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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—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 do 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 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 Solvay Cytec Cycom 5320-1 T650 Unitape Gr 145 Qualification Statistical Analysis Report NCP-RP-2013-001 Rev A. The qualification material was procured to NCAMP Material Specification NMS 532/5 Initial Release dated July 6, 2010. The qualification test panels were cured in accordance with NCAMP Process Specification NPS 85321 Rev A dated September 23, 2010 Baseline "C" Cure Cycle. The NCAMP Test Plan NTP 5325Q1 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. 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 are adequate for the given program.

Aircraft companies should not use the data published in this report without specifying NCAMP Material Specification NMS 532/5. NMS 532/5 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 532/5.* NMS 532/5 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

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
SBS	short beam strength
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}^{smax}	in-plane shear peak strength before 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
su	shear ultimate
t	tension
tu	tension ultimate

Subscripts

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

Acronyms and Definitions

ASTM	American Society for Testing and Materials
B – Basis	95% lower confidence limit on the tenth population percentile
CV	Coefficient of variation
CTD	cold temperature dry
CPT	cured ply thickness
ETD	elevated temperature dry
ETW	elevated temperature wet
Gr/Ep	graphite/epoxy
norm	normalized
RTD	room temperature dry
SACMA	Suppliers of Advanced Composite Materials Association
SRM	SACMA Recommended Method
Tply	thickness divided by the number of plies provides the thickness average per specimen
wet	specimen with an “equilibrium” moisture content
T, RH	temperature, relative humidity

1.3 NIAR–Specimen Naming Format

NIAR NCAMP— CYTEC 5320-1

NAMING FORMAT

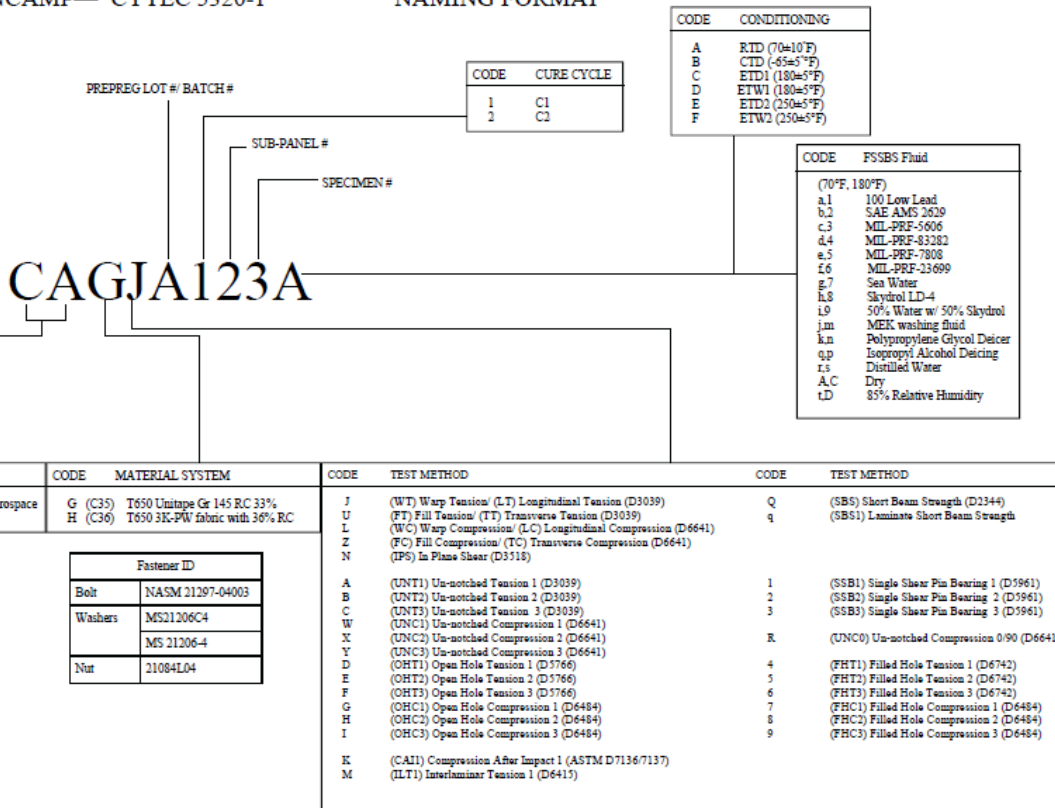


Figure 1-1: Naming Format

1.4 References

ASTM Standards

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:

- ASTM D2344/D2344M-00(2006) – Standard Test Method for Short-Beam Strength of Polymer Matrix Composite Materials and Their Laminates
- ASTM D3039/D3039M-08 – Standard Test Method for Tensile Properties of Polymer Matrix Composite Materials
- ASTM D3518/D3518M-94(2007) – 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-07 – Standard Test Method for Open Hole Tensile Strength of Polymer Matrix Composite Laminates
- ASTM D5961/D5961M-08 – Standard Test Method for Bearing Response of Polymer Matrix Composite Laminates
- ASTM D6415-06ae1 – Standard Test Method for Measuring the Curved Beam Strength of a Fiber-Reinforced Polymer-Matrix Composite
- ASTM D6484/D6484M-04 – Standard Test Method for Open-Hole Compressive Strength of Polymer Matrix Composite Laminates
- ASTM D6641/D6641M-01e1 – Standard Test Method for Determining the Compressive Properties of Polymer Matrix Composite Laminates Using a Combined Loading Compression (CLC) Test Fixture
- ASTM D6742/D6742M-07 – Standard Practice for Filled-Hole Tension and Compression Testing of Polymer Matrix Composite Laminates
- ASTM D7028-07e1 – Standard Test Method for Glass Transition Temperature (DMA Tg) of Polymer Matrix Composites by Dynamic Mechanical Analysis (DMA)
- ASTM D7136/D7136M-07 – Standard Test Method for Measuring the Damage Resistance of a Fiber-Reinforced Polymer Matrix Composite to a Drop-Weight Impact Event
- ASTM D7137/D7137M-07 – Standard Test Method for Compressive Residual Strength Properties of Damaged Polymer Matrix Composite Plates

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.

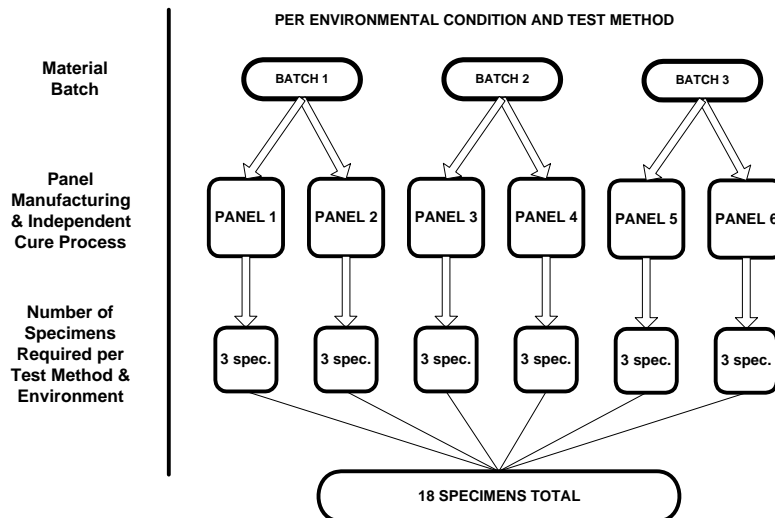


Figure 1-2: Specimen Selection Methodology

All panels were fabricated in accordance with NCAMP process specification 85321 “C” Cure Cycle.

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

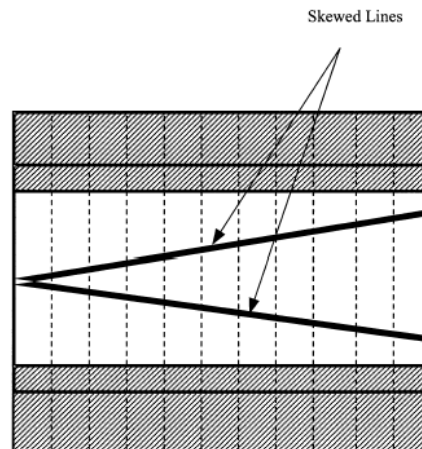


Figure 1-3: Specimen Traceability Line

1.5.2 Specimen & Testing Details

1.5.2.1 Tabbing

Longitudinal Tension coupons were tabbed with Solvay Cytec FM 300-2M and $\pm 45^\circ$ Unbeveled Glass tabstock.

1.5.2.2 Specimen Dimensions & Test Configuration

For filled-hole and bearing tests, the hole diameter was 0.25 in $-0.000 +0.003$ in. For filled-hole tension tests, the fasteners were installed to 85 ± 5 in-lb. For filled-hole compression and bearing tests, the fasteners were installed to 30 ± 5 in-lb. 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 tests, the hole diameter was 0.25 in $-0.000 +0.003$ in. The following fasteners were used:

- 1) NASM 21297-04003 bolts with MS 21084 nuts and MS 21206 washers for FHT and FHC1
- 2) NASM 14181-04004 bolts with MS 14182 nuts and MS14183 washers for FHC2 and FHC3
- 3) NASM 21297-04016 bolts with MS 21084 nuts and MS 21206 washers for SSB

1.5.3 Test Matrix

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

Layup	Test Type and Direction	Property	Number of Batches x No. of Panels x No. of Specimens					
			Test Temperature/Moisture Condition					
			CTD	RTD (4)	ETD1	ETW1	ETD2	ETW2
[0] ₈	ASTM D3039 0° Tension	Strength, Modulus and Poisson's Ratio	3x2x3	3x2x3		1x2x3		3x2x3
[0] ₂₀	ASTM D6641 0° Compression	Modulus	3x2x3	3x2x3 (1)	1x2x3	1x2x3	1x2x3	3x2x3
[90] ₁₆	ASTM D3039 90° Tension	Strength and Modulus	3x2x3	3x2x3		1x2x3		3x2x3
[90] ₂₀	ASTM D6641 90° Compression	Strength and Modulus	3x2x3	3x2x3 (1)	1x2x3	1x2x3 (3)	1x2x3	3x2x3 (3)
[90/0/90] ₇	ASTM D6641 0° Compression (5)	Strength and Modulus	3x2x3	3x2x3 (1)	1x2x3	1x2x3 (3)	1x2x3	3x2x3 (3)
[45/-45] _{4S}	ASTM D3518 In-Plane Shear (2)	Strength and Modulus	3x2x3	3x2x3		1x2x3		3x2x3
[0] _{4S}	ASTM D2344 Short Beam	Strength	3x2x3	3x2x3	1x2x3	1x2x3	1x2x3	3x2x3

Table 1-1: Lamina Level Test Matrix

Note 1: Back-to-back strain gages are needed on the first two specimens of RTD environment. If no buckling is observed, the remaining modulus specimens will require a strain gage on one side of the specimens only. An appropriate extensometer may be used in place of the strain gage.

Note 2: Gripped (tab) length is 1.5±0.5" on each end of the 10" long specimen. Once the samples have reached the 5% strain level, the actuator/crosshead displacement rate can be increased by four times the initial rate. Continue testing at the higher strain rate until ultimate failure is observed.

Note 3: If strain gage is used for modulus measurement, a separate un-gaged specimen must be used for strength measurement; because the strain gage and its protective coating may prevent moisture absorption in the gage area.

Note 4: 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.

Note 5: Derive the 0° lamina compressive strength $F_{0^\circ \text{ plies}}^{cu}$ as follows

$$F_{0^\circ \text{ plies}}^{cu} = F_{0^\circ/90^\circ}^{cu} \frac{E_1}{E_{0^\circ/90^\circ}}$$

Where:

$$F_{0^\circ \text{ plies}}^{cu} = 0^\circ \text{ ply Strength}$$

$$F_{0^\circ/90^\circ}^{cu} = 0^\circ/90^\circ \text{ or } 90^\circ/0^\circ \text{ cross-ply laminate strength}$$

$$E_1 = 0^\circ \text{ Modulus}$$

$$E_{0^\circ/90^\circ} = 0^\circ/90^\circ \text{ or } 90^\circ/0^\circ \text{ cross-ply laminate modulus}$$

Table 1-2 below summarizes the laminate level tests carried out. The layup angles 0°, 45°, -45°, and 90° refer to the orientation of the warp/longitudinal 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 1-2 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 Layup (5)	Property	Number of Batches x Number of Panels x Number of Test Specimens			
			Test Temperature/Moisture Condition			
			CTD	RTD	ETW1	ETW2
(25/50/25 - QI) UNT1	ASTM D3039 Un-notched Tension [45/0/-45/90]2S	Strength & modulus	3x2x3	3x2x3 (7)	1x2x3	3x2x3
(10/80/10) UNT2	ASTM D3039 Un-notched Tension [45/-45/0/45/-45/90/45/-45/45/-45]S	Strength & modulus	3x2x3	3x2x3 (7)		3x2x3
(50/40/10) UNT3	ASTM D3039 Un-notched Tension [0/45/0/90/0/-45/0/45/0/-45]S	Strength & modulus	3x2x3	3x2x3 (7)		3x2x3
(25/50/25 - QI) UNC1	ASTM D6641 Un-notched Compression [45/0/-45/90]3S	Strength & modulus		3x2x3 (4&7)	1x2x3 (6)	3x2x3 (6)
(10/80/10) UNC2	ASTM D6641 Un-notched Compression [45/-45/0/45/-45/90/45/-45/45/-45]S	Strength & modulus		3x2x3 (4&7)		3x2x3 (6)
(50/40/10) UNC3	ASTM D6641 Un-notched Compression [45/0/90/0/-45/0/45/0/-45/0]S	Strength & modulus		3x2x3 (4&7)		3x2x3 (6)
(25/50/25 - QI) SBS1	ASTM D2344 Short Beam [45/0/-45/90]4S (specimens may be taken from panels of similar layup)	Strength		3x2x3		3x2x3
(25/50/25 - QI) OHT1	ASTM D5766 Open Hole Tension (1) [45/0/-45/90]2S	Strength	3x2x3	3x2x3	1x2x3	3x2x3
(10/80/10) OHT2	ASTM D5766 Open Hole Tension (1) [45/-45/0/45/-45/90/45/-45/45/-45]S	Strength	3x2x3	3x2x3		3x2x3
(50/40/10) OHT3	ASTM D5766 Open Hole Tension (1) [0/45/0/90/0/-45/0/45/0/-45]S	Strength	3x2x3	3x2x3		3x2x3
(25/50/25 - QI) FHT1	ASTM D6742 Filled Hole Tension (2) [45/0/-45/90]2S	Strength	3x2x3	3x2x3	1x2x3	3x2x3
(10/80/10) FHT2	ASTM D6742 Filled Hole Tension (2) [45/-45/0/45/-45/90/45/-45/45/-45]S	Strength	3x2x3	3x2x3		3x2x3
(50/40/10) FHT3	ASTM D6742 Filled Hole Tension (2) [0/45/0/90/0/-45/0/45/0/-45]S	Strength	3x2x3	3x2x3		3x2x3
(25/50/25 - QI) OHC1	ASTM D6484 Open Hole Compression (1) [45/0/-45/90]4S	Strength		3x2x3 (4)	1x2x3	3x2x3
(10/80/10) OHC2	ASTM D6484 Open Hole Compression (1) [45/-45/0/45/-45/90/45/-45/45/-45]2S	Strength		3x2x3 (4)		3x2x3
(50/40/10) OHC3	ASTM D6484 Open Hole Compression (1) [0/45/0/90/0/-45/0/45/0/-45]2S	Strength		3x2x3 (4)		3x2x3
(25/50/25 - QI) FHC1	ASTM D6484 Filled Hole Compression (2) [45/0/-45/90]4S	Strength		3x2x3	1x2x3	3x2x3
(10/80/10) FHC2	ASTM D6484 Filled Hole Compression (2) [45/-45/0/45/-45/90/45/-45/45/-45]2S	Strength		3x2x3		3x2x3
(50/40/10) FHC3	ASTM D6484 Filled Hole Compression (2) [0/45/0/90/0/-45/0/45/0/-45]2S	Strength		3x2x3		3x2x3
(25/50/25 - QI) SSB1	ASTM D5961 Single Shear Bearing (3) [45/0/-45/90]2S	Strength & Deformation		3x2x3	1x2x3	3x2x3
(10/80/10) SSB2	ASTM D5961 Single Shear Bearing (3) [45/-45/0/45/-45/90/45/-45/45/-45]S	Strength & Deformation		3x2x3		3x2x3
(50/40/10) SSB3	ASTM D5961 Single Shear Bearing (3) [0/45/0/90/0/-45/0/45/0/-45]S	Strength & Deformation		3x2x3		3x2x3
(100/0/0) ILT	ASTM D6415 Interlaminar Tension [0]30	Strength	1x1x6	1x1x6		1x1x6
(25/50/25 - QI) CAI1	ASTM D7136 & D7137 Compression After Impact (1500 in.lb/in) (4) [45/0/-45/90]4S	Strength		1x1x6		

Table 1-2: Laminate Level Test Matrix

- Note 1:** Open-hole configuration: 0.25” hole diameter, 1.5 inch width.
- Note 2:** Filled-hole test configuration: 0.25” diameter, see section 1.5.2.2 for fastener callout, 1.5” width.
- Note 3:** Single shear bearing test configuration: 0.25: hole diameter, 1.5” width, see section 1.5.2.2 for fastener callout, e/D=3, ASTM D5961-08 Procedure C
- Note 4:** Back-to-back strain gages needed on the first two specimens of each environment. If no buckling is observed, the remaining modulus specimens will require strain gage on one side of the specimens only. Appropriate extensometer may be used in place of the strain gage.
- Note 5:** Loading direction is generally along the 0-degree direction
- Note 6:** If strain gage is used for modulus measurement, a separate un-gaged specimen must be used for strength measurement, because the strain gage and its protective coating may prevent moisture absorption in the gage area.
- Note 7:** 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.

1.5.4 Cured Laminate Physical Testing

The properties in **Table 1-3: Physical Testing Matrix** were determined for each panel used for test coupons with the exception of Tg by DMA which were conducted on one laminate per batch from each oven cure 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 (Note 1)	Min Replicates per panel
Cured Ply Thickness	ASTM D3171-06	All data from mechanical test specimens
Laminate Density	ASTM D792-08	3
Fiber Volume, % by Volume	ASTM D3171-06(Note 2)	3
Resin Content, % by Weight	ASTM D3171-06(Note 2)	3
Ultrasonic Through Transmission, C-Scan	MIL-HDBK-787A (Note 3)	1
Glass Transition Temperature, Tg by DMA flexural loading	Dry and Wet – ASTM D7028	1 Dry, 1 Wet (Note 4)
Glass Transition Temperature, Tg by DMA torsional loading	Dry and Wet – ASTM D5279 (Note 5)	1 Dry, 1 Wet (Note 4)

Table 1-3: Physical Testing Matrix

- Note 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.
- Note 2:** Method II, except for laminates of materials where actual fiber weight is not accurately known prior to impregnation, as in the case for unidirectional materials. For these materials, in order to verify Method II is accurate, a minimum of 12 samples per batch shall be tested by Method I, Procedure B.
- Note 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.
- Note 4:** Minimum total of 24 dry and 24 wet for each material system.
- Note 5:** To be performed by Solvay Cytec Engineered Materials, Greenville, TX

1.5.5 Environmental Conditioning

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

CTD = -65±5°F, dry
 RTD = 70±10°F, dry
 ETD1 = 180±5°F, dry
 ETW1 = 180±5°F, wet
 ETD2 = 250±5°F, dry
 ETW2 = 250±5°F**, wet

** If the wet glass transition temperature as determined in Table 1-3 is not 300°F or higher, the ETW2 test temperature will be reduced to 50°F below the measured wet glass transition temperature.

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. Representative photos are included in the CD accompanying this report.

For dry testing, specimens were dried at 250°F±5°F for at least 24 hours. After drying, specimens were kept in a desiccator until mechanical testing. Alternatively, the specimens may have been left ambient laboratory condition for a maximum of 14 days until mechanical testing (no drying was required if specimens were tested within 14 days from the date they were cured). Ambient laboratory condition is defined as 70°F±10°F. Since moisture absorption and desorption rate for epoxy is very slow at ambient temperature, there was no requirement to maintain relative humidity levels.

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

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

Where:

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

When representative specimens could not be measured to determine the moisture content (due to size, fastener and tab effects), traveler coupons of at least 1" by 1" by specimen thickness and weighing at least 15 grams were used to establish weight gain measurements. If the specimens or traveler coupons pass the criteria for two consecutive readings which are 7 ±0.5 days apart, the specimens were kept in the environmental chamber for up to an additional 60 days. Alternatively, the specimens

may have been removed from the environmental chamber and placed in a sealed plastic bag along with a moist cotton towel for a maximum of 14 days until mechanical testing. Strain-gaged specimens were removed from the controlled environment for a maximum of 2 hours for application of gages in ambient laboratory conditions.

1.5.6 Non-ambient Testing

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

For elevated temperature testing, the temperature chamber, test fixture, and grips were preheated to the specified temperature. Each specimen was heated to the required test temperature as verified by a thermocouple in direct contact with and taped to the specimen gage section. The heat-up time of the specimen did not exceed 5 minutes, unless otherwise specified in individual test summary sheets. The test was started

5^{+1}_{-0} minutes after the specimen reached the test temperature. During the test, the temperature, as measured on the specimen, was within $\pm 5^{\circ}\text{F}$ 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 1-4 lists the requirements for fluid sensitivity screening, which requires ASTM D2344 Short Beam Strength testing on $[0^{\circ}]_{20}$ lamina level specimens dried at $250^{\circ}\text{F} \pm 5^{\circ}\text{F}$ for 24 hours minimum before being subjected to the conditions indicated, five replicates per fluid and one cure cycle. Specimens were cleaned with a dry towel prior to the tests. In addition to short beam strength, load versus displacement curves were plotted to aid in the identification of matrix/resin softening. Since load versus displacement curves are influenced by test machine and fixture compliance, all the tests

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

<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
SAE AMS 2629 Jet Reference Fluid (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
Sea 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 LD-4 (SAE AS1241, Type IV, Class 1)	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 LD-4 (SAE AS1241, Type IV, Class 1)	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	Dry per section 6.1	70°F	FS32RT
	Dry per section 6.1	180°F	FS32ET
85% Relative Humidity	Per section 6.1	70°F	FS33RT
	Per section 6.1	180°F	FS33ET

Table 1-4: 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 90° tensile strength and modulus (unidirectional only), 90° compressive strength and modulus (unidirectional only), in-plane shear strength and modulus, Poisson's ratio, SBS, and ILT. After normalizing, data scatter reduced or remained the same. If data scatter increased significantly after normalizing, the reason was investigated. Wherever properties are normalized, both measured and normalized data were reported.

For unidirectional materials the fiber areal weight cannot be measured in advance of impregnation, hence Method I of ASTM D3171, utilizing acid digestion, will be used to verify the CPT method in accordance with note (2) of Table 1-3.

Method I Fiber Volume (%vol) is 58.67 and Method 2 Fiber Volume (%vol) is 59.20. By comparing Fiber Volume values obtained from Method I and Method II, the values are deemed close enough therefore the FAW is close to the nominal of ~145 gsm. Based on the FAW data from Solvay Cytec (Avg of 144 gsm) and the obtained Method 1 Physical Test data (with an avg void content ~ 0.24%), it is appropriate to use the CPT Method for normalization.

The average cured ply thickness of 0.0055 inch has been used as the nominal cured ply thickness (CPT) for normalization purpose. The following normalization formula was used:

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

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. Witnessing was delegated to an AER. Mechanical testing was carried out at the National Institute for Aviation Research, Wichita State University. The conformity documentation, with required approval signatures, is included in the CD provided with this report.

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 is included on the CD provided with this report.

2. Test Results

2.1 Lamina Level Test Summary

Prepreg Material: Cytec 5320-1 T650 Unitape Gr 145 RC 33% Material Specification: NMS 532/5 Process Specification: NPS 85321 Baseline Cure Cycle C Fiber: T650 Unitape Resin: Cycom 5320-1		Cytec 5320-1 T650 Unitape Gr 145 RC 33% Lamina Properties Summary										
Tg(dry): 389.13 °F Tg(wet): 321.79 °F Tg METHOD: ASTM D7028												
Date of fiber manufacture: Apr 2010, Apr-May 2011 Date of resin manufacture: Aug 2011 Date of prepreg manufacture: Aug 2011 Date of composite manufacture: Sept-Dec 2011		Date of testing: Mar-Oct 2012 Date of data submittal: Feb 2013										
LAMINA MECHANICAL PROPERTY SUMMARY Data reported as: Normalized & Measured (Normalized by CPT=0.0055 inch)												
	CTD Mean		RTD Mean		ETD1 Mean		ETW1 Mean		ETD2 Mean		ETW2 Mean	
	Normalized	Measured	Normalized	Measured	Normalized	Measured	Normalized	Measured	Normalized	Measured	Normalized	Measured
F_1^{tu} [ksi]	293.615	292.317	299.093	299.004			272.989	276.017			274.431	272.069
E_1^i [Msi]	20.214	20.128	20.082	20.077			20.030	20.263			20.084	19.892
ν_{12}		0.325		0.326				0.334				0.337
F_2^{tu} [ksi]	---	10.975	---	10.096			---	8.432			---	4.730
E_2^i [Msi]	---	1.485	---	1.331			---	1.213			---	0.840
F_1^{cu} [ksi] from UNCO*	251.251	251.646	237.098	237.875	228.986	227.566	197.980	197.413	218.848	218.226	179.138	177.128
E_1^c [Msi]	17.256	17.308	18.301	18.356	18.454	18.407	18.534	18.550	18.271	18.220	18.252	18.216
F_2^{cu} [ksi]	---	51.397	---	39.751	---	31.141	---	25.231	---	26.248	---	19.364
E_2^c [Msi]	---	1.531	---	1.427	---	1.301	---	1.292	---	1.244	---	1.094
UNCO Strength [ksi]	97.657	98.354	91.892	92.510	86.522	86.381	75.570	76.027	83.682	83.368	67.275	67.481
UNCO Modulus [Msi]	6.707	6.765	7.093	7.139	6.973	6.987	7.074	7.144	6.987	6.961	6.855	6.940
$F_{12}^{s0.2\%}$ [ksi]	---	11.269	---	8.121			---	5.151			---	3.060
F_{12}^{small} [ksi]	---	17.198	---	---			---	---			---	---
$F_{12}^{s5\%strain}$ [ksi]	---	---	---	13.501			---	8.165			---	5.139
G_{12}^s [Msi]	---	0.838	---	0.718			---	0.547			---	0.325
SBS [ksi]	---	18.126	---	15.639	---	11.730	---	10.250	---	9.665	---	7.722

Table 2-1: Lamina Summary Data

2.2 Laminate Level Test Summary

Prepreg Material: Cytec 5320-1 T650 Unitape Gr 145 RC 33% Material Specification: NMS 532/5 Process Specification: NPS 85321 Baseline Cure Cycle C Fiber: T650 Unitape		Resin: Cycom 5320-1		Cytec 5320-1 T650 Unitape Gr 145 RC 33% Laminate Properties Summary			
Tg(dry): 389.13 °F		Tg(wet): 321.79 °F		Tg METHOD: ASTM D7028			
Date of fiber manufacture Apr 2010, Apr-May 2011 Date of resin manufacture Aug 2011 Date of prepreg manufacture Aug 2011 Date of composite manufacture Sept-Dec 2011		Date of testing Mar-Oct 2012 Date of data submittal Feb 2013					
LAMINATE MECHANICAL PROPERTY SUMMARY Data reported as: Normalized & Measured (Normalized by CPT=0.0055 inch)							
Layup:		25/50/25		10/80/10		50/40/10	
	Test Condition	Normalized	Measured	Normalized	Measured	Normalized	Measured
OHT Strength [ksi]	CTD	47.105	47.046	44.056	43.732	65.202	64.585
	RTD	49.601	49.605	42.535	42.191	70.597	69.906
	ETW1	52.842	52.375	---	---	---	---
	ETW2	53.675	53.427	35.238	34.909	86.585	85.508
OHC Strength [ksi]	RTD	50.894	50.684	44.484	44.400	66.016	65.929
	ETW1	44.630	44.446	---	---	---	---
	ETW2	39.199	39.002	32.389	32.252	52.759	52.603
	CTD	92.513	92.199	71.302	70.795	144.363	143.639
UNT Strength [ksi]	RTD	97.622	97.737	67.633	67.581	153.345	152.653
	ETW1	105.189	105.614	---	---	---	---
	ETW2	103.351	102.659	50.130	49.782	164.899	163.352
	CTD	7.709	7.683	5.124	5.089	11.805	11.750
UNT Modulus [Msi]	RTD	7.580	7.590	4.917	4.914	11.698	11.641
	ETW1	7.209	7.238	---	---	---	---
	ETW2	6.963	6.916	4.173	4.144	11.574	11.489
	RTD	96.628	97.952	72.330	73.618	129.217	130.454
UNC Strength [ksi]	ETW1	81.676	81.965	---	---	---	---
	ETW2	68.635	68.666	43.957	43.965	86.522	86.791
	RTD	7.189	7.301	4.743	4.842	10.913	11.041
	ETW1	7.172	7.171	---	---	---	---
UNC Modulus [Msi]	ETW2	6.752	6.764	3.932	3.927	10.463	10.509
	CTD	56.416	56.125	51.295	51.297	70.552	70.159
	RTD	57.962	57.744	49.558	49.549	77.031	76.861
	ETW1	60.602	60.648	---	---	---	---
FHT Strength [ksi]	ETW2	60.048	59.695	39.898	39.805	83.001	82.528
	RTD	81.560	81.291	61.954	61.727	94.140	93.816
	ETW1	67.154	66.868	---	---	---	---
	ETW2	55.757	55.575	41.262	41.030	71.163	70.894
SBS1 Strength [ksi]	RTD	---	13.710	---	---	---	---
	ETW2	---	7.356	---	---	---	---
SSB Initial Peak Bearing Strength [ksi]	RTD	135.155	138.099	---	---	129.575	130.664
	ETW1	114.633	115.963	---	---	---	---
	ETW2	101.299	101.461	---	---	100.496	100.224
SSB 2% Offset Strength [ksi]	RTD	136.627	139.642	134.738	135.741	137.336	138.310
	ETW1	113.335	114.664	---	---	---	---
	ETW2	102.565	102.719	101.082	100.954	102.704	102.392
SSB Ultimate Bearing Strength [ksi]	RTD	151.576	154.903	161.861	163.020	145.805	146.834
	ETW1	130.335	131.854	---	---	---	---
	ETW2	113.840	114.010	120.367	120.198	120.521	120.150
CBS [lb]*	CTD	---	238.501	---	---	---	---
	RTD	---	251.215	---	---	---	---
	ETW2	---	153.369	---	---	---	---
ILT [ksi]*	CTD	---	6.831	---	---	---	---
	RTD	---	7.399	---	---	---	---
	ETW2	---	4.719	---	---	---	---
CAI Strength [ksi]	RTD	24.280	24.270	---	---	---	---

* lay up is 100/0/0

Table 2-2: Laminate Summary Data

2.3 Individual Test Summaries

2.3.1 Longitudinal Tension Properties (LT)

Material: Cytec 5320-1 T650 Unitape Gr 145 RC 33%									
Resin content: 30.66 % wt		Comp. density: 1.574 g/cc		Tension, 1-axis Cytec 5320-1 T650 Unitape Gr 145 RC 33% [0]8					
Fiber volume: 61.88 % vol									
Ply count: 8									
Test method: ASTM D 3039-08		Modulus calculation: 1000 to 3000 microstrain							
Normalized by: 0.0055 in. CPT									
		CTD		RTD		ETW1		ETW2	
Test Temperature [°F]		-65		70		180		250	
Moisture Conditioning		Dry		Dry		Equilibrium		Equilibrium	
Equilibrium at T, RH						160 F, 85%		160 F, 85%	
Source code		CUGJX XXXB		CUGJX XXXA		CUGJX XXXD		CUGJX XXXF	
		Normalized		Measured		Normalized		Measured	
F₁^{tu} [ksi]	Mean	293.615	292.317	299.093	299.004	272.989	276.017	274.431	272.069
	Minimum	260.542	266.291	272.717	269.754	241.145	248.616	236.839	234.704
	Maximum	323.949	311.839	324.928	320.612	303.649	305.972	312.116	304.278
	C.V.(%)	4.958	4.318	5.290	5.244	8.835	8.285	8.535	8.244
	No. Specimens	21		21		8		23	
No. Prepreg Lots	3		3		1		3		
E₁^t [Msi]	Mean	20.214	20.128	20.082	20.077	20.030	20.263	20.084	19.892
	Minimum	19.248	19.469	18.685	19.536	18.806	19.670	19.202	19.354
	Maximum	20.884	20.620	20.860	20.695	20.693	20.891	20.703	20.546
	C.V.(%)	2.175	1.619	2.195	1.313	3.065	2.291	2.056	1.428
	No. Specimens	21		20		7		22	
No. Prepreg Lots	3		3		1		3		
v₁₂	Mean	0.325		0.326		0.334		0.337	
	No. Specimens	21		20		7		22	
	No. Prepreg Lots	3		3		1		3	

2.3.2 Transverse Tension Properties (TT)

Material: Cytec 5320-1 T650 Unitape Gr 145 RC 33%		Tension, 2-axis Cytec 5320-1 T650 Unitape Gr 145 RC 33% [90]16							
Resin content:	32.21 % wt	Comp. density:		1.580 g/cc					
Fiber volume:	60.74 % vol								
Ply count:	16								
Test method:	ASTM D 3039-08	Modulus calculation:		1000 to 3000 microstrain					
Normalized by:	NA								
		CTD		RTD		ETW1		ETW2	
Test Temperature [°F]		-65		70		180		250	
Moisture Conditioning		Dry		Dry		Equilibrium		Equilibrium	
Equilibrium at T, RH						160 F,85%		160 F,85%	
Source code		CUGUX XXXB		CUGUX XXXA		CUGUX XXXD		CUGUX XXXF	
		Normalized	Measured	Normalized	Measured	Normalized	Measured	Normalized	Measured
F₂^{tu} [ksi]	Mean		10.975		10.096		8.432		4.730
	Minimum		7.610		8.171		7.083		3.546
	Maximum		13.142		11.459		8.844		5.960
	C.V.(%)		13.251		8.045		7.278		12.327
	No. Specimens		24		21		7		24
No. Prepreg Lots		3		3		1		3	
E₂^t [Msi]	Mean		1.485		1.331		1.213		0.840
	Minimum		1.415		1.291		1.178		0.804
	Maximum		1.577		1.403		1.241		0.874
	C.V.(%)		3.218		1.859		1.796		2.367
	No. Specimens		21		21		7		24
No. Prepreg Lots		3		3		1		3	

2.3.3 Longitudinal Compression Properties (LC)

Material: Cytec 5320-1 T650 Unitape Gr 145 RC 33%												Compression, 1-axis Cytec 5320-1 T650 Unitape Gr 145 RC 33% [0]20			
Resin content: 29.85 % wt Fiber volume: 62.60 % vol Ply count: 20		Comp. density: 1.574 g/cc													
Test method: ASTM D 6641-05 Normalized by: 0.0055 in. CPT		Modulus calculation: 1000 to 3000 microstrain													
		CTD		RTD		ETD1		ETW1		ETD2		ETW2			
Test Temperature [°F] Moisture Conditioning Equilibrium at T, RH Source code		-65 Dry CUGLX XXXB		70 Dry CUGLX XXXA		180 Dry CUGLX XXXC		180 Equilibrium 160 F, 85% CUGLX XXXD		250 Dry CUGLX XXXE		250 Equilibrium 160 F, 85% CUGLX XXXF			
		Normalized		Measured		Normalized		Measured		Normalized		Measured			
E_c [Msi]		17.256		17.308		18.301		18.356		18.454		18.407			
		18.534		18.550		18.271		18.220		18.252		18.216			
		15.232		15.000		17.791		17.868		18.304		18.247		17.895	
		17.895		18.094		18.119		18.058		18.409		18.303		19.068	
C.V.(%)		10.064		10.447		1.328		1.633		0.671		0.707			
		2.284		2.585		0.611		0.457		2.488		2.863			
No. Specimens No. Prepreg Lots		21		21		7		7		7		21			
		3		3		1		1		1		3			

2.3.4 Transverse Compression Properties (TC)

Material: Cytec 5320-1 T650 Unitape Gr 145 RC 33%												Compression, 2-axis Cytec 5320-1 T650 Unitape Gr 145 RC 33% [90]20	
Resin content: 29.82 % wt Fiber volume: 62.90 % vol Ply count: 20		Comp. density: 1.581 g/cc											
Test method: ASTM D 6641-05 Normalized by: NA		Modulus calculation: 1000 to 3000 microstrain											
		CTD		RTD		ETD1		ETW1		ETD2		ETW2	
Test Temperature [°F] Moisture Conditioning Equilibrium at T, RH		-65 Dry		70 Dry		180 Dry		180 Equilibrium 160 F, 85%		250 Dry		250 Equilibrium 160 F, 85%	
Source code		CUGZX XXXB		CUGZX XXXA		CUGZX XXXC		CUGZX XXXD		CUGZX XXXE		CUGZX XXXF	
		Normalized	Measured	Normalized	Measured	Normalized	Measured	Normalized	Measured	Normalized	Measured	Normalized	Measured
F_2^{90} [ksi]		Mean	51.397	39.751	31.141	25.231	26.248	19.364					
		Minimum	46.520	35.607	28.982	24.457	24.300	18.232					
		Maximum	53.834	41.579	33.144	26.262	27.387	20.350					
		C.V.(%)	4.200	3.931	4.282	2.715	3.841	2.913					
		No. Specimens	21	23	7	7	7	21					
		No. Prepreg Lots	3	3	1	1	1	3					
E_2^c [Msi]		Mean	1.531	1.427	1.301	1.292	1.244	1.094					
		Minimum	1.485	1.353	1.274	1.249	1.221	0.999					
		Maximum	1.583	1.646	1.353	1.373	1.276	1.194					
		C.V.(%)	1.875	4.673	1.977	3.097	1.435	5.618					
		No. Specimens	21	21	7	7	7	21					
		No. Prepreg Lots	3	3	1	1	1	3					

2.3.5 In-Plane Shear Properties (IPS)

Material: Cytec 5320-1 T650 Unitape Gr 145 RC 33%		In-Plane Shear Cytec 5320-1 T650 Unitape Gr 145 RC 33% [45/-45]4S							
Resin content:	33.55 % wt	Comp. density: 1.571 g/cc							
Fiber volume:	59.17 % vol								
Ply count:	16								
Test method:	ASTM D 3518-07	Modulus calculation: 2000 to 6000 microstrain							
Normalized by:	NA								
		CTD		RTD		ETW1		ETW2	
Test Temperature [°F]		-65		70		180		250	
Moisture Conditioning		Dry		Dry		Equilibrium		Equilibrium	
Equilibrium at T, RH						160 F,85%		160 F,85%	
Source code		CUGNX XXXB		CUGNX XXXA		CUGNX XXXD		CUGNX XXXF	
		Normalized	Measured	Normalized	Measured	Normalized	Measured	Normalized	Measured
F₁₂^{s0.2%} [ksi]	Mean		11.269		8.121		5.151		3.060
	Minimum		10.639		7.820		5.023		2.668
	Maximum		12.321		8.430		5.283		3.430
	C.V.(%)		3.999		1.468		1.608		5.451
	No. Specimens		21		21		7		23
	No. Prepreg Lots		3		3		1		3
F₁₂^{smax} [ksi]	Mean		17.198						
	Minimum		16.245						
	Maximum		18.252						
	C.V.(%)		3.004						
	No. Specimens		21						
	No. Prepreg Lots		3						
F₁₂^{s5%strain} [ksi]	Mean				13.501		8.165		5.139
	Minimum				13.055		7.935		4.695
	Maximum				13.697		8.297		5.438
	C.V.(%)				1.278		1.568		3.874
	No. Specimens				21		6		20
	No. Prepreg Lots				3		1		3
G₁₂^s [Msi]	Mean		0.838		0.718		0.547		0.325
	Minimum		0.791		0.702		0.532		0.275
	Maximum		0.865		0.756		0.564		0.373
	C.V.(%)		2.505		2.152		1.914		6.547
	No. Specimens		21		21		7		23
	No. Prepreg Lots		3		3		1		3

2.3.6 “25/50/25” Unnotched Tension 1 Properties (UNT1)

Material: Cytec 5320-1 T650 Unitape Gr 145 RC 33%		Unnotched Tension 1 Cytec 5320-1 T650 Unitape Gr 145 RC 33% [45/0/-45/90]2S							
Resin content:	32.40 % wt	Comp. density:		1.575 g/cc					
Fiber volume:	60.36 % vol								
Ply count:	16								
Test method:	ASTM D 3039-08	Modulus calculation: 1000 to 3000 microstrain							
Normalized by:	0.0055	in. CPT							
		CTD		RTD		ETW1		ETW2	
Test Temperature [°F]		-65		70		180		250	
Moisture Conditioning		Dry		Dry		Equilibrium		Equilibrium	
Equilibrium at T, RH						160 F,85%		160 F,85%	
Source code		CUGAX XXXB		CUGAX XXXA		CUGAX XXXD		CUGAX XXXF	
		Normalized	Measured	Normalized	Measured	Normalized	Measured	Normalized	Measured
UNT1 Strength [ksi]	Mean	92.513	92.199	97.622	97.737	105.189	105.614	103.351	102.659
	Minimum	87.187	87.194	92.787	92.616	97.105	97.548	96.092	94.640
	Maximum	97.145	96.632	102.902	103.154	112.181	113.558	111.772	110.454
	C.V.(%)	3.247	3.417	2.934	2.733	4.279	4.521	3.081	3.097
	No. Specimens	21		21		7		21	
No. Prepreg Lots	3		3		1		3		
UNT1 Modulus [Msi]	Mean	7.709	7.683	7.580	7.590	7.209	7.238	6.963	6.916
	Minimum	7.416	7.441	7.366	7.343	6.921	6.942	6.696	6.615
	Maximum	7.874	7.887	7.939	7.977	7.534	7.627	7.483	7.458
	C.V.(%)	1.368	1.371	1.849	2.076	3.445	3.600	3.287	3.108
	No. Specimens	21		21		7		21	
No. Prepreg Lots	3		3		1		3		

2.3.7 “10/80/10” Unnotched Tension 2 Properties (UNT2)

Material: Cytec 5320-1 T650 Unitape Gr 145 RC 33%		Unnotched Tension 2 Cytec 5320-1 T650 Unitape Gr 145 RC 33% [45/-45/0/45/-45/90/45/-45/45/-45]S					
Resin content:	33.25 % wt	Comp. density:	1.574 g/cc				
Fiber volume:	59.58 % vol						
Ply count:	20						
Test method:	ASTM D 3039-08	Modulus calculation: 1000 to 3000 microstrain					
Normalized by:	0.0055	in. CPT					
		CTD	RTD		ETW2		
Test Temperature [°F]		-65	70		250		
Moisture Conditioning		Dry	Dry		Equilibrium		
Equilibrium at T, RH					160 F,85%		
Source code		CUGBX XXXB	CUGBX XXXA		CUGBX XXXF		
		Normalized	Measured	Normalized	Measured	Normalized	Measured
UNT2 Strength [ksi]	Mean	71.302	70.795	67.633	67.581	50.130	49.782
	Minimum	67.044	66.653	64.502	63.838	47.580	47.045
	Maximum	76.326	75.468	70.643	70.976	51.761	52.084
	C.V.(%)	3.711	3.217	2.800	2.884	2.119	2.456
	No. Specimens	21		21		21	
No. Prepreg Lots	3		3		3		
UNT2 Modulus [Msi]	Mean	5.124	5.089	4.917	4.914	4.173	4.144
	Minimum	4.973	4.897	4.770	4.723	4.012	3.991
	Maximum	5.252	5.232	5.196	5.201	4.401	4.340
	C.V.(%)	1.417	1.791	2.024	2.253	2.298	2.527
	No. Specimens	21		21		21	
No. Prepreg Lots	3		3		3		

2.3.8 “50/40/10” Unnotched Tension 3 Properties (UNT3)

Material: Cytec 5320-1 T650 Unitape Gr 145 RC 33%		Unnotched Tension 3 Cytec 5320-1 T650 Unitape Gr 145 RC 33% [0/45/0/90/0/-45/0/45/0/-45]S					
Resin content: 34.37 % wt	Comp. density: 1.577 g/cc						
Fiber volume: 58.68 % vol							
Ply count: 20							
Test method: ASTM D 3039-08	Modulus calculation: 1000 to 3000 microstrain						
Normalized by: 0.0055	in. CPT						
	CTD	RTD		ETW2			
Test Temperature [°F]	-65	70		250			
Moisture Conditioning	Dry	Dry		Equilibrium			
Equilibrium at T, RH				160 F, 85%			
Source code	CUGCX XXXB	CUGCX XXXA		CUGCX XXXF			
	Normalized	Measured	Normalized	Measured	Normalized	Measured	
UNT3 Strength [ksi]	144.363	143.639	153.345	152.653	164.899	163.352	
Minimum	133.118	133.604	140.003	140.268	152.789	148.996	
Maximum	160.869	157.692	165.067	164.324	176.367	174.740	
C.V.(%)	4.688	4.038	5.093	4.763	3.984	4.439	
No. Specimens	21		21		21		
No. Prepreg Lots	3		3		3		
UNT3 Modulus [Msi]	11.805	11.750	11.698	11.641	11.574	11.489	
Minimum	11.440	11.381	11.417	11.398	11.083	11.181	
Maximum	12.054	12.212	12.342	12.266	11.849	11.859	
C.V.(%)	1.289	1.700	1.733	1.771	1.702	1.773	
No. Specimens	21		22		23		
No. Prepreg Lots	3		3		3		

2.3.9 “33/0/67” Unnotched Compression 0 Properties (UNC0)

Material: Cytec 5320-1 T650 Unitape Gr 145 RC 33%		Unnotched Compression 0/90 Cytec 5320-1 T650 Unitape Gr 145 RC 33% [90/0/90]7											
Resin content: 29.29 % wt		Comp. density: 1.576 g/cc											
Fiber volume: 63.18 % vol													
Ply count: 21													
Test method: ASTM D 6641-05		Modulus calculation: 1000 to 3000 microstrain											
Normalized by: 0.0055 in. CPT													
		CTD		RTD		ETD1		ETW1		ETD2		ETW2	
Test Temperature [°F]		-65		70		180		180		250		250	
Moisture Conditioning		Dry		Dry		Dry		Equilibrium 160 F, 85%		Dry		Equilibrium 160 F, 85%	
Equilibrium at T, RH													
Source code		CUGRX XXXB		CUGRX XXXA		CUGRX XXXC		CUGRX XXXD		CUGRX XXXE		CUGRX XXXF	
		Normalized		Measured		Normalized		Measured		Normalized		Measured	
UNC0 Strength [ksi]		97.657	98.354	91.892	92.510	86.522	86.381	75.570	76.027	83.682	83.368	67.275	67.481
Minimum		82.923	84.042	81.603	82.226	80.661	80.801	71.961	72.495	78.209	78.574	58.125	58.062
Maximum		113.079	113.808	101.879	105.098	90.716	90.111	77.904	78.453	88.605	88.500	74.912	75.377
C.V.(%)		7.483	7.648	5.573	5.846	3.987	3.810	2.614	2.829	4.603	4.497	5.581	5.765
No. Specimens		21		21		11		7		7		21	
No. Prepreg Lots		3		3		1		1		1		3	
UNC0 Modulus [Msi]		6.707	6.765	7.093	7.139	6.973	6.987	7.074	7.144	6.987	6.961	6.855	6.940
Minimum		5.989	5.968	6.744	6.843	6.856	6.782	6.742	6.909	6.687	6.668	6.442	6.529
Maximum		7.284	7.304	7.562	7.502	7.186	7.299	7.467	7.478	7.104	7.054	7.468	7.525
C.V.(%)		5.914	6.228	2.706	2.112	1.789	2.751	3.701	3.068	2.022	1.913	3.610	4.069
No. Specimens		21		21		7		7		7		21	
No. Prepreg Lots		3		3		1		1		1		3	

2.3.10 “25/50/25” Unnotched Compression 1 Properties (UNC1)

Material: Cytec 5320-1 T650 Unitape Gr 145 RC 33%		Unnotched Compression 1 Cytec 5320-1 T650 Unitape Gr 145 RC 33% [45/0/-45/90]3S					
Resin content: 32.54 % wt	Comp. density: 1.577 g/cc						
Fiber volume: 60.30 % vol							
Ply count: 24							
Test method: ASTM D 6641-05	Modulus calculation: 1000 to 3000 microstrain						
Normalized by: 0.0055	in. CPT						
	RTD	ETW1		ETW2			
Test Temperature [°F]	70	180		250			
Moisture Conditioning	Dry	Equilibrium		Equilibrium			
Equilibrium at T, RH		160 F, 85%		160 F, 85%			
Source code	CUGWX XXXA	CUGWX XXXD		CUGWX XXXF			
	Normalized	Measured	Normalized	Measured	Normalized	Measured	
UNC1 Strength [ksi]	Mean	96.628	97.952	81.676	81.965	68.635	68.666
	Minimum	78.165	84.338	76.344	76.963	64.255	63.768
	Maximum	108.860	109.295	84.627	84.828	72.195	72.456
	C.V.(%)	7.643	6.428	3.779	3.301	3.204	3.274
	No. Specimens	22		9		22	
No. Prepreg Lots	3		1		3		
UNC1 Modulus [Msi]	Mean	7.189	7.301	7.172	7.171	6.752	6.764
	Minimum	6.980	6.870	7.044	7.072	6.353	6.304
	Maximum	7.418	7.753	7.386	7.371	7.088	7.114
	C.V.(%)	1.991	3.051	1.564	1.347	2.693	2.858
	No. Specimens	21		7		21	
No. Prepreg Lots	3		1		3		

2.3.11 “10/80/10” Unnotched Compression 2 Properties (UNC2)

Material: Cytec 5320-1 T650 Unitape Gr 145 RC 33%				Unnotched Compression 2 Cytec 5320-1 T650 Unitape Gr 145 RC 33% [45/-45/0/45/-45/90/45/-45/45/-45]S	
Resin content:	32.58 % wt	Comp. density: 1.580 g/cc			
Fiber volume:	60.39 % vol				
Ply count:	20				
Test method:	ASTM D 6641-05	Modulus calculation: 1000 to 3000 microstrain			
Normalized by:	0.0055	in. CPT			
		RTD	ETW2		
Test Temperature [°F]		70	250		
Moisture Conditioning		Dry	Equilibrium		
Equilibrium at T, RH			160 F,85%		
Source code		CUGXX XXXA	CUGXX XXXF		
		Normalized	Measured	Normalized	Measured
UNC2 Strength [ksi]	Mean	72.330	73.618	43.957	43.965
	Minimum	64.583	68.731	40.233	40.288
	Maximum	77.006	78.152	48.163	47.853
	C.V.(%)	5.475	4.543	4.408	4.665
	No. Specimens	21		21	
No. Prepreg Lots	3		3		
UNC2 Modulus [Msi]	Mean	4.743	4.842	3.932	3.927
	Minimum	4.567	4.514	3.725	3.677
	Maximum	4.953	5.239	4.222	4.175
	C.V.(%)	2.581	4.427	3.470	3.236
	No. Specimens	21		20	
No. Prepreg Lots	3		3		

2.3.12 “50/40/10” Unnotched Compression 3 Properties (UNC3)

Material: Cytec 5320-1 T650 Unitape Gr 145 RC 33%						Unnotched Compression 3 Cytec 5320-1 T650 Unitape Gr 145 RC 33% [45/0/90/0/-45/0/45/0/-45/0]S	
Resin content:	33.53 % wt	Comp. density: 1.577 g/cc					
Fiber volume:	59.42 % vol						
Ply count:	20						
Test method:	ASTM D 6641-05	Modulus calculation: 1000 to 3000 microstrain					
Normalized by:	0.0055	in. CPT					
		RTD		ETW2			
Test Temperature [°F]		70		250			
Moisture Conditioning		Dry		Equilibrium			
Equilibrium at T, RH				160 F,85%			
Source code		CUGYX XXXA		CUGYX XXXF			
		Normalized	Measured	Normalized	Measured		
UNC3 Strength [ksi]	Mean	129.217	130.454	86.522	86.791		
	Minimum	121.715	123.856	82.166	82.456		
	Maximum	136.286	142.082	90.033	90.281		
	C.V.(%)	3.132	3.434	2.309	2.269		
	No. Specimens		21		20		
No. Prepreg Lots		3		3			
UNC3 Modulus [Msi]	Mean	10.913	11.041	10.463	10.509		
	Minimum	10.215	10.493	9.948	10.140		
	Maximum	11.344	11.573	10.994	10.937		
	C.V.(%)	2.500	2.390	2.423	2.116		
	No. Specimens		21		21		
No. Prepreg Lots		3		3			

2.3.13 Lamina Short-Beam Strength Properties (SBS)

Material: Cytec 5320-1 T650 Unitape Gr 145 RC 33%		Short-Beam Strength Cytec 5320-1 T650 Unitape Gr 145 RC 33% [0]45											
Resin content:	32.23 % wt	Comp. density:		1.576 g/cc									
Fiber volume:	60.54 % vol												
Ply count:	45												
Test method:	ASTM D 2344-06												
Normalized by:	NA												
		CTD		RTD		ETD1		ETW1		ETD2		ETW2	
Test Temperature [°F]	-65		70		180		180		250		250		
Moisture Conditioning	Dry		Dry		Dry		Equilibrium		Dry		Equilibrium		
Equilibrium at T, RH							160 F, 85%				160 F, 85%		
Source code	CUGQX XXXB		CUGQX XXXA		CUGQX XXXC		CUGQX XXXD		CUGQX XXXE		CUGQX XXXF		
		Normalized	Measured	Normalized	Measured	Normalized	Measured	Normalized	Measured	Normalized	Measured	Normalized	Measured
SBS Strength [ksi]	Mean	18.126	15.639	11.730	10.250	9.665	7.722						
	Minimum	16.003	14.502	11.071	9.862	9.481	7.327						
	Maximum	19.986	16.698	12.103	10.578	9.878	8.202						
	C.V.(%)	4.936	3.720	2.853	2.794	1.574	3.159						
	No. Specimens	23	21	7	7	8	22						
	No. Prepreg Lots	3	3	1	1	1	3						

2.3.14 Laminate Short-Beam Strength Properties (SBS1)

Material: Cytec 5320-1 T650 Unitape Gr 145 RC 33%				Laminate Short-Beam Strength Cytec 5320-1 T650 Unitape Gr 145 RC 33% [45/0/-45/90]4S	
Resin content: 33.70 % wt	Comp. density: 1.574 g/cc				
Fiber volume: 59.17 % vol					
Ply count: 32					
Test method: ASTM D 2344-06					
Normalized by: NA					
	RTD	ETW2			
Test Temperature [°F]	70	250			
Moisture Conditioning	Dry	Equilibrium			
Equilibrium at T, RH		160 F,85%			
Source code	CUGqX XXXA	CUGqX XXXF			
	Normalized	Measured	Normalized	Measured	
SBS1 Strength [ksi]					
Mean		13.710		7.356	
Minimum		11.168		6.943	
Maximum		14.499		8.102	
C.V.(%)		6.205		5.199	
No. Specimens		21		21	
No. Prepreg Lots		3		3	

2.3.15 “25/50/25” Open-Hole Tension 1 Properties (OHT1)

Material: Cytec 5320-1 T650 Unitape Gr 145 RC 33%		Open-Hole Tension 1 Cytec 5320-1 T650 Unitape Gr 145 RC 33% [45/0/-45/90]2S								
Resin content:	33.61 % wt	Comp. density:		1.573 g/cc						
Fiber volume:	59.20 % vol									
Ply count:	16									
Test method:	ASTM D 5766-11									
Normalized by:	0.0055	in. CPT								
		CTD		RTD		ETW1		ETW2		
Test Temperature [°F]	-65		70		180		250			
Moisture Conditioning	Dry		Dry		Equilibrium		Equilibrium			
Equilibrium at T, RH					160 F,85%		160 F,85%			
Source code	CUGDX XXXB		CUGDX XXXA		CUGDX XXXD		CUGDX XXXF			
		Normalized	Measured	Normalized	Measured	Normalized	Measured	Normalized	Measured	
OHT1 Strength [ksi]	Mean	47.105	47.046	49.601	49.605	52.842	52.375	53.675	53.427	
	Minimum	42.940	43.509	45.207	46.052	47.992	47.409	49.798	49.405	
	Maximum	52.517	52.269	55.184	54.842	55.437	54.620	59.532	58.775	
	C.V.(%)	5.534	5.001	5.909	5.563	4.617	4.563	4.064	3.814	
	No. Specimens	21		21		7		21		
	No. Prepreg Lots	3		3		1		3		

2.3.16 “10/80/10” Open-Hole Tension 2 Properties (OHT2)

Material: Cytec 5320-1 T650 Unitape Gr 145 RC 33%		Open-Hole Tension 2 Cytec 5320-1 T650 Unitape Gr 145 RC 33% [45/-45/0/45/-45/90/45/-45/45/-45]S					
Resin content: 34.09 % wt	Comp. density: 1.575 g/cc						
Fiber volume: 58.86 % vol							
Ply count: 20							
Test method: ASTM D 5766-11							
Normalized by: 0.0055	in. CPT						
	CTD	RTD		ETW2			
Test Temperature [°F]	-65	70		250			
Moisture Conditioning	Dry	Dry		Equilibrium			
Equilibrium at T, RH				160 F,85%			
Source code	CUGEX XXXB	CUGEX XXXA		CUGEX XXXF			
	Normalized	Measured	Normalized	Measured	Normalized	Measured	
OHT2 Strength [ksi]	44.056	43.732	42.535	42.191	35.238	34.909	
Mean	42.671	42.856	41.642	41.612	34.532	34.139	
Minimum	45.222	44.851	43.801	43.439	36.087	35.727	
Maximum	1.564	1.343	1.245	1.183	1.294	1.379	
C.V.(%)							
No. Specimens	21		21		21		
No. Prepreg Lots	3		3		3		

2.3.17 “50/40/10” Open-Hole Tension 3 Properties (OHT3)

Material: Cytec 5320-1 T650 Unitape Gr 145 RC 33%		Open-Hole Tension 3 Cytec 5320-1 T650 Unitape Gr 145 RC 33% [0/45/0/90/0/-45/0/45/0/-45]S					
Resin content: 34.20 % wt	Comp. density: 1.573 g/cc						
Fiber volume: 58.69 % vol							
Ply count: 20							
Test method: ASTM D 5766-11							
Normalized by: 0.0055	in. CPT						
	CTD	RTD		ETW2			
Test Temperature [°F]	-65	70		250			
Moisture Conditioning	Dry	Dry		Equilibrium			
Equilibrium at T, RH				160 F,85%			
Source code	CUGFX XXXB	CUGFX XXXA		CUGFX XXXF			
	Normalized	Measured	Normalized	Measured	Normalized	Measured	
OHT3 Strength [ksi]	65.202	64.585	70.597	69.906	86.585	85.508	
Mean	58.756	58.183	63.981	64.017	79.852	79.014	
Minimum	72.639	71.802	75.804	74.997	92.821	91.001	
Maximum	6.744	6.546	5.019	4.829	3.612	3.581	
C.V.(%)							
No. Specimens	21		21		22		
No. Prepreg Lots	3		3		3		

2.3.18 “25/50/25” Filled-Hole Tension 1 Properties (FHT1)

Material: Cytec 5320-1 T650 Unitape Gr 145 RC 33%		Filled-Hole Tension 1 Cytec 5320-1 T650 Unitape Gr 145 RC 33% [45/0/-45/90]2S							
Resin content: 33.25 % wt	Comp. density: 1.577 g/cc								
Fiber volume: 59.66 % vol									
Ply count: 16									
Test method: ASTM D 6742-07									
Normalized by: 0.0055	in. CPT								
		CTD	RTD		ETW1		ETW2		
Test Temperature [°F]		-65	70		180		250		
Moisture Conditioning		Dry	Dry		Equilibrium		Equilibrium		
Equilibrium at T, RH					160 F,85%		160 F,85%		
Source code		CUG4X XXXB	CUG4X XXXA		CUG4X XXXD		CUG4X XXXF		
		Normalized	Measured	Normalized	Measured	Normalized	Measured	Normalized	Measured
Mean		56.416	56.125	57.962	57.744	60.602	60.648	60.048	59.695
Minimum		53.328	52.580	54.109	53.895	56.759	56.942	58.177	57.298
Maximum		61.980	61.089	62.525	62.265	63.316	63.030	61.781	61.652
FHT1 Strength [ksi] C.V.(%)		3.936	4.234	4.286	4.062	3.692	3.314	1.811	2.026
No. Specimens		21		21		7		21	
No. Prepreg Lots		3		3		1		3	

2.3.19 "10/80/10" Filled-Hole Tension 2 Properties (FHT2)

Material: Cytec 5320-1 T650 Unitape Gr 145 RC 33%		Filled-Hole Tension 2 Cytec 5320-1 T650 Unitape Gr 145 RC 33% [45/-45/0/45/-45/90/45/-45/45/-45]S					
Resin content: 32.39 % wt	Comp. density: 1.575 g/cc						
Fiber volume: 60.35 % vol							
Ply count: 20							
Test method: ASTM D 6742-07							
Normalized by: 0.0055	in. CPT						
	CTD	RTD		ETW2			
Test Temperature [°F]	-65	70		250			
Moisture Conditioning	Dry	Dry		Equilibrium			
Equilibrium at T, RH				160 F,85%			
Source code	CUG5X XXXB	CUG5X XXXA		CUG5X XXXF			
	Normalized	Measured	Normalized	Measured	Normalized	Measured	
Mean	51.295	51.297	49.558	49.549	39.898	39.805	
Minimum	48.468	48.387	46.954	46.531	38.453	38.135	
Maximum	54.251	53.727	52.481	52.400	40.970	41.201	
FHT2 Strength [ksij]	C.V.(%)	3.011	2.977	2.919	2.875	1.661	1.759
No. Specimens	20	20		20			
No. Prepreg Lots	3	3		3			

2.3.20 "50/40/10" Filled-Hole Tension 3 Properties (FHT3)

Material: Cytec 5320-1 T650 Unitape Gr 145 RC 33%		Filled-Hole Tension 3 Cytec 5320-1 T650 Unitape Gr 145 RC 33% [0/45/0/90/0/-45/0/45/0/-45]S					
Resin content: 32.67 % wt	Comp. density: 1.572 g/cc						
Fiber volume: 60.00 % vol							
Ply count: 20							
Test method: ASTM D 6742-07							
Normalized by: 0.0055	in. CPT						
	CTD	RTD	ETW2				
Test Temperature [°F]	-65	70	250				
Moisture Conditioning	Dry	Dry	Equilibrium				
Equilibrium at T, RH			160 F,85%				
Source code	CUG6X XXXB	CUG6X XXXA	CUG6X XXXF				
	Normalized	Measured	Normalized	Measured	Normalized	Measured	
Mean	70.552	70.159	77.031	76.861	83.001	82.528	
Minimum	64.889	64.801	71.921	72.547	78.716	78.292	
Maximum	77.795	76.406	84.274	83.552	87.128	87.230	
FHT3 Strength [ksij] C.V.(%)	5.417	5.071	4.376	3.946	3.331	3.274	
No. Specimens	21		21		22		
No. Prepreg Lots	3		3		3		

2.3.21 “25/50/25” Open-Hole Compression 1 Properties (OHC1)

Material: Cytec 5320-1 T650 Unitape Gr 145 RC 33%		Open-Hole Compression 1 Cytec 5320-1 T650 Unitape Gr 145 RC 33% [45/0/-45/90]4S					
Resin content: 33.77 % wt	Comp. density: 1.574 g/cc						
Fiber volume: 59.11 % vol							
Ply count: 32							
Test method: ASTM D 6484-09							
Normalized by: 0.0055	in. CPT						
	RTD	ETW1		ETW2			
Test Temperature [°F]	70	180		250			
Moisture Conditioning	Dry	Equilibrium		Equilibrium			
Equilibrium at T, RH		160 F,85%		160 F,85%			
Source code	CUGGX XXXA	CUGGX XXXD		CUGGX XXXF			
	Normalized	Measured	Normalized	Measured	Normalized	Measured	
Mean	50.894	50.684	44.630	44.446	39.199	39.002	
Minimum	49.474	49.213	43.711	43.468	36.300	36.542	
Maximum	52.538	52.207	45.454	45.159	41.327	41.000	
OHC1 Strength [ksi]	C.V.(%)	1.894	1.850	1.495	1.418	3.196	2.989
No. Specimens		21		7		21	
No. Prepreg Lots		3		1		3	

2.3.22 "10/80/10" Open-Hole Compression 2 Properties (OHC2)

Material: Cytec 5320-1 T650 Unitape Gr 145 RC 33%						Open-Hole Compression 2 Cytec 5320-1 T650 Unitape Gr 145 RC 33% [45/-45/0/45/-45/90/45/-45/45/-45]2S		
Resin content:	35.13 % wt	Comp. density:		1.734 g/cc				
Fiber volume:	60.03 % vol							
Ply count:	40							
Test method:	ASTM D 6484-09							
Normalized by:	0.0055	in. CPT						
		RTD		ETW2				
Test Temperature [°F]		70		250				
Moisture Conditioning		Dry		Equilibrium				
Equilibrium at T, RH				160 F,85%				
Source code		CUGHX XXXA		CUGHX XXXF				
		Normalized	Measured	Normalized	Measured			
OHC2 Strength [ksi]	Mean	44.484	44.400	32.389	32.252			
	Minimum	41.415	41.462	30.500	30.908			
	Maximum	47.243	47.214	34.082	33.833			
	C.V.(%)	3.682	3.711	2.208	2.011			
	No. Specimens	21		21				
	No. Prepreg Lots	3		3				

2.3.23 "50/40/10" Open-Hole Compression 3 Properties (OHC3)

Material: Cytec 5320-1 T650 Unitape Gr 145 RC 33%		Open-Hole Compression 3 Cytec 5320-1 T650 Unitape Gr 145 RC 33% [0/45/0/90/0/-45/0/45/0/-45]2S			
Resin content: 33.79 % wt	Comp. density: 1.573 g/cc				
Fiber volume: 59.02 % vol					
Ply count: 40					
Test method: ASTM D 6484-09					
Normalized by: 0.0055	in. CPT				
	RTD	ETW2			
Test Temperature [°F]	70	250			
Moisture Conditioning	Dry	Equilibrium			
Equilibrium at T, RH		160 F,85%			
Source code	CUGIX XXXA	CUGIX XXXF			
	Normalized	Measured	Normalized	Measured	
Mean	66.016	65.929	52.759	52.603	
Minimum	63.411	63.450	49.810	49.202	
Maximum	67.837	68.737	56.555	55.537	
OHC3 Strength [ksi]	1.982	2.047	3.131	2.776	
C.V.(%)					
No. Specimens	22		21		
No. Prepreg Lots	3		3		

2.3.24 “25/50/25” Filled-Hole Compression 1 Properties (FHC1)

Material: Cytec 5320-1 T650 Unitape Gr 145 RC 33%		Filled-Hole Compression 1 Cytec 5320-1 T650 Unitape Gr 145 RC 33% [45/0/-45/90]4S					
Resin content: 33.70 % wt	Comp. density: 1.574 g/cc						
Fiber volume: 59.17 % vol							
Ply count: 32							
Test method: ASTM D 6742-07							
Normalized by: 0.0055	in. CPT						
	RTD	ETW1		ETW2			
Test Temperature [°F]	70	180		250			
Moisture Conditioning	Dry	Equilibrium		Equilibrium			
Equilibrium at T, RH		160 F,85%		160 F,85%			
Source code	CUG7X XXXA	CUG7X XXXD		CUG7X XXXF			
	Normalized	Measured	Normalized	Measured	Normalized	Measured	
Mean	81.560	81.291	67.154	66.868	55.757	55.575	
Minimum	70.470	69.941	65.580	65.505	48.536	48.453	
Maximum	85.868	85.246	68.646	68.265	59.972	59.830	
FHC1 Strength [ksij] C.V.(%)	4.599	4.576	1.779	1.641	5.287	5.403	
No. Specimens	21		7		21		
No. Prepreg Lots	3		1		3		

2.3.25 "10/80/10" Filled-Hole Compression 2 Properties (FHC2)

Material: Cytec 5320-1 T650 Unitape Gr 145 RC 33%		Filled-Hole Compression 2 Cytec 5320-1 T650 Unitape Gr 145 RC 33% [45/-45/0/45/-45/90/45/-45/45/-45]2S			
Resin content: 33.63 % wt	Comp. density: 1.574 g/cc				
Fiber volume: 59.23 % vol					
Ply count: 40					
Test method: ASTM D 6742-07					
Normalized by: 0.0055	in. CPT				
	RTD	ETW2			
Test Temperature [°F]	70	250			
Moisture Conditioning	Dry	Equilibrium			
Equilibrium at T, RH		160 F,85%			
Source code	CUG8X XXXA	CUG8X XXXF			
	Normalized	Measured	Normalized	Measured	
FHC2 Strength [ksij]					
Mean	61.954	61.727	41.262	41.030	
Minimum	57.690	57.455	39.055	38.669	
Maximum	65.707	65.454	44.671	44.146	
C.V.(%)	3.376	3.354	3.777	3.723	
No. Specimens	21		21		
No. Prepreg Lots	3		3		

2.3.26 "50/40/10" Filled-Hole Compression 3 Properties (FHC3)

Material: Cytec 5320-1 T650 Unitape Gr 145 RC 33%		Filled-Hole Compression 3 Cytec 5320-1 T650 Unitape Gr 145 RC 33% [0/45/0/90/0/-45/0/45/0/-45]2S			
Resin content: 33.84 % wt	Comp. density: 1.575 g/cc				
Fiber volume: 59.05 % vol					
Ply count: 40					
Test method: ASTM D 6742-07					
Normalized by: 0.0055	in. CPT				
	RTD	ETW2			
Test Temperature [°F]	70	250			
Moisture Conditioning	Dry	Equilibrium			
Equilibrium at T, RH		160 F,85%			
Source code	CUG9X XXXA	CUG9X XXXF			
	Normalized	Measured	Normalized	Measured	
Mean	94.140	93.816	71.163	70.894	
Minimum	87.732	86.804	65.385	64.694	
Maximum	98.210	97.715	76.286	76.410	
FHC3 Strength [ksij]	C.V.(%)	2.912	2.883	4.266	4.813
No. Specimens		21		21	
No. Prepreg Lots		3		3	

2.3.27 “25/50/25” Single-Shear Bearing 1 Properties (SSB1)

Material: Cytec 5320-1 T650 Unitape Gr 145 RC 33%		Single-Shear Bearing 1 Cytec 5320-1 T650 Unitape Gr 145 RC 33% [45/0/-45/90]2S					
Resin content: 27.94 % wt	Comp. density: 1.574 g/cc						
Fiber volume: 64.30 % vol							
Ply count: 16							
Test method: ASTM D 5961-08							
Normalized by: 0.0055	in. CPT						
	RTD	ETW1		ETW2			
Test Temperature [°F]	70	180		250			
Moisture Conditioning	Dry	Equilibrium		Equilibrium			
Equilibrium at T, RH		160 F,85%		160 F,85%			
Source code	CUG1X XXXA	CUG1X XXXD		CUG1X XXXF			
	Normalized	Measured	Normalized	Measured	Normalized	Measured	
SSB1 Initial Peak Bearing Strength [ksi]	Mean	135.155	138.099	114.633	115.963	101.299	101.461
	Minimum	125.560	130.606	110.624	113.079	93.673	93.585
	Maximum	144.899	149.632	119.555	119.851	107.830	110.949
	C.V.(%)	4.044	3.493	2.762	2.123	4.082	4.575
	No. Specimens	18		7		21	
No. Prepreg Lots	3		1		3		
SSB1 2% Offset Strength [ksi]	Mean	136.627	139.642	113.335	114.664	102.565	102.719
	Minimum	128.464	133.145	107.615	108.992	95.820	94.993
	Maximum	143.628	148.320	117.850	119.757	108.411	108.931
	C.V.(%)	3.285	2.546	3.959	3.926	3.249	3.529
	No. Specimens	21		7		21	
No. Prepreg Lots	3		1		3		
SSB1 Ultimate Strength [ksi]	Mean	151.576	154.903	130.335	131.854	113.840	114.010
	Minimum	138.343	145.247	125.191	128.078	106.765	107.451
	Maximum	167.597	168.234	137.403	139.116	121.781	122.547
	C.V.(%)	4.683	3.892	3.228	2.934	3.692	3.929
	No. Specimens	21		7		21	
No. Prepreg Lots	3		1		3		

2.3.28 “10/80/10” Single-Shear Bearing 2 Properties (SSB2)

Material: Cytec 5320-1 T650 Unitape Gr 145 RC 33%						Single-Shear Bearing 2 Cytec 5320-1 T650 Unitape Gr 145 RC 33% [45/-45/0/45/-45/90/45/-45/45/-45]S		
Resin content:	29.23 % wt	Comp. density:		1.575 g/cc				
Fiber volume:	63.18 % vol							
Ply count:	20							
Test method:	ASTM D 5961-08							
Normalized by:	0.0055	in. CPT						
		RTD		ETW2				
Test Temperature [°F]	70		250					
Moisture Conditioning	Dry		Equilibrium					
Equilibrium at T, RH			160 F,85%					
Source code	CUG2X XXXA		CUG2X XXXF					
		Normalized	Measured	Normalized	Measured			
SSB2 2% Offset Strength [ksi]	Mean	134.738	135.741	101.082	100.954			
	Minimum	127.426	123.515	93.513	93.443			
	Maximum	140.341	141.457	105.886	106.759			
	C.V.(%)	2.520	3.143	3.032	3.476			
	No. Specimens	21		21				
No. Prepreg Lots	3		3					
SSB2 Ultimate Strength [ksi]	Mean	161.861	163.020	120.367	120.198			
	Minimum	140.545	145.460	114.344	114.038			
	Maximum	173.405	172.698	134.110	135.217			
	C.V.(%)	4.717	4.500	4.091	4.081			
	No. Specimens	21		21				
No. Prepreg Lots	3		3					

2.3.29 “50/40/10” Single-Shear Bearing 3 Properties (SSB3)

Material: Cytec 5320-1 T650 Unitape Gr 145 RC 33%						Single-Shear Bearing 3 Cytec 5320-1 T650 Unitape Gr 145 RC 33% [0/45/0/90/0/-45/0/45/0/-45]S	
Resin content:	29.59 % wt	Comp. density:		1.574 g/cc			
Fiber volume:	62.83 % vol						
Ply count:	20						
Test method:	ASTM D 5961-08						
Normalized by:	0.0055	in. CPT					
		RTD		ETW2			
Test Temperature [°F]	70		250				
Moisture Conditioning	Dry		Equilibrium				
Equilibrium at T, RH			160 F,85%				
Source code	CUG3X XXXA		CUG3X XXXF				
		Normalized	Measured	Normalized	Measured		
SSB3 Initial Peak Bearing Strength [ksi]	Mean	129.575	130.664	100.496	100.224		
	Minimum	120.707	122.640	93.138	93.350		
	Maximum	137.112	137.351	107.963	108.489		
	C.V.(%)	3.362	3.097	4.099	4.344		
	No. Specimens	20		16			
No. Prepreg Lots	3		3				
SSB3 2% Offset Strength [ksi]	Mean	137.336	138.310	102.704	102.392		
	Minimum	125.465	127.473	96.390	95.641		
	Maximum	145.648	147.111	110.285	110.704		
	C.V.(%)	4.168	4.086	4.630	4.819		
	No. Specimens	22		21			
No. Prepreg Lots	3		3				
SSB3 Ultimate Strength [ksi]	Mean	145.805	146.834	120.521	120.150		
	Minimum	135.066	137.313	110.766	109.603		
	Maximum	156.862	157.196	128.379	128.867		
	C.V.(%)	3.959	3.773	3.527	3.682		
	No. Specimens	22		21			
No. Prepreg Lots	3		3				

2.3.30 Compression After Impact 1 Properties (CAI1)

Material: Cytec 5320-1 T650 Unitape Gr 145 RC 33%				Compression After Impact 1 Cytec 5320-1 T650 Unitape Gr 145 RC 33% [45/0/-45/90]4S	
Resin content:	33.47 % wt	Comp. density:	1.576 g/cc		
Fiber volume:	59.22 % vol				
Ply count:	32				
Test method:	ASTM D7136/7137-07				
Normalized by:	0.0055	in. CPT	RTD		
Test Temperature [°F]	70				
Moisture Conditioning	Dry				
Equilibrium at T, RH					
Source code	CUGKX XXXA				
	Normalized	Measured			
CAI Strength [ksi]	Mean	24.280	24.270		
	Minimum	23.466	23.549		
	Maximum	25.129	25.044		
	C.V.(%)	2.633	2.374		
	No. Specimens	7			
No. Prepreg Lots	1				

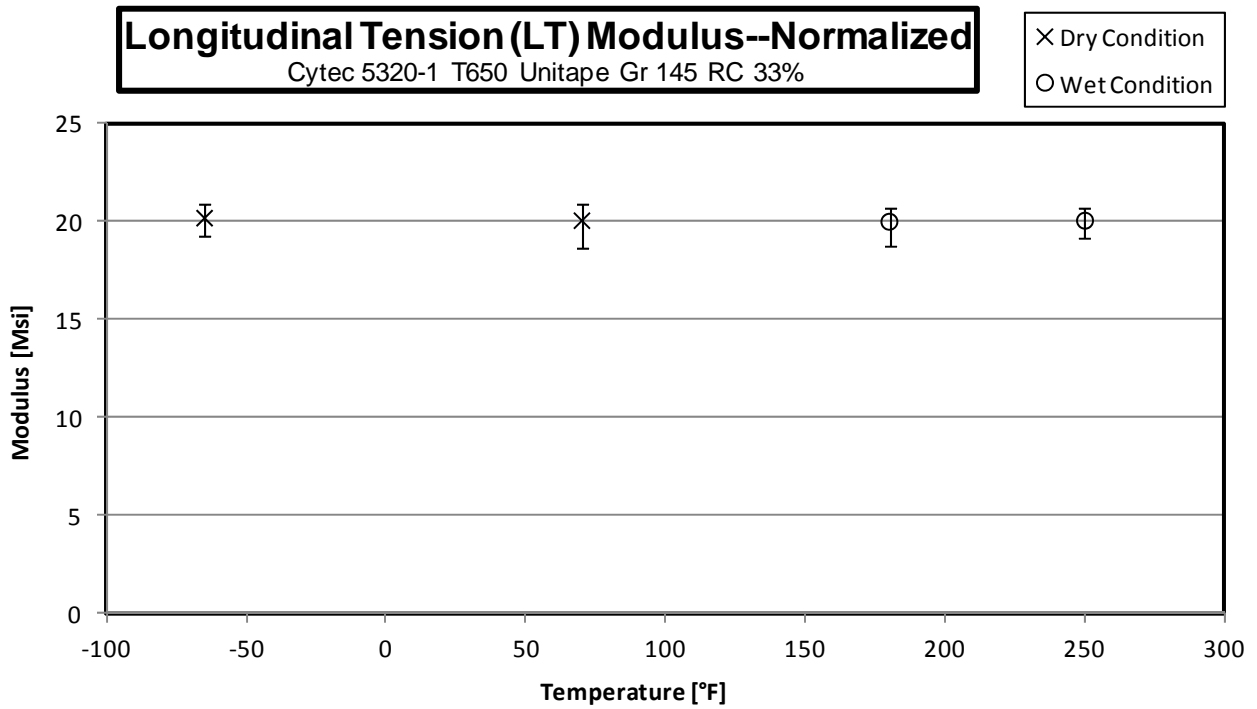
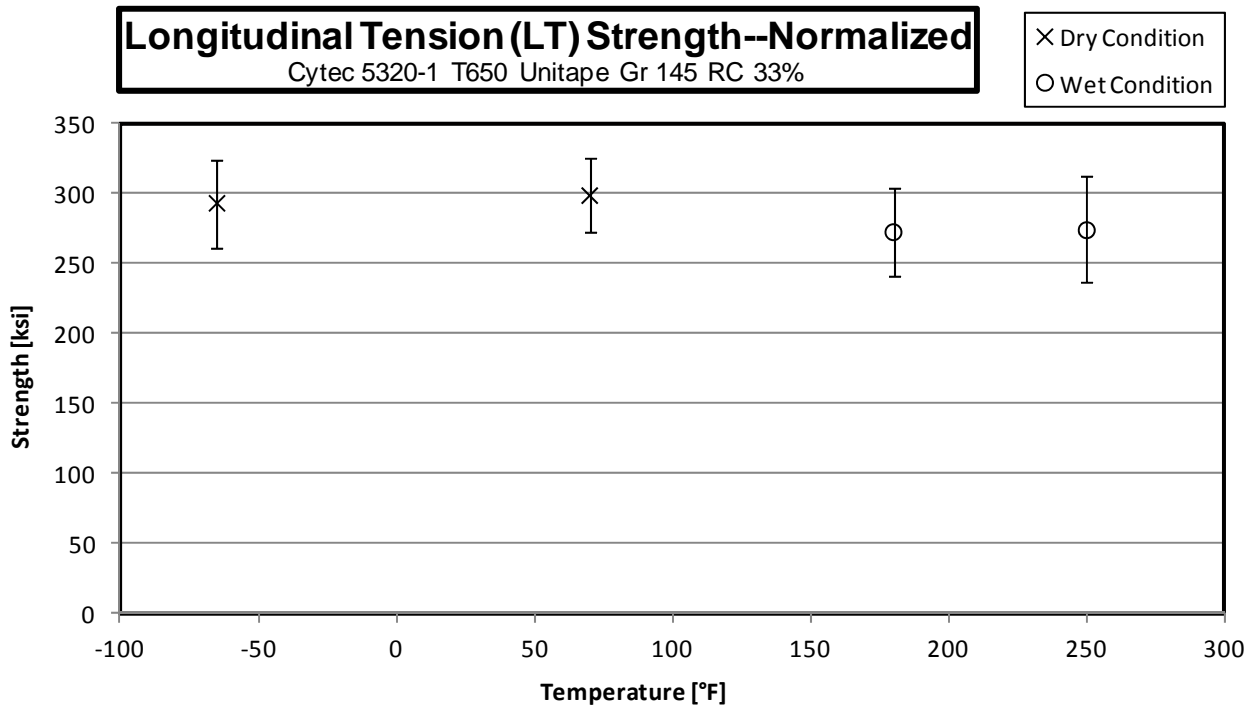
2.3.31 Interlaminar Tension Properties (ILT)

Material: Cytec 5320-1 T650 Unitape Gr 145 RC 33%		Interlaminar Tension Cytec 5320-1 T650 Unitape Gr 145 RC 33% [0]30					
Resin content:	34.37 % wt	Comp. density:		1.590 g/cc			
Fiber volume:	58.93 % vol						
Ply count:	30						
Test method:	ASTM D 6415-06						
Normalized by:	NA						
		CTD	RTD	ETW2			
Test Temperature [°F]		-65	70	250			
Moisture Conditioning		Dry	Dry	Equilibrium			
Equilibrium at T, RH				160 F,85%			
Source code		CUGMX XXXB	CUGMX XXXA	CUGMX XXXF			
		Normalized	Measured	Normalized	Measured	Normalized	
CBS [lb]	Mean		238.501	251.215	153.369		
	Minimum		188.327	213.670	119.620		
	Maximum		281.814	293.481	174.475		
	C.V.(%)		14.934	10.991	12.320		
	No. Specimens		7	7	8		
No. Prepreg Lots		1	1	1			
ILT [ksi]	Mean		6.831	7.399	4.719		
	Minimum		5.416	6.106	3.502		
	Maximum		8.110	8.597	5.489		
	C.V.(%)		14.761	10.959	13.101		
	No. Specimens		7	7	8		
No. Prepreg Lots		1	1	1			

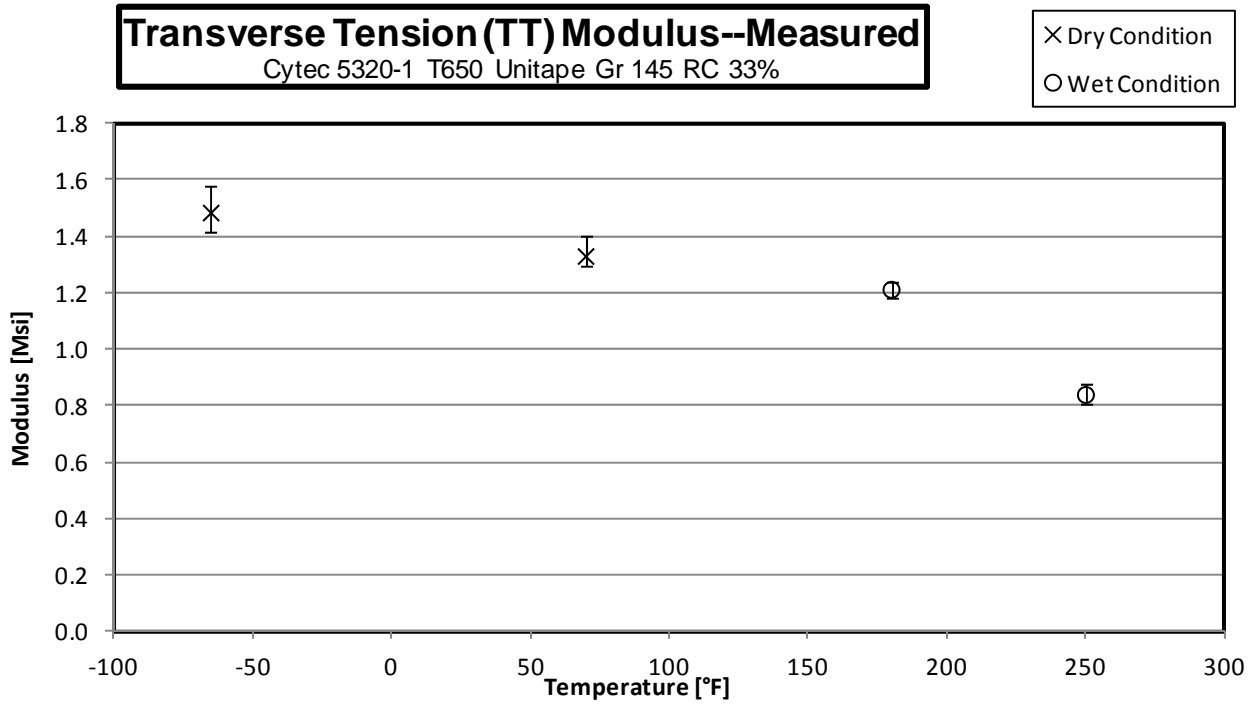
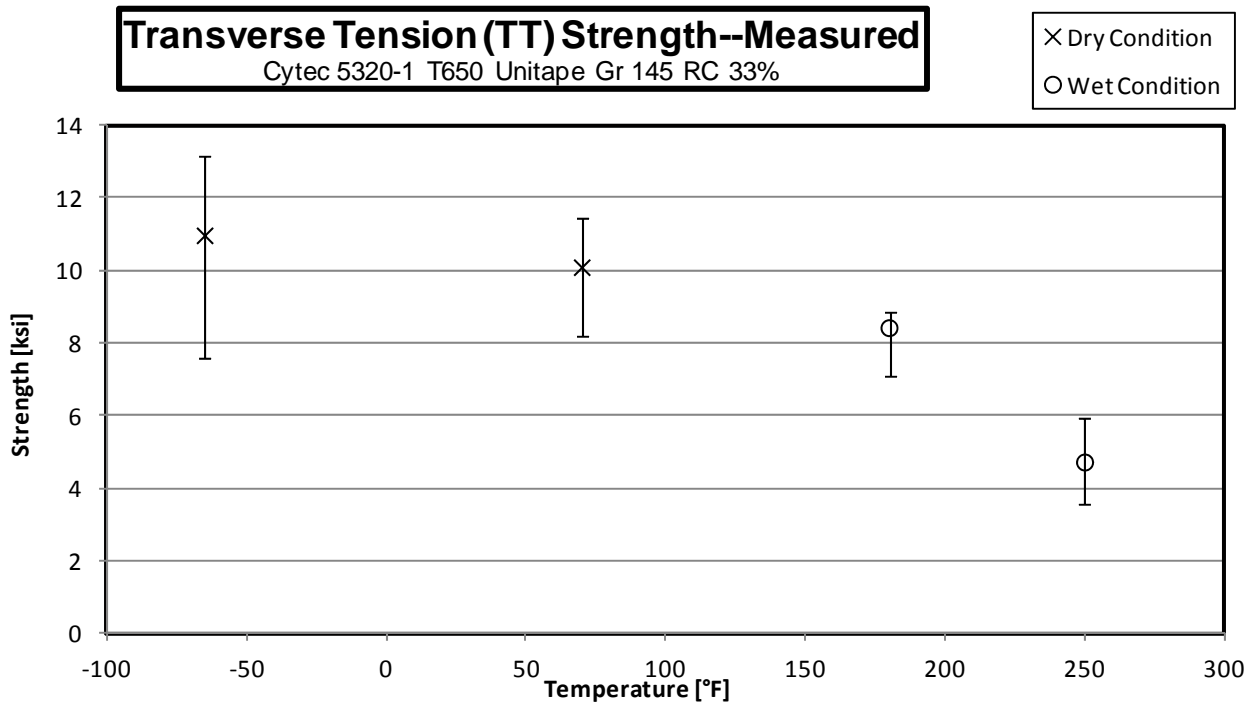
3. Individual Test Charts

These charts combine all three batches of data and plot the minimum and maximum modulus and strength range based on the test temperature.

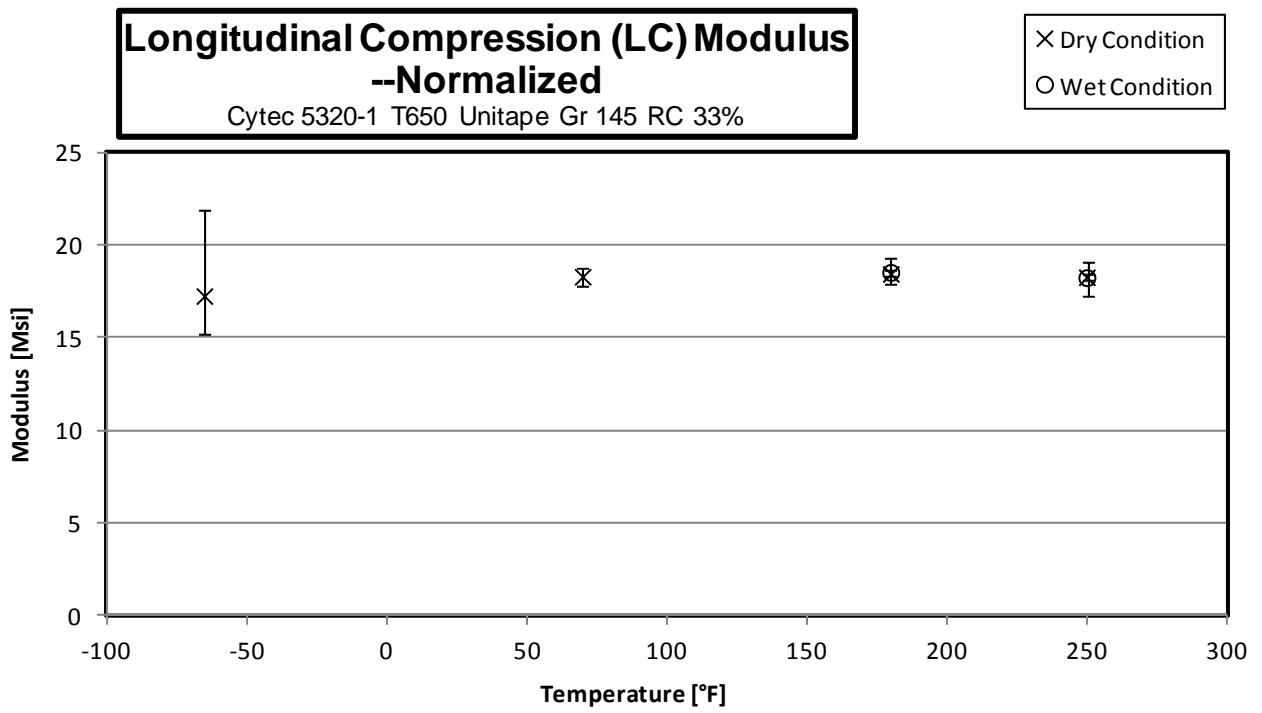
3.1 Longitudinal Tension Properties (LT)



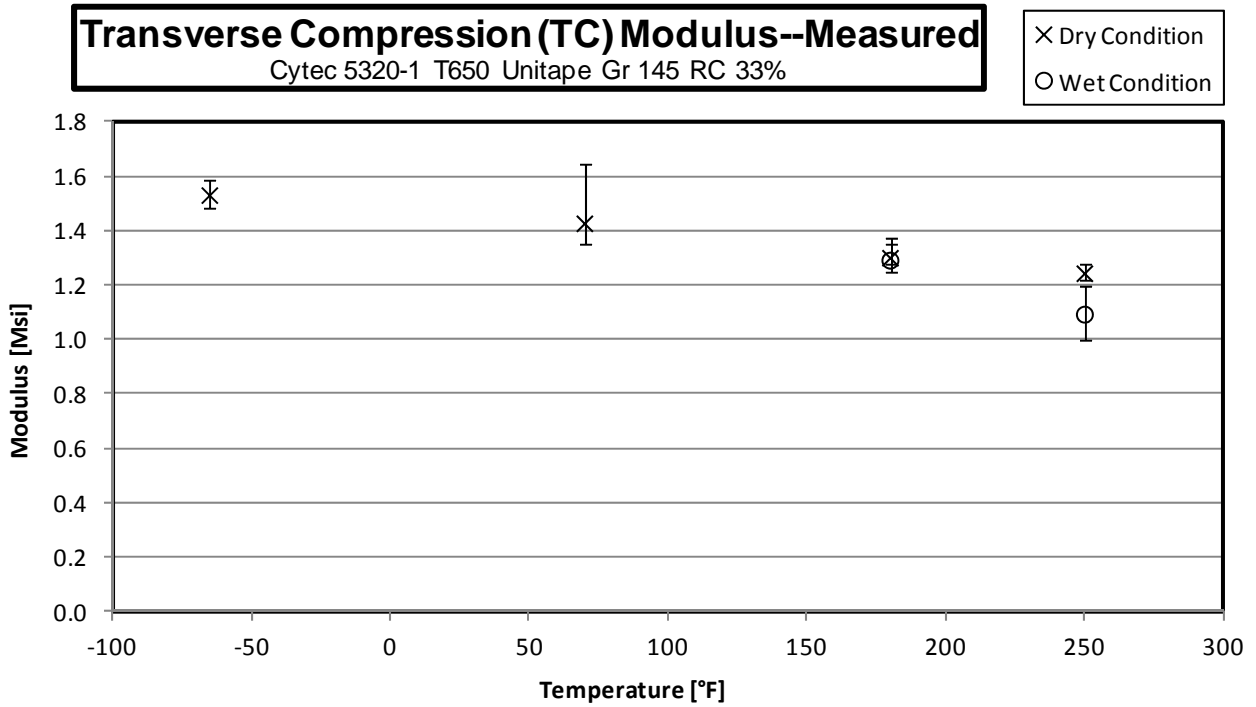
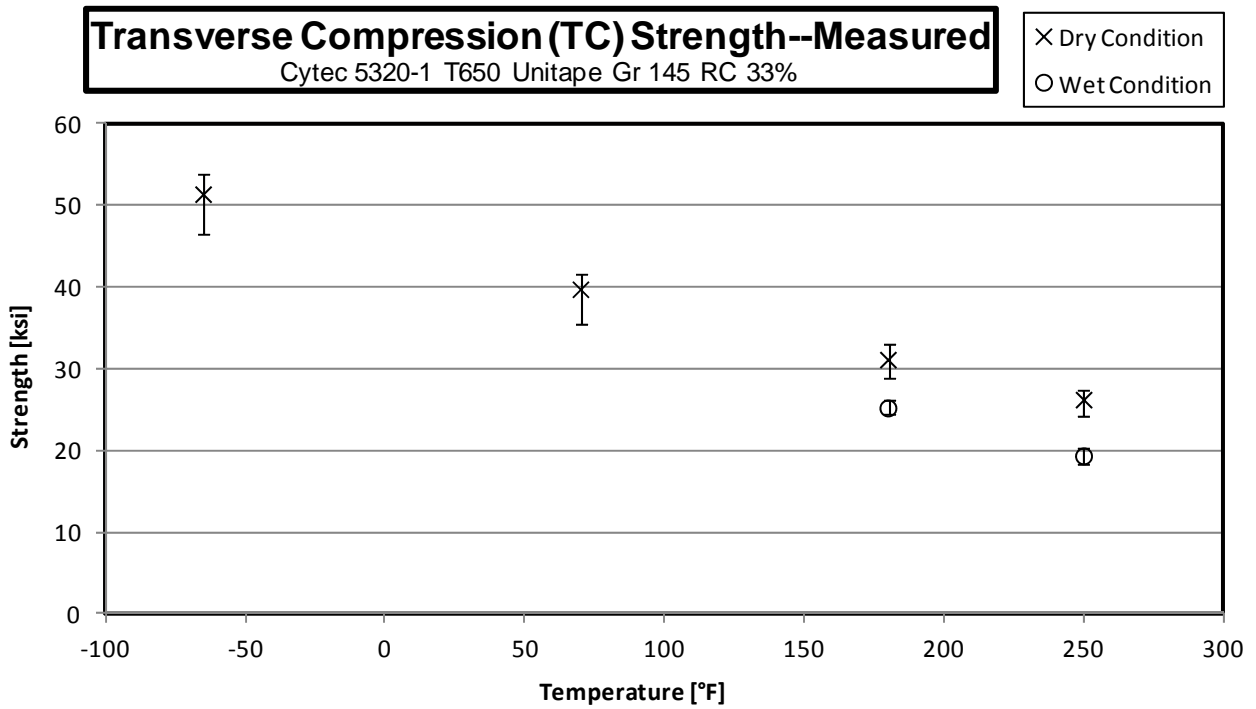
3.2 Transverse Tension Properties (TT)



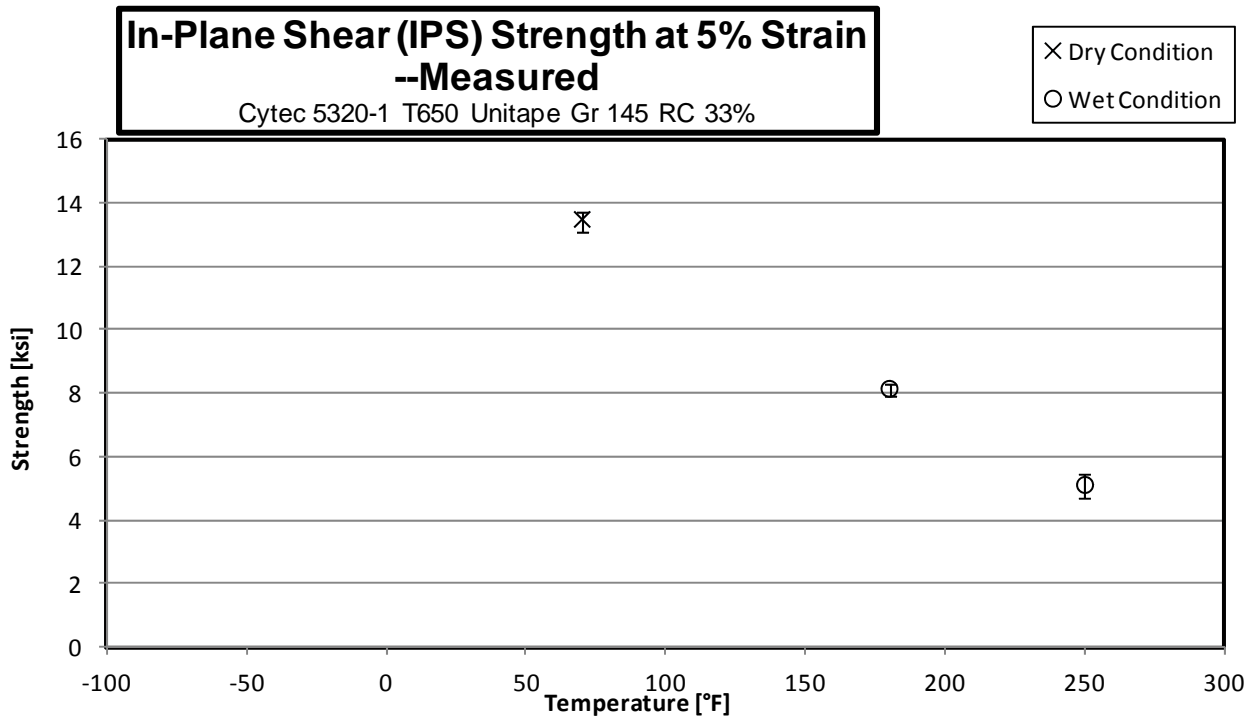
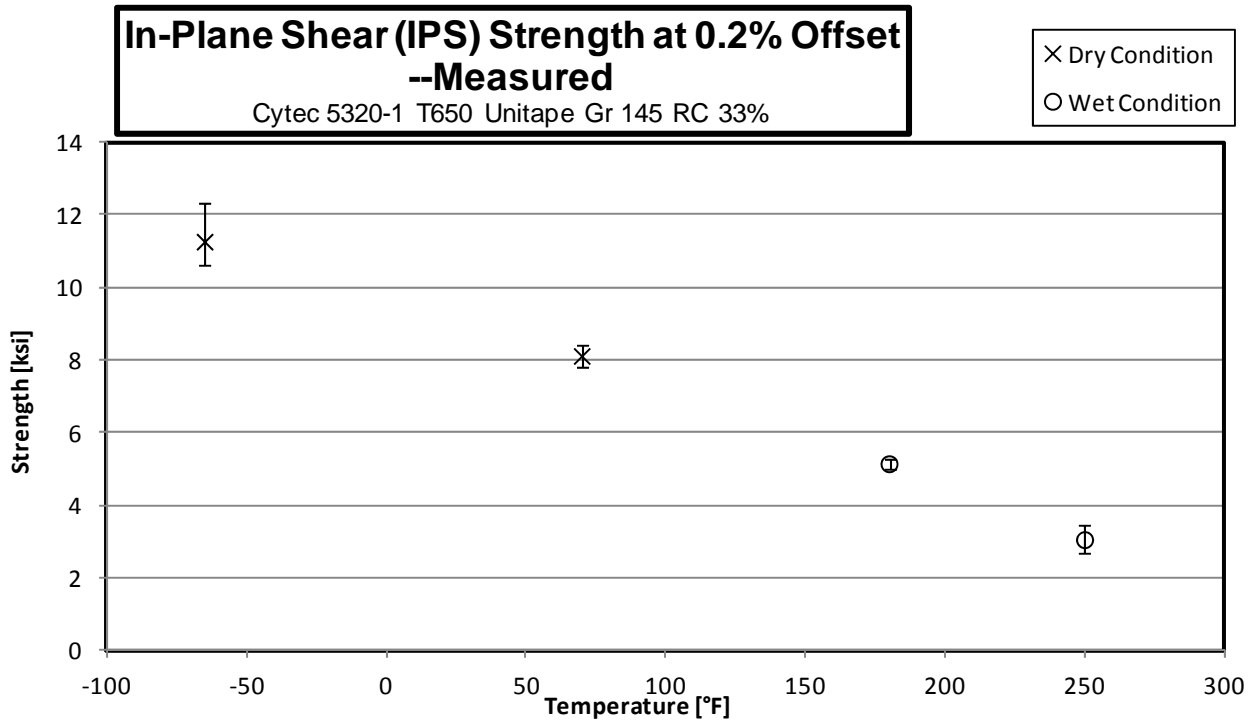
3.3 Longitudinal Compression Properties (LC)

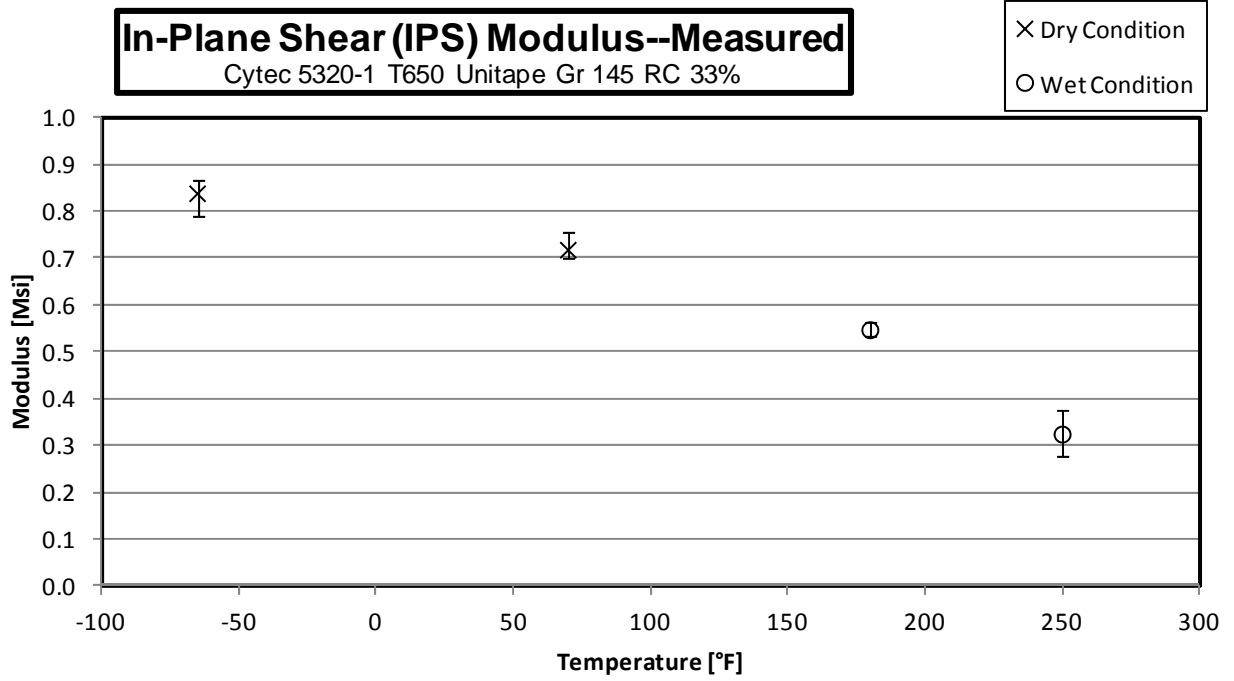


3.4 Transverse Compression Properties (TC)

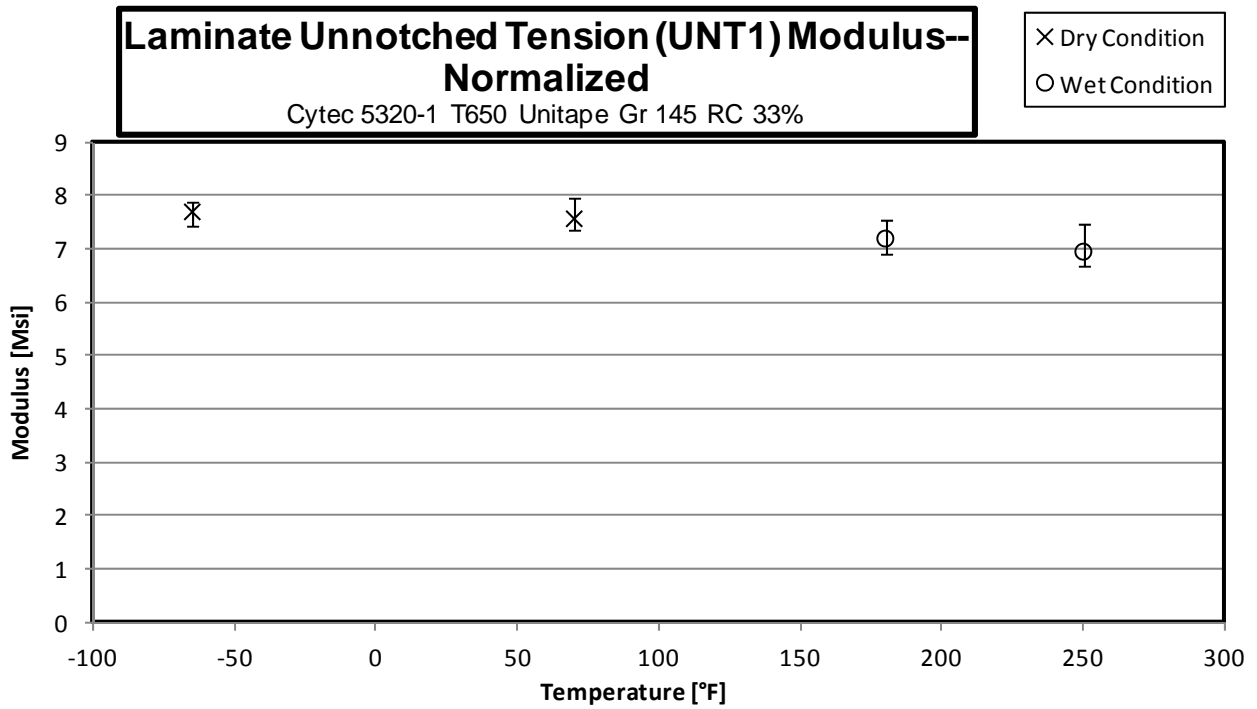
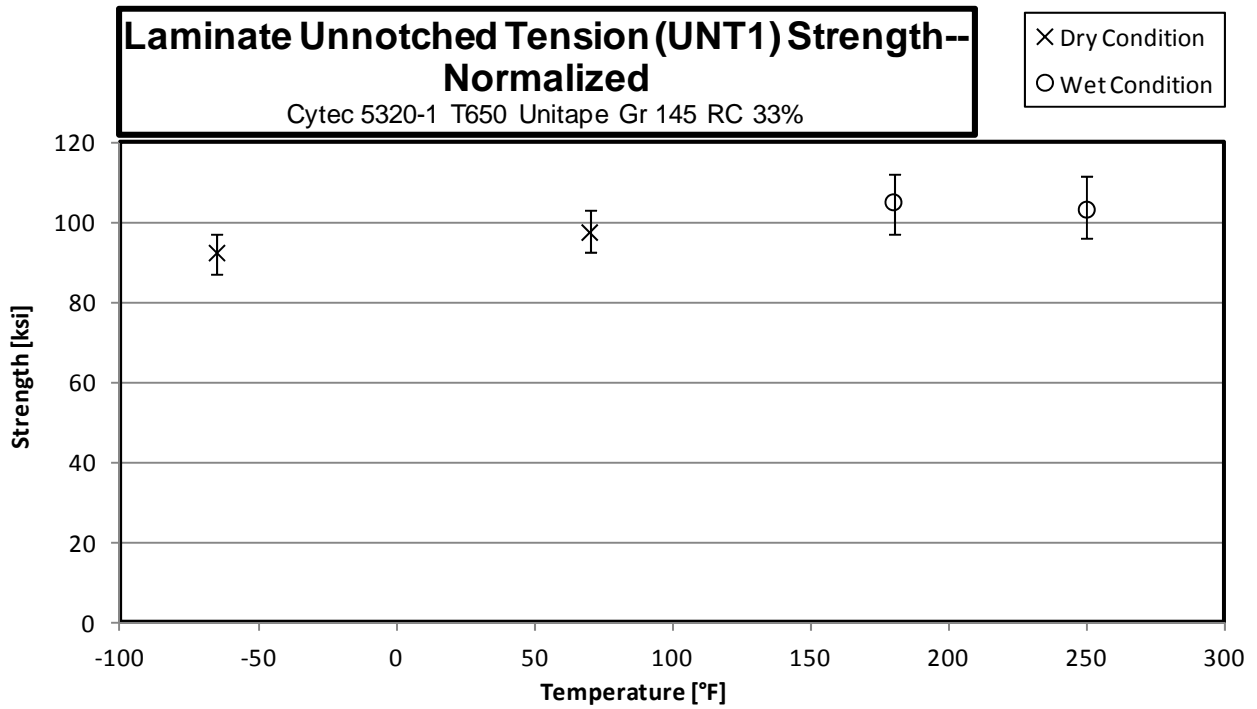


3.5 In-Plane Shear Properties (IPS)

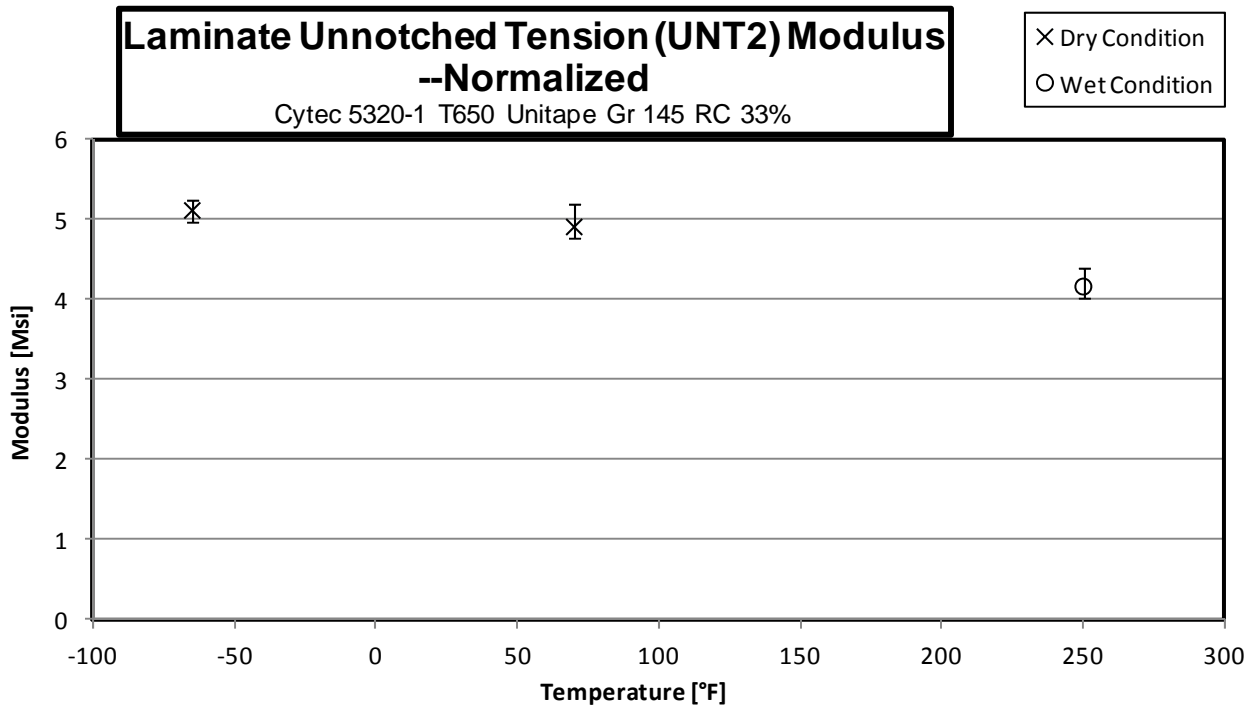
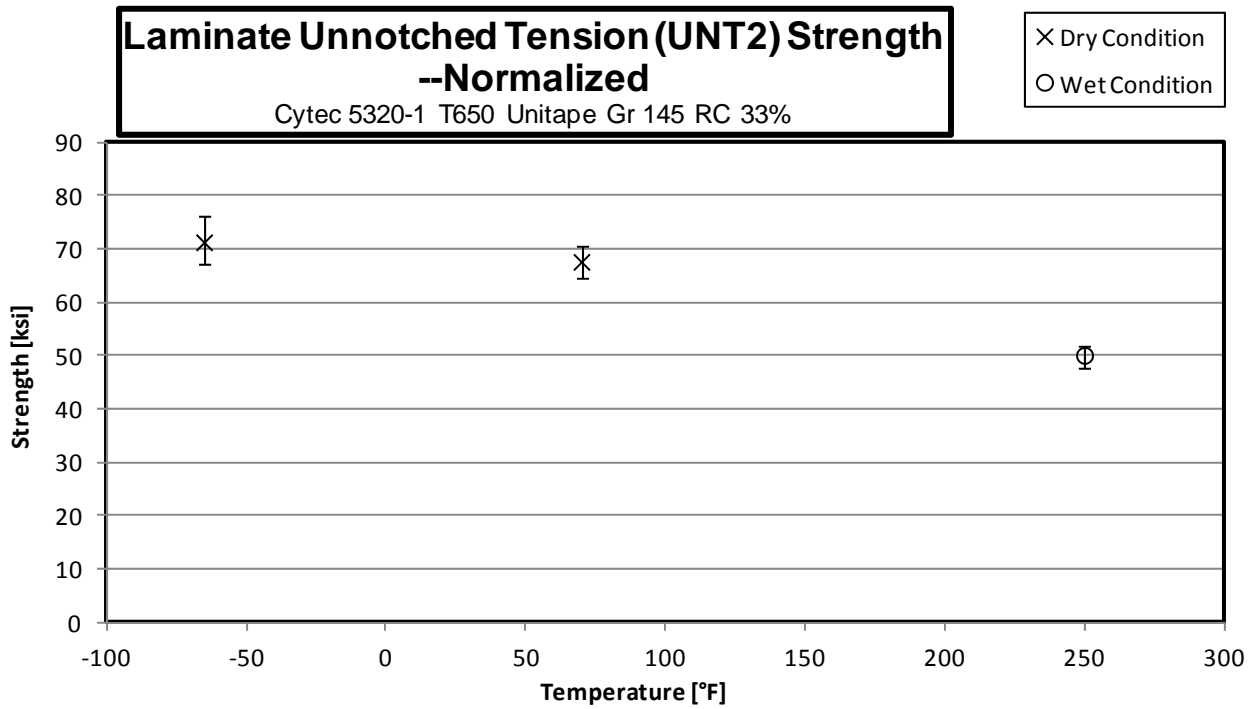




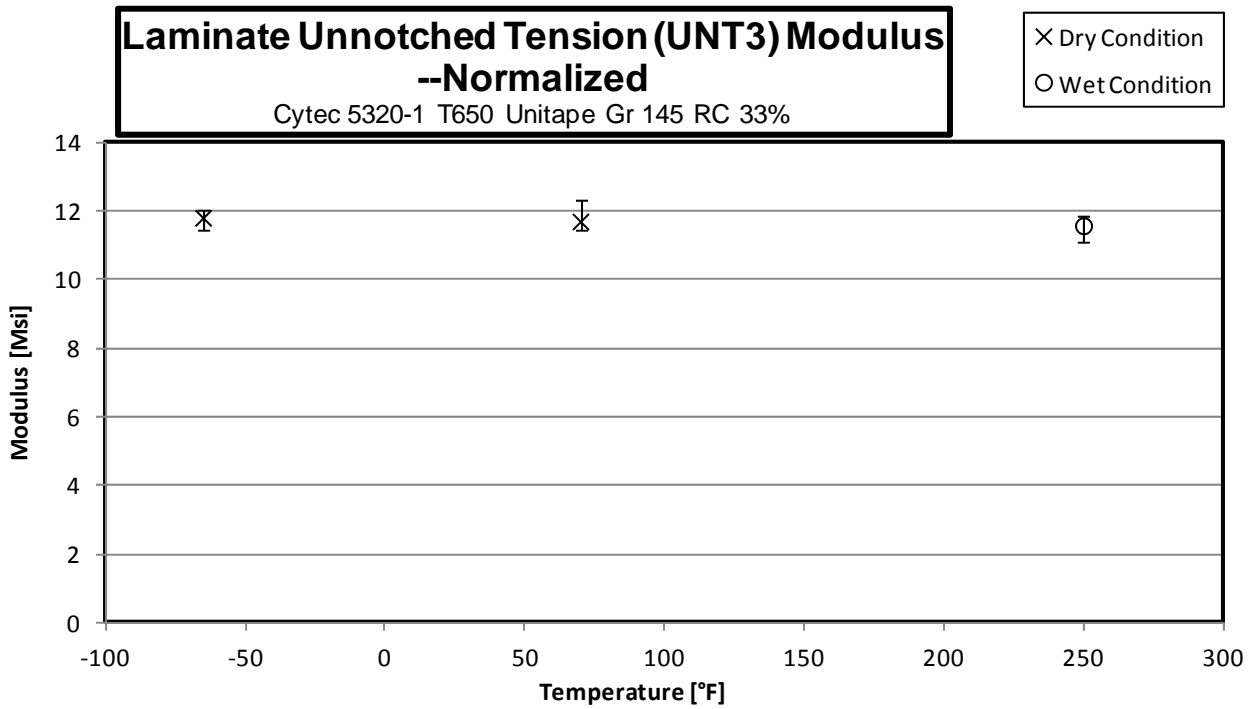
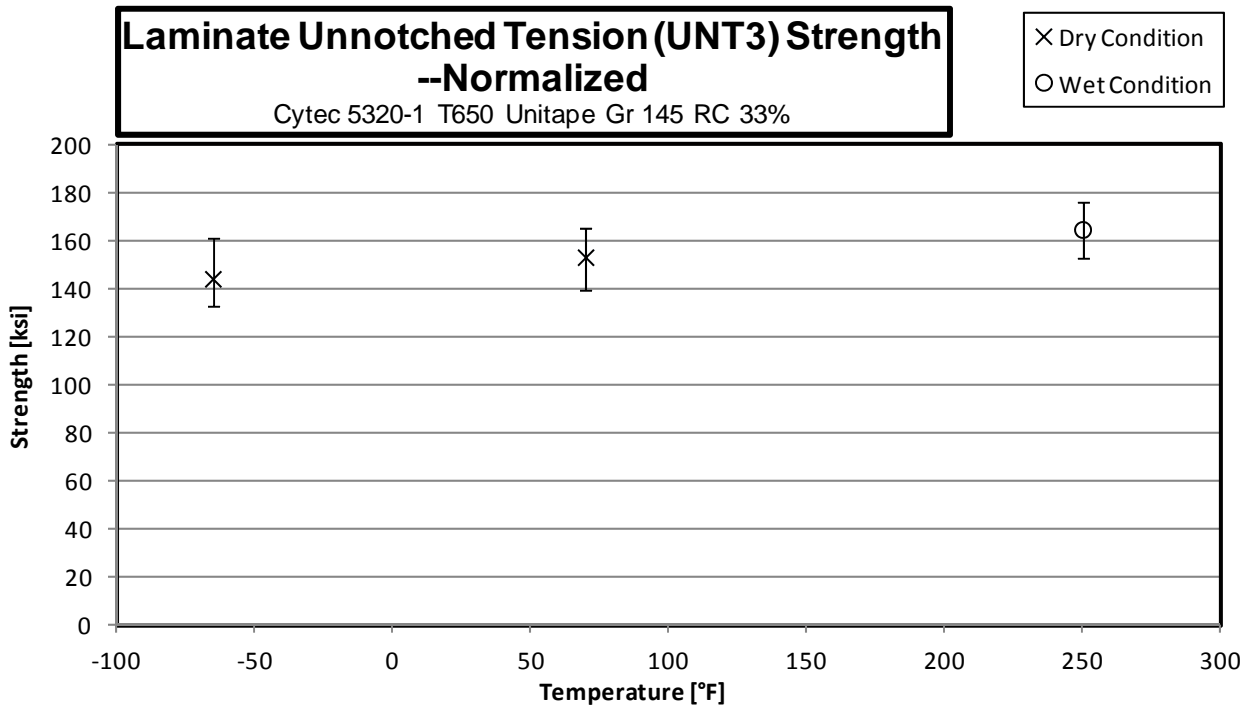
3.6 “25/50/25” Unnotched Tension 1 Properties (UNT1)



