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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-17-1H—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 Cetex® TC1225 (LM PAEK) T300JB 3K 5HS Fabric Qualification Statistical Analysis Report NCP-RP-2024-013 Rev N/C. The qualification material was procured to NCAMP Material Specification NMS 122/3 Rev Initial Release dated September 11, 2023. The qualification test panels were consolidated in accordance with NCAMP Process Specification NPS 81225 Rev E dated July 30, 2025 using Consolidation Cycle "D". (*Note: The laminate must reach at least 340°C (644°F) and experience a minimum pressure of 6 bar (87 psi) for a minimum of 10 minutes at some point to ensure proper consolidation.*). The NCAMP Test Plan NTP 1227Q1 Rev C 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-17-1H. 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-17-1H are adequate for the given program.

Aircraft companies should not use the data published in this report without specifying NCAMP Material Specification NMS 122/3. NMS 122/3 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 122/3.* NMS 122/3 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
$\mu\epsilon$	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
ν_{12}^c	major Poisson's Ratio, compression
ν_{21}^c	minor Poisson's Ratio, compression
$F_{12}^{s5\% \text{ strain}}$	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
CTA	Cold Temperature Ambient
CPT	Cured Ply Thickness
ETA	Elevated Temperature Ambient
ETW	Elevated Temperature Wet
Gr/Ep	Graphite/Epoxy
norm	normalized
RTA	Room Temperature Ambient
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

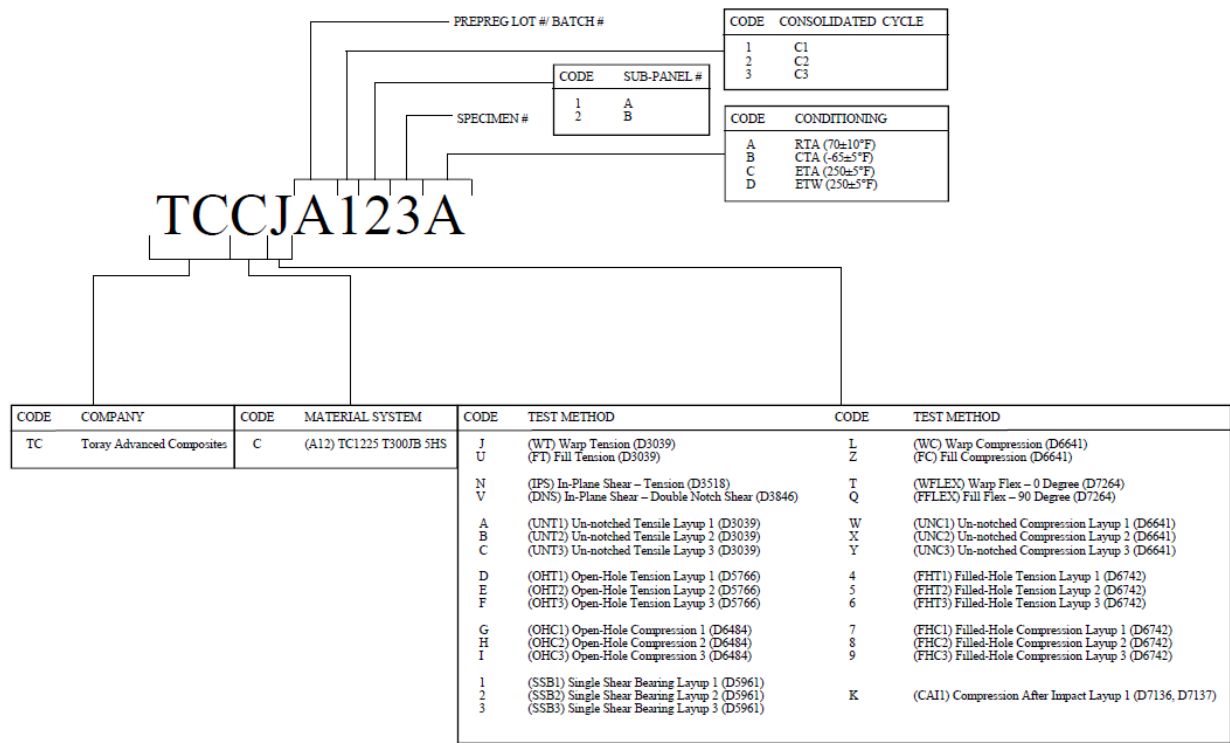


Figure 1-1: Naming Format

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:

Semipreg and Polymer Testing:

- ASTM D792-20 – Standard Test Method for Density and Specific Gravity (Relative Density) of Plastics by Displacement
- ASTM D3418-21 – Standard Test Method for Transition Temperatures and Enthalpies of Fusion and Crystallization of Polymers by Differential Scanning Calorimetry
- ASTM D3529-16(2021) – Standard Test Method for Constituent Content of Composite Prepreg
- ASTM D3776/D3776M-20 – Standard Test Method for Mass Per Unit Area (Weight) of Fabric
- SACMA SRM 23R-94 – Determination of Resin Content and Fiber Areal Weight of Thermoset Prepreg with Destructive Techniques

Consolidated Laminate Physical Testing:

- ASTM D792-20 – Standard Test Method for Density and Specific Gravity (Relative Density) of Plastics by Displacement
- ASTM E1316-23 – Standard Terminology for Nondestructive Examinations
- ASTM E2580-17 – Standard Practice for Ultrasonic Testing of Flat Panel Composites and Sandwich Core Materials Used in Aerospace Applications
- ASTM E831-19 – Standard Test Method for Linear Thermal Expansion of Solid Materials by Thermomechanical Analysis
- ASTM D7028-07(2015) – Standard Test Method for Glass Transition Temperature (DMA T_g) of Polymer Matrix Composites by Dynamic Mechanical Analysis (DMA)
- ASTM D3171-15 – Standard Test Method for Constituent Content of Composite Materials
- ASTM D3418-21 – Standard Test Method for Transition Temperatures and Enthalpies of Fusion and Crystallization of Polymers by Differential Scanning Calorimetry

Mechanical Testing:

- ASTM D3039/D3039M-17 – Standard Test Method for Tensile Properties of Polymer Matrix Composite Materials
- ASTM D3846-08(2015) – Standard Test Method for In-Plane Shear Strength of Reinforced Plastics
- ASTM D3518/D3518M-18 – Standard Test Method for In-Plane Shear Response of Polymer Matrix Composite Materials by Tensile Test of a $\pm 45^\circ$ Laminate In-

Plane Shear Strength and Modulus

- ASTM D5766/D5766M-11(2018) – Standard Test Method for Open Hole Tensile Strength of Polymer Matrix Composite Laminates
- ASTM D5961/D5961M-17 – Standard Test Method for Bearing Response of Polymer Matrix Composite Laminates
- ASTM D6484/D6484M-20 – Standard Test Method for Open-Hole Compressive Strength of Polymer Matrix Composite Laminates
- ASTM D6641/D6641M-16e2 – Standard Test Method for Determining the Compressive Properties of Polymer Matrix Composite Laminates Using a Combined Loading Compression (CLC) Test Fixture
- ASTM D6742/D6742M-17 – Standard Practice for Filled-Hole Tension and Compression Testing of Polymer Matrix Composite Laminates
- ASTM D7136/D7136M-15 – Standard Test Method for Measuring the Damage Resistance of a Fiber-Reinforced Polymer Matrix Composite to a Drop-Weight Impact Event
- ASTM D7137/D7137M-17 – Standard Test Method for Compressive Residual Strength Properties of Damaged Polymer Matrix Composite Plates
- ASTM D7264/D7264M-21 – Standard Test Method for Flexural Properties of Polymer Matrix Composite Materials

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.

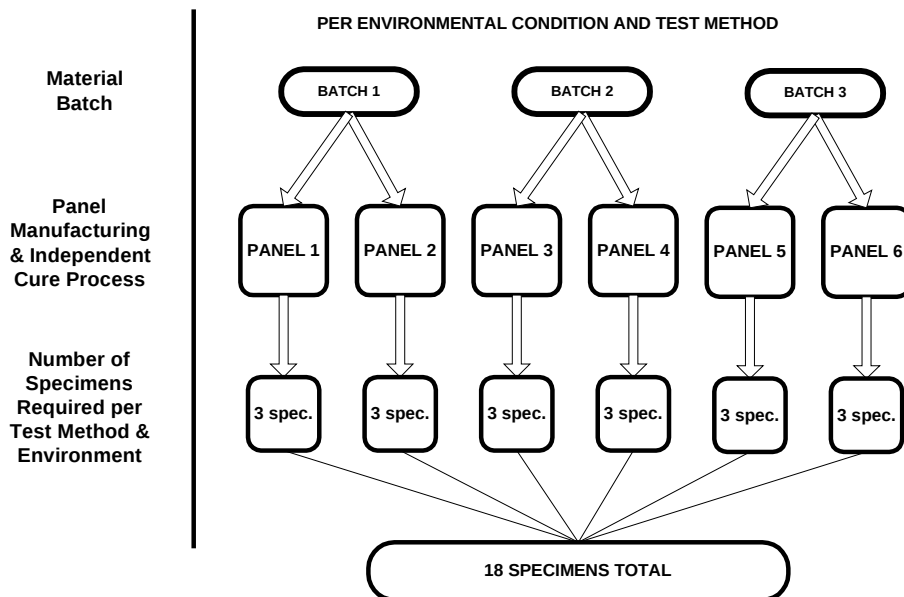


Figure 1-2: Specimen Selection Methodology

All panels were fabricated in accordance with NCAMP Process Specification NPS 81225 Rev D using Consolidation Cycle "D".

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

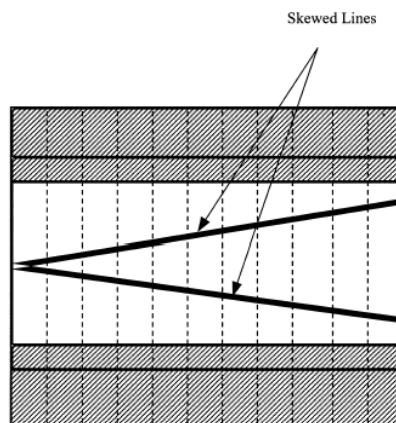


Figure 1-3: Specimen Traceability Line

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 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 $\pm 5^\circ\text{F}$ 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 below.

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 1227Q1.

Uniaxial gages were used on:

- All of CTA Tension specimens except Warp Tension specimens.

- Two RTA Tension specimens except Warp Tension for obtaining full stress strain curves.

- All conditions of combined loading compression specimens.

- Two RTA Open Hole Compression specimens for detecting buckling.

- One CAI un-impacted specimen for balancing.

Biaxial gages were used on:

- All conditions of IPS specimens.

- All of CTA Warp Tension specimens.

- Two RTA Warp Tension specimens for obtaining full stress strain curves.

Uniaxial Extensometers were used on:

- All of RTA, ETA and ETW Tension specimens except Warp Tension specimens.

Biaxial Extensometers were used on:

- All of RTA, ETA and ETW 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 (warp direction)	Test Code	Test Type and Direction	Property	Number of Batches x Number of Panels x Number of Test Specimens			
				Test Temperature/Moisture Condition			
				CTA (-65°F)	RTA (70°F)	ETA (250°F)	ETW (250°F)
[0] _{4S}	WT	ASTM D3039 0° Warp Tension	Strength, Poisson's Ratio, and Modulus	3x2x3	3x2x3 (2)	3x2x3	3x2x3
[0] _{4S}	WC	ASTM D6641 0° Warp Compression	Strength and Modulus	3x2x3	3x2x3 (1)	3x2x3	3x2x3
[90] _{4S}	FT	ASTM D3039 90° Fill Tension	Strength and Modulus	3x2x3	3x2x3 (2)	3x2x3	3x2x3
[90] _{4S}	FC	ASTM D6641 90° Fill Compression	Strength and Modulus	3x2x3	3x2x3 (1)	3x2x3	3x2x3
[+45/-45] _{2S}	IPS	ASTM D3518 In-Plane Shear (4)	0.2% Offset Strength, 5% Strength and Modulus	3x2x3	3x2x3	3x2x3	3x2x3
[0] _{4S}	WFLEX	ASTM D7264 0° Warp Flex, Proc. A	Strength and Modulus	3x2x3	3x2x3	3x2x3	3x2x3
[90] _{4S}	FFLEX	ASTM D7264 90° Fill Flex, Proc. A	Strength and Modulus	3x2x3	3x2x3	3x2x3	3x2x3
[0] _{4S}	DNS	ASTM D3846 In-Plane Shear – Double Notch Shear (3)	Strength	3x2x3	3x2x3	3x2x3	3x2x3
(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) 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. (3) Round notch configuration. (4) Panel layup is [0/90] _{2S} and specimens were machined in 45° direction of the panel, specimen actual layup is [+45/-45] _{2S} .							

Table 1-2: Lamina Level Test Matrix

Table 1-3 below summarizes the laminate level tests carried out. The layup angles 0° , 45° , -45° , and 90° 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°) Actual Test Type	Test Type and Layout (5)	Property	Number of Batches x Number of Panels x Number of Test Specimens			
			Test Temperature/Moisture Condition			
			CTA (-65°F)	RTA (70°F)	ETA (250°F)	ETW (250°F)
(25/50/25 - QI) UNT1	ASTM D3039 Un-notched Tension [0/45]2S	Strength & Modulus	3x2x3	3x2x3 (2)		3x2x3
(10/80/10 - Soft) UNT2	ASTM D3039 Un-notched Tension (3) [0/45/45/45/45]S	Strength & Modulus	3x2x3	3x2x3 (2)		3x2x3
(40/20/40 - Hard) UNT3	ASTM D3039 Un-notched Tension [0/0/45/0/0]S	Strength & Modulus	3x2x3	3x2x3 (2)		3x2x3
(25/50/25 - QI) UNC1	ASTM D6641 Un-notched Compression [0/45]2S	Strength & Modulus		3x2x3 (1)		3x2x3
(10/80/10 - Soft) UNC2	ASTM D6641 Un-notched Compression (3) [0/45/45/45/45]S	Strength & Modulus		3x2x3 (1)		3x2x3
(40/20/40 - Hard) UNC3	ASTM D6641 Un-notched Compression [0/0/45/0/0]S	Strength & Modulus		3x2x3 (1)		3x2x3
(25/50/25 - QI) OHT1	ASTM D5766 Open-Hole Tension [0/45]3S	Strength	3x2x3	3x2x3	3x2x3	3x2x3
(10/80/10 - Soft) OHT2	ASTM D5766 Open-Hole Tension (3) [0/45/45/45/45]S	Strength	3x2x3	3x2x3		3x2x3
(40/20/40 - Hard) OHT3	ASTM D5766 Open-Hole Tension [0/0/45/0/0]S	Strength	3x2x3	3x2x3		3x2x3
(25/50/25 - QI) FHT1	ASTM D6742 Filled-Hole Tension [0/45]3S	Strength	3x2x3	3x2x3		3x2x3
(10/80/10 - Soft) FHT2	ASTM D6742 Filled-Hole Tension (3) [0/45/45/45/45]S	Strength	3x2x3	3x2x3		3x2x3
(40/20/40 - Hard) FHT3	ASTM D6742 Filled-Hole Tension [0/0/45/0/0]S	Strength	3x2x3	3x2x3		3x2x3
(25/50/25 - QI) OHC1	ASTM D6484 Open-Hole Compression Proc. A [0/45]3S	Strength		3x2x3 (4)	3x2x3	3x2x3
(10/80/10 - Soft) OHC2	ASTM D6484 Open-Hole Compression Proc. A (3) [0/45/45/45/45]S	Strength		3x2x3 (4)		3x2x3
(40/20/40 - Hard) OHC3	ASTM D6484 Open-Hole Compression Proc. A [0/0/45/0/0]S	Strength		3x2x3 (4)		3x2x3
(25/50/25 - QI) FHC1	ASTM D6742 Filled-Hole Compression Proc. A [0/45]3S	Strength		3x2x3		3x2x3
(10/80/10 - Soft) FHC2	ASTM D6742 Filled-Hole Compression Proc. A (3) [0/45/45/45/45]S	Strength		3x2x3		3x2x3
(40/20/40 - Hard) FHC3	ASTM D6742 Filled-Hole Compression Proc. A [0/0/45/0/0]S	Strength		3x2x3		3x2x3
(25/50/25 - QI) SSB1	ASTM D5961 Proc.C Single Shear Bearing [0/45]2S	Strength & Deformation		3x2x3		3x2x3
(10/80/10 - Soft) SSB2	ASTM D5961 Proc.C Single Shear Bearing (3) [0/45/45/45/45]S	Strength & Deformation		3x2x3		3x2x3
(40/20/40 - Hard) SSB3	ASTM D5961 Proc.C Single Shear Bearing [0/0/45/0/0]S	Strength & Deformation		3x2x3		3x2x3
(25/50/25 - QI) CAI1	ASTM D7136 & D7137 Compression After Impact (1500 in.lbf/in) [0/45]4S	Strength		1x1x6		1x1x6
(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) 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. (3) Panel layup is [45/0/0/0/0]S and specimens were machined in 45° direction of the panel, specimen actual layup is [0/45/45/45/45]S. (4) Back-to-back strain gages are needed on the first two specimens. If no buckling is observed, the remaining modulus specimens will require no strain gage.						

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 and/or DSC which were conducted on one lamina/laminate per batch from each consolidate 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
Consolidated Ply Thickness	ASTM D3171-15	All data from mechanical test specimens
Laminate Density	ASTM D792-17	3
Fiber Volume, % by Volume	ASTM D3171-15 (2)	3 (2)
Resin (Polymer) Content, % by Weight	ASTM D3171-15 (2)	3 (2)
Ultrasonic Through Transmission, C- Scan (panels)	ASTM E1316-23, ASTM E2580-17 & NAS 410 (3)	1
Differential Scanning Calorimetry (DSC) Glass Transition Temp., Tg Melt Temp. (Peak) Cold Crystallization Temp. Hot Crystallization Temp. (Peak) Crystallinity Percentage	ASTM D3418-21 or SACMA SRM 25R-94	(4)
Dynamic Mechanical Analysis (DMA) Glass Transition Temp., Tg	ASTM D7028-07(2015)	(5)
Coefficient Thermal Expansion (CTE) (6) X (0 degree) direction Y (90 degree) direction Z (Thickness) direction	ASTM E831-19	(6)
(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) Minimum total of 36 ambient for each material system. Ambient: minimum 12 ambient DSC per batch. One DSC specimen is to be machined from a panel, these specimens are machined from Lamina and Laminate panels. (5) Minimum total of 24 ambient and 24 wet for each material system. Ambient: minimum 8 ambient DMA per batch. One DMA specimen is to be machined from a panel, these specimens are machined from Lamina and Laminate panels. WET: minimum 8 wet DMA per batch. One DMA specimen is to be machined from a panel, these specimens are to be machined from Lamina and Laminate panels.		

- (6) Specimens are machined from [0]4S laminate. CTE data may be reported in multiple ranges per direction, this will be decided when the data is available.
 3 specimens/batch/direction.
 Run test from -80C to 250C (-60F to 482F)
 CTE's linear range should be define within these ranges:
- -50C to 125C (-60F to 260F)
 - 160C to 210C (350F to 410F)
- Range may be adjusted if not linear in above ranges, but range needs to be reported.

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.

CTA = -65±5°F, ambient
 RTA = 70±10°F, ambient
 ETA = 250±5°F, ambient
 ETW = 250±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. All tested specimens were digitally photographed after each test in order to pictorially document failure modes.

For ambient testing, as fabricated condition, specimens were kept at 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 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 three 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 three 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 $\pm 5^{\circ}\text{F}$ 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 $\pm 5^{\circ}\text{F}$ 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 D3518 In-Plane Shear testing on $[+45/-45]_{2S}$ lamina level specimens subjected to the conditions indicated, five replicates per fluid and two consolidating cycles.

Panel layup is $[0/90]_{2S}$ and specimens were machined in 45 direction of the panel, specimen actual layup is $[+45/-45]_{2S}$.

Specimens were cleaned with a dry towel prior to the tests. In addition to In-Plane Shear Modulus, 0.2% Offset strength and 5% strength, stress strain curves were plotted to aid in the identification of polymer softening. It is 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

Users must evaluate the applicability of the exposure conditions and time on case-by-case basis.

<u>Extended Contact:</u>	Exposure	Test Condition	Code
100 Low Lead Aviation Fuel (ASTM D910)	90 days min. @ 70°F±10°F	70°F	FS11RT
	90 days min. @ 70°F±10°F	180°F	FS11ET
ASTM D1655 Jet A Fuel (other jet fuel may be used but its type must be reported)	90 days min. @ 70°F±10°F	70°F	FS12RT
	90 days min. @ 70°F±10°F	180°F	FS12ET
MIL-PRF-5606 Hydraulic Oil	90 days min. @ 70°F±10°F	70°F	FS13RT
	90 days min. @ 70°F±10°F	180°F	FS13ET
MIL-PRF-83282 Hydraulic Oil	90 days min. @ 70°F±10°F	70°F	FS14RT
	90 days min. @ 70°F±10°F	180°F	FS14ET
MIL-PRF-7808 Engine Oil	90 days min. @ 70°F±10°F	70°F	FS15RT
	90 days min. @ 70°F±10°F	180°F	FS15ET
MIL-PRF-23699, Class STD Engine Oil	90 days min. @ 70°F±10°F	70°F	FS16RT
	90 days min. @ 70°F±10°F	180°F	FS16ET
Salt Water (ASTM D1141 or equiv.)	90 days min. @ 70°F±10°F	70°F	FS17RT
	90 days min. @ 70°F±10°F	180°F	FS17ET
Skydrol 5, (SAE AS1241, Type V)	90 days min. @ 70°F±10°F	70°F	FS18RT
	90 days min. @ 70°F±10°F	180°F	FS18ET
50% Water with 50% Skydrol 5, (SAE AS1241, Type V)	90 days min. @ 70°F±10°F	70°F	FS19RT
	90 days min. @ 70°F±10°F	180°F	FS19ET
<u>Short Duration Contact:</u>			
MEK washing fluid. ASTM D740	90 minutes min. @ 70°F±10°F	70°F	FS21RT
	90 minutes min. @ 70°F±10°F	180°F	FS21ET
Polypropylene Glycol Deicer (Type I) SAE AMS 1424	90 minutes min. @ 70°F±10°F	70°F	FS22RT
	90 minutes min. @ 70°F±10°F	180°F	FS22ET
Isopropyl Alcohol Deicing Agent (TT-I-735)	48±4 hours @70°F±10°F	70°F	FS23RT
	48±4 hours @70°F±10°F	180°F	FS23ET
<u>Control Tests:</u>			
Distilled Water	90 days min. at 70°F±10°F	70°F	FS31RT
	90 days min. at 70°F±10°F	180°F	FS31ET
Dry	160°F±5°F for 120 hours min.	70°F	FS32RT
	160°F±5°F for 120 hours min.	180°F	FS32ET
85% Relative Humidity	Per section 6.1 Test Plan NTP 1227Q1	70°F	FS33RT
	Per section 6.1 Test Plan NTP 1227Q1	180°F	FS33ET

Table 1-5: Fluid Sensitivity 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, Poisson's ratio
- SBS

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 consolidated ply thickness of 0.01220 inches has been used as the nominal consolidated ply thickness (CPT) for normalization purpose. This has been done at the request of the material supplier. The following normalization formula was used:

$$\text{Normalized Value} = \text{Measured Value} \times \text{Measured CPT} / \text{Nominal CPT}$$

Flexural Test Normalization Calculation:

$$\text{Flexural Normalized Value} = \text{Measured Value} \times (\text{Measured CPT}^2) / (\text{Nominal CPT}^2)$$

For Toray Cetex® TC1225 5HS Fabric material the defined CPT was 0.01220 inches. The average as measured CPT of the qualification panels was 0.01215 inches. The lowest and highest CPT measured were 0.01180 inches and 0.01253 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 Cetex®TC1225 (LM PAEK) T300JB 3K 5HS Fabric Material Specification: NMS 122/3 Process Specification: NPS 81225 Fabric: T300JB 3K 5HS					Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric Lamina Properties Summary				
Resin: TC1225 LM PAEK									
DMA Tg (ambient): 295.10°F DMA Tg (wet): 276.63°F					1 st Heating Cycle 2 nd Heating Cycle				
DSC Tg (ambient): DSC, Melting Temperature (Peak): DSC, Hot Crystallization Temperature (Peak):					302.21°F 308.22°F 587.10°F 586.99°F N/A N/A				
Tg METHOD: DMA (ASTM D7028) & DSC (ASTM D3418)									
Fiber Batch		Batch #1		Batch #2		Batch #3			
Date of fiber manufacture		F4123C1		F4123D1		F4123F2			
Resin Batch		1/3/2023		4/1/2023		6/2/2023			
Date of resin manufacture		V103406		V103264		V103265			
Prepreg Batch		3/20/2023		3/11/2023		3/12/2023			
Date of prepreg manufacture		20233863		20234628		20234872			
Date of composite manufacture		9/21/2023		11/10/2023		1/11/2024			
		10/24/2023 - 3/14/2024							
Date of testing		Mar-24 to Oct-24							
Date of data submittal		11/18/2024							
LAMINA MECHANICAL PROPERTY SUMMARY Data reported as: Normalized & Measured (Normalized by CPT=0.01220 inch)									
Properties		CTA (-65°F) Mean		RTA (70°F) Mean		ETA (250°F) Mean		ETW (250°F) Mean	
		Normalized	Measured	Normalized	Measured	Normalized	Measured	Normalized	Measured
F ₁ ^{tu} [ksi]		113.1	114.4	111.0	111.6	119.2	120.1	114.8	115.9
E ₁ ^t [Msi]		8.609	8.710	8.585	8.627	8.656	8.720	8.539	8.625
ν ₁₂ ^t			0.05257		0.04667		0.04377		0.04660
F ₂ ^{tu} [ksi]		116.8	117.5	109.8	110.4	111.5	112.6	108.3	109.6
E ₂ ^t [Msi]		8.554	8.609	8.492	8.539	8.554	8.634	8.443	8.552
F ₁ ^{cu} [ksi]		103.2	104.7	92.18	93.43	70.87	72.13	69.89	70.75
E ₁ ^c [Msi]		8.018	8.127	8.017	8.123	8.206	8.349	8.225	8.330
F ₂ ^{cu} [ksi]		98.51	99.83	87.97	88.93	65.95	66.97	65.18	66.10
E ₂ ^c [Msi]		8.022	8.134	8.011	8.098	8.190	8.314	8.197	8.313
F ₁₂ ^{s0.2%} [ksi]			7.023		5.672		3.398		3.074
F ₁₂ ^{s5%strain} [ksi]			12.86		9.952		5.966		5.581
G ₁₂ ^s [Msi]			0.6170		0.5529		0.3707		0.3248
(0°) Warp Flex Proc. A Strength [ksi]		163.8	167.0	151.1	154.1	114.3	117.6	110.0	113.4
(0°) Warp Flex Proc. A Modulus [Msi]		9.124	9.303	9.019	9.199	9.104	9.370	8.921	9.203
(90°) Fill Flex Proc. A Strength [ksi]		143.1	144.6	133.5	135.6	101.1	103.0	91.89	93.57
(90°) Fill Flex Proc. A Modulus [Msi]		7.558	7.638	7.509	7.626	7.482	7.618	7.343	7.478
Round Notch DNS In-Plane Shear Strength [ksi]			11.71		9.754		6.697		6.280

Table 2-1: Lamina Summary Data

2.2 Laminate Level Test Summary

Prepreg Material: Toray Cetex®TC1225 (LM PAEK) T300JB 3K 5HS Fabric				Toray Advanced Composites			
Material Specification: NMS 122/3				Cetex® TC1225 T300JB 3K 5HS			
Process Specification: NPS 81225				Fabric			
Fabric: T300JB 3K 5HS				Resin: TC1225 LM PAEK			
				Laminate Properties Summary			
				1 st Heating Cycle		2 nd Heating Cycle	
DMA Tg (ambient): 295.10°F		DSC Tg (ambient):		302.21°F		308.22°F	
DMA Tg (wet): 276.63°F		DSC, Melting Temperature (Peak):		587.10°F		586.99°F	
		DSC, Hot Crystallization Temperature (Peak):		N/A		N/A	
Tg METHOD: DMA (ASTM D7028) & DSC (ASTM D3418)							
		Batch #1	Batch #2	Batch #3			
Fiber Batch		F4123C1	F4123D1	F4123F2			
Date of fiber manufacture		1/3/2023	4/1/2023	6/2/2023			
Resin Batch		V103406	V103264	V103265			
Date of resin manufacture		3/20/2023	3/11/2023	3/12/2023			
Prepreg Batch		20233863	20234628	20234872			
Date of prepreg manufacture		9/21/2023	11/10/2023	1/11/2024			
Date of composite manufacture		10/24/2023 - 3/14/2024					
Date of testing		Mar-24 to Oct-24					
Date of data submittal		11/18/2024					
LAMINATE MECHANICAL PROPERTY SUMMARY							
Data reported as: Normalized & Measured							
(Normalized by CPT=0.01220 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]	CTA (-65°F)	46.53	46.82	36.14	36.29	52.22	52.46
	RTA (70°F)	46.20	46.50	33.81	33.92	51.76	52.02
	ETA (250°F)	47.01	47.28				
	ETW (250°F)	47.01	47.16	26.61	26.73	51.05	51.27
OHC Strength [ksi]	RTA (70°F)	42.72	42.75	32.08	32.22	41.98	42.20
	ETA (250°F)	33.20	33.25				
	ETW (250°F)	32.99	33.06	22.67	22.82	33.44	33.66
UNT Strength [ksi]	CTA (-65°F)	80.97	81.66	50.04	50.43	97.35	97.91
	RTA (70°F)	79.02	79.90	44.92	45.23	97.16	97.62
	ETW (250°F)	75.58	76.23	38.18	38.49	98.85	99.73
UNT Modulus [Msi]	CTA (-65°F)	6.055	6.107	3.883	3.913	7.608	7.652
	RTA (70°F)	6.005	6.071	3.799	3.825	7.618	7.655
	ETW (250°F)	5.712	5.761	3.206	3.232	7.487	7.552
UNC Strength [ksi]	RTA (70°F)	67.55	68.55	37.03	37.51	85.10	85.75
	ETW (250°F)	50.38	51.17	24.73	24.99	63.03	63.55
UNC Modulus [Msi]	RTA (70°F)	5.728	5.812	3.644	3.692	7.184	7.240
	ETW (250°F)	5.743	5.833	3.331	3.368	7.327	7.388
FHT Strength [ksi]	CTA (-65°F)	52.57	52.84	40.01	40.37	55.18	55.77
	RTA (70°F)	49.67	49.97	34.89	35.22	51.54	51.86
	ETW (250°F)	49.26	49.48	29.09	29.38	51.35	51.90
FHC Strength [ksi]	RTA (70°F)	69.03*	69.57*	39.85*	40.00*	81.78	82.49
	ETW (250°F)	52.35*	52.81*	29.82*	30.00*	60.54	61.21
SSB 2% Offset Strength [ksi]	RTA (70°F)	101.8	102.9	96.46	97.02	91.14	91.51
	ETW (250°F)	86.31	87.21	78.02	78.56	75.48	75.90
SSB Ultimate Strength [ksi]	RTA (70°F)	116.2	117.4	112.2	112.9	105.8	106.2
	ETW (250°F)	93.65	94.62	90.48	91.11	84.84	85.30
SSB Chord Stiffness [Msi]	RTA (70°F)	1.570	1.587	1.094	1.100	1.459	1.465
	ETW (250°F)	1.504	1.520	1.020	1.027	1.372	1.379
CAI Strength [ksi]	RTA (70°F)	44.92	45.06				
	ETW (250°F)	37.44	37.78				

*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

Fluid Sensitivity Screening In-Plane Shear Properties (FSIPS)--RT(70°F) Strength and Modulus Toray Advanced Composites Cetex® TC1225 5HS Fabric					
Exposure	Type of Fluid	Fluid Code	Average		
			0.2% Offset Strength [ksi]	5% Shear Strength [ksi]	Modulus [Msi]
90 days min @ 70°F±10°F	100 Low Lead Fuel	FS11RT	5.285	9.745	0.5168
	Jet A Fuel	FS12RT	5.302	9.740	0.5185
	MIL-PRF-5606 Hydraulic Oil	FS13RT	5.290	9.423	0.5224
	MIL-PRF-83282 Hydraulic Oil	FS14RT	5.421	9.712	0.5306
	MIL-PRF-7808 Engine Oil	FS15RT	5.327	9.582	0.5255
	MIL-PRF-23699 Engine Oil	FS16RT	5.342	9.425	0.5243
	Salt Water	FS17RT	5.193	9.197	0.5184
	Skydrol 5	FS18RT	5.384	9.678	0.5264
	50% Water with 50% Skydrol 5	FS19RT	5.312	9.528	0.5246
	Distilled Water	FS31RT	5.131	9.046	0.5015
	MEK washing fluid	FS21RT	5.309	9.607	0.5213
90 mins @ 70°F±10°F	Polypropylene Glycol Deicer	FS22RT	5.406	9.645	0.5342
48±4 hrs @ 70°F±10°F	Isopropyl Alcohol Deicing	FS23RT	5.464	9.672	0.5366
120 hrs @ 165°F±5°F	Dry	FS32RT	5.589	9.812	0.5463
Per section 6.1 Test Plan NTP 1227Q1	85% Relative Humidity	FS33RT	5.419	9.339	0.5435

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

Fluid Sensitivity Screening In-Plane Shear Properties (FSIPS)--ET(180°F) Strength and Modulus Toray Advanced Composites Cetex® TC1225 5HS Fabric					
Exposure	Type of Fluid	Fluid Code	Average		
			0.2% Offset Strength [ksi]	5% Shear Strength [ksi]	Modulus [Msi]
90 days min @ 70°F±10°F	100 Low Lead Fuel	FS11ET	4.091	7.563	0.4089
	Jet A Fuel	FS12ET	4.193	7.607	0.4223
	MIL-PRF-5606 Hydraulic Oil	FS13ET	4.345	7.415	0.4621
	MIL-PRF-83282 Hydraulic Oil	FS14ET	4.340	7.505	0.4596
	MIL-PRF-7808 Engine Oil	FS15ET	4.250	7.416	0.4424
	MIL-PRF-23699 Engine Oil	FS16ET	4.290	7.239	0.4590
	Salt Water	FS17ET	4.226	7.304	0.4489
	Skydrol 5	FS18ET	4.428	7.874	0.4507
	50% Water with 50% Skydrol 5	FS19ET	4.179	7.440	0.4335
	Distilled Water	FS31ET	4.066	6.984	0.4267
	MEK washing fluid	FS21ET	4.143	7.268	0.4353
90 mins @ 70°F±10°F	Polypropylene Glycol Deicer	FS22ET	4.325	7.411	0.4662
48±4 hrs @ 70°F±10°F	Isopropyl Alcohol Deicing	FS23ET	4.424	7.595	0.4702
120 hrs @ 165°F±5°F	Dry	FS32ET	4.211	7.608	0.5775
Per section 6.1 Test Plan NTP 1227Q1	85% Relative Humidity	FS33ET	4.342	7.225	0.4688

Table 2-4: Fluid Sensitivity IPS Summary Data – ET (180°F)

2.4 Cured Laminate Physical Test Summary

2.4.1 DMA

DMA Results Summary Toray TC1225 Thermoplastic T300JB 5HS 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 (Ambient)	146.17	295.10	165.47	329.85
DMA Tg (Wet)	135.90	276.63	155.64	312.15

Table 2-5: DMA Test Summary

2.4.2 DSC

DSC Results Summary Toray TC1225 Thermoplastic T300JB 5HS Qualification										
Heating Cycle	Mean									
	Glass Transition Temperature		Melting Peak Temperature		Enthalpy of Melting	Crystallization Peak Temperature		Enthalpy of Crystallization	Crystallinity (¹ Theoretical R _c)	Crystallinity (² Actual R _c)
	T _g [°C]	T _g [°F]	T _m [°C]	T _m [°F]	ΔH _m [J/g]	T _c [°C]	T _c [°F]	ΔH _c [J/g]	%	%
1st Heating Cycle	150.12	302.21	308.39	587.10	14.90	258.83	497.90	14.80	27.29	23.69
2nd Heating Cycle	153.46	308.22	308.33	586.99	14.68	N/A	N/A	N/A	26.88	23.33

Note 1: Theoretical R_c, nominal = 42%

Note 2: Actual R_c from Method 2.

Table 2-6: DSC Test Summary

2.4.3 TMA

TMA Results Summary - Dry Toray TC1225 Thermoplastic T300JB 5HS Qualification		
Direction	Mean	
	Coefficient of Thermal Expansion	
	α [μm/(m·°C)]	α [μin/(in·°F)]
X	4.54	2.52
Y	4.43	2.46
Z (-50°C to 125°C)	53.72	29.84
Z (160°C to 210°C)	178.7	99.28

Table 2-7: TMA Test Summary

2.5 Individual Test Summaries

2.5.1 Warp Tension Properties (WT)

Material: Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric		Tension, 1-axis Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric [0]4S			
Resin content:	40.67 %wt	Comp. density: 1.528 g/cc			
Fiber volume:	51.22 %vol				
Ply count:	8				
Test method: ASTM D3039-17		Modulus calculation: 1000-3000 microstrain			
Normalized by: 0.01220		in. CPT			
		CTA	RTA	ETA	ETW
Test Temperature [°F]		-65	70	250	250
Moisture Conditioning		Ambient	Ambient	Ambient	Equilibrium
Equilibrium at T, RH					160F,85%
Source code		TCCJX XXXB	TCCJX XXXA	TCCJX XXXC	TCCJX XXXD
		Normalized	Measured	Normalized	Measured
F₁^{tu} [ksi]	Mean	113.1	114.4	119.2	120.1
	Minimum	107.2	107.1	114.5	115.5
	Maximum	119.1	120.7	123.8	123.2
	C.V.(%)	2.498	2.470	2.301	1.807
	No. Specimens	18	18	19	21
	No. Prepreg Lots	3	3	3	3
E₁^t [Msi]	Mean	8.609	8.710	8.656	8.720
	Minimum	8.487	8.573	8.499	8.509
	Maximum	8.819	8.854	8.776	8.910
	C.V.(%)	1.020	0.9620	1.033	1.300
	No. Specimens	18	19	19	22
	No. Prepreg Lots	3	3	3	3
ν₁₂^t	Mean		0.05257		0.04377
	Minimum		0.04186		0.03122
	Maximum		0.07558		0.05478
	C.V.(%)		16.73		18.85
	No. Specimens	18	19	19	22
	No. Prepreg Lots	3	3	3	3

2.5.2 Fill Tension Properties (FT)

Material: Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric		Tension, 2-axis Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric [90]4S							
Resin content:	40.67 %wt	Comp. density: 1.528 g/cc							
Fiber volume:	51.22 %vol								
Ply count:	8								
Test method: ASTM D3039-17		Modulus calculation: 1000-3000 microstrain							
Normalized by: 0.01220		in. CPT							
		CTA		RTA		ETA		ETW	
Test Temperature [°F]		-65		70		250		250	
Moisture Conditioning		Ambient		Ambient		Ambient		Equilibrium	
Equilibrium at T, RH								160F,85%	
Source code		TCCUX XXXB		TCCUX XXXA		TCCUX XXXC		TCCUX XXXD	
		Normalized	Measured	Normalized	Measured	Normalized	Measured	Normalized	Measured
F₂^{tu} [ksi]	Mean	116.8	117.5	109.8	110.4	111.5	112.6	108.3	109.6
	Minimum	102.7	103.9	103.1	102.6	100.8	101.8	71.60	73.26
	Maximum	130.7	132.8	120.7	121.6	122.9	124.5	121.0	122.4
	C.V.(%)	5.849	5.762	5.085	5.151	5.868	5.624	9.720	9.418
	No. Specimens	18		18		18		20	
No. Prepreg Lots		3		3		3		3	
E₂^t [Msi]	Mean	8.554	8.609	8.492	8.539	8.554	8.634	8.443	8.552
	Minimum	7.956	7.988	8.259	8.319	8.359	8.309	8.092	8.223
	Maximum	9.289	9.261	8.767	8.868	9.099	9.186	8.735	8.938
	C.V.(%)	4.040	3.840	1.962	2.215	2.187	2.326	1.906	2.121
	No. Specimens	18		18		18		20	
No. Prepreg Lots		3		3		3		3	

2.5.3 Warp Compression Properties (WC)

Material: Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric		Compression, 1-axis Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric [0]4S							
Resin content:	40.67 %wt	Comp. density: 1.528 g/cc							
Fiber volume:	51.22 %vol								
Ply count:	8								
Test method: ASTM D6641-16e2		Modulus calculation: 1000-3000 microstrain							
Normalized by: 0.01220		in. CPT							
		CTA		RTA		ETA		ETW	
Test Temperature [°F]		-65		70		250		250	
Moisture Conditioning		Ambient		Ambient		Ambient		Equilibrium	
Equilibrium at T, RH								160F,85%	
Source code		TCCLX XXXB		TCCLX XXXA		TCCLX XXXC		TCCLX XXXD	
		Normalized	Measured	Normalized	Measured	Normalized	Measured	Normalized	Measured
F ₁ ^{cu} [ksi]	Mean	103.2	104.7	92.18	93.43	70.87	72.13	69.89	70.75
	Minimum	91.86	92.09	84.29	83.86	61.32	61.75	64.77	65.99
	Maximum	111.1	113.6	96.61	98.85	79.25	81.40	74.31	74.15
	C.V.(%)	5.613	6.346	4.312	5.603	7.764	8.066	3.498	3.429
	No. Specimens	18		20		20		18	
	No. Prepreg Lots	3		3		3		3	
E ₁ ^c [Msi]	Mean	8.018	8.127	8.017	8.123	8.206	8.349	8.225	8.330
	Minimum	7.718	7.813	7.845	7.877	7.988	8.170	7.903	7.997
	Maximum	8.277	8.289	8.232	8.381	8.361	8.656	8.447	8.606
	C.V.(%)	1.916	1.554	1.306	1.845	1.242	1.529	1.658	2.042
	No. Specimens	18		18		18		18	
	No. Prepreg Lots	3		3		3		3	

2.5.4 Fill Compression Properties (FC)

Material: Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric		Compression, 2-axis Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric [90]4S							
Resin content:	40.67 %wt	Comp. density: 1.528 g/cc							
Fiber volume:	51.22 %vol								
Ply count:	8								
Test method: ASTM D6641-16e2		Modulus calculation: 1000-3000 microstrain							
Normalized by: 0.01220		in. CPT							
		CTA		RTA		ETA		ETW	
Test Temperature [°F]		-65		70		250		250	
Moisture Conditioning		Ambient		Ambient		Ambient		Equilibrium	
Equilibrium at T, RH								160F,85%	
Source code		TCCZX XXXB		TCCZX XXXA		TCCZX XXXC		TCCZX XXXD	
		Normalized	Measured	Normalized	Measured	Normalized	Measured	Normalized	Measured
F₂^{cu} [ksi]	Mean	98.51	99.83	87.97	88.93	65.95	66.97	65.18	66.10
	Minimum	69.97	70.89	75.90	76.62	55.69	56.39	58.45	59.92
	Maximum	113.1	113.0	97.07	98.01	74.32	74.92	70.81	70.76
	C.V.(%)	11.39	11.14	5.944	5.869	8.264	8.086	5.744	5.413
	No. Specimens	21		19		18		18	
No. Prepreg Lots		3		3		3		3	
E₂^c [Msi]	Mean	8.022	8.134	8.011	8.098	8.190	8.314	8.197	8.313
	Minimum	7.551	7.726	7.576	7.840	7.867	8.024	7.876	8.040
	Maximum	8.436	8.542	8.400	8.445	8.401	8.515	8.567	8.633
	C.V.(%)	3.014	2.827	2.817	2.109	2.073	1.784	2.432	1.937
	No. Specimens	18		18		18		18	
No. Prepreg Lots		3		3		3		3	

2.5.5 In-Plane Shear Properties (IPS)

Material: Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric		In-Plane Shear Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric [+45/-45]2S			
Resin content:	40.17 %wt	Comp. density: 1.530 g/cc			
Fiber volume:	51.71 %vol				
Ply count:	8				
Test method: ASTM D3518-18		Modulus calculation: 2000-6000 microstrain			
Normalized by: NA					
		CTA		RTA	
Test Temperature [°F]	-65	70		250	
Moisture Conditioning	Ambient	Ambient		Ambient	
Equilibrium at T, RH					
Source code	TCCNX XXXB	TCCNX XXXA		TCCNX XXXC	
		ETA		ETW	
		250		250	
		Equilibrium		Equilibrium	
		160F,85%		160F,85%	
		TCCNX XXXD		TCCNX XXXD	
		Normalized		Measured	
		Normalized		Measured	
		Normalized		Measured	
		Normalized		Measured	
F₁₂^{s0.2%} [ksi]	Mean	7.023		5.672	
	Minimum	6.823		5.477	
	Maximum	7.263		6.318	
	C.V.(%)	1.860		3.244	
	No. Specimens	20		18	
	No. Prepreg Lots	3		3	
F₁₂^{s5% strain} [ksi]	Mean	12.86		9.952	
	Minimum	12.41		9.685	
	Maximum	13.27		10.19	
	C.V.(%)	2.049		1.607	
	No. Specimens	19		18	
	No. Prepreg Lots	3		3	
G₁₂^s [Msi]	Mean	0.6170		0.5529	
	Minimum	0.5980		0.5053	
	Maximum	0.6318		0.5714	
	C.V.(%)	1.367		2.613	
	No. Specimens	21		18	
	No. Prepreg Lots	3		3	

2.5.6 Warp Flexural Properties (WFLEX)

Material:		Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric				Warp Flexural Proc. A Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric [0]4S			
Resin content:	40.67 %wt		Comp. density: 1.528 g/cc						
Fiber volume:	51.22 %vol								
Ply count:	8								
Test method:		ASTM D7264-21, Proc. A		Modulus calculation: 1000-3000 microstrain					
Normalized by:		0.01220 in. CPT							
		CTA		RTA		ETA		ETW	
Test Temperature [°F]		-65		70		250		250	
Moisture Conditioning		Ambient		Ambient		Ambient		Equilibrium	
Equilibrium at T, RH								160F,85%	
Source code		TCCTX XXXB		TCCTX XXXA		TCCTX XXXC		TCCTX XXXD	
		Normalized	Measured	Normalized	Measured	Normalized	Measured	Normalized	Measured
(0°) Warp Flexural, Proc. A Strength [ksi]	Mean	163.8	167.0	151.1	154.1	114.3	117.6	110.0	113.4
	Minimum	157.1	158.8	138.0	145.1	109.4	112.1	101.3	106.4
	Maximum	171.3	176.9	164.5	161.7	123.5	129.9	119.0	122.2
	C.V.(%)	2.432	3.073	4.267	2.933	2.972	3.277	4.461	3.970
	No. Specimens	18		18		18		18	
	No. Prepreg Lots	3		3		3		3	
(0°) Warp Flexural, Proc. A Modulus [Msi]	Mean	9.124	9.303	9.019	9.199	9.104	9.370	8.921	9.203
	Minimum	8.871	8.972	8.750	9.036	8.859	9.071	8.590	8.524
	Maximum	9.423	9.544	9.461	9.334	9.390	9.779	9.512	9.594
	C.V.(%)	1.565	1.689	2.017	0.8297	1.638	2.004	3.036	2.915
	No. Specimens	18		18		18		18	
	No. Prepreg Lots	3		3		3		3	

2.5.7 Fill Flexural Properties (FFLEX)

Material: Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric					Fill Flexural Proc. A Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric [90]4S				
Resin content: 40.67 %wt		Comp. density: 1.528 g/cc							
Fiber volume: 51.22 %vol									
Ply count: 8									
Test method: ASTM D7264-21, Proc. A Modulus calculation: 1000-3000 microstrain									
Normalized by: 0.01220		in. CPT							
		CTA		RTA		ETA		ETW	
Test Temperature [°F]		-65		70		250		250	
Moisture Conditioning		Ambient		Ambient		Ambient		Equilibrium	
Equilibrium at T, RH								160F,85%	
Source code		TCCQX XXXB		TCCQX XXXA		TCCQX XXXC		TCCQX XXXD	
		Normalized	Measured	Normalized	Measured	Normalized	Measured	Normalized	Measured
(90°) Fill Flexural, Proc. A Strength [ksi]	Mean	143.1	144.6	133.5	135.6	101.1	103.0	91.89	93.57
	Minimum	130.7	130.3	121.7	123.6	93.77	94.19	85.13	87.72
	Maximum	151.3	155.9	143.1	147.9	112.4	115.6	105.1	104.6
	C.V.(%)	3.125	3.683	4.913	4.714	5.669	6.318	5.302	4.554
	No. Specimens	18		18		18		18	
	No. Prepreg Lots	3		3		3		3	
(90°) Fill Flexural, Proc. A Modulus [Msi]	Mean	7.558	7.638	7.509	7.626	7.482	7.618	7.343	7.478
	Minimum	7.296	7.281	7.278	7.469	7.299	7.375	6.867	6.917
	Maximum	7.865	7.775	7.809	7.765	7.702	7.874	8.024	7.953
	C.V.(%)	2.332	1.858	2.180	1.321	1.706	1.576	3.997	3.189
	No. Specimens	18		18		18		18	
	No. Prepreg Lots	3		3		3		3	

2.5.8 In-Plane Shear Double Notch Shear (DNS)

Material: Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric		In-Plane Shear, Double Notch Shear Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric [0]4S							
Resin content:	40.67 %wt	Comp. density: 1.528 g/cc							
Fiber volume:	51.22 %vol								
Ply count:	8								
Test method: ASTM D3846-08(2015)									
Normalized by: NA									
		CTA		RTA		ETA		ETW	
Test Temperature [°F]		-65		70		250		250	
Moisture Conditioning		Ambient		Ambient		Ambient		Equilibrium	
Equilibrium at T, RH								160F,85%	
Source code		TCCVX XXXB		TCCVX XXXA		TCCVX XXXC		TCCVX XXXD	
		Normalized	Measured	Normalized	Measured	Normalized	Measured	Normalized	Measured
In-Plane Shear, Double Notch Shear Strength [ksi]	Mean	11.71		9.754		6.697		6.280	
	Minimum	10.86		8.587		6.186		5.520	
	Maximum	12.72		10.84		7.272		6.686	
	C.V.(%)	3.723		7.790		4.280		4.812	
	No. Specimens	18		18		18		17	
No. Prepreg Lots		3		3		3		3	

2.5.9 “25/50/25” Unnotched Tension 1 Properties (UNT1)

Material: Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric		Unnotched Tension 1 Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric [0/45]2S					
Resin content:	40.28 %wt						
Fiber volume:	51.60 %vol						
Ply count:	8						
Test method: ASTM D3039-17		Modulus calculation: 1000-3000 microstrain					
Normalized by: 0.01220		in. CPT					
		CTA		RTA		ETW	
Test Temperature [°F]		-65		70		250	
Moisture Conditioning		Ambient		Ambient		Equilibrium	
Equilibrium at T, RH						160F,85%	
Source code		TCCAX XXXB		TCCAX XXXA		TCCAX XXXD	
		Normalized	Measured	Normalized	Measured	Normalized	Measured
UNT1 Strength [ksi]	Mean	80.97	81.66	79.02	79.90	75.58	76.23
	Minimum	78.70	79.32	76.43	76.89	62.29	63.34
	Maximum	83.30	84.52	82.11	83.68	82.57	83.62
	C.V.(%)	1.520	1.770	2.071	2.417	6.941	6.944
	No. Specimens	18		19		22	
	No. Prepreg Lots	3		3		3	
UNT1 Modulus [Msi]	Mean	6.055	6.107	6.005	6.071	5.712	5.761
	Minimum	5.756	5.767	5.811	5.858	5.582	5.614
	Maximum	6.292	6.385	6.158	6.270	5.857	5.888
	C.V.(%)	3.112	3.315	1.607	1.961	1.385	1.463
	No. Specimens	18		18		22	
	No. Prepreg Lots	3		3		3	

2.5.10 “10/80/10” Unnotched Tension 2 Properties (UNT2)

Material: Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric		Unnotched Tension 2 Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric [0/45/45/45/45]S					
Resin content:	40.51 %wt						
Fiber volume:	51.44 %vol						
Ply count:	10						
Test method: ASTM D3039-17		Modulus calculation: 1000-3000 microstrain					
Normalized by: 0.01220		in. CPT					
		CTA		RTA		ETW	
Test Temperature [°F]		-65		70		250	
Moisture Conditioning		Ambient		Ambient		Equilibrium	
Equilibrium at T, RH						160F,85%	
Source code		TCCBX XXXB		TCCBX XXXA		TCCBX XXXD	
		Normalized	Measured	Normalized	Measured	Normalized	Measured
UNT2 Strength [ksi]	Mean	50.04	50.43	44.92	45.23	38.18	38.49
	Minimum	43.27	43.04	40.41	40.60	32.23	32.34
	Maximum	52.16	52.63	48.91	49.32	40.63	40.93
	C.V.(%)	3.943	4.275	6.846	6.789	4.685	4.807
	No. Specimens	18		20		21	
	No. Prepreg Lots	3		3		3	
UNT2 Modulus [Msi]	Mean	3.883	3.913	3.799	3.825	3.206	3.232
	Minimum	3.678	3.698	3.695	3.705	3.036	3.046
	Maximum	4.054	4.091	3.955	3.980	3.361	3.381
	C.V.(%)	3.119	3.373	1.808	1.826	2.365	2.267
	No. Specimens	18		20		21	
	No. Prepreg Lots	3		3		3	

2.5.11 “40/20/40” Unnotched Tension 3 Properties (UNT3)

Material: Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric		Unnotched Tension 3 Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric [0/0/45/0/0]S					
Resin content:	40.75 %wt						
Fiber volume:	51.12 %vol						
Ply count:	10						
Test method: ASTM D3039-17		Modulus calculation: 1000-3000 microstrain					
Normalized by: 0.01220		in. CPT					
		CTA		RTA		ETW	
Test Temperature [°F]		-65		70		250	
Moisture Conditioning		Ambient		Ambient		Equilibrium	
Equilibrium at T, RH						160F,85%	
Source code		TCCCX XXXB		TCCCX XXXA		TCCCX XXXD	
		Normalized	Measured	Normalized	Measured	Normalized	Measured
UNT3 Strength [ksi]	Mean	97.35	97.91	97.16	97.62	98.85	99.73
	Minimum	93.59	94.66	94.69	95.12	84.13	83.77
	Maximum	100.8	101.7	100.4	100.5	109.3	110.9
	C.V.(%)	2.106	2.203	2.040	1.929	6.880	7.186
	No. Specimens	18		18		23	
	No. Prepreg Lots	3		3		3	
UNT3 Modulus [Msi]	Mean	7.608	7.652	7.618	7.655	7.487	7.552
	Minimum	7.225	7.200	7.479	7.472	7.331	7.345
	Maximum	7.894	7.982	7.748	7.859	7.615	7.705
	C.V.(%)	3.035	3.423	1.133	1.325	1.148	1.435
	No. Specimens	18		18		23	
	No. Prepreg Lots	3		3		3	

2.5.12 “25/50/25” Unnotched Compression 1 Properties (UNC1)

Material: Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric		Unnotched Compression 1 Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric [0/45]2S			
Resin content:	40.28 %wt	Comp. density: 1.529 g/cc			
Fiber volume:	51.60 %vol				
Ply count:	8				
Test method: ASTM D6641-16e2		Modulus calculation: 1000-3000 microstrain			
Normalized by: 0.01220		in. CPT			
		RTA		ETW	
Test Temperature [°F]	70	250			
Moisture Conditioning	Ambient	Equilibrium			
Equilibrium at T, RH		160F,85%			
Source code	TCCWX XXXA	TCCWX XXXD			
		Normalized	Measured	Normalized	Measured
UNC1 Strength [ksi]	Mean	67.55	68.55	50.38	51.17
	Minimum	62.91	63.97	47.36	48.26
	Maximum	71.84	73.22	53.34	54.64
	C.V.(%)	3.323	3.317	2.732	3.017
	No. Specimens	18		19	
	No. Prepreg Lots	3		3	
UNC1 Modulus [Msi]	Mean	5.728	5.812	5.743	5.833
	Minimum	5.565	5.653	5.603	5.664
	Maximum	5.807	5.871	5.885	6.048
	C.V.(%)	0.9731	0.9117	1.475	1.944
	No. Specimens	18		18	
	No. Prepreg Lots	3		3	

2.5.13 “10/80/10” Unnotched Compression 2 Properties (UNC2)

Material: Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric				Unnotched Compression 2			
Resin content: 40.51 %wt Fiber volume: 51.44 %vol Ply count: 10				Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric [0/45/45/45/45]S			
Comp. density: 1.530 g/cc							
Test method: ASTM D6641-16e2				Modulus calculation: 1000-3000 microstrain			
Normalized by: 0.01220 in. CPT							
		RTA		ETW			
Test Temperature [°F]		70		250			
Moisture Conditioning		Ambient		Equilibrium			
Equilibrium at T, RH				160F,85%			
Source code		TCCXX XXXA		TCCXX XXXD			
		Normalized	Measured	Normalized	Measured		
UNC2 Strength [ksi]	Mean	37.03	37.51	24.73	24.99		
	Minimum	34.59	34.54	22.64	22.78		
	Maximum	40.34	41.01	27.49	27.77		
	C.V.(%)	3.817	4.015	5.316	5.368		
	No. Specimens	18		18			
	No. Prepreg Lots	3		3			
UNC2 Modulus [Msi]	Mean	3.644	3.692	3.331	3.368		
	Minimum	3.538	3.587	3.149	3.159		
	Maximum	3.732	3.830	3.513	3.581		
	C.V.(%)	1.467	1.724	2.494	2.899		
	No. Specimens	18		18			
	No. Prepreg Lots	3		3			

2.5.14 “40/20/40” Unnotched Compression 3 Properties (UNC3)

Material: Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric				Unnotched Compression 3			
Resin content: 40.75 %wt Fiber volume: 51.12 %vol Ply count: 10				Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric [0/0/45/0/0]S			
Test method: ASTM D6641-16e2				Modulus calculation: 1000-3000 microstrain			
Normalized by: 0.01220 in. CPT							
		RTA		ETW			
Test Temperature [°F]		70		250			
Moisture Conditioning		Ambient		Equilibrium			
Equilibrium at T, RH				160F,85%			
Source code		TCCYX XXXA		TCCYX XXXD			
		Normalized	Measured	Normalized	Measured		
UNC3 Strength [ksi]	Mean	85.10	85.75	63.03	63.55		
	Minimum	74.66	76.16	57.52	57.86		
	Maximum	88.27	88.49	66.61	67.26		
	C.V.(%)	4.259	3.952	3.902	4.007		
	No. Specimens	18		19			
	No. Prepreg Lots	3		3			
UNC3 Modulus [Msi]	Mean	7.184	7.240	7.327	7.388		
	Minimum	6.966	6.996	7.152	7.203		
	Maximum	7.282	7.405	7.461	7.596		
	C.V.(%)	1.168	1.523	1.186	1.699		
	No. Specimens	18		18			
	No. Prepreg Lots	3		3			

2.5.15 “25/50/25” Open-Hole Tension 1 Properties (OHT1)

Material: Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric		Open-Hole Tension 1 Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric [0/45]3S							
Resin content:	40.68 %wt	Comp. density: 1.530 g/cc							
Fiber volume:	51.29 %vol								
Ply count:	12								
Test method: ASTM D5766-11(2018)									
Normalized by:	0.01220	in. CPT							
		CTA		RTA		ETA		ETW	
Test Temperature [°F]		-65		70		250		250	
Moisture Conditioning		Ambient		Ambient		Ambient		Equilibrium	
Equilibrium at T, RH								160F,85%	
Source code		TCCDX XXXB		TCCDX XXXA		TCCDX XXXC		TCCDX XXXD	
		Normalized	Measured	Normalized	Measured	Normalized	Measured	Normalized	Measured
OHT1 Strength [ksi]	Mean	46.53	46.82	46.20	46.50	47.01	47.28	47.01	47.16
	Minimum	44.92	45.32	45.01	45.29	45.47	45.17	45.59	45.72
	Maximum	48.37	48.67	47.35	48.04	48.99	49.61	48.37	48.40
	C.V.(%)	2.322	2.350	1.497	1.638	1.808	2.135	1.475	1.580
	No. Specimens	18		18		18		18	
No. Prepreg Lots		3		3		3		3	

2.5.16 “10/80/10” Open-Hole Tension 2 Properties (OHT2)

Material: Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric				Open-Hole Tension 2 Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric [0/45/45/45/45]S							
Resin content: 40.51 %wt		Comp. density: 1.530 g/cc									
Fiber volume: 51.44 %vol											
Ply count: 10											
Test method: ASTM D5766-11(2018)											
Normalized by: 0.01220 in. CPT											
		CTA		RTA		ETW					
Test Temperature [°F]		-65		70		250					
Moisture Conditioning		Ambient		Ambient		Equilibrium					
Equilibrium at T, RH						160F,85%					
Source code		TCCEX XXXB		TCCEX XXXA		TCCEX XXXD					
		Normalized	Measured	Normalized	Measured	Normalized	Measured				
OHT2 Strength [ksi]	Mean	36.14	36.29	33.81	33.92	26.61	26.73				
	Minimum	35.03	34.72	32.51	32.62	26.11	26.15				
	Maximum	37.70	37.78	34.76	35.10	27.34	27.82				
	C.V.(%)	1.990	2.309	1.905	2.163	1.068	1.469				
	No. Specimens	18		18		18					
	No. Prepreg Lots	3		3		3					

2.5.17 “40/20/40” Open-Hole Tension 3 Properties (OHT3)

Material: Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric		Open-Hole Tension 3 Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric [0/0/45/0/0]S							
Resin content:	40.75 %wt	Comp. density: 1.527 g/cc							
Fiber volume:	51.12 %vol								
Ply count:	10								
Test method: ASTM D5766-11(2018)									
Normalized by: 0.01220 in. CPT									
		CTA		RTA		ETW			
Test Temperature [°F]		-65		70		250			
Moisture Conditioning		Ambient		Ambient		Equilibrium			
Equilibrium at T, RH						160F,85%			
Source code		TCCFX XXXB		TCCFX XXXA		TCCFX XXXD			
		Normalized		Measured		Normalized		Measured	
OHT3 Strength [ksi]	Mean	52.22	52.46	51.76	52.02	51.05	51.27		
	Minimum	48.25	48.14	48.95	49.23	49.22	49.83		
	Maximum	56.14	56.50	55.52	55.96	52.85	53.56		
	C.V.(%)	4.805	4.876	3.083	2.896	1.900	1.932		
	No. Specimens	19		18		18			
No. Prepreg Lots		3		3		3			

2.5.18 “25/50/25” Filled-Hole Tension 1 Properties (FHT1)

Material: Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric		Filled-Hole Tension 1 Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric [0/45]3S					
Resin content:	40.68 %wt	Comp. density: 1.530 g/cc					
Fiber volume:	51.29 %vol						
Ply count:	12						
Test method:	ASTM D6742-17						
Normalized by:	0.01220	in. CPT					
		CTA		RTA		ETW	
Test Temperature [°F]	-65	-65		70		250	
Moisture Conditioning	Ambient	Ambient		Ambient		Equilibrium	
Equilibrium at T, RH						160F,85%	
Source code	TCC4X XXXB	TCC4X XXXA		TCC4X XXXD			
		Normalized	Measured	Normalized	Measured	Normalized	Measured
FHT1 Strength [ksi]	Mean	52.57	52.84	49.67	49.97	49.26	49.48
	Minimum	49.61	50.10	48.02	48.54	47.60	46.95
	Maximum	58.28	58.41	51.33	51.74	50.51	50.52
	C.V.(%)	5.169	4.984	1.703	1.904	1.572	1.873
	No. Specimens	18		18		18	
No. Prepreg Lots		3		3		3	

2.5.19 “10/80/10” Filled-Hole Tension 2 Properties (FHT2)

Material: Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric		Filled-Hole Tension 2 Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric [0/45/45/45/45]S					
Resin content:	40.51 %wt	Comp. density: 1.530 g/cc					
Fiber volume:	51.44 %vol						
Ply count:	10						
Test method: ASTM D6742-17							
Normalized by: 0.01220 in. CPT							
		CTA		RTA		ETW	
Test Temperature [°F]	-65	-65		70		250	
Moisture Conditioning	Ambient	Ambient		Ambient		Equilibrium	
Equilibrium at T, RH						160F,85%	
Source code	TCC5X XXXB	TCC5X XXXA		TCC5X XXXD			
		Normalized	Measured	Normalized	Measured	Normalized	Measured
FHT2 Strength [ksi]	Mean	40.01	40.37	34.89	35.22	29.09	29.38
	Minimum	36.49	36.50	33.06	33.14	27.55	27.80
	Maximum	43.73	43.83	36.16	36.78	30.41	30.87
	C.V.(%)	3.929	3.874	2.628	3.123	2.751	2.834
	No. Specimens	19		18		18	
No. Prepreg Lots		3		3		3	

2.5.20 “40/20/40” Filled-Hole Tension 3 Properties (FHT3)

Material: Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric				Filled-Hole Tension 3			
Resin content: 40.75 %wt				Toray Advanced Composites Cetex® TC1225 T300JB			
Fiber volume: 51.12 %vol				3K 5HS Fabric			
Ply count: 10				[0/0/45/0/0]S			
Test method: ASTM D6742-17							
Normalized by: 0.01220 in. CPT							
		CTA		RTA		ETW	
Test Temperature [°F]		-65		70		250	
Moisture Conditioning		Ambient		Ambient		Equilibrium	
Equilibrium at T, RH						160F,85%	
Source code		TCC6X XXXB		TCC6X XXXA		TCC6X XXXD	
		Normalized	Measured	Normalized	Measured	Normalized	Measured
FHT3 Strength [ksi]	Mean	55.18	55.77	51.54	51.86	51.35	51.90
	Minimum	52.01	52.50	47.29	47.03	48.81	49.20
	Maximum	58.52	58.90	55.66	56.03	53.27	53.12
	C.V.(%)	3.589	3.382	4.190	4.609	1.887	2.010
	No. Specimens	18		18		18	
No. Prepreg Lots		3		3		3	

2.5.21 “25/50/25” Open-Hole Compression 1 Properties (OHC1)

Material: Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric		Open-Hole Compression 1 Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric [0/45]3S					
Resin content:	40.68 %wt	Comp. density: 1.530 g/cc					
Fiber volume:	51.29 %vol						
Ply count:	12						
Test method: ASTM D6484-20, Proc. A							
Normalized by: 0.01220 in. CPT							
		RTA		ETA		ETW	
Test Temperature [°F]		70		250		250	
Moisture Conditioning		Ambient		Ambient		Equilibrium	
Equilibrium at T, RH						160F,85%	
Source code		TCCGX XXXA		TCCGX XXXC		TCCGX XXXD	
		Normalized	Measured	Normalized	Measured	Normalized	Measured
OHC1 Strength [ksi]	Mean	42.72	42.75	33.20	33.25	32.99	33.06
	Minimum	40.47	41.08	31.97	32.06	30.13	30.10
	Maximum	44.71	44.46	35.02	34.88	38.37	38.05
	C.V.(%)	2.663	2.322	2.706	2.560	5.998	5.608
	No. Specimens	18		18		18	
No. Prepreg Lots		3		3		3	

2.5.22 “10/80/10” Open-Hole Compression 2 Properties (OHC2)

Material: Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric		Open-Hole Compression 2 Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric [0/45/45/45/45]S			
Resin content:	40.51 %wt	Comp. density: 1.530 g/cc			
Fiber volume:	51.44 %vol				
Ply count:	10				
Test method: ASTM D6484-20, Proc. A					
Normalized by: 0.01220 in. CPT					
		RTA		ETW	
Test Temperature [°F]	70	250			
Moisture Conditioning	Ambient	Equilibrium			
Equilibrium at T, RH		160F,85%			
Source code	TCCHX XXXA	TCCHX XXXD			
	Normalized	Measured	Normalized	Measured	
OHC2 Strength [ksi]	Mean	32.08	32.22	22.67	22.82
	Minimum	30.44	30.95	21.29	21.41
	Maximum	33.19	33.38	24.56	24.74
	C.V.(%)	2.278	1.979	4.471	4.148
	No. Specimens	18		18	
No. Prepreg Lots		3		3	

2.5.23 “40/20/40” Open-Hole Compression 3 Properties (OHC3)

Material: Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric		Open-Hole Compression 3 Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric [0/0/45/0/0]S			
Resin content:	40.75 %wt	Comp. density: 1.527 g/cc			
Fiber volume:	51.12 %vol				
Ply count:	10				
Test method: ASTM D6484-20, Proc. A					
Normalized by: 0.01220 in. CPT					
		RTA		ETW	
Test Temperature [°F]	70	250			
Moisture Conditioning	Ambient	Equilibrium			
Equilibrium at T, RH		160F,85%			
Source code	TCCIX XXXA	TCCIX XXXD			
	Normalized	Measured	Normalized	Measured	
OHC3 Strength [ksi]	Mean	41.98	42.20	33.44	33.66
	Minimum	40.20	40.41	31.24	31.42
	Maximum	43.97	44.45	35.39	35.46
	C.V.(%)	2.311	2.422	3.350	3.399
	No. Specimens	18		19	
No. Prepreg Lots	3		3		

2.5.24 “25/50/25” Filled-Hole Compression 1 Properties (FHC1)

Material: Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric				Filled-Hole Compression 1			
Resin content: 40.68 %wt				Comp. density: 1.530 g/cc			
Fiber volume: 51.29 %vol				Toray Advanced Composites Cetex® TC1225 T300JB			
Ply count: 12				3K 5HS Fabric			
				[0/45]3S			
Test method: ASTM D6742-17, Proc. A							
Normalized by: 0.01220 in. CPT							
		RTA		ETW			
Test Temperature [°F]		70		250			
Moisture Conditioning		Ambient		Equilibrium			
Equilibrium at T, RH				160F,85%			
Source code		TCC7X XXXA		TCC7X XXXD			
		Normalized	Measured	Normalized	Measured		
FHC1 Strength [ksi]	Mean*	69.03	69.57	52.35	52.81		
	Minimum	65.55	66.76	49.17	49.83		
	Maximum	72.15	72.21	57.96	57.68		
	C.V.(%)	2.584	2.357	4.328	3.685		
	No. Specimens	19	18				
	No. Prepreg Lots	3	3				

* 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 that FHC1>UNC1.

2.5.25 “10/80/10” Filled-Hole Compression 2 Properties (FHC2)

Material: Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric				Filled-Hole Compression 2 Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric [0/45/45/45/45]S			
Resin content: 40.51 %wt		Comp. density: 1.530 g/cc					
Fiber volume: 51.44 %vol							
Ply count: 10							
Test method: ASTM D6742-17, Proc. A							
Normalized by: 0.01220		in. CPT					
		RTA		ETW			
Test Temperature [°F]		70		250			
Moisture Conditioning		Ambient		Equilibrium			
Equilibrium at T, RH				160F,85%			
Source code		TCC8X XXXA		TCC8X XXXD			
		Normalized	Measured	Normalized	Measured		
FHC2 Strength [ksi]	Mean*	39.85	40.00	29.82	30.00		
	Minimum	37.97	38.22	27.94	28.30		
	Maximum	42.97	43.14	32.00	32.18		
	C.V.(%)	3.704	3.482	3.528	3.456		
	No. Specimens	18		18			
	No. Prepreg Lots	3		3			

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

2.5.26 “40/20/40” Filled-Hole Compression 3 Properties (FHC3)

Material:		Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric		Filled-Hole Compression 3							
Resin content:		40.75 %wt		Comp. density:		1.527 g/cc		Toray Advanced Composites Cetex® TC1225 T300JB			
Fiber volume:		51.12 %vol						3K 5HS Fabric			
Ply count:		10						[0/0/45/0/0]S			
Test method:		ASTM D6742-17, Proc. A									
Normalized by:		0.01220		in. CPT							
		RTA		ETW							
Test Temperature [°F]		70		250							
Moisture Conditioning		Ambient		Equilibrium							
Equilibrium at T, RH				160F,85%							
Source code		TCC9X XXXA		TCC9X XXXD							
		Normalized		Measured		Normalized		Measured			
FHC3 Strength [ksi]	Mean	81.78	82.49	60.54	61.21						
	Minimum	74.34	76.08	45.75	46.47						
	Maximum	87.76	87.94	64.29	64.97						
	C.V.(%)	4.138	3.922	7.150	7.098						
	No. Specimens	20		21							
No. Prepreg Lots		3		3							

2.5.27 “25/50/25” Single-Shear Bearing 1 Properties (SSB1)

Material:		Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric				Single-Shear Bearing 1, Proc. C			
Resin content:		40.28 %wt		Comp. density: 1.529 g/cc		Toray Advanced Composites Cetex® TC1225 T300JB			
Fiber volume:		51.60 %vol				3K 5HS Fabric			
Ply count:		8				[0/45]2S			
Test method:		ASTM D5961-17,Proc. C							
Normalized by:		0.01220		in. CPT					
		RTA		ETW					
Test Temperature [°F]		70		250					
Moisture Conditioning		Ambient		Equilibrium					
Equilibrium at T, RH				160F,85%					
Source code		TCC1X XXXA		TCC1X XXXD					
		Normalized	Measured	Normalized	Measured				
SSB1, Proc. C 2% Offset Strength [ksi]	Mean	101.8	102.9	86.31	87.21				
	Minimum	96.01	96.22	80.03	78.18				
	Maximum	110.0	112.7	103.6	104.5				
	C.V.(%)	3.542	3.882	7.099	7.310				
	No. Specimens	18		18					
	No. Prepreg Lots	3		3					
SSB1, Proc. C Ultimate Strength [ksi]	Mean	116.2	117.4	93.65	94.62				
	Minimum	109.8	109.8	85.39	87.41				
	Maximum	122.2	124.3	107.3	108.2				
	C.V.(%)	2.784	3.145	5.112	5.236				
	No. Specimens	18		18					
	No. Prepreg Lots	3		3					
SSB1, Proc. C Stiffness Chord [Msi]	Mean	1.570	1.587	1.504	1.520				
	Minimum	1.369	1.382	1.336	1.314				
	Maximum	1.706	1.704	1.668	1.686				
	C.V.(%)	5.148	5.103	6.637	6.997				
	No. Specimens	18		18					
	No. Prepreg Lots	3		3					

2.5.28 “10/80/10” Single-Shear Bearing 2 Properties (SSB2)

Material: Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric		Single-Shear Bearing 2, Proc. C Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric [0/45/45/45/45]S			
Resin content:	40.51 %wt	Comp. density: 1.530 g/cc			
Fiber volume:	51.44 %vol				
Ply count:	10				
Test method: ASTM D5961-17, Proc. C					
Normalized by: 0.01220 in. CPT					
		RTA		ETW	
Test Temperature [°F]	70	250			
Moisture Conditioning	Ambient	Equilibrium			
Equilibrium at T, RH		160F, 85%			
Source code	TCC2X XXXA	TCC2X XXXD			
	Normalized	Measured	Normalized	Measured	
SSB2, Proc. C 2% Offset Strength [ksi]	Mean	96.46	97.02	78.02	78.56
	Minimum	91.36	92.16	72.28	72.66
	Maximum	101.3	102.0	89.40	90.31
	C.V.(%)	2.949	3.191	5.870	5.788
	No. Specimens	18		18	
	No. Prepreg Lots	3		3	
SSB2, Proc. C Ultimate Strength [ksi]	Mean	112.2	112.9	90.48	91.11
	Minimum	106.6	107.8	86.50	87.53
	Maximum	120.9	121.8	96.09	96.07
	C.V.(%)	3.435	3.354	3.203	2.958
	No. Specimens	18		18	
	No. Prepreg Lots	3		3	
SSB2, Proc. C Chord Stiffness [Msi]	Mean	1.094	1.100	1.020	1.027
	Minimum	0.9198	0.9274	0.9397	0.9397
	Maximum	1.227	1.236	1.128	1.138
	C.V.(%)	6.145	5.907	5.123	5.256
	No. Specimens	18		18	
	No. Prepreg Lots	3		3	

2.5.29 “40/20/40” Single-Shear Bearing 3 Properties (SSB3)

Material: Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric		Single-Shear Bearing 3, Proc. C			
Resin content:	40.75 %wt	Comp. density: 1.527 g/cc			
Fiber volume:	51.12 %vol	Toray Advanced Composites Cetex® TC1225 T300JB			
Ply count:	10	3K 5HS Fabric			
Test method: ASTM D5961-17, Proc. B		[0/0/45/0/0]S			
Normalized by: 0.01220 in. CPT					
		RTA		ETW	
Test Temperature [°F]	70	250			
Moisture Conditioning	Ambient	Equilibrium			
Equilibrium at T, RH		160F, 85%			
Source code	TCC3X XXXA	TCC3X XXXD			
	Normalized	Measured	Normalized	Measured	
SSB3, Proc. C	Mean	91.14	91.51	75.48	75.90
	Minimum	81.49	82.46	69.15	69.07
	Maximum	96.04	97.21	80.42	81.19
	2% Offset	4.315	4.473	4.511	4.899
	Strength [ksi]				
	No. Specimens	18		18	
SSB3, Proc. C	Mean	105.8	106.2	84.84	85.30
	Minimum	101.4	102.5	82.90	83.20
	Maximum	108.2	108.9	86.55	87.44
	Ultimate Strength	2.014	1.966	1.176	1.411
	Chord Stiffness [ksi]				
	No. Specimens	18		18	
SSB3, Proc. C	Mean	1.459	1.465	1.372	1.379
	Minimum	1.391	1.376	1.262	1.268
	Maximum	1.548	1.549	1.525	1.540
	Chord Stiffness	3.494	3.648	4.549	4.983
	Chord Stiffness [Msi]				
	No. Specimens	18		18	
SSB3, Proc. C	No. Prepreg Lots	3		3	

2.5.30 “25/50/25” Compression After Impact 1 Properties (CAI1)

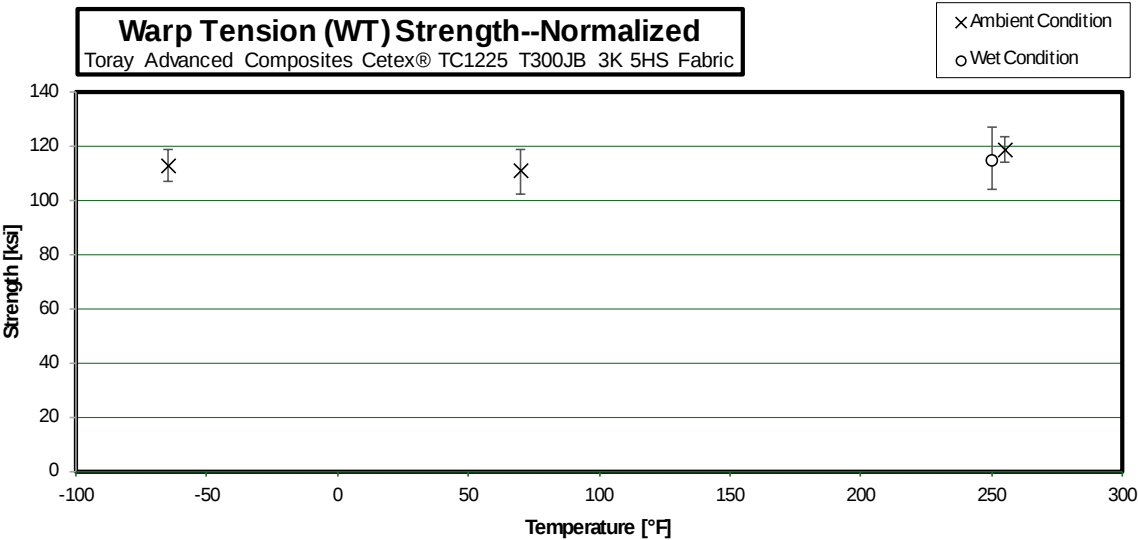
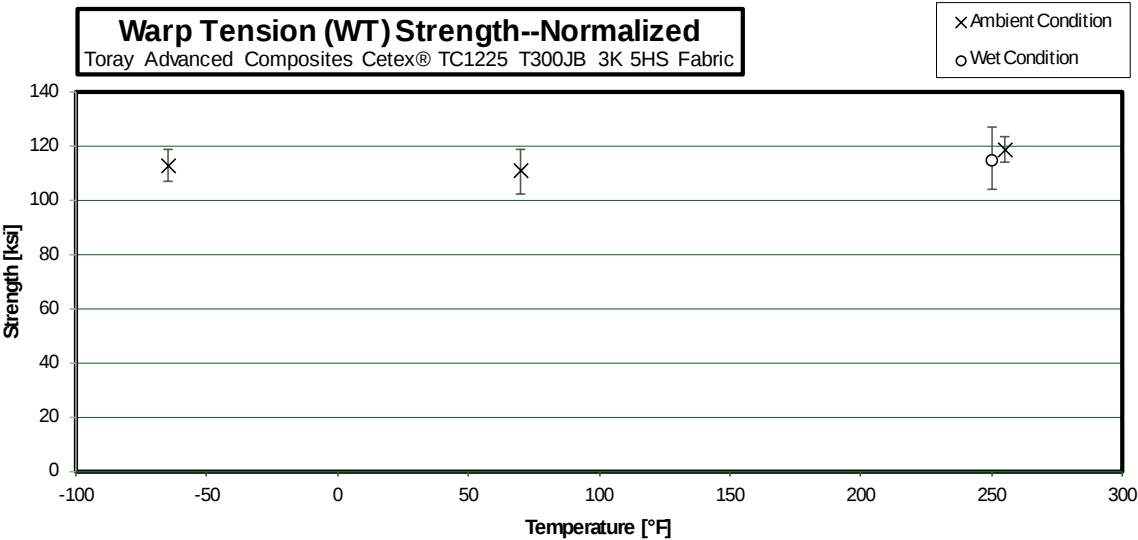
Material: Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric				Compression After Impact 1 Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric [0/45]4S			
Resin content:		40.55 %wt		Comp. density: 1.527 g/cc			
Fiber volume:		51.28 %vol					
Ply count:		16					
Test method: ASTM D7136-15/D7137-17							
Normalized by: 0.01220 in. CPT							
		RTA		ETW			
Test Temperature [°F]		70		250			
Moisture Conditioning		Ambient		Equilibrium			
Equilibrium at T, RH				160F,85%			
Source code		TCCKX XXXA		TCCKX XXXD			
		Normalized	Measured	Normalized	Measured		
CAI1 Strength [ksi]	Mean	44.92	45.06	37.44	37.78		
	Minimum	43.39	43.84	37.04	37.23		
	Maximum	46.20	46.35	37.93	38.29		
	C.V.(%)	2.108	1.974	0.9250	0.9859		
	No. Specimens	6		8			
No. Prepreg Lots		1		1			

3. Individual Test Charts

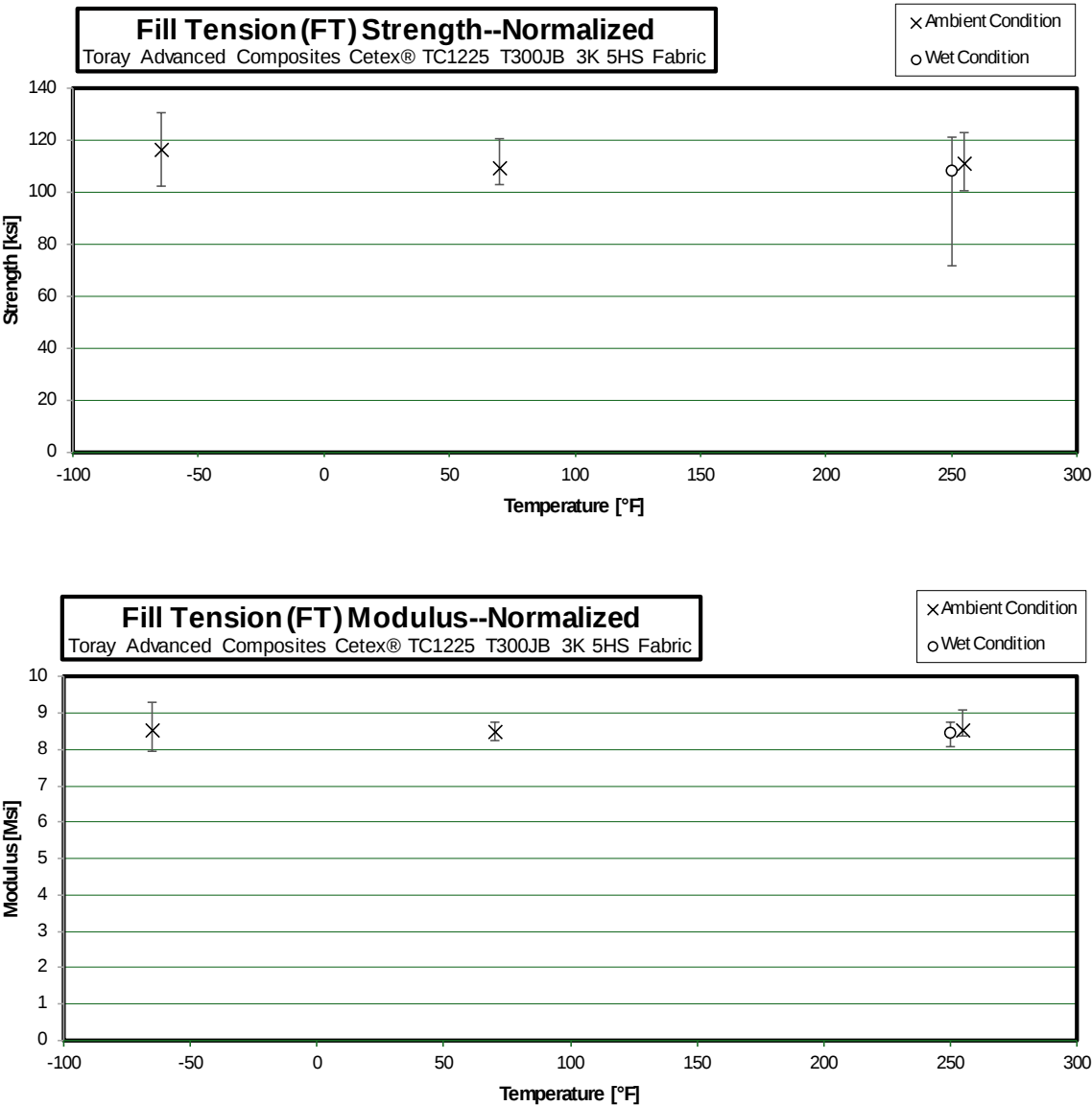
The material property test charts display a combination of all three batches and both consolidate cycles for a particular property as a function of test temperature for ambient and wet test conditions. The average is plotted for each material property and the minimum to maximum range is represented by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

Plots for ETA have been offset to 255°F (from 250°F) to improve clarity and readability.

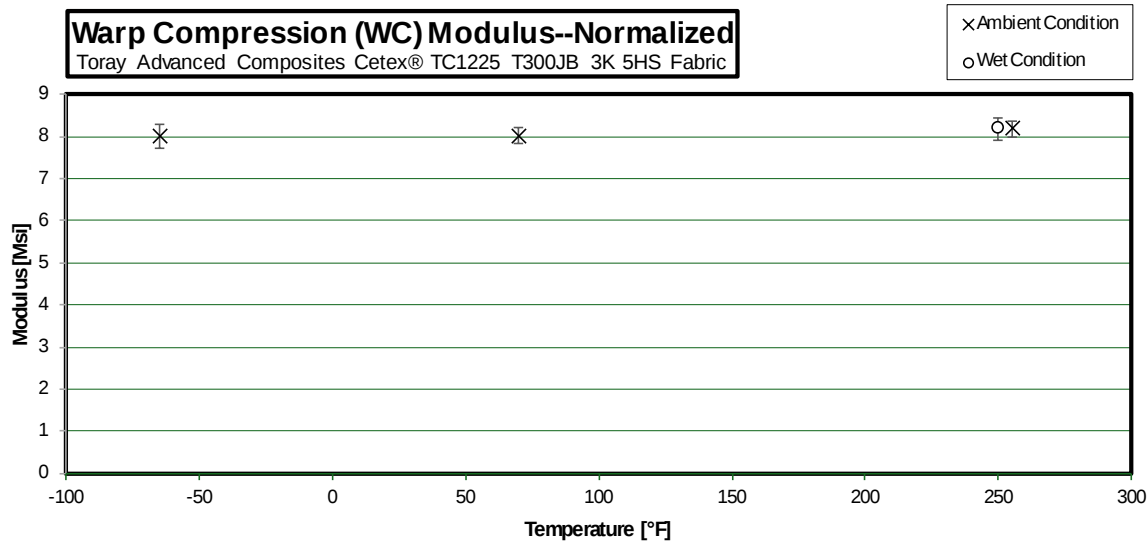
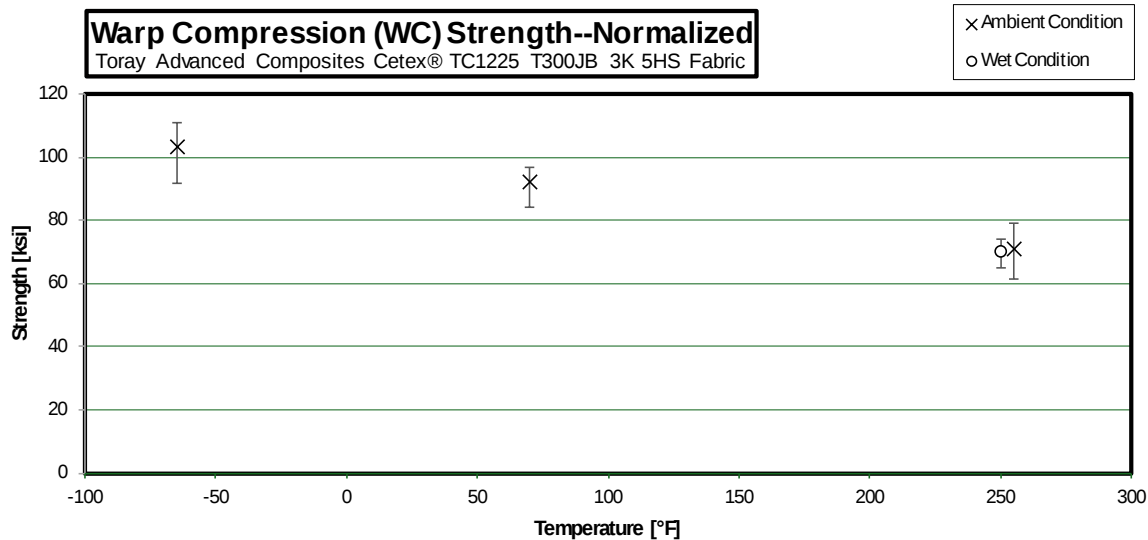
3.1 Warp Tension Properties (WT)



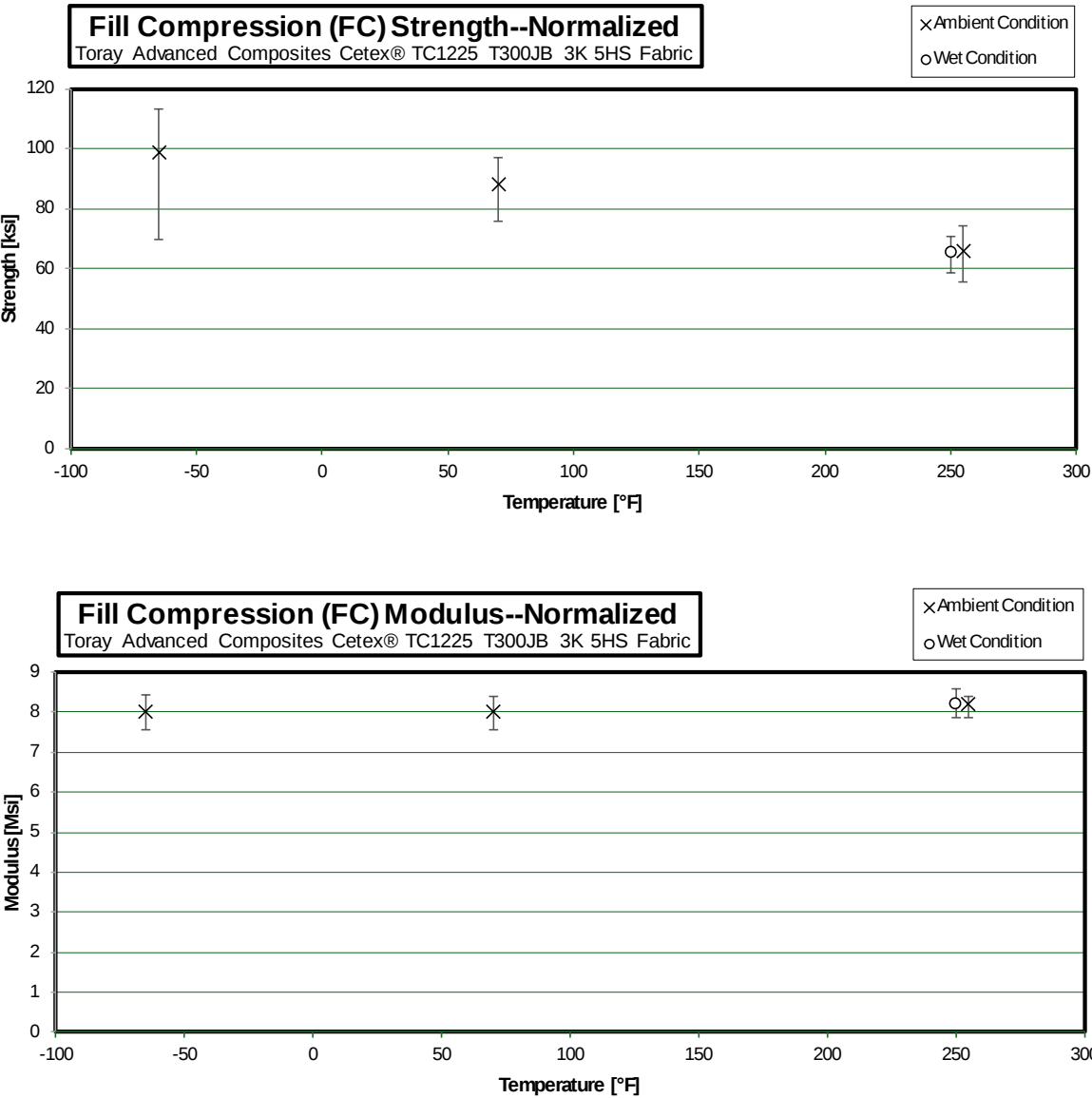
3.2 Fill Tension Properties (FT)



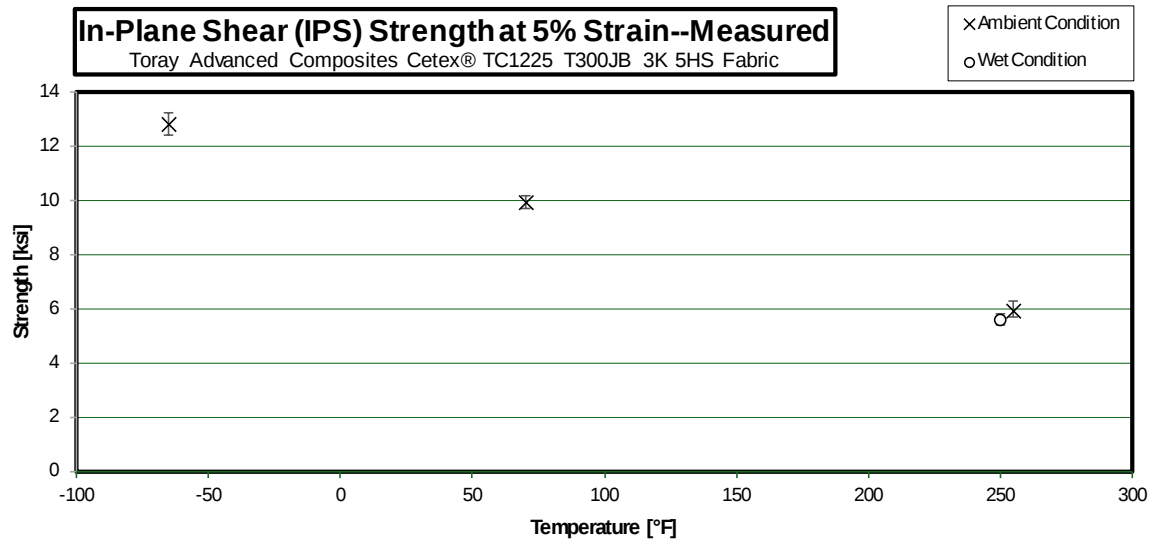
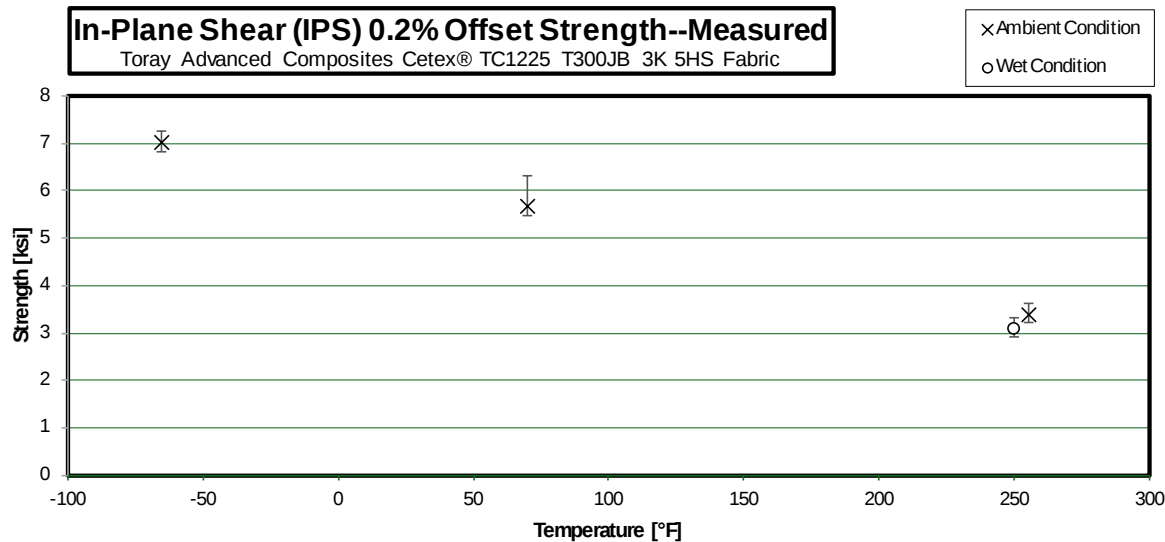
3.3 Warp Compression Properties (WC)

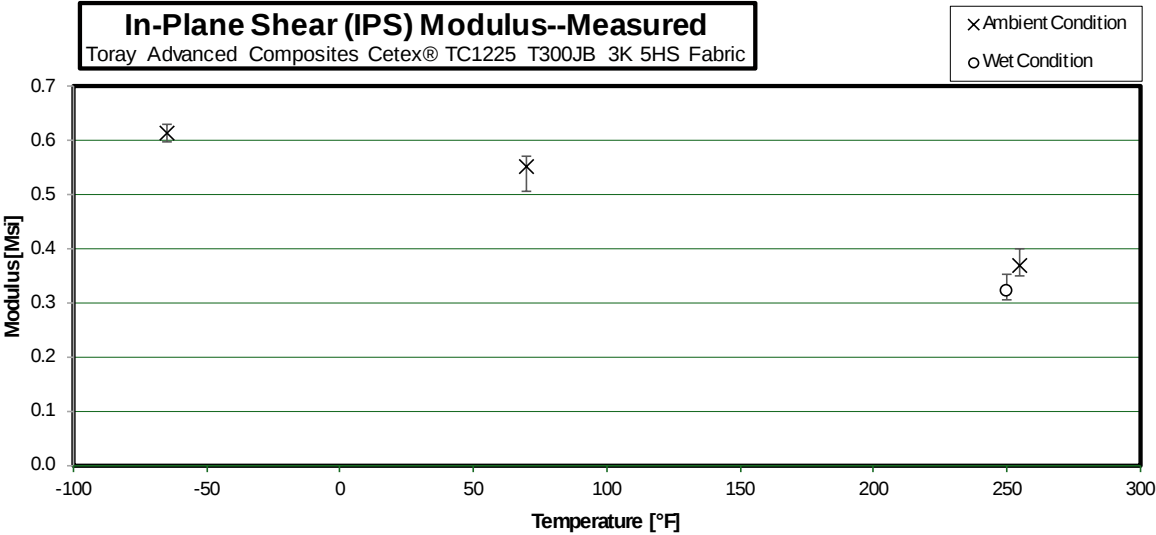


3.4 Fill Compression Properties (FC)

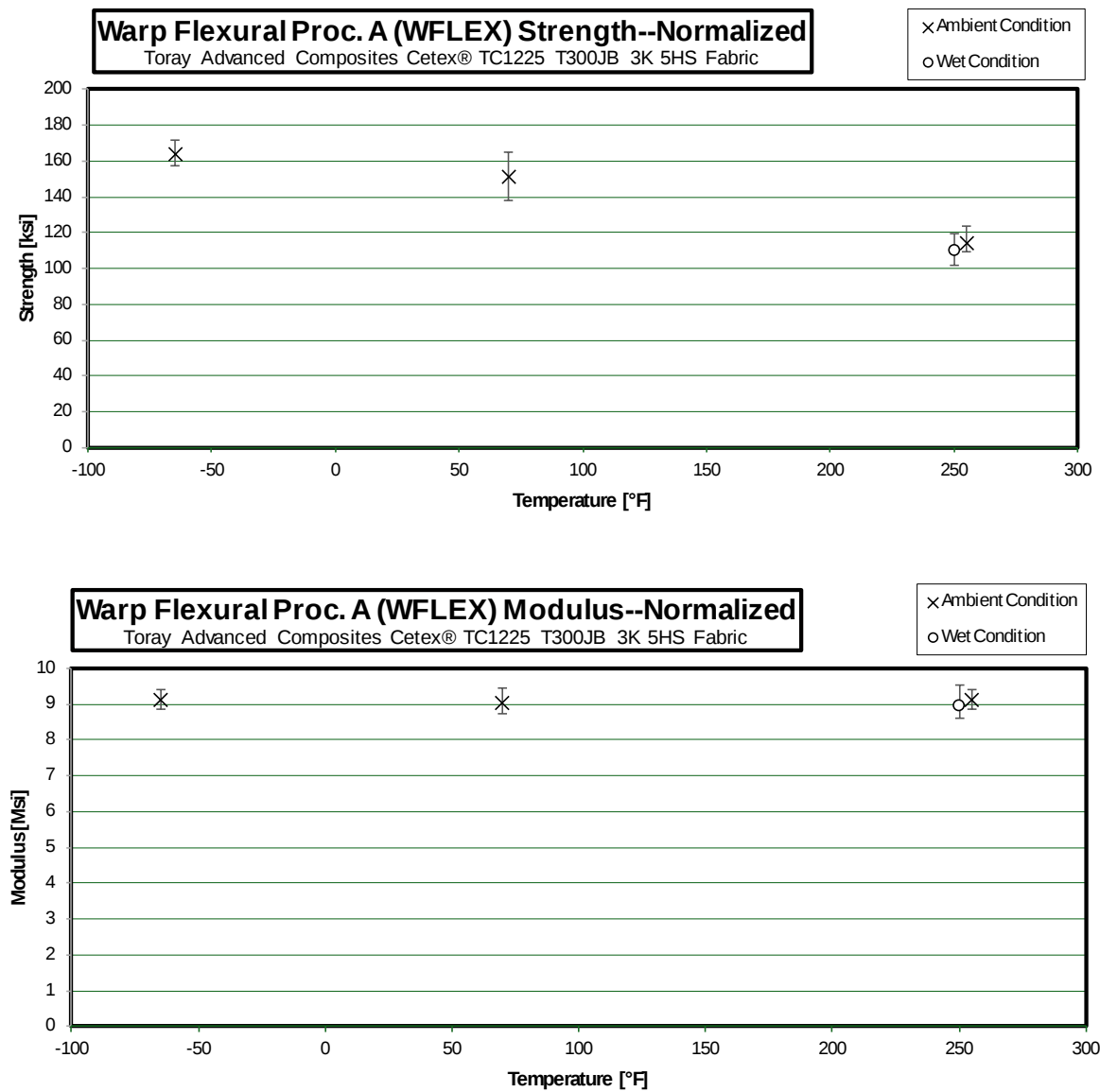


3.5 In-Plane Shear Properties (IPS)

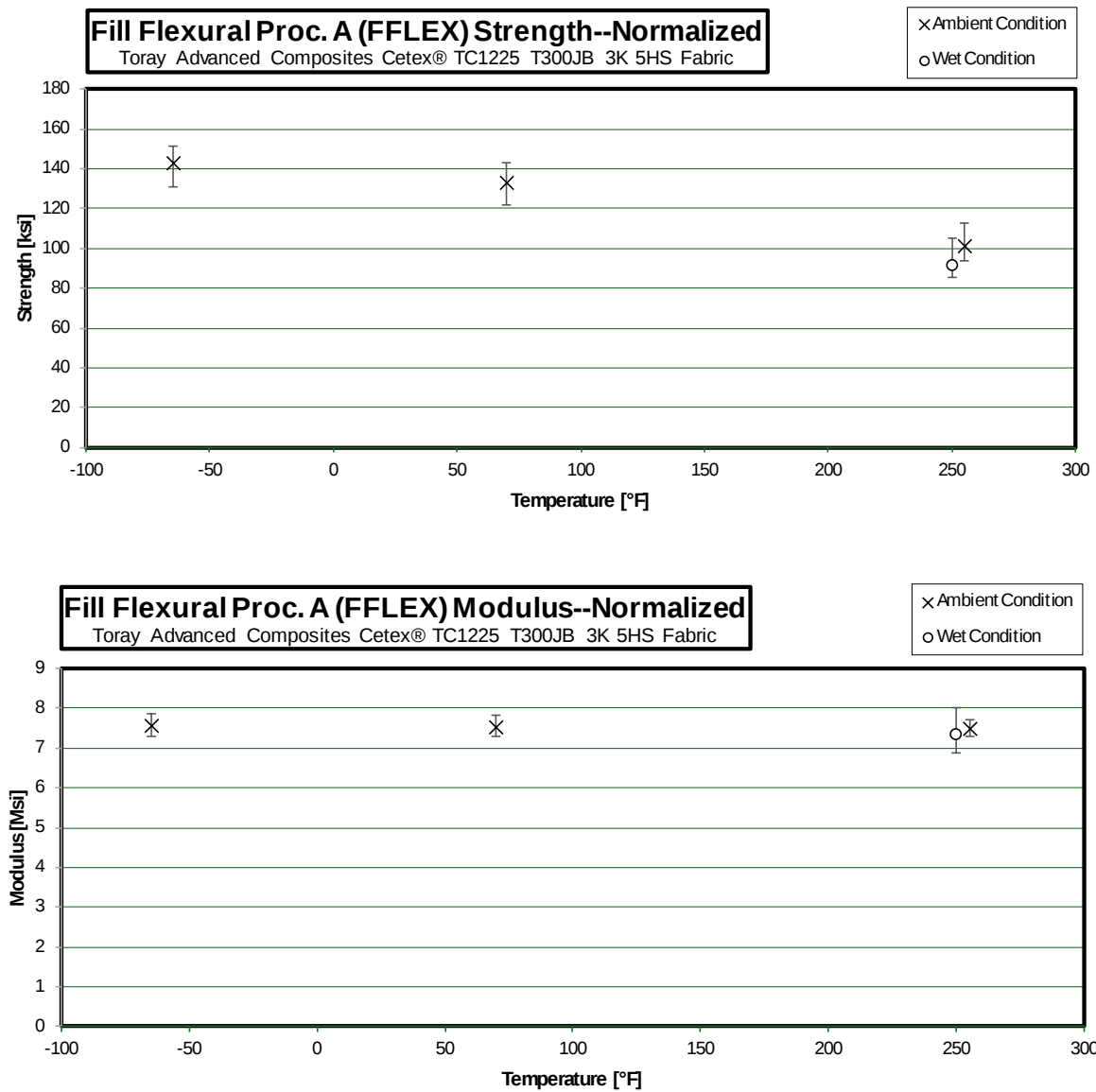




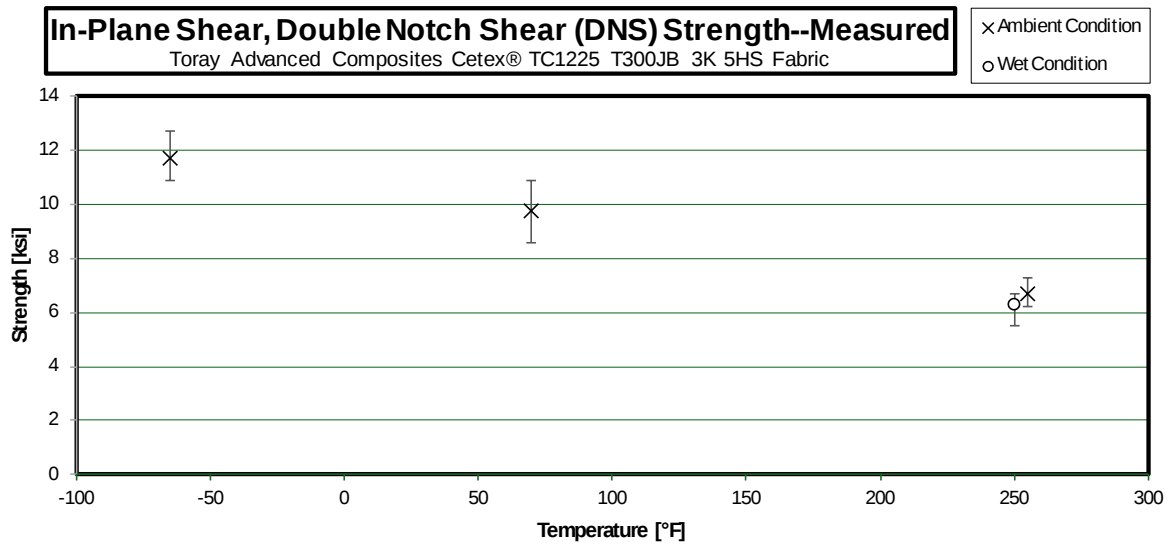
3.6 Warp Flexural Properties (WFLEX)



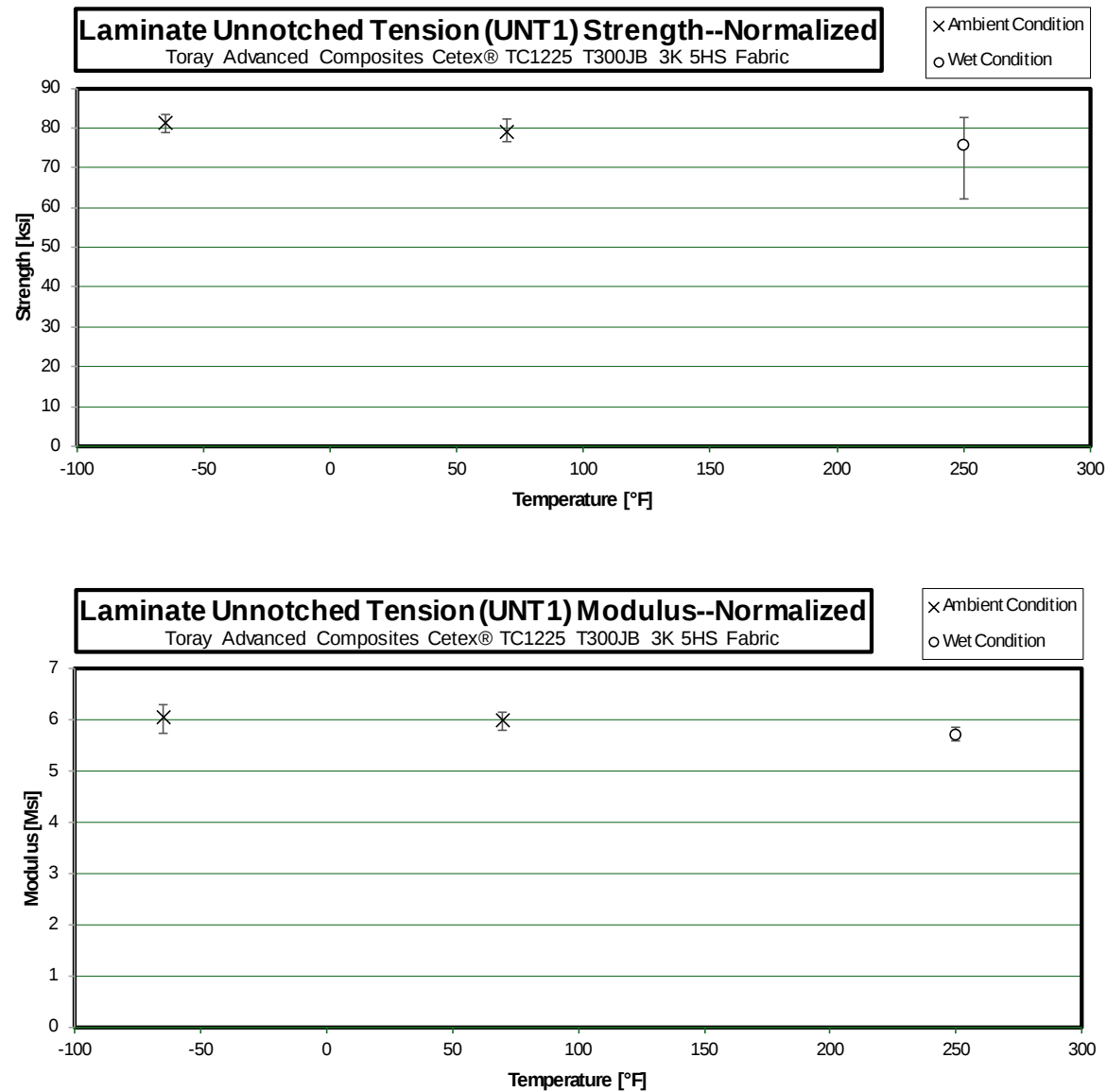
3.7 Fill Flexural Properties (FFLEX)



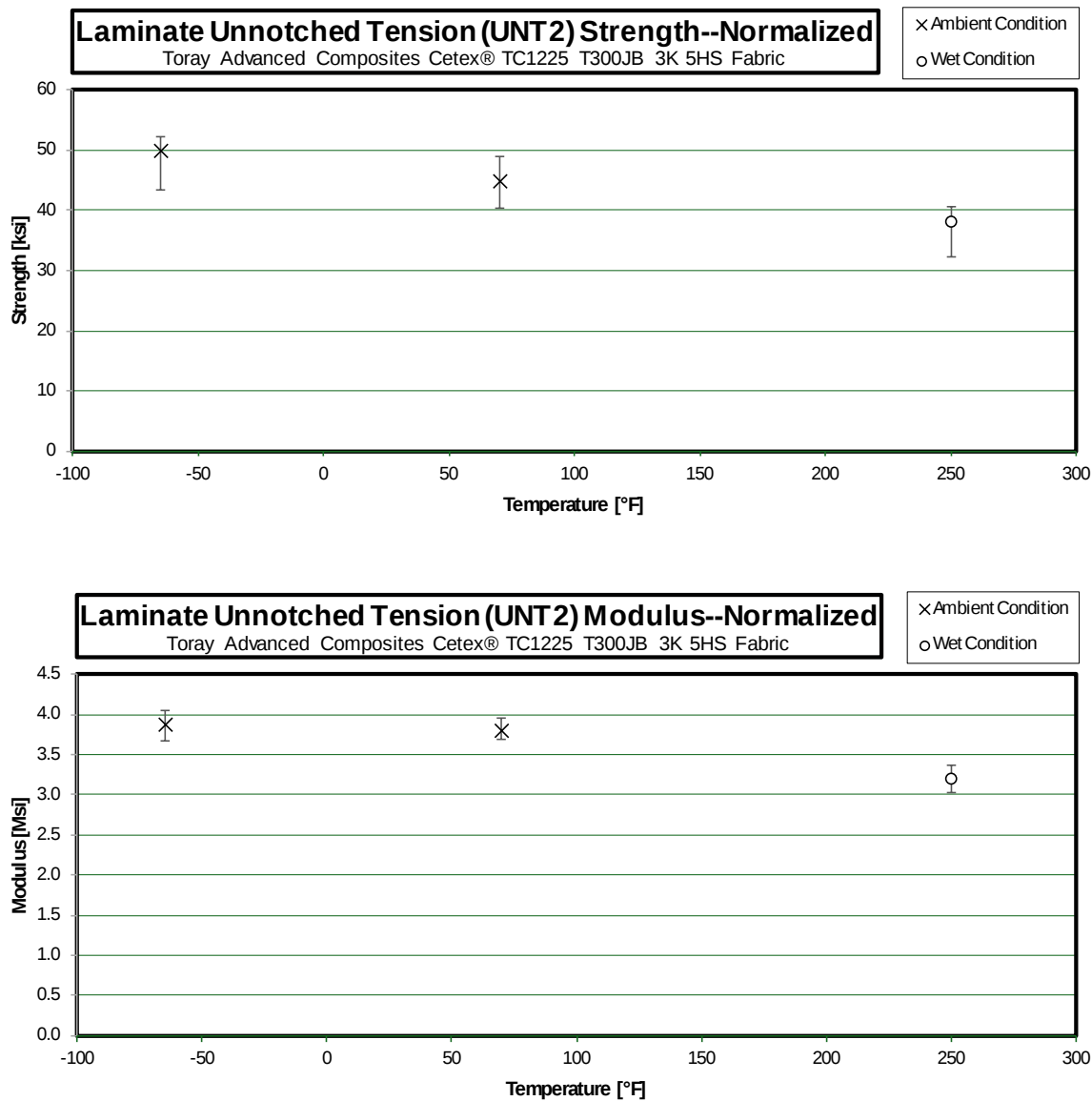
3.8 In-Plane Shear Double Notch Shear (DNS)



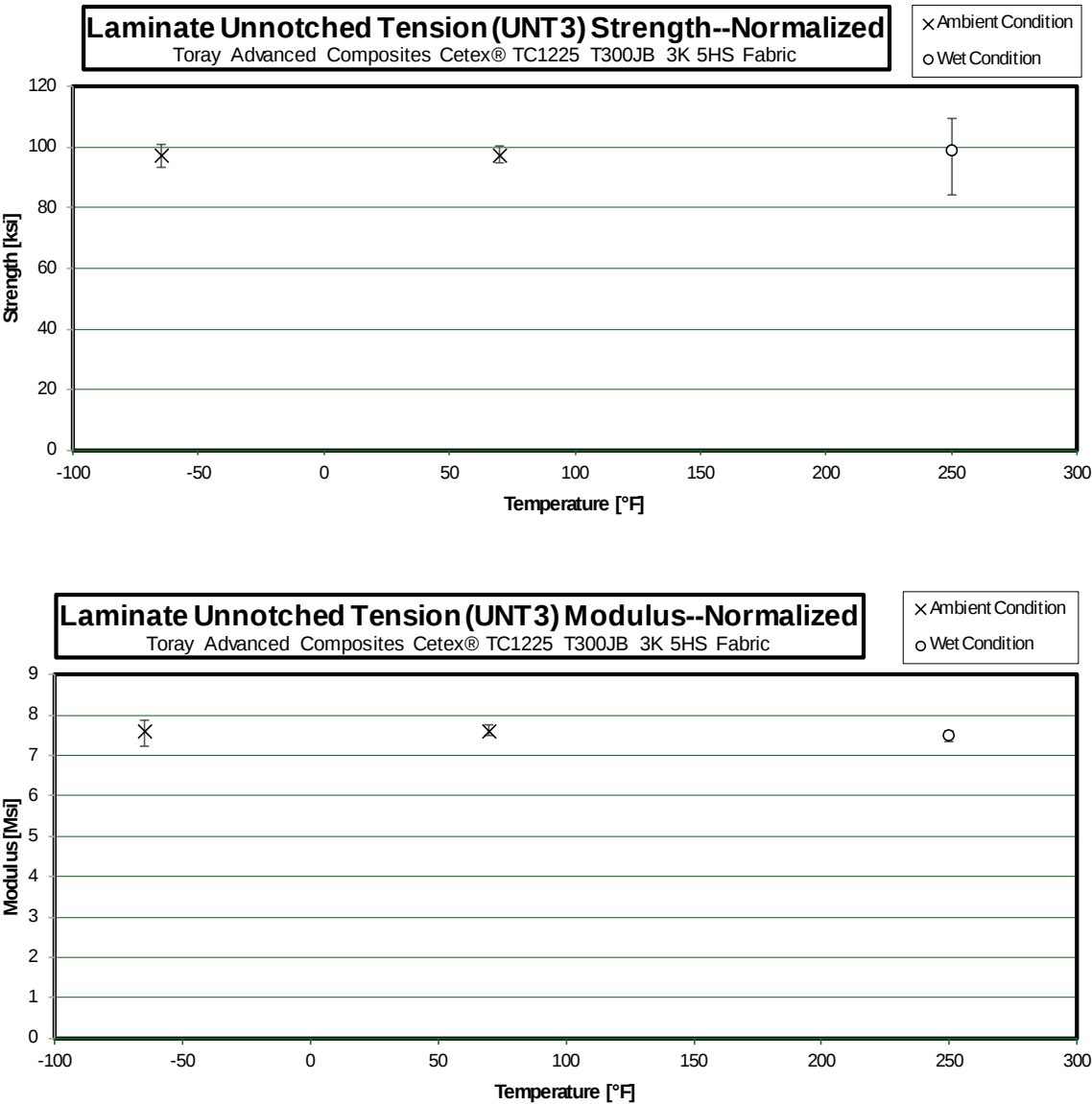
3.9 “25/50/25” Unnotched Tension 1 Properties (UNT1)



3.10 “10/80/10” Unnotched Tension 2 Properties (UNT2)



3.11 “40/20/40” Unnotched Tension 3 Properties (UNT3)



Laminate Unnotched Tension (UNT3) Modulus--Normalized

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

×

Ambient Condition

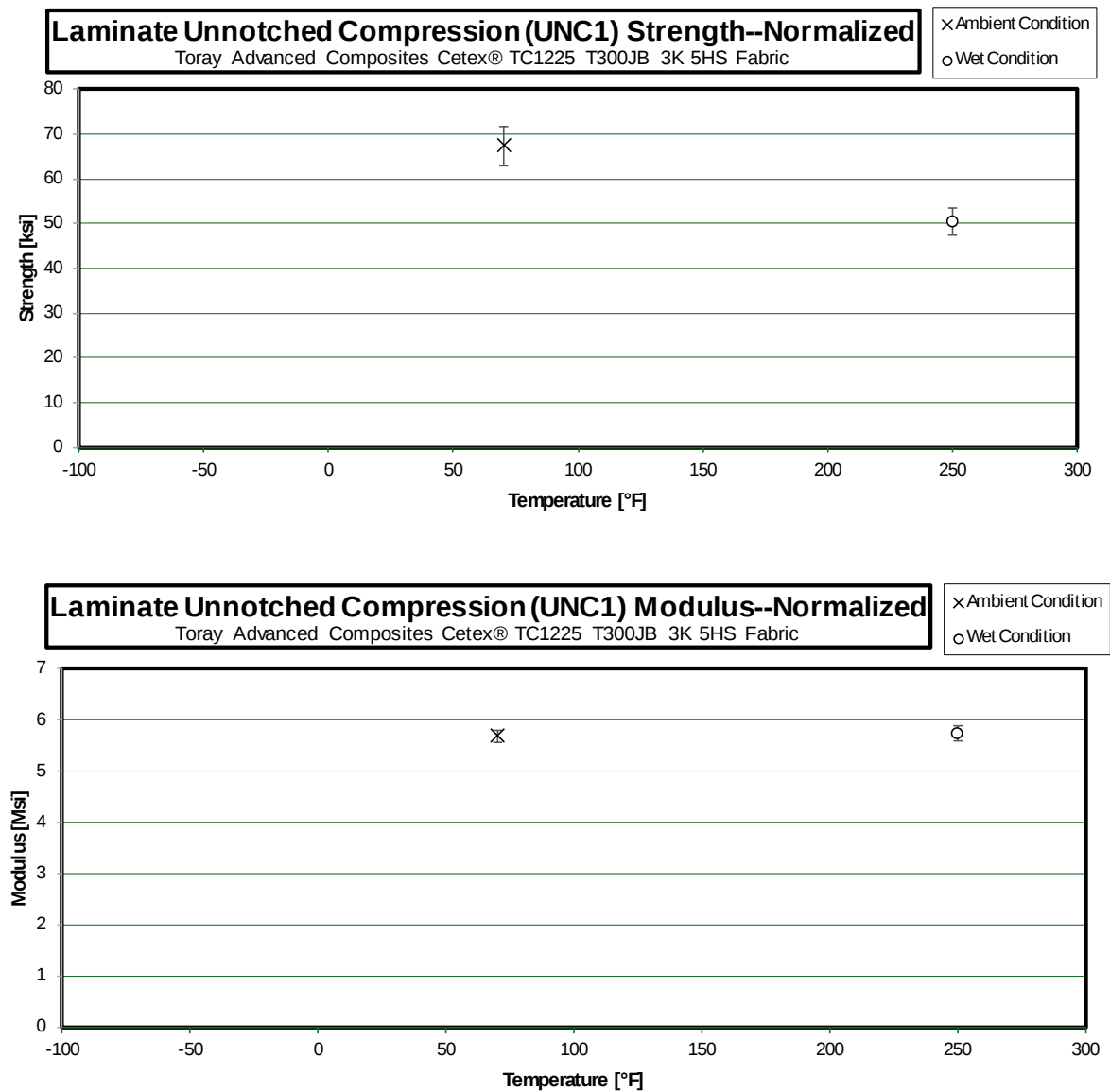
○

Wet Condition

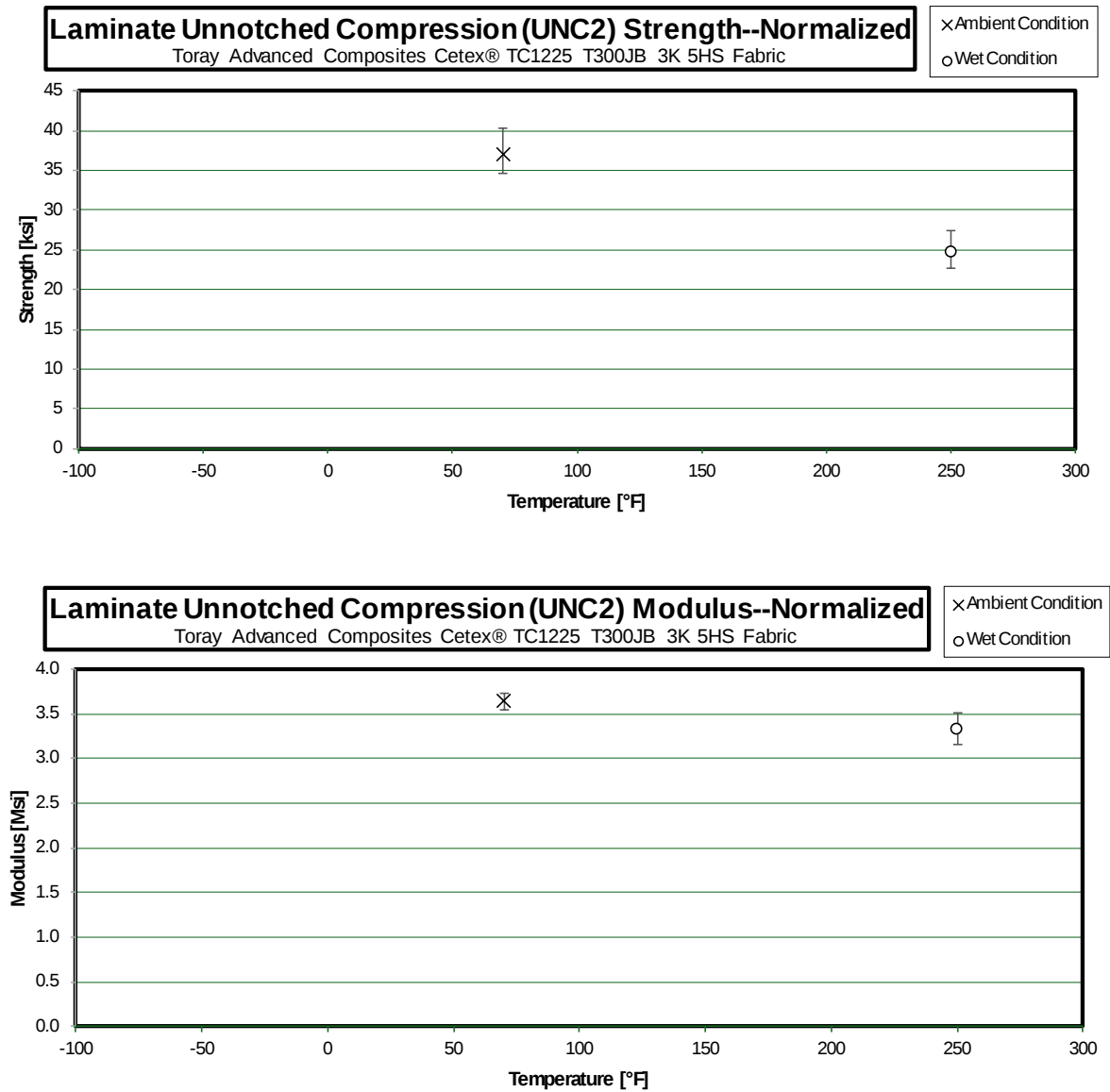
Modulus [Msi]

Temperature [°F]

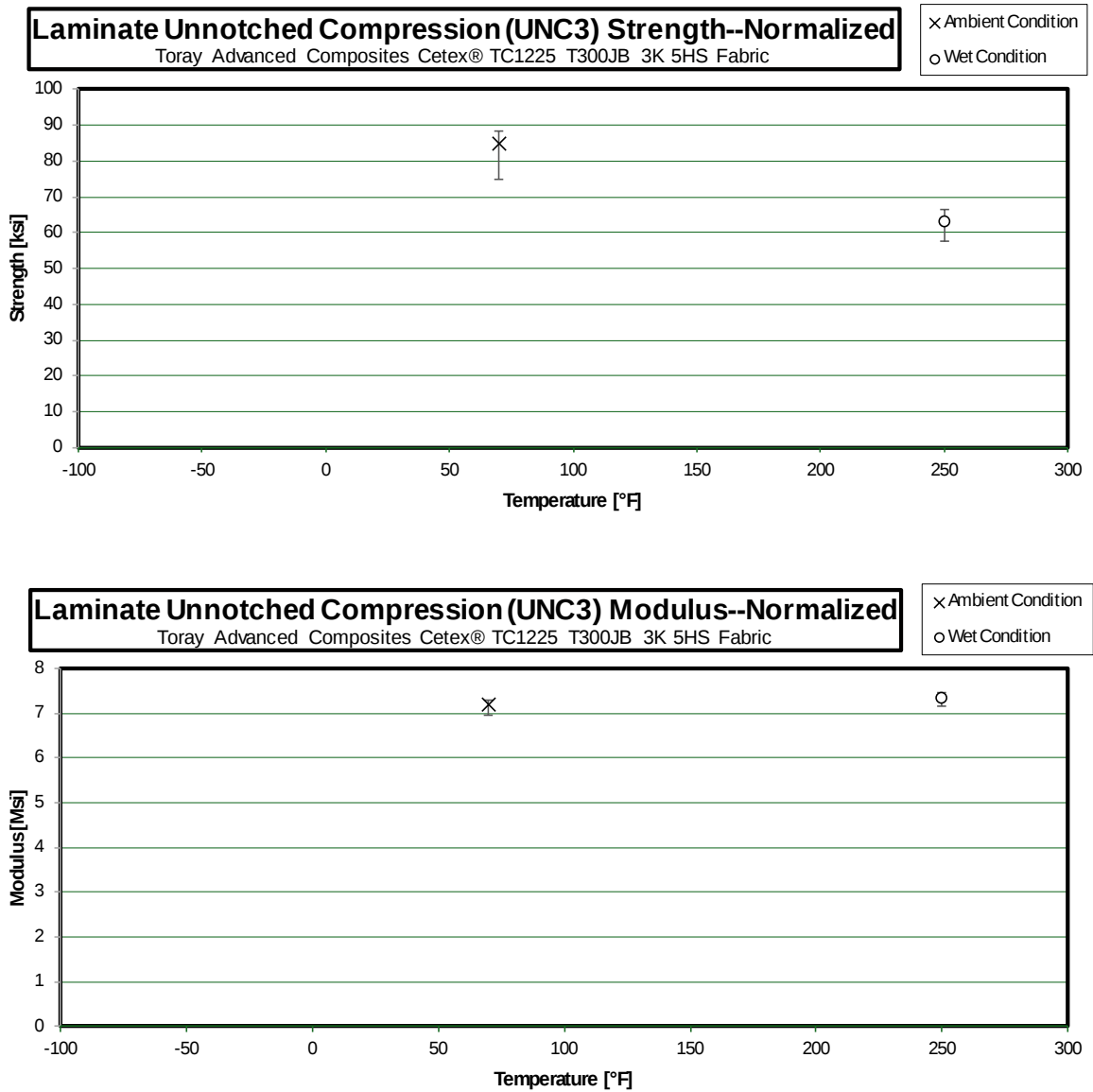
3.12 “25/50/25” Unnotched Compression 1 Properties (UNC1)



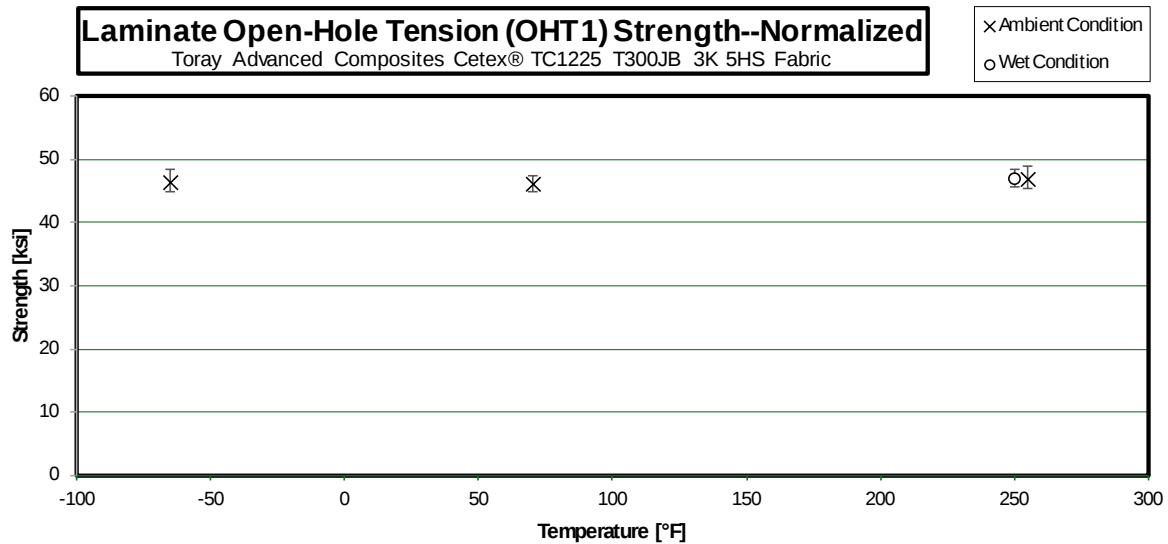
3.13 “10/80/10” Unnotched Compression 2 Properties (UNC2)



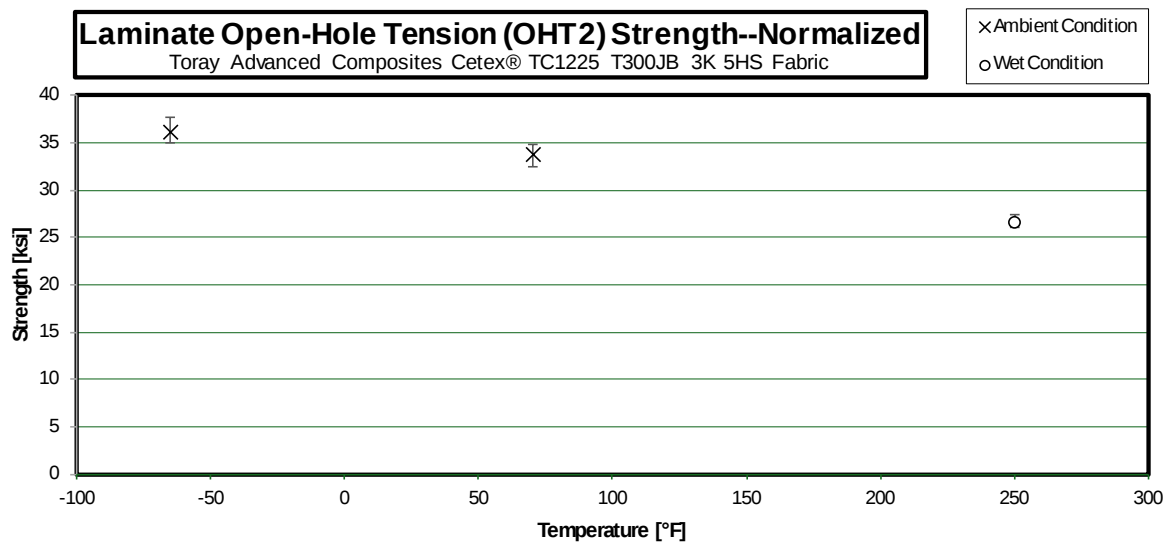
3.14 “40/20/40” Unnotched Compression 3 Properties (UNC3)



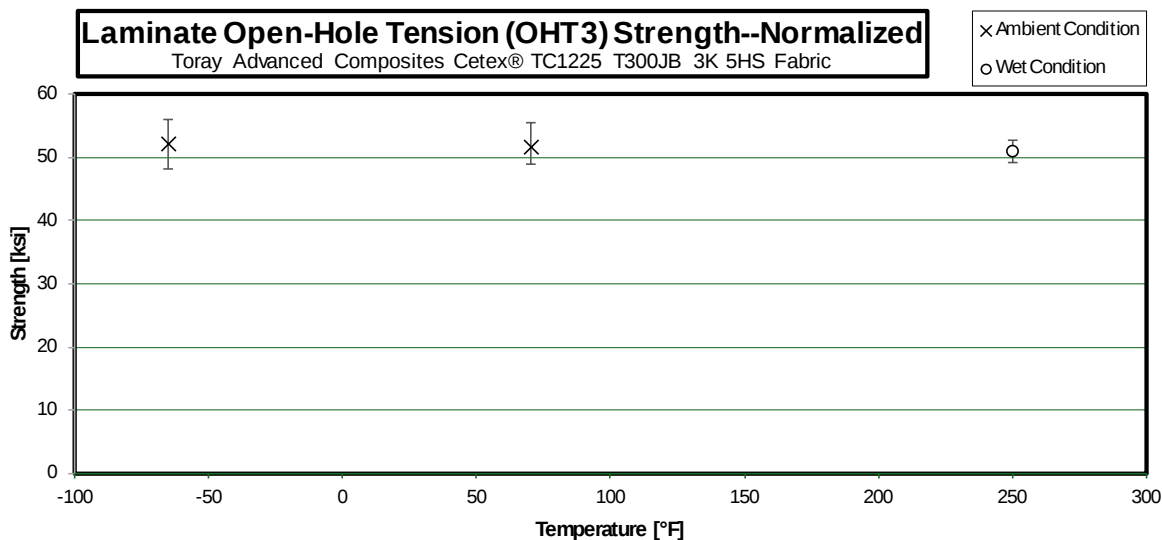
3.15 “25/50/25” Open-Hole Tension 1 Properties (OHT1)



