Solvay Cytec Cycom EP 2202 IM7G Unitape Gr 190 RC 33%
Qualification Material Property Data Report

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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-17G—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 EP 2202 IM7G Unitape Gr 190 RC 33% Qualification Statistical Analysis Report NCP-RP-2014-006 N/C. The qualification material was procured to NCAMP Material Specification NMS 220/1 Rev Initial Release dated March 06, 2012. The qualification test panels were cured in accordance with NCAMP Process Specification 82202 Rev - released January 26, 2012 baseline cure cycle “C”. The NCAMP Test Plan NTP 2201Q1 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-17G. 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-17G are adequate for the given program.

Aircraft companies should not use the data published in this report without specifying NCAMP Material Specification NMS 220/1. NMS 220/1 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 220/1.* NMS 220/1 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
$\mu\varepsilon$	micro-strain
E_1^{c}	compressive modulus, longitudinal / warp direction
E_1^{t}	tensile modulus, longitudinal / warp direction
E_2^{c}	compressive modulus, transverse / fill direction
E_2^{t}	tensile modulus, transverse / fill direction
F_1^{cu}	ultimate compressive strength, longitudinal / warp direction
F_1^{tu}	ultimate tensile strength, longitudinal / warp direction
F_2^{cu}	ultimate compressive strength, transverse / fill direction
F_2^{tu}	ultimate tensile strength, transverse / fill direction
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 EP2202 NAMING FORMAT

PREPREG LOT #/ BATCH #

SUB-PANEL #

SPECIMEN #

EPBJA123A

CODE	CURE CYCLE
1	C1
2	C2

CODE	CONDITIONING
A	RTD (70±10˚F)
B	CTD (-65±5°F)
C	ETD1 (180±5°F)
D	ETW1 (180±5°F)

CODE	FSBS Fluid
	(70°F, 180°F)
a,1	100 Low Lead
b,2	Jet A Fuel
c,3	MIL-PRF-5606
d,4	MIL-PRF-83282
e,5	MIL-PRF-7808
f,6	MIL-PRF-23699
g,7	Sea Water
h,8	Skydrol LD-4
i,9	50% Water w/ 50% Skydrol
j,m	MEK washing fluid
k,n	Polypropylene Glycol Deicer
t,p	Isopropyl Alcohol Deicing
r,s	Distilled Water
A,L	Dry 180˚F
M,N	85% Relative Humidity 180˚F

CODE	COMPANY
EP	Spirit AeroSystems

CODE	MATERIAL SYSTEM
A	(C41) IM7G Uni Gr 190 33% RC
B	(C42) T650 3K PW 38% RC

CODE	TEST METHOD	CODE	TEST METHOD
J	(WT) Warp Tension/ (LT) Longitudinal Tension (D3039)	Q	(SBS) Short-Beam Strength (D2344)
U	(FT) Fill Tension/ (TT) Transverse Tension (D3039)	q	(SBS1) Laminate Short-Beam Strength (D2344)
L	(WC) Warp Compression/ (LC) Longitudinal Compression (D6641)		
Z	(FC) Fill Compression/ (TC) Transverse Compression (D6641)		
N	(IPS) In-Plane Shear (D3518)		
A	(UNT1) Un-notched Tensile Layup 1 (D3039)	1	(SSB1) Single Shear Bearing Layup 1 (D5961)
B	(UNT2) Un-notched Tensile Layup 2 (D3039)	2	(SSB2) Single Shear Bearing Layup 2 (D5961)
C	(UNT3) Un-notched Tensile Layup 3 (D3039)	3	(SSB3) Single Shear Bearing Layup 3 (D5961)
W	(UNC1) Un-notched Compression Layup 1 (D6641)	P	(UNT0) Un-notched Tension 0/90 (D3039)
X	(UNC2) Un-notched Compression Layup 2 (D6641)	R	(UNC0) Un-notched Compression 0/90 (D6641)
Y	(UNC3) Un-notched Compression Layup 3 (D6641)		
D	(OHT1) Open-Hole Tension Layup 1 (D5766)	4	(FHT1) Filled-Hole Tension Layup 1 (D6742)
E	(OHT2) Open-Hole Tension Layup 2 (D5766)	5	(FHT2) Filled-Hole Tension Layup 2 (D6742)
F	(OHT3) Open-Hole Tension Layup 3 (D5766)	6	(FHT3) Filled-Hole Tension Layup 3 (D6742)
G	(OHC1) Open-Hole Compression 1 (D6484)	7	(FHC1) Filled-Hole Compression Layup 1 (D6742)
H	(OHC2) Open-Hole Compression 2 (D6484)	8	(FHC2) Filled-Hole Compression Layup 2 (D6742)
I	(OHC3) Open-Hole Compression 3 (D6484)	9	(FHC3) Filled-Hole Compression Layup 3 (D6742)
K	(CAI1) Compression After Impact Layup 1 (D7136, D7137)		
M	(ILT) Interlaminar Tension (D6415)		

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 D3418-08 - Standard Test Method for Transition Temperatures and Enthalpies of Fusion and Crystallization of Polymers by Differential Scanning Calorimetry
- ASTM D3518/D3518M-94(2007) – Standard Test Method for In-Plane Shear Response of Polymer Matrix Composite Materials by Tensile Test of a ± 45º Laminate In-Plane Shear Strength and Modulus
- ASTM D5766/D5766M-11 – Standard Test Method for Open Hole Tensile Strength of Polymer Matrix Composite Laminates
- ASTM D5961/D5961M-10 – 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-09 – Standard Test Method for Open-Hole Compressive Strength of Polymer Matrix Composite Laminates
- ASTM D6641/D6641M-09 – 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.

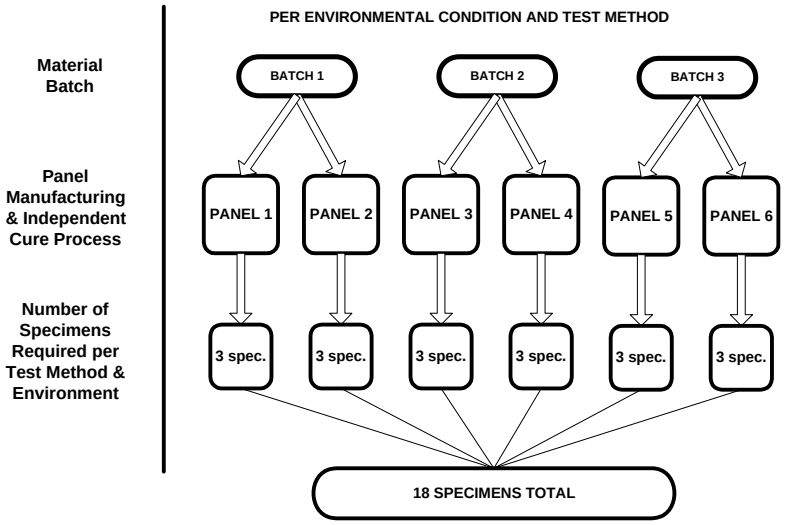


Figure 1-2: Specimen Selection Methodology

All panels were fabricated in accordance with NCAMP process specification 82202 “C” Cure Cycle with caul plate.

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.

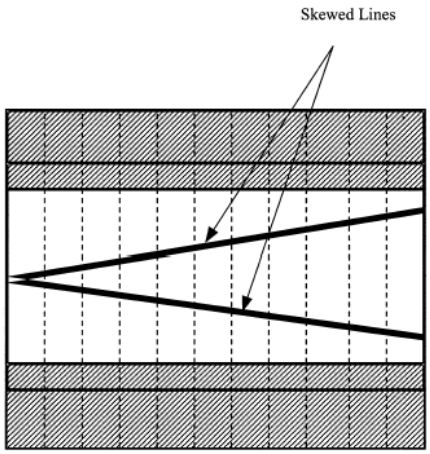


Figure 1-3: Specimen Traceability Line

1.5.2 Specimen & Testing Details

1.5.2.1 Tabbing

Longitudinal Tension coupons were tabbed with SWAF 163-2K and ± 45° Unbeveled Glass tabstock.

1.5.2.2 Specimen Dimensions & Test Configuration

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

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 ±5°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 1 and 3, and FHC 1, 2 and 3.
2) NASM 21297-04004 bolts with MS 21084 nuts and MS 21206 washers for FHT 2 and 3, and FHC 1, 2 and 3.
3) NASM 21297-04016 bolts with MS 21084 nuts and MS 21206 washers for SSB

1.5.2.3 Specimen Strain Device Used

Corresponding Gage ID can be obtained from Appendix 1 of NTP 2201Q1.

Uniaxial gages were used on:

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

Biaxial gages were used on:

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

Uniaxial Extensometers were used on:

All of RTD and ETW Tension specimens except Longitudinal Tension specimens.

Biaxial Extensometers were used on:

All of RTD and ETW Longitudinal Tension specimens.

1.5.3 Test Matrix

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

Layup	Test Type and Direction	Property	Number of Batches x No. of Panels x No. of Specimens			
			Test Temperature/Moisture Condition			
			CTD	RTD	ETD1	ETW1
$[0]_6$	ASTM D3039 0° Tension	Strength, Modulus and Poisson's Ratio	3x2x3	3x2x3 (4)		3x2x3
$[0]_{14}$	ASTM D6641 0° Compression	Modulus	3x2x3	3x2x3 (1) (4)	1x2x3	3x2x3
$[90]_{11}$	ASTM D3039 90° Tension	Strength and Modulus	3x2x3	3x2x3 (4)		3x2x3
$[90]_{14}$	ASTM D6641 90° Compression	Strength and Modulus	3x2x3	3x2x3 (1) (4)	1x2x3	3x2x3 (3)
$[90/0/90]_5$	ASTM D6641 0° Compression (5)	Strength and Modulus	3x2x3	3x2x3 (1) (4)	1x2x3	3x2x3 (3)
$[45/-45]_{4S}$	ASTM D3518 In-Plane Shear (2)	Strength and Modulus	3x2x3	3x2x3 (4)		3x2x3
$[0]_{34}$	ASTM D2344 Short Beam	Strength	3x2x3	3x2x3	1x2x3	3x2x3

Table 1-1: Lamina Level Test Matrix

Note 1: Back-to-back strain gages are needed on the first two specimens of each 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 $F^{cu}_{0^\circ\ plies}$ as follows

$$F^{cu}_{0^\circ\ plies} = F^{cu}_{0^\circ/90^\circ} \frac{E_1}{E_{0^\circ/90^\circ}}$$

Where:

$F^{cu}_{0^\circ\ plies}$ = 0° ply Strength

$F^{cu}_{0^\circ/90^\circ}$ = 0°/90° or 90°/0° cross-ply laminate strength

E_1 = 0° Modulus

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

Table 1-2 below summarizes the laminate level tests carried out. The layup angles 0º, 45º, -45º, and 90º 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.

(%0º/%±45º/%90º) 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
(25/50/25 - QI) UNT1	ASTM D3039 Un-notched Tension [45/0/-45/90]2S	Strength & modulus	3x2x3	3x2x3 (7)	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]2S	Strength & modulus		3x2x3 (4&7)	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]3S (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	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	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]3S	Strength		3x2x3 (4)	3x2x3
(10/80/10) OHC2	ASTM D6484 Open Hole Compression (1) [45/-45/0/45/-45/90/45/-45/45/-45] S	Strength		3x2x3 (4)	3x2x3
(50/40/10) OHC3	ASTM D6484 Open Hole Compression (1) [0/45/0/90/0/-45/0/45/0/-45]S	Strength		3x2x3 (4)	3x2x3
(25/50/25 - QI) FHC1	ASTM D6742 Filled Hole Compression (2) [45/0/-45/90]3S	Strength		3x2x3	3x2x3
(10/80/10) FHC2	ASTM D6742 Filled Hole Compression (2) [45/-45/0/45/-45/90/45/-45/45/-45] S	Strength		3x2x3	3x2x3
(50/40/10) FHC3	ASTM D6742 Filled Hole Compression (2) [0/45/0/90/0/-45/0/45/0/-45]S	Strength		3x2x3	3x2x3
(25/50/25 - QI) SSB1	ASTM D5961 Single Shear Bearing (3) [45/0/-45/90]2S	Strength & Deformation		3x2x3	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]22	Strength	1x1x6	1x1x6	1x1x6
(25/50/25 - QI) CAI1	ASTM D7136 & D7137 Compression After Impact (1500 in.lb/in) (8) [45/0/-45/90]4S	Strength		3x1x6	

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 D5961-11 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.
Note 8: Back-to-back strain gages on two locations (a total of four strain gages) are needed on the first specimen. The specimen should be equivalent to the test specimens in terms of material, layup, and geometry, shall be un-damaged. Alternatively, an instrumented metallic plate, equivalent in thickness to the test specimens to within ±.25 mm [±.010 in.], may be used.

1.5.4 Cured Laminate Physical Testing

The properties in Table 1-3: Physical Testing MatrixTable 1-3 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 D3171-11	All data from mechanical test specimens
Laminate Density	ASTM D792-08	Per Note 5
Fiber Volume, % by Volume	ASTM D3171-11 (Note 2)	3
Resin Content, % by Weight	ASTM D3171-11 (Note 2)	3
Void Content, % by Volume	ASTM D3171-11	Per Note 5
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)

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: Verify that Method II is accurate by testing a minimum of 4 panels per batch by Method I, Procedure B. If the average fiber volume results of Method I and Method II are within 2%, Method II

may be deemed accurate and the remaining panels may use Method II only. Otherwise, use Method I, Procedure B for all the panels.

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: Test frequency same as fiber volume test.

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

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 ±5°F of the required test temperature.

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

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

1.5.7 Fluid Sensitivity Screening

Table 1-4 lists the requirements for fluid sensitivity screening, which requires ASTM D2344 Short Beam Strength testing on $[0°]_{14}$ lamina level specimens dried at 250°F±5°F for 24 hours minimum before being subjected to the conditions indicated, five replicates per fluid and one cure cycle. Specimens were cleaned with a dry towel prior to the tests. In addition to short beam strength, load versus displacement curves were plotted to aid in the identification of matrix/resin softening. Since load versus displacement curves are influenced by test machine and fixture compliance, all the tests were performed with the identical machine and fixture, through a single setup. 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.

Extended Contact:	Exposure	Test Condition	Code
100 Low Lead Aviation Fuel (ASTM D910)	90 days min. @ 70°F±10°F	70°F	FS11RT
	90 days min. @ 70°F±10°F	180°F	FS11ET
ASTM D1655 Jet A Fuel (other jet fuel may be used but its type must be reported)	90 days min. @ 70°F±10°F	70°F	FS12RT
	90 days min. @ 70°F±10°F	180°F	FS12ET
MIL-PRF-5606 Hydraulic Oil	90 days min. @ 70°F±10°F	70°F	FS13RT
	90 days min. @ 70°F±10°F	180°F	FS13ET
MIL-PRF-83282 Hydraulic Oil	90 days min. @ 70°F±10°F	70°F	FS14RT
	90 days min. @ 70°F±10°F	180°F	FS14ET
MIL-PRF-7808 Engine Oil	90 days min. @ 70°F±10°F	70°F	FS15RT
	90 days min. @ 70°F±10°F	180°F	FS15ET
MIL-PRF-23699, Class STD Engine Oil	90 days min. @ 70°F±10°F	70°F	FS16RT
	90 days min. @ 70°F±10°F	180°F	FS16ET
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
Short Duration Contact:			
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
Control Tests:			
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 90º tensile strength and modulus (unidirectional only), 90º 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 58.94 and Method 2 Fiber Volume (%vol) is 58.73. 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 ~190 gsm. Based on the FAW data from Solvay Cytec (Avg ~190 gsm) and Method I Phys test data (Avg. void content ~ 0.26%) it is appropriate to use the CPT Method for normalization.

The average of as-measured cured ply thickness of 0.0072 inches from the actual qualification panels has been used as the nominal cured ply thickness (CPT) for normalization purpose. The following normalization formula was used:

Normalized Value = Measured Value x Measured CPT / 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 have been conformed by an NCAMP AIR.

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

1.5.10 Material Pedigree Information

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

2. Test Results

2.1 Lamina Level Test Summary

Prepreg Material:	EP2202 IM7G Unitape Gr 190 RC 33%				**Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33% Lamina Properties Summary**
Material Specification:	NMS 220/1				
Process Specification:	NPS 82202				
Fiber:	IM7G Unitape	**Resin:**	Epoxy EP 2202		
Tg(dry):	366.74°F	**Tg(wet):**	288.04°F	**Tg METHOD:** ASTM D7028	

Date of fiber manufacture	Jun 2011 - May 2012	**Date of testing**	Jun 2013 - Feb 2014
Date of resin manufacture	Aug 2011 - Aug 2012	**Date of data submittal**	July 30, 2014
Date of prepreg manufacture	Aug 2011 - Oct 2012		
Date of composite manufacture	Feb 2012 - Apr 2013		

LAMINA MECHANICAL PROPERTY SUMMARY
Data reported as: Normalized & Measured
(Normalized by CPT=0.0072 inch)

	CTD Mean		RTD Mean		ETD1 Mean		ETW1 Mean	
	Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
F_1^{tu} [ksi]	439.576	444.296	425.798	430.299			385.457	388.395
E_1^t [Msi]	22.491	22.720	22.582	22.803			22.256	22.423
ν_{12}		0.300		0.317				0.304
F_2^{tu} [ksi]		11.592		11.170				6.736
E_2^t [Msi]		1.434		1.282				1.156
F_1^{cu} [ksi] from UNC0*	281.644	284.162	240.788	244.330	211.475	211.832	185.868	187.674
E_1^c [Msi]	20.624	20.779	20.459	20.750	20.880	20.959	21.423	21.609
F_2^{cu} [ksi]		52.095		37.947		29.398		22.956
E_2^c [Msi]		1.533		1.395		1.313		1.244
UNC0 Strength [ksi]	103.619	104.732	90.750	91.617	76.429	76.937	66.922	67.256
UNC0 Modulus [Msi]	7.588	7.659	7.711	7.781	7.546	7.612	7.713	7.744
$F_{12}^{s0.2\%}$ [ksi]		9.483		7.008				4.806
$F_{12}^{s5\%strain}$ [ksi]		16.557		11.563				7.503
G_{12}^s [Msi]		0.836		0.663				0.489
SBS [ksi]		19.953		15.600		12.328		9.806

*** Derived from cross-ply using back-out factor**

Table 2-1: Lamina Summary Data

2.2 Laminate Level Test Summary

Prepreg Material:	EP2202 IM7G Unitape Gr 190 RC 33%			**Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33% Lamina Properties Summary**
Material Specification:	NMS 220/1			
Process Specification:	NPS 82202			
Fiber:	IM7G Unitape	**Resin:**	Epoxy EP 2202	
Tg(dry):	366.74°F	**Tg(wet):**	288.04°F	**Tg METHOD:** ASTM D7028

Date of fiber manufacture	Jun 2011 - May 2012	**Date of testing**	Jun 2013 - Feb 2014
Date of resin manufacture	Aug 2011 - Aug 2012	**Date of data submittal**	July 30, 2014
Date of prepreg manufacture	Aug 2011 - Oct 2012		
Date of composite manufacture	Feb 2012 - Apr 2013		

LAMINATE MECHANICAL PROPERTY SUMMARY
Data reported as: Normalized & Measured
(Normalized by CPT=0.0072 inch)

	Layup:	25/50/25		10/80/10		50/40/10	
	Test Condition	Normalized	Measured	Normalized	Measured	Normalized	Measured
OHT Strength [ksi]	CTD	77.970	78.519	55.137	55.456	116.767	116.554
	RTD	77.592	78.130	51.976	52.241	118.698	118.769
	ETW1	74.391	75.047	45.847	46.091	116.507	116.830
OHC Strength [ksi]	RTD	48.922	49.049	42.898	43.024	58.359	58.520
	ETW1	36.343	36.426	33.782	33.913	46.650	46.736
UNT Strength [ksi]	CTD	139.581	139.861	88.217	88.394	250.603	251.164
	RTD	140.459	140.693	82.325	82.496	236.539	236.814
	ETW1	137.755	138.374	71.739	71.834	206.716	207.012
UNT Modulus [Msi]	CTD	8.464	8.481	5.528	5.540	13.196	13.226
	RTD	8.247	8.266	5.197	5.208	13.132	13.153
	ETW1	8.146	8.182	4.816	4.822	12.933	12.951
UNC Strength [ksi]	CTD	88.676	89.850	64.512	65.165	124.738	125.938
	ETW1	64.444	64.984	44.188	44.575	90.187	91.406
UNC Modulus [Msi]	CTD	7.758	7.851	4.977	5.030	11.930	12.055
	ETW1	7.945	8.027	4.658	4.699	12.074	12.204
FHT Strength [ksi]	CTD	82.585	82.789	62.327	62.401	113.350	113.895
	RTD	79.588	79.673	57.767	57.804	114.276	114.660
	ETW1	74.510	74.880	48.563	48.736	109.032	109.662
FHC Strength [ksi]	RTD	69.032	69.210	56.774	57.001	85.006	85.503
	ETW1	51.831	52.075	44.209	44.383	64.591	65.067
SBS1 Strength [ksi]	RTD		13.273				
	ETW1		8.868				
SSB % Offset Strength [ksi]	RTD	125.894	126.055	125.181	126.066	127.739	127.999
	ETW1	97.740	98.214	93.289	93.874	94.054	94.153
SSB Ultimate Bearing Strength [ksi]	RTD	148.180	148.363	151.210	152.289	152.253	152.574
	ETW1	116.818	117.368	121.573	122.307	118.553	118.674
CBS [lb]	CTD		206.183				
	RTD		164.398				
	ETW1		153.193				
ILT Strength [ksi]	CTD		6.186				
	RTD		4.962				
	ETW1		4.568				
CAI Strength [ksi]	RTD	50.093	50.313				

Table 2-2: Laminate Summary Data

2.3 Individual Test Summaries

2.3.1 Longitudinal Tension Properties (LT)

Material: Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

Resin content: 30.11 % wt **Comp. density:** 1.578 g/cc
Fiber volume: 61.95 % vol
Ply count: 6

Test method: ASTM D 3039-08 **Modulus calculation:** 1000 to 3000 microstrain

Normalized by: 0.0072 in. CPT

Tension, 1-axis
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33% [0]6

		CTD		RTD		ETW1	
Test Temperature [°F]		-65		70		180	
Moisture Conditioning		Dry		Dry		Equilbrium	
Equilbrium at T, RH						160 F,85%	
Source code		EPAJX XXXB		EPAJX XXXA		EPAJX XXXD	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
F_1^{tu} [ksi]	**Mean**	439.576	444.296	425.798	430.299	385.457	388.395
	Minimum	289.567	289.790	309.944	305.350	333.178	332.792
	Maximum	486.073	487.389	464.167	474.381	413.547	413.866
	C.V.(%)	10.389	10.405	11.463	12.028	5.308	5.546
	No. Specimens	23		21		21	
	No. Prepreg Lots	3		3		3	
E_1^t [Msi]	**Mean**	22.491	22.720	22.582	22.803	22.256	22.423
	Minimum	21.608	21.356	21.503	22.003	21.675	21.878
	Maximum	23.882	24.410	23.492	24.078	22.662	22.981
	C.V.(%)	2.890	3.368	1.909	2.053	1.255	1.409
	No. Specimens	21		21		21	
	No. Prepreg Lots	3		3		3	
ν_{12}	**Mean**		0.300		0.317		0.304
	No. Specimens	20		21		21	
	No. Prepreg Lots	3		3		3	

2.3.2 Transverse Tension Properties (TT)

Material:	Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%							**Tension, 2-axis** Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33% [90]11	
Resin content:	33.05 % wt	**Comp. density:**	1.576 g/cc						
Fiber volume:	59.28 % vol								
Ply count:	11								
Test method:	ASTM D 3039-08	**Modulus calculation:**	1000 to 3000 microstrain						
Normalized by:	NA								
		CTD		**RTD**		**ETW1**			
Test Temperature [°F]		-65		70		180			
Moisture Conditioning		Dry		Dry		Equilbrium			
Equilbrium at T, RH						160 F,85%			
Source code		EPAUX XXXB		EPAUX XXXA		EPAUX XXXD			
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**		
F_2^{tu} [ksi]	**Mean**		11.592		11.170		6.736		
	Minimum		7.678		8.620		5.630		
	Maximum		13.677		12.913		7.568		
	C.V.(%)		12.389		10.182		8.132		
	No. Specimens		24		23		21		
	No. Prepreg Lots		3		3		3		
E_2^t [Msi]	**Mean**		1.434		1.282		1.156		
	Minimum		1.381		1.226		1.131		
	Maximum		1.474		1.312		1.203		
	C.V.(%)		1.793		1.385		1.433		
	No. Specimens		24		23		25		
	No. Prepreg Lots		3		3		3		

2.3.3 Longitudinal Compression Properties (LC)

Material:	Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%							**Compression, 1-axis** Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33% [0]14	
Resin content:	32.48 % wt		**Comp. density:**	1.577 g/cc					
Fiber volume:	59.84 % vol								
Ply count:	14								
Test method:	ASTM D 6641-09		**Modulus calculation:** 1000 to 3000 microstrain						
Normalized by:	0.0072	in. CPT							
		CTD		**RTD**		**ETD1**		**ETW1**	
Test Temperature [°F]		-65		70		180		180	
Moisture Conditioning		Dry		Dry		Dry		Equilbrium	
Equilbrium at T, RH								160 F,85%	
Source code		EPALX XXXB		EPALX XXXA		EPALX XXXC		EPALX XXXD	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
E_1^c **[Msi]**	**Mean**	20.624	20.779	20.459	20.750	20.880	20.959	21.423	21.609
	Minimum	19.665	19.645	19.747	20.089	20.359	20.440	20.731	20.696
	Maximum	21.217	21.709	21.044	21.612	22.986	23.151	21.904	22.595
	C.V.(%)	1.685	2.291	1.640	2.103	3.954	4.067	1.399	2.120
	No. Specimens		21		21		9		21
	No. Prepreg Lots		3		3		1		3

2.3.4 Transverse Compression Properties (TC)

Material:	Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%							**Compression, 2-axis** Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33% [90]14	
Resin content:	35.37 % wt	**Comp. density:**	1.576 g/cc						
Fiber volume:	57.23 % vol								
Ply count:	14								
Test method:	ASTM D 6641-09	**Modulus calculation:**	1000 to 3000 microstrain						
Normalized by:	NA								
		CTD		**RTD**		**ETD1**		**ETW1**	
Test Temperature [°F]		-65		70		180		180	
Moisture Conditioning		Dry		Dry		Dry		Equilbrium	
Equilbrium at T, RH								160 F,85%	
Source code		EPAZX XXXB		EPAZX XXXA		EPAZX XXXC		EPAZX XXXD	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
F_2^{cu} **[ksi]**	**Mean**		52.095		37.947		29.398		22.956
	Minimum		48.684		37.130		28.765		22.341
	Maximum		53.821		39.045		29.611		23.670
	C.V.(%)		2.619		1.537		1.016		1.490
	No. Specimens	21		21		7		20	
	No. Prepreg Lots	3		3		1		3	
E_2^c **[Msi]**	**Mean**		1.533		1.395		1.313		1.244
	Minimum		1.420		1.361		1.299		1.209
	Maximum		1.604		1.433		1.337		1.288
	C.V.(%)		3.001		1.340		1.008		1.650
	No. Specimens	21		21		7		20	
	No. Prepreg Lots	3		3		1		3	

2.3.5 In-Plane Shear Properties (IPS)

In-Plane Shear
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33% [45/-45]4S

Material:	Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%		
Resin content:	33.46 % wt	**Comp. density:**	1.569 g/cc
Fiber volume:	58.67 % vol		
Ply count:	16		
Test method:	ASTM D 3518-07	**Modulus calculation:**	2000 to 6000 microstrain
Normalized by:	NA		

		CTD		RTD		ETW1			
Test Temperature [°F]		-65		70		180			
Moisture Conditioning		Dry		Dry		Equilbrium			
Equilbrium at T, RH						160 F,85%			
Source code		EPANX XXXB		EPANX XXXA		EPANX XXXD			
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**		
$F_{12}^{s0.2\%}$ [ksi]	**Mean**		9.483		7.008		4.806		
	Minimum		9.150		6.857		4.470		
	Maximum		9.892		7.136		5.257		
	C.V.(%)		1.885		1.127		4.963		
	No. Specimens		22		22		21		
	No. Prepreg Lots		3		3		3		
$F_{12}^{s5\%strain}$ [ksi]	**Mean**		16.557		11.563		7.503		
	Minimum		16.170		11.353		7.006		
	Maximum		17.157		11.776		8.037		
	C.V.(%)		1.945		0.958		4.091		
	No. Specimens		21		21		21		
	No. Prepreg Lots		3		3		3		
G_{12}^{s} [Msi]	**Mean**		0.836		0.663		0.489		
	Minimum		0.806		0.646		0.447		
	Maximum		0.854		0.677		0.544		
	C.V.(%)		1.350		1.432		6.903		
	No. Specimens		22		22		21		
	No. Prepreg Lots		3		3		3		

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

Material: Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

Unnotched Tension 1
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
[45/0/-45/90]2S

Resin content: 33.54 % wt **Comp. density:** 1.572 g/cc
Fiber volume: 58.69 % vol
Ply count: 16

Test method: ASTM D 3039-08 **Modulus calculation:** 1000 to 3000 microstrain

Normalized by: 0.0072 in. CPT

		CTD		RTD		ETW1	
Test Temperature [°F]		-65		70		180	
Moisture Conditioning		Dry		Dry		Equilbrium	
Equilbrium at T, RH						160 F,85%	
Source code		EPAAX XXXB		EPAAX XXXA		EPAAX XXXD	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
UNT1 Strength [ksi]	**Mean**	139.581	139.861	140.459	140.693	137.755	138.374
	Minimum	129.734	129.211	132.945	132.619	131.736	131.584
	Maximum	149.853	151.986	150.358	149.364	144.636	144.326
	C.V.(%)	4.044	4.241	3.142	3.257	2.518	2.623
	No. Specimens	21		21		21	
	No. Prepreg Lots	3		3		3	
UNT1 Modulus [Msi]	**Mean**	8.464	8.481	8.247	8.266	8.146	8.182
	Minimum	8.042	7.982	7.851	7.832	7.899	7.989
	Maximum	8.688	8.707	8.610	8.558	8.370	8.361
	C.V.(%)	1.675	1.937	1.680	1.994	1.408	1.236
	No. Specimens	21		22		21	
	No. Prepreg Lots	3		3		3	

2.3.7 "10/80/10" Unnotched Tension 2 Properties (UNT2)

