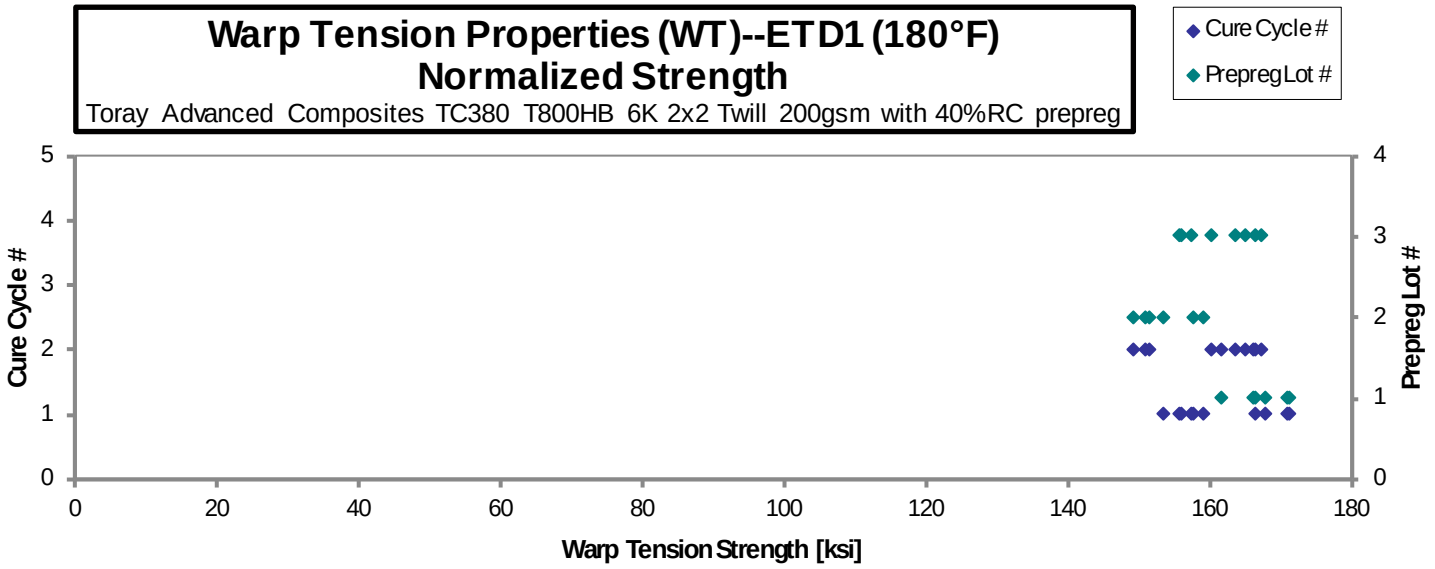
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

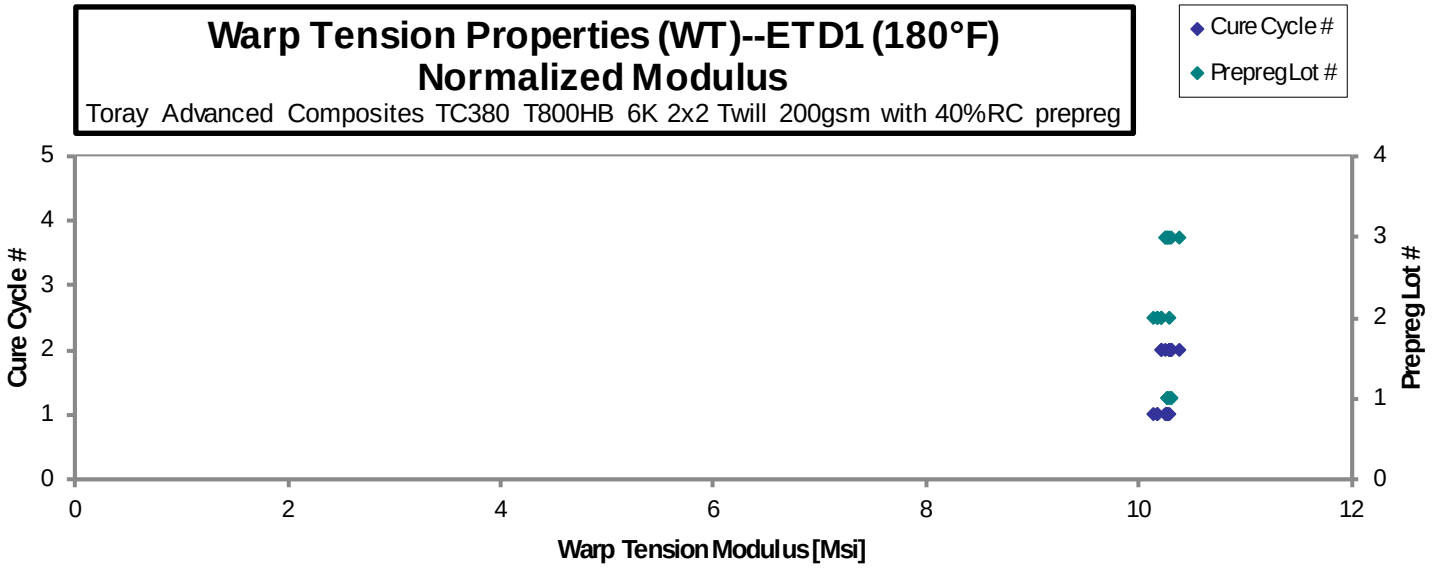
normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Poisson's Ratio	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
TCEJA111C	A	C1	1	1	174.4	10.47	0.08036	0.1036	12	LWT, LIB	0.008635	171.2	10.28
TCEJA112C	A	C1	1	1	176.5	10.59	0.04881	0.1024	12	LAT, LWB	0.008529	171.0	10.26
TCEJA113C	A	C1	1	1	180.4	11.02	0.04348	0.09833	12	LWB, LAT	0.008194	167.9	10.26
TCEJA211C	A	C2	1	2	173.2	10.73	0.03474	0.1015	12	LWT, LAB	0.008456	166.4	10.31
TCEJA212C	A	C2	1	2	173.7	11.05	0.03444	0.09832	12	LAT, LGM	0.008193	161.7	10.29
TCEJA213C	A	C2	1	2	186.7	11.59	0.03122	0.09398	12	LAT, LAB	0.007832	166.2	10.32
TCEJB111C	B	C1	2	1	163.9	10.57	0.04086	0.1016	12	LAB	0.008464	157.7	10.17
TCEJB112C	B	C1	2	1	169.5	10.84	0.02954	0.09917	12	LAT, LAB	0.008264	159.2	10.18
TCEJB113C	B	C1	2	1	170.5	11.27	0.03090	0.09500	12	LWT, LAB	0.007917	153.4	10.14
TCEJB211C	B	C2	2	2	156.1	10.55	0.04384	0.1022	12	LWT, LAB	0.008514	151.0	10.21
TCEJB212C	B	C2	2	2	159.0	10.88	0.04651	0.09907	12	LAT, LAB	0.008256	149.2	10.21
TCEJB213C	B	C2	2	2	167.6	11.39	0.03014	0.09537	12	LAB	0.007947	151.4	10.29
TCEJC111C	C	C1	3	1	162.3	10.70	0.03430	0.1015	12	LWT, LIB	0.008461	156.1	10.29
TCEJC112C	C	C1	3	1	166.4	10.97	0.03268	0.09883	12	LWT, LAB	0.008236	155.8	10.27
TCEJC113C	C	C1	3	1	173.1	11.28	0.03109	0.09605	12	M(A,L)WT, LAB	0.008004	157.4	10.26
TCEJC114C	C	C1	3	1	185.6	11.46	0.03447	0.09470	12	LAT, LWB	0.007892	166.4	10.28
TCEJC211C	C	C2	3	2	170.7	10.58	0.04196	0.1036	12	LWB, LAT	0.008629	167.4	10.37
TCEJC212C	C	C2	3	2	169.9	10.65	0.05048	0.1017	12	LAB, LWT	0.008471	163.5	10.25
TCEJC213C	C	C2	3	2	174.7	10.89	0.04408	0.09973	12	LWB, LAT	0.008311	165.0	10.29
TCEJC214C	C	C2	3	2	169.2	10.88	0.04283	0.1001	12	LAB, LIT	0.008340	160.4	10.31

Average	**171.2**	**10.92**	**0.04034**
Standard Dev.	**7.771**	**0.3321**	**0.01155**
Coeff. of Var. [%]	**4.540**	**3.042**	**28.63**
Min.	**156.1**	**10.47**	**0.02954**
Max.	**186.7**	**11.59**	**0.08036**
Number of Spec.	**20**	**20**	**20**

$Average_{norm}$	**0.008277**	**160.9**	**10.26**
$Standard\ Dev._{norm}$		**6.761**	**0.05605**
Coeff. of Var. $[\%]_{norm}$		**4.201**	**0.5462**
Min.	**0.007832**	**149.2**	**10.14**
Max.	**0.008635**	**171.2**	**10.37**
Number of Spec.	**20**	**20**	**20**


Warp Tension Properties (WT)--ETD1 (180°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Warp Tension Strength [ksi]
0
20
40
60
80
100
120
140
160
180
0
1
2
3
4
5


Warp Tension Properties (WT)--ETD1 (180°F)
Normalized Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Warp Tension Modulus [Msi]
0
2
4
6
8
10
12
0
1
2
3
4
5

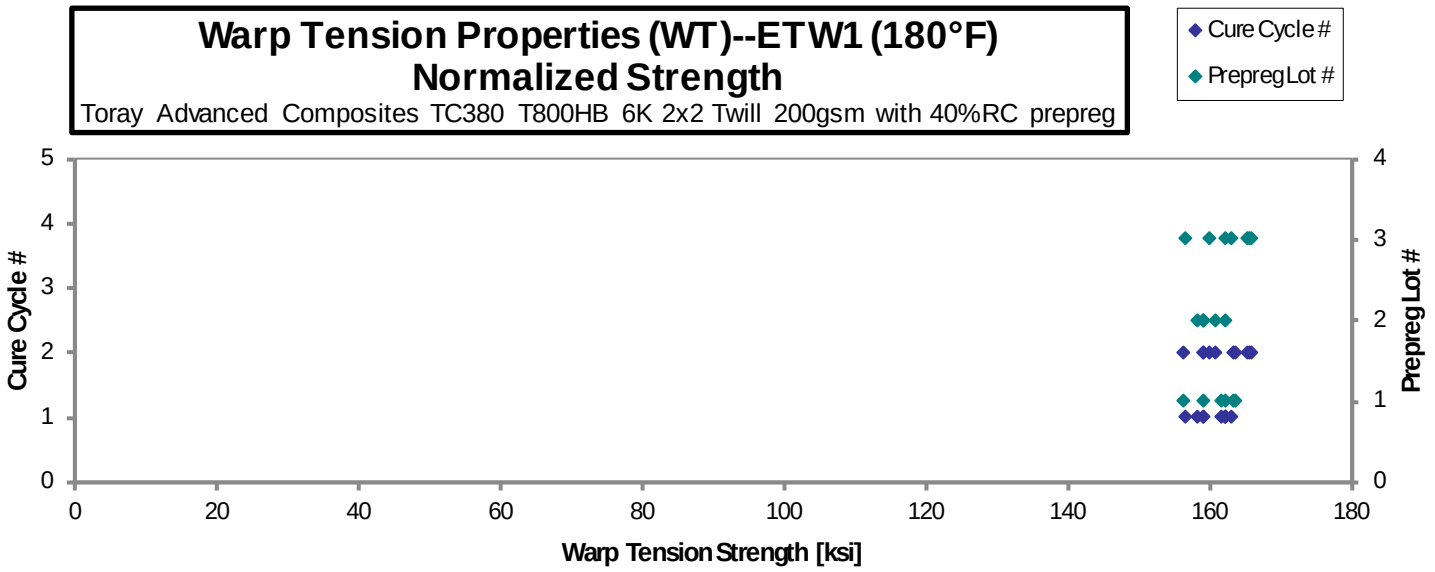
Warp Tension Properties (WT)--ETW1 (180°F)
Strength & Modulus

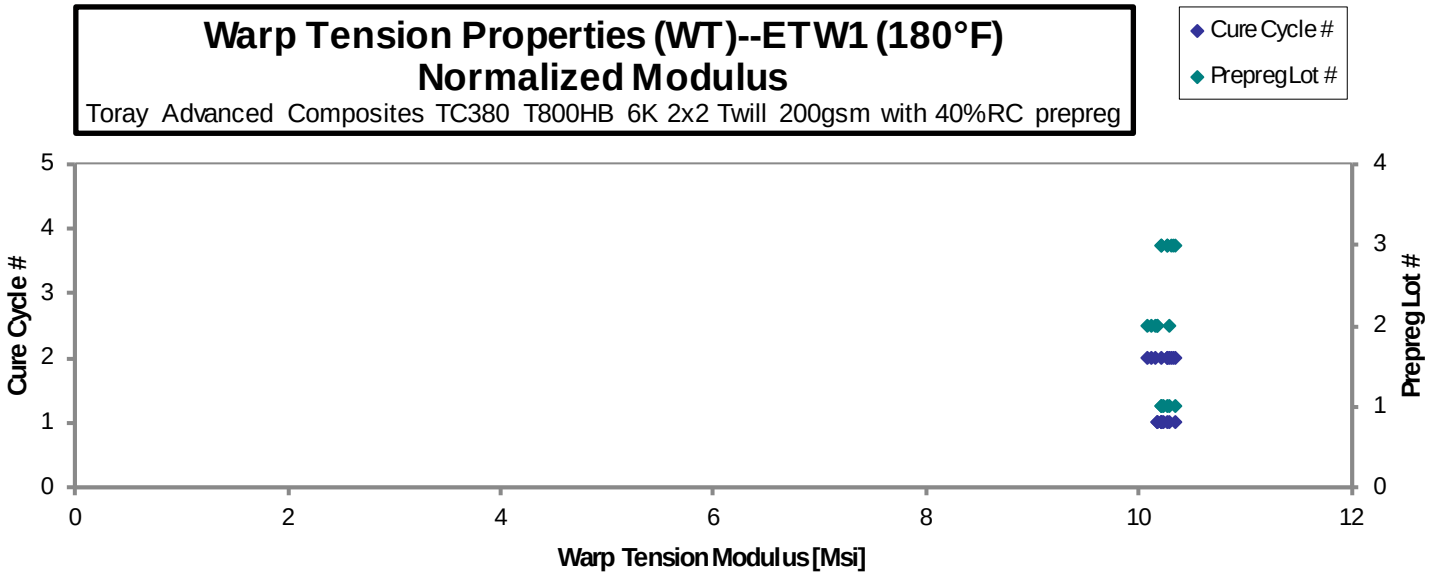
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]: 0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Poisson's Ratio	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
TCEJA111D	A	C1	1	1	171.0	10.92	0.03190	0.1001	12	LWB, LIT	0.008344	162.2	10.35
TCEJA112D	A	C1	1	1	163.3	10.33	0.04670	0.1046	12	LWB, LIT	0.008717	161.8	10.23
TCEJA113D	A	C1	1	1	156.9	10.06	0.04859	0.1072	12	LAT, LIB	0.008931	159.2	10.21
TCEJA211D	A	C2	1	2	163.5	10.68	0.04218	0.1009	12	LAT, LAB	0.008411	156.3	10.21
TCEJA212D	A	C2	1	2	166.7	10.45	0.04162	0.1037	12	LWB, LIT	0.008644	163.8	10.26
TCEJA213D	A	C2	1	2	162.0	10.21	0.04114	0.1065	12	LAT, LIB	0.008872	163.3	10.29
TCEJB111D	B	C1	2	1	171.7	10.89	0.03268	0.09977	12	LWT, LIB	0.008314	162.2	10.29
TCEJB112D	B	C1	2	1	161.3	10.37	0.04080	0.1037	12	LWB, LAT	0.008640	158.4	10.18
TCEJB113D	B	C1	2	1	158.6	10.15	0.03157	0.1060	12	LWT, LIB	0.008831	159.1	10.18
TCEJB211D	B	C2	2	2	165.2	10.55	0.03931	0.1016	12	LAT, LIB	0.008469	159.0	10.15
TCEJB212D	B	C2	2	2	159.7	10.12	0.03377	0.1052	12	LAT, LIB	0.008769	159.2	10.08
TCEJB213D	B	C2	2	2	158.5	9.961	0.03417	0.1072	12	LWB, LAT	0.008932	160.9	10.11
TCEJC111D	C	C1	3	1	166.2	10.83	0.03301	0.09953	12	LAT, LAB	0.008294	156.6	10.21
TCEJC112D	C	C1	3	1	165.2	10.39	0.03264	0.1038	12	LWB, LIT	0.008650	162.4	10.21
TCEJC113D	C	C1	3	1	161.7	10.18	0.03279	0.1065	12	LWT, LAB	0.008876	163.1	10.26
TCEJC211D	C	C2	3	2	171.8	10.72	0.04587	0.1019	12	LWT, LIB	0.008488	165.7	10.34
TCEJC212D	C	C2	3	2	167.8	10.48	0.05066	0.1040	12	AWB, LAT	0.008668	165.3	10.33
TCEJC213D	C	C2	3	2	167.6	10.39	0.04721	0.1045	12	LIT, LAB	0.008707	165.8	10.28
TCEJC214D	C	C2	3	2	160.8	10.36	0.04463	0.1051	12	M(A,L)WT, LIB	0.008757	160.0	10.31

	Strength	Modulus	Poisson's Ratio		$Strength_{norm}$	$Modulus_{norm}$
Average	**164.2**	**10.42**	**0.03954**	**Average$_{norm}$**	**0.008648**	**161.3**	**10.24**
Standard Dev.	**4.520**	**0.2838**	**0.006516**	**Standard Dev.$_{norm}$**		**2.867**	**0.07509**
Coeff. of Var. [%]	**2.753**	**2.723**	**16.48**	**Coeff. of Var. [%]$_{norm}$**		**1.778**	**0.7336**
Min.	**156.9**	**9.961**	**0.03157**	**Min.**	**0.008294**	**156.3**	**10.08**
Max.	**171.8**	**10.92**	**0.05066**	**Max.**	**0.008932**	**165.8**	**10.35**
Number of Spec.	**19**	**19**	**19**	**Number of Spec.**	**19**	**19**	**19**


Warp Tension Properties (WT)--ETW1 (180°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Warp Tension Strength [ksi]
0
20
40
60
80
100
120
140
160
180
0
1
2
3
4
5


Warp Tension Properties (WT)--ETW1 (180°F)
Normalized Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Warp Tension Modulus [Msi]
0
2
4
6
8
10
12
0
1
2
3
4
5

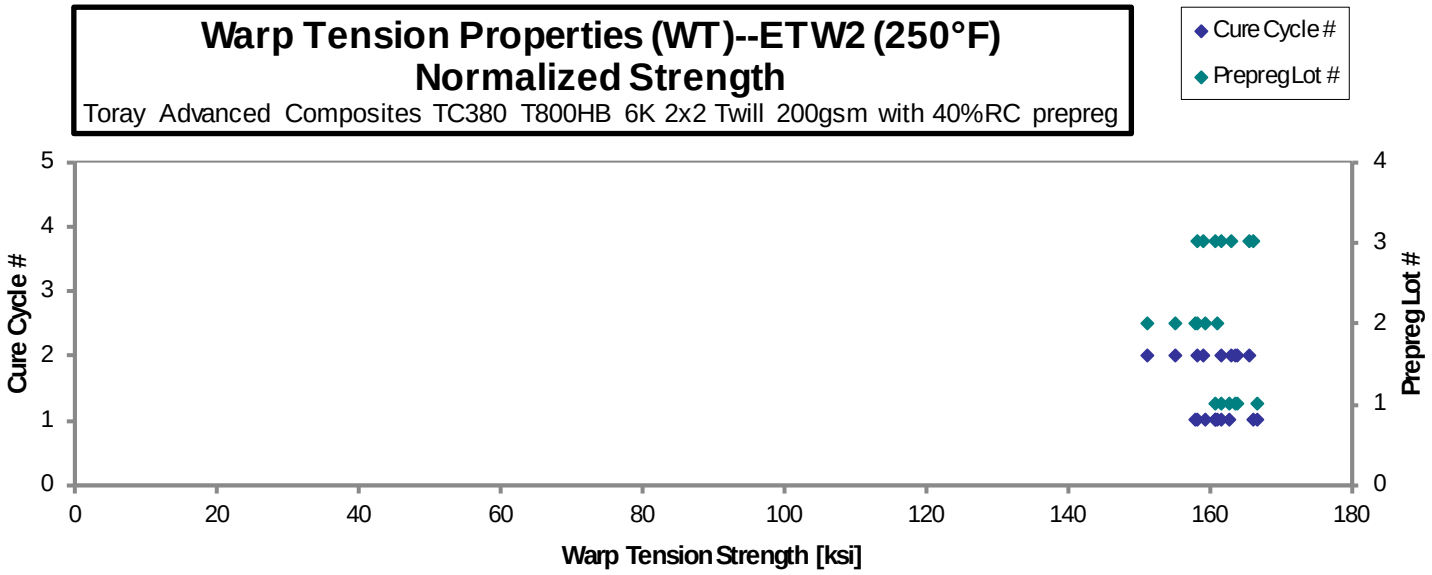
Warp Tension Properties (WT)--ETW2 (250°F)
Strength & Modulus

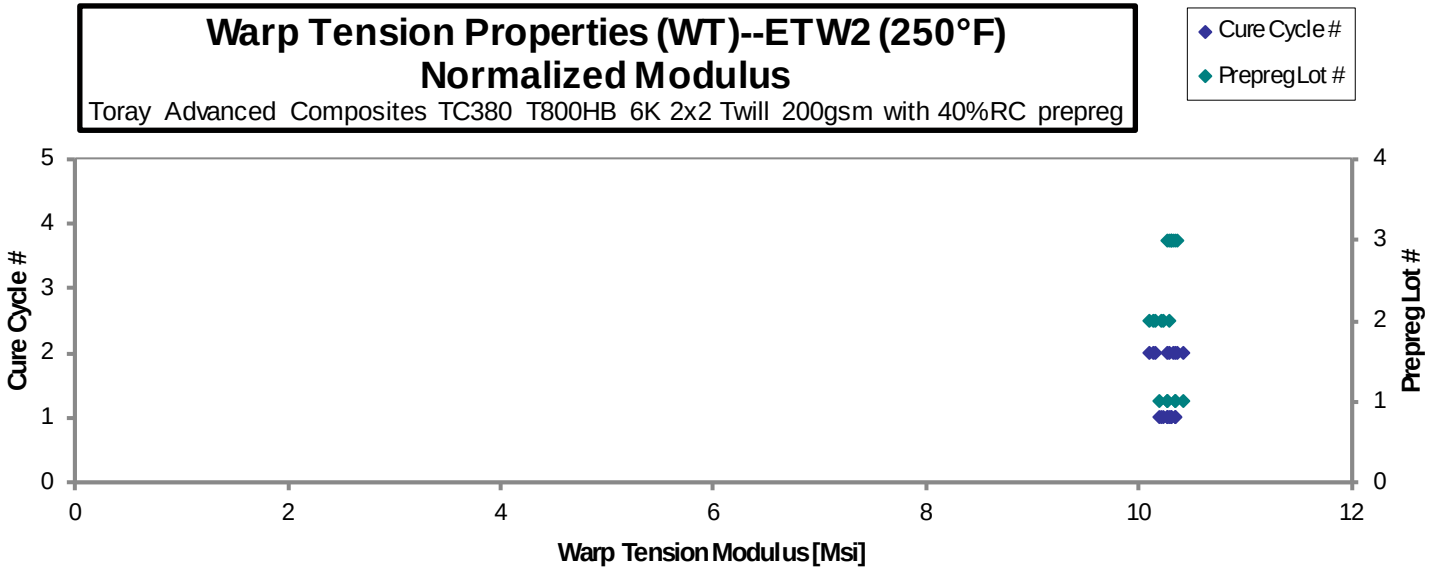
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Poisson's Ratio	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
TCEJA111E	A	C1	1	1	153.9	9.827	0.02938	0.1103	12	LWT, LIB	0.009189	160.7	10.26
TCEJA112E	A	C1	1	1	158.9	10.10	0.03631	0.1083	12	LAT, LWB	0.009021	162.9	10.35
TCEJA113E	A	C1	1	1	166.2	10.16	0.04426	0.1060	12	LAT, LWB	0.008832	166.8	10.20
TCEJA211E	A	C2	1	2	160.3	10.06	0.03676	0.1079	12	LWT, LIB	0.008988	163.7	10.27
TCEJA212E	A	C2	1	2	160.9	10.30	0.04239	0.1061	12	LWT, LIB	0.008840	161.6	10.35
TCEJA213E	A	C2	1	2	167.3	10.63	0.04096	0.1035	12	LGT, LIB	0.008621	163.9	10.42
TCEJB111E	B	C1	2	1	158.3	10.04	0.03742	0.1074	12	LAT, LWB	0.008953	161.1	10.22
TCEJB112E	B	C1	2	1	157.2	10.24	0.03804	0.1061	12	LWT, LIB	0.008844	158.0	10.29
TCEJB113E	B	C1	2	1	162.1	10.41	0.04196	0.1039	12	LAT, LWB	0.008657	159.5	10.24
TCEJB211E	B	C2	2	2	154.3	9.895	0.04304	0.1083	12	LWB, LIT	0.009028	158.3	10.15
TCEJB212E	B	C2	2	2	150.2	10.04	0.04265	0.1063	12	LWT, LAB	0.008854	151.1	10.11
TCEJB213E	B	C2	2	2	158.0	10.33	0.03958	0.1037	12	LAT, LIB	0.008642	155.2	10.14
TCEJC111E	C	C1	3	1	158.7	10.22	0.02947	0.1070	12	LAT, LWB	0.008913	160.8	10.35
TCEJC112E	C	C1	3	1	156.7	10.17	0.03483	0.1067	12	LWT, LWB	0.008889	158.3	10.28
TCEJC113E	C	C1	3	1	168.1	10.44	0.03282	0.1043	12	LAT, LIB	0.008690	166.0	10.31
TCEJC114E	C	C1	3	1	168.4	10.72	0.02792	0.1014	12	LWT, LAB	0.008451	161.7	10.30
TCEJC211E	C	C2	3	2	163.9	10.41	0.03890	0.1051	12	LWB, LAT	0.008761	163.2	10.37
TCEJC212E	C	C2	3	2	160.0	10.34	0.03786	0.1051	12	LWB, LAT	0.008757	159.3	10.29
TCEJC213E	C	C2	3	2	166.5	10.38	0.04321	0.1051	12	LWT, LWB	0.008756	165.7	10.33

Average	**160.5**	**10.25**	**0.03778**	**$Average_{norm}$**	**0.008826**	**160.9**	**10.27**
Standard Dev.	**5.169**	**0.2303**	**0.004998**	**$Standard\ Dev._{norm}$**		**3.849**	**0.08261**
Coeff. of Var. [%]	**3.220**	**2.248**	**13.23**	**Coeff. of Var. $[\%]_{norm}$**		**2.392**	**0.8041**
Min.	**150.2**	**9.827**	**0.02792**	**Min.**	**0.008451**	**151.1**	**10.11**
Max.	**168.4**	**10.72**	**0.04426**	**Max.**	**0.009189**	**166.8**	**10.42**
Number of Spec.	**19**	**19**	**19**	**Number of Spec.**	**19**	**19**	**19**


Warp Tension Properties (WT)--ETW2 (250°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Warp Tension Strength [ksi]
0
20
40
60
80
100
120
140
160
180
0
1
2
3
4
5


Warp Tension Properties (WT)--ETW2 (250°F)
Normalized Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Warp Tension Modulus [Msi]
0
2
4
6
8
10
12
0
1
2
3
4
5

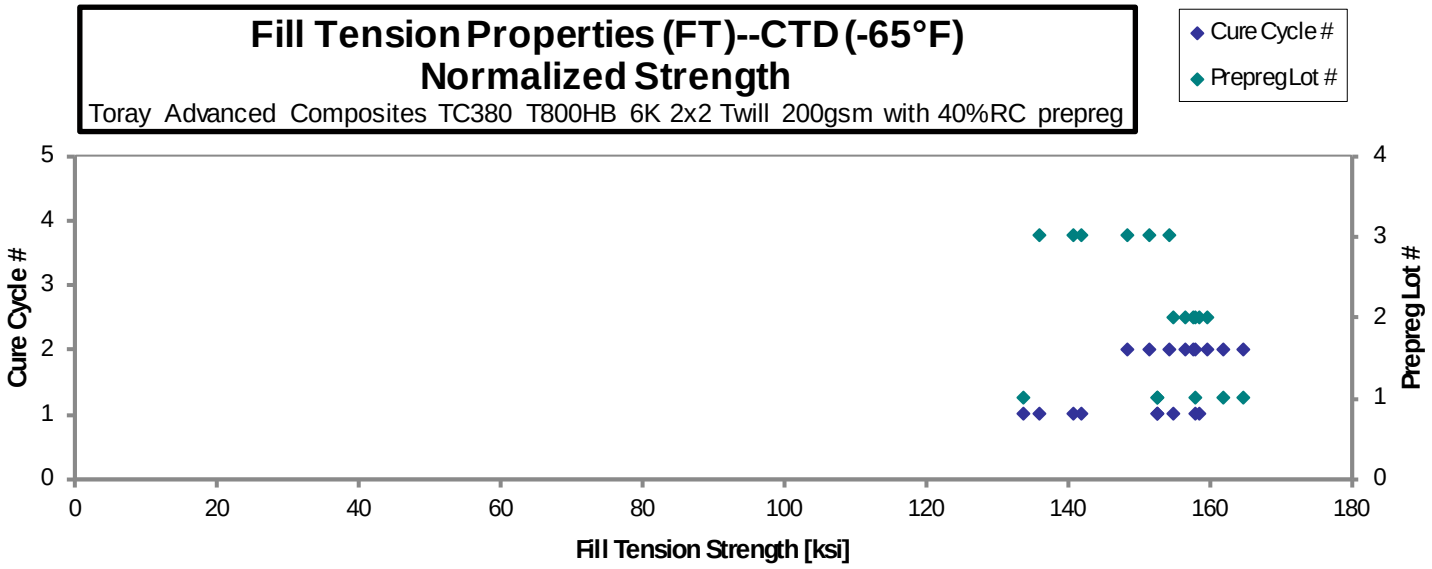
4.2 Fill Tension Properties (FT)

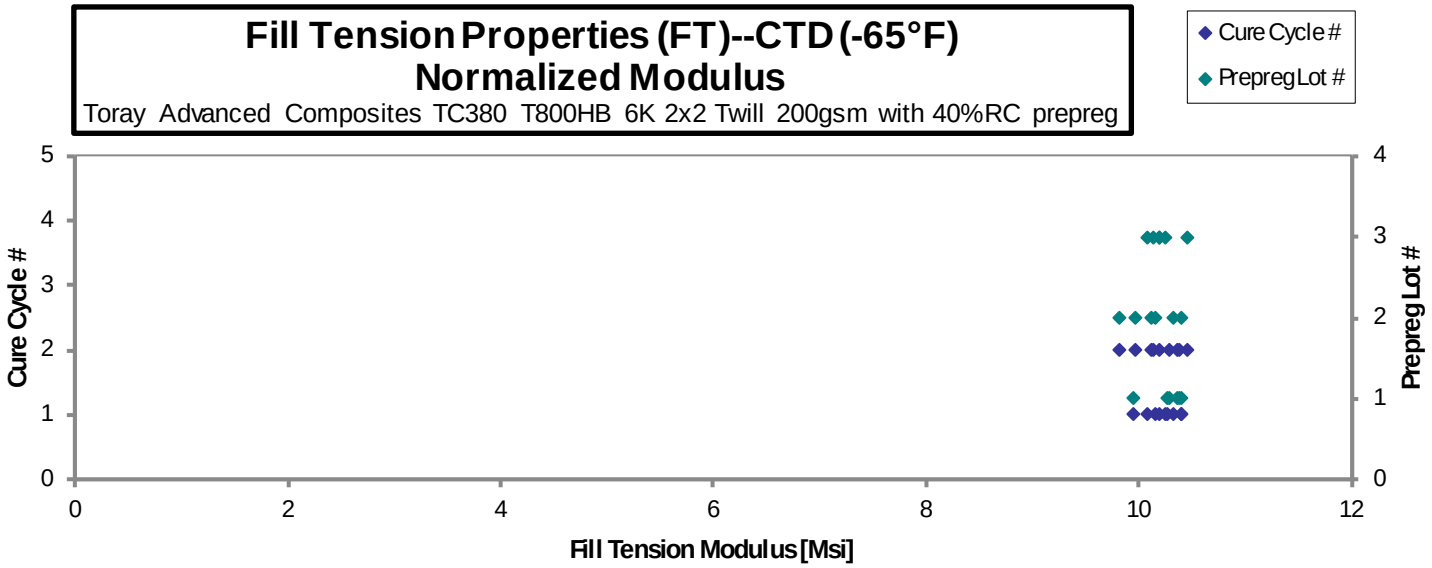
Fill Tension Properties (FT)--CTD (-65°F)
Strength & Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
TCEUA111B	A	C1	1	1	135.4	10.07	0.1044	12	LAB	0.008700	133.8	9.955
TCEUA112B	A	C1	1	1	155.1	10.44	0.1039	12	LAT	0.008658	152.6	10.27
TCEUA113B	A	C1	1	1	153.9	10.49	0.1047	12	LAT	0.008728	152.6	10.41
TCEUA211B	A	C2	1	2	166.7	10.41	0.1043	12	LAT, LAB	0.008694	164.7	10.29
TCEUA212B	A	C2	1	2	163.3	10.47	0.1048	12	LAT, LWB	0.008735	162.1	10.39
TCEUA213B	A	C2	1	2	160.8	10.54	0.1038	12	LAT, LWB	0.008651	158.1	10.36
TCEUB111B	B	C1	2	1	157.8	10.37	0.1060	12	LGM	0.008833	158.4	10.41
TCEUB112B	B	C1	2	1	156.2	10.20	0.1068	12	LWT, LAB	0.008897	157.9	10.32
TCEUB113B	B	C1	2	1	154.9	10.15	0.1056	12	LAT	0.008801	154.9	10.15
TCEUB211B	B	C2	2	2	160.8	10.20	0.1048	12	LAT	0.008735	159.6	10.12
TCEUB212B	B	C2	2	2	157.4	10.01	0.1051	12	LAB	0.008757	156.6	9.960
TCEUB213B	B	C2	2	2	158.8	9.879	0.1049	12	LWT, LAB	0.008744	157.8	9.817
TCEUC111B	C	C1	3	1	143.2	10.28	0.1047	12	LAT	0.008726	142.0	10.19
TCEUC112B	C	C1	3	1	143.1	10.25	0.1040	12	LAT	0.008667	140.9	10.09
TCEUC113B	C	C1	3	1	138.0	10.41	0.1041	12	LAT	0.008672	136.0	10.26
TCEUC211B	C	C2	3	2	156.1	10.24	0.1045	12	LWB, LAT	0.008707	154.4	10.13
TCEUC212B	C	C2	3	2	152.9	10.30	0.1046	12	LAB, LAT	0.008717	151.5	10.20
TCEUC213B	C	C2	3	2	149.8	10.55	0.1046	12	LAB, M(A,L)WT	0.008718	148.4	10.45

Average	**153.6**	**10.29**	**Average$_{norm}$**	**0.008730**	**152.4**	**10.21**
Standard Dev.	**8.592**	**0.1879**	**Standard Dev.$_{norm}$**		**8.828**	**0.1769**
Coeff. of Var. [%]	**5.595**	**1.826**	**Coeff. of Var. [%]$_{norm}$**		**5.794**	**1.733**
Min.	**135.4**	**9.879**	**Min.**	**0.008651**	**133.8**	**9.817**
Max.	**166.7**	**10.55**	**Max.**	**0.008897**	**164.7**	**10.45**
Number of Spec.	**18**	**18**	**Number of Spec.**	**18**	**18**	**18**


Fill Tension Properties (FT)--CTD (-65°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Fill Tension Strength [ksi]
0
20
40
60
80
100
120
140
160
180
0
1
2
3
4
5


Fill Tension Properties (FT)--CTD (-65°F)
Normalized Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Fill Tension Modulus [Msi]
0
2
4
6
8
10
12
0
1
2
3
4
5

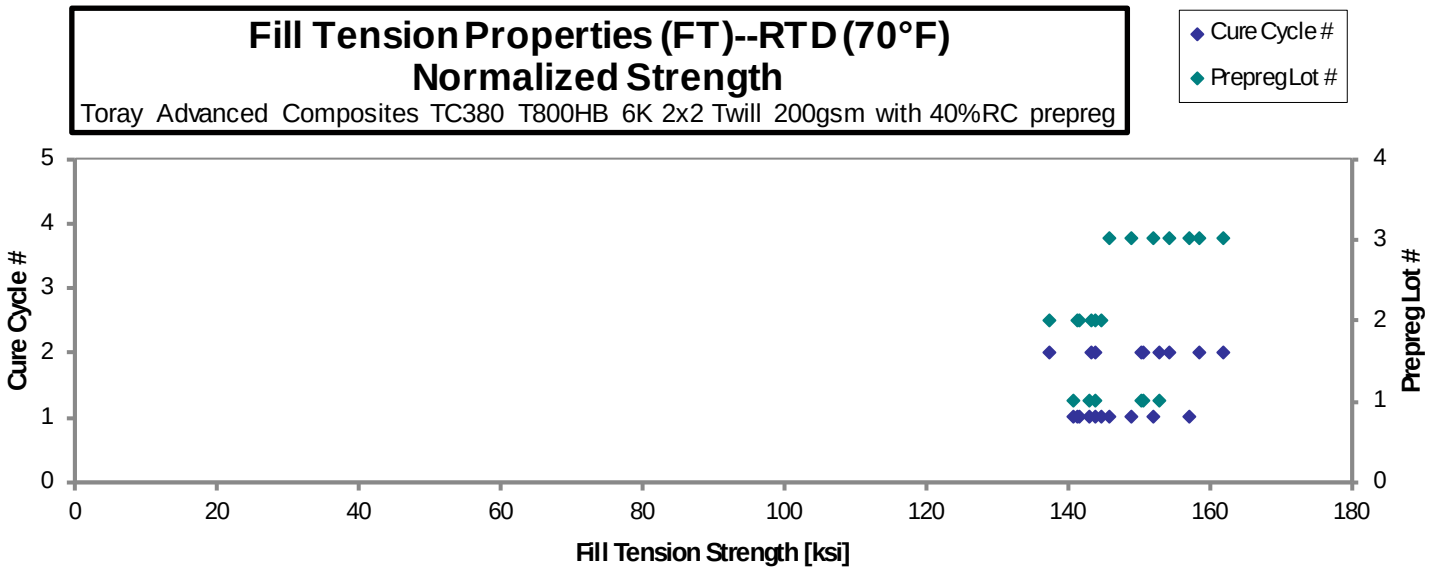
Fill Tension Properties (FT)--RTD (70°F)
Strength & Modulus

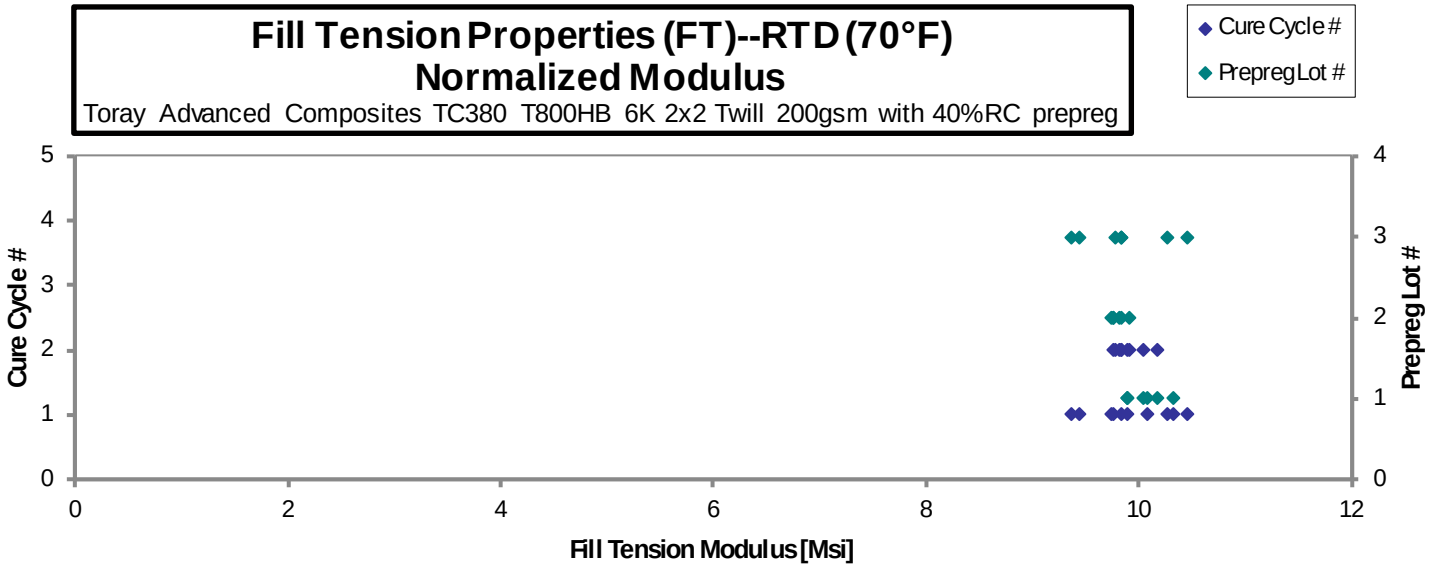
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
TCEUA111A	A	C1	1	1	153.8	11.01	0.09660	12	LAB	0.008050	140.7	10.08
TCEUA112A	A	C1	1	1	151.8	10.95	0.09957	12	LAT	0.008297	143.1	10.32
TCEUA113A	A	C1	1	1	147.0	10.12	0.1033	12	LAB	0.008607	143.8	9.901
TCEUA211A	A	C2	1	2	165.2	11.00	0.09767	12	LGB, LWT	0.008139	152.8	10.17
TCEUA212A	A	C2	1	2	155.6	10.24	0.1020	12	LWB, LAT	0.008499	150.3	9.889
TCEUA213A	A	C2	1	2	152.9	10.19	0.1041	12	LWB, LAT	0.008675	150.7	10.05
TCEUB111A	B	C1	2	1	155.3	10.69	0.09632	12	LWB, LAT	0.008026	141.7	9.751
TCEUB112A	B	C1	2	1	151.5	10.21	0.1010	12	LAT	0.008413	144.8	9.761
TCEUB113A	B	C1	2	1	142.7	9.941	0.1046	12	LWB, LAT	0.008715	141.3	9.845
TCEUB211A	B	C2	2	2	157.4	10.87	0.09625	12	LAB, LAT	0.008021	143.4	9.911
TCEUB212A	B	C2	2	2	144.9	10.37	0.1000	12	LAB, LAT	0.008336	137.3	9.820
TCEUB213A	B	C2	2	2	147.7	10.01	0.1030	12	LAB, LAT	0.008582	144.0	9.757
TCEUC111A	C	C1	3	1	160.8	10.85	0.09983	12	M(A,L)WT, LAB	0.008319	152.0	10.26
TCEUC112A	C	C1	3	1	159.9	10.64	0.1039	12	M(A,L)AT, M(A,L)WB	0.008654	157.3	10.47
TCEUC113A	C	C1	3	1	147.3	9.535	0.1046	12	LAT, M(A,L)AB	0.008718	145.9	9.447
TCEUC114A	C	C1	3	1	152.9	9.618	0.1030	12	LAT, M(A,L)WB	0.008579	149.0	9.377
TCEUC211A	C	C2	3	2	162.3	10.01	0.1032	12	M(A,L)WT, LAB	0.008601	158.6	9.784
TCEUC212A	C	C2	3	2	155.2	9.902	0.1049	12	LWT, LAB	0.008743	154.2	9.838
TCEUC213A	C	C2	3	2	162.3	9.871	0.1053	12	LAT, LWB	0.008772	161.8	9.840

Average	**154.0**	**10.32**	**$Average_{norm}$**	**0.008460**	**148.0**	**9.909**
Standard Dev.	**6.318**	**0.4756**	**$Standard\ Dev._{norm}$**		**6.774**	**0.2716**
Coeff. of Var. [%]	**4.102**	**4.610**	**Coeff. of Var. $[\%]_{norm}$**		**4.576**	**2.741**
Min.	**142.7**	**9.535**	**Min.**	**0.008021**	**137.3**	**9.377**
Max.	**165.2**	**11.01**	**Max.**	**0.008772**	**161.8**	**10.47**
Number of Spec.	**19**	**19**	**Number of Spec.**	**19**	**19**	**19**


Fill Tension Properties (FT)--RTD (70°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Fill Tension Strength [ksi]
0
20
40
60
80
100
120
140
160
180
0
1
2
3
4
5


Fill Tension Properties (FT)--RTD (70°F)
Normalized Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Fill Tension Modulus [Msi]
0
2
4
6
8
10
12
0
1
2
3
4
5

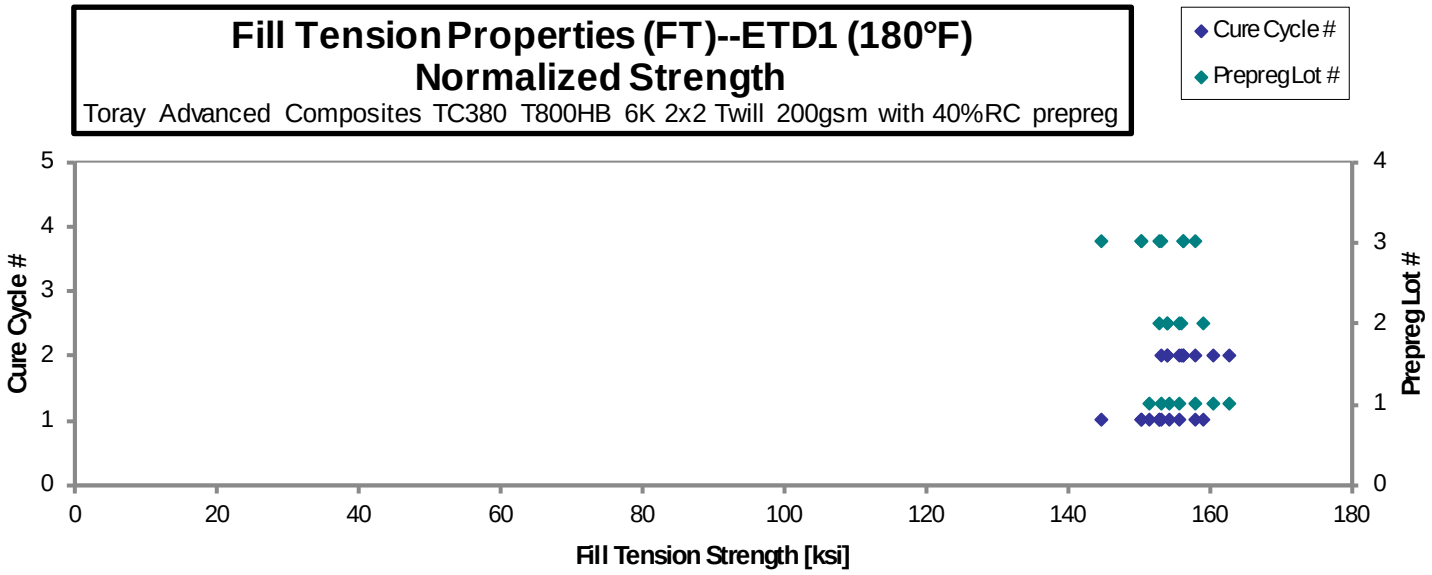
Fill Tension Properties (FT)--ETD1 (180°F)
Strength & Modulus

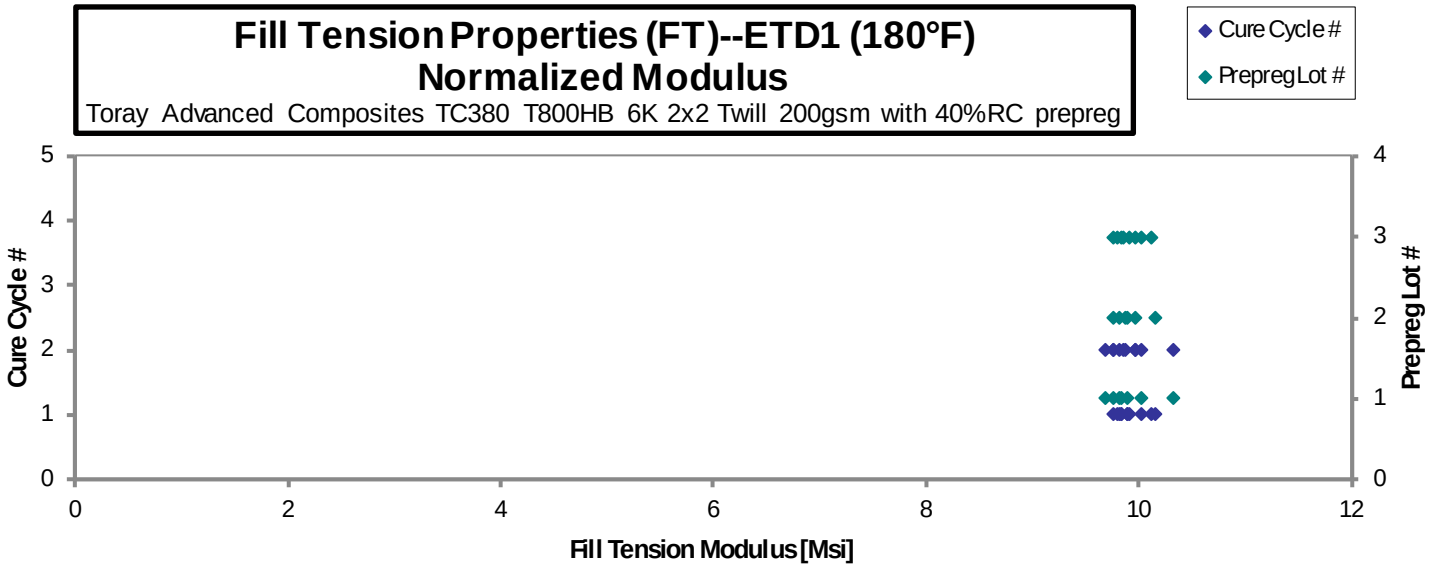
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]: 0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
TCEUA111C	A	C1	1	1	156.7	10.26	0.1032	12	LWT, LAB	0.008600	153.2	10.02
TCEUA112C	A	C1	1	1	158.2	10.07	0.1031	12	LAT	0.008588	154.3	9.826
TCEUA113C	A	C1	1	1	155.9	10.20	0.1026	12	LAT	0.008547	151.4	9.903
TCEUA114C	A	C1	1	1	162.3	10.10	0.1028	12	LAT	0.008568	158.0	9.835
TCEUA211C	A	C2	1	2	163.8	9.951	0.1035	12	LWT, LAB	0.008625	160.5	9.753
TCEUA212C	A	C2	1	2	164.9	9.811	0.1043	12	LWT, LWB	0.008689	162.8	9.687
TCEUA213C	A	C2	1	2	158.4	10.49	0.1039	12	LWT, LWB	0.008654	155.8	10.32
TCEUB111C	B	C1	2	1	154.1	9.835	0.1048	12	LAT, LWB	0.008735	153.0	9.762
TCEUB112C	B	C1	2	1	160.3	9.971	0.1049	12	LAT, LWB	0.008738	159.2	9.901
TCEUB113C	B	C1	2	1	155.7	10.15	0.1056	12	LAT, LGB	0.008799	155.7	10.15
TCEUB211C	B	C2	2	2	157.8	9.924	0.1044	12	LAT	0.008700	156.0	9.811
TCEUB212C	B	C2	2	2	157.7	10.21	0.1031	12	LAB, LAT	0.008592	154.0	9.967
TCEUB213C	B	C2	2	2	156.1	10.01	0.1042	12	LAB	0.008682	154.0	9.879
TCEUC111C	C	C1	3	1	153.8	10.03	0.1033	12	LWT, LAT	0.008606	150.4	9.809
TCEUC112C	C	C1	3	1	152.7	10.27	0.1041	12	LAT	0.008671	150.4	10.12
TCEUC113C	C	C1	3	1	147.7	10.11	0.1035	12	LAT, LWB	0.008621	144.7	9.909
TCEUC114C	C	C1	3	1	155.5	9.988	0.1039	12	LGT, LAB	0.008661	153.0	9.830
TCEUC211C	C	C2	3	2	160.1	9.994	0.1041	12	LWB, LIT	0.008678	157.9	9.855
TCEUC212C	C	C2	3	2	154.6	10.06	0.1046	12	LAB, LWT	0.008714	153.1	9.964
TCEUC213C	C	C2	3	2	158.2	10.13	0.1044	12	LAB, LWT	0.008703	156.4	10.02
TCEUC214C	C	C2	3	2	158.8	9.907	0.1040	12	LWB, LWT	0.008669	156.4	9.760

	Strength [ksi]	Modulus [Msi]		$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
Average	**157.3**	**10.07**	**$Average_{norm}$**	**0.008659**	**154.8**	**9.909**
Standard Dev.	**3.876**	**0.1605**	**Standard $Dev._{norm}$**		**3.944**	**0.1520**
Coeff. of Var. [%]	**2.464**	**1.594**	**Coeff. of Var. $[\%]_{norm}$**		**2.548**	**1.534**
Min.	**147.7**	**9.811**	**Min.**	**0.008547**	**144.7**	**9.687**
Max.	**164.9**	**10.49**	**Max.**	**0.008799**	**162.8**	**10.32**
Number of Spec.	**21**	**21**	**Number of Spec.**	**21**	**21**	**21**


Fill Tension Properties (FT)--ETD1 (180°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Fill Tension Strength [ksi]
0
20
40
60
80
100
120
140
160
180
0
1
2
3
4
5


Fill Tension Properties (FT)--ETD1 (180°F)
Normalized Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Fill Tension Modulus [Msi]
0
2
4
6
8
10
12
0
1
2
3
4
5

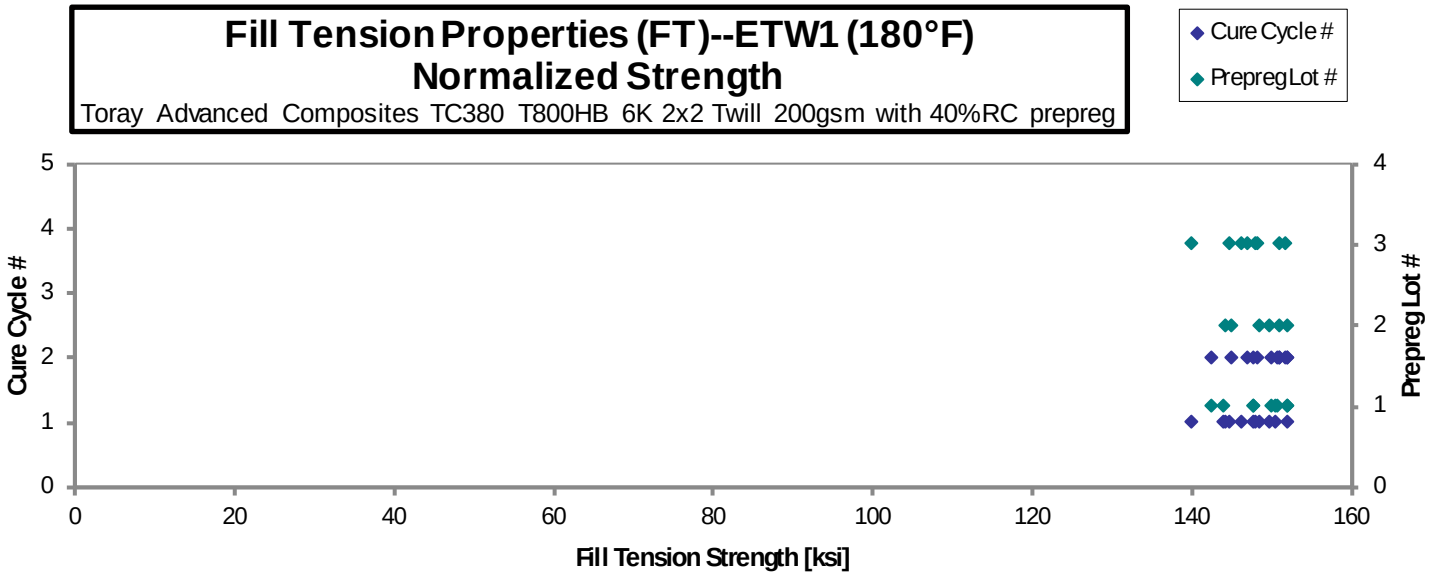
Fill Tension Properties (FT)--ETW1 (180°F)
Strength & Modulus

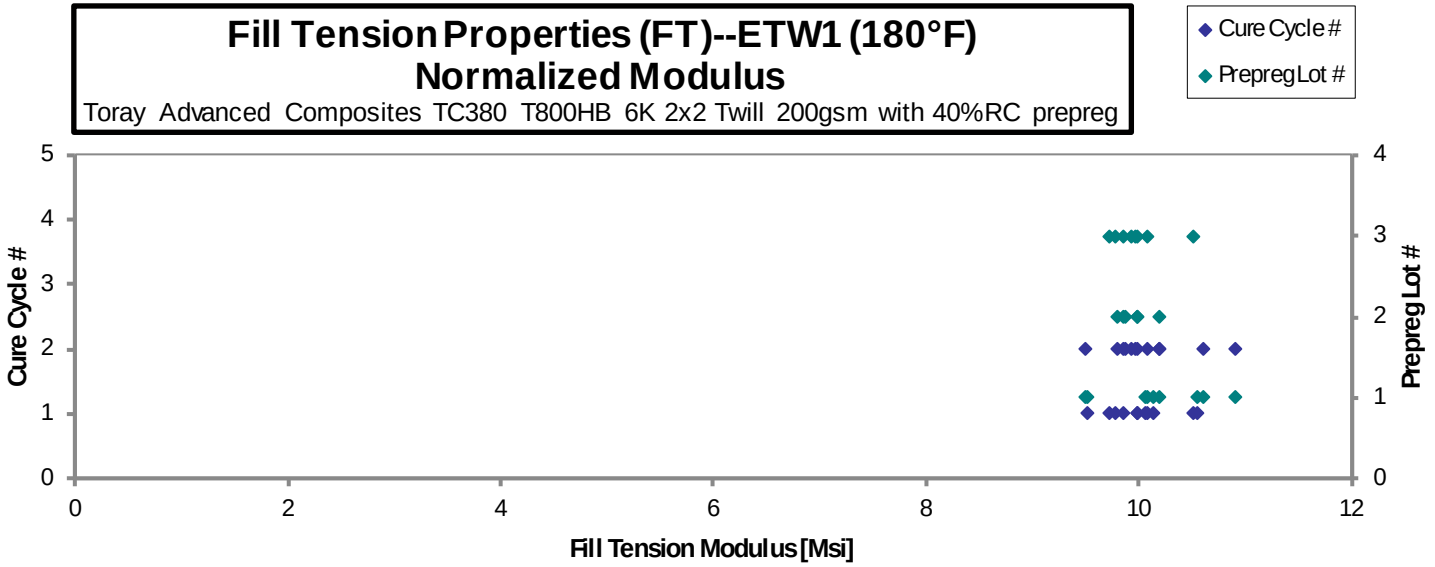
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
TCEUA111D	A	C1	1	1	153.6	10.28	0.1034	12	LWT, LAB	0.008615	150.4	10.07
TCEUA112D	A	C1	1	1	147.7	10.40	0.1029	12	LWT, LAB	0.008575	143.9	10.13
TCEUA113D	A	C1	1	1	152.2	10.87	0.1025	12	LWB, LAT	0.008543	147.8	10.56
TCEUA114D	A	C1	1	1	155.4	9.732	0.1033	12	LWB, LAT	0.008607	152.0	9.518
TCEUA211D	A	C2	1	2	149.5	10.31	0.1044	12	LWT, LWB	0.008697	147.7	10.19
TCEUA212D	A	C2	1	2	152.7	10.80	0.1038	12	LWT, LAB	0.008646	150.0	10.61
TCEUA213D	A	C2	1	2	152.9	10.22	0.1041	12	LWB, LAT	0.008676	150.7	10.08
TCEUA214D	A	C2	1	2	153.4	11.01	0.1046	12	LWT, LAB	0.008715	152.0	10.90
TCEUA215D	A	C2	1	2	143.6	9.576	0.1048	12	LWB, LAT	0.008729	142.4	9.498
TCEUB111D	B	C1	2	1	149.6	10.07	0.1048	12	LAB, LWT	0.008729	148.4	9.986
TCEUB112D	B	C1	2	1	145.8	10.09	0.1045	12	LAB, LWT	0.008707	144.3	9.983
TCEUB113D	B	C1	2	1	151.2	9.960	0.1046	12	LAB, LWT	0.008714	149.7	9.863
TCEUB211D	B	C2	2	2	154.8	9.996	0.1036	12	LWB, LAT	0.008635	151.9	9.808
TCEUB212D	B	C2	2	2	154.4	10.10	0.1033	12	LWB, LAT	0.008604	150.9	9.878
TCEUB213D	B	C2	2	2	148.0	10.42	0.1034	12	LWB, LAT	0.008618	144.9	10.20
TCEUC111D	C	C1	3	1	148.6	10.68	0.1040	12	LAT, LWB, LGB	0.008665	146.3	10.52
TCEUC112D	C	C1	3	1	150.6	9.964	0.1037	12	LWT, LWB	0.008642	147.9	9.785
TCEUC113D	C	C1	3	1	146.7	9.862	0.1041	12	LWB, LAT	0.008676	144.6	9.724
TCEUC114D	C	C1	3	1	142.2	10.25	0.1039	12	LAB, AWT, AGT	0.008660	139.9	10.08
TCEUC211D	C	C2	3	2	154.8	10.17	0.1034	12	LAB, AWT, LGM	0.008619	151.7	9.964
TCEUC212D	C	C2	3	2	149.3	10.01	0.1040	12	LAT, LWT, LIB	0.008664	147.0	9.860
TCEUC213D	C	C2	3	2	152.5	10.03	0.1046	12	LWT, LWB	0.008713	151.0	9.935
TCEUC214D	C	C2	3	2	150.2	10.11	0.1042	12	LWT, LGM	0.008685	148.2	9.982

Average	**150.4**	**10.21**	**$Average_{norm}$**	**0.008658**	**148.0**	**10.05**
Standard Dev.	**3.614**	**0.3568**	**$Standard\ Dev._{norm}$**		**3.371**	**0.3395**
Coeff. of Var. [%]	**2.403**	**3.493**	**$Coeff.\ of\ Var.\ [\%]_{norm}$**		**2.278**	**3.378**
Min.	**142.2**	**9.576**	**Min.**	**0.008543**	**139.9**	**9.498**
Max.	**155.4**	**11.01**	**Max.**	**0.008729**	**152.0**	**10.90**
Number of Spec.	**23**	**23**	**Number of Spec.**	**23**	**23**	**23**


Fill Tension Properties (FT)--ETW1 (180°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Fill Tension Strength [ksi]
0
20
40
60
80
100
120
140
160
0
1
2
3
4
5


Fill Tension Properties (FT)--ETW1 (180°F)
Normalized Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Fill Tension Modulus [Msi]
0
2
4
6
8
10
12
0
1
2
3
4
5

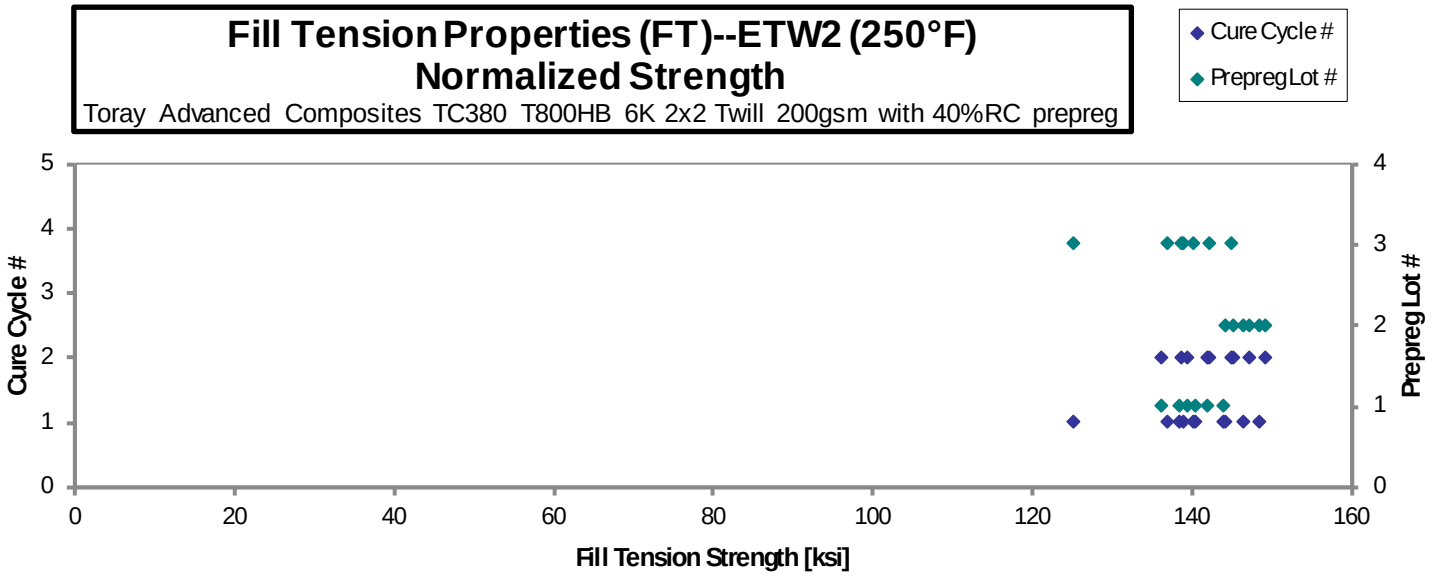
Fill Tension Properties (FT)--ETW2 (250°F)
Strength & Modulus

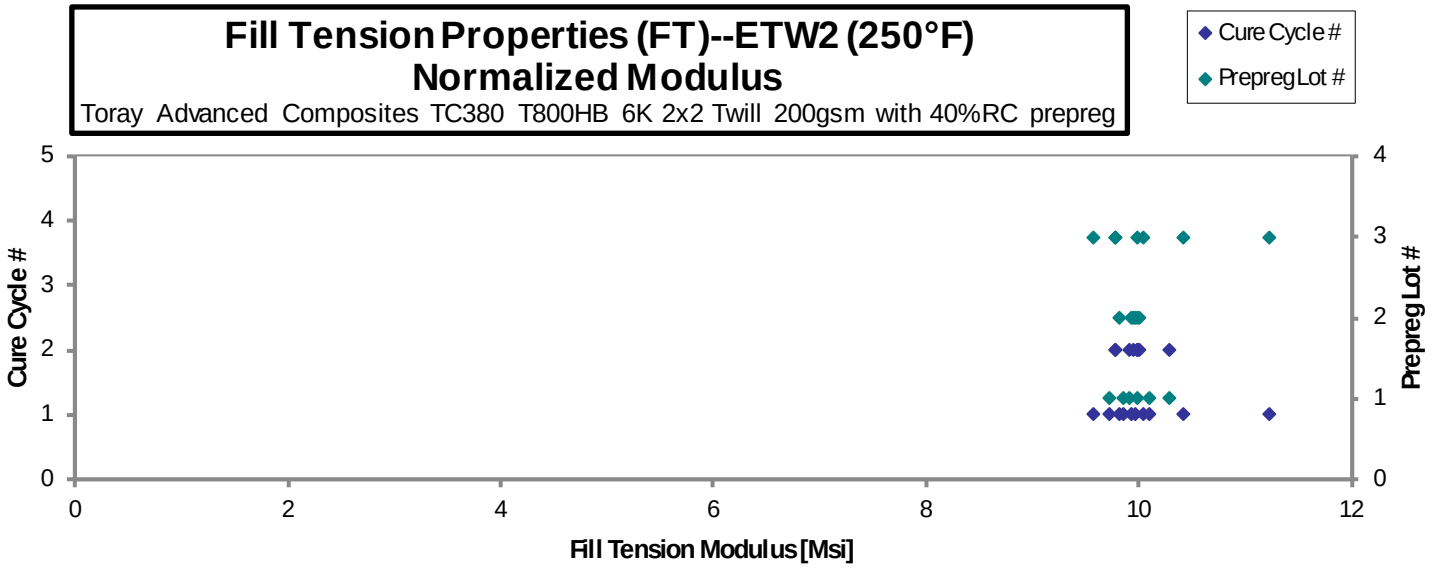
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
TCEUA111E	A	C1	1	1	146.0	9.988	0.1042	12	LWB, LAT	0.008681	144.0	9.852
TCEUA112E	A	C1	1	1	140.2	10.23	0.1042	12	LAB, LAT	0.008686	138.4	10.10
TCEUA113E	A	C1	1	1	141.9	9.824	0.1045	12	LWB, LAT	0.008707	140.4	9.720
TCEUA211E	A	C2	1	2	136.7	10.33	0.1052	12	LWB, LAT	0.008768	136.2	10.29
TCEUA212E	A	C2	1	2	142.5	9.950	0.1051	12	LWB, LAT	0.008758	141.8	9.903
TCEUA213E	A	C2	1	2	140.0	10.03	0.1052	12	LWT, LAB	0.008765	139.5	9.989
TCEUB111E	B	C1	2	1	141.2	9.763	0.1078	12	LWT, LAB	0.008985	144.2	9.968
TCEUB112E	B	C1	2	1	145.3	9.852	0.1065	12	LWB, LAT	0.008872	146.5	9.933
TCEUB113E	B	C1	2	1	147.6	9.758	0.1062	12	LWB, LAT	0.008853	148.5	9.817
TCEUB211E	B	C2	2	2	150.9	10.05	0.1045	12	LAT, LWB	0.008708	149.3	9.947
TCEUB212E	B	C2	2	2	147.6	10.03	0.1053	12	LAT, LWB	0.008775	147.1	10.00
TCEUB213E	B	C2	2	2	147.0	10.11	0.1043	12	LAT, LWB	0.008688	145.1	9.980
TCEUC111E	C	C1	3	1	125.6	9.624	0.1052	12	M(A,L)WT, LWB	0.008763	125.1	9.583
TCEUC112E	C	C1	3	1	142.5	11.40	0.1040	12	LIT, LWB	0.008665	140.3	11.22
TCEUC113E	C	C1	3	1	138.8	10.18	0.1041	12	LWT, LWB	0.008678	136.9	10.04
TCEUC114E	C	C1	3	1	143.1	10.72	0.1026	12	AWT, LAB	0.008547	139.0	10.42
TCEUC211E	C	C2	3	2	139.3	10.03	0.1051	12	LWT, M(A,L)GB	0.008757	138.6	9.985
TCEUC212E	C	C2	3	2	146.2	9.873	0.1047	12	LAT, LGB	0.008724	145.0	9.787
TCEUC213E	C	C2	3	2	143.8	9.889	0.1045	12	M(A,L)GM	0.008707	142.3	9.784

	Strength [ksi]	Modulus [Msi]		t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
Average	**142.4**	**10.09**	**$Average_{norm}$**	**0.008741**	**141.5**	**10.02**
Standard Dev.	**5.450**	**0.4006**	**Standard $Dev._{norm}$**		**5.558**	**0.3479**
Coeff. of Var. [%]	**3.826**	**3.972**	**Coeff. of Var. $[\%]_{norm}$**		**3.929**	**3.474**
Min.	**125.6**	**9.624**	**Min.**	**0.008547**	**125.1**	**9.583**
Max.	**150.9**	**11.40**	**Max.**	**0.008985**	**149.3**	**11.22**
Number of Spec.	**19**	**19**	**Number of Spec.**	**19**	**19**	**19**


Fill Tension Properties (FT)--ETW2 (250°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Fill Tension Strength [ksi]
0
20
40
60
80
100
120
140
160
0
1
2
3
4
5


Fill Tension Properties (FT)--ETW2 (250°F)
Normalized Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Fill Tension Modulus [Msi]
0
2
4
6
8
10
12
0
1
2
3
4
5

4.3 Warp Compression Properties (WC)

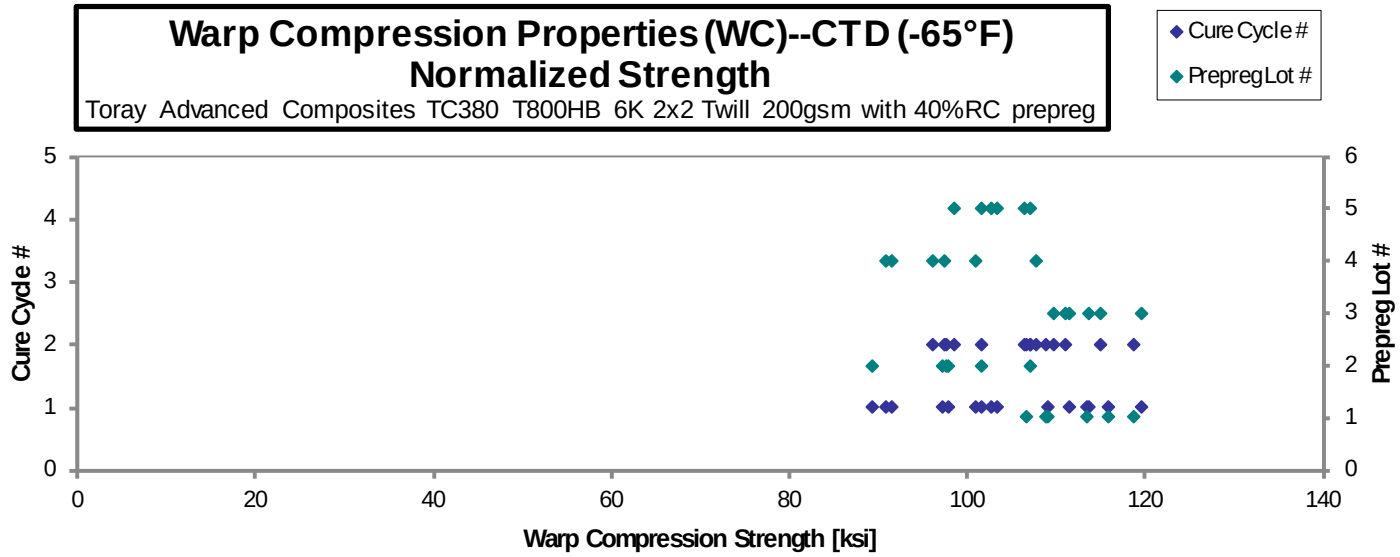
Warp Compression Properties (WC)--CTD (-65°F)
Strength & Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

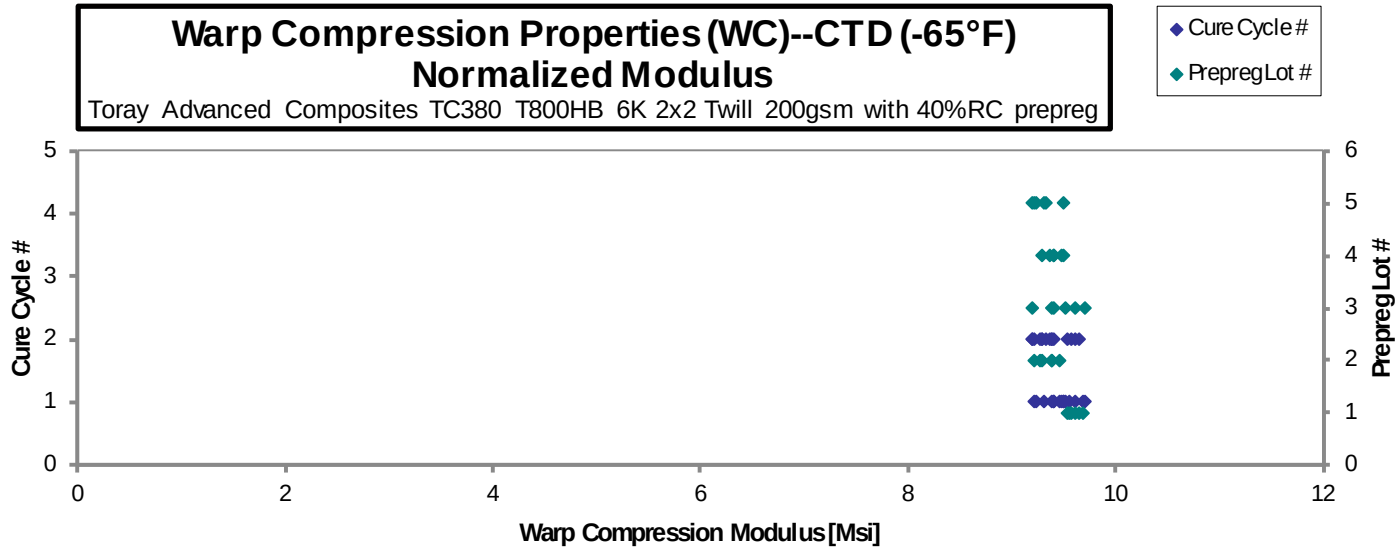
normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
TCELA111B	A	C1	1	1	115.0	9.742	0.1042	12	BAB, HAB/HIB	0.008685	113.5	9.614
TCELA112B	A	C1	1	1	110.0	9.635	0.1047	12	BAT	0.008725	109.1	9.553
TCELA113B	A	C1	1	1	115.4	9.653	0.1059	12	BAT	0.008826	115.8	9.682
TCELA211B	A	C2	1	2	119.7	9.621	0.1047	12	BAB	0.008728	118.7	9.542
TCELA212B	A	C2	1	2	106.6	9.638	0.1057	12	BGM	0.008807	106.6	9.645
TCELA213B	A	C2	1	2	107.9	9.483	0.1066	12	BGM	0.008882	108.9	9.571
TCELB111B	B	C1	2	1	102.1	9.869	0.1013	12	BGM	0.008438	97.86	9.462
TCELB112B	B	C1	2	1	92.09	9.673	0.1025	12	BGM	0.008538	89.34	9.385
TCELB113B	B	C1	2	1	99.53	9.442	0.1031	12	BAB	0.008593	97.19	9.220
TCELB211B	B	C2	2	2	112.5	9.749	0.1006	12	BGM	0.008385	107.2	9.289
TCELB212B	B	C2	2	2	100.8	9.558	0.1024	12	BGM	0.008532	97.74	9.267
TCELB213B	B	C2	2	2	103.6	9.585	0.1035	12	BGM	0.008622	101.5	9.391
TCELC111B	C	C1	3	1	111.9	9.437	0.1053	12	BGM	0.008771	111.5	9.406
TCELC112B	C	C1	3	1	113.4	9.501	0.1059	12	BGM	0.008824	113.7	9.526
TCELC113B	C	C1	3	1	119.2	9.663	0.1060	12	BAT	0.008833	119.6	9.700
TCELC211B	C	C2	3	2	114.9	9.384	0.1056	12	BGM	0.008800	114.9	9.384
TCELC212B	C	C2	3	2	108.7	9.104	0.1066	12	BAT	0.008886	109.7	9.193
TCELC213B	C	C2	3	2	109.8	9.497	0.1068	12	BGM	0.008901	111.1	9.606
TCELD111B	D	C1	4	1	101.3	10.49	0.09463	12	BAB	0.007886	90.79	9.402
TCELD112B	D	C1	4	1	108.9	10.25	0.09798	12	M(B,H)AB	0.008165	101.0	9.508
TCELD113B	D	C1	4	1	96.45	9.980	0.1002	12	BAB	0.008353	91.55	9.473
TCELD211B	D	C2	4	2	110.9	10.70	0.09278	12	BAT	0.007732	97.42	9.404
TCELD212B	D	C2	4	2	119.1	10.28	0.09555	12	BAT	0.007963	107.7	9.300
TCELD213B	D	C2	4	2	104.3	10.16	0.09743	12	BAT	0.008119	96.20	9.376
TCELE111B	E	C1	5	1	117.0	10.83	0.09265	12	BAT	0.007721	102.6	9.501
TCELE112B	E	C1	5	1	113.8	10.17	0.09592	12	BAT	0.007993	103.4	9.237
TCELE113B	E	C1	5	1	108.5	9.938	0.09893	12	BGM	0.008244	101.6	9.311
TCELE211B	E	C2	5	2	110.2	10.45	0.09432	12	BGM	0.007860	98.47	9.335
TCELE212B	E	C2	5	2	116.9	10.04	0.09675	12	BAT	0.008063	107.1	9.201
TCELE213B	E	C2	5	2	114.1	9.884	0.09850	12	BAB	0.008208	106.5	9.220

Average	**109.5**	**9.847**	
Standard Dev.	**6.979**	**0.4144**	
Coeff. of Var. [%]	**6.374**	**4.209**	
Min.	**92.09**	**9.104**	
Max.	**119.7**	**10.83**	
Number of Spec.	**30**	**30**	

$Average_{norm}$	**0.008436**	**104.9**	**9.424**
$Standard\ Dev._{norm}$		**8.170**	**0.1496**
Coeff. of Var. [%]$_{norm}$		**7.785**	**1.587**
Min.	**0.007721**	**89.34**	**9.193**
Max.	**0.008901**	**119.6**	**9.700**
Number of Spec.	**30**	**30**	**30**


Warp Compression Properties (WC)--CTD (-65°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Warp Compression Strength [ksi]
0
20
40
60
80
100
120
140


Warp Compression Properties (WC)--CTD (-65°F)
Normalized Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Warp Compression Modulus [Msi]
0
2
4
6
8
10
12

Warp Compression Properties (WC)--RTD (70°F)
Strength & Modulus

Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

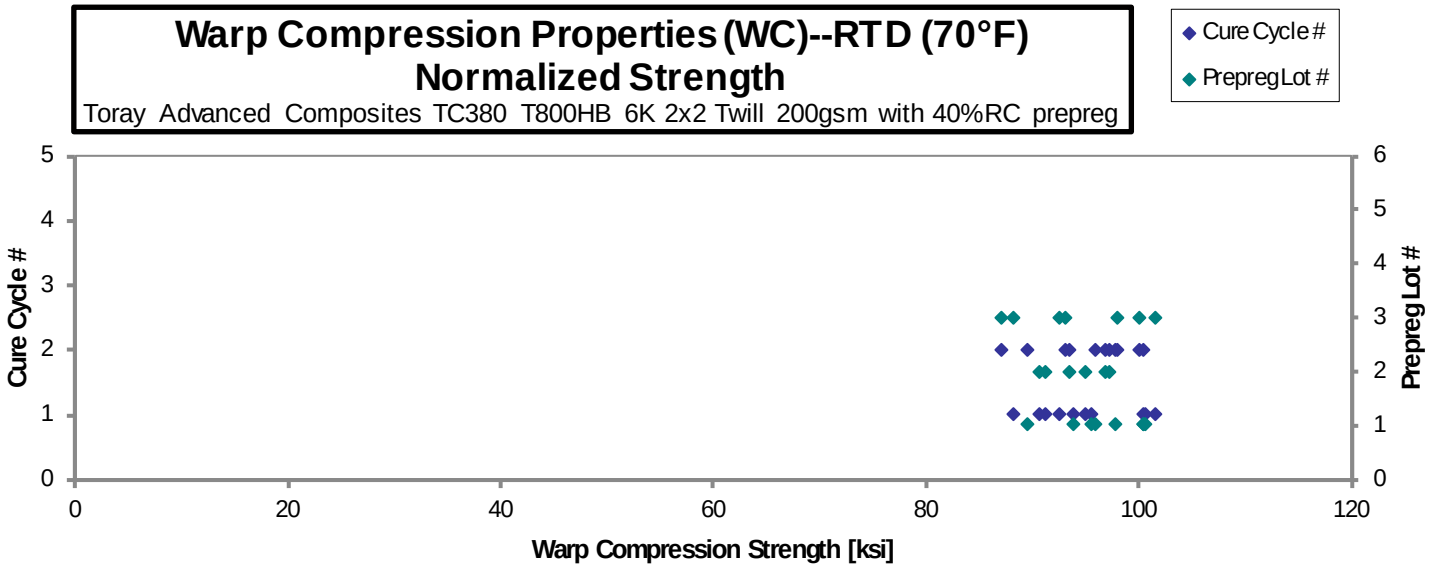
normalizing t_{ply} [in]: 0.008800

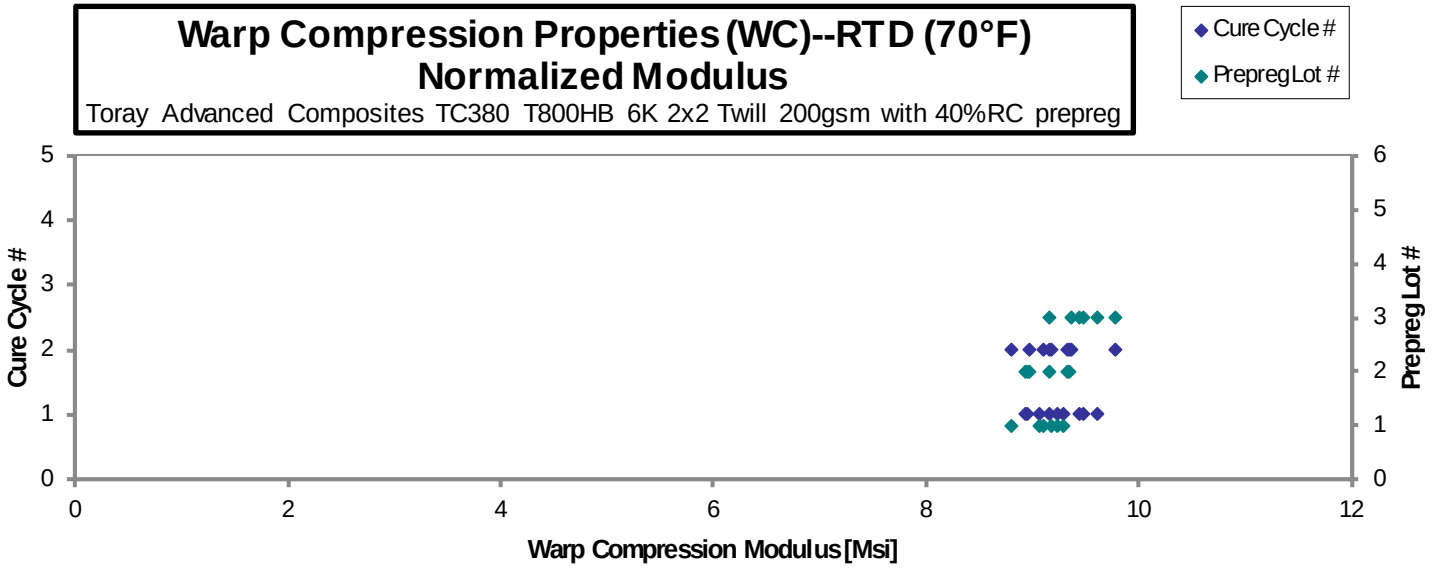
Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
TCELA111A*	A	C1	1	1	104.5	10.09	0.09662	12	BGM, HAB	0.008051	95.58	9.235
TCELA112A*	A	C1	1	1	100.1	9.913	0.09900	12	BAB	0.008250	93.85	9.293
TCELA113A	A	C1	1	1	105.1	9.472	0.1012	12	HAB/HIB	0.008431	100.7	9.075
TCELA114A**	A	C1	1	1	103.1		0.1029	12	HAB/HIB	0.008571	100.5	
TCELA211A	A	C2	1	2	108.4	9.498	0.09792	12	HAB, HIB	0.008160	100.5	8.807
TCELA212A	A	C2	1	2	102.8	9.565	0.1005	12	HAT, HIT	0.008372	97.82	9.100
TCELA213A	A	C2	1	2	99.22	9.485	0.1021	12	BAB	0.008511	95.97	9.173
TCELA214A**	A	C2	1	2	91.06		0.1038	12	BAB	0.008647	89.48	
TCELB111A	B	C1	2	1	108.2	10.44	0.09268	12	BAT	0.007724	95.00	9.161
TCELB112A	B	C1	2	1	100.2	9.884	0.09550	12	BGM	0.007958	90.66	8.939
TCELB113A	B	C1	2	1	98.78	9.696	0.09743	12	BAB	0.008119	91.14	8.946
TCELB211A	B	C2	2	2	110.1	10.20	0.09292	12	BAT	0.007743	96.89	8.975
TCELB212A	B	C2	2	2	103.4	10.33	0.09540	12	HAB, HIB	0.007950	93.40	9.332
TCELB213A	B	C2	2	2	104.9	10.08	0.09797	12	BAB	0.008164	97.30	9.347
TCELC111A	C	C1	3	1	97.65	10.00	0.1000	12	M(B,H)AT	0.008335	92.49	9.471
TCELC112A	C	C1	3	1	105.5	9.991	0.1017	12	BGM, HAT	0.008471	101.5	9.618
TCELC113A	C	C1	3	1	90.49	9.687	0.1030	12	M(B,H)AT	0.008579	88.22	9.443
TCELC211A	C	C2	3	2	105.0	9.818	0.1007	12	BAB, HIB	0.008394	100.1	9.365
TCELC212A	C	C2	3	2	95.88	9.444	0.1025	12	BGM, HIT	0.008542	93.07	9.167
TCELC213A	C	C2	3	2	88.94	9.985	0.1034	12	BAT	0.008618	87.10	9.778
TCELC214A**	C	C2	3	2	98.88		0.1046	12	BAT, HIT	0.008717	97.95	

* Modulus are average values of 2 strain gages.

** Specimen was not gaged, only strength is reported.

Average	**101.1**	**9.865**		**$Average_{norm}$**	**0.008300**	**95.20**	**9.235**
Standard Dev.	**5.868**	**0.3037**		**$Standard\ Dev._{norm}$**		**4.320**	**0.2499**
Coeff. of Var. [%]	**5.807**	**3.078**		**Coeff. of Var. [%]$_{norm}$**		**4.538**	**2.707**
Min.	**88.94**	**9.444**		**Min.**	**0.007724**	**87.10**	**8.807**
Max.	**110.1**	**10.44**		**Max.**	**0.008717**	**101.5**	**9.778**
Number of Spec.	**21**	**18**		**Number of Spec.**	**21**	**21**	**18**


Warp Compression Properties (WC)--RTD (70°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Warp Compression Strength [ksi]
0
20
40
60
80
100
120
0
1
2
3
4
5
6


Warp Compression Properties (WC)--RTD (70°F)
Normalized Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Warp Compression Modulus [Msi]
0
2
4
6
8
10
12
0
1
2
3
4
5
6

Warp Compression Properties (WC)--ETD1 (180°F)
Strength & Modulus

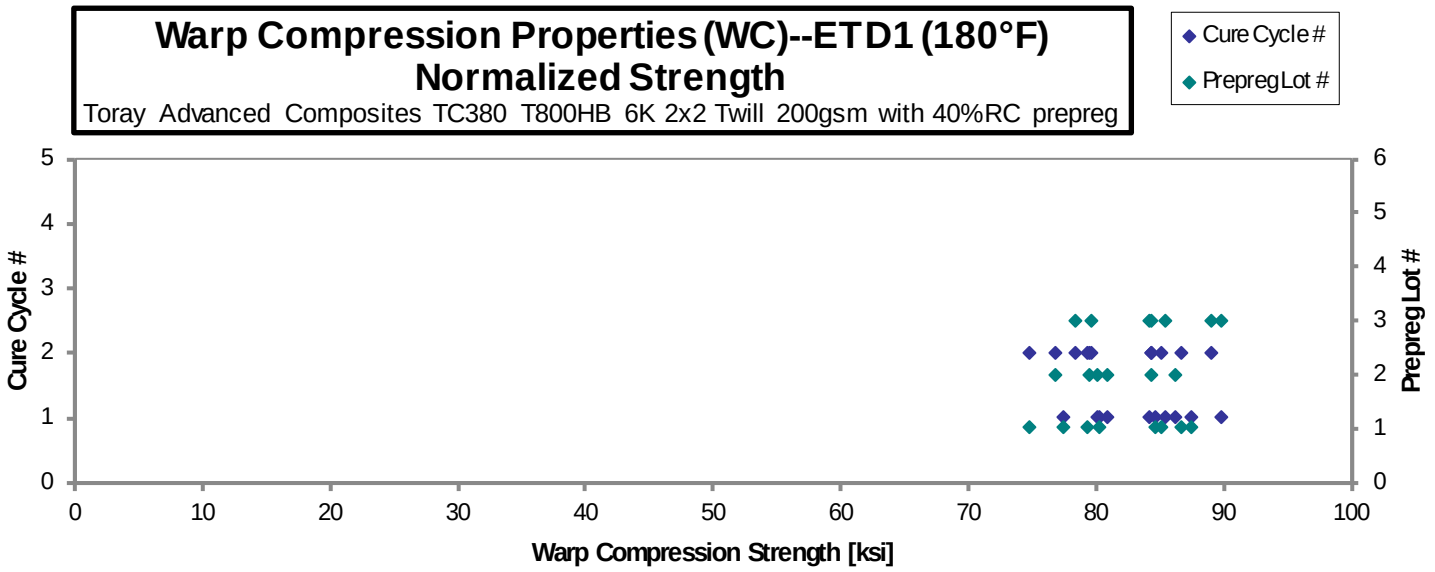
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

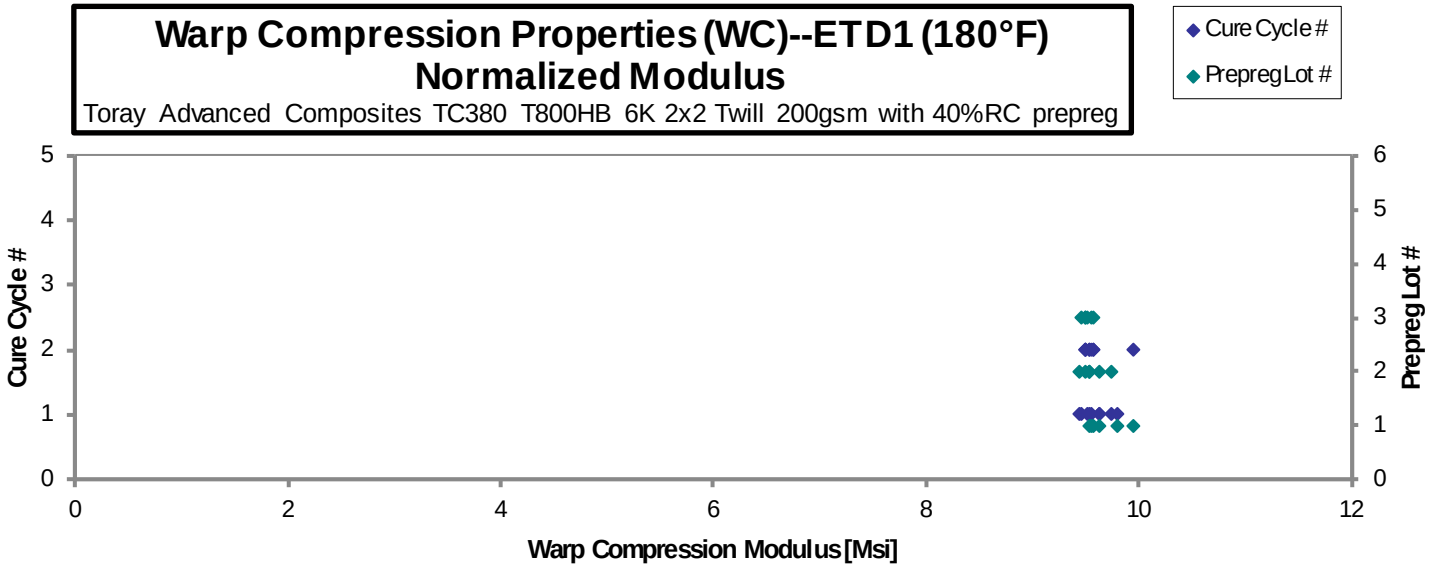
normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
TCELA111C	A	C1	1	1	86.03	9.633	0.1074	12	BAB, HAB.HIB	0.008951	87.51	9.799
TCELA112C	A	C1	1	1	76.68	9.533	0.1066	12	BAB, HAB.HIB	0.008883	77.41	9.623
TCELA113C	A	C1	1	1	83.28	9.374	0.1073	12	BAB	0.008944	84.65	9.528
TCELA114C*	A	C1	1	1	87.69		0.09657	12	BAB	0.008047	80.19	
TCELA211C	A	C2	1	2	73.30	9.760	0.1076	12	BAB	0.008968	74.70	9.947
TCELA212C	A	C2	1	2	77.44	9.353	0.1082	12	BAB	0.009015	79.34	9.582
TCELA213C	A	C2	1	2	83.31	9.340	0.1080	12	BAT, HAT/HIT	0.008997	85.18	9.550
TCELA214C*	A	C2	1	2	93.24		0.09815	12	BAB	0.008179	86.66	
TCELB111C	B	C1	2	1	81.50	9.611	0.1038	12	BAB, HIB	0.008646	80.07	9.443
TCELB112C	B	C1	2	1	82.44	9.925	0.1037	12	BAB	0.008642	80.95	9.747
TCELB113C	B	C1	2	1	87.86	9.821	0.1036	12	M(B,H)AB	0.008631	86.17	9.631
TCELB211C	B	C2	2	2	77.92	9.677	0.1041	12	BAB	0.008675	76.81	9.540
TCELB212C	B	C2	2	2	85.77	9.660	0.1038	12	BAB, HAB/HIB	0.008650	84.30	9.495
TCELB213C	B	C2	2	2	80.78	9.706	0.1038	12	BAB, HAB/HIB	0.008650	79.41	9.541
TCELC111C	C	C1	3	1	85.28	9.505	0.1057	12	BAT	0.008807	85.35	9.513
TCELC112C	C	C1	3	1	89.35	9.503	0.1061	12	BAB, HIB	0.008840	89.76	9.547
TCELC113C	C	C1	3	1	84.06	9.456	0.1057	12	BAT	0.008810	84.15	9.467
TCELC211C	C	C2	3	2	88.19	9.412	0.1066	12	HAT, HIT	0.008883	89.02	9.502
TCELC212C	C	C2	3	2	83.60	9.428	0.1065	12	BAB	0.008872	84.28	9.506
TCELC213C	C	C2	3	2	77.63	9.496	0.1066	12	BAB, HIB	0.008881	78.34	9.583
TCELC214C*	C	C2	3	2	79.62		0.1057	12	BAB, HIB	0.008807	79.69	

* Specimen was not gaged, only strength is reported.

Average	**83.09**	**9.566**		**$Average_{norm}$**	**0.008751**	**82.57**	**9.586**
Standard Dev.	**4.897**	**0.1681**		**$Standard\ Dev._{norm}$**		**4.229**	**0.1276**
Coeff. of Var. [%]	**5.894**	**1.757**		**$Coeff.\ of\ Var.\ [\%]_{norm}$**		**5.122**	**1.331**
Min.	**73.30**	**9.340**		**Min.**	**0.008047**	**74.70**	**9.443**
Max.	**93.24**	**9.925**		**Max.**	**0.009015**	**89.76**	**9.947**
Number of Spec.	**21**	**18**		**Number of Spec.**	**21**	**21**	**18**


Warp Compression Properties (WC)--ETD1 (180°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Warp Compression Strength [ksi]
0
10
20
30
40
50
60
70
80
90
100
0
1
2
3
4
5
6


Warp Compression Properties (WC)--ETD1 (180°F)
Normalized Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Warp Compression Modulus [Msi]
0
2
4
6
8
10
12
0
1
2
3
4
5
6

Warp Compression Properties (WC)--ETW1 (180°F)
Strength & Modulus

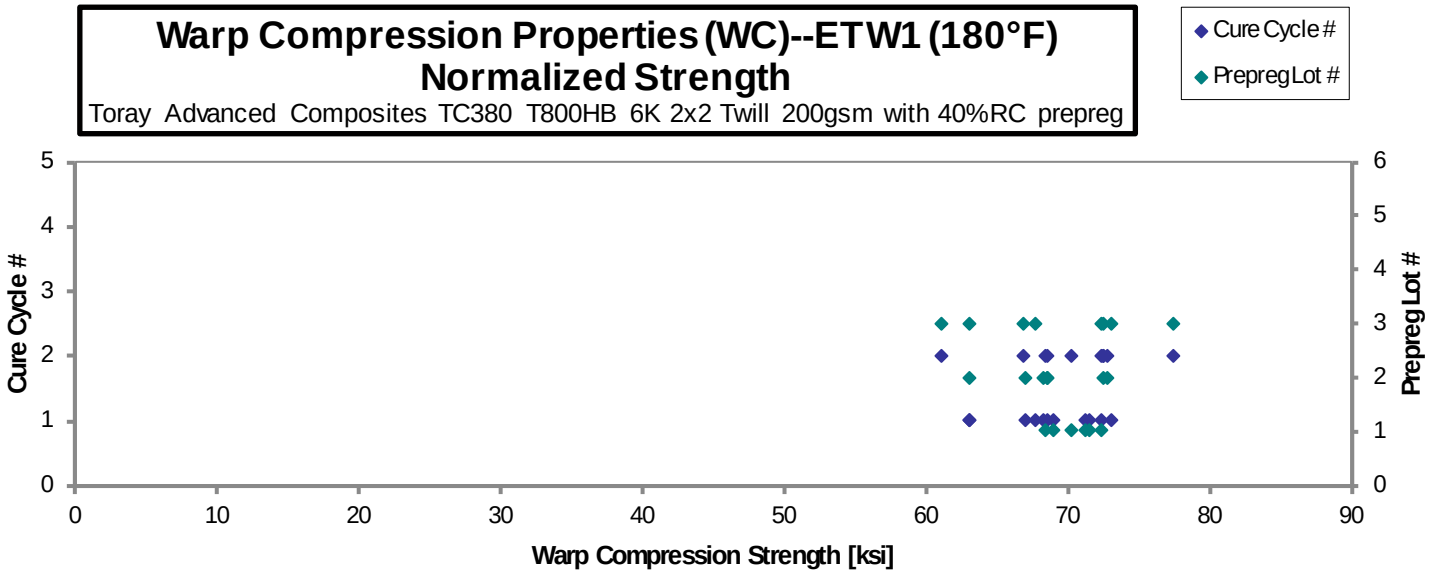
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

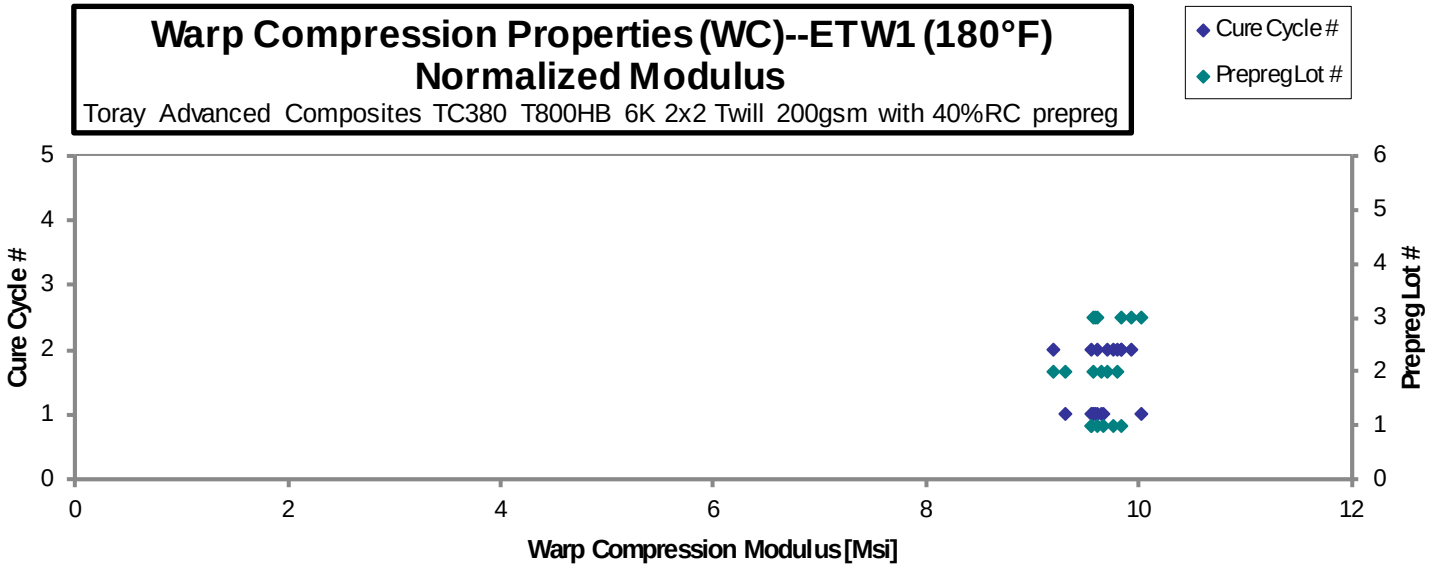
normalizing t_{ply} [in]: 0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
TCELA111D	A	C1	1	1	73.41	10.17	0.09918	12	BAB	0.008265	68.95	9.556
TCELA112D	A	C1	1	1	74.15	9.968	0.1018	12	BAB, HIB	0.008485	71.49	9.611
TCELA113D	A	C1	1	1	72.67	9.861	0.1035	12	BAB	0.008622	71.20	9.662
TCELA211D	A	C2	1	2	71.93	10.27	0.1004	12	BAB	0.008369	68.41	9.770
TCELA212D	A	C2	1	2	71.92	10.06	0.1032	12	BAT, HIT	0.008603	70.31	9.833
TCELA213D	A	C2	1	2	73.07	9.633	0.1047	12	BAT, HIT	0.008721	72.41	9.546
TCELB111D	B	C1	2	1	70.14	9.863	0.1033	12	HAB/HIB	0.008606	68.59	9.645
TCELB112D	B	C1	2	1	68.54	9.533	0.1032	12	BAT	0.008600	66.98	9.317
TCELB113D	B	C1	2	1	70.58	9.880	0.1023	12	HAB	0.008521	68.34	9.567
TCELB114D*	B	C1	2	1	66.26		0.1005	12	BGM	0.008376	63.07	
TCELB211D	B	C2	2	2	69.72	9.977	0.1038	12	BAB	0.008651	68.55	9.809
TCELB213D	B	C2	2	2	74.67	9.473	0.1025	12	BAT, HIT	0.008543	72.49	9.197
TCELB214D	B	C2	2	2	75.69	10.09	0.1015	12	HAT, HIT	0.008457	72.74	9.699
TCELC111D	C	C1	3	1	72.82	9.544	0.1060	12	HAT/HIT	0.008829	73.06	9.576
TCELC112D	C	C1	3	1	72.37	9.588	0.1057	12	BAB	0.008804	72.40	9.592
TCELC113D	C	C1	3	1	68.20	10.09	0.1049	12	BAT	0.008743	67.76	10.03
TCELC114D*	C	C1	3	1	63.89		0.1043	12	BAT	0.008693	63.11	
TCELC211D	C	C2	3	2	77.59	9.624	0.1055	12	BAT	0.008790	77.50	9.613
TCELC212D	C	C2	3	2	67.59	9.947	0.1045	12	BAT	0.008706	66.87	9.840
TCELC213D	C	C2	3	2	62.19	10.11	0.1038	12	BAB	0.008653	61.15	9.940
TCELC214D*	C	C2	3	2	74.25		0.1031	12	BAT	0.008594	72.51	

* Specimen was not gaged, only strength is reported.

	Strength [ksi]	Modulus [Msi]		t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
Average	**71.03**	**9.872**	**$Average_{norm}$**	**0.008602**	**69.42**	**9.655**
Standard Dev.	**3.858**	**0.2480**	**$Standard\ Dev._{norm}$**		**3.887**	**0.2016**
Coeff. of Var. [%]	**5.432**	**2.513**	**$Coeff.\ of\ Var.\ [\%]_{norm}$**		**5.599**	**2.088**
Min.	**62.19**	**9.473**	**Min.**	**0.008265**	**61.15**	**9.197**
Max.	**77.59**	**10.27**	**Max.**	**0.008829**	**77.50**	**10.03**
Number of Spec.	**21**	**18**	**Number of Spec.**	**21**	**21**	**18**


Warp Compression Properties (WC)--ETW1 (180°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Warp Compression Strength [ksi]
0
10
20
30
40
50
60
70
80
90
0
1
2
3
4
5
6


Warp Compression Properties (WC)--ETW1 (180°F)
Normalized Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Warp Compression Modulus [Msi]
0
2
4
6
8
10
12
0
1
2
3
4
5
6

Warp Compression Properties (WC)--ETW2 (250°F)
Strength & Modulus

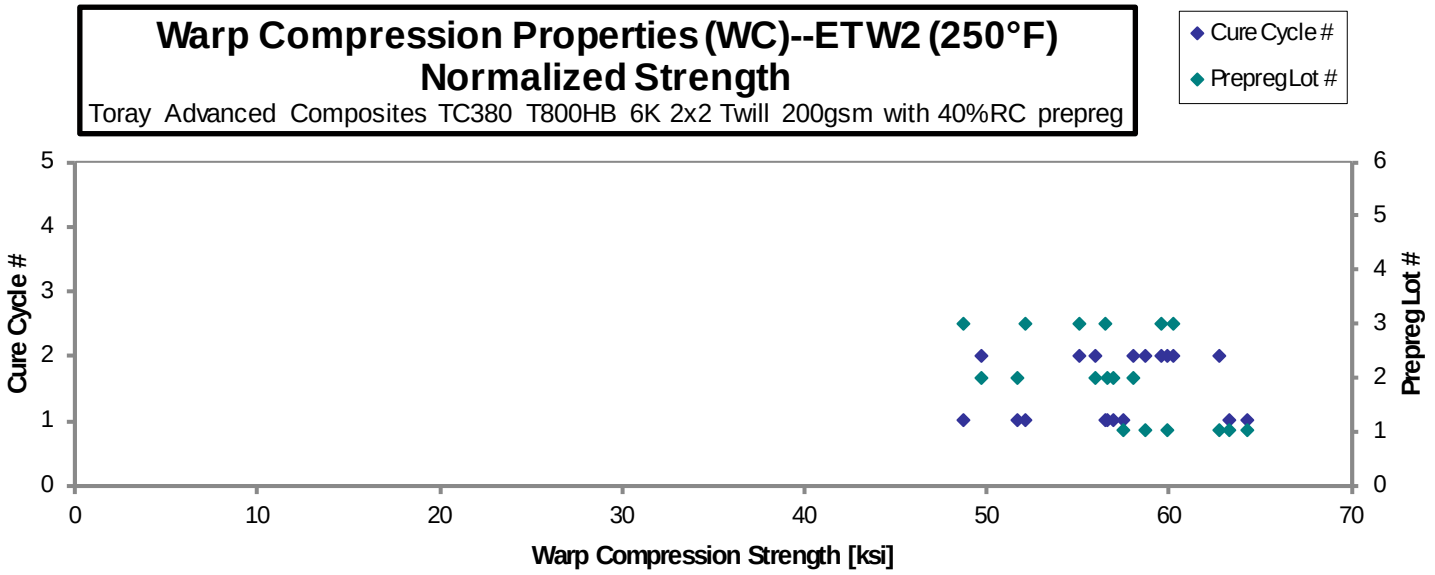
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

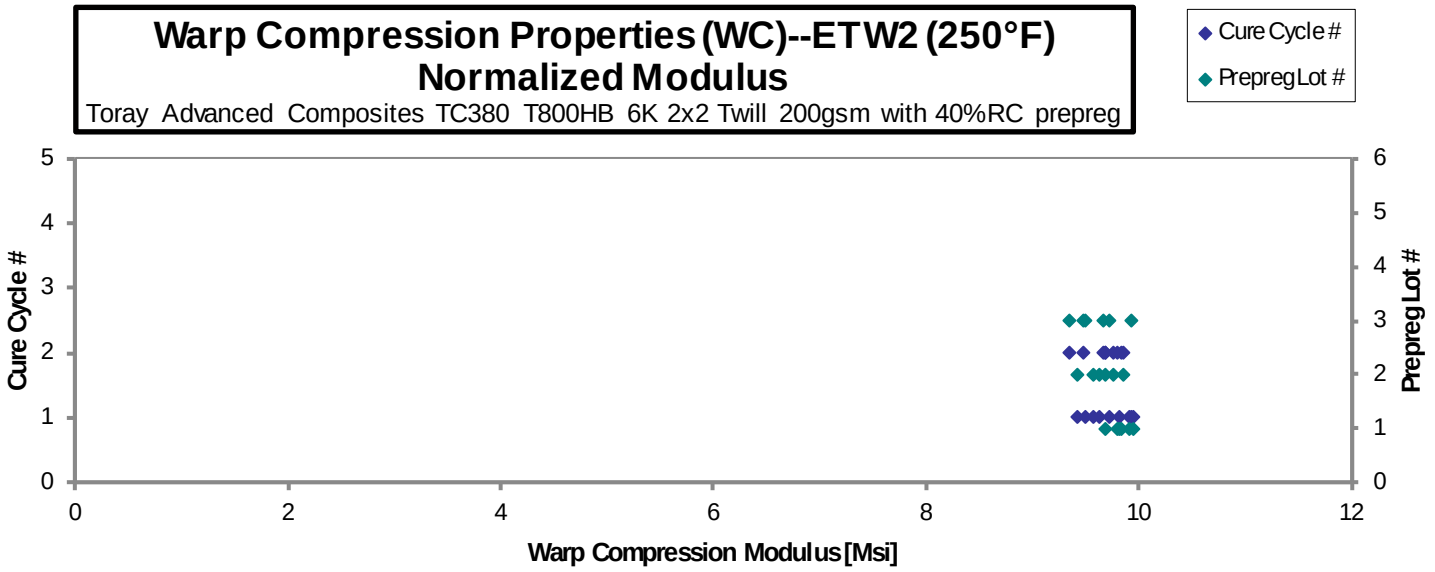
normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
TCELA111E	A	C1	1	1	61.99	9.705	0.1078	12	HAT, HIT	0.008983	63.28	9.907
TCELA112E	A	C1	1	1	62.54	9.550	0.1085	12	BAB, HIB	0.009043	64.27	9.814
TCELA113E	A	C1	1	1	55.58	9.619	0.1092	12	BAT, HIT	0.009097	57.45	9.944
TCELA211E	A	C2	1	2	57.19	9.436	0.1084	12	HAT	0.009033	58.71	9.686
TCELA212E	A	C2	1	2	60.47	9.477	0.1095	12	BAB	0.009128	62.72	9.830
TCELA213E	A	C2	1	2	57.49	9.391	0.1101	12	HAB, HIB	0.009178	59.96	9.795
TCELB111E	B	C1	2	1	55.62	10.15	0.09808	12	M(B,H)AT	0.008174	51.66	9.431
TCELB112E	B	C1	2	1	62.05	10.49	0.09697	12	M(B,H)AT, HIT	0.008081	56.98	9.636
TCELB113E	B	C1	2	1	63.61	10.74	0.09403	12	M(B,H)AT, HIT	0.007836	56.64	9.567
TCELB211E	B	C2	2	2	53.33	10.58	0.09840	12	BAB	0.008200	49.70	9.861
TCELB212E	B	C2	2	2	61.27	10.59	0.09650	12	HAT, HIT	0.008042	55.99	9.679
TCELB213E	B	C2	2	2	64.83	10.90	0.09455	12	BAB, HIT	0.007879	58.05	9.757
TCELC111E	C	C1	3	1	54.15	9.869	0.1016	12	BAB	0.008469	52.12	9.498
TCELC112E	C	C1	3	1	51.66	10.53	0.09958	12	BAT	0.008299	48.72	9.928
TCELC113E	C	C1	3	1	58.19	10.02	0.1026	12	M(B,H)AT	0.008553	56.56	9.734
TCELC211E	C	C2	3	2	57.88	9.949	0.1005	12	M(B,H)AT, HIT	0.008378	55.11	9.472
TCELC212E	C	C2	3	2	63.33	9.935	0.09935	12	BAB	0.008279	59.58	9.347
TCELC213E	C	C2	3	2	62.22	9.995	0.1022	12	M(B,H)AB, HIB	0.008519	60.23	9.676

Average	**59.08**	**10.05**	
Standard Dev.	**3.929**	**0.4831**	
Coeff. of Var. [%]	**6.651**	**4.806**	
Min.	**51.66**	**9.391**	
Max.	**64.83**	**10.90**	
Number of Spec.	**18**	**18**	

$Average_{norm}$	**0.008509**	**57.10**	**9.698**
$Standard\ Dev._{norm}$		**4.433**	**0.1776**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**7.765**	**1.831**
Min.	**0.007836**	**48.72**	**9.347**
Max.	**0.009178**	**64.27**	**9.944**
Number of Spec.	**18**	**18**	**18**


Warp Compression Properties (WC)--ETW2 (250°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Warp Compression Strength [ksi]
0
10
20
30
40
50
60
70
0
1
2
3
4
5
6


Warp Compression Properties (WC)--ETW2 (250°F)
Normalized Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Warp Compression Modulus [Msi]
0
2
4
6
8
10
12
0
1
2
3
4
5
6

4.4 Fill Compression Properties (FC)

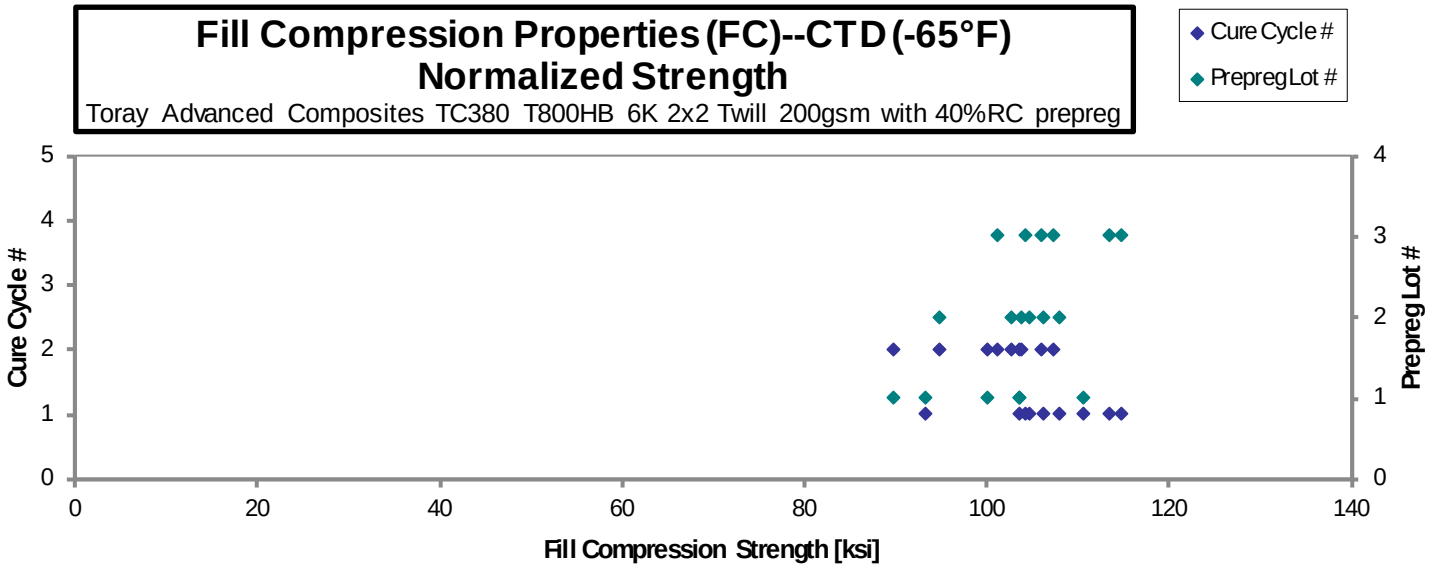
Fill Compression Properties (FC)--CTD (-65°F)
Strength & Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

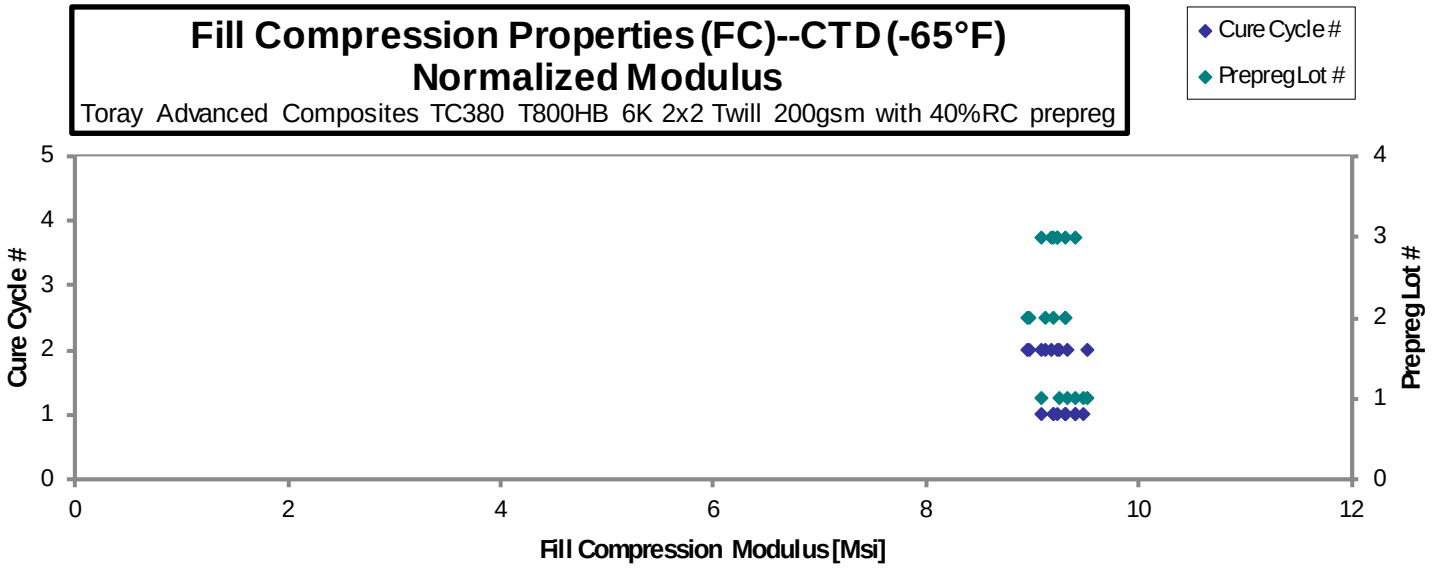
normalizing t_{ply} [in]: 0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
TCEZA111B	A	C1	1	1	109.3	9.380	0.1068	12	BAB	0.008900	110.5	9.486
TCEZA112B	A	C1	1	1	104.8	9.197	0.1044	12	BAB	0.008699	103.6	9.091
TCEZA113B	A	C1	1	1	93.72	9.432	0.1052	12	BAB	0.008768	93.38	9.397
TCEZA211B	A	C2	1	2	102.5	9.157	0.1066	12	BGM	0.008886	103.5	9.246
TCEZA212B	A	C2	1	2	88.81	9.234	0.1068	12	BAT	0.008899	89.81	9.337
TCEZA213B	A	C2	1	2	99.40	9.454	0.1064	12	BGM	0.008865	100.1	9.524
TCEZB111B	B	C1	2	1	106.1	9.449	0.1041	12	BGM	0.008676	104.6	9.316
TCEZB112B	B	C1	2	1	109.7	9.469	0.1039	12	BAB	0.008656	107.9	9.314
TCEZB113B	B	C1	2	1	108.5	9.393	0.1034	12	BGM	0.008618	106.3	9.198
TCEZB211B	B	C2	2	2	97.32	9.367	0.1028	12	BAB	0.008568	94.75	9.120
TCEZB212B	B	C2	2	2	107.1	9.267	0.1023	12	BAB	0.008522	103.8	8.974
TCEZB213B	B	C2	2	2	106.2	9.263	0.1020	12	BGM	0.008501	102.6	8.949
TCEZC111B	C	C1	3	1	105.3	9.290	0.1045	12	BAB	0.008710	104.2	9.195
TCEZC112B*	C	C1	3	1		9.470	0.1048	12	CIT	0.008735		9.399
TCEZC113B	C	C1	3	1	114.2	9.369	0.1049	12	BGM	0.008738	113.4	9.303
TCEZC114B	C	C1	3	1	115.7	9.323	0.1047	12	BGM	0.008724	114.7	9.242
TCEZC211B	C	C2	3	2	100.4	9.102	0.1064	12	BGM	0.008869	101.2	9.174
TCEZC212B	C	C2	3	2	106.3	9.158	0.1065	12	BGM	0.008875	107.2	9.236
TCEZC213B	C	C2	3	2	105.2	9.027	0.1064	12	BAT	0.008865	106.0	9.094

* Strength not reported due to unacceptable failure mode.

Average	**104.5**	**9.305**		**$Average_{norm}$**	**0.008741**	**103.8**	**9.242**
Standard Dev.	**6.703**	**0.1326**		**$Standard\ Dev._{norm}$**		**6.439**	**0.1559**
Coeff. of Var. [%]	**6.416**	**1.425**		**Coeff. of Var. $[\%]_{norm}$**		**6.206**	**1.687**
Min.	**88.81**	**9.027**		**Min.**	**0.008501**	**89.81**	**8.949**
Max.	**115.7**	**9.470**		**Max.**	**0.008900**	**114.7**	**9.524**
Number of Spec.	**18**	**19**		**Number of Spec.**	**19**	**18**	**19**


Fill Compression Properties (FC)--CTD (-65°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Fill Compression Strength [ksi]
0
20
40
60
80
100
120
140
0
1
2
3
4
5


Fill Compression Properties (FC)--CTD (-65°F)
Normalized Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Fill Compression Modulus [Msi]
0
2
4
6
8
10
12
0
1
2
3
4
5

Fill Compression Properties (FC)--RTD (70°F)
Strength & Modulus

Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

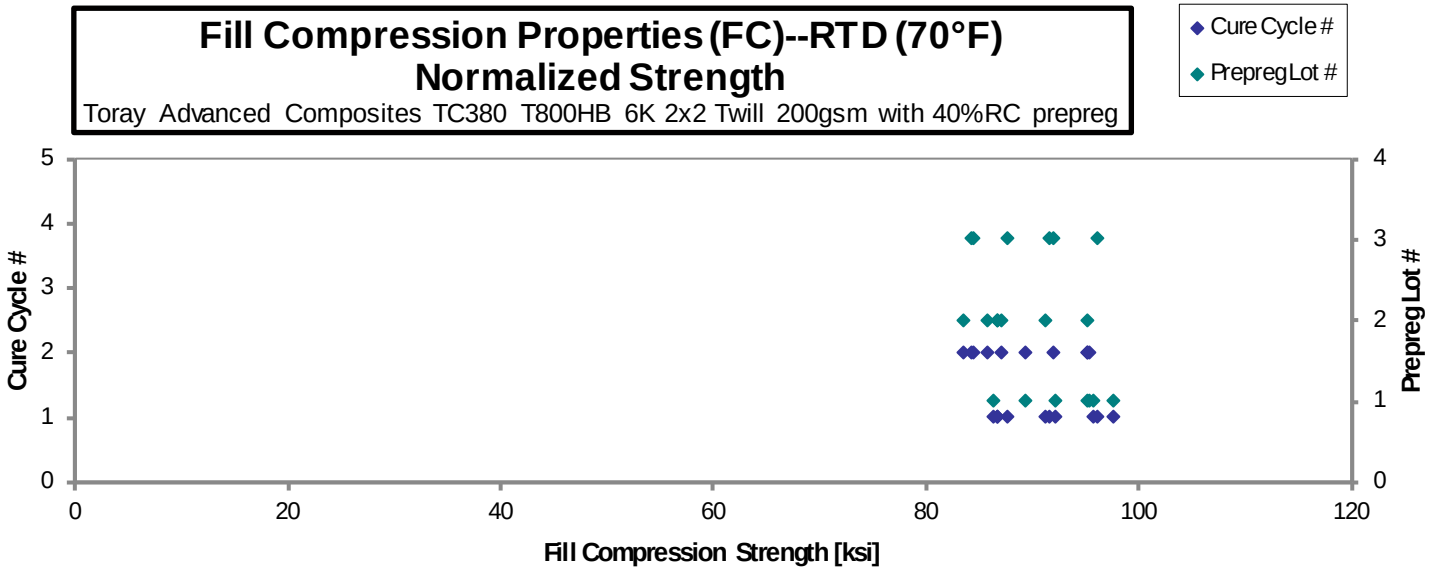
Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
TCEZA111A*	A	C1	1	1	85.57	9.027	0.1066	12	BAT	0.008885	86.39	9.114
TCEZA112A*	A	C1	1	1	90.98	8.988	0.1069	12	BAB	0.008910	92.11	9.100
TCEZA113A	A	C1	1	1	96.36	8.927	0.1070	12	M(B,H)AT	0.008914	97.61	9.043
TCEZA114A**	A	C1	1	1	94.45		0.1070	12	M(B,H)AB, HIB	0.008914	95.67	
TCEZA211A	A	C2	1	2	88.44	8.699	0.1067	12	BAB	0.008888	89.32	8.786
TCEZA212A	A	C2	1	2	94.02	9.220	0.1072	12	BGM	0.008932	95.43	9.358
TCEZA213A	A	C2	1	2	94.86	9.015	0.1060	12	BGM	0.008832	95.20	9.047
TCEZB111A	B	C1	2	1	87.64	9.314	0.1045	12	BAB	0.008707	86.71	9.216
TCEZB112A	B	C1	2	1	88.16	9.633	0.1040	12	BGM	0.008663	86.78	9.483
TCEZB113A	B	C1	2	1	93.06	9.405	0.1035	12	BAB	0.008624	91.19	9.217
TCEZB211A	B	C2	2	2	85.08	9.351	0.1036	12	BAT	0.008631	83.44	9.171
TCEZB212A	B	C2	2	2	95.94	9.163	0.1048	12	BAT	0.008731	95.18	9.091
TCEZB213A	B	C2	2	2	87.71	8.872	0.1033	12	BAT	0.008608	85.80	8.678
TCEZB214A**	B	C2	2	2	89.04		0.1033	12	BGM	0.008610	87.11	
TCEZC111A***	C	C1	3	1		9.410	0.1049	12	HIT	0.008743		9.349
TCEZC112A	C	C1	3	1	88.19	9.369	0.1050	12	BAB	0.008746	87.65	9.311
TCEZC113A	C	C1	3	1	96.18	9.175	0.1055	12	M(B,H)AT	0.008793	96.10	9.167
TCEZC114A**	C	C1	3	1	92.60		0.1045	12	BGM	0.008706	91.61	
TCEZC211A	C	C2	3	2	83.50	9.006	0.1067	12	BAB	0.008892	84.37	9.099
TCEZC212A	C	C2	3	2	83.09	9.232	0.1073	12	BGM	0.008942	84.42	9.380
TCEZC213A	C	C2	3	2	91.28	9.110	0.1064	12	BAB	0.008865	91.96	9.178

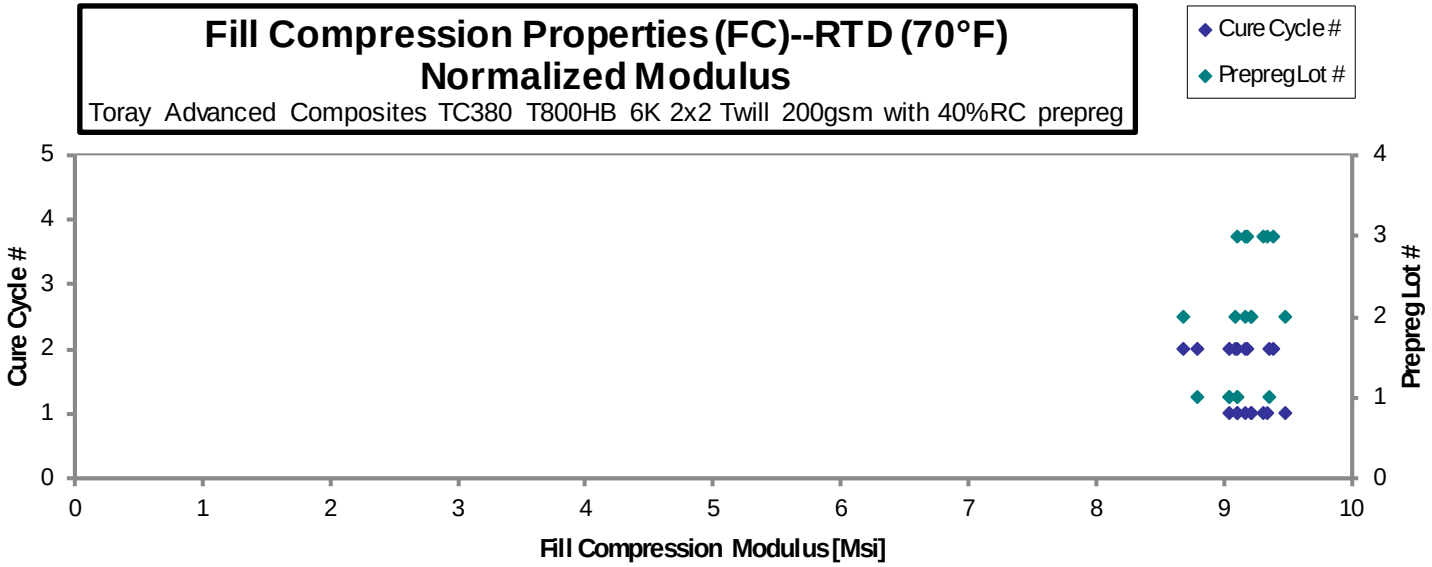
* Modulus are averaged values of 2 strain gages.

** Specimen was not gaged, only strength is reported.

*** Strength not reported due to unacceptable failure mode.

Average	**90.31**	**9.162**		**$Average_{norm}$**	**0.008787**	**90.20**	**9.155**
Standard Dev.	**4.262**	**0.2306**		**$Standard\ Dev._{norm}$**		**4.555**	**0.1985**
Coeff. of Var. [%]	**4.719**	**2.517**		**Coeff. of Var. [%]$_{norm}$**		**5.050**	**2.168**
Min.	**83.09**	**8.699**		**Min.**	**0.008608**	**83.44**	**8.678**
Max.	**96.36**	**9.633**		**Max.**	**0.008942**	**97.61**	**9.483**
Number of Spec.	**20**	**18**		**Number of Spec.**	**21**	**20**	**18**


Fill Compression Properties (FC)--RTD (70°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Fill Compression Strength [ksi]
0
20
40
60
80
100
120
0
1
2
3
4
5


Fill Compression Properties (FC)--RTD (70°F)
Normalized Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Fill Compression Modulus [Msi]
0
1
2
3
4
5
6
7
8
9
10
0
1
2
3
4
5

Fill Compression Properties (FC)--ETD1 (180°F)
Strength & Modulus

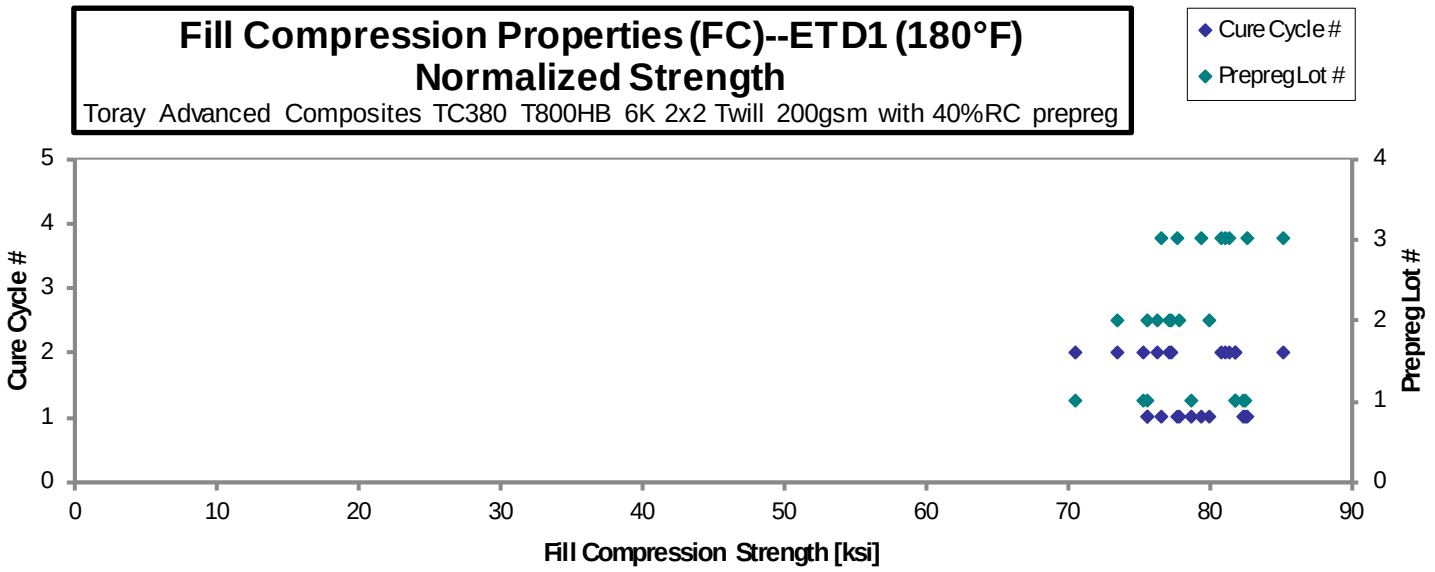
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

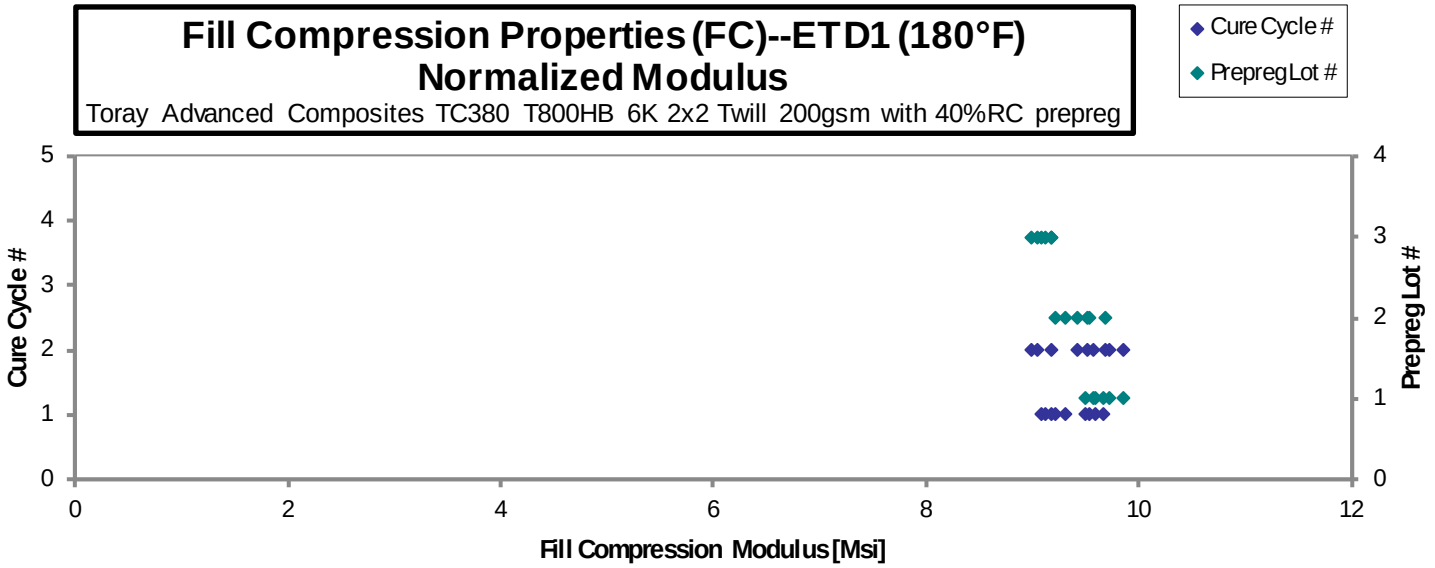
normalizing t_{ply} [in]: 0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
TCEZA111C	A	C1	1	1	84.00	9.849	0.1037	12	BAB, HAB/HIB	0.008644	82.52	9.675
TCEZA112C	A	C1	1	1	80.32	9.776	0.1035	12	BAB, HAB/HIB	0.008628	78.75	9.585
TCEZA113C	A	C1	1	1	76.80	9.642	0.1039	12	BAB	0.008661	75.58	9.490
TCEZA114C*	A	C1	1	1	83.06		0.1048	12	BGM	0.008729	82.39	
TCEZA211C	A	C2	1	2	80.97	9.464	0.1068	12	BAT, HAT/HIT	0.008897	81.86	9.568
TCEZA212C	A	C2	1	2	74.71	9.640	0.1065	12	BAB, HIB	0.008878	75.37	9.725
TCEZA213C	A	C2	1	2	80.70	9.730	0.1071	12	BAT	0.008922	81.82	9.865
TCEZA214C*	A	C2	1	2	69.51		0.1071	12	BAT	0.008928	70.52	
TCEZB111C	B	C1	2	1	79.25	9.388	0.1037	12	BAT	0.008640	77.81	9.217
TCEZB112C	B	C1	2	1	81.45	9.493	0.1036	12	BAT	0.008636	79.93	9.316
TCEZB113C	B	C1	2	1	77.29	9.749	0.1033	12	BAT	0.008604	75.57	9.532
TCEZB211C	B	C2	2	2	78.52	9.791	0.1027	12	BAT, HAT/HIT	0.008560	76.37	9.524
TCEZB212C	B	C2	2	2	79.50	9.951	0.1028	12	HAT/HIT	0.008563	77.36	9.682
TCEZB213C	B	C2	2	2	75.08	9.635	0.1033	12	BAB, HAB/HIB	0.008611	73.47	9.428
TCEZB214C*	B	C2	2	2	78.54		0.1037	12	BAB	0.008640	77.11	
TCEZC111C	C	C1	3	1	80.04	9.152	0.1048	12	BAT, HIT	0.008736	79.46	9.085
TCEZC112C	C	C1	3	1	83.29	9.258	0.1047	12	BAT, HIT	0.008728	82.60	9.182
TCEZC113C	C	C1	3	1	77.32	9.217	0.1046	12	BAB, HIB	0.008715	76.58	9.129
TCEZC114C*	C	C1	3	1	78.52		0.1045	12	BAB, CIB, CIT	0.008706	77.68	
TCEZC211C	C	C2	3	2	84.54	8.986	0.1064	12	M(B,H)AT	0.008868	85.20	9.055
TCEZC212C	C	C2	3	2	80.81	9.109	0.1064	12	BAB, HIB	0.008863	81.39	9.174
TCEZC213C	C	C2	3	2	79.58	8.854	0.1072	12	BAB, HIB	0.008933	80.78	8.988
TCEZC214C*	C	C2	3	2	80.45		0.1064	12	M(B,H)AT, HIT	0.008865	81.05	

* Specimen was not gaged, only strength is reported.