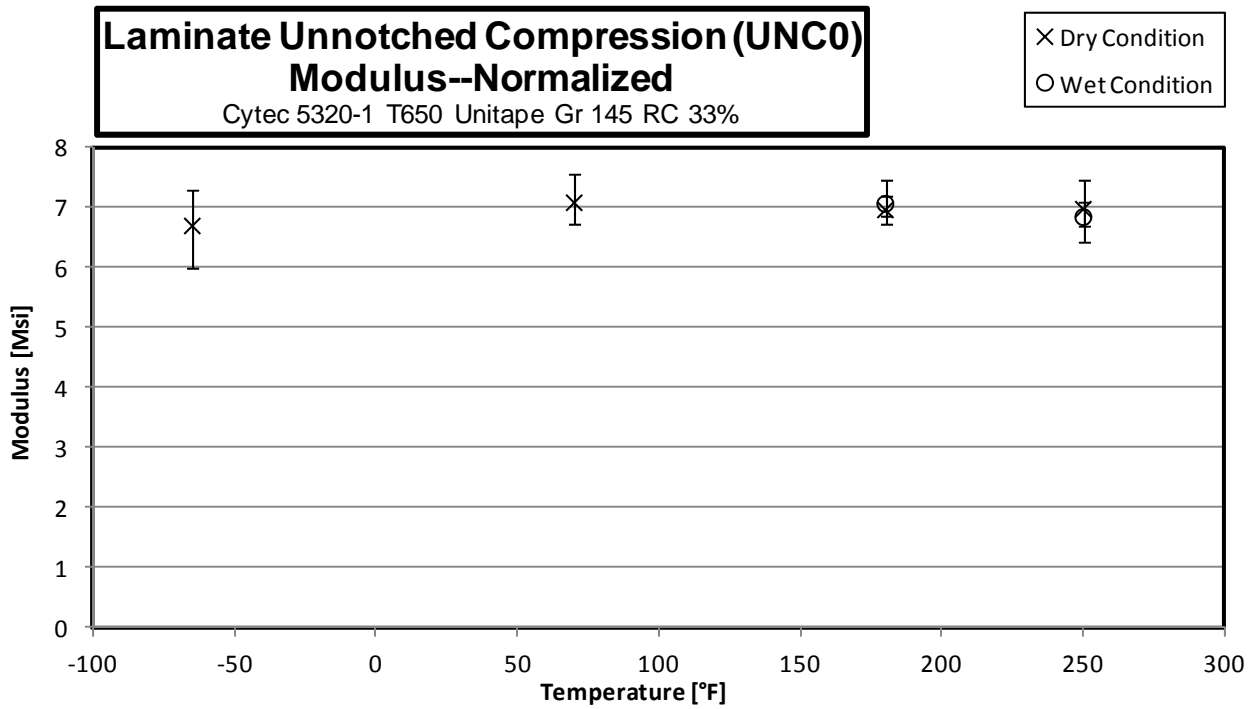
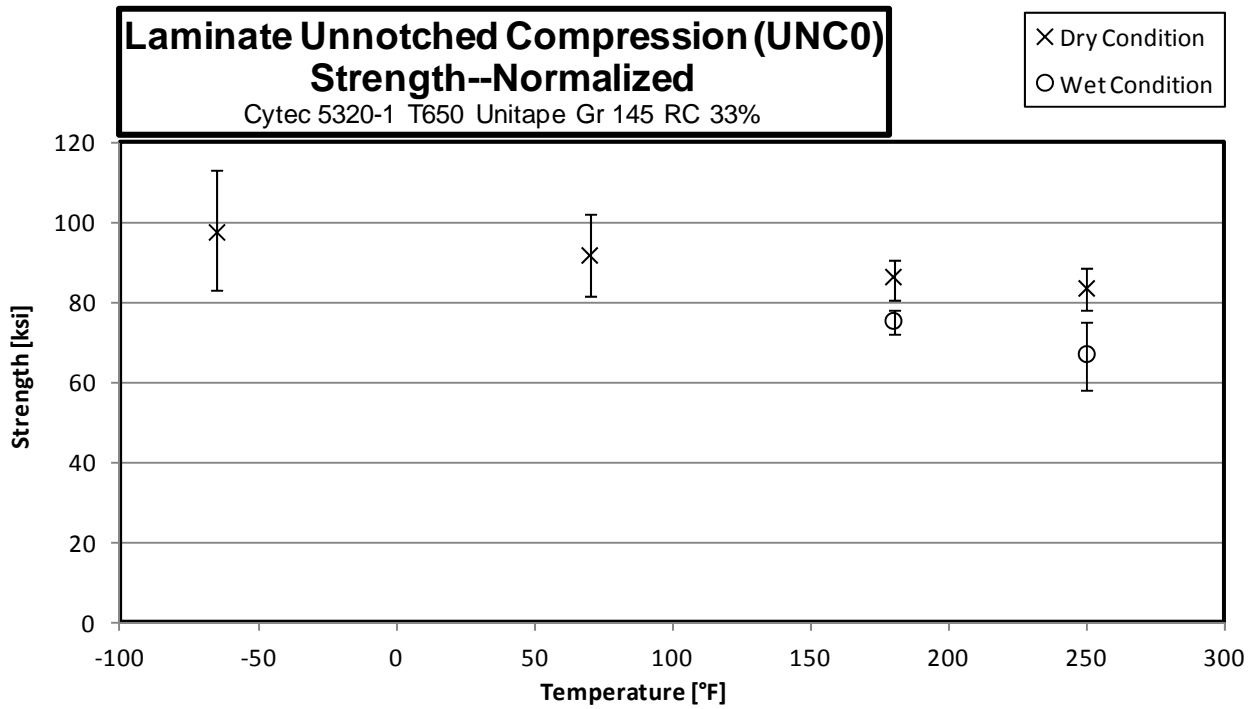
3.7 "10/80/10" Unnotched Tension 2 Properties (UNT2)



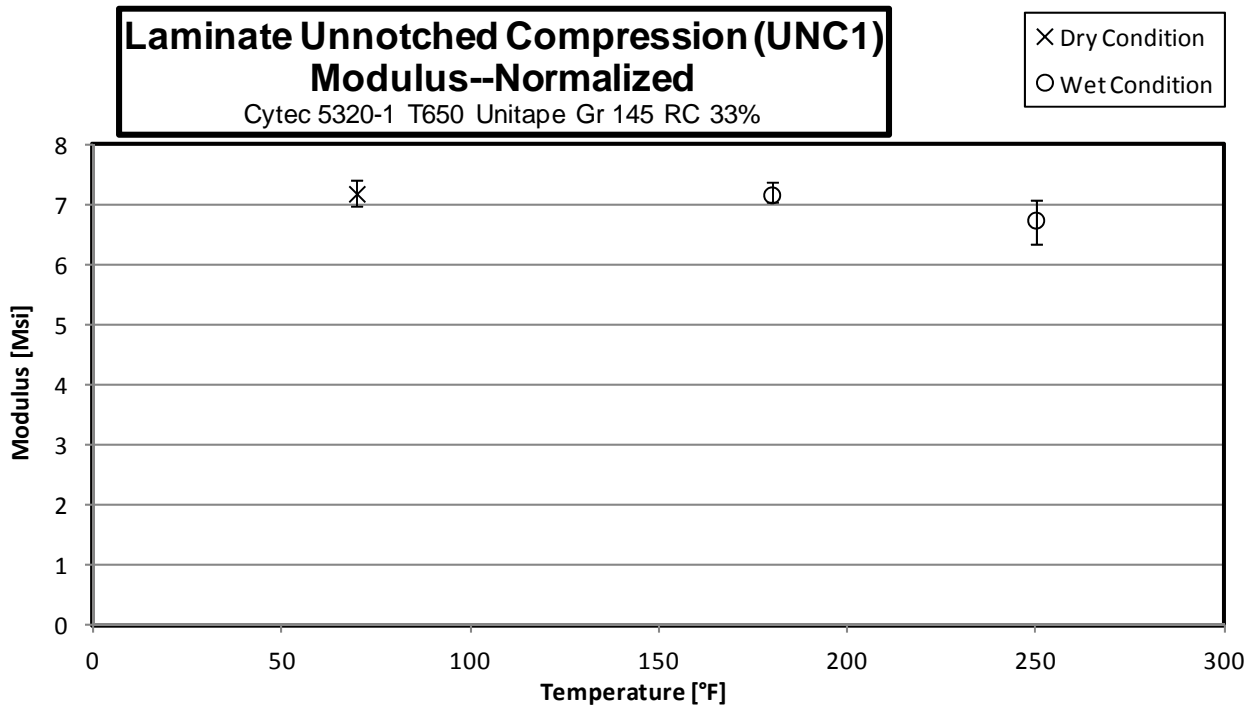
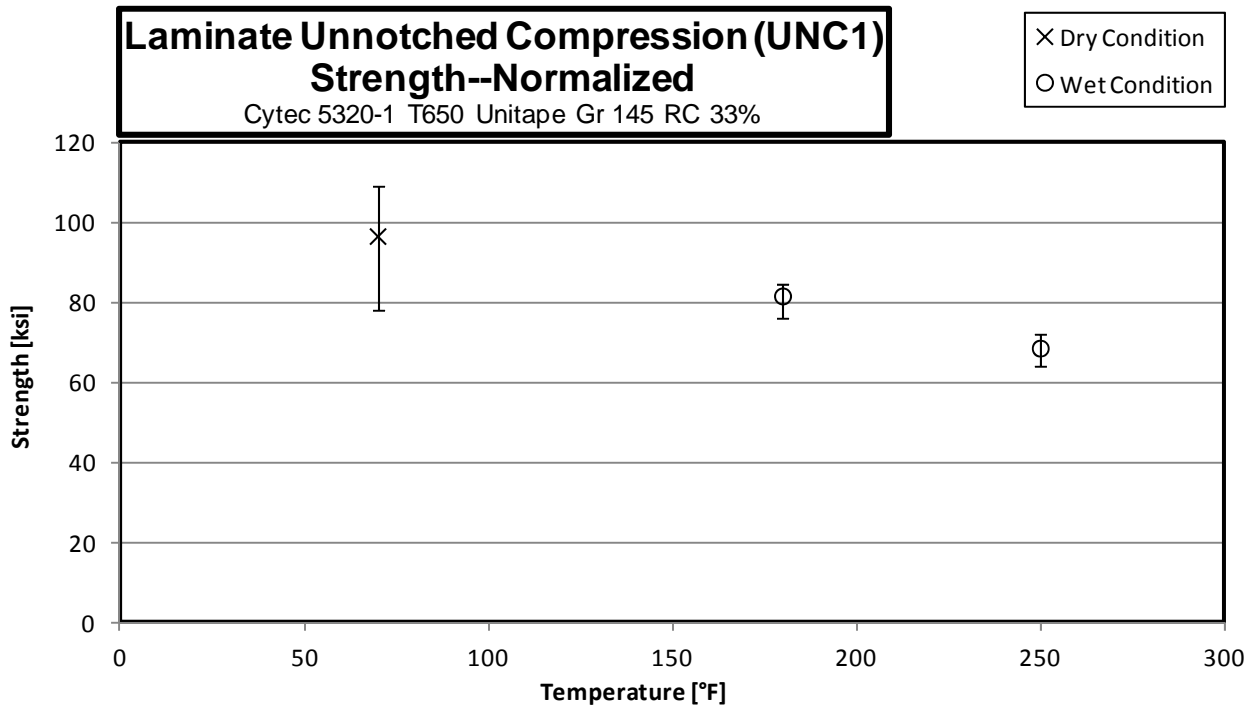
3.8 “50/40/10” Unnotched Tension 3 Properties (UNT3)



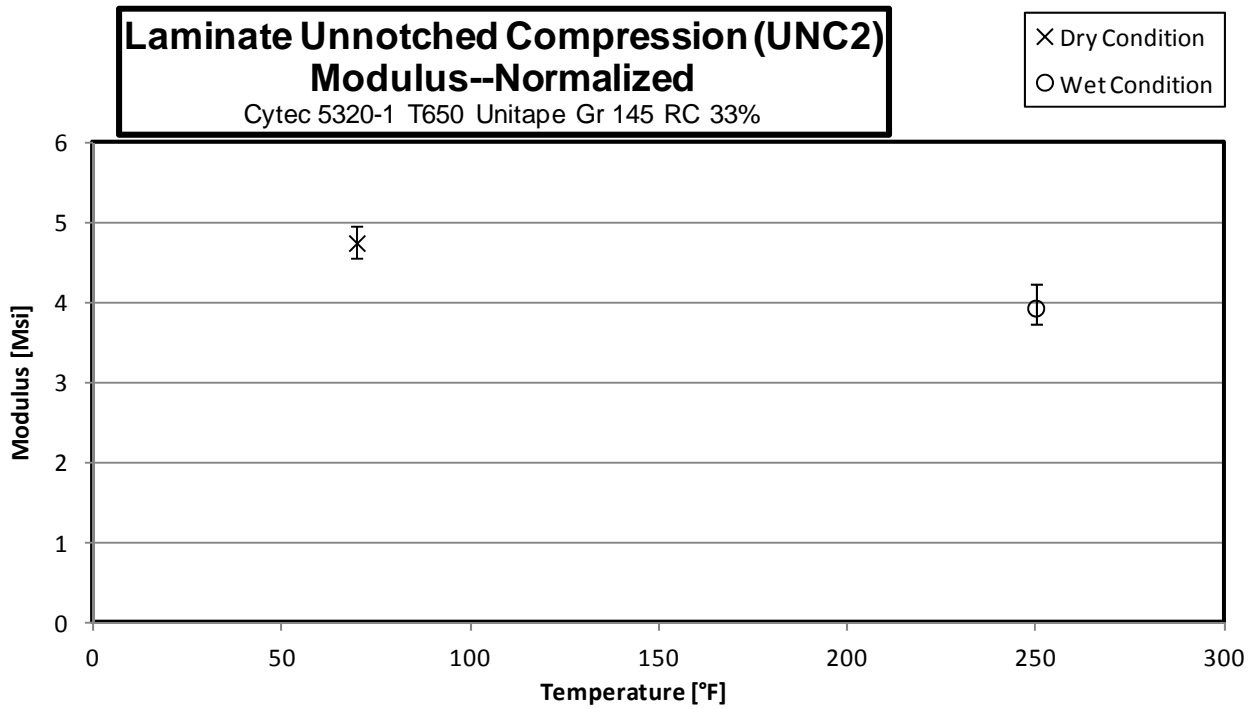
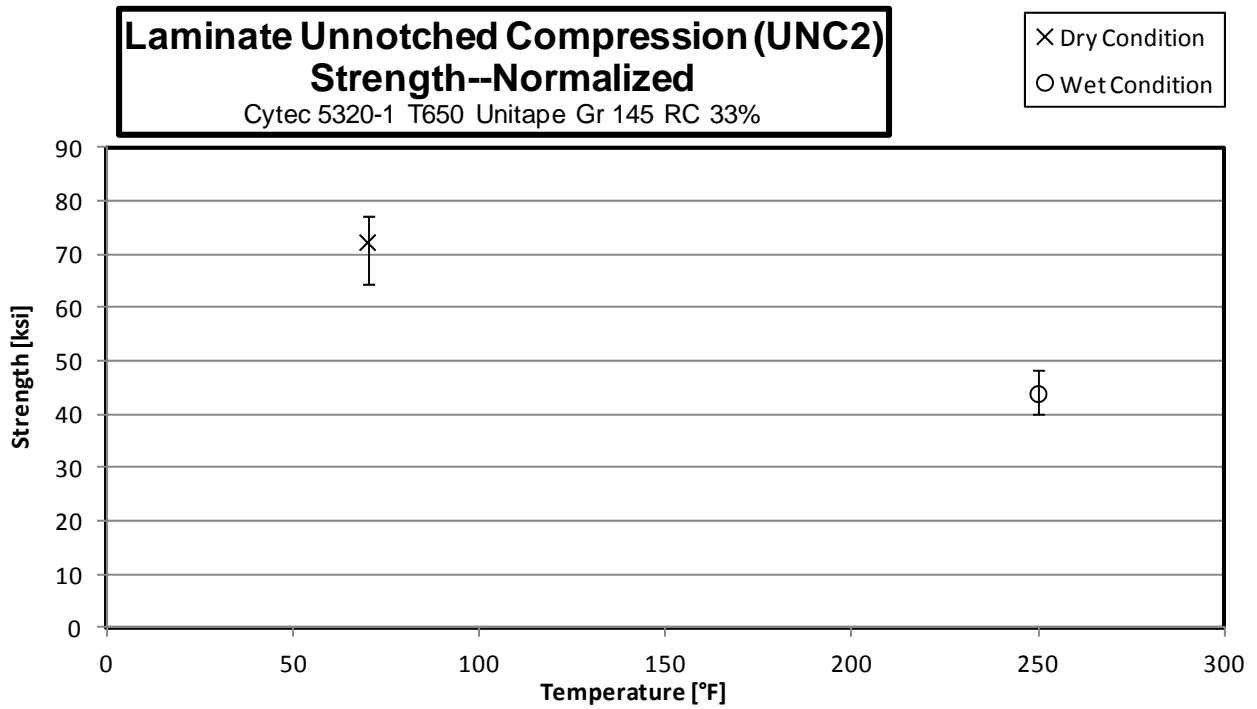
3.9 “33/0/67” Unnotched Compression 0 Properties (UNC0)



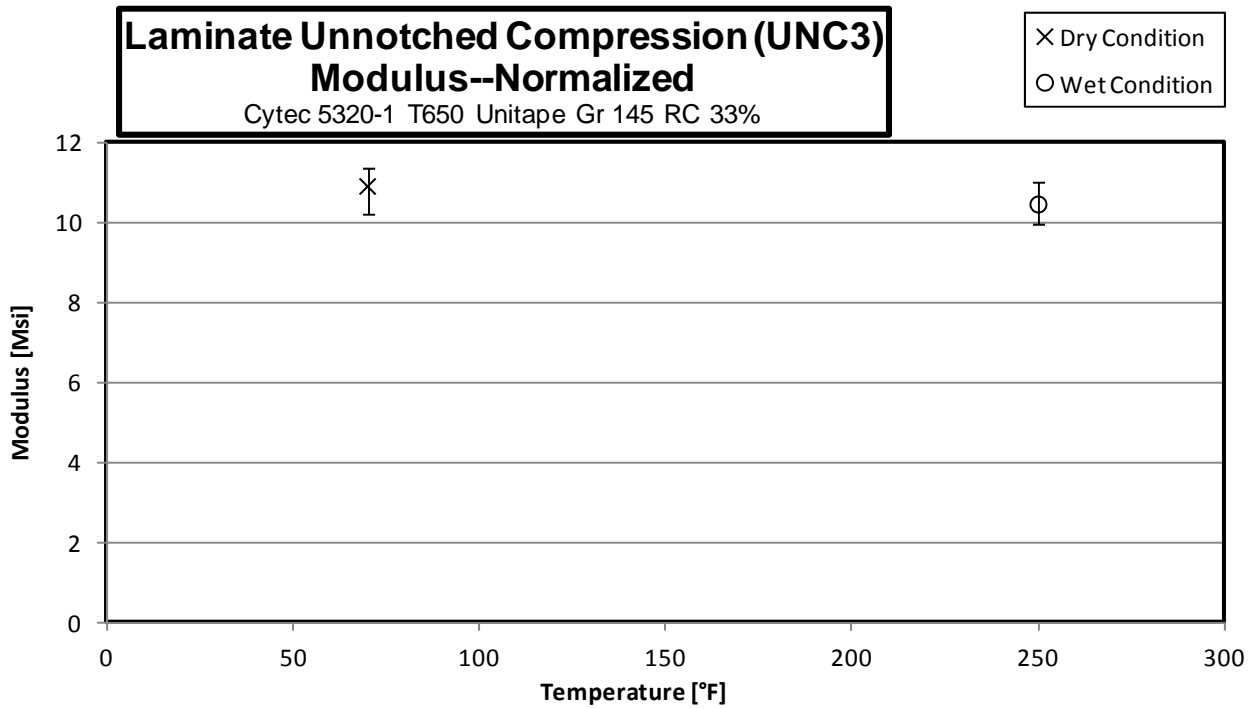
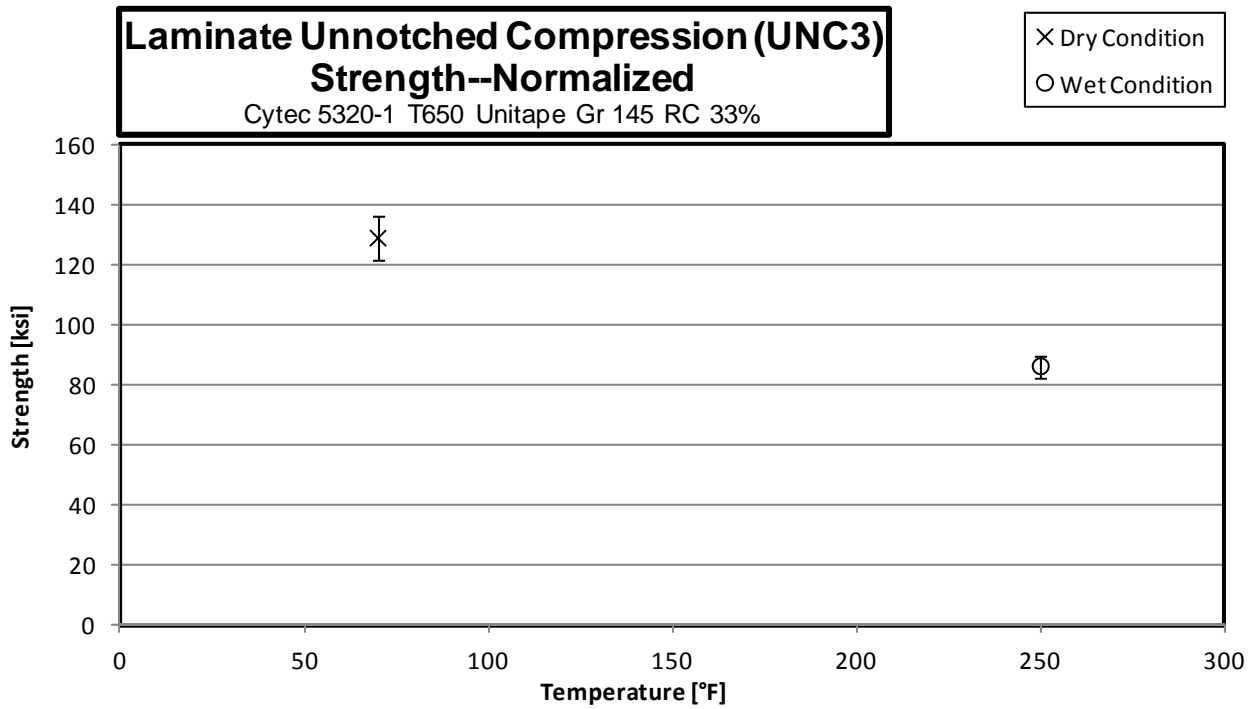
3.10 “25/50/25” Unnotched Compression 1 Properties (UNC1)



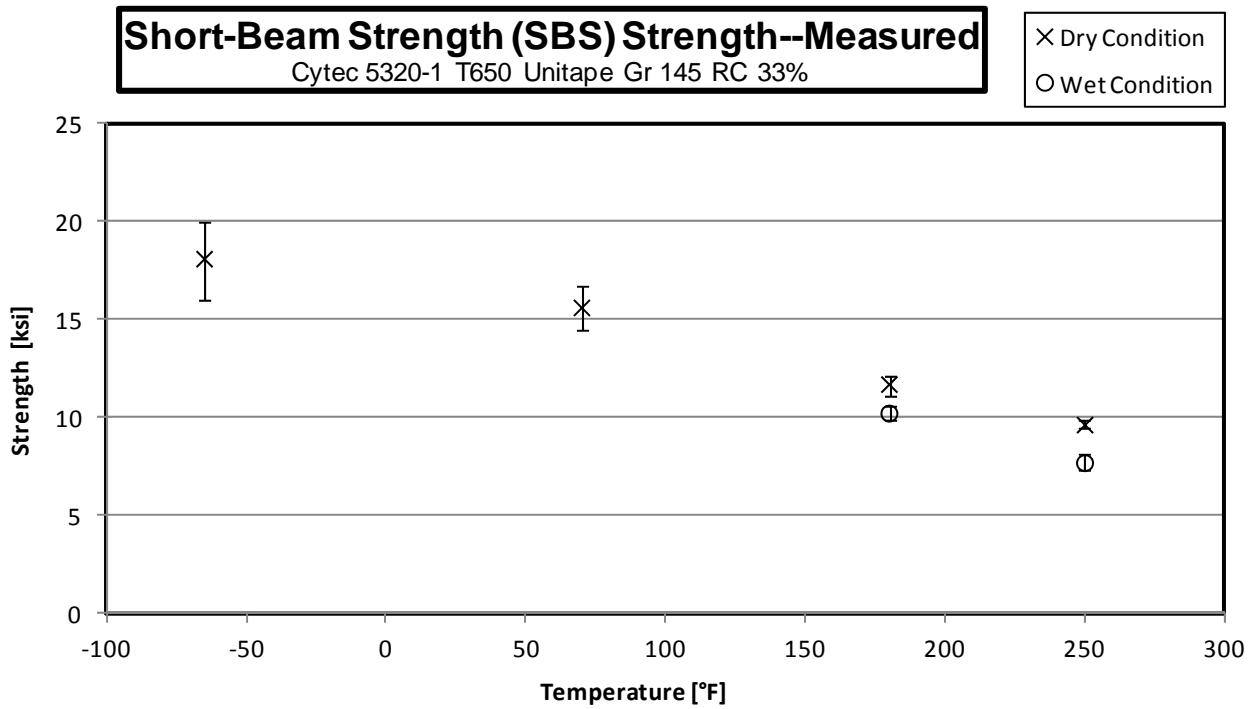
3.11 “10/80/10” Unnotched Compression 2 Properties (UNC2)



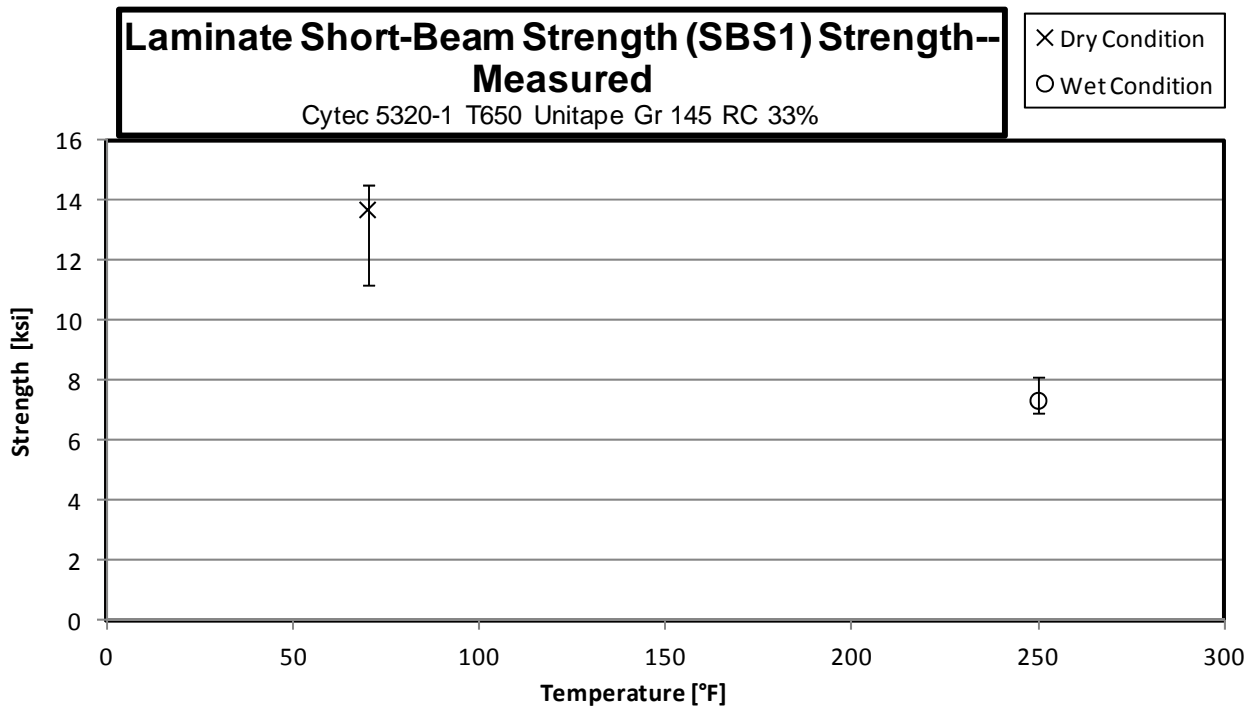
3.12 “50/40/10” Unnotched Compression 3 Properties (UNC3)



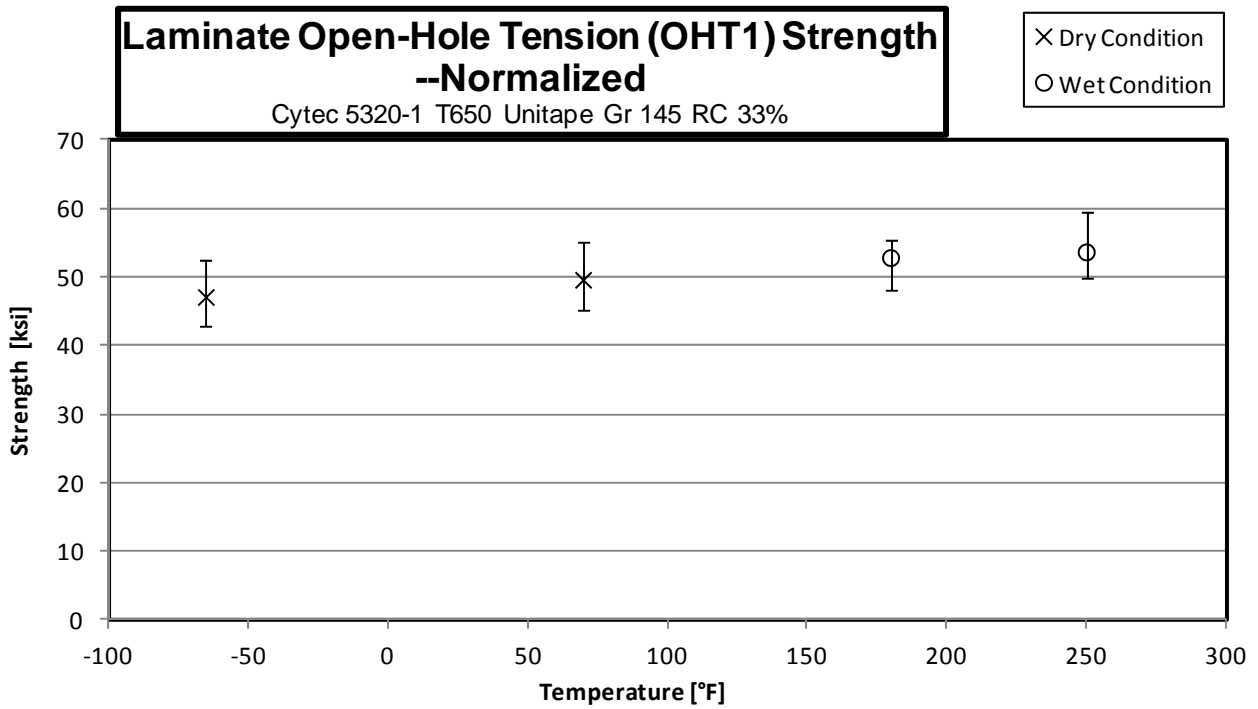
3.13 Lamina Short-Beam Shear Properties (SBS)



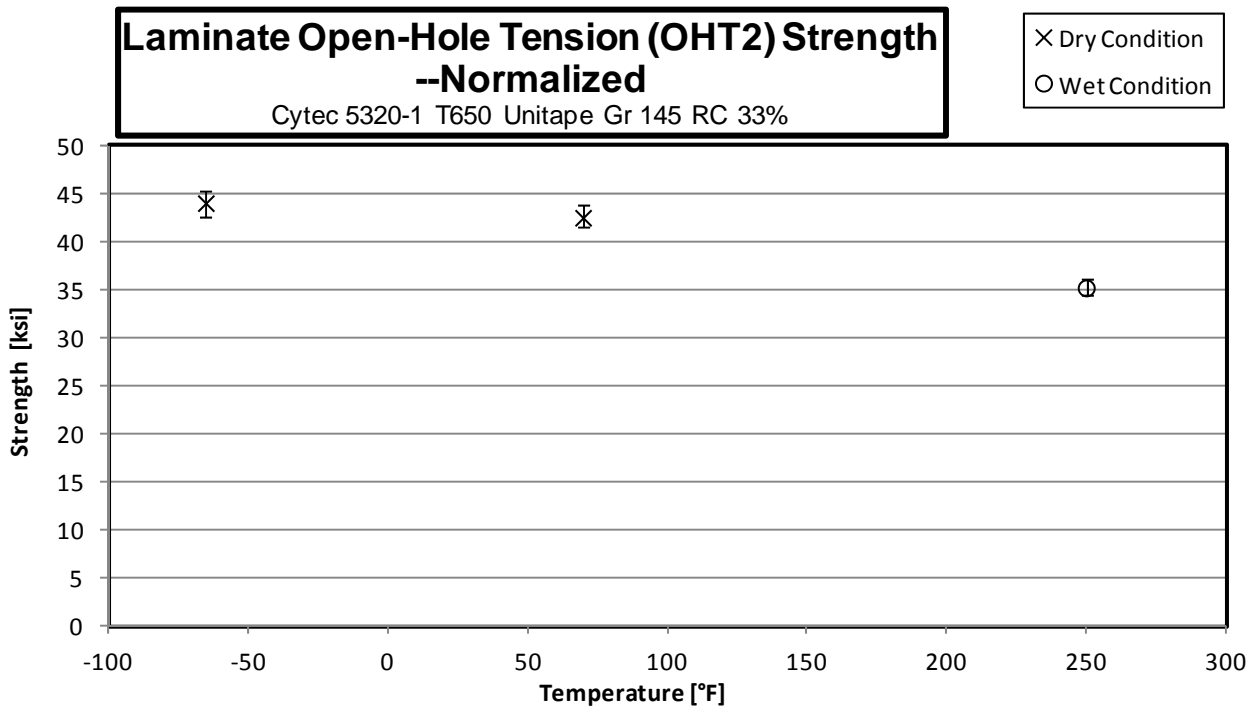
3.14 Laminate Short-Beam Strength Properties (SBS1)



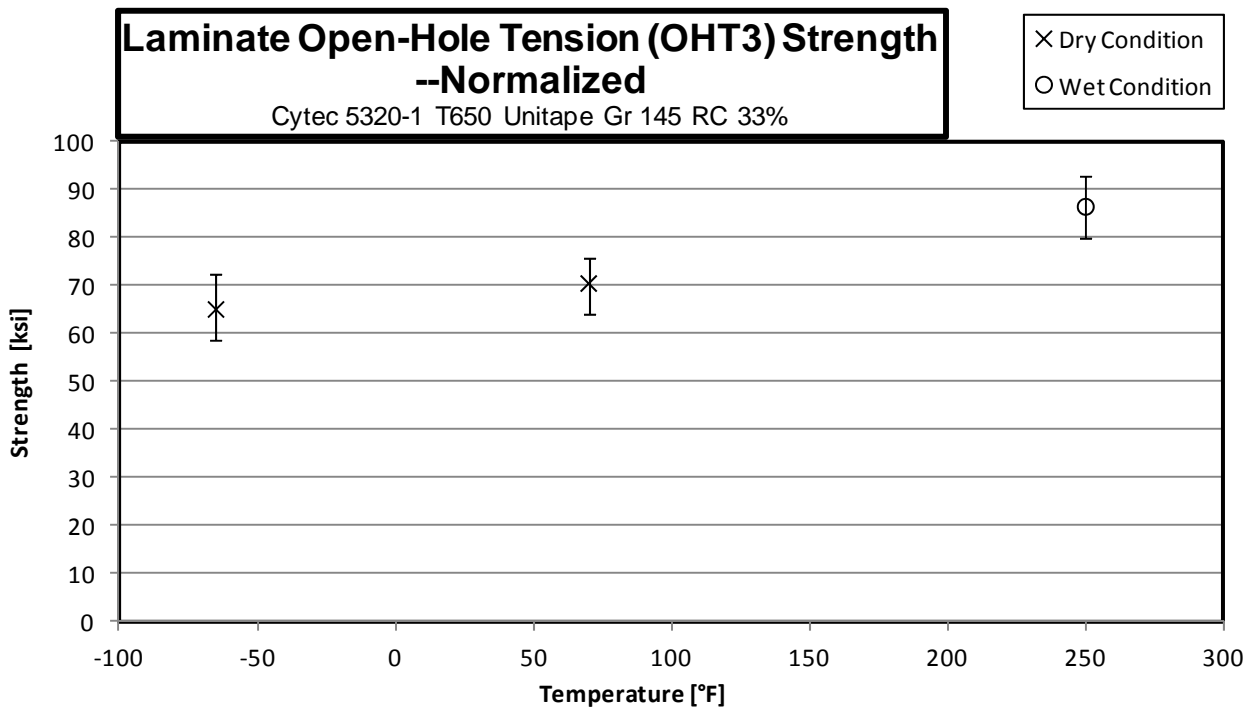
3.15 “25/50/25” Open-Hole Tension 1 Properties (OHT1)



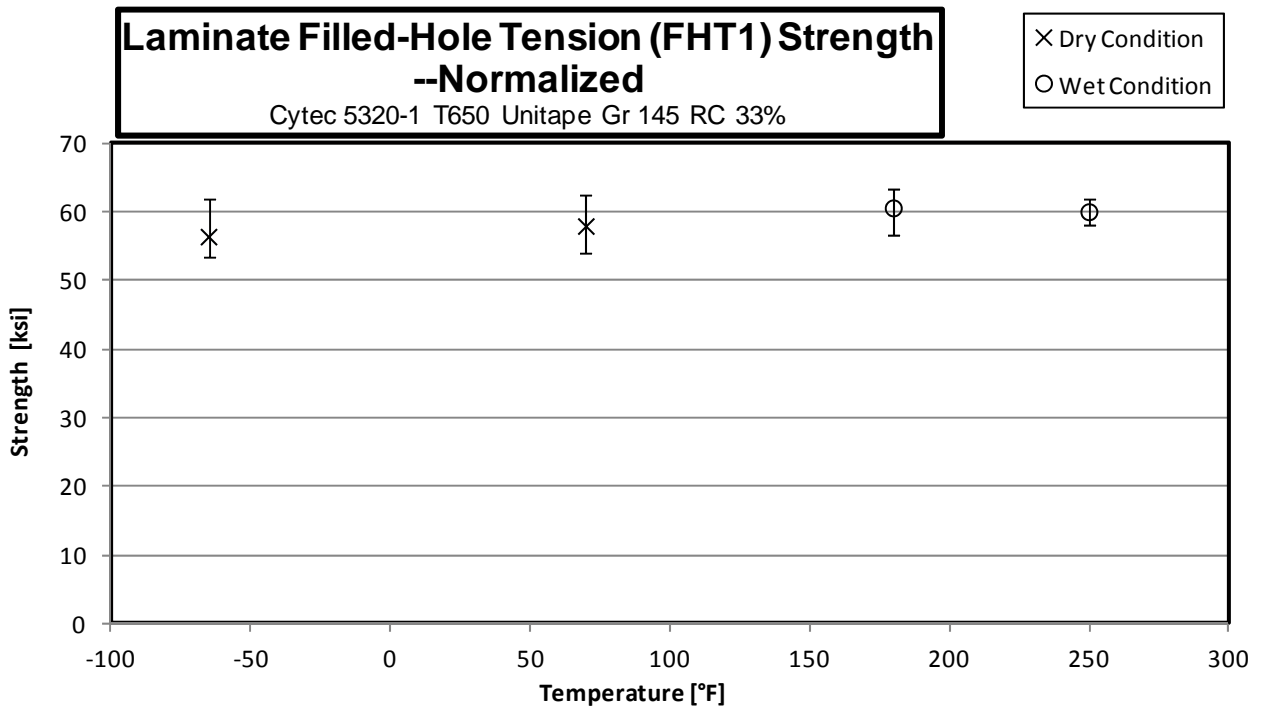
3.16 “10/80/10” Open-Hole Tension 2 Properties (OHT2)



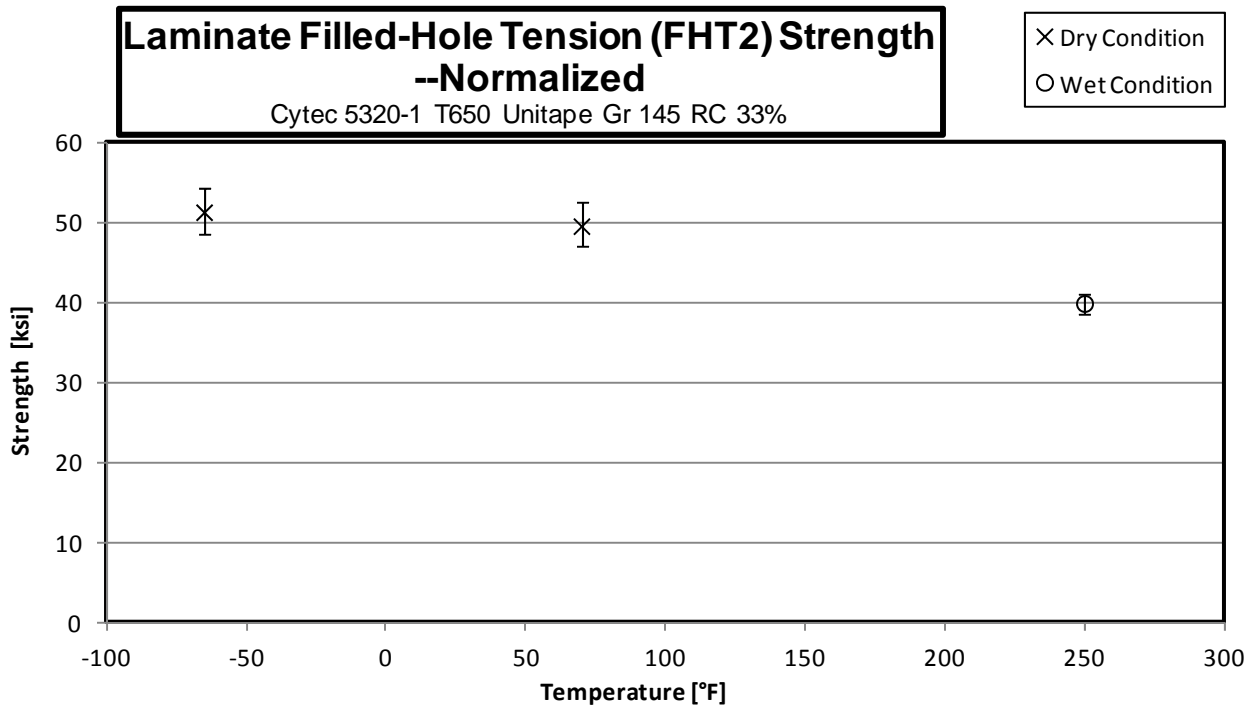
3.17 “50/40/10” Open-Hole Tension 3 Properties (OHT3)



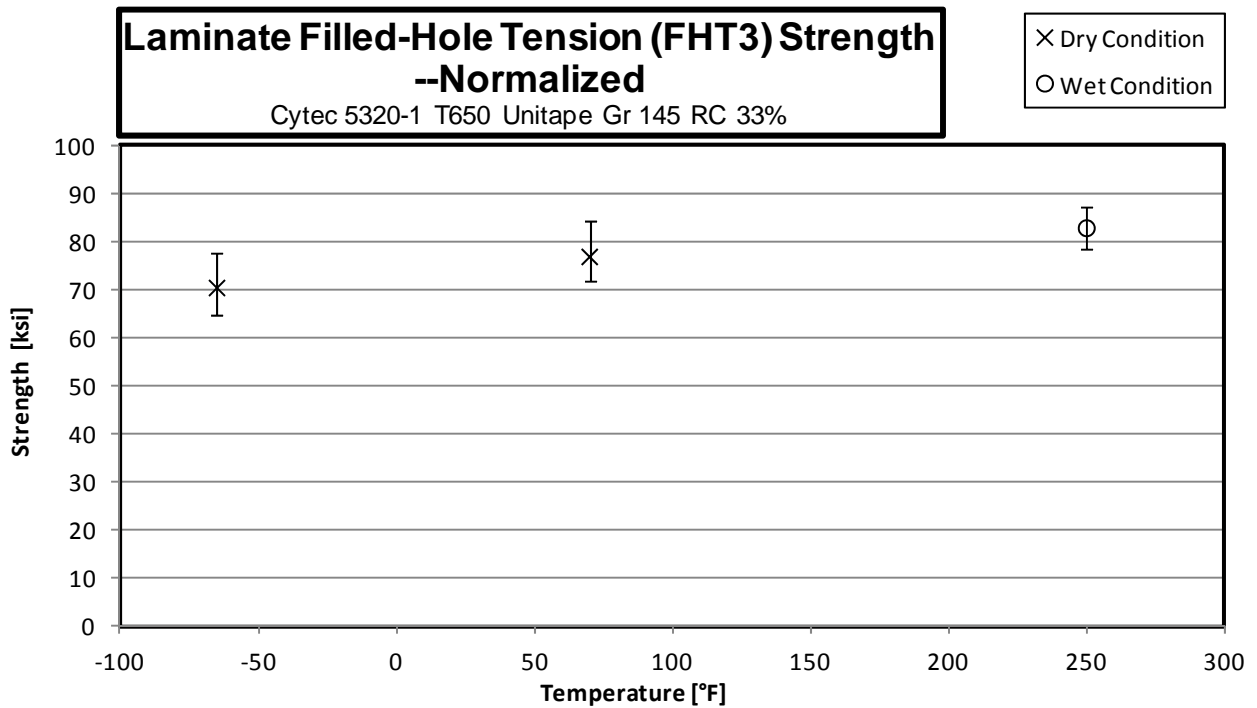
3.18 “25/50/25” Filled-Hole Tension 1 Properties (FHT1)



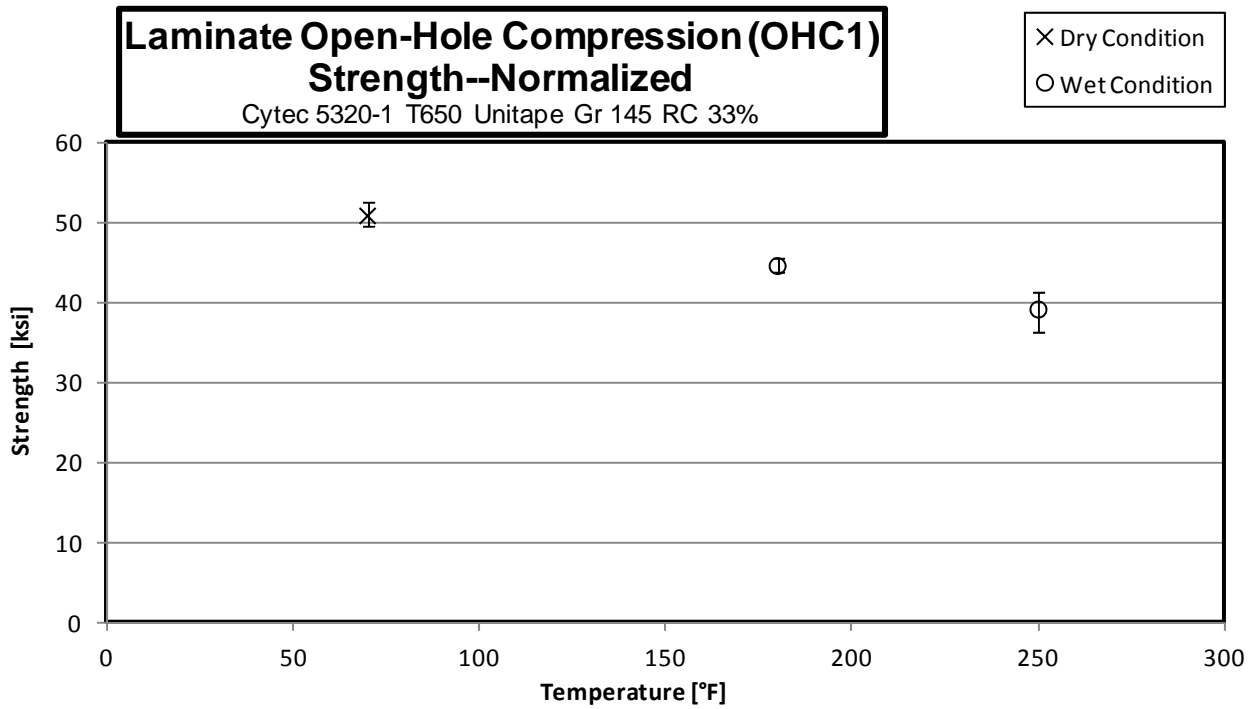
3.19 "10/80/10" Filled-Hole Tension 2 Properties (FHT2)



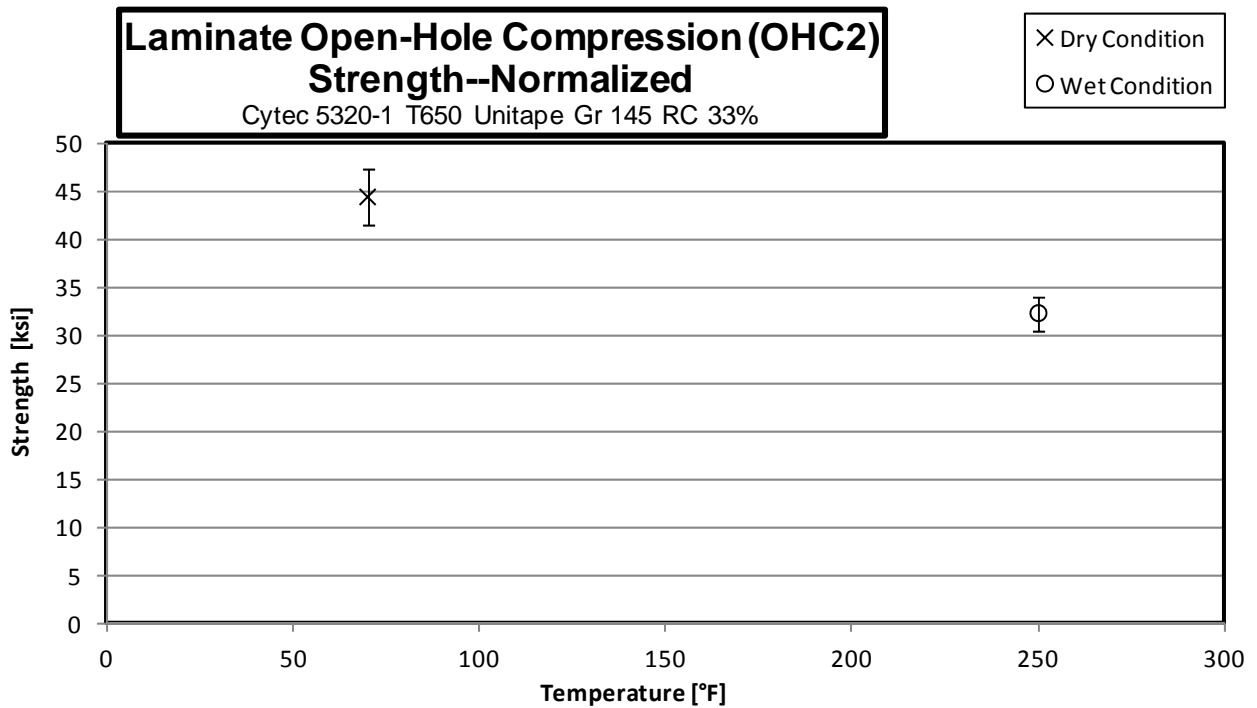
3.20 "50/40/10" Filled-Hole Tension 3 Properties (FHT3)



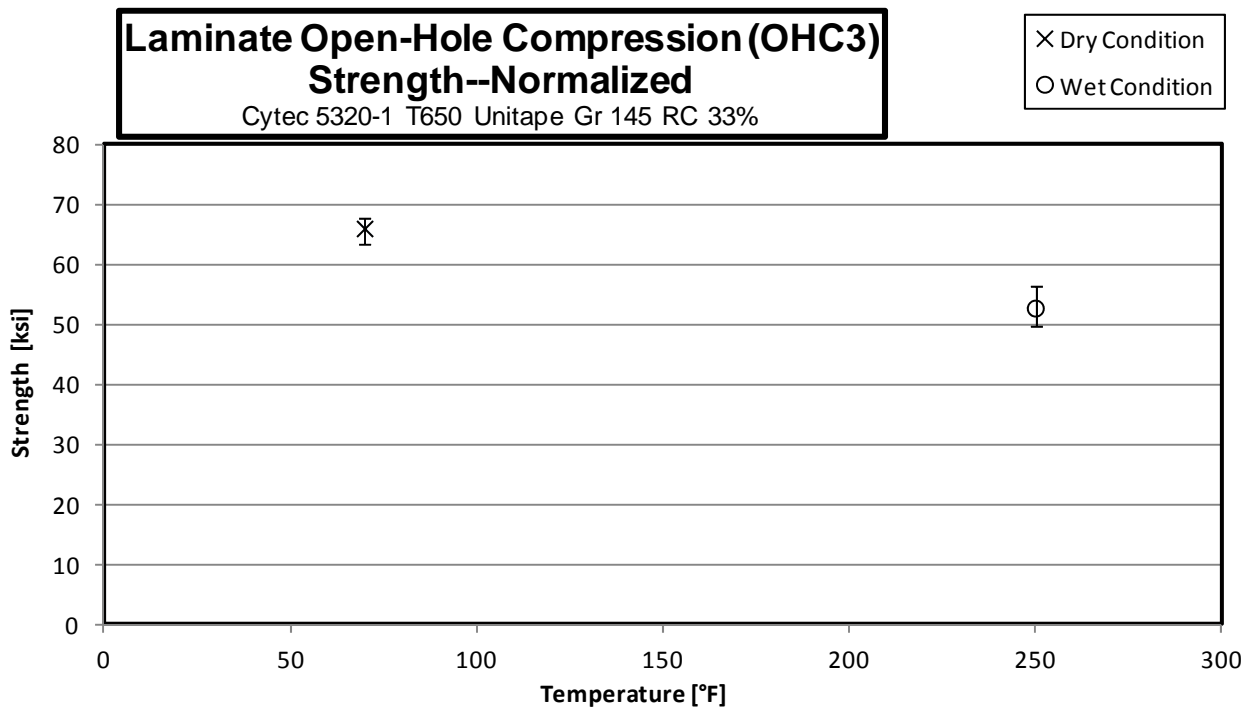
3.21 “25/50/25” Open-Hole Compression 1 Properties (OHC1)



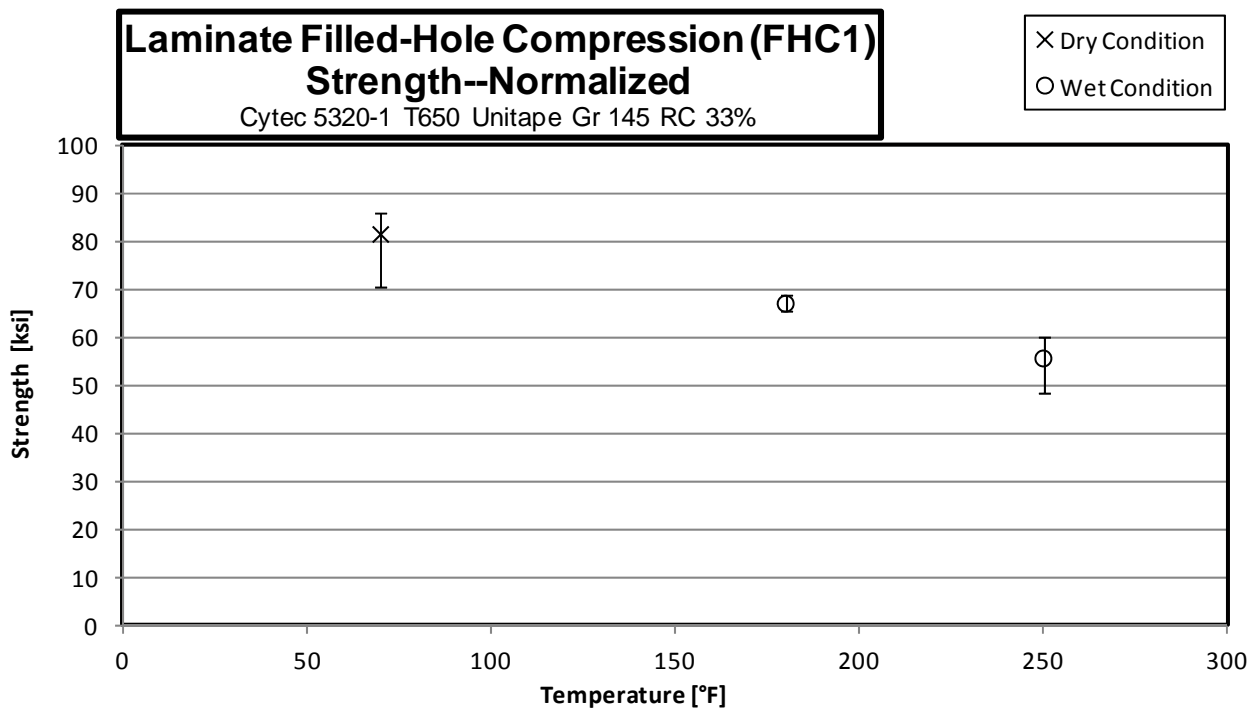
3.22 “10/80/10” Open-Hole Compression 2 Properties (OHC2)



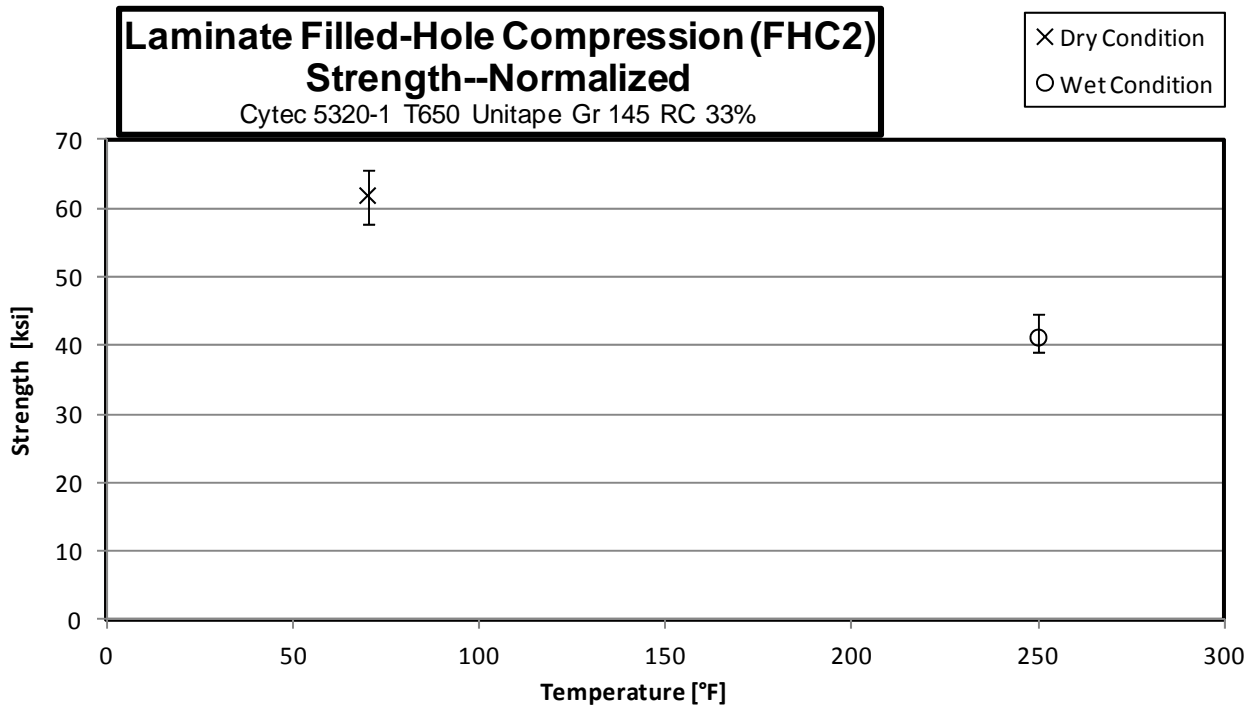
3.23 “50/40/10” Open-Hole Compression 3 Properties (OHC3)



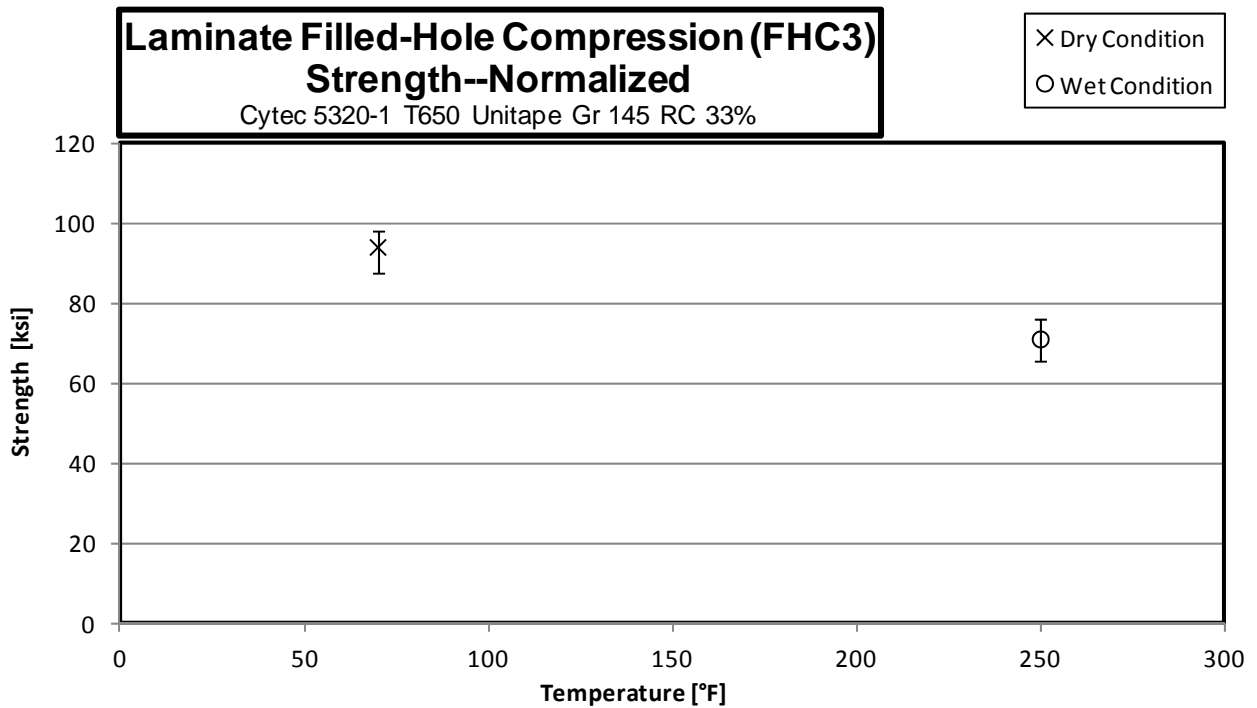
3.24 “25/50/25” Filled-Hole Compression 1 Properties (FHC1)



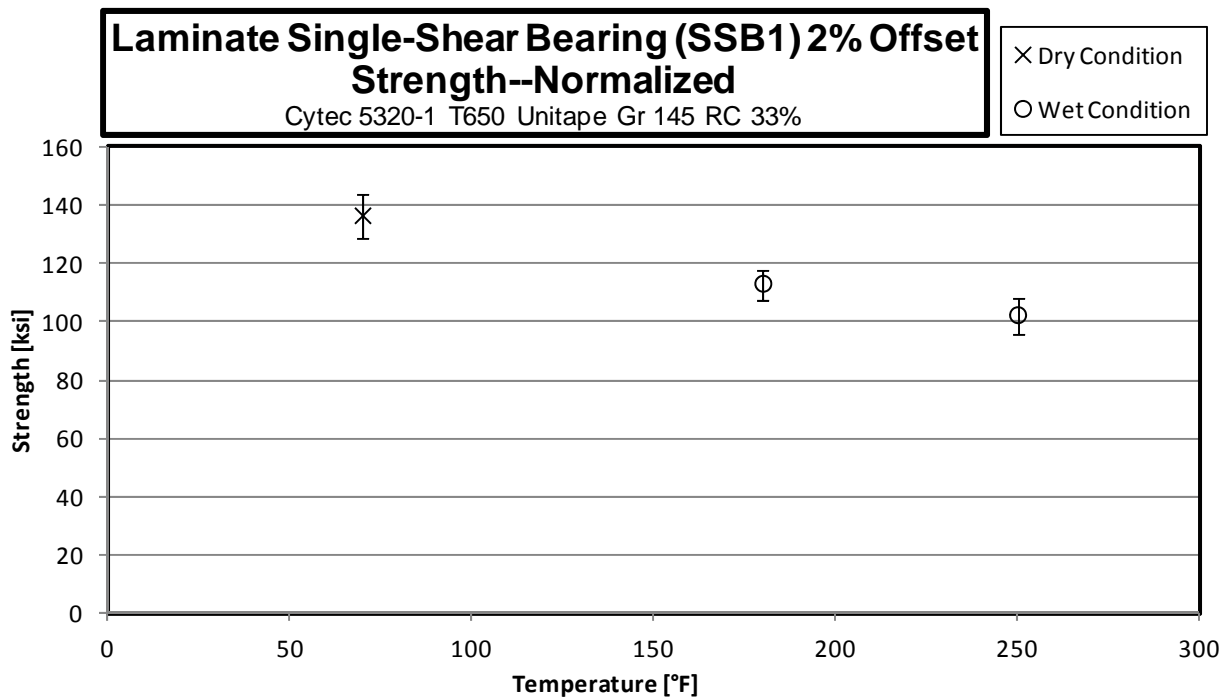
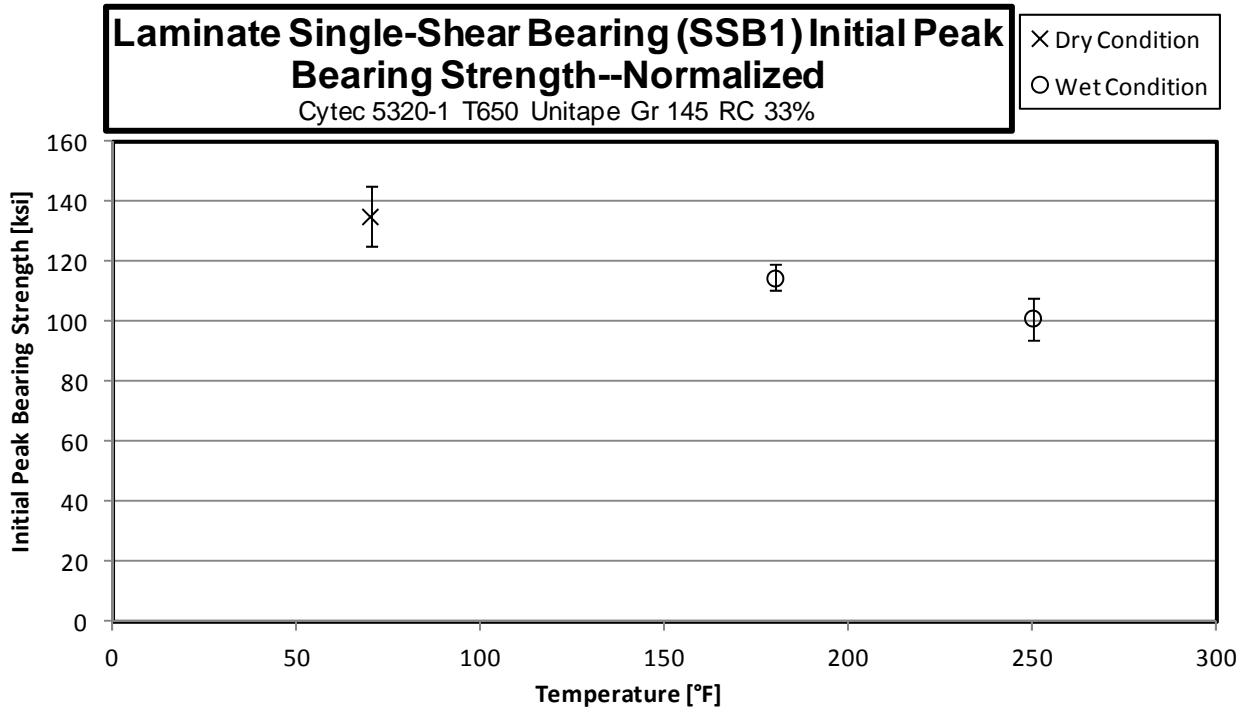
3.25 “10/80/10” Filled-Hole Compression 2 Properties (FHC2)

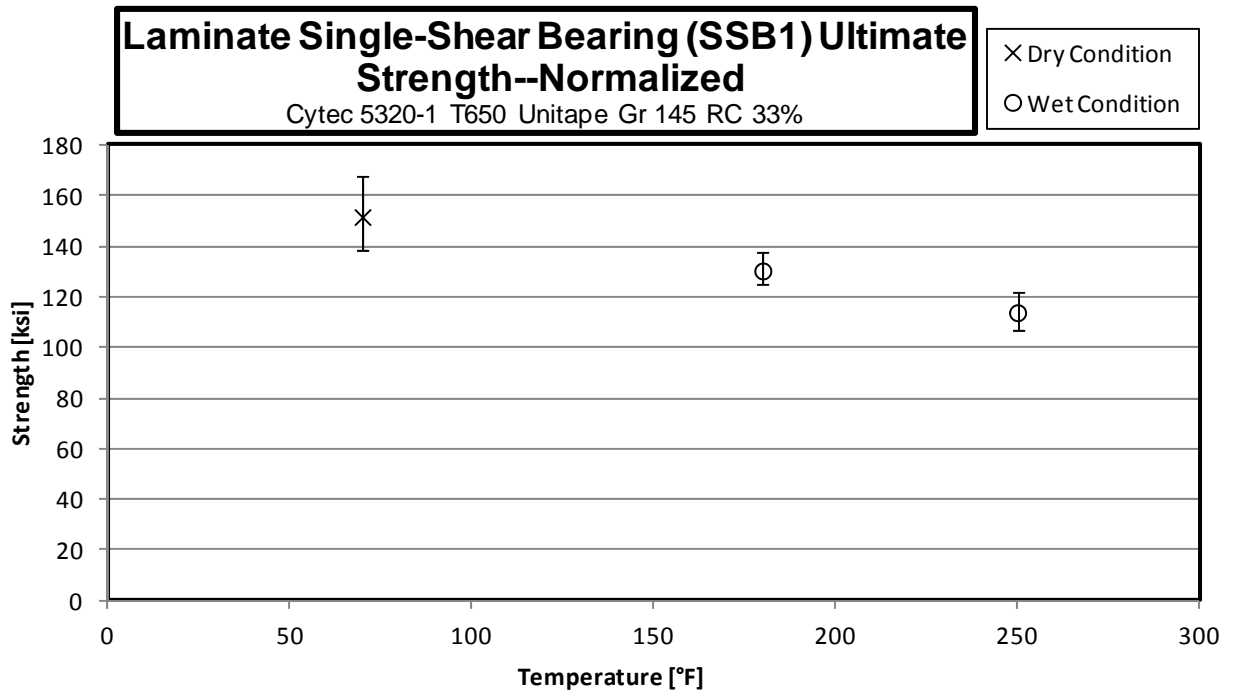


3.26 “50/40/10” Filled-Hole Compression 3 Properties (FHC3)

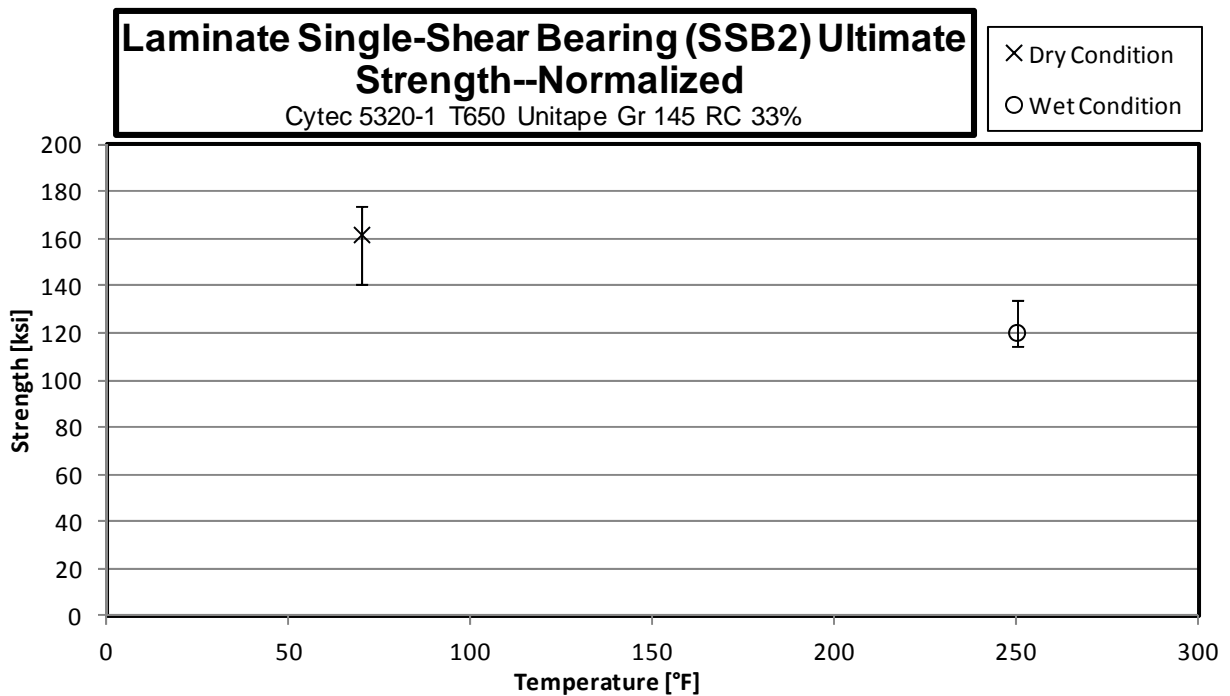
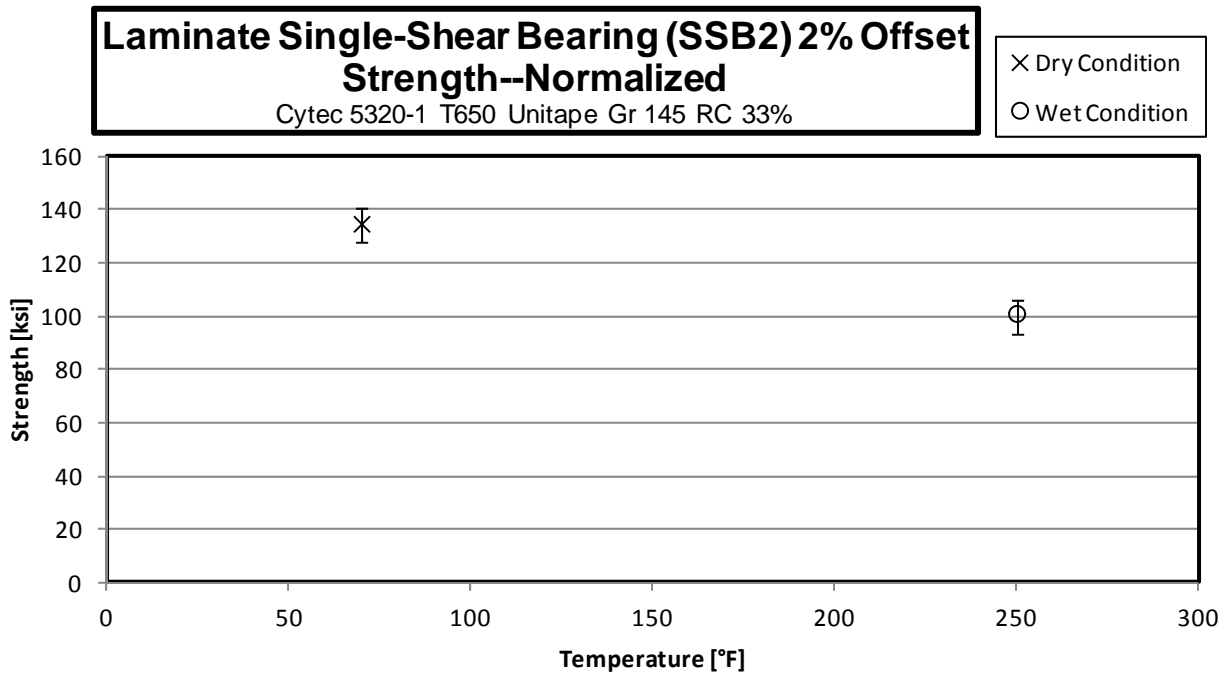


3.27 “25/50/25” Single-Shear Bearing Strength1 Properties (SSB1)

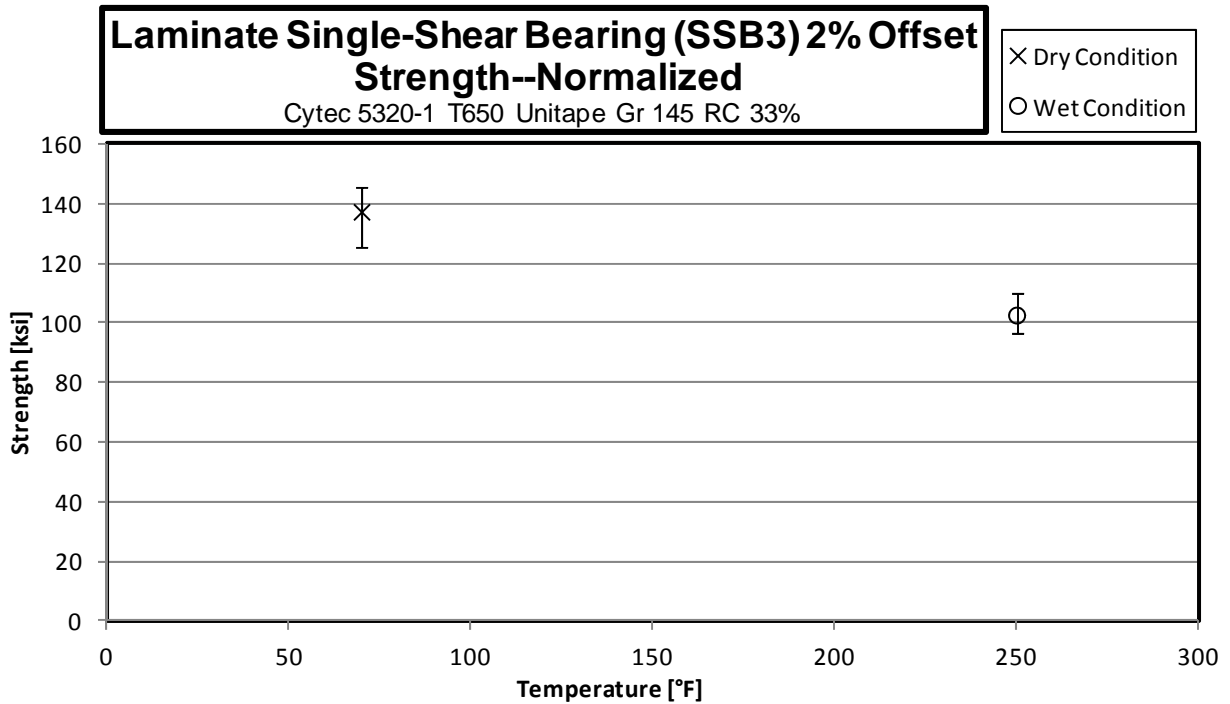
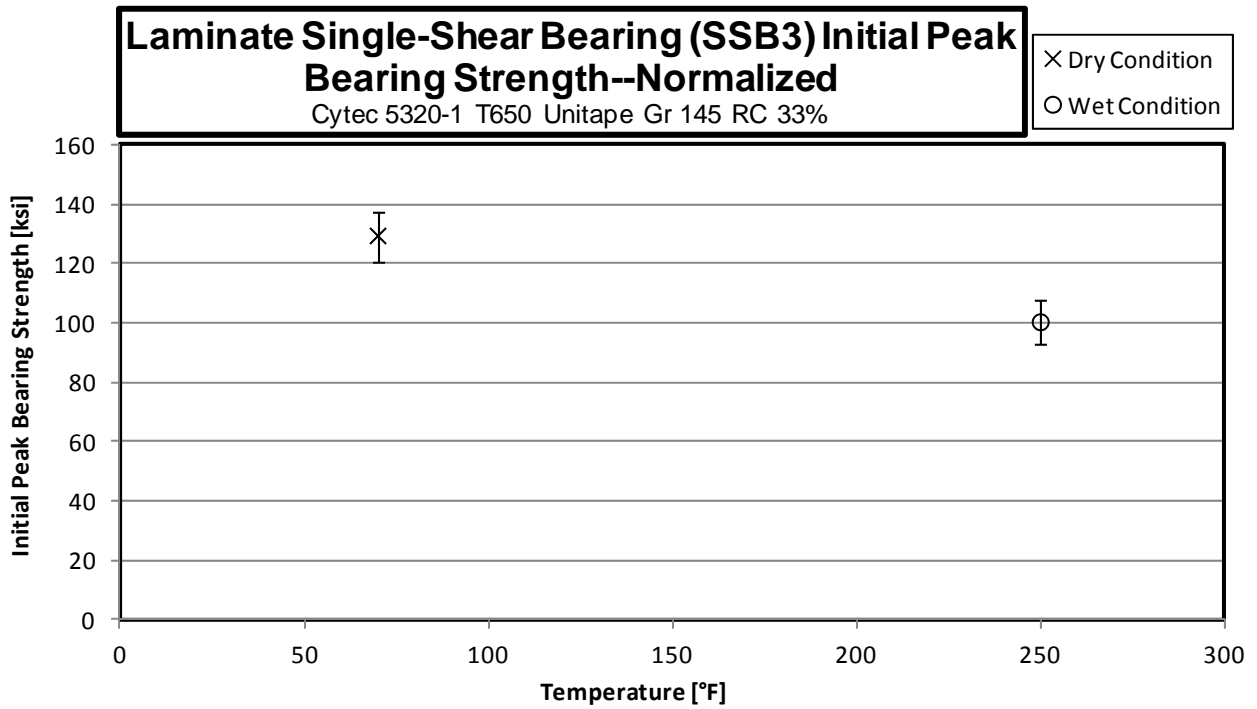


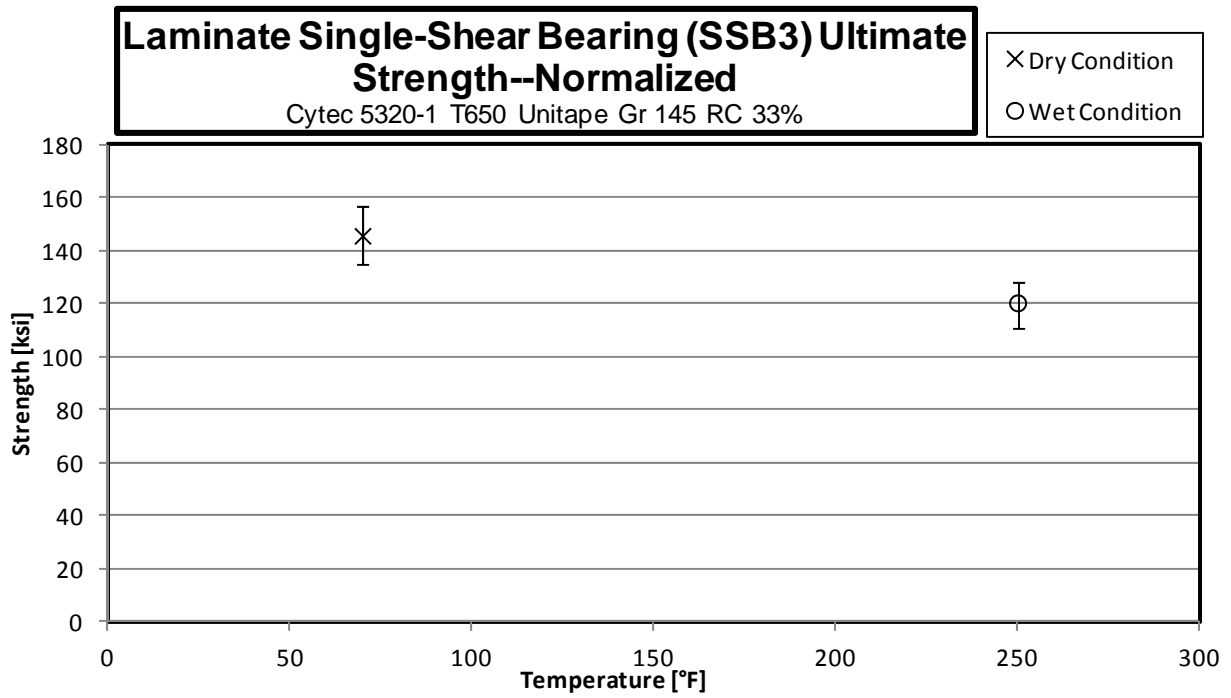


3.28 “10/80/10” Single-Shear Bearing Strength 2 Properties (SSB2)

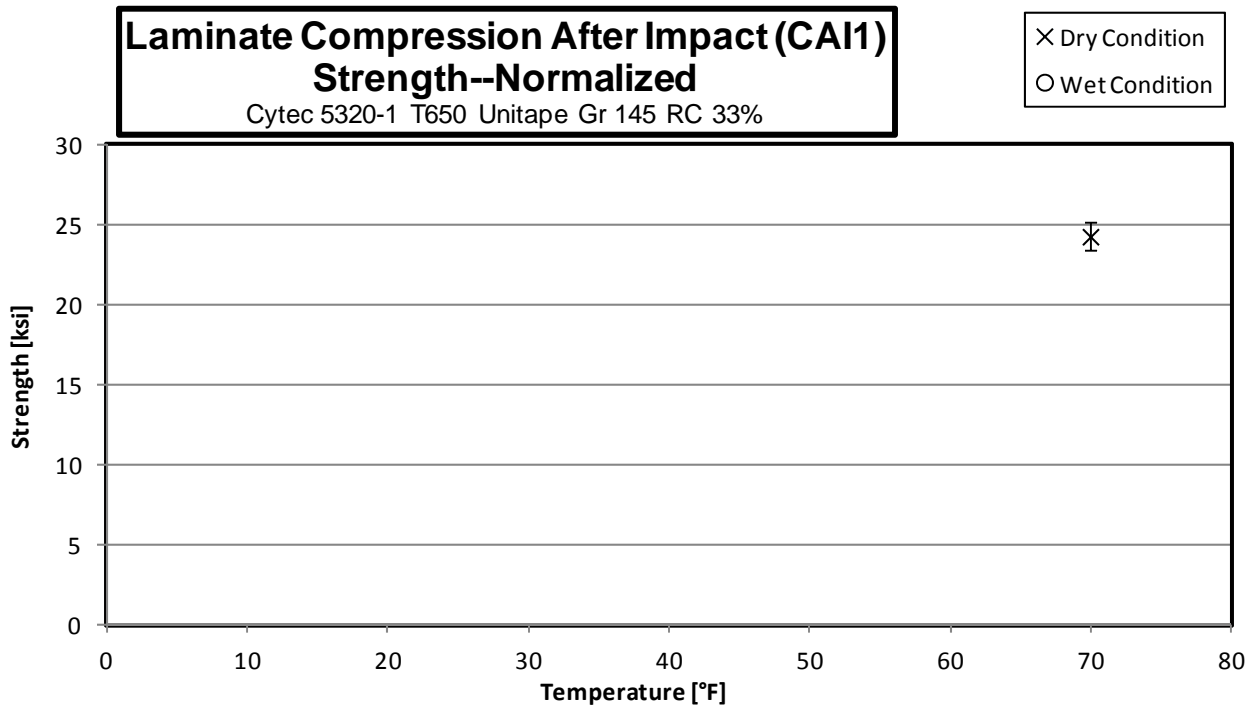


3.29 “50/40/10” Single-Shear Bearing 3 Properties (SSB3)

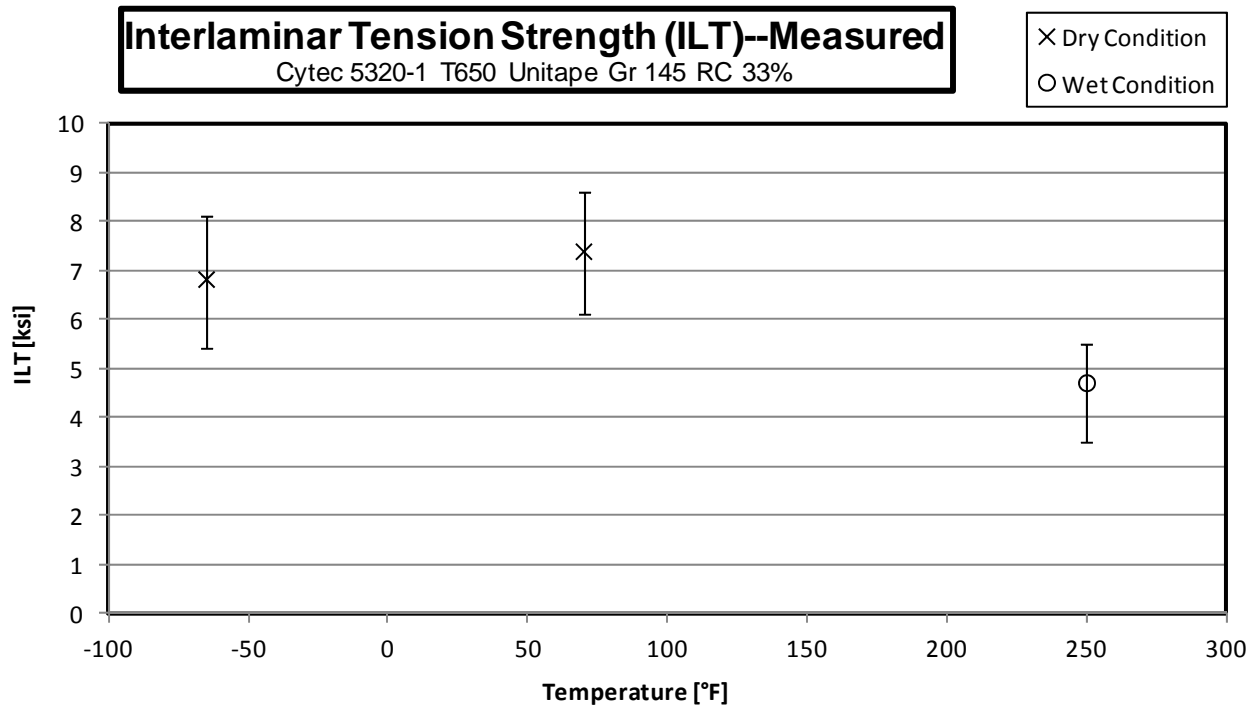
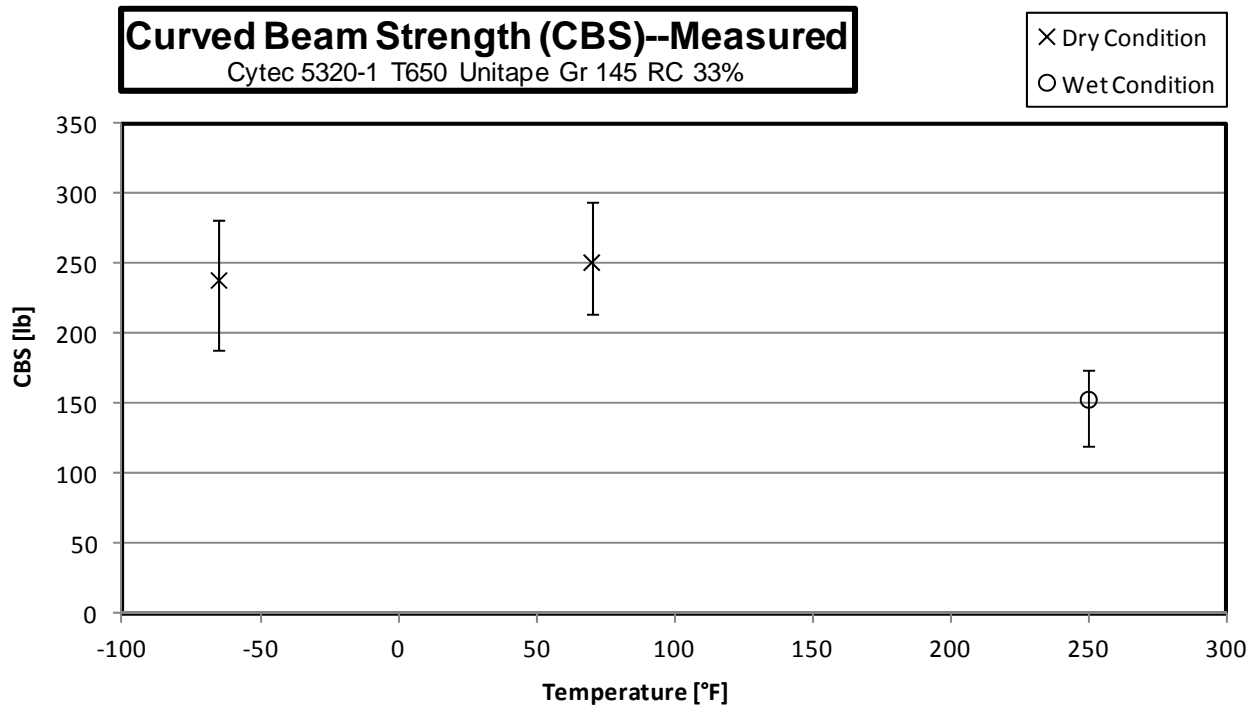




3.30 Compression After Impact 1 Properties (CAI1)



3.31 Interlaminar Tension Properties (ILT)



4. Raw Data

4.1 Longitudinal Tension Properties (LT)

**Longitudinal Tension Properties (LT)--CTD
Strength & Modulus**
Cytec 5320-1 T650 Unitape Gr 145 RC 33%

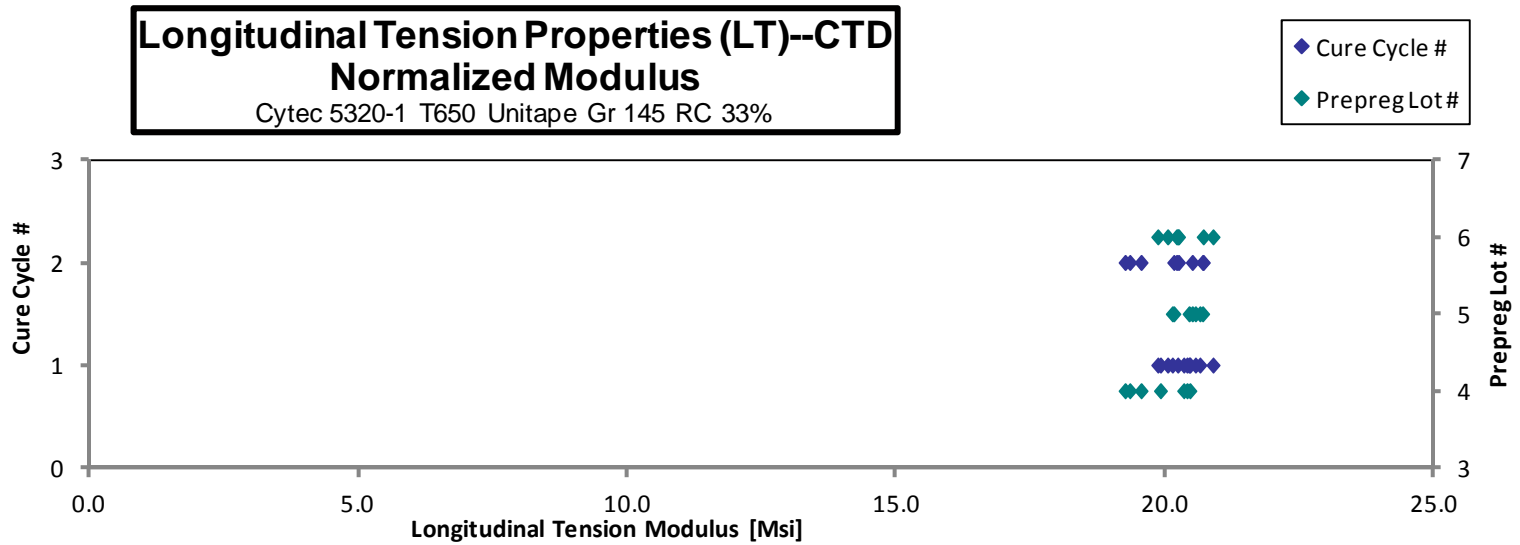
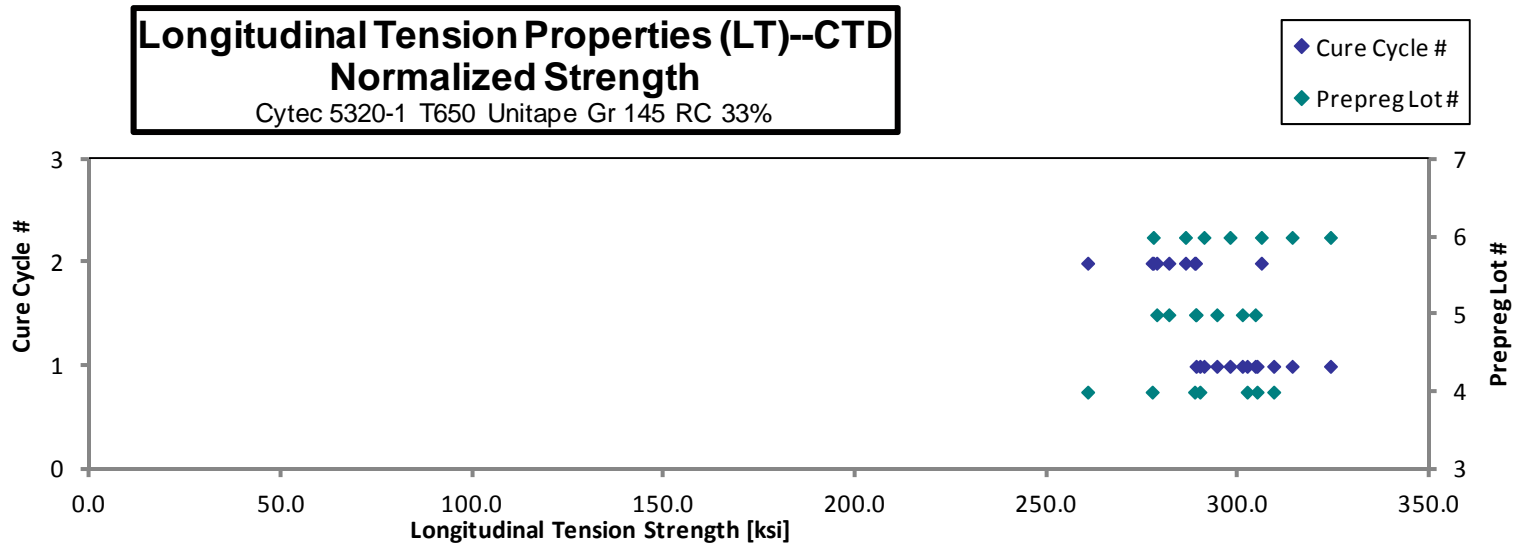
normalizing
 t_{ply} [in]
0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Poisson's Ratio	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUGJD116B	D	C1	4	1	311.839	20.082	0.312	0.044	8	SGM / LGM
CUGJD117B	D	C1	4	1	305.584	20.454	0.324	0.044	8	SGM / LGM
CUGJD118B	D	C1	4	1	305.669	20.573	0.359	0.044	8	SGM / LGM
CUGJD119B	D	C1	4	1	287.991	20.323	0.329	0.044	8	SGM / LGM
CUGJD216B	D	C2	4	2	286.056	19.941	0.320	0.043	8	SGM
CUGJD217B	D	C2	4	2	297.938	20.188	0.361	0.043	8	SGM
CUGJD218B	D	C2	4	2	266.291	19.673	0.316	0.043	8	SGM
CUGJE117B	E	C1	5	1	286.684	20.402	0.337	0.044	8	SGM / LGM
CUGJE118B	E	C1	5	1	295.586	20.048	0.279	0.045	8	SGM / LGM
CUGJE119B	E	C1	5	1	285.512	19.831	0.316	0.045	8	SGM
CUGJE11AB	E	C1	5	1	294.575	19.702	0.308	0.045	8	SGM
CUGJE217B	E	C2	5	2	288.264	20.468	0.316	0.044	8	SGM / LGM
CUGJE218B	E	C2	5	2	278.361	19.913	0.309	0.045	8	SGM
CUGJE219B	E	C2	5	2	277.629	20.620	0.364	0.044	8	SGM
CUGJF117B	F	C1	6	1	297.491	19.842	0.344	0.044	8	SGM
CUGJF119B	F	C1	6	1	308.338	20.511	0.333	0.045	8	SGM
CUGJF11AB	F	C1	6	1	311.785	19.469	0.311	0.046	8	SGM / LGM
CUGJF11CB	F	C1	6	1	294.150	20.262	0.322	0.044	8	SGM / LGM
CUGJF217B	F	C2	6	2	300.770	19.903	0.320	0.045	8	SGM
CUGJF218B	F	C2	6	2	272.926	20.348	0.333	0.045	8	SGM
CUGJF219B	F	C2	6	2	285.220	20.146	0.300	0.044	8	SGM

Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.0055	309.123	19.907
0.0055	304.774	20.400
0.0054	302.196	20.339
0.0055	289.846	20.454
0.0053	277.387	19.337
0.0053	288.459	19.546
0.0054	260.542	19.248
0.0055	288.856	20.556
0.0057	304.319	20.640
0.0057	294.272	20.439
0.0056	300.935	20.128
0.0055	288.701	20.499
0.0056	281.735	20.155
0.0055	278.575	20.691
0.0055	297.716	19.857
0.0056	313.945	20.884
0.0057	323.949	20.228
0.0054	290.919	20.040
0.0056	305.897	20.242
0.0056	277.681	20.702
0.0055	286.084	20.207

Average	292.317	20.128	0.325
Standard Dev.	12.623	0.326	0.021
Coeff. of Var. [%]	4.318	1.619	6.384
Min.	266.291	19.469	0.279
Max.	311.839	20.620	0.364
Number of Spec.	21	21	21

Average _{norm}	0.0055	293.615	20.214
Standard Dev. _{norm}		14.557	0.440
Coeff. of Var. [%] _{norm}		4.958	2.175
Min.	0.0053	260.542	19.248
Max.	0.0057	323.949	20.884
Number of Spec.	21	21	21



**Longitudinal Tension Properties (LT)--RTD
Strength & Modulus**
Cytec 5320-1 T650 Unitape Gr 145 RC 33%

normalizing
t_{ply} [in]
0.0055

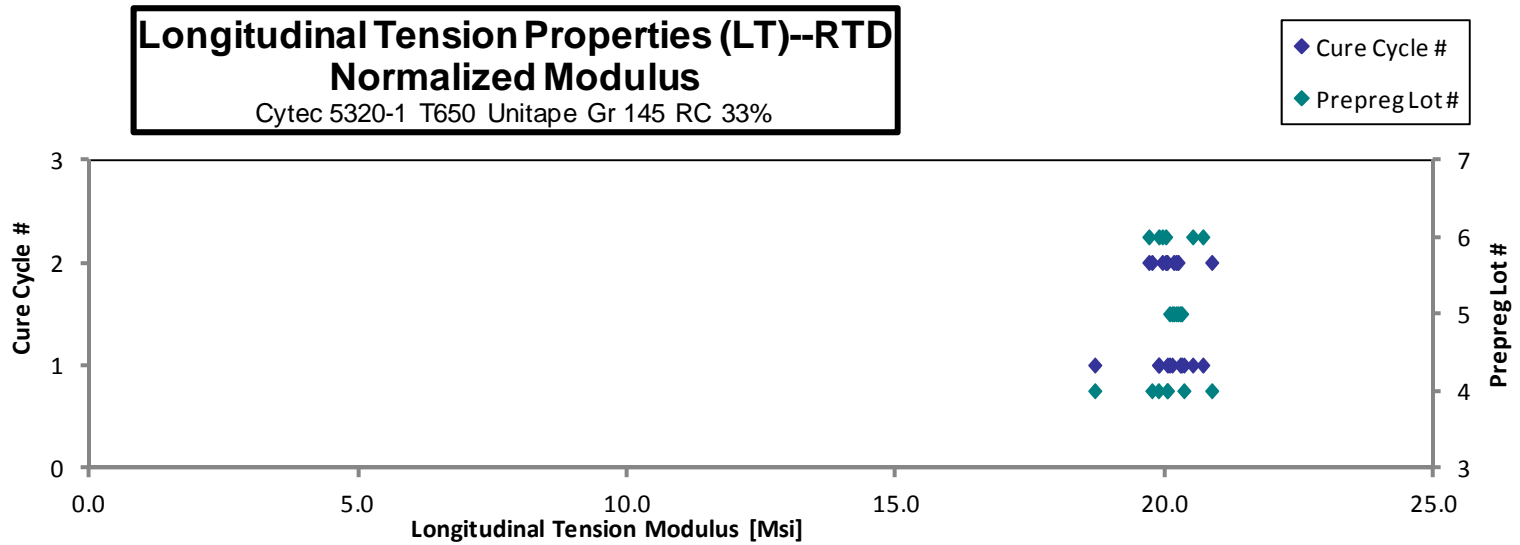
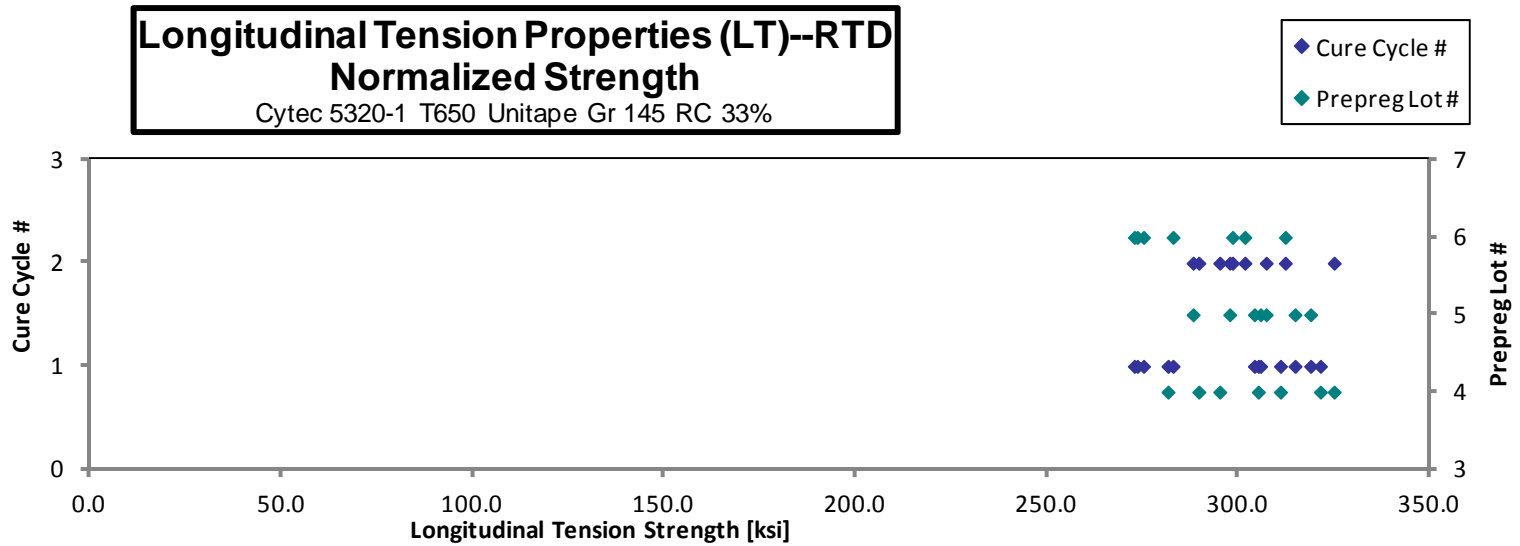
Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Poisson's Ratio	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUGJD112A*	D	C1	4	1	312.095	20.322	0.329	0.043	8	XGM
CUGJD113A*	D	C1	4	1	320.612	20.296	0.317	0.044	8	XGM
CUGJD114A	D	C1	4	1	313.751	20.220	0.317	0.044	8	XGM
CUGJD115A	D	C1	4	1	294.347	19.536	0.332	0.042	8	SGM
CUGJD211A	D	C2	4	2	316.185	20.298	0.323	0.045	8	LGM / SGM
CUGJD212A	D	C2	4	2	293.593	19.931	0.330	0.044	8	SGM
CUGJD213A	D	C2	4	2	290.111	19.785	0.330	0.044	8	LGM / SGM
CUGJE111A	E	C1	5	1	317.221	20.283	0.316	0.044	8	LGM / SGM
CUGJE112A	E	C1	5	1	306.859	20.152	0.319	0.044	8	SGM
CUGJE113A	E	C1	5	1	311.111	19.788	0.314	0.045	8	XGM
CUGJE114A	E	C1	5	1	302.033	20.163	0.341	0.044	8	SGM
CUGJE211A	E	C2	5	2	296.295	20.062	0.328	0.044	8	SGM
CUGJE212A	E	C2	5	2	305.782	20.106	0.317	0.044	8	XGM
CUGJE213A	E	C2	5	2	284.748	19.998	0.322	0.045	8	SGM
CUGJF111A	F	C1	6	1	275.142	20.695	0.371	0.044	8	XGM
CUGJF112A	F	C1	6	1	272.279	**	**	0.044	8	SGM
CUGJF113A	F	C1	6	1	269.754	20.283	0.324	0.044	8	SGM
CUGJF114A	F	C1	6	1	281.776	19.801	0.323	0.044	8	SGM
CUGJF211A	F	C2	6	2	318.682	20.102	0.320	0.043	8	LGM / SGM
CUGJF212A	F	C2	6	2	300.246	19.914	0.320	0.044	8	SGM
CUGJF213A	F	C2	6	2	296.467	19.814	0.320	0.044	8	XGM

Avg. t _{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.0054	305.121	19.868
0.0055	321.341	20.342
0.0055	310.899	20.036
0.0053	281.525	18.685
0.0057	324.928	20.860
0.0055	295.038	20.029
0.0055	289.561	19.747
0.0055	314.697	20.122
0.0055	305.697	20.075
0.0056	318.771	20.275
0.0055	304.092	20.300
0.0055	297.642	20.153
0.0055	307.172	20.197
0.0056	288.092	20.233
0.0055	275.142	20.695
0.0055	273.517	
0.0056	272.717	20.506
0.0055	282.843	19.876
0.0054	312.163	19.691
0.0055	301.611	20.004
0.0055	298.376	19.941

* Strain measurement was measured with SG. Extensometer used on other coupons.

** Modulus and poisson's ratio not reported due to erroneous strain data.

Average	299.004	20.077	0.326	Average_{norm}	0.0055	299.093	20.082
Standard Dev.	15.681	0.264	0.013	Standard Dev._{norm}		15.822	0.441
Coeff. of Var. [%]	5.244	1.313	3.869	Coeff. of Var. [%]_{norm}		5.290	2.195
Min.	269.754	19.536	0.314	Min.	0.0053	272.717	18.685
Max.	320.612	20.695	0.371	Max.	0.0057	324.928	20.860
Number of Spec.	21	20	20	Number of Spec.	21	21	20



Longitudinal Tension Properties (LT)--ETW1
Strength & Modulus
 Cytec 5320-1 T650 Unitape Gr 145 RC 33%

normalizing
 t_{ply} [in]
 0.0055

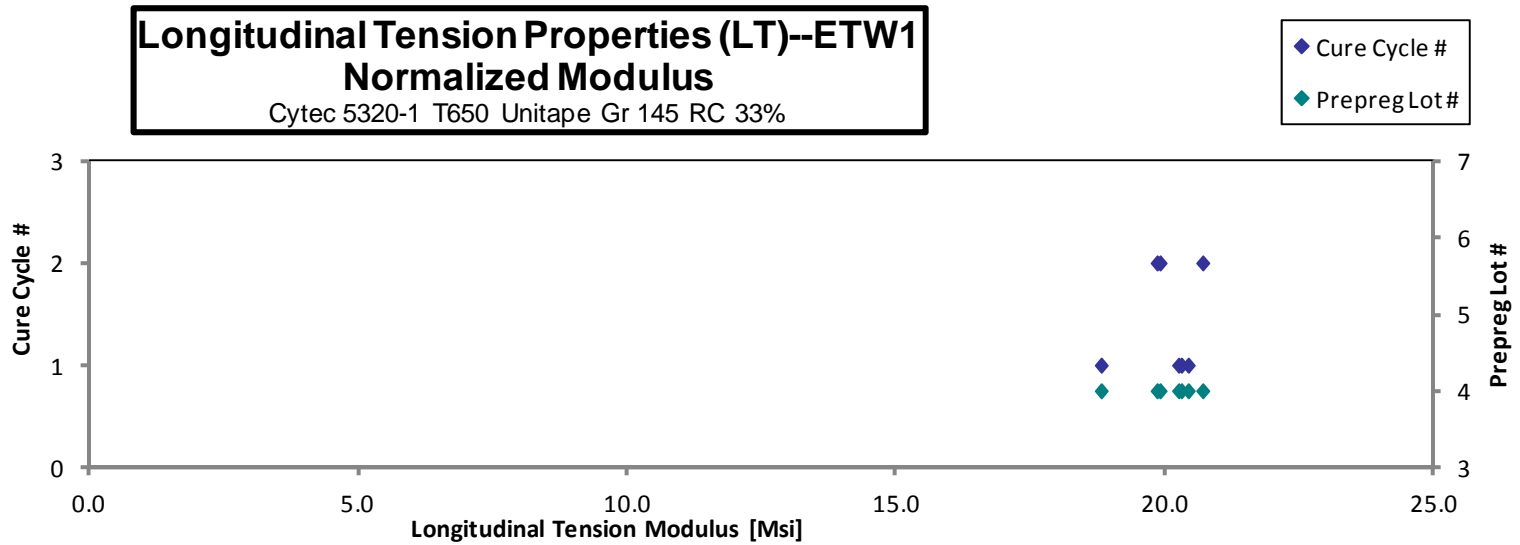
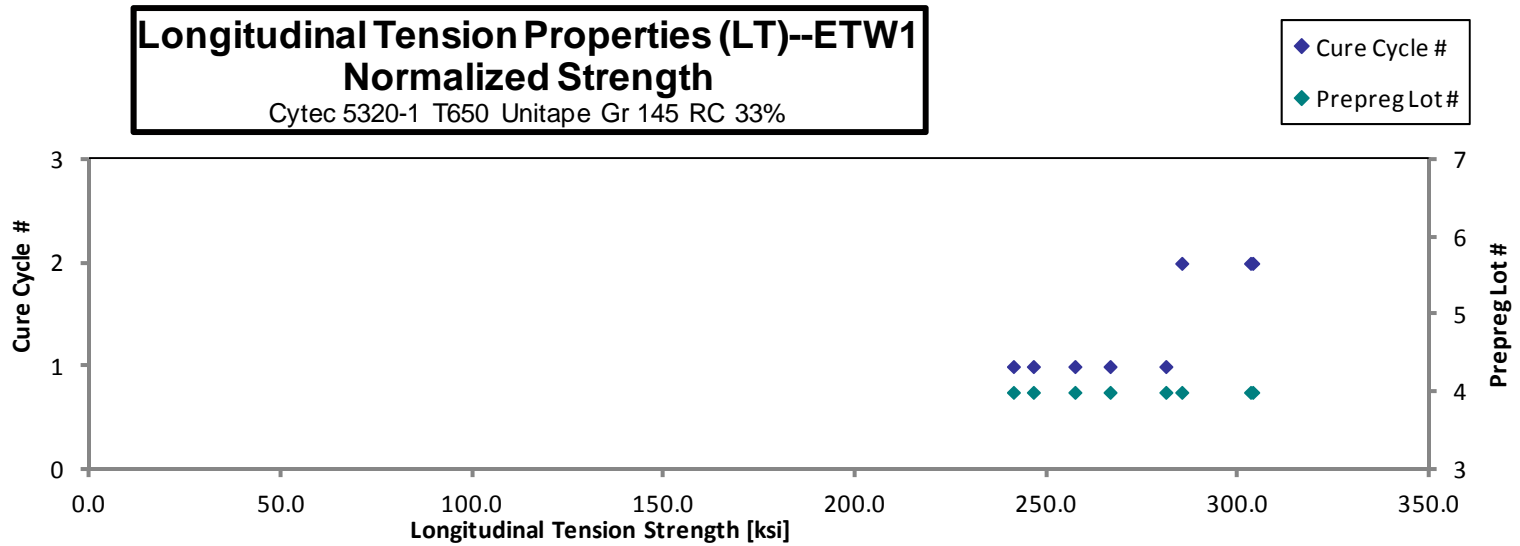
Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Poisson's Ratio	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUGJD11BD	D	C1	4	1	272.164	20.735	0.385	0.043	8	XGM
CUGJD11CD	D	C1	4	1	248.616	*	*	0.044	8	XGM
CUGJD11DD	D	C1	4	1	254.321	20.017	0.336	0.045	8	SGM
CUGJD11ED	D	C1	4	1	282.351	20.525	0.318	0.044	8	XGM
CUGJD11FD	D	C1	4	1	252.228	19.670	0.329	0.042	8	XGM
CUGJD21BD	D	C2	4	2	305.972	20.891	0.318	0.044	8	XGM
CUGJD21CD	D	C2	4	2	303.419	19.829	0.323	0.044	8	SGM / XGM
CUGJD21DD	D	C2	4	2	289.065	20.175	0.329	0.043	8	SGM / XGM

Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.0054	266.391	20.295
0.0055	246.355	
0.0056	257.211	20.245
0.0055	280.960	20.424
0.0053	241.145	18.806
0.0054	303.075	20.693
0.0055	303.649	19.844
0.0054	285.123	19.900

* Modulus and poisson's ratio not reported due to erroneous strain data.

Average	276.017	20.263	0.334
Standard Dev.	22.869	0.464	0.024
Coeff. of Var. [%]	8.285	2.291	7.046
Min.	248.616	19.670	0.318
Max.	305.972	20.891	0.385
Number of Spec.	8	7	7

Average _{norm}	0.0054	272.989	20.030
Standard Dev. _{norm}		24.118	0.614
Coeff. of Var. [%] _{norm}		8.835	3.065
Min.	0.0053	241.145	18.806
Max.	0.0056	303.649	20.693
Number of Spec.	8	8	7



Longitudinal Tension Properties (LT)--ETW2
Strength & Modulus
 Cytec 5320-1 T650 Unitape Gr 145 RC 33%

normalizing
 t_{ply} [in]
 0.0055

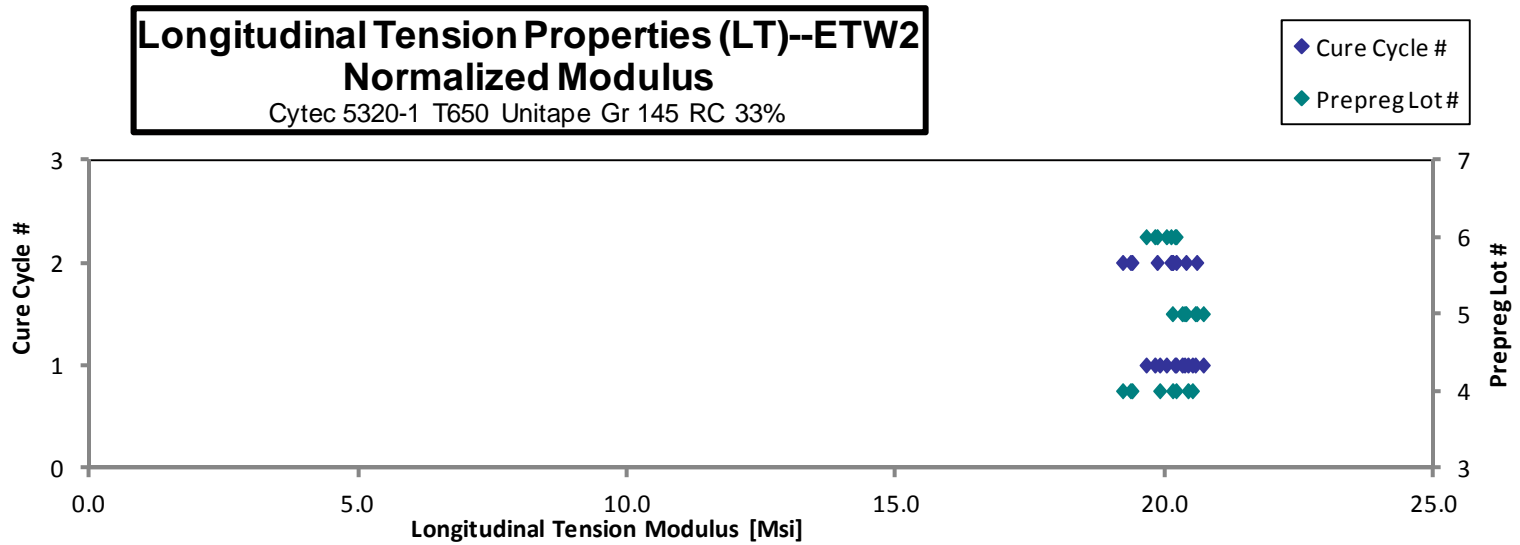
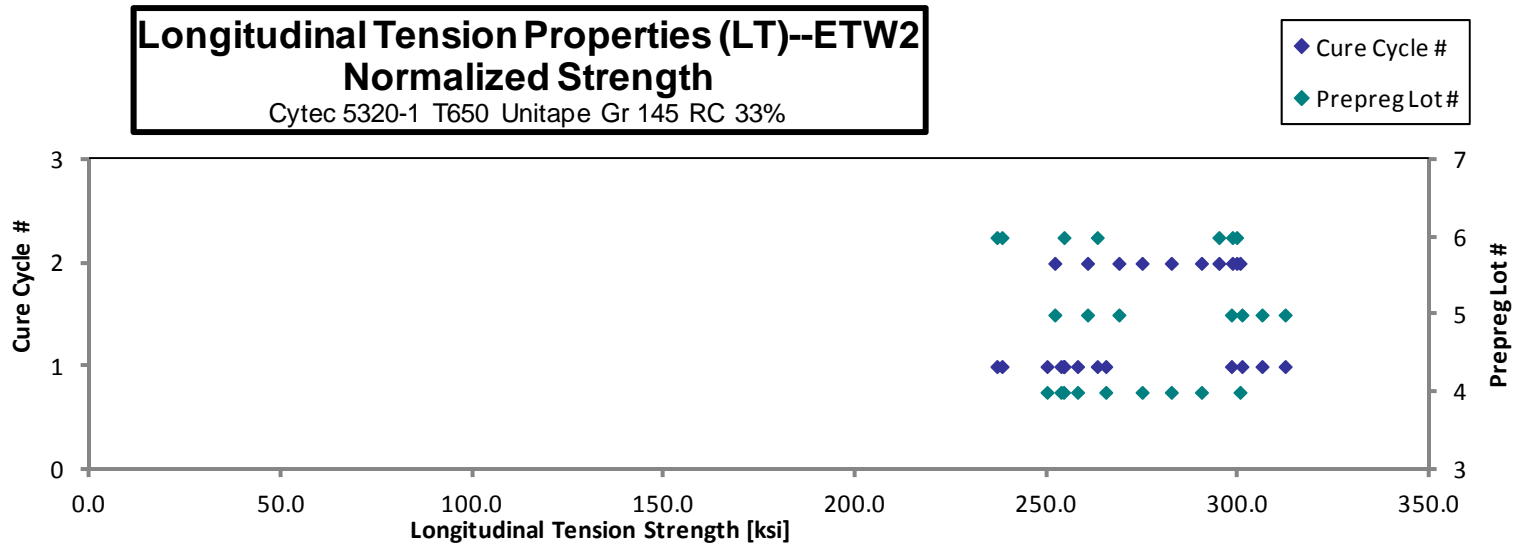
Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Poisson's Ratio	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUGJD11GF	D	C1	4	1	255.897	20.075	0.302	0.044	8	XGM
CUGJD11HF	D	C1	4	1	258.052	*	*	0.043	8	XGM / LGM
CUGJD11IF	D	C1	4	1	258.476	20.546	0.331	0.044	8	XGM / LWT
CUGJD11JF	D	C1	4	1	262.283	20.188	0.340	0.045	8	SGM / XGM
CUGJD11KF	D	C1	4	1	247.300	19.985	0.336	0.044	8	XGM
CUGJD21GF	D	C2	4	2	292.925	19.555	0.350	0.044	8	XGM
CUGJD21HF	D	C2	4	2	282.464	19.740	0.349	0.043	8	SGM / XGM
CUGJD21IF	D	C2	4	2	288.842	19.791	0.353	0.043	8	XGM
CUGJD21JF	D	C2	4	2	297.509	19.943	0.359	0.044	8	XGM
CUGJE11DF	E	C1	5	1	297.397	19.970	0.340	0.045	8	XGM
CUGJE11EF	E	C1	5	1	304.278	19.844	0.345	0.045	8	XGM
CUGJE11FF	E	C1	5	1	289.543	19.926	0.317	0.046	8	XGM
CUGJE11GF	E	C1	5	1	290.707	19.808	0.329	0.045	8	XGM
CUGJE21DF	E	C2	5	2	267.075	20.258	0.337	0.044	8	XGM
CUGJE21EF	E	C2	5	2	249.412	19.925	0.334	0.044	8	XGM
CUGJE21FF	E	C2	5	2	257.676	20.357	0.347	0.044	8	XGM
CUGJF11DF	F	C1	6	1	234.705	19.624	0.344	0.044	8	XGM
CUGJF11EF	F	C1	6	1	257.487	19.593	0.337	0.045	8	SGM / XGM
CUGJF11FF	F	C1	6	1	247.064	19.597	0.317	0.045	8	XGM
CUGJF11GF	F	C1	6	1	234.704	19.354	0.322	0.045	8	SGM
CUGJF21DF	F	C2	6	2	294.329	19.831	0.344	0.045	8	XGM
CUGJF21EF	F	C2	6	2	292.158	19.665	0.334	0.044	8	XGM
CUGJF21FF	F	C2	6	2	297.312	20.054	0.339	0.044	8	XGM

Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.0055	253.571	19.893
0.0054	254.240	
0.0055	257.889	20.500
0.0056	265.263	20.418
0.0056	249.923	20.197
0.0055	290.262	19.377
0.0054	274.760	19.202
0.0054	282.386	19.349
0.0056	300.326	20.132
0.0057	306.071	20.553
0.0056	312.116	20.355
0.0057	300.840	20.703
0.0056	298.085	20.311
0.0055	268.693	20.381
0.0056	251.963	20.129
0.0056	260.507	20.581
0.0056	236.839	19.802
0.0056	263.047	20.016
0.0057	254.364	20.176
0.0056	238.171	19.640
0.0056	298.342	20.102
0.0056	294.814	19.844
0.0055	299.452	20.198

* Modulus and poisson's ratio not reported due to erroneous strain data.