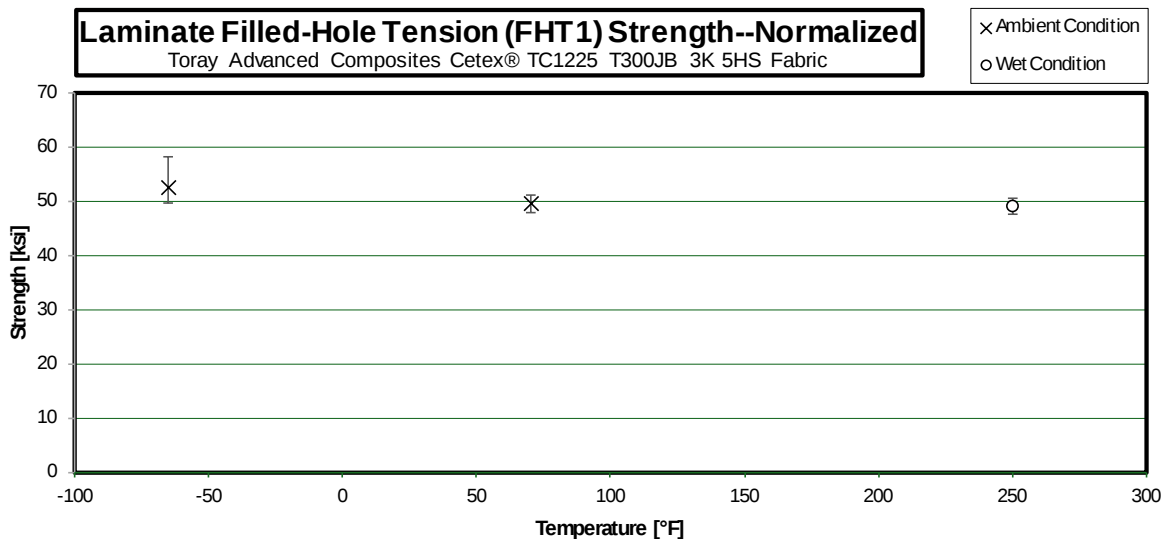
3.16 “10/80/10” Open-Hole Tension 2 Properties (OHT2)



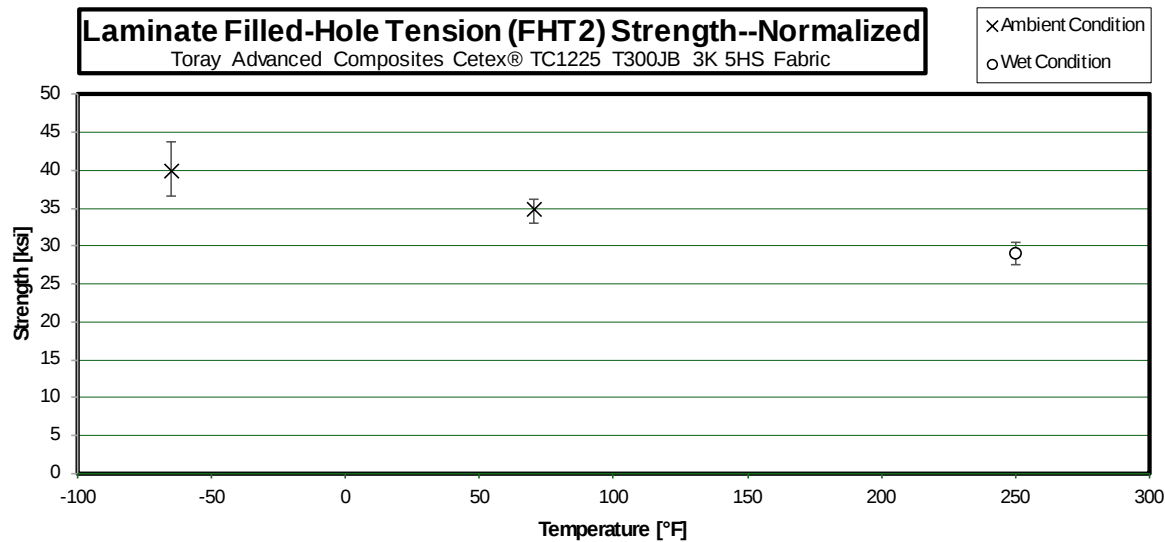
3.17 “40/20/40” Open-Hole Tension 3 Properties (OHT3)



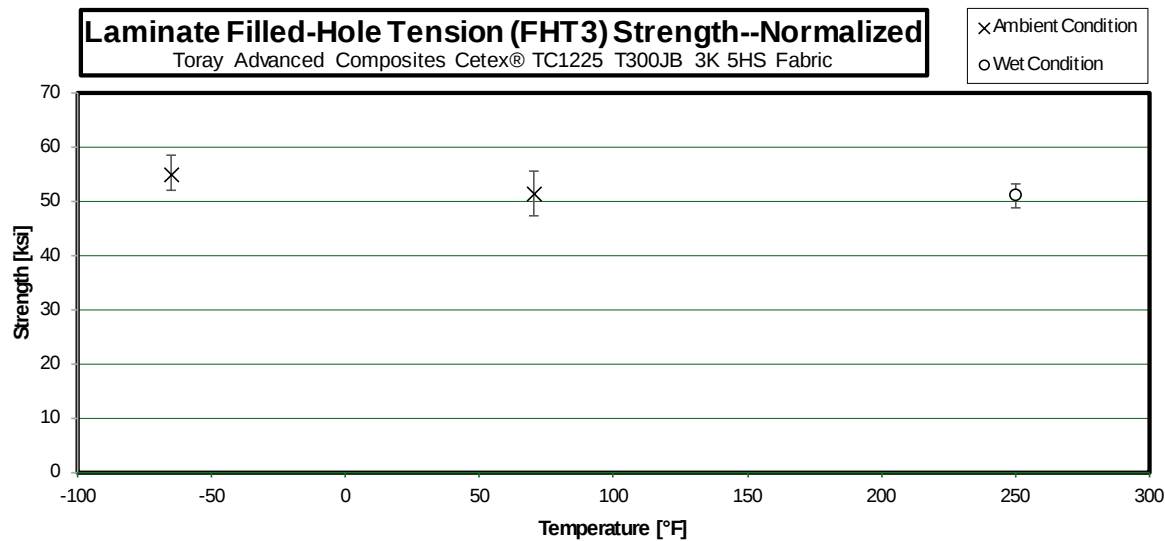
3.18 “25/50/25” Filled-Hole Tension 1 Properties (FHT1)



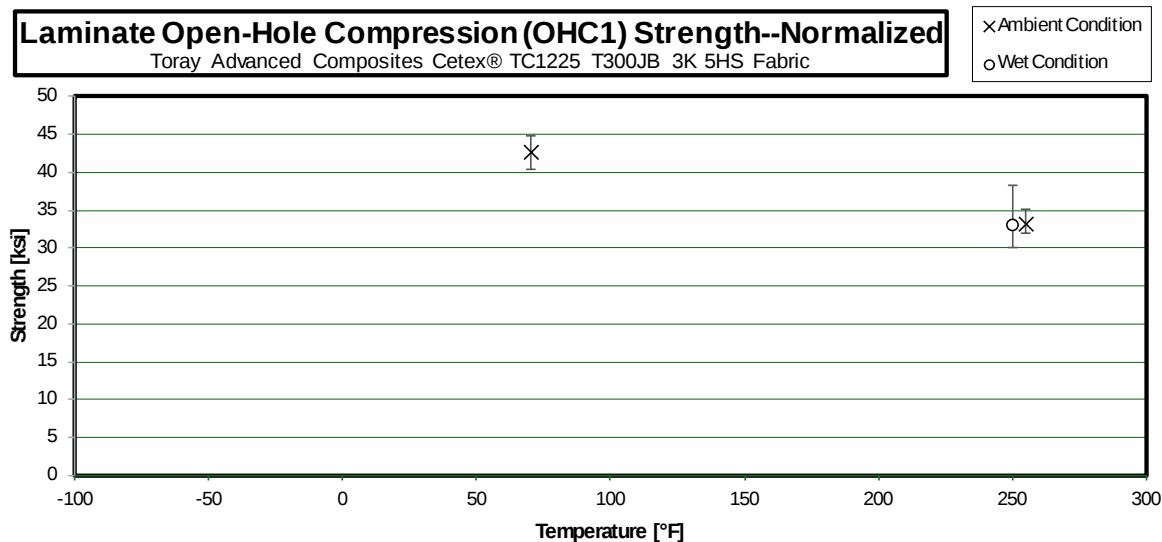
3.19 “10/80/10” Filled-Hole Tension 2 Properties (FHT2)



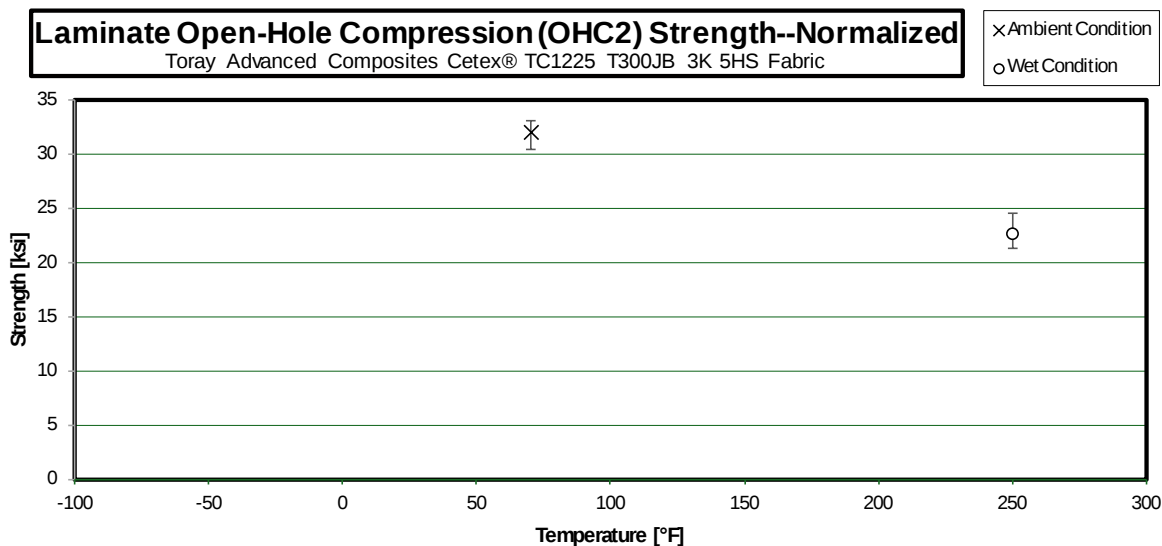
3.20 “40/20/40” Filled-Hole Tension 3 Properties (FHT3)



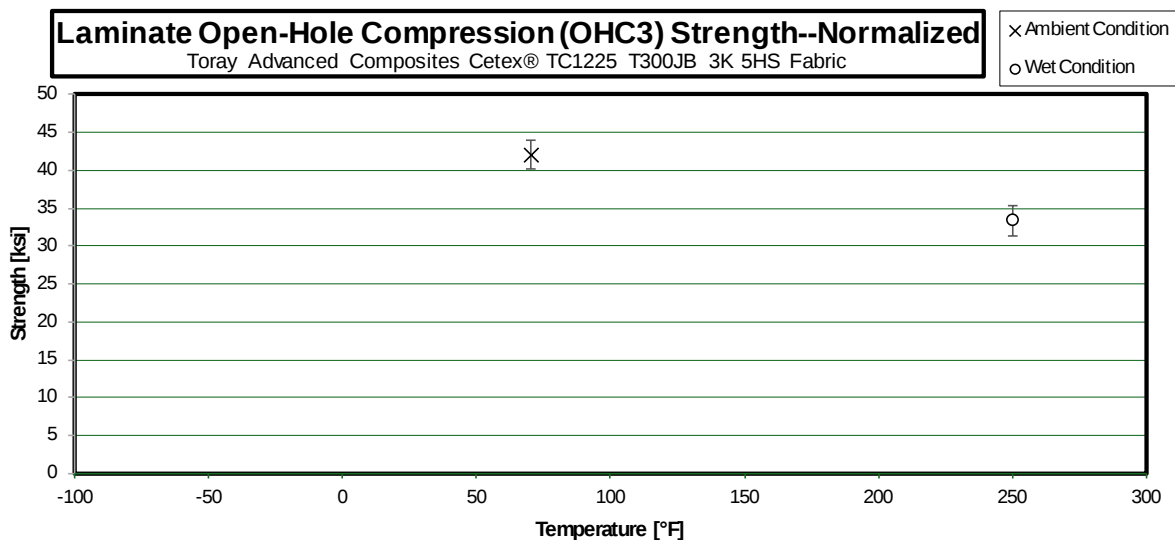
3.21 “25/50/25” Open-Hole Compression 1 Properties (OHC1)



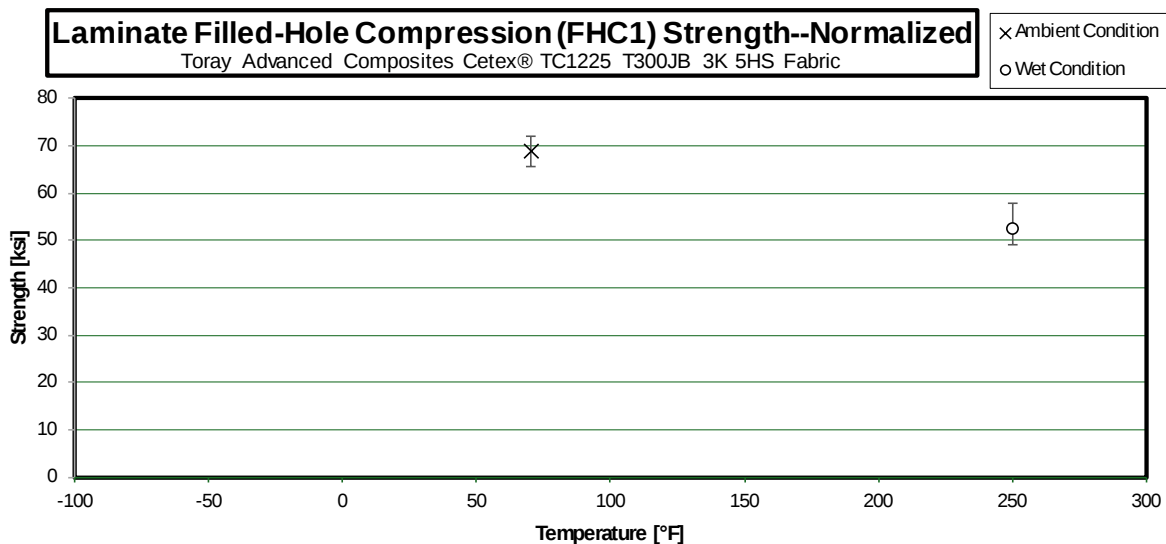
3.22 “10/80/10” Open-Hole Compression 2 Properties (OHC2)



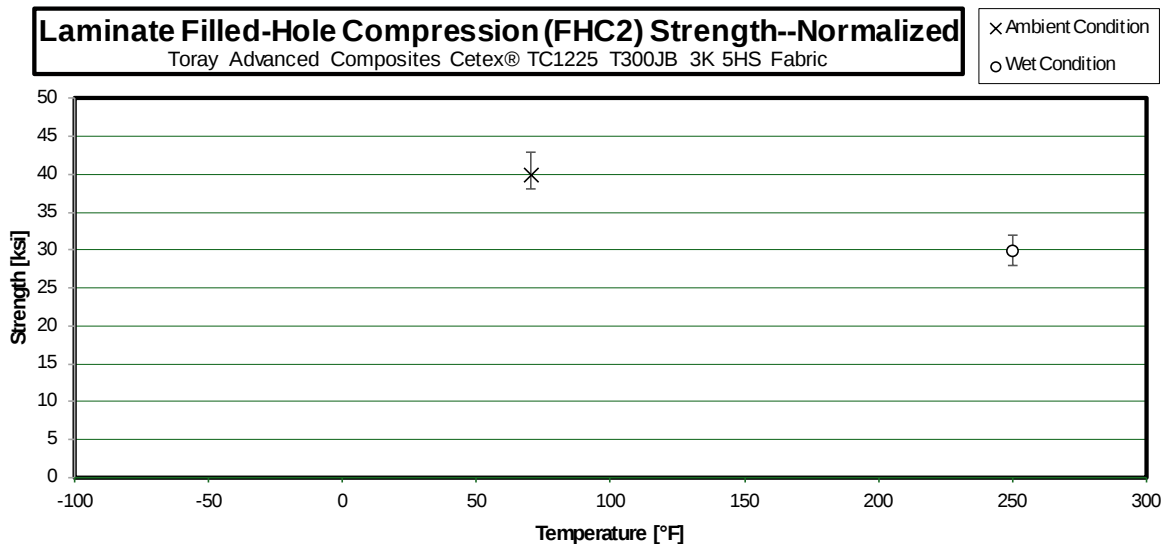
3.23 “40/20/40” Open-Hole Compression 3 Properties (OHC3)



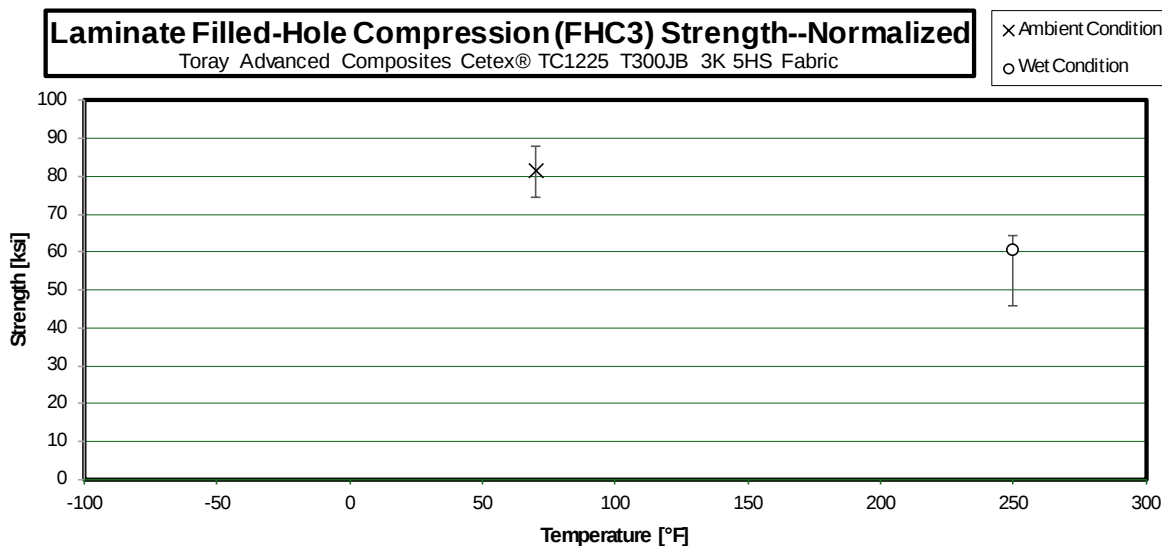
3.24 “25/50/25” Filled-Hole Compression 1 Properties (FHC1)



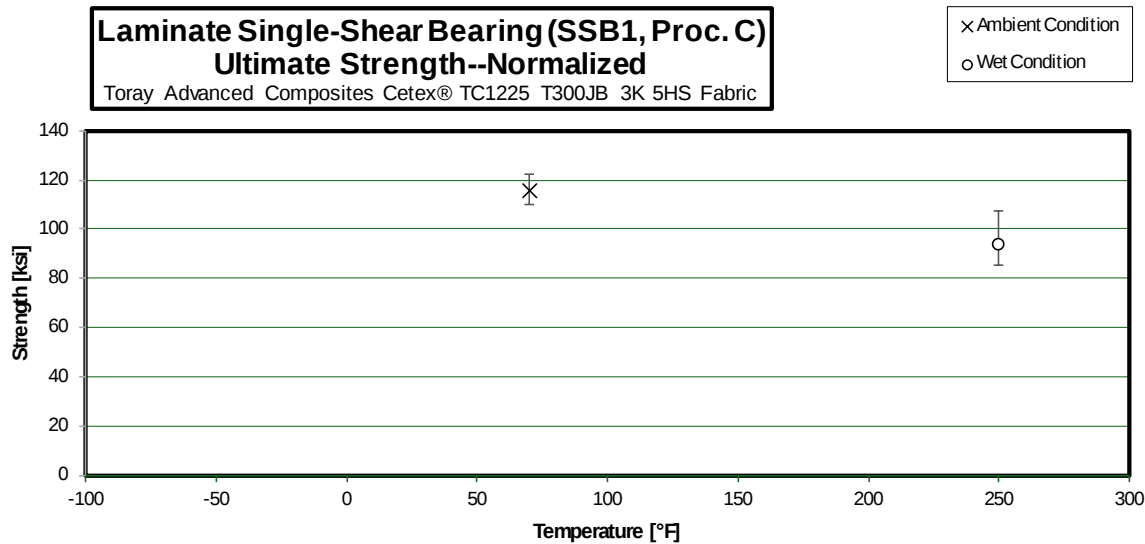
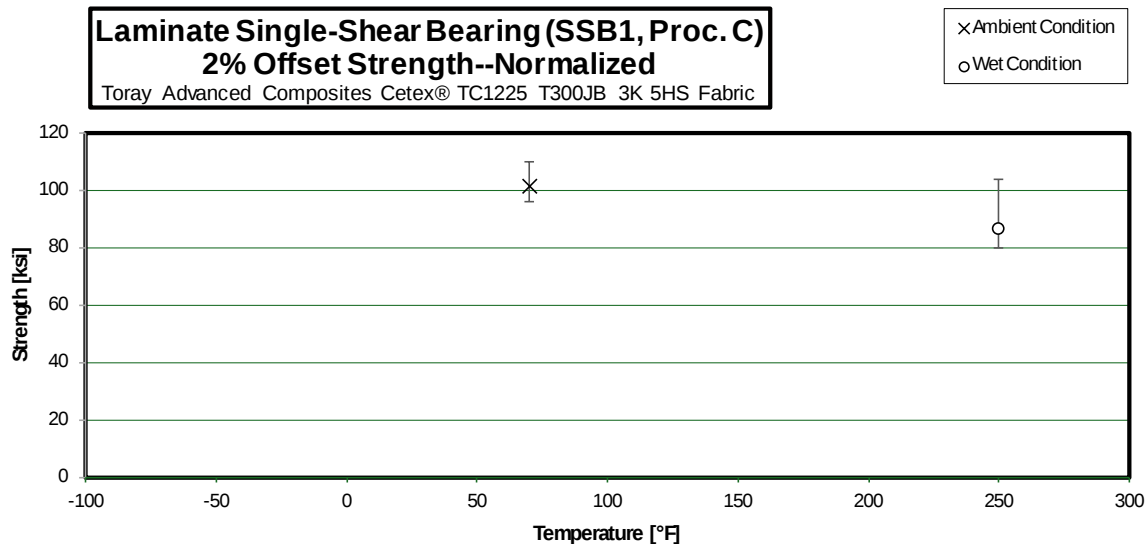
3.25 “10/80/10” Filled-Hole Compression 2 Properties (FHC2)

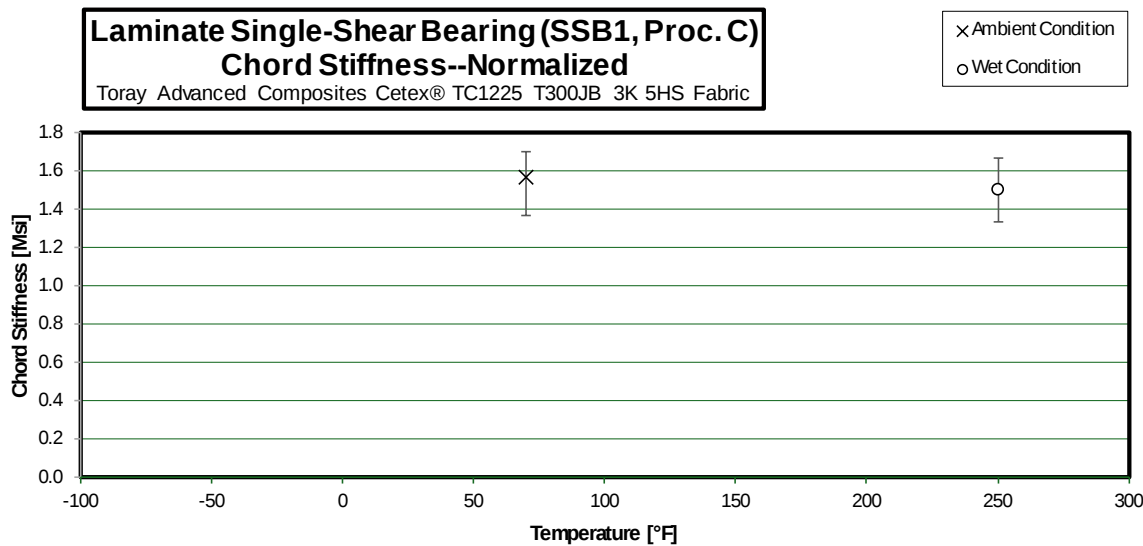


3.26 “40/20/40” Filled-Hole Compression 3 Properties (FHC3)

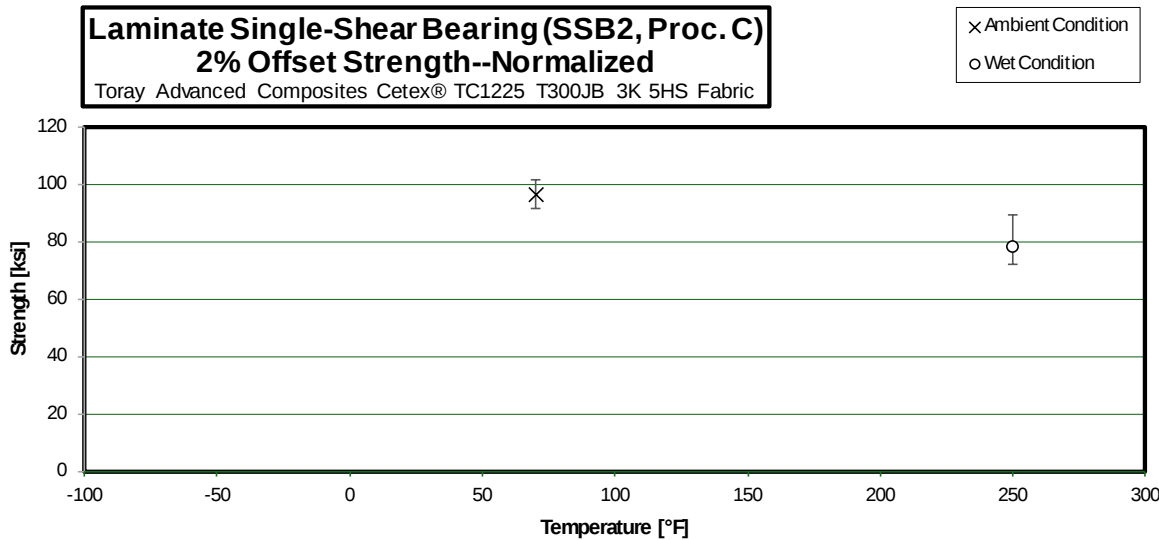


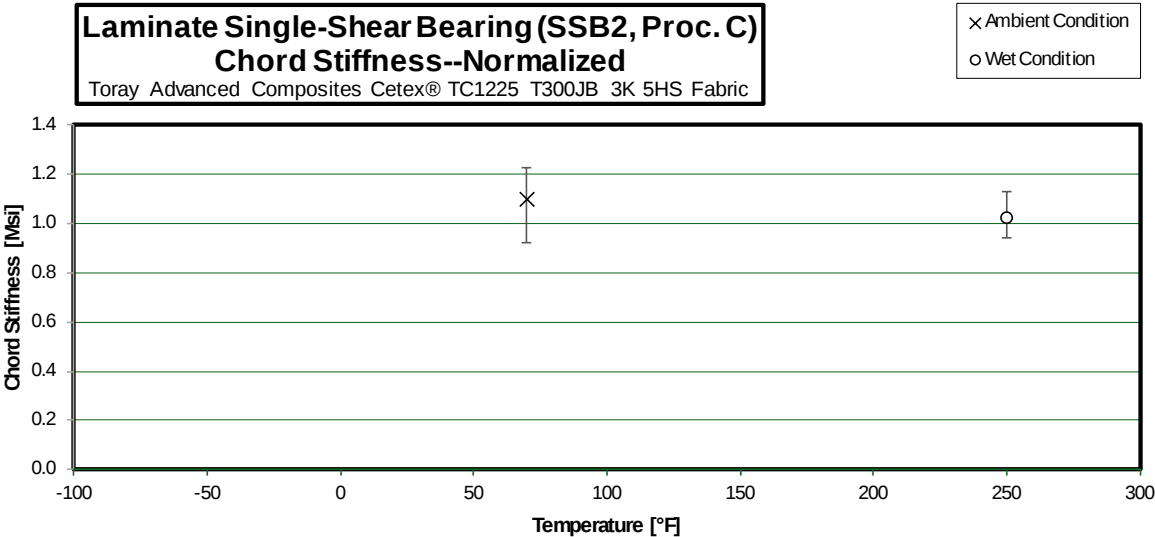
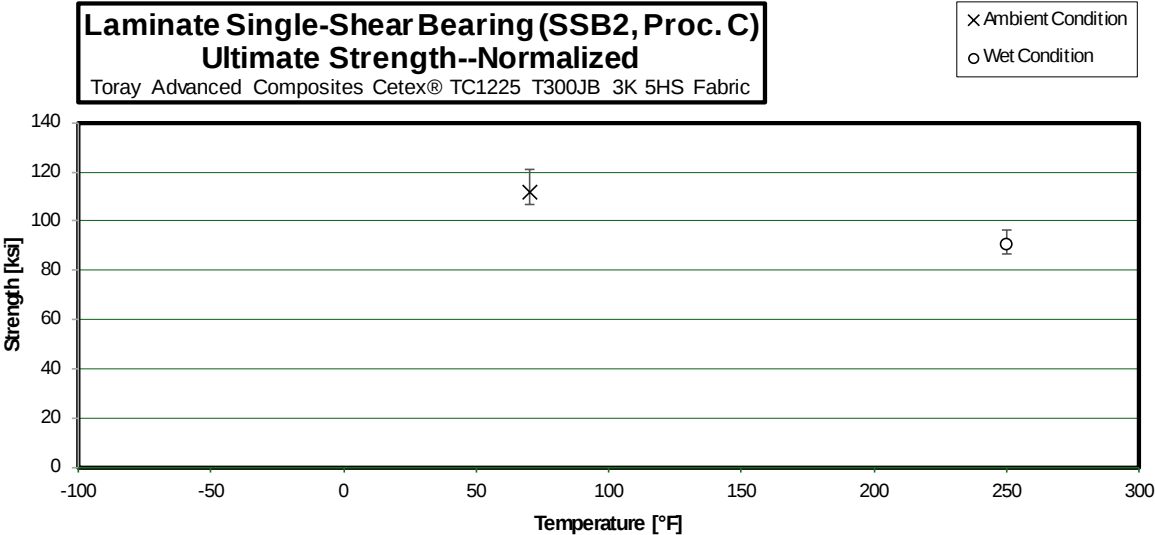
3.27 “25/50/25” Single-Shear Bearing 1 Properties (SSB1)



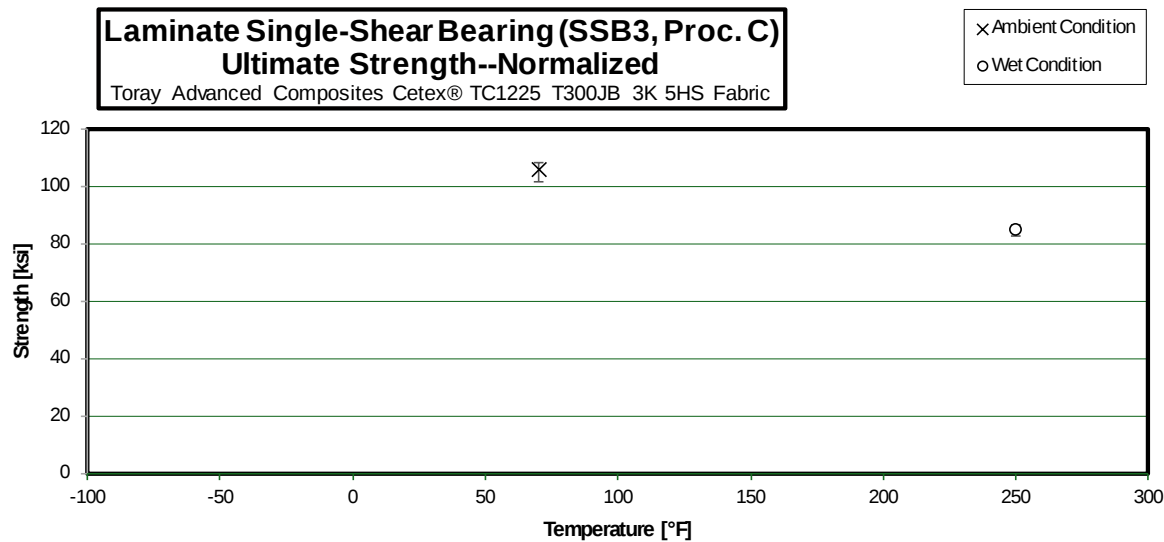
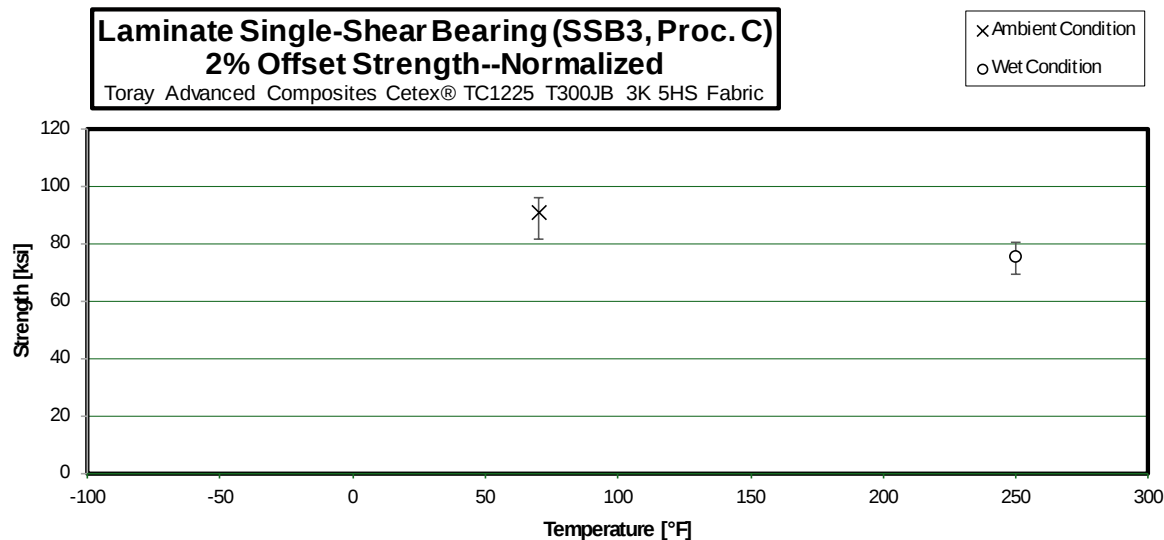


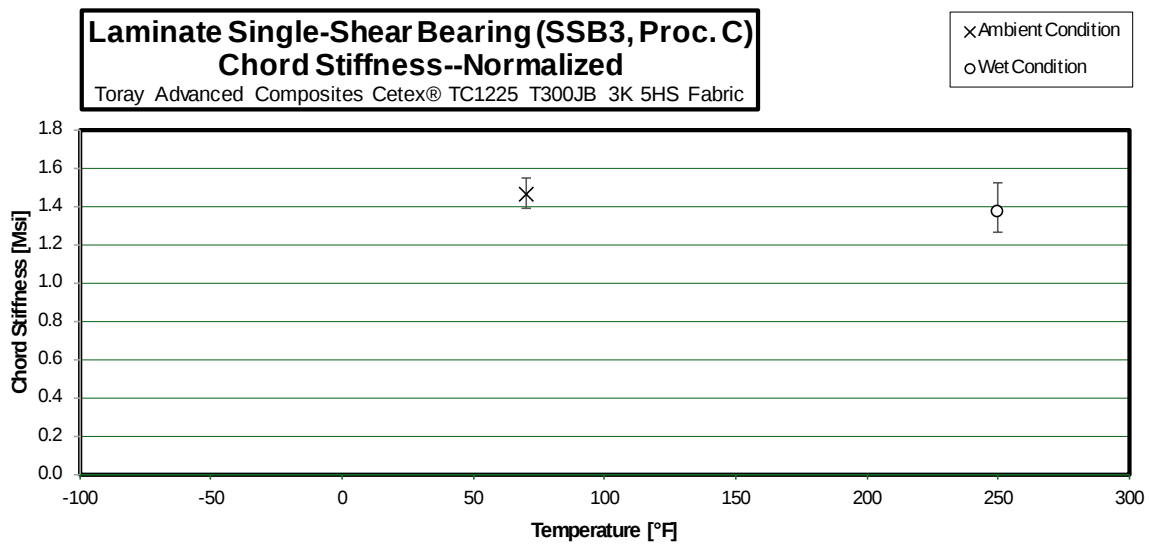
3.28 “10/80/10” Single-Shear Bearing 2 Properties (SSB2)



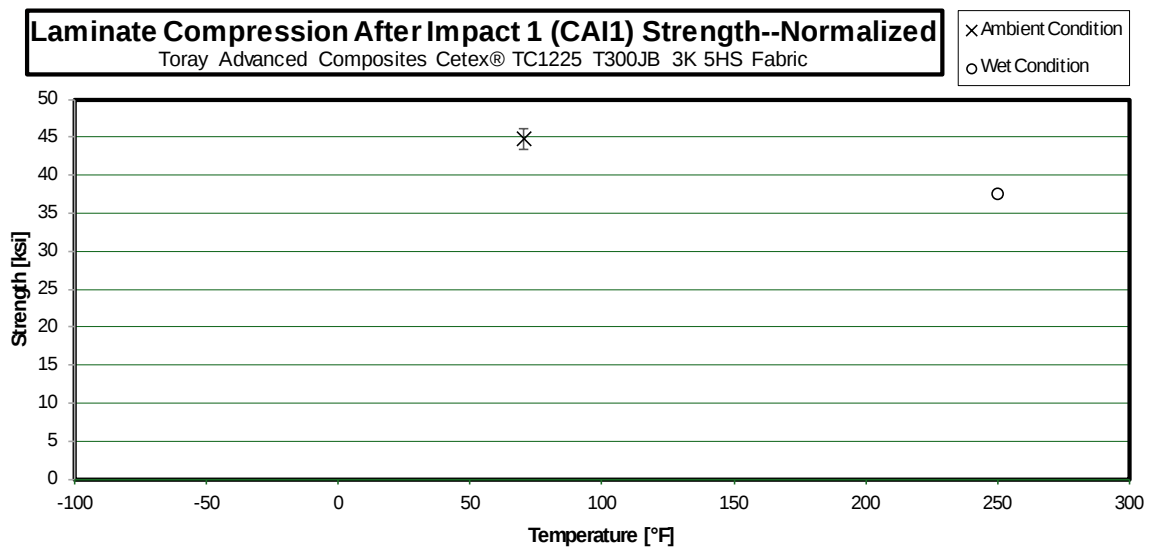


3.29 “40/20/40” Single-Shear Bearing 3 Properties (SSB3)





3.30 “25/50/25” Compression After Impact 1 Properties (CAI1)



4. Raw Data

4.1 Warp Tension Properties (WT)

Warp Tension Properties (WT)--CTA (-65°F)
Strength & Modulus

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

t_{ply} [in]

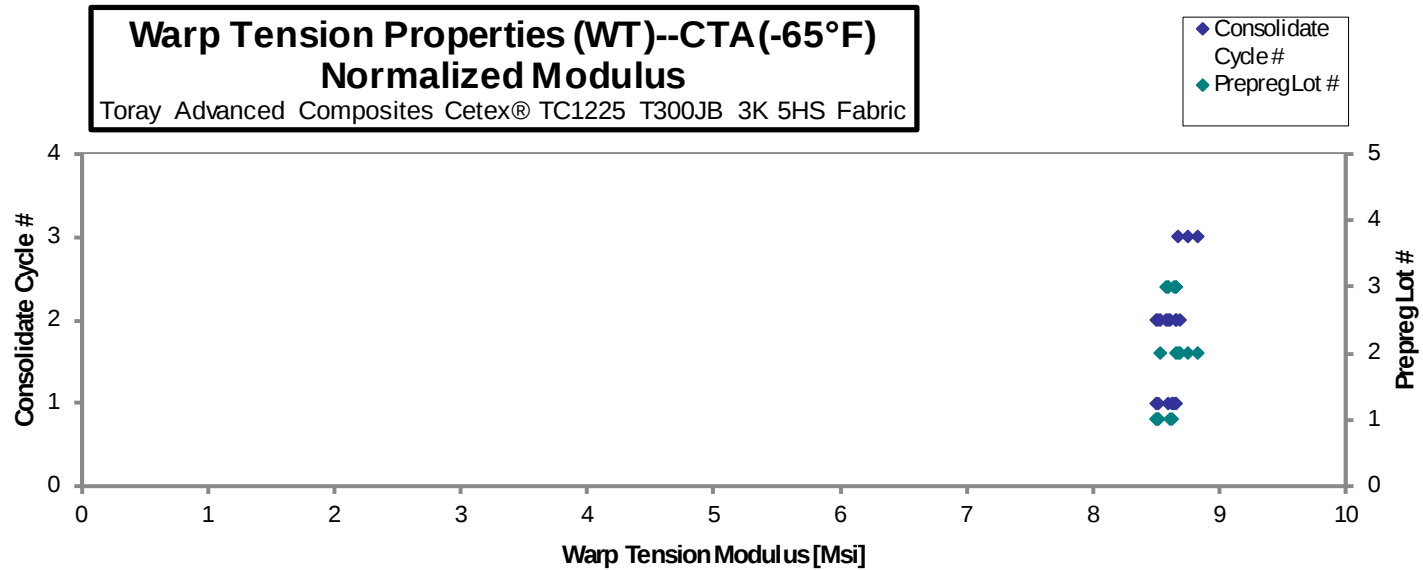
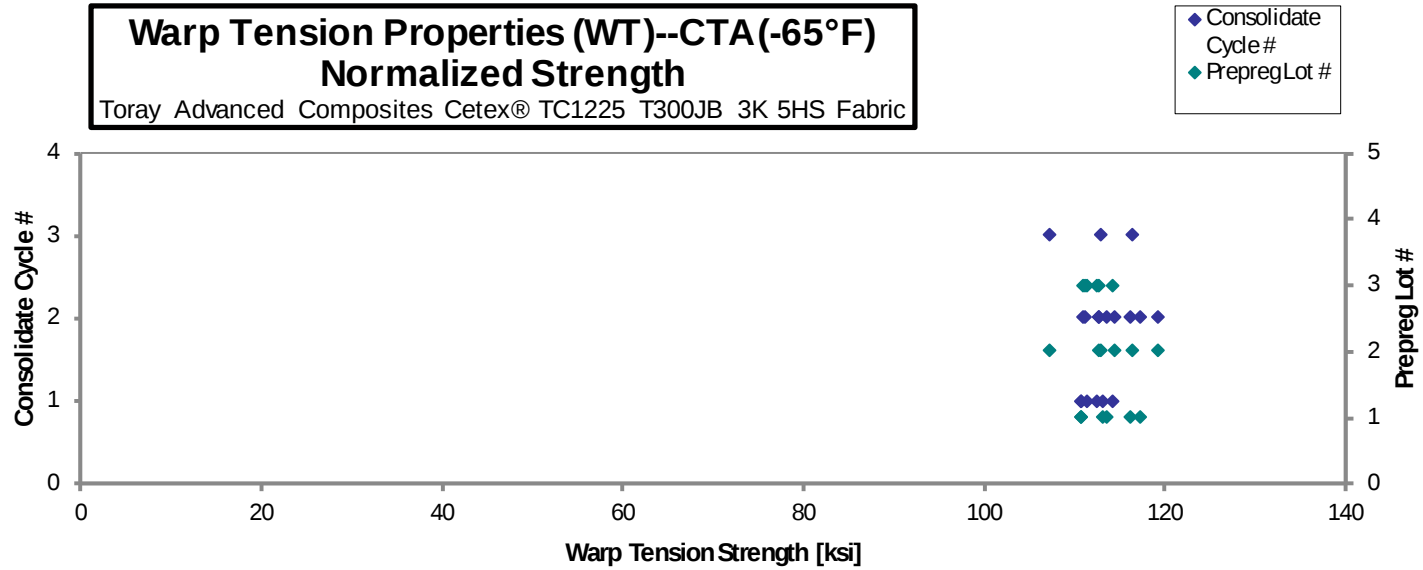
0.01220

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Poisson's Ratio	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
TCCJA111B	A	C1	1	1	112.5	8.630	0.05220	0.09598	8	LAB
TCCJA112B	A	C1	1	1	112.2	8.631	0.04949	0.09623	8	LAB
TCCJA113B	A	C1	1	1	115.6	8.808	0.07287	0.09545	8	LAB
TCCJA211B	A	C2	1	2	117.0	8.585	0.07558	0.09770	8	LAB
TCCJA212B	A	C2	1	2	117.1	8.573	0.04366	0.09673	8	LAB
TCCJA213B	A	C2	1	2	114.7	8.599	0.05713	0.09665	8	LAB
TCCJB211B	B	C2	2	2	115.3	8.733	0.04186	0.09523	8	LAB
TCCJB212B	B	C2	2	2	115.8	8.791	0.04753	0.09628	8	LAT
TCCJB213B	B	C2	2	2	120.7	8.767	0.04816	0.09637	8	LAT
TCCJB311B	B	C3	2	3	107.1	8.659	0.05288	0.09768	8	LAB
TCCJB312B	B	C3	2	3	112.5	8.798	0.05348	0.09783	8	LAT
TCCJB313B	B	C3	2	3	115.3	8.660	0.04899	0.09847	8	LAB
TCCJC111B	C	C1	3	1	112.6	8.750	0.05113	0.09635	8	LAB
TCCJC112B	C	C1	3	1	116.1	8.727	0.05391	0.09605	8	LAB
TCCJC113B	C	C1	3	1	115.0	8.854	0.05351	0.09540	8	LAB
TCCJC211B	C	C2	3	2	113.0	8.723	0.04943	0.09588	8	LAB
TCCJC212B	C	C2	3	2	114.3	8.715	0.04418	0.09612	8	LAB
TCCJC213B	C	C2	3	2	112.6	8.777	0.05018	0.09613	8	LAB

Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.01200	110.7	8.487
0.01203	110.7	8.510
0.01193	113.1	8.614
0.01221	117.1	8.594
0.01209	116.0	8.497
0.01208	113.5	8.516
0.01190	112.5	8.521
0.01204	114.3	8.673
0.01205	119.1	8.656
0.01221	107.2	8.666
0.01223	112.8	8.819
0.01231	116.3	8.737
0.01204	111.2	8.638
0.01201	114.2	8.588
0.01193	112.4	8.654
0.01199	111.0	8.569
0.01201	112.6	8.582
0.01202	110.9	8.645

Average 114.4 8.710 0.05257
Standard Dev. 2.826 0.08379 0.008796
Coeff. of Var. [%] 2.470 0.9620 16.73
Min. 107.1 8.573 0.04186
Max. 120.7 8.854 0.07558
Number of Spec. 18 18 18

Average_{norm} 0.01206 113.1 8.609
Standard Dev._{norm} 2.825 0.08777
Coeff. of Var. [%]_{norm} 2.498 1.020
Min. 0.01190 107.2 8.487
Max. 0.01231 119.1 8.819
Number of Spec. 18 18 18



August 1, 2025

CAM-RP-2024-023 Rev N/C

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

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

t_{ply} [in]

0.01220

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Poisson's Ratio	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
TCCJA111A*	A	C1	1	1	109.1	8.625	0.04630	0.09700	8	LAB
TCCJA112A*	A	C1	1	1	108.8	8.899	0.05342	0.09752	8	LAB
TCCJA113A*	A	C1	1	1	107.9	8.807	0.05397	0.09930	8	LAT
TCCJA211A	A	C2	1	2	115.7	8.461	0.04033	0.09732	8	LAB
TCCJA212A	A	C2	1	2	110.4	8.449	0.04410	0.09732	8	LAT
TCCJA213A	A	C2	1	2	111.8	8.443	0.03962	0.09722	8	LAB
TCCJB211A	B	C2	2	2	116.4	8.654	0.05119	0.09577	8	LAT
TCCJB212A	B	C2	2	2	103.0	8.606	0.04633	0.09718	8	LAB
TCCJB213A	B	C2	2	2	120.3	8.629	0.04596	0.09668	8	LAB
TCCJB311A	B	C3	2	3	104.8	8.529	0.03877	0.09807	8	LAB
TCCJB312A	B	C3	2	3	114.5	8.567	0.03819	0.09768	8	LAT
TCCJB313A**	B	C3	2	3		8.656	0.04117	0.09740	8	LIB
TCCJB314A	B	C3	2	3	111.9	8.705	0.04579	0.09768	8	LAB
TCCJC111A	C	C1	3	1	114.2	8.541	0.05283	0.09725	8	LAT
TCCJC112A	C	C1	3	1	108.8	8.647	0.05220	0.09685	8	LGT
TCCJC113A	C	C1	3	1	107.9	8.672	0.05153	0.09617	8	LGM
TCCJC211A	C	C2	3	2	113.5	8.724	0.04997	0.09600	8	LAB
TCCJC212A	C	C2	3	2	116.2	8.679	0.04940	0.09638	8	LAB
TCCJC213A	C	C2	3	2	113.5	8.630	0.04570	0.09653	8	LAT

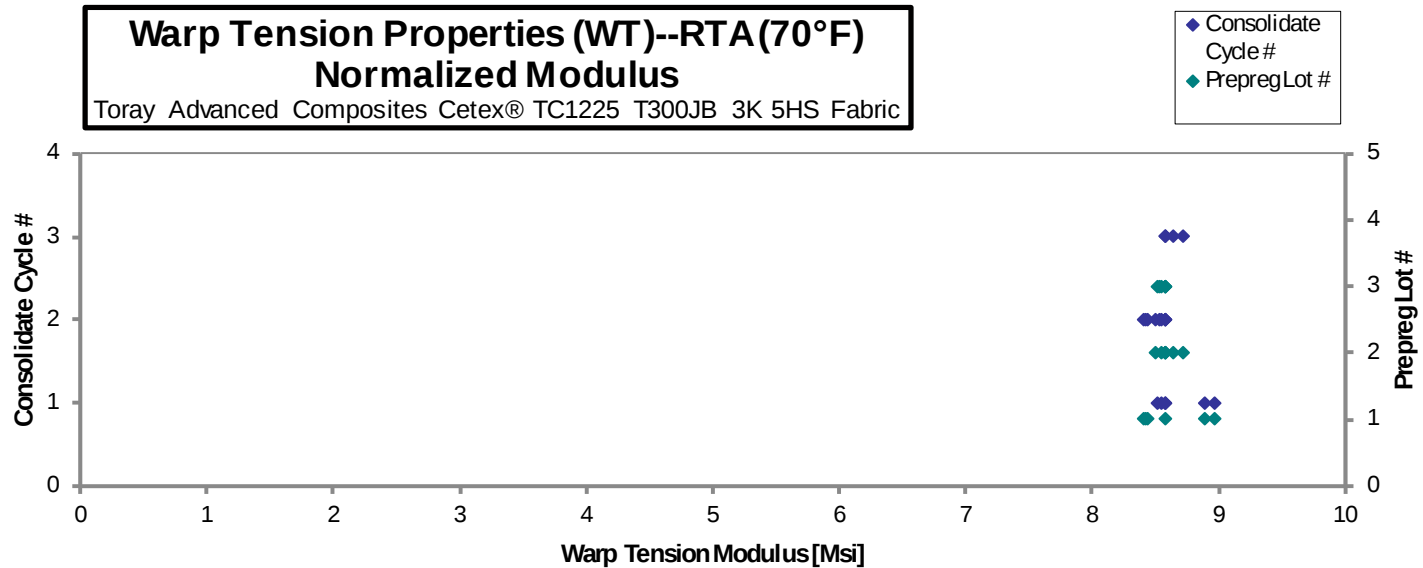
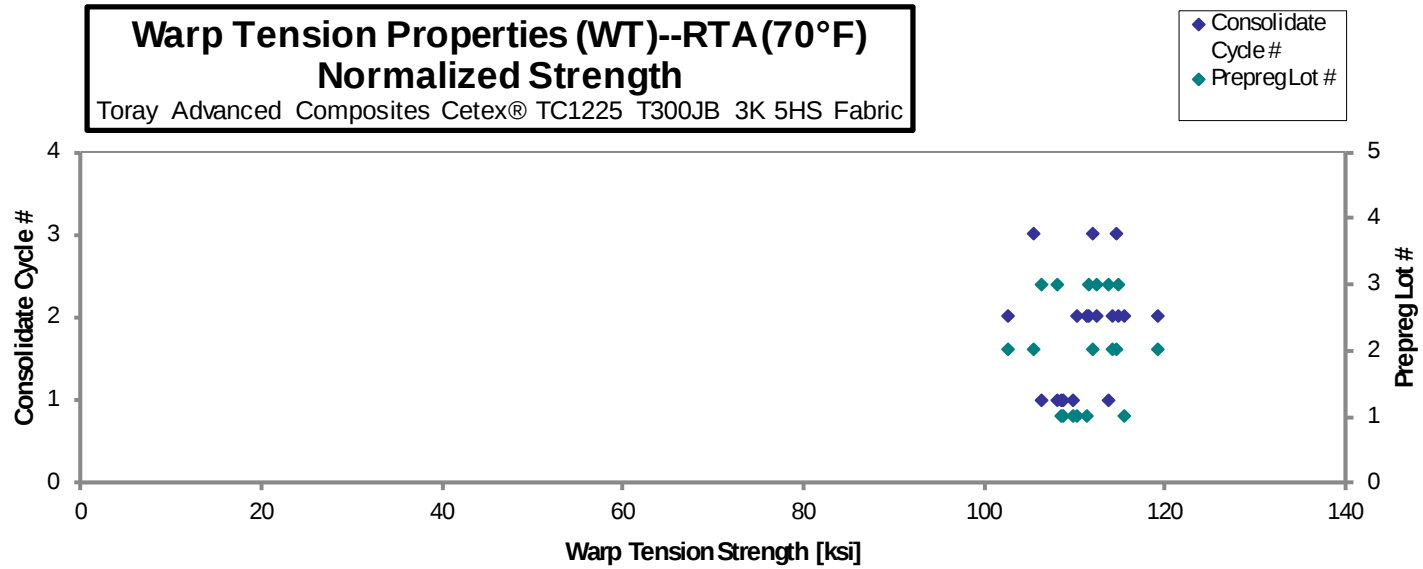
Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.01213	108.4	8.572
0.01219	108.7	8.891
0.01241	109.7	8.961
0.01216	115.4	8.436
0.01216	110.1	8.425
0.01215	111.4	8.410
0.01197	114.2	8.491
0.01215	102.6	8.569
0.01209	119.2	8.548
0.01226	105.3	8.570
0.01221	114.6	8.574
0.01218		8.638
0.01221	112.0	8.712
0.01216	113.8	8.510
0.01211	107.9	8.580
0.01202	106.4	8.545
0.01200	111.6	8.581
0.01205	114.8	8.570
0.01207	112.3	8.536

* Strain measurement was measured with strain gauge. Extensometer used on other specimens.

** Strength not reported due to unacceptable failure mode.

Average	111.6	8.627	0.04667
Standard Dev.	4.415	0.1161	0.005235
Coeff. of Var. [%]	3.956	1.346	11.22
Min.	103.0	8.443	0.03819
Max.	120.3	8.899	0.05397
Number of Spec.	18	19	19

Average _{norm}	0.01214	111.0	8.585
Standard Dev. _{norm}		4.088	0.1401
Coeff. of Var. [%] _{norm}		3.682	1.632
Min.	0.01197	102.6	8.410
Max.	0.01241	119.2	8.961
Number of Spec.	19	18	19



August 1, 2025

CAM-RP-2024-023 Rev N/C

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

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

t_{ply} [in]

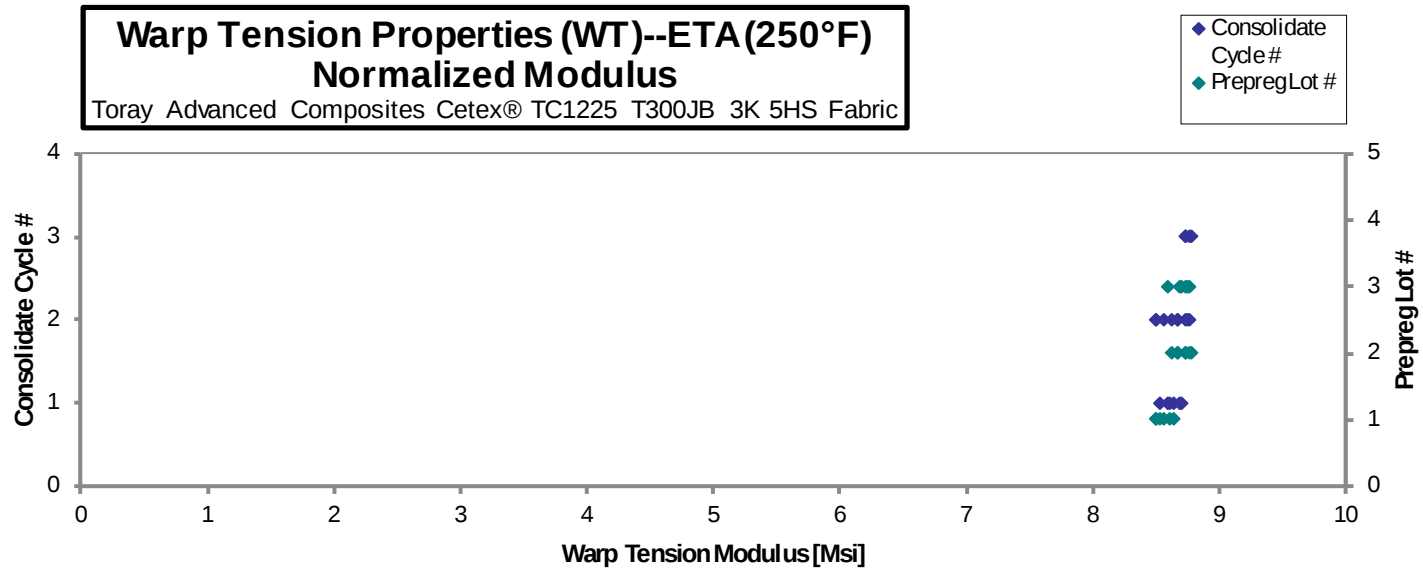
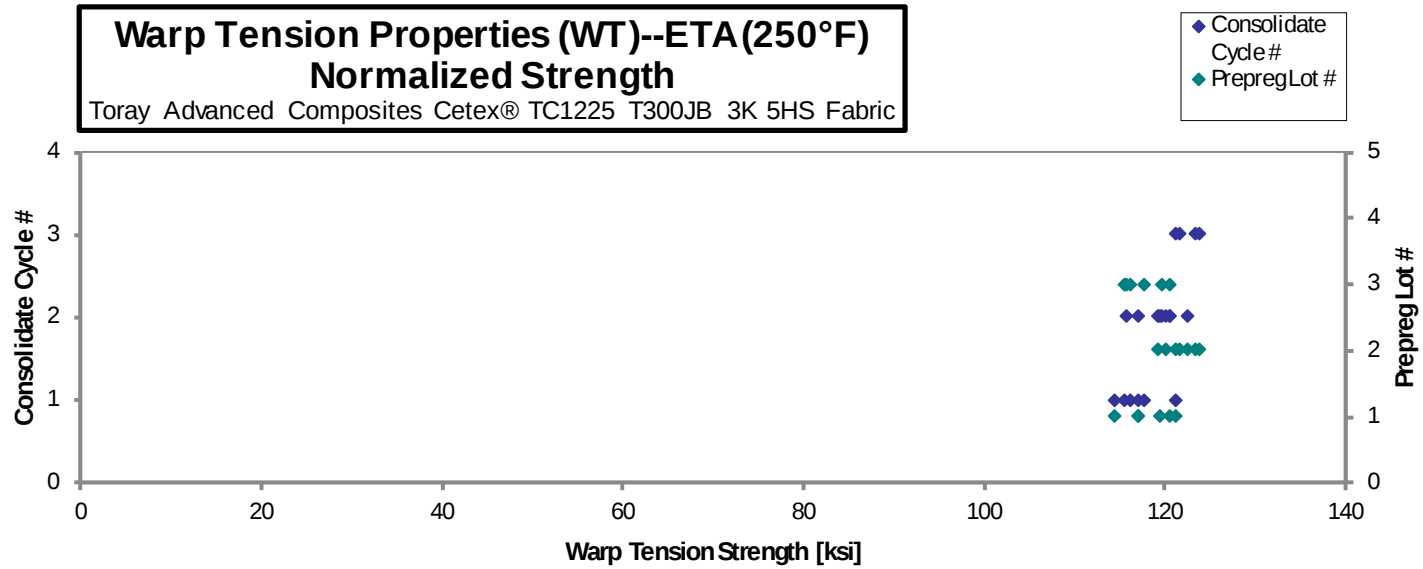
0.01220

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Poisson's Ratio	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
TCCJA111C	A	C1	1	1	118.4	8.717	0.05452	0.09640	8	LAT
TCCJA112C	A	C1	1	1	122.7	8.633	0.04849	0.09643	8	LAB
TCCJA113C	A	C1	1	1	115.5	8.709	0.05115	0.09673	8	LAB
TCCJA211C	A	C2	1	2	120.6	8.593	0.04860	0.09653	8	LAT
TCCJA212C	A	C2	1	2	120.7	8.580	0.04766	0.09733	8	LAT, LWB
TCCJA213C	A	C2	1	2	117.2	8.509	0.04636	0.09748	8	LAB
TCCJB211C	B	C2	2	2	122.2	8.605	0.03132	0.09777	8	LAT
TCCJB212C	B	C2	2	2	118.5	8.619	0.03254	0.09808	8	LAB
TCCJB213C	B	C2	2	2	120.1	8.675	0.03364	0.09752	8	LAT
TCCJB311C	B	C3	2	3	123.1	8.678	0.03288	0.09815	8	LAB
TCCJB312C	B	C3	2	3	121.2	8.755	0.04067	0.09783	8	LAT
TCCJB313C	B	C3	2	3	123.2	8.720	0.03122	0.09763	8	LAT
TCCJB314C	B	C3	2	3	121.1	8.764	0.03553	0.09755	8	LAT
TCCJC111C	C	C1	3	1	118.8	8.800	0.05478	0.09527	8	LAT
TCCJC112C	C	C1	3	1	118.4	8.910	0.04579	0.09510	8	LAB
TCCJC113C	C	C1	3	1	120.2	8.889	0.05183	0.09547	8	LAB
TCCJC211C	C	C2	3	2	120.9	8.837	0.04749	0.09655	8	LAB
TCCJC212C	C	C2	3	2	121.6	8.822	0.04837	0.09660	8	LAB
TCCJC213C	C	C2	3	2	117.0	8.854	0.04877	0.09655	8	LAT

Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.01205	116.9	8.609
0.01205	121.2	8.530
0.01209	114.5	8.632
0.01207	119.3	8.499
0.01217	120.4	8.557
0.01219	117.1	8.499
0.01222	122.4	8.620
0.01226	119.1	8.661
0.01219	120.0	8.667
0.01227	123.8	8.726
0.01223	121.5	8.776
0.01220	123.2	8.723
0.01219	121.0	8.759
0.01191	116.0	8.590
0.01189	115.4	8.682
0.01193	117.6	8.694
0.01207	119.6	8.742
0.01208	120.4	8.732
0.01207	115.7	8.759

Average 120.1 8.720 0.04377
Standard Dev. 2.169 0.1134 0.008249
Coeff. of Var. [%] 1.807 1.300 18.85
Min. 115.5 8.509 0.03122
Max. 123.2 8.910 0.05478
Number of Spec. 19 19 19

Average_{norm} 0.01211 119.2 8.656
Standard Dev_{norm} 2.744 0.08941
Coeff. of Var. [%]_{norm} 2.301 1.033
Min. 0.01189 114.5 8.499
Max. 0.01227 123.8 8.776
Number of Spec. 19 19 19



August 1, 2025

CAM-RP-2024-023 Rev N/C

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

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

t_{ply} [in]

0.01220

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Poisson's Ratio	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
TCCJA111D	A	C1	1	1	109.1	8.677	0.05336	0.09663	8	LAT
TCCJA112D	A	C1	1	1	115.5	8.569	0.05162	0.09675	8	LAB
TCCJA113D	A	C1	1	1	108.9	8.513	0.05011	0.09633	8	LAB
TCCJA211D	A	C2	1	2	109.4	8.617	0.04999	0.09760	8	LGM
TCCJA212D	A	C2	1	2	111.3	8.595	0.05609	0.09680	8	LGM
TCCJA213D	A	C2	1	2	114.7	8.454	0.04623	0.09750	8	LAB
TCCJB211D	B	C2	2	2	105.1	8.598	0.04781	0.09668	8	LAB
TCCJB212D*	B	C2	2	2		8.558	0.04909	0.09668	8	LIB
TCCJB213D	B	C2	2	2	113.1	8.628	0.05629	0.09598	8	LWT, LAB
TCCJB214D	B	C2	2	2	111.5	8.460	0.04693	0.09653	8	LAB
TCCJB311D**	B	C3	2	3	109.7			0.09800	8	LAB
TCCJB312D	B	C3	2	3	113.5	8.563	0.04424	0.09742	8	LAT
TCCJB313D	B	C3	2	3	109.3	8.561	0.04319	0.09740	8	LAT
TCCJB314D	B	C3	2	3	107.7	8.536	0.04958	0.09792	8	LAB
TCCJC111D***	C	C1	3	1		8.703	0.04338	0.09583	8	
TCCJC112D	C	C1	3	1	126.2	8.696	0.04608	0.09633	8	LAB
TCCJC113D	C	C1	3	1	125.3	8.595	0.04721	0.09663	8	LAT
TCCJC114D	C	C1	3	1	122.1	8.669	0.04515	0.09657	8	LAB
TCCJC115D	C	C1	3	1	129.3	8.763	0.04205	0.09612	8	LGT
TCCJC211D	C	C2	3	2	122.3	8.729	0.03502	0.09660	8	LAT
TCCJC212D	C	C2	3	2	122.7	8.756	0.04386	0.09623	8	LWT
TCCJC213D	C	C2	3	2	123.9	8.751	0.04106	0.09570	8	LAB
TCCJC214D	C	C2	3	2	123.0	8.767	0.03697	0.09562	8	LAT

* Strength not reported due to unacceptable failure mode.

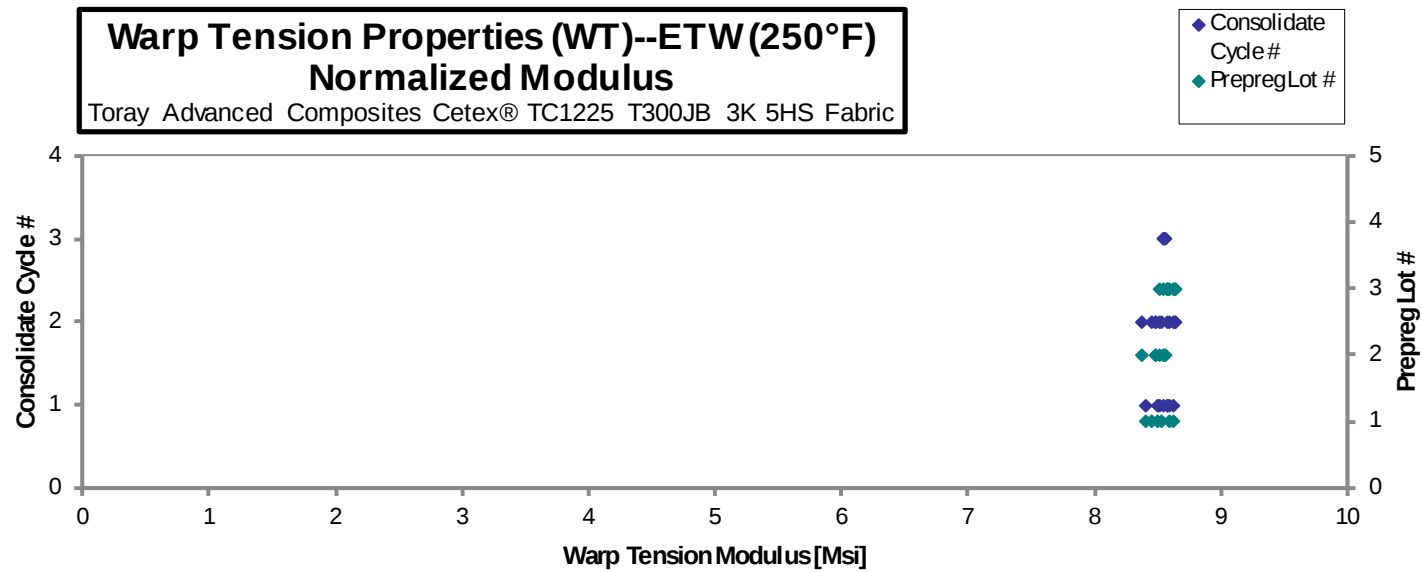
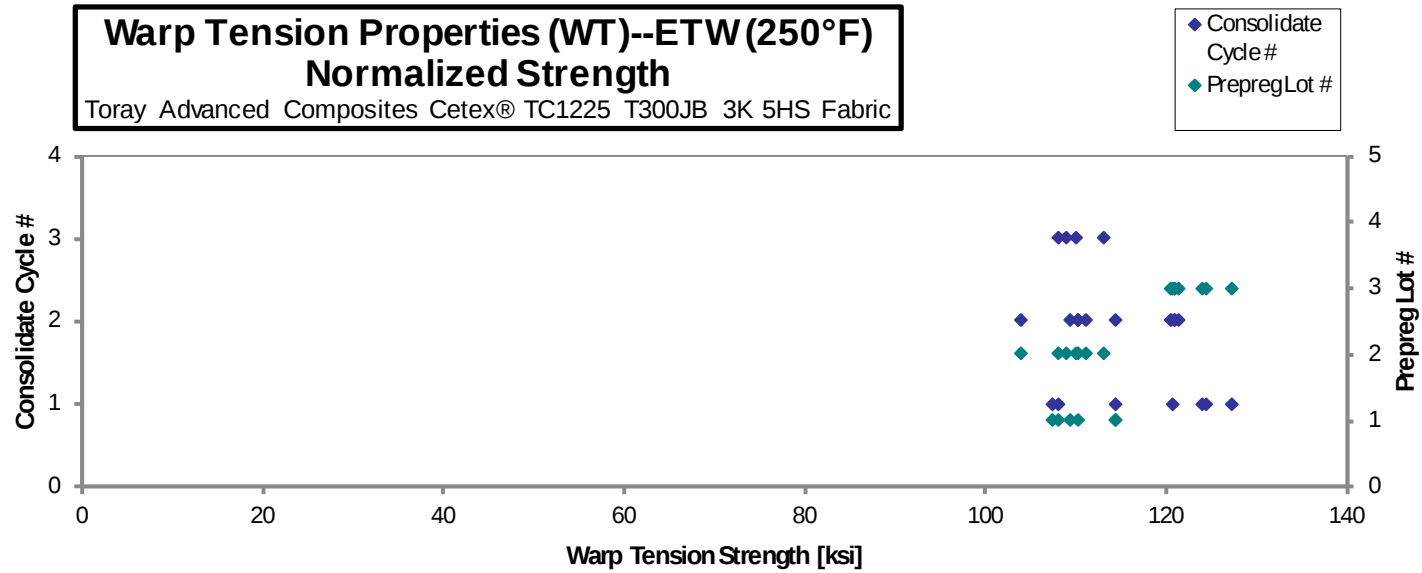
** Modulus and poisson's ratio not reported due to non-linearity.

*** Strength not reported due to slippage during testing.

Average	115.9	8.625	0.04660
Standard Dev.	7.331	0.09612	0.005396
Coeff. of Var. [%]	6.326	1.114	11.58
Min.	105.1	8.454	0.03502
Max.	129.3	8.767	0.05629
Number of Spec.	21	22	22

Average _{norm}	0.01209	114.8	8.539
Standard Dev. _{norm}		6.812	0.07285
Coeff. of Var. [%] _{norm}		5.932	0.8532
Min.	0.01195	104.1	8.367
Max.	0.01225	127.3	8.639
Number of Spec.	23	21	22

Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.01208	108.0	8.591
0.01209	114.5	8.495
0.01204	107.5	8.403
0.01220	109.4	8.617
0.01210	110.4	8.525
0.01219	114.5	8.445
0.01209	104.1	8.517
0.01209		8.477
0.01200	111.2	8.485
0.01207	110.3	8.367
0.01225	110.2	
0.01218	113.2	8.547
0.01218	109.1	8.543
0.01224	108.1	8.564
0.01198		8.546
0.01204	124.6	8.583
0.01208	124.1	8.510
0.01207	120.8	8.577
0.01201	127.3	8.629
0.01208	121.0	8.639
0.01203	121.0	8.633
0.01196	121.5	8.581
0.01195	120.5	8.589



August 1, 2025

CAM-RP-2024-023 Rev N/C

4.2 Fill Tension Properties (FT)

Fill Tension Properties (FT)--CTA (-65°F)

Strength & Modulus

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

t_{ply} [in]

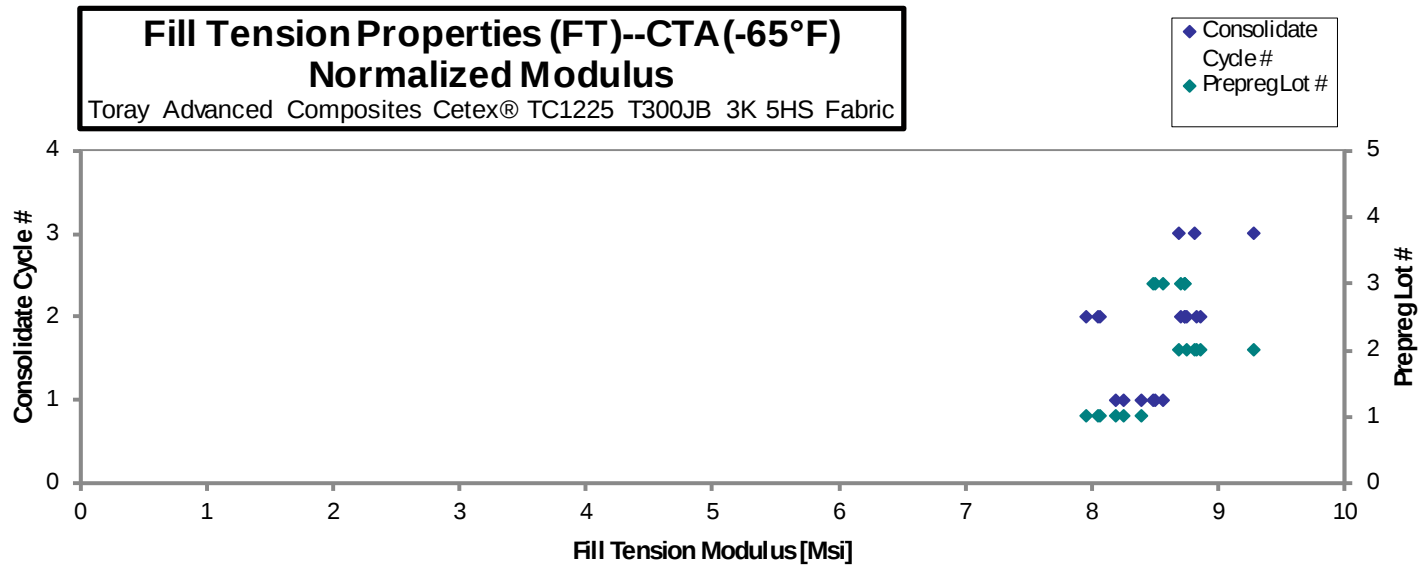
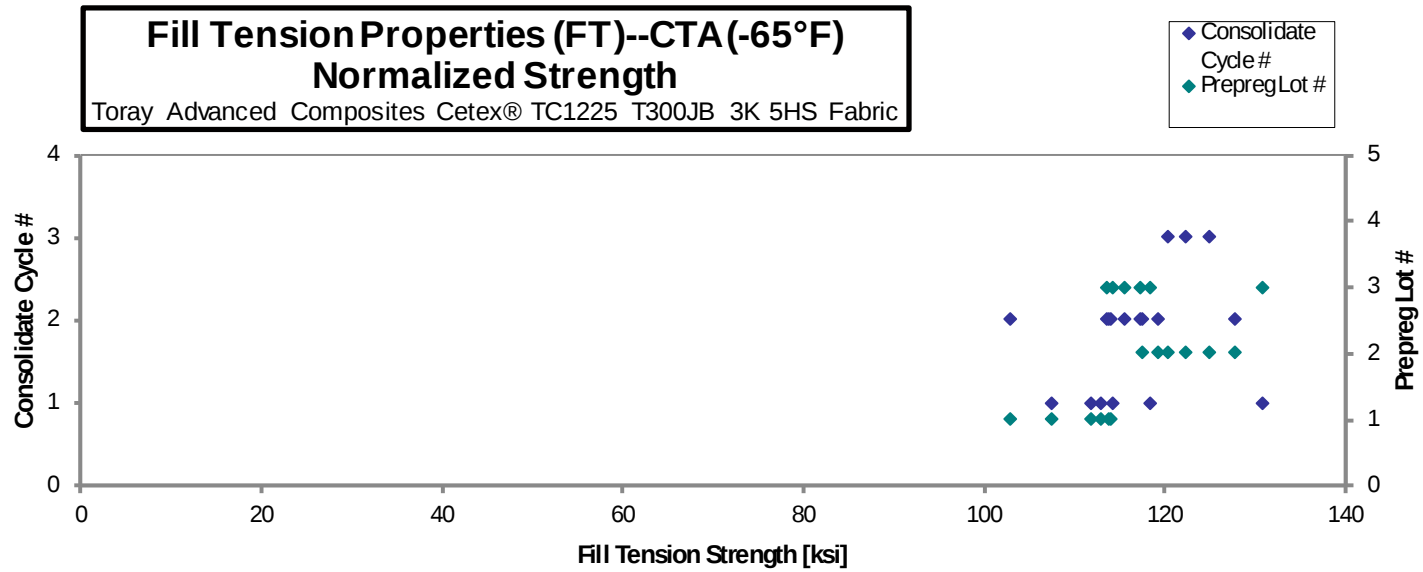
0.01220

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
TCCUA111B	A	C1	1	1	113.8	8.326	0.09672	8	LGT
TCCUA112B	A	C1	1	1	112.9	8.499	0.09650	8	LGB
TCCUA113B	A	C1	1	1	107.8	8.239	0.09713	8	LGM
TCCUA211B	A	C2	1	2	103.9	8.151	0.09642	8	LGB
TCCUA212B	A	C2	1	2	114.1	7.988	0.09722	8	LGT
TCCUA213B	A	C2	1	2	115.5	8.192	0.09618	8	LGB
TCCUB211B	B	C2	2	2	129.1	8.934	0.09648	8	LWT, LAB
TCCUB212B	B	C2	2	2	120.1	8.835	0.09673	8	LGM
TCCUB213B	B	C2	2	2	119.0	8.987	0.09628	8	LGT
TCCUB311B	B	C3	2	3	123.8	8.620	0.09852	8	LGB
TCCUB312B	B	C3	2	3	120.9	8.728	0.09862	8	LGT
TCCUB313B	B	C3	2	3	119.8	9.261	0.09790	8	LAT
TCCUC111B	C	C1	3	1	132.8	8.714	0.09605	8	LWB
TCCUC112B	C	C1	3	1	115.1	8.570	0.09682	8	LWB
TCCUC113B	C	C1	3	1	118.8	8.538	0.09712	8	LWT
TCCUC211B	C	C2	3	2	116.1	8.792	0.09707	8	LGM
TCCUC212B	C	C2	3	2	118.1	8.788	0.09680	8	LAB
TCCUC213B	C	C2	3	2	114.2	8.803	0.09687	8	LAB

Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.01209	112.8	8.250
0.01206	111.6	8.403
0.01214	107.3	8.200
0.01205	102.7	8.052
0.01215	113.7	7.956
0.01202	113.9	8.073
0.01206	127.6	8.832
0.01209	119.0	8.756
0.01204	117.3	8.866
0.01231	124.9	8.701
0.01233	122.2	8.819
0.01224	120.2	9.289
0.01201	130.7	8.575
0.01210	114.2	8.502
0.01214	118.2	8.496
0.01213	115.5	8.744
0.01210	117.1	8.716
0.01211	113.4	8.737

Average 117.5 8.609
 Standard Dev. 6.773 0.3306
 Coeff. of Var. [%] 5.762 3.840
 Min. 103.9 7.988
 Max. 132.8 9.261
 Number of Spec. 18 18

Average_{norm} 0.01212 116.8 8.554
 Standard Dev._{norm} 6.831 0.3456
 Coeff. of Var. [%]_{norm} 5.849 4.040
 Min. 0.01201 102.7 7.956
 Max. 0.01233 130.7 9.289
 Number of Spec. 18 18 18



August 1, 2025

CAM-RP-2024-023 Rev N/C

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

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

t_{ply} [in]

0.01220

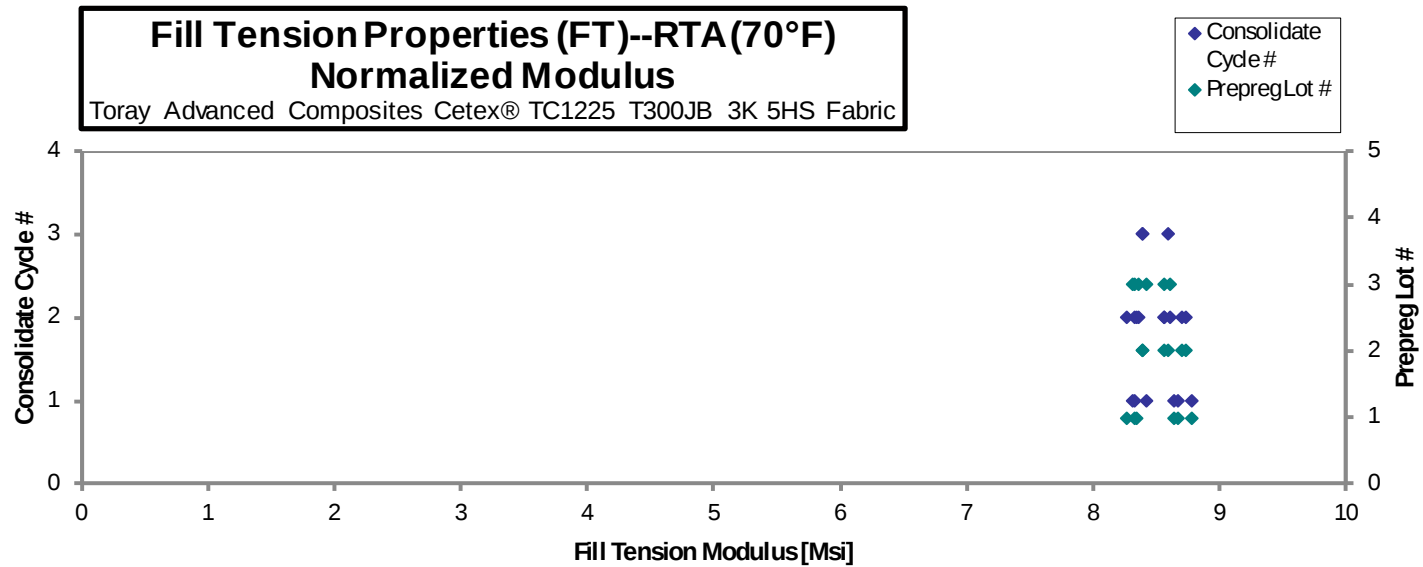
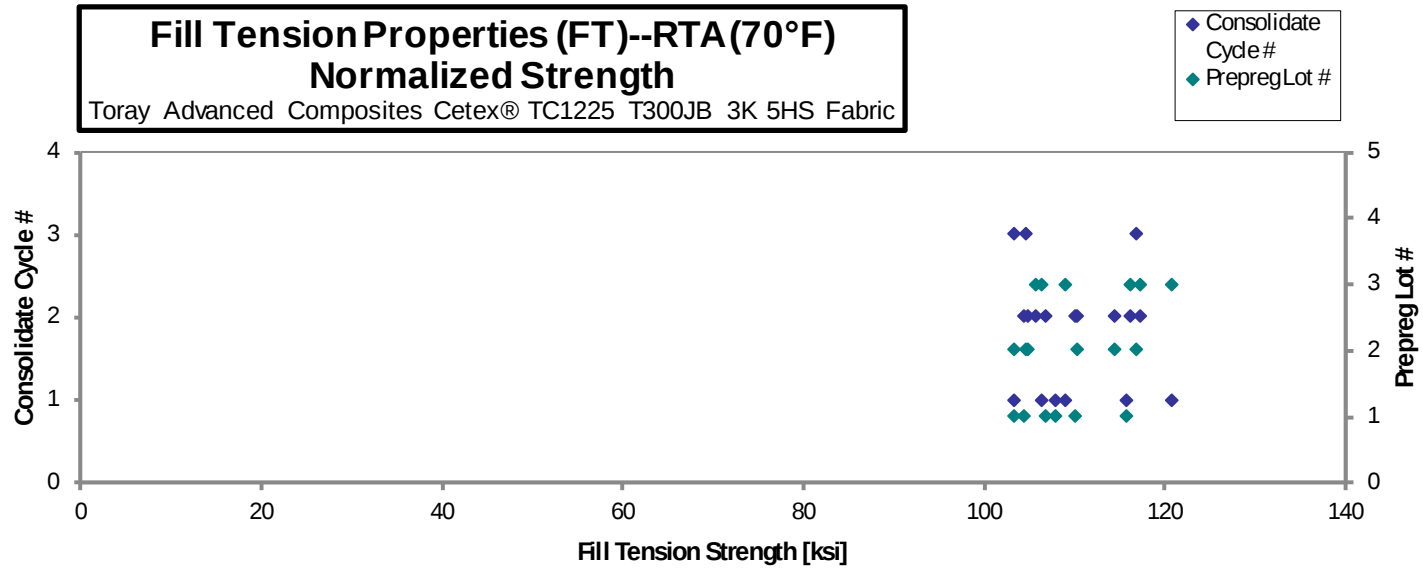
Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
TCCUA111A*	A	C1	1	1	108.6	8.701	0.09683	8	LGT
TCCUA112A*	A	C1	1	1	104.5	8.868	0.09648	8	LGB
TCCUA113A*	A	C1	1	1	115.7	8.677	0.09752	8	LGB
TCCUA211A	A	C2	1	2	107.1	8.362	0.09718	8	LGM
TCCUA212A	A	C2	1	2	110.7	8.388	0.09695	8	LAT
TCCUA213A	A	C2	1	2	105.2	8.340	0.09665	8	LGT
TCCUB211A	B	C2	2	2	106.0	8.791	0.09648	8	LGB
TCCUB212A	B	C2	2	2	115.6	8.652	0.09648	8	LGM
TCCUB213A	B	C2	2	2	111.2	8.796	0.09675	8	LGT
TCCUB311A	B	C3	2	3	102.6	8.546	0.09815	8	LGT
TCCUB312A	B	C3	2	3	103.8	8.319	0.09827	8	LGT
TCCUB313A	B	C3	2	3	116.0	8.335	0.09820	8	LGB
TCCUC111A	C	C1	3	1	109.3	8.352	0.09730	8	LGT
TCCUC112A	C	C1	3	1	106.7	8.330	0.09727	8	LWB
TCCUC113A	C	C1	3	1	121.6	8.473	0.09688	8	LWT
TCCUC211A	C	C2	3	2	106.7	8.652	0.09650	8	LGB
TCCUC212A	C	C2	3	2	118.4	8.439	0.09658	8	LGT
TCCUC213A	C	C2	3	2	117.1	8.687	0.09672	8	LWT

Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.01210	107.7	8.633
0.01206	103.3	8.767
0.01219	115.6	8.670
0.01215	106.6	8.326
0.01212	109.9	8.332
0.01208	104.2	8.259
0.01206	104.8	8.690
0.01206	114.3	8.553
0.01209	110.3	8.719
0.01227	103.1	8.594
0.01228	104.5	8.376
0.01228	116.7	8.386
0.01216	108.9	8.326
0.01216	106.4	8.301
0.01211	120.7	8.411
0.01206	105.5	8.555
0.01207	117.1	8.351
0.01209	116.1	8.609

* Strain measurement was measured with strain gauge. Extensometer used on other specimens.

Average	110.4	8.539
Standard Dev.	5.686	0.1891
Coeff. of Var. [%]	5.151	2.215
Min.	102.6	8.319
Max.	121.6	8.868
Number of Spec.	18	18

Average _{norm}	0.01213	109.8	8.492
Standard Dev. _{norm}		5.582	0.1667
Coeff. of Var. [%] _{norm}		5.085	1.962
Min.	0.01206	103.1	8.259
Max.	0.01228	120.7	8.767
Number of Spec.	18	18	18



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

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

 t_{ply} [in]

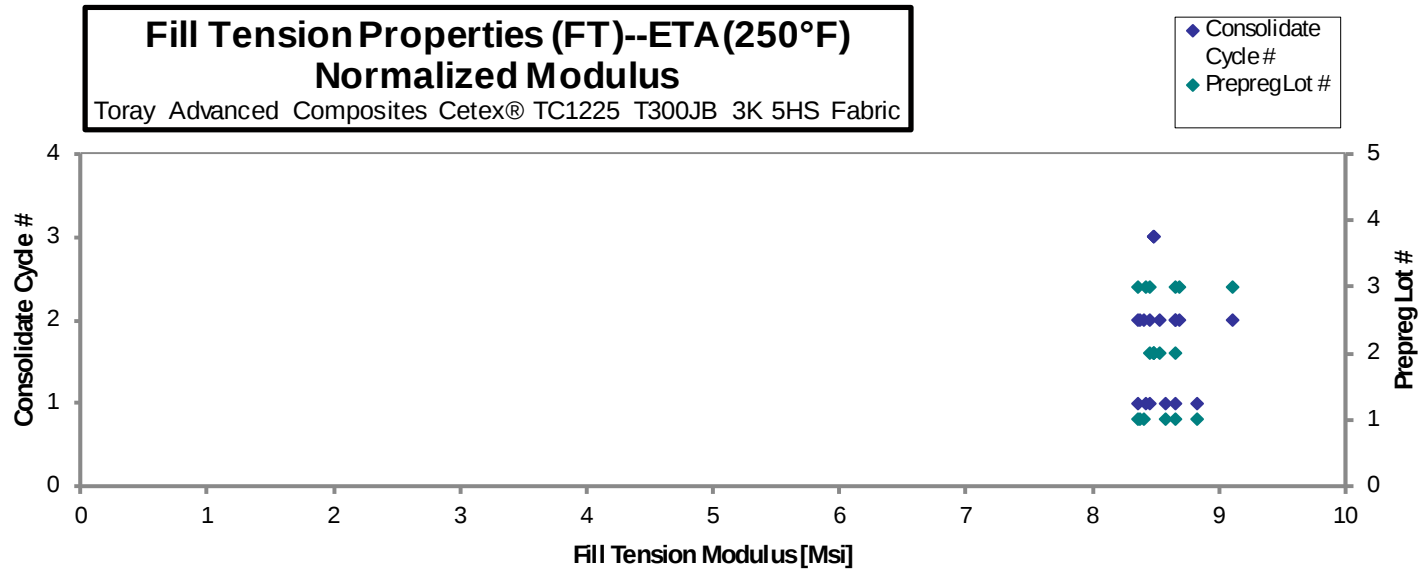
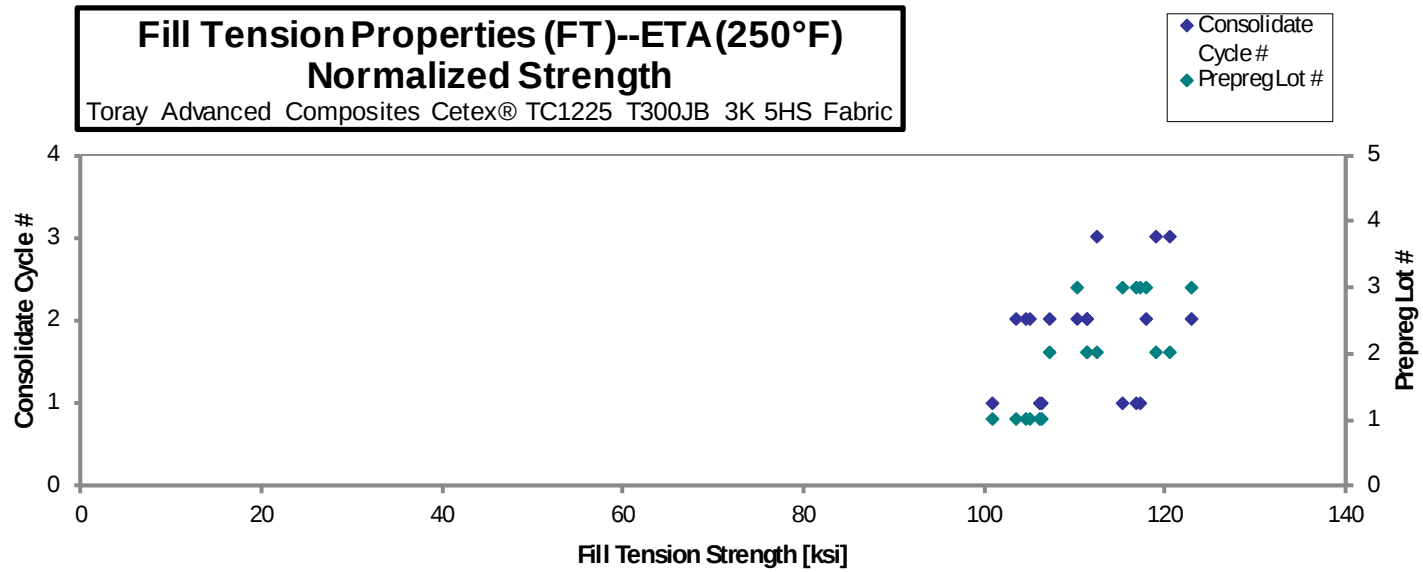
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Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
TCCUA111C	A	C1	1	1	107.4	8.739	0.09658	8	LGM
TCCUA112C	A	C1	1	1	101.8	8.666	0.09668	8	LGB
TCCUA113C	A	C1	1	1	105.7	8.795	0.09797	8	LGT
TCCUA211C	A	C2	1	2	105.3	8.557	0.09592	8	LGT
TCCUA212C	A	C2	1	2	106.3	8.532	0.09585	8	LGB
TCCUA213C	A	C2	1	2	106.9	8.510	0.09587	8	LGB
TCCUB211C	B	C2	2	2	113.0	8.782	0.09613	8	LGT
TCCUB212C	B	C2	2	2	113.5	8.625	0.09567	8	LWT
TCCUB213C	B	C2	2	2	109.4	8.725	0.09545	8	LGM
TCCUB311C	B	C3	2	3	111.7	8.435	0.09817	8	LWT
TCCUB312C	B	C3	2	3	121.2	8.537	0.09702	8	LGM
TCCUB313C	B	C3	2	3	119.0	8.488	0.09750	8	LWB
TCCUC111C	C	C1	3	1	116.4	8.309	0.09823	8	LGT
TCCUC112C	C	C1	3	1	115.9	8.472	0.09707	8	LWT
TCCUC113C	C	C1	3	1	117.0	8.468	0.09747	8	LWB
TCCUC211C	C	C2	3	2	111.3	9.186	0.09668	8	LGM
TCCUC212C	C	C2	3	2	124.5	8.789	0.09637	8	LGM
TCCUC213C	C	C2	3	2	119.8	8.800	0.09603	8	LGM

Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.01207	106.3	8.648
0.01209	100.8	8.584
0.01225	106.1	8.828
0.01199	103.4	8.410
0.01198	104.4	8.379
0.01198	105.0	8.359
0.01202	111.3	8.650
0.01196	111.3	8.454
0.01193	107.0	8.533
0.01227	112.4	8.484
0.01213	120.4	8.486
0.01219	118.8	8.479
0.01228	117.2	8.363
0.01213	115.2	8.425
0.01218	116.8	8.456
0.01209	110.3	9.099
0.01205	122.9	8.678
0.01200	117.8	8.659

Average 112.6 8.634
Standard Dev. 6.330 0.2008
Coeff. of Var. [%] 5.624 2.326
Min. 101.8 8.309
Max. 124.5 9.186
Number of Spec. 18 18

Average_{norm} 0.01209 111.5 8.554
Standard Dev._{norm} 6.544 0.1871
Coeff. of Var. [%]_{norm} 5.868 2.187
Min. 0.01193 100.8 8.359
Max. 0.01228 122.9 9.099
Number of Spec. 18 18 18



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

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

 t_{ply} [in]

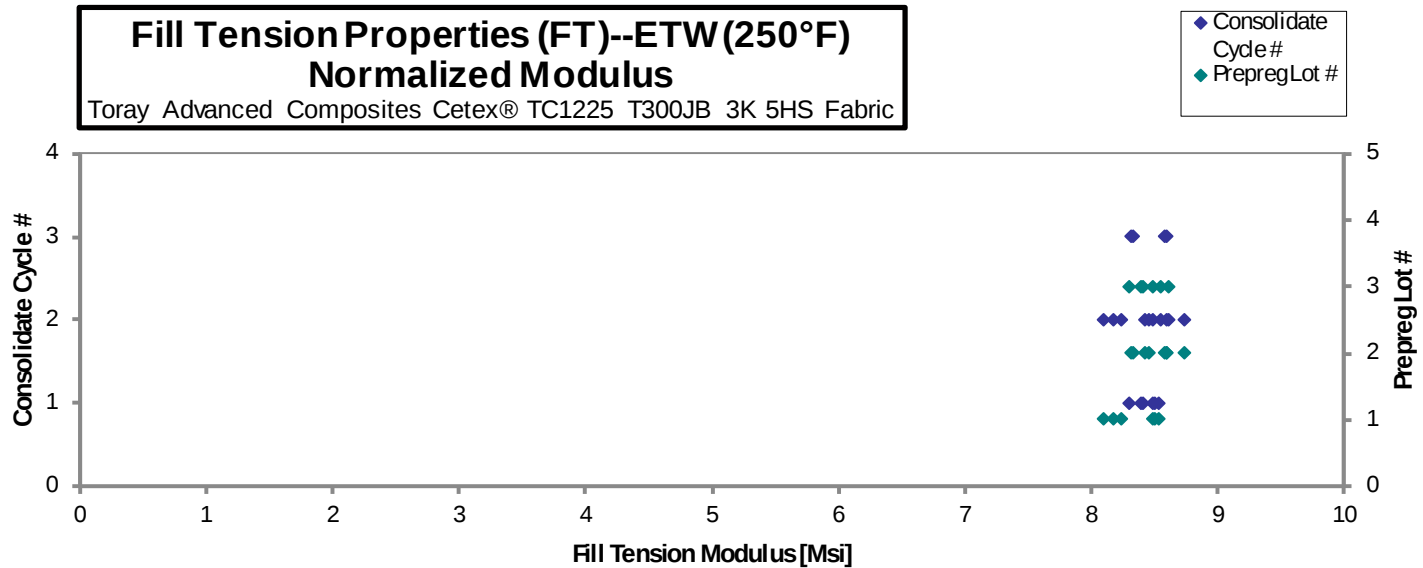
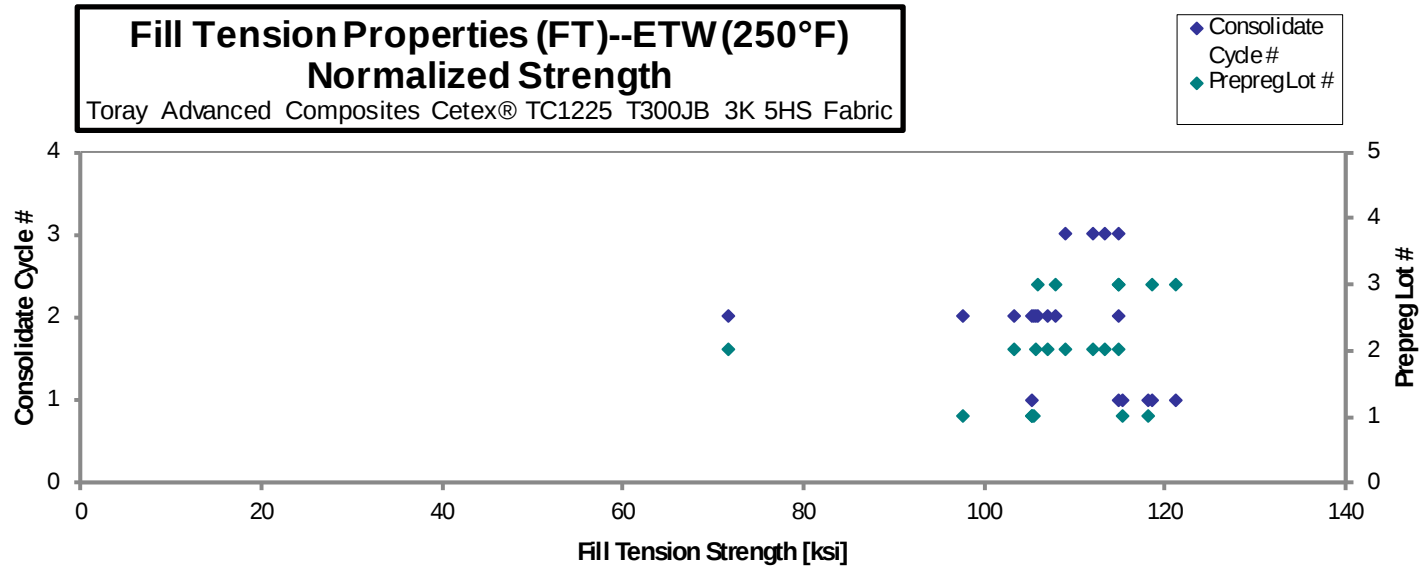
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Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
TCCUA111D	A	C1	1	1	118.5	8.584	0.09713	8	LGT
TCCUA112D	A	C1	1	1	106.8	8.624	0.09613	8	LWT
TCCUA113D	A	C1	1	1	117.3	8.668	0.09582	8	LGM
TCCUA211D	A	C2	1	2	99.03	8.223	0.09605	8	LAT
TCCUA212D	A	C2	1	2	107.2	8.381	0.09603	8	LGM
TCCUA213D	A	C2	1	2	106.7	8.301	0.09623	8	LGB
TCCUB211D	B	C2	2	2	105.6	8.664	0.09532	8	LGT
TCCUB212D	B	C2	2	2	109.6	8.630	0.09523	8	LGM
TCCUB213D	B	C2	2	2	73.26	8.938	0.09538	8	LGT
TCCUB214D	B	C2	2	2	108.0	8.783	0.09550	8	LGM
TCCUB311D	B	C3	2	3	114.5	8.588	0.09778	8	LWT
TCCUB312D	B	C3	2	3	108.4	8.531	0.09813	8	LGB
TCCUB313D	B	C3	2	3	113.1	8.331	0.09765	8	LAB
TCCUB314D	B	C3	2	3	112.3	8.344	0.09725	8	LGB
TCCUC111D	C	C1	3	1	119.9	8.514	0.09640	8	LGT
TCCUC112D	C	C1	3	1	116.2	8.402	0.09642	8	LGB
TCCUC113D	C	C1	3	1	122.4	8.492	0.09650	8	LGT
TCCUC211D	C	C2	3	2	107.3	8.613	0.09618	8	LGB
TCCUC212D	C	C2	3	2	116.5	8.671	0.09620	8	LGB
TCCUC213D	C	C2	3	2	109.6	8.762	0.09592	8	LGB

Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.01214	118.0	8.543
0.01202	105.2	8.494
0.01198	115.1	8.510
0.01201	97.46	8.092
0.01200	105.5	8.247
0.01203	105.3	8.184
0.01191	103.1	8.462
0.01190	106.9	8.420
0.01192	71.60	8.735
0.01194	105.7	8.594
0.01222	114.7	8.605
0.01227	109.0	8.578
0.01221	113.2	8.336
0.01216	111.9	8.314
0.01205	118.5	8.409
0.01205	114.8	8.300
0.01206	121.0	8.396
0.01202	105.8	8.488
0.01203	114.8	8.546
0.01199	107.7	8.611

Average 109.6 8.552
 Standard Dev. 10.32 0.1814
 Coeff. of Var. [%] 9.418 2.121
 Min. 73.26 8.223
 Max. 122.4 8.938
 Number of Spec. 20 20

Average_{norm} 0.01205 108.3 8.443
 Standard Dev._{norm} 10.52 0.1609
 Coeff. of Var. [%]_{norm} 9.720 1.906
 Min. 0.01190 71.60 8.092
 Max. 0.01227 121.0 8.735
 Number of Spec. 20 20 20



4.3 Warp Compression Properties (WC)

Warp Compression Properties (WC)--CTA (-65°F) Strength & Modulus

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

 t_{ply} [in]

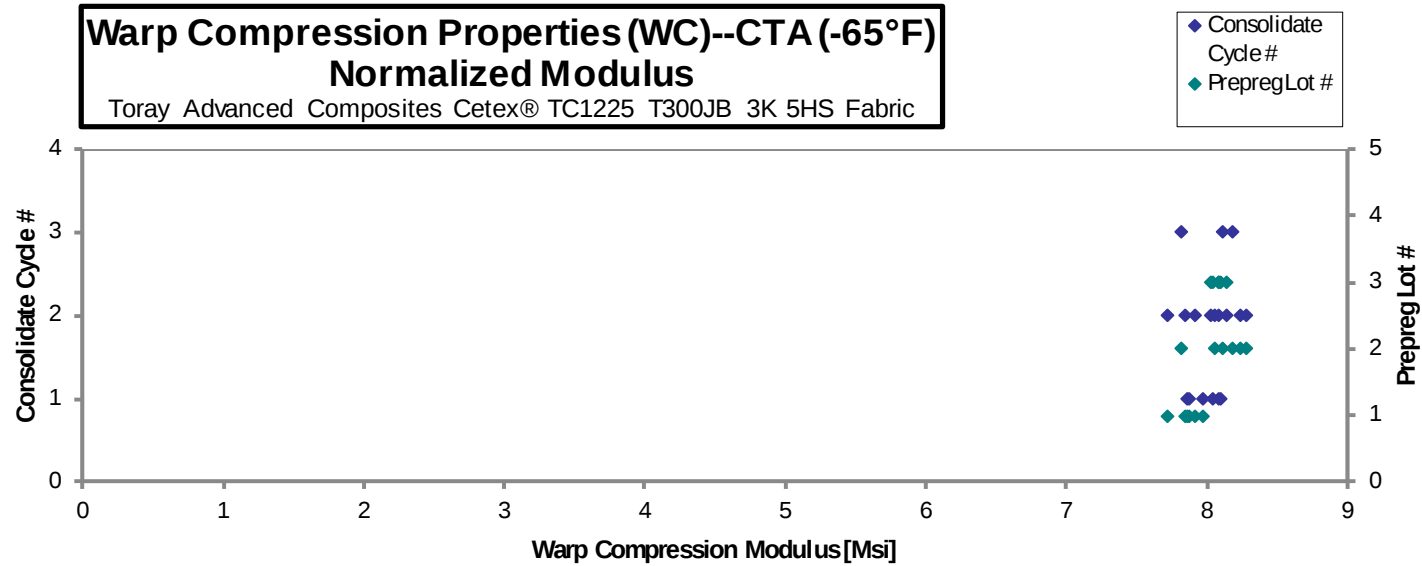
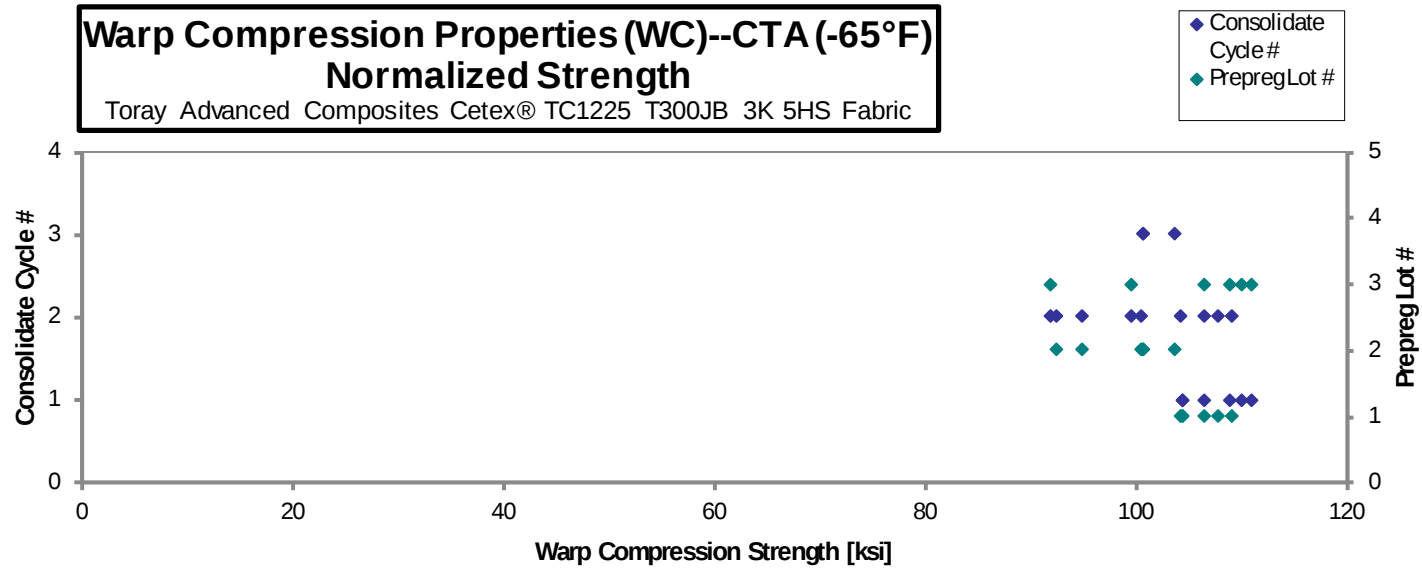
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Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
TCCLA111B	A	C1	1	1	108.6	8.130	0.09572	8	M(B,H)AT, HIB
TCCLA112B	A	C1	1	1	106.8	8.039	0.09543	8	BGM
TCCLA113B	A	C1	1	1	106.6	8.038	0.09558	8	BGM, HAT
TCCLA211B	A	C2	1	2	107.5	8.163	0.09463	8	BGM
TCCLA212B	A	C2	1	2	111.0	8.076	0.09483	8	BGM
TCCLA213B	A	C2	1	2	112.4	7.943	0.09483	8	BGM
TCCLB211B	B	C2	2	2	92.09	8.028	0.09800	8	BGM
TCCLB212B	B	C2	2	2	100.7	8.283	0.09753	8	BAB
TCCLB213B	B	C2	2	2	95.44	8.285	0.09703	8	BGM
TCCLB311B	B	C3	2	3	103.8	7.813	0.09757	8	M(B,H)AB, HIB
TCCLB312B	B	C3	2	3	100.4	8.089	0.09788	8	BAT
TCCLB313B	B	C3	2	3	100.4	8.145	0.09798	8	BAT
TCCLC111B	C	C1	3	1	110.6	8.217	0.09608	8	HAT
TCCLC112B	C	C1	3	1	111.9	8.170	0.09603	8	M(B,H)AT
TCCLC113B	C	C1	3	1	113.6	8.289	0.09538	8	M(B,H)AT
TCCLC211B	C	C2	3	2	108.1	8.187	0.09630	8	BGM
TCCLC212B	C	C2	3	2	101.0	8.135	0.09635	8	BGM
TCCLC213B	C	C2	3	2	93.32	8.263	0.09607	8	BGM

Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.01196	106.5	7.973
0.01193	104.4	7.860
0.01195	104.4	7.872
0.01183	104.3	7.915
0.01185	107.8	7.847
0.01185	109.2	7.718
0.01225	92.46	8.061
0.01219	100.6	8.277
0.01213	94.89	8.237
0.01220	103.8	7.811
0.01224	100.6	8.112
0.01225	100.8	8.177
0.01201	108.9	8.089
0.01200	110.1	8.039
0.01192	111.1	8.101
0.01204	106.6	8.078
0.01204	99.70	8.031
0.01201	91.86	8.134

Average 104.7 8.127
 Standard Dev. 6.643 0.1263
 Coeff. of Var. [%] 6.346 1.554
 Min. 92.09 7.813
 Max. 113.6 8.289
 Number of Spec. 18 18

Average_{norm} 0.01204 103.2 8.018
 Standard Dev._{norm} 5.794 0.1537
 Coeff. of Var. [%]_{norm} 5.613 1.916
 Min. 0.01183 91.86 7.718
 Max. 0.01225 111.1 8.277
 Number of Spec. 18 18 18



August 1, 2025

CAM-RP-2024-023 Rev N/C

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

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

t_{ply} [in]

0.01220

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
TCCLA111A*	A	C1	1	1	96.92	8.193	0.09533	8	BGM
TCCLA112A*	A	C1	1	1	98.58	8.347	0.09493	8	BGM
TCCLA113A	A	C1	1	1	98.23	8.177	0.09598	8	M(B,H)AB, HIB
TCCLA211A	A	C2	1	2	98.21	8.050	0.09560	8	BGM, HAT
TCCLA212A	A	C2	1	2	97.03	8.116	0.09515	8	M(B,H)AT, HIT
TCCLA213A	A	C2	1	2	95.03	8.199	0.09528	8	M(B,H)AB
TCCLB211A	B	C2	2	2	85.83	7.995	0.09823	8	BGM, HAB
TCCLB212A	B	C2	2	2	85.92	7.914	0.09922	8	M(B,H)AT
TCCLB213A	B	C2	2	2	86.47	7.999	0.09847	8	BAT, HAT/HIT
TCCLB311A	B	C3	2	3	83.86	7.952	0.09810	8	M(B,H)AT
TCCLB312A	B	C3	2	3	92.29	7.877	0.09808	8	BGM, HAT
TCCLB313A	B	C3	2	3	85.03	8.036	0.09810	8	HAT, HIT
TCCLB314A**	B	C3	2	3	92.89		0.09787	8	M(B,H)AT, HIT
TCCLC111A	C	C1	3	1	95.99	8.090	0.09465	8	M(B,H)AT
TCCLC112A	C	C1	3	1	98.85	8.098	0.09468	8	BAT, HAT/HIT
TCCLC113A	C	C1	3	1	98.55	8.296	0.09453	8	CIT, CIB, BAB, HAB/HIB
TCCLC114A**	C	C1	3	1	97.99		0.09542	8	BGM, HAT
TCCLC211A	C	C2	3	2	93.62	8.319	0.09590	8	BGM
TCCLC212A	C	C2	3	2	91.24	8.176	0.09607	8	BGM
TCCLC213A	C	C2	3	2	95.97	8.381	0.09587	8	BAT

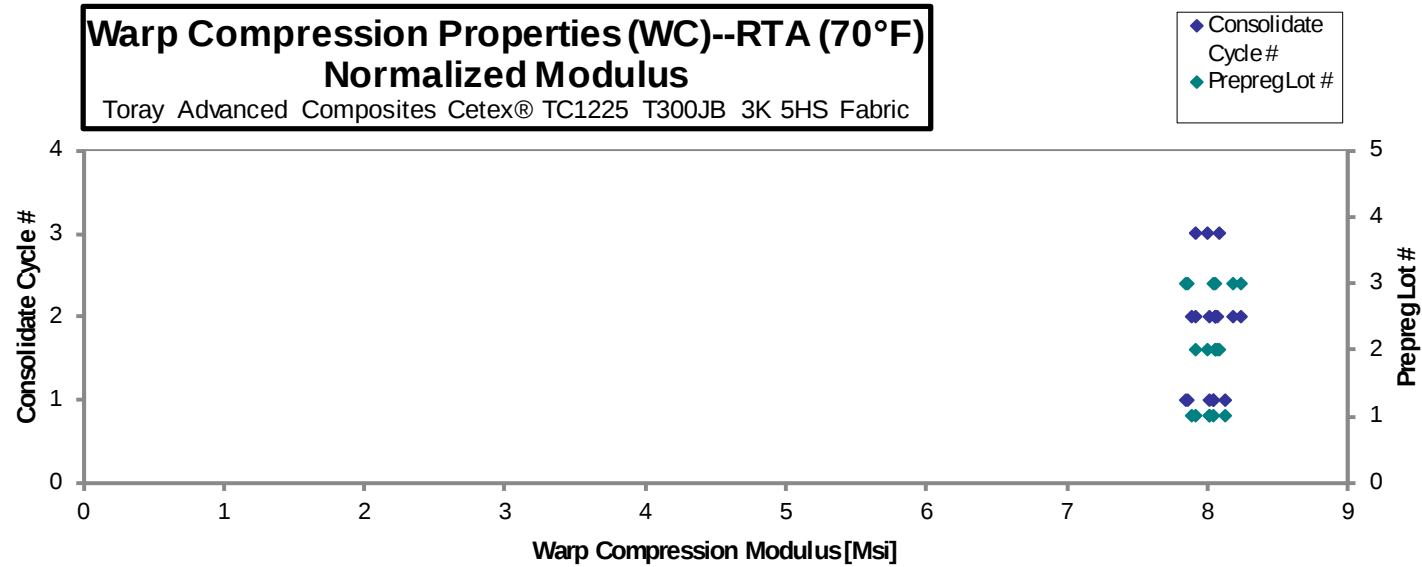
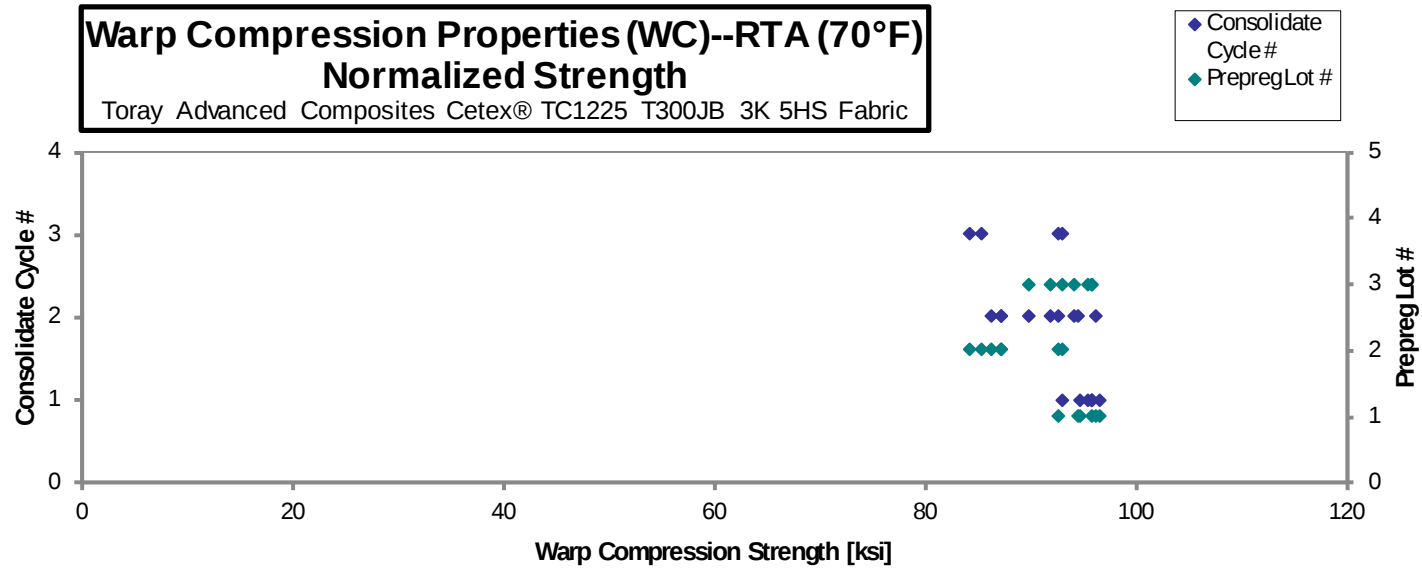
Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.01192	94.67	8.003
0.01187	95.88	8.119
0.01200	96.61	8.042
0.01195	96.19	7.885
0.01189	94.59	7.912
0.01191	92.78	8.005
0.01228	86.39	8.047
0.01240	87.34	8.045
0.01231	87.24	8.070
0.01226	84.29	7.993
0.01226	92.75	7.916
0.01226	85.47	8.077
0.01223	93.14	
0.01183	93.09	7.845
0.01184	95.90	7.856
0.01182	95.45	8.035
0.01193	95.80	
0.01199	91.99	8.175
0.01201	89.81	8.047
0.01198	94.26	8.232

* Modulus are averaged values of 2 strain gages.

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

Average 93.43 8.123
Standard Dev. 5.234 0.1498
Coeff. of Var. [%] 5.603 1.845
Min. 83.86 7.877
Max. 98.85 8.381
Number of Spec. 20 18

Average_{norm} 0.01205 92.18 8.017
Standard Dev._{norm} 3.975 0.1047
Coeff. of Var. [%]_{norm} 4.312 1.306
Min. 0.01182 84.29 7.845
Max. 0.01240 96.61 8.232
Number of Spec. 20 20 18



August 1, 2025

CAM-RP-2024-023 Rev N/C

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

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

t_{ply} [in]

0.01220

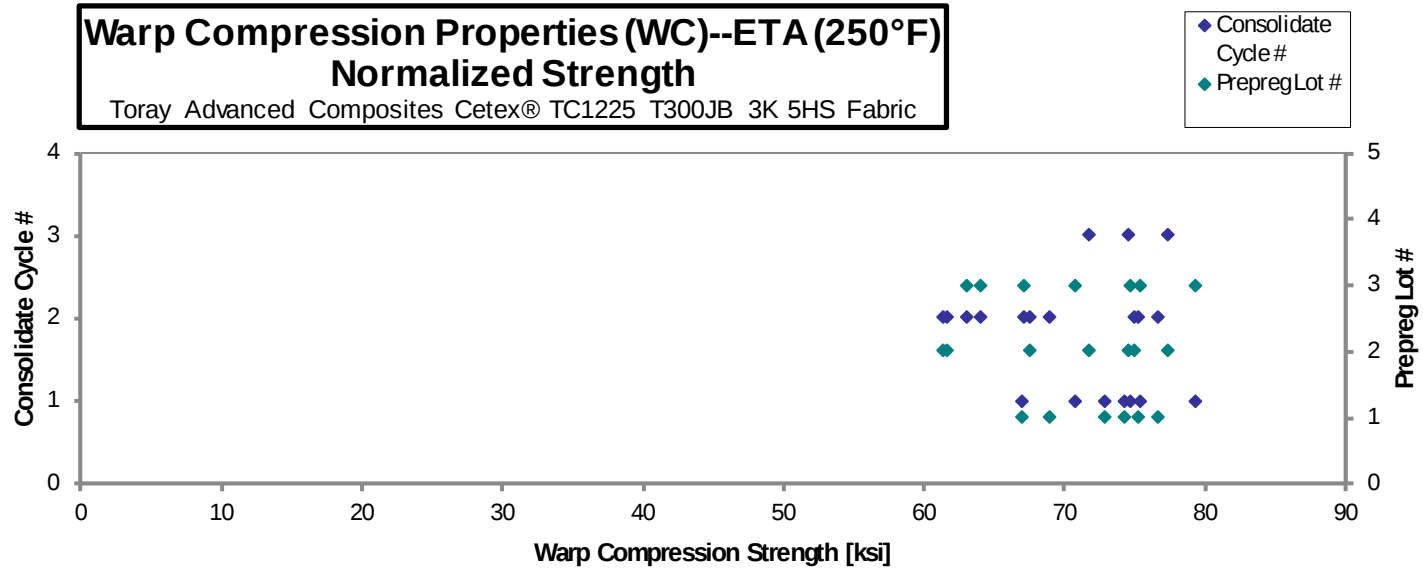
Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
TCCLA111C	A	C1	1	1	76.06	8.343	0.09520	8	M(B,H)AB, HIB
TCCLA112C	A	C1	1	1	68.06	8.279	0.09603	8	M(B,H)AB, HIB
TCCLA113C	A	C1	1	1	74.29	8.346	0.09570	8	BGM
TCCLA211C	A	C2	1	2	78.79	8.221	0.09483	8	BGM
TCCLA212C	A	C2	1	2	70.81	8.231	0.09502	8	BGM
TCCLA213C	A	C2	1	2	76.93	8.299	0.09537	8	BGM, HAT, HIT
TCCLB211C	B	C2	2	2	75.91	8.390	0.09638	8	M(B,H)AT
TCCLB212C	B	C2	2	2	62.36	8.300	0.09633	8	HAT
TCCLB213C	B	C2	2	2	68.64	8.313	0.09590	8	HGM
TCCLB214C*	B	C2	2	2	61.75		0.09692	8	HAB
TCCLB311C	B	C3	2	3	76.96	8.170	0.09800	8	BAB, HIB
TCCLB312C	B	C3	2	3	71.29	8.239	0.09813	8	BAT
TCCLB313C	B	C3	2	3	74.26	8.204	0.09792	8	HAT/HIT
TCCLC111C	C	C1	3	1	81.40	8.550	0.09502	8	M(B,H)AT
TCCLC112C	C	C1	3	1	76.94	8.479	0.09475	8	HAT/HIT
TCCLC113C	C	C1	3	1	73.56	8.656	0.09380	8	BGM
TCCLC114C*	C	C1	3	1	77.78		0.09450	8	HAB/HIB
TCCLC211C	C	C2	3	2	67.95	8.392	0.09637	8	BAT
TCCLC212C	C	C2	3	2	63.67	8.455	0.09652	8	BAT
TCCLC213C	C	C2	3	2	65.28	8.410	0.09563	8	BAT

* Specimen was not gaged, only strength is tested.

Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.01190	74.19	8.137
0.01200	66.97	8.146
0.01196	72.85	8.183
0.01185	76.56	7.988
0.01188	68.93	8.013
0.01192	75.17	8.109
0.01205	74.96	8.286
0.01204	61.55	8.192
0.01199	67.44	8.168
0.01211	61.32	
0.01225	77.27	8.203
0.01227	71.68	8.284
0.01224	74.50	8.230
0.01188	79.25	8.324
0.01184	74.69	8.231
0.01173	70.70	8.319
0.01181	75.31	
0.01205	67.09	8.286
0.01206	62.96	8.361
0.01195	63.96	8.241

Average 72.13 8.349
Standard Dev. 5.818 0.1277
Coeff. of Var. [%] 8.066 1.529
Min. 61.75 8.170
Max. 81.40 8.656
Number of Spec. 20 18

Average_{norm} 0.01199 70.87 8.206
Standard Dev._{norm} 5.502 0.1019
Coeff. of Var. [%]_{norm} 7.764 1.242
Min. 0.01173 61.32 7.988
Max. 0.01227 79.25 8.361
Number of Spec. 20 20 18



August 1, 2025

CAM-RP-2024-023 Rev N/C

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

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

t_{ply} [in]

0.01220

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
TCCLA111D	A	C1	1	1	74.15	8.530	0.09637	8	M(B,H)AT
TCCLA112D*	A	C1	1	1		8.245	0.09585	8	HIB
TCCLA113D	A	C1	1	1	72.46	8.388	0.09652	8	M(B,H)AB
TCCLA114D**	A	C1	1	1	71.73		0.09668	8	M(B,H)AB, HIB
TCCLA212D	A	C2	1	2	72.30	8.236	0.09565	8	BAB
TCCLA213D	A	C2	1	2	70.95	8.199	0.09627	8	BAB
TCCLA215D	A	C2	1	2	69.28	7.997	0.09645	8	BAB
TCCLB211D	B	C2	2	2	66.75	8.286	0.09712	8	BAB
TCCLB212D	B	C2	2	2	67.13	8.317	0.09675	8	HAB/HIB
TCCLB213D	B	C2	2	2	69.74	8.340	0.09733	8	HAB/HIB
TCCLB311D	B	C3	2	3	73.69	8.295	0.09842	8	BAB, HAB/HIB
TCCLB312D	B	C3	2	3	70.62	8.160	0.09868	8	BAB, HAB/HIB
TCCLB313D	B	C3	2	3	69.55	8.033	0.09857	8	BAT, HAT/HIT
TCCLC111D	C	C1	3	1	72.62	8.511	0.09450	8	HAT
TCCLC112D	C	C1	3	1	69.80	8.553	0.09408	8	BAT
TCCLC113D	C	C1	3	1	73.85	8.442	0.09402	8	BAB, HIB
TCCLC211D	C	C2	3	2	70.36	8.435	0.09615	8	BGM
TCCLC212D	C	C2	3	2	65.99	8.606	0.09580	8	BGM
TCCLC213D	C	C2	3	2	72.46	8.371	0.09640	8	BGM

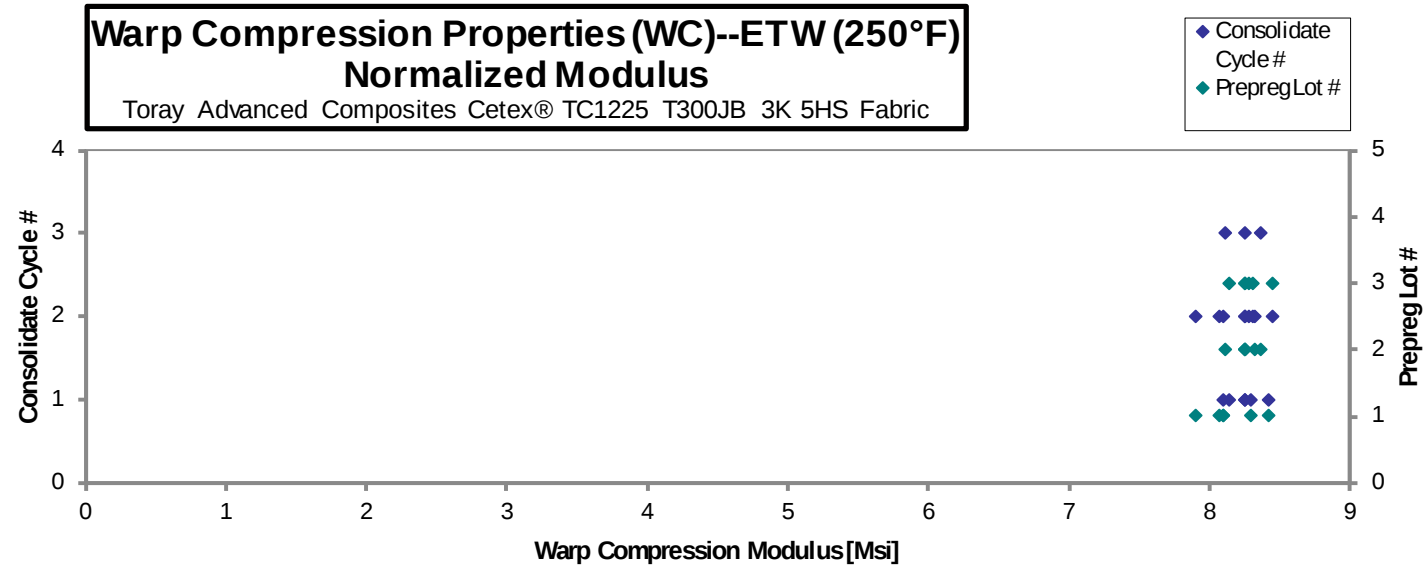
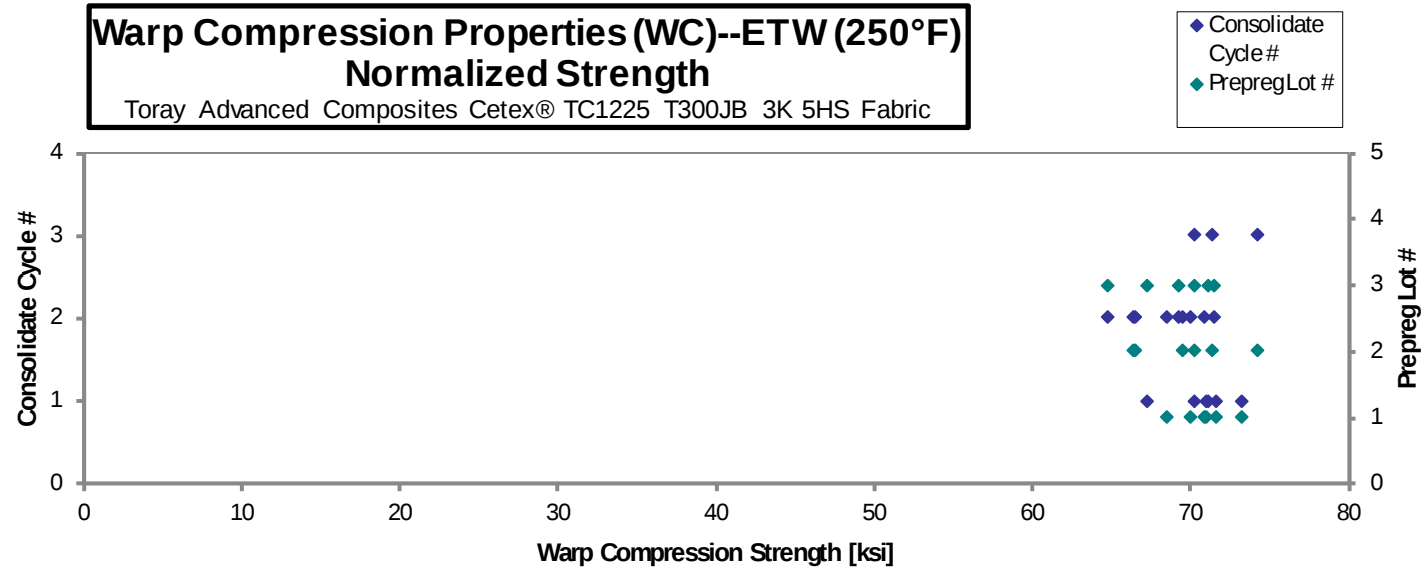
Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.01205	73.21	8.422
0.01198		8.097
0.01206	71.66	8.295
0.01209	71.05	
0.01196	70.85	8.071
0.01203	69.99	8.087
0.01206	68.47	7.903
0.01214	66.42	8.245
0.01209	66.54	8.244
0.01217	69.55	8.317
0.01230	74.31	8.365
0.01234	71.40	8.251
0.01232	70.24	8.113
0.01181	70.31	8.241
0.01176	67.28	8.245
0.01175	71.14	8.132
0.01202	69.31	8.310
0.01198	64.77	8.447
0.01205	71.57	8.268

* Strength not reported due to unacceptable failure mode.