Material:	Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%							**Unnotched Tension 2** Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33% [45/-45/0/45/-45/90/45/-45/45/-45]S	
Resin content:	33.62 % wt		**Comp. density:**	1.571 g/cc					
Fiber volume:	58.60 % vol								
Ply count:	20								
Test method:	ASTM D 3039-08		**Modulus calculation:** 1000 to 3000 microstrain						
Normalized by:	0.0072	in. CPT							
			CTD		**RTD**		**ETW1**		
Test Temperature [°F]			-65		70		180		
Moisture Conditioning			Dry		Dry		Equilbrium		
Equilbrium at T, RH							160 F,85%		
Source code			EPABX XXXB		EPABX XXXA		EPABX XXXD		
			Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	
UNT2 Strength [ksi]	**Mean**		88.217	88.394	82.325	82.496	71.739	71.834	
	Minimum		83.762	85.513	73.191	75.453	67.077	68.347	
	Maximum		91.556	91.061	85.422	85.456	75.987	75.178	
	C.V.(%)		2.170	1.697	3.204	2.705	2.996	2.609	
	No. Specimens		21		21		21		
	No. Prepreg Lots		3		3		3		
UNT2 Modulus [Msi]	**Mean**		5.528	5.540	5.197	5.208	4.816	4.822	
	Minimum		5.394	5.421	5.094	5.103	4.670	4.681	
	Maximum		5.695	5.736	5.367	5.354	5.026	4.973	
	C.V.(%)		1.358	1.729	1.252	1.597	1.941	1.592	
	No. Specimens		21		21		21		
	No. Prepreg Lots		3		3		3		

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

Material: Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

Resin content: 33.94 % wt **Comp. density:** 1.570 g/cc
Fiber volume: 58.28 % vol
Ply count: 20

Test method: ASTM D 3039-08 **Modulus calculation:** 1000 to 3000 microstrain

Normalized by: 0.0072 in. CPT

Unnotched Tension 3
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
[0/45/0/90/0/-45/0/45/0/-45]S

		CTD		RTD		ETW1	
Test Temperature [°F]		-65		70		180	
Moisture Conditioning		Dry		Dry		Equilbrium	
Equilbrium at T, RH						160 F,85%	
Source code		EPACX XXXB		EPACX XXXA		EPACX XXXD	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
UNT3 Strength [ksi]	**Mean**	250.603	251.164	236.539	236.814	206.716	207.012
	Minimum	243.438	243.478	214.510	220.533	189.504	187.596
	Maximum	261.317	261.479	247.236	249.204	218.869	218.616
	C.V.(%)	1.940	2.107	3.170	2.714	3.886	3.850
	No. Specimens	21		21		22	
	No. Prepreg Lots	3		3		3	
UNT3 Modulus [Msi]	**Mean**	13.196	13.226	13.132	13.153	12.933	12.951
	Minimum	12.951	12.987	12.813	12.760	12.624	12.627
	Maximum	13.525	13.606	13.798	13.570	13.342	13.623
	C.V.(%)	1.238	1.360	2.022	1.462	1.635	1.877
	No. Specimens	21		24		23	
	No. Prepreg Lots	3		3		3	

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

Material:	Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%								
Resin content:	33.35 % wt		**Comp. density:**	1.572 g/cc					
Fiber volume:	58.88 % vol								
Ply count:	15								
Test method:	ASTM D 6641-09		**Modulus calculation:**	1000 to 3000 microstrain					
Normalized by:	0.0072	in. CPT							

Unnotched Compression 0/90
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33% [90/0/90]5

		CTD		RTD		ETD1		ETW1	
Test Temperature [°F]		-65		70		180		180	
Moisture Conditioning		Dry		Dry		Dry		Equilbrium	
Equilbrium at T, RH								160 F,85%	
Source code		EPARX XXXB		EPARX XXXA		EPARX XXXC		EPARX XXXD	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
UNC0 Strength [ksi]	**Mean**	103.619	104.732	90.750	91.617	76.429	76.937	66.922	67.256
	Minimum	96.943	98.741	78.335	77.097	68.996	69.640	61.835	62.171
	Maximum	112.884	115.413	99.466	100.867	83.684	83.995	72.753	73.239
	C.V.(%)	4.150	4.212	5.612	6.063	5.873	5.725	4.672	4.669
	No. Specimens	25		21		8		21	
	No. Prepreg Lots	3		3		1		3	
UNC0 Modulus [Msi]	**Mean**	7.588	7.659	7.711	7.781	7.546	7.612	7.713	7.744
	Minimum	7.315	7.247	7.495	7.491	7.442	7.541	7.530	7.508
	Maximum	7.974	8.153	8.001	8.113	7.588	7.648	7.921	8.024
	C.V.(%)	1.993	2.649	1.867	2.259	0.654	0.473	1.721	2.000
	No. Specimens	21		21		7		21	
	No. Prepreg Lots	3		3		1		3	

2.3.10 "25/50/25" Unnotched Compression 1 Properties (UNC1)

Material:	Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%						**Unnotched Compression 1** Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33% [45/0/-45/90]2S		
Resin content:	33.53 % wt		**Comp. density:**	1.574 g/cc					
Fiber volume:	58.78 % vol								
Ply count:	16								
Test method:	ASTM D 6641-09		**Modulus calculation:**	1000 to 3000 microstrain					
Normalized by:	0.0072	in. CPT							
			RTD		**ETW1**				
Test Temperature [°F]			70		180				
Moisture Conditioning			Dry		Equilbrium				
Equilbrium at T, RH					160 F,85%				
Source code			EPAWX XXXA		EPAWX XXXD				
			Normalized	**Measured**	**Normalized**	**Measured**			
UNC1 Strength [ksi]	**Mean**		88.676	89.850	64.444	64.984			
	Minimum		81.382	83.107	59.416	60.779			
	Maximum		96.623	98.635	68.055	68.775			
	C.V.(%)		4.613	4.289	3.813	3.597			
	No. Specimens		19		22				
	No. Prepreg Lots		3		3				
UNC1 Modulus [Msi]	**Mean**		7.758	7.851	7.945	8.027			
	Minimum		7.599	7.701	7.627	7.687			
	Maximum		7.946	8.014	8.289	8.392			
	C.V.(%)		1.166	1.056	2.607	2.622			
	No. Specimens		21		21				
	No. Prepreg Lots		3		3				

2.3.11 "10/80/10" Unnotched Compression 2 Properties (UNC2)

Material:	Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%						**Unnotched Compression 2** Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33% [45/-45/0/45/-45/90/45/-45/45/-45]S			
Resin content:	33.39 % wt		**Comp. density:**	1.577 g/cc						
Fiber volume:	59.00 % vol									
Ply count:	20									
Test method:	ASTM D 6641-09		**Modulus calculation:**	1000 to 3000 microstrain						
Normalized by:	0.0072	in. CPT								
			RTD		**ETW1**					
Test Temperature [°F]			70		180					
Moisture Conditioning			Dry		Equilbrium					
Equilbrium at T, RH					160 F,85%					
Source code			EPAXX XXXA		EPAXX XXXD					
			Normalized	**Measured**	**Normalized**	**Measured**				
UNC2 Strength [ksi]	**Mean**		64.512	65.165	44.188	44.575				
	Minimum		56.995	57.907	40.996	41.201				
	Maximum		72.731	72.938	47.382	48.134				
	C.V.(%)		6.814	6.835	4.087	4.359				
	No. Specimens		22		21					
	No. Prepreg Lots		3		3					
UNC2 Modulus [Msi]	**Mean**		4.977	5.030	4.658	4.699				
	Minimum		4.742	4.754	4.547	4.534				
	Maximum		5.088	5.167	4.784	4.849				
	C.V.(%)		1.637	1.766	1.397	1.709				
	No. Specimens		21		21					
	No. Prepreg Lots		3		3					

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

Material:	Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%						**Unnotched Compression 3** Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33% [45/0/90/0/-45/0/45/0/-45/0]S			
Resin content:	33.35 % wt		**Comp. density:**	1.574 g/cc						
Fiber volume:	58.93 % vol									
Ply count:	20									
Test method:	ASTM D 6641-09		**Modulus calculation:**	1000 to 3000 microstrain						
Normalized by:	0.0072	in. CPT								
			RTD		**ETW1**					
Test Temperature [°F]			70		180					
Moisture Conditioning			Dry		Equilbrium					
Equilbrium at T, RH					160 F,85%					
Source code			EPAYX XXXA		EPAYX XXXD					
			Normalized	**Measured**	**Normalized**	**Measured**				
UNC3 Strength [ksi]	**Mean**		124.738	125.938	90.187	91.406				
	Minimum		103.485	106.101	82.526	84.172				
	Maximum		137.855	138.738	96.080	97.962				
	C.V.(%)		8.668	8.558	3.998	4.112				
	No. Specimens		15		18					
	No. Prepreg Lots		3		3					
UNC3 Modulus [Msi]	**Mean**		11.930	12.055	12.074	12.204				
	Minimum		11.322	11.363	11.806	11.838				
	Maximum		12.241	12.403	12.389	12.452				
	C.V.(%)		2.068	2.341	1.292	1.513				
	No. Specimens		18		18					
	No. Prepreg Lots		3		3					

2.3.13 Lamina Short-Beam Strength Properties (SBS)

Material:	Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%							
Resin content:	33.42 % wt	**Comp. density:**	1.577 g/cc					
Fiber volume:	58.97 % vol							
Ply count:	34							
Test method:	ASTM D 2344-06							
Normalized by:	NA							
		CTD		**RTD**		**ETD1**		**ETW1**	
Test Temperature [°F]		-65		70		180		180	
Moisture Conditioning		Dry		Dry		Dry		Equilbrium	
Equilbrium at T, RH								160 F,85%	
Source code		EPAQX XXXB		EPAQX XXXA		EPAQX XXXC		EPAQX XXXD	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
SBS Strength [ksi]	**Mean**		19.953		15.600		12.328		9.806
	Minimum		18.966		15.174		11.993		9.340
	Maximum		20.435		15.908		12.644		10.301
	C.V.(%)		1.788		1.114		1.730		2.590
	No. Specimens		21		21		7		21
	No. Prepreg Lots		3		3		1		3

Short-Beam Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
[0]34

2.3.14 Laminate Short-Beam Strength Properties (SBS1)

Laminate Short-Beam Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
[45/0/-45/90]3S

Material:	Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%							
Resin content:	Refer OHC1	**Comp. density:**	Refer OHC1					
Fiber volume:	Refer OHC1							
Ply count:	24							
Test method:	ASTM D 2344-06							
Normalized by:	NA							
		RTD		**ETW1**				
Test Temperature [°F]		70		180				
Moisture Conditioning		Dry		Equilbrium				
Equilbrium at T, RH				160 F,85%				
Source code		EPAqX XXXA		EPAqX XXXD				
		Normalized	**Measured**	**Normalized**	**Measured**			
SBS1 Strength [ksi]	**Mean**		13.273		8.868			
	Minimum		12.355		8.365			
	Maximum		13.584		9.229			
	C.V.(%)		2.408		2.410			
	No. Specimens		23		21			
	No. Prepreg Lots		3		3			

Test specimens machined from OHC1 panels.

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

Material:	Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%							**Open-Hole Tension 1** Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33% [45/0/-45/90]2S	
Resin content:	33.65 % wt		**Comp. density:**	1.570 g/cc					
Fiber volume:	58.54 % vol								
Ply count:	16								
Test method:	ASTM D 5766-11								
Normalized by:	0.0072	in. CPT							
			CTD		**RTD**		**ETW1**		
Test Temperature [°F]			-65		70		180		
Moisture Conditioning			Dry		Dry		Equilbrium		
Equilbrium at T, RH							160 F,85%		
Source code			EPADX XXXB		EPADX XXXA		EPADX XXXD		
			Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	
OHT1 Strength [ksi]	**Mean**		77.970	78.519	77.592	78.130	74.391	75.047	
	Minimum		75.033	74.524	73.677	73.496	70.457	71.221	
	Maximum		85.857	86.382	81.418	81.978	79.207	78.627	
	C.V.(%)		3.446	3.580	2.487	2.576	2.467	2.505	
	No. Specimens		21		21		22		
	No. Prepreg Lots		3		3		3		

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

Material:	Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%							**Open-Hole Tension 2** Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33% [45/-45/0/45/-45/90/45/-45/45/-45]S	
Resin content:	33.69 % wt		**Comp. density:**	1.573 g/cc					
Fiber volume:	58.60 % vol								
Ply count:	20								
Test method:	ASTM D 5766-11								
Normalized by:	0.0072	in. CPT							
			CTD		**RTD**		**ETW1**		
Test Temperature [°F]			-65		70		180		
Moisture Conditioning			Dry		Dry		Equilbrium		
Equilbrium at T, RH							160 F,85%		
Source code			EPAEX XXXB		EPAEX XXXA		EPAEX XXXD		
			Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	
OHT2 Strength [ksi]	**Mean**		55.137	55.456	51.976	52.241	45.847	46.091	
	Minimum		53.486	54.284	50.602	50.449	44.565	44.357	
	Maximum		56.785	57.245	52.843	53.285	46.677	47.346	
	C.V.(%)		1.605	1.677	1.138	1.463	1.368	1.458	
	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 Cycom EP2202 IM7G Unitape Gr 190 RC 33%							**Open-Hole Tension 3** Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33% [0/45/0/90/0/-45/0/45/0/-45]S	
Resin content:	33.69 % wt		**Comp. density:**	1.570 g/cc					
Fiber volume:	58.49 % vol								
Ply count:	20								
Test method:	ASTM D 5766-11								
Normalized by:	0.0072	in. CPT							
			CTD		**RTD**		**ETW1**		
Test Temperature [°F]			-65		70		180		
Moisture Conditioning			Dry		Dry		Equilbrium		
Equilbrium at T, RH							160 F,85%		
Source code			EPAFX XXXB		EPAFX XXXA		EPAFX XXXD		
			Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	
OHT3 Strength [ksi]	**Mean**		116.767	116.554	118.698	118.769	116.507	116.830	
	Minimum		111.462	110.756	114.991	112.734	111.950	110.872	
	Maximum		120.933	121.553	123.971	124.516	120.932	121.423	
	C.V.(%)		2.226	2.791	2.126	2.679	2.379	2.788	
	No. Specimens		21		21		21		
	No. Prepreg Lots		3		3		3		

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

Material:	Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%							**Filled-Hole Tension 1** Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33% [45/0/-45/90]2S	
Resin content:	33.53 % wt		**Comp. density:**	1.573 g/cc					
Fiber volume:	58.69 % vol								
Ply count:	16								
Test method:	ASTM D 6742-07								
Normalized by:	0.0072	in. CPT							
			CTD		**RTD**		**ETW1**		
Test Temperature [°F]			-65		70		180		
Moisture Conditioning			Dry		Dry		Equilbrium		
Equilbrium at T, RH							160 F,85%		
Source code			EPA4X XXXB		EPA4X XXXA		EPA4X XXXD		
			Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	
FHT1 Strength [ksi]	**Mean**		82.585	82.789	79.588	79.673	74.510	74.880	
	Minimum		79.999	78.067	73.768	75.226	72.143	71.287	
	Maximum		85.417	85.599	82.769	83.567	77.821	78.479	
	C.V.(%)		1.823	2.651	2.344	3.085	2.097	2.802	
	No. Specimens		21		21		21		
	No. Prepreg Lots		3		3		3		

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

Material:	Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%							**Filled-Hole Tension 2** Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33% [45/-45/0/45/-45/90/45/-45/45/-45]S	
Resin content:	33.84 % wt		**Comp. density:**	1.573 g/cc					
Fiber volume:	58.46 % vol								
Ply count:	20								
Test method:	ASTM D 6742-07								
Normalized by:	0.0072	in. CPT							
			CTD		**RTD**		**ETW1**		
Test Temperature [°F]			-65		70		180		
Moisture Conditioning			Dry		Dry		Equilbrium		
Equilbrium at T, RH							160 F,85%		
Source code			EPA5X XXXB		EPA5X XXXA		EPA5X XXXD		
			Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	
FHT2 Strength [ksi]	**Mean**		62.327	62.401	57.767	57.804	48.563	48.736	
	Minimum		59.447	59.087	53.017	54.241	45.953	46.686	
	Maximum		64.673	65.584	60.963	61.130	50.795	49.962	
	C.V.(%)		2.522	2.565	3.555	3.235	2.352	2.054	
	No. Specimens		21		21		21		
	No. Prepreg Lots		3		3		3		

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

Material:	Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%							**Filled-Hole Tension 3** Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33% [0/45/0/90/0/-45/0/45/0/-45]S	
Resin content:	33.83 % wt		**Comp. density:**	1.578 g/cc					
Fiber volume:	58.68 % vol								
Ply count:	20								
Test method:	ASTM D 6742-07								
Normalized by:	0.0072	in. CPT							
			CTD		**RTD**		**ETW1**		
Test Temperature [°F]			-65		70		180		
Moisture Conditioning			Dry		Dry		Equilbrium		
Equilbrium at T, RH							160 F,85%		
Source code			EPA6X XXXB		EPA6X XXXA		EPA6X XXXD		
			Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	
FHT3 Strength [ksi]	**Mean**		113.350	113.895	114.276	114.660	109.032	109.662	
	Minimum		108.288	107.147	103.163	102.699	101.982	101.046	
	Maximum		118.808	119.751	119.578	121.628	114.129	114.715	
	C.V.(%)		2.458	3.222	3.806	4.570	3.058	3.538	
	No. Specimens		22		21		21		
	No. Prepreg Lots		3		3		3		

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

Material:	Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%						**Open-Hole Compression 1** Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33% [45/0/-45/90]3S		
Resin content:	33.37 % wt		**Comp. density:**	1.566 g/cc					
Fiber volume:	58.62 % vol								
Ply count:	24								
Test method:	ASTM D 6484-09								
Normalized by:	0.0072	in. CPT							
			RTD		**ETW1**				
Test Temperature [°F]			70		180				
Moisture Conditioning			Dry		Equilbrium				
Equilbrium at T, RH					160 F, 85%				
Source code			EPAGX XXXA		EPAGX XXXD				
			Normalized	**Measured**	**Normalized**	**Measured**			
OHC1 Strength [ksi]	**Mean**		48.922	49.049	36.343	36.426			
	Minimum		46.723	47.009	34.928	34.773			
	Maximum		50.194	51.238	37.253	37.901			
	C.V.(%)		1.827	2.379	1.755	2.596			
	No. Specimens		21		22				
	No. Prepreg Lots		3		3				

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

Material:	Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%						**Open-Hole Compression 2** Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33% [45/-45/0/45/-45/90/45/-45/45/-45]S			
Resin content:	34.10 % wt		**Comp. density:**	1.570 g/cc						
Fiber volume:	58.15 % vol									
Ply count:	20									
Test method:	ASTM D 6484-09									
Normalized by:	0.0072	in. CPT								
			RTD		**ETW1**					
Test Temperature [°F]			70		180					
Moisture Conditioning			Dry		Equilbrium					
Equilbrium at T, RH					160 F,85%					
Source code			EPAHX XXXA		EPAHX XXXD					
			Normalized	**Measured**	**Normalized**	**Measured**				
OHC2 Strength [ksi]	**Mean**		42.898	43.024	33.782	33.913				
	Minimum		39.881	40.490	32.054	32.564				
	Maximum		45.114	44.743	36.236	35.817				
	C.V.(%)		3.291	2.558	3.081	2.464				
	No. Specimens		21		22					
	No. Prepreg Lots		3		3					

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

Material:	Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%						**Open-Hole Compression 3** Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33% [0/45/0/90/0/-45/0/45/0/-45]S		
Resin content:	33.90 % wt		**Comp. density:**	1.571 g/cc					
Fiber volume:	58.33 % vol								
Ply count:	20								
Test method:	ASTM D 6484-09								
Normalized by:	0.0072	in. CPT							
			RTD		**ETW1**				
Test Temperature [°F]			70		180				
Moisture Conditioning			Dry		Equilbrium				
Equilbrium at T, RH					160 F,85%				
Source code			EPAIX XXXA		EPAIX XXXD				
			Normalized	**Measured**	**Normalized**	**Measured**			
OHC3 Strength [ksi]	**Mean**		58.359	58.520	46.650	46.736			
	Minimum		54.874	53.614	43.960	43.063			
	Maximum		64.175	65.625	50.758	51.685			
	C.V.(%)		4.808	5.878	4.475	5.306			
	No. Specimens		21		23				
	No. Prepreg Lots		3		3				

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

Material:	Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%						**Filled-Hole Compression 1** Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33% [45/0/-45/90]3S		
Resin content:	33.77 % wt		**Comp. density:**	1.573 g/cc					
Fiber volume:	58.53 % vol								
Ply count:	24								
Test method:	ASTM D 6742-07								
Normalized by:	0.0072	in. CPT							
			RTD		**ETW1**				
Test Temperature [°F]			70		180				
Moisture Conditioning			Dry		Equilbrium				
Equilbrium at T, RH					160 F,85%				
Source code			EPA7X XXXA		EPA7X XXXD				
			Normalized	**Measured**	**Normalized**	**Measured**			
FHC1 Strength [ksi]	**Mean**		69.032	69.210	51.831	52.075			
	Minimum		64.814	66.455	47.705	48.081			
	Maximum		73.196	71.648	54.545	55.144			
	C.V.(%)		3.180	2.487	3.803	4.115			
	No. Specimens		21		21				
	No. Prepreg Lots		3		3				

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

Material:	Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%						**Filled-Hole Compression 2** Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33% [45/-45/0/45/-45/90/45/-45/45/-45]S			
Resin content:	33.80 % wt		**Comp. density:**	1.576 g/cc						
Fiber volume:	58.61 % vol									
Ply count:	20									
Test method:	ASTM D 6742-07									
Normalized by:	0.0072	in. CPT								
			RTD		**ETW1**					
Test Temperature [°F]			70		180					
Moisture Conditioning			Dry		Equilbrium					
Equilbrium at T, RH					160 F,85%					
Source code			EPA8X XXXA		EPA8X XXXD					
			Normalized	**Measured**	**Normalized**	**Measured**				
FHC2 Strength [ksi]	**Mean**		56.774	57.001	44.209	44.383				
	Minimum		52.196	51.979	41.445	41.570				
	Maximum		61.638	62.389	46.401	46.694				
	C.V.(%)		3.864	4.234	2.726	3.026				
	No. Specimens		21		24					
	No. Prepreg Lots		3		3					

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

Material:	Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%						**Filled-Hole Compression 3** Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33% [0/45/0/90/0/-45/0/45/0/-45]S		
Resin content:	33.76 % wt		**Comp. density:**	1.573 g/cc					
Fiber volume:	58.53 % vol								
Ply count:	20								
Test method:	ASTM D 6742-07								
Normalized by:	0.0072	in. CPT							
			RTD		**ETW1**				
Test Temperature [°F]			70		180				
Moisture Conditioning			Dry		Equilbrium				
Equilbrium at T, RH					160 F,85%				
Source code			EPA9X XXXA		EPA9X XXXD				
			Normalized	**Measured**	**Normalized**	**Measured**			
FHC3 Strength [ksi]	**Mean**		85.006	85.503	64.591	65.067			
	Minimum		80.011	77.902	61.124	62.387			
	Maximum		88.866	89.938	66.449	67.448			
	C.V.(%)		3.056	3.483	2.132	2.198			
	No. Specimens		23		21				
	No. Prepreg Lots		3		3				

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

Material:	Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%						**Single-Shear Bearing 1** Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33% [45/0/-45/90]2S		
Resin content:	33.48 % wt		**Comp. density:**	1.570 g/cc					
Fiber volume:	58.66 % vol								
Ply count:	16								
Test method:	ASTM D 5961-10								
Normalized by:	0.0072	in. CPT							
			RTD		**ETW1**				
Test Temperature [°F]			70		180				
Moisture Conditioning			Dry		Equilbrium				
Equilbrium at T, RH					160 F,85%				
Source code			EPA1X XXXA		EPA1X XXXD				
			Normalized	**Measured**	**Normalized**	**Measured**			
	Mean		125.894	126.055	97.740	98.214			
	Minimum		118.393	119.693	91.971	92.024			
	Maximum		131.017	131.762	102.413	104.238			
SSB1 2% Offset Strength [ksi]	**C.V.(%)**		3.126	3.098	2.888	3.425			
	No. Specimens			21		21			
	No. Prepreg Lots			3		3			
	Mean		148.180	148.363	116.818	117.368			
	Minimum		136.264	139.845	112.052	111.971			
	Maximum		157.306	160.066	121.481	121.079			
SSB1 Ultimate Strength [ksi]	**C.V.(%)**		3.306	3.186	2.209	2.285			
	No. Specimens			21		21			
	No. Prepreg Lots			3		3			

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

Material:	Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%						**Single-Shear Bearing 2** Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33% [45/-45/0/45/-45/90/45/-45/45/-45]S			
Resin content:	33.30 % wt		**Comp. density:**	1.571 g/cc						
Fiber volume:	58.87 % vol									
Ply count:	20									
Test method:	ASTM D 5961-10									
Normalized by:	0.0072	in. CPT								
			RTD		**ETW1**					
Test Temperature [°F]			70		180					
Moisture Conditioning			Dry		Equilbrium					
Equilbrium at T, RH					160 F,85%					
Source code			EPA2X XXXA		EPA2X XXXD					
			Normalized	**Measured**	**Normalized**	**Measured**				
	Mean		125.181	126.066	93.289	93.874				
	Minimum		119.471	121.668	80.802	80.774				
	Maximum		136.337	137.707	102.055	103.312				
SSB2 2% Offset Strength [ksi]	**C.V.(%)**		2.992	2.880	6.243	6.525				
	No. Specimens			22		21				
	No. Prepreg Lots			3		3				
	Mean		151.210	152.289	121.573	122.307				
	Minimum		148.643	147.907	112.796	116.115				
	Maximum		157.670	157.899	127.908	128.192				
SSB2 Ultimate Strength [ksi]	**C.V.(%)**		1.676	1.880	3.126	2.940				
	No. Specimens			22		21				
	No. Prepreg Lots			3		3				

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

Material:	Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%						**Single-Shear Bearing 3** Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33% [0/45/0/90/0/-45/0/45/0/-45]S		
Resin content:	33.81 % wt		**Comp. density:**	1.570 g/cc					
Fiber volume:	58.40 % vol								
Ply count:	20								
Test method:	ASTM D 5961-10								
Normalized by:	0.0072	in. CPT							
			RTD		**ETW1**				
Test Temperature [°F]			70		180				
Moisture Conditioning			Dry		Equilbrium				
Equilbrium at T, RH					160 F,85%				
Source code			EPA3X XXXA		EPA3X XXXD				
			Normalized	**Measured**	**Normalized**	**Measured**			
SSB3 Initial Peak Bearing Strength [ksi]	**Mean**		117.532	117.479					
	Minimum		112.223	111.603					
	Maximum		122.669	124.763					
	C.V.(%)		2.758	2.876					
	No. Specimens			17					
	No. Prepreg Lots			3					
SSB3 2% Offset Strength [ksi]	**Mean**		127.739	127.999	94.054	94.153			
	Minimum		122.072	122.345	88.141	86.894			
	Maximum		134.728	134.775	101.734	100.524			
	C.V.(%)		2.514	2.786	3.634	3.858			
	No. Specimens			21		21			
	No. Prepreg Lots			3		3			
SSB3 Ultimate Strength [ksi]	**Mean**		152.253	152.574	118.553	118.674			
	Minimum		142.987	142.197	112.024	113.749			
	Maximum		157.627	160.317	122.291	124.144			
	C.V.(%)		2.404	2.962	2.028	2.350			
	No. Specimens			21		21			
	No. Prepreg Lots			3		3			

2.3.30 Compression After Impact 1 Properties (CAI1)

Material:	Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%									**Compression After Impact 1** Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33% [45/0/-45/90]4S	
Resin content:	33.87 % wt		**Comp. density:**	1.574 g/cc							
Fiber volume:	58.48 % vol										
Ply count:	32										
Test method:	ASTM D7136/7137-07										
Normalized by:	0.0072	in. CPT									
			RTD								
Test Temperature [°F]			70								
Moisture Conditioning			Dry								
Equilbrium at T, RH											
Source code			EPAKX XXXA								
		Normalized	**Measured**								
	Mean	50.093	50.313								
	Minimum	46.734	46.887								
	Maximum	55.016	56.153								
CAI Strength [ksi]	**C.V.(%)**	4.589	5.139								
	No. Specimens		21								
	No. Prepreg Lots		3								

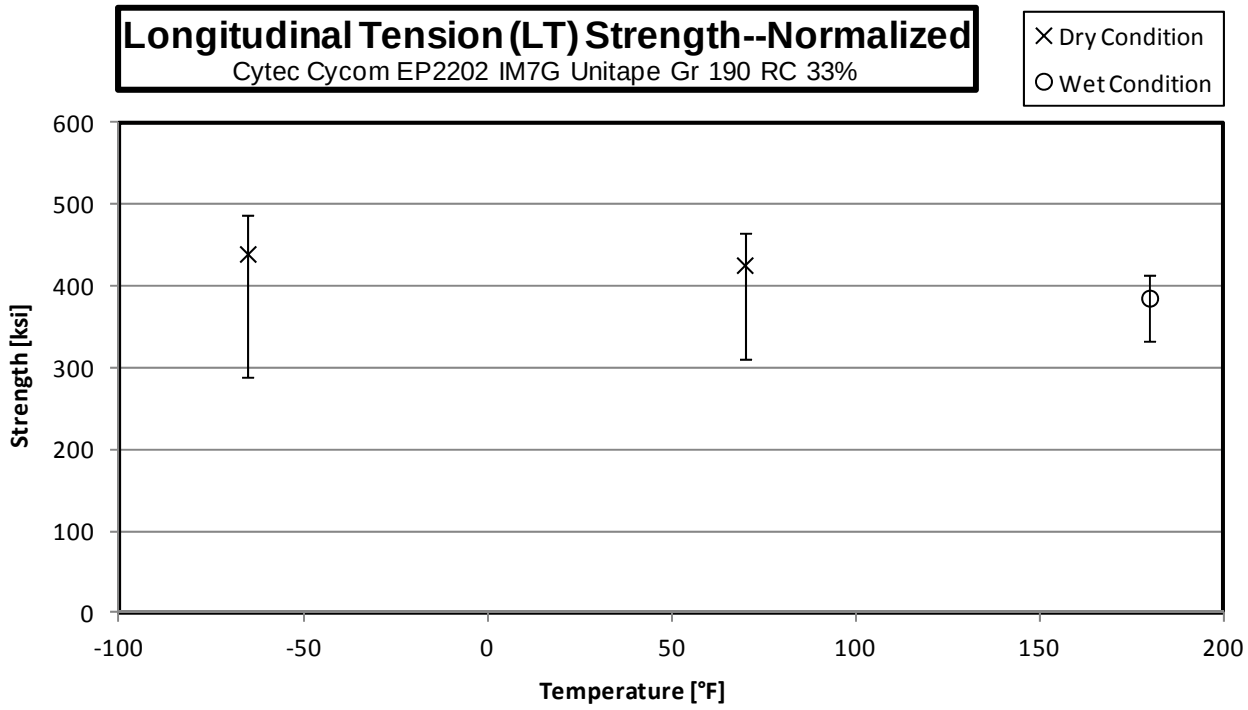
2.3.31 Interlaminar Tension Properties (ILT)