Average	**79.32**	**9.482**		**$Average_{norm}$**	**0.008737**	**78.75**	**9.401**
Standard Dev.	**3.337**	**0.3219**		**Standard $Dev._{norm}$**		**3.474**	**0.2636**
Coeff. of Var. [%]	**4.207**	**3.395**		**Coeff. of Var. $[\%]_{norm}$**		**4.411**	**2.804**
Min.	**69.51**	**8.854**		**Min.**	**0.008560**	**70.52**	**8.988**
Max.	**84.54**	**9.951**		**Max.**	**0.008933**	**85.20**	**9.865**
Number of Spec.	**23**	**18**		**Number of Spec.**	**23**	**23**	**18**


Fill Compression Properties (FC)--ETD1 (180°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Fill Compression Strength [ksi]
0
10
20
30
40
50
60
70
80
90
0
1
2
3
4
5


Fill Compression Properties (FC)--ETD1 (180°F)
Normalized Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Fill Compression Modulus [Msi]
0
2
4
6
8
10
12
0
1
2
3
4
5

Fill Compression Properties (FC)--ETW1 (180°F)
Strength & Modulus

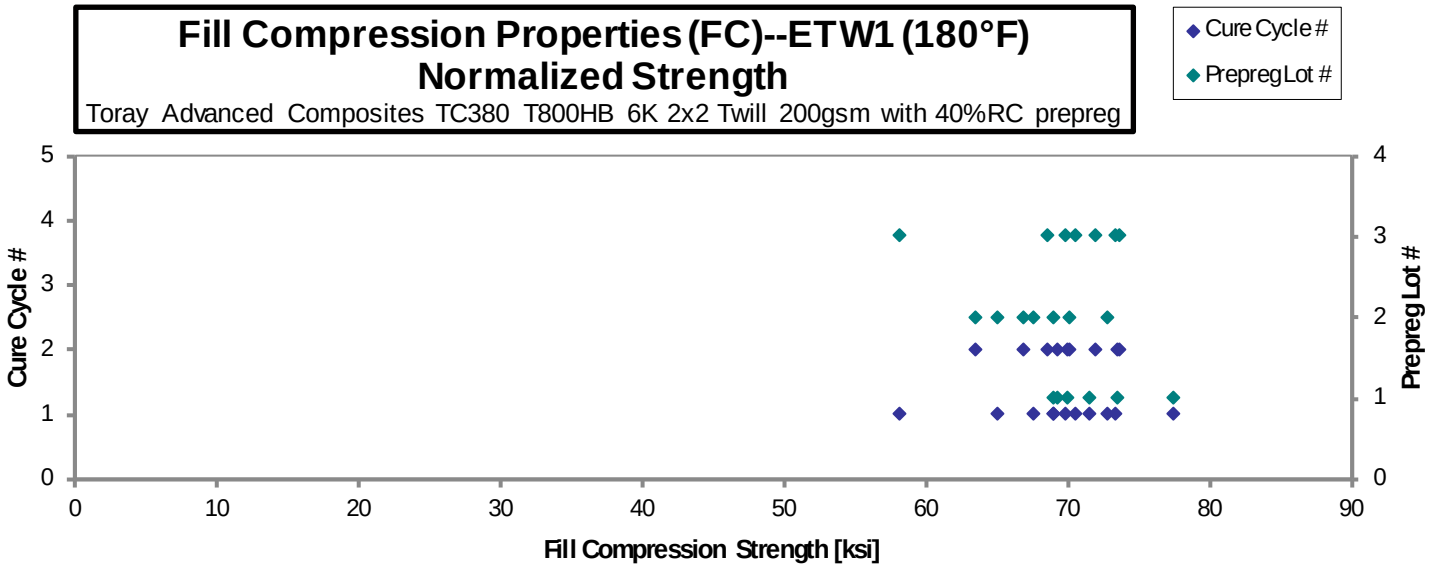
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

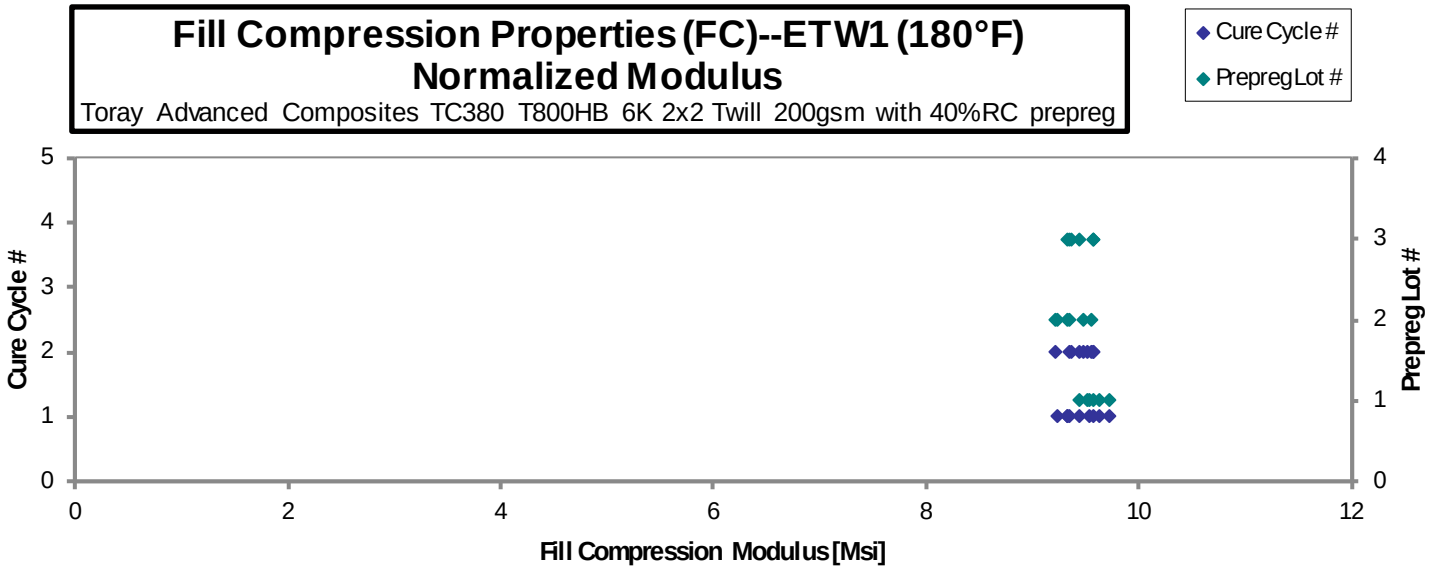
normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
TCEZA111D	A	C1	1	1	71.74	9.661	0.1052	12	BAB	0.008765	71.46	9.623
TCEZA112D	A	C1	1	1	69.12	9.754	0.1053	12	HAB	0.008775	68.92	9.726
TCEZA113D	A	C1	1	1	78.00	9.601	0.1049	12	HAB/HIB	0.008742	77.48	9.537
TCEZA211D	A	C2	1	2	72.12	9.345	0.1076	12	BAB	0.008967	73.49	9.522
TCEZA212D	A	C2	1	2	68.07	9.273	0.1074	12	BGM	0.008953	69.25	9.434
TCEZA213D	A	C2	1	2	68.54	9.378	0.1078	12	HAB, HIB	0.008986	69.99	9.576
TCEZB111D	B	C1	2	1	66.26	9.421	0.1036	12	HAT/HIT	0.008629	64.98	9.238
TCEZB112D	B	C1	2	1	69.35	9.571	0.1029	12	BAB	0.008578	67.60	9.330
TCEZB113D	B	C1	2	1	70.48	9.554	0.1034	12	BAB	0.008617	69.01	9.355
TCEZB114D*	B	C1	2	1	74.34		0.1034	12	HAT, HIT	0.008614	72.76	
TCEZB211D	B	C2	2	2	71.83	9.786	0.1030	12	M(B,H)AB, HIB	0.008585	70.07	9.547
TCEZB212D	B	C2	2	2	69.23	9.817	0.1021	12	BAB	0.008504	66.91	9.487
TCEZB213D	B	C2	2	2	64.84	9.402	0.1035	12	BAB	0.008622	63.53	9.212
TCEZC111D	C	C1	3	1	71.23	9.413	0.1047	12	BAT, HIT	0.008722	70.60	9.330
TCEZC112D	C	C1	3	1	73.97	9.665	0.1047	12	BAB, HIT	0.008722	73.32	9.580
TCEZC113D	C	C1	3	1	58.33	9.460	0.1053	12	BAB	0.008778	58.19	9.437
TCEZC114D*	C	C1	3	1	70.09		0.1053	12	BAT	0.008771	69.86	
TCEZC211D	C	C2	3	2	68.12	9.297	0.1063	12	BAT, HIT	0.008856	68.55	9.355
TCEZC212D	C	C2	3	2	72.72	9.247	0.1069	12	BAT, HIT	0.008911	73.64	9.363
TCEZC213D	C	C2	3	2	71.01	9.440	0.1071	12	BAB	0.008924	72.01	9.573

* Specimen was not gaged, only strength is reported.

Average	**69.97**	**9.505**	**$Average_{norm}$**	**0.008751**	**69.58**	**9.457**
Standard Dev.	**4.023**	**0.1785**	**$Standard\ Dev._{norm}$**		**4.167**	**0.1399**
Coeff. of Var. [%]	**5.750**	**1.878**	**$Coeff.\ of\ Var.\ [\%]_{norm}$**		**5.988**	**1.479**
Min.	**58.33**	**9.247**	**Min.**	**0.008504**	**58.19**	**9.212**
Max.	**78.00**	**9.817**	**Max.**	**0.008986**	**77.48**	**9.726**
Number of Spec.	**20**	**18**	**Number of Spec.**	**20**	**20**	**18**


Fill Compression Properties (FC)--ETW1 (180°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Fill Compression Strength [ksi]
0
10
20
30
40
50
60
70
80
90
0
1
2
3
4
5


Fill Compression Properties (FC)--ETW1 (180°F)
Normalized Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Fill Compression Modulus [Msi]
0
2
4
6
8
10
12
0
1
2
3
4
5

Fill Compression Properties (FC)--ETW2 (250°F)
Strength & Modulus

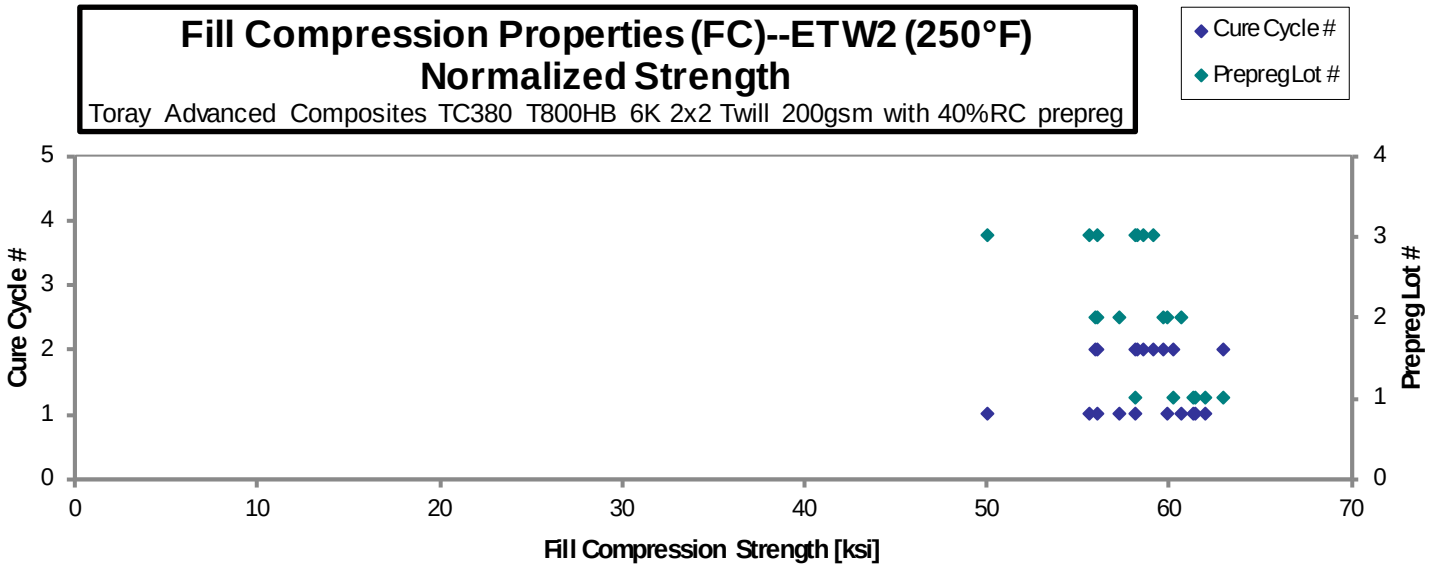
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

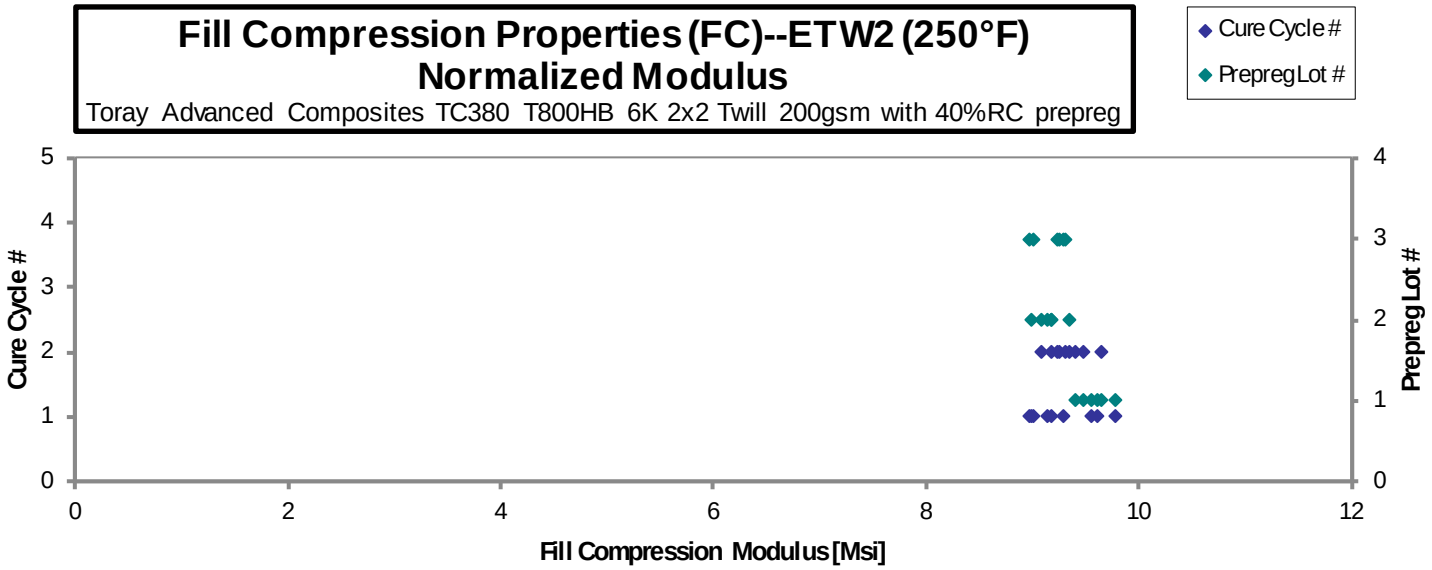
normalizing t_{ply} [in]: 0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
TCEZA111E	A	C1	1	1	61.84	9.628	0.1048	12	HAT/HIT	0.008735	61.38	9.557
TCEZA112E	A	C1	1	1	62.56	9.963	0.1037	12	HGM, HIT	0.008639	61.41	9.780
TCEZA113E	A	C1	1	1	63.45	9.843	0.1031	12	HAT/HIT	0.008590	61.94	9.608
TCEZA211E	A	C2	1	2	62.55	9.423	0.1063	12	M(B,H)AB	0.008858	62.97	9.486
TCEZA212E	A	C2	1	2	59.96	9.366	0.1060	12	BAT, HAT/HIT	0.008833	60.19	9.402
TCEZA213E	A	C2	1	2	58.37	9.689	0.1052	12	HAB/HIB	0.008768	58.16	9.654
TCEZB111E	B	C1	2	1	59.26	9.448	0.1021	12	M(B,H)AB	0.008511	57.31	9.138
TCEZB112E	B	C1	2	1	61.69	9.338	0.1038	12	HAT, HIT	0.008651	60.65	9.180
TCEZB113E	B	C1	2	1	60.87	9.144	0.1039	12	HAB	0.008657	59.88	8.996
TCEZB211E	B	C2	2	2	61.35	9.608	0.1027	12	HAT/HIT	0.008560	59.67	9.346
TCEZB212E	B	C2	2	2	57.57	9.327	0.1028	12	HAT	0.008565	56.04	9.078
TCEZB213E	B	C2	2	2	57.47	9.424	0.1029	12	HAT	0.008576	56.01	9.185
TCEZC111E	C	C1	3	1	56.14	9.304	0.1055	12	BAT, HIT	0.008789	56.06	9.292
TCEZC112E	C	C1	3	1	55.79	9.051	0.1052	12	BAT	0.008767	55.58	9.017
TCEZC113E	C	C1	3	1	58.39	9.007	0.1051	12	BAT	0.008761	58.13	8.967
TCEZC114E*	C	C1	3	1	50.02		0.1056	12	BAB	0.008800	50.02	
TCEZC211E	C	C2	3	2	58.14	9.167	0.1064	12	M(B,H)AT, HIT	0.008869	58.60	9.239
TCEZC212E	C	C2	3	2	57.68	9.157	0.1067	12	M(B,H)AB, HIB	0.008888	58.26	9.248
TCEZC213E	C	C2	3	2	58.47	9.214	0.1068	12	M(B,H)AT, HIT	0.008900	59.13	9.318

* Specimen was not gaged, only strength is reported.

	Strength [ksi]	Modulus [Msi]		Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
Average	**59.03**	**9.395**	**$Average_{norm}$**	**0.008722**	**58.49**	**9.305**
Standard Dev.	**3.139**	**0.2661**	**Standard $Dev._{norm}$**		**2.981**	**0.2373**
Coeff. of Var. [%]	**5.317**	**2.833**	**Coeff. of Var. $[\%]_{norm}$**		**5.097**	**2.550**
Min.	**50.02**	**9.007**	**Min.**	**0.008511**	**50.02**	**8.967**
Max.	**63.45**	**9.963**	**Max.**	**0.008900**	**62.97**	**9.780**
Number of Spec.	**19**	**18**	**Number of Spec.**	**19**	**19**	**18**


Fill Compression Properties (FC)--ETW2 (250°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Fill Compression Strength [ksi]
0
10
20
30
40
50
60
70
0
1
2
3
4
5

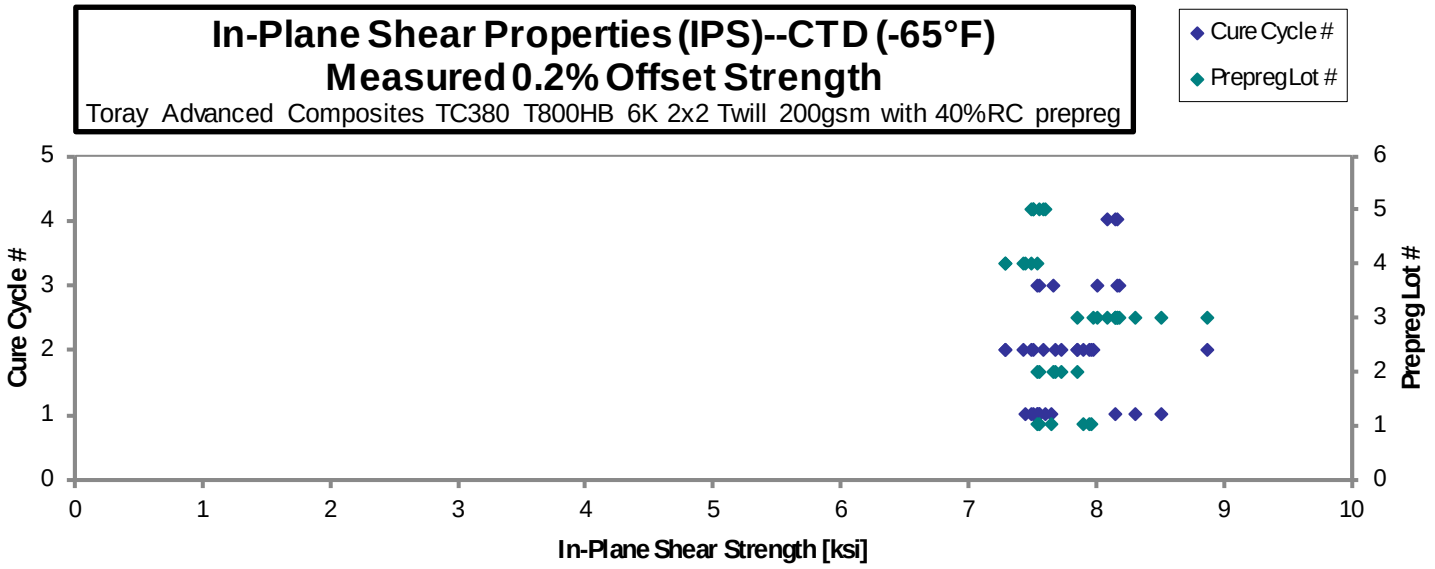

Fill Compression Properties (FC)--ETW2 (250°F)
Normalized Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Fill Compression Modulus [Msi]
0
2
4
6
8
10
12
0
1
2
3
4
5

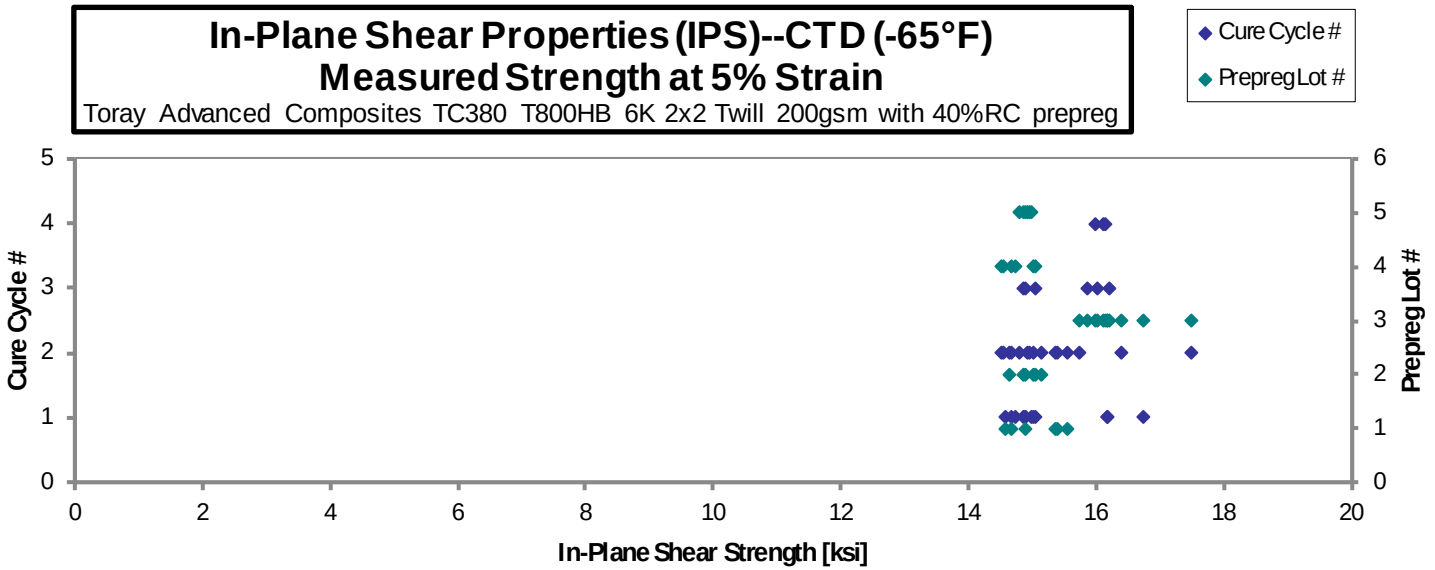
4.5 In-Plane Shear Properties (IPS)

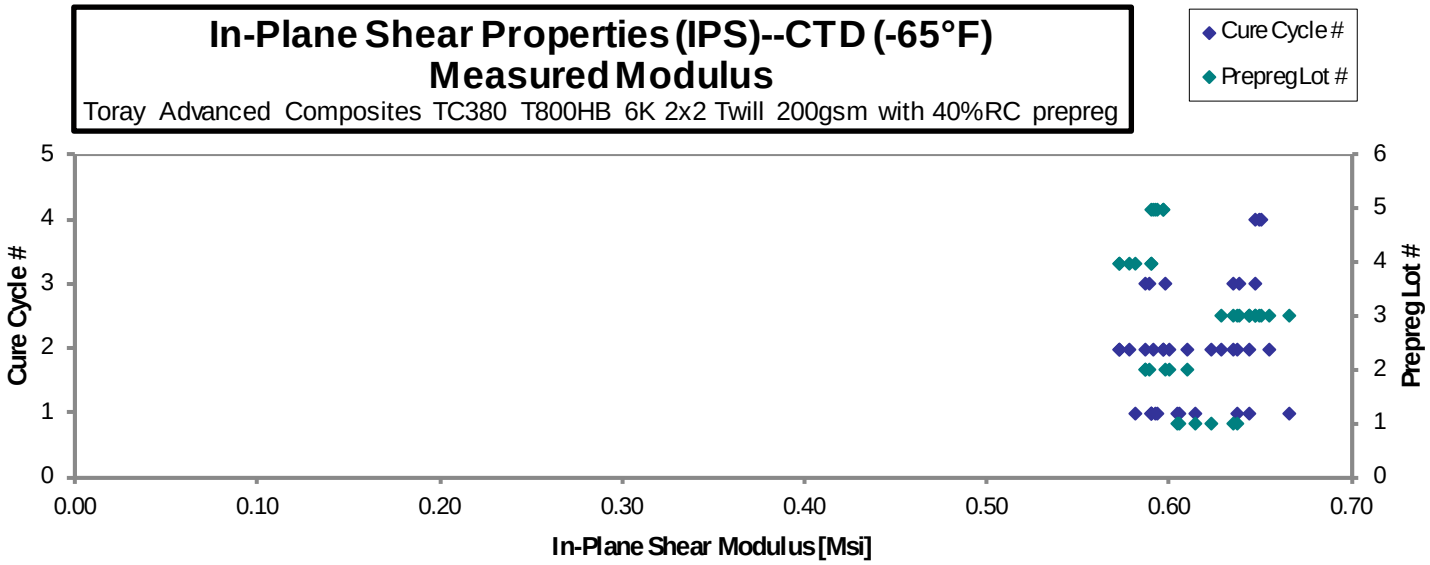
In-Plane Shear Properties (IPS)--CTD (-65°F)
Strength & Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	0.2% Offset Strength [ksi]	Strength at 5% Strain [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]
TCENA111B	A	C1	1	1	7.656	14.89	0.6142	0.07142	8	0.008927
TCENA112B	A	C1	1	1	7.560	14.67	0.6062	0.07202	8	0.009002
TCENA113B	A	C1	1	1	7.544	14.58	0.6048	0.07242	8	0.009052
TCENA211B	A	C2	1	2	7.942	15.54	0.6369	0.06977	8	0.008721
TCENA212B	A	C2	1	2	7.960	15.40	0.6357	0.06937	8	0.008671
TCENA213B	A	C2	1	2	7.905	15.36	0.6235	0.06997	8	0.008746
TCENB211B	B	C2	2	2	7.851	15.13	0.6097	0.06908	8	0.008635
TCENB212B	B	C2	2	2	7.684	15.02	0.6007	0.06967	8	0.008708
TCENB213B	B	C2	2	2	7.734	14.64	0.5873	0.06998	8	0.008748
TCENB311B	B	C3	2	3	7.669	15.04	0.5975	0.07037	8	0.008796
TCENB312B	B	C3	2	3	7.555	14.89	0.5895	0.07087	8	0.008858
TCENB313B	B	C3	2	3	7.539	14.87	0.5865	0.07093	8	0.008867
TCENC111B	C	C1	3	1	8.151	16.18	0.6439	0.06883	8	0.008604
TCENC112B	C	C1	3	1	8.303	16.17	0.6378	0.06848	8	0.008560
TCENC113B	C	C1	3	1	8.516	16.75	0.6665	0.06748	8	0.008435
TCENC211B	C	C2	3	2	7.980	15.73	0.6287	0.07062	8	0.008827
TCENC212B	C	C2	3	2	7.860	16.39	0.6445	0.07088	8	0.008860
TCENC213B	C	C2	3	2	8.868	17.48	0.6545	0.07035	8	0.008794
TCENC311B	C	C3	3	3	8.167	16.20	0.6471	0.06915	8	0.008644
TCENC312B	C	C3	3	3	8.181	15.86	0.6353	0.06933	8	0.008667
TCENC313B	C	C3	3	3	8.004	16.01	0.6384	0.06950	8	0.008688
TCENC411B	C	C4	3	4	8.174	16.11	0.6507	0.06803	8	0.008504
TCENC412B	C	C4	3	4	8.088	15.98	0.6473	0.06773	8	0.008467
TCENC413B	C	C4	3	4	8.152	16.14	0.6493	0.06772	8	0.008465
TCEND111B	D	C1	4	1	7.536	15.02	0.5900	0.07258	8	0.009073
TCEND112B	D	C1	4	1	7.444	14.74	0.5811	0.07313	8	0.009142
TCEND113B	D	C1	4	1	7.486	15.04	0.5902	0.07298	8	0.009123
TCEND211B	D	C2	4	2	7.430	14.66	0.5787	0.07373	8	0.009217
TCEND212B	D	C2	4	2	7.283	14.51	0.5732	0.07295	8	0.009119
TCEND213B	D	C2	4	2	7.291	14.53	0.5728	0.07282	8	0.009102
TCENE111B	E	C1	5	1	7.607	15.00	0.5932	0.07173	8	0.008967
TCENE112B	E	C1	5	1	7.552	14.85	0.5920	0.07178	8	0.008973
TCENE113B	E	C1	5	1	7.502	14.88	0.5900	0.07170	8	0.008963
TCENE211B	E	C2	5	2	7.503	14.93	0.5968	0.07197	8	0.008996
TCENE212B	E	C2	5	2	7.486	14.79	0.5909	0.07187	8	0.008983
TCENE213B	E	C2	5	2	7.588	14.97	0.5966	0.07192	8	0.008990

Average	**7.799**	**15.36**	**0.6134**	**0.008830**
Standard Dev.	**0.3577**	**0.7225**	**0.02729**	
Coeff. of Var. [%]	**4.587**	**4.704**	**4.449**	
Min.	**7.283**	**14.51**	**0.5728**	**0.008435**
Max.	**8.868**	**17.48**	**0.6665**	**0.009217**
Number of Spec.	**36**	**36**	**36**	**36**

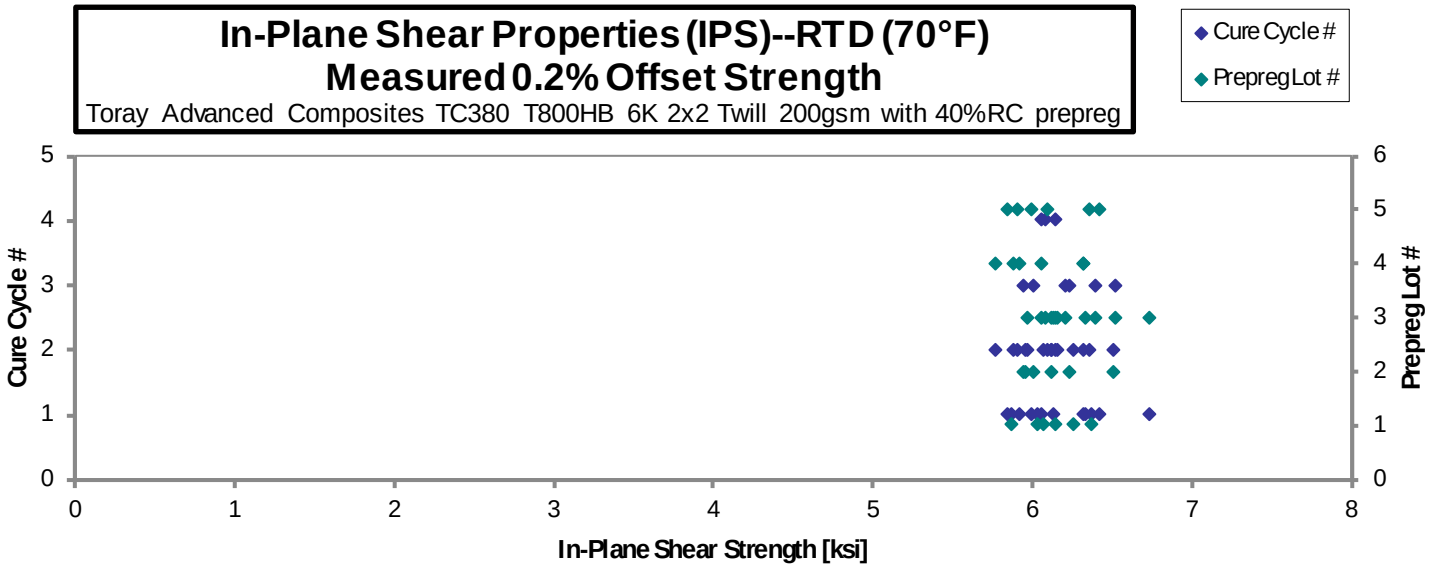

In-Plane Shear Properties (IPS)--CTD (-65°F)
Measured 0.2% Offset Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
In-Plane Shear Strength [ksi]
0 1 2 3 4 5 6 7 8 9 10
0 1 2 3 4 5
0 1 2 3 4 5 6

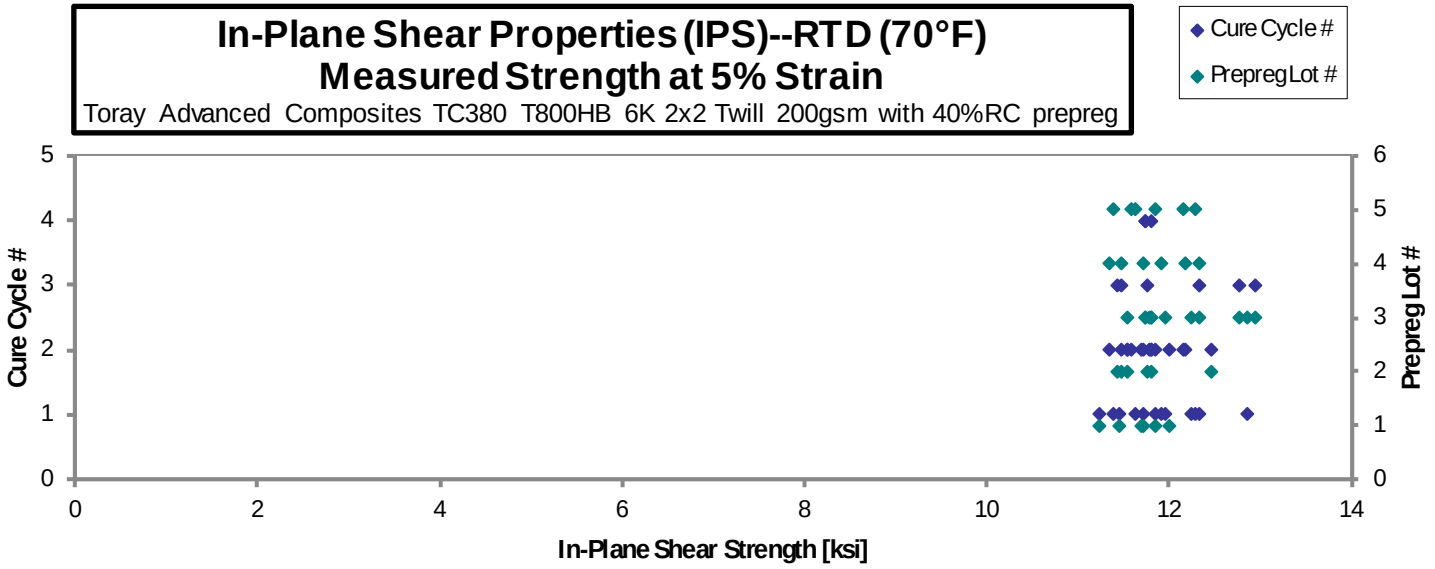

In-Plane Shear Properties (IPS)--CTD (-65°F)
Measured Strength at 5% Strain
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
In-Plane Shear Strength [ksi]
0 2 4 6 8 10 12 14 16 18 20
0 1 2 3 4 5
0 1 2 3 4 5 6

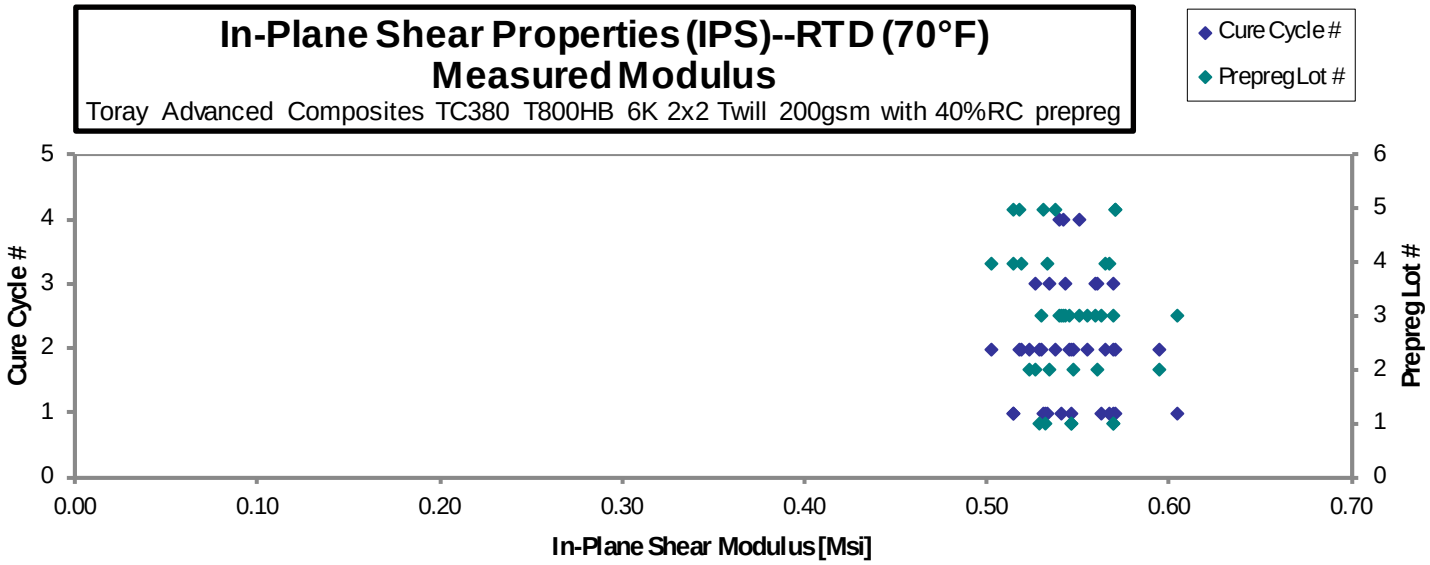

In-Plane Shear Properties (IPS)--CTD (-65°F)
Measured Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
5
6
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
In-Plane Shear Modulus [Msi]

In-Plane Shear Properties (IPS)--RTD (70°F)
Strength & Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	0.2% Offset Strength [ksi]	Strength at 5% Strain [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]
TCENA111A	A	C1	1	1	6.373	11.84	0.5696	0.06365	8	0.007956
TCENA112A	A	C1	1	1	6.026	11.46	0.5467	0.06723	8	0.008404
TCENA113A	A	C1	1	1	5.871	11.24	0.5317	0.06960	8	0.008700
TCENA212A	A	C2	1	2	6.255	11.99	0.5700	0.06595	8	0.008244
TCENA213A	A	C2	1	2	6.070	11.71	0.5461	0.06835	8	0.008544
TCENA214A	A	C2	1	2	6.148	11.72	0.5285	0.06890	8	0.008613
TCENB211A	B	C2	2	2	6.506	12.46	0.5945	0.06075	8	0.007594
TCENB212A	B	C2	2	2	6.124	11.80	0.5471	0.06455	8	0.008069
TCENB213A	B	C2	2	2	5.951	11.53	0.5238	0.06722	8	0.008402
TCENB311A	B	C3	2	3	6.227	11.75	0.5603	0.06235	8	0.007794
TCENB312A	B	C3	2	3	6.013	11.48	0.5343	0.06543	8	0.008179
TCENB313A	B	C3	2	3	5.943	11.43	0.5269	0.06767	8	0.008458
TCENC111A	C	C1	3	1	6.732	12.86	0.6048	0.06185	8	0.007731
TCENC112A	C	C1	3	1	6.329	12.25	0.5631	0.06513	8	0.008142
TCENC113A	C	C1	3	1	6.130	11.95	0.5411	0.06758	8	0.008448
TCENC211A	C	C2	3	2	6.160	11.79	0.5548	0.06667	8	0.008333
TCENC212A	C	C2	3	2	6.121	11.80	0.5452	0.06837	8	0.008546
TCENC213A	C	C2	3	2	5.963	11.54	0.5298	0.06965	8	0.008706
TCENC311A	C	C3	3	3	6.525	12.94	0.5691	0.06622	8	0.008277
TCENC312A	C	C3	3	3	6.397	12.77	0.5600	0.06803	8	0.008504
TCENC313A	C	C3	3	3	6.210	12.33	0.5428	0.06925	8	0.008656
TCENC411A	C	C4	3	4	6.151	11.80	0.5510	0.06638	8	0.008298
TCENC412A	C	C4	3	4	6.080	11.75	0.5426	0.06728	8	0.008410
TCENC413A	C	C4	3	4	6.062	11.74	0.5398	0.06793	8	0.008492
TCEND111A	D	C1	4	1	6.323	12.32	0.5677	0.06352	8	0.007940
TCEND112A	D	C1	4	1	6.058	11.92	0.5332	0.06667	8	0.008333
TCEND113A	D	C1	4	1	5.918	11.71	0.5141	0.06953	8	0.008692
TCEND211A	D	C2	4	2	6.315	12.19	0.5648	0.06333	8	0.007917
TCEND212A	D	C2	4	2	5.883	11.48	0.5189	0.06845	8	0.008556
TCEND213A	D	C2	4	2	5.766	11.33	0.5022	0.07065	8	0.008831
TCENE111A	E	C1	5	1	6.418	12.28	0.5705	0.06247	8	0.007808
TCENE112A	E	C1	5	1	5.991	11.63	0.5307	0.06713	8	0.008392
TCENE113A	E	C1	5	1	5.850	11.40	0.5145	0.06963	8	0.008704
TCENE211A	E	C2	5	2	6.359	12.16	0.5710	0.06373	8	0.007967
TCENE212A	E	C2	5	2	6.098	11.85	0.5380	0.06710	8	0.008388
TCENE213A	E	C2	5	2	5.912	11.59	0.5177	0.06965	8	0.008706
				Average	**6.146**	**11.88**	**0.5463**			**0.008326**
				Standard Dev.	**0.2170**	**0.4237**	**0.02274**			
				Coeff. of Var. [%]	**3.531**	**3.565**	**4.162**			
				Min.	**5.766**	**11.24**	**0.5022**			**0.007594**
				Max.	**6.732**	**12.94**	**0.6048**			**0.008831**
				Number of Spec.	**36**	**36**	**36**			**36**


In-Plane Shear Properties (IPS)--RTD (70°F)
Measured 0.2% Offset Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
In-Plane Shear Strength [ksi]


In-Plane Shear Properties (IPS)--RTD (70°F)
Measured Strength at 5% Strain
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
In-Plane Shear Strength [ksi]


In-Plane Shear Properties (IPS)--RTD (70°F)
Measured Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
5
6
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
In-Plane Shear Modulus [Msi]

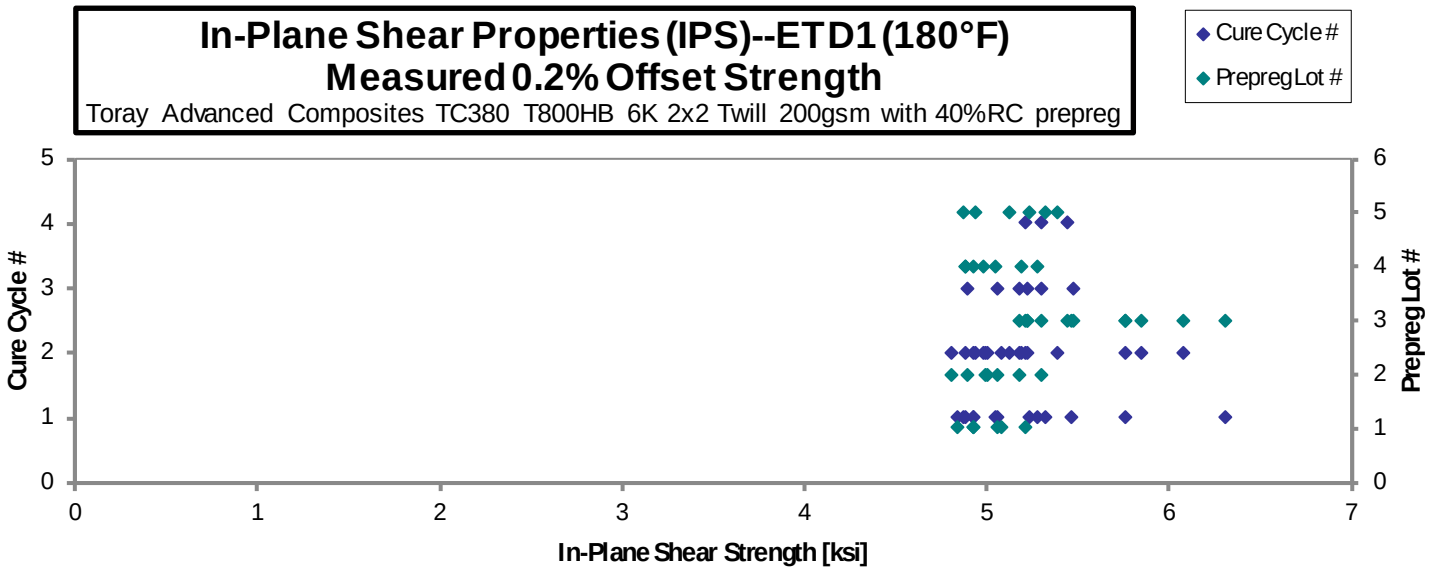
In-Plane Shear Properties (IPS)--ETD1 (180°F)
Strength & Modulus

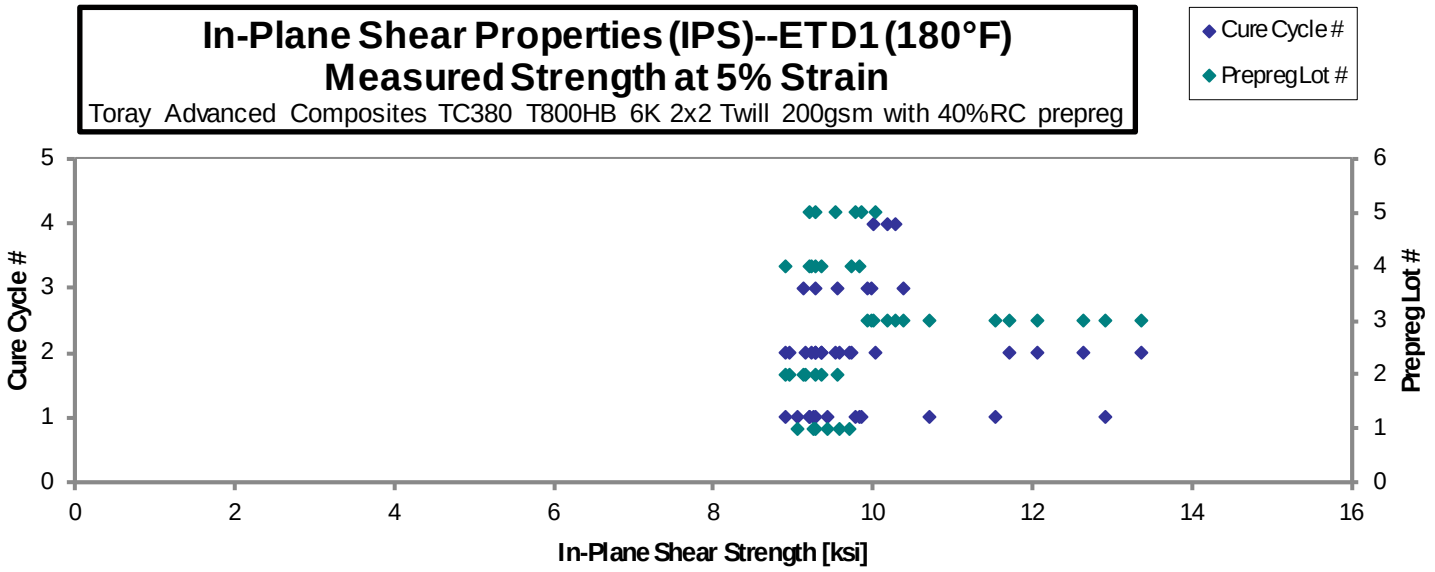
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

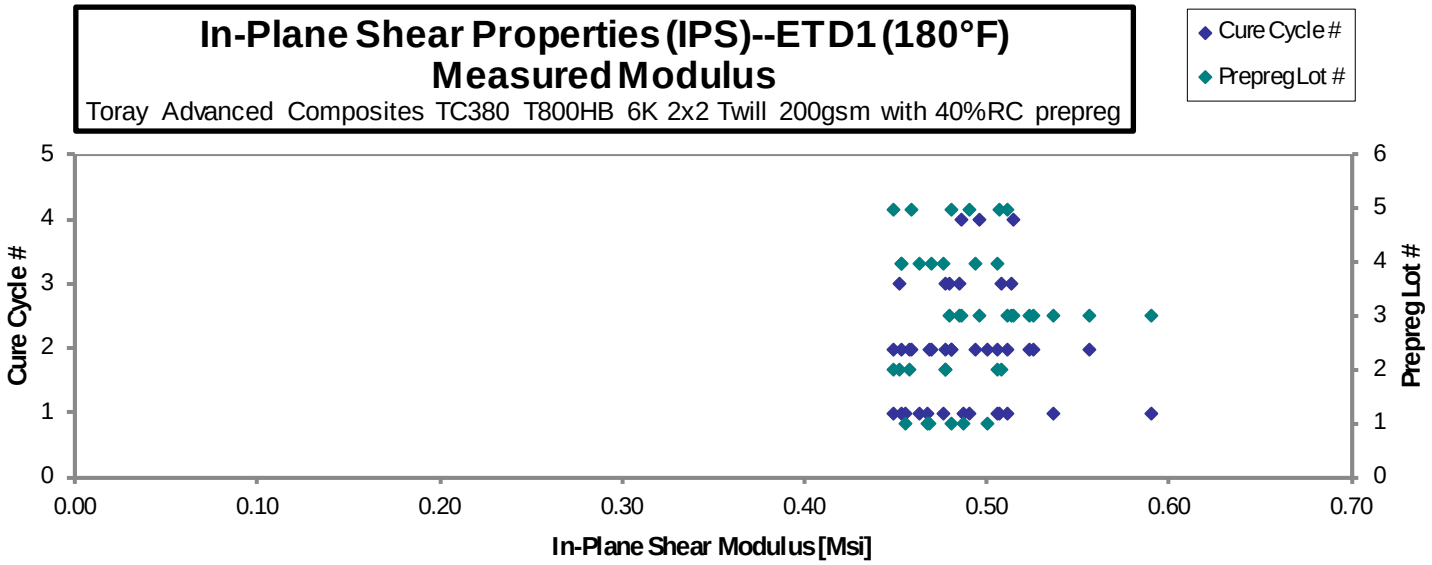
Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	0.2% Offset Strength [ksi]	Strength at 5% Strain [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]
TCENA111C	A	C1	1	1	4.835	9.064	0.4558	0.07112	8	0.008890
TCENA112C	A	C1	1	1	4.932	9.251	0.4672	0.06917	8	0.008646
TCENA113C	A	C1	1	1	5.064	9.434	0.4876	0.06617	8	0.008271
TCENA211C	A	C2	1	2	4.929	9.276	0.4687	0.06852	8	0.008565
TCENA212C	A	C2	1	2	5.077	9.582	0.4802	0.06665	8	0.008331
TCENA213C	A	C2	1	2	5.213	9.708	0.5005	0.06427	8	0.008033
TCENB211C	B	C2	2	2	4.995	8.962	0.4485	0.06845	8	0.008556
TCENB212C	B	C2	2	2	4.809	8.910	0.4580	0.06722	8	0.008402
TCENB213C	B	C2	2	2	5.004	9.153	0.4779	0.06413	8	0.008017
TCENB214C	B	C2	2	2	5.176	9.358	0.5059	0.06193	8	0.007742
TCENB311C	B	C3	2	3	4.898	9.131	0.4524	0.06723	8	0.008404
TCENB312C	B	C3	2	3	5.059	9.279	0.4773	0.06445	8	0.008056
TCENB313C	B	C3	2	3	5.300	9.567	0.5081	0.06085	8	0.007606
TCENC111C	C	C1	3	1	5.462	10.71	0.5111	0.06857	8	0.008571
TCENC112C	C	C1	3	1	5.761	11.54	0.5368	0.06687	8	0.008358
TCENC113C	C	C1	3	1	6.313	12.91	0.5903	0.06403	8	0.008004
TCENC211C*	C	C2	3	2	5.227	13.37		0.06982	8	0.008727
TCENC212C	C	C2	3	2	5.844	12.07	0.5256	0.06892	8	0.008615
TCENC213C	C	C2	3	2	5.761	11.72	0.5232	0.06752	8	0.008440
TCENC214C	C	C2	3	2	6.074	12.63	0.5558	0.06622	8	0.008277
TCENC311C	C	C3	3	3	5.184	9.935	0.4793	0.06913	8	0.008642
TCENC312C	C	C3	3	3	5.226	9.986	0.4855	0.06787	8	0.008483
TCENC313C	C	C3	3	3	5.470	10.38	0.5141	0.06542	8	0.008177
TCENC411C	C	C4	3	4	5.214	10.00	0.4857	0.06792	8	0.008490
TCENC412C	C	C4	3	4	5.304	10.18	0.4962	0.06657	8	0.008321
TCENC413C	C	C4	3	4	5.443	10.28	0.5146	0.06438	8	0.008048
TCEND111C	D	C1	4	1	4.883	9.277	0.4537	0.06953	8	0.008692
TCEND112C	D	C1	4	1	5.053	8.917	0.4760	0.06670	8	0.008338
TCEND113C	D	C1	4	1	5.279	9.827	0.5053	0.06302	8	0.008338
TCEND114C	D	C1	4	1	4.925	9.216	0.4634	0.06798	8	0.008498
TCEND211C	D	C2	4	2	4.882	9.227	0.4534	0.06950	8	0.008688
TCEND212C	D	C2	4	2	4.980	9.346	0.4692	0.06695	8	0.008369
TCEND213C	D	C2	4	2	5.188	9.745	0.4936	0.06415	8	0.008019
TCENE111C	E	C1	5	1	4.873	9.199	0.4491	0.06963	8	0.008704
TCENE112C	E	C1	5	1	5.236	9.772	0.4908	0.06537	8	0.008171
TCENE113C	E	C1	5	1	5.326	9.847	0.5074	0.06348	8	0.007935
TCENE211C	E	C2	5	2	4.934	9.272	0.4584	0.07005	8	0.008756
TCENE212C	E	C2	5	2	5.120	9.538	0.4806	0.06683	8	0.008354
TCENE213C	E	C2	5	2	5.383	10.04	0.5115	0.06377	8	0.007971

* Modulus not reported due to specimen slippage occurred during 1st testing run, 0.2% offset strength and 5% strain were obtained from 2nd testing run.

Average	**5.221**	**9.990**	**0.4900**	**0.008346**
Standard Dev.	**0.3442**	**1.140**	**0.03117**	
Coeff. of Var. [%]	**6.591**	**11.41**	**6.361**	
Min.	**4.809**	**8.910**	**0.4485**	**0.007606**
Max.	**6.313**	**13.37**	**0.5903**	**0.008890**
Number of Spec.	**39**	**39**	**38**	**39**

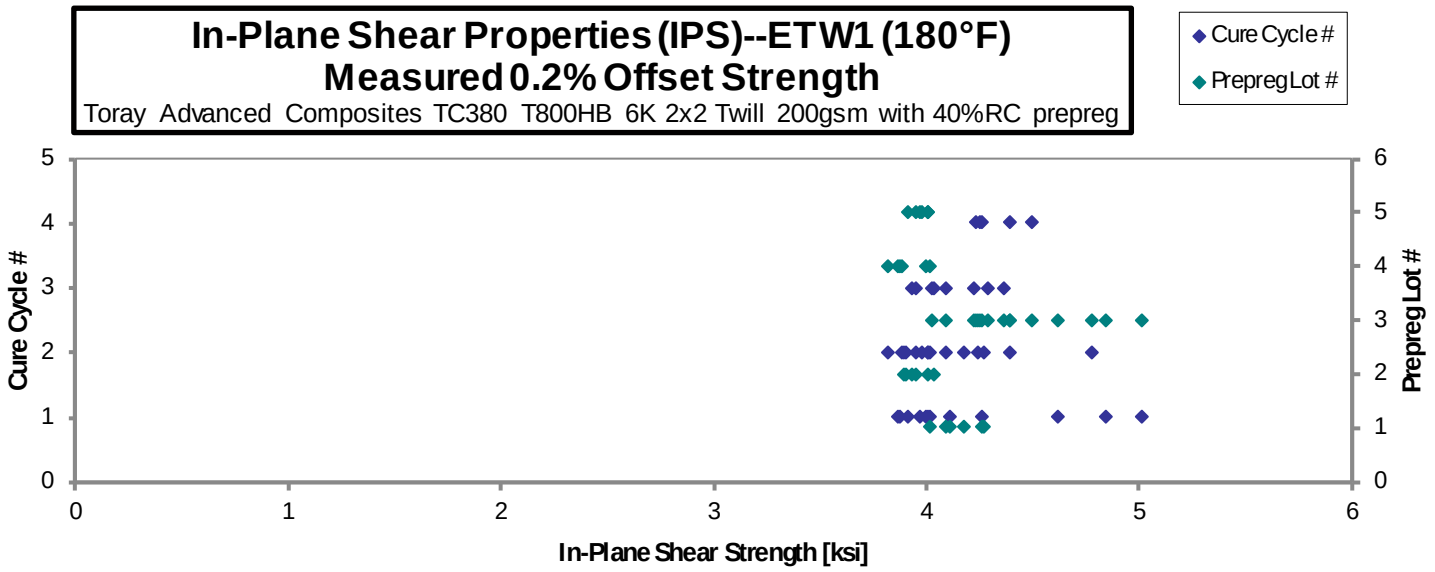

In-Plane Shear Properties (IPS)--ETD1 (180°F)
Measured 0.2% Offset Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
In-Plane Shear Strength [ksi]
0 1 2 3 4 5 6 7
0 1 2 3 4 5 6

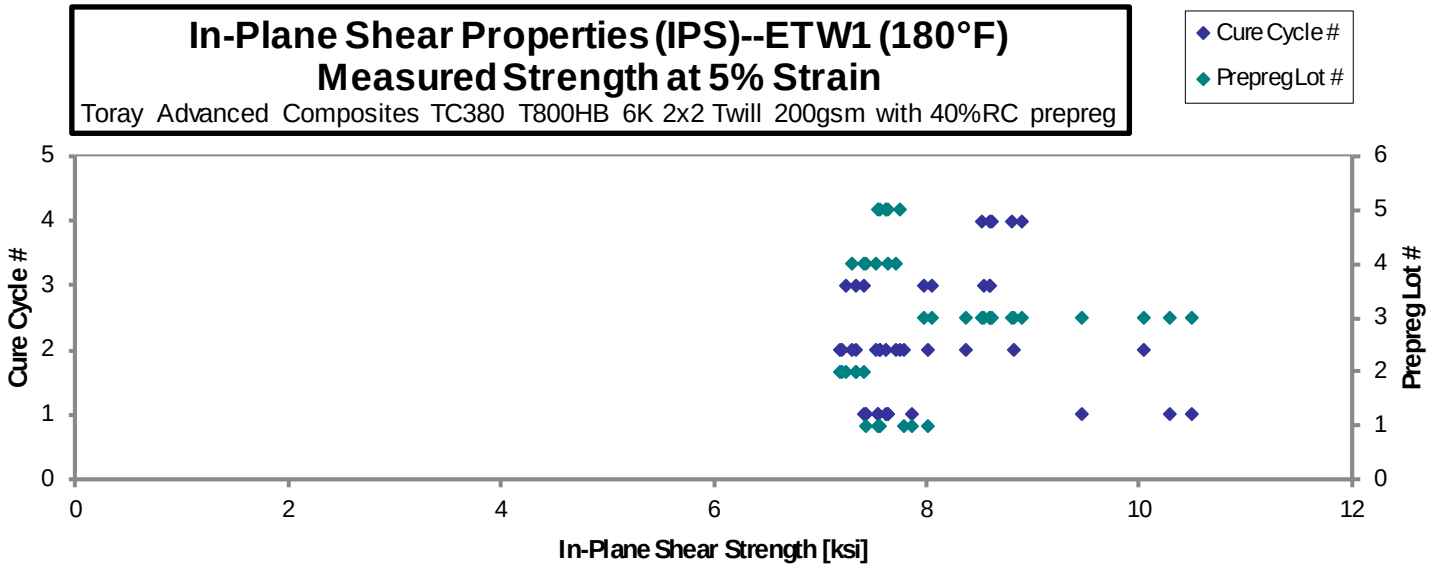

In-Plane Shear Properties (IPS)--ETD1 (180°F)
Measured Strength at 5% Strain
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
In-Plane Shear Strength [ksi]
0 2 4 6 8 10 12 14 16
0 1 2 3 4 5 6

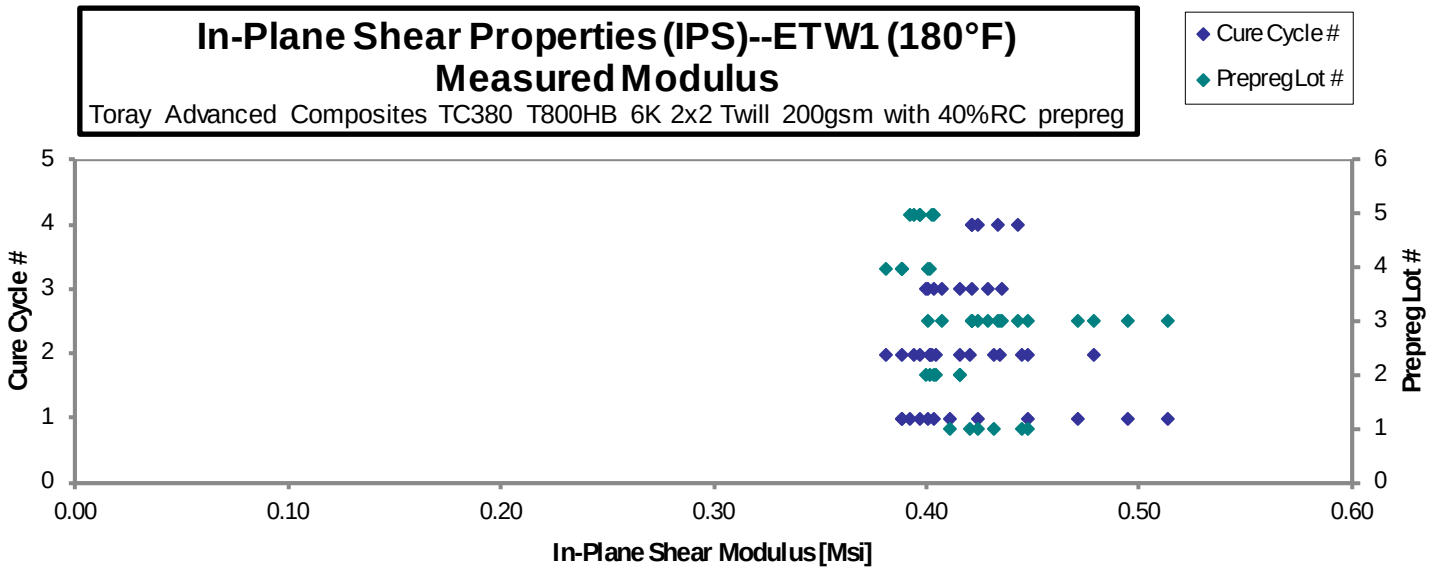

In-Plane Shear Properties (IPS)--ETD1 (180°F)
Measured Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
5
6
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
In-Plane Shear Modulus [Msi]

In-Plane Shear Properties (IPS)--ETW1 (180°F)
Strength & Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	0.2% Offset Strength [ksi]	Strength at 5% Strain [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]
TCENA111D	A	C1	1	1	4.257	7.864	0.4474	0.06828	8	0.008535
TCENA112D	A	C1	1	1	4.111	7.547	0.4242	0.07088	8	0.008860
TCENA113D	A	C1	1	1	4.016	7.421	0.4112	0.07237	8	0.009046
TCENA211D	A	C2	1	2	4.267	8.003	0.4448	0.06772	8	0.008465
TCENA212D	A	C2	1	2	4.175	7.775	0.4316	0.07018	8	0.008773
TCENA213D	A	C2	1	2	4.091	7.551	0.4206	0.07182	8	0.008977
TCENB211D	B	C2	2	2	4.000	7.337	0.4151	0.06623	8	0.008279
TCENB212D	B	C2	2	2	3.890	7.187	0.4039	0.06873	8	0.008592
TCENB213D	B	C2	2	2	3.900	7.206	0.4018	0.07068	8	0.008835
TCENB311D	B	C3	2	3	4.029	7.412	0.4151	0.06740	8	0.008425
TCENB312D	B	C3	2	3	3.930	7.241	0.4029	0.07032	8	0.008790
TCENB313D	B	C3	2	3	3.950	7.340	0.3999	0.07160	8	0.008950
TCENC111D	C	C1	3	1	5.008	10.48	0.5133	0.06655	8	0.008319
TCENC112D	C	C1	3	1	4.837	10.28	0.4947	0.06997	8	0.008746
TCENC113D	C	C1	3	1	4.612	9.450	0.4704	0.07062	8	0.008827
TCENC211D	C	C2	3	2	4.770	10.04	0.4787	0.06883	8	0.008604
TCENC212D	C	C2	3	2	4.388	8.816	0.4473	0.07048	8	0.008810
TCENC213D	C	C2	3	2	4.240	8.365	0.4346	0.07093	8	0.008867
TCENC311D	C	C3	3	3	4.363	8.587	0.4350	0.06952	8	0.008690
TCENC312D	C	C3	3	3	4.290	8.541	0.4290	0.07035	8	0.008794
TCENC313D	C	C3	3	3	4.218	8.582	0.4213	0.07078	8	0.008848
TCENC314D	C	C3	3	3	4.085	8.052	0.4071	0.07112	8	0.008890
TCENC315D	C	C3	3	3	4.026	7.974	0.4001	0.07042	8	0.008802
TCENC411D	C	C4	3	4	4.490	8.805	0.4429	0.06868	8	0.008585
TCENC412D	C	C4	3	4	4.257	8.604	0.4236	0.07025	8	0.008781
TCENC413D	C	C4	3	4	4.390	8.883	0.4332	0.06987	8	0.008733
TCENC414D	C	C4	3	4	4.245	8.584	0.4211	0.07092	8	0.008865
TCENC415D	C	C4	3	4	4.230	8.525	0.4215	0.07067	8	0.008833
TCEND111D	D	C1	4	1	3.994	7.641	0.4000	0.07058	8	0.008833
TCEND112D	D	C1	4	1	3.868	7.418	0.3882	0.07233	8	0.008833
TCEND113D	D	C1	4	1	3.877	7.407	0.3886	0.07313	8	0.008833
TCEND211D	D	C2	4	2	4.010	7.713	0.4018	0.07183	8	0.008833
TCEND212D	D	C2	4	2	3.878	7.514	0.3885	0.07297	8	0.008833
TCEND213D	D	C2	4	2	3.817	7.295	0.3811	0.07362	8	0.008833
TCENE111D	E	C1	5	1	4.008	7.642	0.4030	0.06997	8	0.008833
TCENE112D	E	C1	5	1	3.966	7.611	0.3969	0.07068	8	0.008833
TCENE113D	E	C1	5	1	3.914	7.539	0.3922	0.07133	8	0.008833
TCENE211D	E	C2	5	2	4.006	7.754	0.4023	0.07010	8	0.008833
TCENE212D	E	C2	5	2	3.980	7.605	0.3970	0.07173	8	0.008833
TCENE213D	E	C2	5	2	3.951	7.565	0.3935	0.07233	8	0.008833
				Average	**4.158**	**8.079**	**0.4206**			**0.008763**
				Standard Dev.	**0.2795**	**0.8473**	**0.02957**			
				Coeff. of Var. [%]	**6.721**	**10.49**	**7.029**			
				Min.	**3.817**	**7.187**	**0.3811**			**0.008279**
				Max.	**5.008**	**10.48**	**0.5133**			**0.009046**
				Number of Spec.	**40**	**40**	**40**			**40**

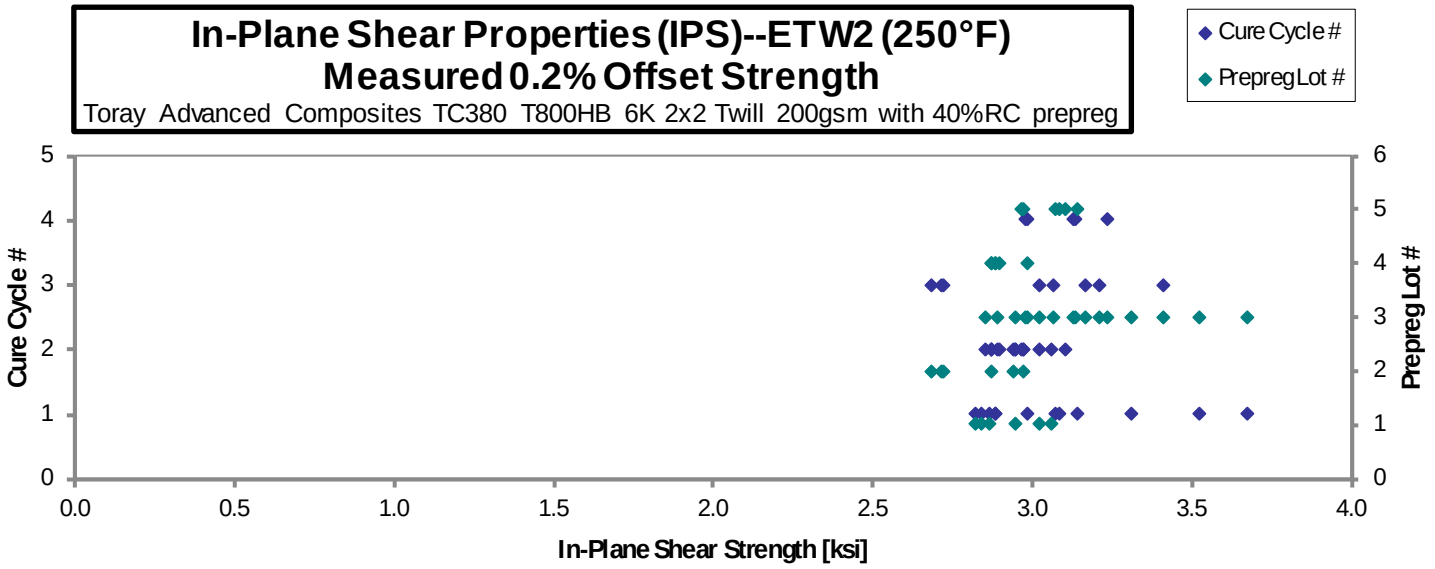

In-Plane Shear Properties (IPS)--ETW1 (180°F)
Measured 0.2% Offset Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
In-Plane Shear Strength [ksi]
0
1
2
3
4
5
6

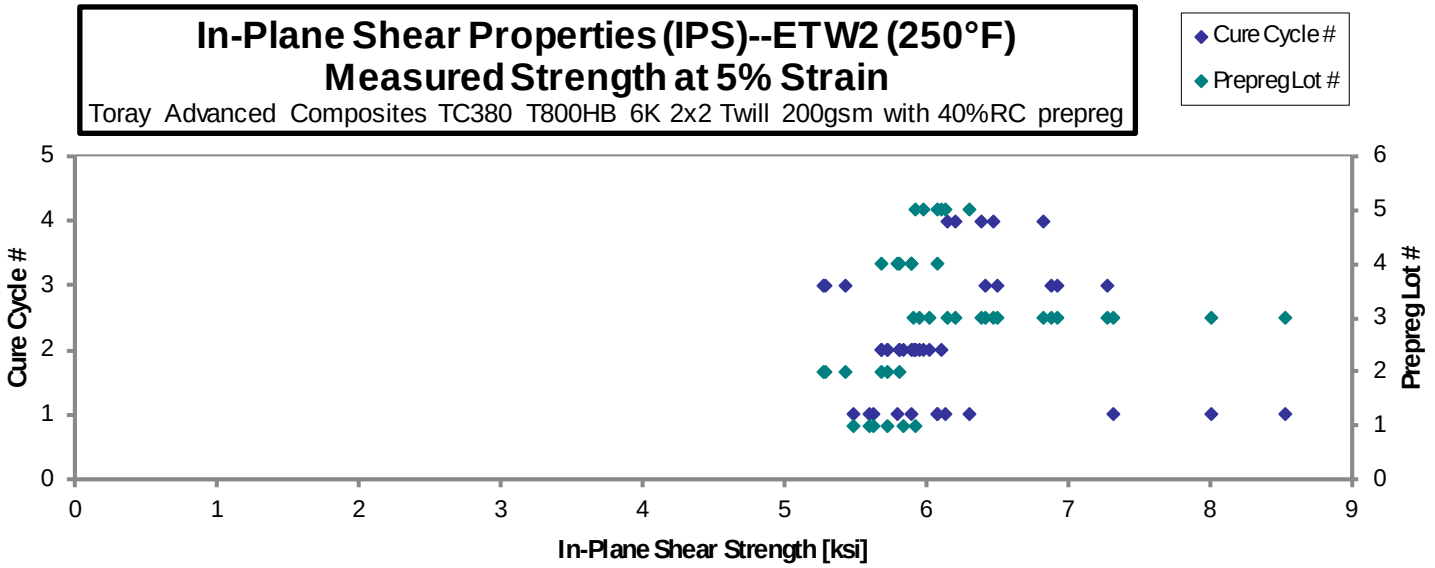

In-Plane Shear Properties (IPS)--ETW1 (180°F)
Measured Strength at 5% Strain
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
In-Plane Shear Strength [ksi]
0
2
4
6
8
10
12

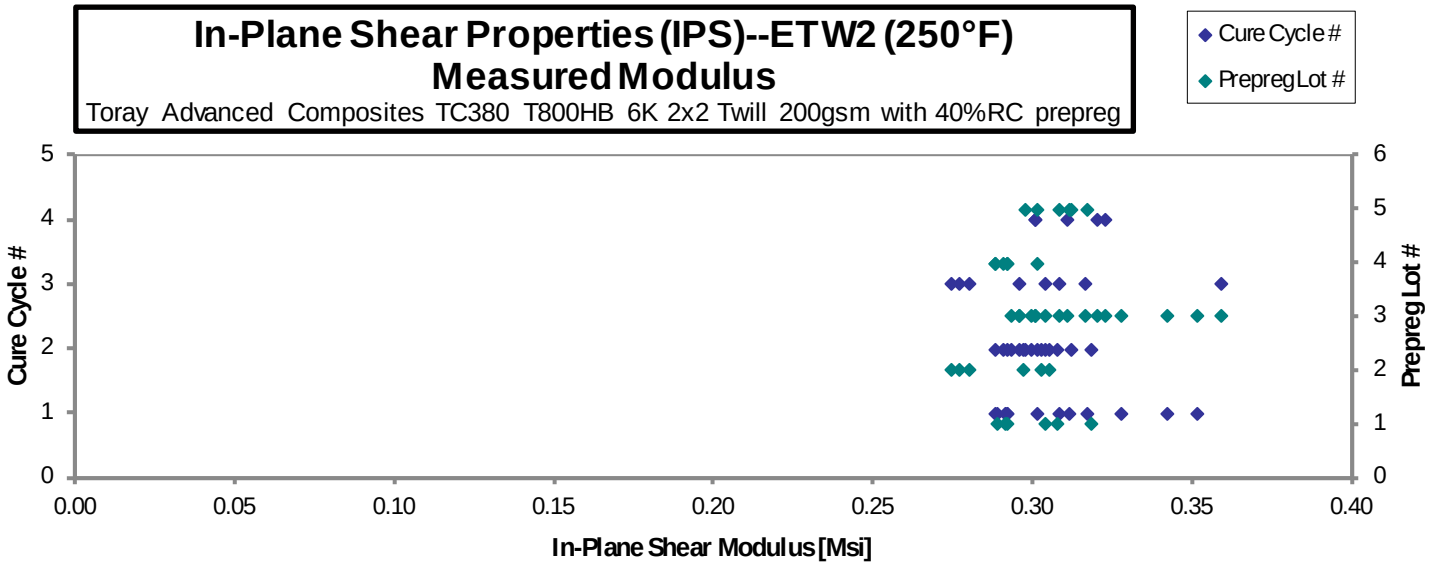

In-Plane Shear Properties (IPS)--ETW1 (180°F)
Measured Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
In-Plane Shear Modulus [Msi]
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0
1
2
3
4
5
6

In-Plane Shear Properties (IPS)--ETW2 (250°F)
Strength & Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	0.2% Offset Strength [ksi]	Strength at 5% Strain [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]
TCENA111E	A	C1	1	1	2.822	5.494	0.2891	0.07333	8	0.009167
TCENA112E	A	C1	1	1	2.867	5.604	0.2917	0.07257	8	0.009071
TCENA113E	A	C1	1	1	2.838	5.630	0.2919	0.07198	8	0.008998
TCENA211E	A	C2	1	2	2.946	5.725	0.3044	0.07288	8	0.009110
TCENA212E	A	C2	1	2	3.060	5.925	0.3183	0.07253	8	0.009067
TCENA213E	A	C2	1	2	3.022	5.846	0.3081	0.07147	8	0.008933
TCENB211E	B	C2	2	2	2.940	5.731	0.3029	0.07138	8	0.008923
TCENB212E	B	C2	2	2	2.872	5.685	0.2974	0.07107	8	0.008883
TCENB213E	B	C2	2	2	2.973	5.807	0.3052	0.06965	8	0.008706
TCENB311E	B	C3	2	3	2.721	5.277	0.2773	0.07235	8	0.009044
TCENB312E	B	C3	2	3	2.682	5.287	0.2747	0.07170	8	0.008963
TCENB313E	B	C3	2	3	2.712	5.431	0.2802	0.06947	8	0.008683
TCENC111E	C	C1	3	1	3.673	8.527	0.3518	0.07100	8	0.008875
TCENC112E	C	C1	3	1	3.526	8.012	0.3425	0.07152	8	0.008940
TCENC113E	C	C1	3	1	3.308	7.319	0.3277	0.07022	8	0.008777
TCENC211E	C	C2	3	2	2.893	5.959	0.2935	0.07070	8	0.008838
TCENC212E	C	C2	3	2	2.850	5.918	0.2957	0.07042	8	0.008802
TCENC213E	C	C2	3	2	2.948	6.028	0.2999	0.07008	8	0.008760
TCENC311E	C	C3	3	3	3.068	6.509	0.3044	0.07055	8	0.008819
TCENC312E	C	C3	3	3	3.023	6.415	0.2958	0.07033	8	0.008792
TCENC313E	C	C3	3	3	3.167	6.884	0.3085	0.07025	8	0.008781
TCENC314E	C	C3	3	3	3.213	6.926	0.3167	0.06867	8	0.008583
TCENC315E	C	C3	3	3	3.408	7.281	0.3594	0.06557	8	0.008196
TCENC411E	C	C4	3	4	3.234	6.826	0.3226	0.06963	8	0.008704
TCENC412E	C	C4	3	4	3.126	6.470	0.3107	0.07032	8	0.008790
TCENC413E	C	C4	3	4	2.985	6.215	0.3010	0.06982	8	0.008727
TCENC414E	C	C4	3	4	2.980	6.147	0.3007	0.06862	8	0.008577
TCENC415E	C	C4	3	4	3.135	6.397	0.3202	0.06487	8	0.008108
TCEND111E	D	C1	4	1	2.884	5.796	0.2882	0.07332	8	0.009165
TCEND112E	D	C1	4	1	2.887	5.902	0.2925	0.07205	8	0.009006
TCEND113E	D	C1	4	1	2.986	6.083	0.3017	0.07000	8	0.008750
TCEND211E	D	C2	4	2	2.869	5.681	0.2882	0.07368	8	0.009210
TCEND212E	D	C2	4	2	2.869	5.811	0.2908	0.07255	8	0.009069
TCEND213E	D	C2	4	2	2.895	5.898	0.2921	0.07032	8	0.008790
TCENE111E	E	C1	5	1	3.069	6.139	0.3087	0.07140	8	0.008925
TCENE112E	E	C1	5	1	3.087	6.078	0.3113	0.07122	8	0.008902
TCENE113E	E	C1	5	1	3.139	6.306	0.3173	0.06890	8	0.008613
TCENE211E	E	C2	5	2	2.969	5.924	0.3016	0.07165	8	0.008956
TCENE212E	E	C2	5	2	2.964	5.987	0.2979	0.07095	8	0.008869
TCENE213E	E	C2	5	2	3.104	6.110	0.3120	0.06997	8	0.008746
				Average	**3.018**	**6.175**	**0.3049**			**0.008840**
				Standard Dev.	**0.2066**	**0.6861**	**0.01806**			
				Coeff. of Var. [%]	**6.847**	**11.11**	**5.925**			
				Min.	**2.682**	**5.277**	**0.2747**			**0.008108**
				Max.	**3.673**	**8.527**	**0.3594**			**0.009210**
				Number of Spec.	**40**	**40**	**40**			**40**


In-Plane Shear Properties (IPS)--ETW2 (250°F)
Measured 0.2% Offset Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
In-Plane Shear Strength [ksi]
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
0
1
2
3
4
5
6


In-Plane Shear Properties (IPS)--ETW2 (250°F)
Measured Strength at 5% Strain
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
In-Plane Shear Strength [ksi]
0
1
2
3
4
5
6
7
8
9
0
1
2
3
4
5
6

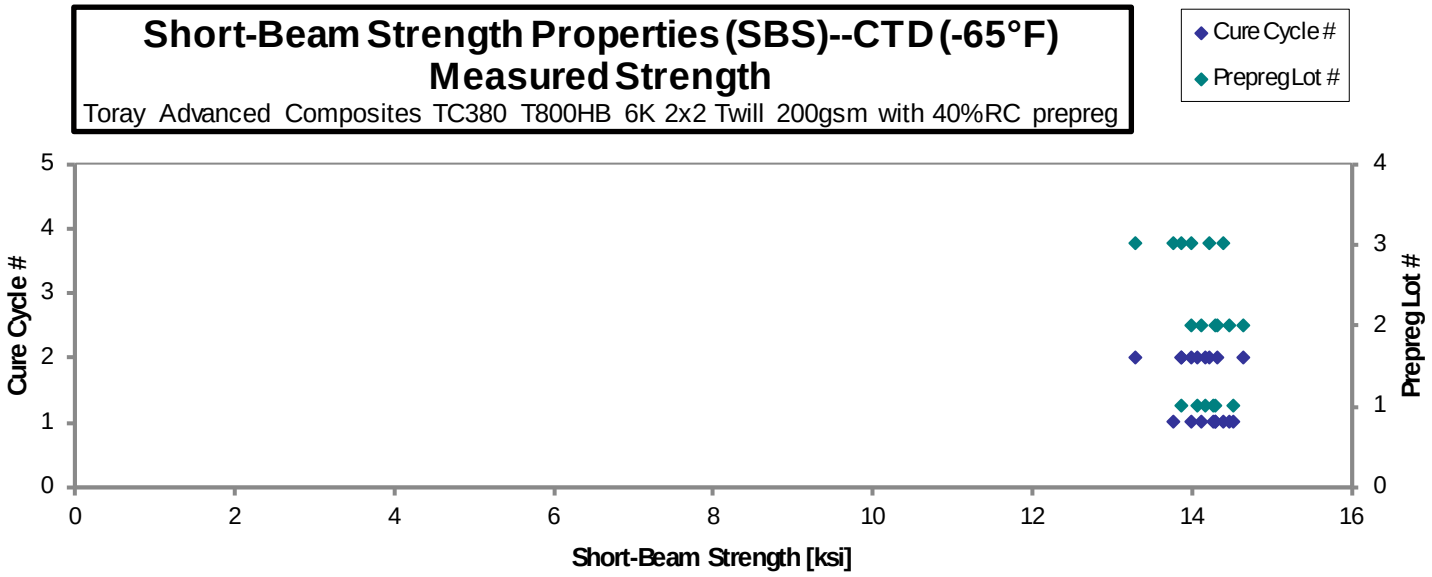

In-Plane Shear Properties (IPS)--ETW2 (250°F)
Measured Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
5
6
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
In-Plane Shear Modulus [Msi]

4.6 Lamina Short-Beam Strength Properties (SBS)

Short-Beam Strength Properties (SBS)--CTD (-65°F)
Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode
TCEQA111B	A	C1	1	1	14.29	0.1981	22	0.009006	INTERLAMINAR SHEAR, COMPRESSION
TCEQA112B	A	C1	1	1	14.51	0.1936	22	0.008798	INTERLAMINAR SHEAR, COMPRESSION
TCEQA114B	A	C1	1	1	14.27	0.1925	22	0.008751	INTERLAMINAR SHEAR, COMPRESSION
TCEQA211B	A	C2	1	2	14.17	0.1814	22	0.008245	INTERLAMINAR SHEAR, COMPRESSION
TCEQA212B	A	C2	1	2	14.08	0.1827	22	0.008303	INTERLAMINAR SHEAR, COMPRESSION
TCEQA213B	A	C2	1	2	13.86	0.1836	22	0.008345	INTERLAMINAR SHEAR, COMPRESSION
TCEQB111B	B	C1	2	1	14.13	0.1811	22	0.008231	INTERLAMINAR SHEAR, COMPRESSION
TCEQB112B	B	C1	2	1	14.47	0.1815	22	0.008251	INTERLAMINAR SHEAR, COMPRESSION
TCEQB113B	B	C1	2	1	14.29	0.1825	22	0.008295	INTERLAMINAR SHEAR, COMPRESSION
TCEQB211B	B	C2	2	2	14.32	0.1772	22	0.008052	INTERLAMINAR SHEAR, COMPRESSION
TCEQB212B	B	C2	2	2	14.00	0.1783	22	0.008102	INTERLAMINAR SHEAR, COMPRESSION
TCEQB213B	B	C2	2	2	14.65	0.1793	22	0.008148	INTERLAMINAR SHEAR, COMPRESSION
TCEQC111B	C	C1	3	1	14.39	0.1864	22	0.008474	INTERLAMINAR SHEAR
TCEQC112B	C	C1	3	1	14.00	0.1873	22	0.008514	INTERLAMINAR SHEAR
TCEQC113B	C	C1	3	1	13.78	0.1874	22	0.008520	INTERLAMINAR SHEAR
TCEQC211B	C	C2	3	2	13.86	0.1868	22	0.008491	INTERLAMINAR SHEAR
TCEQC212B	C	C2	3	2	14.23	0.1877	22	0.008532	INTERLAMINAR SHEAR, COMPRESSION
TCEQC213B	C	C2	3	2	13.28	0.1878	22	0.008535	INTERLAMINAR SHEAR

Average	**14.14**	**0.008422**
Standard Dev.	**0.3196**	
Coeff. of Var. [%]	**2.260**	
Min.	**13.28**	**0.008052**
Max.	**14.65**	**0.009006**
Number of Spec.	**18**	**18**

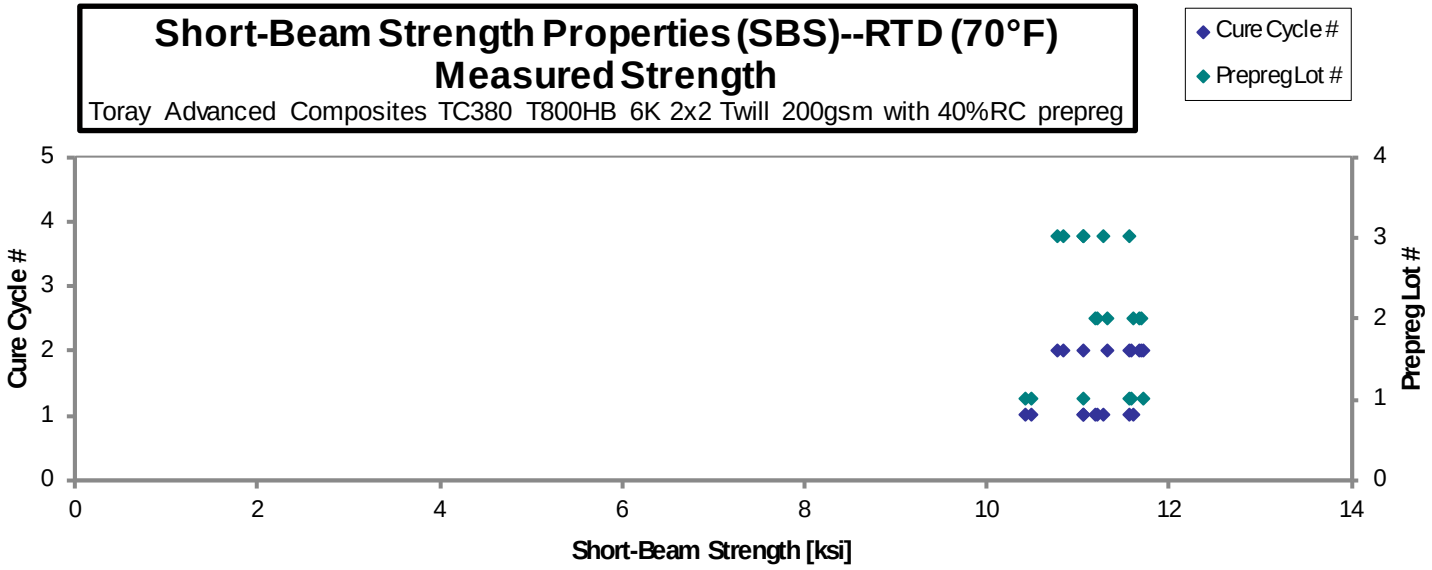

Short-Beam Strength Properties (SBS)--CTD (-65°F)
Measured Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Short-Beam Strength [ksi]
0
1
2
3
4
5
0
2
4
6
8
10
12
14
16

Short-Beam Strength Properties (SBS)--RTD (70°F)
Strength

Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode
TCEQA111A	A	C1	1	1	10.43	0.2013	22	0.009152	INTERLAMINAR SHEAR, COMPRESSION
TCEQA112A	A	C1	1	1	11.06	0.2037	22	0.009260	INTERLAMINAR SHEAR, COMPRESSION
TCEQA113A	A	C1	1	1	10.50	0.2016	22	0.009162	INTERLAMINAR SHEAR, COMPRESSION
TCEQA212A	A	C2	1	2	11.73	0.1748	22	0.007944	INTERLAMINAR SHEAR, COMPRESSION
TCEQA213A	A	C2	1	2	11.59	0.1774	22	0.008063	INTERLAMINAR SHEAR, COMPRESSION
TCEQA214A	A	C2	1	2	11.56	0.1792	22	0.008146	INTERLAMINAR SHEAR, COMPRESSION
TCEQB111A	B	C1	2	1	11.60	0.1735	22	0.007885	INTERLAMINAR SHEAR, COMPRESSION
TCEQB112A	B	C1	2	1	11.18	0.1754	22	0.007972	INTERLAMINAR SHEAR, COMPRESSION
TCEQB113A	B	C1	2	1	11.22	0.1777	22	0.008076	INTERLAMINAR SHEAR, COMPRESSION
TCEQB211A	B	C2	2	2	11.67	0.1697	22	0.007714	INTERLAMINAR SHEAR, COMPRESSION
TCEQB212A	B	C2	2	2	11.69	0.1716	22	0.007801	INTERLAMINAR SHEAR
TCEQB213A	B	C2	2	2	11.33	0.1736	22	0.007891	INTERLAMINAR SHEAR, COMPRESSION
TCEQC111A	C	C1	3	1	11.56	0.1823	22	0.008286	INTERLAMINAR SHEAR, COMPRESSION
TCEQC112A	C	C1	3	1	11.27	0.1831	22	0.008324	INTERLAMINAR SHEAR, COMPRESSION
TCEQC113A	C	C1	3	1	11.05	0.1846	22	0.008389	INTERLAMINAR SHEAR
TCEQC211A	C	C2	3	2	10.85	0.1821	22	0.008277	INTERLAMINAR SHEAR, COMPRESSION
TCEQC212A	C	C2	3	2	11.06	0.1826	22	0.008300	INTERLAMINAR SHEAR, COMPRESSION
TCEQC213A	C	C2	3	2	10.77	0.1847	22	0.008395	INTERLAMINAR SHEAR, COMPRESSION

Average	**11.23**	**0.008280**
Standard Dev.	**0.4034**	
Coeff. of Var. [%]	**3.593**	
Min.	**10.43**	**0.007714**
Max.	**11.73**	**0.009260**
Number of Spec.	**18**	**18**

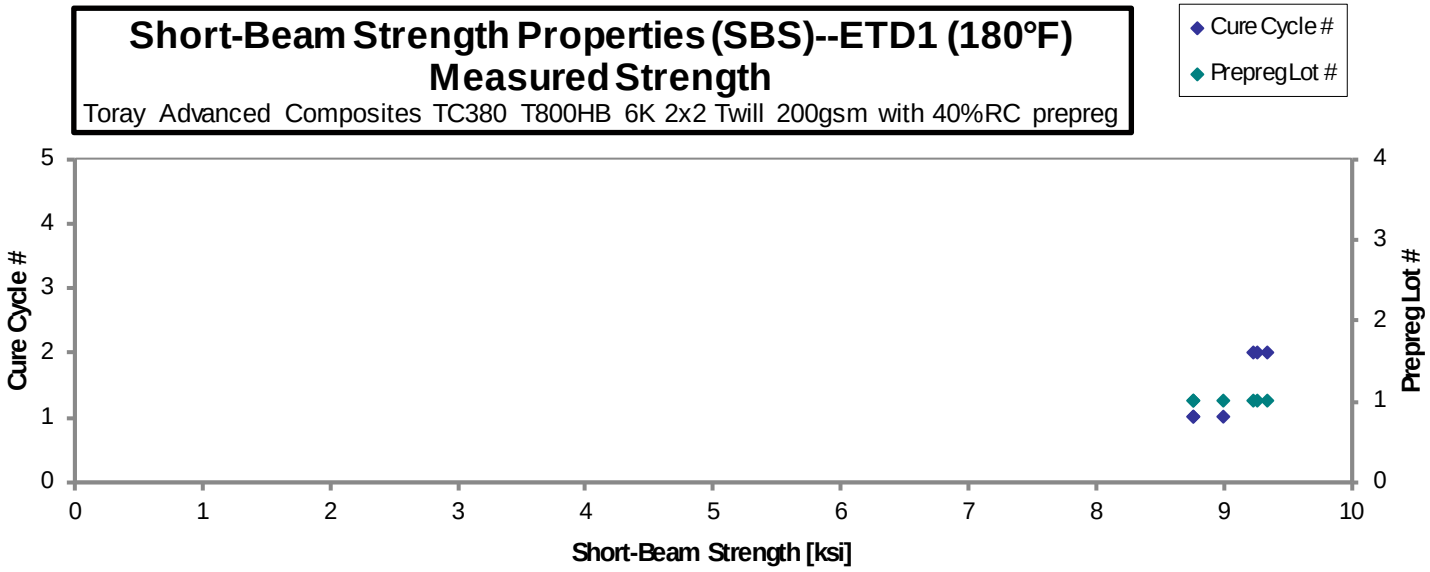

Short-Beam Strength Properties (SBS)--RTD (70°F)
Measured Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Short-Beam Strength [ksi]
0
1
2
3
4
5
0
2
4
6
8
10
12
14

Short-Beam Strength Properties (SBS)--ETD1 (180°F)
Strength

Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode
TCEQA112C	A	C1	1	1	8.995	0.1991	22	0.009050	INTERLAMINAR SHEAR, COMPRESSION
TCEQA113C	A	C1	1	1	8.759	0.1995	22	0.009066	INTERLAMINAR SHEAR, COMPRESSION
TCEQA114C	A	C1	1	1	8.760	0.1992	22	0.009055	INTERLAMINAR SHEAR, COMPRESSION
TCEQA211C	A	C2	1	2	9.236	0.1845	22	0.008386	INTERLAMINAR SHEAR, COMPRESSION
TCEQA212C	A	C2	1	2	9.258	0.1848	22	0.008400	INTERLAMINAR SHEAR, COMPRESSION
TCEQA213C	A	C2	1	2	9.337	0.1837	22	0.008348	INTERLAMINAR SHEAR, COMPRESSION

Average	**9.057**	**0.008717**
Standard Dev.	**0.2576**	
Coeff. of Var. [%]	**2.844**	
Min.	**8.759**	**0.008348**
Max.	**9.337**	**0.009066**
Number of Spec.	**6**	**6**

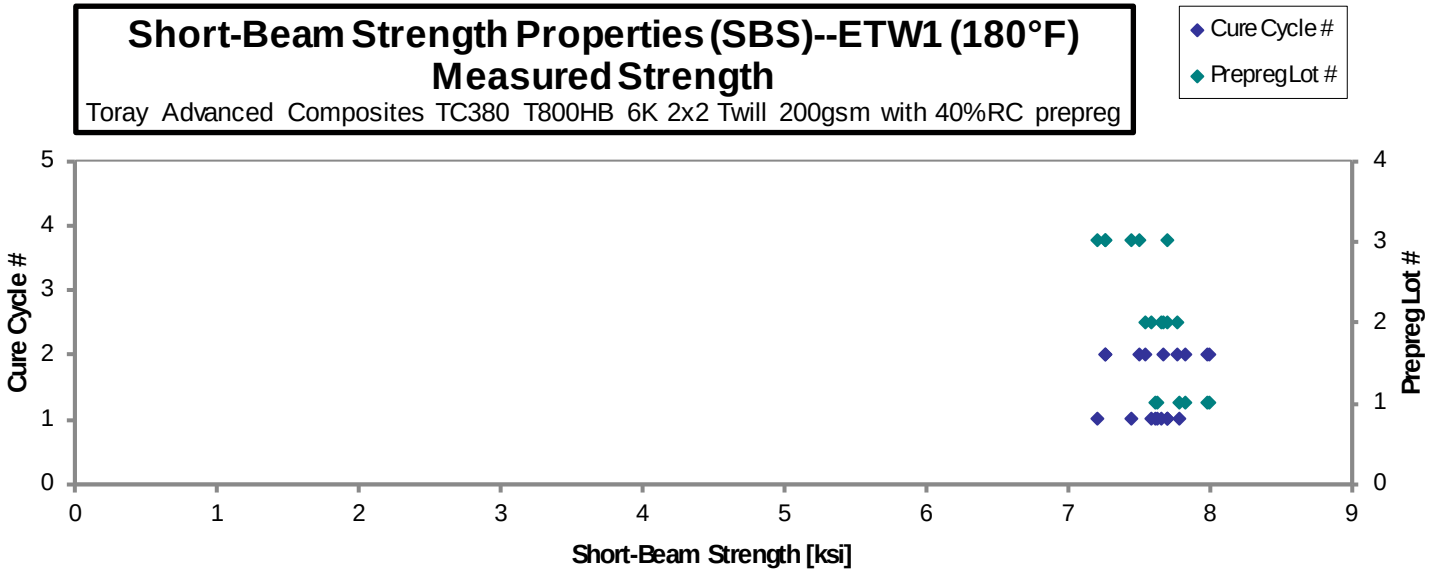

Short-Beam Strength Properties (SBS)--ETD1 (180°F)
Measured Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Short-Beam Strength [ksi]
0
1
2
3
4
5
6
7
8
9
10

Short-Beam Strength Properties (SBS)--ETW1 (180°F)
Strength

Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode
TCEQA111D	A	C1	1	1	7.787	0.1985	22	0.009023	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
TCEQA112D	A	C1	1	1	7.619	0.1981	22	0.009005	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
TCEQA113D	A	C1	1	1	7.638	0.1984	22	0.009017	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
TCEQA211D	A	C2	1	2	7.989	0.1814	22	0.008245	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
TCEQA212D	A	C2	1	2	7.835	0.1795	22	0.008161	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
TCEQA213D	A	C2	1	2	7.991	0.1778	22	0.008080	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
TCEQB111D	B	C1	2	1	7.706	0.1832	22	0.008327	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
TCEQB112D	B	C1	2	1	7.662	0.1773	22	0.008058	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
TCEQB113D	B	C1	2	1	7.587	0.1798	22	0.008174	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
TCEQB211D	B	C2	2	2	7.777	0.1796	22	0.008165	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
TCEQB213D	B	C2	2	2	7.542	0.1769	22	0.008042	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
TCEQB214D	B	C2	2	2	7.676	0.1797	22	0.008169	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION
TCEQC111D	C	C1	3	1	7.700	0.1878	22	0.008538	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
TCEQC112D	C	C1	3	1	7.216	0.1848	22	0.008400	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION
TCEQC113D	C	C1	3	1	7.444	0.1864	22	0.008471	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION
TCEQC211D	C	C2	3	2	7.506	0.1876	22	0.008527	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION
TCEQC212D	C	C2	3	2	7.263	0.1862	22	0.008465	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION
TCEQC213D	C	C2	3	2	7.268	0.1865	22	0.008477	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION

Average	**7.623**	**0.008408**
Standard Dev.	**0.2247**	
Coeff. of Var. [%]	**2.947**	
Min.	**7.216**	**0.008042**
Max.	**7.991**	**0.009023**
Number of Spec.	**18**	**18**

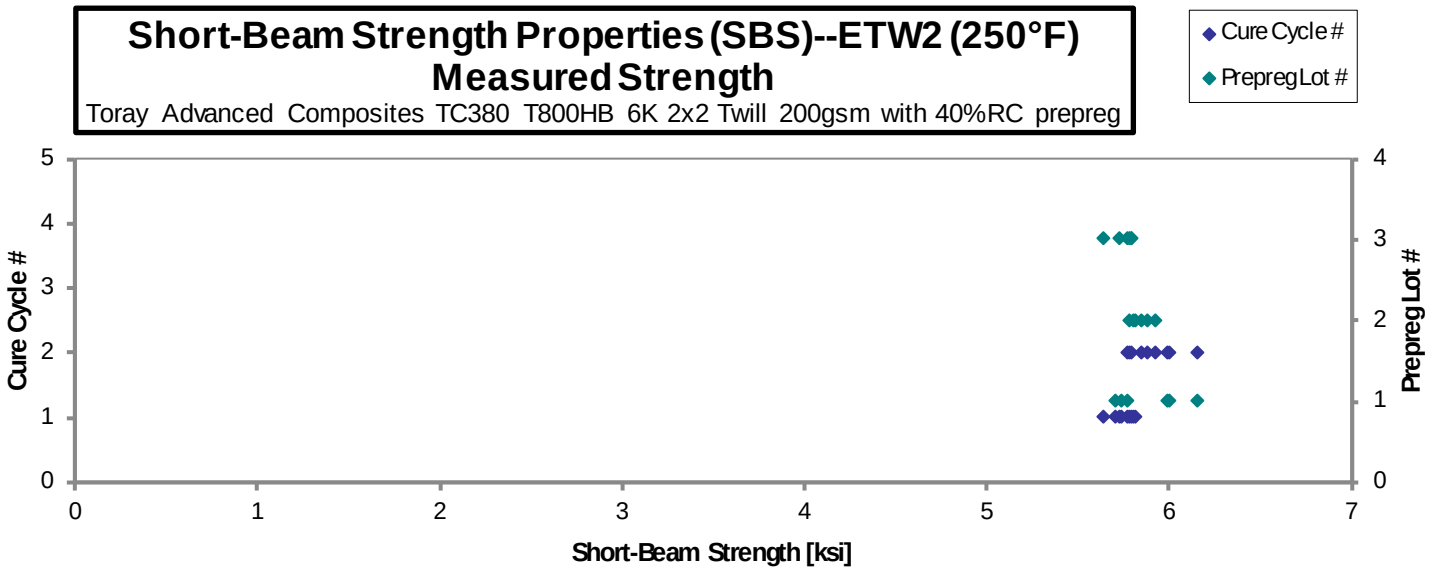

Short-Beam Strength Properties (SBS)--ETW1 (180°F)
Measured Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Short-Beam Strength [ksi]
0
1
2
3
4
5
6
7
8
9

Short-Beam Strength Properties (SBS)--ETW2 (250°F)
Strength

Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode
TCEQA111E	A	C1	1	1	5.741	0.1979	22	0.008994	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
TCEQA112E	A	C1	1	1	5.710	0.2002	22	0.009102	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
TCEQA113E	A	C1	1	1	5.772	0.2018	22	0.009173	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
TCEQA212E	A	C2	1	2	6.153	0.1779	22	0.008086	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
TCEQA213E	A	C2	1	2	5.990	0.1813	22	0.008242	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
TCEQA214E	A	C2	1	2	5.999	0.1840	22	0.008364	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
TCEQB111E	B	C1	2	1	5.786	0.1874	22	0.008517	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
TCEQB112E	B	C1	2	1	5.813	0.1887	22	0.008579	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
TCEQB113E	B	C1	2	1	5.802	0.1896	22	0.008618	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
TCEQB212E	B	C2	2	2	5.843	0.1867	22	0.008485	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
TCEQB213E	B	C2	2	2	5.883	0.1878	22	0.008534	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
TCEQB214E	B	C2	2	2	5.929	0.1877	22	0.008533	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
TCEQC111E	C	C1	3	1	5.795	0.1907	22	0.008668	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION
TCEQC112E	C	C1	3	1	5.723	0.1915	22	0.008703	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION
TCEQC113E	C	C1	3	1	5.637	0.1923	22	0.008739	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION
TCEQC211E	C	C2	3	2	5.792	0.1919	22	0.008721	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION
TCEQC212E	C	C2	3	2	5.777	0.1923	22	0.008742	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION
TCEQC213E	C	C2	3	2	5.776	0.1931	22	0.008776	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION

Average	**5.829**	**0.008643**
Standard Dev.	**0.1230**	
Coeff. of Var. [%]	**2.110**	
Min.	**5.637**	**0.008086**
Max.	**6.153**	**0.009173**
Number of Spec.	**18**	**18**


Short-Beam Strength Properties (SBS)--ETW2 (250°F)
Measured Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Short-Beam Strength [ksi]
0
1
2
3
4
5
6
7

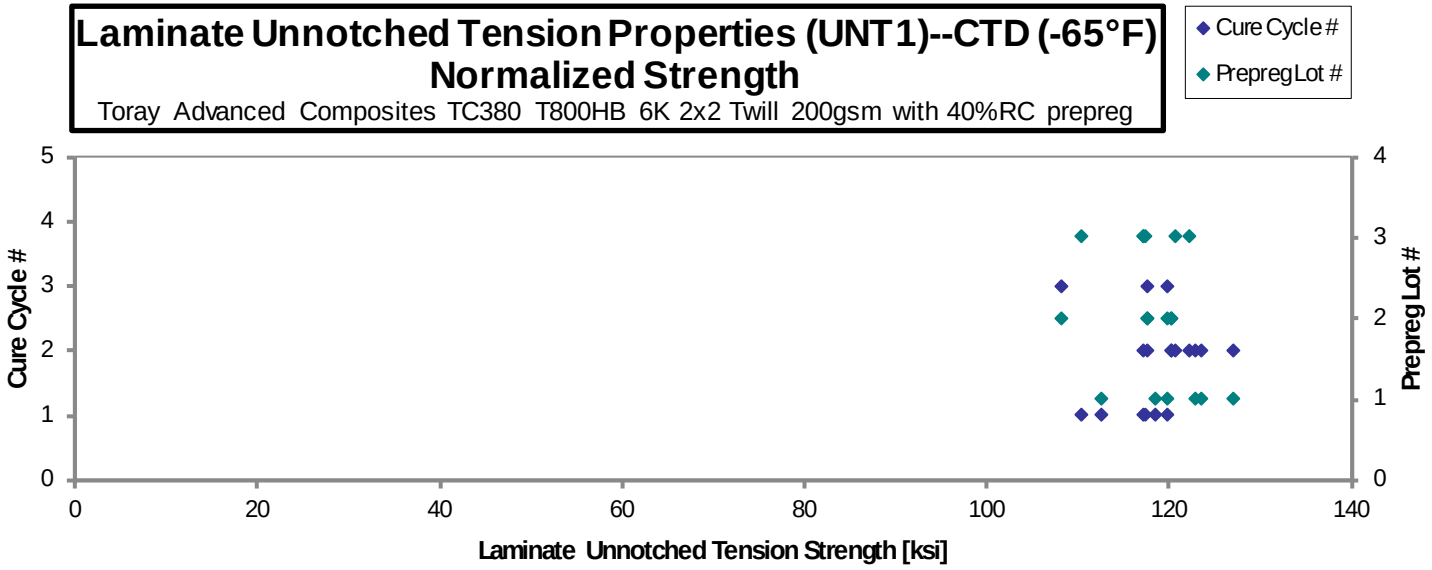
4.7 “25/50/25” Unnotched Tension 1 Properties (UNT1)

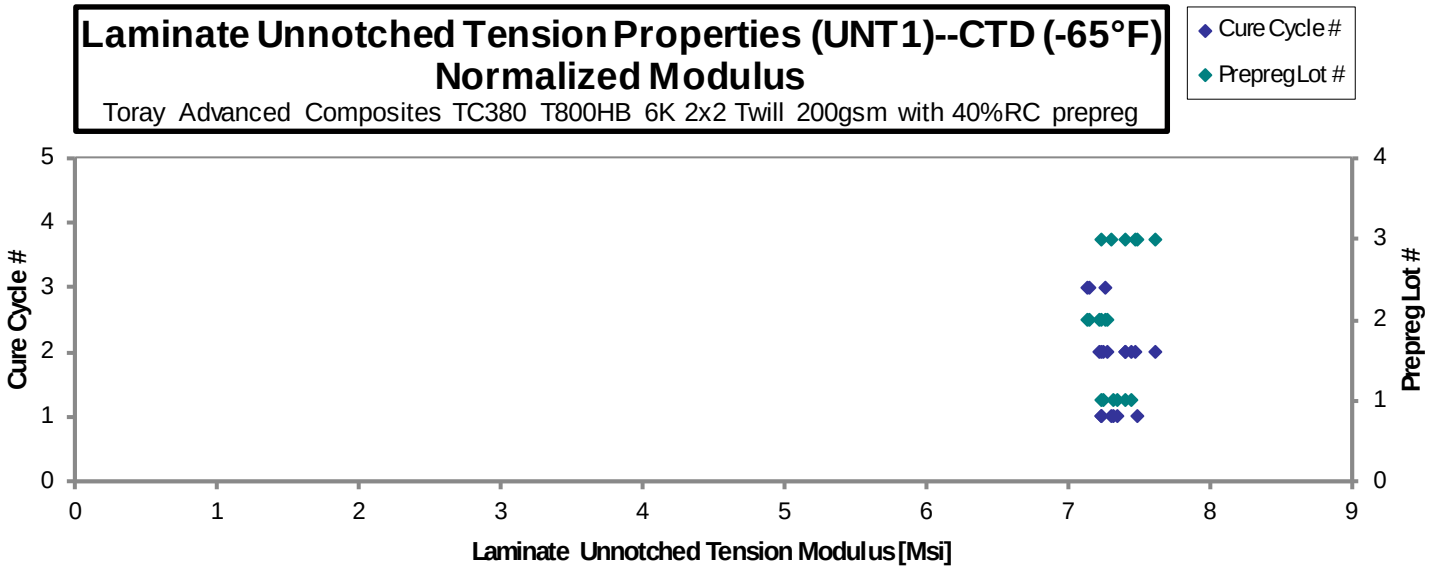
Laminate Unnotched Tension Properties (UNT1)--CTD (-65°F)
Strength & Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
TCEAA111B	A	C1	1	1	122.5	7.486	0.06887	8	LWT, LWB	0.008608	119.8	7.323
TCEAA112B	A	C1	1	1	120.7	7.380	0.06910	8	LWT, LGM	0.008638	118.5	7.243
TCEAA113B	A	C1	1	1	114.2	7.446	0.06943	8	LGM	0.008679	112.6	7.344
TCEAA211B	A	C2	1	2	129.6	7.587	0.06907	8	LGB, LGT	0.008633	127.1	7.444
TCEAA212B	A	C2	1	2	126.4	7.420	0.06880	8	LGB, LWT	0.008600	123.6	7.251
TCEAA213B	A	C2	1	2	124.8	7.531	0.06928	8	LWB, LWT	0.008660	122.8	7.411
TCEAB211B	B	C2	2	2	116.7	7.018	0.07250	8	LWT, LGB	0.009063	120.2	7.228
TCEAB212B	B	C2	2	2	117.9	7.094	0.07183	8	LWT, LGB	0.008979	120.3	7.239
TCEAB213B	B	C2	2	2	115.1	7.113	0.07202	8	LGM	0.009002	117.7	7.276
TCEAB311B	B	C3	2	3	117.8	7.150	0.07023	8	LWB, LGT	0.008779	117.6	7.133
TCEAB312B	B	C3	2	3	120.6	7.187	0.07000	8	LWB, LWT	0.008750	119.9	7.146
TCEAB313B	B	C3	2	3	109.5	7.368	0.06947	8	LWB, LWT	0.008683	108.1	7.270
TCEAC111B	C	C1	3	1	117.7	7.273	0.07008	8	AWT, AGB	0.008760	117.2	7.241
TCEAC112B	C	C1	3	1	111.1	7.349	0.07002	8	AWT, AWB, AGB	0.008752	110.5	7.309
TCEAC113B	C	C1	3	1	118.0	7.520	0.07008	8	AWT, AWB	0.008760	117.5	7.486
TCEAC211B	C	C2	3	2	118.2	7.480	0.06977	8	M(A,L)WT, AWB	0.008721	117.1	7.413
TCEAC212B	C	C2	3	2	121.2	7.516	0.07008	8	AGM, AWT	0.008760	120.6	7.482
TCEAC213B	C	C2	3	2	123.3	7.687	0.06978	8	AWT, AWB	0.008723	122.2	7.620

Average	**119.2**	**7.367**		**$Average_{norm}$**	**0.008753**	**118.5**	**7.326**
Standard Dev.	**5.104**	**0.1892**		**$Standard\ Dev._{norm}$**		**4.607**	**0.1278**
Coeff. of Var. [%]	**4.282**	**2.569**		**Coeff. of Var. [%]$_{norm}$**		**3.887**	**1.744**
Min.	**109.5**	**7.018**		**Min.**	**0.008600**	**108.1**	**7.133**
Max.	**129.6**	**7.687**		**Max.**	**0.009063**	**127.1**	**7.620**
Number of Spec.	**18**	**18**		**Number of Spec.**	**18**	**18**	**18**


Laminate Unnotched Tension Properties (UNT1)--CTD (-65°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Unnotched Tension Strength [ksi]
0
20
40
60
80
100
120
140
0
1
2
3
4
5


Laminate Unnotched Tension Properties (UNT1)--CTD (-65°F)
Normalized Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Unnotched Tension Modulus [Msi]
0
1
2
3
4
5
6
7
8
9
0
1
2
3
4
5

Laminate Unnotched Tension Properties (UNT1)--RTD (70°F)
Strength & Modulus

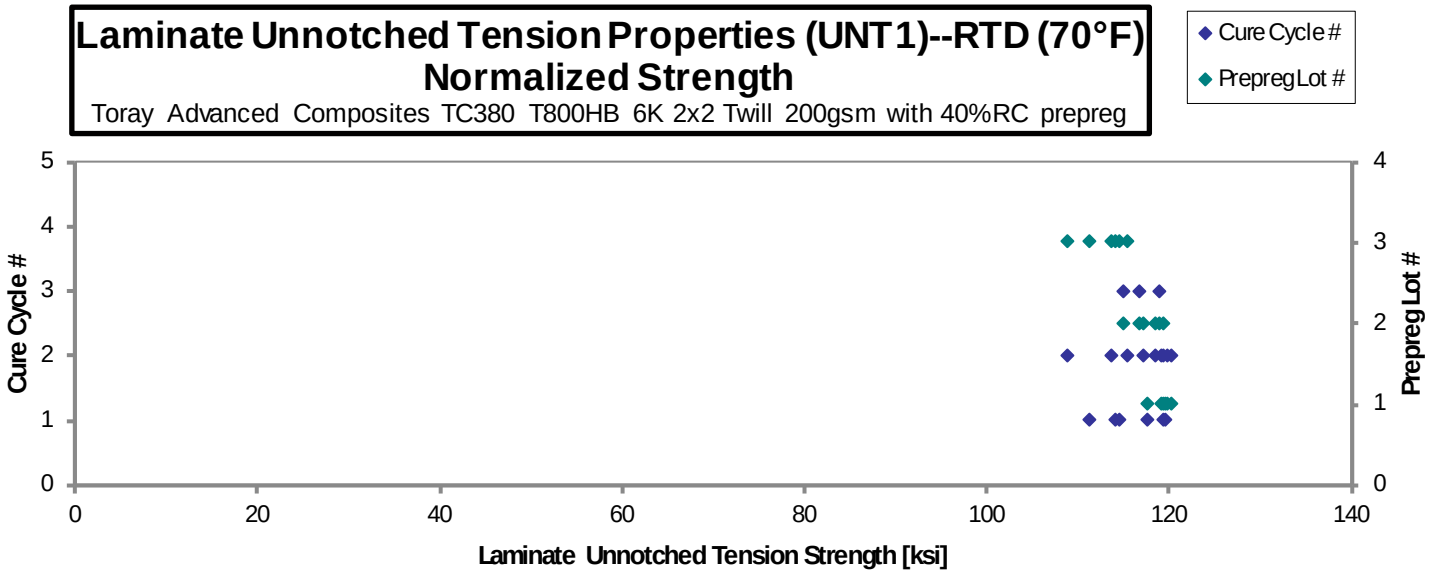
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

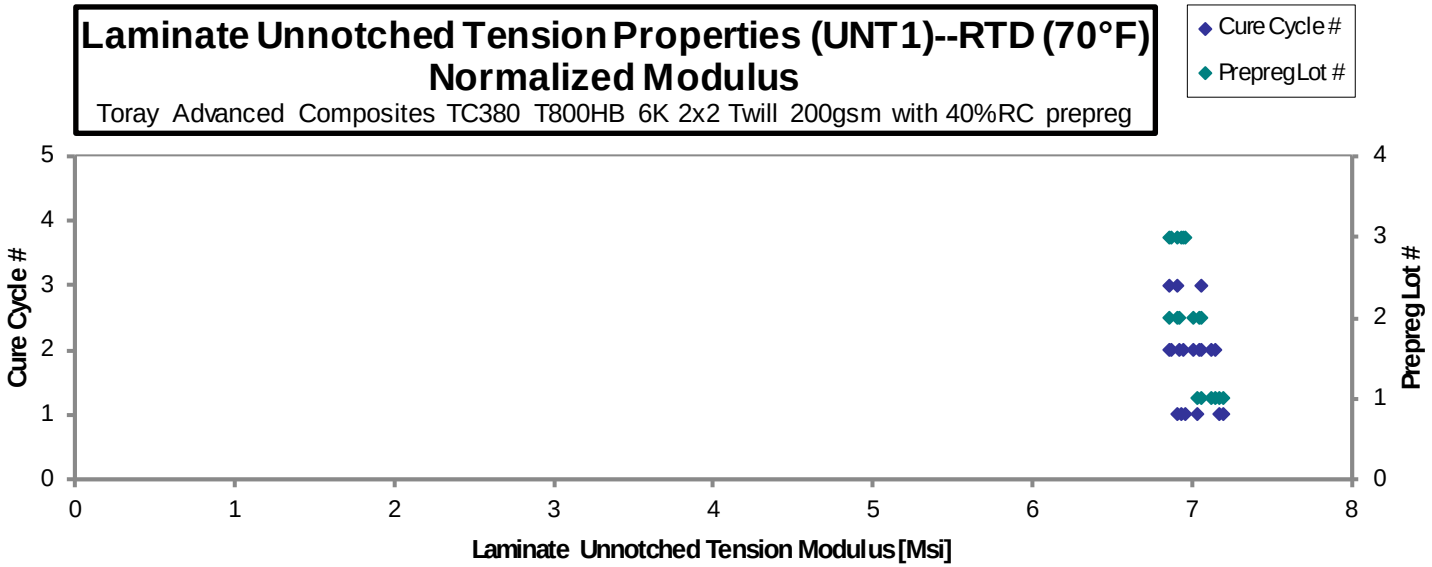
normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
TCEAA111A	A	C1	1	1	133.5	8.030	0.06310	8	LGB, LWT	0.007888	119.7	7.198
TCEAA112A	A	C1	1	1	126.6	7.721	0.06543	8	M(A,L)WT, LWB	0.008179	117.7	7.176
TCEAA113A	A	C1	1	1	125.4	7.386	0.06703	8	LWB, LWT	0.008379	119.4	7.033
TCEAA211A	A	C2	1	2	134.3	8.021	0.06277	8	LWB, M(A,L)WT	0.007846	119.7	7.152
TCEAA212A	A	C2	1	2	129.2	7.582	0.06552	8	LWB, M(A,L)WT	0.008190	120.2	7.056
TCEAA213A	A	C2	1	2	124.3	7.430	0.06745	8	LWB, AWT	0.008431	119.1	7.119
TCEAB211A	B	C2	2	2	127.9	7.613	0.06518	8	LGM, LWT, LWB	0.008148	118.5	7.049
TCEAB212A	B	C2	2	2	121.9	7.196	0.06775	8	LWB, LWT	0.008469	117.3	6.926
TCEAB213A	B	C2	2	2	119.9	7.037	0.07007	8	M(A,L)WB, LGT	0.008758	119.3	7.003
TCEAB311A	B	C3	2	3	131.4	7.800	0.06373	8	LGT, LWB	0.007967	119.0	7.061
TCEAB312A	B	C3	2	3	120.0	7.218	0.06740	8	LWT, LGB	0.008425	114.9	6.910
TCEAB313A	B	C3	2	3	119.2	7.003	0.06890	8	LWB, LGT	0.008613	116.7	6.853
TCEAC111A	C	C1	3	1	122.9	7.437	0.06567	8	M(A,L)WT, M(A,L)WB	0.008208	114.6	6.937
TCEAC112A	C	C1	3	1	117.2	7.095	0.06855	8	M(A,L)WT, M(A,L)WB	0.008569	114.1	6.908
TCEAC113A	C	C1	3	1	112.5	7.033	0.06965	8	M(A,L)GT, M(A,L)WB	0.008706	111.3	6.958
TCEAC211A	C	C2	3	2	119.3	7.199	0.06710	8	M(A,L)WT, AWB	0.008388	113.7	6.862
TCEAC212A	C	C2	3	2	111.7	7.059	0.06855	8	M(A,L)GM, M(A,L)WT	0.008569	108.8	6.873
TCEAC213A	C	C2	3	2	117.4	7.067	0.06918	8	LGT, LWB	0.008648	115.3	6.945

Average	**123.0**	**7.385**	
Standard Dev.	**6.615**	**0.3415**	
Coeff. of Var. [%]	**5.377**	**4.624**	
Min.	**111.7**	**7.003**	
Max.	**134.3**	**8.030**	
Number of Spec.	**18**	**18**	

$Average_{norm}$	**0.008354**	**116.6**	**7.001**
Standard $Dev._{norm}$		**3.231**	**0.1098**
Coeff. of Var. $[\%]_{norm}$		**2.771**	**1.569**
Min.	**0.007846**	**108.8**	**6.853**
Max.	**0.008758**	**120.2**	**7.198**
Number of Spec.	**18**	**18**	**18**


Laminate Unnotched Tension Properties (UNT1)--RTD (70°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Unnotched Tension Strength [ksi]
0
20
40
60
80
100
120
140
0
1
2
3
4
5


Laminate Unnotched Tension Properties (UNT1)--RTD (70°F)
Normalized Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Unnotched Tension Modulus [Msi]
0
1
2
3
4
5
6
7
8
0
1
2
3
4
5

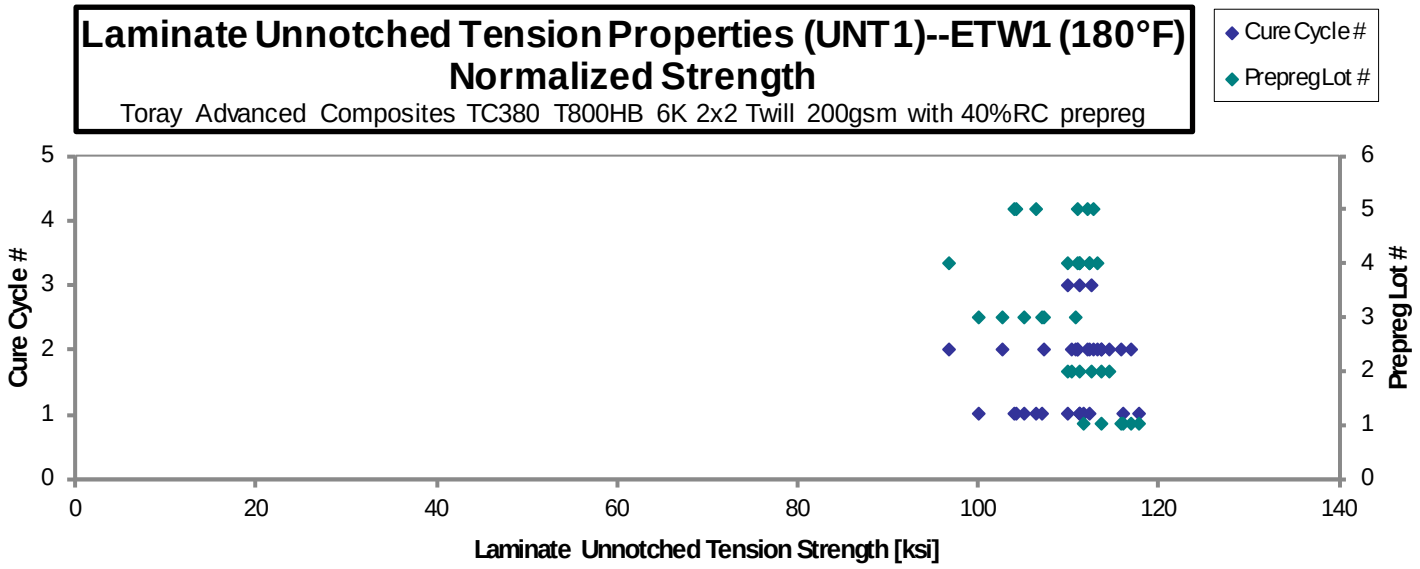
Laminate Unnotched Tension Properties (UNT1)--ETW1 (180°F)
Strength & Modulus

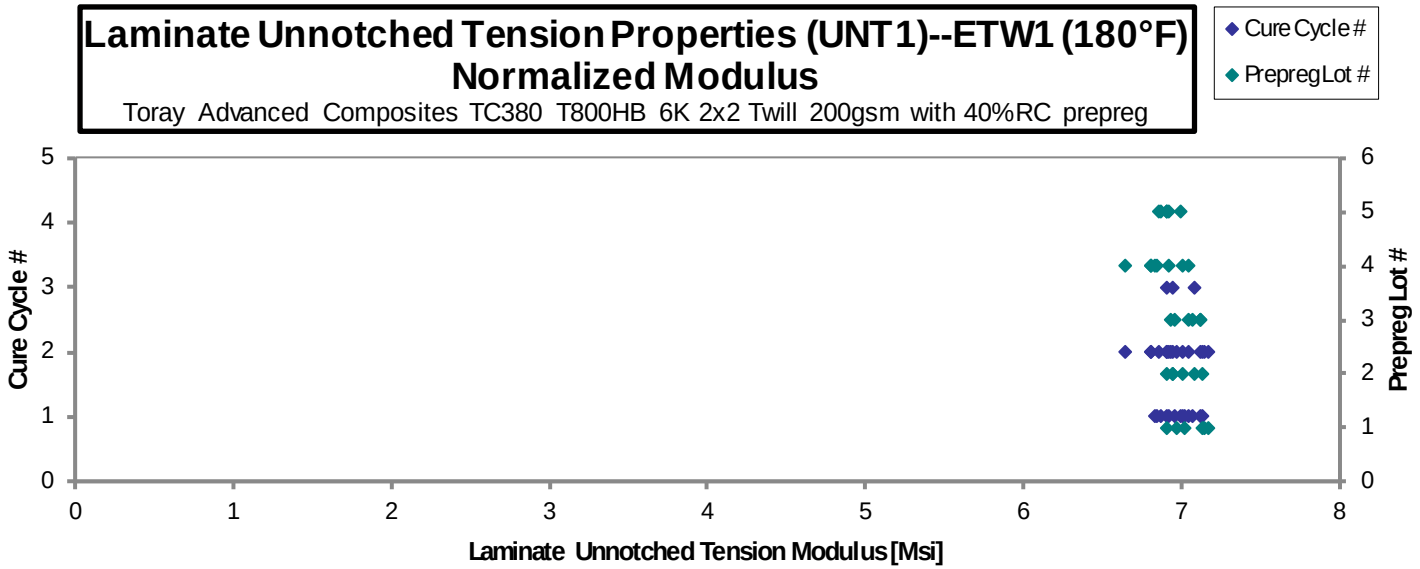
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
TCEAA111D	A	C1	1	1	115.0	7.342	0.06838	8	LGT, LWB	0.008548	111.7	7.131
TCEAA112D	A	C1	1	1	129.7	7.601	0.06402	8	LGM, LWT	0.008002	117.9	6.911
TCEAA113D	A	C1	1	1	122.6	7.404	0.06672	8	LGB, LWT	0.008340	116.1	7.016
TCEAA211D	A	C2	1	2	120.6	7.455	0.06770	8	LWT, LGB	0.008463	116.0	7.169
TCEAA212D	A	C2	1	2	129.8	7.929	0.06345	8	LWT, LWB, LGM	0.007931	117.0	7.146
TCEAA213D	A	C2	1	2	119.1	7.310	0.06720	8	LGT, LWB	0.008400	113.7	6.977
TCEAB211D	B	C2	2	2	112.4	7.129	0.06918	8	LGT, LWB	0.008648	110.4	7.006
TCEAB212D	B	C2	2	2	120.1	7.473	0.06722	8	LGT, LWB	0.008402	114.7	7.135
TCEAB213D	B	C2	2	2	122.9	7.515	0.06508	8	LGB, LWT	0.008135	113.6	6.947
TCEAB311D	B	C3	2	3	116.7	7.340	0.06797	8	LWT, LGB	0.008496	112.7	7.086
TCEAB312D	B	C3	2	3	120.4	7.481	0.06503	8	LGT, LWB	0.008129	111.2	6.911
TCEAB313D	B	C3	2	3	125.6	7.936	0.06160	8	M(A,L)WB, LGT	0.007700	109.9	6.944
TCEAC111D	C	C1	3	1	107.6	7.243	0.06873	8	M(A,L)WT, AWB, AGB	0.008592	105.1	7.071
TCEAC112D	C	C1	3	1	112.9	7.341	0.06677	8	LGT, LWB	0.008346	107.1	6.962
TCEAC113D	C	C1	3	1	106.6	7.587	0.06608	8	AGT, M(A,L)WB	0.008260	100.1	7.122
TCEAC211D	C	C2	3	2	113.6	7.288	0.06875	8	AGT, AWB	0.008594	110.9	7.117
TCEAC212D	C	C2	3	2	111.7	7.330	0.06763	8	AGT, AGB, AWB	0.008454	107.3	7.041
TCEAC213D	C	C2	3	2	106.1	7.167	0.06817	8	AGT, AGB, AWB	0.008521	102.8	6.940
TCEAD111D	D	C1	4	1	123.1	7.553	0.06365	8	LGT, LWB	0.007956	111.3	6.829
TCEAD112D	D	C1	4	1	114.9	7.152	0.06735	8	LWB, LWT	0.008419	109.9	6.842
TCEAD113D	D	C1	4	1	108.4	6.860	0.07227	8	LGT, LWB	0.009033	111.2	7.041
TCEAD114D	D	C1	4	1	109.4	6.826	0.07227	8	LGB, LWT	0.009033	112.3	7.007
TCEAD211D	D	C2	4	2	123.4	7.234	0.06463	8	LWT, LWB	0.008079	113.2	6.642
TCEAD212D	D	C2	4	2	115.9	7.018	0.06832	8	LGB, LWT	0.008540	112.5	6.810
TCEAD213D	D	C2	4	2	96.29	6.769	0.07082	8	LWT, LAB	0.008852	96.86	6.809
TCEAD214D	D	C2	4	2	108.4	6.752	0.07213	8	LGB, LWT	0.009017	111.0	6.918
TCEAE111D	E	C1	5	1	114.2	7.602	0.06412	8	LGM, M(A,L)WT	0.008015	104.0	6.924
TCEAE112D	E	C1	5	1	110.6	7.148	0.06770	8	LGT, LWB	0.008463	106.4	6.874
TCEAE113D	E	C1	5	1	104.4	7.010	0.07022	8	LWT, LWB	0.008777	104.2	6.991
TCEAE211D	E	C2	5	2	120.3	7.412	0.06557	8	LGM, LWB, LAT	0.008196	112.0	6.904
TCEAE212D	E	C2	5	2	115.0	7.035	0.06913	8	LWT, LWB	0.008642	112.9	6.909
TCEAE213D	E	C2	5	2	110.2	6.810	0.07088	8	LGB, LWT	0.008860	110.9	6.857

Average	**115.2**	**7.283**		**$Average_{norm}$**	**0.008433**	**110.2**	**6.968**
Standard Dev.	**7.590**	**0.3035**		**$Standard\ Dev._{norm}$**		**4.855**	**0.1201**
Coeff. of Var. [%]	**6.586**	**4.167**		**$Coeff.\ of\ Var.\ [\%]_{norm}$**		**4.405**	**1.724**
Min.	**96.29**	**6.752**		**Min.**	**0.007700**	**96.86**	**6.642**
Max.	**129.8**	**7.936**		**Max.**	**0.009033**	**117.9**	**7.169**
Number of Spec.	**32**	**32**		**Number of Spec.**	**32**	**32**	**32**


Laminate Unnotched Tension Properties (UNT1)--ETW1 (180°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Unnotched Tension Strength [ksi]
0
20
40
60
80
100
120
140
0
1
2
3
4
5
6


Laminate Unnotched Tension Properties (UNT1)--ETW1 (180°F)
Normalized Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Unnotched Tension Modulus [Msi]
0
1
2
3
4
5
6
7
8
0
1
2
3
4
5
6

Laminate Unnotched Tension Properties (UNT1)--ETW2 (250°F)
Strength & Modulus

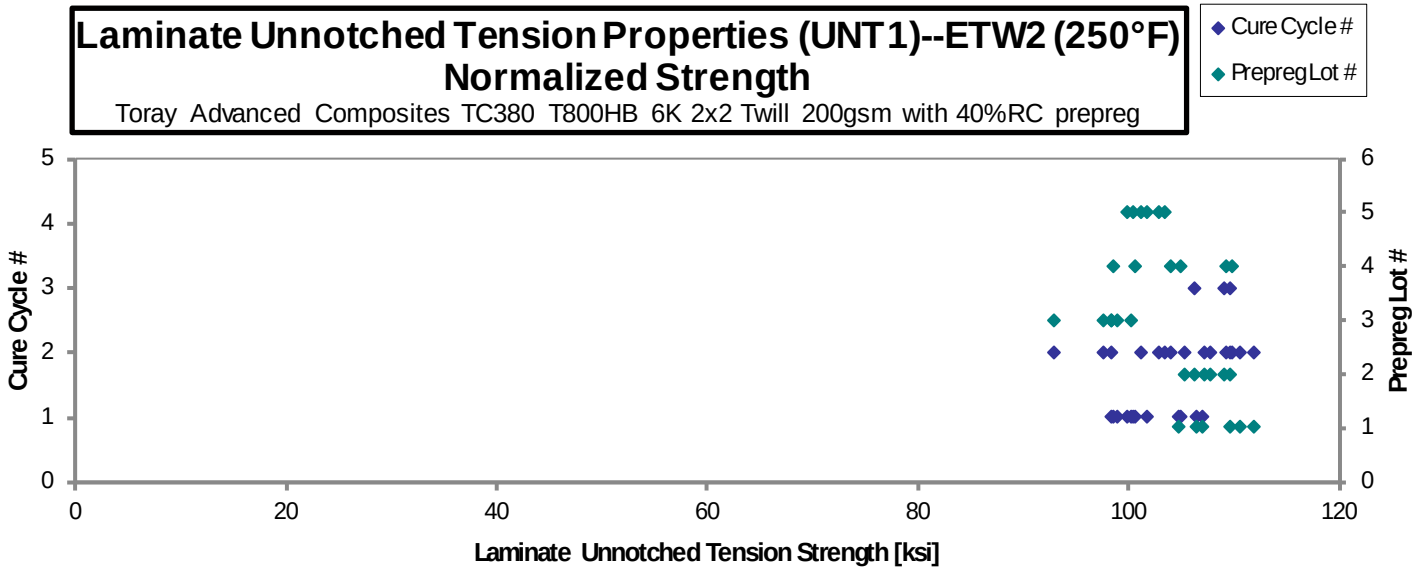
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

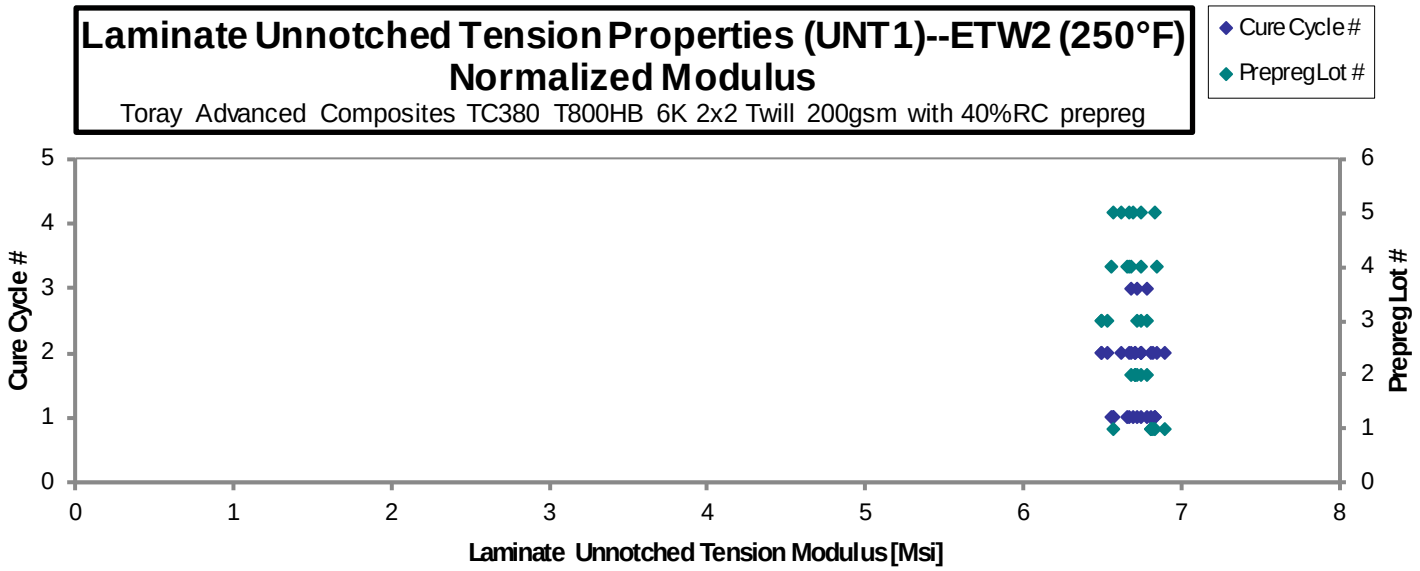
normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
TCEAA111E	A	C1	1	1	105.4	6.704	0.07147	8	LGT, LWB	0.008933	107.0	6.806
TCEAA112E	A	C1	1	1	103.5	6.648	0.07240	8	LGT, LWB	0.009050	106.4	6.837
TCEAA113E	A	C1	1	1	102.0	6.400	0.07232	8	LGT, LWB	0.009040	104.7	6.575
TCEAA211E	A	C2	1	2	111.1	6.750	0.07097	8	M(D,L)GB, M(D,L)WT	0.008871	112.0	6.804
TCEAA212E	A	C2	1	2	109.9	6.778	0.07083	8	M(D,L)GB,M(D,L)WT, M(D,L)WB	0.008854	110.6	6.820
TCEAA213E	A	C2	1	2	108.5	6.833	0.07112	8	M(D,L)GM, M(D,L)WT	0.008890	109.6	6.903
TCEAB211E	B	C2	2	2	102.1	6.544	0.07262	8	M(D,L)GB, M(D,L)WT	0.009077	105.3	6.750
TCEAB212E	B	C2	2	2	102.8	6.442	0.07338	8	M(D,L)GB, M(D,L)WT	0.009173	107.2	6.715
TCEAB213E	B	C2	2	2	104.0	6.478	0.07290	8	M(D,L)GB, M(D,L)WT	0.009113	107.7	6.708
TCEAB311E	B	C3	2	3	103.2	6.491	0.07247	8	LWT, LGB	0.009058	106.2	6.682
TCEAB312E	B	C3	2	3	107.2	6.606	0.07163	8	LGT, LWB	0.008954	109.1	6.722
TCEAB313E	B	C3	2	3	111.1	6.880	0.06947	8	AGM	0.008683	109.7	6.789
TCEAC111E	C	C1	3	1	97.49	6.600	0.07242	8	AGM, AWT	0.009052	100.3	6.789
TCEAC112E	C	C1	3	1	95.66	6.567	0.07237	8	AWT, AGM	0.009046	98.33	6.751
TCEAC113E	C	C1	3	1	96.24	6.539	0.07240	8	AWB, AGT	0.009050	98.97	6.725
TCEAC211E	C	C2	3	2	91.18	6.413	0.07175	8	AGT, AWB	0.008969	92.93	6.536
TCEAC212E	C	C2	3	2	95.33	6.345	0.07210	8	AGT, AWB	0.009013	97.64	6.499
TCEAC213E	C	C2	3	2	97.34	6.419	0.07122	8	AWT, AWB, AGB	0.008902	98.47	6.494
TCEAD111E	D	C1	4	1	95.95	6.255	0.07382	8	LGB, LWT	0.009227	100.6	6.559
TCEAD112E	D	C1	4	1	96.88	6.559	0.07162	8	LWT, LWB	0.008952	98.55	6.673
TCEAD113E	D	C1	4	1	103.2	6.542	0.07162	8	LWT, LWB	0.008952	105.0	6.655
TCEAD211E	D	C2	4	2	100.2	6.430	0.07317	8	LGB, LWT	0.009146	104.1	6.682
TCEAD212E	D	C2	4	2	105.4	6.481	0.07332	8	LGB, LWT	0.009165	109.8	6.750
TCEAD213E	D	C2	4	2	105.8	6.629	0.07268	8	AWB, LWT	0.009085	109.2	6.844
TCEAE111E	E	C1	5	1	97.32	6.650	0.07228	8	LGB, LWT	0.009035	99.92	6.828
TCEAE112E	E	C1	5	1	99.26	6.495	0.07125	8	LWT, LWB	0.008906	100.5	6.573
TCEAE113E	E	C1	5	1	100.8	6.629	0.07110	8	LGT, LWB	0.008888	101.8	6.695
TCEAE211E	E	C2	5	2	98.87	6.474	0.07207	8	LGB, LWT	0.009008	101.2	6.627
TCEAE212E	E	C2	5	2	101.3	6.527	0.07192	8	M(A,L)WB, AGT	0.008990	103.5	6.668
TCEAE213E	E	C2	5	2	101.2	6.636	0.07160	8	LWB, LWT	0.008950	102.9	6.749

Average	**101.7**	**6.558**	
Standard Dev.	**5.007**	**0.1419**	
Coeff. of Var. [%]	**4.924**	**2.164**	
Min.	**91.18**	**6.255**	
Max.	**111.1**	**6.880**	
Number of Spec.	**30**	**30**	

$Average_{norm}$	**0.009001**	**104.0**	**6.707**
Standard $Dev._{norm}$		**4.745**	**0.1068**
Coeff. of Var. $[\%]_{norm}$		**4.564**	**1.592**
Min.	**0.008683**	**92.93**	**6.494**
Max.	**0.009227**	**112.0**	**6.903**
Number of Spec.	**30**	**30**	**30**


Laminate Unnotched Tension Properties (UNT1)--ETW2 (250°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Unnotched Tension Strength [ksi]
0
20
40
60
80
100
120
0
1
2
3
4
5
6


Laminate Unnotched Tension Properties (UNT1)--ETW2 (250°F)
Normalized Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Unnotched Tension Modulus [Msi]
0
1
2
3
4
5
6
7
8
0
1
2
3
4
5
6

4.8 "10/80/10" Unnotched Tension 2 Properties (UNT2)

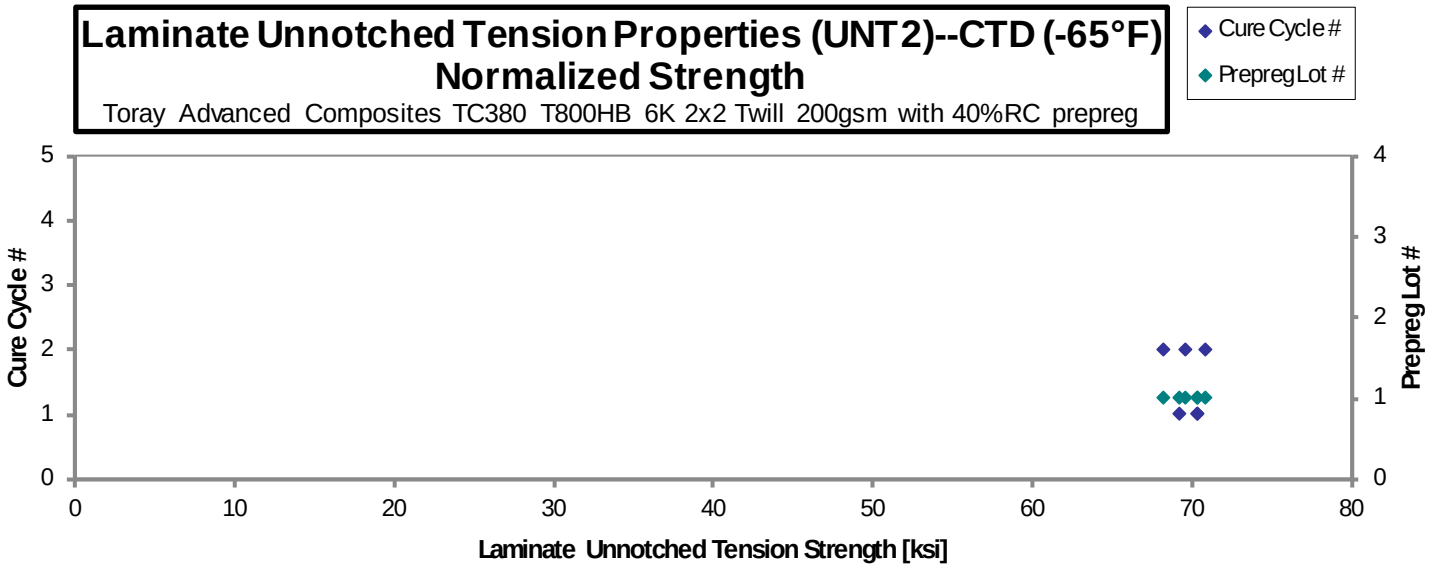
Laminate Unnotched Tension Properties (UNT2)--CTD (-65°F)
Strength & Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