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

Average	70.75	8.330
Standard Dev.	2.426	0.1701
Coeff. of Var. [%]	3.429	2.042
Min.	65.99	7.997
Max.	74.15	8.606
Number of Spec.	18	18

Average _{norm}	0.01205	69.89	8.225
Standard Dev. _{norm}		2.445	0.1364
Coeff. of Var. [%] _{norm}		3.498	1.658
Min.	0.01175	64.77	7.903
Max.	0.01234	74.31	8.447
Number of Spec.	19	18	18



4.4 Fill Compression Properties (FC)

Fill Compression Properties (FC)--CTA (-65°F) Strength & Modulus

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

 t_{ply} [in]

0.01220

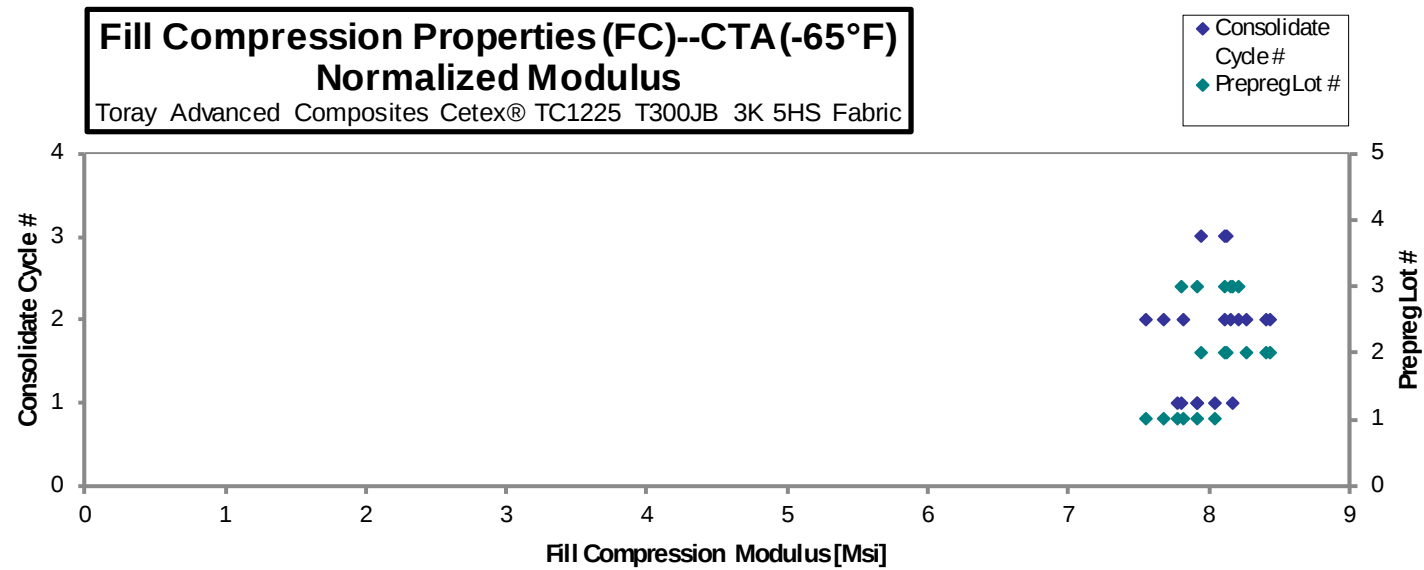
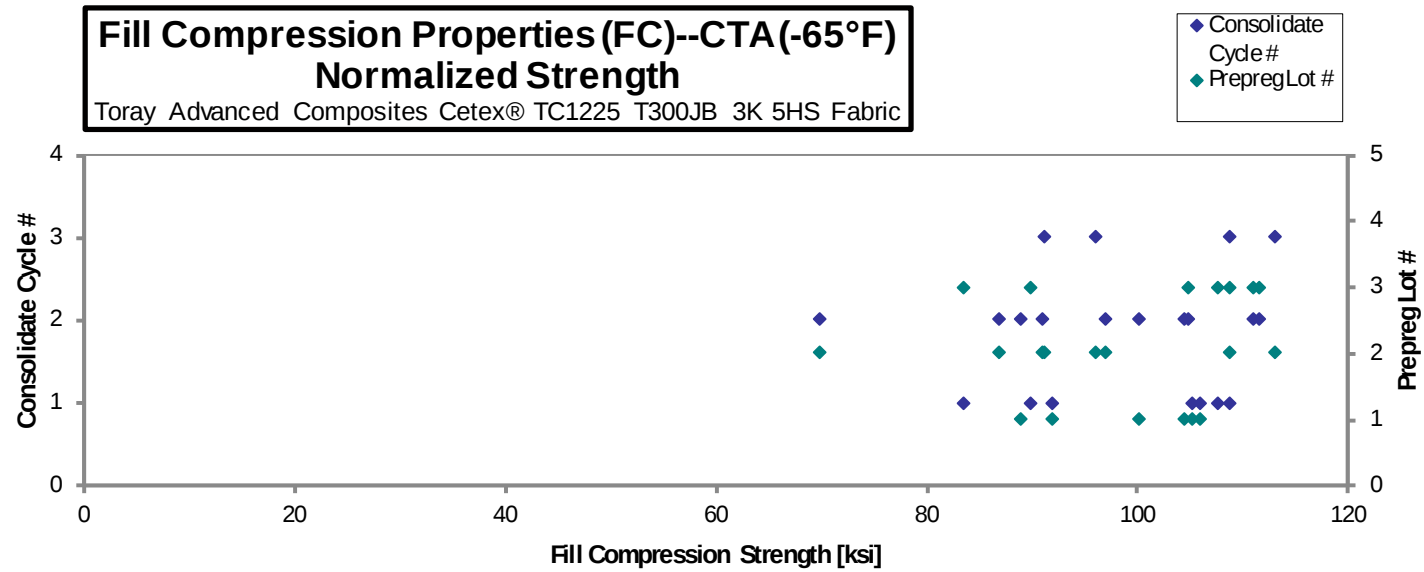
Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
TCCZA111B	A	C1	1	1	93.08	8.010	0.09645	8	BGM
TCCZA112B	A	C1	1	1	107.5	7.891	0.09618	8	BGM
TCCZA113B	A	C1	1	1	107.3	8.194	0.09582	8	BGM
TCCZA211B	A	C2	1	2	102.5	7.726	0.09538	8	BGM
TCCZA212B	A	C2	1	2	106.8	7.989	0.09545	8	BGM
TCCZA213B	A	C2	1	2	90.71	7.830	0.09570	8	BGM
TCCZB211B	B	C2	2	2	70.89	8.509	0.09633	8	BGM
TCCZB212B	B	C2	2	2	98.21	8.542	0.09638	8	BAT
TCCZB213B	B	C2	2	2	88.43	8.401	0.09602	8	BGM
TCCZB214B*	B	C2	2	2	92.36		0.09612	8	BAB
TCCZB311B	B	C3	2	3	95.76	8.084	0.09788	8	BGM
TCCZB312B	B	C3	2	3	108.2	8.074	0.09817	8	BAT
TCCZB313B	B	C3	2	3	91.23	7.930	0.09767	8	BAT
TCCZB314B*	B	C3	2	3	113.0		0.09767	8	BGM, HIB
TCCZC111B	C	C1	3	1	86.38	8.186	0.09437	8	HAB
TCCZC112B	C	C1	3	1	110.4	7.992	0.09525	8	BGM
TCCZC113B	C	C1	3	1	92.61	8.398	0.09483	8	BGM
TCCZC114B*	C	C1	3	1	111.0		0.09568	8	BGM
TCCZC211B	C	C2	3	2	112.3	8.206	0.09650	8	BGM
TCCZC212B	C	C2	3	2	112.4	8.217	0.09690	8	BGM
TCCZC213B	C	C2	3	2	105.3	8.238	0.09725	8	BGM

* Specimen was not gaged, only strength is tested.

Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.01206	91.98	7.916
0.01202	106.0	7.776
0.01198	105.3	8.044
0.01192	100.2	7.551
0.01193	104.5	7.813
0.01196	88.94	7.678
0.01204	69.97	8.398
0.01205	96.98	8.436
0.01200	87.00	8.264
0.01201	90.96	
0.01224	96.04	8.108
0.01227	108.9	8.121
0.01221	91.29	7.936
0.01221	113.1	
0.01180	83.52	7.915
0.01191	107.7	7.799
0.01185	89.98	8.160
0.01196	108.9	
0.01206	111.1	8.114
0.01211	111.6	8.158
0.01216	104.9	8.208

Average 99.83 8.134
 Standard Dev. 11.12 0.2299
 Coeff. of Var. [%] 11.14 2.827
 Min. 70.89 7.726
 Max. 113.0 8.542
 Number of Spec. 21 18

Average_{norm} 0.01204 98.51 8.022
 Standard Dev._{norm} 11.22 0.2418
 Coeff. of Var. [%]_{norm} 11.39 3.014
 Min. 0.01180 69.97 7.551
 Max. 0.01227 113.1 8.436
 Number of Spec. 21 21 18



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

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

 t_{ply} [in]

0.01220

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
TCCZA111A*	A	C1	1	1	90.81	8.119	0.09768	8	BGM
TCCZA112A*	A	C1	1	1	92.73	8.289	0.09632	8	HAT, HIT
TCCZA113A	A	C1	1	1	93.54	8.088	0.09630	8	BGM
TCCZA211A	A	C2	1	2	76.62	8.040	0.09668	8	BGM
TCCZA212A	A	C2	1	2	84.31	7.851	0.09730	8	BGM
TCCZA213A	A	C2	1	2	89.54	7.897	0.09658	8	BGM
TCCZB211A	B	C2	2	2	85.69	8.367	0.09738	8	BGM
TCCZB212A	B	C2	2	2	81.53	8.164	0.09748	8	BGM
TCCZB213A	B	C2	2	2	86.30	8.445	0.09708	8	BGM
TCCZB311A	B	C3	2	3	87.24	8.229	0.09798	8	BGM
TCCZB312A	B	C3	2	3	89.36	8.193	0.09777	8	BGM
TCCZB313A	B	C3	2	3	90.60	8.009	0.09778	8	BGM
TCCZC111A	C	C1	3	1	89.76	8.100	0.09448	8	BGM
TCCZC112A	C	C1	3	1	86.22	7.987	0.09420	8	BGM
TCCZC113A	C	C1	3	1	85.60	7.840	0.09432	8	BGM
TCCZC211A	C	C2	3	2	92.51	7.920	0.09600	8	HAT/HIT
TCCZC212A	C	C2	3	2	91.42	8.190	0.09583	8	M(B,H)AT
TCCZC213A	C	C2	3	2	98.01	8.037	0.09667	8	BGM
TCCZC214A**	C	C2	3	2	97.83		0.09673	8	BGM, HAT

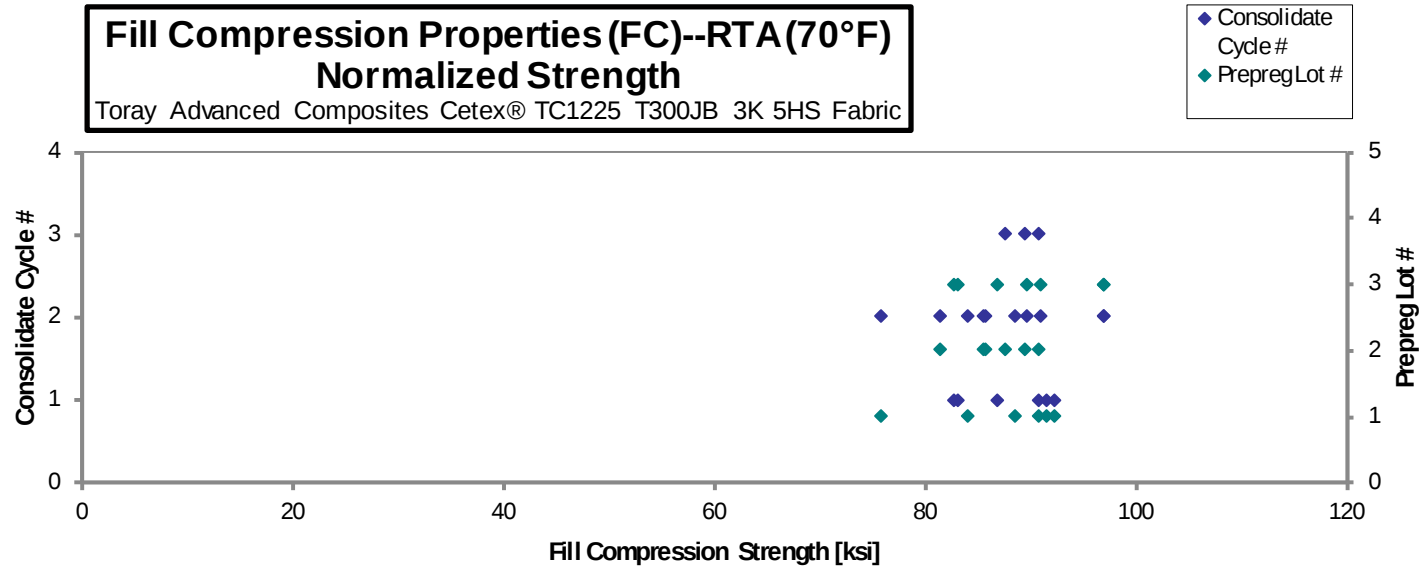
* Modulus are averaged values of 2 strain gages.

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

Average	88.93	8.098
Standard Dev.	5.219	0.1708
Coeff. of Var. [%]	5.869	2.109
Min.	76.62	7.840
Max.	98.01	8.445
Number of Spec.	19	18

Average _{norm}	0.01207	87.97	8.011
Standard Dev. _{norm}		5.229	0.2257
Coeff. of Var. [%] _{norm}		5.944	2.817
Min.	0.01178	75.90	7.576
Max.	0.01225	97.07	8.400
Number of Spec.	19	19	18

Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.01221	90.89	8.126
0.01204	91.51	8.180
0.01204	92.30	7.981
0.01209	75.90	7.965
0.01216	84.05	7.826
0.01207	88.61	7.815
0.01217	85.50	8.349
0.01219	81.44	8.154
0.01214	85.84	8.400
0.01225	87.58	8.261
0.01222	89.51	8.207
0.01222	90.77	8.024
0.01181	86.89	7.842
0.01178	83.22	7.709
0.01179	82.72	7.576
0.01200	90.99	7.790
0.01198	89.76	8.042
0.01208	97.07	7.960
0.01209	96.96	



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

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

 t_{ply} [in]

0.01220

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
TCCZA111C	A	C1	1	1	72.47	8.468	0.09555	8	BGM
TCCZA112C	A	C1	1	1	68.90	8.436	0.09607	8	BGM
TCCZA113C	A	C1	1	1	72.91	8.349	0.09618	8	M(B,H)AT, HIT
TCCZA211C*	A	C2	1	2		8.024	0.09578	8	BGM
TCCZA212C	A	C2	1	2	68.09	8.046	0.09543	8	BGM
TCCZA213C	A	C2	1	2	69.07	8.086	0.09532	8	BGM, HAT
TCCZA214C**	A	C2	1	2	66.66		0.09527	8	BGM
TCCZB211C	B	C2	2	2	58.77	8.515	0.09628	8	M(B,H)AT
TCCZB212C	B	C2	2	2	56.39	8.408	0.09647	8	HAT
TCCZB213C	B	C2	2	2	64.58	8.480	0.09627	8	HGM
TCCZB311C	B	C3	2	3	65.82	8.289	0.09770	8	BAB
TCCZB312C	B	C3	2	3	70.04	8.207	0.09772	8	BAT
TCCZB313C	B	C3	2	3	63.64	8.248	0.09758	8	M(B,H)AB
TCCZC111C	C	C1	3	1	65.27	8.399	0.09482	8	BGM
TCCZC112C	C	C1	3	1	66.60	8.323	0.09468	8	BGM
TCCZC113C	C	C1	3	1	57.29	8.268	0.09488	8	BGM
TCCZC211C	C	C2	3	2	70.20	8.400	0.09680	8	BAT
TCCZC212C	C	C2	3	2	74.92	8.272	0.09682	8	BAB
TCCZC213C	C	C2	3	2	73.78	8.433	0.09617	8	BGM

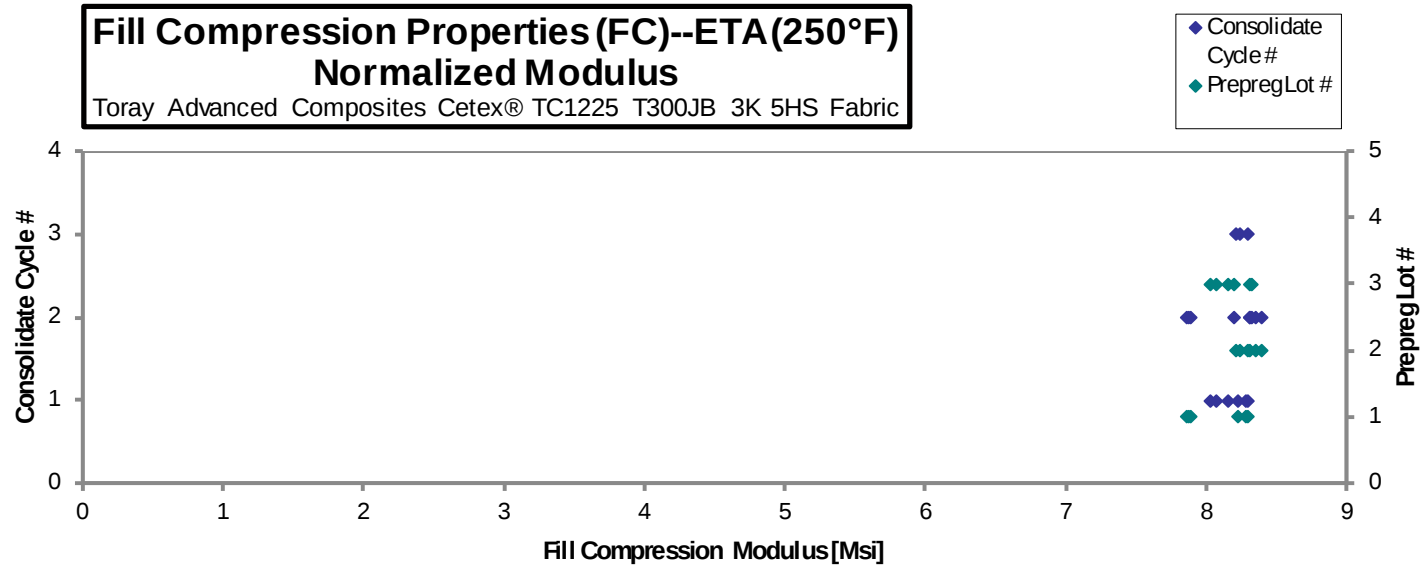
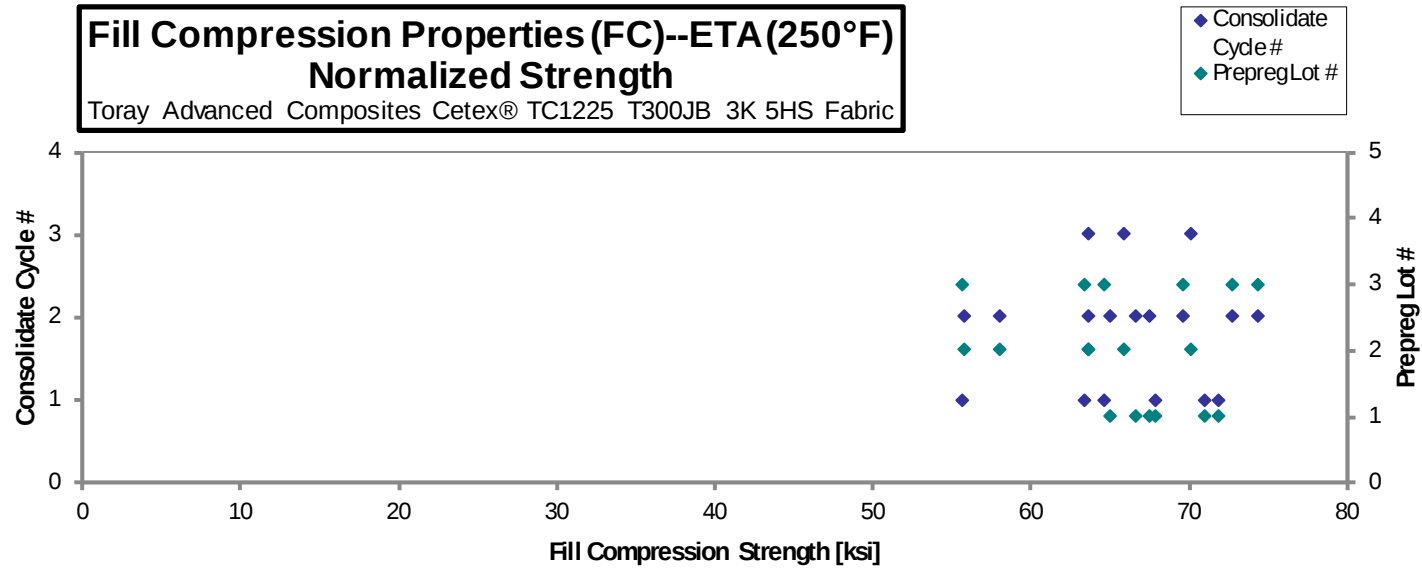
* Strength not reported due to testing temperature issues.

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

Average	66.97	8.314
Standard Dev.	5.415	0.1483
Coeff. of Var. [%]	8.086	1.784
Min.	56.39	8.024
Max.	74.92	8.515
Number of Spec.	18	18

Average _{norm}	0.01201	65.95	8.190
Standard Dev. _{norm}		5.450	0.1698
Coeff. of Var. [%] _{norm}		8.264	2.073
Min.	0.01184	55.69	7.867
Max.	0.01221	74.32	8.401
Number of Spec.	19	18	18

Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.01194	70.94	8.290
0.01201	67.82	8.304
0.01202	71.85	8.228
0.01197		7.875
0.01193	66.58	7.867
0.01191	67.45	7.897
0.01191	65.06	
0.01204	57.98	8.401
0.01206	55.74	8.310
0.01203	63.69	8.364
0.01221	65.89	8.297
0.01221	70.12	8.217
0.01220	63.63	8.246
0.01185	63.41	8.160
0.01184	64.61	8.075
0.01186	55.69	8.038
0.01210	69.62	8.332
0.01210	74.32	8.206
0.01202	72.69	8.309



August 1, 2025

CAM-RP-2024-023 Rev N/C

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

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

t_{ply} [in]

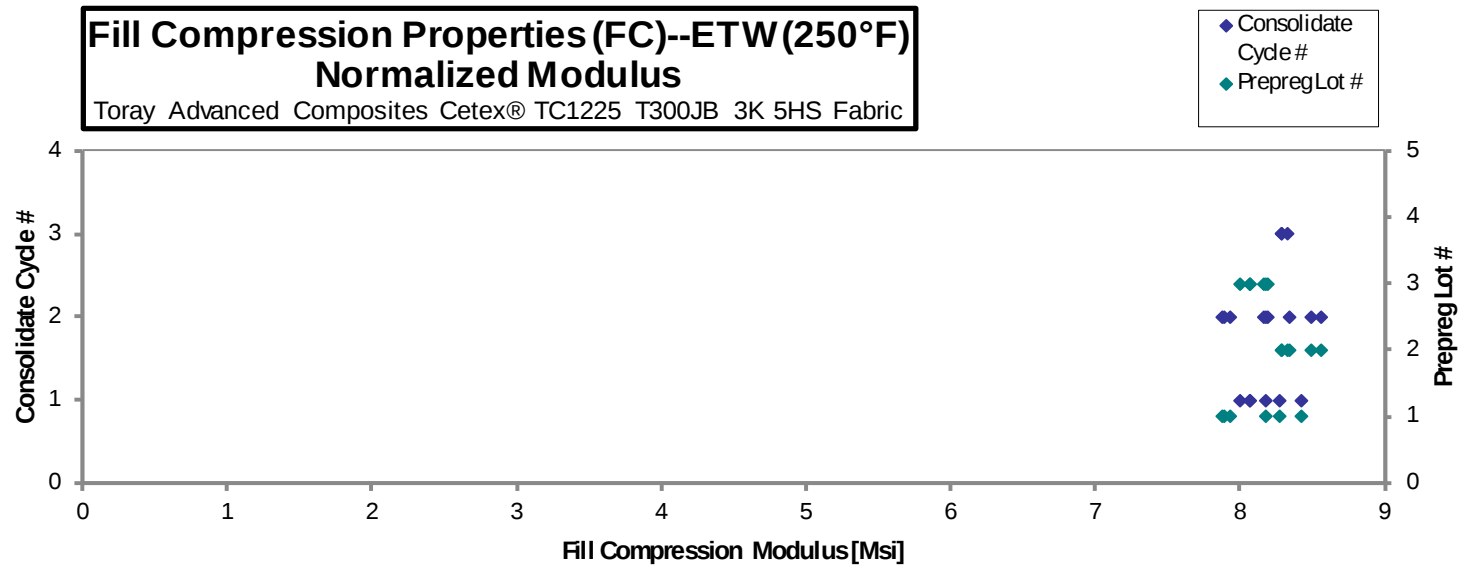
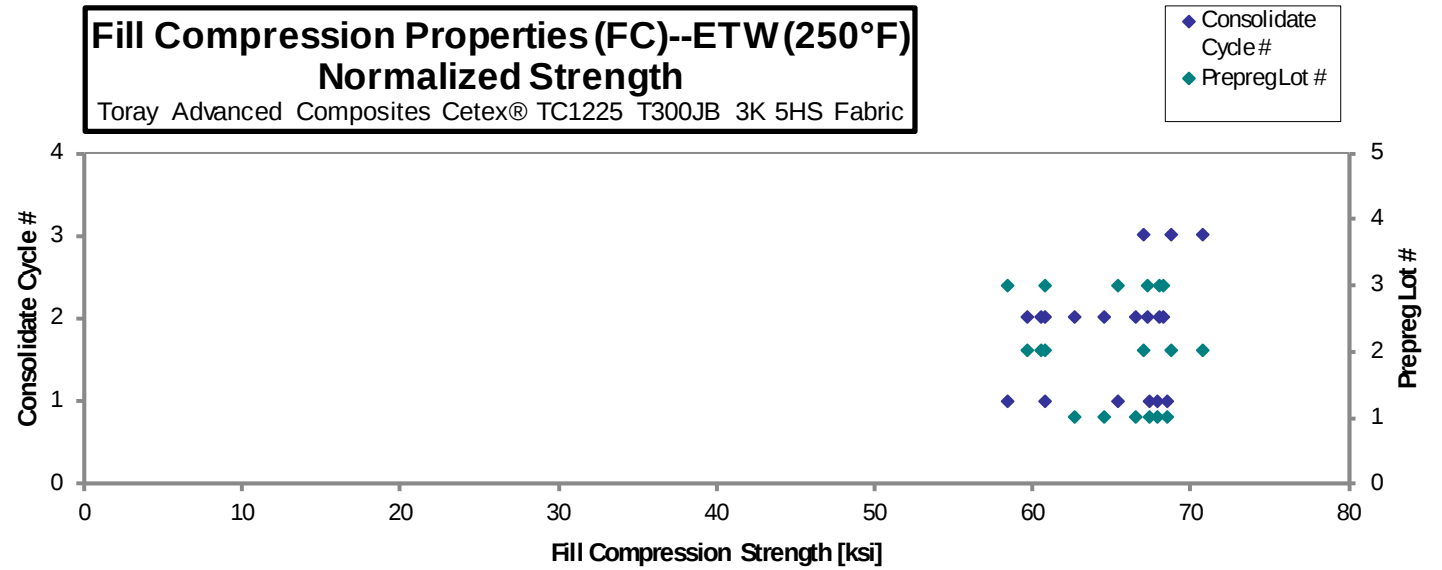
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Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
TCCZA111D	A	C1	1	1	68.93	8.542	0.09620	8	BGM
TCCZA112D	A	C1	1	1	68.25	8.375	0.09638	8	BAB
TCCZA113D	A	C1	1	1	69.46	8.294	0.09623	8	HAT, HIT
TCCZA211D	A	C2	1	2	66.01	8.107	0.09547	8	M(B,H)GM
TCCZA212D	A	C2	1	2	64.09	8.050	0.09548	8	BGM
TCCZA213D	A	C2	1	2	67.81	8.040	0.09575	8	M(B,H)GM
TCCZB211D	B	C2	2	2	61.21	8.409	0.09683	8	HGB
TCCZB212D	B	C2	2	2	61.09	8.576	0.09660	8	HGM
TCCZB213D	B	C2	2	2	60.14	8.633	0.09685	8	M(B,H)GM
TCCZB311D	B	C3	2	3	67.08	8.333	0.09750	8	M(B,H)AB
TCCZB312D	B	C3	2	3	69.00	8.323	0.09718	8	BAB, HAT/HIT
TCCZB313D	B	C3	2	3	70.76	8.288	0.09767	8	BGM
TCCZC111D	C	C1	3	1	67.14	8.204	0.09512	8	BGM
TCCZC112D	C	C1	3	1	59.92	8.276	0.09520	8	M(B,H)AT
TCCZC113D	C	C1	3	1	62.76	8.328	0.09455	8	BAB
TCCZC211D	C	C2	3	2	68.22	8.307	0.09630	8	HAT, HIT
TCCZC212D	C	C2	3	2	68.78	8.271	0.09658	8	M(B,H)AB
TCCZC213D	C	C2	3	2	69.07	8.273	0.09637	8	HAT, HIT

Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.01203	67.94	8.419
0.01205	67.40	8.270
0.01203	68.49	8.178
0.01193	64.57	7.930
0.01194	62.70	7.876
0.01197	66.52	7.888
0.01210	60.73	8.343
0.01208	60.47	8.488
0.01211	59.67	8.567
0.01219	67.01	8.324
0.01215	68.70	8.288
0.01221	70.81	8.293
0.01189	65.43	7.995
0.01190	58.45	8.073
0.01182	60.80	8.067
0.01204	67.31	8.196
0.01207	68.07	8.185
0.01205	68.20	8.168

Average 66.10 8.313
Standard Dev. 3.578 0.1611
Coeff. of Var. [%] 5.413 1.937
Min. 59.92 8.040
Max. 70.76 8.633
Number of Spec. 18 18

Average_{norm} 0.01203 65.18 8.197
Standard Dev._{norm} 3.744 0.1993
Coeff. of Var. [%]_{norm} 5.744 2.432
Min. 0.01182 58.45 7.876
Max. 0.01221 70.81 8.567
Number of Spec. 18 18 18



4.5 In-Plane Shear Properties (IPS)

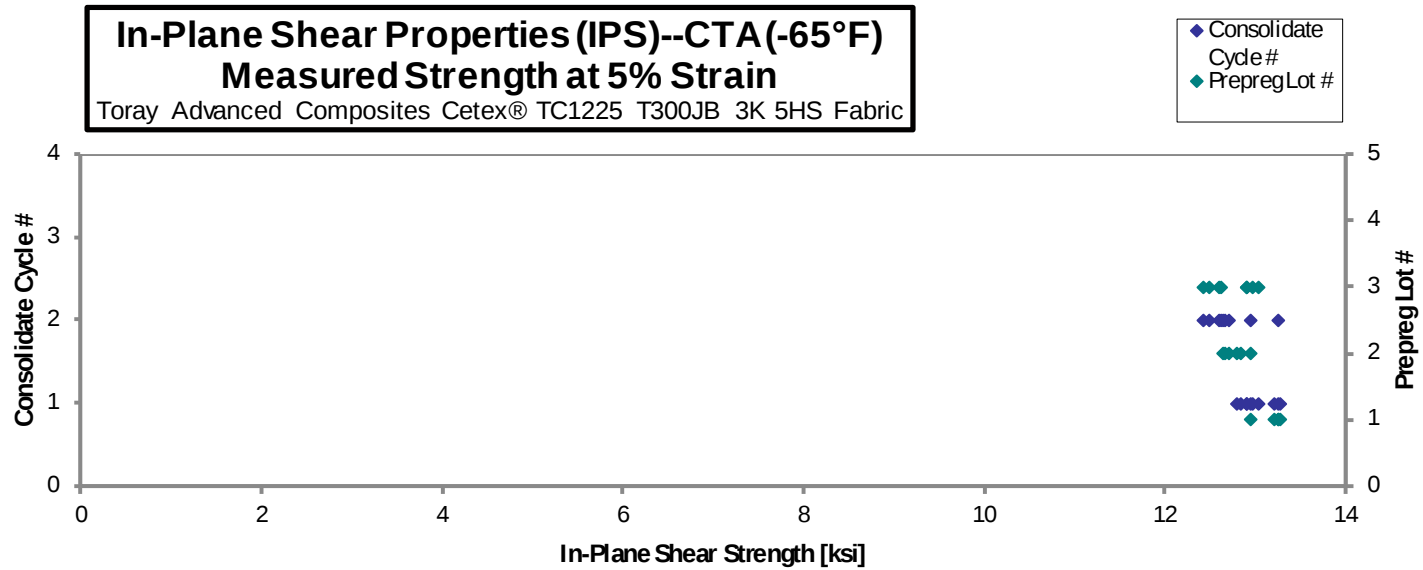
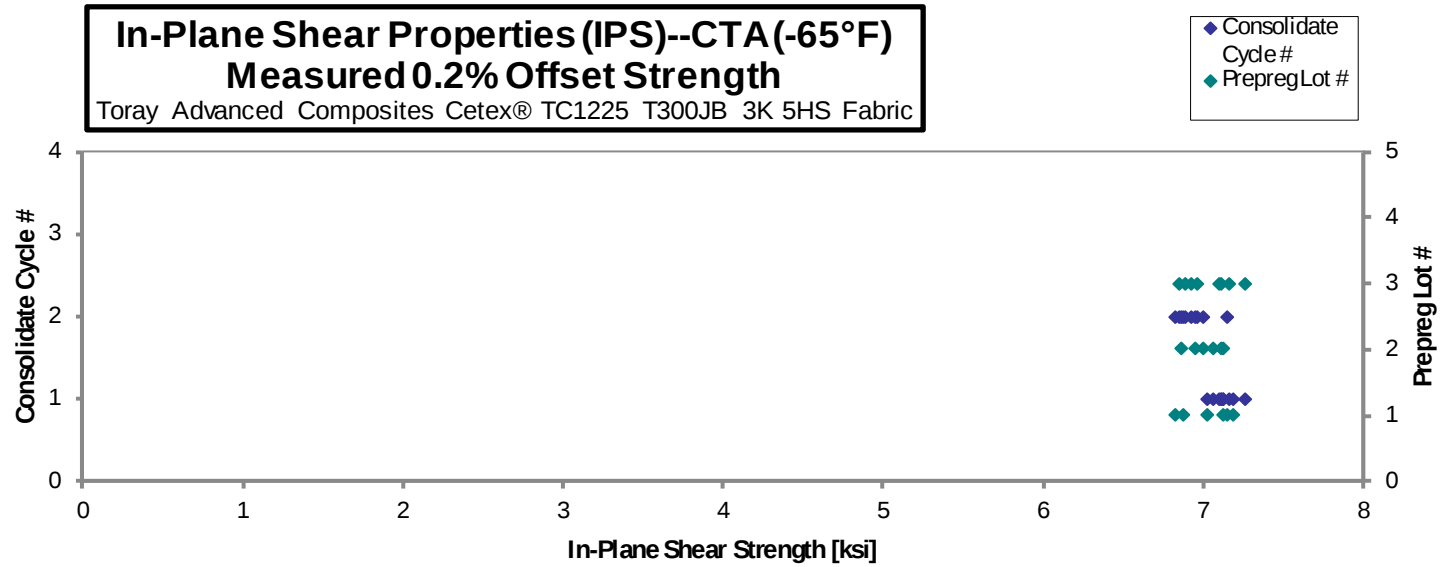
In-Plane Shear Properties (IPS)--CTA (-65°F) Strength & Modulus

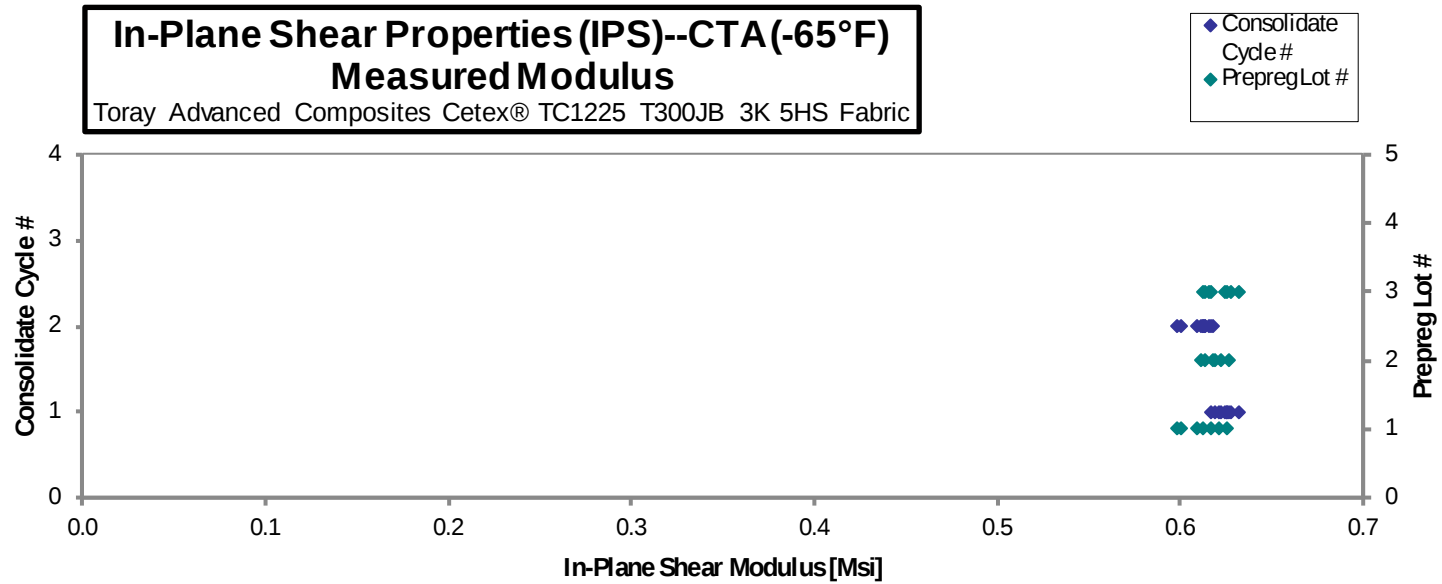
Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	0.2% Offset Strength [ksi]	Strength at 5% Strain [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]
TCCNA111B	A	C1	1	1	7.125	13.20	0.6208	0.09608	8	0.01201
TCCNA112B	A	C1	1	1	7.017	13.27	0.6164	0.09648	8	0.01206
TCCNA113B	A	C1	1	1	7.180	13.25	0.6248	0.09618	8	0.01202
TCCNA211B*	A	C2	1	2			0.6005	0.09722	8	0.01215
TCCNA212B	A	C2	1	2	7.142	13.25	0.6089	0.09683	8	0.01210
TCCNA213B*	A	C2	1	2	6.823		0.5980	0.09787	8	0.01223
TCCNA214B	A	C2	1	2	6.868	12.94	0.6125	0.09665	8	0.01208
TCCNB111B	B	C1	2	1	7.125	12.82	0.6221	0.09645	8	0.01206
TCCNB112B	B	C1	2	1	7.053	12.94	0.6193	0.09610	8	0.01201
TCCNB113B	B	C1	2	1	7.102	12.79	0.6263	0.09612	8	0.01201
TCCNB211B	B	C2	2	2	6.942	12.71	0.6112	0.09570	8	0.01196
TCCNB212B	B	C2	2	2	6.857	12.66	0.6173	0.09623	8	0.01203
TCCNB213B	B	C2	2	2	6.991	12.64	0.6135	0.09608	8	0.01201
TCCNC111B	C	C1	3	1	7.112	12.89	0.6240	0.09583	8	0.01198
TCCNC112B	C	C1	3	1	7.100	12.91	0.6274	0.09580	8	0.01198
TCCNC113B	C	C1	3	1	7.263	13.03	0.6318	0.09557	8	0.01195
TCCNC114B	C	C1	3	1	7.157	12.96	0.6247	0.09550	8	0.01194
TCCNC211B	C	C2	3	2	6.923	12.61	0.6127	0.09768	8	0.01221
TCCNC212B	C	C2	3	2	6.841	12.41	0.6136	0.09727	8	0.01216
TCCNC213B	C	C2	3	2	6.878	12.58	0.6154	0.09728	8	0.01216
TCCNC214B	C	C2	3	2	6.954	12.49	0.6164	0.09748	8	0.01219

* Strength for 0.2% offset and 5% strain are not reported due to shear strain reading error.

Average	7.023	12.86	0.6170	0.01206
Standard Dev.	0.1306	0.2635	0.008438	
Coeff. of Var. [%]	1.860	2.049	1.367	
Min.	6.823	12.41	0.5980	0.01194
Max.	7.263	13.27	0.6318	0.01223
Number of Spec.	20	19	21	21



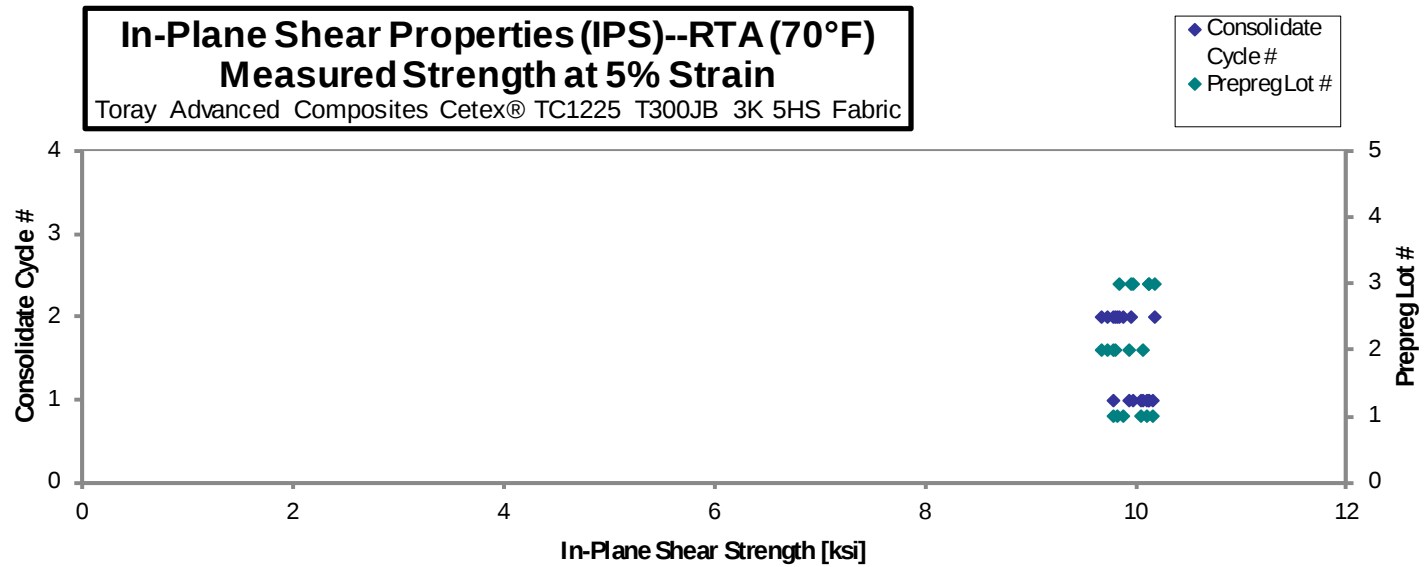
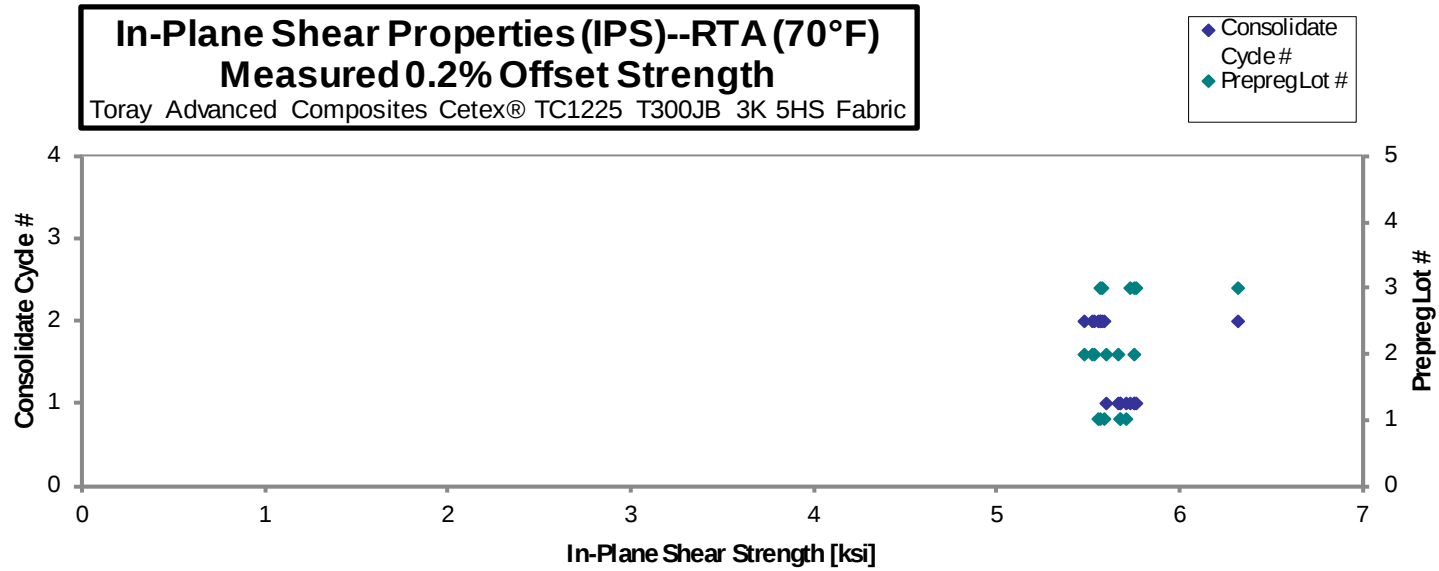


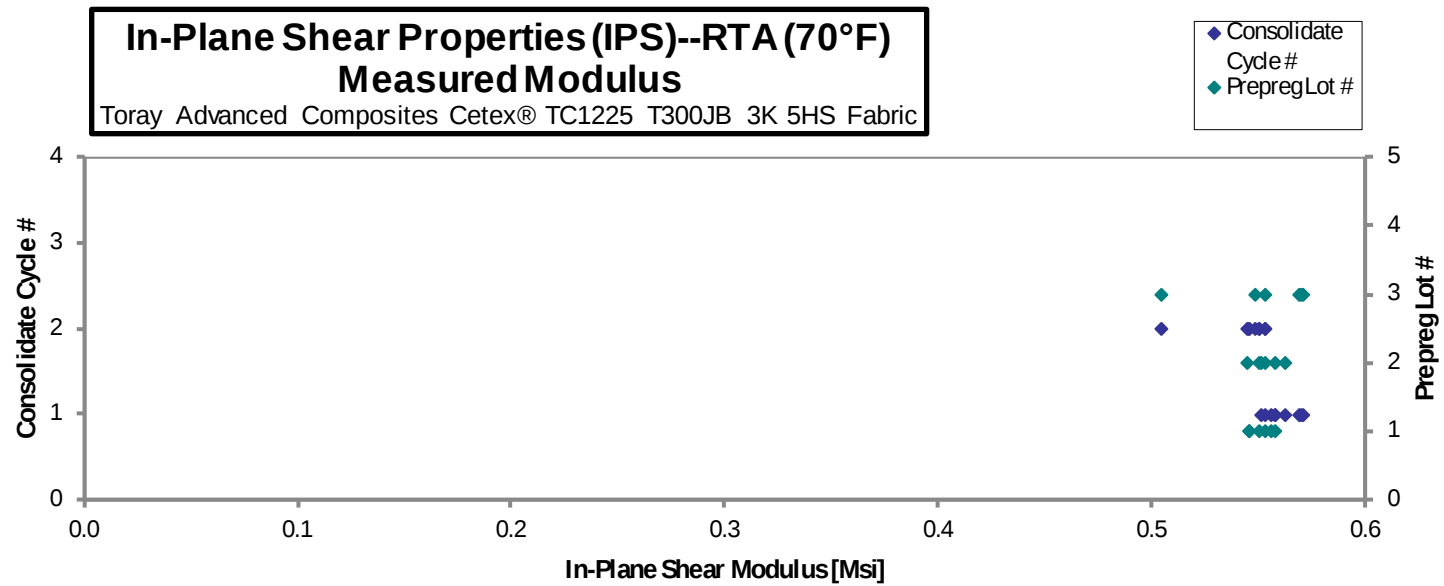
In-Plane Shear Properties (IPS)--RTA (70°F) Strength & Modulus

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	0.2% Offset Strength [ksi]	Strength at 5% Strain [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]
TCCNA111A	A	C1	1	1	5.681	10.10	0.5534	0.09665	8	0.01208
TCCNA112A	A	C1	1	1	5.715	10.18	0.5585	0.09590	8	0.01199
TCCNA113A	A	C1	1	1	5.677	10.06	0.5566	0.09687	8	0.01211
TCCNA211A	A	C2	1	2	5.572	9.880	0.5457	0.09710	8	0.01214
TCCNA212A	A	C2	1	2	5.562	9.832	0.5458	0.09723	8	0.01215
TCCNA213A	A	C2	1	2	5.588	9.794	0.5503	0.09515	8	0.01189
TCCNB111A	B	C1	2	1	5.757	10.08	0.5632	0.09573	8	0.01197
TCCNB112A	B	C1	2	1	5.599	9.795	0.5519	0.09730	8	0.01216
TCCNB113A	B	C1	2	1	5.664	9.946	0.5583	0.09607	8	0.01201
TCCNB211A	B	C2	2	2	5.531	9.811	0.5533	0.09577	8	0.01197
TCCNB212A	B	C2	2	2	5.538	9.746	0.5507	0.09610	8	0.01201
TCCNB213A	B	C2	2	2	5.477	9.685	0.5456	0.09617	8	0.01202
TCCNC111A	C	C1	3	1	5.770	10.14	0.5701	0.09523	8	0.01190
TCCNC112A	C	C1	3	1	5.734	9.985	0.5695	0.09557	8	0.01195
TCCNC113A	C	C1	3	1	5.757	10.12	0.5714	0.09527	8	0.01191
TCCNC211A	C	C2	3	2	6.318	10.19	0.5053	0.09747	8	0.01218
TCCNC212A	C	C2	3	2	5.585	9.957	0.5537	0.09760	8	0.01220
TCCNC213A	C	C2	3	2	5.568	9.847	0.5489	0.09745	8	0.01218

Average	5.672	9.952	0.5529	0.01205
Standard Dev.	0.1840	0.1599	0.01445	
Coeff. of Var. [%]	3.244	1.607	2.613	
Min.	5.477	9.685	0.5053	0.01189
Max.	6.318	10.19	0.5714	0.01220
Number of Spec.	18	18	18	18



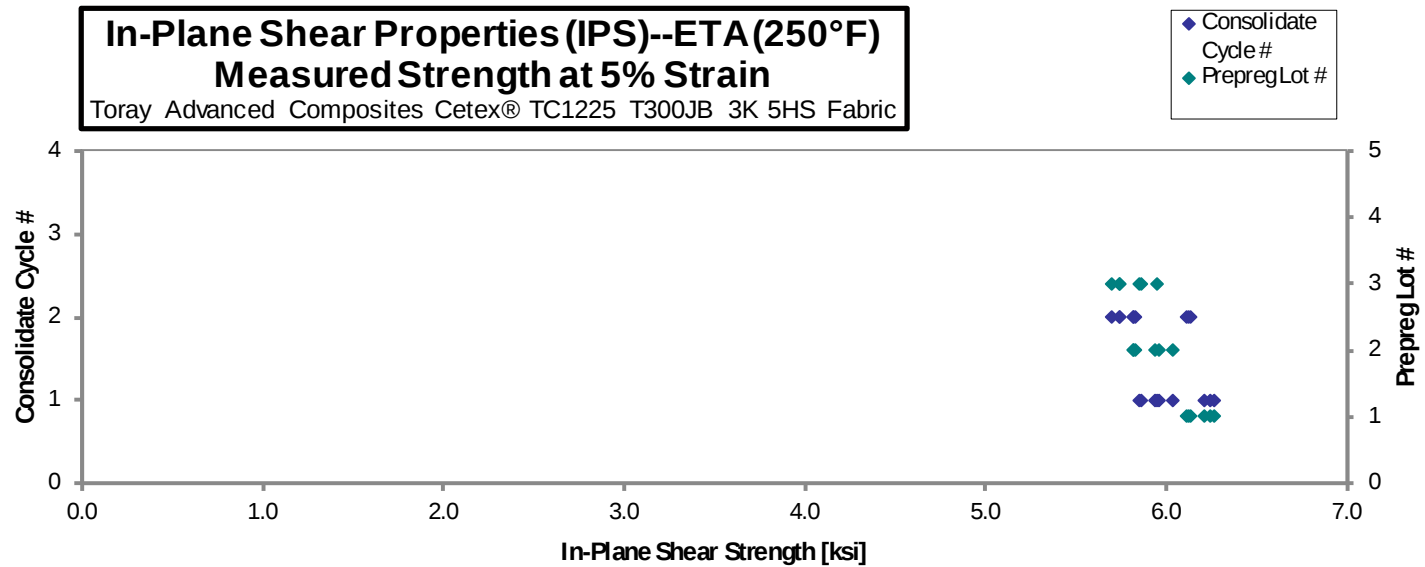
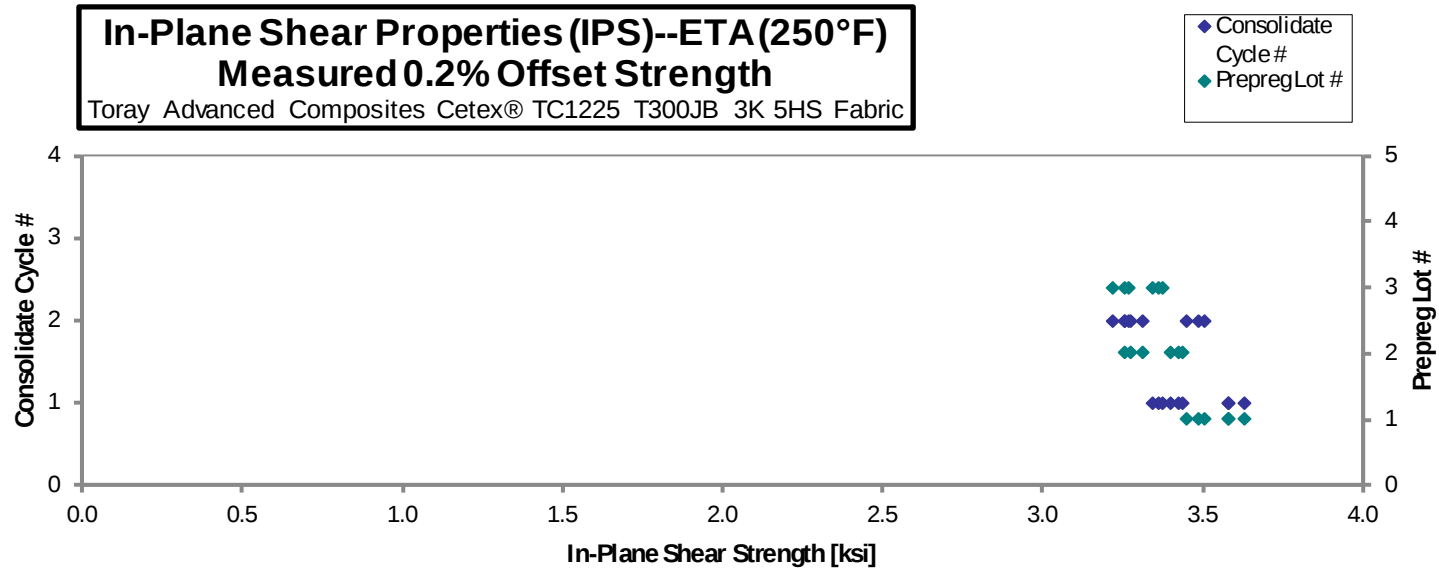


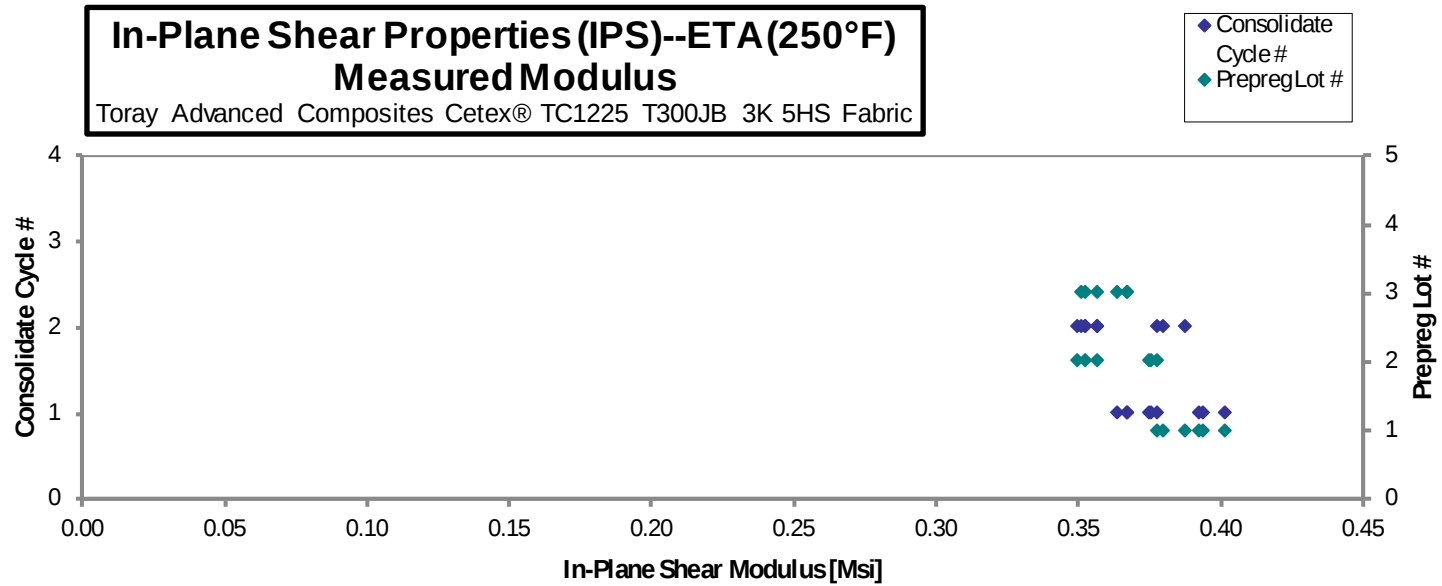
In-Plane Shear Properties (IPS)--ETA (250°F) Strength & Modulus

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	0.2% Offset Strength [ksi]	Strength at 5% Strain [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t _{ply} [in]
TCCNA111C	A	C1	1	1	3.631	6.248	0.4016	0.09595	8	0.01199
TCCNA112C	A	C1	1	1	3.582	6.217	0.3919	0.09583	8	0.01198
TCCNA113C	A	C1	1	1	3.582	6.271	0.3933	0.09633	8	0.01204
TCCNA211C	A	C2	1	2	3.506	6.128	0.3873	0.09680	8	0.01210
TCCNA212C	A	C2	1	2	3.451	6.111	0.3775	0.09685	8	0.01211
TCCNA213C	A	C2	1	2	3.486	6.133	0.3799	0.09652	8	0.01206
TCCNB111C	B	C1	2	1	3.440	6.037	0.3778	0.09585	8	0.01198
TCCNB112C	B	C1	2	1	3.427	5.965	0.3757	0.09625	8	0.01203
TCCNB113C	B	C1	2	1	3.399	5.942	0.3747	0.09582	8	0.01198
TCCNB211C	B	C2	2	2	3.254	5.835	0.3495	0.09620	8	0.01203
TCCNB212C	B	C2	2	2	3.310	5.817	0.3563	0.09585	8	0.01198
TCCNB213C	B	C2	2	2	3.274	5.824	0.3520	0.09607	8	0.01201
TCCNC111C	C	C1	3	1	3.345	5.851	0.3631	0.09523	8	0.01190
TCCNC112C	C	C1	3	1	3.376	5.949	0.3672	0.09527	8	0.01191
TCCNC113C	C	C1	3	1	3.360	5.864	0.3669	0.09512	8	0.01189
TCCNC211C	C	C2	3	2	3.256	5.741	0.3505	0.09697	8	0.01212
TCCNC212C	C	C2	3	2	3.272	5.706	0.3520	0.09722	8	0.01215
TCCNC213C	C	C2	3	2	3.221	5.741	0.3561	0.09655	8	0.01207

Average	3.398	5.966	0.3707	0.01202
Standard Dev.	0.1242	0.1830	0.01621	
Coeff. of Var. [%]	3.656	3.068	4.373	
Min.	3.221	5.706	0.3495	0.01189
Max.	3.631	6.271	0.4016	0.01215
Number of Spec.	18	18	18	18



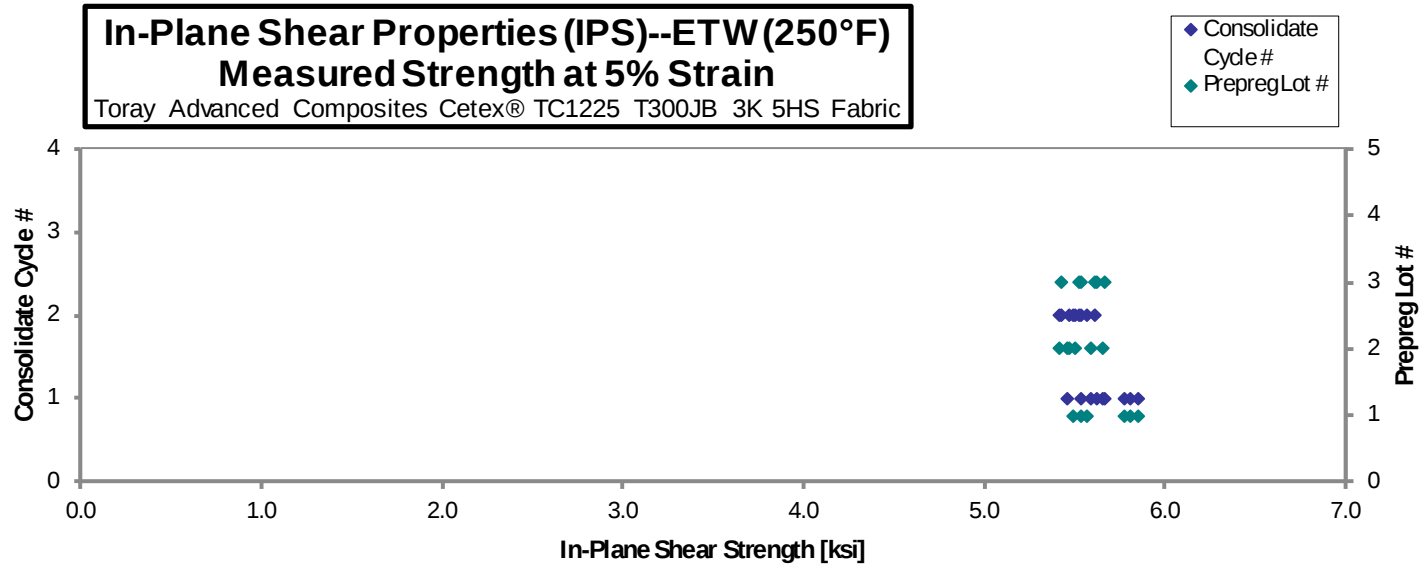
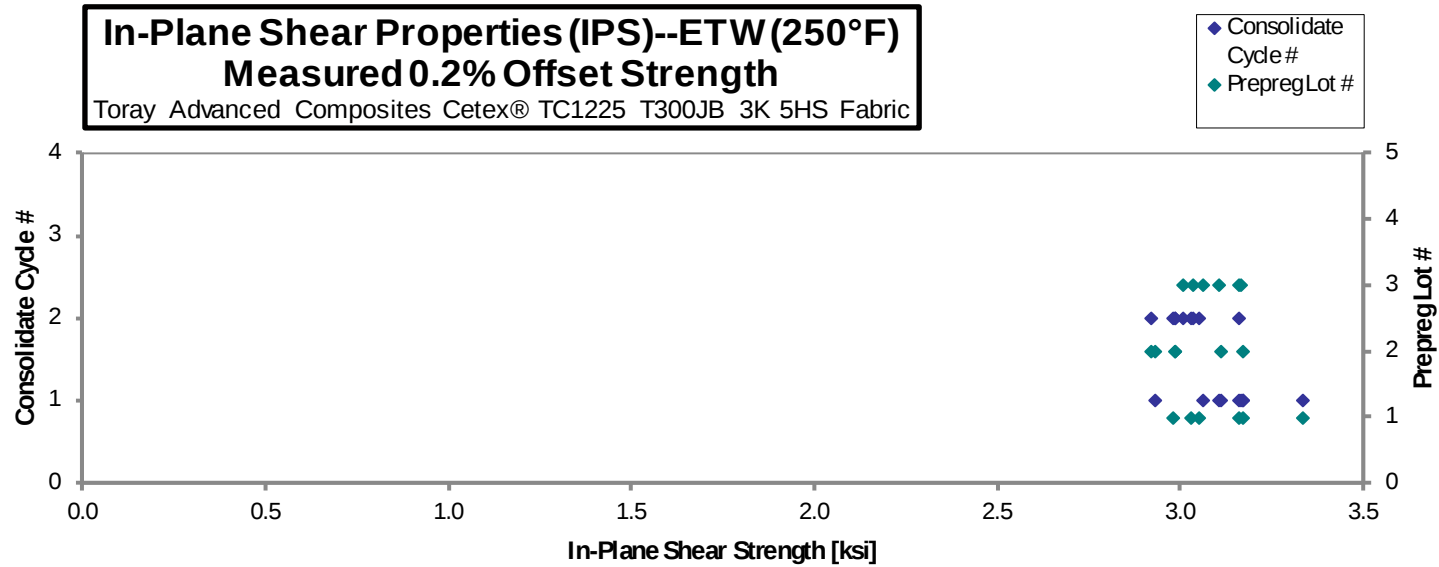


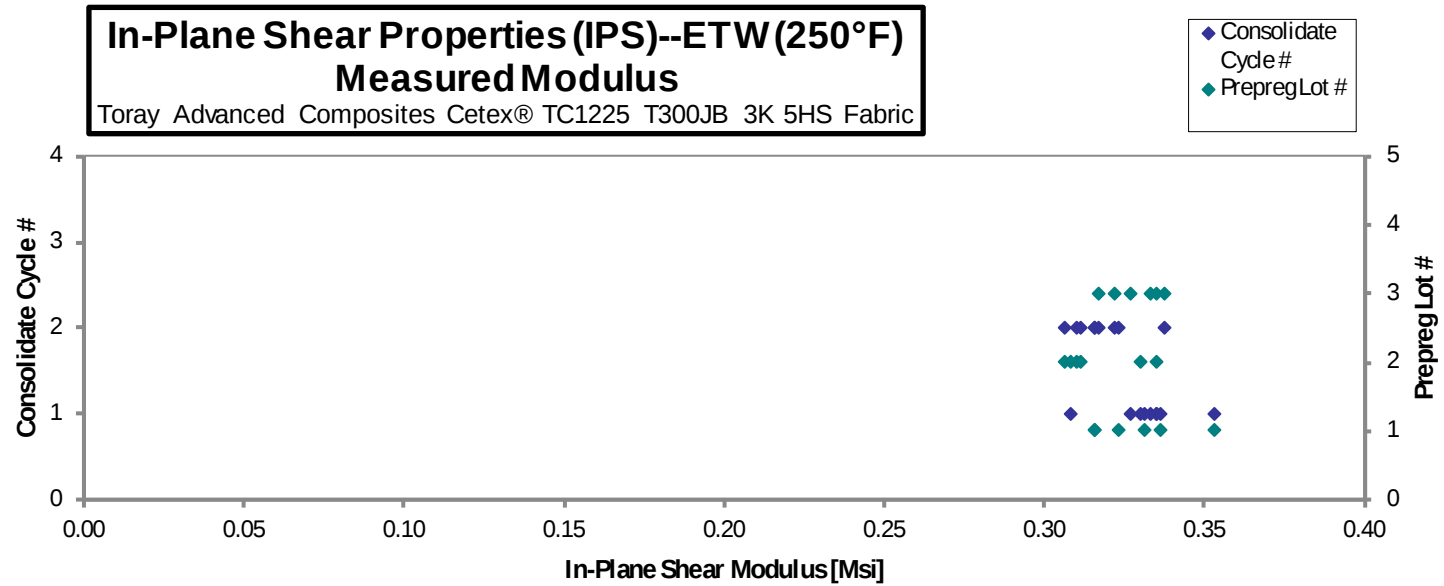
In-Plane Shear Properties (IPS)--ETW (250°F) Strength & Modulus

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	0.2% Offset Strength [ksi]	Strength at 5% Strain [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t _{ply} [in]
TCCNA111D	A	C1	1	1	3.331	5.845	0.3528	0.09573	8	0.01197
TCCNA112D	A	C1	1	1	3.170	5.767	0.3362	0.09532	8	0.01191
TCCNA113D	A	C1	1	1	3.159	5.807	0.3311	0.09585	8	0.01198
TCCNA211D	A	C2	1	2	2.981	5.534	0.3156	0.09685	8	0.01211
TCCNA212D	A	C2	1	2	3.027	5.492	0.3154	0.09680	8	0.01210
TCCNA213D	A	C2	1	2	3.050	5.570	0.3230	0.09700	8	0.01213
TCCNB111D	B	C1	2	1	3.168	5.653	0.3352	0.09585	8	0.01198
TCCNB112D	B	C1	2	1	3.108	5.590	0.3303	0.09677	8	0.01210
TCCNB113D	B	C1	2	1	2.930	5.459	0.3080	0.09622	8	0.01203
TCCNB211D	B	C2	2	2	2.982	5.468	0.3099	0.09608	8	0.01201
TCCNB212D	B	C2	2	2	2.982	5.499	0.3113	0.09582	8	0.01198
TCCNB213D	B	C2	2	2	2.920	5.408	0.3065	0.09632	8	0.01204
TCCNC111D	C	C1	3	1	3.165	5.659	0.3348	0.09530	8	0.01191
TCCNC112D	C	C1	3	1	3.063	5.537	0.3271	0.09558	8	0.01195
TCCNC113D	C	C1	3	1	3.105	5.620	0.3333	0.09552	8	0.01194
TCCNC211D	C	C2	3	2	3.034	5.517	0.3220	0.09695	8	0.01212
TCCNC212D	C	C2	3	2	3.157	5.611	0.3373	0.09700	8	0.01213
TCCNC213D	C	C2	3	2	3.005	5.428	0.3167	0.09712	8	0.01214

Average	3.074	5.581	0.3248	0.01203
Standard Dev.	0.1051	0.1270	0.01259	
Coeff. of Var. [%]	3.418	2.275	3.875	
Min.	2.920	5.408	0.3065	0.01191
Max.	3.331	5.845	0.3528	0.01214
Number of Spec.	18	18	18	18





4.6 Warp Flexural Properties (WFLEX)

Warp Flexural Proc. A Properties (WFLEX)--CTA (-65°F)

Strength & Modulus

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

t_{ply} [in]

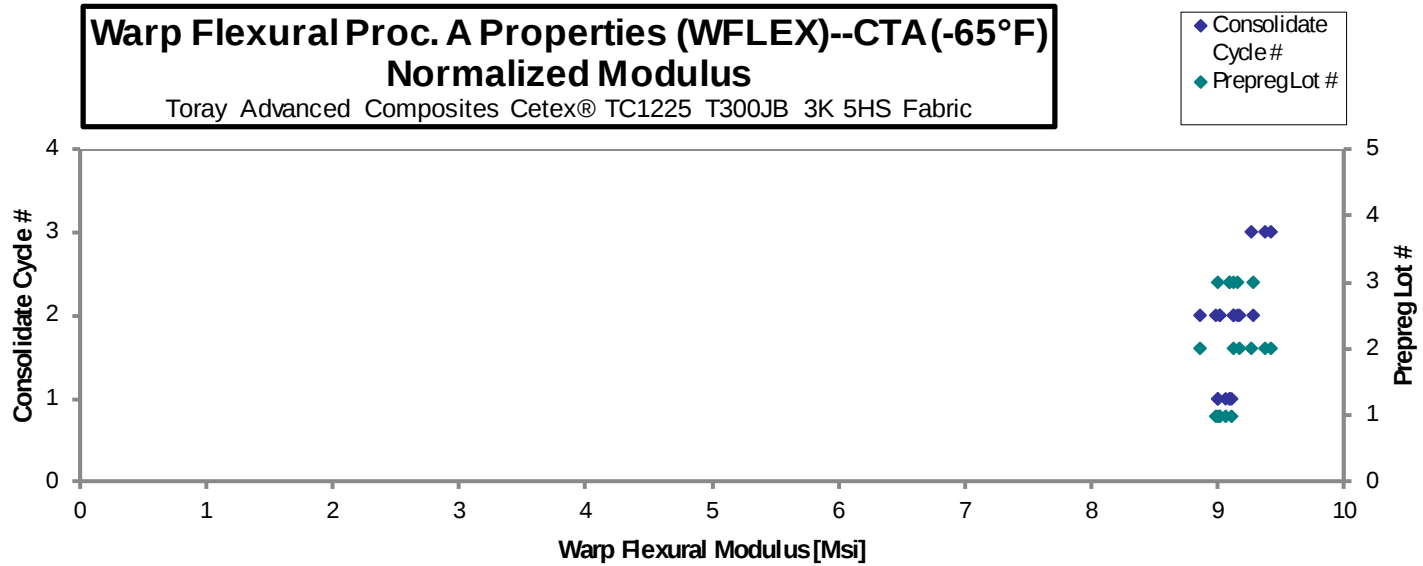
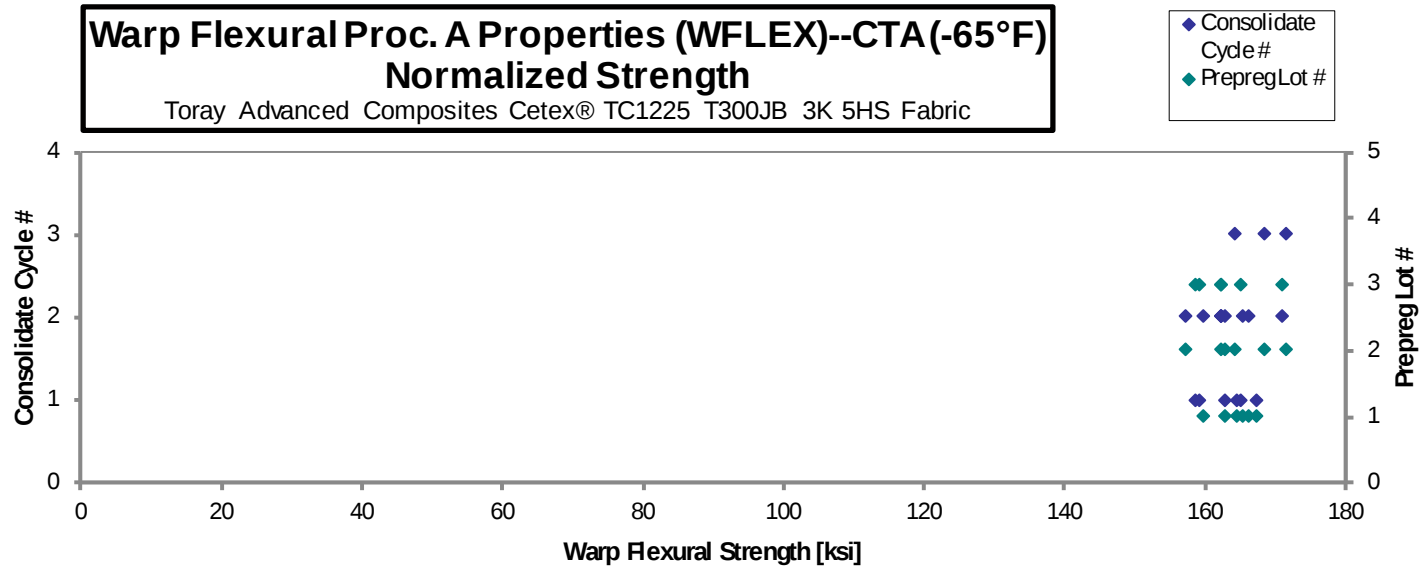
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Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
TCCTA111B	A	C1	1	1	168.2	9.294	0.09603	8	TAB
TCCTA112B	A	C1	1	1	170.5	9.407	0.09585	8	TAB
TCCTA113B	A	C1	1	1	172.3	9.391	0.09615	8	CAT, TAB
TCCTA211B	A	C2	1	2	175.1	9.506	0.09503	8	TAB
TCCTA212B	A	C2	1	2	172.7	9.395	0.09550	8	TAB
TCCTA213B	A	C2	1	2	167.0	9.423	0.09545	8	TAB
TCCTB211B	B	C2	2	2	161.9	9.131	0.09783	8	TAB
TCCTB212B	B	C2	2	2	162.2	9.124	0.09758	8	TAB
TCCTB213B	B	C2	2	2	158.8	8.972	0.09705	8	TAB
TCCTB311B	B	C3	2	3	168.4	9.223	0.09843	8	TAB
TCCTB312B	B	C3	2	3	166.4	9.315	0.09817	8	TAB
TCCTB313B	B	C3	2	3	161.1	9.105	0.09850	8	TAB
TCCTC111B	C	C1	3	1	168.4	9.294	0.09658	8	CAT, TAB, SAM
TCCTC112B	C	C1	3	1	161.4	9.165	0.09677	8	CAT, TAB
TCCTC113B	C	C1	3	1	162.2	9.281	0.09665	8	CAT, TAB
TCCTC211B	C	C2	3	2	166.8	9.395	0.09620	8	CAT, TAB
TCCTC212B	C	C2	3	2	166.5	9.544	0.09628	8	CAT, TAB
TCCTC213B	C	C2	3	2	176.9	9.487	0.09590	8	CAT, TAB

Avg. t _{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.01200	162.8	8.998
0.01198	164.5	9.072
0.01202	167.2	9.114
0.01188	166.0	9.013
0.01194	165.3	8.995
0.01193	159.7	9.012
0.01223	162.7	9.175
0.01220	162.1	9.121
0.01213	157.1	8.871
0.01230	171.3	9.381
0.01227	168.4	9.423
0.01231	164.1	9.274
0.01207	164.9	9.101
0.01210	158.6	9.009
0.01208	159.0	9.101
0.01203	162.0	9.128
0.01204	162.1	9.288
0.01199	170.8	9.160

Average 167.0 9.303
 Standard Dev. 5.134 0.1571
 Coeff. of Var. [%] 3.073 1.689
 Min. 158.8 8.972
 Max. 176.9 9.544
 Number of Spec. 18 18

Average_{norm} 0.01208 163.8 9.124
 Standard Dev._{norm} 3.984 0.1428
 Coeff. of Var. [%]_{norm} 2.432 1.565
 Min. 0.01188 157.1 8.871
 Max. 0.01231 171.3 9.423
 Number of Spec. 18 18 18



August 1, 2025

CAM-RP-2024-023 Rev N/C

Warp Flexural Proc. A Properties (WFLEX)--RTA (70°F)
Strength & Modulus

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

t_{ply} [in]

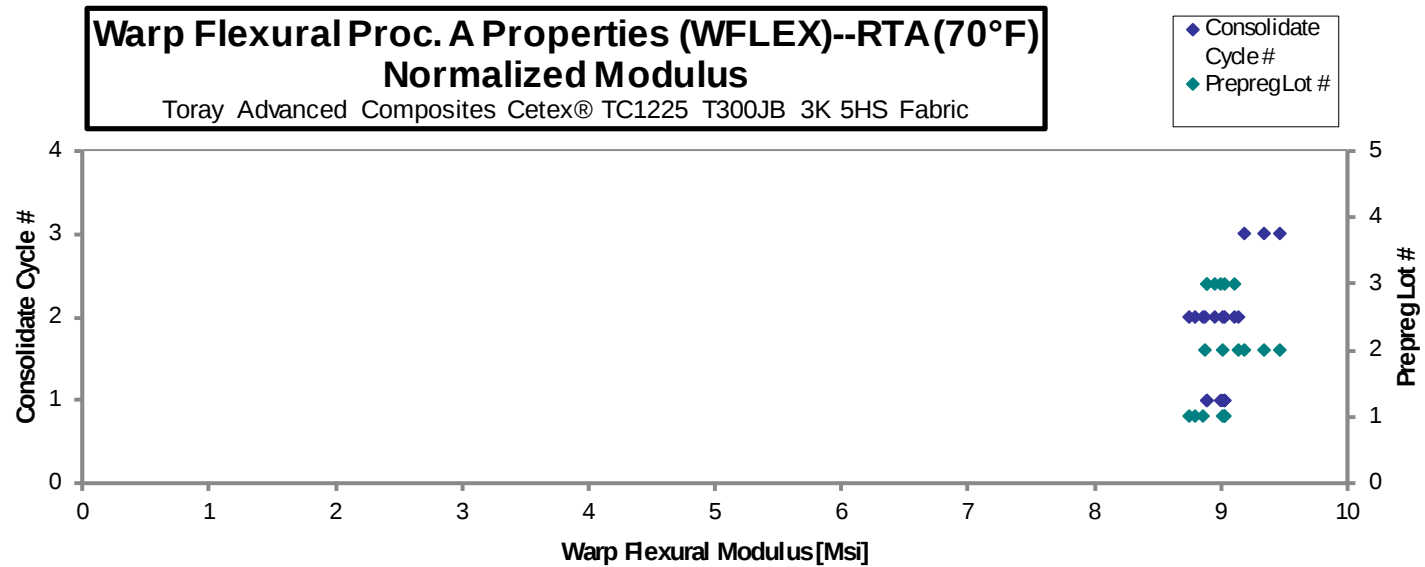
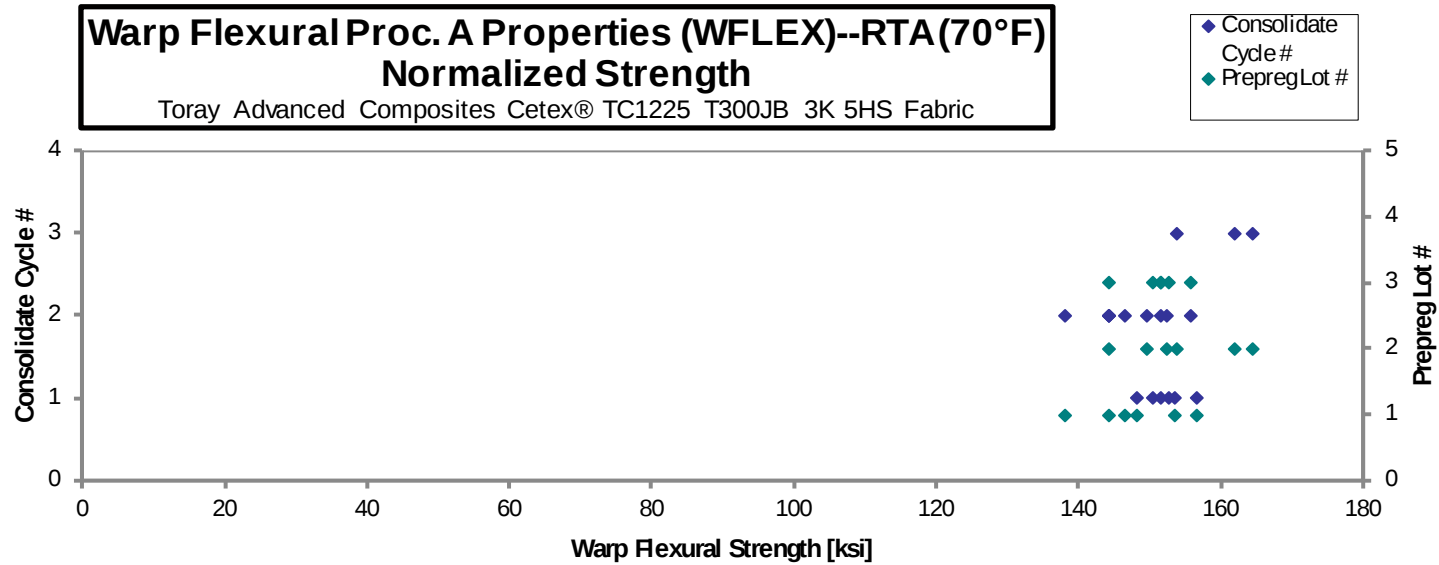
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Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
TCCTA111A	A	C1	1	1	159.0	9.166	0.09687	8	CAT, TAB
TCCTA112A	A	C1	1	1	156.6	9.195	0.09663	8	CAT, TAB
TCCTA113A	A	C1	1	1	152.4	9.273	0.09627	8	CAT, TAB
TCCTA211A	A	C2	1	2	152.4	9.104	0.09568	8	CAT, TAB
TCCTA212A	A	C2	1	2	145.1	9.307	0.09518	8	CAT, TAB
TCCTA213A	A	C2	1	2	151.1	9.212	0.09535	8	CAT, TAB
TCCTB211A	B	C2	2	2	153.3	9.176	0.09737	8	CAT, TAB
TCCTB212A	B	C2	2	2	147.1	9.184	0.09670	8	CAT, TAB
TCCTB213A	B	C2	2	2	154.0	9.129	0.09622	8	CAT, TAB
TCCTB311A	B	C3	2	3	156.9	9.177	0.09910	8	CAT, TAB
TCCTB312A	B	C3	2	3	151.4	9.202	0.09833	8	CAT, TAB
TCCTB313A	B	C3	2	3	161.7	9.036	0.09843	8	TAB
TCCTC111A	C	C1	3	1	157.7	9.248	0.09565	8	CAT, TAB
TCCTC112A	C	C1	3	1	157.9	9.307	0.09597	8	CAT, TAB
TCCTC113A	C	C1	3	1	156.1	9.236	0.09578	8	CAT, TAB
TCCTC215A	C	C2	3	2	147.8	9.334	0.09642	8	TAB, CAT
TCCTC216A	C	C2	3	2	159.2	9.153	0.09653	8	TAB, CAT
TCCTC217A	C	C2	3	2	153.6	9.144	0.09698	8	TAB, CAT

Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.01211	156.6	9.028
0.01208	153.5	9.014
0.01203	148.2	9.021
0.01196	146.4	8.750
0.01190	138.0	8.852
0.01192	144.2	8.792
0.01217	152.5	9.132
0.01209	144.4	9.016
0.01203	149.6	8.872
0.01239	161.8	9.461
0.01229	153.7	9.341
0.01230	164.5	9.191
0.01196	151.4	8.882
0.01200	152.7	8.998
0.01197	150.4	8.895
0.01205	144.2	9.109
0.01207	155.8	8.954
0.01212	151.6	9.029

Average 154.1 9.199
Standard Dev. 4.518 0.07633
Coeff. of Var. [%] 2.933 0.8297
Min. 145.1 9.036
Max. 161.7 9.334
Number of Spec. 18 18

Average_{norm} 0.01208 151.1 9.019
Standard Dev._{norm} 6.447 0.1819
Coeff. of Var. [%]_{norm} 4.267 2.017
Min. 0.01190 138.0 8.750
Max. 0.01239 164.5 9.461
Number of Spec. 18 18 18



August 1, 2025

CAM-RP-2024-023 Rev N/C

Warp Flexural Proc. A Properties (WFLEX)--ETA (250°F)
Strength & Modulus

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

t_{ply} [in]

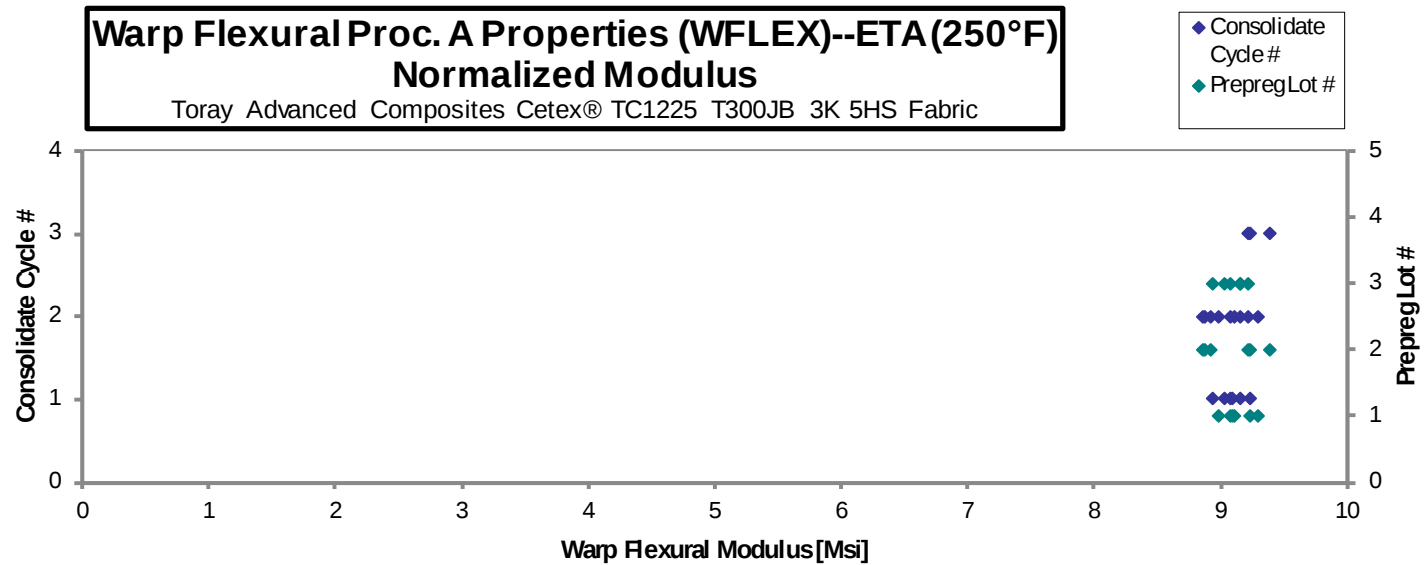
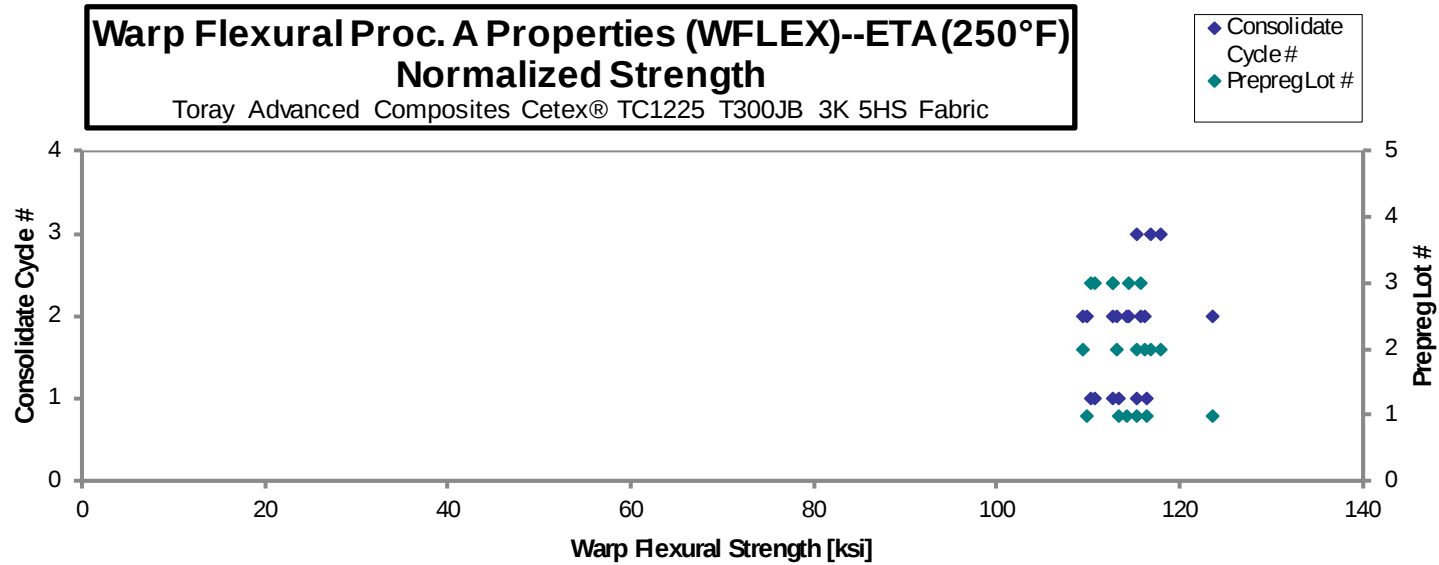
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Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
TCCTA111C	A	C1	1	1	120.6	9.577	0.09582	8	CAT, TAB
TCCTA112C	A	C1	1	1	119.9	9.464	0.09568	8	CAT, TAB
TCCTA113C	A	C1	1	1	118.1	9.465	0.09557	8	CAT, TAB
TCCTA211C	A	C2	1	2	114.3	9.350	0.09563	8	CAT, TAB
TCCTA212C	A	C2	1	2	129.9	9.779	0.09518	8	CAT, TAB
TCCTA213C	A	C2	1	2	118.3	9.434	0.09590	8	CAT, TAB
TCCTB211C	B	C2	2	2	112.1	9.071	0.09645	8	TAB
TCCTB212C	B	C2	2	2	119.3	9.113	0.09633	8	TAB
TCCTB213C	B	C2	2	2	116.1	9.165	0.09632	8	TAB
TCCTB311C	B	C3	2	3	115.3	9.233	0.09753	8	TAB
TCCTB312C	B	C3	2	3	116.4	9.368	0.09772	8	TAB
TCCTB313C	B	C3	2	3	116.7	9.139	0.09810	8	TAB
TCCTC111C	C	C1	3	1	113.6	9.170	0.09638	8	CAT, TAB
TCCTC112C	C	C1	3	1	114.6	9.511	0.09578	8	CAT, TAB
TCCTC113C	C	C1	3	1	117.4	9.412	0.09558	8	CAT, TAB
TCCTC211C	C	C2	3	2	116.4	9.469	0.09598	8	CAT, TAB
TCCTC212C	C	C2	3	2	118.2	9.525	0.09600	8	CAT, TAB
TCCTC213C	C	C2	3	2	120.1	9.413	0.09585	8	CAT, TAB

Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.01198	116.3	9.230
0.01196	115.2	9.096
0.01195	113.2	9.074
0.01195	109.7	8.977
0.01190	123.5	9.301
0.01199	114.3	9.108
0.01206	109.4	8.859
0.01204	116.2	8.878
0.01204	113.1	8.925
0.01219	115.2	9.221
0.01221	116.7	9.390
0.01226	117.9	9.233
0.01205	110.8	8.942
0.01197	110.3	9.161
0.01195	112.6	9.027
0.01200	112.6	9.158
0.01200	114.4	9.216
0.01198	115.8	9.079

Average 117.6 9.370
Standard Dev. 3.855 0.1878
Coeff. of Var. [%] 3.277 2.004
Min. 112.1 9.071
Max. 129.9 9.779
Number of Spec. 18 18

Average_{norm} 0.01203 114.3 9.104
Standard Dev._{norm} 3.397 0.1492
Coeff. of Var. [%]_{norm} 2.972 1.638
Min. 0.01190 109.4 8.859
Max. 0.01226 123.5 9.390
Number of Spec. 18 18 18



August 1, 2025

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Warp Flexural Proc. A Properties (WFLEX)--ETW (250°F)
Strength & Modulus

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

t_{ply} [in]

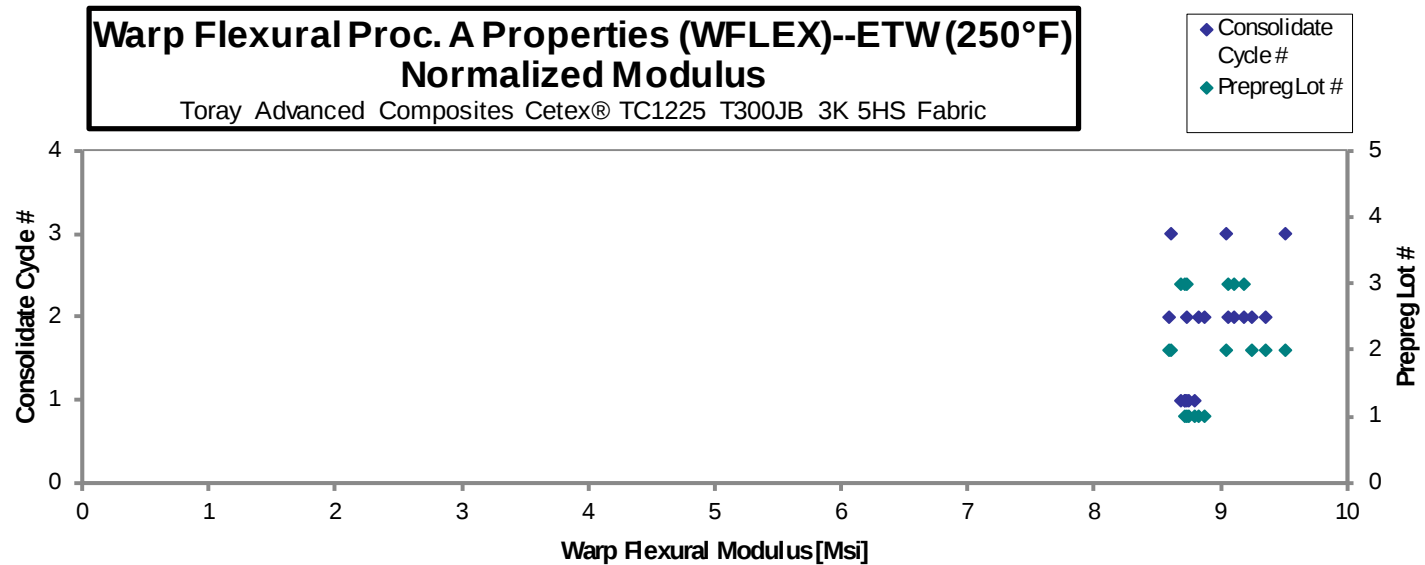
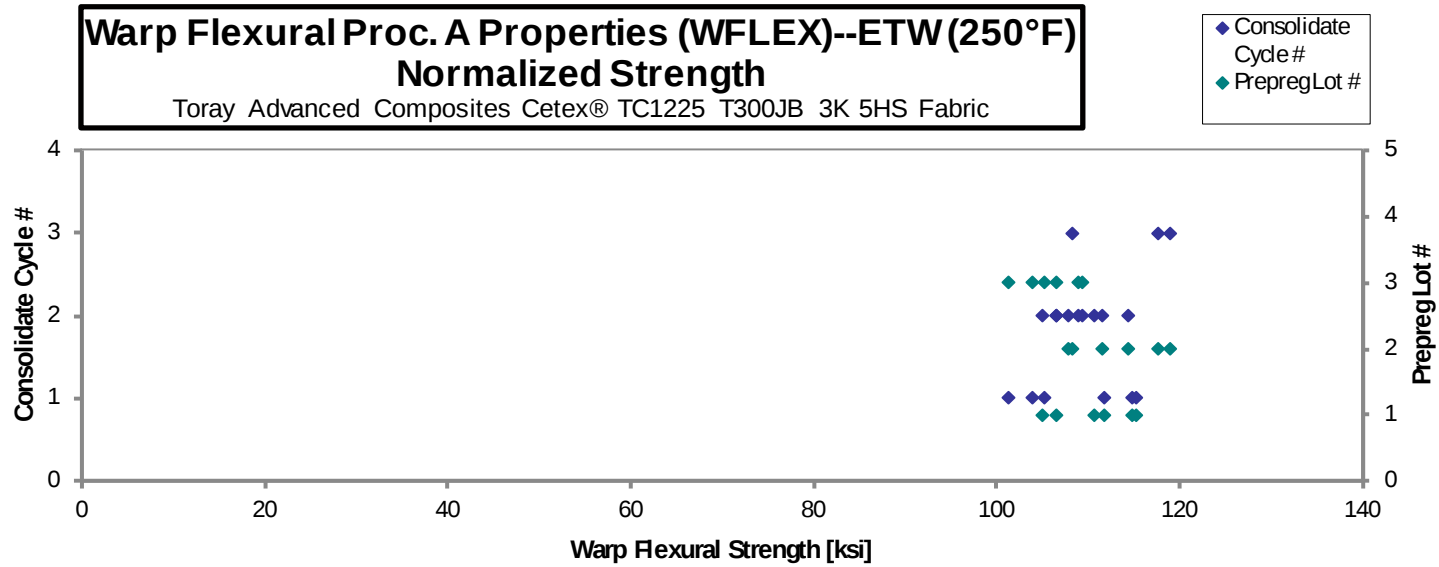
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Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
TCCTA111D	A	C1	1	1	122.2	9.276	0.09482	8	CAT, TAB
TCCTA112D	A	C1	1	1	117.7	9.186	0.09510	8	CAT, TAB
TCCTA113D	A	C1	1	1	119.8	9.168	0.09562	8	CAT, TAB
TCCTA211D	A	C2	1	2	115.2	9.086	0.09573	8	CAT
TCCTA212D	A	C2	1	2	108.3	9.140	0.09613	8	CAT
TCCTA213D	A	C2	1	2	110.1	9.116	0.09607	8	CAT
TCCTB211D	B	C2	2	2	114.1	8.778	0.09655	8	CAT, TAB
TCCTB212D	B	C2	2	2	109.7	9.417	0.09675	8	CAT, TAB
TCCTB213D	B	C2	2	2	117.4	9.594	0.09640	8	CAT, TAB
TCCTB311D	B	C3	2	3	107.1	9.412	0.09812	8	CAT, TAB
TCCTB312D	B	C3	2	3	117.8	8.524	0.09812	8	CAT, TAB
TCCTB313D	B	C3	2	3	116.6	8.962	0.09807	8	CAT, TAB
TCCTC111D	C	C1	3	1	111.2	9.210	0.09497	8	CAT
TCCTC112D	C	C1	3	1	109.9	9.177	0.09497	8	CAT
TCCTC113D	C	C1	3	1	106.4	9.171	0.09523	8	CAT
TCCTC211D	C	C2	3	2	112.7	9.370	0.09595	8	CAT
TCCTC212D	C	C2	3	2	111.5	9.515	0.09547	8	CAT
TCCTC213D	C	C2	3	2	114.0	9.554	0.09568	8	CAT

Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.01185	115.3	8.754
0.01189	111.7	8.722
0.01195	115.0	8.799
0.01197	110.8	8.742
0.01202	105.1	8.867
0.01201	106.7	8.832
0.01207	111.6	8.590
0.01209	107.8	9.253
0.01205	114.5	9.359
0.01226	108.3	9.512
0.01226	119.0	8.615
0.01226	117.7	9.048
0.01187	105.3	8.720
0.01187	104.1	8.689
0.01190	101.3	8.732
0.01199	108.9	9.056
0.01193	106.7	9.104
0.01196	109.5	9.182

Average 113.4 9.203
Standard Dev. 4.503 0.2683
Coeff. of Var. [%] 3.970 2.915
Min. 106.4 8.524
Max. 122.2 9.594
Number of Spec. 18 18

Average_{norm} 0.01201 110.0 8.921
Standard Dev._{norm} 4.906 0.2708
Coeff. of Var. [%]_{norm} 4.461 3.036
Min. 0.01185 101.3 8.590
Max. 0.01226 119.0 9.512
Number of Spec. 18 18 18



4.7 Fill Flexural Properties (FFLEX)

**Fill Flexural Proc. A Properties (FFLEX)--CTA (-65°F)
Strength & Modulus**

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

 t_{ply} [in]

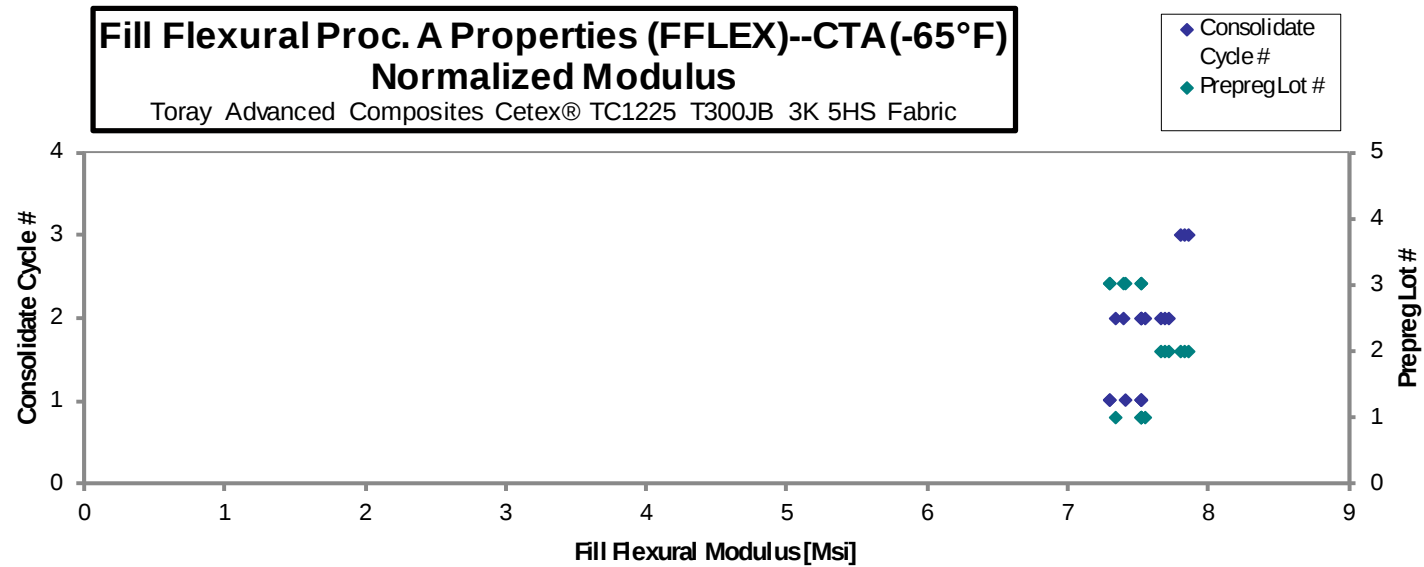
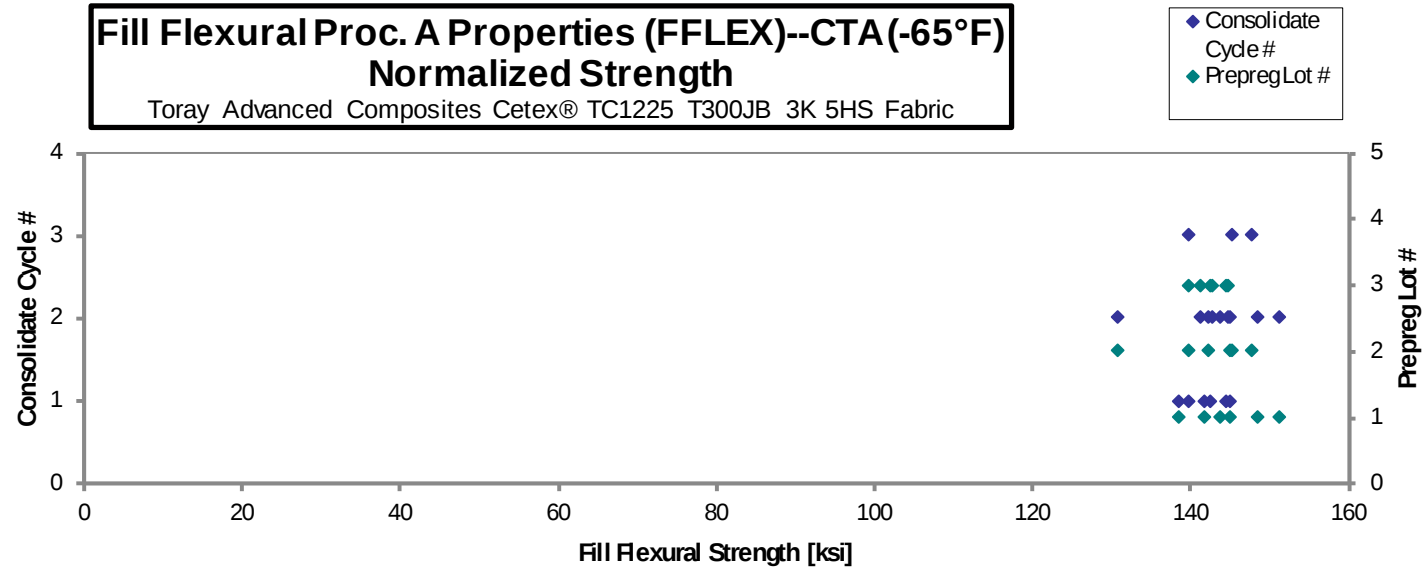
0.01220

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
TCCQA111B	A	C1	1	1	142.8	7.764	0.09610	8	TAB
TCCQA112B	A	C1	1	1	145.6	7.735	0.09630	8	CAT, TAB
TCCQA113B	A	C1	1	1	147.9	7.671	0.09663	8	CAT, TAB
TCCQA211B	A	C2	1	2	151.4	7.709	0.09665	8	CAT, TAB
TCCQA212B	A	C2	1	2	147.5	7.533	0.09633	8	CAT, TAB
TCCQA213B	A	C2	1	2	155.9	7.745	0.09617	8	CAT, TAB
TCCQB211B	B	C2	2	2	141.8	7.650	0.09772	8	TAB
TCCQB212B	B	C2	2	2	130.3	7.665	0.09775	8	TAB
TCCQB213B	B	C2	2	2	145.3	7.748	0.09748	8	TAB
TCCQB311B	B	C3	2	3	144.3	7.775	0.09797	8	TAB
TCCQB312B	B	C3	2	3	138.0	7.767	0.09822	8	TAB
TCCQB313B	B	C3	2	3	146.0	7.716	0.09818	8	TAB
TCCQC111B	C	C1	3	1	141.6	7.506	0.09697	8	CAT, TAB
TCCQC112B	C	C1	3	1	142.2	7.281	0.09770	8	CAT, TAB
TCCQC113B	C	C1	3	1	145.3	7.342	0.09733	8	CAT, TAB
TCCQC211B	C	C2	3	2	147.0	7.636	0.09688	8	CAT, TAB
TCCQC212B	C	C2	3	2	143.2	7.630	0.09692	8	CAT, TAB
TCCQC213B	C	C2	3	2	146.7	7.601	0.09630	8	TAB

Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.01201	138.4	7.528
0.01204	141.7	7.531
0.01208	145.0	7.520
0.01208	148.5	7.559
0.01204	143.7	7.338
0.01202	151.3	7.520
0.01221	142.2	7.668
0.01222	130.7	7.689
0.01219	145.0	7.729
0.01225	145.4	7.834
0.01228	139.7	7.865
0.01227	147.7	7.808
0.01212	139.8	7.409
0.01221	142.4	7.296
0.01217	144.5	7.302
0.01211	144.8	7.524
0.01211	141.2	7.524
0.01204	142.8	7.400

Average 144.6 7.638
 Standard Dev. 5.326 0.1419
 Coeff. of Var. [%] 3.683 1.858
 Min. 130.3 7.281
 Max. 155.9 7.775
 Number of Spec. 18 18

Average_{norm} 0.01214 143.1 7.558
 Standard Dev._{norm} 4.470 0.1762
 Coeff. of Var. [%]_{norm} 3.125 2.332
 Min. 0.01201 130.7 7.296
 Max. 0.01228 151.3 7.865
 Number of Spec. 18 18 18



August 1, 2025

CAM-RP-2024-023 Rev N/C

**Fill Flexural Proc. A Properties (FFLEX)--RTA (70°F)
Strength & Modulus**

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

t_{ply} [in]

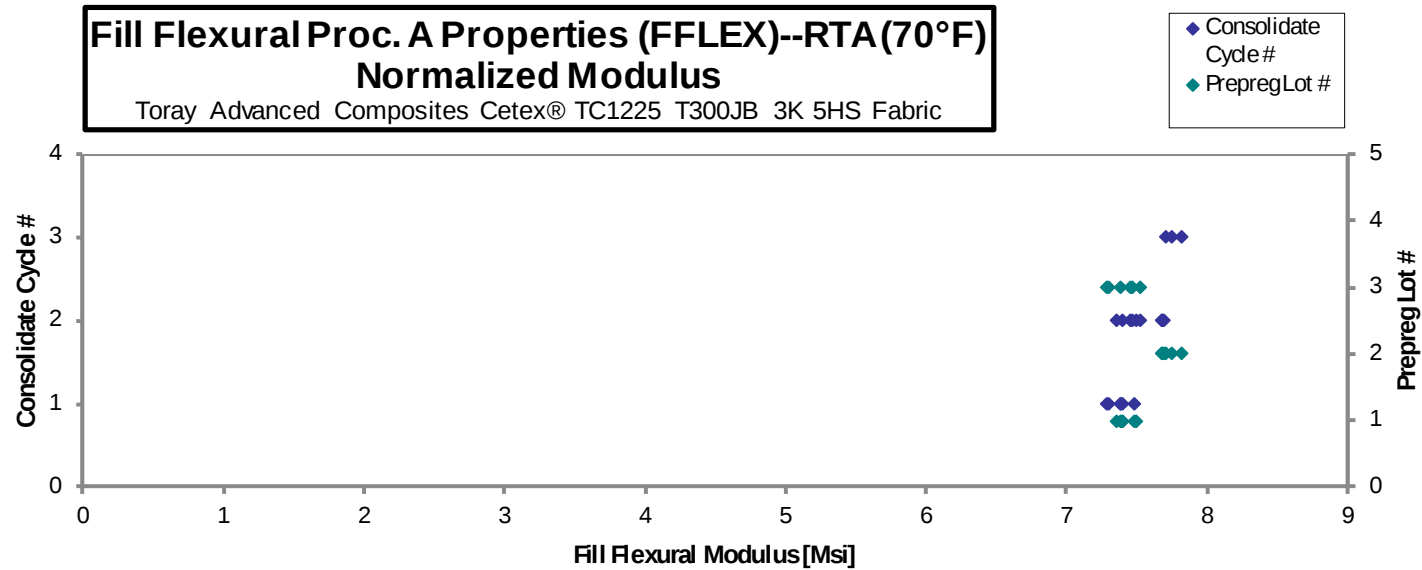
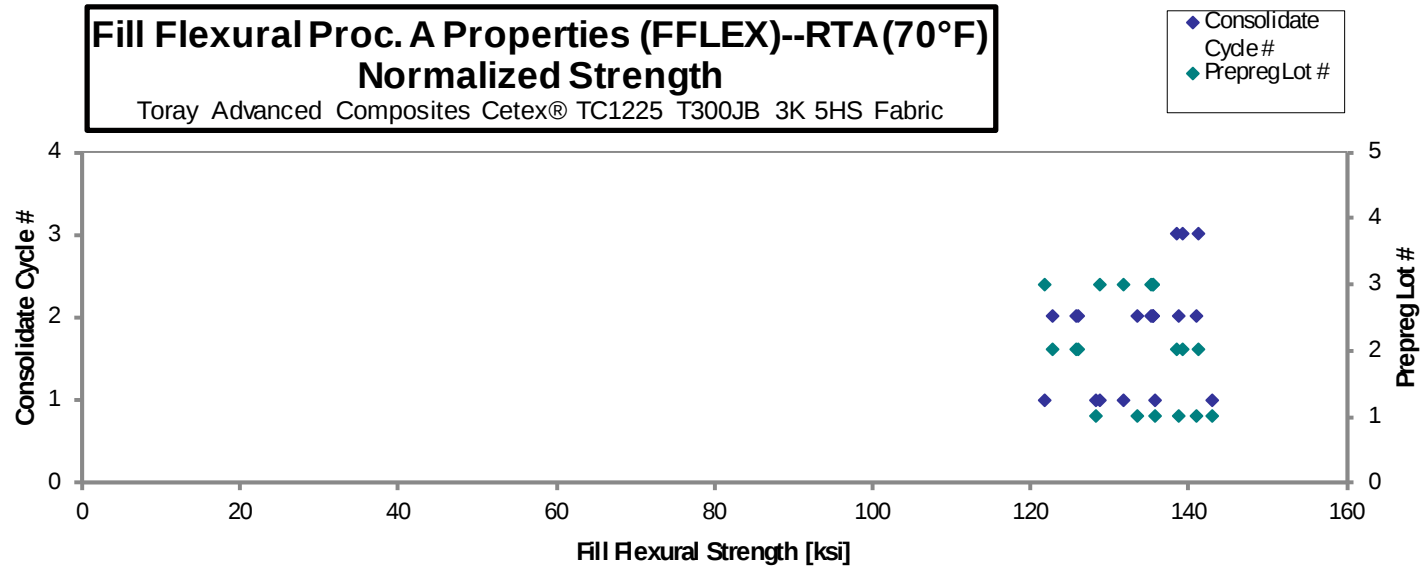
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Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
TCCQA111A	A	C1	1	1	147.9	7.650	0.09598	8	CAT, TAB
TCCQA112A	A	C1	1	1	141.1	7.765	0.09573	8	CAT, TAB
TCCQA113A	A	C1	1	1	133.6	7.677	0.09568	8	CAT, TAB
TCCQA211A	A	C2	1	2	137.1	7.694	0.09628	8	CAT, TAB
TCCQA212A	A	C2	1	2	143.8	7.536	0.09667	8	CAT, TAB
TCCQA213A	A	C2	1	2	141.7	7.510	0.09658	8	CAT, TAB
TCCQB211A	B	C2	2	2	123.6	7.718	0.09728	8	CAT, TAB
TCCQB212A	B	C2	2	2	127.4	7.751	0.09713	8	CAT, TAB
TCCQB213A	B	C2	2	2	126.5	7.741	0.09730	8	TAB
TCCQB311A	B	C3	2	3	137.2	7.589	0.09835	8	TAB
TCCQB312A	B	C3	2	3	139.8	7.724	0.09813	8	TAB
TCCQB313A	B	C3	2	3	136.5	7.625	0.09833	8	TAB
TCCQC111A	C	C1	3	1	134.4	7.701	0.09558	8	CAT, TAB
TCCQC112A	C	C1	3	1	126.4	7.583	0.09577	8	CAT, TAB
TCCQC113A	C	C1	3	1	135.5	7.481	0.09627	8	CAT, TAB
TCCQC211A	C	C2	3	2	135.7	7.469	0.09757	8	CAT, TAB
TCCQC212A	C	C2	3	2	136.2	7.495	0.09728	8	CAT, TAB
TCCQC213A	C	C2	3	2	136.2	7.551	0.09737	8	CAT, TAB

Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.01200	143.1	7.399
0.01197	135.8	7.471
0.01196	128.4	7.378
0.01204	133.5	7.488
0.01208	141.1	7.393
0.01207	138.8	7.355
0.01216	122.8	7.668
0.01214	126.2	7.677
0.01216	125.7	7.693
0.01229	139.3	7.706
0.01227	141.4	7.809
0.01229	138.5	7.740
0.01195	128.9	7.386
0.01197	121.7	7.301
0.01203	131.8	7.278
0.01220	135.6	7.464
0.01216	135.3	7.446
0.01217	135.5	7.515

Average 135.6 7.626
Standard Dev. 6.393 0.1008
Coeff. of Var. [%] 4.714 1.321
Min. 123.6 7.469
Max. 147.9 7.765
Number of Spec. 18 18

Average_{norm} 0.01211 133.5 7.509
Standard Dev._{norm} 6.560 0.1637
Coeff. of Var. [%]_{norm} 4.913 2.180
Min. 0.01195 121.7 7.278
Max. 0.01229 143.1 7.809
Number of Spec. 18 18 18



August 1, 2025

CAM-RP-2024-023 Rev N/C

**Fill Flexural Proc. A Properties (FFLEX)--ETA (250°F)
Strength & Modulus**

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

t_{ply} [in]

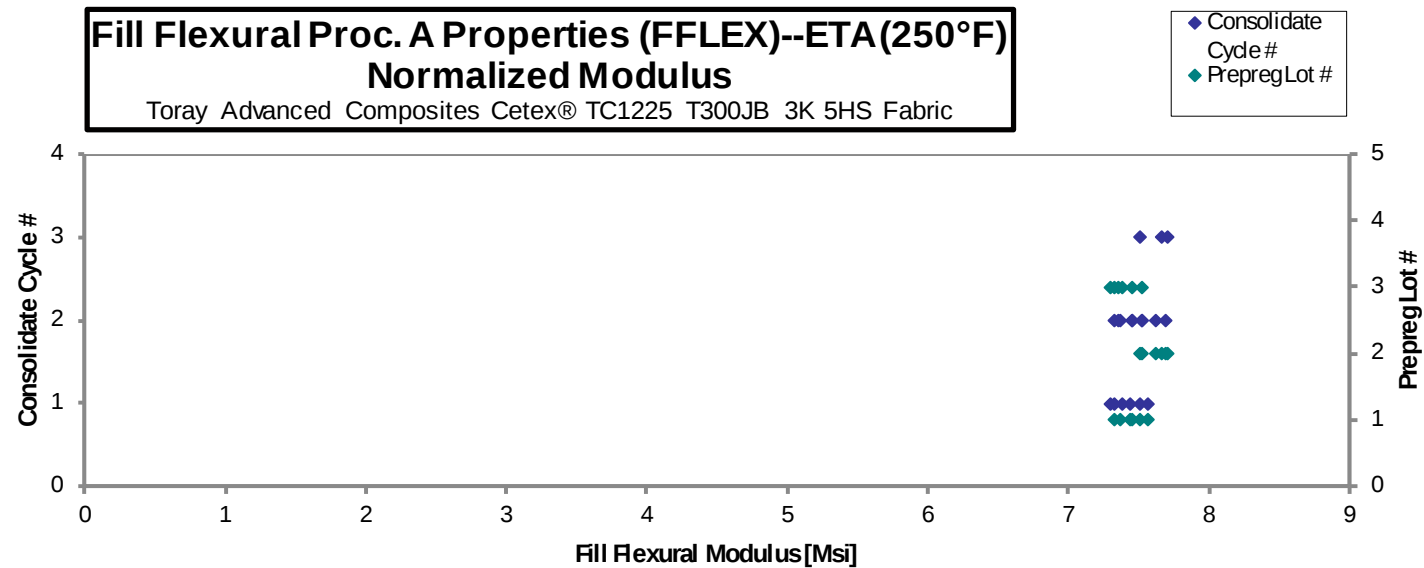
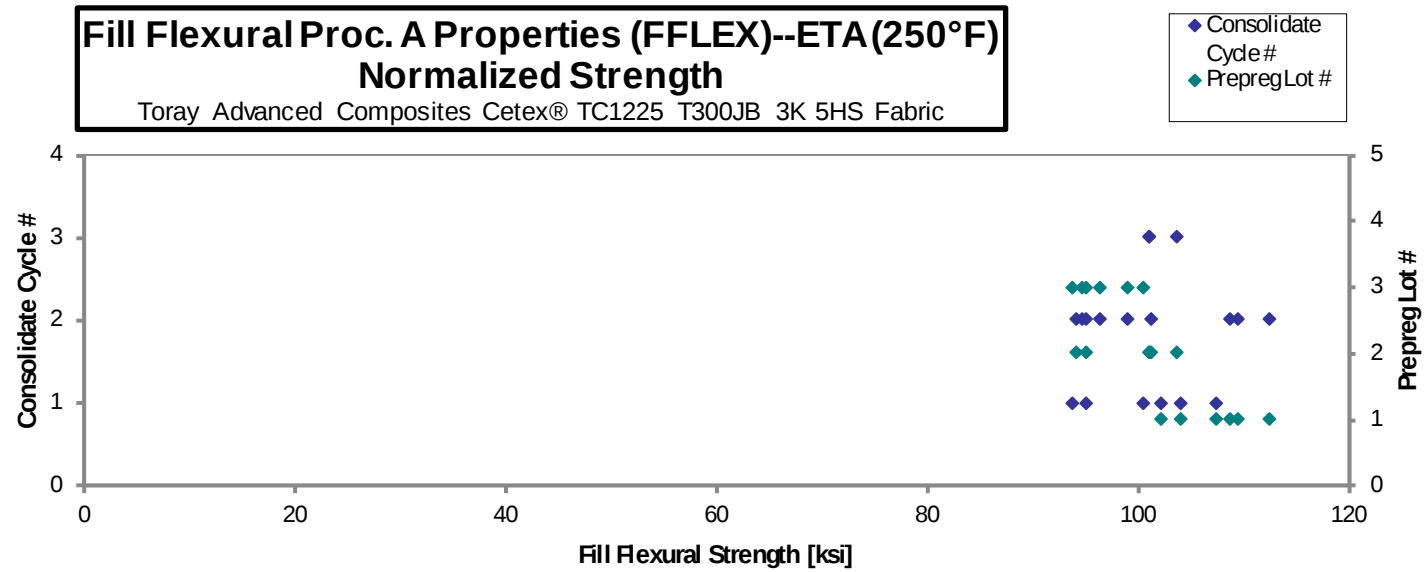
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Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
TCCQA111C	A	C1	1	1	106.6	7.874	0.09562	8	CAT, TAB
TCCQA112C	A	C1	1	1	111.4	7.720	0.09582	8	CAT, TAB
TCCQA113C	A	C1	1	1	108.3	7.805	0.09570	8	CAT, TAB
TCCQA211C	A	C2	1	2	115.6	7.572	0.09625	8	CAT, TAB
TCCQA212C	A	C2	1	2	111.2	7.479	0.09655	8	CAT, TAB
TCCQA213C	A	C2	1	2	113.3	7.705	0.09597	8	CAT, TAB
TCCQB211C	B	C2	2	2	101.0	7.667	0.09772	8	TAB
TCCQB212C	B	C2	2	2	94.70	7.588	0.09777	8	TAB
TCCQB213C	B	C2	2	2	94.19	7.532	0.09757	8	TAB
TCCQB311C	B	C3	2	3	102.4	7.569	0.09823	8	TAB
TCCQB312C	B	C3	2	3	100.5	7.655	0.09790	8	TAB
TCCQB313C	B	C3	2	3	99.40	7.375	0.09843	8	TAB
TCCQC111C	C	C1	3	1	101.9	7.490	0.09692	8	CAT, TAB
TCCQC112C	C	C1	3	1	96.89	7.541	0.09602	8	CAT, TAB
TCCQC113C	C	C1	3	1	99.01	7.631	0.09565	8	CAT, TAB
TCCQC211C	C	C2	3	2	97.02	7.701	0.09643	8	CAT, TAB
TCCQC212C	C	C2	3	2	101.5	7.647	0.09638	8	CAT, TAB
TCCQC213C	C	C2	3	2	99.21	7.576	0.09620	8	CAT, TAB

Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.01195	102.3	7.557
0.01198	107.4	7.440
0.01196	104.1	7.504
0.01203	112.4	7.364
0.01207	108.8	7.319
0.01200	109.5	7.449
0.01221	101.3	7.685
0.01222	95.02	7.614
0.01220	94.12	7.527
0.01228	103.7	7.668
0.01224	101.1	7.702
0.01230	101.1	7.501
0.01211	100.5	7.386
0.01200	93.77	7.299
0.01196	95.09	7.329
0.01205	94.71	7.518
0.01205	99.03	7.458
0.01203	96.38	7.360

Average 103.0 7.618
 Standard Dev. 6.508 0.1200
 Coeff. of Var. [%] 6.318 1.576
 Min. 94.19 7.375
 Max. 115.6 7.874
 Number of Spec. 18 18

Average_{norm} 0.01209 101.1 7.482
 Standard Dev._{norm} 5.733 0.1276
 Coeff. of Var. [%]_{norm} 5.669 1.706
 Min. 0.01195 93.77 7.299
 Max. 0.01230 112.4 7.702
 Number of Spec. 18 18 18



August 1, 2025

CAM-RP-2024-023 Rev N/C

**Fill Flexural Proc. A Properties (FFLEX)--ETW (250°F)
Strength & Modulus**

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

t_{ply} [in]

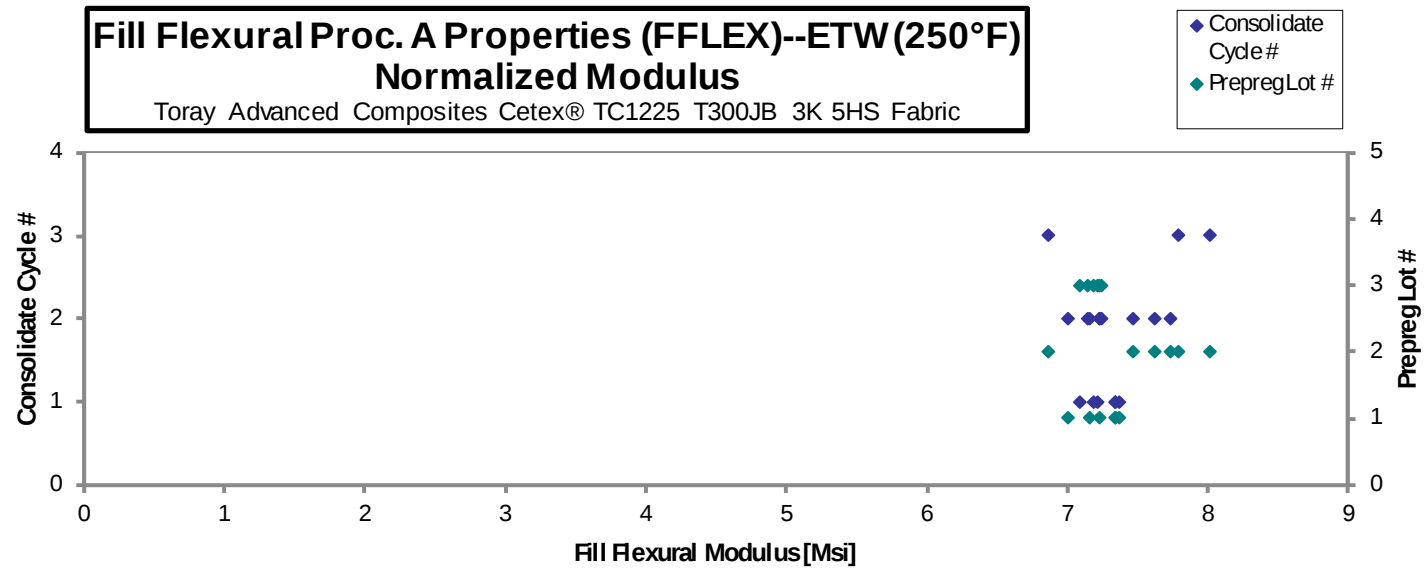
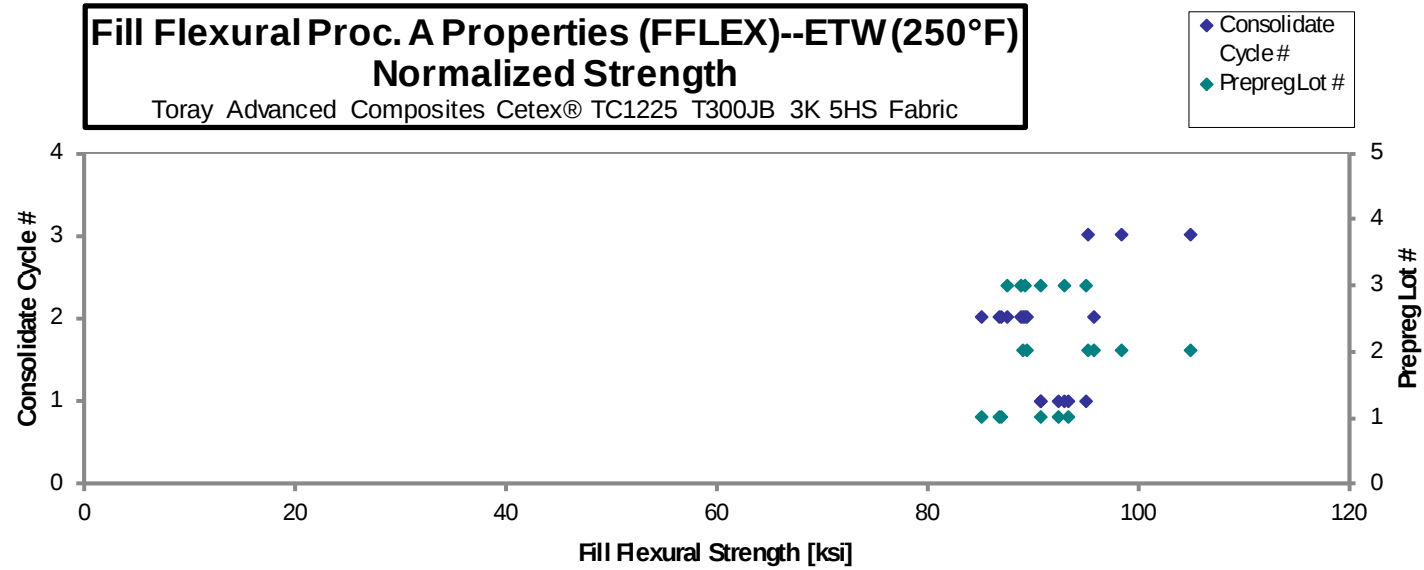
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Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
TCCQA111D	A	C1	1	1	95.04	7.581	0.09630	8	CAT
TCCQA112D	A	C1	1	1	93.55	7.565	0.09617	8	CAT
TCCQA113D	A	C1	1	1	97.62	7.680	0.09548	8	CAT
TCCQA211D	A	C2	1	2	90.61	7.294	0.09572	8	CAT, TAB
TCCQA212D	A	C2	1	2	89.32	7.434	0.09625	8	CAT, TAB
TCCQA213D	A	C2	1	2	87.72	7.376	0.09615	8	CAT, TAB
TCCQB211D	B	C2	2	2	89.10	7.484	0.09757	8	CAT, TAB
TCCQB212D	B	C2	2	2	89.54	7.744	0.09760	8	CAT, TAB
TCCQB213D	B	C2	2	2	96.58	7.680	0.09727	8	CAT, TAB
TCCQB311D	B	C3	2	3	97.58	7.953	0.09803	8	CAT, TAB
TCCQB312D	B	C3	2	3	104.6	7.756	0.09785	8	CAT, TAB
TCCQB313D	B	C3	2	3	96.03	6.917	0.09725	8	CAT, TAB
TCCQC111D	C	C1	3	1	95.89	7.318	0.09612	8	CAT
TCCQC112D	C	C1	3	1	96.67	7.345	0.09677	8	CAT
TCCQC113D	C	C1	3	1	91.12	7.206	0.09748	8	CAT
TCCQC211D	C	C2	3	2	91.79	7.358	0.09625	8	CAT
TCCQC212D	C	C2	3	2	91.53	7.453	0.09618	8	CAT
TCCQC213D	C	C2	3	2	90.08	7.459	0.09623	8	CAT

Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.01204	92.53	7.380
0.01202	90.82	7.345
0.01194	93.43	7.350
0.01196	87.14	7.016
0.01203	86.86	7.230
0.01202	85.13	7.158
0.01220	89.04	7.479
0.01220	89.54	7.744
0.01216	95.92	7.627
0.01225	98.44	8.024
0.01223	105.1	7.795
0.01216	95.34	6.867
0.01201	93.00	7.097
0.01210	95.02	7.220
0.01219	90.90	7.188
0.01203	89.26	7.156
0.01202	88.90	7.238
0.01203	87.58	7.251

Average 93.57 7.478
Standard Dev. 4.261 0.2385
Coeff. of Var. [%] 4.554 3.189
Min. 87.72 6.917
Max. 104.6 7.953
Number of Spec. 18 18

Average_{norm} 0.01209 91.89 7.343
Standard Dev._{norm} 4.872 0.2935
Coeff. of Var. [%]_{norm} 5.302 3.997
Min. 0.01194 85.13 6.867
Max. 0.01225 105.1 8.024
Number of Spec. 18 18 18



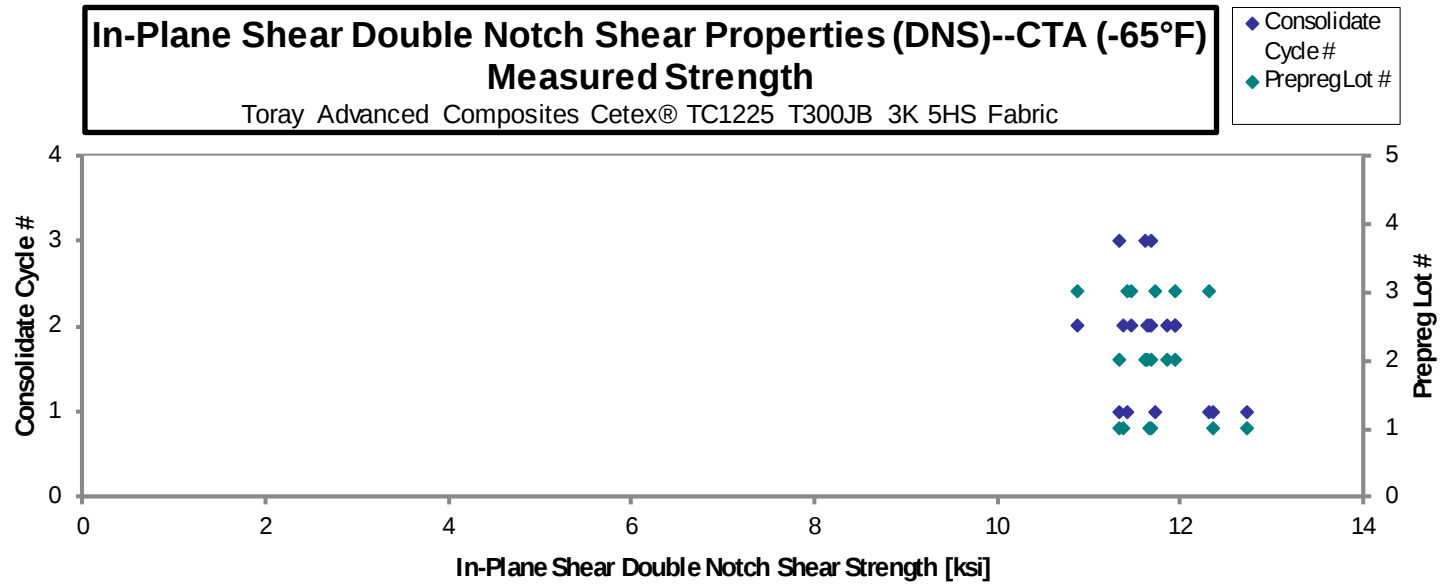
4.8 In-Plane Shear Double Notch Shear (DNS)

**In-Plane Shear Double Notch Shear Properties (DNS)--CTA (-65°F)
Strength**

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode
TCCVA111B	A	C1	1	1	12.35	0.09615	8	0.01202	GAGE SECTION SHEAR
TCCVA112B	A	C1	1	1	12.72	0.09588	8	0.01199	GAGE SECTION SHEAR
TCCVA113B	A	C1	1	1	11.33	0.09525	8	0.01191	GAGE SECTION SHEAR
TCCVA211B	A	C2	1	2	11.65	0.09705	8	0.01213	GAGE SECTION SHEAR
TCCVA212B	A	C2	1	2	11.36	0.09683	8	0.01210	GAGE SECTION SHEAR
TCCVA213B	A	C2	1	2	11.67	0.09678	8	0.01210	GAGE SECTION SHEAR
TCCVB211B	B	C2	2	2	11.86	0.09833	8	0.01229	GAGE SECTION SHEAR
TCCVB212B	B	C2	2	2	11.93	0.09758	8	0.01220	GAGE SECTION SHEAR
TCCVB213B	B	C2	2	2	11.63	0.09793	8	0.01224	GAGE SECTION SHEAR
TCCVB311B	B	C3	2	3	11.32	0.09793	8	0.01224	GAGE SECTION SHEAR
TCCVB312B	B	C3	2	3	11.61	0.09805	8	0.01226	GAGE SECTION SHEAR
TCCVB313B	B	C3	2	3	11.68	0.09757	8	0.01220	GAGE SECTION SHEAR
TCCVC111B	C	C1	3	1	11.42	0.09632	8	0.01204	GAGE SECTION SHEAR
TCCVC112B	C	C1	3	1	11.72	0.09553	8	0.01194	GAGE SECTION SHEAR
TCCVC113B	C	C1	3	1	12.31	0.09642	8	0.01205	GAGE SECTION SHEAR
TCCVC211B	C	C2	3	2	11.45	0.09878	8	0.01235	GAGE SECTION SHEAR
TCCVC212B	C	C2	3	2	11.94	0.09922	8	0.01240	GAGE SECTION SHEAR
TCCVC213B	C	C2	3	2	10.86	0.09913	8	0.01239	GAGE SECTION SHEAR

Average	11.71	0.01216
Standard Dev.	0.4360	
Coeff. of Var. [%]	3.723	
Min.	10.86	0.01191
Max.	12.72	0.01240
Number of Spec.	18	18