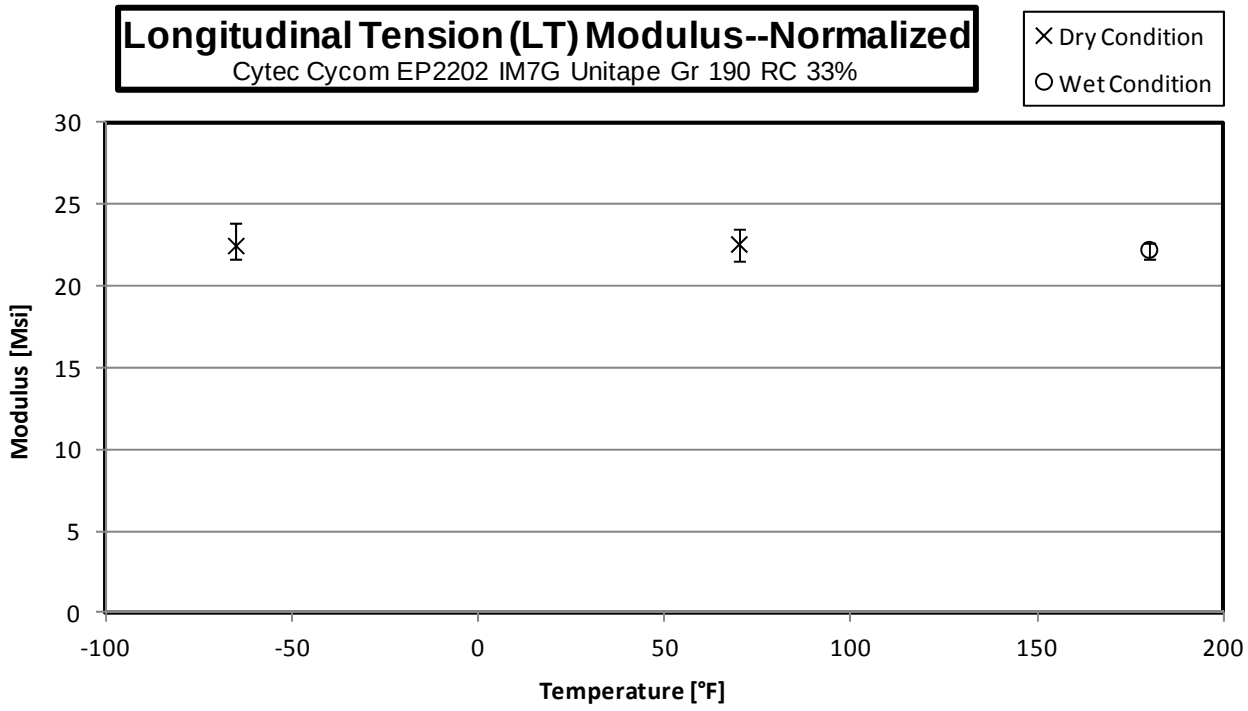
Material:	Cytec Cycom EP 2202 IM7G Unitape Gr 190 RC 33%						**Interlaminar Tension** Cytec Cycom EP 2202 IM7G Unitape Gr 190 RC 33% [0]22		
Resin content	33.36 % wt		**Comp. density:** 1.580 g/cc						
Fiber volume:	59.16 % vol								
Ply count	30								
Test method:	ASTM D 6415-06								
Normalized by:	NA	in. CPT							
		CTD		**RTD**		**ETW2**			
Test Temperature [F]		-65		70		180			
Moisture Conditioning		Dry		Dry		Equilbrium			
Equilbrium at T, RH						160 F,85%			
Source code		EPAMX XXXB		EPAMX XXXA		EPAMX XXXF			
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**		
CBS [lb]	**Mean**		206.183		164.398		153.193		
	Minimum		166.393		153.475		119.791		
	Maximum		233.365		180.852		180.235		
	C.V.(%)		11.917		5.904		14.791		
	No. Specimens	7		6		6			
	No. Prepreg Lots	1		1		1			
ILT [ksi]	**Mean**		6.186		4.962		4.568		
	Minimum		4.985		4.640		3.580		
	Maximum		7.004		5.480		5.372		
	C.V.(%)		12.047		5.987		14.639		
	No. Specimens	7		6		6			
	No. Prepreg Lots	1		1		1			

3. Individual Test Charts

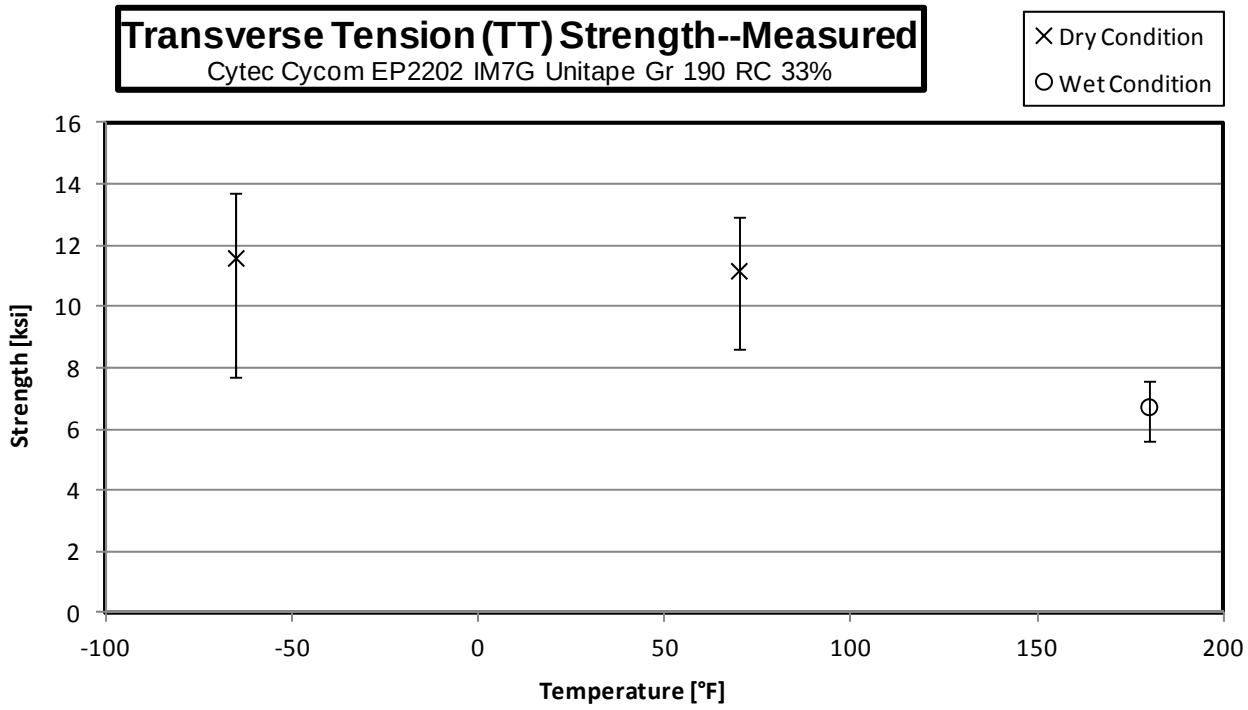
These charts combine all three batches of data and plot the minimum and maximum modulus and strength range based on the test temperature.

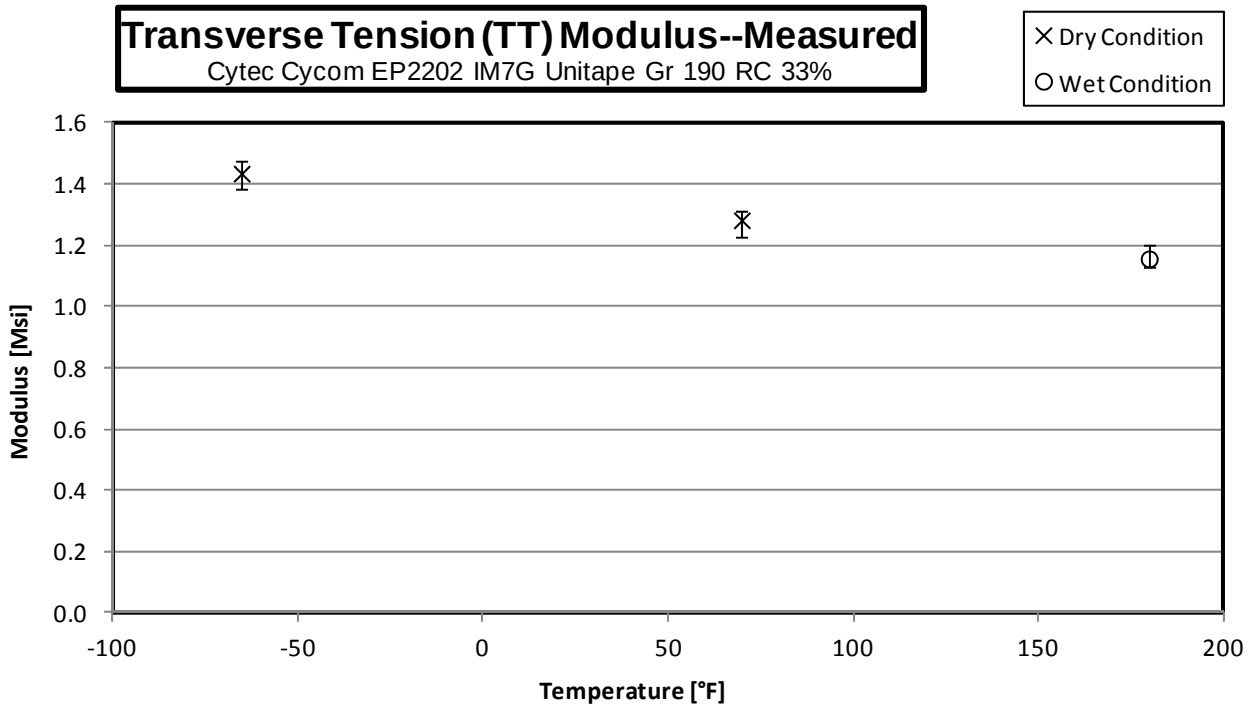
3.1 Longitudinal Tension Properties (LT)



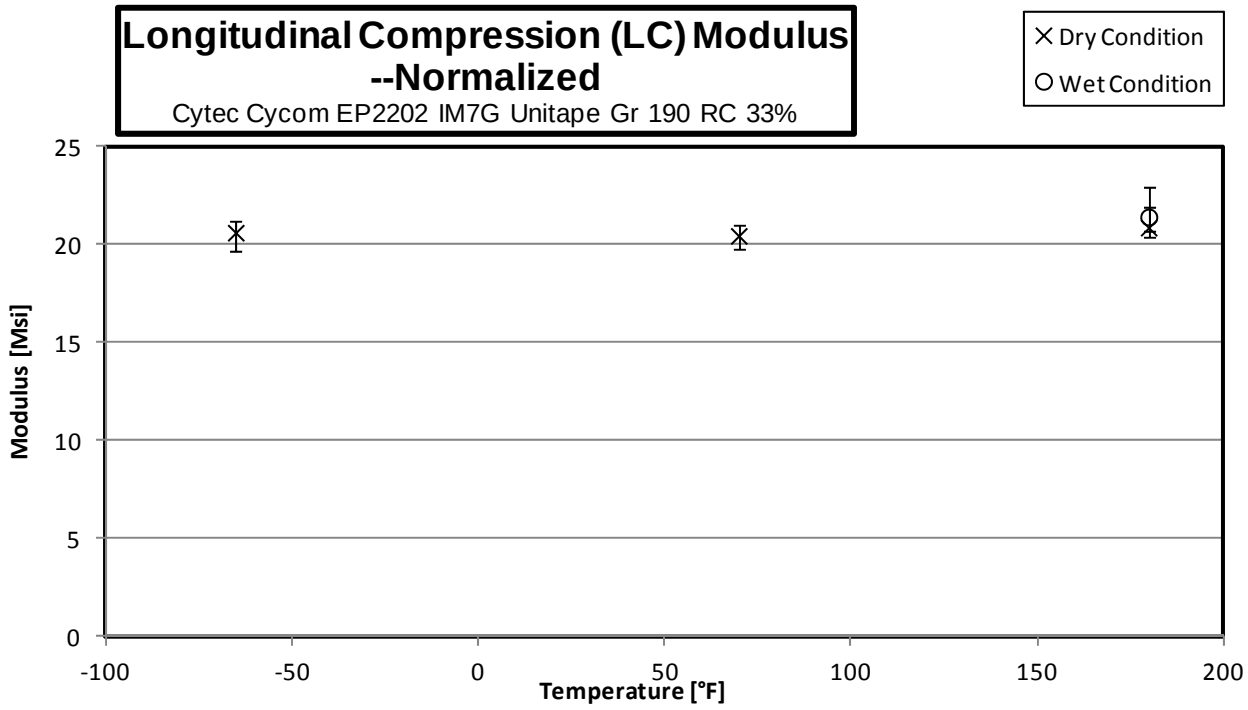


3.2 Transverse Tension Properties (TT)

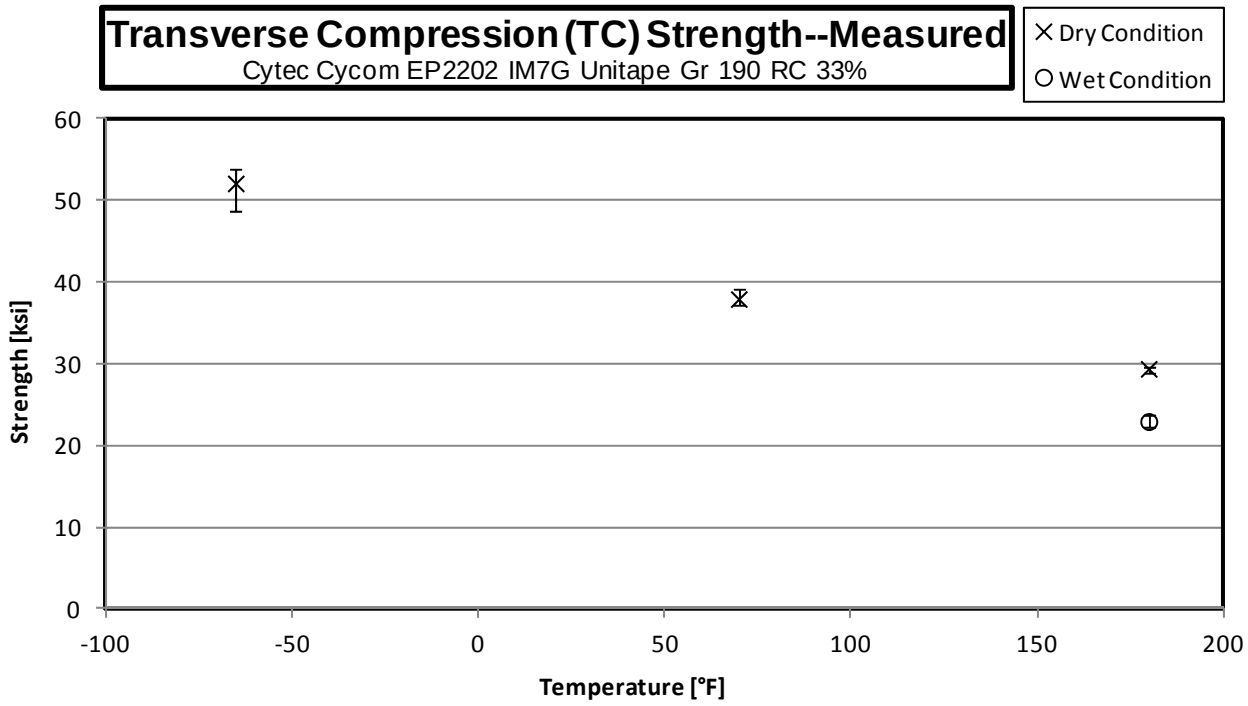


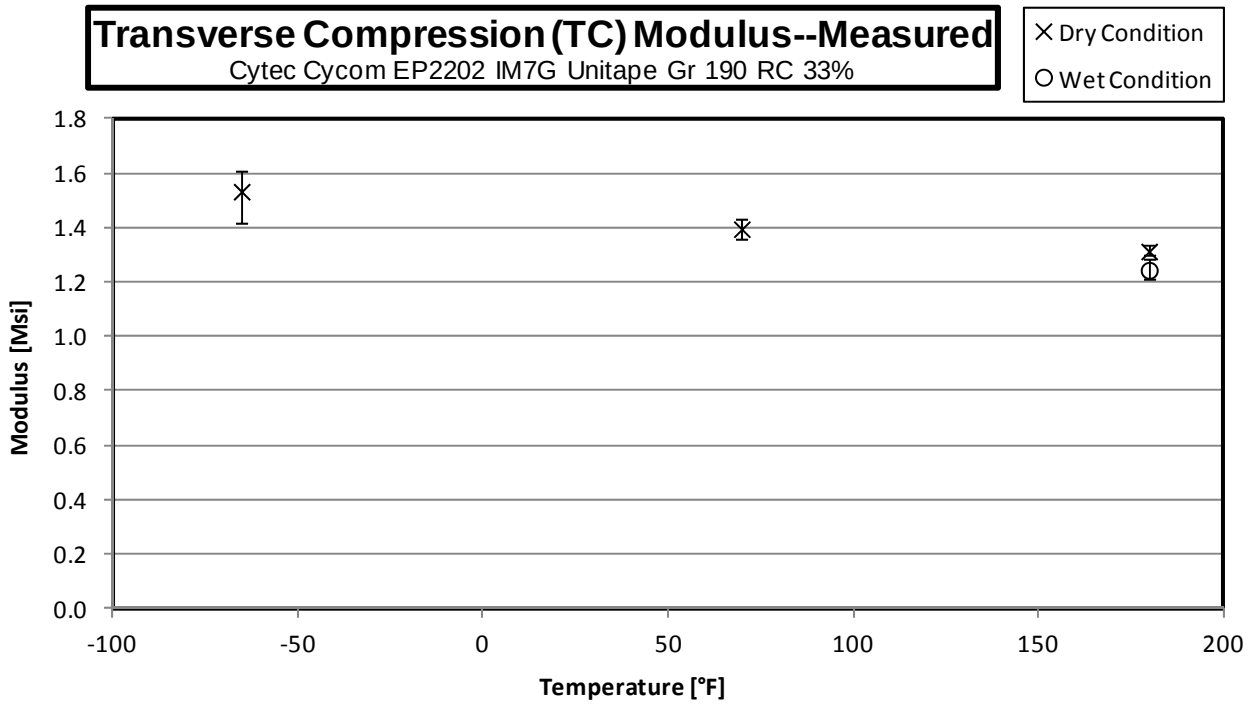


3.3 Longitudinal Compression Properties (LC)

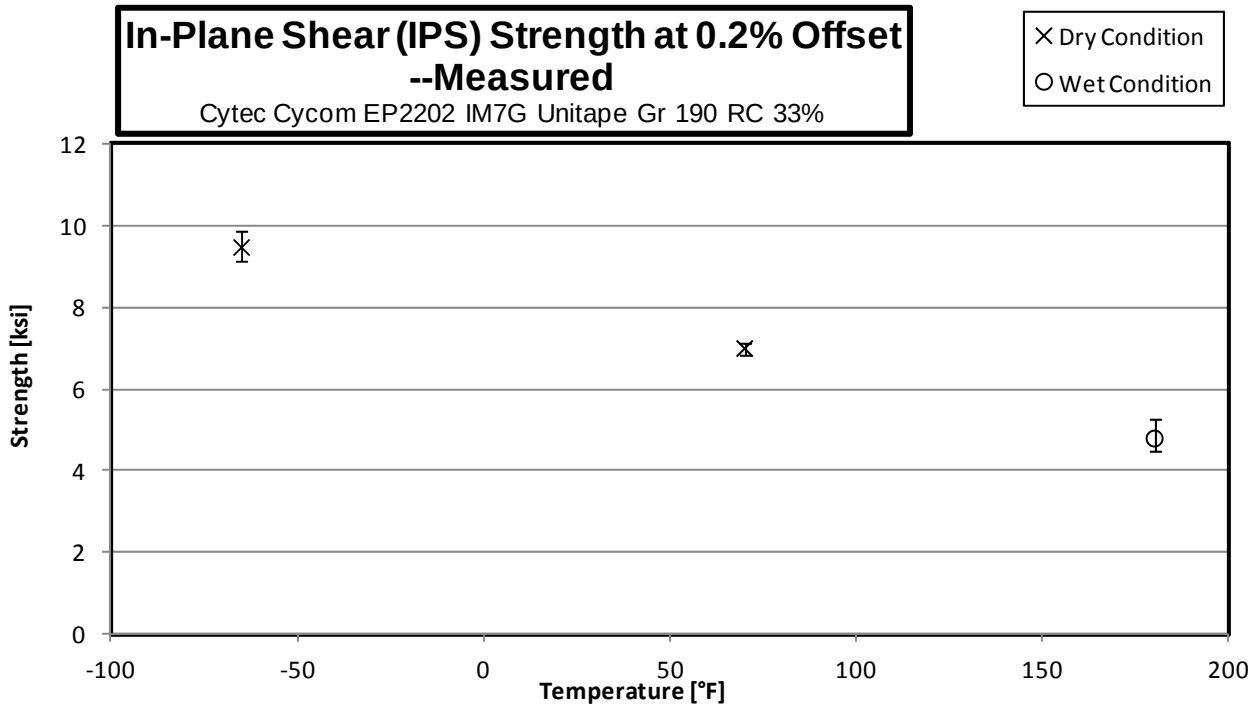


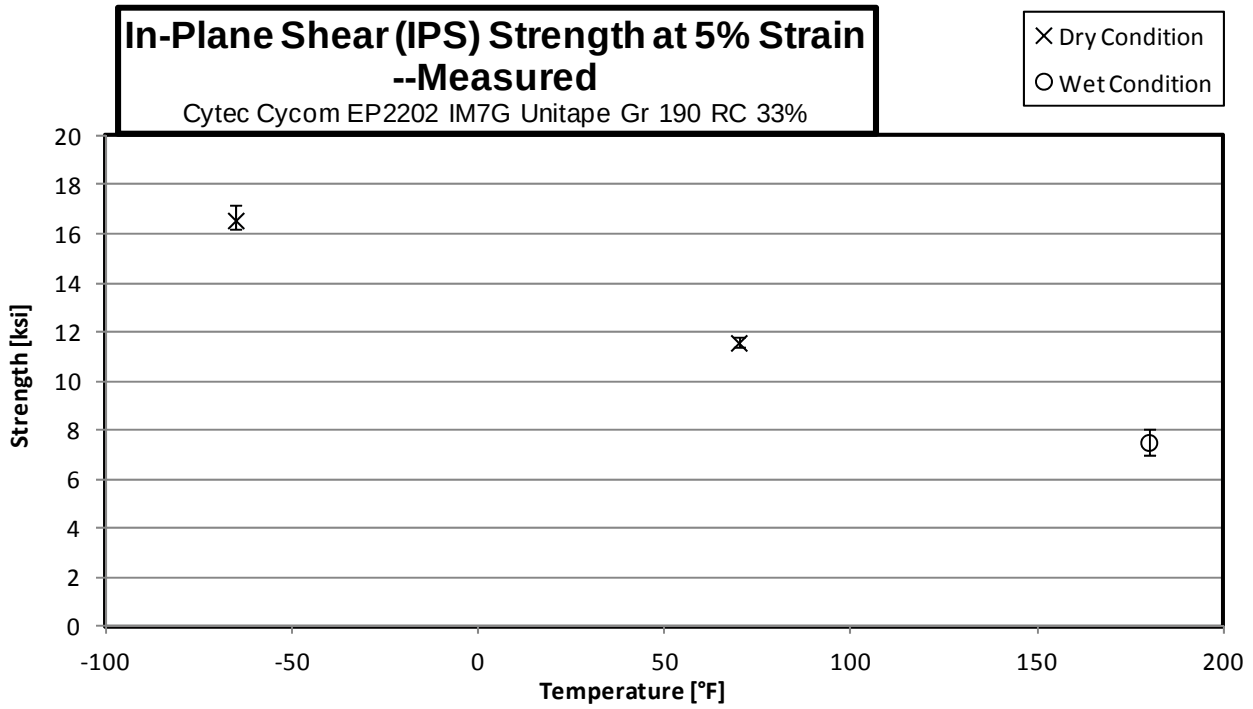
3.4 Transverse Compression Properties (TC)

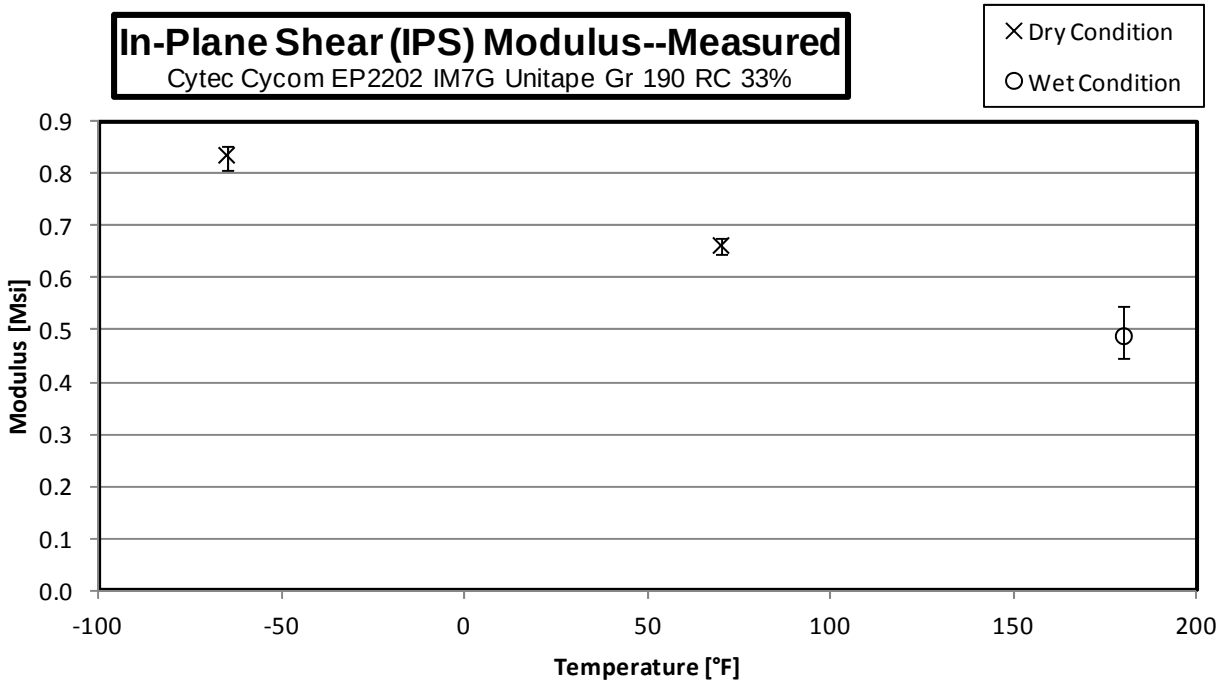




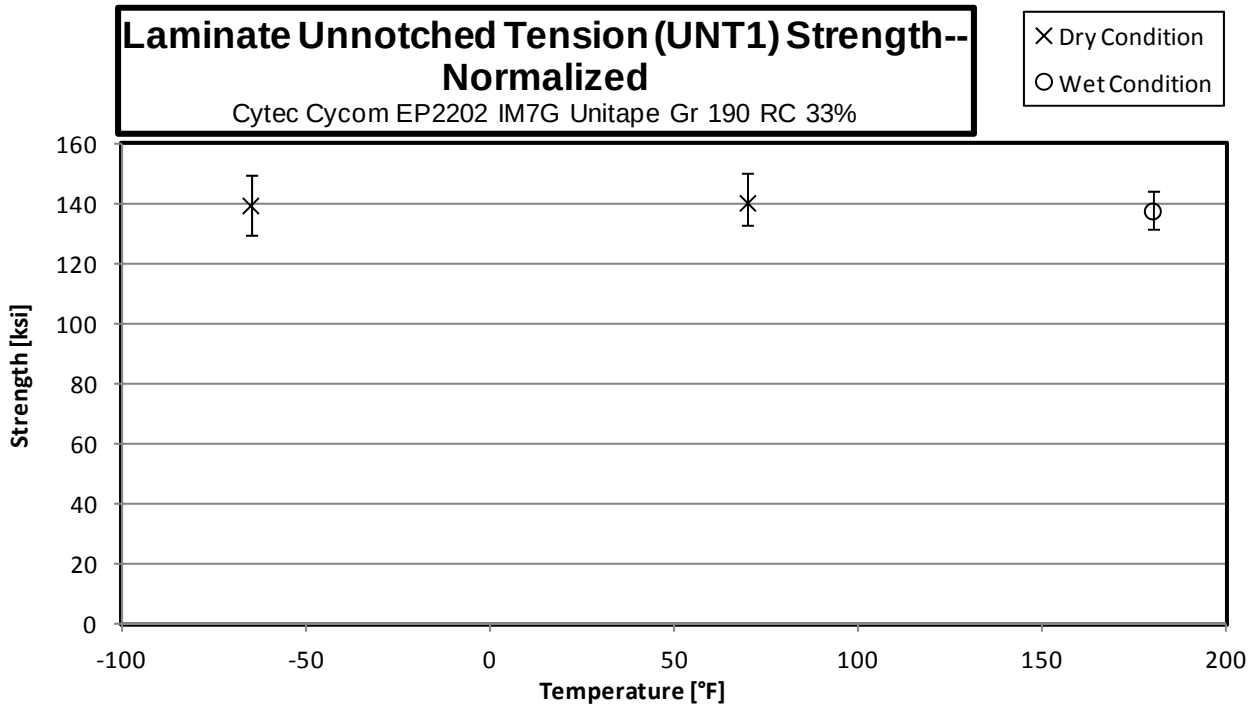
3.5 In-Plane Shear Properties (IPS)