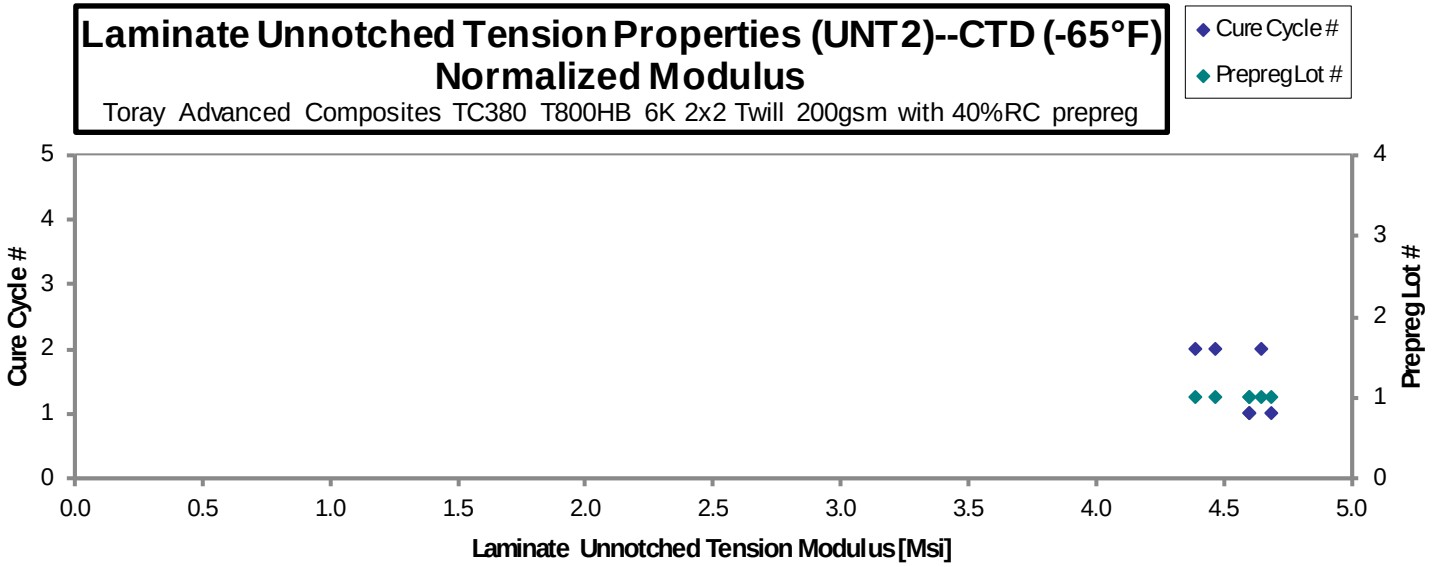
normalizing t_{ply} [in]: 0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
TCEBA111B	A	C1	1	1	71.68	4.688	0.08633	10	AGM	0.008633	70.32	4.599
TCEBA112B	A	C1	1	1	70.37	4.676	0.08658	10	AGT	0.008658	69.24	4.601
TCEBA113B	A	C1	1	1	71.08	4.737	0.08712	10	AGB	0.008712	70.37	4.690
TCEBA211B	A	C2	1	2	70.87	4.647	0.08795	10	AGT	0.008795	70.83	4.644
TCEBA212B	A	C2	1	2	68.51	4.485	0.08763	10	AGT	0.008763	68.22	4.466
TCEBA213B	A	C2	1	2	69.50	4.387	0.08805	10	AGB	0.008805	69.54	4.390

	Strength [ksi]	Modulus [Msi]
Average	**70.34**	**4.603**
Standard Dev.	**1.157**	**0.1364**
Coeff. of Var. [%]	**1.645**	**2.964**
Min.	**68.51**	**4.387**
Max.	**71.68**	**4.737**
Number of Spec.	**6**	**6**

	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
$Average_{norm}$	**0.008728**	**69.75**	**4.565**
Standard $Dev._{norm}$		**0.9512**	**0.1139**
Coeff. of Var. $[\%]_{norm}$		**1.364**	**2.494**
Min.	**0.008633**	**68.22**	**4.390**
Max.	**0.008805**	**70.83**	**4.690**
Number of Spec.	**6**	**6**	**6**


Laminate Unnotched Tension Properties (UNT2)--CTD (-65°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
5
0
10
20
30
40
50
60
70
80
Laminate Unnotched Tension Strength [ksi]


Laminate Unnotched Tension Properties (UNT2)--CTD (-65°F)
Normalized Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
5
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
Laminate Unnotched Tension Modulus [Msi]

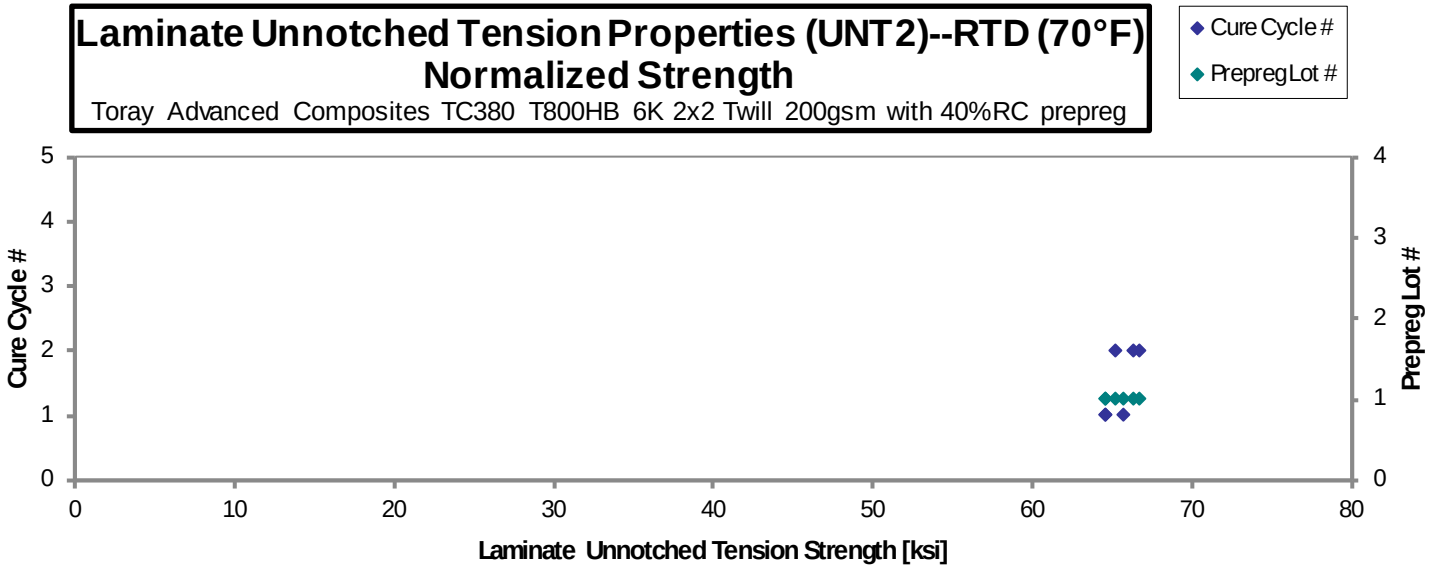
Laminate Unnotched Tension Properties (UNT2)--RTD (70°F)
Strength & Modulus

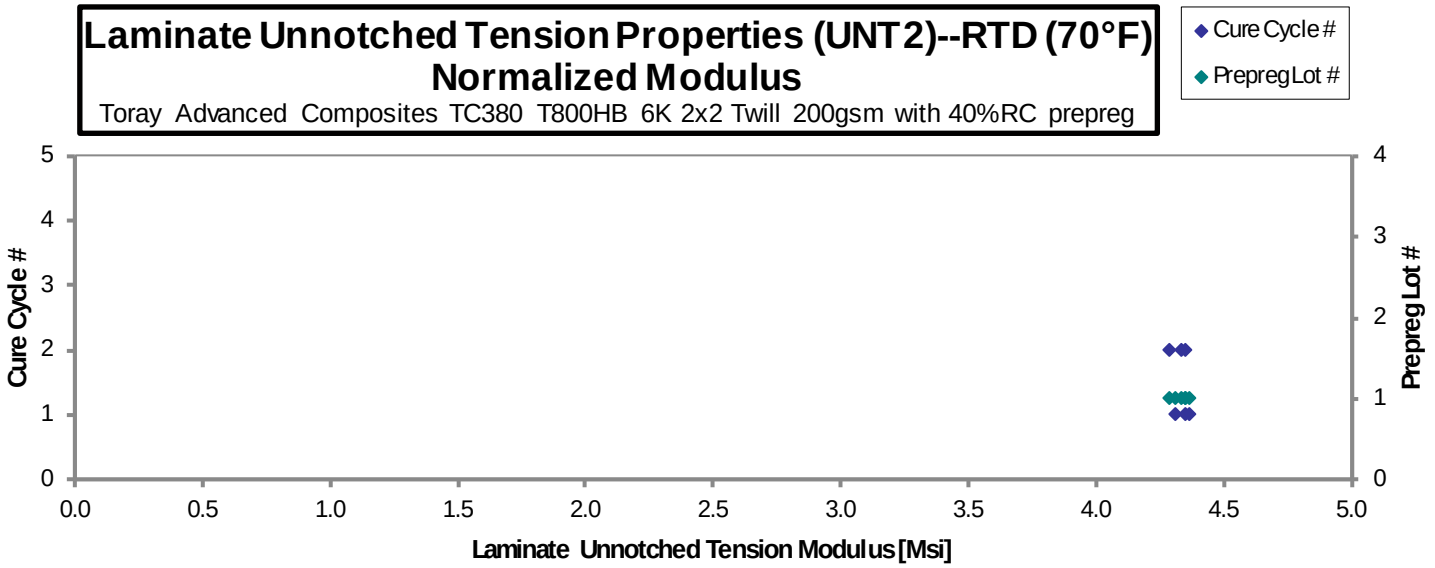
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]: 0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
TCEBA111A	A	C1	1	1	70.55	4.751	0.08060	10	AGM	0.008060	64.62	4.352
TCEBA112A	A	C1	1	1	69.09	4.590	0.08372	10	AGB	0.008372	65.73	4.367
TCEBA113A	A	C1	1	1	66.40	4.435	0.08555	10	AGB	0.008555	64.55	4.311
TCEBA211A	A	C2	1	2	70.65	4.714	0.08125	10	AGT	0.008125	65.23	4.353
TCEBA212A	A	C2	1	2	69.33	4.502	0.08470	10	AGT	0.008470	66.73	4.333
TCEBA213A	A	C2	1	2	67.29	4.356	0.08667	10	AGB	0.008667	66.27	4.290

	Strength [ksi]	Modulus [Msi]			$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
Average	**68.89**	**4.558**		**$Average_{norm}$**	**0.008375**	**65.52**	**4.334**
Standard Dev.	**1.724**	**0.1562**		**Standard $Dev._{norm}$**		**0.8833**	**0.02900**
Coeff. of Var. [%]	**2.503**	**3.428**		**Coeff. of Var. $[\%]_{norm}$**		**1.348**	**0.6691**
Min.	**66.40**	**4.356**		**Min.**	**0.008060**	**64.55**	**4.290**
Max.	**70.65**	**4.751**		**Max.**	**0.008667**	**66.73**	**4.367**
Number of Spec.	**6**	**6**		**Number of Spec.**	**6**	**6**	**6**


Laminate Unnotched Tension Properties (UNT2)--RTD (70°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
5
0
10
20
30
40
50
60
70
80
Laminate Unnotched Tension Strength [ksi]


Laminate Unnotched Tension Properties (UNT2)--RTD (70°F)
Normalized Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
5
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
Laminate Unnotched Tension Modulus [Msi]

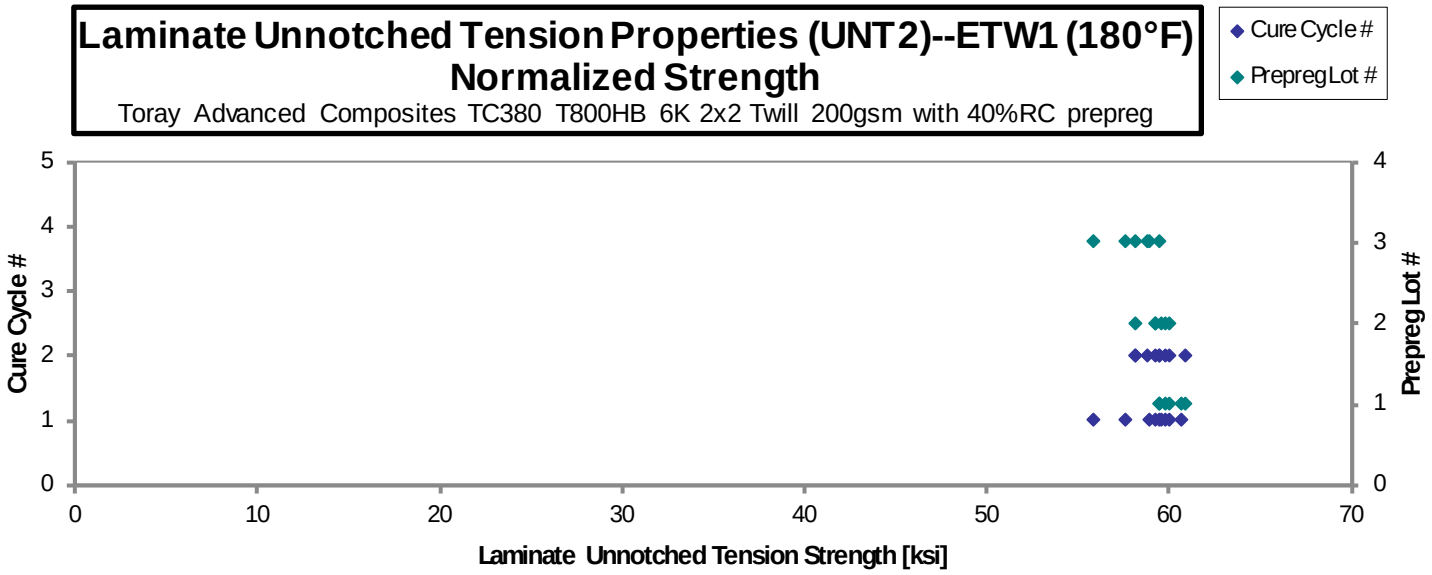
Laminate Unnotched Tension Properties (UNT2)--ETW1 (180°F)
Strength & Modulus

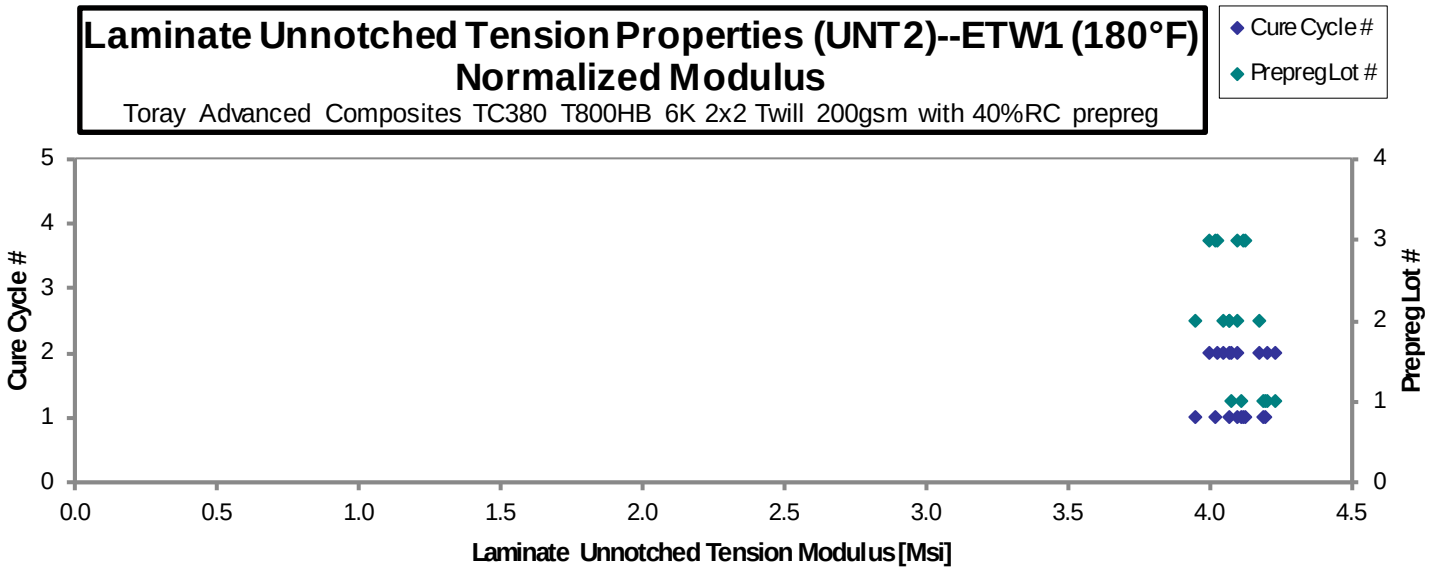
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]: 0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
TCEBA111D	A	C1	1	1	61.87	4.364	0.08455	10	AGT	0.008455	59.45	4.193
TCEBA112D	A	C1	1	1	65.10	4.551	0.08110	10	AGT	0.008110	60.00	4.195
TCEBA113D	A	C1	1	1	63.06	4.270	0.08472	10	AGM	0.008472	60.71	4.110
TCEBA211D	A	C2	1	2	61.29	4.364	0.08533	10	AGT	0.008533	59.43	4.231
TCEBA212D	A	C2	1	2	64.47	4.453	0.08305	10	AGT	0.008305	60.84	4.203
TCEBA213D	A	C2	1	2	60.59	4.133	0.08685	10	AGT	0.008685	59.80	4.079
TCEBB111D	B	C1	2	1	64.96	4.426	0.08095	10	AWT	0.008095	59.76	4.071
TCEBB112D	B	C1	2	1	61.58	4.234	0.08515	10	AGM	0.008515	59.58	4.097
TCEBB113D	B	C1	2	1	59.82	3.994	0.08708	10	AGT	0.008708	59.20	3.952
TCEBB211D	B	C2	2	2	63.46	4.444	0.08060	10	AGB	0.008060	58.12	4.070
TCEBB212D	B	C2	2	2	61.60	4.345	0.08457	10	AGM	0.008457	59.20	4.176
TCEBB213D	B	C2	2	2	60.87	4.102	0.08680	10	AGT	0.008680	60.04	4.046
TCEBC111D	C	C1	3	1	60.95	4.498	0.08063	10	M(A,D)GM	0.008063	55.85	4.121
TCEBC112D	C	C1	3	1	60.48	4.222	0.08385	10	AGM	0.008385	57.63	4.023
TCEBC113D	C	C1	3	1	59.52	4.167	0.08710	10	AGB	0.008710	58.91	4.125
TCEBC211D	C	C2	3	2	61.08	4.153	0.08475	10	AWB	0.008475	58.83	4.000
TCEBC212D	C	C2	3	2	60.56	4.106	0.08635	10	AGM	0.008635	59.43	4.029
TCEBC213D	C	C2	3	2	58.92	4.153	0.08683	10	AGB	0.008683	58.13	4.098

Average	**61.68**	**4.277**	**$Average_{norm}$**	**0.008446**	**59.16**	**4.101**
Standard Dev.	**1.826**	**0.1597**	**$Standard\ Dev._{norm}$**		**1.176**	**0.07674**
Coeff. of Var. [%]	**2.960**	**3.733**	**$Coeff.\ of\ Var.\ [\%]_{norm}$**		**1.988**	**1.871**
Min.	**58.92**	**3.994**	**Min.**	**0.008060**	**55.85**	**3.952**
Max.	**65.10**	**4.551**	**Max.**	**0.008710**	**60.84**	**4.231**
Number of Spec.	**18**	**18**	**Number of Spec.**	**18**	**18**	**18**


Laminate Unnotched Tension Properties (UNT2)--ETW1 (180°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Unnotched Tension Strength [ksi]
0
10
20
30
40
50
60
70
0
1
2
3
4
5


Laminate Unnotched Tension Properties (UNT2)--ETW1 (180°F)
Normalized Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Unnotched Tension Modulus [Msi]
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
0
1
2
3
4
5

Laminate Unnotched Tension Properties (UNT2)--ETW2 (250°F)
Strength & Modulus

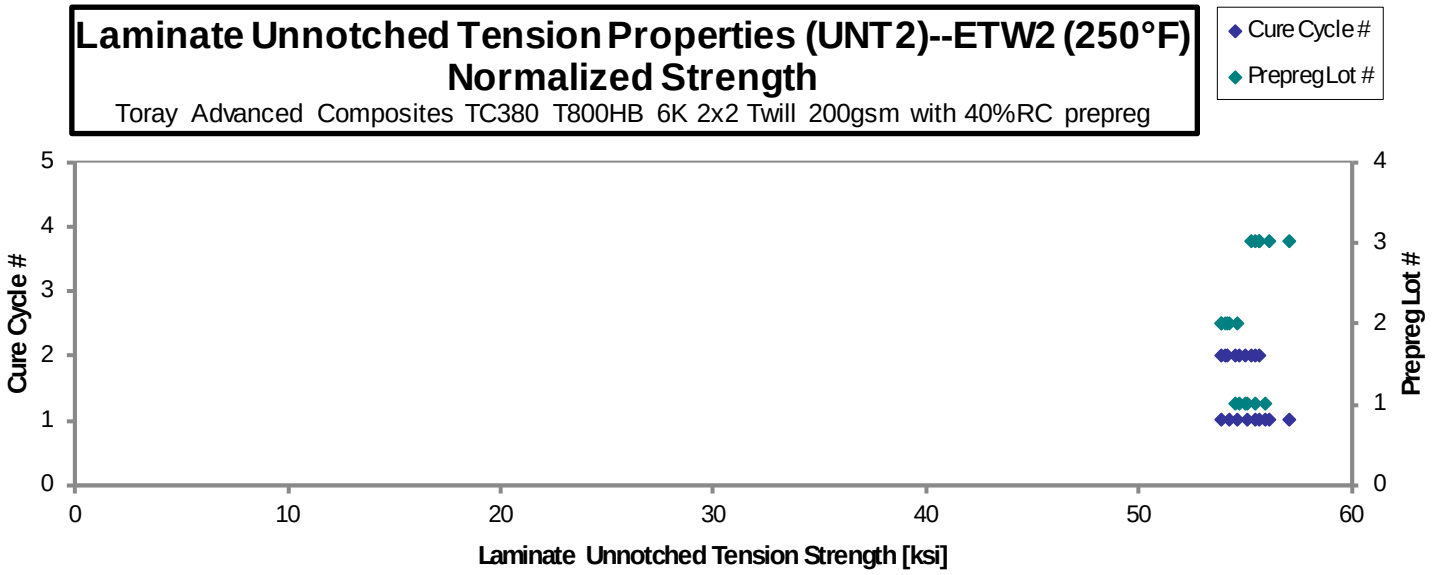
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

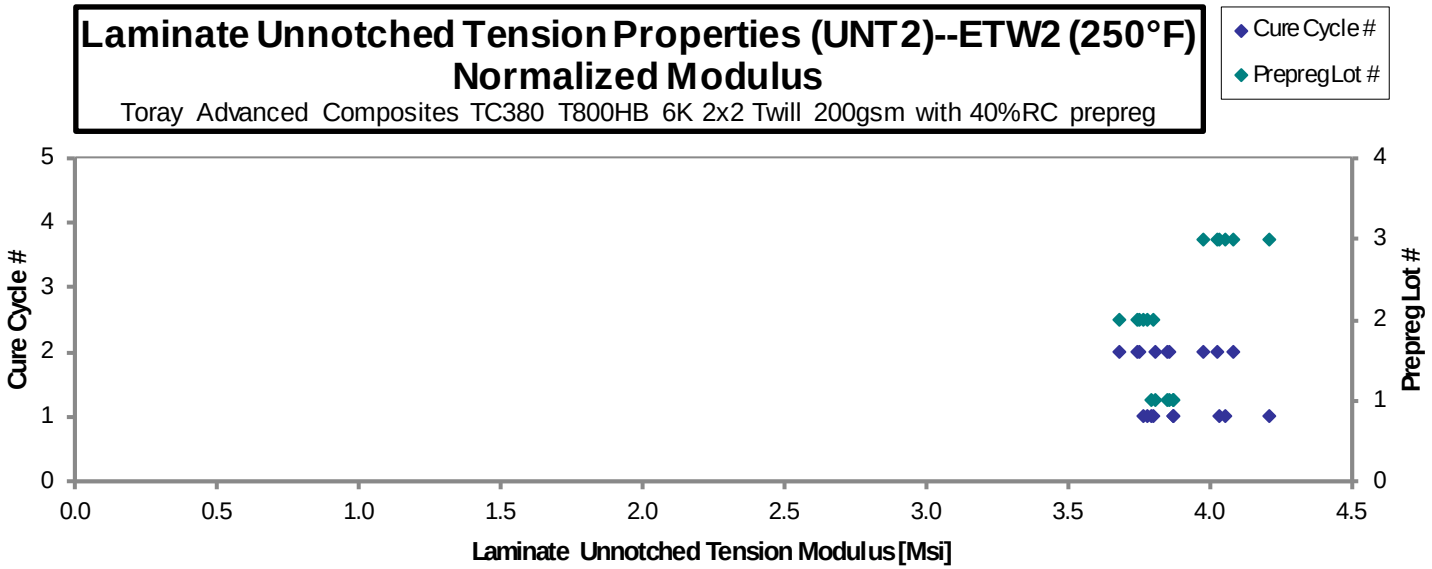
normalizing t_{ply} [in]: 0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
TCEBA111E	A	C1	1	1	54.99	3.731	0.08953	10	AGT	0.008953	55.95	3.796
TCEBA112E	A	C1	1	1	54.13	3.801	0.08963	10	AGM	0.008963	55.14	3.872
TCEBA113E	A	C1	1	1	54.35	3.791	0.08985	10	AGM	0.008985	55.49	3.871
TCEBA211E	A	C2	1	2	52.91	3.736	0.09095	10	AGM	0.009095	54.69	3.861
TCEBA212E	A	C2	1	2	52.25	3.648	0.09192	10	AGT	0.009192	54.58	3.810
TCEBA213E	A	C2	1	2	53.01	3.709	0.09137	10	AWB	0.009137	55.04	3.850
TCEBB111E	B	C1	2	1	52.37	3.692	0.09057	10	AGM	0.009057	53.90	3.800
TCEBB112E	B	C1	2	1	53.63	3.711	0.08973	10	AGM	0.008973	54.68	3.784
TCEBB113E	B	C1	2	1	53.95	3.746	0.08853	10	AWB	0.008853	54.27	3.769
TCEBB211E	B	C2	2	2	53.36	3.622	0.08938	10	AGM	0.008938	54.20	3.678
TCEBB212E	B	C2	2	2	53.10	3.688	0.08962	10	AWB	0.008962	54.07	3.755
TCEBB213E	B	C2	2	2	53.67	3.732	0.08835	10	AGT	0.008835	53.89	3.746
TCEBC111E	C	C1	3	1	55.30	3.978	0.08928	10	AGB	0.008928	56.11	4.036
TCEBC112E	C	C1	3	1	56.42	4.006	0.08902	10	AGB	0.008902	57.08	4.052
TCEBC113E	C	C1	3	1	55.38	4.192	0.08838	10	AGB	0.008838	55.63	4.210
TCEBC211E	C	C2	3	2	55.91	4.014	0.08728	10	AGM	0.008728	55.45	3.981
TCEBC212E	C	C2	3	2	55.97	4.048	0.08748	10	AGB	0.008748	55.64	4.024
TCEBC213E	C	C2	3	2	55.60	4.110	0.08745	10	AGB	0.008745	55.25	4.084

	Strength [ksi]	Modulus [Msi]
Average	**54.24**	**3.831**
Standard Dev.	**1.305**	**0.1759**
Coeff. of Var. [%]	**2.407**	**4.592**
Min.	**52.25**	**3.622**
Max.	**56.42**	**4.192**
Number of Spec.	**18**	**18**

	t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
$Average_{norm}$	**0.008935**	**55.06**	**3.888**
$Standard\ Dev._{norm}$		**0.8594**	**0.1435**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**1.561**	**3.691**
Min.	**0.008728**	**53.89**	**3.678**
Max.	**0.009192**	**57.08**	**4.210**
Number of Spec.	**18**	**18**	**18**


Laminate Unnotched Tension Properties (UNT2)--ETW2 (250°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Unnotched Tension Strength [ksi]
0
10
20
30
40
50
60
0
1
2
3
4
5


Laminate Unnotched Tension Properties (UNT2)--ETW2 (250°F)
Normalized Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Unnotched Tension Modulus [Msi]
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
0
1
2
3
4
5

4.9 "40/20/40" Unnotched Tension 3 Properties (UNT3)

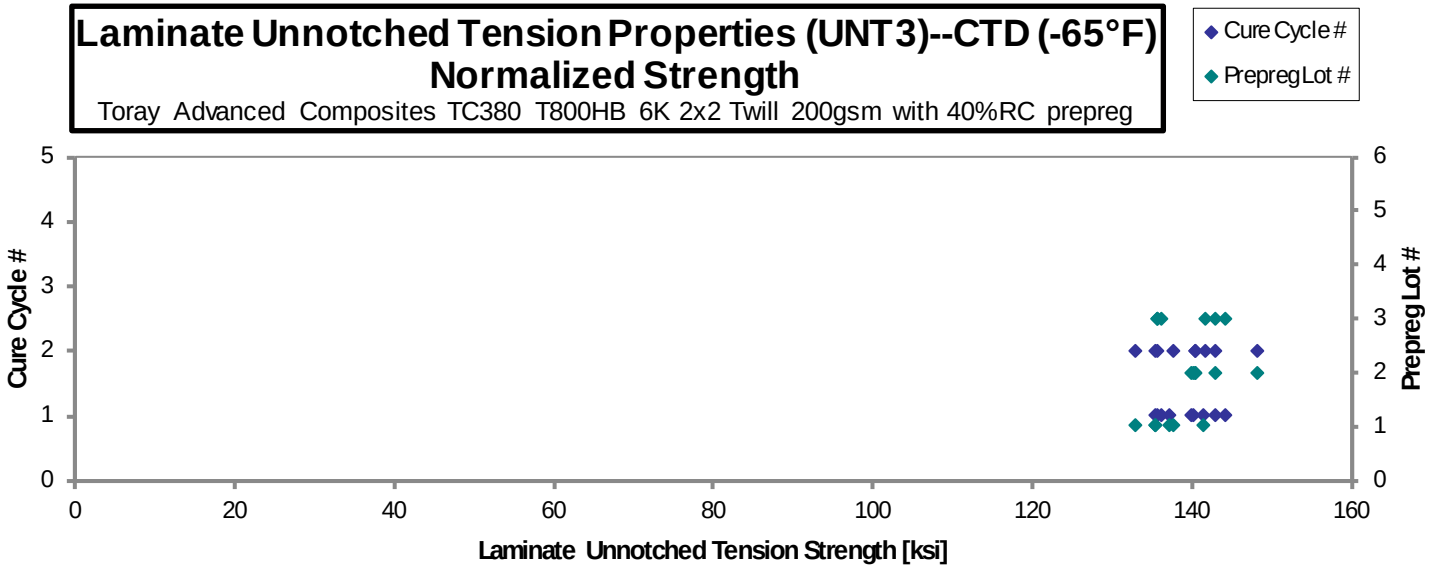
Laminate Unnotched Tension Properties (UNT3)--CTD (-65°F)
Strength & Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

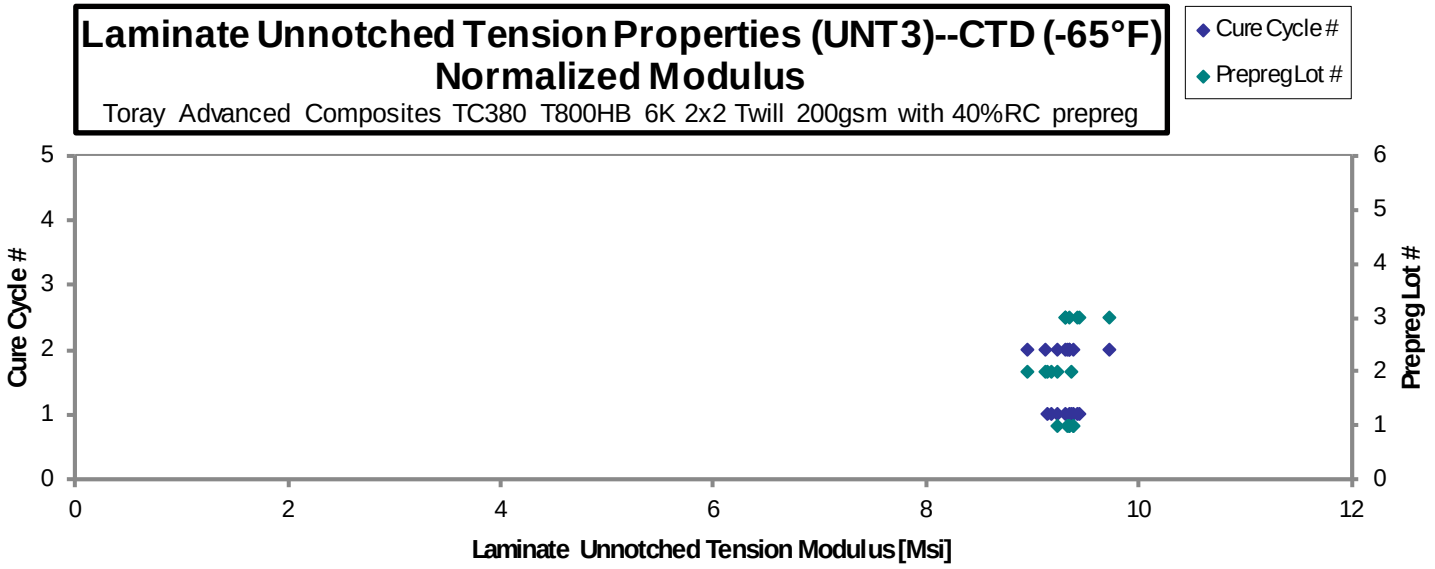
normalizing t_{ply} [in]
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Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
TCECA111B	A	C1	1	1	137.7	9.413	0.08770	10	LWT, LAB	0.008770	137.2	9.381
TCECA112B	A	C1	1	1	141.8	9.370	0.08780	10	LWB, LAT	0.008780	141.4	9.349
TCECA113B	A	C1	1	1	137.2	9.352	0.08692	10	LWB, LAT	0.008692	135.5	9.237
TCECA211B	A	C2	1	2	137.1	9.504	0.08685	10	LAT, LWB	0.008685	135.3	9.380
TCECA212B	A	C2	1	2	138.6	9.404	0.08750	10	LWT, LAB	0.008750	137.8	9.351
TCECA213B	A	C2	1	2	132.7	9.325	0.08810	10	LAT, LWB	0.008810	132.8	9.335
TCECB111B	B	C1	2	1	137.1	9.169	0.08992	10	LWB, LAT	0.008992	140.1	9.369
TCECB112B	B	C1	2	1	136.6	8.905	0.09030	10	LWT, LAB	0.009030	140.2	9.137
TCECB113B	B	C1	2	1	140.5	9.029	0.08945	10	LWT, LAB	0.008945	142.8	9.178
TCECB211B	B	C2	2	2	143.5	8.951	0.09083	10	LAB, LWT	0.009083	148.1	9.239
TCECB212B	B	C2	2	2	135.2	8.790	0.09140	10	LAT, LWB	0.009140	140.5	9.129
TCECB213B	B	C2	2	2	136.6	8.711	0.09047	10	LWT, LAB	0.009047	140.5	8.955
TCECC111B	C	C1	3	1	145.7	9.410	0.08713	10	M(A,L)GT, M(A,L)WT, LAB	0.008713	144.3	9.317
TCECC112B	C	C1	3	1	139.3	9.662	0.08577	10	AGT, AWT, AAB	0.008577	135.7	9.417
TCECC113B	C	C1	3	1	138.7	9.621	0.08640	10	AAT, LWB	0.008640	136.2	9.446
TCECC211B	C	C2	3	2	141.3	9.699	0.08822	10	AGB, AWT	0.008822	141.7	9.723
TCECC212B	C	C2	3	2	143.1	9.316	0.08797	10	M(A,L)GB, AAT	0.008797	143.0	9.313
TCECC213B	C	C2	3	2	135.7	9.351	0.08793	10	M(A,L)GB, M(A,L)AT	0.008793	135.6	9.344

Average	**138.8**	**9.277**	
Standard Dev.	**3.301**	**0.2919**	
Coeff. of Var. [%]	**2.378**	**3.147**	
Min.	**132.7**	**8.711**	
Max.	**145.7**	**9.699**	
Number of Spec.	**18**	**18**	

$Average_{norm}$	**0.008837**	**139.4**	**9.311**
$Standard\ Dev._{norm}$		**3.894**	**0.1600**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**2.794**	**1.718**
Min.	**0.008577**	**132.8**	**8.955**
Max.	**0.009140**	**148.1**	**9.723**
Number of Spec.	**18**	**18**	**18**


Laminate Unnotched Tension Properties (UNT3)--CTD (-65°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Unnotched Tension Strength [ksi]
0
20
40
60
80
100
120
140
160
0
1
2
3
4
5
6


Laminate Unnotched Tension Properties (UNT3)--CTD (-65°F)
Normalized Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Unnotched Tension Modulus [Msi]
0
2
4
6
8
10
12
0
1
2
3
4
5
6

Laminate Unnotched Tension Properties (UNT3)--RTD (70°F)
Strength & Modulus

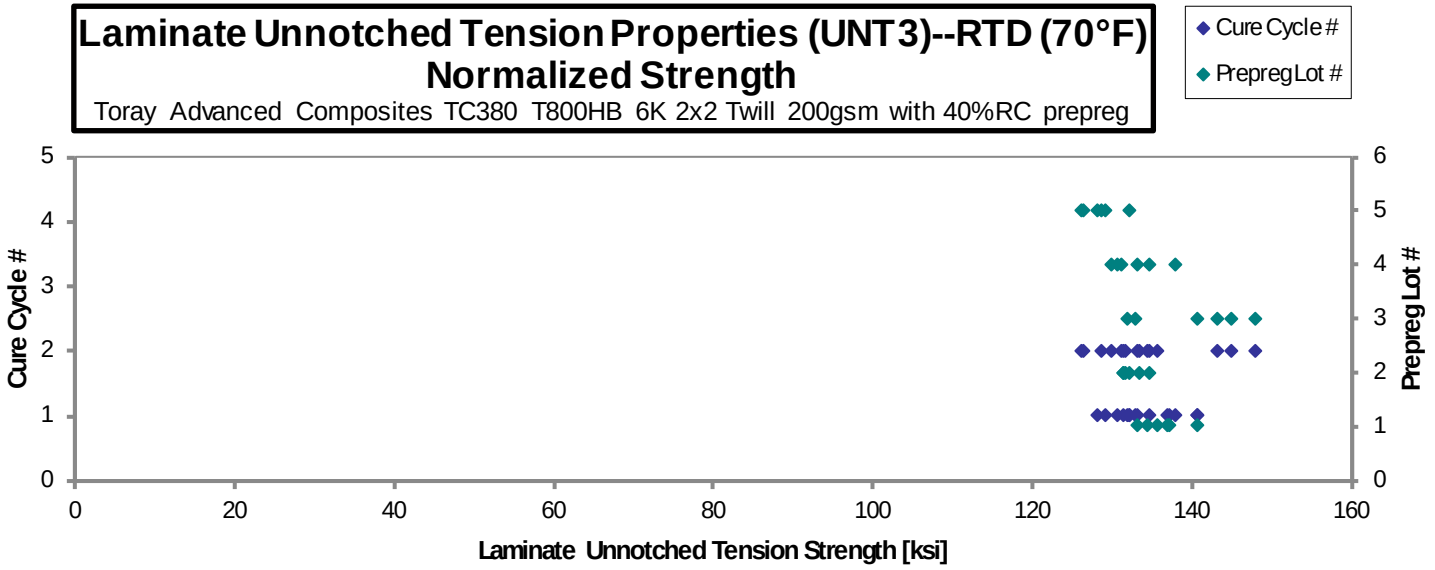
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

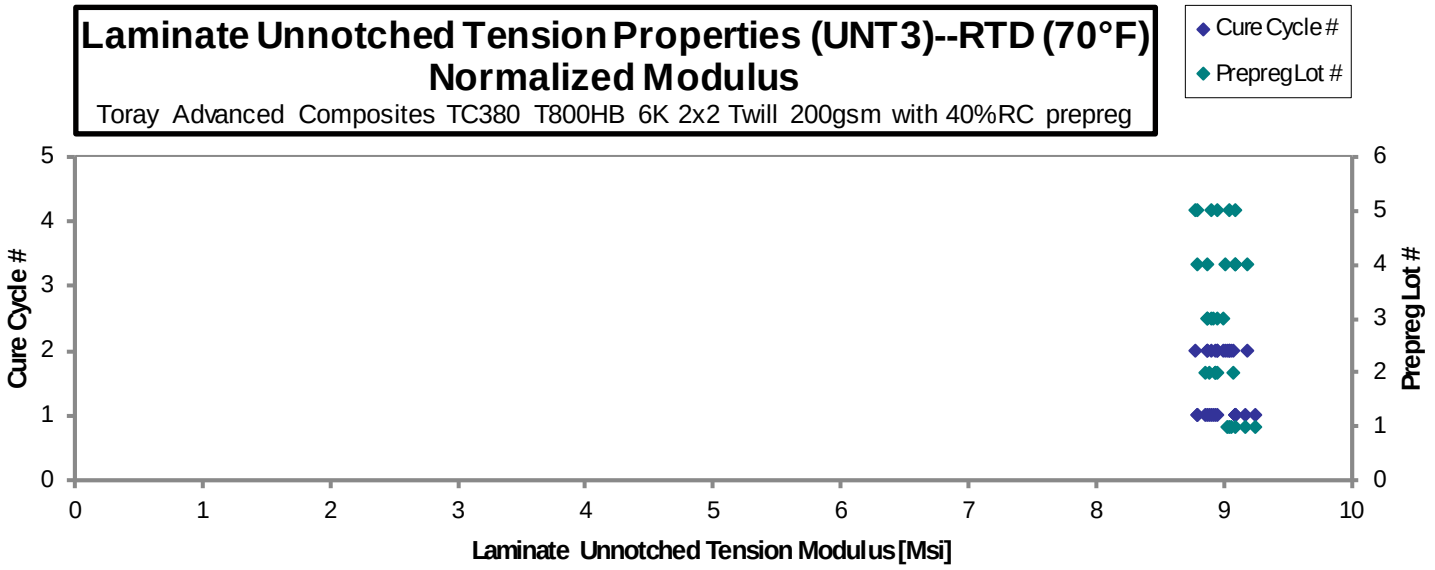
normalizing t_{ply} [in]
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Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
TCECA111A	A	C1	1	1	149.4	9.932	0.08060	10	LAB, LGT	0.008060	136.8	9.097
TCECA112A	A	C1	1	1	143.6	9.678	0.08407	10	LGB, LAT	0.008407	137.1	9.245
TCECA113A	A	C1	1	1	143.4	9.343	0.08640	10	LGB, LAT	0.008640	140.8	9.173
TCECA211A	A	C2	1	2	149.1	9.919	0.08012	10	LWB, M(A,L)WT	0.008012	135.7	9.030
TCECA212A	A	C2	1	2	143.1	9.656	0.08262	10	LWB, M(A,L)WT	0.008262	134.3	9.065
TCECA213A	A	C2	1	2	137.4	9.345	0.08523	10	LAT	0.008523	133.1	9.051
TCECB111A	B	C1	2	1	147.8	9.803	0.08020	10	LAT, LWB	0.008020	134.7	8.934
TCECB112A	B	C1	2	1	138.3	9.320	0.08357	10	LAT, LWB	0.008357	131.4	8.850
TCECB113A	B	C1	2	1	134.2	9.018	0.08670	10	LAT, LWB	0.008670	132.2	8.885
TCECB211A	B	C2	2	2	145.7	9.759	0.08053	10	LGB, LAT	0.008053	133.3	8.931
TCECB212A	B	C2	2	2	137.2	9.474	0.08432	10	LWT, LAB	0.008432	131.5	9.078
TCECB213A	B	C2	2	2	130.0	8.837	0.08913	10	LWT, LAB	0.008913	131.7	8.951
TCECC111A	C	C1	3	1	155.6	9.808	0.07955	10	AAB. AGT	0.007955	140.7	8.867
TCECC112A	C	C1	3	1	140.9	9.438	0.08308	10	M(A,L)GB, AAT	0.008308	133.0	8.911
TCECC113A	C	C1	3	1	136.4	9.245	0.08517	10	M(A,L)GB, M(A,L)AT	0.008517	132.0	8.947
TCECC211A	C	C2	3	2	149.3	9.380	0.08445	10	M(A,L)AT, M(A,L)GB	0.008445	143.2	9.001
TCECC212A	C	C2	3	2	148.1	9.073	0.08607	10	M(A,L)GT, AAB	0.008607	144.9	8.873
TCECC213A	C	C2	3	2	147.6	8.870	0.08825	10	M(A,L)GT, M(A,L)AB	0.008825	148.0	8.896
TCECD111A	D	C1	4	1	152.2	10.03	0.07975	10	LGT, LAB	0.007975	137.9	9.086
TCECD112A	D	C1	4	1	136.1	9.460	0.08453	10	LGB, LAT	0.008453	130.7	9.087
TCECD113A	D	C1	4	1	133.2	8.799	0.08797	10	LGB, LWB, LAT	0.008797	133.1	8.795
TCECD211A	D	C2	4	2	146.9	9.939	0.07858	10	LWB, LAT, LAB	0.007858	131.2	8.876
TCECD212A	D	C2	4	2	137.5	9.717	0.08315	10	LGT, LAT, LAB	0.008315	129.9	9.181
TCECD213A	D	C2	4	2	136.4	9.117	0.08693	10	LGB, LAT	0.008693	134.7	9.007
TCECE111A	E	C1	5	1	145.4	9.789	0.07998	10	LWB, LAT	0.007998	132.1	8.898
TCECE112A	E	C1	5	1	136.8	9.379	0.08248	10	LGB, LAB, LAT	0.008248	128.2	8.791
TCECE113A	E	C1	5	1	130.8	9.202	0.08687	10	LGB, LAT	0.008687	129.1	9.083
TCECE211A	E	C2	5	2	140.1	9.758	0.07917	10	LGB, LWB, LAT	0.007917	126.0	8.779
TCECE212A	E	C2	5	2	135.3	9.590	0.08217	10	LGB, LWT, LAB	0.008217	126.3	8.954
TCECE213A	E	C2	5	2	135.3	9.499	0.08373	10	LGB, LAT	0.008373	128.7	9.038

	Strength	Modulus
Average	**141.4**	**9.472**
Standard Dev.	**6.700**	**0.3466**
Coeff. of Var. [%]	**4.737**	**3.659**
Min.	**130.0**	**8.799**
Max.	**155.6**	**10.03**
Number of Spec.	**30**	**30**

	Avg. t_{ply}	$Strength_{norm}$	$Modulus_{norm}$
$Average_{norm}$	**0.008351**	**134.1**	**8.979**
Standard $Dev._{norm}$		**5.267**	**0.1206**
Coeff. of Var. $[\%]_{norm}$		**3.928**	**1.343**
Min.	**0.007858**	**126.0**	**8.779**
Max.	**0.008913**	**148.0**	**9.245**
Number of Spec.	**30**	**30**	**30**


Laminate Unnotched Tension Properties (UNT3)--RTD (70°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Unnotched Tension Strength [ksi]
0
20
40
60
80
100
120
140
160


Laminate Unnotched Tension Properties (UNT3)--RTD (70°F)
Normalized Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Unnotched Tension Modulus [Msi]
0
1
2
3
4
5
6
7
8
9
10

Laminate Unnotched Tension Properties (UNT3)--ETW1 (180°F)
Strength & Modulus

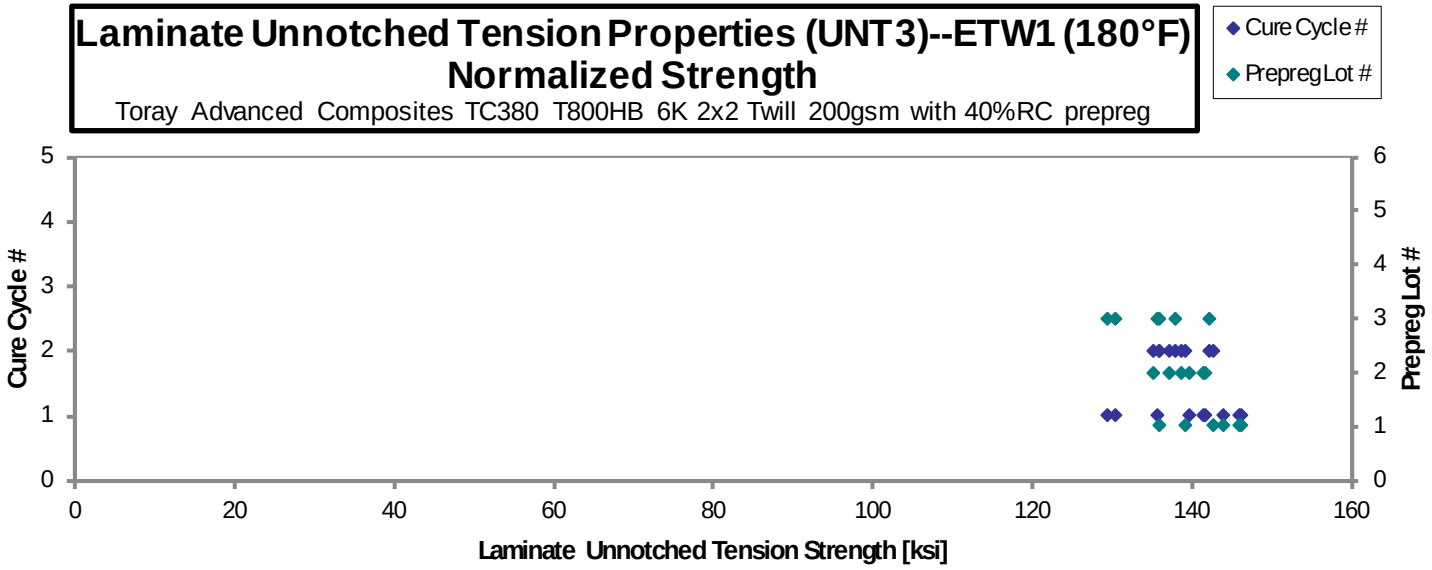
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

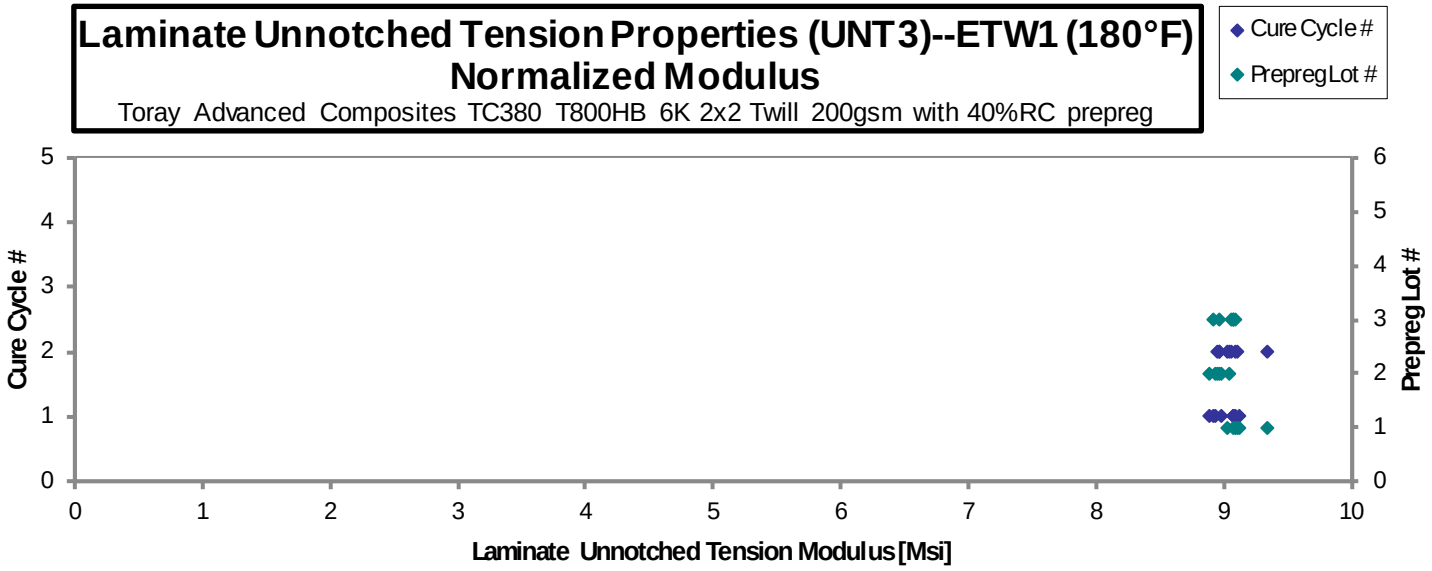
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Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
TCECA111D	A	C1	1	1	149.5	9.429	0.08470	10	LGB, M(A,L)WT	0.008470	143.9	9.075
TCECA112D	A	C1	1	1	156.5	9.769	0.08222	10	M(A,L)WB, LWT	0.008222	146.2	9.127
TCECA113D	A	C1	1	1	149.4	9.312	0.08595	10	LWB, LAT	0.008595	145.9	9.095
TCECA211D	A	C2	1	2	144.5	9.454	0.08473	10	M(A,L)WB, LWT	0.008473	139.1	9.103
TCECA212D	A	C2	1	2	146.4	9.733	0.08168	10	M(A,L)WT, LWB	0.008168	135.9	9.035
TCECA213D	A	C2	1	2	149.2	9.765	0.08425	10	LWT, M(A,L)WB	0.008425	142.8	9.349
TCECB111D	B	C1	2	1	143.0	9.140	0.08602	10	M(A,L)WT, M(A,L)WB	0.008602	139.7	8.934
TCECB112D	B	C1	2	1	155.7	9.761	0.08013	10	LAT, LWB	0.008013	141.8	8.889
TCECB113D	B	C1	2	1	147.3	9.348	0.08453	10	M(A,L)WT, LAB	0.008453	141.5	8.980
TCECB211D	B	C2	2	2	139.2	9.100	0.08665	10	LAT, M(A,L)GB	0.008665	137.1	8.961
TCECB212D	B	C2	2	2	148.2	9.660	0.08237	10	LAT, M(A,L)WB	0.008237	138.7	9.042
TCECB213D	B	C2	2	2	136.6	9.048	0.08707	10	LAT, LWB	0.008707	135.1	8.952
TCECC111D	C	C1	3	1	136.1	9.553	0.08367	10	AWT, LWB, AGB	0.008367	129.4	9.083
TCECC112D	C	C1	3	1	140.8	9.796	0.08150	10	AGB, AWT, M(A,L)WB	0.008150	130.4	9.073
TCECC113D	C	C1	3	1	147.8	9.714	0.08080	10	AGB, AWT, AGT	0.008080	135.7	8.919
TCECC211D	C	C2	3	2	143.8	9.183	0.08707	10	AAT, AWB, AGB	0.008707	142.3	9.085
TCECC212D	C	C2	3	2	142.1	9.340	0.08537	10	AWT, AWB, AGB	0.008537	137.9	9.060
TCECC213D	C	C2	3	2	136.4	8.996	0.08767	10	AWT, AWB, AGB	0.008767	135.9	8.962

Average	**145.1**	**9.450**	
Standard Dev.	**6.020**	**0.2789**	
Coeff. of Var. [%]	**4.148**	**2.951**	
Min.	**136.1**	**8.996**	
Max.	**156.5**	**9.796**	
Number of Spec.	**18**	**18**	

$Average_{norm}$	**0.008424**	**138.9**	**9.040**
Standard $Dev._{norm}$		**4.720**	**0.1054**
Coeff. of Var. $[\%]_{norm}$		**3.399**	**1.166**
Min.	**0.008013**	**129.4**	**8.889**
Max.	**0.008767**	**146.2**	**9.349**
Number of Spec.	**18**	**18**	**18**


Laminate Unnotched Tension Properties (UNT3)--ETW1 (180°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Unnotched Tension Strength [ksi]
0
20
40
60
80
100
120
140
160
0
1
2
3
4
5
6


Laminate Unnotched Tension Properties (UNT3)--ETW1 (180°F)
Normalized Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Unnotched Tension Modulus [Msi]
0
1
2
3
4
5
6
7
8
9
10
0
1
2
3
4
5
6

Laminate Unnotched Tension Properties (UNT3)--ETW2 (250°F)
Strength & Modulus

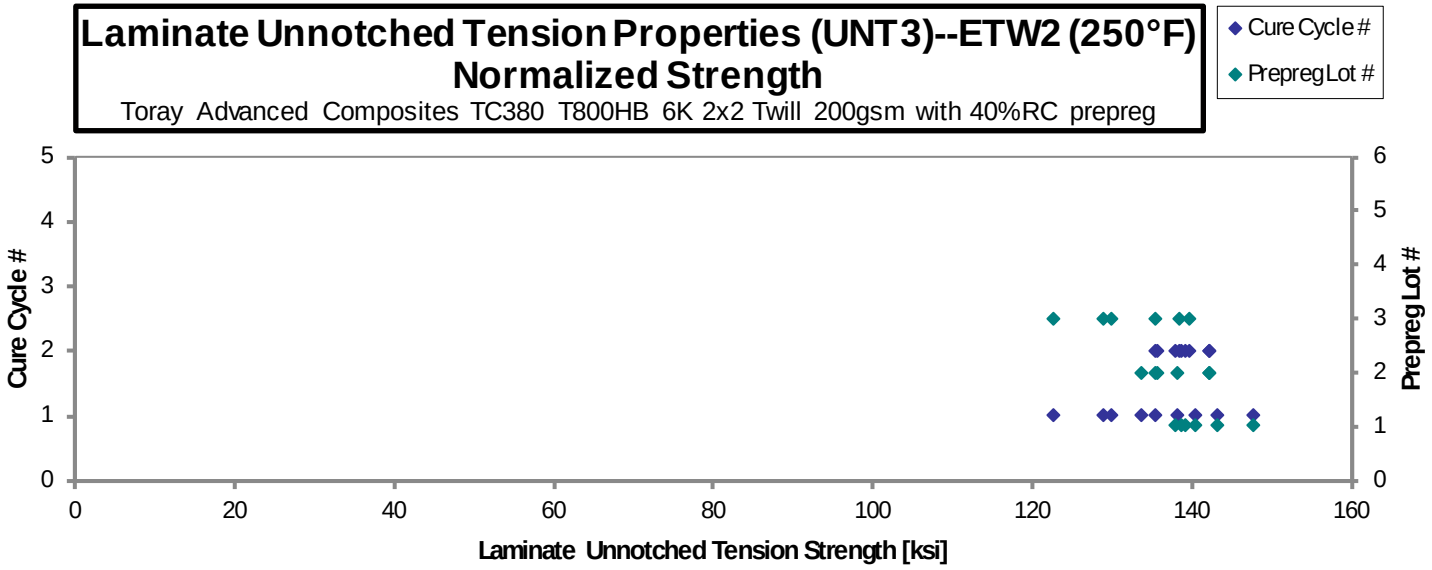
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

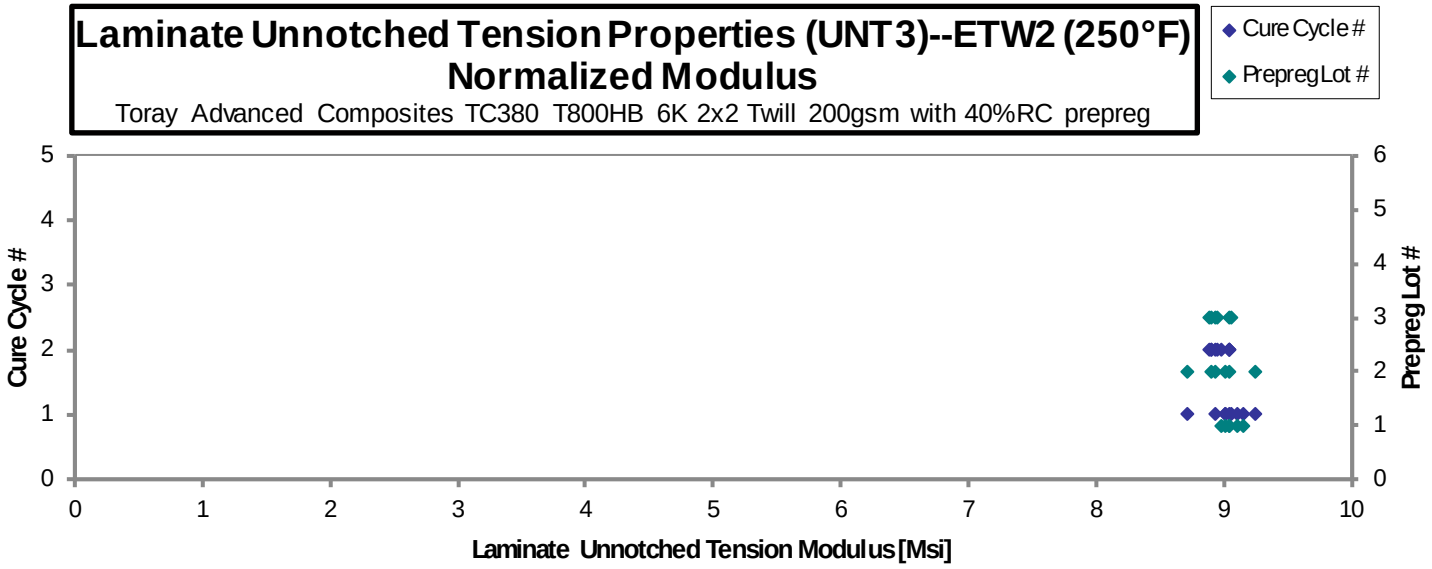
normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
TCECA111E	A	C1	1	1	138.5	8.720	0.09092	10	LGB, LAT	0.009092	143.1	9.009
TCECA112E	A	C1	1	1	143.0	8.821	0.09092	10	LAB, M(A,L)GT	0.009092	147.7	9.113
TCECA113E	A	C1	1	1	136.6	8.891	0.09055	10	LWB, M(A,L)GB, LAT	0.009055	140.5	9.148
TCECA211E	A	C2	1	2	137.0	8.838	0.08937	10	LGB, M(A,L)WT	0.008937	139.1	8.975
TCECA212E	A	C2	1	2	134.9	8.843	0.09005	10	LAT, LWB, M(A,L)GB	0.009005	138.0	9.049
TCECA213E	A	C2	1	2	135.9	8.864	0.08973	10	LAT, LWB, LGB	0.008973	138.6	9.039
TCECB111E	B	C1	2	1	130.5	8.393	0.09130	10	M(A,L)WT, LGB	0.009130	135.4	8.708
TCECB112E	B	C1	2	1	127.3	8.580	0.09248	10	LAT, LWB	0.009248	133.8	9.017
TCECB113E	B	C1	2	1	133.4	8.930	0.09112	10	LAT, LWB	0.009112	138.1	9.247
TCECB211E	B	C2	2	2	128.8	8.445	0.09270	10	M(A,D,L)WB, M(A,L)GT	0.009270	135.6	8.896
TCECB212E	B	C2	2	2	135.2	8.504	0.09252	10	M(D,L)AT, LGM, M(D,L)WB	0.009252	142.1	8.940
TCECB213E	B	C2	2	2	136.2	8.661	0.09190	10	M(D,L)WT, M(D,L)WB	0.009190	142.2	9.044
TCECC111E	C	C1	3	1	129.3	9.091	0.08777	10	AWT, AGT	0.008777	129.0	9.067
TCECC112E	C	C1	3	1	120.9	8.805	0.08935	10	AGT, M(A,L)GB	0.008935	122.7	8.940
TCECC113E	C	C1	3	1	128.6	8.959	0.08883	10	M(A,D)GM, AWT, M(A,L)WB	0.008883	129.9	9.044
TCECC211E	C	C2	3	2	136.6	8.771	0.08913	10	AWT, M(A,L)GT, AWB	0.008913	138.4	8.884
TCECC212E	C	C2	3	2	133.9	8.815	0.08892	10	M(A,L)GT, AWB	0.008892	135.3	8.906
TCECC213E	C	C2	3	2	137.4	8.809	0.08942	10	AWB, AGB, AGT	0.008942	139.6	8.950

Average	**133.6**	**8.763**	
Standard Dev.	**5.147**	**0.1836**	
Coeff. of Var. [%]	**3.854**	**2.095**	
Min.	**120.9**	**8.393**	
Max.	**143.0**	**9.091**	
Number of Spec.	**18**	**18**	

$Average_{norm}$	**0.009039**	**137.2**	**8.999**
Standard $Dev._{norm}$		**5.803**	**0.1180**
Coeff. of Var. $[\%]_{norm}$		**4.230**	**1.311**
Min.	**0.008777**	**122.7**	**8.708**
Max.	**0.009270**	**147.7**	**9.247**
Number of Spec.	**18**	**18**	**18**


Laminate Unnotched Tension Properties (UNT3)--ETW2 (250°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Unnotched Tension Strength [ksi]
0
20
40
60
80
100
120
140
160
0
1
2
3
4
5
6


Laminate Unnotched Tension Properties (UNT3)--ETW2 (250°F)
Normalized Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Unnotched Tension Modulus [Msi]
0
1
2
3
4
5
6
7
8
9
10
0
1
2
3
4
5
6

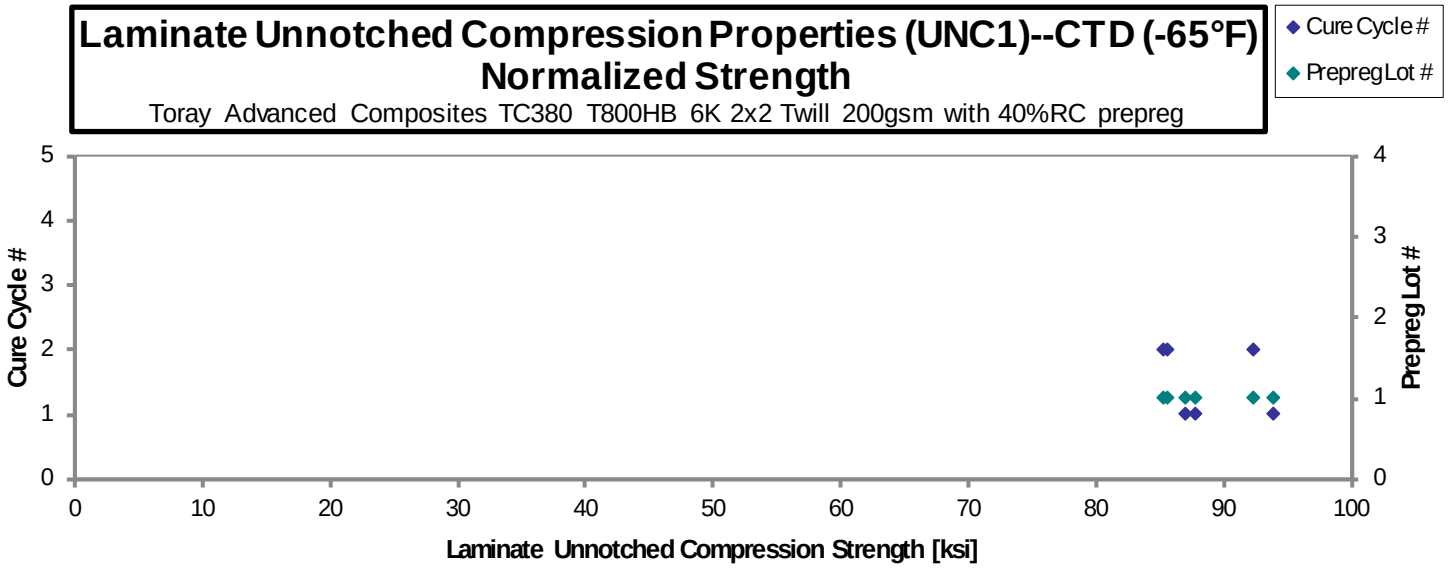
4.10 "25/50/25" Unnotched Compression 1 Properties (UNC1)

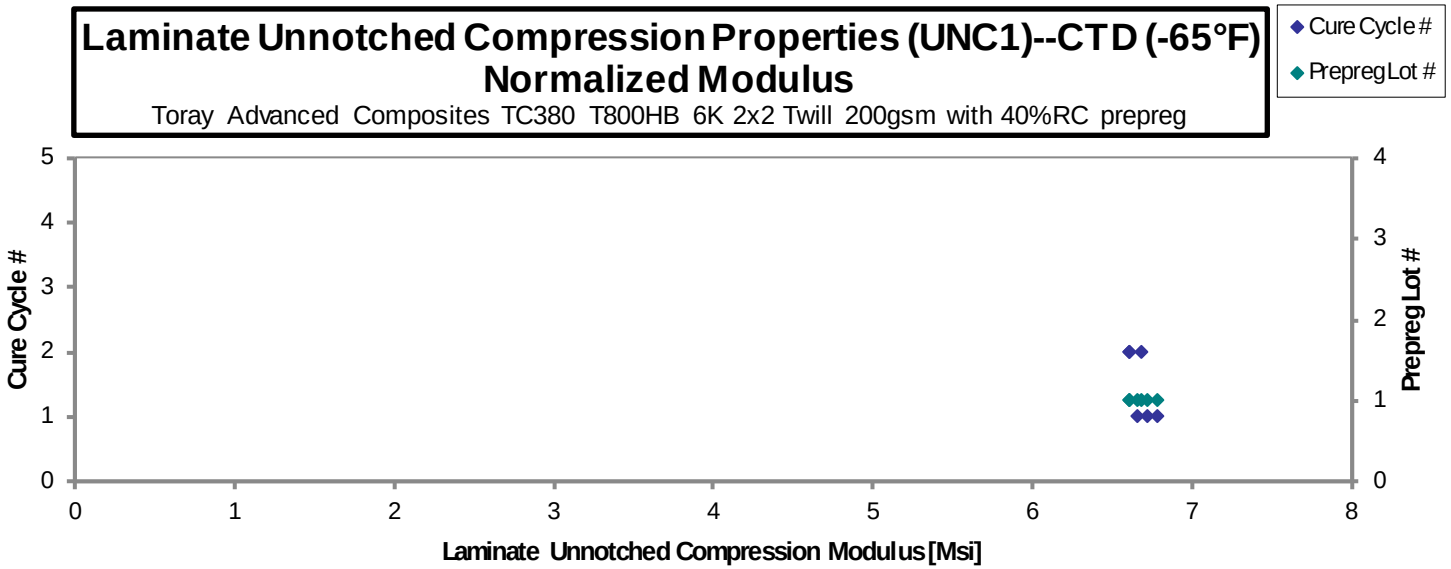
Laminate Unnotched Compression Properties (UNC1)--CTD (-65°F)
Strength & Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
TCEWA111B	A	C1	1	1	90.89	6.896	0.1359	16	BGM	0.008492	87.70	6.654
TCEWA112B	A	C1	1	1	96.43	6.909	0.1371	16	BGM	0.008569	93.89	6.727
TCEWA113B	A	C1	1	1	88.13	6.876	0.1390	16	BGM	0.008688	87.01	6.788
TCEWA211B	A	C2	1	2	95.86	6.948	0.1355	16	BGM	0.008469	92.25	6.686
TCEWA212B	A	C2	1	2	88.67	6.852	0.1358	16	BGM	0.008488	85.53	6.609
TCEWA213B	A	C2	1	2	87.32	6.769	0.1375	16	BGM	0.008596	85.29	6.612

Average	**91.22**	**6.875**	**Average$_{norm}$**	**0.008550**	**88.61**	**6.679**
Standard Dev.	**4.000**	**0.06087**	**Standard Dev.$_{norm}$**		**3.608**	**0.06964**
Coeff. of Var. [%]	**4.385**	**0.8854**	**Coeff. of Var. [%]$_{norm}$**		**4.072**	**1.043**
Min.	**87.32**	**6.769**	**Min.**	**0.008469**	**85.29**	**6.609**
Max.	**96.43**	**6.948**	**Max.**	**0.008688**	**93.89**	**6.788**
Number of Spec.	**6**	**6**	**Number of Spec.**	**6**	**6**	**6**


Laminate Unnotched Compression Properties (UNC1)--CTD (-65°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Unnotched Compression Strength [ksi]
0
10
20
30
40
50
60
70
80
90
100
0
1
2
3
4
5


Laminate Unnotched Compression Properties (UNC1)--CTD (-65°F)
Normalized Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Unnotched Compression Modulus [Msi]
0
1
2
3
4
5
6
7
8
0
1
2
3
4
5

Laminate Unnotched Compression Properties (UNC1)--RTD (70°F)
Strength & Modulus

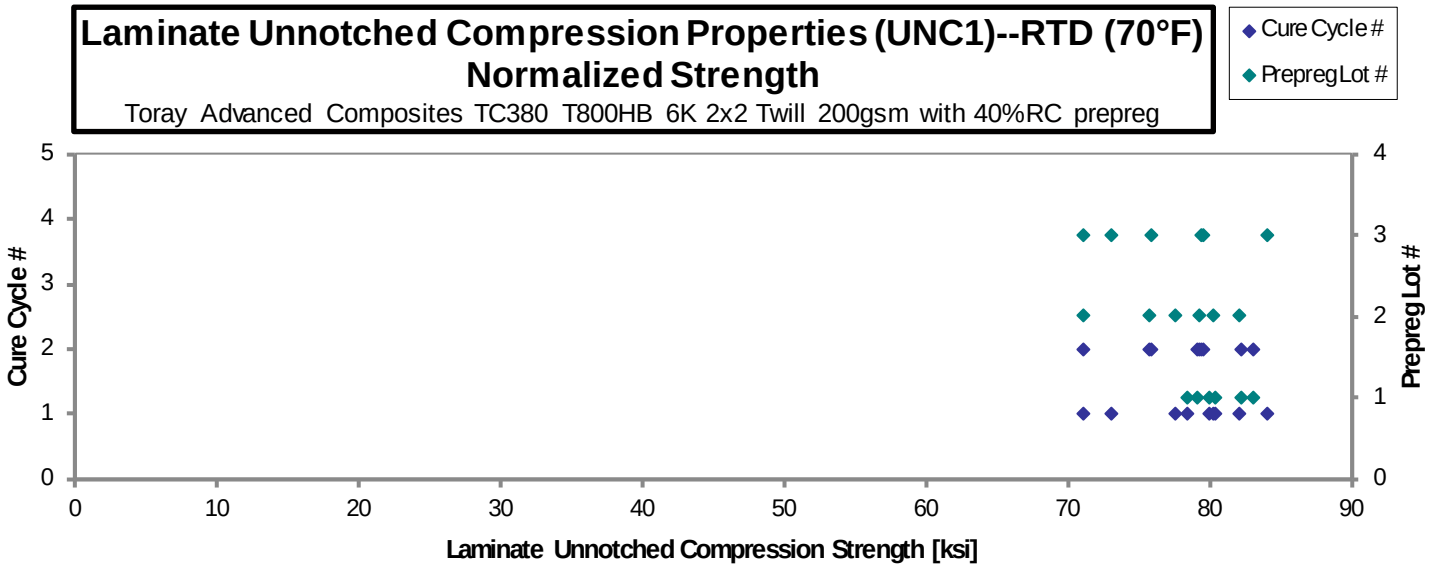
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

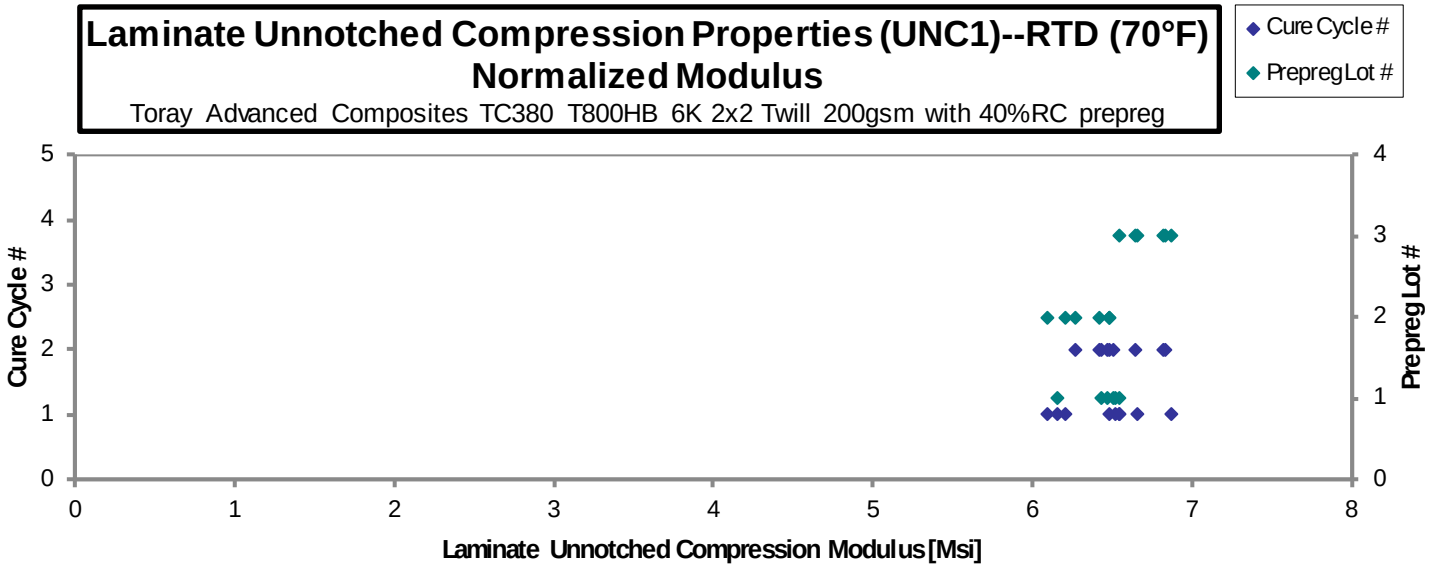
normalizing t_{ply} [in]: 0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
TCEWA111A*	A	C1	1	1	86.74	7.241	0.1273	16	BGM	0.007958	78.45	6.549
TCEWA112A*	A	C1	1	1	87.33	7.085	0.1296	16	BGM	0.008098	80.37	6.519
TCEWA113A	A	C1	1	1	85.03	6.545	0.1324	16	BGM	0.008275	79.95	6.155
TCEWA211A	A	C2	1	2	93.42	7.281	0.1252	16	HAB	0.007824	83.06	6.473
TCEWA212A	A	C2	1	2	90.35	7.150	0.1281	16	BGM	0.008003	82.17	6.502
TCEWA213A	A	C2	1	2	85.38	6.938	0.1305	16	BAB	0.008154	79.11	6.429
TCEWB111A	B	C1	2	1	88.62	6.996	0.1305	16	BGM	0.008153	82.10	6.482
TCEWB112A	B	C1	2	1	84.67	6.428	0.1335	16	BGM	0.008341	80.25	6.093
TCEWB113A	B	C1	2	1	80.04	6.402	0.1365	16	BGM	0.008528	77.57	6.205
TCEWB211A	B	C2	2	2	78.42	6.919	0.1276	16	BGM	0.007977	71.08	6.272
TCEWB212A	B	C2	2	2	81.34	6.888	0.1313	16	BGM	0.008203	75.82	6.420
TCEWB213A	B	C2	2	2	83.05	6.795	0.1345	16	BGM	0.008403	79.31	6.489
TCEWC111A	C	C1	3	1	76.76	7.419	0.1304	16	BGM	0.008149	71.08	6.870
TCEWC112A	C	C1	3	1	77.71	6.963	0.1324	16	BGM	0.008273	73.06	6.546
TCEWC113A	C	C1	3	1	87.94	6.963	0.1345	16	BGM	0.008408	84.03	6.653
TCEWC211A	C	C2	3	2	84.05	7.229	0.1330	16	BGM	0.008310	79.37	6.827
TCEWC212A	C	C2	3	2	79.03	7.119	0.1351	16	BGM	0.008444	75.83	6.831
TCEWC213A	C	C2	3	2	82.04	6.864	0.1364	16	BGM	0.008527	79.50	6.651

* Modulus are averaged values of 2 strain gages.

Average	**84.00**	**6.957**	**$Average_{norm}$**	**0.008224**	**78.45**	**6.498**
Standard Dev.	**4.623**	**0.2820**	**$Standard\ Dev._{norm}$**		**3.789**	**0.2224**
Coeff. of Var. [%]	**5.504**	**4.054**	**$Coeff.\ of\ Var.\ [\%]_{norm}$**		**4.830**	**3.423**
Min.	**76.76**	**6.402**	**Min.**	**0.007824**	**71.08**	**6.093**
Max.	**93.42**	**7.419**	**Max.**	**0.008528**	**84.03**	**6.870**
Number of Spec.	**18**	**18**	**Number of Spec.**	**18**	**18**	**18**


Laminate Unnotched Compression Properties (UNC1)--RTD (70°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Unnotched Compression Strength [ksi]
0
10
20
30
40
50
60
70
80
90
0
1
2
3
4
5


Laminate Unnotched Compression Properties (UNC1)--RTD (70°F)
Normalized Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Unnotched Compression Modulus [Msi]
0
1
2
3
4
5
6
7
8
0
1
2
3
4
5

Laminate Unnotched Compression Properties (UNC1)--ETW1 (180°F)
Strength & Modulus

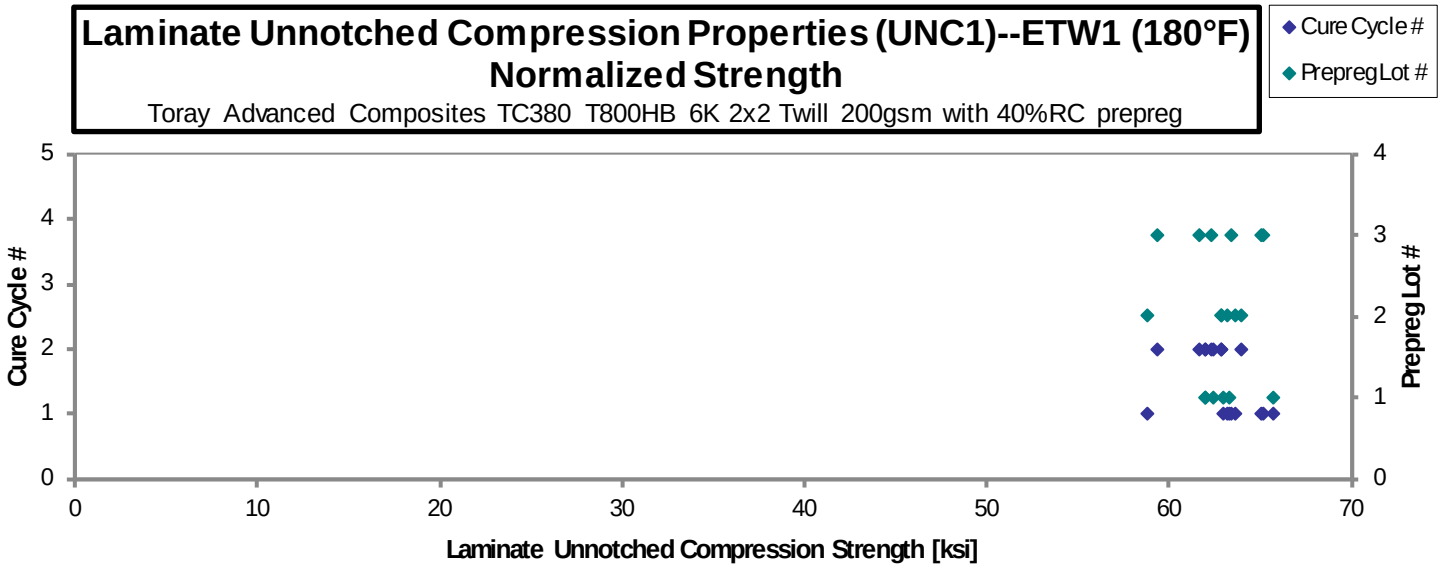
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

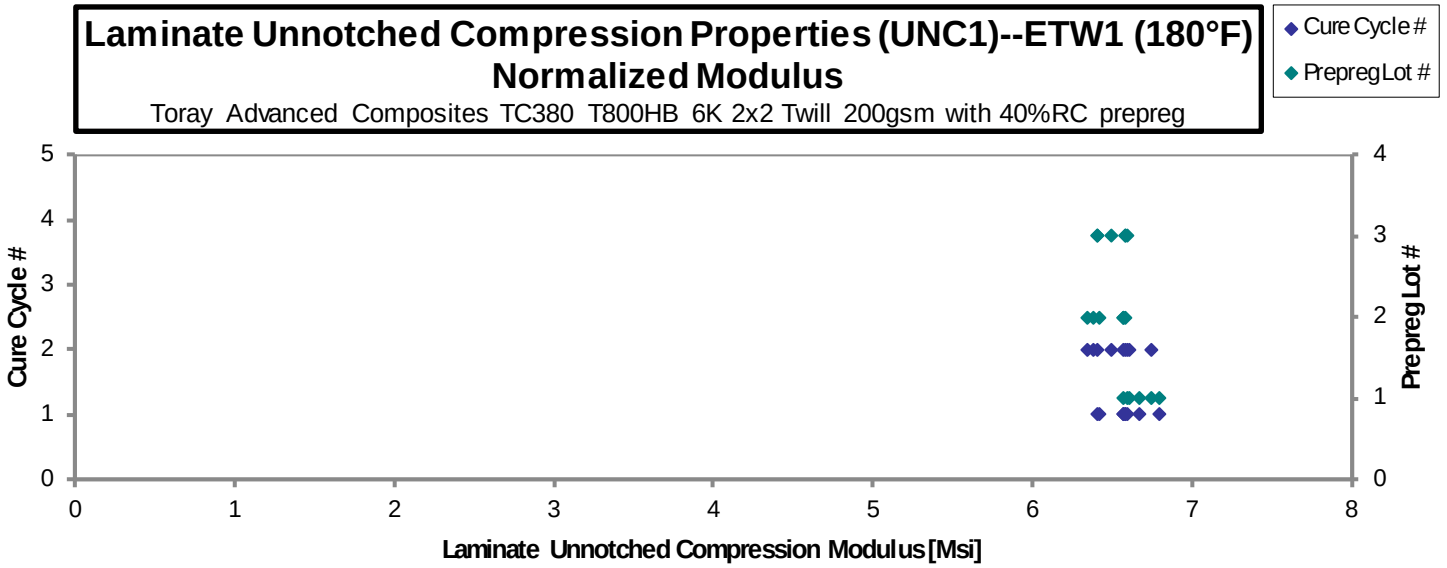
normalizing t_{ply} [in]: 0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
TCEWA111D	A	C1	1	1	66.00	6.695	0.1402	16	BGM	0.008765	65.74	6.668
TCEWA112D	A	C1	1	1	68.62	7.403	0.1293	16	BGM	0.008083	63.03	6.800
TCEWA113D	A	C1	1	1	67.67	7.021	0.1318	16	BAB	0.008234	63.32	6.570
TCEWA211D	A	C2	1	2	63.04	6.855	0.1385	16	M(B,H)AT	0.008655	62.00	6.742
TCEWA212D	A	C2	1	2	68.94	7.332	0.1266	16	HAB	0.007909	61.97	6.590
TCEWA213D	A	C2	1	2	68.04	7.202	0.1292	16	BGM	0.008072	62.41	6.606
TCEWB111D	B	C1	2	1	58.66	6.565	0.1412	16	HAB	0.008824	58.82	6.583
TCEWB112D	B	C1	2	1	63.05	6.513	0.1421	16	BGM	0.008880	63.63	6.572
TCEWB113D	B	C1	2	1	61.53	6.255	0.1446	16	BGM	0.009039	63.19	6.424
TCEWB211D	B	C2	2	2	63.19	6.613	0.1400	16	BGM	0.008752	62.85	6.577
TCEWB212D	B	C2	2	2	63.39	6.324	0.1420	16	BAB	0.008876	63.94	6.378
TCEWB213D	B	C2	2	2	62.40	6.296	0.1418	16	BGM	0.008864	62.85	6.341
TCEWC111D	C	C1	3	1	66.86	6.764	0.1372	16	BGM	0.008573	65.13	6.590
TCEWC112D	C	C1	3	1	65.62	6.643	0.1397	16	BGM	0.008728	65.08	6.588
TCEWC113D	C	C1	3	1	64.07	6.473	0.1393	16	BGM	0.008703	63.36	6.402
TCEWC211D	C	C2	3	2	63.00	6.658	0.1393	16	M(B,H)AT	0.008704	62.31	6.585
TCEWC212D	C	C2	3	2	59.87	6.547	0.1396	16	BGM	0.008725	59.36	6.492
TCEWC213D	C	C2	3	2	61.69	6.411	0.1407	16	BGM	0.008794	61.65	6.406

	Strength [ksi]	Modulus [Msi]
Average	**64.20**	**6.698**
Standard Dev.	**3.000**	**0.3434**
Coeff. of Var. [%]	**4.673**	**5.127**
Min.	**58.66**	**6.255**
Max.	**68.94**	**7.403**
Number of Spec.	**18**	**18**

	t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
$Average_{norm}$	**0.008621**	**62.81**	**6.551**
$Standard\ Dev._{norm}$		**1.762**	**0.1237**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**2.804**	**1.889**
Min.	**0.007909**	**58.82**	**6.341**
Max.	**0.009039**	**65.74**	**6.800**
Number of Spec.	**18**	**18**	**18**


Laminate Unnotched Compression Properties (UNC1)--ETW1 (180°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Unnotched Compression Strength [ksi]
0
10
20
30
40
50
60
70
0
1
2
3
4
5


Laminate Unnotched Compression Properties (UNC1)--ETW1 (180°F)
Normalized Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Unnotched Compression Modulus [Msi]
0
1
2
3
4
5
6
7
8
0
1
2
3
4
5

Laminate Unnotched Compression Properties (UNC1)--ETW2 (250°F)
Strength & Modulus

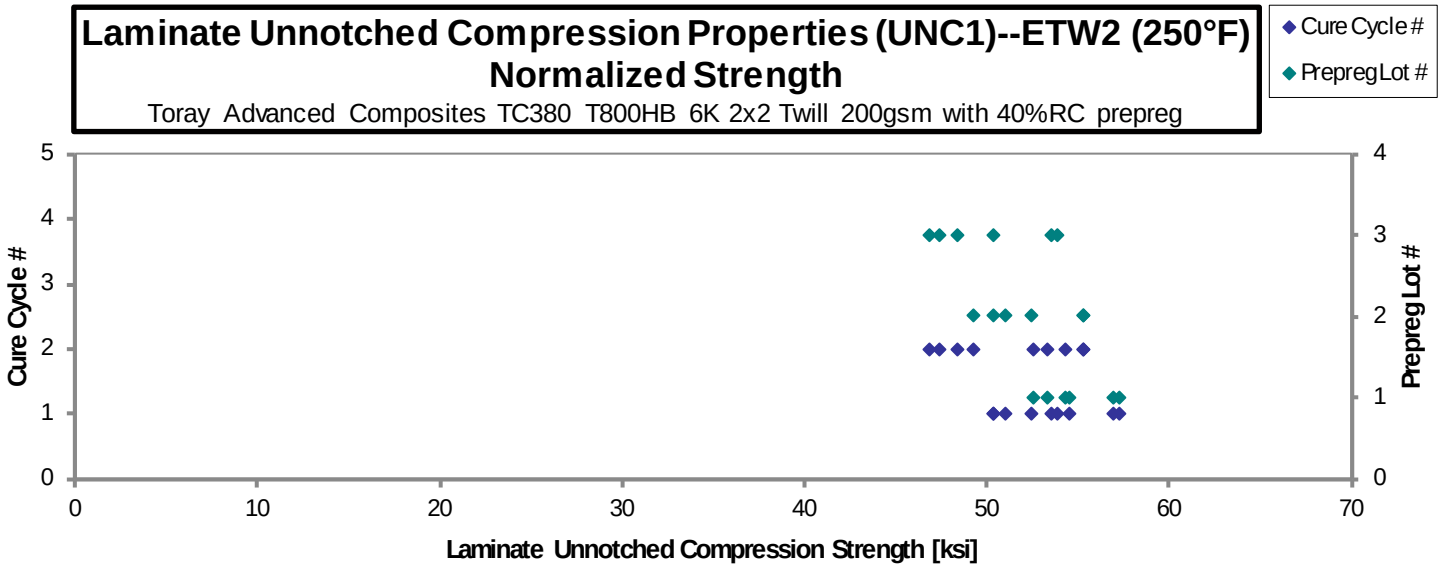
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

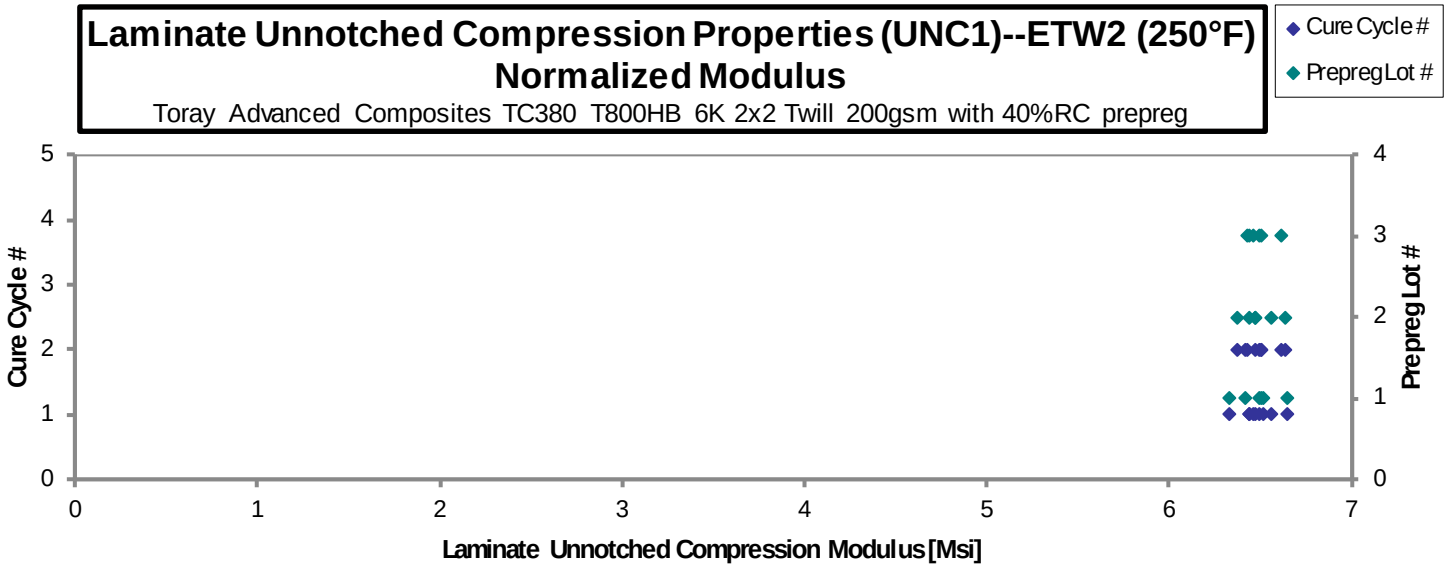
normalizing t_{ply} [in]: 0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
TCEWA111E	A	C1	1	1	55.45	6.439	0.1385	16	BGM	0.008653	54.53	6.331
TCEWA112E	A	C1	1	1	56.83	6.638	0.1410	16	BGM	0.008814	56.91	6.648
TCEWA113E	A	C1	1	1	56.67	6.452	0.1422	16	BGM	0.008885	57.22	6.515
TCEWA211E	A	C2	1	2	54.52	6.564	0.1378	16	BAT	0.008609	53.34	6.422
TCEWA212E	A	C2	1	2	54.90	6.570	0.1394	16	BGM	0.008709	54.34	6.503
TCEWA213E	A	C2	1	2	52.61	6.508	0.1406	16	BAB	0.008789	52.54	6.499
TCEWB111E	B	C1	2	1	51.07	6.384	0.1446	16	M(B,H)GM	0.009038	52.44	6.557
TCEWB112E	B	C1	2	1	49.47	6.350	0.1435	16	BGM	0.008966	50.40	6.470
TCEWB113E	B	C1	2	1	51.12	6.449	0.1406	16	BGM	0.008784	51.03	6.438
TCEWB211E	B	C2	2	2	54.99	6.594	0.1417	16	M(B,H)GM	0.008854	55.33	6.635
TCEWB212E	B	C2	2	2	49.08	6.354	0.1413	16	M(B,H)GM	0.008832	49.26	6.377
TCEWB213E	B	C2	2	2	55.76	6.527	0.1398	16	M(B,H)GM	0.008734	55.34	6.478
TCEWC111E	C	C1	3	1	54.09	6.515	0.1403	16	BGM	0.008767	53.89	6.490
TCEWC112E	C	C1	3	1	54.11	6.527	0.1394	16	BAT	0.008711	53.57	6.462
TCEWC113E	C	C1	3	1	51.50	6.587	0.1377	16	BAT	0.008604	50.36	6.441
TCEWC211E	C	C2	3	2	47.56	6.523	0.1405	16	BAT	0.008779	47.44	6.508
TCEWC212E	C	C2	3	2	49.24	6.541	0.1383	16	M(B,H)AT	0.008646	48.38	6.427
TCEWC213E	C	C2	3	2	47.93	6.763	0.1376	16	BGM	0.008602	46.85	6.611

	Strength [ksi]	Modulus [Msi]
Average	**52.61**	**6.516**
Standard Dev.	**3.051**	**0.1026**
Coeff. of Var. [%]	**5.799**	**1.574**
Min.	**47.56**	**6.350**
Max.	**56.83**	**6.763**
Number of Spec.	**18**	**18**

	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
$Average_{norm}$	**0.008765**	**52.40**	**6.490**
$Standard\ Dev._{norm}$		**3.116**	**0.08372**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**5.946**	**1.290**
Min.	**0.008602**	**46.85**	**6.331**
Max.	**0.009038**	**57.22**	**6.648**
Number of Spec.	**18**	**18**	**18**


Laminate Unnotched Compression Properties (UNC1)--ETW2 (250°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Unnotched Compression Strength [ksi]
0
10
20
30
40
50
60
70
0
1
2
3
4
5


Laminate Unnotched Compression Properties (UNC1)--ETW2 (250°F)
Normalized Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Unnotched Compression Modulus [Msi]
0
1
2
3
4
5
6
7
0
1
2
3
4
5

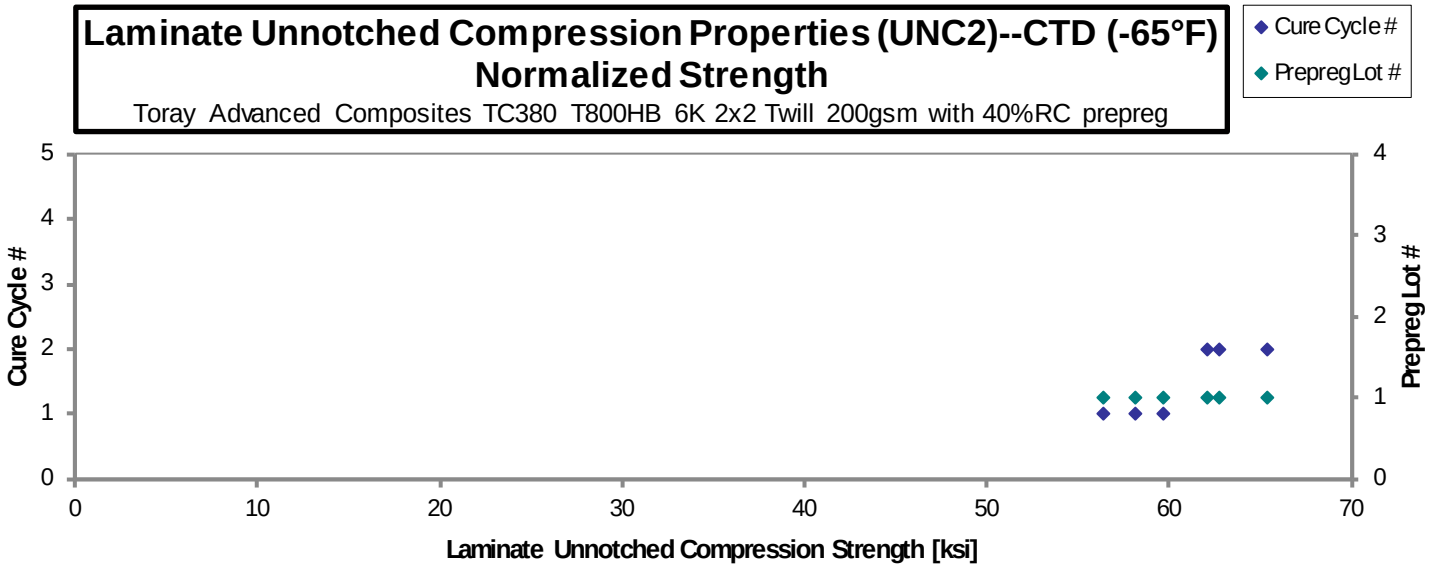
4.11 "10/80/10" Unnotched Compression 2 Properties (UNC2)

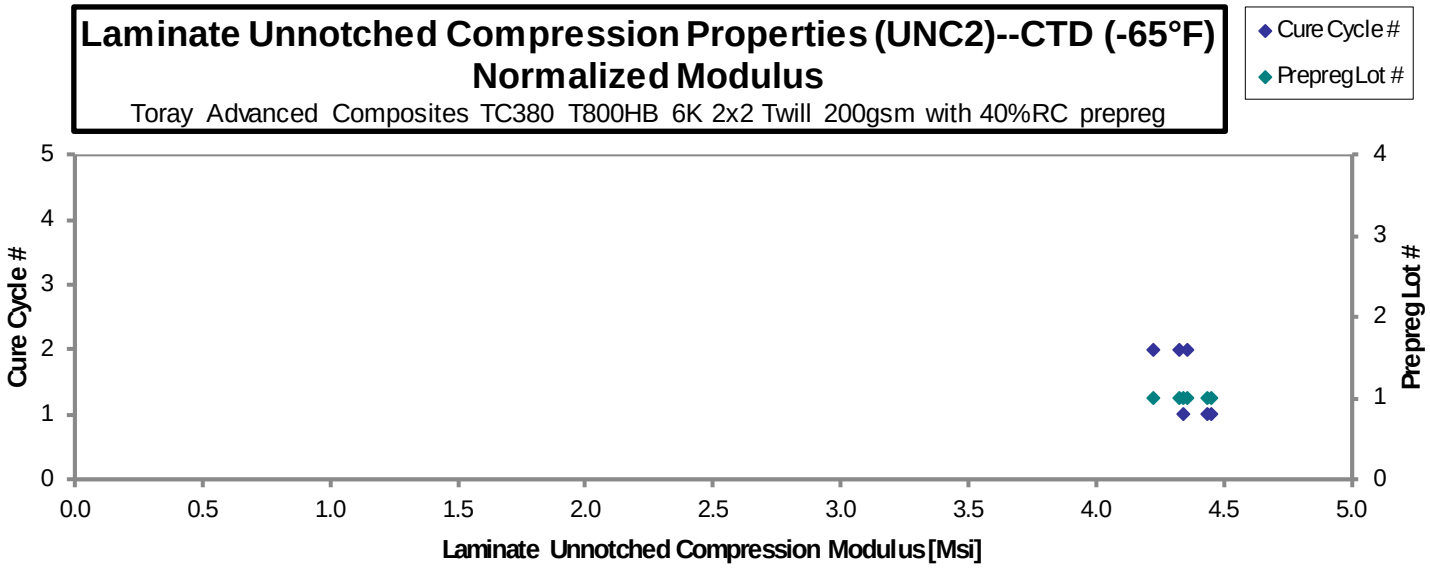
Laminate Unnotched Compression Properties (UNC2)--CTD (-65°F)
Strength & Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]: 0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
TCEXA111B	A	C1	1	1	61.83	4.602	0.08488	10	BGM	0.008488	59.64	4.439
TCEXA112B	A	C1	1	1	57.39	4.422	0.08640	10	BGM	0.008640	56.34	4.341
TCEXA113B	A	C1	1	1	58.76	4.498	0.08703	10	BGM	0.008703	58.11	4.448
TCEXA211B	A	C2	1	2	64.67	4.398	0.08450	10	BGM	0.008450	62.10	4.223
TCEXA212B	A	C2	1	2	67.59	4.472	0.08513	10	BGM	0.008513	65.39	4.326
TCEXA213B	A	C2	1	2	63.82	4.431	0.08650	10	BGM	0.008650	62.73	4.355

Average	**62.34**	**4.470**	**Average$_{norm}$**	**0.008574**	**60.72**	**4.355**
Standard Dev.	**3.815**	**0.07360**	**Standard Dev.$_{norm}$**		**3.312**	**0.08246**
Coeff. of Var. [%]	**6.120**	**1.646**	**Coeff. of Var. [%]$_{norm}$**		**5.454**	**1.893**
Min.	**57.39**	**4.398**	**Min.**	**0.008450**	**56.34**	**4.223**
Max.	**67.59**	**4.602**	**Max.**	**0.008703**	**65.39**	**4.448**
Number of Spec.	**6**	**6**	**Number of Spec.**	**6**	**6**	**6**


Laminate Unnotched Compression Properties (UNC2)--CTD (-65°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Unnotched Compression Strength [ksi]
0
10
20
30
40
50
60
70
0
1
2
3
4
5


Laminate Unnotched Compression Properties (UNC2)--CTD (-65°F)
Normalized Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Unnotched Compression Modulus [Msi]
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
0
1
2
3
4
5

Laminate Unnotched Compression Properties (UNC2)--RTD (70°F)
Strength & Modulus

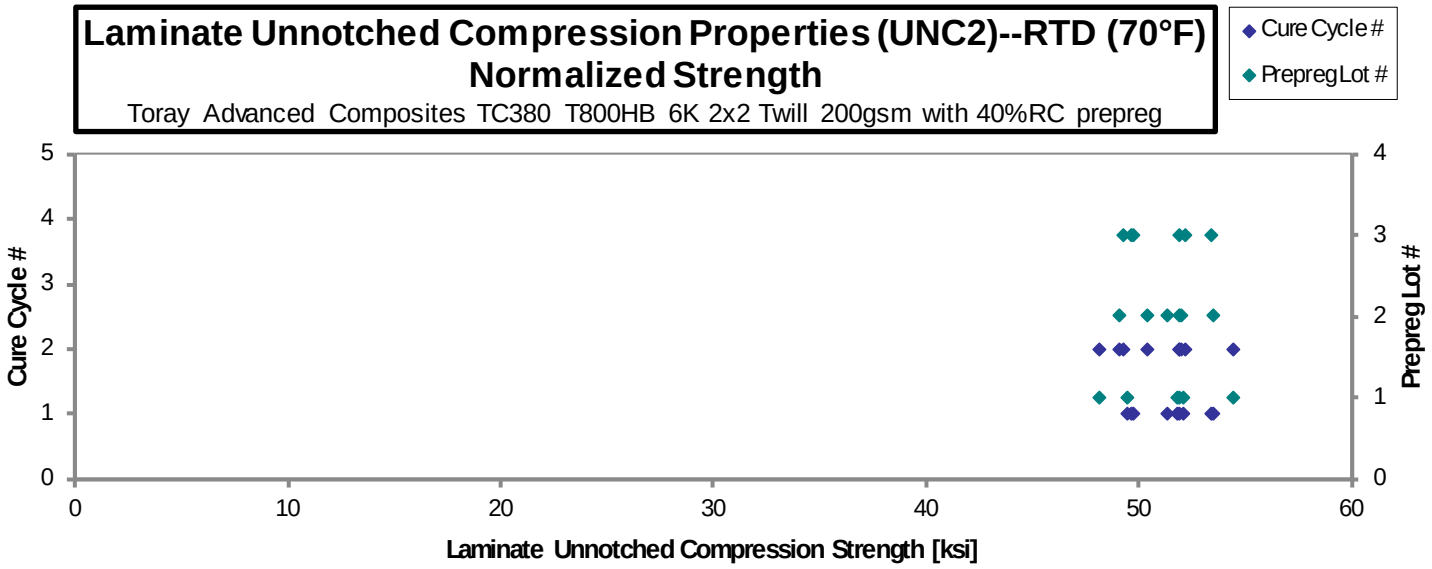
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

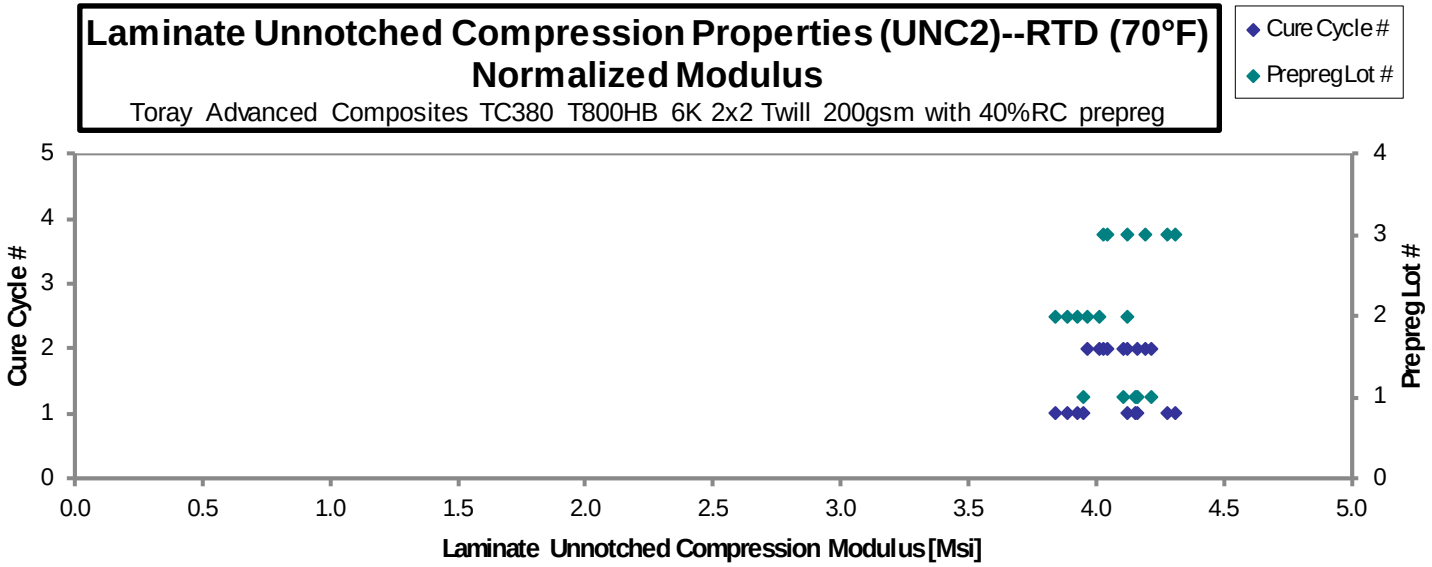
normalizing t_{ply} [in]: 0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
TCEXA111A*	A	C1	1	1	58.43	4.656	0.07852	10	BGM	0.007852	52.13	4.154
TCEXA112A*	A	C1	1	1	56.59	4.538	0.08063	10	BGM	0.008063	51.85	4.158
TCEXA113A	A	C1	1	1	53.04	4.230	0.08215	10	BGM	0.008215	49.51	3.949
TCEXA211A	A	C2	1	2	54.61	4.657	0.07765	10	BGM	0.007765	48.19	4.109
TCEXA212A	A	C2	1	2	60.27	4.673	0.07947	10	BGM	0.007947	54.42	4.220
TCEXA213A	A	C2	1	2	55.87	4.484	0.08172	10	BGM	0.008172	51.88	4.164
TCEXB111A	B	C1	2	1	58.66	4.262	0.08022	10	BGM	0.008022	53.47	3.885
TCEXB112A	B	C1	2	1	54.86	4.193	0.08238	10	BGM	0.008238	51.36	3.925
TCEXB113A	B	C1	2	1	54.05	3.999	0.08453	10	BGM	0.008453	51.92	3.841
TCEXB211A	B	C2	2	2	50.96	4.167	0.08472	10	BGM	0.008472	49.06	4.011
TCEXB212A	B	C2	2	2	52.29	4.142	0.08757	10	BGM	0.008757	52.03	4.122
TCEXB213A	B	C2	2	2	49.78	3.911	0.08918	10	BGM	0.008918	50.45	3.964
TCEXC111A	C	C1	3	1	54.52	4.734	0.08020	10	BGM	0.008020	49.69	4.314
TCEXC112A	C	C1	3	1	53.55	4.430	0.08183	10	BGM	0.008183	49.79	4.119
TCEXC113A	C	C1	3	1	55.41	4.445	0.08478	10	BGM	0.008478	53.39	4.282
TCEXC211A	C	C2	3	2	54.88	4.262	0.08323	10	BGM	0.008323	51.90	4.031
TCEXC212A	C	C2	3	2	54.28	4.361	0.08468	10	BGM	0.008468	52.23	4.197
TCEXC213A	C	C2	3	2	50.74	4.166	0.08540	10	BGM	0.008540	49.24	4.043

* Modulus are averaged values of 2 strain gages.

Average	**54.60**	**4.350**	**Average$_{norm}$**	**0.008271**	**51.25**	**4.083**
Standard Dev.	**2.769**	**0.2413**	**Standard Dev.$_{norm}$**		**1.715**	**0.1350**
Coeff. of Var. [%]	**5.071**	**5.546**	**Coeff. of Var. [%]$_{norm}$**		**3.347**	**3.306**
Min.	**49.78**	**3.911**	**Min.**	**0.007765**	**48.19**	**3.841**
Max.	**60.27**	**4.734**	**Max.**	**0.008918**	**54.42**	**4.314**
Number of Spec.	**18**	**18**	**Number of Spec.**	**18**	**18**	**18**


Laminate Unnotched Compression Properties (UNC2)--RTD (70°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Unnotched Compression Strength [ksi]
0
10
20
30
40
50
60
0
1
2
3
4
5


Laminate Unnotched Compression Properties (UNC2)--RTD (70°F)
Normalized Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Unnotched Compression Modulus [Msi]
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
0
1
2
3
4
5

Laminate Unnotched Compression Properties (UNC2)--ETW1 (180°F)
Strength & Modulus

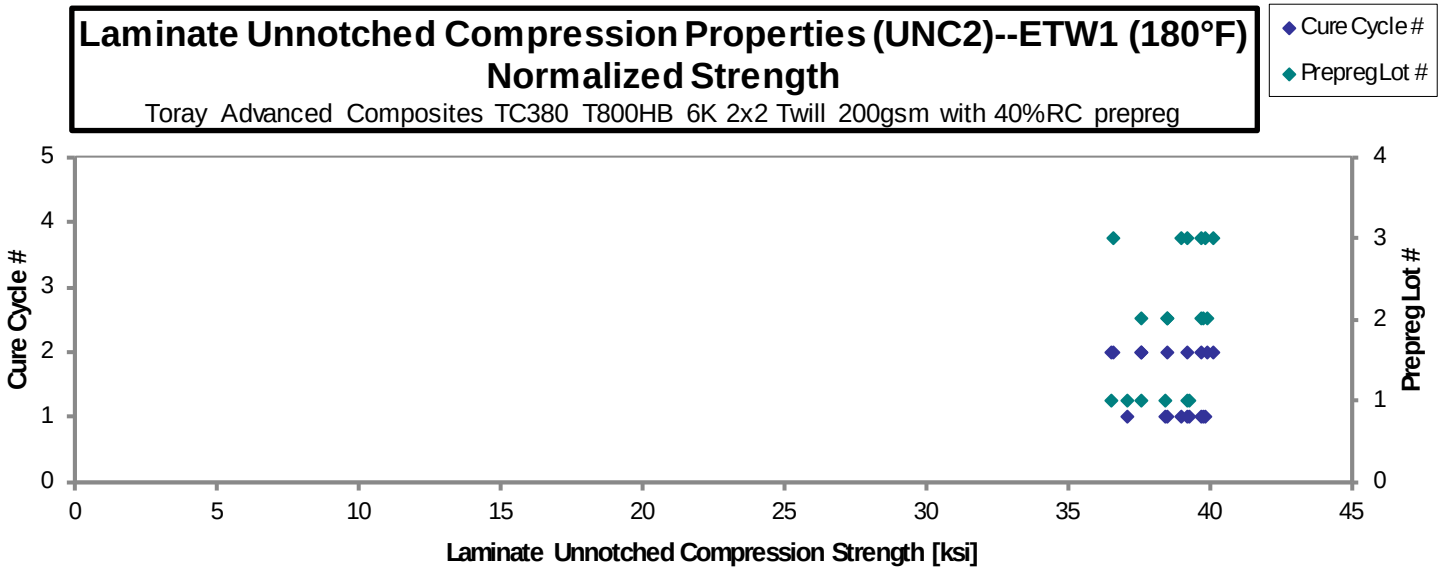
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

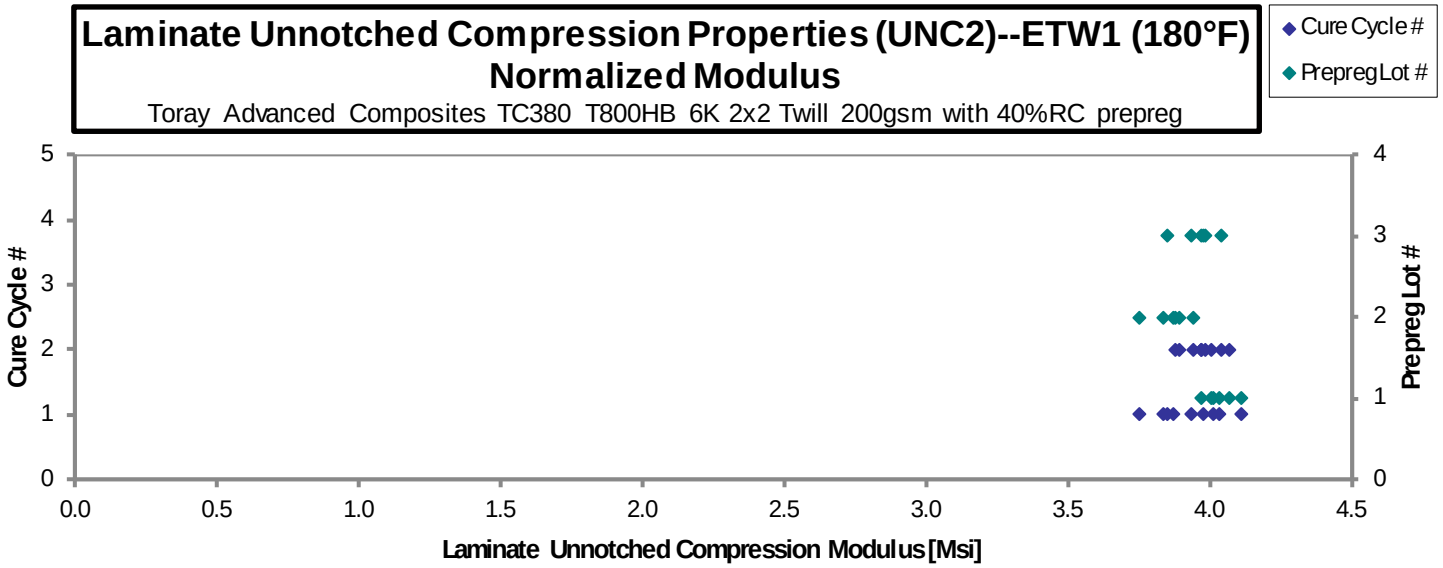
normalizing t_{ply} [in]: 0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
TCEXA111D	A	C1	1	1	38.09	3.980	0.08877	10	BGM	0.008877	38.42	4.014
TCEXA112D	A	C1	1	1	43.66	4.485	0.07912	10	BAB	0.007912	39.25	4.033
TCEXA113D	A	C1	1	1	40.02	4.432	0.08165	10	BAB	0.008165	37.13	4.112
TCEXA211D	A	C2	1	2	36.77	4.001	0.08740	10	BAB	0.008740	36.52	3.974
TCEXA212D	A	C2	1	2	43.94	4.483	0.07860	10	BGM	0.007860	39.25	4.004
TCEXA213D	A	C2	1	2	40.90	4.423	0.08093	10	BAB	0.008093	37.62	4.068
TCEXB111D	B	C1	2	1	39.69	3.876	0.08798	10	BAB	0.008798	39.69	3.876
TCEXB112D	B	C1	2	1	39.50	3.725	0.08868	10	BAB	0.008868	39.80	3.754
TCEXB113D	B	C1	2	1	38.03	3.787	0.08912	10	BAT	0.008912	38.51	3.835
TCEXB211D	B	C2	2	2	36.02	3.734	0.09177	10	BAB	0.009177	37.56	3.894
TCEXB212D	B	C2	2	2	36.68	3.694	0.09238	10	BAT	0.009238	38.51	3.878
TCEXB213D	B	C2	2	2	38.09	3.767	0.09215	10	BGM	0.009215	39.89	3.945
TCEXC111D	C	C1	3	1	40.30	3.894	0.08707	10	BGM	0.008707	39.87	3.853
TCEXC112D	C	C1	3	1	39.09	3.969	0.08823	10	BGM	0.008823	39.19	3.979
TCEXC113D	C	C1	3	1	38.81	3.916	0.08847	10	BGM	0.008847	39.01	3.937
TCEXC211D	C	C2	3	2	40.94	4.054	0.08623	10	BGM	0.008623	40.12	3.972
TCEXC212D	C	C2	3	2	40.39	4.108	0.08658	10	BGM	0.008658	39.74	4.042
TCEXC213D	C	C2	3	2	36.81	4.004	0.08758	10	BGM	0.008758	36.64	3.985

	Strength [ksi]	Modulus [Msi]
Average	**39.32**	**4.019**
Standard Dev.	**2.220**	**0.2676**
Coeff. of Var. [%]	**5.646**	**6.658**
Min.	**36.02**	**3.694**
Max.	**43.94**	**4.485**
Number of Spec.	**18**	**18**

	t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
$Average_{norm}$	**0.008682**	**38.71**	**3.953**
$Standard\ Dev._{norm}$		**1.167**	**0.09091**
Coeff. of Var. [%]$_{norm}$		**3.014**	**2.300**
Min.	**0.007860**	**36.52**	**3.754**
Max.	**0.009238**	**40.12**	**4.112**
Number of Spec.	**18**	**18**	**18**


Laminate Unnotched Compression Properties (UNC2)--ETW1 (180°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Unnotched Compression Strength [ksi]
0
5
10
15
20
25
30
35
40
45
0
1
2
3
4
5


Laminate Unnotched Compression Properties (UNC2)--ETW1 (180°F)
Normalized Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Unnotched Compression Modulus [Msi]
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
0
1
2
3
4
5

Laminate Unnotched Compression Properties (UNC2)--ETW2 (250°F)
Strength & Modulus

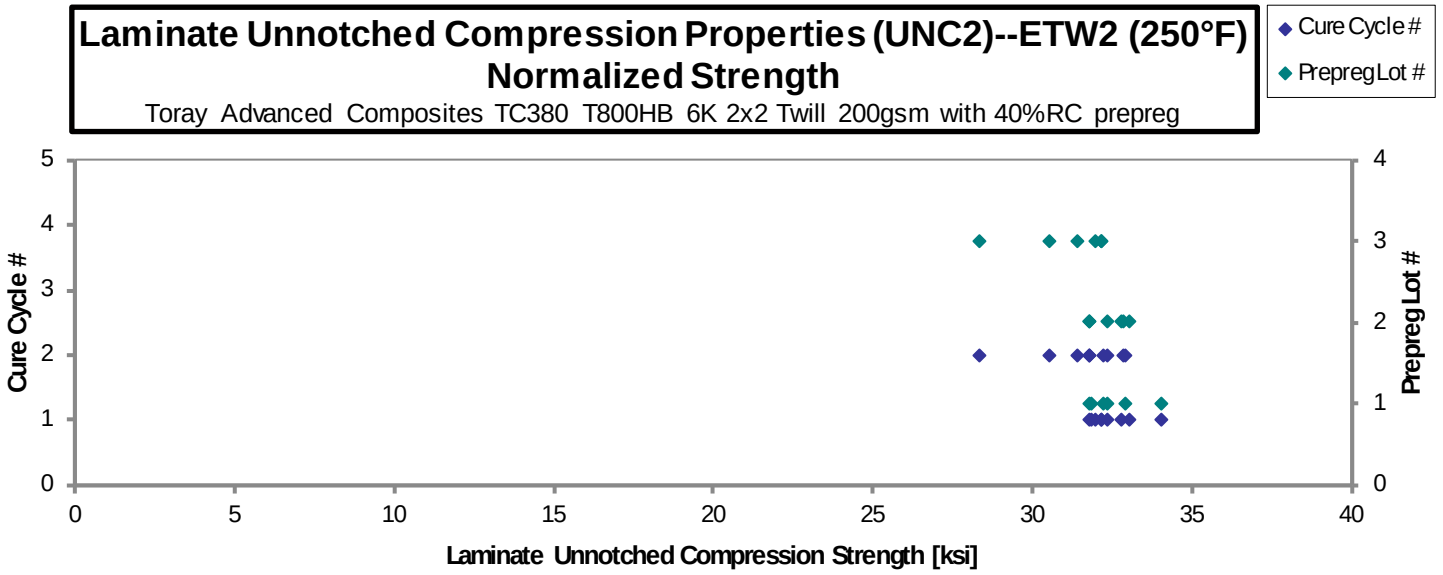
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

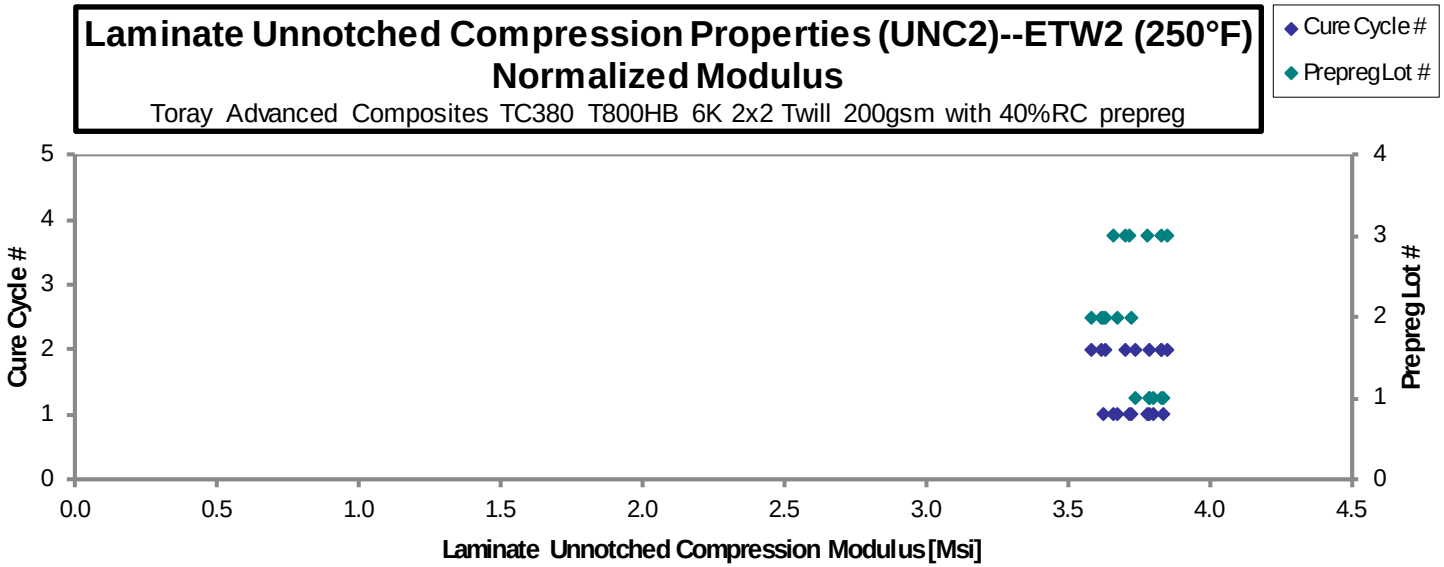
normalizing t_{ply} [in]: 0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
TCEXA111E	A	C1	1	1	32.16	3.831	0.08705	10	BGM	0.008705	31.81	3.790
TCEXA112E	A	C1	1	1	31.70	3.780	0.08848	10	BAB	0.008848	31.87	3.800
TCEXA113E	A	C1	1	1	33.64	3.794	0.08907	10	BGM	0.008907	34.05	3.840
TCEXA211E	A	C2	1	2	32.88	3.891	0.08667	10	BAB	0.008667	32.38	3.832
TCEXA212E	A	C2	1	2	32.80	3.778	0.08825	10	BGM	0.008825	32.89	3.789
TCEXA213E	A	C2	1	2	31.74	3.683	0.08935	10	BGM	0.008935	32.22	3.740
TCEXB111E	B	C1	2	1	32.31	3.637	0.09005	10	M(B,D)GM	0.009005	33.06	3.722
TCEXB112E	B	C1	2	1	31.90	3.573	0.08925	10	BGM	0.008925	32.36	3.623
TCEXB113E	B	C1	2	1	32.92	3.686	0.08768	10	BGM	0.008768	32.81	3.672
TCEXB211E	B	C2	2	2	31.74	3.614	0.08815	10	BAB	0.008815	31.79	3.620
TCEXB212E	B	C2	2	2	33.07	3.655	0.08750	10	BGM	0.008750	32.88	3.634
TCEXB213E	B	C2	2	2	32.67	3.679	0.08563	10	BGM	0.008563	31.79	3.580
TCEXC111E	C	C1	3	1	31.30	3.586	0.08990	10	BGM	0.008990	31.97	3.664
TCEXC112E	C	C1	3	1	32.03	3.701	0.08842	10	BGM	0.008842	32.18	3.718
TCEXC113E	C	C1	3	1	32.25	3.792	0.08778	10	BGM	0.008778	32.17	3.783
TCEXC211E	C	C2	3	2	31.47	3.711	0.08780	10	BGM	0.008780	31.40	3.702
TCEXC212E	C	C2	3	2	30.73	3.879	0.08742	10	M(B,H)GM	0.008742	30.52	3.853
TCEXC213E	C	C2	3	2	28.74	3.882	0.08682	10	BAT	0.008682	28.35	3.830

	Strength [ksi]	Modulus [Msi]
Average	**32.00**	**3.731**
Standard Dev.	**1.084**	**0.1016**
Coeff. of Var. [%]	**3.387**	**2.724**
Min.	**28.74**	**3.573**
Max.	**33.64**	**3.891**
Number of Spec.	**18**	**18**

	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
$Average_{norm}$	**0.008807**	**32.03**	**3.733**
$Standard\ Dev._{norm}$		**1.185**	**0.08619**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**3.700**	**2.309**
Min.	**0.008563**	**28.35**	**3.580**
Max.	**0.009005**	**34.05**	**3.853**
Number of Spec.	**18**	**18**	**18**


Laminate Unnotched Compression Properties (UNC2)--ETW2 (250°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Unnotched Compression Strength [ksi]
0
5
10
15
20
25
30
35
40
0
1
2
3
4
5


Laminate Unnotched Compression Properties (UNC2)--ETW2 (250°F)
Normalized Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Unnotched Compression Modulus [Msi]
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
0
1
2
3
4
5

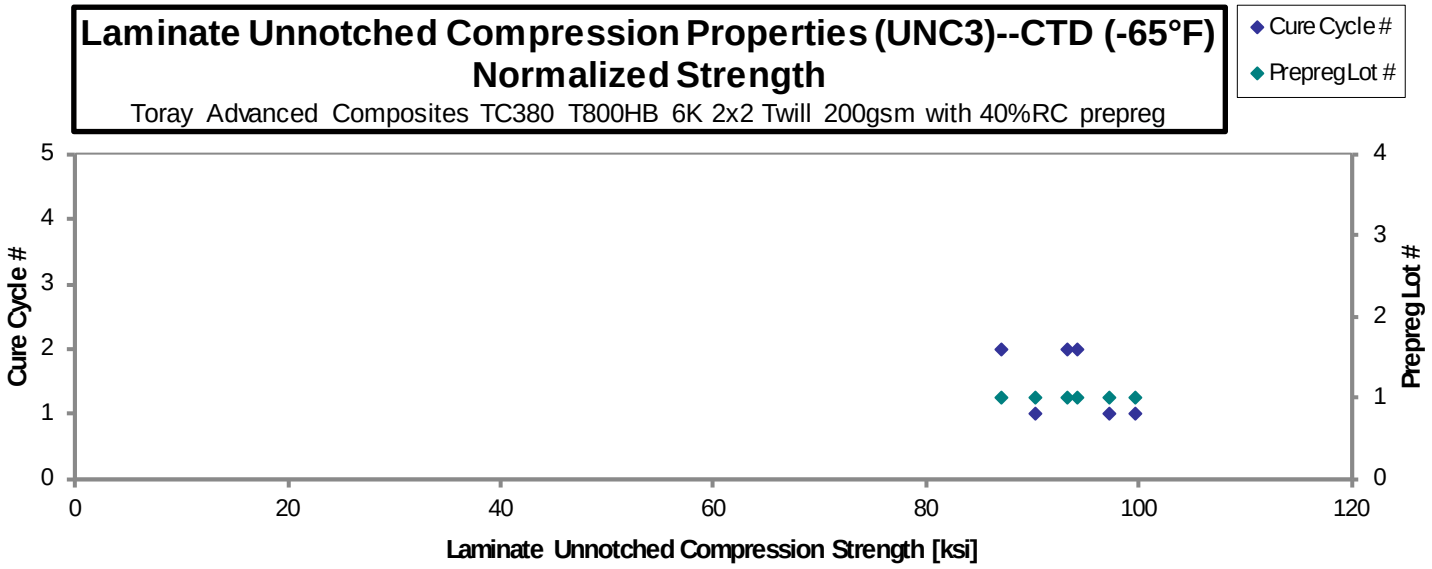
4.12 "40/20/40" Unnotched Compression 3 Properties (UNC3)

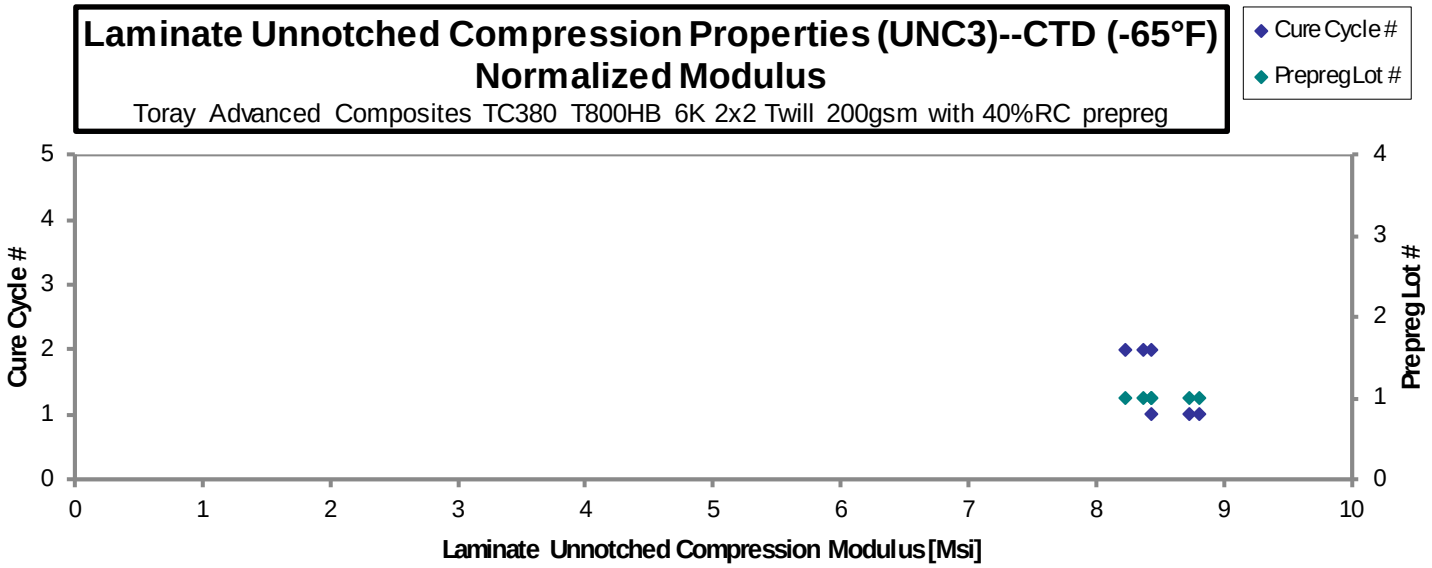
Laminate Unnotched Compression Properties (UNC3)--CTD (-65°F)
Strength & Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]: 0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
TCEYA111B	A	C1	1	1	104.1	9.186	0.08432	10	BAT	0.008432	99.72	8.802
TCEYA112B	A	C1	1	1	92.73	8.957	0.08573	10	BGM	0.008573	90.34	8.726
TCEYA113B	A	C1	1	1	99.95	8.674	0.08558	10	BGM	0.008558	97.20	8.436
TCEYA211B	A	C2	1	2	98.38	8.597	0.08425	10	BGM	0.008425	94.19	8.231
TCEYA212B	A	C2	1	2	89.81	8.689	0.08538	10	BGM	0.008538	87.14	8.431
TCEYA213B	A	C2	1	2	95.00	8.531	0.08640	10	BGM	0.008640	93.28	8.375

	Strength [ksi]	Modulus [Msi]		t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
Average	**96.66**	**8.772**	**Average$_{norm}$**	**0.008528**	**93.64**	**8.500**
Standard Dev.	**5.175**	**0.2493**	**Standard Dev.$_{norm}$**		**4.545**	**0.2185**
Coeff. of Var. [%]	**5.354**	**2.842**	**Coeff. of Var. [%]$_{norm}$**		**4.853**	**2.571**
Min.	**89.81**	**8.531**	**Min.**	**0.008425**	**87.14**	**8.231**
Max.	**104.1**	**9.186**	**Max.**	**0.008640**	**99.72**	**8.802**
Number of Spec.	**6**	**6**	**Number of Spec.**	**6**	**6**	**6**


Laminate Unnotched Compression Properties (UNC3)--CTD (-65°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Unnotched Compression Strength [ksi]
0
20
40
60
80
100
120
0
1
2
3
4
5


Laminate Unnotched Compression Properties (UNC3)--CTD (-65°F)
Normalized Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Unnotched Compression Modulus [Msi]
0
1
2
3
4
5
6
7
8
9
10
0
1
2
3
4
5

Laminate Unnotched Compression Properties (UNC3)--RTD (70°F)
Strength & Modulus

Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

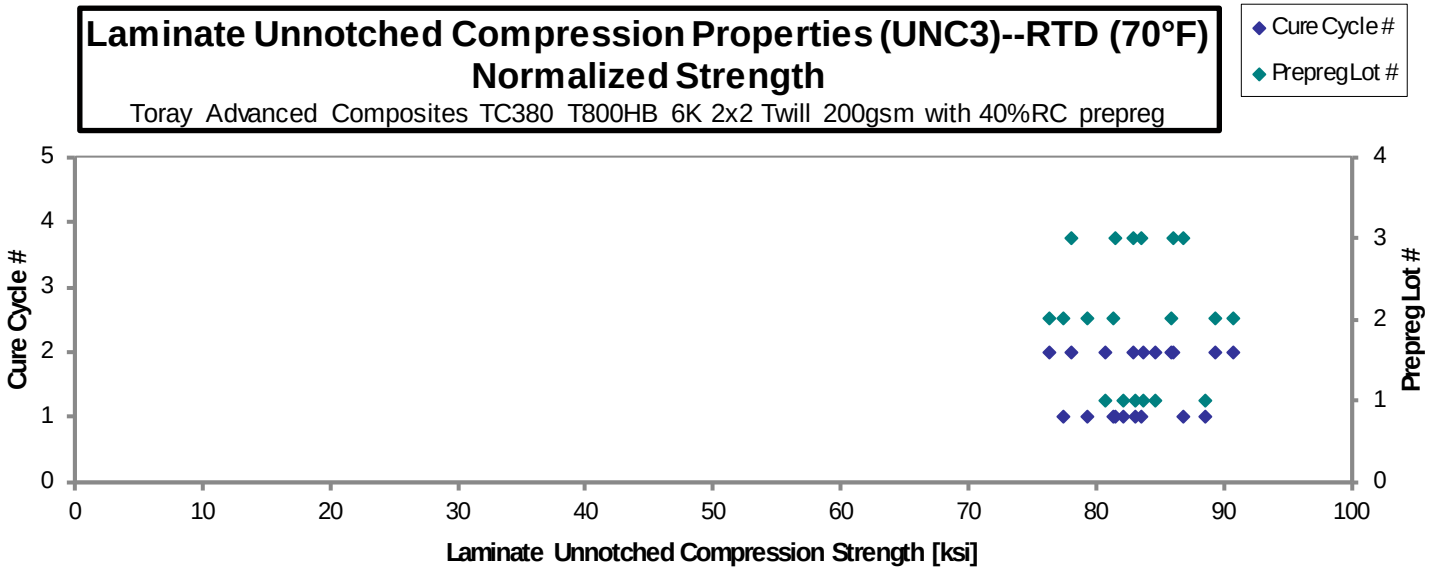
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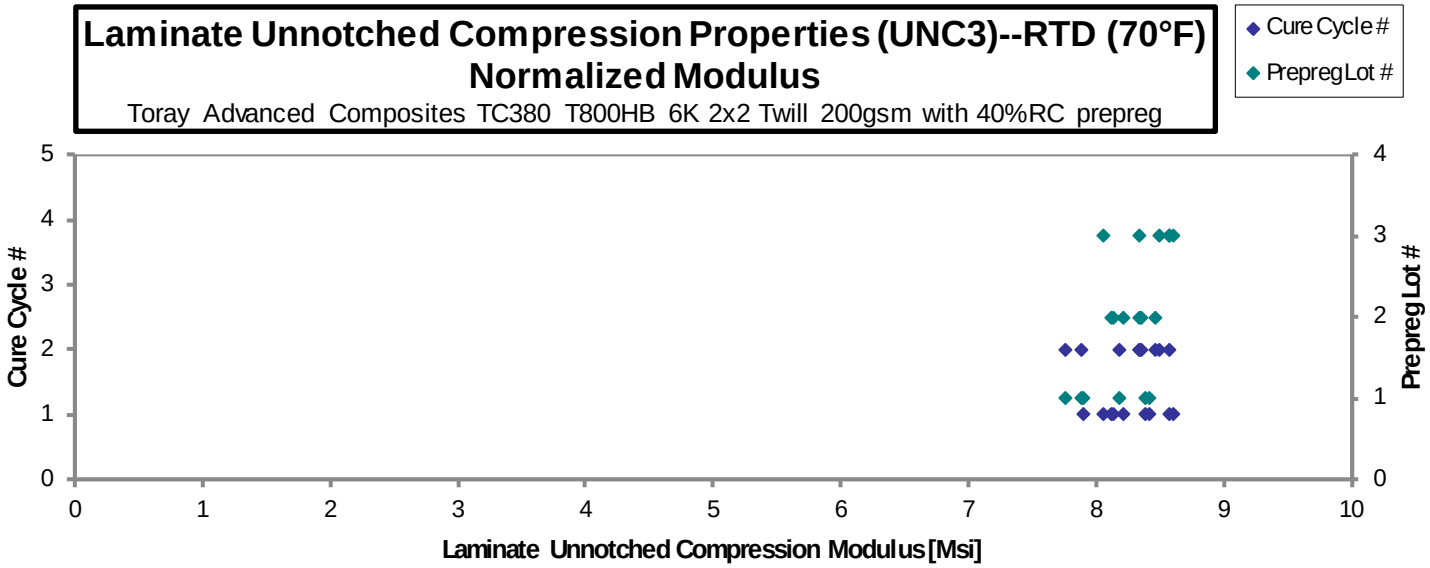
Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
TCEYA111A*	A	C1	1	1	99.27	9.440	0.07845	10	BAB	0.007845	88.50	8.415
TCEYA112A*	A	C1	1	1	91.33	9.218	0.08008	10	BGM	0.008008	83.11	8.388
TCEYA113A	A	C1	1	1	88.56	8.526	0.08157	10	BGM	0.008157	82.09	7.903
TCEYA211A	A	C2	1	2	91.54	8.951	0.07757	10	BAT	0.007757	80.69	7.890
TCEYA212A	A	C2	1	2	93.74	8.591	0.07952	10	BGM	0.007952	84.70	7.763
TCEYA213A	A	C2	1	2	91.13	8.893	0.08090	10	BAT	0.008090	83.77	8.175
TCEYB111A	B	C1	2	1	90.68	9.068	0.07898	10	BAB	0.007898	81.39	8.139
TCEYB112A	B	C1	2	1	85.71	8.878	0.08137	10	BAT	0.008137	79.25	8.209
TCEYB113A	B	C1	2	1	81.68	8.565	0.08345	10	BGM	0.008345	77.46	8.122
TCEYB211A	B	C2	2	2	95.53	9.291	0.07907	10	BAB	0.007907	85.84	8.348
TCEYB212A	B	C2	2	2	81.96	9.088	0.08198	10	M(B,H)AB	0.008198	76.35	8.466
TCEYB213A	B	C2	2	2	93.48	8.729	0.08410	10	BGM	0.008410	89.34	8.342
TCEYB214A**	B	C2	2	2	93.48		0.08548	10	BGM	0.008548	90.81	
TCEYC111A	C	C1	3	1	90.00	8.683	0.08162	10	BGM	0.008162	83.47	8.053
TCEYC112A	C	C1	3	1	91.10	8.985	0.08393	10	BGM	0.008393	86.89	8.569
TCEYC113A	C	C1	3	1	84.12	8.887	0.08527	10	BGM	0.008527	81.51	8.611
TCEYC211A	C	C2	3	2	86.82	8.893	0.08405	10	BGM	0.008405	82.92	8.494
TCEYC212A	C	C2	3	2	80.78	8.872	0.08498	10	BGM	0.008498	78.01	8.568
TCEYC213A	C	C2	3	2	87.59	8.493	0.08645	10	BAT	0.008645	86.05	8.343

* Modulus are averaged values of 2 strain gages.