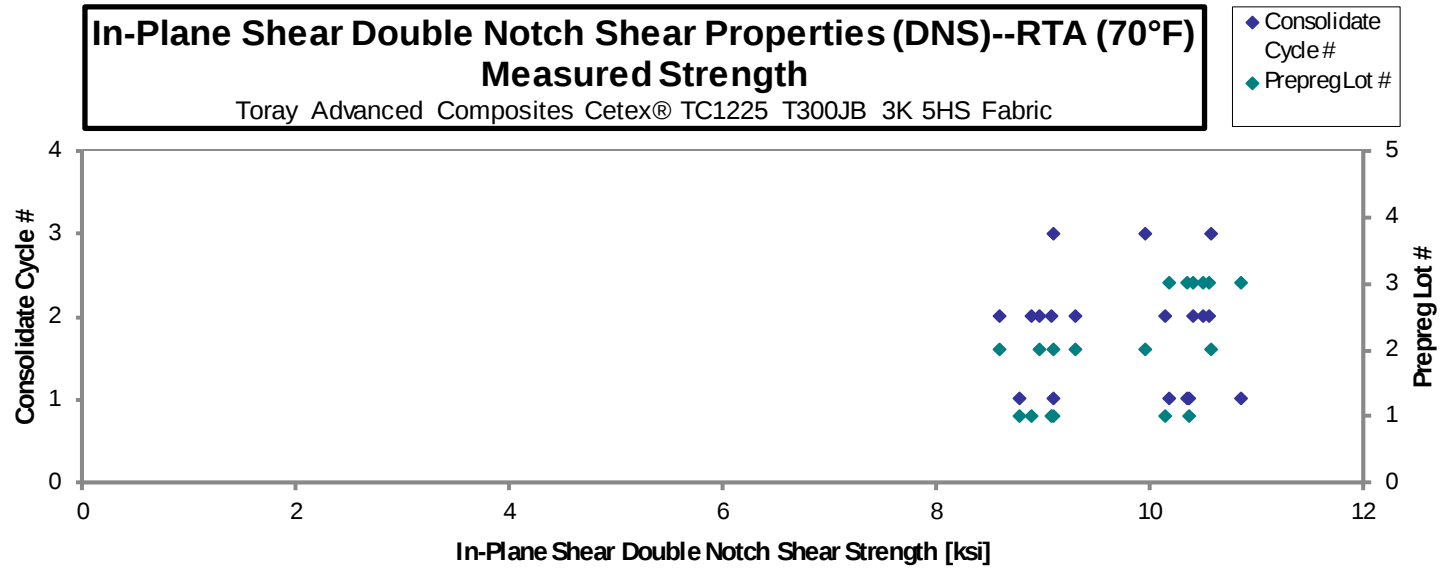


In-Plane Shear Double Notch Shear Properties (DNS)--RTA (70°F) Strength

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode
TCCVA111A	A	C1	1	1	9.098	0.09602	8	0.01200	GAGE SECTION SHEAR
TCCVA112A	A	C1	1	1	8.764	0.09638	8	0.01205	GAGE SECTION SHEAR
TCCVA113A	A	C1	1	1	10.37	0.09617	8	0.01202	GAGE SECTION SHEAR
TCCVA211A	A	C2	1	2	10.14	0.09760	8	0.01220	GAGE SECTION SHEAR
TCCVA212A	A	C2	1	2	8.889	0.09745	8	0.01218	GAGE SECTION SHEAR
TCCVA213A	A	C2	1	2	9.077	0.09705	8	0.01213	GAGE SECTION SHEAR
TCCVB211A	B	C2	2	2	9.297	0.09887	8	0.01236	GAGE SECTION SHEAR
TCCVB213A	B	C2	2	2	8.955	0.09883	8	0.01235	GAGE SECTION SHEAR
TCCVB214A	B	C2	2	2	8.587	0.09882	8	0.01235	GAGE SECTION SHEAR
TCCVB311A	B	C3	2	3	10.57	0.09832	8	0.01229	GAGE SECTION SHEAR
TCCVB312A	B	C3	2	3	9.946	0.09835	8	0.01229	GAGE SECTION SHEAR
TCCVB313A	B	C3	2	3	9.084	0.09873	8	0.01234	GAGE SECTION SHEAR
TCCVC111A	C	C1	3	1	10.84	0.09473	8	0.01184	GAGE SECTION SHEAR
TCCVC112A	C	C1	3	1	10.17	0.09515	8	0.01189	GAGE SECTION SHEAR
TCCVC113A	C	C1	3	1	10.34	0.09522	8	0.01190	GAGE SECTION SHEAR
TCCVC211A	C	C2	3	2	10.56	0.09815	8	0.01227	GAGE SECTION SHEAR
TCCVC212A	C	C2	3	2	10.39	0.09730	8	0.01216	GAGE SECTION SHEAR
TCCVC213A	C	C2	3	2	10.50	0.09773	8	0.01222	GAGE SECTION SHEAR

Average	9.754	0.01216
Standard Dev.	0.7599	
Coeff. of Var. [%]	7.790	
Min.	8.587	0.01184
Max.	10.84	0.01236
Number of Spec.	18	18

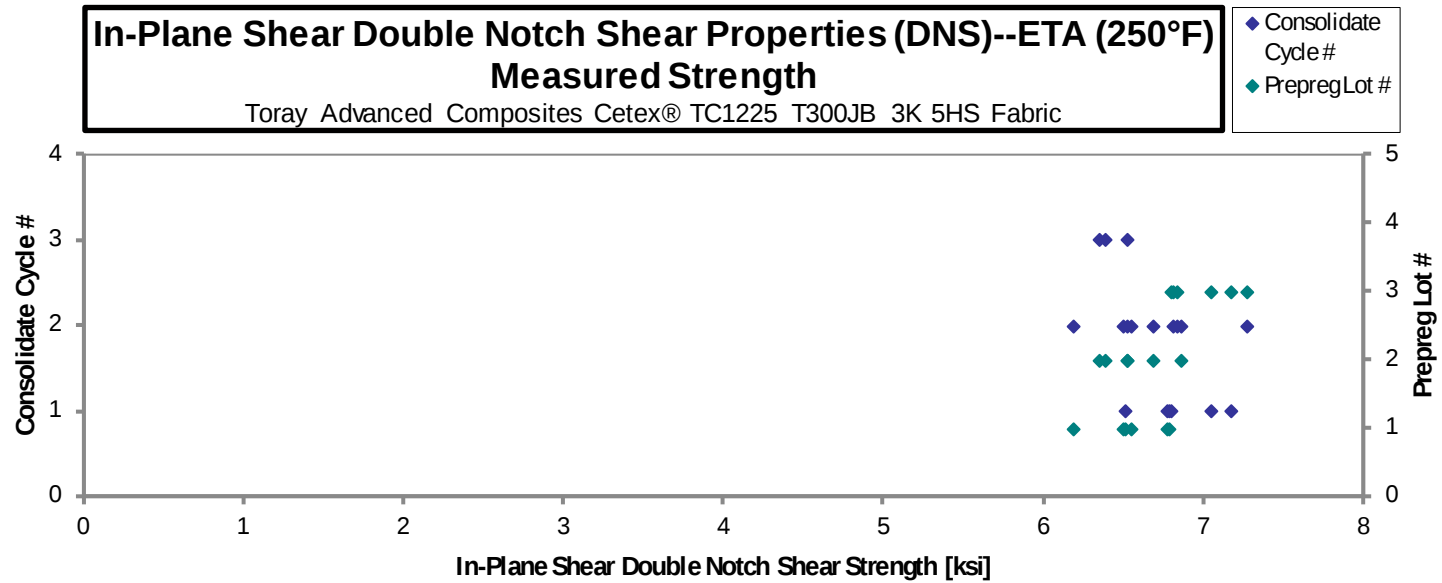


**In-Plane Shear Double Notch Shear Properties (DNS)--ETA (250°F)
Strength**

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode
TCCVA111C	A	C1	1	1	6.507	0.09447	8	0.01181	GAGE SECTION SHEAR
TCCVA112C	A	C1	1	1	6.765	0.09527	8	0.01191	GAGE SECTION SHEAR
TCCVA113C	A	C1	1	1	6.778	0.09540	8	0.01193	GAGE SECTION SHEAR
TCCVA211C	A	C2	1	2	6.550	0.09708	8	0.01214	GAGE SECTION SHEAR
TCCVA212C	A	C2	1	2	6.497	0.09663	8	0.01208	GAGE SECTION SHEAR
TCCVA213C	A	C2	1	2	6.186	0.09680	8	0.01210	GAGE SECTION SHEAR
TCCVB211C	B	C2	2	2	6.522	0.09672	8	0.01209	GAGE SECTION SHEAR
TCCVB212C	B	C2	2	2	6.687	0.09665	8	0.01208	GAGE SECTION SHEAR
TCCVB213C	B	C2	2	2	6.857	0.09650	8	0.01206	GAGE SECTION SHEAR
TCCVB311C	B	C3	2	3	6.389	0.09817	8	0.01227	GAGE SECTION SHEAR
TCCVB312C	B	C3	2	3	6.351	0.09863	8	0.01233	GAGE SECTION SHEAR
TCCVB313C	B	C3	2	3	6.522	0.09837	8	0.01230	GAGE SECTION SHEAR
TCCVC111C	C	C1	3	1	7.176	0.09638	8	0.01205	GAGE SECTION SHEAR
TCCVC112C	C	C1	3	1	7.050	0.09682	8	0.01210	GAGE SECTION SHEAR
TCCVC113C	C	C1	3	1	6.793	0.09690	8	0.01211	GAGE SECTION SHEAR
TCCVC211C	C	C2	3	2	6.838	0.09852	8	0.01231	GAGE SECTION SHEAR
TCCVC212C	C	C2	3	2	6.804	0.09875	8	0.01234	GAGE SECTION SHEAR
TCCVC213C	C	C2	3	2	7.272	0.09890	8	0.01236	GAGE SECTION SHEAR

Average	6.697	0.01213
Standard Dev.	0.2866	
Coeff. of Var. [%]	4.280	
Min.	6.186	0.01181
Max.	7.272	0.01236
Number of Spec.	18	18



August 1, 2025

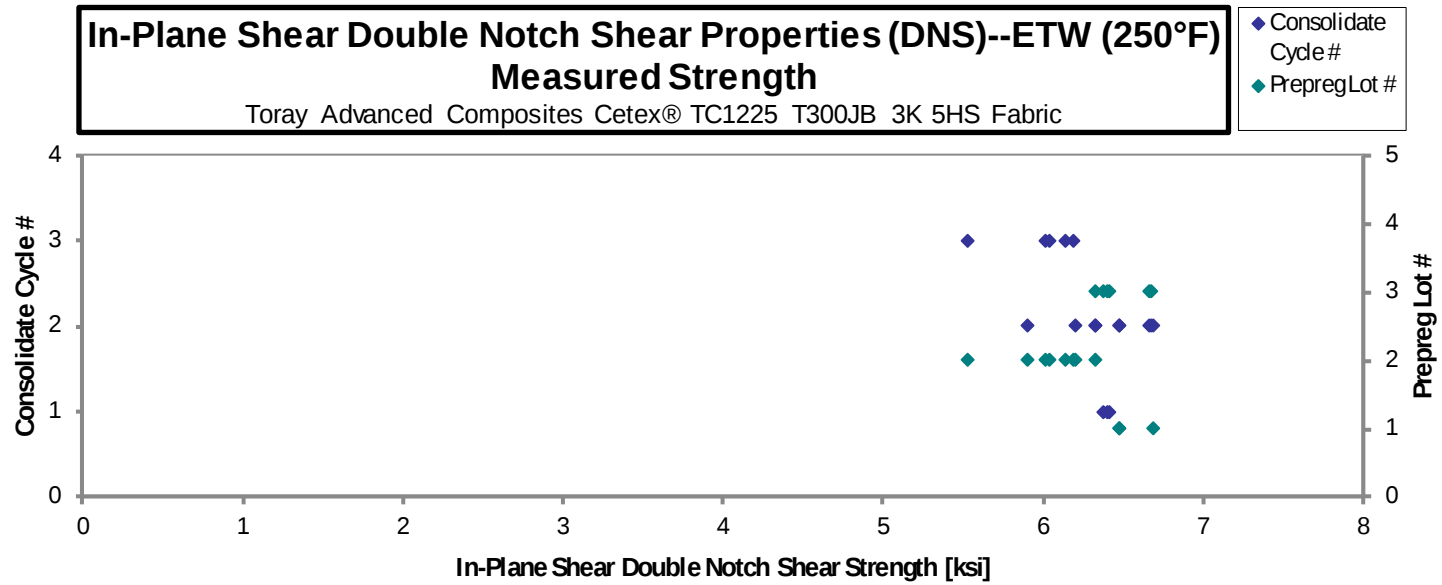
CAM-RP-2024-023 Rev N/C

**In-Plane Shear Double Notch Shear Properties (DNS)--ETW (250°F)
Strength**

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t _{ply} [in]	Failure Mode
TCCVA211D	A	C2	1	2	6.686	0.09672	8	0.01209	GAGE SECTION SHEAR
TCCVA212D	A	C2	1	2	6.466	0.09643	8	0.01205	GAGE SECTION SHEAR
TCCVA213D	A	C2	1	2	6.476	0.09663	8	0.01208	GAGE SECTION SHEAR
TCCVB211D	B	C2	2	2	5.903	0.09730	8	0.01216	GAGE SECTION SHEAR
TCCVB212D	B	C2	2	2	6.199	0.09670	8	0.01209	GAGE SECTION SHEAR
TCCVB213D	B	C2	2	2	6.320	0.09700	8	0.01213	GAGE SECTION SHEAR
TCCVB311D	B	C3	2	3	6.138	0.09862	8	0.01233	GAGE SECTION SHEAR
TCCVB312D	B	C3	2	3	6.035	0.09903	8	0.01238	GAGE SECTION SHEAR, NOTCH SECTION FAILURE
TCCVB313D	B	C3	2	3	5.520	0.09902	8	0.01238	GAGE SECTION SHEAR
TCCVB314D	B	C3	2	3	6.013	0.09883	8	0.01235	GAGE SECTION SHEAR
TCCVB315D	B	C3	2	3	6.185	0.09797	8	0.01225	GAGE SECTION SHEAR
TCCVC111D	C	C1	3	1	6.392	0.09743	8	0.01218	GAGE SECTION SHEAR
TCCVC112D	C	C1	3	1	6.411	0.09715	8	0.01214	GAGE SECTION SHEAR
TCCVC113D	C	C1	3	1	6.368	0.09592	8	0.01199	GAGE SECTION SHEAR
TCCVC211D	C	C2	3	2	6.659	0.09793	8	0.01224	GAGE SECTION SHEAR
TCCVC212D	C	C2	3	2	6.671	0.09833	8	0.01229	GAGE SECTION SHEAR
TCCVC213D	C	C2	3	2	6.325	0.09852	8	0.01231	GAGE SECTION SHEAR

Average	6.280	0.01220
Standard Dev.	0.3022	
Coeff. of Var. [%]	4.812	
Min.	5.520	0.01199
Max.	6.686	0.01238
Number of Spec.	17	17



August 1, 2025

CAM-RP-2024-023 Rev N/C

4.9 “25/50/25” Unnotched Tension 1 Properties (UNT1)

Laminate Unnotched Tension Properties (UNT1)--CTA (-65°F) Strength & Modulus

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

t_{ply} [in]

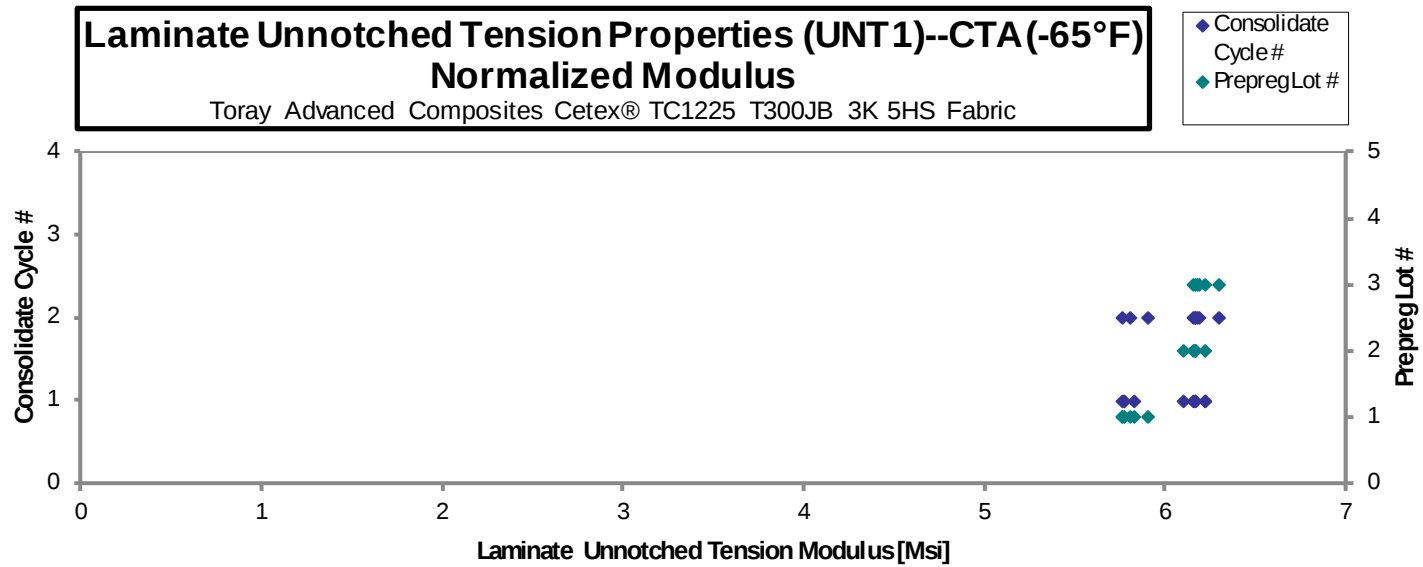
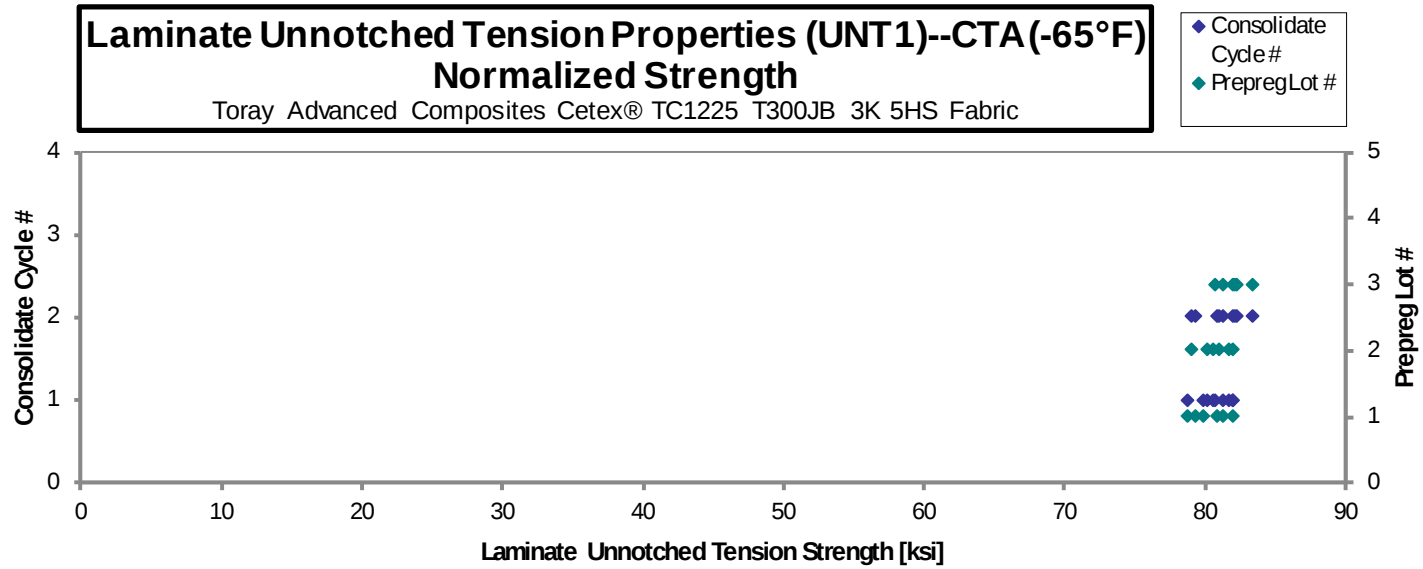
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Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
TCCAA111B	A	C1	1	1	79.38	5.879	0.09677	8	LAT
TCCAA112B	A	C1	1	1	80.95	5.862	0.09618	8	LAT
TCCAA113B	A	C1	1	1	82.71	5.807	0.09673	8	LAT
TCCAA211B	A	C2	1	2	81.35	5.767	0.09750	8	LAT
TCCAA212B	A	C2	1	2	81.08	5.824	0.09723	8	LAB
TCCAA213B	A	C2	1	2	79.32	5.906	0.09758	8	LAT
TCCAB111B	B	C1	2	1	80.87	6.269	0.09675	8	LGT, LWB
TCCAB112B	B	C1	2	1	82.09	6.128	0.09713	8	LAB
TCCAB113B	B	C1	2	1	80.84	6.190	0.09720	8	LAB, LWT
TCCAB211B	B	C2	2	2	79.38	6.197	0.09717	8	M(A,L)GB
TCCAB212B	B	C2	2	2	81.85	6.227	0.09655	8	M(A,L)GB, LAT
TCCAB213B	B	C2	2	2	83.04	6.237	0.09630	8	LAT
TCCAC111B	C	C1	3	1	82.18	6.298	0.09643	8	LAB
TCCAC112B	C	C1	3	1	81.51	6.218	0.09660	8	LAB, LWT
TCCAC113B	C	C1	3	1	82.44	6.208	0.09698	8	LAT, LWB
TCCAC211B	C	C2	3	2	84.52	6.385	0.09618	8	LAT
TCCAC212B	C	C2	3	2	83.49	6.271	0.09610	8	LWT, LAB
TCCAC213B	C	C2	3	2	82.96	6.259	0.09653	8	LWT, LAB

Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.01210	78.70	5.828
0.01202	79.78	5.777
0.01209	81.98	5.756
0.01219	81.26	5.761
0.01215	80.78	5.802
0.01220	79.31	5.905
0.01209	80.17	6.214
0.01214	81.70	6.099
0.01215	80.51	6.165
0.01215	79.02	6.170
0.01207	80.97	6.160
0.01204	81.94	6.154
0.01205	81.20	6.222
0.01208	80.67	6.154
0.01212	81.92	6.169
0.01202	83.30	6.292
0.01201	82.21	6.174
0.01207	82.05	6.191

Average 81.66 6.107
 Standard Dev. 1.446 0.2024
 Coeff. of Var. [%] 1.770 3.315
 Min. 79.32 5.767
 Max. 84.52 6.385
 Number of Spec. 18 18

Average_{norm} 0.01210 80.97 6.055
 Standard Dev._{norm} 1.231 0.1884
 Coeff. of Var. [%]_{norm} 1.520 3.112
 Min. 0.01201 78.70 5.756
 Max. 0.01220 83.30 6.292
 Number of Spec. 18 18 18



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CAM-RP-2024-023 Rev N/C

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

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

t_{ply} [in]

0.01220

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
TCCAA111A*	A	C1	1	1	77.39	6.023	0.09638	8	LAB
TCCAA112A*	A	C1	1	1	78.68	6.028	0.09660	8	LAT
TCCAA113A*	A	C1	1	1	80.57	6.083	0.09587	8	LWT, LAB
TCCAA114A**	A	C1	1	1	78.23		0.09612	8	LWB, LAT
TCCAA211A	A	C2	1	2	78.06	5.907	0.09693	8	LAB
TCCAA212A	A	C2	1	2	79.12	5.858	0.09682	8	LAB
TCCAA213A	A	C2	1	2	79.59	5.882	0.09683	8	LAB
TCCAB111A	B	C1	2	1	78.45	6.109	0.09733	8	M(A,L)WT, LAB
TCCAB112A	B	C1	2	1	80.93	6.084	0.09702	8	LAB
TCCAB113A	B	C1	2	1	80.50	6.035	0.09693	8	LAB
TCCAB211A	B	C2	2	2	78.51	6.031	0.09727	8	M(A,L)AB
TCCAB212A	B	C2	2	2	78.75	5.975	0.09743	8	LAT
TCCAB213A	B	C2	2	2	76.89	6.039	0.09732	8	LAB
TCCAC111A	C	C1	3	1	80.47	6.136	0.09573	8	LAT
TCCAC112A	C	C1	3	1	83.68	6.201	0.09577	8	LAB
TCCAC113A	C	C1	3	1	80.78	6.230	0.09567	8	LWT, LAB
TCCAC211A	C	C2	3	2	82.67	6.184	0.09637	8	LWB, LAT
TCCAC212A	C	C2	3	2	82.86	6.194	0.09578	8	LAB
TCCAC213A	C	C2	3	2	81.98	6.270	0.09585	8	LAT

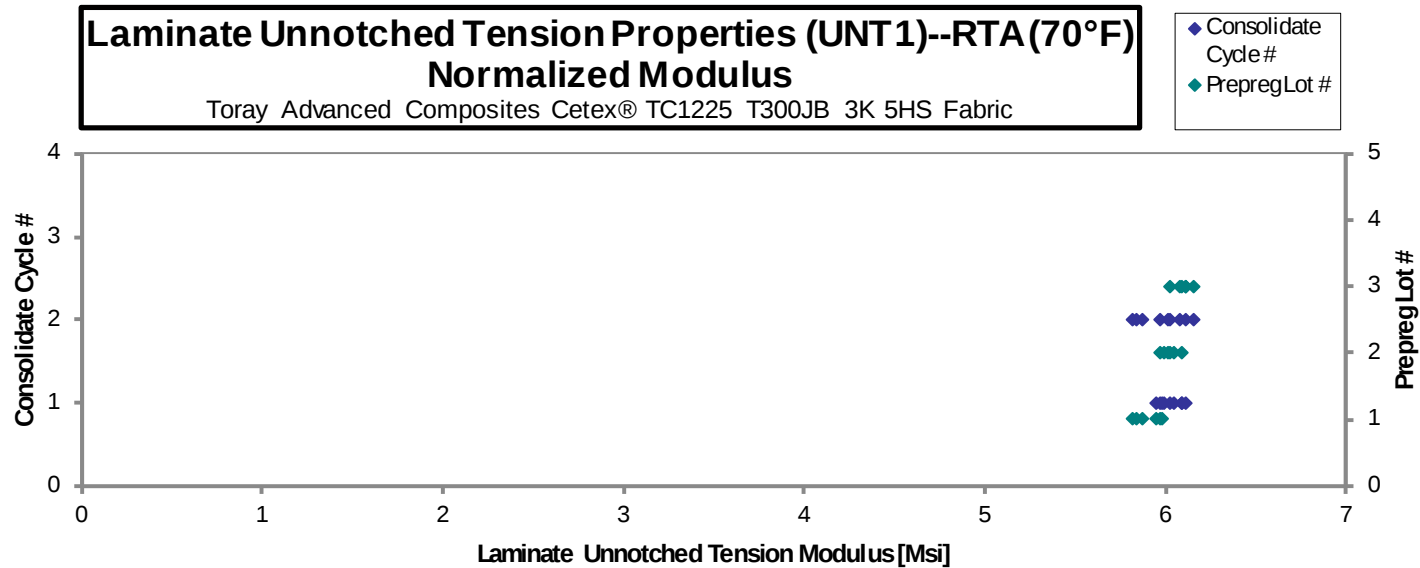
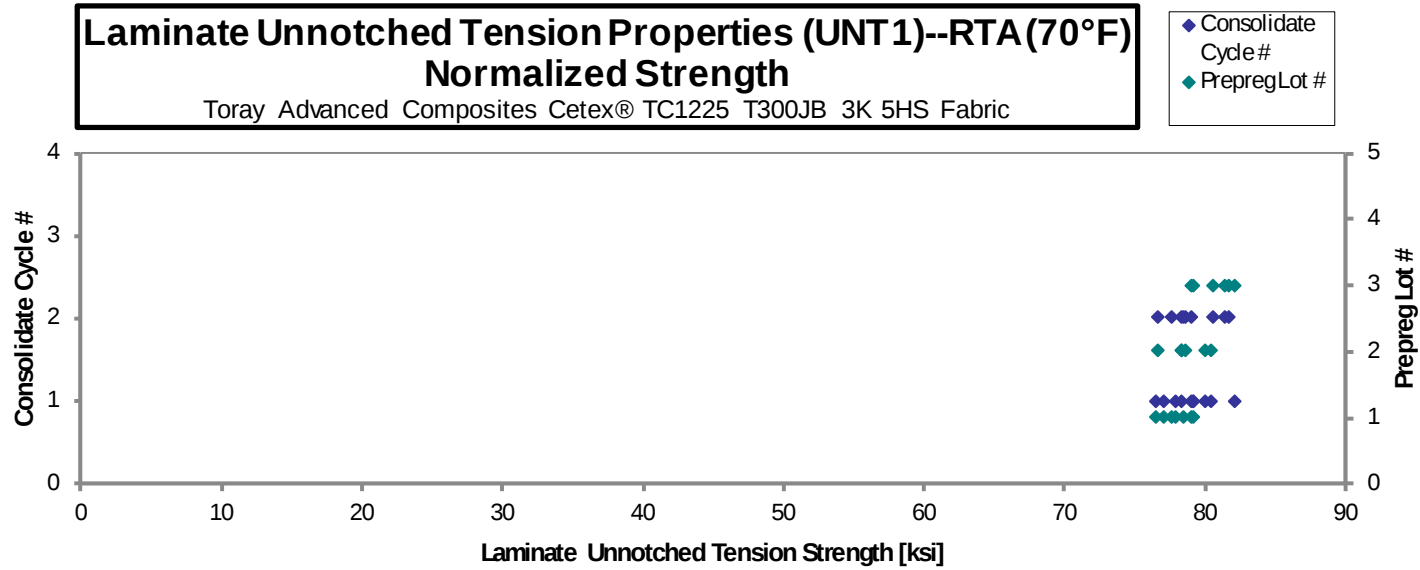
Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.01205	76.43	5.948
0.01208	77.88	5.966
0.01198	79.14	5.975
0.01201	77.04	
0.01212	77.53	5.867
0.01210	78.48	5.811
0.01210	78.97	5.836
0.01217	78.23	6.092
0.01213	80.44	6.048
0.01212	79.95	5.993
0.01216	78.24	6.011
0.01218	78.62	5.964
0.01216	76.67	6.021
0.01197	78.94	6.018
0.01197	82.11	6.085
0.01196	79.18	6.106
0.01205	81.62	6.106
0.01197	81.32	6.079
0.01198	80.51	6.158

* Strain measurement was measured with strain gauge. Extensometer used on other specimens.

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

Average	79.90	6.071
Standard Dev.	1.931	0.1190
Coeff. of Var. [%]	2.417	1.961
Min.	76.89	5.858
Max.	83.68	6.270
Number of Spec.	19	18

Average _{norm}	0.01207	79.02	6.005
Standard Dev. _{norm}		1.636	0.09648
Coeff. of Var. [%] _{norm}		2.071	1.607
Min.	0.01196	76.43	5.811
Max.	0.01218	82.11	6.158
Number of Spec.	19	19	18



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CAM-RP-2024-023 Rev N/C

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

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

t_{ply} [in]

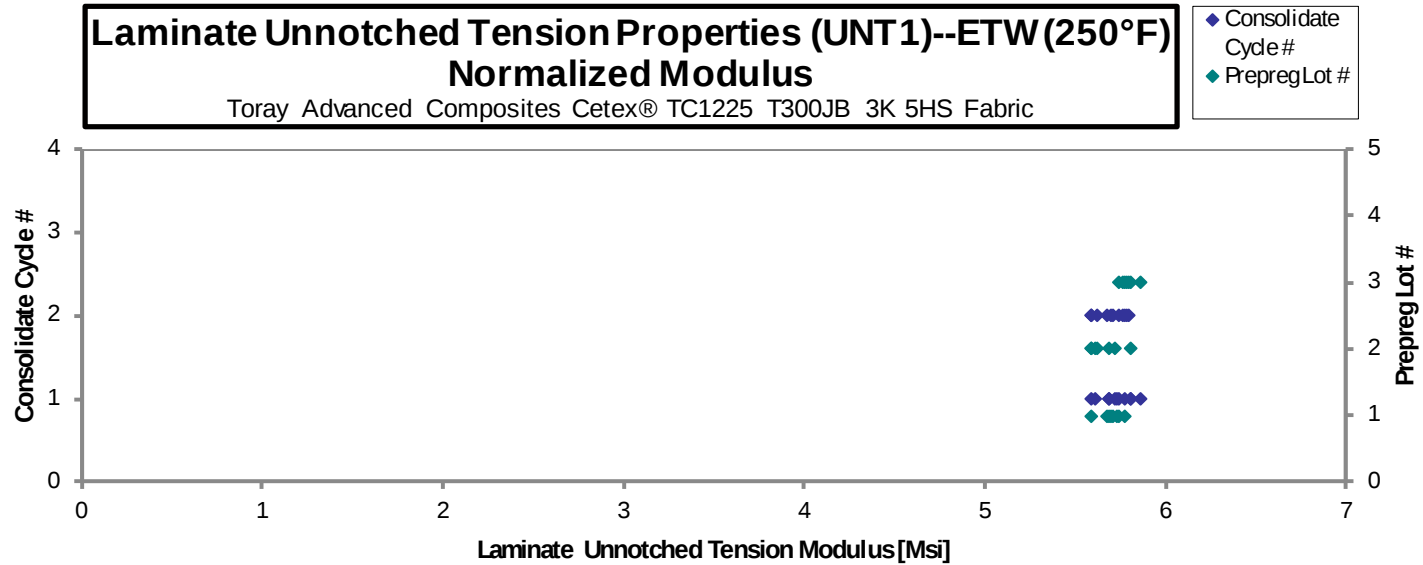
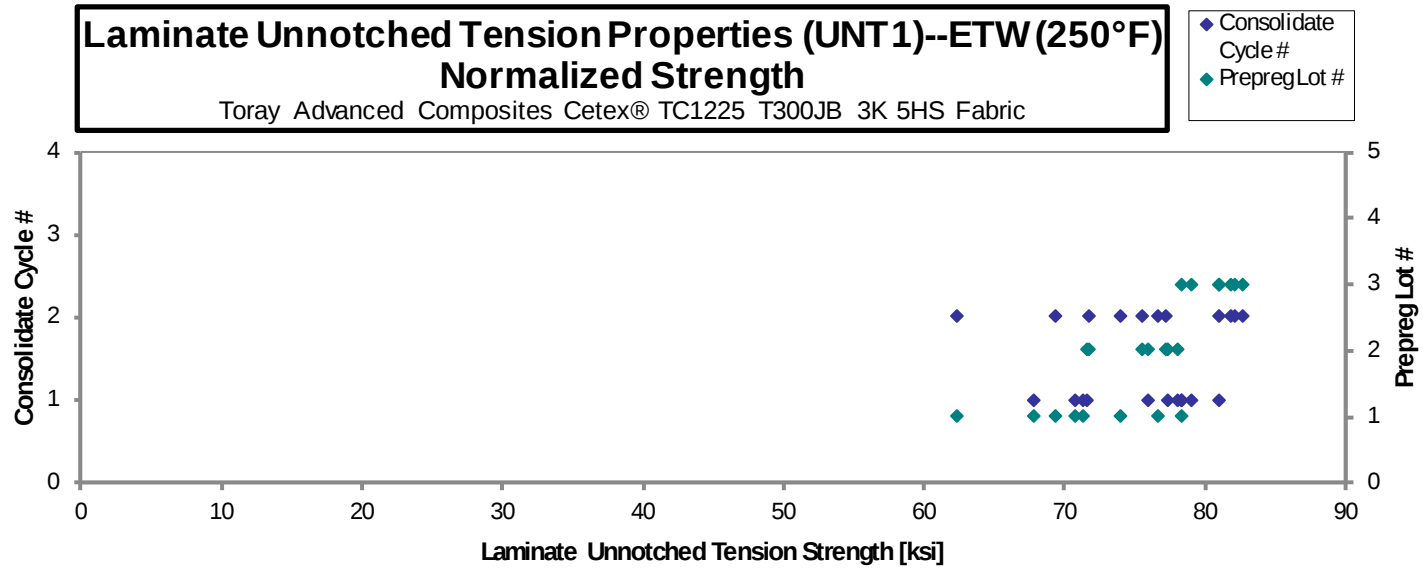
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Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
TCCAA111D	A	C1	1	1	78.65	5.615	0.09712	8	LGB
TCCAA112D	A	C1	1	1	71.61	5.762	0.09635	8	LAT
TCCAA113D	A	C1	1	1	71.83	5.786	0.09683	8	LWT
TCCAA114D	A	C1	1	1	68.16	5.761	0.09710	8	LAT
TCCAA211D	A	C2	1	2	70.05	5.748	0.09660	8	LGT
TCCAA212D	A	C2	1	2	74.01	5.771	0.09753	8	LAT
TCCAA213D	A	C2	1	2	63.34	5.799	0.09598	8	LWT
TCCAA214D	A	C2	1	2	77.66	5.750	0.09633	8	M(A,L)GT
TCCAB111D	B	C1	2	1	72.12	5.648	0.09687	8	AGT
TCCAB112D	B	C1	2	1	78.52	5.752	0.09702	8	AWB, M(A,L)WT
TCCAB113D	B	C1	2	1	76.40	5.844	0.09688	8	M(A,L)GT, M(A,L)AB
TCCAB114D	B	C1	2	1	77.26	5.687	0.09758	8	LGT, AWB
TCCAB211D	B	C2	2	2	72.37	5.638	0.09663	8	LGB
TCCAB212D	B	C2	2	2	77.87	5.662	0.09673	8	AWB
TCCAB213D	B	C2	2	2	75.84	5.614	0.09710	8	AWB, AWT
TCCAC111D	C	C1	3	1	78.80	5.843	0.09690	8	LGM
TCCAC112D	C	C1	3	1	79.39	5.888	0.09708	8	M(A,L)GT
TCCAC113D	C	C1	3	1	81.29	5.799	0.09710	8	LGM
TCCAC211D	C	C2	3	2	82.10	5.815	0.09622	8	AGM
TCCAC212D	C	C2	3	2	83.62	5.829	0.09638	8	LAT, LWB
TCCAC213D	C	C2	3	2	83.23	5.869	0.09630	8	LGM
TCCAC214D	C	C2	3	2	82.87	5.863	0.09632	8	LGB

Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.01214	78.26	5.588
0.01204	70.69	5.688
0.01210	71.26	5.740
0.01214	67.81	5.731
0.01208	69.33	5.689
0.01219	73.96	5.767
0.01200	62.29	5.703
0.01204	76.66	5.675
0.01211	71.58	5.605
0.01213	78.05	5.718
0.01211	75.84	5.801
0.01220	77.25	5.686
0.01208	71.65	5.582
0.01209	77.18	5.612
0.01214	75.45	5.586
0.01211	78.24	5.801
0.01214	78.97	5.857
0.01214	80.88	5.769
0.01203	80.93	5.732
0.01205	82.57	5.756
0.01204	82.12	5.791
0.01204	81.78	5.786

Average 76.23 5.761
 Standard Dev. 5.293 0.08430
 Coeff. of Var. [%] 6.944 1.463
 Min. 63.34 5.614
 Max. 83.62 5.888
 Number of Spec. 22 22

Average_{norm} 0.01210 75.58 5.712
 Standard Dev._{norm} 5.246 0.07908
 Coeff. of Var. [%]_{norm} 6.941 1.385
 Min. 0.01200 62.29 5.582
 Max. 0.01220 82.57 5.857
 Number of Spec. 22 22 22



August 1, 2025

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4.10 “10/80/10” Unnotched Tension 2 Properties (UNT2)

Laminate Unnotched Tension Properties (UNT2)--CTA (-65°F) Strength & Modulus

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

t_{ply} [in]

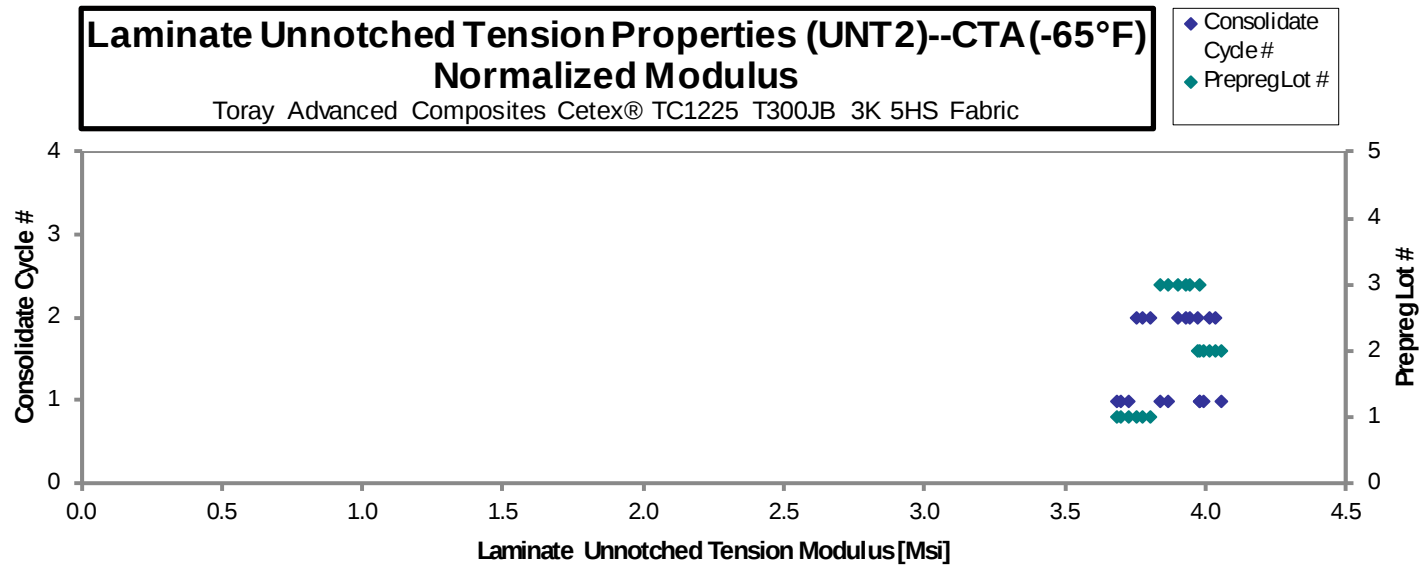
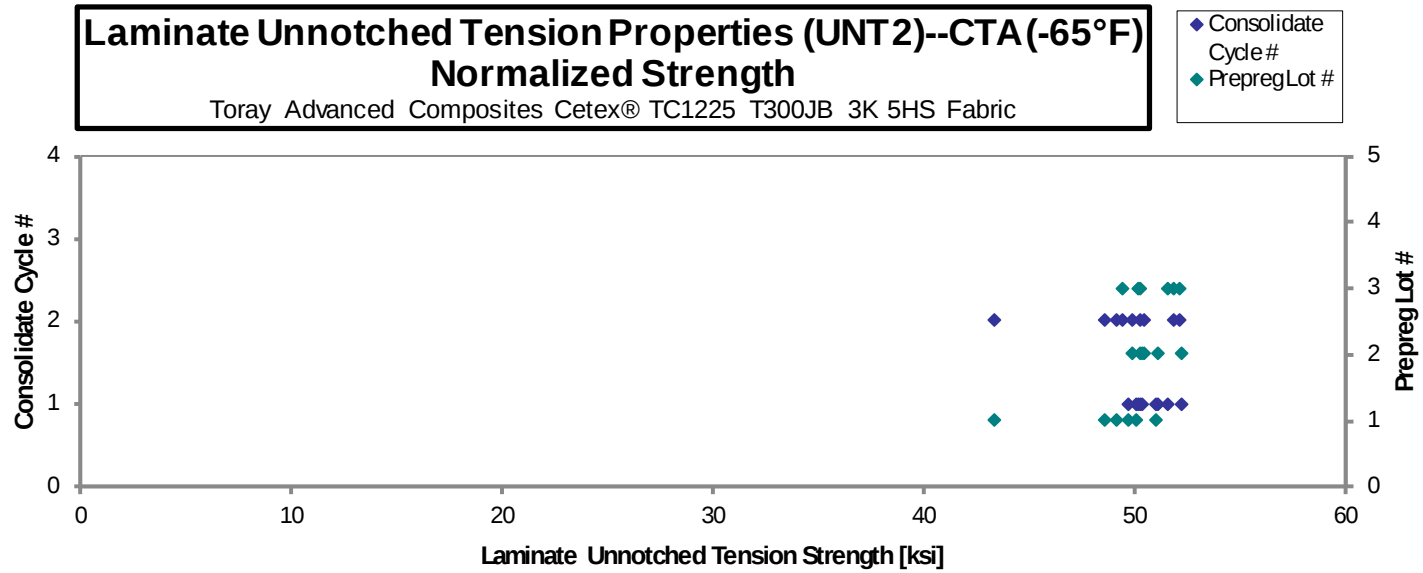
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Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
TCCBA111B	A	C1	1	1	51.28	3.698	0.1214	10	LWB
TCCBA112B	A	C1	1	1	49.94	3.745	0.1213	10	LWT
TCCBA113B	A	C1	1	1	50.72	3.745	0.1205	10	LWT
TCCBA211B	A	C2	1	2	43.04	3.781	0.1227	10	M(A,L)WT
TCCBA212B	A	C2	1	2	48.65	3.721	0.1231	10	M(A,L)WT
TCCBA213B	A	C2	1	2	48.74	3.789	0.1214	10	M(A,L)WT
TCCBB111B	B	C1	2	1	52.11	3.972	0.1221	10	M(A,L)GT
TCCBB112B	B	C1	2	1	50.71	4.022	0.1211	10	M(A,L)GM
TCCBB113B	B	C1	2	1	51.55	4.091	0.1209	10	LAB
TCCBB211B	B	C2	2	2	50.38	4.013	0.1206	10	AGM
TCCBB212B	B	C2	2	2	50.93	4.072	0.1208	10	LAB
TCCBB213B	B	C2	2	2	50.73	4.050	0.1208	10	LAT
TCCBC111B	C	C1	3	1	50.92	4.029	0.1203	10	M(A,D,L)GM
TCCBC112B	C	C1	3	1	50.90	3.927	0.1201	10	M(A,D,L)GM
TCCBC113B	C	C1	3	1	52.27	3.894	0.1202	10	M(A,L)WT
TCCBC211B	C	C2	3	2	49.87	3.967	0.1207	10	M(A,D,L)WT
TCCBC212B	C	C2	3	2	52.63	3.939	0.1207	10	M(D,L)WB
TCCBC213B	C	C2	3	2	52.39	3.984	0.1207	10	M(A,D,L)WB

Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.01214	51.01	3.678
0.01213	49.63	3.722
0.01205	50.08	3.698
0.01227	43.27	3.801
0.01231	49.07	3.753
0.01214	48.50	3.770
0.01221	52.16	3.976
0.01211	50.33	3.992
0.01209	51.09	4.054
0.01206	49.81	3.968
0.01208	50.44	4.033
0.01208	50.22	4.009
0.01203	50.21	3.973
0.01201	50.11	3.866
0.01202	51.51	3.837
0.01207	49.34	3.925
0.01207	52.07	3.896
0.01207	51.83	3.941

Average 50.43 3.913
 Standard Dev. 2.156 0.1320
 Coeff. of Var. [%] 4.275 3.373
 Min. 43.04 3.698
 Max. 52.63 4.091
 Number of Spec. 18 18

Average_{norm} 0.01211 50.04 3.883
 Standard Dev_{norm} 1.973 0.1211
 Coeff. of Var. [%]_{norm} 3.943 3.119
 Min. 0.01201 43.27 3.678
 Max. 0.01231 52.16 4.054
 Number of Spec. 18 18 18



August 1, 2025

CAM-RP-2024-023 Rev N/C

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

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

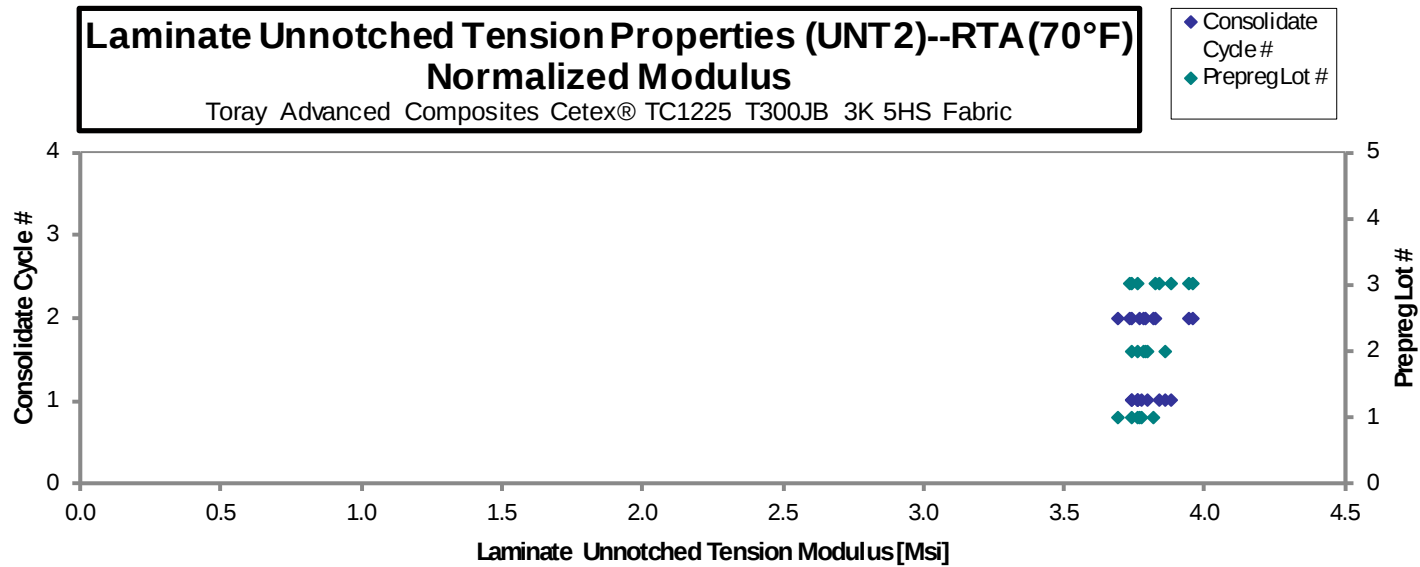
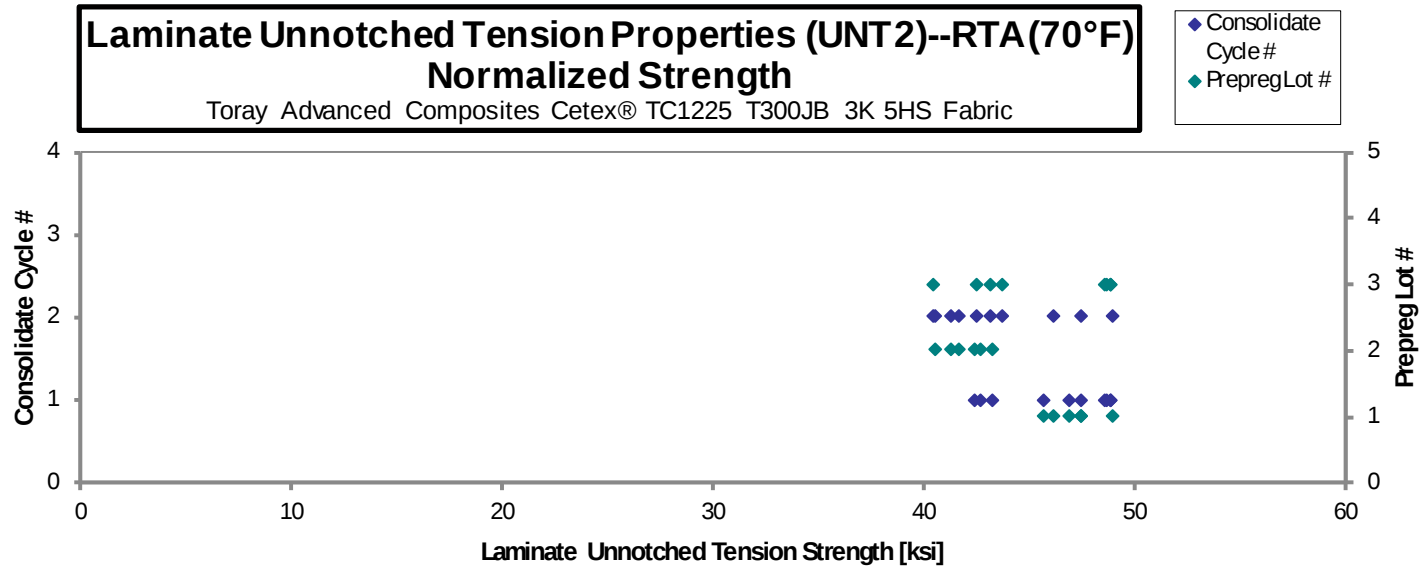
t_{ply} [in]

0.01220

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
TCCBA111A	A	C1	1	1	47.66	3.798	0.1213	10	LWT	0.01213	47.39	3.777
TCCBA112A	A	C1	1	1	47.34	3.779	0.1207	10	M(A,L)WB	0.01207	46.85	3.739
TCCBA113A	A	C1	1	1	46.32	3.811	0.1203	10	LWT	0.01203	45.68	3.759
TCCBA211A	A	C2	1	2	48.95	3.820	0.1219	10	LGB	0.01219	48.91	3.816
TCCBA212A	A	C2	1	2	47.45	3.774	0.1219	10	LGB	0.01219	47.42	3.771
TCCBA213A	A	C2	1	2	46.19	3.705	0.1217	10	LGB	0.01217	46.06	3.695
TCCBB111A	B	C1	2	1	42.60	3.781	0.1214	10	M(A,L)AT	0.01214	42.40	3.763
TCCBB112A	B	C1	2	1	42.97	3.826	0.1210	10	M(A,L)AB	0.01210	42.61	3.794
TCCBB113A	B	C1	2	1	43.34	3.866	0.1217	10	M(A,L)GT	0.01217	43.25	3.857
TCCBB211A	B	C2	2	2	42.14	3.835	0.1206	10	M(A,L)GB	0.01206	41.65	3.791
TCCBB212A	B	C2	2	2	41.72	3.781	0.1207	10	M(A,L)GM	0.01207	41.28	3.741
TCCBB213A	B	C2	2	2	40.79	3.810	0.1212	10	M(A,L)GB	0.01212	40.51	3.784
TCCBC111A	C	C1	3	1	49.00	3.777	0.1216	10	M(D,L)AT	0.01216	48.82	3.763
TCCBC112A	C	C1	3	1	48.94	3.865	0.1211	10	DGB, M(A,L)AB	0.01211	48.59	3.838
TCCBC113A	C	C1	3	1	48.97	3.774	0.1209	10	M(A,D,L)GB	0.01209	48.55	3.741
TCCBC114A	C	C1	3	1	49.32	3.925	0.1207	10	M(A,D,L)WB	0.01207	48.78	3.882
TCCBC211A	C	C2	3	2	40.60	3.842	0.1214	10	M(D,A,L)WT	0.01214	40.41	3.824
TCCBC212A	C	C2	3	2	42.76	3.976	0.1211	10	DGM, M(A,L)GB	0.01211	42.44	3.946
TCCBC213A	C	C2	3	2	43.52	3.769	0.1209	10	M(D,A,L)GM	0.01209	43.13	3.735
TCCBC214A	C	C2	3	2	43.96	3.980	0.1212	10	M(D,A,L)GB	0.01212	43.68	3.955

Average 45.23 3.825
 Standard Dev. 3.070 0.06985
 Coeff. of Var. [%] 6.789 1.826
 Min. 40.60 3.705
 Max. 49.32 3.980
 Number of Spec. 20 20

Average_{norm} 0.01212 44.92 3.799
 Standard Dev._{norm} 3.075 0.06868
 Coeff. of Var. [%]_{norm} 6.846 1.808
 Min. 0.01203 40.41 3.695
 Max. 0.01219 48.91 3.955
 Number of Spec. 20 20 20



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

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

 t_{ply} [in]

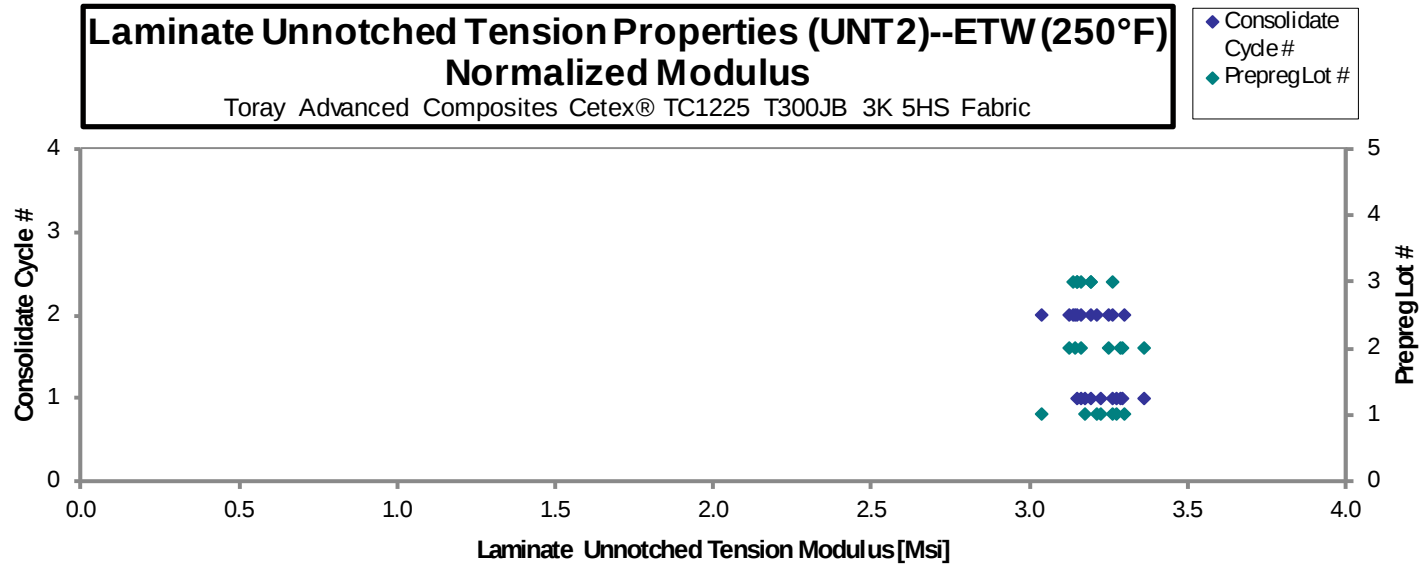
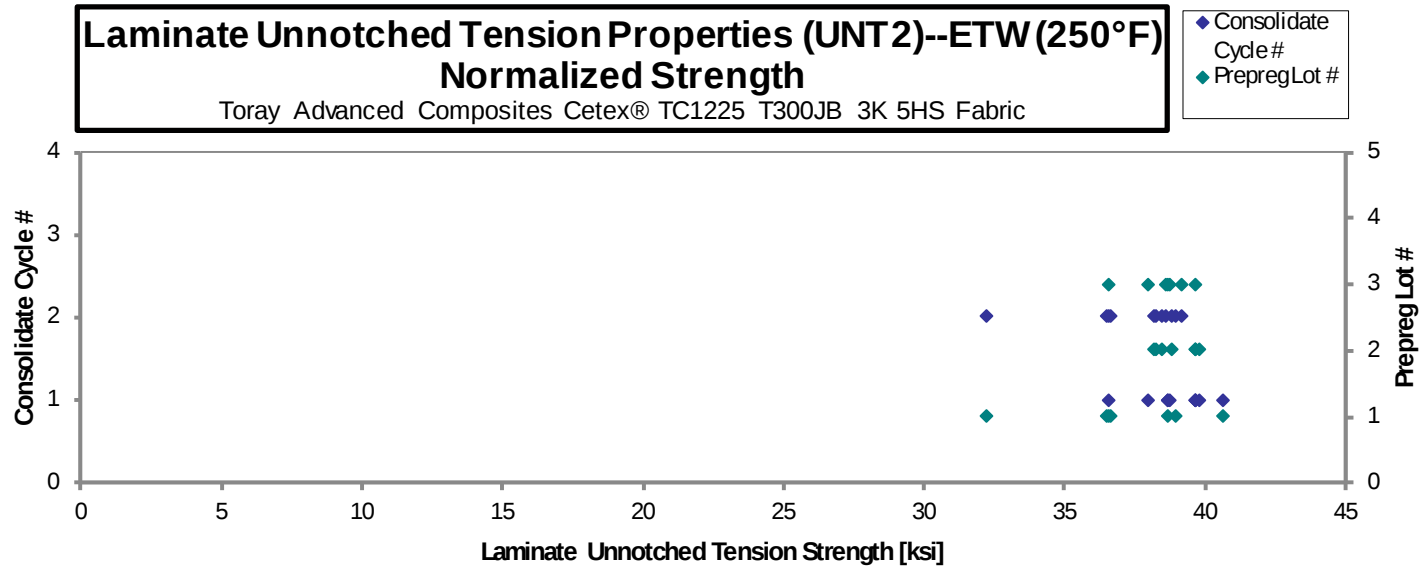
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Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
TCCBA111D	A	C1	1	1	40.93	3.245	0.1211	10	M(A,L)GB
TCCBA112D	A	C1	1	1	36.79	3.298	0.1211	10	M(A,L)WT
TCCBA113D	A	C1	1	1	39.04	3.208	0.1207	10	AGT
TCCBA211D	A	C2	1	2	36.55	3.271	0.1217	10	M(A,L)GT
TCCBA212D	A	C2	1	2	36.63	3.302	0.1219	10	M(A,L)WT
TCCBA213D	A	C2	1	2	32.34	3.046	0.1216	10	M(A,L)GT
TCCBA214D	A	C2	1	2	39.05	3.216	0.1217	10	M(A,L)GM
TCCBB111D	B	C1	2	1	39.79	3.306	0.1216	10	M(A,L)GM
TCCBB112D	B	C1	2	1	39.94	3.302	0.1214	10	M(A,D)GM
TCCBB113D	B	C1	2	1	39.84	3.381	0.1213	10	M(A,L)GM
TCCBB211D	B	C2	2	2	38.65	3.175	0.1208	10	AGM
TCCBB212D	B	C2	2	2	39.20	3.198	0.1206	10	M(A,L)GM
TCCBB213D	B	C2	2	2	38.95	3.290	0.1204	10	M(A,L)GM
TCCBB214D	B	C2	2	2	38.63	3.164	0.1205	10	M(A,L)GM
TCCBC111D	C	C1	3	1	38.40	3.227	0.1206	10	M(D,A,L)GM
TCCBC112D	C	C1	3	1	39.07	3.188	0.1206	10	M(D,A,L)GM
TCCBC113D	C	C1	3	1	40.16	3.304	0.1203	10	M(D,A,L)GM
TCCBC114D	C	C1	3	1	39.23	3.199	0.1205	10	M(D,A,L)GT
TCCBC211D	C	C2	3	2	39.50	3.179	0.1209	10	M(D,L)GM
TCCBC212D	C	C2	3	2	38.79	3.210	0.1214	10	M(D,A,L)WB
TCCBC213D	C	C2	3	2	36.82	3.165	0.1210	10	M(D,A,L)GM

Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.01211	40.63	3.222
0.01211	36.52	3.274
0.01207	38.63	3.174
0.01217	36.44	3.262
0.01219	36.59	3.298
0.01216	32.23	3.036
0.01217	38.95	3.208
0.01216	39.65	3.295
0.01214	39.74	3.285
0.01213	39.61	3.361
0.01208	38.25	3.143
0.01206	38.76	3.162
0.01204	38.45	3.248
0.01205	38.15	3.125
0.01206	37.96	3.190
0.01206	38.63	3.151
0.01203	39.60	3.258
0.01205	38.74	3.159
0.01209	39.13	3.149
0.01214	38.61	3.195
0.01210	36.52	3.139

Average 38.49 3.232
 Standard Dev. 1.850 0.07328
 Coeff. of Var. [%] 4.807 2.267
 Min. 32.34 3.046
 Max. 40.93 3.381
 Number of Spec. 21 21

Average_{norm} 0.01210 38.18 3.206
 Standard Dev._{norm} 1.789 0.07584
 Coeff. of Var. [%]_{norm} 4.685 2.365
 Min. 0.01203 32.23 3.036
 Max. 0.01219 40.63 3.361
 Number of Spec. 21 21 21



4.11 “40/20/40” Unnotched Tension 3 Properties (UNT3)

**Laminate Unnotched Tension Properties (UNT3)--CTA (-65°F)
Strength & Modulus**

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

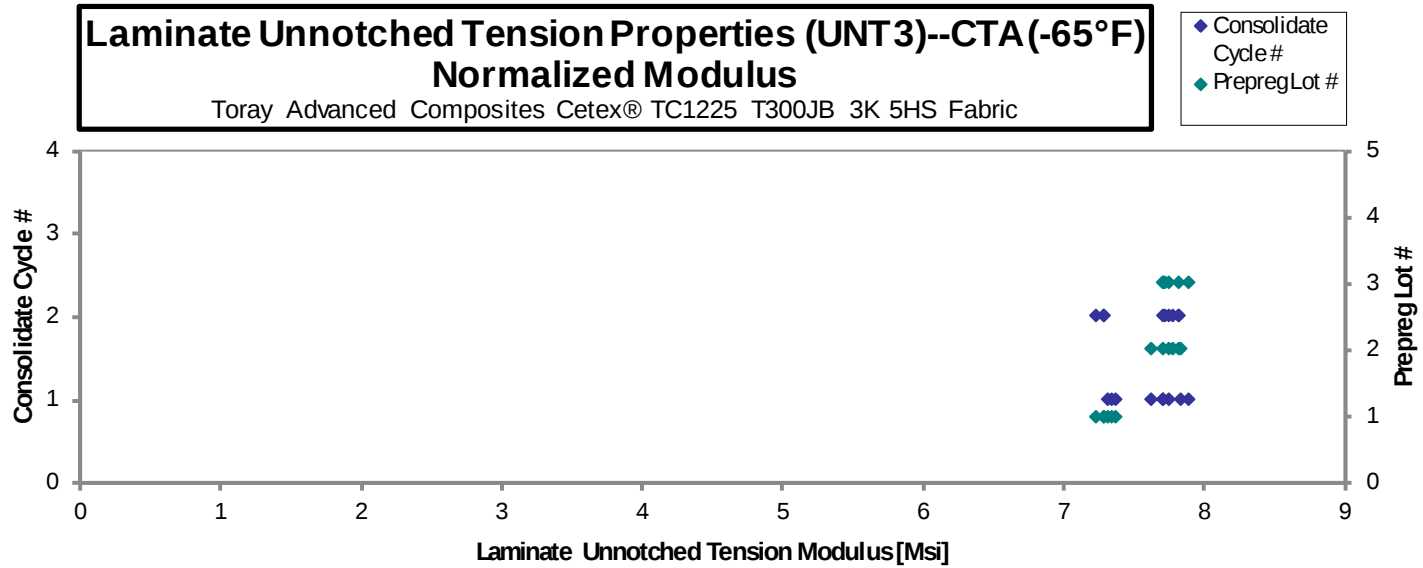
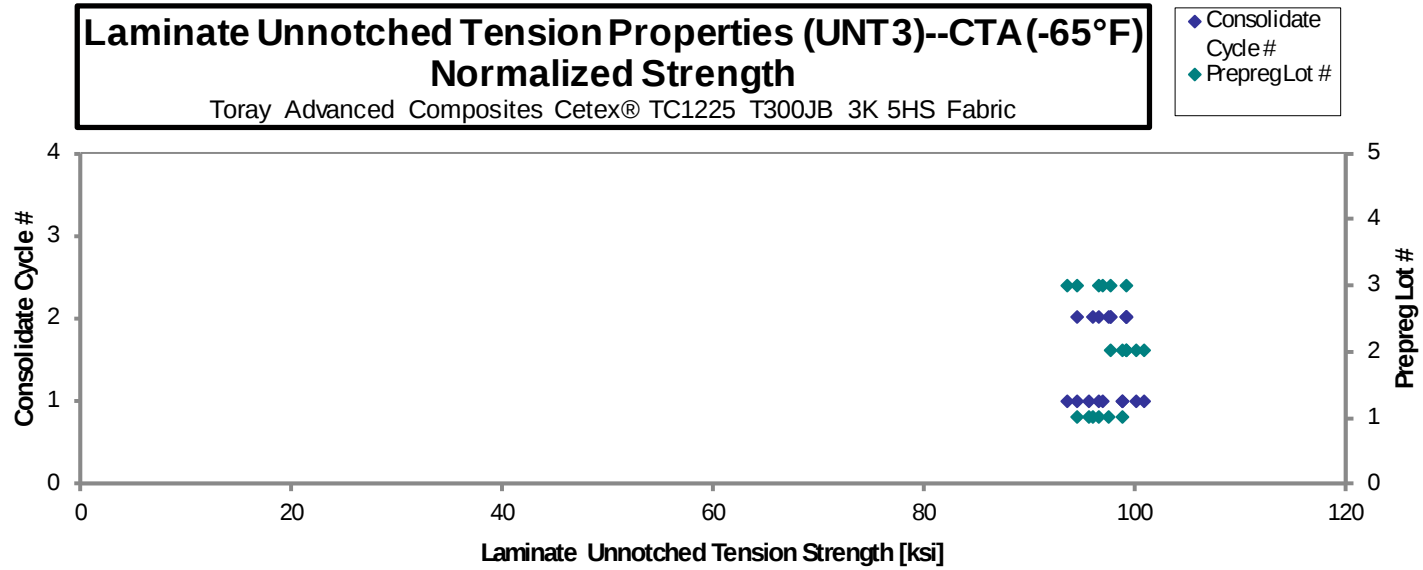
t_{ply} [in]

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Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t _{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
TCCCA111B	A	C1	1	1	96.14	7.353	0.1214	10	LAT	0.01214	95.63	7.314
TCCCA112B	A	C1	1	1	94.66	7.394	0.1216	10	LAT	0.01216	94.37	7.371
TCCCA113B	A	C1	1	1	99.17	7.365	0.1216	10	LAB	0.01216	98.80	7.338
TCCCA211B	A	C2	1	2	96.48	7.282	0.1221	10	LAT	0.01221	96.55	7.288
TCCCA212B	A	C2	1	2	95.40	7.249	0.1227	10	LAT	0.01227	95.94	7.289
TCCCA213B	A	C2	1	2	97.17	7.200	0.1224	10	LAB	0.01224	97.50	7.225
TCCCB111B	B	C1	2	1	101.7	7.771	0.1209	10	LAT	0.01209	100.8	7.703
TCCCB112B	B	C1	2	1	99.57	7.685	0.1209	10	LAB	0.01209	98.70	7.618
TCCCB113B	B	C1	2	1	100.5	7.863	0.1216	10	LAB	0.01216	100.1	7.837
TCCCB211B	B	C2	2	2	98.55	7.848	0.1209	10	LAB	0.01209	97.66	7.777
TCCCB212B	B	C2	2	2	100.0	7.891	0.1209	10	LAB	0.01209	99.12	7.821
TCCCB213B	B	C2	2	2	100.0	7.830	0.1209	10	LAB, LWT	0.01209	99.07	7.757
TCCCC111B	C	C1	3	1	97.97	7.982	0.1207	10	LWT, LAB	0.01207	96.89	7.894
TCCCC112B	C	C1	3	1	94.71	7.842	0.1206	10	LAB	0.01206	93.59	7.750
TCCCC113B	C	C1	3	1	97.56	7.793	0.1206	10	LAB	0.01206	96.44	7.704
TCCCC211B	C	C2	3	2	94.96	7.874	0.1213	10	LAT	0.01213	94.40	7.828
TCCCC212B	C	C2	3	2	99.58	7.764	0.1215	10	LAT, LWB	0.01215	99.13	7.729
TCCCC213B	C	C2	3	2	98.23	7.756	0.1212	10	LAB	0.01212	97.57	7.704

Average 97.91 7.652
 Standard Dev. 2.157 0.2619
 Coeff. of Var. [%] 2.203 3.423
 Min. 94.66 7.200
 Max. 101.7 7.982
 Number of Spec. 18 18

Average_{norm} 0.01213 97.35 7.608
 Standard Dev_{norm} 2.050 0.2309
 Coeff. of Var. [%]_{norm} 2.106 3.035
 Min. 0.01206 93.59 7.225
 Max. 0.01227 100.8 7.894
 Number of Spec. 18 18 18



August 1, 2025

CAM-RP-2024-023 Rev N/C

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

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

t_{ply} [in]

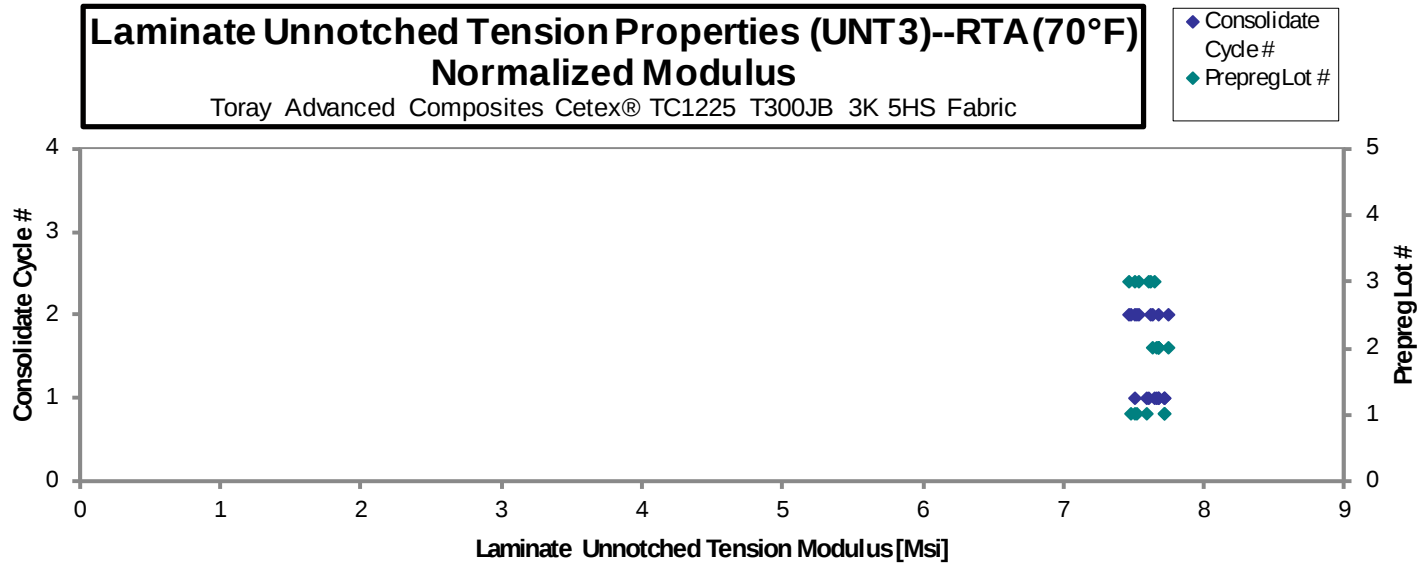
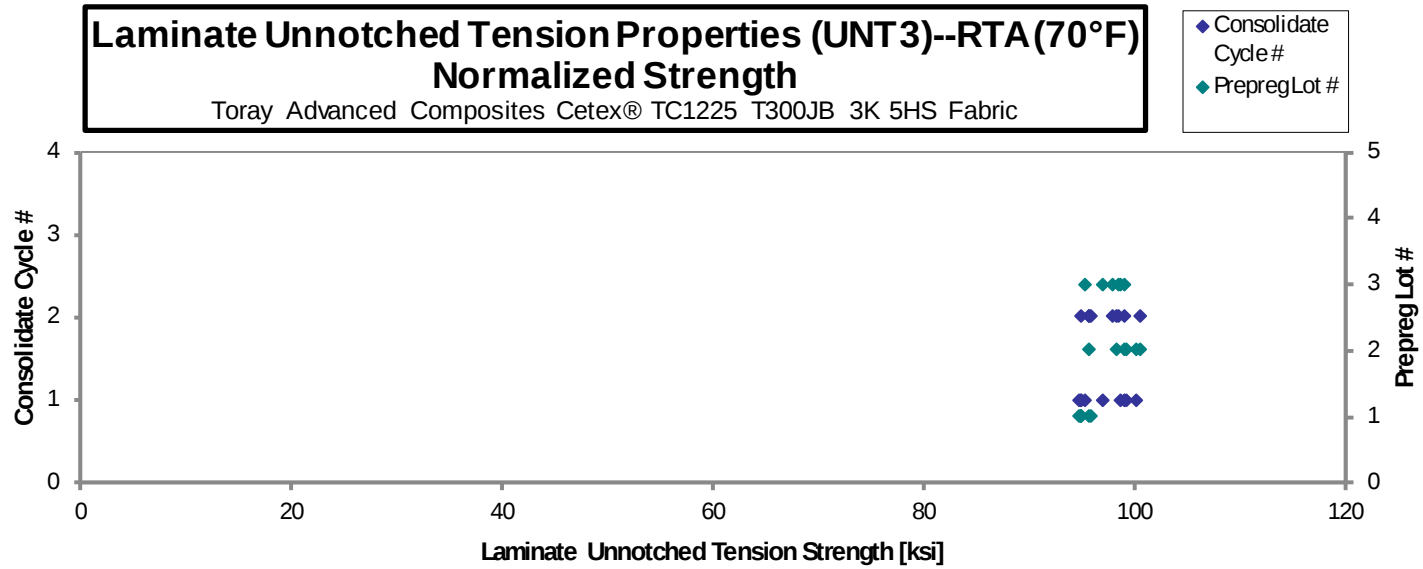
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Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
TCCCA111A	A	C1	1	1	95.28	7.774	0.1212	10	LAB, LWT
TCCCA112A	A	C1	1	1	95.13	7.744	0.1216	10	LAB, LWT
TCCCA113A	A	C1	1	1	95.64	7.663	0.1210	10	LAB
TCCCA211A	A	C2	1	2	95.12	7.544	0.1216	10	LAT
TCCCA212A	A	C2	1	2	95.45	7.472	0.1223	10	LAB
TCCCA213A	A	C2	1	2	95.76	7.529	0.1220	10	LAT, M(A,L)WB
TCCCB111A	B	C1	2	1	99.40	7.697	0.1217	10	LAT
TCCCB112A	B	C1	2	1	100.0	7.669	0.1220	10	LAB
TCCCB113A	B	C1	2	1	98.77	7.668	0.1223	10	LAB
TCCCB211A	B	C2	2	2	97.01	7.859	0.1203	10	LAT
TCCCB212A	B	C2	2	2	100.5	7.687	0.1219	10	LAB
TCCCB213A	B	C2	2	2	98.48	7.668	0.1216	10	LAT, M(A,L)WB
TCCCC111A	C	C1	3	1	96.66	7.619	0.1203	10	M(A,L)WB, LAT
TCCCC112A	C	C1	3	1	99.80	7.703	0.1206	10	LWT, LAB
TCCCC113A	C	C1	3	1	97.93	7.748	0.1206	10	LWB, LAT
TCCCC211A	C	C2	3	2	97.92	7.492	0.1218	10	LAT
TCCCC212A	C	C2	3	2	99.32	7.573	0.1215	10	LAB
TCCCC213A	C	C2	3	2	99.07	7.675	0.1212	10	LAB

Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.01212	94.69	7.725
0.01216	94.83	7.720
0.01210	94.86	7.600
0.01216	94.79	7.518
0.01223	95.67	7.489
0.01220	95.76	7.529
0.01217	99.13	7.676
0.01220	99.99	7.667
0.01223	99.01	7.687
0.01203	95.64	7.748
0.01219	100.4	7.683
0.01216	98.16	7.643
0.01203	95.30	7.512
0.01206	98.67	7.616
0.01206	96.81	7.659
0.01218	97.76	7.479
0.01215	98.94	7.544
0.01212	98.43	7.626

Average 97.62 7.655
 Standard Dev. 1.883 0.1014
 Coeff. of Var. [%] 1.929 1.325
 Min. 95.12 7.472
 Max. 100.5 7.859
 Number of Spec. 18 18

Average_{norm} 0.01214 97.16 7.618
 Standard Dev._{norm} 1.982 0.08632
 Coeff. of Var. [%]_{norm} 2.040 1.133
 Min. 0.01203 94.69 7.479
 Max. 0.01223 100.4 7.748
 Number of Spec. 18 18 18



August 1, 2025

CAM-RP-2024-023 Rev N/C

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

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

t_{ply} [in]

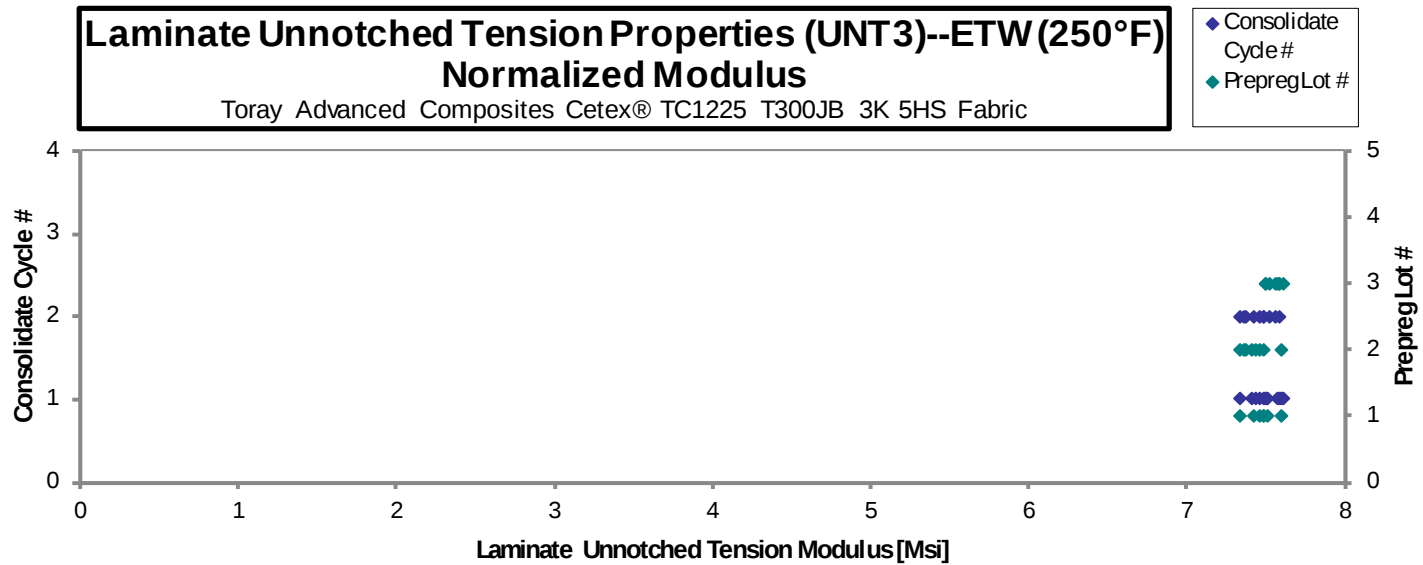
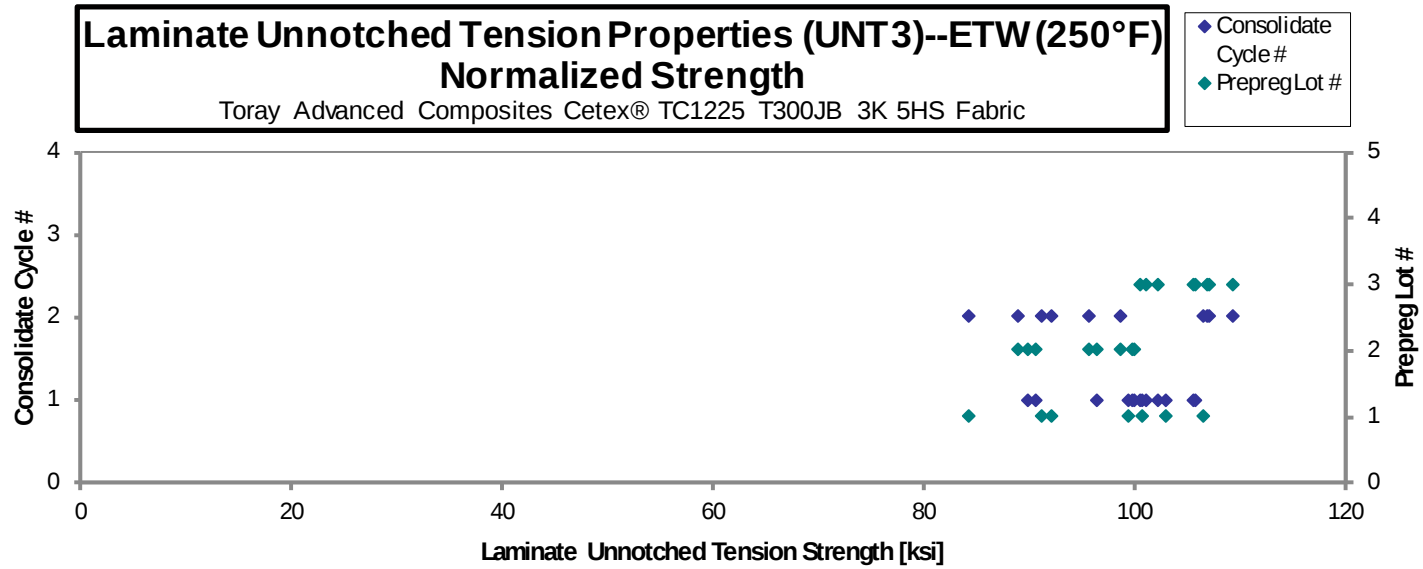
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Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
TCCCA111D	A	C1	1	1	100.8	7.626	0.1202	10	LWB, M(A,L)AT
TCCCA112D	A	C1	1	1	104.1	7.549	0.1206	10	LWB, M(A,L)WT
TCCCA113D	A	C1	1	1	101.2	7.634	0.1214	10	M(A,L)AT
TCCCA211D	A	C2	1	2	91.16	7.345	0.1220	10	M(A,L)WT
TCCCA212D	A	C2	1	2	83.77	7.399	0.1225	10	M(A,L)WT
TCCCA213D	A	C2	1	2	106.9	7.511	0.1216	10	LWB, LAT
TCCCA214D	A	C2	1	2	92.08	7.489	0.1220	10	LWT
TCCCB111D	B	C1	2	1	97.13	7.470	0.1211	10	LGB, AAT
TCCCB112D	B	C1	2	1	100.6	7.555	0.1210	10	LGT, LWB
TCCCB113D	B	C1	2	1	100.4	7.470	0.1215	10	LAB
TCCCB114D	B	C1	2	1	91.31	7.670	0.1209	10	LWT, LIB
TCCCB115D	B	C1	2	1	90.33	7.380	0.1212	10	LAB
TCCCB211D	B	C2	2	2	89.71	7.437	0.1208	10	LWB
TCCCB212D	B	C2	2	2	96.63	7.443	0.1208	10	M(A,L)AT
TCCCB213D	B	C2	2	2	99.65	7.536	0.1207	10	LGB, AAT
TCCCC111D	C	C1	3	1	103.3	7.670	0.1207	10	LAB
TCCCC112D	C	C1	3	1	102.1	7.579	0.1206	10	LGB, M(A,L)WT
TCCCC113D	C	C1	3	1	107.1	7.679	0.1204	10	LGB, LAT
TCCCC114D	C	C1	3	1	106.6	7.575	0.1207	10	LAT, LWB
TCCCC115D	C	C1	3	1	101.6	7.705	0.1206	10	LWT, LGB
TCCCC211D	C	C2	3	2	108.3	7.620	0.1204	10	LGT, LAB
TCCCC212D	C	C2	3	2	110.9	7.691	0.1203	10	LGB, LAT
TCCCC213D	C	C2	3	2	108.1	7.665	0.1204	10	LGB, LWT

Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.01202	99.30	7.516
0.01206	102.9	7.464
0.01214	100.6	7.594
0.01220	91.12	7.342
0.01225	84.13	7.430
0.01216	106.5	7.485
0.01220	92.07	7.488
0.01211	96.38	7.412
0.01210	99.70	7.490
0.01215	99.91	7.438
0.01209	90.45	7.597
0.01212	89.74	7.331
0.01208	88.84	7.365
0.01208	95.67	7.369
0.01207	98.61	7.456
0.01207	102.2	7.589
0.01206	101.0	7.493
0.01204	105.7	7.576
0.01207	105.5	7.493
0.01206	100.5	7.615
0.01204	106.9	7.521
0.01203	109.3	7.581
0.01204	106.7	7.567

Average 99.73 7.552
Standard Dev. 7.166 0.1084
Coeff. of Var. [%] 7.186 1.435
Min. 83.77 7.345
Max. 110.9 7.705
Number of Spec. 23 23

Average_{norm} 0.01210 98.85 7.487
Standard Dev._{norm} 6.802 0.08595
Coeff. of Var. [%]_{norm} 6.880 1.148
Min. 0.01202 84.13 7.331
Max. 0.01225 109.3 7.615
Number of Spec. 23 23 23



4.12 “25/50/25” Unnotched Compression 1 Properties (UNC1)

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

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

t_{ply} [in]

0.01220

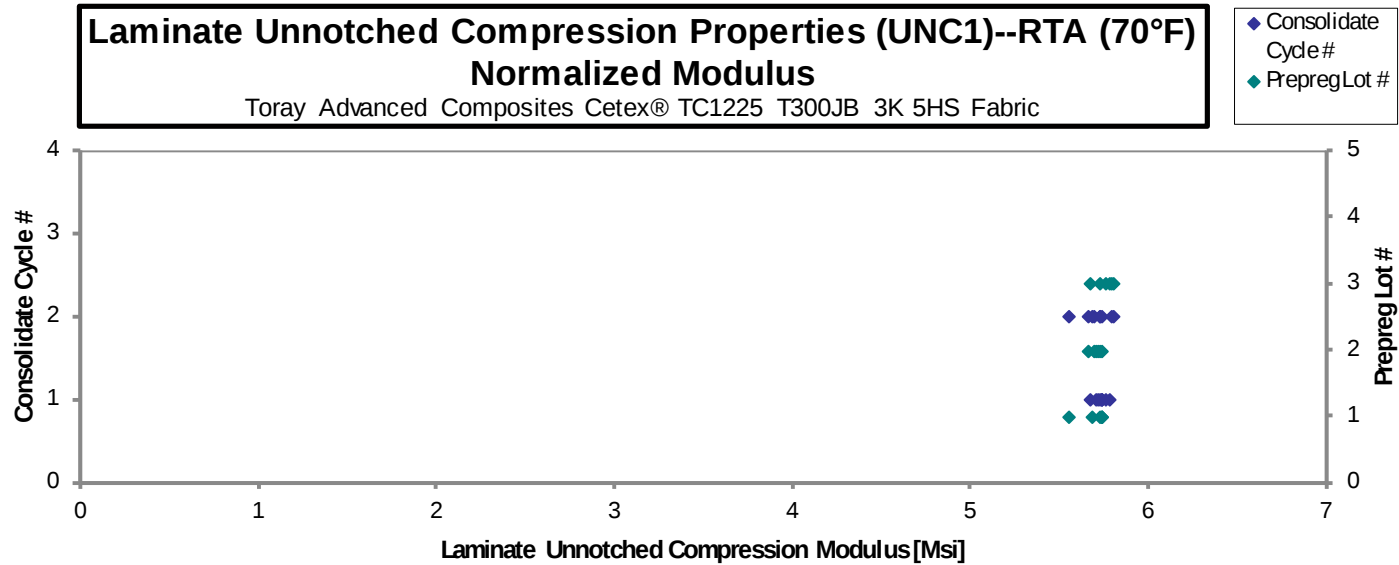
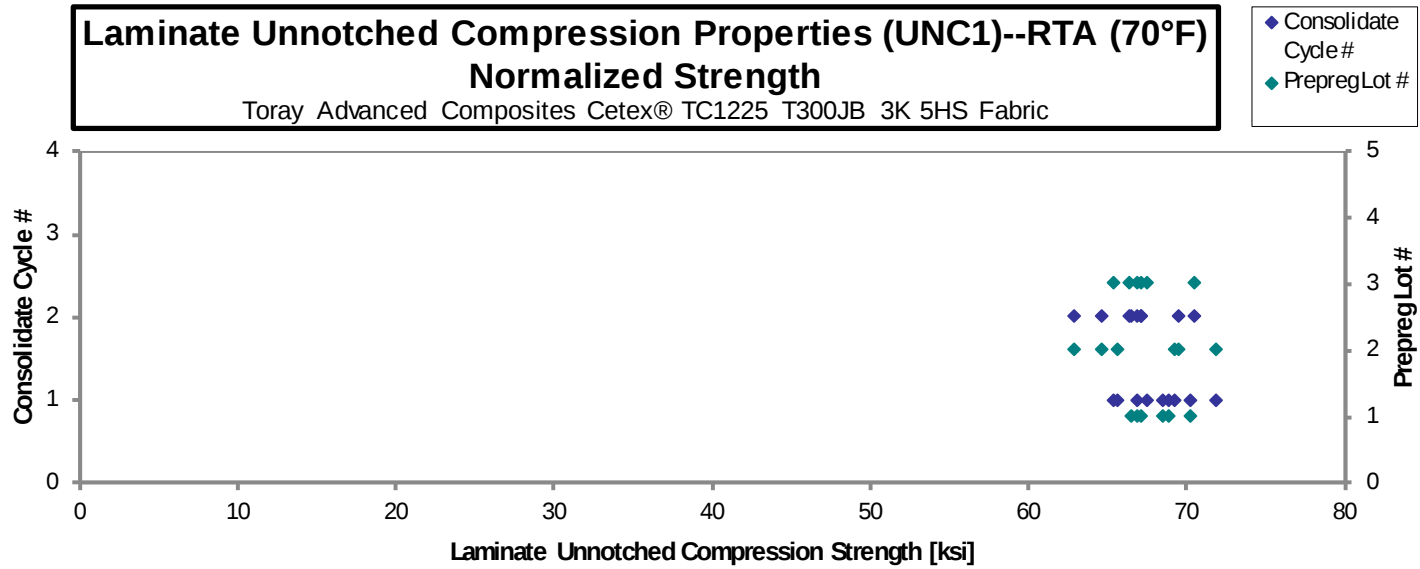
Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
TCCWA111A*	A	C1	1	1	69.48	5.788	0.09680	8	BGM
TCCWA112A*	A	C1	1	1	71.14	5.813	0.09643	8	BGM
TCCWA113A	A	C1	1	1	69.59	5.823	0.09610	8	BGM
TCCWA211A	A	C2	1	2	67.40	5.772	0.09628	8	BGM
TCCWA212A	A	C2	1	2	68.16	5.653	0.09608	8	BGM
TCCWA213A	A	C2	1	2	67.84	5.826	0.09632	8	BGM
TCCWB111A	B	C1	2	1	73.22	5.821	0.09577	8	BAB
TCCWB112A	B	C1	2	1	66.95	5.840	0.09570	8	BGM
TCCWB113A	B	C1	2	1	70.69	5.861	0.09563	8	BGM
TCCWB211A	B	C2	2	2	63.97	5.832	0.09598	8	BGM
TCCWB212A	B	C2	2	2	65.84	5.770	0.09582	8	BGM
TCCWB213A	B	C2	2	2	70.78	5.813	0.09580	8	M(B,H)GM
TCCWC111A	C	C1	3	1	68.69	5.864	0.09602	8	BAT
TCCWC112A	C	C1	3	1	66.33	5.871	0.09623	8	BAT
TCCWC113A	C	C1	3	1	67.74	5.754	0.09635	8	BAT
TCCWC211A	C	C2	3	2	67.14	5.803	0.09652	8	BGM
TCCWC212A	C	C2	3	2	71.19	5.867	0.09660	8	BAT
TCCWC213A	C	C2	3	2	67.82	5.853	0.09670	8	BGM

Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.01210	68.91	5.740
0.01205	70.29	5.743
0.01201	68.52	5.734
0.01204	66.49	5.694
0.01201	67.10	5.565
0.01204	66.95	5.750
0.01197	71.84	5.712
0.01196	65.64	5.726
0.01195	69.27	5.743
0.01200	62.91	5.735
0.01198	64.64	5.664
0.01198	69.48	5.706
0.01200	67.57	5.769
0.01203	65.40	5.789
0.01204	66.87	5.681
0.01206	66.39	5.739
0.01208	70.46	5.807
0.01209	67.20	5.799

* Modulus are averaged values of 2 strain gages.

Average 68.55 5.812
Standard Dev. 2.274 0.05299
Coeff. of Var. [%] 3.317 0.9117
Min. 63.97 5.653
Max. 73.22 5.871
Number of Spec. 18 18

Average_{norm} 0.01202 67.55 5.728
Standard Dev_{norm} 2.245 0.05574
Coeff. of Var. [%]_{norm} 3.323 0.9731
Min. 0.01195 62.91 5.565
Max. 0.01210 71.84 5.807
Number of Spec. 18 18 18



August 1, 2025

CAM-RP-2024-023 Rev N/C

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

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

t_{ply} [in]

0.01220

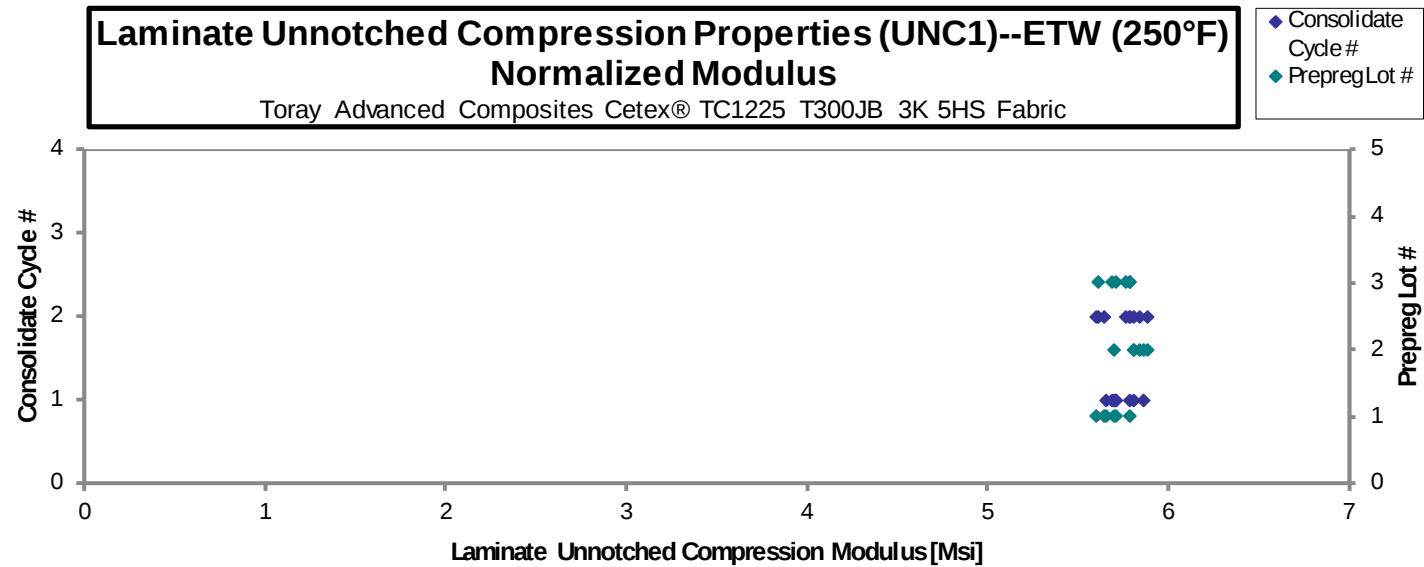
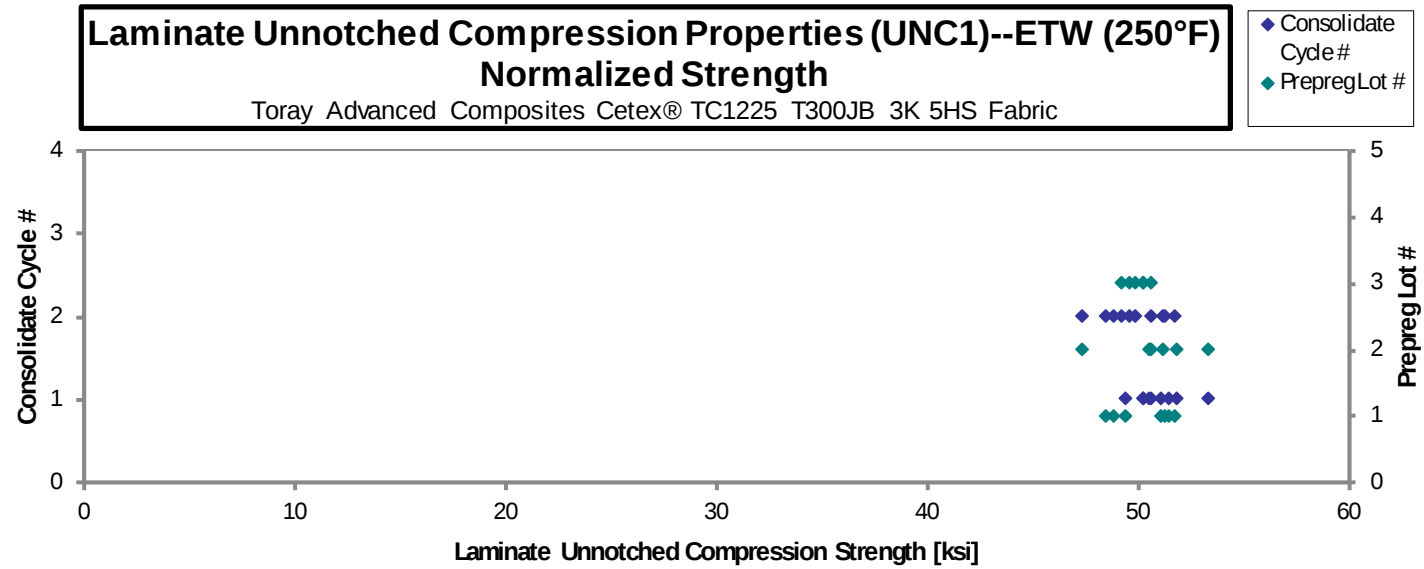
Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
TCCWA111D	A	C1	1	1	51.75	5.775	0.09633	8	BGM
TCCWA112D	A	C1	1	1	50.07	5.791	0.09627	8	BAB
TCCWA113D	A	C1	1	1	52.09	5.725	0.09640	8	BAT
TCCWA211D	A	C2	1	2	52.64	5.700	0.09593	8	M(B,H)AT
TCCWA212D	A	C2	1	2	49.64	5.881	0.09610	8	BAB
TCCWA213D	A	C2	1	2	49.25	5.735	0.09612	8	BAB
TCCWA214D*	A	C2	1	2	52.07		0.09623	8	M(B,H)AT
TCCWB111D	B	C1	2	1	54.64	5.954	0.09528	8	BAT
TCCWB112D	B	C1	2	1	52.94	5.990	0.09555	8	HAT
TCCWB113D	B	C1	2	1	51.60	5.825	0.09558	8	BAT
TCCWB211D	B	C2	2	2	52.09	6.048	0.09498	8	BAT
TCCWB212D	B	C2	2	2	52.68	6.012	0.09482	8	BAT
TCCWB213D	B	C2	2	2	48.26	5.916	0.09578	8	BAB
TCCWC111D	C	C1	3	1	50.91	5.764	0.09633	8	HAT
TCCWC112D	C	C1	3	1	50.99	5.828	0.09687	8	HAB
TCCWC113D	C	C1	3	1	50.29	5.715	0.09748	8	HAT
TCCWC211D	C	C2	3	2	49.71	5.664	0.09670	8	HAT
TCCWC212D	C	C2	3	2	50.11	5.822	0.09660	8	HAB
TCCWC213D	C	C2	3	2	50.51	5.859	0.09647	8	HAT

* Specimen was not gaged, only strength is tested.

Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.01204	51.08	5.700
0.01203	49.39	5.712
0.01205	51.45	5.655
0.01199	51.74	5.603
0.01201	48.88	5.791
0.01201	48.50	5.648
0.01203	51.34	
0.01191	53.34	5.812
0.01194	51.83	5.864
0.01195	50.53	5.704
0.01187	50.69	5.885
0.01185	51.18	5.840
0.01197	47.36	5.806
0.01204	50.25	5.689
0.01211	50.61	5.784
0.01219	50.23	5.708
0.01209	49.25	5.612
0.01208	49.59	5.762
0.01206	49.93	5.791

Average 51.17 5.833
Standard Dev. 1.544 0.1134
Coeff. of Var. [%] 3.017 1.944
Min. 48.26 5.664
Max. 54.64 6.048
Number of Spec. 19 18

Average_{norm} 0.01201 50.38 5.743
Standard Dev._{norm} 1.377 0.08470
Coeff. of Var. [%]_{norm} 2.732 1.475
Min. 0.01185 47.36 5.603
Max. 0.01219 53.34 5.885
Number of Spec. 19 19 18



4.13 “10/80/10” Unnotched Compression 2 Properties (UNC2)

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

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

t_{ply} [in]

0.01220

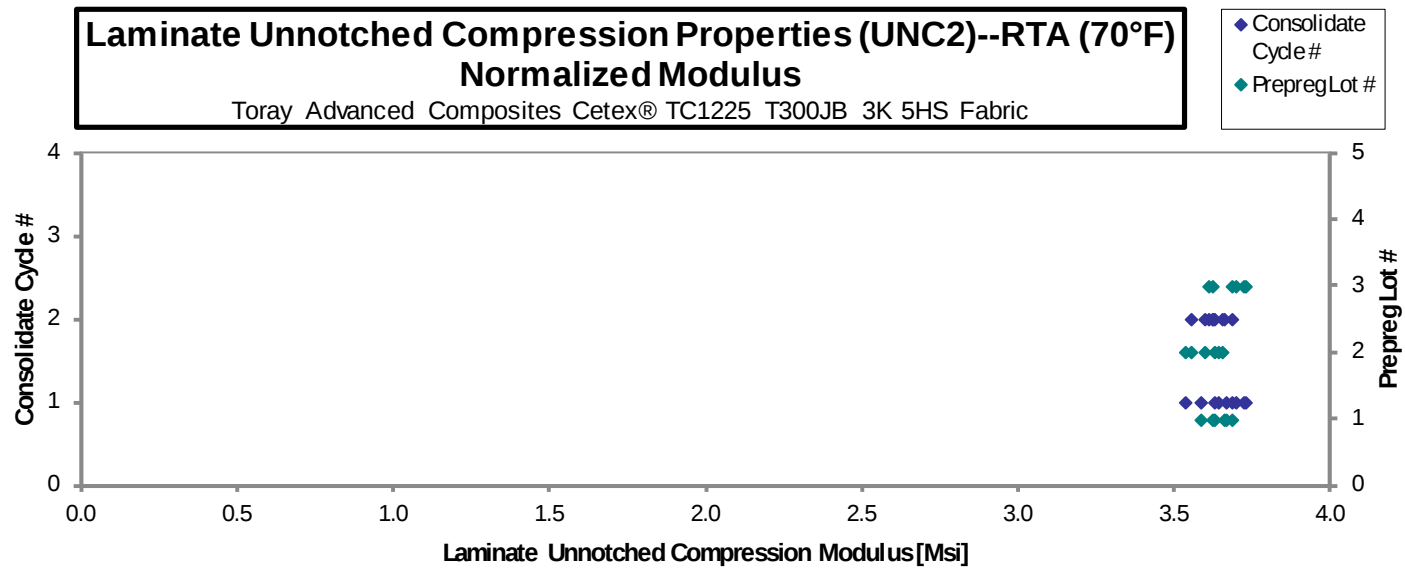
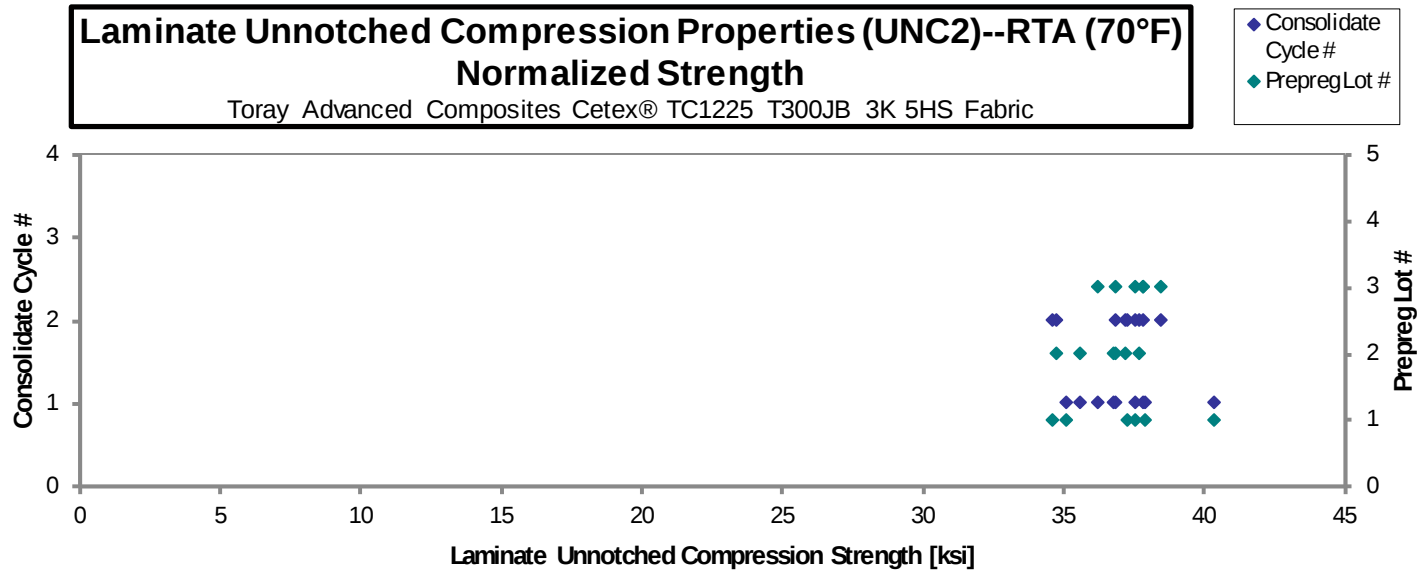
Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
TCCXA111A*	A	C1	1	1	38.74	3.746	0.1195	10	BGM
TCCXA112A*	A	C1	1	1	41.01	3.752	0.1200	10	BGM
TCCXA113A	A	C1	1	1	35.72	3.654	0.1199	10	BGM
TCCXA211A	A	C2	1	2	34.54	3.662	0.1222	10	BGM
TCCXA212A	A	C2	1	2	37.58	3.635	0.1219	10	BGM
TCCXA213A	A	C2	1	2	37.29	3.625	0.1220	10	BGM
TCCXB111A	B	C1	2	1	37.37	3.682	0.1204	10	BGM
TCCXB112A	B	C1	2	1	36.09	3.697	0.1203	10	BAT
TCCXB113A	B	C1	2	1	37.30	3.587	0.1203	10	BGM
TCCXB211A	B	C2	2	2	35.31	3.713	0.1201	10	BGM
TCCXB212A	B	C2	2	2	37.84	3.665	0.1199	10	BGM
TCCXB213A	B	C2	2	2	38.52	3.633	0.1195	10	BGM
TCCXC111A	C	C1	3	1	38.83	3.830	0.1189	10	BGM
TCCXC112A	C	C1	3	1	36.83	3.789	0.1200	10	BGM
TCCXC113A	C	C1	3	1	38.10	3.757	0.1203	10	BGM
TCCXC211A	C	C2	3	2	37.25	3.653	0.1207	10	BGM
TCCXC212A	C	C2	3	2	38.11	3.655	0.1211	10	BGM
TCCXC213A	C	C2	3	2	38.79	3.722	0.1210	10	BGM

Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.01195	37.94	3.668
0.01200	40.34	3.690
0.01199	35.10	3.590
0.01222	34.59	3.667
0.01219	37.56	3.632
0.01220	37.29	3.626
0.01204	36.88	3.633
0.01203	35.58	3.645
0.01203	36.79	3.538
0.01201	34.76	3.656
0.01199	37.19	3.602
0.01195	37.72	3.558
0.01189	37.84	3.732
0.01200	36.21	3.725
0.01203	37.57	3.704
0.01207	36.84	3.614
0.01211	37.84	3.629
0.01210	38.45	3.690

* Modulus are averaged values of 2 strain gages.

Average	37.51	3.692
Standard Dev.	1.506	0.06363
Coeff. of Var. [%]	4.015	1.724
Min.	34.54	3.587
Max.	41.01	3.830
Number of Spec.	18	18

Average _{norm}	0.01204	37.03	3.644
Standard Dev _{norm}		1.413	0.05347
Coeff. of Var. [%] _{norm}		3.817	1.467
Min.	0.01189	34.59	3.538
Max.	0.01222	40.34	3.732
Number of Spec.	18	18	18



August 1, 2025

CAM-RP-2024-023 Rev N/C

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

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

t_{ply} [in]

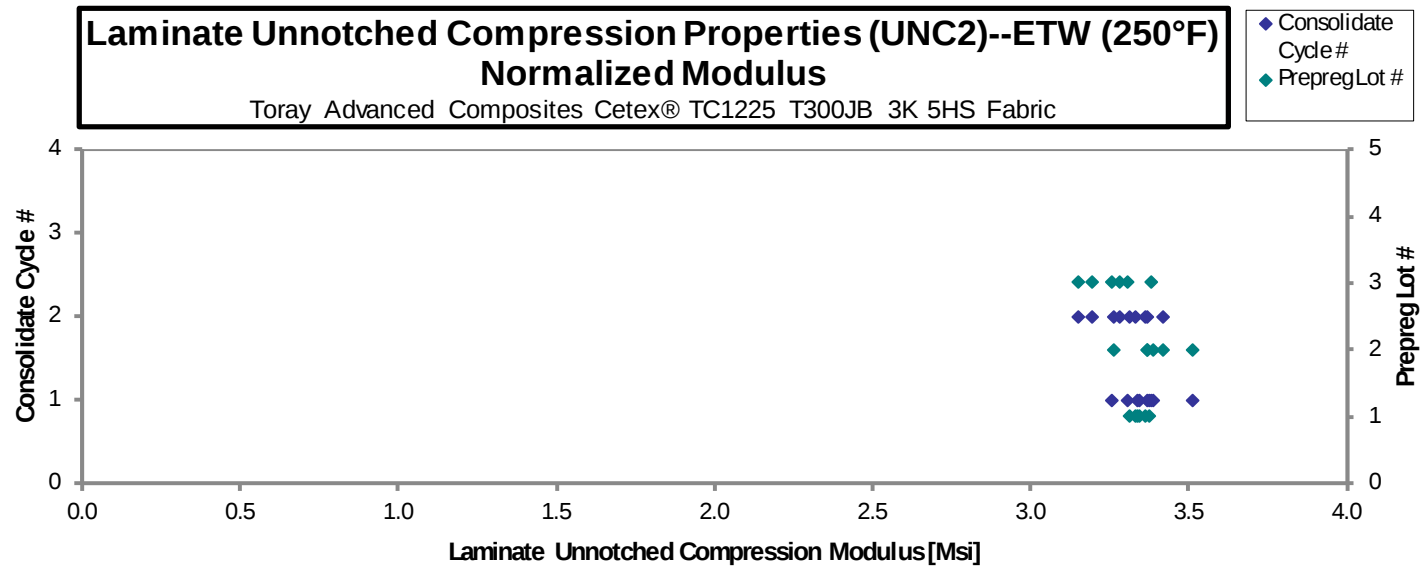
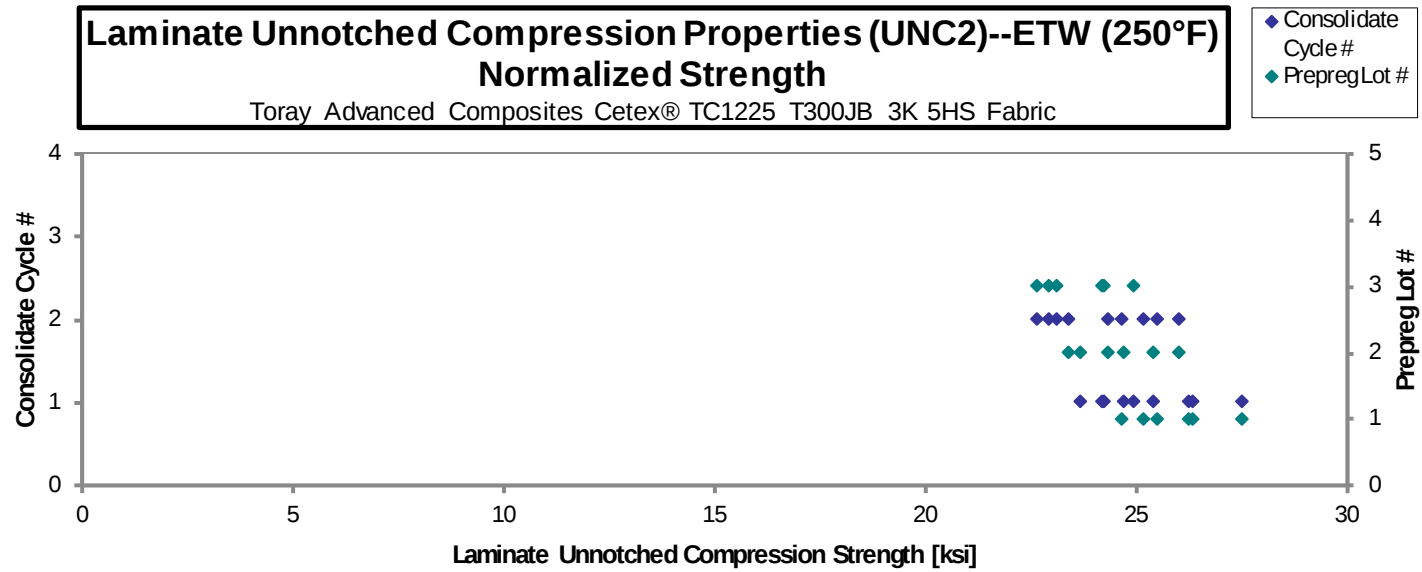
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Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
TCCXA111D	A	C1	1	1	26.63	3.371	0.1208	10	BGM
TCCXA112D	A	C1	1	1	27.77	3.411	0.1208	10	DGM
TCCXA113D	A	C1	1	1	26.43	3.369	0.1211	10	BGM
TCCXA211D	A	C2	1	2	25.44	3.354	0.1224	10	DGM
TCCXA212D	A	C2	1	2	25.26	3.322	0.1217	10	DGM
TCCXA213D	A	C2	1	2	24.71	3.341	0.1217	10	DGM
TCCXB111D	B	C1	2	1	25.20	3.437	0.1197	10	DGM
TCCXB112D	B	C1	2	1	25.91	3.581	0.1197	10	DGM
TCCXB113D	B	C1	2	1	24.21	3.461	0.1194	10	DGM
TCCXB211D	B	C2	2	2	26.49	3.429	0.1198	10	DGM
TCCXB212D	B	C2	2	2	23.83	3.328	0.1197	10	DGM
TCCXB213D	B	C2	2	2	24.68	3.471	0.1202	10	DGM
TCCXC111D	C	C1	3	1	25.31	3.430	0.1203	10	BGM
TCCXC112D	C	C1	3	1	24.56	3.298	0.1205	10	BGM
TCCXC113D	C	C1	3	1	24.48	3.342	0.1206	10	BGM
TCCXC211D	C	C2	3	2	23.18	3.159	0.1216	10	BGM
TCCXC212D	C	C2	3	2	22.78	3.303	0.1213	10	BGM
TCCXC213D	C	C2	3	2	23.03	3.210	0.1215	10	BGM

Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.01208	26.35	3.336
0.01208	27.49	3.376
0.01211	26.23	3.344
0.01224	25.53	3.365
0.01217	25.20	3.314
0.01217	24.65	3.333
0.01197	24.72	3.372
0.01197	25.42	3.513
0.01194	23.68	3.385
0.01198	26.01	3.368
0.01197	23.38	3.266
0.01202	24.31	3.419
0.01203	24.96	3.383
0.01205	24.25	3.257
0.01206	24.20	3.304
0.01216	23.11	3.149
0.01213	22.64	3.283
0.01215	22.92	3.196

Average 24.99 3.368
Standard Dev. 1.342 0.09764
Coeff. of Var. [%] 5.368 2.899
Min. 22.78 3.159
Max. 27.77 3.581
Number of Spec. 18 18

Average_{norm} 0.01207 24.73 3.331
Standard Dev._{norm} 1.314 0.08307
Coeff. of Var. [%]_{norm} 5.316 2.494
Min. 0.01194 22.64 3.149
Max. 0.01224 27.49 3.513
Number of Spec. 18 18 18



4.14 “40/20/40” Unnotched Compression 3 Properties (UNC3)

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

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

t_{ply} [in]

0.01220

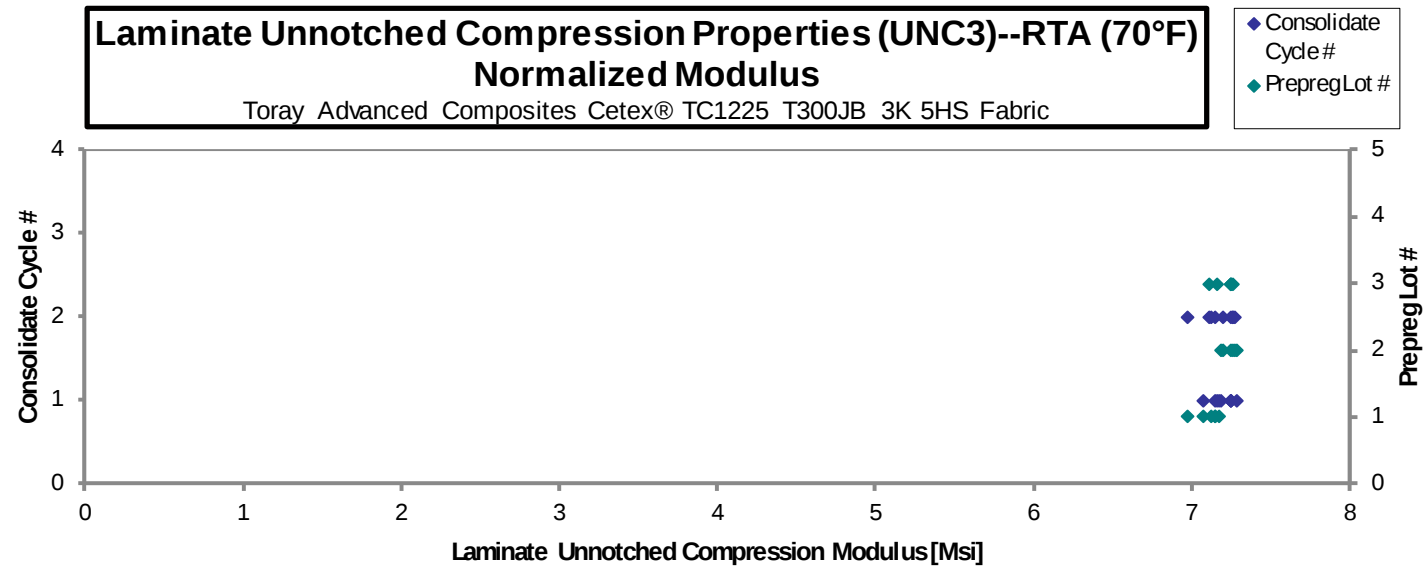
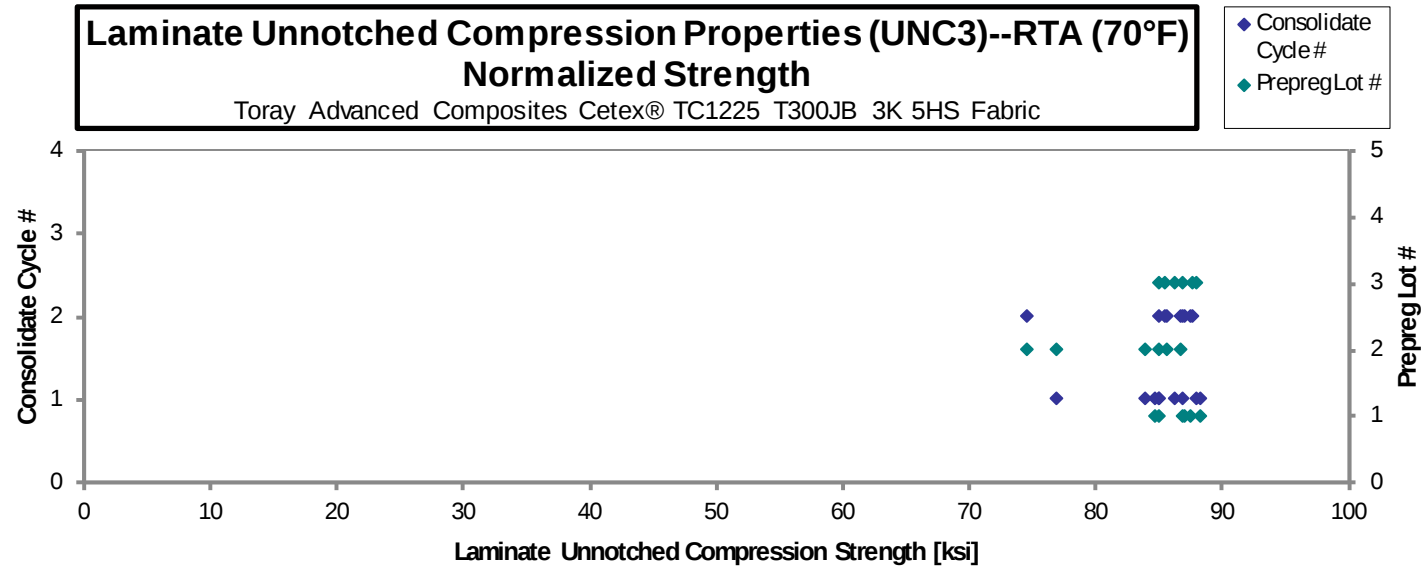
Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
TCCYA111A*	A	C1	1	1	88.49	7.186	0.1217	10	BGM
TCCYA112A*	A	C1	1	1	85.01	7.146	0.1220	10	BGM
TCCYA113A	A	C1	1	1	85.28	7.109	0.1213	10	BGM
TCCYA211A	A	C2	1	2	87.28	7.149	0.1215	10	BGM
TCCYA212A	A	C2	1	2	87.38	6.996	0.1215	10	BGM
TCCYA213A	A	C2	1	2	88.30	7.209	0.1210	10	BGM
TCCYB111A	B	C1	2	1	77.99	7.345	0.1203	10	BAT
TCCYB112A	B	C1	2	1	86.41	7.302	0.1200	10	BAT
TCCYB113A	B	C1	2	1	85.06	7.381	0.1204	10	BAB
TCCYB211A	B	C2	2	2	87.77	7.355	0.1207	10	BAB
TCCYB212A	B	C2	2	2	86.64	7.283	0.1205	10	BAB
TCCYB213A	B	C2	2	2	76.16	7.405	0.1196	10	M(B,H)AB
TCCYC111A	C	C1	3	1	87.74	7.324	0.1208	10	BAT
TCCYC112A	C	C1	3	1	88.40	7.183	0.1215	10	BAT
TCCYC113A	C	C1	3	1	86.88	7.302	0.1211	10	BGM
TCCYC211A	C	C2	3	2	87.96	7.278	0.1216	10	BAB
TCCYC212A	C	C2	3	2	85.26	7.258	0.1218	10	BAB
TCCYC213A	C	C2	3	2	85.52	7.113	0.1219	10	BAB

Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.01217	88.27	7.168
0.01220	85.03	7.148
0.01213	84.79	7.068
0.01215	86.88	7.117
0.01215	87.01	6.966
0.01210	87.57	7.149
0.01203	76.92	7.243
0.01200	85.02	7.185
0.01204	83.92	7.282
0.01207	86.82	7.275
0.01205	85.59	7.195
0.01196	74.66	7.259
0.01208	86.86	7.251
0.01215	88.01	7.152
0.01211	86.27	7.250
0.01216	87.66	7.253
0.01218	85.11	7.245
0.01219	85.45	7.107

* Modulus are averaged values of 2 strain gages.

Average	85.75	7.240
Standard Dev.	3.389	0.1103
Coeff. of Var. [%]	3.952	1.523
Min.	76.16	6.996
Max.	88.49	7.405
Number of Spec.	18	18

Average _{norm}	0.01211	85.10	7.184
Standard Dev _{norm}		3.624	0.08393
Coeff. of Var. [%] _{norm}		4.259	1.168
Min.	0.01196	74.66	6.966
Max.	0.01220	88.27	7.282
Number of Spec.	18	18	18



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

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

t_{ply} [in]

0.01220

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
TCCYA111D	A	C1	1	1	62.99	7.203	0.1224	10	BAT
TCCYA112D	A	C1	1	1	64.84	7.281	0.1223	10	BGM, HIB
TCCYA113D*	A	C1	1	1		7.271	0.1220	10	HIT
TCCYA114D**	A	C1	1	1	60.22		0.1216	10	BAT
TCCYA211D	A	C2	1	2	65.26	7.214	0.1210	10	BAB
TCCYA212D	A	C2	1	2	65.15	7.365	0.1209	10	M(B,H)AB
TCCYA213D	A	C2	1	2	64.91	7.328	0.1212	10	BAB
TCCYB111D	B	C1	2	1	67.26	7.498	0.1208	10	BAB
TCCYB112D	B	C1	2	1	64.07	7.549	0.1206	10	BAB
TCCYB113D	B	C1	2	1	59.79	7.468	0.1205	10	HAB
TCCYB211D	B	C2	2	2	65.35	7.596	0.1198	10	BGM
TCCYB212D	B	C2	2	2	64.20	7.531	0.1195	10	BAT
TCCYB213D	B	C2	2	2	67.13	7.569	0.1199	10	BAB
TCCYC111D	C	C1	3	1	64.66	7.387	0.1213	10	HAT, HIT
TCCYC112D	C	C1	3	1	60.34	7.410	0.1212	10	HGM
TCCYC113D	C	C1	3	1	57.86	7.296	0.1213	10	M(B,H)GM
TCCYC114D**	C	C1	3	1	61.76		0.1213	10	M(B,H)AB
TCCYC211D	C	C2	3	2	65.46	7.295	0.1215	10	HAB
TCCYC212D	C	C2	3	2	63.57	7.279	0.1214	10	HAT
TCCYC213D	C	C2	3	2	62.65	7.446	0.1206	10	HGM

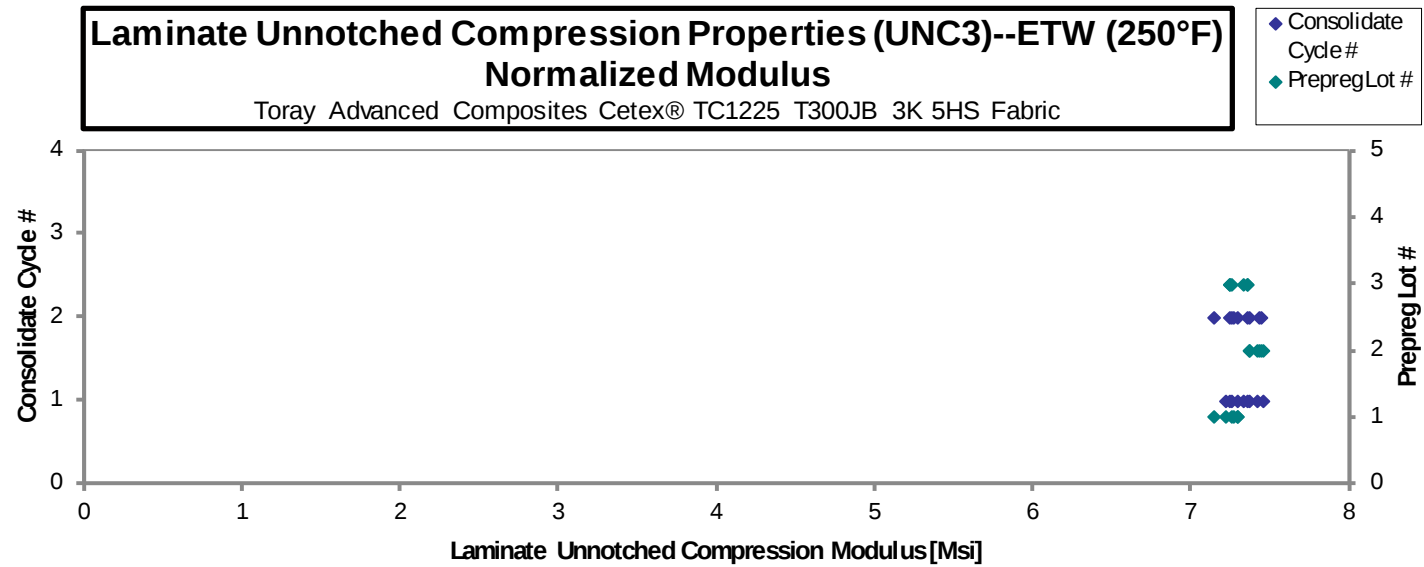
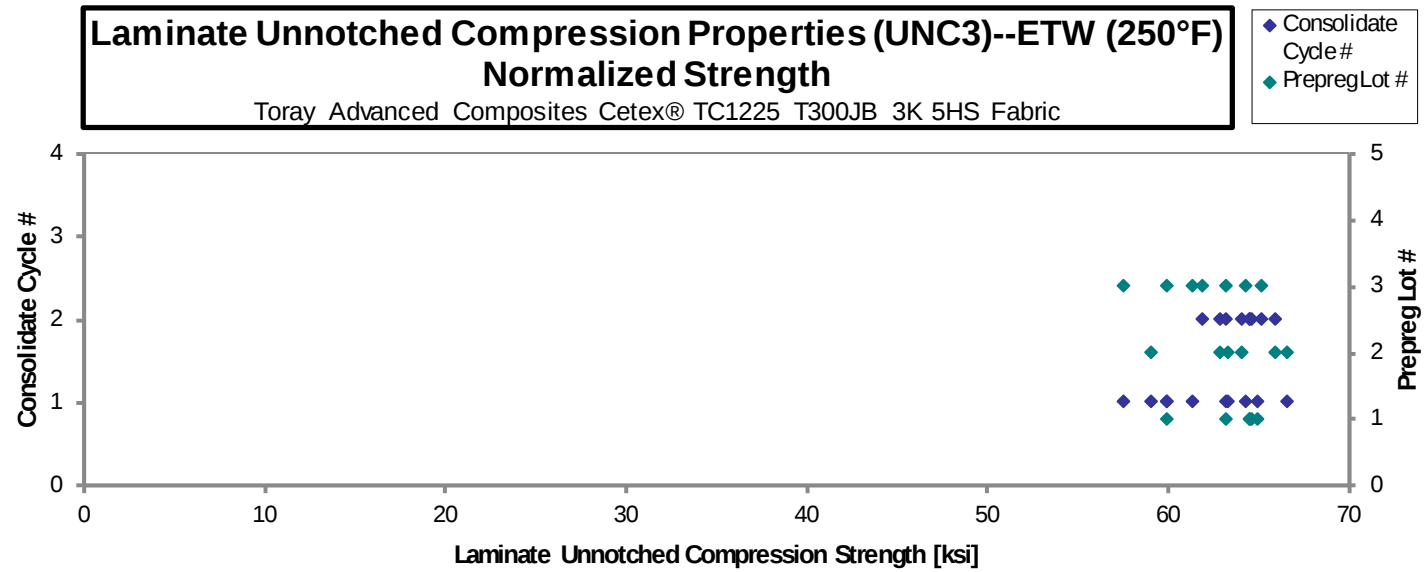
Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.01224	63.19	7.226
0.01223	64.98	7.297
0.01220		7.268
0.01216	60.01	
0.01210	64.69	7.152
0.01209	64.55	7.298
0.01212	64.50	7.281
0.01208	66.61	7.425
0.01206	63.32	7.461
0.01205	59.07	7.378
0.01198	64.15	7.456
0.01195	62.87	7.375
0.01199	65.99	7.440
0.01213	64.29	7.345
0.01212	59.95	7.363
0.01213	57.52	7.253
0.01213	61.42	
0.01215	65.20	7.266
0.01214	63.28	7.246
0.01206	61.91	7.358

* Strength not reported due to unacceptable failure mode.