Average	272.069	19.892	0.337
Standard Dev.	22.429	0.284	0.013
Coeff. of Var. [%]	8.244	1.428	3.942
Min.	234.704	19.354	0.302
Max.	304.278	20.546	0.359
Number of Spec.	23	22	22

Average _{norm}	0.0055	274.431	20.084
Standard Dev. _{norm}		23.422	0.413
Coeff. of Var. [%] _{norm}		8.535	2.056
Min.	0.0054	236.839	19.202
Max.	0.0057	312.116	20.703
Number of Spec.	23	23	22



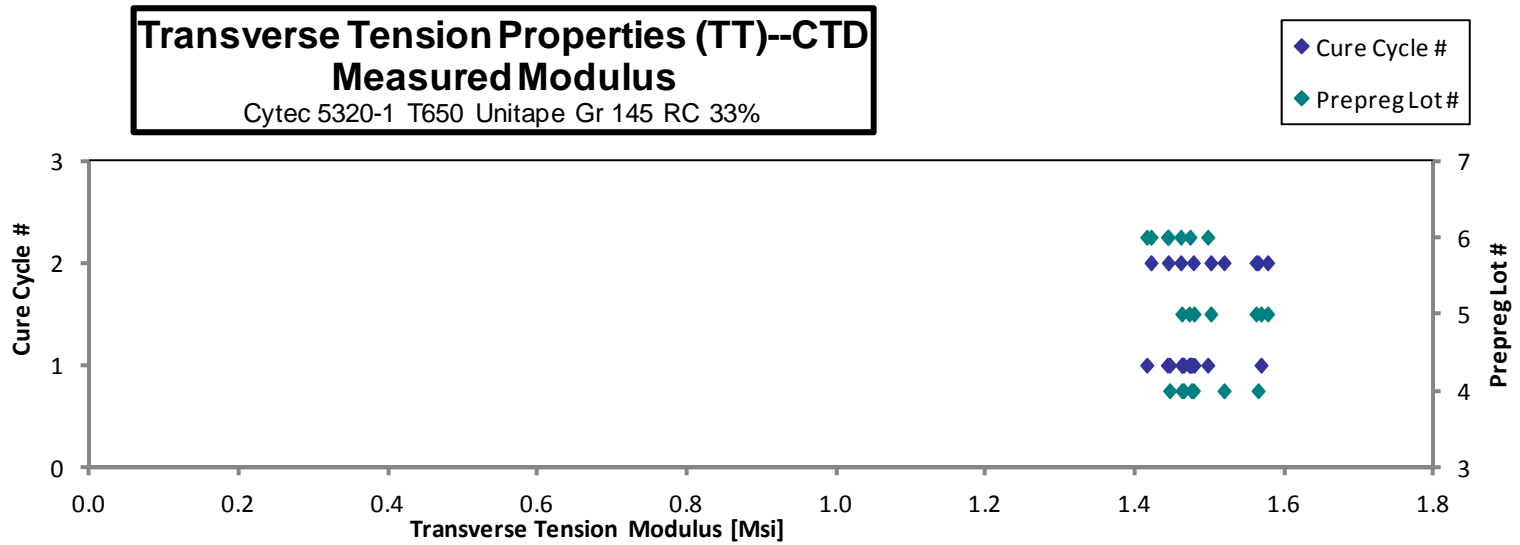
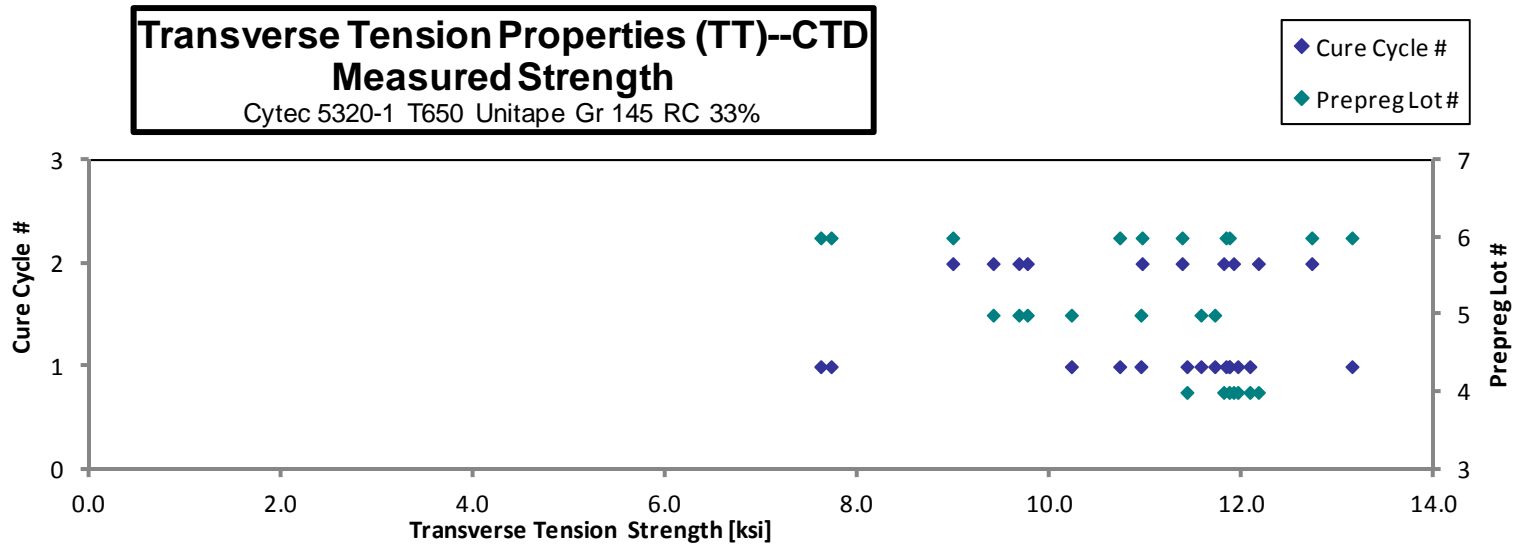
4.2 Transverse Tension Properties (TT)

Transverse Tension Properties (TT)--CTD Strength & Modulus Cytec 5320-1 T650 Unitape Gr 145 RC 33%
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Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t _{ply} [in]
CUGUD116B	D	C1	4	1	11.863	1.464	0.087	16	LAT	0.0055
CUGUD117B	D	C1	4	1	12.078	1.446	0.088	16	LAT	0.0055
CUGUD118B	D	C1	4	1	11.423	1.475	0.088	16	LAT	0.0055
CUGUD119B	D	C1	4	1	11.953	1.462	0.088	16	LAB	0.0055
CUGUD216B	D	C2	4	2	11.909	1.477	0.088	16	LAB	0.0055
CUGUD217B	D	C2	4	2	11.806	1.518	0.087	16	LAB	0.0054
CUGUD218B	D	C2	4	2	12.167	1.564	0.087	16	LAB	0.0054
CUGUE117B	E	C1	5	1	11.713	1.462	0.089	16	LAT	0.0056
CUGUE118B	E	C1	5	1	11.569	1.472	0.088	16	LAT	0.0055
CUGUE119B	E	C1	5	1	10.944	1.478	0.088	16	LAB	0.0055
CUGUE11AB	E	C1	5	1	10.220	1.568	0.089	16	LAB	0.0055
CUGUE216B	E	C2	5	2	9.673	1.501	0.087	16	LGM	0.0054
CUGUE217B	E	C2	5	2	9.405	1.561	0.087	16	LGM	0.0055
CUGUE218B	E	C2	5	2	9.761	1.577	0.088	16	LGM	0.0055
CUGUF117B	F	C1	6	1	7.610	1.415	0.089	16	LAT	0.0055
CUGUF118B	F	C1	6	1	10.723	1.473	0.088	16	LAT	0.0055
CUGUF119B	F	C1	6	1	7.718	1.497	0.087	16	LAB	0.0054
CUGUF11AB	F	C1	6	1	11.866	1.443	0.088	16	LAB	0.0055
CUGUF11BB*	F	C1	6	1	11.830		0.088	16	LAB	0.0055
CUGUF11CB*	F	C1	6	1	13.142		0.088	16	LAB	0.0055
CUGUF216B	F	C2	6	2	8.985	1.460	0.089	16	LAB	0.0055
CUGUF217B	F	C2	6	2	12.724	1.421	0.088	16	LAT	0.0055
CUGUF218B	F	C2	6	2	10.956	1.444	0.088	16	LAB	0.0055
CUGUF219B*	F	C2	6	2	11.373		0.089	16	LAB	0.0055

*Specimen was not gaged

Average	10.975	1.485	Average	0.0055
Standard Dev.	1.454	0.048	Standard Dev.	
Coeff. of Var. [%]	13.251	3.218	Coeff. of Var. [%]	
Min.	7.610	1.415	Min.	0.0054
Max.	13.142	1.577	Max.	0.0056
Number of Spec.	24	21	Number of Spec.	24

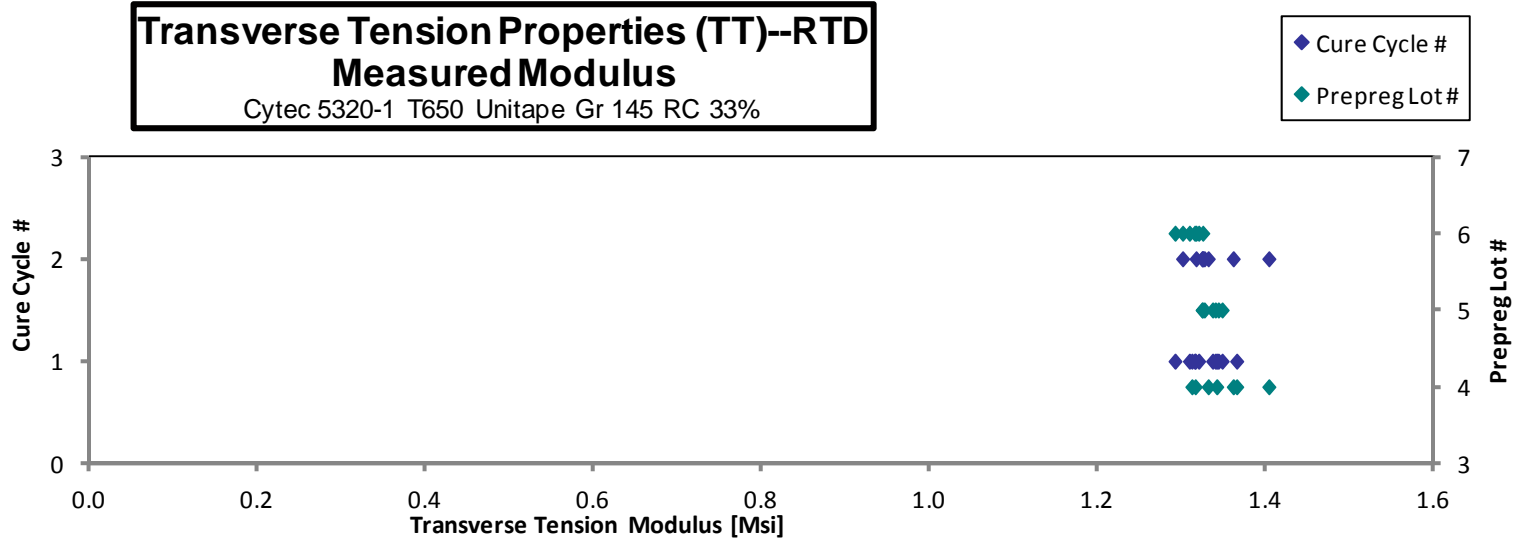
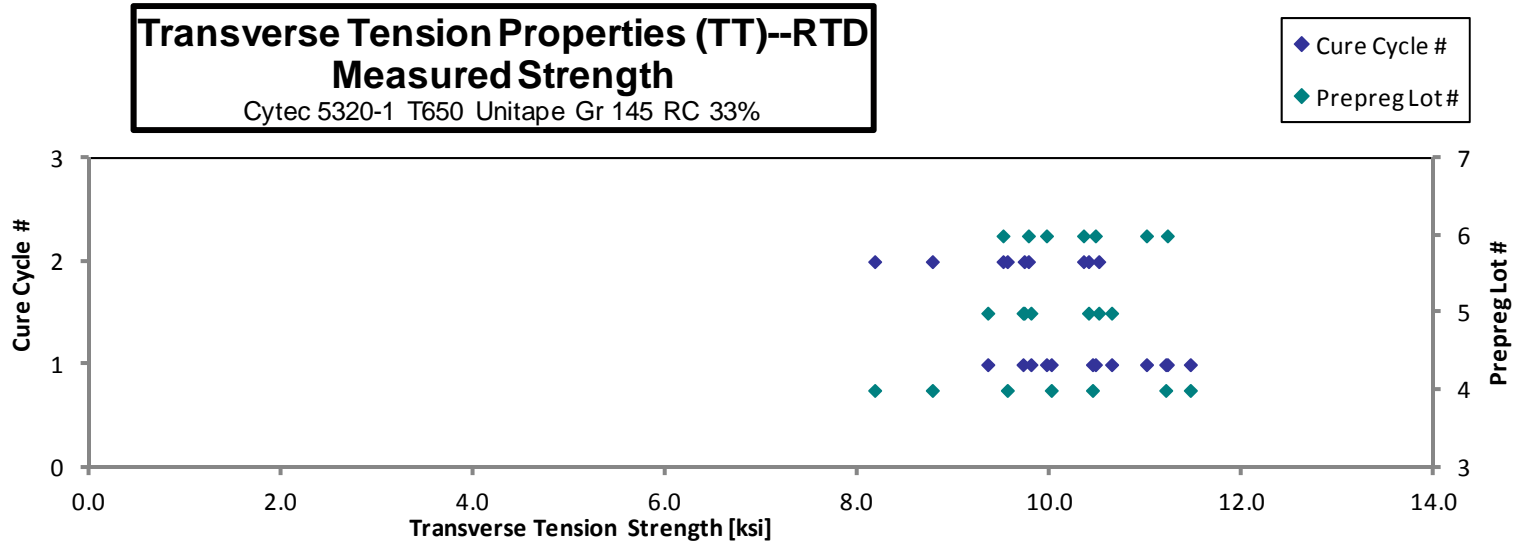


Transverse Tension Properties (TT)--RTD Strength & Modulus Cytec 5320-1 T650 Unitape Gr 145 RC 33%
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Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t _{ply} [in]
CUGUD111A*	D	C1	4	1	10.439	1.365	0.085	16	LGM	0.0053
CUGUD112A*	D	C1	4	1	10.010	1.341	0.087	16	LGM	0.0054
CUGUD113A	D	C1	4	1	11.202	1.315	0.088	16	LAT	0.0055
CUGUD114A	D	C1	4	1	11.459	1.311	0.088	16	LAT	0.0055
CUGUD211A	D	C2	4	2	8.171	1.403	0.084	16	LAB	0.0052
CUGUD212A	D	C2	4	2	9.553	1.361	0.086	16	LAT	0.0054
CUGUD213A	D	C2	4	2	8.772	1.331	0.087	16	LAB	0.0054
CUGUE111A	E	C1	5	1	9.716	1.336	0.087	16	LAT	0.0055
CUGUE112A	E	C1	5	1	10.639	1.339	0.088	16	LAT	0.0055
CUGUE113A	E	C1	5	1	9.798	1.347	0.088	16	LAB	0.0055
CUGUE114A	E	C1	5	1	9.349	1.343	0.088	16	LAB	0.0055
CUGUE211A	E	C2	5	2	9.728	1.326	0.088	16	LAB	0.0055
CUGUE212A	E	C2	5	2	10.505	1.324	0.088	16	LAB	0.0055
CUGUE213A	E	C2	5	2	10.398	1.324	0.087	16	LGM	0.0055
CUGUF111A	F	C1	6	1	11.219	1.291	0.089	16	LGM	0.0055
CUGUF112A	F	C1	6	1	11.002	1.320	0.087	16	LGM	0.0054
CUGUF113A	F	C1	6	1	10.470	1.308	0.088	16	LAB	0.0055
CUGUF114A	F	C1	6	1	9.961	1.315	0.087	16	LAB	0.0054
CUGUF211A	F	C2	6	2	9.772	1.324	0.087	16	LAT	0.0055
CUGUF212A	F	C2	6	2	10.346	1.316	0.088	16	LAB	0.0055
CUGUF213A	F	C2	6	2	9.508	1.300	0.088	16	LAB	0.0055

* Strain measurement was measured with SG. Extensometer used on other coupons.

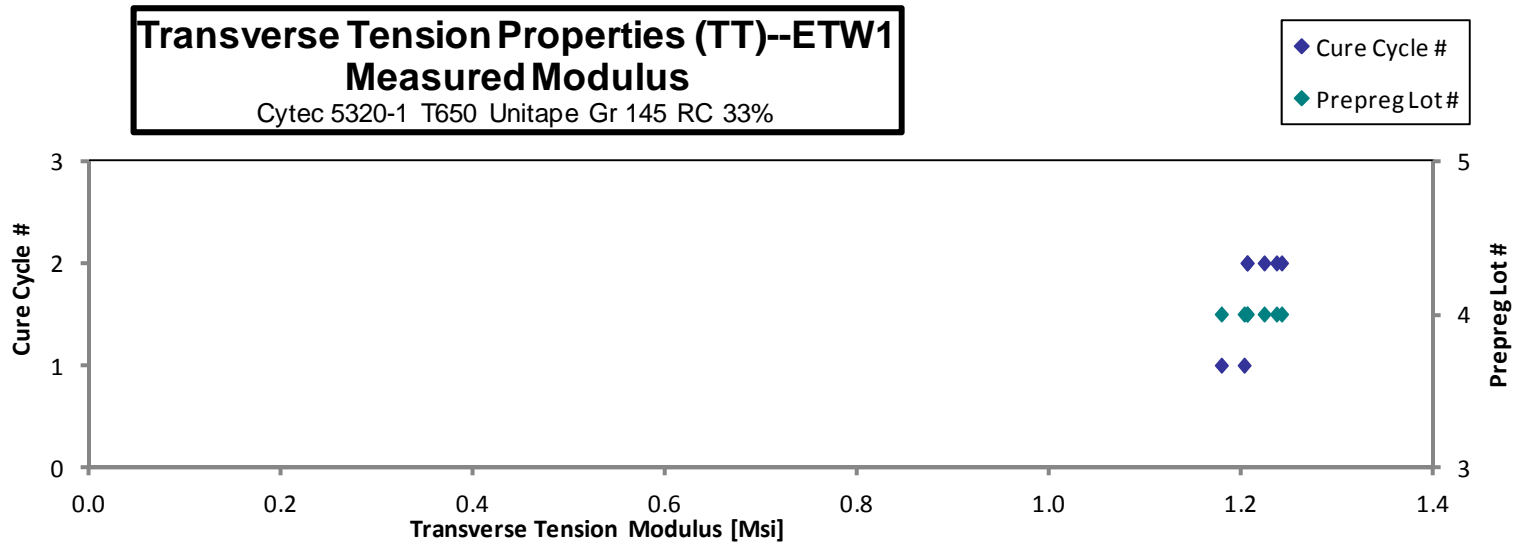
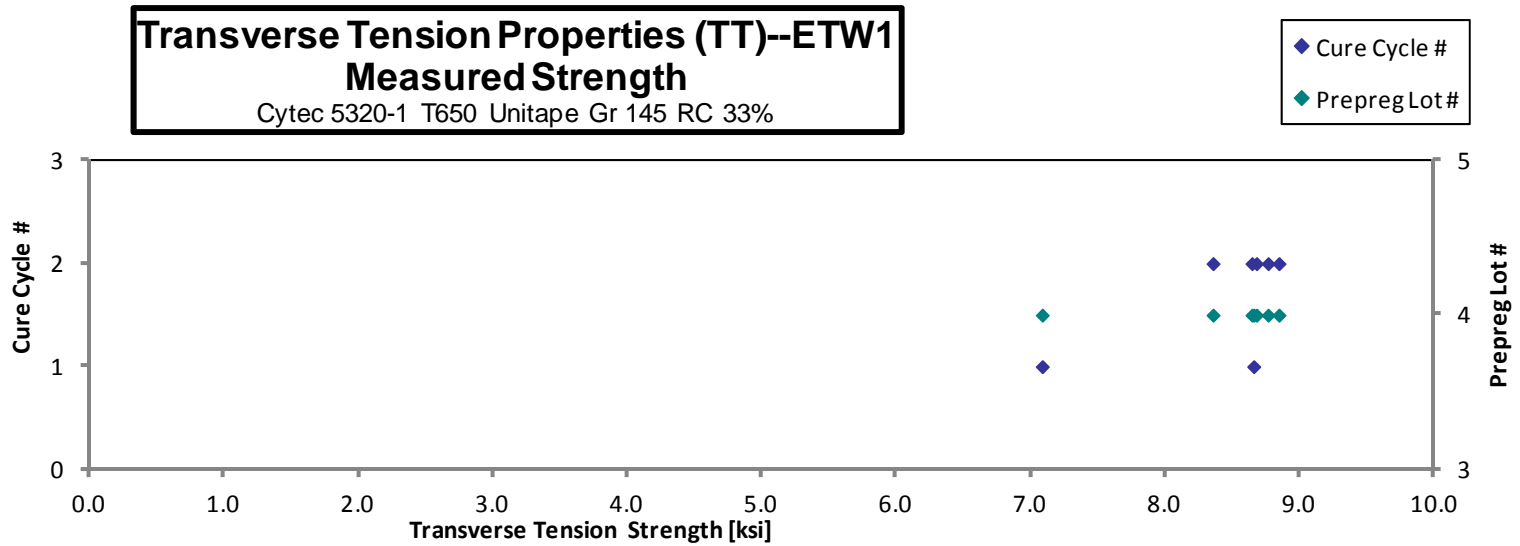
Average	10.096	1.331	Average	0.0055
Standard Dev.	0.812	0.025	Standard Dev.	
Coeff. of Var. [%]	8.045	1.859	Coeff. of Var. [%]	
Min.	8.171	1.291	Min.	0.0052
Max.	11.459	1.403	Max.	0.0055
Number of Spec.	21	21	Number of Spec.	21



Transverse Tension Properties (TT)--ETW1 Strength & Modulus Cytec 5320-1 T650 Unitape Gr 145 RC 33%

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t _{ply} [in]
CUGUD11BD	D	C1	4	1	8.656	1.202	0.087	16	LGM	0.0055
CUGUD11FD	D	C1	4	1	7.083	1.178	0.088	16	LAB	0.0055
CUGUD21BD	D	C2	4	2	8.764	1.241	0.087	16	LWT	0.0054
CUGUD21CD	D	C2	4	2	8.643	1.205	0.087	16	LWT	0.0055
CUGUD21DD	D	C2	4	2	8.354	1.223	0.087	16	LWB	0.0054
CUGUD21ED	D	C2	4	2	8.677	1.205	0.087	16	LGM	0.0055
CUGUD21FD	D	C2	4	2	8.844	1.236	0.087	16	LWT	0.0055

Average	8.432	1.213	Average	0.0055
Standard Dev.	0.614	0.022	Standard Dev.	
Coeff. of Var. [%]	7.278	1.796	Coeff. of Var. [%]	
Min.	7.083	1.178	Min.	0.0054
Max.	8.844	1.241	Max.	0.0055
Number of Spec.	7	7	Number of Spec.	7

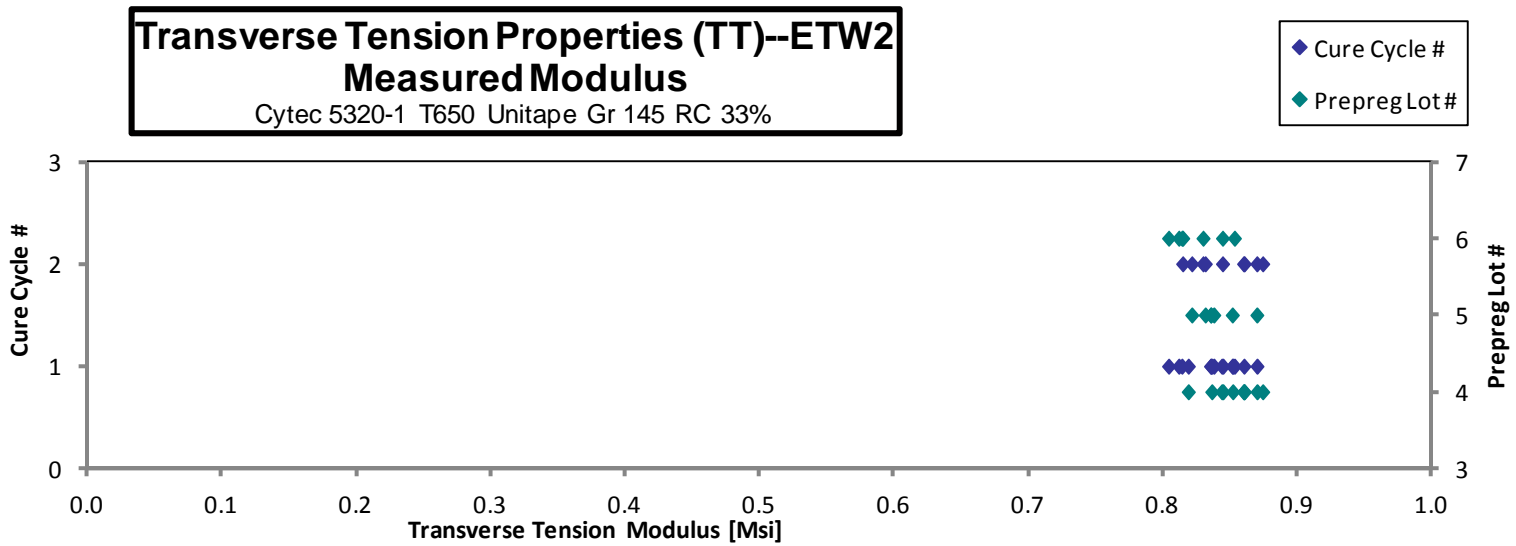
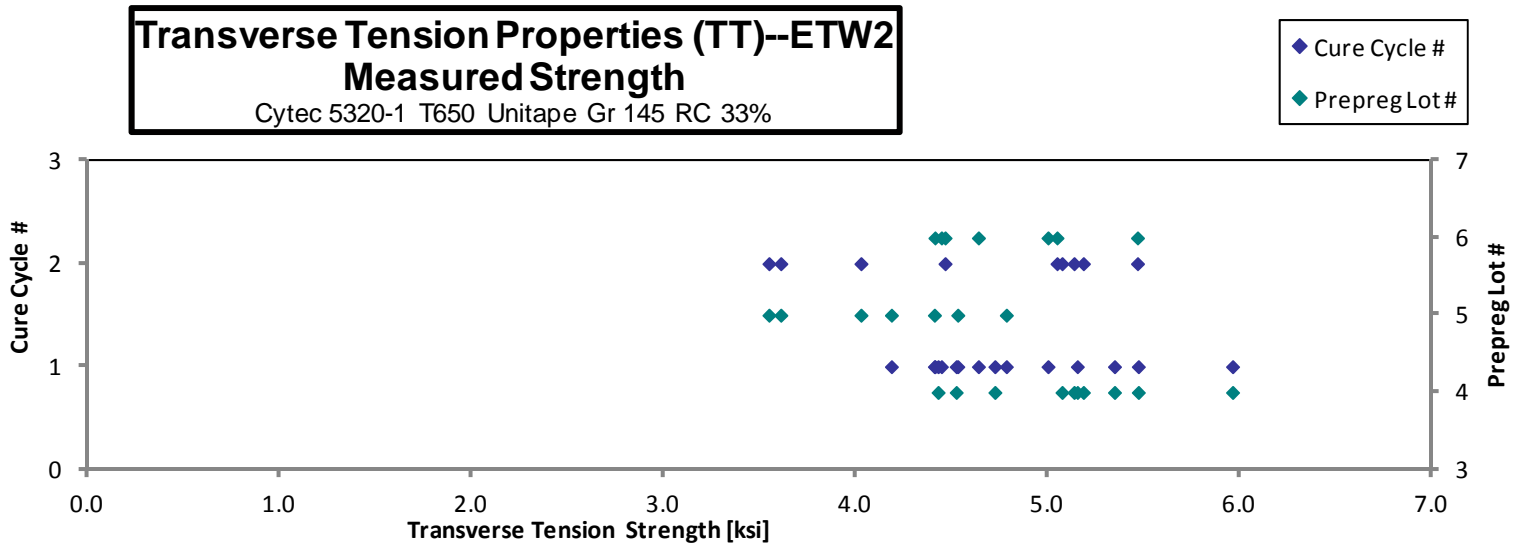


Transverse Tension Properties (TT)--ETW2 Strength & Modulus Cytec 5320-1 T650 Unitape Gr 145 RC 33%

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t _{ply} [in]
CUGUD11GF	D	C1	4	1	5.960	0.843	0.088	16	LGM	0.0055
CUGUD11HF	D	C1	4	1	5.469	0.870	0.088	16	LGM	0.0055
CUGUD11IF	D	C1	4	1	5.345	0.852	0.088	16	LGM	0.0055
CUGUD11JF	D	C1	4	1	4.722	0.844	0.087	16	LGM	0.0055
CUGUD11CF*	D	C1	4	1	4.521	0.836	0.088	16	LGM	0.0055
CUGUD11DF*	D	C1	4	1	4.426	0.818	0.087	16	LGM	0.0055
CUGUD11EF*	D	C1	4	1	5.151	0.860	0.088	16	LGM	0.0055
CUGUD21GF	D	C2	4	2	5.072	0.860	0.087	16	LGM	0.0055
CUGUD21HF	D	C2	4	2	5.183	0.874	0.086	16	LGM	0.0054
CUGUD21IF	D	C2	4	2	5.134	0.860	0.088	16	LGM	0.0055
CUGUE11DF	E	C1	5	1	4.183	0.835	0.089	16	LGM	0.0055
CUGUE11EF	E	C1	5	1	4.782	0.851	0.088	16	LWB	0.0055
CUGUE11FF	E	C1	5	1	4.407	0.837	0.089	16	LWT	0.0055
CUGUE11GF	E	C1	5	1	4.529	0.835	0.088	16	LGM	0.0055
CUGUE21BF	E	C2	5	2	3.607	0.831	0.088	16	LGM	0.0055
CUGUE21CF	E	C2	5	2	3.546	0.869	0.088	16	LGM	0.0055
CUGUE21DF	E	C2	5	2	4.025	0.821	0.088	16	LGM	0.0055
CUGUF11DF	F	C1	6	1	4.443	0.804	0.088	16	LGM	0.0055
CUGUF11EF	F	C1	6	1	4.636	0.814	0.088	16	LGM	0.0055
CUGUF11FF	F	C1	6	1	4.410	0.811	0.087	16	LGM	0.0055
CUGUF11GF	F	C1	6	1	4.999	0.853	0.088	16	LWT	0.0055
CUGUF21BF	F	C2	6	2	5.465	0.814	0.089	16	LGM	0.0055
CUGUF21CF	F	C2	6	2	5.046	0.844	0.089	16	LGM	0.0055
CUGUF21DF	F	C2	6	2	4.463	0.829	0.089	16	LGM	0.0056

* Coupons are from 180F set but was accidentally tested at 250F

Average	4.730	0.840	Average	0.0055
Standard Dev.	0.583	0.020	Standard Dev.	
Coeff. of Var. [%]	12.327	2.367	Coeff. of Var. [%]	
Min.	3.546	0.804	Min.	0.0054
Max.	5.960	0.874	Max.	0.0056
Number of Spec.	24	24	Number of Spec.	24



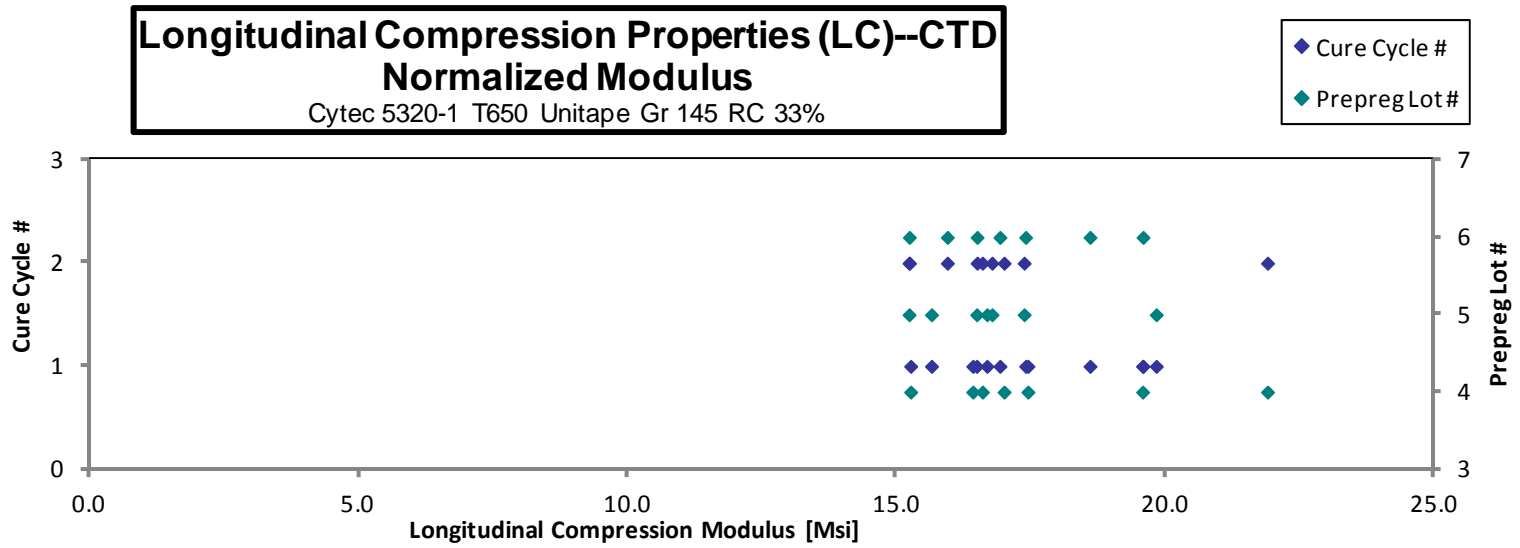
4.3 Longitudinal Compression Properties (LC)

Longitudinal Compression Properties (LC)--CTD
Modulus
 Cytec 5320-1 T650 Unitape Gr 145 RC 33%

normalizing
 t_{ply} [in]
 0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]	Modulus _{norm} [Msi]
CUGLD117B	D	C1	4	1	17.192	0.112	20	0.0056	17.442
CUGLD118B	D	C1	4	1	15.000	0.112	20	0.0056	15.261
CUGLD119B	D	C1	4	1	16.372	0.110	20	0.0055	16.417
CUGLD11AB	D	C1	4	1	19.344	0.111	20	0.0056	19.575
CUGLD216B	D	C2	4	2	17.121	0.107	20	0.0053	16.596
CUGLD217B	D	C2	4	2	22.407	0.108	20	0.0054	21.898
CUGLD218B	D	C2	4	2	17.198	0.109	20	0.0054	16.998
CUGLE117B	E	C1	5	1	16.789	0.109	20	0.0055	16.680
CUGLE118B	E	C1	5	1	16.801	0.108	20	0.0054	16.490
CUGLE119B	E	C1	5	1	19.928	0.109	20	0.0055	19.828
CUGLE11AB	E	C1	5	1	15.658	0.110	20	0.0055	15.649
CUGLE216B	E	C2	5	2	15.261	0.110	20	0.0055	15.232
CUGLE217B	E	C2	5	2	17.607	0.109	20	0.0054	17.371
CUGLE218B	E	C2	5	2	17.238	0.107	20	0.0054	16.774
CUGLF116B	F	C1	6	1	16.871	0.110	20	0.0055	16.920
CUGLF117B	F	C1	6	1	17.374	0.110	20	0.0055	17.399
CUGLF118B	F	C1	6	1	19.527	0.110	20	0.0055	19.583
CUGLF119B	F	C1	6	1	18.478	0.111	20	0.0055	18.596
CUGLF216B	F	C2	6	2	16.411	0.111	20	0.0055	16.496
CUGLF217B	F	C2	6	2	15.855	0.111	20	0.0055	15.944
CUGLF218B	F	C2	6	2	15.032	0.112	20	0.0056	15.236

Average	17.308	Average_{norm}	0.0055	17.256
Standard Dev.	1.808	Standard Dev._{norm}		1.737
Coeff. of Var. [%]	10.447	Coeff. of Var. [%]_{norm}		10.064
Min.	15.000	Min.	0.0053	15.232
Max.	22.407	Max.	0.0056	21.898
Number of Spec.	21	Number of Spec.	21	21

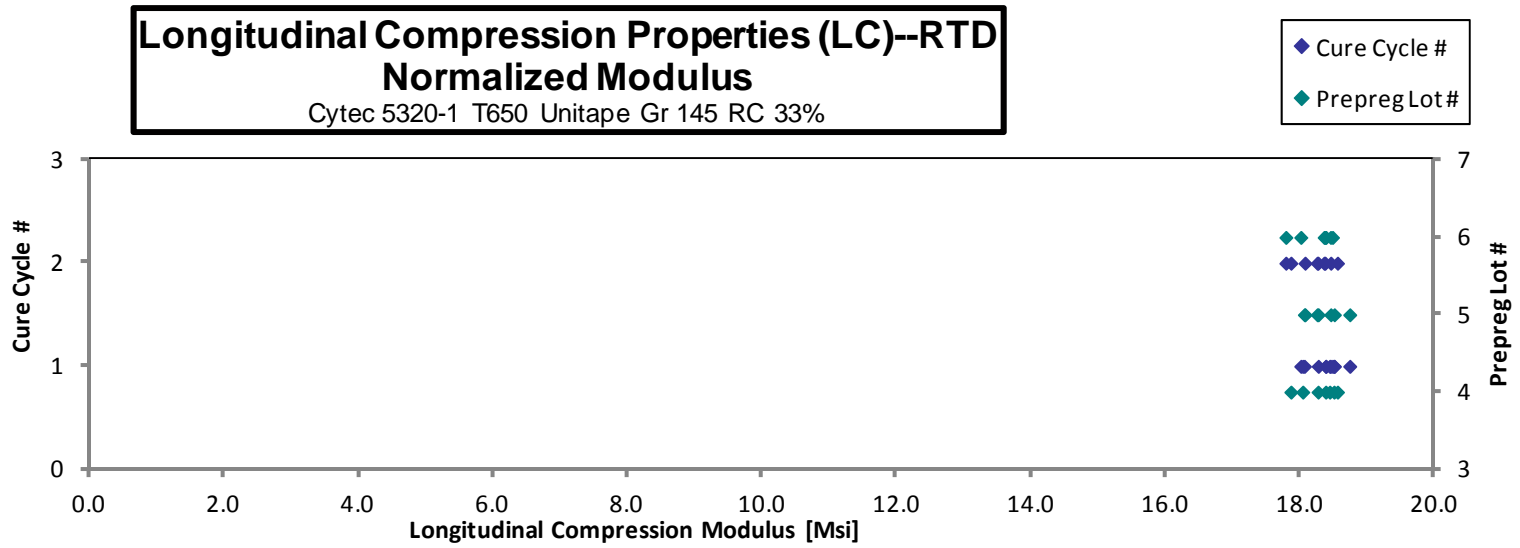


**Longitudinal Compression Properties (LC)--RTD
Modulus**
Cytec 5320-1 T650 Unitape Gr 145 RC 33%

normalizing
t_{ply} [in]
0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t _{ply} [in]	Modulus _{norm} [Msi]
CUGLD112A	D	C1	4	1	18.352	0.111	20	0.0055	18.443
CUGLD113A	D	C1	4	1	17.916	0.111	20	0.0055	18.042
CUGLD114A	D	C1	4	1	18.248	0.112	20	0.0056	18.507
CUGLD115A	D	C1	4	1	18.023	0.112	20	0.0056	18.383
CUGLD211A	D	C2	4	2	18.322	0.111	20	0.0056	18.559
CUGLD212A	D	C2	4	2	17.950	0.109	20	0.0055	17.866
CUGLD213A	D	C2	4	2	18.289	0.110	20	0.0055	18.270
CUGLE111A	E	C1	5	1	18.659	0.108	20	0.0054	18.273
CUGLE112A	E	C1	5	1	18.513	0.107	20	0.0054	18.067
CUGLE113A	E	C1	5	1	18.592	0.110	20	0.0055	18.512
CUGLE114A	E	C1	5	1	18.767	0.110	20	0.0055	18.741
CUGLE211A	E	C2	5	2	18.572	0.107	20	0.0054	18.076
CUGLE212A	E	C2	5	2	19.023	0.107	20	0.0053	18.459
CUGLE213A	E	C2	5	2	18.752	0.107	20	0.0054	18.257
CUGLF111A	F	C1	6	1	18.204	0.109	20	0.0054	18.014
CUGLF112A	F	C1	6	1	18.382	0.110	20	0.0055	18.456
CUGLF113A	F	C1	6	1	18.332	0.110	20	0.0055	18.386
CUGLF114A	F	C1	6	1	18.287	0.111	20	0.0056	18.485
CUGLF211A	F	C2	6	2	17.868	0.110	20	0.0055	17.791
CUGLF212A	F	C2	6	2	18.131	0.111	20	0.0056	18.360
CUGLF213A	F	C2	6	2	18.307	0.110	20	0.0055	18.373

Average	18.356	Average_{norm}	0.0055	18.301
Standard Dev.	0.300	Standard Dev._{norm}		0.243
Coeff. of Var. [%]	1.633	Coeff. of Var. [%]_{norm}		1.328
Min.	17.868	Min.	0.0053	17.791
Max.	19.023	Max.	0.0056	18.741
Number of Spec.	21	Number of Spec.	21	21



Longitudinal Compression Properties (LC)--ETD1
Modulus
 Cytec 5320-1 T650 Unitape Gr 145 RC 33%

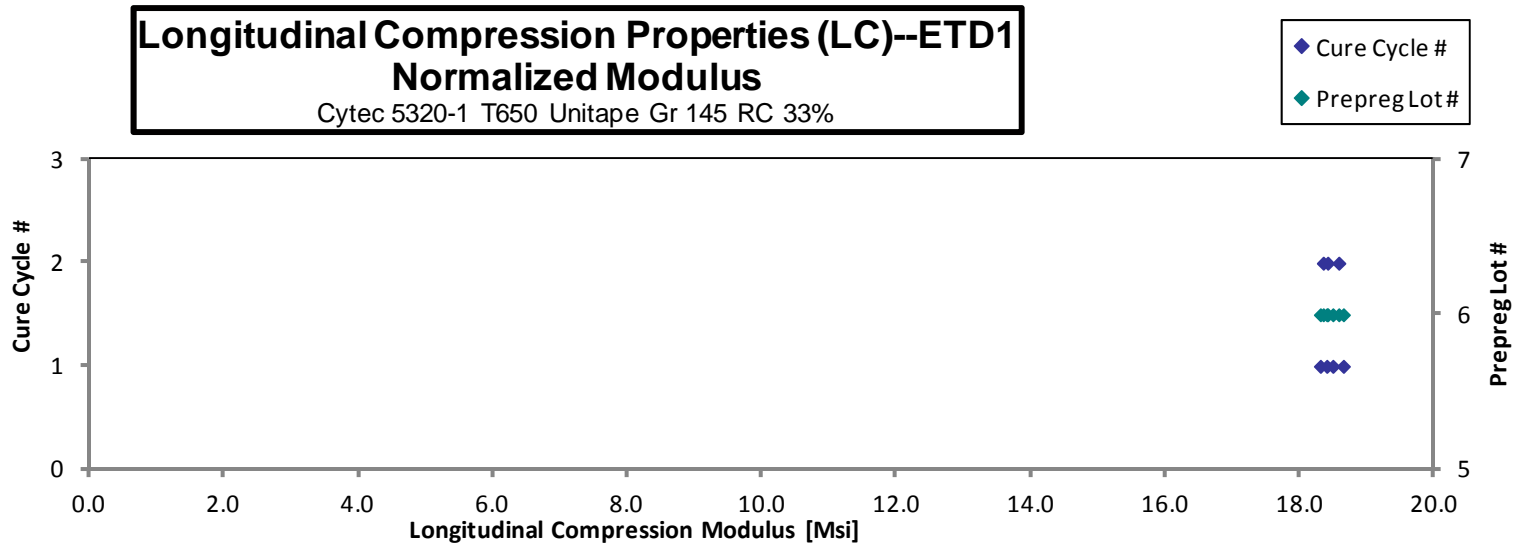
normalizing
 t_{ply} [in]
 0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate
CUGLF11BC	F	C1	6	1	18.377	0.110	20
CUGLF11CC	F	C1	6	1	18.319	0.110	20
CUGLF11EC	F	C1	6	1	18.445	0.110	20
CUGLF11KC	F	C1	6	1	18.615	0.110	20
CUGLF21BC	F	C2	6	2	18.318	0.111	20
CUGLF21CC	F	C2	6	2	18.528	0.110	20
CUGLF21DC	F	C2	6	2	18.247	0.111	20

Avg. t_{ply} [in]	Modulus _{norm} [Msi]
0.0055	18.400
0.0055	18.304
0.0055	18.491
0.0055	18.646
0.0055	18.413
0.0055	18.579
0.0055	18.348

Average 18.407
 Standard Dev. 0.130
 Coeff. of Var. [%] 0.707
 Min. 18.247
 Max. 18.615
 Number of Spec. 7

Average_{norm} 0.0055 18.454
 Standard Dev._{norm} 0.124
 Coeff. of Var. [%]_{norm} 0.671
 Min. 0.0055 18.304
 Max. 0.0055 18.646
 Number of Spec. 7 7



Longitudinal Compression Properties (LC)--ETW1
Modulus
 Cytec 5320-1 T650 Unitape Gr 145 RC 33%

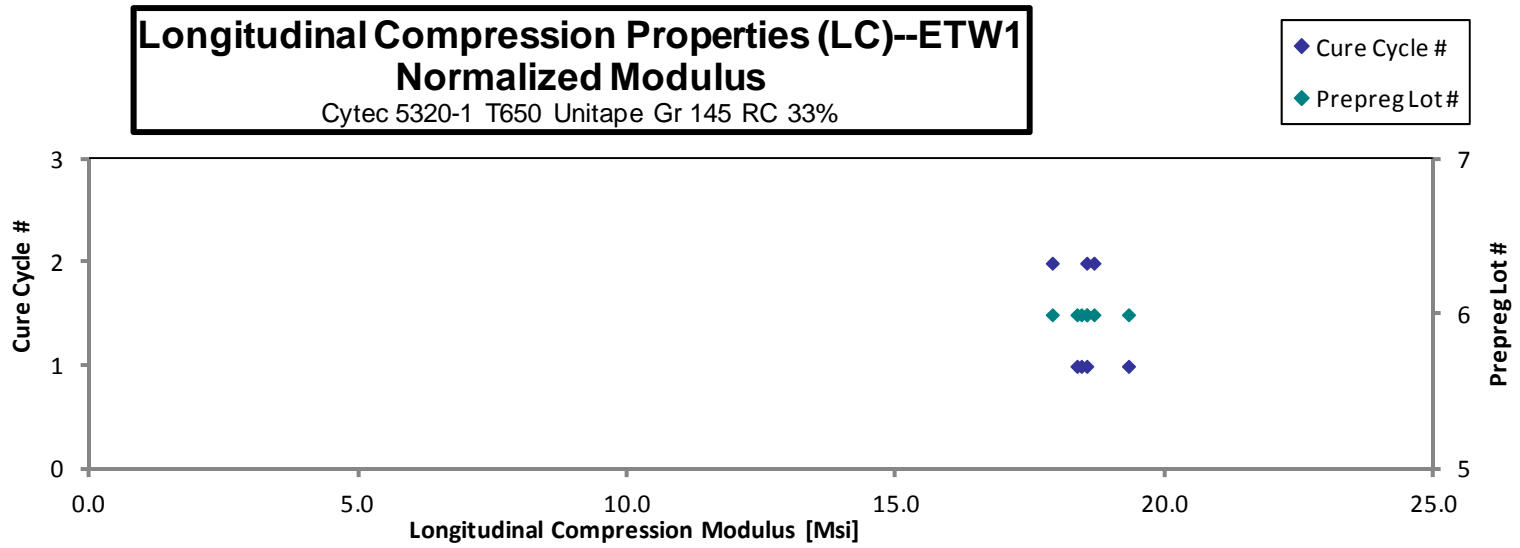
normalizing
 t_{ply} [in]
 0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate
CUGLF131D	F	C1	6	1	19.573	0.109	20
CUGLF132D	F	C1	6	1	18.281	0.110	20
CUGLF133D	F	C1	6	1	18.473	0.110	20
CUGLF134D	F	C1	6	1	18.347	0.111	20
CUGLF231D	F	C2	6	2	18.094	0.109	20
CUGLF232D	F	C2	6	2	18.484	0.110	20
CUGLF233D	F	C2	6	2	18.595	0.110	20

Avg. t_{ply} [in]	Modulus _{norm} [Msi]
0.0054	19.312
0.0055	18.354
0.0055	18.536
0.0055	18.434
0.0054	17.895
0.0055	18.535
0.0055	18.669

Average 18.550
Standard Dev. 0.480
Coeff. of Var. [%] 2.585
Min. 18.094
Max. 19.573
Number of Spec. 7

Average_{norm} 0.0055 **18.534**
Standard Dev._{norm} 0.423
Coeff. of Var. [%]_{norm} 2.284
Min. 0.0054 **17.895**
Max. 0.0055 **19.312**
Number of Spec. 7 7



Longitudinal Compression Properties (LC)--ETD2
Modulus
 Cytec 5320-1 T650 Unitape Gr 145 RC 33%

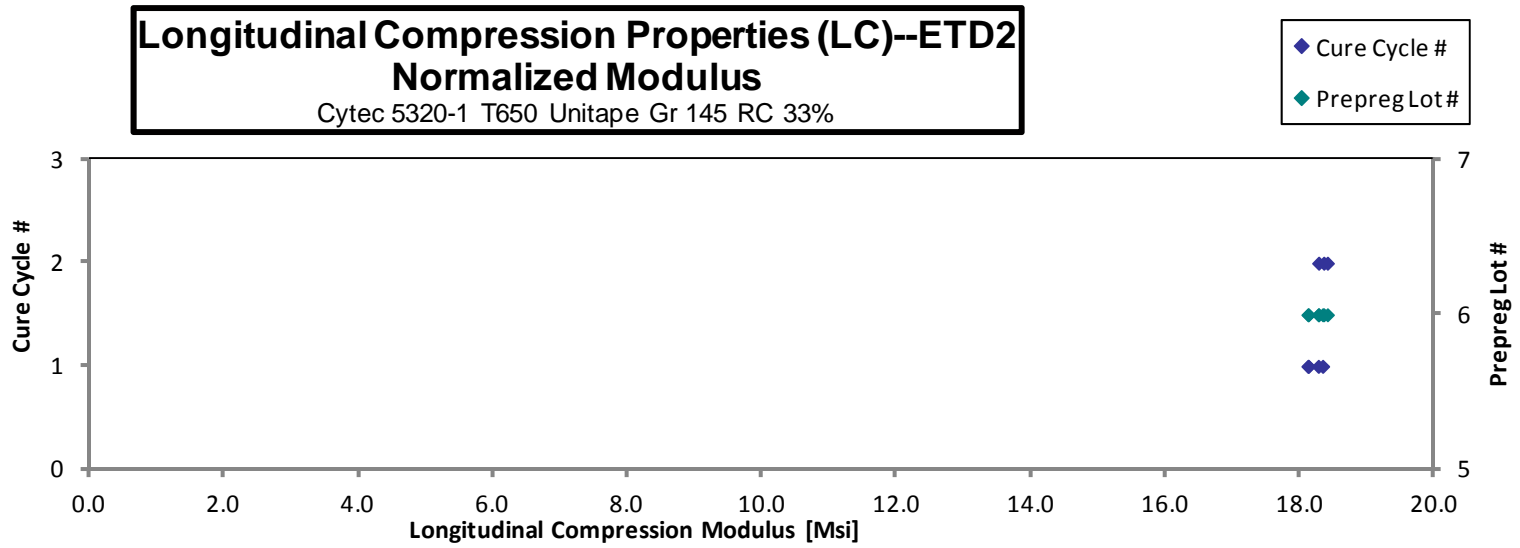
normalizing
 t_{ply} [in]
 0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate
CUGLF11DE	F	C1	6	1	18.058	0.110	20
CUGLF11HE	F	C1	6	1	18.204	0.109	20
CUGLF11IE	F	C1	6	1	18.208	0.110	20
CUGLF11JE	F	C1	6	1	18.276	0.110	20
CUGLF21GE	F	C2	6	2	18.288	0.110	20
CUGLF21HE	F	C2	6	2	18.202	0.110	20
CUGLF21IE	F	C2	6	2	18.303	0.111	20

Avg. t_{ply} [in]	Modulus _{norm} [Msi]
0.0055	18.126
0.0055	18.119
0.0055	18.274
0.0055	18.339
0.0055	18.355
0.0055	18.278
0.0055	18.409

Average 18.220
Standard Dev. 0.083
Coeff. of Var. [%] 0.457
Min. 18.058
Max. 18.303
Number of Spec. 7

Average_{norm} 0.0055
Standard Dev._{norm} 0.112
Coeff. of Var. [%]_{norm} 0.611
Min. 0.0055
Max. 0.0055
Number of Spec. 7

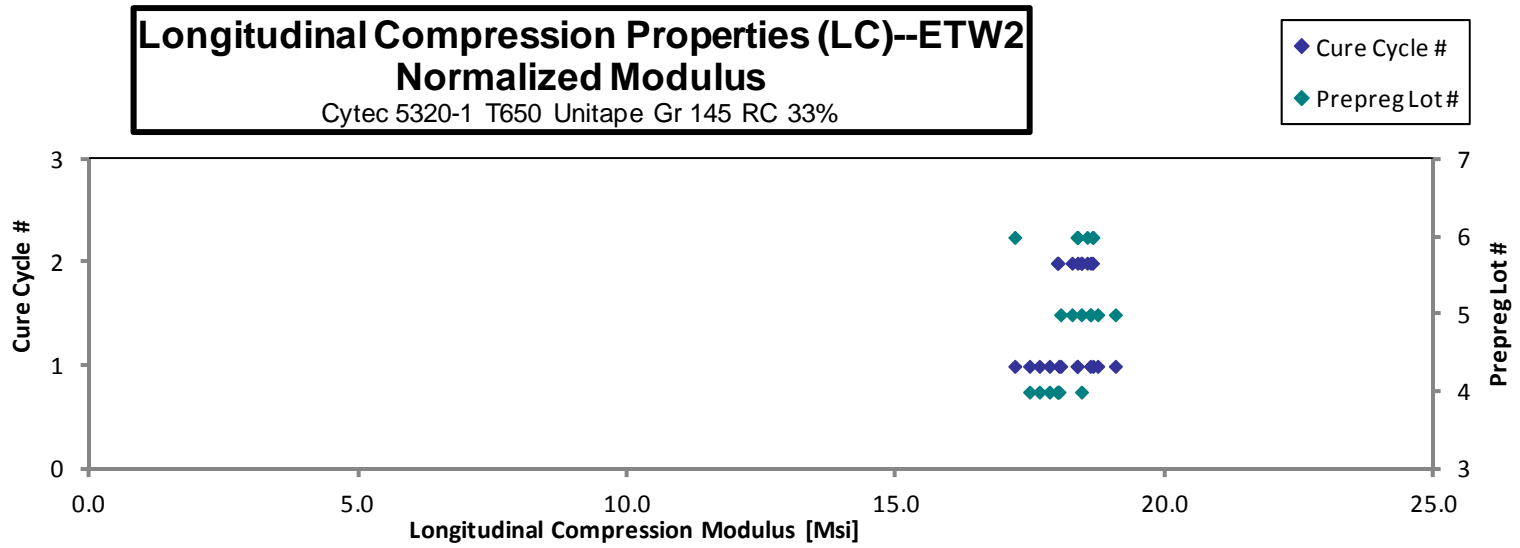


Longitudinal Compression Properties (LC)--ETW2
Modulus
 Cytec 5320-1 T650 Unitape Gr 145 RC 33%

normalizing
 t_{ply} [in]
 0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]	Modulus _{norm} [Msi]
CUGLD11DF	D	C1	4	1	17.257	0.111	20	0.0056	17.472
CUGLD11EF	D	C1	4	1	17.701	0.112	20	0.0056	18.019
CUGLD11FF	D	C1	4	1	17.551	0.112	20	0.0056	17.842
CUGLD11GF	D	C1	4	1	17.478	0.111	20	0.0056	17.655
CUGLD21BF	D	C2	4	2	18.382	0.108	20	0.0054	17.990
CUGLD21CF	D	C2	4	2	18.440	0.110	20	0.0055	18.438
CUGLD21DF	D	C2	4	2	18.102	0.109	20	0.0055	17.999
CUGLE11DF	E	C1	5	1	18.750	0.112	20	0.0056	19.068
CUGLE11EF	E	C1	5	1	18.608	0.110	20	0.0055	18.602
CUGLE11FF	E	C1	5	1	18.015	0.110	20	0.0055	18.050
CUGLE11GF	E	C1	5	1	18.458	0.112	20	0.0056	18.740
CUGLE21BF	E	C2	5	2	19.083	0.107	20	0.0054	18.606
CUGLE21CF	E	C2	5	2	18.633	0.109	20	0.0054	18.436
CUGLE21DF	E	C2	5	2	18.563	0.108	20	0.0054	18.261
CUGLF137F	F	C1	6	1	18.482	0.109	20	0.0055	18.360
CUGLF138F	F	C1	6	1	17.093	0.111	20	0.0055	17.198
CUGLF139F	F	C1	6	1	18.167	0.111	20	0.0056	18.354
CUGLF13AF	F	C1	6	1	18.529	0.111	20	0.0055	18.651
CUGLF236F	F	C2	6	2	18.260	0.111	20	0.0055	18.366
CUGLF237F	F	C2	6	2	18.548	0.111	20	0.0055	18.643
CUGLF238F	F	C2	6	2	18.430	0.111	20	0.0055	18.544

Average	18.216	Average_{norm}	0.0055	18.252
Standard Dev.	0.522	Standard Dev._{norm}		0.454
Coeff. of Var. [%]	2.863	Coeff. of Var. [%]_{norm}		2.488
Min.	17.093	Min.	0.0054	17.198
Max.	19.083	Max.	0.0056	19.068
Number of Spec.	21	Number of Spec.	21	21

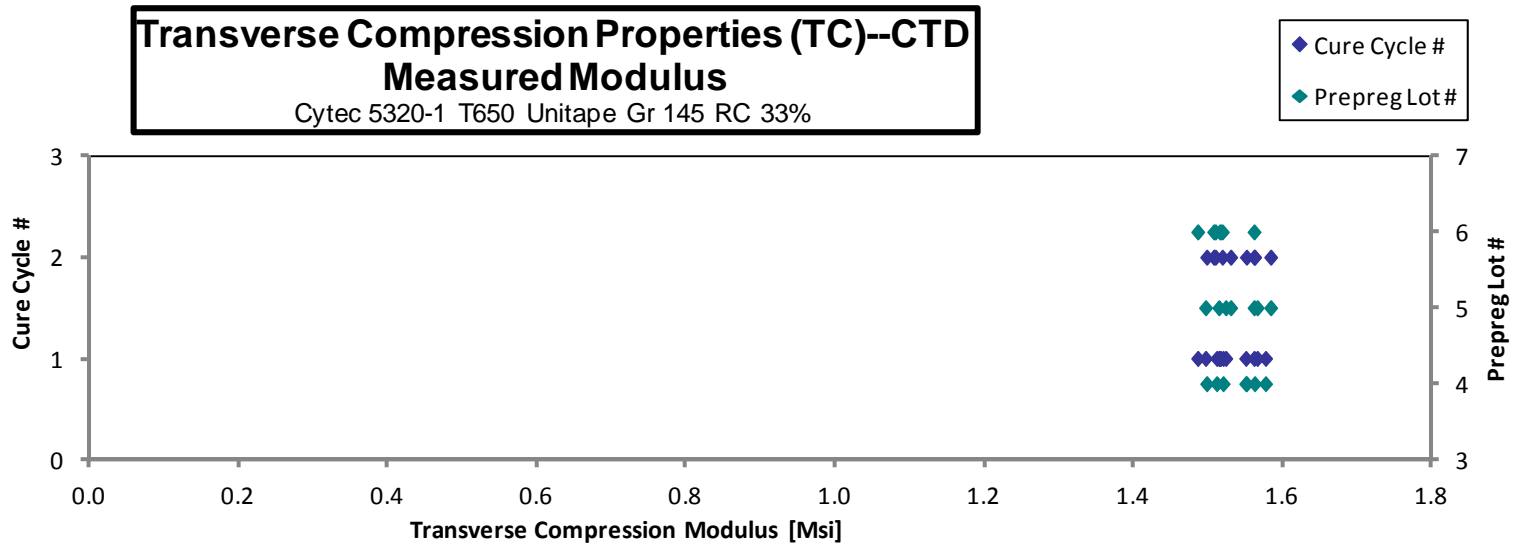
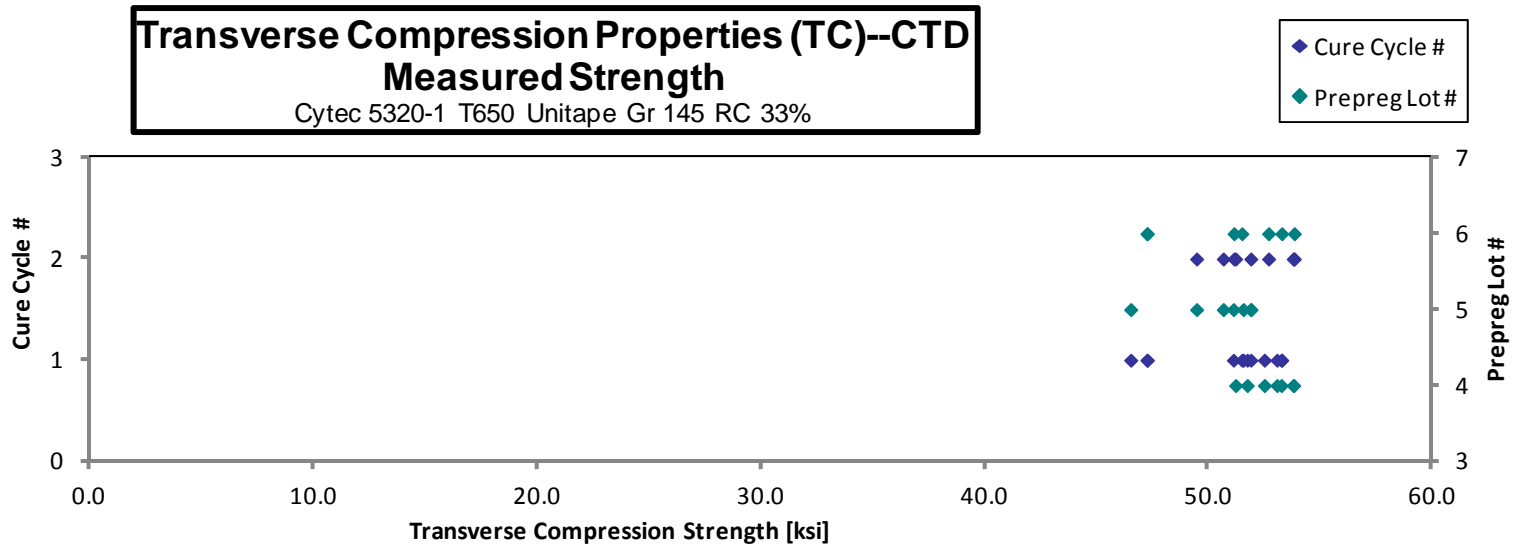


4.4 Transverse Compression Properties (TC)

Transverse Compression Properties (TC)--CTD
Strength & Modulus
 Cytec 5320-1 T650 Unitape Gr 145 RC 33%

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t _{ply} [in]
CUGZD117B	D	C1	4	1	52.496	1.576	0.110	20	BGM	0.0055
CUGZD118B	D	C1	4	1	51.727	1.519	0.110	20	BGM	0.0055
CUGZD119B	D	C1	4	1	53.055	1.511	0.109	20	BGM	0.0055
CUGZD11AB	D	C1	4	1	53.252	1.550	0.109	20	BGM	0.0055
CUGZD216B	D	C2	4	2	53.788	1.551	0.110	20	BGM	0.0055
CUGZD217B	D	C2	4	2	53.802	1.497	0.109	20	BGM	0.0055
CUGZD218B	D	C2	4	2	51.208	1.562	0.109	20	BGM	0.0054
CUGZE117B	E	C1	5	1	51.889	1.514	0.112	20	BGM	0.0056
CUGZE118B	E	C1	5	1	46.520	1.523	0.112	20	BGM	0.0056
CUGZE119B	E	C1	5	1	51.110	1.496	0.111	20	BGM	0.0056
CUGZE11AB	E	C1	5	1	51.551	1.565	0.112	20	BGM	0.0056
CUGZE216B	E	C2	5	2	51.888	1.583	0.109	20	BGM	0.0055
CUGZE217B	E	C2	5	2	49.465	1.530	0.109	20	BGM	0.0055
CUGZE218B	E	C2	5	2	50.658	1.561	0.109	20	BGM	0.0054
CUGZF117B	F	C1	6	1	47.244	1.516	0.111	20	BGM	0.0056
CUGZF118B	F	C1	6	1	53.272	1.485	0.112	20	BGM	0.0056
CUGZF119B	F	C1	6	1	51.489	1.561	0.111	20	BGM	0.0056
CUGZF11AB	F	C1	6	1	47.263	1.515	0.111	20	BGM	0.0056
CUGZF216B	F	C2	6	2	53.834	1.518	0.110	20	BGM	0.0055
CUGZF217B	F	C2	6	2	51.138	1.509	0.111	20	BGM	0.0055
CUGZF218B	F	C2	6	2	52.681	1.507	0.111	20	BGM	0.0055

Average	51.397	1.531	Average	0.0055
Standard Dev.	2.159	0.029	Standard Dev.	
Coeff. of Var. [%]	4.200	1.875	Coeff. of Var. [%]	
Min.	46.520	1.485	Min.	0.0054
Max.	53.834	1.583	Max.	0.0056
Number of Spec.	21	21	Number of Spec.	21

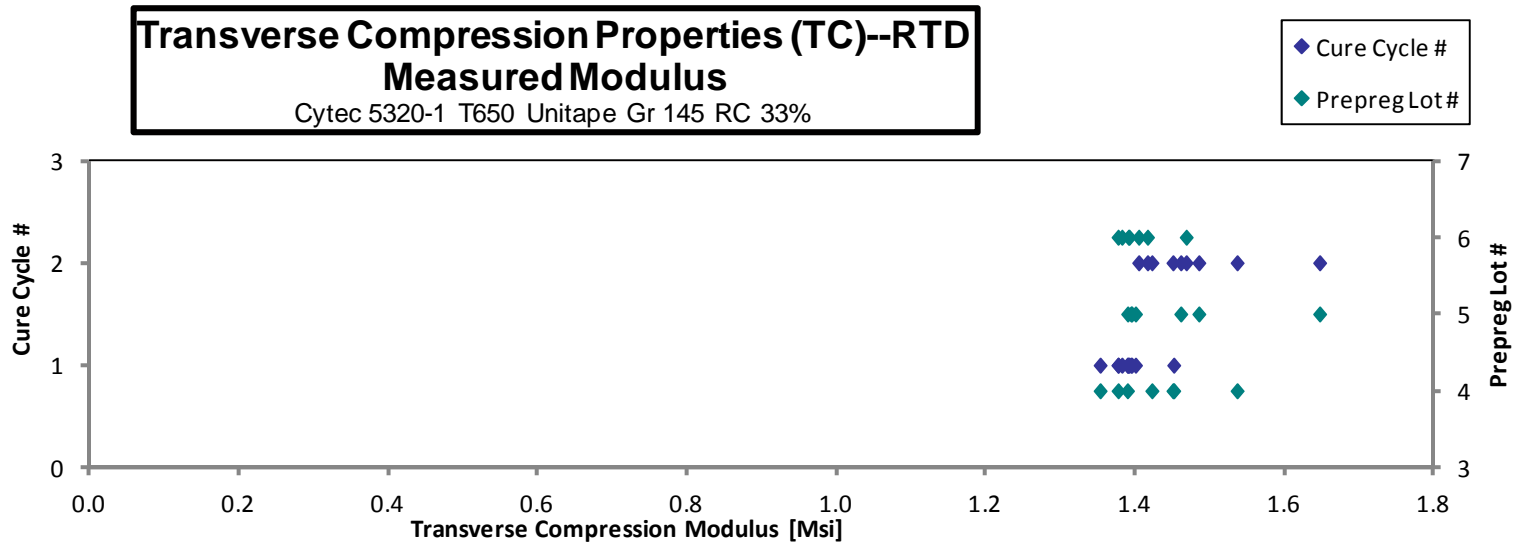
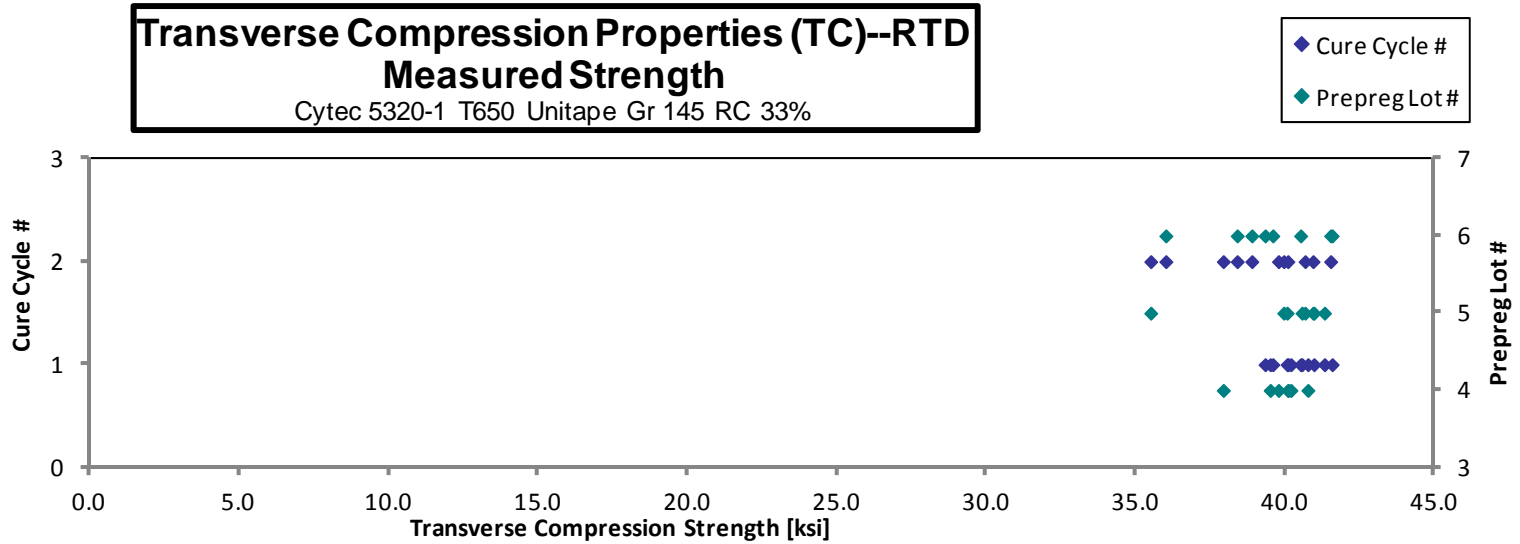


Transverse Compression Properties (TC)--RTD Strength & Modulus Cytec 5320-1 T650 Unitape Gr 145 RC 33%
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Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t _{ply} [in]
CUGZD111A	D	C1	4	1	39.507	1.451	0.103	20	BGM	0.0052
CUGZD112A	D	C1	4	1	40.200	1.377	0.109	20	BGM	0.0054
CUGZD113A	D	C1	4	1	40.109	1.353	0.109	20	BGM	0.0055
CUGZD114A	D	C1	4	1	40.767	1.389	0.109	20	BGM	0.0055
CUGZD211A	D	C2	4	2	37.936	1.536	0.104	20	BGM	0.0052
CUGZD212A	D	C2	4	2	39.782	1.450	0.109	20	BGM	0.0055
CUGZD213A	D	C2	4	2	40.096	1.422	0.109	20	BGM	0.0054
CUGZE112A	E	C1	5	1	40.570	1.394	0.112	20	BGM	0.0056
CUGZE113A	E	C1	5	1	41.323	1.395	0.112	20	BGM	0.0056
CUGZE114A	E	C1	5	1	40.071	1.400	0.112	20	BGM	0.0056
CUGZE115A	E	C1	5	1	40.970	1.389	0.112	20	BGM	0.0056
CUGZE211A	E	C2	5	2	35.507	1.646	0.102	20	BGM	0.0051
CUGZE212A	E	C2	5	2	39.959	1.485	0.109	20	BGM	0.0054
CUGZE213A	E	C2	5	2	40.673	1.460	0.109	20	BGM	0.0054
CUGZE214A*	E	C2	5	2	40.939		0.110	20	BGM	0.0055
CUGZF111A	F	C1	6	1	40.525	1.390	0.110	20	BGM	0.0055
CUGZF112A	F	C1	6	1	39.336	1.391	0.112	20	BGM	0.0056
CUGZF113A	F	C1	6	1	39.593	1.382	0.111	20	BGM	0.0056
CUGZF114A	F	C1	6	1	41.579	1.376	0.111	20	BGM	0.0056
CUGZF211A	F	C2	6	2	36.012	1.468	0.103	20	BGM	0.0051
CUGZF212A	F	C2	6	2	38.890	1.416	0.111	20	BGM	0.0055
CUGZF213A	F	C2	6	2	41.529	1.404	0.110	20	BGM	0.0055
CUGZF214A*	F	C2	6	2	38.401		0.112	20	BGM	0.0056

*Specimen was not gaged

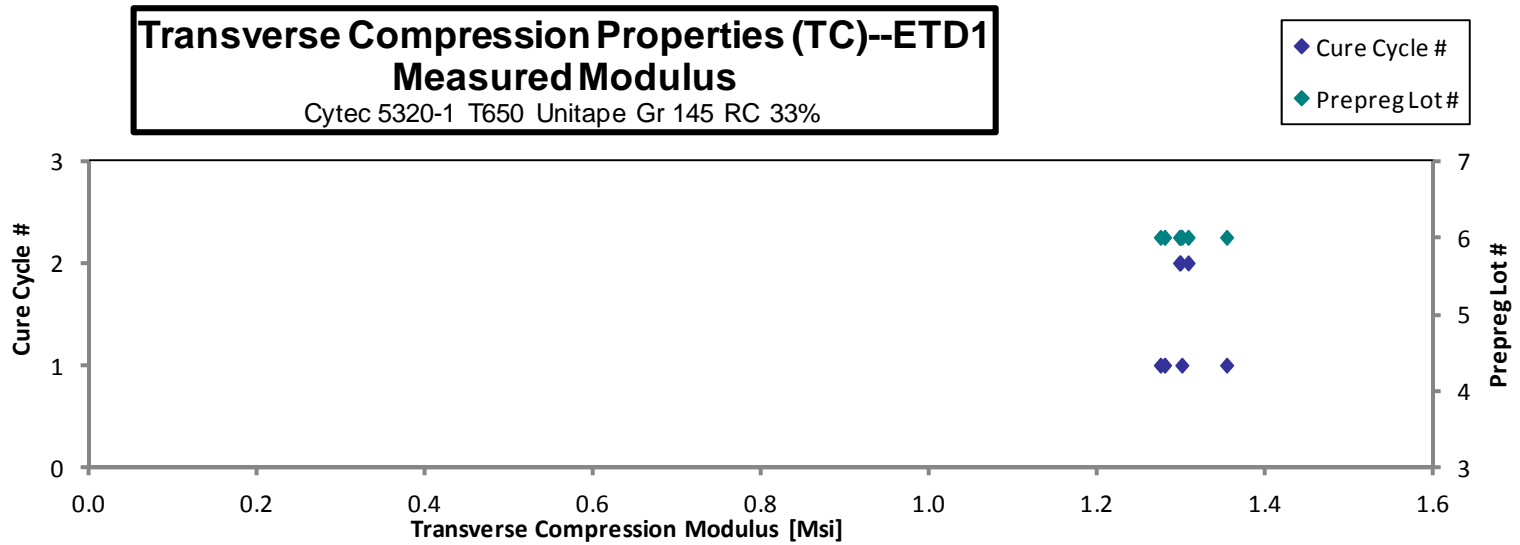
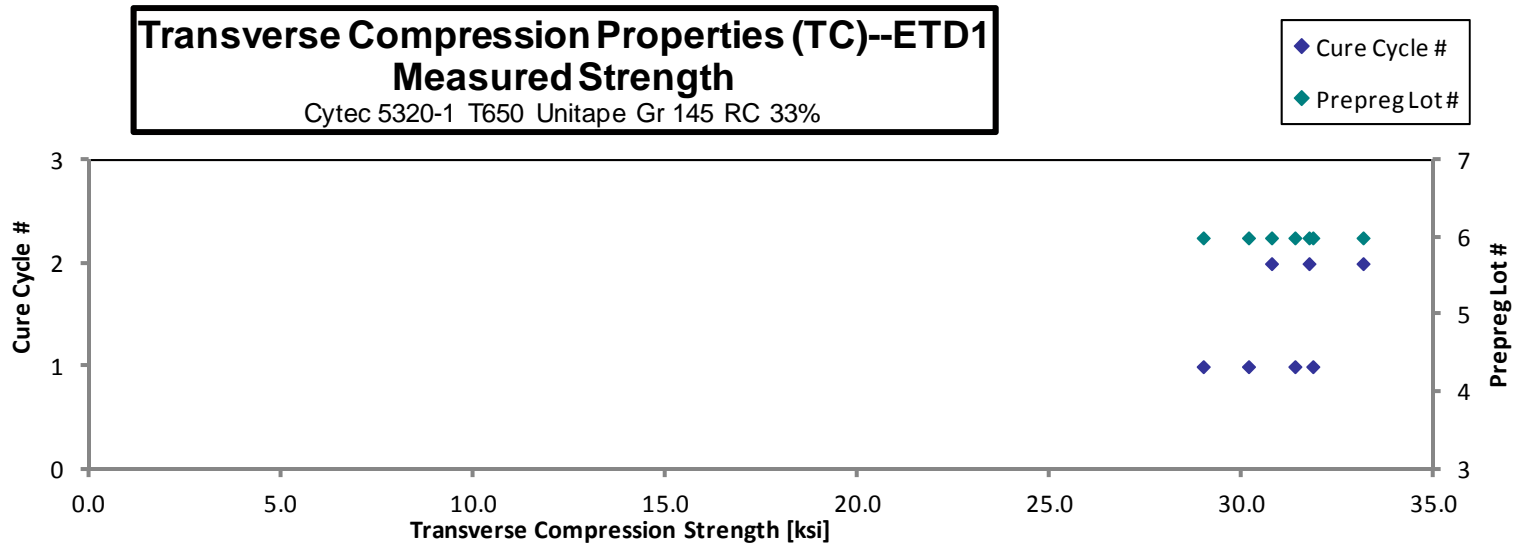
Average	39.751	1.427	Average	0.0055
Standard Dev.	1.563	0.067	Standard Dev.	
Coeff. of Var. [%]	3.931	4.673	Coeff. of Var. [%]	
Min.	35.507	1.353	Min.	0.0051
Max.	41.579	1.646	Max.	0.0056
Number of Spec.	23	21	Number of Spec.	23



Transverse Compression Properties (TC)--ETD1 Strength & Modulus Cytec 5320-1 T650 Unitape Gr 145 RC 33%

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t _{ply} [in]
CUGZF11DC	F	C1	6	1	28.982	1.353	0.104	20	BAB	0.0052
CUGZF11EC	F	C1	6	1	30.161	1.274	0.113	20	BGM	0.0056
CUGZF11FC	F	C1	6	1	31.835	1.299	0.111	20	BGM	0.0056
CUGZF11HC	F	C1	6	1	31.370	1.279	0.112	20	BGM	0.0056
CUGZF21BC	F	C2	6	2	30.760	1.307	0.110	20	BGM	0.0055
CUGZF21CC	F	C2	6	2	33.144	1.297	0.110	20	BGM	0.0055
CUGZF21DC	F	C2	6	2	31.737	1.298	0.111	20	BGM	0.0055

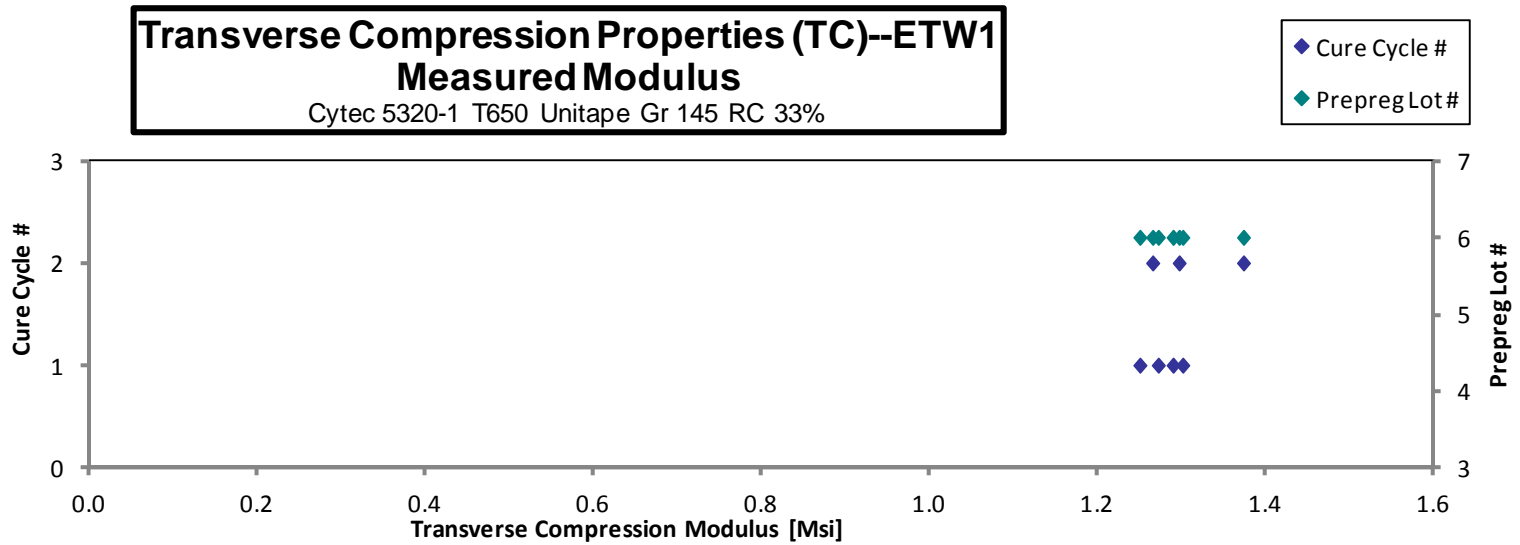
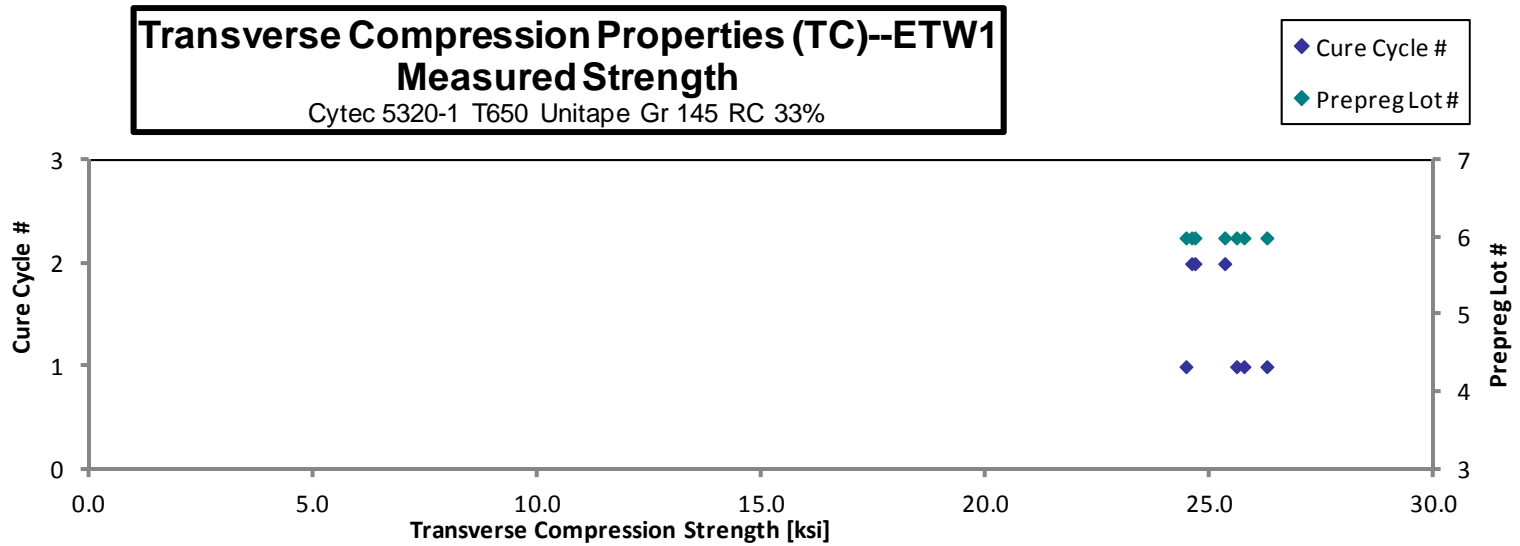
Average	31.141	1.301	Average	0.0055
Standard Dev.	1.333	0.026	Standard Dev.	
Coeff. of Var. [%]	4.282	1.977	Coeff. of Var. [%]	
Min.	28.982	1.274	Min.	0.0052
Max.	33.144	1.353	Max.	0.0056
Number of Spec.	7	7	Number of Spec.	7



Transverse Compression Properties (TC)--ETW1
Strength & Modulus
 Cytec 5320-1 T650 Unitape Gr 145 RC 33%

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t _{ply} [in]
CUGZF131D	F	C1	6	1		1.249	0.111	20	BGM	0.0055
CUGZF132D	F	C1	6	1		1.289	0.110	20	BGM	0.0055
CUGZF133D	F	C1	6	1		1.301	0.110	20	HGM	0.0055
CUGZF134D	F	C1	6	1		1.271	0.110	20	BGM	0.0055
CUGZF135D	F	C1	6	1	26.262		0.111	20	HGM	0.0055
CUGZF136D	F	C1	6	1	25.752		0.111	20	BGM / BAT	0.0055
CUGZF137D	F	C1	6	1	24.457		0.111	20	BAT	0.0055
CUGZF138D	F	C1	6	1	25.586		0.111	20	BGM	0.0055
CUGZF231D	F	C2	6	2		1.373	0.104	20	BGM	0.0052
CUGZF232D	F	C2	6	2		1.296	0.110	20	BGM	0.0055
CUGZF233D	F	C2	6	2		1.265	0.111	20	BGM	0.0055
CUGZF234D	F	C2	6	2	24.657		0.111	20	BGM	0.0055
CUGZF235D	F	C2	6	2	25.322		0.111	20	HGM	0.0056
CUGZF236D	F	C2	6	2	24.584		0.111	20	BGM	0.0056

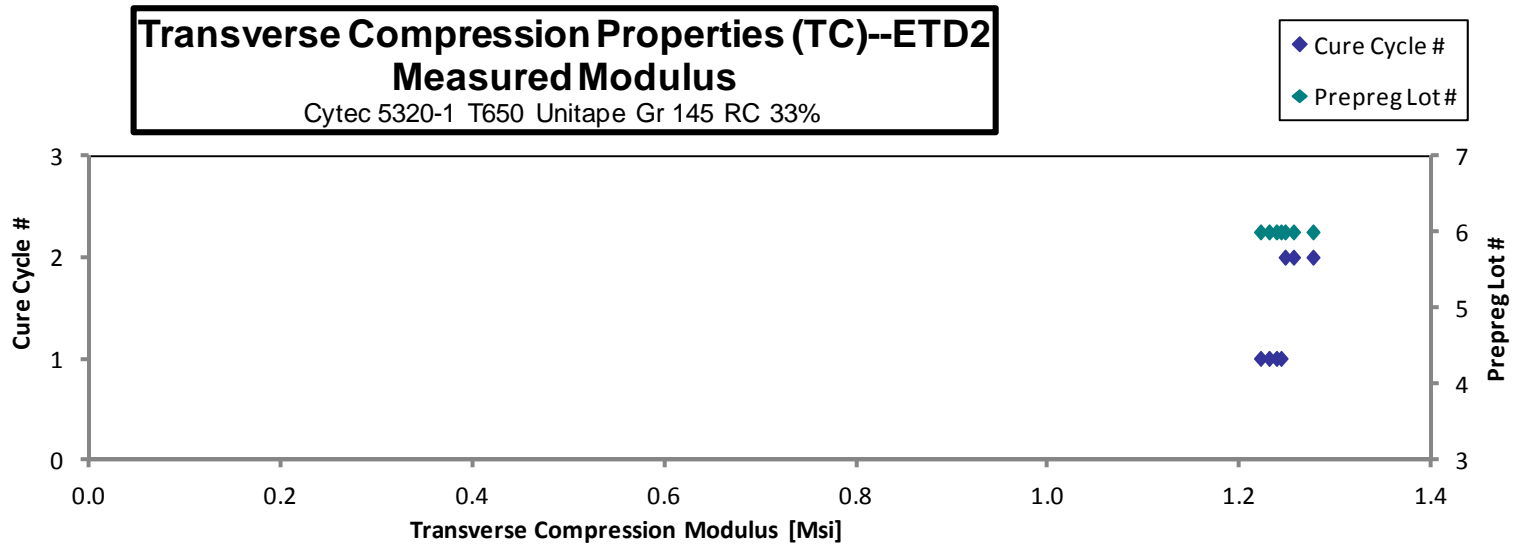
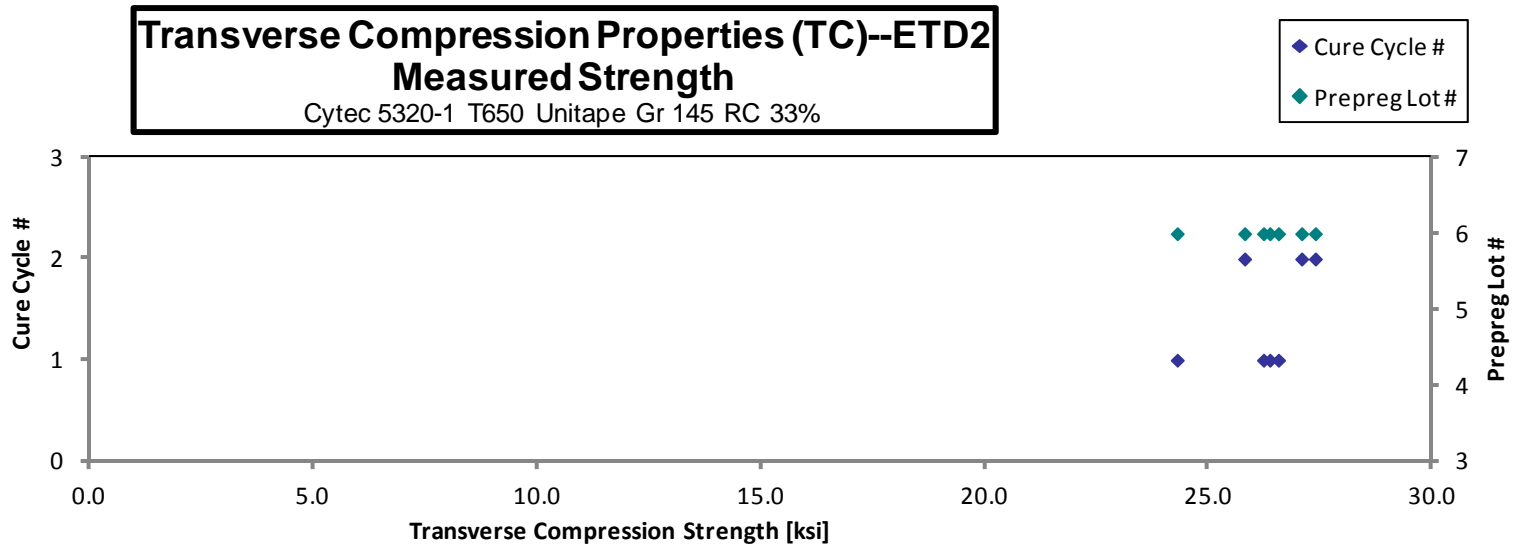
Average	25.231	1.292	Average	0.0055
Standard Dev.	0.685	0.040	Standard Dev.	
Coeff. of Var. [%]	2.715	3.097	Coeff. of Var. [%]	
Min.	24.457	1.249	Min.	0.0052
Max.	26.262	1.373	Max.	0.0056
Number of Spec.	7	7	Number of Spec.	14



Transverse Compression Properties (TC)--ETD2 Strength & Modulus Cytec 5320-1 T650 Unitape Gr 145 RC 33%

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t _{ply} [in]
CUGZF11JE	F	C1	6	1	24.300	1.237	0.111	20	BGM	0.0056
CUGZF11KE	F	C1	6	1	26.228	1.230	0.112	20	BGM	0.0056
CUGZF11LE	F	C1	6	1	26.370	1.242	0.112	20	BGM	0.0056
CUGZF11ME	F	C1	6	1	26.563	1.221	0.111	20	BGM	0.0056
CUGZF21GE	F	C2	6	2	25.807	1.276	0.111	20	BGM	0.0056
CUGZF21HE	F	C2	6	2	27.387	1.255	0.110	20	BGM	0.0055
CUGZF21IE	F	C2	6	2	27.081	1.246	0.111	20	BGM	0.0055

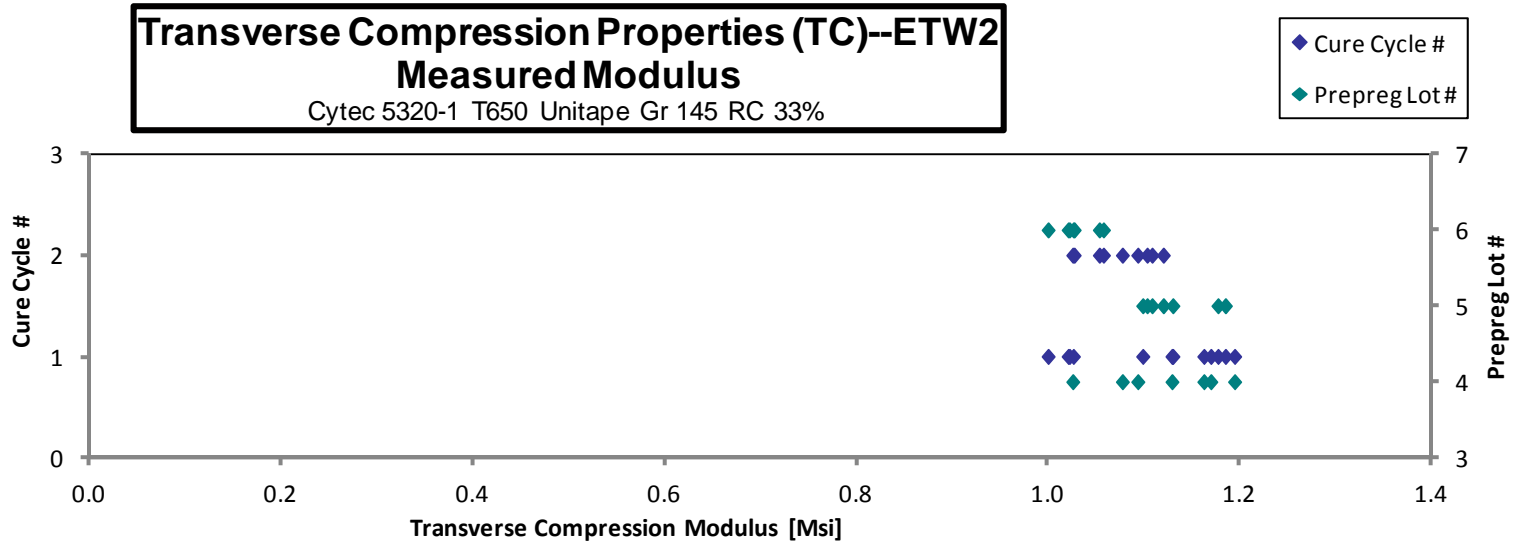
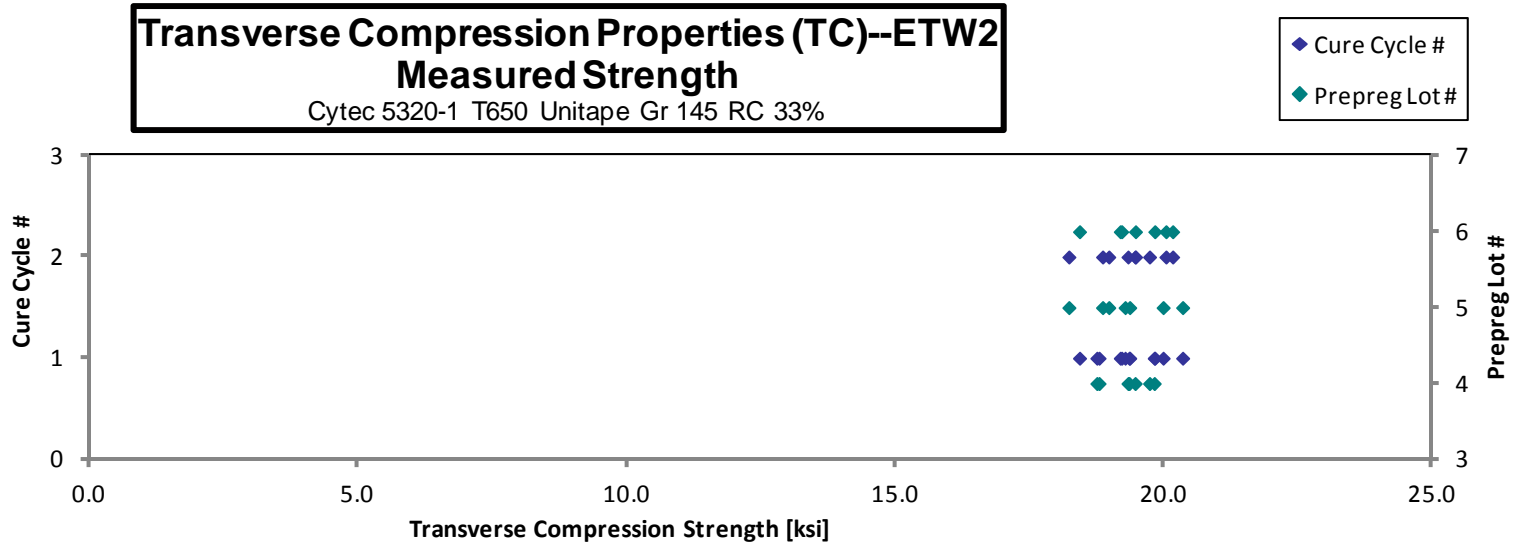
Average	26.248	1.244	Average	0.0056
Standard Dev.	1.008	0.018	Standard Dev.	
Coeff. of Var. [%]	3.841	1.435	Coeff. of Var. [%]	
Min.	24.300	1.221	Min.	0.0055
Max.	27.387	1.276	Max.	0.0056
Number of Spec.	7	7	Number of Spec.	7



Transverse Compression Properties (TC)--ETW2
Strength & Modulus
 Cytec 5320-1 T650 Unitape Gr 145 RC 33%

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t _{ply} [in]
CUGZD11DF	D	C1	4	1		1.169	0.105	20	BGM	0.0052
CUGZD11EF	D	C1	4	1		1.194	0.109	20	HGM	0.0054
CUGZD11FF	D	C1	4	1		1.128	0.110	20	BGM	0.0055
CUGZD11GF	D	C1	4	1		1.162	0.109	20	BGM / TAT	0.0055
CUGZD11HF	D	C1	4	1	19.821		0.110	20	HGM	0.0055
CUGZD11IF	D	C1	4	1	19.354		0.109	20	BGM	0.0055
CUGZD11JF	D	C1	4	1	18.794		0.110	20	BGM	0.0055
CUGZD11KF	D	C1	4	1	18.752		0.110	20	HGM	0.0055
CUGZD21BF	D	C2	4	2		1.025	0.109	20	HGM	0.0055
CUGZD21CF	D	C2	4	2		1.077	0.109	20	BGM	0.0054
CUGZD21DF	D	C2	4	2		1.093	0.108	20	BGM / TAB	0.0054
CUGZD21EF	D	C2	4	2	19.734		0.109	20	BGM	0.0054
CUGZD21FF	D	C2	4	2	19.332		0.109	20	HGM / TAT	0.0054
CUGZD21GF	D	C2	4	2	19.465		0.109	20	HGM	0.0054
CUGZE11DF	E	C1	5	1		1.176	0.103	20	BGM / TAT	0.0051
CUGZE11EF	E	C1	5	1		1.129	0.110	20	HGM	0.0055
CUGZE11FF	E	C1	5	1		1.098	0.111	20	HGM	0.0056
CUGZE11GF	E	C1	5	1		1.184	0.111	20	BGM	0.0056
CUGZE11HF	E	C1	5	1	19.987		0.110	20	TAT / HGM	0.0055
CUGZE11IF	E	C1	5	1	20.350		0.111	20	BGM	0.0056
CUGZE11JF	E	C1	5	1	19.278		0.111	20	BGM	0.0056
CUGZE11KF	E	C1	5	1	19.364		0.111	20	BGM	0.0056
CUGZE21BF	E	C2	5	2		1.119	0.109	20	HGM / TAT	0.0055
CUGZE21CF	E	C2	5	2		1.108	0.109	20	BGM	0.0055
CUGZE21DF	E	C2	5	2		1.103	0.109	20	BGM / TAT	0.0055
CUGZE21EF	E	C2	5	2	18.975		0.109	20	BGM	0.0055
CUGZE21FF	E	C2	5	2	18.859		0.109	20	BGM	0.0055
CUGZE21GF	E	C2	5	2	18.232		0.109	20	HGM	0.0055
CUGZF13DF	F	C1	6	1		0.999	0.112	20	BGM	0.0056
CUGZF13EF	F	C1	6	1		1.020	0.112	20	HGM / TAT	0.0056
CUGZF13FF	F	C1	6	1		1.022	0.111	20	HGM / TAT	0.0055
CUGZF13GF	F	C1	6	1		1.026	0.112	20	BGM	0.0056
CUGZF13HF	F	C1	6	1	18.430		0.113	20	BGM	0.0056
CUGZF13IF	F	C1	6	1	19.189		0.112	20	BGM	0.0056
CUGZF13JF	F	C1	6	1	19.216		0.112	20	BGM	0.0056
CUGZF13KF	F	C1	6	1	19.832		0.111	20	HGM	0.0056
CUGZF23BF	F	C2	6	2		1.057	0.111	20	HGM	0.0056
CUGZF23CF	F	C2	6	2		1.053	0.111	20	BGM	0.0055
CUGZF23DF	F	C2	6	2		1.027	0.111	20	BGM	0.0056
CUGZF23EF	F	C2	6	2	20.039		0.110	20	BGM / TAB	0.0055
CUGZF23FF	F	C2	6	2	20.164		0.111	20	BGM	0.0056
CUGZF23GF	F	C2	6	2	19.472		0.111	20	BGM	0.0056

Average	19.364	1.094	Average	0.0055
Standard Dev.	0.564	0.061	Standard Dev.	
Coeff. of Var. [%]	2.913	5.618	Coeff. of Var. [%]	
Min.	18.232	0.999	Min.	0.0051
Max.	20.350	1.194	Max.	0.0056
Number of Spec.	21	21	Number of Spec.	42



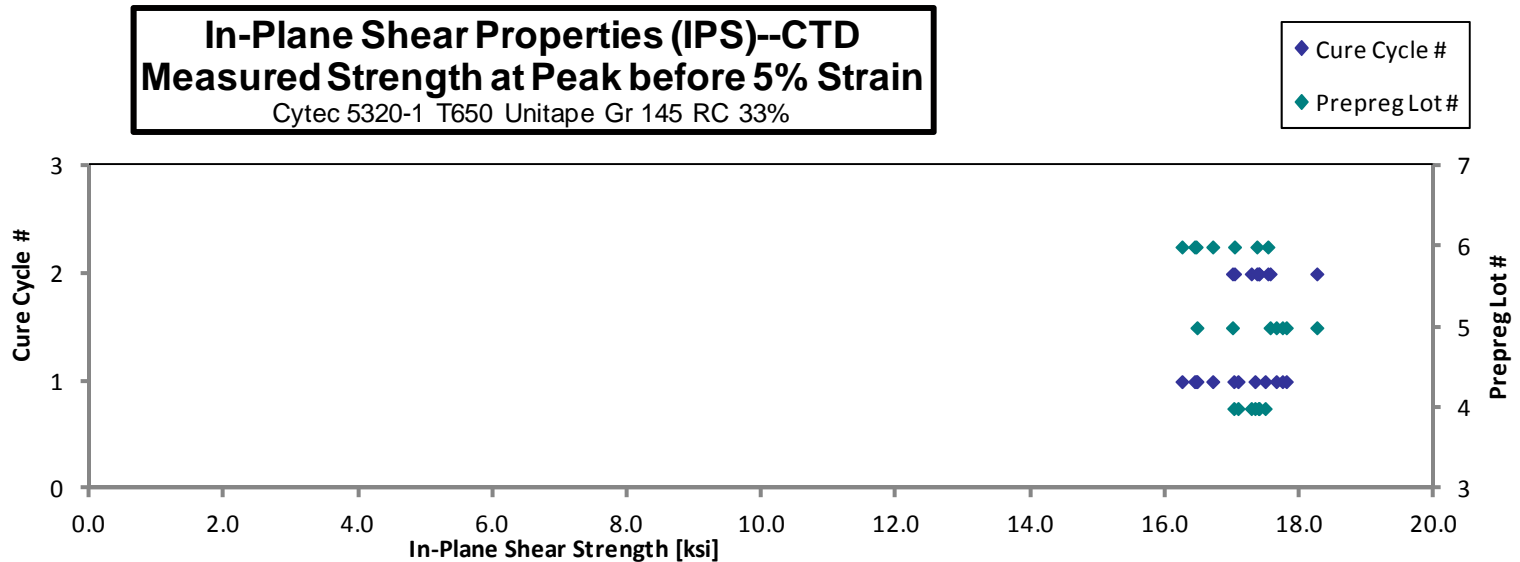
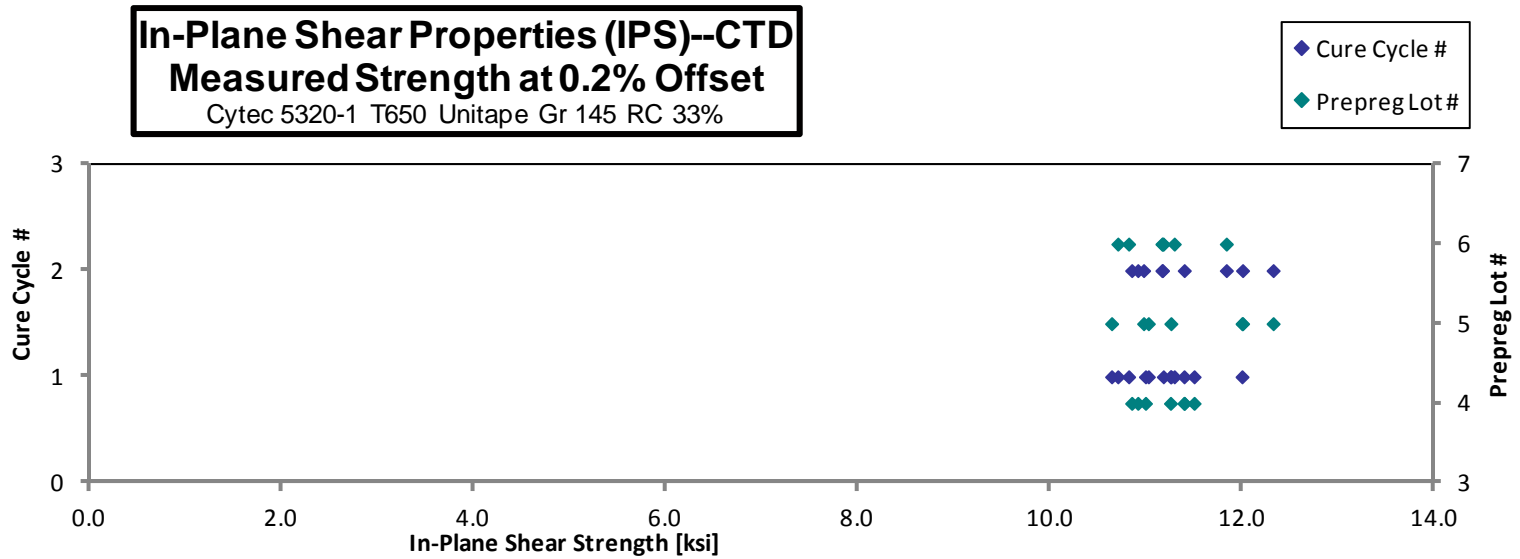
4.5 In-Plane Shear Properties (IPS)

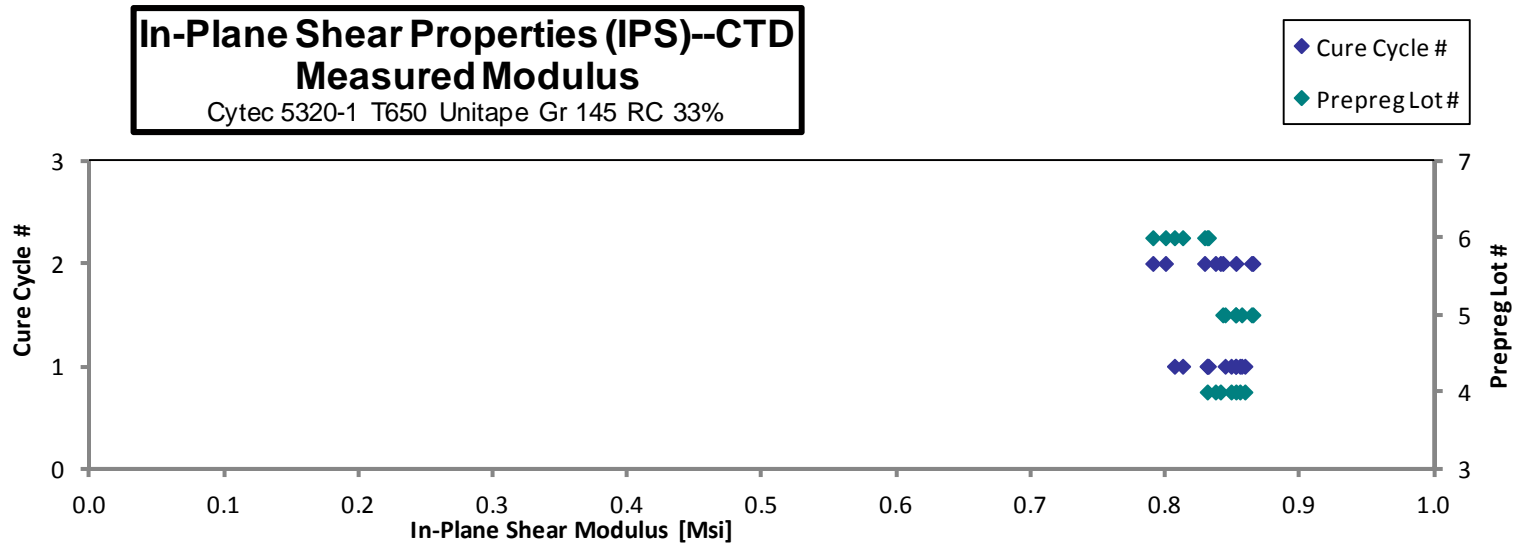
**In-Plane Shear Properties (IPS)--CTD
Strength & Modulus**
Cyttec 5320-1 T650 Unitape Gr 145 RC 33%

Specimen Number	Cyttec Batch #	Cyttec Cure Cycle	Prepreg Lot #	Cure Cycle #	0.2% Offset Strength [ksi]	Peak Shear Strength before 5% Strain [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t _{ply} [in]
CUGND115B	D	C1	4	1	11.394	17.483	0.855	0.088	16	0.0055
CUGND116B	D	C1	4	1	11.498	17.331	0.849	0.088	16	0.0055
CUGND117B	D	C1	4	1	11.252	17.079	0.859	0.088	16	0.0055
CUGND118B	D	C1	4	1	10.991	17.017	0.831	0.089	16	0.0055
CUGND215B	D	C2	4	2	10.848	17.384	0.837	0.089	16	0.0056
CUGND216B	D	C2	4	2	11.396	17.393	0.852	0.088	16	0.0055
CUGND217B	D	C2	4	2	10.912	17.276	0.841	0.090	16	0.0056
CUGNE117B	E	C1	5	1	11.021	17.739	0.852	0.089	16	0.0056
CUGNE118B	E	C1	5	1	11.256	17.648	0.852	0.089	16	0.0056
CUGNE119B	E	C1	5	1	10.639	17.797	0.844	0.089	16	0.0056
CUGNE11AB	E	C1	5	1	11.997	16.468	0.857	0.089	16	0.0056
CUGNE216B	E	C2	5	2	12.321	17.556	0.865	0.088	16	0.0055
CUGNE217B	E	C2	5	2	12.003	16.997	0.843	0.089	16	0.0056
CUGNE218B	E	C2	5	2	10.972	18.252	0.864	0.088	16	0.0055
CUGNF117B	F	C1	6	1	11.291	16.703	0.831	0.087	16	0.0054
CUGNF118B	F	C1	6	1	11.177	16.456	0.832	0.088	16	0.0055
CUGNF119B	F	C1	6	1	10.816	16.434	0.813	0.088	16	0.0055
CUGNF11AB	F	C1	6	1	10.704	16.245	0.807	0.088	16	0.0055
CUGNF216B	F	C2	6	2	11.163	17.360	0.800	0.089	16	0.0056
CUGNF217B	F	C2	6	2	11.834	17.027	0.791	0.090	16	0.0056
CUGNF218B	F	C2	6	2	11.169	17.523	0.829	0.089	16	0.0056

Strength at 5% strain is not available because strain gage failed prior to reaching 5% strain.