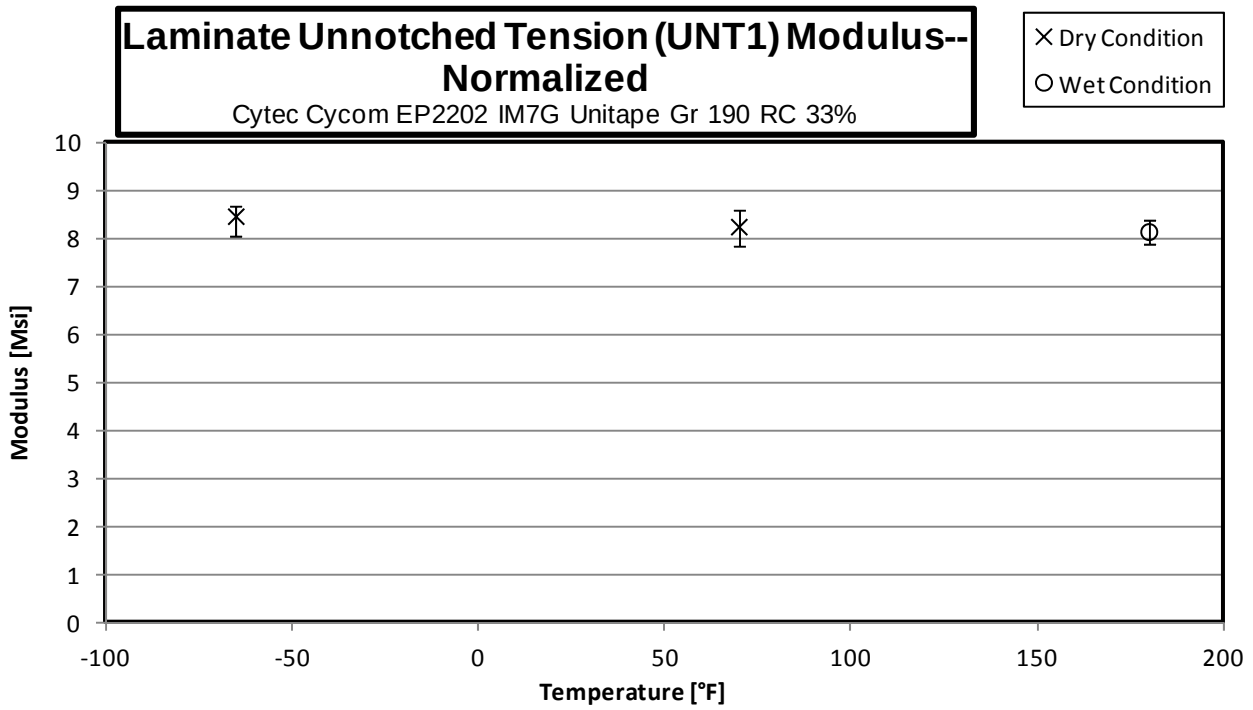




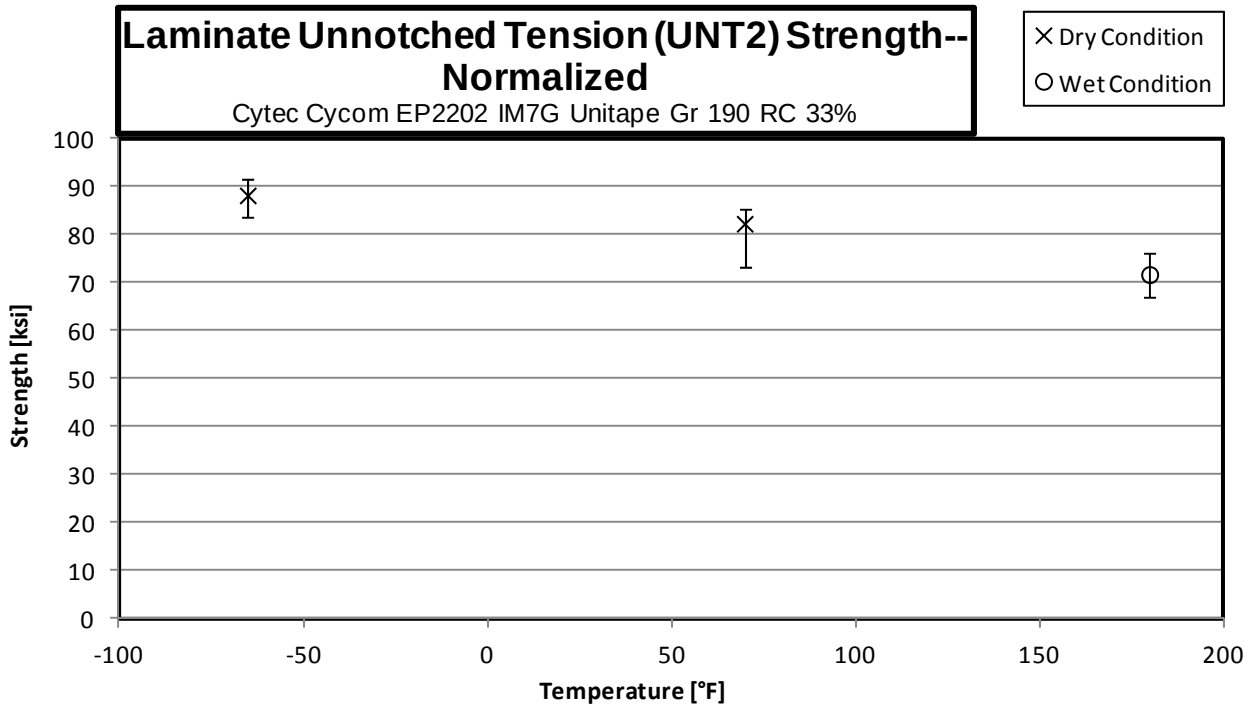

In-Plane Shear (IPS) Modulus--Measured
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Dry Condition
Wet Condition
Modulus [Msi]
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-100
-50
0
50
100
150
200
Temperature [°F]

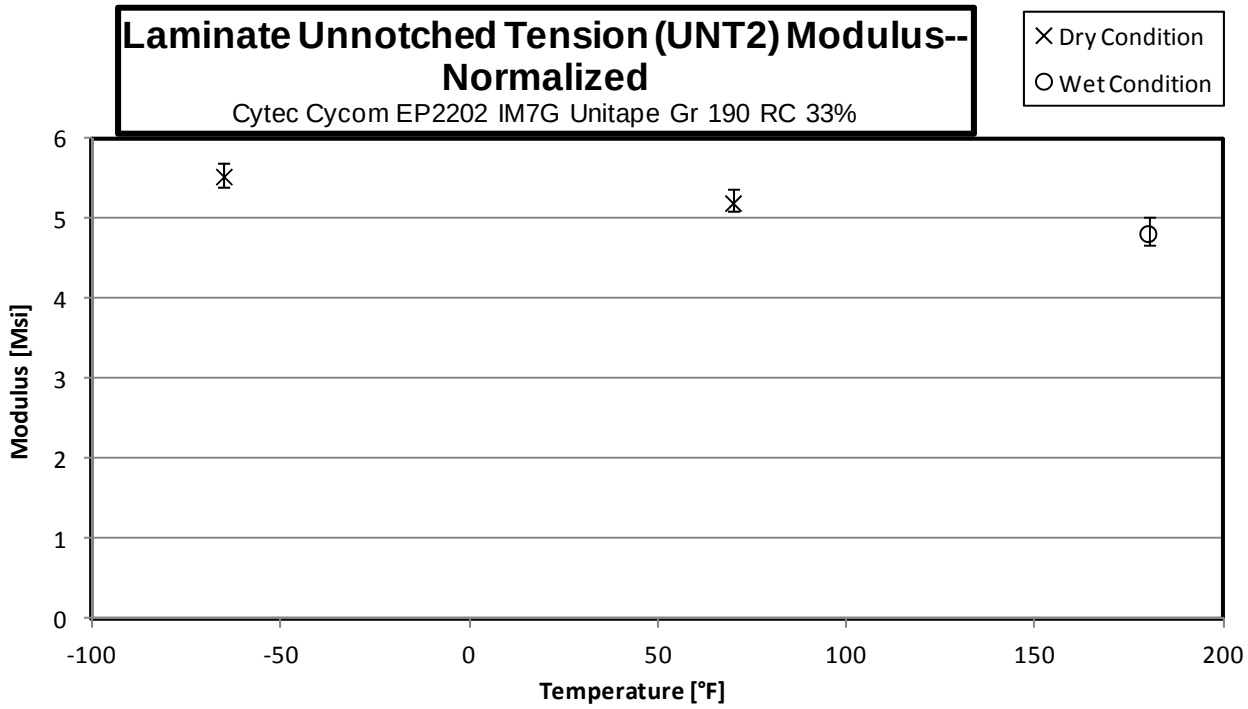
3.6 "25/50/25" Unnotched Tension 1 Properties (UNT1)



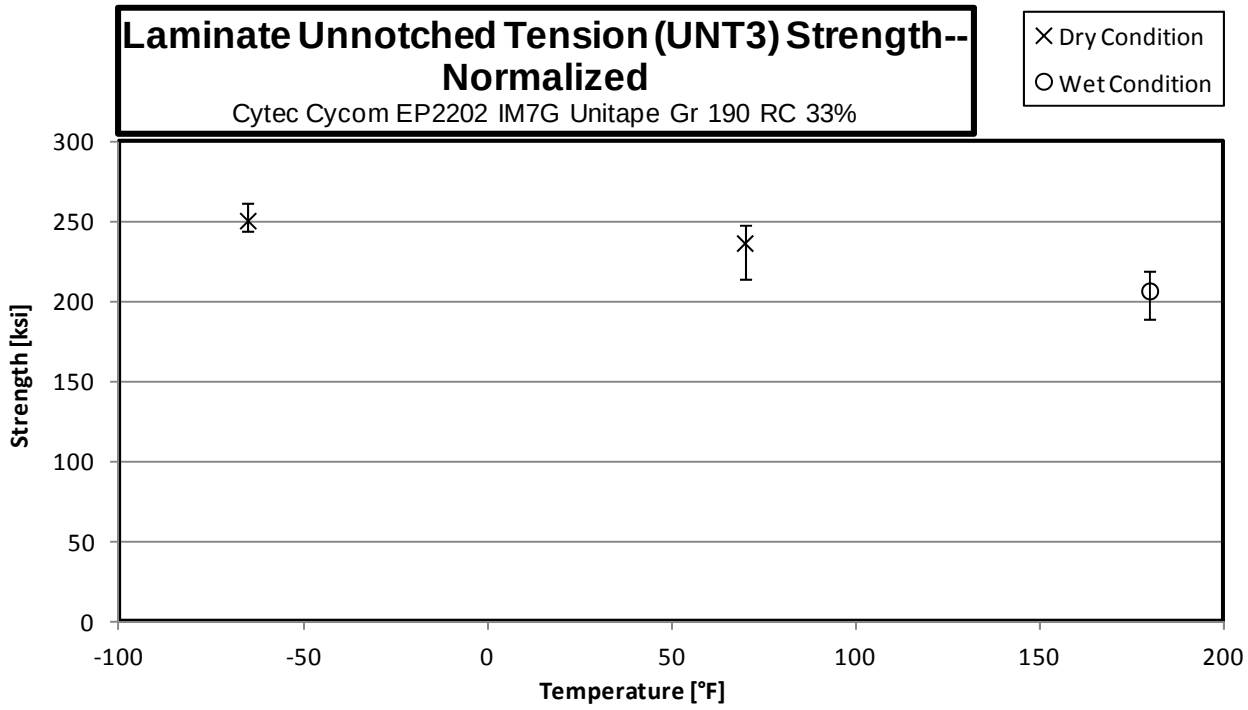


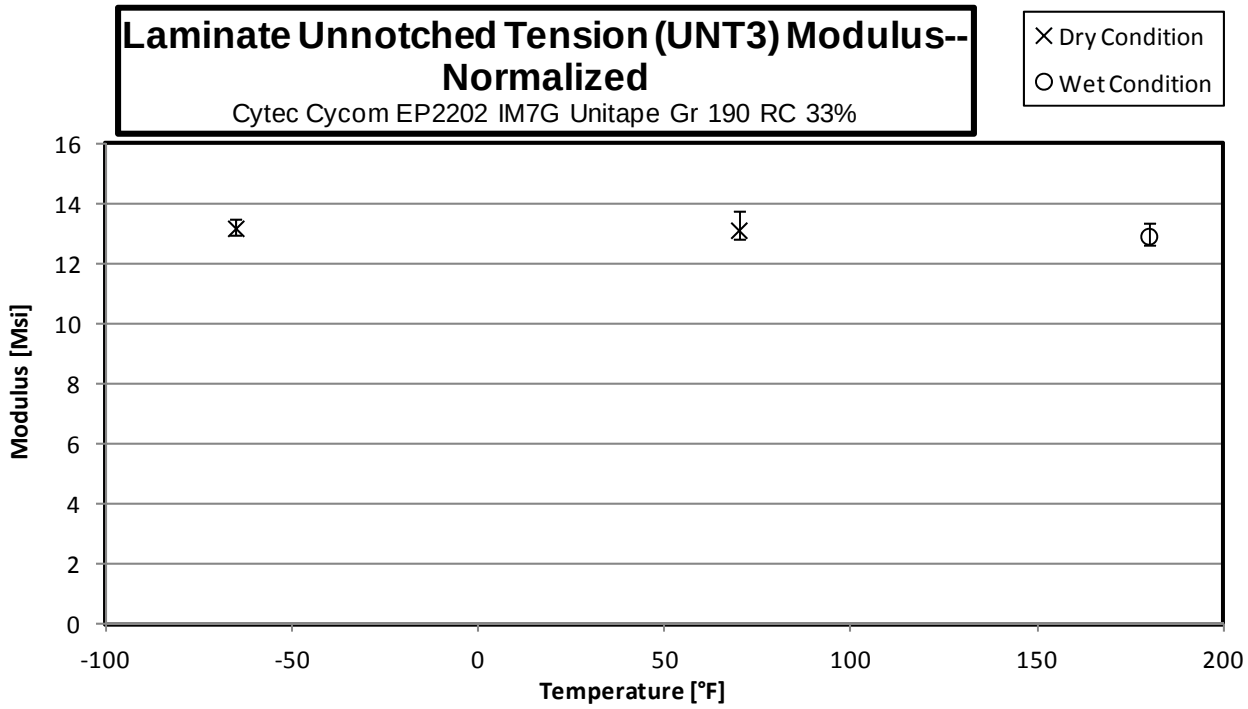
3.7 "10/80/10" Unnotched Tension 2 Properties (UNT2)



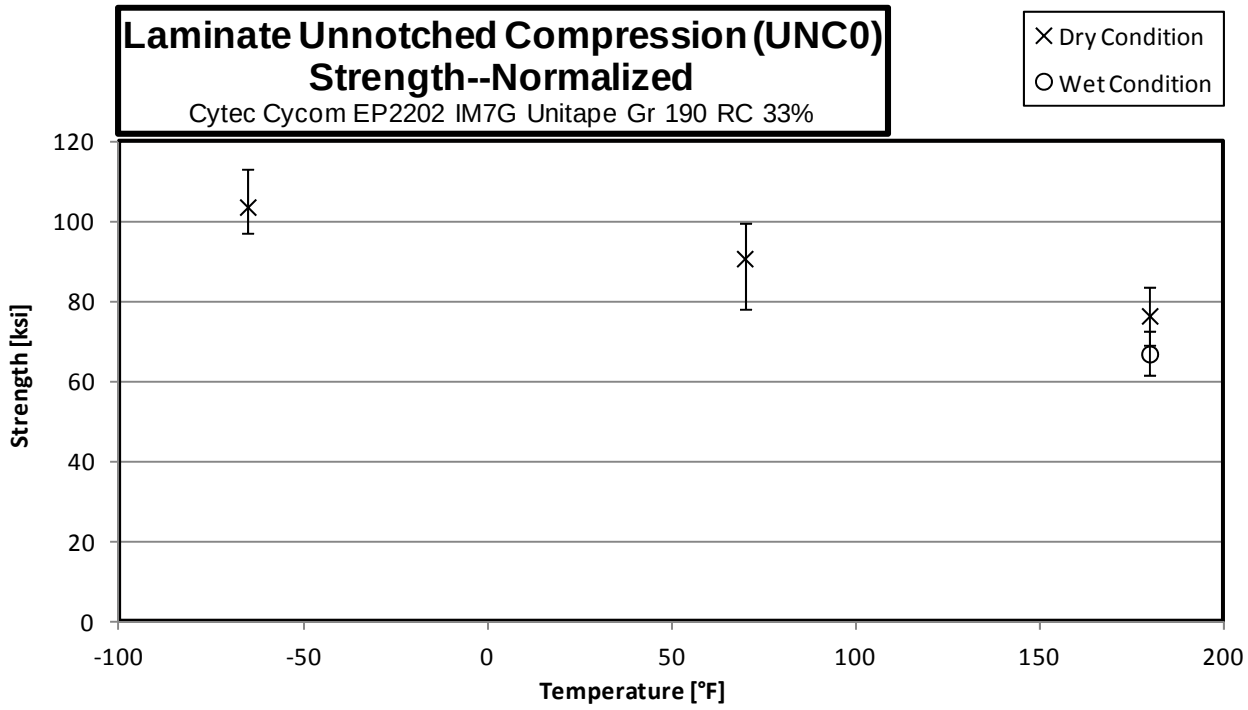


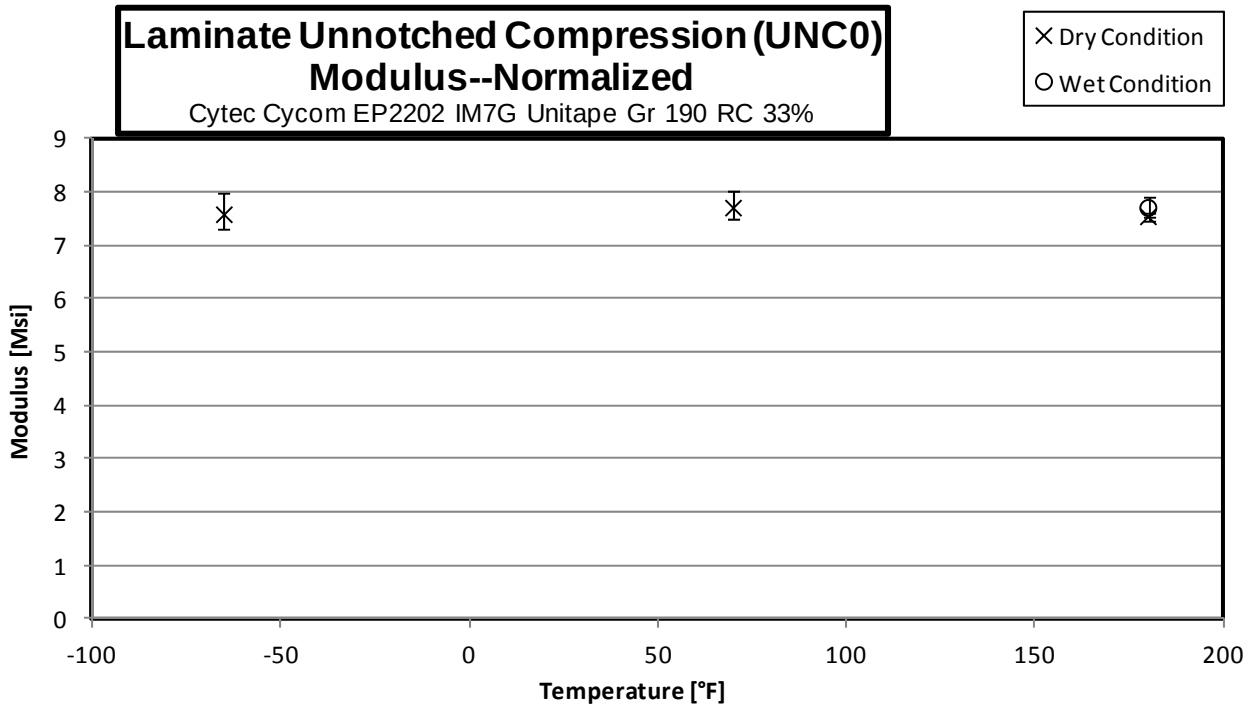
3.8 "50/40/10" Unnotched Tension 3 Properties (UNT3)



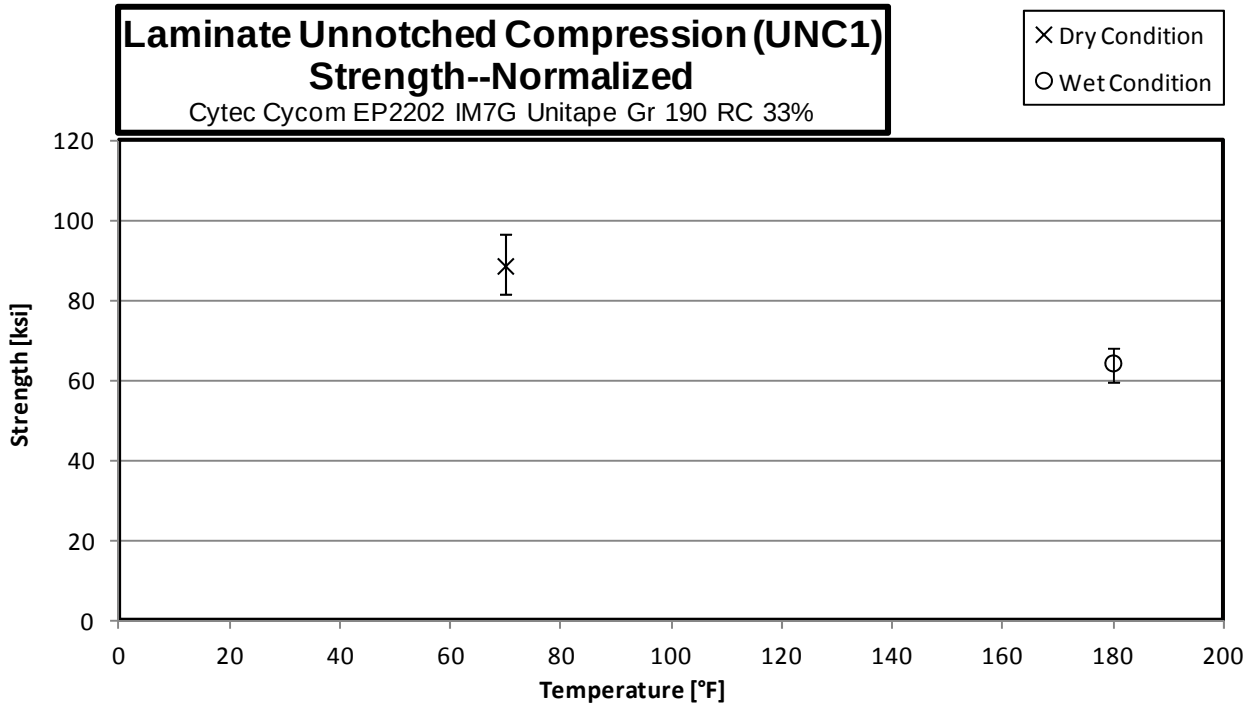


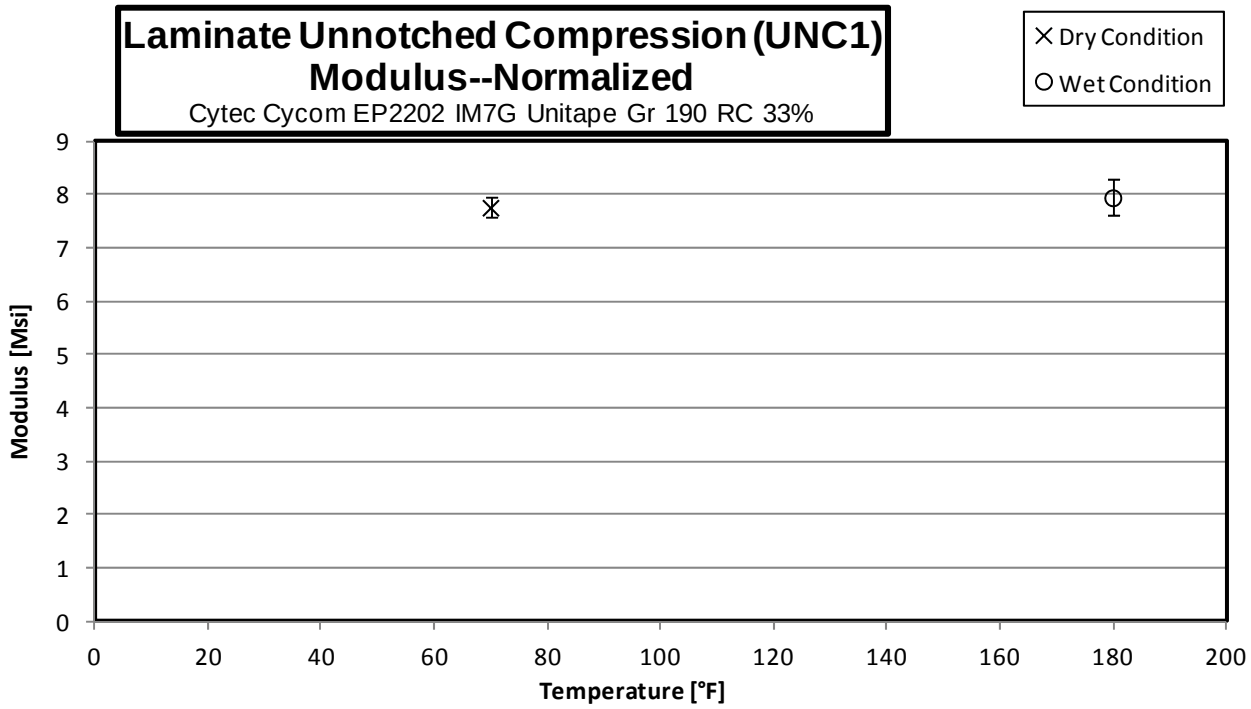
3.9 "33/0/67" Unnotched Compression 0 Properties (UNC0)



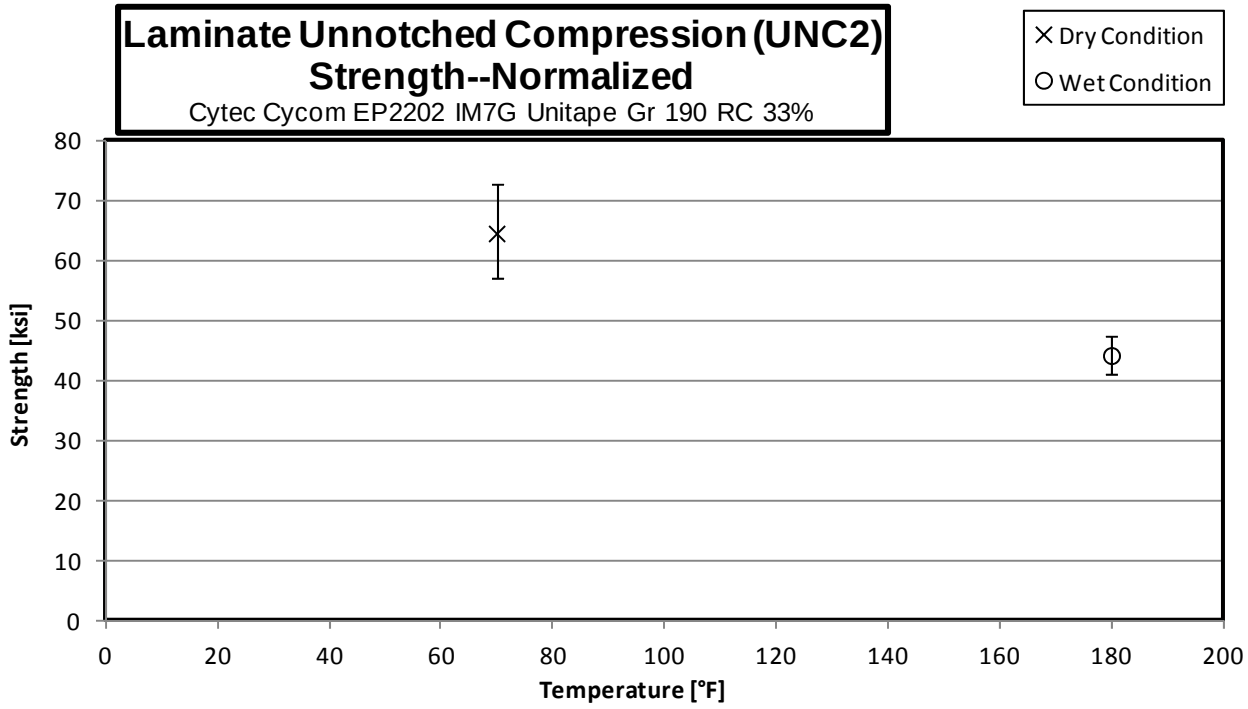


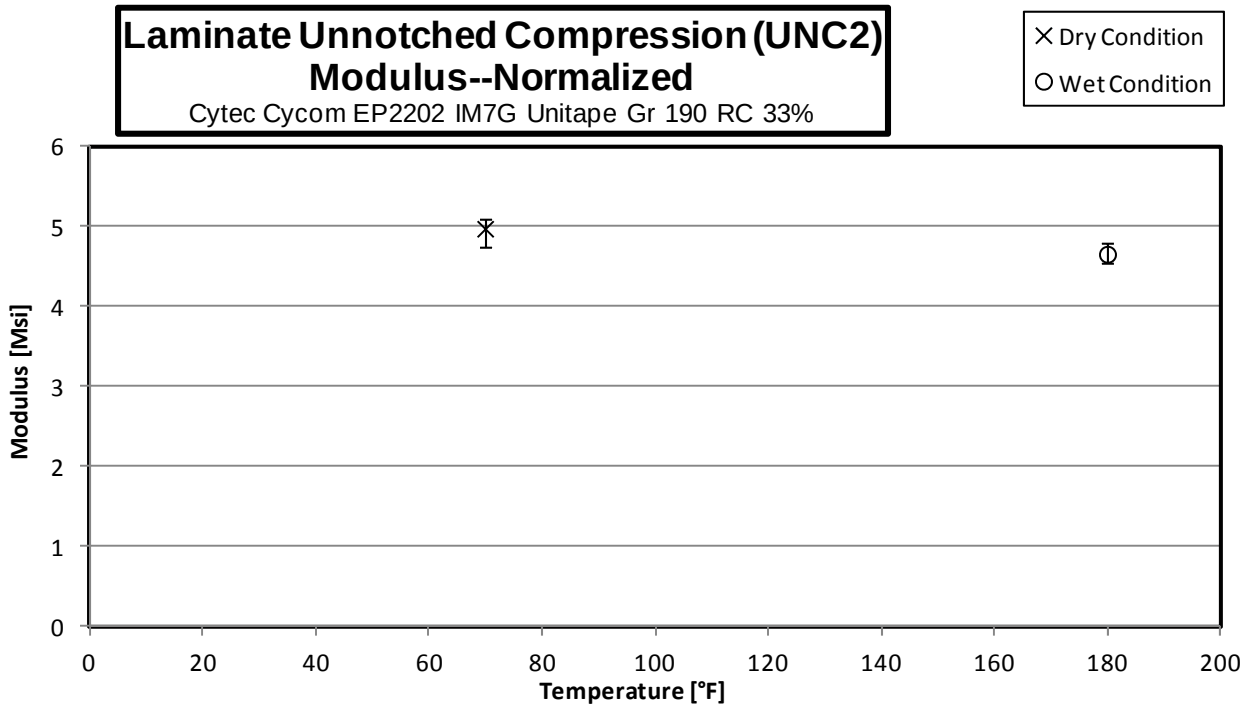
3.10 "25/50/25" Unnotched Compression 1 Properties (UNC1)