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

Average 63.55 7.388
Standard Dev. 2.547 0.1255
Coeff. of Var. [%] 4.007 1.699
Min. 57.86 7.203
Max. 67.26 7.596
Number of Spec. 19 18

Average_{norm} 0.01210 63.03 7.327
Standard Dev._{norm} 2.459 0.08693
Coeff. of Var. [%]_{norm} 3.902 1.186
Min. 0.01195 57.52 7.152
Max. 0.01224 66.61 7.461
Number of Spec. 20 19 18



4.15 “25/50/25” Open-Hole Tension 1 Properties (OHT1)

**Laminate Open-Hole Tension Properties (OHT1)--CTA (-65°F)
Strength**

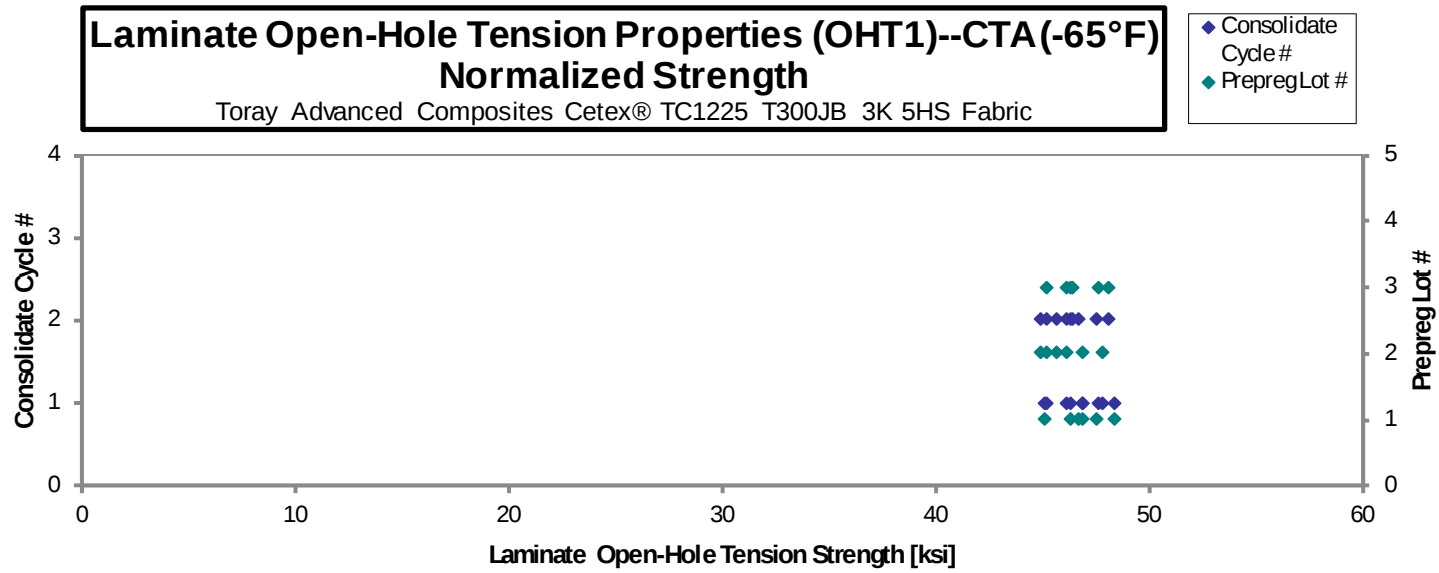
Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

 normalizing
 t_{ply} [in]
 0.01220

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	Strength _{norm} [ksi]
TCCDA111B	A	C1	1	1	45.32	0.1456	12	LGM	0.01214	45.09
TCCDA112B	A	C1	1	1	48.61	0.1457	12	LGM	0.01214	48.37
TCCDA113B	A	C1	1	1	47.09	0.1457	12	LGM	0.01214	46.86
TCCDA211B	A	C2	1	2	47.56	0.1464	12	LGM	0.01220	47.56
TCCDA212B	A	C2	1	2	46.20	0.1467	12	LGM	0.01222	46.29
TCCDA213B	A	C2	1	2	46.90	0.1457	12	LGM	0.01214	46.67
TCCDB111B	B	C1	2	1	48.08	0.1457	12	LGM	0.01214	47.86
TCCDB112B	B	C1	2	1	46.05	0.1467	12	LGM	0.01222	46.14
TCCDB113B	B	C1	2	1	47.12	0.1458	12	LGM	0.01215	46.92
TCCDB211B	B	C2	2	2	45.57	0.1451	12	LGM	0.01209	45.17
TCCDB212B	B	C2	2	2	46.08	0.1452	12	LGM	0.01210	45.69
TCCDB213B	B	C2	2	2	45.34	0.1450	12	LGM	0.01208	44.92
TCCDC111B	C	C1	3	1	48.23	0.1447	12	LGM	0.01205	47.65
TCCDC112B	C	C1	3	1	46.86	0.1449	12	LGM	0.01208	46.37
TCCDC113B	C	C1	3	1	45.47	0.1455	12	LGM	0.01212	45.18
TCCDC211B	C	C2	3	2	47.23	0.1440	12	LGM	0.01200	46.46
TCCDC212B	C	C2	3	2	48.67	0.1448	12	LGM	0.01207	48.15
TCCDC213B	C	C2	3	2	46.40	0.1455	12	LGM	0.01213	46.12

Average 46.82
 Standard Dev. 1.100
 Coeff. of Var. [%] 2.350
 Min. 45.32
 Max. 48.67
 Number of Spec. 18

Average_{norm} 0.01212 46.53
 Standard Dev._{norm} 1.080
 Coeff. of Var. [%]_{norm} 2.322
 Min. 0.01200 44.92
 Max. 0.01222 48.37
 Number of Spec. 18



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

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

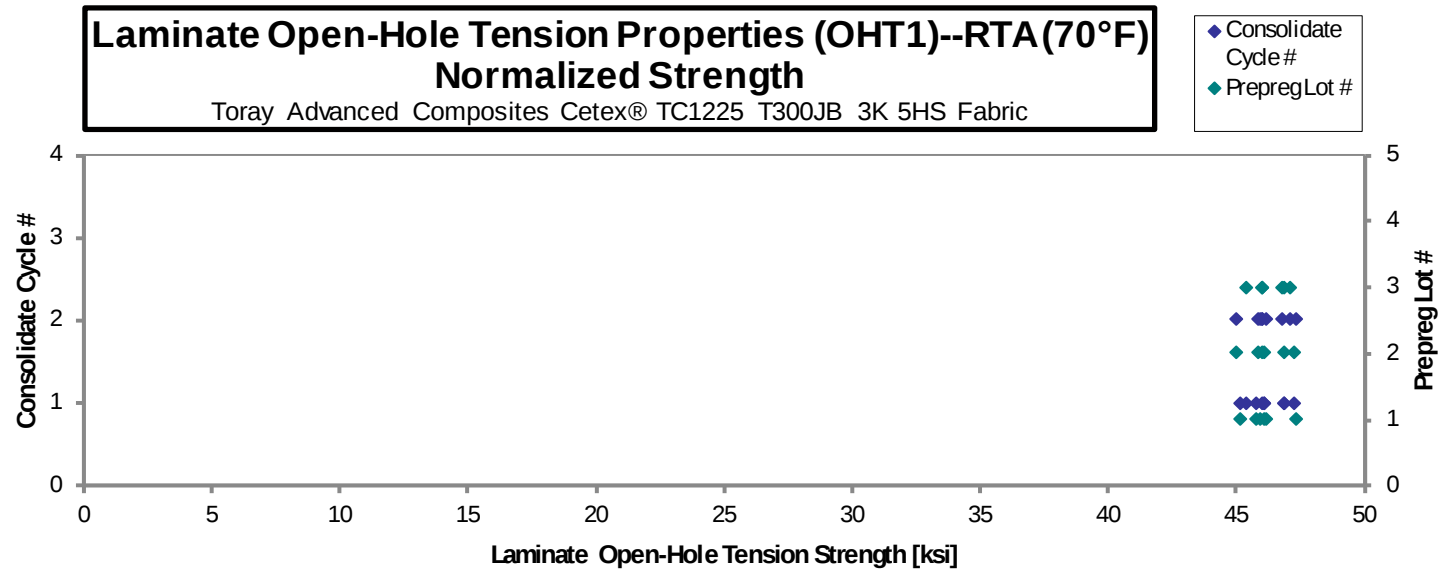
 t_{ply} [in]

0.01220

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	Strength _{norm} [ksi]
TCCDA111A	A	C1	1	1	45.50	0.1473	12	LGM	0.01227	45.77
TCCDA112A	A	C1	1	1	46.06	0.1464	12	LGM	0.01220	46.07
TCCDA113A	A	C1	1	1	45.29	0.1461	12	LGM	0.01217	45.18
TCCDA211A	A	C2	1	2	47.08	0.1472	12	LGM	0.01227	47.35
TCCDA212A	A	C2	1	2	46.11	0.1465	12	LGM	0.01221	46.15
TCCDA213A	A	C2	1	2	46.16	0.1456	12	LGM	0.01213	45.90
TCCDB111A	B	C1	2	1	47.01	0.1460	12	LGM	0.01216	46.87
TCCDB112A	B	C1	2	1	46.35	0.1455	12	LGM	0.01213	46.06
TCCDB113A	B	C1	2	1	46.86	0.1478	12	LGM	0.01231	47.29
TCCDB211A	B	C2	2	2	45.48	0.1449	12	LGM	0.01207	45.01
TCCDB212A	B	C2	2	2	46.22	0.1452	12	LGM	0.01210	45.84
TCCDB213A	B	C2	2	2	46.48	0.1449	12	LGM	0.01208	46.00
TCCDC111A	C	C1	3	1	47.50	0.1444	12	M(A,L)GM	0.01203	46.84
TCCDC112A	C	C1	3	1	46.41	0.1451	12	M(A,L)GM	0.01209	45.99
TCCDC113A	C	C1	3	1	45.91	0.1448	12	LGM	0.01207	45.42
TCCDC211A	C	C2	3	2	47.59	0.1439	12	LGM	0.01199	46.76
TCCDC212A	C	C2	3	2	46.89	0.1438	12	M(A,L)GM	0.01198	46.05
TCCDC213A	C	C2	3	2	48.04	0.1436	12	LGM	0.01196	47.10

Average 46.50
 Standard Dev. 0.7615
 Coeff. of Var. [%] 1.638
 Min. 45.29
 Max. 48.04
 Number of Spec. 18

Average_{norm} 0.01212 46.20
 Standard Dev._{norm} 0.6915
 Coeff. of Var. [%]_{norm} 1.497
 Min. 0.01196 45.01
 Max. 0.01231 47.35
 Number of Spec. 18 18



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

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

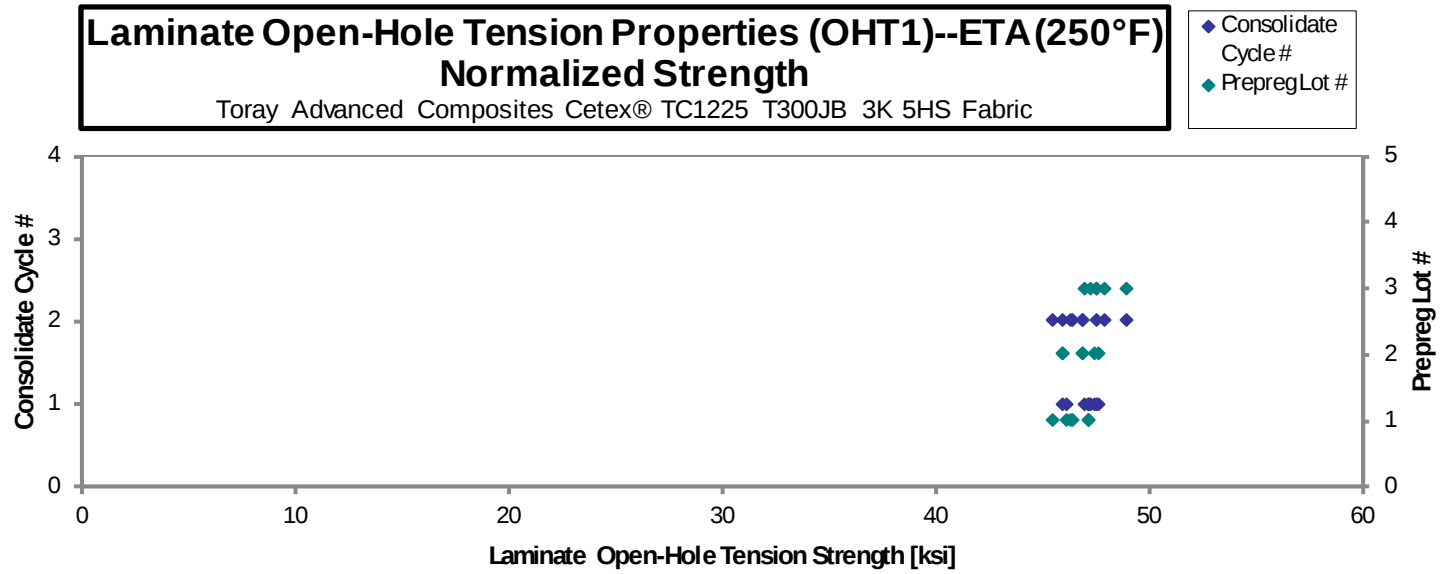
 t_{ply} [in]

0.01220

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	Strength _{norm} [ksi]
TCCDA111C	A	C1	1	1	47.37	0.1457	12	AGM	0.01214	47.15
TCCDA112C	A	C1	1	1	47.37	0.1459	12	AGM	0.01216	47.22
TCCDA113C	A	C1	1	1	46.74	0.1447	12	AGM	0.01205	46.18
TCCDA211C	A	C2	1	2	46.52	0.1463	12	M(A,L)GM	0.01219	46.47
TCCDA212C	A	C2	1	2	46.32	0.1466	12	M(A,L)GM	0.01222	46.38
TCCDA213C	A	C2	1	2	45.17	0.1474	12	M(A,L)GM	0.01228	45.47
TCCDB111C	B	C1	2	1	45.91	0.1464	12	LGM	0.01220	45.92
TCCDB112C	B	C1	2	1	47.85	0.1453	12	LGM	0.01211	47.50
TCCDB113C	B	C1	2	1	47.78	0.1461	12	AGM	0.01218	47.69
TCCDB211C	B	C2	2	2	47.23	0.1455	12	M(A,L)GM	0.01212	46.92
TCCDB212C	B	C2	2	2	46.41	0.1450	12	M(A,L)GM	0.01208	45.95
TCCDB213C	B	C2	2	2	47.04	0.1460	12	LGM	0.01217	46.91
TCCDC111C	C	C1	3	1	47.62	0.1446	12	M(A,L)GM	0.01205	47.03
TCCDC112C	C	C1	3	1	47.92	0.1445	12	M(A,L)GM	0.01204	47.30
TCCDC113C	C	C1	3	1	48.06	0.1450	12	M(A,L)GM	0.01208	47.59
TCCDC211C	C	C2	3	2	48.20	0.1456	12	M(A,L)GM	0.01213	47.92
TCCDC212C	C	C2	3	2	47.87	0.1453	12	M(A,L)GM	0.01211	47.51
TCCDC213C	C	C2	3	2	49.61	0.1446	12	M(A,L)GM	0.01205	48.99

Average 47.28
 Standard Dev. 1.009
 Coeff. of Var. [%] 2.135
 Min. 45.17
 Max. 49.61
 Number of Spec. 18

Average_{norm} 0.01213 47.01
 Standard Dev._{norm} 0.8499
 Coeff. of Var. [%]_{norm} 1.808
 Min. 0.01204 45.47
 Max. 0.01228 48.99
 Number of Spec. 18 18



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

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

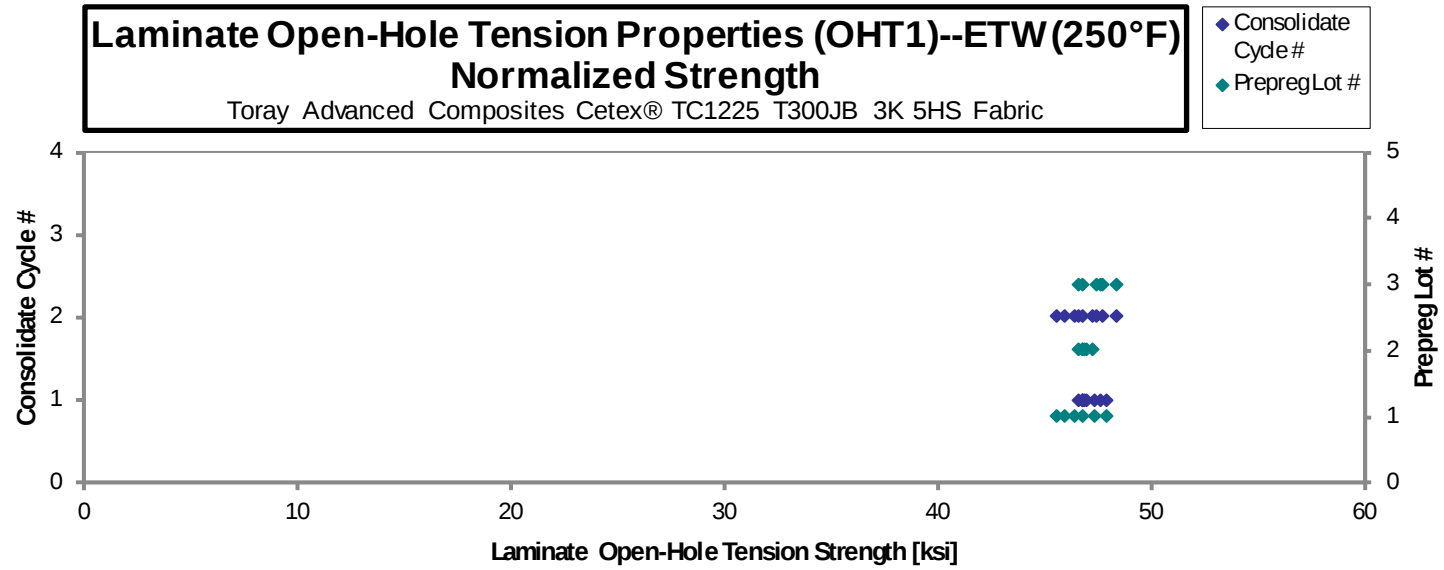
 t_{ply} [in]

0.01220

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	Strength _{norm} [ksi]
TCCDA111D	A	C1	1	1	47.17	0.1454	12	M(A,L)GM	0.01211	46.84
TCCDA112D	A	C1	1	1	48.26	0.1455	12	AGM	0.01212	47.96
TCCDA113D	A	C1	1	1	47.60	0.1458	12	M(A,L)GM	0.01215	47.39
TCCDA211D	A	C2	1	2	45.92	0.1464	12	M(A,L)GM	0.01220	45.93
TCCDA212D	A	C2	1	2	45.72	0.1460	12	AGM	0.01216	45.59
TCCDA213D	A	C2	1	2	46.51	0.1462	12	LGM	0.01219	46.45
TCCDB111D	B	C1	2	1	47.19	0.1457	12	M(A,L)GM	0.01214	46.96
TCCDB112D	B	C1	2	1	46.91	0.1462	12	M(A,L)GM	0.01219	46.86
TCCDB113D	B	C1	2	1	47.13	0.1455	12	M(A,L)GM	0.01212	46.83
TCCDB211D	B	C2	2	2	46.83	0.1462	12	LGM	0.01218	46.77
TCCDB212D	B	C2	2	2	47.50	0.1457	12	AGM	0.01214	47.26
TCCDB213D	B	C2	2	2	46.87	0.1455	12	LGM	0.01213	46.58
TCCDC111D	C	C1	3	1	46.69	0.1469	12	M(A,L)GM	0.01224	46.84
TCCDC112D	C	C1	3	1	46.66	0.1462	12	AGM	0.01218	46.59
TCCDC113D	C	C1	3	1	48.11	0.1449	12	M(A,L)GM	0.01207	47.60
TCCDC211D	C	C2	3	2	47.38	0.1468	12	AGM	0.01223	47.50
TCCDC212D	C	C2	3	2	47.98	0.1457	12	LGM	0.01214	47.77
TCCDC213D	C	C2	3	2	48.40	0.1463	12	LGM	0.01219	48.37

Average 47.16
 Standard Dev. 0.7453
 Coeff. of Var. [%] 1.580
 Min. 45.72
 Max. 48.40
 Number of Spec. 18

Average_{norm} 0.01216 47.01
 Standard Dev._{norm} 0.6931
 Coeff. of Var. [%]_{norm} 1.475
 Min. 0.01207 45.59
 Max. 0.01224 48.37
 Number of Spec. 18 18



4.16 “10/80/10” Open-Hole Tension 2 Properties (OHT2)

**Laminate Open-Hole Tension Properties (OHT2)--CTA (-65°F)
Strength**

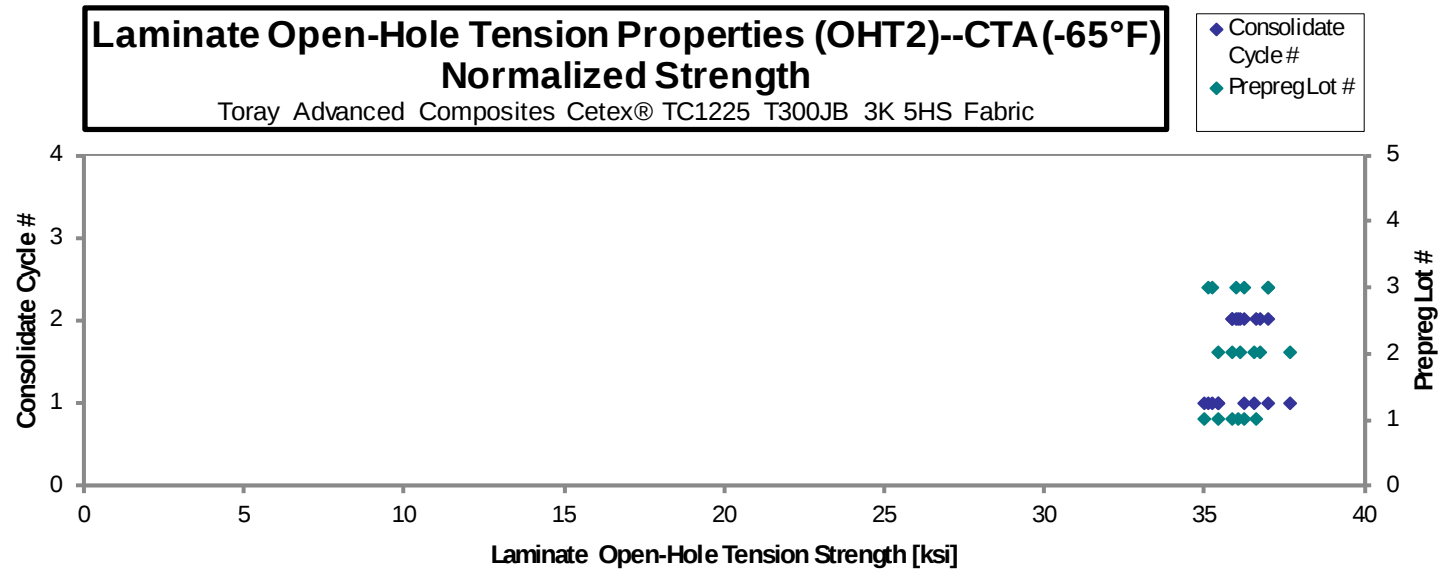
Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

 normalizing
 t_{ply} [in]
 0.01220

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	Strength _{norm} [ksi]
TCCEA111B	A	C1	1	1	35.20	0.1214	10	M(A,L)GM	0.01214	35.03
TCCEA112B	A	C1	1	1	35.82	0.1208	10	M(A,L)GM	0.01208	35.46
TCCEA113B	A	C1	1	1	36.39	0.1215	10	M(A,L)GM	0.01215	36.24
TCCEA211B	A	C2	1	2	36.68	0.1218	10	M(A,L)GM	0.01218	36.61
TCCEA212B	A	C2	1	2	35.74	0.1225	10	M(A,L)GM	0.01225	35.90
TCCEA213B	A	C2	1	2	36.24	0.1215	10	M(A,L)GM	0.01215	36.08
TCCEB111B	B	C1	2	1	37.04	0.1204	10	AGM	0.01204	36.54
TCCEB112B	B	C1	2	1	37.78	0.1218	10	AGM	0.01218	37.70
TCCEB113B	B	C1	2	1	35.79	0.1209	10	AGM	0.01209	35.46
TCCEB211B	B	C2	2	2	37.53	0.1195	10	AGM	0.01195	36.74
TCCEB212B	B	C2	2	2	36.82	0.1197	10	AGM	0.01197	36.12
TCCEB213B	B	C2	2	2	36.55	0.1198	10	AGM	0.01198	35.88
TCCEC111B	C	C1	3	1	34.72	0.1235	10	AGM	0.01235	35.15
TCCEC112B	C	C1	3	1	35.11	0.1225	10	AGM	0.01225	35.25
TCCEC113B	C	C1	3	1	36.24	0.1246	10	AGM	0.01246	37.02
TCCEC211B	C	C2	3	2	36.06	0.1227	10	AGM	0.01227	36.26
TCCEC212B	C	C2	3	2	36.10	0.1217	10	AGM	0.01217	36.00
TCCEC213B	C	C2	3	2	37.39	0.1207	10	AGM	0.01207	36.99

Average 36.29
 Standard Dev. 0.8381
 Coeff. of Var. [%] 2.309
 Min. 34.72
 Max. 37.78
 Number of Spec. 18

Average_{norm} 0.01215 36.14
 Standard Dev._{norm} 0.7192
 Coeff. of Var. [%]_{norm} 1.990
 Min. 0.01195 35.03
 Max. 0.01246 37.70
 Number of Spec. 18



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

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

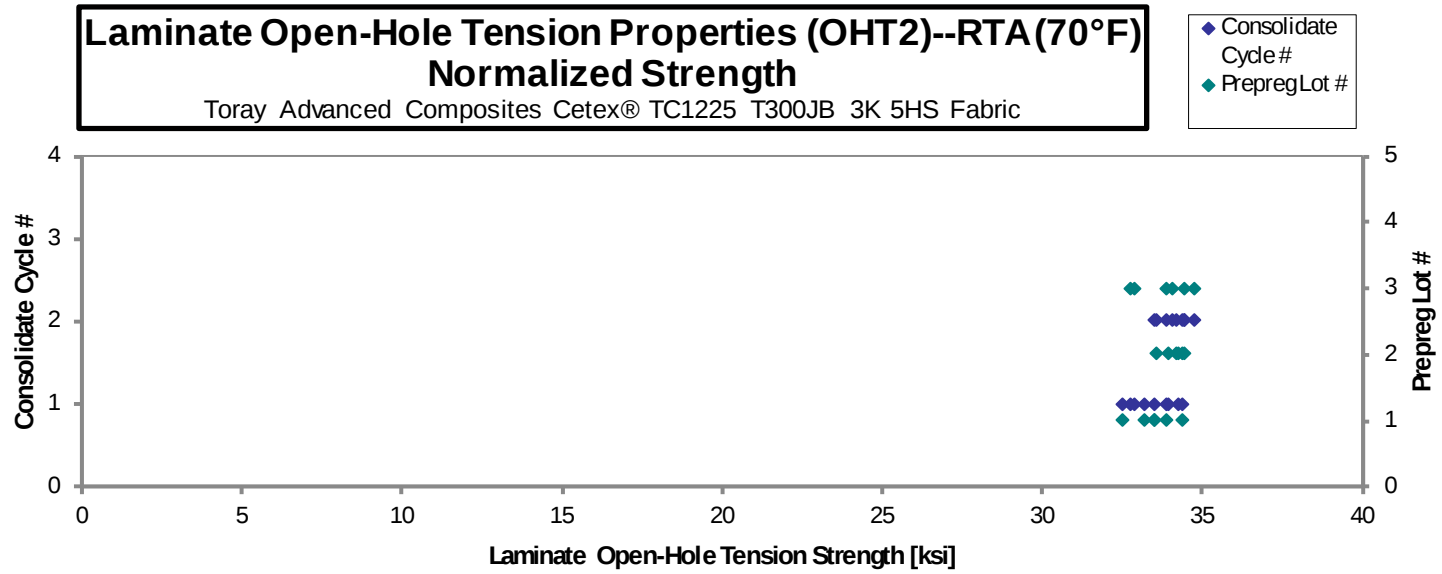
 t_{ply} [in]

0.01220

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	Strength _{norm} [ksi]
TCCEA111A	A	C1	1	1	33.73	0.1213	10	AGM	0.01213	33.53
TCCEA112A	A	C1	1	1	32.72	0.1212	10	AGM	0.01212	32.51
TCCEA113A	A	C1	1	1	33.06	0.1226	10	AGM	0.01226	33.21
TCCEA211A	A	C2	1	2	33.89	0.1220	10	M(A,L)GM	0.01220	33.90
TCCEA212A	A	C2	1	2	34.26	0.1224	10	M(A,L)GM	0.01224	34.37
TCCEA213A	A	C2	1	2	33.53	0.1219	10	M(A,L)GM	0.01219	33.51
TCCEB111A	B	C1	2	1	34.63	0.1210	10	AGM	0.01210	34.36
TCCEB112A	B	C1	2	1	34.42	0.1215	10	AGM	0.01215	34.27
TCCEB113A	B	C1	2	1	34.30	0.1208	10	AGM	0.01208	33.96
TCCEB211A	B	C2	2	2	35.10	0.1198	10	AGM	0.01198	34.46
TCCEB212A	B	C2	2	2	33.94	0.1206	10	AGM	0.01206	33.54
TCCEB213A	B	C2	2	2	34.90	0.1196	10	AGM	0.01196	34.20
TCCEC111A	C	C1	3	1	32.90	0.1220	10	AGM	0.01220	32.90
TCCEC112A	C	C1	3	1	32.62	0.1225	10	AGM	0.01225	32.76
TCCEC113A	C	C1	3	1	33.77	0.1224	10	AGM	0.01224	33.86
TCCEC211A	C	C2	3	2	34.08	0.1234	10	AGM	0.01234	34.46
TCCEC212A	C	C2	3	2	34.67	0.1223	10	AGM	0.01223	34.76
TCCEC213A	C	C2	3	2	34.10	0.1218	10	AGM	0.01218	34.05

Average 33.92
 Standard Dev. 0.7337
 Coeff. of Var. [%] 2.163
 Min. 32.62
 Max. 35.10
 Number of Spec. 18

Average_{norm} 0.01216 33.81
 Standard Dev._{norm} 0.6440
 Coeff. of Var. [%]_{norm} 1.905
 Min. 0.01196 32.51
 Max. 0.01234 34.76
 Number of Spec. 18 18



August 1, 2025

CAM-RP-2024-023 Rev N/C

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

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

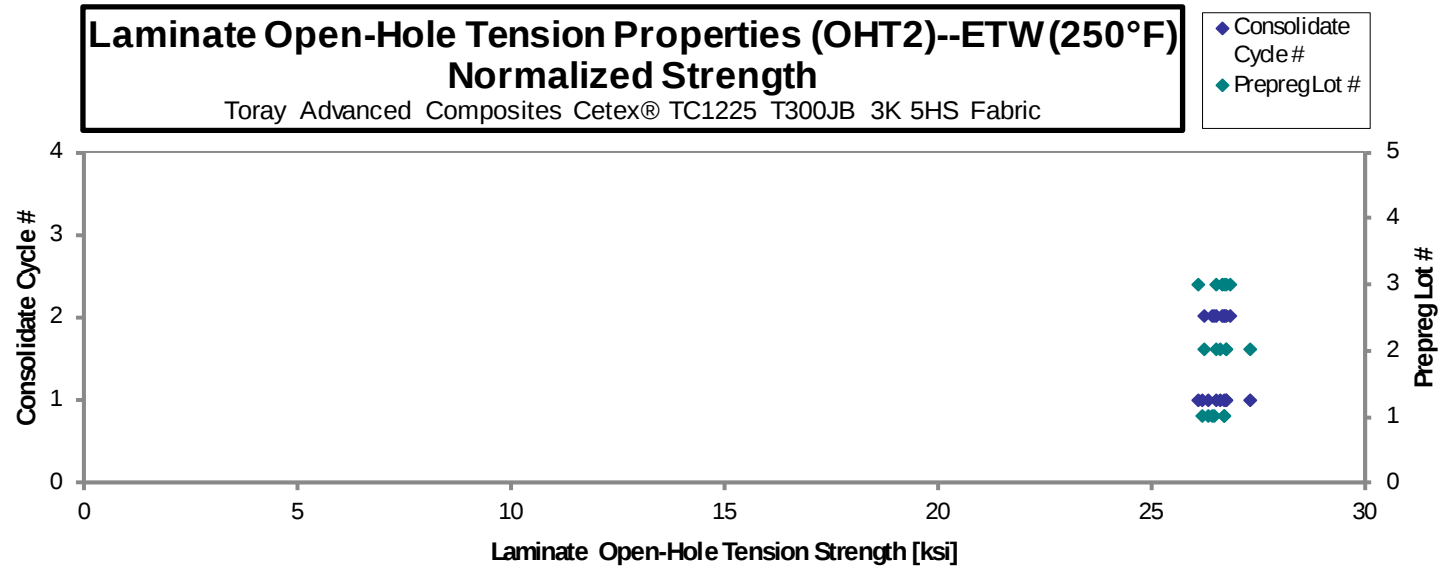
t_{ply} [in]

0.01220

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	Strength _{norm} [ksi]
TCCEA111D	A	C1	1	1	26.81	0.1217	10	AGM	0.01217	26.73
TCCEA112D	A	C1	1	1	26.46	0.1214	10	AGM	0.01214	26.32
TCCEA113D	A	C1	1	1	26.44	0.1210	10	AGM	0.01210	26.21
TCCEA211D	A	C2	1	2	26.38	0.1223	10	AGM	0.01223	26.44
TCCEA212D	A	C2	1	2	26.79	0.1218	10	AGM	0.01218	26.74
TCCEA213D	A	C2	1	2	26.53	0.1218	10	AGM	0.01218	26.50
TCCEB111D	B	C1	2	1	27.82	0.1199	10	AGM	0.01199	27.34
TCCEB112D	B	C1	2	1	26.97	0.1204	10	AGM	0.01204	26.61
TCCEB113D	B	C1	2	1	27.14	0.1204	10	AGM	0.01204	26.77
TCCEB211D	B	C2	2	2	27.20	0.1200	10	AGM	0.01200	26.75
TCCEB212D	B	C2	2	2	26.70	0.1200	10	AGM	0.01200	26.27
TCCEB213D	B	C2	2	2	26.92	0.1203	10	AGM	0.01203	26.54
TCCEC111D	C	C1	3	1	26.15	0.1218	10	AGM	0.01218	26.11
TCCEC112D	C	C1	3	1	26.64	0.1225	10	AGM	0.01225	26.75
TCCEC113D	C	C1	3	1	26.44	0.1225	10	AGM	0.01225	26.54
TCCEC211D	C	C2	3	2	26.32	0.1245	10	AGM	0.01245	26.85
TCCEC212D	C	C2	3	2	26.59	0.1224	10	AGM	0.01224	26.68
TCCEC213D	C	C2	3	2	26.86	0.1215	10	AGM	0.01215	26.74

Average 26.73
Standard Dev. 0.3927
Coeff. of Var. [%] 1.469
Min. 26.15
Max. 27.82
Number of Spec. 18

Average_{norm} 0.01214 26.61
Standard Dev._{norm} 0.2842
Coeff. of Var. [%]_{norm} 1.068
Min. 0.01199 26.11
Max. 0.01245 27.34
Number of Spec. 18 18



4.17 “40/20/40” Open-Hole Tension 3 Properties (OHT3)

**Laminate Open-Hole Tension Properties (OHT3)--CTA (-65°F)
Strength**

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

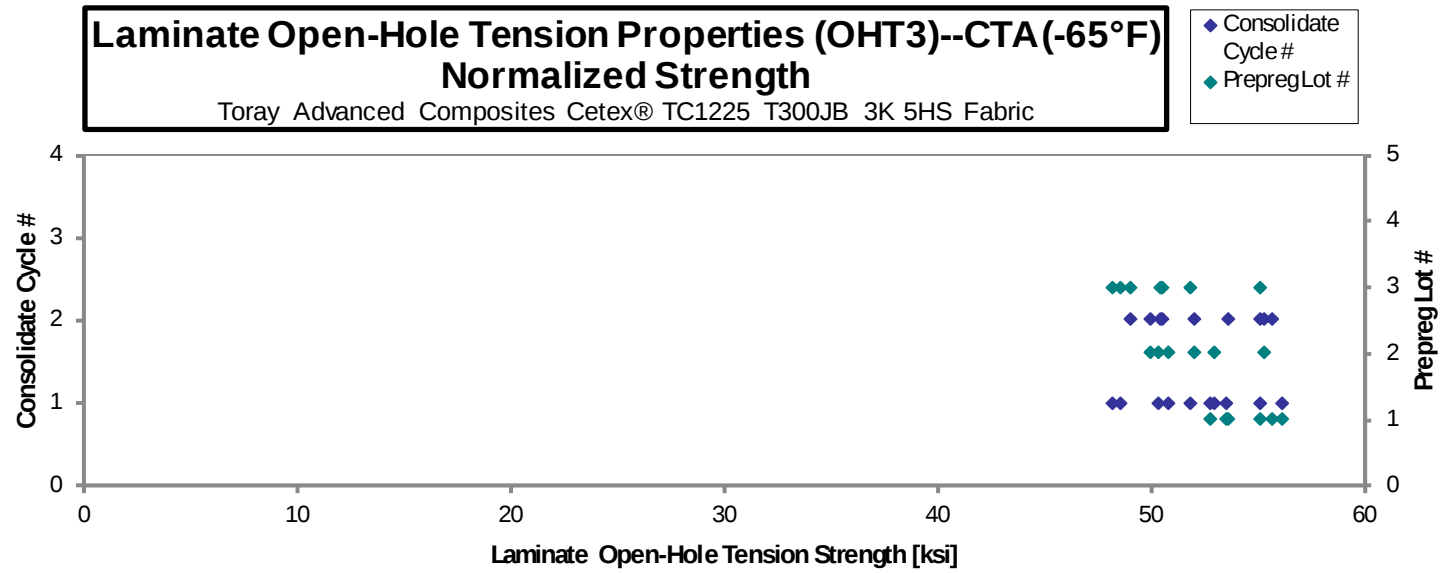
 t_{ply} [in]

0.01220

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	Strength _{norm} [ksi]
TCCFA111B	A	C1	1	1	52.82	0.1220	10	LGM	0.01220	52.82
TCCFA112B	A	C1	1	1	56.47	0.1213	10	LGM	0.01213	56.14
TCCFA113B	A	C1	1	1	53.57	0.1219	10	LGM	0.01219	53.54
TCCFA211B	A	C2	1	2	53.78	0.1217	10	LGM	0.01217	53.62
TCCFA212B	A	C2	1	2	55.34	0.1227	10	LGM	0.01227	55.66
TCCFA213B	A	C2	1	2	55.01	0.1222	10	LGM	0.01222	55.12
TCCFB111B	B	C1	2	1	50.93	0.1217	10	LGM	0.01217	50.81
TCCFB112B	B	C1	2	1	52.72	0.1225	10	LGM	0.01225	52.93
TCCFB113B	B	C1	2	1	50.08	0.1228	10	LGM	0.01228	50.40
TCCFB211B	B	C2	2	2	51.31	0.1189	10	LGM	0.01189	49.98
TCCFB212B	B	C2	2	2	53.44	0.1189	10	LGM	0.01189	52.08
TCCFB213B	B	C2	2	2	56.50	0.1194	10	LGM	0.01194	55.27
TCCFC111B	C	C1	3	1	48.14	0.1231	10	LGM	0.01231	48.58
TCCFC112B	C	C1	3	1	48.47	0.1215	10	LGM	0.01215	48.25
TCCFC113B	C	C1	3	1	55.28	0.1216	10	LGM	0.01216	55.09
TCCFC114B	C	C1	3	1	51.62	0.1226	10	LGM	0.01226	51.88
TCCFC211B	C	C2	3	2	50.94	0.1208	10	LGM	0.01208	50.43
TCCFC212B	C	C2	3	2	49.34	0.1213	10	LGM	0.01213	49.06
TCCFC213B	C	C2	3	2	51.08	0.1206	10	LGM	0.01206	50.51

Average 52.46
 Standard Dev. 2.558
 Coeff. of Var. [%] 4.876
 Min. 48.14
 Max. 56.50
 Number of Spec. 19

Average_{norm} 0.01214 52.22
 Standard Dev._{norm} 2.509
 Coeff. of Var. [%]_{norm} 4.805
 Min. 0.01189 48.25
 Max. 0.01231 56.14
 Number of Spec. 19 19



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

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

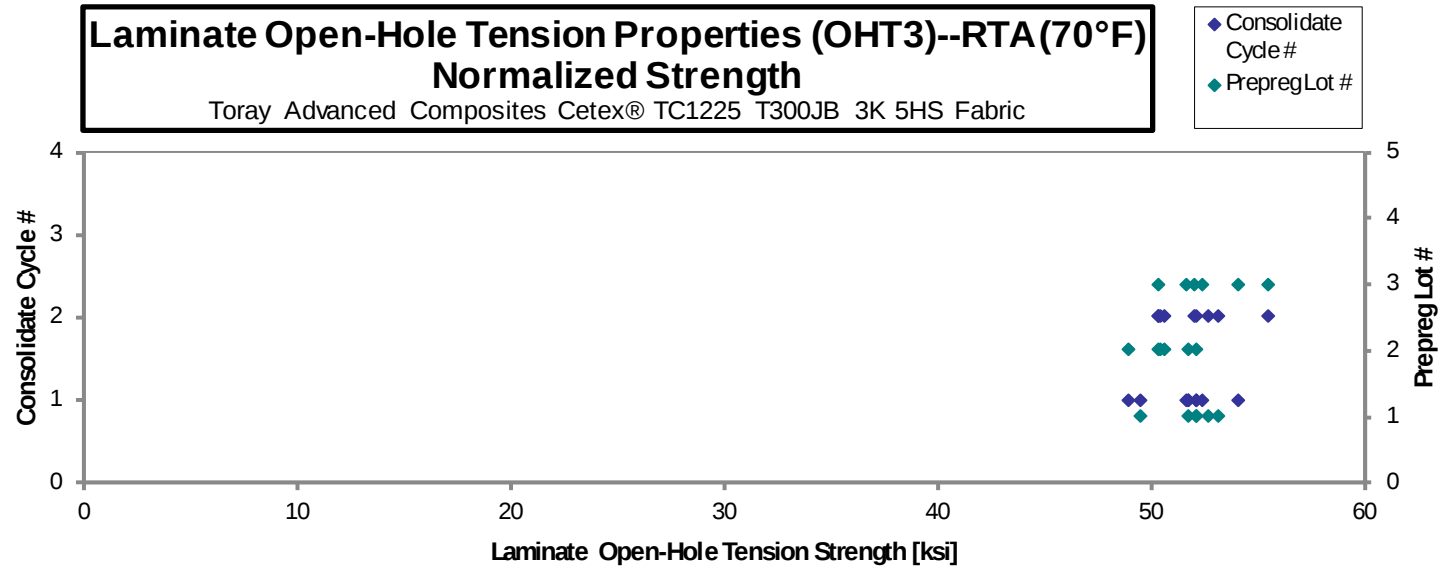
 t_{ply} [in]

0.01220

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	Strength _{norm} [ksi]
TCCFA111A	A	C1	1	1	52.64	0.1208	10	LGM	0.01208	52.12
TCCFA112A	A	C1	1	1	49.89	0.1211	10	LGM	0.01211	49.51
TCCFA113A	A	C1	1	1	51.99	0.1214	10	LGM	0.01214	51.72
TCCFA211A	A	C2	1	2	51.85	0.1226	10	LGM	0.01226	52.10
TCCFA212A	A	C2	1	2	52.65	0.1222	10	LGM	0.01222	52.73
TCCFA213A	A	C2	1	2	53.10	0.1221	10	LGM	0.01221	53.13
TCCFB111A	B	C1	2	1	52.23	0.1218	10	LGM	0.01218	52.16
TCCFB112A	B	C1	2	1	51.91	0.1216	10	LGM	0.01216	51.72
TCCFB113A	B	C1	2	1	49.23	0.1213	10	LGM	0.01213	48.95
TCCFB211A	B	C2	2	2	51.70	0.1195	10	LGM	0.01195	50.62
TCCFB212A	B	C2	2	2	51.56	0.1192	10	LGM	0.01192	50.39
TCCFB213A	B	C2	2	2	51.79	0.1188	10	LGM	0.01188	50.43
TCCFC111A	C	C1	3	1	54.10	0.1220	10	M(A,L)GM	0.01220	54.09
TCCFC112A	C	C1	3	1	52.10	0.1227	10	LGM	0.01227	52.42
TCCFC113A	C	C1	3	1	50.66	0.1245	10	LGM	0.01245	51.70
TCCFC211A	C	C2	3	2	52.38	0.1213	10	LGM	0.01213	52.06
TCCFC212A	C	C2	3	2	55.96	0.1210	10	LGM	0.01210	55.52
TCCFC213A	C	C2	3	2	50.61	0.1213	10	LGM	0.01213	50.32

Average 52.02
 Standard Dev. 1.507
 Coeff. of Var. [%] 2.896
 Min. 49.23
 Max. 55.96
 Number of Spec. 18

Average_{norm} 0.01214 51.76
 Standard Dev._{norm} 1.596
 Coeff. of Var. [%]_{norm} 3.083
 Min. 0.01188 48.95
 Max. 0.01245 55.52
 Number of Spec. 18 18



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

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

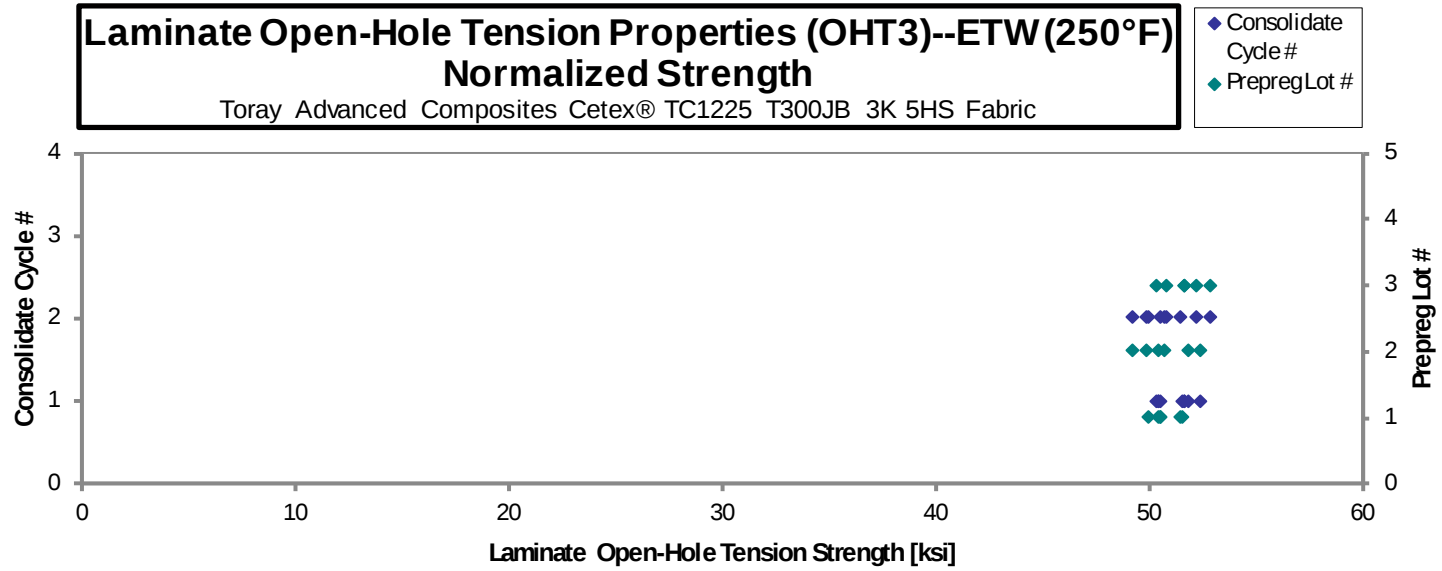
 t_{ply} [in]

0.01220

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	Strength _{norm} [ksi]
TCCFA111D	A	C1	1	1	50.57	0.1220	10	LGM	0.01220	50.57
TCCFA112D	A	C1	1	1	50.64	0.1216	10	LGM	0.01216	50.48
TCCFA113D	A	C1	1	1	51.72	0.1216	10	LGM	0.01216	51.56
TCCFA211D	A	C2	1	2	50.19	0.1216	10	LGM	0.01216	50.01
TCCFA212D	A	C2	1	2	50.58	0.1218	10	LGM	0.01218	50.51
TCCFA213D	A	C2	1	2	51.29	0.1224	10	LGM	0.01224	51.46
TCCFB111D	B	C1	2	1	51.71	0.1223	10	LGM	0.01223	51.85
TCCFB112D	B	C1	2	1	52.27	0.1223	10	LGM	0.01223	52.41
TCCFB113D	B	C1	2	1	50.41	0.1221	10	LGM	0.01221	50.45
TCCFB211D	B	C2	2	2	50.18	0.1197	10	LGM	0.01197	49.22
TCCFB212D	B	C2	2	2	51.18	0.1190	10	LGM	0.01190	49.92
TCCFB213D	B	C2	2	2	51.86	0.1194	10	LGM	0.01194	50.75
TCCFC111D	C	C1	3	1	51.10	0.1234	10	LGM	0.01234	51.68
TCCFC112D	C	C1	3	1	51.38	0.1227	10	LGM	0.01227	51.68
TCCFC113D	C	C1	3	1	49.83	0.1233	10	LGM	0.01233	50.37
TCCFC211D	C	C2	3	2	53.56	0.1204	10	LGM	0.01204	52.85
TCCFC212D	C	C2	3	2	53.01	0.1203	10	LGM	0.01203	52.27
TCCFC213D	C	C2	3	2	51.49	0.1204	10	M(A,L)GM	0.01204	50.82

Average 51.27
 Standard Dev. 0.9905
 Coeff. of Var. [%] 1.932
 Min. 49.83
 Max. 53.56
 Number of Spec. 18

Average_{norm} 0.01215 51.05
 Standard Dev._{norm} 0.9698
 Coeff. of Var. [%]_{norm} 1.900
 Min. 0.01190 49.22
 Max. 0.01234 52.85
 Number of Spec. 18 18



4.18 “25/50/25” Filled-Hole Tension 1 Properties (FHT1)

**Laminate Filled-Hole Tension Properties (FHT1)--CTA (-65°F)
Strength**

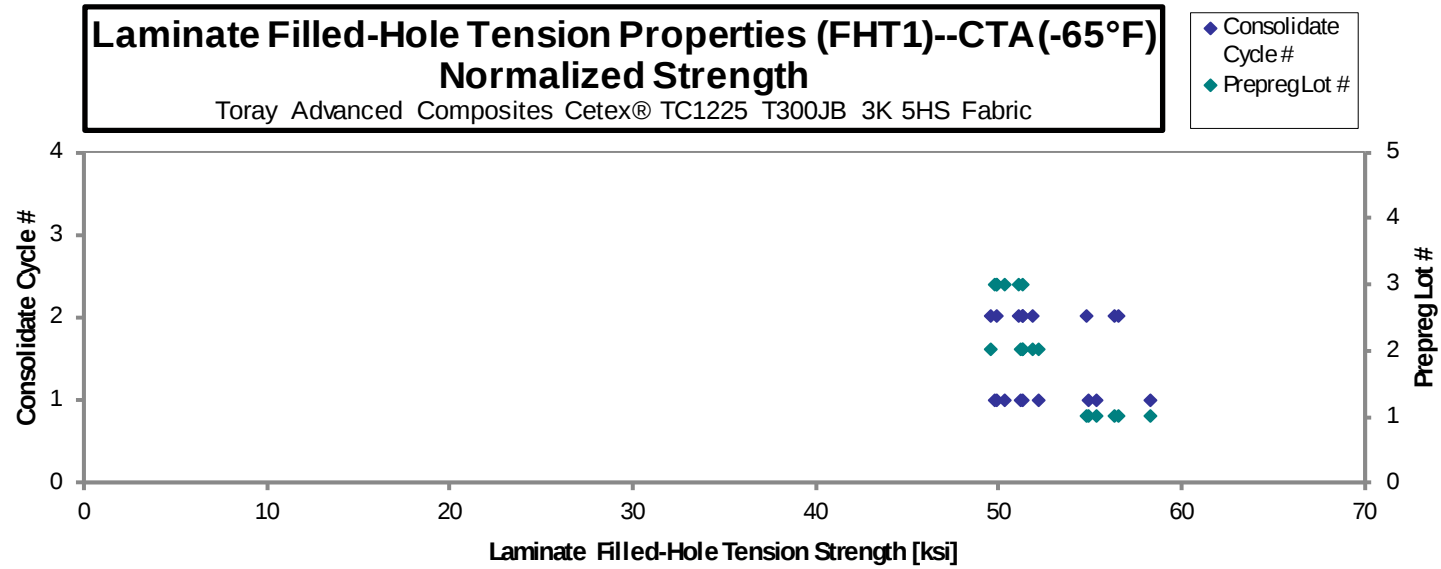
Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

 normalizing
 t_{ply} [in]
 0.01220

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	Strength _{norm} [ksi]
TCC4A111B	A	C1	1	1	55.26	0.1455	12	LGM	0.01212	54.90
TCC4A112B	A	C1	1	1	58.41	0.1461	12	LGM	0.01217	58.28
TCC4A113B	A	C1	1	1	55.41	0.1462	12	LGM	0.01218	55.33
TCC4A211B	A	C2	1	2	56.30	0.1466	12	LGM	0.01222	56.39
TCC4A212B	A	C2	1	2	56.18	0.1474	12	M(A,L)GM	0.01228	56.57
TCC4A213B	A	C2	1	2	55.80	0.1438	12	LGM	0.01198	54.81
TCC4B111B	B	C1	2	1	51.66	0.1455	12	LGM	0.01212	51.34
TCC4B112B	B	C1	2	1	52.37	0.1461	12	LGM	0.01217	52.26
TCC4B113B	B	C1	2	1	51.34	0.1462	12	LGM	0.01218	51.26
TCC4B211B	B	C2	2	2	52.70	0.1441	12	LGM	0.01201	51.88
TCC4B212B	B	C2	2	2	52.17	0.1440	12	LGM	0.01200	51.30
TCC4B213B	B	C2	2	2	50.44	0.1440	12	LGM	0.01200	49.61
TCC4C111B	C	C1	3	1	50.80	0.1450	12	LGM	0.01208	50.31
TCC4C112B	C	C1	3	1	50.57	0.1446	12	LGM	0.01205	49.96
TCC4C113B	C	C1	3	1	50.31	0.1450	12	LGM	0.01208	49.83
TCC4C211B	C	C2	3	2	50.10	0.1460	12	LGM	0.01216	49.94
TCC4C212B	C	C2	3	2	51.03	0.1472	12	LGM	0.01227	51.30
TCC4C213B	C	C2	3	2	50.36	0.1485	12	LGM	0.01237	51.07

Average 52.84
 Standard Dev. 2.634
 Coeff. of Var. [%] 4.984
 Min. 50.10
 Max. 58.41
 Number of Spec. 18

Average_{norm} 0.01214 52.57
 Standard Dev._{norm} 2.718
 Coeff. of Var. [%]_{norm} 5.169
 Min. 0.01198 49.61
 Max. 0.01237 58.28
 Number of Spec. 18



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

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

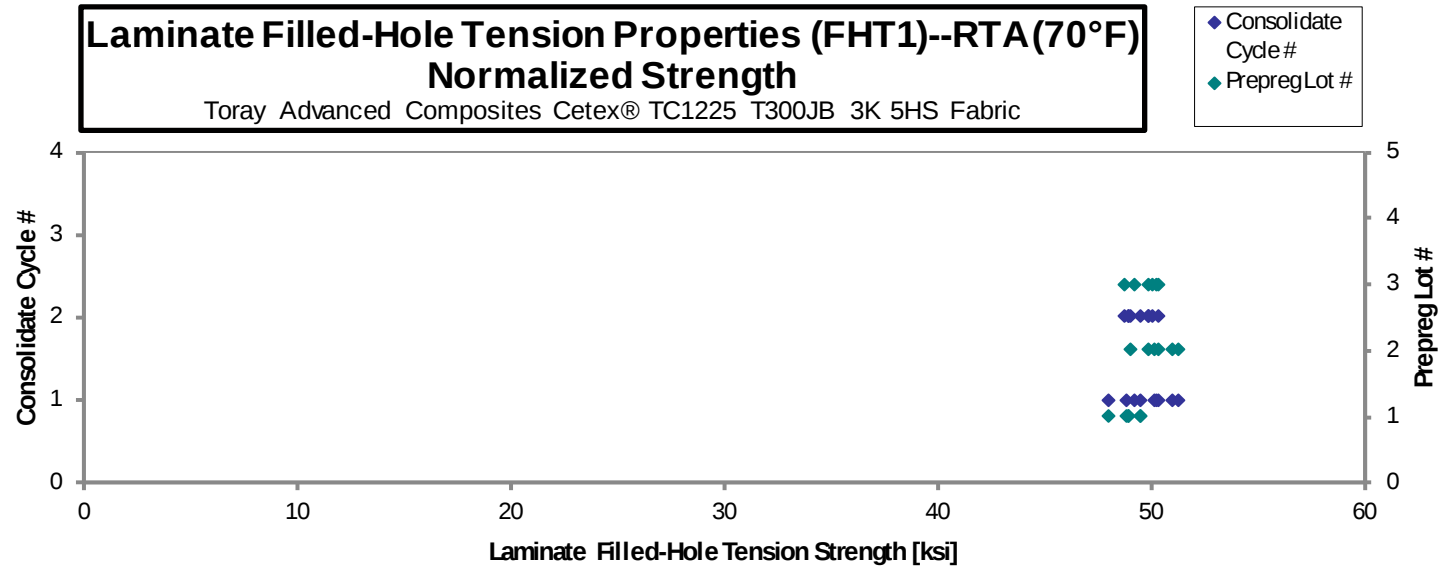
 t_{ply} [in]

0.01220

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	Strength _{norm} [ksi]
TCC4A111A	A	C1	1	1	48.54	0.1448	12	LGM	0.01207	48.02
TCC4A112A	A	C1	1	1	49.71	0.1458	12	LGM	0.01215	49.50
TCC4A113A	A	C1	1	1	49.08	0.1457	12	LGM	0.01214	48.84
TCC4A211A	A	C2	1	2	48.90	0.1466	12	LGM	0.01222	48.98
TCC4A212A	A	C2	1	2	49.24	0.1472	12	M(A,L)GM	0.01227	49.52
TCC4A213A	A	C2	1	2	49.17	0.1457	12	M(A,L)GM	0.01214	48.93
TCC4B111A	B	C1	2	1	50.47	0.1456	12	LGM	0.01214	50.21
TCC4B112A	B	C1	2	1	51.74	0.1452	12	LGM	0.01210	51.33
TCC4B113A	B	C1	2	1	51.59	0.1447	12	LGM	0.01205	50.97
TCC4B211A	B	C2	2	2	50.98	0.1445	12	LGM	0.01204	50.33
TCC4B212A	B	C2	2	2	49.81	0.1442	12	LGM	0.01202	49.05
TCC4B213A	B	C2	2	2	50.72	0.1439	12	LGM	0.01199	49.85
TCC4C111A	C	C1	3	1	50.62	0.1452	12	M(A,L)GM	0.01210	50.22
TCC4C112A	C	C1	3	1	50.70	0.1455	12	LGM	0.01213	50.40
TCC4C113A	C	C1	3	1	49.58	0.1454	12	LGM	0.01211	49.22
TCC4C211A	C	C2	3	2	48.78	0.1463	12	LGM	0.01219	48.75
TCC4C212A	C	C2	3	2	49.98	0.1467	12	LGM	0.01223	50.09
TCC4C213A	C	C2	3	2	49.79	0.1468	12	LGM	0.01223	49.92

Average 49.97
 Standard Dev. 0.9516
 Coeff. of Var. [%] 1.904
 Min. 48.54
 Max. 51.74
 Number of Spec. 18

Average_{norm} 0.01213 49.67
 Standard Dev._{norm} 0.8459
 Coeff. of Var. [%]_{norm} 1.703
 Min. 0.01199 48.02
 Max. 0.01227 51.33
 Number of Spec. 18 18



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

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

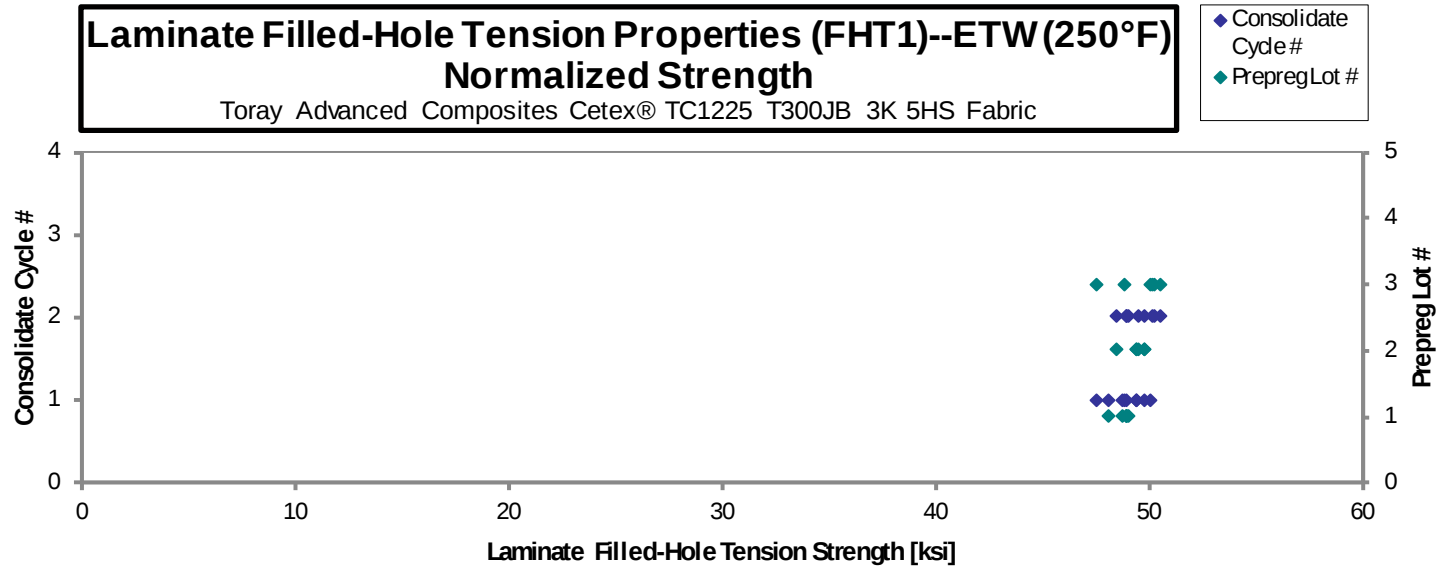
 t_{ply} [in]

0.01220

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	Strength _{norm} [ksi]
TCC4A111D	A	C1	1	1	48.45	0.1454	12	M(A,L)GM	0.01212	48.13
TCC4A112D	A	C1	1	1	49.16	0.1457	12	M(A,L)GM	0.01214	48.92
TCC4A113D	A	C1	1	1	48.78	0.1464	12	M(A,L)GM	0.01220	48.78
TCC4A211D	A	C2	1	2	49.12	0.1458	12	LGM	0.01215	48.92
TCC4A212D	A	C2	1	2	48.87	0.1468	12	LGM	0.01223	48.99
TCC4A213D	A	C2	1	2	49.38	0.1455	12	M(A,L)GM	0.01213	49.08
TCC4B111D	B	C1	2	1	49.70	0.1456	12	AGM	0.01213	49.41
TCC4B112D	B	C1	2	1	49.94	0.1450	12	AGM	0.01208	49.47
TCC4B113D	B	C1	2	1	50.26	0.1451	12	AGM	0.01209	49.81
TCC4B211D	B	C2	2	2	50.06	0.1448	12	AGM	0.01207	49.51
TCC4B212D	B	C2	2	2	48.87	0.1451	12	AGM	0.01209	48.44
TCC4B213D	B	C2	2	2	50.12	0.1455	12	AGM	0.01212	49.80
TCC4C111D	C	C1	3	1	46.95	0.1484	12	LGM	0.01237	47.60
TCC4C112D	C	C1	3	1	50.49	0.1452	12	AGM	0.01210	50.07
TCC4C113D	C	C1	3	1	49.11	0.1456	12	AGM	0.01213	48.85
TCC4C211D	C	C2	3	2	50.52	0.1456	12	LGM	0.01213	50.25
TCC4C212D	C	C2	3	2	50.45	0.1456	12	LGM	0.01213	50.17
TCC4C213D	C	C2	3	2	50.43	0.1467	12	AGM	0.01222	50.51

Average 49.48
 Standard Dev. 0.9270
 Coeff. of Var. [%] 1.873
 Min. 46.95
 Max. 50.52
 Number of Spec. 18

Average_{norm} 0.01215 49.26
 Standard Dev._{norm} 0.7743
 Coeff. of Var. [%]_{norm} 1.572
 Min. 0.01207 47.60
 Max. 0.01237 50.51
 Number of Spec. 18 18



4.19 “10/80/10” Filled-Hole Tension 2 Properties (FHT2)

Laminate Filled-Hole Tension Properties (FHT2)--CTA (-65°F) Strength

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

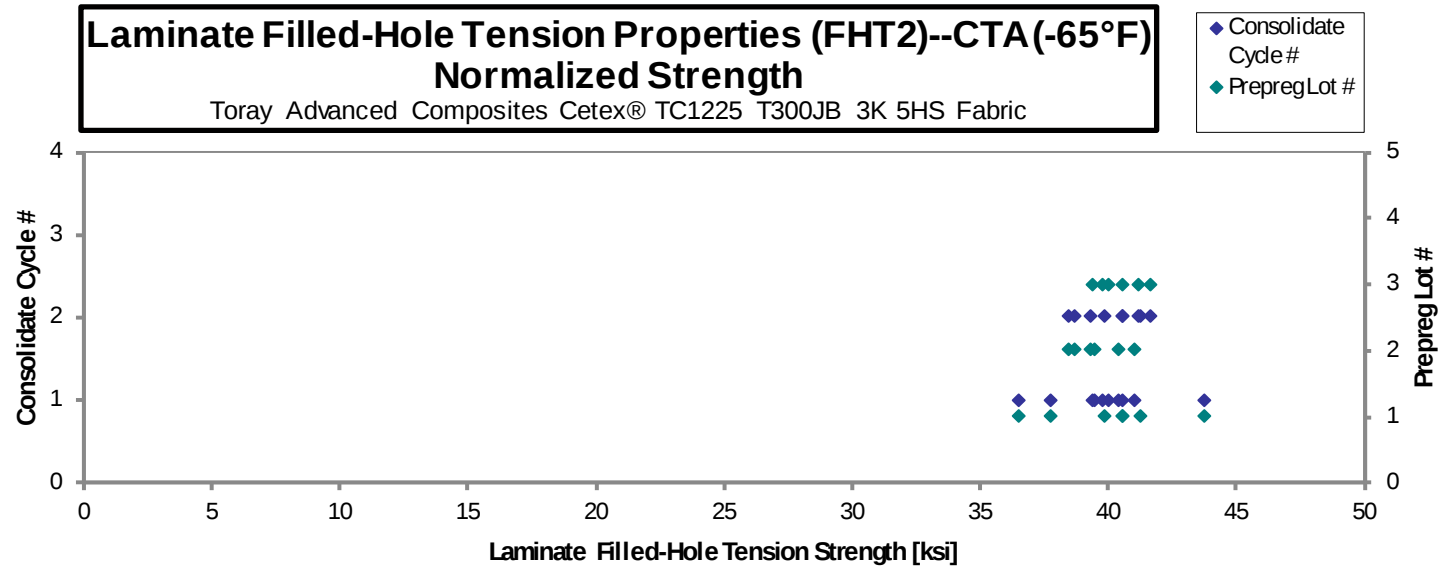
 t_{ply} [in]

0.01220

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	Strength _{norm} [ksi]
TCC5A111B	A	C1	1	1	43.83	0.1217	10	M(A,L)GM	0.01217	43.73
TCC5A112B	A	C1	1	1	36.50	0.1220	10	M(A,L)GM	0.01220	36.49
TCC5A113B	A	C1	1	1	38.11	0.1210	10	M(A,L)GM	0.01210	37.79
TCC5A114B	A	C1	1	1	40.62	0.1219	10	M(A,L)GM	0.01219	40.57
TCC5A211B	A	C2	1	2	41.38	0.1218	10	M(A,L)GM	0.01218	41.30
TCC5A212B	A	C2	1	2	40.88	0.1211	10	M(A,L)GM	0.01211	40.58
TCC5A213B	A	C2	1	2	39.54	0.1229	10	M(A,L)GM	0.01229	39.84
TCC5B111B	B	C1	2	1	40.01	0.1203	10	AGM	0.01203	39.45
TCC5B112B	B	C1	2	1	41.56	0.1205	10	AGM	0.01205	41.06
TCC5B113B	B	C1	2	1	40.91	0.1205	10	AGM	0.01205	40.39
TCC5B211B	B	C2	2	2	39.04	0.1201	10	AGM	0.01201	38.43
TCC5B212B	B	C2	2	2	39.18	0.1204	10	AGM	0.01204	38.67
TCC5B213B	B	C2	2	2	39.82	0.1205	10	AGM	0.01205	39.34
TCC5C111B	C	C1	3	1	40.19	0.1196	10	AGM	0.01196	39.40
TCC5C112B	C	C1	3	1	40.38	0.1202	10	AGM	0.01202	39.78
TCC5C113B	C	C1	3	1	40.85	0.1196	10	AGM	0.01196	40.04
TCC5C211B	C	C2	3	2	40.90	0.1210	10	AGM	0.01210	40.56
TCC5C212B	C	C2	3	2	42.23	0.1203	10	AGM	0.01203	41.65
TCC5C213B	C	C2	3	2	41.17	0.1219	10	AGM	0.01219	41.15

Average 40.37
 Standard Dev. 1.564
 Coeff. of Var. [%] 3.874
 Min. 36.50
 Max. 43.83
 Number of Spec. 19

Average_{norm} 0.01209 40.01
 Standard Dev._{norm} 1.572
 Coeff. of Var. [%]_{norm} 3.929
 Min. 0.01196 36.49
 Max. 0.01229 43.73
 Number of Spec. 19 19



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

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

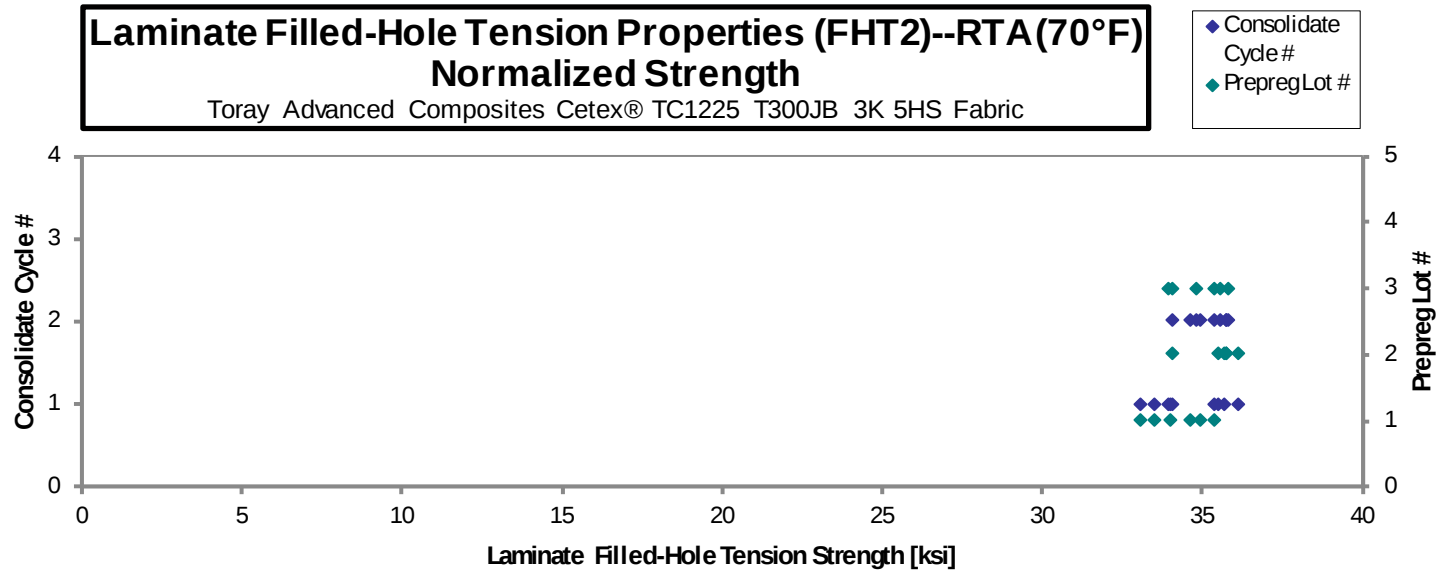
 t_{ply} [in]

0.01220

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	Strength _{norm} [ksi]
TCC5A111A	A	C1	1	1	33.14	0.1217	10	M(A,L)GM	0.01217	33.06
TCC5A112A	A	C1	1	1	33.32	0.1227	10	M(A,L)GM	0.01227	33.52
TCC5A113A	A	C1	1	1	34.00	0.1220	10	M(A,L)GM	0.01220	34.01
TCC5A211A	A	C2	1	2	35.48	0.1217	10	M(A,L)GM	0.01217	35.40
TCC5A212A	A	C2	1	2	35.11	0.1214	10	M(A,L)GM	0.01214	34.93
TCC5A213A	A	C2	1	2	34.64	0.1219	10	M(A,L)GM	0.01219	34.61
TCC5B111A	B	C1	2	1	36.78	0.1199	10	AGM	0.01199	36.16
TCC5B112A	B	C1	2	1	36.49	0.1193	10	AGM	0.01193	35.68
TCC5B113A	B	C1	2	1	36.29	0.1193	10	AGM	0.01193	35.50
TCC5B211A	B	C2	2	2	34.46	0.1206	10	AGM	0.01206	34.06
TCC5B212A	B	C2	2	2	36.24	0.1204	10	AGM	0.01204	35.75
TCC5B213A	B	C2	2	2	36.19	0.1205	10	AGM	0.01205	35.73
TCC5C111A	C	C1	3	1	35.99	0.1200	10	AGM	0.01200	35.41
TCC5C112A	C	C1	3	1	34.60	0.1200	10	AGM	0.01200	34.04
TCC5C113A	C	C1	3	1	34.26	0.1209	10	AGM	0.01209	33.93
TCC5C211A	C	C2	3	2	35.86	0.1210	10	AGM	0.01210	35.56
TCC5C212A	C	C2	3	2	35.13	0.1209	10	AGM	0.01209	34.81
TCC5C213A	C	C2	3	2	36.03	0.1213	10	AGM	0.01213	35.82

Average 35.22
 Standard Dev. 1.100
 Coeff. of Var. [%] 3.123
 Min. 33.14
 Max. 36.78
 Number of Spec. 18

Average_{norm} 0.01209 34.89
 Standard Dev._{norm} 0.9168
 Coeff. of Var. [%]_{norm} 2.628
 Min. 0.01193 33.06
 Max. 0.01227 36.16
 Number of Spec. 18 18



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

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

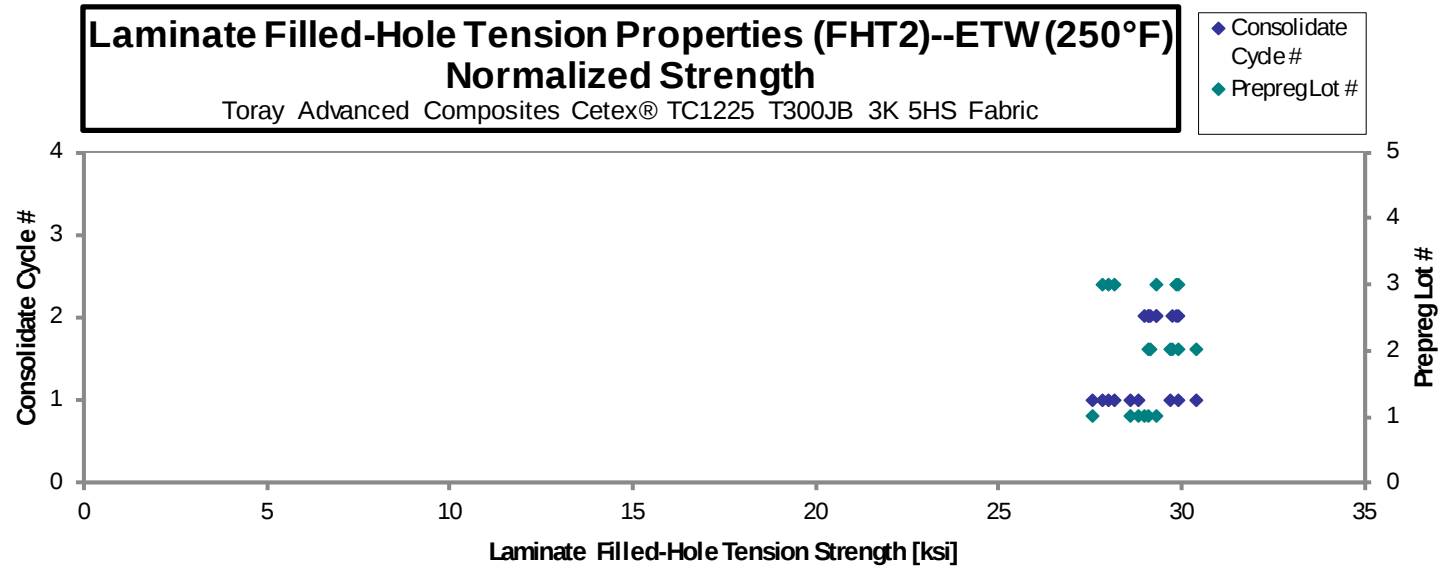
 t_{ply} [in]

0.01220

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	Strength _{norm} [ksi]
TCC5A111D	A	C1	1	1	28.97	0.1214	10	AGM	0.01214	28.83
TCC5A112D	A	C1	1	1	28.93	0.1207	10	AGM	0.01207	28.62
TCC5A113D	A	C1	1	1	27.80	0.1209	10	AGM	0.01209	27.55
TCC5A211D	A	C2	1	2	28.80	0.1229	10	AGM	0.01229	29.00
TCC5A212D	A	C2	1	2	29.15	0.1217	10	AGM	0.01217	29.08
TCC5A213D	A	C2	1	2	29.49	0.1214	10	AGM	0.01214	29.35
TCC5B111D	B	C1	2	1	30.17	0.1209	10	AGM	0.01209	29.90
TCC5B112D	B	C1	2	1	30.87	0.1202	10	AGM	0.01202	30.41
TCC5B113D	B	C1	2	1	30.03	0.1207	10	AGM	0.01207	29.70
TCC5B211D	B	C2	2	2	29.65	0.1200	10	AGM	0.01200	29.17
TCC5B212D	B	C2	2	2	30.03	0.1208	10	AGM	0.01208	29.74
TCC5B213D	B	C2	2	2	29.28	0.1214	10	AGM	0.01214	29.13
TCC5C111D	C	C1	3	1	28.24	0.1202	10	AGM	0.01202	27.83
TCC5C112D	C	C1	3	1	28.74	0.1197	10	AGM	0.01197	28.19
TCC5C113D	C	C1	3	1	28.31	0.1206	10	AGM	0.01206	27.98
TCC5C211D	C	C2	3	2	30.25	0.1207	10	AGM	0.01207	29.92
TCC5C212D	C	C2	3	2	30.35	0.1201	10	AGM	0.01201	29.86
TCC5C213D	C	C2	3	2	29.78	0.1201	10	AGM	0.01201	29.32

Average **29.38**
 Standard Dev. **0.8327**
 Coeff. of Var. [%] **2.834**
 Min. **27.80**
 Max. **30.87**
 Number of Spec. **18**

Average_{norm} **0.01208**
 Standard Dev._{norm} **0.8003**
 Coeff. of Var. [%]_{norm} **2.751**
 Min. **0.01197**
 Max. **0.01229**
 Number of Spec. **18**



4.20 “40/20/40” Filled-Hole Tension 3 Properties (FHT3)

**Laminate Filled-Hole Tension Properties (FHT3)--CTA (-65°F)
Strength**

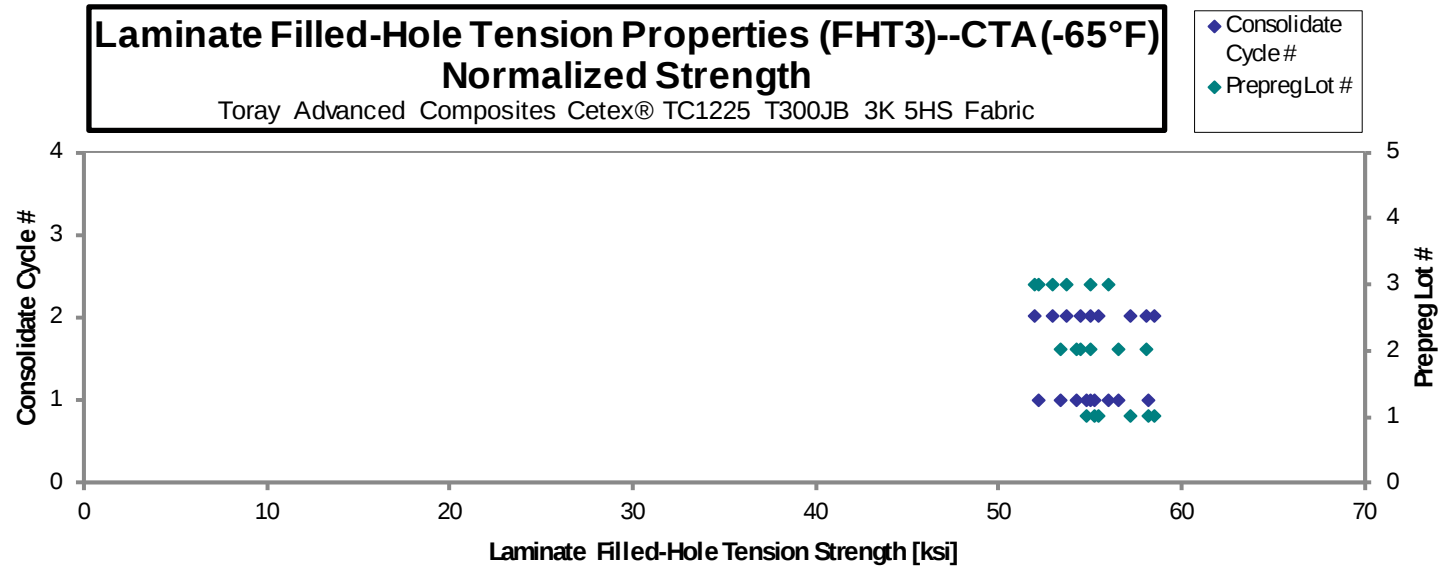
Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

 normalizing
 t_{ply} [in]
 0.01220

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	Strength _{norm} [ksi]
TCC6A111B	A	C1	1	1	55.63	0.1201	10	LGM	0.01201	54.78
TCC6A112B	A	C1	1	1	58.70	0.1210	10	LGM	0.01210	58.21
TCC6A113B	A	C1	1	1	55.60	0.1214	10	LGM	0.01214	55.31
TCC6A211B	A	C2	1	2	57.14	0.1222	10	LGM	0.01222	57.25
TCC6A212B	A	C2	1	2	55.29	0.1223	10	LGM	0.01223	55.42
TCC6A213B	A	C2	1	2	58.41	0.1222	10	LGM	0.01222	58.52
TCC6B111B	B	C1	2	1	53.56	0.1218	10	LGM	0.01218	53.45
TCC6B112B	B	C1	2	1	57.10	0.1208	10	LGM	0.01208	56.52
TCC6B113B	B	C1	2	1	54.92	0.1206	10	LGM	0.01206	54.29
TCC6B211B	B	C2	2	2	58.90	0.1204	10	LGM	0.01204	58.12
TCC6B212B	B	C2	2	2	55.44	0.1200	10	LGM	0.01200	54.52
TCC6B213B	B	C2	2	2	55.82	0.1203	10	LGM	0.01203	55.04
TCC6C111B	C	C1	3	1	56.31	0.1193	10	LGM	0.01193	55.06
TCC6C112B	C	C1	3	1	57.13	0.1197	10	LGM	0.01197	56.03
TCC6C113B	C	C1	3	1	53.23	0.1196	10	LGM	0.01196	52.18
TCC6C211B	C	C2	3	2	53.61	0.1204	10	LGM	0.01204	52.92
TCC6C212B	C	C2	3	2	54.54	0.1201	10	LGM	0.01201	53.68
TCC6C213B	C	C2	3	2	52.50	0.1209	10	LGM	0.01209	52.01

Average 55.77
 Standard Dev. 1.886
 Coeff. of Var. [%] 3.382
 Min. 52.50
 Max. 58.90
 Number of Spec. 18

Average_{norm} 0.01207 55.18
 Standard Dev._{norm} 1.981
 Coeff. of Var. [%]_{norm} 3.589
 Min. 0.01193 52.01
 Max. 0.01223 58.52
 Number of Spec. 18



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

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

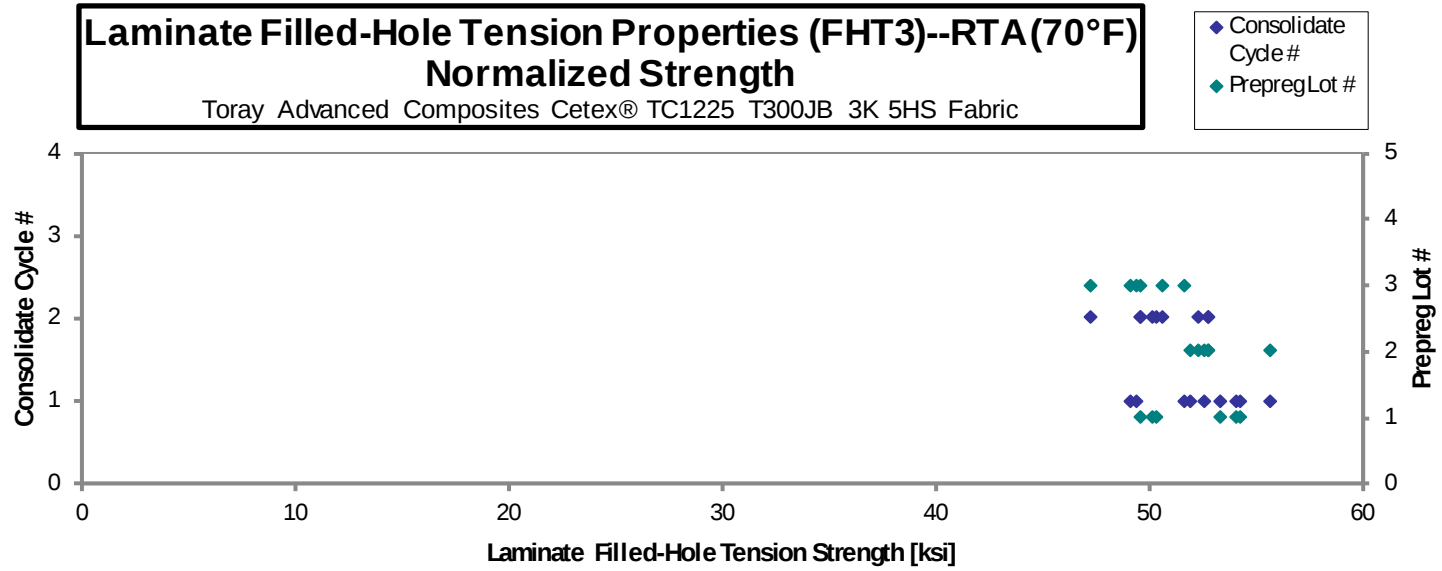
 t_{ply} [in]

0.01220

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	Strength _{norm} [ksi]
TCC6A111A	A	C1	1	1	54.68	0.1206	10	M(A,L)GM	0.01206	54.05
TCC6A112A	A	C1	1	1	55.15	0.1201	10	M(A,L)GM	0.01201	54.29
TCC6A113A	A	C1	1	1	54.38	0.1197	10	M(A,L)GM	0.01197	53.34
TCC6A211A	A	C2	1	2	49.33	0.1226	10	LGM	0.01226	49.58
TCC6A212A	A	C2	1	2	50.00	0.1230	10	LGM	0.01230	50.40
TCC6A213A	A	C2	1	2	49.75	0.1229	10	LGM	0.01229	50.13
TCC6B111A	B	C1	2	1	52.78	0.1216	10	LGM	0.01216	52.62
TCC6B112A	B	C1	2	1	52.14	0.1216	10	LGM	0.01216	51.96
TCC6B113A	B	C1	2	1	56.03	0.1212	10	LGM	0.01212	55.66
TCC6B211A	B	C2	2	2	53.00	0.1216	10	LGM	0.01216	52.83
TCC6B212A	B	C2	2	2	53.22	0.1211	10	LGM	0.01211	52.82
TCC6B213A	B	C2	2	2	52.80	0.1209	10	LGM	0.01209	52.32
TCC6C111A	C	C1	3	1	52.20	0.1208	10	LGM	0.01208	51.68
TCC6C112A	C	C1	3	1	49.61	0.1209	10	LGM	0.01209	49.16
TCC6C113A	C	C1	3	1	49.90	0.1208	10	LGM	0.01208	49.38
TCC6C211A	C	C2	3	2	47.03	0.1227	10	LGM	0.01227	47.29
TCC6C212A	C	C2	3	2	51.37	0.1203	10	LGM	0.01203	50.66
TCC6C213A	C	C2	3	2	50.18	0.1206	10	LGM	0.01206	49.62

Average 51.86
 Standard Dev. 2.391
 Coeff. of Var. [%] 4.609
 Min. 47.03
 Max. 56.03
 Number of Spec. 18

Average_{norm} 0.01213 51.54
 Standard Dev._{norm} 2.160
 Coeff. of Var. [%]_{norm} 4.190
 Min. 0.01197 47.29
 Max. 0.01230 55.66
 Number of Spec. 18 18



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

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

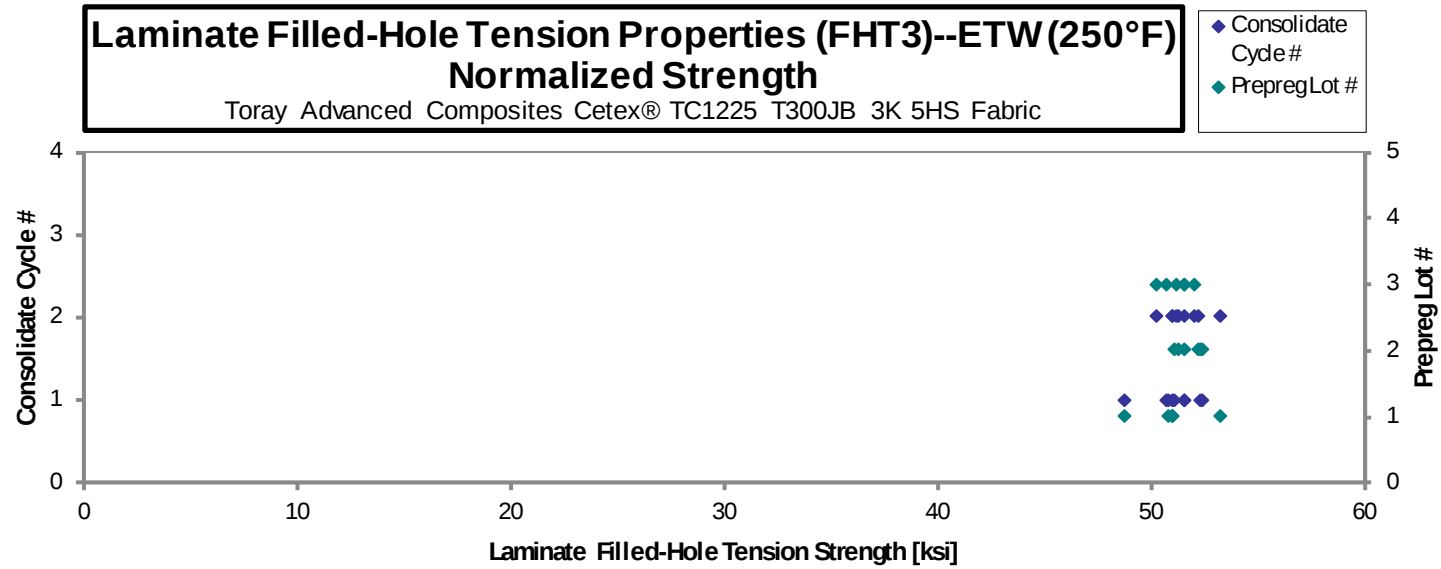
 t_{ply} [in]

0.01220

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	Strength _{norm} [ksi]
TCC6A111D	A	C1	1	1	51.71	0.1202	10	LGM	0.01202	50.97
TCC6A112D	A	C1	1	1	49.20	0.1210	10	LGM	0.01210	48.81
TCC6A113D	A	C1	1	1	51.65	0.1202	10	LGM	0.01202	50.86
TCC6A211D	A	C2	1	2	50.94	0.1222	10	LGM	0.01222	51.01
TCC6A212D	A	C2	1	2	50.95	0.1222	10	LGM	0.01222	51.04
TCC6A213D	A	C2	1	2	53.12	0.1223	10	LGM	0.01223	53.27
TCC6B111D	B	C1	2	1	51.51	0.1211	10	LGM	0.01211	51.11
TCC6B112D	B	C1	2	1	53.01	0.1207	10	LGM	0.01207	52.46
TCC6B113D	B	C1	2	1	53.05	0.1203	10	LGM	0.01203	52.30
TCC6B211D	B	C2	2	2	52.06	0.1201	10	LGM	0.01201	51.25
TCC6B212D	B	C2	2	2	52.97	0.1203	10	LGM	0.01203	52.21
TCC6B213D	B	C2	2	2	52.74	0.1194	10	LGM	0.01194	51.60
TCC6C111D	C	C1	3	1	51.67	0.1199	10	LGM	0.01199	50.77
TCC6C112D	C	C1	3	1	52.46	0.1198	10	LGM	0.01198	51.52
TCC6C113D	C	C1	3	1	52.64	0.1196	10	LGM	0.01196	51.59
TCC6C211D	C	C2	3	2	50.54	0.1213	10	LGM	0.01213	50.23
TCC6C212D	C	C2	3	2	51.55	0.1212	10	LGM	0.01212	51.20
TCC6C213D	C	C2	3	2	52.45	0.1211	10	LGM	0.01211	52.06

Average 51.90
 Standard Dev. 1.043
 Coeff. of Var. [%] 2.010
 Min. 49.20
 Max. 53.12
 Number of Spec. 18

Average_{norm} 0.01207 51.35
 Standard Dev._{norm} 0.9687
 Coeff. of Var. [%]_{norm} 1.887
 Min. 0.01194 48.81
 Max. 0.01223 53.27
 Number of Spec. 18 18



4.21 “25/50/25” Open-Hole Compression 1 Properties (OHC1)

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

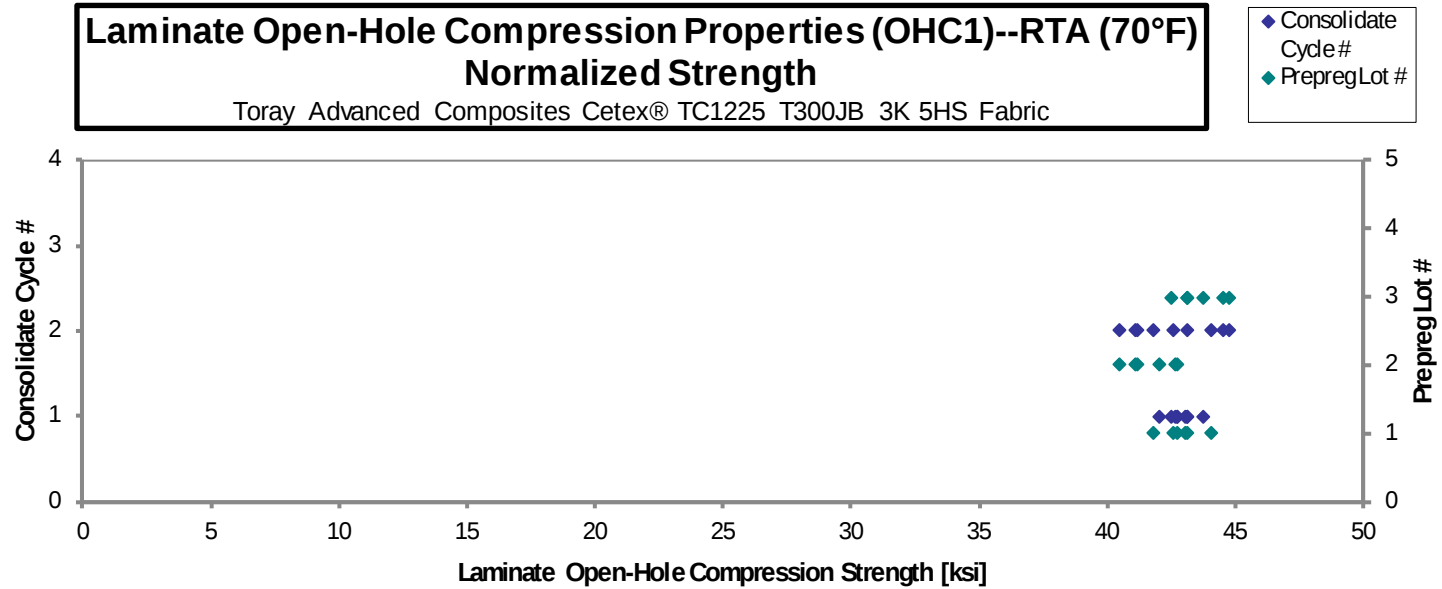
Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

 normalizing
 t_{ply} [in]
 0.01220

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	Strength _{norm} [ksi]
TCCGA111A	A	C1	1	1	42.97	0.1469	12	LGM	0.01224	43.13
TCCGA112A	A	C1	1	1	42.43	0.1474	12	LGM	0.01228	42.72
TCCGA113A	A	C1	1	1	43.01	0.1465	12	LGM	0.01221	43.05
TCCGA211A	A	C2	1	2	44.03	0.1466	12	LGM	0.01221	44.07
TCCGA212A	A	C2	1	2	42.23	0.1475	12	LGM	0.01229	42.55
TCCGA213A	A	C2	1	2	41.51	0.1475	12	LGM	0.01229	41.81
TCCGB111A	B	C1	2	1	43.10	0.1451	12	LGM	0.01209	42.72
TCCGB112A	B	C1	2	1	42.30	0.1453	12	LGM	0.01211	41.98
TCCGB113A	B	C1	2	1	43.07	0.1448	12	M(A,L)GM	0.01207	42.61
TCCGB211A	B	C2	2	2	41.58	0.1450	12	LGM	0.01208	41.18
TCCGB212A	B	C2	2	2	41.60	0.1446	12	LGM	0.01205	41.09
TCCGB213A	B	C2	2	2	41.08	0.1442	12	LGM	0.01202	40.47
TCCGC111A	C	C1	3	1	42.36	0.1488	12	LGM	0.01240	43.06
TCCGC112A	C	C1	3	1	42.32	0.1471	12	LGM	0.01226	42.51
TCCGC113A	C	C1	3	1	43.77	0.1462	12	LGM	0.01218	43.71
TCCGC211A	C	C2	3	2	44.46	0.1472	12	LGM	0.01227	44.71
TCCGC212A	C	C2	3	2	44.36	0.1469	12	LGM	0.01224	44.50
TCCGC213A	C	C2	3	2	43.30	0.1457	12	LGM	0.01214	43.10

Average 42.75
 Standard Dev. 0.9925
 Coeff. of Var. [%] 2.322
 Min. 41.08
 Max. 44.46
 Number of Spec. 18

Average_{norm} 0.01219 42.72
 Standard Dev._{norm} 1.138
 Coeff. of Var. [%]_{norm} 2.663
 Min. 0.01202 40.47
 Max. 0.01240 44.71
 Number of Spec. 18



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

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

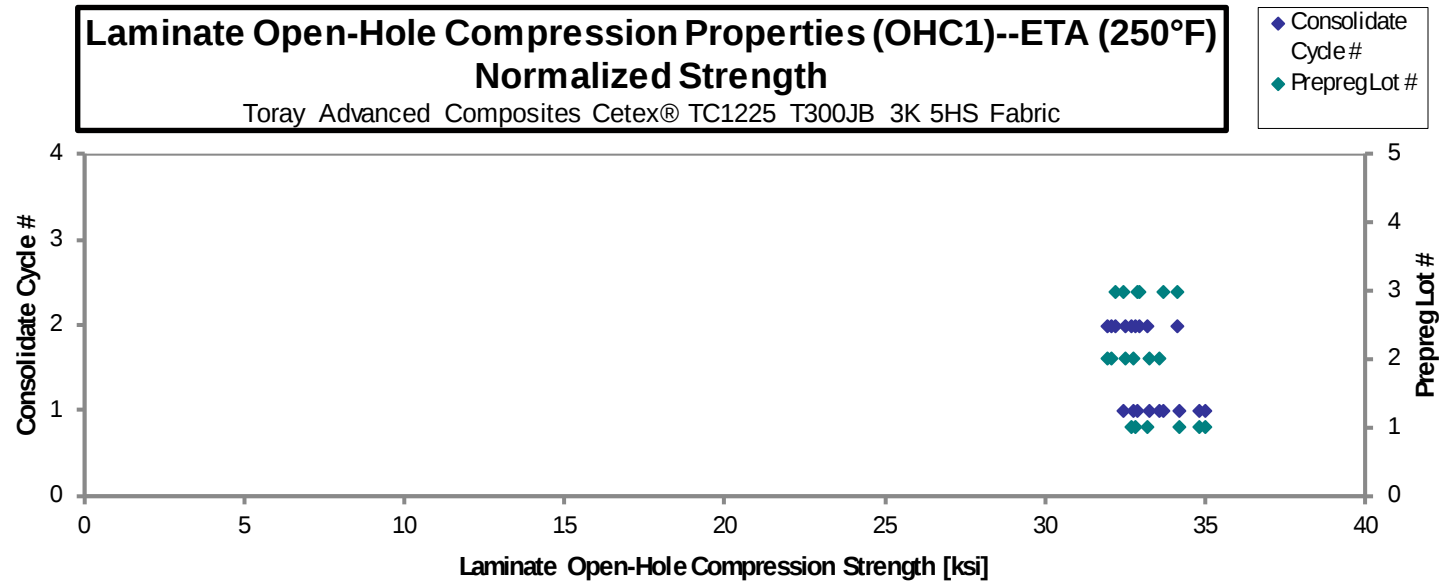
 t_{ply} [in]

0.01220

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	Strength _{norm} [ksi]
TCCGA111C	A	C1	1	1	34.16	0.1466	12	LGM	0.01222	34.21
TCCGA112C	A	C1	1	1	34.88	0.1470	12	LGM	0.01225	35.02
TCCGA113C	A	C1	1	1	34.56	0.1476	12	LGM	0.01230	34.85
TCCGA211C	A	C2	1	2	32.83	0.1481	12	LGM	0.01234	33.21
TCCGA212C	A	C2	1	2	32.70	0.1466	12	LGM	0.01221	32.74
TCCGA213C	A	C2	1	2	32.65	0.1472	12	LGM	0.01227	32.83
TCCGB111C	B	C1	2	1	33.97	0.1447	12	LGM	0.01206	33.57
TCCGB112C	B	C1	2	1	33.65	0.1449	12	LGM	0.01207	33.30
TCCGB113C	B	C1	2	1	33.22	0.1444	12	LGM	0.01203	32.77
TCCGB211C	B	C2	2	2	32.87	0.1450	12	LGM	0.01208	32.55
TCCGB212C	B	C2	2	2	32.06	0.1460	12	LGM	0.01217	31.97
TCCGB213C	B	C2	2	2	32.13	0.1462	12	LGM	0.01218	32.08
TCCGC111C	C	C1	3	1	32.52	0.1463	12	LGM	0.01219	32.50
TCCGC112C	C	C1	3	1	32.81	0.1469	12	LGM	0.01224	32.93
TCCGC113C	C	C1	3	1	33.43	0.1478	12	LGM	0.01231	33.74
TCCGC211C	C	C2	3	2	32.48	0.1453	12	LGM	0.01210	32.22
TCCGC212C	C	C2	3	2	33.19	0.1454	12	LGM	0.01211	32.96
TCCGC213C	C	C2	3	2	34.43	0.1452	12	LGM	0.01210	34.16

Average 33.25
 Standard Dev. 0.8512
 Coeff. of Var. [%] 2.560
 Min. 32.06
 Max. 34.88
 Number of Spec. 18

Average_{norm} 0.01218 33.20
 Standard Dev._{norm} 0.8985
 Coeff. of Var. [%]_{norm} 2.706
 Min. 0.01203 31.97
 Max. 0.01234 35.02
 Number of Spec. 18 18



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

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

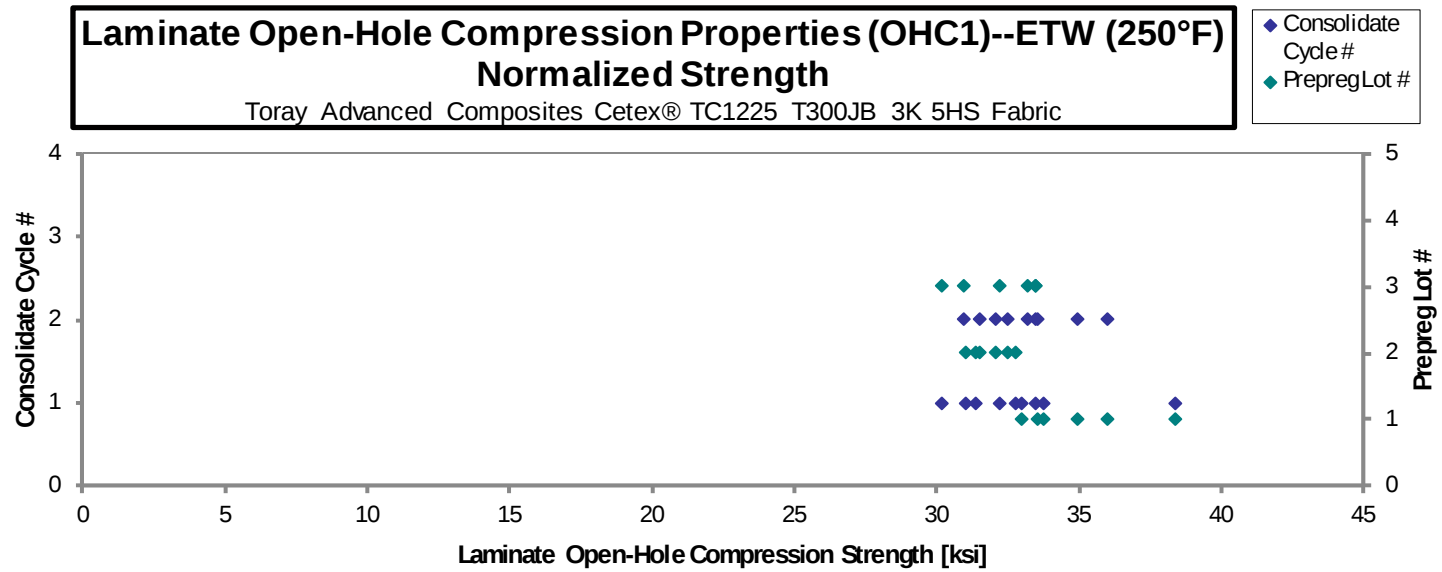
 t_{ply} [in]

0.01220

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	Strength _{norm} [ksi]
TCCGA111D	A	C1	1	1	38.05	0.1476	12	M(A,L)GM	0.01230	38.37
TCCGA112D	A	C1	1	1	33.59	0.1470	12	LGM	0.01225	33.73
TCCGA113D	A	C1	1	1	33.01	0.1463	12	LGM	0.01219	32.98
TCCGA211D	A	C2	1	2	34.91	0.1464	12	LGM	0.01220	34.91
TCCGA212D	A	C2	1	2	35.87	0.1469	12	LGM	0.01224	35.98
TCCGA213D	A	C2	1	2	33.34	0.1473	12	LGM	0.01227	33.54
TCCGB111D	B	C1	2	1	33.16	0.1445	12	LGM	0.01204	32.73
TCCGB112D	B	C1	2	1	31.74	0.1445	12	LGM	0.01204	31.33
TCCGB113D	B	C1	2	1	31.45	0.1442	12	LGM	0.01202	30.98
TCCGB211D	B	C2	2	2	32.85	0.1447	12	LGM	0.01206	32.46
TCCGB212D	B	C2	2	2	32.33	0.1451	12	LGM	0.01209	32.03
TCCGB213D	B	C2	2	2	31.41	0.1467	12	LGM	0.01222	31.47
TCCGC111D	C	C1	3	1	30.10	0.1465	12	LGM	0.01221	30.13
TCCGC112D	C	C1	3	1	32.18	0.1463	12	LGM	0.01219	32.16
TCCGC113D	C	C1	3	1	33.32	0.1469	12	LGM	0.01224	33.43
TCCGC211D	C	C2	3	2	30.96	0.1461	12	LGM	0.01217	30.90
TCCGC212D	C	C2	3	2	33.46	0.1463	12	LGM	0.01219	33.44
TCCGC213D	C	C2	3	2	33.29	0.1459	12	LGM	0.01216	33.17

Average 33.06
 Standard Dev. 1.854
 Coeff. of Var. [%] 5.608
 Min. 30.10
 Max. 38.05
 Number of Spec. 18

Average_{norm} 0.01217 32.99
 Standard Dev._{norm} 1.978
 Coeff. of Var. [%]_{norm} 5.998
 Min. 0.01202 30.13
 Max. 0.01230 38.37
 Number of Spec. 18 18



4.22 “10/80/10” Open-Hole Compression 2 Properties (OHC2)

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

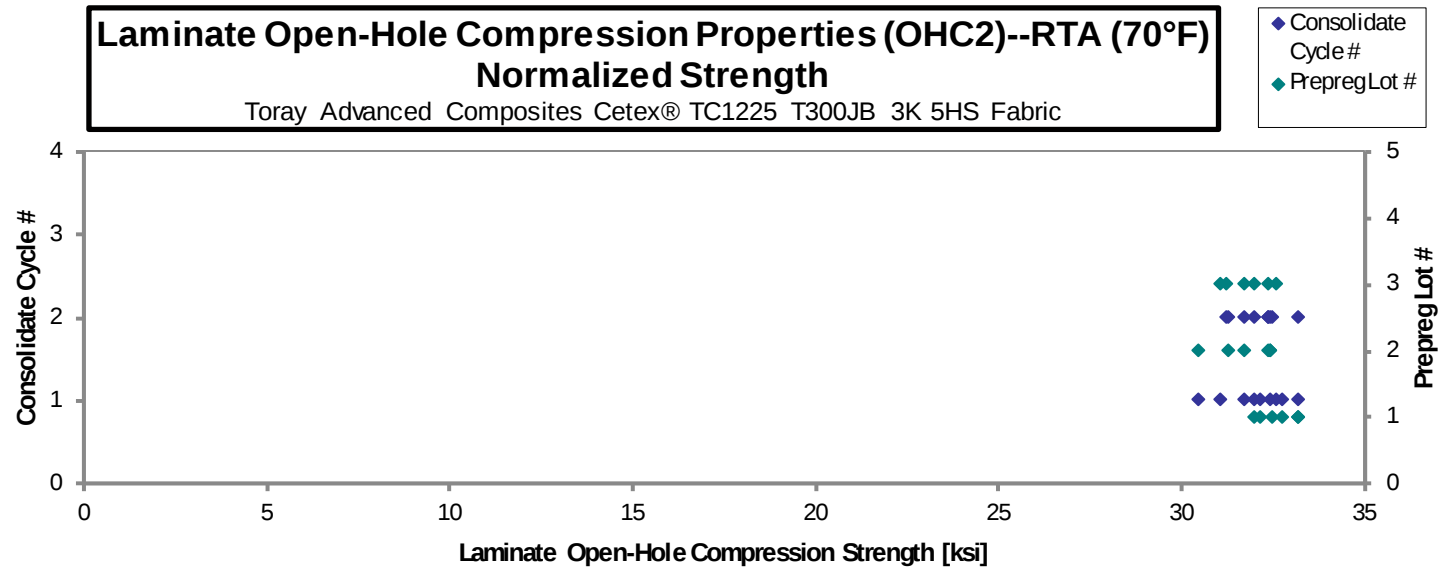
Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

 normalizing
 t_{ply} [in]
 0.01220

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	Strength _{norm} [ksi]
TCCHA111A	A	C1	1	1	32.89	0.1216	10	AGM	0.01216	32.77
TCCHA112A	A	C1	1	1	33.38	0.1213	10	AGM	0.01213	33.19
TCCHA113A	A	C1	1	1	32.34	0.1213	10	M(A,L)GM	0.01213	32.16
TCCHA211A	A	C2	1	2	31.82	0.1227	10	AGM	0.01227	32.01
TCCHA212A	A	C2	1	2	32.16	0.1233	10	AGM	0.01233	32.51
TCCHA213A	A	C2	1	2	32.71	0.1238	10	AGM	0.01238	33.18
TCCHB111A	B	C1	2	1	32.63	0.1213	10	AGM	0.01213	32.44
TCCHB112A	B	C1	2	1	32.00	0.1210	10	AGM	0.01210	31.73
TCCHB113A	B	C1	2	1	30.95	0.1200	10	AGM	0.01200	30.44
TCCHB211A	B	C2	2	2	32.58	0.1212	10	AGM	0.01212	32.35
TCCHB212A	B	C2	2	2	31.68	0.1206	10	AGM	0.01206	31.31
TCCHB213A	B	C2	2	2	32.77	0.1208	10	AGM	0.01208	32.44
TCCHC111A	C	C1	3	1	32.17	0.1213	10	AGM	0.01213	31.99
TCCHC112A	C	C1	3	1	32.67	0.1218	10	M(A,L)GM	0.01218	32.60
TCCHC113A	C	C1	3	1	31.24	0.1214	10	AGM	0.01214	31.09
TCCHC211A	C	C2	3	2	32.59	0.1211	10	AGM	0.01211	32.35
TCCHC212A	C	C2	3	2	31.98	0.1210	10	AGM	0.01210	31.73
TCCHC213A	C	C2	3	2	31.34	0.1215	10	AGM	0.01215	31.20

Average 32.22
 Standard Dev. 0.6377
 Coeff. of Var. [%] 1.979
 Min. 30.95
 Max. 33.38
 Number of Spec. 18

Average_{norm} 0.01215 32.08
 Standard Dev._{norm} 0.7309
 Coeff. of Var. [%]_{norm} 2.278
 Min. 0.01200 30.44
 Max. 0.01238 33.19
 Number of Spec. 18



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

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

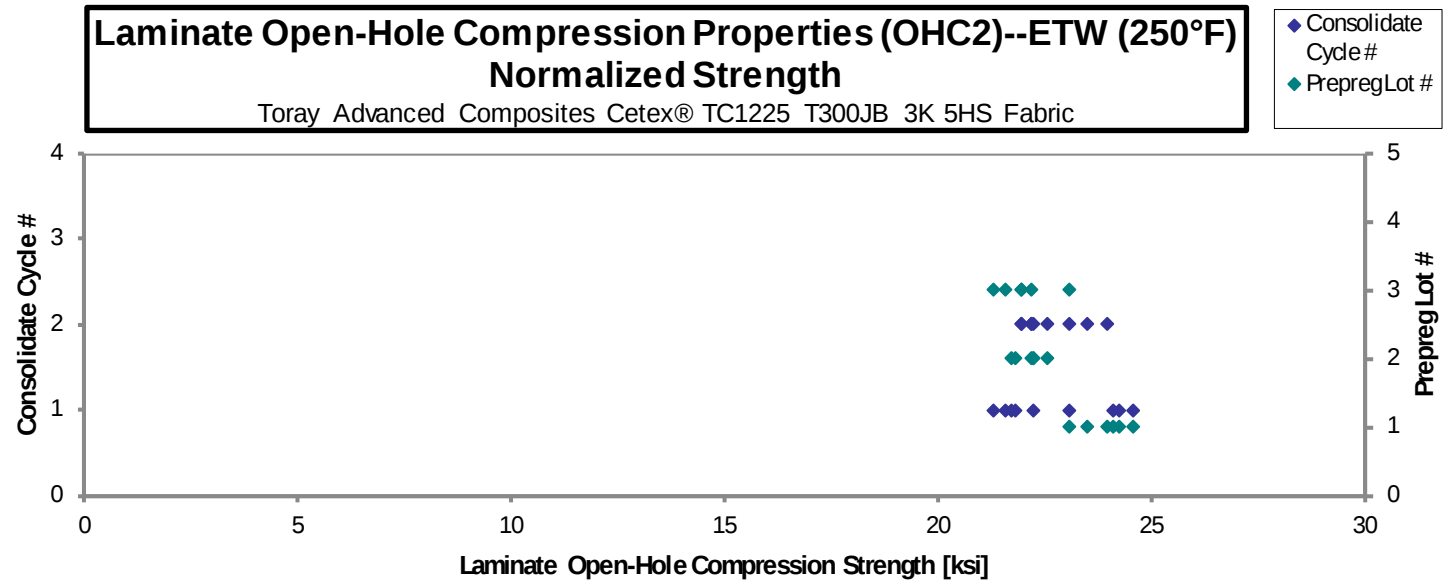
 t_{ply} [in]

0.01220

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	Strength _{norm} [ksi]
TCCHA111D	A	C1	1	1	24.74	0.1211	10	AGM	0.01211	24.56
TCCHA112D	A	C1	1	1	24.11	0.1220	10	AGM	0.01220	24.11
TCCHA113D	A	C1	1	1	24.33	0.1215	10	AGM	0.01215	24.23
TCCHA211D	A	C2	1	2	23.80	0.1227	10	AGM	0.01227	23.93
TCCHA212D	A	C2	1	2	23.42	0.1224	10	AGM	0.01224	23.49
TCCHA213D	A	C2	1	2	23.01	0.1223	10	AGM	0.01223	23.08
TCCHB111D	B	C1	2	1	22.22	0.1196	10	AGM	0.01196	21.79
TCCHB112D	B	C1	2	1	21.85	0.1212	10	AGM	0.01212	21.70
TCCHB113D	B	C1	2	1	22.38	0.1211	10	AGM	0.01211	22.21
TCCHB211D	B	C2	2	2	22.51	0.1201	10	AGM	0.01201	22.15
TCCHB212D	B	C2	2	2	23.02	0.1196	10	AGM	0.01196	22.56
TCCHB213D	B	C2	2	2	22.64	0.1197	10	AGM	0.01197	22.21
TCCHC111D	C	C1	3	1	23.10	0.1217	10	AGM	0.01217	23.04
TCCHC112D	C	C1	3	1	21.41	0.1214	10	AGM	0.01214	21.29
TCCHC113D	C	C1	3	1	21.97	0.1197	10	AGM	0.01197	21.56
TCCHC211D	C	C2	3	2	22.37	0.1210	10	AGM	0.01210	22.20
TCCHC212D	C	C2	3	2	21.98	0.1218	10	AGM	0.01218	21.94
TCCHC213D	C	C2	3	2	21.89	0.1224	10	AGM	0.01224	21.96

Average 22.82
 Standard Dev. 0.9466
 Coeff. of Var. [%] 4.148
 Min. 21.41
 Max. 24.74
 Number of Spec. 18

Average_{norm} 0.01212 22.67
 Standard Dev._{norm} 1.013
 Coeff. of Var. [%]_{norm} 4.471
 Min. 0.01196 21.29
 Max. 0.01227 24.56
 Number of Spec. 18 18



4.23 “40/20/40” Open-Hole Compression 3 Properties (OHC3)

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

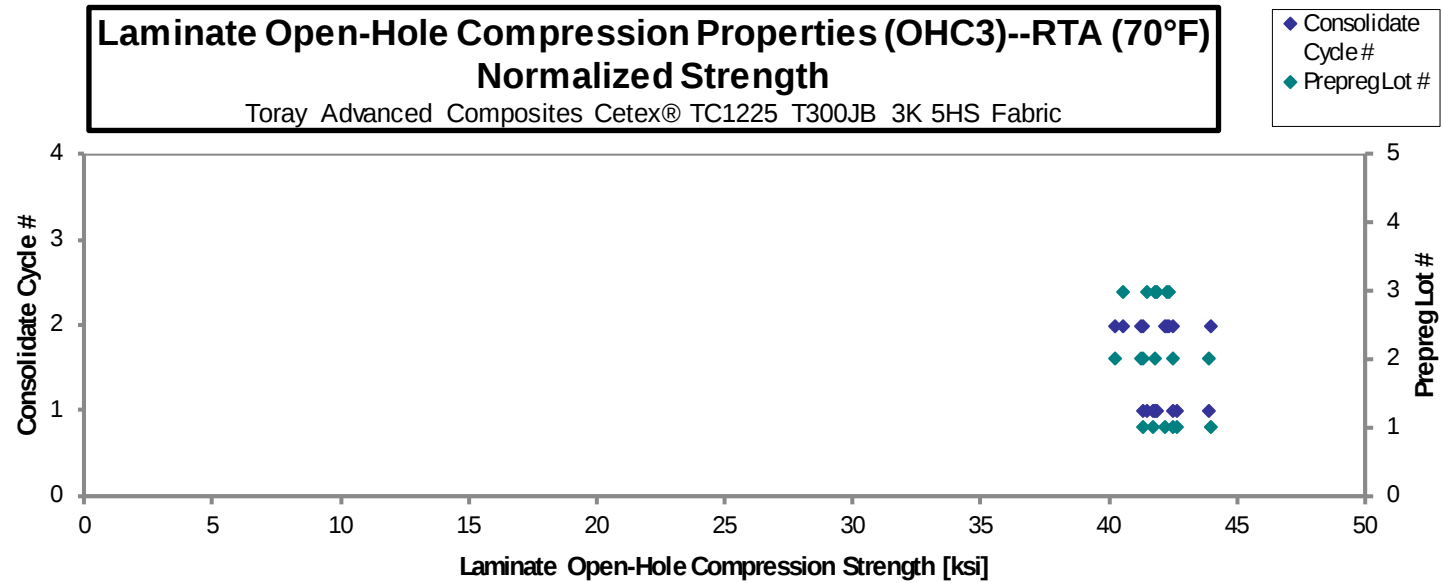
Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

 normalizing
 t_{ply} [in]
 0.01220

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	Strength _{norm} [ksi]
TCCIA111A	A	C1	1	1	43.07	0.1209	10	LGM	0.01209	42.68
TCCIA112A	A	C1	1	1	41.83	0.1205	10	LGM	0.01205	41.32
TCCIA113A	A	C1	1	1	42.08	0.1210	10	LGM	0.01210	41.72
TCCIA211A	A	C2	1	2	42.49	0.1221	10	LGM	0.01221	42.52
TCCIA212A	A	C2	1	2	42.35	0.1216	10	LGM	0.01216	42.20
TCCIA213A	A	C2	1	2	44.45	0.1207	10	LGM	0.01207	43.97
TCCIB112A	B	C1	2	1	42.03	0.1212	10	M(A,L)GM	0.01212	41.76
TCCIB113A	B	C1	2	1	43.12	0.1203	10	LGM	0.01203	42.50
TCCIB114A	B	C1	2	1	44.25	0.1210	10	LGM	0.01210	43.88
TCCIB211A	B	C2	2	2	40.67	0.1206	10	LGM	0.01206	40.20
TCCIB212A	B	C2	2	2	41.66	0.1209	10	LGM	0.01209	41.29
TCCIB213A	B	C2	2	2	41.81	0.1203	10	LGM	0.01203	41.24
TCCIC111A	C	C1	3	1	42.14	0.1211	10	LGM	0.01211	41.82
TCCIC112A	C	C1	3	1	41.60	0.1216	10	LGM	0.01216	41.46
TCCIC113A	C	C1	3	1	41.78	0.1223	10	LGM	0.01223	41.88
TCCIC211A	C	C2	3	2	40.41	0.1224	10	LGM	0.01224	40.54
TCCIC212A	C	C2	3	2	42.00	0.1227	10	LGM	0.01227	42.24
TCCIC213A	C	C2	3	2	41.92	0.1232	10	LGM	0.01232	42.34

Average 42.20
 Standard Dev. 1.022
 Coeff. of Var. [%] 2.422
 Min. 40.41
 Max. 44.45
 Number of Spec. 18

Average_{norm} 0.01213 41.98
 Standard Dev._{norm} 0.9699
 Coeff. of Var. [%]_{norm} 2.311
 Min. 0.01203 40.20
 Max. 0.01232 43.97
 Number of Spec. 18



Laminate Open-Hole Compression Properties (OHC3)--ETW (250°F) Strength

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

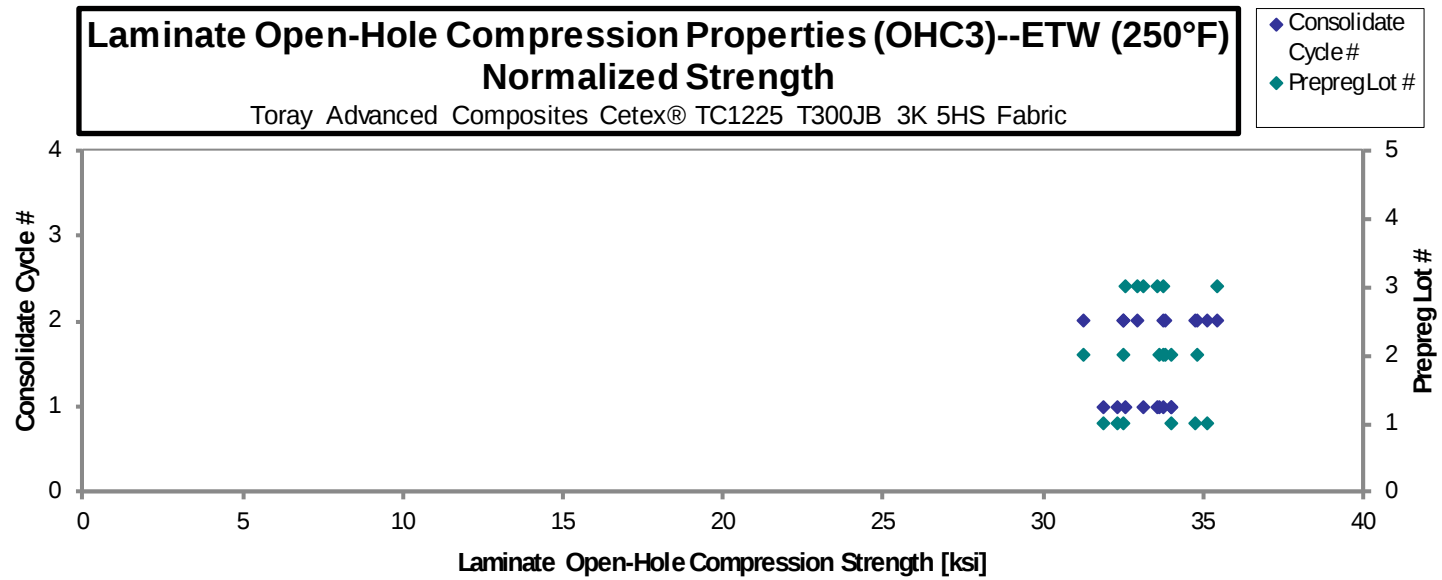
 t_{ply} [in]

0.01220

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	Strength _{norm} [ksi]
TCCIA111D	A	C1	1	1	34.18	0.1212	10	LGM	0.01212	33.97
TCCIA112D	A	C1	1	1	32.51	0.1212	10	LGM	0.01212	32.28
TCCIA113D	A	C1	1	1	31.91	0.1218	10	LGM	0.01218	31.86
TCCIA211D	A	C2	1	2	34.98	0.1212	10	LGM	0.01212	34.75
TCCIA212D	A	C2	1	2	32.70	0.1213	10	LGM	0.01213	32.51
TCCIA213D	A	C2	1	2	35.46	0.1207	10	LGM	0.01207	35.09
TCCIB111D	B	C1	2	1	33.96	0.1213	10	LGM	0.01213	33.75
TCCIB112D	B	C1	2	1	33.97	0.1207	10	LGM	0.01207	33.62
TCCIB113D	B	C1	2	1	34.40	0.1204	10	LGM	0.01204	33.96
TCCIB211D	B	C2	2	2	34.06	0.1212	10	LGM	0.01212	33.82
TCCIB212D	B	C2	2	2	34.86	0.1217	10	LGM	0.01217	34.77
TCCIB213D	B	C2	2	2	31.42	0.1213	10	LGM	0.01213	31.24
TCCIB214D	B	C2	2	2	32.76	0.1209	10	LGM	0.01209	32.47
TCCIC111D	C	C1	3	1	33.11	0.1221	10	LGM	0.01221	33.13
TCCIC112D	C	C1	3	1	33.98	0.1205	10	LGM	0.01205	33.57
TCCIC113D	C	C1	3	1	32.84	0.1208	10	LGM	0.01208	32.53
TCCIC211D	C	C2	3	2	32.99	0.1218	10	LGM	0.01218	32.93
TCCIC212D	C	C2	3	2	35.45	0.1218	10	LGM	0.01218	35.39
TCCIC213D	C	C2	3	2	34.00	0.1211	10	LGM	0.01211	33.74

Average 33.66
 Standard Dev. 1.144
 Coeff. of Var. [%] 3.399
 Min. 31.42
 Max. 35.46
 Number of Spec. 19

Average_{norm} 0.01212 33.44
 Standard Dev._{norm} 1.120
 Coeff. of Var. [%]_{norm} 3.350
 Min. 0.01204 31.24
 Max. 0.01221 35.39
 Number of Spec. 19 19



4.24 “25/50/25” Filled-Hole Compression 1 Properties (FHC1)

In some cases of the 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 that FHC1>UNC1.