** Specimen was not gaged, only strength is reported.

Average	**89.40**	**8.892**	**$Average_{norm}$**	**0.008204**	**83.27**	**8.267**
Standard Dev.	**4.971**	**0.2666**	**$Standard\ Dev._{norm}$**		**4.021**	**0.2509**
Coeff. of Var. [%]	**5.561**	**2.998**	**$Coeff.\ of\ Var.\ [\%]_{norm}$**		**4.829**	**3.035**
Min.	**80.78**	**8.493**	**Min.**	**0.007757**	**76.35**	**7.763**
Max.	**99.27**	**9.440**	**Max.**	**0.008645**	**90.81**	**8.611**
Number of Spec.	**19**	**18**	**Number of Spec.**	**19**	**19**	**18**


Laminate Unnotched Compression Properties (UNC3)--RTD (70°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Unnotched Compression Strength [ksi]
0
10
20
30
40
50
60
70
80
90
100
0
1
2
3
4
5


Laminate Unnotched Compression Properties (UNC3)--RTD (70°F)
Normalized Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Unnotched Compression Modulus [Msi]
0
1
2
3
4
5
6
7
8
9
10
0
1
2
3
4
5

Laminate Unnotched Compression Properties (UNC3)--ETW1 (180°F)
Strength & Modulus

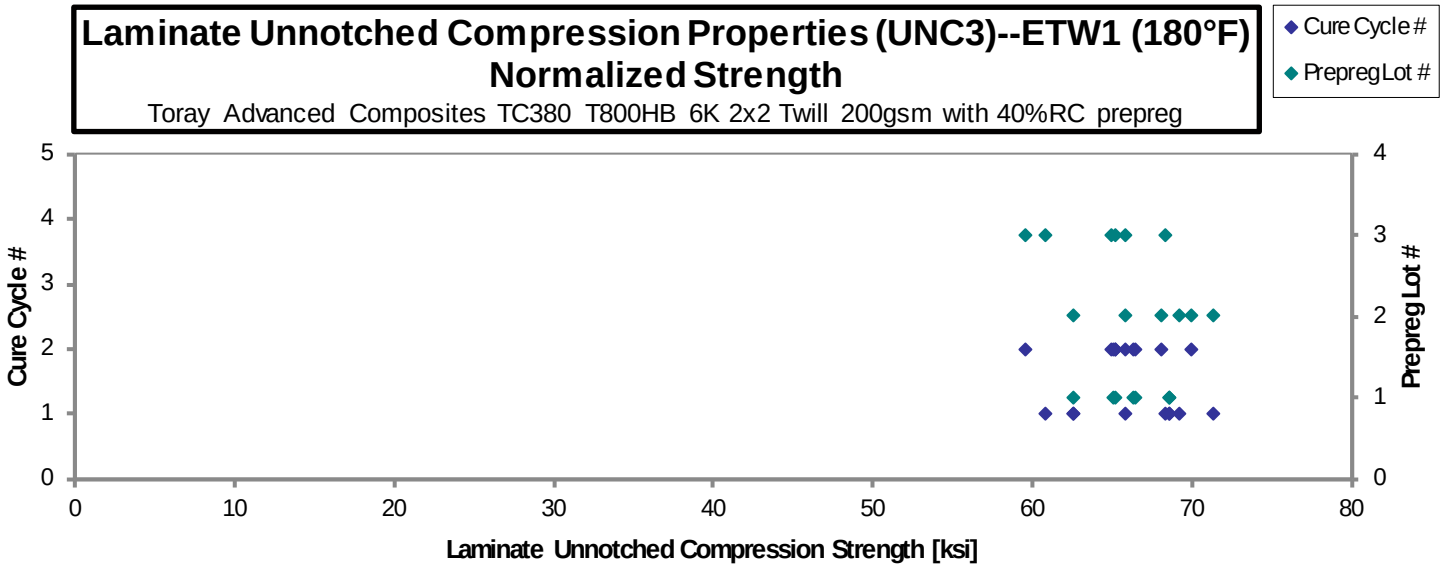
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

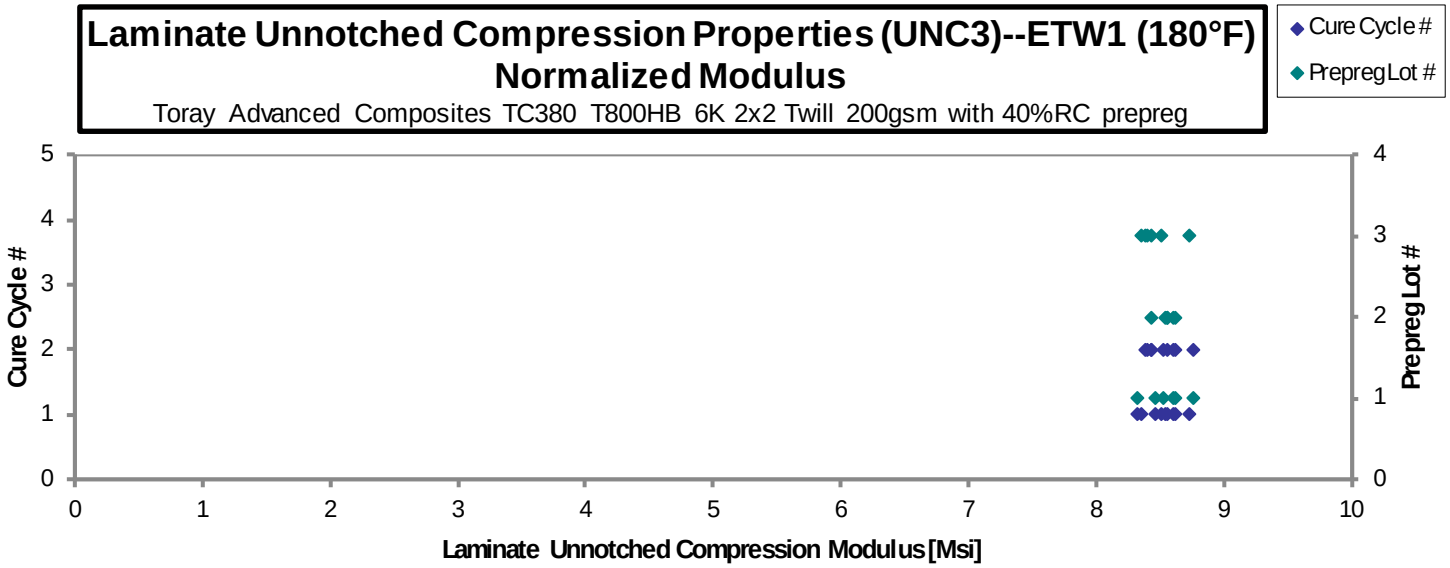
normalizing t_{ply} [in]: 0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
TCEYA111D	A	C1	1	1	69.36	8.699	0.08698	10	BAT	0.008698	68.56	8.598
TCEYA112D	A	C1	1	1	69.99	9.308	0.07863	10	BAB	0.007863	62.54	8.317
TCEYA113D	A	C1	1	1	74.77	9.239	0.08065	10	BAB	0.008065	68.53	8.468
TCEYA211D	A	C2	1	2	66.71	8.679	0.08748	10	HAB	0.008748	66.32	8.628
TCEYA212D*	A	C2	1	2	73.69		0.07785	10	BGM	0.007785	65.19	
TCEYA213D	A	C2	1	2	72.63	9.322	0.08052	10	HAB	0.008052	66.45	8.530
TCEYA214D	A	C2	1	2	69.68	9.375	0.08218	10	HAB	0.008218	65.08	8.756
TCEYB111D	B	C1	2	1	72.29	8.738	0.08682	10	BAT	0.008682	71.31	8.621
TCEYB112D	B	C1	2	1	62.75	8.574	0.08773	10	BAB	0.008773	62.56	8.548
TCEYB113D	B	C1	2	1	69.11	8.544	0.08813	10	M(B,H)AB	0.008813	69.21	8.557
TCEYB211D	B	C2	2	2	66.65	8.534	0.08688	10	BGM	0.008688	65.80	8.426
TCEYB212D	B	C2	2	2	68.07	8.561	0.08797	10	BAT	0.008797	68.04	8.558
TCEYB213D	B	C2	2	2	69.24	8.523	0.08890	10	HAB/HIB	0.008890	69.94	8.610
TCEYC111D	C	C1	3	1	66.02	8.530	0.08782	10	BAT	0.008782	65.88	8.512
TCEYC112D	C	C1	3	1	67.77	8.661	0.08868	10	BAB	0.008868	68.29	8.729
TCEYC113D	C	C1	3	1	59.62	8.176	0.08985	10	BAT	0.008985	60.87	8.348
TCEYC211D	C	C2	3	2	64.53	8.301	0.08887	10	BAB	0.008887	65.17	8.383
TCEYC212D	C	C2	3	2	59.23	8.351	0.08857	10	BGM	0.008857	59.61	8.405
TCEYC213D	C	C2	3	2	65.20	8.457	0.08773	10	BAB	0.008773	65.00	8.431

* Specimen was not gaged, only strength is reported.

	Strength [ksi]	Modulus [Msi]			$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
Average	**67.75**	**8.699**		**$Average_{norm}$**	**0.008591**	**66.02**	**8.524**
Standard Dev.	**4.283**	**0.3653**		**Standard $Dev._{norm}$**		**3.082**	**0.1239**
Coeff. of Var. [%]	**6.322**	**4.200**		**Coeff. of Var. $[\%]_{norm}$**		**4.668**	**1.453**
Min.	**59.23**	**8.176**		**Min.**	**0.007785**	**59.61**	**8.317**
Max.	**74.77**	**9.375**		**Max.**	**0.008985**	**71.31**	**8.756**
Number of Spec.	**19**	**18**		**Number of Spec.**	**19**	**19**	**18**


Laminate Unnotched Compression Properties (UNC3)--ETW1 (180°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Unnotched Compression Strength [ksi]
0
10
20
30
40
50
60
70
80
0
1
2
3
4
5


Laminate Unnotched Compression Properties (UNC3)--ETW1 (180°F)
Normalized Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Unnotched Compression Modulus [Msi]
0
1
2
3
4
5
6
7
8
9
10
0
1
2
3
4
5

Laminate Unnotched Compression Properties (UNC3)--ETW2 (250°F)
Strength & Modulus

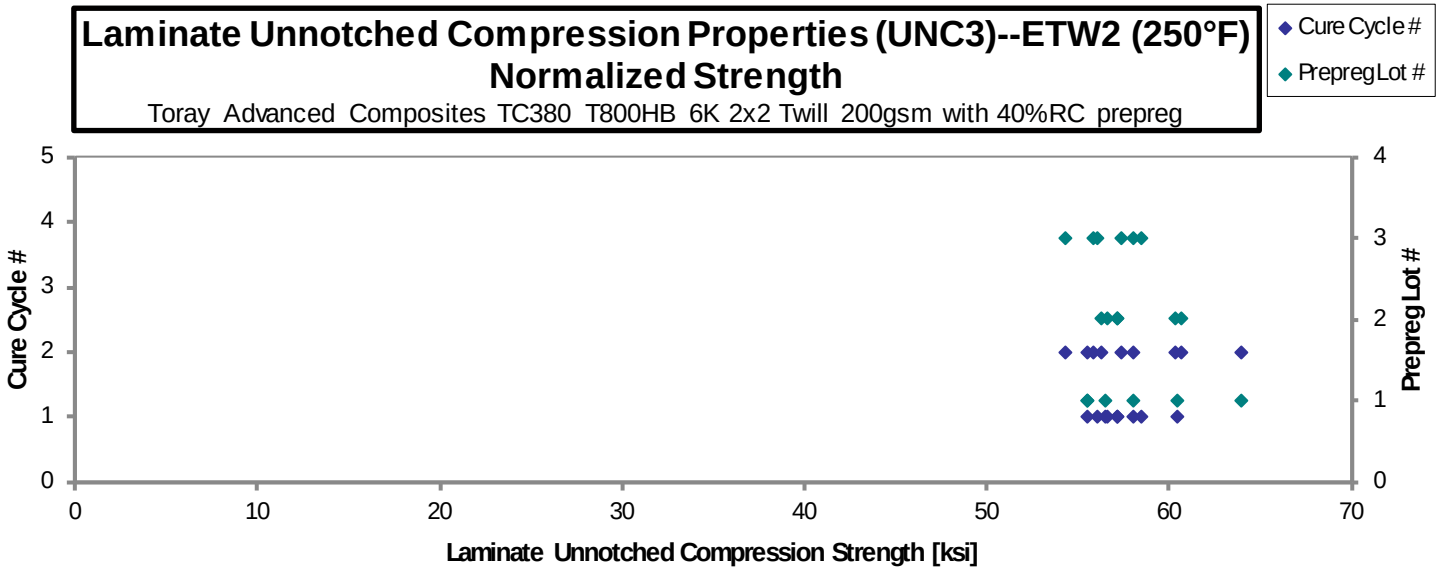
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

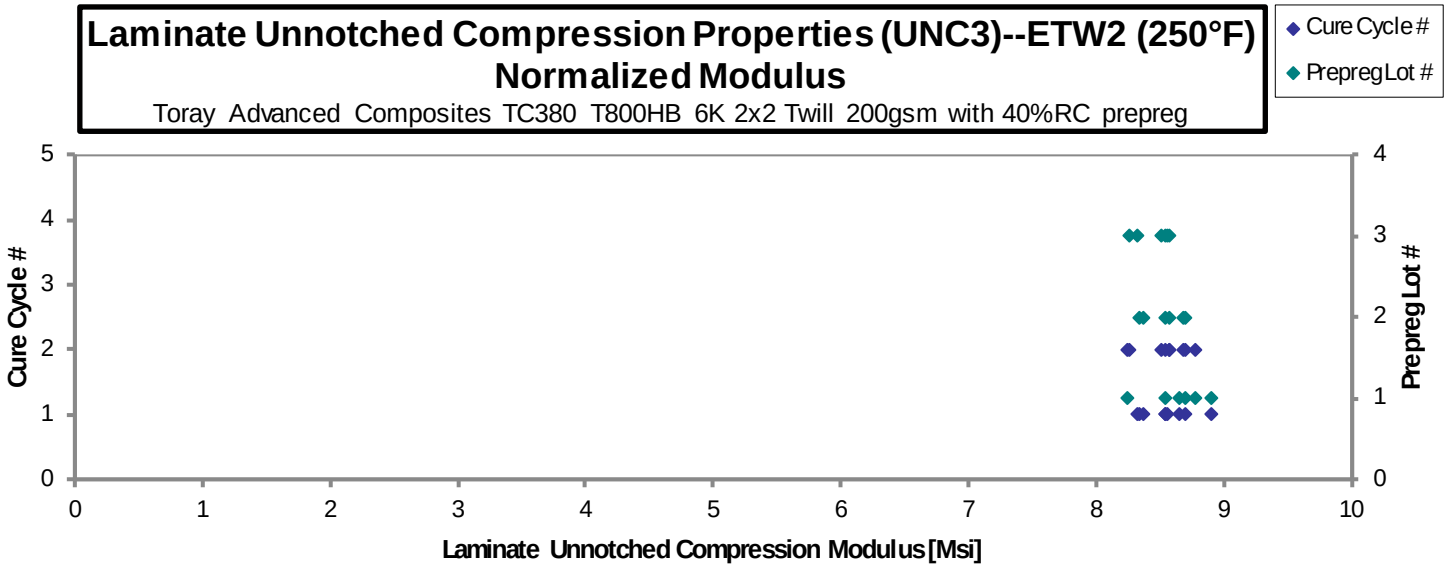
normalizing t_{ply} [in]: 0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
TCEYA111E	A	C1	1	1	57.94	9.129	0.08577	10	M(B,H)GM	0.008577	56.47	8.898
TCEYA112E	A	C1	1	1	55.99	8.762	0.08730	10	HAT/HIT	0.008730	55.55	8.692
TCEYA113E	A	C1	1	1	60.36	8.625	0.08820	10	HAT, HIT	0.008820	60.50	8.645
TCEYA211E	A	C2	1	2	57.43	9.092	0.08502	10	BAB	0.008502	55.48	8.784
TCEYA212E	A	C2	1	2	58.41	8.608	0.08740	10	M(B,H)GM	0.008740	58.01	8.549
TCEYA213E	A	C2	1	2	63.76	8.228	0.08822	10	BAB	0.008822	63.91	8.248
TCEYB111E	B	C1	2	1	56.65	8.276	0.08872	10	M(B,H)AT	0.008872	57.12	8.344
TCEYB112E	B	C1	2	1	57.41	8.396	0.08768	10	M(B,H)AT	0.008768	57.20	8.366
TCEYB113E	B	C1	2	1	57.90	8.736	0.08607	10	M(B,H)AT	0.008607	56.63	8.544
TCEYB211E	B	C2	2	2	59.89	8.619	0.08862	10	M(B,H)AT	0.008862	60.31	8.680
TCEYB212E	B	C2	2	2	60.37	8.666	0.08838	10	BAB, HIT	0.008838	60.63	8.703
TCEYB213E	B	C2	2	2	57.01	8.677	0.08688	10	M(B,H)GM	0.008688	56.29	8.566
TCEYC111E	C	C1	3	1	57.58	8.208	0.08932	10	BAB	0.008932	58.45	8.331
TCEYC112E	C	C1	3	1	57.42	8.451	0.08893	10	BAT	0.008893	58.03	8.541
TCEYC113E	C	C1	3	1	56.44	8.611	0.08750	10	BAB	0.008750	56.12	8.562
TCEYC211E	C	C2	3	2	56.14	8.303	0.08760	10	BAT	0.008760	55.89	8.265
TCEYC212E	C	C2	3	2	54.91	8.593	0.08712	10	BAB	0.008712	54.36	8.507
TCEYC213E	C	C2	3	2	58.24	8.694	0.08675	10	M(B,H)GM	0.008675	57.41	8.570

	Strength [ksi]	Modulus [Msi]
Average	**57.99**	**8.593**
Standard Dev.	**2.052**	**0.2584**
Coeff. of Var. [%]	**3.538**	**3.007**
Min.	**54.91**	**8.208**
Max.	**63.76**	**9.129**
Number of Spec.	**18**	**18**

	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
$Average_{norm}$	**0.008753**	**57.69**	**8.544**
$Standard\ Dev._{norm}$		**2.357**	**0.1789**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**4.085**	**2.093**
Min.	**0.008502**	**54.36**	**8.248**
Max.	**0.008932**	**63.91**	**8.898**
Number of Spec.	**18**	**18**	**18**


Laminate Unnotched Compression Properties (UNC3)--ETW2 (250°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Unnotched Compression Strength [ksi]
0
10
20
30
40
50
60
70
0
1
2
3
4
5


Laminate Unnotched Compression Properties (UNC3)--ETW2 (250°F)
Normalized Modulus
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Unnotched Compression Modulus [Msi]
0
1
2
3
4
5
6
7
8
9
10
0
1
2
3
4
5

4.13 "25/50/25" Open-Hole Tension 1 Properties (OHT1)

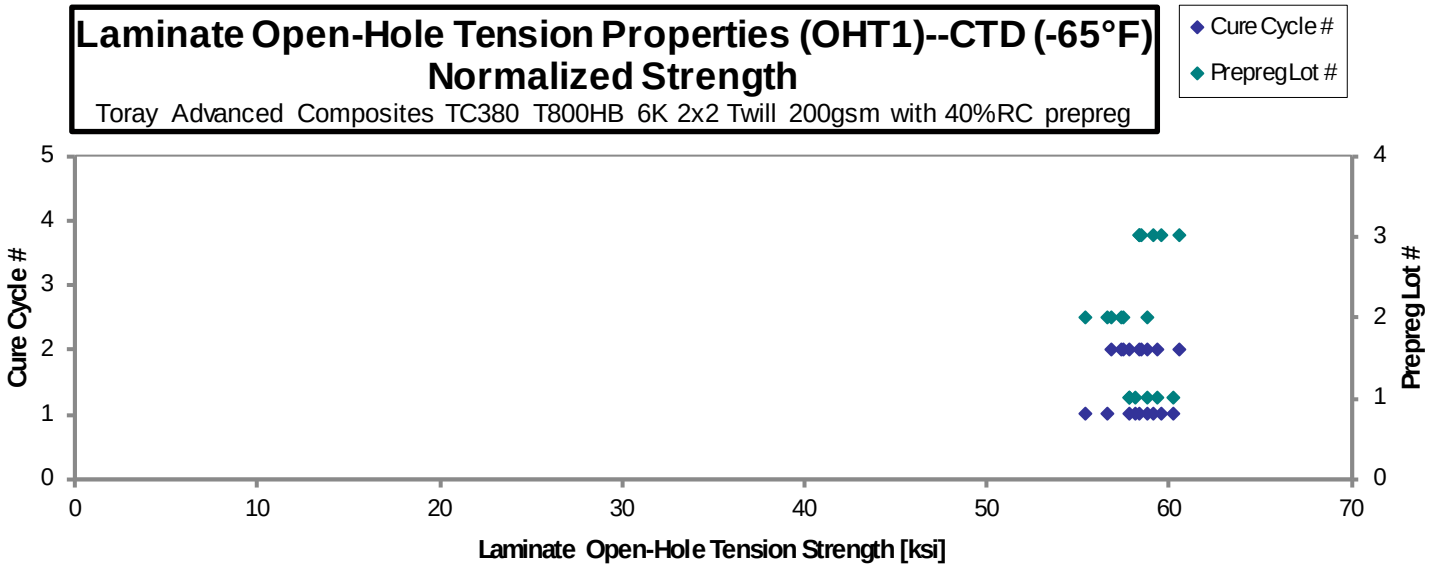
Laminate Open-Hole Tension Properties (OHT1)--CTD (-65°F)
Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCEDA111B	A	C1	1	1	55.94	0.1463	16	LGM	0.009146	58.14
TCEDA112B	A	C1	1	1	58.06	0.1461	16	LGM	0.009130	60.24
TCEDA113B	A	C1	1	1	55.64	0.1463	16	LGM	0.009141	57.80
TCEDA211B	A	C2	1	2	56.84	0.1471	16	LGM	0.009196	59.40
TCEDA212B	A	C2	1	2	56.37	0.1468	16	LGM	0.009173	58.76
TCEDA213B	A	C2	1	2	55.45	0.1468	16	LGM	0.009177	57.82
TCEDB111B	B	C1	2	1	54.36	0.1468	16	LGM	0.009172	56.65
TCEDB112B	B	C1	2	1	56.68	0.1460	16	LGM	0.009122	58.76
TCEDB113B	B	C1	2	1	53.49	0.1459	16	LGM	0.009121	55.44
TCEDB211B	B	C2	2	2	56.84	0.1424	16	LGM	0.008901	57.49
TCEDB212B	B	C2	2	2	56.61	0.1427	16	LGM	0.008916	57.35
TCEDB213B	B	C2	2	2	55.64	0.1439	16	LGM	0.008993	56.85
TCEDC111B	C	C1	3	1	57.73	0.1443	16	LGM	0.009017	59.15
TCEDC112B	C	C1	3	1	58.42	0.1436	16	LGM	0.008973	59.57
TCEDC113B	C	C1	3	1	57.27	0.1435	16	LGM	0.008969	58.37
TCEDC211B	C	C2	3	2	60.14	0.1418	16	LGM	0.008864	60.57
TCEDC212B	C	C2	3	2	57.70	0.1427	16	LGM	0.008916	58.45
TCEDC213B	C	C2	3	2	57.57	0.1427	16	LGM	0.008920	58.36

Average	**56.71**	
Standard Dev.	**1.537**	
Coeff. of Var. [%]	**2.710**	
Min.	**53.49**	
Max.	**60.14**	
Number of Spec.	**18**	

$Average_{norm}$	**0.009047**	**58.29**
$Standard\ Dev._{norm}$		**1.283**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**2.200**
Min.	**0.008864**	**55.44**
Max.	**0.009196**	**60.57**
Number of Spec.	**18**	**18**


Laminate Open-Hole Tension Properties (OHT1)--CTD (-65°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Open-Hole Tension Strength [ksi]
0
10
20
30
40
50
60
70
0
1
2
3
4
5

Laminate Open-Hole Tension Properties (OHT1)--RTD (70°F)
Strength

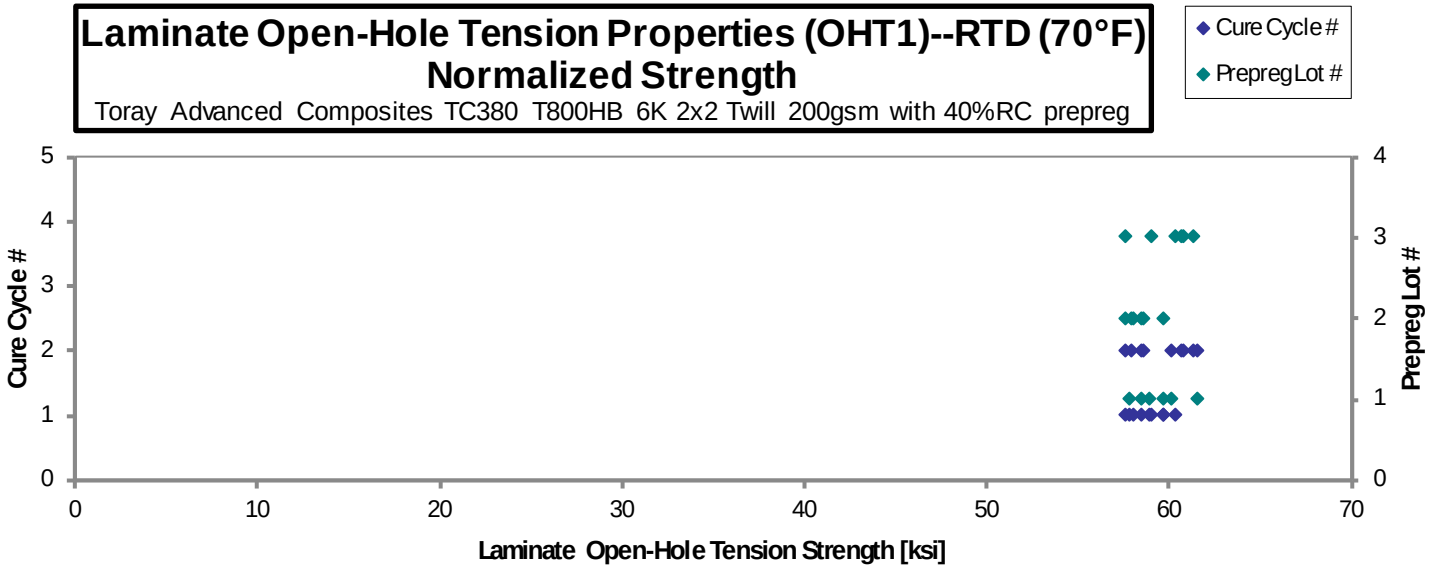
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCEDA111A	A	C1	1	1	60.48	0.1372	16	M(A,L)GM	0.008577	58.95
TCEDA112A	A	C1	1	1	56.74	0.1435	16	M(A,L)GM	0.008970	57.84
TCEDA113A	A	C1	1	1	57.31	0.1467	16	M(A,L)GM	0.009167	59.70
TCEDA211A	A	C2	1	2	60.13	0.1369	16	M(A,L)GM	0.008554	58.45
TCEDA212A	A	C2	1	2	59.94	0.1445	16	M(A,L)GM	0.009030	61.51
TCEDA213A	A	C2	1	2	57.33	0.1477	16	M(A,L)GM	0.009232	60.15
TCEDB111A	B	C1	2	1	63.07	0.1332	16	M(A,L)GM	0.008322	59.65
TCEDB112A	B	C1	2	1	58.19	0.1404	16	M(A,L)GM	0.008773	58.01
TCEDB113A	B	C1	2	1	56.68	0.1452	16	M(A,L)GM	0.009077	58.47
TCEDB211A	B	C2	2	2	60.54	0.1340	16	M(A,L)GM	0.008374	57.61
TCEDB212A	B	C2	2	2	58.41	0.1413	16	M(A,L)GM	0.008833	58.64
TCEDB213A	B	C2	2	2	56.35	0.1449	16	M(A,L)GM	0.009056	57.99
TCEDC111A	C	C1	3	1	59.13	0.1371	16	LGM	0.008570	57.58
TCEDC112A	C	C1	3	1	59.77	0.1421	16	LGM	0.008879	60.31
TCEDC113A	C	C1	3	1	57.62	0.1442	16	LGM	0.009009	58.99
TCEDC211A	C	C2	3	2	62.60	0.1367	16	LGM	0.008544	60.77
TCEDC212A	C	C2	3	2	60.77	0.1421	16	LGM	0.008880	61.33
TCEDC213A	C	C2	3	2	59.81	0.1430	16	LGM	0.008934	60.72

Average	**59.16**	
Standard Dev.	**1.974**	
Coeff. of Var. [%]	**3.337**	
Min.	**56.35**	
Max.	**63.07**	
Number of Spec.	**18**	

$Average_{norm}$	**0.008821**	**59.26**
$Standard\ Dev._{norm}$		**1.297**
Coeff. of Var. [%]$_{norm}$		**2.188**
Min.	**0.008322**	**57.58**
Max.	**0.009232**	**61.51**
Number of Spec.	**18**	**18**


Laminate Open-Hole Tension Properties (OHT1)--RTD (70°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
5
0
10
20
30
40
50
60
70
Laminate Open-Hole Tension Strength [ksi]

Laminate Open-Hole Tension Properties (OHT1)--ETD1 (180°F)
Strength

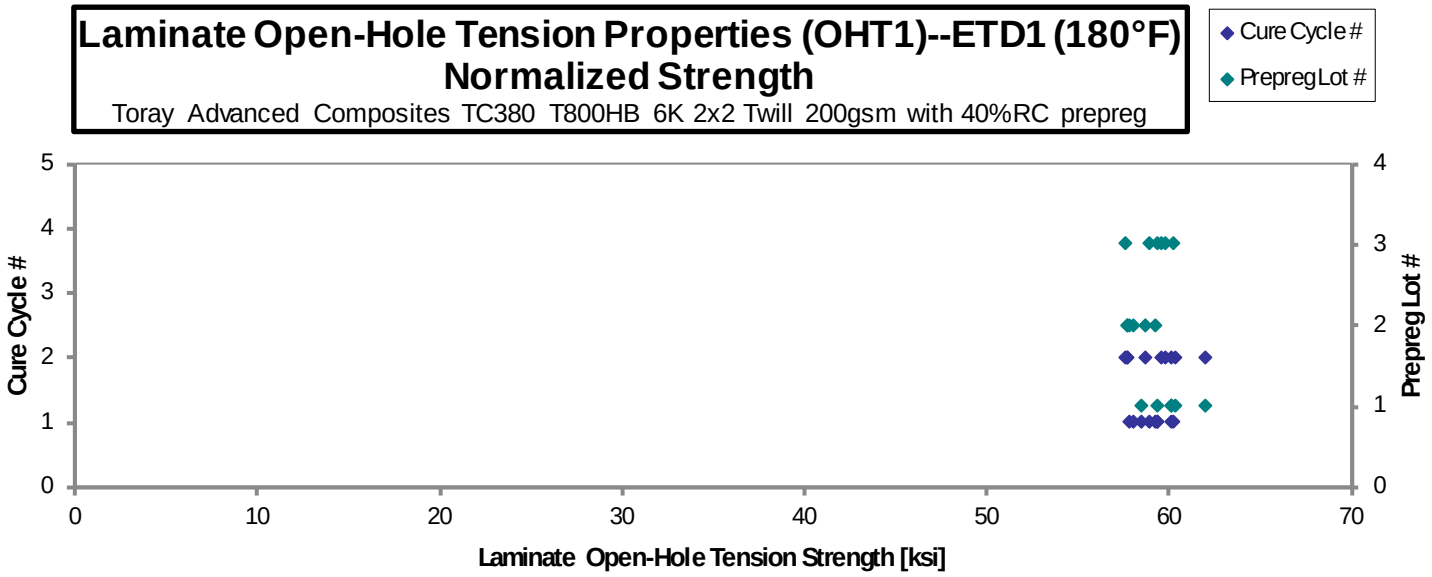
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCEDA111C	A	C1	1	1	56.07	0.1467	16	LGM	0.009170	58.43
TCEDA112C	A	C1	1	1	58.40	0.1432	16	M(A,L)GM	0.008951	59.40
TCEDA113C	A	C1	1	1	61.56	0.1376	16	LGM	0.008600	60.16
TCEDA211C	A	C2	1	2	59.19	0.1474	16	LGM	0.009210	61.95
TCEDA212C	A	C2	1	2	59.13	0.1437	16	LGM	0.008980	60.34
TCEDA213C	A	C2	1	2	62.14	0.1362	16	LGM	0.008513	60.11
TCEDB111C	B	C1	2	1	55.82	0.1459	16	M(A,L)GM	0.009121	57.85
TCEDB112C	B	C1	2	1	58.79	0.1418	16	LGM	0.008865	59.23
TCEDB113C	B	C1	2	1	60.58	0.1348	16	AGM	0.008424	57.99
TCEDB211C	B	C2	2	2	57.75	0.1432	16	LGM	0.008949	58.72
TCEDB212C	B	C2	2	2	58.23	0.1395	16	M(A,L)GM	0.008716	57.67
TCEDB213C	B	C2	2	2	61.65	0.1319	16	AGM	0.008245	57.76
TCEDC111C	C	C1	3	1	57.58	0.1442	16	LGM	0.009014	58.97
TCEDC112C	C	C1	3	1	58.78	0.1422	16	M(A,L)GM	0.008884	59.34
TCEDC113C	C	C1	3	1	61.49	0.1379	16	LGM	0.008617	60.21
TCEDC211C	C	C2	3	2	58.58	0.1439	16	LGM	0.008991	59.85
TCEDC212C	C	C2	3	2	57.19	0.1419	16	LGM	0.008867	57.62
TCEDC213C	C	C2	3	2	60.96	0.1376	16	LGM	0.008602	59.59

Average	**59.10**	
Standard Dev.	**1.920**	
Coeff. of Var. [%]	**3.248**	
Min.	**55.82**	
Max.	**62.14**	
Number of Spec.	**18**	

$Average_{norm}$	**0.008818**	**59.18**
$Standard\ Dev._{norm}$		**1.172**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**1.980**
Min.	**0.008245**	**57.62**
Max.	**0.009210**	**61.95**
Number of Spec.	**18**	**18**


Laminate Open-Hole Tension Properties (OHT1)--ETD1 (180°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Open-Hole Tension Strength [ksi]
0
10
20
30
40
50
60
70
0
1
2
3
4
5

Laminate Open-Hole Tension Properties (OHT1)--ETW1 (180°F)
Strength

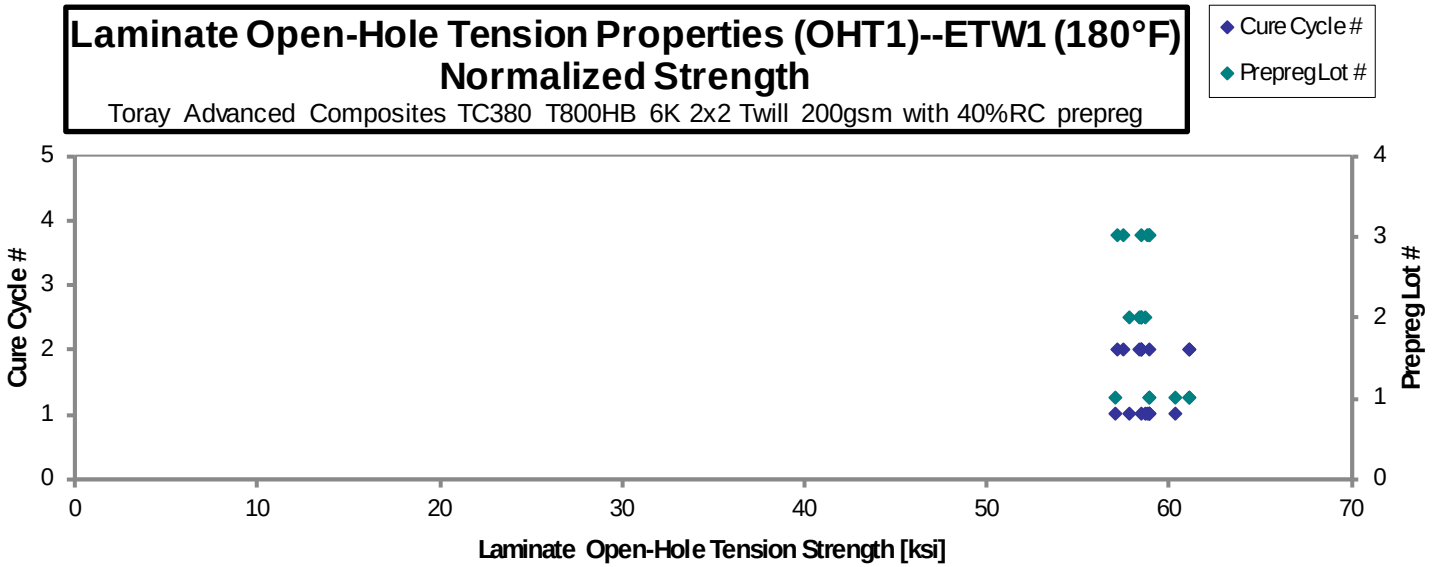
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCEDA111D	A	C1	1	1	59.25	0.1434	16	M(A,L)GM	0.008965	60.35
TCEDA112D	A	C1	1	1	56.66	0.1463	16	M(A,L)GM	0.009145	58.88
TCEDA113D	A	C1	1	1	55.07	0.1458	16	M(A,L)GM	0.009113	57.03
TCEDA211D	A	C2	1	2	58.12	0.1428	16	AGM	0.008927	58.96
TCEDA212D	A	C2	1	2	58.54	0.1470	16	M(A,L)GM	0.009186	61.11
TCEDA213D	A	C2	1	2	58.49	0.1471	16	M(A,L)GM	0.009191	61.08
TCEDB111D	B	C1	2	1	58.34	0.1417	16	M(A,L)GM	0.008853	58.69
TCEDB112D	B	C1	2	1	55.83	0.1458	16	M(A,L)GM	0.009111	57.80
TCEDB113D	B	C1	2	1	56.12	0.1467	16	M(A,L)GM	0.009168	58.46
TCEDB211D	B	C2	2	2	57.92	0.1419	16	M(A,L)GM	0.008871	58.39
TCEDB212D	B	C2	2	2	56.61	0.1456	16	M(A,L)GM	0.009097	58.52
TCEDB213D	B	C2	2	2	56.70	0.1454	16	M(A,L)GM	0.009084	58.53
TCEDC111D	C	C1	3	1	58.57	0.1417	16	LGM	0.008855	58.94
TCEDC112D	C	C1	3	1	57.65	0.1436	16	LGM	0.008977	58.81
TCEDC113D	C	C1	3	1	57.81	0.1435	16	M(A,L)GM	0.008970	58.93
TCEDC211D	C	C2	3	2	55.78	0.1442	16	LGM	0.009011	57.12
TCEDC212D	C	C2	3	2	56.49	0.1433	16	LGM	0.008954	57.48
TCEDC213D	C	C2	3	2	57.62	0.1429	16	LGM	0.008930	58.47

Average	**57.31**	
Standard Dev.	**1.181**	
Coeff. of Var. [%]	**2.061**	
Min.	**55.07**	
Max.	**59.25**	
Number of Spec.	**18**	

$Average_{norm}$	**0.009023**	**58.75**
$Standard\ Dev._{norm}$		**1.143**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**1.946**
Min.	**0.008853**	**57.03**
Max.	**0.009191**	**61.11**
Number of Spec.	**18**	**18**


Laminate Open-Hole Tension Properties (OHT1)--ETW1 (180°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Open-Hole Tension Strength [ksi]
0
10
20
30
40
50
60
70
0
1
2
3
4
5

Laminate Open-Hole Tension Properties (OHT1)--ETW2 (250°F)
Strength

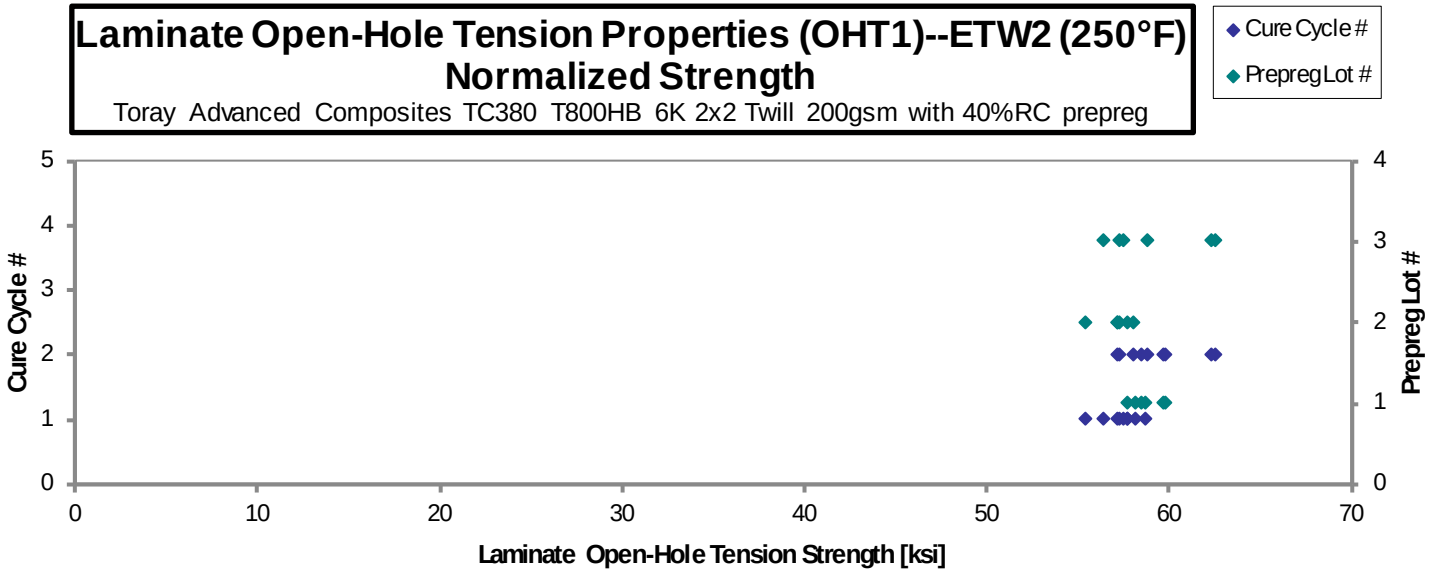
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCEDA111E	A	C1	1	1	56.58	0.1448	16	M(A,L)GM	0.009051	58.20
TCEDA112E	A	C1	1	1	56.70	0.1456	16	M(A,L)GM	0.009102	58.65
TCEDA113E	A	C1	1	1	55.62	0.1462	16	M(A,L)GM	0.009135	57.74
TCEDA211E	A	C2	1	2	57.93	0.1454	16	AGM	0.009085	59.81
TCEDA212E	A	C2	1	2	56.56	0.1457	16	AGM	0.009106	58.52
TCEDA213E	A	C2	1	2	58.66	0.1434	16	AGM	0.008960	59.73
TCEDB111E	B	C1	2	1	53.37	0.1461	16	AGM	0.009133	55.39
TCEDB112E	B	C1	2	1	54.76	0.1469	16	AGM	0.009181	57.13
TCEDB113E	B	C1	2	1	55.88	0.1454	16	M(A,L)GM	0.009089	57.72
TCEDB211E	B	C2	2	2	55.77	0.1444	16	AGM	0.009024	57.19
TCEDB212E	B	C2	2	2	55.57	0.1450	16	M(A,L)GM	0.009064	57.23
TCEDB213E	B	C2	2	2	56.83	0.1439	16	AGM	0.008995	58.09
TCEDC111E	C	C1	3	1	56.07	0.1417	16	M(A,L)GM	0.008855	56.42
TCEDC112E	C	C1	3	1	55.88	0.1443	16	M(A,L)GM	0.009017	57.26
TCEDC113E	C	C1	3	1	56.71	0.1428	16	AGM	0.008926	57.53
TCEDC211E	C	C2	3	2	57.73	0.1434	16	M(A,L)GM	0.008964	58.80
TCEDC212E	C	C2	3	2	60.74	0.1450	16	M(A,L)GM	0.009060	62.54
TCEDC213E	C	C2	3	2	62.03	0.1416	16	AGM	0.008847	62.36

	Strength [ksi]	$Strength_{norm}$ [ksi]
Average	56.86	58.35
Standard Dev.	2.039	1.835
Coeff. of Var. [%]	3.586	3.145
Min.	53.37	55.39
Max.	62.03	62.54
Number of Spec.	18	18

	t_{ply} [in]	$Strength_{norm}$ [ksi]
$Average_{norm}$	0.009033	58.35
$Standard\ Dev._{norm}$		1.835
$Coeff.\ of\ Var.\ [\%]_{norm}$		3.145
Min.	0.008847	55.39
Max.	0.009181	62.54
Number of Spec.	18	18


Laminate Open-Hole Tension Properties (OHT1)--ETW2 (250°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Open-Hole Tension Strength [ksi]
0
10
20
30
40
50
60
70
0
1
2
3
4
5

4.14 "10/80/10" Open-Hole Tension 2 Properties (OHT2)

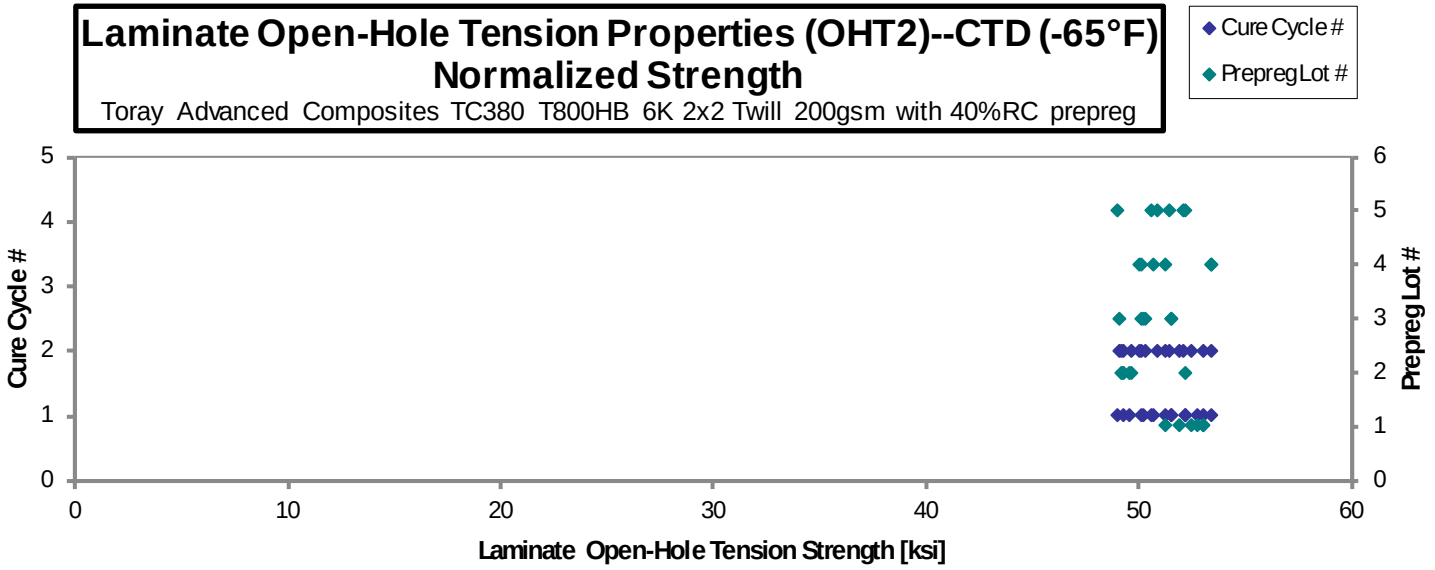
Laminate Open-Hole Tension Properties (OHT2)--CTD (-65°F)
Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCEEA111B	A	C1	1	1	51.49	0.09062	10	AGM	0.009062	53.02
TCEEA112B	A	C1	1	1	51.47	0.09027	10	AGM	0.009027	52.79
TCEEA113B	A	C1	1	1	49.70	0.09077	10	AGM	0.009077	51.26
TCEEA211B	A	C2	1	2	51.08	0.09138	10	AGM	0.009138	53.04
TCEEA212B	A	C2	1	2	50.91	0.09077	10	AGM	0.009077	52.51
TCEEA213B	A	C2	1	2	50.08	0.09127	10	AGM	0.009127	51.93
TCEEB111B	B	C1	2	1	48.07	0.09068	10	AGM	0.009068	49.53
TCEEB112B	B	C1	2	1	48.17	0.09012	10	AGM	0.009012	49.32
TCEEB113B	B	C1	2	1	50.68	0.09057	10	AGM	0.009057	52.16
TCEEB211B	B	C2	2	2	47.79	0.09082	10	AGM	0.009082	49.32
TCEEB212B	B	C2	2	2	47.68	0.09167	10	AGM	0.009167	49.66
TCEEB213B	B	C2	2	2	47.31	0.09150	10	AGM	0.009150	49.19
TCEEC111B	C	C1	3	1	50.52	0.08747	10	AGM	0.008747	50.21
TCEEC112B	C	C1	3	1	51.85	0.08743	10	AGM	0.008743	51.51
TCEEC114B	C	C1	3	1	51.44	0.08817	10	AGM	0.008817	51.53
TCEEC211B	C	C2	3	2	49.89	0.08875	10	AGM	0.008875	50.32
TCEEC212B	C	C2	3	2	49.47	0.08908	10	AGM	0.008908	50.08
TCEEC213B	C	C2	3	2	48.25	0.08948	10	AGM	0.008948	49.06
TCEED111B	D	C1	4	1	51.21	0.09178	10	AGM	0.009178	53.41
TCEED112B	D	C1	4	1	49.36	0.08943	10	AGM	0.008943	50.16
TCEED113B	D	C1	4	1	53.56	0.08323	10	AGM	0.008323	50.66
TCEED211B	D	C2	4	2	48.22	0.09353	10	AGM	0.009353	51.25
TCEED212B	D	C2	4	2	51.58	0.09108	10	AGM	0.009108	53.38
TCEED213B	D	C2	4	2	50.39	0.08735	10	AGM	0.008735	50.02
TCEEE111B	E	C1	5	1	50.02	0.09187	10	AGM	0.009187	52.22
TCEEE112B	E	C1	5	1	48.37	0.08907	10	AGM	0.008907	48.96
TCEEE113B	E	C1	5	1	52.70	0.08452	10	AGM	0.008452	50.61
TCEEE211B	E	C2	5	2	50.42	0.09088	10	AGM	0.009088	52.07
TCEEE212B	E	C2	5	2	50.19	0.08920	10	AGM	0.008920	50.87
TCEEE213B	E	C2	5	2	53.60	0.08448	10	AGM	0.008448	51.46

Average	**50.18**	
Standard Dev.	**1.693**	
Coeff. of Var. [%]	**3.374**	
Min.	**47.31**	
Max.	**53.60**	
Number of Spec.	**30**	

$Average_{norm}$	**0.008957**	**51.05**
Standard $Dev._{norm}$		**1.384**
Coeff. of Var. $[\%]_{norm}$		**2.711**
Min.	**0.008323**	**48.96**
Max.	**0.009353**	**53.41**
Number of Spec.	**30**	**30**


Laminate Open-Hole Tension Properties (OHT2)--CTD (-65°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
5
6
0
10
20
30
40
50
60
Laminate Open-Hole Tension Strength [ksi]

Laminate Open-Hole Tension Properties (OHT2)--RTD (70°F)
Strength

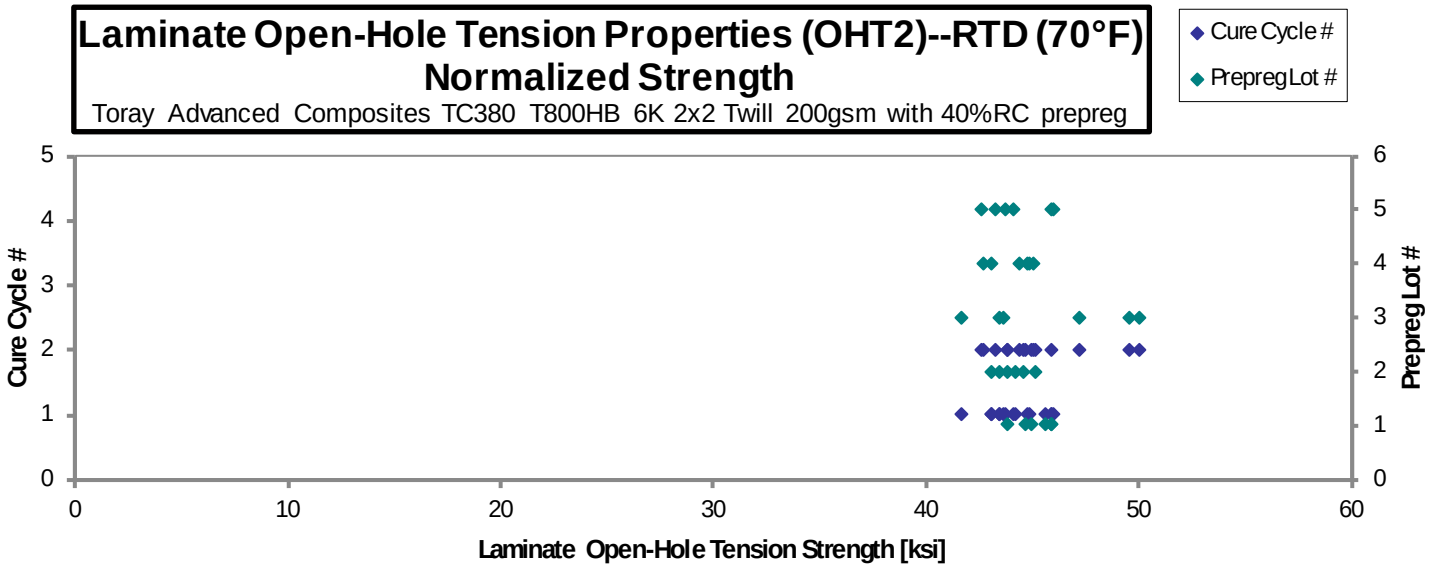
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]: 0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCEEA111A	A	C1	1	1	47.73	0.08417	10	AGM	0.008417	45.65
TCEEA112A	A	C1	1	1	45.04	0.08968	10	AGM	0.008968	45.90
TCEEA113A	A	C1	1	1	44.33	0.09112	10	AGM	0.009112	45.90
TCEEA211A	A	C2	1	2	45.19	0.08543	10	AGM	0.008543	43.88
TCEEA212A	A	C2	1	2	43.97	0.09003	10	AGM	0.009003	44.98
TCEEA213A	A	C2	1	2	42.66	0.09220	10	AGM	0.009220	44.69
TCEEB111A	B	C1	2	1	45.36	0.08353	10	AGM	0.008353	43.05
TCEEB112A	B	C1	2	1	43.05	0.08890	10	AGM	0.008890	43.49
TCEEB113A	B	C1	2	1	42.28	0.09195	10	AGM	0.009195	44.17
TCEEB211A	B	C2	2	2	42.22	0.09128	10	AGM	0.009128	43.80
TCEEB212A	B	C2	2	2	43.08	0.09223	10	AGM	0.009223	45.16
TCEEB213A	B	C2	2	2	42.66	0.09190	10	AGM	0.009190	44.55
TCEEC111A	C	C1	3	1	45.16	0.08472	10	AGM	0.008472	43.47
TCEEC112A	C	C1	3	1	41.70	0.08792	10	AGM	0.008792	41.66
TCEEC113A	C	C1	3	1	43.41	0.08840	10	AGM	0.008840	43.61
TCEEC211A	C	C2	3	2	48.54	0.08558	10	AGM	0.008558	47.20
TCEEC212A	C	C2	3	2	49.25	0.08858	10	AGM	0.008858	49.58
TCEEC213A	C	C2	3	2	49.09	0.08962	10	AGM	0.008962	49.99
TCEED111A	D	C1	4	1	46.75	0.08110	10	AGM	0.008110	43.09
TCEED112A	D	C1	4	1	44.66	0.08820	10	AGM	0.008820	44.76
TCEED113A	D	C1	4	1	43.03	0.09183	10	AGM	0.009183	44.90
TCEED211A	D	C2	4	2	45.68	0.08227	10	AGM	0.008227	42.70
TCEED212A	D	C2	4	2	44.40	0.08923	10	AGM	0.008923	45.02
TCEED213A	D	C2	4	2	41.71	0.09367	10	AGM	0.009367	44.40
TCEEE111A	E	C1	5	1	46.53	0.08275	10	AGM	0.008275	43.75
TCEEE112A	E	C1	5	1	43.82	0.08868	10	AGM	0.008868	44.16
TCEEE113A	E	C1	5	1	44.36	0.09123	10	AGM	0.009123	45.99
TCEEE211A	E	C2	5	2	46.12	0.08262	10	AGM	0.008262	43.30
TCEEE212A	E	C2	5	2	45.75	0.08820	10	AGM	0.008820	45.86
TCEEE213A	E	C2	5	2	41.40	0.09063	10	AGM	0.009063	42.64

Average	**44.63**	
Standard Dev.	**2.174**	
Coeff. of Var. [%]	**4.871**	
Min.	**41.40**	
Max.	**49.25**	
Number of Spec.	**30**	

$Average_{norm}$	**0.008826**	**44.71**
Standard $Dev._{norm}$		**1.831**
Coeff. of Var. $[\%]_{norm}$		**4.096**
Min.	**0.008110**	**41.66**
Max.	**0.009367**	**49.99**
Number of Spec.	**30**	**30**


Laminate Open-Hole Tension Properties (OHT2)--RTD (70°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
5
6
0
10
20
30
40
50
60
Laminate Open-Hole Tension Strength [ksi]

Laminate Open-Hole Tension Properties (OHT2)--ETD1 (180°F)
Strength

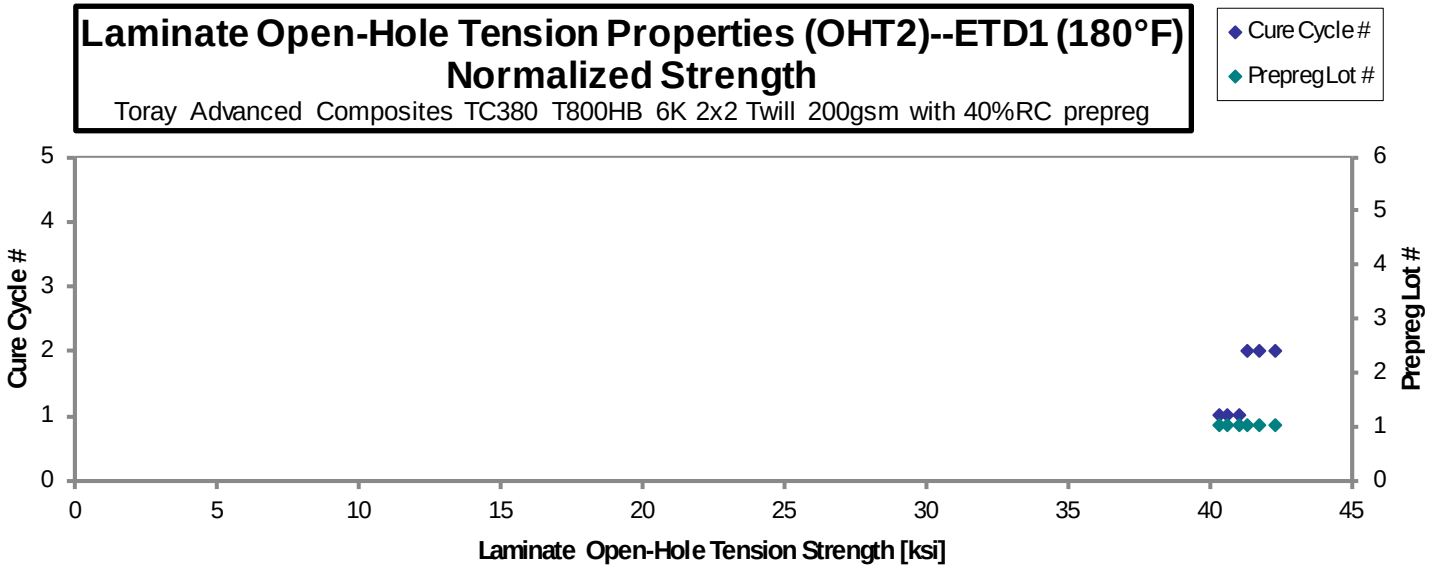
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCEEA111C	A	C1	1	1	39.11	0.09148	10	AGM	0.009148	40.66
TCEEA112C	A	C1	1	1	40.45	0.08923	10	AGM	0.008923	41.02
TCEEA113C	A	C1	1	1	42.17	0.08417	10	AGM	0.008417	40.33
TCEEA211C	A	C2	1	2	39.43	0.09230	10	AGM	0.009230	41.36
TCEEA212C	A	C2	1	2	41.41	0.08988	10	AGM	0.008988	42.30
TCEEA213C	A	C2	1	2	43.23	0.08502	10	AGM	0.008502	41.77

Average	**40.97**	
Standard Dev.	**1.602**	
Coeff. of Var. [%]	**3.910**	
Min.	**39.11**	
Max.	**43.23**	
Number of Spec.	**6**	

$Average_{norm}$	**0.008868**	**41.24**
$Standard\ Dev._{norm}$		**0.7249**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**1.758**
Min.	**0.008417**	**40.33**
Max.	**0.009230**	**42.30**
Number of Spec.	**6**	**6**


Laminate Open-Hole Tension Properties (OHT2)--ETD1 (180°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Open-Hole Tension Strength [ksi]
0
1
2
3
4
5
6
0
5
10
15
20
25
30
35
40
45

Laminate Open-Hole Tension Properties (OHT2)--ETW1 (180°F)
Strength

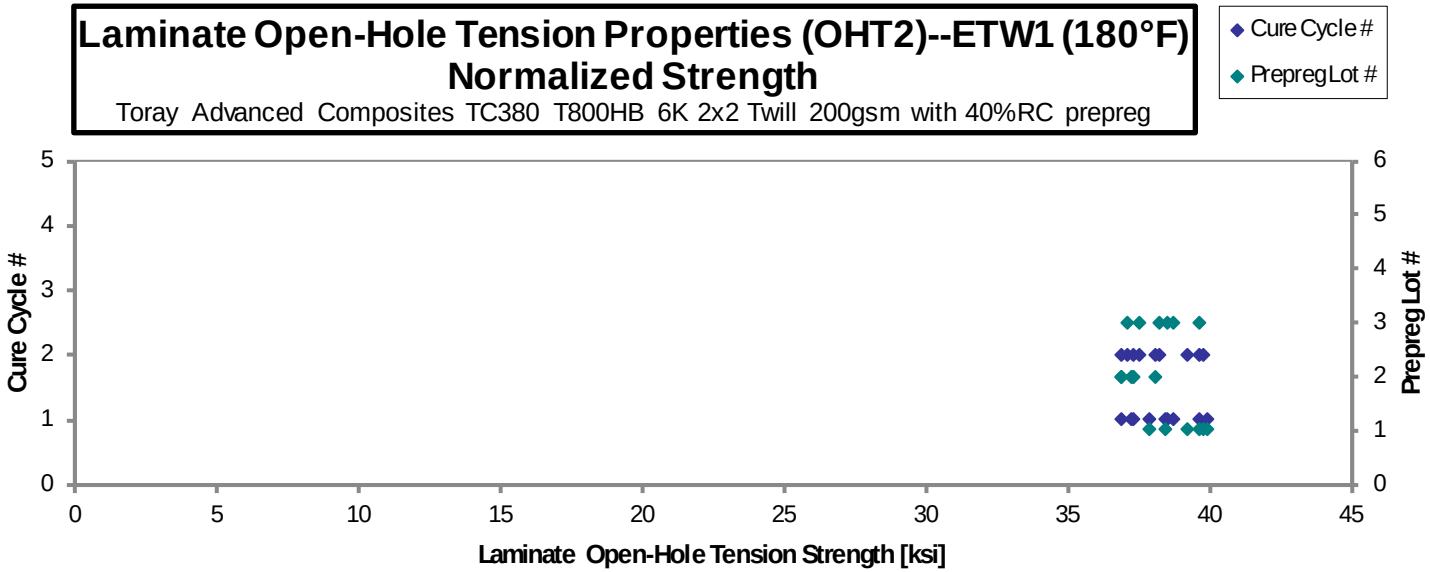
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCEEA111D	A	C1	1	1	39.21	0.08958	10	AGM	0.008958	39.92
TCEEA112D	A	C1	1	1	36.75	0.09077	10	AGM	0.009077	37.91
TCEEA113D	A	C1	1	1	37.45	0.09040	10	AGM	0.009040	38.47
TCEEA211D	A	C2	1	2	38.70	0.09015	10	AGM	0.009015	39.64
TCEEA212D	A	C2	1	2	37.56	0.09183	10	AGM	0.009183	39.19
TCEEA213D	A	C2	1	2	38.42	0.09118	10	AGM	0.009118	39.81
TCEEB111D	B	C1	2	1	36.25	0.09045	10	AGM	0.009045	37.26
TCEEB112D	B	C1	2	1	39.13	0.08292	10	AGM	0.008292	36.87
TCEEB113D	B	C1	2	1	36.86	0.08902	10	AGM	0.008902	37.29
TCEEB211D	B	C2	2	2	38.53	0.08420	10	AGM	0.008420	36.87
TCEEB212D	B	C2	2	2	36.58	0.09168	10	AGM	0.009168	38.11
TCEEB213D	B	C2	2	2	35.65	0.09217	10	AGM	0.009217	37.34
TCEEC111D	C	C1	3	1	38.50	0.08800	10	AGM	0.008800	38.50
TCEEC112D	C	C1	3	1	39.76	0.08768	10	AGM	0.008768	39.62
TCEEC113D	C	C1	3	1	40.21	0.08482	10	AGM	0.008482	38.75
TCEEC211D	C	C2	3	2	36.45	0.08948	10	AGM	0.008948	37.07
TCEEC212D	C	C2	3	2	37.38	0.08830	10	AGM	0.008830	37.50
TCEEC213D	C	C2	3	2	39.44	0.08530	10	AGM	0.008530	38.23

Average	**37.94**	
Standard Dev.	**1.342**	
Coeff. of Var. [%]	**3.537**	
Min.	**35.65**	
Max.	**40.21**	
Number of Spec.	**18**	

$Average_{norm}$	**0.008877**	**38.24**
$Standard\ Dev._{norm}$		**1.054**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**2.757**
Min.	**0.008292**	**36.87**
Max.	**0.009217**	**39.92**
Number of Spec.	**18**	**18**


Laminate Open-Hole Tension Properties (OHT2)--ETW1 (180°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Open-Hole Tension Strength [ksi]
0
1
2
3
4
5
6
0
5
10
15
20
25
30
35
40
45

Laminate Open-Hole Tension Properties (OHT2)--ETW2 (250°F)
Strength

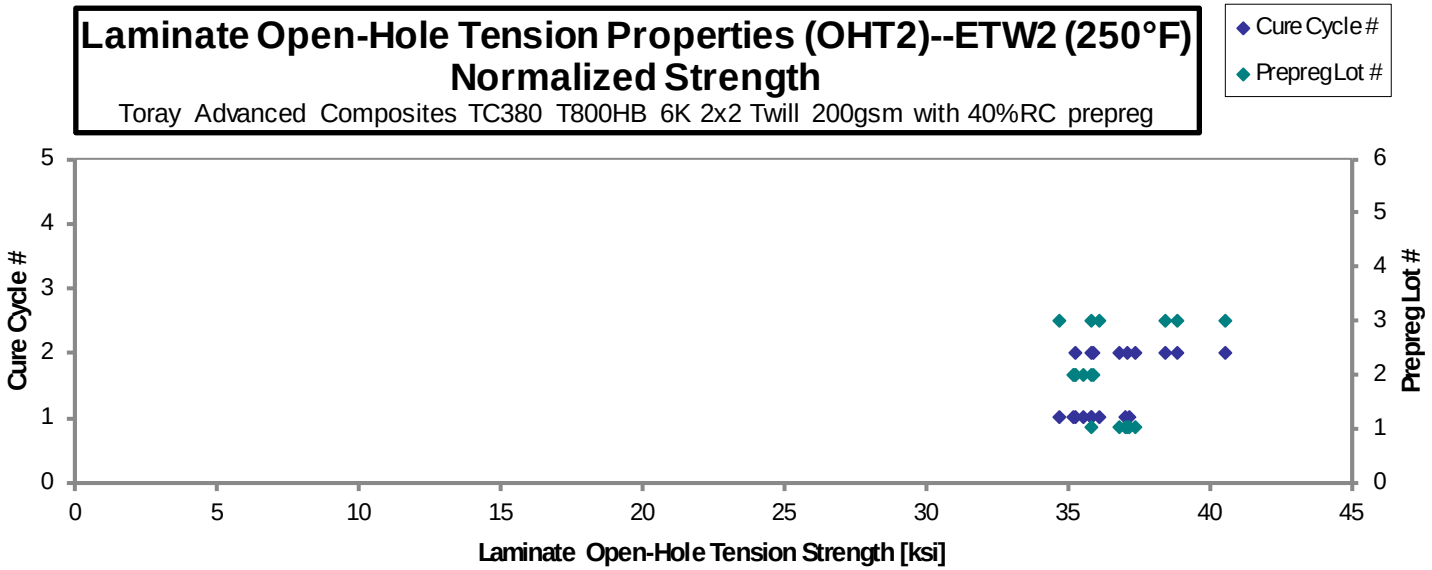
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCEEA111E	A	C1	1	1	35.30	0.08938	10	AGM	0.008938	35.86
TCEEA112E	A	C1	1	1	36.02	0.09075	10	AGM	0.009075	37.15
TCEEA113E	A	C1	1	1	35.90	0.09078	10	AGM	0.009078	37.04
TCEEA211E	A	C2	1	2	36.30	0.09002	10	AGM	0.009002	37.13
TCEEA212E	A	C2	1	2	36.06	0.09120	10	AGM	0.009120	37.37
TCEEA213E	A	C2	1	2	35.36	0.09157	10	AGM	0.009157	36.79
TCEEB111E	B	C1	2	1	34.57	0.08980	10	AGM	0.008980	35.27
TCEEB112E	B	C1	2	1	35.20	0.08890	10	AGM	0.008890	35.56
TCEEB113E	B	C1	2	1	34.40	0.09007	10	AGM	0.009007	35.21
TCEEB211E	B	C2	2	2	34.90	0.09057	10	AGM	0.009057	35.92
TCEEB212E	B	C2	2	2	33.77	0.09195	10	AGM	0.009195	35.29
TCEEB213E	B	C2	2	2	34.09	0.09253	10	AGM	0.009253	35.85
TCEEC111E	C	C1	3	1	35.49	0.08892	10	AGM	0.008892	35.86
TCEEC112E	C	C1	3	1	36.05	0.08808	10	AGM	0.008808	36.09
TCEEC113E	C	C1	3	1	34.76	0.08777	10	AGM	0.008777	34.67
TCEEC211E	C	C2	3	2	38.40	0.08810	10	AGM	0.008810	38.45
TCEEC212E	C	C2	3	2	38.23	0.08952	10	AGM	0.008952	38.89
TCEEC213E	C	C2	3	2	39.78	0.08968	10	AGM	0.008968	40.54

	Strength [ksi]	$Strength_{norm}$ [ksi]
Average	**35.81**	**36.61**
Standard Dev.	**1.576**	**1.499**
Coeff. of Var. [%]	**4.402**	**4.094**
Min.	**33.77**	**34.67**
Max.	**39.78**	**40.54**
Number of Spec.	**18**	**18**

	Avg. t_{ply} [in]
$Average_{norm}$	**0.008998**
Standard $Dev._{norm}$	
Coeff. of Var. $[\%]_{norm}$	
Min.	**0.008777**
Max.	**0.009253**
Number of Spec.	**18**


Laminate Open-Hole Tension Properties (OHT2)--ETW2 (250°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Open-Hole Tension Strength [ksi]
0
1
2
3
4
5
6
0
5
10
15
20
25
30
35
40
45

4.15 "40/20/40" Open-Hole Tension 3 Properties (OHT3)

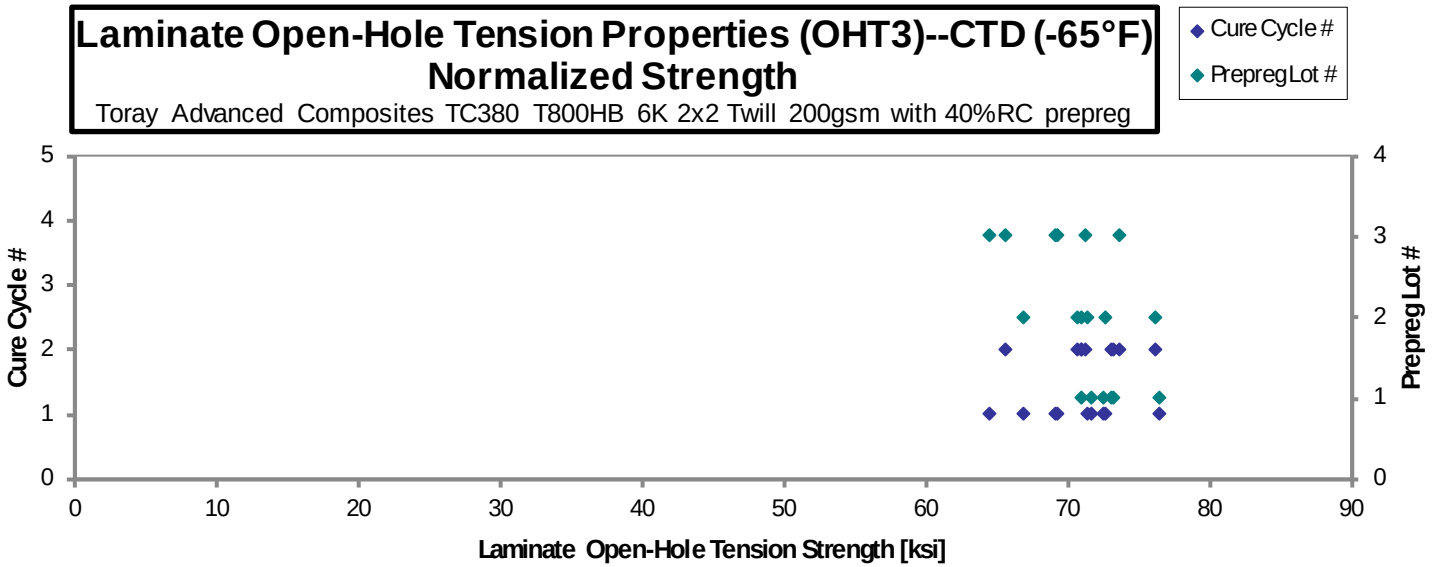
Laminate Open-Hole Tension Properties (OHT3)--CTD (-65°F)
Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCEFA111B	A	C1	1	1	69.21	0.09113	10	LGM	0.009113	71.67
TCEFA112B	A	C1	1	1	70.47	0.09052	10	LGM	0.009052	72.49
TCEFA113B	A	C1	1	1	74.31	0.09048	10	LGM	0.009048	76.41
TCEFA211B	A	C2	1	2	72.66	0.08868	10	LGM	0.008868	73.23
TCEFA212B	A	C2	1	2	70.22	0.08887	10	LGM	0.008887	70.91
TCEFA213B	A	C2	1	2	72.54	0.08865	10	LGM	0.008865	73.08
TCEFB111B	B	C1	2	1	71.02	0.09000	10	LGM	0.009000	72.64
TCEFB112B	B	C1	2	1	69.33	0.09053	10	LGM	0.009053	71.33
TCEFB113B	B	C1	2	1	64.80	0.09087	10	LGM	0.009087	66.91
TCEFB211B	B	C2	2	2	70.41	0.08867	10	LGM	0.008867	70.95
TCEFB212B	B	C2	2	2	76.11	0.08805	10	LGM	0.008805	76.15
TCEFB213B	B	C2	2	2	70.10	0.08880	10	LGM	0.008880	70.73
TCEFC111B	C	C1	3	1	68.82	0.08843	10	LGM	0.008843	69.16
TCEFC112B	C	C1	3	1	64.14	0.08838	10	LGM	0.008838	64.42
TCEFC113B	C	C1	3	1	69.02	0.08830	10	LGM	0.008830	69.26
TCEFC211B	C	C2	3	2	74.47	0.08695	10	LGM	0.008695	73.58
TCEFC212B	C	C2	3	2	66.68	0.08663	10	LGM	0.008663	65.65
TCEFC213B	C	C2	3	2	71.43	0.08775	10	LGM	0.008775	71.23

Average	**70.32**	
Standard Dev.	**3.134**	
Coeff. of Var. [%]	**4.457**	
Min.	**64.14**	
Max.	**76.11**	
Number of Spec.	**18**	

$Average_{norm}$	**0.008898**	**71.10**
Standard $Dev._{norm}$		**3.184**
Coeff. of Var. $[\%]_{norm}$		**4.478**
Min.	**0.008663**	**64.42**
Max.	**0.009113**	**76.41**
Number of Spec.	**18**	**18**


Laminate Open-Hole Tension Properties (OHT3)--CTD (-65°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Open-Hole Tension Strength [ksi]
0
10
20
30
40
50
60
70
80
90
0
1
2
3
4
5

Laminate Open-Hole Tension Properties (OHT3)--RTD (70°F)
Strength

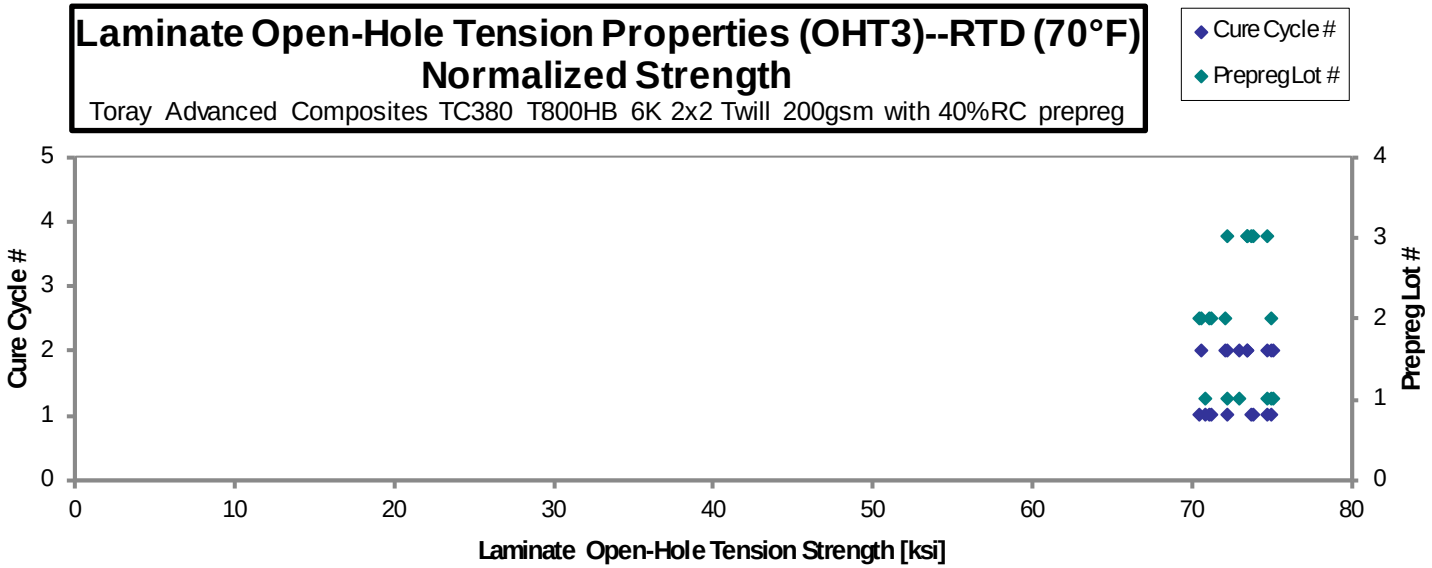
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCEFA111A	A	C1	1	1	74.52	0.08362	10	M(A,L)GM	0.008362	70.81
TCEFA112A	A	C1	1	1	73.52	0.08982	10	LGM	0.008982	75.04
TCEFA113A	A	C1	1	1	68.01	0.09340	10	M(A,L)GM	0.009340	72.18
TCEFA211A	A	C2	1	2	79.31	0.08327	10	M(A,L)GM	0.008327	75.05
TCEFA212A	A	C2	1	2	72.83	0.08812	10	M(A,L)GM	0.008812	72.93
TCEFA213A	A	C2	1	2	72.73	0.09048	10	M(A,L)GM	0.009048	74.78
TCEFB111A	B	C1	2	1	68.32	0.09070	10	M(A,L)GM	0.009070	70.42
TCEFB112A	B	C1	2	1	69.27	0.09047	10	M(A,L)GM	0.009047	71.21
TCEFB113A	B	C1	2	1	69.95	0.08938	10	M(A,L)GM	0.008938	71.05
TCEFB211A	B	C2	2	2	75.88	0.08367	10	M(A,L)GM	0.008367	72.14
TCEFB212A	B	C2	2	2	69.76	0.08902	10	M(A,L)GM	0.008902	70.56
TCEFB213A	B	C2	2	2	72.73	0.09075	10	M(A,L)GM	0.009075	75.00
TCEFC111A	C	C1	3	1	76.74	0.08573	10	LGM	0.008573	74.76
TCEFC112A	C	C1	3	1	73.75	0.08812	10	M(A,L)GM	0.008812	73.85
TCEFC113A	C	C1	3	1	73.43	0.08835	10	AGM	0.008835	73.72
TCEFC211A	C	C2	3	2	74.88	0.08488	10	LGM	0.008488	72.23
TCEFC212A	C	C2	3	2	73.48	0.08795	10	LGM	0.008795	73.44
TCEFC213A	C	C2	3	2	73.12	0.08845	10	LGM	0.008845	73.49

Average	**72.90**	
Standard Dev.	**2.968**	
Coeff. of Var. [%]	**4.072**	
Min.	**68.01**	
Max.	**79.31**	
Number of Spec.	**18**	

$Average_{norm}$	**0.008812**	**72.93**
$Standard\ Dev._{norm}$		**1.656**
Coeff. of Var. [%]$_{norm}$		**2.271**
Min.	**0.008327**	**70.42**
Max.	**0.009340**	**75.05**
Number of Spec.	**18**	**18**


Laminate Open-Hole Tension Properties (OHT3)--RTD (70°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
5
0
10
20
30
40
50
60
70
80
Laminate Open-Hole Tension Strength [ksi]

Laminate Open-Hole Tension Properties (OHT3)--ETD1 (180°F)
Strength

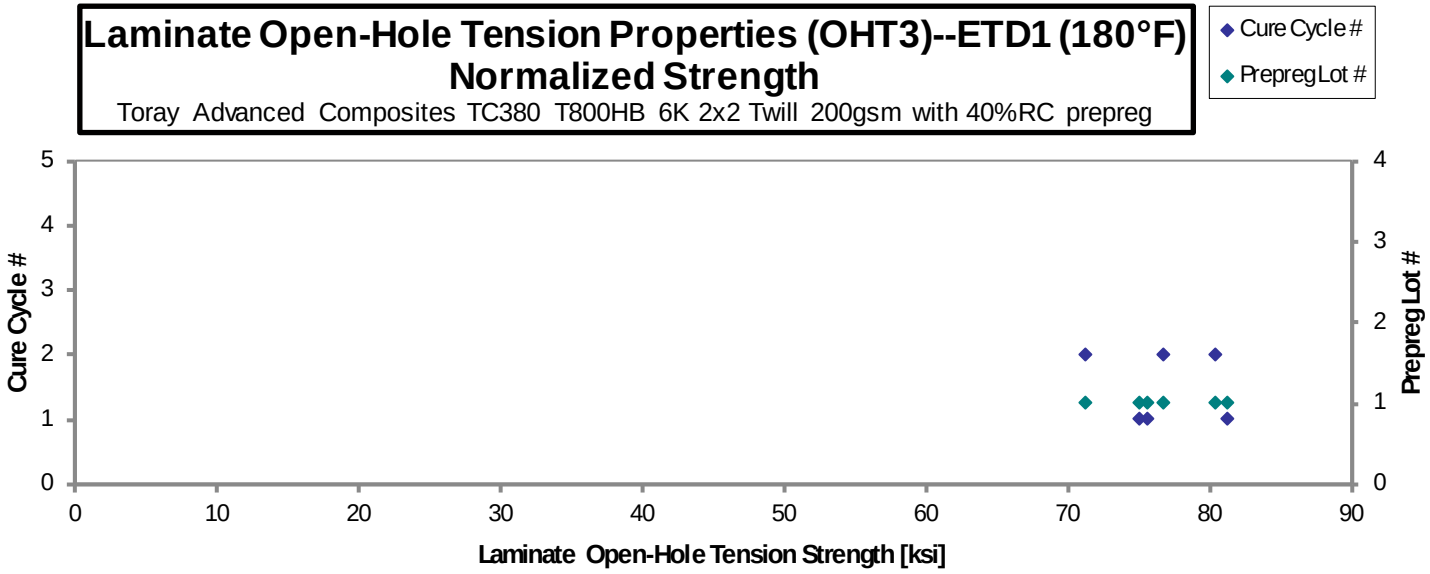
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCEFA111C	A	C1	1	1	78.39	0.09120	10	LGM	0.009120	81.24
TCEFA112C	A	C1	1	1	74.50	0.08863	10	LGM	0.008863	75.04
TCEFA113C	A	C1	1	1	79.95	0.08325	10	M(A,L)GM	0.008325	75.64
TCEFA211C	A	C2	1	2	78.99	0.08952	10	LGM	0.008952	80.35
TCEFA212C	A	C2	1	2	71.89	0.08728	10	LGM	0.008728	71.30
TCEFA213C	A	C2	1	2	82.56	0.08175	10	LGM	0.008175	76.70

Average	**77.71**	
Standard Dev.	**3.870**	
Coeff. of Var. [%]	**4.980**	
Min.	**71.89**	
Max.	**82.56**	
Number of Spec.	**6**	

$Average_{norm}$	**0.008694**	**76.71**
$Standard\ Dev._{norm}$		**3.660**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**4.772**
Min.	**0.008175**	**71.30**
Max.	**0.009120**	**81.24**
Number of Spec.	**6**	**6**


Laminate Open-Hole Tension Properties (OHT3)--ETD1 (180°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Open-Hole Tension Strength [ksi]
0
10
20
30
40
50
60
70
80
90
0
1
2
3
4
5

Laminate Open-Hole Tension Properties (OHT3)--ETW1 (180°F)
Strength

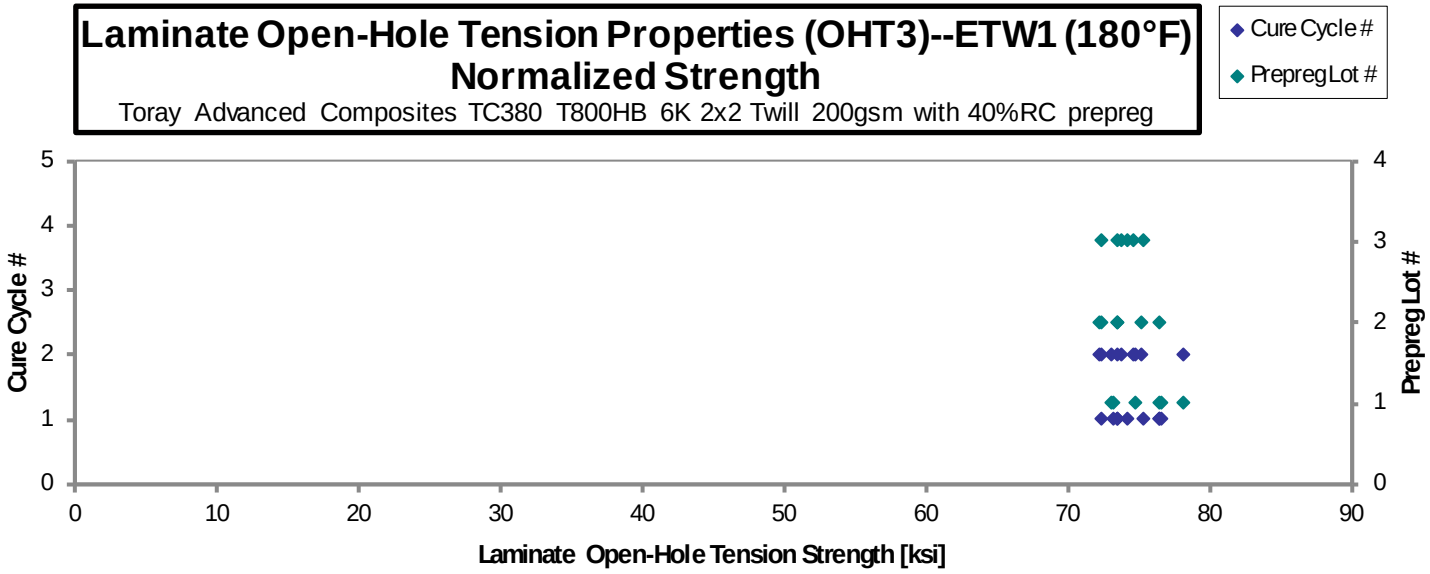
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCEFA111D	A	C1	1	1	72.23	0.08928	10	M(A,L)GM	0.008928	73.28
TCEFA112D	A	C1	1	1	73.95	0.09100	10	M(A,L)GM	0.009100	76.47
TCEFA113D	A	C1	1	1	73.69	0.09142	10	M(A,L)GM	0.009142	76.55
TCEFA211D	A	C2	1	2	75.71	0.08693	10	M(A,L)GM	0.008693	74.79
TCEFA212D	A	C2	1	2	76.53	0.08978	10	M(A,L)GM	0.008978	78.09
TCEFA213D	A	C2	1	2	71.95	0.08935	10	M(A,L)GM	0.008935	73.05
TCEFB111D	B	C1	2	1	78.41	0.08243	10	M(A,L)GM	0.008243	73.45
TCEFB112D	B	C1	2	1	74.43	0.09035	10	M(A,L)GM	0.009035	76.42
TCEFB113D	B	C1	2	1	71.21	0.08950	10	M(A,L)GM	0.008950	72.43
TCEFB211D	B	C2	2	2	71.00	0.08957	10	M(A,L)GM	0.008957	72.26
TCEFB212D	B	C2	2	2	78.13	0.08280	10	M(A,L)GM	0.008280	73.51
TCEFB213D	B	C2	2	2	75.59	0.08762	10	M(A,L)GM	0.008762	75.26
TCEFC111D	C	C1	3	1	73.42	0.08807	10	M(A,L)GM	0.008807	73.47
TCEFC112D	C	C1	3	1	74.90	0.08727	10	M(A,L)GM	0.008727	74.27
TCEFC113D	C	C1	3	1	78.69	0.08427	10	M(A,L)GM	0.008427	75.35
TCEFC211D	C	C2	3	2	74.42	0.08728	10	M(A,L)GM	0.008728	73.81
TCEFC212D	C	C2	3	2	76.54	0.08585	10	M(A,L)GM	0.008585	74.67
TCEFC213D	C	C2	3	2	76.83	0.08290	10	M(A,L)GM	0.008290	72.38

Average	**74.87**	
Standard Dev.	**2.389**	
Coeff. of Var. [%]	**3.191**	
Min.	**71.00**	
Max.	**78.69**	
Number of Spec.	**18**	

$Average_{norm}$	**0.008754**	**74.42**
$Standard\ Dev._{norm}$		**1.661**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**2.233**
Min.	**0.008243**	**72.26**
Max.	**0.009142**	**78.09**
Number of Spec.	**18**	**18**


Laminate Open-Hole Tension Properties (OHT3)--ETW1 (180°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Open-Hole Tension Strength [ksi]
0
10
20
30
40
50
60
70
80
90
0
1
2
3
4
5

Laminate Open-Hole Tension Properties (OHT3)--ETW2 (250°F)
Strength

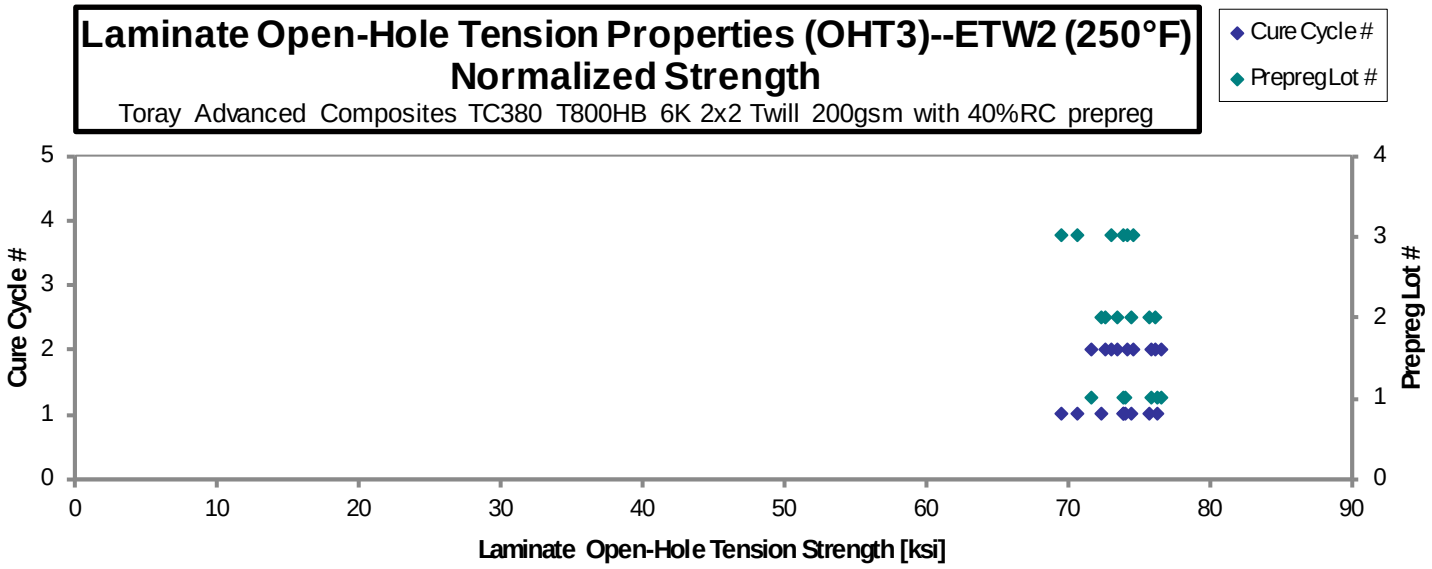
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCEFA111E	A	C1	1	1	72.67	0.08955	10	M(A,L)GM	0.008955	73.95
TCEFA112E	A	C1	1	1	71.97	0.09052	10	M(A,L)GM	0.009052	74.03
TCEFA113E	A	C1	1	1	73.74	0.09100	10	M(A,L)GM	0.009100	76.26
TCEFA211E	A	C2	1	2	75.91	0.08797	10	M(A,L)GM	0.008797	75.88
TCEFA212E	A	C2	1	2	70.58	0.08940	10	M(A,L)GM	0.008940	71.70
TCEFA213E	A	C2	1	2	75.49	0.08922	10	M(A,L)GM	0.008922	76.53
TCEFB111E	B	C1	2	1	73.84	0.08883	10	M(A,L)GM	0.008883	74.54
TCEFB112E	B	C1	2	1	70.40	0.09042	10	M(A,L)GM	0.009042	72.33
TCEFB113E	B	C1	2	1	73.86	0.09030	10	M(A,L)GM	0.009030	75.79
TCEFB211E	B	C2	2	2	75.35	0.08902	10	M(A,L)GM	0.008902	76.22
TCEFB212E	B	C2	2	2	72.11	0.08872	10	M(A,L)GM	0.008872	72.69
TCEFB213E	B	C2	2	2	71.69	0.09018	10	M(A,L)GM	0.009018	73.47
TCEFC111E	C	C1	3	1	69.85	0.08755	10	AGM	0.008755	69.49
TCEFC112E	C	C1	3	1	71.13	0.08752	10	M(A,L)GM	0.008752	70.74
TCEFC113E	C	C1	3	1	74.77	0.08695	10	M(A,L)GM	0.008695	73.88
TCEFC211E	C	C2	3	2	73.69	0.08853	10	M(A,L)GM	0.008853	74.13
TCEFC212E	C	C2	3	2	73.49	0.08750	10	M(A,L)GM	0.008750	73.07
TCEFC213E	C	C2	3	2	74.74	0.08790	10	M(A,L)GM	0.008790	74.66

Average	**73.07**	
Standard Dev.	**1.858**	
Coeff. of Var. [%]	**2.543**	
Min.	**69.85**	
Max.	**75.91**	
Number of Spec.	**18**	

$Average_{norm}$	**0.008895**	**73.85**
$Standard\ Dev._{norm}$		**1.961**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**2.656**
Min.	**0.008695**	**69.49**
Max.	**0.009100**	**76.53**
Number of Spec.	**18**	**18**


Laminate Open-Hole Tension Properties (OHT3)--ETW2 (250°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
5
0
10
20
30
40
50
60
70
80
90
Laminate Open-Hole Tension Strength [ksi]

4.16 "25/50/25" Filled-Hole Tension 1 Properties (FHT1)

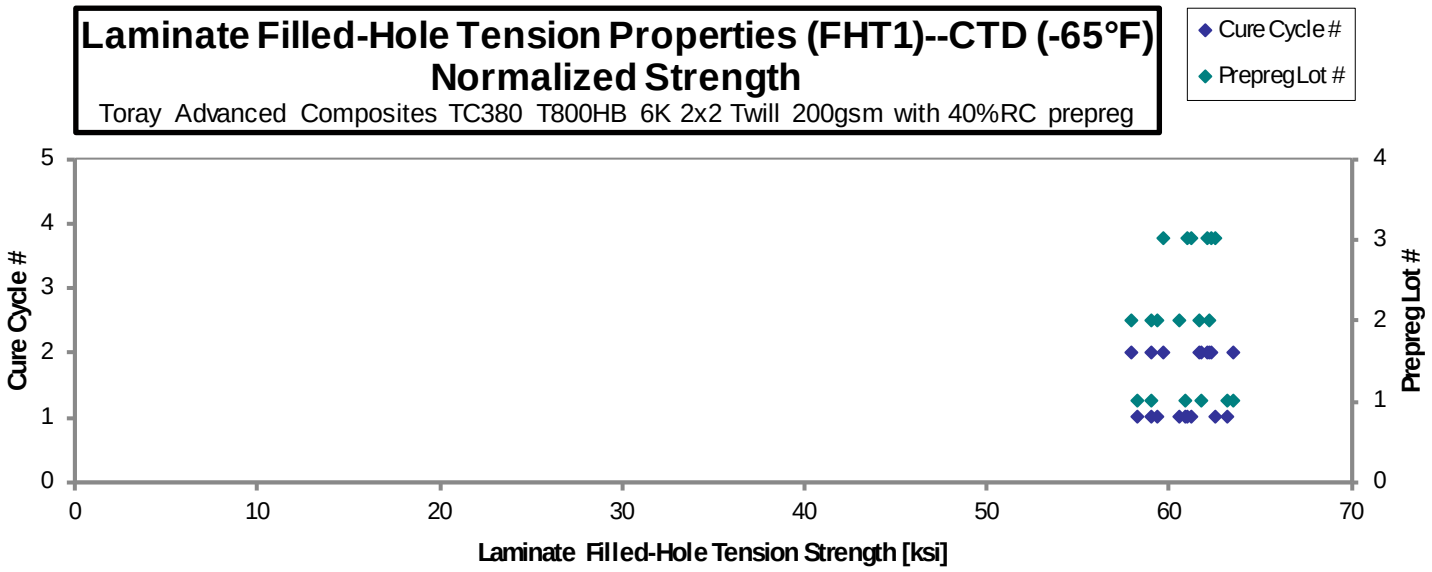
Laminate Filled-Hole Tension Properties (FHT1)--CTD (-65°F)
Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCE4A111B	A	C1	1	1	60.80	0.1464	16	LGM	0.009152	63.23
TCE4A112B	A	C1	1	1	56.24	0.1458	16	LGM	0.009110	58.22
TCE4A113B	A	C1	1	1	58.51	0.1466	16	LGM	0.009165	60.93
TCE4A211B	A	C2	1	2	60.10	0.1447	16	LGM	0.009044	61.77
TCE4A212B	A	C2	1	2	61.94	0.1445	16	LGM	0.009030	63.56
TCE4A213B	A	C2	1	2	57.53	0.1446	16	LGM	0.009036	59.08
TCE4B111B	B	C1	2	1	57.81	0.1446	16	LGM	0.009039	59.37
TCE4B112B	B	C1	2	1	58.94	0.1446	16	LGM	0.009036	60.53
TCE4B113B	B	C1	2	1	57.19	0.1454	16	LGM	0.009085	59.05
TCE4B211B	B	C2	2	2	60.80	0.1441	16	LGM	0.009008	62.24
TCE4B212B	B	C2	2	2	56.98	0.1432	16	LGM	0.008949	57.94
TCE4B213B	B	C2	2	2	60.53	0.1433	16	LGM	0.008956	61.61
TCE4C111B	C	C1	3	1	60.93	0.1415	16	LGM	0.008842	61.22
TCE4C112B	C	C1	3	1	62.47	0.1408	16	LGM	0.008802	62.49
TCE4C113B	C	C1	3	1	60.70	0.1415	16	LGM	0.008842	60.99
TCE4C211B	C	C2	3	2	59.40	0.1415	16	LGM	0.008845	59.70
TCE4C212B	C	C2	3	2	61.69	0.1418	16	LGM	0.008859	62.11
TCE4C213B	C	C2	3	2	61.39	0.1429	16	LGM	0.008931	62.30

Average	**59.66**	
Standard Dev.	**1.900**	
Coeff. of Var. [%]	**3.184**	
Min.	**56.24**	
Max.	**62.47**	
Number of Spec.	**18**	

$Average_{norm}$	**0.008985**	**60.91**
Standard $Dev._{norm}$		**1.684**
Coeff. of Var. $[\%]_{norm}$		**2.764**
Min.	**0.008802**	**57.94**
Max.	**0.009165**	**63.56**
Number of Spec.	**18**	**18**


Laminate Filled-Hole Tension Properties (FHT1)--CTD (-65°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
5
0
10
20
30
40
50
60
70
Laminate Filled-Hole Tension Strength [ksi]

Laminate Filled-Hole Tension Properties (FHT1)--RTD (70°F)
Strength

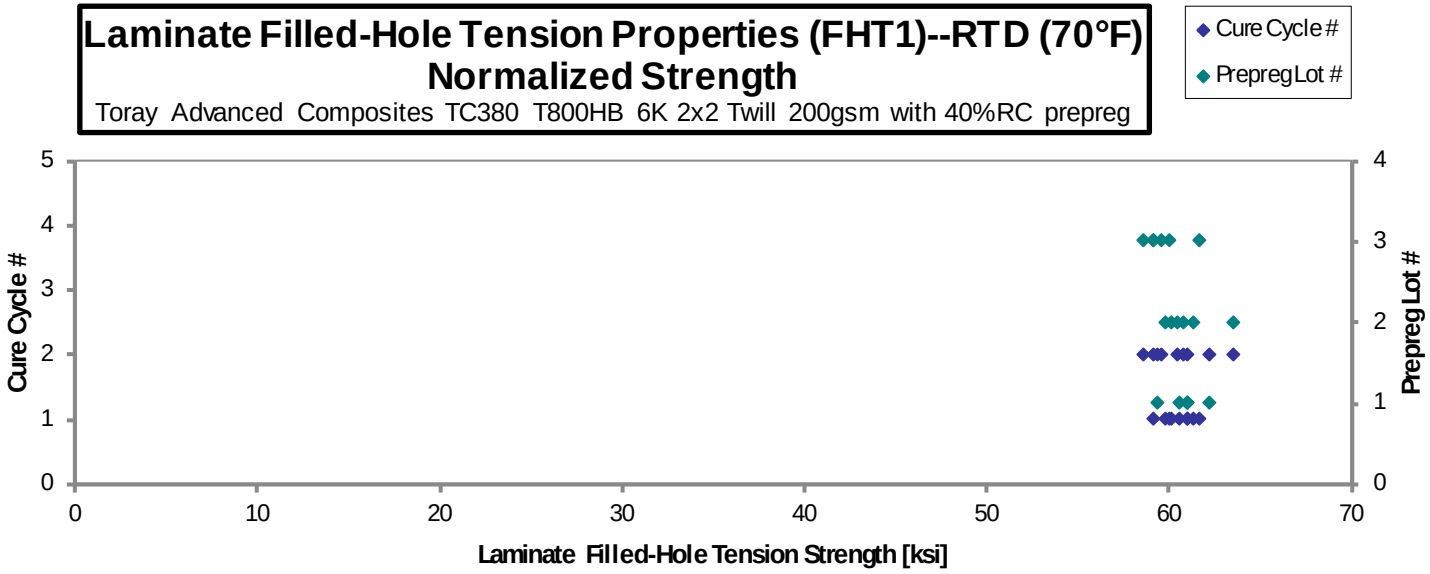
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCE4A111A	A	C1	1	1	62.72	0.1370	16	M(A,L)GM	0.008563	61.03
TCE4A112A	A	C1	1	1	59.23	0.1439	16	M(A,L)GM	0.008995	60.54
TCE4A113A	A	C1	1	1	58.05	0.1478	16	M(A,L)GM	0.009240	60.95
TCE4A211A	A	C2	1	2	64.50	0.1331	16	M(A,L)GM	0.008318	60.96
TCE4A212A	A	C2	1	2	59.29	0.1409	16	M(A,L)GM	0.008803	59.31
TCE4A213A	A	C2	1	2	60.42	0.1450	16	M(A,L)GM	0.009059	62.20
TCE4B111A	B	C1	2	1	63.66	0.1330	16	M(A,L)GM	0.008315	60.15
TCE4B112A	B	C1	2	1	59.66	0.1411	16	M(A,L)GM	0.008819	59.79
TCE4B113A	B	C1	2	1	59.44	0.1453	16	M(A,L)GM	0.009080	61.34
TCE4B211A	B	C2	2	2	64.00	0.1336	16	M(A,L)GM	0.008350	60.73
TCE4B212A	B	C2	2	2	60.07	0.1417	16	M(A,L)GM	0.008853	60.44
TCE4B213A	B	C2	2	2	61.91	0.1444	16	M(A,L)GM	0.009027	63.51
TCE4C111A	C	C1	3	1	62.34	0.1356	16	LGM	0.008473	60.03
TCE4C112A	C	C1	3	1	61.70	0.1407	16	LGM	0.008792	61.64
TCE4C113A	C	C1	3	1	58.38	0.1426	16	LGM	0.008910	59.11
TCE4C211A	C	C2	3	2	60.97	0.1367	16	LGM	0.008543	59.18
TCE4C212A	C	C2	3	2	58.75	0.1428	16	LGM	0.008923	59.57
TCE4C213A	C	C2	3	2	57.38	0.1439	16	LGM	0.008994	58.64

Average	**60.69**	
Standard Dev.	**2.141**	
Coeff. of Var. [%]	**3.528**	
Min.	**57.38**	
Max.	**64.50**	
Number of Spec.	**18**	

$Average_{norm}$	**0.008781**	**60.51**
$Standard\ Dev._{norm}$		**1.211**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**2.001**
Min.	**0.008315**	**58.64**
Max.	**0.009240**	**63.51**
Number of Spec.	**18**	**18**


Laminate Filled-Hole Tension Properties (FHT1)--RTD (70°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
5
0
10
20
30
40
50
60
70
Laminate Filled-Hole Tension Strength [ksi]

Laminate Filled-Hole Tension Properties (FHT1)--ETW1 (180°F)
Strength

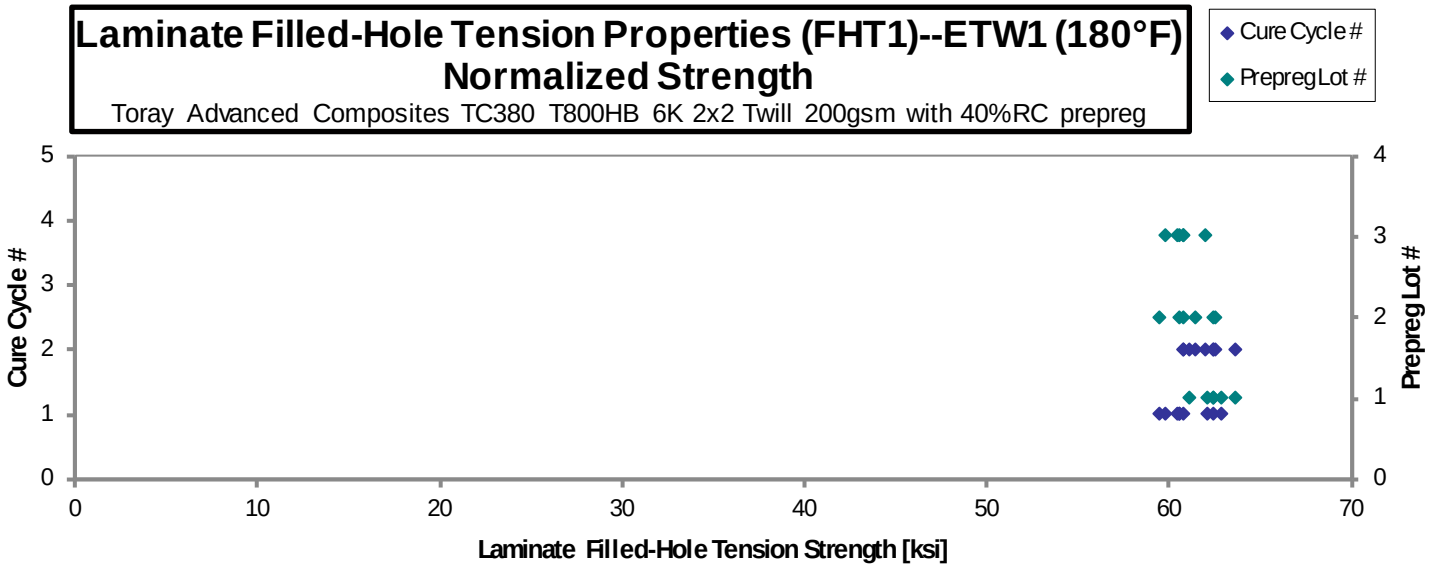
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCE4A111D	A	C1	1	1	59.84	0.1462	16	M(A,L)GM	0.009134	62.12
TCE4A112D	A	C1	1	1	65.02	0.1361	16	M(A,L)GM	0.008503	62.83
TCE4A113D	A	C1	1	1	61.28	0.1435	16	M(A,L)GM	0.008967	62.45
TCE4A211D	A	C2	1	2	61.29	0.1463	16	M(A,L)GM	0.009144	63.69
TCE4A212D	A	C2	1	2	61.20	0.1436	16	M(A,L)GM	0.008974	62.41
TCE4A213D	A	C2	1	2	63.26	0.1361	16	M(A,L)GM	0.008506	61.15
TCE4B111D	B	C1	2	1	59.09	0.1444	16	M(A,L)GM	0.009027	60.61
TCE4B112D	B	C1	2	1	59.45	0.1440	16	AGM	0.009002	60.81
TCE4B113D	B	C1	2	1	57.83	0.1449	16	M(A,L)GM	0.009054	59.50
TCE4B211D	B	C2	2	2	61.28	0.1437	16	M(A,L)GM	0.008982	62.55
TCE4B212D	B	C2	2	2	65.29	0.1346	16	M(A,L)GM	0.008410	62.40
TCE4B213D	B	C2	2	2	61.22	0.1413	16	AGM	0.008828	61.41
TCE4C111D	C	C1	3	1	59.23	0.1436	16	AGM	0.008977	60.42
TCE4C112D	C	C1	3	1	63.25	0.1347	16	AGM	0.008421	60.53
TCE4C113D	C	C1	3	1	60.39	0.1394	16	AGM	0.008715	59.81
TCE4C211D	C	C2	3	2	60.33	0.1418	16	M(A,L)GM	0.008860	60.74
TCE4C212D	C	C2	3	2	60.91	0.1405	16	M(A,L)GM	0.008782	60.79
TCE4C213D	C	C2	3	2	63.93	0.1365	16	M(A,L)GM	0.008532	61.99

Average	**61.34**	
Standard Dev.	**2.072**	
Coeff. of Var. [%]	**3.378**	
Min.	**57.83**	
Max.	**65.29**	
Number of Spec.	**18**	

$Average_{norm}$	**0.008823**	**61.46**
$Standard\ Dev._{norm}$		**1.142**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**1.859**
Min.	**0.008410**	**59.50**
Max.	**0.009144**	**63.69**
Number of Spec.	**18**	**18**


Laminate Filled-Hole Tension Properties (FHT1)--ETW1 (180°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Filled-Hole Tension Strength [ksi]
0
10
20
30
40
50
60
70
0
1
2
3
4
5

Laminate Filled-Hole Tension Properties (FHT1)--ETW2 (250°F)
Strength

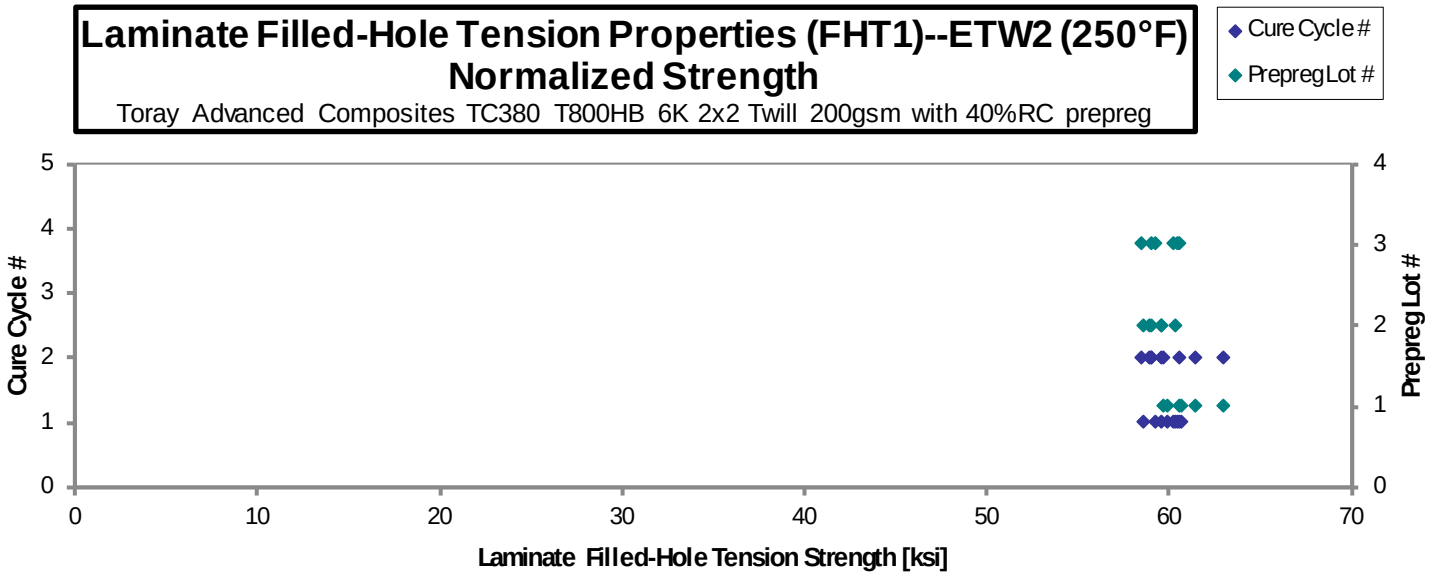
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCE4A111E	A	C1	1	1	58.05	0.1452	16	AGM	0.009075	59.86
TCE4A112E	A	C1	1	1	59.38	0.1435	16	M(A,L)GM	0.008970	60.52
TCE4A113E	A	C1	1	1	59.11	0.1446	16	M(A,L)GM	0.009034	60.68
TCE4A211E	A	C2	1	2	62.01	0.1431	16	M(A,L)GM	0.008941	63.00
TCE4A212E	A	C2	1	2	59.60	0.1451	16	AGM	0.009068	61.42
TCE4A213E	A	C2	1	2	57.75	0.1456	16	AGM	0.009097	59.70
TCE4B111E	B	C1	2	1	57.81	0.1450	16	M(A,L)GM	0.009064	59.54
TCE4B112E	B	C1	2	1	63.87	0.1331	16	M(A,L)GM	0.008319	60.38
TCE4B113E	B	C1	2	1	58.69	0.1406	16	AGM	0.008786	58.60
TCE4B211E	B	C2	2	2	57.09	0.1454	16	AGM	0.009086	58.95
TCE4B212E	B	C2	2	2	57.65	0.1454	16	M(A,L)GM	0.009090	59.55
TCE4B213E	B	C2	2	2	57.19	0.1453	16	AGM	0.009082	59.03
TCE4C111E	C	C1	3	1	60.64	0.1403	16	M(A,L)GM	0.008769	60.43
TCE4C112E	C	C1	3	1	59.27	0.1406	16	AGM	0.008790	59.20
TCE4C113E	C	C1	3	1	60.09	0.1411	16	AGM	0.008817	60.20
TCE4C211E	C	C2	3	2	59.49	0.1432	16	AGM	0.008952	60.52
TCE4C212E	C	C2	3	2	58.00	0.1432	16	M(A,L)GM	0.008952	59.01
TCE4C213E	C	C2	3	2	57.68	0.1428	16	M(A,L)GM	0.008924	58.49

Average	**59.08**	
Standard Dev.	**1.764**	
Coeff. of Var. [%]	**2.986**	
Min.	**57.09**	
Max.	**63.87**	
Number of Spec.	**18**	

$Average_{norm}$	**0.008934**	**59.95**
$Standard\ Dev._{norm}$		**1.106**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**1.845**
Min.	**0.008319**	**58.49**
Max.	**0.009097**	**63.00**
Number of Spec.	**18**	**18**


Laminate Filled-Hole Tension Properties (FHT1)--ETW2 (250°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Filled-Hole Tension Strength [ksi]
0
10
20
30
40
50
60
70
0
1
2
3
4
5

4.17 "10/80/10" Filled-Hole Tension 2 Properties (FHT2)

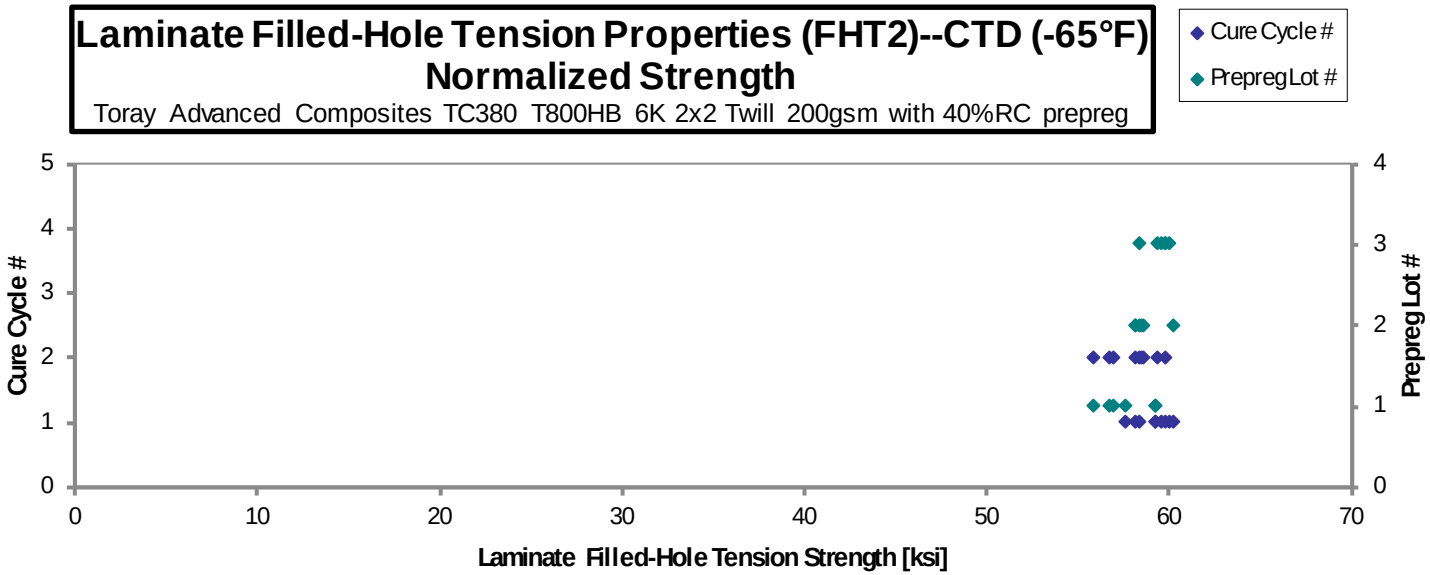
Laminate Filled-Hole Tension Properties (FHT2)--CTD (-65°F)
Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCE5A111B	A	C1	1	1	57.09	0.09132	10	AGM	0.009132	59.24
TCE5A112B	A	C1	1	1	57.62	0.09052	10	AGM	0.009052	59.27
TCE5A113B	A	C1	1	1	55.78	0.09087	10	AGM	0.009087	57.60
TCE5A211B	A	C2	1	2	55.18	0.09052	10	AGM	0.009052	56.76
TCE5A212B	A	C2	1	2	55.94	0.08962	10	AGM	0.008962	56.97
TCE5A213B	A	C2	1	2	54.17	0.09073	10	AGM	0.009073	55.85
TCE5B111B	B	C1	2	1	55.90	0.09193	10	AGM	0.009193	58.40
TCE5B112B	B	C1	2	1	55.52	0.09210	10	AGM	0.009210	58.11
TCE5B113B	B	C1	2	1	57.72	0.09188	10	AGM	0.009188	60.27
TCE5B211B	B	C2	2	2	57.19	0.09017	10	AGM	0.009017	58.59
TCE5B212B	B	C2	2	2	56.87	0.09005	10	AGM	0.009005	58.20
TCE5B213B	B	C2	2	2	57.00	0.09030	10	AGM	0.009030	58.49
TCE5C111B	C	C1	3	1	58.75	0.08955	10	AGM	0.008955	59.79
TCE5C112B	C	C1	3	1	59.33	0.08902	10	AGM	0.008902	60.02
TCE5C113B	C	C1	3	1	58.97	0.08887	10	AGM	0.008887	59.55
TCE5C211B	C	C2	3	2	59.07	0.08847	10	AGM	0.008847	59.39
TCE5C212B	C	C2	3	2	59.57	0.08835	10	AGM	0.008835	59.81
TCE5C213B	C	C2	3	2	58.02	0.08850	10	AGM	0.008850	58.35

Average	**57.21**	
Standard Dev.	**1.569**	
Coeff. of Var. [%]	**2.743**	
Min.	**54.17**	
Max.	**59.57**	
Number of Spec.	**18**	

$Average_{norm}$	**0.009015**	**58.59**
Standard $Dev._{norm}$		**1.216**
Coeff. of Var. $[\%]_{norm}$		**2.075**
Min.	**0.008835**	**55.85**
Max.	**0.009210**	**60.27**
Number of Spec.	**18**	**18**


Laminate Filled-Hole Tension Properties (FHT2)--CTD (-65°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Filled-Hole Tension Strength [ksi]
0
10
20
30
40
50
60
70
0
1
2
3
4
5

Laminate Filled-Hole Tension Properties (FHT2)--RTD (70°F)
Strength

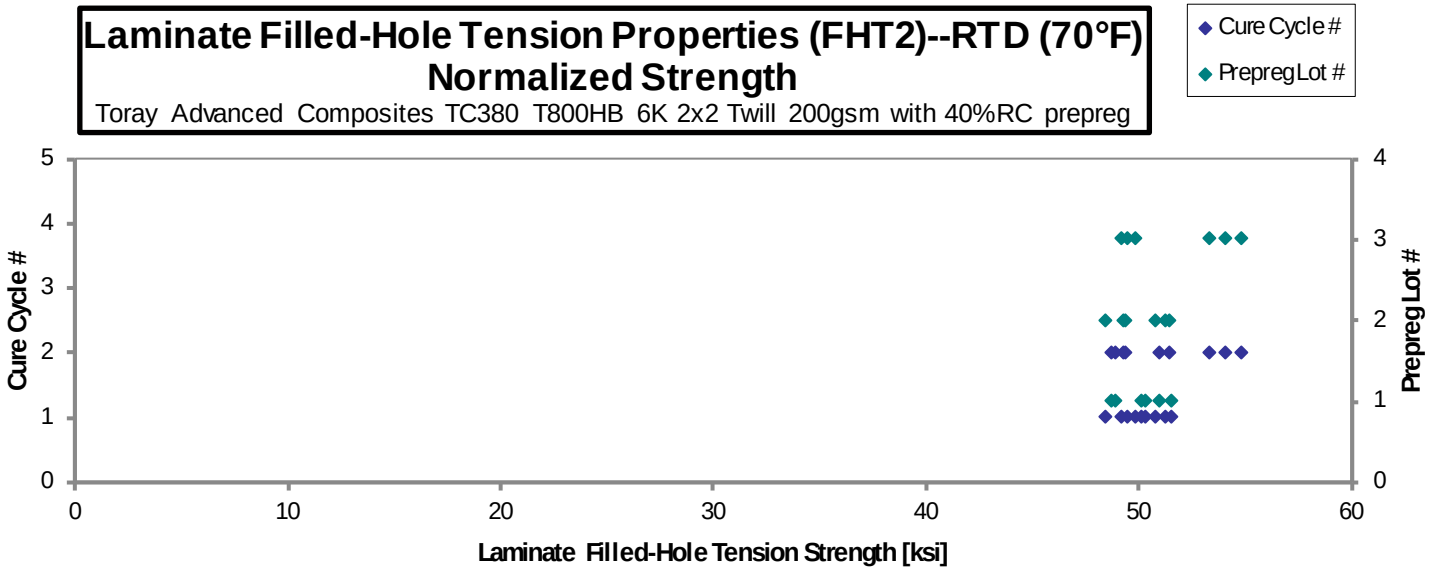
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCE5A111A	A	C1	1	1	51.88	0.08498	10	AGM	0.008498	50.10
TCE5A112A	A	C1	1	1	50.60	0.08967	10	AGM	0.008967	51.56
TCE5A113A	A	C1	1	1	47.84	0.09255	10	AGM	0.009255	50.32
TCE5A211A	A	C2	1	2	52.66	0.08523	10	AGM	0.008523	51.00
TCE5A212A	A	C2	1	2	47.58	0.09038	10	AGM	0.009038	48.87
TCE5A213A	A	C2	1	2	46.91	0.09143	10	AGM	0.009143	48.74
TCE5B111A	B	C1	2	1	51.24	0.08313	10	AGM	0.008313	48.41
TCE5B112A	B	C1	2	1	49.46	0.09038	10	AGM	0.009038	50.80
TCE5B113A	B	C1	2	1	48.55	0.09292	10	AGM	0.009292	51.26
TCE5B211A	B	C2	2	2	54.41	0.08322	10	AGM	0.008322	51.45
TCE5B212A	B	C2	2	2	48.65	0.08920	10	AGM	0.008920	49.32
TCE5B213A	B	C2	2	2	47.39	0.09173	10	AGM	0.009173	49.40
TCE5C111A	C	C1	3	1	50.74	0.08528	10	AGM	0.008528	49.17
TCE5C112A	C	C1	3	1	51.44	0.08527	10	AGM	0.008527	49.84
TCE5C113A	C	C1	3	1	49.51	0.08790	10	AGM	0.008790	49.45
TCE5C211A	C	C2	3	2	56.94	0.08478	10	AGM	0.008478	54.86
TCE5C212A	C	C2	3	2	54.17	0.08783	10	AGM	0.008783	54.07
TCE5C213A	C	C2	3	2	52.80	0.08890	10	AGM	0.008890	53.34

Average	**50.71**	
Standard Dev.	**2.769**	
Coeff. of Var. [%]	**5.460**	
Min.	**46.91**	
Max.	**56.94**	
Number of Spec.	**18**	

$Average_{norm}$	**0.008804**	**50.66**
$Standard\ Dev._{norm}$		**1.856**
Coeff. of Var. [%]$_{norm}$		**3.663**
Min.	**0.008313**	**48.41**
Max.	**0.009292**	**54.86**
Number of Spec.	**18**	**18**


Laminate Filled-Hole Tension Properties (FHT2)--RTD (70°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Filled-Hole Tension Strength [ksi]
0
10
20
30
40
50
60
0
1
2
3
4
5

Laminate Filled-Hole Tension Properties (FHT2)--ETW1 (180°F)
Strength

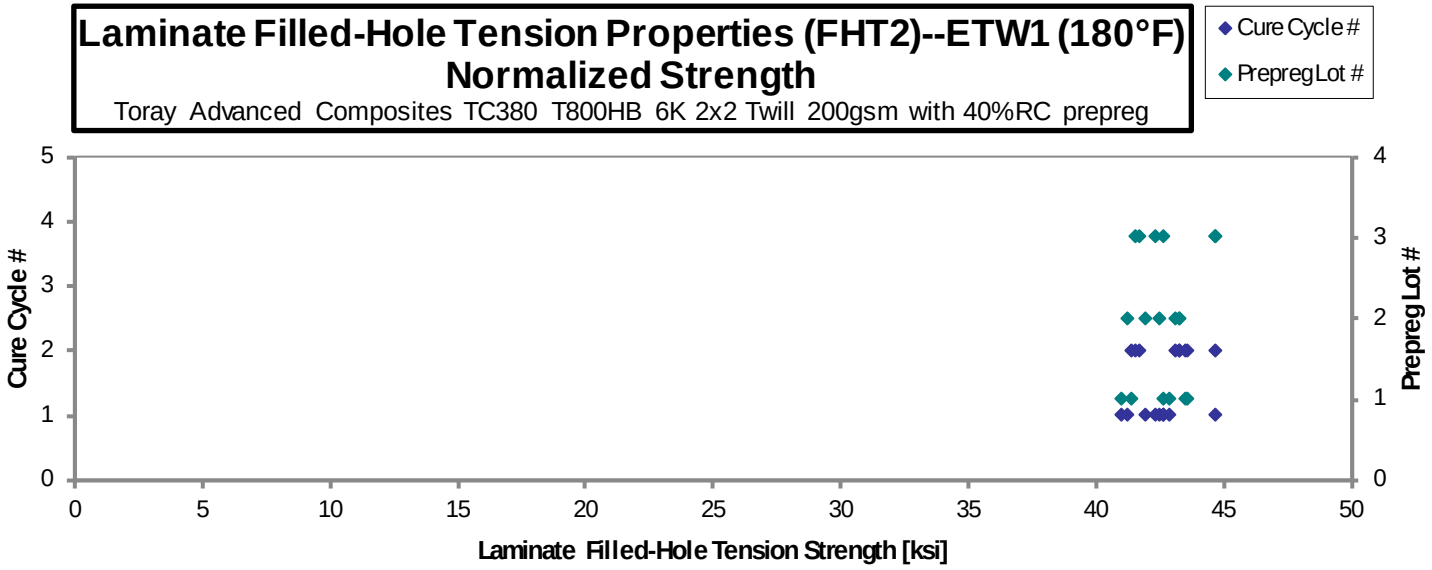
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCE5A111D	A	C1	1	1	40.38	0.09340	10	AGM	0.009340	42.86
TCE5A112D	A	C1	1	1	39.52	0.09127	10	AGM	0.009127	40.99
TCE5A113D	A	C1	1	1	43.94	0.08533	10	AGM	0.008533	42.60
TCE5A211D	A	C2	1	2	41.74	0.09173	10	AGM	0.009173	43.51
TCE5A212D	A	C2	1	2	42.96	0.08920	10	AGM	0.008920	43.55
TCE5A213D	A	C2	1	2	43.63	0.08350	10	AGM	0.008350	41.40
TCE5B111D	B	C1	2	1	39.18	0.09257	10	AGM	0.009257	41.21
TCE5B112D	B	C1	2	1	44.51	0.08290	10	AGM	0.008290	41.93
TCE5B113D	B	C1	2	1	42.23	0.08847	10	AGM	0.008847	42.46
TCE5B211D	B	C2	2	2	41.58	0.09158	10	AGM	0.009158	43.28
TCE5B212D	B	C2	2	2	42.83	0.08862	10	AGM	0.008862	43.13
TCE5B213D	B	C2	2	2	45.92	0.08290	10	AGM	0.008290	43.26
TCE5C111D	C	C1	3	1	41.49	0.08982	10	AGM	0.008982	42.35
TCE5C112D	C	C1	3	1	41.38	0.09073	10	AGM	0.009073	42.67
TCE5C113D	C	C1	3	1	44.64	0.08800	10	AGM	0.008800	44.64
TCE5C211D	C	C2	3	2	41.18	0.08902	10	AGM	0.008902	41.66
TCE5C212D	C	C2	3	2	41.71	0.08765	10	AGM	0.008765	41.54
TCE5C213D	C	C2	3	2	45.91	0.08563	10	AGM	0.008563	44.68

Average	**42.49**	
Standard Dev.	**1.973**	
Coeff. of Var. [%]	**4.643**	
Min.	**39.18**	
Max.	**45.92**	
Number of Spec.	**18**	

$Average_{norm}$	**0.008846**	**42.65**
$Standard\ Dev._{norm}$		**1.083**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**2.539**
Min.	**0.008290**	**40.99**
Max.	**0.009340**	**44.68**
Number of Spec.	**18**	**18**


Laminate Filled-Hole Tension Properties (FHT2)--ETW1 (180°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Filled-Hole Tension Strength [ksi]
0
1
2
3
4
5
0
5
10
15
20
25
30
35
40
45
50

Laminate Filled-Hole Tension Properties (FHT2)--ETW2 (250°F)
Strength

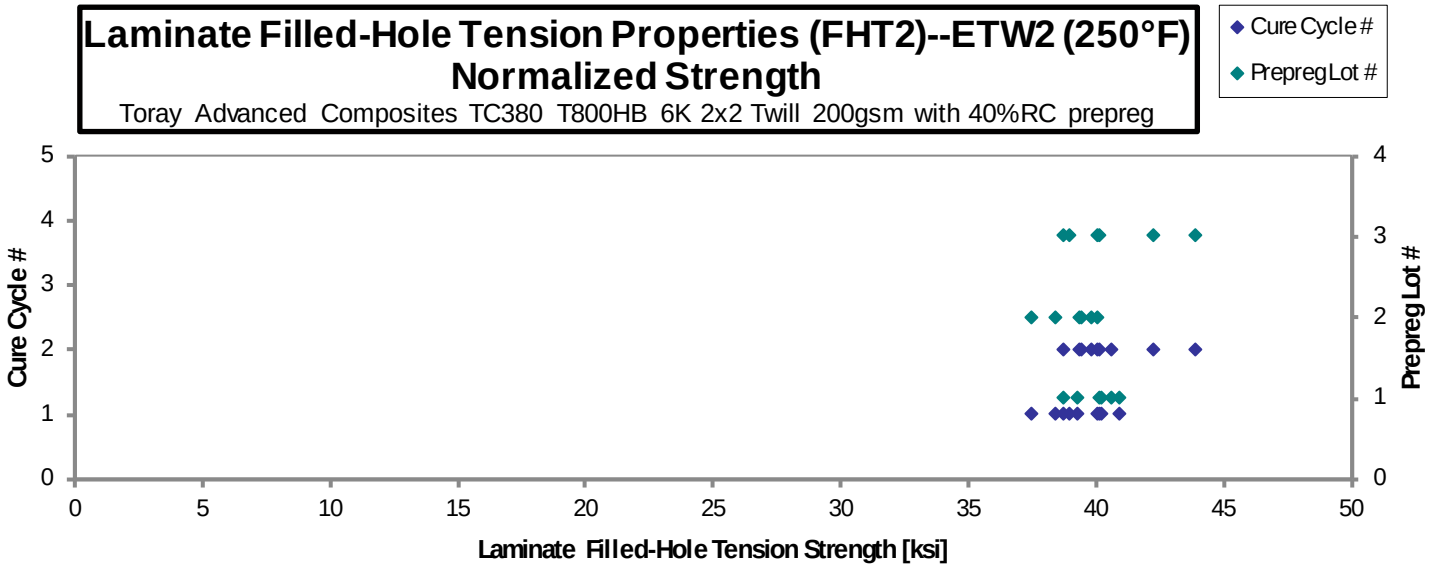
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCE5A111E	A	C1	1	1	39.14	0.09203	10	AGM	0.009203	40.94
TCE5A112E	A	C1	1	1	38.86	0.09112	10	AGM	0.009112	40.24
TCE5A113E	A	C1	1	1	38.22	0.09045	10	AGM	0.009045	39.29
TCE5A211E	A	C2	1	2	38.35	0.09207	10	AGM	0.009207	40.12
TCE5A212E	A	C2	1	2	38.81	0.09207	10	AGM	0.009207	40.61
TCE5A213E	A	C2	1	2	37.66	0.09038	10	AGM	0.009038	38.68
TCE5B111E	B	C1	2	1	37.66	0.08967	10	AGM	0.008967	38.37
TCE5B112E	B	C1	2	1	37.08	0.08895	10	AGM	0.008895	37.48
TCE5B113E	B	C1	2	1	38.94	0.09043	10	AGM	0.009043	40.01
TCE5B211E	B	C2	2	2	38.04	0.09100	10	AGM	0.009100	39.34
TCE5B212E	B	C2	2	2	37.88	0.09150	10	AGM	0.009150	39.39
TCE5B213E	B	C2	2	2	38.87	0.09022	10	AGM	0.009022	39.85
TCE5C111E	C	C1	3	1	38.36	0.08928	10	AGM	0.008928	38.92
TCE5C112E	C	C1	3	1	40.17	0.08790	10	AGM	0.008790	40.12
TCE5C113E	C	C1	3	1	38.48	0.08858	10	AGM	0.008858	38.73
TCE5C211E	C	C2	3	2	40.23	0.08765	10	AGM	0.008765	40.07
TCE5C212E	C	C2	3	2	42.32	0.08777	10	AGM	0.008777	42.20
TCE5C213E	C	C2	3	2	43.97	0.08780	10	AGM	0.008780	43.87

Average	**39.06**	
Standard Dev.	**1.710**	
Coeff. of Var. [%]	**4.379**	
Min.	**37.08**	
Max.	**43.97**	
Number of Spec.	**18**	

$Average_{norm}$	**0.008994**	**39.90**
$Standard\ Dev._{norm}$		**1.452**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**3.638**
Min.	**0.008765**	**37.48**
Max.	**0.009207**	**43.87**
Number of Spec.	**18**	**18**


Laminate Filled-Hole Tension Properties (FHT2)--ETW2 (250°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Filled-Hole Tension Strength [ksi]
0
5
10
15
20
25
30
35
40
45
50
0
1
2
3
4
5

4.18 "40/20/40" Filled-Hole Tension 3 Properties (FHT3)

Laminate Filled-Hole Tension Properties (FHT3)--CTD (-65°F)
Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

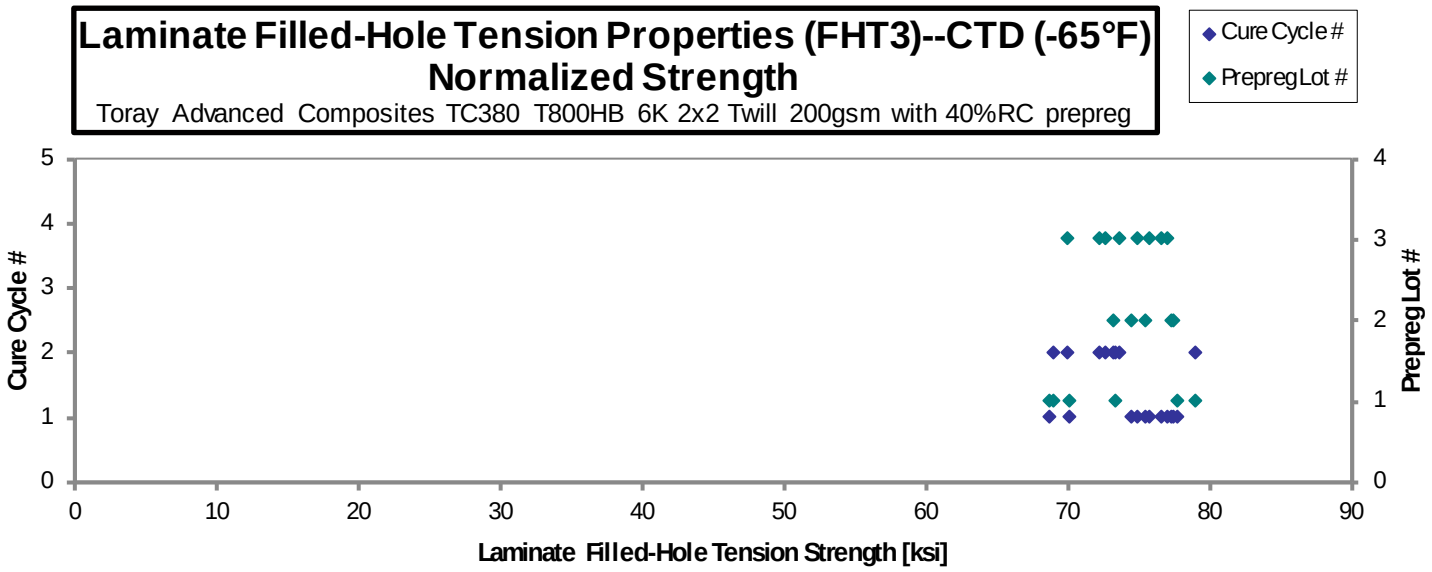
normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCE6A111B	A	C1	1	1	77.43	0.08830	10	LGM	0.008830	77.69
TCE6A112B	A	C1	1	1	70.14	0.08800	10	LGM	0.008800	70.14
TCE6A113B	A	C1	1	1	68.26	0.08850	10	AGM	0.008850	68.65
TCE6A211B	A	C2	1	2	75.99	0.09148	10	LGM	0.009148	79.00
TCE6A212B	A	C2	1	2	66.68	0.09102	10	LGM	0.009102	68.97
TCE6A213B	A	C2	1	2	70.60	0.09140	10	LGM	0.009140	73.32
TCE6B111B	B	C1	2	1	73.56	0.09030	10	LGM	0.009030	75.49
TCE6B112B	B	C1	2	1	75.58	0.09012	10	LGM	0.009012	77.40
TCE6B113B	B	C1	2	1	75.39	0.09023	10	LGM	0.009023	77.30
TCEFB114B	B	C1	2	1	73.66	0.08895	10	LGM	0.008895	74.46
TCEFB214B	B	C2	2	2	70.35	0.09160	10	LGM	0.009160	73.23
TCE6C111B	C	C1	3	1	77.01	0.08750	10	LGM	0.008750	76.57
TCE6C112B	C	C1	3	1	77.32	0.08758	10	M(A,L)GM	0.008758	76.95
TCE6C113B	C	C1	3	1	75.90	0.08787	10	M(A,L)GM	0.008787	75.78
TCE6C114B	C	C1	3	1	74.55	0.08847	10	LGM	0.008847	74.95
TCE6C211B	C	C2	3	2	71.94	0.08843	10	M(A,L)GM	0.008843	72.29
TCE6C212B	C	C2	3	2	69.52	0.08858	10	M(A,L)GM	0.008858	69.98
TCE6C213B	C	C2	3	2	73.48	0.08815	10	LGM	0.008815	73.60
TCE6C214B	C	C2	3	2	72.12	0.08857	10	LGM	0.008857	72.58

TCEFB114B and TCEFB214B: Specimens were taken from OHT3 and tested as FHT3.