Average	11.269	17.198	0.838	Average	0.0055
Standard Dev.	0.451	0.517	0.021	Standard Dev.	
Coeff. of Var. [%]	3.999	3.004	2.505	Coeff. of Var. [%]	
Min.	10.639	16.245	0.791	Min.	0.0054
Max.	12.321	18.252	0.865	Max.	0.0056
Number of Spec.	21	21	21	Number of Spec.	21

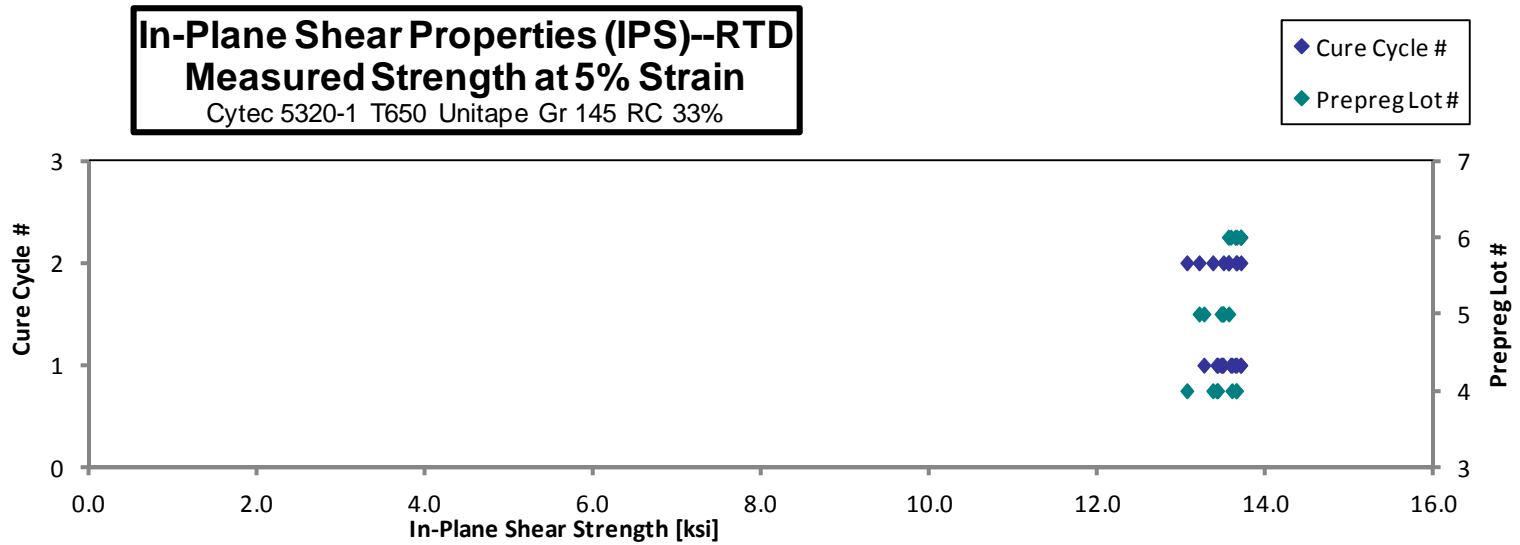
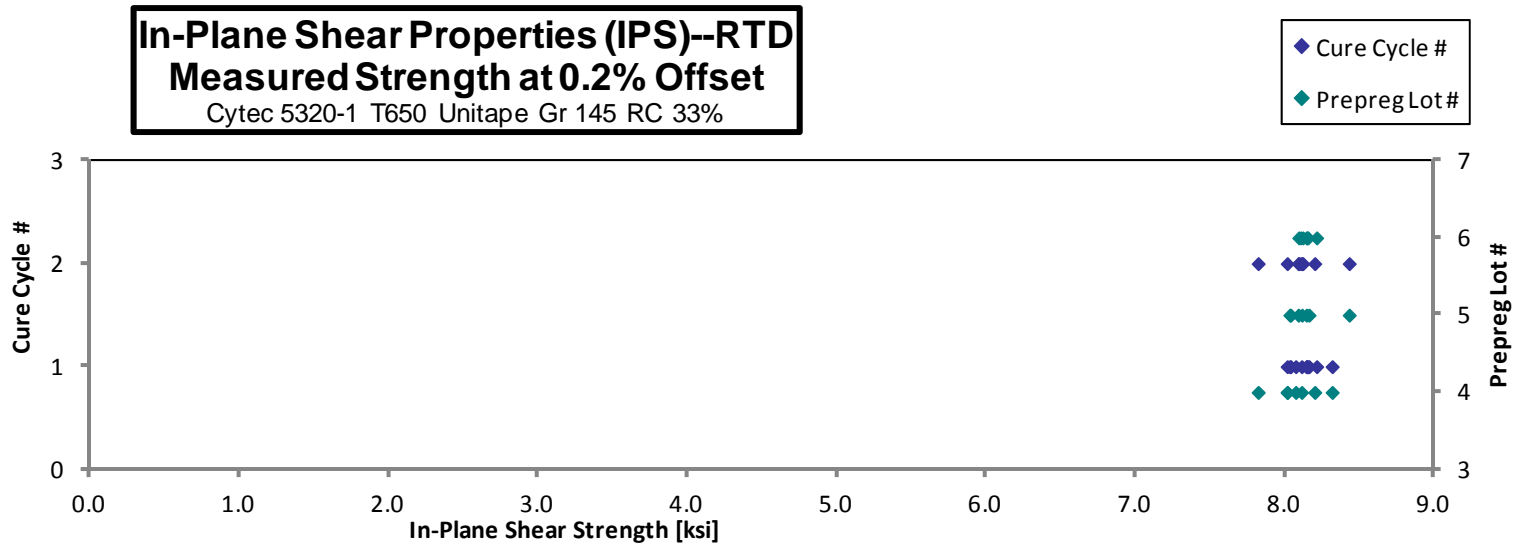




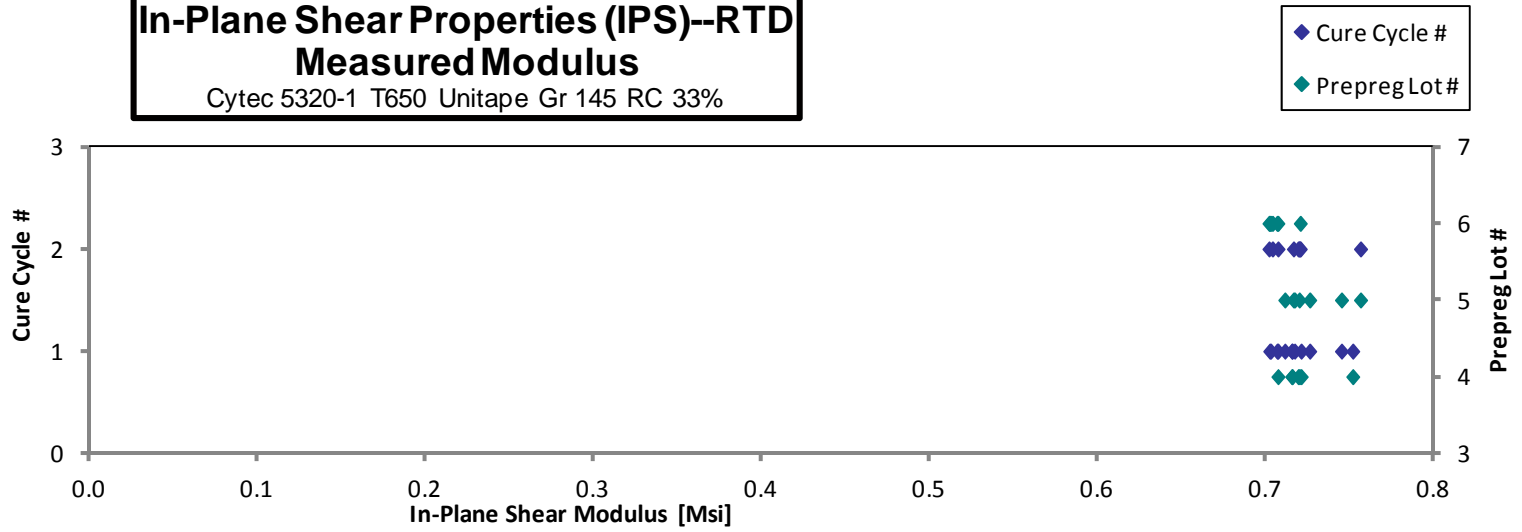
In-Plane Shear Properties (IPS)--RTD Strength & Modulus Cytec 5320-1 T650 Unitape Gr 145 RC 33%

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	0.2% Offset Strength [ksi]	Strength at 5% Strain [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t _{ply} [in]
CUGND111A	D	C1	4	1	8.316	13.644	0.751	0.086	16	0.0054
CUGND112A	D	C1	4	1	8.015	13.420	0.715	0.087	16	0.0054
CUGND113A	D	C1	4	1	8.111	13.591	0.721	0.088	16	0.0055
CUGND114A	D	C1	4	1	8.072	13.411	0.715	0.089	16	0.0056
CUGND211A	D	C2	4	2	8.015	13.363	0.719	0.088	16	0.0055
CUGND213A	D	C2	4	2	8.199	13.640	0.720	0.088	16	0.0055
CUGND214A	D	C2	4	2	7.820	13.055	0.707	0.088	16	0.0055
CUGNE111A	E	C1	5	1	8.161	13.257	0.745	0.088	16	0.0055
CUGNE112A	E	C1	5	1	8.144	13.475	0.726	0.089	16	0.0056
CUGNE113A	E	C1	5	1	8.033	13.483	0.717	0.089	16	0.0055
CUGNE114A	E	C1	5	1	8.038	13.462	0.711	0.089	16	0.0056
CUGNE211A	E	C2	5	2	8.430	13.200	0.756	0.088	16	0.0055
CUGNE212A	E	C2	5	2	8.090	13.552	0.720	0.088	16	0.0055
CUGNE213A	E	C2	5	2	8.114	13.490	0.716	0.089	16	0.0056
CUGNF111A	F	C1	6	1	8.212	13.696	0.702	0.087	16	0.0055
CUGNF112A	F	C1	6	1	8.143	13.629	0.706	0.089	16	0.0055
CUGNF113A	F	C1	6	1	8.153	13.693	0.703	0.087	16	0.0055
CUGNF114A	F	C1	6	1	8.147	13.576	0.707	0.088	16	0.0055
CUGNF211A	F	C2	6	2	8.120	13.548	0.720	0.087	16	0.0055
CUGNF212A	F	C2	6	2	8.106	13.697	0.702	0.088	16	0.0055
CUGNF213A	F	C2	6	2	8.093	13.648	0.704	0.089	16	0.0055

Average	8.121	13.501	0.718	Average	0.0055
Standard Dev.	0.119	0.173	0.015	Standard Dev.	
Coeff. of Var. [%]	1.468	1.278	2.152	Coeff. of Var. [%]	
Min.	7.820	13.055	0.702	Min.	0.0054
Max.	8.430	13.697	0.756	Max.	0.0056
Number of Spec.	21	21	21	Number of Spec.	21



**In-Plane Shear Properties (IPS)--RTD
Measured Modulus**
Cyttec 5320-1 T650 Unitape Gr 145 RC 33%

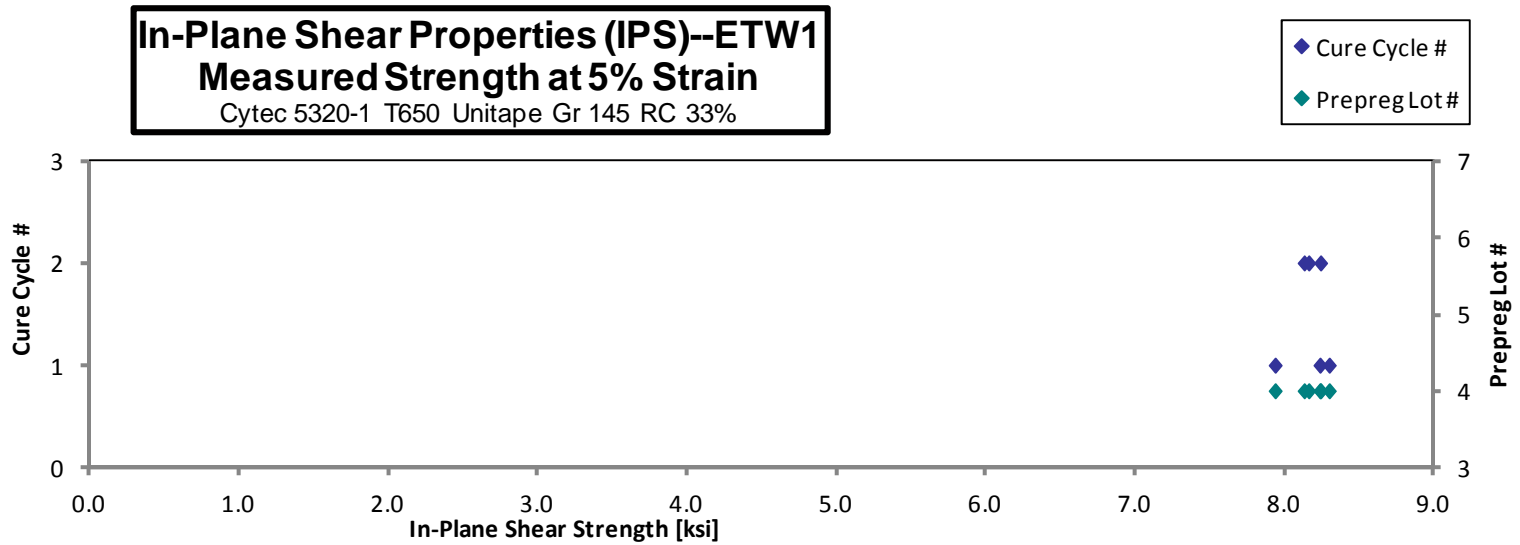
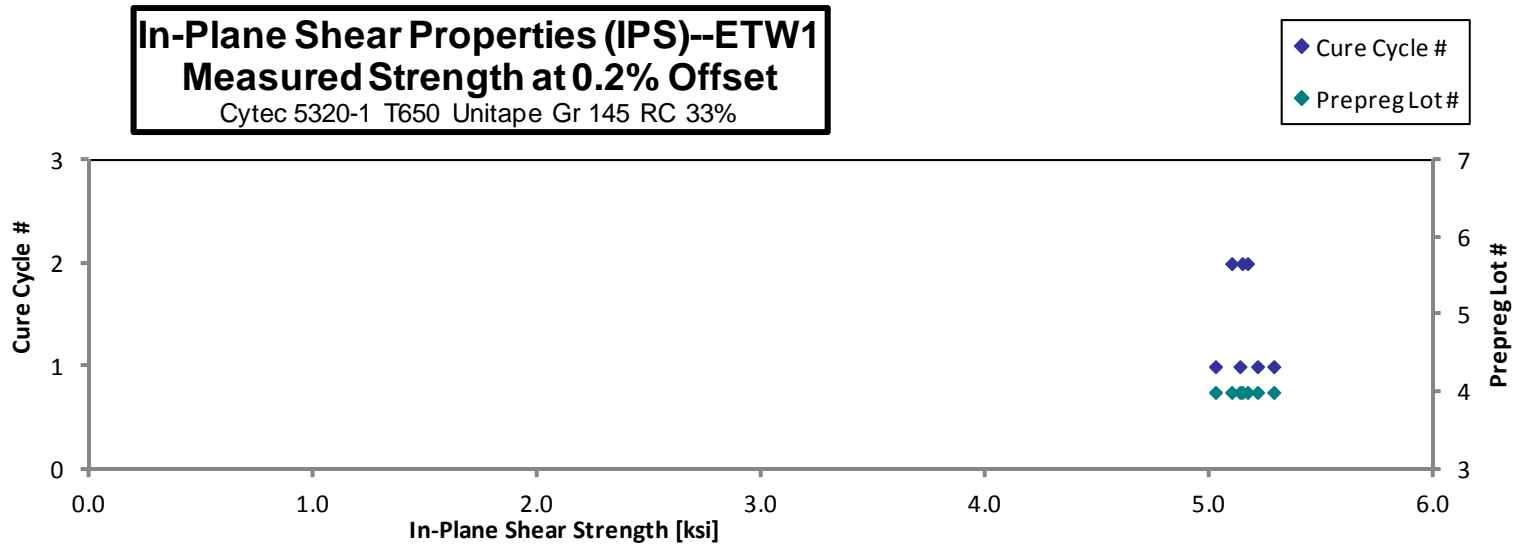


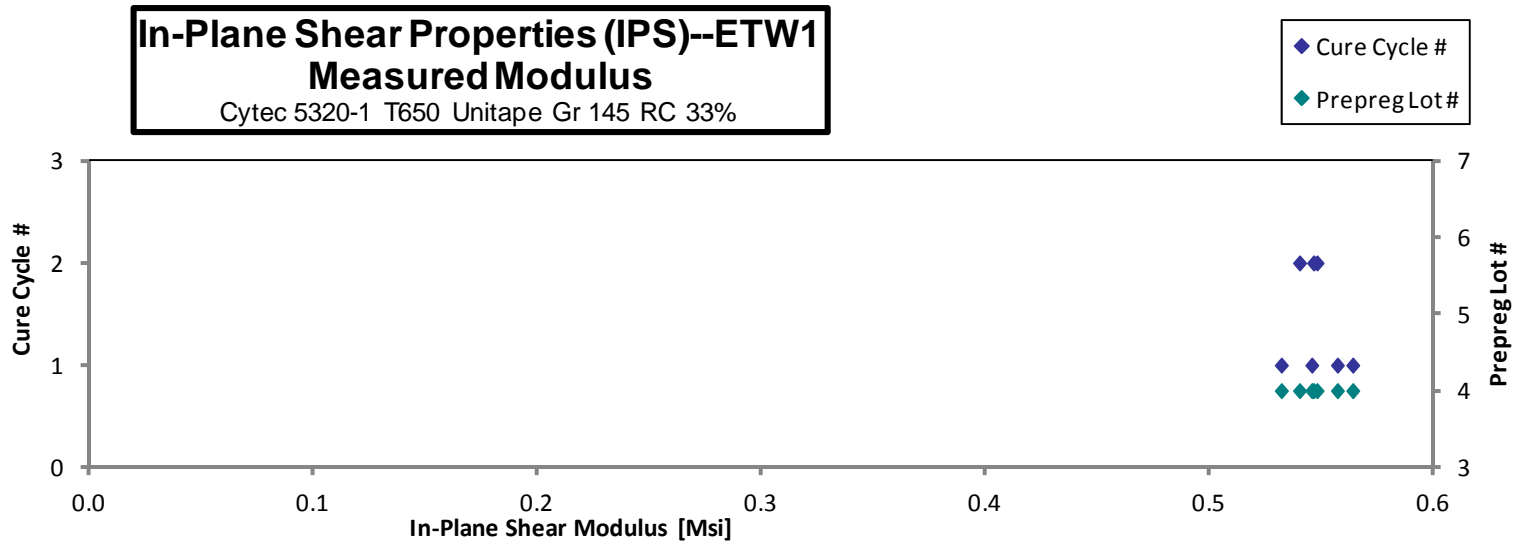
In-Plane Shear Properties (IPS)--ETW1 Strength & Modulus Cyttec 5320-1 T650 Unitape Gr 145 RC 33%

Specimen Number	Cyttec Batch #	Cyttec Cure Cycle	Prepreg Lot #	Cure Cycle #	0.2% Offset Strength [ksi]	Strength at 5% Strain [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t _{ply} [in]
CUGND119D	D	C1	4	1	5.211	8.297	0.557	0.088	16	0.0055
CUGND11AD	D	C1	4	1	5.023	7.935	0.532	0.088	16	0.0055
CUGND11BD	D	C1	4	1	5.283	8.234	0.564	0.089	16	0.0055
CUGND11CD*	D	C1	4	1	5.132		0.545	0.087	16	0.0055
CUGND219D	D	C2	4	2	5.166	8.238	0.548	0.089	16	0.0056
CUGND21AD	D	C2	4	2	5.143	8.129	0.546	0.088	16	0.0055
CUGND21BD	D	C2	4	2	5.096	8.159	0.540	0.090	16	0.0056

*Strength at 5% strain is not available because strain gage failed prior to reaching 5% strain.

Average	5.151	8.165	0.547	Average	0.0055
Standard Dev.	0.083	0.128	0.010	Standard Dev.	
Coeff. of Var. [%]	1.608	1.568	1.914	Coeff. of Var. [%]	
Min.	5.023	7.935	0.532	Min.	0.0055
Max.	5.283	8.297	0.564	Max.	0.0056
Number of Spec.	7	6	7	Number of Spec.	7





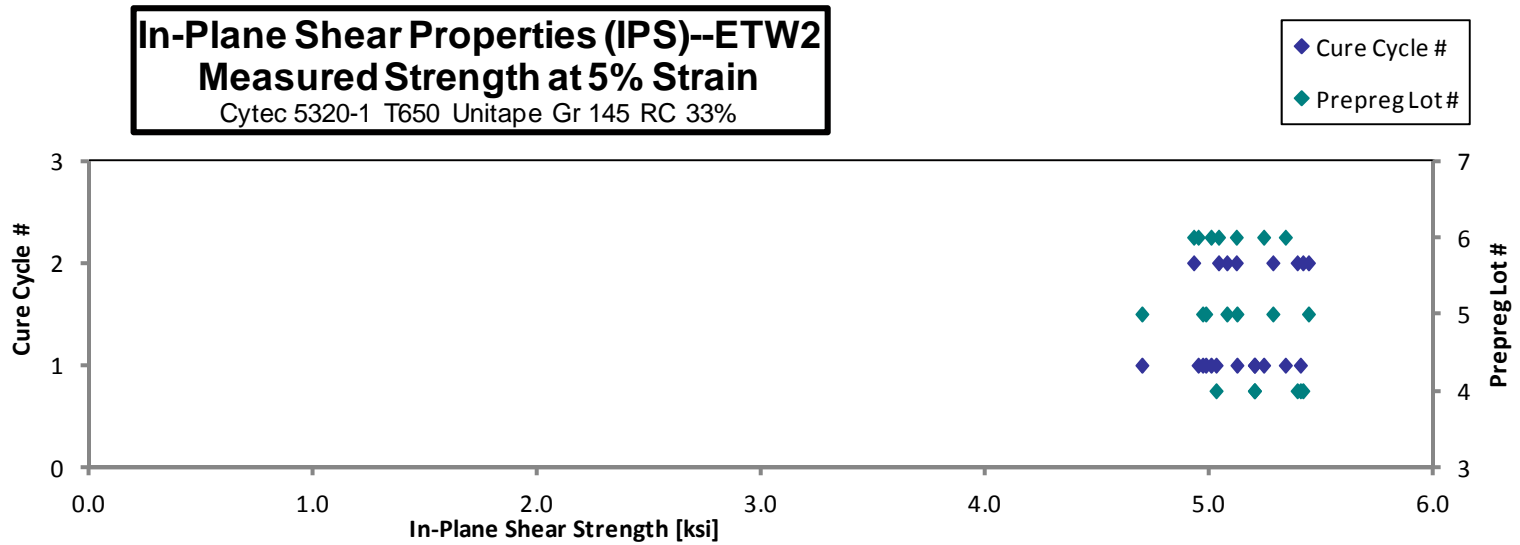
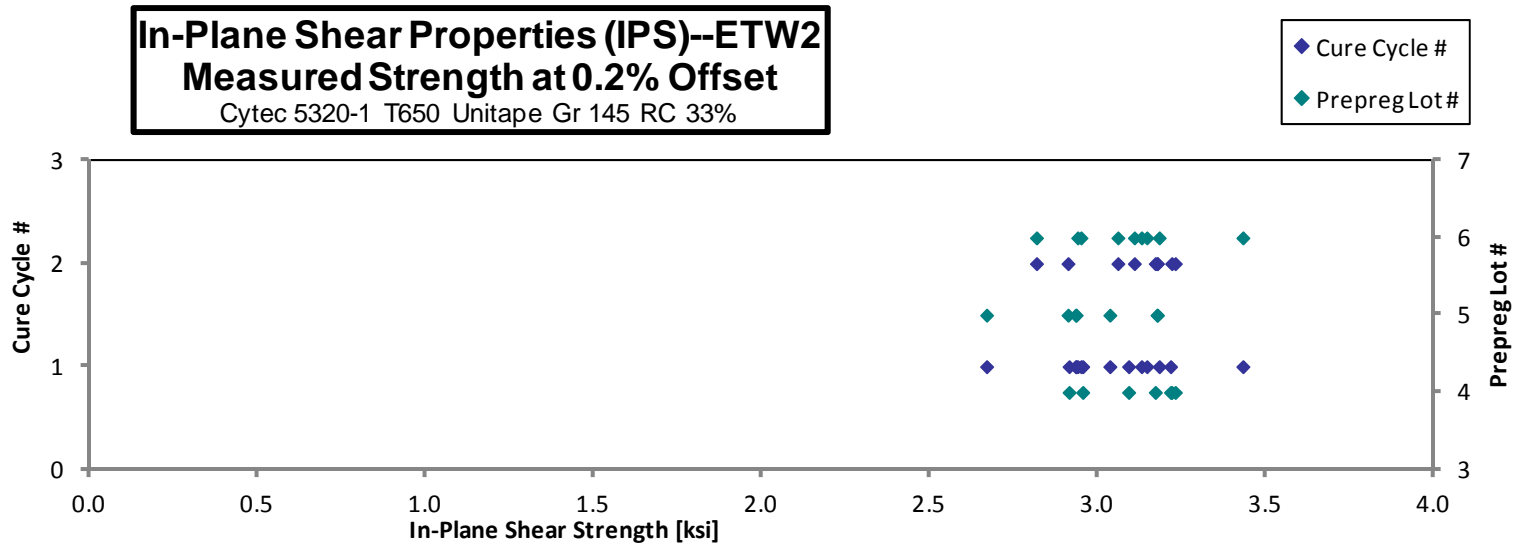
In-Plane Shear Properties (IPS)--ETW2 Strength & Modulus Cytec 5320-1 T650 Unitape Gr 145 RC 33%
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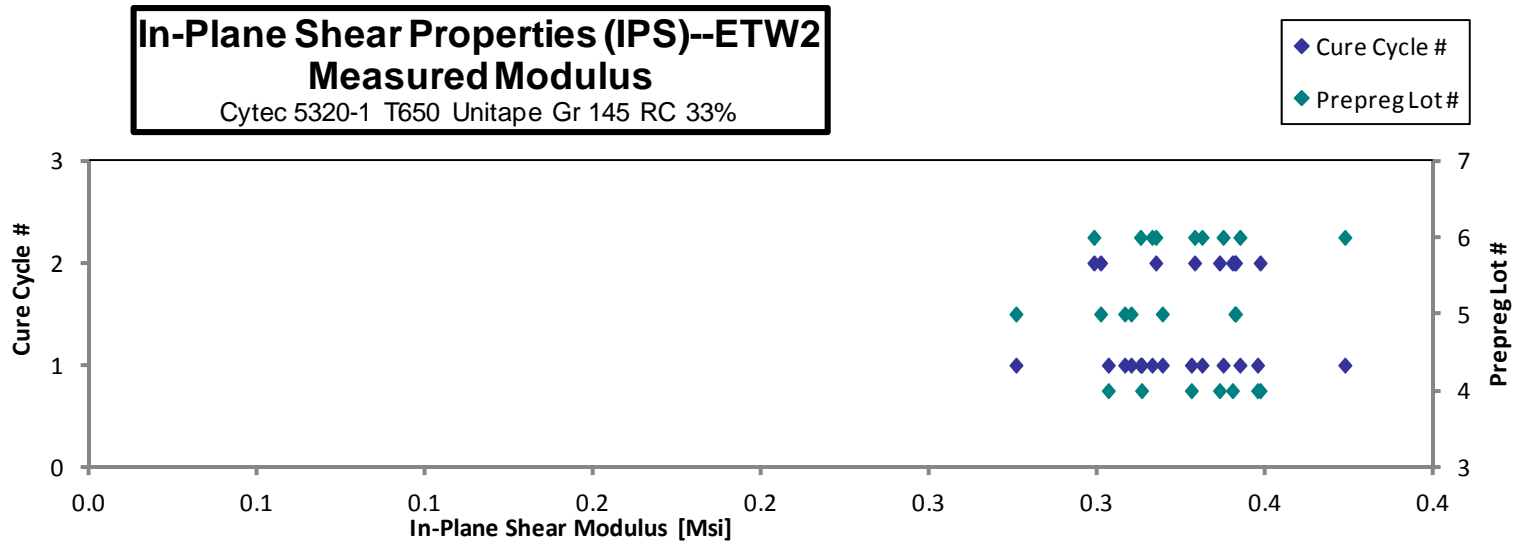
Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	0.2% Offset Strength [ksi]	Strength at 5% Strain [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t _{ply} [in]
CUGND11EF	D	C1	4	1	2.913	5.026	0.303	0.089	16	0.0056
CUGND11FF	D	C1	4	1	3.090	5.197	0.328	0.088	16	0.0055
CUGND11GF	D	C1	4	1	3.215	5.402	0.347	0.088	16	0.0055
CUGND11HF	D	C1	4	1	2.954	5.197	0.313	0.087	16	0.0054
CUGND21EF	D	C2	4	2	3.219	5.388	0.348	0.089	16	0.0055
CUGND21FF	D	C2	4	2	3.229	5.413	0.340	0.089	16	0.0056
CUGND21GF*	D	C2	4	2	3.170		0.336	0.089	16	0.0056
CUGNE11DF	E	C1	5	1	2.932	4.980	0.310	0.089	16	0.0056
CUGNE11EF	E	C1	5	1	3.034	5.119	0.319	0.090	16	0.0056
CUGNE11FF	E	C1	5	1	2.668	4.695	0.275	0.090	16	0.0056
CUGNE11GF	E	C1	5	1	2.934	4.966	0.308	0.090	16	0.0056
CUGNE21BF	E	C2	5	2	3.176	5.279	0.341	0.089	16	0.0055
CUGNE21CF	E	C2	5	2	2.910	5.074	0.301	0.089	16	0.0056
CUGNE21DF	E	C2	5	2	3.175	5.438	0.341	0.089	16	0.0055
CUGNF11DF**	F	C1	6	1	3.129		0.331	0.088	16	0.0055
CUGNF11EF	F	C1	6	1	3.430	5.335	0.373	0.089	16	0.0055
CUGNF11FF*	F	C1	6	1	3.181		0.337	0.088	16	0.0055
CUGNF11GF	F	C1	6	1	3.145	5.238	0.342	0.088	16	0.0055
CUGNF11HF	F	C1	6	1	2.948	5.003	0.316	0.089	16	0.0055
CUGNF11IF	F	C1	6	1	2.939	4.946	0.313	0.088	16	0.0055
CUGNF21BF	F	C2	6	2	3.107	5.116	0.329	0.089	16	0.0056
CUGNF21CF	F	C2	6	2	2.816	4.926	0.299	0.089	16	0.0056
CUGNF21DF	F	C2	6	2	3.058	5.037	0.317	0.089	16	0.0056

*Strength at 5% strain is not available because strain gage failed prior to reaching 5% strain.

**Strength at 5% strain is not available due to the strain gauge malfunction during testing.

Average	3.060	5.139	0.325	Average	0.0055
Standard Dev.	0.167	0.199	0.021	Standard Dev.	
Coeff. of Var. [%]	5.451	3.874	6.547	Coeff. of Var. [%]	
Min.	2.668	4.695	0.275	Min.	0.0054
Max.	3.430	5.438	0.373	Max.	0.0056
Number of Spec.	23	20	23	Number of Spec.	23





4.6 “25/50/25” Unnotched Tension 1 Properties (UNT1)

Laminate Unnotched Tension Properties (UNT1)--CTD
Strength & Modulus
 Cytec 5320-1 T650 Unitape Gr 145 RC 33%

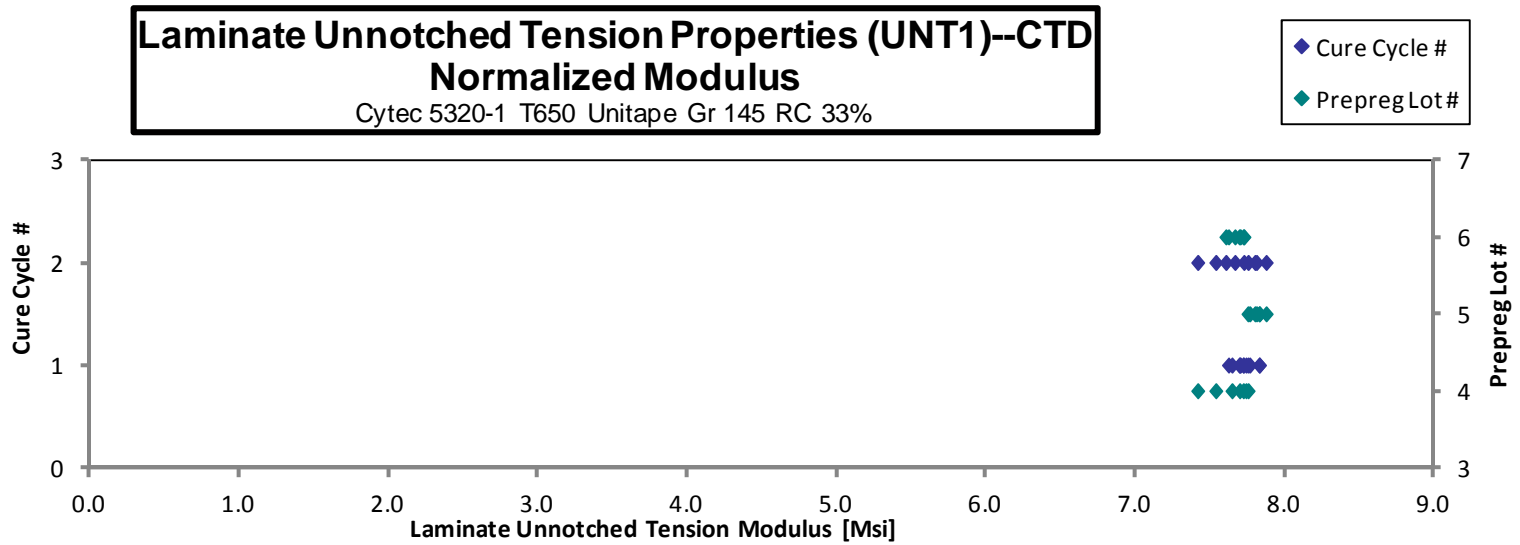
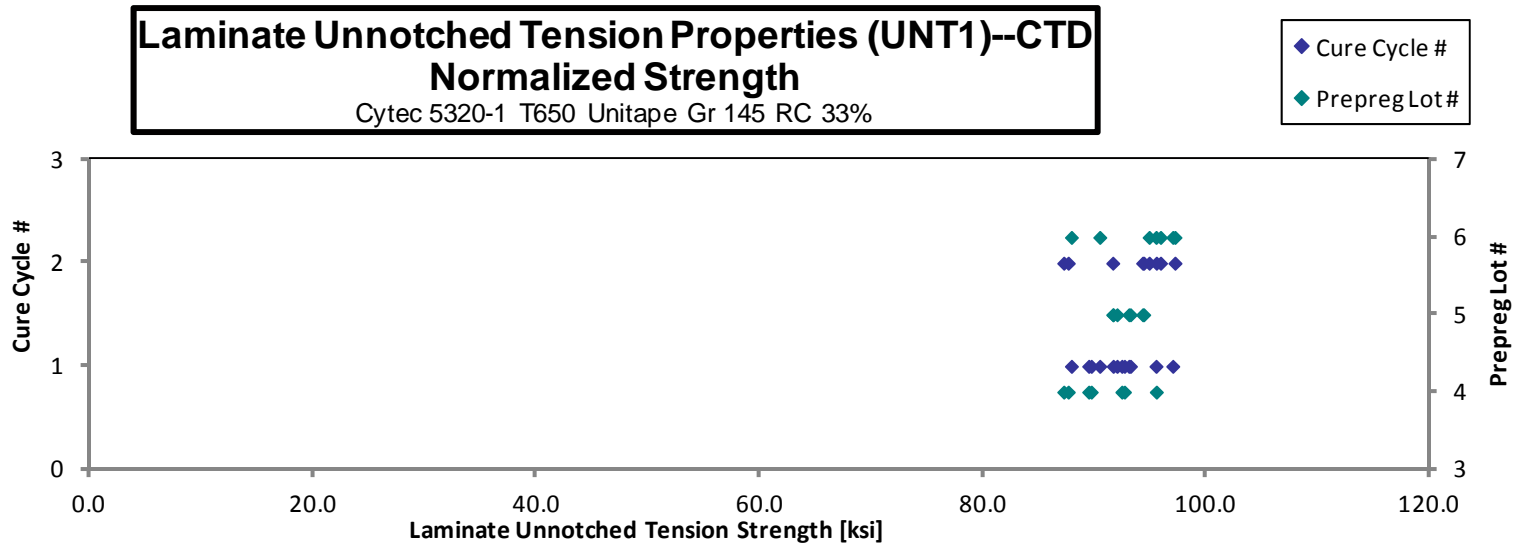
normalizing
 t_{ply} [in]
 0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUGAD115B	D	C1	4	1	90.002	7.789	0.087	16	LGM
CUGAD116B	D	C1	4	1	91.891	7.585	0.089	16	LWT
CUGAD117B	D	C1	4	1	89.208	7.683	0.088	16	LGM
CUGAD118B	D	C1	4	1	91.921	7.657	0.088	16	LGM
CUGAD215B	D	C2	4	2	87.485	7.441	0.088	16	LWB
CUGAD216B	D	C2	4	2	87.194	7.503	0.088	16	LWB
CUGAD217B	D	C2	4	2	96.297	7.820	0.087	16	LGM
CUGAE117B	E	C1	5	1	90.755	7.754	0.089	16	LGM
CUGAE118B	E	C1	5	1	91.022	7.648	0.090	16	LGM
CUGAE119B	E	C1	5	1	92.080	7.674	0.089	16	LGM
CUGAE11AB	E	C1	5	1	90.519	7.643	0.089	16	LGM
CUGAE216B	E	C2	5	2	94.271	7.811	0.088	16	LWT
CUGAE217B	E	C2	5	2	91.733	7.887	0.088	16	LGM
CUGAE218B	E	C2	5	2	94.134	7.781	0.088	16	LGM
CUGAF117B	F	C1	6	1	87.524	7.663	0.088	16	LGM
CUGAF118B	F	C1	6	1	96.493	7.685	0.088	16	LGM
CUGAF119B	F	C1	6	1	89.629	7.634	0.089	16	LGM
CUGAF11AB	F	C1	6	1	95.810	7.651	0.088	16	LGM
CUGAF216B	F	C2	6	2	95.301	7.642	0.088	16	LGM
CUGAF217B	F	C2	6	2	96.632	7.624	0.088	16	LGM
CUGAF218B	F	C2	6	2	96.287	7.760	0.088	16	LGM

Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.0055	89.423	7.739
0.0055	92.622	7.645
0.0055	89.647	7.721
0.0055	92.391	7.697
0.0055	87.187	7.416
0.0055	87.591	7.537
0.0055	95.477	7.753
0.0056	91.615	7.828
0.0056	93.159	7.828
0.0056	93.021	7.752
0.0056	91.959	7.764
0.0055	94.253	7.810
0.0055	91.577	7.874
0.0055	94.348	7.799
0.0055	87.872	7.694
0.0055	96.950	7.721
0.0055	90.410	7.701
0.0055	95.447	7.622
0.0055	94.832	7.605
0.0055	97.145	7.665
0.0055	95.849	7.725

Average 92.199 7.683
Standard Dev. 3.150 0.105
Coeff. of Var. [%] 3.417 1.371
Min. 87.194 7.441
Max. 96.632 7.887
Number of Spec. 21 21

Average_{norm} 0.0055 92.513 7.709
Standard Dev._{norm} 3.004 0.105
Coeff. of Var. [%]_{norm} 3.247 1.368
Min. 0.0055 87.187 7.416
Max. 0.0056 97.145 7.874
Number of Spec. 21 21 21



**Laminate Unnotched Tension Properties (UNT1)--RTD
Strength & Modulus**

Cytec 5320-1 T650 Unitape Gr 145 RC 33%

normalizing
t_{ply} [in]
0.0055

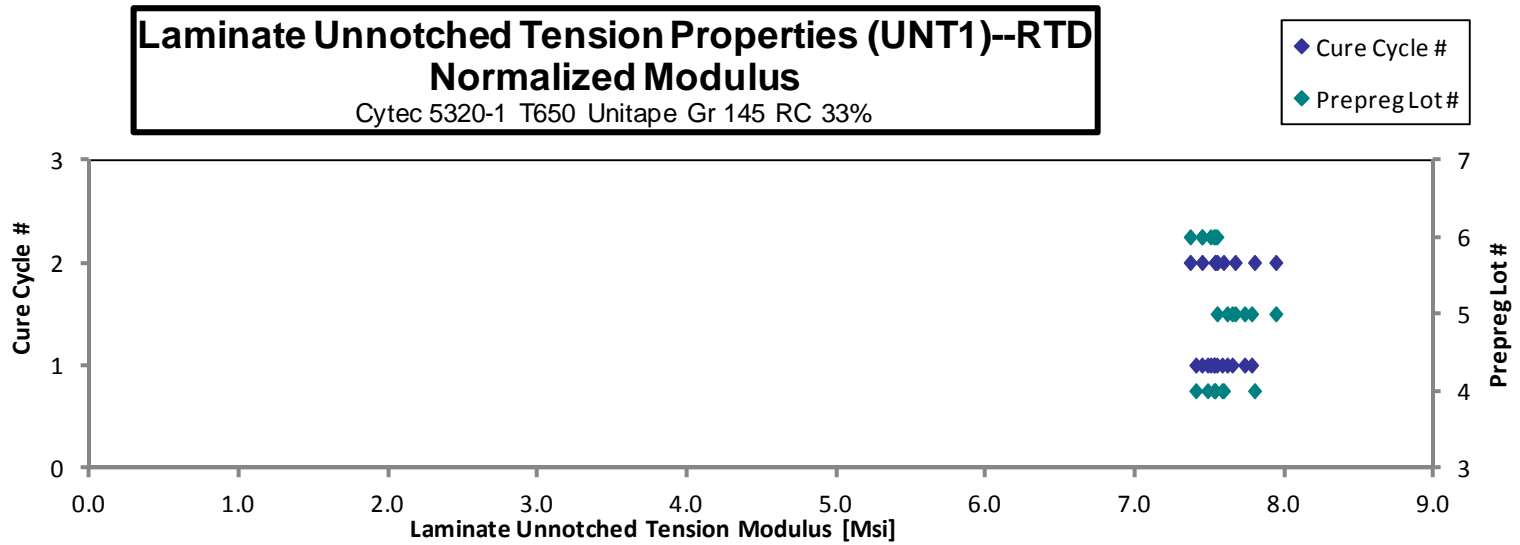
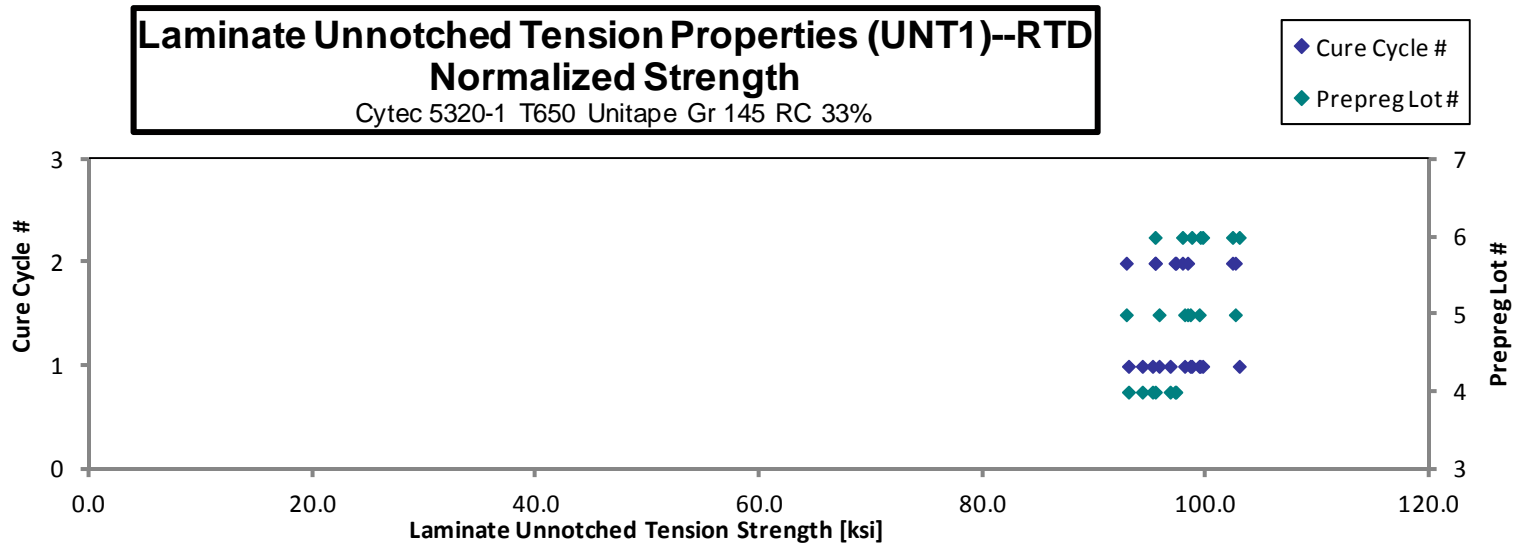
Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUGAD111A*	D	C1	4	1	98.353	7.609	0.087	16	LGM
CUGAD112A*	D	C1	4	1	94.456	7.598	0.088	16	LGM
CUGAD113A	D	C1	4	1	95.715	7.572	0.087	16	LGM
CUGAD114A	D	C1	4	1	92.616	7.374	0.088	16	LWT
CUGAD211A	D	C2	4	2	99.409	7.977	0.086	16	LGM
CUGAD212A	D	C2	4	2	98.359	7.619	0.087	16	AGM / LGM
CUGAD213A	D	C2	4	2	96.572	7.683	0.087	16	AGM
CUGAE111A	E	C1	5	1	94.098	7.599	0.090	16	LGM
CUGAE112A	E	C1	5	1	97.514	7.569	0.089	16	LWB
CUGAE113A	E	C1	5	1	98.682	7.727	0.089	16	LGM
CUGAE114A	E	C1	5	1	97.954	7.609	0.088	16	LGM
CUGAE211A	E	C2	5	2	95.001	7.850	0.086	16	LWB
CUGAE212A	E	C2	5	2	98.037	7.527	0.088	16	LWB
CUGAE213A	E	C2	5	2	100.852	7.807	0.089	16	LWB / LWT
CUGAF111A	F	C1	6	1	98.681	7.504	0.088	16	LAT
CUGAF112A	F	C1	6	1	98.986	7.475	0.089	16	LGM
CUGAF113A	F	C1	6	1	102.999	7.551	0.088	16	LGM
CUGAF114A	F	C1	6	1	98.648	7.386	0.089	16	LGM
CUGAF211A	F	C2	6	2	95.914	7.576	0.088	16	LGM
CUGAF212A	F	C2	6	2	103.154	7.427	0.087	16	LGM
CUGAF213A	F	C2	6	2	96.484	7.343	0.089	16	LWB

Avg. t _{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.0054	96.714	7.482
0.0055	94.223	7.579
0.0055	95.134	7.526
0.0055	92.984	7.403
0.0054	97.150	7.796
0.0054	97.223	7.531
0.0054	95.383	7.588
0.0056	95.720	7.730
0.0056	98.512	7.646
0.0055	99.317	7.777
0.0055	98.009	7.613
0.0054	92.787	7.667
0.0055	98.278	7.546
0.0056	102.551	7.939
0.0055	98.644	7.501
0.0055	99.623	7.523
0.0055	102.902	7.544
0.0055	99.414	7.444
0.0055	95.369	7.533
0.0055	102.294	7.366
0.0056	97.818	7.445

* Strain measurement was measured with SG. Extensometer used on other coupons.

Average	97.737	7.590
Standard Dev.	2.671	0.158
Coeff. of Var. [%]	2.733	2.076
Min.	92.616	7.343
Max.	103.154	7.977
Number of Spec.	21	21

Average_{norm}	0.0055	97.622	7.580
Standard Dev._{norm}		2.864	0.140
Coeff. of Var. [%]_{norm}		2.934	1.849
Min.	0.0054	92.787	7.366
Max.	0.0056	102.902	7.939
Number of Spec.	21	21	21



Laminate Unnotched Tension Properties (UNT1)--ETW1
Strength & Modulus
 Cytec 5320-1 T650 Unitape Gr 145 RC 33%

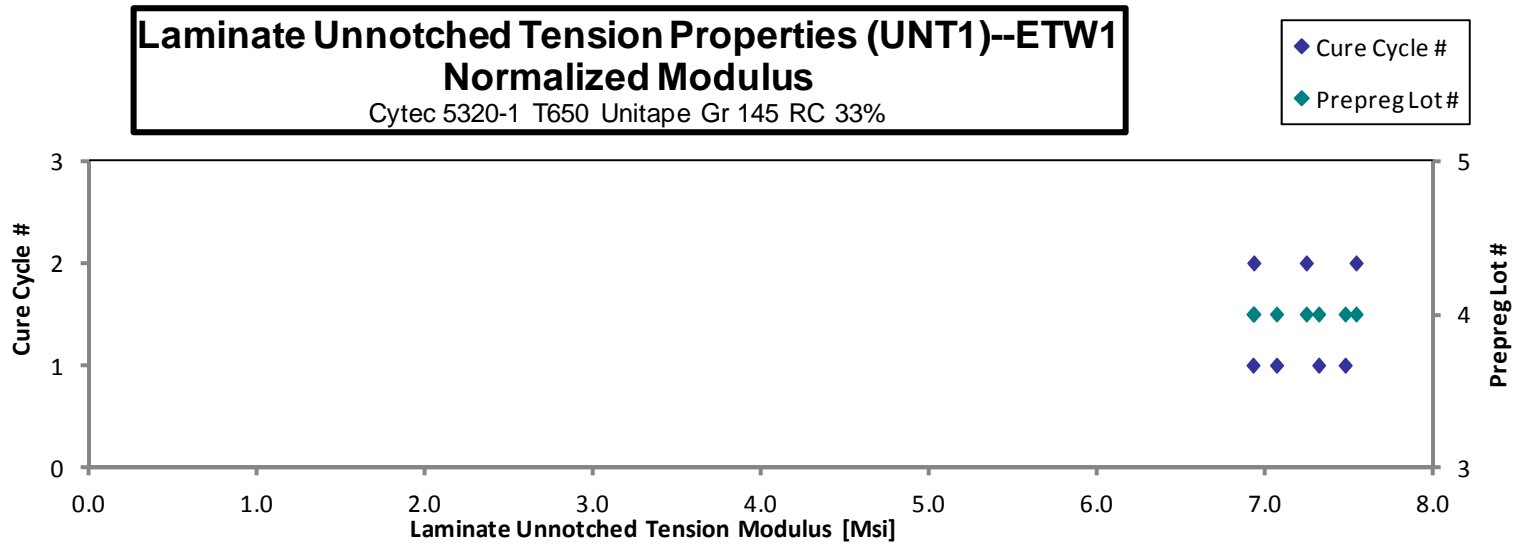
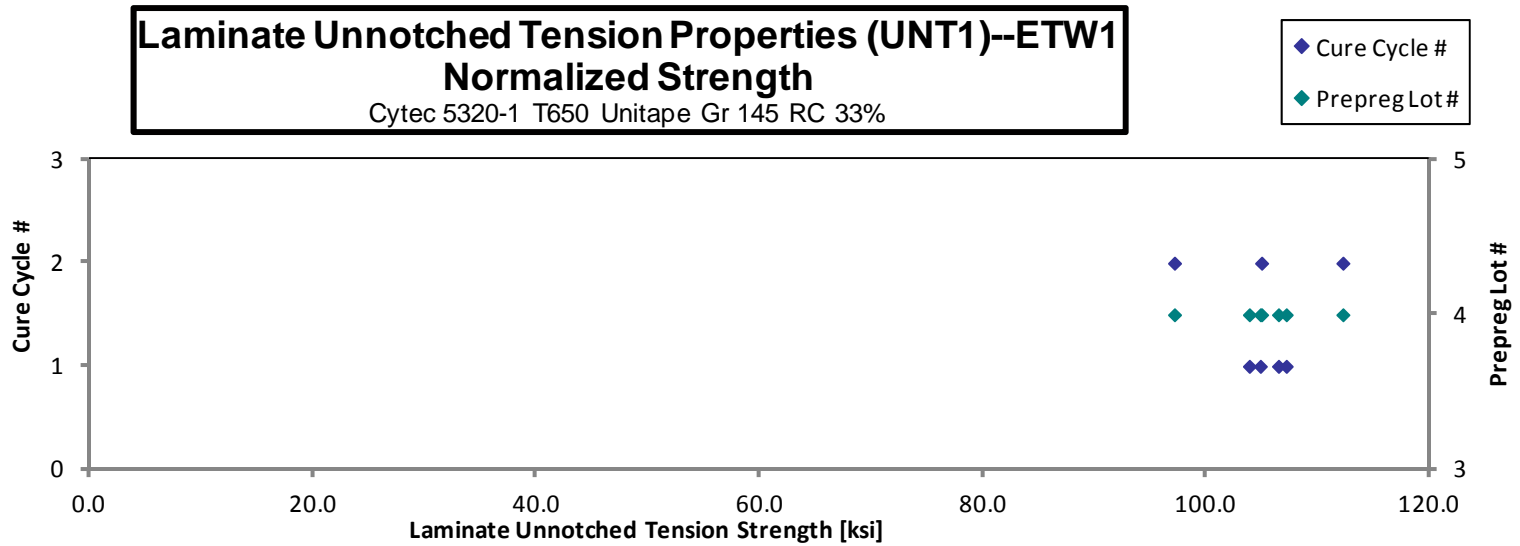
normalizing
 t_{ply} [in]
 0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUGAD119D	D	C1	4	1	103.653	7.050	0.088	16	LAB / LWB / AWT
CUGAD11AD	D	C1	4	1	107.700	7.511	0.088	16	LWB / LGM
CUGAD11BD	D	C1	4	1	105.716	7.264	0.089	16	LWB / LWT
CUGAD11CD	D	C1	4	1	105.111	6.942	0.088	16	LGM / LWB
CUGAD219D	D	C2	4	2	106.010	6.999	0.087	16	LAB / AWT
CUGAD21AD	D	C2	4	2	113.558	7.627	0.087	16	LWB / AWT
CUGAD21BD	D	C2	4	2	97.548	7.271	0.088	16	LGM

Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.0055	103.810	7.061
0.0055	107.109	7.469
0.0055	106.417	7.312
0.0055	104.792	6.921
0.0054	104.906	6.926
0.0054	112.181	7.534
0.0055	97.105	7.238

Average	105.614	7.238
Standard Dev.	4.775	0.261
Coeff. of Var. [%]	4.521	3.600
Min.	97.548	6.942
Max.	113.558	7.627
Number of Spec.	7	7

Average_{norm}	0.0055	105.189	7.209
Standard Dev._{norm}		4.501	0.248
Coeff. of Var. [%]_{norm}		4.279	3.445
Min.	0.0054	97.105	6.921
Max.	0.0055	112.181	7.534
Number of Spec.	7	7	7



Laminate Unnotched Tension Properties (UNT1)--ETW2
Strength & Modulus
 Cytec 5320-1 T650 Unitape Gr 145 RC 33%

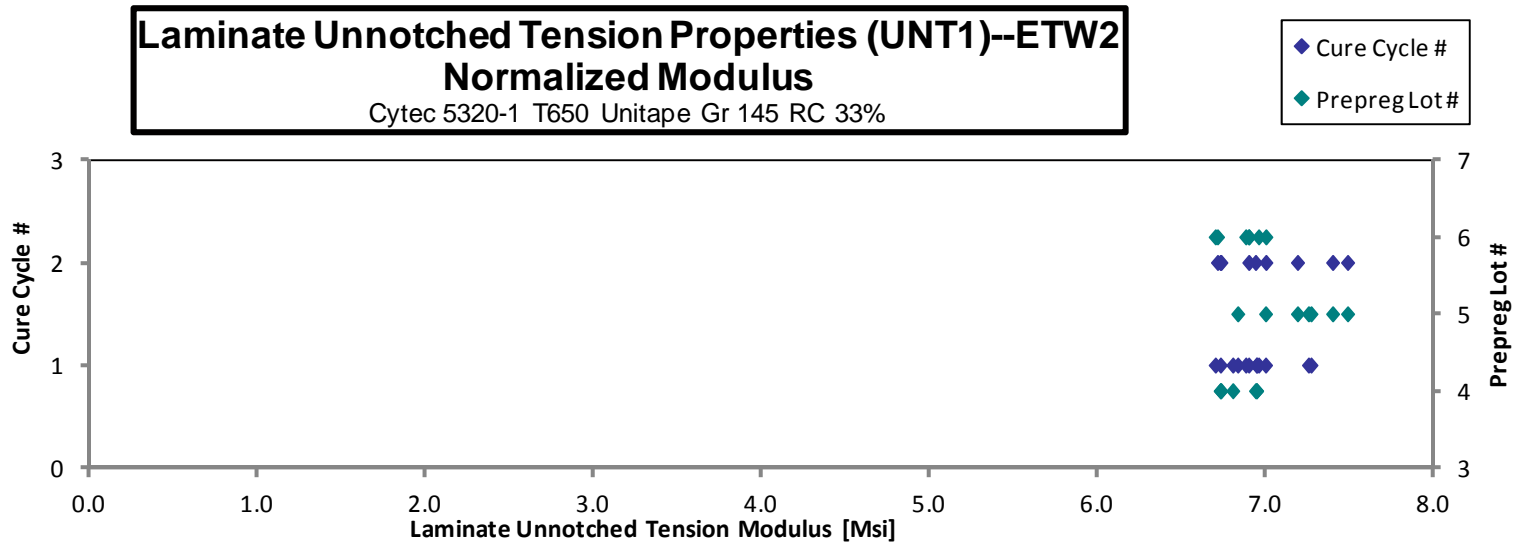
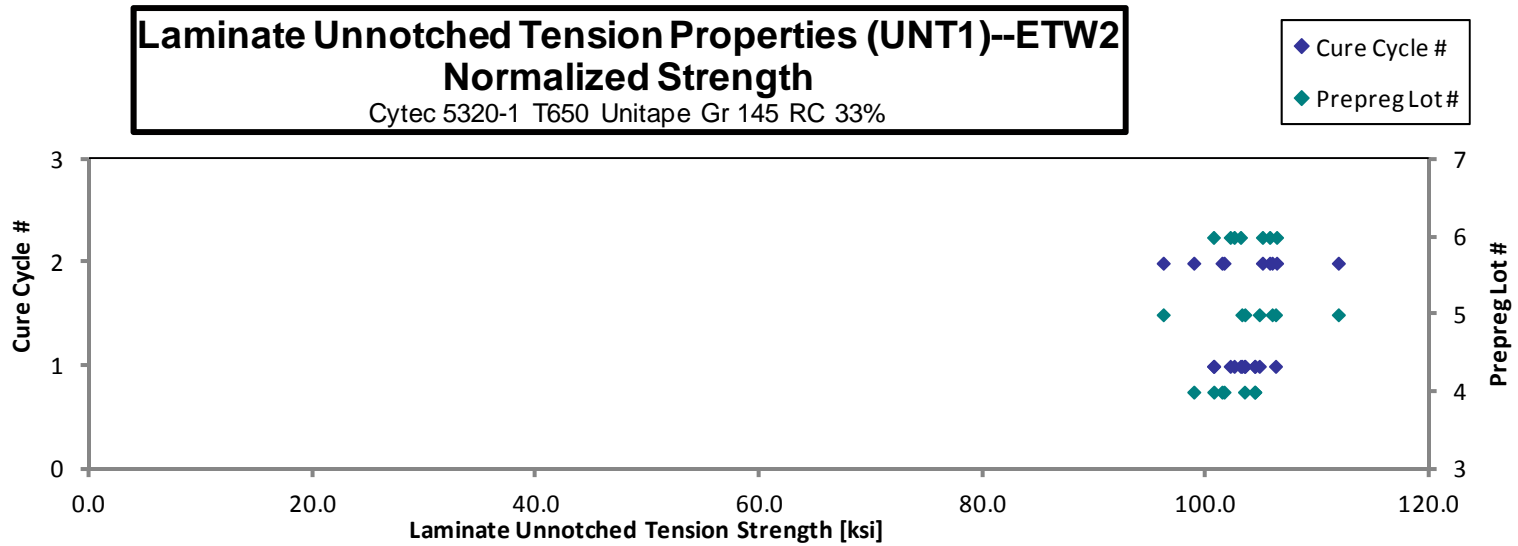
normalizing
 t_{ply} [in]
 0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUGAD11EF	D	C1	4	1	103.631	6.899	0.089	16	LGM
CUGAD11FF	D	C1	4	1	103.573	6.753	0.089	16	AGM / LGM
CUGAD11GF	D	C1	4	1	102.360	6.874	0.089	16	LGM / DGM
CUGAD11HF	D	C1	4	1	99.786	6.671	0.089	16	LGM / DGM
CUGAD21EF	D	C2	4	2	99.870	6.796	0.087	16	LGM / DGM
CUGAD21FF	D	C2	4	2	100.975	6.704	0.088	16	LWT / LWB
CUGAD21GF	D	C2	4	2	101.830	6.955	0.088	16	LGM / DGM
CUGAE11DF	E	C1	5	1	102.150	7.196	0.089	16	LWB / LWT / DGM
CUGAE11EF	E	C1	5	1	104.272	6.872	0.090	16	LGM / AGM
CUGAE11FF	E	C1	5	1	101.840	7.141	0.089	16	AGM
CUGAE11GF	E	C1	5	1	104.025	6.786	0.089	16	DGM / LGM
CUGAE21BF	E	C2	5	2	110.454	7.307	0.089	16	LGM / LWB
CUGAE21CF	E	C2	5	2	105.487	7.458	0.088	16	LGM
CUGAE21DF	E	C2	5	2	94.640	7.077	0.089	16	LWT
CUGAF11DF	F	C1	6	1	100.626	6.779	0.089	16	LGM
CUGAF11EF	F	C1	6	1	102.338	6.850	0.089	16	AWT / LWT / DGM
CUGAF11FF	F	C1	6	1	99.373	6.615	0.089	16	AGM
CUGAF11GF	F	C1	6	1	101.978	6.923	0.088	16	AGM
CUGAF21BF	F	C2	6	2	106.632	6.920	0.088	16	LGM
CUGAF21CF	F	C2	6	2	105.115	6.718	0.088	16	LGM
CUGAF21DF	F	C2	6	2	104.891	6.949	0.089	16	LGM

Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.0055	104.279	6.942
0.0055	104.299	6.800
0.0056	103.368	6.942
0.0055	100.618	6.727
0.0054	98.830	6.725
0.0055	101.358	6.730
0.0055	101.540	6.936
0.0056	103.136	7.266
0.0056	106.149	6.996
0.0056	103.402	7.251
0.0055	104.695	6.830
0.0056	111.772	7.395
0.0055	105.847	7.483
0.0056	96.092	7.185
0.0056	102.093	6.878
0.0055	103.016	6.895
0.0056	100.596	6.696
0.0055	102.441	6.954
0.0055	106.248	6.896
0.0055	104.975	6.709
0.0055	105.626	6.997

Average 102.659 6.916
 Standard Dev. 3.180 0.215
 Coeff. of Var. [%] 3.097 3.108
 Min. 94.640 6.615
 Max. 110.454 7.458
 Number of Spec. 21 21

Average_{norm} 0.0055 103.351 6.963
 Standard Dev._{norm} 3.184 0.229
 Coeff. of Var. [%]_{norm} 3.081 3.287
 Min. 0.0054 96.092 6.696
 Max. 0.0056 111.772 7.483
 Number of Spec. 21 21 21



4.7 “10/80/10” Unnotched Tension 2 Properties (UNT2)

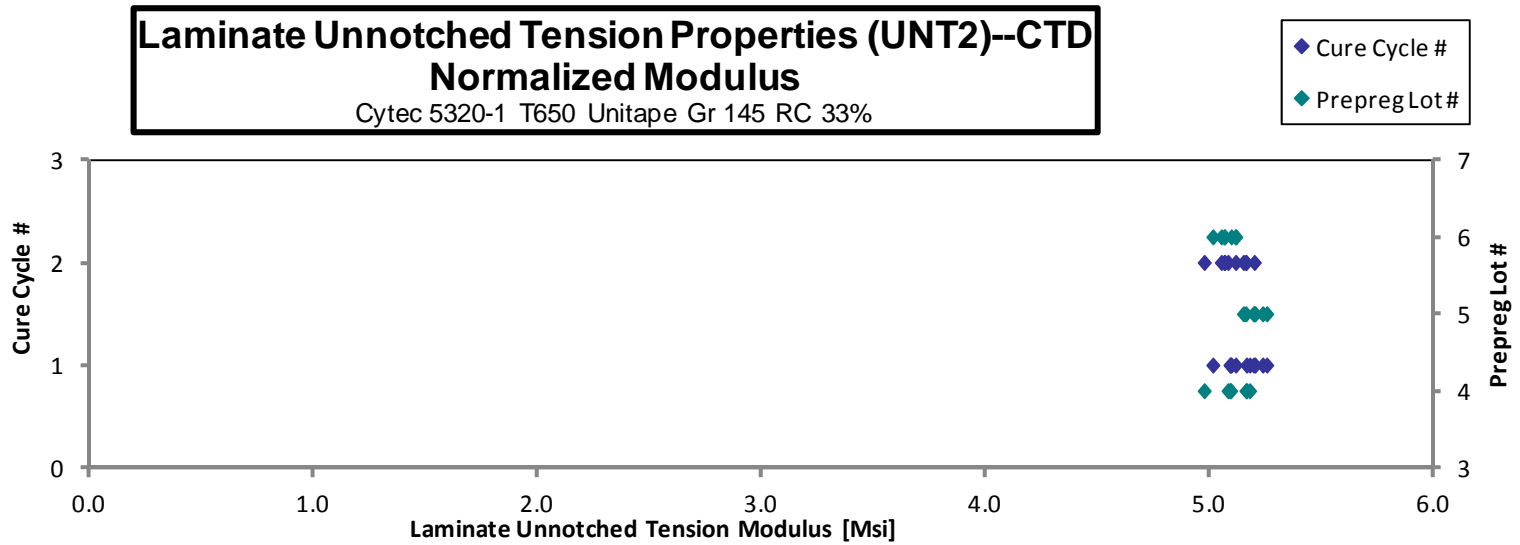
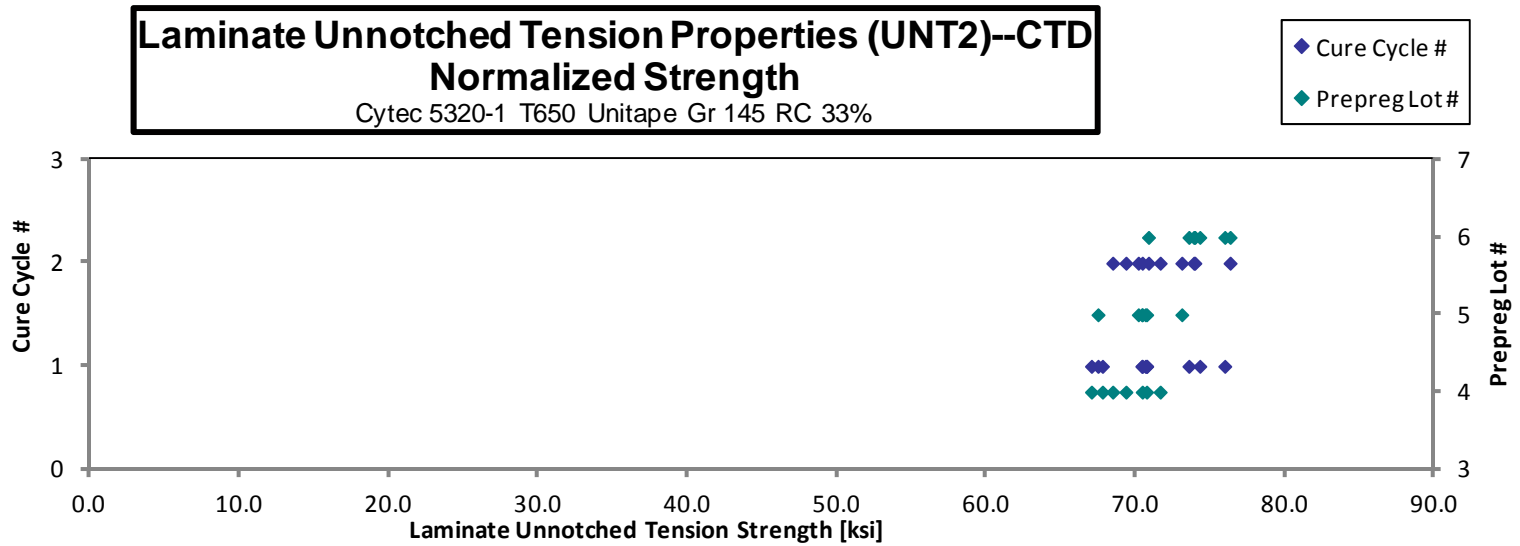
Laminate Unnotched Tension Properties (UNT2) --CTD
Strength & Modulus
 Cytec 5320-1 T650 Unitape Gr 145 RC 33%

normalizing
 t_{ply} [in]
 0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUGBD117B	D	C1	4	1	67.536	5.128	0.109	20	AWT
CUGBD118B	D	C1	4	1	67.378	5.131	0.111	20	AGM
CUGBD119B	D	C1	4	1	71.068	5.222	0.109	20	AGM
CUGBD11AB	D	C1	4	1	70.754	5.089	0.110	20	AWT
CUGBD216B	D	C2	4	2	68.698	4.989	0.110	20	AWB
CUGBD217B	D	C2	4	2	71.623	5.077	0.110	20	AWB
CUGBD218B	D	C2	4	2	69.340	5.159	0.110	20	AWB
CUGBE117B	E	C1	5	1	70.772	5.195	0.110	20	AWB
CUGBE118B	E	C1	5	1	70.382	5.232	0.110	20	AWB
CUGBE119B	E	C1	5	1	66.653	5.136	0.111	20	AGM
CUGBE11AB	E	C1	5	1	70.164	5.215	0.110	20	AWB
CUGBE216B	E	C2	5	2	69.779	5.109	0.111	20	AWT
CUGBE217B	E	C2	5	2	69.516	5.147	0.111	20	AWT
CUGBE218B	E	C2	5	2	72.163	5.082	0.111	20	AWT
CUGBF114B	F	C1	6	1	72.180	5.016	0.112	20	AWB
CUGBF115B	F	C1	6	1	74.238	4.897	0.113	20	AGM
CUGBF116B	F	C1	6	1	73.243	5.021	0.112	20	AWB
CUGBF217B	F	C2	6	2	75.468	4.992	0.111	20	AGM
CUGBF218B	F	C2	6	2	72.663	4.974	0.112	20	AWB
CUGBF219B	F	C2	6	2	73.227	5.018	0.111	20	AGM
CUGBF21AB	F	C2	6	2	69.856	5.041	0.112	20	AWB

Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.0055	67.044	5.091
0.0055	67.776	5.162
0.0055	70.443	5.176
0.0055	70.733	5.087
0.0055	68.469	4.973
0.0055	71.645	5.079
0.0055	69.350	5.159
0.0055	70.740	5.193
0.0055	70.649	5.252
0.0056	67.481	5.200
0.0055	70.419	5.234
0.0056	70.445	5.158
0.0056	70.179	5.196
0.0056	73.093	5.148
0.0056	73.569	5.113
0.0056	75.970	5.011
0.0056	74.297	5.094
0.0056	76.326	5.049
0.0056	73.963	5.063
0.0056	73.893	5.063
0.0056	70.862	5.113

Average	70.795	5.089	Average_{norm}	0.0055	71.302	5.124
Standard Dev.	2.277	0.091	Standard Dev._{norm}		2.646	0.073
Coeff. of Var. [%]	3.217	1.791	Coeff. of Var. [%]_{norm}		3.711	1.417
Min.	66.653	4.897	Min.	0.0055	67.044	4.973
Max.	75.468	5.232	Max.	0.0056	76.326	5.252
Number of Spec.	21	21	Number of Spec.	21	21	21



**Laminate Unnotched Tension Properties (UNT2) --RTD
Strength & Modulus**

Cytec 5320-1 T650 Unitape Gr 145 RC 33%

normalizing

t_{ply} [in]

0.0055

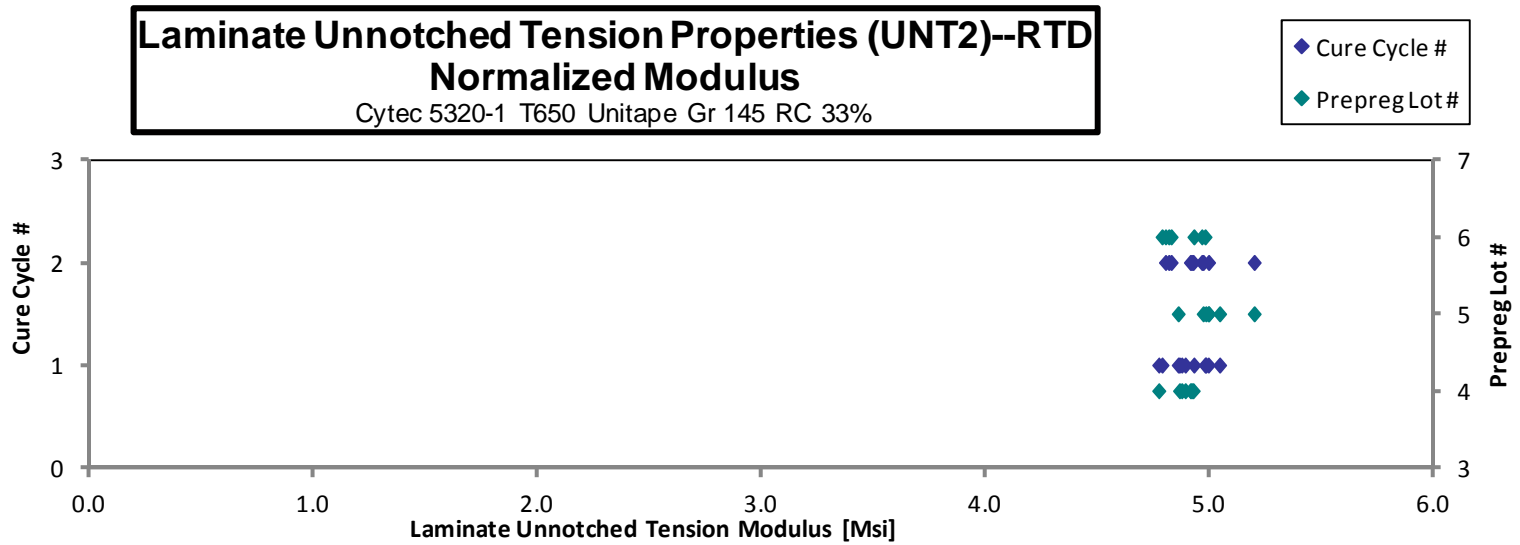
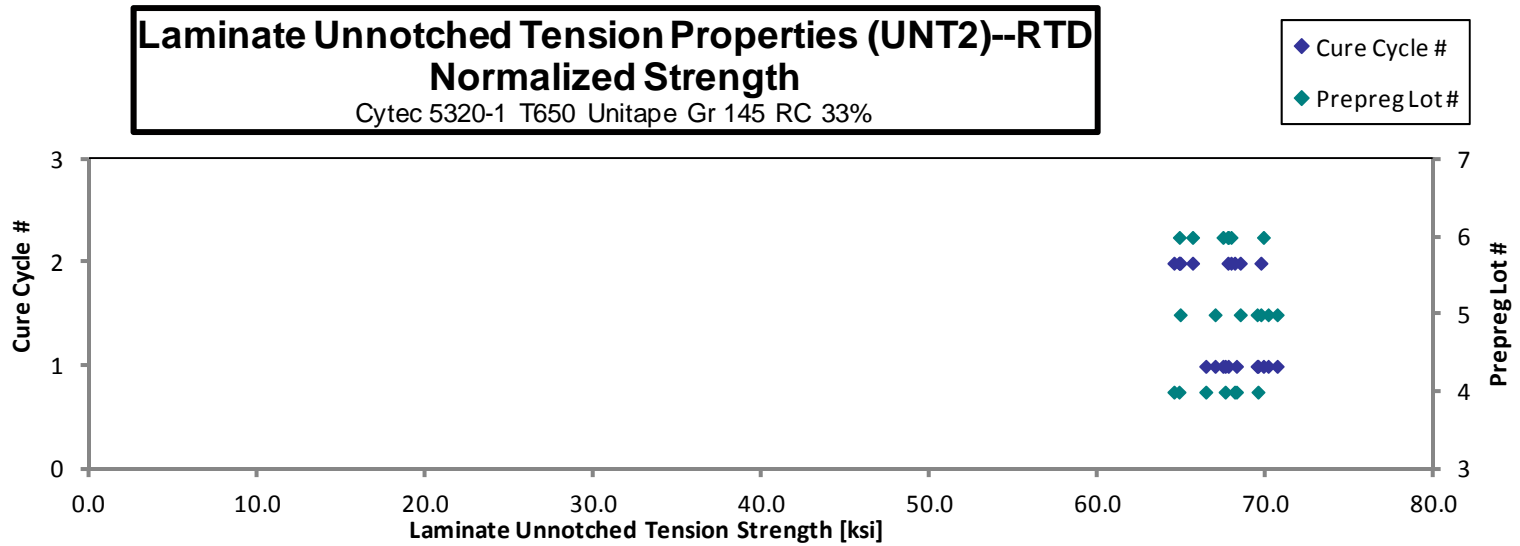
Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUGBD111A*	D	C1	4	1	67.305	4.835	0.109	20	AGM
CUGBD112A*	D	C1	4	1	69.012	4.978	0.108	20	AGM
CUGBD113A	D	C1	4	1	69.071	4.949	0.109	20	AGM
CUGBD114A	D	C1	4	1	69.589	4.868	0.110	20	AGM
CUGBD211A	D	C2	4	2	65.124	4.971	0.109	20	AGM
CUGBD212A	D	C2	4	2	68.186	4.916	0.110	20	AGM
CUGBD213A	D	C2	4	2	65.250	4.951	0.109	20	AWT
CUGBE111A	E	C1	5	1	70.976	5.065	0.109	20	AGM
CUGBE112A	E	C1	5	1	68.836	4.936	0.111	20	AGM
CUGBE113A	E	C1	5	1	69.436	4.810	0.111	20	AGM
CUGBE114A	E	C1	5	1	66.438	4.953	0.111	20	AWT
CUGBE211A	E	C2	5	2	65.034	5.005	0.110	20	AGM
CUGBE212A	E	C2	5	2	69.805	4.977	0.110	20	AGM
CUGBE213A	E	C2	5	2	68.522	5.201	0.110	20	AWB
CUGBF111A	F	C1	6	1	66.834	4.884	0.111	20	AWB / DGM
CUGBF112A	F	C1	6	1	66.670	4.899	0.112	20	AWT
CUGBF113A	F	C1	6	1	68.919	4.723	0.111	20	DGM / AWB
CUGBF211A	F	C2	6	2	68.338	4.870	0.109	20	DGM / AWT
CUGBF212A	F	C2	6	2	64.807	4.901	0.111	20	AWT
CUGBF213A	F	C2	6	2	63.838	4.741	0.112	20	AWB
CUGBF214A	F	C2	6	2	67.208	4.751	0.111	20	DGM / AGM

Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.0054	66.398	4.770
0.0054	67.548	4.873
0.0054	68.224	4.888
0.0055	69.504	4.862
0.0054	64.502	4.923
0.0055	68.114	4.911
0.0055	64.805	4.917
0.0055	70.643	5.042
0.0055	69.451	4.980
0.0056	70.109	4.857
0.0055	66.951	4.991
0.0055	64.876	4.993
0.0055	69.679	4.968
0.0055	68.449	5.196
0.0055	67.422	4.927
0.0056	67.731	4.977
0.0056	69.828	4.785
0.0055	67.717	4.825
0.0056	65.612	4.962
0.0056	64.824	4.815
0.0056	67.900	4.800

* Strain measurement was measured with SG. Extensometer used on other coupons.

Average	67.581	4.914
Standard Dev.	1.949	0.111
Coeff. of Var. [%]	2.884	2.253
Min.	63.838	4.723
Max.	70.976	5.201
Number of Spec.	21	21

Average_{norm}	0.0055	67.633	4.917
Standard Dev._{norm}		1.894	0.100
Coeff. of Var. [%]_{norm}		2.800	2.024
Min.	0.0054	64.502	4.770
Max.	0.0056	70.643	5.196
Number of Spec.	21	21	21



Laminate Unnotched Tension Properties (UNT2) --ETW2
Strength & Modulus
 Cytec 5320-1 T650 Unitape Gr 145 RC 33%

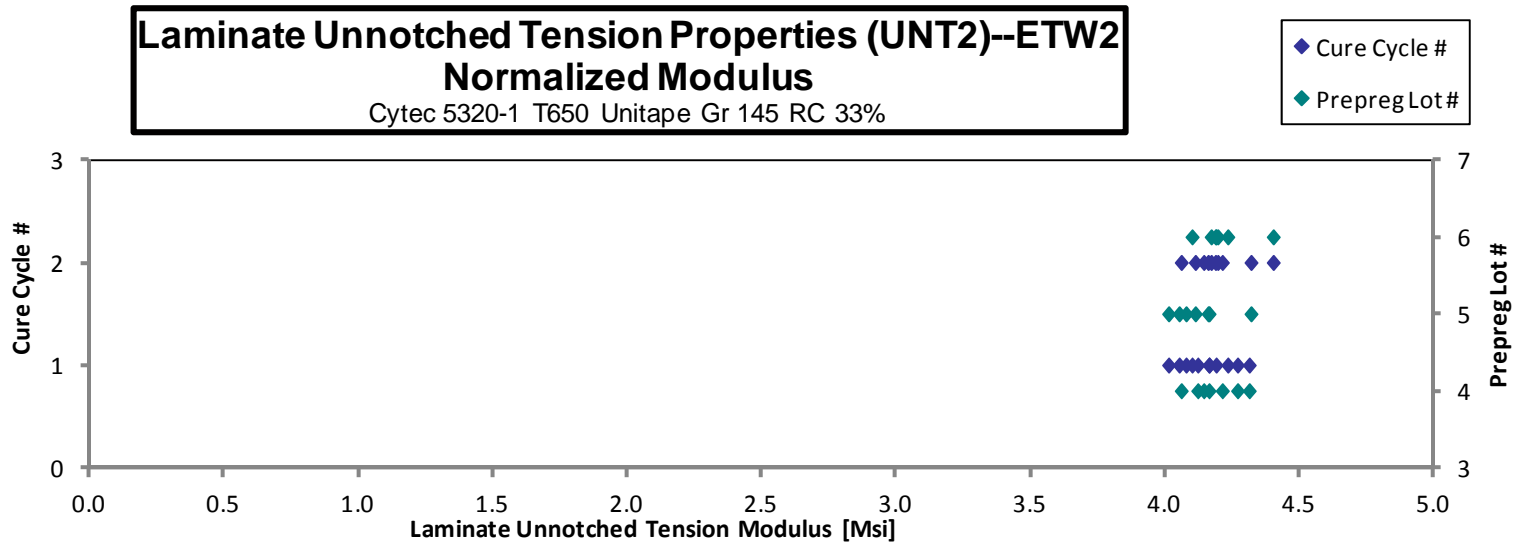
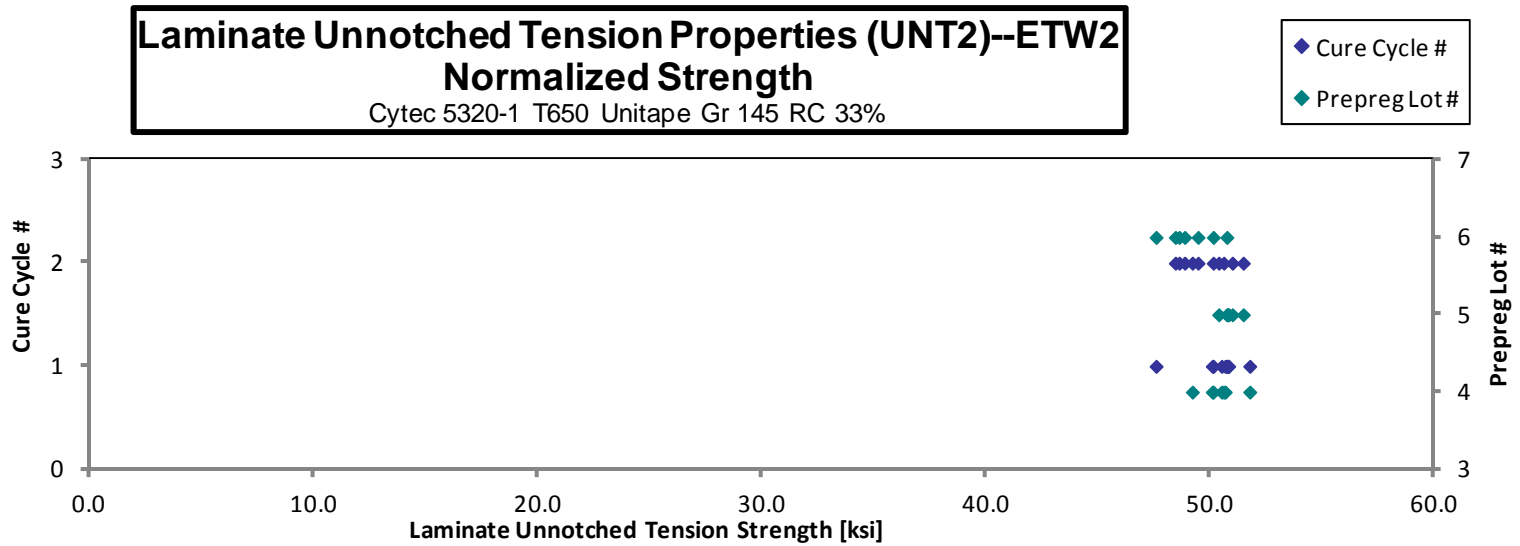
normalizing
 t_{ply} [in]
 0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUGBD11DF	D	C1	4	1	52.084	4.188	0.109	20	DGM / AGM
CUGBD11EF	D	C1	4	1	50.405	4.146	0.109	20	DGM / AGM
CUGBD11FF	D	C1	4	1	51.053	4.314	0.109	20	DGM / AGM
CUGBD11GF	D	C1	4	1	50.658	4.311	0.110	20	DGM / AGM
CUGBD21BF	D	C2	4	2	49.793	4.076	0.112	20	DGM / AGM
CUGBD21CF	D	C2	4	2	49.837	4.187	0.111	20	DGM / AGM
CUGBD21DF	D	C2	4	2	49.349	4.071	0.110	20	DGM / AGM
CUGBE11DF	E	C1	5	1	50.046	3.991	0.112	20	DGM / AGM
CUGBE11EF	E	C1	5	1	50.076	4.106	0.112	20	DGM / AGM
CUGBE11FF	E	C1	5	1	50.137	4.022	0.112	20	DGM / AGM
CUGBE11GF	E	C1	5	1	50.490	3.992	0.111	20	DGM / AGM
CUGBE21BF	E	C2	5	2	51.426	4.314	0.110	20	DGM / AGM
CUGBE21CF	E	C2	5	2	50.498	4.119	0.111	20	DGM / AGM
CUGBE21EF	E	C2	5	2	50.080	4.087	0.111	20	DGM / AGM
CUGBF117F	F	C1	6	1	49.461	4.175	0.112	20	DGM / AGM
CUGBF118F	F	C1	6	1	49.878	4.029	0.112	20	DGM / AGM
CUGBF119F	F	C1	6	1	47.045	4.141	0.111	20	DGM / AGM
CUGBF21DF	F	C2	6	2	47.994	4.133	0.111	20	DGM / AGM
CUGBF21EF	F	C2	6	2	47.768	4.340	0.112	20	DGM / AGM
CUGBF21FF	F	C2	6	2	48.330	4.125	0.111	20	DGM / AGM
CUGBF21GF	F	C2	6	2	49.015	4.157	0.111	20	DGM / AGM

Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.0055	51.761	4.162
0.0055	50.092	4.120
0.0054	50.504	4.268
0.0055	50.666	4.312
0.0056	50.600	4.142
0.0055	50.132	4.211
0.0055	49.200	4.059
0.0056	50.797	4.051
0.0056	50.759	4.162
0.0056	50.821	4.076
0.0055	50.734	4.012
0.0055	51.472	4.318
0.0056	50.987	4.158
0.0055	50.376	4.111
0.0056	50.136	4.232
0.0056	50.740	4.099
0.0056	47.580	4.188
0.0056	48.612	4.186
0.0056	48.441	4.401
0.0056	48.858	4.170
0.0055	49.453	4.195

Average 49.782 4.144
Standard Dev. 1.223 0.105
Coeff. of Var. [%] 2.456 2.527
Min. 47.045 3.991
Max. 52.084 4.340
Number of Spec. 21 21

Average_{norm} 0.0055 50.130 4.173
Standard Dev._{norm} 1.062 0.096
Coeff. of Var. [%]_{norm} 2.119 2.298
Min. 0.0054 47.580 4.012
Max. 0.0056 51.761 4.401
Number of Spec. 21 21 21



4.8 “50/40/10” Unnotched Tension 3 Properties (UNT3)

Laminate Unnotched Tension Properties (UNT3)--CTD
Strength & Modulus
 Cytec 5320-1 T650 Unitape Gr 145 RC 33%

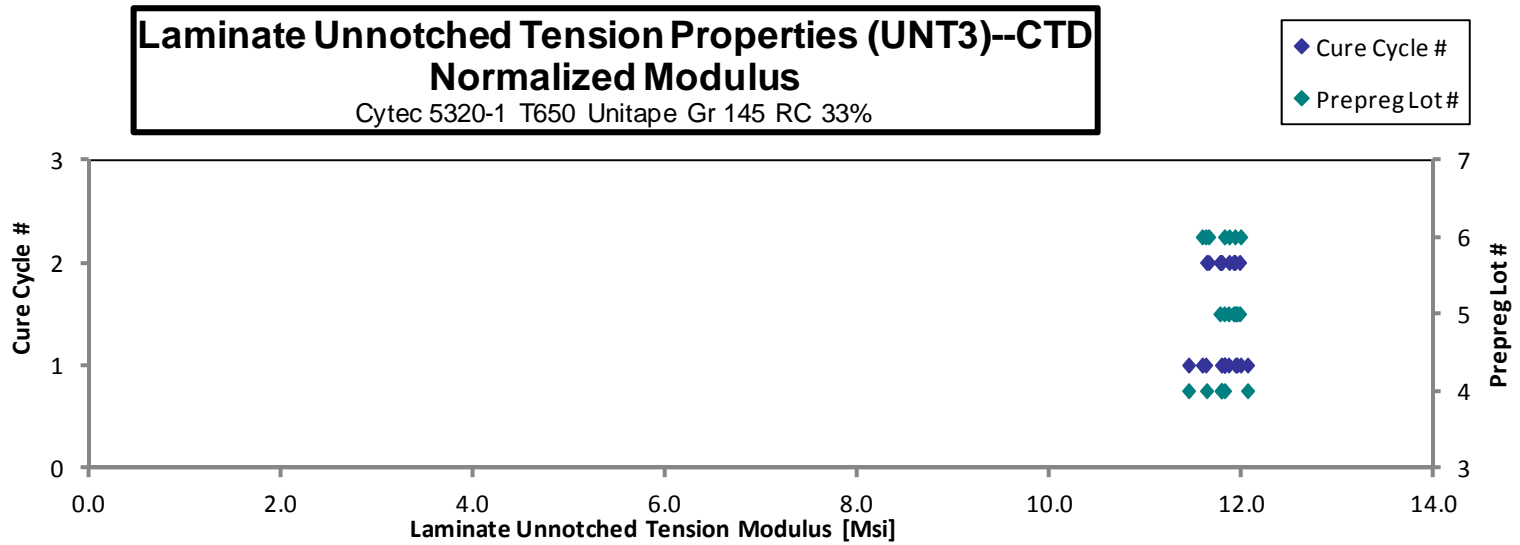
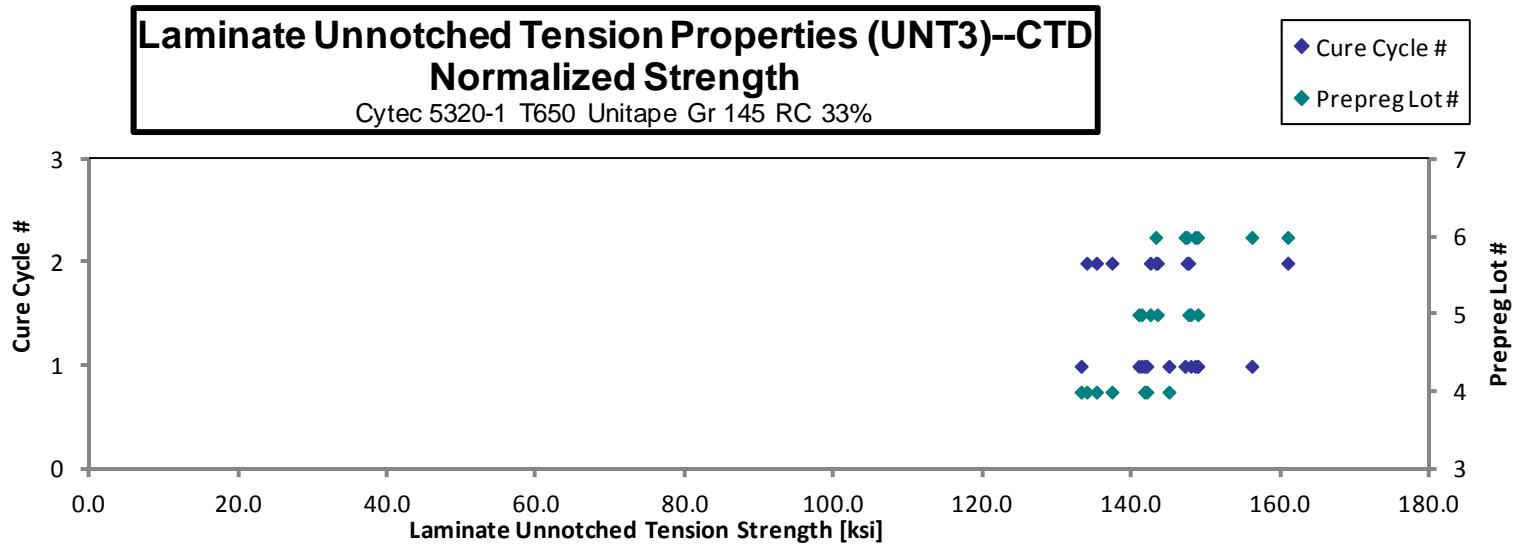
normalizing
 t_{ply} [in]
 0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUGCD117B	D	C1	4	1	145.860	11.516	0.109	20	LAT
CUGCD118B	D	C1	4	1	142.082	11.854	0.110	20	LAT
CUGCD119B	D	C1	4	1	133.604	11.825	0.110	20	LAT
CUGCD11AB	D	C1	4	1	143.788	12.212	0.109	20	LWT / LAB
CUGCD216B	D	C2	4	2	137.425	11.799	0.110	20	LAB
CUGCD217B	D	C2	4	2	135.810	11.950	0.108	20	LAT
CUGCD218B	D	C2	4	2	136.125	11.710	0.109	20	LAT
CUGCE117B	E	C1	5	1	139.319	11.813	0.111	20	LAB
CUGCE118B	E	C1	5	1	146.961	11.785	0.111	20	LAT
CUGCE119B	E	C1	5	1	139.446	11.778	0.111	20	LAT
CUGCE11AB	E	C1	5	1	148.353	11.778	0.110	20	LWT / LAB
CUGCE216B	E	C2	5	2	148.785	12.071	0.109	20	LAB
CUGCE217B	E	C2	5	2	142.476	11.836	0.111	20	LAB
CUGCE218B	E	C2	5	2	143.171	11.829	0.109	20	LAB
CUGCF117B	F	C1	6	1	146.165	11.381	0.112	20	LAB
CUGCF118B	F	C1	6	1	145.882	11.420	0.112	20	LAB
CUGCF119B	F	C1	6	1	144.050	11.738	0.112	20	LAB
CUGCF11AB	F	C1	6	1	153.303	11.606	0.112	20	LAB
CUGCF216B	F	C2	6	2	141.114	11.485	0.112	20	LWB / AWB
CUGCF217B	F	C2	6	2	145.020	11.676	0.112	20	LWB
CUGCF218B	F	C2	6	2	157.692	11.687	0.112	20	LAB

Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.0055	144.910	11.440
0.0055	141.630	11.816
0.0055	133.118	11.782
0.0054	141.936	12.054
0.0055	137.258	11.785
0.0054	133.875	11.779
0.0055	135.176	11.628
0.0056	140.860	11.944
0.0055	147.852	11.856
0.0056	141.242	11.929
0.0055	148.781	11.812
0.0055	147.568	11.973
0.0055	143.361	11.910
0.0055	142.412	11.766
0.0056	148.756	11.583
0.0056	148.424	11.619
0.0056	147.062	11.983
0.0056	156.044	11.814
0.0056	143.145	11.650
0.0056	147.349	11.863
0.0056	160.869	11.923

Average 143.639 11.750
 Standard Dev. 5.800 0.200
 Coeff. of Var. [%] 4.038 1.700
 Min. 133.604 11.381
 Max. 157.692 12.212
 Number of Spec. 21 21

Average_{norm} 0.0055 144.363 11.805
 Standard Dev._{norm} 6.768 0.152
 Coeff. of Var. [%]_{norm} 4.688 1.289
 Min. 0.0054 133.118 11.440
 Max. 0.0056 160.869 12.054
 Number of Spec. 21 21 21



**Laminate Unnotched Tension Properties (UNT3)--RTD
Strength & Modulus**

Cytec 5320-1 T650 Unitape Gr 145 RC 33%

normalizing
t_{ply} [in]
0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUGCD111A*	D	C1	4	1	151.209	11.807	0.107	20	LAB
CUGCD112A*	D	C1	4	1	161.850	11.671	0.110	20	AWT / AWB
CUGCD113A	D	C1	4	1	164.324	11.864	0.110	20	LAT / LWB
CUGCD114A	D	C1	4	1	144.562	11.502	0.109	20	LAT
CUGCD211A	D	C2	4	2	150.226	11.580	0.110	20	LAT / LAB
CUGCD212A	D	C2	4	2	157.693	11.562	0.109	20	LAB
CUGCD213A	D	C2	4	2	140.471	11.729	0.110	20	LAT
CUGCE111A	E	C1	5	1	157.874	11.813	0.110	20	AAB / LWT
CUGCE112A	E	C1	5	1	150.474	11.851	0.110	20	LAT
CUGCE113A	E	C1	5	1	150.757	11.716	0.111	20	LAT
CUGCE114A	E	C1	5	1	149.767	11.760	0.111	20	LAT
CUGCE211A	E	C2	5	2	152.132	11.610	0.109	20	LAT
CUGCE212A	E	C2	5	2	152.770	11.693	0.109	20	LAT
CUGCE213A	E	C2	5	2	157.479	12.266	0.111	20	LAT / LWB
CUGCF111A	F	C1	6	1	144.058	11.413	0.111	20	LAB
CUGCF112A	F	C1	6	1	140.268	11.398	0.112	20	LAT
CUGCF113A	F	C1	6	1	159.981	11.430	0.113	20	LAB / LWT
CUGCF114A	F	C1	6	1	158.764	11.425	0.112	20	LAB / LAT / AWT
CUGCF211A	F	C2	6	2	162.846	11.596	0.112	20	LAB / AWT
CUGCF212A	F	C2	6	2	143.005	11.452	0.112	20	LAB
CUGCF213A	F	C2	6	2	**	11.461	0.112	20	LIT
CUGCF214A	F	C2	6	2	155.198	11.511	0.112	20	LAB

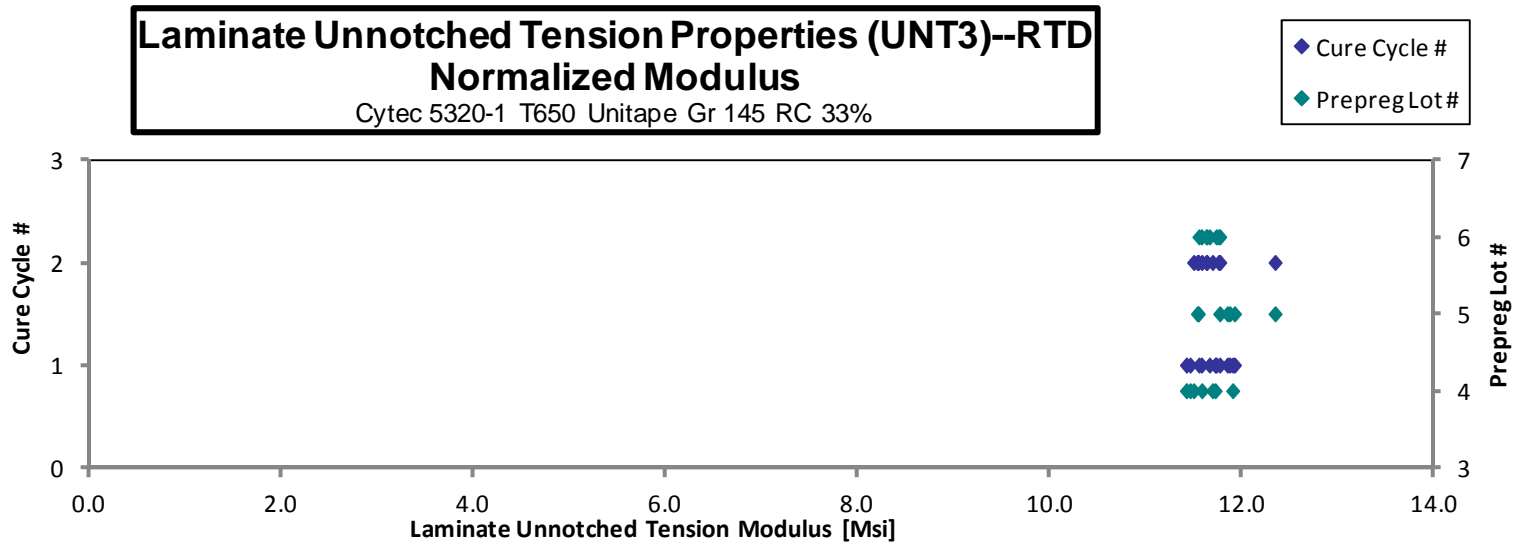
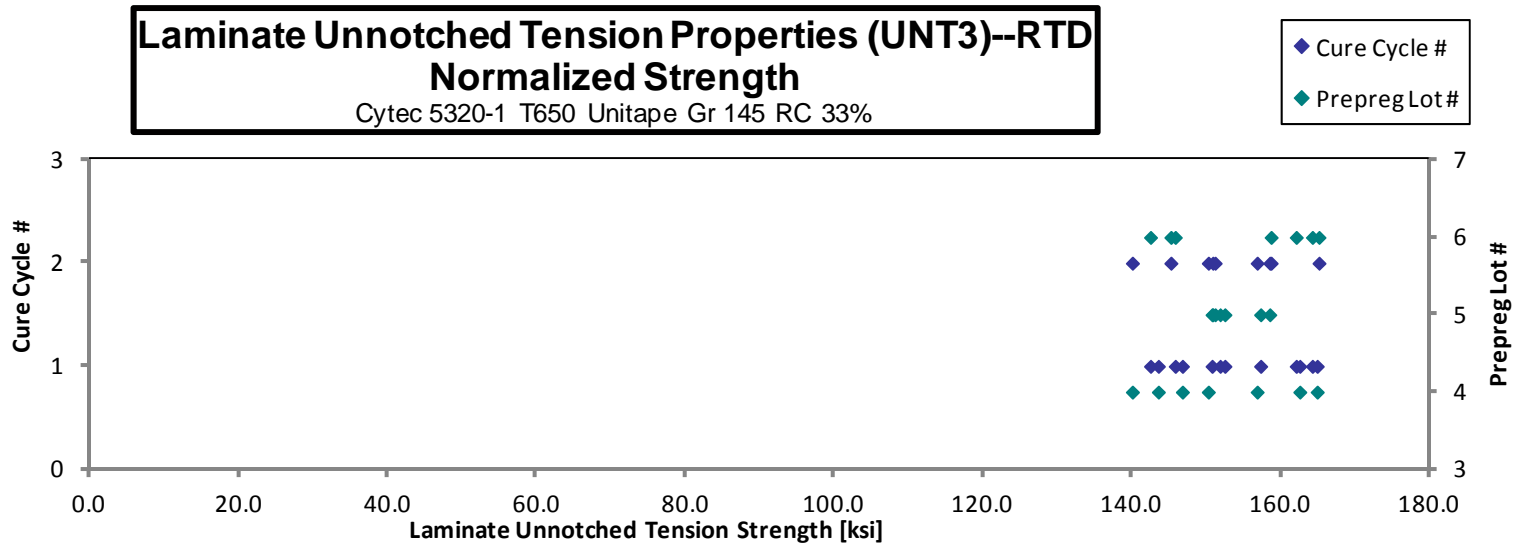
Avg. t _{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.0053	146.718	11.457
0.0055	162.487	11.717
0.0055	164.822	11.900
0.0055	143.488	11.417
0.0055	150.203	11.578
0.0055	156.761	11.493
0.0055	140.003	11.690
0.0055	157.228	11.765
0.0055	150.702	11.869
0.0056	152.424	11.845
0.0056	151.786	11.919
0.0055	151.117	11.532
0.0054	150.802	11.542
0.0055	158.457	12.342
0.0056	145.760	11.548
0.0056	142.435	11.574
0.0056	164.174	11.729
0.0056	162.011	11.658
0.0056	165.067	11.754
0.0056	145.172	11.625
0.0056		11.630
0.0056	158.632	11.766

* Strain measurement was measured with SG. Extensometer used on other coupons.

** Strength not reported due to unacceptable failure mode.

Average	152.653	11.641
Standard Dev.	7.271	0.206
Coeff. of Var. [%]	4.763	1.771
Min.	140.268	11.398
Max.	164.324	12.266
Number of Spec.	21	22

Average _{norm}	0.0055	153.345	11.698
Standard Dev _{norm}		7.810	0.203
Coeff. of Var. [%] _{norm}		5.093	1.733
Min.	0.0053	140.003	11.417
Max.	0.0056	165.067	12.342
Number of Spec.	22	21	22



Laminate Unnotched Tension Properties (UNT3)--ETW2
Strength & Modulus
 Cytec 5320-1 T650 Unitape Gr 145 RC 33%

normalizing
 t_{ply} [in]
 0.0055

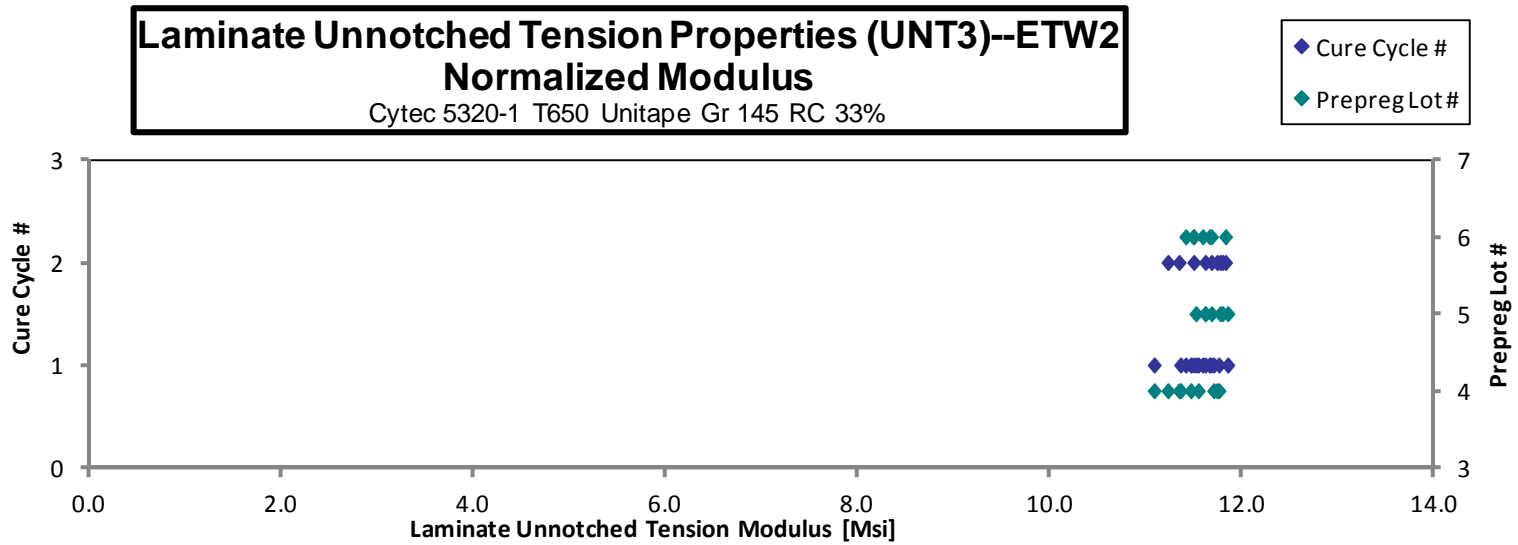
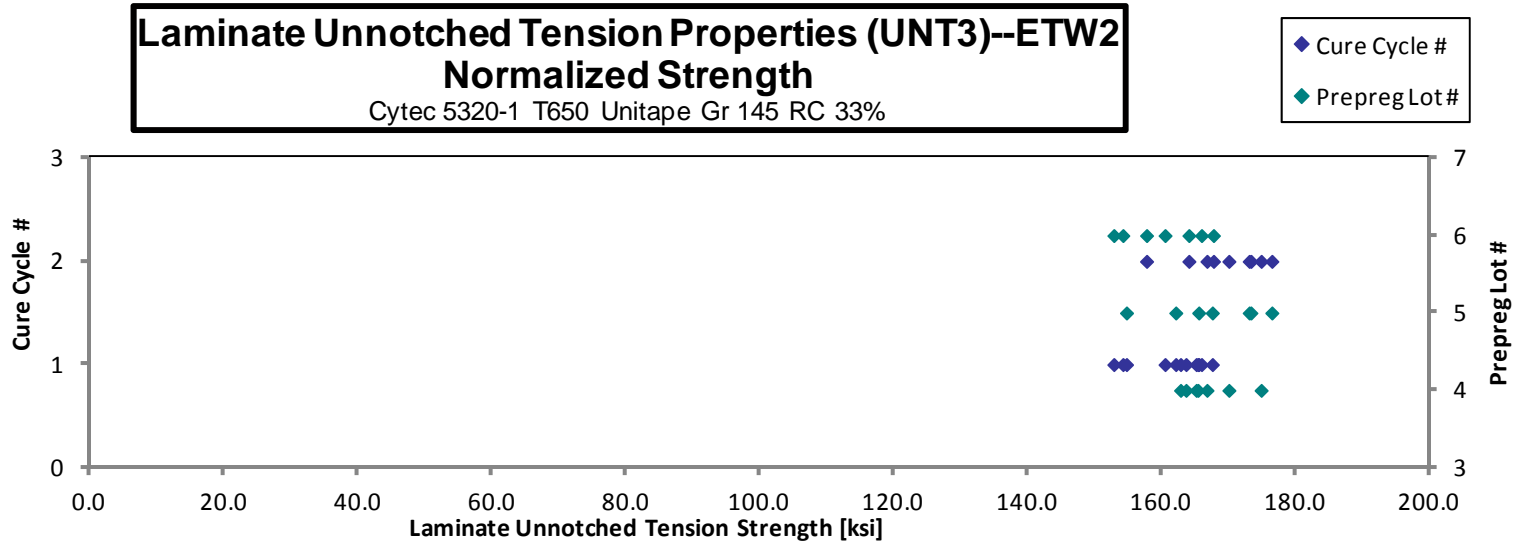
Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUGCD11DF	D	C1	4	1	*	11.477	0.109	20	LIT
CUGCD11EF	D	C1	4	1	*	11.802	0.108	20	LIT
CUGCD11FF	D	C1	4	1	166.536	11.181	0.109	20	AWT / LWB
CUGCD11GF	D	C1	4	1	164.658	11.781	0.109	20	DGM / LGM / LAB
CUGCD11HF	D	C1	4	1	167.465	11.612	0.109	20	LWT / LAB
CUGCD11IF	D	C1	4	1	164.160	11.859	0.109	20	LAB
CUGCD21BF	D	C2	4	2	166.684	11.342	0.110	20	AWT / LWB
CUGCD21CF	D	C2	4	2	174.740	11.735	0.110	20	AWB / LWT
CUGCD21DF	D	C2	4	2	170.136	11.238	0.110	20	LAT / LWB
CUGCE11DF	E	C1	5	1	160.137	11.479	0.111	20	LWT / AWB
CUGCE11EF	E	C1	5	1	165.033	11.509	0.112	20	LWT / LAB
CUGCE11FF	E	C1	5	1	162.866	11.663	0.112	20	LWT / LWB
CUGCE11GF	E	C1	5	1	151.999	11.318	0.112	20	LWT / LAB
CUGCE21BF	E	C2	5	2	174.438	11.663	0.111	20	AWT
CUGCE21CF	E	C2	5	2	170.940	11.478	0.111	20	AWT / LWB
CUGCE21DF	E	C2	5	2	169.816	11.537	0.112	20	AWT
CUGCF11DF	F	C1	6	1	150.687	11.231	0.113	20	LIB / LWT
CUGCF11EF	F	C1	6	1	157.608	11.453	0.112	20	AWT
CUGCF11FF	F	C1	6	1	148.996	11.300	0.113	20	LWT / AWB
CUGCF11GF	F	C1	6	1	162.575	11.184	0.112	20	LWT / AWB
CUGCF21BF	F	C2	6	2	155.134	11.636	0.112	20	LWT / LWB
CUGCF21CF	F	C2	6	2	164.075	11.430	0.112	20	DGM / AGM
CUGCF21DF	F	C2	6	2	161.711	11.335	0.112	20	AGM / LAB

Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.0054		11.357
0.0054		11.543
0.0055	165.073	11.083
0.0055	163.560	11.702
0.0054	165.334	11.464
0.0055	162.742	11.756
0.0055	166.684	11.342
0.0055	174.766	11.737
0.0055	169.955	11.226
0.0056	162.030	11.614
0.0056	167.484	11.680
0.0056	165.458	11.849
0.0056	154.671	11.517
0.0056	176.367	11.792
0.0056	172.986	11.615
0.0056	173.238	11.770
0.0056	154.134	11.488
0.0056	160.425	11.658
0.0056	152.789	11.587
0.0056	165.876	11.411
0.0056	157.673	11.826
0.0056	167.655	11.679
0.0056	163.990	11.495

*Strength not reported due to unacceptable failure mode.

Average	163.352	11.489
Standard Dev.	7.251	0.204
Coeff. of Var. [%]	4.439	1.773
Min.	148.996	11.181
Max.	174.740	11.859
Number of Spec.	21	23

Average_{norm}	0.0055	164.899	11.574
Standard Dev._{norm}		6.570	0.197
Coeff. of Var. [%]_{norm}		3.984	1.702
Min.	0.0054	152.789	11.083
Max.	0.0056	176.367	11.849
Number of Spec.	23	21	23



4.9 “33/0/67” Unnotched Compression 0 Properties (UNC0)

Laminate Unnotched Compression Properties (UNC0)--CTD
Strength & Modulus
 Cytec 5320-1 T650 Unitape Gr 145 RC 33%

normalizing
 t_{ply} [in]
 0.0055

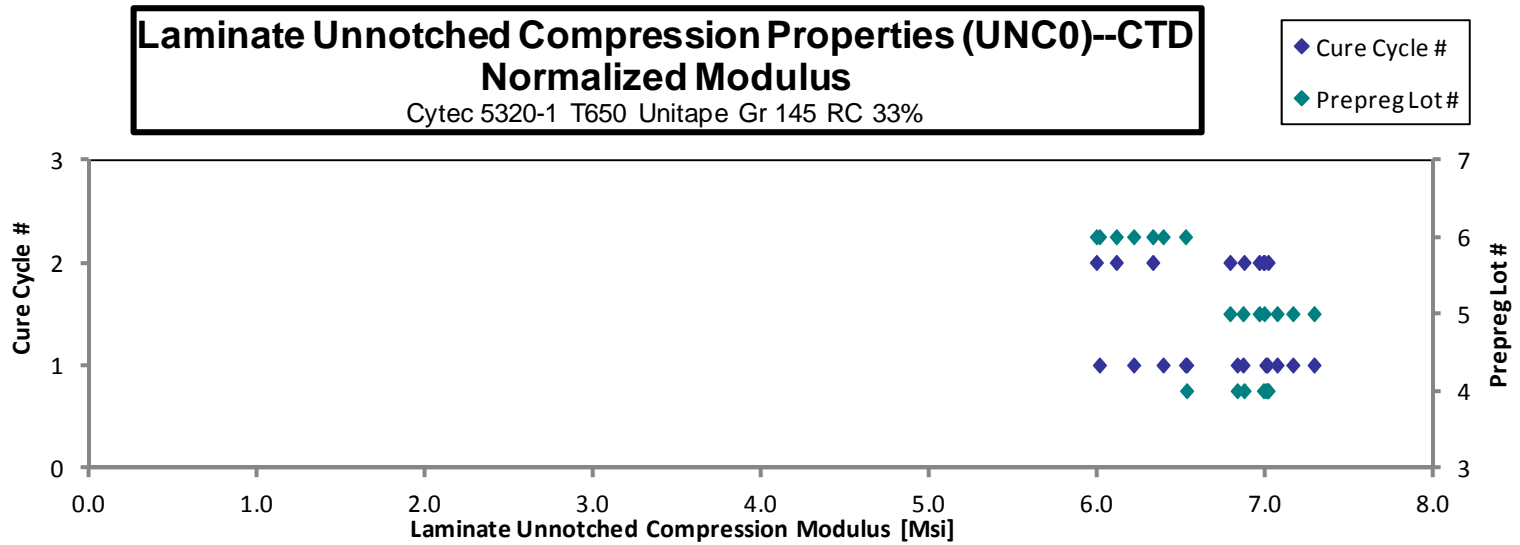
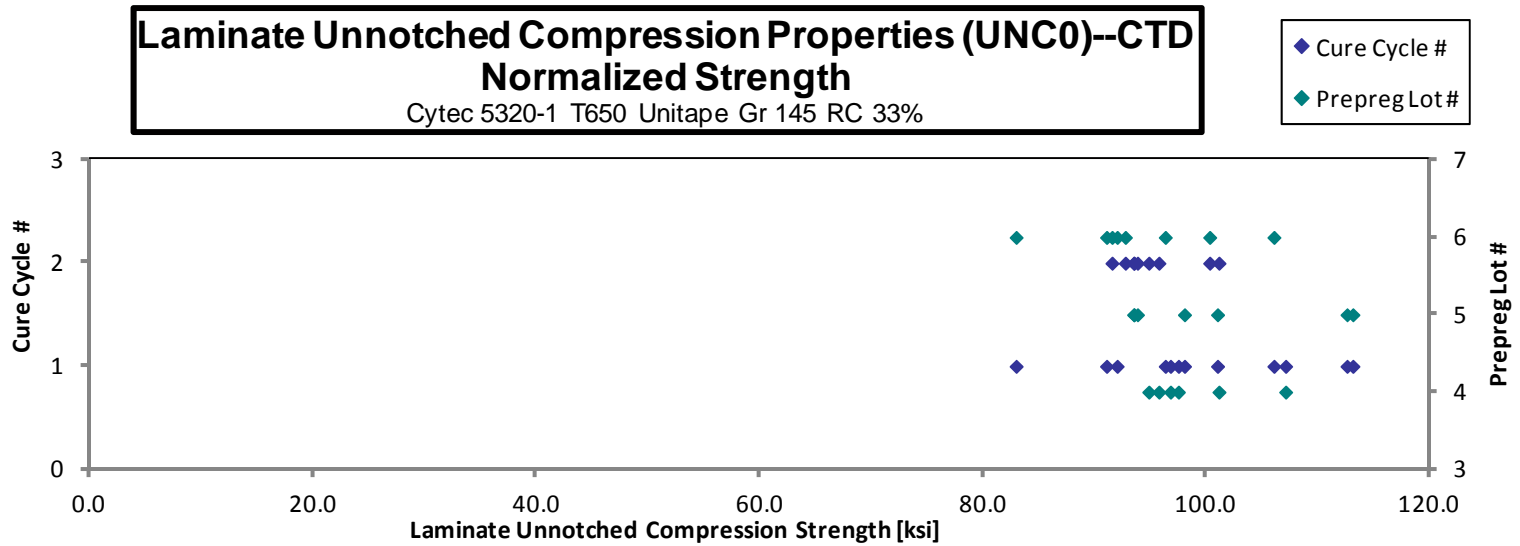
Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksj]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUGRD117B	D	C1	4	1	100.846	6.753	0.112	21	BGM
CUGRD118B	D	C1	4	1	99.312	7.182	0.113	21	BGM
CUGRD119B	D	C1	4	1	109.729	7.180	0.113	21	BGM
CUGRD11AB	D	C1	4	1	*	7.052	0.112	21	HIB
CUGRD216B	D	C2	4	2	101.316	6.999	0.115	21	BGM
CUGRD217B	D	C2	4	2	95.335	6.841	0.116	21	BGM
CUGRD218B	D	C2	4	2	94.710	7.004	0.116	21	BGM
CUGRE117B	E	C1	5	1	113.808	6.938	0.114	21	BGM
CUGRE118B	E	C1	5	1	98.509	7.101	0.115	21	BGM
CUGRE119B	E	C1	5	1	113.067	7.157	0.116	21	BGM
CUGRE11AB	E	C1	5	1	*	7.304	0.115	21	HIB
CUGRE11BB	E	C1	5	1	100.967	**	0.115	21	BGM
CUGRE216B	E	C2	5	2	94.098	7.035	0.115	21	BGM
CUGRE217B	E	C2	5	2	94.460	6.833	0.115	21	BGM
CUGRE218B	E	C2	5	2	*	7.027	0.114	21	HIT / BGM
CUGRE21AB	E	C2	5	2	94.216	**	0.115	21	BGM
CUGRF117B	F	C1	6	1	106.656	6.559	0.115	21	BGM
CUGRF118B	F	C1	6	1	91.206	6.019	0.115	21	BGM
CUGRF119B	F	C1	6	1	84.042	6.472	0.114	21	BGM
CUGRF11AB	F	C1	6	1	92.680	6.258	0.115	21	BGM
CUGRF11BB	F	C1	6	1	97.183	**	0.114	21	BGM
CUGRF216B	F	C2	6	2	92.382	5.968	0.116	21	BGM
CUGRF217B	F	C2	6	2	99.971	6.307	0.116	21	BGM
CUGRF218B	F	C2	6	2	90.948	6.070	0.116	21	BGM

Avg. t_{ply} [in]	Strength _{norm} [ksj]	Modulus _{norm} [Msi]
0.0053	97.452	6.526
0.0054	96.743	6.996
0.0054	107.057	7.005
0.0053		6.827
0.0055	101.086	6.983
0.0055	95.706	6.867
0.0055	94.803	7.011
0.0054	112.552	6.861
0.0055	97.997	7.064
0.0055	113.079	7.158
0.0055		7.284
0.0055	100.956	
0.0055	93.457	6.987
0.0055	93.785	6.784
0.0054		6.957
0.0055	93.472	
0.0055	106.009	6.519
0.0055	91.019	6.007
0.0054	82.923	6.386
0.0055	91.968	6.210
0.0054	96.279	
0.0055	92.702	5.989
0.0055	100.253	6.324
0.0055	91.509	6.107

*Strength not reported due to unacceptable failure mode.

**Specimen was not gaged.

Average	98.354	6.765	Average_{norm}	0.0055	97.657	6.707
Standard Dev.	7.523	0.421	Standard Dev._{norm}		7.308	0.397
Coeff. of Var. [%]	7.648	6.228	Coeff. of Var. [%]_{norm}		7.483	5.914
Min.	84.042	5.968	Min.	0.0053	82.923	5.989
Max.	113.808	7.304	Max.	0.0055	113.079	7.284
Number of Spec.	21	21	Number of Spec.	24	21	21



**Laminate Unnotched Compression Properties (UNC0)--RTD
Strength & Modulus**

Cytec 5320-1 T650 Unitape Gr 145 RC 33%

normalizing

t_{ply} [in]

0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUGRD112A	D	C1	4	1	*	7.028	0.112	21	CIB/ HIB
CUGRD113A	D	C1	4	1	96.028	6.996	0.112	21	BGM
CUGRD114A	D	C1	4	1	92.928	6.863	0.113	21	BGM
CUGRD115A	D	C1	4	1	105.098	7.203	0.112	21	BGM
CUGRD116A	D	C1	4	1	87.563	**	0.113	21	BGM
CUGRD212A	D	C2	4	2	95.663	7.502	0.116	21	BGM
CUGRD213A	D	C2	4	2	99.557	7.161	0.116	21	BGM
CUGRD214A	D	C2	4	2	85.606	6.983	0.118	21	BGM
CUGRE111A	E	C1	5	1	90.088	7.135	0.115	21	BGM
CUGRE112A	E	C1	5	1	94.330	7.164	0.116	21	BGM
CUGRE113A	E	C1	5	1	86.267	7.231	0.116	21	BGM
CUGRE114A	E	C1	5	1	87.969	7.243	0.115	21	BGM
CUGRE211A	E	C2	5	2	95.585	7.268	0.112	21	BGM
CUGRE212A	E	C2	5	2	95.320	7.282	0.115	21	BGM
CUGRE213A	E	C2	5	2	94.970	7.265	0.114	21	BGM
CUGRF111A	F	C1	6	1	82.226	7.088	0.115	21	BGM
CUGRF112A	F	C1	6	1	100.169	7.120	0.115	21	BGM
CUGRF113A	F	C1	6	1	91.606	7.018	0.114	21	BGM
CUGRF114A	F	C1	6	1	89.347	7.143	0.115	21	BGM
CUGRF212A	F	C2	6	2	89.871	6.843	0.115	21	BGM
CUGRF213A	F	C2	6	2	89.742	7.220	0.115	21	BGM
CUGRF214A	F	C2	6	2	92.784	7.159	0.116	21	BGM

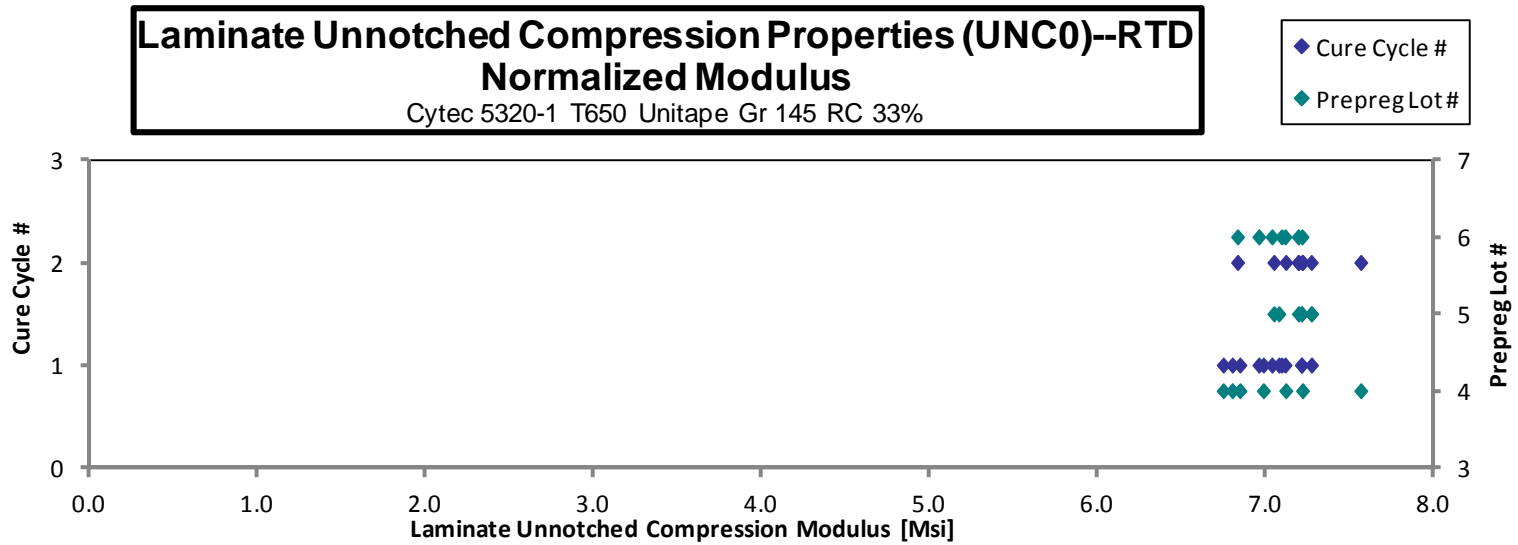
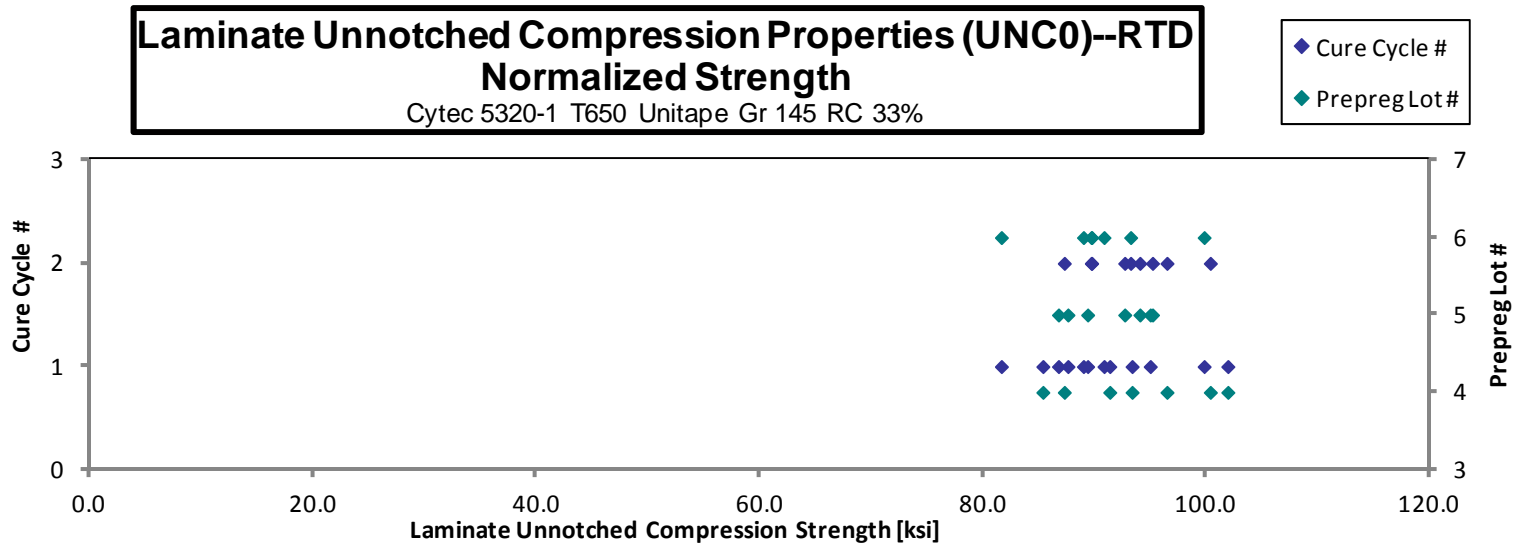
Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.0054		6.843
0.0053	93.305	6.798
0.0054	91.309	6.744
0.0053	101.879	6.983
0.0054	85.317	
0.0055	96.429	7.562
0.0055	100.311	7.216
0.0056	87.236	7.116
0.0055	89.327	7.075
0.0055	94.932	7.210
0.0055	86.716	7.269
0.0055	87.560	7.209
0.0053	92.647	7.045
0.0055	95.134	7.268
0.0054	94.004	7.191
0.0055	81.603	7.034
0.0055	99.757	7.091
0.0055	90.793	6.956
0.0055	88.950	7.112
0.0055	89.686	6.829
0.0055	89.655	7.213
0.0055	93.175	7.190

*Strength not reported due to unacceptable failure mode.