Laminate Filled-Hole Compression Properties (FHC1)--RTA (70°F) Strength

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

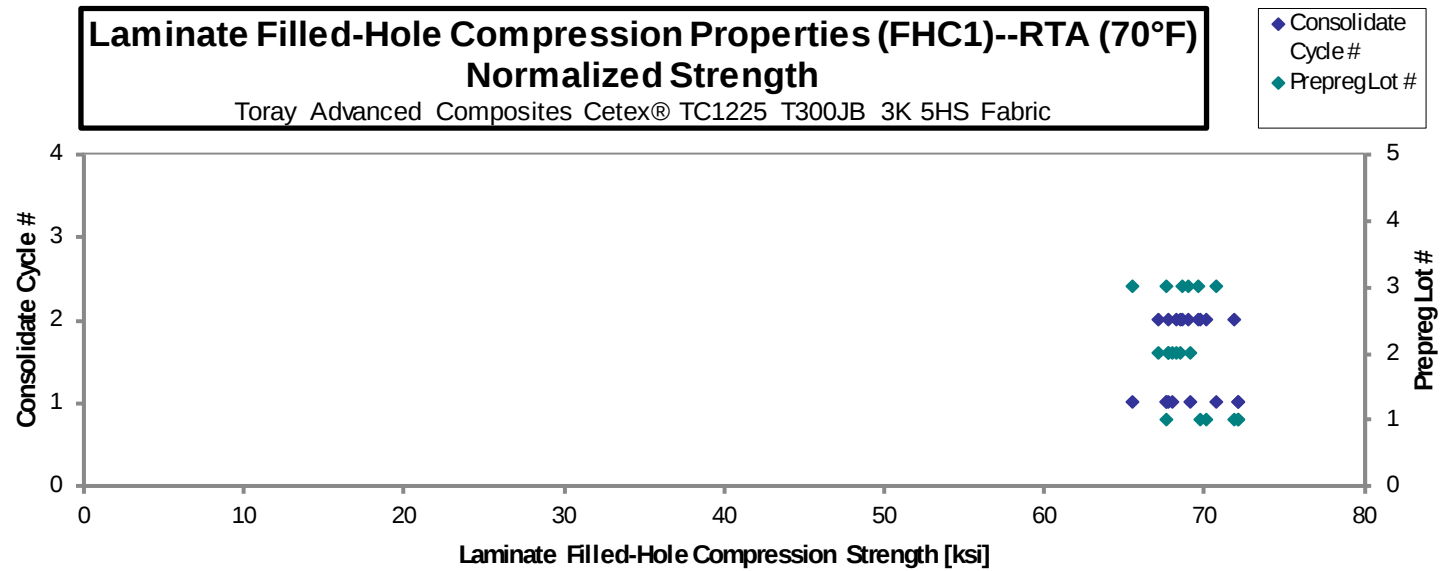
t_{ply} [in]

0.01220

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	Strength _{norm} [ksi]
TCC7A111A	A	C1	1	1	67.78	0.1461	12	AWB	0.01218	67.64
TCC7A112A	A	C1	1	1	72.08	0.1465	12	AWT	0.01221	72.15
TCC7A113A	A	C1	1	1	71.90	0.1468	12	AWT	0.01224	72.12
TCC7A211A	A	C2	1	2	69.48	0.1478	12	LWB	0.01232	70.14
TCC7A212A	A	C2	1	2	69.27	0.1475	12	AWT	0.01229	69.80
TCC7A213A	A	C2	1	2	71.56	0.1471	12	AWB	0.01226	71.90
TCC7B111A	B	C1	2	1	70.14	0.1444	12	LWB	0.01203	69.19
TCC7B112A	B	C1	2	1	69.00	0.1444	12	LWT	0.01203	68.06
TCC7B113A	B	C1	2	1	68.20	0.1454	12	LGB	0.01212	67.74
TCC7B211A	B	C2	2	2	67.60	0.1454	12	LWB	0.01212	67.16
TCC7B212A	B	C2	2	2	69.88	0.1436	12	LGB	0.01197	68.54
TCC7B213A	B	C2	2	2	68.59	0.1446	12	LWT	0.01205	67.76
TCC7B214A	B	C2	2	2	69.31	0.1442	12	M(A,L)GF	0.01201	68.25
TCC7C111A	C	C1	3	1	67.40	0.1470	12	LWT	0.01225	67.67
TCC7C112A	C	C1	3	1	66.76	0.1437	12	LWB	0.01198	65.55
TCC7C113A	C	C1	3	1	72.21	0.1434	12	LGF	0.01195	70.71
TCC7C211A	C	C2	3	2	70.86	0.1439	12	LGF	0.01199	69.63
TCC7C212A	C	C2	3	2	70.32	0.1437	12	LWT	0.01197	69.00
TCC7C213A	C	C2	3	2	69.50	0.1445	12	LGT	0.01204	68.58

Average 69.57
Standard Dev. 1.640
Coeff. of Var. [%] 2.357
Min. 66.76
Max. 72.21
Number of Spec. 19

Average_{norm} 0.01210 69.03
Standard Dev._{norm} 1.783
Coeff. of Var. [%]_{norm} 2.584
Min. 0.01195 65.55
Max. 0.01232 72.15
Number of Spec. 19 19



Laminate Filled-Hole Compression Properties (FHC1)--ETW (250°F) Strength

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

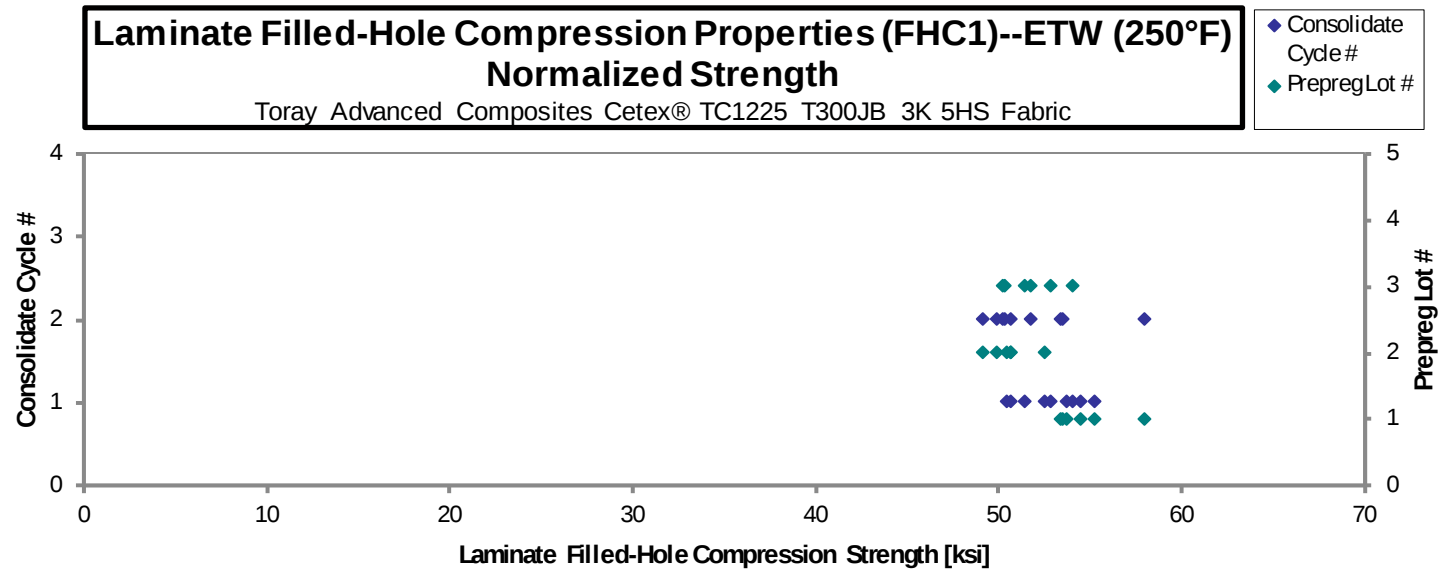
 t_{ply} [in]

0.01220

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	Strength _{norm} [ksi]
TCC7A111D	A	C1	1	1	55.19	0.1465	12	LWT	0.01221	55.22
TCC7A112D	A	C1	1	1	53.80	0.1463	12	LGB	0.01219	53.75
TCC7A113D	A	C1	1	1	54.35	0.1469	12	LGF	0.01224	54.53
TCC7A211D	A	C2	1	2	57.68	0.1471	12	LGT	0.01226	57.96
TCC7A212D	A	C2	1	2	53.15	0.1472	12	LGF	0.01226	53.43
TCC7A213D	A	C2	1	2	53.70	0.1458	12	LWB	0.01215	53.48
TCC7B111D	B	C1	2	1	51.66	0.1436	12	LWT	0.01197	50.67
TCC7B112D	B	C1	2	1	51.31	0.1439	12	LGF	0.01199	50.43
TCC7B113D	B	C1	2	1	53.15	0.1448	12	LGF	0.01206	52.55
TCC7B211D	B	C2	2	2	51.38	0.1443	12	LGF	0.01202	50.62
TCC7B212D	B	C2	2	2	50.62	0.1444	12	LWT	0.01203	49.93
TCC7B213D	B	C2	2	2	49.83	0.1445	12	LWT	0.01204	49.17
TCC7C111D	C	C1	3	1	53.44	0.1447	12	LWB	0.01205	52.80
TCC7C112D	C	C1	3	1	51.98	0.1449	12	LWB	0.01207	51.44
TCC7C113D	C	C1	3	1	54.60	0.1449	12	LGF	0.01208	54.04
TCC7C211D	C	C2	3	2	52.89	0.1433	12	LWB	0.01194	51.77
TCC7C212D	C	C2	3	2	51.04	0.1440	12	LWT	0.01200	50.19
TCC7C213D	C	C2	3	2	50.84	0.1450	12	LGF	0.01209	50.36

Average **52.81**
 Standard Dev. **1.946**
 Coeff. of Var. [%] **3.685**
 Min. **49.83**
 Max. **57.68**
 Number of Spec. **18**

Average_{norm} **0.01209** **52.35**
 Standard Dev._{norm} **2.266**
 Coeff. of Var. [%]_{norm} **4.328**
 Min. **0.01194** **49.17**
 Max. **0.01226** **57.96**
 Number of Spec. **18** **18**



4.25 “10/80/10” Filled-Hole Compression 2 Properties (FHC2)

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

Laminate Filled-Hole Compression Properties (FHC2)--RTA (70°F) Strength

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

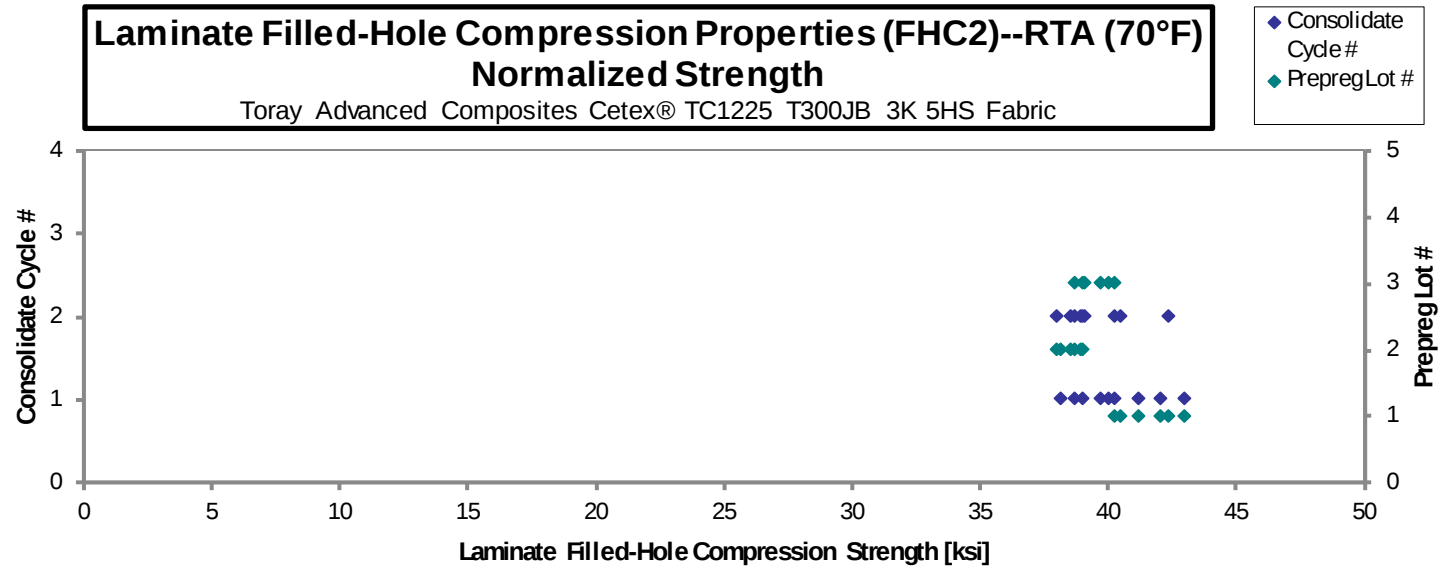
t_{ply} [in]

0.01220

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	Strength _{norm} [ksi]
TCC8A111A	A	C1	1	1	42.15	0.1217	10	AGF	0.01217	42.05
TCC8A112A	A	C1	1	1	43.14	0.1215	10	AGF	0.01215	42.97
TCC8A113A	A	C1	1	1	41.09	0.1222	10	AGF	0.01222	41.15
TCC8A211A	A	C2	1	2	41.79	0.1236	10	AGF	0.01236	42.35
TCC8A212A	A	C2	1	2	40.02	0.1226	10	AGO	0.01226	40.22
TCC8A213A	A	C2	1	2	40.45	0.1222	10	AGO	0.01222	40.51
TCC8B111A	B	C1	2	1	39.52	0.1205	10	AGF	0.01205	39.02
TCC8B112A	B	C1	2	1	39.39	0.1199	10	AGF	0.01199	38.71
TCC8B113A	B	C1	2	1	38.73	0.1201	10	AGF	0.01201	38.13
TCC8B211A	B	C2	2	2	38.22	0.1212	10	AGF	0.01212	37.97
TCC8B212A	B	C2	2	2	38.57	0.1218	10	AGF	0.01218	38.51
TCC8B213A	B	C2	2	2	39.21	0.1211	10	AGF	0.01211	38.92
TCC8C111A	C	C1	3	1	40.49	0.1206	10	AGO	0.01206	40.02
TCC8C112A	C	C1	3	1	40.62	0.1209	10	AGO	0.01209	40.25
TCC8C113A	C	C1	3	1	40.41	0.1200	10	AGO	0.01200	39.74
TCC8C211A	C	C2	3	2	38.92	0.1226	10	AWB	0.01226	39.10
TCC8C212A	C	C2	3	2	38.38	0.1229	10	AGO	0.01229	38.67
TCC8C213A	C	C2	3	2	38.88	0.1224	10	AGF	0.01224	39.01

Average **40.00**
Standard Dev. **1.393**
Coeff. of Var. [%] **3.482**
Min. **38.22**
Max. **43.14**
Number of Spec. **18**

Average_{norm} **0.01215**
Standard Dev._{norm} **1.476**
Coeff. of Var. [%]_{norm} **3.704**
Min. **0.01199**
Max. **0.01236**
Number of Spec. **18**



Laminate Filled-Hole Compression Properties (FHC2)--ETW (250°F) Strength

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

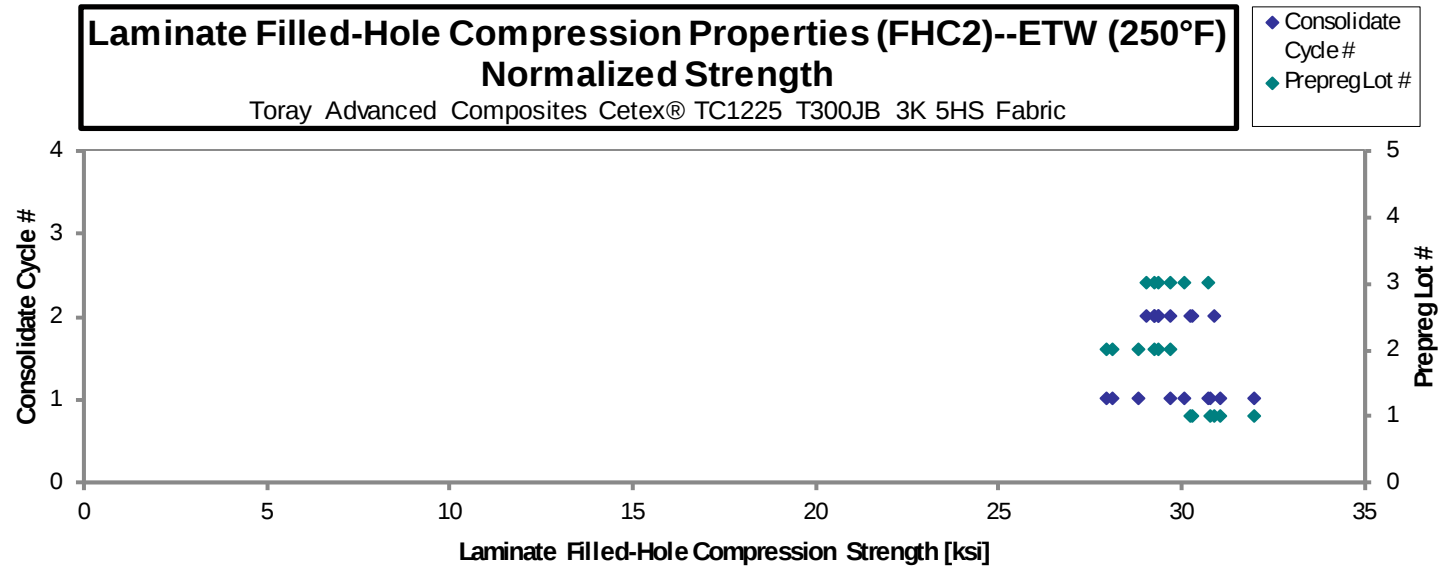
 t_{ply} [in]

0.01220

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	Strength _{norm} [ksi]
TCC8A111D	A	C1	1	1	31.15	0.1216	10	AGF	0.01216	31.04
TCC8A112D	A	C1	1	1	32.18	0.1213	10	AGF	0.01213	32.00
TCC8A113D	A	C1	1	1	30.90	0.1217	10	AGF	0.01217	30.82
TCC8A211D	A	C2	1	2	30.25	0.1221	10	AGF	0.01221	30.27
TCC8A212D	A	C2	1	2	30.83	0.1224	10	AGF	0.01224	30.92
TCC8A213D	A	C2	1	2	29.99	0.1232	10	AGF	0.01232	30.27
TCC8B111D	B	C1	2	1	28.30	0.1204	10	AGF	0.01204	27.94
TCC8B112D	B	C1	2	1	28.55	0.1202	10	AGF	0.01202	28.13
TCC8B113D	B	C1	2	1	29.25	0.1202	10	AGF	0.01202	28.82
TCC8B211D	B	C2	2	2	29.98	0.1196	10	AGF	0.01196	29.38
TCC8B212D	B	C2	2	2	30.29	0.1197	10	AGF	0.01197	29.72
TCC8B213D	B	C2	2	2	29.76	0.1200	10	AGF	0.01200	29.27
TCC8C111D	C	C1	3	1	31.15	0.1205	10	AGF	0.01205	30.76
TCC8C112D	C	C1	3	1	30.42	0.1206	10	AGO	0.01206	30.07
TCC8C113D	C	C1	3	1	30.23	0.1200	10	AGF	0.01200	29.73
TCC8C211D	C	C2	3	2	29.22	0.1226	10	AGF	0.01226	29.35
TCC8C212D	C	C2	3	2	28.80	0.1230	10	AGF	0.01230	29.05
TCC8C213D	C	C2	3	2	28.84	0.1238	10	AGF	0.01238	29.27

Average **30.00**
 Standard Dev. **1.037**
 Coeff. of Var. [%] **3.456**
 Min. **28.30**
 Max. **32.18**
 Number of Spec. **18**

Average_{norm} **0.01213** **29.82**
 Standard Dev._{norm} **1.052**
 Coeff. of Var. [%]_{norm} **3.528**
 Min. **0.01196** **27.94**
 Max. **0.01238** **32.00**
 Number of Spec. **18** **18**



4.26 “40/20/40” Filled-Hole Compression 3 Properties (FHC3)

**Laminate Filled-Hole Compression Properties (FHC3)--RTA (70°F)
Strength**

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

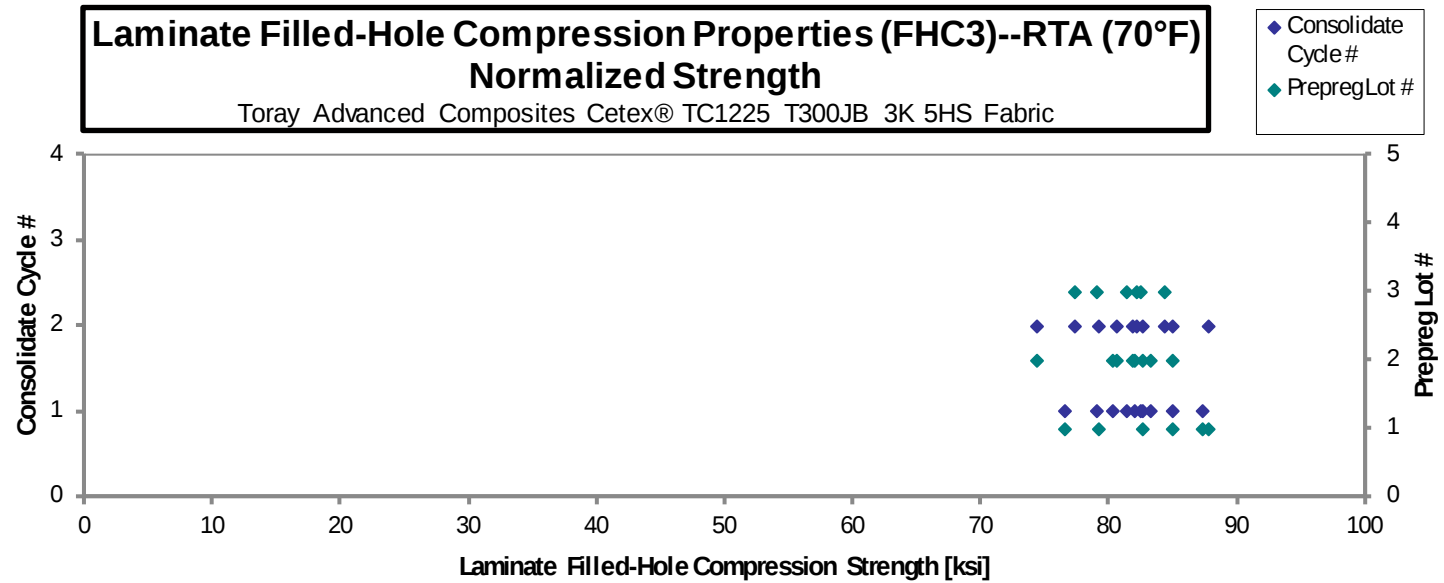
t_{ply} [in]

0.01220

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t _{ply} [in]	Strength _{norm} [ksi]
TCC9A111A	A	C1	1	1	76.64	0.1218	10	LGT	0.01218	76.54
TCC9A112A	A	C1	1	1	87.94	0.1212	10	LWT	0.01212	87.35
TCC9A113A	A	C1	1	1	82.73	0.1218	10	LWT	0.01218	82.62
TCC9A211A	A	C2	1	2	87.28	0.1227	10	M(A,L)WB	0.01227	87.76
TCC9A212A	A	C2	1	2	84.55	0.1226	10	AGO	0.01226	84.99
TCC9A213A	A	C2	1	2	78.77	0.1228	10	LWT	0.01228	79.30
TCC9B111A	B	C1	2	1	83.00	0.1205	10	M(A,L)WT	0.01205	82.00
TCC9B112A	B	C1	2	1	83.98	0.1211	10	M(A,L)WT	0.01211	83.35
TCC9B113A	B	C1	2	1	85.77	0.1209	10	M(A,L)WB	0.01209	84.97
TCC9B114A	B	C1	2	1	81.63	0.1201	10	M(A,L)GF	0.01201	80.36
TCC9B211A	B	C2	2	2	82.05	0.1198	10	M(A,L)GF	0.01198	80.57
TCC9B212A	B	C2	2	2	83.48	0.1196	10	M(A,L)GF	0.01196	81.82
TCC9B213A	B	C2	2	2	84.28	0.1196	10	M(A,L)AT	0.01196	82.63
TCC9B214A	B	C2	2	2	76.08	0.1192	10	M(A,L)GF	0.01192	74.34
TCC9C111A	C	C1	3	1	79.84	0.1209	10	LWB	0.01209	79.13
TCC9C112A	C	C1	3	1	83.37	0.1208	10	LGF	0.01208	82.52
TCC9C113A	C	C1	3	1	82.94	0.1198	10	LWB	0.01198	81.43
TCC9C211A	C	C2	3	2	84.90	0.1212	10	M(A,L)GF	0.01212	84.35
TCC9C212A	C	C2	3	2	82.63	0.1214	10	M(A,L)GF	0.01214	82.22
TCC9C213A	C	C2	3	2	77.94	0.1211	10	LGF	0.01211	77.38

Average 82.49
 Standard Dev. 3.236
 Coeff. of Var. [%] 3.922
 Min. 76.08
 Max. 87.94
 Number of Spec. 20

Average_{norm} 0.01209 81.78
 Standard Dev._{norm} 3.384
 Coeff. of Var. [%]_{norm} 4.138
 Min. 0.01192 74.34
 Max. 0.01228 87.76
 Number of Spec. 20 20



Laminate Filled-Hole Compression Properties (FHC3)--ETW (250°F) Strength

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

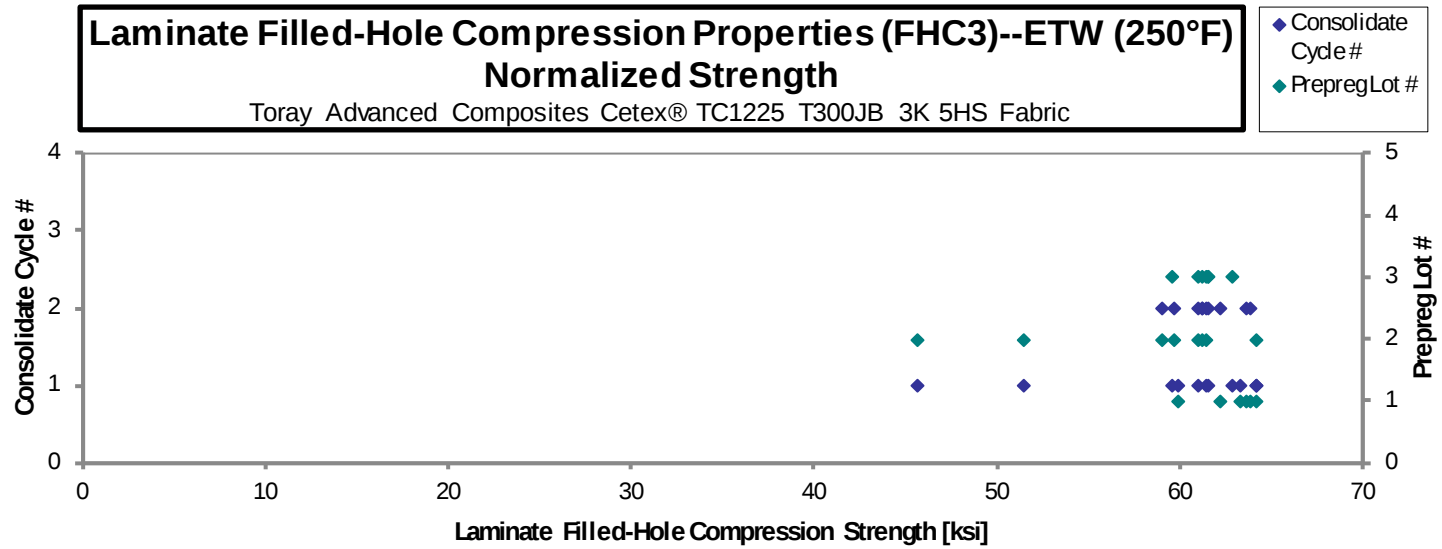
 t_{ply} [in]

0.01220

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	Strength _{norm} [ksi]
TCC9A111D	A	C1	1	1	64.93	0.1208	10	LGF	0.01208	64.29
TCC9A112D	A	C1	1	1	63.54	0.1217	10	LGF	0.01217	63.37
TCC9A113D	A	C1	1	1	60.26	0.1214	10	LBG	0.01214	59.94
TCC9A211D	A	C2	1	2	63.65	0.1221	10	LGF	0.01221	63.69
TCC9A212D	A	C2	1	2	61.95	0.1225	10	LWB	0.01225	62.21
TCC9A213D	A	C2	1	2	63.83	0.1221	10	LGF	0.01221	63.90
TCC9B111D	B	C1	2	1	46.47	0.1201	10	LGM	0.01201	45.75
TCC9B112D	B	C1	2	1	64.97	0.1206	10	LWT	0.01206	64.24
TCC9B113D	B	C1	2	1	61.03	0.1221	10	LGF	0.01221	61.09
TCC9B114D	B	C1	2	1	51.64	0.1218	10	LAT	0.01218	51.54
TCC9B115D	B	C1	2	1	61.98	0.1210	10	LWT	0.01210	61.48
TCC9B211D	B	C2	2	2	60.93	0.1197	10	LWT	0.01197	59.75
TCC9B212D	B	C2	2	2	60.49	0.1192	10	LWT	0.01192	59.10
TCC9B213D	B	C2	2	2	62.66	0.1192	10	LWT	0.01192	61.24
TCC9C111D	C	C1	3	1	64.18	0.1197	10	LWB	0.01197	62.95
TCC9C112D	C	C1	3	1	60.63	0.1201	10	LGF	0.01201	59.68
TCC9C113D	C	C1	3	1	62.95	0.1194	10	LWB	0.01194	61.62
TCC9C211D	C	C2	3	2	62.34	0.1200	10	LAB	0.01200	61.32
TCC9C212D	C	C2	3	2	62.52	0.1200	10	LWT	0.01200	61.49
TCC9C213D	C	C2	3	2	61.91	0.1203	10	LAB	0.01203	61.04
TCC9C214D	C	C2	3	2	62.57	0.1202	10	LGM, LGF	0.01202	61.64

Average 61.21
 Standard Dev. 4.345
 Coeff. of Var. [%] 7.098
 Min. 46.47
 Max. 64.97
 Number of Spec. 21

Average_{norm} 0.01207 60.54
 Standard Dev._{norm} 4.329
 Coeff. of Var. [%]_{norm} 7.150
 Min. 0.01192 45.75
 Max. 0.01225 64.29
 Number of Spec. 21 21



August 1, 2025

CAM-RP-2024-023 Rev N/C

4.27 “25/50/25” Single-Shear Bearing 1 Properties (SSB1)

Laminate Single-Shear Bearing Properties (SSB1, Proc. C)--RTA (70°F) Strength

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

t_{ply} [in]

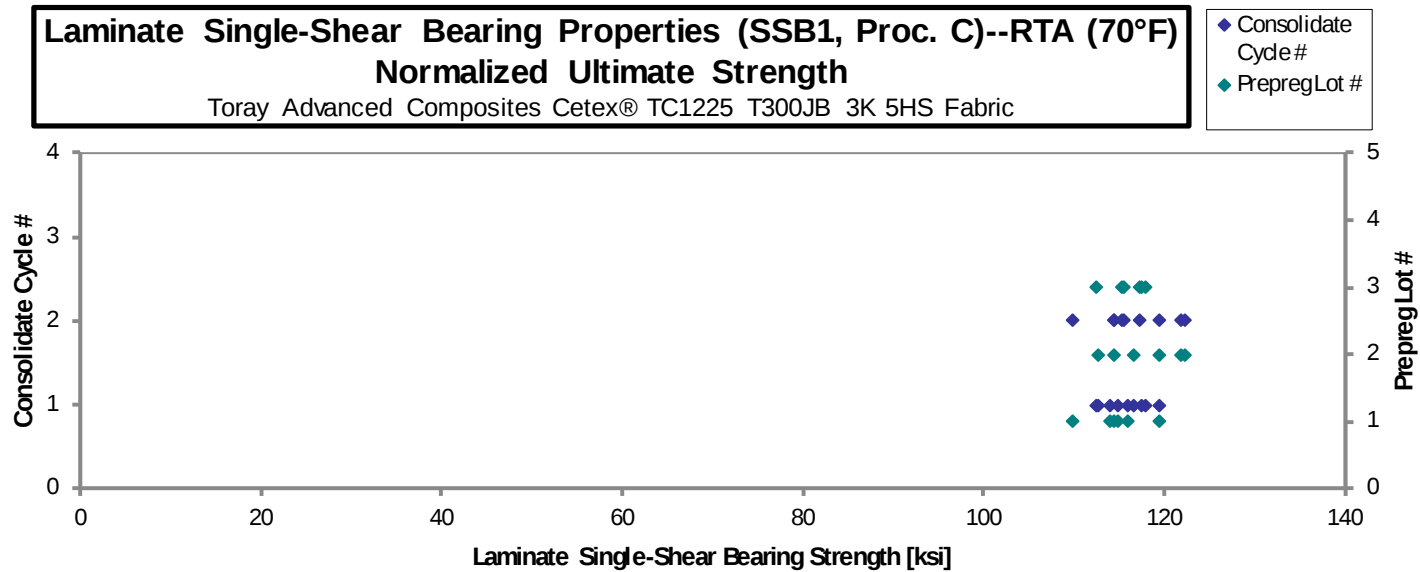
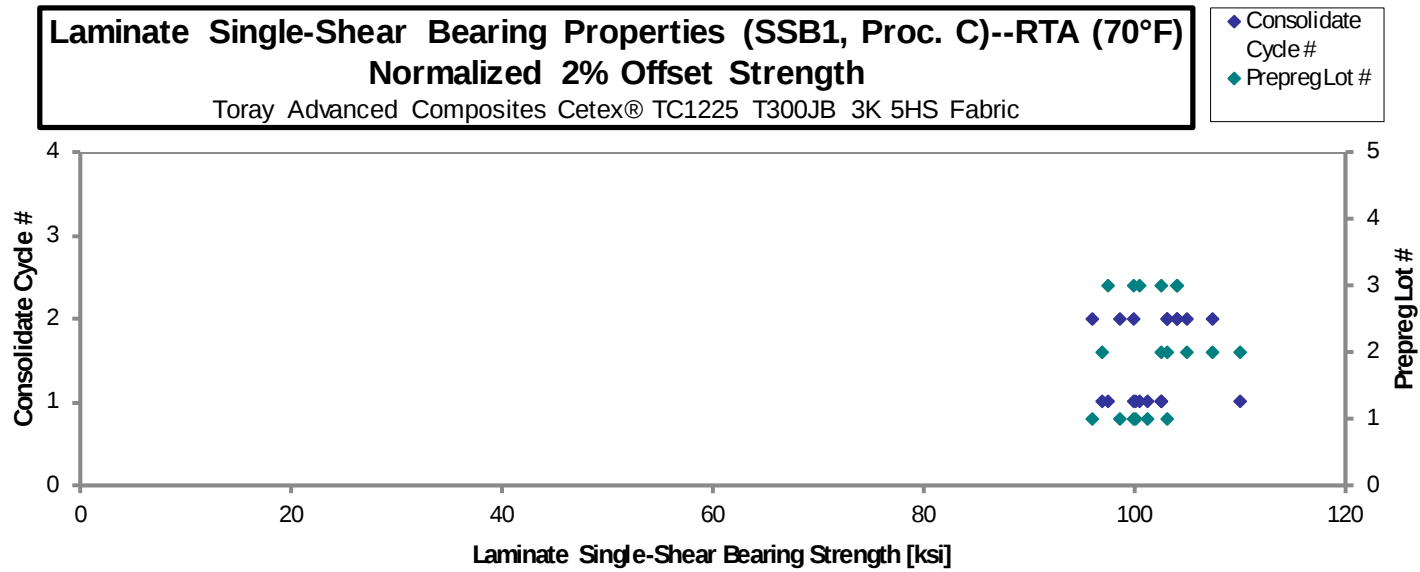
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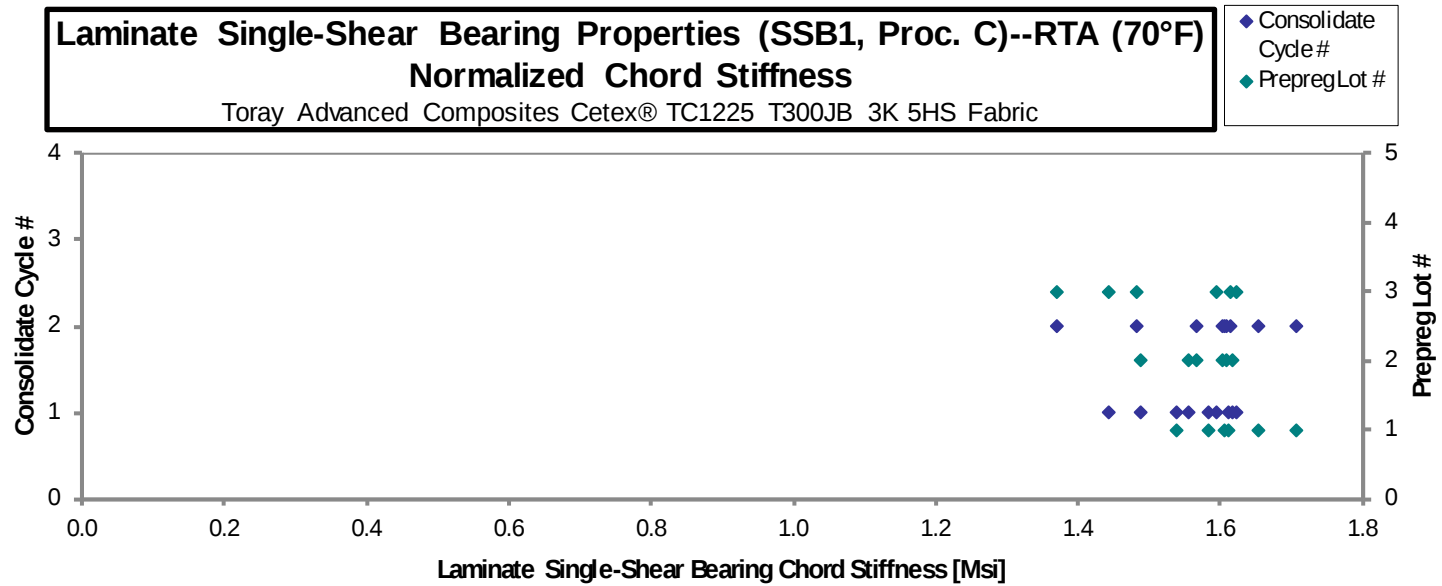
Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	2% Offset Strength [ksi]	Ultimate Strength [ksi]	Chord Stiffness [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
TCC1A111A	A	C1	1	1	102.5	116.4	1.557	0.09640	8	B1I
TCC1A112A	A	C1	1	1	101.0	115.0	1.625	0.09672	8	B1I
TCC1A113A	A	C1	1	1	99.89	115.9	1.583	0.09760	8	B1I
TCC1A211A	A	C2	1	2	96.22	119.6	1.609	0.09738	8	B1I
TCC1A212A	A	C2	1	2	98.69	109.8	1.655	0.09752	8	B1I
TCC1A213A	A	C2	1	2	103.0	114.3	1.704	0.09772	8	B1I
TCC1B111A	B	C1	2	1	104.0	114.3	1.579	0.09613	8	B1I
TCC1B112A	B	C1	2	1	99.04	119.0	1.651	0.09562	8	B1I
TCC1B113A	B	C1	2	1	112.7	122.4	1.524	0.09523	8	B1I
TCC1B211A	B	C2	2	2	105.4	116.7	1.600	0.09558	8	B1I
TCC1B212A	B	C2	2	2	106.1	123.2	1.620	0.09652	8	B1I
TCC1B213A	B	C2	2	2	109.3	124.3	1.635	0.09595	8	B1I
TCC1C111A	C	C1	3	1	98.53	113.7	1.460	0.09650	8	B1I
TCC1C112A	C	C1	3	1	103.8	118.9	1.641	0.09652	8	B1I
TCC1C113A	C	C1	3	1	101.8	119.4	1.615	0.09642	8	B1I
TCC1C211A	C	C2	3	2	105.0	116.4	1.382	0.09672	8	B1I
TCC1C212A	C	C2	3	2	102.0	119.8	1.648	0.09558	8	B1I
TCC1C213A	C	C2	3	2	103.5	115.0	1.475	0.09810	8	B1I

Avg. t_{ply} [in]	2% Offset Strength _{norm} [ksi]	Ultimate Strength _{norm} [ksi]	Chord Stiffness _{norm} [Msi]
0.01205	101.2	114.9	1.538
0.01209	100.1	114.0	1.611
0.01220	99.89	115.9	1.583
0.01217	96.01	119.4	1.605
0.01219	98.61	109.8	1.654
0.01221	103.1	114.4	1.706
0.01202	102.5	112.6	1.555
0.01195	97.03	116.6	1.618
0.01190	110.0	119.4	1.487
0.01195	103.2	114.3	1.567
0.01206	104.9	121.8	1.602
0.01199	107.4	122.2	1.607
0.01206	97.42	112.4	1.444
0.01206	102.6	117.5	1.623
0.01205	100.5	117.9	1.596
0.01209	104.1	115.4	1.369
0.01195	99.92	117.3	1.614
0.01226	104.1	115.6	1.482

Average	102.9	117.4	1.587
Standard Dev.	3.996	3.693	0.08098
Coeff. of Var. [%]	3.882	3.145	5.103
Min.	96.22	109.8	1.382
Max.	112.7	124.3	1.704
Number of Spec.	18	18	18

Average _{norm}	0.01207	101.8	116.2	1.570
Standard Dev. _{norm}		3.606	3.235	0.08082
Coeff. of Var. [%] _{norm}		3.542	2.784	5.148
Min.	0.01190	96.01	109.8	1.369
Max.	0.01226	110.0	122.2	1.706
Number of Spec.	18	18	18	18





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Laminate Single-Shear Bearing Properties (SSB1, Proc. C)--ETW (250°F)
Strength

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

t_{ply} [in]

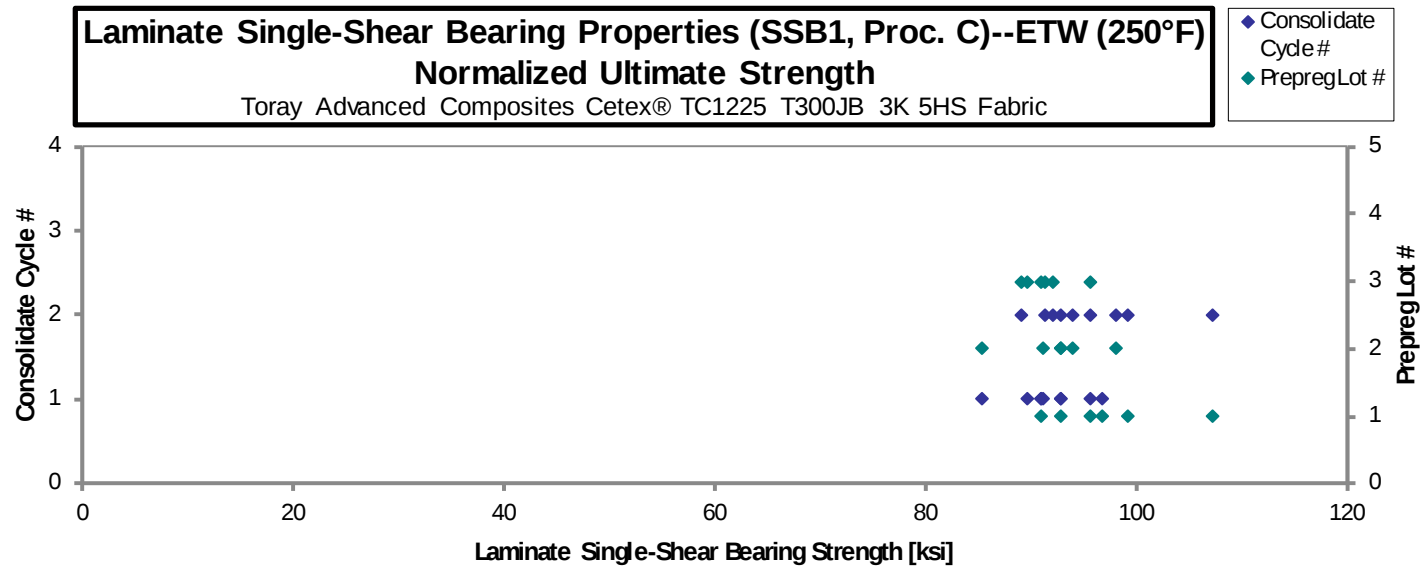
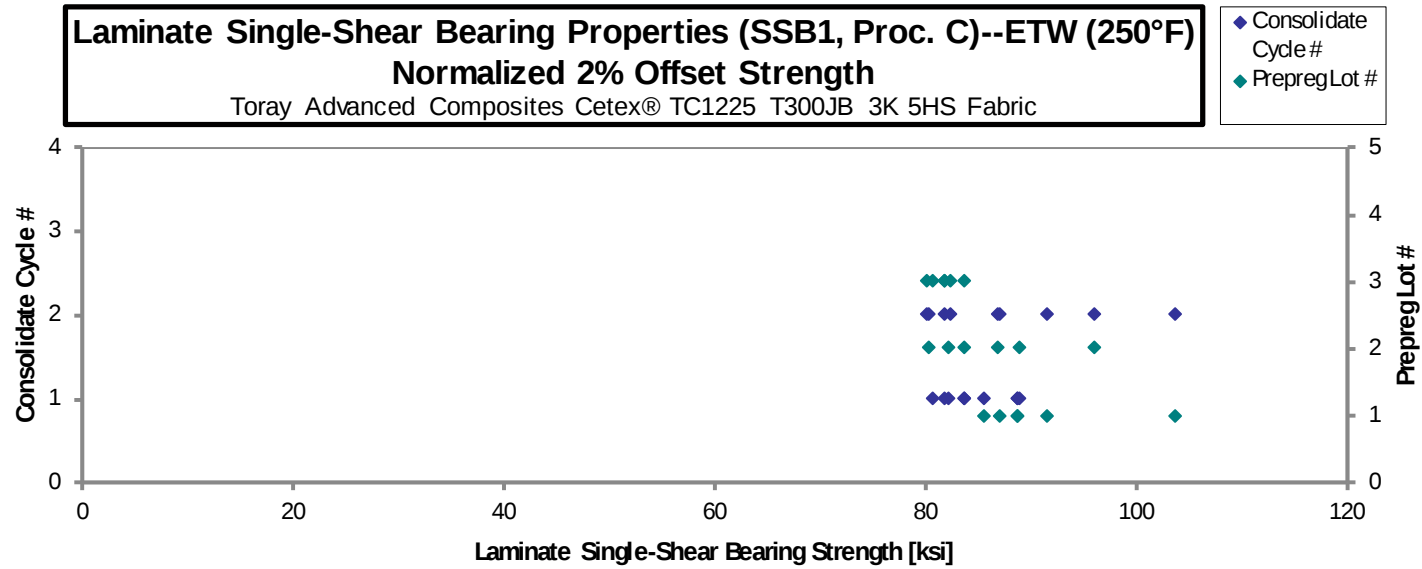
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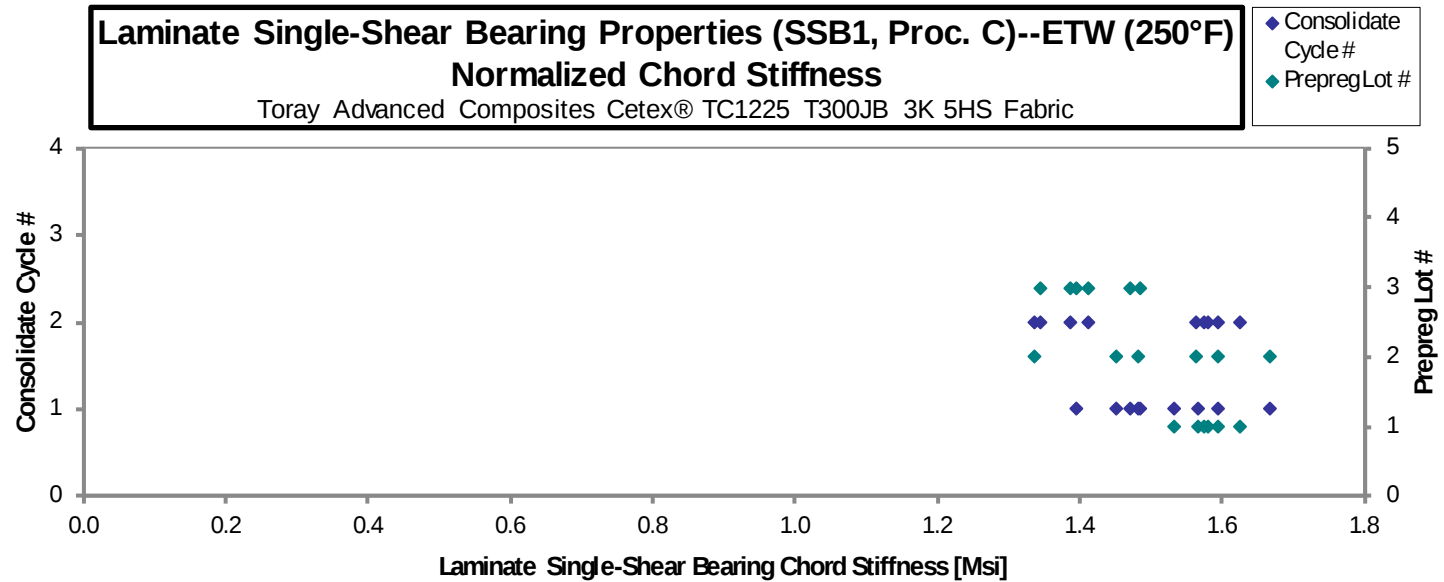
Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	2% Offset Strength [ksi]	Ultimate Strength [ksi]	Chord Stiffness [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
TCC1A111D	A	C1	1	1	89.43	91.58	1.605	0.09692	8	B1I
TCC1A112D	A	C1	1	1	85.49	96.76	1.533	0.09758	8	B1I
TCC1A113D	A	C1	1	1	89.39	93.47	1.577	0.09695	8	B1I
TCC1A211D	A	C2	1	2	92.35	96.58	1.596	0.09668	8	B1I
TCC1A212D	A	C2	1	2	104.5	108.2	1.640	0.09678	8	B1I
TCC1A213D	A	C2	1	2	87.63	99.73	1.583	0.09703	8	B1I
TCC1B111D	B	C1	2	1	89.86	92.14	1.686	0.09658	8	B1I
TCC1B112D	B	C1	2	1	84.13	87.41	1.487	0.09535	8	B1I
TCC1B113D	B	C1	2	1	85.26	94.69	1.511	0.09573	8	B1I
TCC1B211D	B	C2	2	2	81.97	95.84	1.364	0.09562	8	B1I
TCC1B212D	B	C2	2	2	98.05	100.0	1.628	0.09567	8	B1I
TCC1B213D	B	C2	2	2	88.72	94.77	1.598	0.09555	8	B1I
TCC1C111D	C	C1	3	1	83.33	97.44	1.422	0.09582	8	B1I
TCC1C112D	C	C1	3	1	85.77	91.92	1.524	0.09515	8	B1I
TCC1C113D	C	C1	3	1	82.55	93.02	1.506	0.09538	8	B1I
TCC1C211D	C	C2	3	2	78.18	89.23	1.314	0.09992	8	B1I
TCC1C212D	C	C2	3	2	82.66	92.43	1.419	0.09723	8	B1I
TCC1C213D	C	C2	3	2	80.58	87.82	1.365	0.09912	8	B1I

Avg. t_{ply} [in]	2% Offset Strength _{norm} [ksi]	Ultimate Strength _{norm} [ksi]	Chord Stiffness _{norm} [Msi]
0.01211	88.81	90.94	1.594
0.01220	85.47	96.75	1.532
0.01212	88.80	92.85	1.567
0.01209	91.48	95.67	1.581
0.01210	103.6	107.3	1.626
0.01213	87.12	99.15	1.574
0.01207	88.92	91.18	1.668
0.01192	82.19	85.39	1.453
0.01197	83.63	92.88	1.482
0.01195	80.30	93.89	1.336
0.01196	96.10	98.06	1.596
0.01194	86.85	92.78	1.565
0.01198	81.81	95.66	1.396
0.01189	83.61	89.61	1.486
0.01192	80.67	90.90	1.472
0.01249	80.03	91.35	1.345
0.01215	82.35	92.08	1.413
0.01239	81.83	89.18	1.387

Average 87.21 94.62 1.520
Standard Dev. 6.375 4.954 0.1064
Coeff. of Var. [%] 7.310 5.236 6.997
Min. 78.18 87.41 1.314
Max. 104.5 108.2 1.686
Number of Spec. 18 18 18

Average_{norm} 0.01208 86.31 93.65 1.504
Standard Dev._{norm} 6.127 4.787 0.09982
Coeff. of Var. [%]_{norm} 7.099 5.112 6.637
Min. 0.01189 80.03 85.39 1.336
Max. 0.01249 103.6 107.3 1.668
Number of Spec. 18 18 18 18





August 1, 2025

CAM-RP-2024-023 Rev N/C

4.28 “10/80/10” Single-Shear Bearing 2 Properties (SSB2)

Laminate Single-Shear Bearing Properties (SSB2, Proc. C)--RTA (70°F) Strength

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

t_{ply} [in]

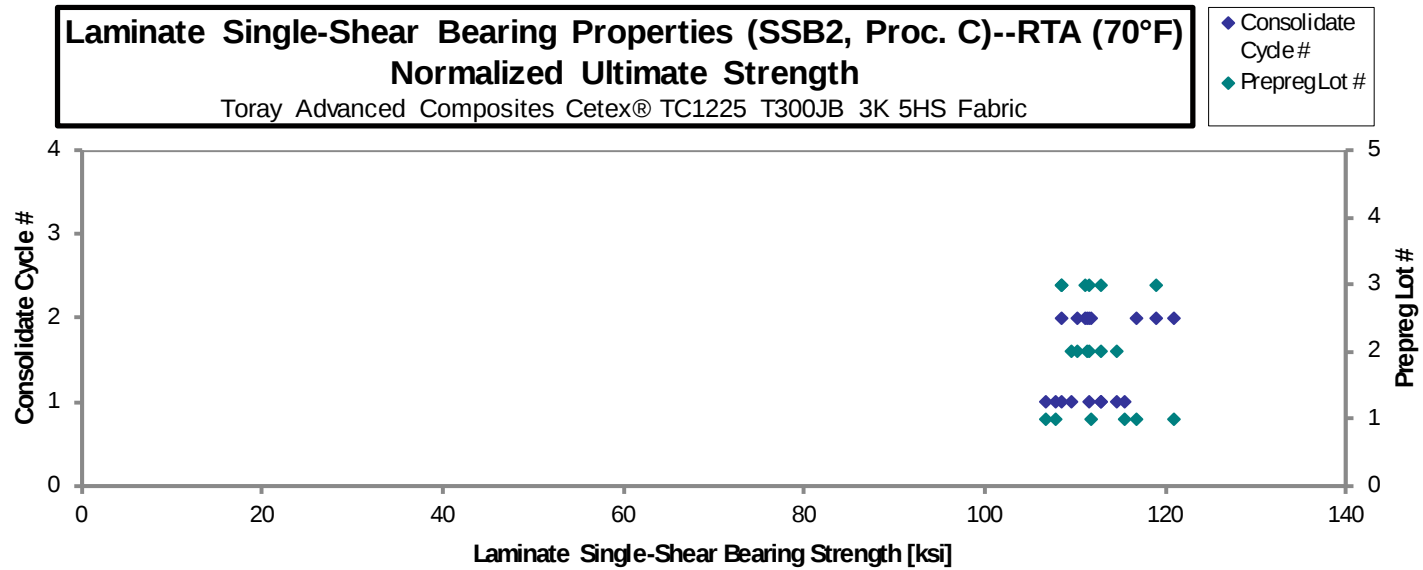
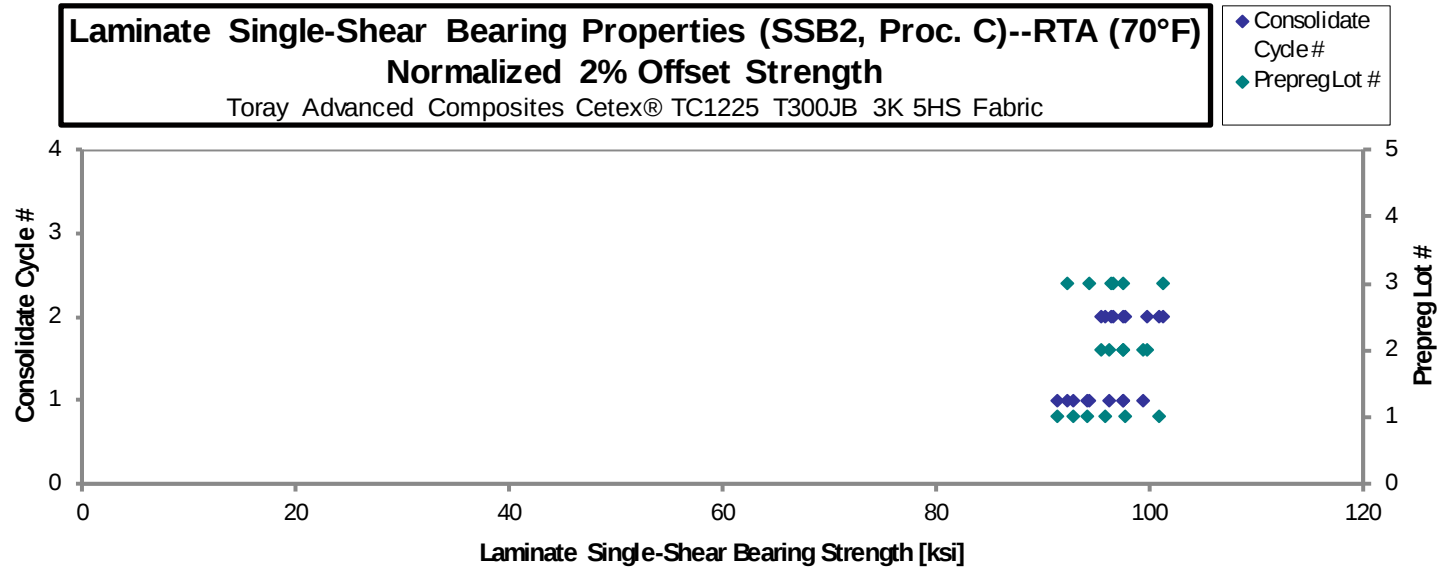
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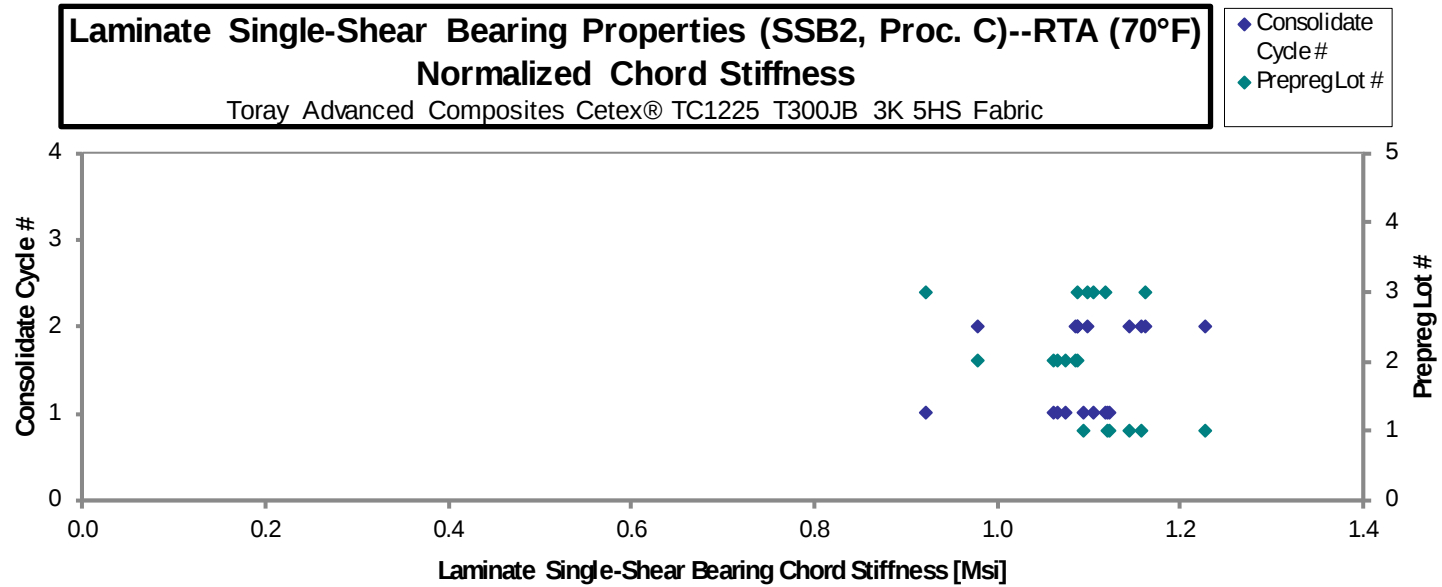
Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	2% Offset Strength [ksi]	Ultimate Strength [ksi]	Chord Stiffness [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
TCC2A111A	A	C1	1	1	94.26	107.9	1.122	0.1217	10	B1I
TCC2A112A	A	C1	1	1	92.16	114.8	1.114	0.1228	10	B1I
TCC2A113A	A	C1	1	1	92.34	107.8	1.104	0.1207	10	B1I
TCC2A211A	A	C2	1	2	97.01	110.8	1.135	0.1228	10	B1I
TCC2A212A	A	C2	1	2	95.90	116.9	1.157	0.1218	10	B1I
TCC2A213A	A	C2	1	2	101.6	121.8	1.236	0.1211	10	B1I
TCC2B111A	B	C1	2	1	98.51	115.8	1.086	0.1206	10	B1I
TCC2B112A	B	C1	2	1	101.1	114.6	1.079	0.1199	10	B1I
TCC2B113A	B	C1	2	1	97.58	111.2	1.080	0.1203	10	B1I
TCC2B211A	B	C2	2	2	96.78	112.8	0.9905	0.1204	10	B1I
TCC2B212A	B	C2	2	2	100.6	111.1	1.096	0.1210	10	B1I
TCC2B213A	B	C2	2	2	98.47	112.6	1.095	0.1208	10	B1I
TCC2C111A	C	C1	3	1	98.27	109.3	0.9274	0.1210	10	B1I
TCC2C112A	C	C1	3	1	92.99	113.7	1.114	0.1210	10	B1I
TCC2C113A	C	C1	3	1	93.92	111.2	1.114	0.1224	10	B1I
TCC2C211A	C	C2	3	2	96.62	108.7	1.088	0.1219	10	B1I
TCC2C212A	C	C2	3	2	96.25	118.9	1.096	0.1221	10	B1I
TCC2C213A	C	C2	3	2	102.0	111.9	1.168	0.1212	10	B1I

Avg. t_{ply} [in]	2% Offset Strength _{norm} [ksi]	Ultimate Strength _{norm} [ksi]	Chord Stiffness _{norm} [Msi]
0.01217	94.04	107.7	1.120
0.01228	92.77	115.5	1.122
0.01207	91.36	106.6	1.092
0.01228	97.67	111.6	1.143
0.01218	95.74	116.7	1.155
0.01211	100.9	120.9	1.227
0.01206	97.41	114.5	1.074
0.01199	99.37	112.7	1.061
0.01203	96.24	109.6	1.065
0.01204	95.47	111.3	0.9771
0.01210	99.80	110.2	1.087
0.01208	97.49	111.4	1.084
0.01210	97.47	108.4	0.9198
0.01210	92.19	112.7	1.105
0.01224	94.20	111.6	1.117
0.01219	96.51	108.5	1.087
0.01221	96.31	119.0	1.097
0.01212	101.3	111.1	1.160

Average	97.02	112.9	1.100
Standard Dev.	3.096	3.786	0.06499
Coeff. of Var. [%]	3.191	3.354	5.907
Min.	92.16	107.8	0.9274
Max.	102.0	121.8	1.236
Number of Spec.	18	18	18

Average _{norm}	0.01213	96.46	112.2	1.094
Standard Dev. _{norm}		2.845	3.855	0.06722
Coeff. of Var. [%] _{norm}		2.949	3.435	6.145
Min.	0.01199	91.36	106.6	0.9198
Max.	0.01228	101.3	120.9	1.227
Number of Spec.	18	18	18	18





August 1, 2025

CAM-RP-2024-023 Rev N/C

Laminate Single-Shear Bearing Properties (SSB2, Proc. C)--ETW (250°F)
Strength

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

t_{ply} [in]

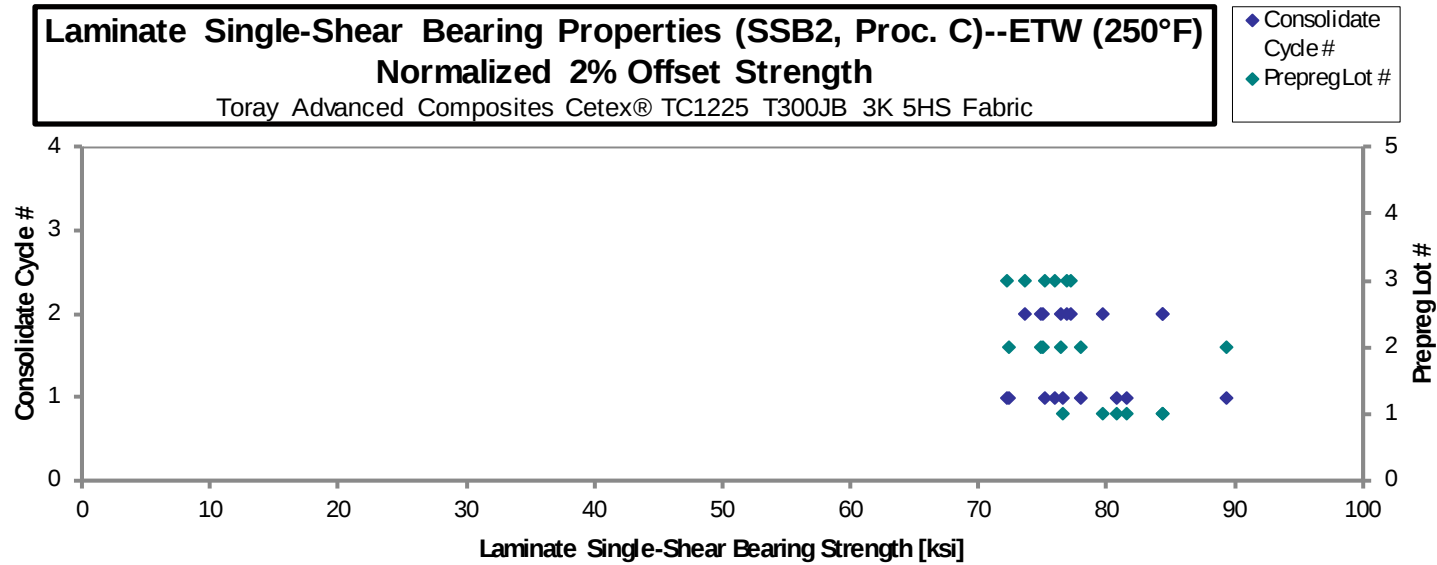
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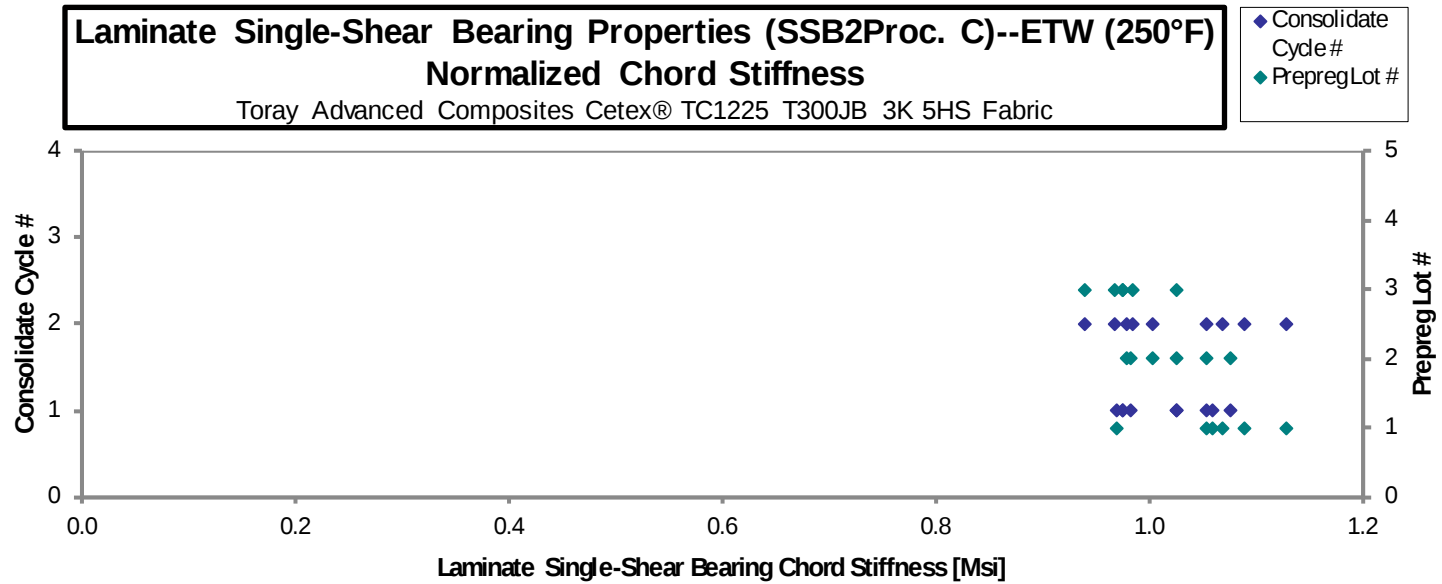
Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	2% Offset Strength [ksi]	Ultimate Strength [ksi]	Chord Stiffness [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
TCC2A111D	A	C1	1	1	81.13	95.56	0.9638	0.1227	10	B1I
TCC2A112D	A	C1	1	1	77.53	92.16	1.072	0.1205	10	B1I
TCC2A113D	A	C1	1	1	80.38	89.16	1.049	0.1226	10	B1I
TCC2A211D	A	C2	1	2	85.08	96.07	1.138	0.1210	10	B1I
TCC2A212D	A	C2	1	2	79.87	93.27	1.071	0.1217	10	B1I
TCC2A213D	A	C2	1	2	84.98	94.65	1.098	0.1211	10	B1I
TCC2B111D	B	C1	2	1	79.33	91.65	1.042	0.1201	10	B1I
TCC2B112D	B	C1	2	1	90.31	92.90	1.087	0.1208	10	B1I
TCC2B113D	B	C1	2	1	73.26	88.28	0.9955	0.1204	10	B1I
TCC2B211D	B	C2	2	2	75.59	88.76	1.063	0.1210	10	B1I
TCC2B212D	B	C2	2	2	77.59	89.07	0.9940	0.1201	10	B1I
TCC2B213D	B	C2	2	2	75.95	87.84	1.019	0.1202	10	B1I
TCC2C111D	C	C1	3	1	76.51	87.53	1.033	0.1210	10	B1I
TCC2C112D	C	C1	3	1	75.94	92.04	0.9858	0.1207	10	B1I
TCC2C113D	C	C1	3	1	72.66	88.57	0.9798	0.1214	10	B1I
TCC2C211D	C	C2	3	2	73.97	89.20	0.9720	0.1215	10	B1I
TCC2C212D	C	C2	3	2	77.27	92.27	0.9397	0.1220	10	B1I
TCC2C213D	C	C2	3	2	76.77	90.94	0.9834	0.1222	10	B1I

Avg. t_{ply} [in]	2% Offset Strength _{norm} [ksi]	Ultimate Strength _{norm} [ksi]	Chord Stiffness _{norm} [Msi]
0.01227	81.57	96.09	0.9690
0.01205	76.54	90.99	1.059
0.01226	80.76	89.59	1.054
0.01210	84.36	95.26	1.128
0.01217	79.69	93.05	1.068
0.01211	84.37	93.96	1.090
0.01201	78.06	90.18	1.025
0.01208	89.40	91.96	1.076
0.01204	72.31	87.14	0.9826
0.01210	74.96	88.02	1.054
0.01201	76.36	87.65	0.9783
0.01202	74.79	86.50	1.004
0.01210	75.89	86.83	1.025
0.01207	75.13	91.06	0.9753
0.01214	72.28	88.11	0.9747
0.01215	73.68	88.85	0.9682
0.01220	77.27	92.27	0.9397
0.01222	76.88	91.06	0.9847

Average 78.56 91.11 1.027
Standard Dev. 4.547 2.695 0.05399
Coeff. of Var. [%] 5.788 2.958 5.256
Min. 72.66 87.53 0.9397
Max. 90.31 96.07 1.138
Number of Spec. 18 18 18

Average_{norm} 0.01212 78.02 90.48 1.020
Standard Dev._{norm} 4.580 2.898 0.05224
Coeff. of Var. [%]_{norm} 5.870 3.203 5.123
Min. 0.01201 72.28 86.50 0.9397
Max. 0.01227 89.40 96.09 1.128
Number of Spec. 18 18 18 18





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4.29 “40/20/40” Single-Shear Bearing 3 Properties (SSB3)

Laminate Single-Shear Bearing Properties (SSB3, Proc. C)--RTA (70°F) Strength

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

t_{ply} [in]

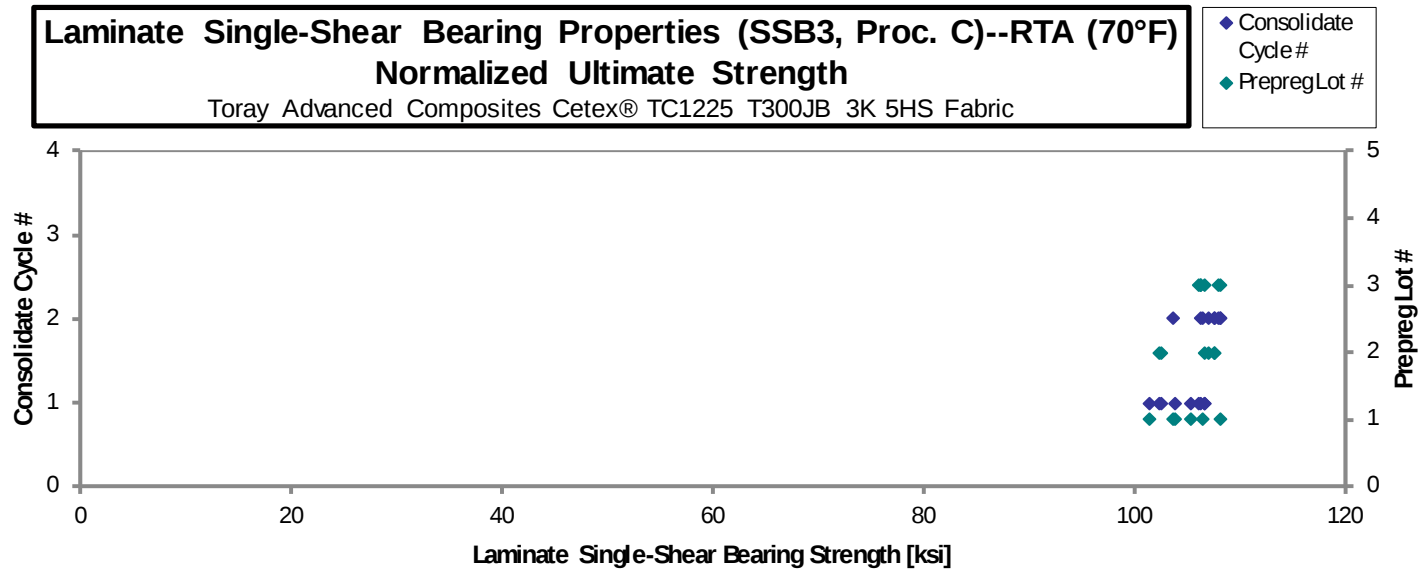
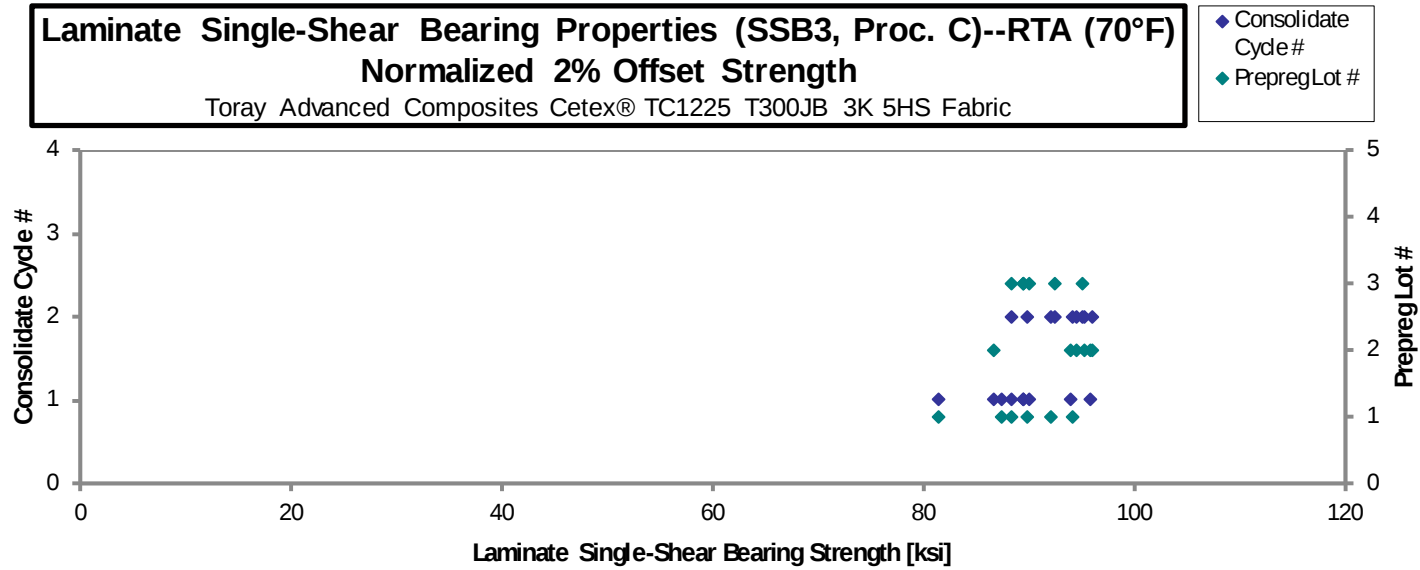
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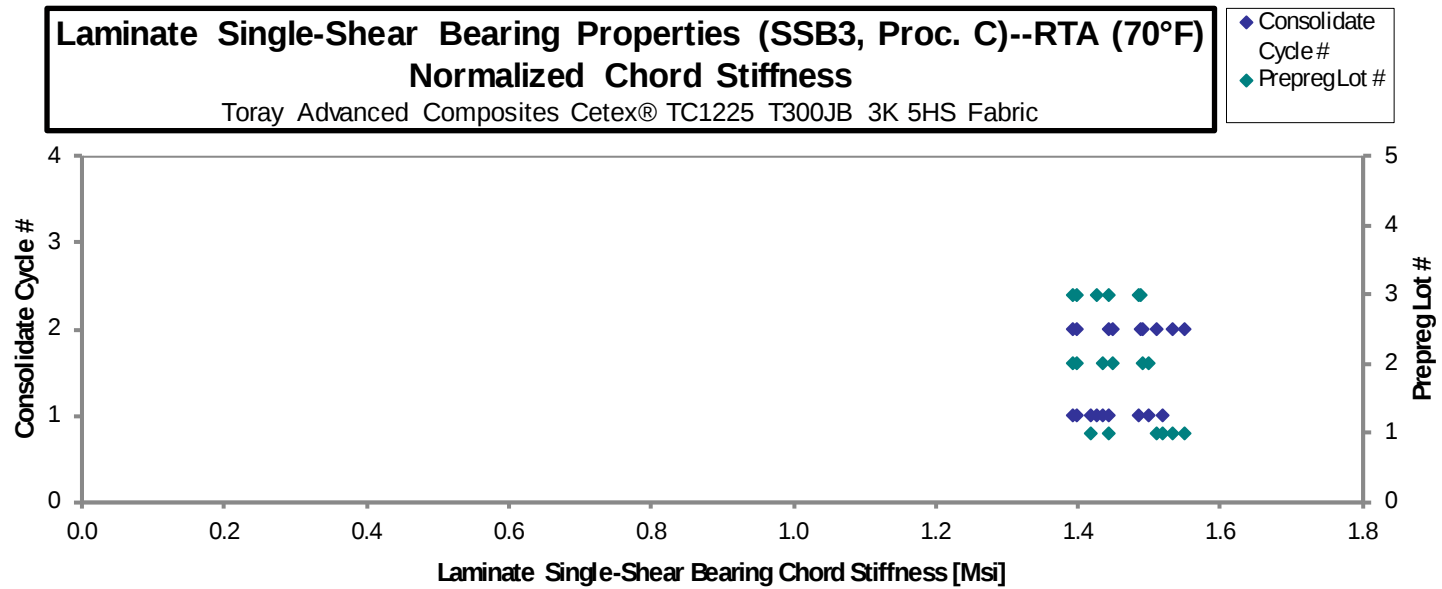
Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	2% Offset Strength [ksi]	Ultimate Strength [ksi]	Chord Stiffness [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
TCC3A111A	A	C1	1	1	89.63	105.5	1.542	0.1202	10	B1I
TCC3A112A	A	C1	1	1	82.46	106.7	1.433	0.1206	10	B1I
TCC3A113A	A	C1	1	1	88.31	102.5	1.458	0.1207	10	B1I
TCC3A211A	A	C2	1	2	94.28	108.3	1.549	0.1219	10	B1I
TCC3A212A	A	C2	1	2	92.37	106.9	1.513	0.1217	10	B1I
TCC3A213A	A	C2	1	2	89.73	103.5	1.531	0.1221	10	B1I
TCC3B111A	B	C1	2	1	87.77	103.6	1.414	0.1206	10	B1I
TCC3B112A	B	C1	2	1	95.18	108.1	1.454	0.1203	10	B1I
TCC3B113A	B	C1	2	1	97.21	103.9	1.520	0.1204	10	B1I
TCC3B211A	B	C2	2	2	94.71	107.2	1.452	0.1218	10	B1I
TCC3B212A	B	C2	2	2	95.81	108.1	1.398	0.1214	10	B1I
TCC3B213A	B	C2	2	2	97.12	108.9	1.508	0.1207	10	B1I
TCC3C111A	C	C1	3	1	88.40	104.8	1.376	0.1235	10	M(S,B)1I
TCC3C112A	C	C1	3	1	88.24	104.4	1.456	0.1246	10	B1I
TCC3C113A	C	C1	3	1	88.51	105.2	1.413	0.1233	10	B1I
TCC3C211A	C	C2	3	2	95.78	108.8	1.454	0.1212	10	B1I
TCC3C212A	C	C2	3	2	92.99	108.9	1.497	0.1212	10	B1I
TCC3C213A	C	C2	3	2	88.76	106.8	1.405	0.1214	10	B1I

Avg. t_{ply} [in]	2% Offset Strength _{norm} [ksi]	Ultimate Strength _{norm} [ksi]	Chord Stiffness _{norm} [Msi]
0.01202	88.27	103.9	1.518
0.01206	81.49	105.4	1.416
0.01207	87.35	101.4	1.443
0.01219	94.22	108.2	1.548
0.01217	92.12	106.6	1.509
0.01221	89.82	103.6	1.533
0.01206	86.73	102.4	1.397
0.01203	93.87	106.6	1.434
0.01204	95.91	102.5	1.500
0.01218	94.56	107.1	1.450
0.01214	95.35	107.6	1.391
0.01207	96.04	107.7	1.491
0.01235	89.49	106.1	1.393
0.01246	90.09	106.6	1.486
0.01233	89.44	106.3	1.427
0.01212	95.11	108.0	1.444
0.01212	92.37	108.2	1.487
0.01214	88.32	106.3	1.398

Average 91.51 106.2 1.465
 Standard Dev. 4.093 2.088 0.05345
 Coeff. of Var. [%] 4.473 1.966 3.648
 Min. 82.46 102.5 1.376
 Max. 97.21 108.9 1.549
 Number of Spec. 18 18 18

Average_{norm} 0.01215 91.14 105.8 1.459
 Standard Dev._{norm} 3.933 2.131 0.05099
 Coeff. of Var. [%]_{norm} 4.315 2.014 3.494
 Min. 0.01202 81.49 101.4 1.391
 Max. 0.01246 96.04 108.2 1.548
 Number of Spec. 18 18 18 18





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Laminate Single-Shear Bearing Properties (SSB3, Proc. C)--ETW (250°F)
Strength

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

t_{ply} [in]

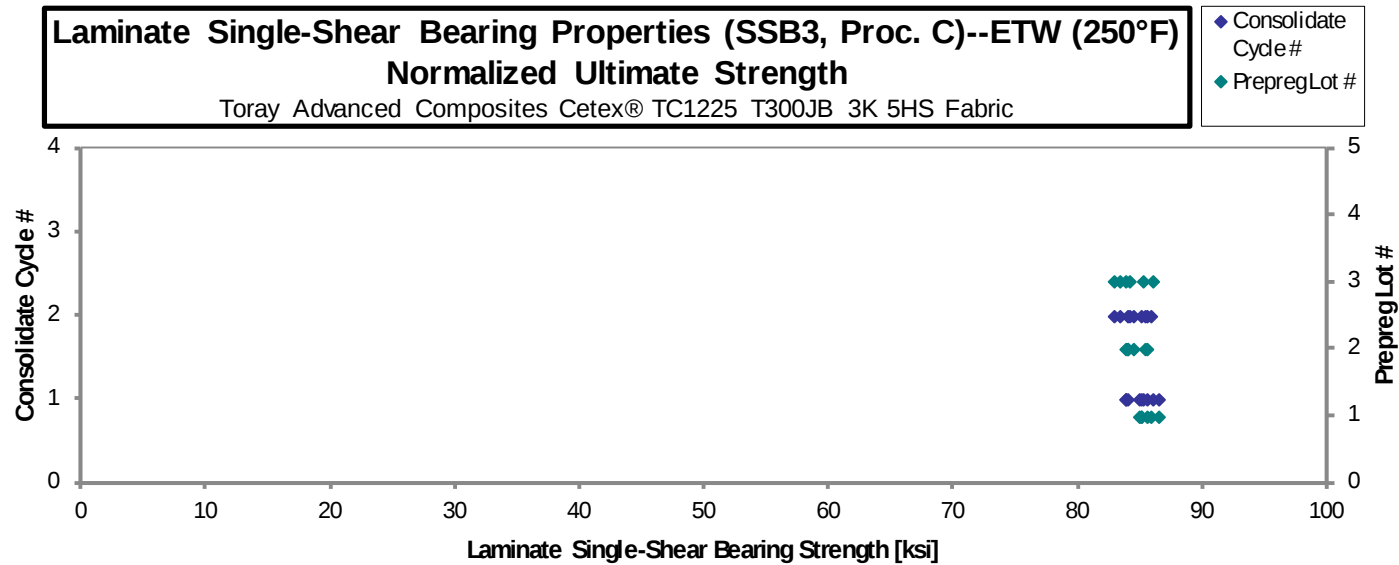
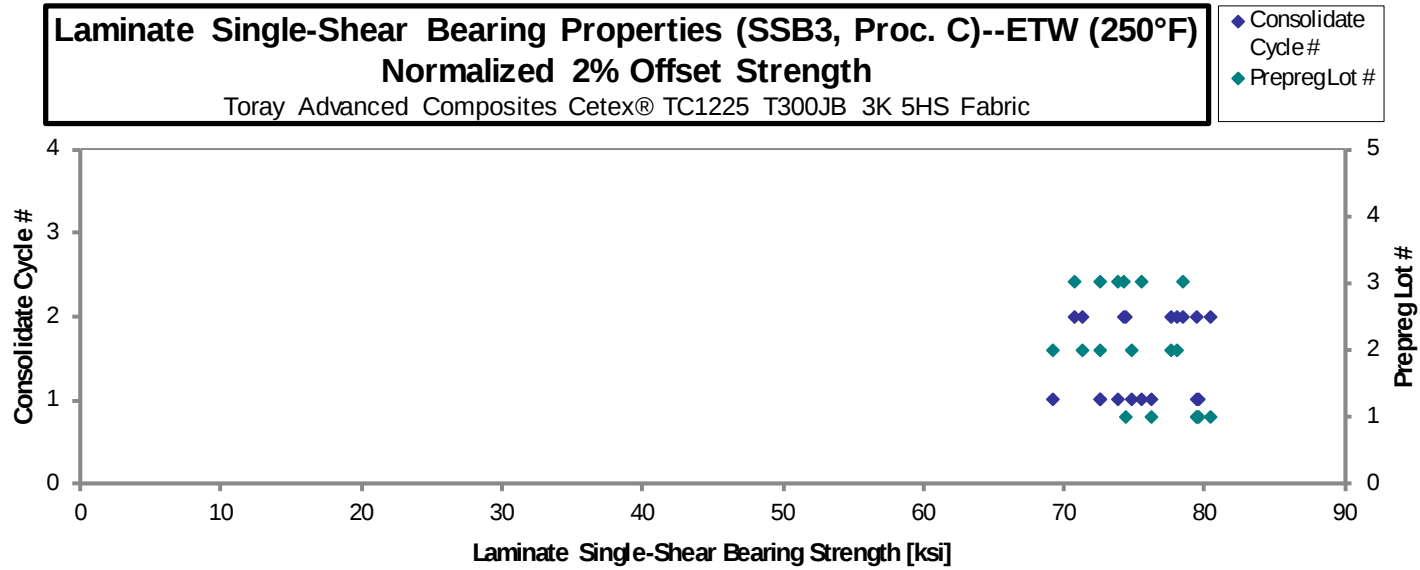
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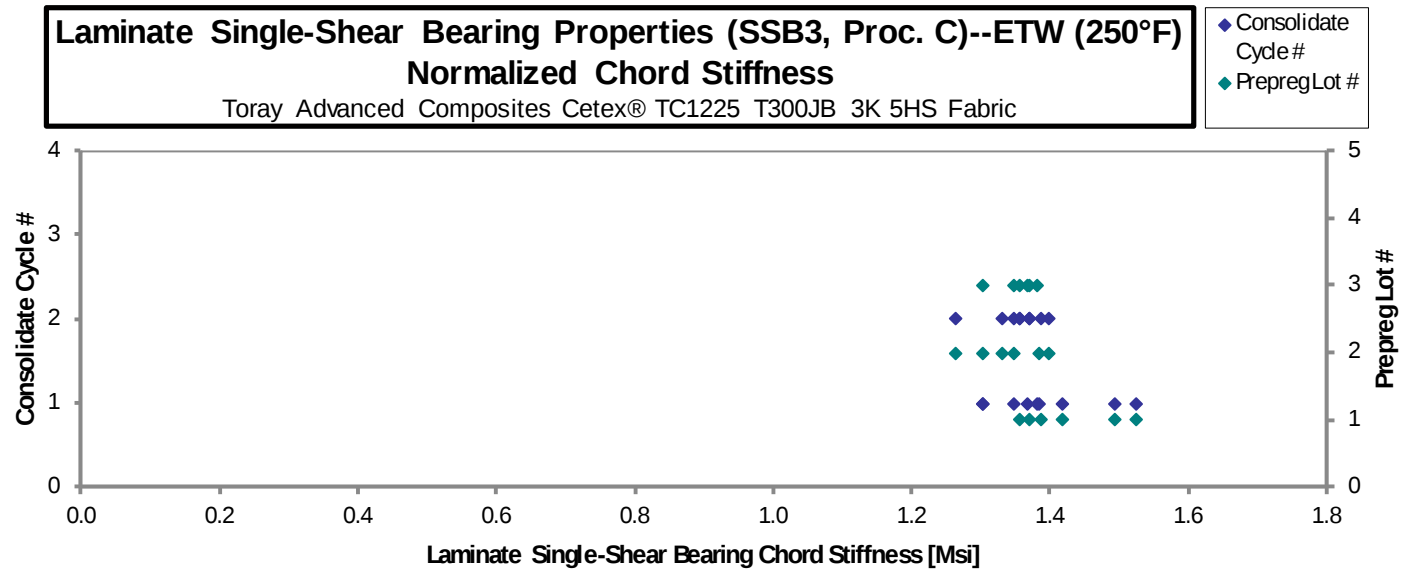
Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	2% Offset Strength [ksi]	Ultimate Strength [ksi]	Chord Stiffness [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
TCC3A111D	A	C1	1	1	77.06	87.44	1.540	0.1208	10	B1I
TCC3A112D	A	C1	1	1	80.67	86.33	1.514	0.1202	10	B1I
TCC3A113D	A	C1	1	1	81.19	86.80	1.445	0.1197	10	B1I
TCC3A211D	A	C2	1	2	80.25	85.99	1.398	0.1209	10	B1I
TCC3A212D	A	C2	1	2	74.91	86.51	1.365	0.1211	10	B1I
TCC3A213D	A	C2	1	2	80.53	85.66	1.371	0.1218	10	B1I
TCC3B111D	B	C1	2	1	73.02	86.15	1.355	0.1213	10	B1I
TCC3B112D	B	C1	2	1	74.71	84.00	1.382	0.1221	10	B1I
TCC3B113D	B	C1	2	1	69.07	83.78	1.300	0.1221	10	B1I
TCC3B211D	B	C2	2	2	71.71	84.97	1.268	0.1214	10	B1I
TCC3B212D	B	C2	2	2	78.63	84.75	1.408	0.1211	10	B1I
TCC3B213D	B	C2	2	2	78.26	86.25	1.343	0.1210	10	B1I
TCC3C111D	C	C1	3	1	72.50	85.23	1.380	0.1221	10	B1I
TCC3C112D	C	C1	3	1	74.79	84.93	1.383	0.1205	10	B1I
TCC3C113D	C	C1	3	1	74.67	85.24	1.289	0.1233	10	B1I
TCC3C211D	C	C2	3	2	74.73	83.36	1.376	0.1213	10	B1I
TCC3C212D	C	C2	3	2	79.02	84.75	1.366	0.1211	10	B1I
TCC3C213D	C	C2	3	2	70.47	83.20	1.342	0.1224	10	B1I

Avg. t_{ply} [in]	2% Offset Strength _{norm} [ksi]	Ultimate Strength _{norm} [ksi]	Chord Stiffness _{norm} [Msi]
0.01208	76.27	86.55	1.525
0.01202	79.48	85.05	1.492
0.01197	79.66	85.17	1.418
0.01209	79.51	85.20	1.385
0.01211	74.35	85.86	1.355
0.01218	80.42	85.55	1.369
0.01213	72.59	85.64	1.347
0.01221	74.78	84.08	1.383
0.01221	69.15	83.87	1.301
0.01214	71.38	84.58	1.262
0.01211	78.05	84.12	1.398
0.01210	77.60	85.52	1.331
0.01221	72.56	85.30	1.381
0.01205	73.86	83.87	1.366
0.01233	75.46	86.15	1.303
0.01213	74.32	82.90	1.369
0.01211	78.46	84.15	1.356
0.01224	70.69	83.47	1.346

Average 75.90 85.30 1.379
Standard Dev. 3.719 1.204 0.06872
Coeff. of Var. [%] 4.899 1.411 4.983
Min. 69.07 83.20 1.268
Max. 81.19 87.44 1.540
Number of Spec. 18 18 18

Average_{norm} 0.01213 75.48 84.84 1.372
Standard Dev._{norm} 3.405 0.9978 0.06239
Coeff. of Var. [%]_{norm} 4.511 1.176 4.549
Min. 0.01197 69.15 82.90 1.262
Max. 0.01233 80.42 86.55 1.525
Number of Spec. 18 18 18 18





4.30 “25/50/25” Compression After Impact 1 Properties (CAI1)

**Laminate Compression After Impact 1 Properties (CAI1)--RTA (70°F)
Strength**

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

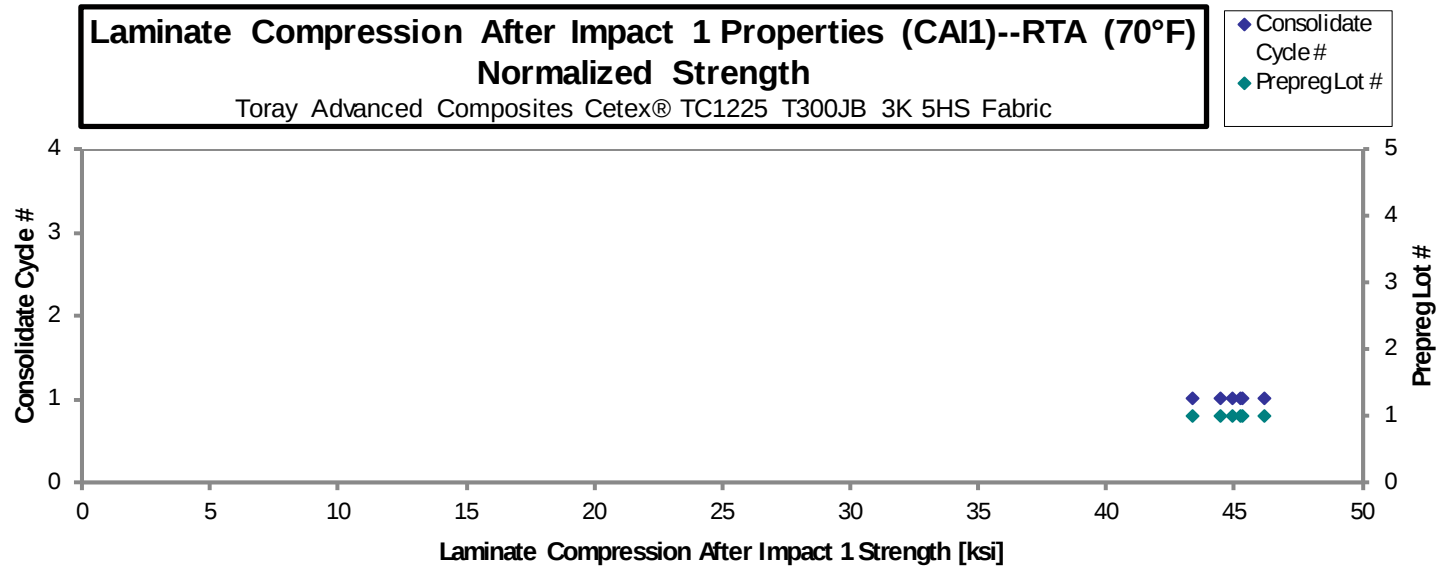
 t_{ply} [in]

0.01220

Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Measured Impact Energy [in-lbf]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	Strength _{norm} [ksi]
TCCKA112A	A	C1	1	1	45.40	289.7	0.1949	16	LDM	0.01218	45.33
TCCKA113A	A	C1	1	1	43.84	286.7	0.1932	16	M(A,L)DM	0.01208	43.39
TCCKA114A	A	C1	1	1	46.35	291.8	0.1946	16	M(A,L)DM	0.01216	46.20
TCCKA115A	A	C1	1	1	44.75	291.6	0.1959	16	M(A,L)DM	0.01224	44.91
TCCKA116A	A	C1	1	1	44.49	291.8	0.1950	16	M(A,L)DM	0.01219	44.44
TCCKA117A	A	C1	1	1	45.55	288.5	0.1940	16	M(A,L)DM	0.01213	45.27

Average 45.06
 Standard Dev. 0.8895
 Coeff. of Var. [%] 1.974
 Min. 43.84
 Max. 46.35
 Number of Spec. 6

Average_{norm} 0.01216 44.92
 Standard Dev._{norm} 0.9472
 Coeff. of Var. [%]_{norm} 2.108
 Min. 0.01208 43.39
 Max. 0.01224 46.20
 Number of Spec. 6 6



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Laminate Compression After Impact 1 Properties (CAI1)--ETW (250°F)

Strength

Toray Advanced Composites Cetex® TC1225 T300JB 3K 5HS Fabric

normalizing

t_{ply} [in]

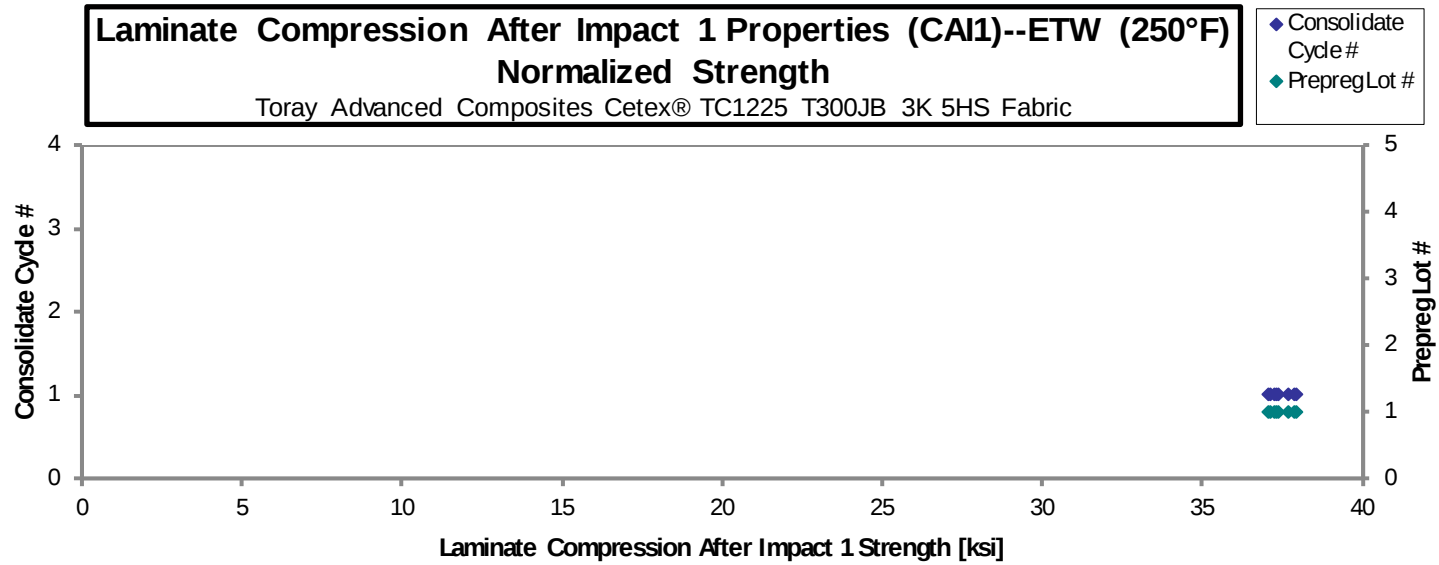
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Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	Strength [ksi]	Measured Impact Energy [in-lbf]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
TCCKA111D	A	C1	1	1	37.74	288.7	0.1932	16	LDM
TCCKA112D	A	C1	1	1	37.50	288.1	0.1932	16	LDM
TCCKA113D	A	C1	1	1	37.68	288.5	0.1933	16	LDM
TCCKA114D	A	C1	1	1	38.29	290.7	0.1934	16	LDM
TCCKA115D	A	C1	1	1	37.23	290.9	0.1942	16	LDM
TCCKA116D	A	C1	1	1	38.17	288.7	0.1938	16	LDM
TCCKA117D	A	C1	1	1	38.09	290.9	0.1931	16	LDM
TCCKA118D	A	C1	1	1	37.52	288.8	0.1937	16	LDM

Avg. t_{ply} [in]	Strength _{norm} [ksi]
0.01208	37.36
0.01208	37.11
0.01208	37.32
0.01209	37.93
0.01214	37.04
0.01211	37.89
0.01207	37.67
0.01210	37.23

Average 37.78
 Standard Dev. 0.3724
 Coeff. of Var. [%] 0.9859
 Min. 37.23
 Max. 38.29
 Number of Spec. 8

Average_{norm} 0.01209 37.44
 Standard Dev._{norm} 0.3464
 Coeff. of Var. [%]_{norm} 0.9250
 Min. 0.01207 37.04
 Max. 0.01214 37.93
 Number of Spec. 8

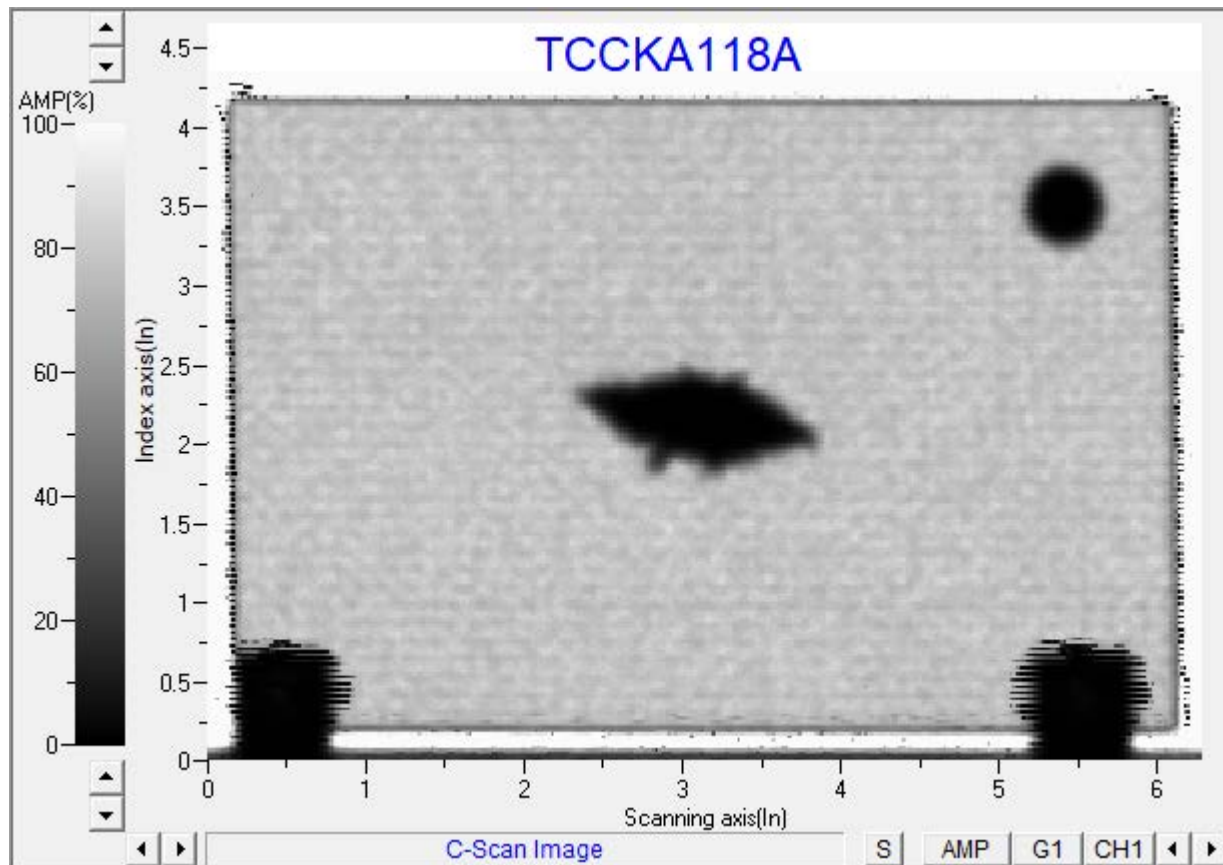


5. Additional Compression After Impact Data

Target Impact Energy Level: 1500 in-lb/in

Impactor Diameter: 0.625"

Representative of Damage Area:

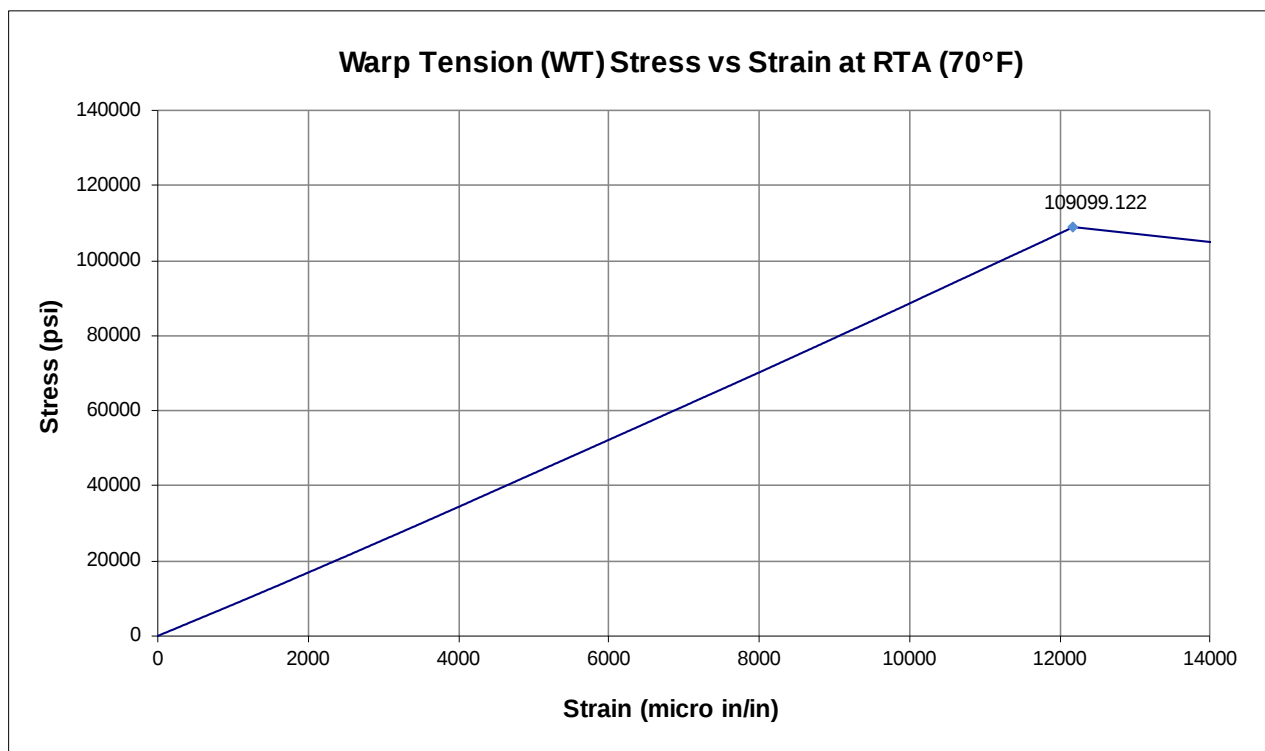
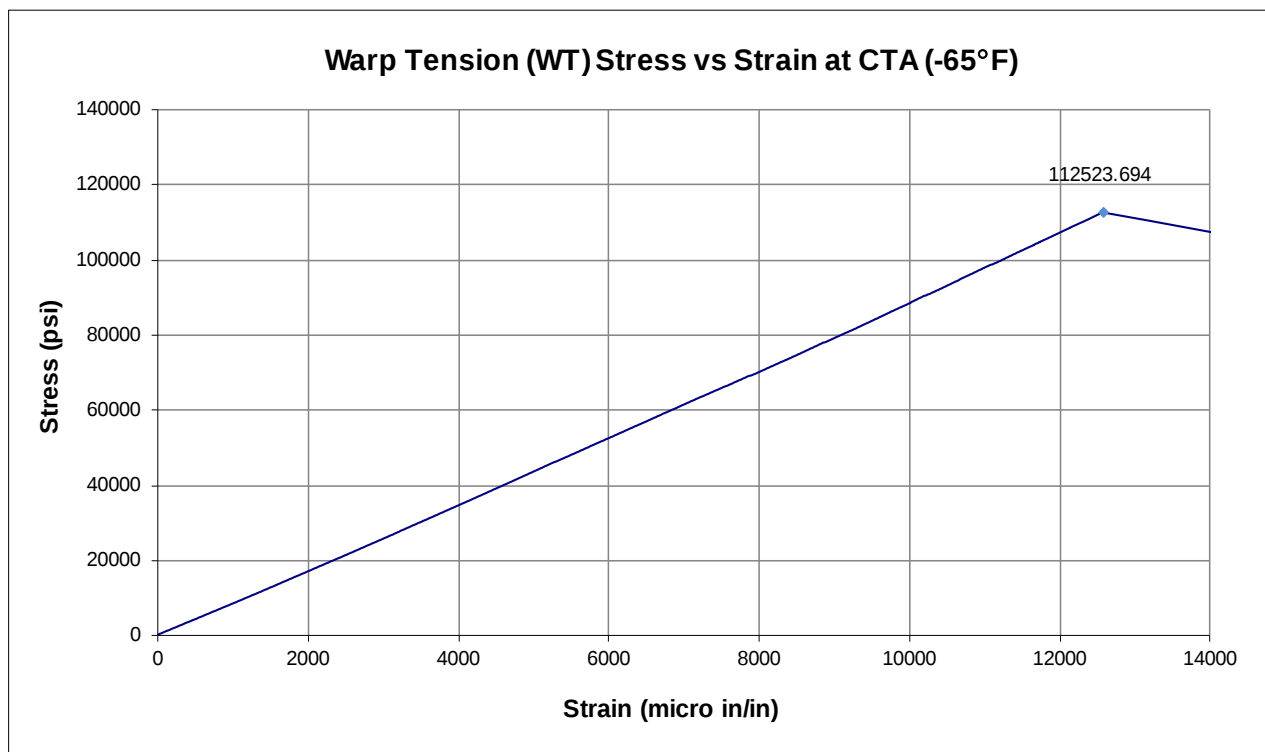


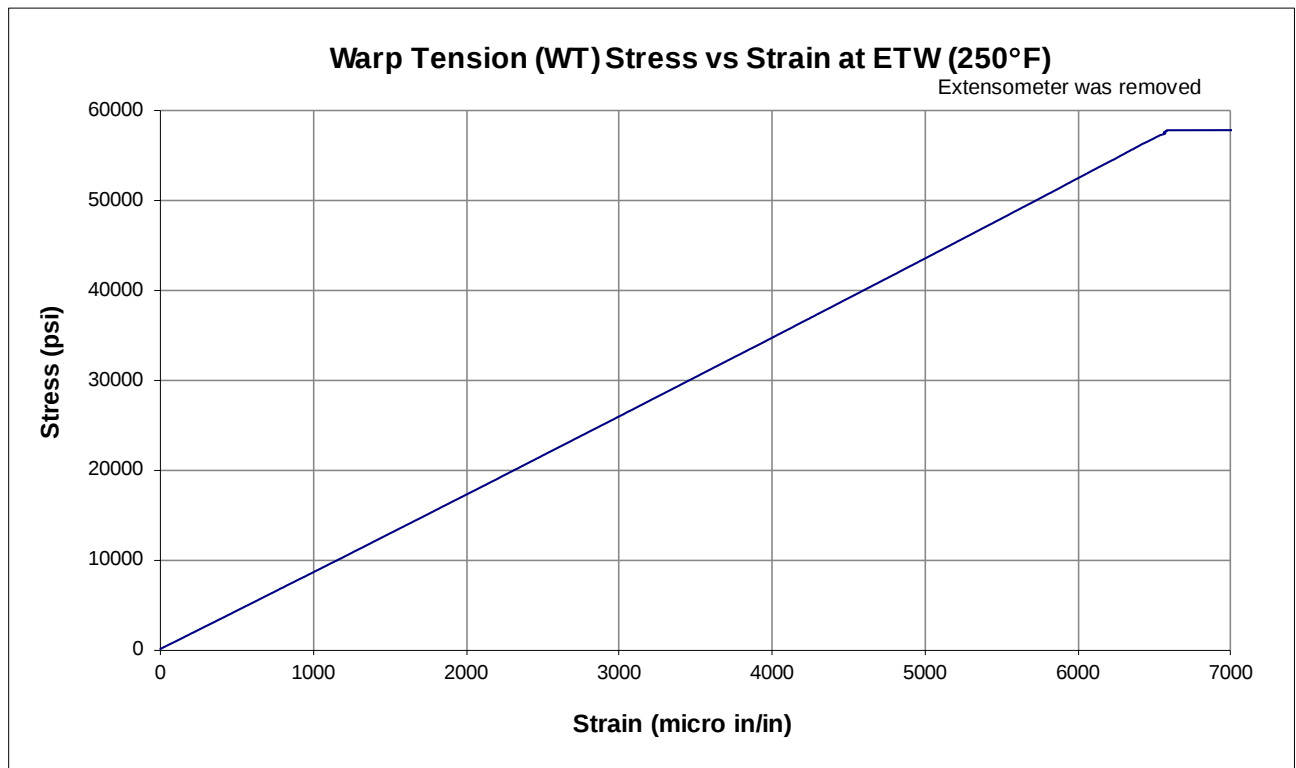
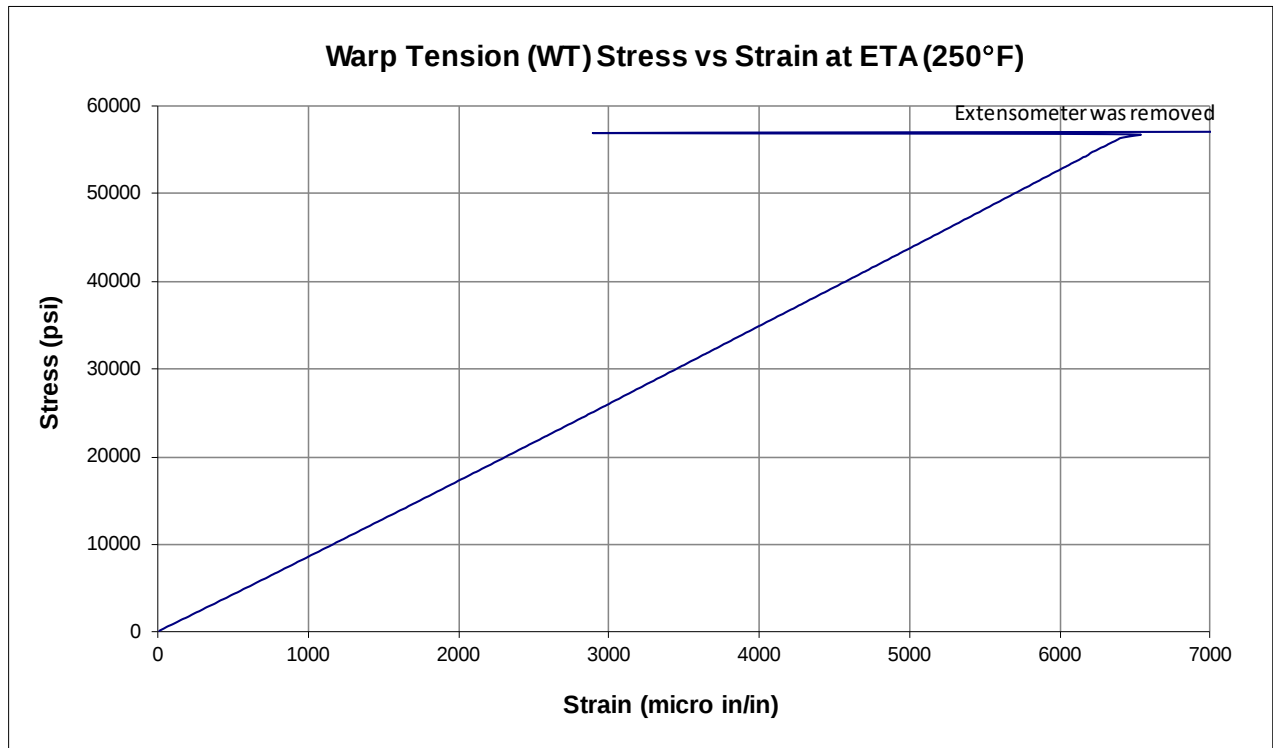
Damage Area and Dent Depth Summary:

Specimen ID	Damage Area (inch ²)	Dent Depth (inch)
TCCKA112A	0.5892	0.0270
TCCKA113A	0.5596	0.0295
TCCKA114A	0.6256	0.0280
TCCKA115A	0.5744	0.0265
TCCKA116A	0.5936	0.0270
TCCKA117A	0.5828	0.0260
TCCKA118A	0.5908	0.0285
TCCKA111D	0.5732	0.0275
TCCKA112D	0.5940	0.0285
TCCKA113D	0.5392	0.0275
TCCKA114D	0.5988	0.0285
TCCKA115D	0.5952	0.0285
TCCKA116D	0.5992	0.0280
TCCKA117D	0.5704	0.0285
TCCKA118D	0.5980	0.0295
TCCKA119D	0.5692	0.0295

6. Full Stress vs. Strain Curve

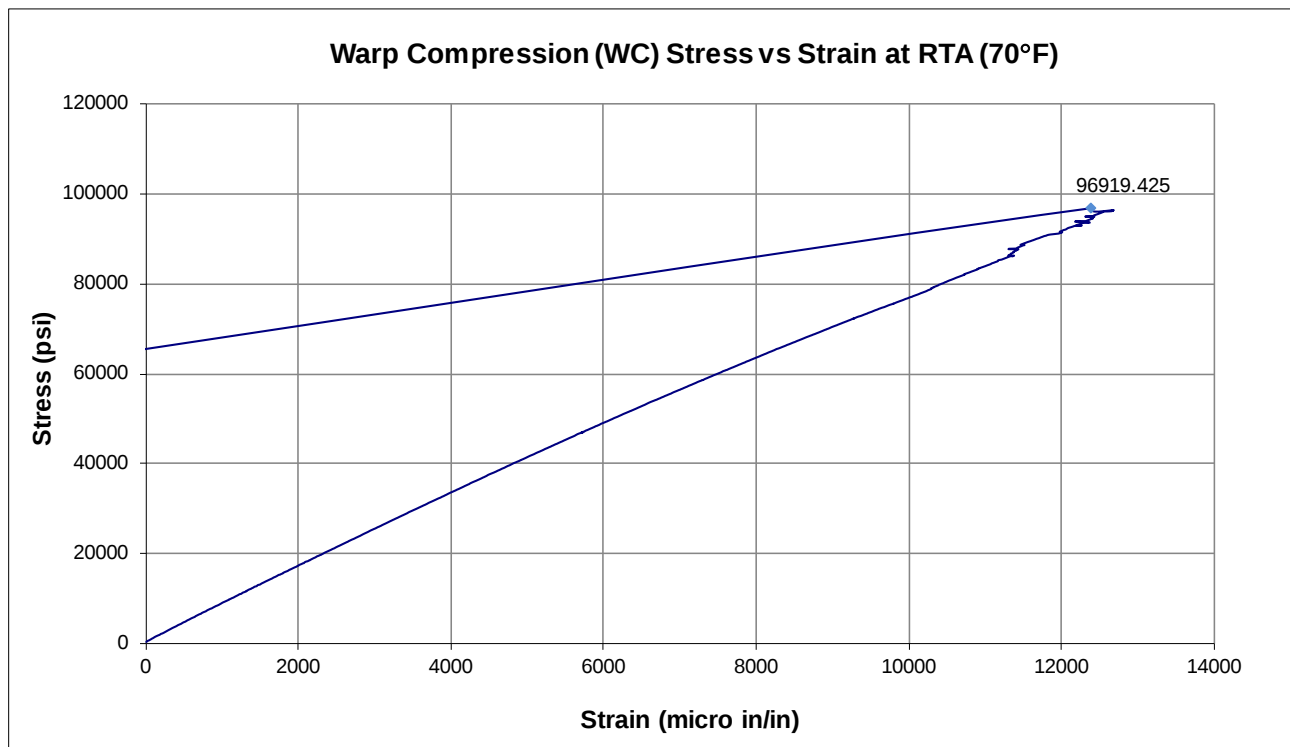
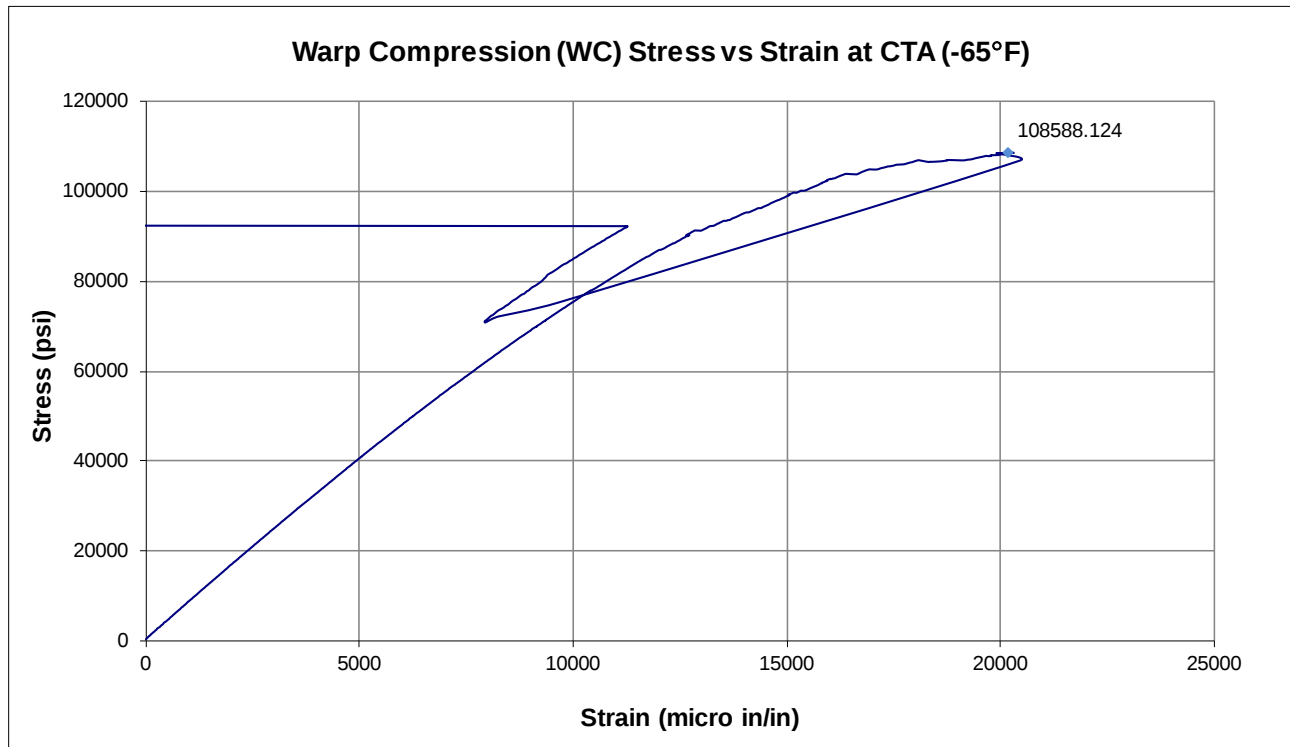
6.1 Warp Tension (WT)

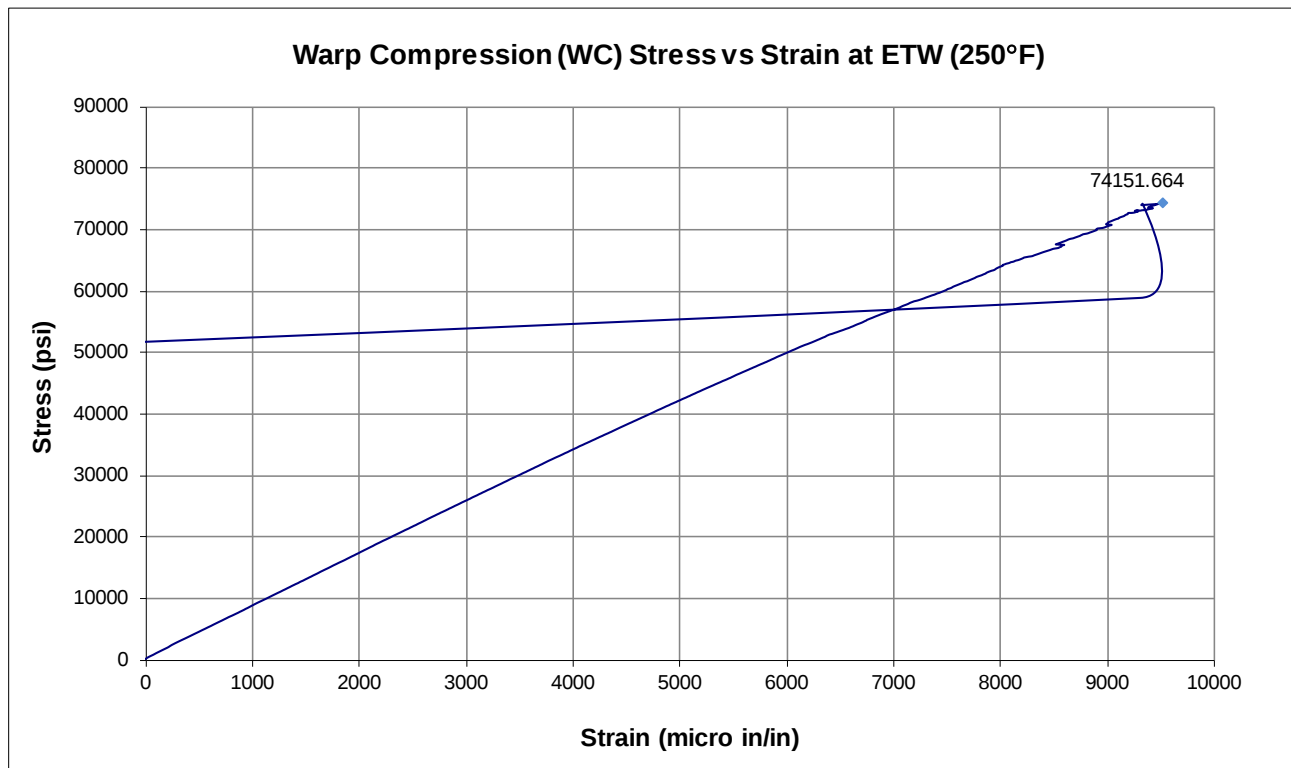
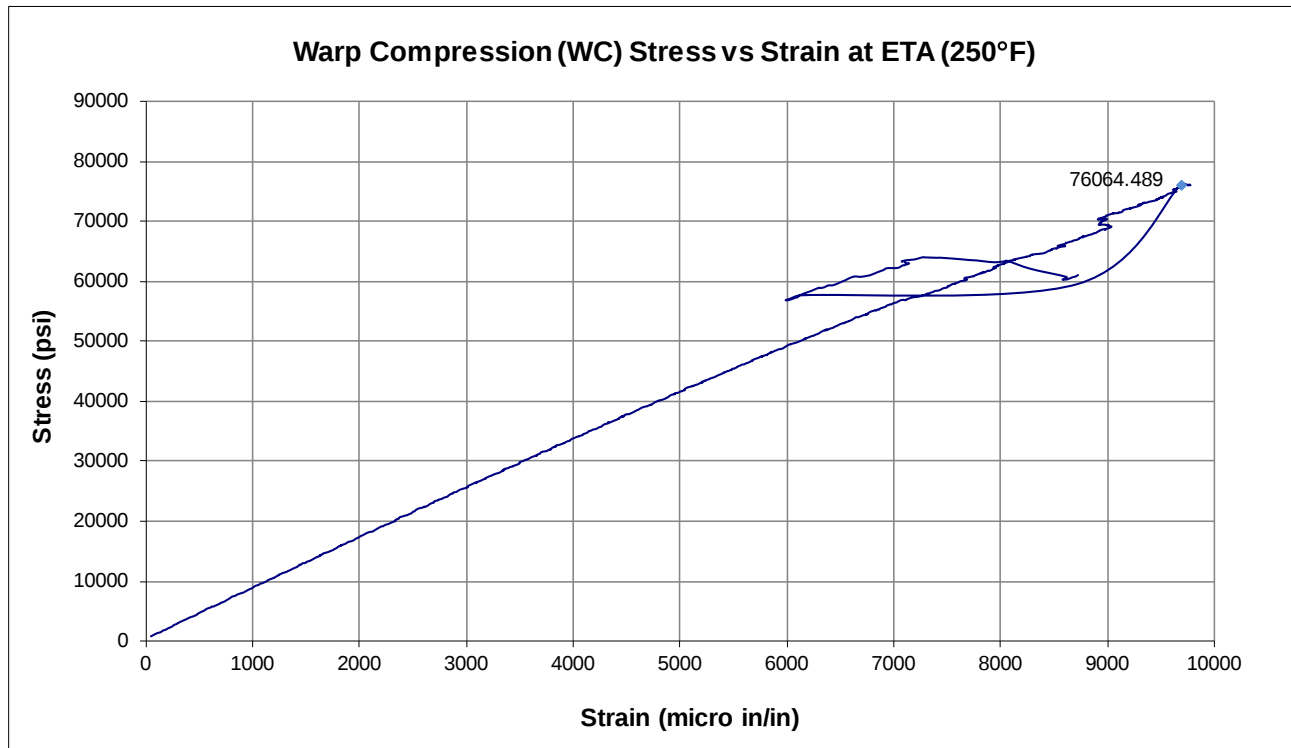




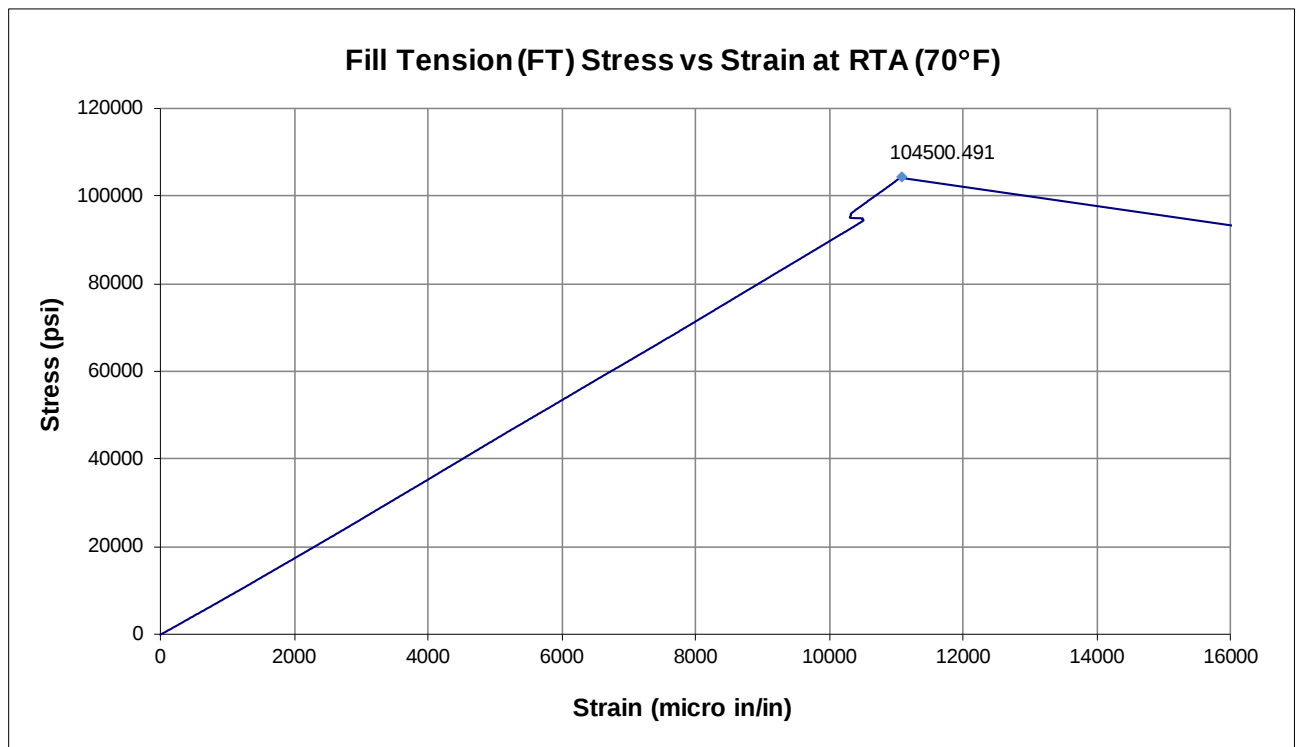
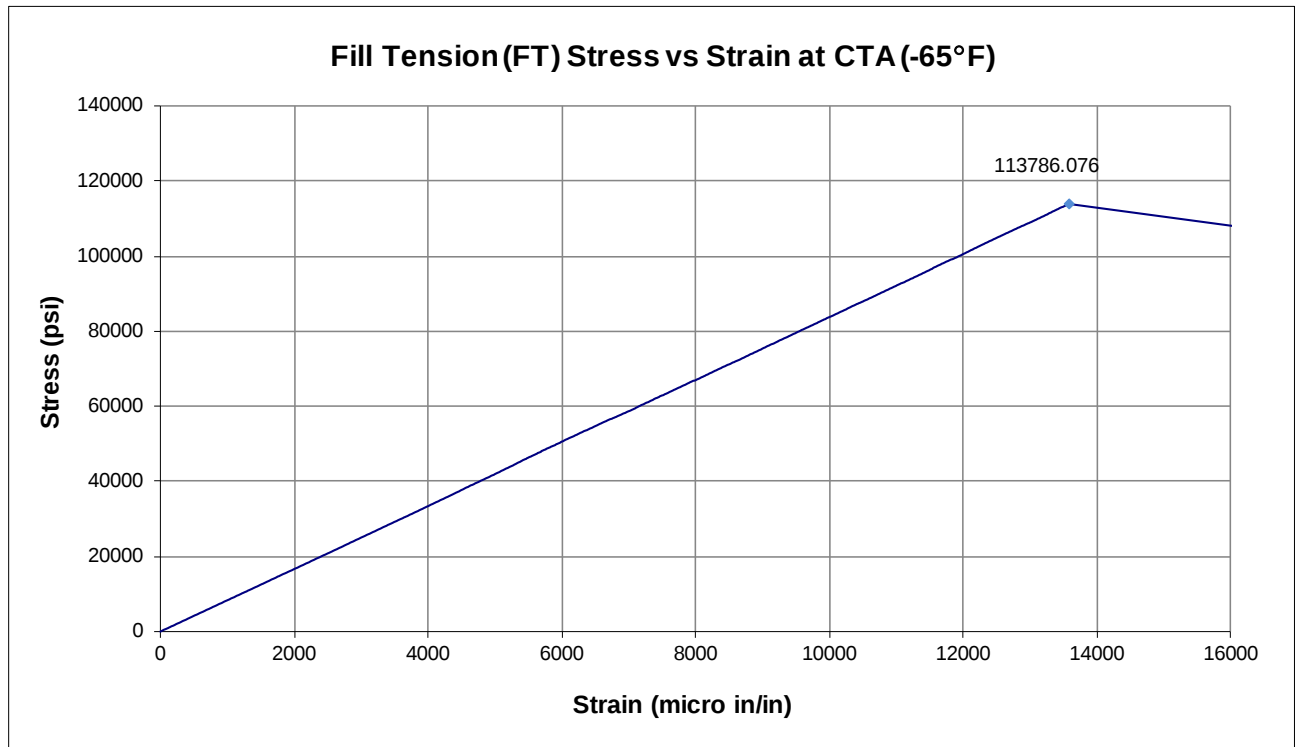
Extensometer was removed before failure.