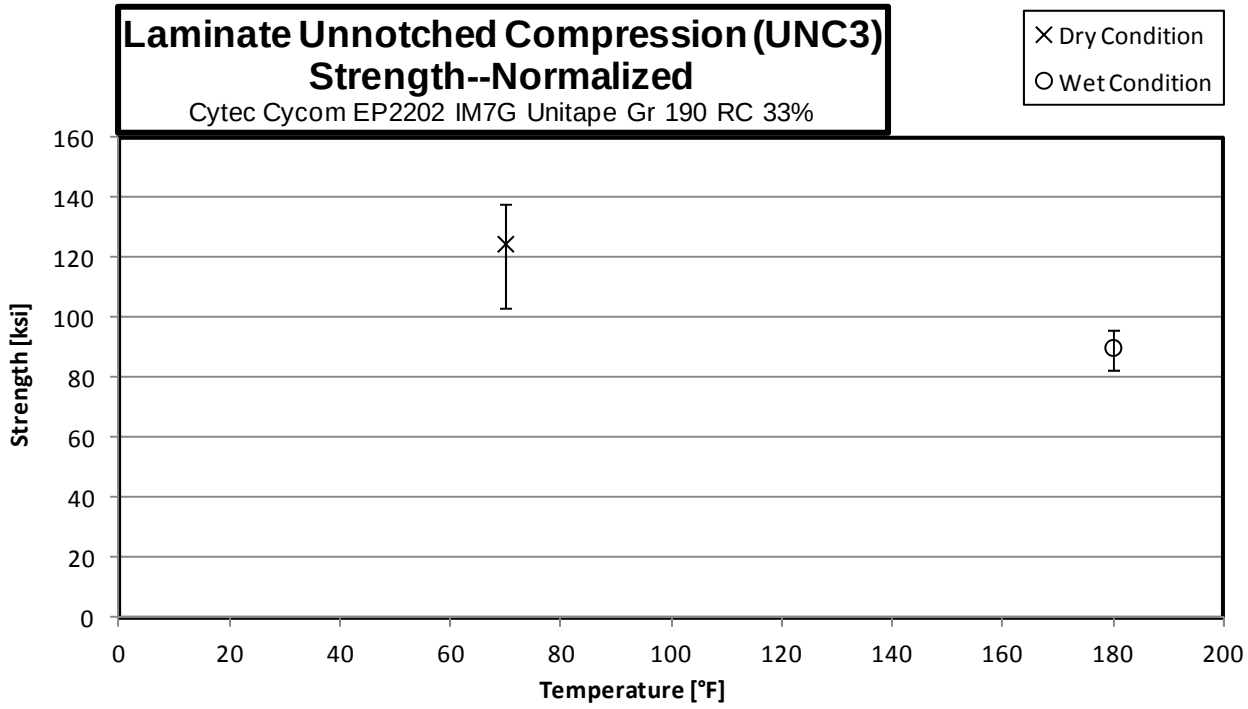


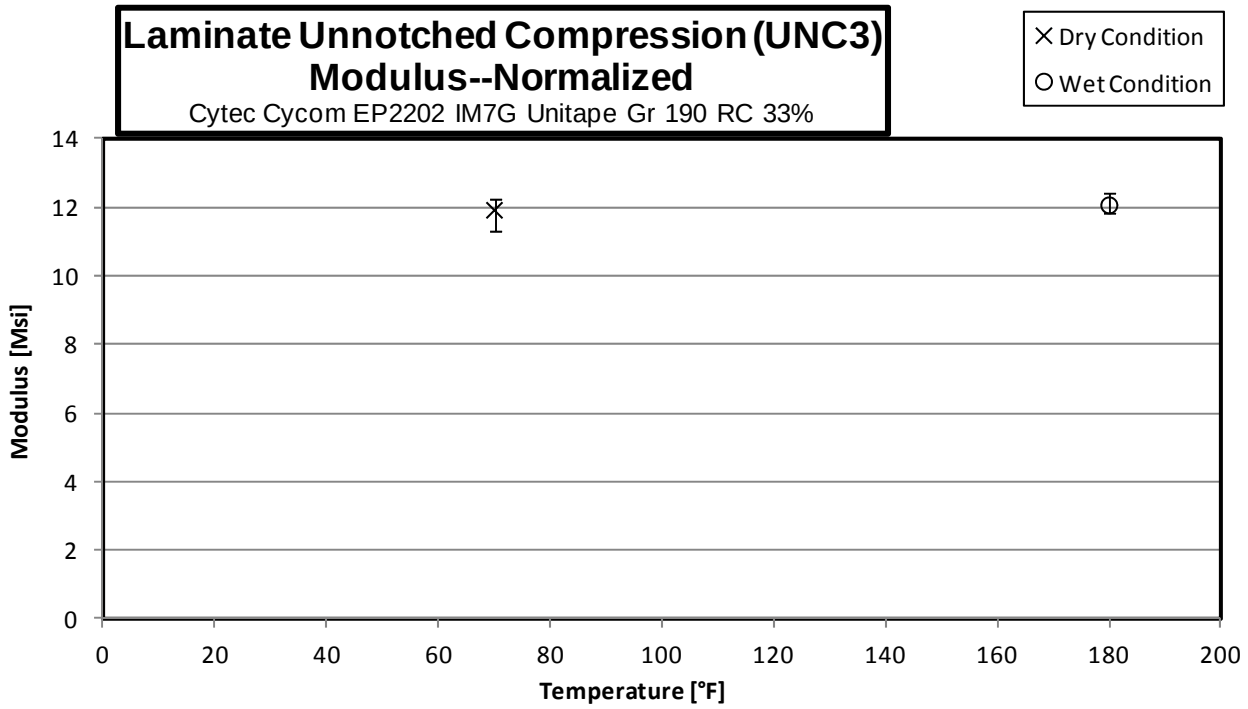
3.11 "10/80/10" Unnotched Compression 2 Properties (UNC2)



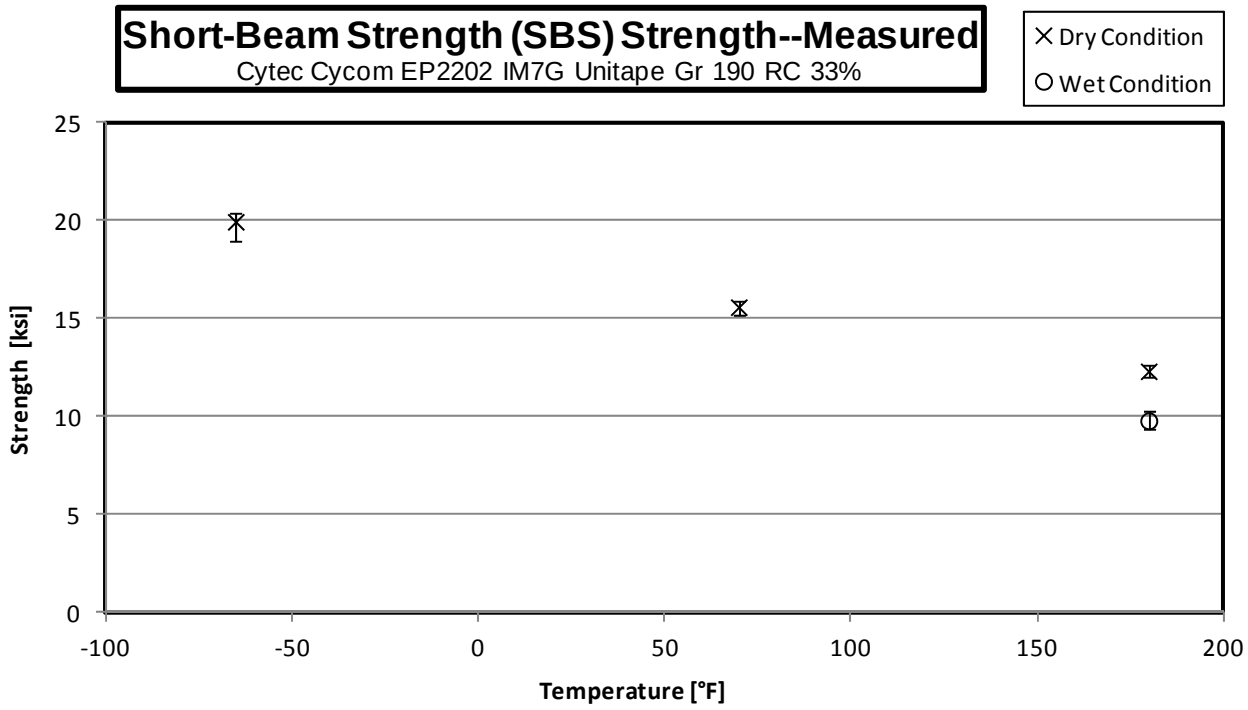


3.12 "50/40/10" Unnotched Compression 3 Properties (UNC3)

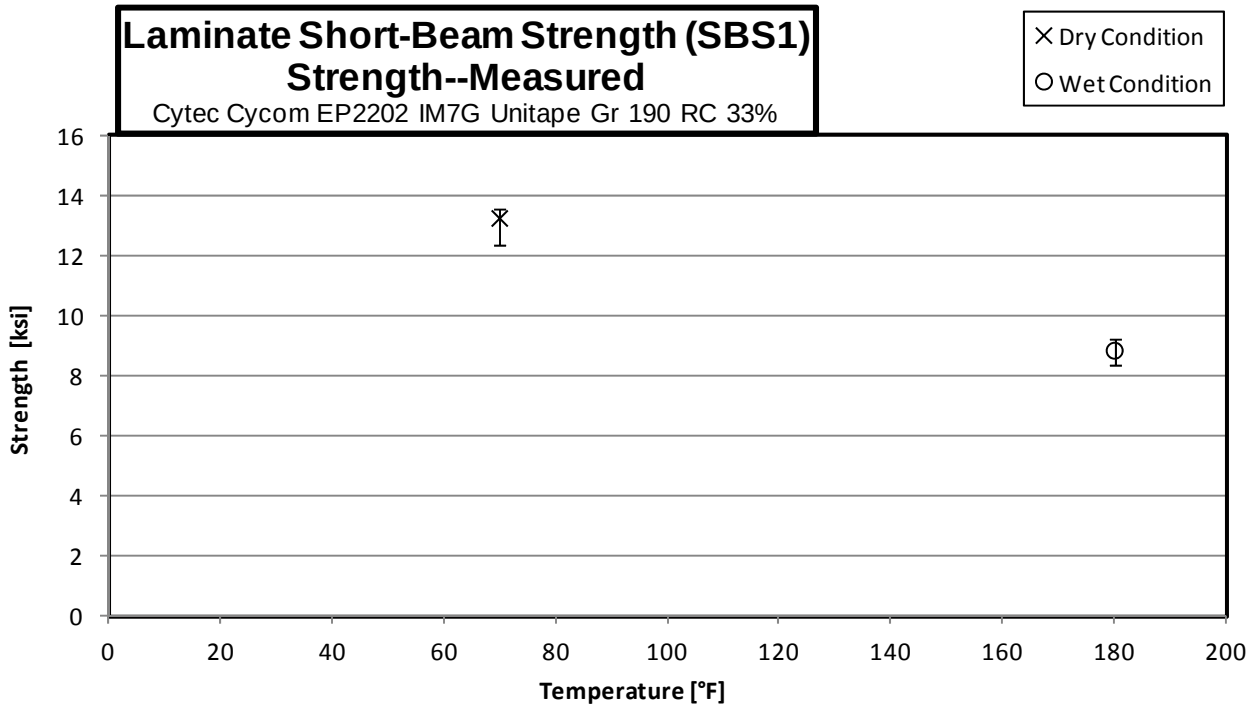




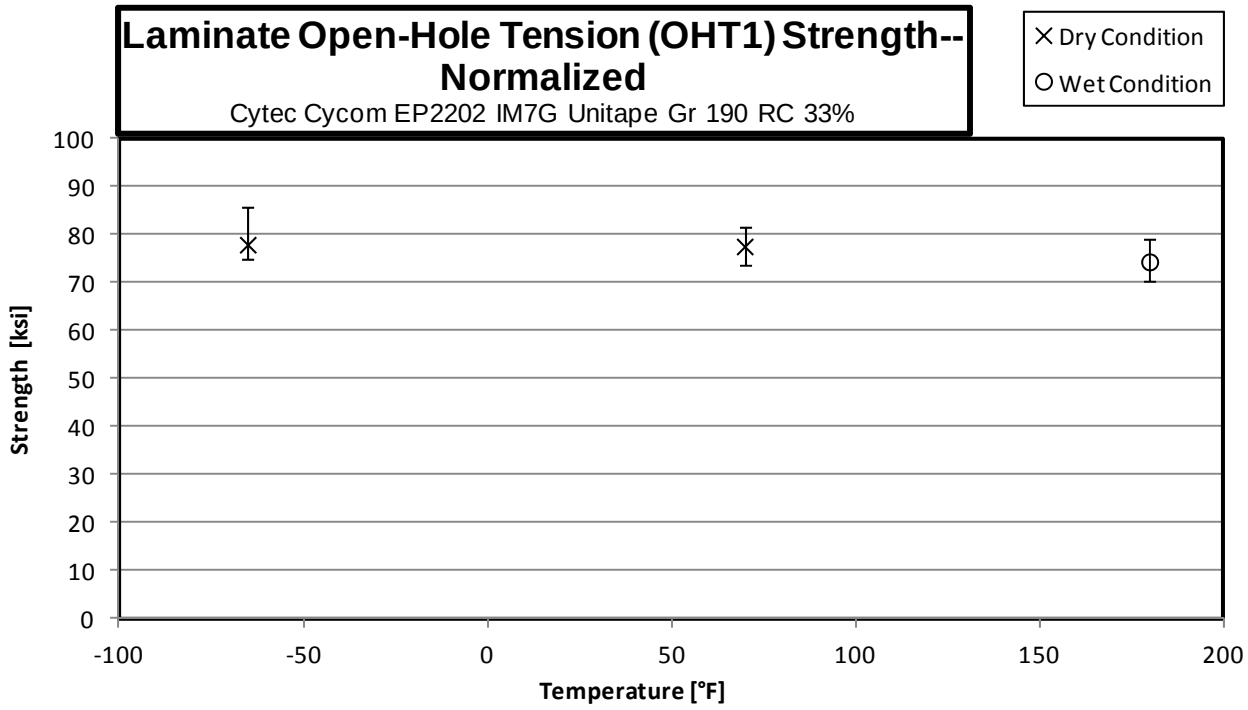
3.13 Lamina Short-Beam Shear Properties (SBS)



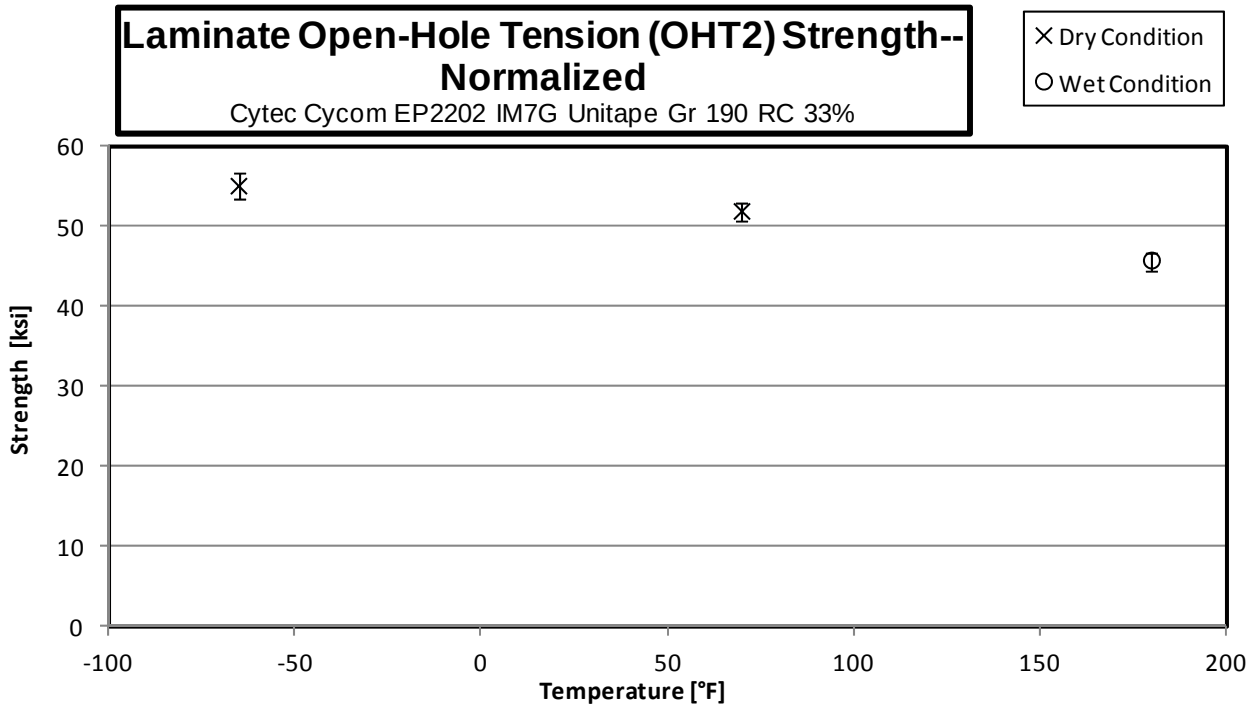
3.14 Laminate Short-Beam Strength Properties (SBS1)



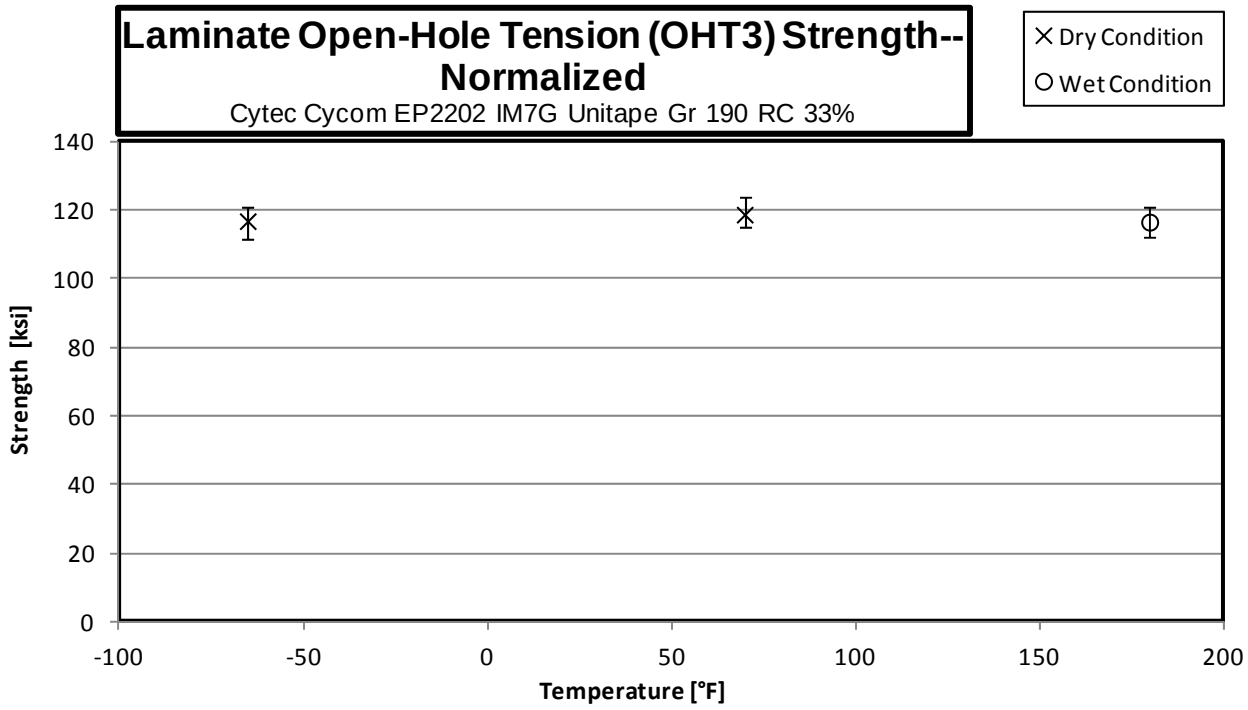
3.15 "25/50/25" Open-Hole Tension 1 Properties (OHT1)



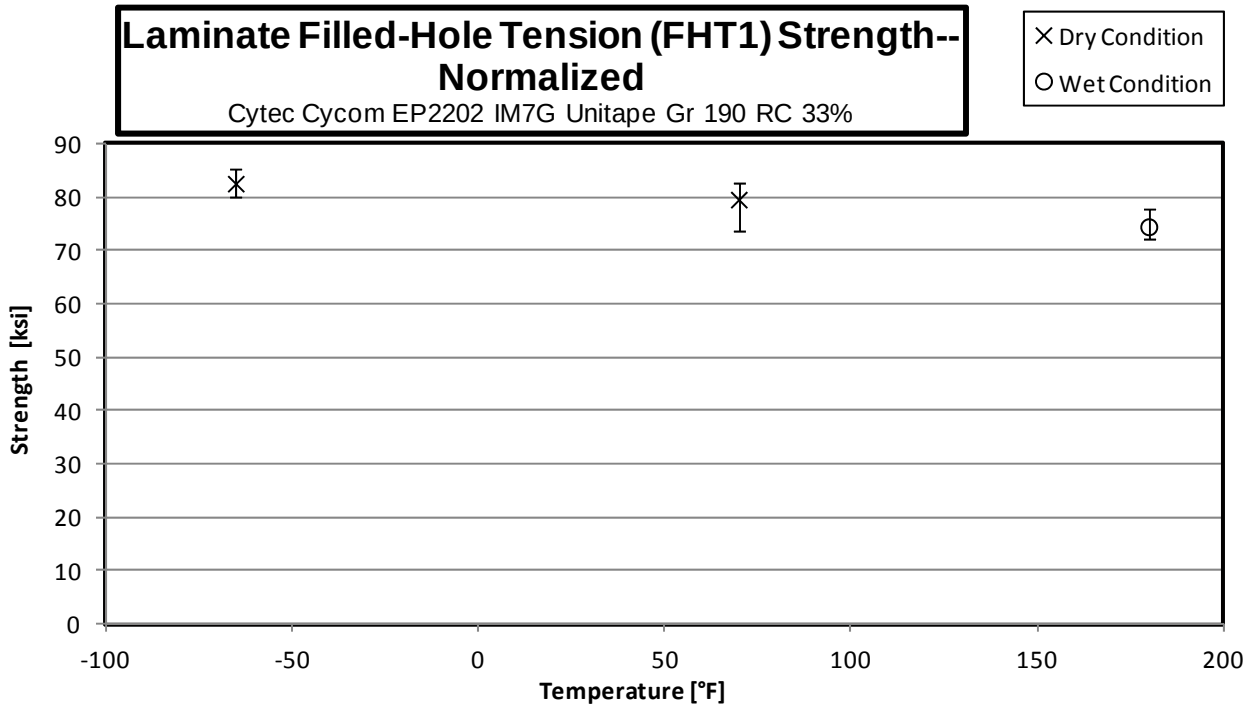
3.16 "10/80/10" Open-Hole Tension 2 Properties (OHT2)



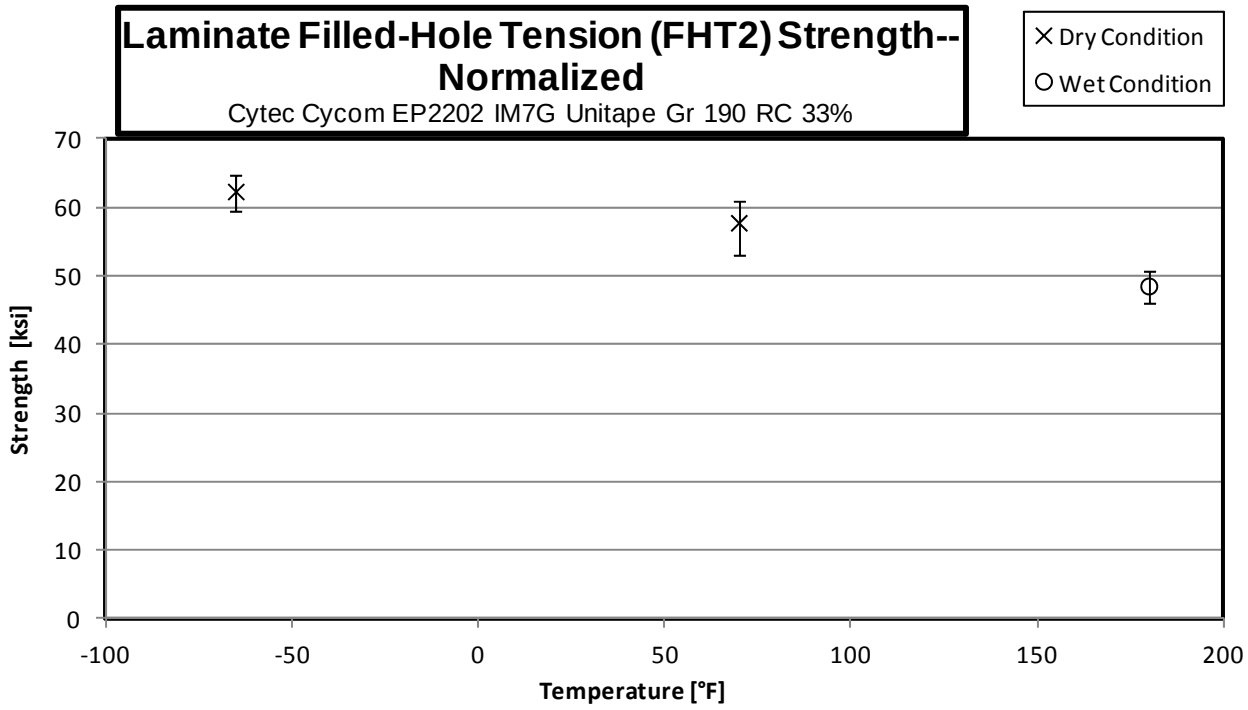
3.17 "50/40/10" Open-Hole Tension 3 Properties (OHT3)



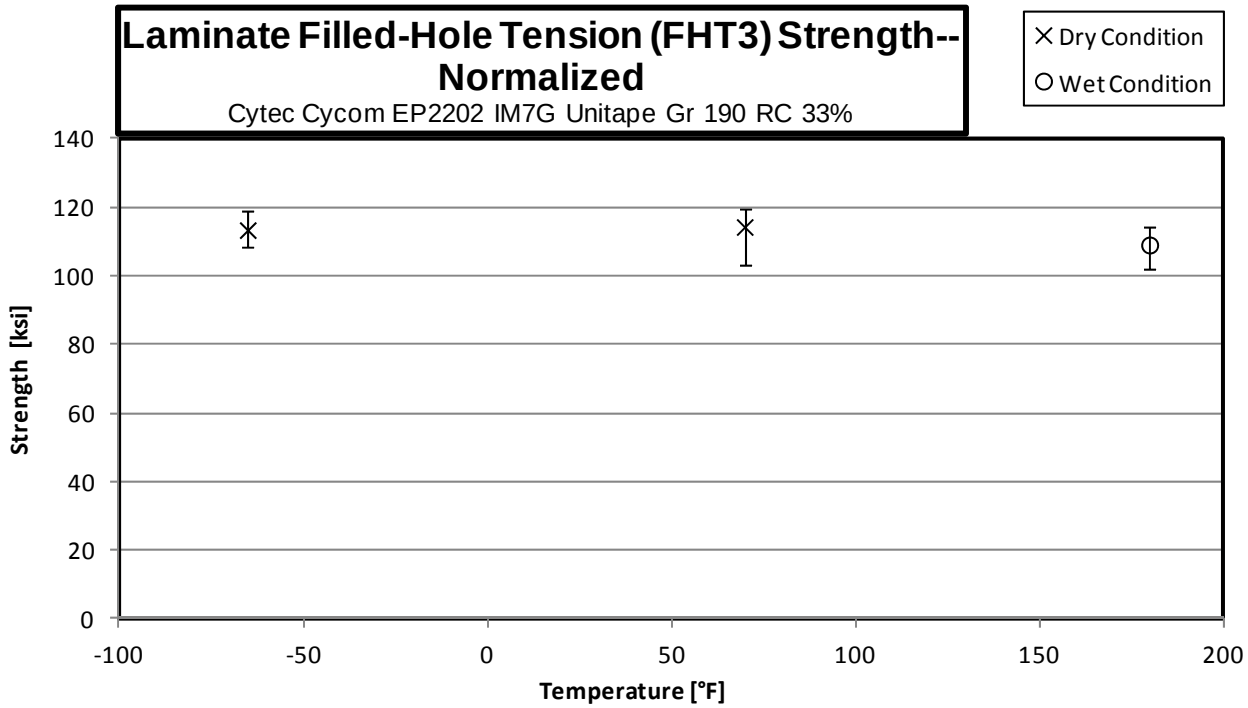
3.18 "25/50/25" Filled-Hole Tension 1 Properties (FHT1)