**Specimen was not gaged.

Average	92.510	7.139
Standard Dev.	5.408	0.151
Coeff. of Var. [%]	5.846	2.112
Min.	82.226	6.843
Max.	105.098	7.502
Number of Spec.	21	21

Average_{norm}	0.0055	91.892	7.093
Standard Dev._{norm}		5.121	0.192
Coeff. of Var. [%]_{norm}		5.573	2.706
Min.	0.0053	81.603	6.744
Max.	0.0056	101.879	7.562
Number of Spec.	22	21	21



**Laminate Unnotched Compression Properties (UNC0)--ETD1
Strength & Modulus**

Cytec 5320-1 T650 Unitape Gr 145 RC 33%

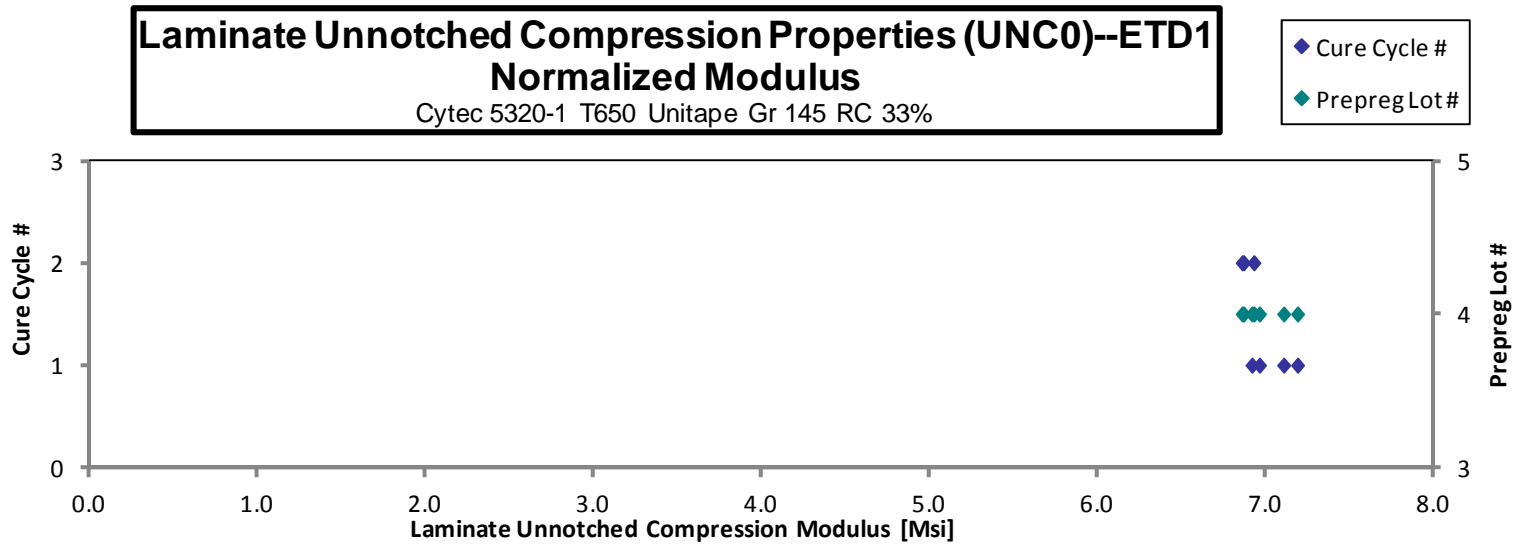
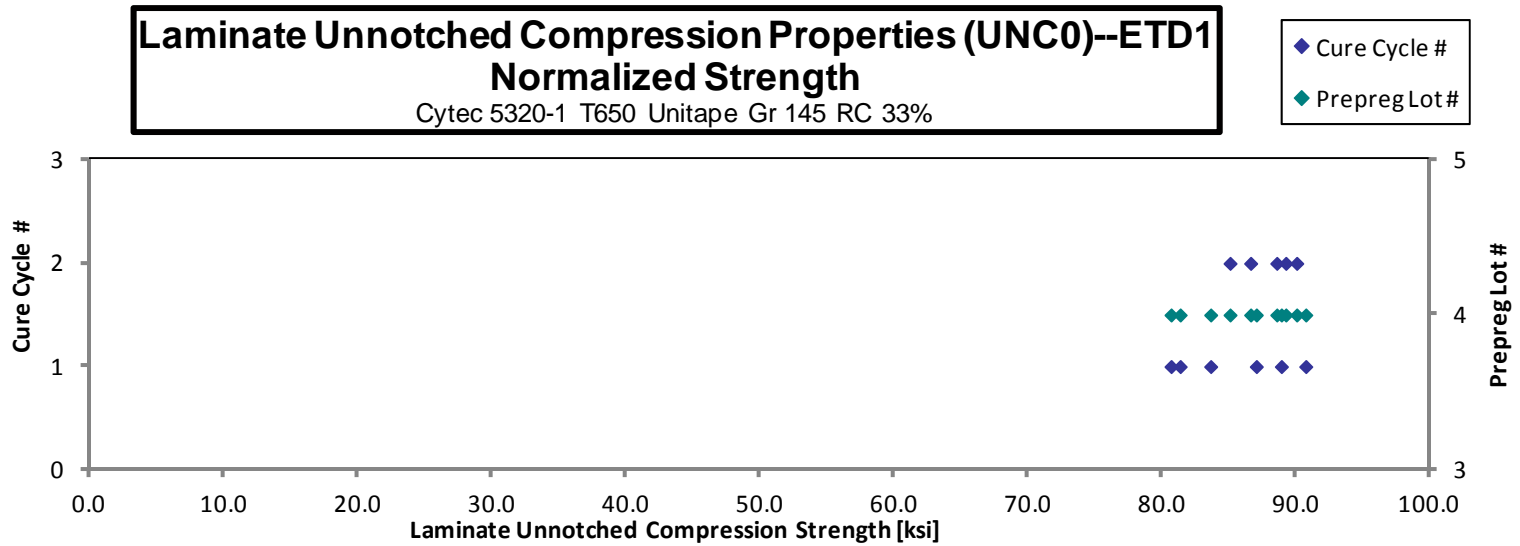
normalizing
t_{ply} [in]
0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUGRD11DC	D	C1	4	1	89.424	7.299	0.112	21	BGM / HIT
CUGRD11EC	D	C1	4	1	89.660	7.019	0.115	21	BGM
CUGRD11FC	D	C1	4	1	82.487	7.012	0.114	21	BGM
CUGRD11GC	D	C1	4	1	83.197	7.150	0.116	21	BGM
CUGRD11HC	D	C1	4	1	90.111	*	0.116	21	BGM
CUGRD11IC	D	C1	4	1	80.801	*	0.115	21	BGM
CUGRD21BC	D	C2	4	2	83.983	6.838	0.117	21	HIT / BGM
CUGRD21CC	D	C2	4	2	87.585	6.782	0.117	21	HIT / BGM
CUGRD21DC	D	C2	4	2	89.305	6.809	0.116	21	CIT / HIB / BGM
CUGRD21EC	D	C2	4	2	87.774	*	0.117	21	HIT / BGM
CUGRD21FC	D	C2	4	2	85.868	*	0.116	21	BGM

Avg. t _{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.0054	87.024	7.103
0.0055	88.893	6.959
0.0054	81.344	6.915
0.0055	83.620	7.186
0.0055	90.716	
0.0055	80.661	
0.0056	85.065	6.926
0.0056	88.552	6.856
0.0055	90.040	6.865
0.0056	89.228	
0.0055	86.602	

*Specimen was not gaged.

Average	86.381	6.987	Average_{norm}	0.0055	86.522	6.973
Standard Dev.	3.291	0.192	Standard Dev._{norm}		3.449	0.125
Coeff. of Var. [%]	3.810	2.751	Coeff. of Var. [%]_{norm}		3.987	1.789
Min.	80.801	6.782	Min.	0.0054	80.661	6.856
Max.	90.111	7.299	Max.	0.0056	90.716	7.186
Number of Spec.	11	7	Number of Spec.	11	11	7



**Laminate Unnotched Compression Properties (UNC0)--ETW1
Strength & Modulus**

Cytec 5320-1 T650 Unitape Gr 145 RC 33%

normalizing

t_{ply} [in]

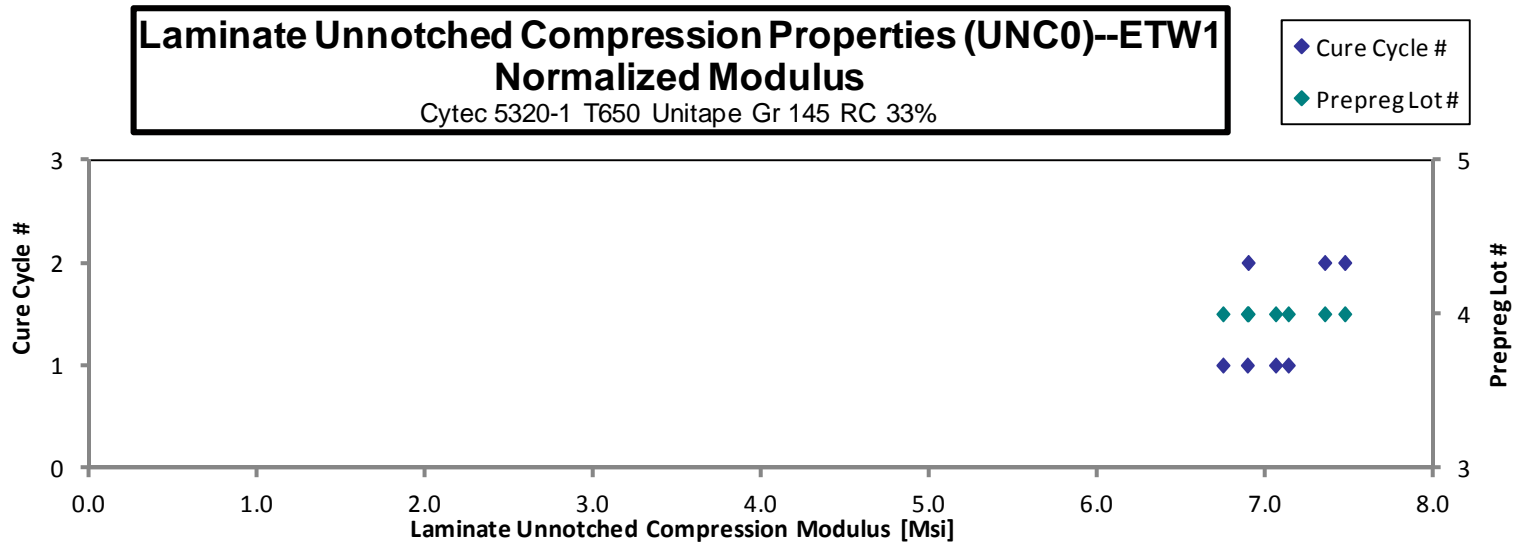
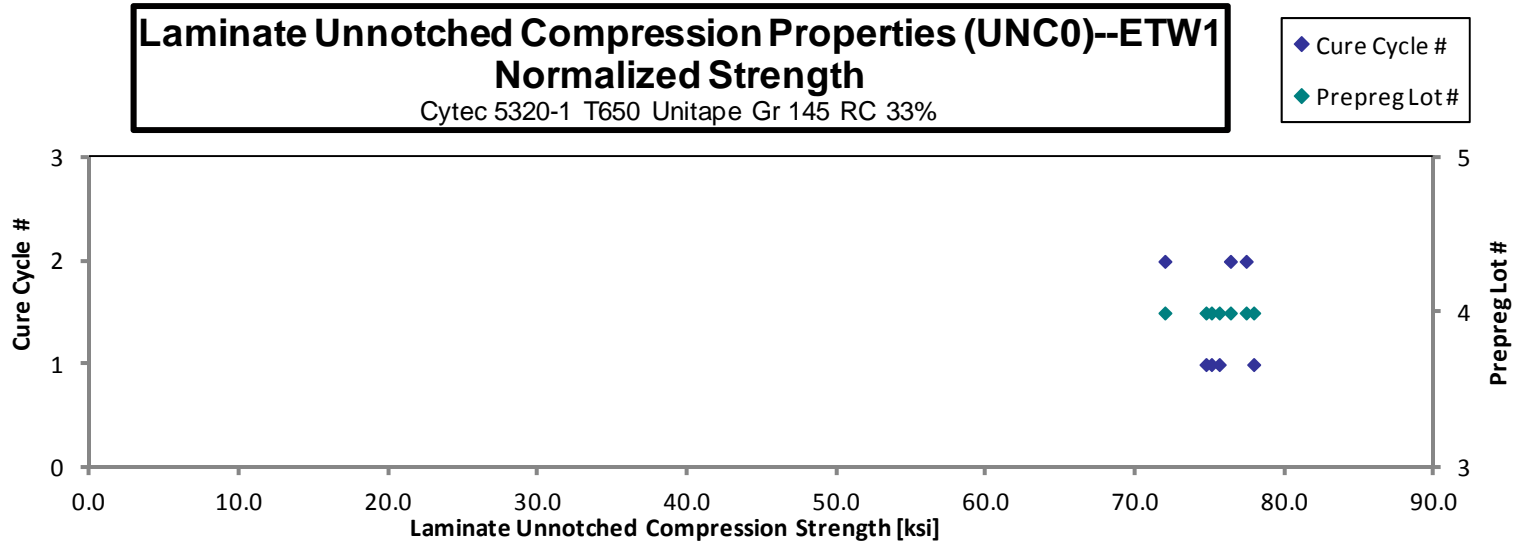
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Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUGRD131D	D	C1	4	1		7.018	0.111	21	BGM
CUGRD132D	D	C1	4	1		7.137	0.114	21	BGM
CUGRD133D	D	C1	4	1		6.909	0.115	21	BGM
CUGRD134D	D	C1	4	1		7.148	0.115	21	BGM
CUGRD135D	D	C1	4	1	78.414		0.115	21	BGM / HIB
CUGRD136D	D	C1	4	1	74.868		0.116	21	BGM / HIB
CUGRD137D	D	C1	4	1	75.991		0.115	21	HIB / BGM
CUGRD138D	D	C1	4	1	74.899		0.115	21	HIB / BGM
CUGRD232D	D	C2	4	2		7.478	0.115	21	BGM / HIT
CUGRD233D	D	C2	4	2		6.929	0.115	21	HIB / BGM
CUGRD234D	D	C2	4	2		7.387	0.115	21	HIB / BGM
CUGRD235D	D	C2	4	2	72.495		0.115	21	BGM
CUGRD236D	D	C2	4	2	77.071		0.114	21	BGM
CUGRD237D	D	C2	4	2	78.453		0.114	21	BGM

Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.0053		6.742
0.0054		7.055
0.0055		6.887
0.0055		7.131
0.0055	77.904	
0.0055	75.070	
0.0055	75.596	
0.0055	74.713	
0.0055		7.467
0.0055		6.892
0.0055		7.347
0.0055	71.961	
0.0054	76.345	
0.0054	77.400	

Average	76.027	7.144
Standard Dev.	2.151	0.219
Coeff. of Var. [%]	2.829	3.068
Min.	72.495	6.909
Max.	78.453	7.478
Number of Spec.	7	7

Average _{norm}	0.0055	75.570	7.074
Standard Dev. _{norm}		1.975	0.262
Coeff. of Var. [%] _{norm}		2.614	3.701
Min.	0.0053	71.961	6.742
Max.	0.0055	77.904	7.467
Number of Spec.	14	7	7



Laminate Unnotched Compression Properties (UNC0)--ETD2
Strength & Modulus
 Cytec 5320-1 T650 Unitape Gr 145 RC 33%

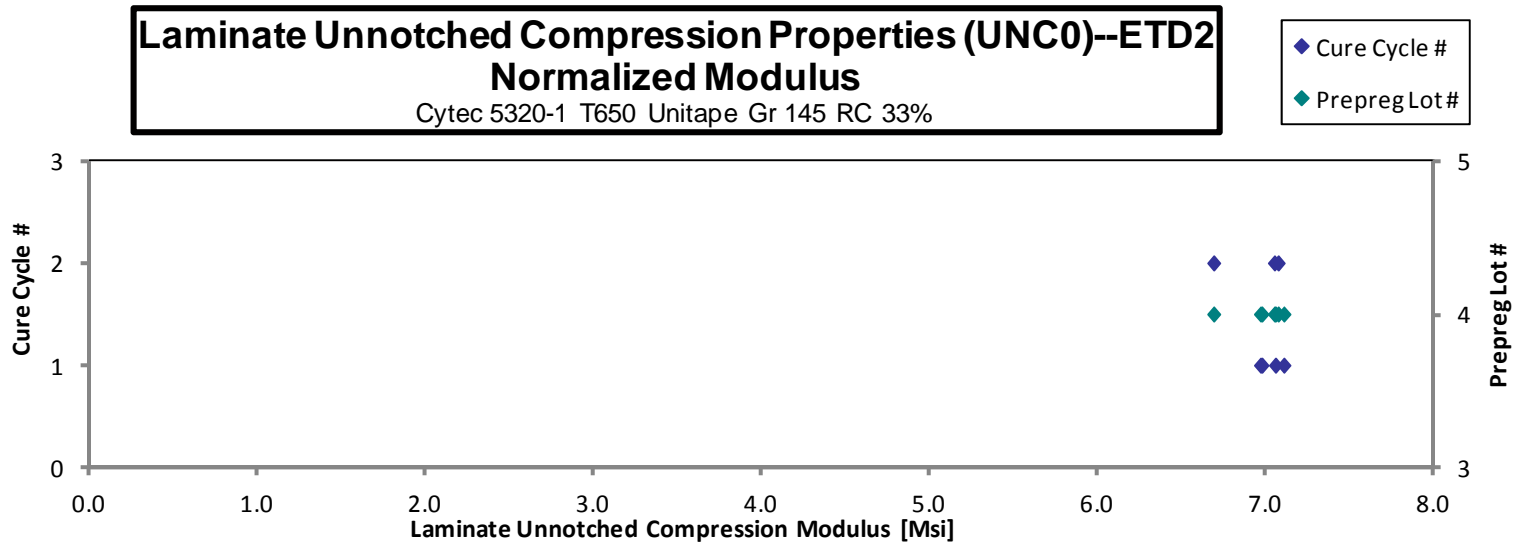
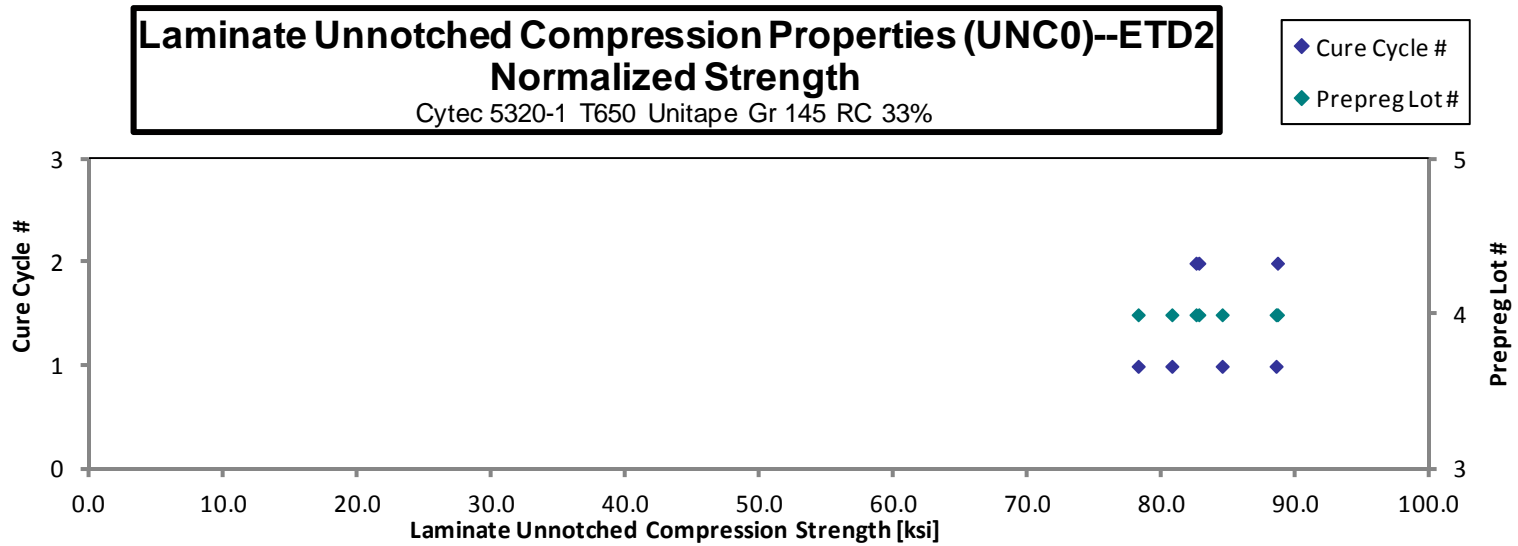
normalizing
 t_{ply} [in]
 0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUGRD11JE	D	C1	4	1	78.574	7.007	0.115	21	BGM
CUGRD11KE	D	C1	4	1	84.441	6.963	0.116	21	BGM
CUGRD11LE	D	C1	4	1	80.047	7.045	0.116	21	BGM/CIT
CUGRD11ME	D	C1	4	1	88.500	7.054	0.116	21	HGM/CIT
CUGRD21GE	D	C2	4	2	81.745	6.982	0.117	21	HGM
CUGRD21HE	D	C2	4	2	87.778	7.005	0.117	21	BGM / HIT
CUGRD21IE	D	C2	4	2	82.493	6.668	0.116	21	BGM

Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.0055	78.209	6.974
0.0055	84.478	6.966
0.0055	80.723	7.104
0.0055	88.500	7.054
0.0056	82.524	7.048
0.0056	88.605	7.071
0.0055	82.734	6.687

Average	83.368	6.961
Standard Dev.	3.749	0.133
Coeff. of Var. [%]	4.497	1.913
Min.	78.574	6.668
Max.	88.500	7.054
Number of Spec.	7	7

Average _{norm}	0.0055	83.682	6.987
Standard Dev. _{norm}		3.852	0.141
Coeff. of Var. [%] _{norm}		4.603	2.022
Min.	0.0055	78.209	6.687
Max.	0.0056	88.605	7.104
Number of Spec.	7	7	7

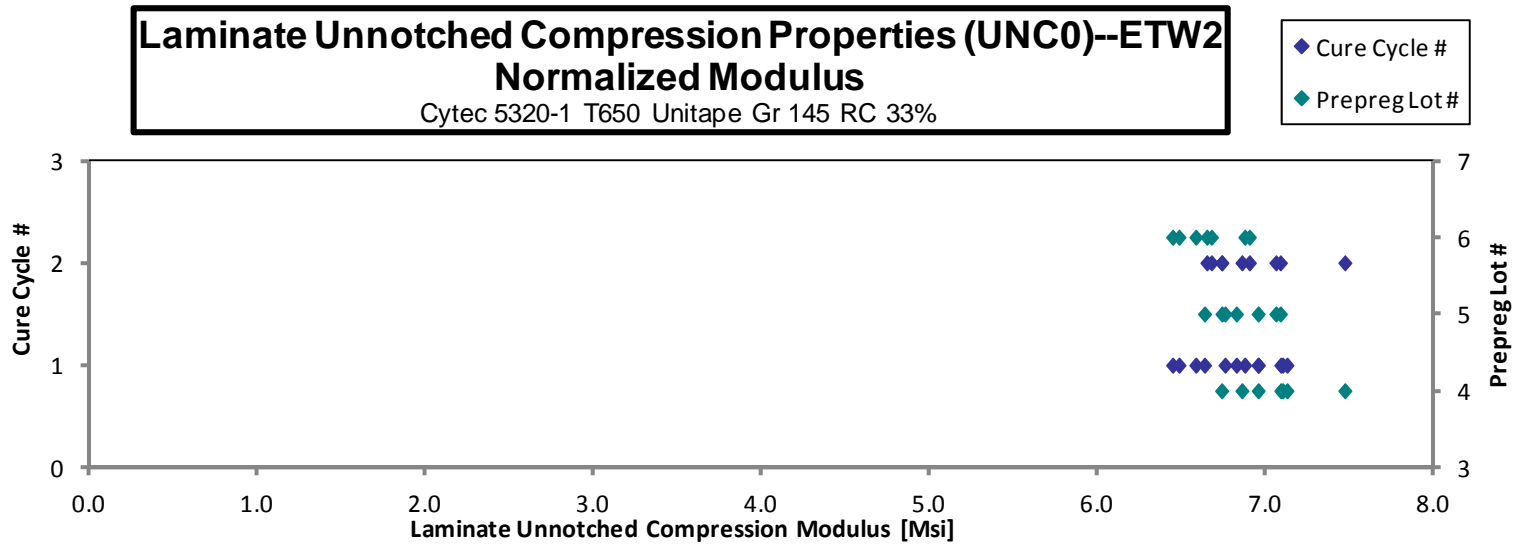
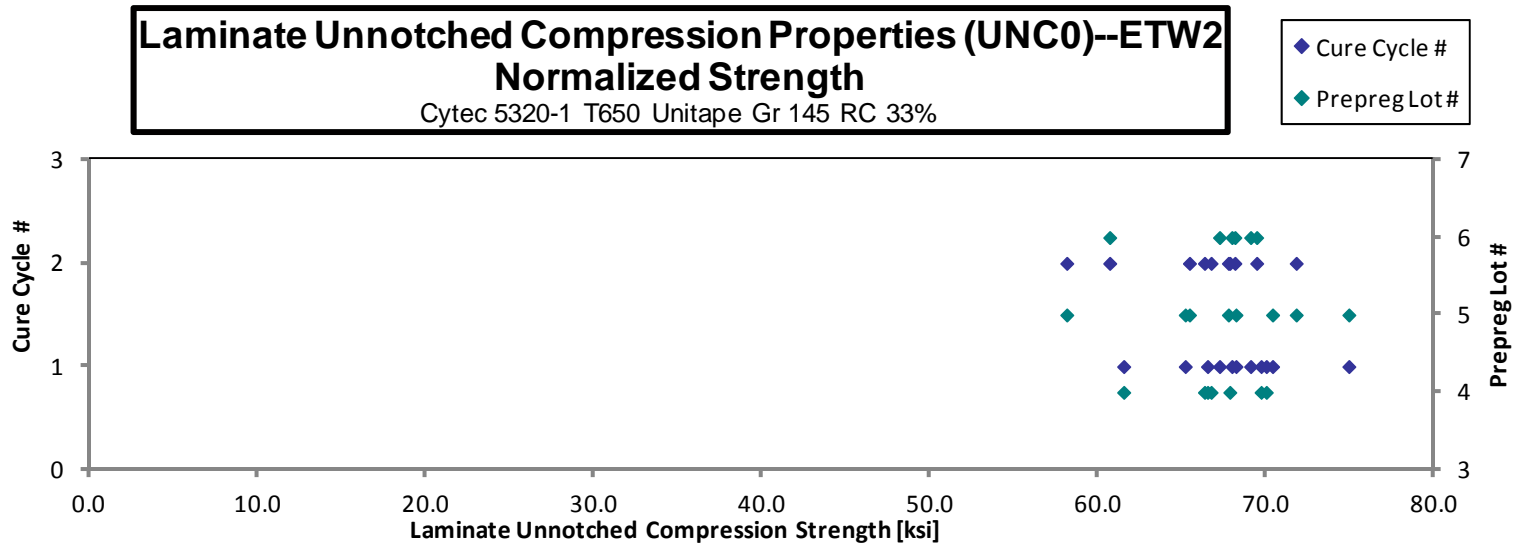


Laminate Unnotched Compression Properties (UNC0)--ETW2
Strength & Modulus
 Cytec 5320-1 T650 Unitape Gr 145 RC 33%

normalizing
 t_{ply} [in]
 0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
CUGRD13DF	D	C1	4	1		7.525	0.109	21	BGM / HIB	0.0052		7.086
CUGRD13EF	D	C1	4	1		7.159	0.112	21	HIT	0.0053		6.952
CUGRD13FF	D	C1	4	1		7.220	0.114	21	BGM	0.0054		7.097
CUGRD13GF	D	C1	4	1		7.226	0.114	21	BGM / HIB	0.0054		7.123
CUGRD13HF	D	C1	4	1	70.653		0.114	21	HIB / BGM	0.0054	69.690	
CUGRD13IF	D	C1	4	1	67.142		0.114	21	HIB / HGM	0.0054	66.503	
CUGRD13KF	D	C1	4	1	71.193		0.114	21	HIB / BGM	0.0054	69.999	
CUGRD13LF	D	C1	4	1	62.350		0.114	21	HIB / BGM	0.0054	61.513	
CUGRD23BF	D	C2	4	2		7.468	0.115	21	HIT / HIB / BGM	0.0055		7.468
CUGRD23CF	D	C2	4	2		6.920	0.114	21	HIB / BGM	0.0054		6.855
CUGRD23DF	D	C2	4	2		6.764	0.115	21	HIT / BGM	0.0055		6.734
CUGRD23EF	D	C2	4	2	67.894		0.115	21	BGM / HIB	0.0055	67.827	
CUGRD23FF	D	C2	4	2	66.693		0.116	21	BGM / HIB	0.0055	66.714	
CUGRD23GF	D	C2	4	2	66.631		0.115	21	BGM / HAB	0.0055	66.321	
CUGRE11DF	E	C1	5	1		6.694	0.114	21	HIT / BGM	0.0054		6.632
CUGRE11EF	E	C1	5	1		6.952	0.116	21	HAT / BGM	0.0055		6.952
CUGRE11FF	E	C1	5	1		6.752	0.116	21	HIB / BGM	0.0055		6.754
CUGRE11GF	E	C1	5	1		6.861	0.115	21	HIB / BGM	0.0055		6.822
CUGRE11HF	E	C1	5	1	68.040		0.116	21	HIT / BGM	0.0055	68.194	
CUGRE11IF	E	C1	5	1	75.377		0.115	21	HIT / HIB / BGM	0.0055	74.912	
CUGRE11JF	E	C1	5	1	70.739		0.115	21	BGM / HIB	0.0055	70.371	
CUGRE11KF	E	C1	5	1	65.352		0.115	21	BGM	0.0055	65.175	
CUGRE21BF	E	C2	5	2		6.968	0.112	21	BGM	0.0053		6.736
CUGRE21CF	E	C2	5	2		7.132	0.114	21	HIB / BGM	0.0054		7.057
CUGRE21DF	E	C2	5	2		7.134	0.115	21	BGM / HIB	0.0055		7.084
CUGRE21EF	E	C2	5	2	58.062		0.116	21	BGM	0.0055	58.125	
CUGRE21FF	E	C2	5	2	71.803		0.115	21	BGM / HIB	0.0055	71.779	
CUGRE21GF	E	C2	5	2	67.700		0.116	21	HAB / BGM	0.0055	67.744	
CUGRE21HF	E	C2	5	2	65.214		0.116	21	HAB / BGM	0.0055	65.426	
CUGRF11DF	F	C1	6	1		6.557	0.114	21	HGM	0.0054		6.481
CUGRF11EF	F	C1	6	1		6.956	0.114	21	BGM / HIB	0.0054		6.872
CUGRF11FF	F	C1	6	1		6.647	0.114	21	HIB / BGM	0.0054		6.581
CUGRF11GF	F	C1	6	1		6.529	0.114	21	HIB / BAT	0.0054		6.442
CUGRF11HF	F	C1	6	1	69.593		0.115	21	HGM	0.0055	69.066	
CUGRF11IF	F	C1	6	1	68.122		0.115	21	HIB / BGM	0.0055	67.953	
CUGRF11JF	F	C1	6	1	67.782		0.115	21	HGM / HIB	0.0055	67.218	
CUGRF21BF	F	C2	6	2		6.947	0.115	21	BGM	0.0055		6.900
CUGRF21CF	F	C2	6	2		6.679	0.115	21	BGM / HIB	0.0055		6.673
CUGRF21DF	F	C2	6	2		6.646	0.116	21	HAT / BGM	0.0055		6.646
CUGRF21EF	F	C2	6	2	69.135		0.116	21	BGM / HAB	0.0055	69.427	
CUGRF21FF	F	C2	6	2	67.421		0.117	21	HIB / BGM	0.0056	68.129	
CUGRF21GF	F	C2	6	2	60.211		0.116	21	BGM	0.0055	60.681	

Average	67.481	6.940	Average_{norm}	0.0055	67.275	6.855
Standard Dev.	3.891	0.282	Standard Dev._{norm}		3.754	0.247
Coeff. of Var. [%]	5.765	4.069	Coeff. of Var. [%]_{norm}		5.581	3.610
Min.	58.062	6.529	Min.	0.0052	58.125	6.442
Max.	75.377	7.525	Max.	0.0056	74.912	7.468
Number of Spec.	21	21	Number of Spec.	42	21	21



4.10 “25/50/25” Unnotched Compression 1 Properties (UNC1)

Laminate Unnotched Compression Properties (UNC1)--RTD
Strength & Modulus
 Cytec 5320-1 T650 Unitape Gr 145 RC 33%

normalizing
 t_{ply} [in]
 0.0055

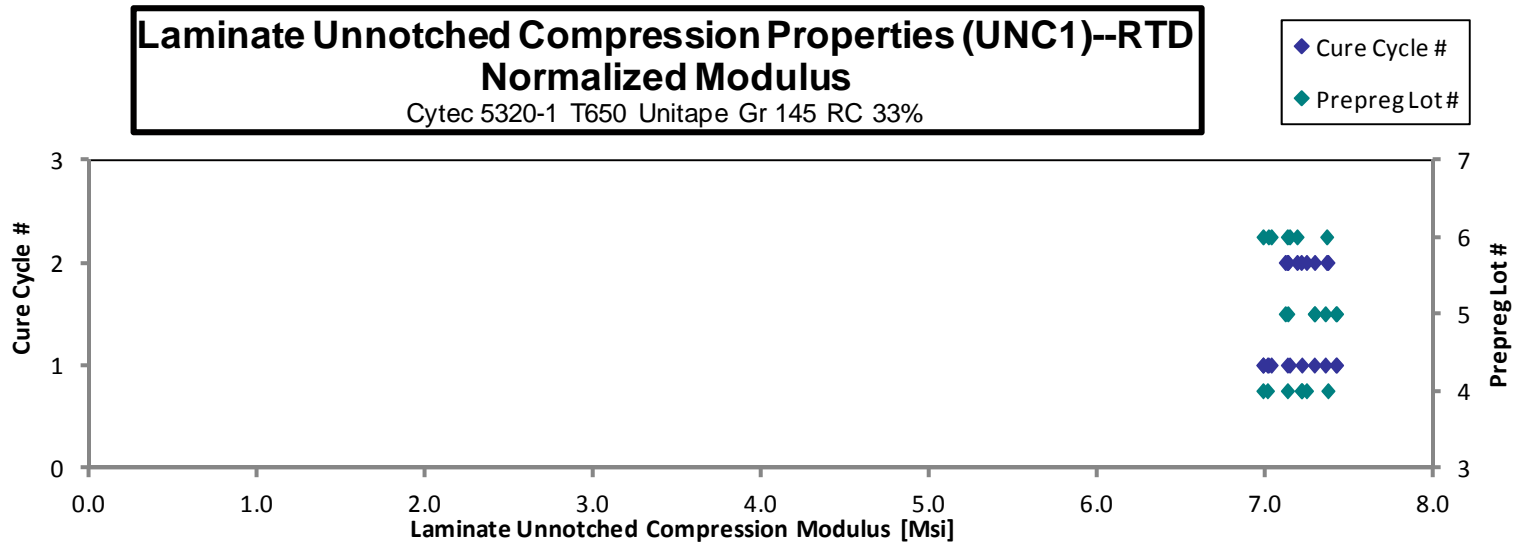
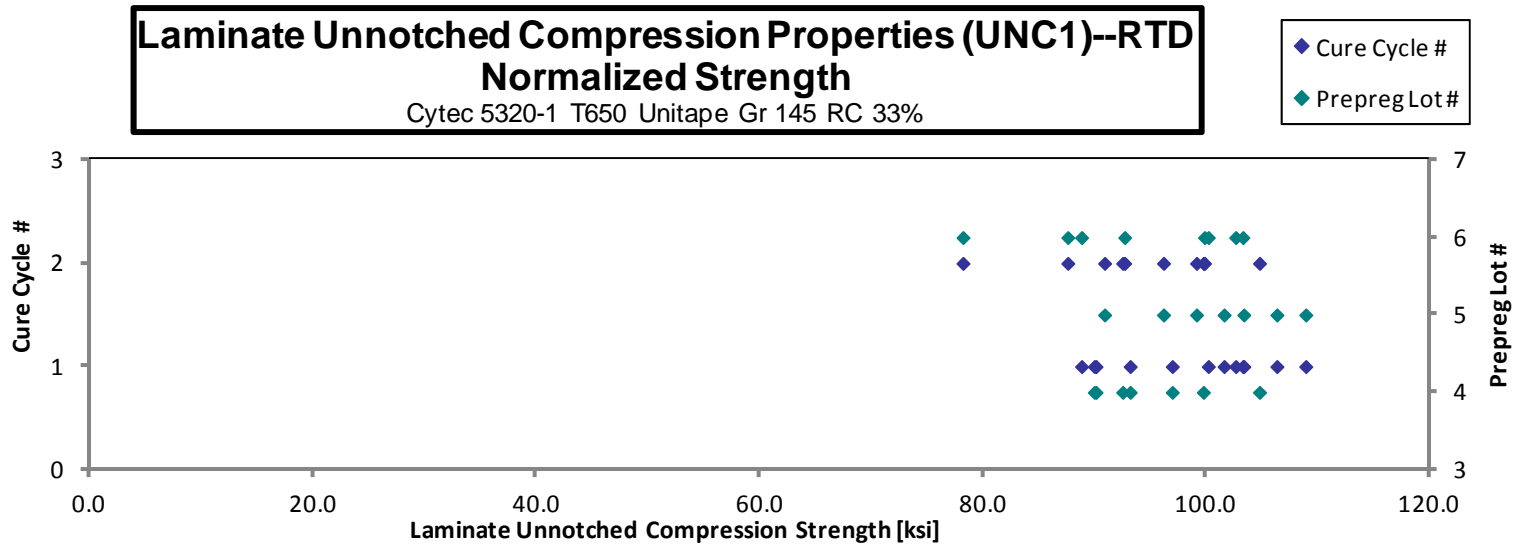
Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksj]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUGWD111A	D	C1	4	1	93.712	7.515	0.127	24	BGM
CUGWD112A	D	C1	4	1	*	7.040	0.131	24	HIB
CUGWD113A	D	C1	4	1	95.031	7.122	0.129	24	BGM
CUGWD114A	D	C1	4	1	97.776	7.190	0.131	24	BGM
CUGWD115A	D	C1	4	1	91.303	**	0.130	24	BGM
CUGWD211A	D	C2	4	2	97.314	7.753	0.125	24	HGM
CUGWD212A	D	C2	4	2	99.813	7.217	0.132	24	BGM
CUGWD213A	D	C2	4	2	105.790	7.313	0.131	24	HGM
CUGWE111A	E	C1	5	1	105.132	7.414	0.130	24	BGM
CUGWE112A	E	C1	5	1	106.483	7.433	0.132	24	BGM
CUGWE113A	E	C1	5	1	109.295	7.444	0.131	24	BGM
CUGWE114A	E	C1	5	1	101.815	7.370	0.132	24	BGM
CUGWE211A	E	C2	5	2	93.428	7.315	0.128	24	BGM
CUGWE212A	E	C2	5	2	100.814	7.253	0.130	24	BGM
CUGWE213A	E	C2	5	2	97.152	7.366	0.131	24	BGM
CUGWF111A	F	C1	6	1	93.723	7.420	0.125	24	BGM
CUGWF112A	F	C1	6	1	100.410	7.031	0.132	24	BGM
CUGWF113A	F	C1	6	1	102.599	7.095	0.133	24	BGM
CUGWF114A	F	C1	6	1	100.966	6.870	0.134	24	BGM
CUGWF211A	F	C2	6	2	84.338	7.750	0.122	24	BGM
CUGWF212A	F	C2	6	2	99.302	7.090	0.133	24	BGM
CUGWF213A	F	C2	6	2	87.104	7.322	0.133	24	BGM
CUGWF214A	F	C2	6	2	91.645	**	0.133	24	BGM

Avg. t_{ply} [in]	Strength _{norm} [ksj]	Modulus _{norm} [Msi]
0.0053	89.922	7.211
0.0055		7.006
0.0054	93.132	6.980
0.0055	96.905	7.126
0.0054	90.076	
0.0052	92.467	7.367
0.0055	99.690	7.208
0.0054	104.718	7.239
0.0054	103.310	7.286
0.0055	106.271	7.418
0.0055	108.860	7.414
0.0055	101.545	7.351
0.0053	90.845	7.113
0.0054	99.076	7.128
0.0054	96.121	7.288
0.0052	88.788	7.029
0.0055	100.134	7.012
0.0055	103.230	7.138
0.0056	102.582	6.980
0.0051	78.165	7.183
0.0055	99.791	7.125
0.0055	87.550	7.359
0.0056	92.643	

*Strength not reported due to unacceptable failure mode.

**Specimen was not gaged.

Average	97.952	7.301	Average_{norm}	0.0054	96.628	7.189
Standard Dev.	6.296	0.223	Standard Dev._{norm}		7.386	0.143
Coeff. of Var. [%]	6.428	3.051	Coeff. of Var. [%]_{norm}		7.643	1.991
Min.	84.338	6.870	Min.	0.0051	78.165	6.980
Max.	109.295	7.753	Max.	0.0056	108.860	7.418
Number of Spec.	22	21	Number of Spec.	23	22	21



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

Cytec 5320-1 T650 Unitape Gr 145 RC 33%

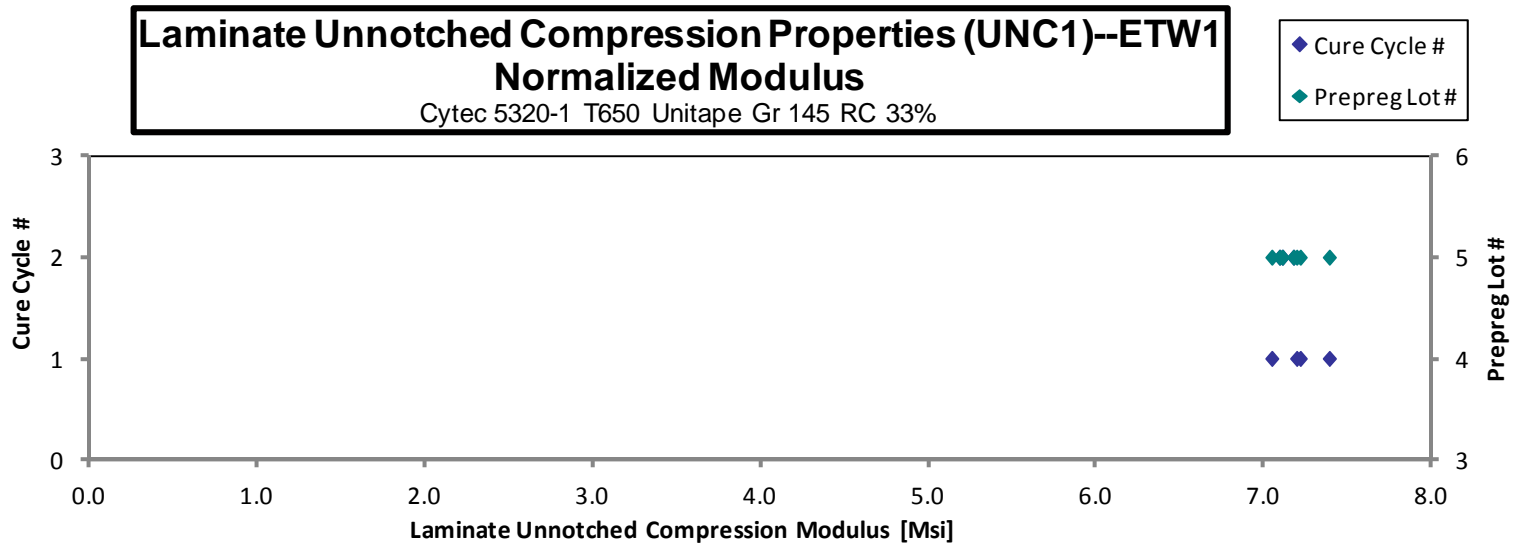
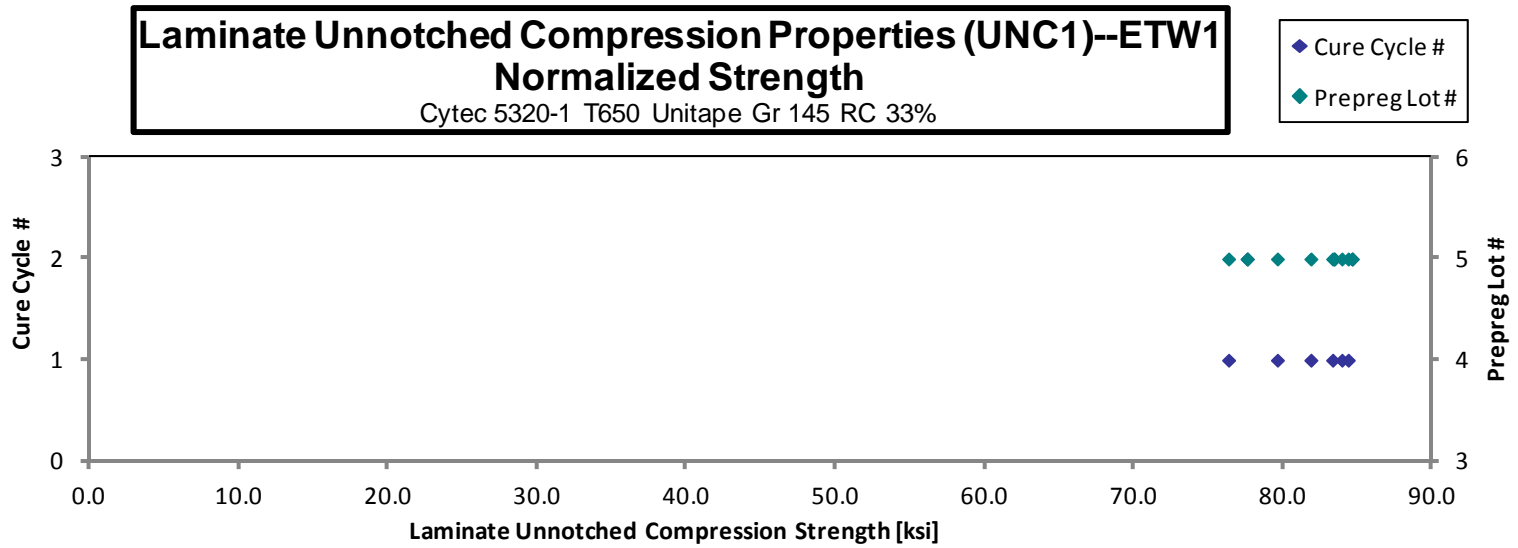
normalizing
 t_{ply} [in]
 0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUGWE117D	E	C1	5	1		7.142	0.133	24	BGM
CUGWE118D	E	C1	5	1		7.371	0.132	24	BGM
CUGWE119D	E	C1	5	1		7.207	0.132	24	HIT/CIT/CIB
CUGWE11AD	E	C1	5	1		7.072	0.131	24	BGM / HIT/CIT
CUGWE11BD	E	C1	5	1	81.898		0.132	24	BGM
CUGWE11CD	E	C1	5	1	84.023		0.133	24	BGM
CUGWE11DD	E	C1	5	1	80.040		0.131	24	BGM
CUGWE11ED	E	C1	5	1	83.710		0.132	24	BGM / CIT
CUGWE11FD	E	C1	5	1	83.493		0.132	24	BGM
CUGWE11GD	E	C1	5	1	76.963		0.131	24	BGM
CUGWE217D	E	C2	5	2		7.132	0.132	24	BGM / CIT / CIB
CUGWE218D	E	C2	5	2		7.131	0.131	24	CIT / BGM
CUGWE219D	E	C2	5	2		7.142	0.133	24	CIT / HIB / BGM
CUGWE21BD	E	C2	5	2	83.741		0.132	24	BGM
CUGWE21CD	E	C2	5	2	84.828		0.132	24	BGM / HIB
CUGWE21ED	E	C2	5	2	78.989		0.130	24	BGM

Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.0055		7.192
0.0055		7.386
0.0055		7.213
0.0055		7.044
0.0055	81.859	
0.0055	84.366	
0.0055	79.615	
0.0055	83.940	
0.0055	83.319	
0.0055	76.344	
0.0055		7.107
0.0055		7.090
0.0055		7.173
0.0055	83.424	
0.0055	84.627	
0.0054	77.591	

Average 81.965 7.171
Standard Dev. 2.705 0.097
Coeff. of Var. [%] 3.301 1.347
Min. 76.963 7.072
Max. 84.828 7.371
Number of Spec. 9 7

Average_{norm} 0.0055 81.676 7.172
Standard Dev._{norm} 3.087 0.112
Coeff. of Var. [%]_{norm} 3.779 1.564
Min. 0.0054 76.344 7.044
Max. 0.0055 84.627 7.386
Number of Spec. 16 9 7

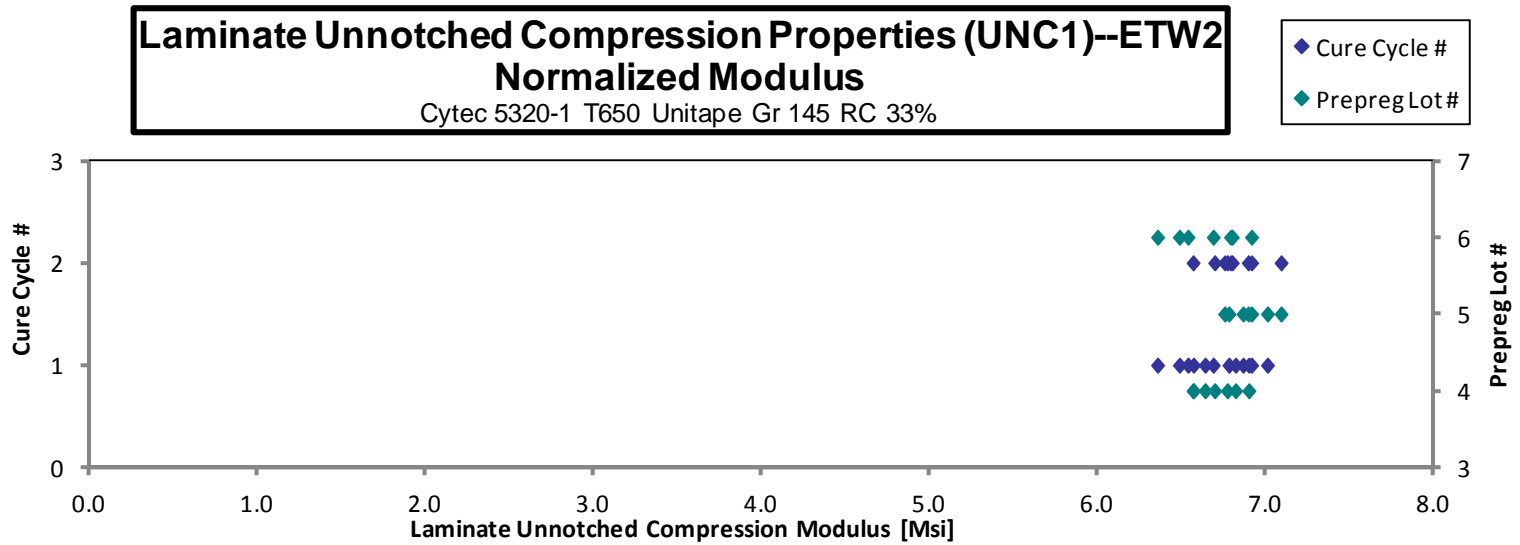
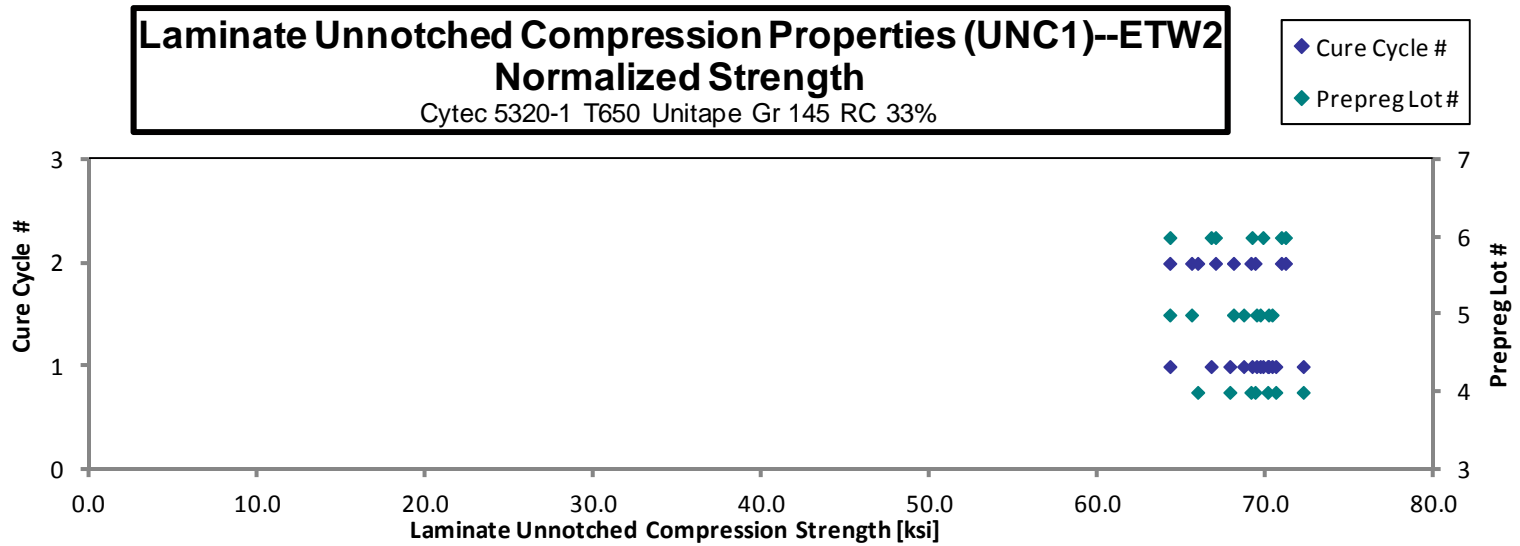


Laminate Unnotched Compression Properties (UNC1)--ETW2
Strength & Modulus
 Cytec 5320-1 T650 Unitape Gr 145 RC 33%

normalizing
 t_{ply} [in]
 0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
CUGWD117F	D	C1	4	1		7.032	0.129	24	BGM	0.0054		6.896
CUGWD118F	D	C1	4	1		6.766	0.129	24	BGM	0.0054		6.636
CUGWD119F	D	C1	4	1		6.956	0.129	24	BGM	0.0054		6.817
CUGWD11AF	D	C1	4	1		6.684	0.130	24	BGM / HGM	0.0054		6.567
CUGWD11BF	D	C1	4	1	71.774		0.130	24	HGM	0.0054	70.564	
CUGWD11DF	D	C1	4	1	70.355		0.131	24	BGM / HAT	0.0055	70.082	
CUGWD11EF	D	C1	4	1	72.456		0.132	24	BGM	0.0055	72.195	
CUGWD11FF	D	C1	4	1	68.212		0.131	24	BGM	0.0055	67.831	
CUGWD217F	D	C2	4	2		6.793	0.132	24	BGM	0.0055		6.768
CUGWD218F	D	C2	4	2		6.762	0.131	24	BGM	0.0054		6.693
CUGWD219F	D	C2	4	2		6.641	0.130	24	HGM / HIT	0.0054		6.564
CUGWD21AF	D	C2	4	2	67.116		0.130	24	BGM	0.0054	65.915	
CUGWD21BF	D	C2	4	2	69.509		0.131	24	HGM	0.0055	69.081	
CUGWD21CF	D	C2	4	2	70.047		0.131	24	BGM / HIT	0.0054	69.330	
CUGWE11JF	E	C1	5	1		6.754	0.132	24	CIB/CIT/BGM	0.0055		6.778
CUGWE11KF	E	C1	5	1		6.818	0.133	24	BGM	0.0055		6.862
CUGWE11LF	E	C1	5	1		6.999	0.132	24	HGM	0.0055		7.007
CUGWE11MF	E	C1	5	1		6.860	0.133	24	BGM	0.0055		6.912
CUGWE11NF	E	C1	5	1	70.472		0.132	24	BGM / HIT	0.0055	70.346	
CUGWE11OF	E	C1	5	1	70.192		0.132	24	HGM	0.0055	70.133	
CUGWE11PF	E	C1	5	1	68.718		0.133	24	BGM	0.0056	69.414	
CUGWE11QF	E	C1	5	1	68.919		0.131	24	HGM	0.0055	68.652	
CUGWE11RF	E	C1	5	1	69.293		0.133	24	BGM	0.0055	69.634	
CUGWE21HF	E	C2	5	2		6.915	0.132	24	BGM	0.0055		6.893
CUGWE21IF	E	C2	5	2		6.780	0.131	24	BGM	0.0055		6.752
CUGWE21JF	E	C2	5	2		7.114	0.132	24	BGM	0.0055		7.088
CUGWE21KF	E	C2	5	2	64.524		0.131	24	BGM	0.0055	64.255	
CUGWE21LF	E	C2	5	2	65.883		0.131	24	BGM	0.0055	65.552	
CUGWE21MF	E	C2	5	2	68.420		0.131	24	BGM	0.0055	68.044	
CUGWF118F	F	C1	6	1		6.518	0.132	24	CIT / BGM	0.0055		6.534
CUGWF119F	F	C1	6	1		6.304	0.133	24	BGM	0.0055		6.353
CUGWF11AF	F	C1	6	1		6.634	0.133	24	BGM	0.0055		6.684
CUGWF11BF	F	C1	6	1		6.440	0.133	24	HIB / BGM	0.0055		6.483
CUGWF11CF	F	C1	6	1	63.768		0.133	24	BGM	0.0055	64.263	
CUGWF11DF	F	C1	6	1	66.066		0.133	24	BGM	0.0056	66.716	
CUGWF11EF	F	C1	6	1	68.378		0.133	24	BGM	0.0056	69.148	
CUGWF11FF	F	C1	6	1	69.353		0.133	24	BGM	0.0055	69.799	
CUGWF217F	F	C2	6	2		6.718	0.133	24	CIT / CIB / BGM	0.0056		6.788
CUGWF218F	F	C2	6	2		6.840	0.133	24	BGM	0.0056		6.912
CUGWF219F	F	C2	6	2		6.722	0.133	24	BGM / CIT	0.0056		6.797
CUGWF21AF	F	C2	6	2	70.110		0.133	24	BGM / HIB	0.0056	70.893	
CUGWF21BF	F	C2	6	2	66.347		0.133	24	HGM	0.0056	66.976	
CUGWF21CF	F	C2	6	2	70.734		0.133	24	HGM	0.0055	71.142	

Average	68.666	6.764	Average_{norm}	0.0055	68.635	6.752
Standard Dev.	2.248	0.193	Standard Dev._{norm}		2.199	0.182
Coeff. of Var. [%]	3.274	2.858	Coeff. of Var. [%]_{norm}		3.204	2.693
Min.	63.768	6.304	Min.	0.0054	64.255	6.353
Max.	72.456	7.114	Max.	0.0056	72.195	7.088
Number of Spec.	22	21	Number of Spec.	43	22	21



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

Laminate Unnotched Compression Properties (UNC2)--RTD
Strength & Modulus
 Cytec 5320-1 T650 Unitape Gr 145 RC 33%

normalizing
 t_{ply} [in]
 0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUGXD111A	D	C1	4	1	*	5.036	0.104	20	CIB (END CRUSH) / BGM
CUGXD112A	D	C1	4	1	78.152	4.773	0.108	20	BGM
CUGXD113A	D	C1	4	1	73.521	4.693	0.108	20	BGM
CUGXD114A	D	C1	4	1	76.166	4.822	0.109	20	BGM
CUGXD115A	D	C1	4	1	74.924	**	0.108	20	BGM
CUGXD211A	D	C2	4	2	68.731	5.081	0.103	20	BGM
CUGXD212A	D	C2	4	2	77.128	4.971	0.109	20	BGM
CUGXD213A	D	C2	4	2	71.849	4.662	0.109	20	BGM
CUGXE111A	E	C1	5	1	77.452	5.239	0.102	20	BGM
CUGXE112A	E	C1	5	1	77.530	4.875	0.109	20	BGM
CUGXE113A	E	C1	5	1	78.008	4.963	0.109	20	BGM
CUGXE114A	E	C1	5	1	71.085	4.767	0.109	20	BGM
CUGXE211A	E	C2	5	2	69.988	5.059	0.107	20	BGM
CUGXE212A	E	C2	5	2	75.201	4.976	0.109	20	BGM
CUGXE213A	E	C2	5	2	77.079	4.628	0.110	20	BGM
CUGXF111A	F	C1	6	1	70.307	5.219	0.102	20	BGM
CUGXF112A	F	C1	6	1	70.054	4.699	0.111	20	BGM
CUGXF113A	F	C1	6	1	69.355	4.622	0.111	20	BGM
CUGXF114A	F	C1	6	1	75.164	4.514	0.111	20	BGM
CUGXF211A	F	C2	6	2	69.706	4.905	0.104	20	BGM
CUGXF212A	F	C2	6	2	74.425	4.634	0.111	20	BGM
CUGXF213A	F	C2	6	2	70.145	4.540	0.111	20	BGM

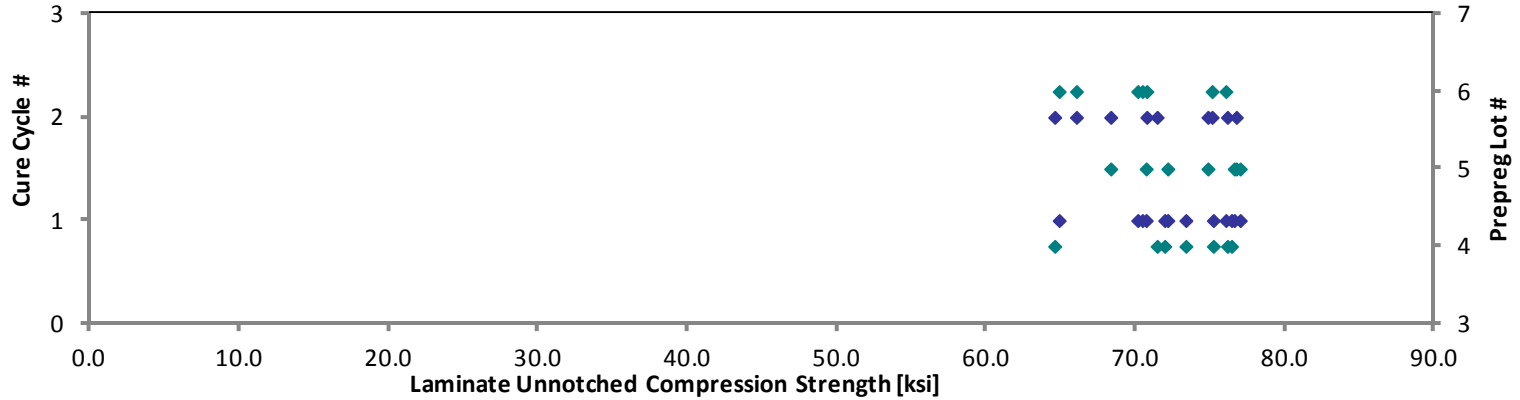
Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.0052		4.738
0.0054	76.420	4.667
0.0054	71.950	4.593
0.0054	75.205	4.761
0.0054	73.366	
0.0052	64.583	4.775
0.0054	76.146	4.908
0.0055	71.441	4.635
0.0051	72.153	4.881
0.0054	76.605	4.817
0.0054	77.006	4.899
0.0055	70.706	4.741
0.0054	68.334	4.939
0.0055	74.842	4.953
0.0055	76.746	4.608
0.0051	64.882	4.817
0.0055	70.452	4.725
0.0056	70.143	4.674
0.0056	76.044	4.567
0.0052	66.039	4.647
0.0056	75.119	4.677
0.0055	70.751	4.579

*Strength not reported due to unacceptable failure mode.
 **Specimen was not gaged.

Average	73.618	4.842
Standard Dev.	3.344	0.214
Coeff. of Var. [%]	4.543	4.427
Min.	68.731	4.514
Max.	78.152	5.239
Number of Spec.	21	21

Average_{norm}	0.0054	72.330	4.743
Standard Dev_{norm}		3.960	0.122
Coeff. of Var. [%]_{norm}		5.475	2.581
Min.	0.0051	64.583	4.567
Max.	0.0056	77.006	4.953
Number of Spec.	22	21	21

Laminate Unnotched Compression Properties (UNC2)--RTD
Normalized Strength
Cytec 5320-1 T650 Unitape Gr 145 RC 33%



Laminate Unnotched Compression Properties (UNC2)--ETW2
Strength & Modulus
 Cytec 5320-1 T650 Unitape Gr 145 RC 33%

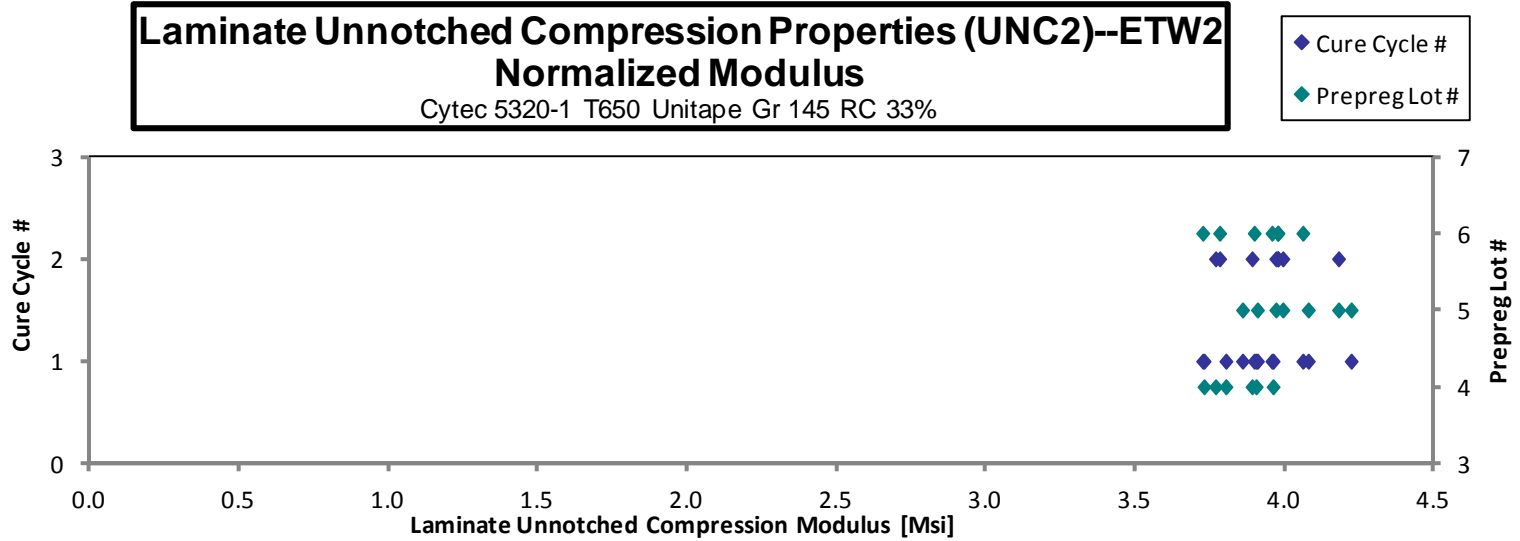
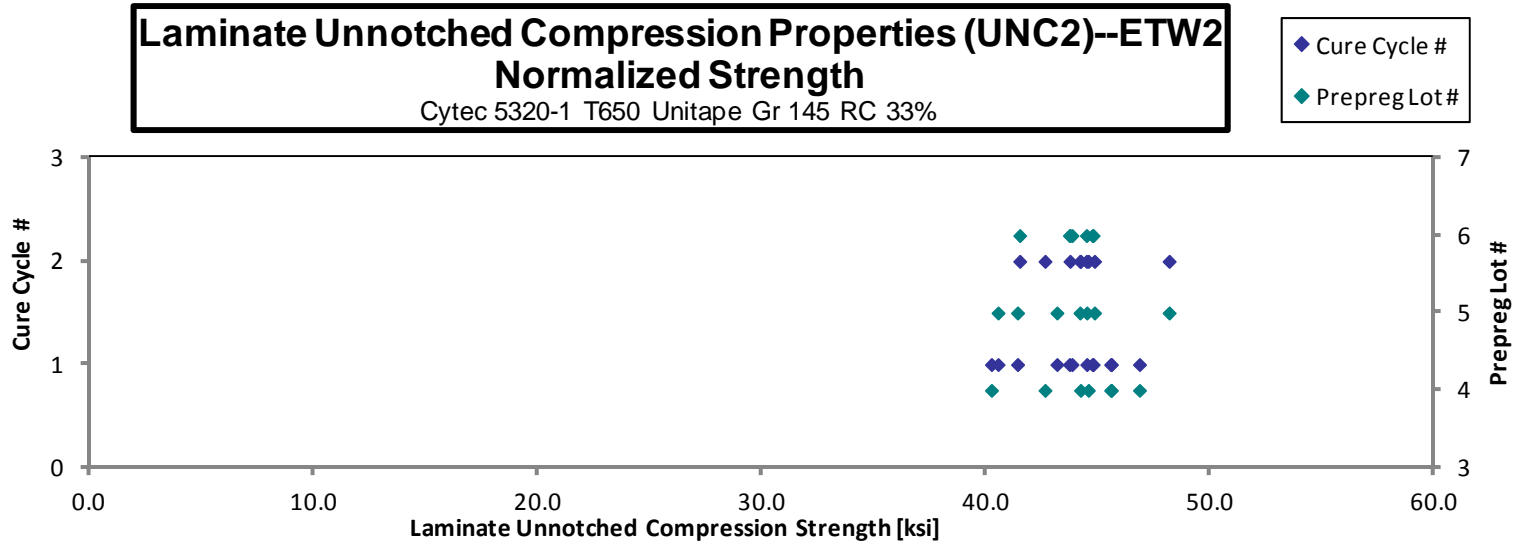
normalizing
 t_{ply} [in]
 0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUGXD117F	D	C1	4	1		4.051	0.108	20	BGM
CUGXD118F	D	C1	4	1		3.964	0.108	20	BGM
CUGXD119F	D	C1	4	1		3.827	0.109	20	DIT / CIT
CUGXD11AF	D	C1	4	1		3.784	0.108	20	BGM
CUGXD11BF	D	C1	4	1	40.794		0.108	20	BGM
CUGXD11CF	D	C1	4	1	46.121		0.109	20	BGM
CUGXD11DF	D	C1	4	1	47.839		0.108	20	BGM / DGB
CUGXD11EF	D	C1	4	1	46.038		0.109	20	BGM
CUGXD218F	D	C2	4	2		3.944	0.109	20	BGM
CUGXD219F	D	C2	4	2		3.821	0.108	20	BGM
CUGXD21AF	D	C2	4	2	43.177		0.109	20	BGM
CUGXD21BF	D	C2	4	2	44.768		0.109	20	BGM
CUGXD21CF	D	C2	4	2	44.876		0.109	20	BGM
CUGXE117F	E	C1	5	1		3.878	0.109	20	BGM
CUGXE118F	E	C1	5	1		3.924	0.110	20	BGM
CUGXE119F	E	C1	5	1		4.175	0.111	20	BGM
CUGXE11AF	E	C1	5	1		4.061	0.110	20	BGM
CUGXE11BF	E	C1	5	1	43.376		0.109	20	BGM
CUGXE11CF	E	C1	5	1	40.288		0.111	20	BGM
CUGXE11DF	E	C1	5	1	44.625		0.110	20	BGM
CUGXE11EF	E	C1	5	1	41.283		0.110	20	BGM
CUGXE217F	E	C2	5	2		3.949	0.111	20	BGM
CUGXE218F	E	C2	5	2		3.959	0.111	20	BGM
CUGXE219F	E	C2	5	2		4.160	0.111	20	BGM
CUGXE21AF	E	C2	5	2	44.012		0.110	20	BGM
CUGXE21BF	E	C2	5	2	45.025		0.110	20	BGM
CUGXE21CF	E	C2	5	2	47.853		0.111	20	BGM
CUGXF117F	F	C1	6	1		3.844	0.112	20	BGM
CUGXF118F	F	C1	6	1		4.011	0.111	20	BGM
CUGXF119F	F	C1	6	1		3.912	0.111	20	BGM
CUGXF11AF	F	C1	6	1		3.677	0.111	20	BGM
CUGXF11BF	F	C1	6	1	43.155		0.111	20	BGM
CUGXF11CF	F	C1	6	1	43.618		0.111	20	BGM
CUGXF11DF	F	C1	6	1	44.106		0.112	20	BGM
CUGXF11EF	F	C1	6	1	44.249		0.111	20	BGM
CUGXF217F	F	C2	6	2		3.936	0.111	20	BGM
CUGXF218F	F	C2	6	2		3.743	0.111	20	BGM
CUGXF219F	F	C2	6	2		3.928	0.111	20	BGM
CUGXF21AF	F	C2	6	2	42.972		0.112	20	BGM
CUGXF21BF	F	C2	6	2	41.064		0.111	20	BGM
CUGXF21CF	F	C2	6	2	44.030		0.111	20	BGM

Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.0054		3.960
0.0054		3.903
0.0055		3.802
0.0054		3.729
0.0054	40.233	
0.0054	45.587	
0.0054	46.839	
0.0054	45.557	
0.0054		3.890
0.0054		3.768
0.0054	42.622	
0.0054	44.208	
0.0055	44.555	
0.0055		3.858
0.0055		3.908
0.0056		4.222
0.0055		4.078
0.0055	43.154	
0.0055	40.526	
0.0055	44.488	
0.0055	41.396	
0.0055		3.970
0.0055		3.993
0.0055		4.179
0.0055	44.182	
0.0055	44.831	
0.0055	48.163	
0.0056		3.897
0.0056		4.060
0.0056		3.956
0.0056		3.725
0.0056	43.714	
0.0055	43.827	
0.0056	44.732	
0.0056	44.772	
0.0056		3.976
0.0056		3.781
0.0056		3.976
0.0056	43.739	
0.0056	41.494	
0.0056	44.470	

Average 43.965 3.927
 Standard Dev. 2.051 0.127
 Coeff. of Var. [%] 4.665 3.236
 Min. 40.288 3.677
 Max. 47.853 4.175
 Number of Spec. 21 20

Average_{norm} 0.0055 43.957 3.932
 Standard Dev_{norm} 1.937 0.136
 Coeff. of Var. [%]_{norm} 4.408 3.470
 Min. 0.0054 40.233 3.725
 Max. 0.0056 48.163 4.222
 Number of Spec. 41 21 20



4.12 “50/40/10” Unnotched Compression 3 Properties (UNC3)

Laminate Unnotched Compression Properties (UNC3)--RTD
Strength & Modulus
 Cytec 5320-1 T650 Unitape Gr 145 RC 33%

normalizing
 t_{ply} [in]
 0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUGYD111A	D	C1	4	1	142.082	11.573	0.106	20	BGM
CUGYD112A	D	C1	4	1	129.410	10.902	0.110	20	BGM
CUGYD113A	D	C1	4	1	129.199	10.493	0.107	20	BGM
CUGYD114A	D	C1	4	1	134.536	10.740	0.109	20	BGM
CUGYD211A	D	C2	4	2	*	11.324	0.105	20	HIT
CUGYD212A	D	C2	4	2	*	11.375	0.109	20	HIT
CUGYD213A	D	C2	4	2	127.028	11.051	0.107	20	BGM
CUGYD214A	D	C2	4	2	132.296	**	0.108	20	BGM
CUGYD215A	D	C2	4	2	128.591	**	0.107	20	BGM
CUGYE111A	E	C1	5	1	137.217	11.282	0.109	20	BGM
CUGYE112A	E	C1	5	1	129.252	11.268	0.111	20	BGM
CUGYE113A	E	C1	5	1	126.180	11.013	0.109	20	BGM
CUGYE114A	E	C1	5	1	128.453	11.036	0.110	20	BGM
CUGYE211A	E	C2	5	2	131.775	11.224	0.107	20	*BGM
CUGYE212A	E	C2	5	2	132.016	11.194	0.110	20	BGM
CUGYE213A	E	C2	5	2	124.214	11.103	0.108	20	*BGM
CUGYF111A	F	C1	6	1	*	10.987	0.106	20	CIB (END CRUSH)
CUGYF112A	F	C1	6	1	133.972	10.831	0.109	20	BGM
CUGYF113A	F	C1	6	1	134.109	10.959	0.110	20	BGM
CUGYF114A	F	C1	6	1	123.856	10.757	0.110	20	BGM
CUGYF115A	F	C1	6	1	129.081	**	0.109	20	BGM
CUGYF211A	F	C2	6	2	133.011	10.798	0.110	20	BGM
CUGYF212A	F	C2	6	2	124.536	10.715	0.111	20	BGM
CUGYF213A	F	C2	6	2	128.721	11.231	0.111	20	BGM

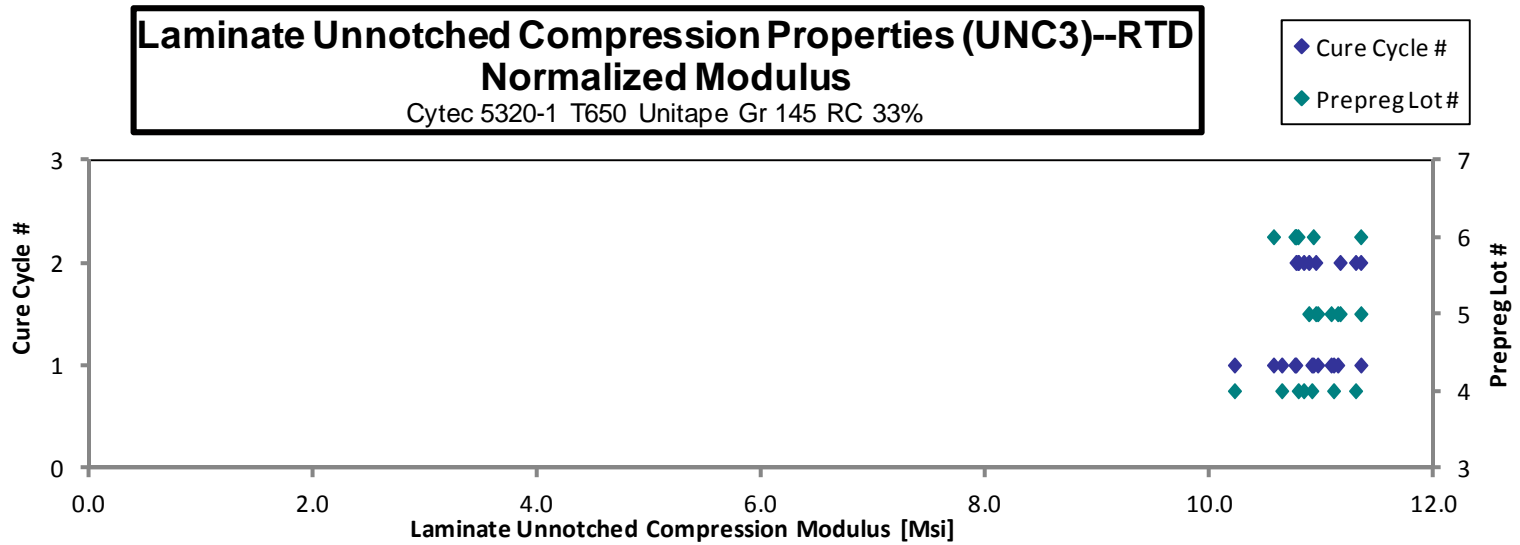
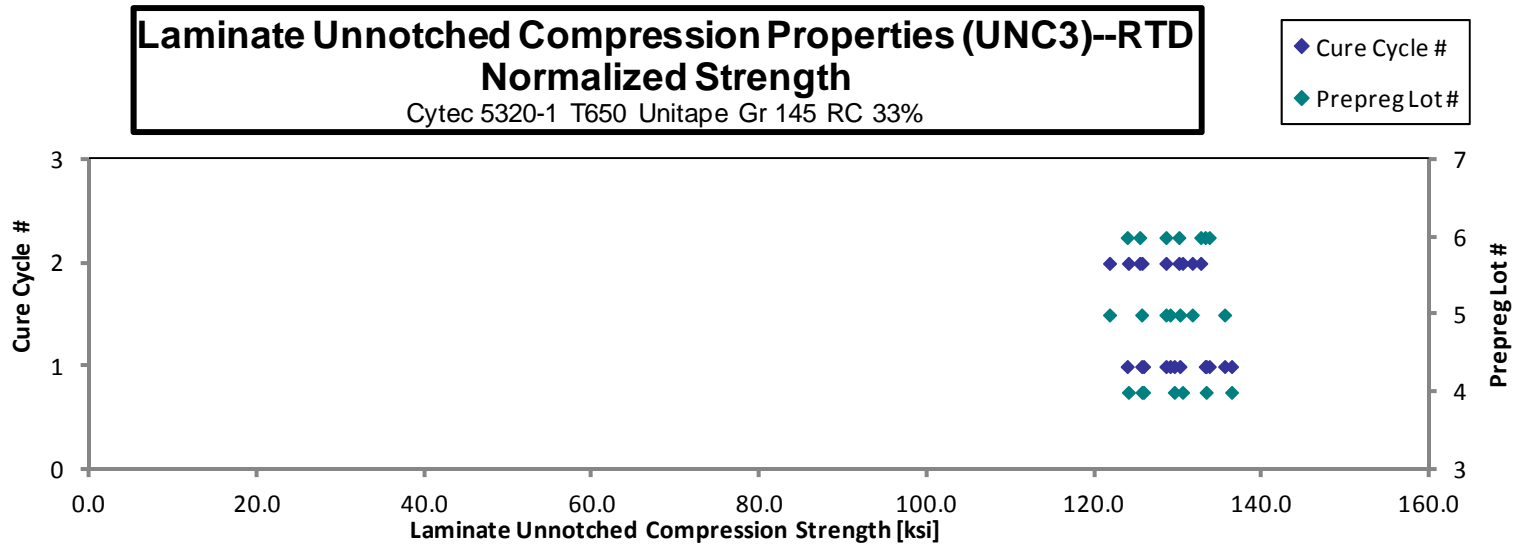
Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.0053	136.286	11.101
0.0055	129.454	10.906
0.0054	125.778	10.215
0.0054	133.252	10.637
0.0053		10.834
0.0055		11.297
0.0054	123.968	10.785
0.0054	130.431	
0.0054	125.595	
0.0054	135.455	11.137
0.0055	130.118	11.344
0.0055	125.549	10.958
0.0055	128.949	11.079
0.0054	128.451	10.941
0.0055	131.596	11.159
0.0054	121.715	10.879
0.0053		10.564
0.0055	133.134	10.764
0.0055	133.622	10.919
0.0055	123.827	10.755
0.0055	128.450	
0.0055	132.602	10.765
0.0055	125.328	10.783
0.0056	129.993	11.342

*Strength not reported due to unacceptable failure mode.

**Specimen was not gaged.

Average	130.454	11.041
Standard Dev.	4.480	0.264
Coeff. of Var. [%]	3.434	2.390
Min.	123.856	10.493
Max.	142.082	11.573
Number of Spec.	21	21

Average _{norm}	0.0054	129.217	10.913
Standard Dev. _{norm}		4.047	0.273
Coeff. of Var. [%] _{norm}		3.132	2.500
Min.	0.0053	121.715	10.215
Max.	0.0056	136.286	11.344
Number of Spec.	24	21	21



Laminate Unnotched Compression Properties (UNC3)--ETW2
Strength & Modulus
 Cytec 5320-1 T650 Unitape Gr 145 RC 33%

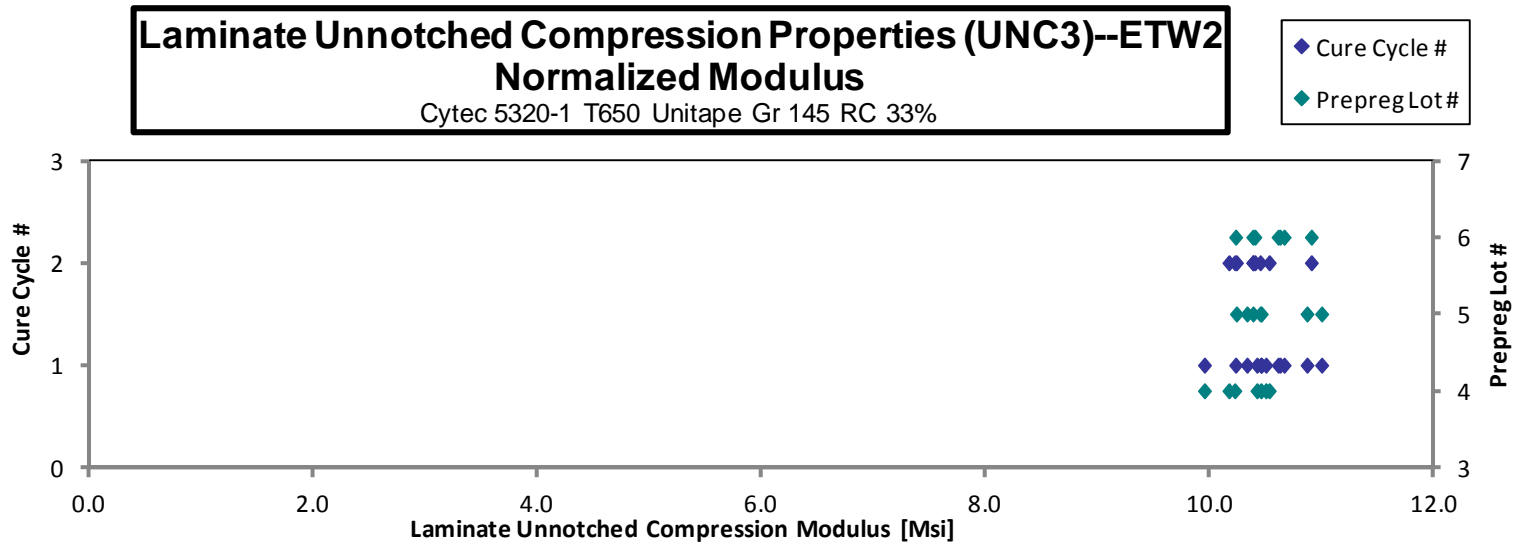
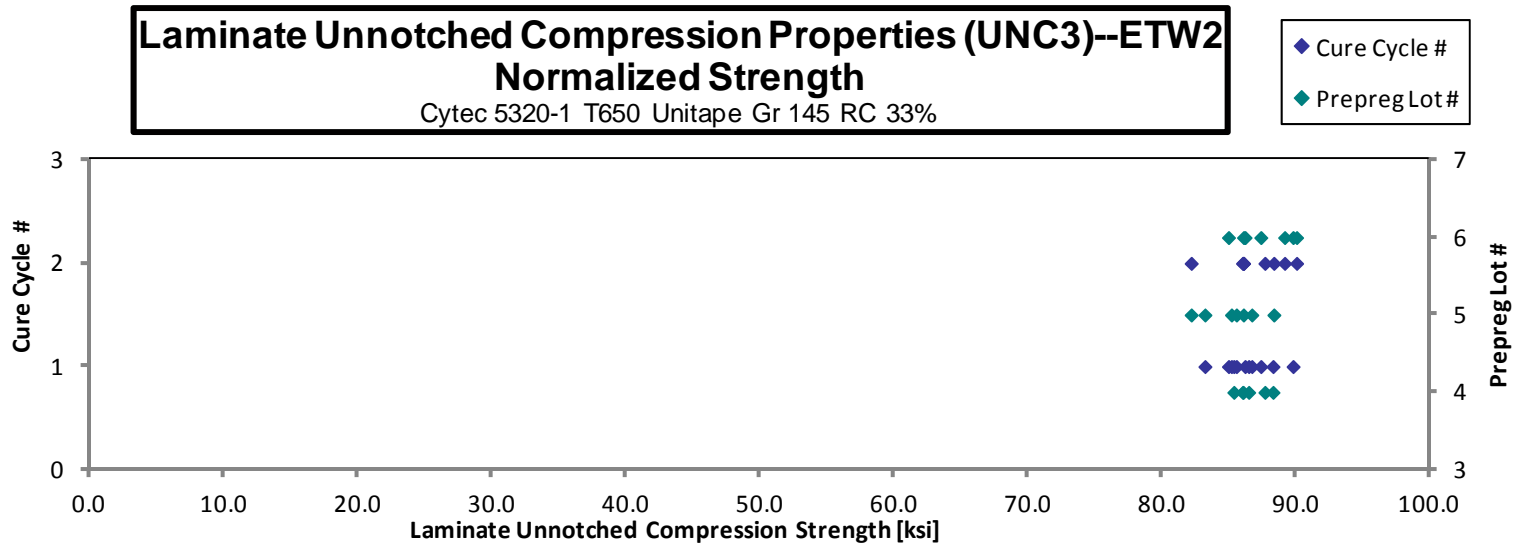
normalizing
 t_{ply} [in]
 0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUGYD118F	D	C1	4	1		10.817	0.107	20	BGM / HIB
CUGYD119F	D	C1	4	1		10.140	0.108	20	CIT / CIB
CUGYD11AF	D	C1	4	1		10.589	0.109	20	BAB / HIB
CUGYD11BF	D	C1	4	1		10.634	0.108	20	BGM
CUGYD11DF	D	C1	4	1	86.967		0.109	20	HGM
CUGYD11FF	D	C1	4	1	89.305		0.109	20	HIB / HAT
CUGYD11GF	D	C1	4	1	85.961		0.109	20	BGM
CUGYD217F	D	C2	4	2		10.605	0.109	20	HIB
CUGYD218F	D	C2	4	2		10.366	0.108	20	HIB
CUGYD219F	D	C2	4	2		10.326	0.108	20	HIB / HGM
CUGYD21BF	D	C2	4	2	87.204		0.109	20	HIT / BAT
CUGYD21CF	D	C2	4	2	87.027		0.109	20	HIB / BAB
CUGYD21DF	D	C2	4	2	88.828		0.109	20	BGM
CUGYE117F	E	C1	5	1		10.376	0.109	20	BAB / HIB
CUGYE118F	E	C1	5	1		10.493	0.110	20	BAB / HIB
CUGYE119F	E	C1	5	1		10.912	0.110	20	BAB / HIB
CUGYE11AF	E	C1	5	1		10.937	0.111	20	BAB / HIB
CUGYE11BF	E	C1	5	1	85.482		0.110	20	BGM
CUGYE11CF	E	C1	5	1	85.192		0.110	20	BAT / HIT
CUGYE11DF	E	C1	5	1	86.229		0.111	20	BAB / HIB
CUGYE11EF	E	C1	5	1	83.495		0.110	20	BAB / HIB
CUGYE217F	E	C2	5	2		10.437	0.109	20	BGM / HIB
CUGYE218F	E	C2	5	2		10.357	0.109	20	BAB
CUGYE219F	E	C2	5	2		10.484	0.110	20	BAT / HIT
CUGYE21AF	E	C2	5	2	88.901		0.109	20	BAB / HIB
CUGYE21BF	E	C2	5	2	87.122		0.109	20	BAT
CUGYE21CF	E	C2	5	2	82.456		0.110	20	BAB
CUGYF117F	F	C1	6	1		10.584	0.111	20	HGM
CUGYF118F	F	C1	6	1		10.653	0.110	20	BGM / HIB
CUGYF119F	F	C1	6	1		10.224	0.110	20	BGM
CUGYF11AF	F	C1	6	1		10.590	0.110	20	HGM
CUGYF11CF	F	C1	6	1	85.375		0.109	20	BAB / HIB
CUGYF11DF	F	C1	6	1	87.023		0.110	20	BGM
CUGYF11EF	F	C1	6	1	86.696		0.109	20	BAB / HIB
CUGYF11FF	F	C1	6	1	90.281		0.109	20	BAB / HIB
CUGYF217F	F	C2	6	2		10.678	0.112	20	BAB / HIB
CUGYF218F	F	C2	6	2		10.251	0.111	20	BGM / HIB
CUGYF219F	F	C2	6	2		10.242	0.112	20	BGM / HIB
CUGYF21AF	F	C2	6	2	85.122		0.111	20	BAB / HIB
CUGYF21BF	F	C2	6	2	88.503		0.111	20	BAB
CUGYF21CF	F	C2	6	2	88.662		0.112	20	BGM

Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.0053		10.497
0.0054		9.948
0.0054		10.452
0.0054		10.416
0.0055	86.453	
0.0054	88.270	
0.0055	85.345	
0.0055		10.527
0.0054		10.219
0.0054		10.166
0.0054	86.044	
0.0054	85.998	
0.0054	87.667	
0.0055		10.328
0.0055		10.455
0.0055		10.864
0.0055		10.994
0.0055	85.171	
0.0055	85.540	
0.0055	86.689	
0.0055	83.191	
0.0055		10.381
0.0054		10.233
0.0055		10.446
0.0055	88.335	
0.0054	86.063	
0.0055	82.166	
0.0055		10.659
0.0055		10.622
0.0055		10.227
0.0055		10.606
0.0055	84.948	
0.0055	87.359	
0.0055	86.184	
0.0055	89.768	
0.0056		10.902
0.0056		10.380
0.0056		10.398
0.0056	86.070	
0.0055	89.137	
0.0056	90.033	

Average 86.791 10.509
 Standard Dev. 1.969 0.222
 Coeff. of Var. [%] 2.269 2.116
 Min. 82.456 10.140
 Max. 90.281 10.937
 Number of Spec. 20 21

Average_{norm} 0.0055 86.522 10.463
 Standard Dev_{norm} 1.998 0.254
 Coeff. of Var. [%]_{norm} 2.309 2.423
 Min. 0.0053 82.166 9.948
 Max. 0.0056 90.033 10.994
 Number of Spec. 41 20 21

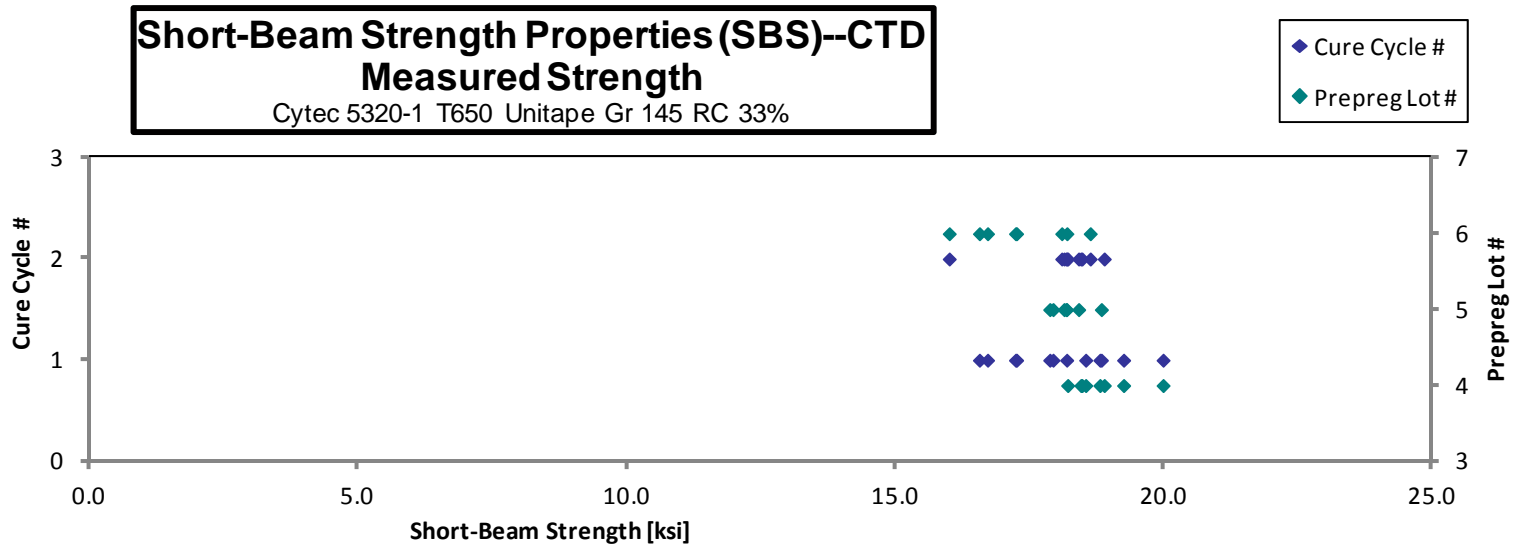


4.13 Lamina Short-Beam Strength Properties (SBS)

Short-Beam Strength Properties (SBS)--CTD
Strength
 Cytec 5320-1 T650 Unitape Gr 145 RC 33%

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksj]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t _{ply} [in]	Failure Mode
CUGQD117B	D	C1	4	1	18.810	0.238	45	0.0053	ILS
CUGQD118B	D	C1	4	1	19.986	0.239	45	0.0053	ILS
CUGQD119B	D	C1	4	1	18.544	0.241	45	0.0054	ILS
CUGQD11AB	D	C1	4	1	19.250	0.239	45	0.0053	ILS
CUGQD216B	D	C2	4	2	18.890	0.235	45	0.0052	ILS
CUGQD217B	D	C2	4	2	18.476	0.236	45	0.0052	ILS / TENSION
CUGQD218B	D	C2	4	2	18.210	0.239	45	0.0053	ILS
CUGQD219B	D	C2	4	2	18.455	0.238	45	0.0053	ILS / COMPRESSION
CUGQE11BB	E	C1	5	1	18.837	0.248	45	0.0055	ILS
CUGQE11DB	E	C1	5	1	18.191	0.245	45	0.0054	ILS / TENSION
CUGQE11EB	E	C1	5	1	17.936	0.248	45	0.0055	ILS
CUGQE11FB	E	C1	5	1	17.876	0.247	45	0.0055	ILS / TENSION / COMPRESSION
CUGQE21BB	E	C2	5	2	18.179	0.247	45	0.0055	ILS / TENSION
CUGQE21DB	E	C2	5	2	18.414	0.248	45	0.0055	ILS
CUGQE21EB	E	C2	5	2	18.142	0.249	45	0.0055	ILS
CUGQF119B	F	C1	6	1	17.257	0.247	45	0.0055	ILS
CUGQF11AB	F	C1	6	1	17.238	0.247	45	0.0055	ILS
CUGQF11BB	F	C1	6	1	16.717	0.248	45	0.0055	ILS
CUGQF11DB	F	C1	6	1	16.566	0.251	45	0.0056	ILS
CUGQF21BB	F	C2	6	2	18.195	0.247	45	0.0055	ILS
CUGQF21CB	F	C2	6	2	16.003	0.238	45	0.0053	ILS
CUGQF21DB	F	C2	6	2	18.098	0.249	45	0.0055	ILS
CUGQF21EB	F	C2	6	2	18.630	0.250	45	0.0056	ILS

Average	18.126	Average	0.0054
Standard Dev.	0.895	Standard Dev.	
Coeff. of Var. [%]	4.936	Coeff. of Var. [%]	
Min.	16.003	Min.	0.0052
Max.	19.986	Max.	0.0056
Number of Spec.	23	Number of Spec.	23

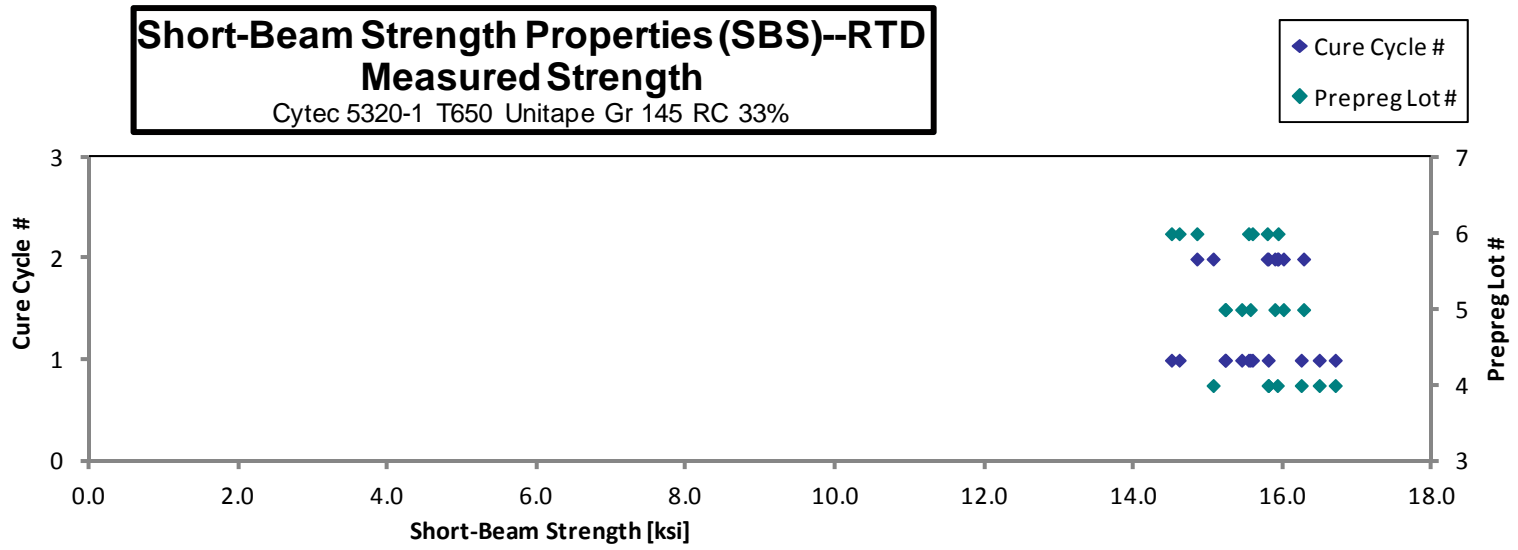


**Short-Beam Strength Properties (SBS)--RTD
Strength**
Cytec 5320-1 T650 Unitape Gr 145 RC 33%

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t _{ply} [in]	Failure Mode
CUGQD111A	D	C1	4	1	15.800	0.233	45	0.0052	ILS
CUGQD112A	D	C1	4	1	16.698	0.235	45	0.0052	ILS
CUGQD113A	D	C1	4	1	16.484	0.235	45	0.0052	ILS
CUGQD114A	D	C1	4	1	16.243	0.237	45	0.0053	ILS
CUGQD211A	D	C2	4	2	15.061	0.239	45	0.0053	ILS
CUGQD212A	D	C2	4	2	15.800	0.238	45	0.0053	ILS
CUGQD213A	D	C2	4	2	15.922	0.238	45	0.0053	ILS
CUGQE117A	E	C1	5	1	15.444	0.245	45	0.0054	ILS
CUGQE118A	E	C1	5	1	15.559	0.247	45	0.0055	ILS
CUGQE119A	E	C1	5	1	15.226	0.247	45	0.0055	ILS
CUGQE11AA	E	C1	5	1	15.220	0.248	45	0.0055	ILS
CUGQE217A	E	C2	5	2	16.004	0.247	45	0.0055	ILS
CUGQE218A	E	C2	5	2	15.889	0.248	45	0.0055	ILS
CUGQE219A	E	C2	5	2	16.274	0.248	45	0.0055	ILS
CUGQF111A	F	C1	6	1	15.588	0.248	45	0.0055	ILS
CUGQF112A	F	C1	6	1	15.535	0.251	45	0.0056	ILS
CUGQF113A	F	C1	6	1	14.502	0.247	45	0.0055	ILS
CUGQF117A	F	C1	6	1	14.606	0.248	45	0.0055	ILS
CUGQF217A	F	C2	6	2	14.843	0.249	45	0.0055	ILS
CUGQF218A	F	C2	6	2	15.786	0.249	45	0.0055	ILS
CUGQF219A	F	C2	6	2	15.932	0.249	45	0.0055	ILS

Average **15.639**
 Standard Dev. **0.582**
 Coeff. of Var. [%] **3.720**
 Min. **14.502**
 Max. **16.698**
 Number of Spec. **21**

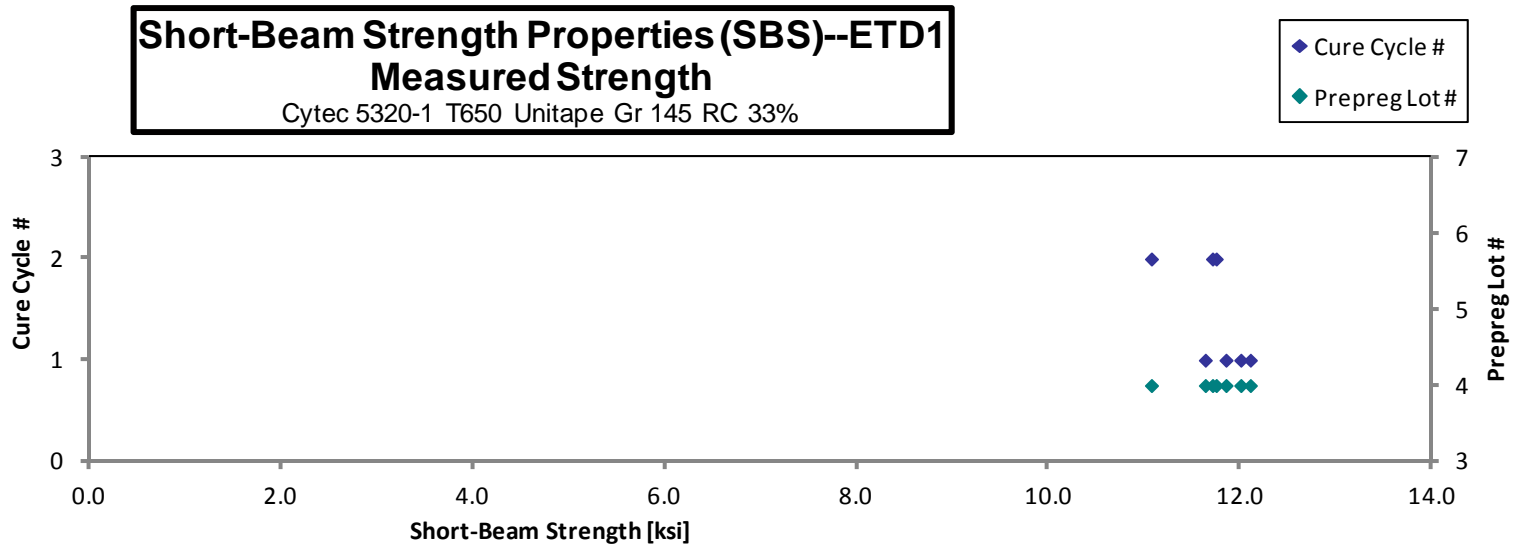
Average **0.0054**
 Standard Dev. **0.0001**
 Coeff. of Var. [%] **1.875**
 Min. **0.0052**
 Max. **0.0056**
 Number of Spec. **21**



**Short-Beam Strength Properties (SBS)--ETD1
Strength**
Cytec 5320-1 T650 Unitape Gr 145 RC 33%

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode
CUGQD11DC	D	C1	4	1	12.103	0.238	45	0.0053	ILS
CUGQD11EC	D	C1	4	1	11.633	0.240	45	0.0053	ILS
CUGQD11FC	D	C1	4	1	11.848	0.241	45	0.0053	ILS
CUGQD11GC	D	C1	4	1	12.003	0.239	45	0.0053	ILS
CUGQD21BC	D	C2	4	2	11.071	0.237	45	0.0053	ILS
CUGQD21CC	D	C2	4	2	11.747	0.237	45	0.0053	ILS
CUGQD21DC	D	C2	4	2	11.708	0.237	45	0.0053	ILS

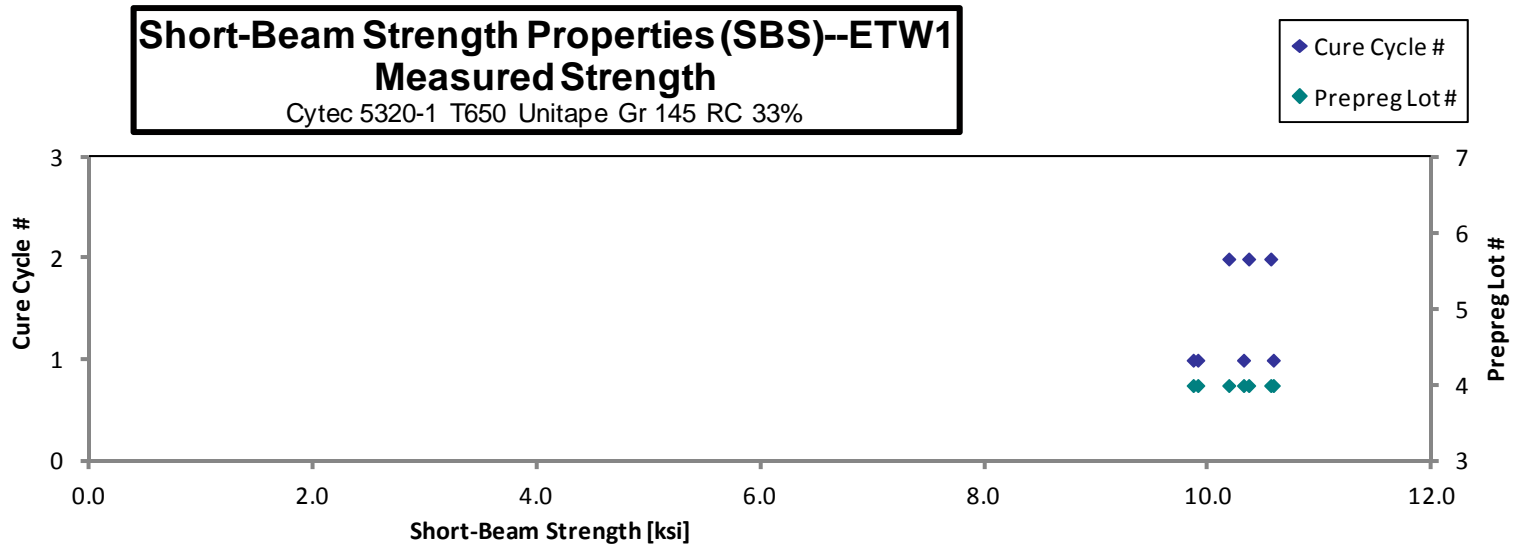
Average	11.730	Average	0.0053
Standard Dev.	0.335	Standard Dev.	
Coeff. of Var. [%]	2.853	Coeff. of Var. [%]	
Min.	11.071	Min.	0.0053
Max.	12.103	Max.	0.0053
Number of Spec.	7	Number of Spec.	7



Short-Beam Strength Properties (SBS)--ETW1 Strength Cytec 5320-1 T650 Unitape Gr 145 RC 33%

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode
CUGQD131D	D	C1	4	1	10.578	0.242	45	0.0054	ILS
CUGQD132D	D	C1	4	1	9.862	0.244	45	0.0054	ILS
CUGQD133D	D	C1	4	1	9.904	0.244	45	0.0054	ILS
CUGQD134D	D	C1	4	1	10.312	0.246	45	0.0055	ILS
CUGQD231D	D	C2	4	2	10.181	0.244	45	0.0054	ILS
CUGQD232D	D	C2	4	2	10.358	0.243	45	0.0054	ILS
CUGQD233D	D	C2	4	2	10.556	0.246	45	0.0055	ILS

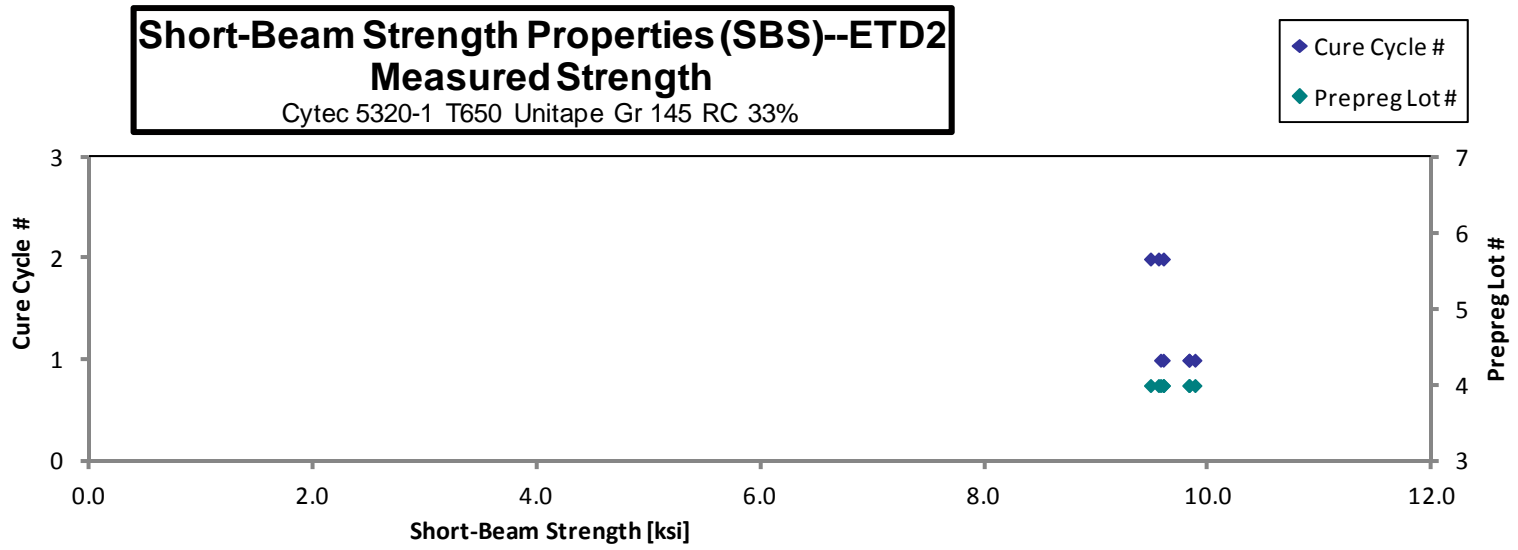
Average	10.250	Average	0.0054
Standard Dev.	0.286	Standard Dev.	
Coeff. of Var. [%]	2.794	Coeff. of Var. [%]	
Min.	9.862	Min.	0.0054
Max.	10.578	Max.	0.0055
Number of Spec.	7	Number of Spec.	7



Short-Beam Strength Properties (SBS)--ETD2
Strength
 Cytec 5320-1 T650 Unitape Gr 145 RC 33%

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t _{ply} [in]	Failure Mode
CUGQD11JE	D	C1	4	1	9.878	0.243	45	0.0054	ILS
CUGQD11KE	D	C1	4	1	9.824	0.245	45	0.0054	ILS
CUGQD11LE	D	C1	4	1	9.826	0.244	45	0.0054	ILS
CUGQD11ME	D	C1	4	1	9.571	0.242	45	0.0054	ILS
CUGQD11NE	D	C1	4	1	9.594	0.243	45	0.0054	ILS
CUGQD21HE	D	C2	4	2	9.552	0.231	45	0.0051	ILS
CUGQD21KE	D	C2	4	2	9.596	0.235	45	0.0052	ILS
CUGQD21LE	D	C2	4	2	9.481	0.239	45	0.0053	ILS

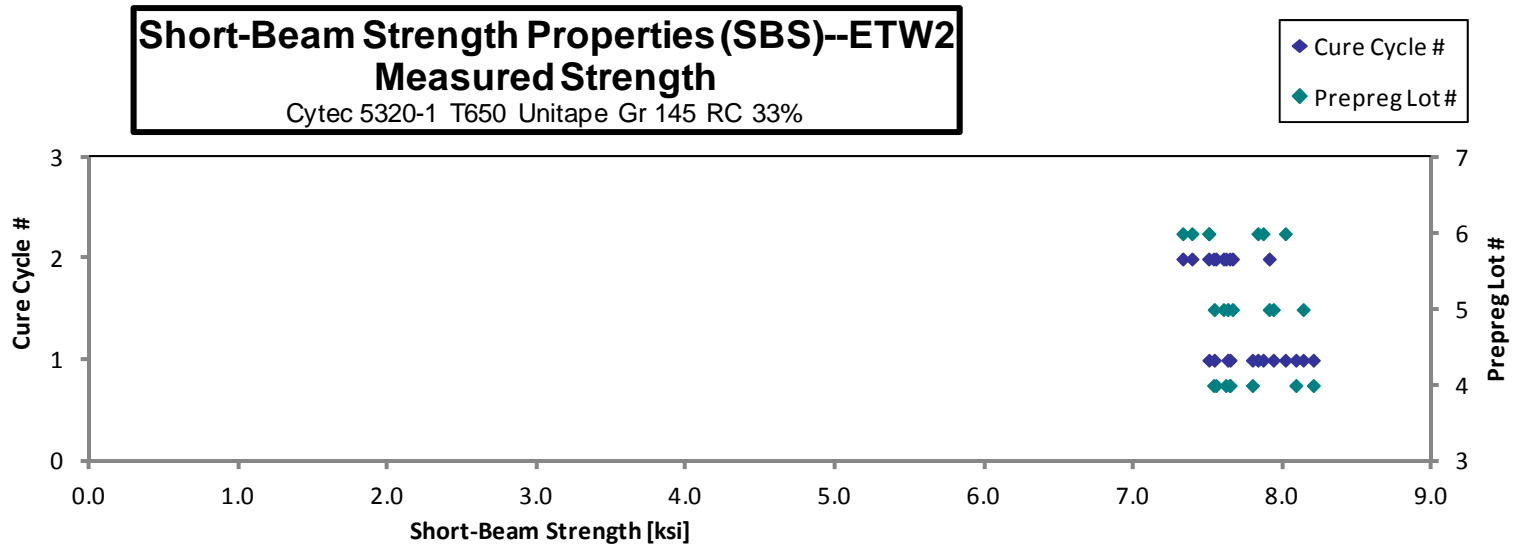
Average	9.665	Average	0.0053
Standard Dev.	0.152	Standard Dev.	
Coeff. of Var. [%]	1.574	Coeff. of Var. [%]	
Min.	9.481	Min.	0.0051
Max.	9.878	Max.	0.0054
Number of Spec.	8	Number of Spec.	8



Short-Beam Strength Properties (SBS)--ETW2 Strength Cytec 5320-1 T650 Unitape Gr 145 RC 33%

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t _{ply} [in]	Failure Mode
CUGQD137F	D	C1	4	1	8.202	0.247	45	0.0055	ILS / INELASTIC DEFORMATION
CUGQD138F	D	C1	4	1	8.085	0.244	45	0.0054	ILS / INELASTIC DEFORMATION
CUGQD139F	D	C1	4	1	7.794	0.245	45	0.0055	ILS / INELASTIC DEFORMATION
CUGQD13AF	D	C1	4	1	7.644	0.246	45	0.0055	ILS / INELASTIC DEFORMATION
CUGQD237F	D	C2	4	2	7.641	0.244	45	0.0054	ILS / INELASTIC DEFORMATION
CUGQD238F	D	C2	4	2	7.616	0.247	45	0.0055	ILS / INELASTIC DEFORMATION
CUGQD239F	D	C2	4	2	7.534	0.246	45	0.0055	ILS / INELASTIC DEFORMATION
CUGQD23AF	D	C2	4	2	7.549	0.248	45	0.0055	ILS / INELASTIC DEFORMATION
CUGQE11GF	E	C1	5	1	8.134	0.248	45	0.0055	ILS / INELASTIC DEFORMATION
CUGQE11HF	E	C1	5	1	7.629	0.248	45	0.0055	ILS / INELASTIC DEFORMATION
CUGQE11JF	E	C1	5	1	7.934	0.247	45	0.0055	ILS / INELASTIC DEFORMATION
CUGQE11LF	E	C1	5	1	7.538	0.247	45	0.0055	ILS / INELASTIC DEFORMATION
CUGQE21HF	E	C2	5	2	7.600	0.249	45	0.0055	ILS / INELASTIC DEFORMATION
CUGQE21IF	E	C2	5	2	7.660	0.247	45	0.0055	ILS / INELASTIC DEFORMATION
CUGQE21JF	E	C2	5	2	7.907	0.246	45	0.0055	ILS / INELASTIC DEFORMATION
CUGQF11FF	F	C1	6	1	7.865	0.247	45	0.0055	ILS / INELASTIC DEFORMATION
CUGQF11GF	F	C1	6	1	8.015	0.248	45	0.0055	ILS / INELASTIC DEFORMATION
CUGQF11HF	F	C1	6	1	7.830	0.249	45	0.0055	ILS / INELASTIC DEFORMATION
CUGQF11JF	F	C1	6	1	7.502	0.245	45	0.0055	ILS / INELASTIC DEFORMATION
CUGQF21GF	F	C2	6	2	7.327	0.240	45	0.0053	ILS / INELASTIC DEFORMATION
CUGQF21HF	F	C2	6	2	7.500	0.249	45	0.0055	ILS / INELASTIC DEFORMATION
CUGQF21IF	F	C2	6	2	7.389	0.249	45	0.0055	ILS / INELASTIC DEFORMATION

Average	7.722	Average	0.0055
Standard Dev.	0.244	Standard Dev.	
Coeff. of Var. [%]	3.159	Coeff. of Var. [%]	
Min.	7.327	Min.	0.0053
Max.	8.202	Max.	0.0055
Number of Spec.	22	Number of Spec.	22

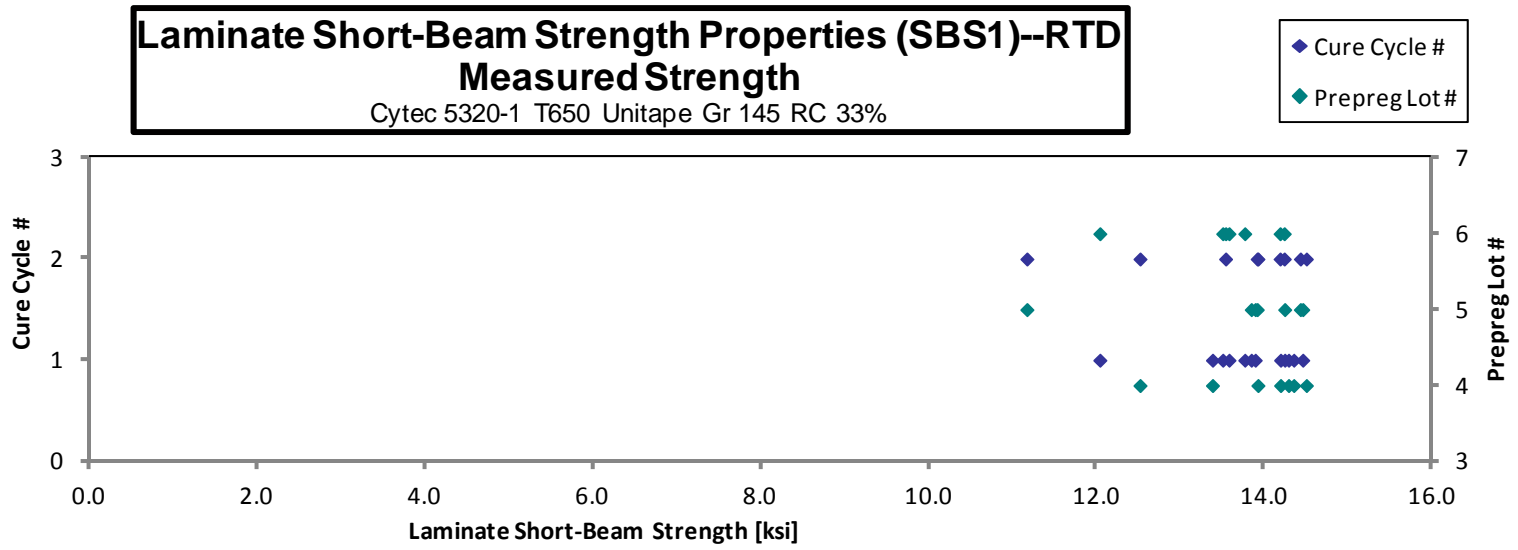


4.14 Laminate Short-Beam Strength Properties (SBS1)

**Laminate Short-Beam Strength Properties (SBS1)--RTD
Strength**
Cytec 5320-1 T650 Unitape Gr 145 RC 33%

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksij]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t _{ply} [in]	Failure Mode
CUGqD171A	D	C1	4	1	14.287	0.175	32	0.0055	ILS
CUGqD172A	D	C1	4	1	14.348	0.175	32	0.0055	ILS
CUGqD173A	D	C1	4	1	14.192	0.176	32	0.0055	ILS
CUGqD174A	D	C1	4	1	13.380	0.177	32	0.0055	ILS
CUGqD271A	D	C2	4	2	12.516	0.172	32	0.0054	ILS
CUGqD272A	D	C2	4	2	13.922	0.175	32	0.0055	ILS
CUGqD273A	D	C2	4	2	14.499	0.176	32	0.0055	ILS
CUGqE171A	E	C1	5	1	14.455	0.177	32	0.0055	ILS
CUGqE172A	E	C1	5	1	13.842	0.179	32	0.0056	ILS
CUGqE173A	E	C1	5	1	14.241	0.177	32	0.0055	ILS
CUGqE174A	E	C1	5	1	13.889	0.177	32	0.0055	ILS
CUGqE271A	E	C2	5	2	11.168	0.168	32	0.0053	ILS
CUGqE272A	E	C2	5	2	14.428	0.175	32	0.0055	ILS
CUGqE273A	E	C2	5	2	13.913	0.174	32	0.0054	ILS
CUGqF171A	F	C1	6	1	12.037	0.171	32	0.0053	ILS
CUGqF172A	F	C1	6	1	13.577	0.177	32	0.0055	ILS
CUGqF173A	F	C1	6	1	13.502	0.177	32	0.0055	ILS
CUGqF174A	F	C1	6	1	13.765	0.177	32	0.0055	ILS
CUGqF271A	F	C2	6	2	14.235	0.176	32	0.0055	ILS
CUGqF272A	F	C2	6	2	13.536	0.177	32	0.0055	ILS
CUGqF273A	F	C2	6	2	14.186	0.178	32	0.0056	ILS