Average	**73.13**	
Standard Dev.	**3.201**	
Coeff. of Var. [%]	**4.377**	
Min.	**66.68**	
Max.	**77.43**	
Number of Spec.	**19**	

$Average_{norm}$	**0.008921**	**74.12**
$Standard\ Dev._{norm}$		**3.106**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**4.191**
Min.	**0.008750**	**68.65**
Max.	**0.009160**	**79.00**
Number of Spec.	**19**	**19**


Laminate Filled-Hole Tension Properties (FHT3)--CTD (-65°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Filled-Hole Tension Strength [ksi]
0
10
20
30
40
50
60
70
80
90
0
1
2
3
4
5

Laminate Filled-Hole Tension Properties (FHT3)--RTD (70°F)
Strength

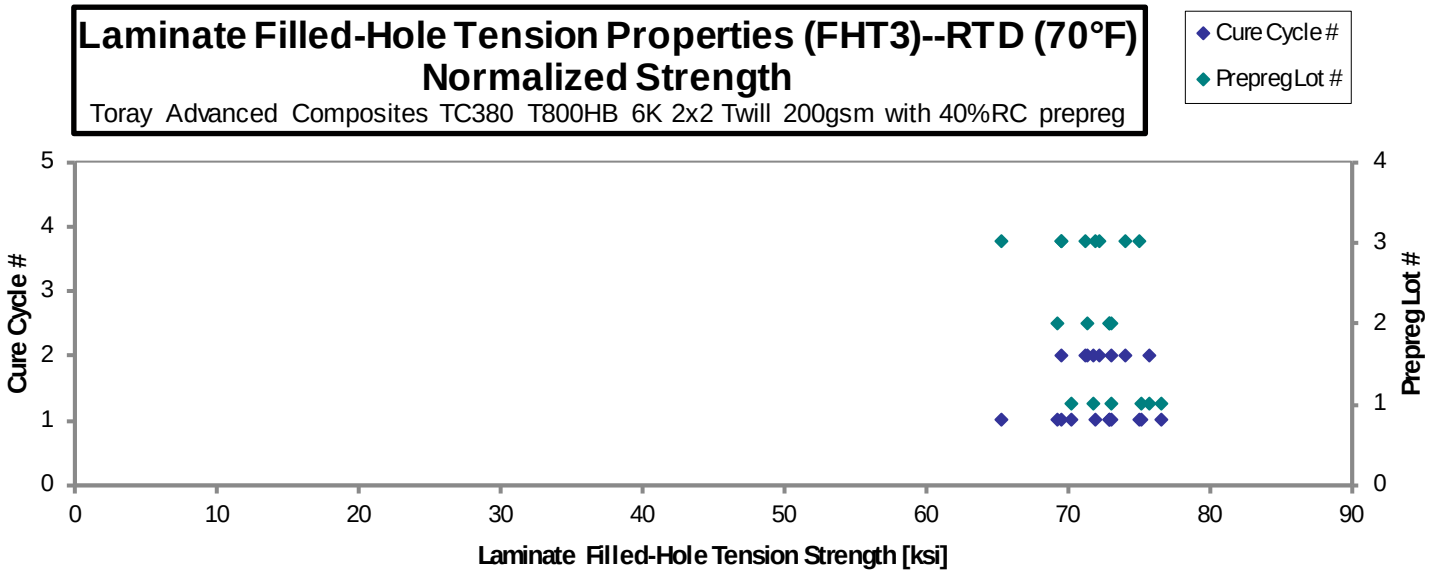
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCE6A111A	A	C1	1	1	73.64	0.08398	10	LGM	0.008398	70.28
TCE6A112A	A	C1	1	1	75.98	0.08863	10	M(A,L)GM	0.008863	76.53
TCE6A113A	A	C1	1	1	73.74	0.08978	10	M(A,L)GM	0.008978	75.23
TCE6A211A	A	C2	1	2	80.21	0.08313	10	M(A,L)GM	0.008313	75.77
TCE6A212A	A	C2	1	2	71.67	0.08818	10	M(A,L)GM	0.008818	71.82
TCE6A213A	A	C2	1	2	70.43	0.09135	10	M(A,L)GM	0.009135	73.11
TCE6B111A	B	C1	2	1	71.57	0.08970	10	M(A,L)GM	0.008970	72.95
TCE6B112A	B	C1	2	1	71.51	0.08980	10	M(A,L)GM	0.008980	72.97
TCE6B113A	B	C1	2	1	68.31	0.08928	10	M(A,L)GM	0.008928	69.30
TCEFB114A	B	C1	2	1	71.69	0.08962	10	LGM	0.008962	73.01
TCEFB214A	B	C2	2	2	69.92	0.08978	10	LGM	0.008978	71.33
TCE6C111A	C	C1	3	1	77.79	0.08485	10	AGM	0.008485	75.01
TCE6C112A	C	C1	3	1	71.54	0.08857	10	AGM	0.008857	72.00
TCE6C113A	C	C1	3	1	68.47	0.08940	10	AGM	0.008940	69.56
TCE6C114A	C	C1	3	1	64.98	0.08848	10	LGM	0.008848	65.34
TCE6C211A	C	C2	3	2	71.51	0.08555	10	M(A,L)GM	0.008555	69.52
TCE6C212A	C	C2	3	2	74.25	0.08780	10	AGM	0.008780	74.08
TCE6C213A	C	C2	3	2	69.96	0.08963	10	M(A,L)GM	0.008963	71.26
TCE6C214A	C	C2	3	2	70.71	0.08990	10	LGM	0.008990	72.24

TCEFB114A and TCEFB214A: Specimens were taken from OHT3 and tested as FHT3.

Average	**71.99**		**$Average_{norm}$**	**0.008829**	**72.17**
Standard Dev.	**3.469**		**$Standard\ Dev._{norm}$**		**2.686**
Coeff. of Var. [%]	**4.819**		**$Coeff.\ of\ Var.\ [\%]_{norm}$**		**3.722**
Min.	**64.98**		**Min.**	**0.008313**	**65.34**
Max.	**80.21**		**Max.**	**0.009135**	**76.53**
Number of Spec.	**19**		**Number of Spec.**	**19**	**19**


Laminate Filled-Hole Tension Properties (FHT3)--RTD (70°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Filled-Hole Tension Strength [ksi]
0
10
20
30
40
50
60
70
80
90
0
1
2
3
4
5

Laminate Filled-Hole Tension Properties (FHT3)--ETW1 (180°F)
Strength

Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

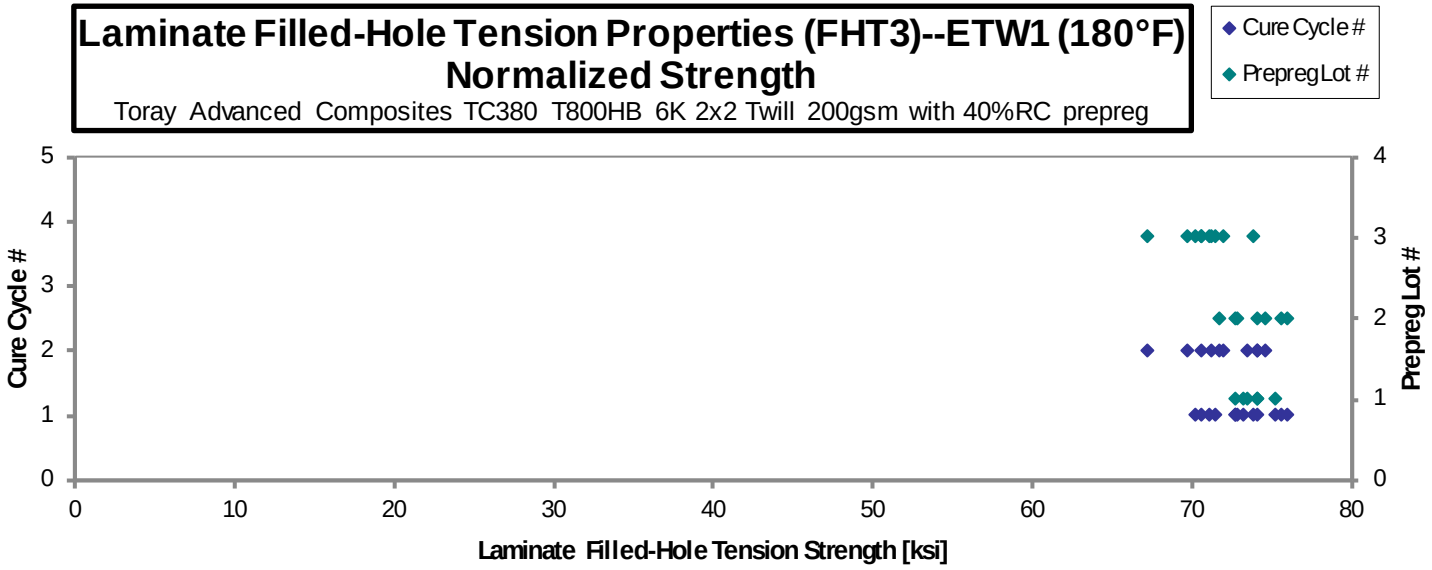
normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCE6A111D	A	C1	1	1	74.56	0.08873	10	M(A,L)GM	0.008873	75.18
TCE6A112D	A	C1	1	1	74.61	0.08638	10	LGM	0.008638	73.24
TCE6A113D	A	C1	1	1	78.58	0.08150	10	M(A,L)GM	0.008150	72.78
TCE6A211D	A	C2	1	2	70.68	0.09222	10	M(A,L)GM	0.009222	74.06
TCE6A212D	A	C2	1	2	71.72	0.09010	10	M(A,L)GM	0.009010	73.43
TCE6A213D	A	C2	1	2	76.22	0.08550	10	M(A,L)GM	0.008550	74.05
TCE6B111D	B	C1	2	1	79.42	0.08378	10	LGM	0.008378	75.62
TCE6B112D	B	C1	2	1	71.33	0.08980	10	LGM	0.008980	72.79
TCE6B113D	B	C1	2	1	72.49	0.08992	10	M(A,L)GM	0.008992	74.07
TCEFB114D	B	C1	2	1	72.39	0.08843	10	LGM	0.008843	72.75
TCEFB115D	B	C1	2	1	75.89	0.08815	10	AGM	0.008815	76.02
TCEFB214D	B	C2	2	2	72.84	0.09008	10	M(A,L)GM	0.009008	74.56
TCEFB215D	B	C2	2	2	70.25	0.08992	10	LGM	0.008992	71.78
TCE6C111D	C	C1	3	1	70.17	0.08853	10	M(A,L)GM	0.008853	70.60
TCE6C112D	C	C1	3	1	74.58	0.08438	10	M(A,L)GM	0.008438	71.52
TCE6C113D	C	C1	3	1	70.17	0.08807	10	AGM	0.008807	70.22
TCE6C114D	C	C1	3	1	73.64	0.08830	10	M(A,L)GM	0.008830	73.90
TCE6C115D	C	C1	3	1	70.93	0.08825	10	LGM	0.008825	71.13
TCE6C211D	C	C2	3	2	69.39	0.08848	10	LGM	0.008848	69.77
TCE6C212D	C	C2	3	2	69.91	0.08887	10	M(A,L)GM	0.008887	70.60
TCE6C213D	C	C2	3	2	71.03	0.08825	10	AGM	0.008825	71.23
TCE6C214D	C	C2	3	2	66.63	0.08872	10	LGM	0.008872	67.17
TCE6C215D	C	C2	3	2	71.19	0.08900	10	M(A,L)GM	0.008900	72.00

TCEFB114D, TCEFB115D, TCEFB214D and TCEFB215D: Specimens were taken from OHT3 and tested as FHT3.

Average	**72.55**	
Standard Dev.	**3.039**	
Coeff. of Var. [%]	**4.188**	
Min.	**66.63**	
Max.	**79.42**	
Number of Spec.	**23**	

$Average_{norm}$	**0.008806**	**72.54**
Standard $Dev._{norm}$		**2.110**
Coeff. of $Var._{norm}$ [%]		**2.908**
Min.	**0.008150**	**67.17**
Max.	**0.009222**	**76.02**
Number of Spec.	**23**	**23**


Laminate Filled-Hole Tension Properties (FHT3)--ETW1 (180°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Filled-Hole Tension Strength [ksi]
0
10
20
30
40
50
60
70
80
0
1
2
3
4
5

Laminate Filled-Hole Tension Properties (FHT3)--ETW2 (250°F)
Strength

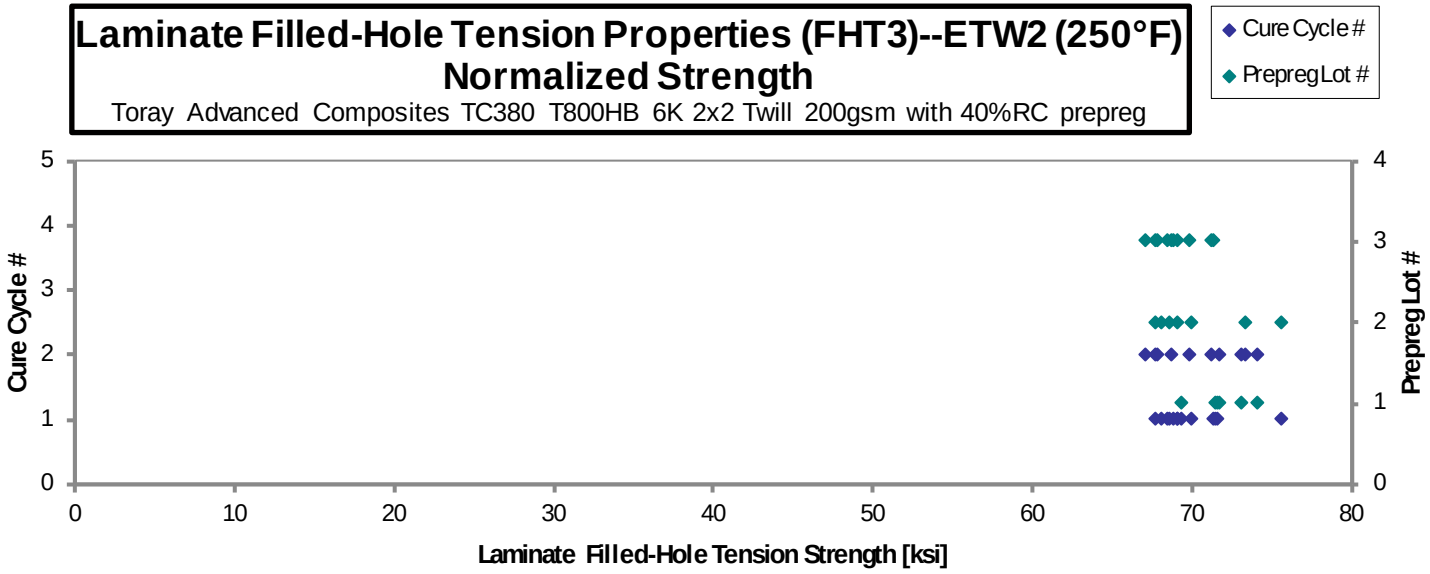
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCE6A111E	A	C1	1	1	67.83	0.08998	10	M(A,L)GM	0.008998	69.36
TCE6A112E	A	C1	1	1	70.33	0.08965	10	M(A,L)GM	0.008965	71.64
TCE6A113E	A	C1	1	1	70.90	0.08867	10	M(A,L)GM	0.008867	71.43
TCE6A211E	A	C2	1	2	71.44	0.08998	10	M(A,L)GM	0.008998	73.05
TCE6A212E	A	C2	1	2	71.91	0.09065	10	M(A,L)GM	0.009065	74.07
TCE6A213E	A	C2	1	2	69.72	0.09053	10	LGM	0.009053	71.73
TCE6B111E	B	C1	2	1	74.45	0.08930	10	M(A,L)GM	0.008930	75.55
TCE6B112E	B	C1	2	1	67.51	0.09005	10	M(A,L)GM	0.009005	69.08
TCE6B113E	B	C1	2	1	68.41	0.09007	10	M(A,L)GM	0.009007	70.01
TCEFB114E	B	C1	2	1	69.04	0.08742	10	M(A,L)GM	0.008742	68.59
TCEFB115E	B	C1	2	1	73.06	0.08195	10	AGM	0.008195	68.04
TCEFB214E	B	C2	2	2	66.47	0.08972	10	LGM	0.008972	67.76
TCEFB215E	B	C2	2	2	72.17	0.08942	10	M(A,L)GM	0.008942	73.33
TCE6C111E	C	C1	3	1	69.50	0.08755	10	M(A,L)GM	0.008755	69.14
TCE6C112E	C	C1	3	1	71.60	0.08772	10	LGM	0.008772	71.37
TCE6C113E	C	C1	3	1	69.21	0.08757	10	AGM	0.008757	68.87
TCE6C114E	C	C1	3	1	68.04	0.08757	10	M(A,L)GM	0.008757	67.71
TCE6C115E	C	C1	3	1	68.37	0.08813	10	M(A,L)GM	0.008813	68.47
TCE6C211E	C	C2	3	2	66.82	0.08933	10	M(A,L)GM	0.008933	67.83
TCE6C212E	C	C2	3	2	68.31	0.08855	10	AGM	0.008855	68.73
TCE6C213E	C	C2	3	2	68.79	0.08582	10	LGM	0.008582	67.08
TCE6C214E	C	C2	3	2	74.35	0.08432	10	M(A,L)GM	0.008432	71.24
TCE6C215E	C	C2	3	2	69.45	0.08843	10	AGM	0.008843	69.80

TCEFB114E, TCEFB115E, TCEFB214E and TCEFB215E: Specimens were taken from OHT3 and tested as FHT3.

Average	**69.90**	**Average$_{norm}$**	**0.008836**	**70.17**
Standard Dev.	**2.244**	**Standard Dev.$_{norm}$**		**2.285**
Coeff. of Var. [%]	**3.211**	**Coeff. of Var. [%]$_{norm}$**		**3.256**
Min.	**66.47**	**Min.**	**0.008195**	**67.08**
Max.	**74.45**	**Max.**	**0.009065**	**75.55**
Number of Spec.	**23**	**Number of Spec.**	**23**	**23**


Laminate Filled-Hole Tension Properties (FHT3)--ETW2 (250°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
5
0
10
20
30
40
50
60
70
80
Laminate Filled-Hole Tension Strength [ksi]

4.19 "25/50/25" Open-Hole Compression 1 Properties (OHC1)

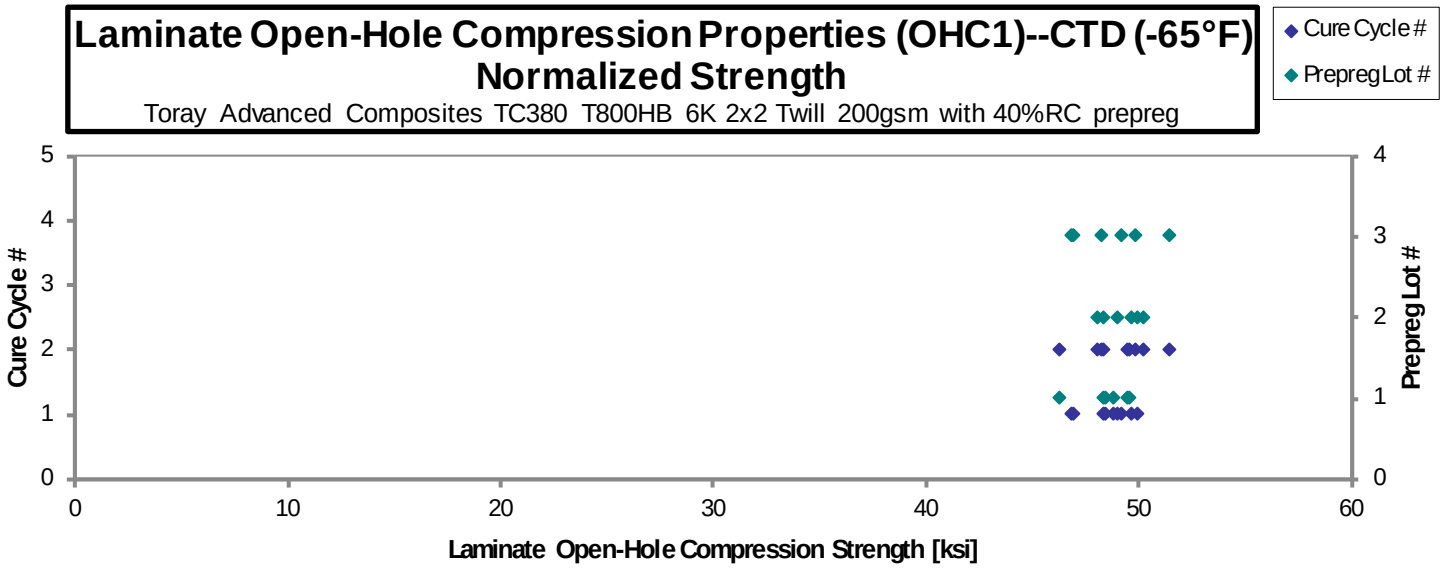
Laminate Open-Hole Compression Properties (OHC1)--CTD (-65°F)
Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCEGA111B	A	C1	1	1	47.30	0.1442	16	M(A,L)GM	0.009009	48.42
TCEGA112B	A	C1	1	1	47.50	0.1434	16	M(A,L)GM	0.008963	48.38
TCEGA113B	A	C1	1	1	47.78	0.1440	16	M(A,L)GM	0.008997	48.85
TCEGA211B	A	C2	1	2	44.53	0.1463	16	M(A,L)GM	0.009145	46.27
TCEGA212B	A	C2	1	2	48.06	0.1448	16	M(A,L)GM	0.009051	49.43
TCEGA213B	A	C2	1	2	48.09	0.1452	16	M(A,L)GM	0.009076	49.60
TCEGB111B	B	C1	2	1	47.83	0.1443	16	M(A,L)GM	0.009016	49.00
TCEGB112B	B	C1	2	1	49.00	0.1435	16	M(A,L)GM	0.008967	49.92
TCEGB113B	B	C1	2	1	48.41	0.1444	16	M(A,L)GM	0.009024	49.64
TCEGB211B	B	C2	2	2	46.66	0.1451	16	M(A,L)GM	0.009070	48.09
TCEGB212B	B	C2	2	2	46.95	0.1449	16	M(A,L)GM	0.009054	48.30
TCEGB213B	B	C2	2	2	48.66	0.1454	16	M(A,L)GM	0.009084	50.24
TCEGC111B	C	C1	3	1	46.60	0.1415	16	M(A,L)GM	0.008842	46.82
TCEGC112B	C	C1	3	1	48.91	0.1417	16	M(A,L)GM	0.008856	49.23
TCEGC113B	C	C1	3	1	46.59	0.1417	16	M(A,L)GM	0.008855	46.89
TCEGC211B	C	C2	3	2	47.55	0.1430	16	M(A,L)GM	0.008935	48.28
TCEGC212B	C	C2	3	2	49.02	0.1433	16	M(A,L)GM	0.008954	49.87
TCEGC213B	C	C2	3	2	50.72	0.1427	16	M(A,L)GM	0.008918	51.40

Average	**47.79**	
Standard Dev.	**1.328**	
Coeff. of Var. [%]	**2.780**	
Min.	**44.53**	
Max.	**50.72**	
Number of Spec.	**18**	

$Average_{norm}$	**0.008990**	**48.81**
$Standard\ Dev._{norm}$		**1.295**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**2.654**
Min.	**0.008842**	**46.27**
Max.	**0.009145**	**51.40**
Number of Spec.	**18**	**18**


Laminate Open-Hole Compression Properties (OHC1)--CTD (-65°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
5
0
10
20
30
40
50
60
Laminate Open-Hole Compression Strength [ksi]

Laminate Open-Hole Compression Properties (OHC1)--RTD (70°F)
Strength

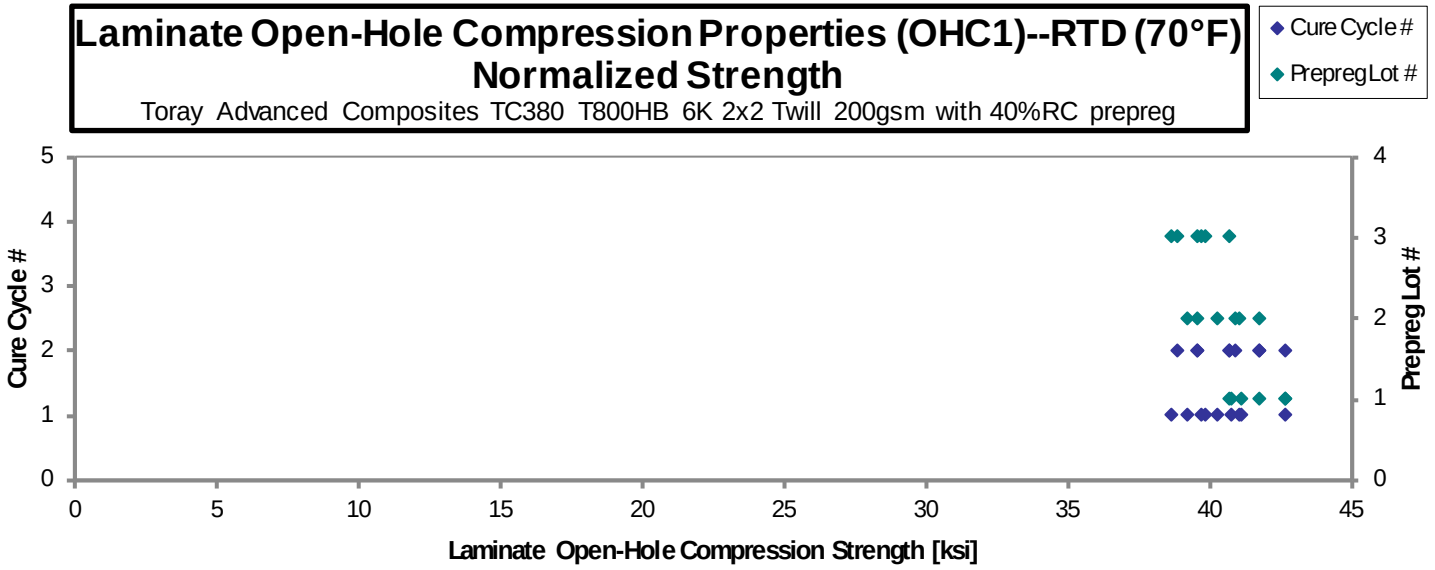
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCEGA111A	A	C1	1	1	42.87	0.1350	16	LGM	0.008435	41.09
TCEGA112A	A	C1	1	1	40.40	0.1420	16	LGM	0.008877	40.75
TCEGA113A	A	C1	1	1	41.39	0.1451	16	LGM	0.009071	42.66
TCEGA211A	A	C2	1	2	43.37	0.1356	16	LGM	0.008476	41.78
TCEGA212A	A	C2	1	2	42.02	0.1429	16	LGM	0.008932	42.65
TCEGA213A	A	C2	1	2	38.92	0.1472	16	LGM	0.009199	40.69
TCEGB111A	B	C1	2	1	41.79	0.1322	16	LGM	0.008259	39.22
TCEGB112A	B	C1	2	1	40.79	0.1390	16	M(L,A)GM	0.008684	40.25
TCEGB113A	B	C1	2	1	40.47	0.1428	16	LGM	0.008925	41.05
TCEGB211A	B	C2	2	2	41.42	0.1346	16	LGM	0.008410	39.59
TCEGB212A	B	C2	2	2	40.41	0.1426	16	LGM	0.008909	40.91
TCEGB213A	B	C2	2	2	40.22	0.1462	16	LGM	0.009134	41.75
TCEGC111A	C	C1	3	1	39.99	0.1361	16	M(A,L)GM	0.008505	38.65
TCEGC112A	C	C1	3	1	39.76	0.1407	16	LGM	0.008796	39.74
TCEGC113A	C	C1	3	1	39.21	0.1431	16	M(A,L)GM	0.008946	39.86
TCEGC211A	C	C2	3	2	39.75	0.1377	16	M(A,L)GM	0.008603	38.86
TCEGC212A	C	C2	3	2	40.37	0.1420	16	M(A,L)GM	0.008877	40.73
TCEGC213A	C	C2	3	2	38.12	0.1460	16	M(A,L)GM	0.009126	39.53

Average	**40.63**	
Standard Dev.	**1.341**	
Coeff. of Var. [%]	**3.301**	
Min.	**38.12**	
Max.	**43.37**	
Number of Spec.	**18**	

$Average_{norm}$	**0.008787**	**40.54**
$Standard\ Dev._{norm}$		**1.188**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**2.929**
Min.	**0.008259**	**38.65**
Max.	**0.009199**	**42.66**
Number of Spec.	**18**	**18**


Laminate Open-Hole Compression Properties (OHC1)--RTD (70°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Open-Hole Compression Strength [ksi]
0
5
10
15
20
25
30
35
40
45
0
1
2
3
4
5

Laminate Open-Hole Compression Properties (OHC1)--ETD1 (180°F) Strength

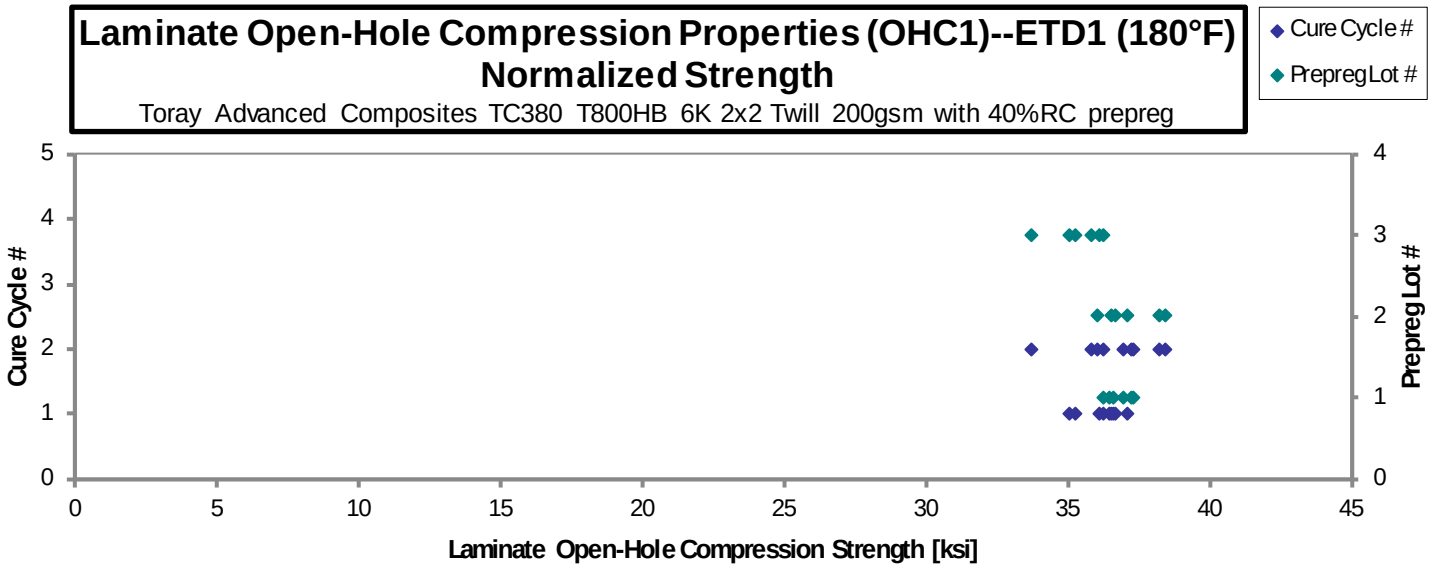
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCEGA111C	A	C1	1	1	35.20	0.1458	16	M(A,L)GM	0.009115	36.46
TCEGA112C	A	C1	1	1	35.70	0.1431	16	LGM	0.008941	36.28
TCEGA113C	A	C1	1	1	38.14	0.1352	16	LGM	0.008447	36.61
TCEGA211C	A	C2	1	2	36.02	0.1459	16	M(A,L)GM	0.009116	37.31
TCEGA212C	A	C2	1	2	36.54	0.1424	16	M(A,L)GM	0.008902	36.96
TCEGA213C	A	C2	1	2	38.58	0.1360	16	LGM	0.008500	37.27
TCEGB111C	B	C1	2	1	36.37	0.1438	16	M(A,L)GM	0.008984	37.13
TCEGB112C	B	C1	2	1	36.94	0.1399	16	M(A,L)GM	0.008744	36.70
TCEGB113C	B	C1	2	1	38.36	0.1342	16	M(A,L)GM	0.008386	36.56
TCEGB211C	B	C2	2	2	36.86	0.1461	16	M(A,L)GM	0.009130	38.25
TCEGB212C	B	C2	2	2	38.10	0.1421	16	LGM	0.008878	38.44
TCEGB213C	B	C2	2	2	37.96	0.1337	16	LGM	0.008358	36.06
TCEGC111C	C	C1	3	1	34.77	0.1420	16	LGM	0.008875	35.06
TCEGC112C	C	C1	3	1	36.24	0.1403	16	M(A,L)GM	0.008769	36.11
TCEGC113C	C	C1	3	1	36.77	0.1349	16	M(A,L)GM	0.008433	35.24
TCEGC211C	C	C2	3	2	35.08	0.1439	16	M(A,L)GM	0.008991	35.84
TCEGC212C	C	C2	3	2	33.29	0.1427	16	M(A,L)GM	0.008918	33.74
TCEGC213C	C	C2	3	2	36.92	0.1382	16	LGM	0.008635	36.23

Average	**36.55**	
Standard Dev.	**1.407**	
Coeff. of Var. [%]	**3.851**	
Min.	**33.29**	
Max.	**38.58**	
Number of Spec.	**18**	

$Average_{norm}$	**0.008785**	**36.46**
$Standard\ Dev._{norm}$		**1.108**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**3.040**
Min.	**0.008358**	**33.74**
Max.	**0.009130**	**38.44**
Number of Spec.	**18**	**18**


Laminate Open-Hole Compression Properties (OHC1)--ETD1 (180°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Open-Hole Compression Strength [ksi]
0
1
2
3
4
5
0
5
10
15
20
25
30
35
40
45

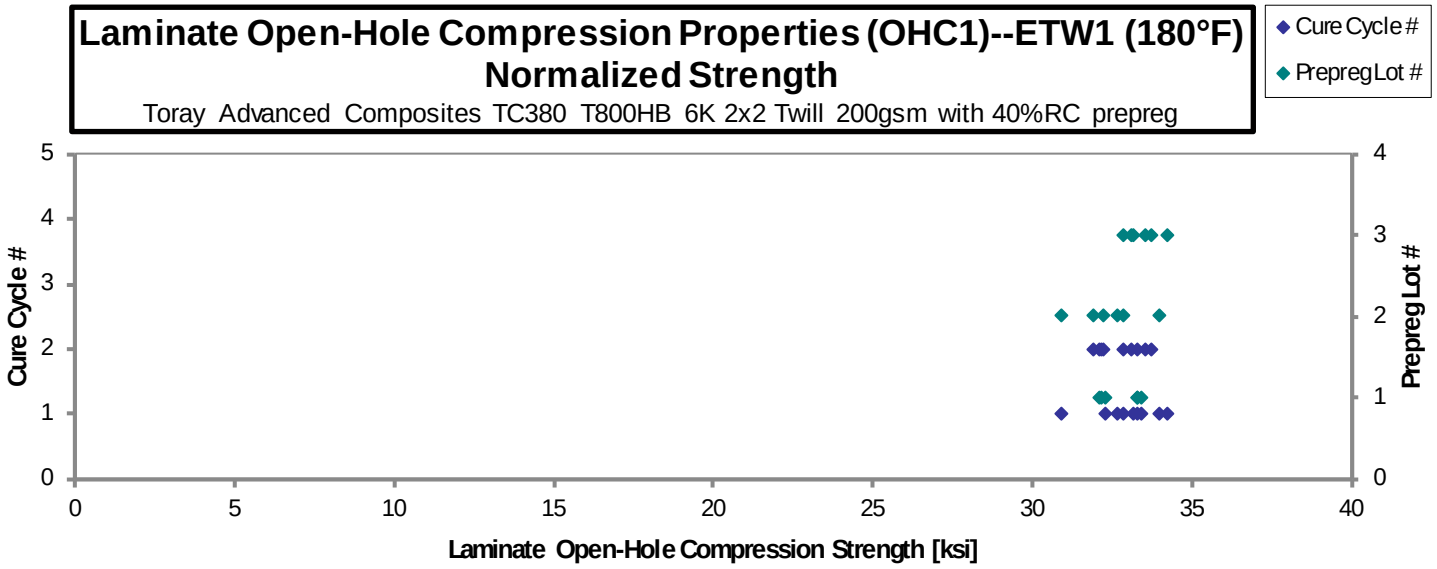
Laminate Open-Hole Compression Properties (OHC1)--ETW1 (180°F) Strength

Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCEGA111D	A	C1	1	1	33.19	0.1418	16	LGM	0.008863	33.43
TCEGA112D	A	C1	1	1	32.50	0.1443	16	LGM	0.009021	33.32
TCEGA113D	A	C1	1	1	31.50	0.1445	16	LGM	0.009028	32.32
TCEGA211D	A	C2	1	2	31.76	0.1424	16	LGM	0.008902	32.13
TCEGA212D	A	C2	1	2	31.13	0.1456	16	M(A,L)GM	0.009098	32.18
TCEGA213D	A	C2	1	2	32.18	0.1456	16	LGM	0.009098	33.27
TCEGB111D	B	C1	2	1	31.33	0.1390	16	LGM	0.008689	30.93
TCEGB112D	B	C1	2	1	31.89	0.1442	16	M(A,L)GM	0.009009	32.65
TCEGB113D	B	C1	2	1	33.16	0.1444	16	M(A,L)GM	0.009022	34.00
TCEGB211D	B	C2	2	2	32.06	0.1415	16	M(A,L)GM	0.008845	32.23
TCEGB212D	B	C2	2	2	30.80	0.1460	16	M(A,L)GM	0.009124	31.94
TCEGB213D	B	C2	2	2	31.69	0.1460	16	M(A,L)GM	0.009123	32.86
TCEGC111D	C	C1	3	1	33.35	0.1388	16	M(A,L)GM	0.008676	32.88
TCEGC112D	C	C1	3	1	32.97	0.1416	16	M(A,L)GM	0.008852	33.17
TCEGC113D	C	C1	3	1	34.25	0.1407	16	M(A,L)GM	0.008792	34.22
TCEGC211D	C	C2	3	2	32.59	0.1448	16	M(A,L)GM	0.009052	33.52
TCEGC212D	C	C2	3	2	32.94	0.1441	16	M(A,L)GM	0.009008	33.72
TCEGC213D	C	C2	3	2	32.30	0.1444	16	M(A,L)GM	0.009024	33.12

	Strength [ksi]		$Strength_{norm}$ [ksi]
Average	**32.31**	**$Average_{norm}$**	**0.008957**	**32.88**
Standard Dev.	**0.8916**	**$Standard\ Dev._{norm}$**		**0.8218**
Coeff. of Var. [%]	**2.759**	**Coeff. of Var. $[\%]_{norm}$**		**2.499**
Min.	**30.80**	**Min.**	**0.008676**	**30.93**
Max.	**34.25**	**Max.**	**0.009124**	**34.22**
Number of Spec.	**18**	**Number of Spec.**	**18**	**18**


Laminate Open-Hole Compression Properties (OHC1)--ETW1 (180°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Open-Hole Compression Strength [ksi]
0
1
2
3
4
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0
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10
15
20
25
30
35
40

Laminate Open-Hole Compression Properties (OHC1)--ETW2 (250°F)
Strength

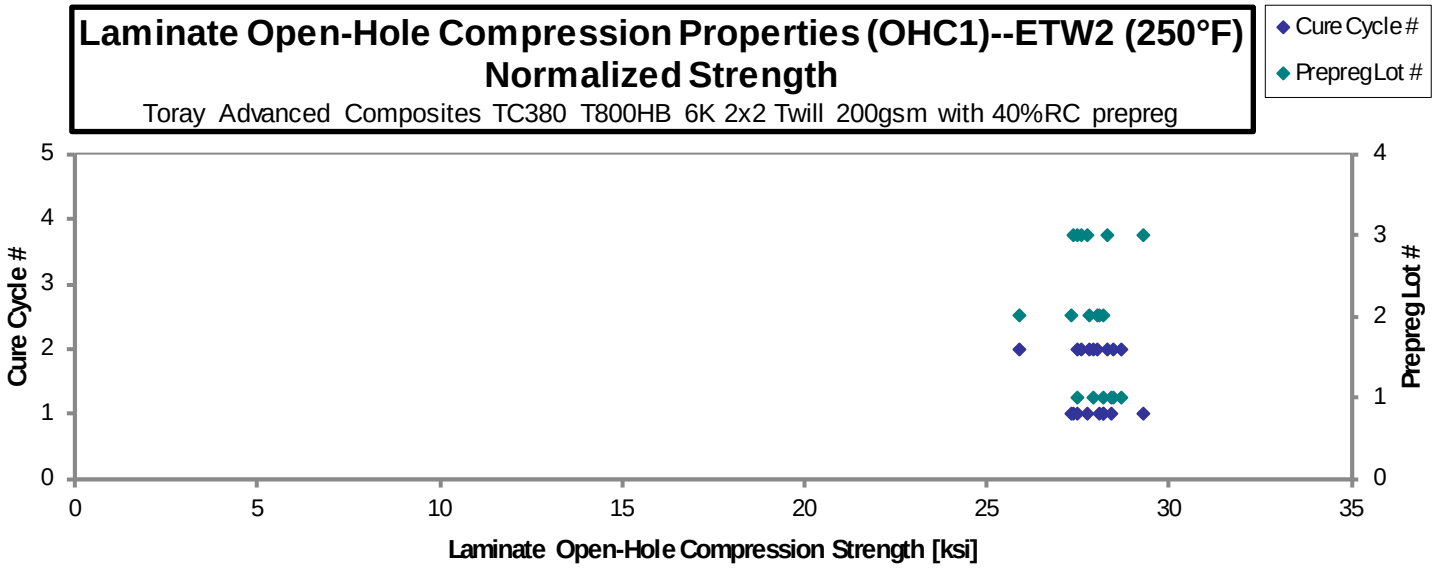
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCEGA111E	A	C1	1	1	27.85	0.1425	16	LGM	0.008905	28.18
TCEGA112E	A	C1	1	1	27.86	0.1436	16	LGM	0.008977	28.42
TCEGA113E	A	C1	1	1	26.89	0.1441	16	M(A,L)GM	0.009003	27.51
TCEGA211E	A	C2	1	2	27.17	0.1447	16	LGM	0.009045	27.93
TCEGA212E	A	C2	1	2	27.67	0.1461	16	M(A,L)GM	0.009133	28.72
TCEGA213E	A	C2	1	2	27.52	0.1456	16	M(A,L)GM	0.009101	28.47
TCEGB111E	B	C1	2	1	26.62	0.1444	16	LGM	0.009027	27.31
TCEGB112E	B	C1	2	1	27.23	0.1453	16	LGM	0.009079	28.09
TCEGB113E	B	C1	2	1	27.58	0.1440	16	LGM	0.008999	28.20
TCEGB211E	B	C2	2	2	25.25	0.1443	16	M(A,L)GM	0.009020	25.89
TCEGB212E	B	C2	2	2	27.08	0.1457	16	LGM	0.009103	28.01
TCEGB213E	B	C2	2	2	26.85	0.1458	16	LGM	0.009114	27.81
TCEGC111E	C	C1	3	1	27.77	0.1407	16	M(A,L)GM	0.008793	27.75
TCEGC112E	C	C1	3	1	27.39	0.1406	16	M(A,L)GM	0.008790	27.36
TCEGC113E	C	C1	3	1	29.33	0.1407	16	M(A,L)GM	0.008792	29.30
TCEGC211E	C	C2	3	2	27.80	0.1434	16	M(A,L)GM	0.008960	28.31
TCEGC212E	C	C2	3	2	26.90	0.1444	16	M(A,L)GM	0.009027	27.59
TCEGC213E	C	C2	3	2	26.81	0.1444	16	M(A,L)GM	0.009024	27.49

	Strength [ksi]
Average	27.31
Standard Dev.	0.8030
Coeff. of Var. [%]	2.940
Min.	25.25
Max.	29.33
Number of Spec.	18

	t_{ply} [in]	$Strength_{norm}$ [ksi]
$Average_{norm}$	0.008994	27.91
$Standard\ Dev._{norm}$		0.7175
$Coeff.\ of\ Var.\ [\%]_{norm}$		2.571
Min.	0.008790	25.89
Max.	0.009133	29.30
Number of Spec.	18	18


Laminate Open-Hole Compression Properties (OHC1)--ETW2 (250°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Open-Hole Compression Strength [ksi]
0
1
2
3
4
5
0
5
10
15
20
25
30
35

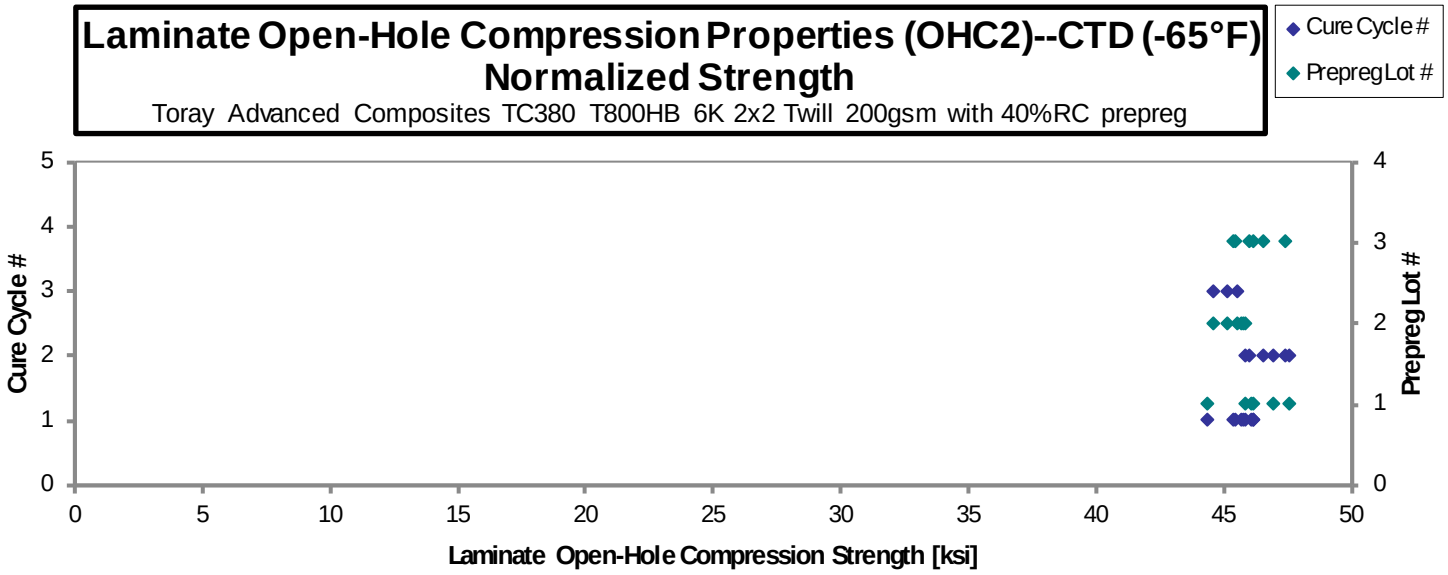
4.20 "10/80/10" Open-Hole Compression 2 Properties (OHC2)

Laminate Open-Hole Compression Properties (OHC2)--CTD (-65°F)
Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCEHA111B	A	C1	1	1	44.80	0.1811	20	M(A,L)GM	0.009055	46.10
TCEHA112B	A	C1	1	1	43.00	0.1815	20	M(A,L)GM	0.009076	44.35
TCEHA113B	A	C1	1	1	44.77	0.1816	20	M(A,L)GM	0.009078	46.19
TCEHA211B	A	C2	1	2	45.48	0.1816	20	M(A,L)GM	0.009080	46.93
TCEHA212B	A	C2	1	2	46.08	0.1816	20	M(A,L)GM	0.009078	47.53
TCEHA213B	A	C2	1	2	44.52	0.1814	20	M(A,L)GM	0.009068	45.88
TCEHB111B	B	C1	2	1	44.81	0.1795	20	M(A,L)GM	0.008977	45.71
TCEHB112B	B	C1	2	1	44.94	0.1792	20	M(A,L)GM	0.008959	45.76
TCEHB113B	B	C1	2	1	44.96	0.1796	20	M(A,L)GM	0.008980	45.88
TCEHB311B	B	C3	2	3	43.87	0.1788	20	M(A,L)GM	0.008942	44.58
TCEHB312B	B	C3	2	3	44.52	0.1785	20	M(A,L)GM	0.008926	45.16
TCEHB313B	B	C3	2	3	44.49	0.1802	20	M(A,L)GM	0.009010	45.55
TCEHC111B	C	C1	3	1	45.12	0.1773	20	M(A,L)GM	0.008864	45.45
TCEHC112B	C	C1	3	1	45.07	0.1772	20	M(A,L)GM	0.008858	45.36
TCEHC113B	C	C1	3	1	45.64	0.1780	20	M(A,L)GM	0.008898	46.15
TCEHC211B	C	C2	3	2	46.46	0.1795	20	M(A,L)GM	0.008973	47.38
TCEHC212B	C	C2	3	2	45.24	0.1790	20	M(A,L)GM	0.008950	46.01
TCEHC213B	C	C2	3	2	45.73	0.1792	20	M(A,L)GM	0.008958	46.55

	Strength [ksi]	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
Average	44.97	$Average_{norm}$	0.008985	45.92
Standard Dev.	0.7919	$Standard\ Dev._{norm}$		0.8362
Coeff. of Var. [%]	1.761	$Coeff.\ of\ Var.\ [\%]_{norm}$		1.821
Min.	43.00	Min.	0.008858	44.35
Max.	46.46	Max.	0.009080	47.53
Number of Spec.	18	Number of Spec.	18	18


Laminate Open-Hole Compression Properties (OHC2)--CTD (-65°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Open-Hole Compression Strength [ksi]
0
1
2
3
4
5
0
5
10
15
20
25
30
35
40
45
50

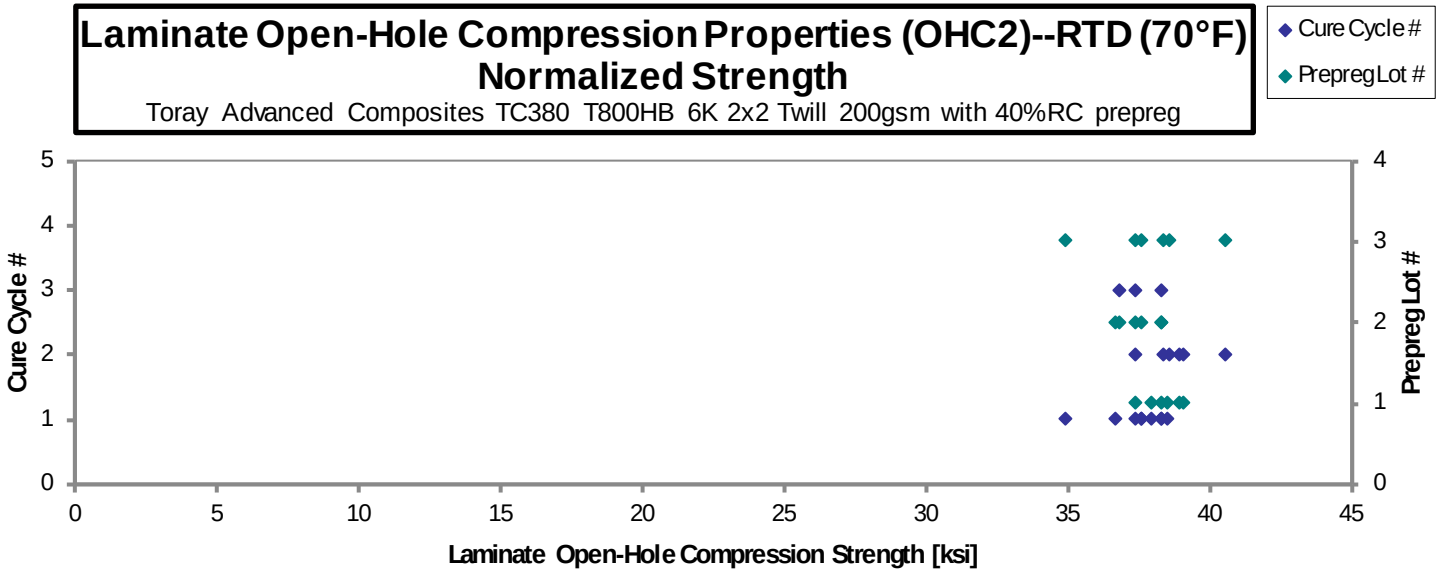
Laminate Open-Hole Compression Properties (OHC2)--RTD (70°F)
Strength

Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCEHA111A	A	C1	1	1	39.18	0.1704	20	M(L,A)GM	0.008520	37.94
TCEHA112A	A	C1	1	1	38.02	0.1773	20	M(L,A)GM	0.008864	38.30
TCEHA113A	A	C1	1	1	37.41	0.1813	20	M(L,A)GM	0.009066	38.54
TCEHA211A	A	C2	1	2	38.65	0.1703	20	M(L,A)GM	0.008515	37.40
TCEHA212A	A	C2	1	2	38.43	0.1783	20	M(L,A)GM	0.008916	38.93
TCEHA213A	A	C2	1	2	37.84	0.1816	20	M(L,A)GM	0.009082	39.06
TCEHB111A	B	C1	2	1	39.31	0.1684	20	M(L,A)GM	0.008421	37.61
TCEHB112A	B	C1	2	1	37.09	0.1742	20	M(L,A)GM	0.008711	36.71
TCEHB113A	B	C1	2	1	37.80	0.1785	20	M(L,A)GM	0.008923	38.33
TCEHB311A	B	C3	2	3	38.74	0.1700	20	M(L,A)GM	0.008500	37.42
TCEHB312A	B	C3	2	3	36.78	0.1761	20	M(L,A)GM	0.008806	36.80
TCEHB313A	B	C3	2	3	37.57	0.1793	20	M(L,A)GM	0.008964	38.27
TCEHC111A	C	C1	3	1	35.78	0.1718	20	LGM	0.008591	34.93
TCEHC112A	C	C1	3	1	37.24	0.1777	20	M(A,L)GM	0.008883	37.59
TCEHC113A	C	C1	3	1	36.65	0.1795	20	M(A,L)GM	0.008977	37.38
TCEHC211A	C	C2	3	2	39.01	0.1732	20	M(A,L)GM	0.008662	38.40
TCEHC212A	C	C2	3	2	38.15	0.1780	20	M(A,L)GM	0.008899	38.58
TCEHC213A	C	C2	3	2	39.55	0.1806	20	M(A,L)GM	0.009030	40.58

	Strength		$Strength_{norm}$
Average	**37.96**	**$Average_{norm}$**	**0.008796**	**37.93**
Standard Dev.	**1.027**	**$Standard\ Dev._{norm}$**		**1.177**
Coeff. of Var. [%]	**2.705**	**$Coeff.\ of\ Var.\ [\%]_{norm}$**		**3.102**
Min.	**35.78**	**Min.**	**0.008421**	**34.93**
Max.	**39.55**	**Max.**	**0.009082**	**40.58**
Number of Spec.	**18**	**Number of Spec.**	**18**	**18**


Laminate Open-Hole Compression Properties (OHC2)--RTD (70°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Open-Hole Compression Strength [ksi]
0
1
2
3
4
5
0
5
10
15
20
25
30
35
40
45

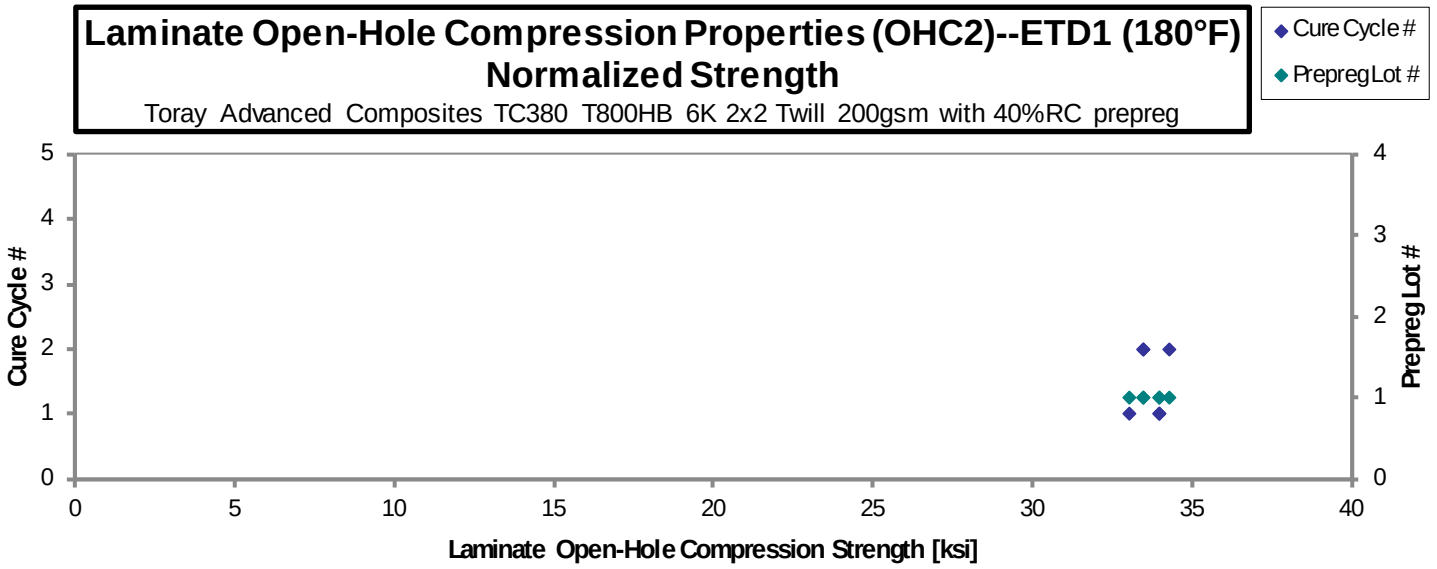
Laminate Open-Hole Compression Properties (OHC2)--ETD1 (180°F) Strength

Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCEHA111C	A	C1	1	1	32.94	0.1817	20	M(A,L)GM	0.009085	34.01
TCEHA112C	A	C1	1	1	33.58	0.1781	20	LGM	0.008907	33.99
TCEHA113C	A	C1	1	1	34.43	0.1689	20	M(A,L)GM	0.008444	33.03
TCEHA211C	A	C2	1	2	32.51	0.1813	20	M(A,L)GM	0.009063	33.48
TCEHA212C	A	C2	1	2	33.32	0.1770	20	M(A,L)GM	0.008849	33.50
TCEHA213C	A	C2	1	2	35.67	0.1693	20	M(A,L)GM	0.008466	34.32

Average	**33.74**		**Average$_{norm}$**	**0.008802**	**33.72**
Standard Dev.	**1.145**		**Standard Dev.$_{norm}$**		**0.4666**
Coeff. of Var. [%]	**3.392**		**Coeff. of Var. [%]$_{norm}$**		**1.384**
Min.	**32.51**		**Min.**	**0.008444**	**33.03**
Max.	**35.67**		**Max.**	**0.009085**	**34.32**
Number of Spec.	**6**		**Number of Spec.**	**6**	**6**


Laminate Open-Hole Compression Properties (OHC2)--ETD1 (180°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Open-Hole Compression Strength [ksi]
0
1
2
3
4
5
0
5
10
15
20
25
30
35
40

Laminate Open-Hole Compression Properties (OHC2)--ETW1 (180°F)
Strength

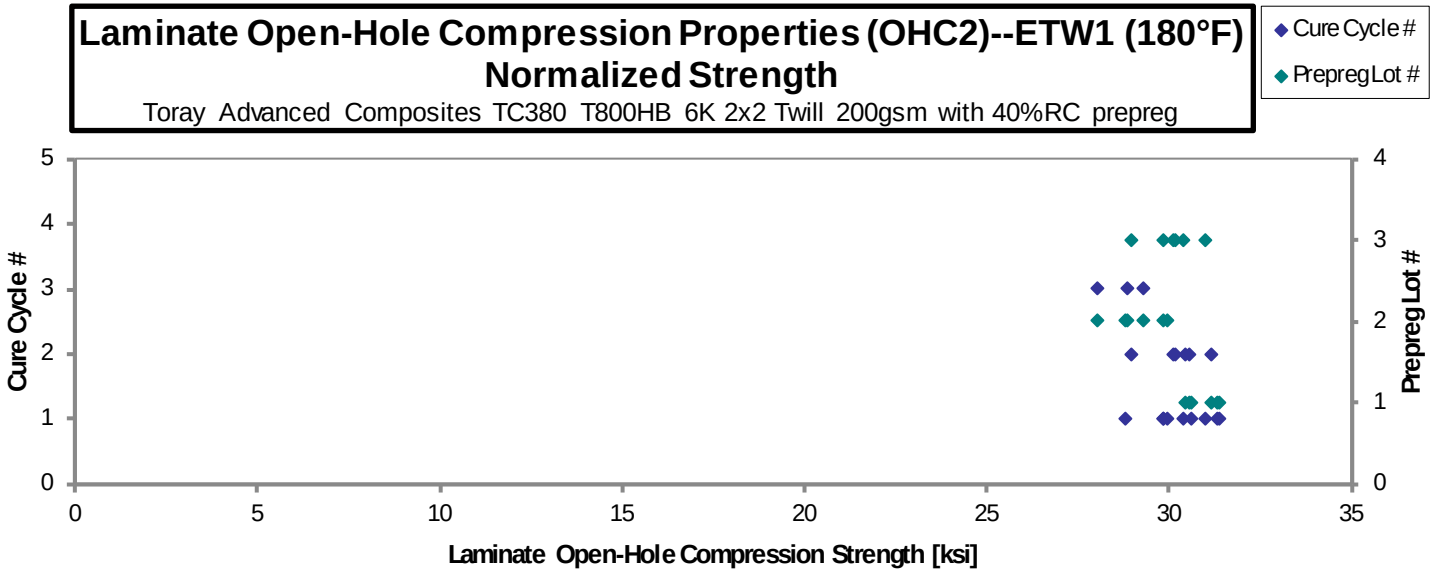
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCEHA111D	A	C1	1	1	30.35	0.1776	20	M(A,L)GM	0.008878	30.61
TCEHA112D	A	C1	1	1	30.49	0.1812	20	M(A,L)GM	0.009061	31.39
TCEHA113D	A	C1	1	1	30.38	0.1815	20	M(A,L)GM	0.009077	31.34
TCEHA211D	A	C2	1	2	30.27	0.1777	20	M(A,L)GM	0.008883	30.55
TCEHA212D	A	C2	1	2	29.53	0.1816	20	M(A,L)GM	0.009079	30.47
TCEHA213D	A	C2	1	2	30.16	0.1819	20	M(A,L)GM	0.009096	31.17
TCEHB111D	B	C1	2	1	29.21	0.1798	20	M(A,L)GM	0.008989	29.84
TCEHB112D	B	C1	2	1	30.01	0.1758	20	M(A,L)GM	0.008788	29.96
TCEHB113D	B	C1	2	1	29.92	0.1695	20	M(A,L)GM	0.008473	28.81
TCEHB311D	B	C3	2	3	28.34	0.1791	20	M(A,L)GM	0.008953	28.84
TCEHB312D	B	C3	2	3	29.44	0.1753	20	M(A,L)GM	0.008763	29.31
TCEHB313D	B	C3	2	3	29.39	0.1679	20	M(A,L)GM	0.008393	28.03
TCEHC111D	C	C1	3	1	29.93	0.1786	20	AGM	0.008929	30.37
TCEHC112D	C	C1	3	1	30.91	0.1699	20	AGM	0.008493	29.84
TCEHC113D	C	C1	3	1	30.81	0.1770	20	M(A,L)GM	0.008849	30.98
TCEHC211D	C	C2	3	2	29.55	0.1798	20	M(A,L)GM	0.008988	30.18
TCEHC212D	C	C2	3	2	29.84	0.1777	20	M(A,L)GM	0.008886	30.13
TCEHC213D	C	C2	3	2	29.75	0.1713	20	M(A,L)GM	0.008564	28.96

Average	**29.90**	
Standard Dev.	**0.6192**	
Coeff. of Var. [%]	**2.071**	
Min.	**28.34**	
Max.	**30.91**	
Number of Spec.	**18**	

$Average_{norm}$	**0.008841**	**30.04**
$Standard\ Dev._{norm}$		**0.9518**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**3.168**
Min.	**0.008393**	**28.03**
Max.	**0.009096**	**31.39**
Number of Spec.	**18**	**18**


Laminate Open-Hole Compression Properties (OHC2)--ETW1 (180°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Open-Hole Compression Strength [ksi]
0
1
2
3
4
5
0
5
10
15
20
25
30
35

Laminate Open-Hole Compression Properties (OHC2)--ETW2 (250°F)
Strength

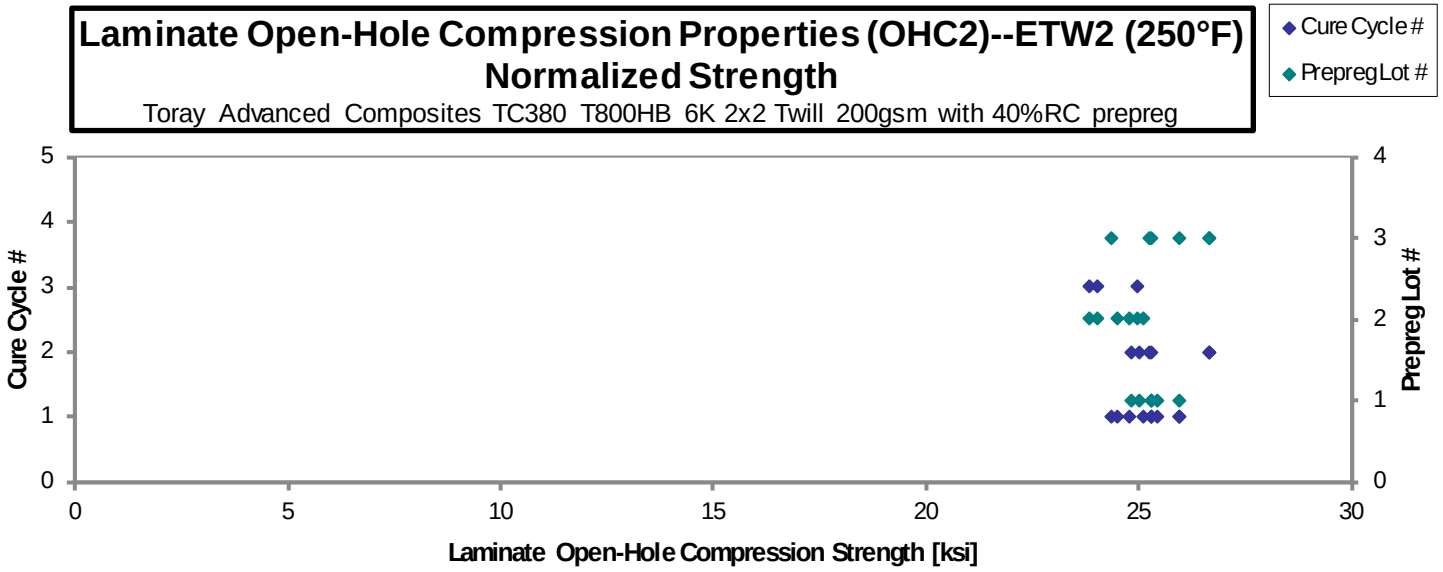
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCEHA111E	A	C1	1	1	25.18	0.1815	20	M(A,L)GM	0.009077	25.97
TCEHA112E	A	C1	1	1	24.53	0.1825	20	M(A,L)GM	0.009123	25.43
TCEHA113E	A	C1	1	1	24.53	0.1814	20	M(A,L)GM	0.009068	25.28
TCEHA211E	A	C2	1	2	24.58	0.1810	20	M(A,L)GM	0.009050	25.28
TCEHA212E	A	C2	1	2	24.16	0.1823	20	M(A,L)GM	0.009117	25.03
TCEHA213E	A	C2	1	2	24.04	0.1816	20	M(A,L)GM	0.009082	24.81
TCEHB111E	B	C1	2	1	23.92	0.1801	20	M(A,L)GM	0.009004	24.48
TCEHB112E	B	C1	2	1	24.16	0.1804	20	M(A,L)GM	0.009020	24.76
TCEHB113E	B	C1	2	1	24.55	0.1801	20	M(A,L)GM	0.009006	25.12
TCEHB311E	B	C3	2	3	23.26	0.1802	20	M(A,L)GM	0.009011	23.82
TCEHB312E	B	C3	2	3	23.38	0.1809	20	M(A,L)GM	0.009046	24.03
TCEHB313E	B	C3	2	3	24.44	0.1799	20	M(A,L)GM	0.008993	24.98
TCEHC111E	C	C1	3	1	25.60	0.1786	20	M(A,L)GM	0.008928	25.98
TCEHC112E	C	C1	3	1	24.94	0.1786	20	M(A,L)GM	0.008928	25.30
TCEHC113E	C	C1	3	1	23.91	0.1792	20	M(A,L)GM	0.008958	24.34
TCEHC211E	C	C2	3	2	24.85	0.1788	20	M(A,L)GM	0.008938	25.24
TCEHC212E	C	C2	3	2	26.11	0.1799	20	M(A,L)GM	0.008994	26.68
TCEHC213E	C	C2	3	2	26.10	0.1798	20	M(A,L)GM	0.008991	26.67

	Strength [ksi]
Average	**24.57**
Standard Dev.	**0.8042**
Coeff. of Var. [%]	**3.273**
Min.	**23.26**
Max.	**26.11**
Number of Spec.	**18**

	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
$Average_{norm}$	**0.009019**	**25.18**
Standard $Dev._{norm}$		**0.7892**
Coeff. of $Var._{norm}$ [%]		**3.134**
Min.	**0.008928**	**23.82**
Max.	**0.009123**	**26.68**
Number of Spec.	**18**	**18**


Laminate Open-Hole Compression Properties (OHC2)--ETW2 (250°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Open-Hole Compression Strength [ksi]
0
1
2
3
4
5
0
5
10
15
20
25
30

4.21 "40/20/40" Open-Hole Compression 3 Properties (OHC3)

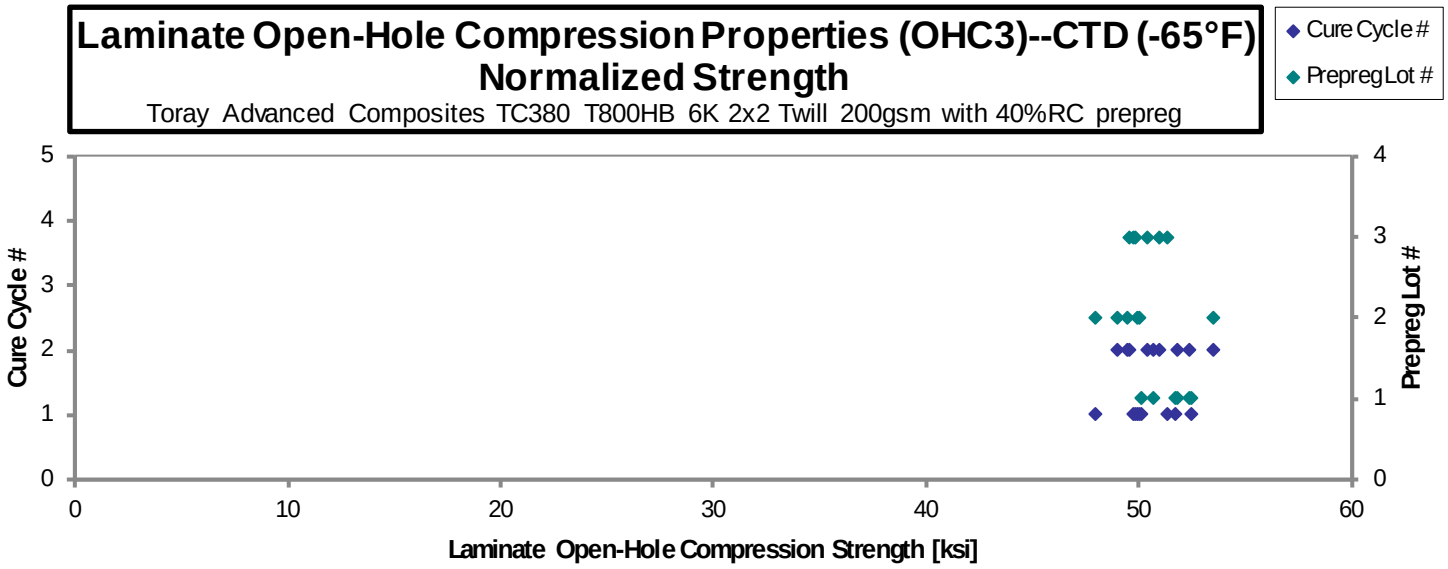
Laminate Open-Hole Compression Properties (OHC3)--CTD (-65°F)
Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCEIA111B	A	C1	1	1	50.58	0.1825	20	M(A,L)GM	0.009125	52.45
TCEIA112B	A	C1	1	1	50.21	0.1814	20	M(A,L)GM	0.009069	51.75
TCEIA113B	A	C1	1	1	48.57	0.1817	20	M(A,L)GM	0.009085	50.14
TCEIA211B	A	C2	1	2	48.80	0.1830	20	M(A,L)GM	0.009148	50.73
TCEIA212B	A	C2	1	2	50.39	0.1828	20	M(A,L)GM	0.009141	52.34
TCEIA213B	A	C2	1	2	49.68	0.1835	20	M(A,L)GM	0.009176	51.81
TCEIB111B	B	C1	2	1	49.01	0.1794	20	M(A,L)GM	0.008970	49.95
TCEIB112B	B	C1	2	1	49.42	0.1782	20	M(A,L)GM	0.008912	50.05
TCEIB113B	B	C1	2	1	47.02	0.1794	20	M(A,L)GM	0.008968	47.92
TCEIB211B	B	C2	2	2	48.12	0.1793	20	M(A,L)GF	0.008964	49.02
TCEIB212B	B	C2	2	2	48.71	0.1786	20	M(A,L)GF	0.008932	49.44
TCEIB213B	B	C2	2	2	52.33	0.1801	20	M(A,L)GF	0.009004	53.54
TCEIC111B	C	C1	3	1	49.13	0.1784	20	M(A,L)GM	0.008921	49.80
TCEIC112B	C	C1	3	1	50.81	0.1780	20	M(A,L)GM	0.008900	51.39
TCEIC113B	C	C1	3	1	49.20	0.1778	20	M(A,L)GM	0.008891	49.71
TCEIC211B	C	C2	3	2	50.04	0.1794	20	LGM	0.008968	50.99
TCEIC212B	C	C2	3	2	49.81	0.1781	20	M(A,L)GM	0.008903	50.40
TCEIC213B	C	C2	3	2	48.80	0.1786	20	M(A,L)GM	0.008932	49.53

Average	**49.48**	
Standard Dev.	**1.178**	
Coeff. of Var. [%]	**2.381**	
Min.	**47.02**	
Max.	**52.33**	
Number of Spec.	**18**	

$Average_{norm}$	**0.009000**	**50.61**
$Standard\ Dev._{norm}$		**1.398**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**2.763**
Min.	**0.008891**	**47.92**
Max.	**0.009176**	**53.54**
Number of Spec.	**18**	**18**


Laminate Open-Hole Compression Properties (OHC3)--CTD (-65°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
5
0
10
20
30
40
50
60
Laminate Open-Hole Compression Strength [ksi]

Laminate Open-Hole Compression Properties (OHC3)--RTD (70°F)
Strength

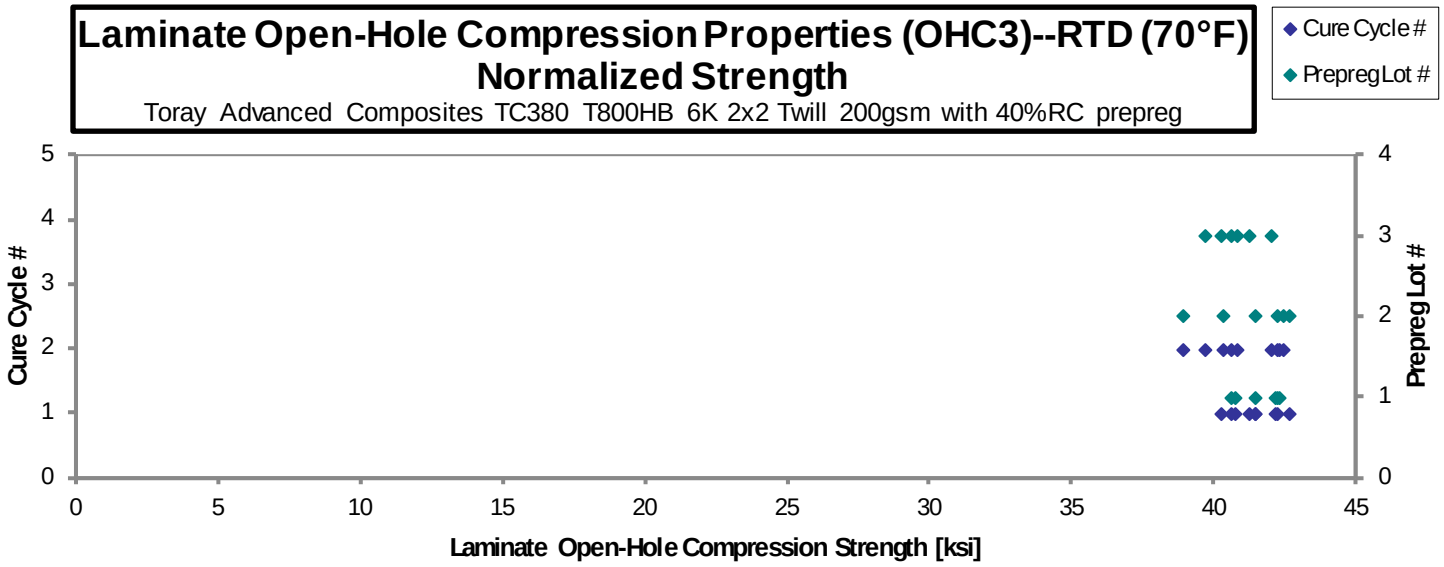
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCEIA111A	A	C1	1	1	42.86	0.1703	20	LGM	0.008514	41.47
TCEIA112A	A	C1	1	1	40.10	0.1790	20	LGM	0.008949	40.77
TCEIA113A	A	C1	1	1	40.75	0.1823	20	LGM	0.009117	42.22
TCEIA211A	A	C2	1	2	42.17	0.1696	20	LGM	0.008479	40.63
TCEIA212A	A	C2	1	2	41.73	0.1786	20	LGM	0.008930	42.35
TCEIA213A	A	C2	1	2	40.64	0.1829	20	LGM	0.009145	42.23
TCEIB111A	B	C1	2	1	44.58	0.1685	20	LGM	0.008424	42.67
TCEIB112A	B	C1	2	1	41.78	0.1748	20	LGM	0.008739	41.49
TCEIB113A	B	C1	2	1	41.62	0.1788	20	LGM	0.008939	42.27
TCEIB211A	B	C2	2	2	40.40	0.1697	20	LGM	0.008485	38.95
TCEIB212A	B	C2	2	2	42.64	0.1754	20	LGM	0.008771	42.50
TCEIB213A	B	C2	2	2	39.70	0.1788	20	LGM	0.008941	40.34
TCEIC111A	C	C1	3	1	41.25	0.1719	20	M(A,L)GM	0.008593	40.27
TCEIC112A	C	C1	3	1	40.93	0.1773	20	M(A,L)GM	0.008867	41.24
TCEIC113A	C	C1	3	1	39.86	0.1796	20	M(A,L)GM	0.008978	40.66
TCEIC211A	C	C2	3	2	40.76	0.1716	20	M(A,L)GM	0.008578	39.73
TCEIC212A	C	C2	3	2	40.60	0.1773	20	M(A,L)GM	0.008863	40.89
TCEIC213A	C	C2	3	2	41.16	0.1797	20	M(A,L)GM	0.008986	42.03

Average	**41.31**	
Standard Dev.	**1.208**	
Coeff. of Var. [%]	**2.925**	
Min.	**39.70**	
Max.	**44.58**	
Number of Spec.	**18**	

$Average_{norm}$	**0.008794**	**41.26**
$Standard\ Dev._{norm}$		**1.055**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**2.556**
Min.	**0.008424**	**38.95**
Max.	**0.009145**	**42.67**
Number of Spec.	**18**	**18**


Laminate Open-Hole Compression Properties (OHC3)--RTD (70°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
5
0
5
10
15
20
25
30
35
40
45
Laminate Open-Hole Compression Strength [ksi]

Laminate Open-Hole Compression Properties (OHC3)--ETD1 (180°F) Strength

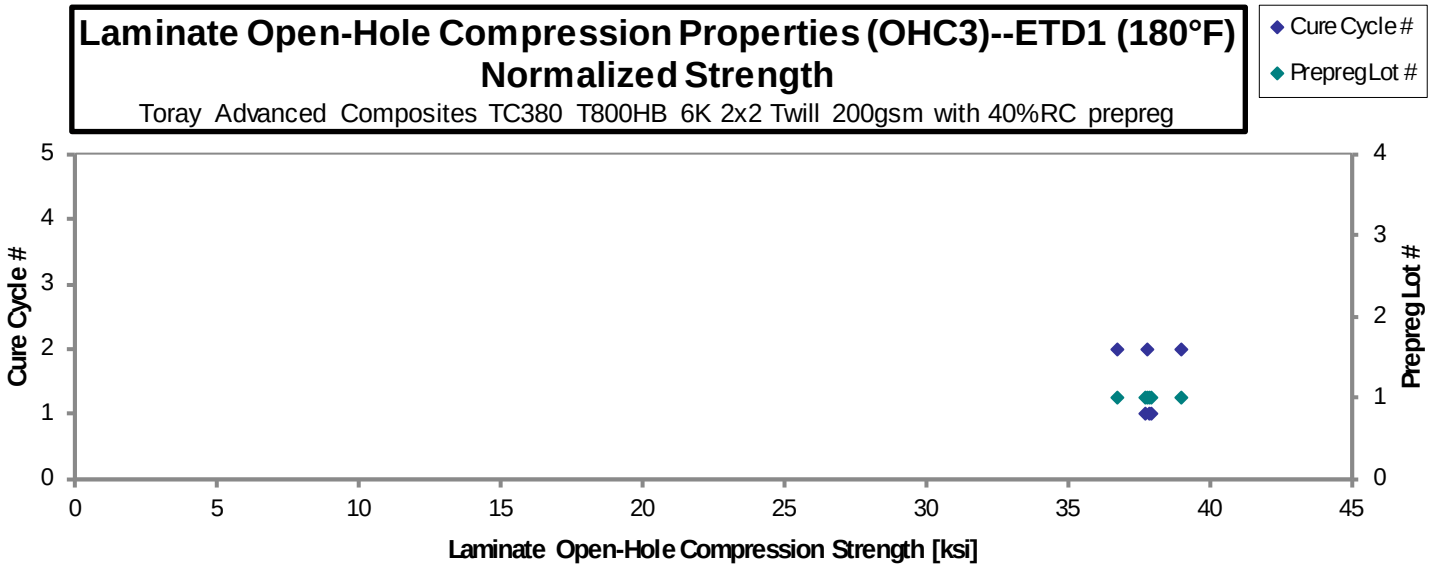
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCEIA111C	A	C1	1	1	36.79	0.1806	20	LGM	0.009028	37.74
TCEIA112C	A	C1	1	1	37.92	0.1761	20	M(A,L)GM	0.008805	37.95
TCEIA113C	A	C1	1	1	39.28	0.1696	20	M(A,L)GM	0.008479	37.85
TCEIA211C	A	C2	1	2	36.32	0.1831	20	M(A,L)GM	0.009153	37.78
TCEIA212C	A	C2	1	2	36.11	0.1791	20	LGM	0.008957	36.76
TCEIA213C	A	C2	1	2	40.12	0.1711	20	LGM	0.008557	39.01

Average	**37.76**	
Standard Dev.	**1.651**	
Coeff. of Var. [%]	**4.372**	
Min.	**36.11**	
Max.	**40.12**	
Number of Spec.	**6**	

$Average_{norm}$	**0.008830**	**37.85**
$Standard\ Dev._{norm}$		**0.7166**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**1.893**
Min.	**0.008479**	**36.76**
Max.	**0.009153**	**39.01**
Number of Spec.	**6**	**6**


Laminate Open-Hole Compression Properties (OHC3)--ETD1 (180°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Open-Hole Compression Strength [ksi]
0
5
10
15
20
25
30
35
40
45
0
1
2
3
4
5

Laminate Open-Hole Compression Properties (OHC3)--ETW1 (180°F)
Strength

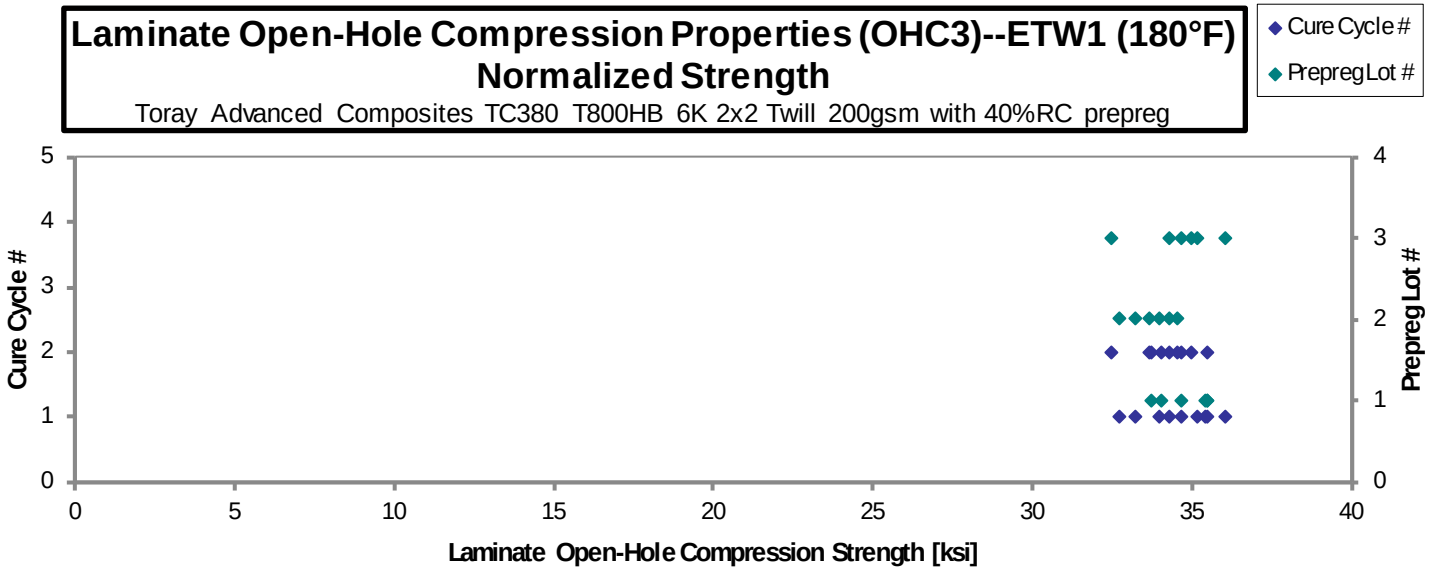
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCEIA111D	A	C1	1	1	34.61	0.1765	20	M(A,L)GM	0.008823	34.70
TCEIA112D	A	C1	1	1	34.78	0.1795	20	LGM	0.008973	35.46
TCEIA113D	A	C1	1	1	34.47	0.1808	20	LGM	0.009042	35.41
TCEIA211D	A	C2	1	2	33.61	0.1768	20	M(A,L)GM	0.008840	33.76
TCEIA212D	A	C2	1	2	34.31	0.1820	20	LGM	0.009100	35.48
TCEIA213D	A	C2	1	2	32.80	0.1826	20	LGM	0.009128	34.02
TCEIB111D	B	C1	2	1	33.65	0.1778	20	LGM	0.008892	34.00
TCEIB112D	B	C1	2	1	33.25	0.1731	20	M(A,L)GM	0.008657	32.71
TCEIB113D	B	C1	2	1	35.24	0.1659	20	LGM	0.008293	33.21
TCEIB211D	B	C2	2	2	33.96	0.1791	20	M(A,L)GM	0.008956	34.56
TCEIB212D	B	C2	2	2	33.93	0.1747	20	LGM	0.008736	33.68
TCEIB213D	B	C2	2	2	35.55	0.1698	20	LGM	0.008492	34.30
TCEIC111D	C	C1	3	1	33.97	0.1776	20	LGM	0.008880	34.28
TCEIC112D	C	C1	3	1	36.08	0.1716	20	LGM	0.008578	35.17
TCEIC113D	C	C1	3	1	35.44	0.1791	20	LGM	0.008955	36.06
TCEIC211D	C	C2	3	2	34.20	0.1783	20	LGM	0.008915	34.65
TCEIC212D	C	C2	3	2	34.95	0.1763	20	LGM	0.008813	35.00
TCEIC213D	C	C2	3	2	33.39	0.1711	20	LGM	0.008557	32.47

Average	**34.34**	
Standard Dev.	**0.8780**	
Coeff. of Var. [%]	**2.557**	
Min.	**32.80**	
Max.	**36.08**	
Number of Spec.	**18**	

$Average_{norm}$	**0.008813**	**34.39**
$Standard\ Dev._{norm}$		**0.9840**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**2.862**
Min.	**0.008293**	**32.47**
Max.	**0.009128**	**36.06**
Number of Spec.	**18**	**18**


Laminate Open-Hole Compression Properties (OHC3)--ETW1 (180°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Open-Hole Compression Strength [ksi]
0
1
2
3
4
5
0
5
10
15
20
25
30
35
40

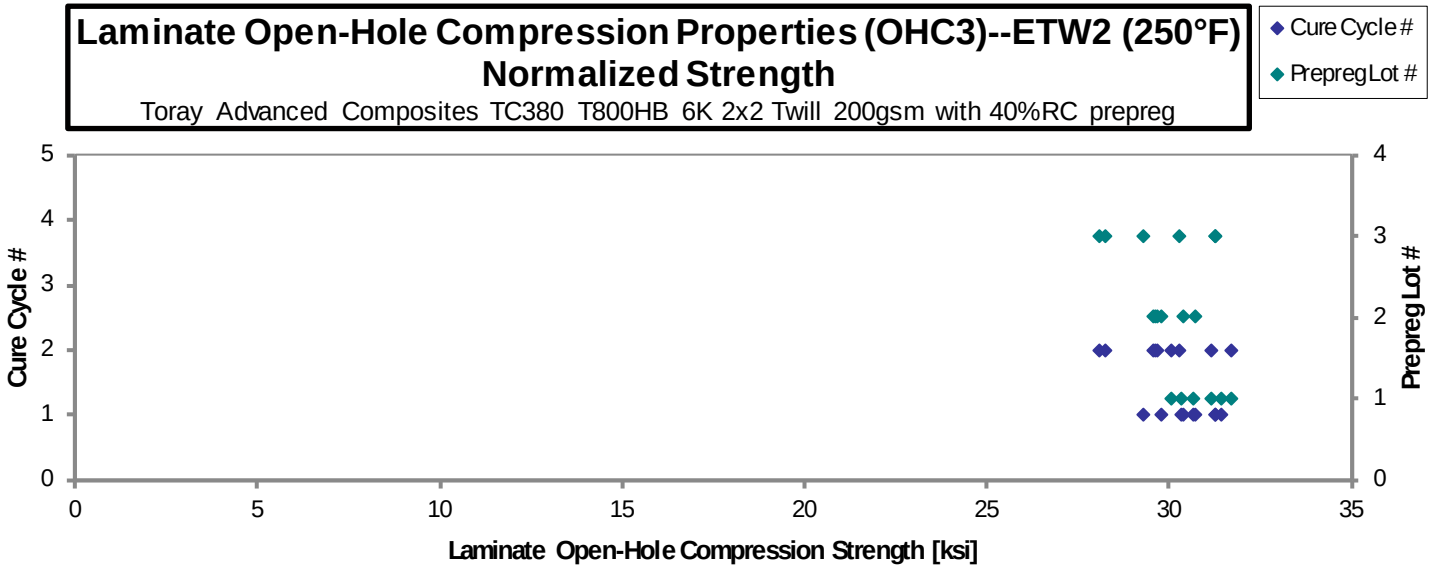
Laminate Open-Hole Compression Properties (OHC3)--ETW2 (250°F)
Strength

Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]: 0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCEIA111E	A	C1	1	1	29.86	0.1787	20	LGM	0.008933	30.31
TCEIA112E	A	C1	1	1	30.08	0.1795	20	LGM	0.008975	30.68
TCEIA113E	A	C1	1	1	30.92	0.1789	20	LGM	0.008943	31.42
TCEIA211E	A	C2	1	2	30.11	0.1820	20	LGM	0.009101	31.14
TCEIA212E	A	C2	1	2	30.53	0.1829	20	LGM	0.009146	31.73
TCEIA213E	A	C2	1	2	28.85	0.1833	20	LGM	0.009165	30.05
TCEIB111E	B	C1	2	1	29.87	0.1791	20	LGM	0.008957	30.40
TCEIB112E	B	C1	2	1	29.89	0.1811	20	LGM	0.009053	30.75
TCEIB113E	B	C1	2	1	29.23	0.1794	20	LGM	0.008968	29.79
TCEIB211E	B	C2	2	2	29.10	0.1789	20	LGM	0.008943	29.57
TCEIB212E	B	C2	2	2	29.10	0.1796	20	LGM	0.008978	29.68
TCEIB213E	B	C2	2	2	29.11	0.1790	20	LGM	0.008948	29.60
TCEIC111E	C	C1	3	1	28.80	0.1791	20	M(A,L)GM	0.008953	29.30
TCEIC112E	C	C1	3	1	30.80	0.1788	20	LGM	0.008942	31.29
TCEIC113E	C	C1	3	1	30.91	0.1781	20	M(A,L)GM	0.008906	31.29
TCEIC211E	C	C2	3	2	27.66	0.1788	20	LGM	0.008941	28.10
TCEIC212E	C	C2	3	2	27.75	0.1791	20	LGM	0.008957	28.25
TCEIC213E	C	C2	3	2	29.95	0.1781	20	LGM	0.008903	30.30

	Strength [ksi]		$Strength_{norm}$ [ksi]
Average	**29.58**	**Average$_{norm}$**	**0.008984**	**30.20**
Standard Dev.	**0.9667**	**Standard Dev.$_{norm}$**		**1.027**
Coeff. of Var. [%]	**3.268**	**Coeff. of Var. [%]$_{norm}$**		**3.401**
Min.	**27.66**	**Min.**	**0.008903**	**28.10**
Max.	**30.92**	**Max.**	**0.009165**	**31.73**
Number of Spec.	**18**	**Number of Spec.**	**18**	**18**


Laminate Open-Hole Compression Properties (OHC3)--ETW2 (250°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Open-Hole Compression Strength [ksi]
0
1
2
3
4
5
0
5
10
15
20
25
30
35

4.22 "25/50/25" Filled-Hole Compression 1 Properties (FHC1)

In some cases of FHC1>UNC1, UNC1 data is recommended for design. The FHC1 data is for informational purposes only and is not appropriate to be used for design. Shaded values indicated FHC1>UNC1.

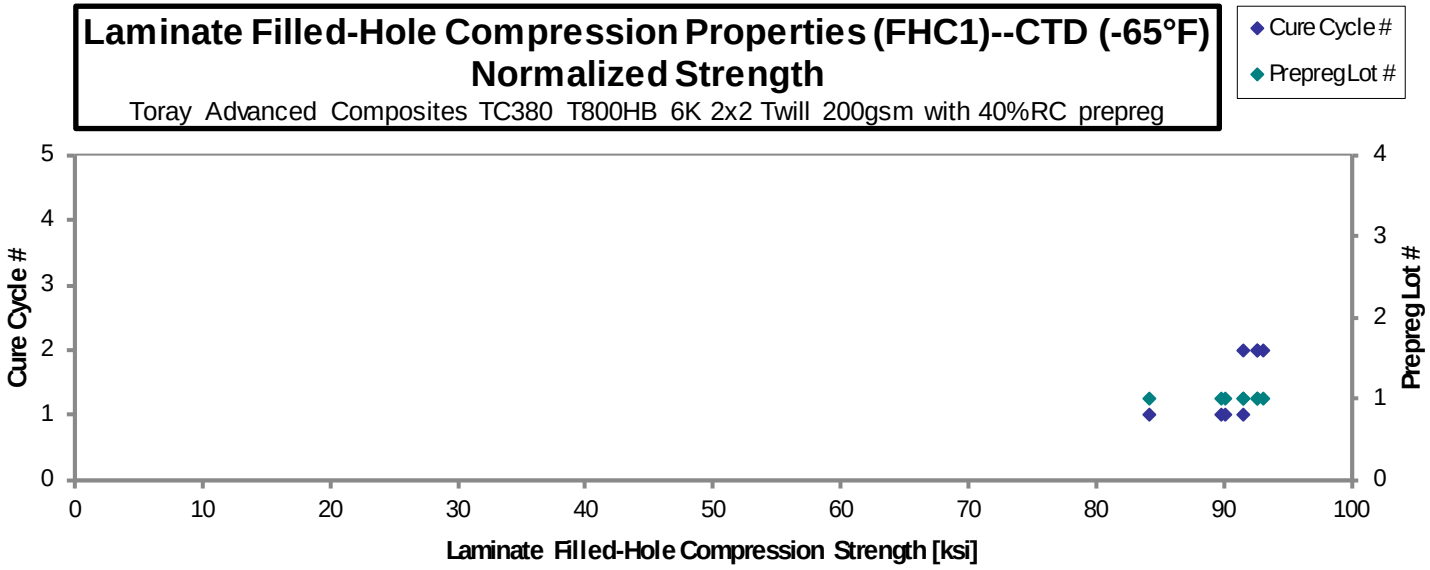
Laminate Filled-Hole Compression Properties (FHC1)--CTD (-65°F)
Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCE7A111B	A	C1	1	1	82.78	0.1431	16	M(A,L)GF	0.008945	84.15
TCE7A112B	A	C1	1	1	88.73	0.1425	16	M(A,L)GF	0.008905	89.79
TCE7A113B	A	C1	1	1	88.83	0.1428	16	M(A,L)WB	0.008926	90.10
TCE7A114B	A	C1	1	1	89.87	0.1435	16	M(A,L)GF	0.008969	91.59
TCE7A211B	A	C2	1	2	91.16	0.1431	16	M(A,L)WB	0.008946	92.67
TCE7A212B	A	C2	1	2	90.38	0.1426	16	M(A,L)GF	0.008915	91.55
TCE7A213B	A	C2	1	2	91.18	0.1437	16	M(A,L)WT	0.008979	93.04
TCE7A214B	A	C2	1	2	89.77	0.1452	16	M(A,L)GT	0.009076	92.59

Average	**89.09**	
Standard Dev.	**2.709**	
Coeff. of Var. [%]	**3.041**	
Min.	**82.78**	
Max.	**91.18**	
Number of Spec.	**8**	

$Average_{norm}$	**0.008958**	**90.69**
$Standard\ Dev._{norm}$		**2.893**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**3.190**
Min.	**0.008905**	**84.15**
Max.	**0.009076**	**93.04**
Number of Spec.	**8**	**8**


Laminate Filled-Hole Compression Properties (FHC1)--CTD (-65°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Filled-Hole Compression Strength [ksi]
0
10
20
30
40
50
60
70
80
90
100
0
1
2
3
4
5

Laminate Filled-Hole Compression Properties (FHC1)--RTD (70°F)
Strength

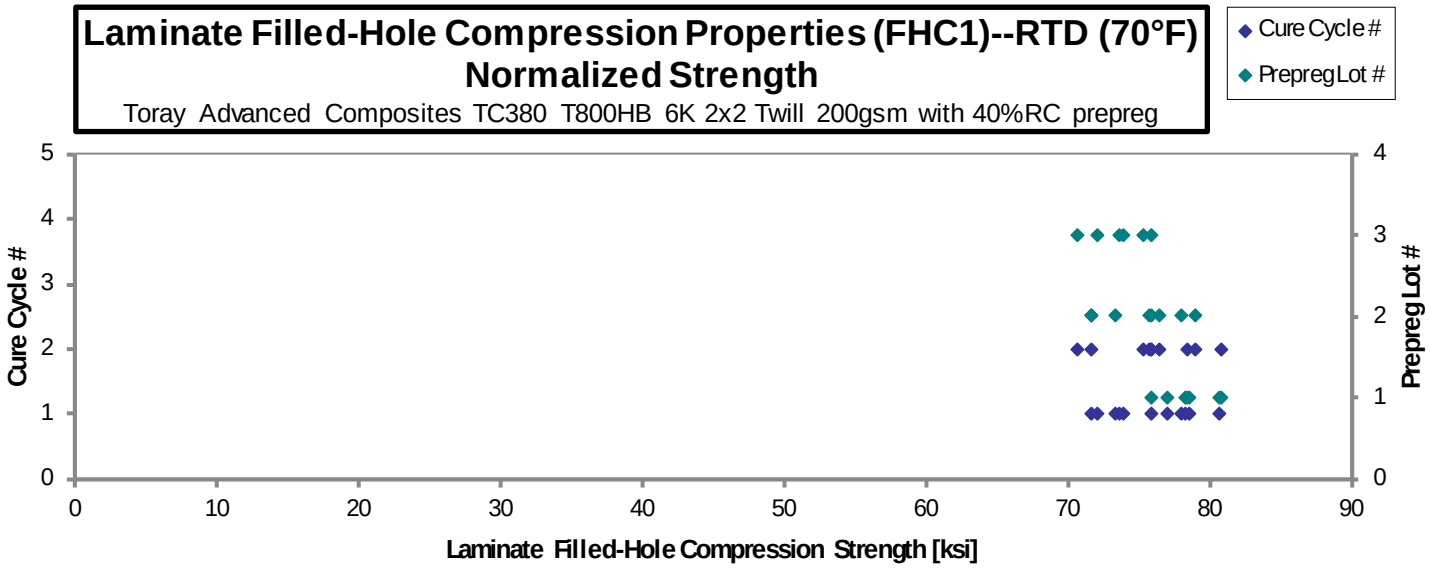
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCE7A111A	A	C1	1	1	80.32	0.1349	16	M(A,L)WB	0.008431	76.95
TCE7A112A	A	C1	1	1	78.37	0.1413	16	M(A,L)GF	0.008829	78.63
TCE7A113A	A	C1	1	1	76.55	0.1440	16	M(A,L)GF	0.009002	78.31
TCE7A114A	A	C1	1	1	78.86	0.1440	16	M(A,L)WB	0.009002	80.67
TCE7A211A	A	C2	1	2	79.31	0.1347	16	M(A,L)GF	0.008416	75.85
TCE7A212A	A	C2	1	2	80.47	0.1415	16	M(A,L)GF	0.008846	80.89
TCE7A213A	A	C2	1	2	76.73	0.1440	16	M(A,L)GF	0.009002	78.50
TCE7B111A	B	C1	2	1	75.98	0.1360	16	LWB	0.008501	73.40
TCE7B112A	B	C1	2	1	71.48	0.1412	16	M(A,L)GF	0.008823	71.67
TCE7B113A	B	C1	2	1	73.25	0.1458	16	M(A,L)GF	0.009113	75.85
TCE7B114A	B	C1	2	1	74.90	0.1466	16	LGB	0.009164	77.99
TCE7B211A	B	C2	2	2	76.30	0.1323	16	M(A,L)GF	0.008271	71.71
TCE7B212A	B	C2	2	2	75.07	0.1421	16	LWB	0.008879	75.75
TCE7B213A	B	C2	2	2	73.66	0.1462	16	M(A,L)GF	0.009138	76.48
TCE7B214A	B	C2	2	2	75.72	0.1469	16	LGF	0.009178	78.98
TCE7C111A	C	C1	3	1	72.74	0.1396	16	M(A,L)WB	0.008726	72.13
TCE7C112A	C	C1	3	1	72.96	0.1426	16	LWT	0.008915	73.91
TCE7C113A	C	C1	3	1	72.15	0.1438	16	LGF	0.008985	73.67
TCE7C211A	C	C2	3	2	78.25	0.1356	16	LWT	0.008477	75.38
TCE7C212A	C	C2	3	2	71.74	0.1386	16	LWB	0.008665	70.64
TCE7C213A	C	C2	3	2	75.94	0.1408	16	LWB	0.008800	75.94

Average	**75.75**	
Standard Dev.	**2.797**	
Coeff. of Var. [%]	**3.693**	
Min.	**71.48**	
Max.	**80.47**	
Number of Spec.	**21**	

$Average_{norm}$	**0.008817**	**75.87**
Standard $Dev._{norm}$		**2.965**
Coeff. of Var. $[\%]_{norm}$		**3.907**
Min.	**0.008271**	**70.64**
Max.	**0.009178**	**80.89**
Number of Spec.	**21**	**21**


Laminate Filled-Hole Compression Properties (FHC1)--RTD (70°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Filled-Hole Compression Strength [ksi]
0
10
20
30
40
50
60
70
80
90
0
1
2
3
4
5

Laminate Filled-Hole Compression Properties (FHC1)--ETW1 (180°F) Strength

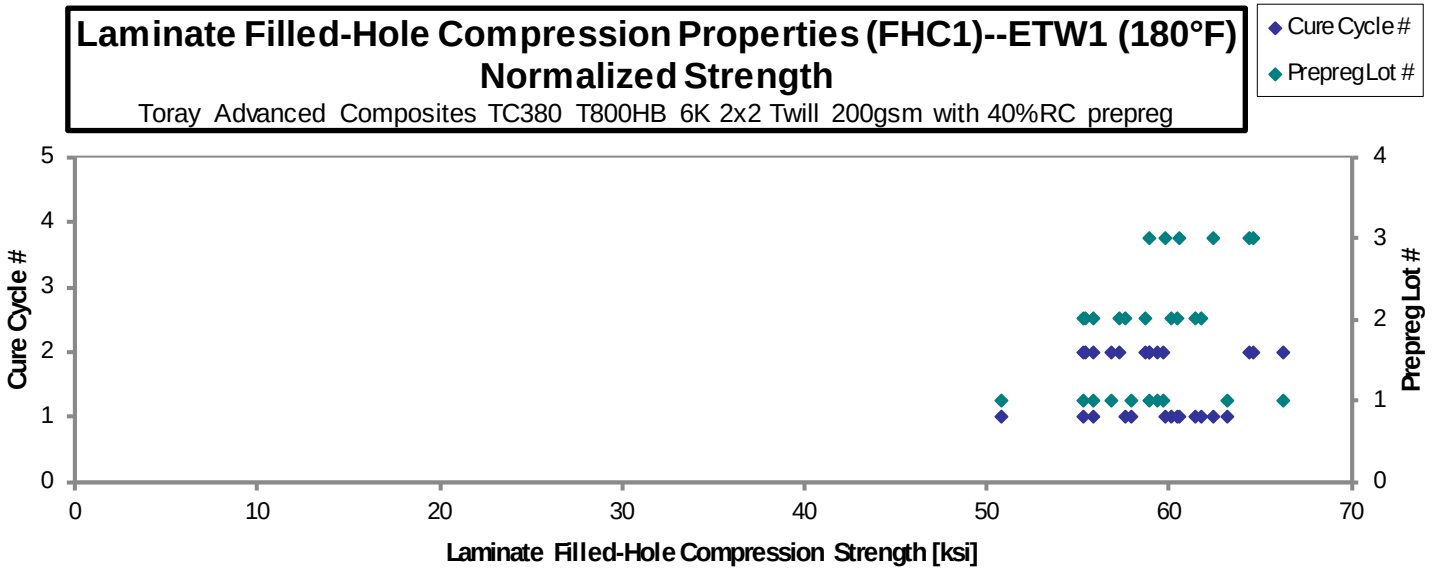
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]: 0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCE7A111D	A	C1	1	1	56.87	0.1435	16	M(A,L)GF	0.008966	57.94
TCE7A112D	A	C1	1	1	55.43	0.1405	16	M(A,L)GF	0.008780	55.30
TCE7A113D	A	C1	1	1	58.45	0.1345	16	M(A,L)GF	0.008403	55.81
TCE7A114D	A	C1	1	1	52.87	0.1353	16	M(A,L)WB	0.008457	50.82
TCE7A115D	A	C1	1	1	62.60	0.1421	16	M(A,L)GF	0.008883	63.20
TCE7A211D	A	C2	1	2	64.76	0.1440	16	LWT	0.009001	66.24
TCE7A212D	A	C2	1	2	59.20	0.1401	16	LWT	0.008755	58.89
TCE7A213D	A	C2	1	2	60.48	0.1325	16	LAB	0.008278	56.89
TCE7A214D	A	C2	1	2	61.75	0.1354	16	LWT	0.008464	59.39
TCE7A215D	A	C2	1	2	59.41	0.1415	16	LWB	0.008845	59.71
TCE7B111D	B	C1	2	1	60.04	0.1448	16	LWB	0.009051	61.76
TCE7B112D	B	C1	2	1	61.52	0.1406	16	LWT	0.008784	61.41
TCE7B113D	B	C1	2	1	60.94	0.1330	16	LAB	0.008315	57.57
TCE7B114D	B	C1	2	1	62.49	0.1355	16	LWB	0.008470	60.15
TCE7B115D	B	C1	2	1	60.07	0.1417	16	LGT	0.008856	60.46
TCE7B211D	B	C2	2	2	53.28	0.1465	16	LGF	0.009155	55.43
TCE7B212D	B	C2	2	2	56.80	0.1420	16	LGF	0.008873	57.27
TCE7B213D	B	C2	2	2	57.31	0.1358	16	LAB	0.008488	55.28
TCE7B214D	B	C2	2	2	58.20	0.1351	16	LAB	0.008444	55.84
TCE7B215D	B	C2	2	2	58.58	0.1411	16	LGF	0.008819	58.71
TCE7C111D	C	C1	3	1	61.15	0.1438	16	AGF	0.008990	62.47
TCE7C112D	C	C1	3	1	59.53	0.1416	16	AGF	0.008847	59.84
TCE7C113D	C	C1	3	1	61.77	0.1381	16	AGF	0.008632	60.60
TCE7C211D	C	C2	3	2	64.26	0.1411	16	M(A,L)GF	0.008817	64.39
TCE7C212D	C	C2	3	2	65.17	0.1397	16	M(A,L)GF	0.008728	64.64
TCE7C213D	C	C2	3	2	61.04	0.1358	16	M(A,L)GF	0.008489	58.88

Average	**59.77**	
Standard Dev.	**3.125**	
Coeff. of Var. [%]	**5.229**	
Min.	**52.87**	
Max.	**65.17**	
Number of Spec.	**26**	

$Average_{norm}$	**0.008715**	**59.19**
Standard $Dev._{norm}$		**3.468**
Coeff. of Var. $[\%]_{norm}$		**5.860**
Min.	**0.008278**	**50.82**
Max.	**0.009155**	**66.24**
Number of Spec.	**26**	**26**


Laminate Filled-Hole Compression Properties (FHC1)--ETW1 (180°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Filled-Hole Compression Strength [ksi]
0
10
20
30
40
50
60
70
0
1
2
3
4
5

Laminate Filled-Hole Compression Properties (FHC1)--ETW2 (250°F)
Strength

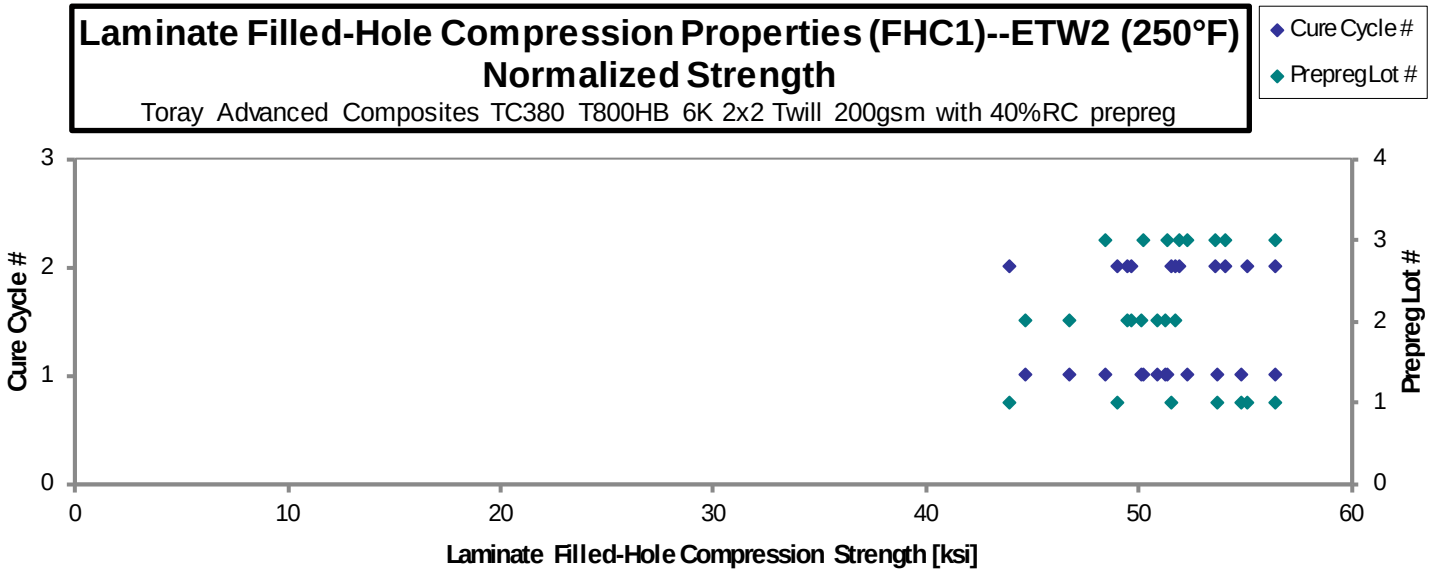
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCE7A111E	A	C1	1	1	55.09	0.1442	16	M(A,L)GF	0.009014	56.42
TCE7A112E	A	C1	1	1	53.65	0.1440	16	M(A,L)GF	0.008997	54.85
TCE7A113E	A	C1	1	1	52.87	0.1431	16	M(A,L)GF	0.008944	53.74
TCE7A211E	A	C2	1	2	42.66	0.1449	16	M(A,L)AB	0.009058	43.91
TCE7A212E	A	C2	1	2	47.93	0.1441	16	M(A,L)GF	0.009004	49.04
TCE7A213E	A	C2	1	2	50.86	0.1428	16	M(A,L)GF	0.008925	51.58
TCE7A214E	A	C2	1	2	54.53	0.1423	16	M(A,L)GF	0.008891	55.09
TCE7B111E	B	C1	2	1	48.56	0.1452	16	M(A,L)GF	0.009077	50.09
TCE7B112E	B	C1	2	1	49.32	0.1462	16	LWT	0.009136	51.21
TCE7B113E	B	C1	2	1	49.51	0.1448	16	M(A,L)GF	0.009047	50.90
TCE7B114E	B	C1	2	1	47.00	0.1400	16	LWB	0.008751	46.74
TCE7B115E	B	C1	2	1	47.57	0.1321	16	LWT	0.008257	44.64
TCE7B211E	B	C2	2	2	48.01	0.1457	16	M(A,L)GF	0.009104	49.67
TCE7B212E	B	C2	2	2	47.24	0.1476	16	M(A,L)GF	0.009222	49.51
TCE7B213E	B	C2	2	2	49.59	0.1469	16	M(A,L)GF	0.009183	51.75
TCE7C111E	C	C1	3	1	51.50	0.1430	16	AGF	0.008938	52.30
TCE7C112E	C	C1	3	1	47.36	0.1440	16	LGT	0.009002	48.45
TCE7C113E	C	C1	3	1	49.13	0.1439	16	LGT	0.008992	50.20
TCE7C114E	C	C1	3	1	50.94	0.1418	16	AWB	0.008863	51.30
TCE7C211E	C	C2	3	2	56.30	0.1411	16	AWB	0.008820	56.43
TCE7C212E	C	C2	3	2	53.77	0.1416	16	AGF	0.008849	54.07
TCE7C213E	C	C2	3	2	51.37	0.1422	16	AWT	0.008888	51.88
TCE7C214E	C	C2	3	2	53.81	0.1404	16	AGF	0.008773	53.64

Average	**50.37**	
Standard Dev.	**3.263**	
Coeff. of Var. [%]	**6.478**	
Min.	**42.66**	
Max.	**56.30**	
Number of Spec.	**23**	

$Average_{norm}$	**0.008945**	**51.19**
$Standard\ Dev._{norm}$		**3.315**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**6.475**
Min.	**0.008257**	**43.91**
Max.	**0.009222**	**56.43**
Number of Spec.	**23**	**23**


Laminate Filled-Hole Compression Properties (FHC1)--ETW2 (250°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Filled-Hole Compression Strength [ksi]
0
10
20
30
40
50
60
0
1
2
3
4

4.23 "10/80/10" Filled-Hole Compression 2 Properties (FHC2)

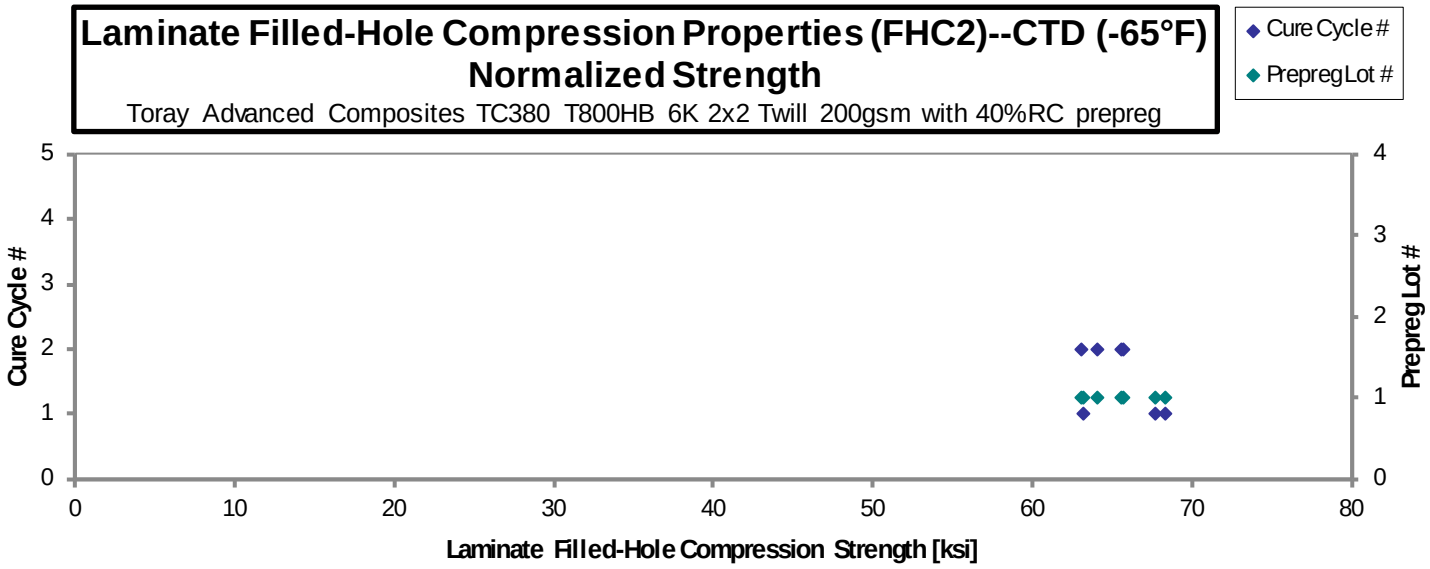
In some cases of FHC2>UNC2, UNC2 data is recommended for design. The FHC data is for informational purposes only and is not appropriate to be used for design. Shaded values indicated FHC2>UNC2.

Laminate Filled-Hole Compression Properties (FHC2)--CTD (-65°F)
Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCE8A111B	A	C1	1	1	66.30	0.1799	20	M(A,L)GF	0.008994	67.76
TCE8A112B	A	C1	1	1	67.00	0.1794	20	M(A,L)GF	0.008971	68.30
TCE8A113B	A	C1	1	1	61.57	0.1807	20	M(A,L)GF	0.009033	63.20
TCE8A211B	A	C2	1	2	62.41	0.1806	20	AGF	0.009032	64.05
TCE8A212B	A	C2	1	2	63.75	0.1811	20	M(A,L)GF	0.009057	65.61
TCE8A213B	A	C2	1	2	61.52	0.1803	20	AWT	0.009017	63.04
TCE8A214B	A	C2	1	2	63.62	0.1819	20	M(A,L)GT	0.009097	65.77

	Strength [ksi]	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
Average	**63.74**	**0.009029**	**65.39**
Standard Dev.	**2.182**		**2.096**
Coeff. of Var. [%]	**3.423**		**3.206**
Min.	**61.52**	**0.008971**	**63.04**
Max.	**67.00**	**0.009097**	**68.30**
Number of Spec.	**7**	**7**	**7**


Laminate Filled-Hole Compression Properties (FHC2)--CTD (-65°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Filled-Hole Compression Strength [ksi]
0
10
20
30
40
50
60
70
80
0
1
2
3
4
5

Laminate Filled-Hole Compression Properties (FHC2)--RTD (70°F)
Strength

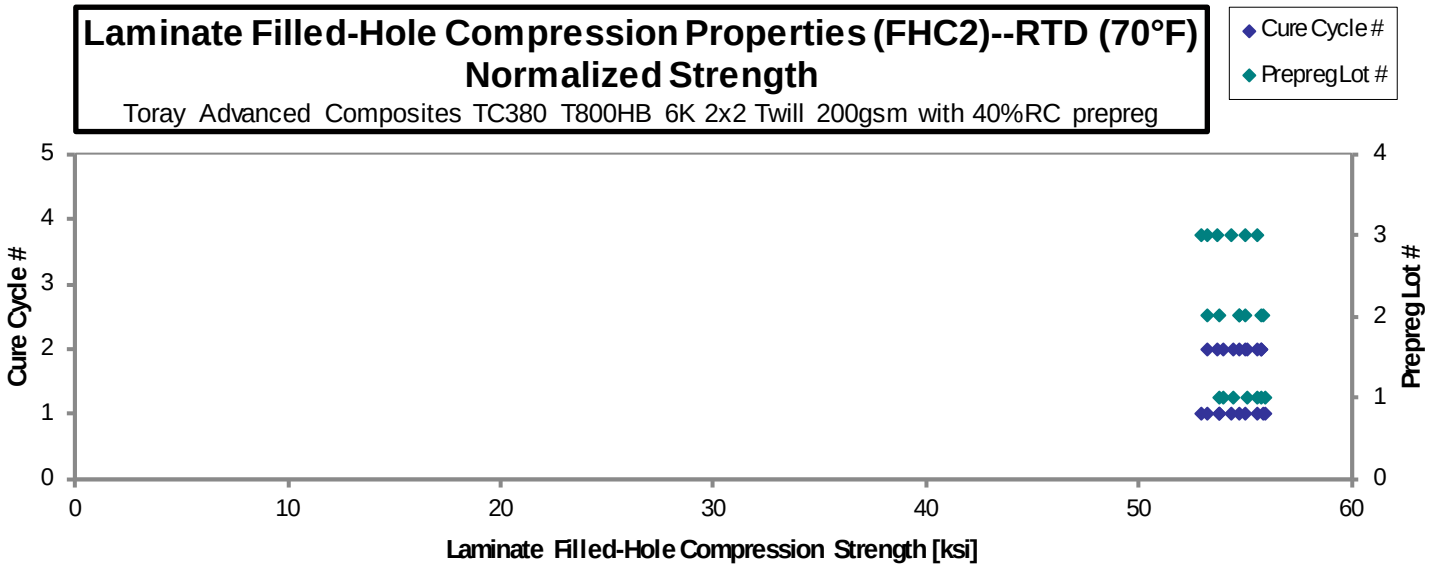
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCE8A111A	A	C1	1	1	58.27	0.1691	20	M(A,L)GF	0.008454	55.98
TCE8A112A	A	C1	1	1	53.82	0.1759	20	LGB	0.008797	53.80
TCE8A113A	A	C1	1	1	54.38	0.1798	20	LGF	0.008988	55.54
TCE8A211A	A	C2	1	2	56.62	0.1694	20	M(A,L)WB	0.008469	54.49
TCE8A212A	A	C2	1	2	54.88	0.1768	20	LWB	0.008842	55.14
TCE8A213A	A	C2	1	2	52.48	0.1811	20	M(A,L)GB	0.009054	54.00
TCE8A214A	A	C2	1	2	54.06	0.1817	20	M(A,L)GT	0.009084	55.80
TCE8B111A	B	C1	2	1	56.56	0.1675	20	AGB	0.008373	53.82
TCE8B112A	B	C1	2	1	55.08	0.1748	20	AGF	0.008741	54.71
TCE8B113A	B	C1	2	1	54.64	0.1798	20	M(A,L)WB	0.008991	55.82
TCE8B114A	B	C1	2	1	53.14	0.1822	20	M(A,L)GF	0.009111	55.01
TCE8B211A	B	C2	2	2	55.58	0.1685	20	M(A,L)GF	0.008424	53.21
TCE8B212A	B	C2	2	2	54.88	0.1754	20	AGT	0.008770	54.69
TCE8B213A	B	C2	2	2	54.32	0.1807	20	LGF	0.009034	55.77
TCE8C111A	C	C1	3	1	54.13	0.1722	20	M(A,L)WB	0.008611	52.97
TCE8C112A	C	C1	3	1	52.92	0.1770	20	M(A,L)GF, LGT	0.008849	53.22
TCE8C113A	C	C1	3	1	53.53	0.1788	20	M(A,L)GT	0.008941	54.39
TCE8C211A	C	C2	3	2	55.19	0.1712	20	M(A,L)GB	0.008560	53.69
TCE8C212A	C	C2	3	2	54.88	0.1765	20	M(A,L)GF	0.008823	55.02
TCE8C213A	C	C2	3	2	54.81	0.1784	20	M(A,L)WB	0.008919	55.55

Average	**54.71**	
Standard Dev.	**1.353**	
Coeff. of Var. [%]	**2.472**	
Min.	**52.48**	
Max.	**58.27**	
Number of Spec.	**20**	

$Average_{norm}$	**0.008792**	**54.63**
$Standard\ Dev._{norm}$		**0.9642**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**1.765**
Min.	**0.008373**	**52.97**
Max.	**0.009111**	**55.98**
Number of Spec.	**20**	**20**


Laminate Filled-Hole Compression Properties (FHC2)--RTD (70°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
5
0
10
20
30
40
50
60
Laminate Filled-Hole Compression Strength [ksi]

Laminate Filled-Hole Compression Properties (FHC2)--ETW1 (180°F) Strength

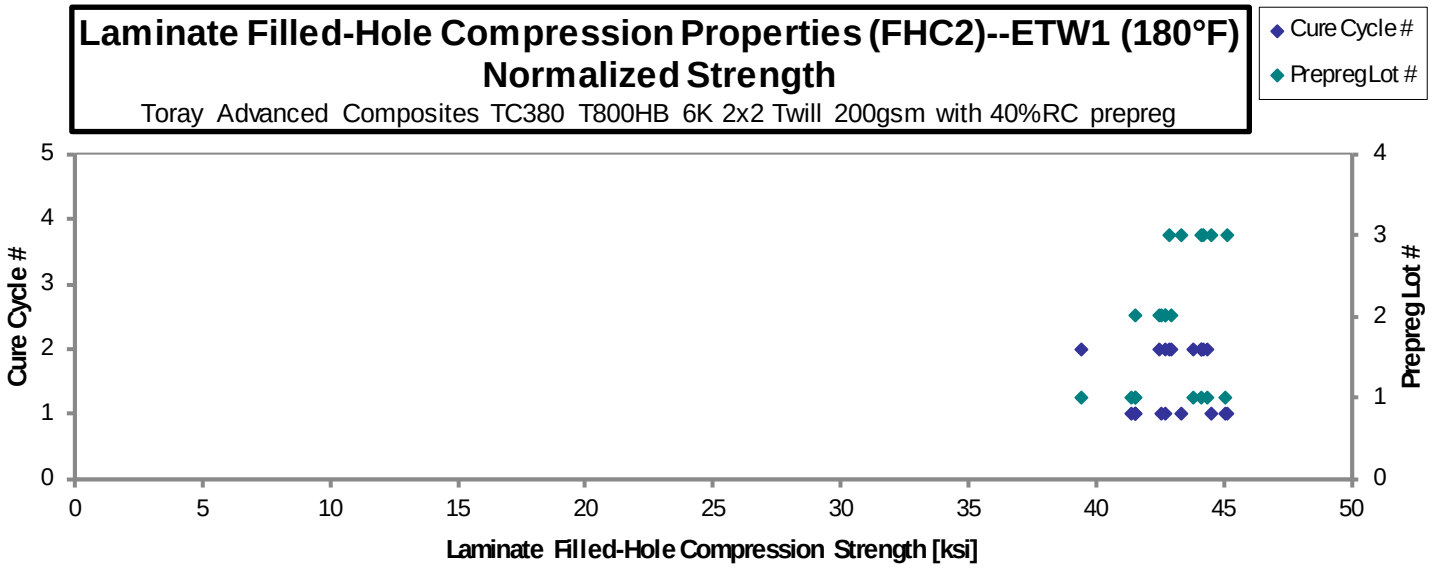
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCE8A111D	A	C1	1	1	44.07	0.1799	20	M(A,L)GF	0.008993	45.03
TCE8A112D	A	C1	1	1	41.54	0.1754	20	M(A,L)WT	0.008772	41.41
TCE8A113D	A	C1	1	1	43.25	0.1689	20	M(A,L)GT	0.008444	41.50
TCE8A114D	A	C1	1	1	43.16	0.1695	20	M(A,L)GF	0.008477	41.57
TCE8A211D	A	C2	1	2	43.25	0.1805	20	M(A,L)GB	0.009023	44.35
TCE8A212D	A	C2	1	2	43.69	0.1764	20	LGF	0.008819	43.78
TCE8A213D	A	C2	1	2	45.71	0.1698	20	M(A,L)WT	0.008490	44.10
TCE8A214D	A	C2	1	2	40.86	0.1698	20	M(A,L)GT	0.008491	39.42
TCE8B111D	B	C1	2	1	41.22	0.1818	20	M(A,L)GF	0.009089	42.57
TCE8B112D	B	C1	2	1	42.57	0.1766	20	M(A,L)GF	0.008831	42.72
TCE8B113D	B	C1	2	1	43.18	0.1694	20	M(A,L)GF	0.008470	41.56
TCE8B211D	B	C2	2	2	41.30	0.1811	20	M(A,L)GB	0.009053	42.49
TCE8B212D	B	C2	2	2	44.17	0.1711	20	LWB	0.008557	42.95
TCE8B213D	B	C2	2	2	42.37	0.1774	20	M(A,L)WB	0.008872	42.71
TCE8C111D	C	C1	3	1	44.40	0.1789	20	AGF	0.008943	45.12
TCE8C112D	C	C1	3	1	44.46	0.1763	20	M(A,L)GT	0.008815	44.54
TCE8C113D	C	C1	3	1	44.45	0.1717	20	AGB	0.008583	43.35
TCE8C211D	C	C2	3	2	43.44	0.1791	20	AGF	0.008953	44.19
TCE8C212D	C	C2	3	2	44.26	0.1754	20	AWT	0.008768	44.09
TCE8C213D	C	C2	3	2	43.92	0.1719	20	AGF	0.008596	42.90

Average	**43.26**	
Standard Dev.	**1.283**	
Coeff. of Var. [%]	**2.966**	
Min.	**40.86**	
Max.	**45.71**	
Number of Spec.	**20**	

$Average_{norm}$	**0.008752**	**43.02**
$Standard\ Dev._{norm}$		**1.445**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**3.360**
Min.	**0.008444**	**39.42**
Max.	**0.009089**	**45.12**
Number of Spec.	**20**	**20**


Laminate Filled-Hole Compression Properties (FHC2)--ETW1 (180°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Filled-Hole Compression Strength [ksi]
0
1
2
3
4
5
0
5
10
15
20
25
30
35
40
45
50

Laminate Filled-Hole Compression Properties (FHC2)--ETW2 (250°F) Strength

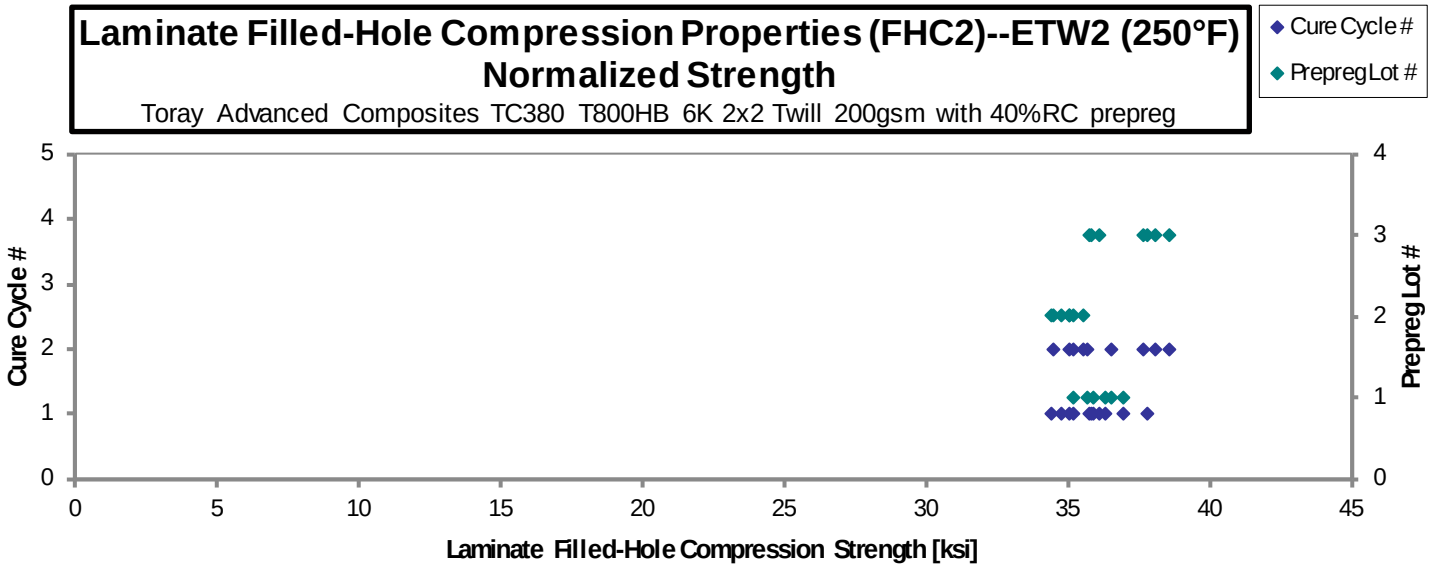
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCE8A111E	A	C1	1	1	36.12	0.1803	20	M(A,L)GB	0.009013	36.99
TCE8A112E	A	C1	1	1	34.90	0.1810	20	M(A,L)GB	0.009048	35.88
TCE8A113E	A	C1	1	1	35.64	0.1795	20	M(A,L)GB	0.008974	36.35
TCE8A211E	A	C2	1	2	35.55	0.1811	20	M(A,L)GT	0.009053	36.57
TCE8A212E	A	C2	1	2	34.02	0.1820	20	M(A,L)GT	0.009101	35.19
TCE8A213E	A	C2	1	2	34.59	0.1816	20	M(A,L)GF	0.009078	35.69
TCE8B111E	B	C1	2	1	33.54	0.1806	20	M(A,L)WB	0.009029	34.41
TCE8B112E	B	C1	2	1	33.42	0.1831	20	M(A,L)GF	0.009154	34.77
TCE8B113E	B	C1	2	1	33.98	0.1823	20	M(A,L)GT	0.009113	35.18
TCE8B114E	B	C1	2	1	34.69	0.1779	20	M(A,L)GT	0.008893	35.05
TCE8B211E	B	C2	2	2	34.68	0.1804	20	M(A,L)GF	0.009021	35.55
TCE8B212E	B	C2	2	2	33.82	0.1824	20	M(A,L)GF	0.009118	35.05
TCE8B213E	B	C2	2	2	33.47	0.1813	20	LGT	0.009065	34.47
TCE8C111E	C	C1	3	1	35.53	0.1789	20	AGF	0.008944	36.11
TCE8C112E	C	C1	3	1	36.94	0.1800	20	AGF	0.008999	37.78
TCE8C113E	C	C1	3	1	35.18	0.1789	20	AGT	0.008947	35.76
TCE8C114E	C	C1	3	1	36.01	0.1752	20	AGF	0.008760	35.84
TCE8C211E	C	C2	3	2	38.06	0.1783	20	AGF, LWT	0.008913	38.55
TCE8C212E	C	C2	3	2	37.69	0.1779	20	AGF, AWT	0.008895	38.09
TCE8C213E	C	C2	3	2	37.24	0.1780	20	AGF	0.008898	37.66

	Strength [ksi]
Average	**35.25**
Standard Dev.	**1.416**
Coeff. of Var. [%]	**4.018**
Min.	**33.42**
Max.	**38.06**
Number of Spec.	**20**

	t_{ply} [in]	$Strength_{norm}$ [ksi]
$Average_{norm}$	**0.009001**	**36.05**
$Standard\ Dev._{norm}$		**1.216**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**3.373**
Min.	**0.008760**	**34.41**
Max.	**0.009154**	**38.55**
Number of Spec.	**20**	**20**


Laminate Filled-Hole Compression Properties (FHC2)--ETW2 (250°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Filled-Hole Compression Strength [ksi]
0
1
2
3
4
5
0
5
10
15
20
25
30
35
40
45

4.24 "40/20/40" Filled-Hole Compression 3 Properties (FHC3)

In some cases of FHC3>UNC3, UNC3 data is recommended for design. The FHC3 data is for informational purposes only and is not appropriate to be used for design. Shaded values indicated FHC3>UNC3.