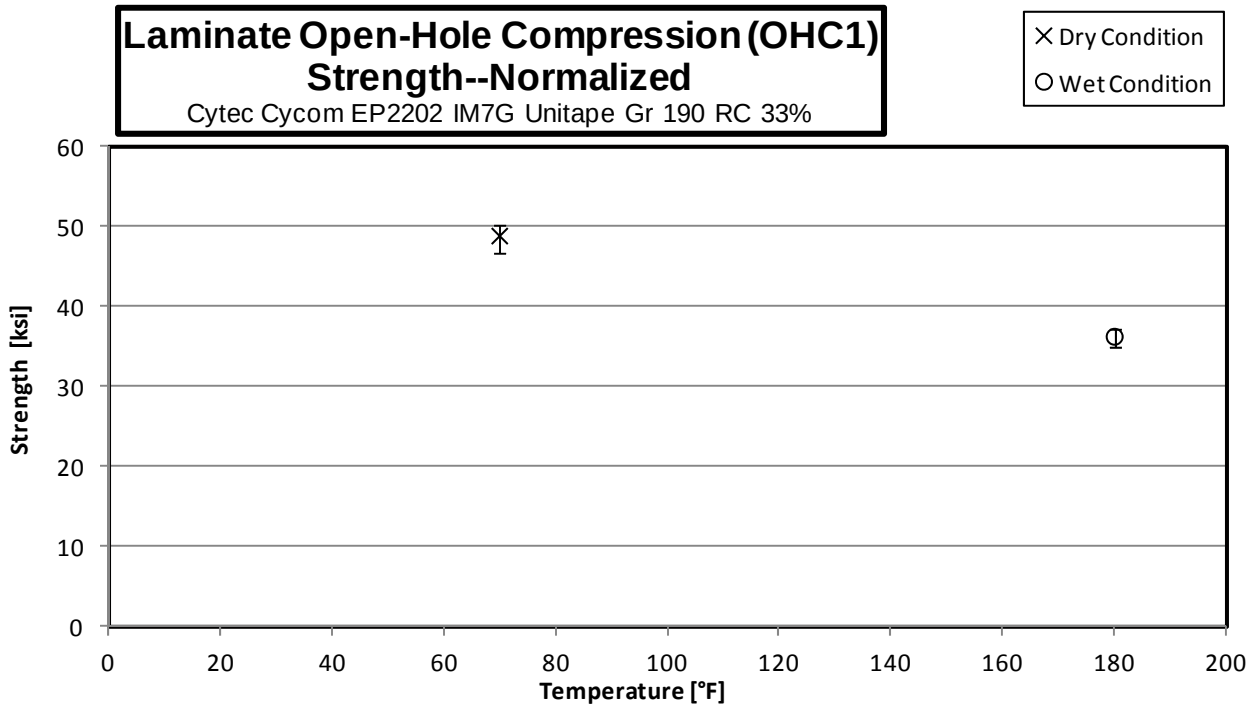
3.19 "10/80/10" Filled-Hole Tension 2 Properties (FHT2)



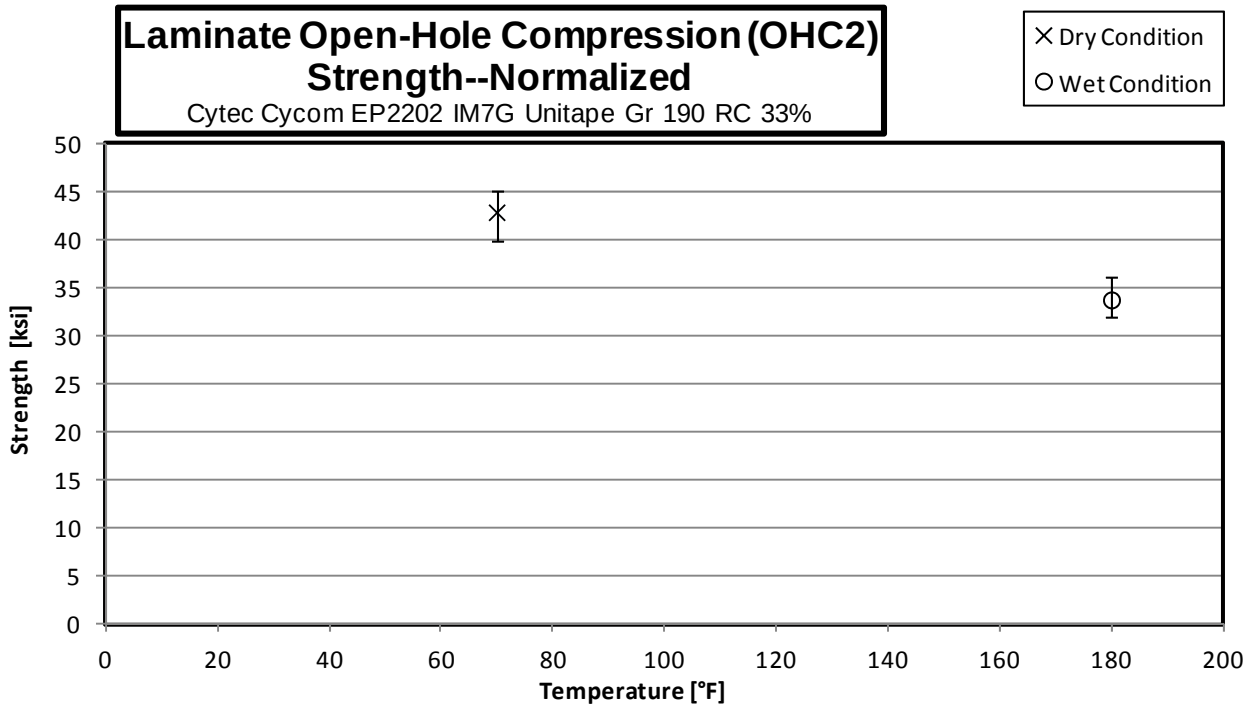
3.20 "50/40/10" Filled-Hole Tension 3 Properties (FHT3)



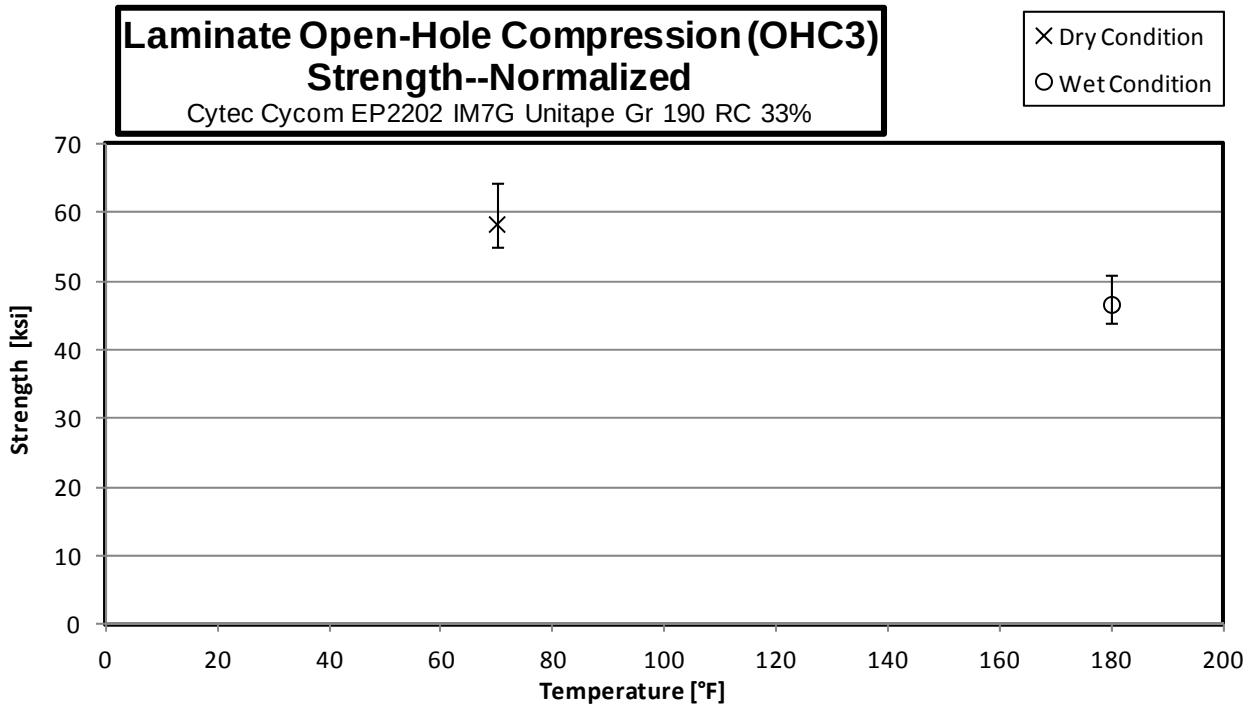
3.21 "25/50/25" Open-Hole Compression 1 Properties (OHC1)



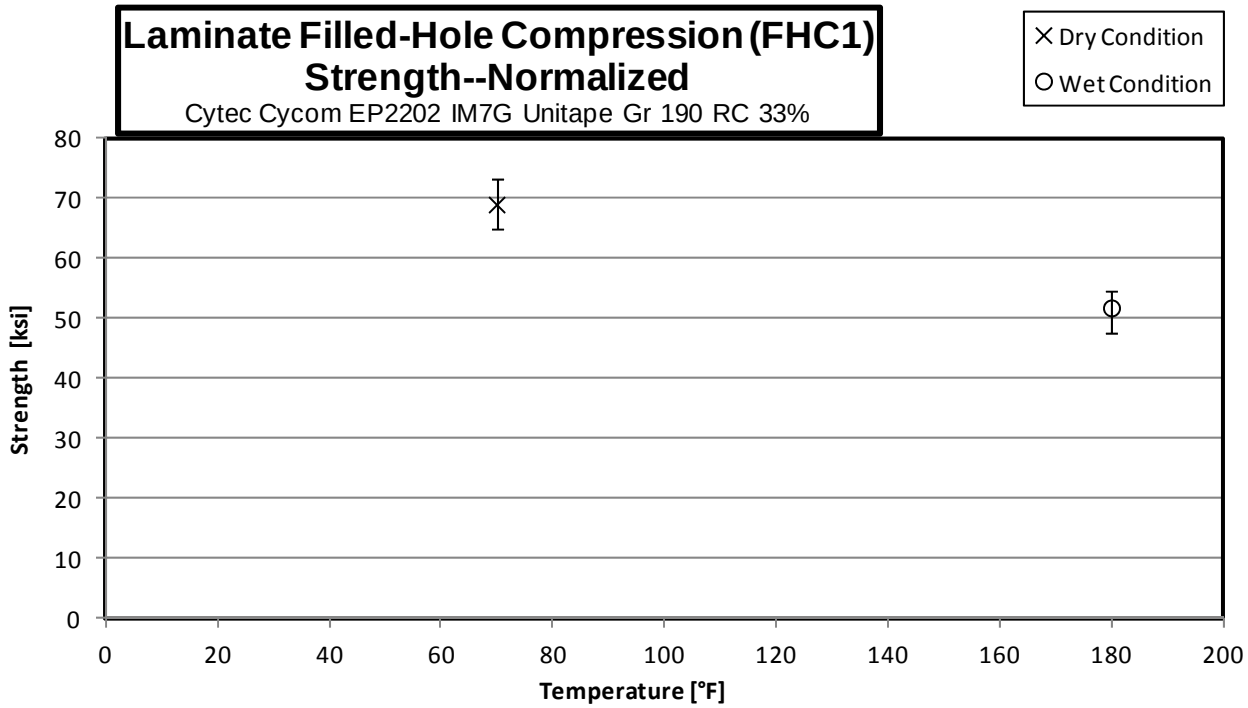
3.22 "10/80/10" Open-Hole Compression 2 Properties (OHC2)



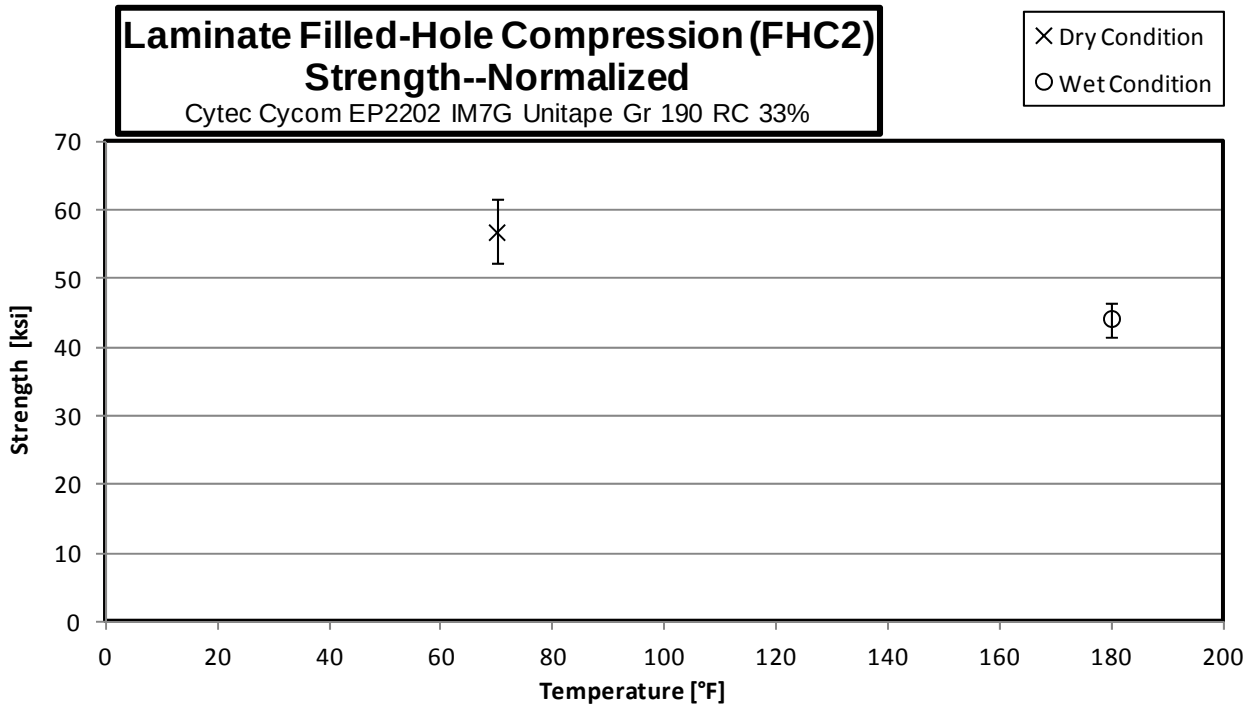
3.23 "50/40/10" Open-Hole Compression 3 Properties (OHC3)



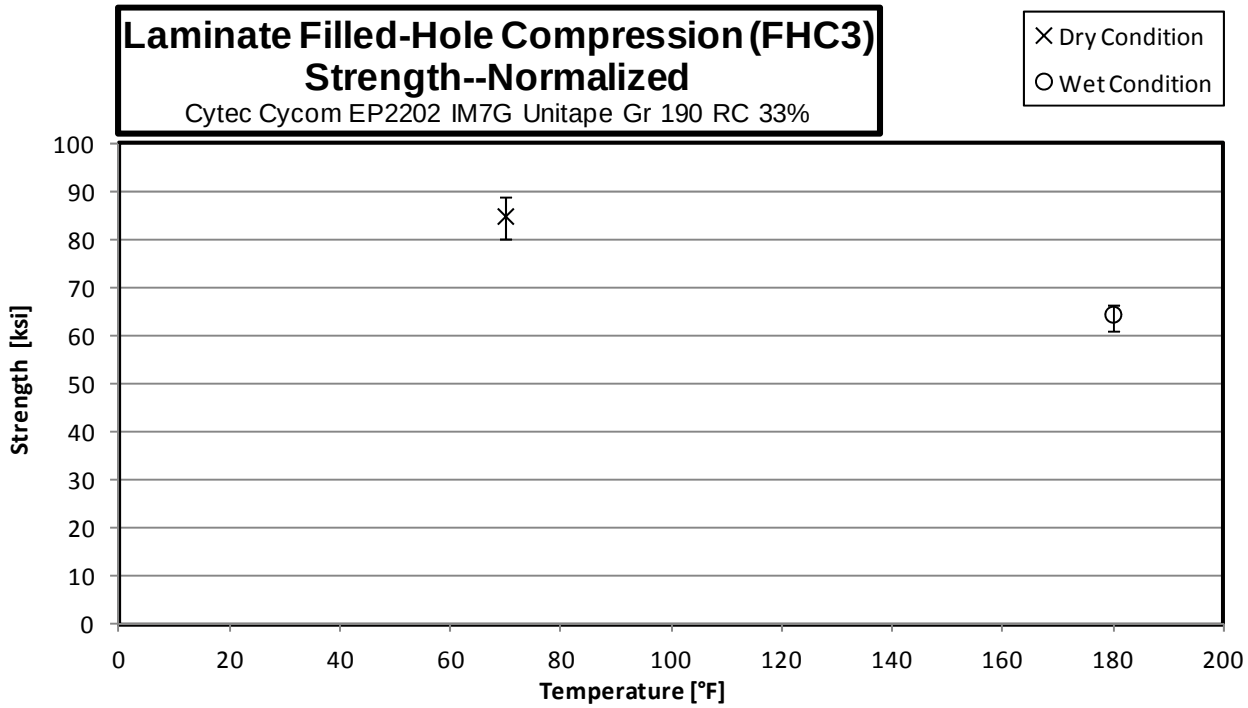
3.24 "25/50/25" Filled-Hole Compression 1 Properties (FHC1)



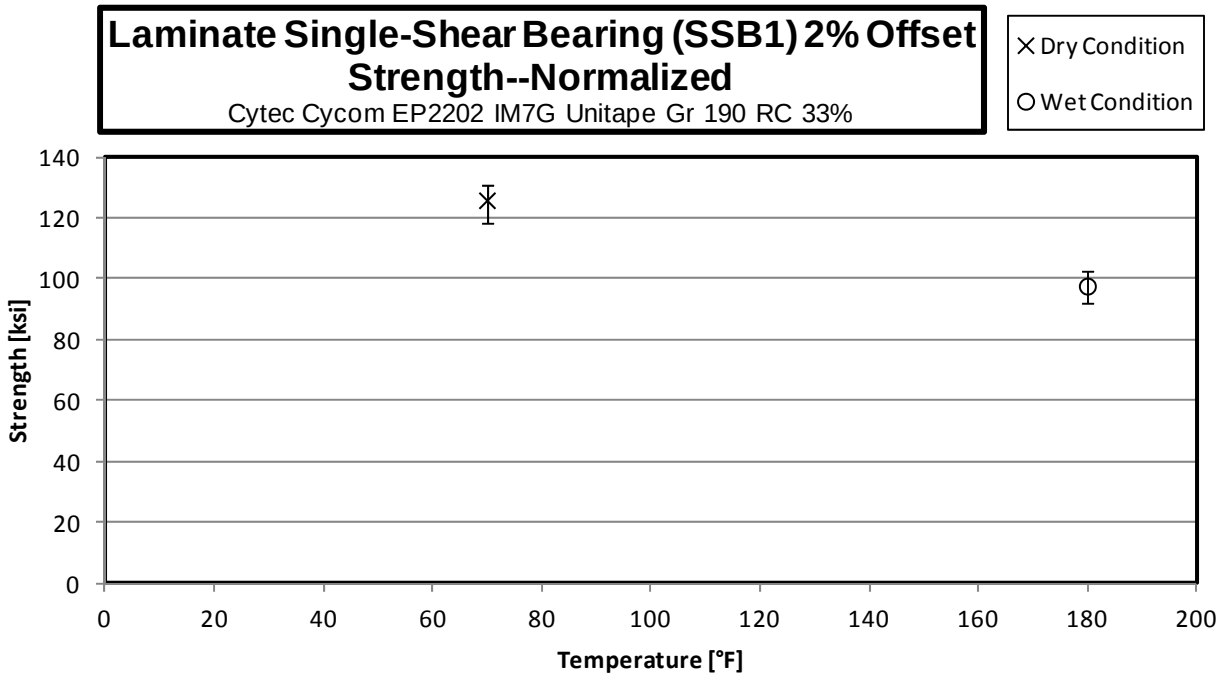
3.25 "10/80/10" Filled-Hole Compression 2 Properties (FHC2)

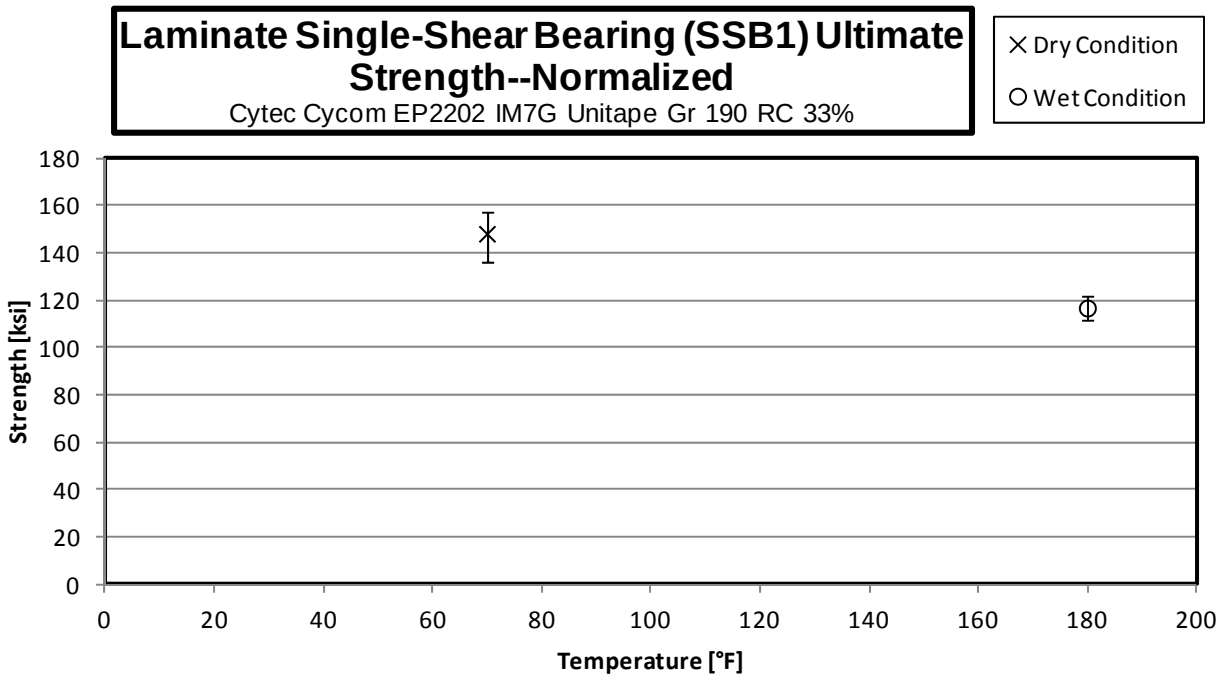


3.26 "50/40/10" Filled-Hole Compression 3 Properties (FHC3)

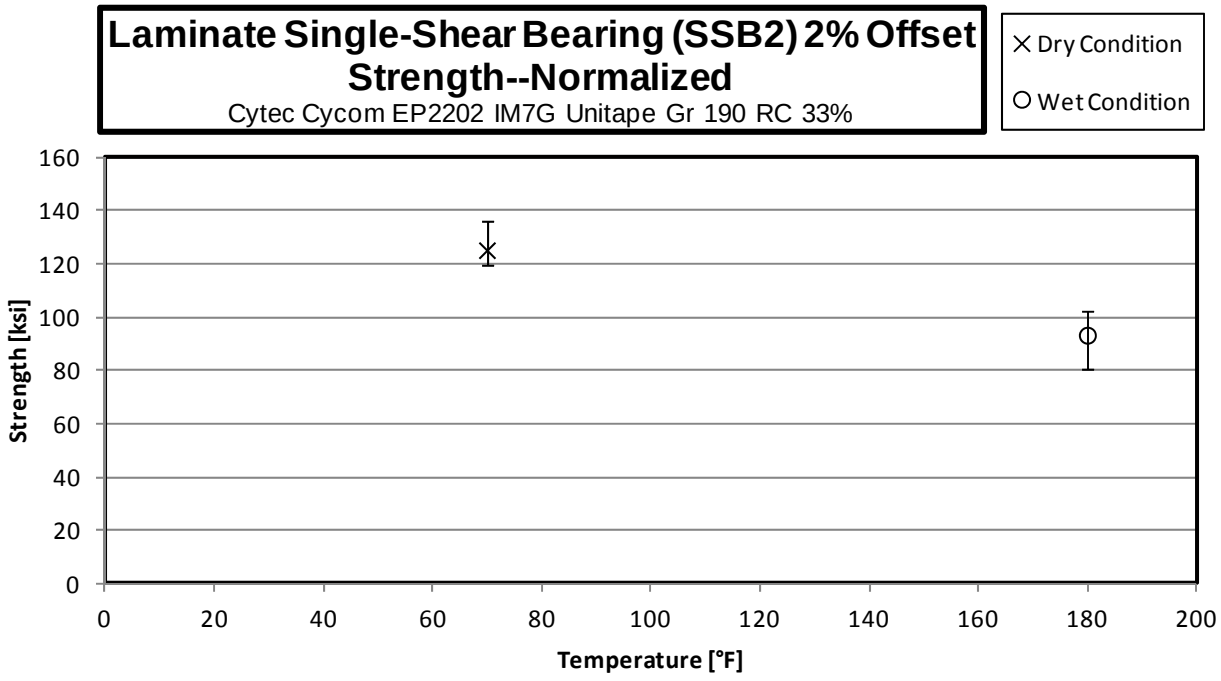


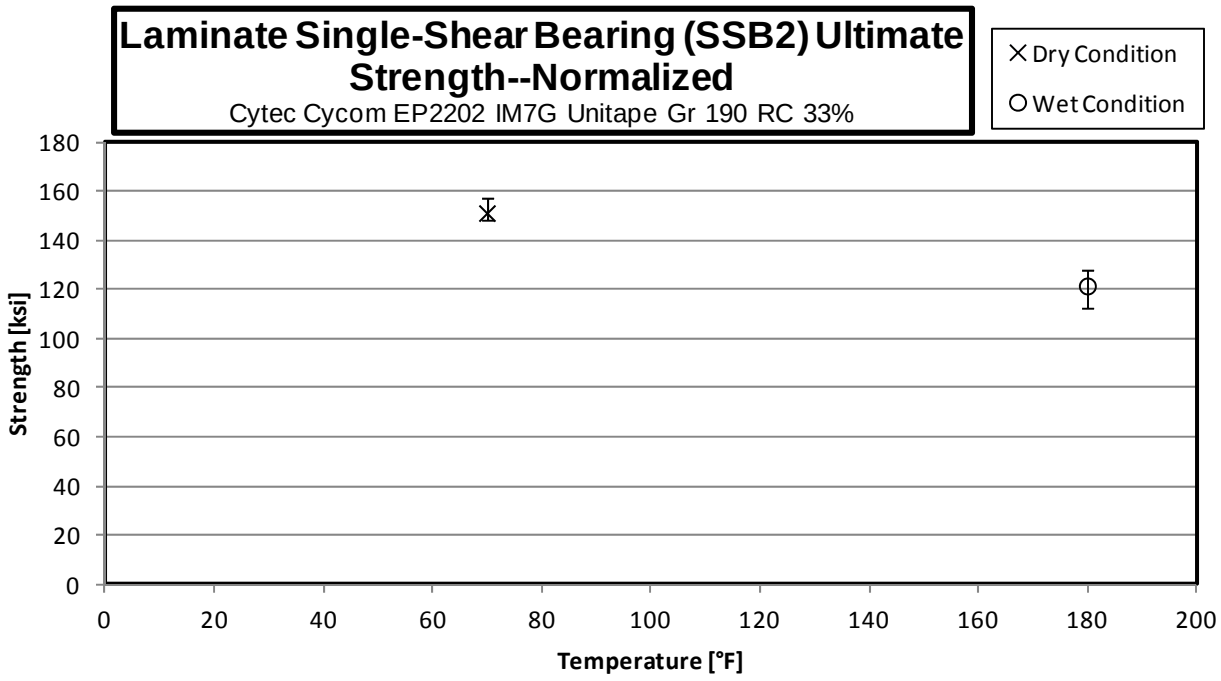
3.27 "25/50/25" Single-Shear Bearing Strength1 Properties (SSB1)



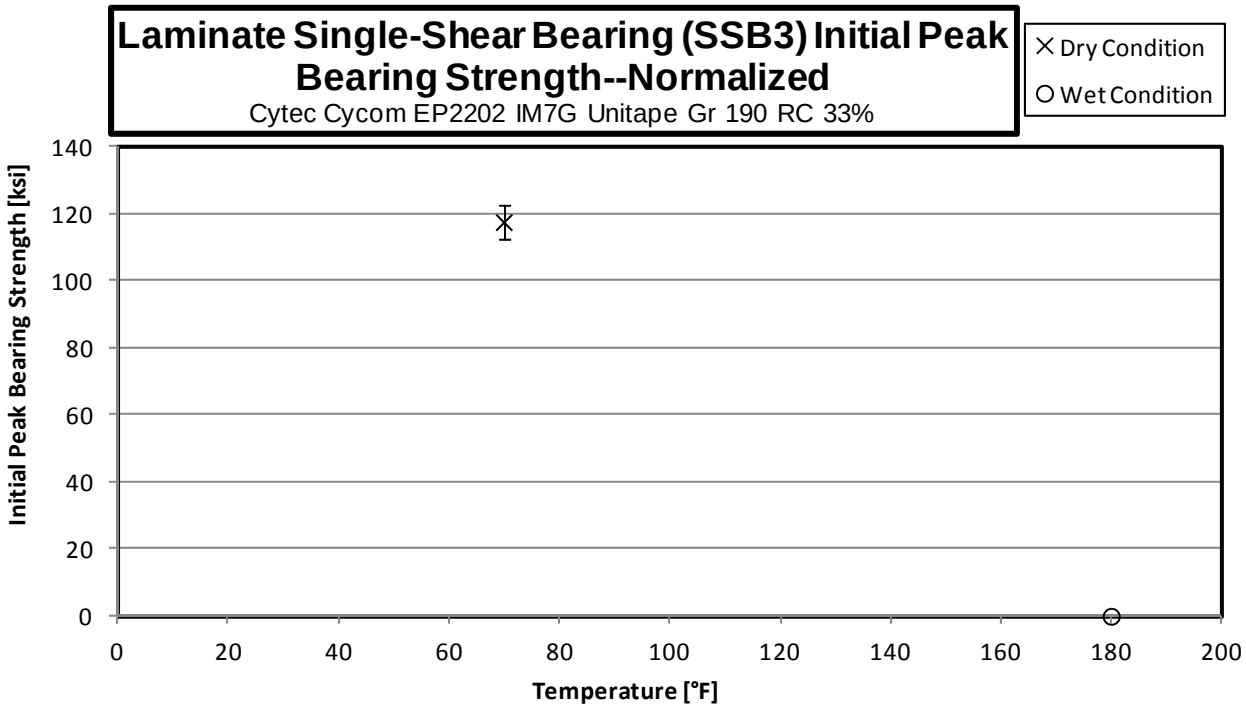


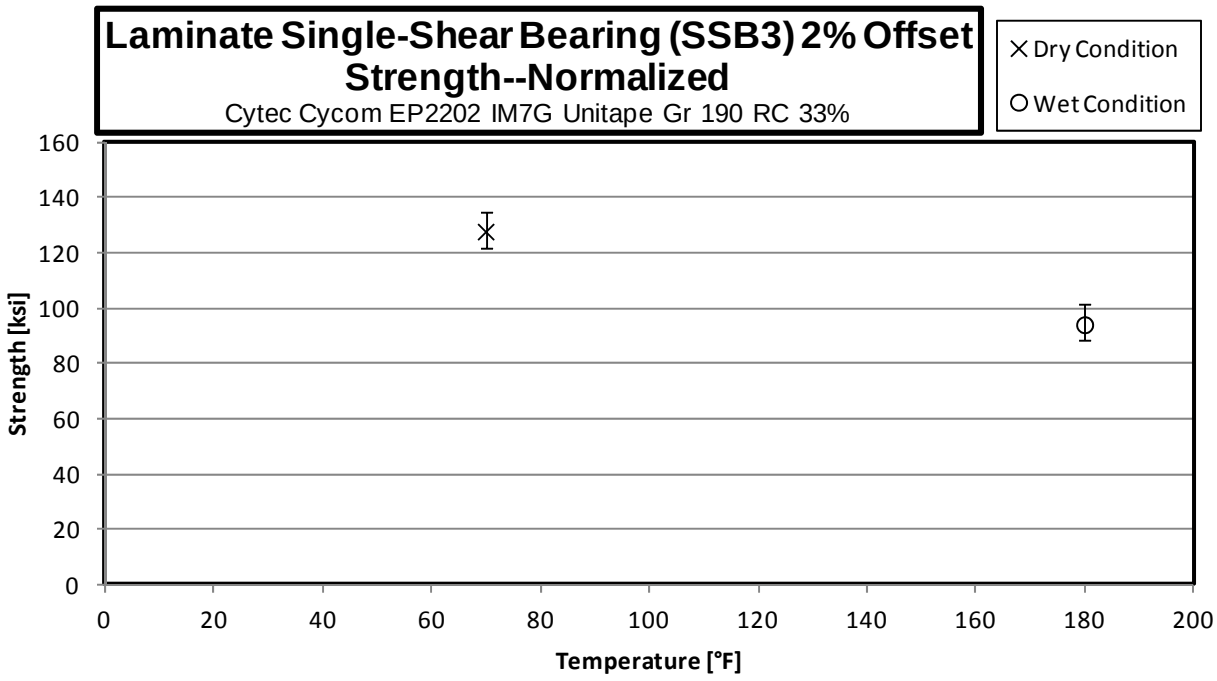
3.28 "10/80/10" Single-Shear Bearing Strength 2 Properties (SSB2)