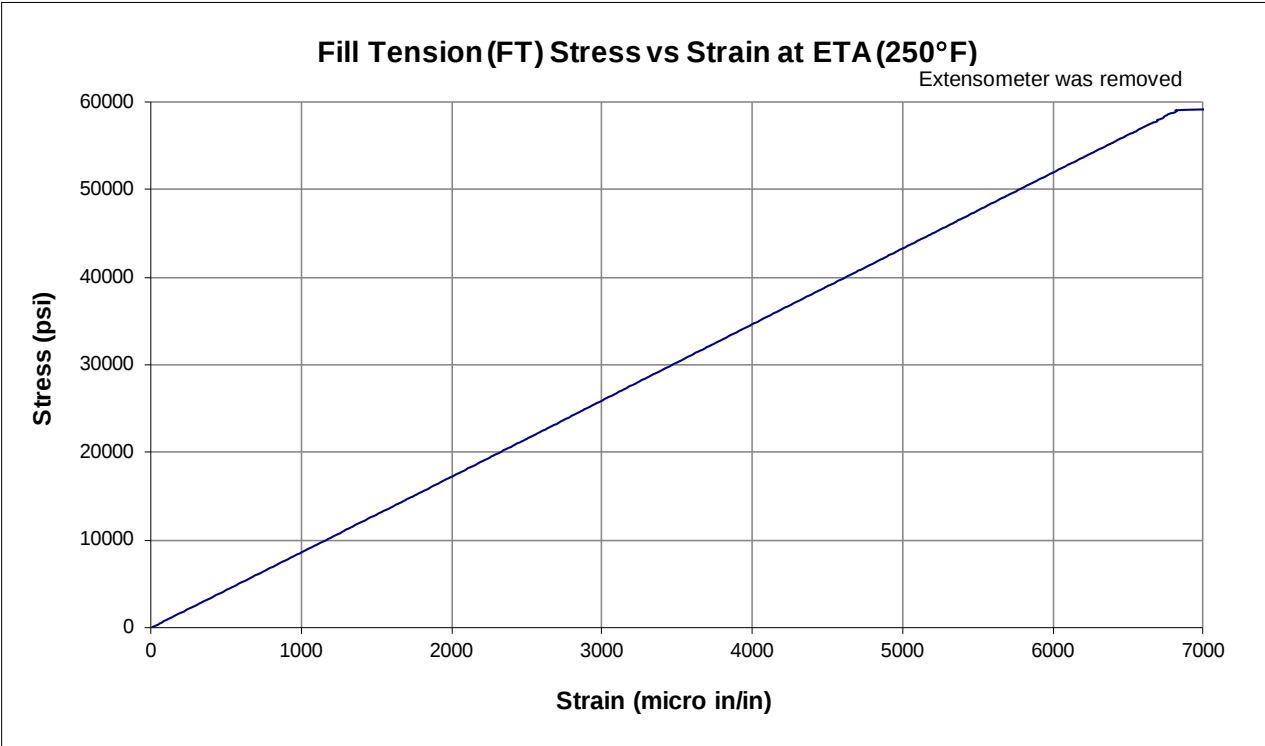
6.2 Warp Compression (WC)



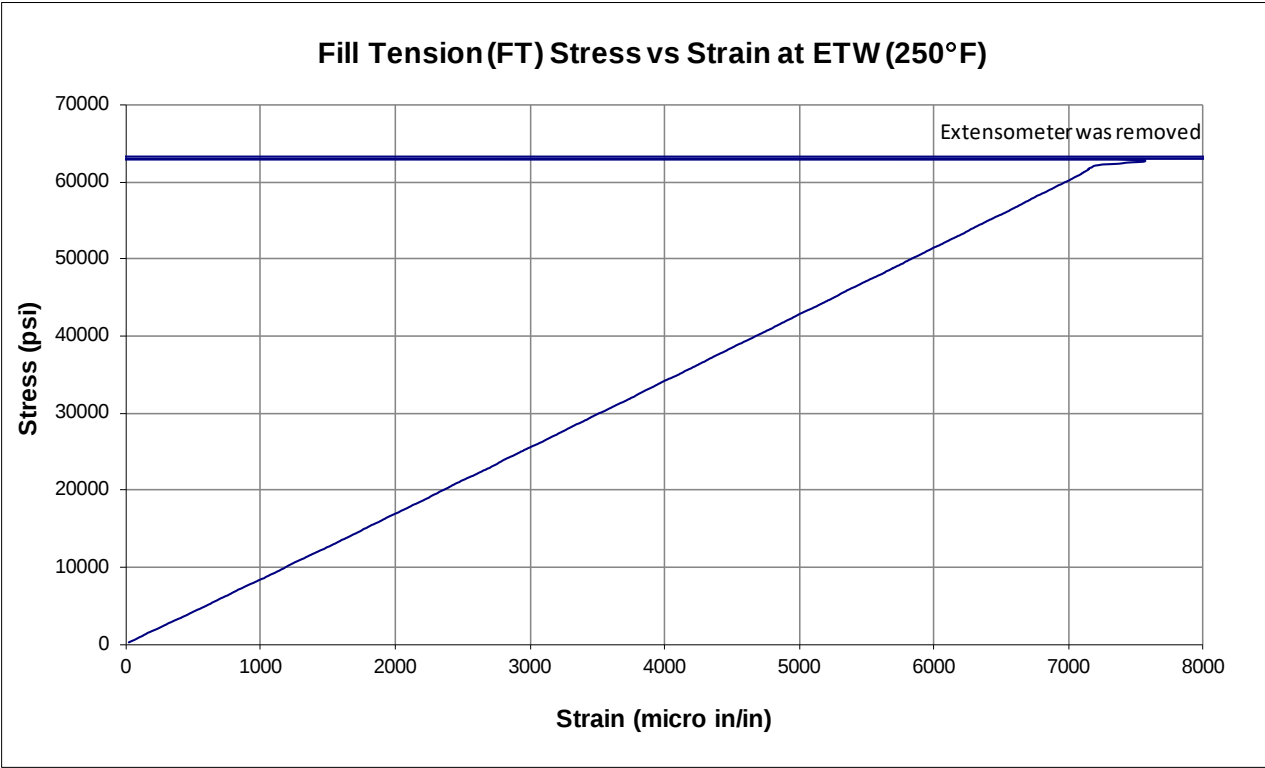


6.3 Fill Tension (FT)



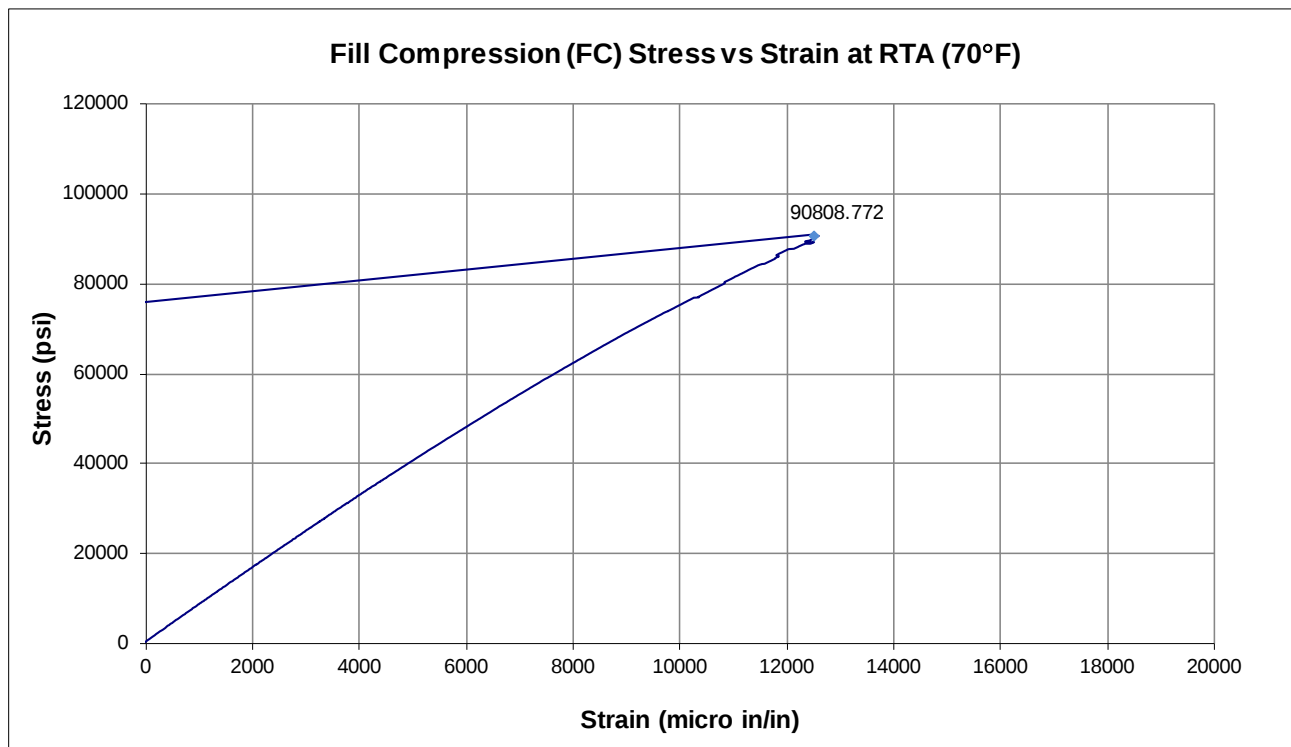
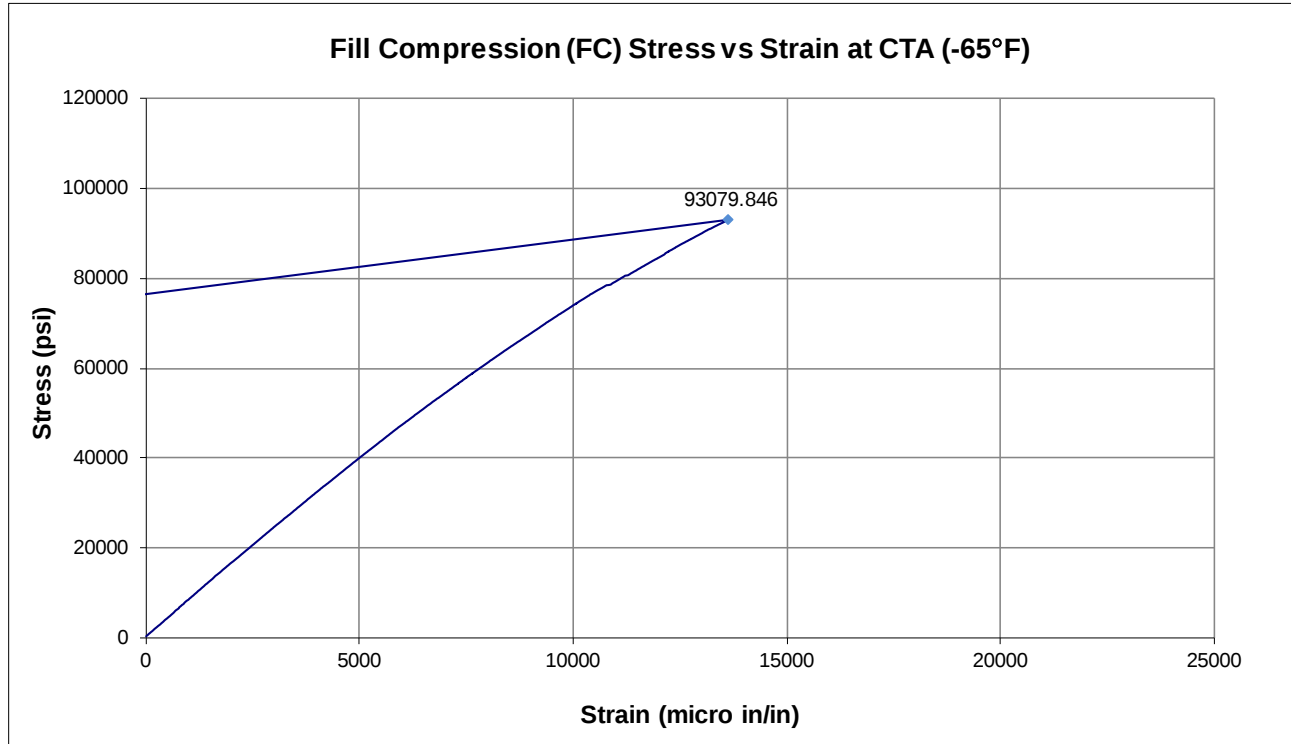


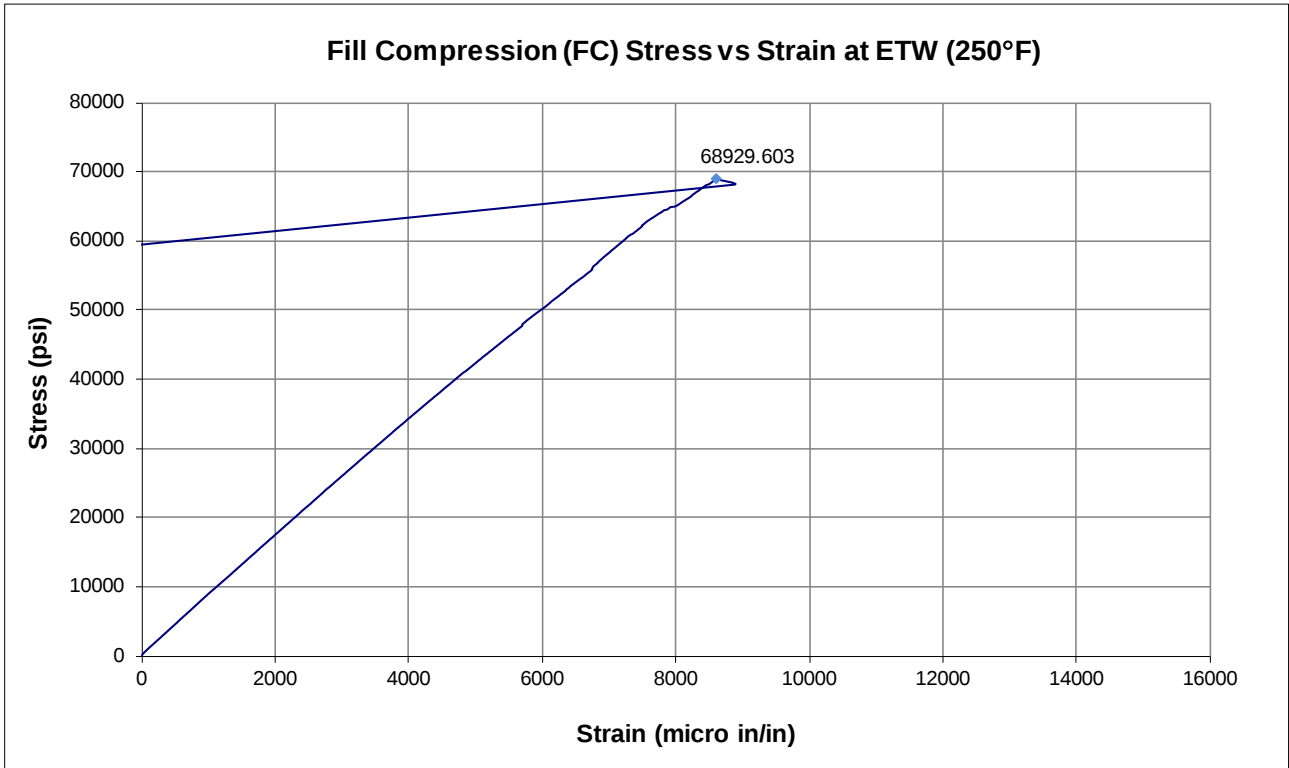
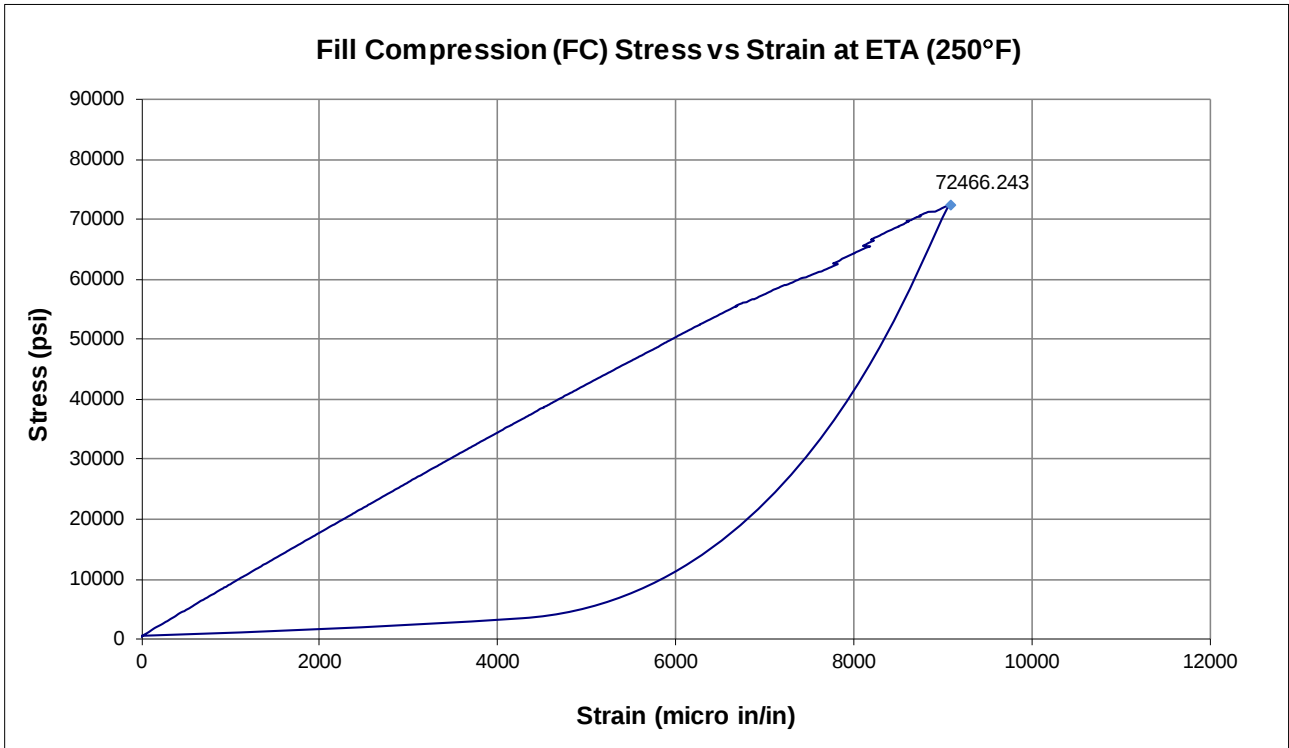
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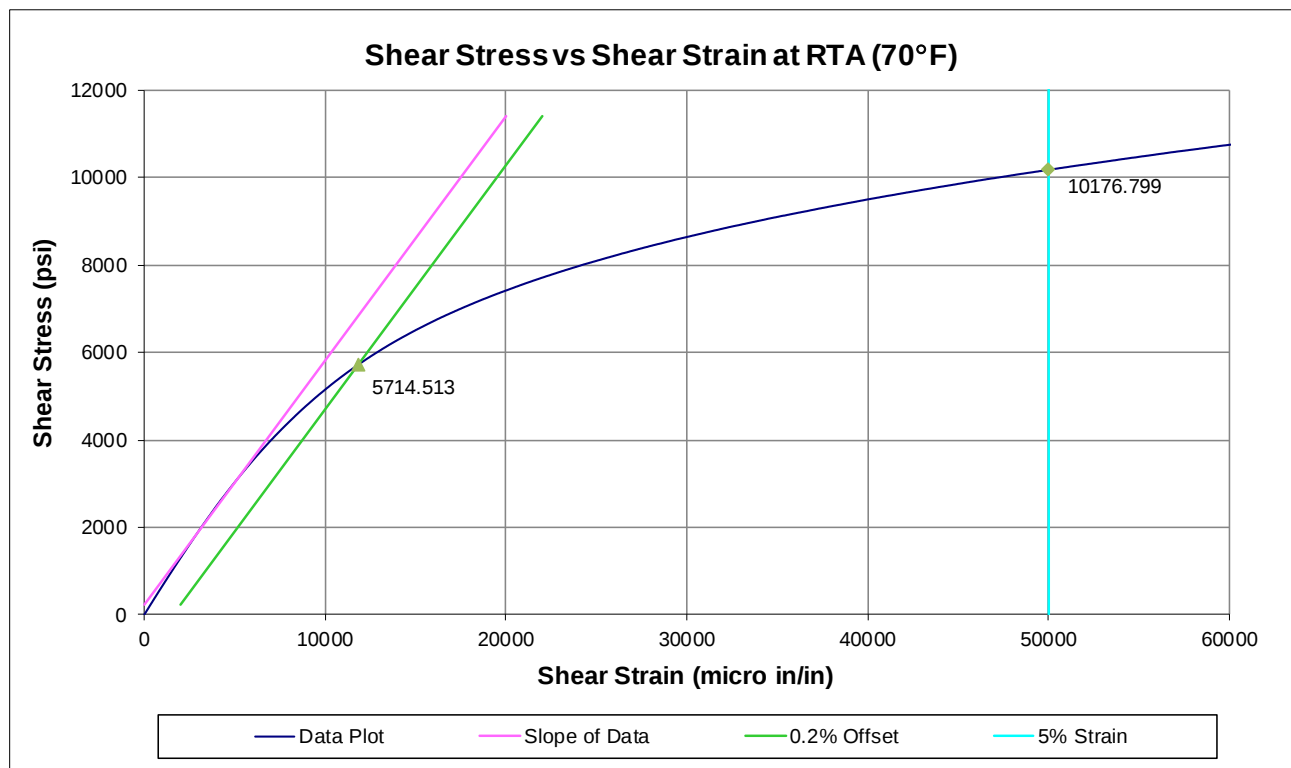
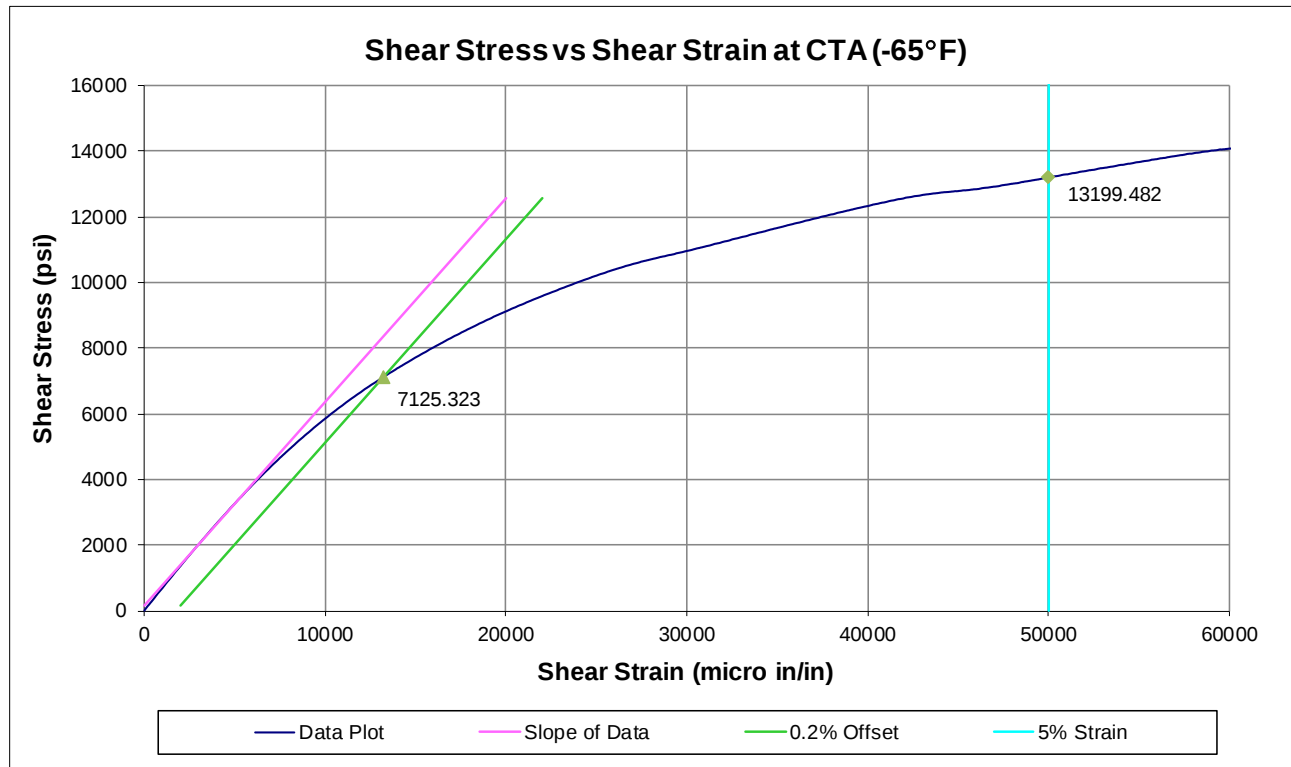
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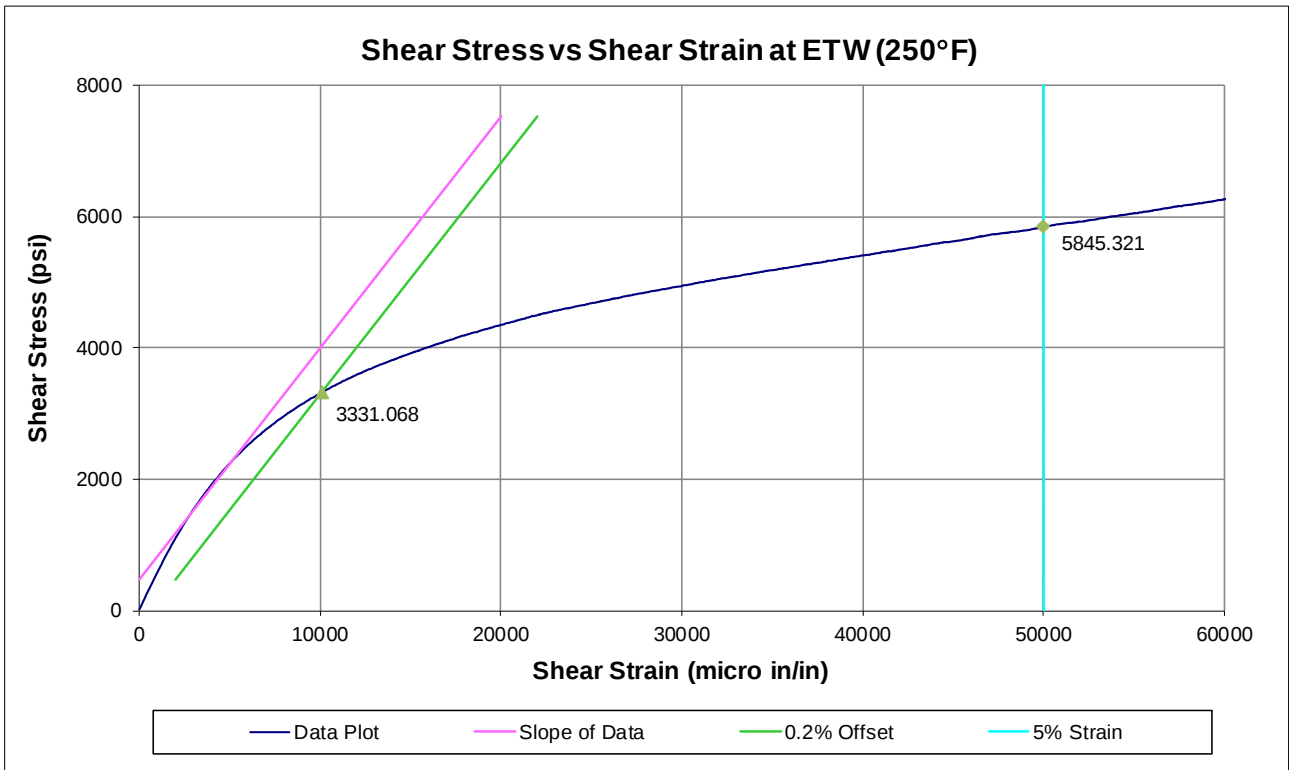
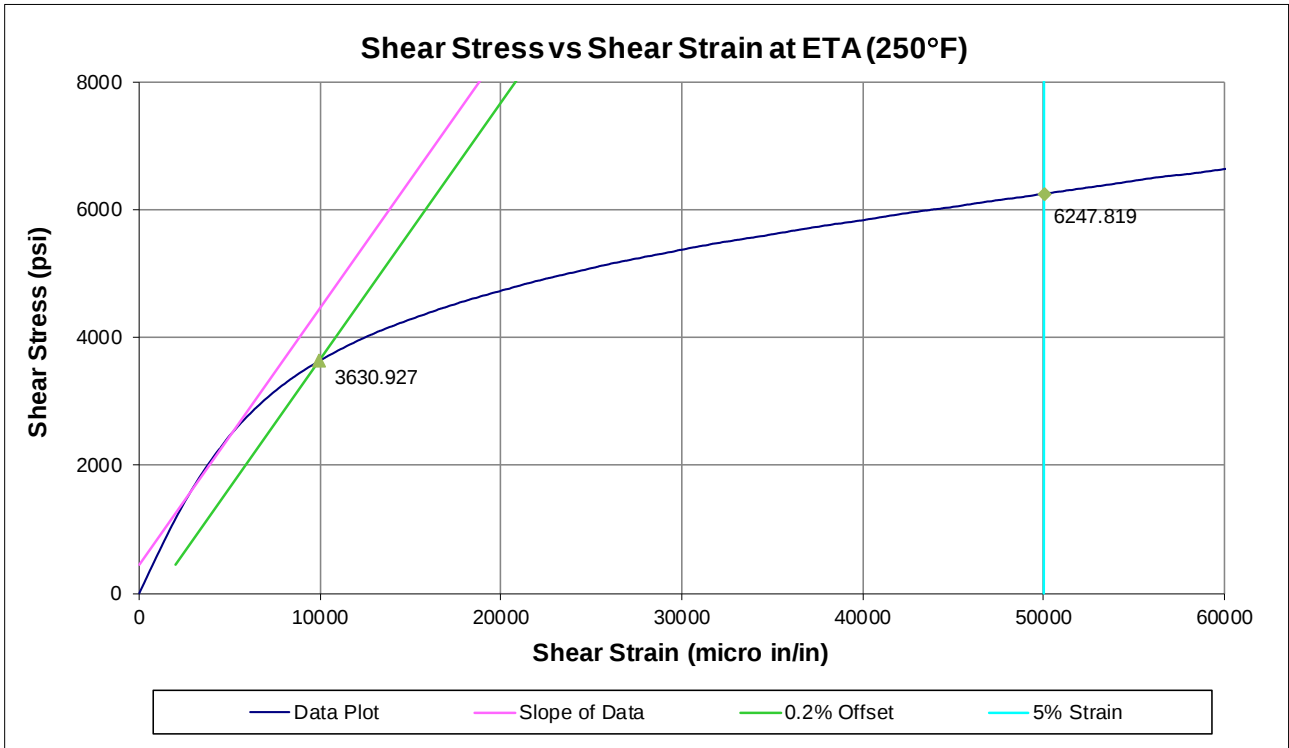
6.4 Fill Compression (FC)



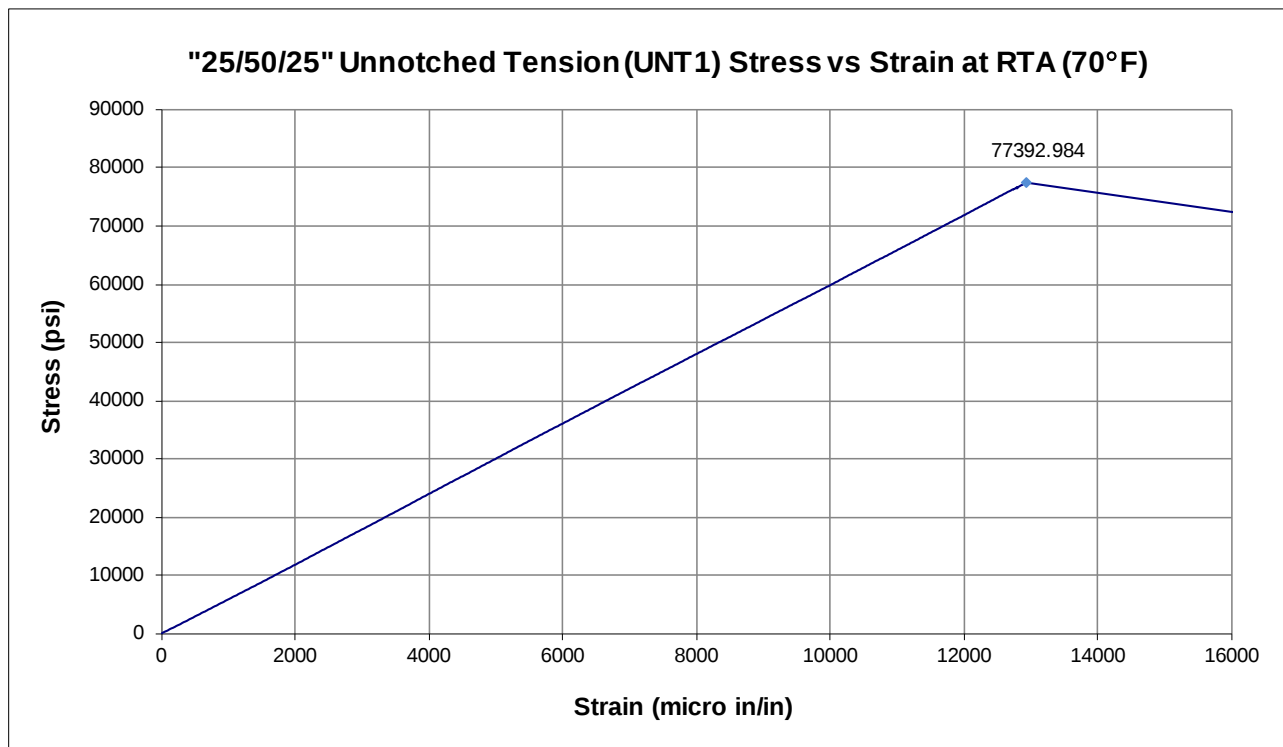
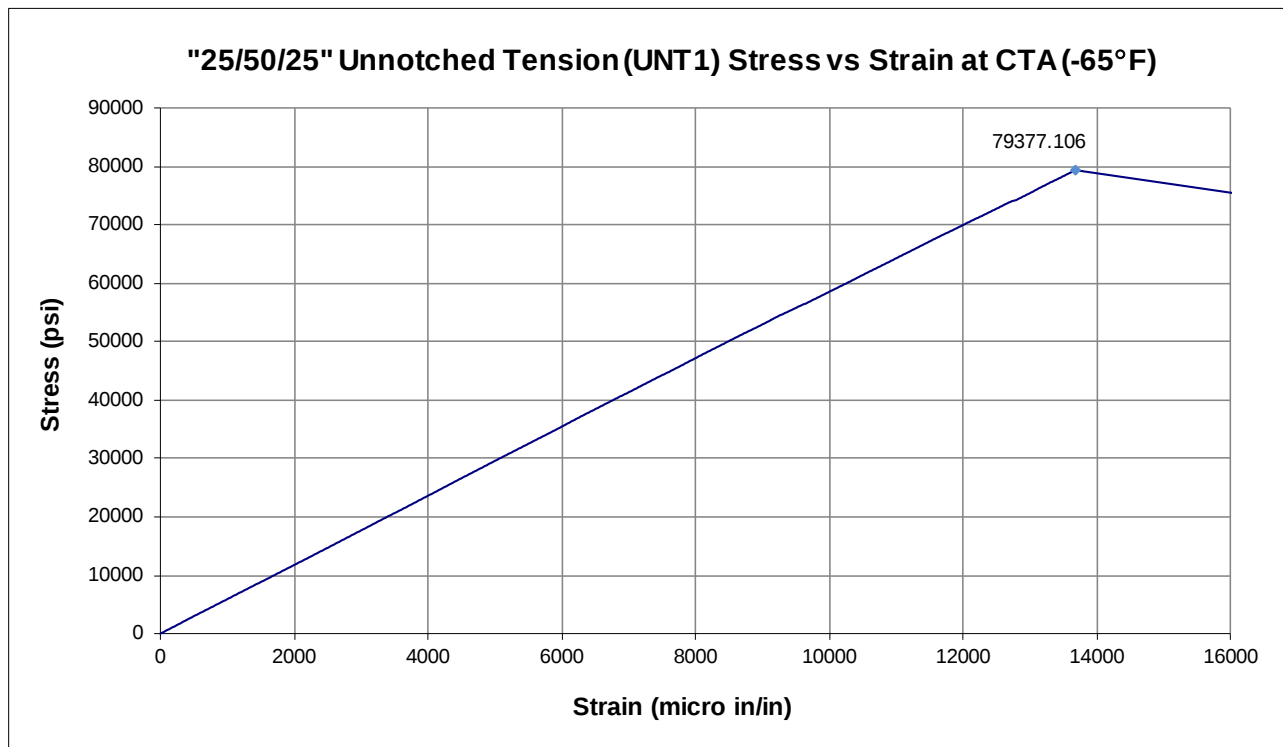


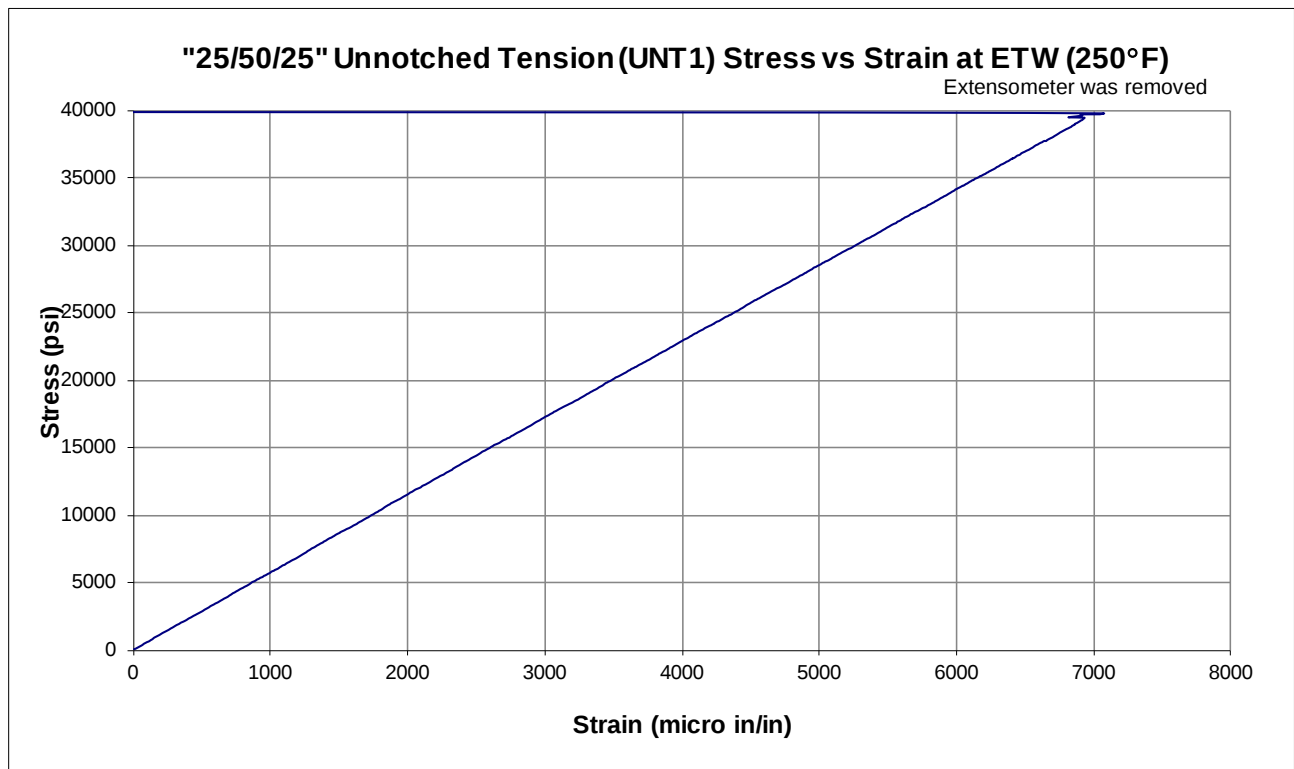
6.5 In-Plane Shear (IPS)





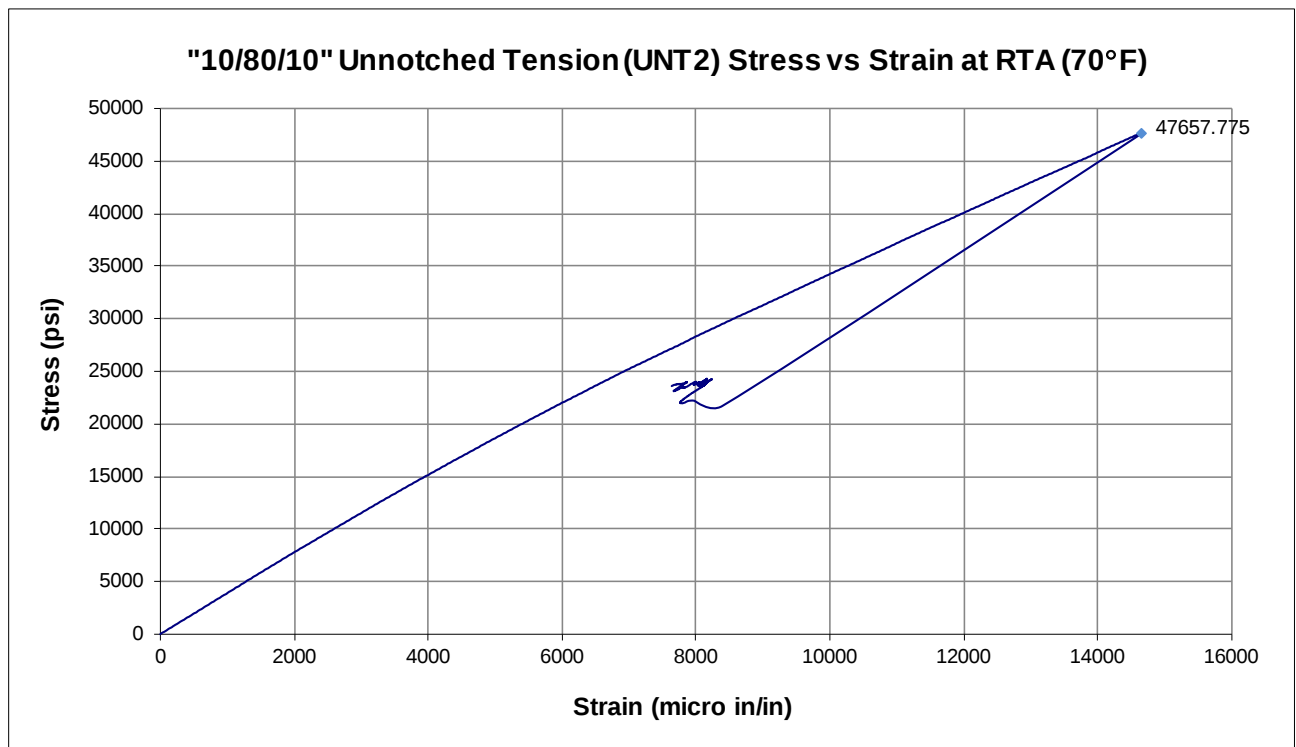
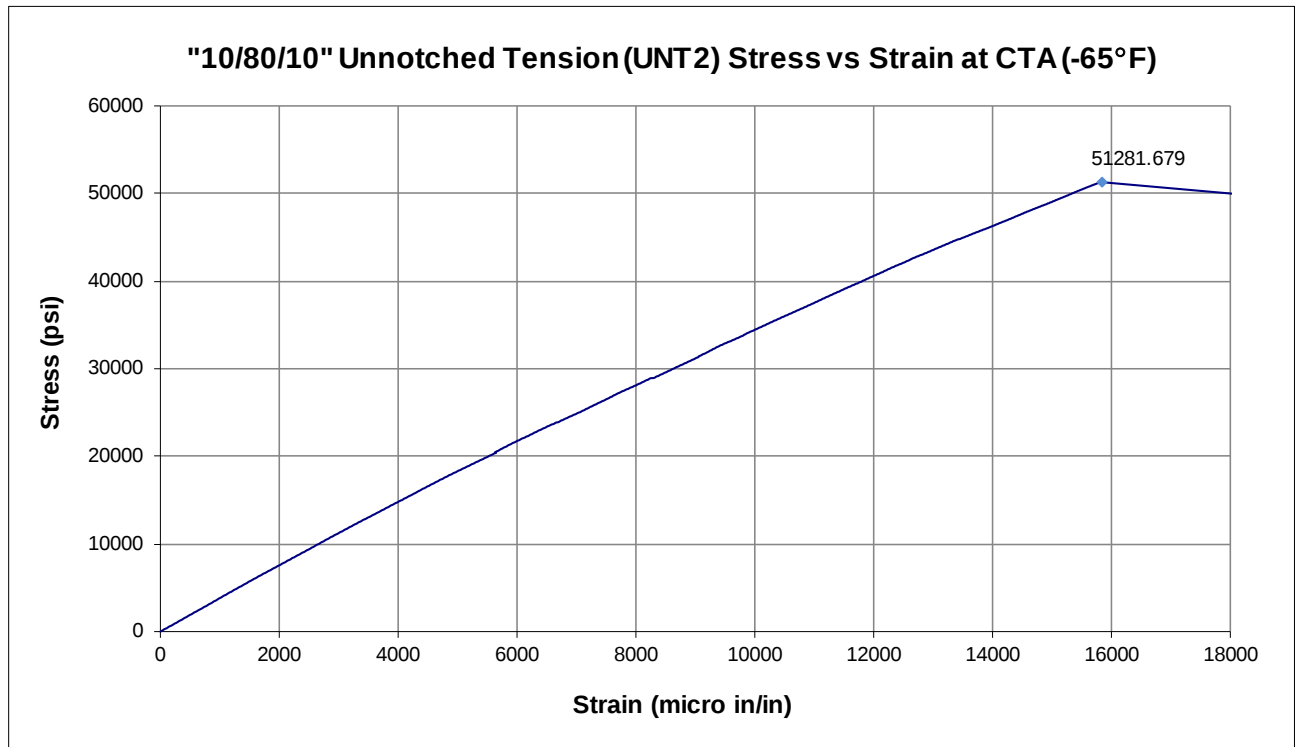
6.6 "25/50/25" Unnotched Tension (UNT1)

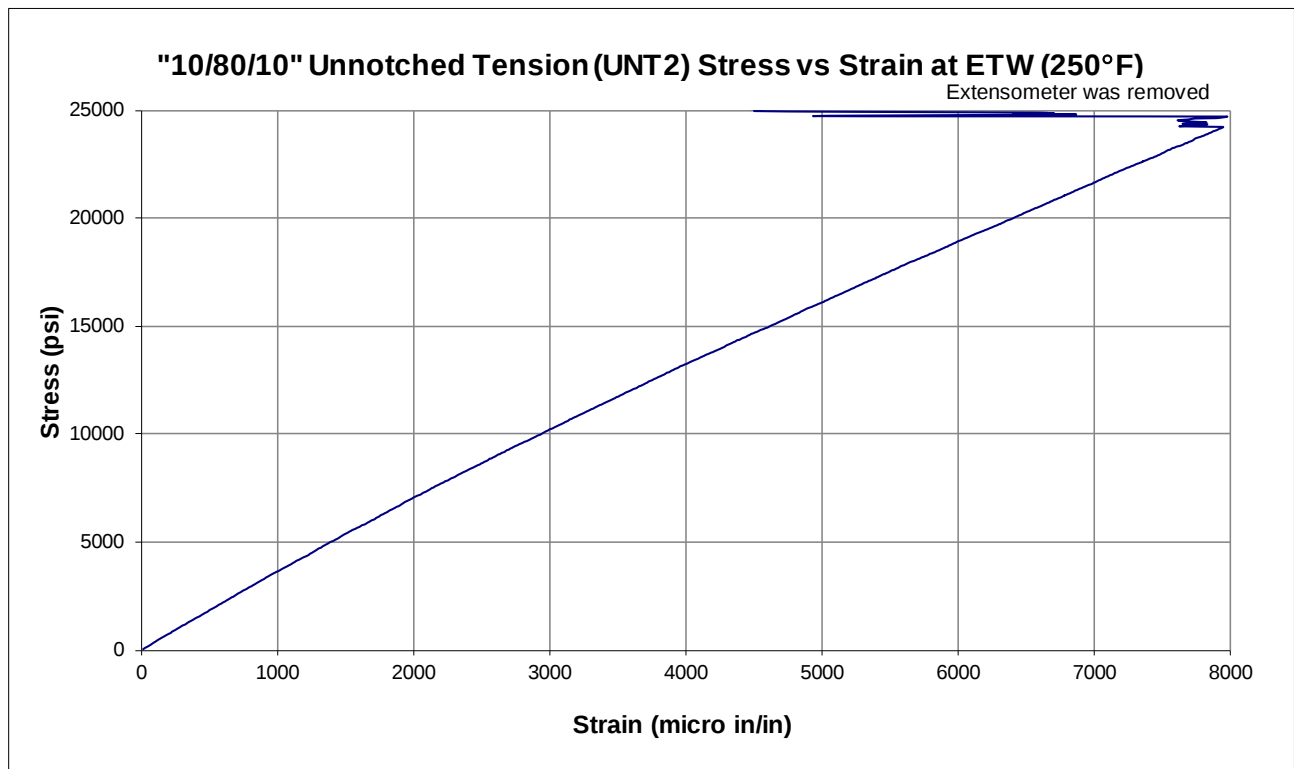




Extensometer was removed before failure.

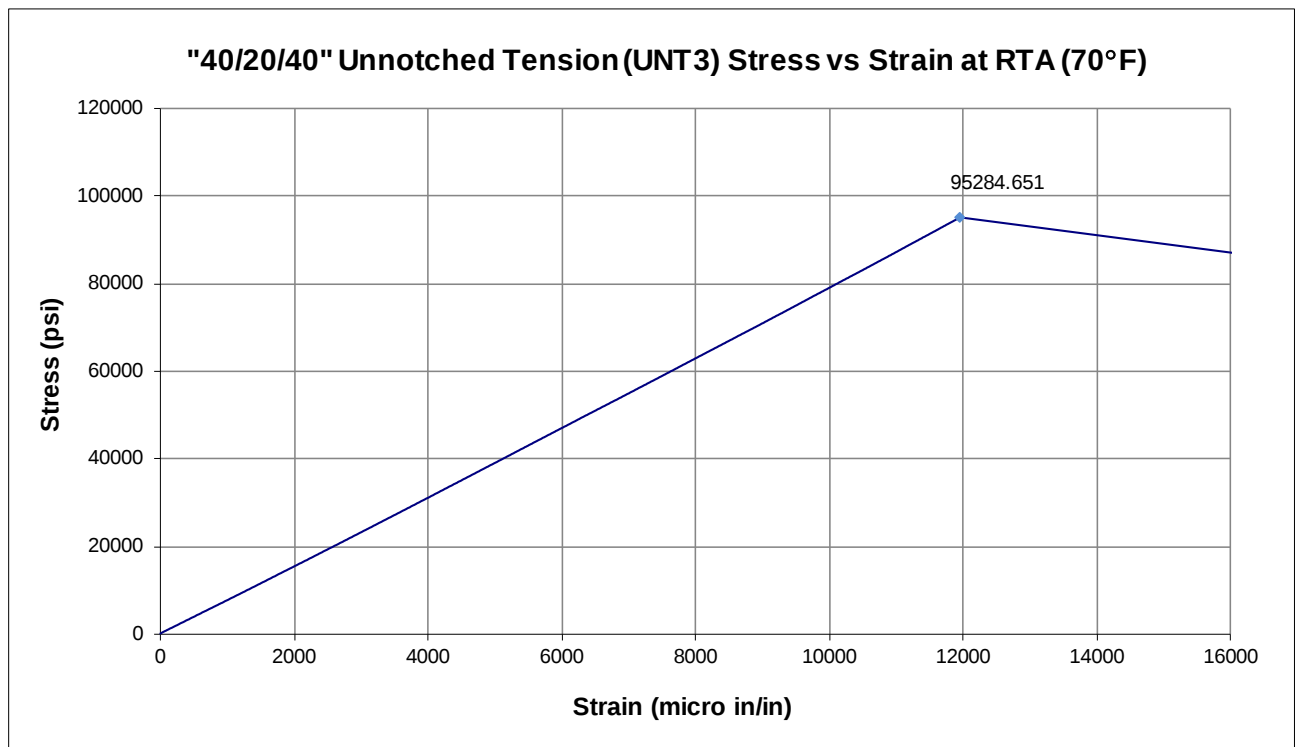
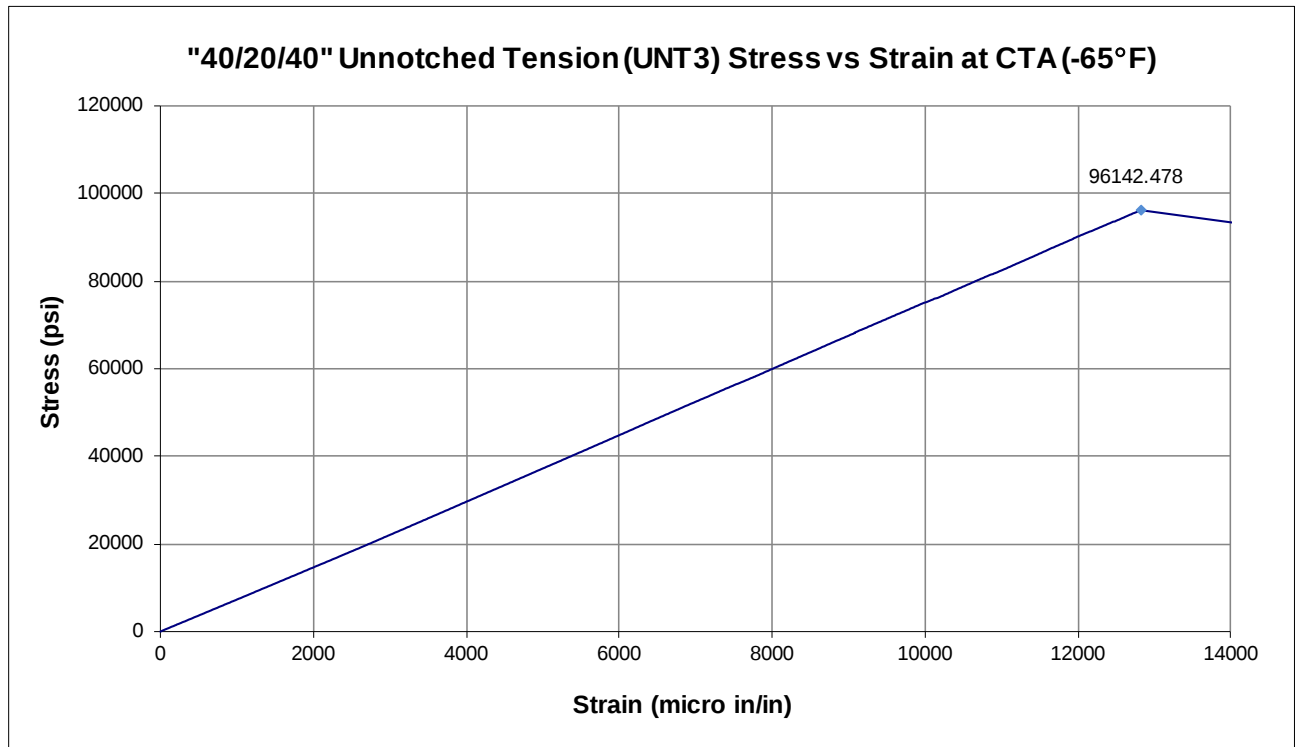
6.7 "10/80/10" Unnotched Tension (UNT2)

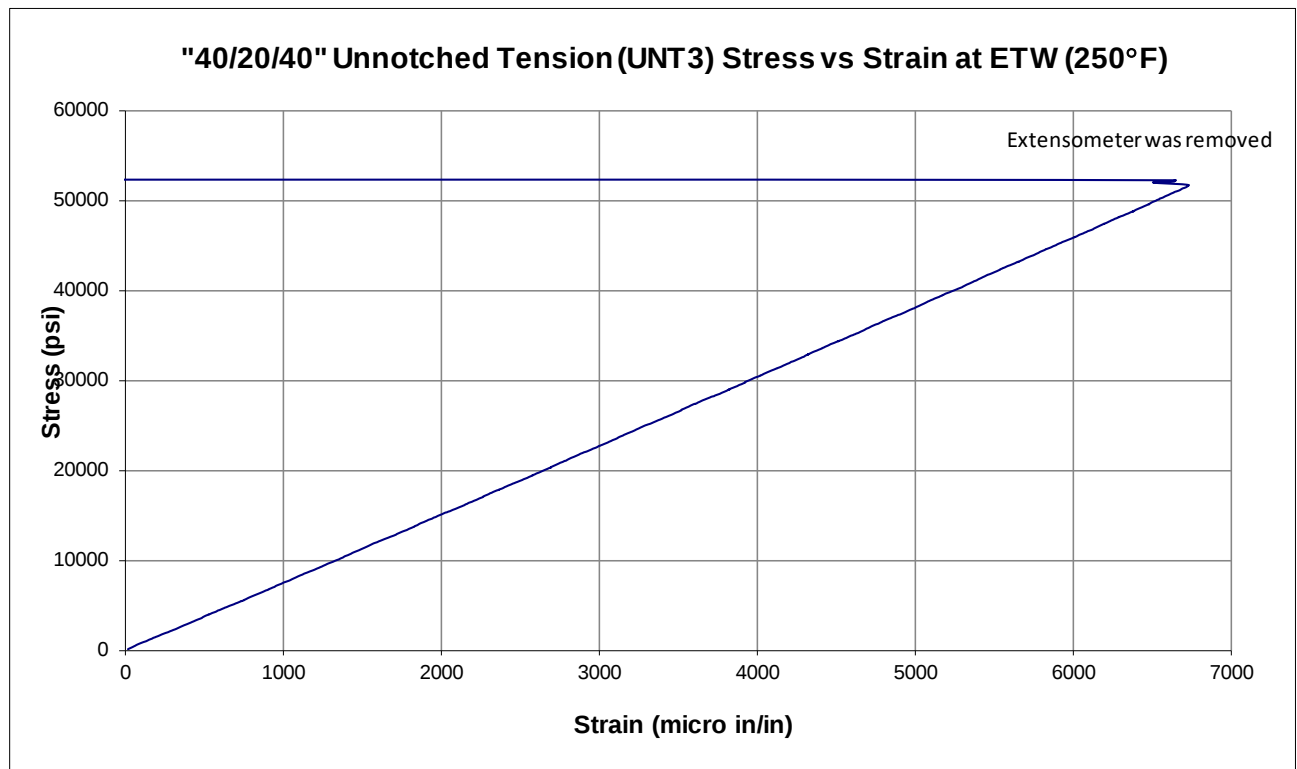




Extensometer was removed before failure.

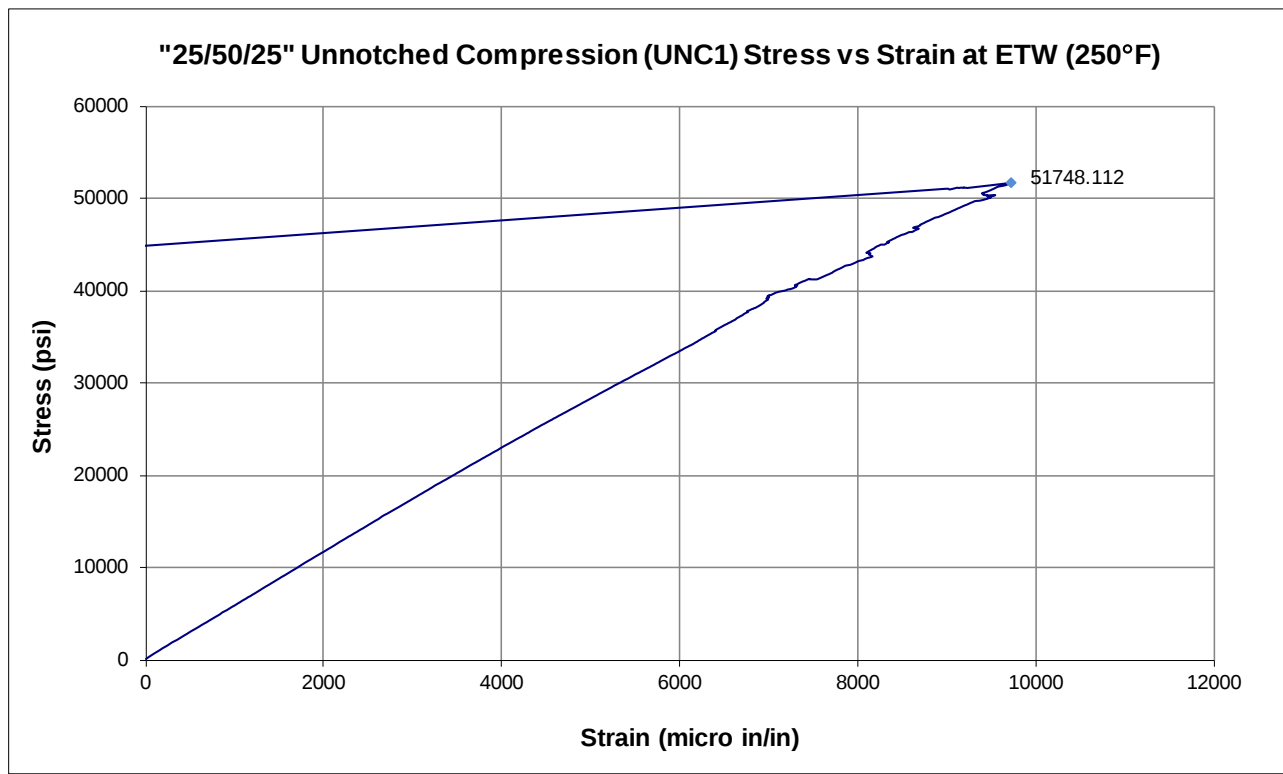
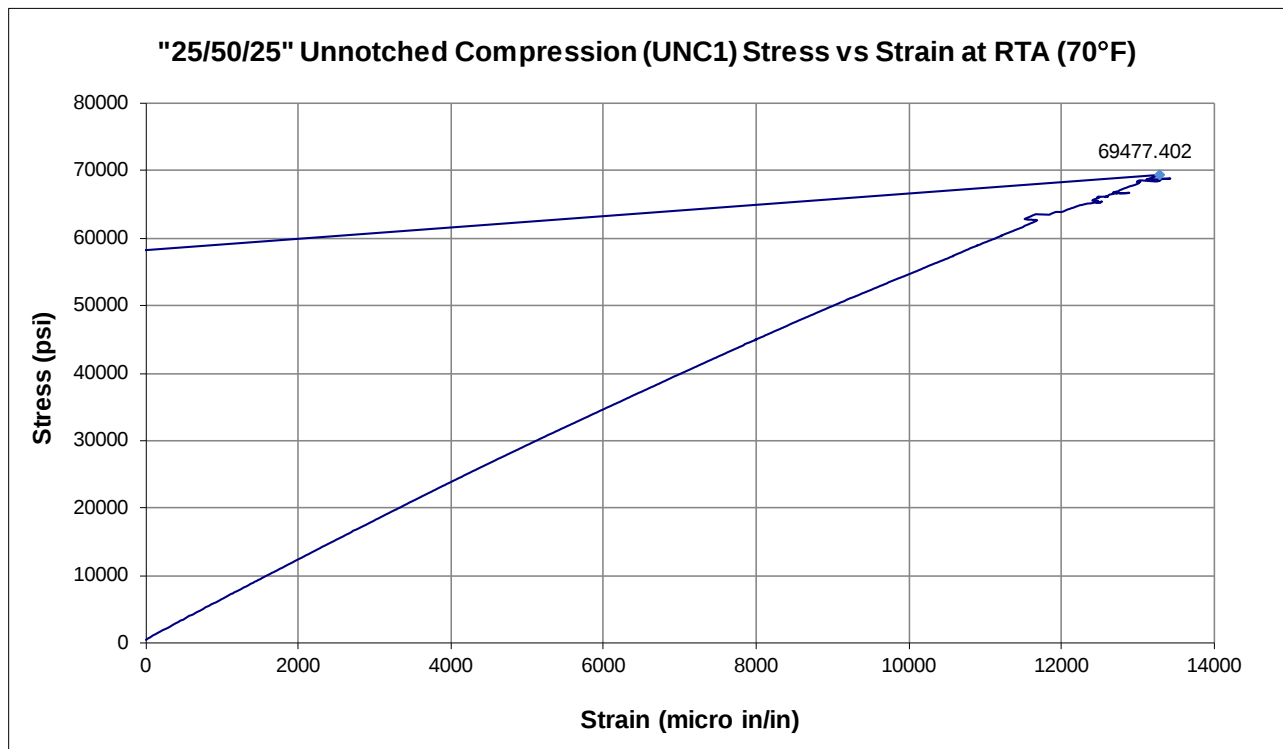
6.8 "40/20/40" Unnotched Tension (UNT3)



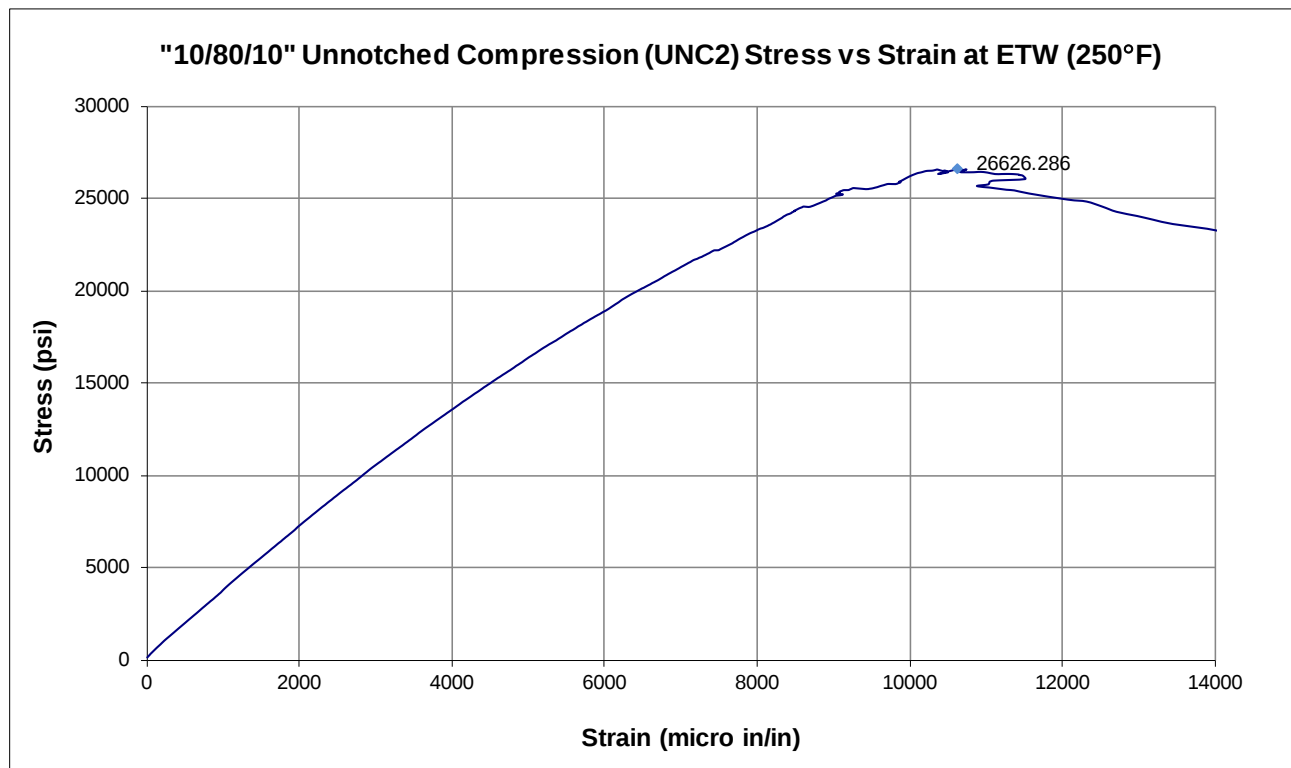
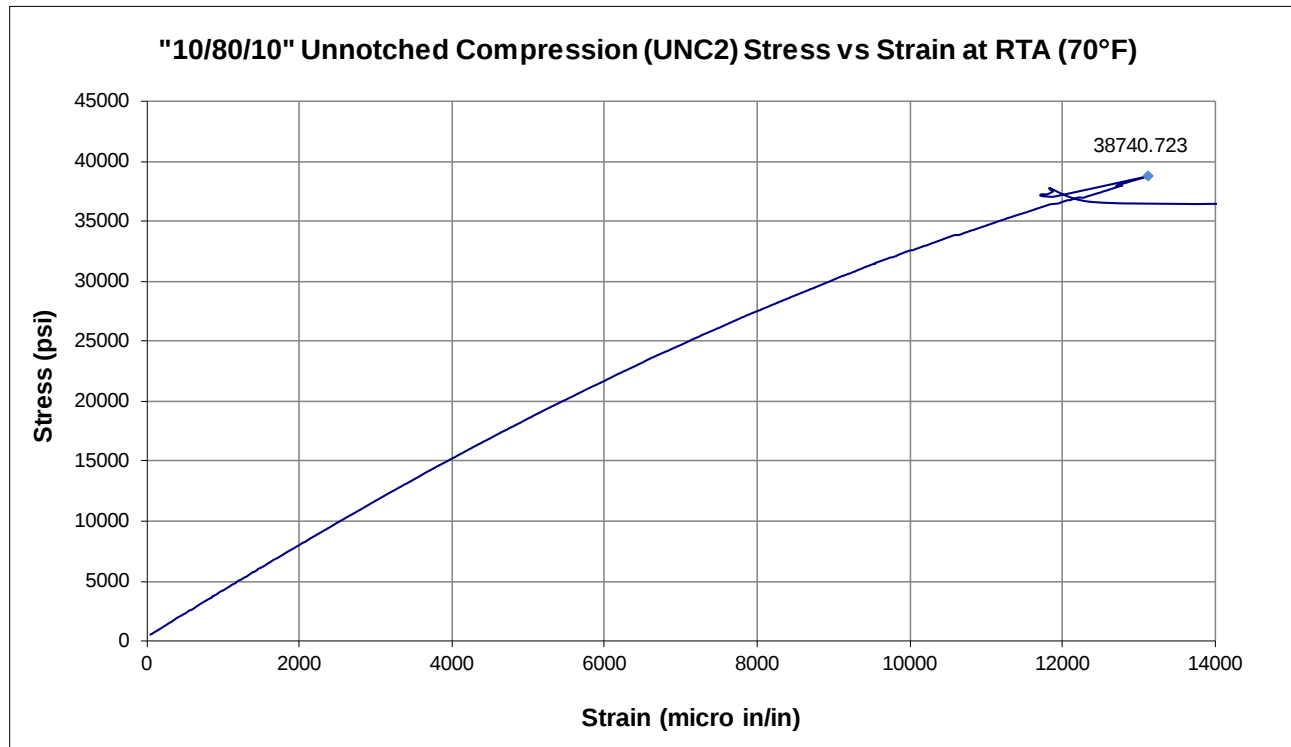


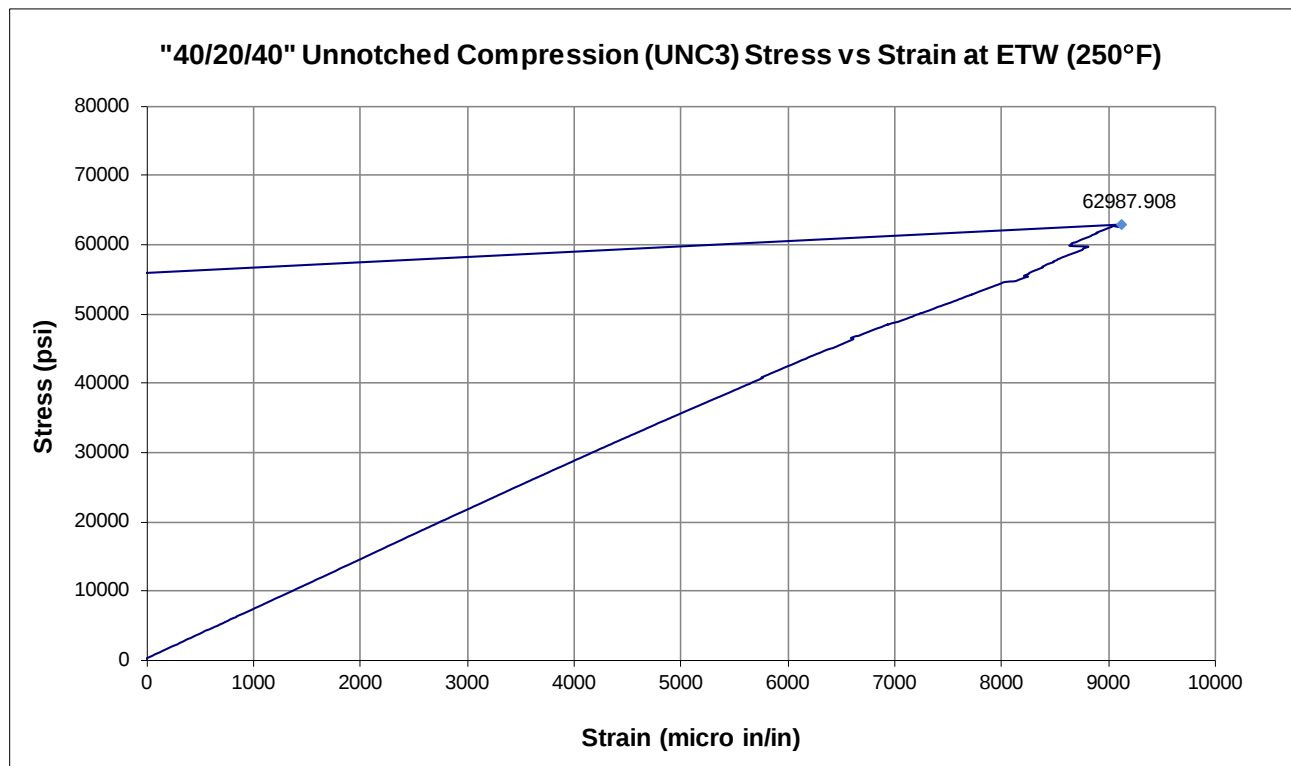
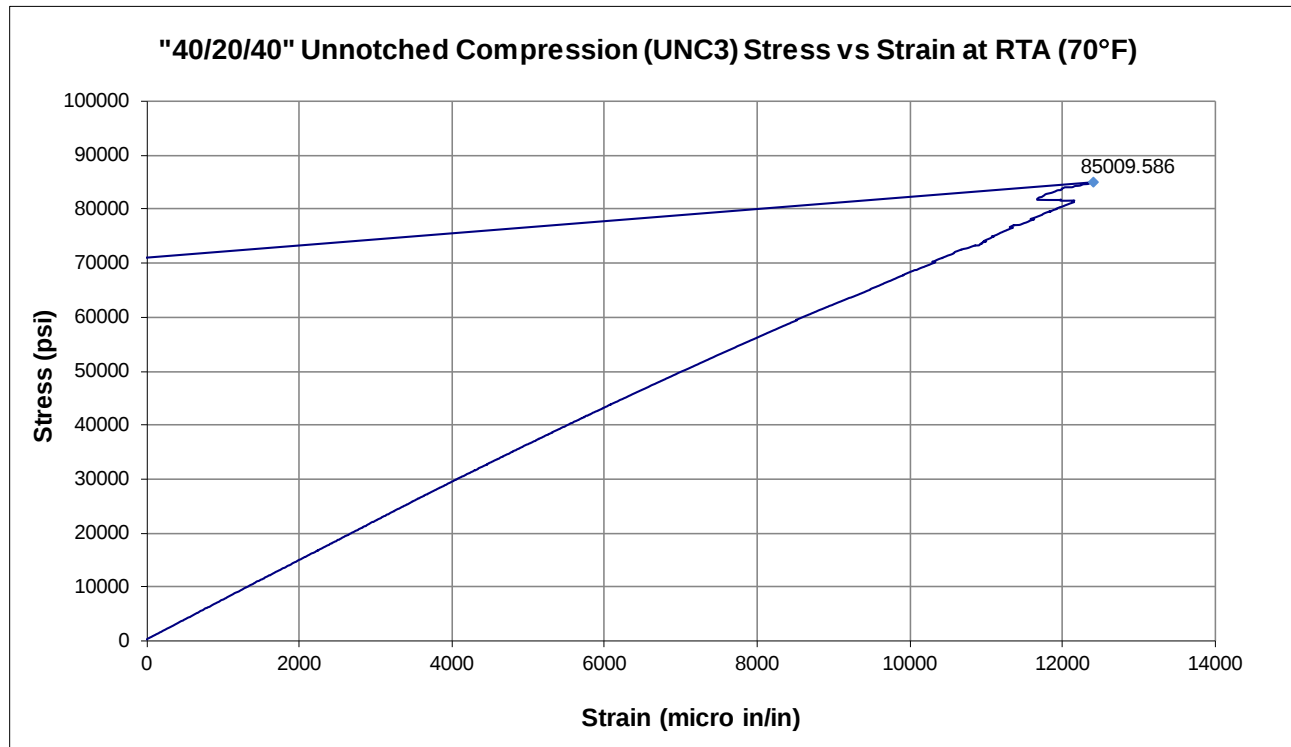
Extensometer was removed before failure.

6.9 "25/50/25" Unnotched Compression (UNC1)



6.10 "10/80/10" Unnotched Compression (UNC2)

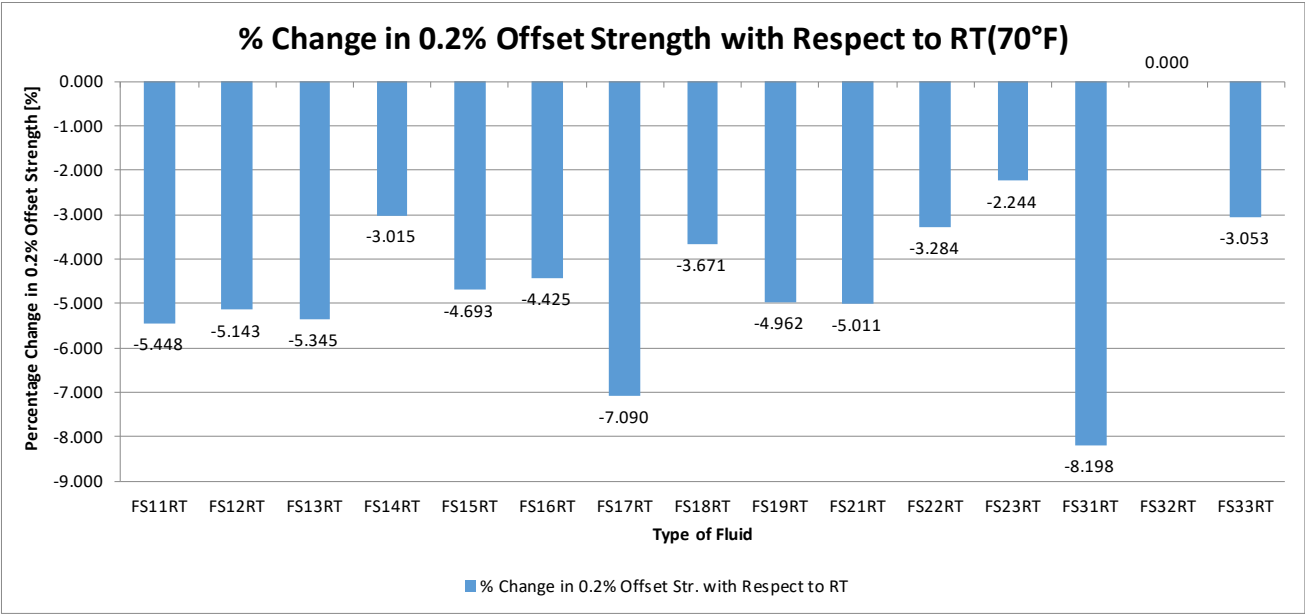
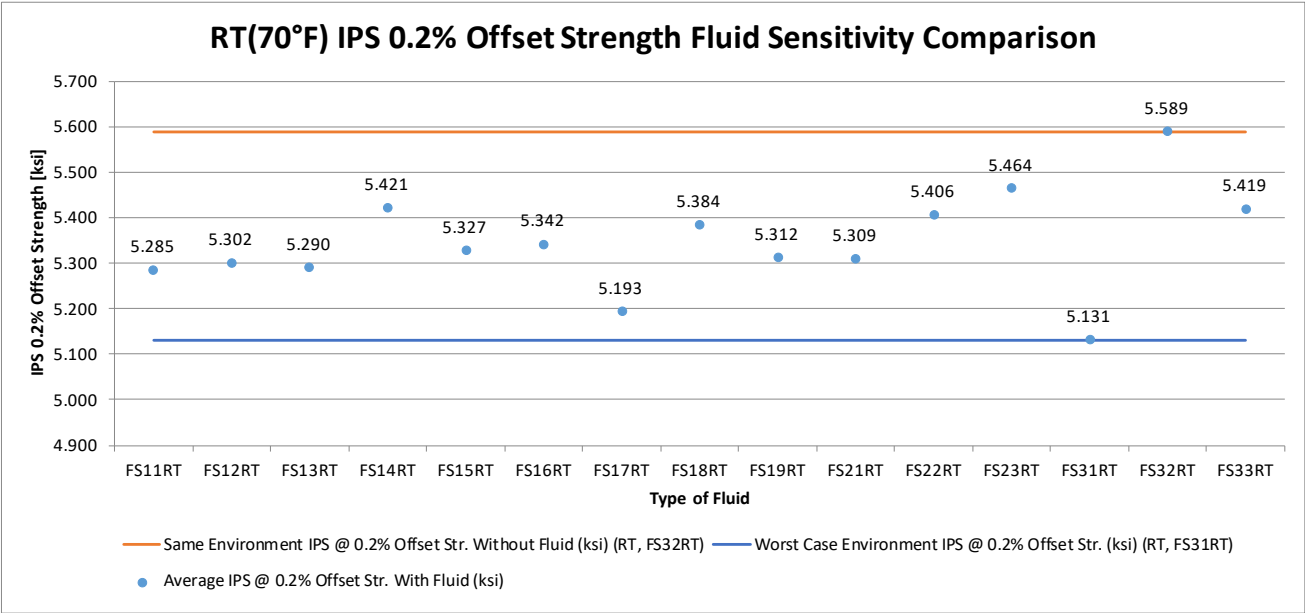


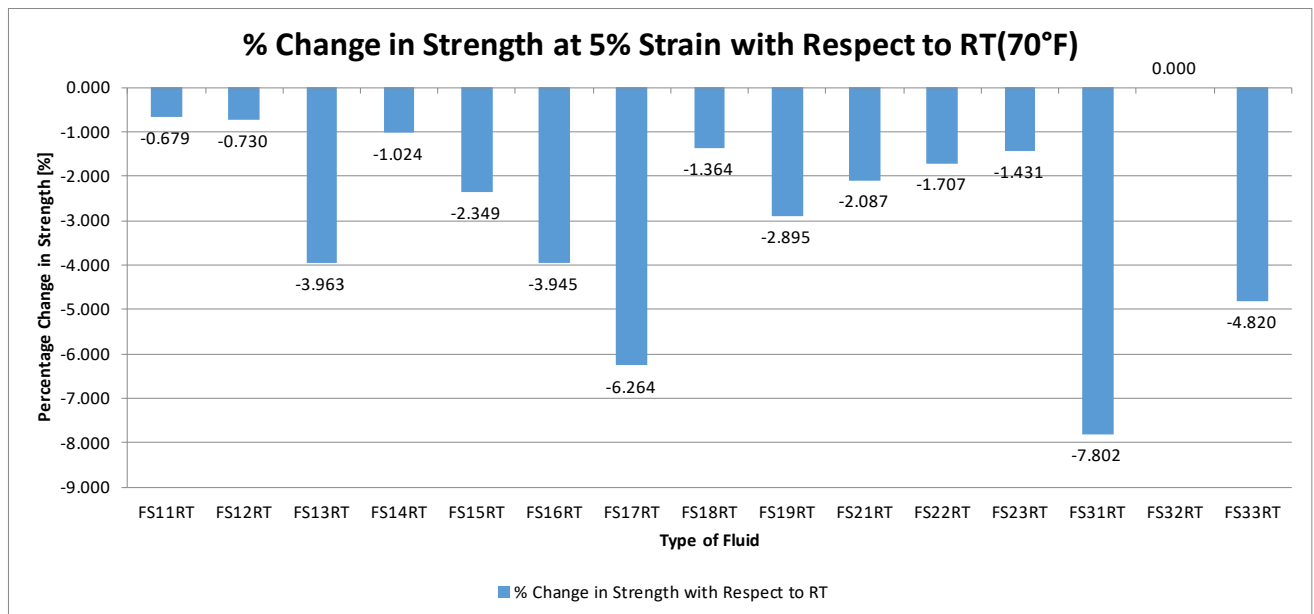
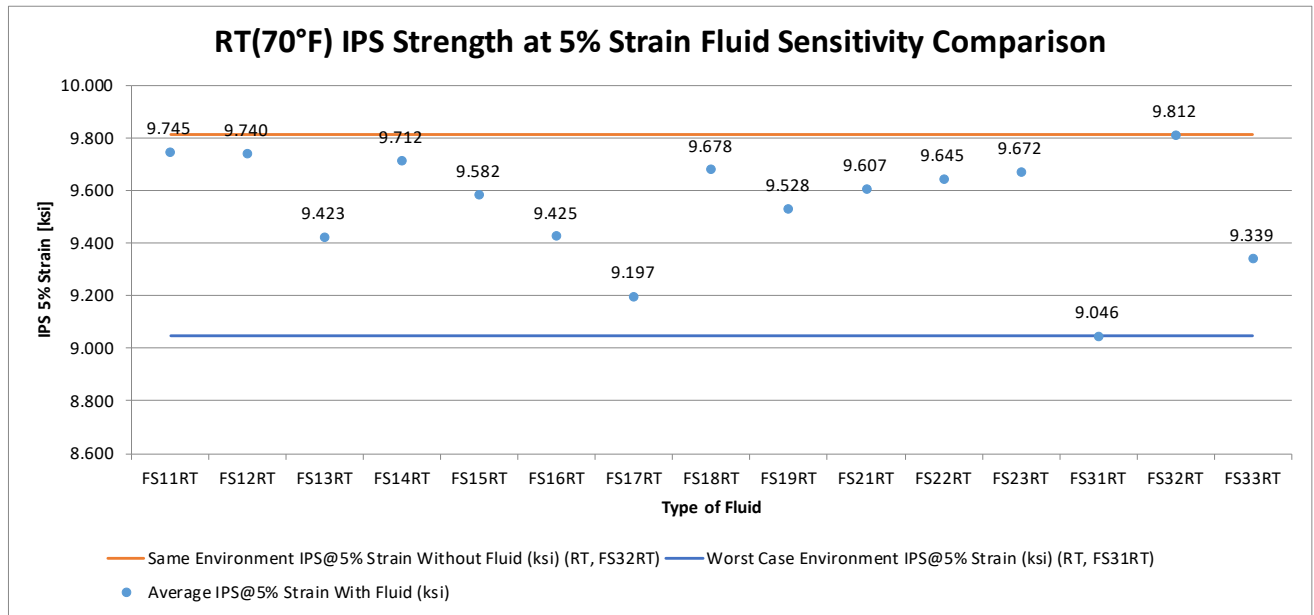
6.11 "40/20/40" Unnotched Compression (UNC3)

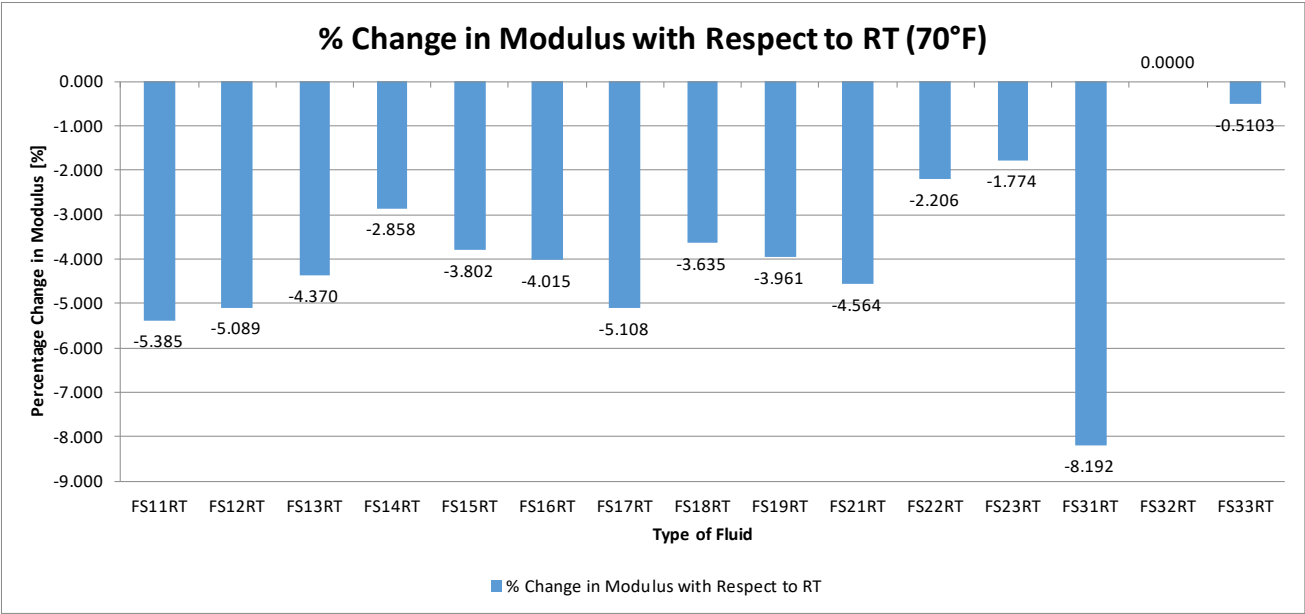
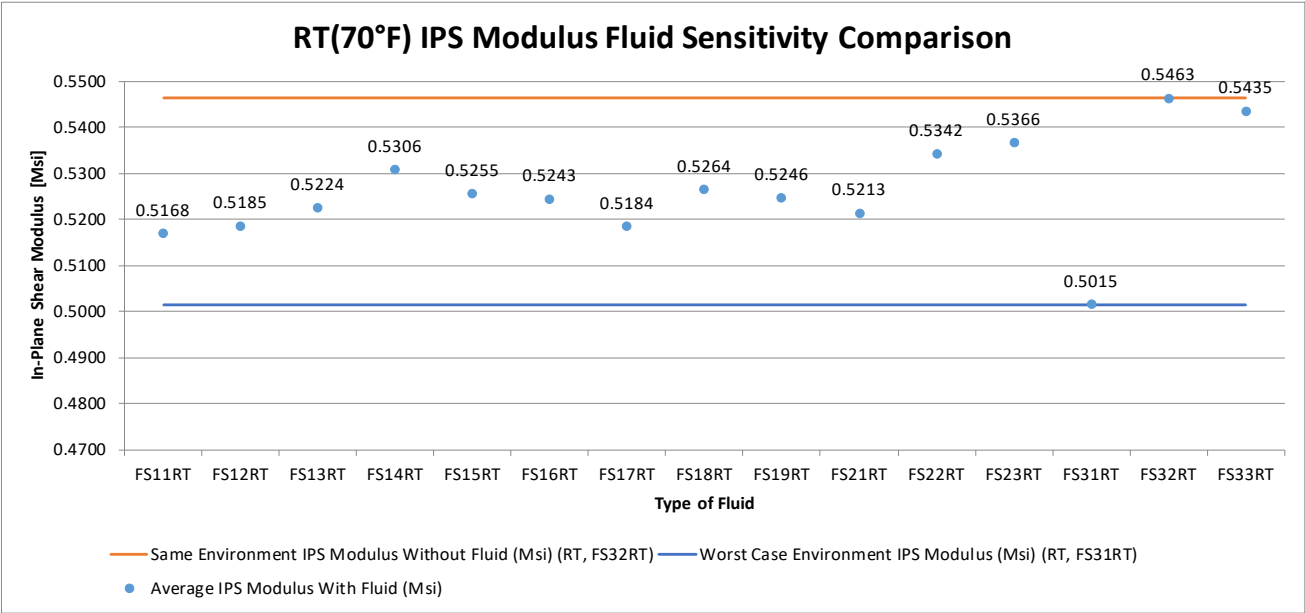
7. Fluid Sensitivity Comparison

7.1 Room Temperature Test Data

Code	Type of Fluid	Exposure
FS11RT	100 Low Lead Fuel	90 days min @ 70°F±10°F
FS12RT	Jet A Fuel	
FS13RT	MIL-PRF-5606 Hydraulic Oil	
FS14RT	MIL-PRF-83282 Hydraulic Oil	
FS15RT	MIL-PRF-7808 Engine Oil	
FS16RT	MIL-PRF-23699 Engine Oil	
FS17RT	Salt Water	
FS18RT	Skydrol 5	
FS19RT	50% Water with 50% Skydrol 5	
FS31RT	Distilled Water	
FS21RT	MEK washing fluid	90 mins @ 70°F±10°F
FS22RT	Polypropylene Glycol Deicer	
FS23RT	Isopropyl Alcohol Deicing	48±4 hrs @ 70°F±10°F
FS32RT	Dry	120 hrs @ 160°F±5°F
FS33RT	85% Relative Humidity	Per section 6.1 Test Plan NTP 1227Q1







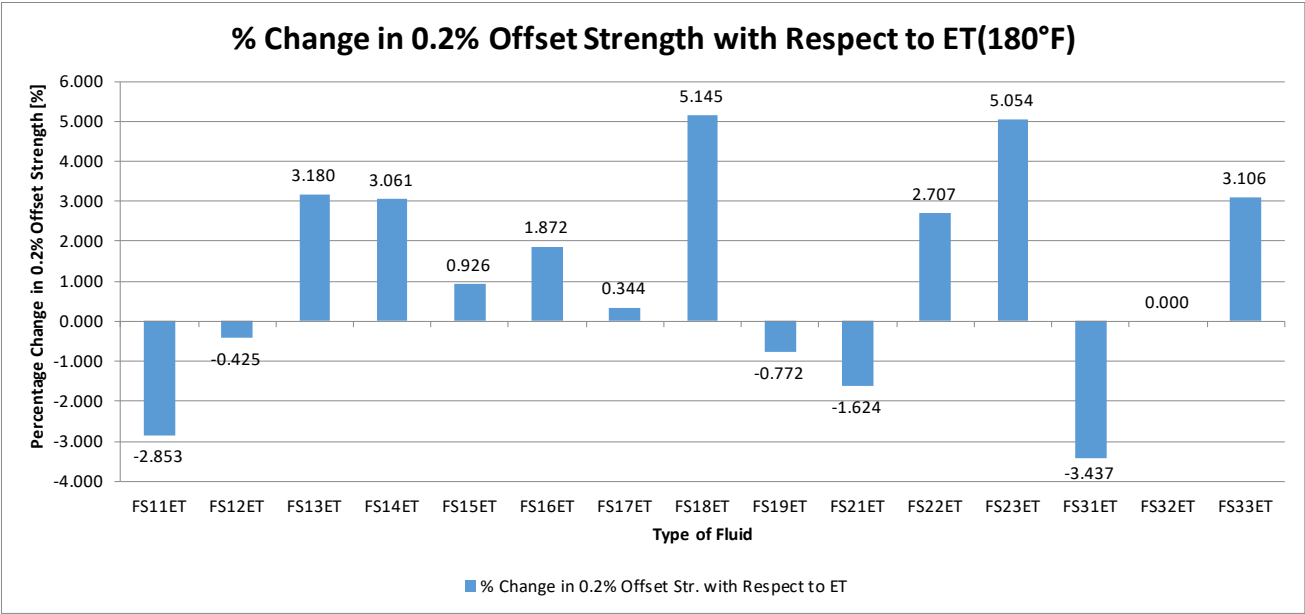
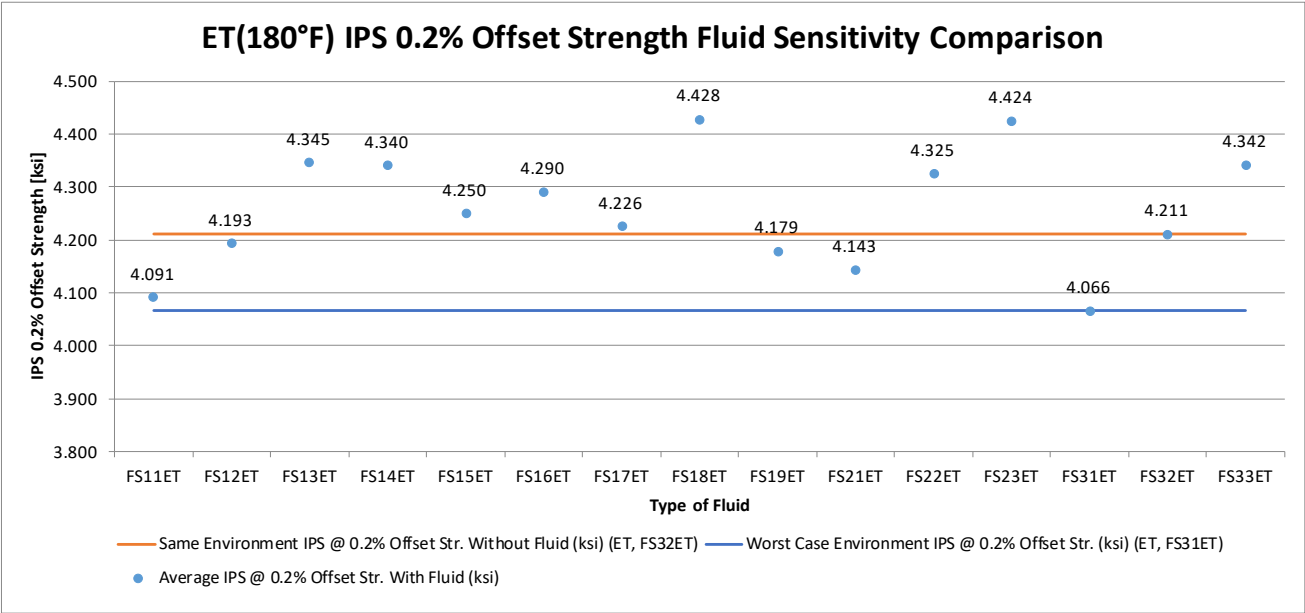
Fluid Code	Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	0.2% Offset Strength [ksi]	5% Shear Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]	Average		
												0.2% Offset Strength [ksi]	5% Shear Strength [ksi]	Modulus [Msi]

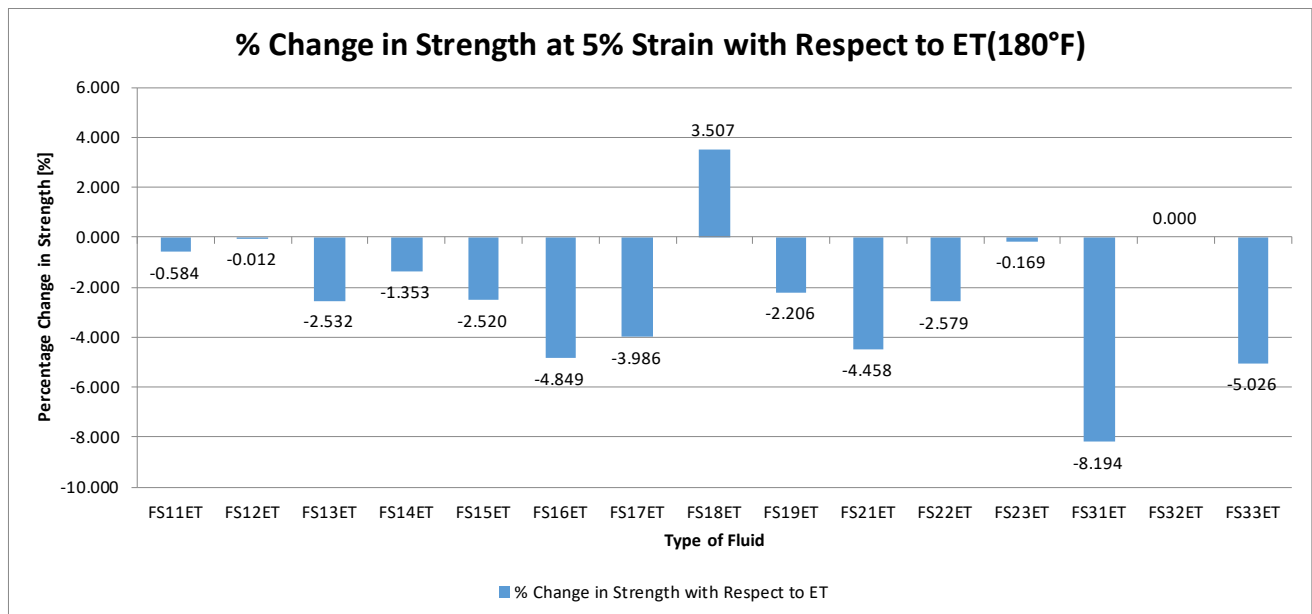
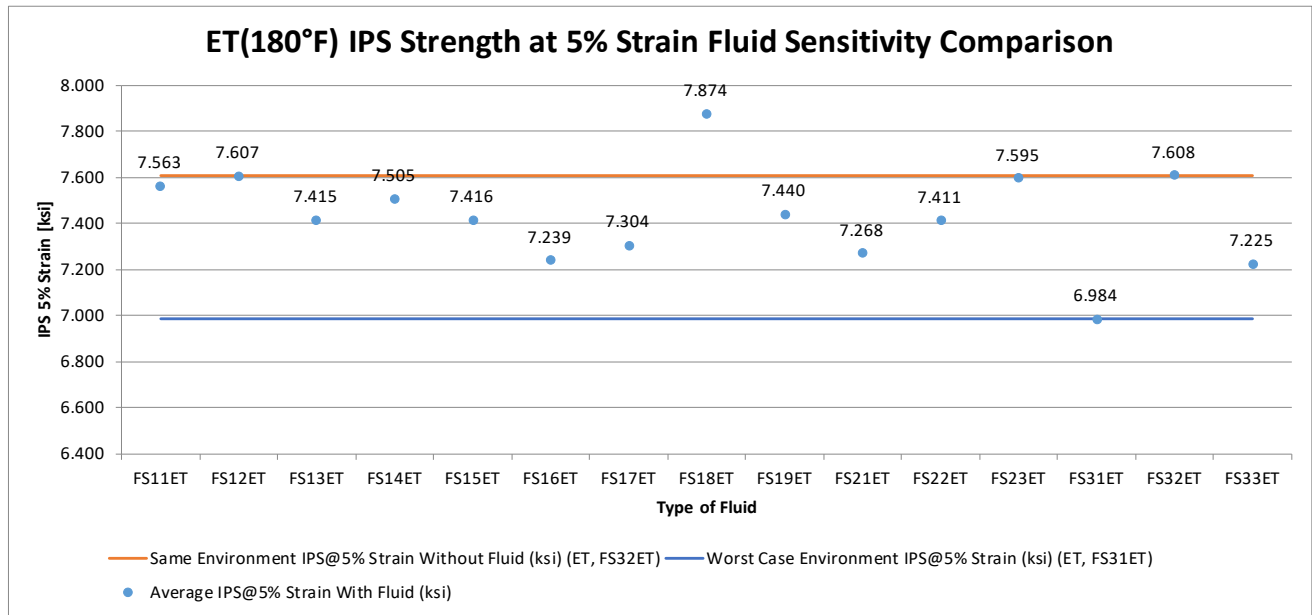
Fluid Sensitivity Screening														
In-Plane Shear Properties (FSIPS)--RT(70°F) Strength and Modulus														
Toray Advanced Composites Cetex® TC1225 5HS Fabric														
Fluid Code	Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	0.2% Offset Strength [ksi]	5% Shear Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]	0.2% Offset Strength [ksi]	5% Shear Strength [ksi]	Modulus [Msi]
FS11RT	TCCNA111FS11RT	A	C1	1	1	5.291	9.753	0.5236	0.09643	8	0.01205	5.285	9.745	0.5168
	TCCNA112FS11RT	A	C1	1	1	5.329	9.812	0.5183	0.09683	8	0.01210			
	TCCNA113FS11RT	A	C1	1	1	5.294	9.823	0.5162	0.09732	8	0.01216			
	TCCNA114FS11RT	A	C1	1	1	5.263	9.708	0.5176	0.09690	8	0.01211			
	TCCNA115FS11RT	A	C1	1	1	5.246	9.632	0.5085	0.09760	8	0.01220			
FS12RT	TCCNA111FS12RT	A	C1	1	1	5.320	9.811	0.5207	0.09728	8	0.01216	5.302	9.740	0.5185
	TCCNA112FS12RT	A	C1	1	1	5.325	9.857	0.5195	0.09688	8	0.01211			
	TCCNA113FS12RT	A	C1	1	1	5.279	9.686	0.5113	0.09793	8	0.01224			
	TCCNA114FS12RT	A	C1	1	1	5.207	9.585	0.5133	0.09713	8	0.01214			
	TCCNA115FS12RT	A	C1	1	1	5.378	9.761	0.5275	0.09600	8	0.01200			
FS13RT	TCCNA111FS13RT	A	C1	1	1	5.322	9.473	0.5244	0.09735	8	0.01217	5.290	9.423	0.5224
	TCCNA112FS13RT	A	C1	1	1	5.312	9.415	0.5202	0.09737	8	0.01217			
	TCCNA113FS13RT	A	C1	1	1	5.304	9.473	0.5229	0.09802	8	0.01225			
	TCCNA114FS13RT	A	C1	1	1	5.299	9.497	0.5273	0.09783	8	0.01223			
	TCCNA115FS13RT	A	C1	1	1	5.215	9.259	0.5171	0.09830	8	0.01229			
FS14RT	TCCNA111FS14RT	A	C1	1	1	5.423	9.715	0.5321	0.09737	8	0.01217	5.421	9.712	0.5306
	TCCNA112FS14RT	A	C1	1	1	5.493	9.868	0.5357	0.09692	8	0.01211			
	TCCNA113FS14RT	A	C1	1	1	5.458	9.818	0.5317	0.09708	8	0.01214			
	TCCNA114FS14RT	A	C1	1	1	5.339	9.546	0.5245	0.09828	8	0.01229			
	TCCNA115FS14RT	A	C1	1	1	5.390	9.610	0.5292	0.09718	8	0.01215			
FS15RT	TCCNA111FS15RT	A	C1	1	1	5.298	9.515	0.5233	0.09715	8	0.01214	5.327	9.582	0.5255
	TCCNA112FS15RT	A	C1	1	1	5.362	9.591	0.5233	0.09662	8	0.01208			
	TCCNA113FS15RT	A	C1	1	1	5.357	9.668	0.5296	0.09660	8	0.01208			
	TCCNA114FS15RT	A	C1	1	1	5.323	9.632	0.5269	0.09632	8	0.01204			
	TCCNA115FS15RT	A	C1	1	1	5.293	9.502	0.5243	0.09650	8	0.01206			
FS16RT	TCCNA111FS16RT	A	C1	1	1	5.341	9.481	0.5245	0.09750	8	0.01219	5.342	9.425	0.5243
	TCCNA112FS16RT	A	C1	1	1	5.325	9.429	0.5200	0.09813	8	0.01227			
	TCCNA113FS16RT	A	C1	1	1	5.311	9.354	0.5242	0.09800	8	0.01225			
	TCCNA114FS16RT	A	C1	1	1	5.378	9.468	0.5272	0.09725	8	0.01216			
	TCCNA115FS16RT	A	C1	1	1	5.355	9.393	0.5257	0.09702	8	0.01213			
FS17RT	TCCNA111FS17RT	A	C1	1	1	5.212	9.221	0.5158	0.09643	8	0.01205	5.193	9.197	0.5184
	TCCNA112FS17RT	A	C1	1	1	5.173	9.157	0.5135	0.09677	8	0.01210			
	TCCNA113FS17RT	A	C1	1	1	5.204	9.227	0.5234	0.09653	8	0.01207			
	TCCNA114FS17RT	A	C1	1	1	5.194	9.174	0.5168	0.09705	8	0.01213			
	TCCNA115FS17RT	A	C1	1	1	5.181	9.208	0.5224	0.09683	8	0.01210			
FS18RT	TCCNA111FS18RT	A	C1	1	1	5.403	9.709	0.5249	0.09658	8	0.01207	5.384	9.678	0.5264
	TCCNA112FS18RT	A	C1	1	1	5.435	9.747	0.5262	0.09562	8	0.01195			
	TCCNA113FS18RT	A	C1	1	1	5.371	9.669	0.5273	0.09630	8	0.01204			
	TCCNA114FS18RT	A	C1	1	1	5.347	9.614	0.5259	0.09667	8	0.01208			
	TCCNA115FS18RT	A	C1	1	1	5.364	9.653	0.5276	0.09655	8	0.01207			
FS19RT	TCCNA111FS19RT	A	C1	1	1	5.294	9.439	0.5183	0.09713	8	0.01214	5.312	9.528	0.5246
	TCCNA112FS19RT	A	C1	1	1	5.258	9.468	0.5263	0.09675	8	0.01209			
	TCCNA113FS19RT	A	C1	1	1	5.271	9.479	0.5223	0.09657	8	0.01207			
	TCCNA114FS19RT	A	C1	1	1	5.357	9.612	0.5254	0.09635	8	0.01204			
	TCCNA115FS19RT	A	C1	1	1	5.378	9.642	0.5307	0.09588	8	0.01199			
FS21RT	TCCNA211FS21RT	A	C2	1	2	5.277	9.514	0.5179	0.09618	8	0.01202	5.309	9.607	0.5213
	TCCNA212FS21RT	A	C2	1	2	5.290	9.574	0.5215	0.09658	8	0.01207			
	TCCNA213FS21RT	A	C2	1	2	5.307	9.632	0.5192	0.09628	8	0.01204			
	TCCNA214FS21RT	A	C2	1	2	5.335	9.677	0.5219	0.09635	8	0.01204			
	TCCNA215FS21RT	A	C2	1	2	5.335	9.638	0.5261	0.09613	8	0.01202			
FS22RT	TCCNA211FS22RT	A	C2	1	2	5.413	9.645	0.5371	0.09628	8	0.01204	5.406	9.645	0.5342
	TCCNA212FS22RT	A	C2	1	2	5.421	9.658	0.5363	0.09695	8	0.01212			
	TCCNA213FS22RT	A	C2	1	2	5.406	9.651	0.5329	0.09705	8	0.01213			
	TCCNA214FS22RT	A	C2	1	2	5.400	9.651	0.5313	0.09693	8	0.01212			
	TCCNA215FS22RT	A	C2	1	2	5.387	9.617	0.5334	0.09665	8	0.01208			
FS23RT	TCCNA211FS23RT	A	C2	1	2	5.472	9.690	0.5376	0.09675	8	0.01209	5.464	9.672	0.5366
	TCCNA212FS23RT	A	C2	1	2	5.495	9.714	0.5391	0.09667	8	0.01208			
	TCCNA213FS23RT	A	C2	1	2	5.465	9.689	0.5363	0.09647	8	0.01206			
	TCCNA214FS23RT	A	C2	1	2	5.446	9.648	0.5345	0.09668	8	0.01209			
	TCCNA215FS23RT	A	C2	1	2	5.440	9.616	0.5353	0.09660	8	0.01208			
FS31RT	TCCNA211FS31RT	A	C2	1	2	5.099	8.988	0.5015	0.09760	8	0.01220	5.131	9.046	0.5015
	TCCNA212FS31RT	A	C2	1	2	5.107	9.020	0.4988	0.09717	8	0.01215			
	TCCNA213FS31RT	A	C2	1	2	5.126	9.042	0.4991	0.09690	8	0.01211			
	TCCNA214FS31RT	A	C2	1	2	5.162	9.076	0.5042	0.09738	8	0.01217			
	TCCNA215FS31RT	A	C2	1	2	5.162	9.106	0.5038	0.09715	8	0.01214			
FS32RT	TCCNA211FS32RT	A	C2	1	2	5.552	9.748	0.5427	0.09717	8	0.01215	5.589	9.812	0.5463
	TCCNA212FS32RT	A	C2	1	2	5.590	9.842	0.5445	0.09642	8	0.01205			
	TCCNA213FS32RT	A	C2	1	2	5.638	9.907	0.5492	0.09612	8	0.01201			
	TCCNA214FS32RT	A	C2	1	2	5.604	9.841	0.5475	0.09618	8	0.01202			
	TCCNA215FS32RT	A	C2	1	2	5.561	9.722	0.5474	0.09590	8	0.01199			
FS33RT	TCCNA211FS33RT	A	C2	1	2	5.418	9.292	0.5458	0.09623	8	0.01203	5.419	9.339	0.5435
	TCCNA212FS33RT	A	C2	1	2	5.416	9.326	0.5442	0.09632	8	0.01204			
	TCCNA213FS33RT	A	C2	1	2	5.442	9.388	0.5459	0.09635	8	0.01204			
	TCCNA214FS33RT	A	C2	1	2	5.396	9.278	0.5398	0.09667	8	0.01208			
	TCCNA216FS33RT	A	C2	1	2	5.420	9.412	0.5417	0.09708	8	0.01214			

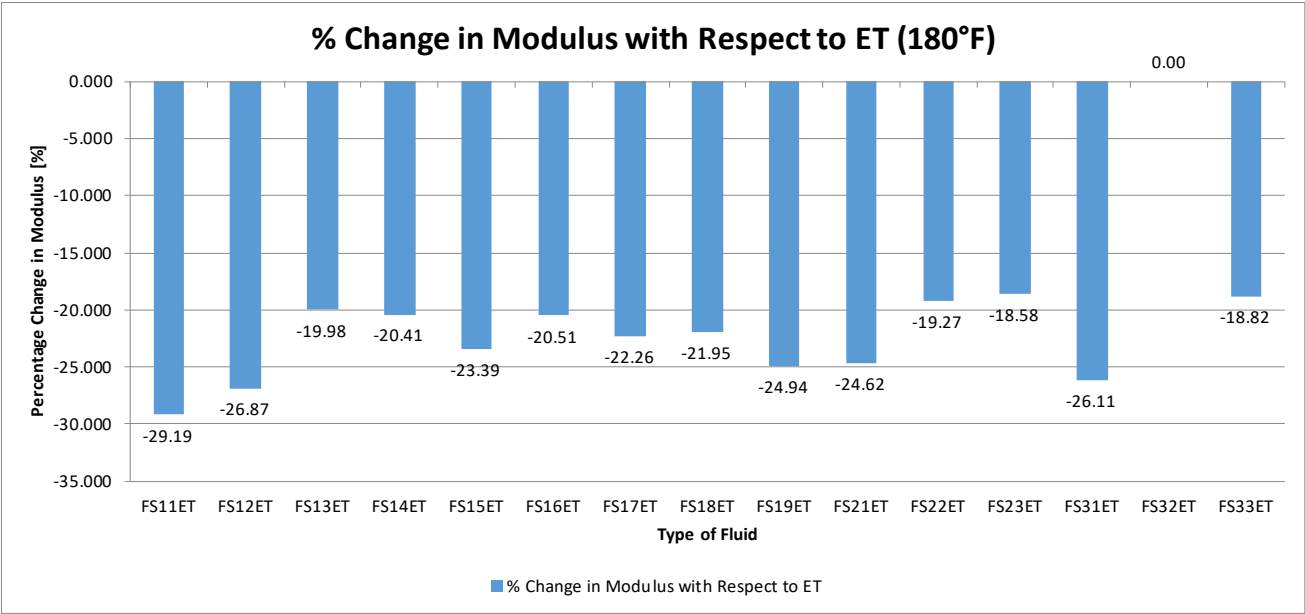
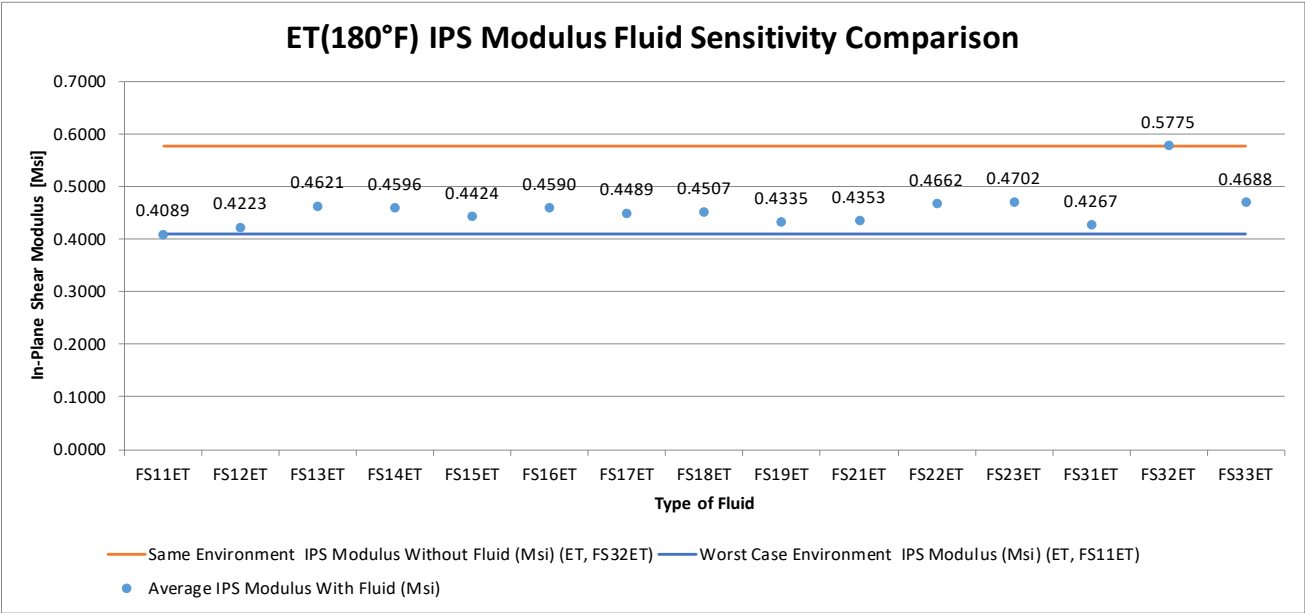
Modulus calculation is obtained from 2000 - 6000 microstrain for all fluid sensitivity tests.

7.2 Elevated Temperature Test Data

Code	Type of Fluid	Exposure
FS11ET	100 Low lead Fuel	90 days min @ 70°F±10°F
FS12ET	Jet A Fuel	
FS13ET	MIL-PRF-5606 Hydraulic Oil	
FS14ET	MIL-PRF-83282 Hydraulic Oil	
FS15ET	MIL-PRF-7808 Engine Oil	
FS16ET	MIL-PRF-23699 Engine Oil	
FS17ET	Salt Water	
FS18ET	Skydrol 5	
FS19ET	50% Water with 50% Skydrol 5	
FS31ET	Distilled Water	
FS21ET	MEK washing fluid	90 mins @ 70°F±10°F
FS22ET	Polypropylene Glycol Deicer	
FS23ET	Isopropyl Alcohol Deicing	48±4 hrs @ 70°F±10°F
FS32ET	Dry	120 hrs @ 160°F±5°F
FS33ET	85% Relative Humidity	Per section 6.1 Test Plan NTP 1227Q1







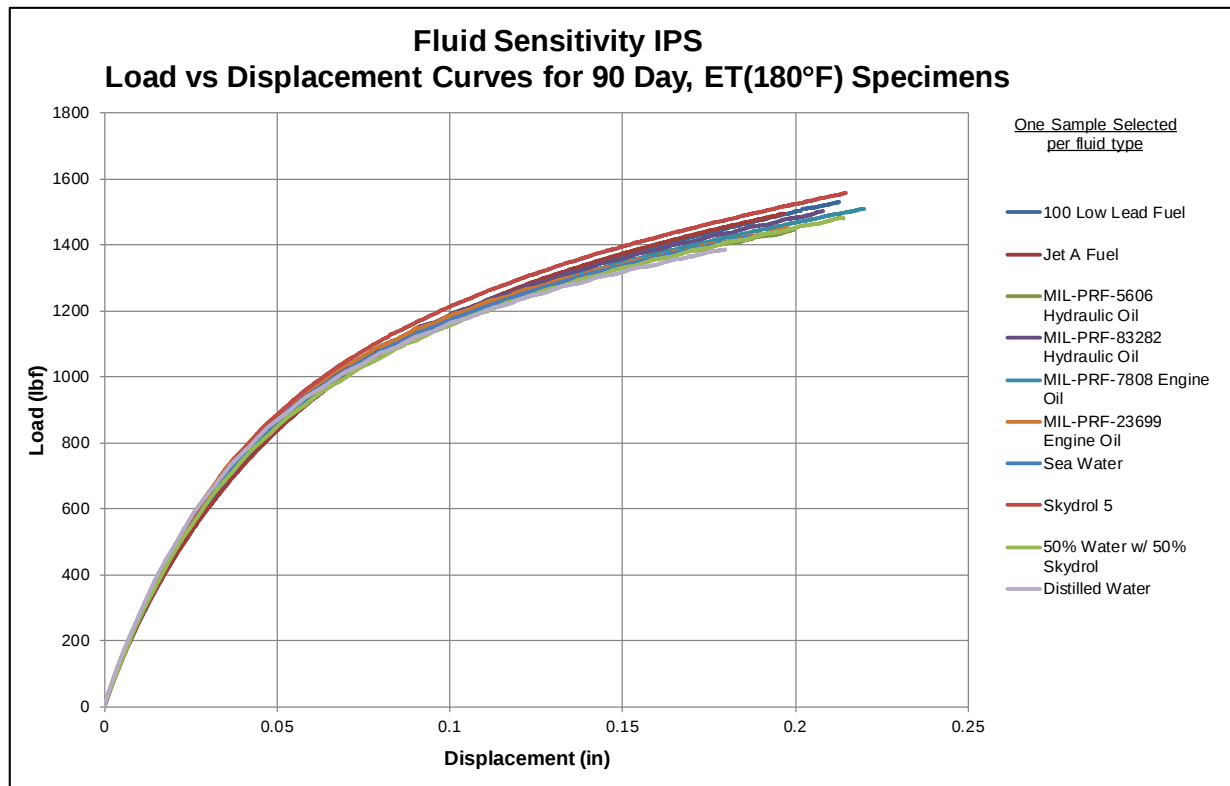
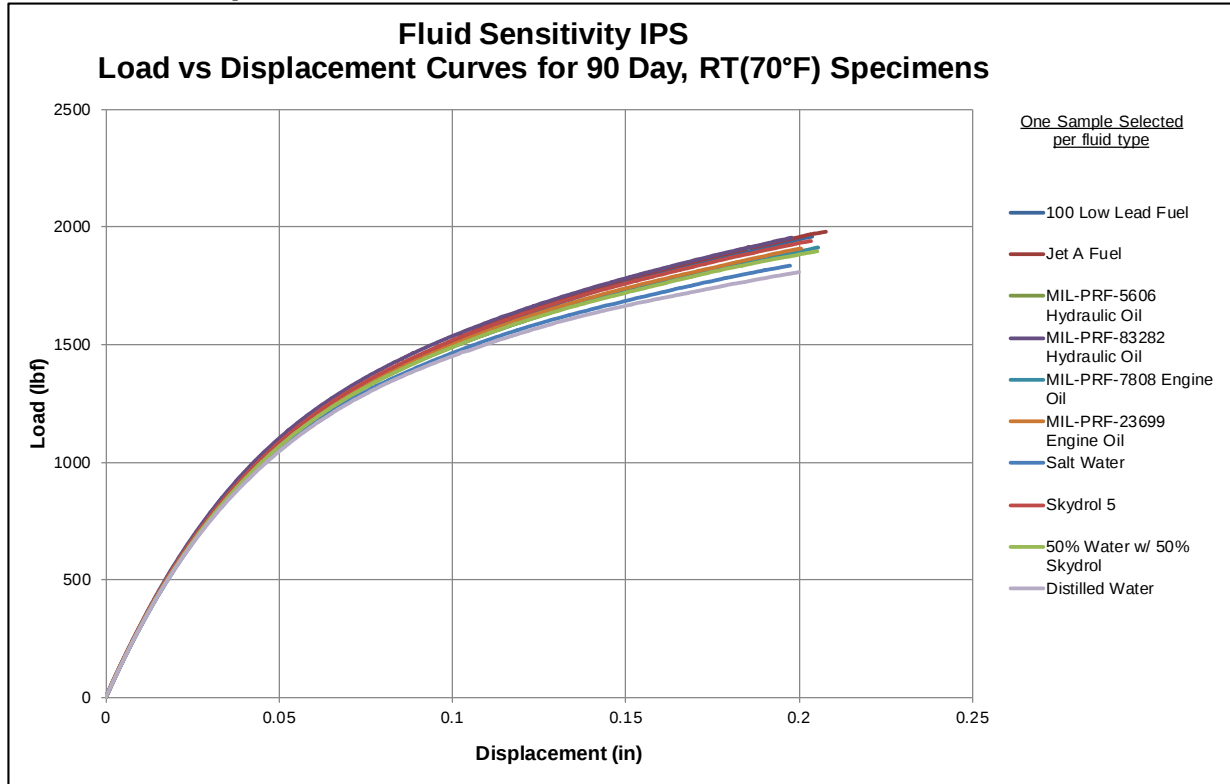
Fluid Sensitivity Screening
In-Plane Shear Properties (FSIPS)--ET(180°F) Strength and Modulus
Toray Advanced Composites Cetex® TC1225 5HS Fabric

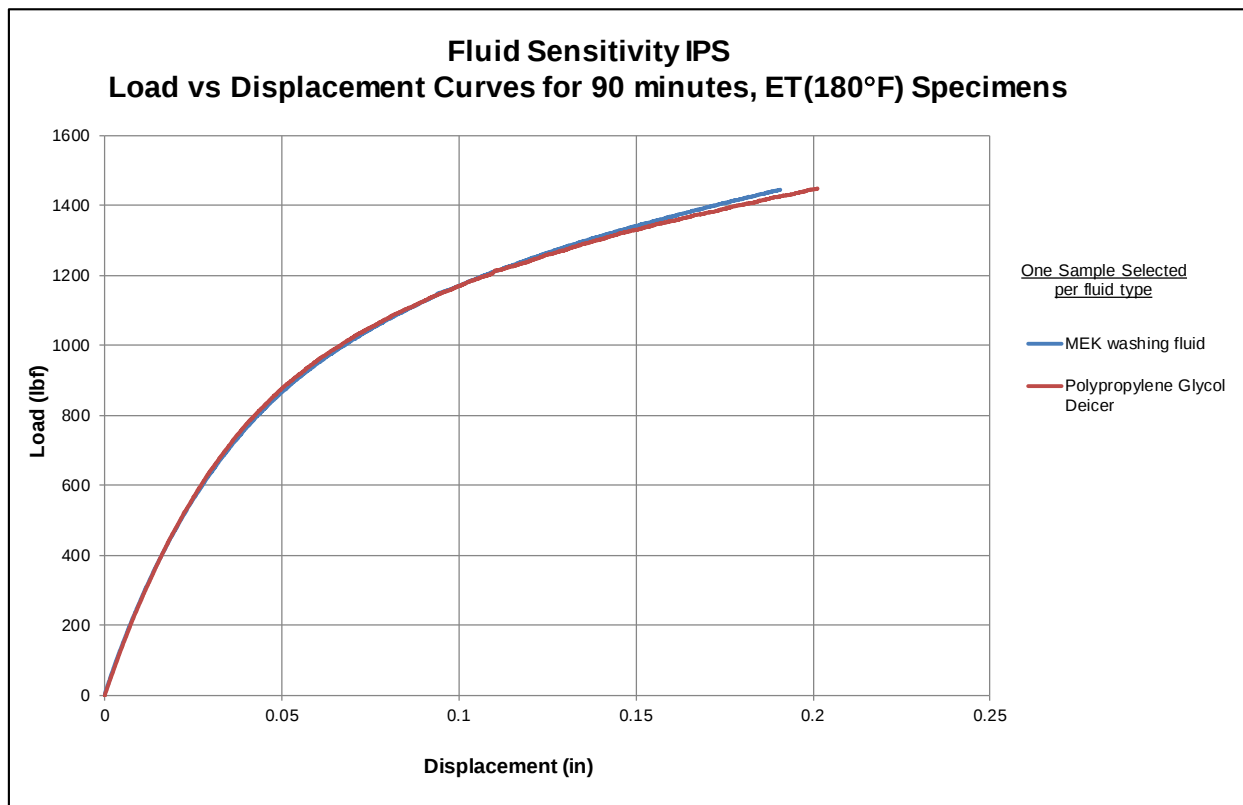
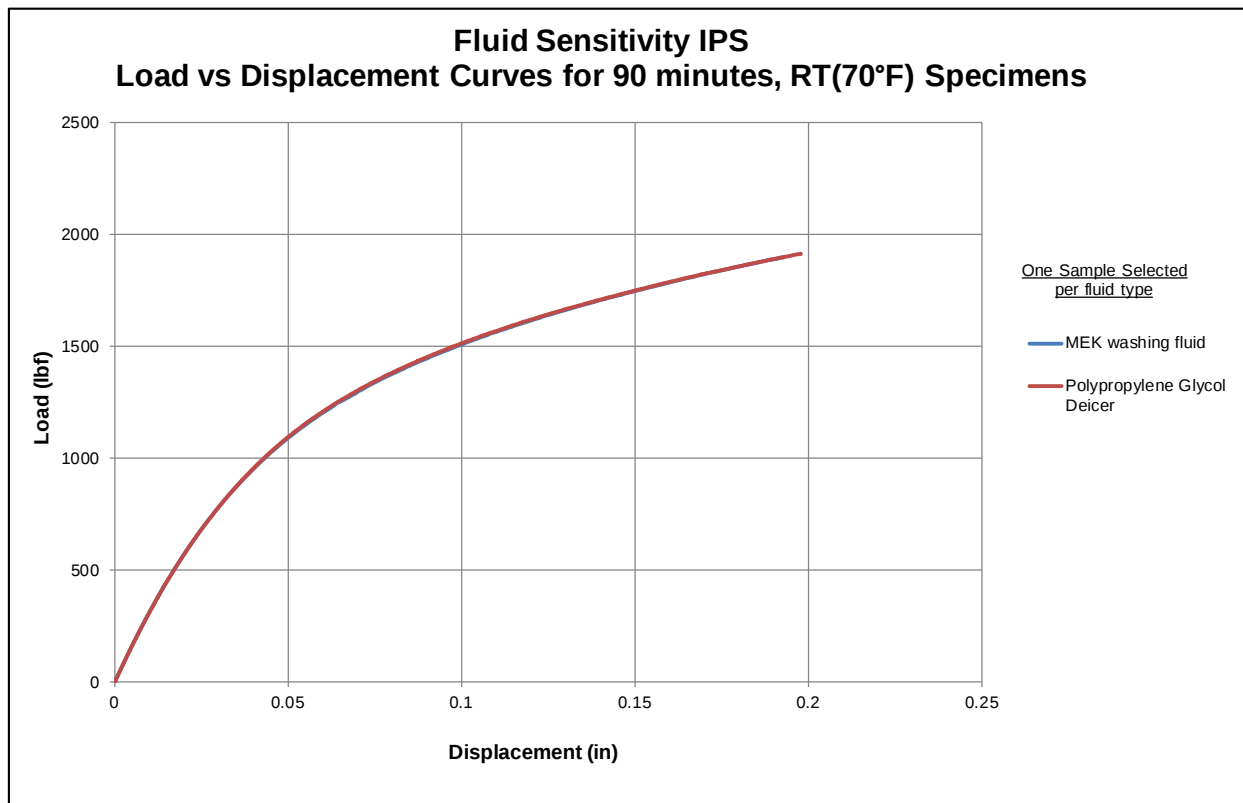
Fluid Code	Specimen Number	Toray Batch #	Toray Consolidate Cycle	Prepreg Lot #	Consolidate Cycle #	0.2% Offset Strength [ksi]	5% Shear Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]	Average		
												0.2% Offset Strength [ksi]	5% Shear Strength [ksi]	Modulus [Msi]
FS11ET	TCCNA111FS11ET	A	C1	1	1	4.217	7.747	0.4280	0.09630	8	0.01204	4.091	7.563	0.4089
	TCCNA112FS11ET	A	C1	1	1	4.223	7.729	0.4268	0.09578	8	0.01197			
	TCCNA113FS11ET	A	C1	1	1	4.239	7.738	0.4281	0.09570	8	0.01196			
	TCCNA114FS11ET	A	C1	1	1	4.242	7.774	0.4272	0.09538	8	0.01192			
	TCCNA115FS11ET	A	C1	1	1	3.894	7.342	0.3822	0.09682	8	0.01210			
	TCCNA116FS11ET	A	C1	1	1	3.899	7.280	0.3829	0.09773	8	0.01222			
	TCCNA117FS11ET	A	C1	1	1	3.924	7.333	0.3873	0.09687	8	0.01211			
FS12ET	TCCNA111FS12ET	A	C1	1	1	4.180	7.581	0.4145	0.09648	8	0.01206	4.193	7.607	0.4223
	TCCNA112FS12ET	A	C1	1	1	4.218	7.608	0.4211	0.09605	8	0.01201			
	TCCNA113FS12ET	A	C1	1	1	4.212	7.553	0.4500	0.09610	8	0.01201			
	TCCNA114FS12ET	A	C1	1	1	4.193	7.627	0.4127	0.09562	8	0.01195			
	TCCNA115FS12ET	A	C1	1	1	4.163	7.665	0.4133	0.09580	8	0.01198			
FS13ET	TCCNA111FS13ET	A	C1	1	1	4.328	7.331	0.4594	0.09695	8	0.01212	4.345	7.415	0.4621
	TCCNA112FS13ET	A	C1	1	1	4.351	7.418	0.4645	0.09622	8	0.01203			
	TCCNA113FS13ET	A	C1	1	1	4.334	7.394	0.4609	0.09667	8	0.01208			
	TCCNA114FS13ET	A	C1	1	1	4.326	7.385	0.4611	0.09717	8	0.01215			
	TCCNA115FS13ET	A	C1	1	1	4.387	7.546	0.4644	0.09637	8	0.01205			
FS14ET	TCCNA111FS14ET	A	C1	1	1	4.397	7.622	0.4653	0.09677	8	0.01210	4.340	7.505	0.4596
	TCCNA112FS14ET	A	C1	1	1	4.364	7.572	0.4615	0.09762	8	0.01220			
	TCCNA113FS14ET	A	C1	1	1	4.309	7.463	0.4583	0.09725	8	0.01216			
	TCCNA114FS14ET	A	C1	1	1	4.288	7.416	0.4541	0.09820	8	0.01228			
	TCCNA115FS14ET	A	C1	1	1	4.342	7.450	0.4588	0.09723	8	0.01215			
FS15ET	TCCNA111FS15ET	A	C1	1	1	4.253	7.546	0.4426	0.09742	8	0.01218	4.250	7.416	0.4424
	TCCNA112FS15ET	A	C1	1	1	4.259	7.564	0.4406	0.09738	8	0.01217			
	TCCNA113FS15ET	A	C1	1	1	4.268	7.380	0.4447	0.09712	8	0.01214			
	TCCNA114FS15ET	A	C1	1	1	4.256	7.348	0.4420	0.09712	8	0.01214			
	TCCNA115FS15ET	A	C1	1	1	4.214	7.242	0.4420	0.09763	8	0.01220			
FS16ET	TCCNA111FS16ET	A	C1	1	1	4.309	7.235	0.4579	0.09768	8	0.01221	4.290	7.239	0.4590
	TCCNA112FS16ET	A	C1	1	1	4.293	7.239	0.4579	0.09782	8	0.01223			
	TCCNA113FS16ET	A	C1	1	1	4.295	7.288	0.4594	0.09797	8	0.01225			
	TCCNA114FS16ET	A	C1	1	1	4.292	7.256	0.4617	0.09773	8	0.01222			
	TCCNA115FS16ET	A	C1	1	1	4.261	7.176	0.4583	0.09763	8	0.01220			
FS17ET	TCCNA111FS17ET	A	C1	1	1	4.226	7.281	0.4469	0.09617	8	0.01202	4.226	7.304	0.4489
	TCCNA112FS17ET	A	C1	1	1	4.212	7.240	0.4465	0.09692	8	0.01211			
	TCCNA113FS17ET	A	C1	1	1	4.157	7.155	0.4426	0.09712	8	0.01214			
	TCCNA114FS17ET	A	C1	1	1	4.280	7.444	0.4565	0.09715	8	0.01214			
	TCCNA115FS17ET	A	C1	1	1	4.255	7.401	0.4520	0.09728	8	0.01216			
FS18ET	TCCNA111FS18ET	A	C1	1	1	4.420	7.835	0.4531	0.09685	8	0.01211	4.428	7.874	0.4507
	TCCNA112FS18ET	A	C1	1	1	4.443	7.861	0.4543	0.09668	8	0.01209			
	TCCNA113FS18ET	A	C1	1	1	4.424	7.948	0.4493	0.09682	8	0.01210			
	TCCNA114FS18ET	A	C1	1	1	4.436	7.882	0.4486	0.09638	8	0.01205			
	TCCNA115FS18ET	A	C1	1	1	4.417	7.845	0.4481	0.09630	8	0.01204			
FS19ET	TCCNA111FS19ET	A	C1	1	1	4.155	7.384	0.4328	0.09677	8	0.01210	4.179	7.440	0.4335
	TCCNA112FS19ET	A	C1	1	1	4.181	7.402	0.4342	0.09658	8	0.01207			
	TCCNA113FS19ET	A	C1	1	1	4.184	7.486	0.4309	0.09662	8	0.01208			
	TCCNA114FS19ET	A	C1	1	1	4.179	7.439	0.4330	0.09637	8	0.01205			
	TCCNA115FS19ET	A	C1	1	1	4.195	7.488	0.4364	0.09613	8	0.01202			
FS21ET	TCCNA211FS21ET	A	C2	1	2	4.190	7.345	0.4403	0.09663	8	0.01208	4.143	7.268	0.4353
	TCCNA212FS21ET	A	C2	1	2	4.146	7.266	0.4366	0.09727	8	0.01216			
	TCCNA213FS21ET	A	C2	1	2	4.113	7.222	0.4322	0.09720	8	0.01215			
	TCCNA214FS21ET	A	C2	1	2	4.136	7.251	0.4336	0.09745	8	0.01218			
	TCCNA215FS21ET	A	C2	1	2	4.129	7.258	0.4338	0.09702	8	0.01213			
FS22ET	TCCNA211FS22ET	A	C2	1	2	4.307	7.365	0.4657	0.09653	8	0.01207	4.325	7.411	0.4662
	TCCNA212FS22ET	A	C2	1	2	4.342	7.470	0.4679	0.09595	8	0.01199			
	TCCNA213FS22ET	A	C2	1	2	4.348	7.438	0.4708	0.09585	8	0.01198			
	TCCNA214FS22ET	A	C2	1	2	4.328	7.401	0.4653	0.09652	8	0.01206			
	TCCNA215FS22ET	A	C2	1	2	4.301	7.382	0.4611	0.09700	8	0.01213			
FS23ET	TCCNA211FS23ET	A	C2	1	2	4.460	7.647	0.4765	0.09633	8	0.01204	4.424	7.595	0.4702
	TCCNA212FS23ET	A	C2	1	2	4.429	7.561	0.4688	0.09642	8	0.01205			
	TCCNA213FS23ET	A	C2	1	2	4.405	7.592	0.4698	0.09613	8	0.01202			
	TCCNA214FS23ET	A	C2	1	2	4.422	7.603	0.4682	0.09622	8	0.01203			
	TCCNA215FS23ET	A	C2	1	2	4.404	7.571	0.4674	0.09677	8	0.01210			
FS31ET	TCCNA211FS31ET	A	C2	1	2	4.035	6.973	0.4260	0.09770	8	0.01221	4.066	6.984	0.4267
	TCCNA212FS31ET	A	C2	1	2	4.069	6.940	0.4280	0.09680	8	0.01210			
	TCCNA213FS31ET	A	C2	1	2	4.060	6.995	0.4258	0.09647	8	0.01206			
	TCCNA214FS31ET	A	C2	1	2	4.067	6.959	0.4273	0.09752	8	0.01219			
	TCCNA215FS31ET	A	C2	1	2	4.101	7.054	0.4264	0.09653	8	0.01207			
FS32ET	TCCNA211FS32ET	A	C2	1	2	4.220	7.629	0.5774	0.09633	8	0.01204	4.211	7.608	0.5775
	TCCNA212FS32ET	A	C2	1	2	4.220	7.621	0.5811	0.09613	8	0.01202			
	TCCNA213FS32ET	A	C2	1	2	4.228	7.654	0.5756	0.09647	8	0.01206			
	TCCNA214FS32ET	A	C2	1	2	4.220	7.660	0.5761	0.09615	8	0.01202			
	TCCNA215FS32ET	A	C2	1	2	4.168	7.473	0.5771	0.09590	8	0.01199			
FS33ET	TCCNA211FS33ET	A	C2	1	2	4.334	7.215	0.4682	0.09698	8	0.01212	4.342	7.225	0.4688
	TCCNA212FS33ET	A	C2	1	2	4.369	7.284	0.4728	0.09695	8	0.01212			
	TCCNA213FS33ET	A	C2	1	2	4.315	7.196	0.4655	0.09738	8	0.01217			
	TCCNA214FS33ET	A	C2	1	2	4.369	7.262	0.4690	0.09688	8	0.01211			
	TCCNA215FS33ET	A	C2	1	2	4.353	7.225	0.4705	0.09708	8	0.01214			
	TCCNA216FS33ET	A	C2	1	2	4.313	7.169	0.4666	0.09742	8	0.01218			

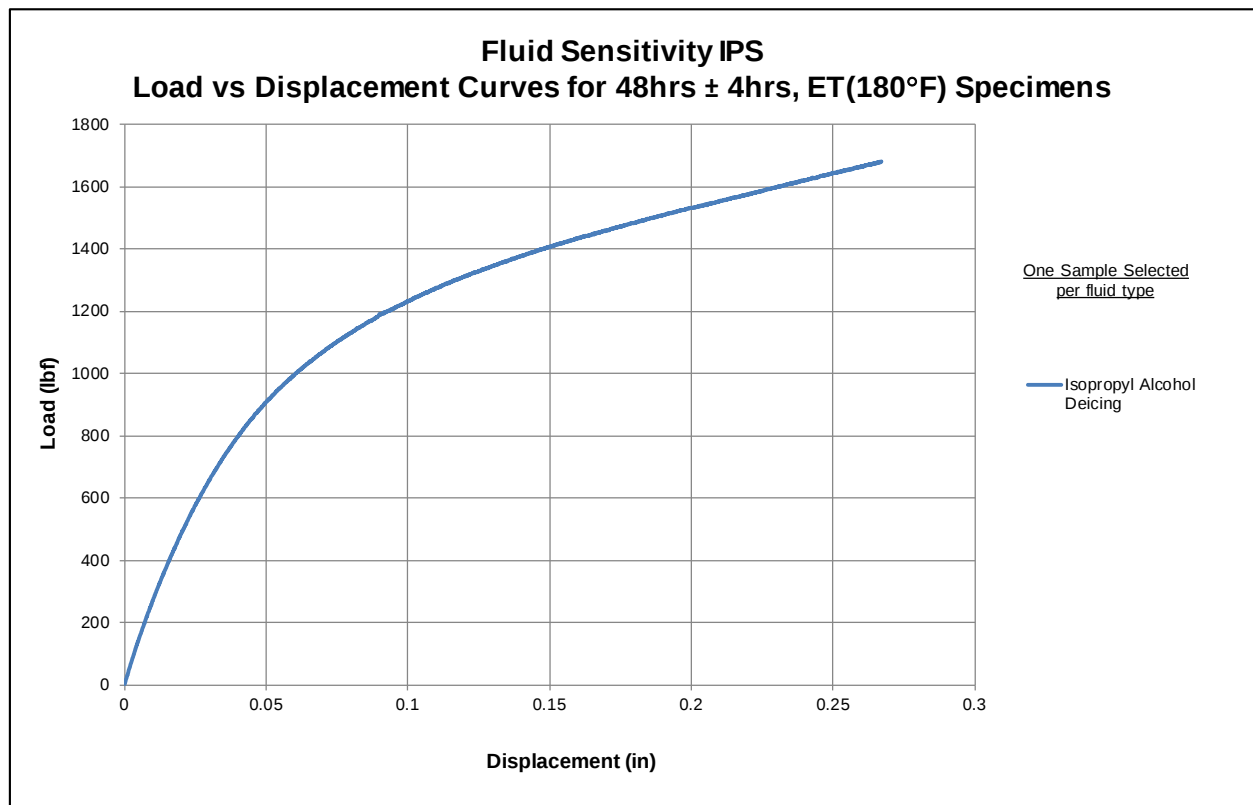
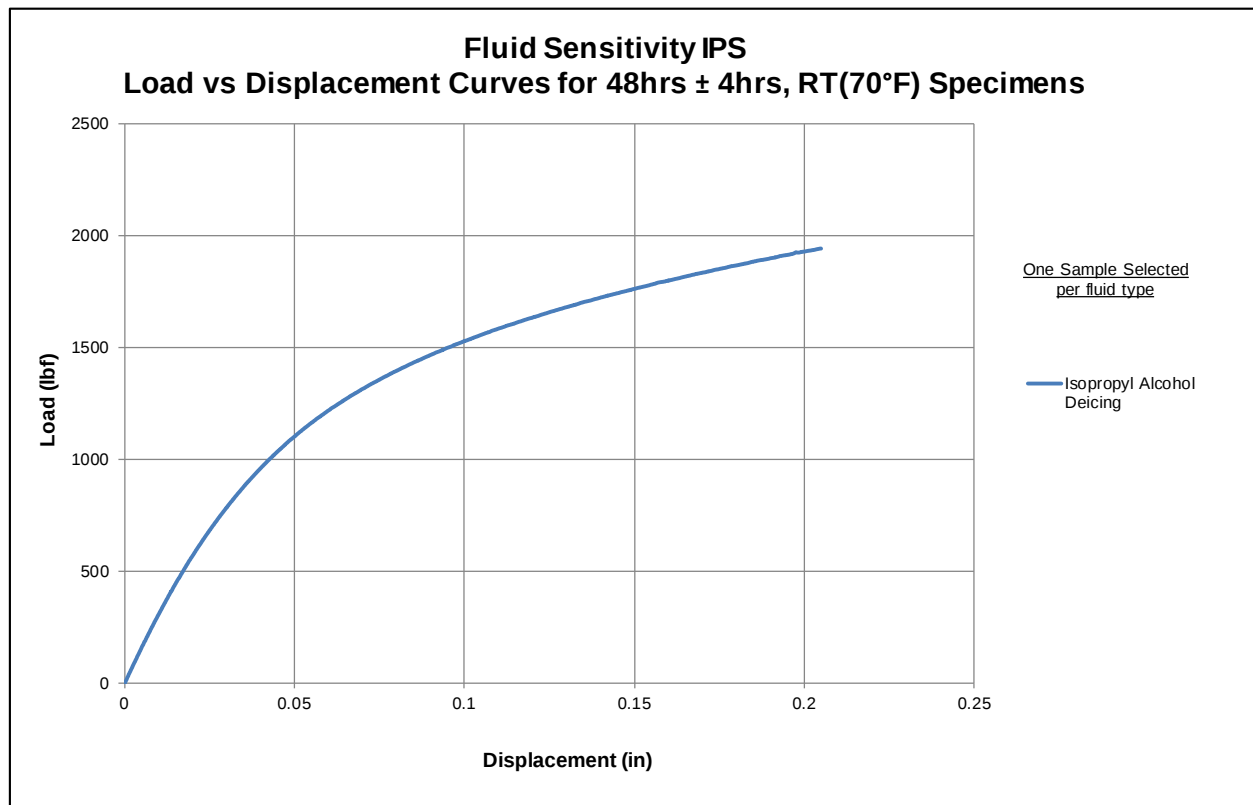
Modulus calculation is obtained from 2000 - 6000 microstrain for all fluid sensitivity tests except FS32RT.