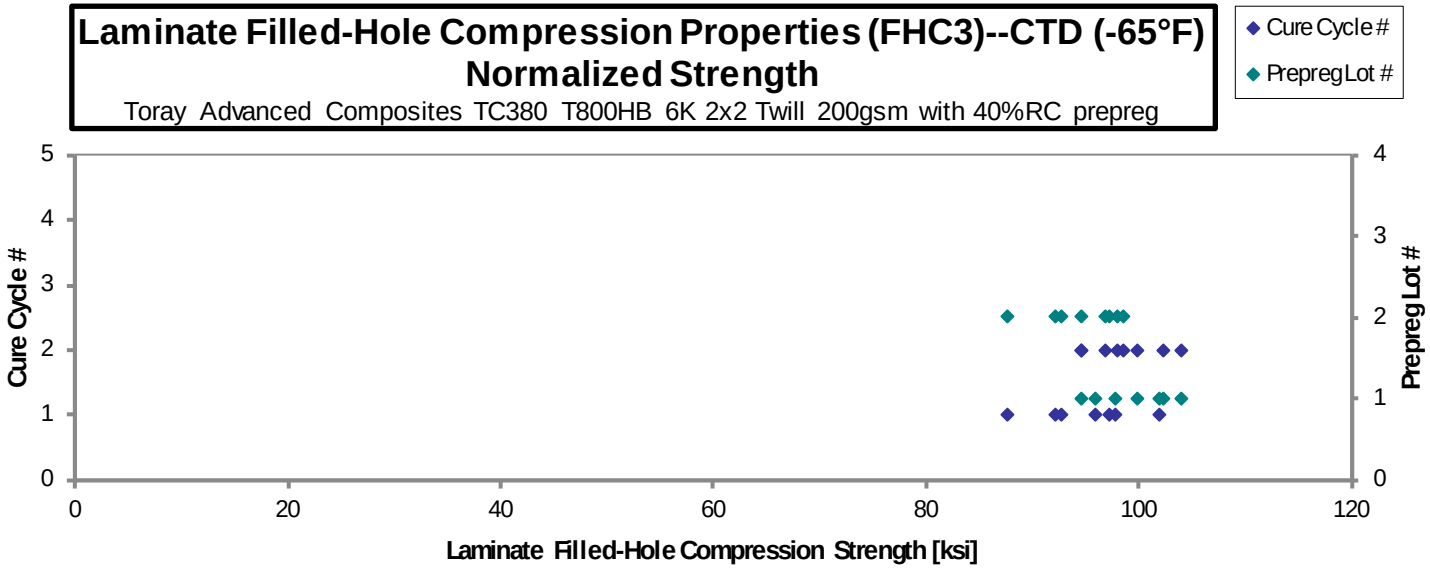
Laminate Filled-Hole Compression Properties (FHC3)--CTD (-65°F)
Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCE9A111B	A	C1	1	1	93.04	0.1815	20	M(A,L)GF	0.009076	95.95
TCE9A112B	A	C1	1	1	98.82	0.1817	20	M(A,L)GF	0.009085	102.0
TCE9A113B	A	C1	1	1	94.49	0.1821	20	M(A,L)GF	0.009106	97.78
TCE9A211B	A	C2	1	2	98.85	0.1852	20	M(A,L)GF	0.009258	104.0
TCE9A212B	A	C2	1	2	89.96	0.1849	20	M(A,L)GF	0.009247	94.53
TCE9A213B	A	C2	1	2	97.14	0.1854	20	M(A,L)WB	0.009271	102.3
TCE9A214B	A	C2	1	2	93.91	0.1871	20	M(A,L)WT	0.009357	99.85
TCE9B111B	B	C1	2	1	91.39	0.1786	20	LGF	0.008929	92.73
TCE9B112B	B	C1	2	1	91.19	0.1780	20	M(A,L)GF	0.008898	92.20
TCE9B113B	B	C1	2	1	96.22	0.1781	20	M(A,L)WT	0.008903	97.34
TCE9B114B	B	C1	2	1	86.66	0.1780	20	M(A,L)WT	0.008900	87.64
TCE9B211B	B	C2	2	2	95.60	0.1805	20	M(A,L)GT	0.009023	98.02
TCE9B212B	B	C2	2	2	92.82	0.1793	20	M(A,L)WT	0.008966	94.57
TCE9B213B	B	C2	2	2	94.88	0.1798	20	M(A,L)GF	0.008988	96.91
TCE9B214B	B	C2	2	2	96.07	0.1806	20	M(A,L)GM	0.009028	98.56

Average	**94.07**	
Standard Dev.	**3.344**	
Coeff. of Var. [%]	**3.555**	
Min.	**86.66**	
Max.	**98.85**	
Number of Spec.	**15**	

$Average_{norm}$	**0.009069**	**96.96**
$Standard\ Dev._{norm}$		**4.282**
Coeff. of Var. $[\%]_{norm}$		**4.416**
Min.	**0.008898**	**87.64**
Max.	**0.009357**	**104.0**
Number of Spec.	**15**	**15**


Laminate Filled-Hole Compression Properties (FHC3)--CTD (-65°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Filled-Hole Compression Strength [ksi]
0
20
40
60
80
100
120
0
1
2
3
4
5

Laminate Filled-Hole Compression Properties (FHC3)--RTD (70°F)
Strength

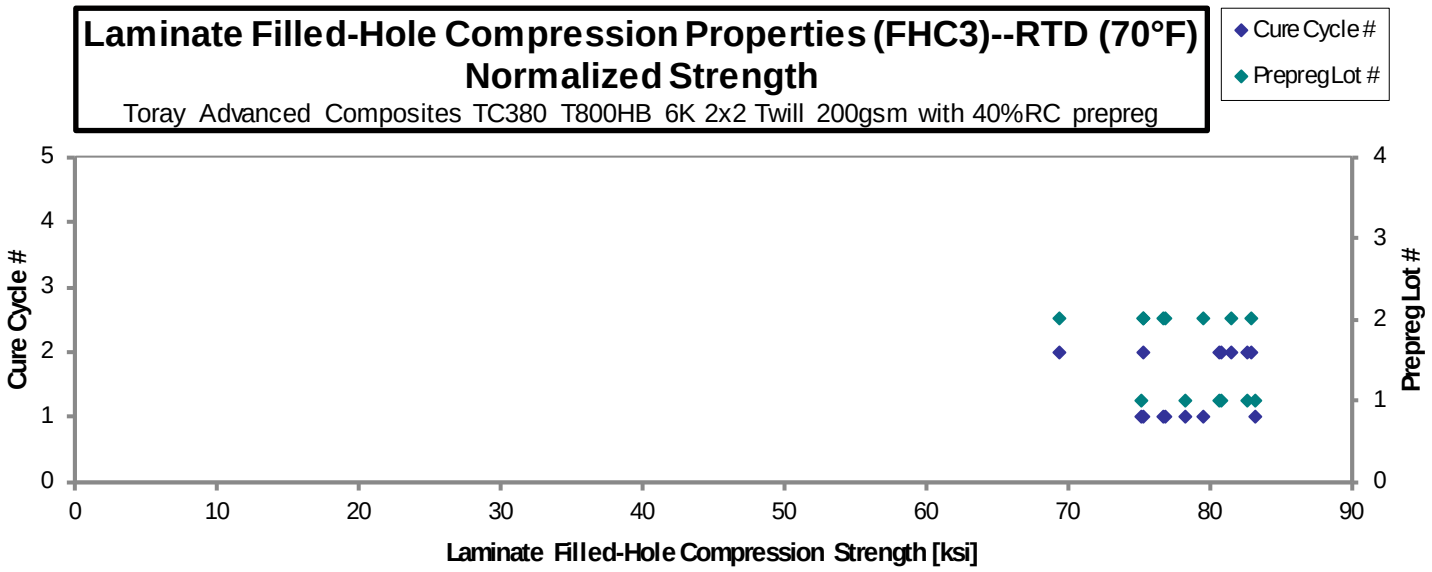
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCE9A111A	A	C1	1	1	80.64	0.1710	20	M(A,L)GF	0.008548	78.33
TCE9A112A	A	C1	1	1	74.54	0.1777	20	M(A,L)GF	0.008885	75.26
TCE9A113A	A	C1	1	1	80.91	0.1811	20	M(A,L)GF	0.009054	83.25
TCE9A211A	A	C2	1	2	82.31	0.1726	20	M(A,L)GF	0.008630	80.72
TCE9A212A	A	C2	1	2	80.21	0.1815	20	M(A,L)GF	0.009075	82.72
TCE9A213A	A	C2	1	2	77.20	0.1843	20	M(A,L)GF	0.009213	80.82
TCE9B111A	B	C1	2	1	78.39	0.1693	20	M(A,L)GF	0.008463	75.39
TCE9B112A	B	C1	2	1	77.30	0.1751	20	M(A,L)GF	0.008756	76.91
TCE9B113A	B	C1	2	1	75.96	0.1779	20	LWB	0.008896	76.79
TCE9B114A	B	C1	2	1	78.27	0.1790	20	LGB	0.008951	79.61
TCE9B211A	B	C2	2	2	71.87	0.1699	20	LWB	0.008497	69.40
TCE9B212A	B	C2	2	2	75.01	0.1768	20	LGF	0.008838	75.33
TCE9B213A	B	C2	2	2	79.68	0.1801	20	LGF	0.009005	81.53
TCE9B214A	B	C2	2	2	80.63	0.1812	20	LGF	0.009058	82.99

Average	**78.07**	
Standard Dev.	**2.942**	
Coeff. of Var. [%]	**3.769**	
Min.	**71.87**	
Max.	**82.31**	
Number of Spec.	**14**	

$Average_{norm}$	**0.008848**	**78.50**
$Standard\ Dev._{norm}$		**3.920**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**4.994**
Min.	**0.008463**	**69.40**
Max.	**0.009213**	**83.25**
Number of Spec.	**14**	**14**


Laminate Filled-Hole Compression Properties (FHC3)--RTD (70°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Filled-Hole Compression Strength [ksi]
0
10
20
30
40
50
60
70
80
90
0
1
2
3
4
5

Laminate Filled-Hole Compression Properties (FHC3)--ETW1 (180°F)
Strength

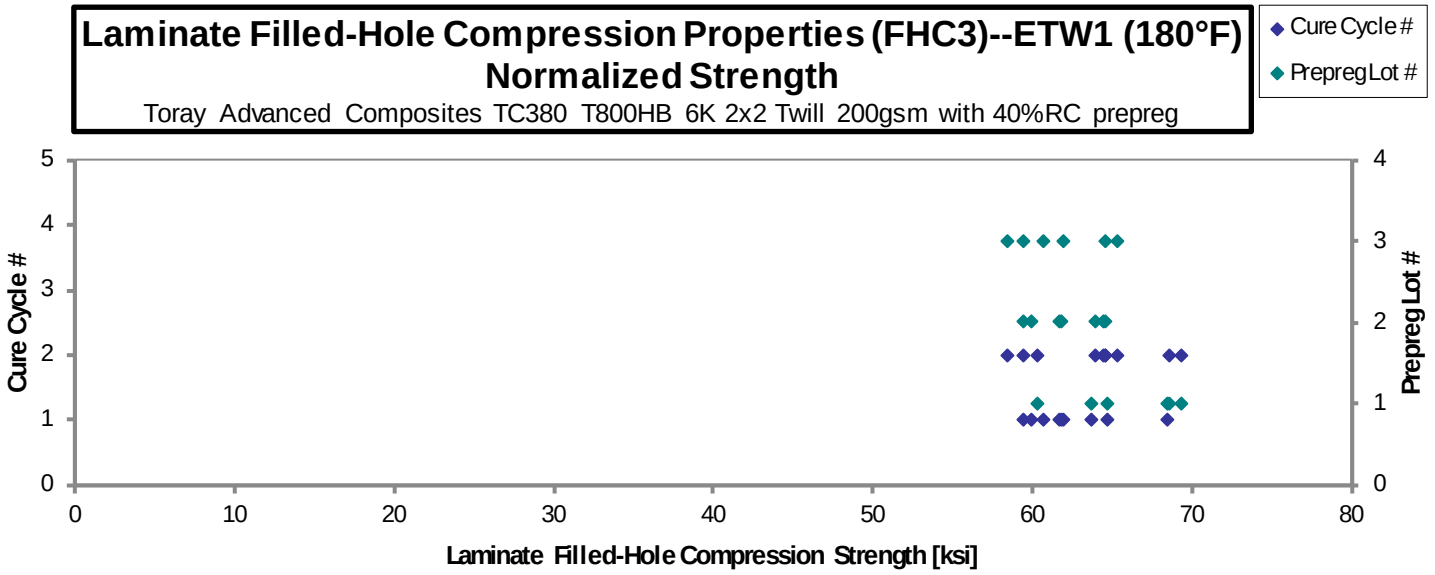
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCE9A111D	A	C1	1	1	66.67	0.1807	20	LGF	0.009034	68.45
TCE9A112D	A	C1	1	1	63.13	0.1776	20	LGF	0.008882	63.71
TCE9A113D	A	C1	1	1	67.04	0.1699	20	LGF	0.008496	64.73
TCE9A211D	A	C2	1	2	65.88	0.1851	20	M(A,L)GF	0.009254	69.28
TCE9A212D	A	C2	1	2	66.68	0.1811	20	M(A,L)GF	0.009054	68.60
TCE9A213D	A	C2	1	2	61.62	0.1722	20	LGF	0.008612	60.30
TCE9B111D	B	C1	2	1	61.62	0.1765	20	M(A,L)GF	0.008824	61.79
TCE9B112D	B	C1	2	1	62.84	0.1727	20	M(A,L)GF	0.008637	61.67
TCE9B113D	B	C1	2	1	63.11	0.1672	20	M(A,L)GF	0.008362	59.97
TCE9B211D	B	C2	2	2	63.47	0.1791	20	M(A,L)WB	0.008955	64.59
TCE9B212D	B	C2	2	2	64.62	0.1754	20	LGF	0.008772	64.41
TCE9B213D	B	C2	2	2	67.21	0.1673	20	M(A,L)GF	0.008366	63.90
TCE9B214D	B	C2	2	2	62.20	0.1682	20	LGF	0.008408	59.43
TCE9C111D	C	C1	3	1	64.05	0.1701	20	AGF	0.008507	61.92
TCE9C112D	C	C1	3	1	59.68	0.1751	20	AGF	0.008756	59.38
TCE9C113D	C	C1	3	1	59.57	0.1792	20	AGF	0.008959	60.65
TCE9C211D	C	C2	3	2	66.55	0.1708	20	LGF	0.008542	64.60
TCE9C212D	C	C2	3	2	58.23	0.1766	20	M(A,L)GF	0.008829	58.42
TCE9C213D	C	C2	3	2	64.66	0.1779	20	M(A,L)GF	0.008897	65.37

Average	**63.62**	
Standard Dev.	**2.701**	
Coeff. of Var. [%]	**4.246**	
Min.	**58.23**	
Max.	**67.21**	
Number of Spec.	**19**	

$Average_{norm}$	**0.008744**	**63.22**
$Standard\ Dev._{norm}$		**3.247**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**5.135**
Min.	**0.008362**	**58.42**
Max.	**0.009254**	**69.28**
Number of Spec.	**19**	**19**


Laminate Filled-Hole Compression Properties (FHC3)--ETW1 (180°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Filled-Hole Compression Strength [ksi]
0
10
20
30
40
50
60
70
80
0
1
2
3
4
5

Laminate Filled-Hole Compression Properties (FHC3)--ETW2 (250°F) Strength

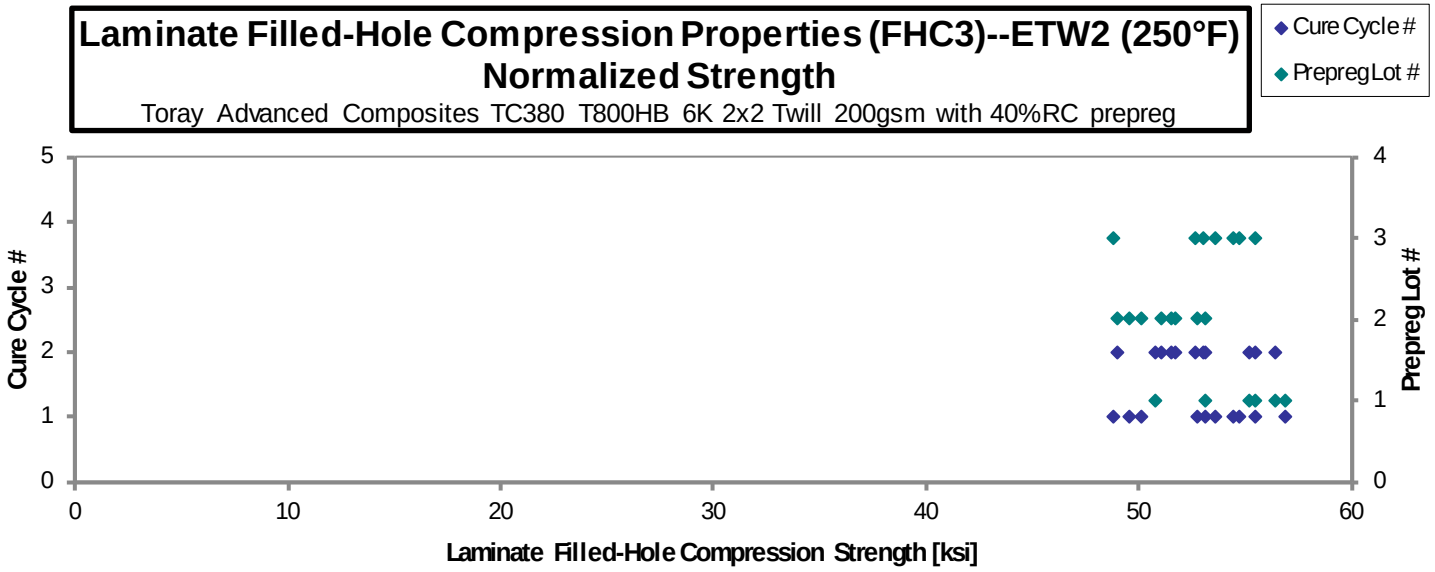
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCE9A111E	A	C1	1	1	51.70	0.1808	20	LGF	0.009038	53.10
TCE9A112E	A	C1	1	1	53.60	0.1822	20	M(A,L)GF	0.009112	55.50
TCE9A113E	A	C1	1	1	55.13	0.1816	20	LGF	0.009081	56.89
TCE9A211E	A	C2	1	2	52.72	0.1844	20	M(A,L)GF	0.009220	55.24
TCE9A212E	A	C2	1	2	53.56	0.1856	20	M(A,L)GF	0.009278	56.46
TCE9A213E	A	C2	1	2	48.31	0.1849	20	LGF	0.009245	50.75
TCE9B111E	B	C1	2	1	48.73	0.1791	20	M(A,L)GF	0.008954	49.58
TCE9B112E	B	C1	2	1	51.73	0.1796	20	M(A,L)GF	0.008982	52.80
TCE9B113E	B	C1	2	1	49.11	0.1795	20	M(A,L)GF	0.008977	50.09
TCE9B211E	B	C2	2	2	50.19	0.1809	20	LWT	0.009043	51.58
TCE9B212E	B	C2	2	2	50.11	0.1816	20	LWT	0.009080	51.71
TCE9B213E	B	C2	2	2	51.81	0.1804	20	LGF	0.009019	53.10
TCE9B214E	B	C2	2	2	47.98	0.1796	20	M(A,L)GF	0.008978	48.95
TCE9B215E	B	C2	2	2	49.95	0.1799	20	LGF	0.008993	51.05
TCE9C111E	C	C1	3	1	56.73	0.1697	20	M(A,L)GF	0.008485	54.70
TCE9C112E	C	C1	3	1	49.04	0.1752	20	M(A,L)WB	0.008759	48.81
TCE9C113E	C	C1	3	1	53.32	0.1769	20	M(A,L)GF	0.008846	53.60
TCE9C114E	C	C1	3	1	53.79	0.1781	20	M(A,L)GF	0.008903	54.42
TCE9C211E	C	C2	3	2	54.46	0.1702	20	M(A,L)GF	0.008512	52.68
TCE9C212E	C	C2	3	2	53.25	0.1754	20	AGF	0.008768	53.06
TCE9C213E	C	C2	3	2	54.91	0.1778	20	M(A,L)GF	0.008889	55.47

Average	**51.91**	
Standard Dev.	**2.524**	
Coeff. of Var. [%]	**4.862**	
Min.	**47.98**	
Max.	**56.73**	
Number of Spec.	**21**	

$Average_{norm}$	**0.008960**	**52.84**
$Standard\ Dev._{norm}$		**2.408**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**4.557**
Min.	**0.008485**	**48.81**
Max.	**0.009278**	**56.89**
Number of Spec.	**21**	**21**


Laminate Filled-Hole Compression Properties (FHC3)--ETW2 (250°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Filled-Hole Compression Strength [ksi]
0
10
20
30
40
50
60
0
1
2
3
4
5

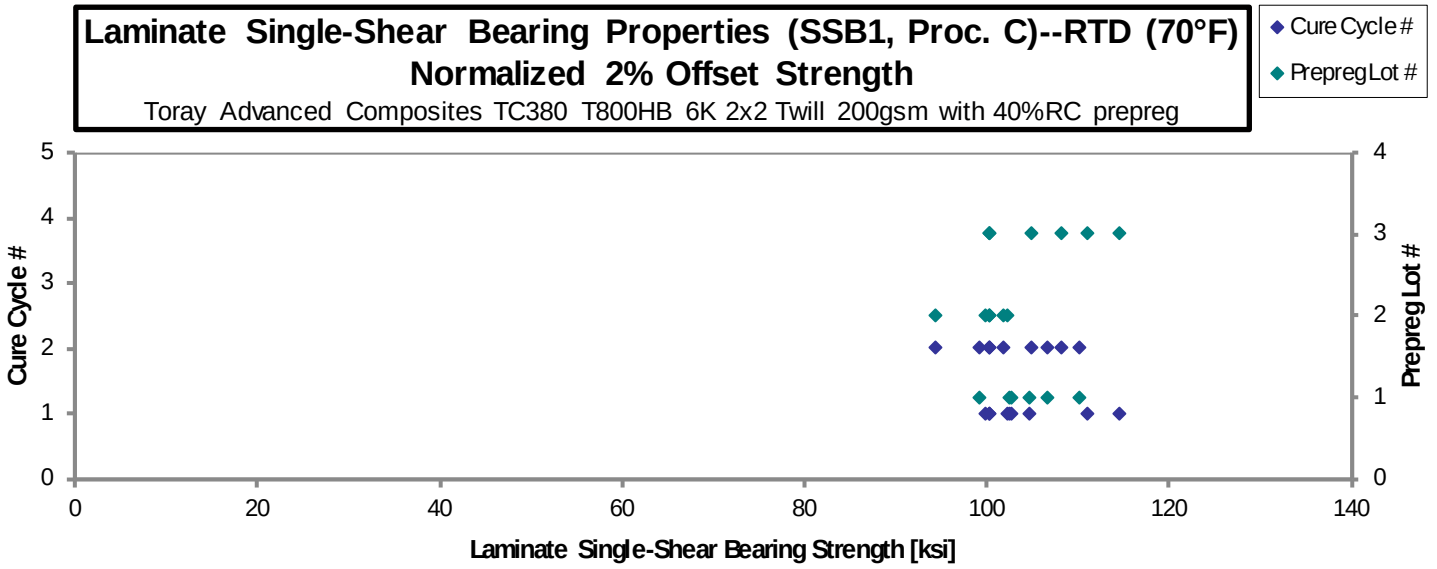
4.25 "25/50/25" Single-Shear Bearing 1 Properties (SSB1, Proc. C)

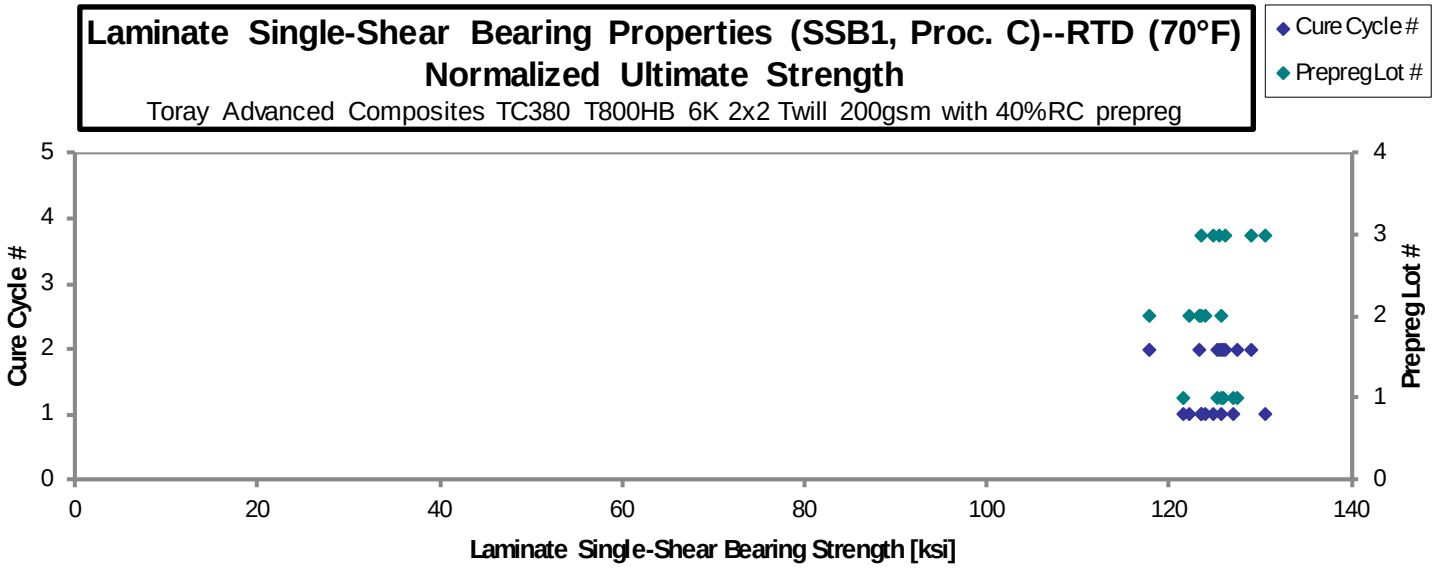
Laminate Single-Shear Bearing Properties (SSB1, Proc. C)--RTD (70°F)
Strength & Chord Stiffness
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

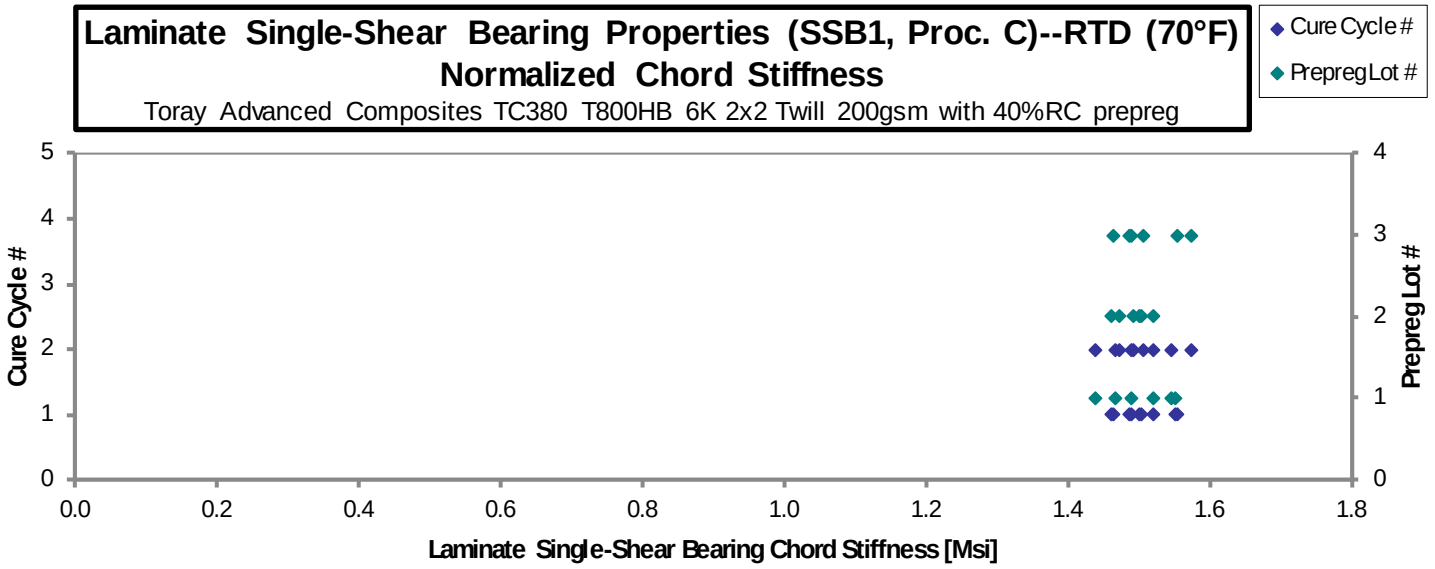
normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	2% Offset Strength [ksi]	Ultimate Strength [ksi]	Chord Stiffness [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	2% Offset $Strength_{norm}$ [ksi]	Ultimate $Strength_{norm}$ [ksi]	Chord $Stiffness_{norm}$ [Msi]
TCE1A111A	A	C1	1	1	112.5	133.3	1.634	0.1285	16	B1I	0.008030	102.6	121.6	1.491
TCE1A112A	A	C1	1	1	109.1	134.0	1.654	0.1322	16	B1I	0.008261	102.4	125.8	1.553
TCE1A113A	A	C1	1	1	109.5	132.9	1.591	0.1345	16	B1I	0.008406	104.6	127.0	1.520
TCE1A211A	A	C2	1	2	111.5	141.5	1.735	0.1254	16	B1I	0.007838	99.27	126.0	1.545
TCE1A212A	A	C2	1	2	116.6	137.0	1.602	0.1288	16	B1I	0.008051	106.7	125.3	1.466
TCE1A213A	A	C2	1	2	118.7	137.4	1.550	0.1307	16	B1I	0.008168	110.2	127.6	1.439
TCE1B111A	B	C1	2	1	113.5	135.5	1.666	0.1269	16	B1I	0.007933	102.3	122.2	1.502
TCE1B112A	B	C1	2	1	107.8	133.3	1.617	0.1309	16	B1I	0.008178	100.2	123.9	1.503
TCE1B113A	B	C1	2	1	106.3	131.6	1.554	0.1323	16	B1I	0.008270	99.93	123.6	1.460
TCE1B211A	B	C2	2	2	114.0	131.9	1.671	0.1259	16	B1I	0.007867	101.9	117.9	1.494
TCE1B212A	B	C2	2	2	109.2	134.3	1.656	0.1293	16	B1I	0.008081	100.3	123.4	1.521
TCE1B213A	B	C2	2	2	101.3	134.8	1.580	0.1313	16	B1I	0.008204	94.43	125.7	1.473
TCE1C111A	C	C1	3	1	119.7	136.2	1.623	0.1349	16	B1I	0.008431	114.7	130.4	1.555
TCE1C112A	C	C1	3	1	115.0	127.8	1.539	0.1361	16	B1I	0.008505	111.1	123.6	1.487
TCE1C113A	C	C1	3	1	103.8	129.2	1.516	0.1360	16	B1I	0.008499	100.3	124.8	1.464
TCE1C211A	C	C2	3	2	105.2	135.2	1.577	0.1344	16	B1I	0.008401	100.4	129.0	1.505
TCE1C212A	C	C2	3	2	108.5	130.5	1.628	0.1362	16	B1I	0.008513	105.0	126.2	1.575
TCE1C213A	C	C2	3	2	111.5	129.3	1.538	0.1365	16	B1I	0.008533	108.1	125.4	1.491

Average	**110.8**	**133.7**	**1.607**		**Average$_{norm}$**	**0.008232**	**103.6**	**125.0**	**1.502**
Standard Dev.	**5.001**	**3.351**	**0.05729**		**Standard Dev.$_{norm}$**		**4.980**	**2.849**	**0.03684**
Coeff. of Var. [%]	**4.515**	**2.507**	**3.565**		**Coeff. of Var. [%]$_{norm}$**		**4.808**	**2.280**	**2.452**
Min.	**101.3**	**127.8**	**1.516**		**Min.**	**0.007838**	**94.43**	**117.9**	**1.439**
Max.	**119.7**	**141.5**	**1.735**		**Max.**	**0.008533**	**114.7**	**130.4**	**1.575**
Number of Spec.	**18**	**18**	**18**		**Number of Spec.**	**18**	**18**	**18**	**18**


Laminate Single-Shear Bearing Properties (SSB1, Proc. C)--RTD (70°F)
Normalized 2% Offset Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Single-Shear Bearing Strength [ksi]
0
20
40
60
80
100
120
140
0
1
2
3
4
5


Laminate Single-Shear Bearing Properties (SSB1, Proc. C)--RTD (70°F)
Normalized Ultimate Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Single-Shear Bearing Strength [ksi]
0
20
40
60
80
100
120
140
0
1
2
3
4
5

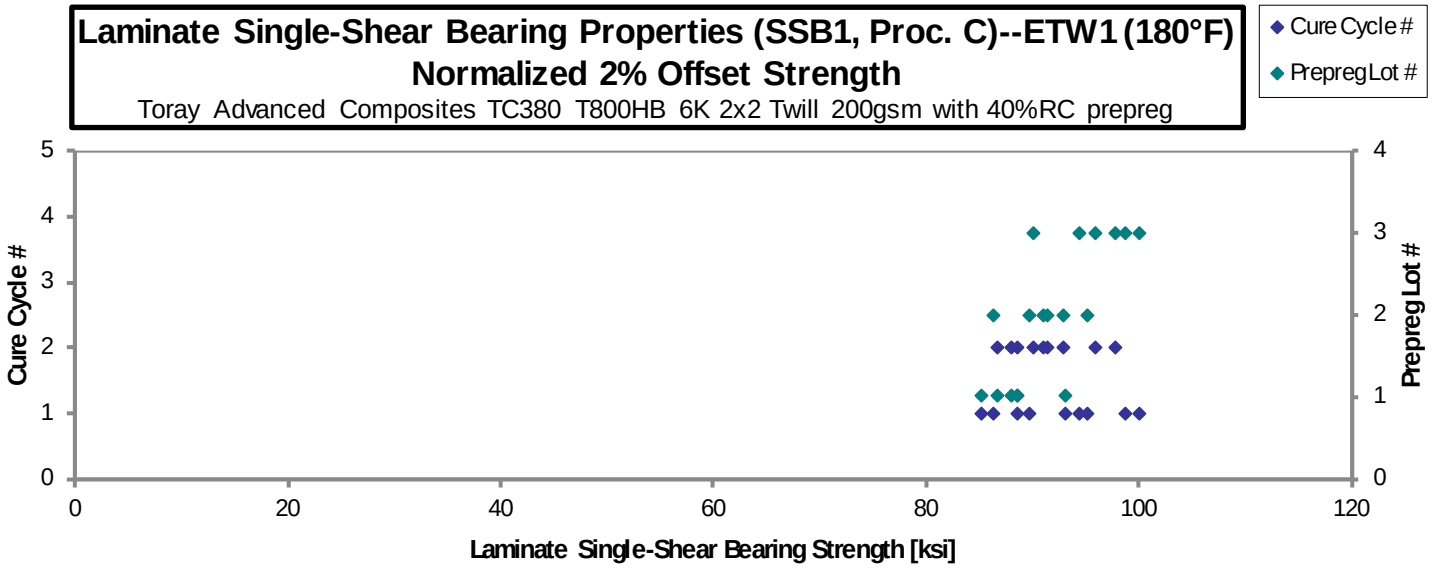

Laminate Single-Shear Bearing Properties (SSB1, Proc. C)--RTD (70°F)
Normalized Chord Stiffness
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Single-Shear Bearing Chord Stiffness [Msi]
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
0
1
2
3
4
5

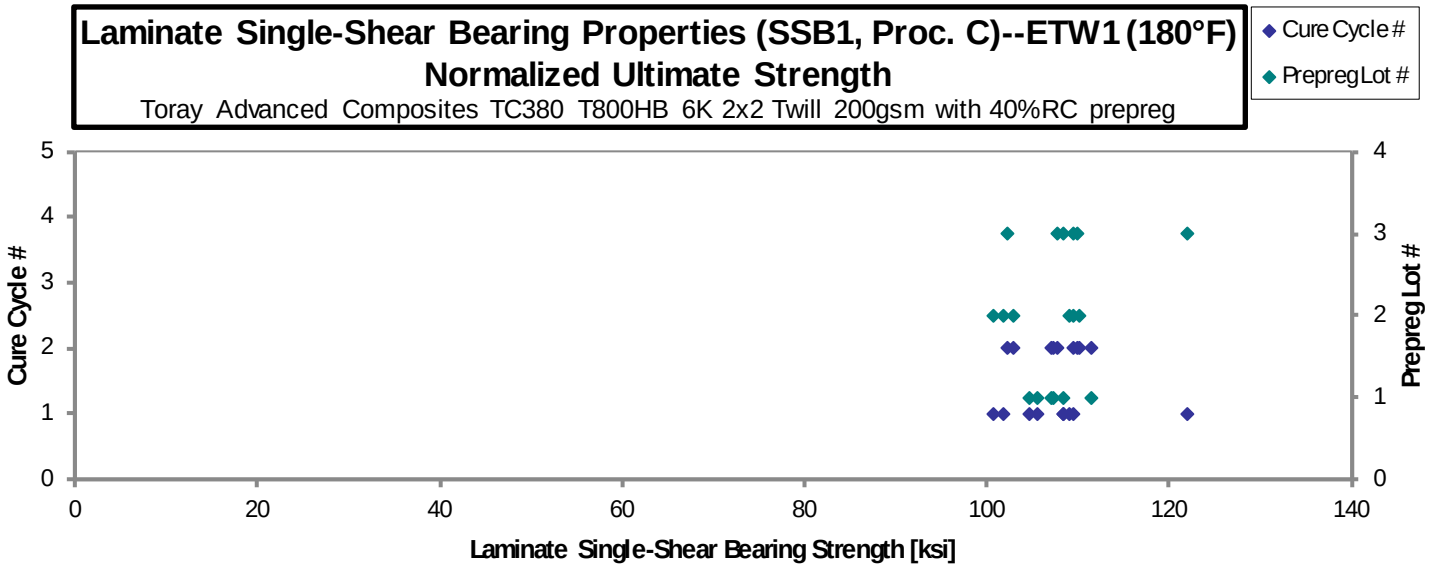
Laminate Single-Shear Bearing Properties (SSB1, Proc. C)--ETW1 (180°F)
Strength & Chord Stiffness
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

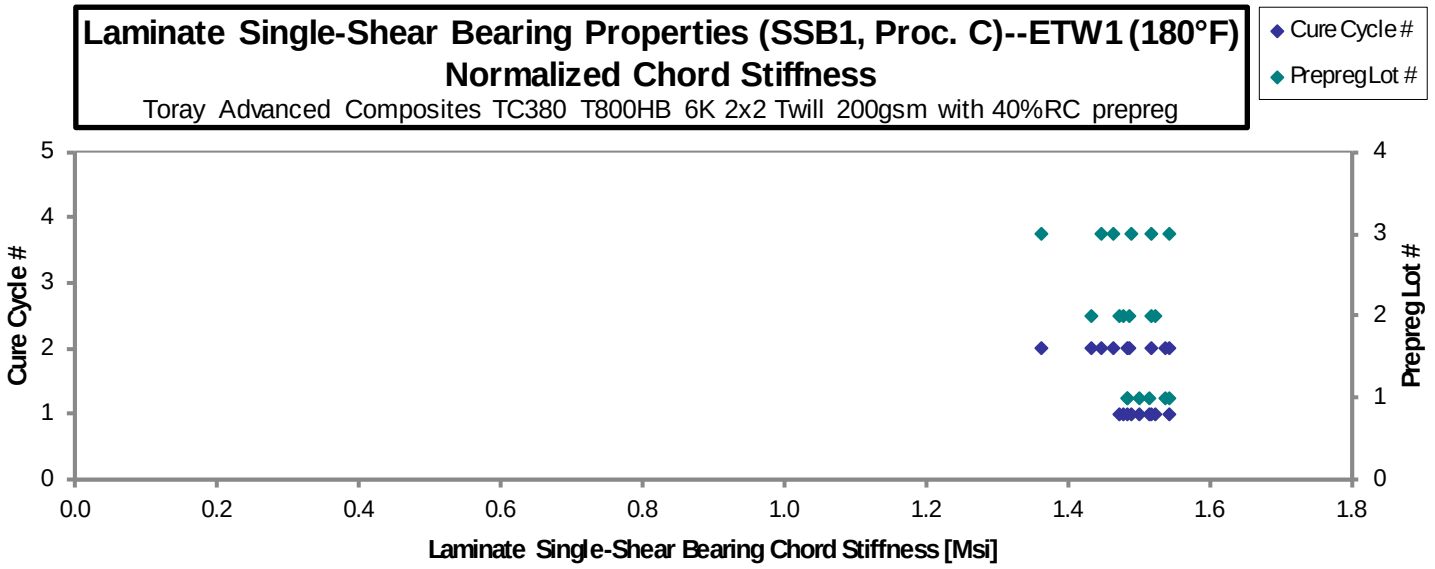
normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	2% Offset Strength [ksi]	Ultimate Strength [ksi]	Chord Stiffness [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	2% Offset $Strength_{norm}$ [ksi]	Ultimate $Strength_{norm}$ [ksi]	Chord $Stiffness_{norm}$ [Msi]
TCE1A111D	A	C1	1	1	88.86	113.1	1.546	0.1351	16	B1I	0.008445	85.27	108.5	1.483
TCE1A112D	A	C1	1	1	99.59	111.9	1.605	0.1317	16	B1I	0.008231	93.15	104.7	1.502
TCE1A113D	A	C1	1	1	97.16	115.7	1.661	0.1284	16	B1I	0.008024	88.59	105.5	1.515
TCE1A211D	A	C2	1	2	95.13	115.2	1.650	0.1311	16	B1I	0.008196	88.60	107.3	1.537
TCE1A212D	A	C2	1	2	95.32	120.7	1.609	0.1299	16	B1I	0.008121	87.96	111.4	1.484
TCE1A213D	A	C2	1	2	96.26	119.1	1.714	0.1268	16	B1I	0.007922	86.66	107.2	1.543
TCE1B111D	B	C1	2	1	95.52	108.2	1.574	0.1323	16	B1I	0.008271	89.77	101.7	1.480
TCE1B112D	B	C1	2	1	93.09	108.5	1.588	0.1307	16	B1I	0.008166	86.38	100.7	1.474
TCE1B113D	B	C1	2	1	104.5	119.7	1.673	0.1283	16	B1I	0.008016	95.22	109.0	1.524
TCE1B211D	B	C2	2	2	97.55	117.5	1.593	0.1314	16	B1I	0.008211	91.03	109.6	1.487
TCE1B212D	B	C2	2	2	100.3	118.9	1.547	0.1304	16	B1I	0.008148	92.86	110.1	1.433
TCE1B213D	B	C2	2	2	99.81	112.6	1.659	0.1288	16	B1I	0.008052	91.33	103.0	1.518
TCE1C111D	C	C1	3	1	101.8	125.9	1.594	0.1364	16	B1I	0.008527	98.68	122.0	1.544
TCE1C112D	C	C1	3	1	104.3	113.0	1.553	0.1351	16	B1I	0.008443	100.1	108.4	1.490
TCE1C113D	C	C1	3	1	99.66	115.6	1.603	0.1334	16	B1I	0.008338	94.42	109.5	1.519
TCE1C211D	C	C2	3	2	100.5	105.2	1.401	0.1370	16	B1I	0.008560	97.76	102.3	1.363
TCE1C212D	C	C2	3	2	93.28	114.0	1.518	0.1359	16	B1I	0.008493	90.03	110.0	1.465
TCE1C213D	C	C2	3	2	100.3	112.8	1.515	0.1346	16	B1I	0.008410	95.84	107.8	1.448

Average	**97.94**	**114.9**	**1.589**	**$Average_{norm}$**	**0.008254**	**91.87**	**107.7**	**1.489**
Standard Dev.	**4.043**	**5.003**	**0.07204**	**$Standard\ Dev._{norm}$**		**4.411**	**4.783**	**0.04449**
Coeff. of Var. [%]	**4.128**	**4.356**	**4.534**	**Coeff. of Var. $[\%]_{norm}$**		**4.802**	**4.441**	**2.988**
Min.	**88.86**	**105.2**	**1.401**	**Min.**	**0.007922**	**85.27**	**100.7**	**1.363**
Max.	**104.5**	**125.9**	**1.714**	**Max.**	**0.008560**	**100.1**	**122.0**	**1.544**
Number of Spec.	**18**	**18**	**18**	**Number of Spec.**	**18**	**18**	**18**	**18**


Laminate Single-Shear Bearing Properties (SSB1, Proc. C)--ETW1 (180°F)
Normalized 2% Offset Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Single-Shear Bearing Strength [ksi]
0
20
40
60
80
100
120
0
1
2
3
4
5


Laminate Single-Shear Bearing Properties (SSB1, Proc. C)--ETW1 (180°F)
Normalized Ultimate Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Single-Shear Bearing Strength [ksi]
0
20
40
60
80
100
120
140
0
1
2
3
4
5

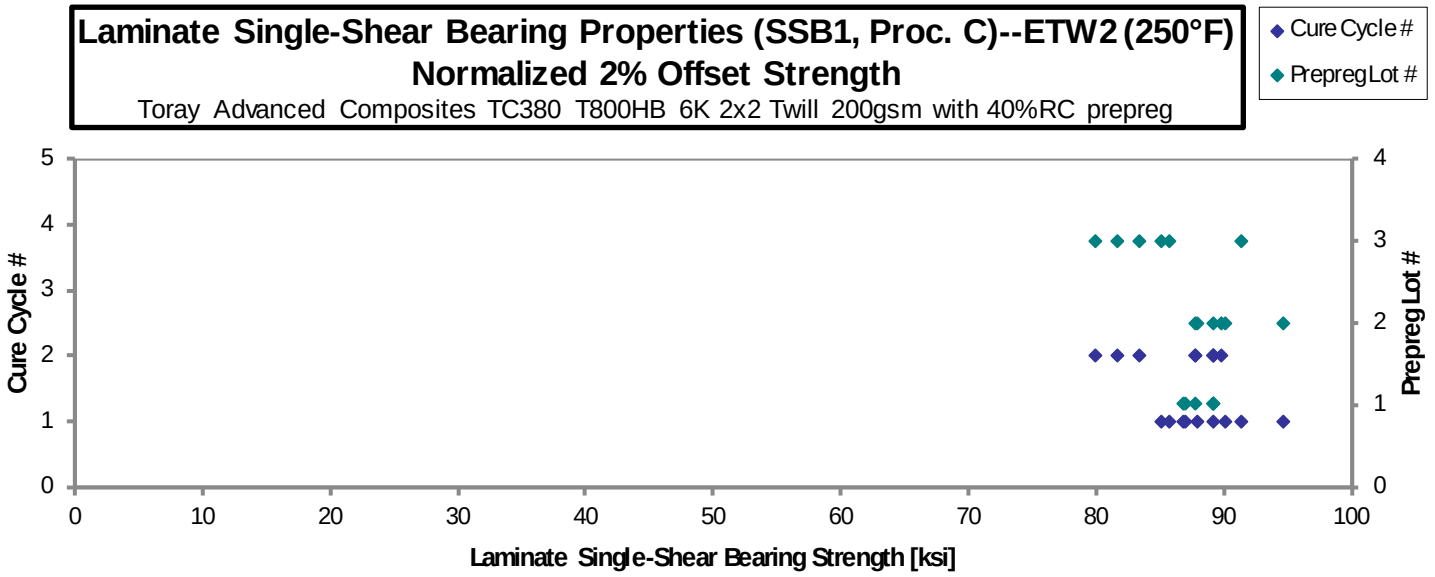

Laminate Single-Shear Bearing Properties (SSB1, Proc. C)--ETW1 (180°F)
Normalized Chord Stiffness
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
5
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
Laminate Single-Shear Bearing Chord Stiffness [Msi]

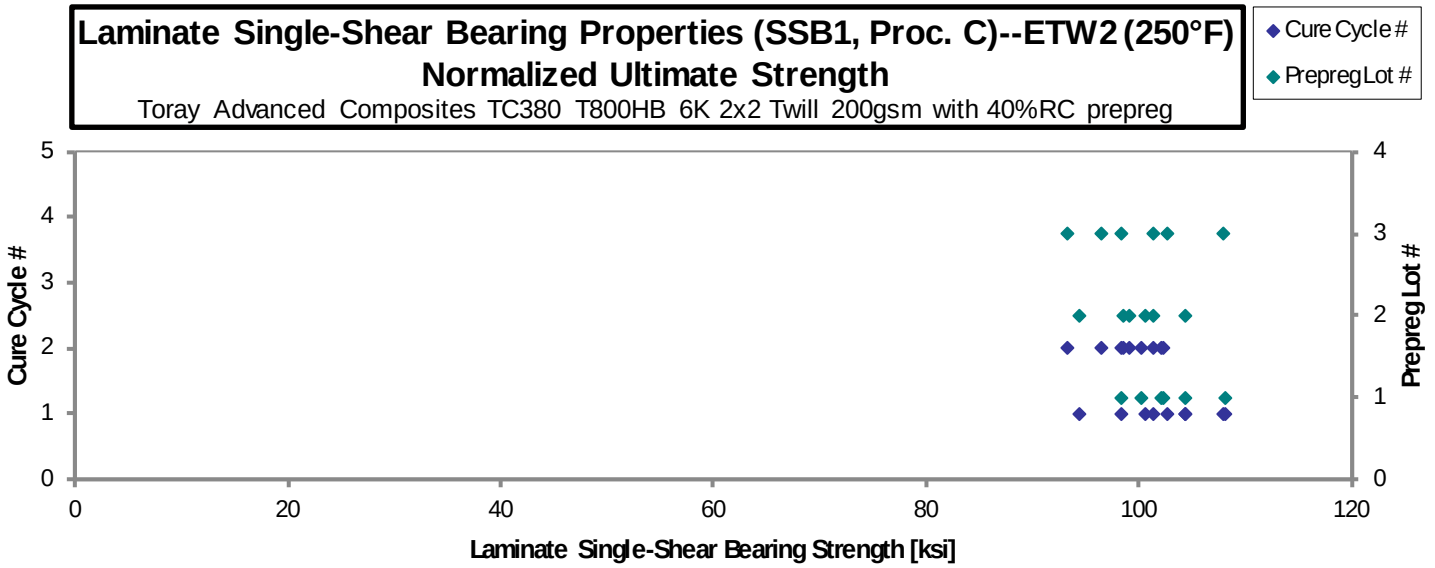
Laminate Single-Shear Bearing Properties (SSB1, Proc. C)--ETW2 (250°F)
Strength & Chord Stiffness
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

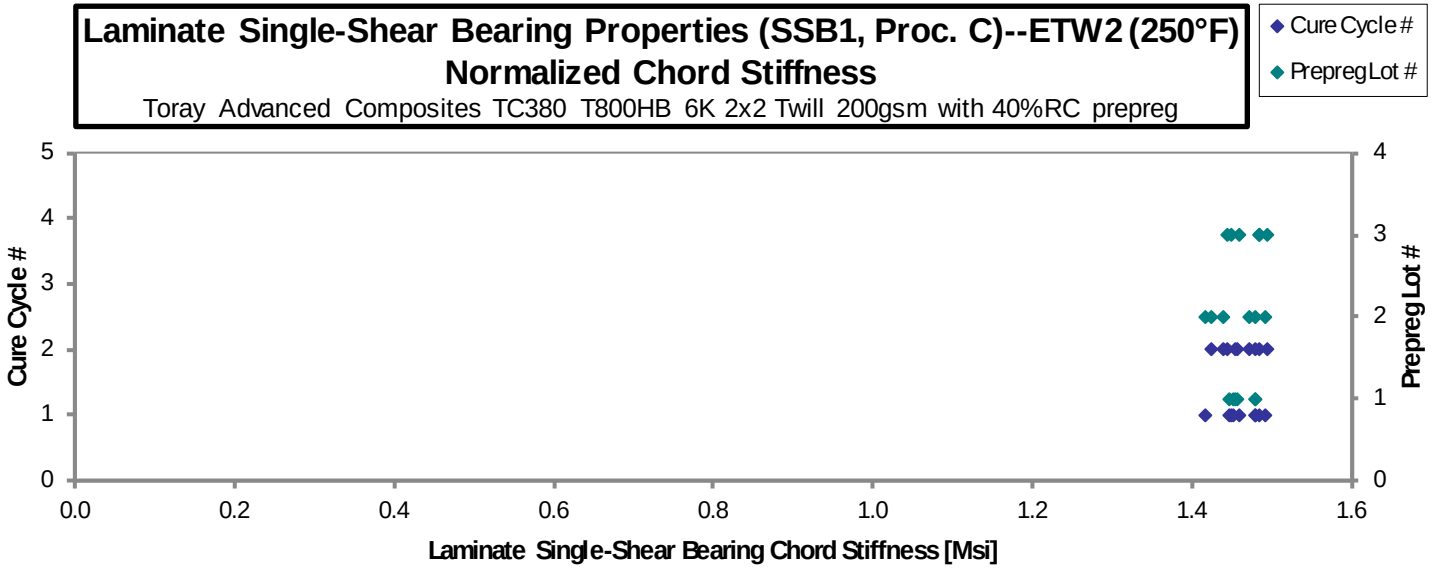
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Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	2% Offset Strength [ksi]	Ultimate Strength [ksi]	Chord Stiffness [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	2% Offset Strength$_{norm}$ [ksi]	Ultimate Strength$_{norm}$ [ksi]	Chord Stiffness$_{norm}$ [Msi]
TCE1A111E	A	C1	1	1	83.19	103.6	1.385	0.1471	16	B1I	0.009191	86.89	108.2	1.446
TCE1A112E	A	C1	1	1	84.51	93.14	1.376	0.1487	16	B1I	0.009292	89.23	98.35	1.453
TCE1A113E	A	C1	1	1	83.36	100.0	1.419	0.1469	16	B1I	0.009183	86.99	104.4	1.480
TCE1A211E	A	C2	1	2	85.55	99.60	1.440	0.1446	16	B1I	0.009035	87.84	102.3	1.479
TCE1A212E	A	C2	1	2	85.77	96.48	1.401	0.1463	16	B1I	0.009146	89.14	100.3	1.456
TCE1A213E	A	C2	1	2	86.69	99.30	1.414	0.1448	16	B1I	0.009048	89.14	102.1	1.453
TCE1B111E	B	C1	2	1	85.88	92.33	1.384	0.1440	16	B1I	0.009002	87.85	94.45	1.416
TCE1B112E	B	C1	2	1	91.36	97.07	1.428	0.1459	16	B1I	0.009120	94.68	100.6	1.480
TCE1B113E	B	C1	2	1	87.49	101.3	1.448	0.1450	16	B1I	0.009063	90.10	104.4	1.491
TCE1B211E	B	C2	2	2	86.78	98.65	1.433	0.1447	16	B1I	0.009044	89.18	101.4	1.472
TCE1B212E	B	C2	2	2	84.26	94.60	1.366	0.1467	16	B1I	0.009171	87.81	98.58	1.424
TCE1B213E	B	C2	2	2	86.98	95.99	1.394	0.1454	16	B1I	0.009090	89.84	99.15	1.440
TCE1C111E	C	C1	3	1	85.60	102.6	1.457	0.1410	16	B1I	0.008813	85.72	102.8	1.459
TCE1C112E	C	C1	3	1	90.74	107.3	1.474	0.1418	16	B1I	0.008860	91.36	108.0	1.484
TCE1C113E	C	C1	3	1	84.46	100.6	1.441	0.1418	16	B1I	0.008861	85.05	101.3	1.451
TCE1C211E	C	C2	3	2	83.06	96.13	1.487	0.1414	16	B1I	0.008838	83.41	96.54	1.493
TCE1C212E	C	C2	3	2	81.60	98.24	1.444	0.1409	16	B1I	0.008806	81.66	98.31	1.445
TCE1C213E	C	C2	3	2	79.61	92.93	1.479	0.1413	16	B1I	0.008833	79.91	93.28	1.485

Average	**85.38**	**98.33**	**1.426**	**Average$_{norm}$**	**0.009022**	**87.55**	**100.8**	**1.462**
Standard Dev.	**2.872**	**3.967**	**0.03631**	**Standard Dev.$_{norm}$**		**3.500**	**4.029**	**0.02272**
Coeff. of Var. [%]	**3.363**	**4.034**	**2.546**	**Coeff. of Var. [%]$_{norm}$**		**3.998**	**3.997**	**1.555**
Min.	**79.61**	**92.33**	**1.366**	**Min.**	**0.008806**	**79.91**	**93.28**	**1.416**
Max.	**91.36**	**107.3**	**1.487**	**Max.**	**0.009292**	**94.68**	**108.2**	**1.493**
Number of Spec.	**18**	**18**	**18**	**Number of Spec.**	**18**	**18**	**18**	**18**


Laminate Single-Shear Bearing Properties (SSB1, Proc. C)--ETW2 (250°F)
Normalized 2% Offset Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Single-Shear Bearing Strength [ksi]
0
10
20
30
40
50
60
70
80
90
100
0
1
2
3
4
5


Laminate Single-Shear Bearing Properties (SSB1, Proc. C)--ETW2 (250°F)
Normalized Ultimate Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Single-Shear Bearing Strength [ksi]
0
20
40
60
80
100
120
0
1
2
3
4
5


Laminate Single-Shear Bearing Properties (SSB1, Proc. C)--ETW2 (250°F)
Normalized Chord Stiffness
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
5
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
Laminate Single-Shear Bearing Chord Stiffness [Msi]

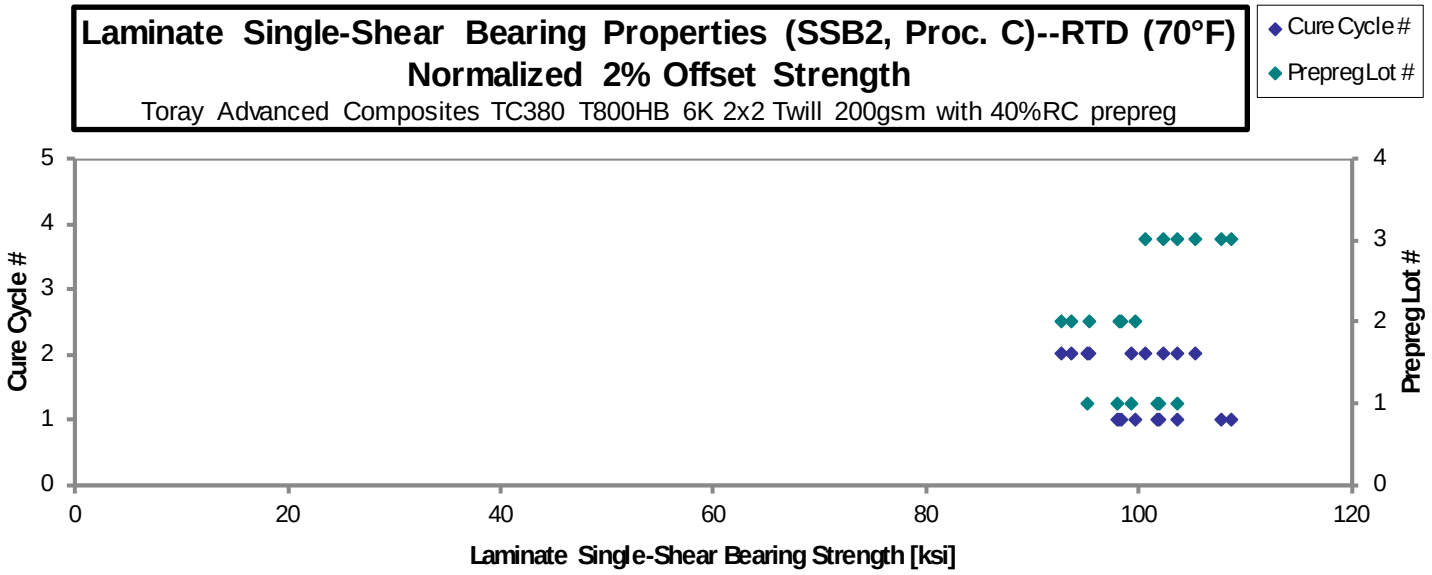
4.26 "10/80/10" Single-Shear Bearing 2 Properties (SSB2, Proc. C)

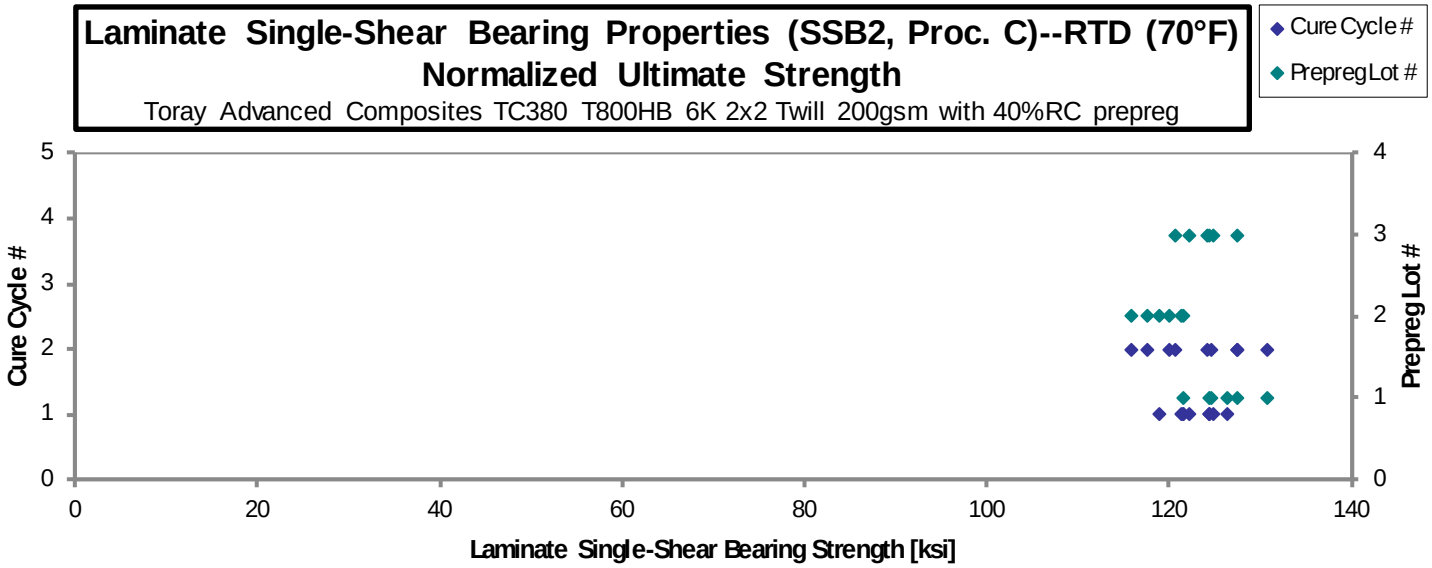
Laminate Single-Shear Bearing Properties (SSB2, Proc. C)--RTD (70°F)
Strength & Chord Stiffness
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

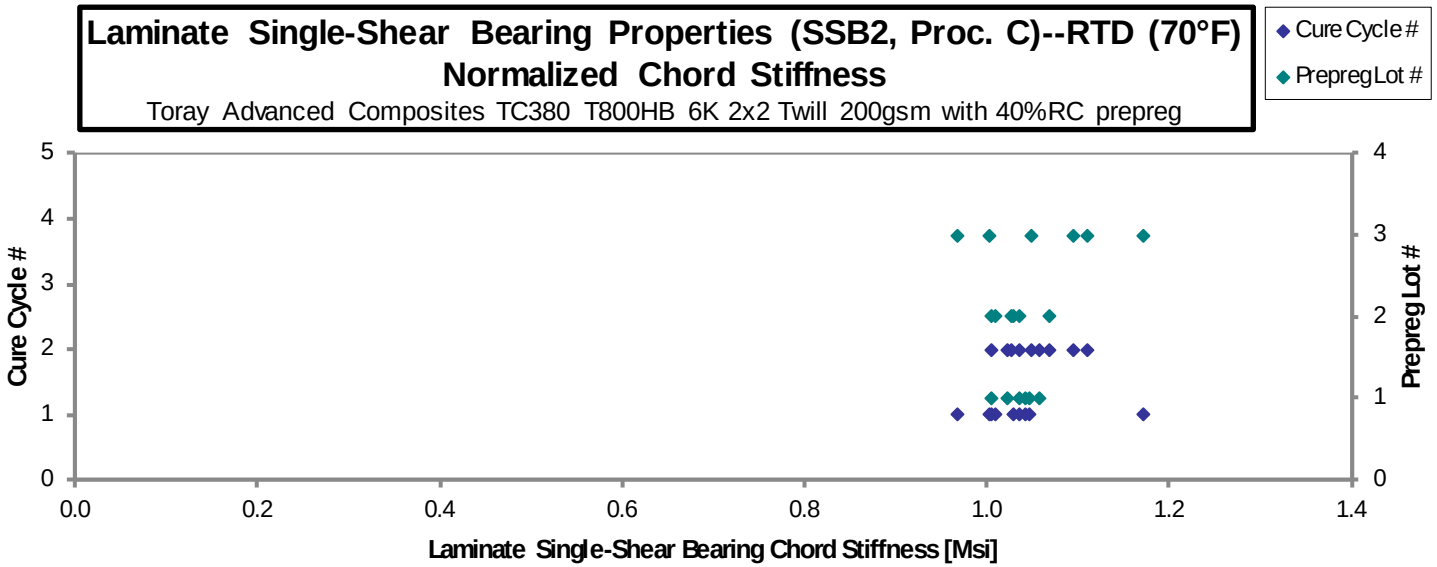
normalizing t_{ply} [in]
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Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	2% Offset Strength [ksi]	Ultimate Strength [ksi]	Chord Stiffness [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	2% Offset Strength$_{norm}$ [ksi]	Ultimate Strength$_{norm}$ [ksi]	Chord Stiffness$_{norm}$ [Msi]
TCE2A111A	A	C1	1	1	107.7	138.9	1.145	0.1602	20	B1l, E3l	0.008009	97.99	126.4	1.042
TCE2A112A	A	C1	1	1	109.3	130.3	1.123	0.1642	20	B1l, E3l	0.008209	102.0	121.5	1.048
TCE2A113A	A	C1	1	1	107.0	130.8	1.056	0.1674	20	B1l, E3l	0.008368	101.7	124.4	1.004
TCE2A211A	A	C2	1	2	109.0	134.1	1.089	0.1674	20	B1l, E3l	0.008368	103.6	127.5	1.036
TCE2A212A	A	C2	1	2	102.8	135.6	1.060	0.1699	20	B1l, E3l	0.008495	99.22	130.9	1.023
TCE2A213A	A	C2	1	2	94.93	124.3	1.055	0.1766	20	B1l, E3l	0.008829	95.24	124.7	1.059
TCE2B111A	B	C1	2	1	110.2	134.3	1.145	0.1593	20	B1l, E3l	0.007966	99.74	121.6	1.037
TCE2B112A	B	C1	2	1	106.6	128.8	1.093	0.1625	20	B1l, E3l	0.008125	98.42	118.9	1.009
TCE2B113A	B	C1	2	1	104.2	128.7	1.091	0.1659	20	B1l, E3l	0.008293	98.19	121.2	1.029
TCE2B211A	B	C2	2	2	104.5	131.2	1.192	0.1579	20	B1l, E3l	0.007893	93.69	117.7	1.069
TCE2B212A	B	C2	2	2	100.5	130.0	1.112	0.1624	20	B1l, E3l	0.008121	92.78	120.0	1.026
TCE2B213A	B	C2	2	2	101.6	123.7	1.072	0.1651	20	B1l, E3l	0.008253	95.29	116.0	1.005
TCE2C111A	C	C1	3	1	113.0	130.4	1.227	0.1680	20	B1l	0.008402	107.9	124.5	1.172
TCE2C112A	C	C1	3	1	111.7	128.5	1.032	0.1711	20	B1l	0.008555	108.6	124.9	1.003
TCE2C113A	C	C1	3	1	106.0	125.1	0.992	0.1719	20	B1l	0.008596	103.6	122.2	0.969
TCE2C211A	C	C2	3	2	111.1	131.0	1.170	0.1669	20	B1l	0.008343	105.3	124.2	1.110
TCE2C212A	C	C2	3	2	106.5	125.6	1.092	0.1692	20	B1l	0.008458	102.4	120.7	1.050
TCE2C213A	C	C2	3	2	103.1	130.7	1.123	0.1717	20	B1l	0.008585	100.6	127.5	1.095

Average	**106.1**	**130.1**	**1.104**	**Average$_{norm}$**	**0.008326**	**100.3**	**123.0**	**1.044**
Standard Dev.	**4.505**	**3.989**	**0.05827**	**Standard Dev.$_{norm}$**		**4.526**	**3.777**	**0.04664**
Coeff. of Var. [%]	**4.246**	**3.066**	**5.279**	**Coeff. of Var. [%]$_{norm}$**		**4.511**	**3.070**	**4.470**
Min.	**94.93**	**123.7**	**0.9916**	**Min.**	**0.007893**	**92.78**	**116.0**	**0.9685**
Max.	**113.0**	**138.9**	**1.227**	**Max.**	**0.008829**	**108.6**	**130.9**	**1.172**
Number of Spec.	**18**	**18**	**18**	**Number of Spec.**	**18**	**18**	**18**	**18**


Laminate Single-Shear Bearing Properties (SSB2, Proc. C)--RTD (70°F)
Normalized 2% Offset Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Single-Shear Bearing Strength [ksi]
0
20
40
60
80
100
120
0
1
2
3
4
5

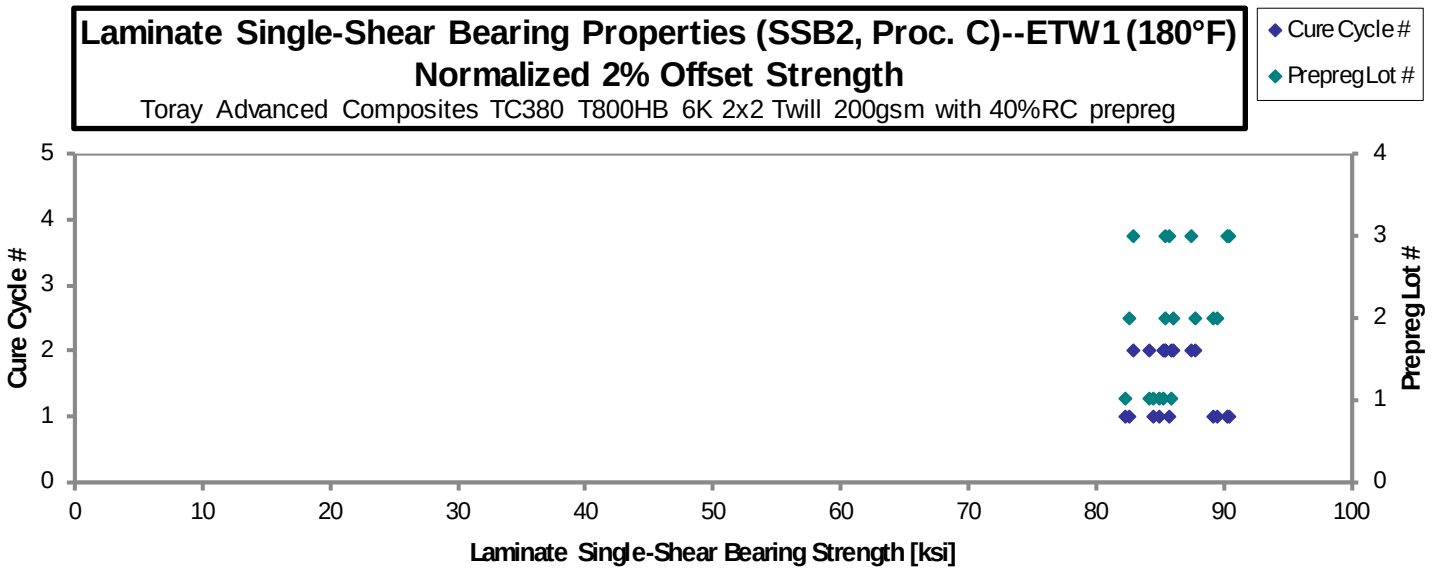

Laminate Single-Shear Bearing Properties (SSB2, Proc. C)--RTD (70°F)
Normalized Ultimate Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Single-Shear Bearing Strength [ksi]
0
20
40
60
80
100
120
140
0
1
2
3
4
5

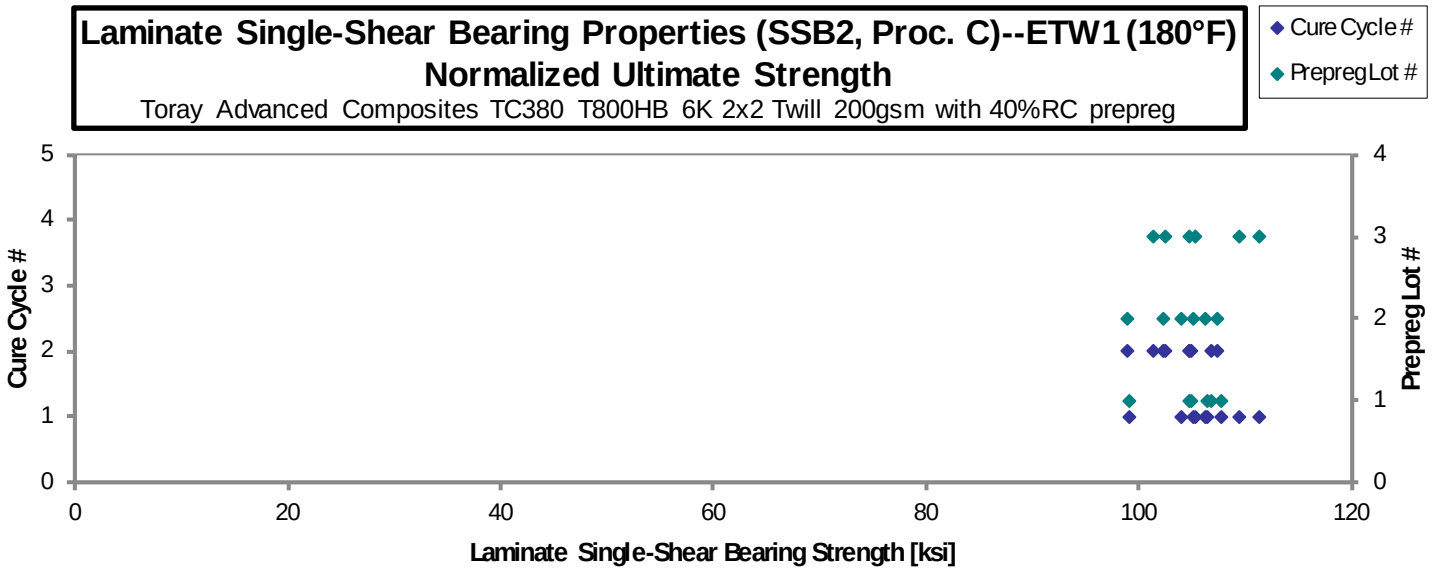

Laminate Single-Shear Bearing Properties (SSB2, Proc. C)--RTD (70°F)
Normalized Chord Stiffness
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
5
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
Laminate Single-Shear Bearing Chord Stiffness [Msi]

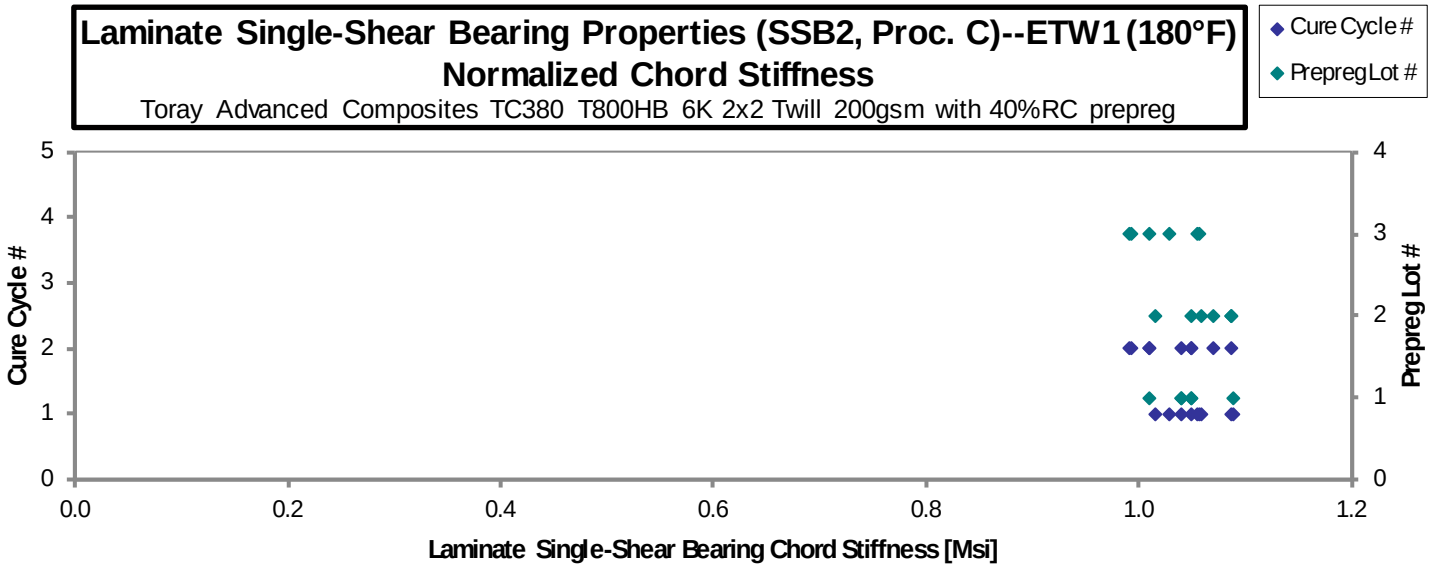
Laminate Single-Shear Bearing Properties (SSB2, Proc. C)--ETW1 (180°F)
Strength & Chord Stiffness
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]: 0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	2% Offset Strength [ksi]	Ultimate Strength [ksi]	Chord Stiffness [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	2% Offset Strength$_{norm}$ [ksi]	Ultimate Strength$_{norm}$ [ksi]	Chord Stiffness$_{norm}$ [Msi]
TCE2A111D	A	C1	1	1	88.46	111.6	1.100	0.1680	20	B1I	0.008399	84.43	106.5	1.049
TCE2A112D	A	C1	1	1	87.30	105.1	1.104	0.1659	20	B1I	0.008294	82.28	99.06	1.040
TCE2A113D	A	C1	1	1	91.70	116.3	1.176	0.1630	20	B1I	0.008150	84.93	107.7	1.089
TCE2A211D	A	C2	1	2	84.86	106.4	1.005	0.1767	20	B1I	0.008837	85.21	106.8	1.010
TCE2A212D	A	C2	1	2	85.20	106.1	1.053	0.1739	20	B1I	0.008696	84.19	104.9	1.041
TCE2A213D	A	C2	1	2	89.62	109.6	1.097	0.1686	20	B1I	0.008428	85.83	104.9	1.050
TCE2B111D	B	C1	2	1	95.15	113.1	1.081	0.1655	20	B1I	0.008273	89.45	106.3	1.016
TCE2B112D	B	C1	2	1	96.05	113.3	1.170	0.1635	20	B1I	0.008173	89.21	105.2	1.086
TCE2B113D	B	C1	2	1	91.01	114.6	1.167	0.1599	20	B1I	0.007993	82.65	104.1	1.059
TCE2B211D	B	C2	2	2	90.81	113.3	1.107	0.1669	20	B1I	0.008343	86.09	107.4	1.049
TCE2B212D	B	C2	2	2	93.66	105.6	1.143	0.1649	20	B1I	0.008243	87.73	98.90	1.071
TCE2B213D	B	C2	2	2	93.08	111.5	1.186	0.1614	20	B1I	0.008069	85.35	102.2	1.088
TCE2C111D	C	C1	3	1	92.37	107.7	1.081	0.1720	20	B1I	0.008600	90.28	105.3	1.056
TCE2C112D	C	C1	3	1	93.00	114.4	1.085	0.1712	20	B1I	0.008558	90.45	111.3	1.055
TCE2C113D	C	C1	3	1	89.04	113.7	1.069	0.1694	20	B1I	0.008472	85.72	109.5	1.029
TCE2C211D	C	C2	3	2	89.92	105.4	1.020	0.1712	20	B1I	0.008561	87.47	102.5	0.9921
TCE2C212D	C	C2	3	2	85.17	104.3	1.021	0.1712	20	B1I	0.008560	82.85	101.4	0.9928
TCE2C213D	C	C2	3	2	89.42	109.6	1.056	0.1683	20	B1I	0.008413	85.49	104.8	1.010
Average					**90.32**	**110.1**	**1.095**				**Average$_{norm}$**	**0.008392**	**86.09**	**104.9**	**1.044**
Standard Dev.					**3.319**	**3.916**	**0.05516**				**Standard Dev.$_{norm}$**		**2.527**	**3.250**	**0.03044**
Coeff. of Var. [%]					**3.674**	**3.558**	**5.036**				**Coeff. of Var. [%]$_{norm}$**		**2.935**	**3.098**	**2.917**
Min.					**84.86**	**104.3**	**1.005**				**Min.**	**0.007993**	**82.28**	**98.90**	**0.9921**
Max.					**96.05**	**116.3**	**1.186**				**Max.**	**0.008837**	**90.45**	**111.3**	**1.089**
Number of Spec.					**18**	**18**	**18**				**Number of Spec.**	**18**	**18**	**18**	**18**


Laminate Single-Shear Bearing Properties (SSB2, Proc. C)--ETW1 (180°F)
Normalized 2% Offset Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Single-Shear Bearing Strength [ksi]
0
10
20
30
40
50
60
70
80
90
100
0
1
2
3
4
5


Laminate Single-Shear Bearing Properties (SSB2, Proc. C)--ETW1 (180°F)
Normalized Ultimate Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Single-Shear Bearing Strength [ksi]
0
20
40
60
80
100
120
0
1
2
3
4
5

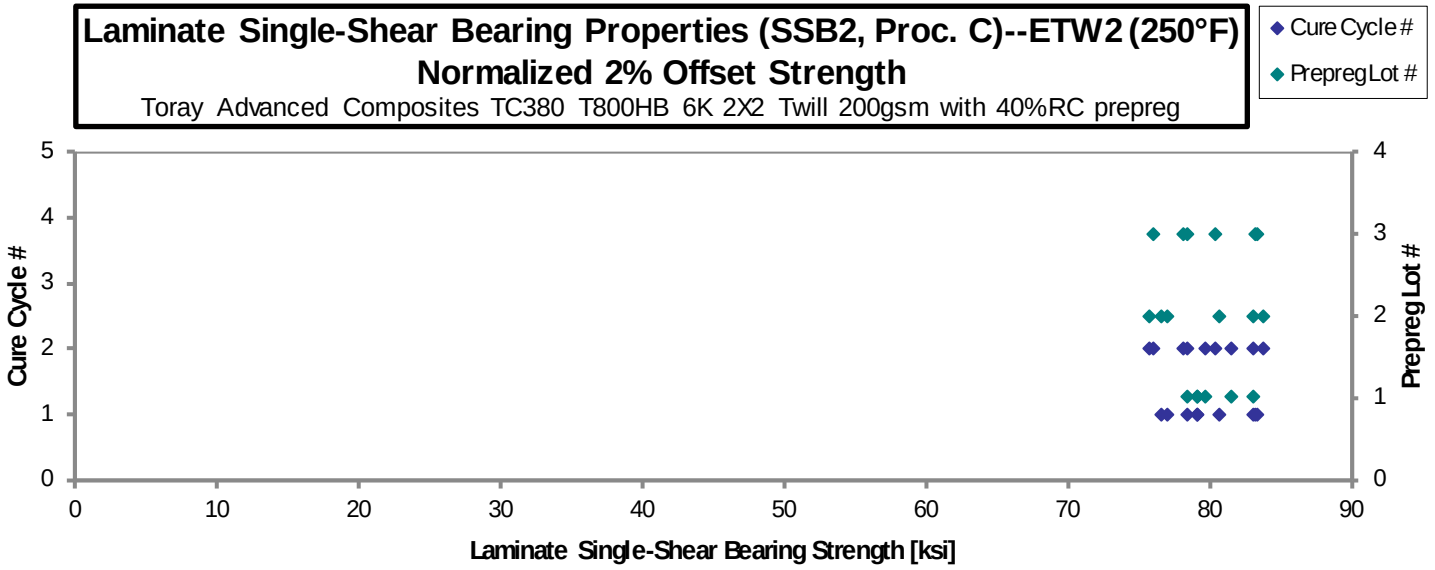

Laminate Single-Shear Bearing Properties (SSB2, Proc. C)--ETW1 (180°F)
Normalized Chord Stiffness
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
5
0.0
0.2
0.4
0.6
0.8
1.0
1.2
Laminate Single-Shear Bearing Chord Stiffness [Msi]

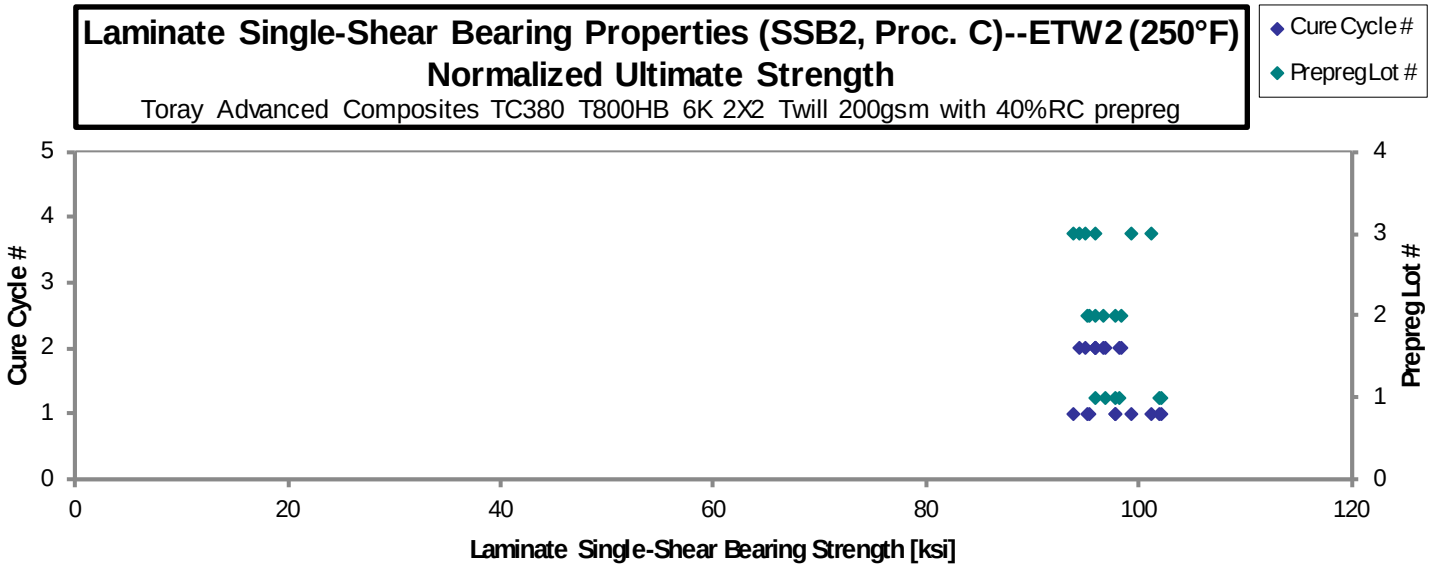
Laminate Single-Shear Bearing Properties (SSB2, Proc. C)--ETW2 (250°F)
Strength & Chord Stiffness
Toray Advanced Composites TC380 T800HB 6K 2X2 Twill 200gsm with 40%RC prepreg

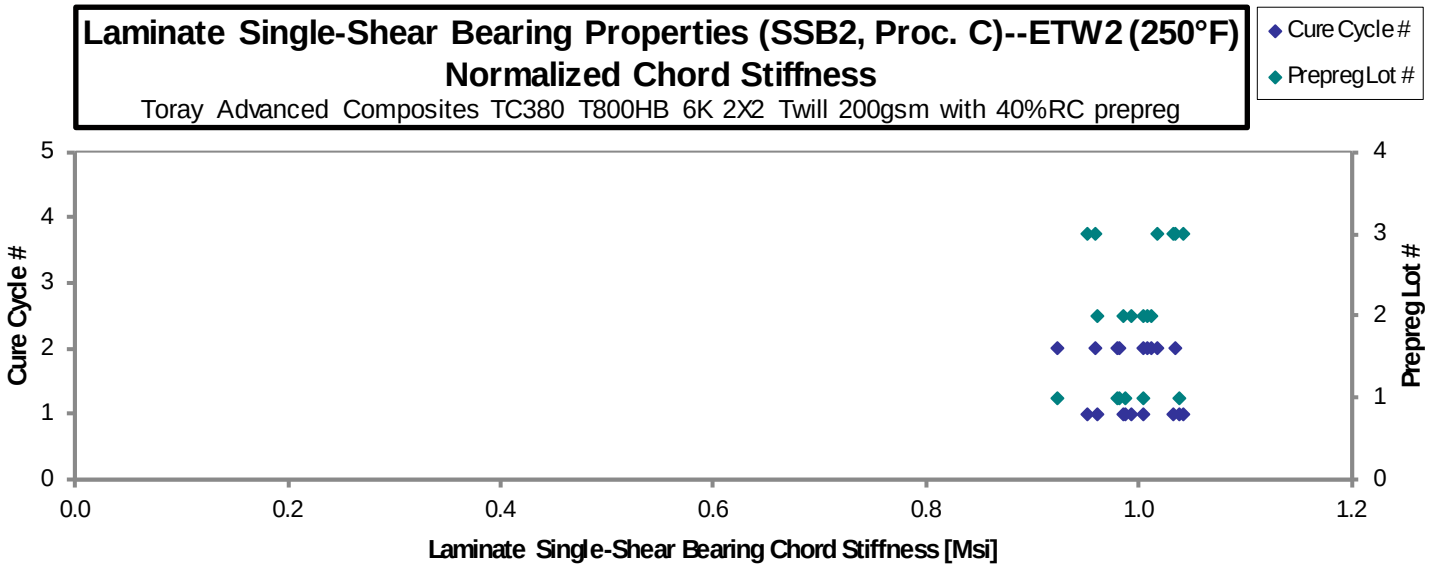
normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	2% Offset Strength [ksi]	Ultimate Strength [ksi]	Chord Stiffness [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	2% Offset $Strength_{norm}$ [ksi]	Ultimate $Strength_{norm}$ [ksi]	Chord $Stiffness_{norm}$ [Msi]
TCE2A111E	A	C1	1	1	80.73	99.01	0.9583	0.1812	20	B1I	0.009061	83.12	101.9	0.9867
TCE2A112E	A	C1	1	1	75.79	93.69	0.9946	0.1837	20	B1I	0.009185	79.11	97.79	1.038
TCE2A113E	A	C1	1	1	76.44	98.70	0.9717	0.1821	20	B1I	0.009103	79.07	102.1	1.005
TCE2A211E	A	C2	1	2	76.70	92.23	0.8888	0.1830	20	B1I	0.009151	79.75	95.91	0.9243
TCE2A212E	A	C2	1	2	74.33	92.98	0.9299	0.1858	20	B1I	0.009290	78.46	98.15	0.9816
TCE2A213E	A	C2	1	2	77.79	92.51	0.9357	0.1843	20	B1I	0.009216	81.46	96.88	0.9800
TCE2B111E	B	C1	2	1	79.46	93.68	0.9475	0.1787	20	B1I	0.008936	80.69	95.13	0.9621
TCE2B112E	B	C1	2	1	74.53	95.11	0.9599	0.1809	20	B1I	0.009043	76.59	97.74	0.9865
TCE2B113E	B	C1	2	1	75.44	93.43	0.9720	0.1798	20	B1I	0.008988	77.05	95.43	0.9928
TCE2B211E	B	C2	2	2	82.81	97.36	1.000	0.1780	20	B1I	0.008898	83.73	98.44	1.011
TCE2B212E	B	C2	2	2	73.88	94.28	0.9822	0.1805	20	B1I	0.009024	75.77	96.68	1.007
TCE2B213E	B	C2	2	2	81.60	94.23	0.9866	0.1791	20	B1I	0.008953	83.02	95.87	1.004
TCE2C111E	C	C1	3	1	82.09	99.82	1.019	0.1783	20	B1I	0.008917	83.18	101.1	1.033
TCE2C112E	C	C1	3	1	82.32	92.76	0.9392	0.1783	20	B1I	0.008913	83.38	93.95	0.9513
TCE2C113E	C	C1	3	1	77.06	97.51	1.023	0.1792	20	B1I	0.008958	78.44	99.25	1.041
TCE2C211E	C	C2	3	2	77.60	95.19	0.9517	0.1774	20	B1I	0.008868	78.19	95.92	0.9590
TCE2C212E	C	C2	3	2	75.34	94.02	1.007	0.1778	20	B1I	0.008888	76.09	94.95	1.017
TCE2C213E	C	C2	3	2	79.30	93.24	1.021	0.1783	20	B1I	0.008917	80.35	94.47	1.035

Average	**77.96**	**94.99**	**0.9716**		**$Average_{norm}$**	**0.009017**	**79.86**	**97.32**	**0.9953**
Standard Dev.	**2.961**	**2.414**	**0.03643**		**$Standard\ Dev._{norm}$**		**2.658**	**2.486**	**0.03249**
Coeff. of Var. [%]	**3.798**	**2.542**	**3.749**		**Coeff. of Var. $[\%]_{norm}$**		**3.328**	**2.554**	**3.264**
Min.	**73.88**	**92.23**	**0.8888**		**Min.**	**0.008868**	**75.77**	**93.95**	**0.9243**
Max.	**82.81**	**99.82**	**1.023**		**Max.**	**0.009290**	**83.73**	**102.1**	**1.041**
Number of Spec.	**18**	**18**	**18**		**Number of Spec.**	**18**	**18**	**18**	**18**


Laminate Single-Shear Bearing Properties (SSB2, Proc. C)--ETW2 (250°F)
Normalized 2% Offset Strength
Toray Advanced Composites TC380 T800HB 6K 2X2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Single-Shear Bearing Strength [ksi]
0
10
20
30
40
50
60
70
80
90
0
1
2
3
4
5


Laminate Single-Shear Bearing Properties (SSB2, Proc. C)--ETW2 (250°F)
Normalized Ultimate Strength
Toray Advanced Composites TC380 T800HB 6K 2X2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Single-Shear Bearing Strength [ksi]
0
20
40
60
80
100
120
0
1
2
3
4
5


Laminate Single-Shear Bearing Properties (SSB2, Proc. C)--ETW2 (250°F)
Normalized Chord Stiffness
Toray Advanced Composites TC380 T800HB 6K 2X2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
5
0.0
0.2
0.4
0.6
0.8
1.0
1.2
Laminate Single-Shear Bearing Chord Stiffness [Msi]

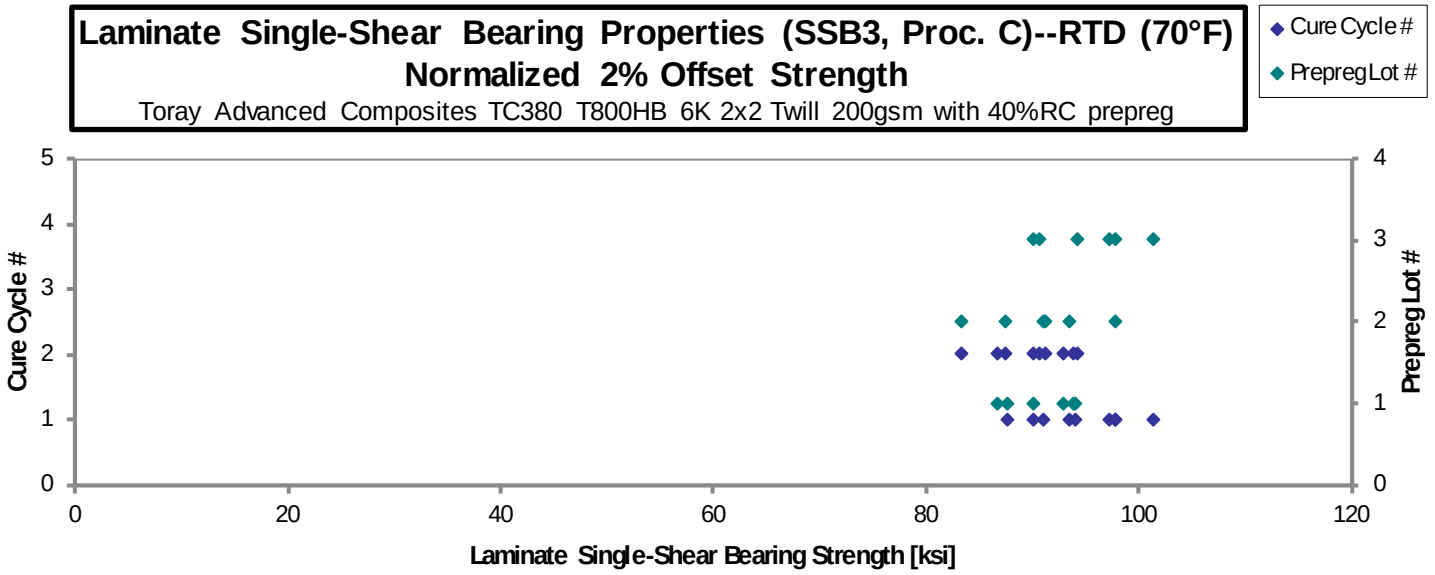
4.27 "40/20/40" Single-Shear Bearing 3 Properties (SSB3, Proc. C)

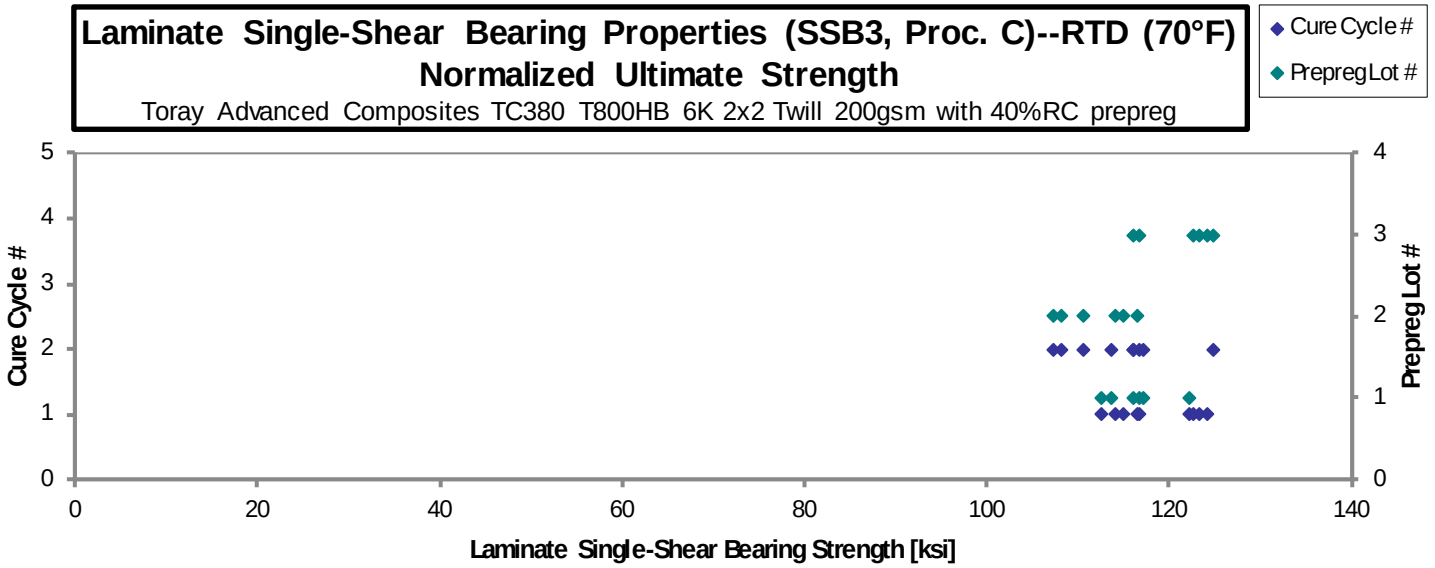
Laminate Single-Shear Bearing Properties (SSB3, Proc. C)--RTD (70°F)
Strength & Chord Stiffness
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

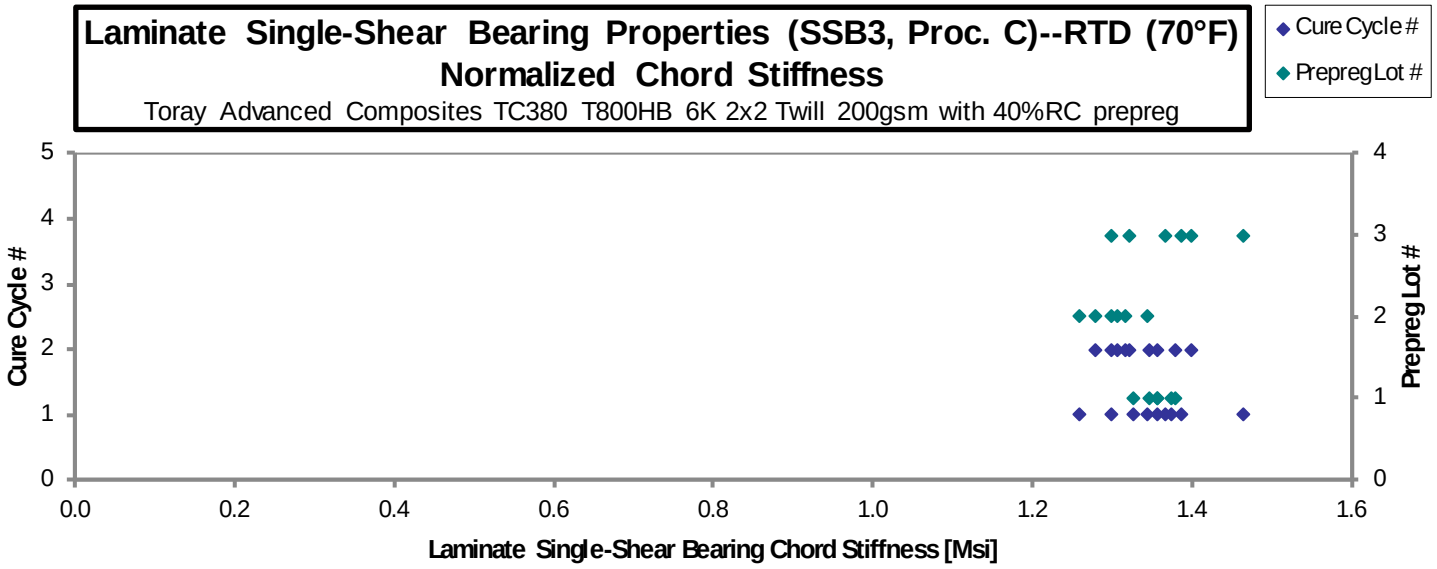
normalizing t_{ply} [in]: 0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	2% Offset Strength [ksi]	Ultimate Strength [ksi]	Chord Stiffness [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	2% Offset Strength$_{norm}$ [ksi]	Ultimate Strength$_{norm}$ [ksi]	Chord Stiffness$_{norm}$ [Msi]
TCE3A111A	A	C1	1	1	95.26	122.2	1.473	0.1621	20	B1I	0.008103	87.71	112.5	1.357
TCE3A112A	A	C1	1	1	95.70	129.8	1.459	0.1657	20	B1I, E3I	0.008287	90.12	122.2	1.374
TCE3A113A	A	C1	1	1	98.47	122.2	1.388	0.1682	20	B1I	0.008410	94.10	116.8	1.327
TCE3A211A	A	C2	1	2	104.8	129.6	1.540	0.1576	20	B1I	0.007880	93.87	116.0	1.379
TCE3A212A	A	C2	1	2	100.5	126.6	1.468	0.1628	20	B1I	0.008140	92.99	117.1	1.358
TCE3A213A	A	C2	1	2	92.50	121.3	1.435	0.1650	20	B1I	0.008250	86.72	113.7	1.345
TCE3B111A	B	C1	2	1	102.8	125.6	1.479	0.1599	20	B1I	0.007997	93.40	114.1	1.344
TCE3B112A	B	C1	2	1	98.23	125.6	1.357	0.1632	20	B1I	0.008159	91.08	116.4	1.258
TCE3B113A	B	C1	2	1	104.0	122.3	1.384	0.1654	20	B1I	0.008269	97.75	114.9	1.300
TCE3B211A	B	C2	2	2	91.42	117.8	1.403	0.1605	20	B1I	0.008023	83.35	107.4	1.279
TCE3B212A	B	C2	2	2	94.31	116.8	1.420	0.1632	20	B1I	0.008160	87.45	108.3	1.317
TCE3B213A	B	C2	2	2	97.33	118.0	1.392	0.1651	20	B1I	0.008255	91.30	110.7	1.306
TCE3C111A	C	C1	3	1	99.53	126.4	1.489	0.1729	20	B1I	0.008647	97.80	124.2	1.463
TCE3C112A	C	C1	3	1	101.0	122.2	1.362	0.1766	20	B1I	0.008832	101.4	122.6	1.367
TCE3C113A	C	C1	3	1	96.01	121.7	1.371	0.1782	20	B1I	0.008908	97.19	123.2	1.388
TCE3C211A	C	C2	3	2	95.91	122.8	1.479	0.1664	20	B1I	0.008318	90.66	116.1	1.398
TCE3C212A	C	C2	3	2	93.62	129.7	1.372	0.1695	20	B1I	0.008473	90.14	124.8	1.321
TCE3C213A	C	C2	3	2	96.98	120.2	1.339	0.1709	20	B1I	0.008543	94.15	116.7	1.300

Average	**97.69**	**123.4**	**1.423**	**Average$_{norm}$**	**0.008314**	**92.29**	**116.5**	**1.343**
Standard Dev.	**3.844**	**4.026**	**0.05689**	**Standard Dev.$_{norm}$**		**4.521**	**5.212**	**0.04885**
Coeff. of Var. [%]	**3.935**	**3.264**	**3.998**	**Coeff. of Var. [%]$_{norm}$**		**4.899**	**4.472**	**3.636**
Min.	**91.42**	**116.8**	**1.339**	**Min.**	**0.007880**	**83.35**	**107.4**	**1.258**
Max.	**104.8**	**129.8**	**1.540**	**Max.**	**0.008908**	**101.4**	**124.8**	**1.463**
Number of Spec.	**18**	**18**	**18**	**Number of Spec.**	**18**	**18**	**18**	**18**


Laminate Single-Shear Bearing Properties (SSB3, Proc. C)--RTD (70°F)
Normalized 2% Offset Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Single-Shear Bearing Strength [ksi]
0
20
40
60
80
100
120
0
1
2
3
4
5


Laminate Single-Shear Bearing Properties (SSB3, Proc. C)--RTD (70°F)
Normalized Ultimate Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Single-Shear Bearing Strength [ksi]
0
20
40
60
80
100
120
140
0
1
2
3
4
5

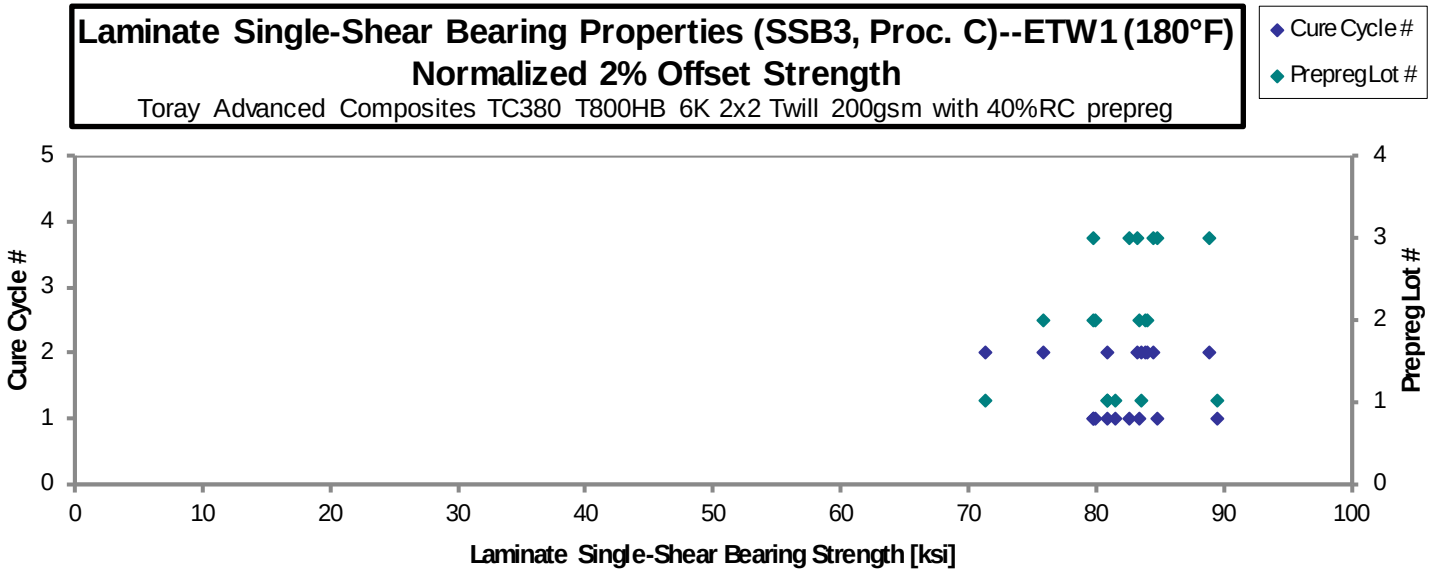

Laminate Single-Shear Bearing Properties (SSB3, Proc. C)--RTD (70°F)
Normalized Chord Stiffness
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Single-Shear Bearing Chord Stiffness [Msi]
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
0
1
2
3
4
5

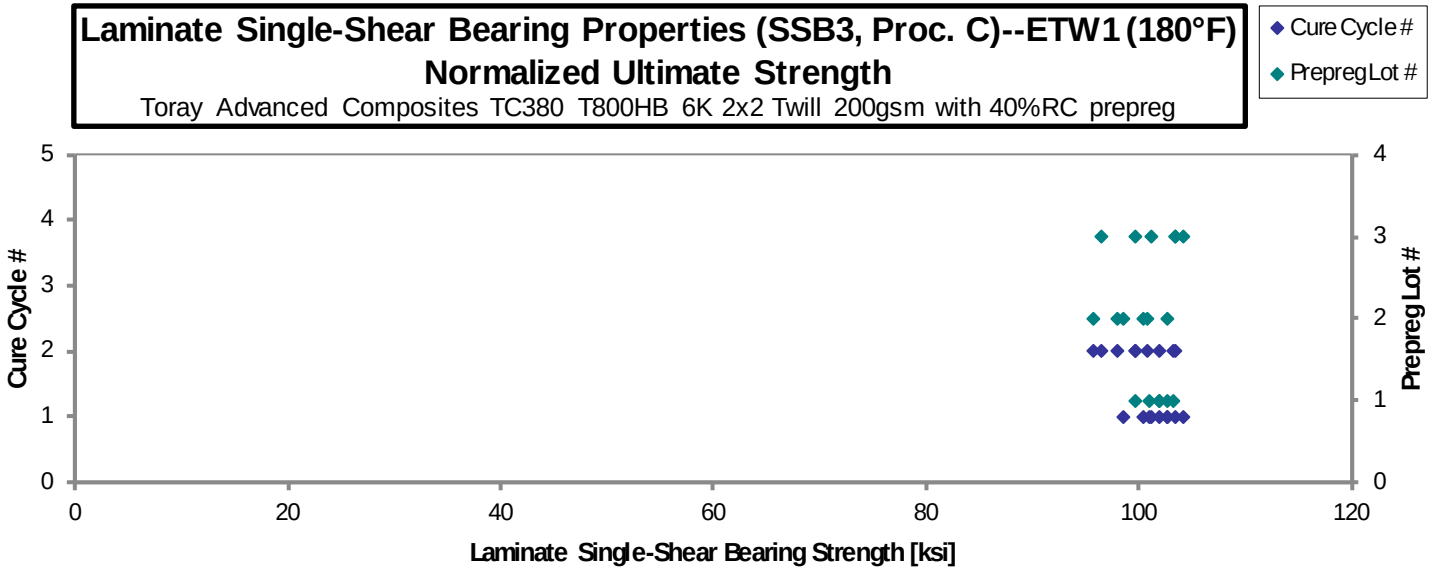
Laminate Single-Shear Bearing Properties (SSB3, Proc. C)--ETW1 (180°F)
Strength & Chord Stiffness
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

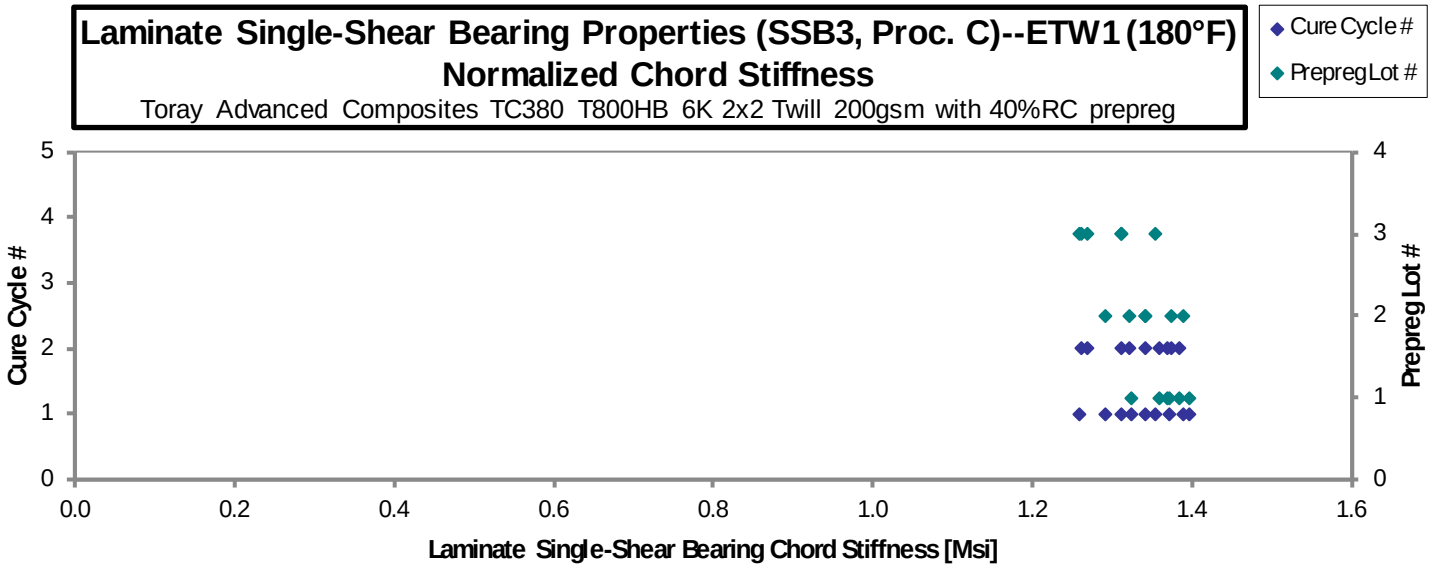
normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	2% Offset Strength [ksi]	Ultimate Strength [ksi]	Chord Stiffness [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	2% Offset Strength$_{norm}$ [ksi]	Ultimate Strength$_{norm}$ [ksi]	Chord Stiffness$_{norm}$ [Msi]
TCE3A111D	A	C1	1	1	93.30	107.0	1.381	0.1689	20	B1I	0.008443	89.51	102.7	1.325
TCE3A112D	A	C1	1	1	86.11	107.6	1.474	0.1668	20	B1I	0.008338	81.58	101.9	1.396
TCE3A113D	A	C1	1	1	87.56	109.3	1.484	0.1627	20	B1I	0.008135	80.94	101.1	1.372
TCE3A211D	A	C2	1	2	88.65	109.5	1.443	0.1658	20	B1I	0.008291	83.52	103.2	1.360
TCE3A212D	A	C2	1	2	87.50	107.7	1.496	0.1628	20	B1I	0.008139	80.93	99.61	1.384
TCE3A213D	A	C2	1	2	78.69	112.3	1.511	0.1596	20	B1I	0.007981	71.36	101.9	1.370
TCE3B111D	B	C1	2	1	88.81	104.8	1.427	0.1654	20	B1I	0.008269	83.45	98.50	1.341
TCE3B112D	B	C1	2	1	85.99	110.8	1.393	0.1632	20	B1I	0.008160	79.74	102.8	1.291
TCE3B113D	B	C1	2	1	88.11	110.8	1.532	0.1596	20	B1I	0.007980	79.90	100.5	1.389
TCE3B211D	B	C2	2	2	89.09	104.0	1.403	0.1658	20	B1I	0.008289	83.92	98.00	1.321
TCE3B212D	B	C2	2	2	90.04	102.5	1.473	0.1643	20	B1I	0.008216	84.06	95.74	1.375
TCE3B213D	B	C2	2	2	82.89	110.1	1.467	0.1611	20	B1I	0.008055	75.87	100.8	1.343
TCE3C111D	C	C1	3	1	83.42	101.8	1.332	0.1789	20	B1I	0.008943	84.78	103.5	1.354
TCE3C112D	C	C1	3	1	82.45	104.1	1.256	0.1763	20	B1I	0.008816	82.60	104.3	1.259
TCE3C113D	C	C1	3	1	81.91	103.8	1.346	0.1716	20	B1I	0.008578	79.84	101.2	1.312
TCE3C211D	C	C2	3	2	87.01	99.46	1.307	0.1708	20	B1I	0.008538	84.42	96.51	1.268
TCE3C212D	C	C2	3	2	92.32	107.5	1.362	0.1695	20	B1I	0.008474	88.90	103.5	1.312
TCE3C213D	C	C2	3	2	87.63	105.0	1.329	0.1671	20	B1I	0.008356	83.20	99.66	1.262

Average	**86.75**	**106.6**	**1.412**	**Average$_{norm}$**	**0.008333**	**82.14**	**100.8**	**1.335**
Standard Dev.	**3.724**	**3.568**	**0.07868**	**Standard Dev.$_{norm}$**		**4.192**	**2.453**	**0.04434**
Coeff. of Var. [%]	**4.293**	**3.348**	**5.572**	**Coeff. of Var. [%]$_{norm}$**		**5.103**	**2.432**	**3.321**
Min.	**78.69**	**99.46**	**1.256**	**Min.**	**0.007980**	**71.36**	**95.74**	**1.259**
Max.	**93.30**	**112.3**	**1.532**	**Max.**	**0.008943**	**89.51**	**104.3**	**1.396**
Number of Spec.	**18**	**18**	**18**	**Number of Spec.**	**18**	**18**	**18**	**18**


Laminate Single-Shear Bearing Properties (SSB3, Proc. C)--ETW1 (180°F)
Normalized 2% Offset Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Single-Shear Bearing Strength [ksi]
0
10
20
30
40
50
60
70
80
90
100
0
1
2
3
4
5


Laminate Single-Shear Bearing Properties (SSB3, Proc. C)--ETW1 (180°F)
Normalized Ultimate Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Single-Shear Bearing Strength [ksi]
0
20
40
60
80
100
120
0
1
2
3
4
5

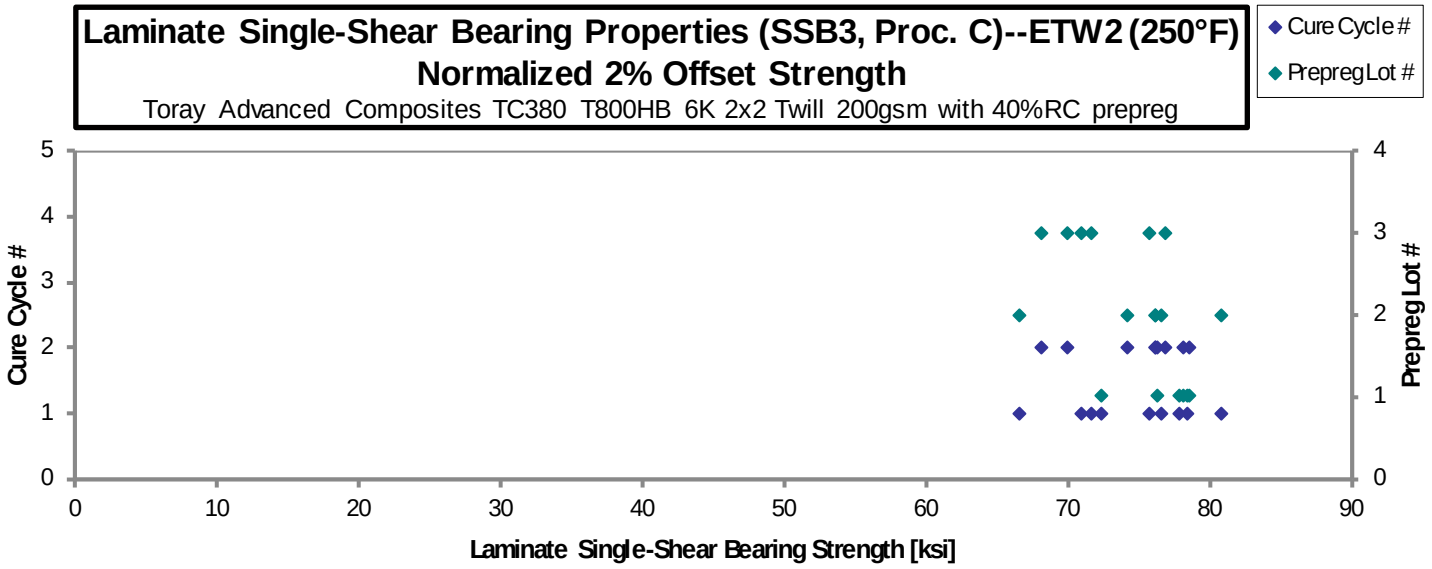

Laminate Single-Shear Bearing Properties (SSB3, Proc. C)--ETW1 (180°F)
Normalized Chord Stiffness
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
5
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
Laminate Single-Shear Bearing Chord Stiffness [Msi]

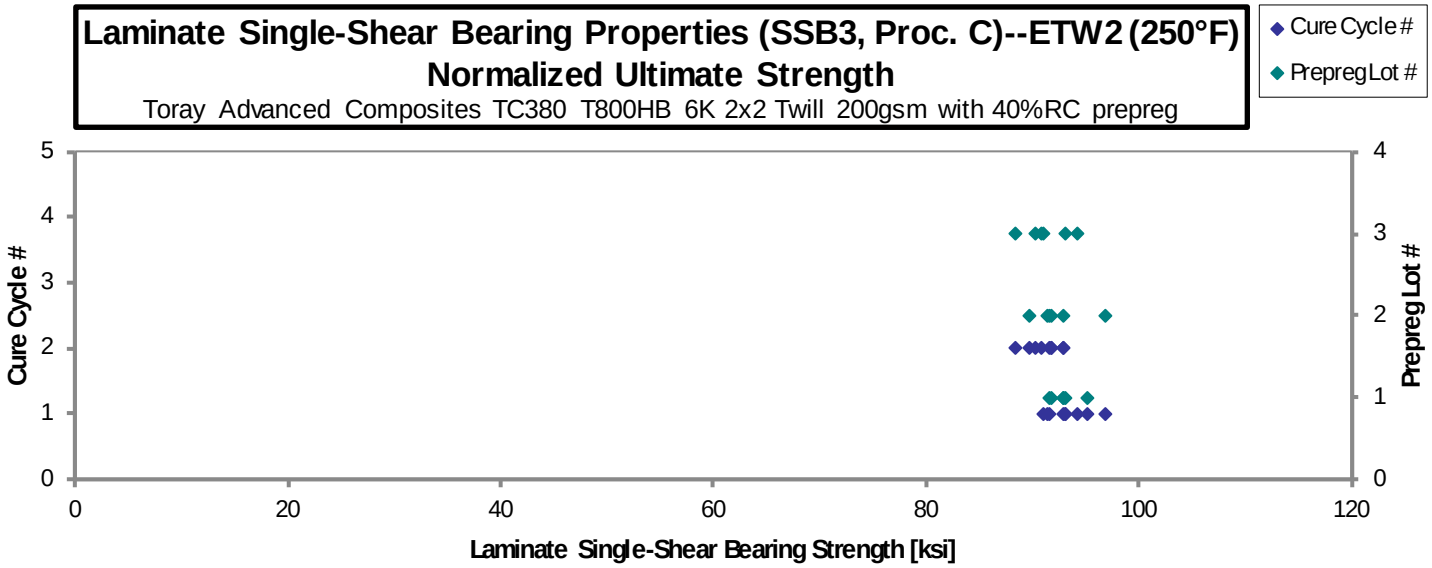
Laminate Single-Shear Bearing Properties (SSB3, Proc. C)--ETW2 (250°F)
Strength & Chord Stiffness
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

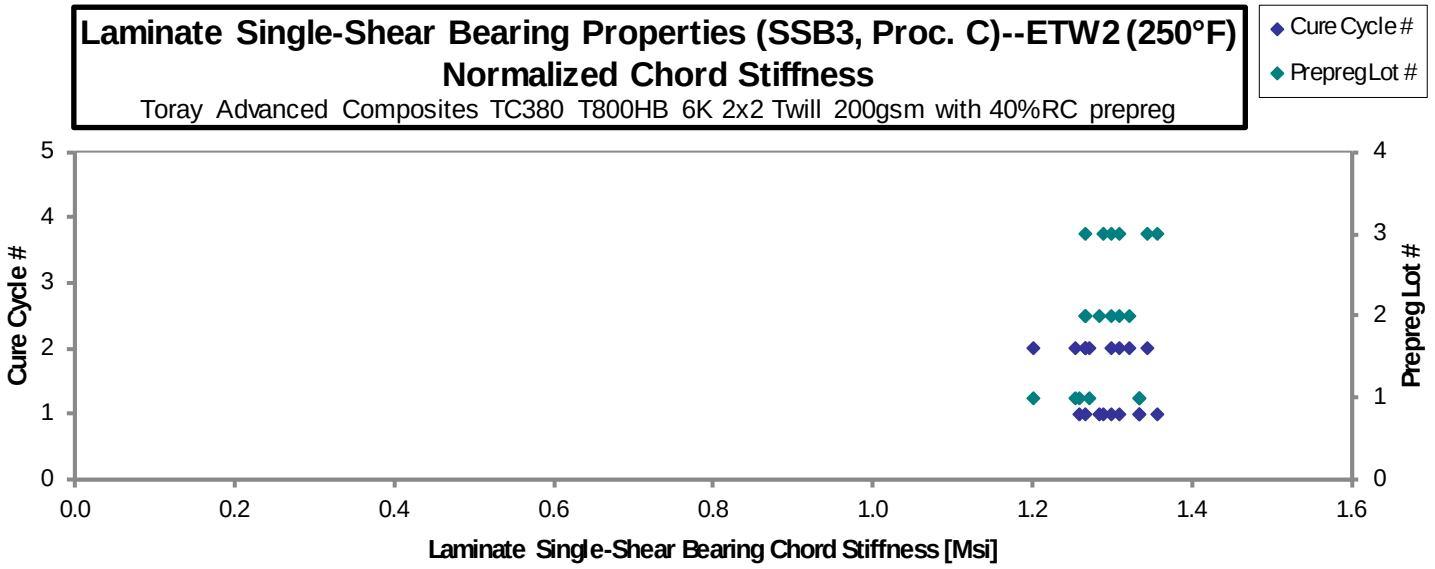
normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	2% Offset Strength [ksi]	Ultimate Strength [ksi]	Chord Stiffness [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	2% Offset Strength$_{norm}$ [ksi]	Ultimate Strength$_{norm}$ [ksi]	Chord Stiffness$_{norm}$ [Msi]
TCE3A111E	A	C1	1	1	70.75	91.12	1.232	0.1800	20	B1I	0.009000	72.36	93.19	1.260
TCE3A112E	A	C1	1	1	75.97	92.18	1.292	0.1819	20	B1I	0.009093	78.49	95.24	1.334
TCE3A113E	A	C1	1	1	75.86	89.27	1.300	0.1807	20	B1I	0.009036	77.89	91.66	1.335
TCE3A211E	A	C2	1	2	76.36	90.36	1.169	0.1810	20	B1I	0.009048	78.51	92.90	1.202
TCE3A212E	A	C2	1	2	73.18	89.11	1.202	0.1834	20	B1I	0.009170	76.26	92.86	1.253
TCE3A213E	A	C2	1	2	75.57	88.72	1.228	0.1821	20	B1I	0.009105	78.19	91.79	1.271
TCE3B111E	B	C1	2	1	79.32	94.93	1.285	0.1795	20	B1I	0.008973	80.88	96.80	1.310
TCE3B112E	B	C1	2	1	64.28	88.21	1.223	0.1823	20	B1I	0.009117	66.59	91.39	1.267
TCE3B113E	B	C1	2	1	74.11	89.87	1.241	0.1820	20	B1I	0.009098	76.62	92.91	1.283
TCE3B211E	B	C2	2	2	75.48	90.89	1.309	0.1776	20	B1I	0.008879	76.16	91.71	1.321
TCE3B212E	B	C2	2	2	73.97	88.90	1.228	0.1814	20	B1I	0.009068	76.22	91.61	1.265
TCE3B213E	B	C2	2	2	72.54	87.77	1.271	0.1799	20	B1I	0.008997	74.16	89.73	1.300
TCE3C111E	C	C1	3	1	74.48	92.65	1.278	0.1791	20	B1I	0.008953	75.78	94.26	1.300
TCE3C112E	C	C1	3	1	69.83	91.69	1.269	0.1788	20	B1I	0.008938	70.92	93.13	1.289
TCE3C113E	C	C1	3	1	70.89	90.07	1.341	0.1781	20	B1I	0.008903	71.72	91.13	1.357
TCE3C211E	C	C2	3	2	67.04	87.05	1.246	0.1789	20	B1I	0.008943	68.13	88.47	1.266
TCE3C212E	C	C2	3	2	75.62	88.72	1.286	0.1790	20	B1I	0.008950	76.91	90.23	1.308
TCE3C213E	C	C2	3	2	69.50	90.25	1.336	0.1770	20	B1I	0.008852	69.91	90.78	1.344

Average	**73.04**	**90.10**	**1.263**	**Average$_{norm}$**	**0.009007**	**74.76**	**92.21**	**1.293**
Standard Dev.	**3.725**	**1.935**	**0.04555**	**Standard Dev.$_{norm}$**		**3.961**	**1.981**	**0.03853**
Coeff. of Var. [%]	**5.099**	**2.148**	**3.606**	**Coeff. of Var. [%]$_{norm}$**		**5.298**	**2.148**	**2.981**
Min.	**64.28**	**87.05**	**1.169**	**Min.**	**0.008852**	**66.59**	**88.47**	**1.202**
Max.	**79.32**	**94.93**	**1.341**	**Max.**	**0.009170**	**80.88**	**96.80**	**1.357**
Number of Spec.	**18**	**18**	**18**	**Number of Spec.**	**18**	**18**	**18**	**18**


Laminate Single-Shear Bearing Properties (SSB3, Proc. C)--ETW2 (250°F)
Normalized 2% Offset Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Single-Shear Bearing Strength [ksi]
0
10
20
30
40
50
60
70
80
90
0
1
2
3
4
5


Laminate Single-Shear Bearing Properties (SSB3, Proc. C)--ETW2 (250°F)
Normalized Ultimate Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Single-Shear Bearing Strength [ksi]
0
20
40
60
80
100
120
0
1
2
3
4
5


Laminate Single-Shear Bearing Properties (SSB3, Proc. C)--ETW2 (250°F)
Normalized Chord Stiffness
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
5
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
Laminate Single-Shear Bearing Chord Stiffness [Msi]

4.28 "25/50/25" Compression After Impact 1 Properties (CAI1)

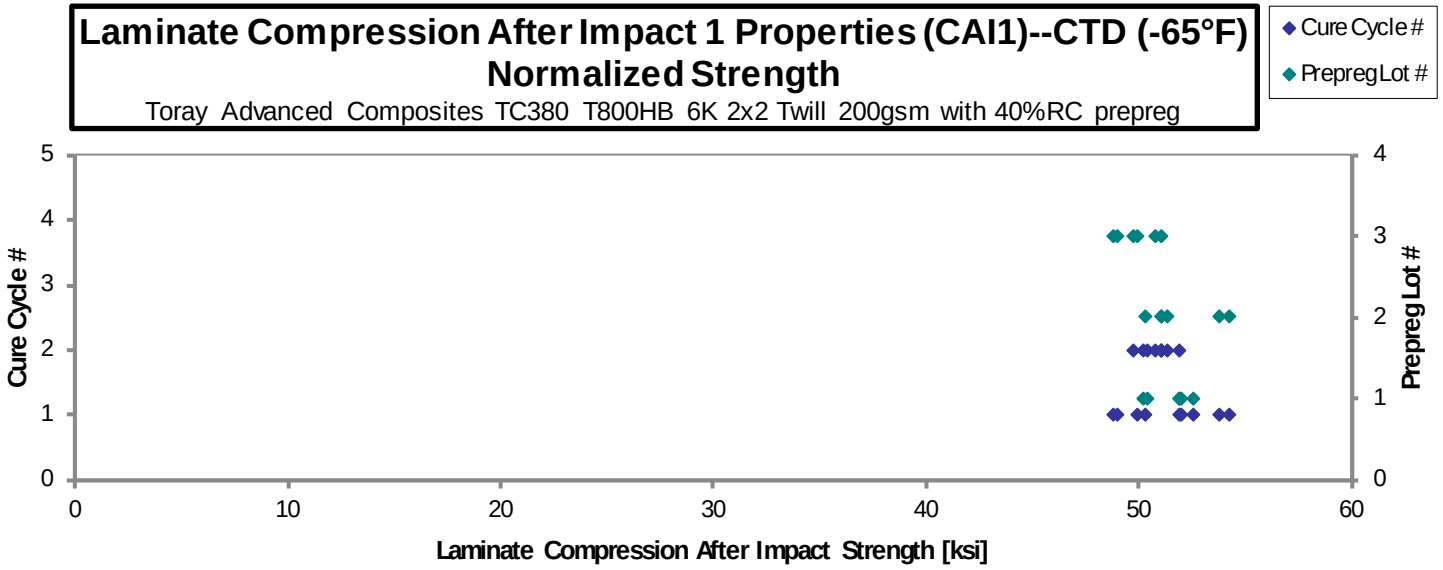
Laminate Compression After Impact 1 Properties (CAI1)--CTD (-65°F)
Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Measured Impact Energy [in-lbf]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCEKA111B	A	C1	1	1	50.40	329.6	0.2176	24	LDM	0.009067	51.93
TCEKA112B	A	C1	1	1	51.93	313.7	0.2113	24	LDM	0.008806	51.96
TCEKA113B	A	C1	1	1	51.74	322.6	0.2144	24	LDM	0.008935	52.54
TCEKA211B	A	C2	1	2	50.34	329.6	0.2176	24	LDM	0.009068	51.87
TCEKA212B	A	C2	1	2	50.78	313.7	0.2096	24	LDM	0.008733	50.39
TCEKA213B	A	C2	1	2	49.38	322.6	0.2150	24	LDM	0.008957	50.27
TCEKB111B	B	C1	2	1	50.64	319.1	0.2099	24	LDM	0.008745	50.32
TCEKB112B	B	C1	2	1	52.53	322.0	0.2164	24	LDM	0.009017	53.82
TCEKB113B	B	C1	2	1	53.16	322.2	0.2157	24	LDM	0.008986	54.29
TCEKB211B	B	C2	2	2	51.56	311.5	0.2092	24	LDM	0.008716	51.07
TCEKB212B	B	C2	2	2	50.10	321.7	0.2154	24	LDM	0.008973	51.08
TCEKB213B	B	C2	2	2	52.38	308.5	0.2069	24	LDM	0.008621	51.32
TCEKC112B	C	C1	3	1	48.27	320.5	0.2136	24	M(A,L)DM	0.008899	48.81
TCEKC113B	C	C1	3	1	49.76	310.6	0.2081	24	M(A,L)DM	0.008670	49.03
TCEKC114B	C	C1	3	1	49.72	316.6	0.2122	24	M(A,L)DM	0.008843	49.96
TCEKC211B	C	C2	3	2	50.45	310.7	0.2082	24	LDM	0.008673	49.73
TCEKC212B	C	C2	3	2	50.40	318.1	0.2128	24	LDM	0.008865	50.77
TCEKC214B	C	C2	3	2	50.90	318.6	0.2117	24	LDM	0.008822	51.03

	Strength [ksi]
Average	**50.80**
Standard Dev.	**1.228**
Coeff. of Var. [%]	**2.418**
Min.	**48.27**
Max.	**53.16**
Number of Spec.	**18**

	t_{ply} [in]	$Strength_{norm}$ [ksi]
$Average_{norm}$	**0.008855**	**51.12**
Standard $Dev._{norm}$		**1.462**
Coeff. of Var. $[\%]_{norm}$		**2.860**
Min.	**0.008621**	**48.81**
Max.	**0.009068**	**54.29**
Number of Spec.	**18**	**18**


Laminate Compression After Impact 1 Properties (CAI1)--CTD (-65°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Compression After Impact Strength [ksi]
0
10
20
30
40
50
60
0
1
2
3
4
5

Laminate Compression After Impact 1 Properties (CAI1)--RTD (70°F)
Strength

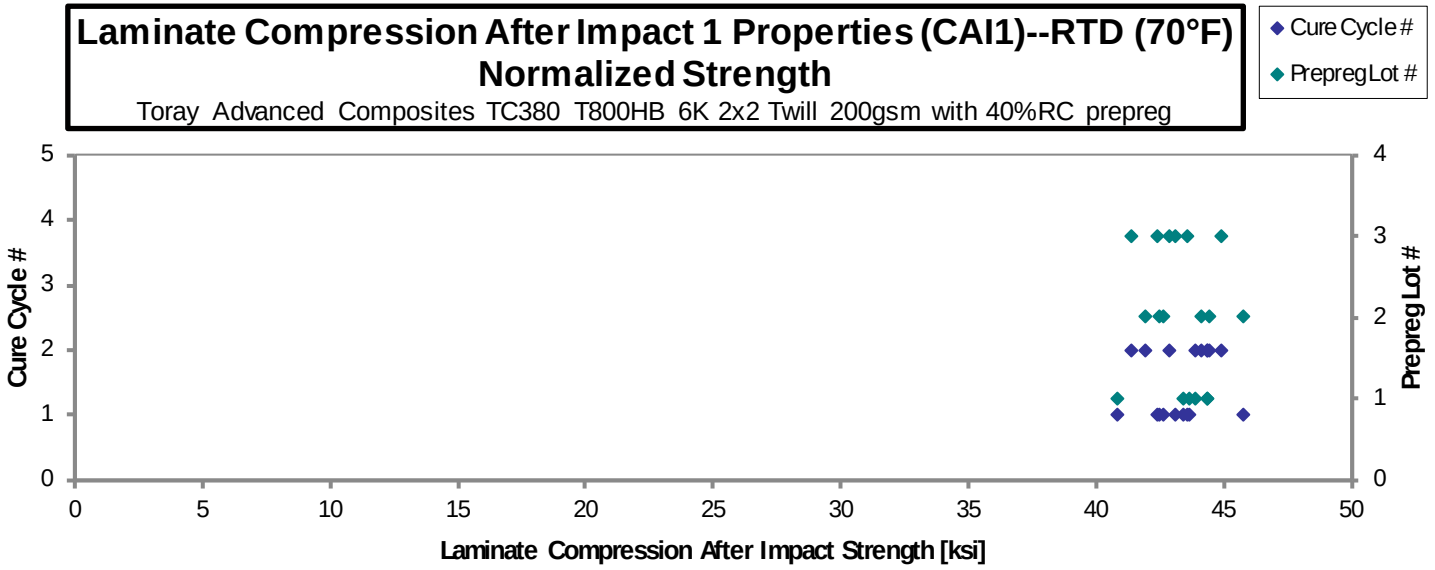
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Measured Impact Energy [in-lbf]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCEKA112A	A	C1	1	1	44.49	312.6	0.2061	24	LDM	0.008588	43.41
TCEKA113A	A	C1	1	1	42.36	307.2	0.2176	24	LDM	0.009067	43.65
TCEKA114A	A	C1	1	1	40.87	326.5	0.2112	24	LDM	0.008799	40.87
TCEKA211A	A	C2	1	2	43.80	318.4	0.2117	24	LDM	0.008820	43.89
TCEKA212A	A	C2	1	2	45.38	307.6	0.2063	24	LDM	0.008597	44.33
TCEKA213A	A	C2	1	2	42.88	330.9	0.2186	24	LDM	0.009108	44.38
TCEKB111A	B	C1	2	1	44.28	301.7	0.2027	24	LDM	0.008445	42.50
TCEKB112A	B	C1	2	1	43.34	310.5	0.2077	24	LDM	0.008653	42.61
TCEKB113A	B	C1	2	1	46.81	306.9	0.2065	24	LDM	0.008603	45.76
TCEKB211A	B	C2	2	2	45.35	309.1	0.2054	24	LDM	0.008559	44.11
TCEKB212A	B	C2	2	2	44.86	312.0	0.2093	24	LDM	0.008720	44.45
TCEKB213A	B	C2	2	2	42.08	311.8	0.2105	24	LDM	0.008770	41.94
TCEKC111A	C	C1	3	1	44.57	309.8	0.2066	24	LDM	0.008608	43.60
TCEKC112A	C	C1	3	1	43.31	313.7	0.2100	24	LDM	0.008752	43.07
TCEKC113A	C	C1	3	1	42.95	312.7	0.2083	24	LDM	0.008680	42.36
TCEKC211A	C	C2	3	2	42.48	310.9	0.2057	24	LDM	0.008570	41.37
TCEKC212A	C	C2	3	2	45.05	309.4	0.2106	24	LDM	0.008774	44.92
TCEKC213A	C	C2	3	2	43.41	312.3	0.2085	24	LDM	0.008686	42.85

Average	**43.79**	
Standard Dev.	**1.444**	
Coeff. of Var. [%]	**3.297**	
Min.	**40.87**	
Max.	**46.81**	
Number of Spec.	**18**	

$Average_{norm}$	**0.008711**	**43.34**
$Standard\ Dev._{norm}$		**1.265**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**2.918**
Min.	**0.008445**	**40.87**
Max.	**0.009108**	**45.76**
Number of Spec.	**18**	**18**


Laminate Compression After Impact 1 Properties (CAI1)--RTD (70°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Compression After Impact Strength [ksi]
0
1
2
3
4
5
0
5
10
15
20
25
30
35
40
45
50

4.29 "40/20/40" Compression After Impact 3 Properties (CAI3)

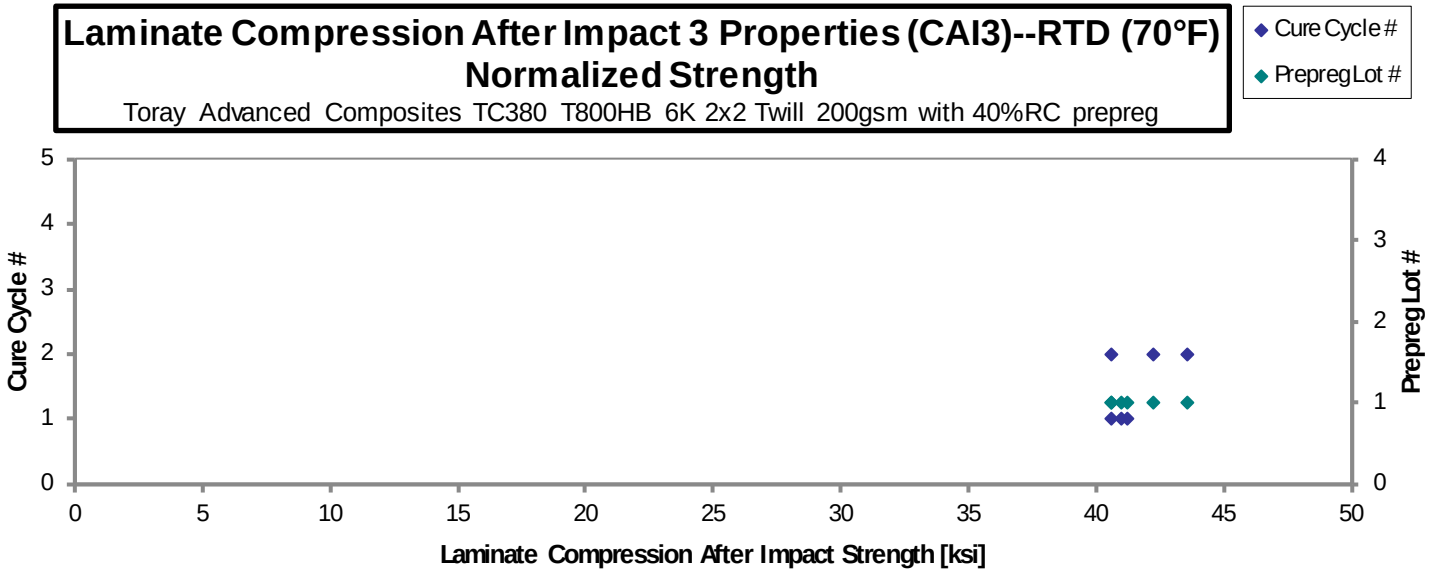
Laminate Compression After Impact 3 Properties (CAI3)--RTD (70°F)
Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

normalizing t_{ply} [in]
0.008800

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Measured Impact Energy [in-lbf]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
TCEPA112A	A	C1	1	1	41.33	262.3	0.1746	20	LDM	0.008732	41.01
TCEPA113A	A	C1	1	1	41.74	260.5	0.1738	20	LDM	0.008691	41.22
TCEPA114A	A	C1	1	1	40.76	261.4	0.1752	20	LDM	0.008758	40.56
TCEPA211A	A	C2	1	2	42.55	260.5	0.1747	20	LDM	0.008735	42.24
TCEPA212A	A	C2	1	2	42.28	254.1	0.1689	20	LDM	0.008443	40.57
TCEPA213A	A	C2	1	2	42.54	269.3	0.1801	20	LDM	0.009007	43.54

Average	**41.87**	
Standard Dev.	**0.7245**	
Coeff. of Var. [%]	**1.730**	
Min.	**40.76**	
Max.	**42.55**	
Number of Spec.	**6**	

$Average_{norm}$	**0.008728**	**41.52**
$Standard\ Dev._{norm}$		**1.163**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**2.800**
Min.	**0.008443**	**40.56**
Max.	**0.009007**	**43.54**
Number of Spec.	**6**	**6**


Laminate Compression After Impact 3 Properties (CAI3)--RTD (70°F)
Normalized Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Compression After Impact Strength [ksi]
0
1
2
3
4
5
0
5
10
15
20
25
30
35
40
45
50

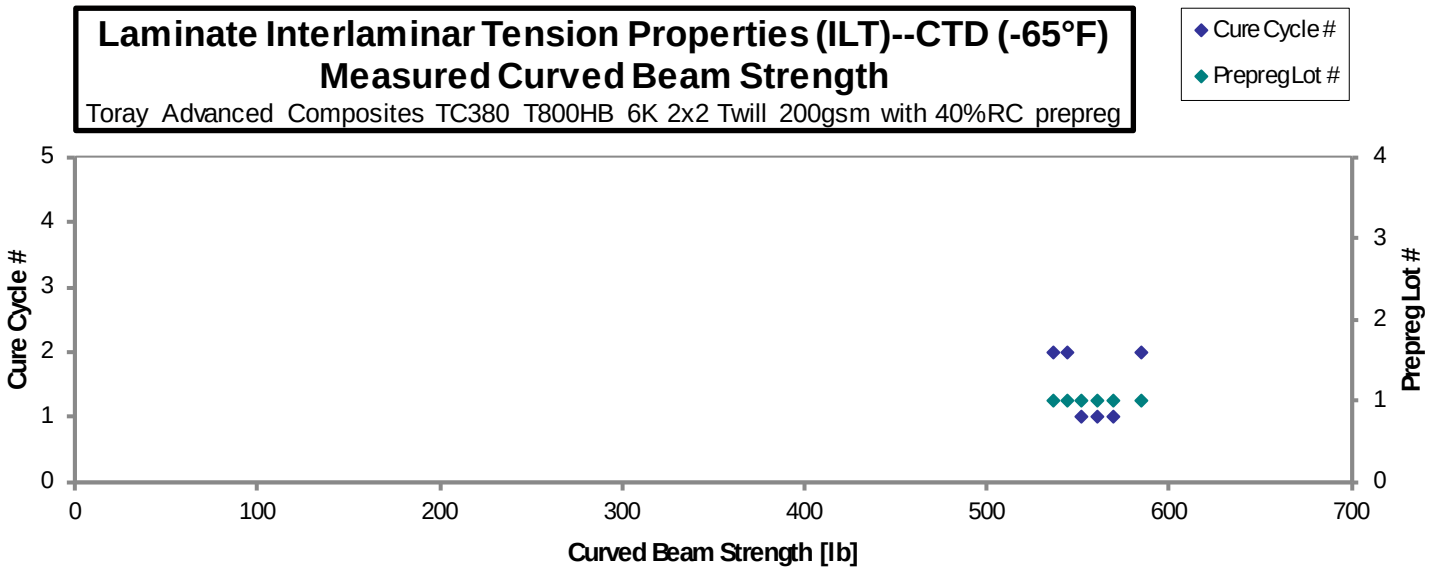
4.30 “50/0/50” Interlaminar Tension Properties (ILT)

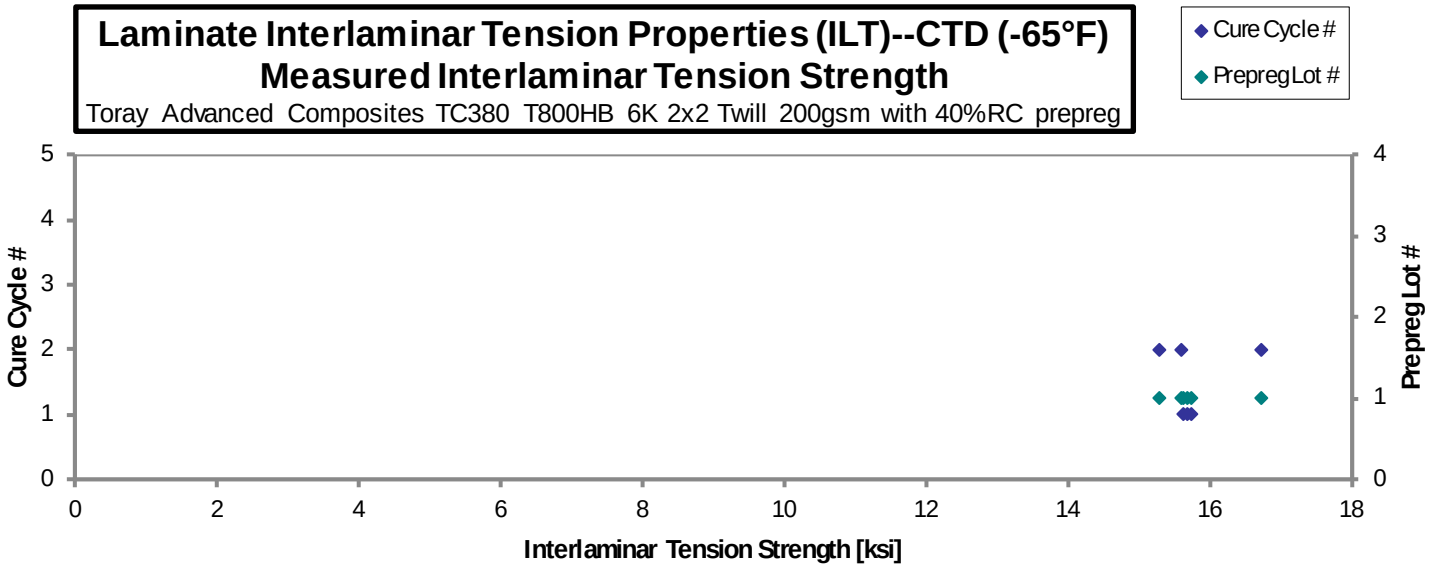
Laminate Interlaminar Tension Properties (ILT)--CTD (-65°F)
Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Curved Beam Strength [lb]	Interlaminar Tension Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode
TCEMA111B*	A	C1	1	1	552.0	15.68	0.1641	20	0.008206	INTERLAMINAR TENSILE FAILURE
TCEMA112B*	A	C1	1	1	561.2	15.73	0.1659	20	0.008296	INTERLAMINAR TENSILE FAILURE
TCEMA113B*	A	C1	1	1	568.9	15.64	0.1686	20	0.008431	INTERLAMINAR TENSILE FAILURE
TCEMA211B*	A	C2	1	2	536.7	15.28	0.1638	20	0.008191	INTERLAMINAR TENSILE FAILURE
TCEMA212B*	A	C2	1	2	543.8	15.60	0.1628	20	0.008139	INTERLAMINAR TENSILE FAILURE
TCEMA213B*	A	C2	1	2	585.3	16.73	0.1633	20	0.008164	INTERLAMINAR TENSILE FAILURE

* Cross head displacement exceeds 0.2 inches.