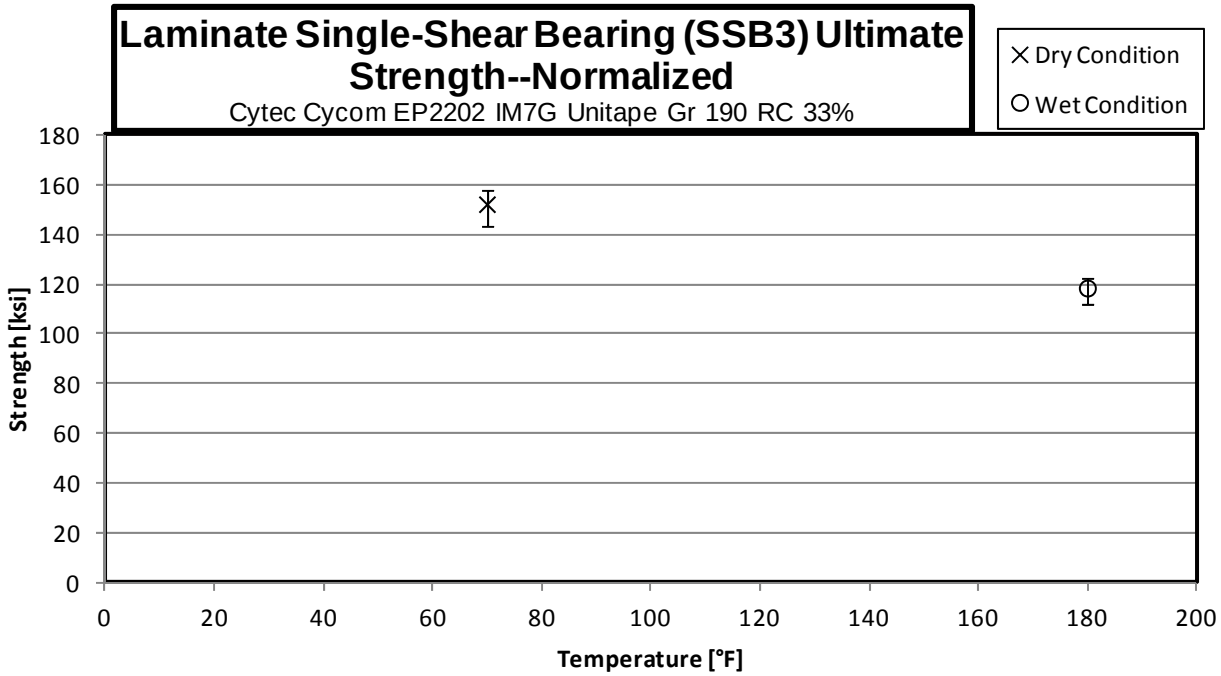




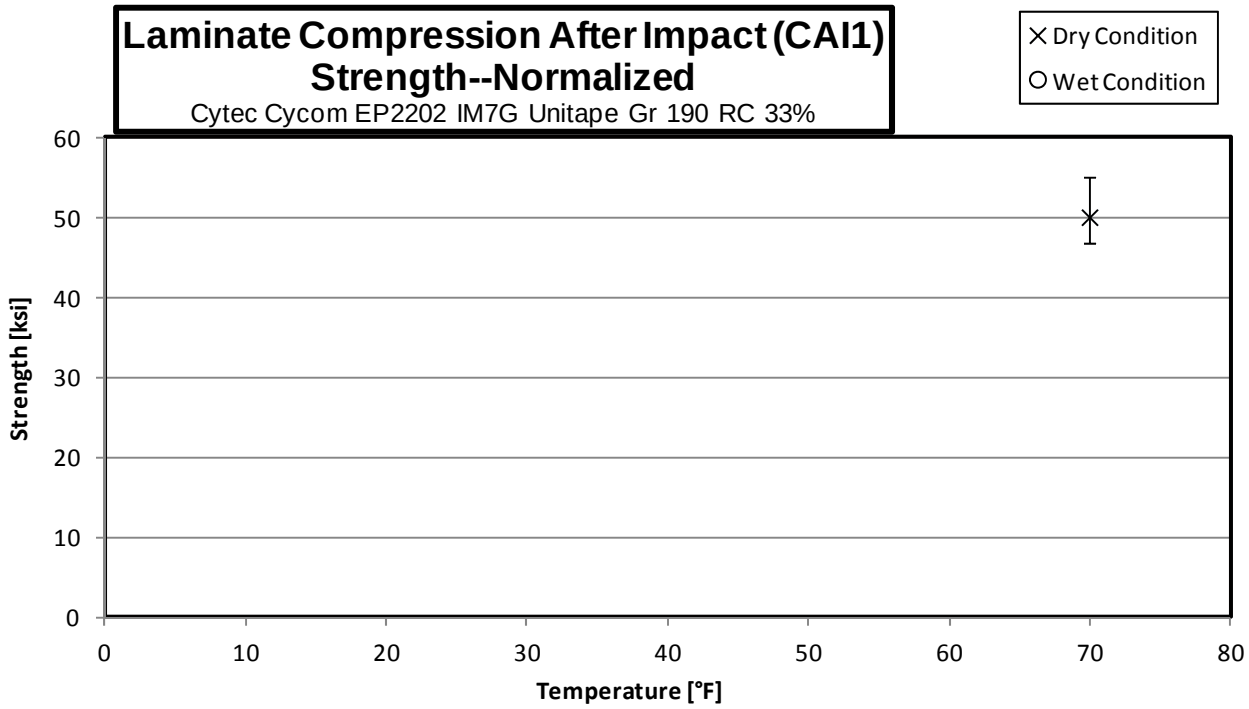
3.29 "50/40/10" Single-Shear Bearing 3 Properties (SSB3)



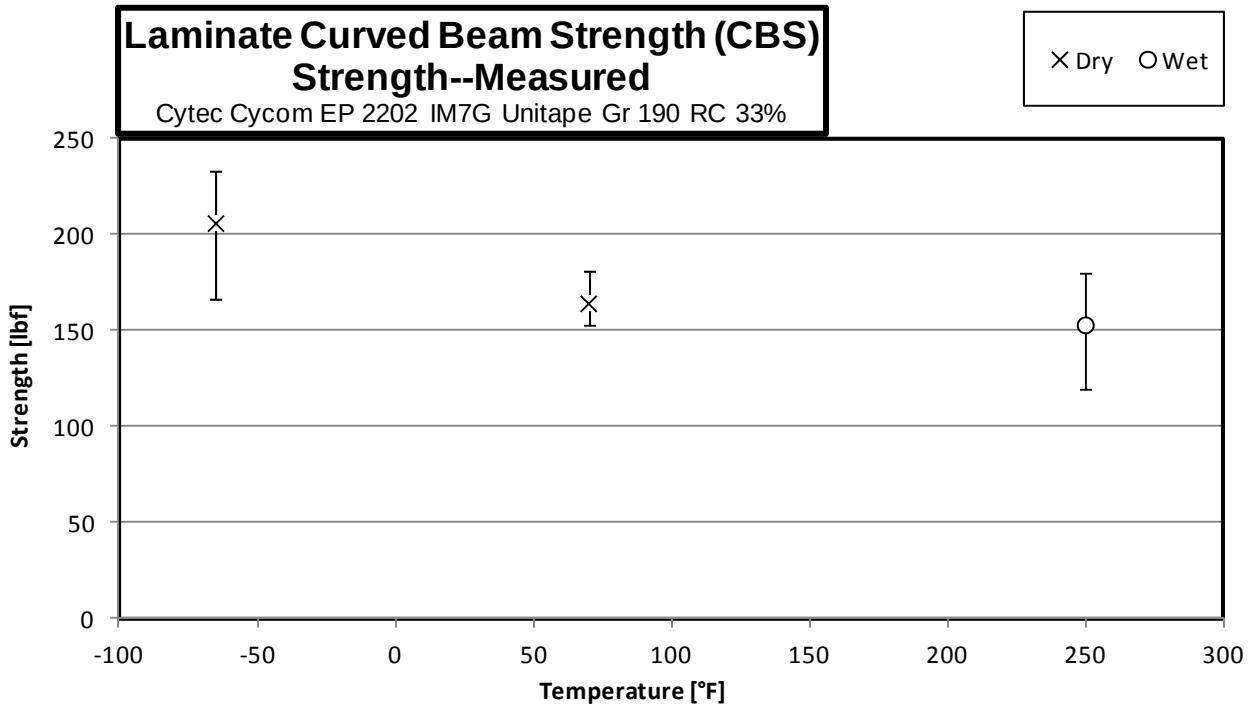


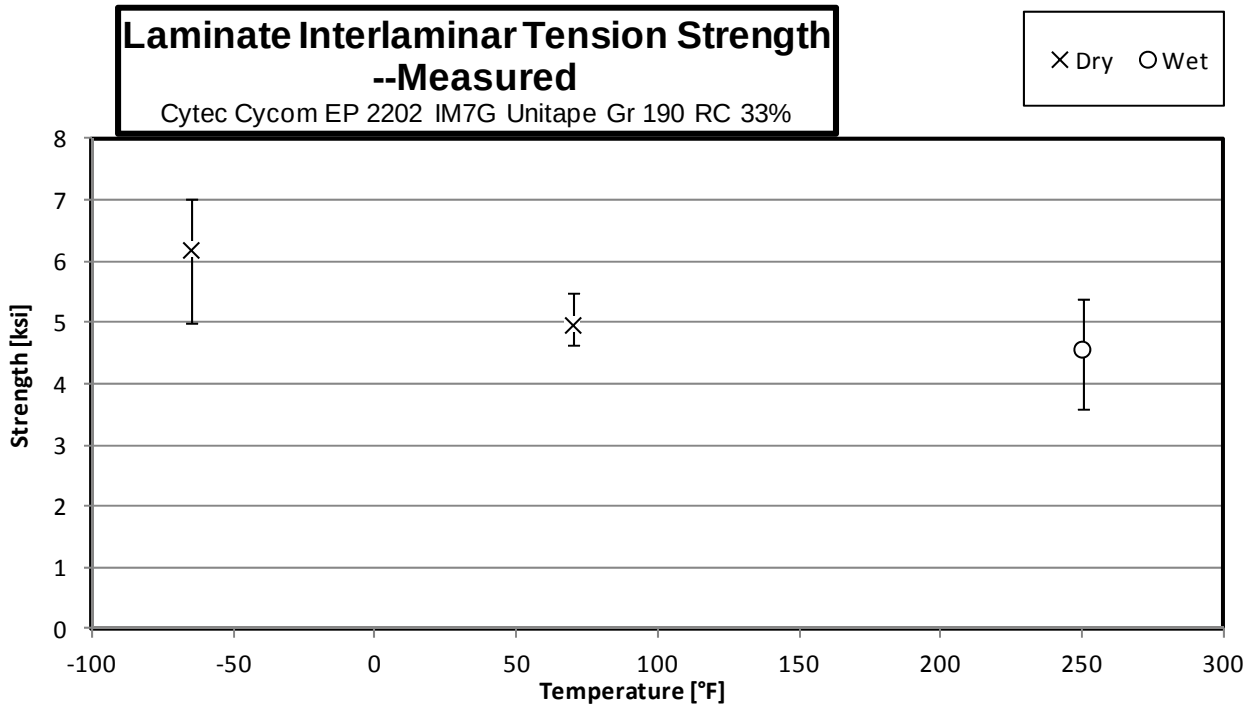


3.30 Compression After Impact 1 Properties (CAI1)



3.31 Interlaminar Tension Properties (ILT)





4. Raw Data

4.1 Longitudinal Tension Properties (LT)

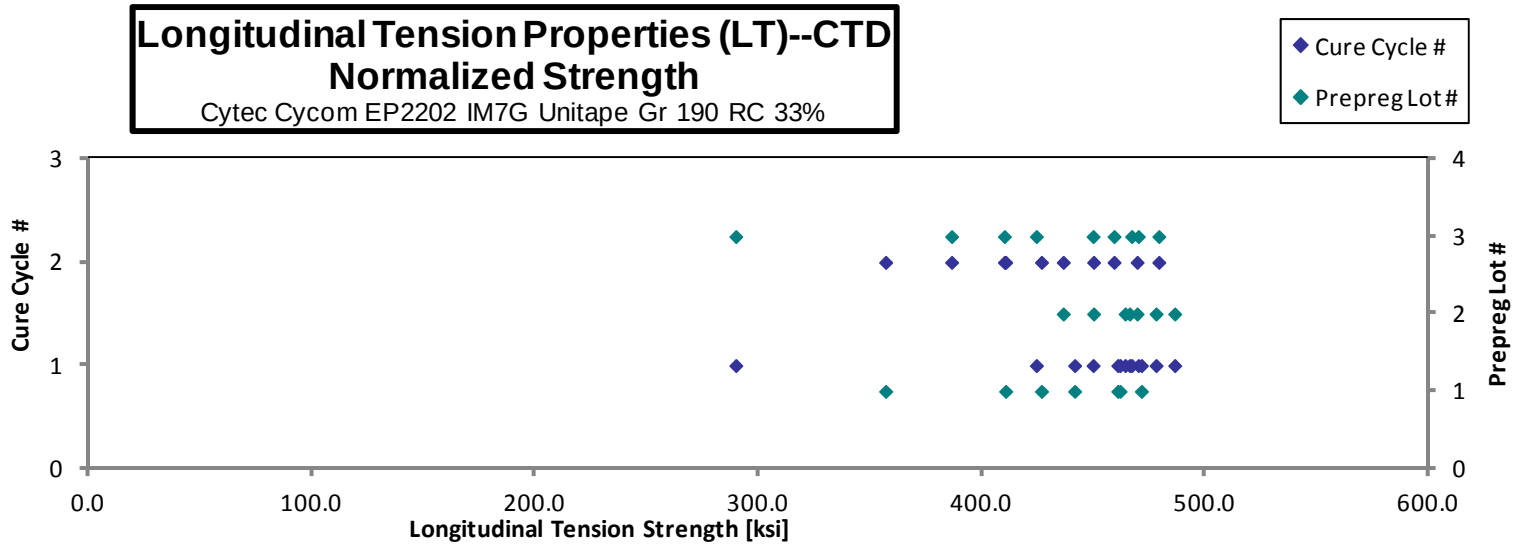
Longitudinal Tension Properties (LT)--CTD
Strength & Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

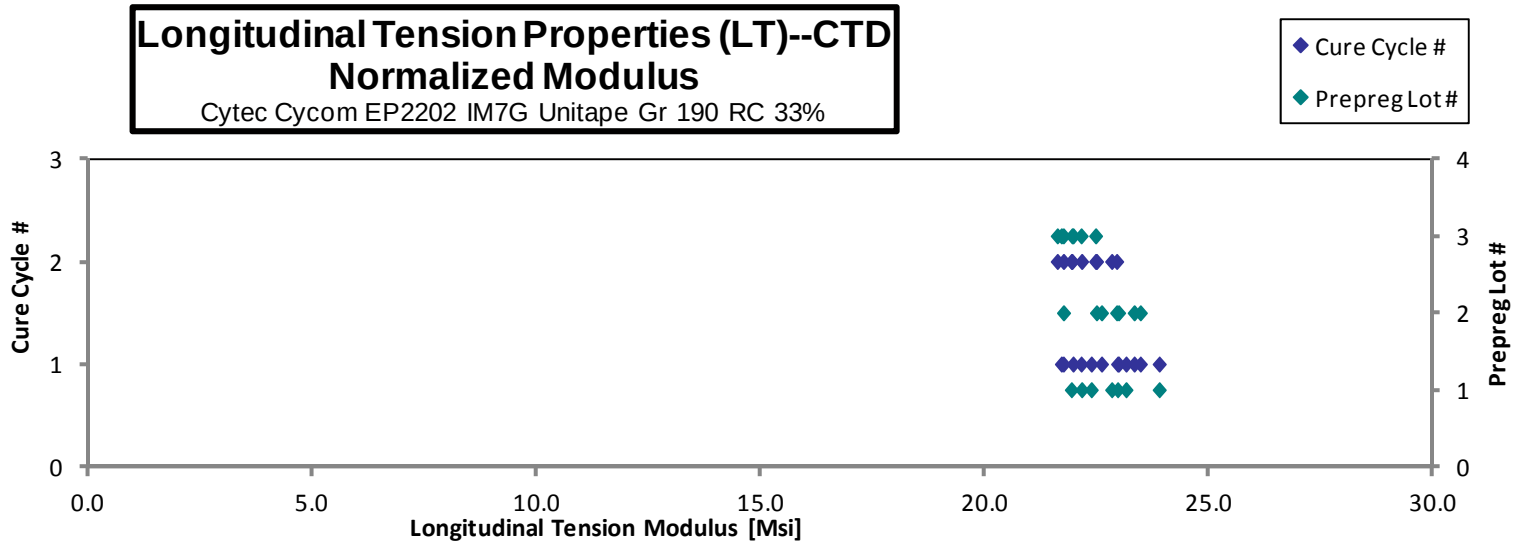
normalizing t_{ply} [in]
0.0072

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	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
EPAJA116B	A	C1	1	1	**	23.671	0.322	0.042	6	SLIPPED	0.0070		23.142
EPAJA117B	A	C1	1	1	471.775	24.410	***	0.042	6	XGM	0.0070	461.582	23.882
EPAJA118B	A	C1	1	1	471.126	23.479	0.341	0.042	6	SGM / XGM	0.0070	460.584	22.953
EPAJA119B	A	C1	1	1	484.032	22.977	0.284	0.042	6	XGM	0.0070	471.147	22.366
EPAJA11AB	A	C1	1	1	454.587			0.042	6	XGM	0.0070	441.258	
EPAJA215B	A	C2	1	2	363.643	22.353	0.318	0.042	6	SGM / XGM	0.0071	356.628	21.922
EPAJA216B	A	C2	1	2	415.324	23.098	0.336	0.043	6	XGM	0.0071	410.357	22.822
EPAJA217B	A	C2	1	2	435.138	22.605	0.331	0.042	6	XGM	0.0071	426.408	22.151
EPAJB116B	B	C1	2	1	471.125	22.851	0.295	0.043	6	SGM	0.0071	465.854	22.596
EPAJB117B	B	C1	2	1	479.751	23.422	0.319	0.043	6	SGM / XGM	0.0072	477.715	23.323
EPAJB118B	B	C1	2	1	487.389	23.038	0.289	0.043	6	SGM / XGM	0.0072	486.073	22.976
EPAJB119B	B	C1	2	1	468.040	23.671	0.317	0.043	6	SGM / XGM	0.0071	463.887	23.461
EPAJB215B	B	C2	2	2	453.772	22.683	0.307	0.043	6	SGM / XGM	0.0071	449.745	22.482
EPAJB216B	B	C2	2	2	469.053	22.923	0.274	0.043	6	SGM / XGM	0.0072	469.234	22.932
EPAJB217B	B	C2	2	2	452.385	22.555	0.305	0.042	6	SGM / XGM	0.0069	436.154	21.746
EPAJC116B*	C	C1	3	1	289.790	21.715	0.297	0.043	6	SGM / XGM	0.0072	289.567	21.698
EPAJC117B	C	C1	3	1	465.890	21.918	0.255	0.043	6	SGM / XGM	0.0072	466.789	21.960
EPAJC118B	C	C1	3	1	416.567	21.356	0.263	0.044	6	SGM / XGM	0.0073	424.120	21.743
EPAJC119B	C	C1	3	1	445.743	21.953	0.307	0.044	6	XGM	0.0073	449.526	22.139
EPAJC11AB	C	C1	3	1	470.685			0.043	6	SGM / XGM	0.0072	469.778	
EPAJC215B*	C	C2	3	2	388.576	22.073	0.253	0.043	6	SGM / XGM	0.0072	386.178	21.936
EPAJC216B	C	C2	3	2	482.661	21.776	0.274	0.043	6	SGM / XGM	0.0071	478.936	21.608
EPAJC217B	C	C2	3	2	461.574	22.594	0.306	0.043	6	SGM / XGM	0.0072	458.903	22.463
EPAJC218B	C	C2	3	2	420.193			0.042	6	XGM	0.0070	409.818	

* data point investigated, did not find reason to eliminate data
** Strength not reported due to slippage during testing.
*** Poisson's ratio not reported due to non-linearity.

Average	**444.296**	**22.720**	**0.300**	**$Average_{norm}$**	**0.0071**	**439.576**	**22.491**
Standard Dev.	**46.228**	**0.765**	**0.026**	**Standard $Dev._{norm}$**		**45.666**	**0.650**
Coeff. of Var. [%]	**10.405**	**3.368**	**8.644**	**Coeff. of Var. $[\%]_{norm}$**		**10.389**	**2.890**
Min.	**289.790**	**21.356**	**0.253**	**Min.**	**0.0069**	**289.567**	**21.608**
Max.	**487.389**	**24.410**	**0.341**	**Max.**	**0.0073**	**486.073**	**23.882**
Number of Spec.	**23**	**21**	**20**	**Number of Spec.**	**24**	**23**	**21**


Longitudinal Tension Properties (LT)--CTD
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
100.0
200.0
300.0
400.0
500.0
600.0
Longitudinal Tension Strength [ksi]


Longitudinal Tension Properties (LT)--CTD
Normalized Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
5.0
10.0
15.0
20.0
25.0
30.0
Longitudinal Tension Modulus [Msi]

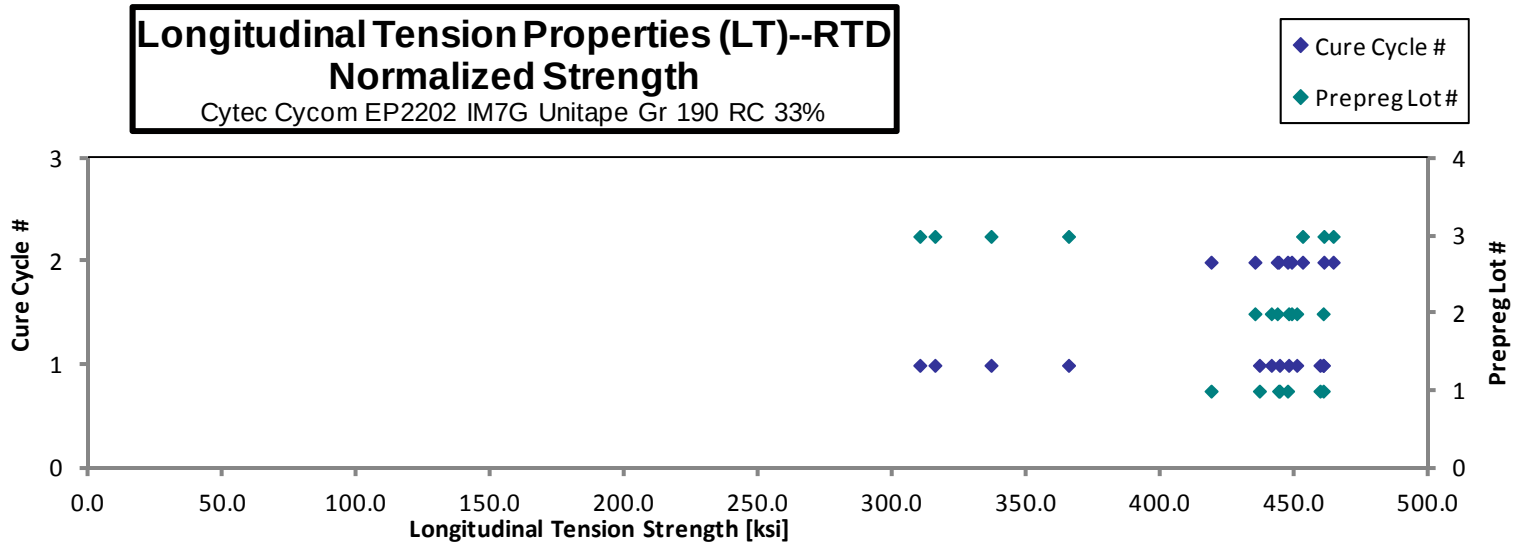
Longitudinal Tension Properties (LT)--RTD
Strength & Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

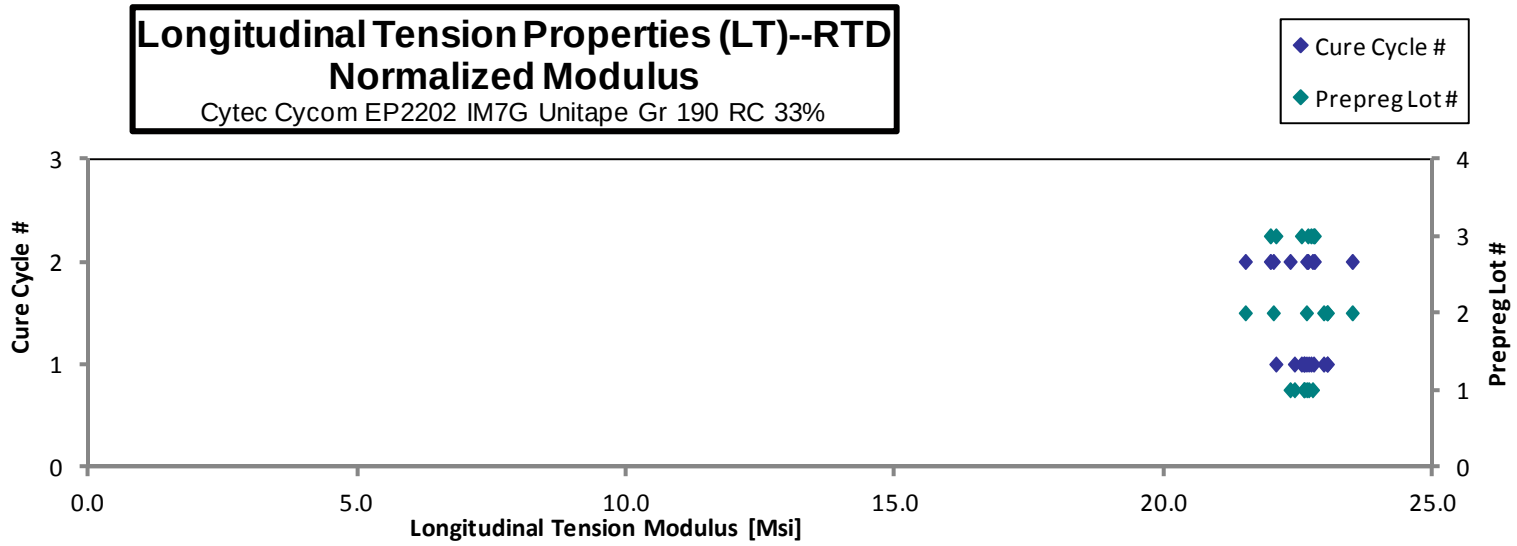
normalizing t_{ply} [in]
0.0072

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	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
EPAJA111A*	A	C1	1	1	474.381	23.094	0.327	0.042	6	XGM	0.0070	460.471	22.417
EPAJA112A*	A	C1	1	1	451.478	23.055	0.364	0.043	6	SGM / XGM	0.0071	444.163	22.681
EPAJA113A	A	C1	1	1	445.248	23.044	0.320	0.042	6	SGM / XGM	0.0071	436.659	22.599
EPAJA114A	A	C1	1	1	469.582	23.098	0.298	0.042	6	XGM	0.0070	459.256	22.590
EPAJA211A	A	C2	1	2	457.564	23.282	0.307	0.042	6	XGM	0.0070	447.149	22.752
EPAJA212A	A	C2	1	2	450.066	22.964	0.307	0.043	6	XGM	0.0071	443.815	22.645
EPAJA213A	A	C2	1	2	426.689	22.766	0.310	0.042	6	XGM	0.0071	418.622	22.336
EPAJB111A	B	C1	2	1	468.213	23.412	0.329	0.042	6	SGM / XGM	0.0071	460.446	23.023
EPAJB112A	B	C1	2	1	437.369	22.833	0.320	0.044	6	SGM / XGM	0.0073	441.082	23.027
EPAJB113A	B	C1	2	1	443.448	22.749	0.334	0.044	6	SGM / XGM	0.0073	447.554	22.959
EPAJB114A	B	C1	2	1	452.146	22.719	0.322	0.043	6	SGM / XGM	0.0072	450.576	22.640
EPAJB211A	B	C2	2	2	454.263	22.456	0.309	0.041	6	XGM	0.0069	434.985	21.503
EPAJB212A	B	C2	2	2	453.796	22.546	0.319	0.042	6	SGM / XGM	0.0070	443.291	22.024
EPAJB213A	B	C2	2	2	459.789	24.078	0.338	0.042	6	XGM	0.0070	448.614	23.492
EPAJC111A	C	C1	3	1	314.599	22.003	0.301	0.043	6	LGM / XGM	0.0072	315.570	22.071
EPAJC112A	C	C1	3	1	305.350	22.211	0.316	0.044	6	SGM / XGM	0.0073	309.944	22.546
EPAJC113A	C	C1	3	1	336.258	22.707	0.315	0.043	6	XGM	0.0072	336.518	22.724
EPAJC114A	C	C1	3	1	365.848	22.799	0.300	0.043	6	SGM / XGM	0.0072	365.425	22.772
EPAJC211A	C	C2	3	2	460.746	22.357	0.314	0.042	6	XGM	0.0071	452.747	21.968
EPAJC212A	C	C2	3	2	451.809	22.229	0.301	0.044	6	SGM / XGM	0.0073	460.699	22.667
EPAJC213A	C	C2	3	2	457.635	22.465	0.314	0.044	6	SGM / XGM	0.0073	464.167	22.786