Average	13.710	Average	0.0055
Standard Dev.	0.851	Standard Dev.	
Coeff. of Var. [%]	6.205	Coeff. of Var. [%]	
Min.	11.168	Min.	0.0053
Max.	14.499	Max.	0.0056
Number of Spec.	21	Number of Spec.	21

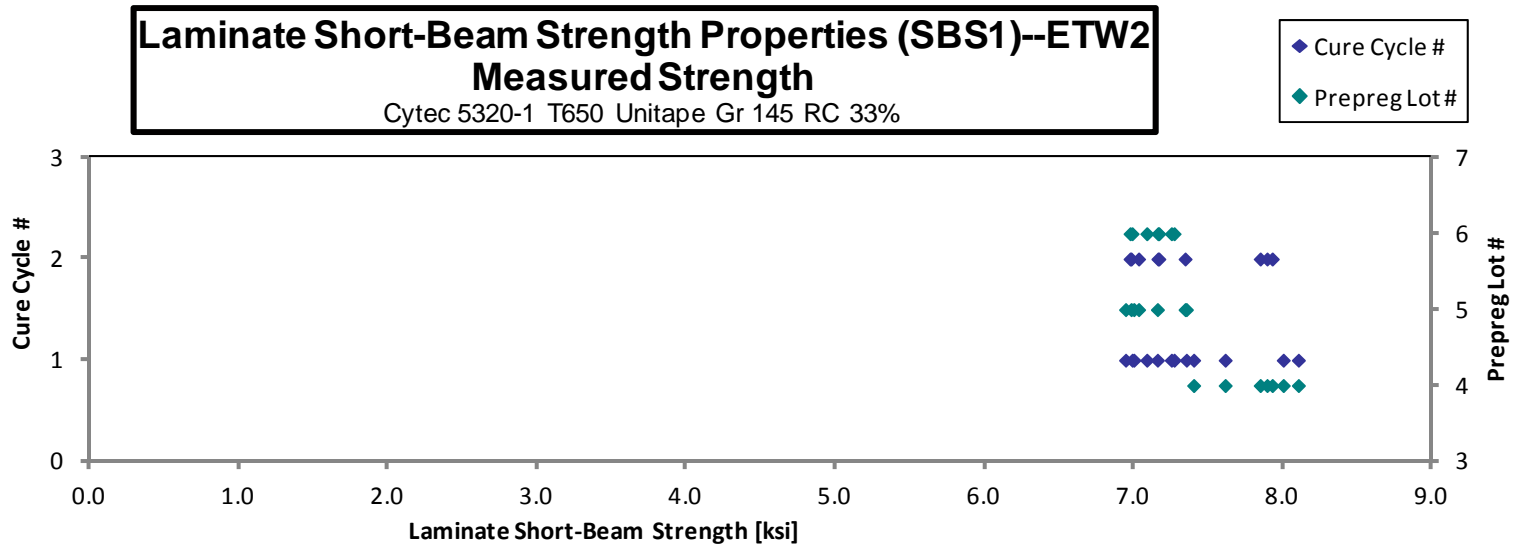


Laminate Short-Beam Strength Properties (SBS1)--ETW2
Strength
 Cytec 5320-1 T650 Unitape Gr 145 RC 33%

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t _{ply} [in]	Failure Mode
CUGqD177F	D	C1	4	1	8.102	0.173	32	0.0054	ILS
CUGqD178F	D	C1	4	1	8.001	0.175	32	0.0055	ILS
CUGqD179F	D	C1	4	1	7.400	0.177	32	0.0055	ILS
CUGqD17AF	D	C1	4	1	7.611	0.175	32	0.0055	ILS
CUGqD276F	D	C2	4	2	7.927	0.175	32	0.0055	ILS
CUGqD277F	D	C2	4	2	7.892	0.175	32	0.0055	ILS
CUGqD278F	D	C2	4	2	7.846	0.174	32	0.0054	ILS
CUGqE177F	E	C1	5	1	7.351	0.177	32	0.0055	ILS
CUGqE178F	E	C1	5	1	6.943	0.175	32	0.0055	ILS
CUGqE179F	E	C1	5	1	7.157	0.175	32	0.0055	ILS
CUGqE17AF	E	C1	5	1	6.999	0.175	32	0.0055	ILS
CUGqE276F	E	C2	5	2	6.981	0.176	32	0.0055	ILS
CUGqE277F	E	C2	5	2	7.031	0.182	32	0.0057	ILS
CUGqE278F	E	C2	5	2	7.343	0.178	32	0.0056	ILS
CUGqF177F	F	C1	6	1	7.251	0.176	32	0.0055	ILS
CUGqF178F	F	C1	6	1	7.269	0.176	32	0.0055	ILS
CUGqF179F	F	C1	6	1	6.987	0.177	32	0.0055	ILS
CUGqF17AF	F	C1	6	1	7.086	0.177	32	0.0055	ILS
CUGqF275F	F	C2	6	2	6.974	0.178	32	0.0055	ILS
CUGqF276F	F	C2	6	2	7.160	0.178	32	0.0056	ILS
CUGqF277F	F	C2	6	2	7.166	0.177	32	0.0055	ILS

Average 7.356
 Standard Dev. 0.382
 Coeff. of Var. [%] 5.199
 Min. 6.943
 Max. 8.102
 Number of Spec. 21

Average 0.0055
 Standard Dev. 0.0001
 Coeff. of Var. [%] 1.960
 Min. 0.0054
 Max. 0.0057
 Number of Spec. 21



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

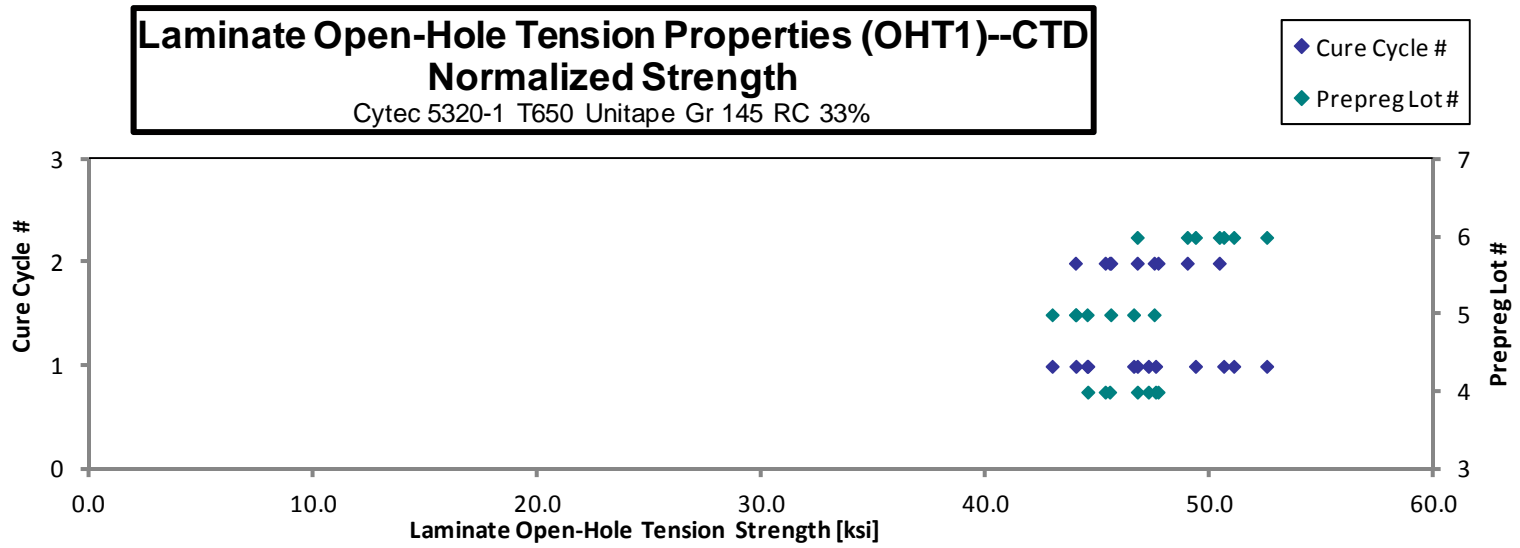
Laminate Open-Hole Tension Properties (OHT1)--CTD
Strength
 Cytec 5320-1 T650 Unitape Gr 145 RC 33%

normalizing
 t_{ply} [in]
 0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	Strength _{norm} [ksi]
CUGDD115B	D	C1	4	1	47.191	0.087	16	LGM	0.0054	46.744
CUGDD116B	D	C1	4	1	46.876	0.089	16	LGM	0.0056	47.560
CUGDD117B	D	C1	4	1	45.025	0.087	16	LGM	0.0054	44.530
CUGDD118B	D	C1	4	1	47.541	0.087	16	LGM	0.0055	47.235
CUGDD214B	D	C2	4	2	47.604	0.088	16	LGM	0.0055	47.667
CUGDD215B	D	C2	4	2	45.053	0.089	16	LGM	0.0056	45.505
CUGDD216B	D	C2	4	2	44.733	0.089	16	LGM	0.0056	45.309
CUGDE116B	E	C1	5	1	47.021	0.087	16	LGM	0.0054	46.576
CUGDE117B	E	C1	5	1	44.999	0.086	16	LGM	0.0054	44.002
CUGDE118B	E	C1	5	1	43.509	0.087	16	LGM	0.0054	42.940
CUGDE119B	E	C1	5	1	44.384	0.088	16	LGM	0.0055	44.501
CUGDE216B	E	C2	5	2	43.847	0.088	16	LGM	0.0055	43.980
CUGDE217B	E	C2	5	2	45.807	0.088	16	LGM	0.0055	45.556
CUGDE218B	E	C2	5	2	47.619	0.088	16	LGM	0.0055	47.493
CUGDF116B	F	C1	6	1	50.472	0.089	16	LGM	0.0056	51.046
CUGDF117B	F	C1	6	1	52.269	0.088	16	LGM	0.0055	52.517
CUGDF118B	F	C1	6	1	49.990	0.089	16	LGM	0.0056	50.596
CUGDF119B	F	C1	6	1	48.620	0.089	16	LGM	0.0056	49.338
CUGDF216B	F	C2	6	2	49.974	0.089	16	LGM	0.0055	50.400
CUGDF217B	F	C2	6	2	48.475	0.089	16	LGM	0.0056	48.971
CUGDF218B	F	C2	6	2	46.959	0.088	16	LGM	0.0055	46.737

Average 47.046
Standard Dev. 2.353
Coeff. of Var. [%] 5.001
Min. 43.509
Max. 52.269
Number of Spec. 21

Average_{norm} 0.0055 **47.105**
Standard Dev._{norm} **2.607**
Coeff. of Var. [%]_{norm} **5.534**
Min. 0.0054 **42.940**
Max. 0.0056 **52.517**
Number of Spec. 21 **21**



**Laminate Open-Hole Tension Properties (OHT1)--RTD
Strength**

Cytec 5320-1 T650 Unitape Gr 145 RC 33%

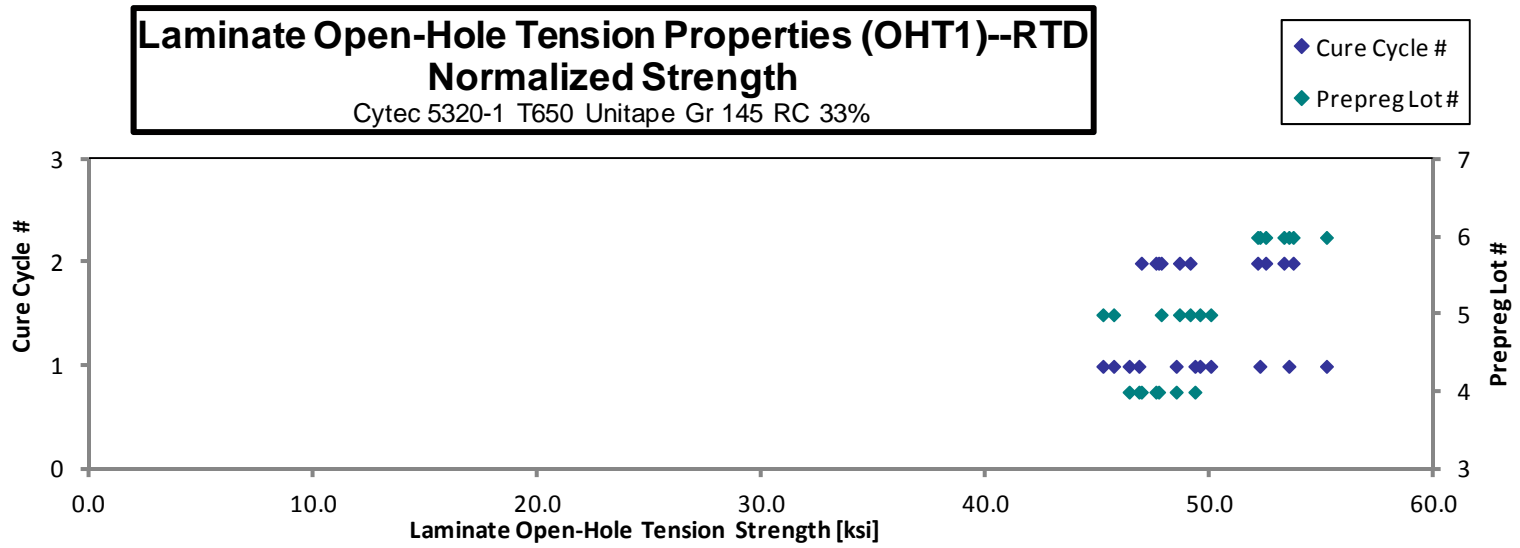
normalizing
t_{ply} [in]
0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUGDD111A	D	C1	4	1	48.304	0.088	16	LGM
CUGDD112A	D	C1	4	1	50.431	0.086	16	LGM
CUGDD113A	D	C1	4	1	46.228	0.088	16	LGM
CUGDD114A	D	C1	4	1	46.984	0.088	16	LGM
CUGDD211A	D	C2	4	2	47.717	0.088	16	LGM
CUGDD212A	D	C2	4	2	46.674	0.088	16	LGM
CUGDD213A	D	C2	4	2	47.628	0.088	16	LGM
CUGDE111A	E	C1	5	1	49.819	0.088	16	LGM
CUGDE112A	E	C1	5	1	46.285	0.086	16	LGM
CUGDE113A	E	C1	5	1	50.430	0.087	16	LGM
CUGDE114A	E	C1	5	1	46.052	0.087	16	LGM
CUGDE211A	E	C2	5	2	47.943	0.088	16	LGM
CUGDE212A	E	C2	5	2	48.538	0.089	16	LGM
CUGDE213A	E	C2	5	2	48.077	0.089	16	LGM
CUGDF111A	F	C1	6	1	54.842	0.089	16	LGM
CUGDF112A	F	C1	6	1	51.519	0.089	16	LGM
CUGDF113A	F	C1	6	1	53.085	0.089	16	LGM
CUGDF211A	F	C2	6	2	53.526	0.088	16	LGM
CUGDF212A	F	C2	6	2	52.323	0.088	16	LGM
CUGDF213A	F	C2	6	2	53.133	0.089	16	LGM
CUGDF214A	F	C2	6	2	52.171	0.088	16	LGM

Avg. t _{ply} [in]	Strength _{norm} [ksi]
0.0055	48.478
0.0054	49.313
0.0055	46.376
0.0055	46.815
0.0055	47.572
0.0055	46.921
0.0055	47.691
0.0055	49.536
0.0054	45.207
0.0055	50.020
0.0055	45.686
0.0055	47.807
0.0056	49.099
0.0056	48.624
0.0055	55.184
0.0056	52.212
0.0055	53.508
0.0055	53.283
0.0055	52.471
0.0056	53.697
0.0055	52.112

Average 49.605
Standard Dev. 2.760
Coeff. of Var. [%] 5.563
Min. 46.052
Max. 54.842
Number of Spec. 21

Average_{norm} 0.0055 49.601
Standard Dev._{norm} 2.931
Coeff. of Var. [%]_{norm} 5.909
Min. 0.0054 45.207
Max. 0.0056 55.184
Number of Spec. 21 21



**Laminate Open-Hole Tension Properties (OHT1)--ETW1
Strength**

Cytec 5320-1 T650 Unitape Gr 145 RC 33%

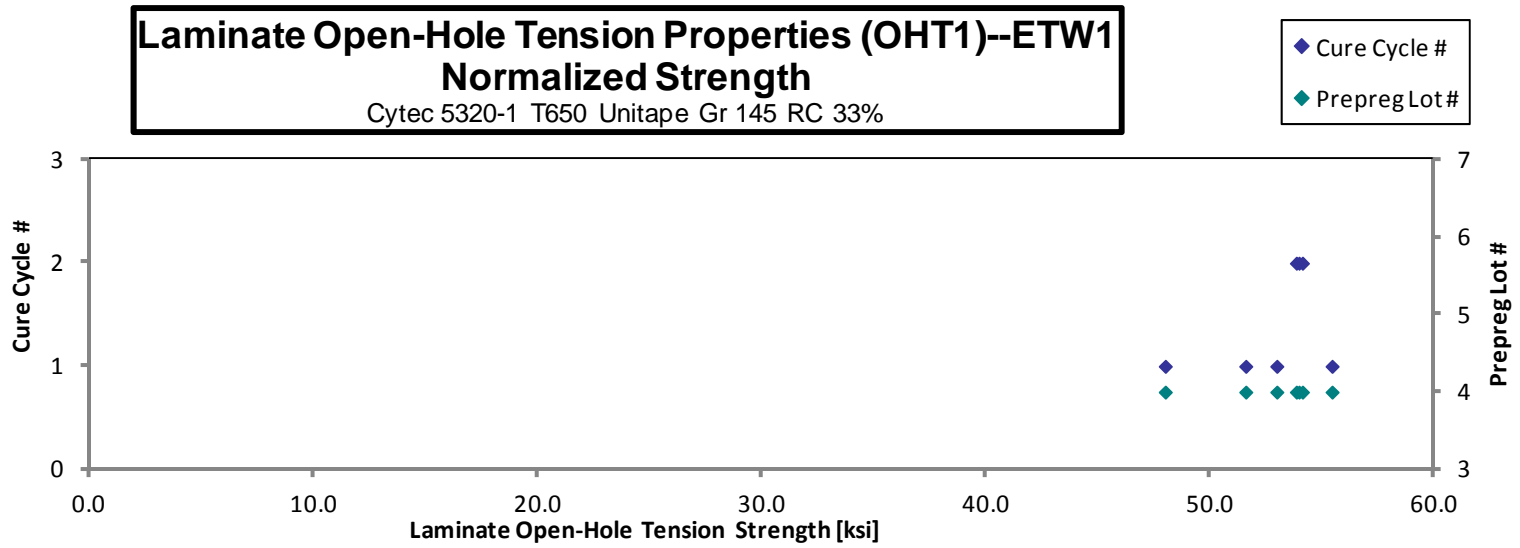
normalizing
t_{ply} [in]
0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUGDD119D	D	C1	4	1	47.409	0.089	16	LGM
CUGDD11AD	D	C1	4	1	54.620	0.089	16	LGM
CUGDD11BD	D	C1	4	1	52.276	0.089	16	LGM
CUGDD11CD	D	C1	4	1	51.722	0.088	16	LGM
CUGDD217D	D	C2	4	2	53.797	0.089	16	LGM
CUGDD218D	D	C2	4	2	53.363	0.089	16	LGM
CUGDD219D	D	C2	4	2	53.437	0.089	16	LGM

Avg. t _{ply} [in]	Strength _{norm} [ksi]
0.0056	47.992
0.0056	55.437
0.0056	52.969
0.0055	51.584
0.0055	54.113
0.0056	53.960
0.0055	53.842

Average 52.375
Standard Dev. 2.390
Coeff. of Var. [%] 4.563
Min. 47.409
Max. 54.620
Number of Spec. 7

Average_{norm} 0.0055 52.842
Standard Dev._{norm} 2.440
Coeff. of Var. [%]_{norm} 4.617
Min. 0.0055 47.992
Max. 0.0056 55.437
Number of Spec. 7 7



**Laminate Open-Hole Tension Properties (OHT1)--ETW2
Strength**

Cytec 5320-1 T650 Unitape Gr 145 RC 33%

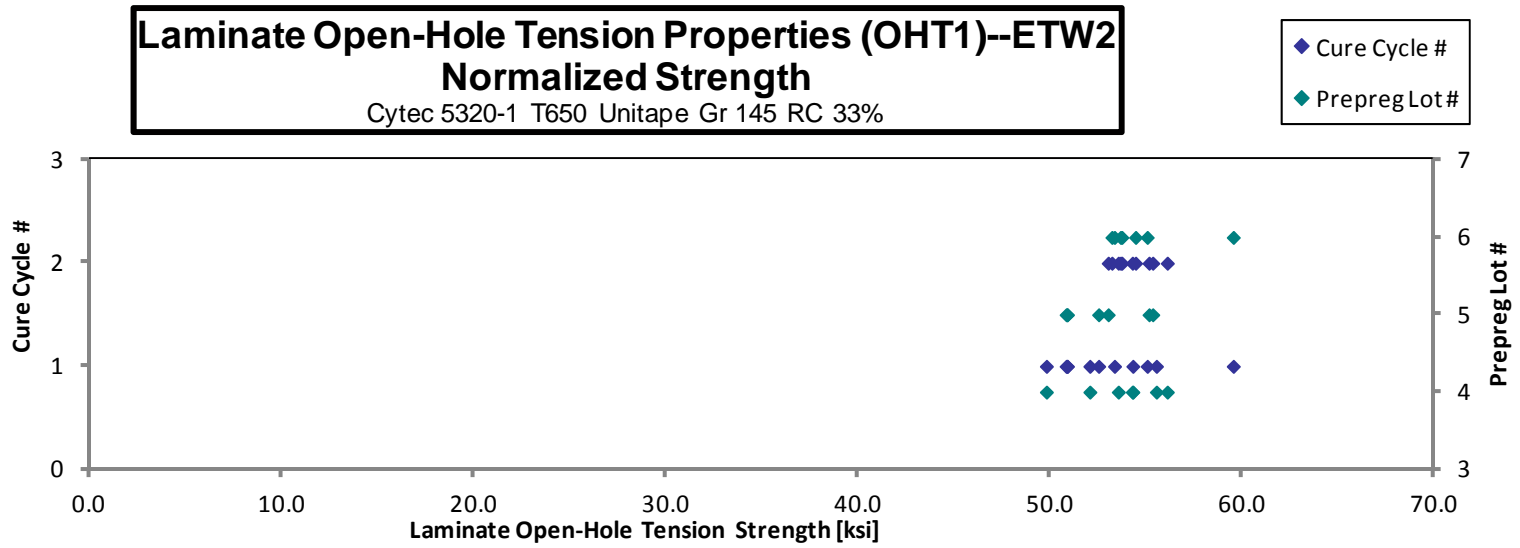
normalizing
t_{ply} [in]
0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUGDD11DF	D	C1	4	1	51.555	0.089	16	LGM
CUGDD11EF	D	C1	4	1	49.405	0.089	16	AGM
CUGDD11FF	D	C1	4	1	55.028	0.089	16	LGM
CUGDD11GF	D	C1	4	1	54.423	0.088	16	AGM
CUGDD21CF	D	C2	4	2	53.493	0.088	16	AGM
CUGDD21DF	D	C2	4	2	55.214	0.089	16	AGM
CUGDD21EF	D	C2	4	2	53.209	0.090	16	AGM
CUGDE11BF	E	C1	5	1	50.444	0.089	16	LGM
CUGDE11CF	E	C1	5	1	51.031	0.088	16	AGM
CUGDE11DF	E	C1	5	1	52.911	0.087	16	LGM
CUGDE11EF	E	C1	5	1	51.336	0.087	16	LGM
CUGDE21BF	E	C2	5	2	52.737	0.088	16	AGM
CUGDE21CF	E	C2	5	2	54.564	0.089	16	AGM
CUGDE21DF	E	C2	5	2	55.643	0.088	16	AGM
CUGDF11BF	F	C1	6	1	54.440	0.089	16	AGM
CUGDF11CF	F	C1	6	1	58.775	0.089	16	AGM
CUGDF11DF	F	C1	6	1	52.915	0.089	16	AGM
CUGDF21BF	F	C2	6	2	53.921	0.089	16	AGM
CUGDF21CF	F	C2	6	2	54.129	0.087	16	AGM
CUGDF21DF	F	C2	6	2	53.424	0.088	16	AGM
CUGDF21EF	F	C2	6	2	53.373	0.088	16	AGM

Avg. t _{ply} [in]	Strength _{norm} [ksi]
0.0056	52.062
0.0055	49.798
0.0056	55.528
0.0055	54.300
0.0055	53.543
0.0056	56.093
0.0056	54.277
0.0055	50.826
0.0055	50.886
0.0055	52.520
0.0055	50.879
0.0055	53.017
0.0056	55.143
0.0055	55.337
0.0056	55.048
0.0056	59.532
0.0055	53.346
0.0056	54.442
0.0055	53.729
0.0055	53.211
0.0055	53.656

Average 53.427
Standard Dev. 2.038
Coeff. of Var. [%] 3.814
Min. 49.405
Max. 58.775
Number of Spec. 21

Average_{norm} 0.0055 53.675
Standard Dev._{norm} 2.181
Coeff. of Var. [%]_{norm} 4.064
Min. 0.0055 49.798
Max. 0.0056 59.532
Number of Spec. 21 21



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

Laminate Open-Hole Tension Properties (OHT2)--CTD Strength
 Cytec 5320-1 T650 Unitape Gr 145 RC 33%

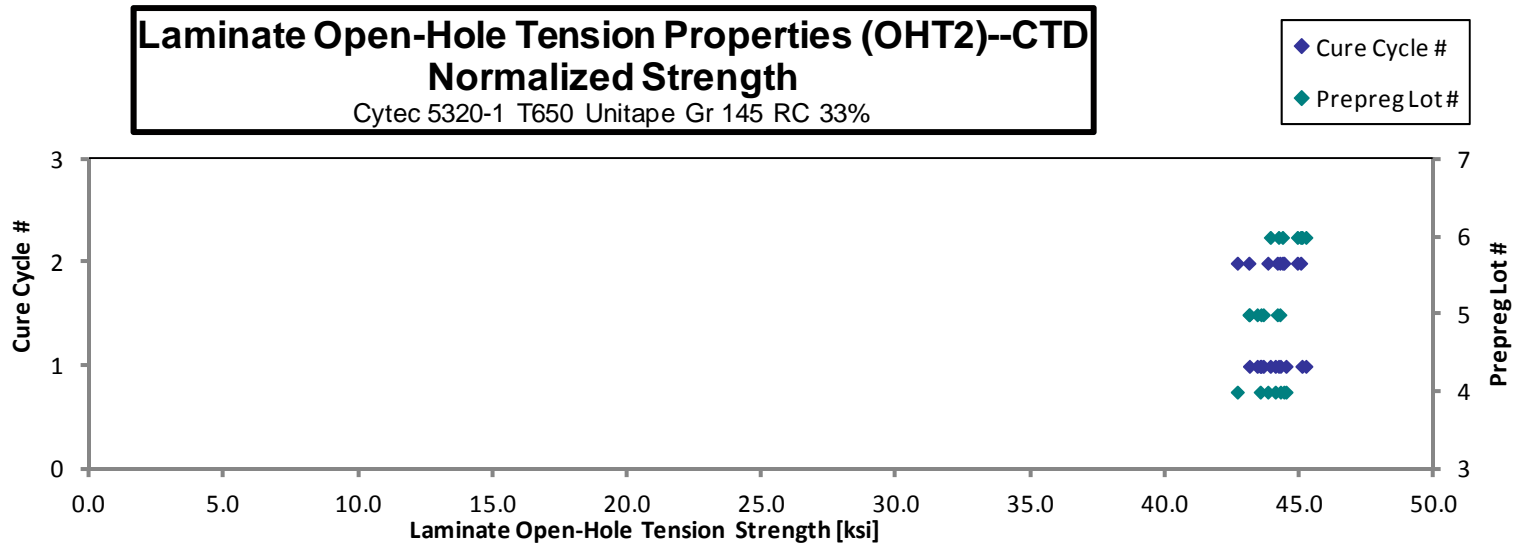
normalizing
 t_{ply} [in]
 0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksj]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUGED116B	D	C1	4	1	43.380	0.112	20	AGM
CUGED117B	D	C1	4	1	44.003	0.111	20	AGM
CUGED118B	D	C1	4	1	43.432	0.110	20	AGM
CUGED119B	D	C1	4	1	43.956	0.111	20	AGM
CUGED216B	D	C2	4	2	42.970	0.109	20	AGM
CUGED217B	D	C2	4	2	43.812	0.110	20	AGM
CUGED218B	D	C2	4	2	44.510	0.110	20	AGM
CUGEE116B	E	C1	5	1	43.358	0.109	20	AGM
CUGEE117B	E	C1	5	1	43.029	0.111	20	AGM
CUGEE118B	E	C1	5	1	43.000	0.112	20	AGM
CUGEE119B	E	C1	5	1	43.325	0.110	20	AGM
CUGEE216B	E	C2	5	2	43.538	0.112	20	AGM
CUGEE217B	E	C2	5	2	42.856	0.111	20	AGM
CUGEE218B	E	C2	5	2	43.699	0.111	20	AGM
CUGEF116B	F	C1	6	1	44.643	0.111	20	AGM
CUGEF117B	F	C1	6	1	43.354	0.111	20	AGM
CUGEF118B	F	C1	6	1	44.111	0.110	20	AGM
CUGEF119B	F	C1	6	1	44.015	0.113	20	AGM
CUGEF216B	F	C2	6	2	43.945	0.111	20	AGM
CUGEF217B	F	C2	6	2	44.851	0.110	20	AGM
CUGEF218B	F	C2	6	2	44.587	0.111	20	AGM

Avg. t_{ply} [in]	Strength _{norm} [ksi]
0.0056	44.084
0.0055	44.276
0.0055	43.524
0.0056	44.482
0.0055	42.671
0.0055	43.806
0.0055	44.402
0.0055	43.121
0.0056	43.550
0.0056	43.638
0.0055	43.410
0.0056	44.158
0.0055	43.103
0.0056	44.255
0.0056	45.075
0.0056	43.900
0.0055	44.204
0.0057	45.222
0.0056	44.351
0.0055	45.028
0.0055	44.905

Average 43.732
 Standard Dev. 0.587
 Coeff. of Var. [%] 1.343
 Min. 42.856
 Max. 44.851
 Number of Spec. 21

Average_{norm} 0.0055 44.056
 Standard Dev._{norm} 0.689
 Coeff. of Var. [%]_{norm} 1.564
 Min. 0.0055 42.671
 Max. 0.0057 45.222
 Number of Spec. 21 21



**Laminate Open-Hole Tension Properties (OHT2)--RTD
Strength**

Cytec 5320-1 T650 Unitape Gr 145 RC 33%

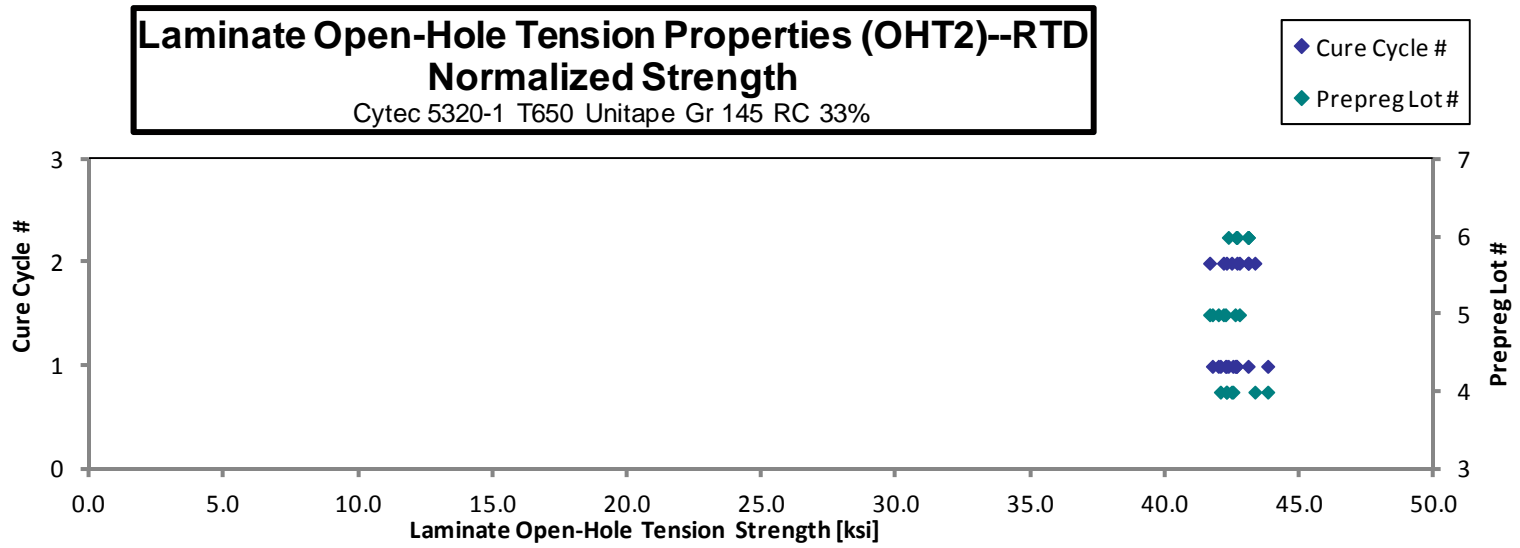
normalizing
t_{ply} [in]
0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksj]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUGED111A	D	C1	4	1	41.612	0.111	20	AGM
CUGED112A	D	C1	4	1	42.270	0.111	20	AGM
CUGED113A	D	C1	4	1	41.746	0.111	20	AGM
CUGED114A	D	C1	4	1	43.439	0.111	20	AGM
CUGED211A	D	C2	4	2	42.423	0.110	20	AGM
CUGED212A	D	C2	4	2	41.627	0.112	20	AGM
CUGED213A	D	C2	4	2	42.934	0.111	20	AGM
CUGEE111A	E	C1	5	1	42.494	0.109	20	AGM
CUGEE112A	E	C1	5	1	41.612	0.110	20	AGM
CUGEE113A	E	C1	5	1	41.805	0.110	20	AGM
CUGEE114A	E	C1	5	1	42.603	0.110	20	AGM
CUGEE211A	E	C2	5	2	42.024	0.109	20	AGM
CUGEE212A	E	C2	5	2	42.757	0.110	20	AGM
CUGEE213A	E	C2	5	2	41.694	0.111	20	AGM
CUGEF111A	F	C1	6	1	41.954	0.111	20	AGM
CUGEF112A	F	C1	6	1	42.335	0.112	20	AGM
CUGEF113A	F	C1	6	1	41.804	0.112	20	AGM
CUGEF114A	F	C1	6	1	41.946	0.112	20	AGM
CUGEF212A	F	C2	6	2	42.747	0.111	20	AGM
CUGEF213A	F	C2	6	2	42.123	0.111	20	AGM
CUGEF214A	F	C2	6	2	42.056	0.113	20	AGM

Avg. t _{ply} [in]	Strength _{norm} [ksj]
0.0056	42.041
0.0055	42.507
0.0056	42.265
0.0055	43.801
0.0055	42.269
0.0056	42.460
0.0056	43.324
0.0055	42.230
0.0055	41.744
0.0055	41.964
0.0055	42.590
0.0055	41.642
0.0055	42.750
0.0056	42.155
0.0056	42.336
0.0056	43.073
0.0056	42.641
0.0056	42.633
0.0055	43.071
0.0056	42.660
0.0056	43.082

Average 42.191
Standard Dev. 0.499
Coeff. of Var. [%] 1.183
Min. 41.612
Max. 43.439
Number of Spec. 21

Average_{norm} 0.0055 42.535
Standard Dev._{norm} 0.530
Coeff. of Var. [%]_{norm} 1.245
Min. 0.0055 41.642
Max. 0.0056 43.801
Number of Spec. 21 21



**Laminate Open-Hole Tension Properties (OHT2)--ETW2
Strength**

Cytec 5320-1 T650 Unitape Gr 145 RC 33%

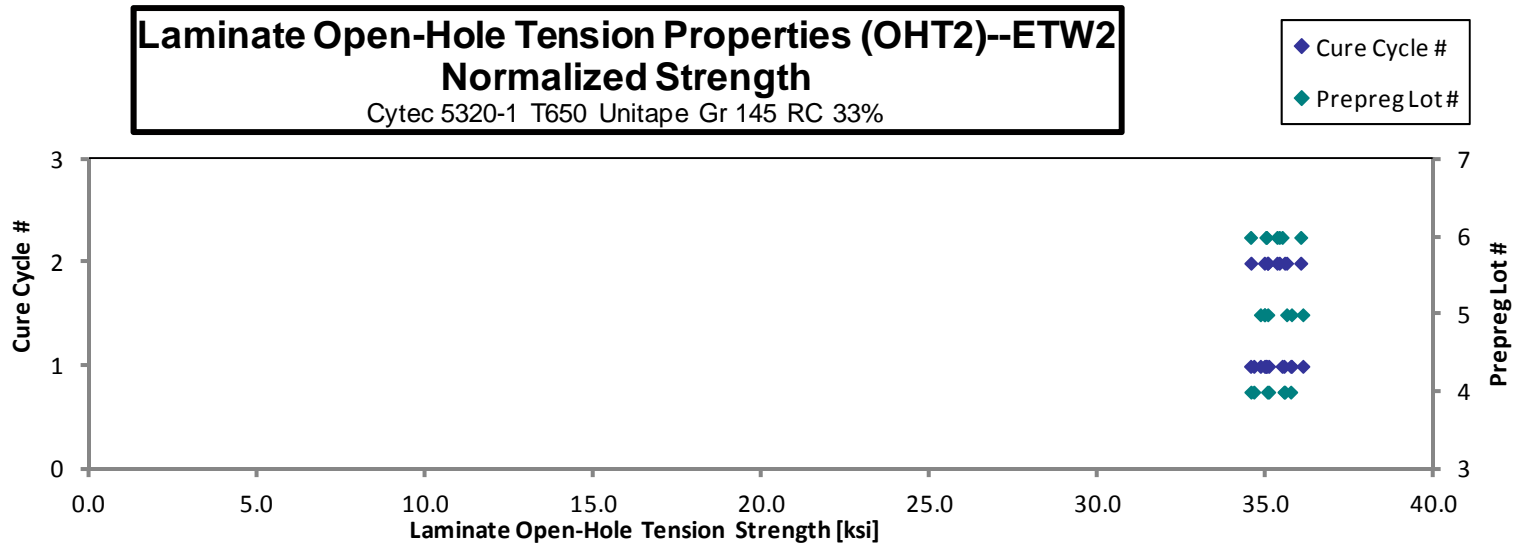
normalizing
t_{ply} [in]
0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUGED11BF	D	C1	4	1	35.531	0.110	20	AGM
CUGED11CF	D	C1	4	1	35.266	0.111	20	AGM
CUGED11DF	D	C1	4	1	35.055	0.110	20	AGM
CUGED11EF	D	C1	4	1	34.569	0.110	20	AGM
CUGED21BF	D	C2	4	2	35.567	0.110	20	AGM
CUGED21CF	D	C2	4	2	34.834	0.111	20	AGM
CUGED21DF	D	C2	4	2	34.955	0.109	20	AGM
CUGEE11BF	E	C1	5	1	35.390	0.112	20	AGM
CUGEE11CF	E	C1	5	1	34.489	0.111	20	AGM
CUGEE11EF	E	C1	5	1	34.176	0.112	20	AGM
CUGEE11FF	E	C1	5	1	35.449	0.111	20	AGM
CUGEE21BF	E	C2	5	2	35.231	0.111	20	AGM
CUGEE21CF	E	C2	5	2	34.870	0.111	20	AGM
CUGEE21DF	E	C2	5	2	34.529	0.111	20	AGM
CUGEF11BF	F	C1	6	1	34.188	0.113	20	AGM
CUGEF11CF	F	C1	6	1	34.391	0.112	20	AGM
CUGEF11DF	F	C1	6	1	34.139	0.111	20	AGM
CUGEF11EF	F	C1	6	1	34.977	0.112	20	AGM
CUGEF21BF	F	C2	6	2	34.869	0.112	20	AGM
CUGEF21CF	F	C2	6	2	35.727	0.111	20	AGM
CUGEF21DF	F	C2	6	2	34.881	0.111	20	AGM

Avg. t _{ply} [in]	Strength _{norm} [ksi]
0.0055	35.525
0.0056	35.726
0.0055	35.071
0.0055	34.627
0.0055	35.546
0.0055	35.035
0.0054	34.542
0.0056	36.087
0.0056	34.824
0.0056	34.947
0.0055	35.749
0.0056	35.604
0.0055	35.044
0.0056	34.943
0.0056	34.986
0.0056	35.006
0.0056	34.532
0.0056	35.470
0.0056	35.387
0.0055	36.024
0.0056	35.320

Average 34.909
Standard Dev. 0.481
Coeff. of Var. [%] 1.379
Min. 34.139
Max. 35.727
Number of Spec. 21

Average_{norm} 0.0056 35.238
Standard Dev._{norm} 0.456
Coeff. of Var. [%]_{norm} 1.294
Min. 0.0054 34.532
Max. 0.0056 36.087
Number of Spec. 21 21



4.17 “50/40/10” Open-Hole Tension 3 Properties (OHT3)

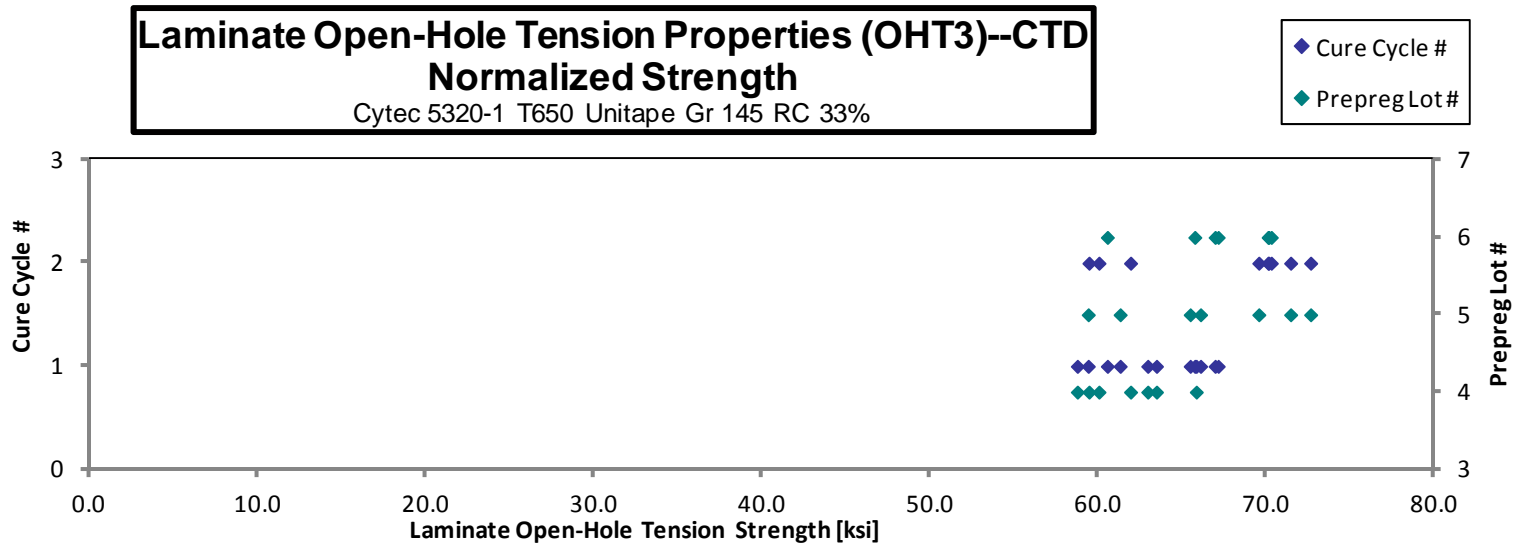
**Laminate Open-Hole Tension Properties (OHT3)--CTD
Strength**
Cytec 5320-1 T650 Unitape Gr 145 RC 33%

normalizing
 t_{ply} [in]
0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksij]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	Strength _{norm} [ksij]
CUGFD116B	D	C1	4	1	58.183	0.111	20	LGM	0.0056	58.756
CUGFD117B	D	C1	4	1	63.405	0.110	20	LGM	0.0055	63.463
CUGFD118B	D	C1	4	1	64.831	0.112	20	LGM	0.0056	65.833
CUGFD119B	D	C1	4	1	63.080	0.110	20	LGM	0.0055	62.946
CUGFD216B	D	C2	4	2	61.419	0.111	20	LGM	0.0055	61.921
CUGFD217B	D	C2	4	2	60.022	0.110	20	LGM	0.0055	60.040
CUGFD218B	D	C2	4	2	59.303	0.110	20	LGM	0.0055	59.447
CUGFE116B	E	C1	5	1	58.788	0.111	20	LGM	0.0056	59.403
CUGFE117B	E	C1	5	1	65.344	0.111	20	LGM	0.0056	66.086
CUGFE118B	E	C1	5	1	60.870	0.111	20	LGM	0.0055	61.303
CUGFE119B	E	C1	5	1	64.609	0.111	20	LGM	0.0056	65.471
CUGFE216B	E	C2	5	2	71.167	0.110	20	LGM	0.0055	71.447
CUGFE217B	E	C2	5	2	71.802	0.111	20	LGM	0.0056	72.639
CUGFE218B	E	C2	5	2	68.690	0.111	20	LGM	0.0056	69.554
CUGFF116B	F	C1	6	1	66.463	0.111	20	LGM	0.0056	67.138
CUGFF117B	F	C1	6	1	65.788	0.112	20	LGM	0.0056	66.955
CUGFF118B	F	C1	6	1	59.682	0.112	20	LGM	0.0056	60.541
CUGFF119B	F	C1	6	1	65.192	0.111	20	LGM	0.0055	65.745
CUGFF216B	F	C2	6	2	69.310	0.111	20	LGM	0.0056	70.139
CUGFF217B	F	C2	6	2	68.990	0.112	20	LGM	0.0056	70.296
CUGFF218B	F	C2	6	2	69.351	0.111	20	LGM	0.0056	70.108

Average 64.585
Standard Dev. 4.228
Coeff. of Var. [%] 6.546
Min. 58.183
Max. 71.802
Number of Spec. 21

Average_{norm} 0.0056 65.202
Standard Dev._{norm} 4.398
Coeff. of Var. [%]_{norm} 6.744
Min. 0.0055 58.756
Max. 0.0056 72.639
Number of Spec. 21 21



**Laminate Open-Hole Tension Properties (OHT3)--RTD
Strength**

Cytec 5320-1 T650 Unitape Gr 145 RC 33%

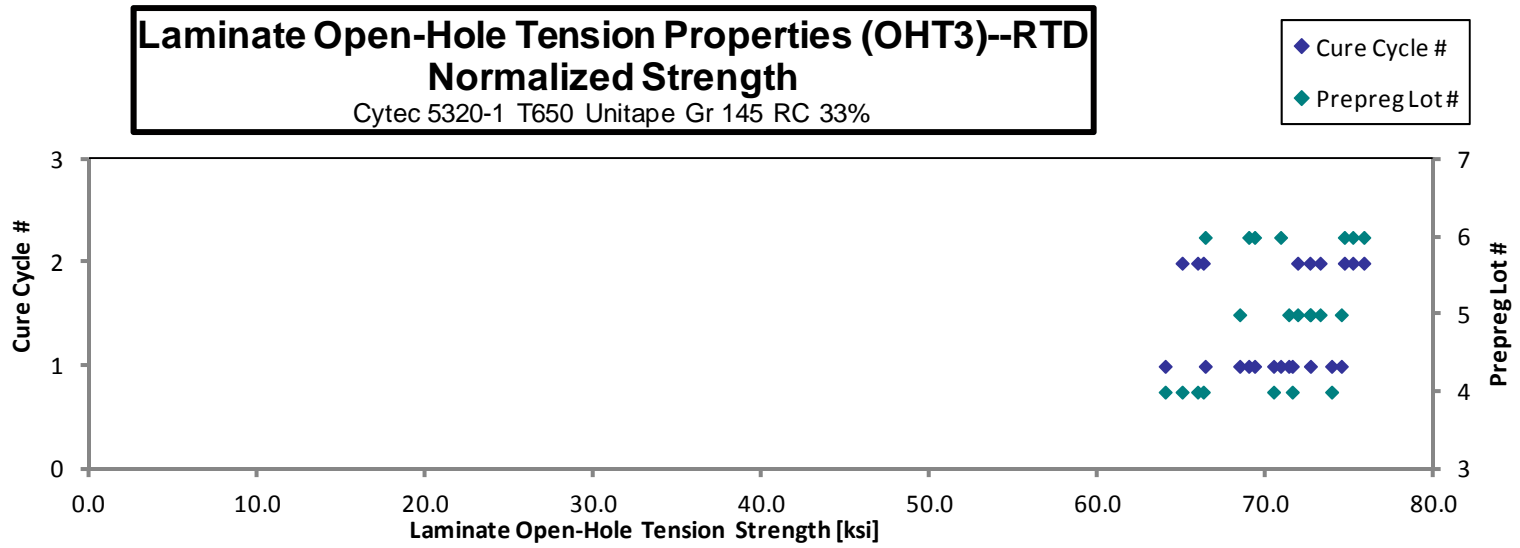
normalizing
t_{ply} [in]
0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUGFD111A	D	C1	4	1	72.433	0.109	20	LGM
CUGFD112A	D	C1	4	1	73.012	0.111	20	LGM
CUGFD113A	D	C1	4	1	64.538	0.109	20	LGM
CUGFD114A	D	C1	4	1	69.976	0.111	20	LGM
CUGFD211A	D	C2	4	2	64.017	0.112	20	LGM
CUGFD212A	D	C2	4	2	65.631	0.110	20	LGM
CUGFD213A	D	C2	4	2	65.839	0.111	20	LGM
CUGFE112A	E	C1	5	1	71.562	0.112	20	LGM
CUGFE113A	E	C1	5	1	67.495	0.112	20	LGM
CUGFE114A	E	C1	5	1	70.437	0.111	20	LGM
CUGFE115A	E	C1	5	1	73.395	0.112	20	LGM
CUGFE211A	E	C2	5	2	72.675	0.111	20	LGM
CUGFE212A	E	C2	5	2	71.162	0.111	20	LGM
CUGFE213A	E	C2	5	2	71.329	0.112	20	LGM
CUGFF111A	F	C1	6	1	68.891	0.110	20	LGM
CUGFF112A	F	C1	6	1	67.660	0.113	20	LGM
CUGFF113A	F	C1	6	1	65.708	0.111	20	LGM
CUGFF114A	F	C1	6	1	69.513	0.112	20	LGM
CUGFF211A	F	C2	6	2	74.997	0.111	20	LGM
CUGFF212A	F	C2	6	2	74.015	0.111	20	LGM
CUGFF213A	F	C2	6	2	73.737	0.112	20	LGM

Avg. t _{ply} [in]	Strength _{norm} [ksi]
0.0054	71.544
0.0056	73.886
0.0055	63.981
0.0055	70.432
0.0056	64.987
0.0055	65.909
0.0055	66.248
0.0056	72.624
0.0056	68.416
0.0056	71.333
0.0056	74.462
0.0055	73.204
0.0056	71.862
0.0056	72.594
0.0055	68.953
0.0056	69.301
0.0056	66.365
0.0056	70.851
0.0056	75.804
0.0055	74.643
0.0056	75.145

Average 69.906
Standard Dev. 3.376
Coeff. of Var. [%] 4.829
Min. 64.017
Max. 74.997
Number of Spec. 21

Average_{norm} 0.0056 70.597
Standard Dev._{norm} 3.543
Coeff. of Var. [%]_{norm} 5.019
Min. 0.0054 63.981
Max. 0.0056 75.804
Number of Spec. 21 21



**Laminate Open-Hole Tension Properties (OHT3)--ETW2
Strength**

Cytec 5320-1 T650 Unitape Gr 145 RC 33%

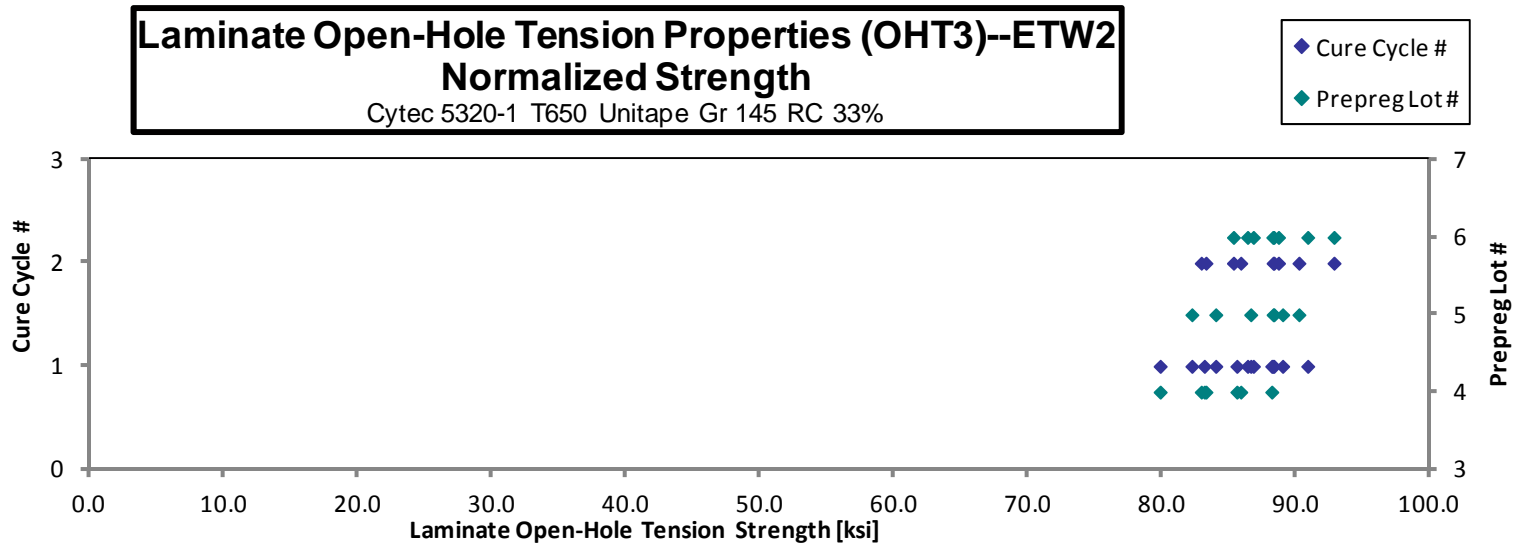
normalizing
t_{ply} [in]
0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUGFD11BF	D	C1	4	1	83.449	0.110	20	LGM
CUGFD11CF	D	C1	4	1	86.758	0.112	20	LGM
CUGFD11DF	D	C1	4	1	84.652	0.111	20	LGM
CUGFD11EF	D	C1	4	1	79.014	0.111	20	LGM
CUGFD21AF	D	C2	4	2	84.345	0.112	20	LGM
CUGFD21BF	D	C2	4	2	81.837	0.111	20	LGM
CUGFD21CF	D	C2	4	2	81.899	0.112	20	LGM
CUGFE11AF	E	C1	5	1	85.188	0.112	20	LGM
CUGFE11BF	E	C1	5	1	81.760	0.111	20	LGM
CUGFE11DF	E	C1	5	1	82.608	0.112	20	LGM
CUGFE11FF	E	C1	5	1	88.162	0.111	20	LGM
CUGFE21BF	E	C2	5	2	88.673	0.112	20	LGM
CUGFE21CF	E	C2	5	2	86.949	0.112	20	LGM
CUGFE21DF	E	C2	5	2	87.931	0.110	20	LGM
CUGFF11CF	F	C1	6	1	88.006	0.110	20	LGM
CUGFF11DF	F	C1	6	1	86.948	0.112	20	LGM
CUGFF11EF	F	C1	6	1	85.232	0.111	20	LGM
CUGFF11FF	F	C1	6	1	84.501	0.113	20	LGM
CUGFF11GF	F	C1	6	1	90.573	0.110	20	LGM
CUGFF21BF	F	C2	6	2	87.750	0.111	20	LGM
CUGFF21CF	F	C2	6	2	91.001	0.112	20	LGM
CUGFF21DF	F	C2	6	2	83.934	0.112	20	LGM

Avg. t _{ply} [in]	Strength _{norm} [ksi]
0.0055	83.145
0.0056	88.178
0.0056	85.575
0.0056	79.852
0.0056	85.866
0.0056	82.916
0.0056	83.264
0.0056	86.608
0.0055	82.218
0.0056	83.998
0.0056	88.990
0.0056	90.205
0.0056	88.345
0.0055	88.277
0.0055	88.326
0.0056	88.252
0.0056	86.369
0.0057	86.805
0.0055	90.861
0.0056	88.680
0.0056	92.821
0.0056	85.320

Average 85.508
Standard Dev. 3.062
Coeff. of Var. [%] 3.581
Min. 79.014
Max. 91.001
Number of Spec. 22

Average_{norm} 0.0056 86.585
Standard Dev._{norm} 3.128
Coeff. of Var. [%]_{norm} 3.612
Min. 0.0055 79.852
Max. 0.0057 92.821
Number of Spec. 22 22



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

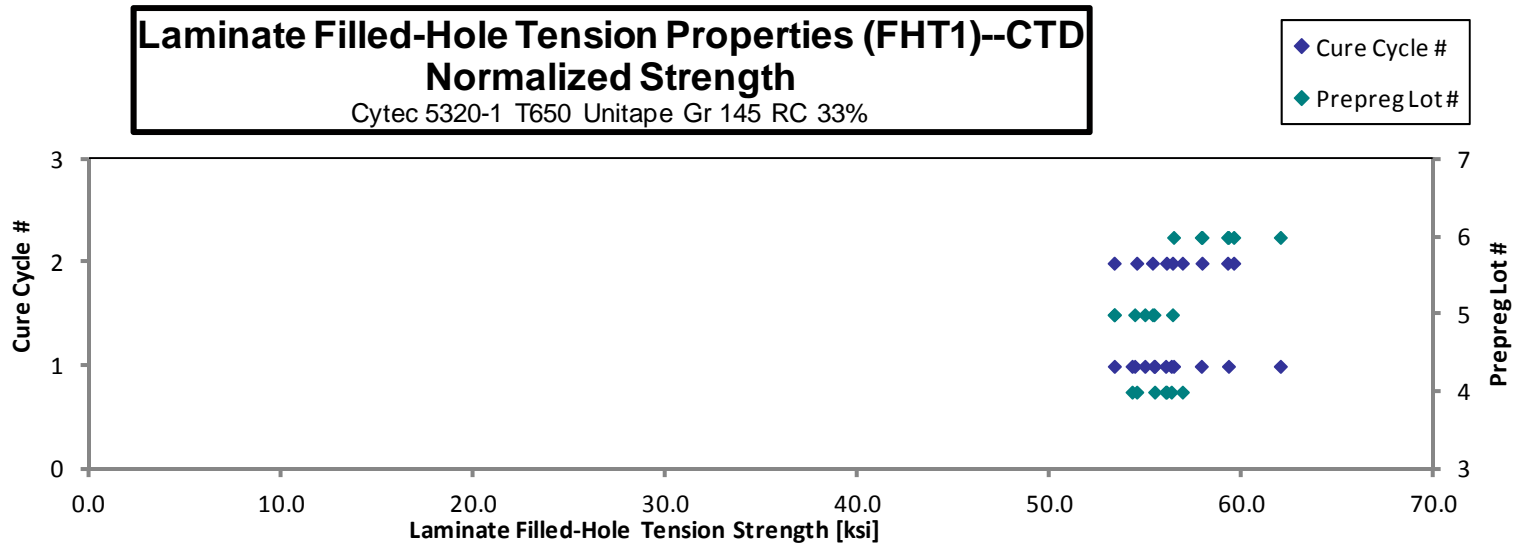
Laminate Filled-Hole Tension Properties (FHT1)--CTD
Strength
 Cytec 5320-1 T650 Unitape Gr 145 RC 33%

normalizing
 t_{ply} [in]
 0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	Strength _{norm} [ksi]
CUG4D115B	D	C1	4	1	55.962	0.088	16	LGM	0.0055	56.005
CUG4D116B	D	C1	4	1	53.945	0.089	16	LGM	0.0055	54.262
CUG4D117B	D	C1	4	1	55.748	0.089	16	LGM	0.0056	56.297
CUG4D118B	D	C1	4	1	54.515	0.089	16	LGM	0.0056	55.434
CUG4D215B	D	C2	4	2	54.001	0.089	16	LGM	0.0056	54.502
CUG4D216B	D	C2	4	2	54.919	0.090	16	LGM	0.0056	56.052
CUG4D217B	D	C2	4	2	57.172	0.088	16	LGM	0.0055	56.879
CUG4E116B	E	C1	5	1	52.580	0.089	16	LGM	0.0056	53.337
CUG4E117B	E	C1	5	1	54.058	0.089	16	LGM	0.0055	54.396
CUG4E118B	E	C1	5	1	55.127	0.088	16	LGM	0.0055	55.399
CUG4E119B	E	C1	5	1	54.663	0.088	16	LGM	0.0055	54.922
CUG4E216B	E	C2	5	2	56.299	0.088	16	LGM	0.0055	56.363
CUG4E217B	E	C2	5	2	55.363	0.088	16	LGM	0.0055	55.321
CUG4E218B	E	C2	5	2	52.650	0.089	16	LGM	0.0056	53.328
CUG4F116B	F	C1	6	1	61.089	0.089	16	LGM	0.0056	61.980
CUG4F117B	F	C1	6	1	57.853	0.088	16	LGM	0.0055	57.864
CUG4F118B	F	C1	6	1	56.261	0.088	16	LGM	0.0055	56.421
CUG4F119B	F	C1	6	1	58.933	0.089	16	LGM	0.0055	59.279
CUG4F217B	F	C2	6	2	59.224	0.088	16	LGM	0.0055	59.236
CUG4F218B	F	C2	6	2	60.248	0.087	16	LGM	0.0054	59.552
CUG4F21AB	F	C2	6	2	58.012	0.088	16	LGM	0.0055	57.902

Average 56.125
 Standard Dev. 2.376
 Coeff. of Var. [%] 4.234
 Min. 52.580
 Max. 61.089
 Number of Spec. 21

Average_{norm} 0.0055 56.416
 Standard Dev._{norm} 2.220
 Coeff. of Var. [%]_{norm} 3.936
 Min. 0.0054 53.328
 Max. 0.0056 61.980
 Number of Spec. 21 21



**Laminate Filled-Hole Tension Properties (FHT1)--RTD
Strength**

Cytec 5320-1 T650 Unitape Gr 145 RC 33%

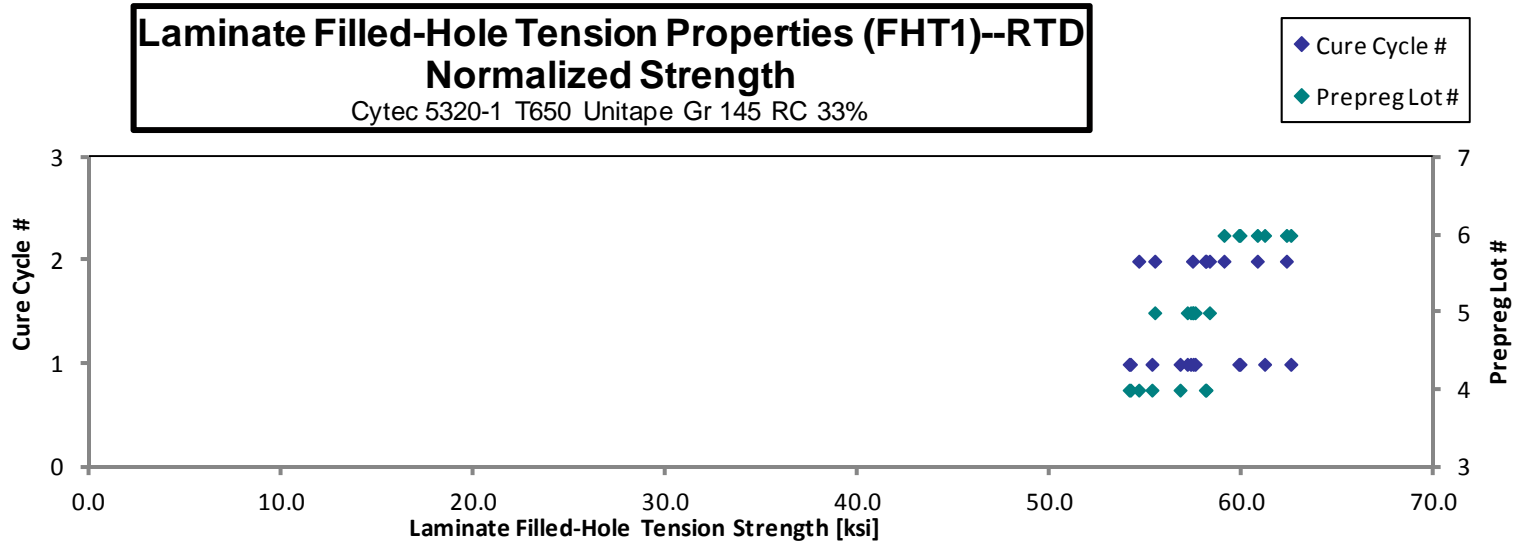
normalizing
t_{ply} [in]
0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksj]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUG4D111A	D	C1	4	1	56.566	0.088	16	LGM
CUG4D112A	D	C1	4	1	54.820	0.087	16	LGM
CUG4D113A	D	C1	4	1	53.895	0.088	16	LGM
CUG4D114A	D	C1	4	1	55.211	0.088	16	LGM
CUG4D211A	D	C2	4	2	58.153	0.088	16	LGM
CUG4D212A	D	C2	4	2	54.534	0.088	16	LGM
CUG4D213A	D	C2	4	2	57.728	0.089	16	LGM
CUG4E111A	E	C1	5	1	56.923	0.089	16	LGM
CUG4E112A	E	C1	5	1	57.058	0.088	16	LGM
CUG4E113A	E	C1	5	1	56.209	0.089	16	LGM
CUG4E114A	E	C1	5	1	57.619	0.088	16	LGM
CUG4E211A	E	C2	5	2	56.014	0.087	16	LGM
CUG4E212A	E	C2	5	2	57.313	0.090	16	LGM
CUG4E213A	E	C2	5	2	57.040	0.089	16	LGM
CUG4F111A	F	C1	6	1	59.853	0.088	16	LGM
CUG4F112A	F	C1	6	1	60.282	0.089	16	LGM
CUG4F113A	F	C1	6	1	59.869	0.088	16	LGM
CUG4F114A	F	C1	6	1	62.265	0.088	16	LGM
CUG4F213A	F	C2	6	2	61.769	0.089	16	LGM
CUG4F214A	F	C2	6	2	59.023	0.088	16	LGM
CUG4F215A	F	C2	6	2	60.482	0.088	16	LGM

Avg. t _{ply} [in]	Strength _{norm} [ksj]
0.0055	56.759
0.0054	54.176
0.0055	54.109
0.0055	55.295
0.0055	58.076
0.0055	54.607
0.0055	58.111
0.0056	57.440
0.0055	57.307
0.0056	57.135
0.0055	57.542
0.0054	55.441
0.0056	58.290
0.0055	57.407
0.0055	59.819
0.0056	61.162
0.0055	59.880
0.0055	62.525
0.0055	62.296
0.0055	59.045
0.0055	60.780

Average 57.744
Standard Dev. 2.345
Coeff. of Var. [%] 4.062
Min. 53.895
Max. 62.265
Number of Spec. 21

Average_{norm} 0.0055 57.962
Standard Dev._{norm} 2.484
Coeff. of Var. [%]_{norm} 4.286
Min. 0.0054 54.109
Max. 0.0056 62.525
Number of Spec. 21 21



**Laminate Filled-Hole Tension Properties (FHT1)--ETW1
Strength**

Cytec 5320-1 T650 Unitape Gr 145 RC 33%

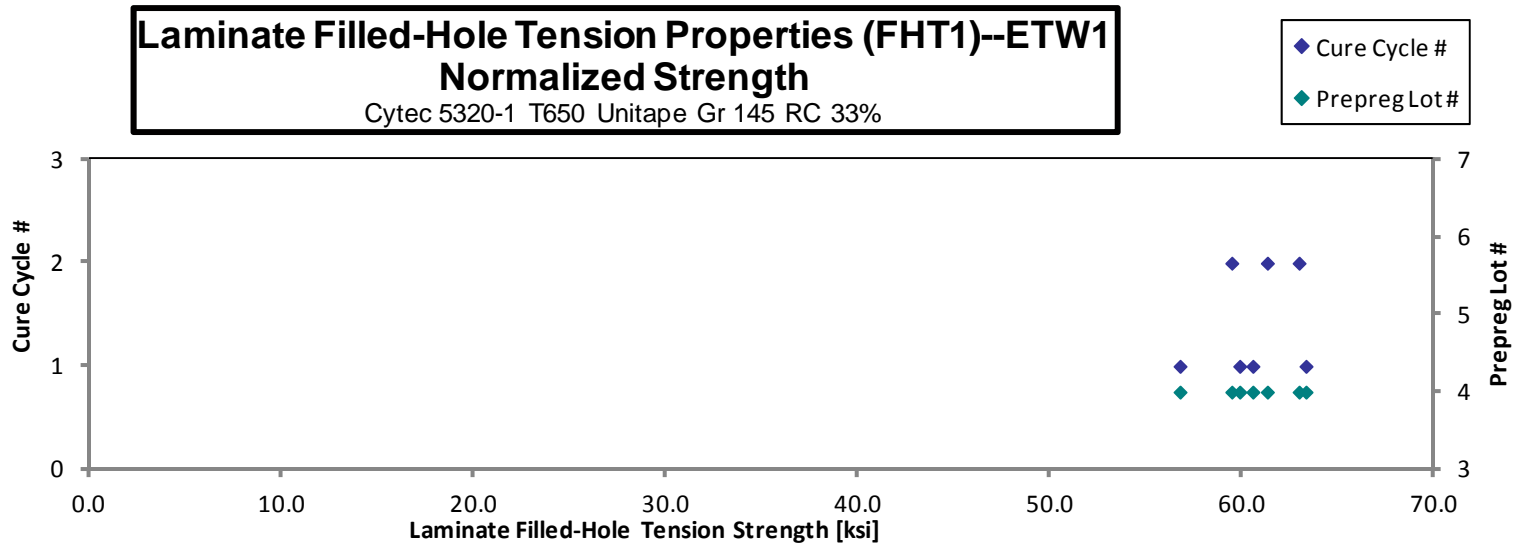
normalizing
t_{ply} [in]
0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksj]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUG4D119D	D	C1	4	1	60.730	0.087	16	LGM
CUG4D11AD	D	C1	4	1	61.084	0.087	16	LGM
CUG4D11BD	D	C1	4	1	56.942	0.088	16	LGM
CUG4D11CD	D	C1	4	1	63.030	0.088	16	LGM
CUG4D218D	D	C2	4	2	61.306	0.088	16	LGM
CUG4D219D	D	C2	4	2	62.169	0.089	16	LGM
CUG4D21AD	D	C2	4	2	59.274	0.088	16	LGM

Avg. t _{ply} [in]	Strength _{norm} [ksj]
0.0054	59.868
0.0055	60.552
0.0055	56.759
0.0055	63.316
0.0055	61.306
0.0056	62.957
0.0055	59.453

Average 60.648
Standard Dev. 2.010
Coeff. of Var. [%] 3.314
Min. 56.942
Max. 63.030
Number of Spec. 7

Average_{norm} 0.0055 60.602
Standard Dev._{norm} 2.238
Coeff. of Var. [%]_{norm} 3.692
Min. 0.0054 56.759
Max. 0.0056 63.316
Number of Spec. 7 7



**Laminate Filled-Hole Tension Properties (FHT1)--ETW2
Strength**

Cytec 5320-1 T650 Unitape Gr 145 RC 33%

normalizing
t_{ply} [in]
0.0055

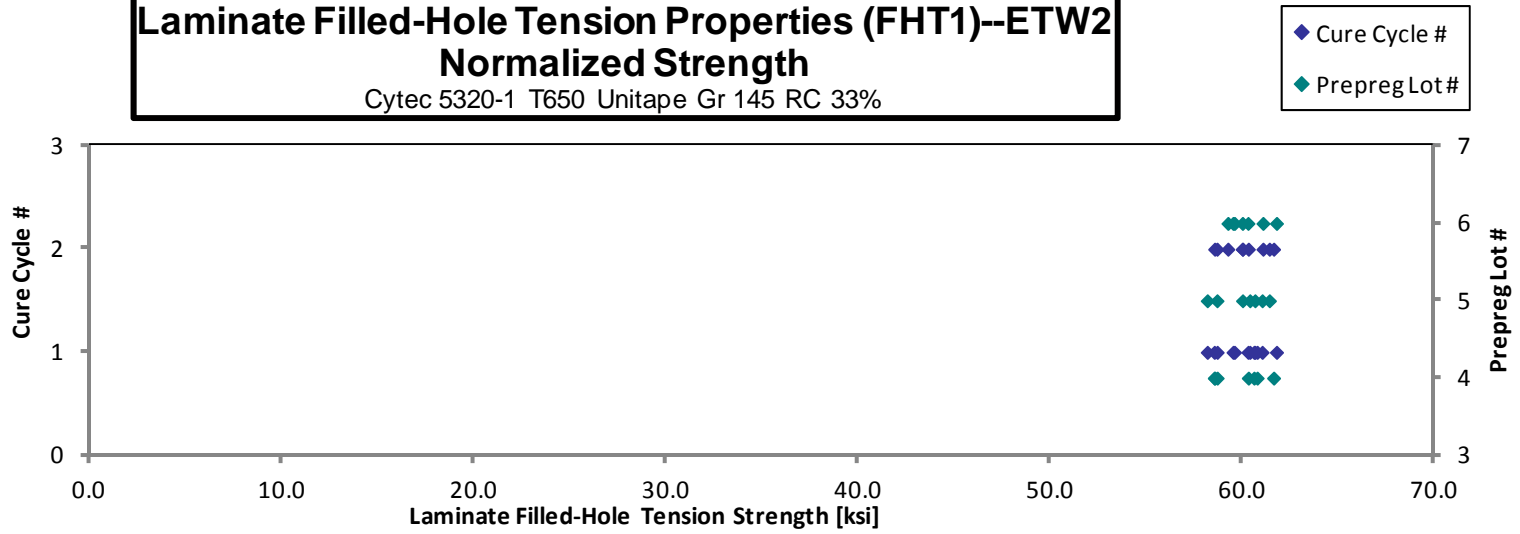
Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksj]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUG4D11DF	D	C1	4	1	60.579	0.088	16	LGM
CUG4D11EF	D	C1	4	1	58.250	0.089	16	LGM
CUG4D11FF	D	C1	4	1	60.664	0.088	16	LGM
CUG4D11GF	D	C1	4	1	58.301	0.088	16	MGM
CUG4D21CF	D	C2	4	2	57.914	0.089	16	AGM
CUG4D21DF	D	C2	4	2	60.810	0.087	16	LGM
CUG4D21FF	D	C2	4	2	61.652	0.088	16	MGM
CUG4E11BF	E	C1	5	1	60.779	0.088	16	AGM
CUG4E11CF	E	C1	5	1	60.109	0.088	16	AGM
CUG4E11DF	E	C1	5	1	59.896	0.089	16	AGM
CUG4E11EF	E	C1	5	1	57.298	0.089	16	AGM
CUG4E21BF	E	C2	5	2	58.657	0.090	16	AGM
CUG4E21CF	E	C2	5	2	58.747	0.088	16	AGM
CUG4E21DF	E	C2	5	2	60.709	0.089	16	LGM
CUG4F11BF	F	C1	6	1	59.160	0.089	16	AGM
CUG4F11CF	F	C1	6	1	59.898	0.089	16	AGM
CUG4F11DF	F	C1	6	1	59.235	0.089	16	AGM
CUG4F11EF	F	C1	6	1	61.247	0.089	16	AGM
CUG4F21BF	F	C2	6	2	60.856	0.088	16	AGM
CUG4F21CF	F	C2	6	2	59.995	0.088	16	AGM
CUG4F21GF	F	C2	6	2	58.837	0.089	16	AGM

Avg. t _{ply} [in]	Strength _{norm} [ksj]
0.0055	60.774
0.0055	58.692
0.0055	60.607
0.0055	58.544
0.0056	58.561
0.0055	60.315
0.0055	61.629
0.0055	61.033
0.0055	60.393
0.0056	60.656
0.0056	58.177
0.0056	60.012
0.0055	58.681
0.0056	61.410
0.0055	59.519
0.0055	60.295
0.0055	59.594
0.0055	61.781
0.0055	61.075
0.0055	60.006
0.0055	59.249

Average 59.695
Standard Dev. 1.209
Coeff. of Var. [%] 2.026
Min. 57.298
Max. 61.652
Number of Spec. 21

Average_{norm} 0.0055 60.048
Standard Dev._{norm} 1.087
Coeff. of Var. [%]_{norm} 1.811
Min. 0.0055 58.177
Max. 0.0056 61.781
Number of Spec. 21 21

Laminate Filled-Hole Tension Properties (FHT1)--ETW2
Normalized Strength
Cytec 5320-1 T650 Unitape Gr 145 RC 33%



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

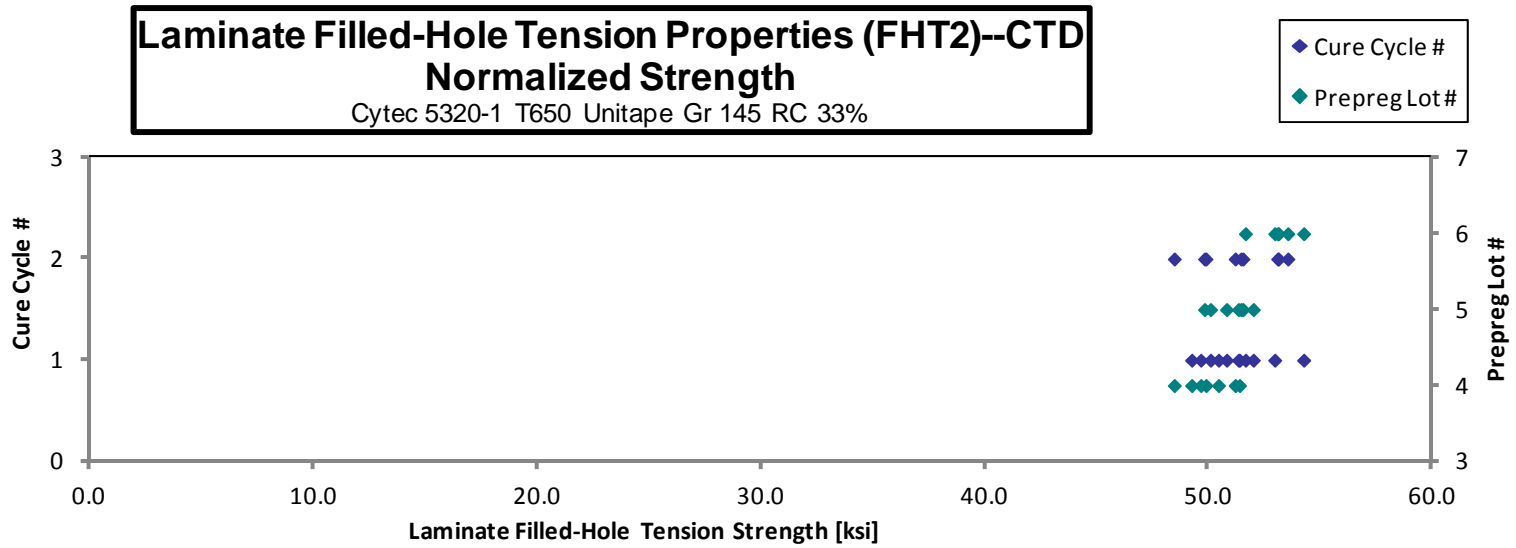
Laminate Filled-Hole Tension Properties (FHT2)--CTD
Strength
 Cytec 5320-1 T650 Unitape Gr 145 RC 33%

normalizing
 t_{ply} [in]
 0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	Strength _{norm} [ksi]
CUG5D116B	D	C1	4	1	51.283	0.110	20	AGM	0.0055	51.384
CUG5D118B	D	C1	4	1	49.457	0.110	20	AGM	0.0055	49.652
CUG5D119B	D	C1	4	1	50.884	0.109	20	AGM	0.0055	50.444
CUG5D11AB	D	C1	4	1	49.194	0.110	20	AGM	0.0055	49.246
CUG5D216B	D	C2	4	2	51.074	0.110	20	AGM	0.0055	51.190
CUG5D217B	D	C2	4	2	49.935	0.110	20	AGM	0.0055	49.882
CUG5D218B	D	C2	4	2	48.387	0.110	20	AGM	0.0055	48.468
CUG5E117B	E	C1	5	1	50.529	0.111	20	AGM	0.0055	50.804
CUG5E118B	E	C1	5	1	51.218	0.110	20	AGM	0.0055	51.334
CUG5E119B	E	C1	5	1	52.055	0.110	20	AGM	0.0055	52.000
CUG5E11AB	E	C1	5	1	50.109	0.110	20	AGM	0.0055	50.087
CUG5E216B	E	C2	5	2	50.248	0.109	20	AGM	0.0055	49.822
CUG5E217B	E	C2	5	2	51.347	0.110	20	AGM	0.0055	51.534
CUG5E219B	E	C2	5	2	52.305	0.108	20	AGM	0.0054	51.449
CUG5F116B	F	C1	6	1	51.422	0.110	20	AGM	0.0055	51.648
CUG5F117B	F	C1	6	1	52.354	0.111	20	AGM	0.0056	52.957
CUG5F118B	F	C1	6	1	53.569	0.111	20	AGM	0.0056	54.251
CUG5F216B	F	C2	6	2	53.577	0.110	20	AGM	0.0055	53.545
CUG5F217B	F	C2	6	2	53.259	0.110	20	AGM	0.0055	53.089
CUG5F218B	F	C2	6	2	53.727	0.109	20	AGM	0.0054	53.124

Average 51.297
 Standard Dev. 1.527
 Coeff. of Var. [%] 2.977
 Min. 48.387
 Max. 53.727
 Number of Spec. 20

Average_{norm} 0.0055 51.295
 Standard Dev._{norm} 1.545
 Coeff. of Var. [%]_{norm} 3.011
 Min. 0.0054 48.468
 Max. 0.0056 54.251
 Number of Spec. 20 20



**Laminate Filled-Hole Tension Properties (FHT2)--RTD
Strength**

Cytec 5320-1 T650 Unitape Gr 145 RC 33%

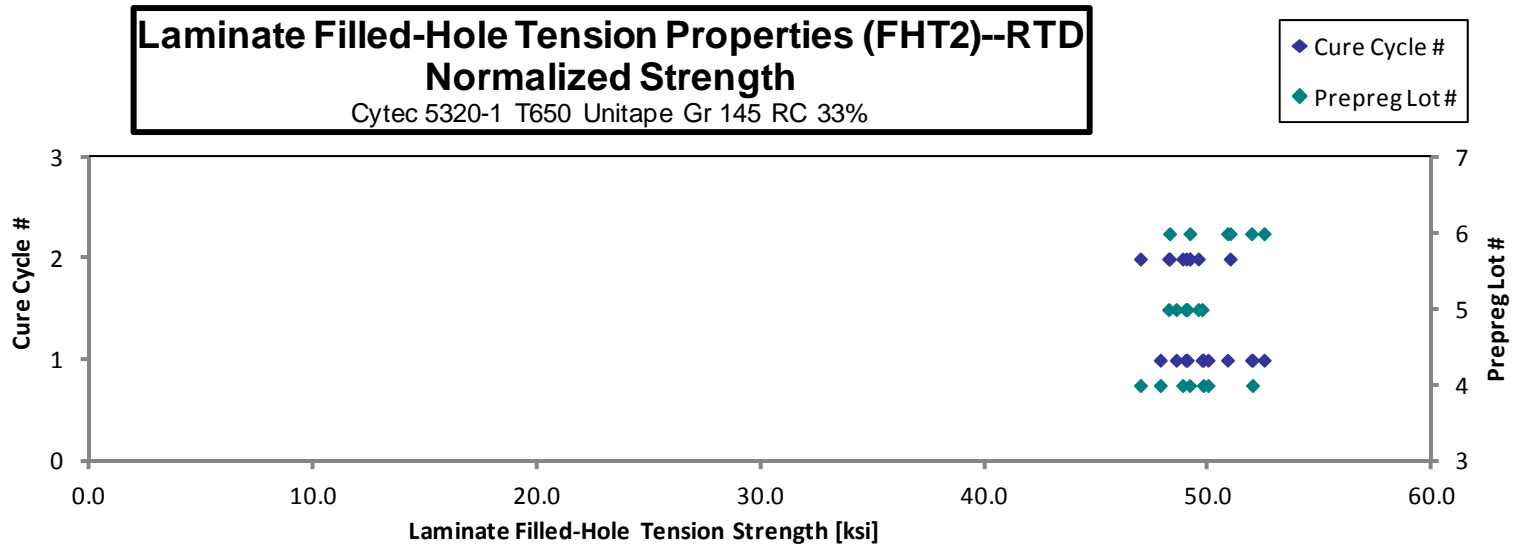
normalizing
t_{ply} [in]
0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksj]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUG5D111A	D	C1	4	1	50.327	0.109	20	AGM
CUG5D112A	D	C1	4	1	52.400	0.109	20	AGM
CUG5D113A	D	C1	4	1	50.312	0.109	20	AGM
CUG5D114A	D	C1	4	1	47.886	0.110	20	AGM
CUG5D211A	D	C2	4	2	46.531	0.111	20	AGM
CUG5D212A	D	C2	4	2	49.329	0.110	20	AGM
CUG5D214A	D	C2	4	2	48.510	0.111	20	AGM
CUG5E111A	E	C1	5	1	48.756	0.110	20	AGM
CUG5E113A	E	C1	5	1	49.341	0.109	20	AGM
CUG5E115A	E	C1	5	1	49.906	0.110	20	AGM
CUG5E116A	E	C1	5	1	49.408	0.109	20	AGM
CUG5E212A	E	C2	5	2	48.545	0.111	20	AGM
CUG5E213A	E	C2	5	2	49.791	0.109	20	AGM
CUG5E214A	E	C2	5	2	47.954	0.111	20	AGM
CUG5F111A	F	C1	6	1	51.529	0.112	20	AGM
CUG5F112A	F	C1	6	1	50.342	0.111	20	AGM
CUG5F113A	F	C1	6	1	51.390	0.111	20	AGM
CUG5F211A	F	C2	6	2	51.137	0.110	20	AGM
CUG5F212A	F	C2	6	2	48.457	0.110	20	AGM
CUG5F213A	F	C2	6	2	49.135	0.110	20	AGM

Avg. t _{ply} [in]	Strength _{norm} [ksj]
0.0054	49.763
0.0055	51.963
0.0055	49.977
0.0055	47.842
0.0056	46.954
0.0055	49.150
0.0055	48.841
0.0055	48.556
0.0055	48.974
0.0055	49.709
0.0055	49.041
0.0056	49.001
0.0055	49.542
0.0055	48.216
0.0056	52.481
0.0056	50.845
0.0056	51.919
0.0055	50.966
0.0055	48.259
0.0055	49.165

Average 49.549
Standard Dev. 1.425
Coeff. of Var. [%] 2.875
Min. 46.531
Max. 52.400
Number of Spec. 20

Average_{norm} 0.0055 49.558
Standard Dev._{norm} 1.447
Coeff. of Var. [%]_{norm} 2.919
Min. 0.0054 46.954
Max. 0.0056 52.481
Number of Spec. 20 20



**Laminate Filled-Hole Tension Properties (FHT2)--ETW2
Strength**

Cytec 5320-1 T650 Unitape Gr 145 RC 33%

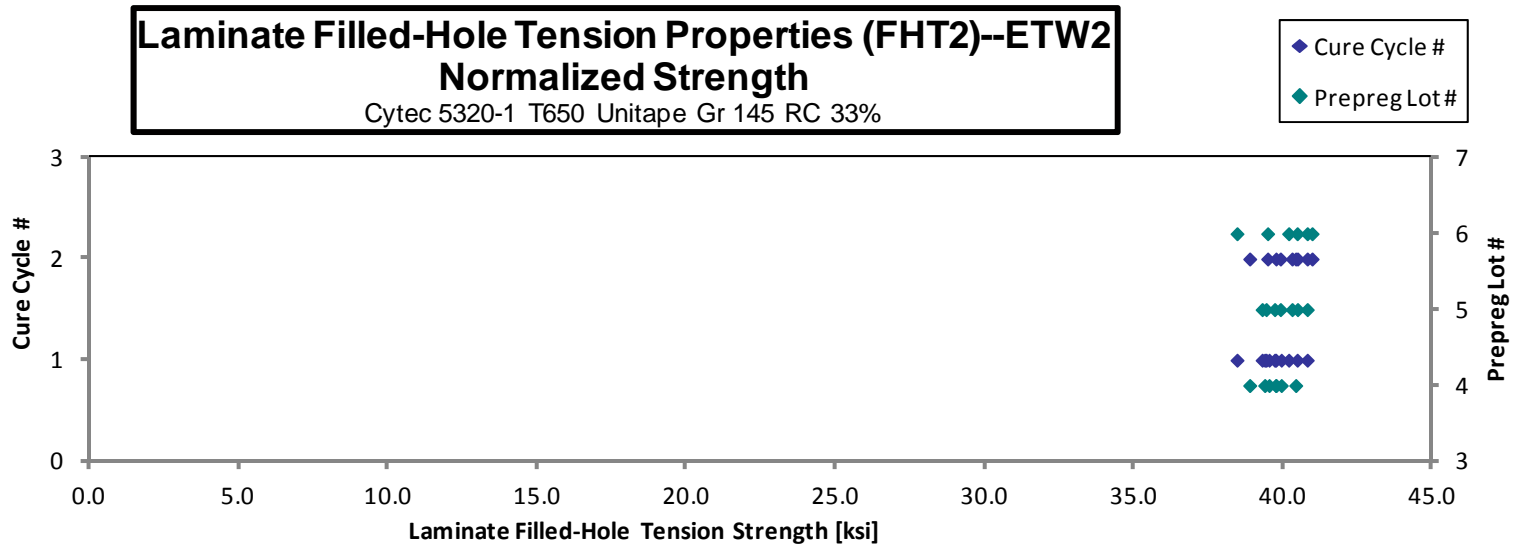
normalizing
t_{ply} [in]
0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksj]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUG5D11BF	D	C1	4	1	40.229	0.109	20	MGM
CUG5D11CF	D	C1	4	1	39.445	0.110	20	MGM
CUG5D11DF	D	C1	4	1	40.050	0.109	20	LGM
CUG5D11EF	D	C1	4	1	39.605	0.109	20	LGM
CUG5D21BF	D	C2	4	2	39.116	0.109	20	MGM
CUG5D21CF	D	C2	4	2	40.227	0.111	20	LGM
CUG5D21DF	D	C2	4	2	40.002	0.109	20	LGM
CUG5E11BF	E	C1	5	1	40.222	0.112	20	MGM
CUG5E11CF	E	C1	5	1	38.994	0.111	20	LGM
CUG5E11DF	E	C1	5	1	39.434	0.111	20	MGM
CUG5E11EF	E	C1	5	1	39.448	0.110	20	MGM
CUG5E21CF	E	C2	5	2	39.889	0.110	20	MGM
CUG5E21DF	E	C2	5	2	40.075	0.111	20	LGM
CUG5E21EF	E	C2	5	2	39.830	0.111	20	LGM
CUG5F11BF	F	C1	6	1	38.135	0.111	20	AGM
CUG5F11CF	F	C1	6	1	39.975	0.111	20	AGM
CUG5F11DF	F	C1	6	1	40.129	0.110	20	AGM
CUG5F21BF	F	C2	6	2	41.201	0.109	20	AGM
CUG5F21EF	F	C2	6	2	41.061	0.109	20	AGM
CUG5F21FF	F	C2	6	2	39.037	0.111	20	AGM

Avg. t _{ply} [in]	Strength _{norm} [ksj]
0.0055	39.937
0.0055	39.528
0.0055	39.753
0.0055	39.383
0.0055	38.879
0.0055	40.422
0.0055	39.760
0.0056	40.807
0.0055	39.295
0.0055	39.715
0.0055	39.430
0.0055	39.908
0.0056	40.482
0.0056	40.300
0.0055	38.453
0.0056	40.471
0.0055	40.184
0.0055	40.970
0.0055	40.806
0.0056	39.480

Average **39.805**
Standard Dev. **0.700**
Coeff. of Var. [%] **1.759**
Min. **38.135**
Max. **41.201**
Number of Spec. **20**

Average_{norm} **0.0055** **39.898**
Standard Dev._{norm} **0.663**
Coeff. of Var. [%]_{norm} **1.661**
Min. **0.0055** **38.453**
Max. **0.0056** **40.970**
Number of Spec. **20** **20**



4.20 “50/40/10” Filled-Hole Tension 3 Properties (FHT3)

Laminate Filled-Hole Tension Properties (FHT3)--CTD
Strength
 Cytec 5320-1 T650 Unitape Gr 145 RC 33%

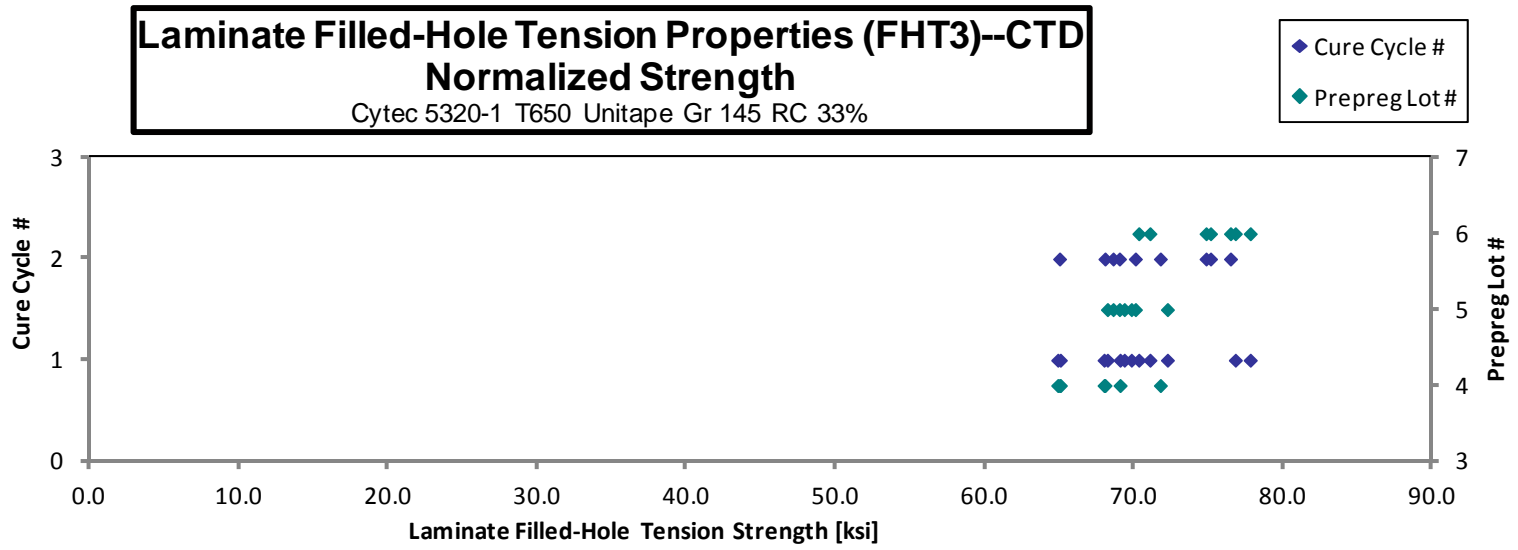
normalizing
 t_{ply} [in]
 0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUG6D116B	D	C1	4	1	64.801	0.110	20	LGM
CUG6D117B	D	C1	4	1	68.169	0.110	20	LGM
CUG6D118B	D	C1	4	1	65.220	0.110	20	LGM
CUG6D119B	D	C1	4	1	69.991	0.109	20	LGM
CUG6D216B	D	C2	4	2	64.813	0.110	20	LGM
CUG6D217B	D	C2	4	2	68.996	0.109	20	LGM
CUG6D218B	D	C2	4	2	70.287	0.112	20	LGM
CUG6E116B	E	C1	5	1	71.417	0.111	20	LGM
CUG6E117B	E	C1	5	1	68.334	0.112	20	LGM
CUG6E118B	E	C1	5	1	67.685	0.111	20	LGM
CUG6E119B	E	C1	5	1	69.716	0.110	20	LGM
CUG6E216B	E	C2	5	2	69.608	0.111	20	LGM
CUG6E218B	E	C2	5	2	69.349	0.109	20	LGM
CUG6E219B	E	C2	5	2	68.546	0.110	20	LGM
CUG6F116B	F	C1	6	1	68.588	0.113	20	LGM
CUG6F117B	F	C1	6	1	76.406	0.112	20	LGM
CUG6F118B	F	C1	6	1	75.647	0.112	20	LGM
CUG6F119B	F	C1	6	1	69.934	0.112	20	LGM
CUG6F216B	F	C2	6	2	74.870	0.110	20	LGM
CUG6F217B	F	C2	6	2	74.809	0.110	20	LGM
CUG6F218B	F	C2	6	2	76.147	0.110	20	LGM

Avg. t_{ply} [in]	Strength _{norm} [ksi]
0.0055	64.889
0.0055	67.994
0.0055	65.062
0.0054	69.068
0.0055	65.009
0.0054	68.055
0.0056	71.767
0.0056	72.240
0.0056	69.349
0.0055	68.218
0.0055	69.821
0.0055	70.093
0.0055	69.023
0.0055	68.598
0.0056	70.324
0.0056	77.795
0.0056	76.794
0.0056	71.068
0.0055	75.131
0.0055	74.831
0.0055	76.470

Average **70.159**
 Standard Dev. **3.558**
 Coeff. of Var. [%] **5.071**
 Min. **64.801**
 Max. **76.406**
 Number of Spec. **21**

Average_{norm} **0.0055** **70.552**
 Standard Dev._{norm} **3.821**
 Coeff. of Var. [%]_{norm} **5.417**
 Min. **0.0054** **64.889**
 Max. **0.0056** **77.795**
 Number of Spec. **21** **21**



**Laminate Filled-Hole Tension Properties (FHT3)--RTD
Strength**

Cytec 5320-1 T650 Unitape Gr 145 RC 33%

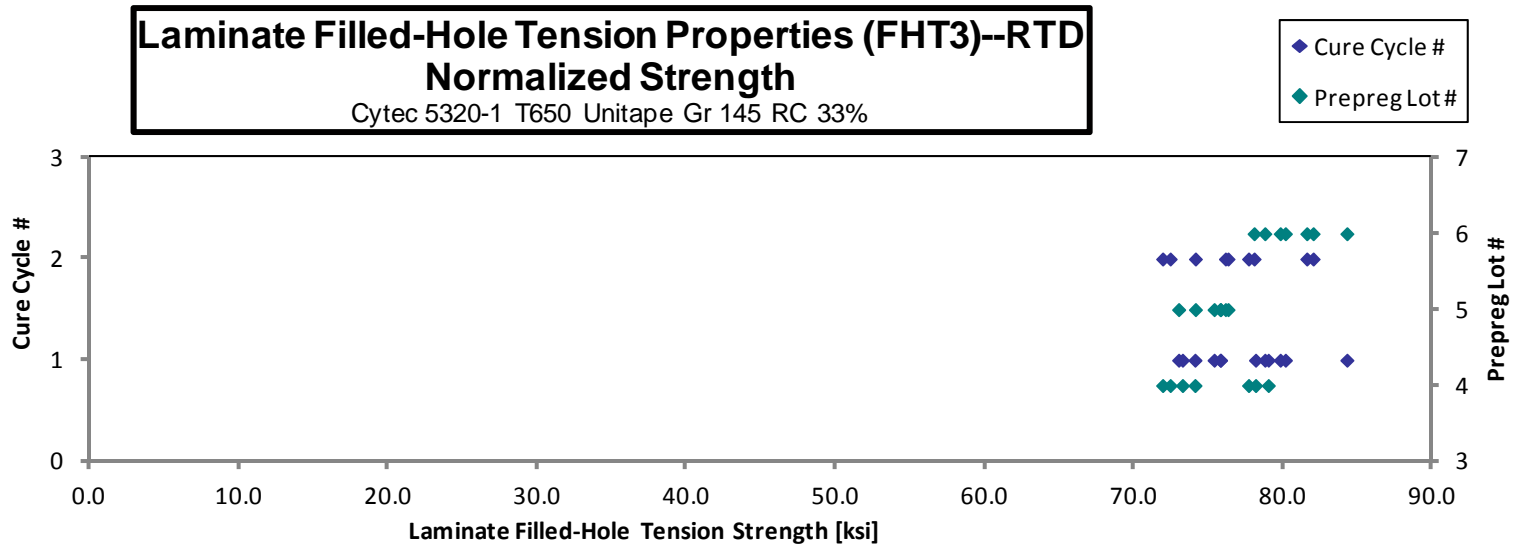
normalizing
t_{ply} [in]
0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUG6D111A	D	C1	4	1	74.723	0.109	20	LGM
CUG6D112A	D	C1	4	1	78.064	0.110	20	LGM
CUG6D114A	D	C1	4	1	78.777	0.110	20	LGM
CUG6D115A	D	C1	4	1	73.226	0.110	20	LGM
CUG6D211A	D	C2	4	2	78.236	0.109	20	LGM
CUG6D212A	D	C2	4	2	74.447	0.107	20	LGM
CUG6D214A	D	C2	4	2	72.547	0.109	20	LGM
CUG6E111A	E	C1	5	1	75.074	0.110	20	LGM
CUG6E112A	E	C1	5	1	73.965	0.113	20	LGM
CUG6E113A	E	C1	5	1	74.394	0.112	20	LGM
CUG6E114A	E	C1	5	1	72.961	0.110	20	LGM
CUG6E211A	E	C2	5	2	76.686	0.109	20	LGM
CUG6E212A	E	C2	5	2	74.604	0.109	20	LGM
CUG6E213A	E	C2	5	2	76.745	0.109	20	LGM
CUG6F111A	F	C1	6	1	78.963	0.112	20	LGM
CUG6F112A	F	C1	6	1	83.552	0.111	20	LGM
CUG6F113A	F	C1	6	1	77.540	0.112	20	LGM
CUG6F114A	F	C1	6	1	78.990	0.111	20	LGM
CUG6F211A	F	C2	6	2	78.040	0.110	20	LGM
CUG6F212A	F	C2	6	2	82.336	0.110	20	LGM
CUG6F214A	F	C2	6	2	80.213	0.112	20	LGM

Avg. t _{ply} [in]	Strength _{norm} [ksi]
0.0055	74.089
0.0055	78.147
0.0055	79.004
0.0055	73.248
0.0055	77.679
0.0054	72.428
0.0055	71.921
0.0055	75.369
0.0056	75.781
0.0056	75.803
0.0055	72.994
0.0055	76.303
0.0055	74.118
0.0055	76.129
0.0056	80.147
0.0055	84.274
0.0056	78.773
0.0056	79.804
0.0055	78.052
0.0055	82.011
0.0056	81.586

Average 76.861
Standard Dev. 3.033
Coeff. of Var. [%] 3.946
Min. 72.547
Max. 83.552
Number of Spec. 21

Average_{norm} 0.0055 77.031
Standard Dev._{norm} 3.371
Coeff. of Var. [%]_{norm} 4.376
Min. 0.0054 71.921
Max. 0.0056 84.274
Number of Spec. 21 21



**Laminate Filled-Hole Tension Properties (FHT3)--ETW2
Strength**

Cytec 5320-1 T650 Unitape Gr 145 RC 33%

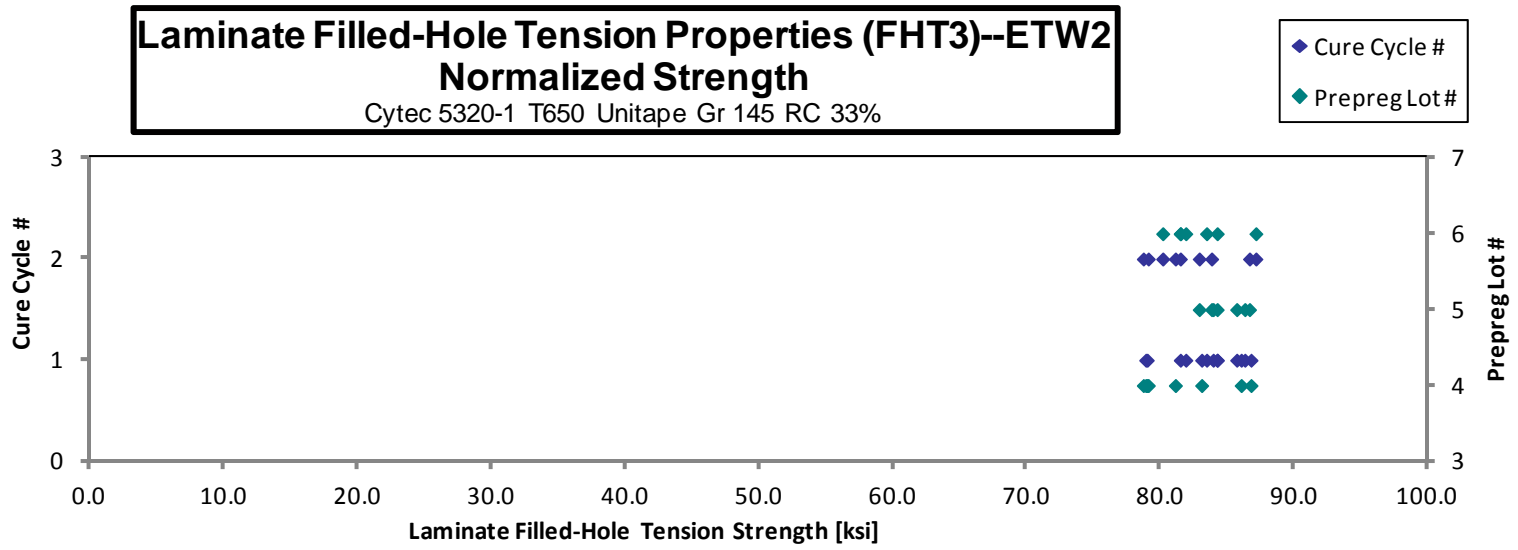
normalizing
t_{ply} [in]
0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksj]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUG6D11BF	D	C1	4	1	86.500	0.110	20	LGM
CUG6D11CF	D	C1	4	1	84.670	0.112	20	LGM
CUG6D11DF	D	C1	4	1	79.392	0.109	20	LGM
CUG6D11EF	D	C1	4	1	79.018	0.110	20	LGM
CUG6D11FF	D	C1	4	1	83.302	0.110	20	LGM
CUG6D21CF	D	C2	4	2	79.124	0.109	20	LGM
CUG6D21DF	D	C2	4	2	82.332	0.108	20	LGM
CUG6D21EF	D	C2	4	2	78.292	0.111	20	LGM
CUG6E11BF	E	C1	5	1	82.667	0.112	20	LGM
CUG6E11CF	E	C1	5	1	85.985	0.110	20	LGM
CUG6E11DF	E	C1	5	1	82.877	0.111	20	LGM
CUG6E11EF	E	C1	5	1	84.581	0.111	20	LGM
CUG6E21BF	E	C2	5	2	82.531	0.110	20	LGM
CUG6E21CF	E	C2	5	2	87.230	0.109	20	LGM
CUG6E21DF	E	C2	5	2	83.428	0.111	20	LGM
CUG6F11BF	F	C1	6	1	82.207	0.112	20	LGM
CUG6F11CF	F	C1	6	1	82.636	0.112	20	LGM
CUG6F11DF	F	C1	6	1	80.337	0.112	20	LGM
CUG6F11EF	F	C1	6	1	80.616	0.112	20	LGM
CUG6F21BF	F	C2	6	2	79.385	0.111	20	LGM
CUG6F21CF	F	C2	6	2	81.332	0.110	20	LGM
CUG6F21DF	F	C2	6	2	87.168	0.110	20	LGM

Avg. t _{ply} [in]	Strength _{norm} [ksj]
0.0055	86.763
0.0056	86.030
0.0055	79.007
0.0055	78.898
0.0055	83.075
0.0055	78.716
0.0054	81.109
0.0056	79.087
0.0056	84.232
0.0055	86.298
0.0056	83.932
0.0056	85.696
0.0055	82.894
0.0055	86.648
0.0055	83.820
0.0056	83.440
0.0056	84.238
0.0056	81.481
0.0056	81.886
0.0056	80.167
0.0055	81.480
0.0055	87.128

Average **82.528**
Standard Dev. **2.702**
Coeff. of Var. [%] **3.274**
Min. **78.292**
Max. **87.230**
Number of Spec. **22**

Average_{norm} **0.0055** **83.001**
Standard Dev._{norm} **2.765**
Coeff. of Var. [%]_{norm} **3.331**
Min. **0.0054** **78.716**
Max. **0.0056** **87.128**
Number of Spec. **22** **22**



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

Laminate Open-Hole Compression Properties (OHC1)--RTD
Strength
 Cytec 5320-1 T650 Unitape Gr 145 RC 33%

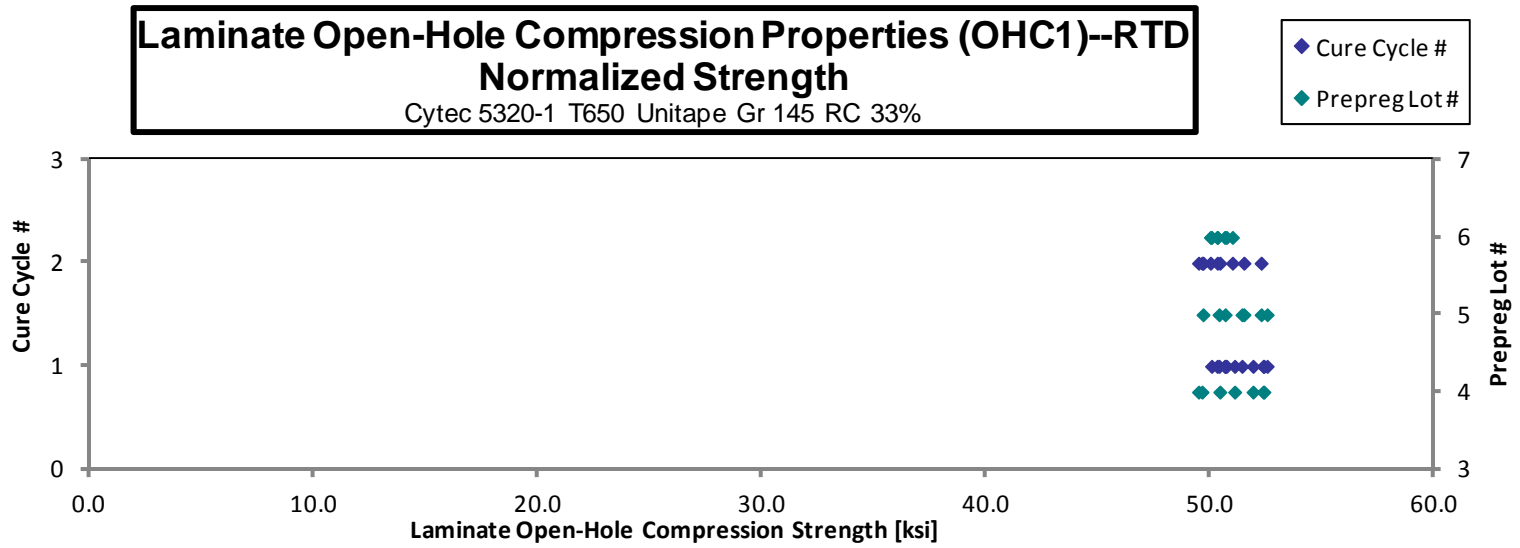
normalizing
 t_{ply} [in]
 0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUGGD111A	D	C1	4	1	51.412	0.175	32	LGM
CUGGD112A	D	C1	4	1	51.390	0.178	32	LGM
CUGGD113A	D	C1	4	1	52.207	0.177	32	LGM
CUGGD114A	D	C1	4	1	52.081	0.177	32	LGM
CUGGD211A	D	C2	4	2	50.354	0.176	32	LGM
CUGGD212A	D	C2	4	2	49.724	0.176	32	LGM
CUGGD213A	D	C2	4	2	49.213	0.177	32	LGM
CUGGE111A	E	C1	5	1	51.506	0.176	32	LGM
CUGGE112A	E	C1	5	1	51.866	0.178	32	LGM
CUGGE113A	E	C1	5	1	50.148	0.177	32	LGM
CUGGE114A	E	C1	5	1	50.549	0.176	32	LGM
CUGGE211A	E	C2	5	2	49.647	0.176	32	LGM
CUGGE214A	E	C2	5	2	52.028	0.177	32	LGM
CUGGE215A	E	C2	5	2	51.312	0.177	32	LGM
CUGGF111A	F	C1	6	1	50.181	0.176	32	LGM
CUGGF112A	F	C1	6	1	50.664	0.176	32	LGM
CUGGF113A	F	C1	6	1	50.554	0.176	32	LGM
CUGGF114A	F	C1	6	1	49.910	0.177	32	LGM
CUGGF211A	F	C2	6	2	50.407	0.178	32	LGM
CUGGF212A	F	C2	6	2	49.867	0.178	32	LGM
CUGGF213A	F	C2	6	2	49.336	0.178	32	LGM

Avg. t_{ply} [in]	Strength _{norm} [ksi]
0.0055	51.086
0.0056	51.906
0.0055	52.360
0.0055	52.391
0.0055	50.426
0.0055	49.629
0.0055	49.474
0.0055	51.413
0.0056	52.538
0.0055	50.390
0.0055	50.664
0.0055	49.676
0.0055	52.270
0.0055	51.502
0.0055	50.310
0.0055	50.722
0.0055	50.645
0.0055	50.056
0.0056	50.989
0.0055	50.316
0.0056	50.004

Average 50.684
 Standard Dev. 0.937
 Coeff. of Var. [%] 1.850
 Min. 49.213
 Max. 52.207
 Number of Spec. 21

Average_{norm} 0.0055 50.894
 Standard Dev._{norm} 0.964
 Coeff. of Var. [%]_{norm} 1.894
 Min. 0.0055 49.474
 Max. 0.0056 52.538
 Number of Spec. 21 21



**Laminate Open-Hole Compression Properties (OHC1)--ETW1
Strength**

Cytec 5320-1 T650 Unitape Gr 145 RC 33%

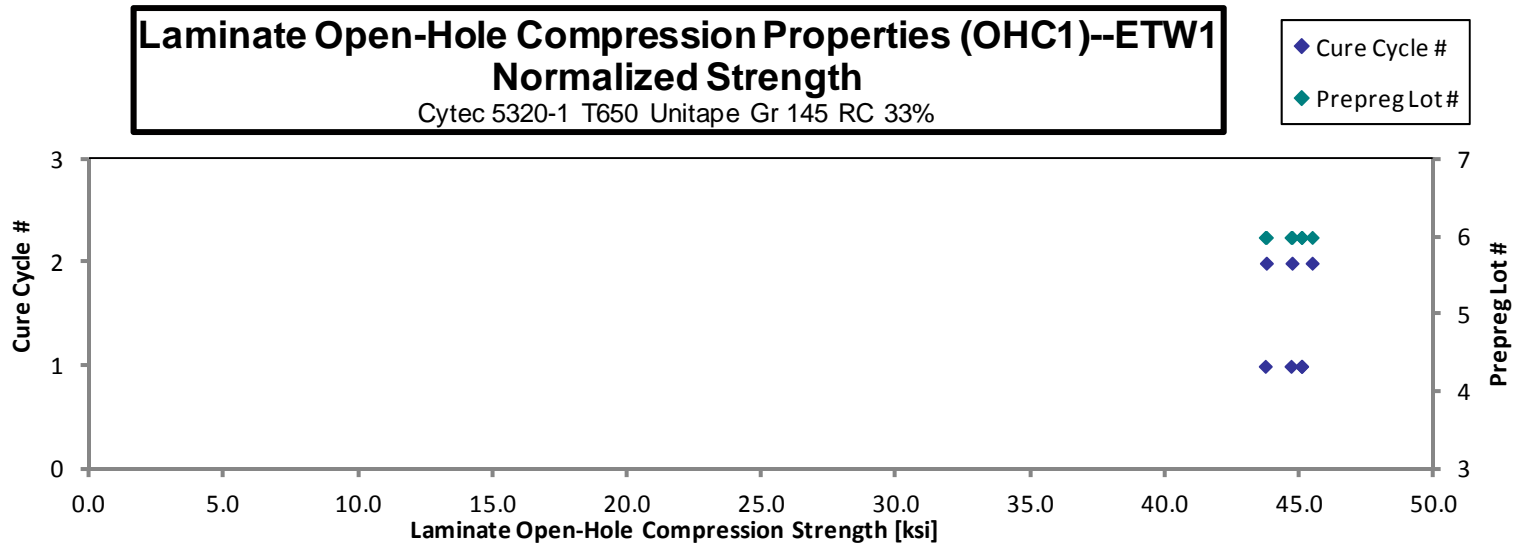
normalizing
t_{ply} [in]
0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUGGF116D	F	C1	6	1	44.885	0.177	32	LGM / MGM
CUGGF117D	F	C1	6	1	43.686	0.176	32	LGM
CUGGF118D	F	C1	6	1	44.756	0.177	32	LGM
CUGGF119D	F	C1	6	1	44.501	0.177	32	LGM
CUGGF216D	F	C2	6	2	43.468	0.177	32	LGM
CUGGF217D	F	C2	6	2	44.669	0.176	32	LGM
CUGGF218D	F	C2	6	2	45.159	0.177	32	LGM

Avg. t _{ply} [in]	Strength _{norm} [ksi]
0.0055	45.063
0.0055	43.711
0.0055	44.056
0.0055	44.669
0.0055	43.752
0.0055	44.707
0.0055	45.454

Average 44.446
Standard Dev. 0.630
Coeff. of Var. [%] 1.418
Min. 43.468
Max. 45.159
Number of Spec. 7

Average_{norm} 0.0055 44.630
Standard Dev._{norm} 0.667
Coeff. of Var. [%]_{norm} 1.495
Min. 0.0055 43.711
Max. 0.0055 45.454
Number of Spec. 7 7



**Laminate Open-Hole Compression Properties (OHC1)--ETW2
Strength**

Cytec 5320-1 T650 Unitape Gr 145 RC 33%

normalizing
t_{ply} [in]
0.0055

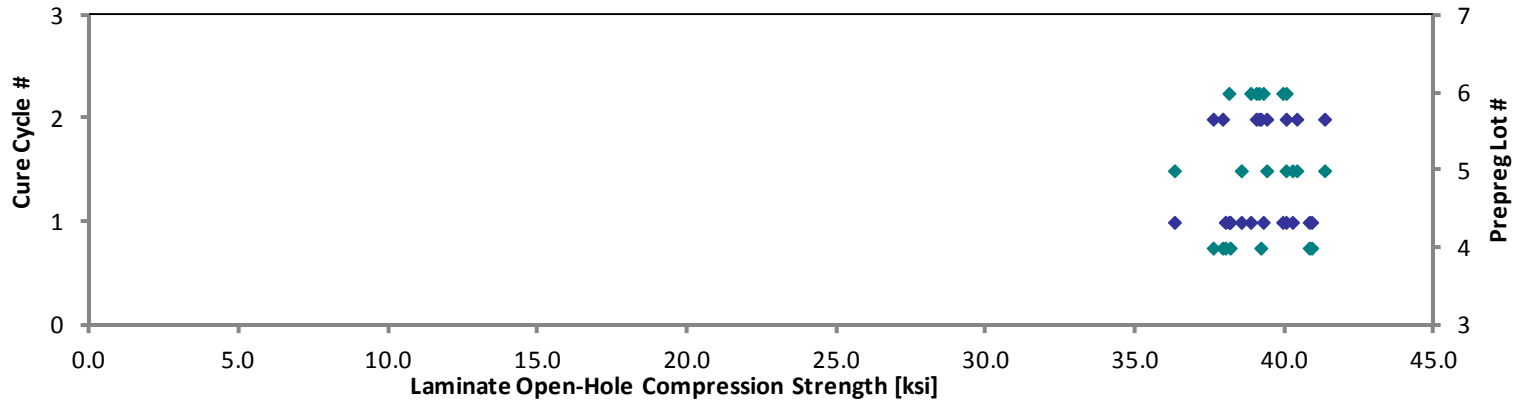
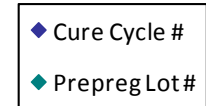
Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUGGD117F	D	C1	4	1	38.138	0.175	32	LGM
CUGGD118F	D	C1	4	1	37.472	0.179	32	LGM
CUGGD119F	D	C1	4	1	40.436	0.178	32	LGM
CUGGD11AF	D	C1	4	1	40.554	0.177	32	LGM
CUGGD216F	D	C2	4	2	38.563	0.179	32	LGM / MGM
CUGGD217F	D	C2	4	2	37.719	0.177	32	LGM
CUGGD218F	D	C2	4	2	37.479	0.177	32	LGM
CUGGE117F	E	C1	5	1	36.542	0.175	32	LGM
CUGGE118F	E	C1	5	1	39.798	0.178	32	LGM
CUGGE119F	E	C1	5	1	39.532	0.178	32	LGM
CUGGE11AF	E	C1	5	1	38.385	0.177	32	LGM
CUGGE216F	E	C2	5	2	40.242	0.177	32	LGM
CUGGE217F	E	C2	5	2	39.232	0.177	32	LGM
CUGGE218F	E	C2	5	2	41.000	0.177	32	LGM
CUGGF11BF	F	C1	6	1	39.375	0.176	32	LGM
CUGGF11CF	F	C1	6	1	39.931	0.176	32	LGM
CUGGF11DF	F	C1	6	1	38.129	0.176	32	LGM
CUGGF11EF	F	C1	6	1	39.061	0.175	32	LGM
CUGGF21BF	F	C2	6	2	38.771	0.178	32	LGM
CUGGF21CF	F	C2	6	2	39.839	0.177	32	LGM
CUGGF21DF	F	C2	6	2	38.844	0.177	32	LGM

Avg. t _{ply} [in]	Strength _{norm} [ksi]
0.0055	38.001
0.0056	38.164
0.0056	40.891
0.0055	40.811
0.0056	39.191
0.0055	37.912
0.0055	37.596
0.0055	36.300
0.0056	40.250
0.0056	40.033
0.0055	38.537
0.0055	40.395
0.0055	39.388
0.0055	41.327
0.0055	39.271
0.0055	39.923
0.0055	38.122
0.0055	38.850
0.0056	39.131
0.0055	40.039
0.0055	39.039

Average 39.002
Standard Dev. 1.166
Coeff. of Var. [%] 2.989
Min. 36.542
Max. 41.000
Number of Spec. 21

Average_{norm} 0.0055 39.199
Standard Dev._{norm} 1.253
Coeff. of Var. [%]_{norm} 3.196
Min. 0.0055 36.300
Max. 0.0056 41.327
Number of Spec. 21 21

Laminate Open-Hole Compression Properties (OHC1)--ETW2
Normalized Strength
Cyttec 5320-1 T650 Unitape Gr 145 RC 33%