Average	**558.0**	**15.78**	**0.008238**
Standard Dev.	**17.72**	**0.4936**	
Coeff. of Var. [%]	**3.175**	**3.128**	
Min.	**536.7**	**15.28**	**0.008139**
Max.	**585.3**	**16.73**	**0.008431**
Number of Spec.	**6**	**6**	**6**


Laminate Interlaminar Tension Properties (ILT)--CTD (-65°F)
Measured Curved Beam Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Curved Beam Strength [lb]
0
100
200
300
400
500
600
700
0
1
2
3
4
5


Laminate Interlaminar Tension Properties (ILT)--CTD (-65°F)
Measured Interlaminar Tension Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Interlaminar Tension Strength [ksi]
0
2
4
6
8
10
12
14
16
18
0
1
2
3
4
5

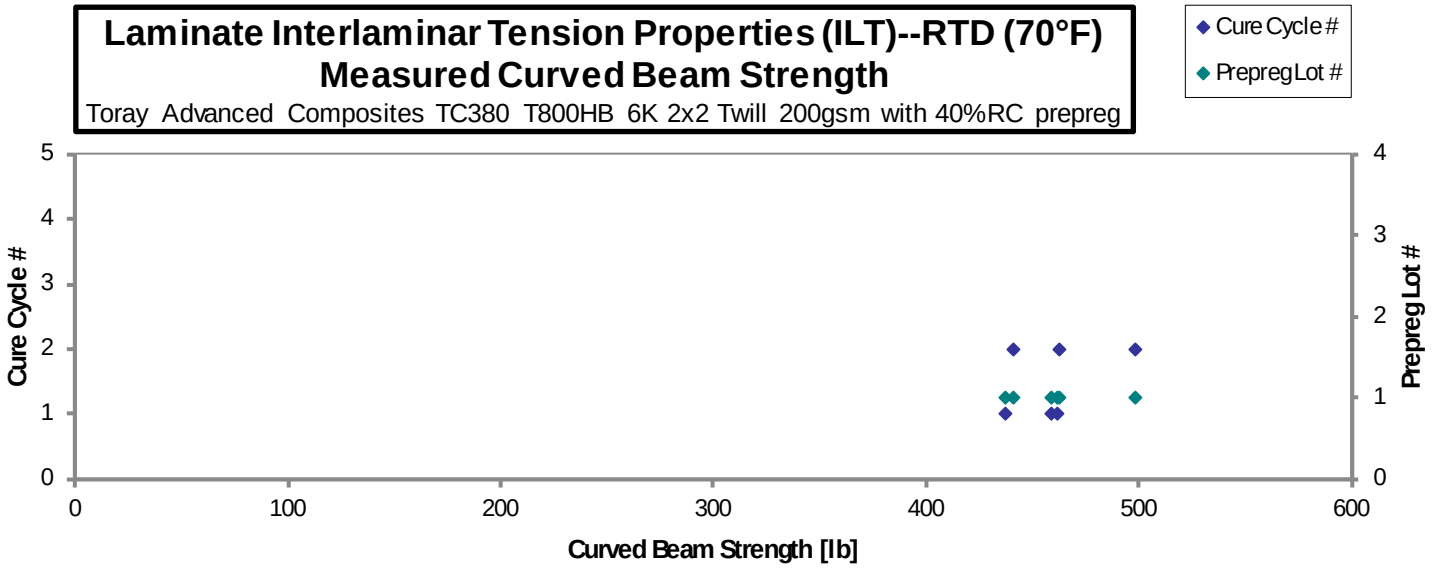
Laminate Interlaminar Tension Properties (ILT)--RTD (70°F)
Strength

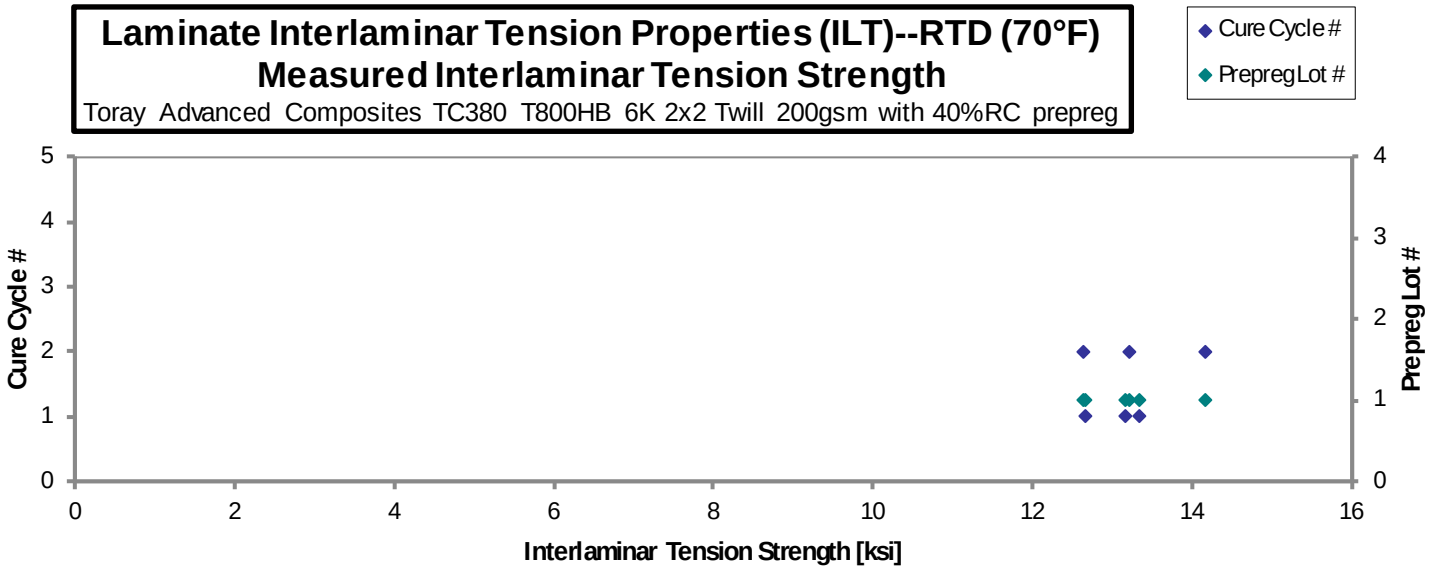
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Curved Beam Strength [lb]	Interlaminar Tension Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode
TCEMA111A*	A	C1	1	1	461.4	13.35	0.1616	20	0.008079	INTERLAMINAR TENSILE FAILURE
TCEMA112A*	A	C1	1	1	458.7	13.17	0.1627	20	0.008134	INTERLAMINAR TENSILE FAILURE
TCEMA113A*	A	C1	1	1	437.2	12.68	0.1613	20	0.008066	INTERLAMINAR TENSILE FAILURE
TCEMA211A*	A	C2	1	2	462.3	13.21	0.1633	20	0.008165	INTERLAMINAR TENSILE FAILURE
TCEMA212A*	A	C2	1	2	498.4	14.17	0.1640	20	0.008201	INTERLAMINAR TENSILE FAILURE
TCEMA213A*	A	C2	1	2	440.9	12.65	0.1628	20	0.008139	INTERLAMINAR TENSILE FAILURE

* Cross head displacement exceeds 0.2 inches.

Average	**459.8**	**13.20**	**0.008131**
Standard Dev.	**21.76**	**0.5544**	
Coeff. of Var. [%]	**4.731**	**4.198**	
Min.	**437.2**	**12.65**	**0.008066**
Max.	**498.4**	**14.17**	**0.008201**
Number of Spec.	**6**	**6**	**6**


Laminate Interlaminar Tension Properties (ILT)--RTD (70°F)
Measured Curved Beam Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Curved Beam Strength [lb]
0
100
200
300
400
500
600
0
1
2
3
4
5


Laminate Interlaminar Tension Properties (ILT)--RTD (70°F)
Measured Interlaminar Tension Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Interlaminar Tension Strength [ksi]
0
2
4
6
8
10
12
14
16
0
1
2
3
4
5

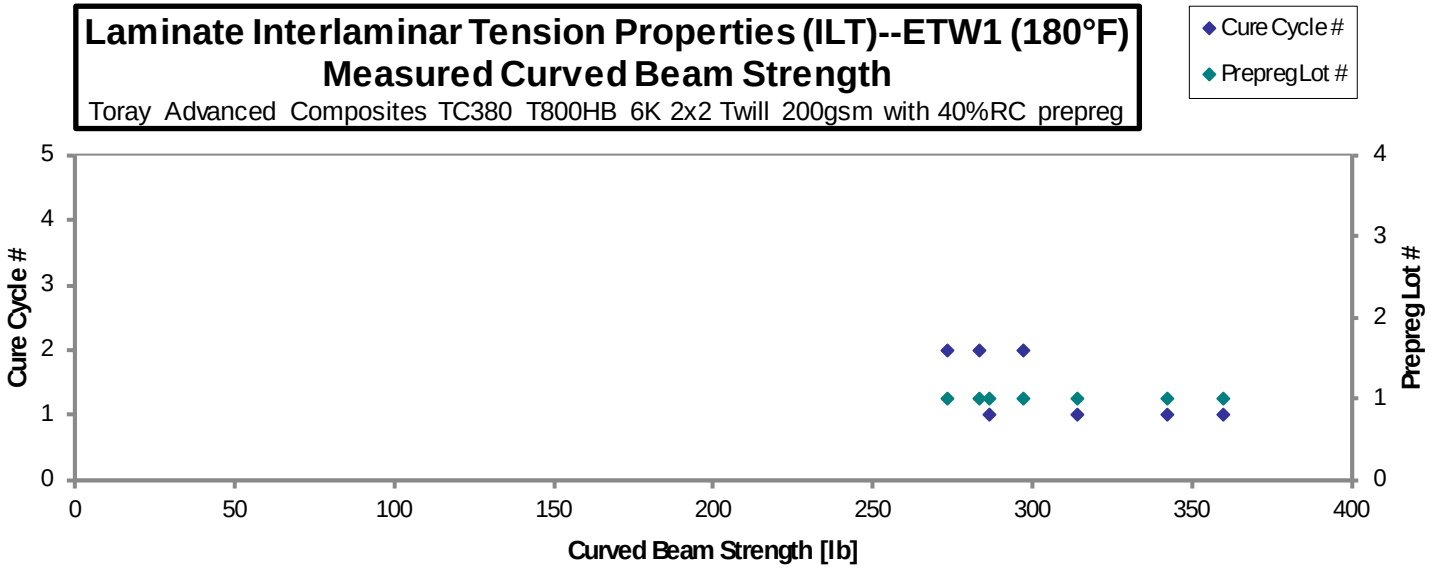
Laminate Interlaminar Tension Properties (ILT)--ETW1 (180°F)
Strength

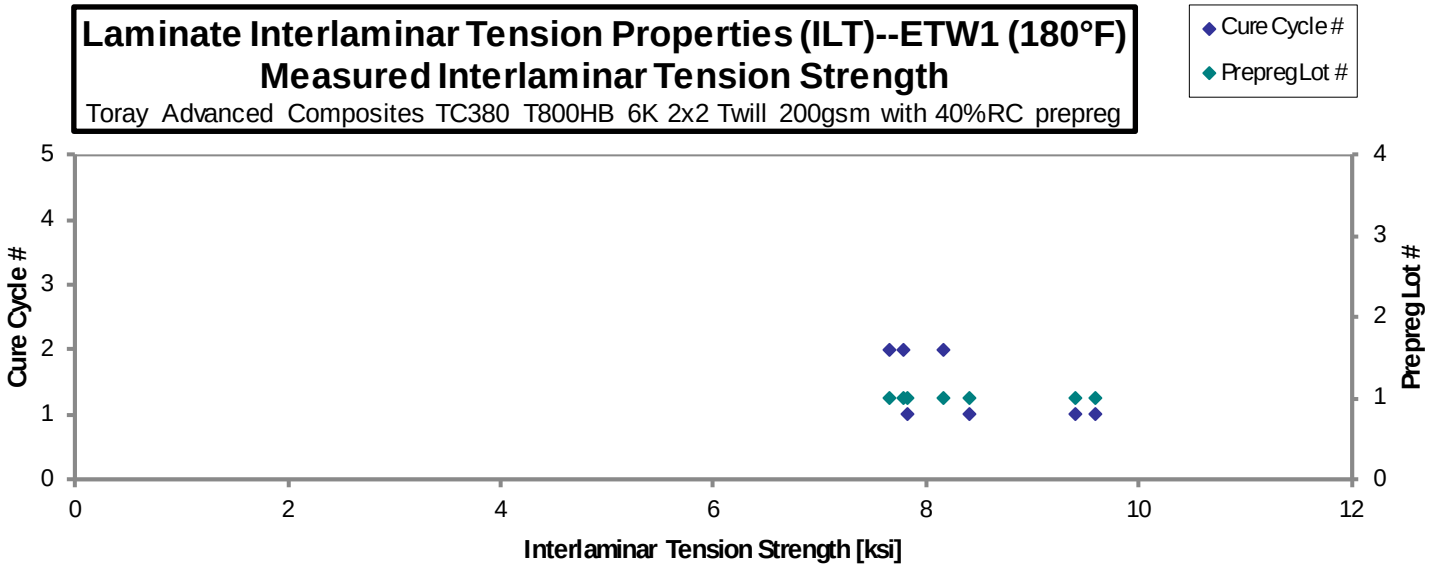
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Curved Beam Strength [lb]	Interlaminar Tension Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode
TCEMA111D*	A	C1	1	1	286.6	7.829	0.1696	20	0.008478	INTERLAMINAR TENSILE FAILURE
TCEMA112D*	A	C1	1	1	342.3	9.398	0.1689	20	0.008443	INTERLAMINAR TENSILE FAILURE
TCEMA113D*	A	C1	1	1	359.8	9.589	0.1731	20	0.008653	INTERLAMINAR TENSILE FAILURE
TCEMA114D*	A	C1	1	1	313.9	8.404	0.1724	20	0.008620	INTERLAMINAR TENSILE FAILURE
TCEMA211D*	A	C2	1	2	296.9	7.663	0.1777	20	0.008886	INTERLAMINAR TENSILE FAILURE
TCEMA212D*	A	C2	1	2	283.7	8.159	0.1624	20	0.008121	INTERLAMINAR TENSILE FAILURE
TCEMA213D	A	C2	1	2	273.1	7.783	0.1637	20	0.008185	INTERLAMINAR TENSILE FAILURE

* Cross head displacement exceeds 0.2 inches.

Average	**308.0**	**8.404**	**0.008484**
Standard Dev.	**32.35**	**0.7872**	
Coeff. of Var. [%]	**10.50**	**9.367**	
Min.	**273.1**	**7.663**	**0.008121**
Max.	**359.8**	**9.589**	**0.008886**
Number of Spec.	**7**	**7**	**7**


Laminate Interlaminar Tension Properties (ILT)--ETW1 (180°F)
Measured Curved Beam Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
5
0
50
100
150
200
250
300
350
400
Curved Beam Strength [lb]


Laminate Interlaminar Tension Properties (ILT)--ETW1 (180°F)
Measured Interlaminar Tension Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
5
0
2
4
6
8
10
12
Interlaminar Tension Strength [ksi]

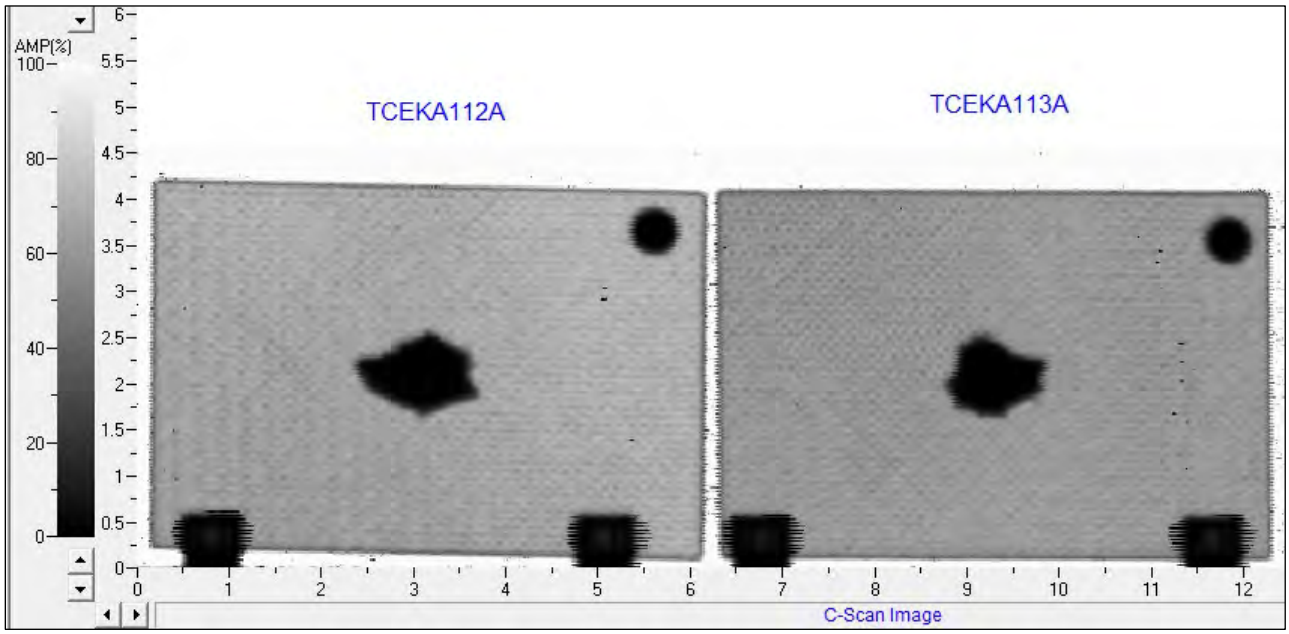
5. Additional Compression After Impact Data

5.1 “25/50/25” Compression After Impact 1 (CAI1)

Target Impact Energy Level: 1500 in-lb/in

Impactor Diameter: 0.625”

Representative of Damage Area:



Damage Area and Dent Depth Summary:

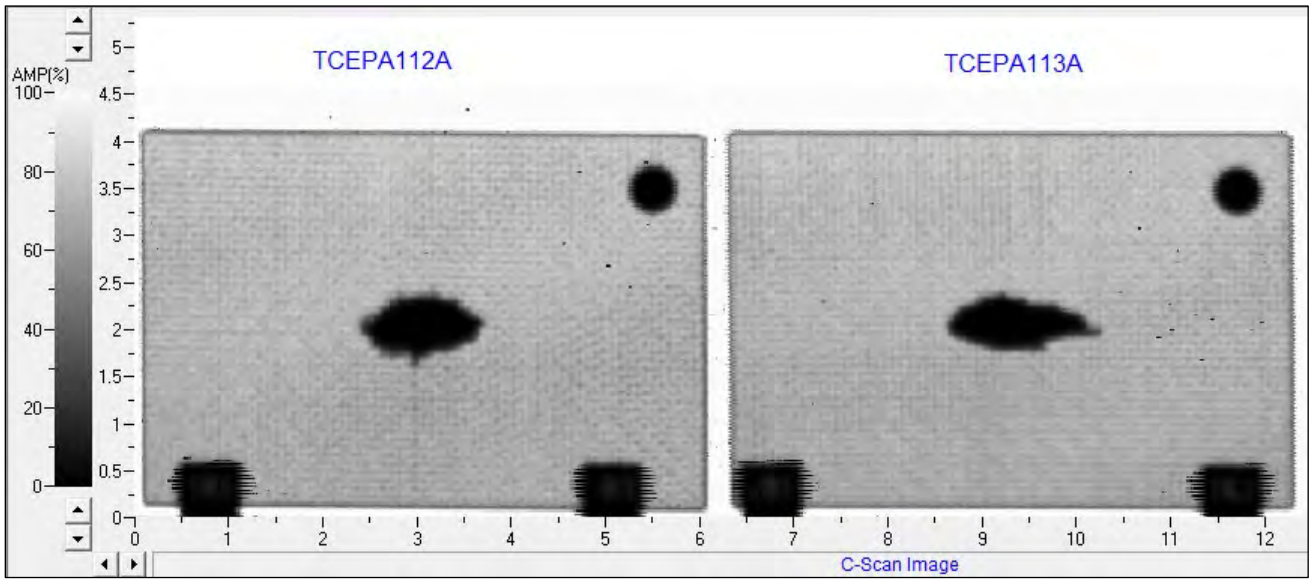
Specimen ID	Damage Area ($inch^2$)	Dent Depth (inch)
TCEKA111B	0.6536	0.0175
TCEKA112B	0.7512	0.0165
TCEKA113B	0.7120	0.0150
TCEKA211B	0.6596	0.0160
TCEKA212B	0.7120	0.0155
TCEKA213B	0.6892	0.0155
TCEKB111B	0.7056	0.0150
TCEKB112B	0.6780	0.0160
TCEKB113B	0.6496	0.0160
TCEKB211B	0.6592	0.0185
TCEKB212B	0.6664	0.0175
TCEKB213B	0.6556	0.0165
TCEKC111B	0.7164	0.0175
TCEKC112B	0.7440	0.0160
TCEKC113B	0.7244	0.0170
TCEKC114B	0.7548	0.0165
TCEKC211B	0.7924	0.0170
TCEKC212B	0.7176	0.0165
TCEKC213B	0.7464	0.0175
TCEKC214B	0.7464	0.0165
TCEKA112A	0.7508	0.0165
TCEKA113A	0.6404	0.0170
TCEKA114A	0.7032	0.0165
TCEKA211A	0.6988	0.0175
TCEKA212A	0.6424	0.0165
TCEKA213A	0.7176	0.0160
TCEKB111A	0.6176	0.0150
TCEKB112A	0.6556	0.0155
TCEKB113A	0.6488	0.0160
TCEKB211A	0.6664	0.0165
TCEKB212A	0.6860	0.0150
TCEKB213A	0.6764	0.0165
TCEKC111A	0.7232	0.0155
TCEKC112A	0.7224	0.0160
TCEKC113A	0.6752	0.0180
TCEKC211A	0.6980	0.0175
TCEKC212A	0.6764	0.0155
TCEKC213A	0.7604	0.0175

5.2 “40/20/40” Compression After Impact 3 (CAI3)

Target Impact Energy Level: 1500 in-lb/in

Impactor Diameter: 0.625”

Representative of Damage Area:

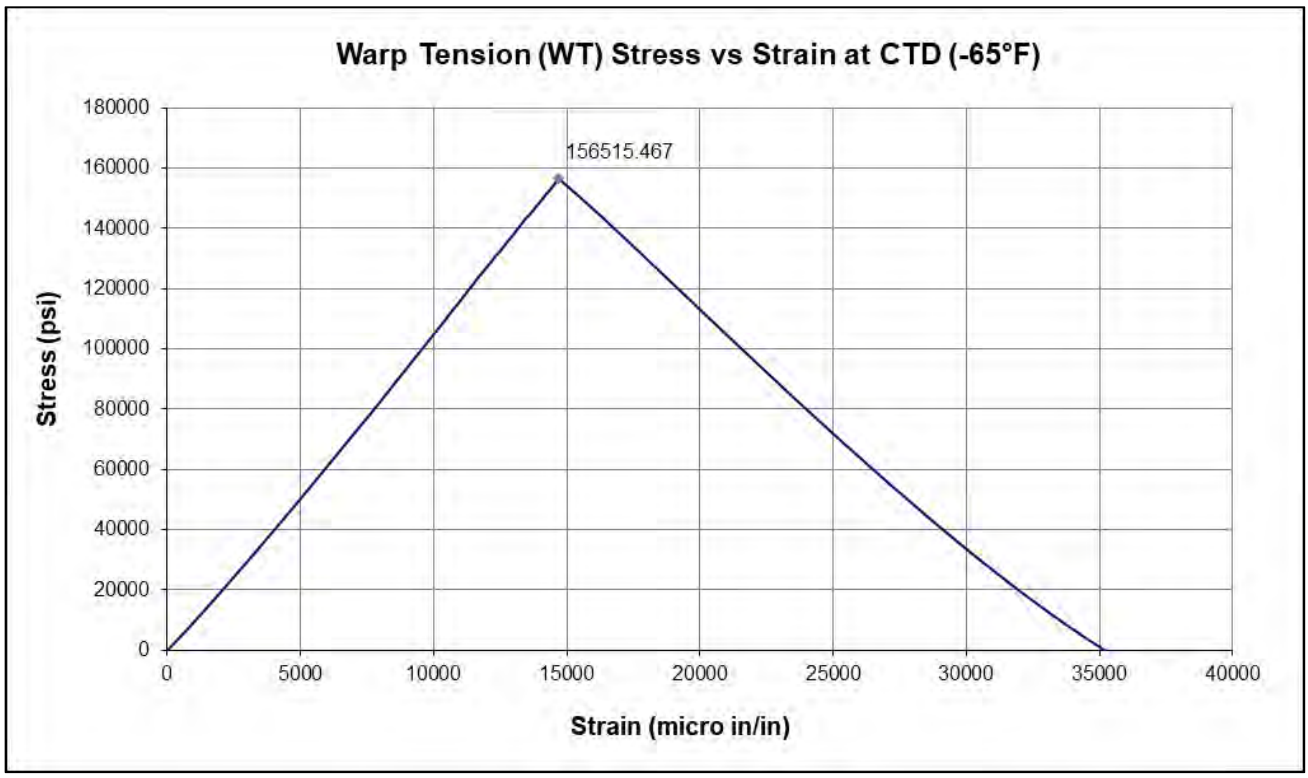


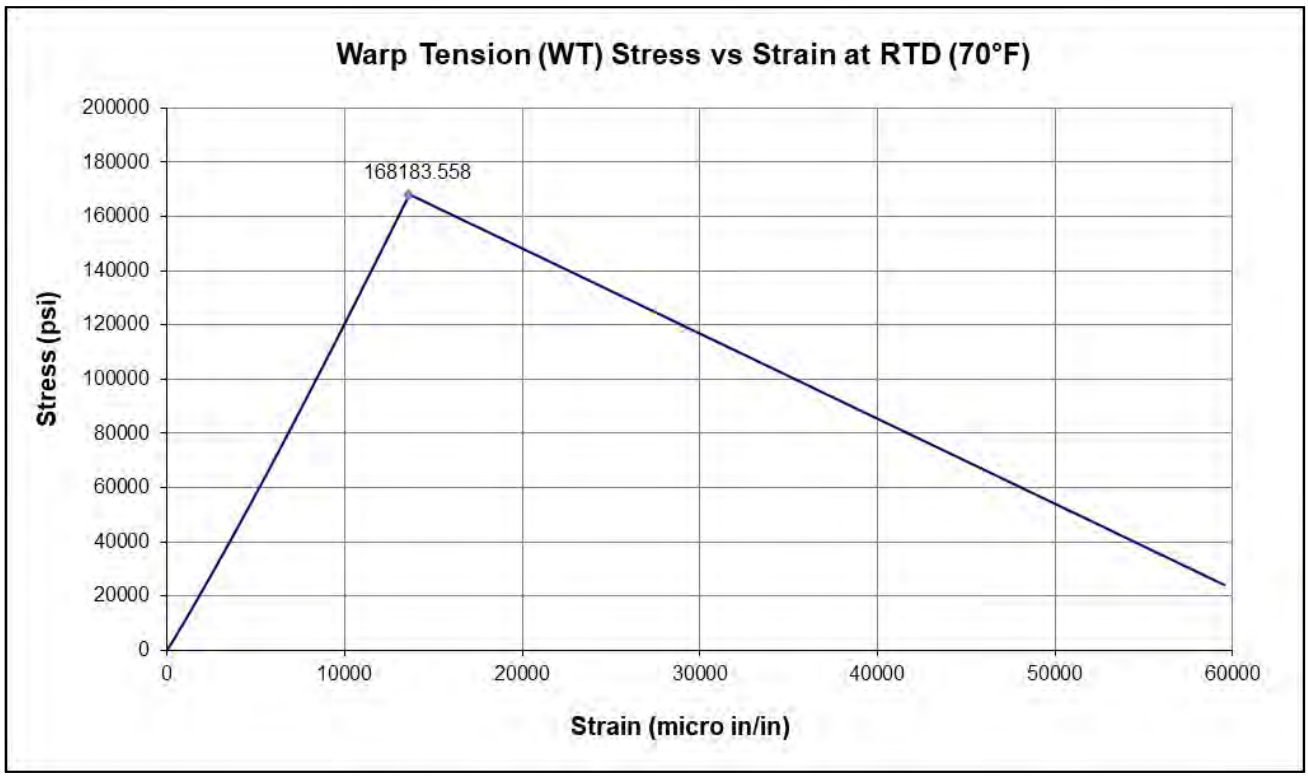
Damage Area and Dent Depth Summary:

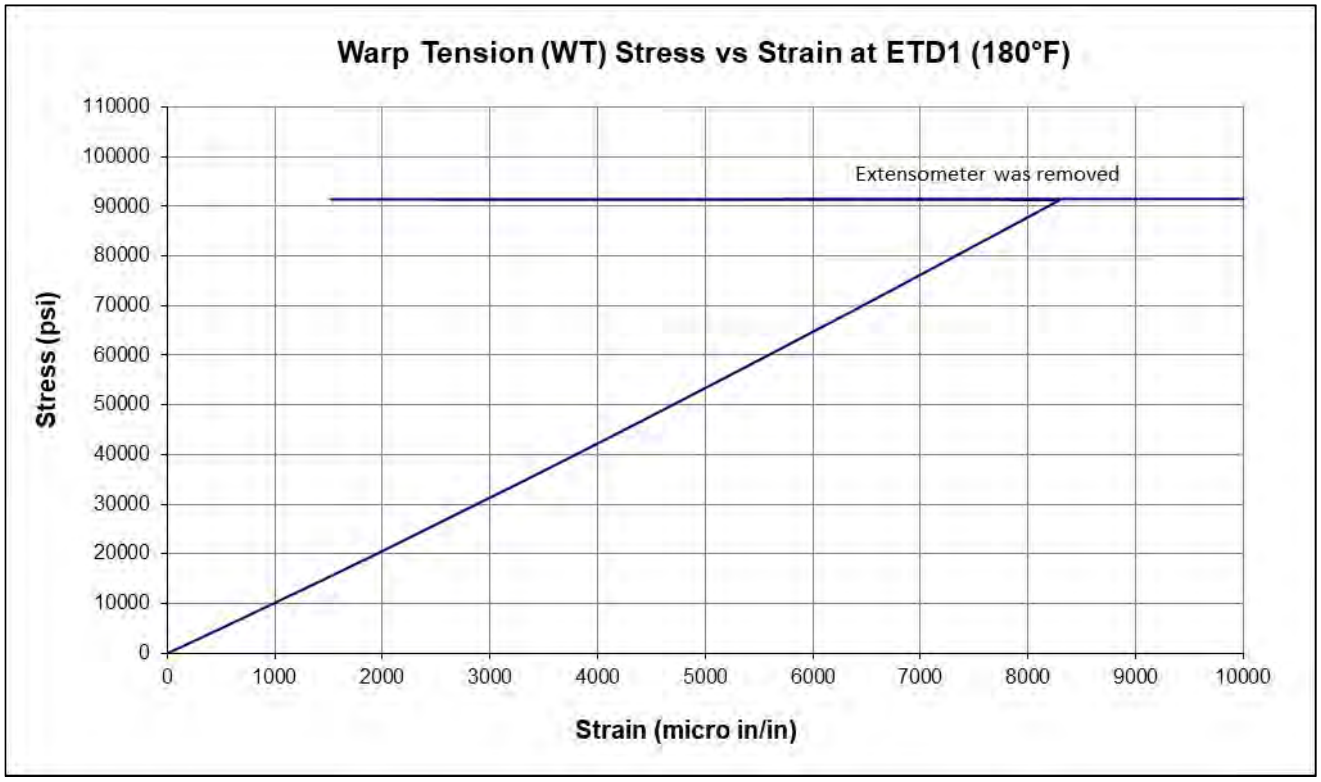
Specimen ID	Damage Area ($inch^2$)	Dent Depth (inch)
TCEPA112A	0.6248	0.0155
TCEPA113A	0.6244	0.0155
TCEPA114A	0.6296	0.0150
TCEPA211A	0.6264	0.0140
TCEPA212A	0.6420	0.0140
TCEPA213A	0.5780	0.0150

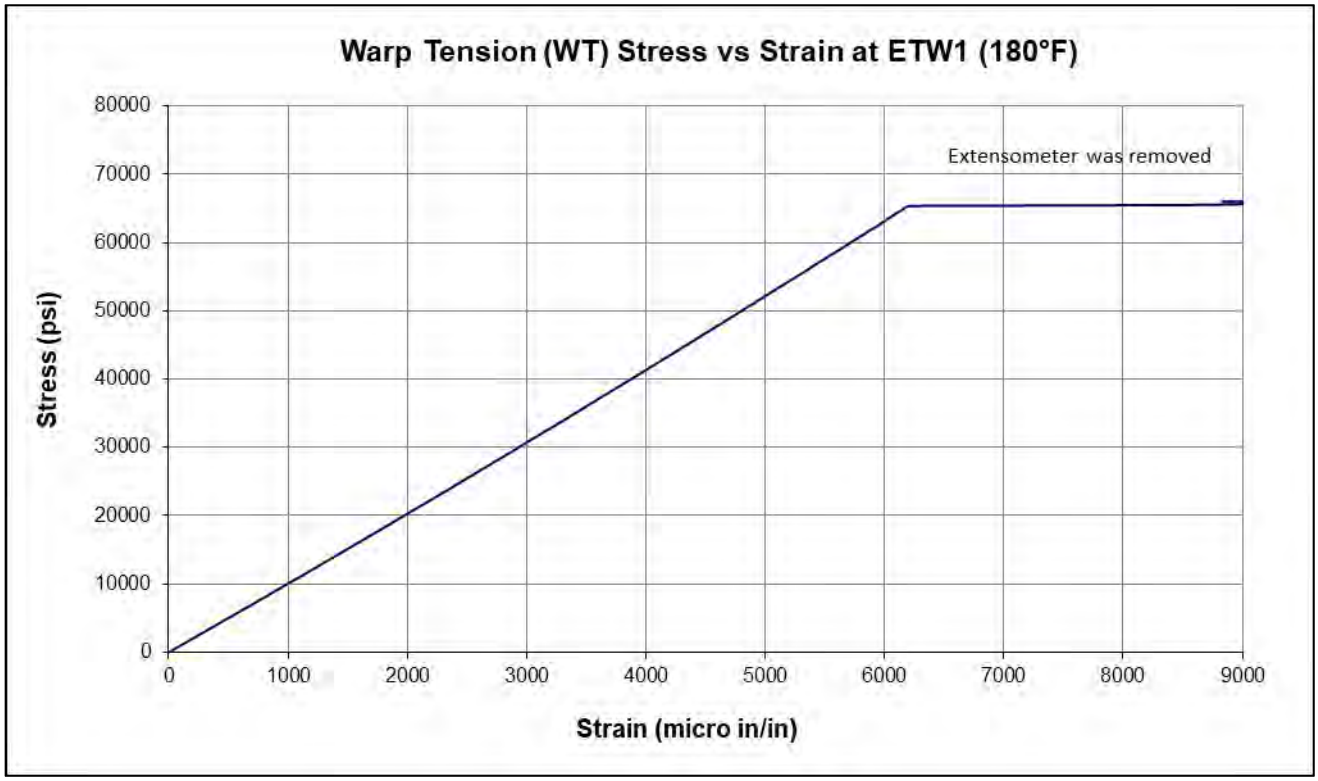
6. Full Stress vs. Strain Curve

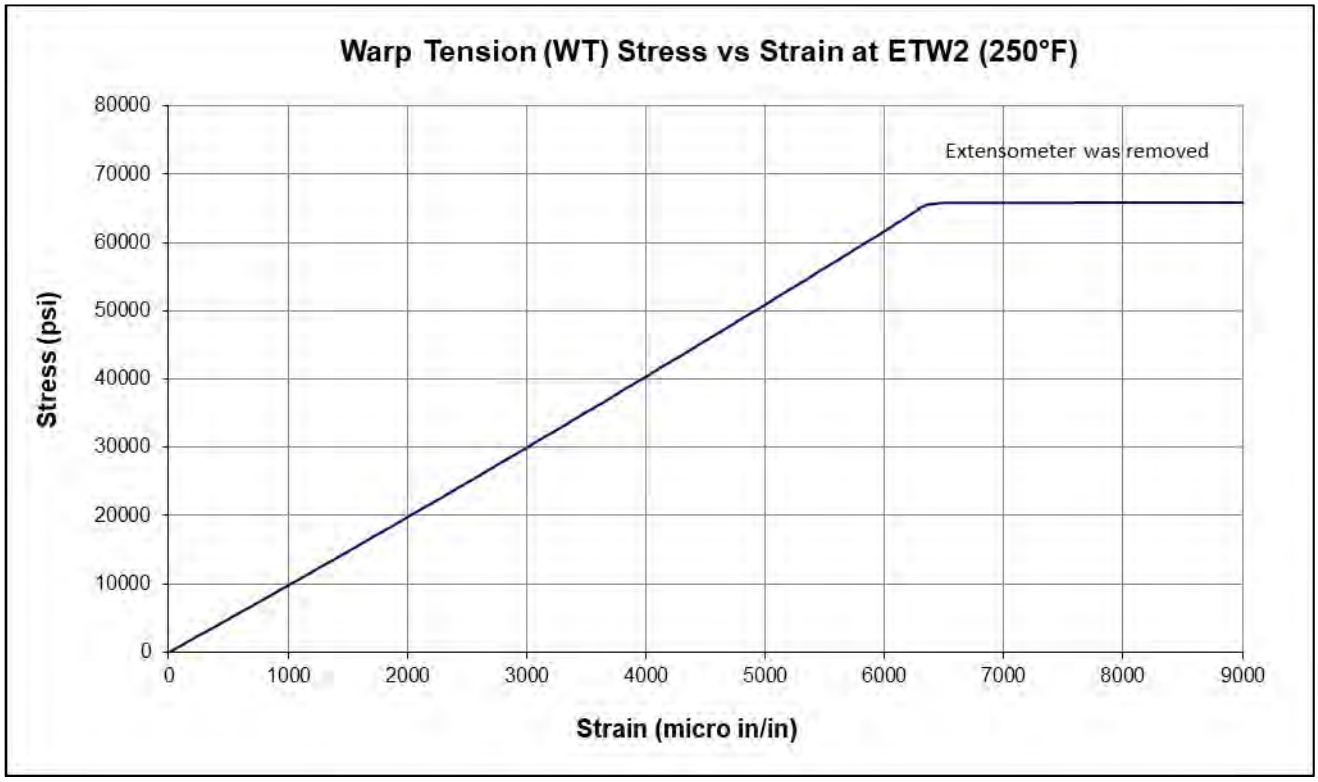
6.1 Warp Tension (WT)



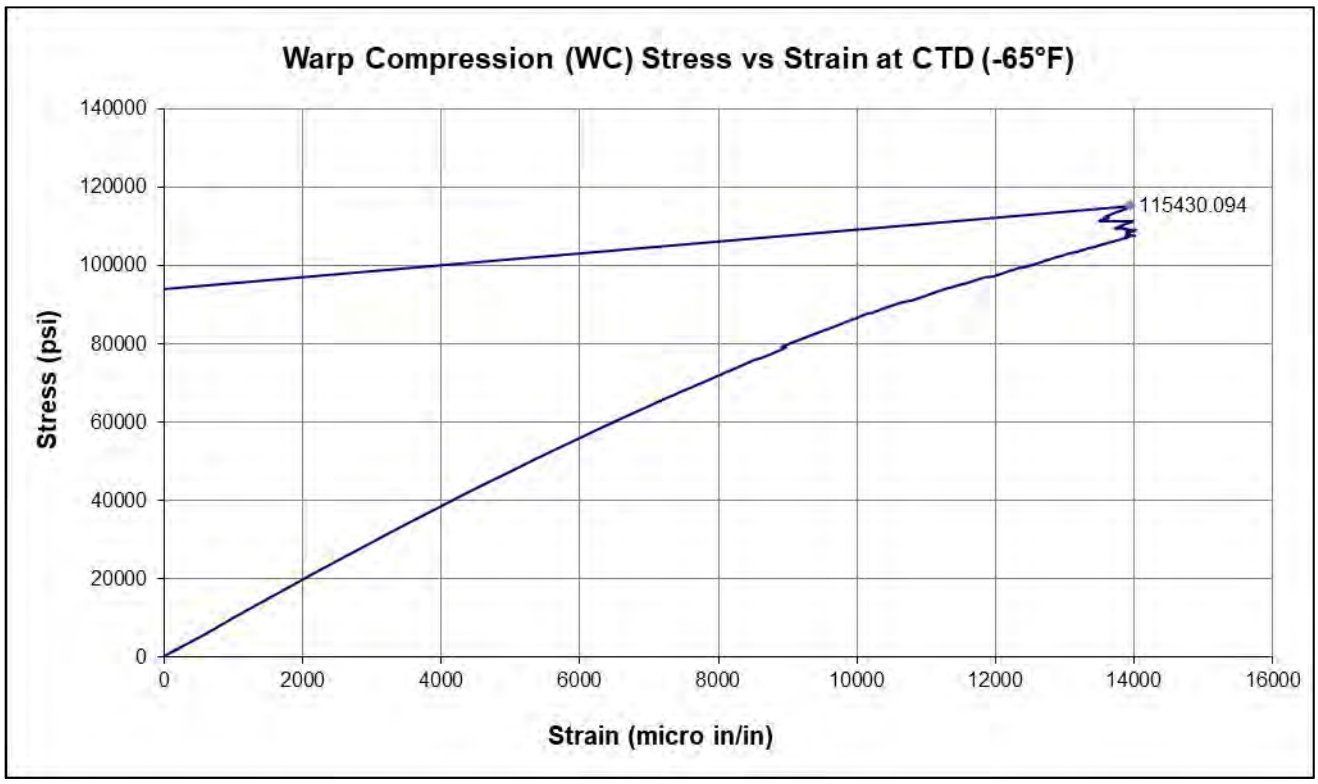


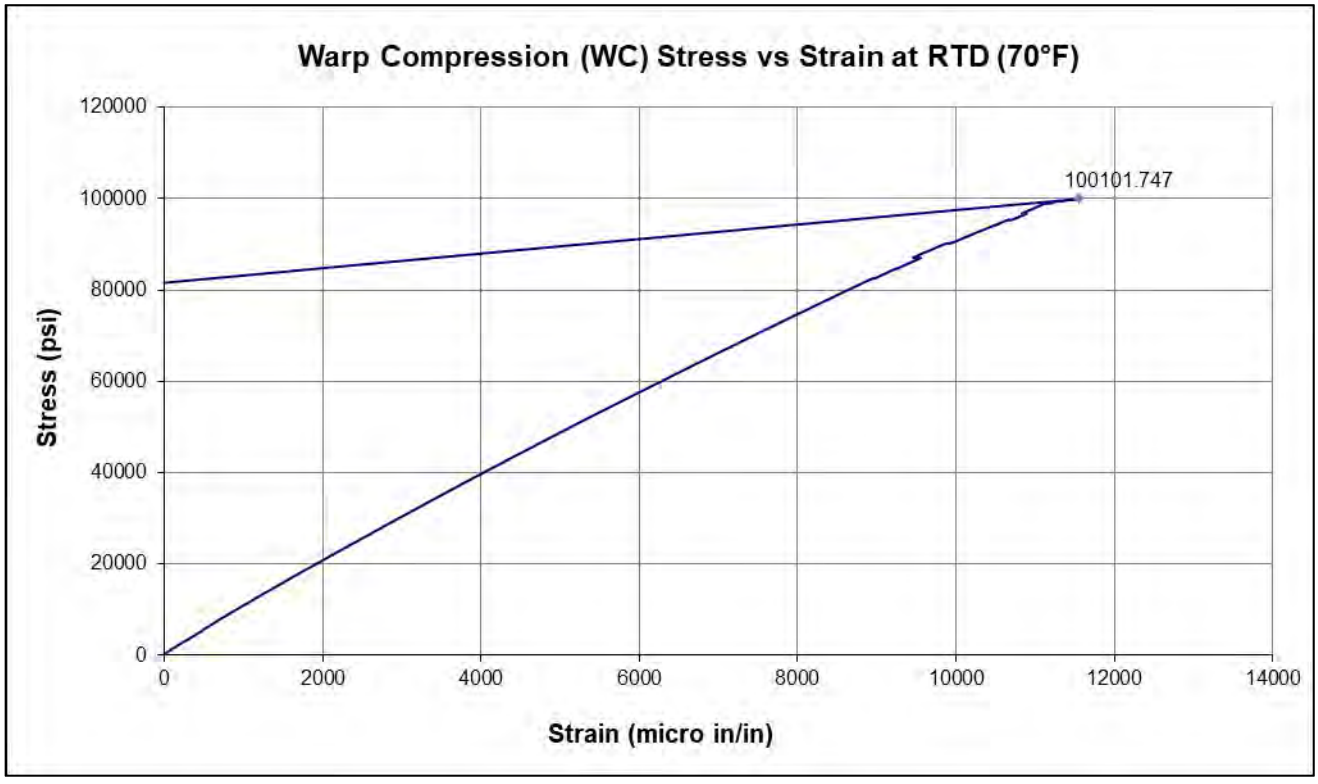

Warp Tension (WT) Stress vs Strain at ETD1 (180°F)
Extensometer was removed
Stress (psi)
110000
100000
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
Strain (micro in/in)

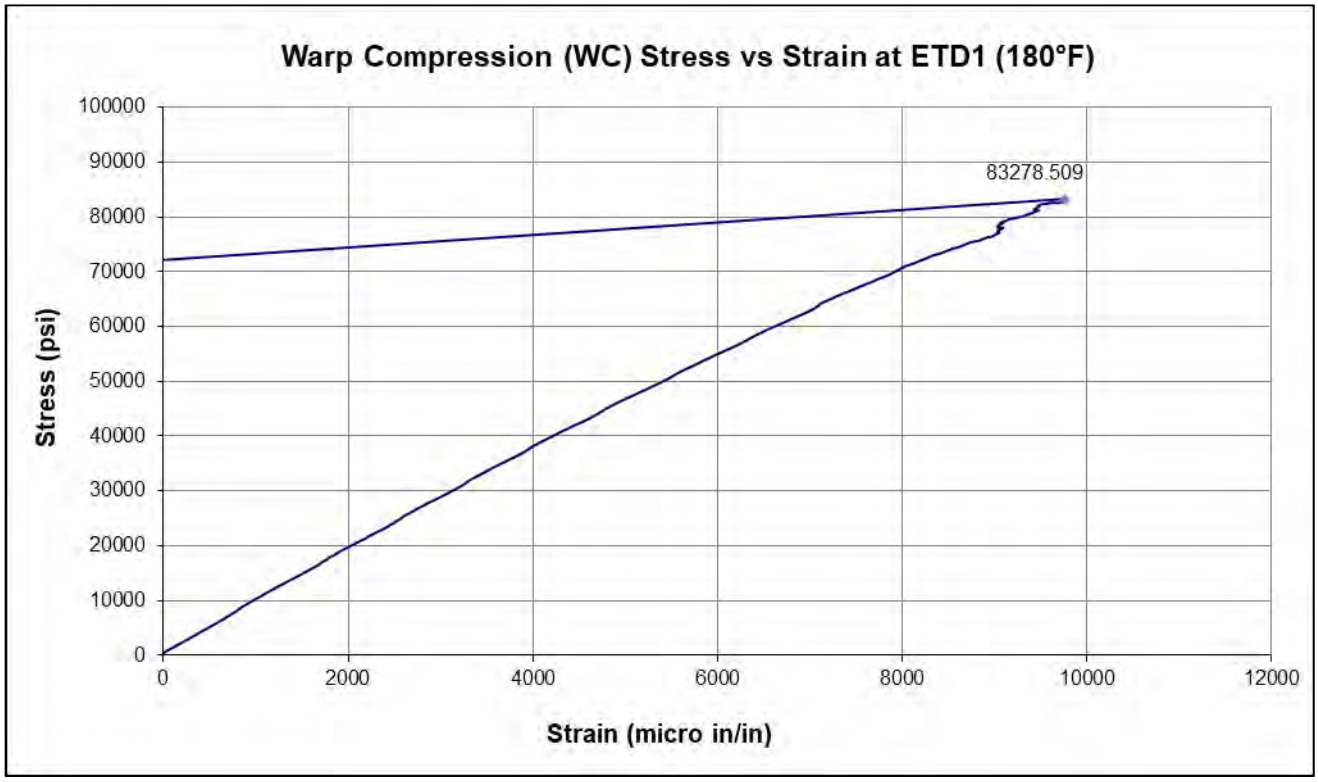

Warp Tension (WT) Stress vs Strain at ETW1 (180°F)
Extensometer was removed
Stress (psi)
80000
70000
60000
50000
40000
30000
20000
10000
0
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Strain (micro in/in)

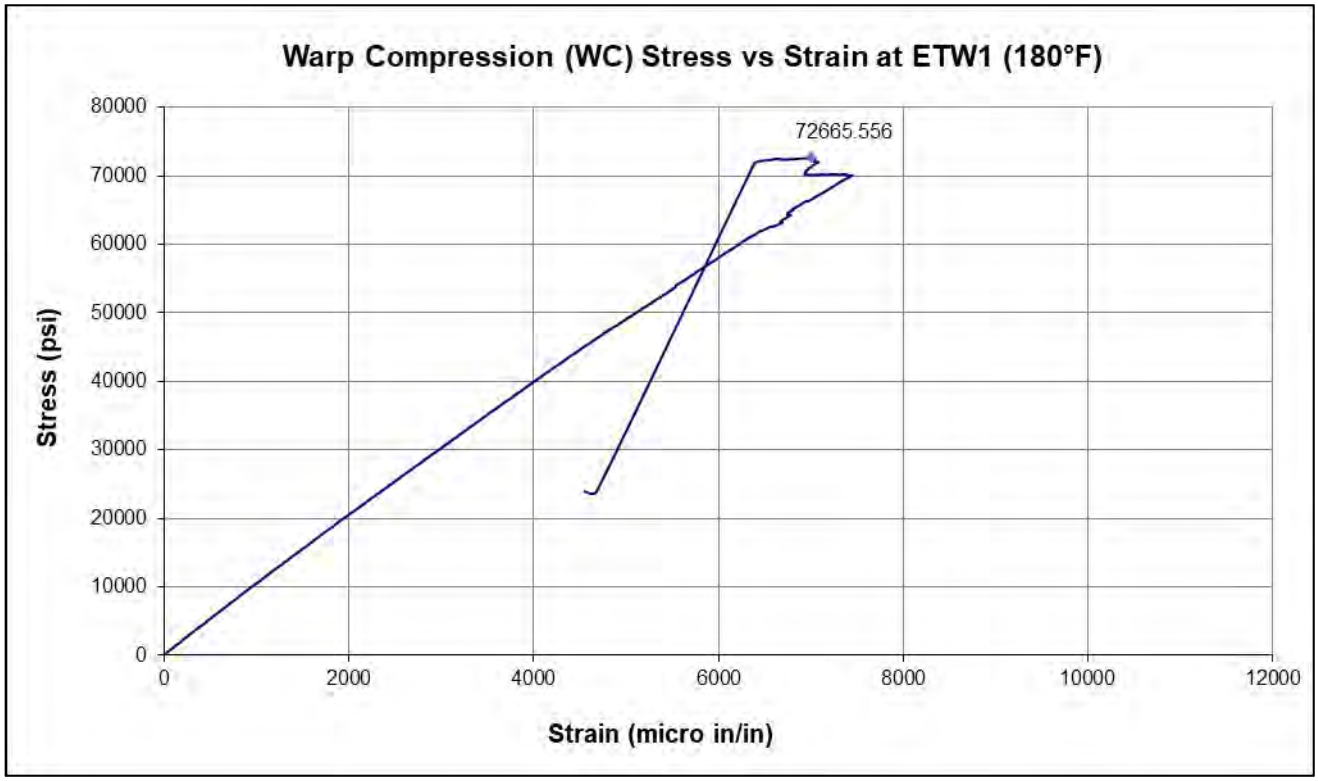

Warp Tension (WT) Stress vs Strain at ETW2 (250°F)
Extensometer was removed
Stress (psi)
80000
70000
60000
50000
40000
30000
20000
10000
0
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
Strain (micro in/in)

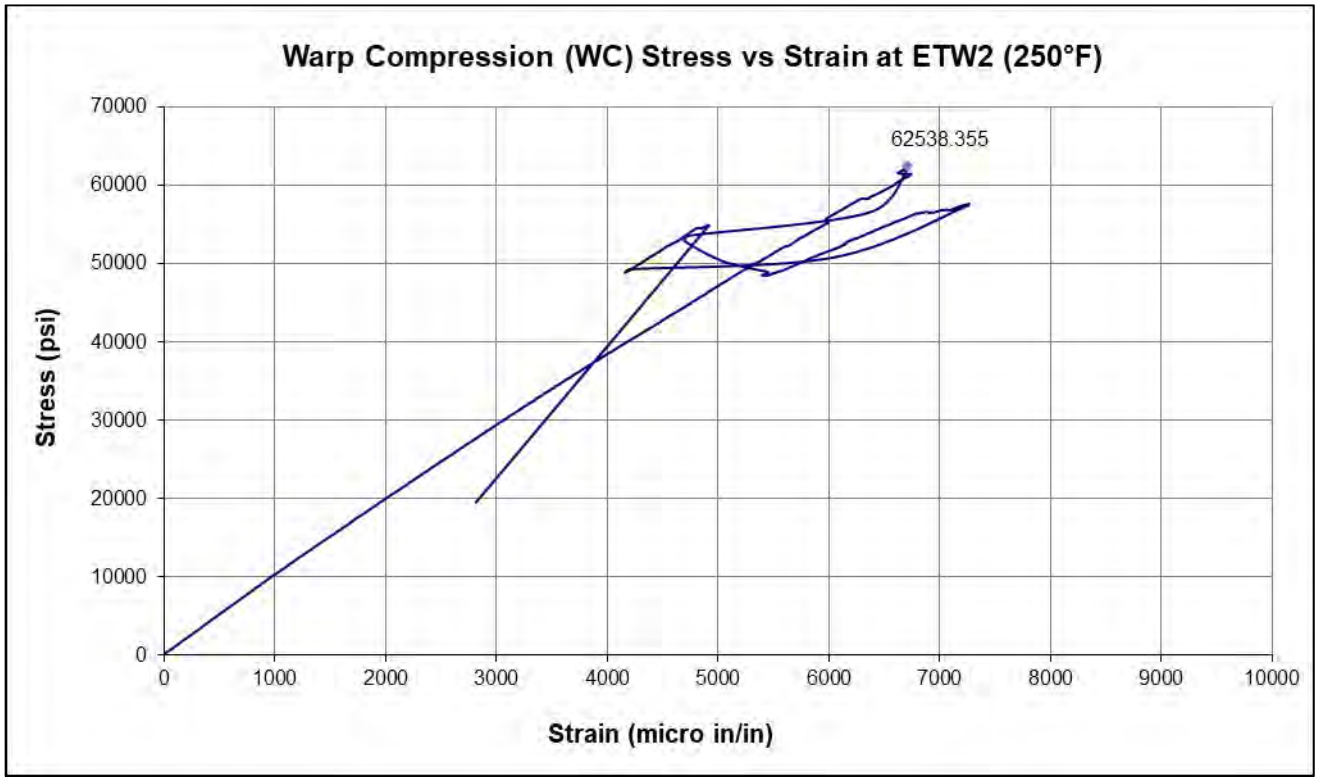
6.2 Warp Compression (WC)



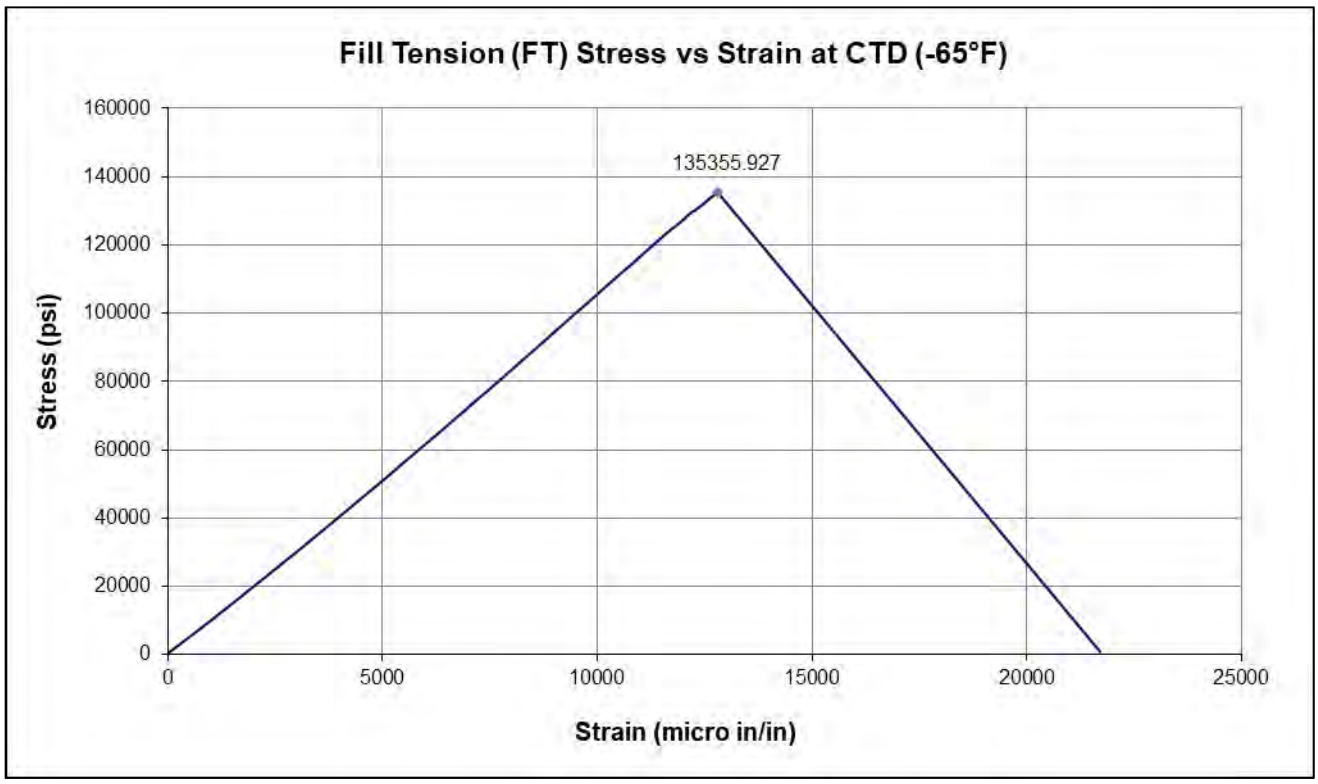


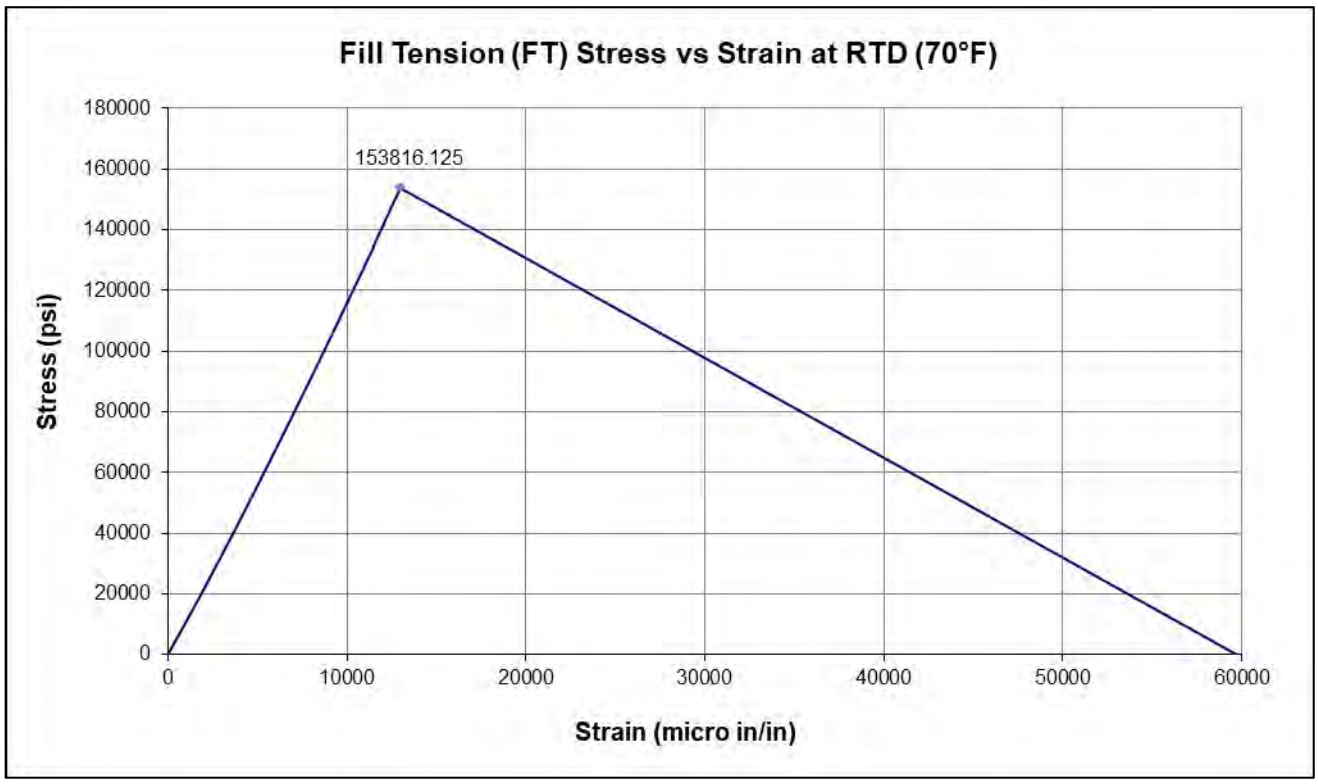

Warp Compression (WC) Stress vs Strain at ETD1 (180°F)
83278.509
Stress (psi)
100000
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
0
2000
4000
6000
8000
10000
12000
Strain (micro in/in)

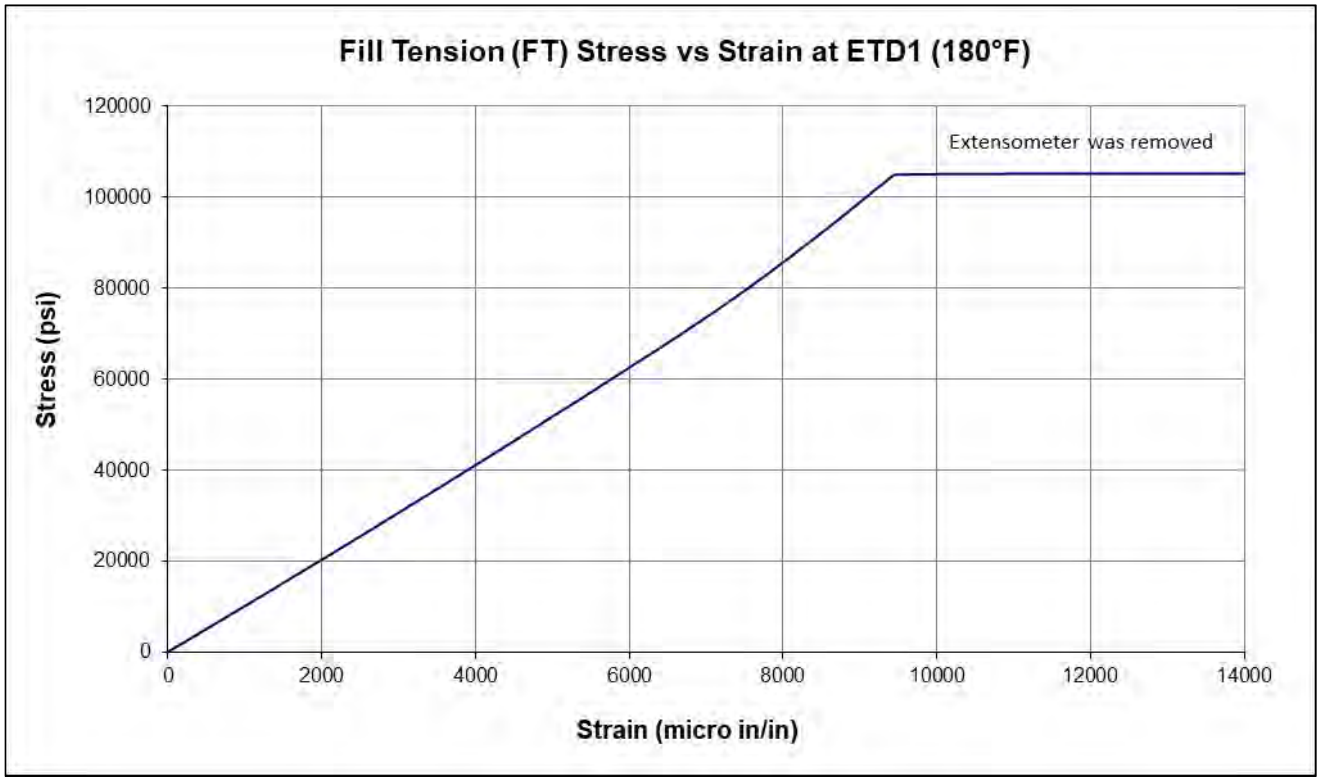

Warp Compression (WC) Stress vs Strain at ETW1 (180°F)
72665.556
Stress (psi)
80000
70000
60000
50000
40000
30000
20000
10000
0
0
2000
4000
6000
8000
10000
12000
Strain (micro in/in)

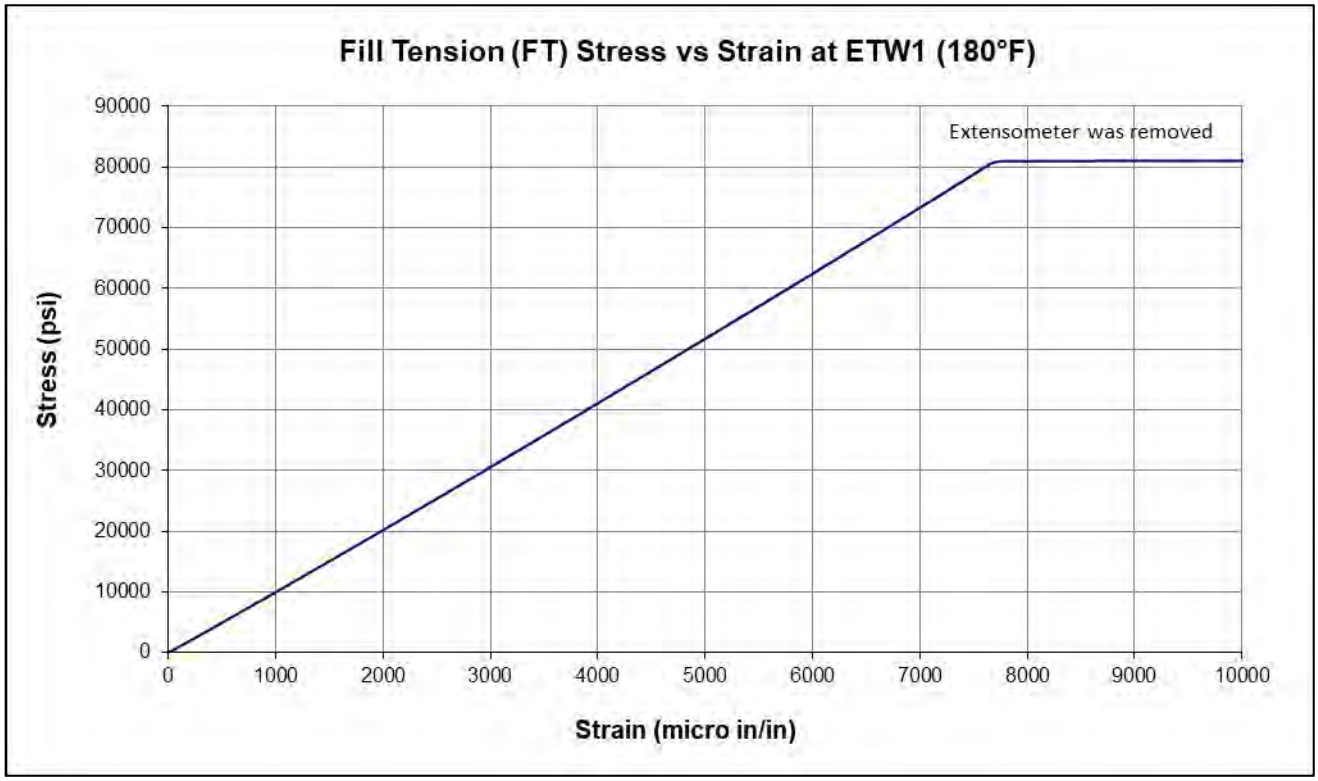

Warp Compression (WC) Stress vs Strain at ETW2 (250°F)
62538.355
Stress (psi)
70000
60000
50000
40000
30000
20000
10000
0
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
Strain (micro in/in)

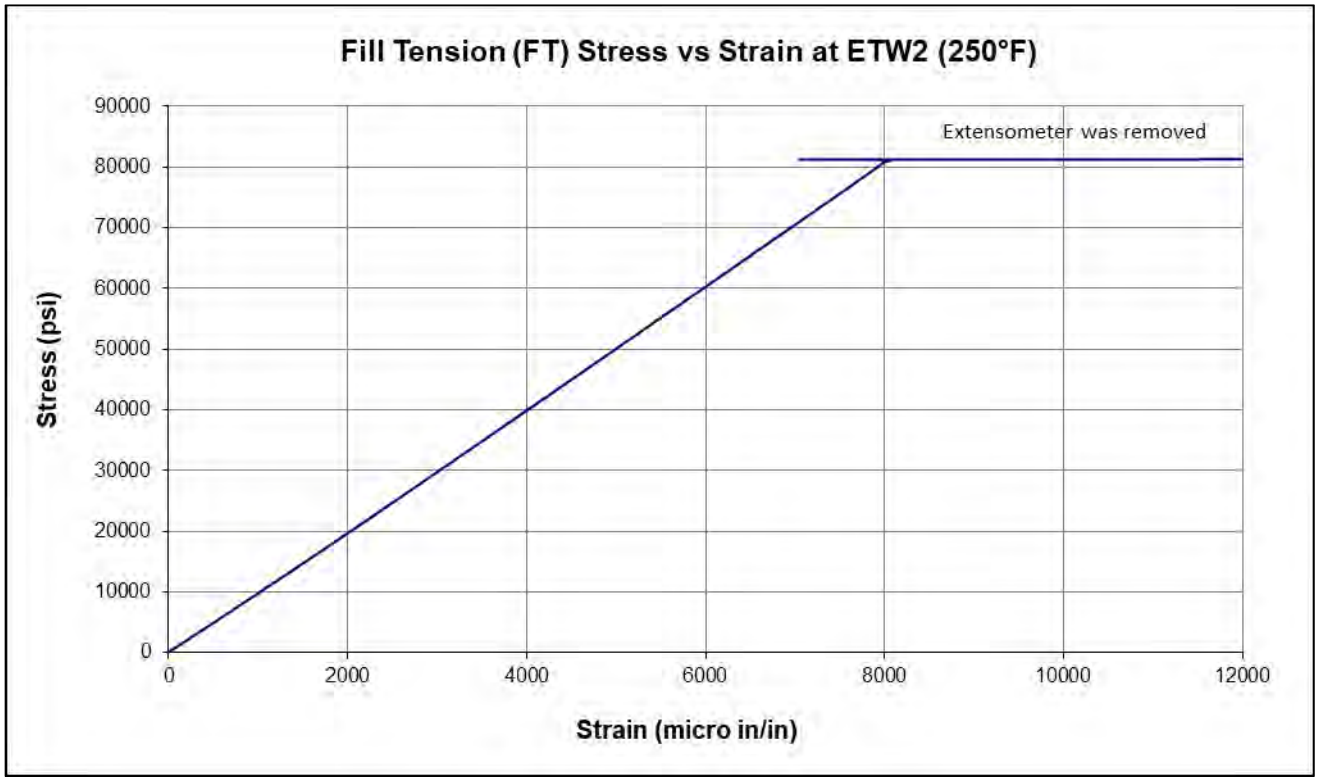
6.3 Fill Tension (FT)



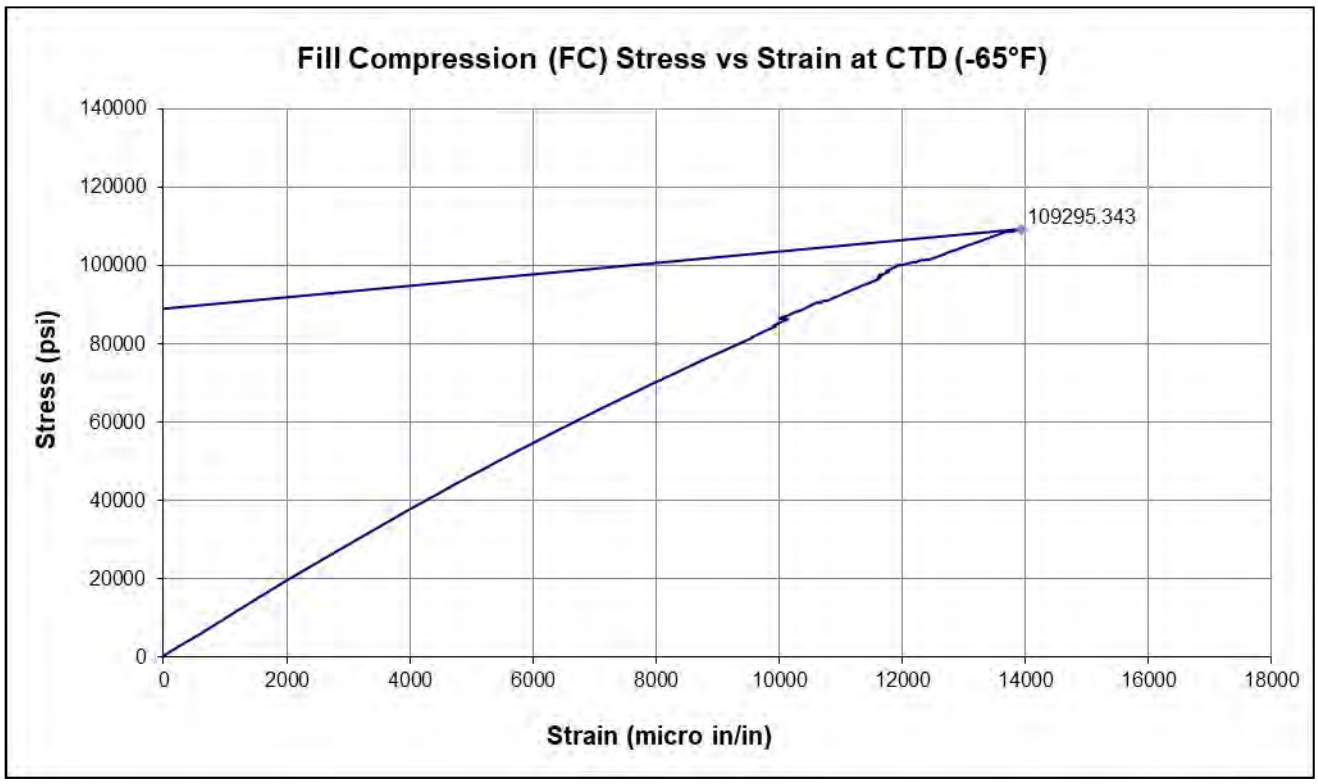


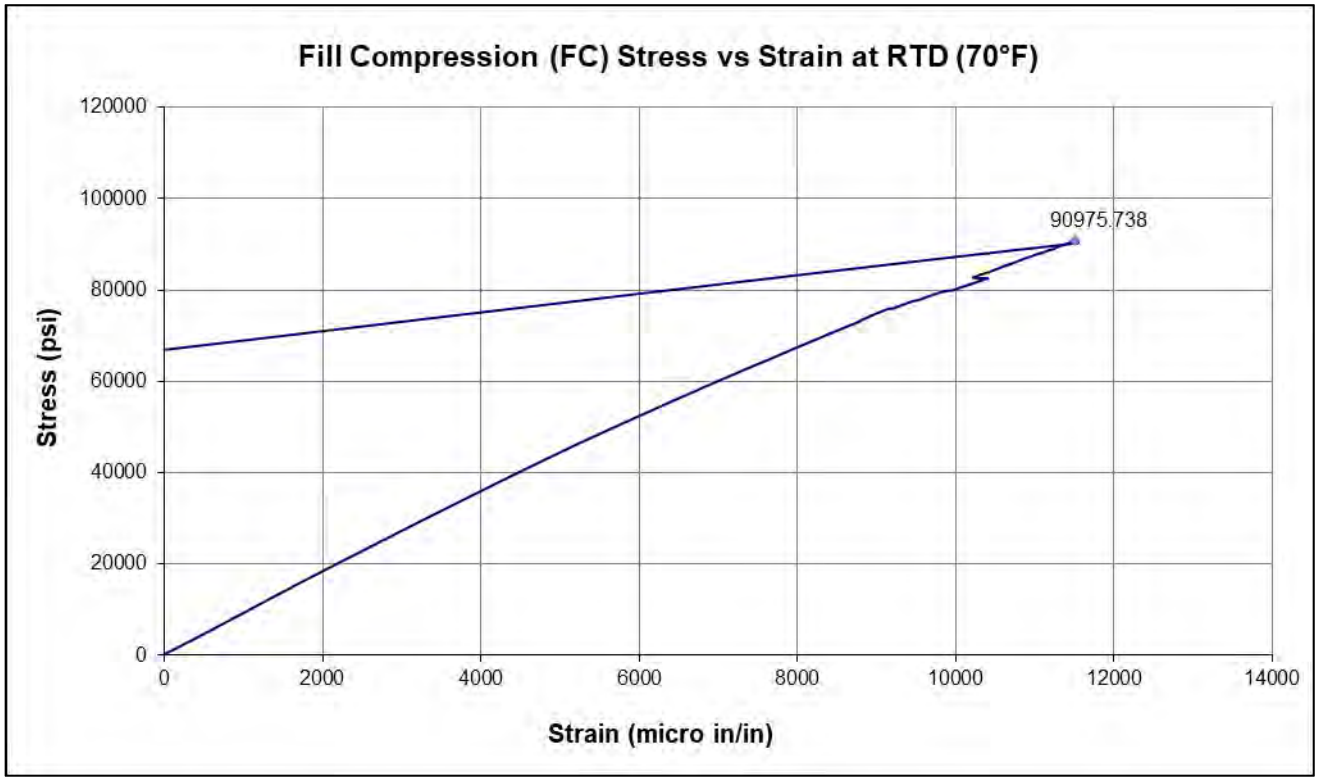

Fill Tension (FT) Stress vs Strain at ETD1 (180°F)
Extensometer was removed
Stress (psi)
120000
100000
80000
60000
40000
20000
0
0
2000
4000
6000
8000
10000
12000
14000
Strain (micro in/in)

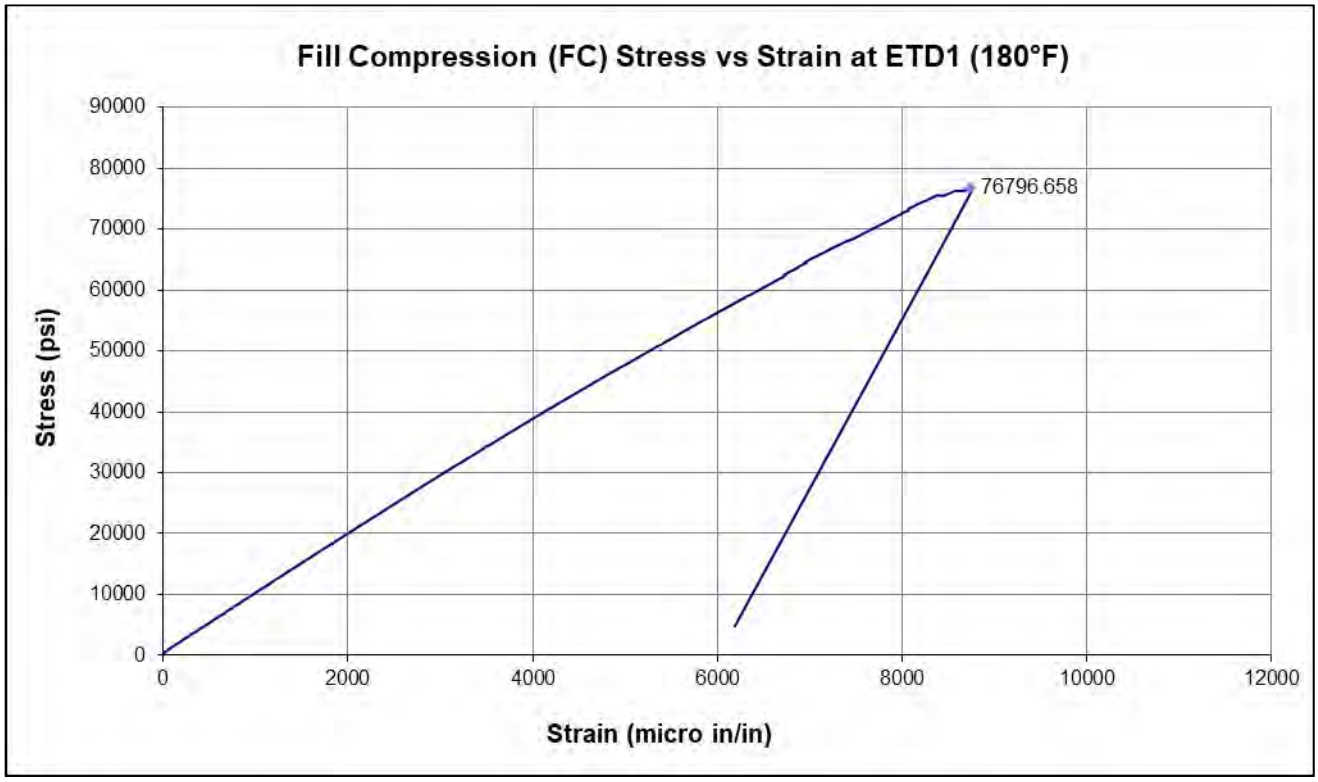

Fill Tension (FT) Stress vs Strain at ETW1 (180°F)
Extensometer was removed
Stress (psi)
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
Strain (micro in/in)

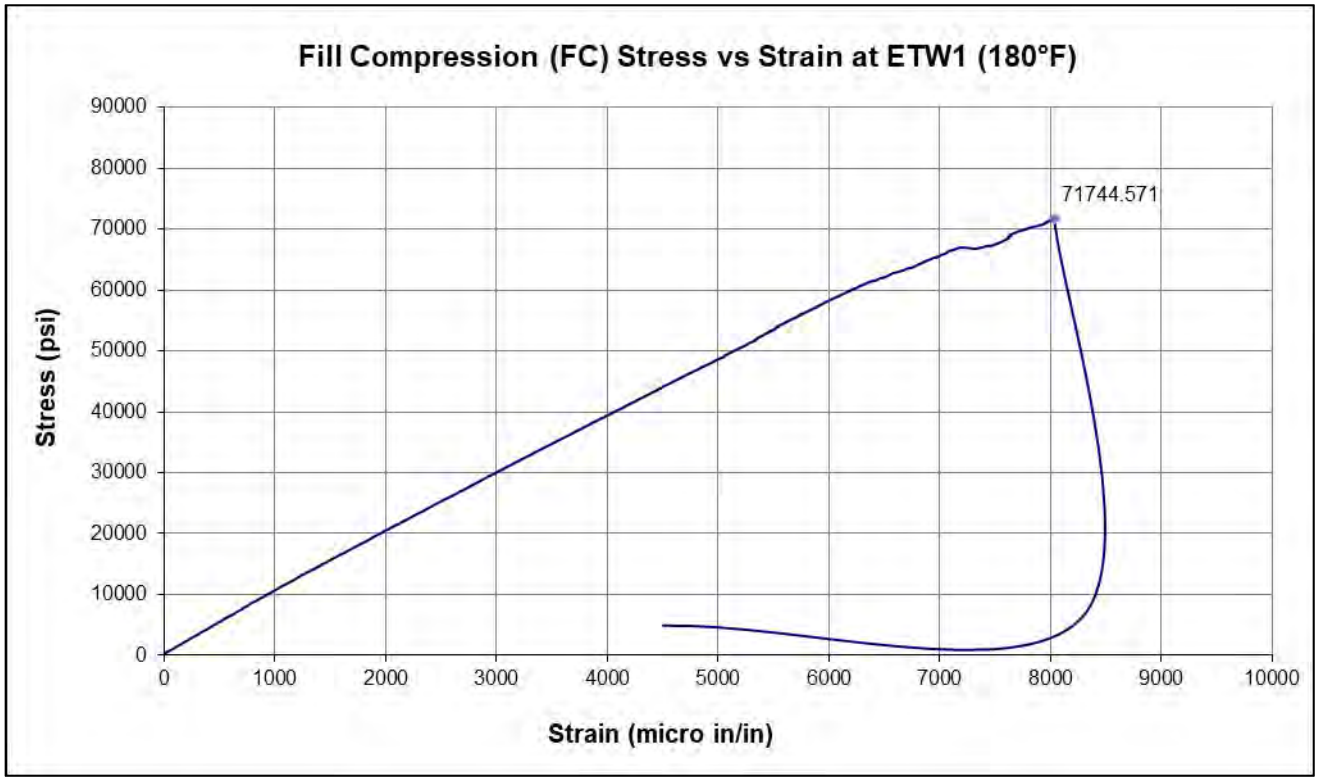

Fill Tension (FT) Stress vs Strain at ETW2 (250°F)
Extensometer was removed
Stress (psi)
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
0
2000
4000
6000
8000
10000
12000
Strain (micro in/in)

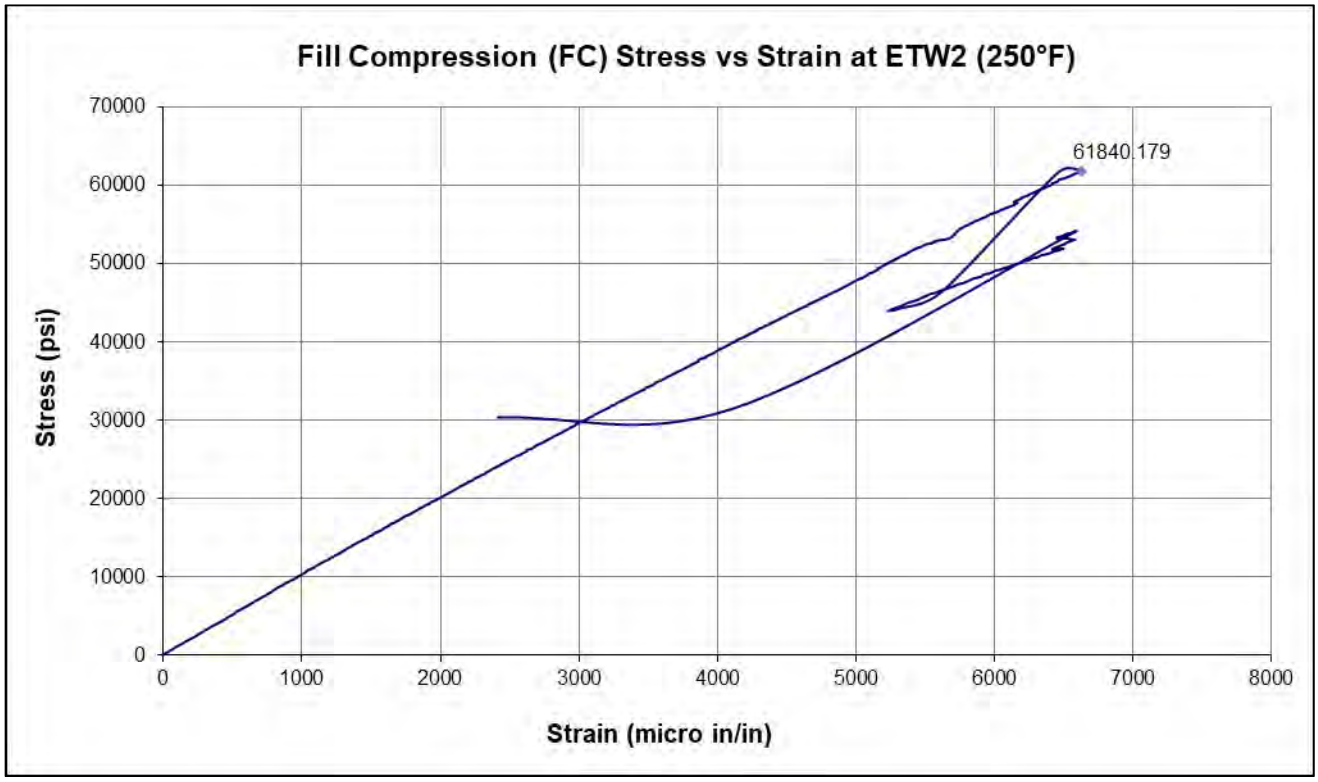
6.4 Fill Compression (FC)



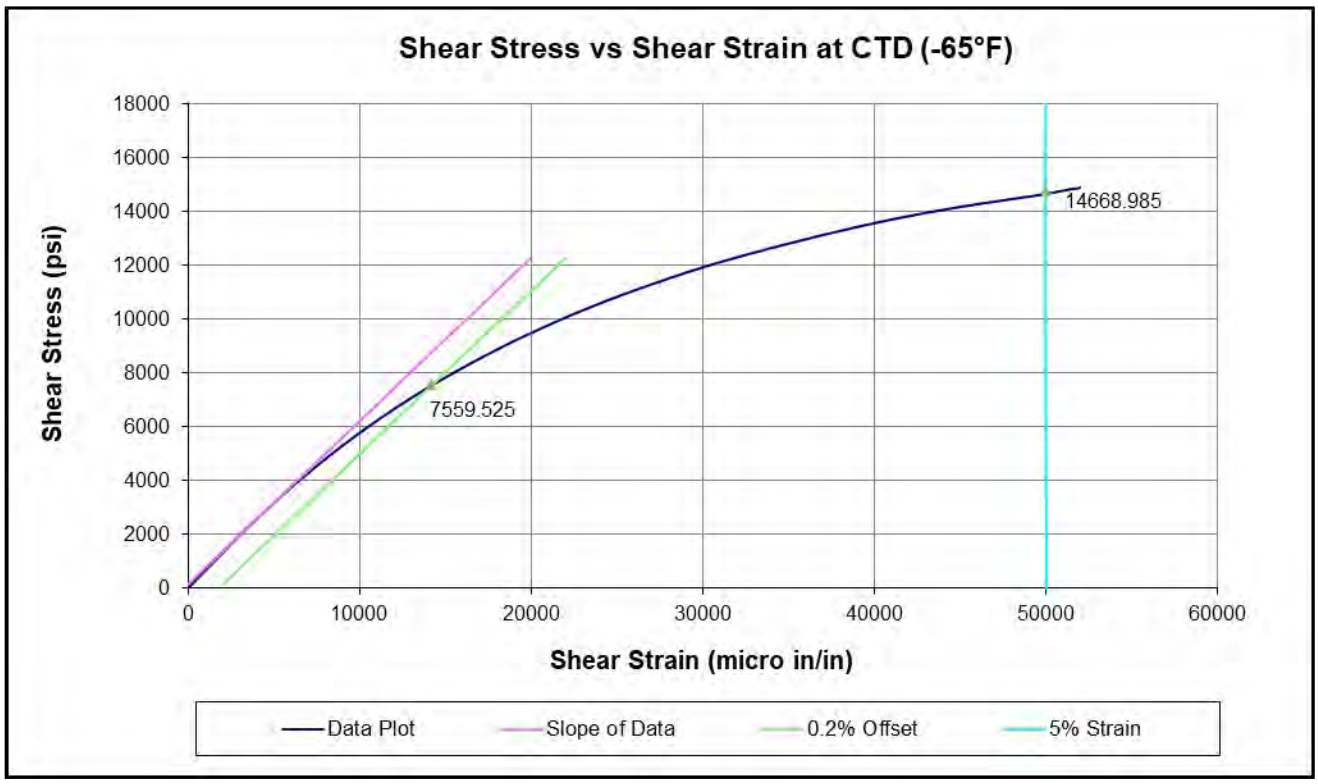


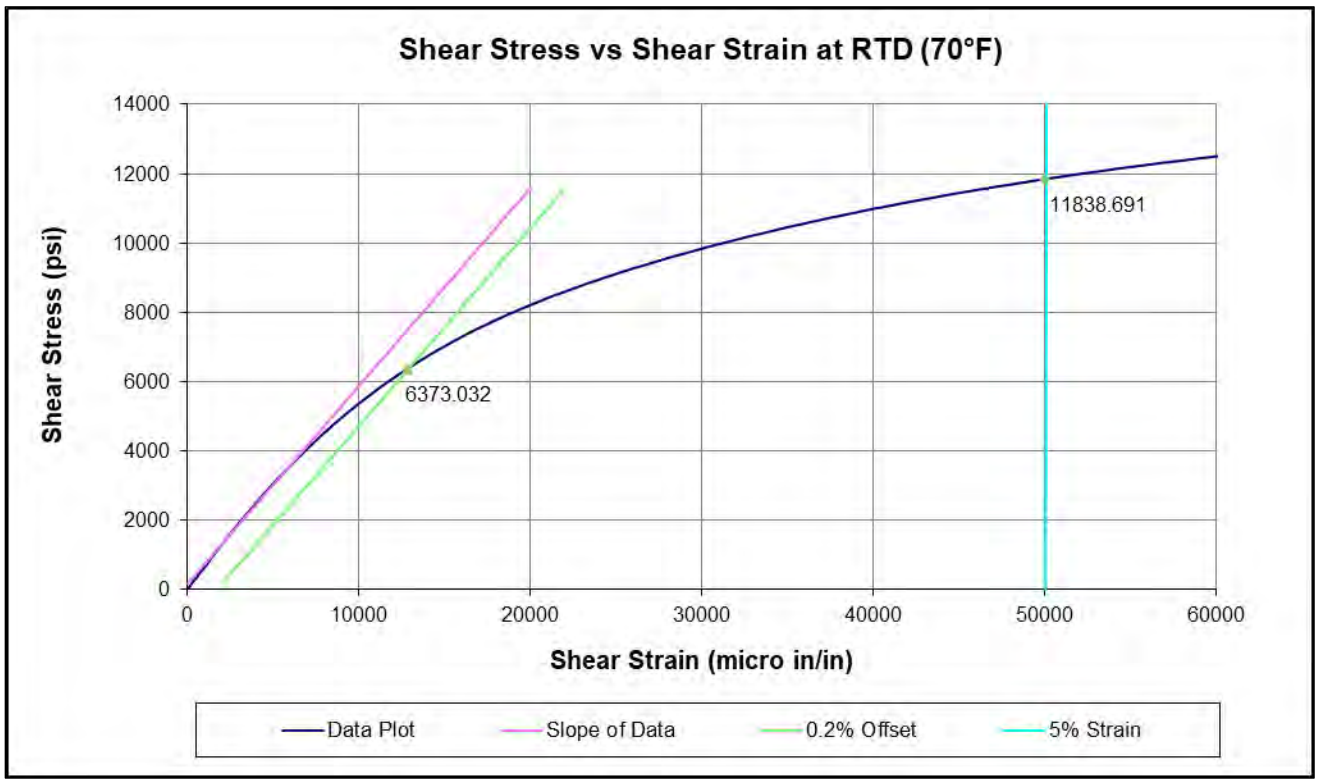

Fill Compression (FC) Stress vs Strain at ETD1 (180°F)
Stress (psi)
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
0
2000
4000
6000
8000
10000
12000
Strain (micro in/in)
76796.658

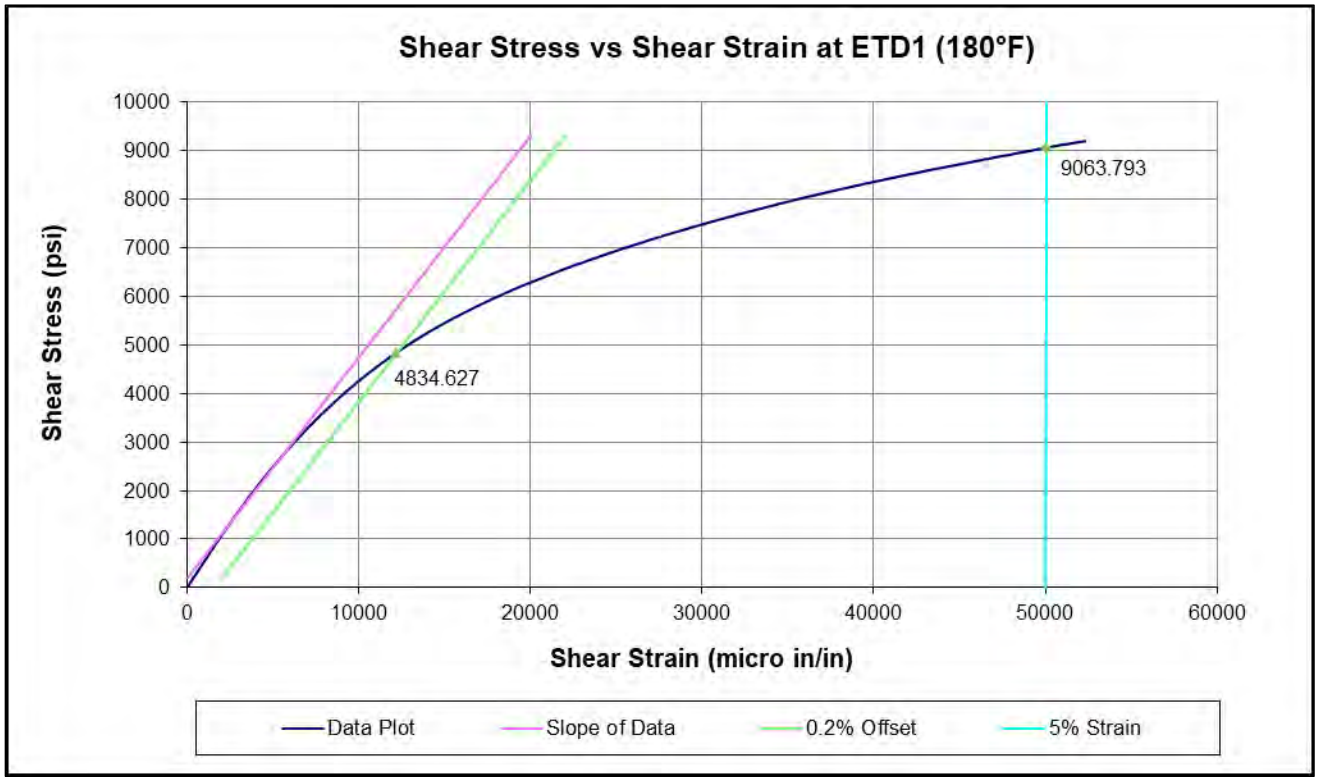

Fill Compression (FC) Stress vs Strain at ETW1 (180°F)
Stress (psi)
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
Strain (micro in/in)
71744.571

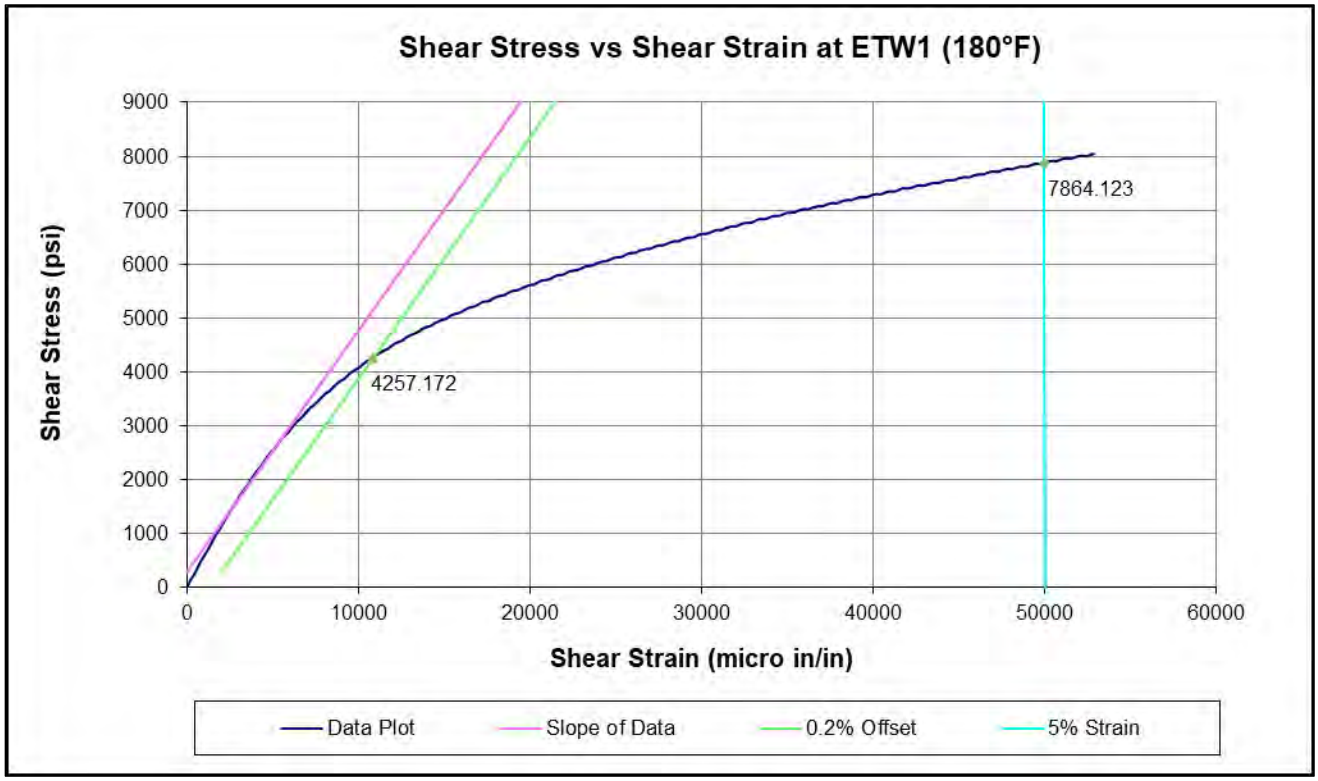

Fill Compression (FC) Stress vs Strain at ETW2 (250°F)
Stress (psi)
70000
60000
50000
40000
30000
20000
10000
0
0
1000
2000
3000
4000
5000
6000
7000
8000
Strain (micro in/in)
61840.179

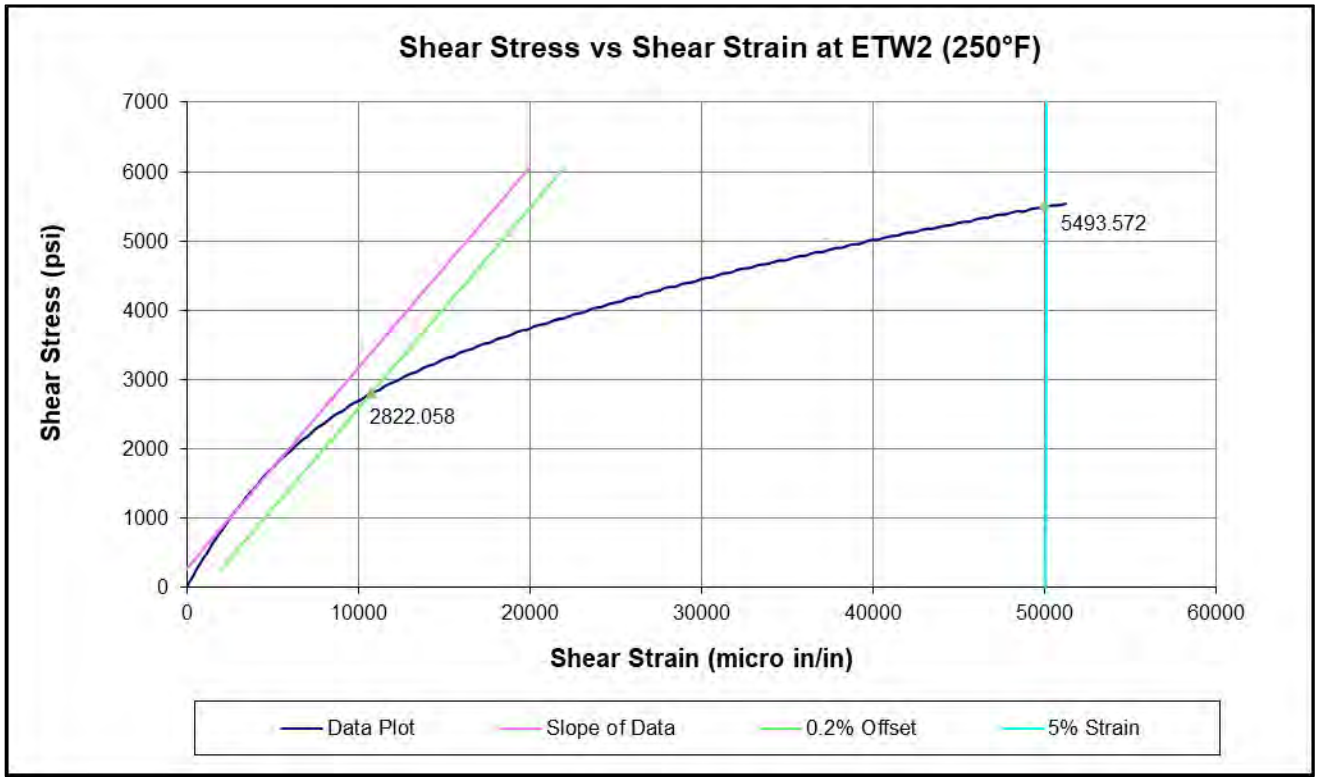
6.5 In-Plane Shear (IPS)



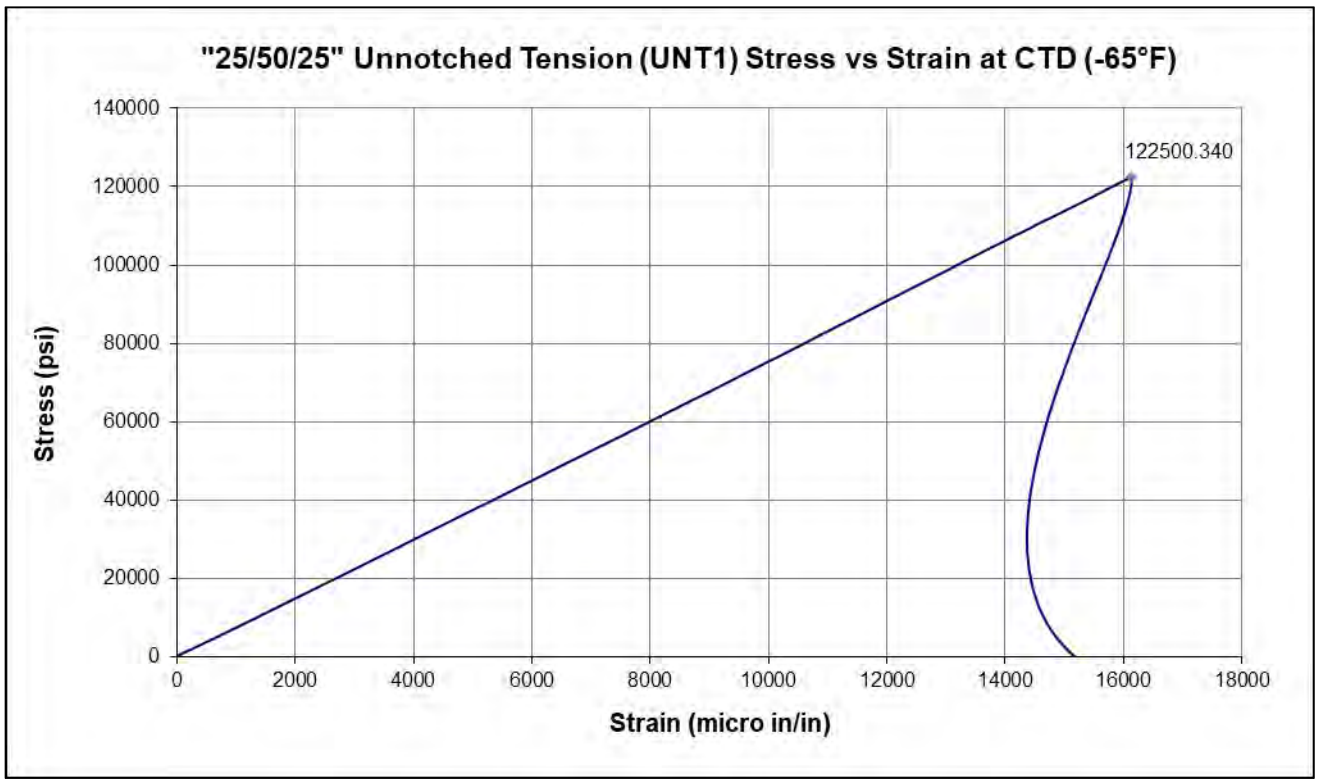


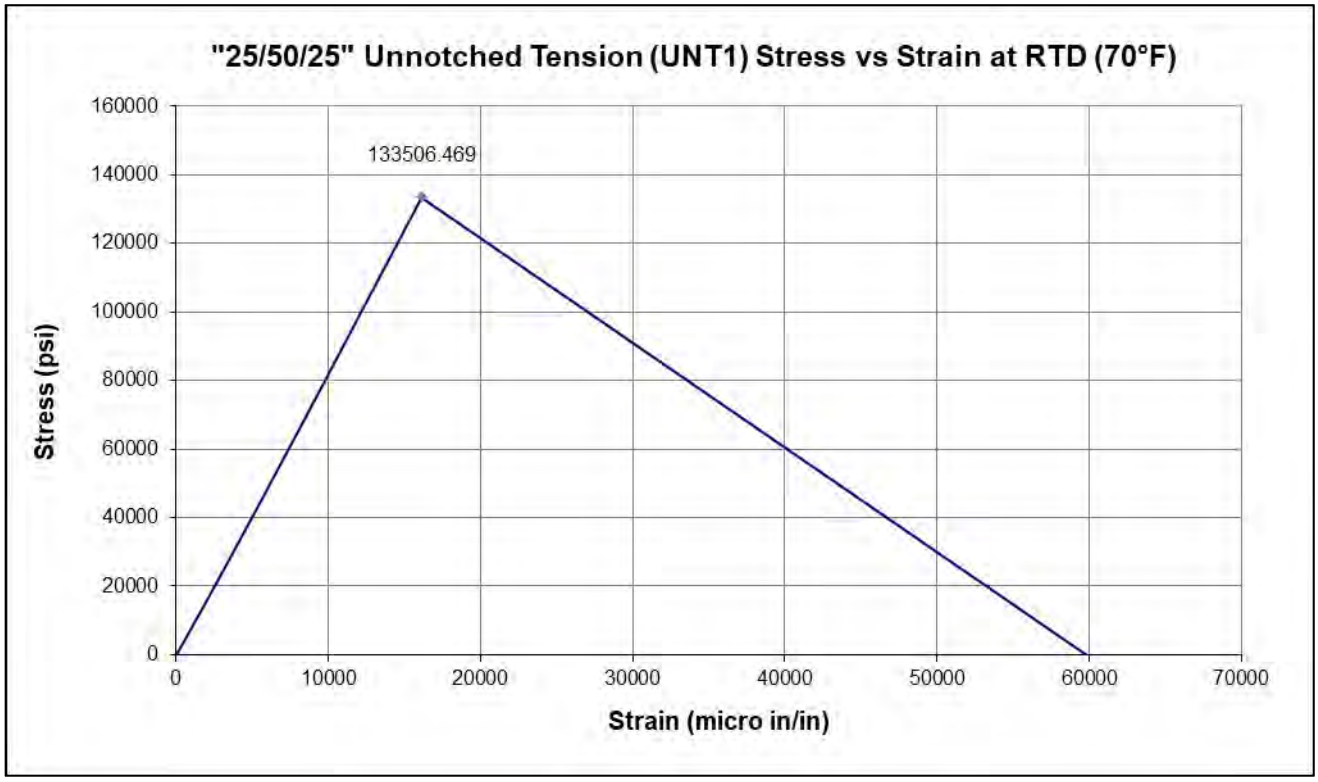

Shear Stress vs Shear Strain at ETD1 (180°F)
Shear Stress (psi)
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
0
10000
20000
30000
40000
50000
60000
Shear Strain (micro in/in)
9063.793
4834.627
Data Plot
Slope of Data
0.2% Offset
5% Strain

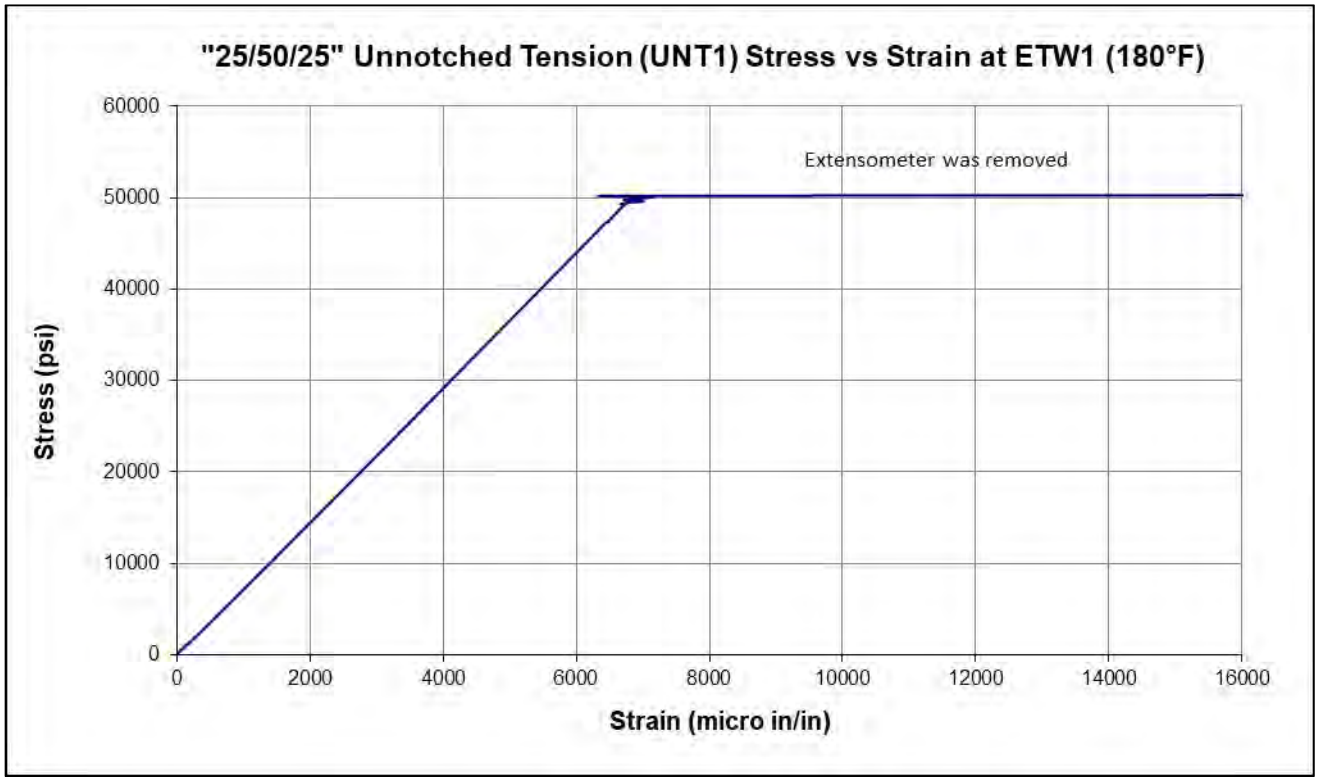

Shear Stress vs Shear Strain at ETW1 (180°F)
Shear Stress (psi)
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
0
10000
20000
30000
40000
50000
60000
Shear Strain (micro in/in)
7864.123
4257.172
Data Plot
Slope of Data
0.2% Offset
5% Strain

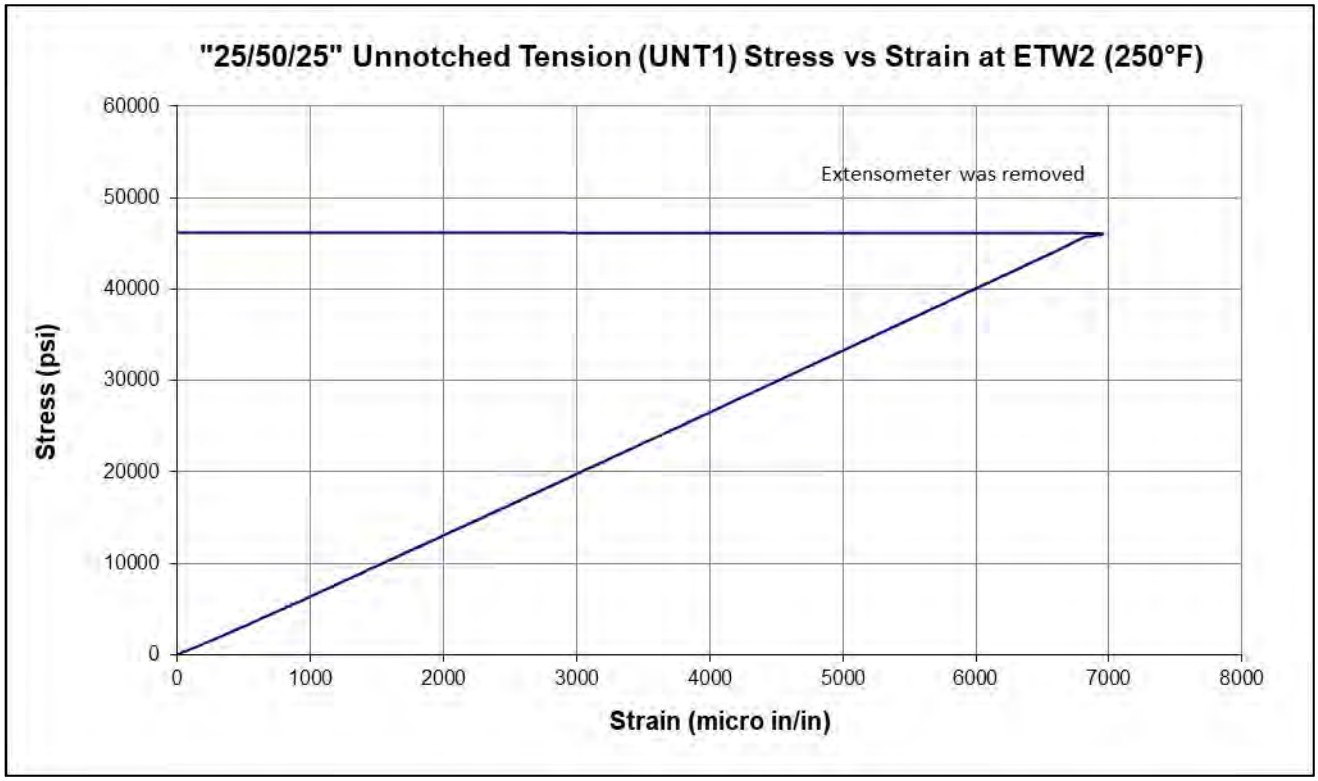

Shear Stress vs Shear Strain at ETW2 (250°F)
Shear Stress (psi)
7000
6000
5000
4000
3000
2000
1000
0
0
10000
20000
30000
40000
50000
60000
Shear Strain (micro in/in)
2822.058
5493.572
Data Plot
Slope of Data
0.2% Offset
5% Strain

6.6 “25/50/25” Unnotched Tension 1 (UNT1)

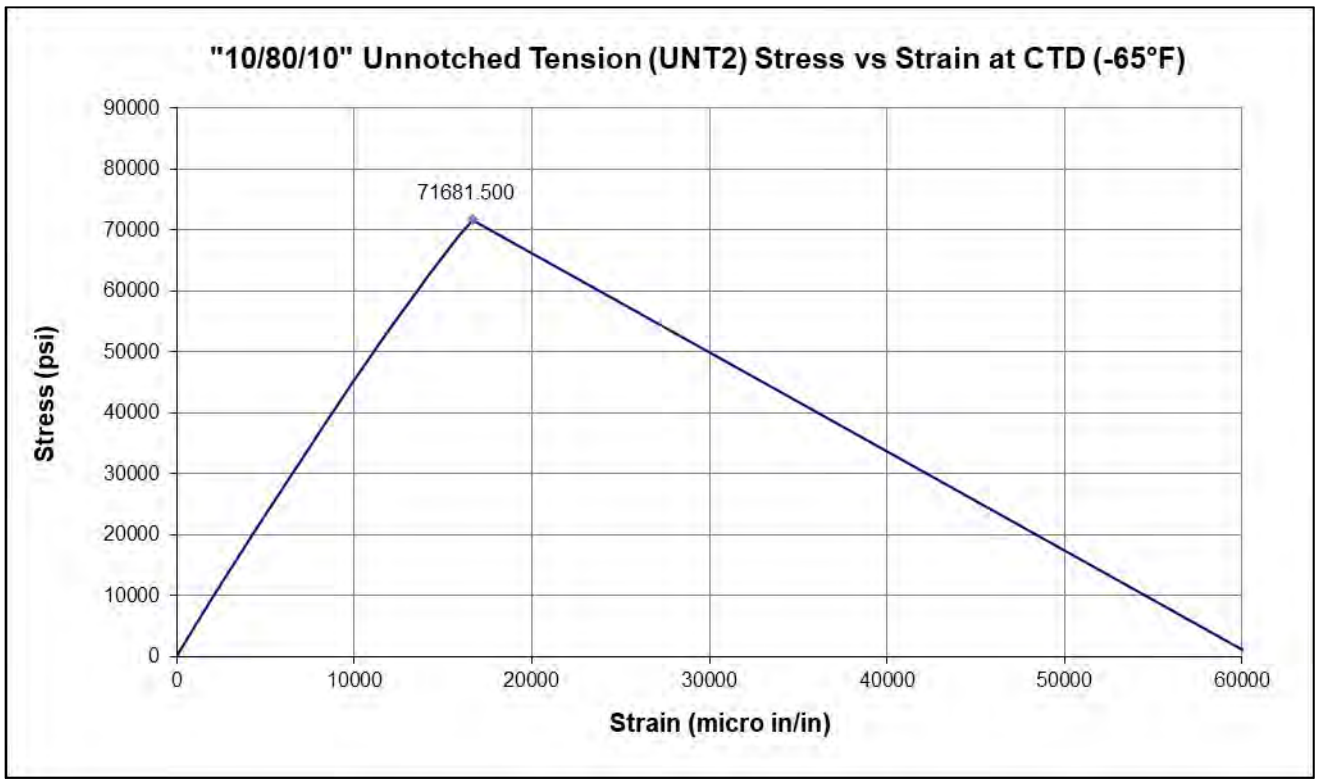


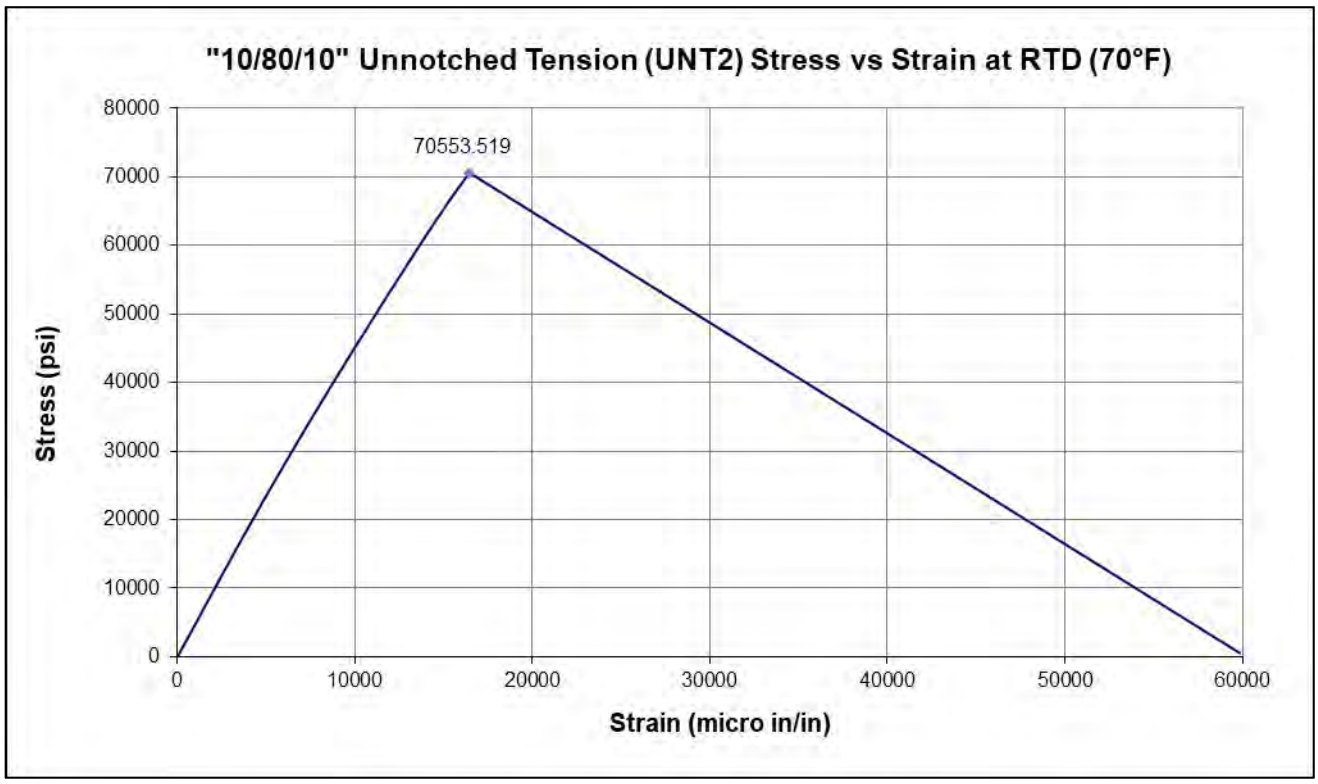


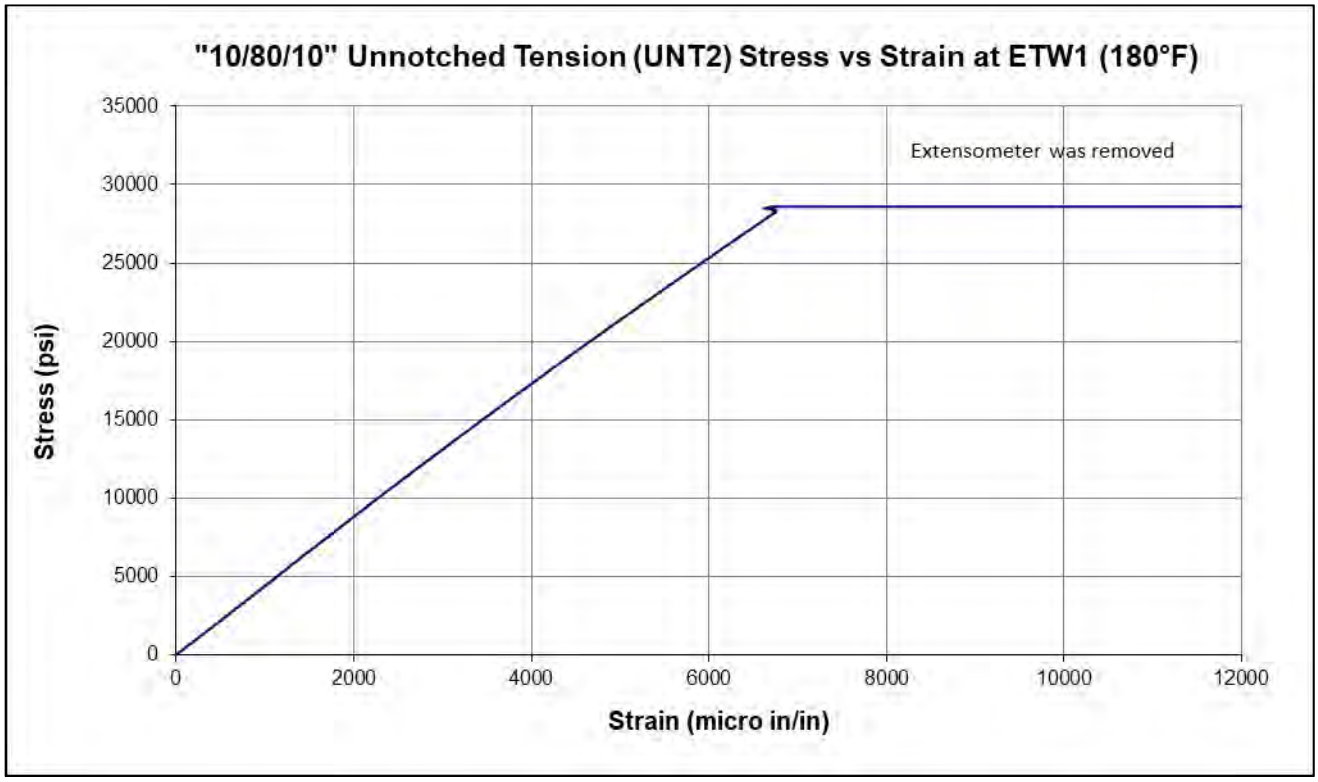

"25/50/25" Unnotched Tension (UNT1) Stress vs Strain at ETW1 (180°F)
Extensometer was removed
Stress (psi)
60000
50000
40000
30000
20000
10000
0
0
2000
4000
6000
8000
10000
12000
14000
16000
Strain (micro in/in)

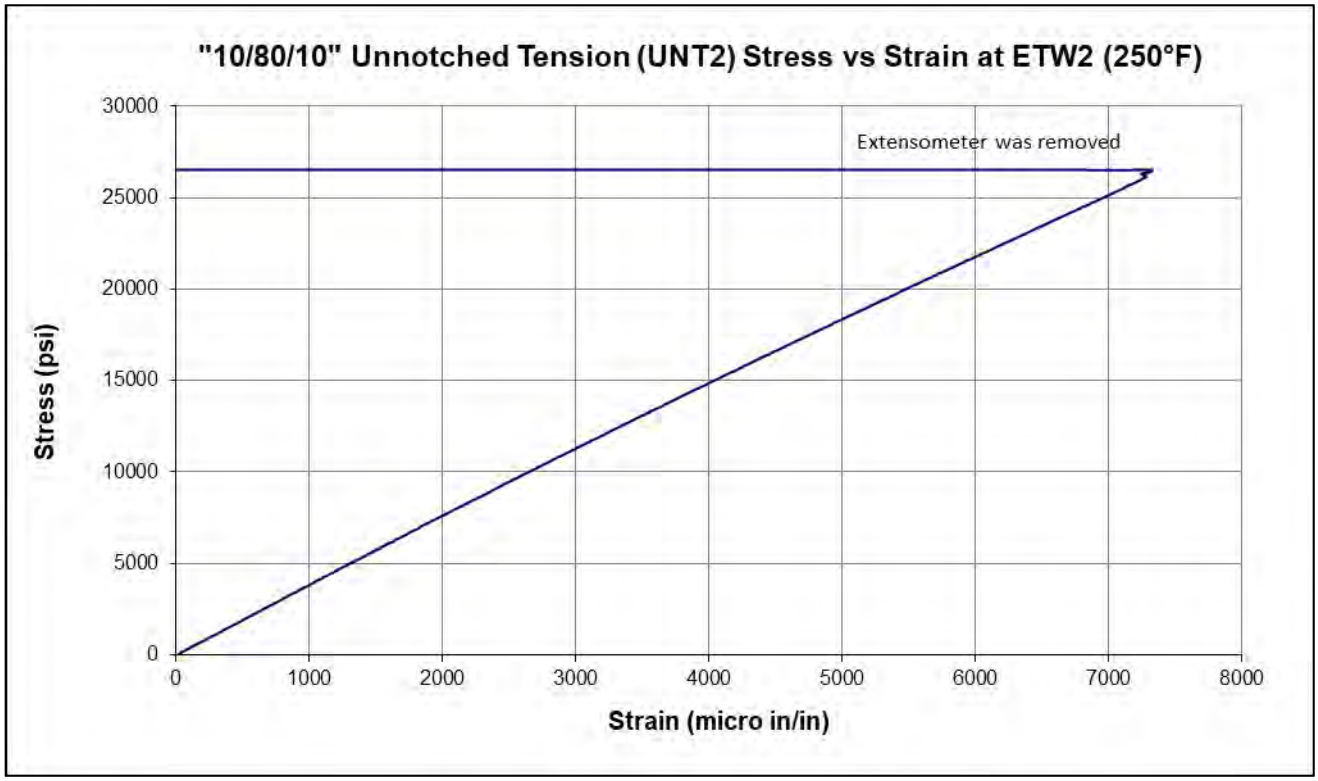

"25/50/25" Unnotched Tension (UNT1) Stress vs Strain at ETW2 (250°F)
Extensometer was removed
Stress (psi)
60000
50000
40000
30000
20000
10000
0
0
1000
2000
3000
4000
5000
6000
7000
8000
Strain (micro in/in)

6.7 “10/80/10” Unnotched Tension 2 (UNT2)

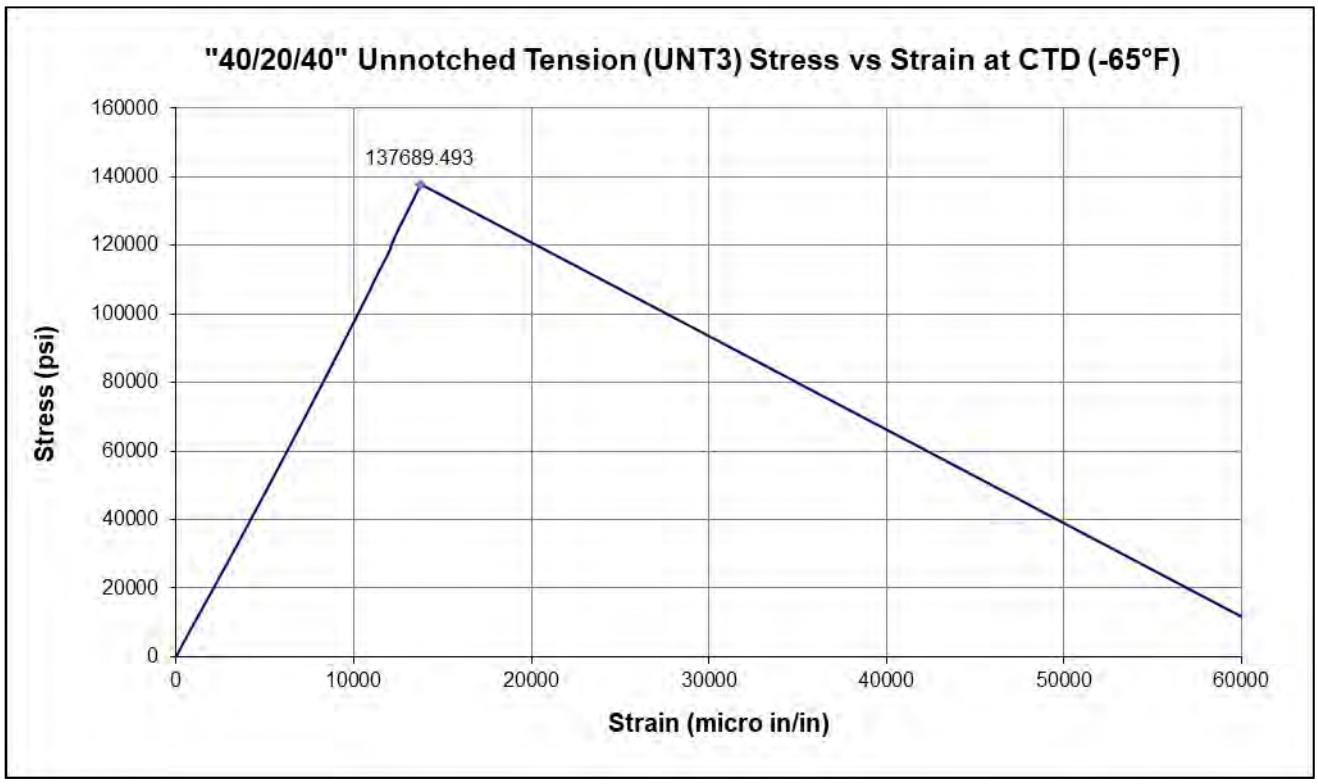


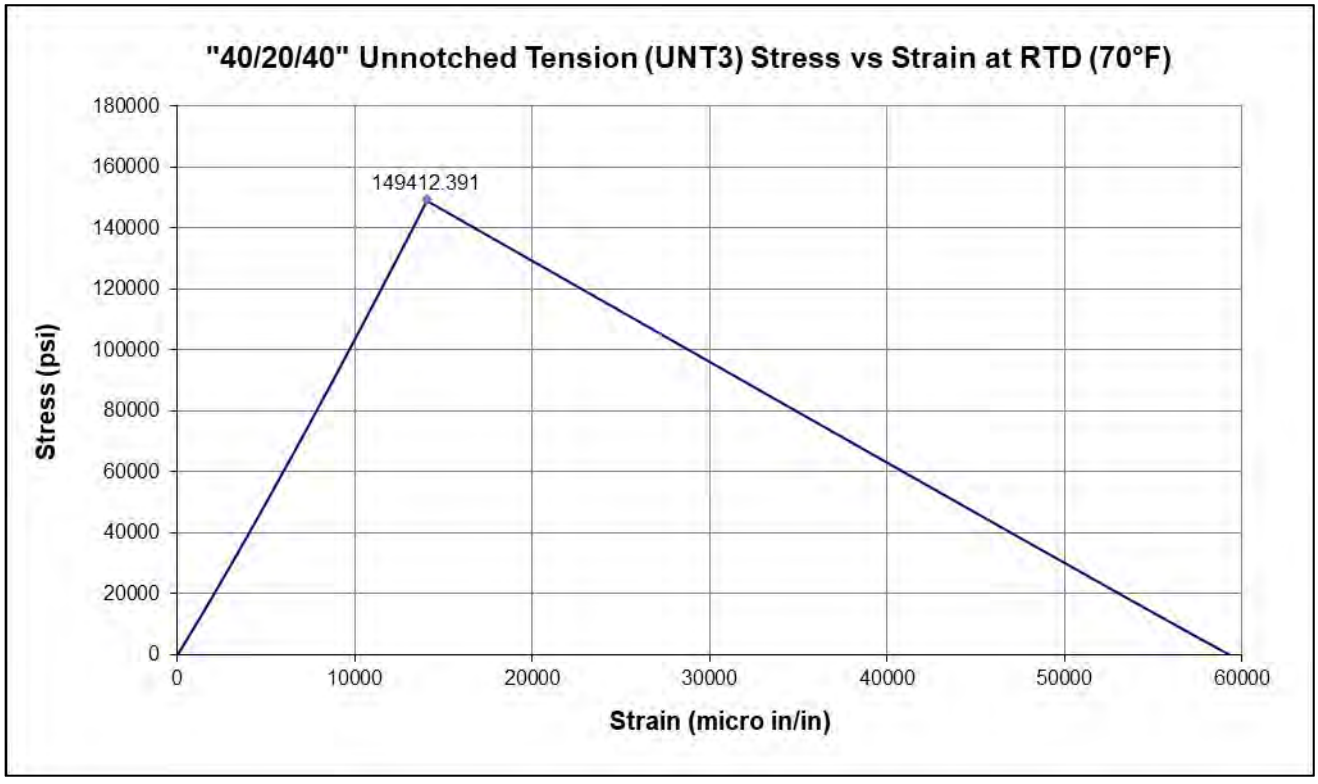


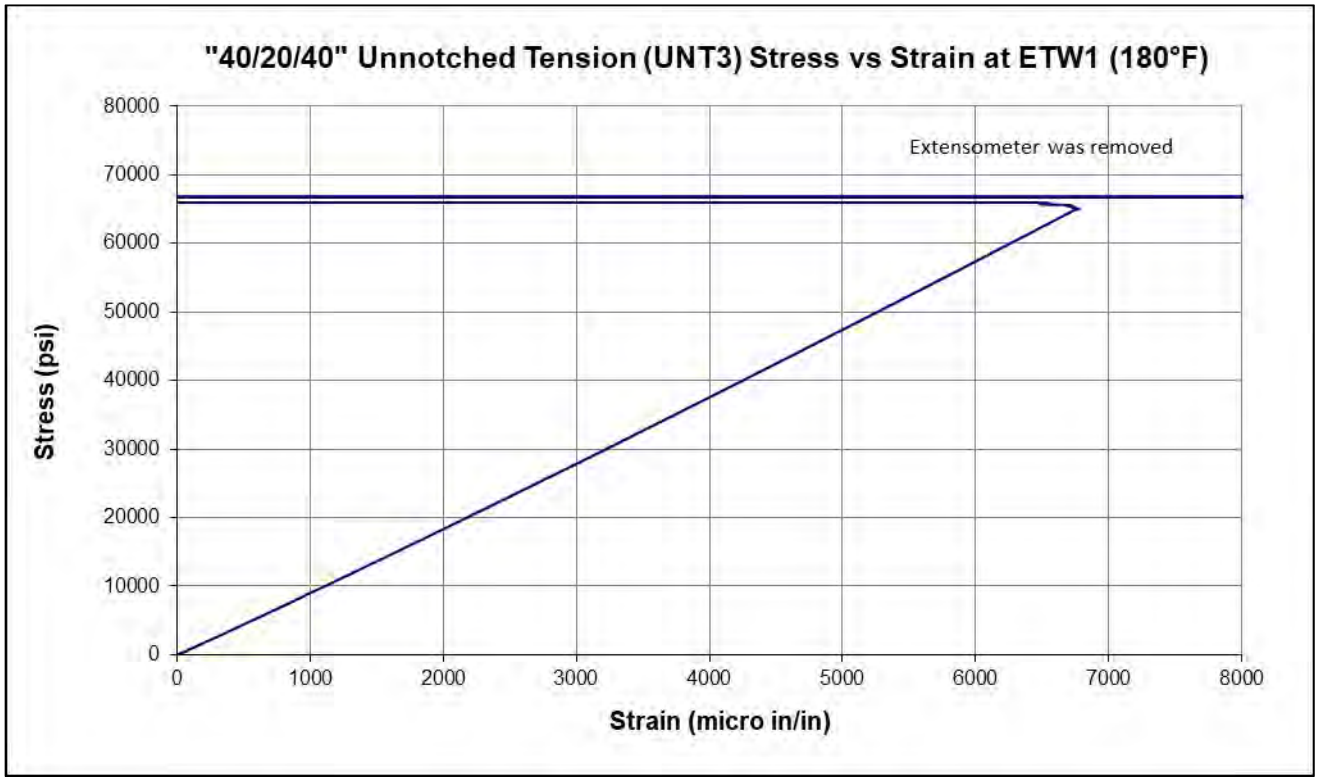

"10/80/10" Unnotched Tension (UNT2) Stress vs Strain at ETW1 (180°F)
Extensometer was removed
Stress (psi)
35000
30000
25000
20000
15000
10000
5000
0
0
2000
4000
6000
8000
10000
12000
Strain (micro in/in)