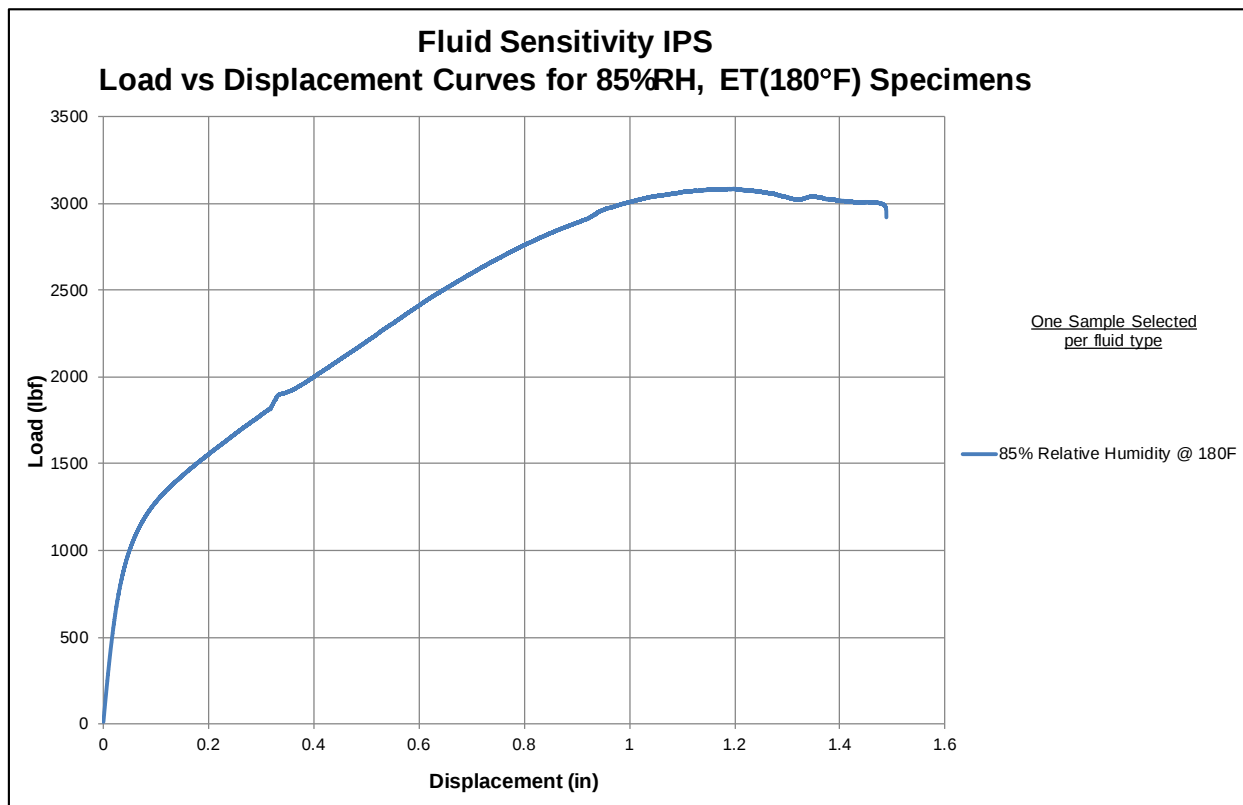
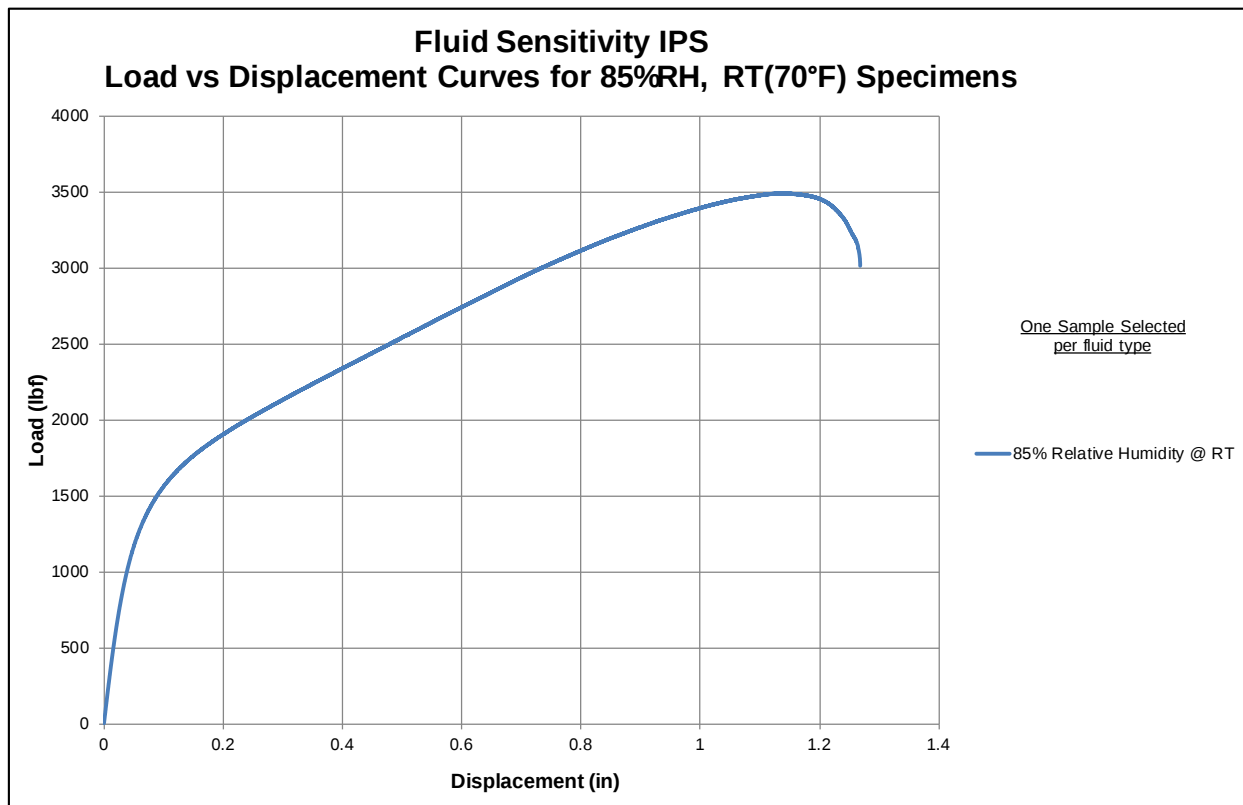
FS32ET - Modulus calculation is obtained from 1000 - 3000 microstrain.

7.3 Load Displacement Curves



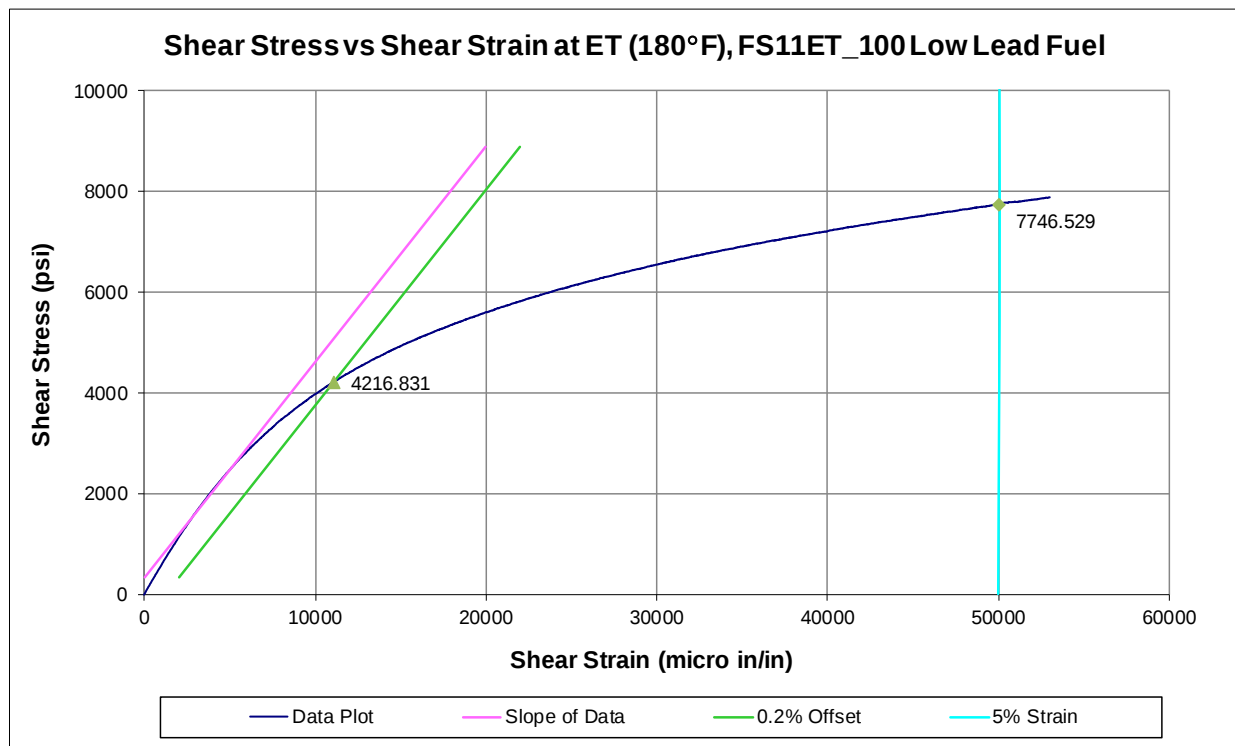
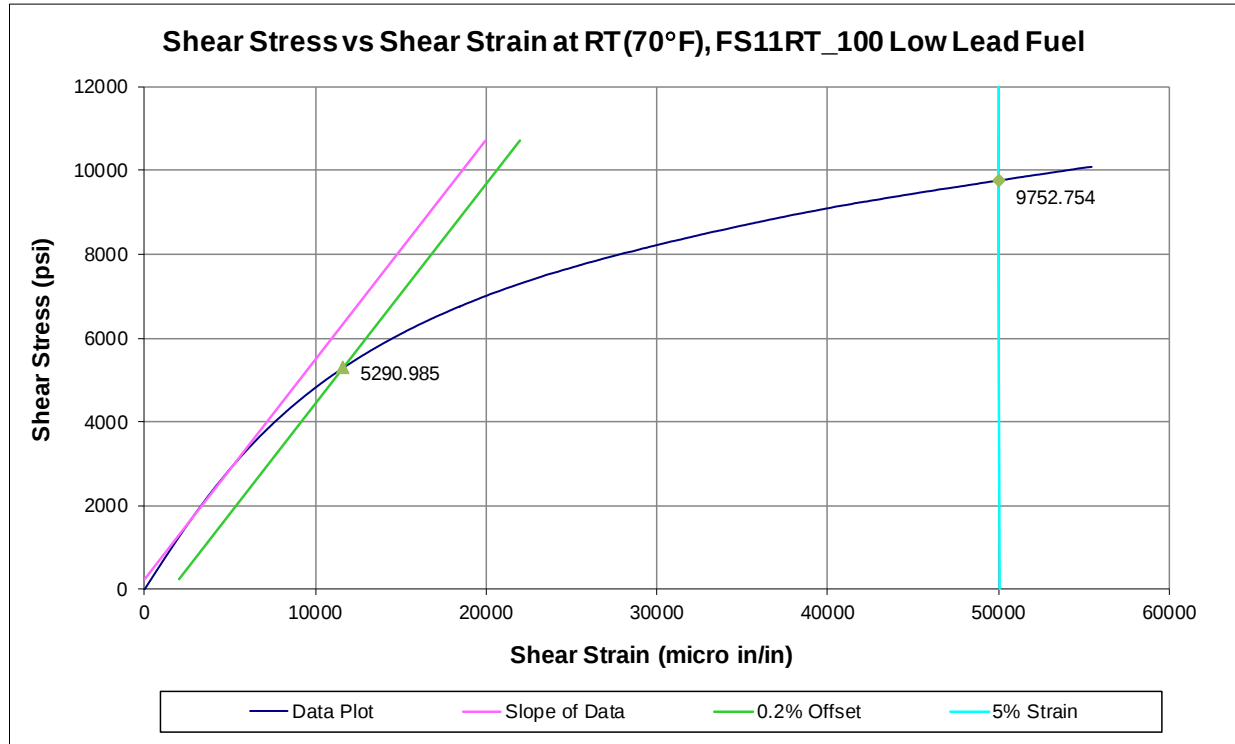




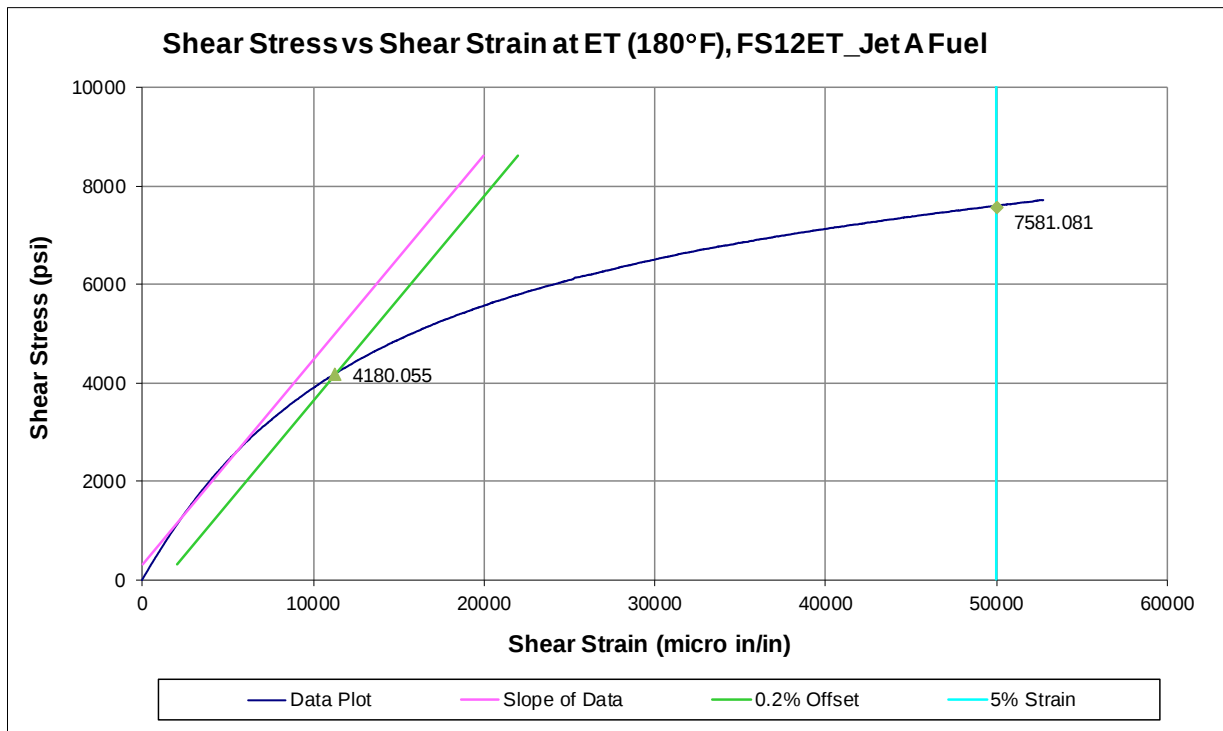
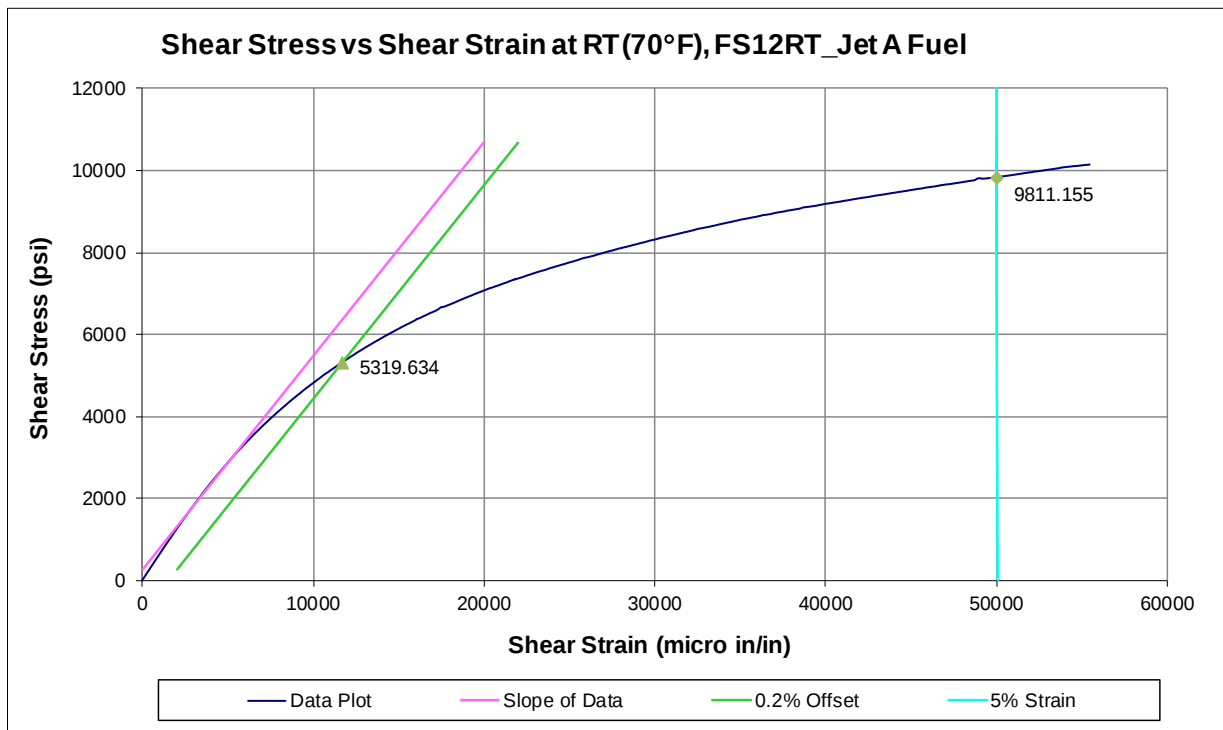


7.4 Fluid Sensitivity IPS – Full Stress vs. Strain Curve

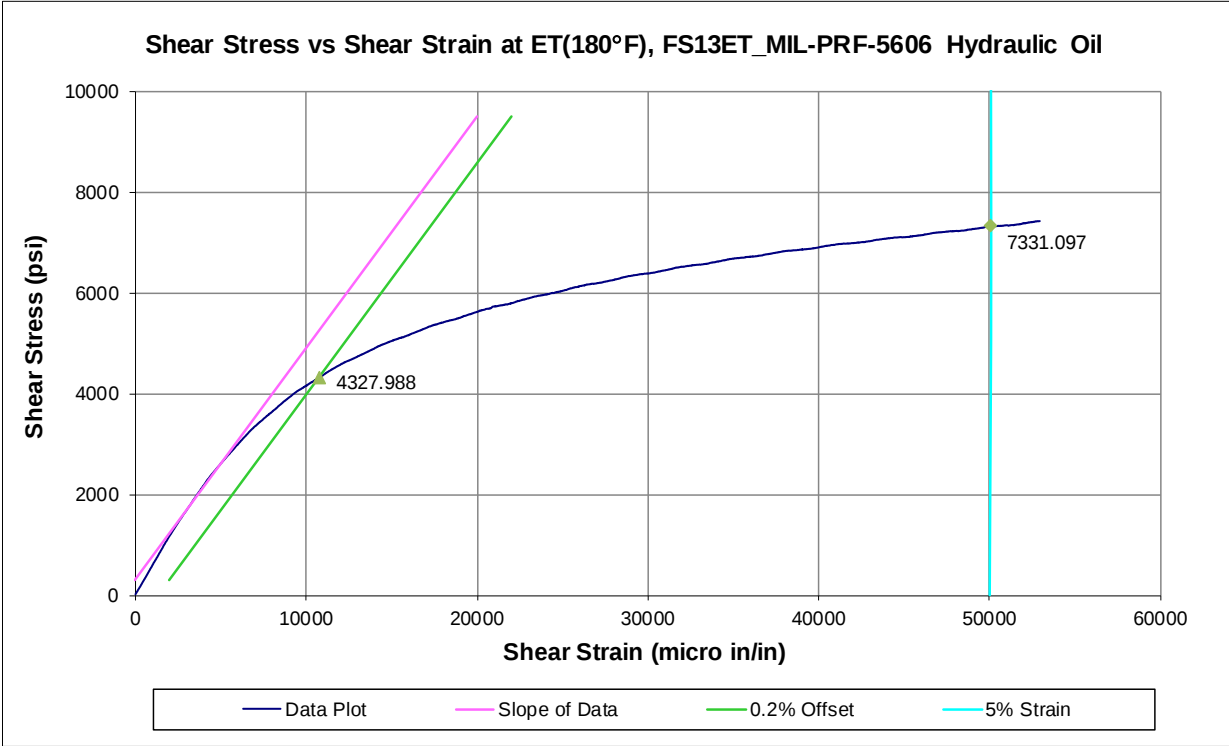
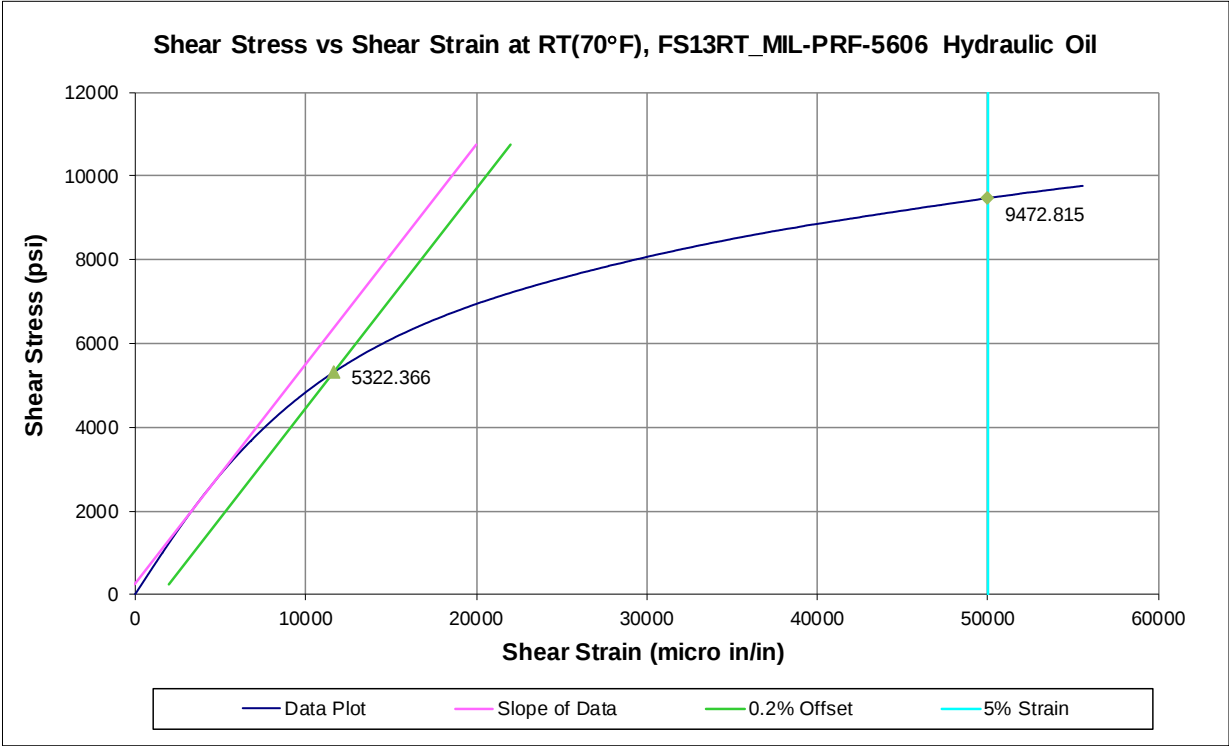
7.4.1 100 Low Lead Fuel (FS11RT / FS11ET)



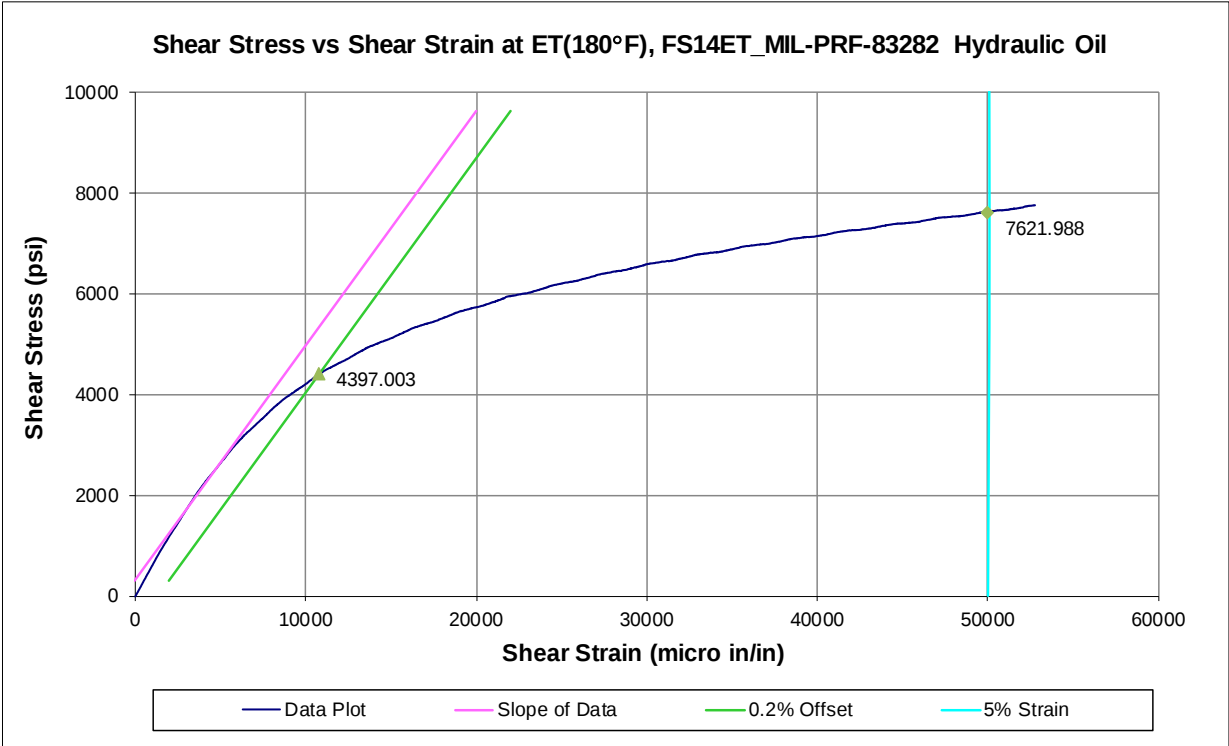
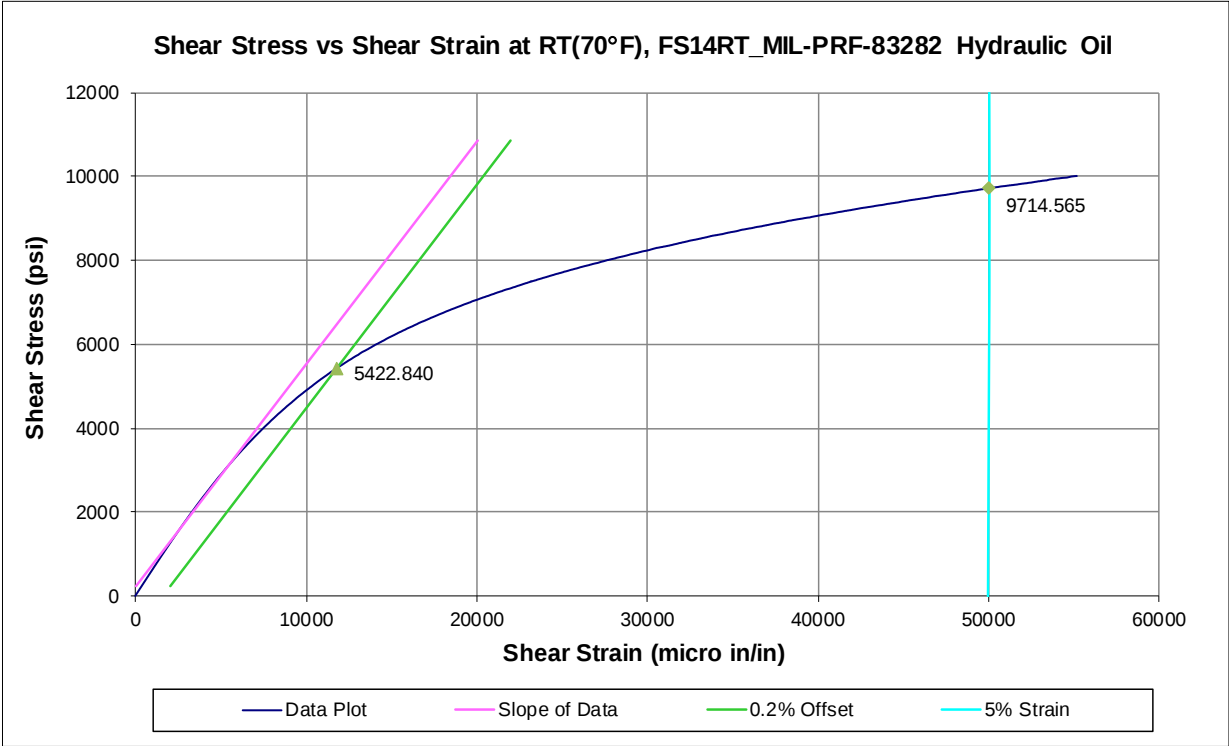
7.4.2 Jet A Fuel (FS12RT / FS12ET))



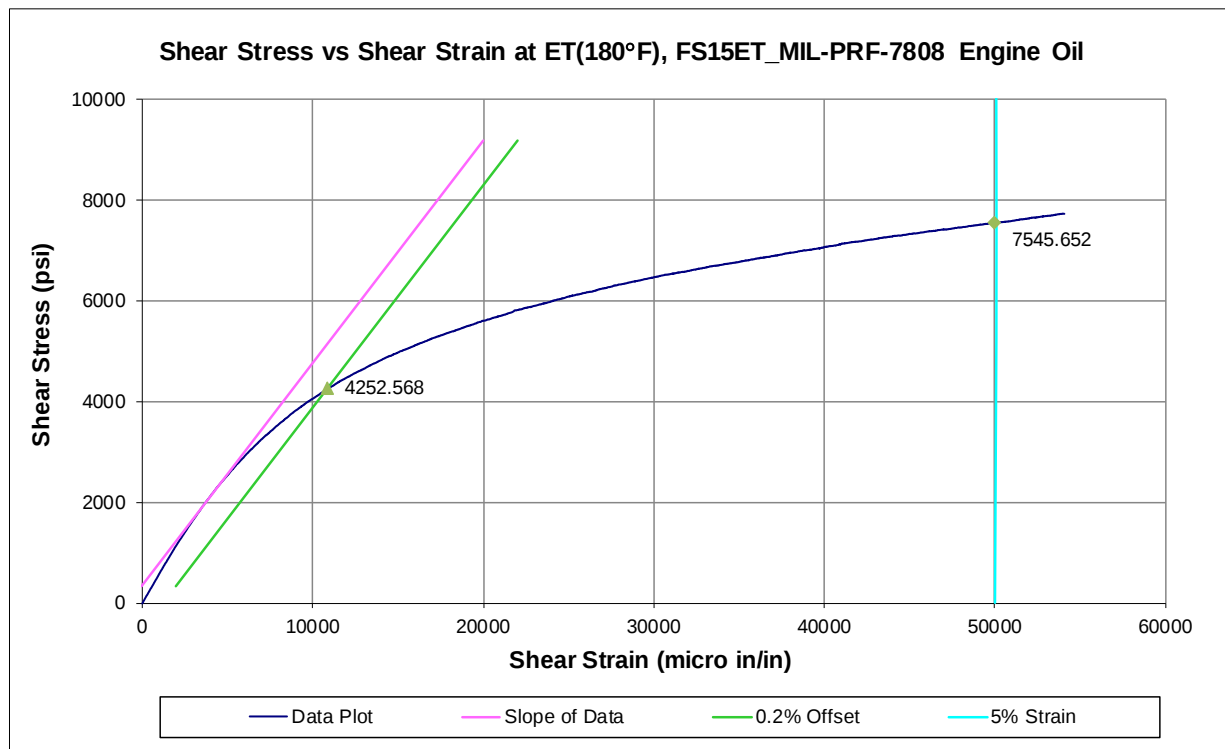
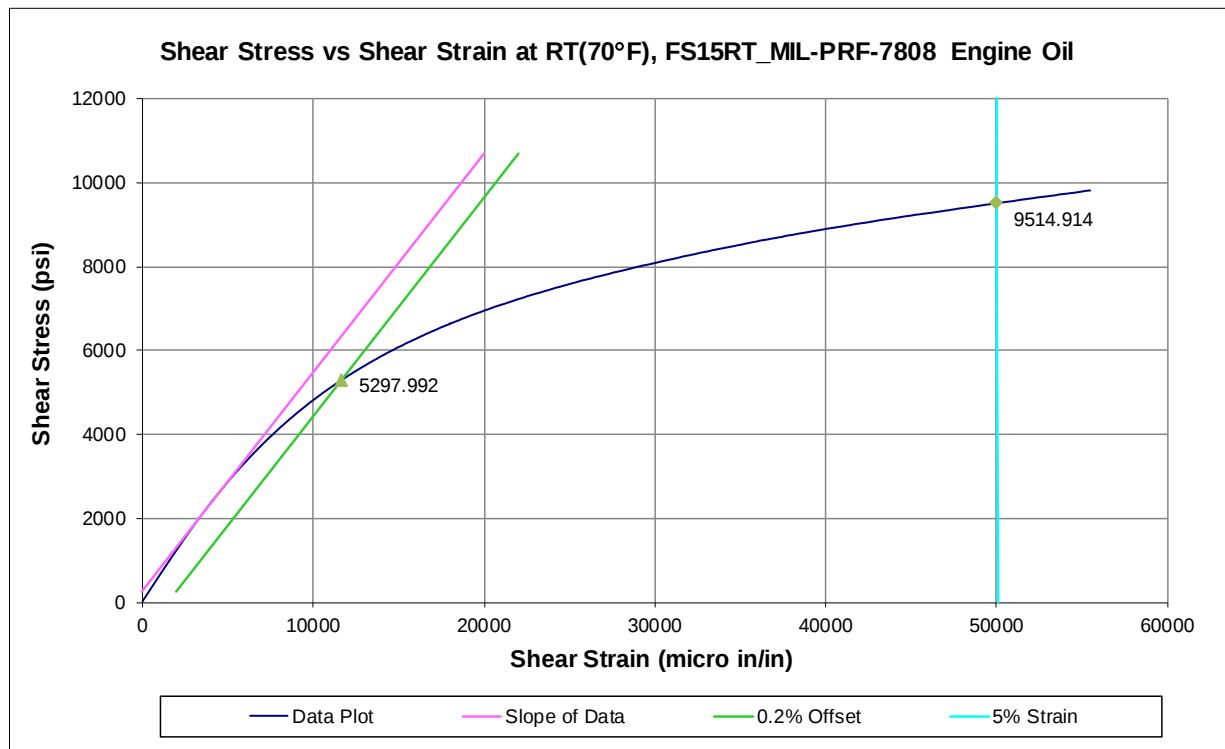
7.4.3 MIL-PRF-5606 Hydraulic Oil (FS13RT / FS13ET)



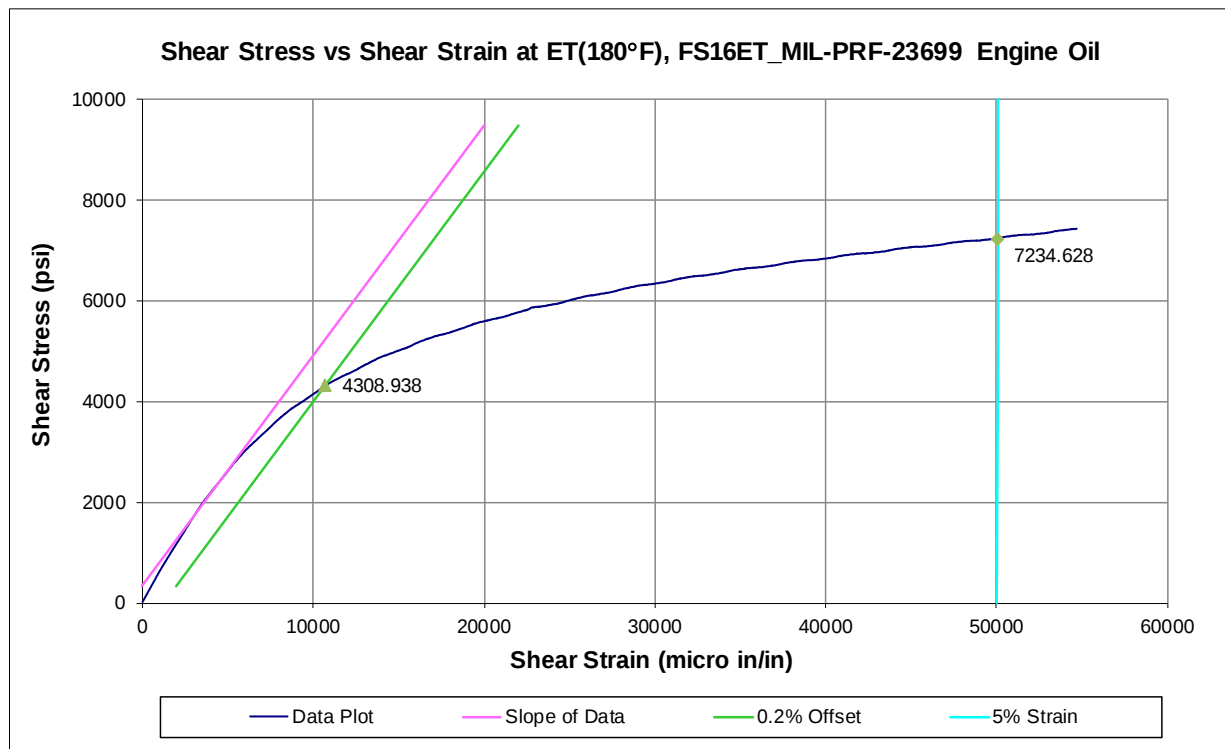
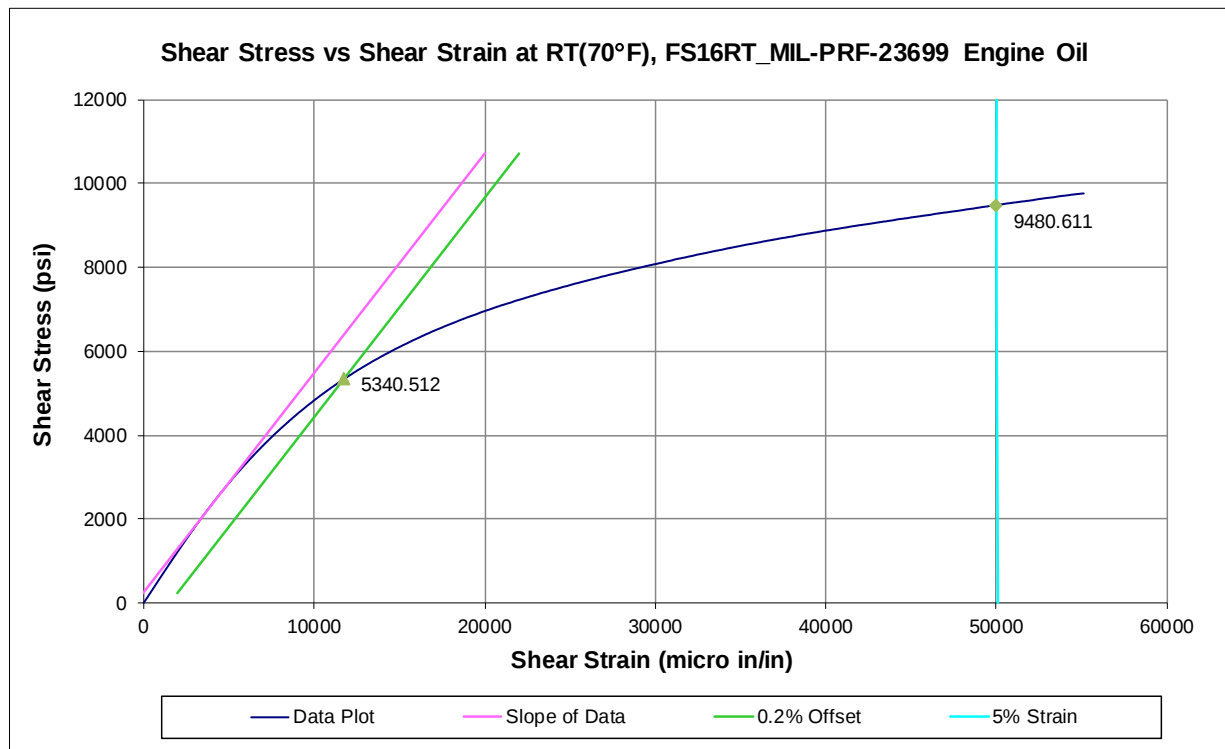
7.4.4 MIL-PRF-83282 Hydraulic Oil (FS14RT / FS14ET)



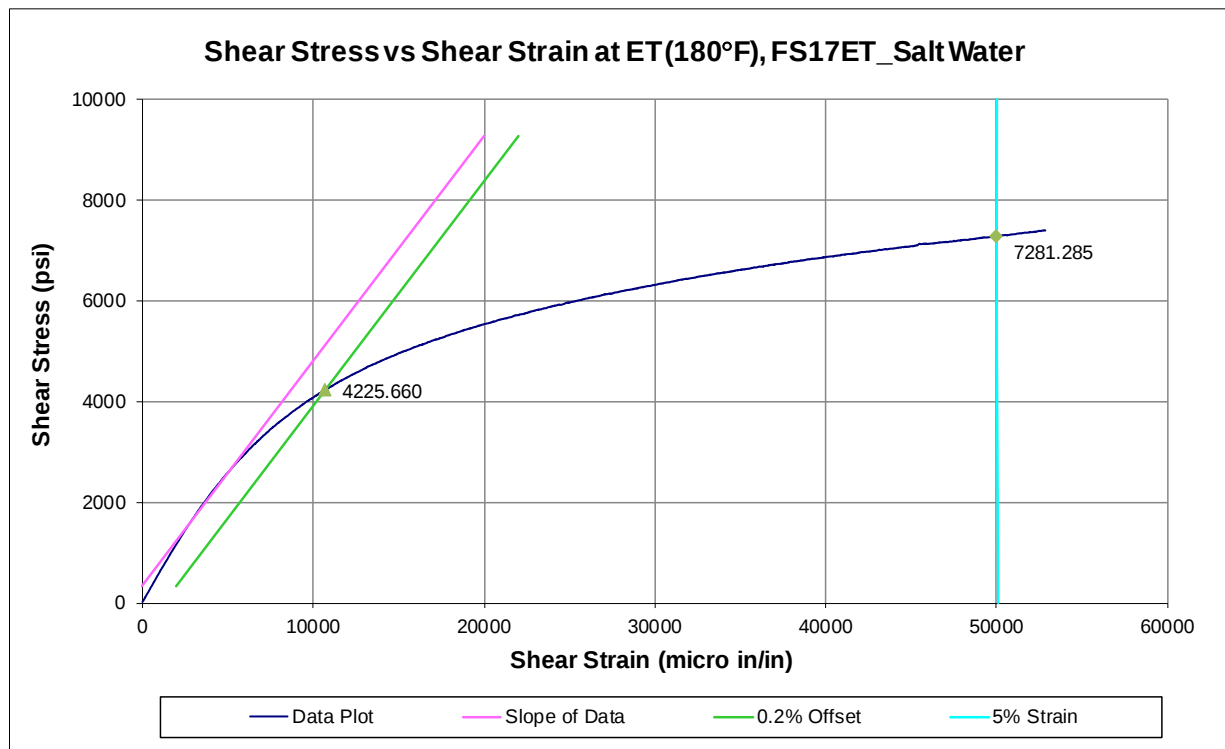
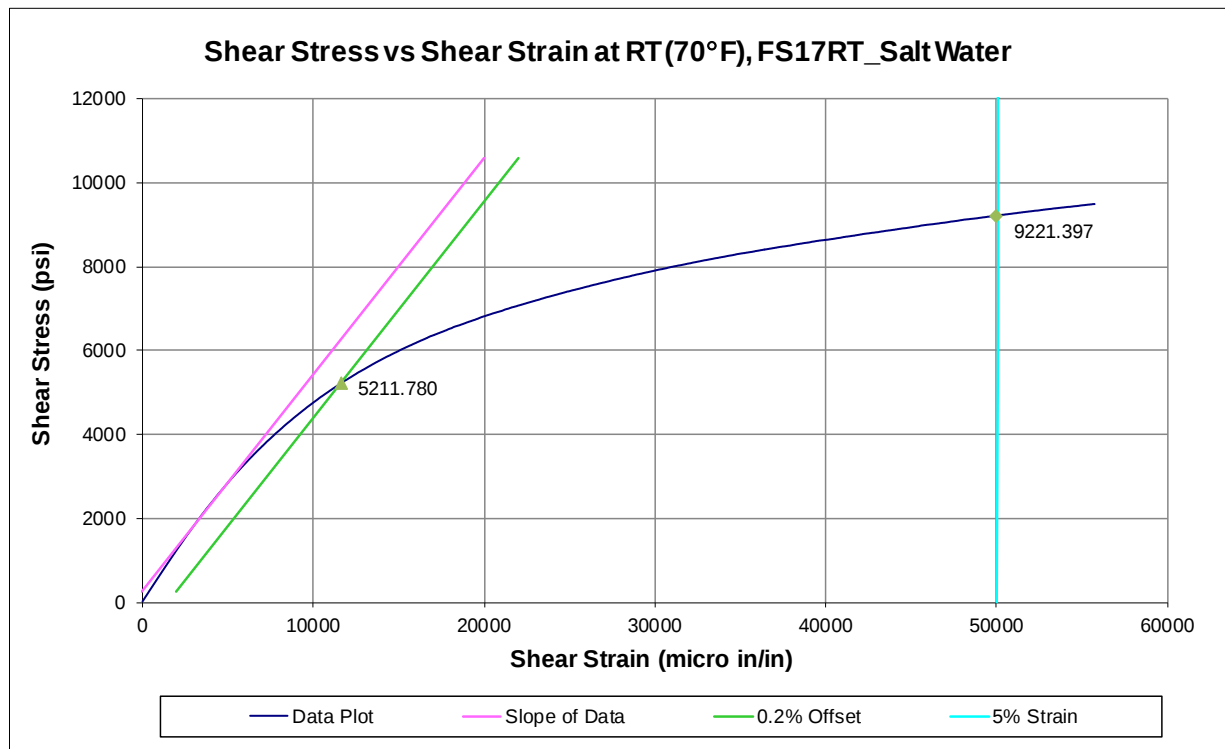
7.4.5 MIL-PRF-7808 Engine Oil (FS15RT / FS15ET)



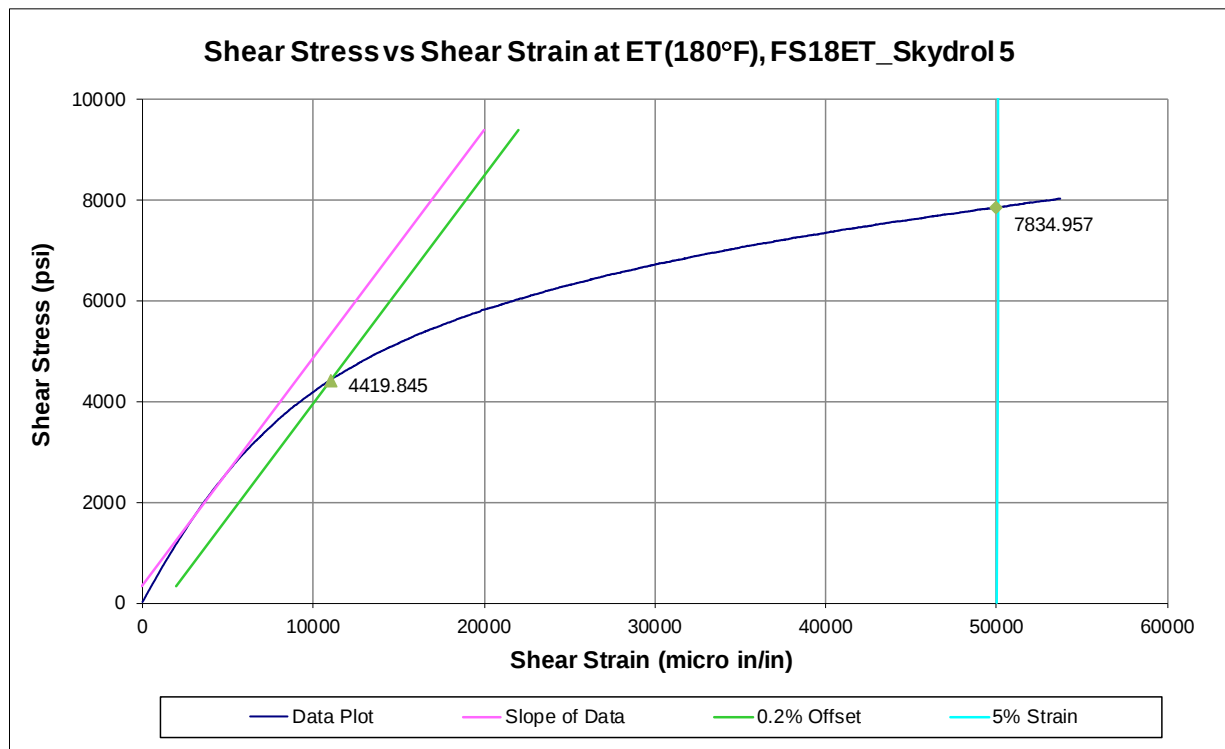
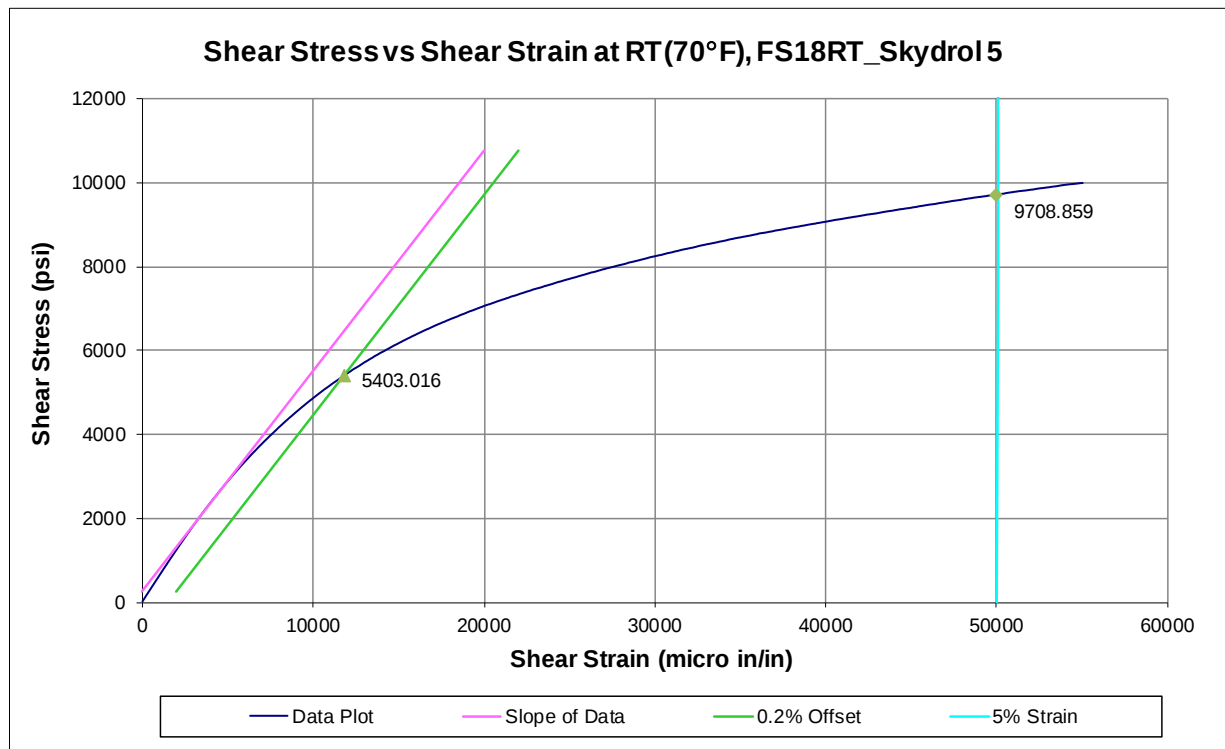
7.4.6 MIL-PRF-23699 Engine Oil (FS16RT / FS16ET)



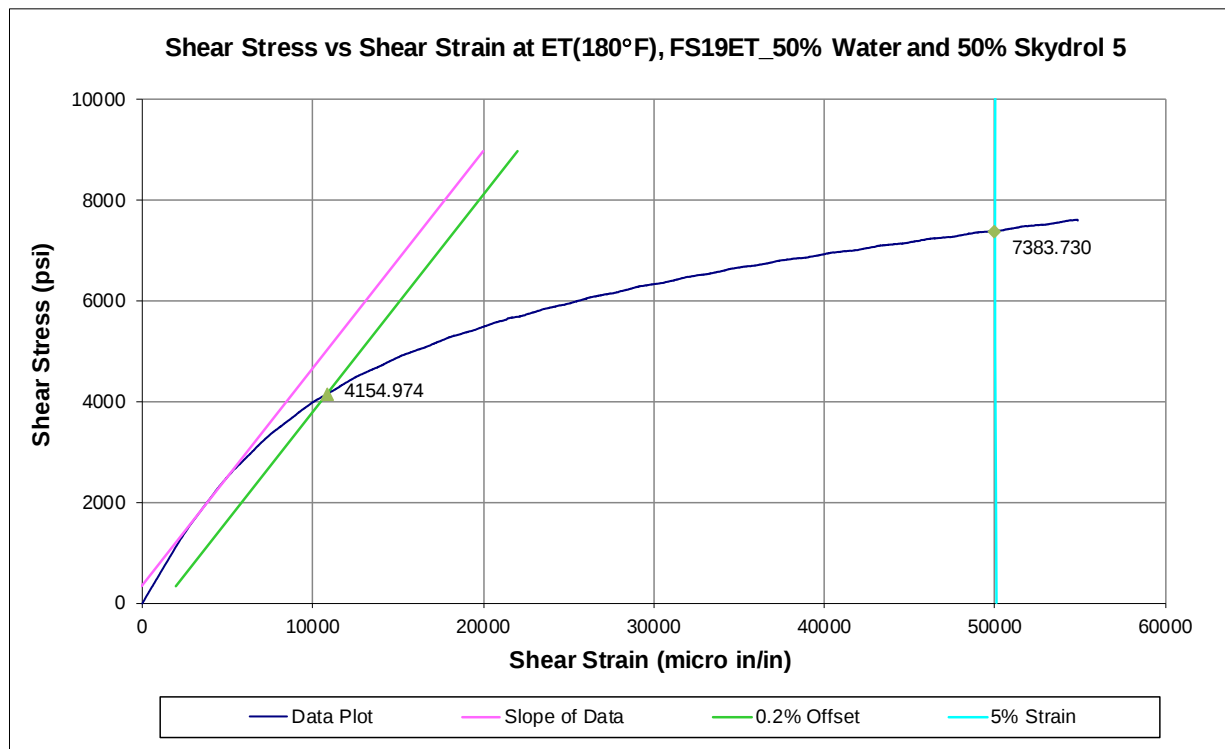
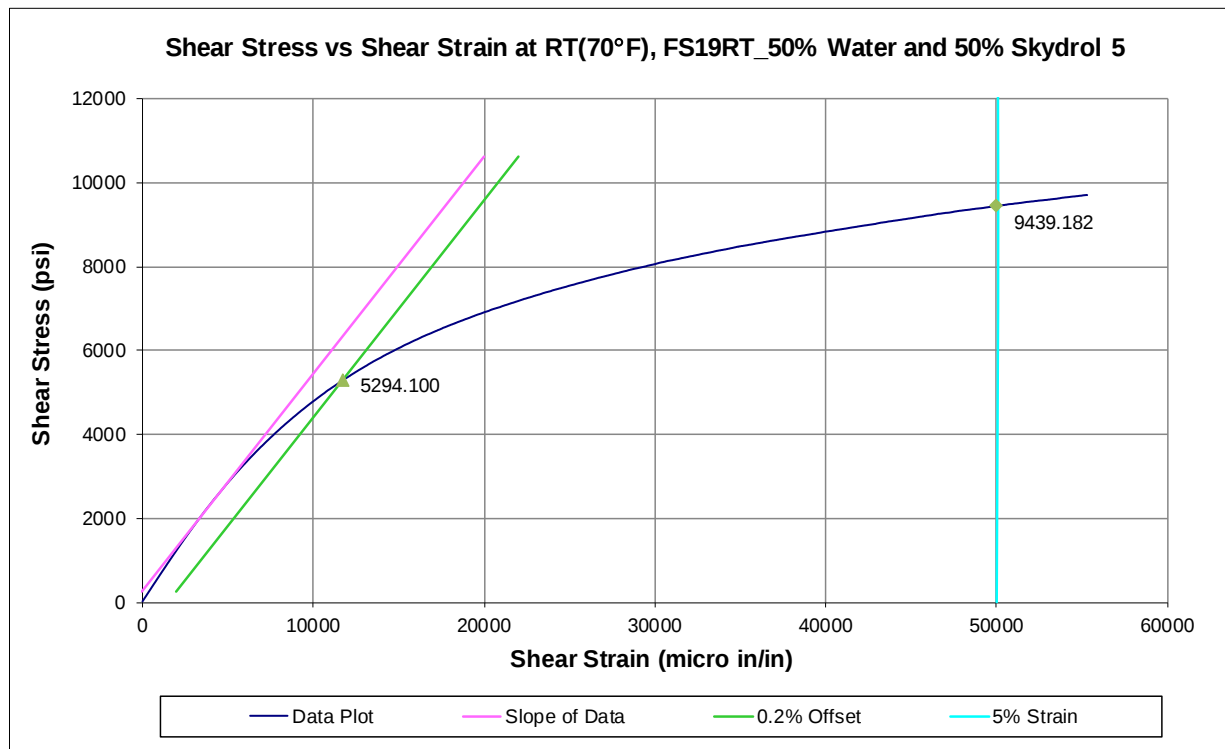
7.4.7 Salt Water (FS17RT / FS17ET)



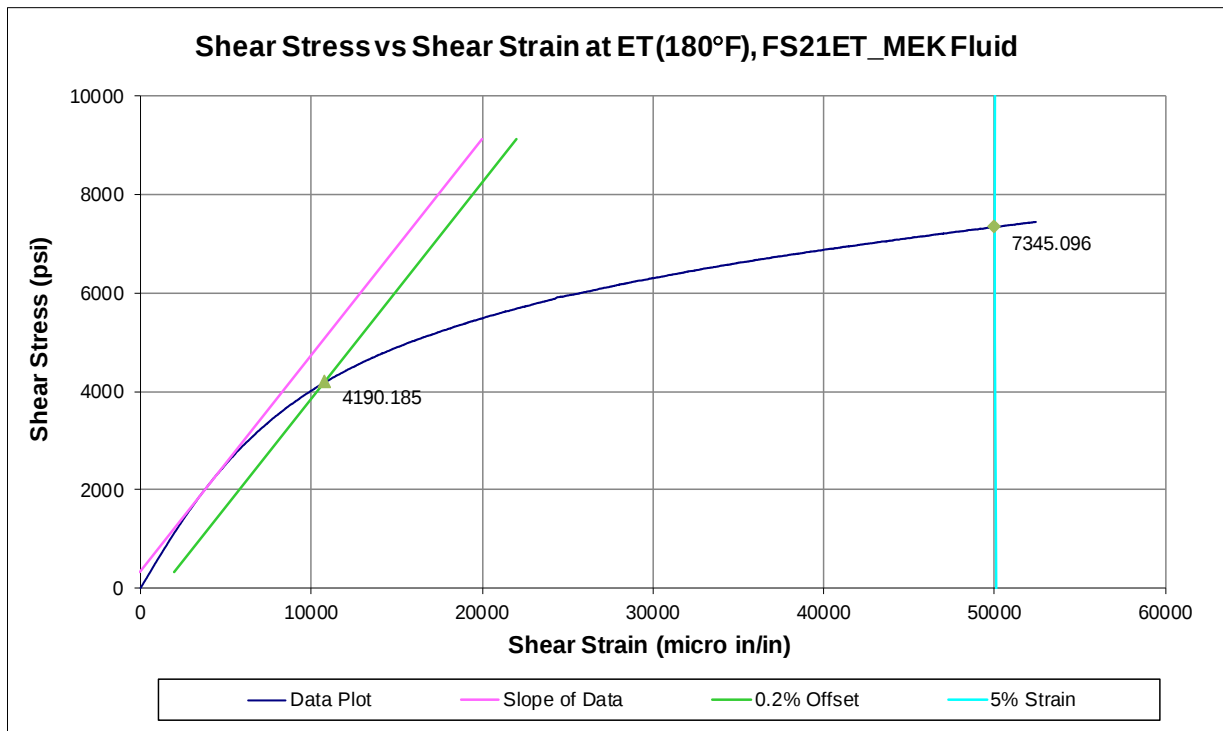
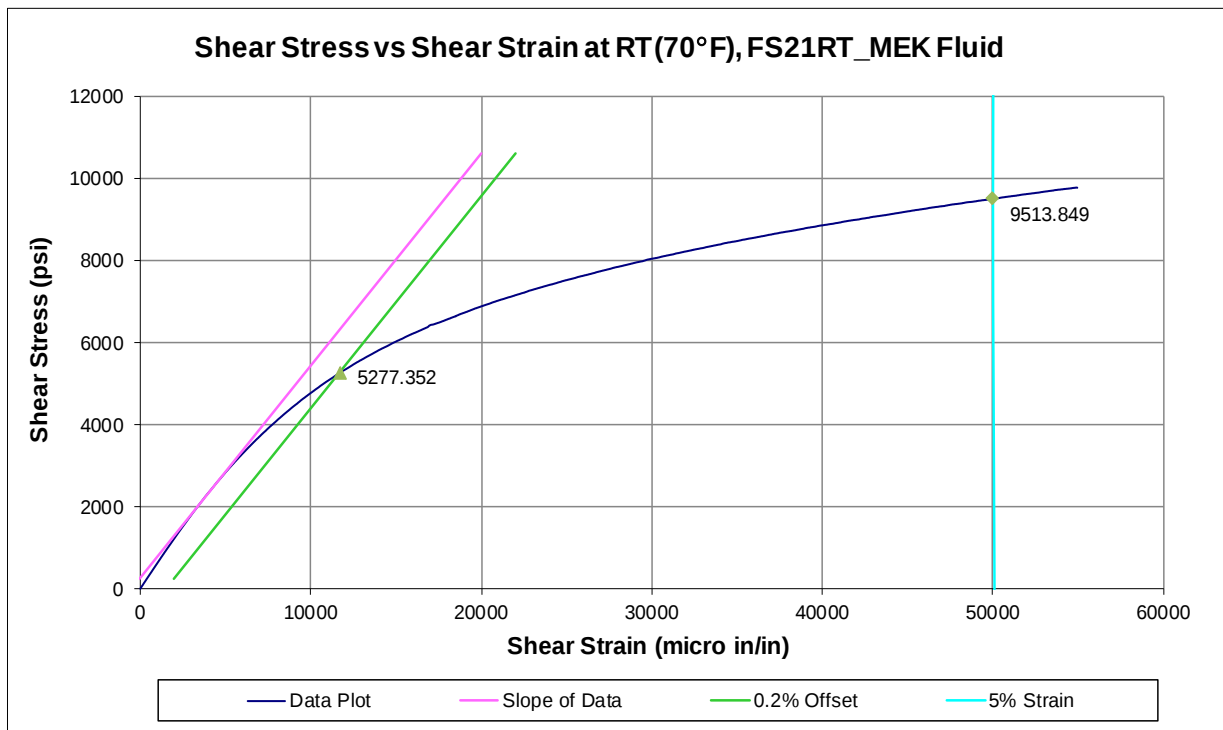
7.4.8 Skydrol 5 (FS18RT/ FS18ET)



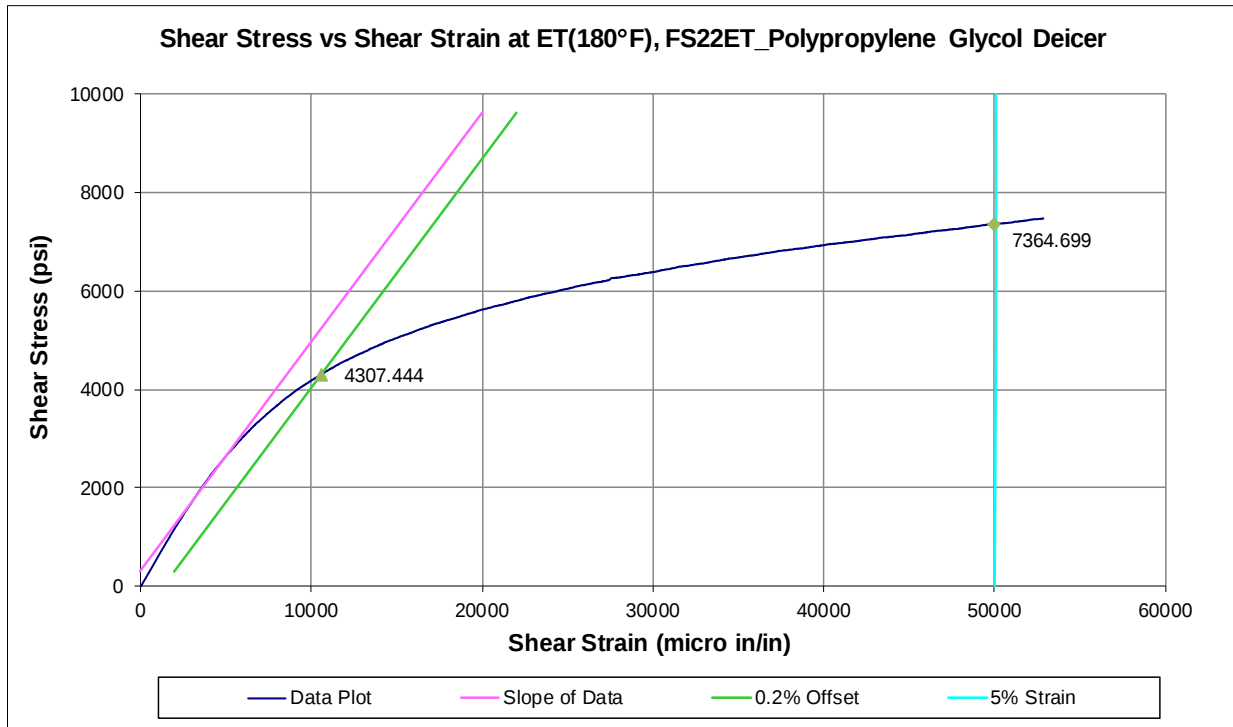
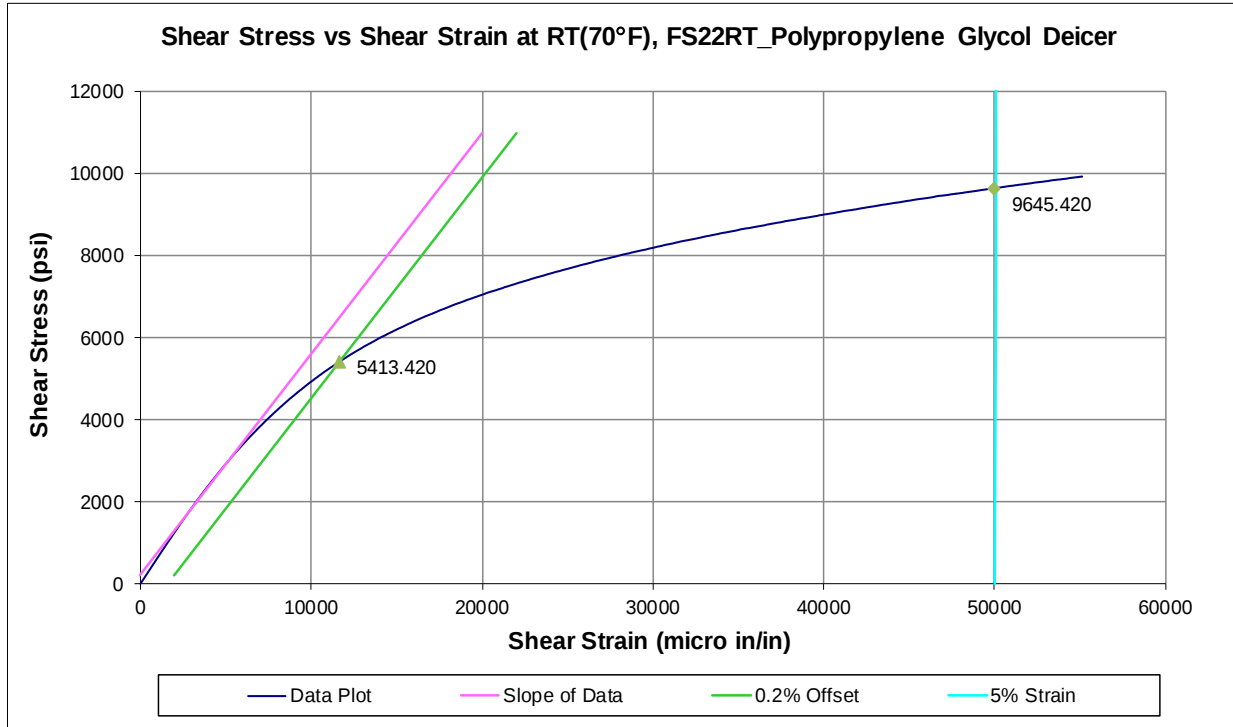
7.4.9 50% Water with 50% Skydrol 5 (FS19RT / FS19ET)



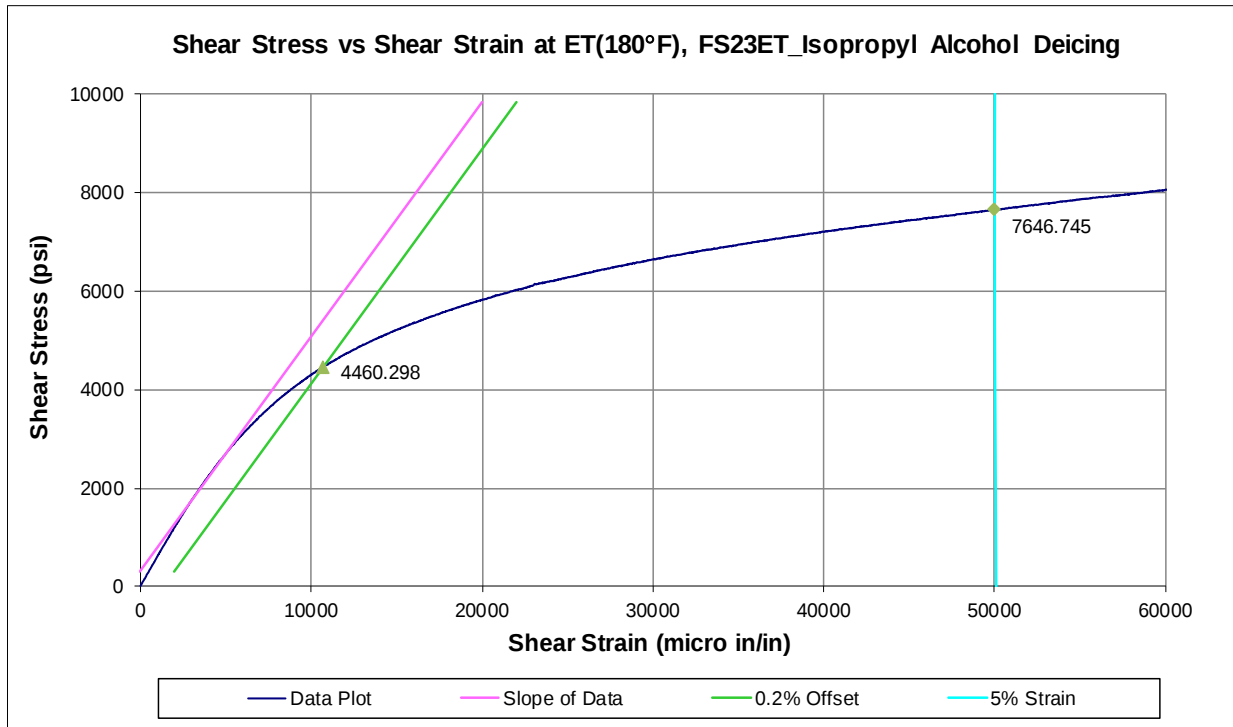
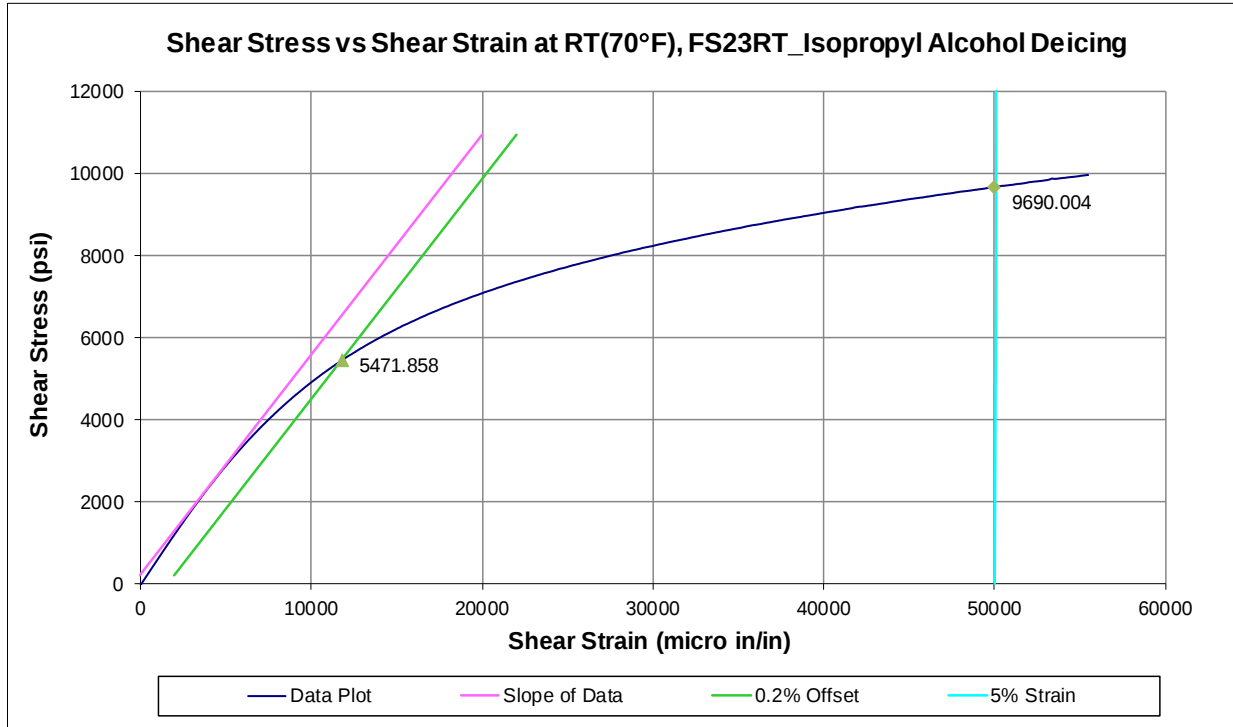
7.4.10 MEK washing fluid (FS21RT / FS21ET)



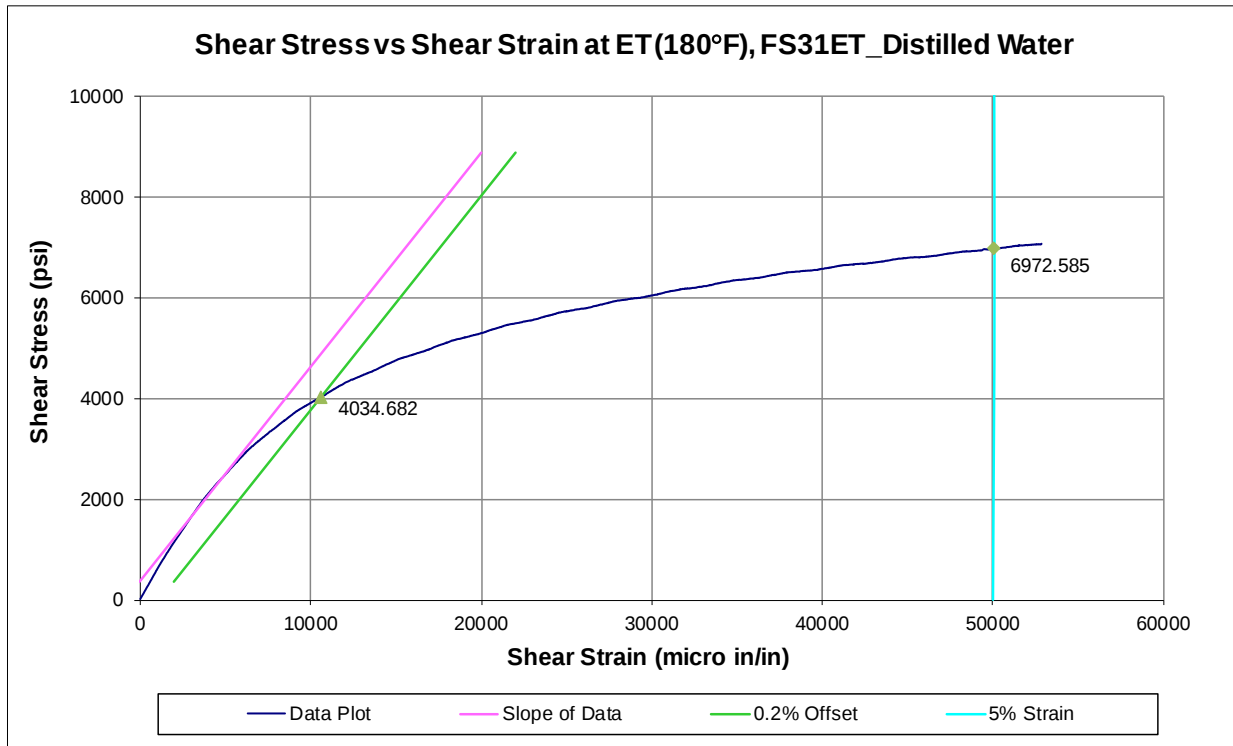
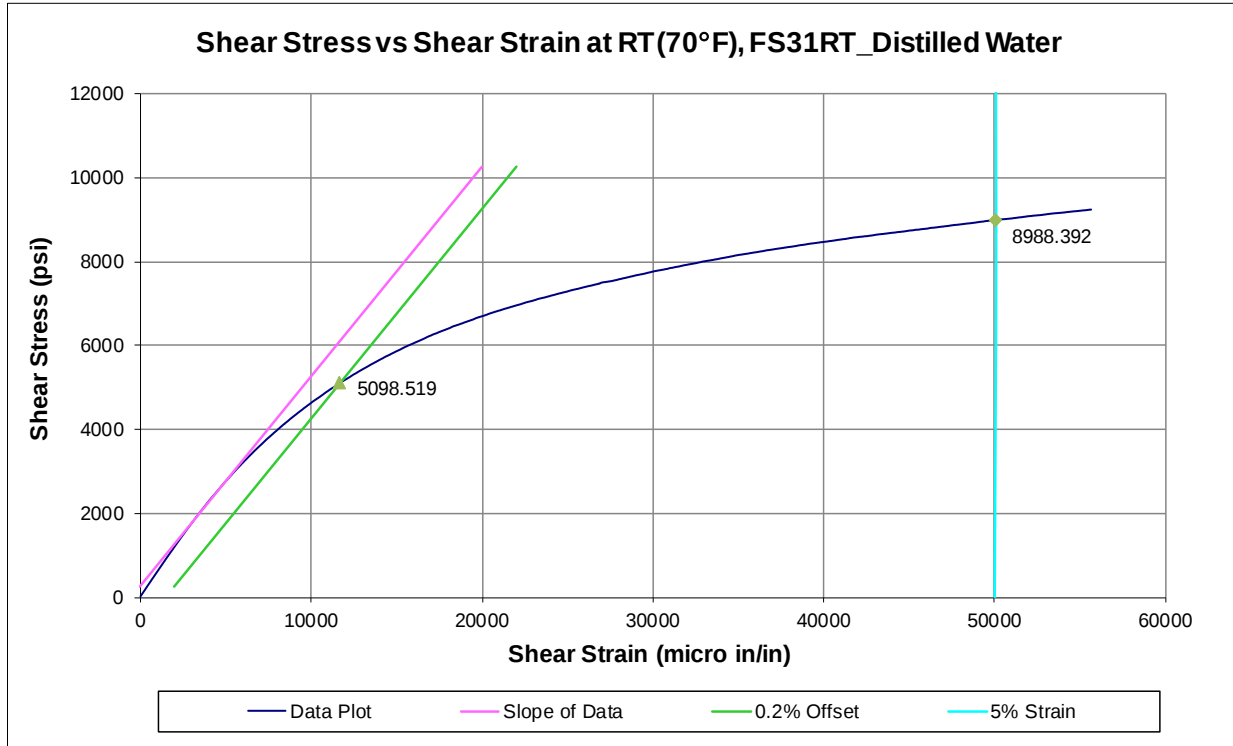
7.4.11 Polypropylene Glycol Deicing (FS22RT / FS22ET)



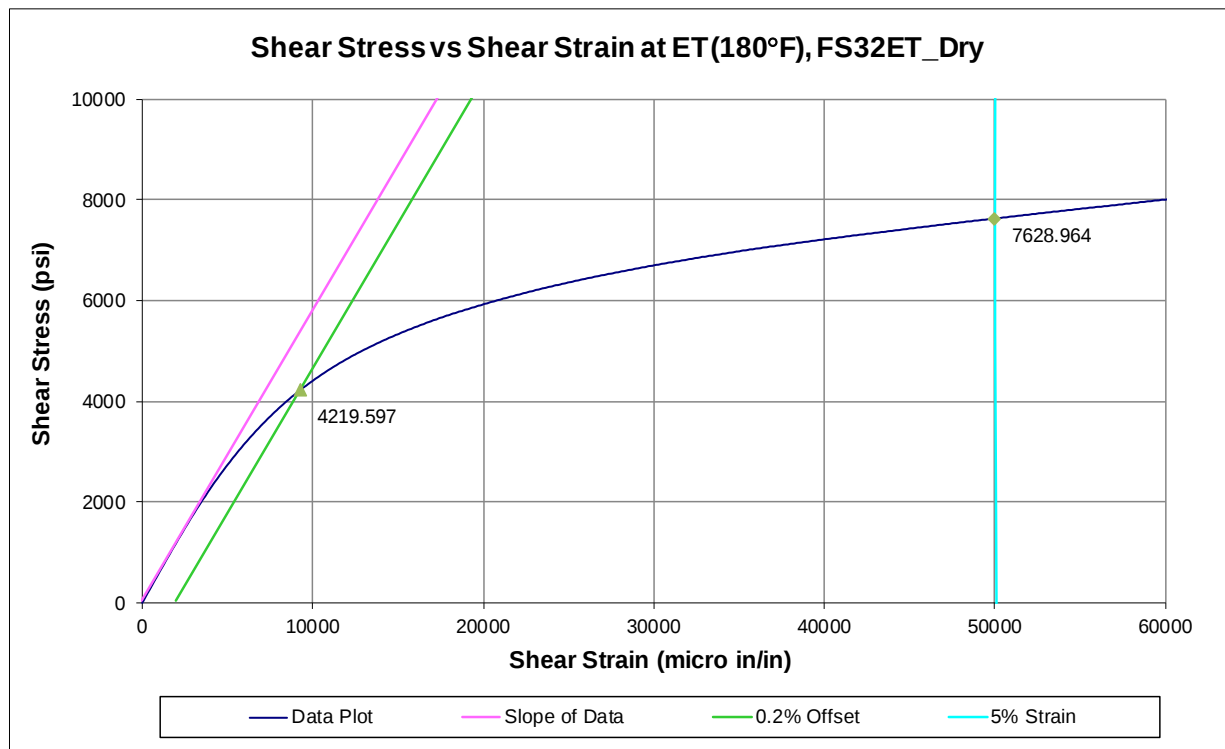
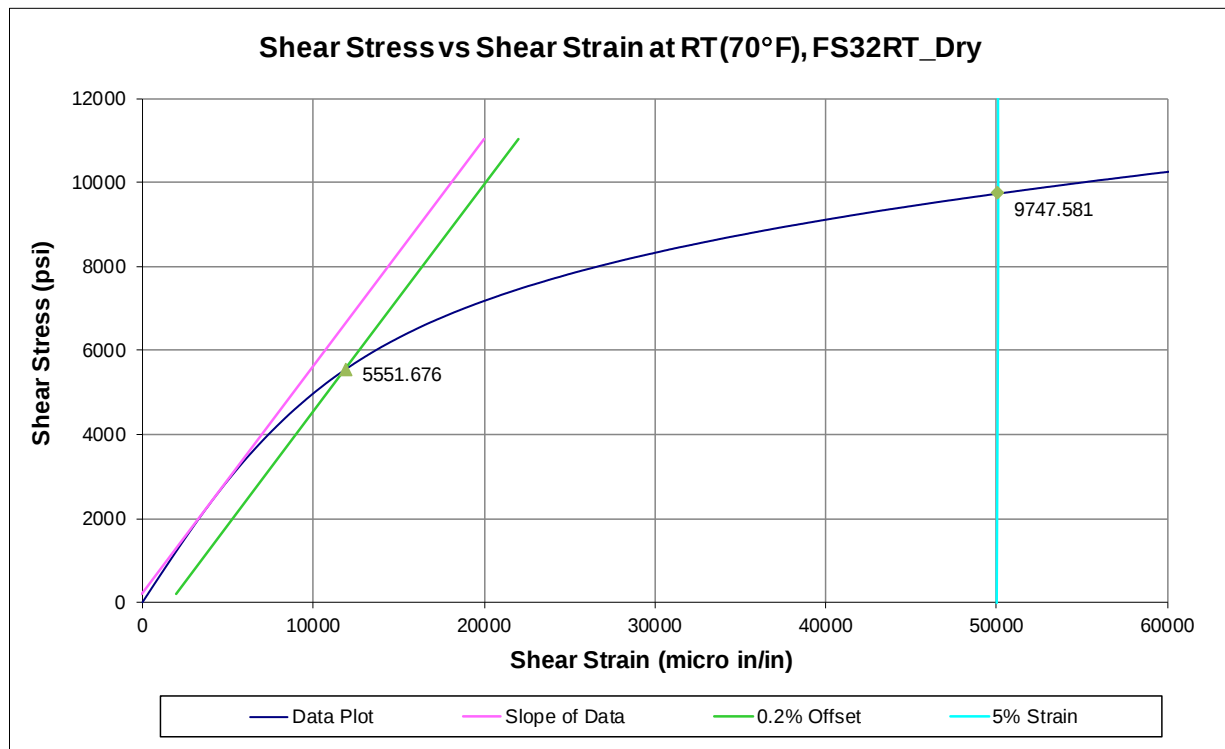
7.4.12 Isopropyl Alcohol Deicing (FS23RT / FS23ET)



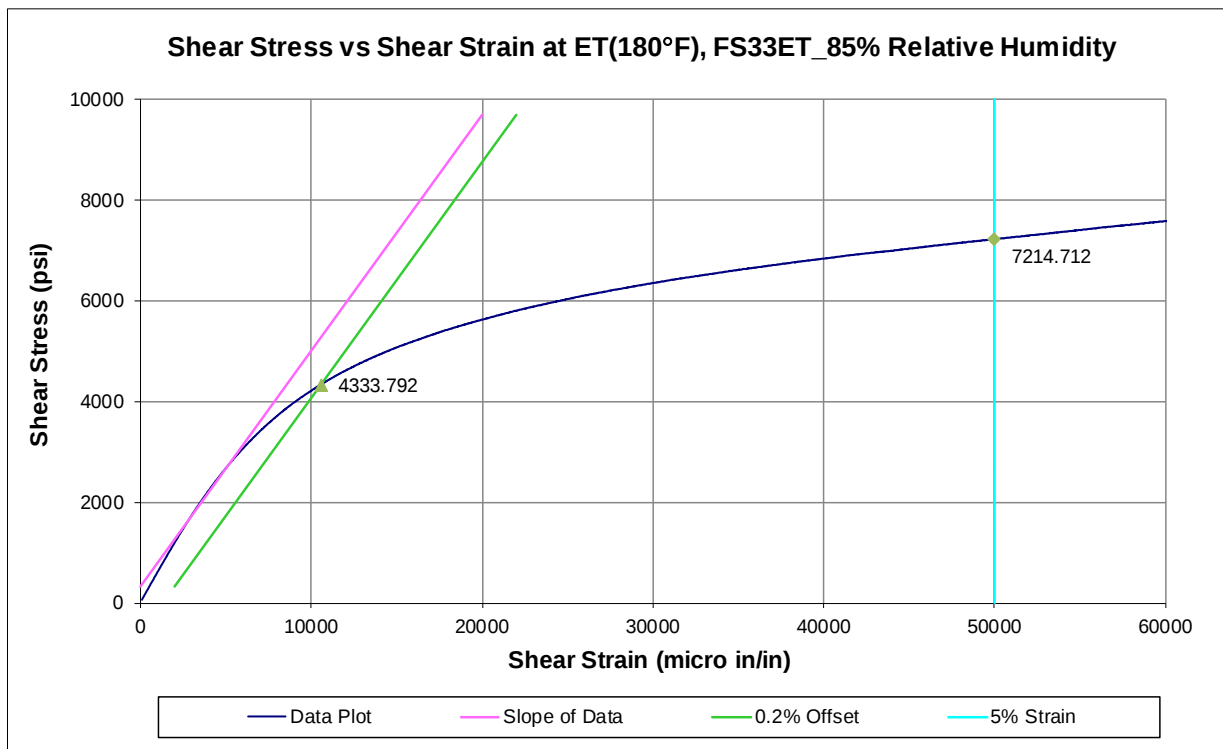
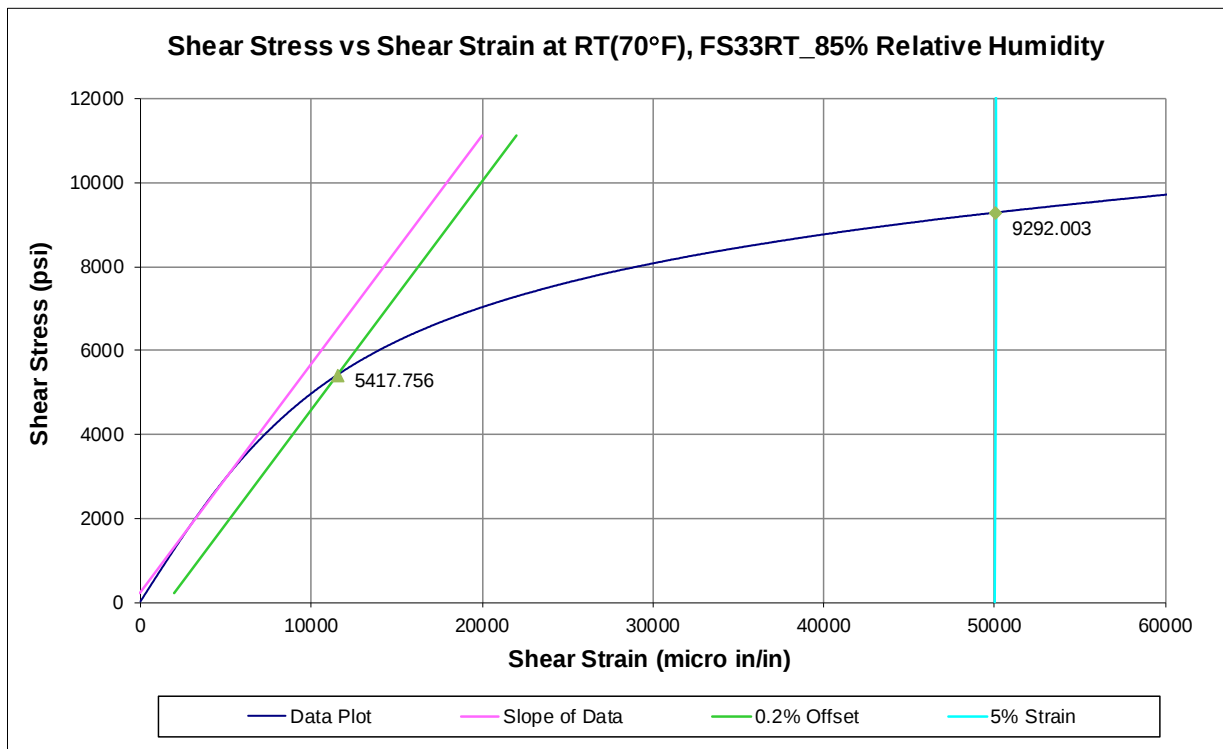
7.4.13 Distilled Water (FS31RT / FS31ET)



7.4.14 Dry (FS32RT / FS32ET)

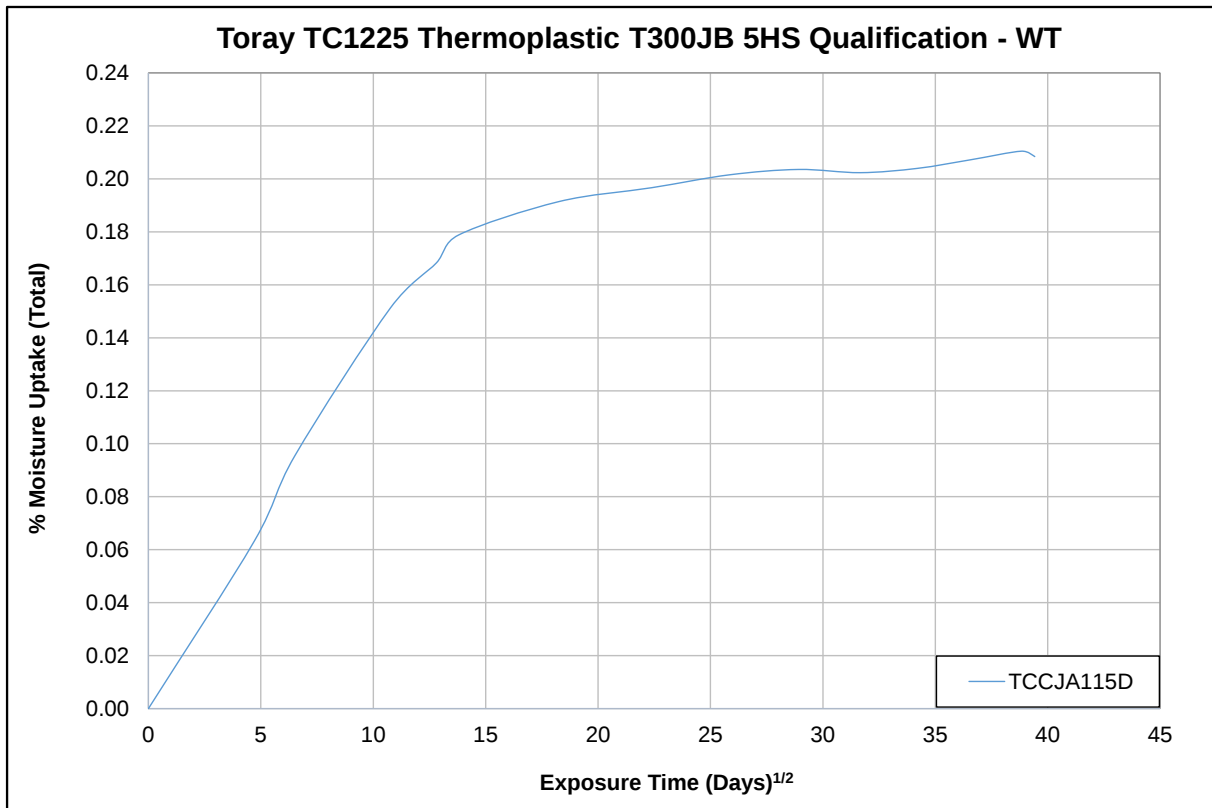


7.4.15 85% Relative Humidity (FS33RT / FS33ET)

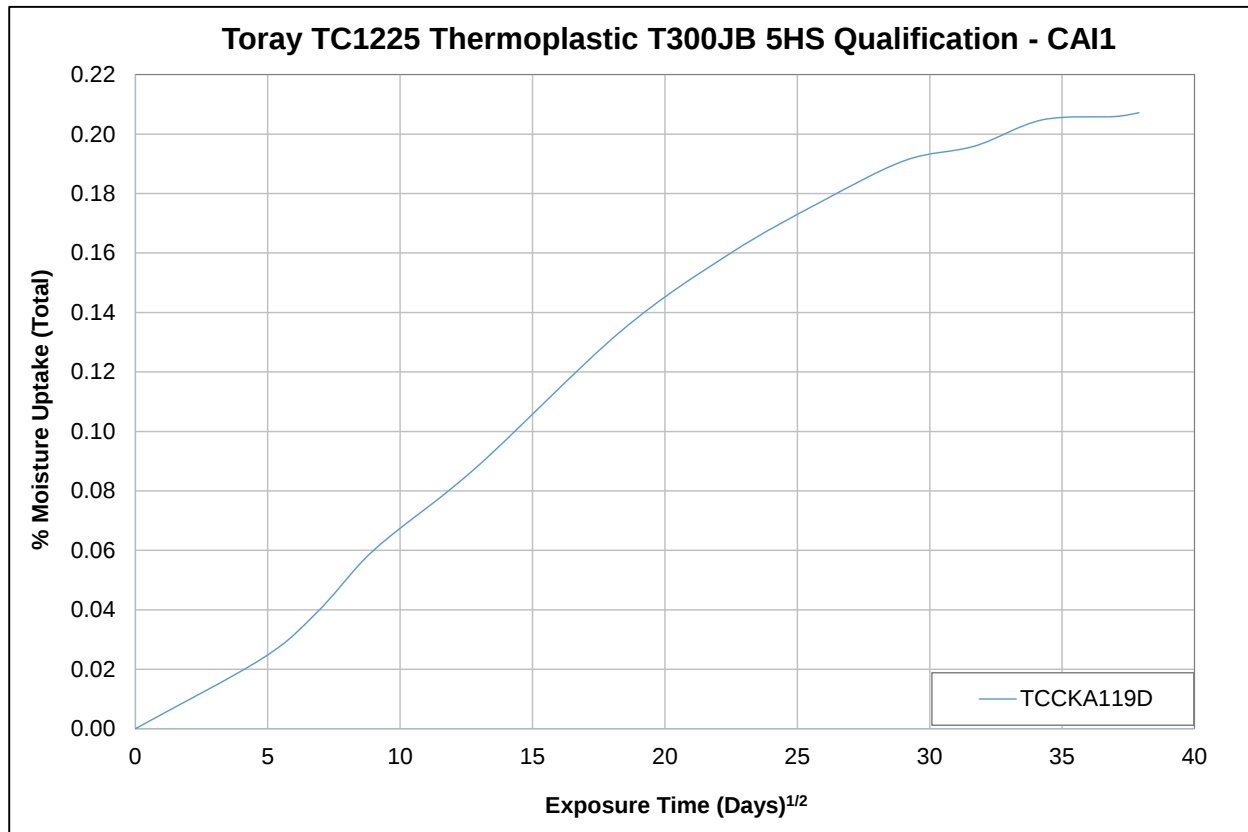


8. Moisture Conditioning Charts

8.1 Warp Tension (WT)- Thinnest Panel



8.2 “25/50/25” Compression After Impact (CAI1) - Thickest Panel



9. DMA Results

9.1 DMA Dry

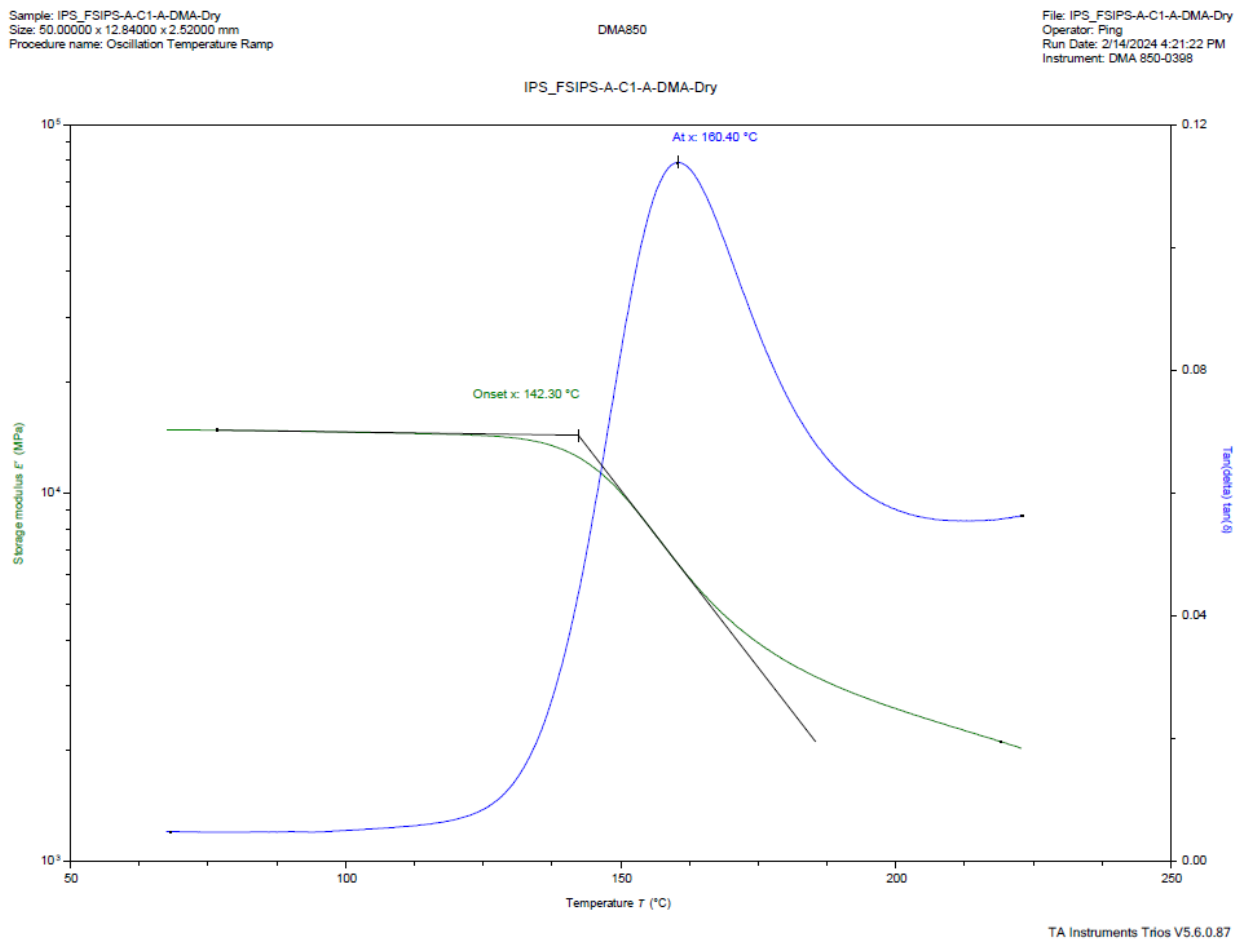
DMA Results Summary				
Toray TC1225 Thermoplastic T300JB 5HS Qualification DMA Dry				
Sample ID	Onset Storage Modulus		Peak of Tangent Delta	
	T _g [°C]	T _g [°F]	T _g [°C]	T _g [°F]
IPS/FSIPS-A-C1-A-DMA-Dry	142.30	288.14	160.40	320.72
IPS/FSIPS-A-C1-A-DMA-Dry-R	147.73	297.91	166.56	331.81
IPS/FSIPS-A-C2-A-DMA-Dry	143.76	290.77	161.95	323.51
IPS/FSIPS-A-C2-A-DMA-Dry-R	147.86	298.15	166.55	331.79
IPS-B-C1-A-DMA-Dry	148.53	299.35	166.60	331.88
IPS-B-C2-A-DMA-Dry	147.06	296.71	166.45	331.61
IPS-C-C1-A-DMA-Dry	143.62	290.52	163.90	327.02
IPS-C-C2-A-DMA-Dry	143.05	289.49	166.05	330.89
UNT1/UNC1/SSB1-A-C1-A-DMA-Dry	144.63	292.33	163.70	326.66
UNT1/UNC1/SSB1-A-C2-A-DMA-Dry	145.96	294.73	165.29	329.52
UNT1/UNC1/SSB1-B-C1-A-DMA-Dry	146.69	296.04	165.71	330.28
UNT1/UNC1/SSB1-B-C2-A-DMA-Dry	146.41	295.54	166.52	331.74
UNT1/UNC1/SSB1-C-C1-A-DMA-Dry	144.35	291.83	165.52	329.94
UNT1/UNC1/SSB1-C-C2-A-DMA-Dry	143.40	290.12	165.80	330.44
UNT3/UNC3/SSB3/OHT3/FHT3/OHC3/OHC3-A-C1-A-DMA-Dry	147.97	298.35	165.31	329.56
UNT3/UNC3/SSB3/OHT3/FHT3/OHC3/OHC3-A-C2-A-DMA-Dry	148.41	299.14	166.40	331.52
UNT3/UNC3/SSB3/OHT3/FHT3/OHC3/OHC3-B-C1-A-DMA-Dry	148.47	299.25	166.96	332.53
UNT3/UNC3/SSB3/OHT3/FHT3/OHC3/OHC3-B-C2-A-DMA-Dry	148.17	298.71	166.59	331.86
UNT3/UNC3/SSB3/OHT3/FHT3/OHC3/OHC3-C-C1-A-DMA-Dry	145.13	293.23	163.70	326.66
UNT3/UNC3/SSB3/OHT3/FHT3/OHC3/OHC3-C-C2-A-DMA-Dry	145.50	293.90	165.84	330.51
WT/WC/FT/FC/WFLEX/FFLEX/DNS-A-C1-A-DMA-Dry	146.86	296.35	165.28	329.50
WT/WC/FT/FC/WFLEX/FFLEX/DNS-A-C2-A-DMA-Dry	147.69	297.84	165.37	329.67
WT/WC/FT/FC/WFLEX/FFLEX/DNS-B-C1-A-DMA-Dry	147.79	298.02	167.36	333.25
WT/WC/FT/FC/WFLEX/FFLEX/DNS-B-C2-A-DMA-Dry	148.24	298.83	167.08	332.74
WT/WC/FT/FC/WFLEX/FFLEX/DNS-C-C1-A-DMA-Dry	145.33	293.59	165.17	329.31
WT/WC/FT/FC/WFLEX/FFLEX/DNS-C-C2-A-DMA-Dry	145.49	293.88	166.27	331.29
Average	146.17	295.10	165.47	329.85
Standard Deviation	1.922	3.459	1.606	2.891

9.2 DMA Wet

DMA Results Summary				
Toray TC1225 Thermoplastic T300JB 5HS Qualification DMA Wet				
Sample ID	Onset Storage Modulus		Peak of Tangent Delta	
	T _g [°C]	T _g [°F]	T _g [°C]	T _g [°F]
IPS/FSIPS-A-C1-A-DMA-Wet	133.30	271.94	156.58	313.84
IPS/FSIPS-A-C1-A-DMA-Wet-R	136.58	277.84	156.66	313.99
IPS/FSIPS-A-C2-A-DMA-Wet	133.57	272.43	156.74	314.13
IPS/FSIPS-A-C2-A-DMA-Wet-R	136.29	277.32	155.93	312.67
IPS-B-C1-A-DMA-Wet	134.84	274.71	154.93	310.87
IPS-B-C2-A-DMA-Wet	135.30	275.54	155.99	312.78
IPS-C-C1-A-DMA-Wet	136.09	276.96	155.22	311.40
IPS-C-C2-A-DMA-Wet	136.65	277.97	155.46	311.83
UNT1/UNC1/SSB1-A-C1-A-DMA-Wet	135.94	276.69	155.50	311.90
UNT1/UNC1/SSB1-A-C2-A-DMA-Wet	135.79	276.42	155.23	311.41
UNT1/UNC1/SSB1-B-C1-A-DMA-Wet	136.35	277.43	156.04	312.87
UNT1/UNC1/SSB1-B-C2-A-DMA-Wet	135.91	276.64	155.84	312.51
UNT1/UNC1/SSB1-C-C1-A-DMA-Wet	134.78	274.60	155.83	312.49
UNT1/UNC1/SSB1-C-C2-A-DMA-Wet	135.02	275.04	155.26	311.47
UNT3/UNC3/SSB3/OHT3/FHT3/OHC3/OHC3-A-C1-A-DMA-Wet	137.21	278.98	155.50	311.90
UNT3/UNC3/SSB3/OHT3/FHT3/OHC3/OHC3-A-C2-A-DMA-Wet	137.16	278.89	155.58	312.04
UNT3/UNC3/SSB3/OHT3/FHT3/OHC3/OHC3-B-C1-A-DMA-Wet	136.06	276.91	155.06	311.11
UNT3/UNC3/SSB3/OHT3/FHT3/OHC3/OHC3-B-C2-A-DMA-Wet	135.46	275.83	155.22	311.40
UNT3/UNC3/SSB3/OHT3/FHT3/OHC3/OHC3-C-C1-A-DMA-Wet	136.54	277.77	155.20	311.36
UNT3/UNC3/SSB3/OHT3/FHT3/OHC3/OHC3-C-C2-A-DMA-Wet	136.51	277.72	155.16	311.29
WT/WC/FT/FC/WFLEX/FFLEX/DNS-A-C1-A-DMA-Wet	137.24	279.03	155.87	312.57
WT/WC/FT/FC/WFLEX/FFLEX/DNS-A-C2-A-DMA-Wet	136.80	278.24	155.58	312.04
WT/WC/FT/FC/WFLEX/FFLEX/DNS-B-C1-A-DMA-Wet	136.43	277.57	155.79	312.42
WT/WC/FT/FC/WFLEX/FFLEX/DNS-B-C2-A-DMA-Wet	134.56	274.21	155.78	312.40
WT/WC/FT/FC/WFLEX/FFLEX/DNS-C-C1-A-DMA-Wet	136.55	277.79	155.48	311.86
WT/WC/FT/FC/WFLEX/FFLEX/DNS-C-C2-A-DMA-Wet	136.59	277.86	155.14	311.25
Average	135.90	276.63	155.64	312.15
Standard Deviation	1.040	1.871	0.4881	0.8786

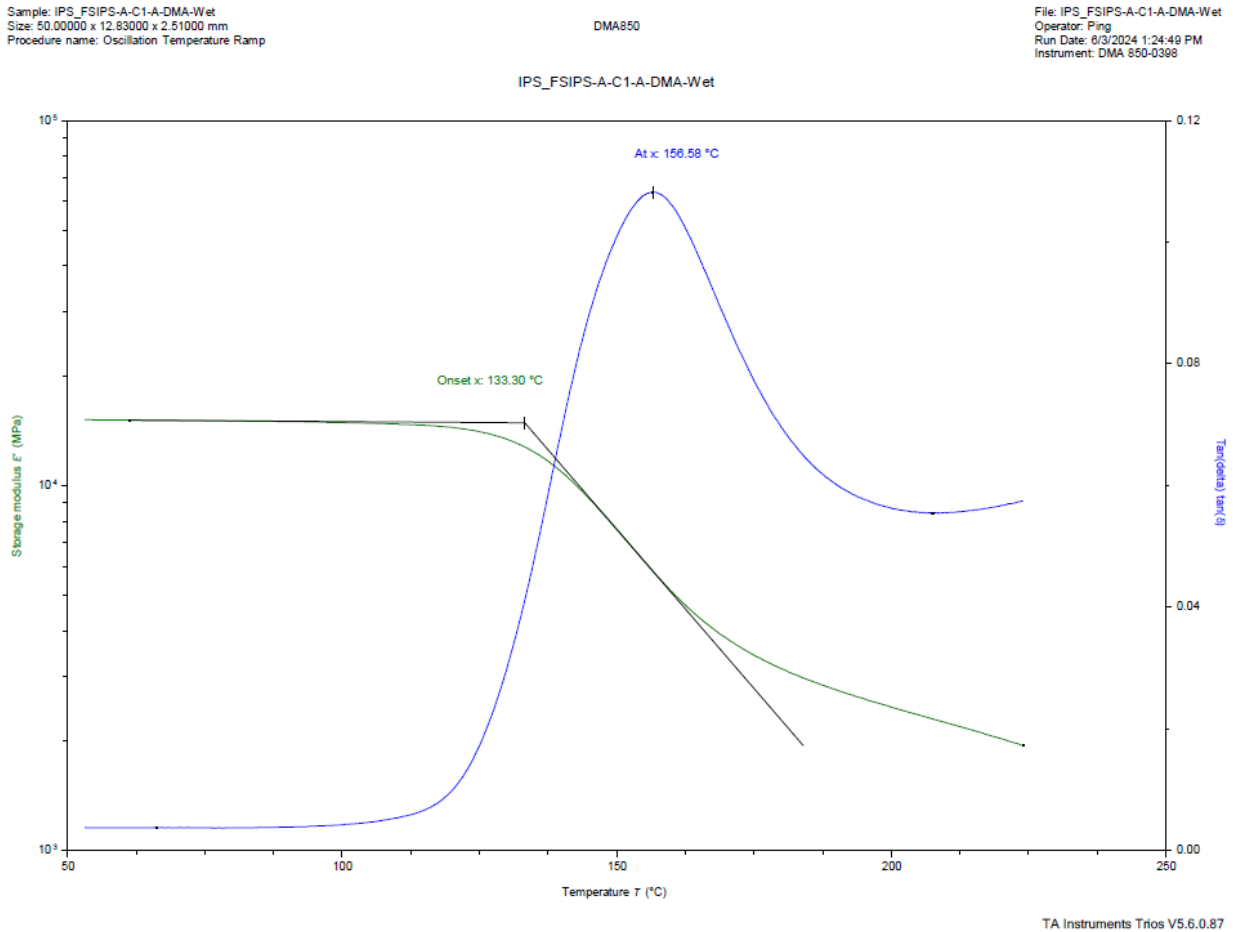
9.3 DMA Dry Batch A

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. DSC Results

DSC Results - 1 st Heating Cycle										
Toray TC1225 Thermoplastic T300JB 5HS Qualification DSC										
Sample ID	Glass Transition Temperature		Melting Peak Temperature		Enthalpy of Melting ΔH_m [J/g]	Crystallization Peak Temperature		Enthalpy of Crystallization ΔH_c [J/g]	Crystallinity ($\bar{x}$ Theoretical R_c) %	Crystallinity ($\bar{x}$ Actual R_c) %
	T_g [°C]	T_g [°F]	T_m [°C]	T_m [°F]		T_c [°C]	T_c [°F]			
IPS/FSIPS-A-C1-A-DSC	146.66	295.99	308.77	587.79	13.178	259.69	499.44	14.639	24.14	20.73
IPS/FSIPS-A-C2-A-DSC	147.47	297.45	308.52	587.34	14.794	259.26	498.67	14.807	27.10	23.77
IPS-B-C1-A-DSC	147.62	297.72	307.79	586.02	14.522	258.68	497.62	14.424	26.60	23.42
IPS-B-C2-A-DSC	150.93	303.67	308.55	587.39	14.804	258.13	496.63	14.274	27.11	23.81
IPS-C-C1-A-DSC	146.00	294.80	308.14	586.65	14.489	258.27	496.89	14.515	26.54	23.57
IPS-C-C2-A-DSC	147.53	297.55	308.55	587.39	14.530	258.36	497.05	14.383	26.61	23.08
OHT1/FHT1/OHC1/FHC1-A-C1-A-DSC	148.88	299.98	308.38	587.08	15.134	259.02	498.24	14.673	27.72	23.98
OHT1/FHT1/OHC1/FHC1-A-C2-A-DSC	149.38	300.88	308.54	587.37	15.700	259.62	499.32	14.986	28.75	24.68
OHT1/FHT1/OHC1/FHC1-B-C1-A-DSC	148.84	299.91	308.14	586.65	14.108	258.62	497.52	14.453	25.84	22.30
OHT1/FHT1/OHC1/FHC1-B-C2-A-DSC	152.20	305.96	308.56	587.41	15.248	258.20	496.76	14.208	27.93	24.15
OHT1/FHT1/OHC1/FHC1-C-C1-A-DSC	149.74	301.53	308.20	586.76	14.982	258.47	497.25	14.816	27.44	23.88
OHT1/FHT1/OHC1/FHC1-C-C2-A-DSC	151.50	304.70	308.75	587.75	15.104	258.34	497.01	15.052	27.66	23.80
UNT1/UNC1/SSB1-A-C1-A-DSC	149.05	300.29	307.83	586.09	14.876	259.44	498.99	15.158	27.25	23.85
UNT1/UNC1/SSB1-A-C2-A-DSC	149.78	301.60	308.45	587.21	15.446	260.55	500.99	15.803	28.29	24.51
UNT1/UNC1/SSB1-B-C1-A-DSC	150.48	302.86	307.74	585.93	14.796	258.67	497.61	14.635	27.10	23.80
UNT1/UNC1/SSB1-B-C2-A-DSC	150.14	302.25	308.20	586.76	15.872	258.56	497.41	14.906	29.07	25.54
UNT1/UNC1/SSB1-C-C1-A-DSC	149.48	301.06	308.03	586.45	15.001	258.25	496.85	14.590	27.47	23.93
UNT1/UNC1/SSB1-C-C2-A-DSC	152.40	306.32	308.58	587.44	14.578	258.37	497.07	14.543	26.70	23.15
UNT2/UNC2/SSB2/OHT2/FHT2/OHC2/FHC2-A-C1-A-DSC	149.94	301.89	308.57	587.43	16.020	260.51	500.92	15.947	29.34	25.68
UNT2/UNC2/SSB2/OHT2/FHT2/OHC2/FHC2-A-C2-A-DSC	150.49	302.88	308.51	587.32	15.501	259.48	499.06	15.052	28.39	24.34
UNT2/UNC2/SSB2/OHT2/FHT2/OHC2/FHC2-B-C1-A-DSC	149.95	301.91	308.70	587.66	14.494	258.41	497.14	14.355	26.55	23.14
UNT2/UNC2/SSB2/OHT2/FHT2/OHC2/FHC2-B-C2-A-DSC	155.31	311.56	308.72	587.70	13.907	258.14	496.65	13.843	25.47	22.16
UNT2/UNC2/SSB2/OHT2/FHT2/OHC2/FHC2-C-C1-A-DSC	153.08	307.54	308.75	587.75	14.687	258.43	497.17	14.506	26.90	23.18
UNT2/UNC2/SSB2/OHT2/FHT2/OHC2/FHC2-C-C2-A-DSC	152.81	307.06	308.25	586.85	14.931	258.37	497.07	14.683	27.35	23.72
UNT3/UNC3/SSB3/OHT3/FHT3/OHC3/FHC3-A-C1-A-DSC	148.78	299.80	308.26	586.87	14.975	259.57	499.23	15.380	27.43	24.08
UNT3/UNC3/SSB3/OHT3/FHT3/OHC3/FHC3-A-C2-A-DSC	149.58	301.24	308.47	587.25	15.320	260.26	500.47	15.728	28.06	23.95
UNT3/UNC3/SSB3/OHT3/FHT3/OHC3/FHC3-B-C1-A-DSC	150.86	303.55	308.49	587.28	14.752	258.44	497.19	15.138	27.02	23.30
UNT3/UNC3/SSB3/OHT3/FHT3/OHC3/FHC3-B-C2-A-DSC	151.85	305.33	308.14	586.65	14.470	258.13	496.63	14.940	26.50	22.73
UNT3/UNC3/SSB3/OHT3/FHT3/OHC3/FHC3-C-C1-A-DSC	152.07	305.73	308.42	587.16	14.276	258.17	496.71	14.739	26.15	22.80
UNT3/UNC3/SSB3/OHT3/FHT3/OHC3/FHC3-C-C2-A-DSC	150.98	303.76	308.82	587.88	14.303	258.03	496.45	13.776	26.20	22.52
WT/MC/FT/FC/WFLEX/FFLEX/DNS-A-C1-A-DSC	148.93	300.07	308.03	586.45	15.755	260.14	500.25	15.158	28.86	24.80
WT/MC/FT/FC/WFLEX/FFLEX/DNS-A-C2-A-DSC	148.76	299.77	308.95	588.11	15.885	259.78	499.60	15.526	29.09	25.36
WT/MC/FT/FC/WFLEX/FFLEX/DNS-B-C2-A-DSC	151.85	305.33	308.15	586.67	14.865	258.02	496.44	14.297	27.23	23.42
WT/MC/FT/FC/WFLEX/FFLEX/DNS-B-C3-A-DSC	151.73	305.11	308.22	586.80	15.424	258.48	497.26	14.925	28.25	24.07
WT/MC/FT/FC/WFLEX/FFLEX/DNS-C-C1-A-DSC	149.67	301.41	308.27	586.89	15.330	258.67	497.61	15.114	28.08	24.47
WT/MC/FT/FC/WFLEX/FFLEX/DNS-C-C2-A-DSC	149.57	301.23	308.65	587.57	14.442	258.45	497.21	14.691	26.45	23.15
Average	150.12	302.21	308.39	587.10	14.903	258.83	497.90	14.796	27.29	23.69
Standard Deviation	1.92	3.46	0.300	0.540	0.600	0.748	1.35	0.495	1.10	0.968

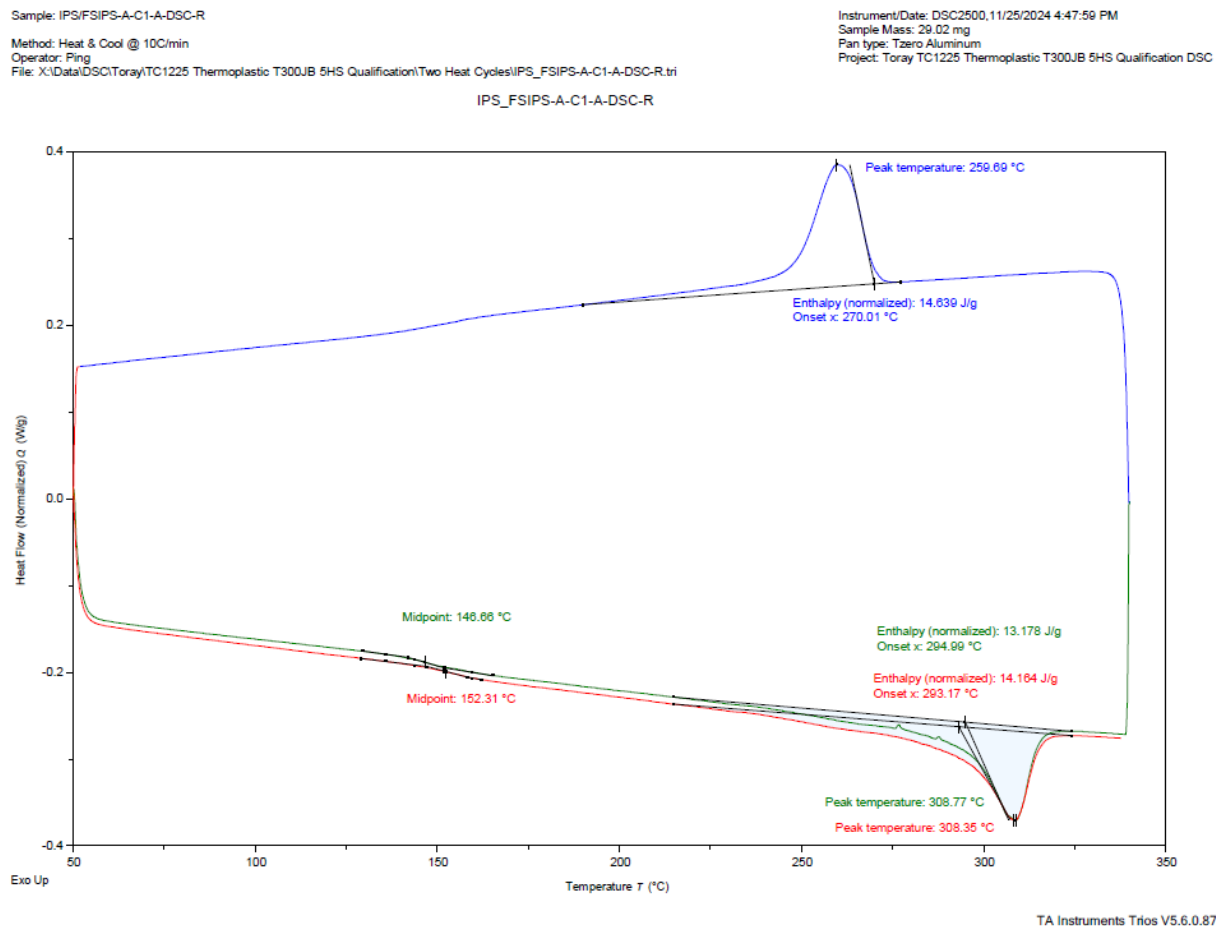
Note 1: Theoretical R_c , nominal = 42%Note 2: Actual R_c from Method 2.

DSC Results - 2 nd Heating Cycle							
Toray TC1225 Thermoplastic T300JB 5HS Qualification DSC							
Sample ID	Glass Transition Temperature		Melting Peak Temperature		Enthalpy of Melting ΔH_m [J/g]	Crystallinity (¹ Theoretical R_c) %	Crystallinity (² Actual R_c) %
	T_g [°C]	T_g [°F]	T_m [°C]	T_m [°F]			
IPS/FSIPS-A-C1-A-DSC	152.31	306.16	308.35	587.03	14.164	25.94	22.28
IPS/FSIPS-A-C2-A-DSC	152.45	306.41	308.52	587.34	14.230	26.06	22.87
IPS-B-C1-A-DSC	152.28	306.10	308.37	587.07	14.431	26.43	23.28
IPS-B-C2-A-DSC	152.42	306.36	308.21	586.78	14.050	25.73	22.60
IPS-C-C1-A-DSC	152.97	307.35	308.37	587.07	14.306	26.20	23.27
IPS-C-C2-A-DSC	152.98	307.36	308.12	586.62	14.257	26.11	22.65
OHT1/FHT1/OHC1/FHC1-A-C1-A-DSC	153.39	308.10	308.28	586.90	14.928	27.34	23.65
OHT1/FHT1/OHC1/FHC1-A-C2-A-DSC	153.28	307.90	308.20	586.76	15.273	27.97	24.01
OHT1/FHT1/OHC1/FHC1-B-C1-A-DSC	153.61	308.50	308.20	586.76	14.615	26.77	23.11
OHT1/FHT1/OHC1/FHC1-B-C2-A-DSC	153.37	308.07	308.21	586.78	14.466	26.49	22.92
OHT1/FHT1/OHC1/FHC1-C-C1-A-DSC	153.48	308.26	308.35	587.03	15.018	27.51	23.94
OHT1/FHT1/OHC1/FHC1-C-C2-A-DSC	153.30	307.94	308.41	587.14	14.593	26.73	22.99
UNT1/UNC1/SSB1-A-C1-A-DSC	153.03	307.45	308.40	587.12	15.084	27.63	24.18
UNT1/UNC1/SSB1-A-C2-A-DSC	155.31	311.56	308.11	586.60	15.866	29.06	25.17
UNT1/UNC1/SSB1-B-C1-A-DSC	153.09	307.56	308.33	586.99	14.536	26.62	23.39
UNT1/UNC1/SSB1-B-C2-A-DSC	153.89	309.00	308.13	586.63	14.505	26.57	23.34
UNT1/UNC1/SSB1-C-C1-A-DSC	154.18	309.52	308.26	586.87	14.414	26.40	22.99
UNT1/UNC1/SSB1-C-C2-A-DSC	152.98	307.36	308.07	586.53	14.155	25.92	22.48
UNT2/UNC2/SSB2/OHT2/FHT2/OHC2/FHC2-A-C1-A-DSC	153.32	307.98	308.30	586.94	15.554	28.49	24.93
UNT2/UNC2/SSB2/OHT2/FHT2/OHC2/FHC2-A-C2-A-DSC	153.74	308.73	308.68	587.62	14.898	27.29	23.39
UNT2/UNC2/SSB2/OHT2/FHT2/OHC2/FHC2-B-C1-A-DSC	153.73	308.71	308.44	587.19	13.906	25.47	22.20
UNT2/UNC2/SSB2/OHT2/FHT2/OHC2/FHC2-B-C2-A-DSC	155.59	312.06	308.21	586.78	13.960	25.57	22.24
UNT2/UNC2/SSB2/OHT2/FHT2/OHC2/FHC2-C-C1-A-DSC	153.81	308.86	308.75	587.75	14.687	26.90	23.18
UNT2/UNC2/SSB2/OHT2/FHT2/OHC2/FHC2-C-C2-A-DSC	153.76	308.77	307.91	586.24	14.525	26.60	23.08
UNT3/UNC3/SSB3/OHT3/FHT3/OHC3/FHC3-A-C1-A-DSC	153.50	308.30	308.09	586.56	15.337	28.09	24.67
UNT3/UNC3/SSB3/OHT3/FHT3/OHC3/FHC3-A-C2-A-DSC	153.24	307.83	308.63	587.53	15.520	28.42	24.26
UNT3/UNC3/SSB3/OHT3/FHT3/OHC3/FHC3-B-C1-A-DSC	154.22	309.60	308.40	587.12	14.281	26.16	22.55
UNT3/UNC3/SSB3/OHT3/FHT3/OHC3/FHC3-B-C2-A-DSC	153.63	308.53	308.13	586.63	14.397	26.37	22.61
UNT3/UNC3/SSB3/OHT3/FHT3/OHC3/FHC3-C-C1-A-DSC	153.51	308.32	308.49	587.28	14.642	26.82	23.38
UNT3/UNC3/SSB3/OHT3/FHT3/OHC3/FHC3-C-C2-A-DSC	154.10	309.38	309.06	588.31	13.391	24.53	21.09
WTWC/FT/FC/WFLEX/FFLEX/DNS-A-C1-A-DSC	153.38	308.08	308.10	586.58	15.371	28.15	24.19
WTWC/FT/FC/WFLEX/FFLEX/DNS-A-C2-A-DSC	152.79	307.02	308.20	586.76	15.732	28.81	25.11
WTWC/FT/FC/WFLEX/FFLEX/DNS-B-C2-A-DSC	153.14	307.65	308.31	586.96	14.673	26.87	23.12
WTWC/FT/FC/WFLEX/FFLEX/DNS-B-C3-A-DSC	153.28	307.90	308.22	586.80	14.552	26.65	22.71
WTWC/FT/FC/WFLEX/FFLEX/DNS-C-C1-A-DSC	153.53	308.35	308.51	587.32	15.355	28.12	24.51
WTWC/FT/FC/WFLEX/FFLEX/DNS-C-C2-A-DSC	153.80	308.84	308.46	587.23	14.645	26.82	23.48
Average	153.46	308.22	308.33	586.99	14.675	26.88	23.33
Standard Deviation	0.692	1.25	0.221	0.397	0.557	1.02	0.899

Note 1: Theoretical R_c , nominal = 42%Note 2: Actual R_c from Method 2.

10.1 DSC Graph

A representative of DSC profile from Batch A is provided below.



11. TMA Results

11.1 X Direction

TMA Results - X Direction		
Toray TC1225 Thermoplastic T300JB 5HS Qualification TMA Dry		
Sample ID	Coefficient of Thermal Expansion in x-direction	
	α [$\mu\text{m}/(\text{m}\cdot^{\circ}\text{C})$]	α [$\mu\text{in}/(\text{in}\cdot^{\circ}\text{F})$]
WTWC/FT/FC/WFLEX/FFLEX/DNS-A-C1-A-XCTE-1	4.85	2.69
WTWC/FT/FC/WFLEX/FFLEX/DNS-A-C1-A-XCTE-2	4.30	2.39
WTWC/FT/FC/WFLEX/FFLEX/DNS-A-C1-A-XCTE-3	4.82	2.68
WTWC/FT/FC/WFLEX/FFLEX/DNS-B-C2-A-XCTE-1	5.06	2.81
WTWC/FT/FC/WFLEX/FFLEX/DNS-B-C2-A-XCTE-2	5.02	2.79
WTWC/FT/FC/WFLEX/FFLEX/DNS-B-C2-A-XCTE-3	4.81	2.67
WTWC/FT/FC/WFLEX/FFLEX/DNS-C-C1-A-XCTE-1	4.03	2.24
WTWC/FT/FC/WFLEX/FFLEX/DNS-C-C1-A-XCTE-2	3.35	1.86
WTWC/FT/FC/WFLEX/FFLEX/DNS-C-C1-A-XCTE-3	4.65	2.58
Average	4.54	2.52
St. Dev.	0.5573	0.3096

11.2 Y Direction

TMA Results - Y Direction		
Toray TC1225 Thermoplastic T300JB 5HS Qualification TMA Dry		
Sample ID	Coefficient of Thermal Expansion in y-direction	
	α [$\mu\text{m}/(\text{m}\cdot^{\circ}\text{C})$]	α [$\mu\text{in}/(\text{in}\cdot^{\circ}\text{F})$]
WTWC/FT/FC/WFLEX/FFLEX/DNS-A-C1-A-YCTE-1	3.58	1.99
WTWC/FT/FC/WFLEX/FFLEX/DNS-A-C1-A-YCTE-2	5.11	2.84
WTWC/FT/FC/WFLEX/FFLEX/DNS-A-C1-A-YCTE-3	4.64	2.58
WTWC/FT/FC/WFLEX/FFLEX/DNS-B-C2-A-YCTE-1	5.05	2.81
WTWC/FT/FC/WFLEX/FFLEX/DNS-B-C2-A-YCTE-2	4.44	2.46
WTWC/FT/FC/WFLEX/FFLEX/DNS-B-C2-A-YCTE-3	4.92	2.73
WTWC/FT/FC/WFLEX/FFLEX/DNS-C-C1-A-YCTE-1	4.43	2.46
WTWC/FT/FC/WFLEX/FFLEX/DNS-C-C1-A-YCTE-2	4.55	2.53
WTWC/FT/FC/WFLEX/FFLEX/DNS-C-C1-A-YCTE-3	3.19	1.77
Average	4.43	2.46
St. Dev.	0.6531	0.3628

11.3 Z Direction

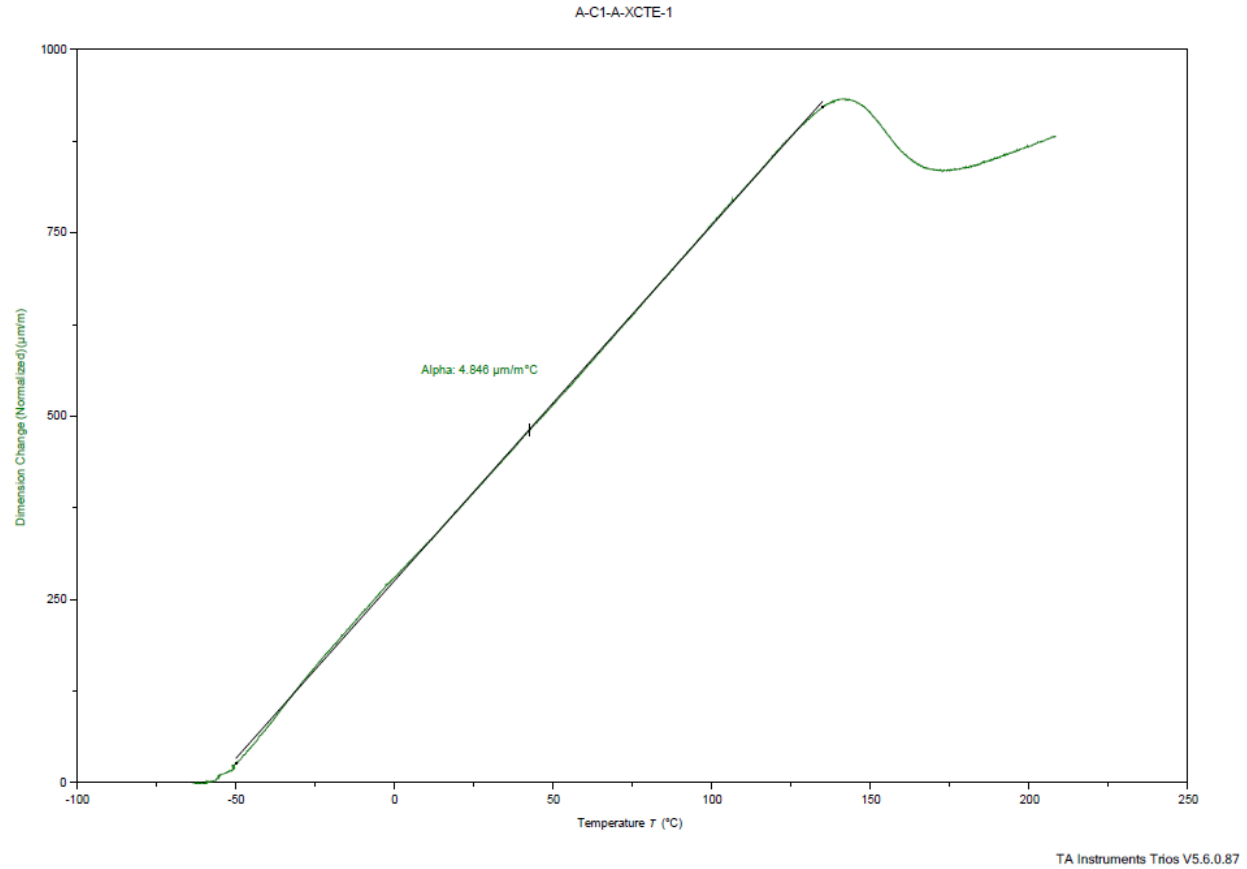
TMA Results - Z Direction		
Toray TC1225 Thermoplastic T300JB 5HS Qualification TMA Dry		
Sample ID	Coefficient of Thermal Expansion in z-direction (-50°C to 125°C)	
	α [$\mu\text{m}/(\text{m}\cdot^\circ\text{C})$]	α [$\mu\text{in}/(\text{in}\cdot^\circ\text{F})$]
WTWC/FT/FC/WFLEX/FFLEX/DNS-A-C1-A-ZCTE-1	47.59	26.44
WTWC/FT/FC/WFLEX/FFLEX/DNS-A-C1-A-ZCTE-2	53.17	29.54
WTWC/FT/FC/WFLEX/FFLEX/DNS-A-C1-A-ZCTE-3	53.10	29.50
WTWC/FT/FC/WFLEX/FFLEX/DNS-B-C2-A-ZCTE-1	49.64	27.58
WTWC/FT/FC/WFLEX/FFLEX/DNS-B-C2-A-ZCTE-2	55.05	30.58
WTWC/FT/FC/WFLEX/FFLEX/DNS-B-C2-A-ZCTE-3	56.04	31.13
WTWC/FT/FC/WFLEX/FFLEX/DNS-C-C1-A-ZCTE-1	51.53	28.63
WTWC/FT/FC/WFLEX/FFLEX/DNS-C-C1-A-ZCTE-2	57.43	31.91
WTWC/FT/FC/WFLEX/FFLEX/DNS-C-C1-A-ZCTE-3	59.90	33.28
Average	53.72	29.84
St. Dev.	3.854	2.141
Sample ID	Coefficient of Thermal Expansion in z-direction (160°C to 210°C)	
	α [$\mu\text{m}/(\text{m}\cdot^\circ\text{C})$]	α [$\mu\text{in}/(\text{in}\cdot^\circ\text{F})$]
WTWC/FT/FC/WFLEX/FFLEX/DNS-A-C1-A-ZCTE-1	177.5	98.61
WTWC/FT/FC/WFLEX/FFLEX/DNS-A-C1-A-ZCTE-2	186.6	103.7
WTWC/FT/FC/WFLEX/FFLEX/DNS-A-C1-A-ZCTE-3	186.1	103.4
WTWC/FT/FC/WFLEX/FFLEX/DNS-B-C2-A-ZCTE-1	176.0	97.78
WTWC/FT/FC/WFLEX/FFLEX/DNS-B-C2-A-ZCTE-2	167.2	92.89
WTWC/FT/FC/WFLEX/FFLEX/DNS-B-C2-A-ZCTE-3	163.8	91.00
WTWC/FT/FC/WFLEX/FFLEX/DNS-C-C1-A-ZCTE-1	177.8	98.78
WTWC/FT/FC/WFLEX/FFLEX/DNS-C-C1-A-ZCTE-2	184.4	102.4
WTWC/FT/FC/WFLEX/FFLEX/DNS-C-C1-A-ZCTE-3	189.0	105.0
Average	178.7	99.28
St. Dev.	8.800	4.889

11.4 TMA Graph

A representative of TMA Dry profile from Batch A is provided below.

Sample: A-C1-A-XCTE-1
Method: Temperature Ramp @ 5C/min
Operator: Ping
File: X:\Data\TMA\Toray\TC1225 Thermoplastic T300JB 5HS Qualification\A-C1-A-XCTE-1.tri

Instrument/Date: TMA450.2/14/2024 10:27:09 AM
Initial Length: 10.21059 mm
Project: Toray TC1225 Thermoplastic T300JB 5HS Qualification TMA Dry



12. Moisture Loss

A representative specimen was used to measure the moisture loss.

Layup	Test Type	Specimen ID	Weight Pre-Test (g)	Weight Post-Test (g)	Moisture Loss (g)
[+45]4S	IPS	TCCNA115D	24.75	24.72	0.0218
[0/45]4S	CAI1	TCCKA119D	117.4	117.3	0.0123

13. Deviations

N/A