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

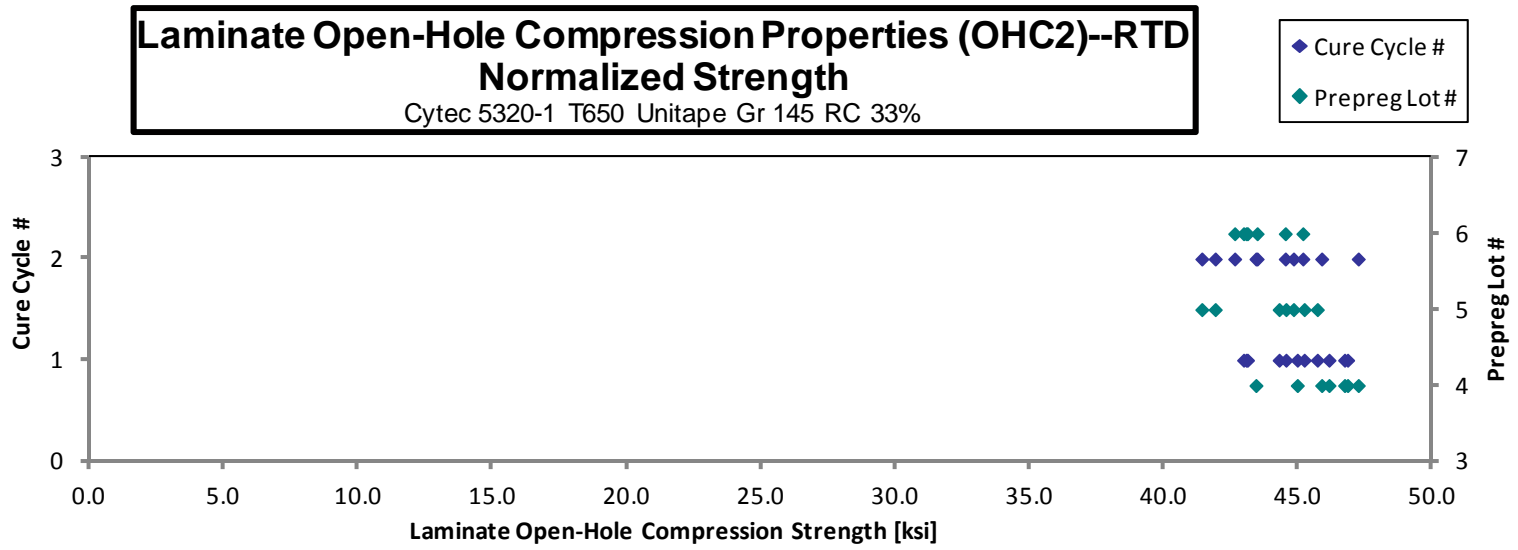
Laminate Open-Hole Compression Properties (OHC2)--RTD
Strength
 Cytec 5320-1 T650 Unitape Gr 145 RC 33%

normalizing
 t_{ply} [in]
 0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	Strength _{norm} [ksi]
CUGHD111A	D	C1	4	1	45.067	0.220	40	AGM	0.0055	44.972
CUGHD112A	D	C1	4	1	46.598	0.221	40	AGM	0.0055	46.845
CUGHD113A	D	C1	4	1	46.005	0.221	40	AGM	0.0055	46.152
CUGHD114A	D	C1	4	1	46.670	0.220	40	AGM / LGM	0.0055	46.733
CUGHD211A	D	C2	4	2	45.890	0.220	40	AGM / LGM	0.0055	45.879
CUGHD212A	D	C2	4	2	47.214	0.220	40	MGM / AGM	0.0055	47.243
CUGHD213A	D	C2	4	2	43.481	0.220	40	MGM / AGM	0.0055	43.431
CUGHE111A	E	C1	5	1	45.496	0.219	40	AGM / LGM	0.0055	45.231
CUGHE112A	E	C1	5	1	43.772	0.223	40	MGM	0.0056	44.296
CUGHE113A	E	C1	5	1	44.518	0.220	40	LGM / AGM	0.0055	44.548
CUGHE114A	E	C1	5	1	45.574	0.221	40	MGM / AGM	0.0055	45.716
CUGHE211A	E	C2	5	2	44.893	0.220	40	MGM / AGM	0.0055	44.828
CUGHE212A	E	C2	5	2	41.692	0.221	40	AGM / MGM	0.0055	41.913
CUGHE213A	E	C2	5	2	41.462	0.220	40	AGM	0.0055	41.415
CUGHF111A	F	C1	6	1	43.321	0.219	40	AGM / MGM	0.0055	43.114
CUGHF112A	F	C1	6	1	43.109	0.219	40	AGM / MGM	0.0055	42.972
CUGHF113A	F	C1	6	1	42.975	0.220	40	MGM	0.0055	43.066
CUGHF211A	F	C2	6	2	44.136	0.222	40	AGM / LGM	0.0055	44.523
CUGHF212A	F	C2	6	2	43.126	0.222	40	AGM / MGM	0.0055	43.475
CUGHF213A	F	C2	6	2	45.032	0.221	40	AGM / LGM	0.0055	45.178
CUGHF214A	F	C2	6	2	42.360	0.221	40	AGM / LGM	0.0055	42.640

Average 44.400
Standard Dev. 1.648
Coeff. of Var. [%] 3.711
Min. 41.462
Max. 47.214
Number of Spec. 21

Average_{norm} 0.0055 44.484
Standard Dev._{norm} 1.638
Coeff. of Var. [%]_{norm} 3.682
Min. 0.0055 41.415
Max. 0.0056 47.243
Number of Spec. 21 21



**Laminate Open-Hole Compression Properties (OHC2)--ETW2
Strength**

Cytec 5320-1 T650 Unitape Gr 145 RC 33%

normalizing
t_{ply} [in]
0.0055

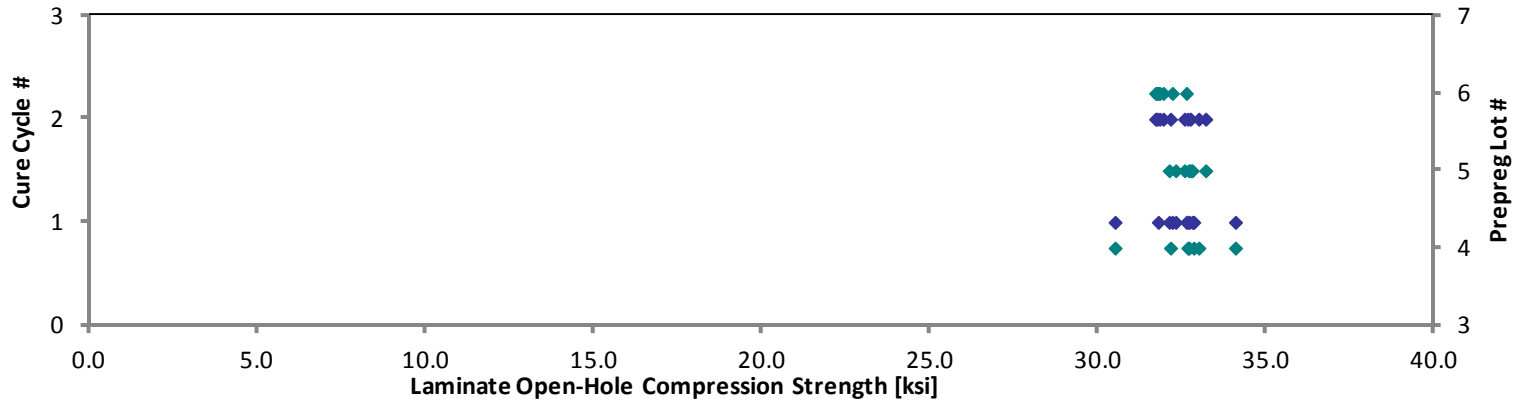
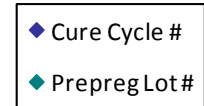
Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksj]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUGHD117F	D	C1	4	1	30.908	0.217	40	LGM
CUGHD118F	D	C1	4	1	32.538	0.222	40	LGM / MGM
CUGHD119F	D	C1	4	1	32.686	0.220	40	LGM / MGM
CUGHD11AF	D	C1	4	1	33.833	0.222	40	LGM / AGM
CUGHD216F	D	C2	4	2	33.130	0.219	40	LGM
CUGHD217F	D	C2	4	2	32.666	0.220	40	LGM / MGM
CUGHD218F	D	C2	4	2	32.370	0.219	40	LGM / MGM
CUGHE117F	E	C1	5	1	31.997	0.221	40	LGM / MGM
CUGHE118F	E	C1	5	1	32.258	0.223	40	LGM / MGM
CUGHE119F	E	C1	5	1	32.468	0.222	40	MGM
CUGHE11AF	E	C1	5	1	32.139	0.221	40	LGM / MGM
CUGHE216F	E	C2	5	2	32.435	0.222	40	LGM / AGM
CUGHE217F	E	C2	5	2	32.865	0.222	40	LGM / MGM
CUGHE218F	E	C2	5	2	32.317	0.222	40	LGM / MGM
CUGHF116F	F	C1	6	1	32.508	0.221	40	LGM / MGM
CUGHF117F	F	C1	6	1	32.235	0.220	40	LGM / MGM
CUGHF118F	F	C1	6	1	31.697	0.221	40	LGM / AGM
CUGHF217F	F	C2	6	2	31.424	0.222	40	LGM / MGM
CUGHF218F	F	C2	6	2	31.742	0.221	40	LGM / MGM
CUGHF219F	F	C2	6	2	31.571	0.222	40	LGM
CUGHF21AF	F	C2	6	2	31.506	0.222	40	LGM / MGM

Avg. t _{ply} [in]	Strength _{norm} [ksj]
0.0054	30.500
0.0056	32.842
0.0055	32.698
0.0055	34.082
0.0055	32.992
0.0055	32.666
0.0055	32.150
0.0055	32.113
0.0056	32.693
0.0056	32.795
0.0055	32.305
0.0056	32.744
0.0056	33.196
0.0055	32.567
0.0055	32.624
0.0055	32.206
0.0055	31.786
0.0055	31.705
0.0055	31.934
0.0055	31.827
0.0055	31.752

Average 32.252
Standard Dev. 0.648
Coeff. of Var. [%] 2.011
Min. 30.908
Max. 33.833
Number of Spec. 21

Average_{norm} 0.0055 32.389
Standard Dev._{norm} 0.715
Coeff. of Var. [%]_{norm} 2.208
Min. 0.0054 30.500
Max. 0.0056 34.082
Number of Spec. 21 21

Laminate Open-Hole Compression Properties (OHC2)--ETW2
Normalized Strength
Cytec 5320-1 T650 Unitape Gr 145 RC 33%



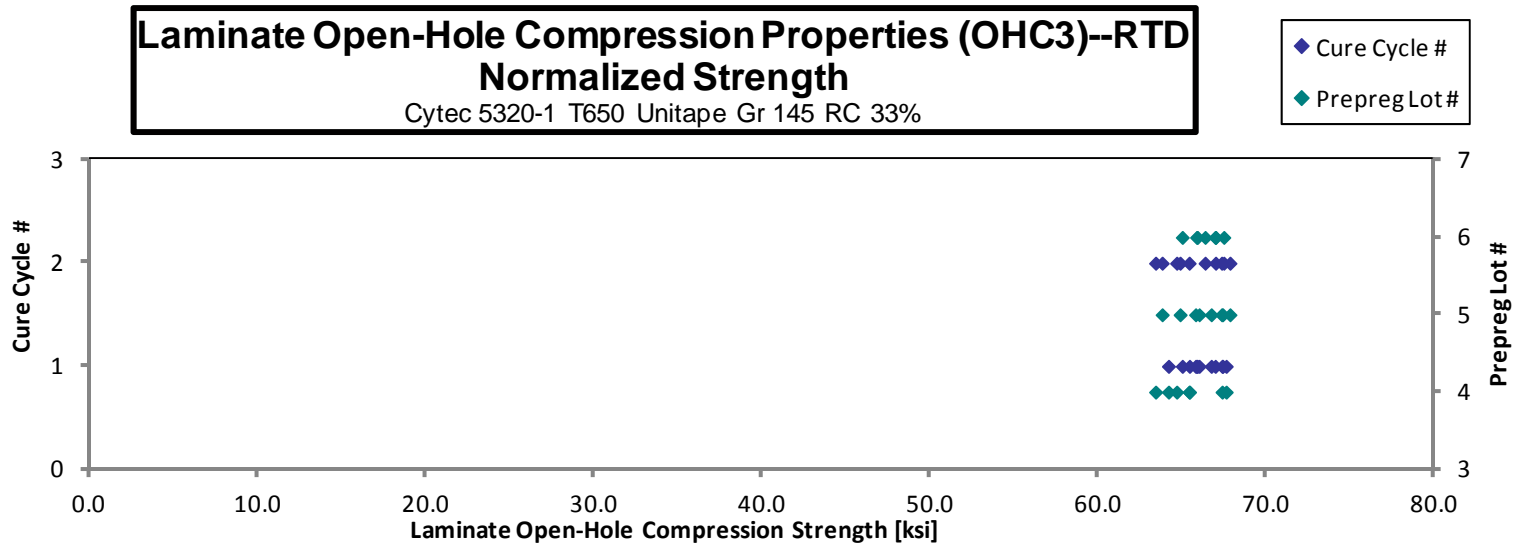
4.23 “50/40/10” Open-Hole Compression 3 Properties (OHC3)

**Laminate Open-Hole Compression Properties (OHC3)--RTD
Strength**
Cytec 5320-1 T650 Unitape Gr 145 RC 33%

normalizing
t_{ply} [in]
0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t _{ply} [in]	Strength _{norm} [ksi]
CUGID111A	D	C1	4	1	68.737	0.216	40	AGM / LGM	0.0054	67.367
CUGID112A	D	C1	4	1	66.500	0.216	40	AGM / LGM	0.0054	65.427
CUGID113A	D	C1	4	1	65.177	0.217	40	AGM / LGM	0.0054	64.180
CUGID114A	D	C1	4	1	67.820	0.219	40	AGM / LGM	0.0055	67.610
CUGID211A	D	C2	4	2	65.999	0.218	40	AGM / LGM	0.0055	65.409
CUGID212A	D	C2	4	2	64.690	0.216	40	AGM / LGM	0.0054	63.411
CUGID213A	D	C2	4	2	65.001	0.219	40	AGM / LGM	0.0055	64.666
CUGIE111A	E	C1	5	1	66.764	0.218	40	AGM / LGM	0.0054	66.005
CUGIE112A	E	C1	5	1	66.284	0.221	40	AGM / LGM	0.0055	66.721
CUGIE113A	E	C1	5	1	67.255	0.220	40	AGM / LGM	0.0055	67.402
CUGIE115A	E	C1	5	1	65.073	0.222	40	AGM / LGM	0.0056	65.792
CUGIE211A	E	C2	5	2	63.450	0.221	40	AGM / LGM	0.0055	63.801
CUGIE212A	E	C2	5	2	67.093	0.221	40	AGM / LGM	0.0055	67.342
CUGIE213A	E	C2	5	2	67.510	0.221	40	AGM / LGM	0.0055	67.837
CUGIE214A	E	C2	5	2	64.242	0.222	40	AGM / LGM	0.0056	64.870
CUGIF111A	F	C1	6	1	64.978	0.223	40	AGM / LGM	0.0056	65.894
CUGIF112A	F	C1	6	1	64.995	0.223	40	AGM / LGM	0.0056	65.852
CUGIF113A	F	C1	6	1	65.543	0.225	40	AGM / LGM	0.0056	66.958
CUGIF114A	F	C1	6	1	63.863	0.224	40	AGM / LGM	0.0056	65.000
CUGIF211A	F	C2	6	2	66.216	0.220	40	AGM / LGM	0.0055	66.356
CUGIF212A	F	C2	6	2	66.833	0.222	40	AGM / LGM	0.0056	67.471
CUGIF213A	F	C2	6	2	66.427	0.222	40	AGM / LGM	0.0055	66.981

Average	65.929	Average _{norm}	0.0055	66.016
Standard Dev.	1.350	Standard Dev. _{norm}		1.308
Coeff. of Var. [%]	2.047	Coeff. of Var. [%] _{norm}		1.982
Min.	63.450	Min.	0.0054	63.411
Max.	68.737	Max.	0.0056	67.837
Number of Spec.	22	Number of Spec.	22	22



**Laminate Open-Hole Compression Properties (OHC3)--ETW2
Strength**

Cytec 5320-1 T650 Unitape Gr 145 RC 33%

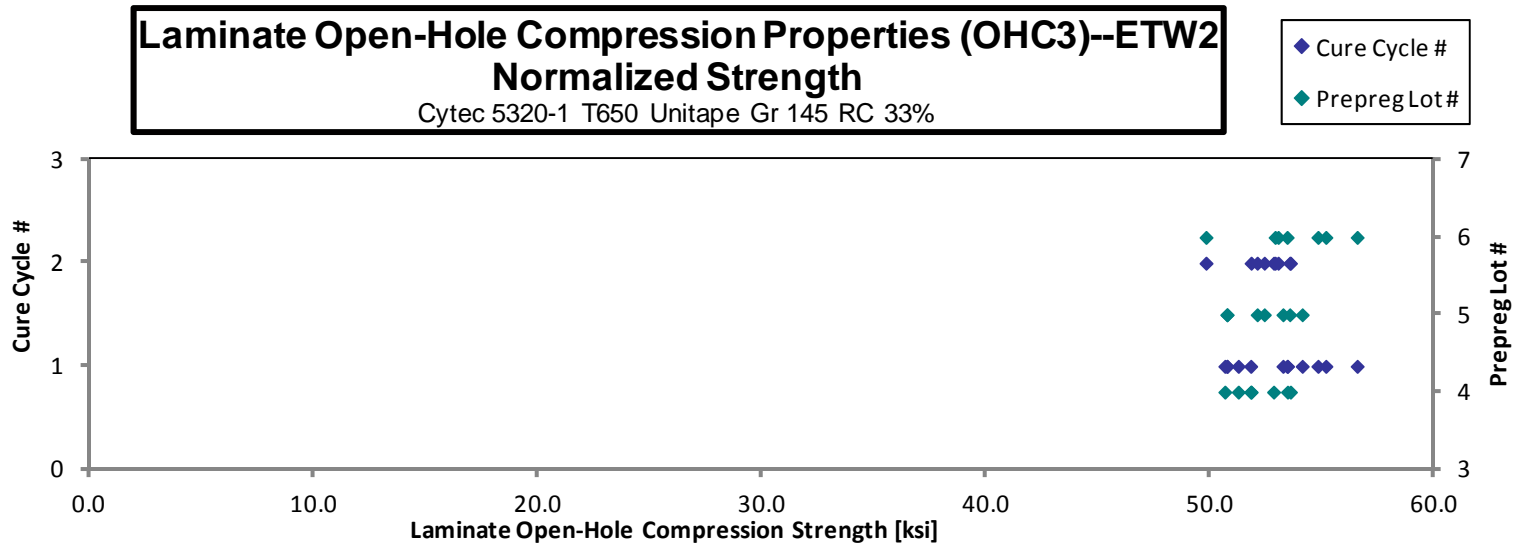
normalizing
t_{ply} [in]
0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksj]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUGID117F	D	C1	4	1	54.285	0.217	40	LGM
CUGID118F	D	C1	4	1	51.779	0.218	40	LGM
CUGID119F	D	C1	4	1	51.389	0.217	40	LGM
CUGID11AF	D	C1	4	1	51.859	0.220	40	LGM
CUGID216F	D	C2	4	2	54.052	0.218	40	LGM
CUGID217F	D	C2	4	2	52.631	0.217	40	LGM / MGM
CUGID218F	D	C2	4	2	52.881	0.220	40	LGM
CUGIE117F	E	C1	5	1	51.281	0.218	40	LGM
CUGIE118F	E	C1	5	1	53.841	0.221	40	LGM
CUGIE119F	E	C1	5	1	50.612	0.221	40	LGM
CUGIE11AF	E	C1	5	1	53.284	0.220	40	LGM
CUGIE216F	E	C2	5	2	51.540	0.224	40	LGM
CUGIE217F	E	C2	5	2	53.166	0.222	40	LGM
CUGIE218F	E	C2	5	2	51.550	0.222	40	LGM
CUGIF117F	F	C1	6	1	52.593	0.224	40	LGM
CUGIF118F	F	C1	6	1	54.148	0.224	40	LGM
CUGIF119F	F	C1	6	1	54.039	0.223	40	LGM
CUGIF11AF	F	C1	6	1	55.537	0.224	40	LGM
CUGIF216F	F	C2	6	2	52.610	0.222	40	LGM
CUGIF217F	F	C2	6	2	52.375	0.222	40	LGM
CUGIF218F	F	C2	6	2	49.202	0.223	40	LGM

Avg. t _{ply} [in]	Strength _{norm} [ksj]
0.0054	53.446
0.0054	51.250
0.0054	50.649
0.0055	51.804
0.0055	53.577
0.0054	51.822
0.0055	52.825
0.0054	50.749
0.0055	54.102
0.0055	50.742
0.0055	53.244
0.0056	52.410
0.0055	53.545
0.0056	52.093
0.0056	53.429
0.0056	55.157
0.0056	54.805
0.0056	56.555
0.0055	53.028
0.0056	52.894
0.0056	49.810

Average 52.603
Standard Dev. 1.460
Coeff. of Var. [%] 2.776
Min. 49.202
Max. 55.537
Number of Spec. 21

Average_{norm} 0.0055 52.759
Standard Dev._{norm} 1.652
Coeff. of Var. [%]_{norm} 3.131
Min. 0.0054 49.810
Max. 0.0056 56.555
Number of Spec. 21 21



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

Laminate Filled-Hole Compression Properties (FHC1)--RTD
Strength
 Cytec 5320-1 T650 Unitape Gr 145 RC 33%

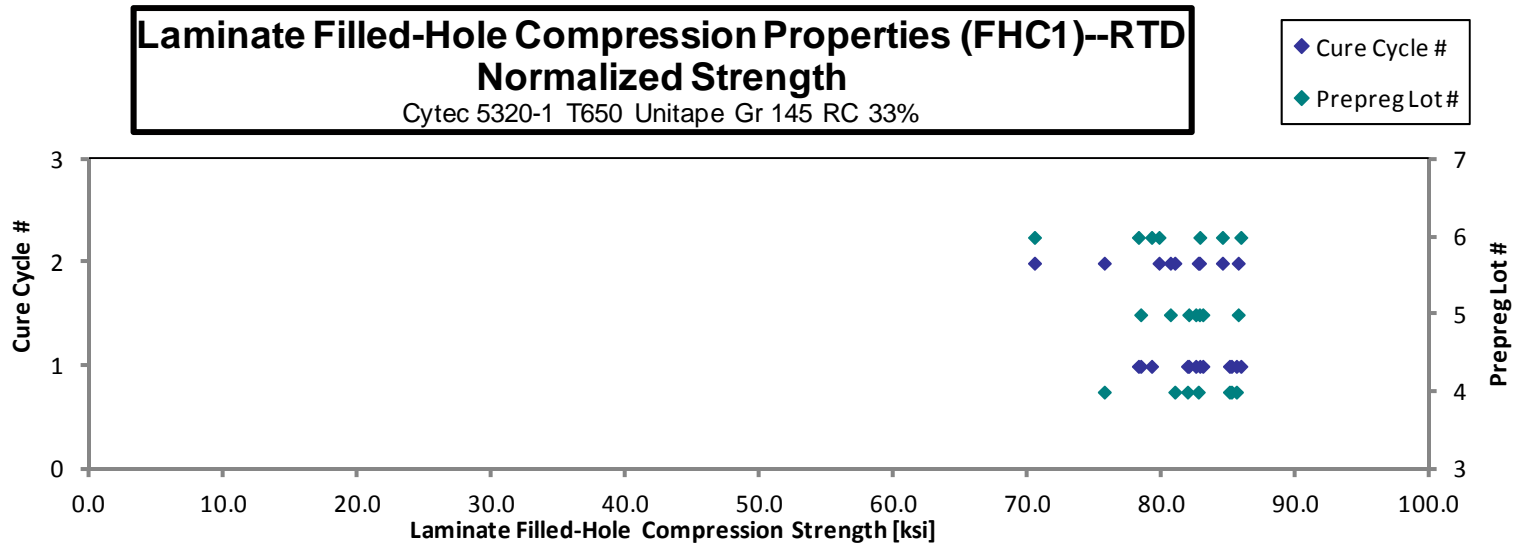
normalizing
 t_{ply} [in]
 0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUG7D111A	D	C1	4	1	84.715	0.177	32	LGF
CUG7D112A	D	C1	4	1	84.713	0.177	32	LGF
CUG7D113A	D	C1	4	1	81.719	0.176	32	LGF
CUG7D114A	D	C1	4	1	84.954	0.177	32	LGF
CUG7D211A	D	C2	4	2	76.113	0.175	32	LGF
CUG7D212A	D	C2	4	2	81.073	0.176	32	LGF
CUG7D213A	D	C2	4	2	82.700	0.176	32	LGF
CUG7E111A	E	C1	5	1	83.692	0.175	32	LGF
CUG7E112A	E	C1	5	1	78.145	0.177	32	LGF
CUG7E113A	E	C1	5	1	81.506	0.177	32	LGF
CUG7E114A	E	C1	5	1	82.760	0.175	32	LGF
CUG7E211A	E	C2	5	2	82.610	0.176	32	LGF
CUG7E212A	E	C2	5	2	85.174	0.177	32	LGF
CUG7E213A	E	C2	5	2	80.414	0.176	32	LGF
CUG7F111A	F	C1	6	1	78.393	0.178	32	LGF
CUG7F112A	F	C1	6	1	78.070	0.176	32	LGF
CUG7F113A	F	C1	6	1	85.246	0.177	32	LGF
CUG7F114A	F	C1	6	1	82.270	0.177	32	LGF
CUG7F211A	F	C2	6	2	69.941	0.177	32	LGF
CUG7F212A	F	C2	6	2	83.812	0.177	32	LGF
CUG7F213A	F	C2	6	2	79.097	0.177	32	LGF

Avg. t_{ply} [in]	Strength _{norm} [ksi]
0.0055	85.020
0.0055	85.170
0.0055	81.889
0.0055	85.541
0.0055	75.681
0.0055	80.942
0.0055	82.692
0.0055	83.034
0.0055	78.397
0.0055	81.984
0.0055	82.509
0.0055	82.782
0.0055	85.674
0.0055	80.612
0.0056	79.209
0.0055	78.226
0.0055	85.868
0.0055	82.808
0.0055	70.470
0.0055	84.494
0.0055	79.763

Average 81.291
 Standard Dev. 3.719
 Coeff. of Var. [%] 4.576
 Min. 69.941
 Max. 85.246
 Number of Spec. 21

Average_{norm} 0.0055 81.560
 Standard Dev._{norm} 3.751
 Coeff. of Var. [%]_{norm} 4.599
 Min. 0.0055 70.470
 Max. 0.0056 85.868
 Number of Spec. 21 21



**Laminate Filled-Hole Compression Properties (FHC1)--ETW1
Strength**

Cytec 5320-1 T650 Unitape Gr 145 RC 33%

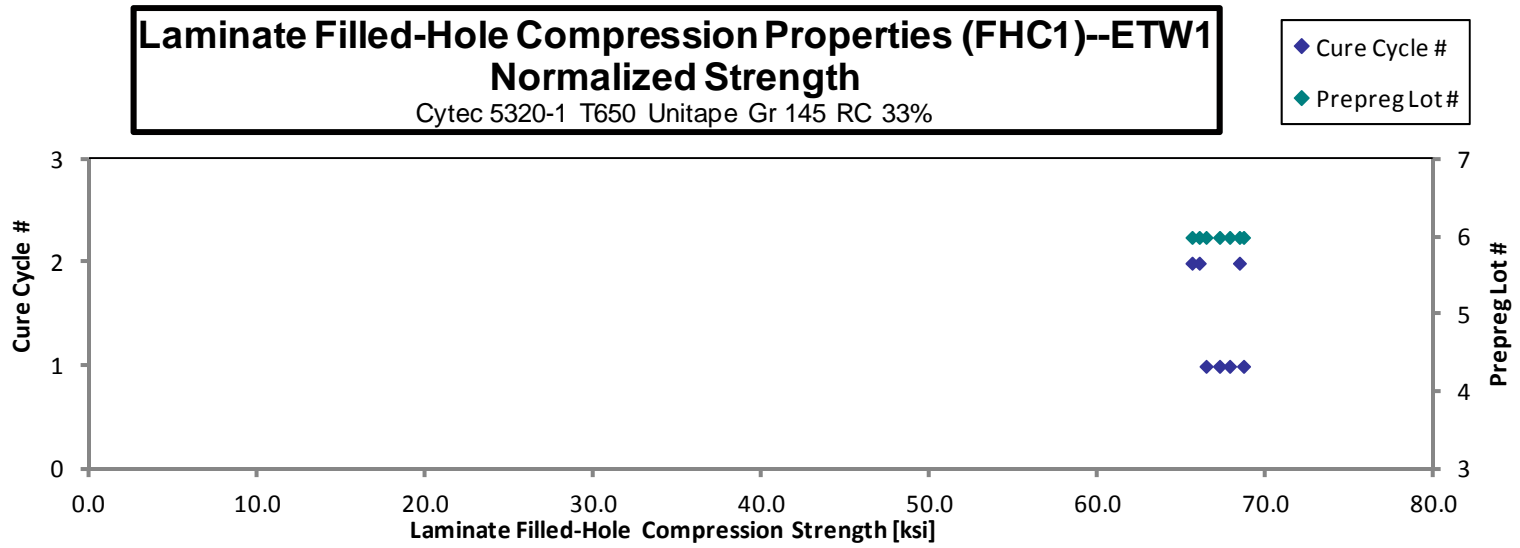
normalizing
t_{ply} [in]
0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUG7F116D	F	C1	6	1	68.265	0.177	32	LGF / LGM
CUG7F117D	F	C1	6	1	66.509	0.176	32	LGF / LGM
CUG7F118D	F	C1	6	1	67.006	0.177	32	LGF / LGM
CUG7F119D	F	C1	6	1	67.315	0.177	32	LGF / LGM
CUG7F216D	F	C2	6	2	65.505	0.177	32	LGF / LGM
CUG7F217D	F	C2	6	2	67.967	0.177	32	LGF / LGM
CUG7F218D	F	C2	6	2	65.506	0.176	32	LGF / LGM

Avg. t _{ply} [in]	Strength _{norm} [ksi]
0.0055	68.646
0.0055	66.414
0.0055	67.215
0.0055	67.819
0.0055	66.007
0.0055	68.399
0.0055	65.580

Average 66.868
Standard Dev. 1.097
Coeff. of Var. [%] 1.641
Min. 65.505
Max. 68.265
Number of Spec. 7

Average_{norm} 0.0055 67.154
Standard Dev._{norm} 1.195
Coeff. of Var. [%]_{norm} 1.779
Min. 0.0055 65.580
Max. 0.0055 68.646
Number of Spec. 7 7



**Laminate Filled-Hole Compression Properties (FHC1)--ETW2
Strength**

Cytec 5320-1 T650 Unitape Gr 145 RC 33%

normalizing
t_{ply} [in]
0.0055

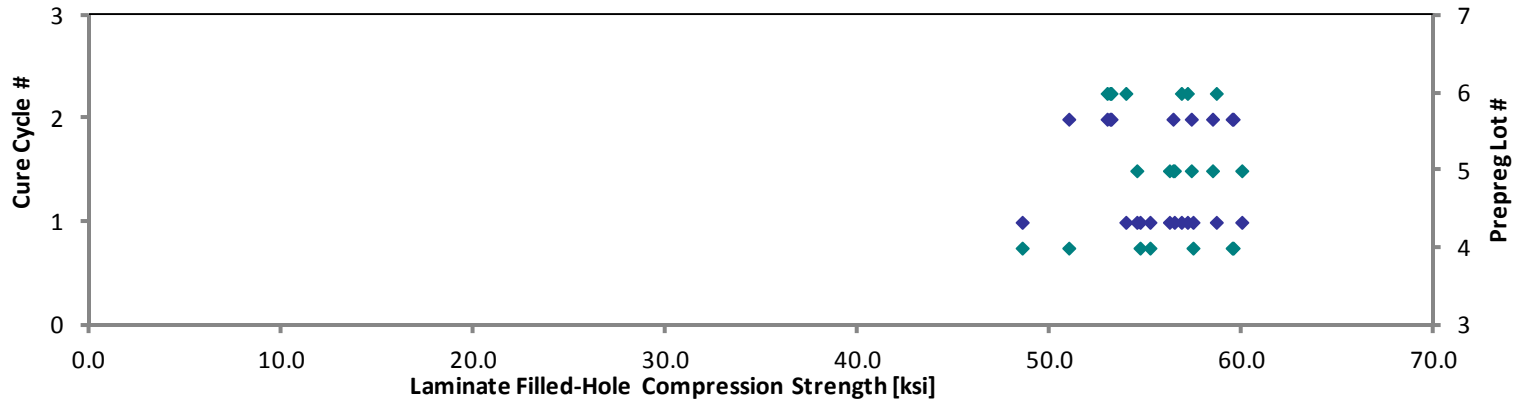
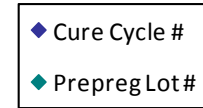
Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksj]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUG7D117F	D	C1	4	1	48.453	0.176	32	LGM
CUG7D118F	D	C1	4	1	54.467	0.177	32	LGM
CUG7D119F	D	C1	4	1	55.307	0.176	32	LGM / LGF
CUG7D11AF	D	C1	4	1	57.405	0.176	32	LGM / LGF
CUG7D216F	D	C2	4	2	51.109	0.176	32	LGF / LGM
CUG7D217F	D	C2	4	2	59.517	0.176	32	LGF / LGM
CUG7D218F	D	C2	4	2	59.628	0.176	32	LGF / LGM
CUG7E117F	E	C1	5	1	59.830	0.176	32	LGF / LGM
CUG7E118F	E	C1	5	1	54.148	0.177	32	LGF / LGM
CUG7E119F	E	C1	5	1	55.931	0.178	32	LGF
CUG7E11AF	E	C1	5	1	55.624	0.178	32	LGF / AGM
CUG7E216F	E	C2	5	2	57.426	0.176	32	LGF / LGM
CUG7E217F	E	C2	5	2	56.194	0.177	32	LGF / LGM
CUG7E218F	E	C2	5	2	58.163	0.177	32	LGF / LGM
CUG7F11BF	F	C1	6	1	57.128	0.176	32	LGF / LGM
CUG7F11CF	F	C1	6	1	53.814	0.176	32	LGF / LGM
CUG7F11DF	F	C1	6	1	56.735	0.176	32	LGF / LGM
CUG7F11EF	F	C1	6	1	58.474	0.177	32	LGF / LGM
CUG7F21BF	F	C2	6	2	52.786	0.177	32	LGF / LGM
CUG7F21CF	F	C2	6	2	52.489	0.178	32	LGF / LGM
CUG7F21DF	F	C2	6	2	52.456	0.178	32	LGM

Avg. t _{ply} [in]	Strength _{norm} [ksj]
0.0055	48.536
0.0055	54.674
0.0055	55.191
0.0055	57.432
0.0055	50.963
0.0055	59.523
0.0055	59.470
0.0055	59.972
0.0055	54.506
0.0056	56.461
0.0056	56.204
0.0055	57.344
0.0055	56.391
0.0055	58.449
0.0055	57.139
0.0055	53.936
0.0055	56.826
0.0055	58.646
0.0055	53.166
0.0055	52.962
0.0056	53.112

Average 55.575
Standard Dev. 3.003
Coeff. of Var. [%] 5.403
Min. 48.453
Max. 59.830
Number of Spec. 21

Average_{norm} 0.0055 55.575
Standard Dev._{norm} 2.948
Coeff. of Var. [%]_{norm} 5.287
Min. 0.0055 48.536
Max. 0.0056 59.972
Number of Spec. 21 21

Laminate Filled-Hole Compression Properties (FHC1)--ETW2
Normalized Strength
Cytec 5320-1 T650 Unitape Gr 145 RC 33%



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

Laminate Filled-Hole Compression Properties (FHC2)--RTD
Strength
 Cytec 5320-1 T650 Unitape Gr 145 RC 33%

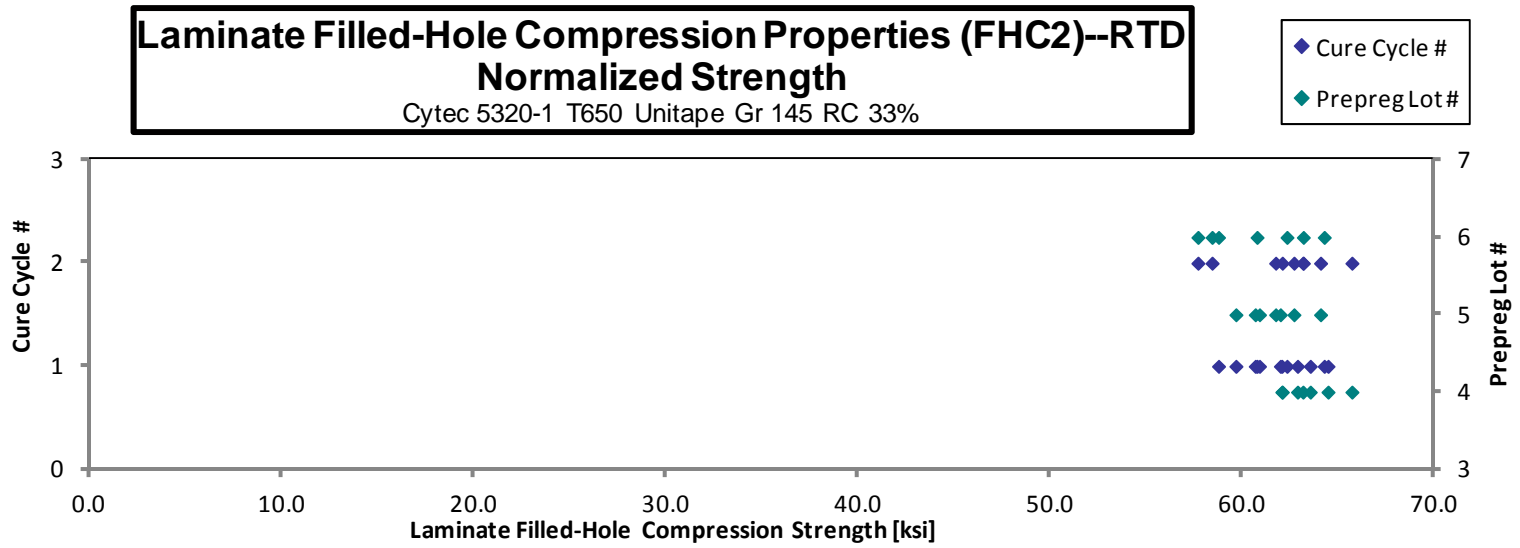
normalizing
 t_{ply} [in]
 0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksj]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUG8D111A	D	C1	4	1	62.473	0.219	40	LGF
CUG8D112A	D	C1	4	1	64.021	0.222	40	LGF
CUG8D113A	D	C1	4	1	63.714	0.219	40	AGF
CUG8D114A	D	C1	4	1	62.708	0.221	40	AGF
CUG8D211A	D	C2	4	2	65.454	0.221	40	LGF
CUG8D212A	D	C2	4	2	63.141	0.220	40	LGF/AGO
CUG8D213A	D	C2	4	2	62.084	0.220	40	AGF
CUG8E111A	E	C1	5	1	60.330	0.221	40	LGF/AGO
CUG8E112A	E	C1	5	1	60.720	0.221	40	LGF/AGF
CUG8E113A	E	C1	5	1	59.461	0.221	40	MGF
CUG8E114A	E	C1	5	1	62.076	0.220	40	AGF
CUG8E211A	E	C2	5	2	63.509	0.222	40	LGF
CUG8E212A	E	C2	5	2	62.228	0.222	40	LGF/AGF
CUG8E213A	E	C2	5	2	61.420	0.221	40	LGF/AGO
CUG8F111A	F	C1	6	1	60.759	0.220	40	AGF
CUG8F112A	F	C1	6	1	58.194	0.222	40	LGF
CUG8F113A	F	C1	6	1	61.956	0.221	40	AGF
CUG8F114A	F	C1	6	1	63.487	0.223	40	AGF
CUG8F211A	F	C2	6	2	58.352	0.220	40	MGF
CUG8F212A	F	C2	6	2	57.455	0.221	40	AGF
CUG8F213A	F	C2	6	2	62.731	0.222	40	AGF

Avg. t_{ply} [in]	Strength _{norm} [ksj]
0.0055	62.061
0.0055	64.462
0.0055	63.541
0.0055	62.875
0.0055	65.707
0.0055	63.156
0.0055	62.079
0.0055	60.677
0.0055	60.895
0.0055	59.668
0.0055	61.982
0.0055	64.076
0.0055	62.690
0.0055	61.737
0.0055	60.768
0.0056	58.763
0.0055	62.327
0.0056	64.266
0.0055	58.427
0.0055	57.690
0.0055	63.178

Average 61.727
 Standard Dev. 2.070
 Coeff. of Var. [%] 3.354
 Min. 57.455
 Max. 65.454
 Number of Spec. 21

Average_{norm} 0.0055 61.954
 Standard Dev._{norm} 2.092
 Coeff. of Var. [%]_{norm} 3.376
 Min. 0.0055 57.690
 Max. 0.0056 65.707
 Number of Spec. 21 21



**Laminate Filled-Hole Compression Properties (FHC2)--ETW2
Strength**

Cytec 5320-1 T650 Unitape Gr 145 RC 33%

normalizing
t_{ply} [in]
0.0055

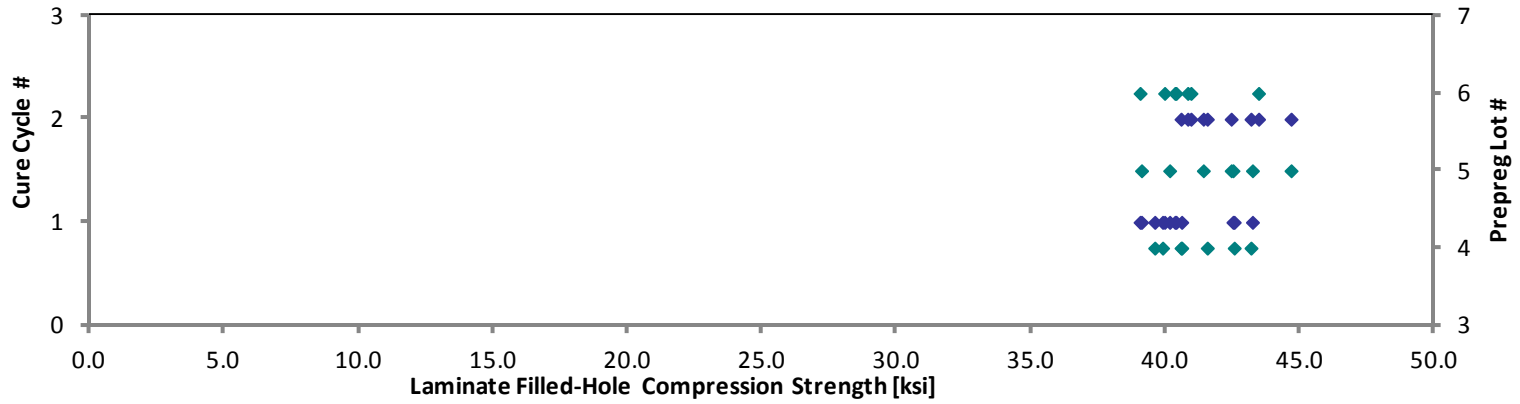
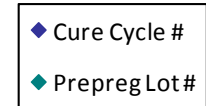
Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksj]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUG8D117F	D	C1	4	1	40.404	0.217	40	LGF / AGM
CUG8D118F	D	C1	4	1	39.143	0.223	40	LGM
CUG8D119F	D	C1	4	1	40.318	0.222	40	LGF / LGM
CUG8D11AF	D	C1	4	1	42.572	0.220	40	AGF / LGM
CUG8D216F	D	C2	4	2	41.719	0.219	40	LGM / AGF
CUG8D217F	D	C2	4	2	43.011	0.221	40	LGM / AGF
CUG8D218F	D	C2	4	2	40.646	0.220	40	LGM / AGF
CUG8E117F	E	C1	5	1	39.228	0.219	40	LGM / AGM
CUG8E118F	E	C1	5	1	39.859	0.222	40	AGF / AGM
CUG8E119F	E	C1	5	1	42.144	0.222	40	AGF / LGM
CUG8E11AF	E	C1	5	1	42.743	0.223	40	LGM
CUG8E216F	E	C2	5	2	44.146	0.223	40	AGF / LGM
CUG8E217F	E	C2	5	2	42.414	0.220	40	LGF / LGM
CUG8E218F	E	C2	5	2	40.946	0.222	40	LGF / LGM
CUG8F116F	F	C1	6	1	40.070	0.222	40	LGM / MGF
CUG8F117F	F	C1	6	1	38.669	0.222	40	LGM / AGF
CUG8F119F	F	C1	6	1	39.515	0.223	40	LGM / AGF
CUG8F11AF	F	C1	6	1	40.123	0.222	40	AGF / LGM
CUG8F216F	F	C2	6	2	40.279	0.223	40	AGM / MGM
CUG8F217F	F	C2	6	2	43.138	0.222	40	LGF / LGM
CUG8F218F	F	C2	6	2	40.541	0.222	40	LGM

Avg. t _{ply} [in]	Strength _{norm} [ksj]
0.0054	39.893
0.0056	39.600
0.0055	40.602
0.0055	42.556
0.0055	41.555
0.0055	43.180
0.0055	40.578
0.0055	39.109
0.0055	40.155
0.0055	42.511
0.0056	43.235
0.0056	44.671
0.0055	42.443
0.0056	41.408
0.0055	40.352
0.0056	39.055
0.0056	39.967
0.0055	40.396
0.0056	40.826
0.0055	43.461
0.0056	40.947

Average 41.030
Standard Dev. 1.527
Coeff. of Var. [%] 3.723
Min. 38.669
Max. 44.146
Number of Spec. 21

Average_{norm} 0.0055 41.262
Standard Dev._{norm} 1.558
Coeff. of Var. [%]_{norm} 3.777
Min. 0.0054 39.055
Max. 0.0056 44.671
Number of Spec. 21 21

Laminate Filled-Hole Compression Properties (FHC2)--ETW2
Normalized Strength
Cytec 5320-1 T650 Unitape Gr 145 RC 33%



4.26 “50/40/10” Filled-Hole Compression 3 Properties (FHC3)

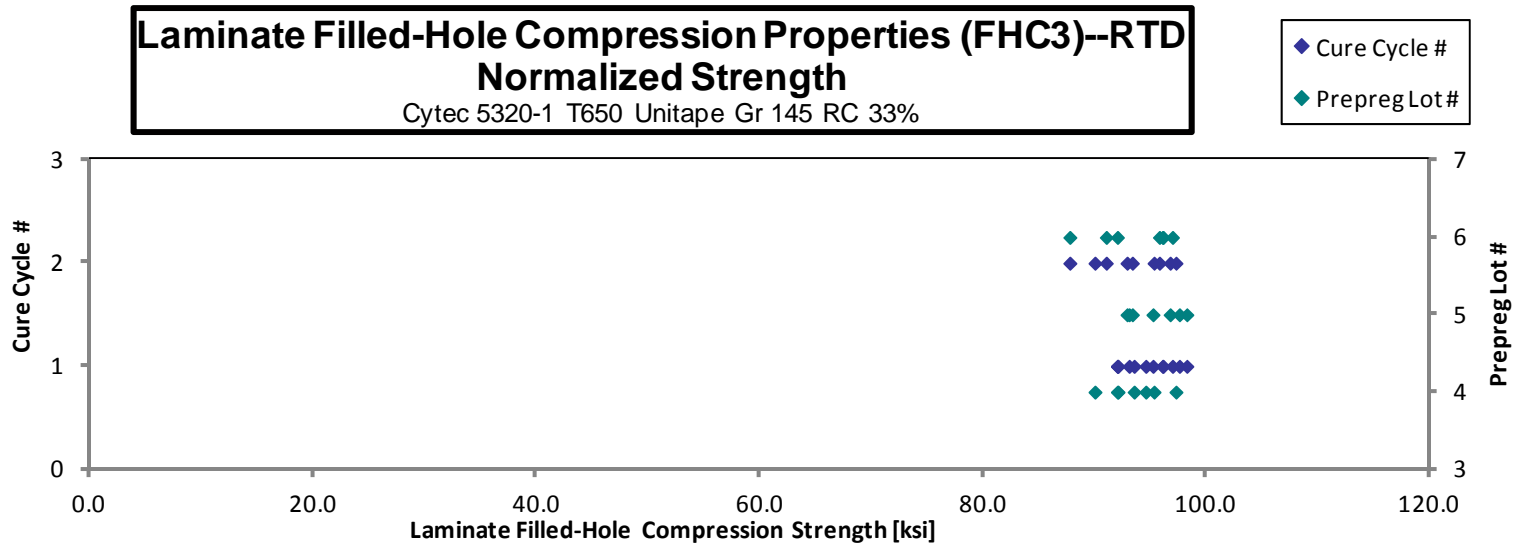
Laminate Filled-Hole Compression Properties (FHC3)--RTD
Strength
 Cytec 5320-1 T650 Unitape Gr 145 RC 33%

normalizing
 t_{ply} [in]
 0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksij]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	Strength _{norm} [ksij]
CUG9D111A	D	C1	4	1	92.194	0.220	40	AGO	0.0055	91.991
CUG9D112A	D	C1	4	1	93.483	0.220	40	AGO	0.0055	93.490
CUG9D113A	D	C1	4	1	94.623	0.220	40	AGO	0.0055	94.537
CUG9D114A	D	C1	4	1	91.743	0.221	40	AGO	0.0055	92.049
CUG9D211A	D	C2	4	2	95.613	0.219	40	AGO	0.0055	95.272
CUG9D212A	D	C2	4	2	91.992	0.215	40	AGO	0.0054	89.985
CUG9D213A	D	C2	4	2	96.745	0.221	40	AGO	0.0055	97.236
CUG9E111A	E	C1	5	1	94.178	0.217	40	AGO	0.0054	93.044
CUG9E112A	E	C1	5	1	97.604	0.221	40	AGO	0.0055	98.210
CUG9E113A	E	C1	5	1	94.495	0.222	40	AGO	0.0055	95.175
CUG9E114A	E	C1	5	1	97.715	0.220	40	AGO	0.0055	97.545
CUG9E211A	E	C2	5	2	91.592	0.224	40	AGO	0.0056	93.327
CUG9E212A	E	C2	5	2	92.457	0.221	40	AGO	0.0055	92.856
CUG9E213A	E	C2	5	2	96.432	0.221	40	AGO	0.0055	96.717
CUG9F111A	F	C1	6	1	95.403	0.222	40	AGO	0.0055	96.082
CUG9F112A	F	C1	6	1	95.926	0.222	40	AGO	0.0056	96.922
CUG9F113A	F	C1	6	1	95.620	0.221	40	AGO	0.0055	96.033
CUG9F114A	F	C1	6	1	91.158	0.222	40	AGO	0.0056	91.993
CUG9F211A	F	C2	6	2	86.804	0.222	40	AGO	0.0056	87.732
CUG9F212A	F	C2	6	2	94.173	0.224	40	MGO	0.0056	95.757
CUG9F213A	F	C2	6	2	90.190	0.222	40	AGO	0.0055	90.996

Average 93.816
 Standard Dev. 2.705
 Coeff. of Var. [%] 2.883
 Min. 86.804
 Max. 97.715
 Number of Spec. 21

Average_{norm} 0.0055 94.140
 Standard Dev._{norm} 2.742
 Coeff. of Var. [%]_{norm} 2.912
 Min. 0.0054 87.732
 Max. 0.0056 98.210
 Number of Spec. 21 21



**Laminate Filled-Hole Compression Properties (FHC3)--ETW2
Strength**

Cytec 5320-1 T650 Unitape Gr 145 RC 33%

normalizing
t_{ply} [in]
0.0055

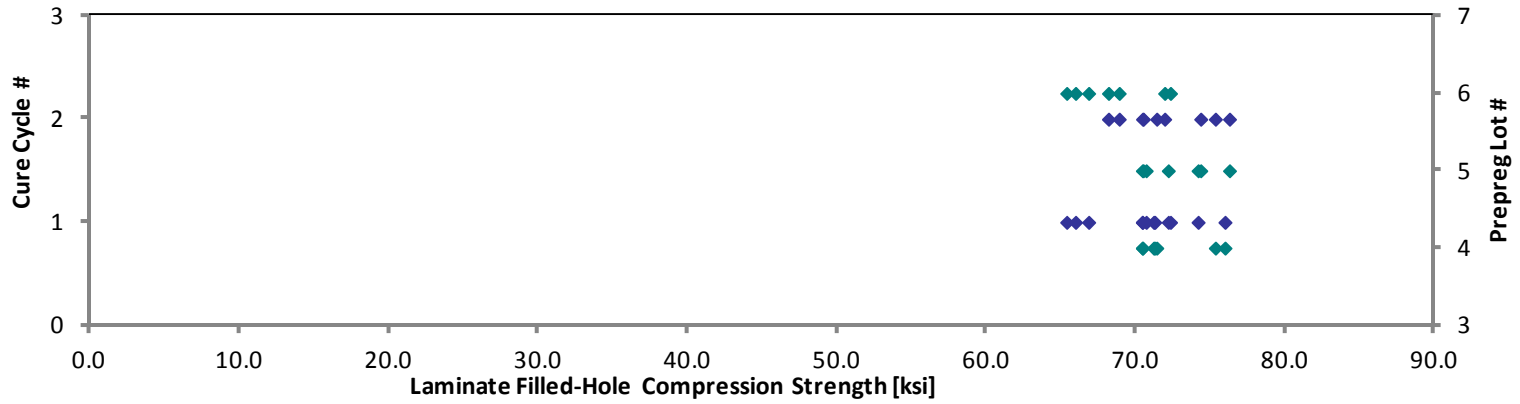
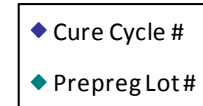
Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksj]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUG9D117F	D	C1	4	1	70.848	0.219	40	LGM
CUG9D118F	D	C1	4	1	71.050	0.221	40	LGM
CUG9D119F	D	C1	4	1	76.410	0.219	40	LGM
CUG9D11AF	D	C1	4	1	70.935	0.221	40	LGM
CUG9D215F	D	C2	4	2	76.008	0.218	40	LGF / LGM
CUG9D219F	D	C2	4	2	70.322	0.220	40	LGM
CUG9D21AF	D	C2	4	2	72.106	0.218	40	LGM
CUG9E117F	E	C1	5	1	74.182	0.220	40	LGF
CUG9E118F	E	C1	5	1	70.291	0.221	40	LGF
CUG9E119F	E	C1	5	1	70.012	0.221	40	LGF / LGM
CUG9E11AF	E	C1	5	1	71.899	0.221	40	LGF / LGM
CUG9E216F	E	C2	5	2	69.992	0.222	40	LGF / LGM
CUG9E217F	E	C2	5	2	76.396	0.220	40	LGF / LGM
CUG9E218F	E	C2	5	2	74.393	0.220	40	LGF / LGM
CUG9F117F	F	C1	6	1	65.025	0.223	40	LGF / LGM
CUG9F118F	F	C1	6	1	64.694	0.222	40	LGM
CUG9F119F	F	C1	6	1	65.726	0.224	40	LGM
CUG9F11AF	F	C1	6	1	71.604	0.222	40	LGF / LGM
CUG9F215F	F	C2	6	2	67.479	0.222	40	LGF / LGM
CUG9F216F	F	C2	6	2	68.368	0.222	40	LGM
CUG9F217F	F	C2	6	2	71.036	0.223	40	LGM

Avg. t _{ply} [in]	Strength _{norm} [ksj]
0.0055	70.451
0.0055	71.212
0.0055	75.982
0.0055	71.279
0.0055	75.340
0.0055	70.466
0.0054	71.413
0.0055	74.182
0.0055	70.706
0.0055	70.452
0.0055	72.188
0.0055	70.517
0.0055	76.286
0.0055	74.359
0.0056	65.976
0.0056	65.385
0.0056	66.856
0.0056	72.336
0.0056	68.185
0.0055	68.901
0.0056	71.946

Average 70.894
Standard Dev. 3.412
Coeff. of Var. [%] 4.813
Min. 64.694
Max. 76.410
Number of Spec. 21

Average_{norm} 0.0055 71.163
Standard Dev._{norm} 3.036
Coeff. of Var. [%]_{norm} 4.266
Min. 0.0054 65.385
Max. 0.0056 76.286
Number of Spec. 21 21

Laminate Filled-Hole Compression Properties (FHC3)--ETW2
Normalized Strength
Cytec 5320-1 T650 Unitape Gr 145 RC 33%



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

Laminate Single-Shear Bearing Properties (SSB1)–RTD Strength
 Cytec 5320-1 T650 Unitape Gr 145 RC 33%

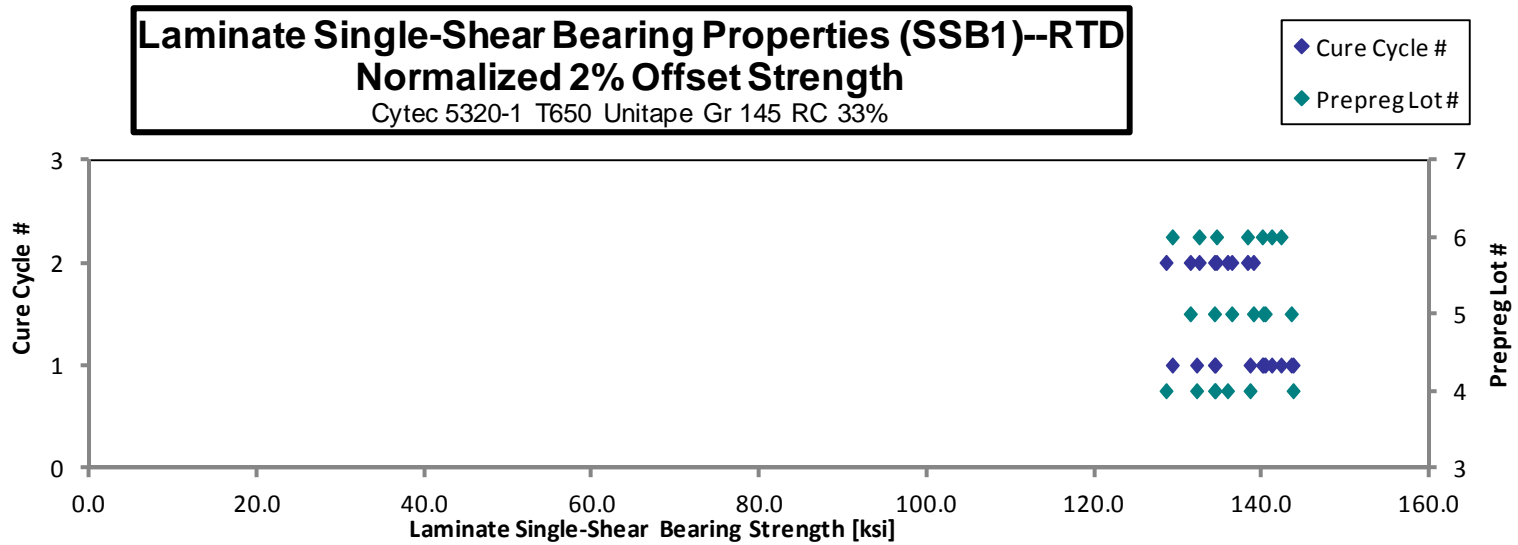
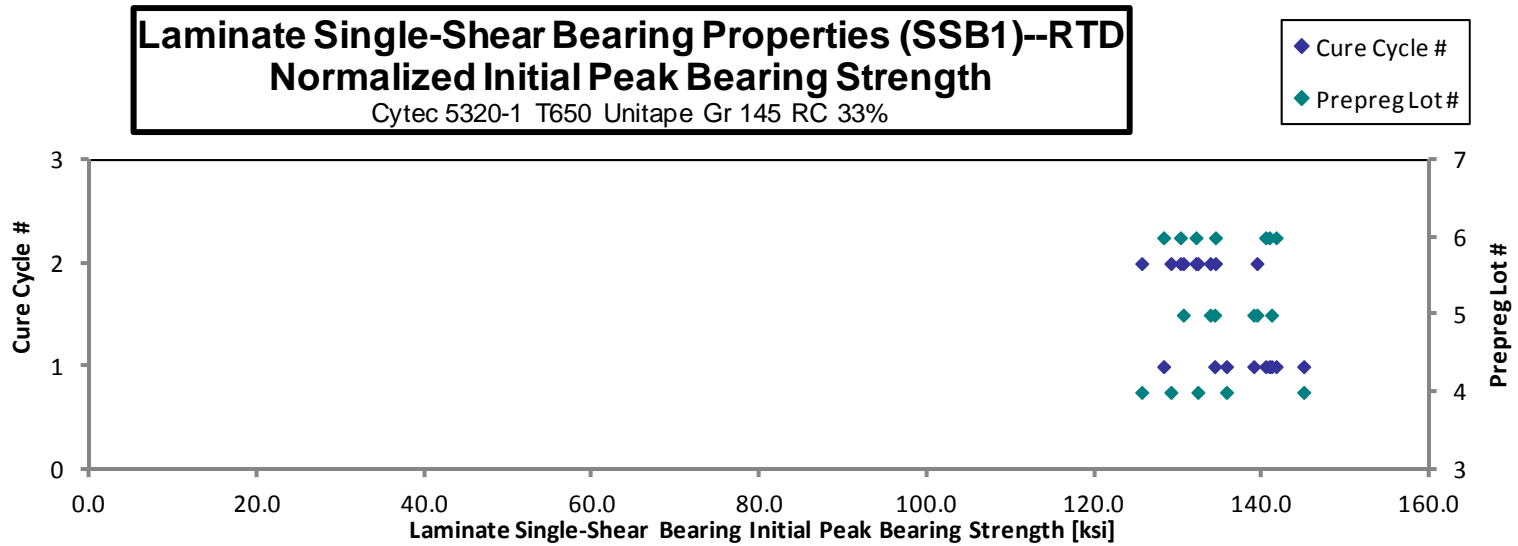
normalizing
 t_{ply} [in]
 0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Initial Peak Bearing Strength [ksi]	2% Offset Strength [ksi]	Ultimate Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Comments
CUG1D111A	D	C1	4	1		137.478	150.969	0.085	16	B11
CUG1D112A	D	C1	4	1		142.426	152.791	0.086	16	B11
CUG1D113A	D	C1	4	1	140.304	138.900	161.408	0.085	16	B11
CUG1D114A	D	C1	4	1	149.632	148.320	150.933	0.085	16	B11
CUG1D211A	D	C2	4	2	130.606	133.627	152.214	0.085	16	B11
CUG1D212A	D	C2	4	2	135.601	139.222	147.349	0.086	16	B11
CUG1D213A	D	C2	4	2	133.703	139.101	159.219	0.085	16	B11
CUG1E111A	E	C1	5	1	137.387	137.367	152.926	0.086	16	B11
CUG1E112A	E	C1	5	1		143.899	166.797	0.088	16	B11
CUG1E113A	E	C1	5	1	142.876	142.100	157.120	0.087	16	B11
CUG1E114A	E	C1	5	1	139.485	140.638	149.805	0.088	16	B11
CUG1E211A	E	C2	5	2	144.099	143.656	162.382	0.085	16	B11
CUG1E212A	E	C2	5	2	132.301	133.145	157.802	0.087	16	B11
CUG1E213A	E	C2	5	2	135.803	138.399	151.834	0.087	16	B11
CUG1F111A	F	C1	6	1	133.986	135.066	152.659	0.084	16	B11
CUG1F112A	F	C1	6	1	141.324	140.490	168.234	0.088	16	B11
CUG1F113A	F	C1	6	1	140.699	142.542	156.645	0.088	16	B11
CUG1F114A	F	C1	6	1	141.338	140.806	154.837	0.088	16	B11
CUG1F211A	F	C2	6	2	136.680	139.017	145.247	0.084	16	B11
CUG1F212A	F	C2	6	2	132.763	138.950	152.442	0.088	16	B11
CUG1F213A	F	C2	6	2	137.194	137.323	149.353	0.086	16	B11

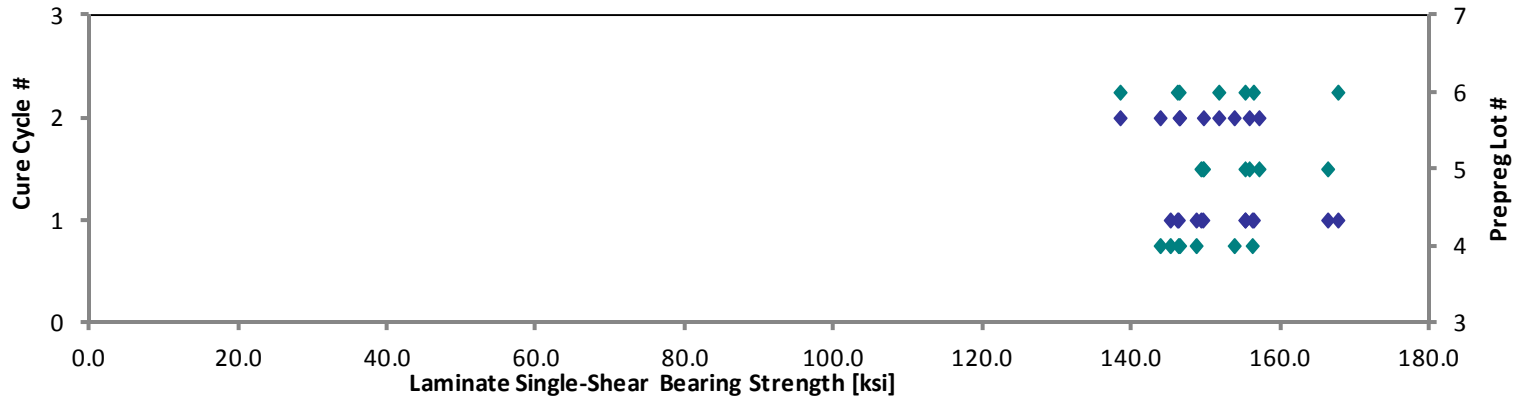
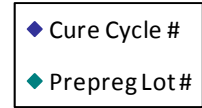
Avg. t_{ply} [in]	Initial Peak Bearing Strength _{norm} [ksi]	2% Offset Strength _{norm} [ksi]	Ultimate Strength _{norm} [ksi]
0.0053		132.114	145.079
0.0053		138.488	148.566
0.0053	135.680	134.323	156.089
0.0053	144.899	143.628	146.160
0.0053	125.560	128.464	146.333
0.0054	132.262	135.795	143.721
0.0053	129.043	134.254	153.671
0.0054	134.264	134.245	149.451
0.0055		143.409	166.228
0.0054	141.063	140.297	155.127
0.0055	138.930	140.078	149.210
0.0053	139.323	138.895	157.000
0.0054	130.522	131.354	155.680
0.0054	133.745	136.302	149.534
0.0053	128.174	129.208	146.038
0.0055	140.788	139.958	167.597
0.0055	140.352	142.191	156.259
0.0055	141.605	141.073	155.130
0.0052	130.182	132.409	138.343
0.0055	132.034	138.186	151.605
0.0054	134.362	134.488	146.270

Average	138.099	139.642	154.903
Standard Dev.	4.824	3.555	6.028
Coeff. of Var. [%]	3.493	2.546	3.892
Min.	130.606	133.145	145.247
Max.	149.632	148.320	168.234
Number of Spec.	18	21	21

Average _{norm}	0.0054	135.155	136.627	151.576
Standard Dev. _{norm}		5.466	4.488	7.098
Coeff. of Var. [%] _{norm}		4.044	3.285	4.683
Min.	0.0052	125.560	128.464	138.343
Max.	0.0055	144.899	143.628	167.597
Number of Spec.	21	18	21	21



Laminate Single-Shear Bearing Properties (SSB1)--RTD
Normalized Ultimate Strength
Cytec 5320-1 T650 Unitape Gr 145 RC 33%



**Laminate Single-Shear Bearing Properties (SSB1)--ETW1
Strength**
Cytec 5320-1 T650 Unitape Gr 145 RC 33%

normalizing
t_{ply} [in]
0.0055

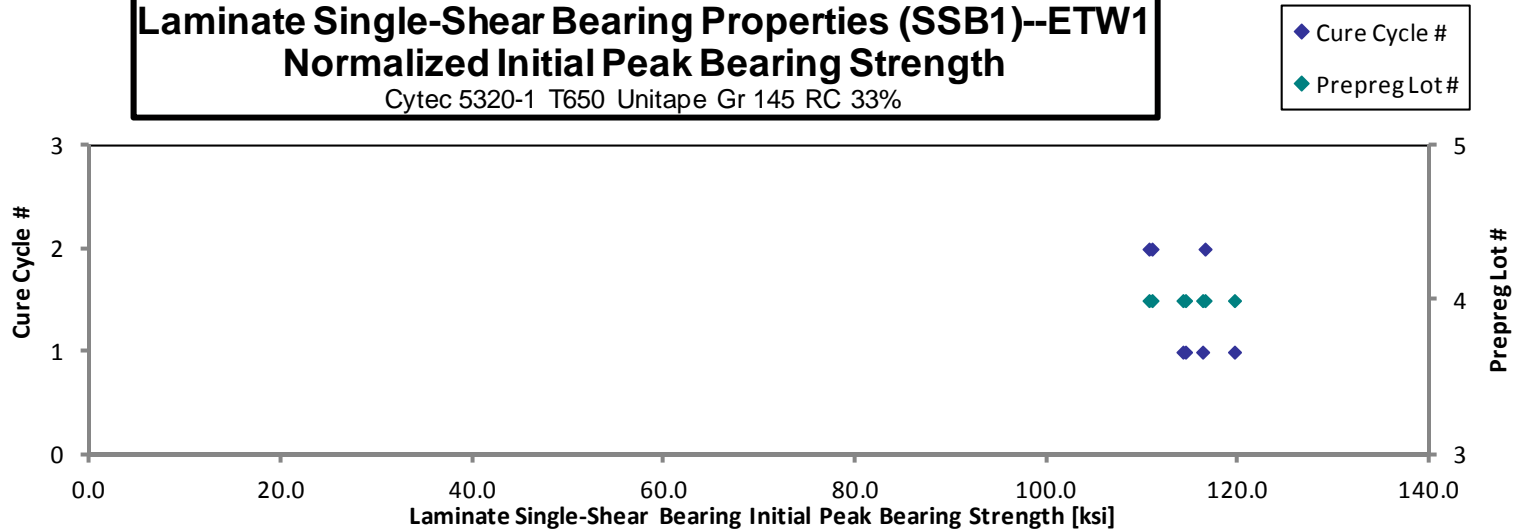
Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Initial Peak Bearing Strength [ksij]	2% Offset Strength [ksij]	Ultimate Strength [ksij]	Avg. Specimen Thickness [in]	# Plies in Laminate	Comments
CUG1D117D	D	C1	4	1	115.647	119.090	133.384	0.087	16	B11
CUG1D118D	D	C1	4	1	119.851	116.147	133.474	0.088	16	B11
CUG1D119D	D	C1	4	1	115.260	108.992	128.277	0.087	16	B11
CUG1D11AD	D	C1	4	1	116.802	111.079	130.745	0.088	16	B11
CUG1D215D	D	C2	4	2	113.175	110.097	128.078	0.086	16	B11
CUG1D216D	D	C2	4	2	117.929	117.486	139.116	0.087	16	B11
CUG1D217D	D	C2	4	2	113.079	119.757	129.905	0.086	16	B11

Avg. t _{ply} [in]	Initial Peak Bearing Strength _{norm} [ksij]	2% Offset Strength _{norm} [ksij]	Ultimate Strength _{norm} [ksij]
0.0054	114.443	117.850	131.995
0.0055	119.555	115.861	133.145
0.0054	114.169	107.960	127.062
0.0055	116.227	110.532	130.101
0.0054	110.624	107.615	125.191
0.0054	116.478	116.039	137.403
0.0054	110.938	117.488	127.445

Average	115.963	114.664	131.854
Standard Dev.	2.462	4.501	3.868
Coeff. of Var. [%]	2.123	3.926	2.934
Min.	113.079	108.992	128.078
Max.	119.851	119.757	139.116
Number of Spec.	7	7	7

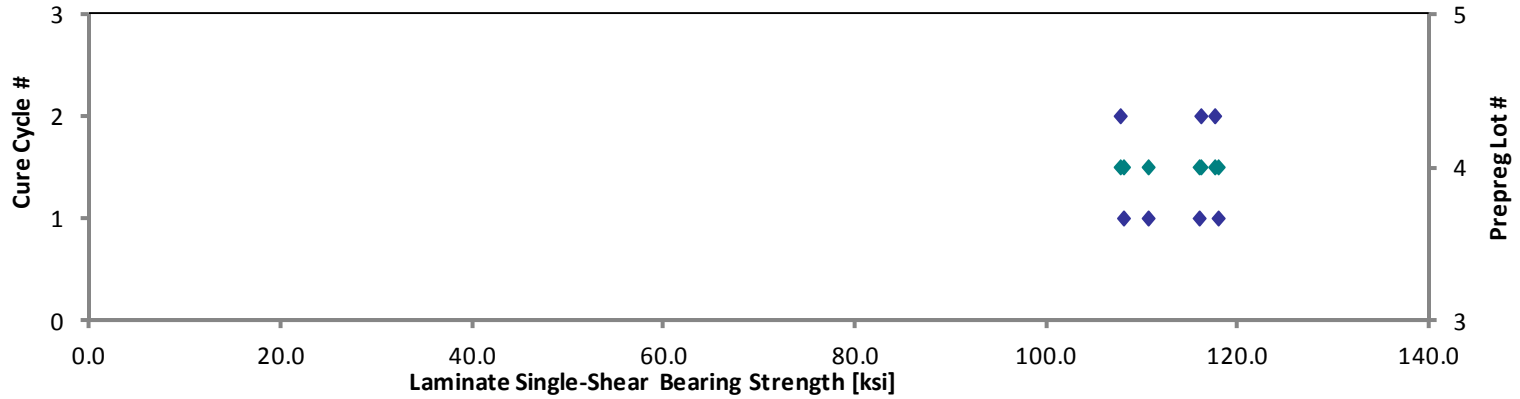
Average _{norm}	0.0054	114.633	113.335	130.335
Standard Dev. _{norm}		3.166	4.487	4.207
Coeff. of Var. [%] _{norm}		2.762	3.959	3.228
Min.	0.0054	110.624	107.615	125.191
Max.	0.0055	119.555	117.850	137.403
Number of Spec.	7	7	7	7

**Laminate Single-Shear Bearing Properties (SSB1)--ETW1
Normalized Initial Peak Bearing Strength**
Cytec 5320-1 T650 Unitape Gr 145 RC 33%



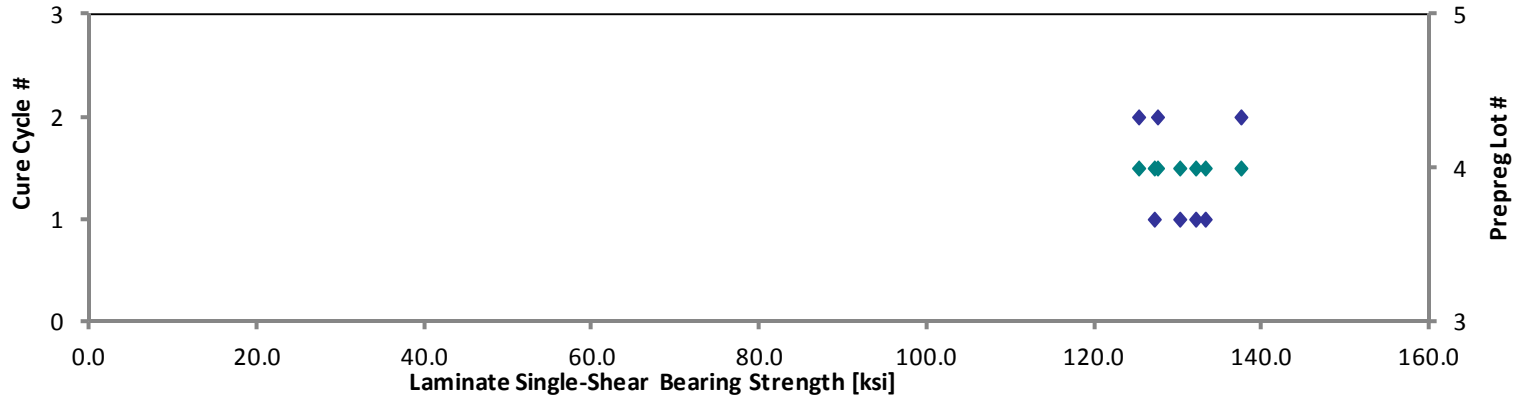
Laminate Single-Shear Bearing Properties (SSB1)--ETW1
Normalized 2% Offset Strength
Cytec 5320-1 T650 Unitape Gr 145 RC 33%

◆ Cure Cycle #
◆ Prepreg Lot #



Laminate Single-Shear Bearing Properties (SSB1)--ETW1
Normalized Ultimate Strength
Cytec 5320-1 T650 Unitape Gr 145 RC 33%

◆ Cure Cycle #
◆ Prepreg Lot #



**Laminate Single-Shear Bearing Properties (SSB1)--ETW2
Strength**
Cytec 5320-1 T650 Unitape Gr 145 RC 33%

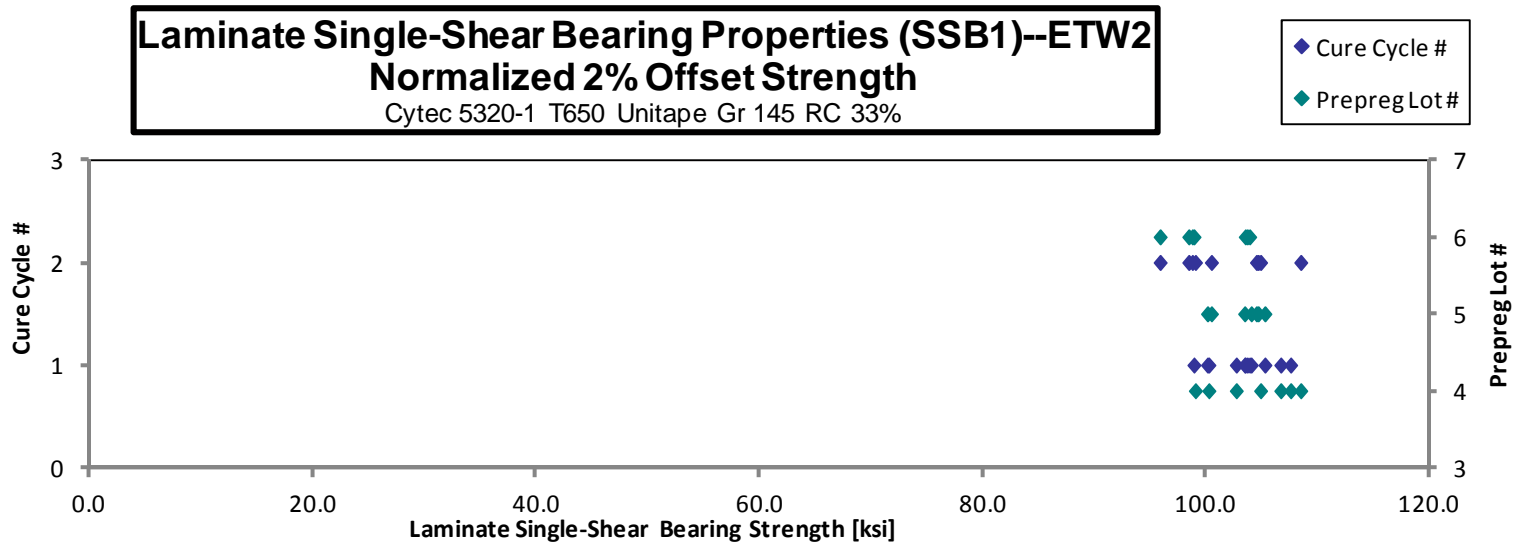
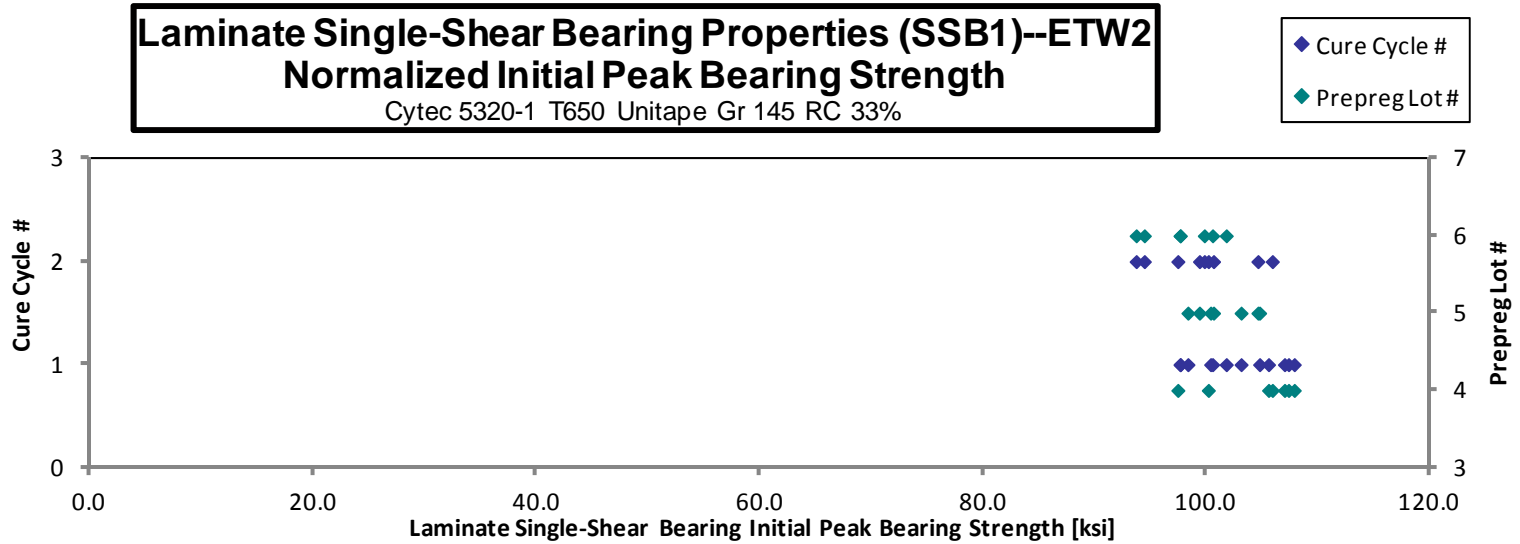
normalizing
t_{ply} [in]
0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Initial Peak Bearing Strength [ksij]	2% Offset Strength [ksij]	Ultimate Strength [ksij]	Avg. Specimen Thickness [in]	# Plies in Laminate	Comments
CUG1D11DF	D	C1	4	1	110.949	106.116	118.874	0.085	16	B1I
CUG1D11EF	D	C1	4	1	109.257	108.931	111.633	0.087	16	B1I
CUG1D11FF	D	C1	4	1	107.519	102.076	116.299	0.086	16	B1I
CUG1D11GF	D	C1	4	1	107.626	107.289	122.547	0.087	16	B1I
CUG1D219F	D	C2	4	2	100.512	108.823	116.327	0.088	16	B1I
CUG1D21AF	D	C2	4	2	104.812	103.776	109.198	0.089	16	B1I
CUG1D21BF	D	C2	4	2	97.457	99.031	109.769	0.088	16	B1I
CUG1E117F	E	C1	5	1	103.793	104.116	121.949	0.087	16	B1I
CUG1E118F	E	C1	5	1	98.008	104.881	115.971	0.088	16	B1I
CUG1E119F	E	C1	5	1	99.177	98.898	108.865	0.089	16	B1I
CUG1E11AF	E	C1	5	1	103.064	102.326	107.451	0.089	16	B1I
CUG1E216F	E	C2	5	2	101.037	100.849	111.608	0.088	16	B1I
CUG1E217F	E	C2	5	2	98.723	103.947	110.411	0.089	16	B1I
CUG1E218F	E	C2	5	2	104.003	103.870	112.652	0.088	16	B1I
CUG1F117F	F	C1	6	1	98.959	100.211	116.890	0.087	16	B1I
CUG1F118F	F	C1	6	1	97.966	104.208	114.844	0.088	16	B1I
CUG1F119F	F	C1	6	1	100.056	102.979	109.950	0.088	16	B1I
CUG1F11AF	F	C1	6	1	101.336	103.214	115.421	0.088	16	B1I
CUG1F216F	F	C2	6	2	94.895	99.669	108.158	0.087	16	B1I
CUG1F217F	F	C2	6	2	97.955	96.903	118.544	0.090	16	B1I
CUG1F218F	F	C2	6	2	93.585	94.993	116.853	0.089	16	B1I

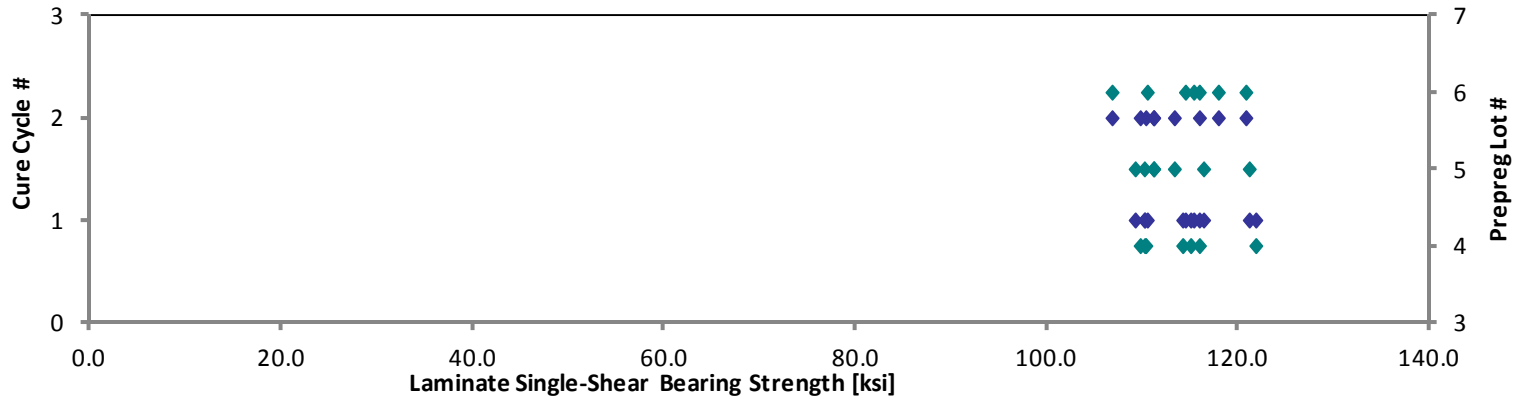
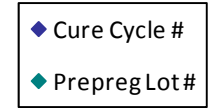
Avg. t _{ply} [in]	Initial Peak Bearing Strength _{norm} [ksij]	2% Offset Strength _{norm} [ksij]	Ultimate Strength _{norm} [ksij]
0.0053	107.314	102.639	114.979
0.0054	107.830	107.507	110.175
0.0054	105.523	100.182	114.141
0.0055	106.954	106.619	121.781
0.0055	100.132	108.411	115.886
0.0056	105.865	104.818	110.294
0.0055	97.402	98.974	109.706
0.0055	103.066	103.386	121.094
0.0055	98.305	105.199	116.322
0.0056	100.341	100.059	110.143
0.0056	104.724	103.974	109.181
0.0055	100.597	100.410	111.121
0.0055	99.340	104.597	111.101
0.0055	104.574	104.441	113.271
0.0054	97.609	98.844	115.296
0.0055	97.613	103.833	114.430
0.0055	100.511	103.447	110.449
0.0055	101.739	103.624	115.880
0.0054	93.673	98.385	106.765
0.0056	99.773	98.701	120.744
0.0055	94.401	95.820	117.871

Average	101.461	102.719	114.010
Standard Dev.	4.642	3.625	4.479
Coeff. of Var. [%]	4.575	3.529	3.929
Min.	93.585	94.993	107.451
Max.	110.949	108.931	122.547
Number of Spec.	21	21	21

Average _{norm}	0.0055	101.299	102.565	113.840
Standard Dev. _{norm}		4.135	3.332	4.202
Coeff. of Var. [%] _{norm}		4.082	3.249	3.692
Min.	0.0053	93.673	95.820	106.765
Max.	0.0056	107.830	108.411	121.781
Number of Spec.	21	21	21	21



Laminate Single-Shear Bearing Properties (SSB1)--ETW2
Normalized Ultimate Strength
Cytec 5320-1 T650 Unitape Gr 145 RC 33%



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

Laminate Single-Shear Bearing Properties (SSB2)--RTD Strength
 Cytec 5320-1 T650 Unitape Gr 145 RC 33%

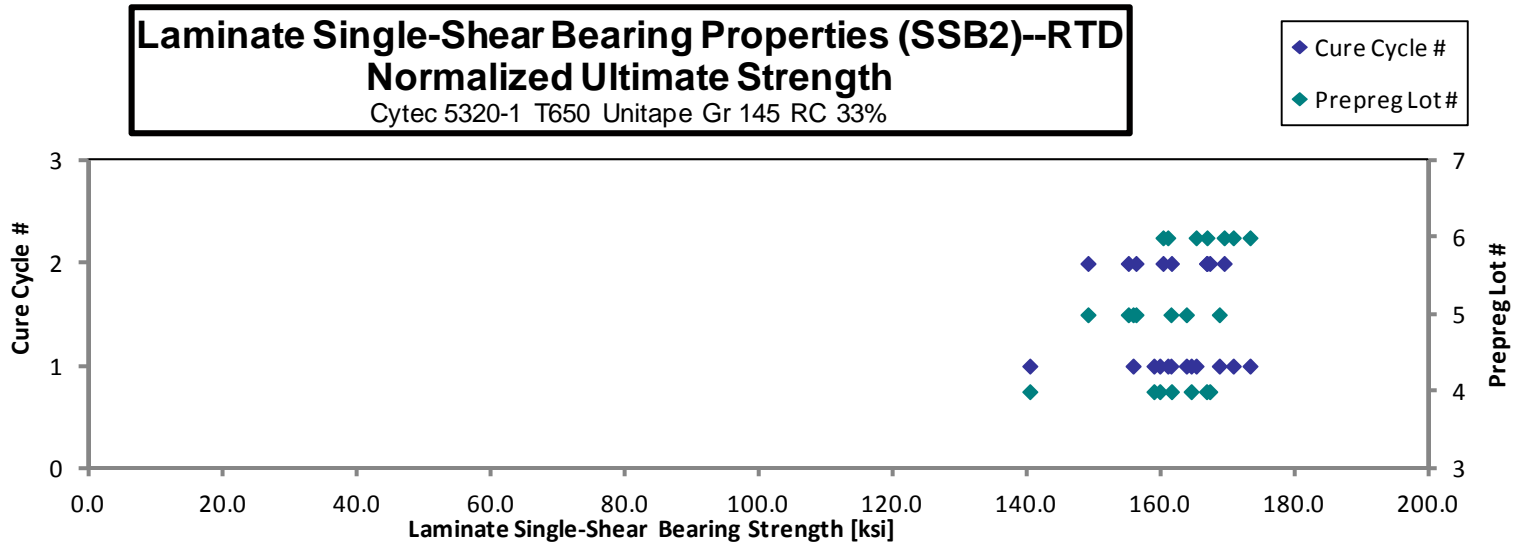
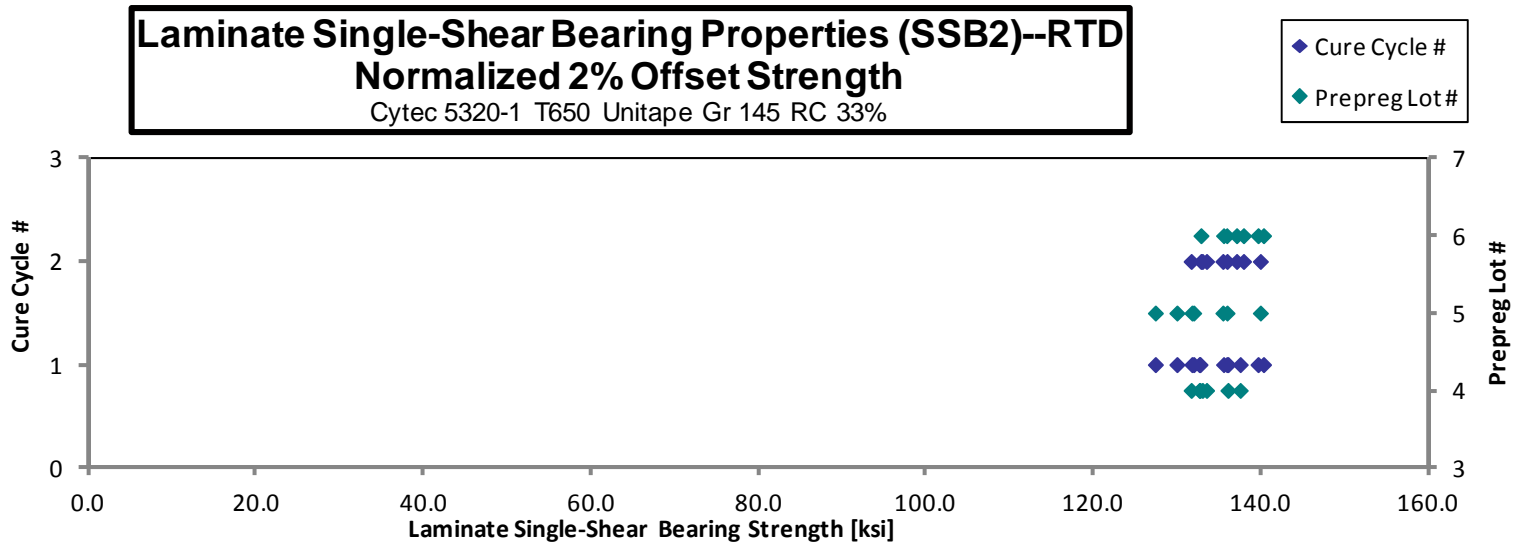
normalizing
 t_{ply} [in]
 0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	2% Offset Strength [ksi]	Ultimate Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Comments
CUG2D111A	D	C1	4	1	137.394	145.460	0.1063	20	B1I
CUG2D112A	D	C1	4	1	141.457	164.475	0.1070	20	B1I
CUG2D113A	D	C1	4	1	137.426	164.763	0.1062	20	B1I
CUG2D114A	D	C1	4	1	140.305	169.709	0.1067	20	B1I
CUG2D211A	D	C2	4	2	135.096	165.855	0.1072	20	B1I
CUG2D212A	D	C2	4	2	135.170	169.592	0.1083	20	B1I
CUG2D213A	D	C2	4	2	136.383	170.980	0.1077	20	B1I
CUG2E111A	E	C1	5	1	123.515	151.169	0.1135	20	B1I
CUG2E112A	E	C1	5	1	129.142	162.827	0.1107	20	B1I
CUG2E113A	E	C1	5	1	130.701	160.271	0.1109	20	B1I
CUG2E114A	E	C1	5	1	130.616	167.049	0.1112	20	B1I
CUG2E211A	E	C2	5	2	139.040	152.576	0.1076	20	B1I
CUG2E212A	E	C2	5	2	139.391	154.611	0.1105	20	B1I
CUG2E213A	E	C2	5	2	136.131	157.130	0.1095	20	B1I
CUG2F111A	F	C1	6	1	135.404	165.160	0.1101	20	B1I
CUG2F112A	F	C1	6	1	139.791	170.236	0.1104	20	B1I
CUG2F113A	F	C1	6	1	138.490	159.752	0.1110	20	B1I
CUG2F114A	F	C1	6	1	135.397	172.698	0.1105	20	B1I
CUG2F211A	F	C2	6	2	134.215	162.037	0.1089	20	B1I
CUG2F212A	F	C2	6	2	137.600	167.565	0.1096	20	B1I
CUG2F213A	F	C2	6	2	137.907	169.495	0.1100	20	B1I

Avg. t_{ply} [in]	2% Offset Strength _{norm} [ksi]	Ultimate Strength _{norm} [ksi]
0.0053	132.752	140.545
0.0053	137.556	159.939
0.0053	132.678	159.072
0.0053	136.096	164.618
0.0054	131.698	161.684
0.0054	133.040	166.920
0.0054	133.531	167.405
0.0057	127.426	155.956
0.0055	130.003	163.912
0.0055	131.790	161.607
0.0056	132.001	168.821
0.0054	135.985	149.224
0.0055	139.962	155.244
0.0055	135.491	156.392
0.0055	135.568	165.361
0.0055	140.341	170.907
0.0055	139.686	161.132
0.0055	135.951	173.405
0.0054	132.873	160.417
0.0055	137.120	166.981
0.0055	137.949	169.546

Average 135.741 163.020
Standard Dev. 4.266 7.335
Coeff. of Var. [%] 3.143 4.500
Min. 123.515 145.460
Max. 141.457 172.698
Number of Spec. 21 21

Average_{norm} 0.0055 134.738 161.861
Standard Dev._{norm} 3.395 7.635
Coeff. of Var. [%]_{norm} 2.520 4.717
Min. 0.0053 127.426 140.545
Max. 0.0057 140.341 173.405
Number of Spec. 21 21 21



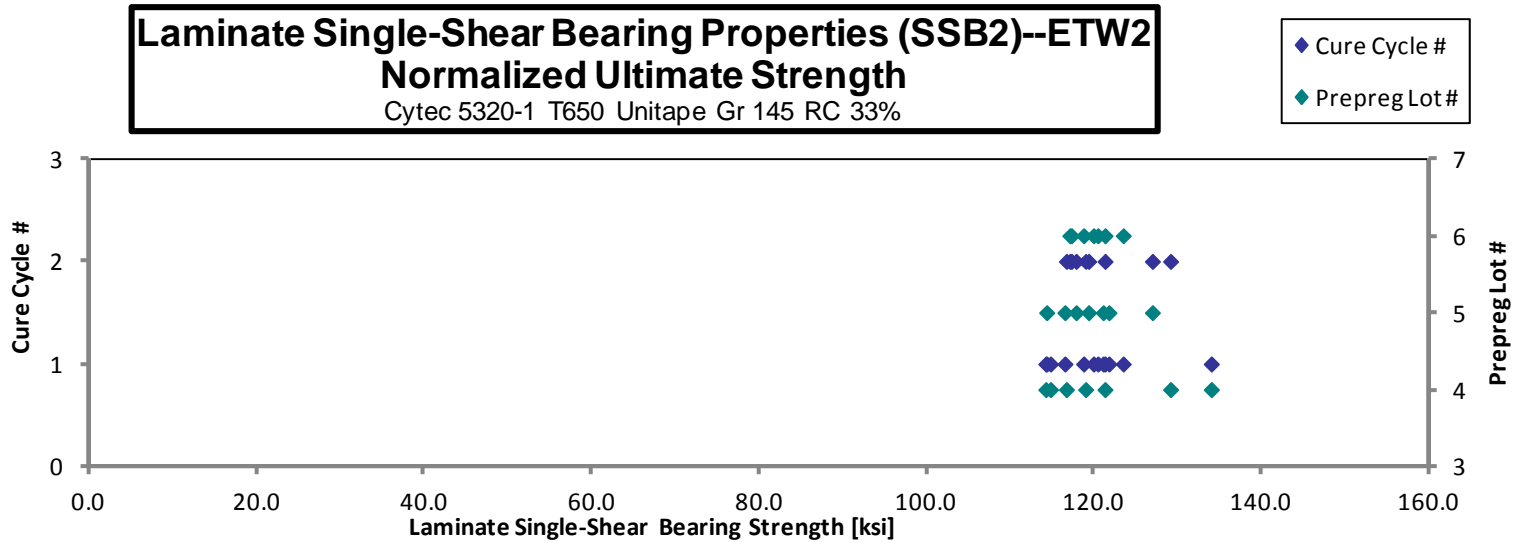
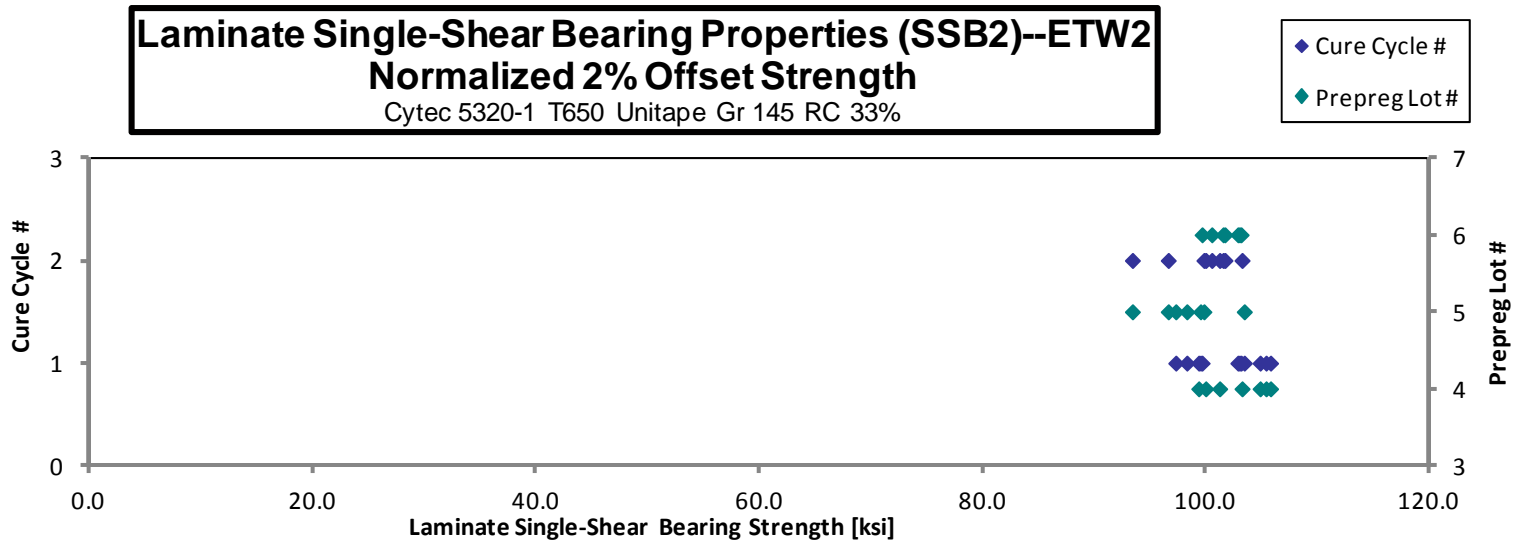
**Laminate Single-Shear Bearing Properties (SSB2)--ETW2
Strength**

Cytec 5320-1 T650 Unitape Gr 145 RC 33%

normalizing
t_{ply} [in]
0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	2% Offset Strength [ksi]	Ultimate Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Comments	Avg. t _{ply} [in]	2% Offset Strength _{norm} [ksi]	Ultimate Strength _{norm} [ksi]
CUG2D117F	D	C1	4	1	102.403	117.734	0.1068	20	B1I	0.0053	99.455	114.344
CUG2D118F	D	C1	4	1	105.975	116.038	0.1089	20	B1I	0.0054	104.947	114.912
CUG2D119F	D	C1	4	1	106.759	122.412	0.1091	20	B1I	0.0055	105.886	121.411
CUG2D11AF	D	C1	4	1	106.354	135.217	0.1091	20	B1I	0.0055	105.484	134.110
CUG2D216F	D	C2	4	2	102.958	128.773	0.1104	20	B1I	0.0055	103.333	129.241
CUG2D217F	D	C2	4	2	99.060	115.616	0.1111	20	B1I	0.0056	100.081	116.807
CUG2D218F	D	C2	4	2	102.021	119.920	0.1093	20	B1I	0.0055	101.326	119.103
CUG2E117F	E	C1	5	1	102.862	120.417	0.1107	20	B1I	0.0055	103.532	121.201
CUG2E118F	E	C1	5	1	98.038	114.038	0.1104	20	B1I	0.0055	98.394	114.452
CUG2E119F	E	C1	5	1	99.089	116.014	0.1106	20	B1I	0.0055	99.615	116.629
CUG2E11AF	E	C1	5	1	96.317	120.534	0.1112	20	B1I	0.0056	97.397	121.885
CUG2E216F	E	C2	5	2	93.443	119.369	0.1101	20	B1I	0.0055	93.513	119.459
CUG2E217F	E	C2	5	2	98.840	125.701	0.1112	20	B1I	0.0056	99.918	127.072
CUG2E218F	E	C2	5	2	95.765	116.804	0.1111	20	B1I	0.0056	96.722	117.972
CUG2F117F	F	C1	6	1	104.688	122.588	0.1082	20	B1I	0.0054	102.959	120.563
CUG2F118F	F	C1	6	1	101.915	117.491	0.1113	20	B1I	0.0056	103.104	118.862
CUG2F119F	F	C1	6	1	101.461	121.458	0.1119	20	B1I	0.0056	103.244	123.593
CUG2F11AF	F	C1	6	1	98.296	118.284	0.1116	20	B1I	0.0056	99.755	120.040
CUG2F216F	F	C2	6	2	101.172	118.060	0.1094	20	B1I	0.0055	100.620	117.416
CUG2F217F	F	C2	6	2	101.336	120.866	0.1105	20	B1I	0.0055	101.797	121.416
CUG2F218F	F	C2	6	2	101.289	116.815	0.1104	20	B1I	0.0055	101.642	117.222

Average	100.954	120.198	Average_{norm}	0.0055	101.082	120.367
Standard Dev.	3.510	4.906	Standard Dev._{norm}		3.065	4.924
Coeff. of Var. [%]	3.476	4.081	Coeff. of Var. [%]_{norm}		3.032	4.091
Min.	93.443	114.038	Min.	0.0053	93.513	114.344
Max.	106.759	135.217	Max.	0.0056	105.886	134.110
Number of Spec.	21	21	Number of Spec.	21	21	21



4.29 “50/40/10” Single-Shear Bearing 3 Properties (SSB3)

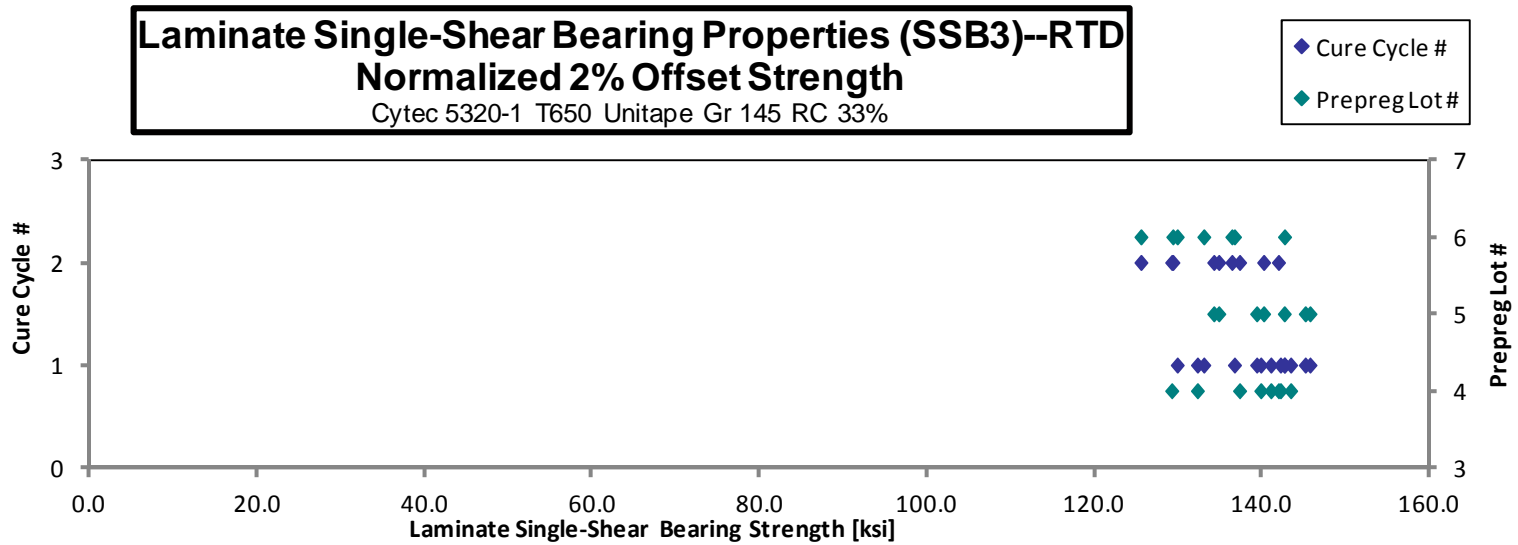
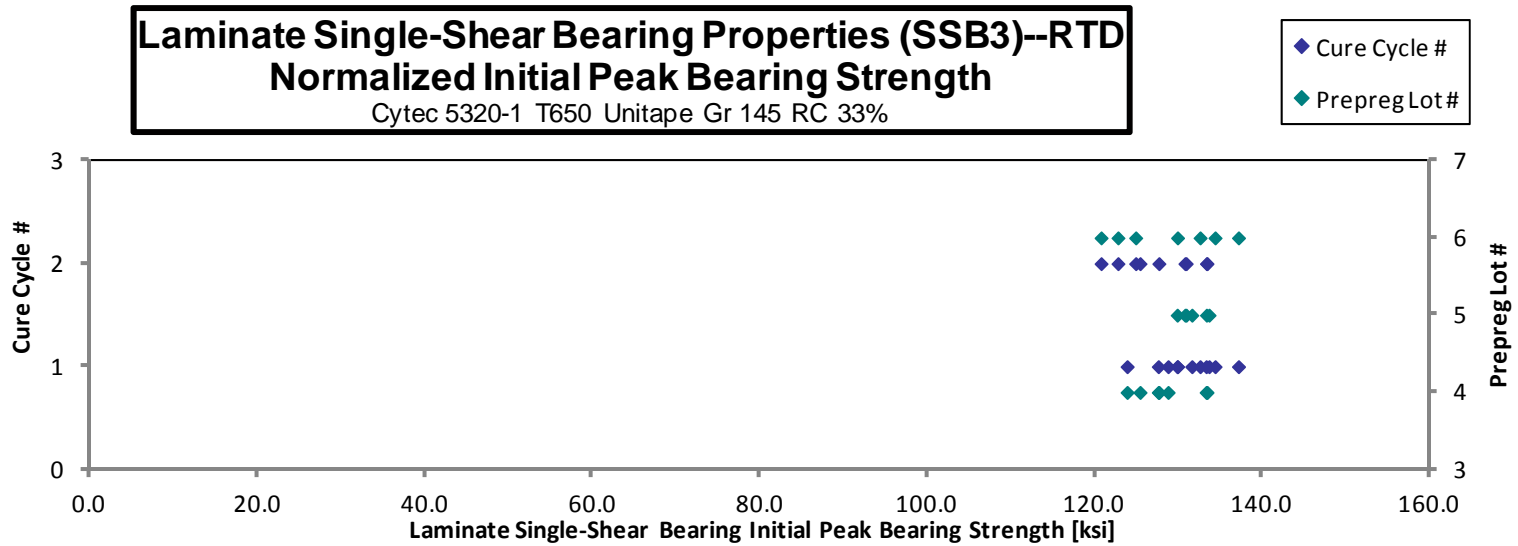
Laminate Single-Shear Bearing Properties (SSB3)--RTD Strength
 Cytec 5320-1 T650 Unitape Gr 145 RC 33%

normalizing
 t_{ply} [in]
 0.0055

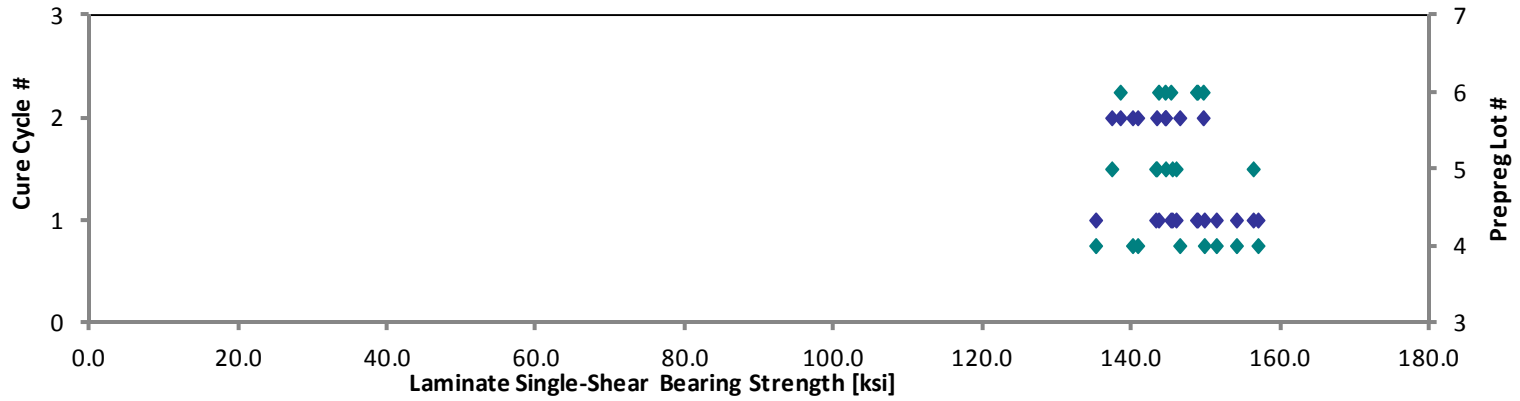
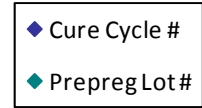
Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Initial Peak Bearing Strength [ksi]	2% Offset Strength [ksi]	Ultimate Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Comments
CUG3D111A	D	C1	4	1	129.900	142.358	156.825	0.1080	20	S11
CUG3D112A	D	C1	4	1	125.877	134.410	137.313	0.1082	20	S11
CUG3D113A	D	C1	4	1	128.941	143.602	151.542	0.1098	20	S11
CUG3D114A	D	C1	4	1	142.425	157.196	157.196	0.1098	20	S11
CUG3D115A	D	C1	4	1	134.761	142.573	151.355	0.1088	20	S11
CUG3D211A	D	C2	4	2	130.842	140.721	144.268	0.1073	20	S11
CUG3D212A	D	C2	4	2	128.171	132.045	143.169	0.1076	20	S11
CUG3D213A	D	C2	4	2	137.351	146.134	150.740	0.1068	20	B11
CUG3E111A	E	C1	5	1	131.612	147.111	147.383	0.1085	20	S11
CUG3E112A	E	C1	5	1	143.496	153.917	153.917	0.1117	20	S11
CUG3E113A	E	C1	5	1	130.166	141.082	144.333	0.1112	20	S11
CUG3E114A	E	C1	5	1	132.495	138.133	141.954	0.1109	20	S11
CUG3E211A	E	C2	5	2	136.492	143.484	147.933	0.1074	20	S11
CUG3E212A	E	C2	5	2	132.151	136.081	144.655	0.1089	20	S11
CUG3E213A	E	C2	5	2	132.349	135.829	138.931	0.1087	20	S11
CUG3F111A	F	C1	6	1	132.544	129.821	148.766	0.1100	20	B11
CUG3F112A	F	C1	6	1	127.461	130.539	142.501	0.1121	20	S11
CUG3F113A	F	C1	6	1	132.963	135.256	147.119	0.1111	20	B11
CUG3F114A	F	C1	6	1	135.979	141.426	142.327	0.1109	20	S11
CUG3F211A	F	C2	6	2	122.640	127.473	151.904	0.1083	20	B11
CUG3F212A	F	C2	6	2	126.698	131.202	146.547	0.1084	20	S11
CUG3F213A	F	C2	6	2	123.885	137.619	139.674	0.1090	20	S11

Avg. t_{ply} [in]	Initial Peak Bearing Strength _{norm} [ksi]	2% Offset Strength _{norm} [ksi]	Ultimate Strength _{norm} [ksi]
0.0054	127.539	139.769	153.973
0.0054	123.817	132.210	135.066
0.0055	128.707	143.341	151.266
0.0055	142.425	142.123	156.862
0.0054	133.250	140.974	149.658
0.0054	127.611	137.245	140.705
0.0054	125.355	129.144	140.024
0.0053	133.355	141.883	146.355
0.0054	129.798	145.082	145.351
0.0056	145.648	145.648	156.226
0.0056	131.546	142.579	145.864
0.0055	133.599	139.284	143.137
0.0054	133.286	140.115	144.459
0.0054	130.869	134.762	143.252
0.0054	130.724	134.162	137.226
0.0055	132.524	129.802	148.743
0.0056	129.837	132.972	145.157
0.0056	134.312	136.629	148.613
0.0055	137.112	142.604	143.513
0.0054	120.707	125.465	149.510
0.0054	124.836	129.274	144.393
0.0054	122.722	136.326	138.362

Average	130.664	138.310	146.834	Average _{norm}	0.0055	129.575	137.336	145.805
Standard Dev.	4.047	5.652	5.540	Standard Dev. _{norm}		4.356	5.724	5.773
Coeff. of Var. [%]	3.097	4.086	3.773	Coeff. of Var. [%] _{norm}		3.362	4.168	3.959
Min.	122.640	127.473	137.313	Min.	0.0053	120.707	125.465	135.066
Max.	137.351	147.111	157.196	Max.	0.0056	137.112	145.648	156.862
Number of Spec.	20	22	22	Number of Spec.	22	20	22	22



Laminate Single-Shear Bearing Properties (SSB3)--RTD
Normalized Ultimate Strength
Cyttec 5320-1 T650 Unitape Gr 145 RC 33%



**Laminate Single-Shear Bearing Properties (SSB3)--ETW2
Strength**
Cytec 5320-1 T650 Unitape Gr 145 RC 33%

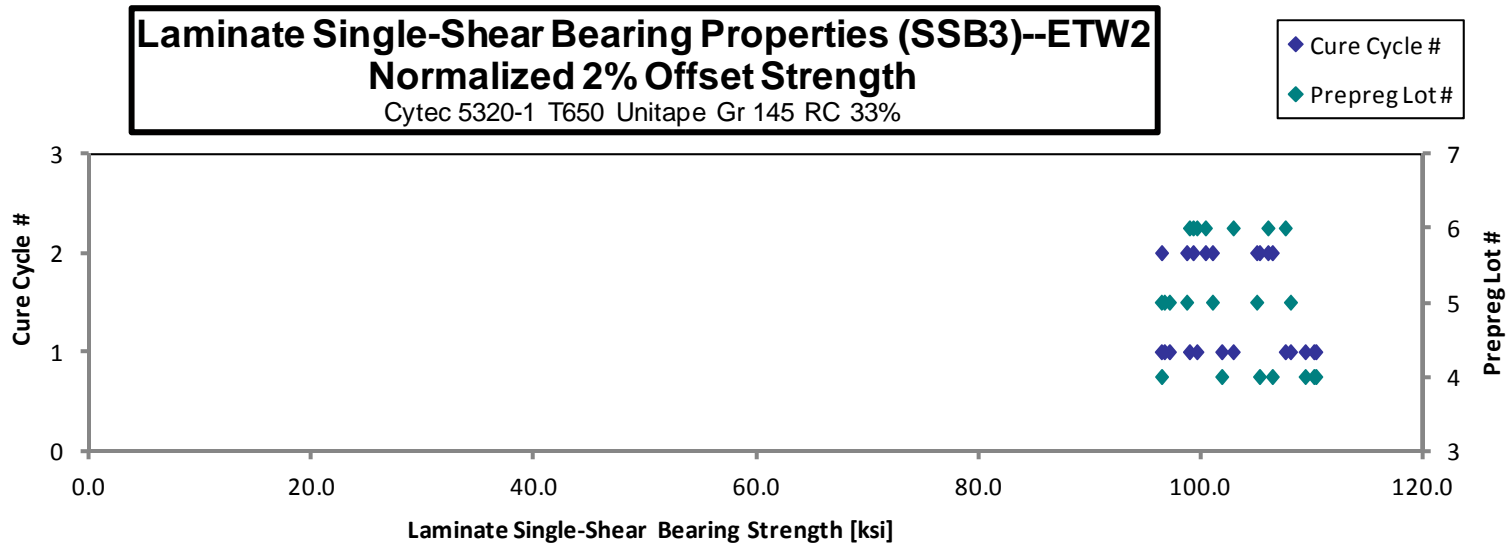
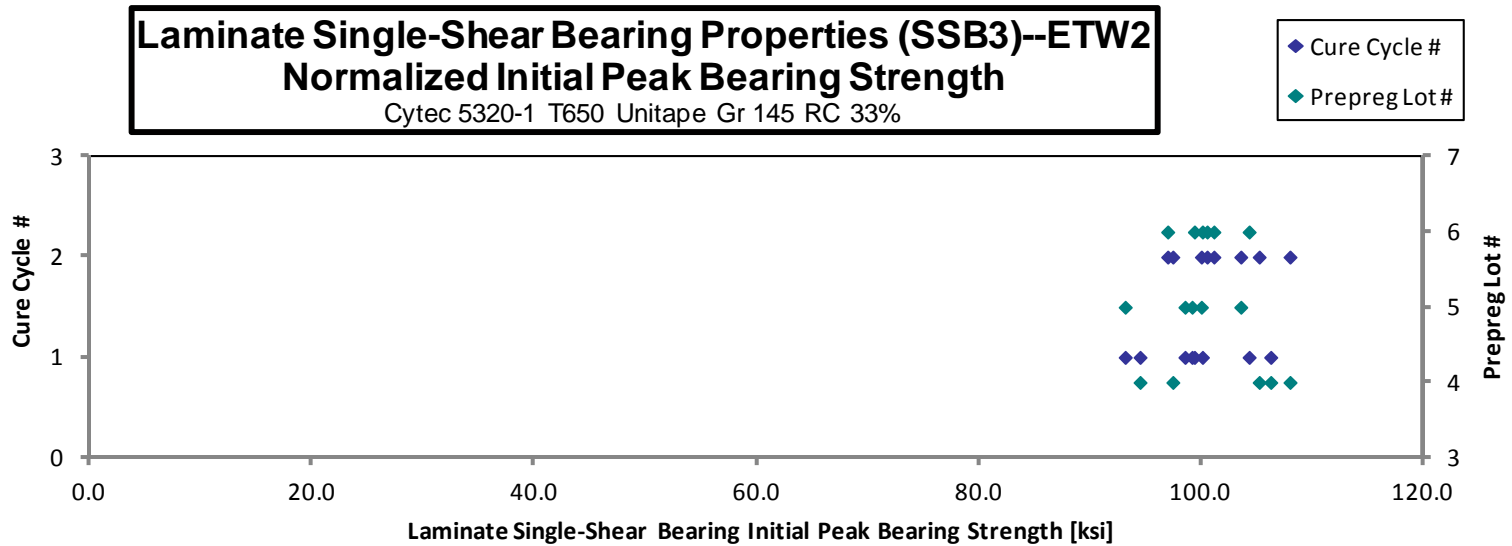
normalizing
t_{ply} [in]
0.0055