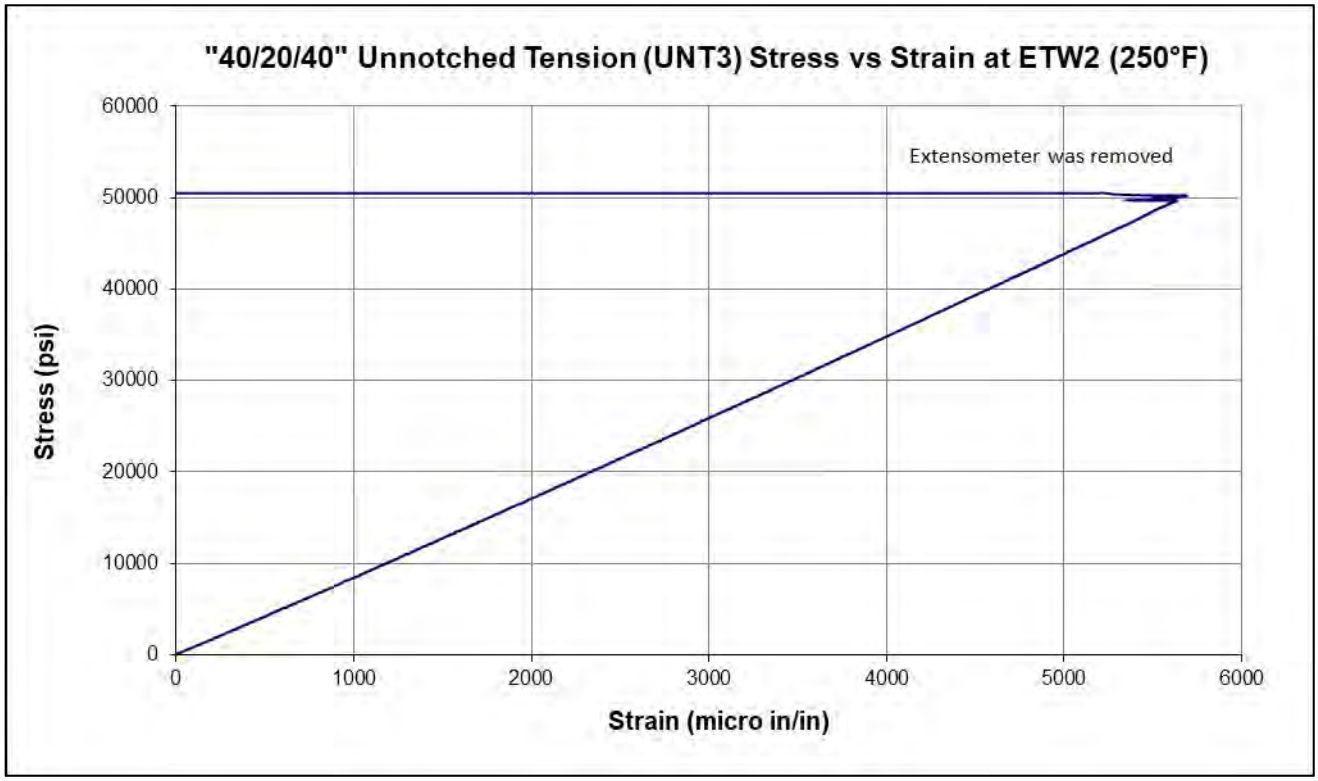

"10/80/10" Unnotched Tension (UNT2) Stress vs Strain at ETW2 (250°F)
Extensometer was removed
Stress (psi)
30000
25000
20000
15000
10000
5000
0
0
1000
2000
3000
4000
5000
6000
7000
8000
Strain (micro in/in)

6.8 “40/20/40” Unnotched Tension 3 (UNT3)

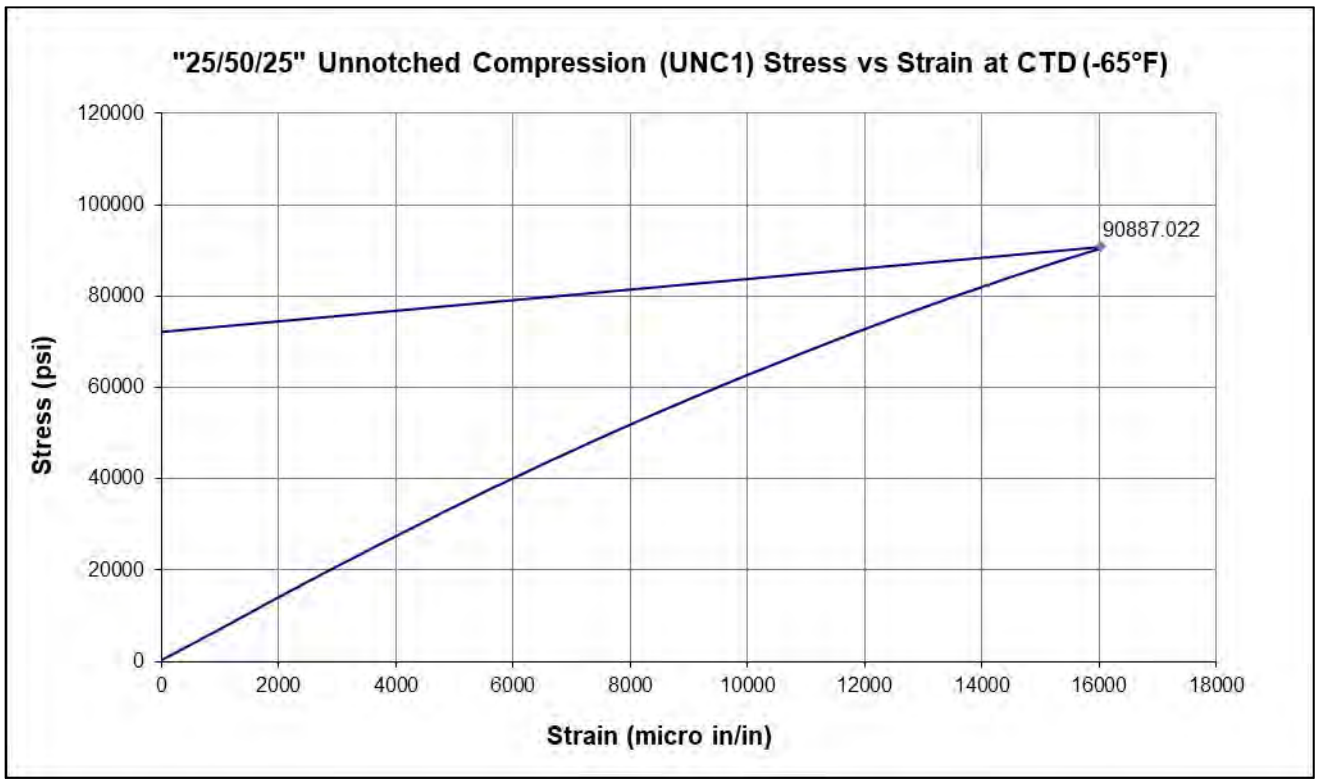


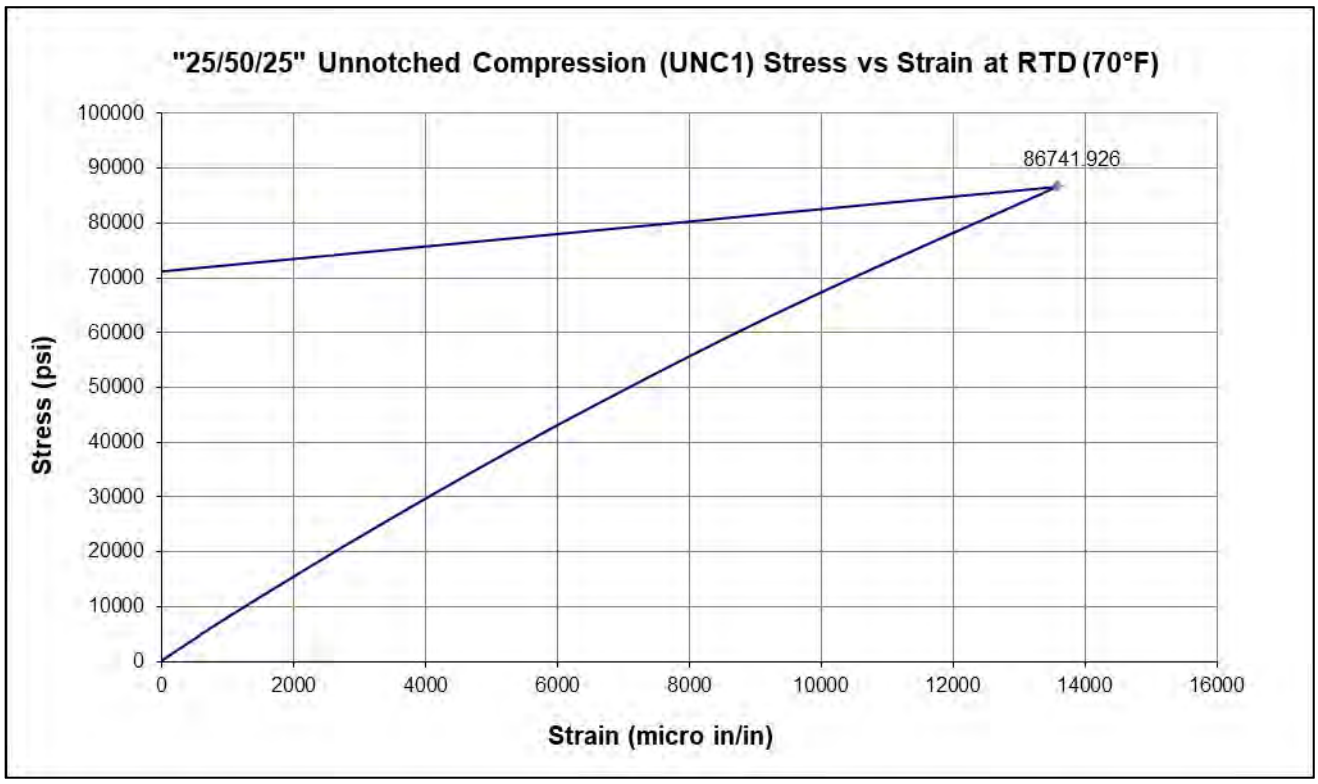


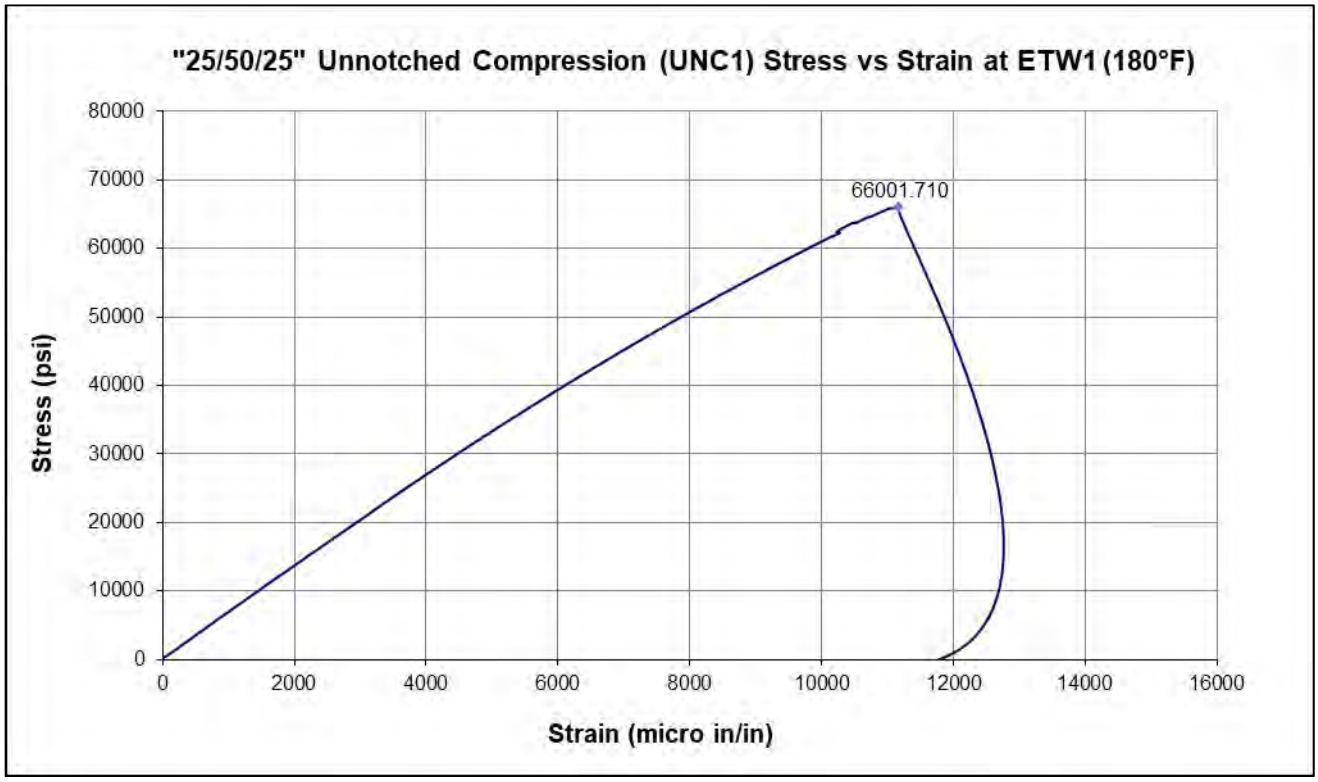

"40/20/40" Unnotched Tension (UNT3) Stress vs Strain at ETW1 (180°F)
Extensometer was removed
Stress (psi)
80000
70000
60000
50000
40000
30000
20000
10000
0
0
1000
2000
3000
4000
5000
6000
7000
8000
Strain (micro in/in)

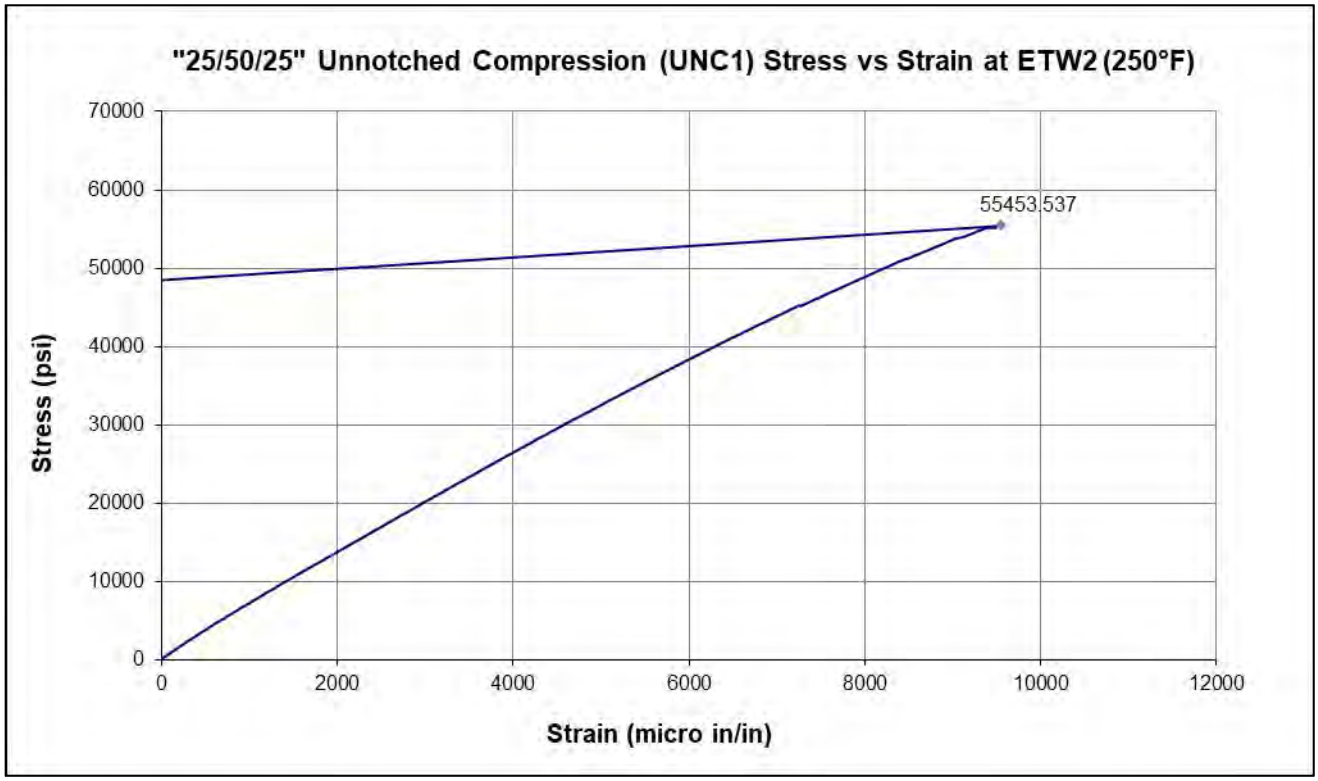

"40/20/40" Unnotched Tension (UNT3) Stress vs Strain at ETW2 (250°F)
Extensometer was removed
Stress (psi)
60000
50000
40000
30000
20000
10000
0
0
1000
2000
3000
4000
5000
6000
Strain (micro in/in)

6.9 “25/50/25” Unnotched Compression 1 (UNC1)

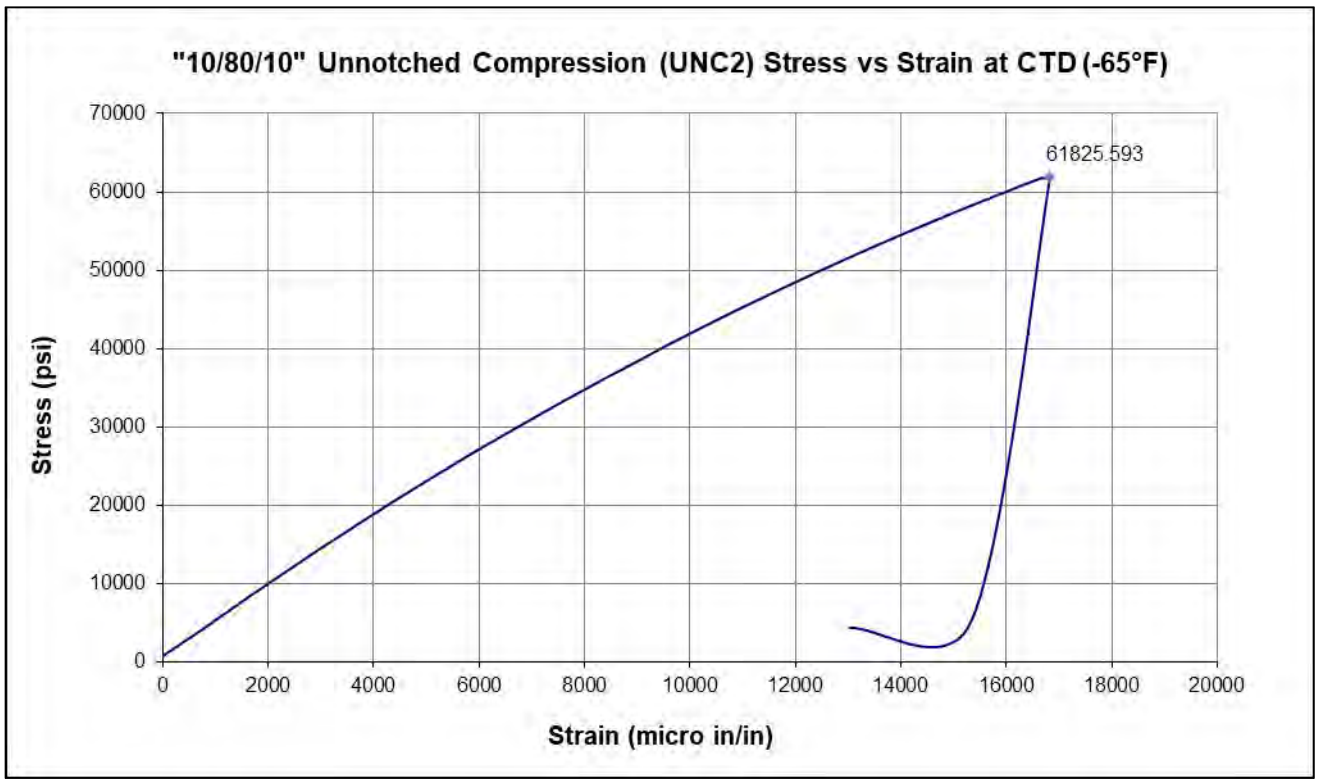


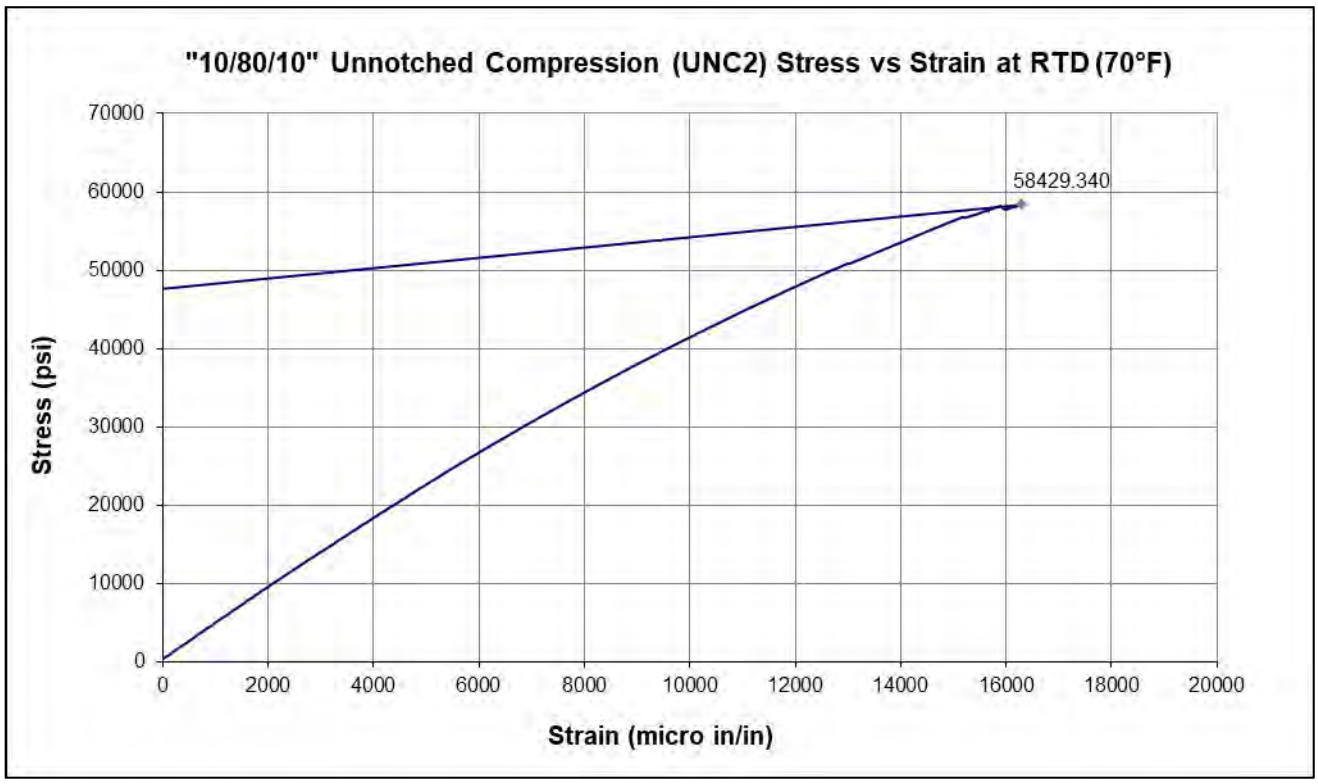


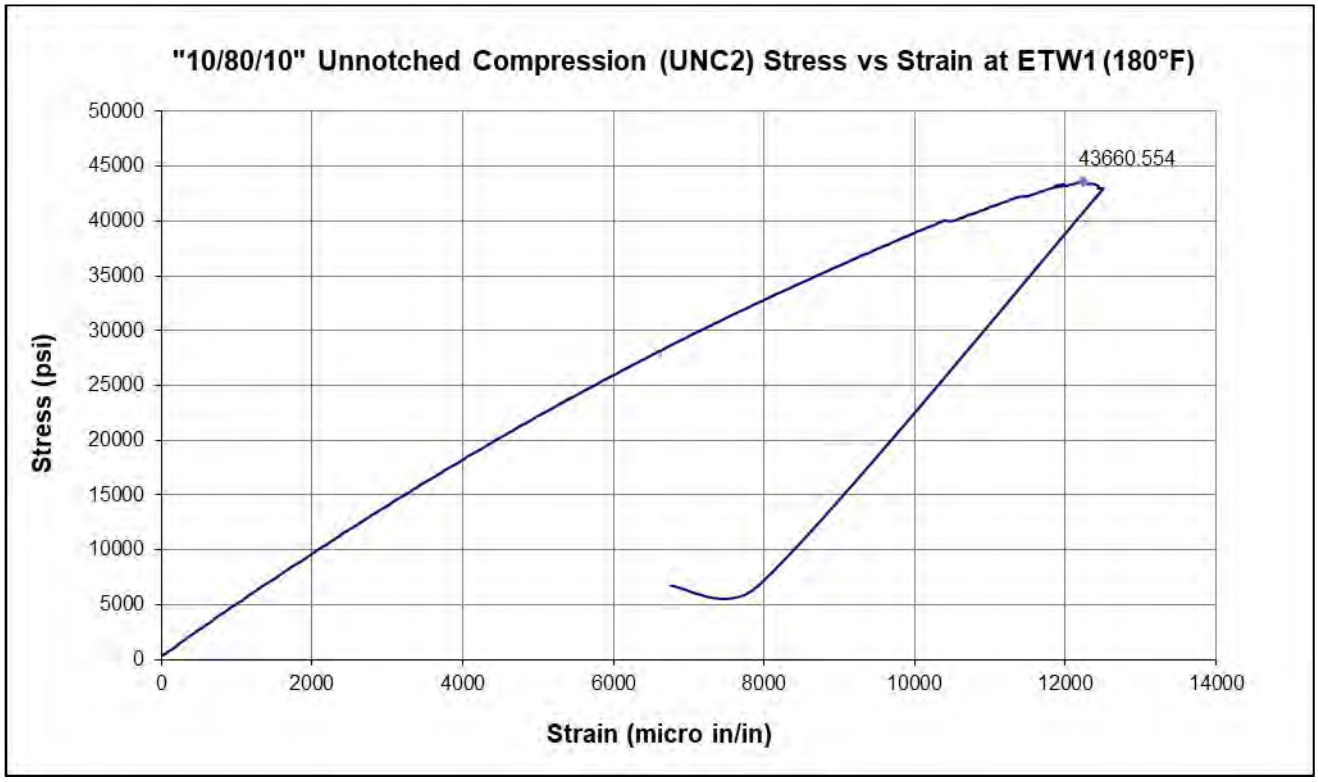

"25/50/25" Unnotched Compression (UNC1) Stress vs Strain at ETW1 (180°F)
Stress (psi)
80000
70000
60000
50000
40000
30000
20000
10000
0
66001.710
0
2000
4000
6000
8000
10000
12000
14000
16000
Strain (micro in/in)

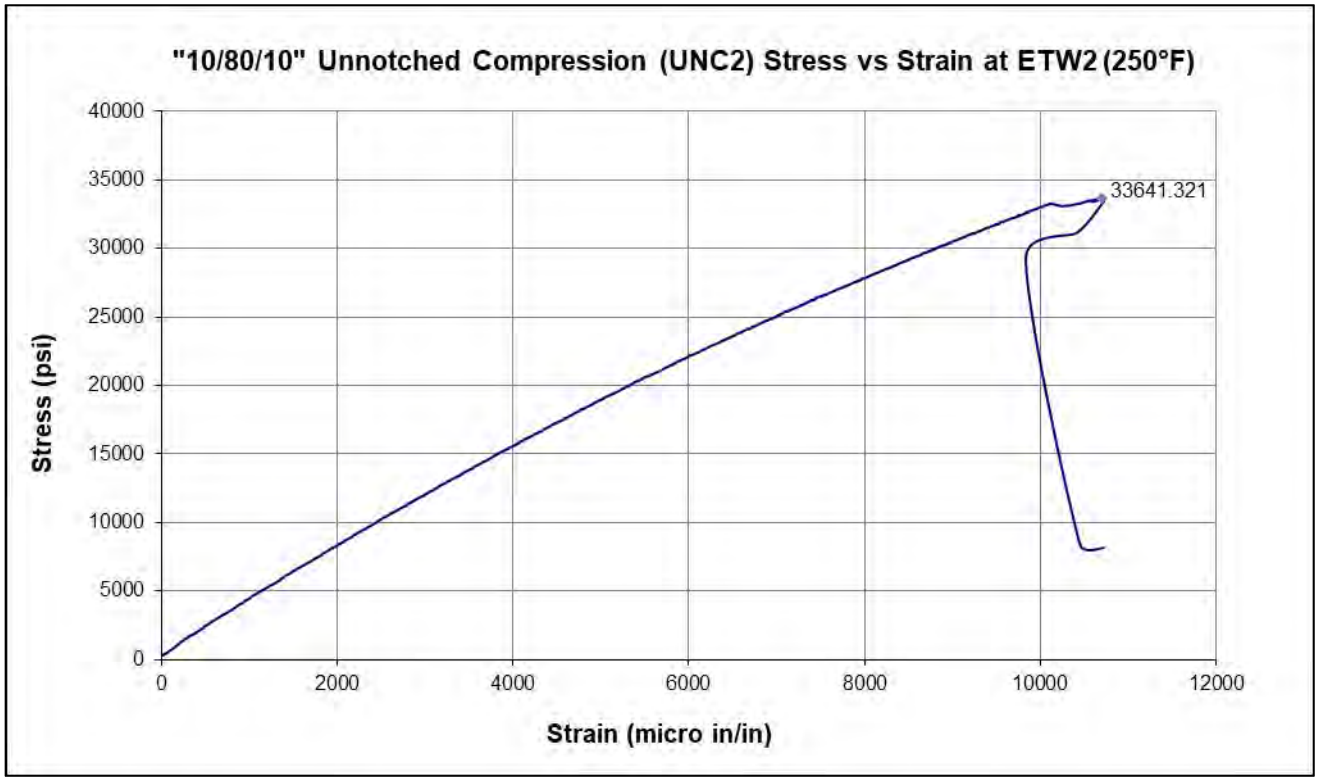

"25/50/25" Unnotched Compression (UNC1) Stress vs Strain at ETW2 (250°F)
Stress (psi)
70000
60000
50000
40000
30000
20000
10000
0
55453.537
0
2000
4000
6000
8000
10000
12000
Strain (micro in/in)

6.10 “10/80/10” Unnotched Compression 2 (UNC2)

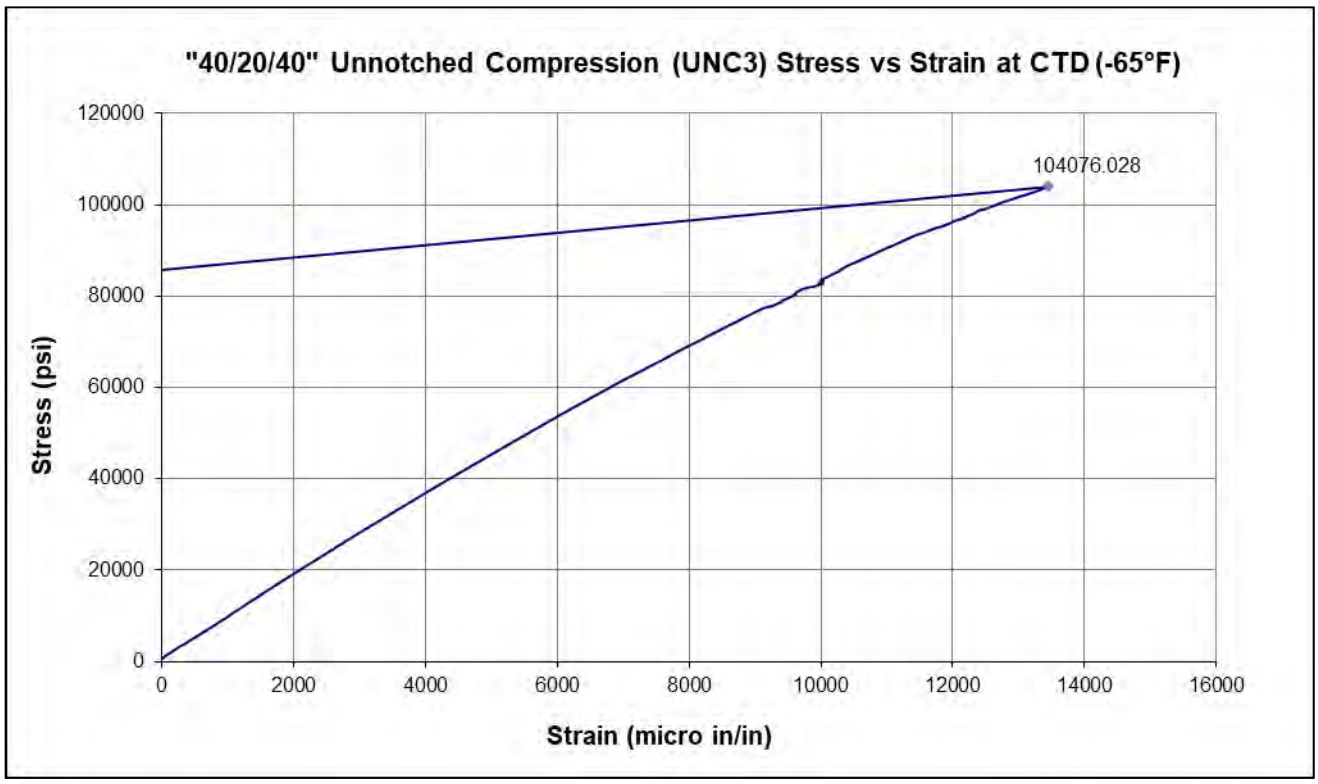


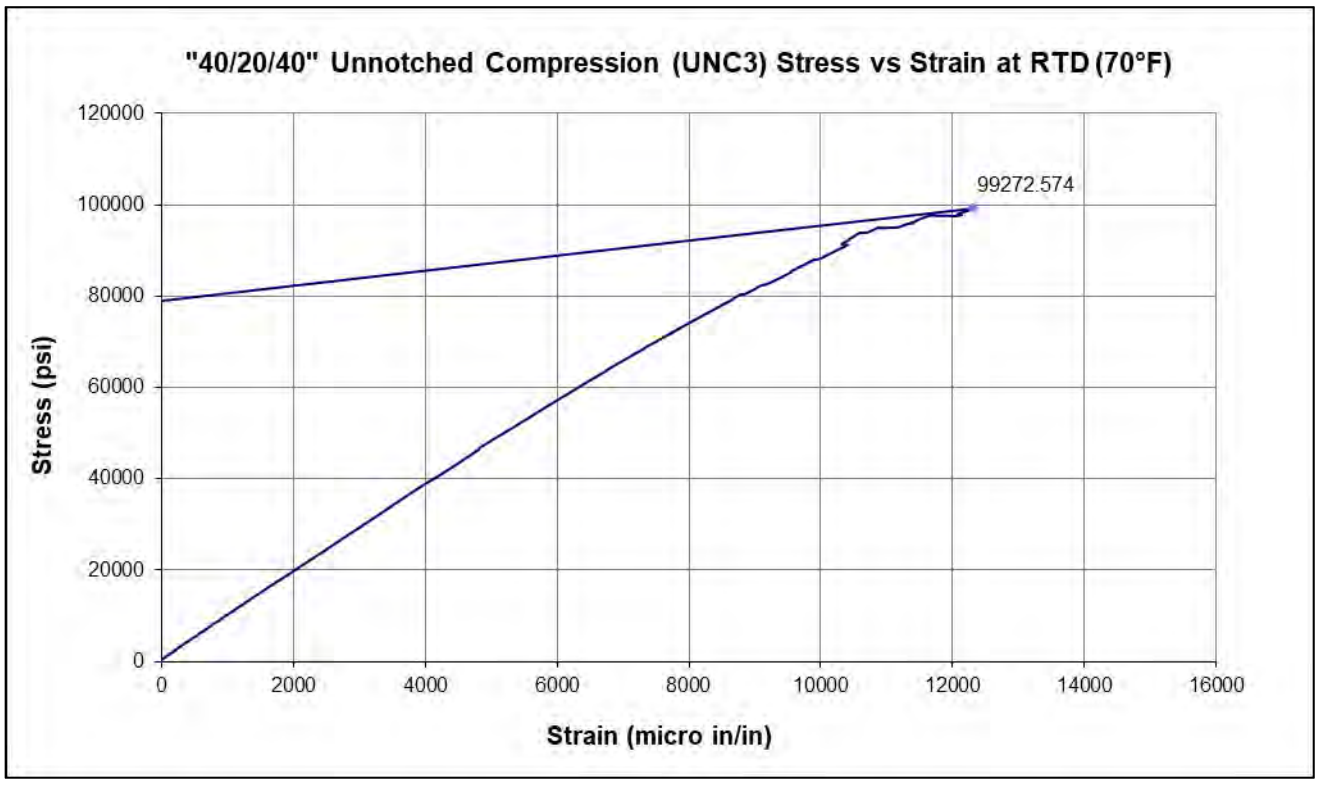


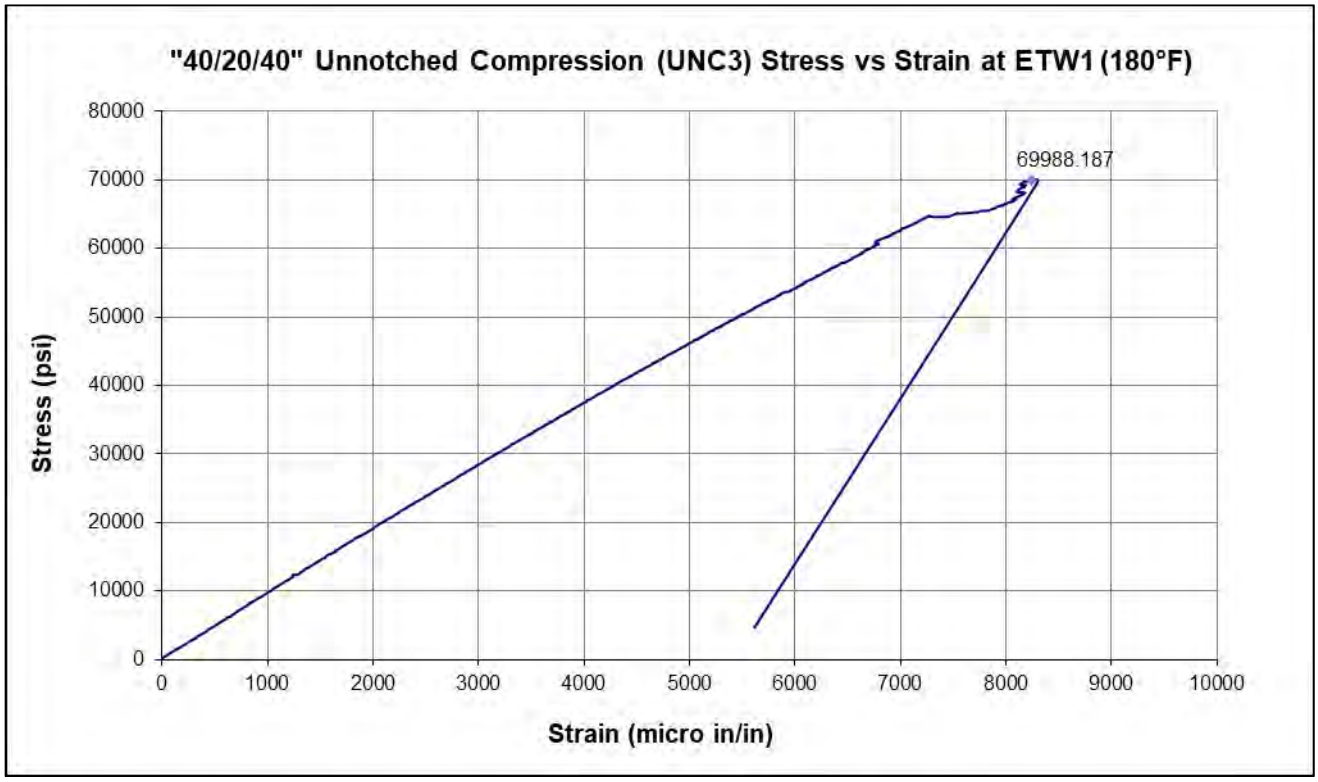

"10/80/10" Unnotched Compression (UNC2) Stress vs Strain at ETW1 (180°F)
Stress (psi)
Strain (micro in/in)
43660.554
50000
45000
40000
35000
30000
25000
20000
15000
10000
5000
0
0
2000
4000
6000
8000
10000
12000
14000

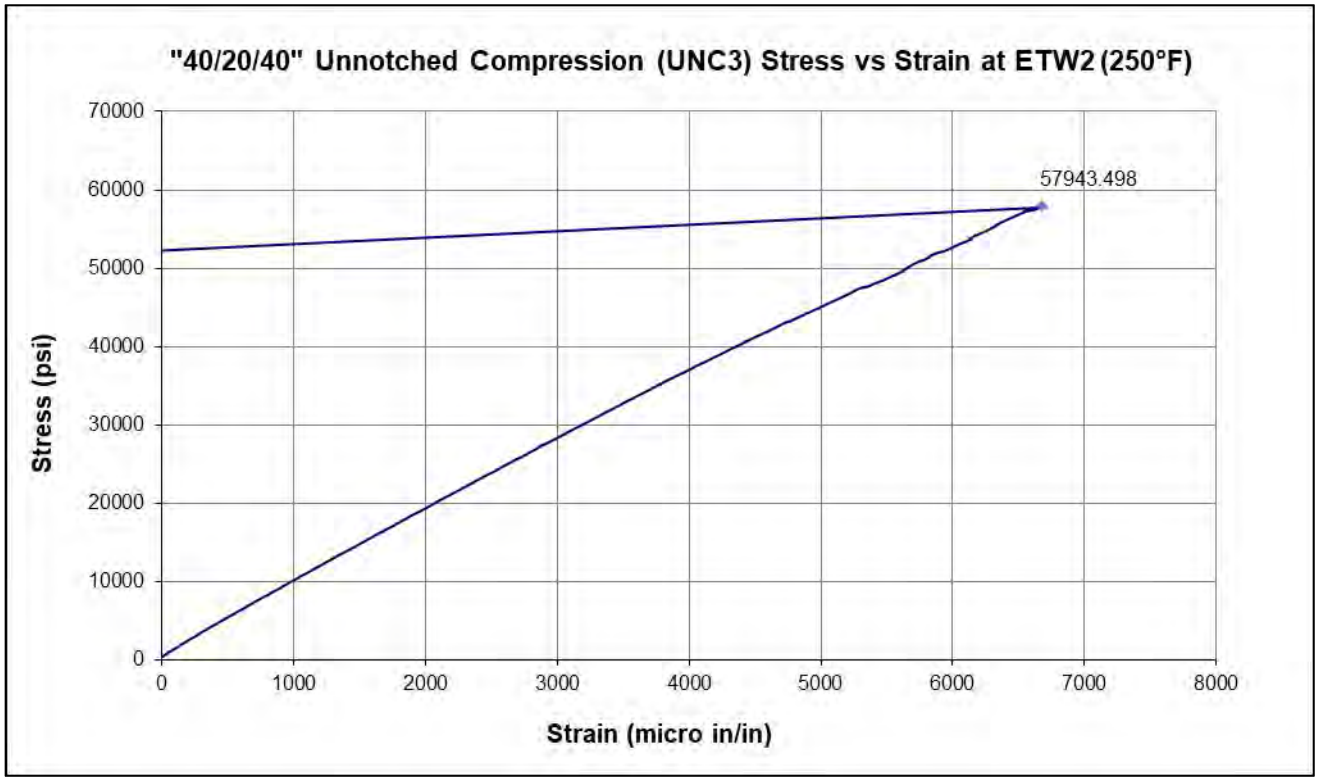

"10/80/10" Unnotched Compression (UNC2) Stress vs Strain at ETW2 (250°F)
Stress (psi)
Strain (micro in/in)
33641.321
40000
35000
30000
25000
20000
15000
10000
5000
0
0
2000
4000
6000
8000
10000
12000

6.11 "40/20/40" Unnotched Compression 3 (UNC3)






"40/20/40" Unnotched Compression (UNC3) Stress vs Strain at ETW1 (180°F)
69988.187
Stress (psi)
80000
70000
60000
50000
40000
30000
20000
10000
0
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
Strain (micro in/in)

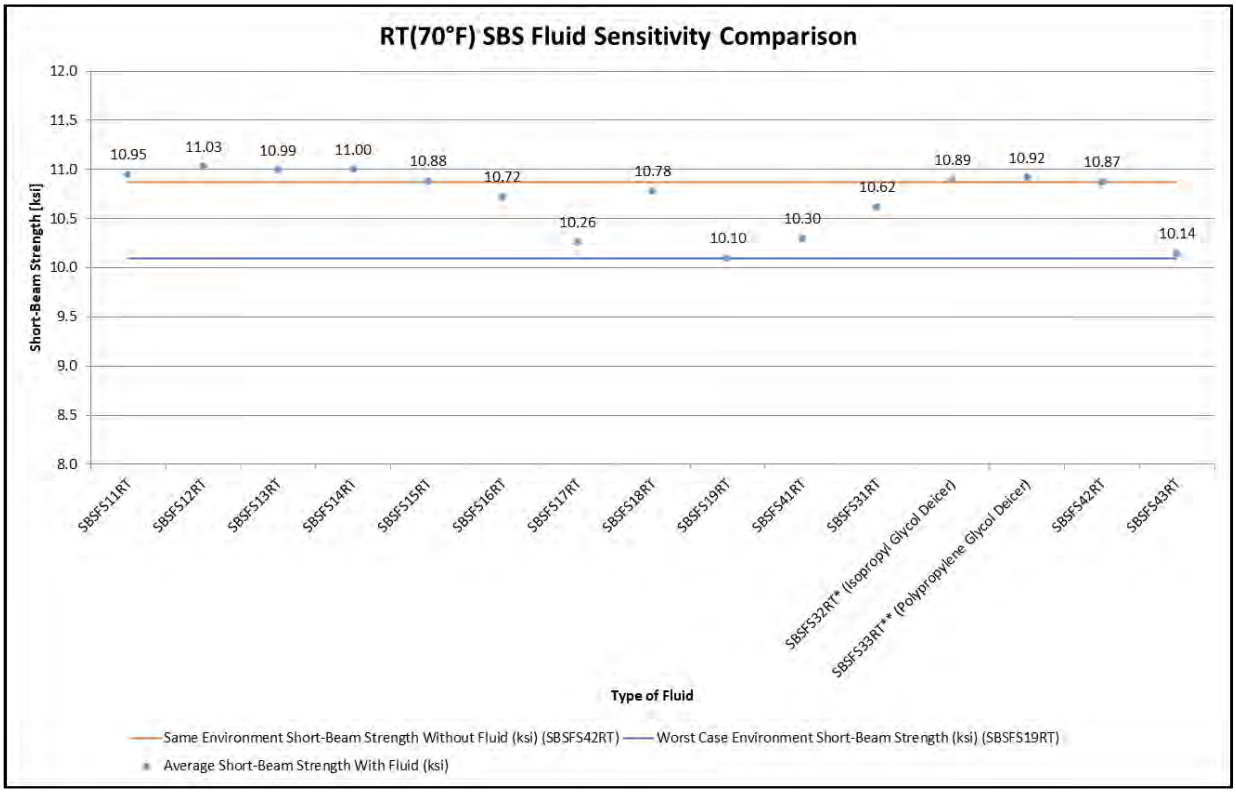

"40/20/40" Unnotched Compression (UNC3) Stress vs Strain at ETW2 (250°F)
57943.498
Stress (psi)
70000
60000
50000
40000
30000
20000
10000
0
0
1000
2000
3000
4000
5000
6000
7000
8000
Strain (micro in/in)

7. Fluid Sensitivity Comparison

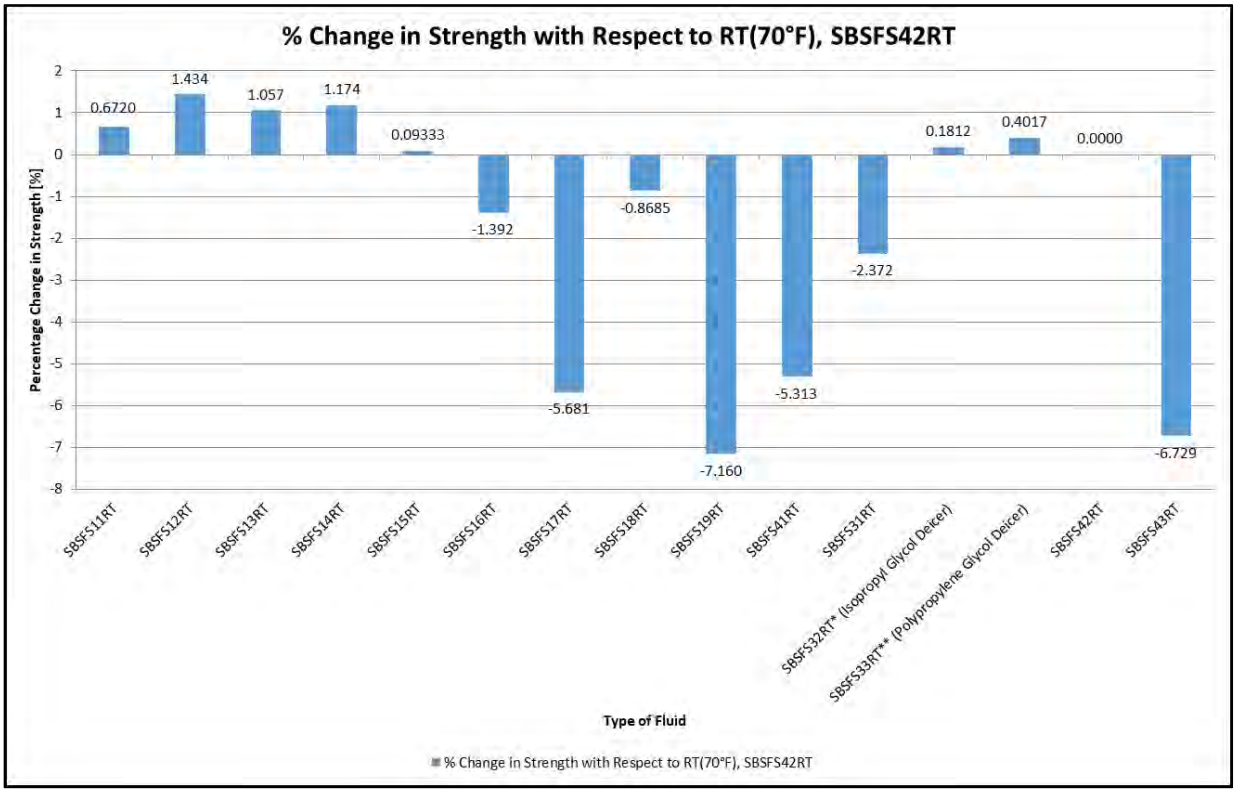
7.1 Short Beam Strength Fluid Sensitivity (SBSFS)

7.1.1 SBSFS Room Temperature Test Data

Code	Type of Fluid	Exposure
SBSFS11RT	100 Low Lead Fuel	90 days min @ 70°F±10°F
SBSFS12RT	Jet A Fuel	
SBSFS13RT	MIL-PRF-5606 Hydraulic Oil	
SBSFS14RT	MIL-PRF-83282 Hydraulic Oil	
SBSFS15RT	MIL-PRF-7808 Engine Oil	
SBSFS16RT	MIL-PRF-23699 Engine Oil	
SBSFS17RT	Sea Water	
SBSFS18RT	Skydrol LD-4	
SBSFS19RT	50% Water with 50% Skydrol LD-4	
SBSFS41RT	Distilled Water	
SBSFS31RT	MEK washing fluid	90 mins @ 70°F±10°F
SBSFS32RT	Polypropylene Glycol Deicer (Type I) SAE AMS 1424	
SBSFS33RT	Isopropyl Alcohol Deicing	48±4 hrs @ 70°F±10°F
SBSFS42RT	Dry	Per section 6.1 Test Plan NTP 3801Q1
SBSFS43RT	85% Relative Humidity	Per section 6.1 Test Plan NTP 3801Q1



*SBSFS32RT - Deviated from test plan NTP 3801Q1 Rev E, specimens were soaked in Isopropyl Alcohol Deicing for 48 hours.
**SBSFS33RT - Deviated from test plan NTP 3801Q1 Rev E, specimens were soaked in Polypropylene Glycol Deicer for 90 minutes.



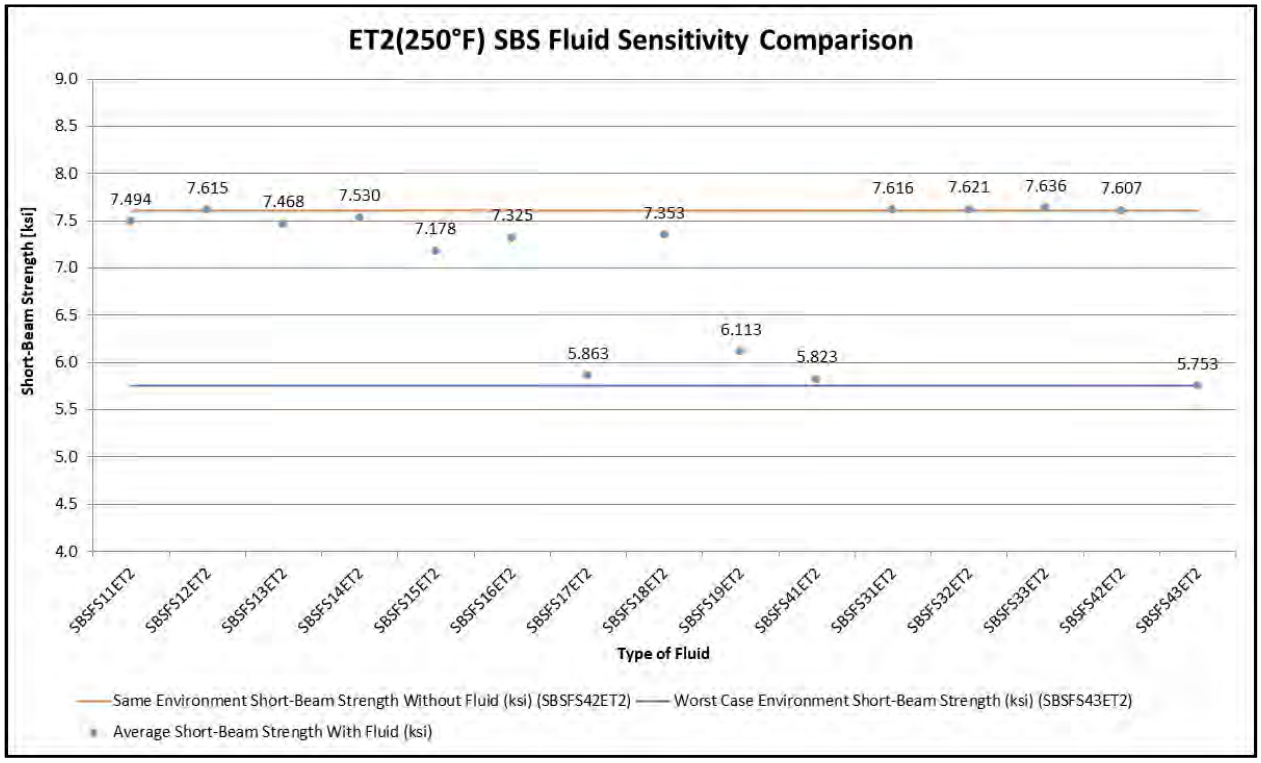
Fluid Sensitivity Screening
Short Beam Strength Properties (SBSFS)--RT(70°F) Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

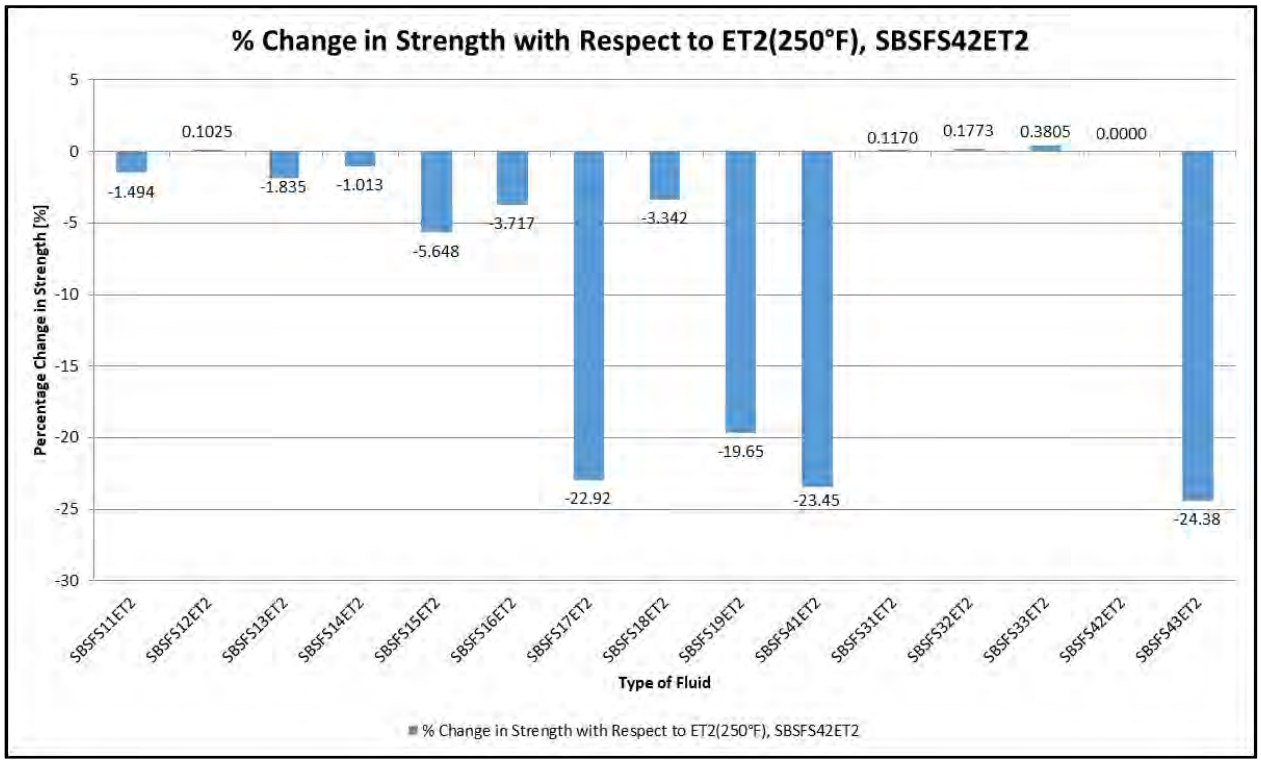
Fluid Code	Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]	Average Strength [ksi]	Failure Mode
SBSFS11RT	TCEQA111FS11RT	A	C1	1	1	10.96	0.1767	22	0.008033	10.95	ILS
	TCEQA112FS11RT	A	C1	1	1	10.91	0.1799	22	0.008175		ILS
	TCEQA113FS11RT	A	C1	1	1	11.24	0.1823	22	0.008286		ILS
	TCEQA114FS11RT	A	C1	1	1	10.88	0.1825	22	0.008296		ILS
	TCEQA115FS11RT	A	C1	1	1	10.95	0.1825	22	0.008296		ILS
	TCEQA116FS11RT	A	C1	1	1	10.74	0.1826	22	0.008298		ILS
SBSFS12RT	TCEQA111FS12RT	A	C1	1	1	10.86	0.1822	22	0.008283	11.03	ILS
	TCEQA112FS12RT	A	C1	1	1	11.05	0.1827	22	0.008305		ILS
	TCEQA114FS12RT	A	C1	1	1	11.19	0.1793	22	0.008151		ILS
	TCEQA115FS12RT	A	C1	1	1	10.95	0.1789	22	0.008132		ILS
	TCEQA116FS12RT	A	C1	1	1	11.09	0.1824	22	0.008291		ILS
SBSFS13RT	TCEQA111FS13RT	A	C1	1	1	10.85	0.1959	22	0.008902	10.99	ILS
	TCEQA112FS13RT	A	C1	1	1	11.14	0.1841	22	0.008368		ILS
	TCEQA113FS13RT	A	C1	1	1	11.06	0.1842	22	0.008374		ILS
	TCEQA115FS13RT	A	C1	1	1	10.89	0.1852	22	0.008418		ILS
	TCEQA116FS13RT	A	C1	1	1	10.98	0.1857	22	0.008442		ILS
	TCEQA117FS13RT	A	C1	1	1	11.02	0.1849	22	0.008402		ILS
SBSFS14RT	TCEQA111FS14RT	A	C1	1	1	11.07	0.1883	22	0.008558	11.00	ILS
	TCEQA112FS14RT	A	C1	1	1	11.16	0.1881	22	0.008549		ILS
	TCEQA113FS14RT	A	C1	1	1	11.00	0.1883	22	0.008558		ILS
	TCEQA114FS14RT	A	C1	1	1	10.86	0.1879	22	0.008539		ILS
	TCEQA115FS14RT	A	C1	1	1	10.92	0.1872	22	0.008510		ILS
SBSFS15RT	TCEQA111FS15RT	A	C1	1	1	10.72	0.1906	22	0.008661	10.88	ILS
	TCEQA112FS15RT	A	C1	1	1	10.91	0.1917	22	0.008715		ILS
	TCEQA113FS15RT	A	C1	1	1	11.01	0.1917	22	0.008714		ILS
	TCEQA114FS15RT	A	C1	1	1	10.78	0.1912	22	0.008689		ILS
	TCEQA115FS15RT	A	C1	1	1	11.01	0.1910	22	0.008682		ILS
SBSFS16RT	TCEQA111FS16RT	A	C1	1	1	10.79	0.1904	22	0.008655	10.72	ILS
	TCEQA112FS16RT	A	C1	1	1	11.04	0.1870	22	0.008502		ILS
	TCEQA114FS16RT	A	C1	1	1	10.44	0.1890	22	0.008592		ILS
	TCEQA115FS16RT	A	C1	1	1	11.02	0.1920	22	0.008725		ILS
	TCEQA116FS16RT	A	C1	1	1	10.33	0.1943	22	0.008831		ILS
SBSFS17RT	TCEQA111FS17RT	A	C1	1	1	10.16	0.1928	22	0.008763	10.26	ILS
	TCEQA112FS17RT	A	C1	1	1	10.31	0.1942	22	0.008828		ILS
	TCEQA113FS17RT	A	C1	1	1	10.12	0.1946	22	0.008847		ILS
	TCEQA114FS17RT	A	C1	1	1	10.17	0.1945	22	0.008841		ILS
	TCEQA115FS17RT	A	C1	1	1	10.51	0.1934	22	0.008792		ILS
SBSFS18RT	TCEQA111FS18RT	A	C1	1	1	10.91	0.1950	22	0.008864	10.78	ILS
	TCEQA112FS18RT	A	C1	1	1	10.67	0.1952	22	0.008873		ILS
	TCEQA113FS18RT	A	C1	1	1	10.94	0.1949	22	0.008861		ILS
	TCEQA114FS18RT	A	C1	1	1	10.55	0.1947	22	0.008849		ILS
	TCEQA115FS18RT	A	C1	1	1	10.83	0.1950	22	0.008863		ILS
SBSFS19RT	TCEQA111FS19RT	A	C1	1	1	10.15	0.1981	22	0.009004	10.10	ILS
	TCEQA112FS19RT	A	C1	1	1	10.30	0.1977	22	0.008986		ILS
	TCEQA113FS19RT	A	C1	1	1	10.20	0.1975	22	0.008977		ILS
	TCEQA114FS19RT	A	C1	1	1	10.01	0.1973	22	0.008967		ILS
	TCEQA115FS19RT	A	C1	1	1	9.817	0.1970	22	0.008954		ILS
SBSFS41RT	TCEQA111FS41RT	A	C1	1	1	10.41	0.1999	22	0.009088	10.30	ILS
	TCEQA112FS41RT	A	C1	1	1	10.31	0.1993	22	0.009059		ILS
	TCEQA113FS41RT	A	C1	1	1	10.19	0.1995	22	0.009069		ILS
	TCEQA114FS41RT	A	C1	1	1	10.17	0.1988	22	0.009037		ILS
	TCEQA115FS41RT	A	C1	1	1	10.40	0.1990	22	0.009045		ILS
SBSFS31RT	TCEQA113FS31RT	A	C1	1	1	10.59	0.1974	22	0.008974	10.62	ILS
	TCEQA114FS31RT	A	C1	1	1	10.65	0.1990	22	0.009047		ILS
	TCEQA115FS31RT	A	C1	1	1	10.69	0.1992	22	0.009055		ILS
	TCEQA116FS31RT	A	C1	1	1	10.69	0.1985	22	0.009023		ILS
	TCEQA117FS31RT	A	C1	1	1	10.46	0.1981	22	0.009006		ILS
SBSFS32RT* (Isopropyl Glycol Deicer)	TCEQA111FS32RT*	A	C1	1	1	10.67	0.1992	22	0.009056	10.89	ILS
	TCEQA112FS32RT*	A	C1	1	1	11.21	0.1995	22	0.009067		ILS
	TCEQA113FS32RT*	A	C1	1	1	10.64	0.1976	22	0.008980		ILS
	TCEQA115FS32RT*	A	C1	1	1	10.81	0.1870	22	0.008498		ILS
	TCEQA116FS32RT*	A	C1	1	1	11.14	0.1932	22	0.008780		ILS
SBSFS33RT** (Polypropylene Glycol Deicer)	TCEQA111FS33RT	A	C1	1	1	11.15	0.1979	22	0.008993	10.92	ILS
	TCEQA112FS33RT	A	C1	1	1	11.11	0.1979	22	0.008995		ILS
	TCEQA113FS33RT	A	C1	1	1	10.95	0.1990	22	0.009045		ILS
	TCEQA114FS33RT	A	C1	1	1	10.57	0.1998	22	0.009082		ILS
	TCEQA115FS33RT	A	C1	1	1	10.82	0.1995	22	0.009070		ILS
SBSFS42RT	TCEQA111FS42RT	A	C1	1	1	10.68	0.1984	22	0.009017	10.87	ILS, COMPRESSION
	TCEQA112FS42RT	A	C1	1	1	11.02	0.2005	22	0.009111		ILS, COMPRESSION
	TCEQA113FS42RT	A	C1	1	1	11.03	0.2011	22	0.009142		ILS, COMPRESSION
	TCEQA114FS42RT	A	C1	1	1	10.89	0.2005	22	0.009113		ILS, COMPRESSION
	TCEQA115FS42RT	A	C1	1	1	10.75	0.1998	22	0.009080		ILS, COMPRESSION
SBSFS43RT	TCEQA111FS43RT	A	C1	1	1	9.982	0.1983	22	0.009012	10.14	ILS
	TCEQA112FS43RT	A	C1	1	1	10.03	0.1943	22	0.008833		ILS
	TCEQA115FS43RT	A	C1	1	1	10.51	0.1980	22	0.009002		ILS
	TCEQA116FS43RT	A	C1	1	1	10.19	0.2000	22	0.009092		ILS
	TCEQA117FS43RT	A	C1	1	1	10.00	0.2004	22	0.009110		ILS

*SBSFS32RT - Deviated from test plan NTP 3801Q1 Rev E, specimens were soaked in Isopropyl Alcohol Deicing for 48 hours.
**SBSFS33RT - Deviated from test plan NTP 3801Q1 Rev E, specimens were soaked in Polypropylene Glycol Deicer for 90 minutes.

7.1.2 SBSFS Elevated Temperature Test Data

Code	Type of Fluid	Exposure
SBSFS11ET2	100 Low lead Fuel	90 days min @ 70°F±10°F
SBSFS12ET2	Jet A Fuel	
SBSFS13ET2	MIL-PRF-5606 Hydraulic Oil	
SBSFS14ET2	MIL-PRF-83282 Hydraulic Oil	
SBSFS15ET2	MIL-PRF-7808 Engine Oil	
SBSFS16ET2	MIL-PRF-23699 Engine Oil	
SBSFS17ET2	Sea Water	
SBSFS18ET2	Skydrol LD-4	
SBSFS19ET2	50% Water with 50% Skydrol LD-4	
SBSFS41ET2	Distilled Water	
SBSFS31ET2	MEK washing fluid	90 mins @ 70°F±10°F
SBSFS32ET2	Polypropylene Glycol Deicer (Type I) SAE AMS 1424	
SBSFS33ET2	Isopropyl Alcohol Deicing	48±4 hrs @ 70°F±10°F
SBSFS42ET2	Dry	Per section 6.1 Test Plan NTP 3801Q1
SBSFS43ET2	85% Relative Humidity	Per section 6.1 Test Plan NTP 3801Q1

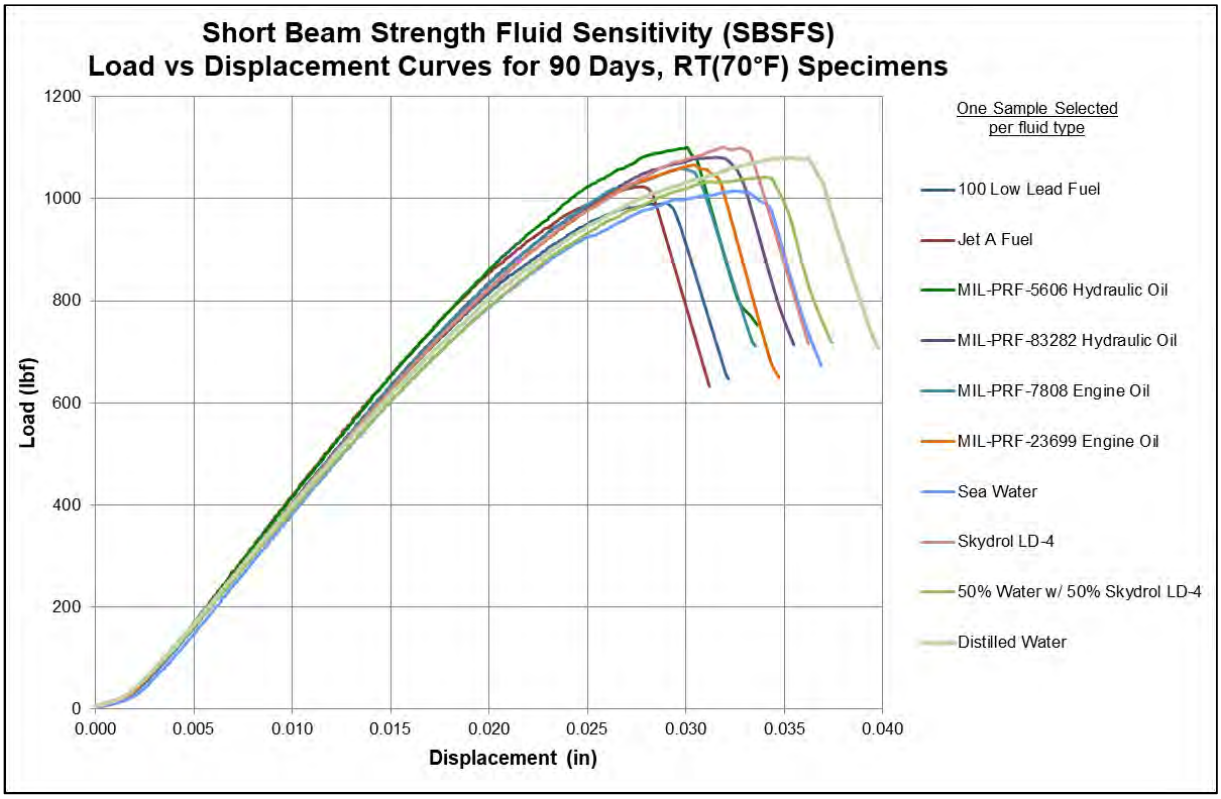

ET2(250°F) SBS Fluid Sensitivity Comparison
Short-Beam Strength [ksi]
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
7.494
7.615
7.468
7.530
7.178
7.325
7.353
5.863
6.113
5.823
7.616
7.621
7.636
7.607
5.753
SBSFS11ET2
SBSFS12ET2
SBSFS13ET2
SBSFS14ET2
SBSFS15ET2
SBSFS16ET2
SBSFS17ET2
SBSFS18ET2
SBSFS19ET2
SBSFS41ET2
SBSFS31ET2
SBSFS32ET2
SBSFS33ET2
SBSFS42ET2
SBSFS43ET2
Type of Fluid
Same Environment Short-Beam Strength Without Fluid (ksi) (SBSFS42ET2)
Worst Case Environment Short-Beam Strength (ksi) (SBSFS43ET2)
Average Short-Beam Strength With Fluid (ksi)

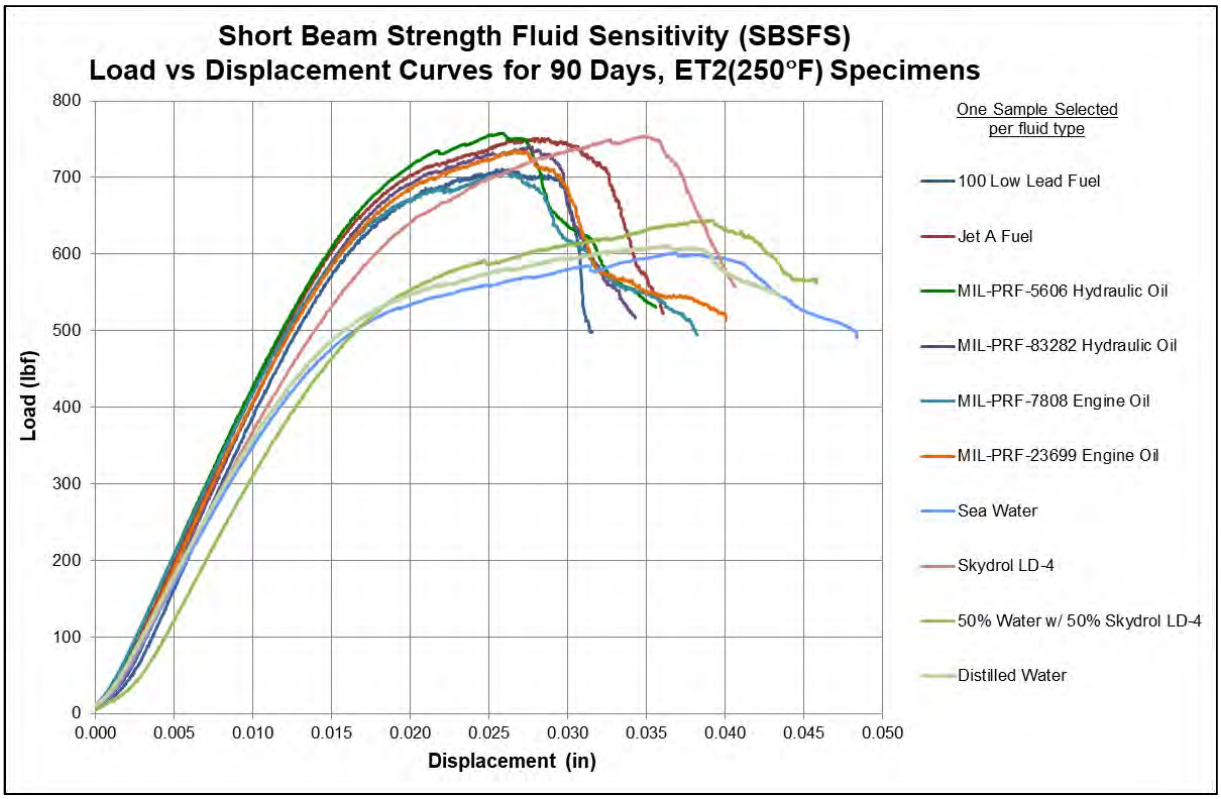

% Change in Strength with Respect to ET2(250°F), SBSFS42ET2
Percentage Change in Strength [%]
5
0
-5
-10
-15
-20
-25
-30
-1.494
0.1025
-1.835
-1.013
-5.648
-3.717
-22.92
-3.342
-19.65
-23.45
0.1170
0.1773
0.3805
0.0000
-24.38
SBSFS11ET2
SBSFS12ET2
SBSFS13ET2
SBSFS14ET2
SBSFS15ET2
SBSFS16ET2
SBSFS17ET2
SBSFS18ET2
SBSFS19ET2
SBSFS41ET2
SBSFS31ET2
SBSFS32ET2
SBSFS33ET2
SBSFS42ET2
SBSFS43ET2
Type of Fluid
% Change in Strength with Respect to ET2(250°F), SBSFS42ET2

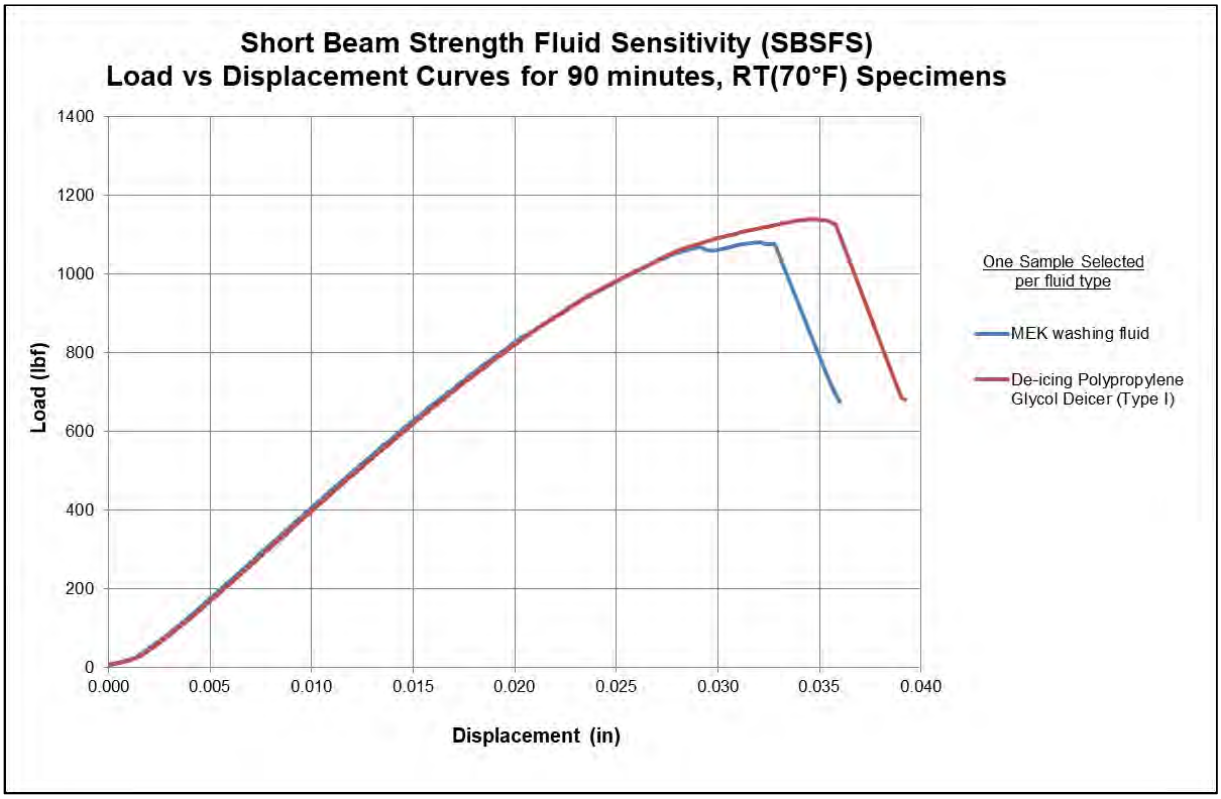
Fluid Sensitivity Screening
Short Beam Strength Properties (SBSFS)--ET2(250°F)Strength
Toray Advanced Composites TC380 T800HB 6K 2x2 Twill 200gsm with 40%RC prepreg

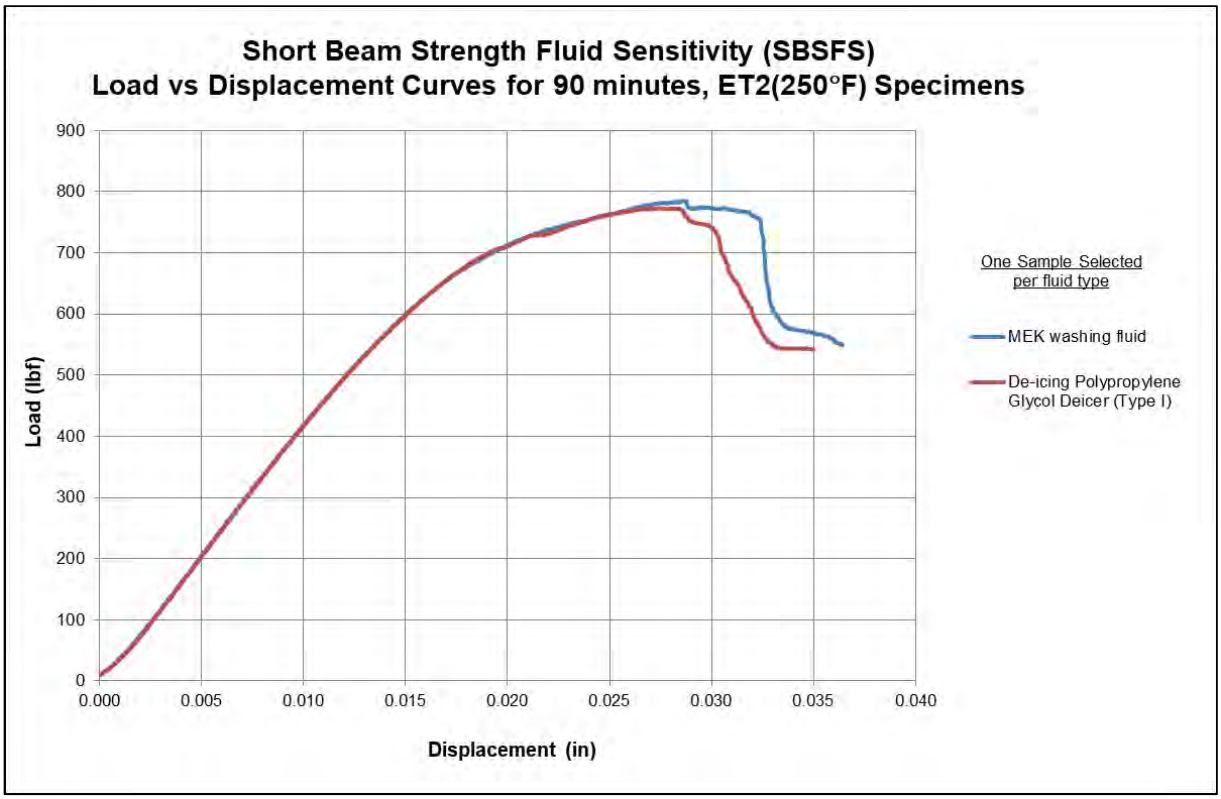
Fluid Code	Specimen Number	Toray Batch #	NIAR Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]	Average Strength [ksi]	Failure Mode
	TCEQA111FS11ET2	A	C1	1	1	7.627	0.1823	22	0.008286		ILS, INELEASTIC DEFORMATION
	TCEQA112FS11ET2	A	C1	1	1	7.271	0.1820	22	0.008273		ILS, INELEASTIC DEFORMATION
SBSFS11ET2	TCEQA113FS11ET2	A	C1	1	1	7.562	0.1820	22	0.008274	7.494	ILS, INELEASTIC DEFORMATION
	TCEQA116FS11ET2	A	C1	1	1	7.541	0.1811	22	0.008233		ILS, INELEASTIC DEFORMATION
	TCEQA117FS11ET2	A	C1	1	1	7.468	0.1817	22	0.008258		ILS, INELEASTIC DEFORMATION
	TCEQA111FS12ET2	A	C1	1	1	7.824	0.1859	22	0.008449		ILS, INELEASTIC DEFORMATION
	TCEQA112FS12ET2	A	C1	1	1	7.561	0.1856	22	0.008436		ILS, INELEASTIC DEFORMATION
SBSFS12ET2	TCEQA113FS12ET2	A	C1	1	1	7.464	0.1854	22	0.008427	7.615	ILS, INELEASTIC DEFORMATION
	TCEQA114FS12ET2	A	C1	1	1	7.626	0.1962	22	0.008920		ILS, INELEASTIC DEFORMATION
	TCEQA115FS12ET2	A	C1	1	1	7.601	0.1962	22	0.008918		ILS, INELEASTIC DEFORMATION
	TCEQA112FS13ET2	A	C1	1	1	7.420	0.1976	22	0.008980		ILS, INELEASTIC DEFORMATION
	TCEQA113FS13ET2	A	C1	1	1	7.372	0.1979	22	0.008995		ILS, INELEASTIC DEFORMATION
SBSFS13ET2	TCEQA115FS13ET2	A	C1	1	1	7.721	0.1891	22	0.008596	7.468	ILS, INELEASTIC DEFORMATION
	TCEQA116FS13ET2	A	C1	1	1	7.725	0.1889	22	0.008586		ILS, INELEASTIC DEFORMATION
	TCEQA117FS13ET2	A	C1	1	1	7.102	0.1979	22	0.008993		ILS, INELEASTIC DEFORMATION
	TCEQA111FS14ET2	A	C1	1	1	7.613	0.1873	22	0.008514		ILS, INELEASTIC DEFORMATION
	TCEQA112FS14ET2	A	C1	1	1	7.470	0.1888	22	0.008582		ILS, INELEASTIC DEFORMATION
SBSFS14ET2	TCEQA113FS14ET2	A	C1	1	1	7.468	0.1891	22	0.008597	7.530	ILS, INELEASTIC DEFORMATION
	TCEQA114FS14ET2	A	C1	1	1	7.440	0.1879	22	0.008540		ILS, INELEASTIC DEFORMATION
	TCEQA115FS14ET2	A	C1	1	1	7.661	0.1848	22	0.008400		ILS, INELEASTIC DEFORMATION
	TCEQA111FS15ET2	A	C1	1	1	7.155	0.1906	22	0.008665		ILS, INELEASTIC DEFORMATION
	TCEQA112FS15ET2	A	C1	1	1	7.142	0.1900	22	0.008634		ILS, INELEASTIC DEFORMATION
SBSFS15ET2	TCEQA113FS15ET2	A	C1	1	1	7.234	0.1897	22	0.008624	7.178	ILS, INELEASTIC DEFORMATION
	TCEQA114FS15ET2	A	C1	1	1	7.169	0.1904	22	0.008655		ILS, INELEASTIC DEFORMATION
	TCEQA115FS15ET2	A	C1	1	1	7.189	0.1910	22	0.008683		ILS, INELEASTIC DEFORMATION
	TCEQA111FS16ET2	A	C1	1	1	7.318	0.1936	22	0.008801		ILS, INELEASTIC DEFORMATION
	TCEQA112FS16ET2	A	C1	1	1	7.328	0.1932	22	0.008780		ILS, INELEASTIC DEFORMATION
SBSFS16ET2	TCEQA113FS16ET2	A	C1	1	1	7.381	0.1932	22	0.008783	7.325	ILS, INELEASTIC DEFORMATION
	TCEQA114FS16ET2	A	C1	1	1	7.298	0.1928	22	0.008764		ILS, INELEASTIC DEFORMATION
	TCEQA115FS16ET2	A	C1	1	1	7.299	0.1926	22	0.008755		ILS, INELEASTIC DEFORMATION
	TCEQA112FS17ET2	A	C1	1	1	5.986	0.1943	22	0.008830		ILS, INELEASTIC DEFORMATION
	TCEQA113FS17ET2	A	C1	1	1	5.870	0.1963	22	0.008922		ILS, INELEASTIC DEFORMATION
SBSFS17ET2	TCEQA114FS17ET2	A	C1	1	1	5.836	0.1962	22	0.008917	5.863	ILS, INELEASTIC DEFORMATION
	TCEQA115FS17ET2	A	C1	1	1	5.860	0.1959	22	0.008905		ILS, INELEASTIC DEFORMATION
	TCEQA116FS17ET2	A	C1	1	1	5.765	0.1958	22	0.008902		ILS, INELEASTIC DEFORMATION
	TCEQA111FS18ET2	A	C1	1	1	7.299	0.1967	22	0.008940		ILS, INELEASTIC DEFORMATION, COMPRESSION
	TCEQA112FS18ET2	A	C1	1	1	7.495	0.1947	22	0.008848		ILS, INELEASTIC DEFORMATION
SBSFS18ET2	TCEQA113FS18ET2	A	C1	1	1	7.354	0.1911	22	0.008687	7.353	ILS, INELEASTIC DEFORMATION
	TCEQA115FS18ET2	A	C1	1	1	7.294	0.1917	22	0.008711		ILS, INELEASTIC DEFORMATION
	TCEQA116FS18ET2	A	C1	1	1	7.324	0.1959	22	0.008905		ILS, INELEASTIC DEFORMATION
	TCEQA111FS19ET2	A	C1	1	1	6.320	0.1968	22	0.008944		ILS, INELEASTIC DEFORMATION
	TCEQA112FS19ET2	A	C1	1	1	6.087	0.1972	22	0.008964		ILS, INELEASTIC DEFORMATION
	TCEQA113FS19ET2	A	C1	1	1	6.206	0.1979	22	0.008995		ILS, INELEASTIC DEFORMATION
SBSFS19ET2	TCEQA114FS19ET2	A	C1	1	1	5.881	0.1990	22	0.009044	6.113	ILS, INELEASTIC DEFORMATION
	TCEQA115FS19ET2	A	C1	1	1	6.070	0.1984	22	0.009019		ILS, INELEASTIC DEFORMATION
	TCEQA116FS19ET2	A	C1	1	1	6.123	0.1971	22	0.008959		ILS, INELEASTIC DEFORMATION
	TCEQA117FS19ET2	A	C1	1	1	6.101	0.1925	22	0.008748		ILS, INELEASTIC DEFORMATION
	TCEQA111FS41ET2	A	C1	1	1	5.863	0.2010	22	0.009136		ILS, INELEASTIC DEFORMATION
	TCEQA112FS41ET2	A	C1	1	1	5.848	0.2009	22	0.009131		ILS, INELEASTIC DEFORMATION
SBSFS41ET2	TCEQA113FS41ET2	A	C1	1	1	5.914	0.2006	22	0.009116	5.823	ILS, INELEASTIC DEFORMATION
	TCEQA114FS41ET2	A	C1	1	1	5.681	0.1986	22	0.009027		ILS, INELEASTIC DEFORMATION
	TCEQA115FS41ET2	A	C1	1	1	5.810	0.1946	22	0.008845		ILS, INELEASTIC DEFORMATION
	TCEQA111FS31ET2	A	C1	1	1	7.670	0.1981	22	0.009003		ILS
	TCEQA112FS31ET2	A	C1	1	1	7.635	0.1976	22	0.008981		ILS
SBSFS31ET2	TCEQA113FS31ET2	A	C1	1	1	7.721	0.1975	22	0.008978	7.616	ILS
	TCEQA114FS31ET2	A	C1	1	1	7.554	0.1976	22	0.008982		ILS
	TCEQA115FS31ET2	A	C1	1	1	7.501	0.1977	22	0.008984		ILS
	TCEQA111FS32ET2	A	C1	1	1	7.505	0.1994	22	0.009062		ILS
	TCEQA112FS32ET2	A	C1	1	1	7.765	0.1998	22	0.009083		ILS
SBSFS32ET2	TCEQA113FS32ET2	A	C1	1	1	7.594	0.1999	22	0.009087	7.621	ILS
	TCEQA114FS32ET2	A	C1	1	1	7.748	0.1989	22	0.009042		ILS
	TCEQA115FS32ET2	A	C1	1	1	7.492	0.1983	22	0.009015		ILS
	TCEQA111FS33ET2	A	C1	1	1	7.885	0.1934	22	0.008789		ILS
	TCEQA114FS33ET2	A	C1	1	1	7.667	0.1975	22	0.008977		ILS
SBSFS33ET2	TCEQA115FS33ET2	A	C1	1	1	7.495	0.1999	22	0.009086	7.636	ILS
	TCEQA116FS33ET2	A	C1	1	1	7.563	0.2004	22	0.009110		ILS
	TCEQA117FS33ET2	A	C1	1	1	7.571	0.1993	22	0.009058		ILS
	TCEQA111FS42ET2	A	C1	1	1	7.719	0.1988	22	0.009035		ILS, COMPRESSION
	TCEQA112FS42ET2	A	C1	1	1	7.740	0.1992	22	0.009055		ILS, COMPRESSION
SBSFS42ET2	TCEQA113FS42ET2	A	C1	1	1	7.705	0.1990	22	0.009046	7.607	ILS, COMPRESSION
	TCEQA114FS42ET2	A	C1	1	1	7.277	0.2016	22	0.009164		ILS, COMPRESSION
	TCEQA115FS42ET2	A	C1	1	1	7.596	0.2022	22	0.009191		ILS, COMPRESSION
	TCEQA111FS43ET2	A	C1	1	1	6.082	0.1998	22	0.009082		ILS, INELEASTIC DEFORMATION, COMPRESSION
	TCEQA112FS43ET2	A	C1	1	1	5.789	0.1996	22	0.009071		ILS, INELEASTIC DEFORMATION
SBSFS43ET2	TCEQA113FS43ET2	A	C1	1	1	5.695	0.1989	22	0.009039	5.753	ILS, INELEASTIC DEFORMATION
	TCEQA114FS43ET2	A	C1	1	1	5.560	0.1988	22	0.009036		ILS, INELEASTIC DEFORMATION
	TCEQA115FS43ET2	A	C1	1	1	5.638	0.1983	22	0.009012		ILS, INELEASTIC DEFORMATION, COMPRESSION

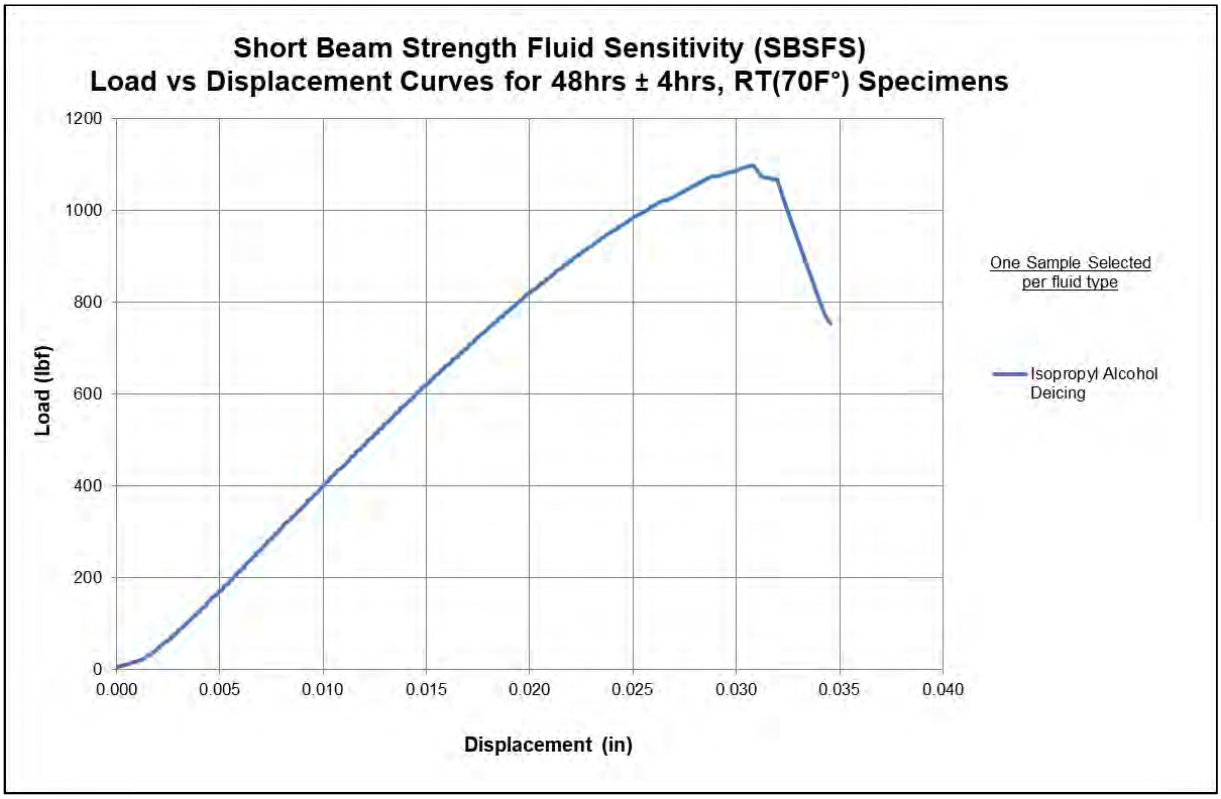
7.2 Load Displacement Curves

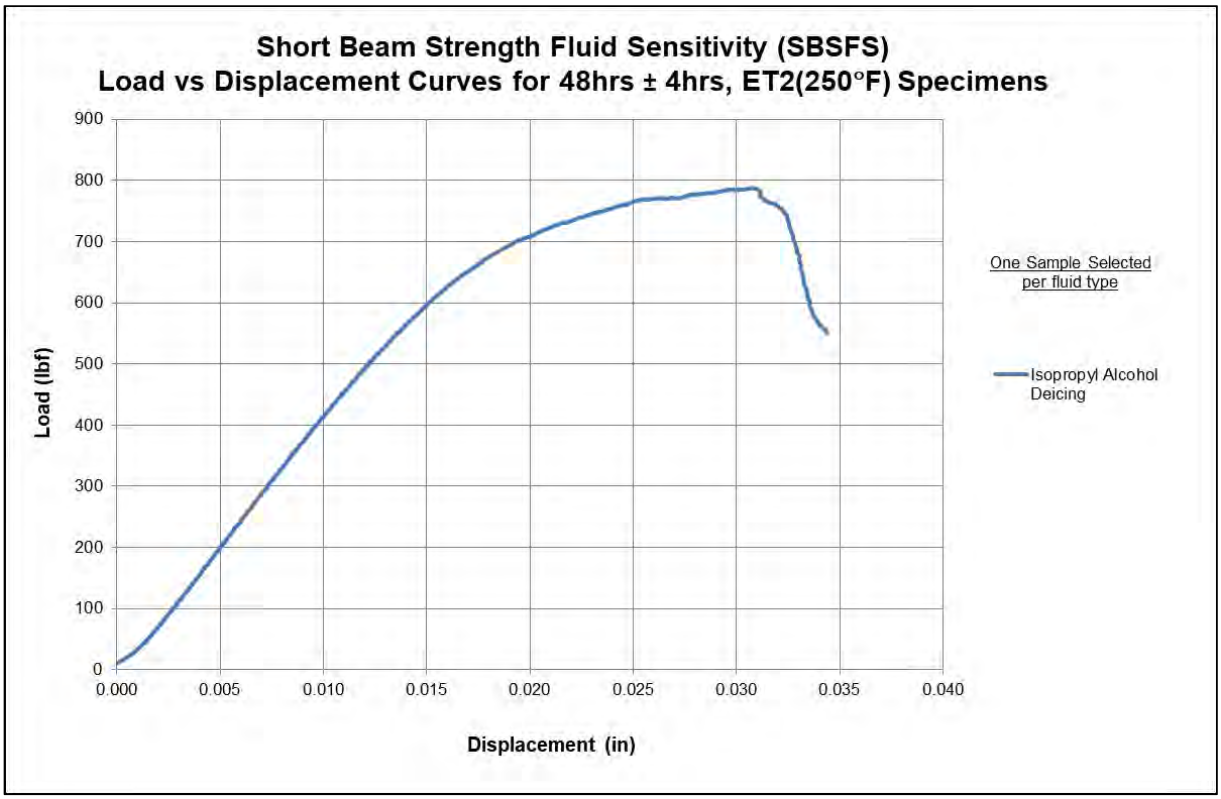


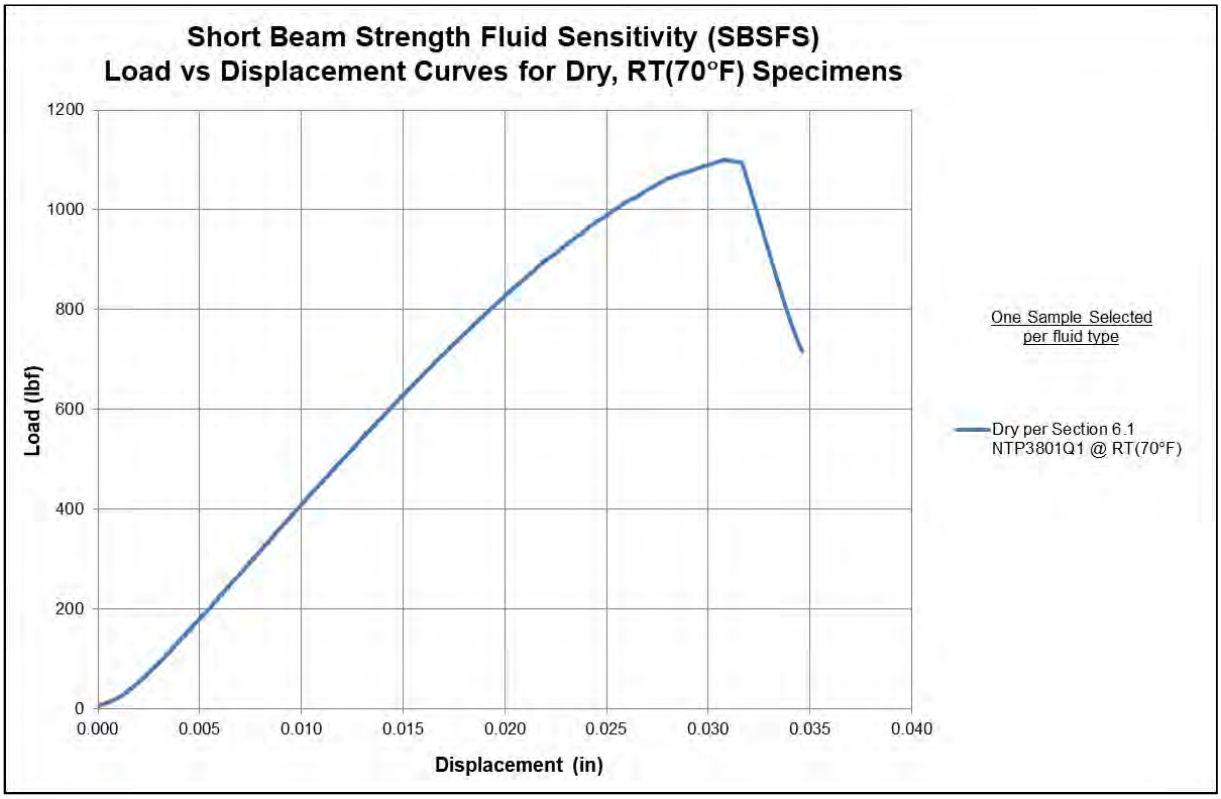


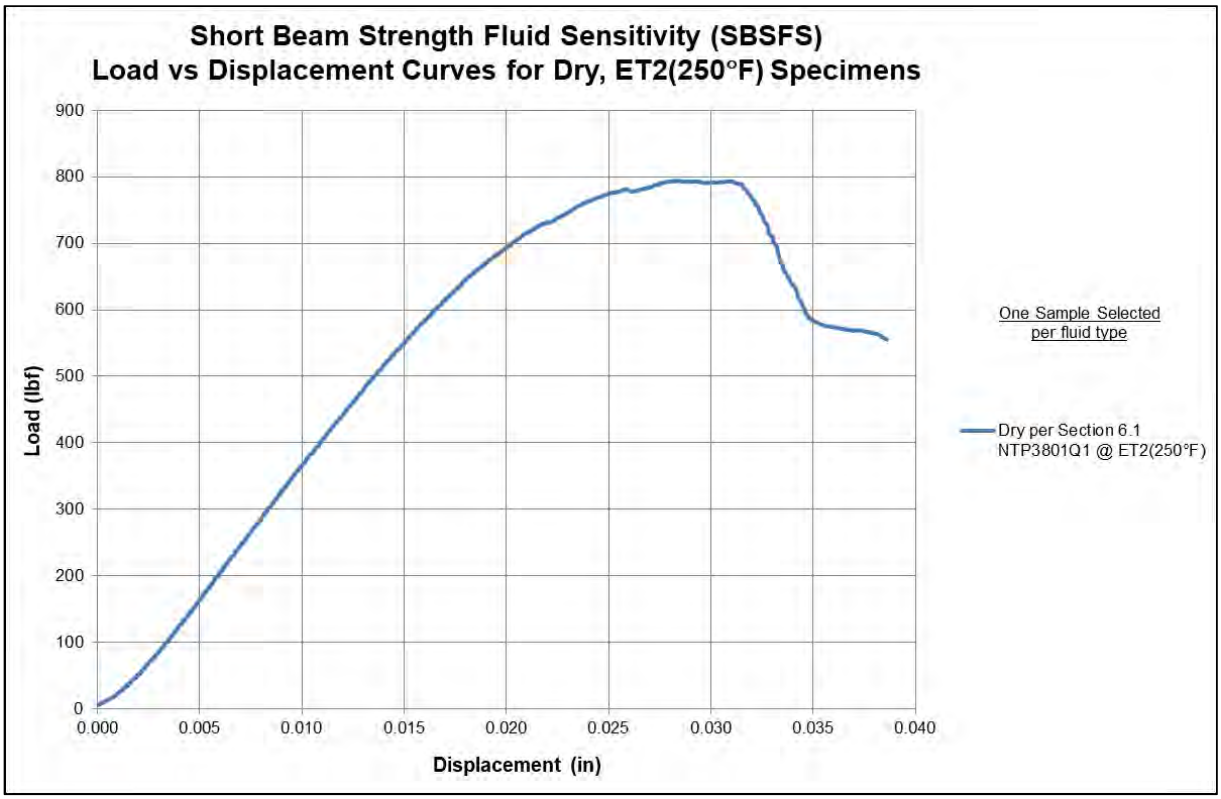

Short Beam Strength Fluid Sensitivity (SBSFS)
Load vs Displacement Curves for 90 minutes, RT(70°F) Specimens
Load (lbf)
1400
1200
1000
800
600
400
200
0
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
0.040
Displacement (in)
One Sample Selected per fluid type
MEK washing fluid
De-icing Polypropylene Glycol Deicer (Type I)

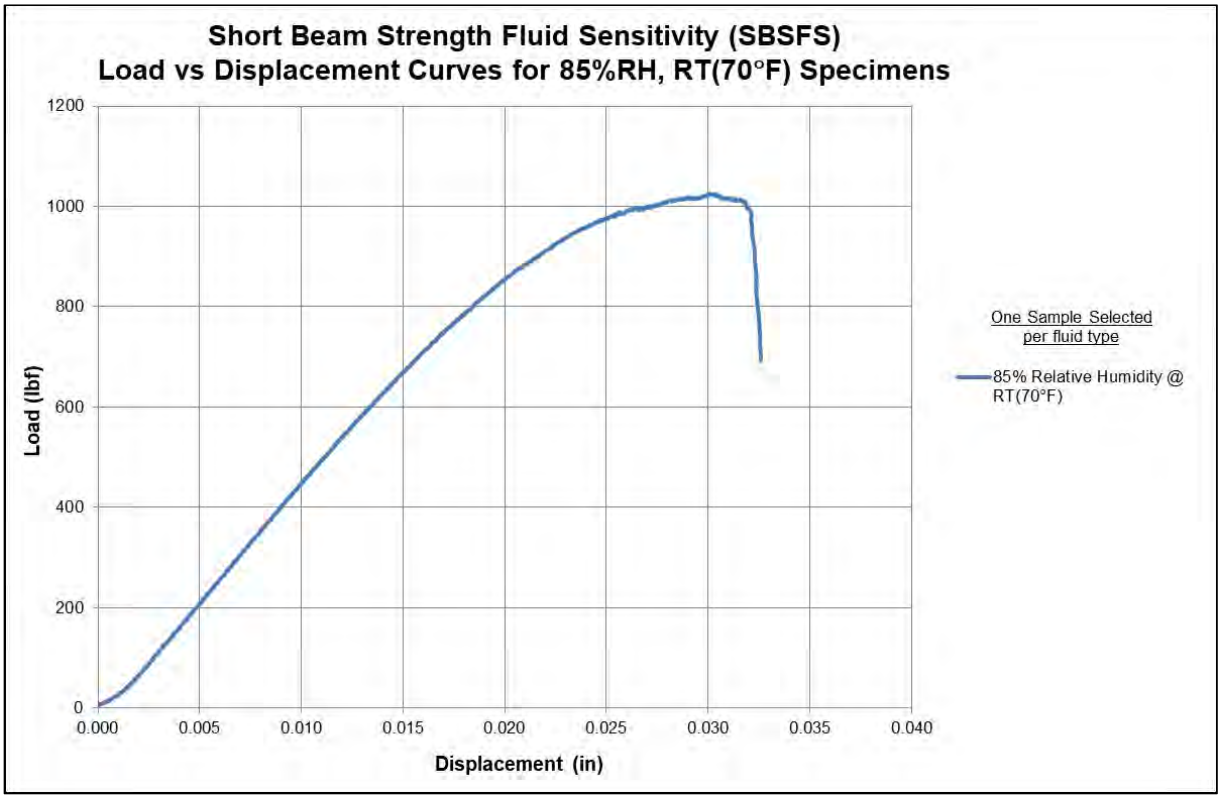

Short Beam Strength Fluid Sensitivity (SBSFS)
Load vs Displacement Curves for 90 minutes, ET2(250°F) Specimens
Load (lbf)
900
800
700
600
500
400
300
200
100
0
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
0.040
Displacement (in)
One Sample Selected per fluid type
MEK washing fluid
De-icing Polypropylene Glycol Deicer (Type I)

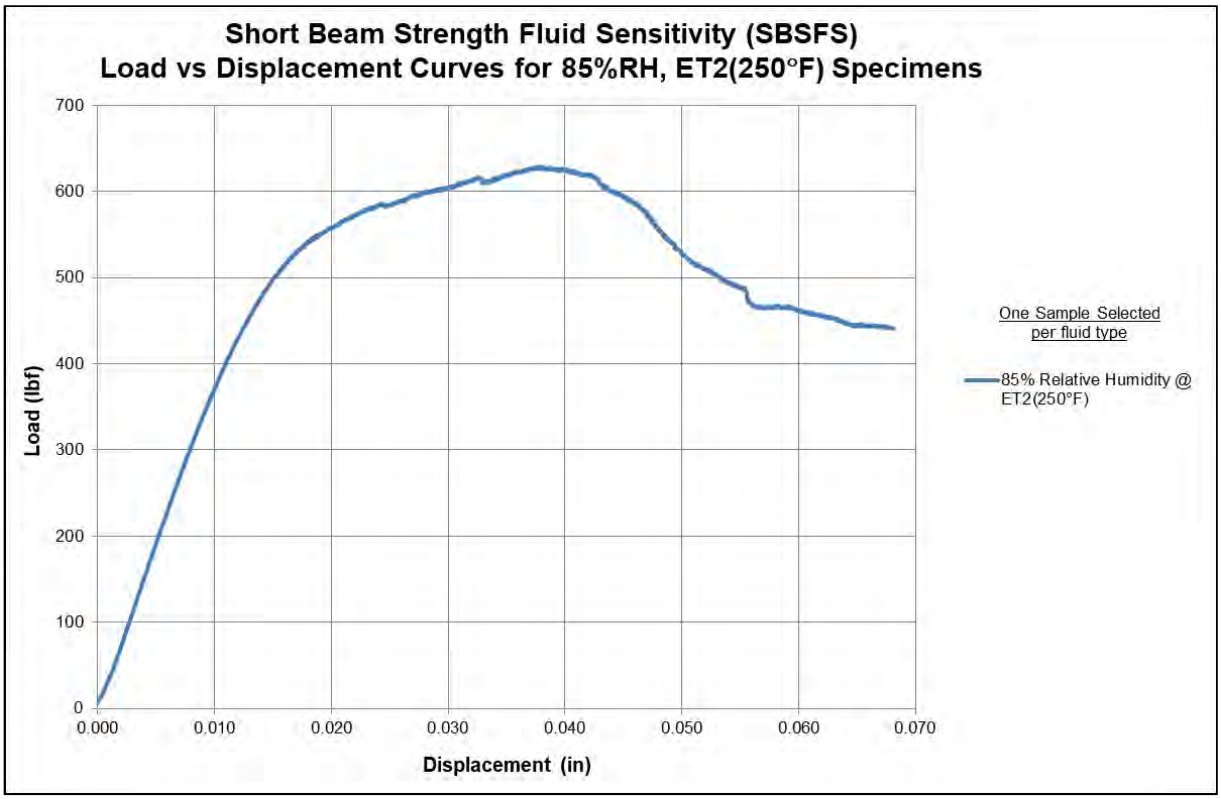

Short Beam Strength Fluid Sensitivity (SBSFS)
Load vs Displacement Curves for 48hrs ± 4hrs, RT(70F°) Specimens
Load (lbf)
1200
1000
800
600
400
200
0
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
0.040
Displacement (in)
One Sample Selected per fluid type
Isopropyl Alcohol Deicing


Short Beam Strength Fluid Sensitivity (SBSFS)
Load vs Displacement Curves for 48hrs ± 4hrs, ET2(250°F) Specimens
Load (lbf)
900
800
700
600
500
400
300
200
100
0
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
0.040
Displacement (in)
One Sample Selected per fluid type
Isopropyl Alcohol Deicing


Short Beam Strength Fluid Sensitivity (SBSFS)
Load vs Displacement Curves for Dry, RT(70°F) Specimens
Load (lbf)
1200
1000
800
600
400
200
0
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
0.040
Displacement (in)
One Sample Selected per fluid type
Dry per Section 6.1 NTP3801Q1 @ RT(70°F)

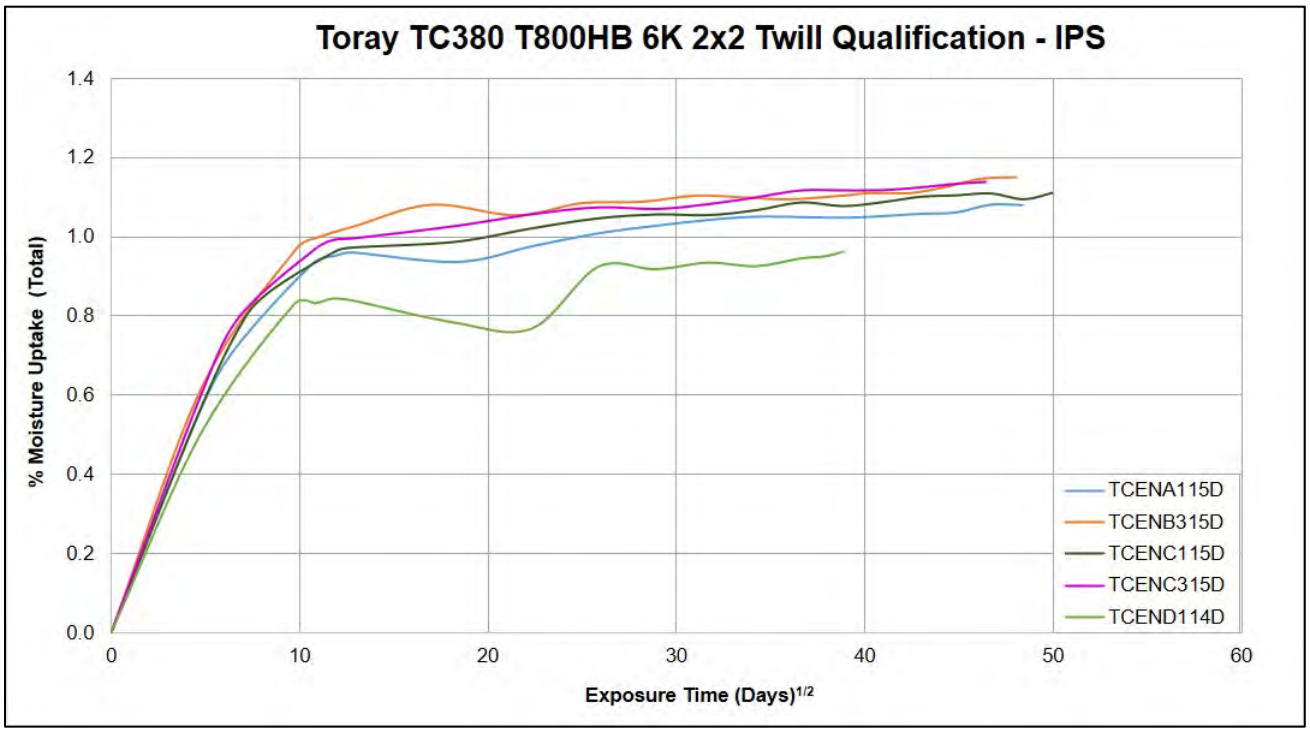

Short Beam Strength Fluid Sensitivity (SBSFS)
Load vs Displacement Curves for Dry, ET2(250°F) Specimens
Load (lbf)
900
800
700
600
500
400
300
200
100
0
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
0.040
Displacement (in)
One Sample Selected per fluid type
Dry per Section 6.1 NTP3801Q1 @ ET2(250°F)


Short Beam Strength Fluid Sensitivity (SBSFS)
Load vs Displacement Curves for 85%RH, RT(70°F) Specimens
Load (lbf)
1200
1000
800
600
400
200
0
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
0.040
Displacement (in)
One Sample Selected per fluid type
85% Relative Humidity @ RT(70°F)

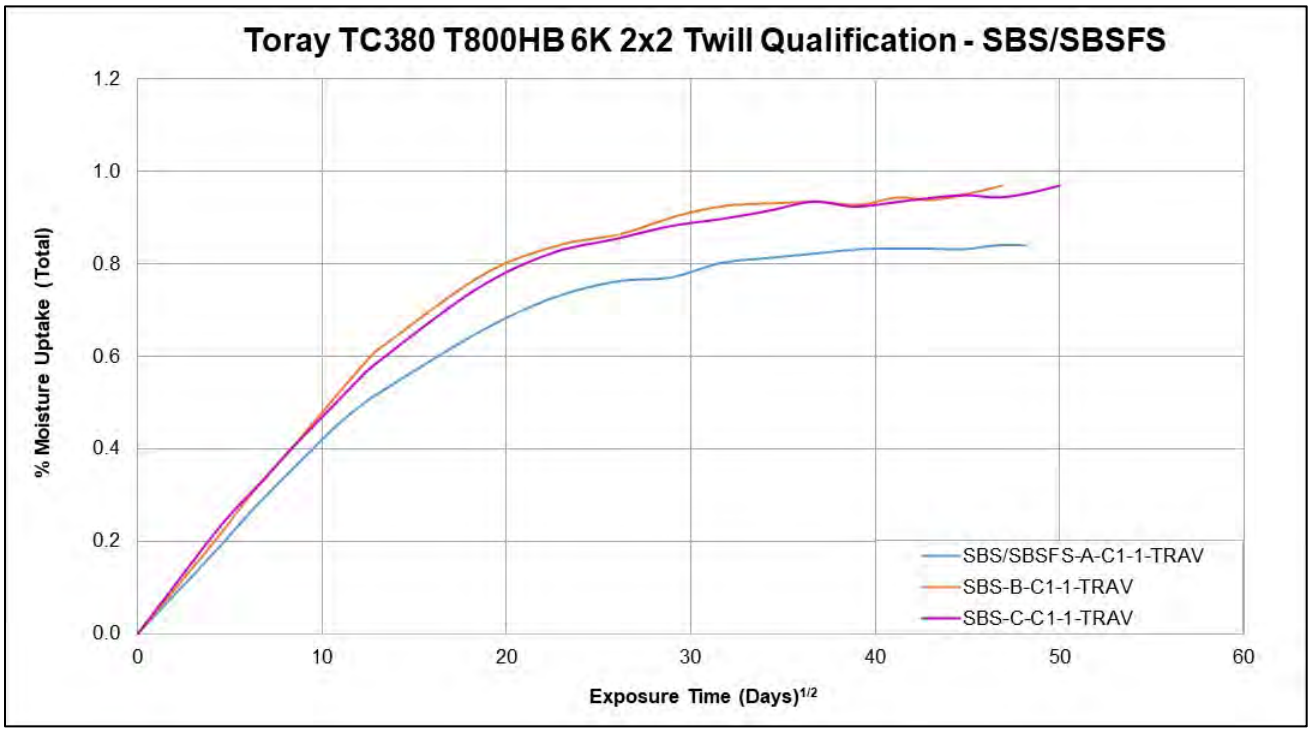

Short Beam Strength Fluid Sensitivity (SBSFS)
Load vs Displacement Curves for 85%RH, ET2(250°F) Specimens
Load (lbf)
700
600
500
400
300
200
100
0
0.000
0.010
0.020
0.030
0.040
0.050
0.060
0.070
Displacement (in)
One Sample Selected per fluid type
85% Relative Humidity @ ET2(250°F)

8. Moisture Conditioning Charts

8.1 In-Plane Shear (IPS) - Thinnest Panel



8.2 Short-Beam Strength (SBS) - Thickest Panel



9. DMA Results

9.1 DMA Dry Data

DMA Results Summary

Toray Advanced Composites TC380 T800HB 6K 2x2 Twill Qualification DMA Dry

Sample ID	Onset Storage Modulus		Peak of Tangent Delta	
	T_g [°C]	T_g [°F]	T_g [°C]	T_g [°F]
NTP3801Q1-TAC-T02-NR-SSB1-A-C1-1-DMA-D	208.69	407.64	218.11	424.60
NTP3801Q1-TAC-T02-NR-SSB1-A-C2-1-DMA-D	208.69	407.64	217.81	424.06
NTP3801Q1-TAC-T02-NR-SSB1-B-C1-1-DMA-D	209.56	409.21	218.62	425.52
NTP3801Q1-TAC-T02-NR-SSB1-B-C2-1-DMA-D	210.13	410.23	218.75	425.75
NTP3801Q1-TAC-T02-NR-SSB1-C-C1-1-DMA-D	210.03	410.05	219.37	426.87
NTP3801Q1-TAC-T02-NR-SSB1-C-C2-1-DMA-D	210.03	410.05	219.46	427.03
NTP3801Q1-TAC-T02-NR-SSB2-A-C1-1-DMA-D	209.10	408.38	219.47	427.05
NTP3801Q1-TAC-T02-NR-SSB2-A-C2-1-DMA-D	207.94	406.29	218.95	426.11
NTP3801Q1-TAC-T02-NR-SSB2-B-C1-1-DMA-D	207.18	404.92	217.33	423.19
NTP3801Q1-TAC-T02-NR-SSB2-B-C2-1-DMA-D	207.85	406.13	217.92	424.26
NTP3801Q1-TAC-T02-NR-SSB2-C-C1-1-DMA-D	210.09	410.16	220.63	429.13
NTP3801Q1-TAC-T02-NR-SSB2-C-C2-1-DMA-D	210.46	410.83	220.78	429.40
NTP3801Q1-TAC-T02-NR-UNT1-D-C1-1-DMA-D	206.07	402.93	216.74	422.13
NTP3801Q1-TAC-T02-NR-UNT1-D-C2-1-DMA-D	205.69	402.24	216.46	421.63
NTP3801Q1-TAC-T02-NR-UNT1-E-C1-1-DMA-D	207.37	405.27	217.76	423.97
NTP3801Q1-TAC-T02-NR-UNT1-E-C2-1-DMA-D	207.06	404.71	217.43	423.37
NTP3801Q1-TAC-T02-NR-UNT3-D-C1-1-DMA-D	202.06	395.71	212.05	413.69
NTP3801Q1-TAC-T02-NR-UNT3-D-C2-1-DMA-D	203.27	397.89	213.37	416.07
NTP3801Q1-TAC-T02-NR-UNT3-E-C1-1-DMA-D	205.18	401.32	215.36	419.65
NTP3801Q1-TAC-T02-NR-UNT3-E-C2-1-DMA-D	205.01	401.02	214.82	418.68
NTP3801Q1-TAC-T02-NR-WC/FC-A-C1-1-DMA-D	197.77	387.99	208.39	407.10
NTP3801Q1-TAC-T02-NR-WC/FC-A-C2-1-DMA-D	209.00	408.20	217.66	423.79
NTP3801Q1-TAC-T02-NR-WC/FC-B-C1-1-DMA-D	208.77	407.79	217.33	423.19
NTP3801Q1-TAC-T02-NR-WC/FC-B-C2-1-DMA-D	209.06	408.31	217.68	423.82
NTP3801Q1-TAC-T02-NR-WC/FC-C-C1-1-DMA-D	209.32	408.78	217.79	424.02
NTP3801Q1-TAC-T02-NR-WC/FC-C-C2-1-DMA-D	210.11	410.20	218.62	425.52
NTP3801Q1-TAC-T02-NR-WC-D-C1-1-DMA-D	202.51	396.52	212.50	414.50
NTP3801Q1-TAC-T02-NR-WC-D-C2-1-DMA-D	202.60	396.68	212.89	415.20
NTP3801Q1-TAC-T02-NR-WC-E-C1-1-DMA-D	205.44	401.79	215.44	419.79
NTP3801Q1-TAC-T02-NR-WC-E-C2-1-DMA-D	204.65	400.37	214.62	418.32
NTP3801Q1-TAC-T02-NR-WT-A-C1-1-DMA-D	209.07	408.33	217.94	424.29
NTP3801Q1-TAC-T02-NR-WT-A-C2-1-DMA-D	208.16	406.69	217.39	423.30
NTP3801Q1-TAC-T02-NR-WT-B-C1-1-DMA-D	209.40	408.92	217.86	424.15
NTP3801Q1-TAC-T02-NR-WT-B-C2-1-DMA-D	209.35	408.83	217.81	424.06
NTP3801Q1-TAC-T02-NR-WT-C-C1-1-DMA-D	201.63	394.93	212.90	415.22
NTP3801Q1-TAC-T02-NR-WT-C-C2-1-DMA-D	208.55	407.39	217.13	422.83
Average	207.13	404.84	216.81	422.26
Standard Deviation	3.04	5.47	2.65	4.77

9.2 DMA Wet Data

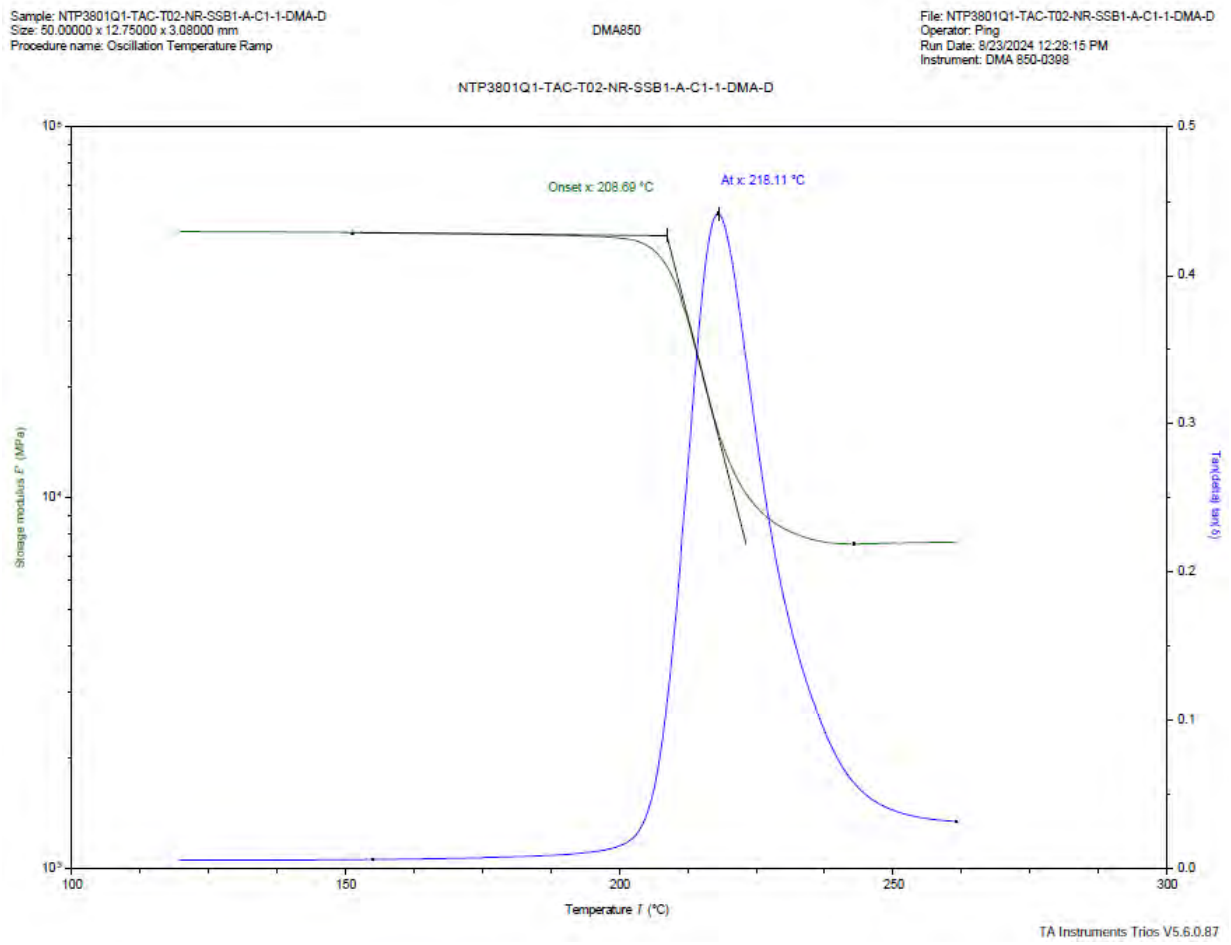
DMA Results Summary

Toray Advanced Composites TC380 T800HB 6K 2x2 Twill Qualification DMA Wet

Sample ID	Onset Storage Modulus		Peak of Tangent Delta	
	T_g [°C]	T_g [°F]	T_g [°C]	T_g [°F]
NTP3801Q1-TAC-T02-NR-SSB1-A-C1-1-DMA-W	166.55	331.79	182.56	360.61
NTP3801Q1-TAC-T02-NR-SSB1-A-C2-1-DMA-W	167.07	332.73	179.44	354.99
NTP3801Q1-TAC-T02-NR-SSB1-B-C1-1-DMA-W	166.52	331.74	190.63	375.13
NTP3801Q1-TAC-T02-NR-SSB1-B-C2-1-DMA-W	167.24	333.03	190.57	375.03
NTP3801Q1-TAC-T02-NR-SSB1-C-C1-1-DMA-W	163.89	327.00	183.45	362.21
NTP3801Q1-TAC-T02-NR-SSB1-C-C2-1-DMA-W	164.09	327.36	183.42	362.16
NTP3801Q1-TAC-T02-NR-SSB2-A-C1-1-DMA-W	166.62	331.92	186.32	367.38
NTP3801Q1-TAC-T02-NR-SSB2-A-C2-1-DMA-W	166.28	331.30	186.50	367.70
NTP3801Q1-TAC-T02-NR-SSB2-B-C1-1-DMA-W	167.24	333.03	192.93	379.27
NTP3801Q1-TAC-T02-NR-SSB2-B-C2-1-DMA-W	167.57	333.63	192.14	377.85
NTP3801Q1-TAC-T02-NR-SSB2-C-C1-1-DMA-W	163.92	327.06	184.17	363.51
NTP3801Q1-TAC-T02-NR-SSB2-C-C2-1-DMA-W	164.19	327.54	184.42	363.96
NTP3801Q1-TAC-T02-NR-UNT1-D-C1-1-DMA-W	173.44	344.19	200.61	393.10
NTP3801Q1-TAC-T02-NR-UNT1-D-C2-1-DMA-W	173.23	343.81	200.68	393.22
NTP3801Q1-TAC-T02-NR-UNT1-E-C1-1-DMA-W	173.76	344.77	203.15	397.67
NTP3801Q1-TAC-T02-NR-UNT1-E-C2-1-DMA-W	174.13	345.43	203.48	398.26
NTP3801Q1-TAC-T02-NR-UNT3-D-C1-1-DMA-W	167.12	332.82	179.17	354.51
NTP3801Q1-TAC-T02-NR-UNT3-D-C2-1-DMA-W	167.41	333.34	181.33	358.39
NTP3801Q1-TAC-T02-NR-UNT3-E-C1-1-DMA-W	167.67	333.81	187.62	369.72
NTP3801Q1-TAC-T02-NR-UNT3-E-C2-1-DMA-W	166.78	332.20	187.52	369.54
NTP3801Q1-TAC-T02-NR-WC/FC-A-C1-1-DMA-W	166.93	332.47	177.60	351.68
NTP3801Q1-TAC-T02-NR-WC/FC-A-C2-1-DMA-W	166.29	331.32	177.93	352.27
NTP3801Q1-TAC-T02-NR-WC/FC-B-C1-1-DMA-W	165.43	329.77	182.98	361.36
NTP3801Q1-TAC-T02-NR-WC/FC-B-C2-1-DMA-W	165.20	329.36	180.33	356.59
NTP3801Q1-TAC-T02-NR-WC/FC-C-C1-1-DMA-W	162.47	324.45	174.35	345.83
NTP3801Q1-TAC-T02-NR-WC/FC-C-C2-1-DMA-W	163.36	326.05	175.06	347.11
NTP3801Q1-TAC-T02-NR-WC-D-C1-1-DMA-W	167.72	333.90	179.47	355.05
NTP3801Q1-TAC-T02-NR-WC-D-C2-1-DMA-W	168.27	334.89	180.21	356.38
NTP3801Q1-TAC-T02-NR-WC-E-C1-1-DMA-W	168.02	334.44	183.58	362.44
NTP3801Q1-TAC-T02-NR-WC-E-C2-1-DMA-W	166.56	331.81	182.71	360.88
NTP3801Q1-TAC-T02-NR-WT-A-C1-1-DMA-W	166.29	331.32	181.40	358.52
NTP3801Q1-TAC-T02-NR-WT-A-C2-1-DMA-W	165.86	330.55	177.42	351.36
NTP3801Q1-TAC-T02-NR-WT-B-C1-1-DMA-W	166.00	330.80	180.06	356.11
NTP3801Q1-TAC-T02-NR-WT-B-C2-1-DMA-W	165.53	329.95	182.00	359.60
NTP3801Q1-TAC-T02-NR-WT-C-C1-1-DMA-W	162.67	324.81	173.90	345.02
NTP3801Q1-TAC-T02-NR-WT-C-C2-1-DMA-W	163.50	326.30	179.24	354.63
Average	166.80	332.24	184.68	364.42
Standard Deviation	2.89	5.20	7.75	13.96

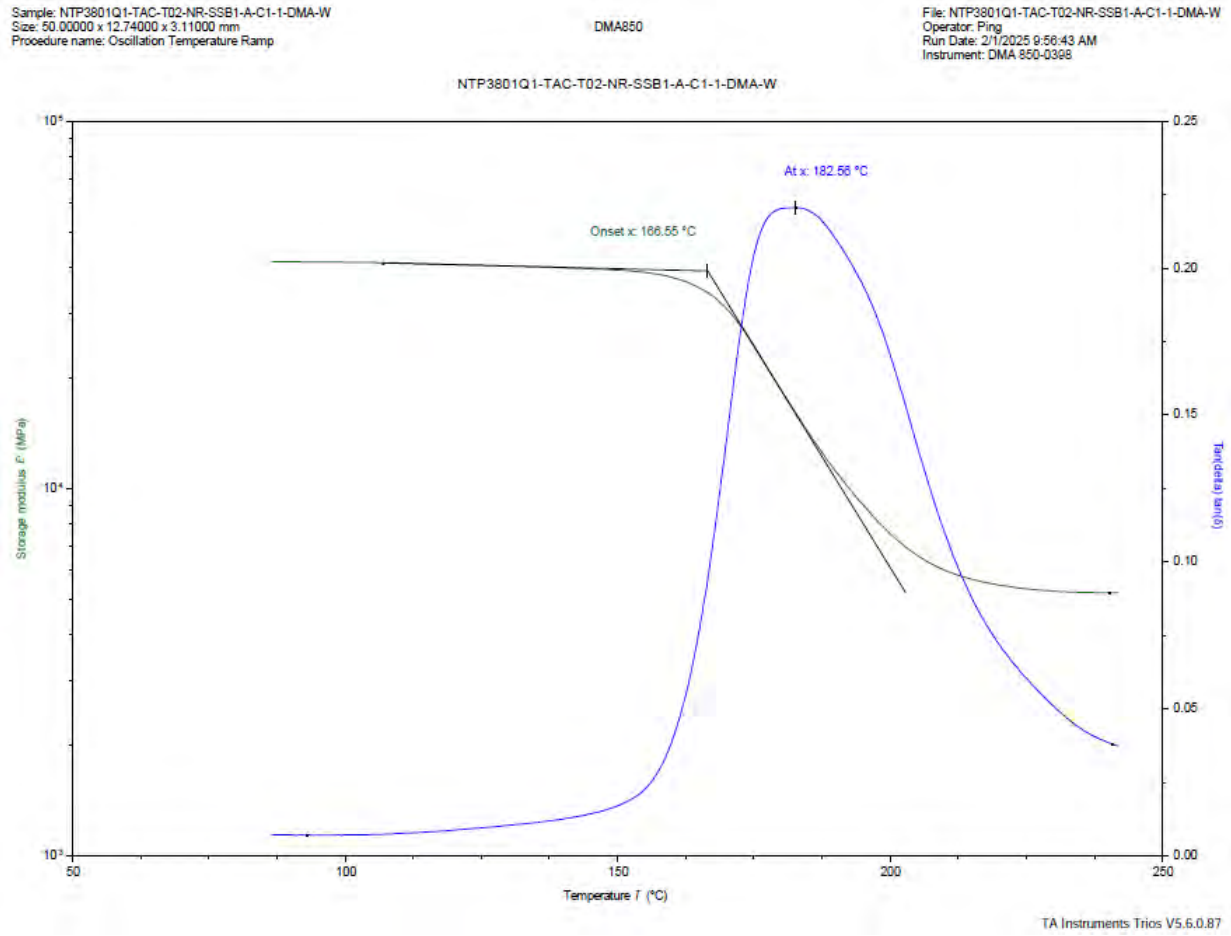
9.3 DMA Dry Batch A

A representative of DMA Dry profile from Batch A is provided below.



9.4 DMA Wet Batch A

A representative of DMA Wet profile from Batch A is provided below.



10. Moisture Loss

A representative specimen was used to measure the moisture loss for every combination of test temperature and stacking sequence.

Layup	Test Type	Test Temperature	Specimen ID	Weight Pre-Test (g)	Weight Post-Test (g)	Moisture Loss (g)
$[0]_{12}$	WT	ETW1(180°F)	TCEJA115D	26.85	26.82	0.02600
		ETW2(250°F)	TCEJA115E	24.78	24.76	0.02010
$[0]_{12}$	WC	ETW1(180°F)	TCELA115D	7.361	7.353	0.00820
		ETW2(250°F)	TCELA115E	7.486	7.470	0.01660
$[90]_{12}$	FT	ETW1(180°F)	TCEUA115D	26.28	26.26	0.02050
		ETW2(250°F)	TCEUA115E	25.57	25.53	0.03430
$[45/-45]_{2S}$	IPS	ETW1(180°F)	TCENA115D	17.86	17.85	0.01360
		ETW2(250°F)	TCENA115E	16.67	16.65	0.01690
$[0]_{22}$	SBS	ETW1(180°F)	T02-NR-SBS/SBSFS-A-C1-1-TRAV	2.191	2.189	0.00150
		ETW2(250°F)	TCDQA115E	1.090	1.088	0.00150
$[45/0/-45/90]_{S}$	UNT1	ETW1(180°F)	TCEAA115D	17.32	17.30	0.01880
		ETW2(250°F)	TCEAA115E	17.57	17.53	0.03630
$[45/-45/90/45/-45]_{S}$	UNT2	ETW1(180°F)	TCEBA115D	22.33	22.31	0.02410
		ETW2(250°F)	TCEBA115E	22.00	21.96	0.04050
$[0/90/-45/0/90]_{S}$	UNT3	ETW1(180°F)	TCECA115D	22.26	22.24	0.02420
		ETW2(250°F)	TCECA115E	21.63	21.59	0.03500
$[45/0/-45/90]_{2S}$	UNC1	ETW1(180°F)	TCEWA115D	9.360	9.352	0.00850
		ETW2(250°F)	TCEWA115E	9.710	9.694	0.01590
$[45/-45/90/45/-45]_{S}$	UNC2	ETW1(180°F)	TCEXA115D	5.841	5.836	0.00520
		ETW2(250°F)	TCEXA115E	6.090	6.075	0.01490
$[0/90/-45/0/90]_{S}$	UNC3	ETW1(180°F)	TCEYA115D	5.839	5.833	0.00580
		ETW2(250°F)	TCEYA115E	6.084	6.068	0.01620
$[45/0/-45/90]_{2S}$	OHT1	ETW1(180°F)	TCEDA115D	64.24	64.21	0.03440
		ETW2(250°F)	TCEDA115E	61.71	61.65	0.06060
$[45/-45/90/45/-45]_{S}$	OHT2	ETW1(180°F)	TCEEA115D	39.93	39.89	0.03630
		ETW2(250°F)	TCEEA115E	38.08	38.02	0.05280
$[0/90/-45/0/90]_{S}$	OHT3	ETW1(180°F)	TCEFA115D	39.88	39.84	0.03700
		ETW2(250°F)	TCEFA115E	37.76	37.69	0.06490
$[45/0/-45/90]_{2S}$	FHT1	ETW1(180°F)	TCD4A115D	52.59	52.57	0.02390
		ETW2(250°F)	TCD4A115E	52.78	52.72	0.05880
$[45/-45/90/45/-45]_{S}$	FHT2	ETW1(180°F)	TCD5A215D	44.06	44.03	0.02860
		ETW2(250°F)	TCD5A215E	44.32	44.27	0.05280
$[0/90/-45/0/90]_{S}$	FHT3	ETW1(180°F)	TCD6A115D	44.55	44.51	0.03500
		ETW2(250°F)	TCD6A115E	44.79	44.74	0.04940
$[45/0/-45/90]_{2S}$	FHC1	ETW1(180°F)	TCD7A115D	52.78	52.76	0.02840
		ETW2(250°F)	TCD7A115E	52.96	52.91	0.05020
$[45/-45/90/45/-45]_{2S}$	FHC2	ETW1(180°F)	TCD8A115D	43.94	43.92	0.02570
		ETW2(250°F)	TCD8A115E	44.24	44.12	0.12020
$[0/90/-45/0/90]_{2S}$	FHC3	ETW1(180°F)	TCD9A115D	44.21	44.18	0.02870
		ETW2(250°F)	TCD9A115E	44.60	44.55	0.05690
$[45/0/-45/90]_{2S}$	OHC1	ETW1(180°F)	TCEGA115D	63.10	63.06	0.04170
		ETW2(250°F)	TCEGA115E	60.44	60.38	0.06220
$[45/-45/90/45/-45]_{2S}$	OHC2	ETW1(180°F)	TCEHA115D	79.57	79.53	0.04050
		ETW2(250°F)	TCEHA115E	75.40	75.34	0.06730
$[0/90/-45/0/90]_{2S}$	OHC3	ETW1(180°F)	TCEIA115D	79.09	79.05	0.03610
		ETW2(250°F)	TCEIA115E	75.63	75.57	0.06280
$[45/0/-45/90]_{2S}$	SSB1	ETW1(180°F)	TCE1A115D	28.98	28.96	0.02180
		ETW2(250°F)	TCE1A115E	27.49	27.45	0.03380
$[45/-45/90/45/-45]_{2S}$	SSB2	ETW1(180°F)	TCE2A115D	35.93	35.90	0.02430
		ETW2(250°F)	TCE2A115E	35.18	35.14	0.04370
$[0/90/-45/0/90]_{2S}$	SSB3	ETW1(180°F)	TCE3A115D	35.78	35.76	0.02940
		ETW2(250°F)	TCE3A115E	35.04	35.00	0.04480
$[0]_{20}$	ILT	ETW1(180°F)	TCEMA115D	34.31	34.29	0.02210

11. Composite Material Data Collection

11.1 Fiber, Resin, Prepreg Manufacturing Dates

	Lot 1 (Batch A)	Lot 2 (Batch B)	Lot 3 (Batch C)	Lot 4 (Batch D)	Lot 5 (Batch E)
Fiber Lot ID	JB123E2	JB123G1	JB124A1	JB125E1	JB125G2
Date of Fiber Manufacture	5/1/2023	7/1/2023	1/1/2024	5/1/2025	7/1/2025
Resin Lot ID	032624-49M	051024-9M	061224-22M 061224-23M	010726-16M	010726-17M
Date of Resin Manufacture	3/26/2024	5/10/2024	6/12/2024	1/7/2026	1/7/2026
Prepreg Lot ID	032924-1T3	052924-1F6	071324-1T3	011326-1T3	011526-1T3
Date of Prepreg Manufacture	3/29/2024	5/29/2024	7/13/2024	1/13/2026	1/15/2026

11.2 Prepreg, Testing and Data Submission Dates

		Start Date	End Date
Lot 1, 2 and 3 (Batch A, B and C)	Date of Composite Manufacture	7/19/2024	5/13/2025
	Date of Testing	10/30/2024	9/2/2025
	Date of Data Submittal	9/4/2025	
Lot 4 and 5 (Batch D and E)	Date of Composite Manufacture	3/12/2026	3/26/2026
	Date of Testing	5/6/2026	7/20/2026
	Date of Data Submittal	7/21/2026	

12. Deviations

N/A