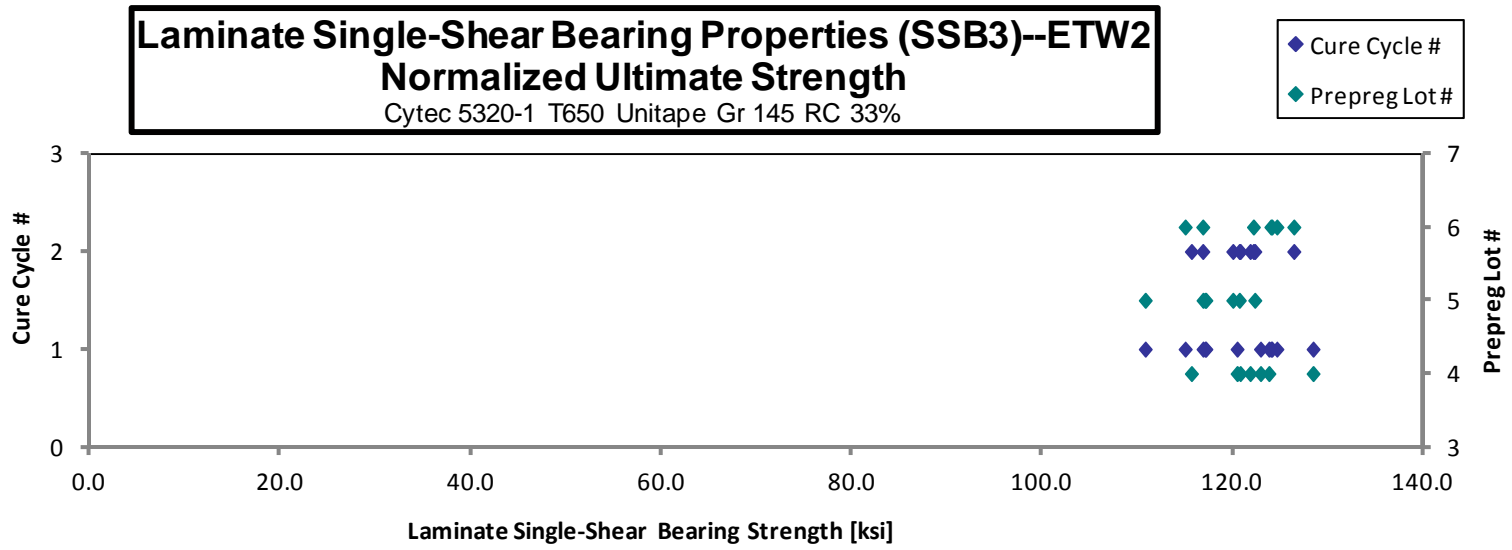
Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Initial Peak Bearing Strength [ksij]	2% Offset Strength [ksij]	Ultimate Strength [ksij]	Avg. Specimen Thickness [in]	# Plies in Laminate	Comments
CUG3D117F	D	C1	4	1	106.168	101.762	123.670	0.1101	20	B1I
CUG3D118F	D	C1	4	1		110.044	121.195	0.1093	20	B1I
CUG3D119F	D	C1	4	1		109.283	121.943	0.1108	20	B1I
CUG3D11AF	D	C1	4	1	94.832	110.704	128.867	0.1096	20	B1I
CUG3D216F	D	C2	4	2	106.059	106.090	121.725	0.1091	20	B1I
CUG3D217F	D	C2	4	2	108.489	106.889	122.369	0.1095	20	B1I
CUG3D218F	D	C2	4	2	98.454	97.429	116.833	0.1089	20	B1I
CUG3E117F	E	C1	5	1	93.350	96.610	117.092	0.1098	20	B1I
CUG3E118F	E	C1	5	1	97.816	95.805	115.546	0.1115	20	B1I
CUG3E119F	E	C1	5	1		106.682	115.601	0.1114	20	B1I
CUG3E11AF	E	C1	5	1	97.483	95.641	109.603	0.1112	20	B1I
CUG3E216F	E	C2	5	2		105.640	120.729	0.1093	20	B1I
CUG3E217F	E	C2	5	2	103.349	100.801	122.038	0.1102	20	B1I
CUG3E218F	E	C2	5	2	100.202	98.879	120.897	0.1098	20	B1I
CUG3F116F	F	C1	6	1	104.273	102.832	124.558	0.1100	20	B1I
CUG3F117F	F	C1	6	1	99.874	99.375	114.710	0.1102	20	B1I
CUG3F118F	F	C1	6	1	97.923	97.485	122.263	0.1116	20	B1I
CUG3F119F	F	C1	6	1		106.025	122.211	0.1116	20	B1I
CUG3F216F	F	C2	6	2	99.890	98.041	120.633	0.1114	20	B1I
CUG3F217F	F	C2	6	2	95.527	98.869	115.076	0.1117	20	B1I
CUG3F219F	F	C2	6	2	99.897	105.337	125.594	0.1107	20	B1I

Avg. t _{ply} [in]	Initial Peak Bearing Strength _{norm} [ksij]	2% Offset Strength _{norm} [ksij]	Ultimate Strength _{norm} [ksij]
0.0055	106.232	101.823	123.745
0.0055		109.327	120.405
0.0055		110.111	122.867
0.0055	94.473	110.285	128.379
0.0055	105.191	105.222	120.729
0.0055	107.963	106.370	121.776
0.0054	97.425	96.410	115.611
0.0055	93.138	96.390	116.826
0.0056	99.150	97.112	117.121
0.0056		108.007	117.038
0.0056	98.517	96.656	110.766
0.0055		104.968	119.961
0.0055	103.536	100.984	122.259
0.0055	99.989	98.669	120.641
0.0055	104.289	102.848	124.577
0.0055	100.086	99.585	114.954
0.0056	99.362	98.918	124.060
0.0056		107.535	123.951
0.0056	101.116	99.244	122.114
0.0056	96.959	100.352	116.802
0.0055	100.502	105.975	126.355

Average	100.224	102.392	120.150
Standard Dev.	4.354	4.934	4.424
Coeff. of Var. [%]	4.344	4.819	3.682
Min.	93.350	95.641	109.603
Max.	108.489	110.704	128.867
Number of Spec.	16	21	21

Average _{norm}	0.0055	100.496	102.704	120.521
Standard Dev. _{norm}		4.119	4.755	4.251
Coeff. of Var. [%] _{norm}		4.099	4.630	3.527
Min.	0.0054	93.138	96.390	110.766
Max.	0.0056	107.963	110.285	128.379
Number of Spec.	21	16	21	21





4.30 Compression After Impact 1 Properties (CAI1)

**Laminate Compression After Impact Properties (CAI1)--RTD
Strength**
Cytec 5320-1 T650 Unitape Gr 145 RC 33%

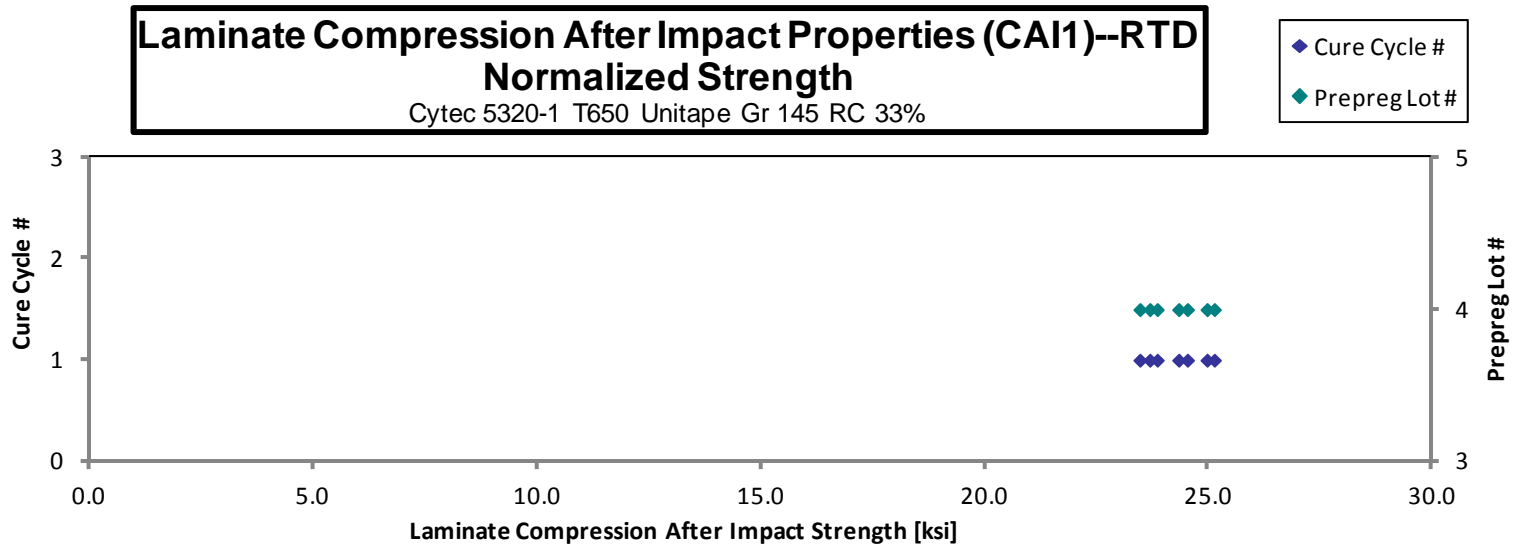
normalizing
t_{ply} [in]
0.0055

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Measured Impact Energy (in-lbf)	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
CUGKD111A	D	C1	4	1	23.711	261.36	0.17418	32	LDM
CUGKD112A	D	C1	4	1	24.283	264.07	0.17636	32	LDM
CUGKD113A	D	C1	4	1	23.923	264.53	0.17549	32	LDM
CUGKD114A	D	C1	4	1	24.897	266.06	0.17649	32	LDM
CUGKD115A	D	C1	4	1	25.044	265.73	0.17660	32	LDM
CUGKD116A	D	C1	4	1	24.487	264.28	0.17629	32	LDM
CUGKD117A	D	C1	4	1	23.549	264.73	0.17704	32	LDM

Avg. t _{ply} [in]	Strength _{norm} [ksi]
0.0054	23.466
0.0055	24.333
0.0055	23.853
0.0055	24.966
0.0055	25.129
0.0055	24.527
0.0055	23.687

Average 24.270
Standard Dev. 0.576
Coeff. of Var. [%] 2.374
Min. 23.549
Max. 25.044
Number of Spec. 7

Average_{norm} 0.0055 24.280
Standard Dev_{norm} 0.639
Coeff. of Var. [%]_{norm} 2.633
Min. 0.0054 23.466
Max. 0.0055 25.129
Number of Spec. 7 7



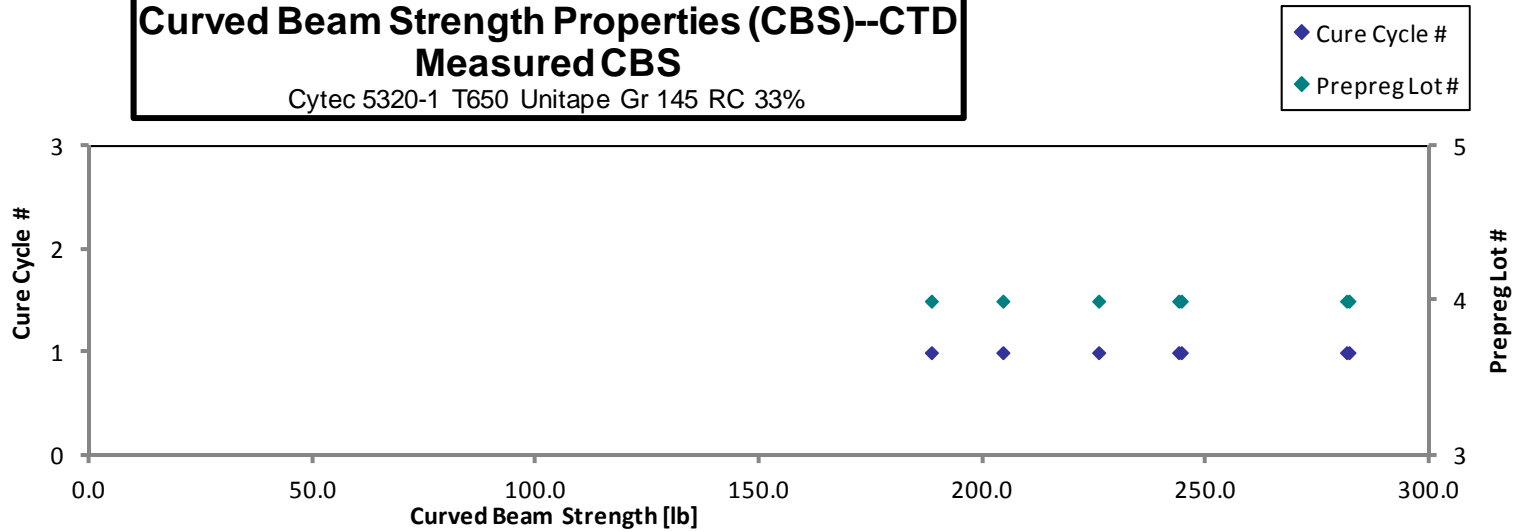
4.31 Interlaminar Tension Properties (ILT)

**Interlaminar Tension Properties (ILT)--CTD
Strength**
Cytec 5320-1 T650 Unitape Gr 145 RC 33%

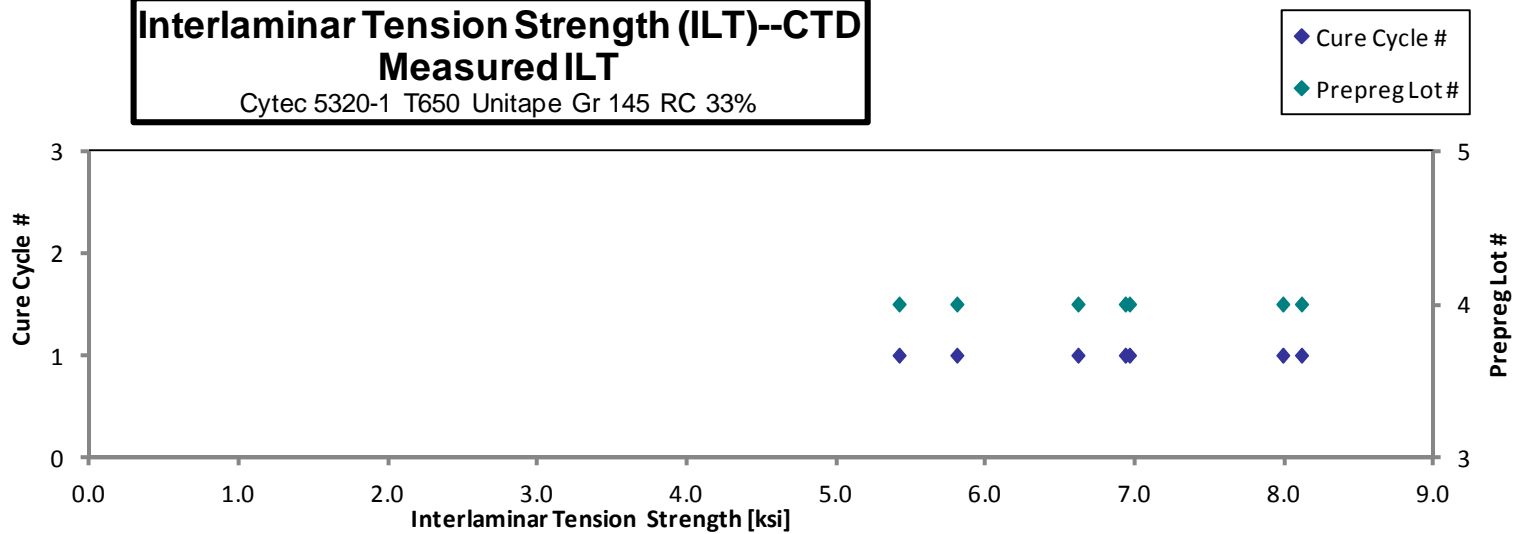
Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Curved Beam Strength [lb]	Interlaminar Tension Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t _{ply} [in]	Failure Mode
CUGMD118B	D	C1	4	1	281.270	8.110	0.162	30	0.0054	ILT
CUGMD119B	D	C1	4	1	281.814	7.986	0.164	30	0.0055	ILT
CUGMD11AB	D	C1	4	1	244.277	6.959	0.164	30	0.0055	ILT
CUGMD11BB	D	C1	4	1	243.688	6.931	0.164	30	0.0055	ILT
CUGMD11CB	D	C1	4	1	188.327	5.416	0.162	30	0.0054	ILT
CUGMD11DB	D	C1	4	1	225.782	6.614	0.160	30	0.0053	ILT
CUGMD11EB	D	C1	4	1	204.346	5.803	0.164	30	0.0055	ILT

Average	238.501	6.831	Average	0.0054
Standard Dev.	35.617	1.008	Standard Dev.	
Coeff. of Var. [%]	14.934	14.761	Coeff. of Var. [%]	
Min.	188.327	5.416	Min.	0.0053
Max.	281.814	8.110	Max.	0.0055
Number of Spec.	7	7	Number of Spec.	7

Curved Beam Strength Properties (CBS)--CTD
Measured CBS
Cyttec 5320-1 T650 Unitape Gr 145 RC 33%



Interlaminar Tension Strength (ILT)--CTD
Measured ILT
Cyttec 5320-1 T650 Unitape Gr 145 RC 33%

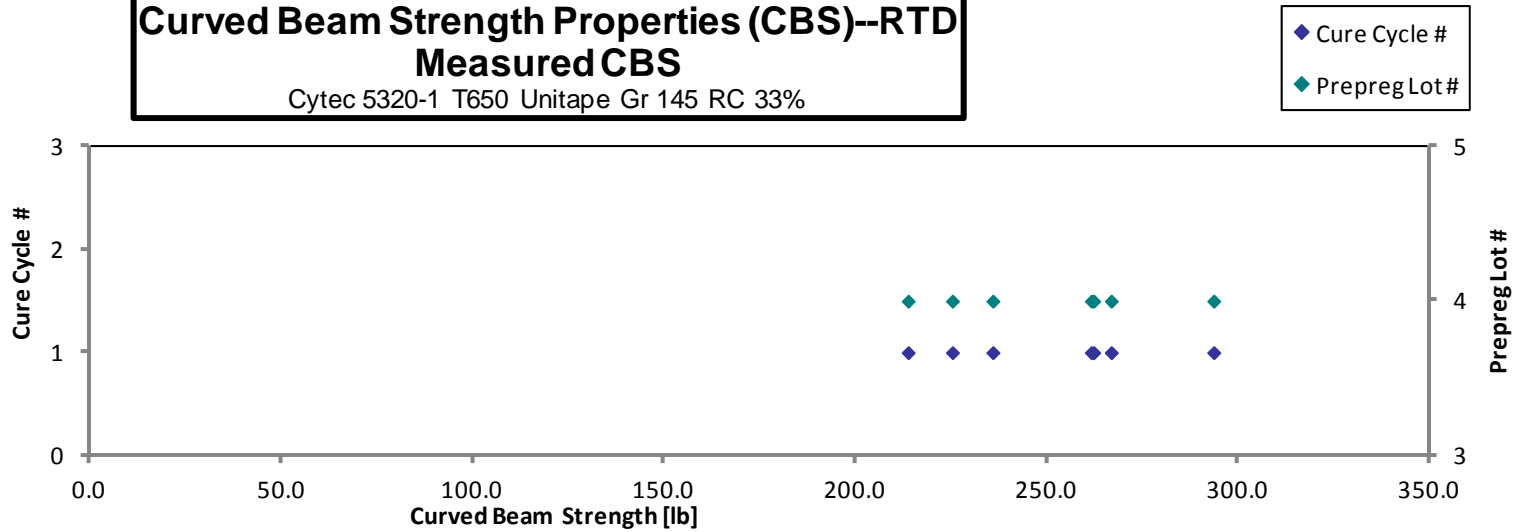


**Interlaminar Tension Properties (ILT)--RTD
Strength**
Cytec 5320-1 T650 Unitape Gr 145 RC 33%

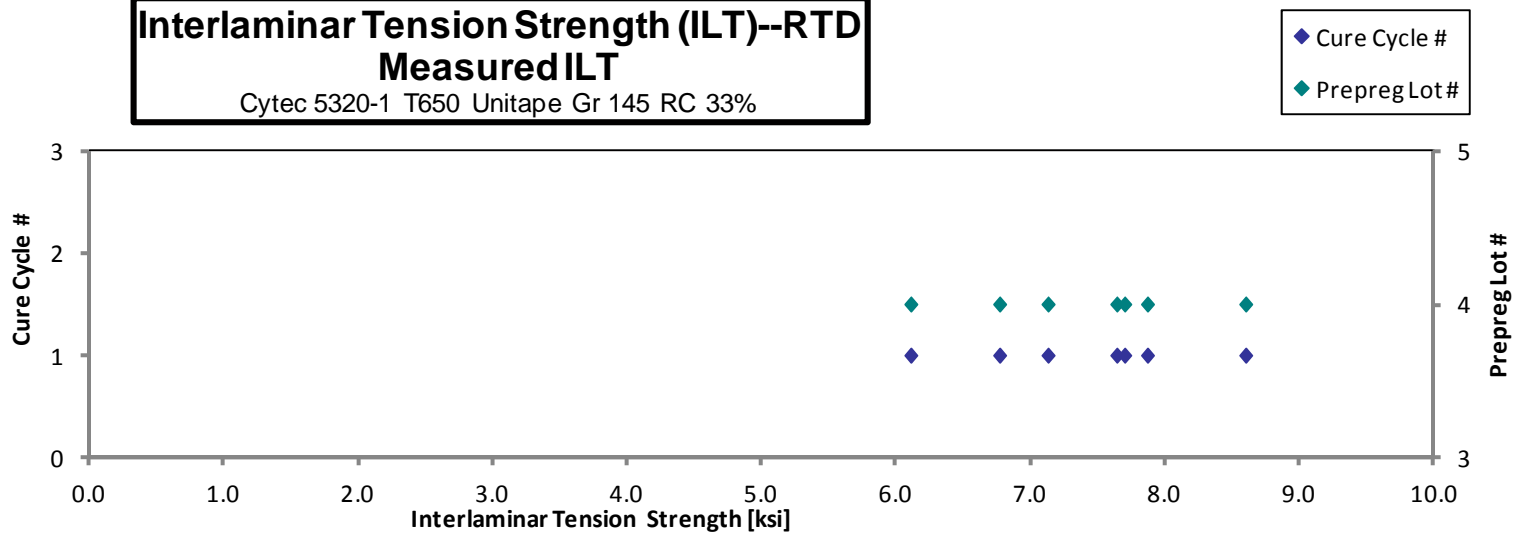
Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Curved Beam Strength [lb]	Interlaminar Tension Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode
CUGMD111A	D	C1	4	1	213.670	6.106	0.163	30	0.0054	ILT
CUGMD112A	D	C1	4	1	235.787	6.766	0.163	30	0.0054	ILT
CUGMD113A	D	C1	4	1	262.114	7.638	0.161	30	0.0054	ILT
CUGMD114A	D	C1	4	1	261.505	7.696	0.159	30	0.0053	ILT
CUGMD115A	D	C1	4	1	266.717	7.866	0.159	30	0.0053	ILT
CUGMD116A	D	C1	4	1	225.227	7.127	0.150	30	0.0050	ILT
CUGMD117A	D	C1	4	1	293.481	8.597	0.160	30	0.0053	ILT

Average	251.215	7.399	Average	0.0053
Standard Dev.	27.612	0.811	Standard Dev.	
Coeff. of Var. [%]	10.991	10.959	Coeff. of Var. [%]	
Min.	213.670	6.106	Min.	0.0050
Max.	293.481	8.597	Max.	0.0054
Number of Spec.	7	7	Number of Spec.	7

Curved Beam Strength Properties (CBS)--RTD
Measured CBS
Cyttec 5320-1 T650 Unitape Gr 145 RC 33%



Interlaminar Tension Strength (ILT)--RTD
Measured ILT
Cyttec 5320-1 T650 Unitape Gr 145 RC 33%

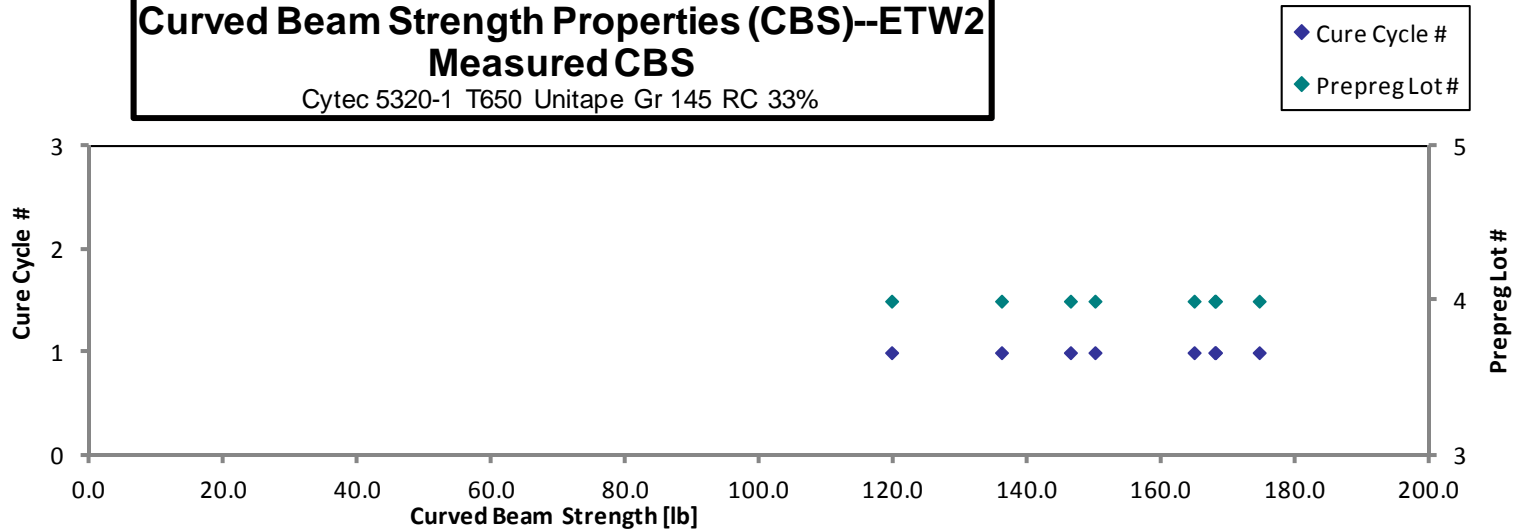


Interlaminar Tension Properties (ILT)--ETW2
Strength
 Cytec 5320-1 T650 Unitape Gr 145 RC 33%

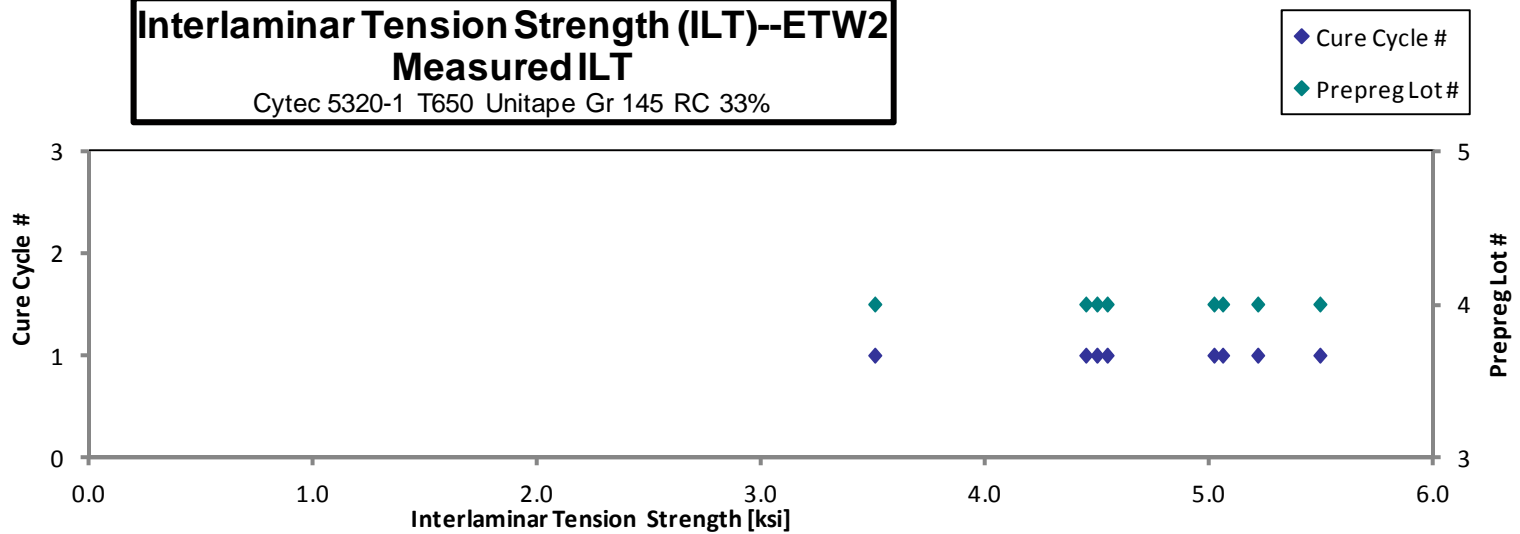
Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Curved Beam Strength [lb]	Interlaminar Tension Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode
CUGMD11FF	D	C1	4	1	119.620	3.502	0.167	30	0.0056	ILT
CUGMD11GF	D	C1	4	1	167.951	5.055	0.163	30	0.0054	ILT
CUGMD11HF	D	C1	4	1	164.763	5.016	0.162	30	0.0054	ILT
CUGMD11IF	D	C1	4	1	149.971	4.540	0.162	30	0.0054	ILT
CUGMD11JF	D	C1	4	1	174.475	5.212	0.164	30	0.0055	ILT
CUGMD11KF	D	C1	4	1	146.305	4.444	0.162	30	0.0054	ILT
CUGMD11LF	D	C1	4	1	136.017	4.494	0.151	30	0.0050	ILT
CUGMD11MF	D	C1	4	1	167.852	5.489	0.152	30	0.0051	ILT

Average	153.369	4.719	Average	0.0054
Standard Dev.	18.895	0.618	Standard Dev.	
Coeff. of Var. [%]	12.320	13.101	Coeff. of Var. [%]	
Min.	119.620	3.502	Min.	0.0050
Max.	174.475	5.489	Max.	0.0056
Number of Spec.	8	8	Number of Spec.	8

Curved Beam Strength Properties (CBS)--ETW2
Measured CBS
Cytec 5320-1 T650 Unitape Gr 145 RC 33%



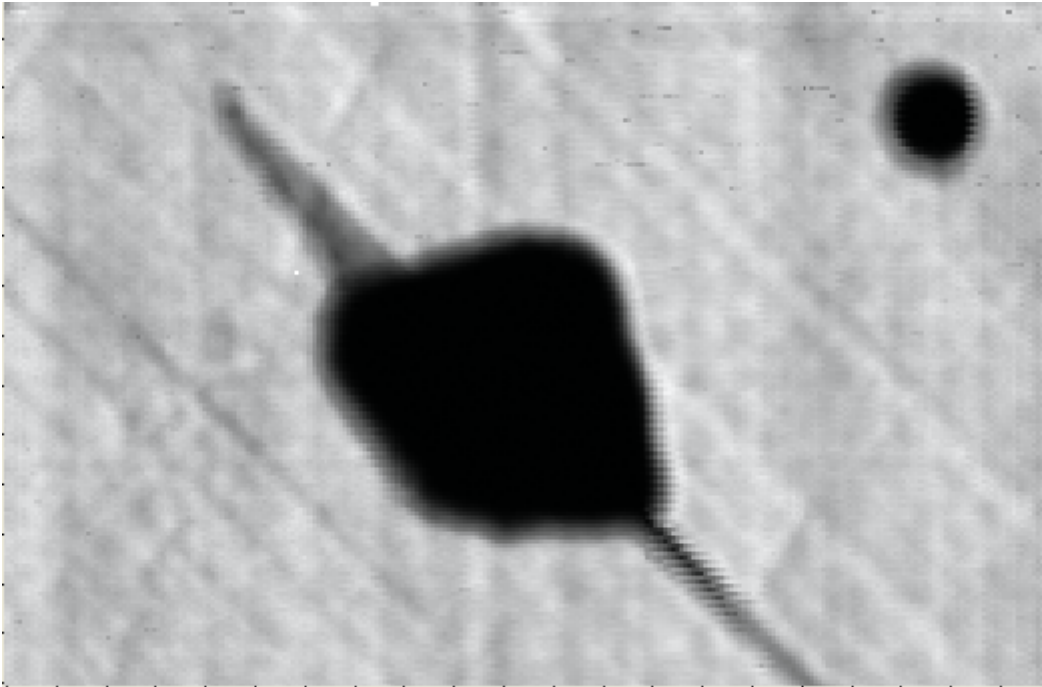
Interlaminar Tension Strength (ILT)--ETW2
Measured ILT
Cytec 5320-1 T650 Unitape Gr 145 RC 33%



5. Additional Compression After Impact Data

Impactor Diameter: 0.625"

Representative of Damage Area:

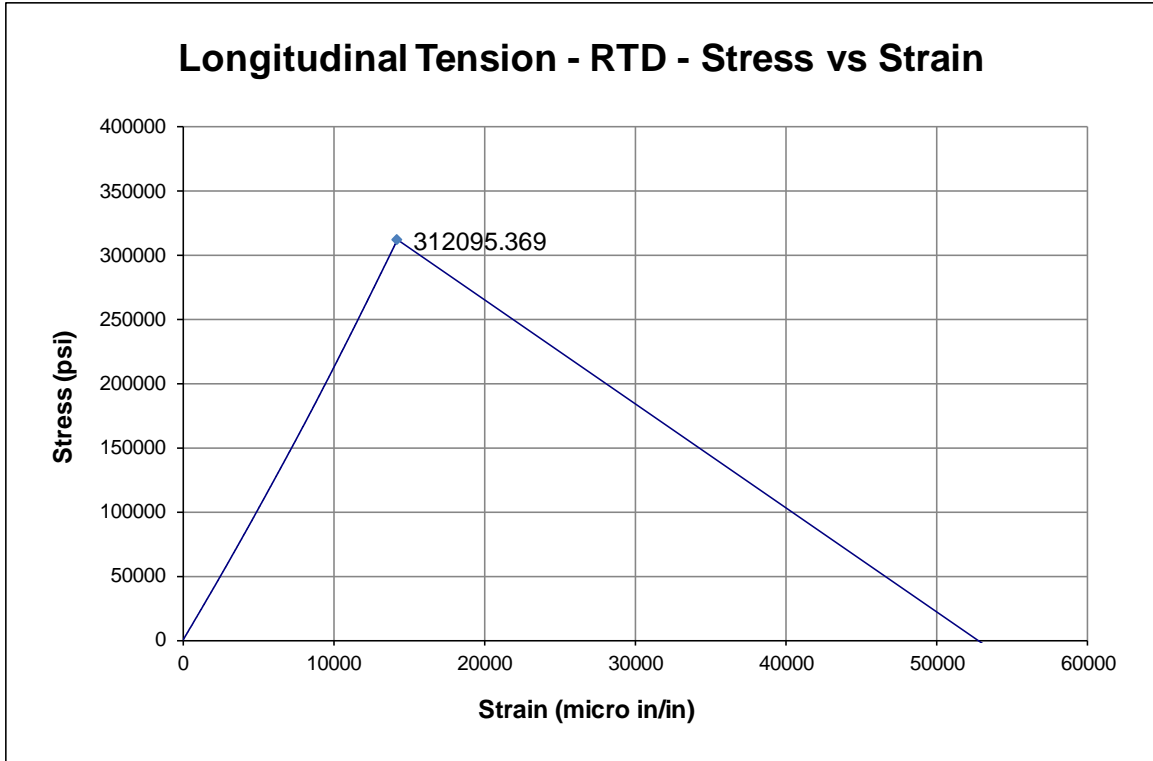


Damage Area and Dent Depth Summary:

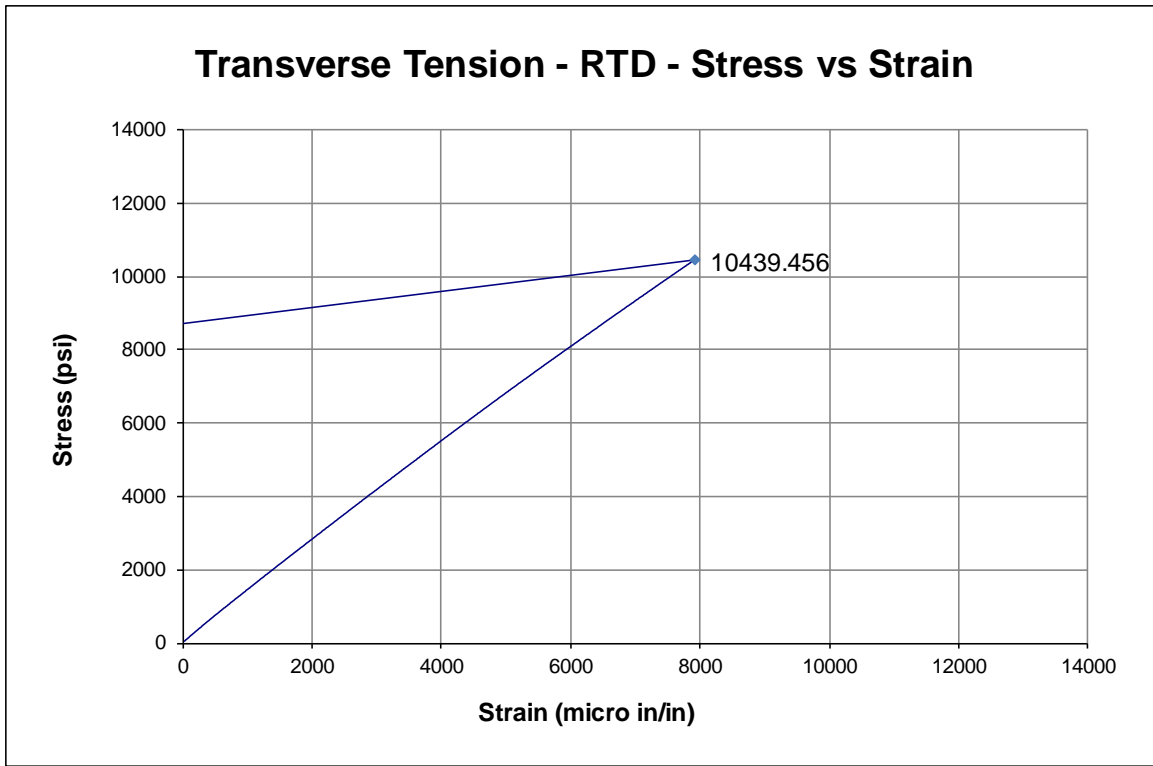
Specimen ID	Damage Area (inch²)	Dent Depth (inch)
CUGKD111A	2.252	0.0765
CUGKD112A	2.424	0.058
CUGKD113A	2.014	0.055
CUGKD114A	2.707	0.0575
CUGKD115A	2.793	0.0615
CUGKD116A	3.085	0.0615
CUGKD117A	3.052	0.0665

6. Full Stress vs. Strain Curves

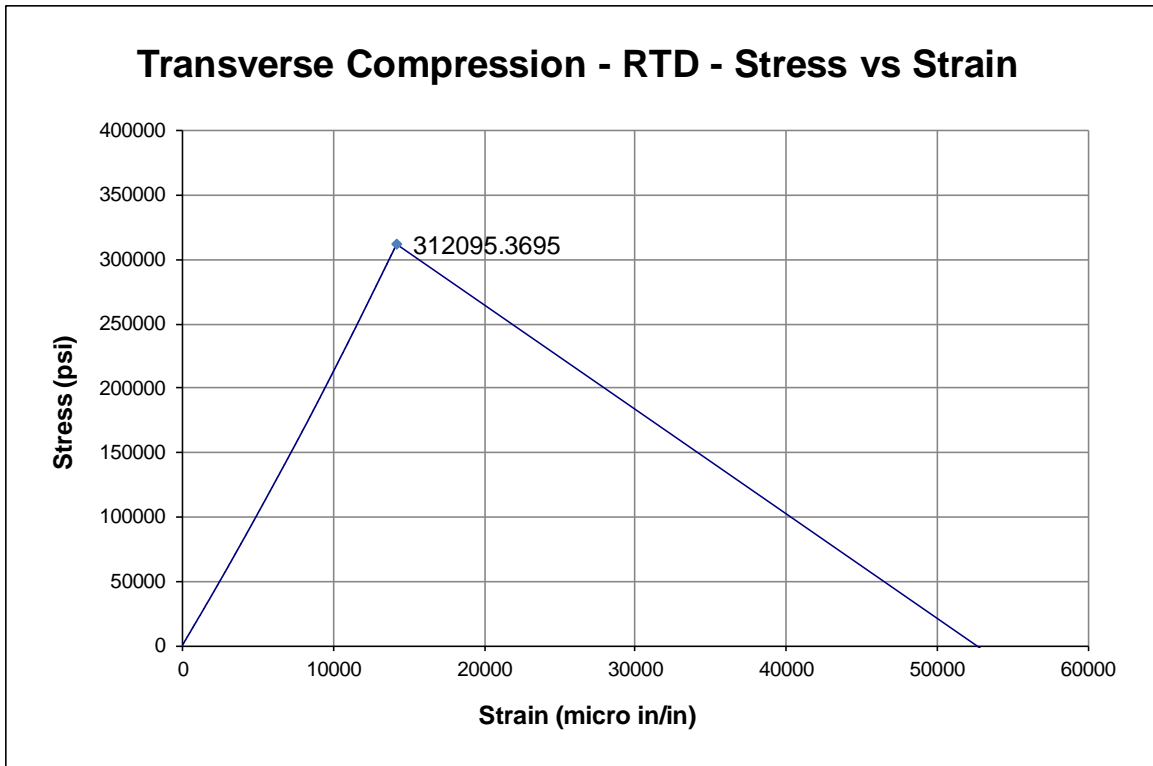
6.1 Longitudinal Tension - RTD



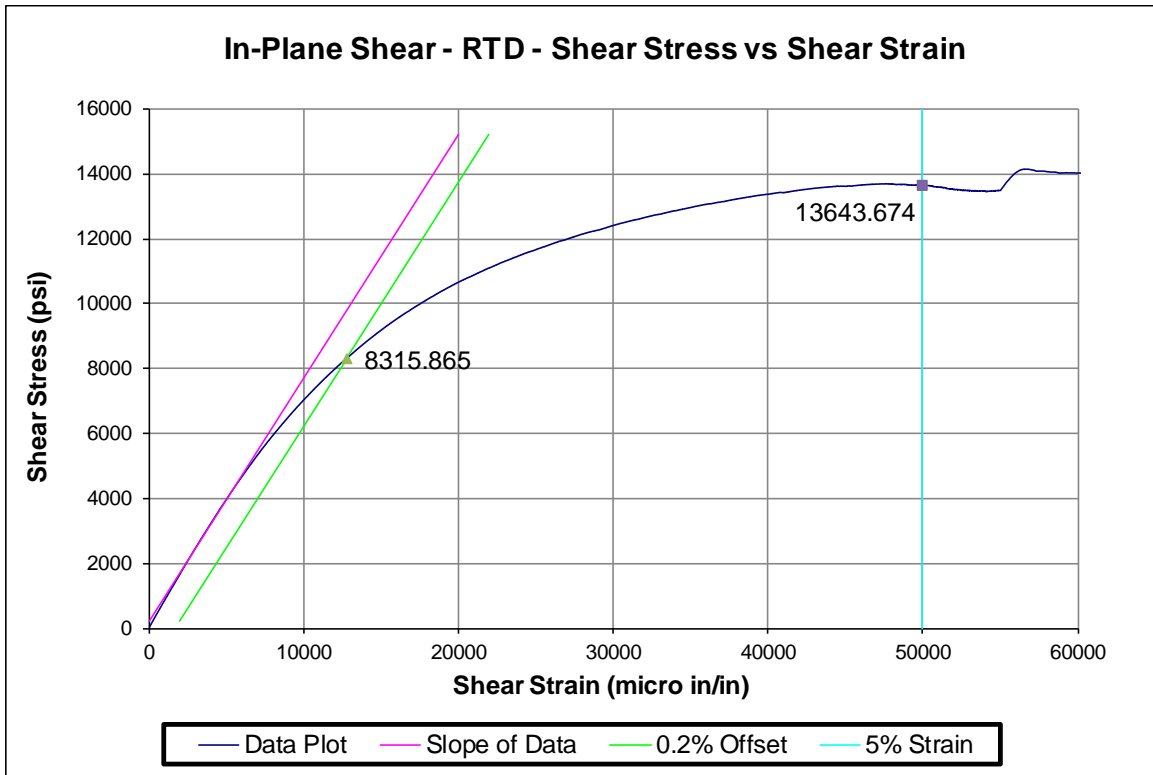
6.2 Transverse Tension – RTD



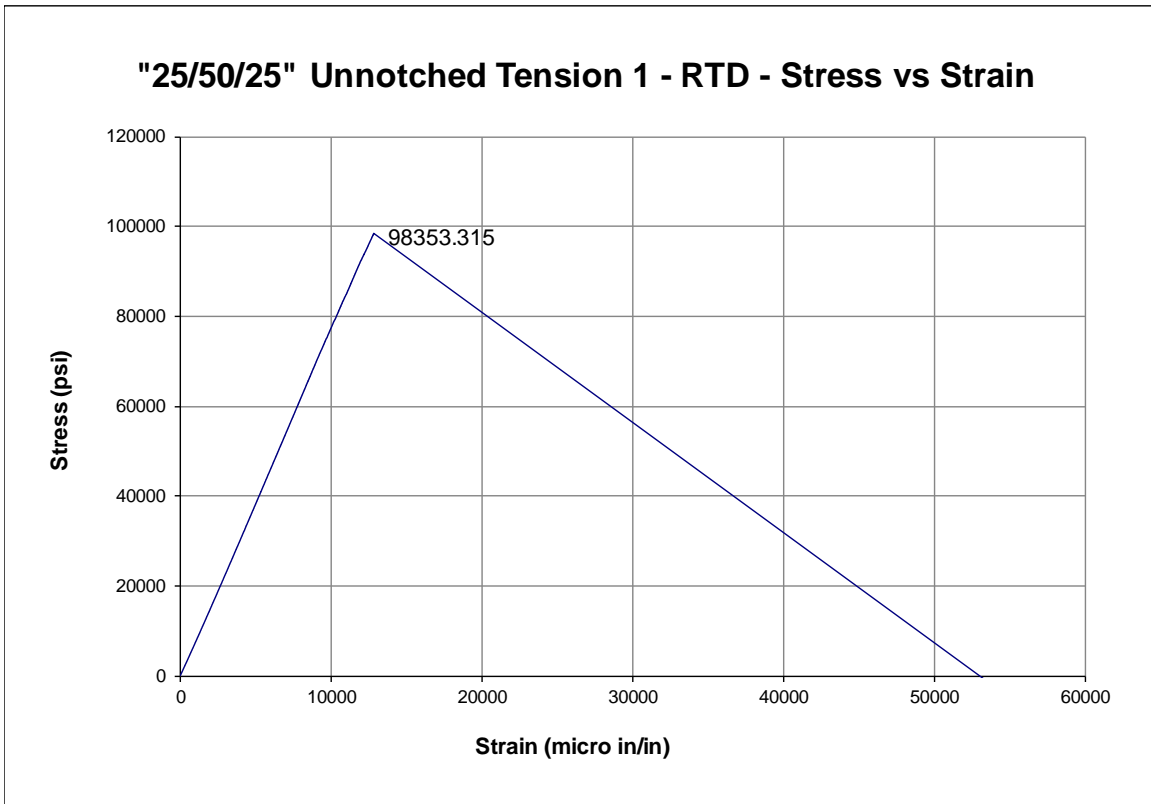
6.3 Transverse Compression – RTD



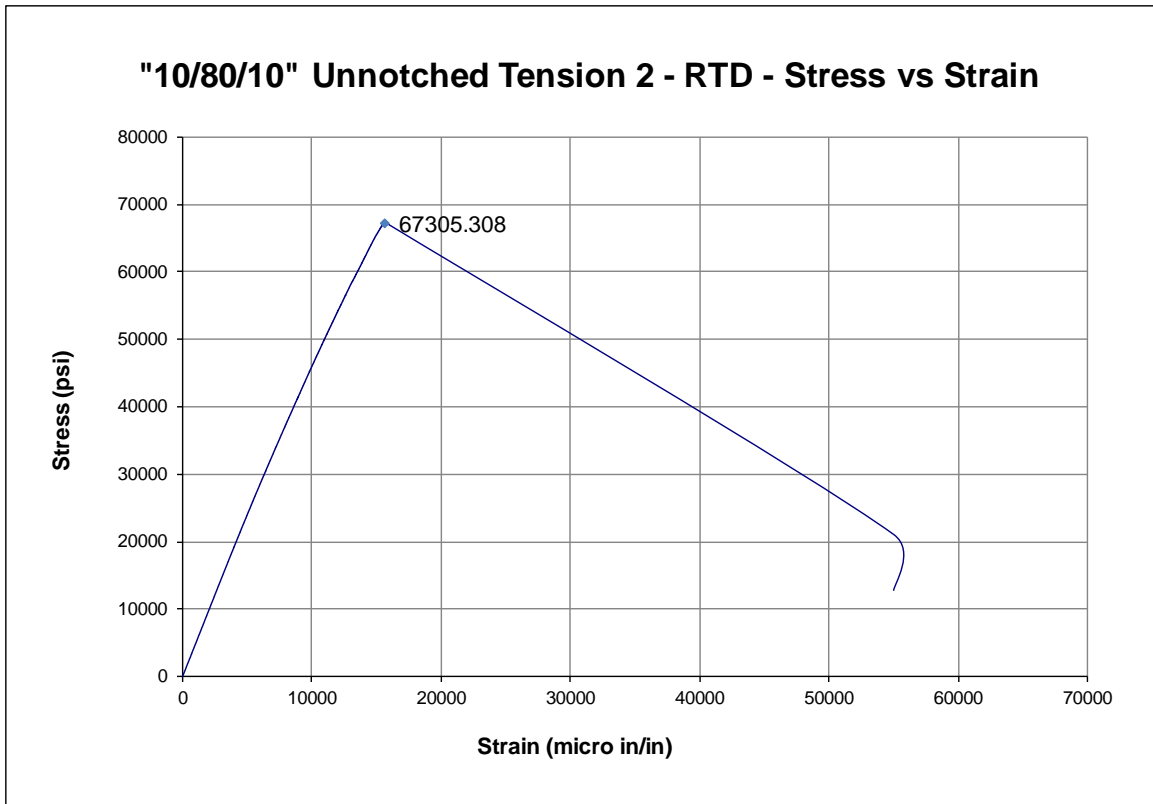
6.4 In-Plane Shear – RTD



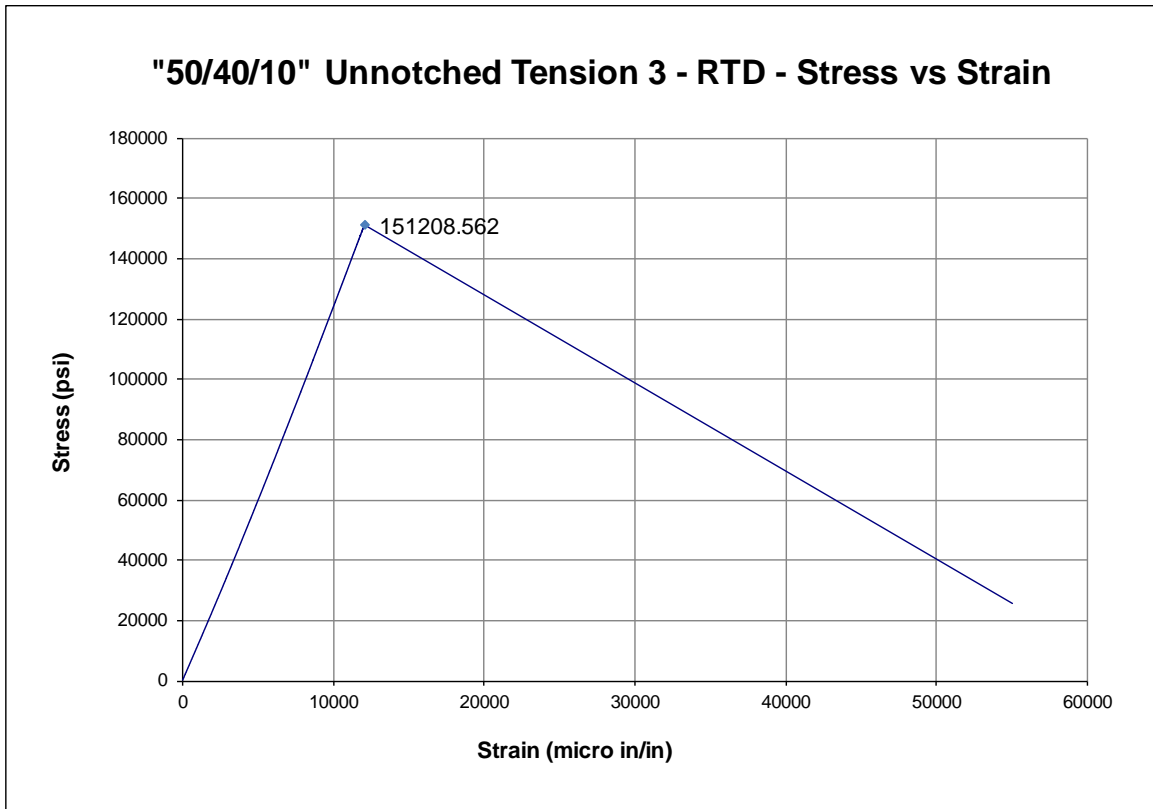
6.5 "25/50/25" Unnotched Tension 1 – RTD



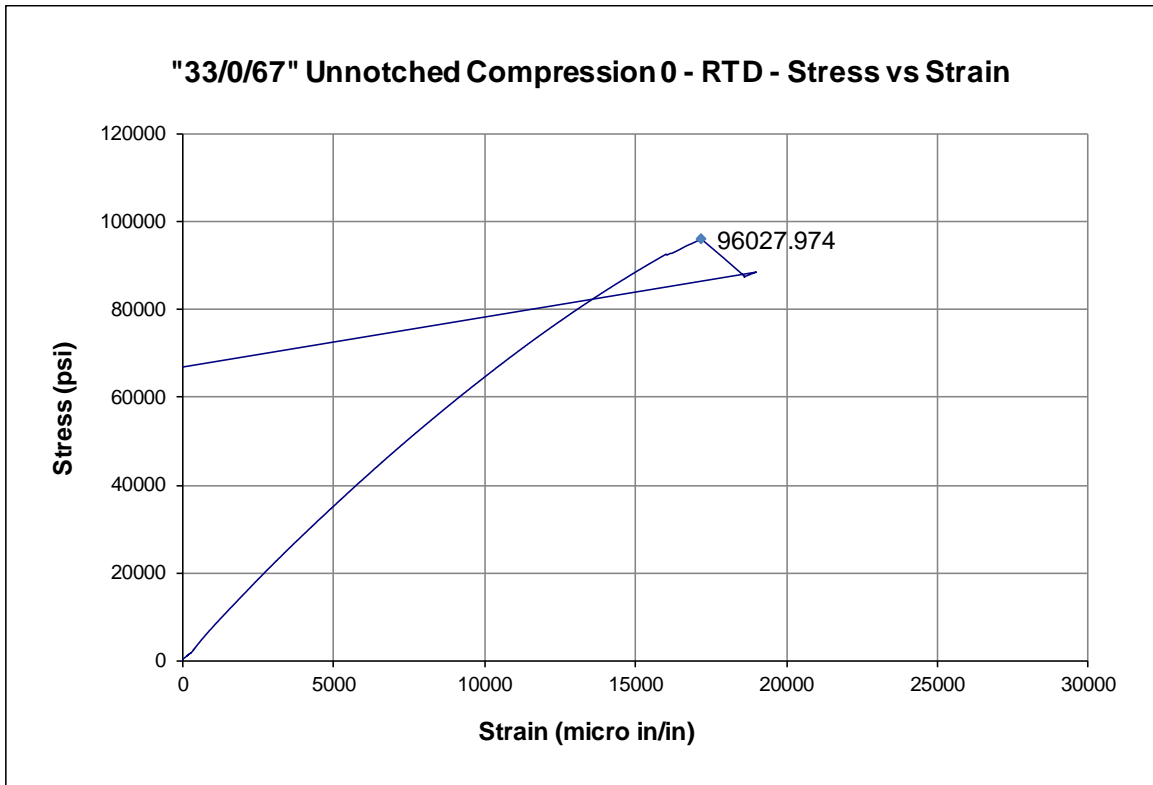
6.6 "10/80/10" Unnotched Tension 2 – RTD



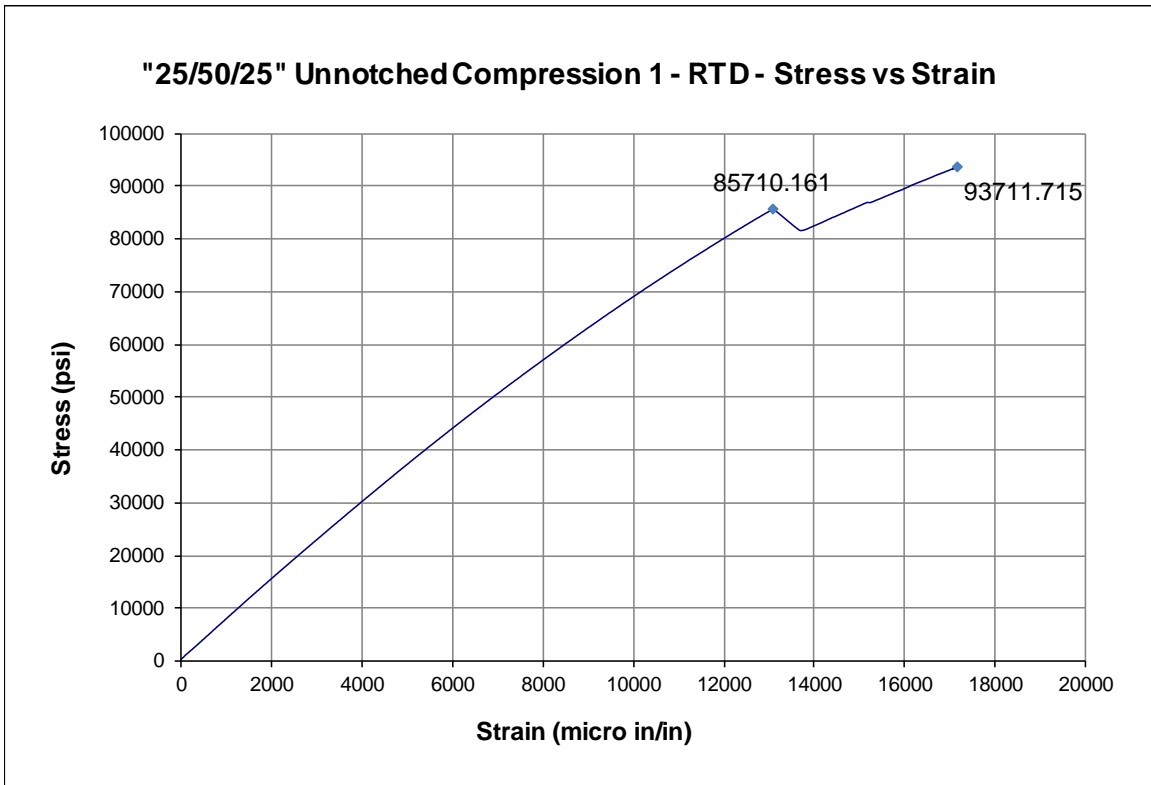
6.7 "50/40/10" Unnotched Tension 3 – RTD



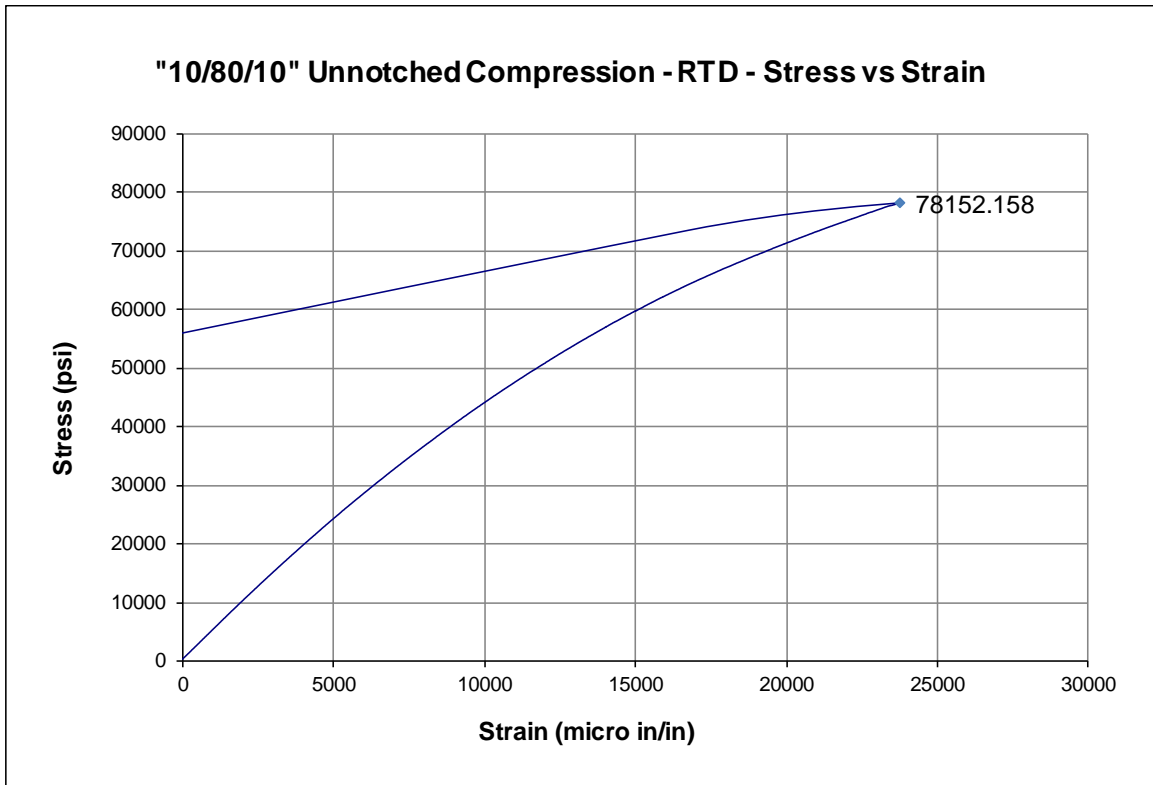
6.8 "33/0/67" Unnotched Compression 0 – RTD



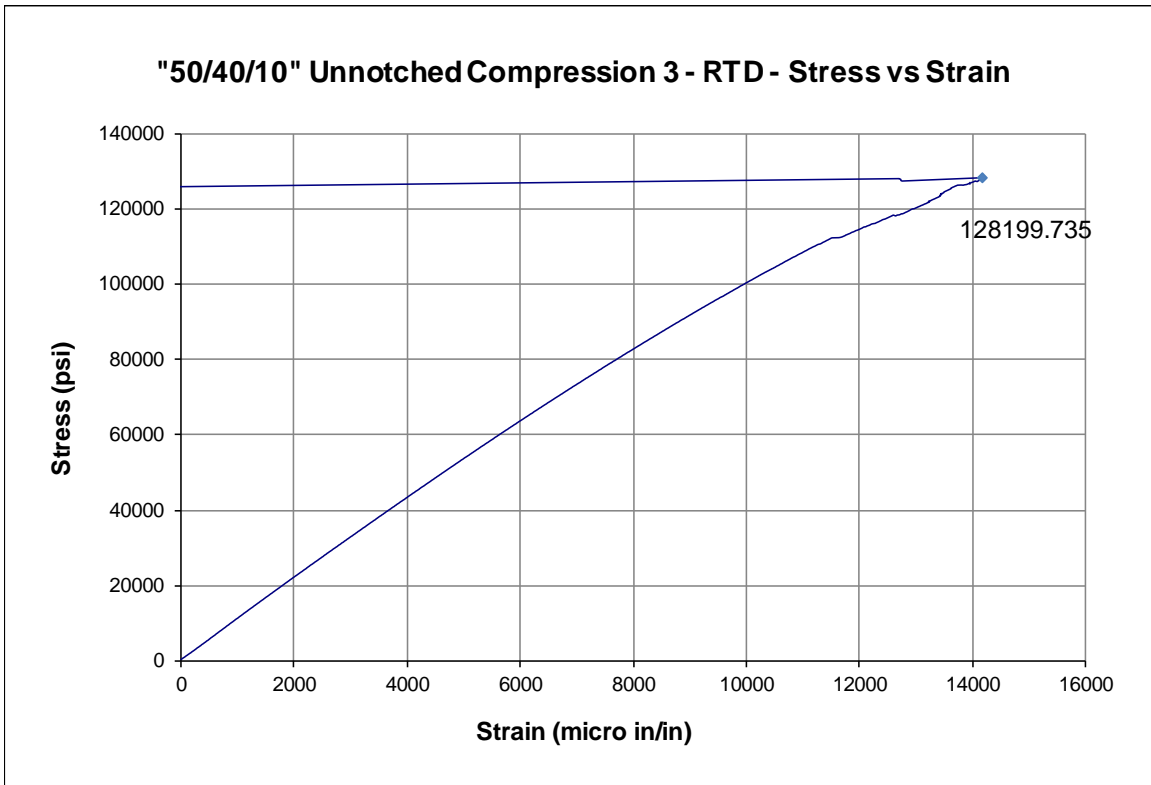
6.9 "25/50/25" Unnotched Compression 1 – RTD



6.10 "10/80/10" Unnotched Compression 2 – RTD



6.11 "50/40/10" Unnotched Compression 3 – RTD



7. Fluid Sensitivity Comparison

7.1 Room Temperature Data

	Fluid	Exposure
a	100 Low lead Fuel	90 days min @ 70°F ± 10F
b	Jet A Fuel	
c	Mil-H-5606 Hydraulic Oil	
d	Mil-H-83282 Hydraulic Oil	
e	Engine Lube Oil Mil-L-7808	
f	Engine Lube Oil Mil-L-23699	
g	Salt Water	
h	Skydrol LD-4	
i	50% Water w/ 50% Skydrol	
r	Distilled Water	
j	MEK washing fluid	90 mins @ 70°F ± 10F
k	Polypropylene Glycol Deicer	
q	Isopropyl Alcohol Deicing	48±4 hrs @ 70°F ± 10F
A	Dry	Per section 6.1 Test Plan
t	85% Relative Humidity	

Fluid	Average Short-Beam Strength With Fluid	Same Environment Short-Beam Strength	Worst Case Environment Short-	% Strength
	(ksi)	Without Fluid (ksi) (RTD)	Beam Strength (ksi) (RTW)	Reduction With Respect to RTD
a	17.397	17.846	15.419	2.518
b	17.196	17.846	15.419	3.643
c	*	17.846	15.419	*
d	17.213	17.846	15.419	3.551
e	17.486	17.846	15.419	2.019
f	18.245	17.846	15.419	-2.235
g	16.404	17.846	15.419	8.082
h	17.299	17.846	15.419	3.069
i	16.391	17.846	15.419	8.157
j	17.549	17.846	15.419	1.669
k	17.149	17.846	15.419	3.908
q	17.452	17.846	15.419	2.212
r	15.838	17.846	15.419	11.257
A	17.846	17.846	15.419	0.000
t	15.419	17.846	15.419	13.600

*Data for coupons soaked in Mil-H-5606 Hydraulic Oil tested at RTA is not available because data output files could not be located.

Fluid Sensitivity Screening
Short-Beam Strength Properties (FSSBS)--RT Strength
 Cytec 5320-1 T650 Unitape Gr 145 RC 33%

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Fluid	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode	Average
CUGQE 131a	E	C	5	a	16.883	0.109	20	0.0054	ILS	17.397
CUGQE 132a	E	C	5	a	17.828	0.109	20	0.0054	ILS	
CUGQE 133a	E	C	5	a	16.956	0.109	20	0.0055	ILS	
CUGQE 134a	E	C	5	a	17.520	0.109	20	0.0054	ILS	
CUGQE 135a	E	C	5	a	17.800	0.110	20	0.0055	ILS	
CUGQE 13Fb	E	C	5	b	17.698	0.112	20	0.0056	ILS	17.196
CUGQE 13Gb	E	C	5	b	16.488	0.109	20	0.0055	ILS	
CUGQE 13Hb	E	C	5	b	17.557	0.111	20	0.0056	ILS	
CUGQE 13Ib	E	C	5	b	17.376	0.110	20	0.0055	ILS	
CUGQE 13Jb	E	C	5	b	16.863	0.110	20	0.0055	ILS	
Data for coupons soaked in Mil-H-5606 Hydraulic Oil tested at RTA is not available because data output files could not be located.										
CUGQE 14Fd	E	C	5	d	16.902	0.111	20	0.0055	ILS	17.213
CUGQE 14Gd	E	C	5	d	17.602	0.109	20	0.0055	ILS	
CUGQE 14Hd	E	C	5	d	17.001	0.112	20	0.0056	ILS	
CUGQE 14Id	E	C	5	d	17.768	0.109	20	0.0055	ILS	
CUGQE 14Jd	E	C	5	d	16.791	0.111	20	0.0056	ILS	
CUGQE 151e	E	C	5	e	16.968	0.111	20	0.0055	ILS	17.486
CUGQE 152e	E	C	5	e	17.591	0.110	20	0.0055	ILS	
CUGQE 153e	E	C	5	e	18.093	0.109	20	0.0054	ILS	
CUGQE 154e	E	C	5	e	17.277	0.109	20	0.0055	ILS	
CUGQE 155e	E	C	5	e	17.501	0.109	20	0.0055	ILS	
CUGQE 15Ff	E	C	5	f	18.572	0.110	20	0.0055	ILS	18.245
CUGQE 15Gf	E	C	5	f	18.661	0.108	20	0.0054	ILS	
CUGQE 15Hf	E	C	5	f	18.038	0.111	20	0.0056	ILS	
CUGQE 15If	E	C	5	f	18.542	0.110	20	0.0055	ILS	
CUGQE 15Jf	E	C	5	f	17.414	0.111	20	0.0055	ILS	
CUGQE 161g	E	C	5	g	16.689	0.109	20	0.0055	ILS	16.404
CUGQE 162g	E	C	5	g	16.405	0.109	20	0.0054	ILS	
CUGQE 163g	E	C	5	g	16.083	0.111	20	0.0055	ILS	
CUGQE 164g	E	C	5	g	16.126	0.109	20	0.0054	ILS	
CUGQE 165g	E	C	5	g	16.718	0.112	20	0.0056	ILS	
CUGQE 16Fh	E	C	5	h	17.475	0.108	20	0.0054	ILS	17.299
CUGQE 16Gh	E	C	5	h	17.019	0.109	20	0.0054	ILS	
CUGQE 16Hh	E	C	5	h	17.679	0.110	20	0.0055	ILS	
CUGQE 16Ih	E	C	5	h	17.130	0.109	20	0.0054	ILS	
CUGQE 16Jh	E	C	5	h	17.190	0.110	20	0.0055	ILS	

CUGQE 171i	E	C	5	i	16.030	0.111	20	0.0055	ILS	
CUGQE 172i	E	C	5	i	16.821	0.109	20	0.0054	ILS	
CUGQE 173i	E	C	5	i	16.223	0.108	20	0.0054	ILS	16.391
CUGQE 174i	E	C	5	i	16.720	0.109	20	0.0054	ILS	
CUGQE 175i	E	C	5	i	16.159	0.109	20	0.0055	ILS	
CUGQE 181j	E	C	5	j	17.112	0.111	20	0.0055	ILS	
CUGQE 182j	E	C	5	j	17.910	0.110	20	0.0055	ILS	
CUGQE 183j	E	C	5	j	17.640	0.109	20	0.0054	ILS	17.549
CUGQE 184j	E	C	5	j	17.223	0.110	20	0.0055	ILS	
CUGQE 185j	E	C	5	j	17.858	0.110	20	0.0055	ILS	
CUGQE 18Fk	E	C	5	k	17.673	0.110	20	0.0055	ILS	
CUGQE 18Gk	E	C	5	k	16.690	0.109	20	0.0055	ILS	
CUGQE 18Hk	E	C	5	k	18.175	0.111	20	0.0056	ILS	17.149
CUGQE 18Ik	E	C	5	k	17.200	0.110	20	0.0055	ILS	
CUGQE 18Jk	E	C	5	k	16.006	0.111	20	0.0055	ILS	
CUGQE 191q	E	C	5	q	17.414	0.111	20	0.0056	ILS	
CUGQE 192q	E	C	5	q	17.673	0.110	20	0.0055	ILS	
CUGQE 193q	E	C	5	q	17.140	0.109	20	0.0054	ILS	17.452
CUGQE 194q	E	C	5	q	17.823	0.110	20	0.0055	ILS	
CUGQE 195q	E	C	5	q	17.209	0.110	20	0.0055	ILS	
CUGQE 19Fr	E	C	5	r	16.163	0.111	20	0.0055	ILS	
CUGQE 19Gr	E	C	5	r	15.815	0.109	20	0.0055	ILS	
CUGQE 19Hr	E	C	5	r	15.884	0.112	20	0.0056	ILS	15.838
CUGQE 19Ir	E	C	5	r	15.956	0.110	20	0.0055	ILS	
CUGQE 19Jr	E	C	5	r	15.370	0.111	20	0.0056	ILS	
CUGQE 1A1A	E	C	5	A	17.154	0.111	20	0.0055	ILS	
CUGQE 1A2A	E	C	5	A	18.428	0.109	20	0.0055	ILS	
CUGQE 1A3A	E	C	5	A	18.287	0.109	20	0.0054	ILS	17.846
CUGQE 1A4A	E	C	5	A	18.009	0.110	20	0.0055	ILS	
CUGQE 1A5A	E	C	5	A	17.355	0.110	20	0.0055	ILS	
CUGQE 1AFt	E	C	5	t	15.251	0.110	20	0.0055	ILS	
CUGQE 1AGt	E	C	5	t	15.775	0.109	20	0.0055	ILS	
CUGQE 1AHt	E	C	5	t	15.711	0.112	20	0.0056	ILS	15.419
CUGQE 1Alt	E	C	5	t	15.594	0.110	20	0.0055	ILS	
CUGQE 1AJt	E	C	5	t	14.767	0.111	20	0.0056	ILS	

Average 17.063
Standard Dev. 0.860
Coeff. of Var. [%] 5.040
Min. 14.767
Max. 18.661
Number of Spec. 70

7.2 Elevated Temperature Test Data

	Fluid	Exposure
1	100 Low lead Fuel	90 days min @ 70°F ± 10F
2	Jet A Fuel	
3	Mil-H-5606 Hydraulic Oil	
4	Mil-H-83282 Hydraulic Oil	
5	Engine Lube Oil Mil-L-7808	
6	Engine Lube Oil Mil-L-23699	
7	Salt Water	
8	Skydrol LD-4	
9	50% Water w/ 50% Skydrol	
s	Distilled Water	
m	MEK washing fluid	90 mins @ 70°F ± 10F
n	Polypropylene Glycol Deicer	
p	Isopropyl Alcohol Deicing	48±4 hrs @ 70°F ± 10F
C	Dry	Per section 6.1 Test Plan
D	85% Relative Humidity	

Fluid	Average Short-Beam Strength With Fluid	Same Environment Short-Beam Strength	Worst Case Environment Short-Beam	% Strength Reduction With Respect to ETD
	(ksi)	Without Fluid (ksi) (ETD)	Strength (ksi) (ETW)	
1	13.202	14.048	11.336	6.019
2	13.462	14.048	11.336	4.170
3	13.267	14.048	11.336	5.560
4	13.568	14.048	11.336	3.419
5	13.353	14.048	11.336	4.949
6	14.187	14.048	11.336	-0.993
7	12.366	14.048	11.336	11.974
8	13.403	14.048	11.336	4.593
9	12.121	14.048	11.336	13.716
m	13.304	14.048	11.336	5.294
n	13.396	14.048	11.336	4.639
p	13.061	14.048	11.336	7.023
s	12.891	14.048	11.336	8.235
C	14.048	14.048	11.336	0.000
D	11.336	14.048	11.336	19.303

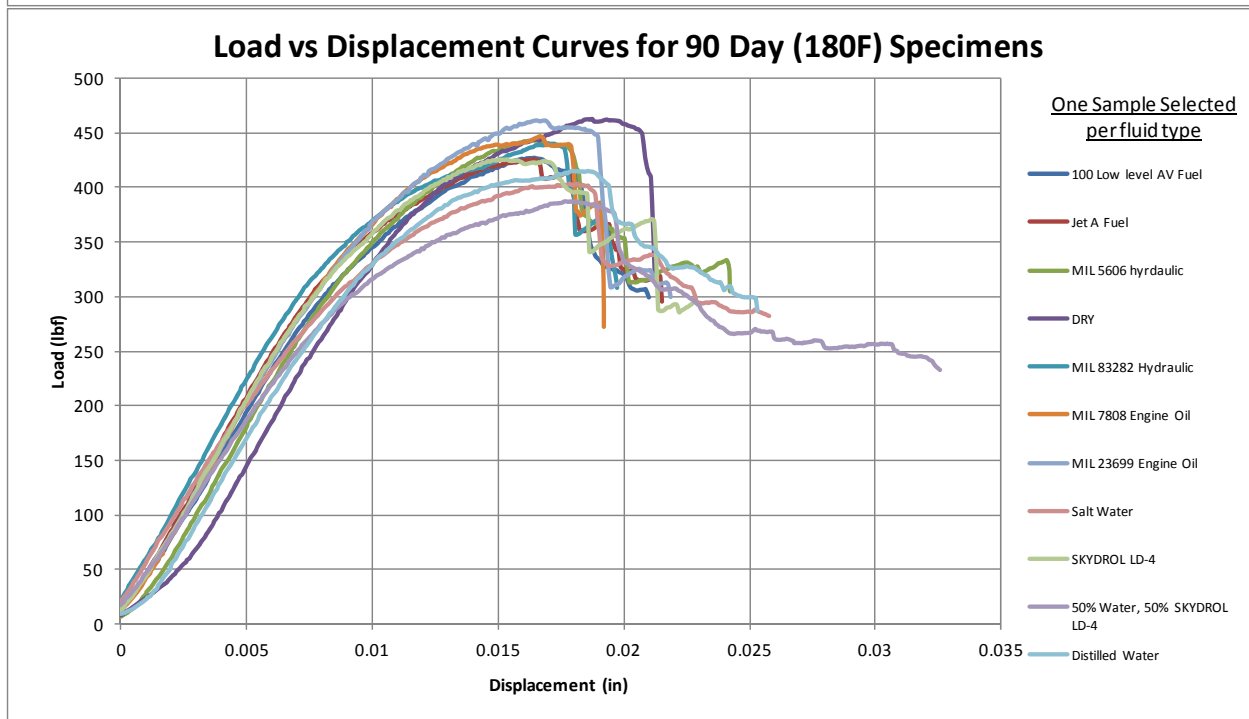
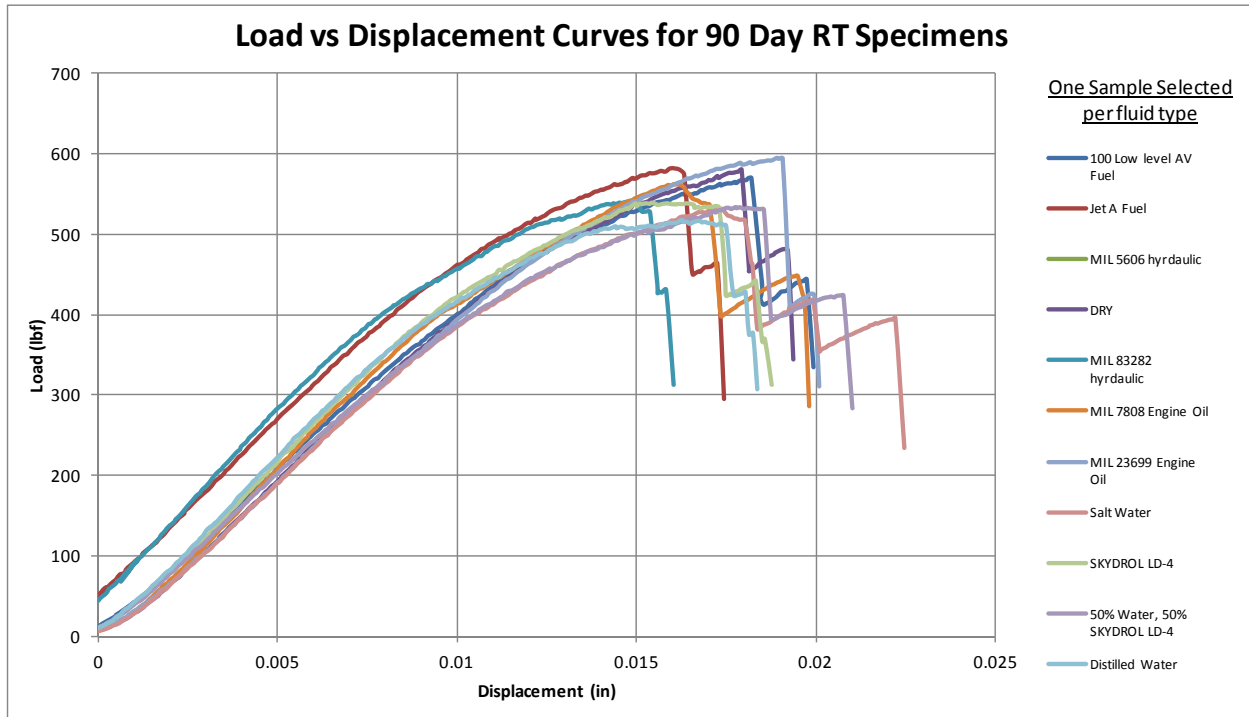
Fluid Sensitivity Screening
Short-Beam Strength Properties (FSSBS)--ET Strength
 Cytec 5320-1 T650 Unitape Gr 145 RC 33%

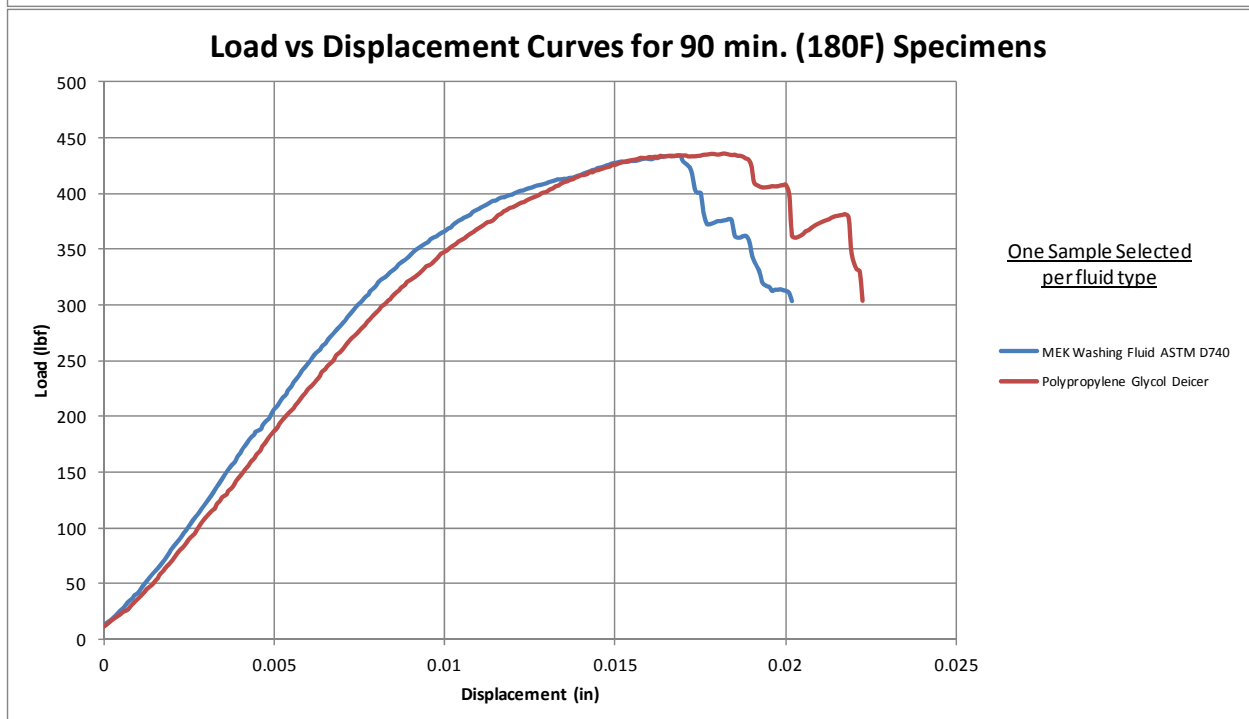
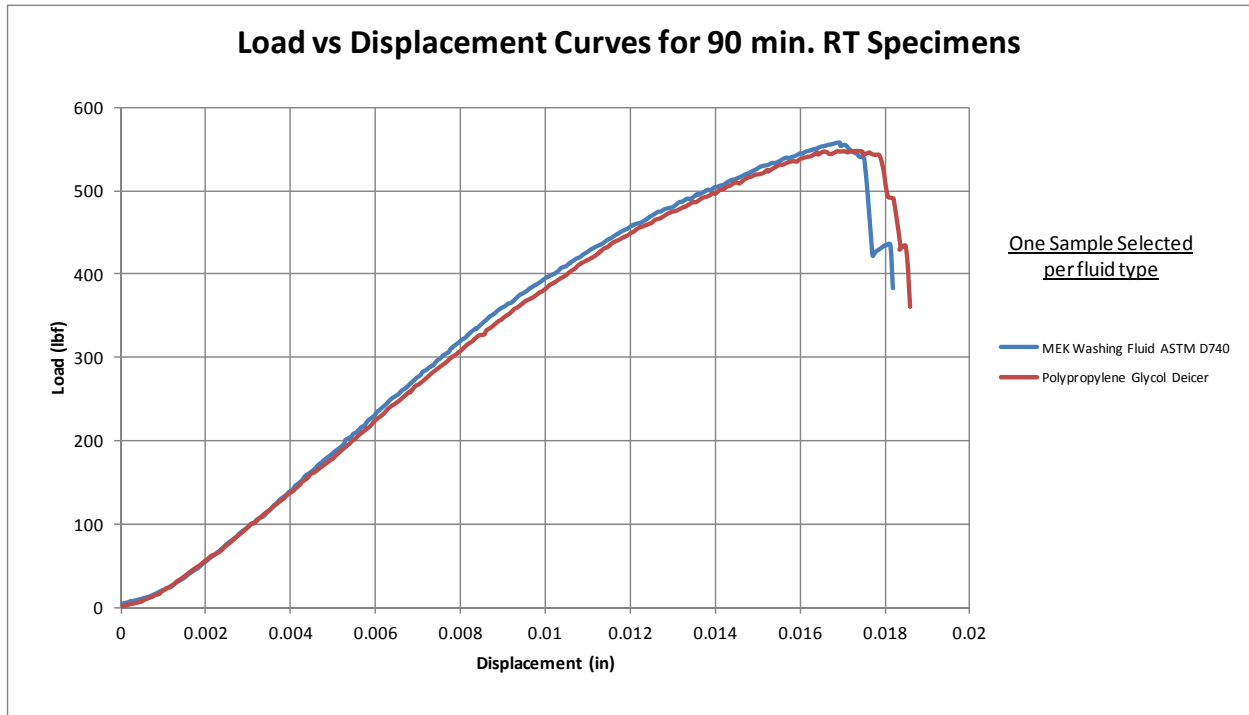
Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Fluid	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t _{ply} [in]	Failure Mode	Average
CUGQE 1381	E	C	5	1	12.751	0.109	20	0.0054	ILS	13.202
CUGQE 1391	E	C	5	1	13.655	0.110	20	0.0055	ILS	
CUGQE 13A1	E	C	5	1	13.188	0.111	20	0.0055	ILS	
CUGQE 13B1	E	C	5	1	13.317	0.109	20	0.0055	ILS	
CUGQE 13C1	E	C	5	1	13.101	0.109	20	0.0054	ILS	
CUGQE 13M2	E	C	5	2	13.696	0.110	20	0.0055	ILS	13.462
CUGQE 13N2	E	C	5	2	13.319	0.109	20	0.0055	ILS	
CUGQE 13O2	E	C	5	2	13.526	0.109	20	0.0055	ILS	
CUGQE 13P2	E	C	5	2	13.306	0.108	20	0.0054	ILS	
CUGQE 13Q2	E	C	5	2	13.463	0.109	20	0.0054	ILS	
CUGQE 1483	E	C	5	3	13.637	0.112	20	0.0056	ILS	13.267
CUGQE 1493	E	C	5	3	13.042	0.110	20	0.0055	ILS	
CUGQE 14A3	E	C	5	3	13.832	0.109	20	0.0054	ILS	
CUGQE 14B3	E	C	5	3	12.983	0.109	20	0.0055	ILS	
CUGQE 14C3	E	C	5	3	12.841	0.111	20	0.0055	ILS	
CUGQE 14M4	E	C	5	4	13.675	0.111	20	0.0055	ILS	13.568
CUGQE 14N4	E	C	5	4	13.874	0.111	20	0.0055	ILS	
CUGQE 14O4	E	C	5	4	13.532	0.111	20	0.0055	ILS	
CUGQE 14P4	E	C	5	4	13.315	0.109	20	0.0055	ILS	
CUGQE 14Q4	E	C	5	4	13.444	0.109	20	0.0054	ILS	
CUGQE 1585	E	C	5	5	13.736	0.112	20	0.0056	ILS	13.353
CUGQE 1595	E	C	5	5	13.712	0.110	20	0.0055	ILS	
CUGQE 15A5	E	C	5	5	13.234	0.109	20	0.0054	ILS	
CUGQE 15B5	E	C	5	5	12.800	0.109	20	0.0055	ILS	
CUGQE 15C5	E	C	5	5	13.281	0.111	20	0.0055	ILS	
CUGQE 15M6	E	C	5	6	14.478	0.110	20	0.0055	ILS	14.187
CUGQE 15N6	E	C	5	6	14.071	0.110	20	0.0055	ILS	
CUGQE 15O6	E	C	5	6	14.202	0.110	20	0.0055	ILS	
CUGQE 15P6	E	C	5	6	13.910	0.109	20	0.0054	ILS	
CUGQE 15Q6	E	C	5	6	14.276	0.108	20	0.0054	ILS	
CUGQE 1687	E	C	5	7	12.221	0.109	20	0.0055	ILS	12.366
CUGQE 1697	E	C	5	7	12.428	0.109	20	0.0055	ILS	
CUGQE 16A7	E	C	5	7	12.508	0.111	20	0.0055	ILS	
CUGQE 16B7	E	C	5	7	12.604	0.110	20	0.0055	ILS	
CUGQE 16C7	E	C	5	7	12.067	0.111	20	0.0055	ILS	
CUGQE 16M8	E	C	5	8	12.998	0.109	20	0.0054	ILS	13.403
CUGQE 16N8	E	C	5	8	13.942	0.109	20	0.0055	ILS	
CUGQE 16O8	E	C	5	8	13.108	0.111	20	0.0055	ILS	
CUGQE 16P8	E	C	5	8	13.188	0.111	20	0.0056	ILS	
CUGQE 16Q8	E	C	5	8	13.778	0.110	20	0.0055	ILS	

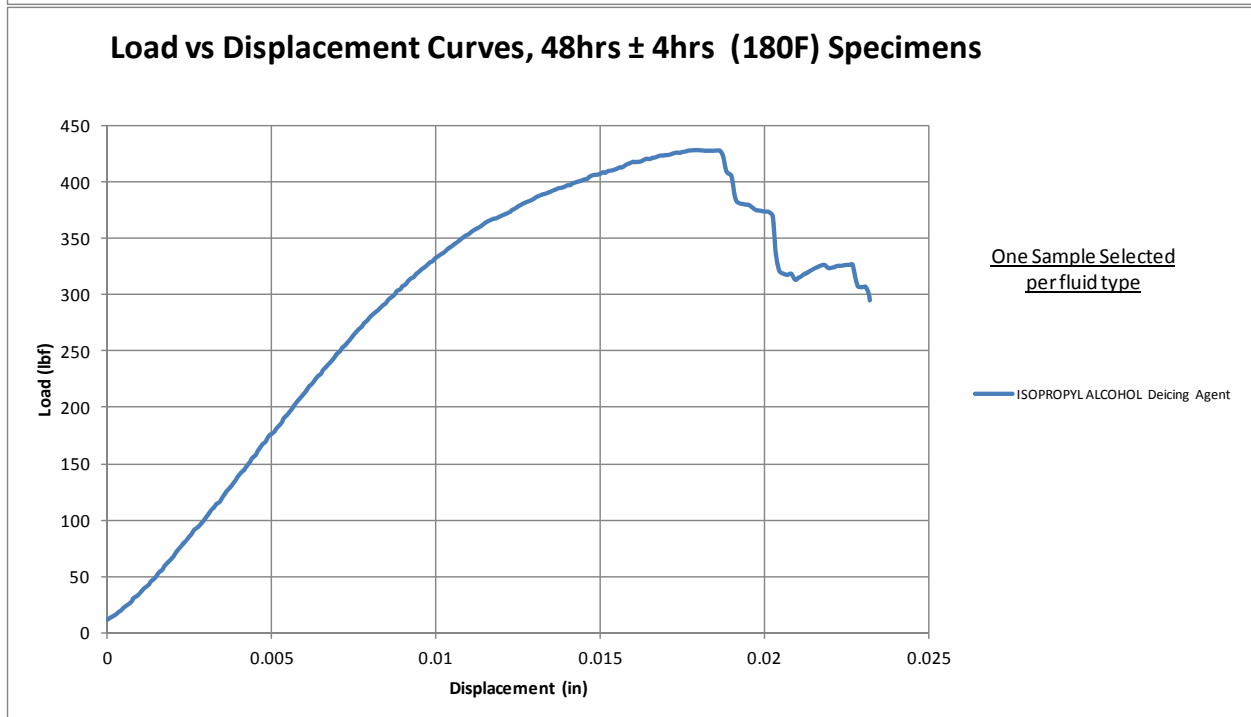
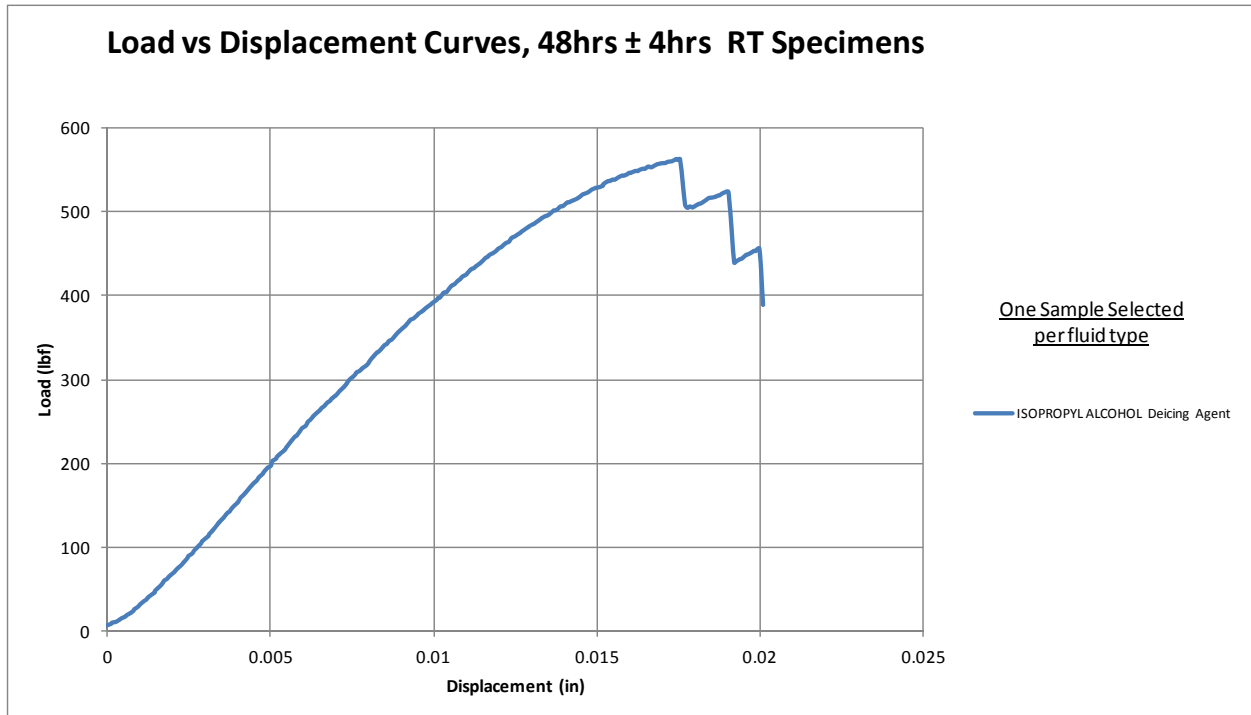
CUGQE 1789	E	C	5	9	11.967	0.112	20	0.0056	ILS	
CUGQE 1799	E	C	5	9	11.776	0.110	20	0.0055	ILS	
CUGQE 17A9	E	C	5	9	12.230	0.109	20	0.0054	ILS	12.121
CUGQE 17B9	E	C	5	9	12.488	0.110	20	0.0055	ILS	
CUGQE 17C9	E	C	5	9	12.145	0.111	20	0.0056	ILS	
CUGQE 188m	E	C	5	m	13.329	0.112	20	0.0056	ILS	
CUGQE 189m	E	C	5	m	12.861	0.110	20	0.0055	ILS	
CUGQE 18Am	E	C	5	m	13.870	0.109	20	0.0055	ILS	13.304
CUGQE 18Bm	E	C	5	m	13.323	0.110	20	0.0055	ILS	
CUGQE 18Cm	E	C	5	m	13.139	0.111	20	0.0055	ILS	
CUGQE 18Mn	E	C	5	n	13.500	0.111	20	0.0056	ILS	
CUGQE 18Nn	E	C	5	n	13.940	0.110	20	0.0055	ILS	
CUGQE 18On	E	C	5	n	12.917	0.110	20	0.0055	ILS	13.396
CUGQE 18Pn	E	C	5	n	13.264	0.109	20	0.0055	ILS	
CUGQE 18Qn	E	C	5	n	13.360	0.108	20	0.0054	ILS	
CUGQE 198p	E	C	5	p	12.573	0.112	20	0.0056	ILS	
CUGQE 199p	E	C	5	p	13.376	0.110	20	0.0055	ILS	
CUGQE 19Ap	E	C	5	p	13.284	0.109	20	0.0055	ILS	13.061
CUGQE 19Bp	E	C	5	p	12.859	0.109	20	0.0055	ILS	
CUGQE 19Cp	E	C	5	p	13.215	0.111	20	0.0056	ILS	
CUGQE 19Ms	E	C	5	s	13.584	0.110	20	0.0055	ILS	
CUGQE 19Ns	E	C	5	s	12.935	0.110	20	0.0055	ILS	
CUGQE 19Os	E	C	5	s	12.828	0.111	20	0.0055	ILS	12.891
CUGQE 19Ps	E	C	5	s	12.695	0.109	20	0.0055	ILS	
CUGQE 19Qs	E	C	5	s	12.414	0.109	20	0.0054	ILS	
CUGQE 1A8C	E	C	5	C	14.160	0.112	20	0.0056	ILS	
CUGQE 1A9C	E	C	5	C	13.856	0.110	20	0.0055	ILS	
CUGQE 1AAC	E	C	5	C	14.108	0.109	20	0.0054	ILS	14.048
CUGQE 1ABC	E	C	5	C	13.646	0.109	20	0.0055	ILS	
CUGQE 1ACC	E	C	5	C	14.471	0.111	20	0.0055	ILS	
CUHQB 1AMD	B	C	2	D	11.674	0.111	20	0.0055	ILS	
CUHQB 1AND	B	C	2	D	11.427	0.110	20	0.0055	ILS	
CUHQB 1AOD	B	C	2	D	11.244	0.110	20	0.0055	ILS	11.336
CUHQB 1APD	B	C	2	D	11.211	0.109	20	0.0055	ILS	
CUHQB 1AQD	B	C	2	D	11.125	0.109	20	0.0054	ILS	

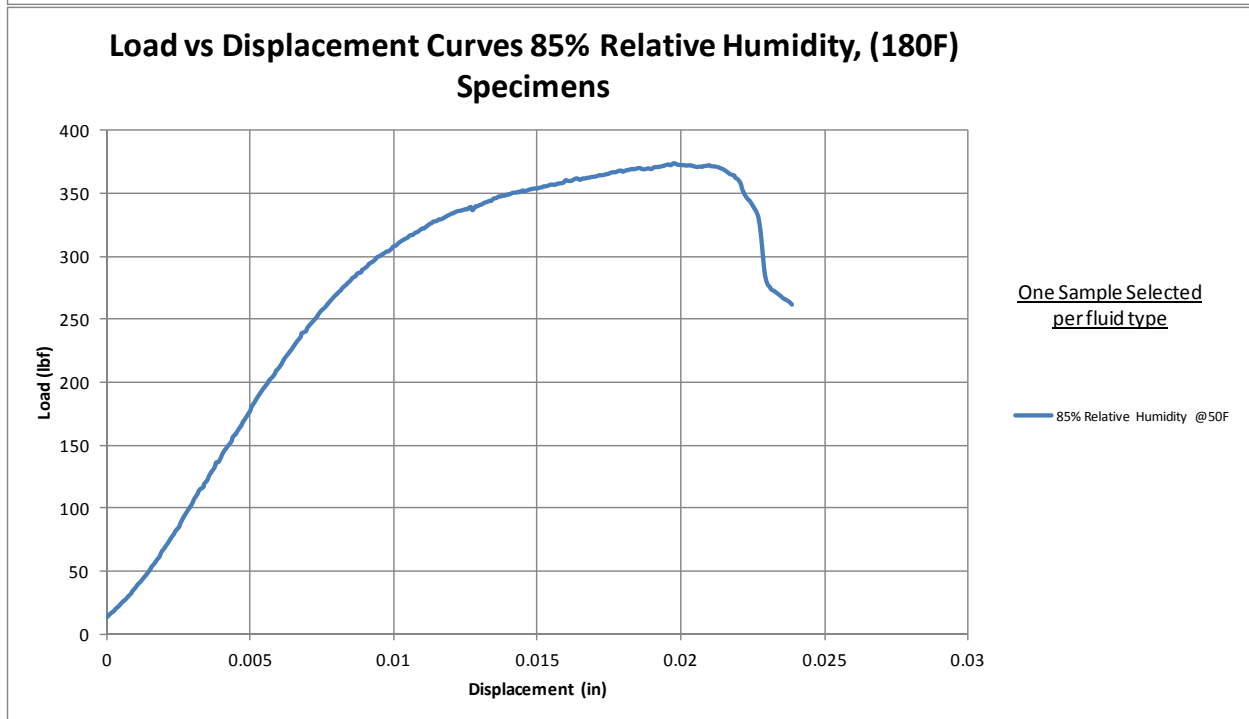
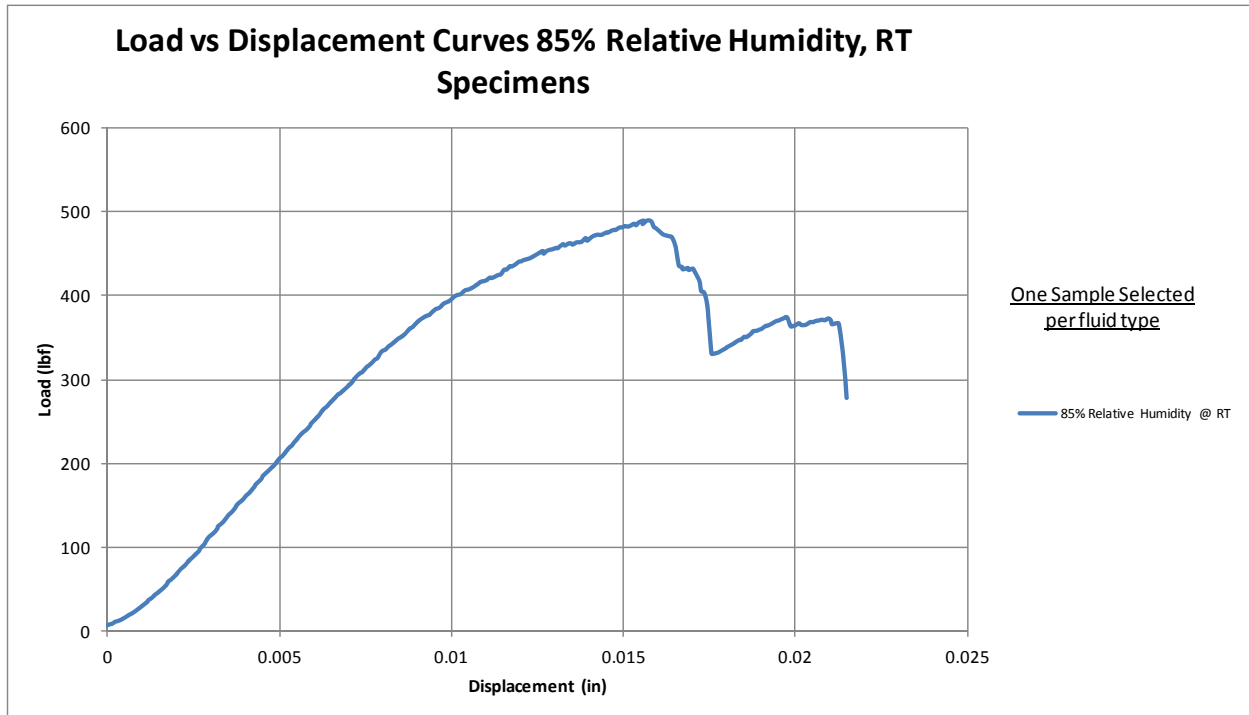
Average 13.131
Standard Dev. 0.765
Coeff. of Var. [%] 5.828
Min. 11.125
Max. 14.478
Number of Spec. 75

7.3 Load Displacement Curves



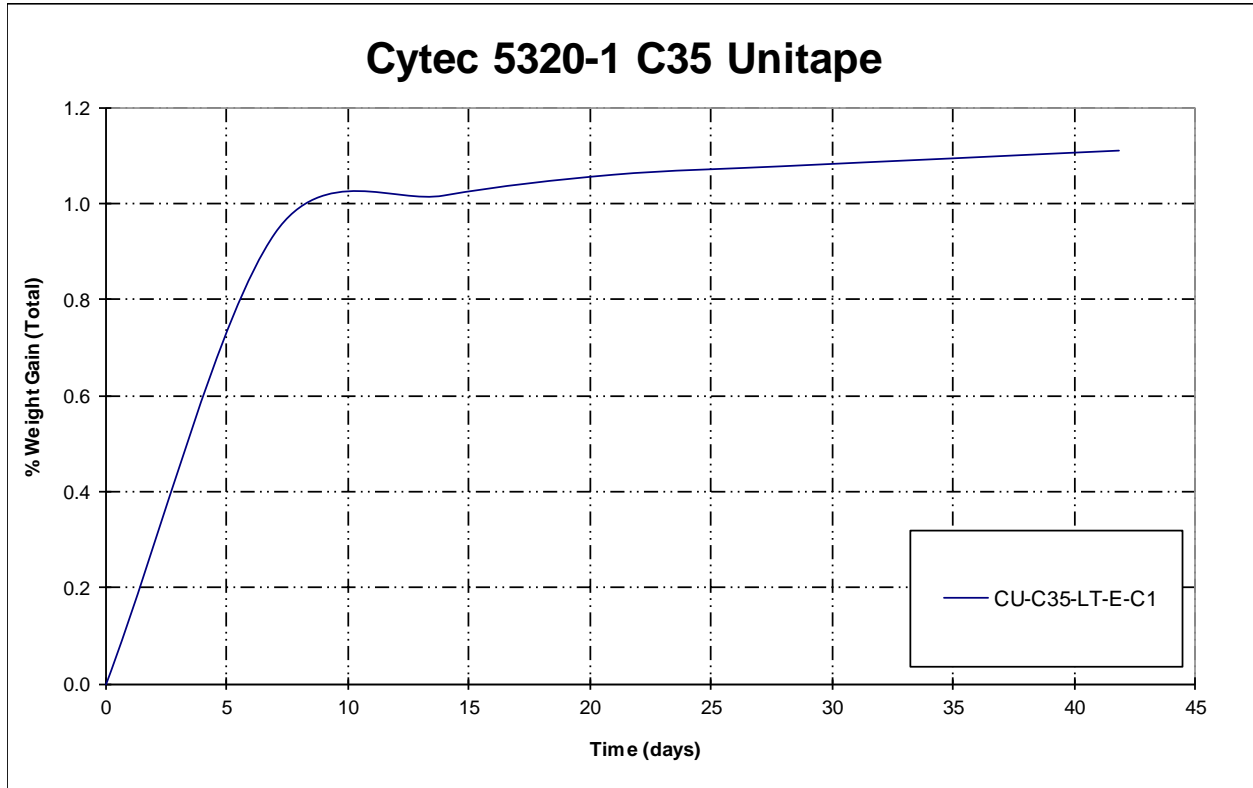




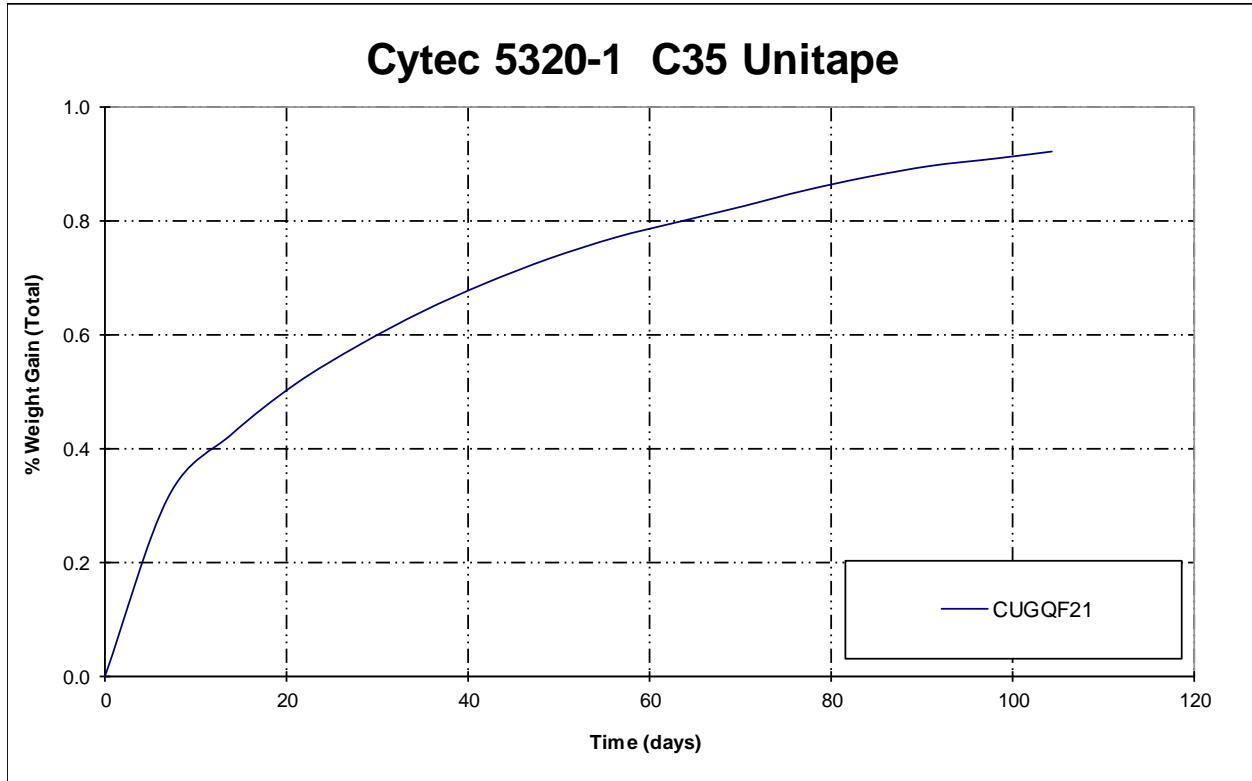


8. Moisture Conditioning Charts

8.1 Longitudinal Tension – Thinnest Panel



8.2 Short Beam Strength – Thickest Panel



For “wet” mechanical test specimens, the drying procedures may not have completely dried the specimens prior to moisture conditioning, so the total amount of moisture absorbed by the specimens may be higher than those recorded in the moisture gain charts.

9. DMA Results

DMA Results Summary				
Cytec 5320-1 Uni (C35) Gulfstream Aerospace CUGDX XX DMA DRY				
Sample #	Onset Storage Modulus		Peak of Tangent Delta	
	Average		Average	
	Tg [°C]	Tg [°F]	Tg [°C]	Tg [°F]
CUG7E 21 - 1	196.84	386.31	214.13	417.43
CUG7E 21 - 2	199.39	390.90	214.14	417.45
CUGJD 11 - 1	207.63	405.73	225.69	438.24
CUGJD 11 - 2	209.06	408.31	227.55	441.59
CUGJD 21 - 1	209.73	409.51	234.63	454.33
CUGJD 21 - 2	209.35	408.83	229.25	444.65
CUGJE 11 - 1	206.37	403.47	225.23	437.41
CUGJE 11 - 2	206.67	404.01	224.39	435.90
CUGJE 21 - 1	208.39	407.10	228.67	443.61
CUGJE 21 - 2	205.80	402.44	226.77	440.19
CUGJF 11 - 1	207.42	405.36	226.23	439.21
CUGJF 11 - 2	207.79	406.02	225.65	438.17
CUGJF 21 - 1	206.77	404.19	226.76	440.17
CUGJF 21 - 2	207.70	405.86	226.19	439.14
CUGLF 11 - 1	194.35	381.83	209.85	409.73
CUGLF 11 - 2	194.17	381.51	210.14	410.25
CUGLF 21 - 1	193.98	381.16	209.62	409.32
CUGLF 21 - 2	193.46	380.23	209.57	409.23
CUGWD 11 - 1	194.56	382.21	212.25	414.05
CUGWD 11 - 2	194.19	381.54	211.89	413.40
CUGWD 21 - 1	197.11	386.80	213.13	415.63
CUGWD 21 - 2	195.91	384.64	213.11	415.60
CUGWE 11 - 1	188.24	370.83	206.52	403.74
CUGWE 11 - 2	187.88	370.18	206.96	404.53
CUGWF 11 - 1	192.12	377.82	210.87	411.57
CUGWF 11 - 2	191.91	377.44	210.85	411.53
CUGYD 11 - 1	191.32	376.38	210.55	410.99
CUGYD 11 - 2	192.47	378.45	210.78	411.40
CUGYD 21 - 1	190.78	375.40	209.11	408.40
CUGYD 21 - 2	191.76	377.17	210.22	410.40
CUGYE 11 - 1	194.49	382.08	211.12	412.02
CUGYE 11 - 2	193.30	379.94	210.87	411.57
CUGYE 21 - 1	195.05	383.09	210.65	411.17
CUGYE 21 - 2	193.70	380.66	211.15	412.07
CUGYF 21 - 1	194.63	382.33	212.11	413.80
CUGYF 21 - 2	194.69	382.44	211.73	413.11
Average		389.13		421.65
Stdev		12.93		14.74

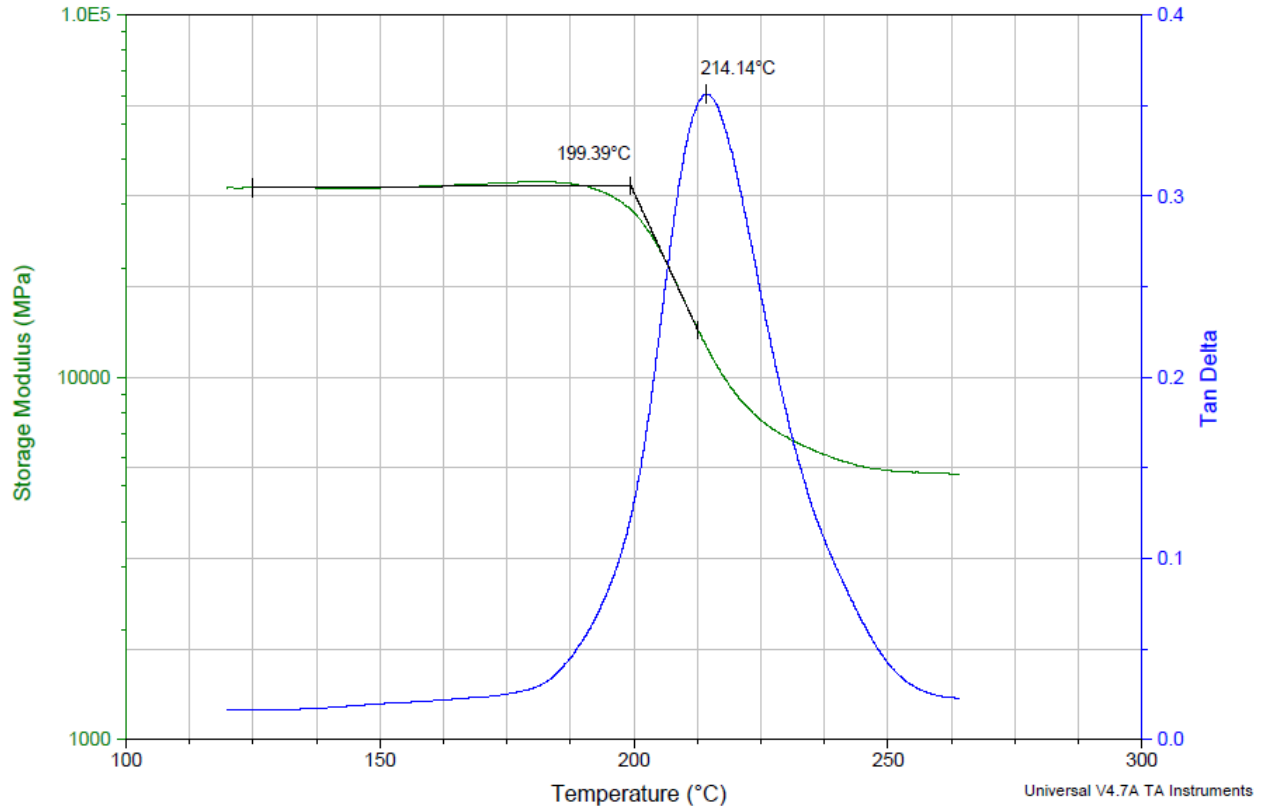
DMA Results Summary				
Cytec 5320-1 uni (C35) Gulfstream Aerospace CUGDX XX DMA WET				
Sample #	Onset Storage Modulus		Peak of Tangent Delta	
	Average		Average	
	Tg [°C]	Tg [°F]	Tg [°C]	Tg [°F]
CUG7E 21 - 1	161.37	322.47	172.79	343.02
CUG7E 21 - 2	160.87	321.57	173.44	344.19
CUGJD 11 - 1	166.47	331.65	178.98	354.16
CUGJD 11 - 2	166.55	331.79	178.17	352.71
CUGJD 21 - 1	161.55	322.79	174.80	346.64
CUGJD 21 - 2	162.17	323.91	174.13	345.43
CUGJE 11 - 1	161.97	323.55	174.36	345.85
CUGJE 11 - 2	161.97	323.55	173.98	345.16
CUGJE 21 - 1	162.57	324.63	175.04	347.07
CUGJE 21 - 2	162.64	324.75	175.00	347.00
CUGJF 11 - 1	165.97	330.75	178.36	353.05
CUGJF 11 - 2	165.47	329.85	177.70	351.86
CUGJF 21 - 1	165.92	330.66	177.76	351.97
CUGJF 21 - 2	166.04	330.87	177.96	352.33
CUGLF 11 - 1	159.85	319.73	170.48	338.86
CUGLF 11 - 2	160.34	320.61	171.07	339.93
CUGLF 21 - 1	159.20	318.56	169.57	337.23
CUGLF 21 - 2	159.01	318.22	170.08	338.14
CUGWD 11 - 1	159.32	318.78	173.23	343.81
CUGWD 11 - 2	160.18	320.32	173.18	343.72
CUGWD 21 - 1	159.67	319.41	173.11	343.60
CUGWD 21 - 2	160.07	320.13	173.01	343.42
CUGWE 11 - 1	158.64	317.55	171.51	340.72
CUGWE 11 - 2	159.35	318.83	172.16	341.89
CUGWF 11 - 1	158.96	318.13	172.84	343.11
CUGWF 11 - 2	159.20	318.56	172.50	342.50
CUGYD 11 - 1	160.02	320.04	171.84	341.31
CUGYD 11 - 2	158.83	317.89	171.71	341.08
CUGYD 21 - 1	158.80	317.84	170.73	339.31
CUGYD 21 - 2	158.69	317.64	170.77	339.39
CUGYE 11 - 1	158.89	318.00	169.85	337.73
CUGYE 11 - 2	158.26	316.87	170.29	338.52
CUGYE 21 - 1	158.48	317.26	169.94	337.89
CUGYE 21 - 2	158.77	317.79	170.30	338.54
CUGYF 21 - 1	158.83	317.89	170.71	339.28
CUGYF 21 - 2	159.16	318.49	170.78	339.40
Average		321.79		343.73
Stdev		4.77		4.99

9.1 DMA Dry Batch A

Sample: CUG7E 21 - 2
Size: 50.0000 x 12.7500 x 4.5500 mm
Method: Strain Controlled Ramp @ 5C/min
Comment: NCAMP Cytec 5320-1 UNI C35 CUG7E 21 CU-C35-FHC1-E-C2 DRY

DMA

File: C:\...CUG7E 21\CUG7E 21 - 2.001
Operator: Ping Q800-SN0188
Run Date: 11-Sep-2012 08:03
Instrument: DMA Q800 V7.5 Build 127

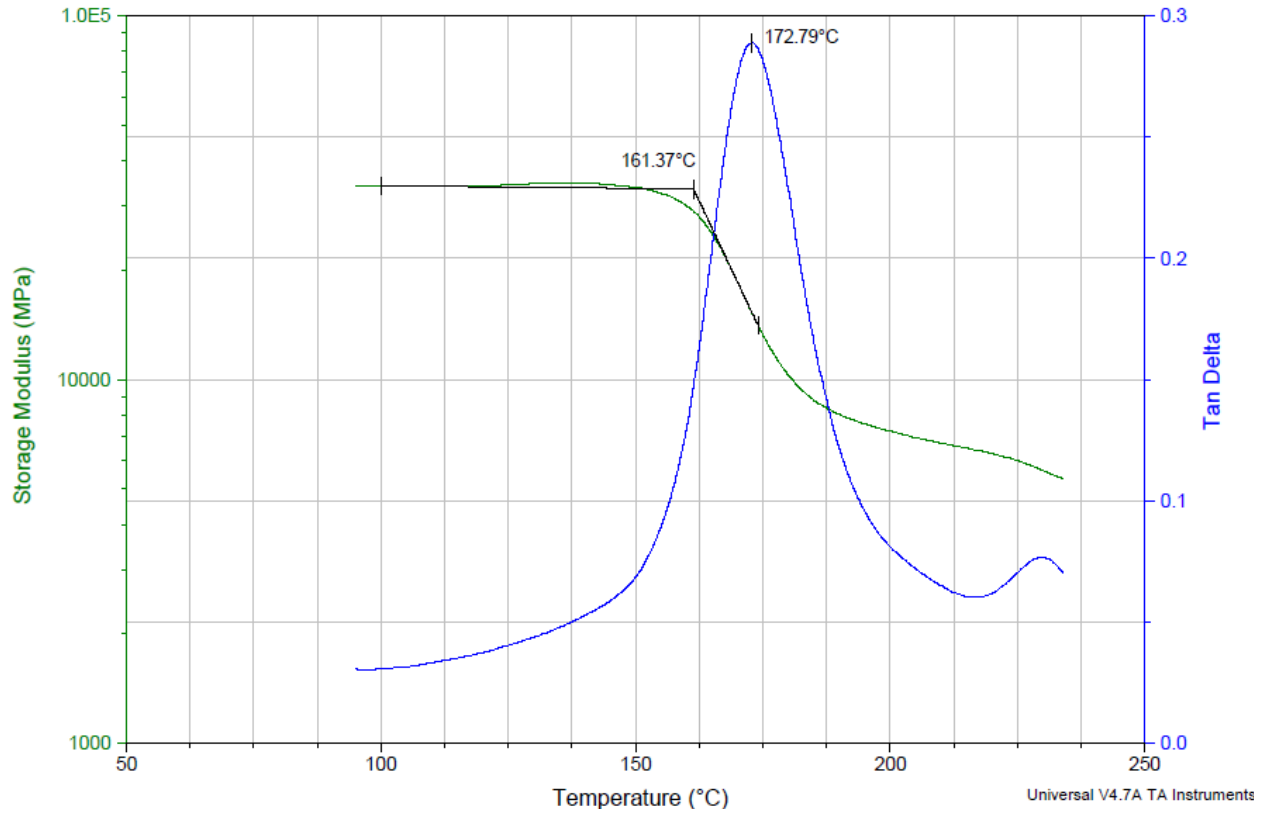


9.2 DMA Wet Batch A

Sample: CUG7E 21 - 1
Size: 50.0000 x 12.7500 x 4.5900 mm
Method: Strain Controlled Ramp @ 5C/min
Comment: NCAMP Cytec 5320-1 PW C35 CUG7E 21 CU-C35-FHC1-E-C2 WET

DMA

File: C:\...\CUG7E 21\CUG7E 21 - 1.001
Operator: Ping Q800-SN0188
Run Date: 26-Nov-2012 16:14
Instrument: DMA Q800 V7.5 Build 127



10. Deviations

1. Fluid Sensitivity Screening:
 - a. Jet A fuel was used instead of SAE AMS 2629 Jet Reference Fluid.
 - b. MIL-H-5606 Hydraulic Oil at RTA is not available.