* Strain measurement was measured with strain gauge. Extensometer used on other coupons.
Same test parameters used for all testing. Cause for low Strength values for Lot# 3 Cure 1 is unclear

Average	**430.299**	**22.803**	**0.317**	**$Average_{norm}$**	**0.0071**	**425.798**	**22.582**
Standard Dev.	**51.755**	**0.468**	**0.015**	**Standard $Dev._{norm}$**		**48.809**	**0.431**
Coeff. of Var. [%]	**12.028**	**2.053**	**4.884**	**Coeff. of Var. $[\%]_{norm}$**		**11.463**	**1.909**
Min.	**305.350**	**22.003**	**0.298**	**Min.**	**0.0069**	**309.944**	**21.503**
Max.	**474.381**	**24.078**	**0.364**	**Max.**	**0.0073**	**464.167**	**23.492**
Number of Spec.	**21**	**21**	**21**	**Number of Spec.**	**21**	**21**	**21**


Longitudinal Tension Properties (LT)--RTD
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
50.0
100.0
150.0
200.0
250.0
300.0
350.0
400.0
450.0
500.0
Longitudinal Tension Strength [ksi]


Longitudinal Tension Properties (LT)--RTD
Normalized Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
5.0
10.0
15.0
20.0
25.0
Longitudinal Tension Modulus [Msi]

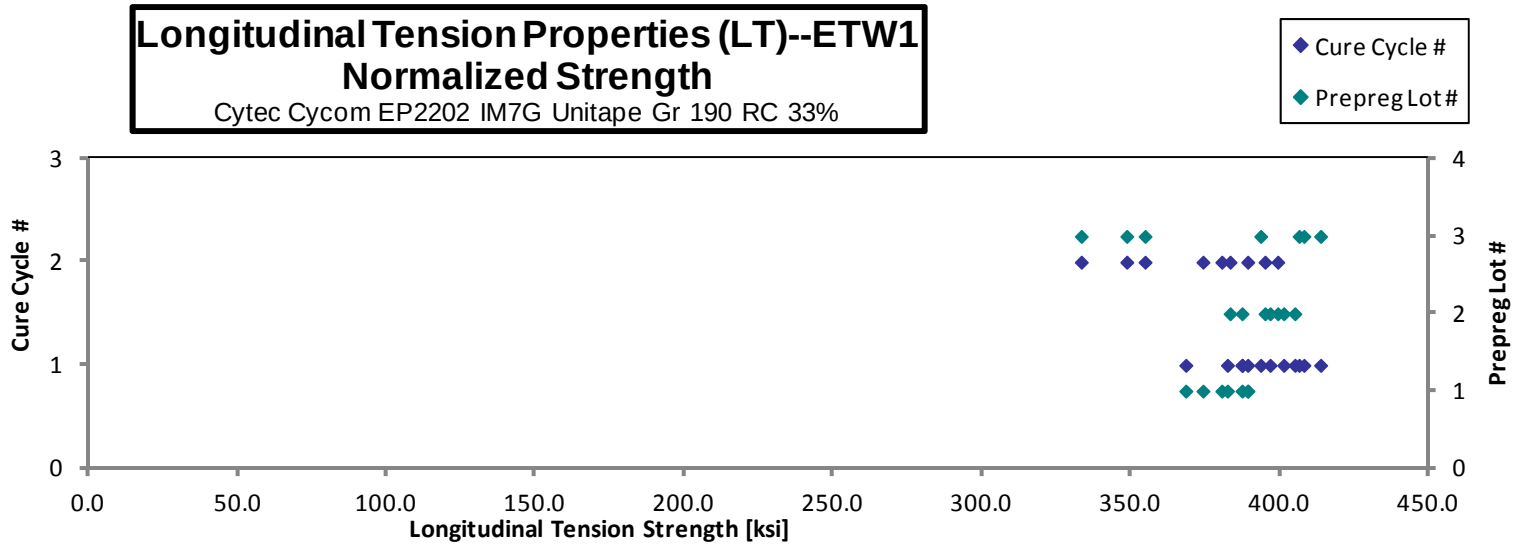
Longitudinal Tension Properties (LT)--ETW1
Strength & Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

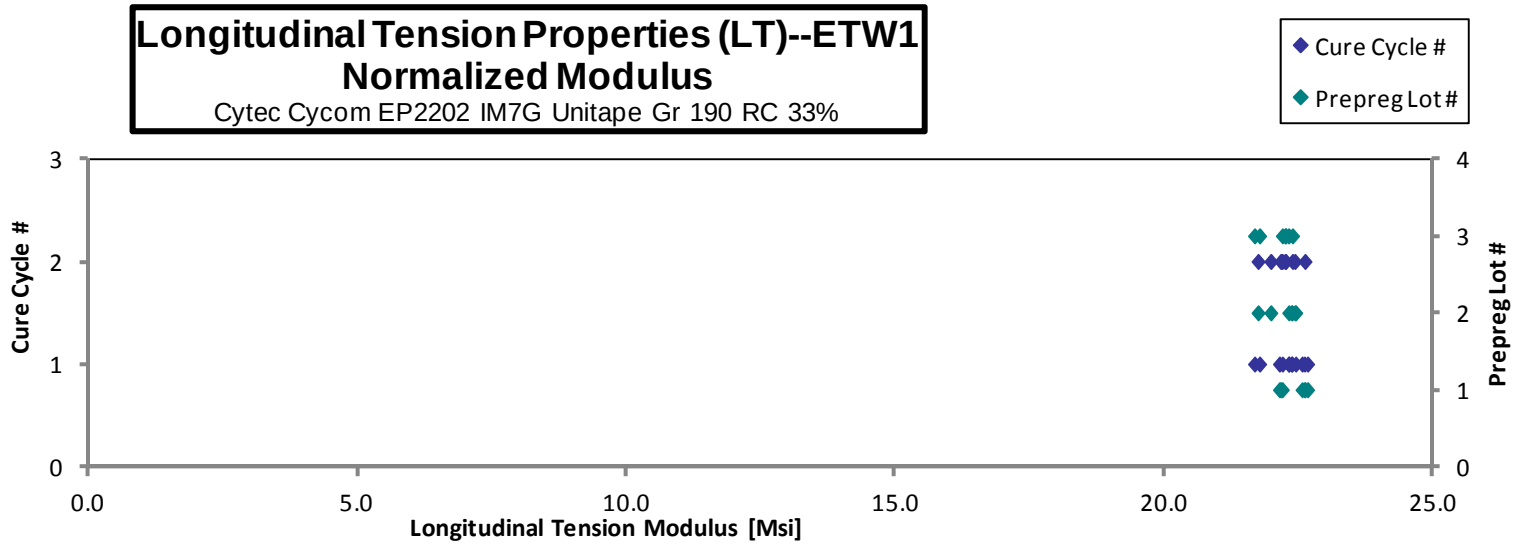
normalizing t_{ply} [in]
0.0072

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	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
EPAJA11BD	A	C1	1	1	391.531	22.389	0.320	0.043	6	XGM	0.0071	387.150	22.138
EPAJA11CD	A	C1	1	1	385.356	22.788	0.309	0.043	6	XGM	0.0071	382.234	22.603
EPAJA11DD	A	C1	1	1	373.171	22.859	0.305	0.043	6	XGM	0.0071	368.276	22.560
EPAJA11ED	A	C1	1	1	394.553	22.981	0.310	0.043	6	XGM	0.0071	389.074	22.662
EPAJA219D	A	C2	1	2	384.675	22.868	0.300	0.043	6	XGM	0.0071	380.371	22.613
EPAJA21AD	A	C2	1	2	380.642	22.554	0.294	0.042	6	XGM	0.0071	374.033	22.162
EPAJA21BD	A	C2	1	2	398.765	22.744	0.319	0.042	6	XGM	0.0070	389.073	22.191
EPAJB11BD	B	C1	2	1	389.380	22.032	0.302	0.044	6	XGM	0.0073	396.591	22.440
EPAJB11CD	B	C1	2	1	399.919	22.297	0.309	0.043	6	XGM	0.0072	401.153	22.366
EPAJB11DD	B	C1	2	1	390.937	22.529	0.315	0.043	6	XGM	0.0071	387.167	22.312
EPAJB11ED	B	C1	2	1	407.093	22.489	0.304	0.043	6	XGM	0.0072	404.894	22.367
EPAJB219D	B	C2	2	2	403.750	22.471	0.291	0.042	6	XGM	0.0070	394.871	21.977
EPAJB21AD	B	C2	2	2	391.605	22.221	0.299	0.042	6	XGM	0.0070	383.145	21.741
EPAJB21BD	B	C2	2	2	403.039	22.643	0.294	0.043	6	XGM	0.0071	399.151	22.425
EPAJC11BD	C	C1	3	1	413.866	22.210	0.298	0.043	6	XGM	0.0072	413.547	22.193
EPAJC11CD	C	C1	3	1	395.868	22.447	0.296	0.043	6	XGM	0.0072	393.424	22.308
EPAJC11DD	C	C1	3	1	410.789	21.922	0.299	0.043	6	XGM	0.0072	407.936	21.770
EPAJC11ED	C	C1	3	1	410.093	21.878	0.309	0.043	6	XGM	0.0071	406.296	21.675
EPAJC219D	C	C2	3	2	352.681	22.132	0.324	0.043	6	XGM	0.0072	354.586	22.251
EPAJC21AD	C	C2	3	2	345.787	22.209	0.299	0.044	6	XGM	0.0073	348.455	22.380
EPAJC21BD	C	C2	3	2	332.792	22.220	0.299	0.043	6	XGM	0.0072	333.178	22.246

Average	**388.395**	**22.423**	**0.304**
Standard Dev.	**21.541**	**0.316**	**0.009**
Coeff. of Var. [%]	**5.546**	**1.409**	**3.044**
Min.	**332.792**	**21.878**	**0.291**
Max.	**413.866**	**22.981**	**0.324**
Number of Spec.	**21**	**21**	**21**

$Average_{norm}$	**0.0071**	**385.457**	**22.256**
Standard $Dev._{norm}$		**20.458**	**0.279**
Coeff. of Var. $[\%]_{norm}$		**5.308**	**1.255**
Min.	**0.0070**	**333.178**	**21.675**
Max.	**0.0073**	**413.547**	**22.662**
Number of Spec.	**21**	**21**	**21**


Longitudinal Tension Properties (LT)--ETW1
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
50.0
100.0
150.0
200.0
250.0
300.0
350.0
400.0
450.0
Longitudinal Tension Strength [ksi]

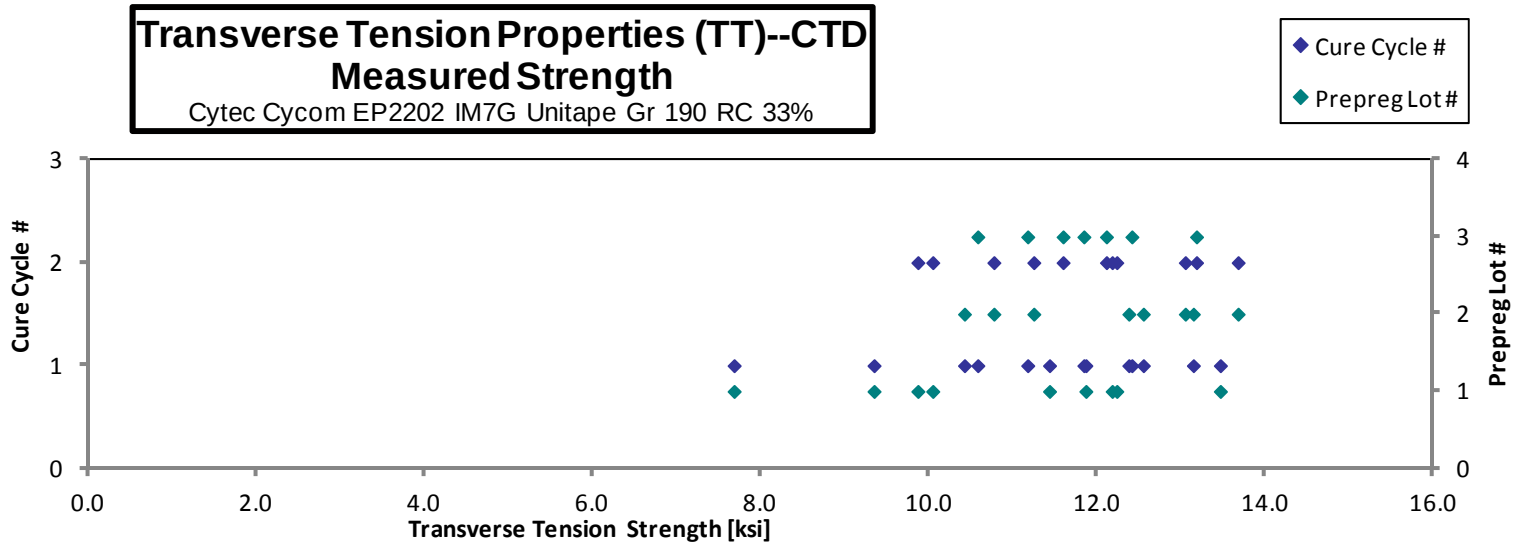

Longitudinal Tension Properties (LT)--ETW1
Normalized Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
5.0
10.0
15.0
20.0
25.0
Longitudinal Tension Modulus [Msi]

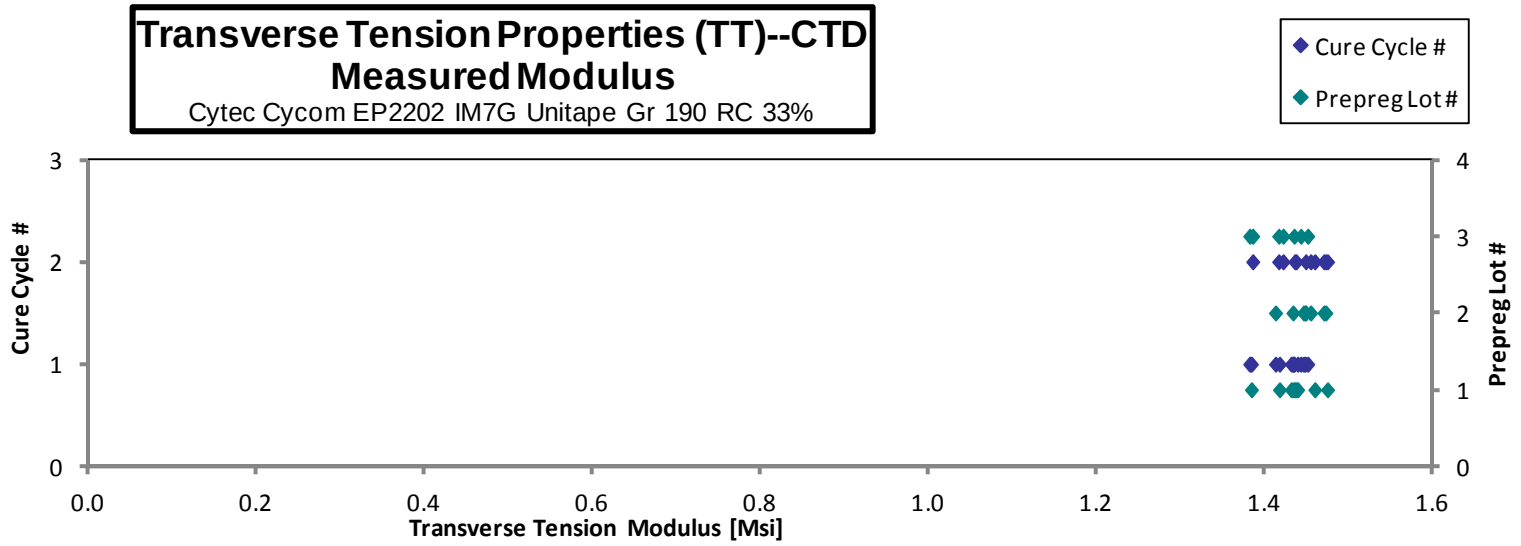
4.2 Transverse Tension Properties (TT)

Transverse Tension Properties (TT)--CTD
Strength & Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode
EPAUA116B	A	C1	1	1	11.864	1.383	0.078	11	0.0071	LAB
EPAUA117B	A	C1	1	1	13.465	1.431	0.078	11	0.0071	LGM
EPAUA118B	A	C1	1	1	9.343	1.434	0.078	11	0.0071	LGM
EPAUA119B	A	C1	1	1	11.432	1.439	0.078	11	0.0071	LGM
EPAUA11AB	A	C1	1	1	7.678	1.417	0.078	11	0.0071	LWB
EPAUA215B	A	C2	1	2	12.177	1.459	0.078	11	0.0070	LGM
EPAUA216B	A	C2	1	2	10.042	1.435	0.077	11	0.0070	LWB
EPAUA217B	A	C2	1	2	9.865	1.474	0.078	11	0.0071	LGM
EPAUA218B	A	C2	1	2	12.232	1.437	0.078	11	0.0071	LAB / LAT
EPAUB116B	B	C1	2	1	12.549	1.433	0.079	11	0.0072	LAB / LAT
EPAUB117B	B	C1	2	1	10.419	1.412	0.080	11	0.0072	LGM / LWT
EPAUB118B	B	C1	2	1	13.144	1.446	0.079	11	0.0072	LAB / LWT
EPAUB119B	B	C1	2	1	12.375	1.447	0.079	11	0.0072	LAB / LAT
EPAUB215B	B	C2	2	2	13.048	1.470	0.079	11	0.0072	LAB / LAT
EPAUB216B	B	C2	2	2	10.769	1.454	0.079	11	0.0072	LAT
EPAUB217B	B	C2	2	2	11.245	1.472	0.079	11	0.0072	LAT
EPAUB218B	B	C2	2	2	13.677	1.448	0.079	11	0.0072	LAT
EPAUC116B	C	C1	3	1	11.840	1.442	0.079	11	0.0072	LAT
EPAUC117B	C	C1	3	1	10.578	1.451	0.079	11	0.0072	LAT
EPAUC118B	C	C1	3	1	11.172	1.434	0.079	11	0.0072	LAT
EPAUC119B	C	C1	3	1	12.412	1.381	0.079	11	0.0072	LAT
EPAUC215B	C	C2	3	2	12.109	1.385	0.079	11	0.0072	LAT
EPAUC216B	C	C2	3	2	11.593	1.416	0.079	11	0.0072	LAT
EPAUC217B	C	C2	3	2	13.181	1.421	0.079	11	0.0072	LAT

Average	**11.592**	**1.434**	**Average**	**0.0072**
Standard Dev.	**1.436**	**0.026**	**Standard Dev.**	
Coeff. of Var. [%]	**12.389**	**1.793**	**Coeff. of Var. [%]**	
Min.	**7.678**	**1.381**	**Min.**	**0.0070**
Max.	**13.677**	**1.474**	**Max.**	**0.0072**
Number of Spec.	**24**	**24**	**Number of Spec.**	**24**


Transverse Tension Properties (TT)--CTD
Measured Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
Transverse Tension Strength [ksi]

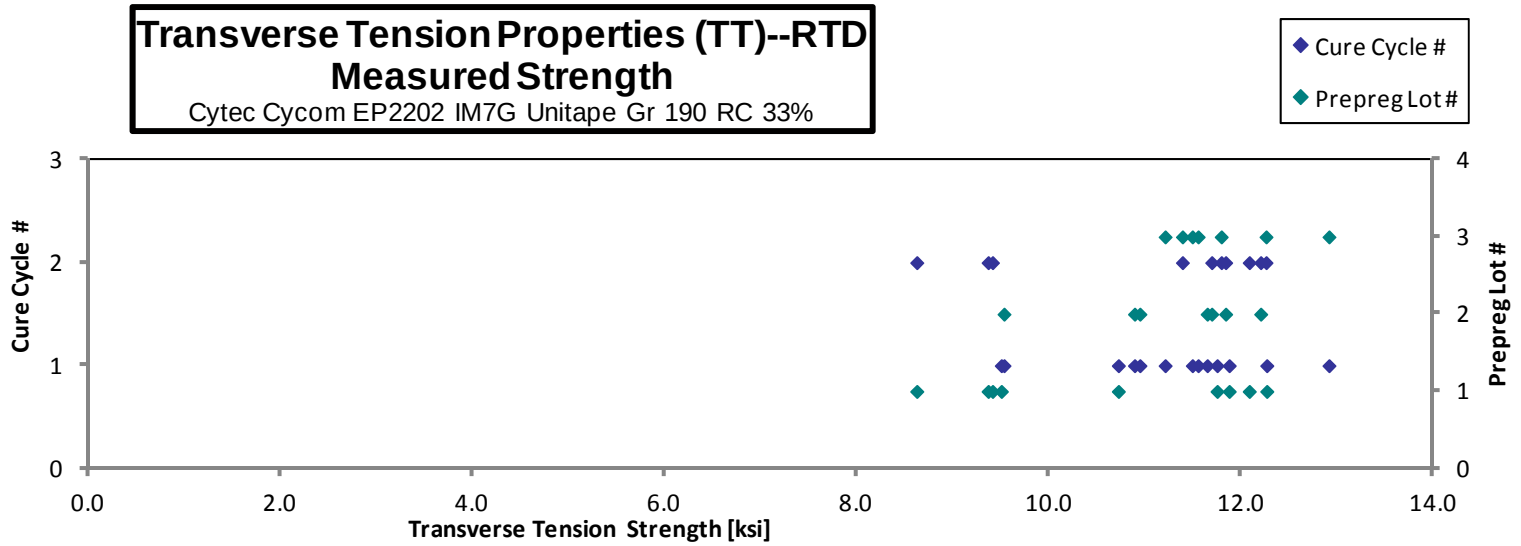

Transverse Tension Properties (TT)--CTD
Measured Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
Transverse Tension Modulus [Msi]

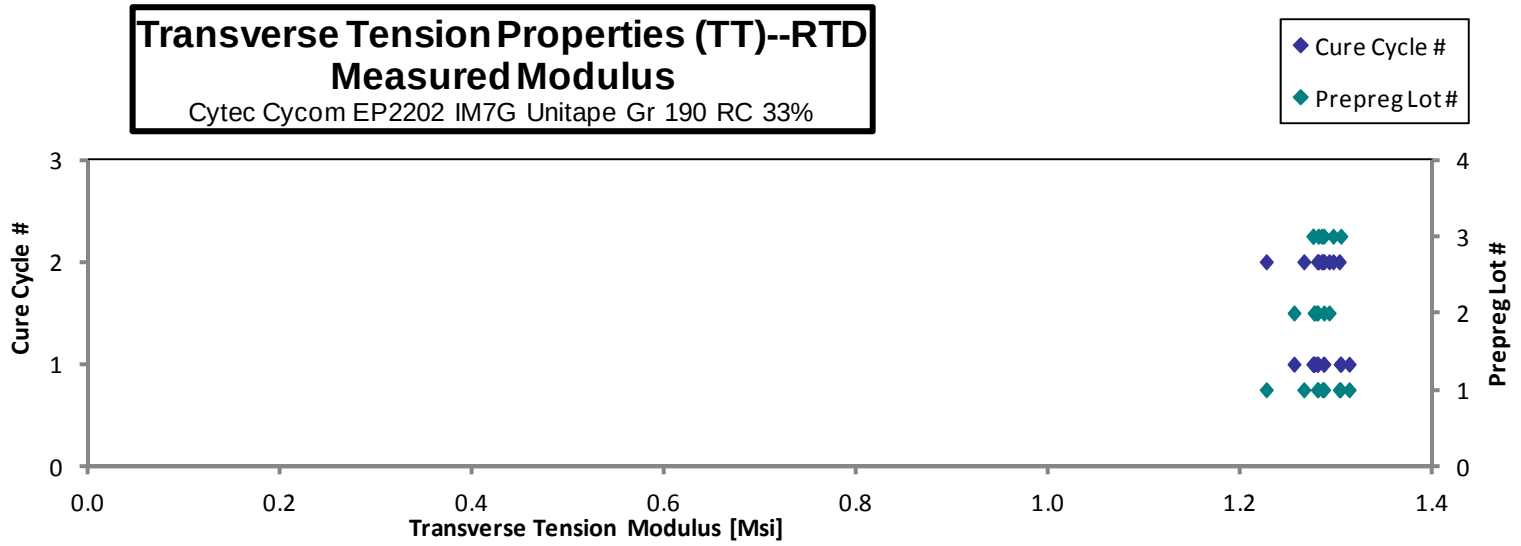
Transverse Tension Properties (TT)--RTD
Strength & Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode
EPAUA111A*	A	C1	1	1	9.501	1.312	0.078	11	0.0071	LGM
EPAUA112A*	A	C1	1	1	11.748	1.303	0.078	11	0.0071	LAT
EPAUA113A	A	C1	1	1	10.719	1.286	0.078	11	0.0071	LGM
EPAUA114A	A	C1	1	1	12.265	1.279	0.078	11	0.0071	LAB / LAT
EPAUA115A	A	C1	1	1	11.874	1.279	0.078	11	0.0071	LGM
EPAUA211A	A	C2	1	2	9.363	1.226	0.078	11	0.0071	LGM
EPAUA212A	A	C2	1	2	8.620	1.302	0.077	11	0.0070	LGM
EPAUA213A	A	C2	1	2	12.083	1.265	0.078	11	0.0071	LWB
EPAUA214A	A	C2	1	2	9.409	1.285	0.077	11	0.0070	LWB
EPAUB111A	B	C1	2	1	10.944	1.276	0.080	11	0.0072	LGM
EPAUB112A	B	C1	2	1	9.529	1.276	0.079	11	0.0072	LWT
EPAUB113A	B	C1	2	1	10.888	1.279	0.079	11	0.0072	LAT
EPAUB114A	B	C1	2	1	11.645	1.255	0.080	11	0.0072	LAB
EPAUB211A	B	C2	2	2	12.202	1.292	0.079	11	0.0072	LAT / LAB
EPAUB212A	B	C2	2	2	11.837	1.279	0.079	11	0.0072	LAB
EPAUB213A	B	C2	2	2	11.692	1.286	0.079	11	0.0072	LAB / LAT
EPAUC111A	C	C1	3	1	12.913	1.275	0.079	11	0.0072	LAB
EPAUC112A	C	C1	3	1	11.551	1.275	0.079	11	0.0072	LAB
EPAUC113A	C	C1	3	1	11.490	1.286	0.079	11	0.0072	LAB / LWT
EPAUC115A	C	C1	3	1	11.207	1.304	0.079	11	0.0072	LWT
EPAUC211A	C	C2	3	2	11.791	1.280	0.080	11	0.0072	LAT / LAB
EPAUC212A	C	C2	3	2	11.387	1.296	0.079	11	0.0072	LAT
EPAUC213A	C	C2	3	2	12.257	1.284	0.079	11	0.0072	LAB

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

Average	**11.170**	**1.282**	**Average**	**0.0072**
Standard Dev.	**1.137**	**0.018**	**Standard Dev.**	
Coeff. of Var. [%]	**10.182**	**1.385**	**Coeff. of Var. [%]**	
Min.	**8.620**	**1.226**	**Min.**	**0.0070**
Max.	**12.913**	**1.312**	**Max.**	**0.0072**
Number of Spec.	**23**	**23**	**Number of Spec.**	**23**


Transverse Tension Properties (TT)--RTD
Measured Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Transverse Tension Strength [ksi]
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
0
1
2
3
4

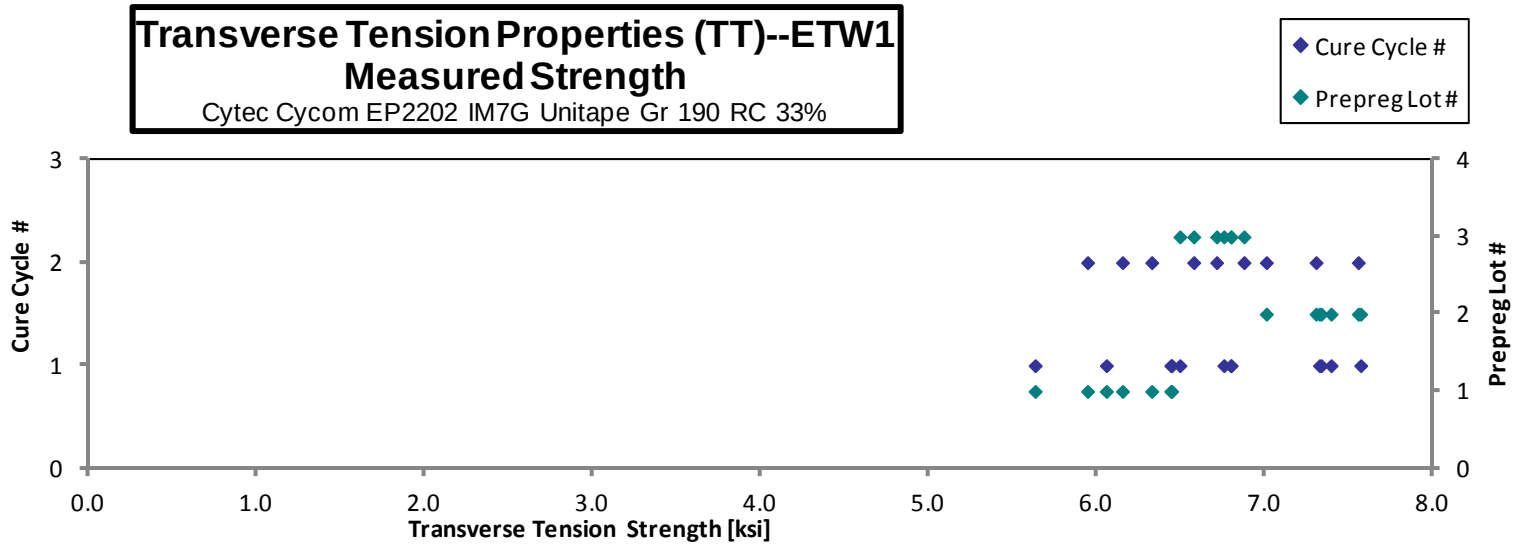

Transverse Tension Properties (TT)--RTD
Measured Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Transverse Tension Modulus [Msi]
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
0
1
2
3
4

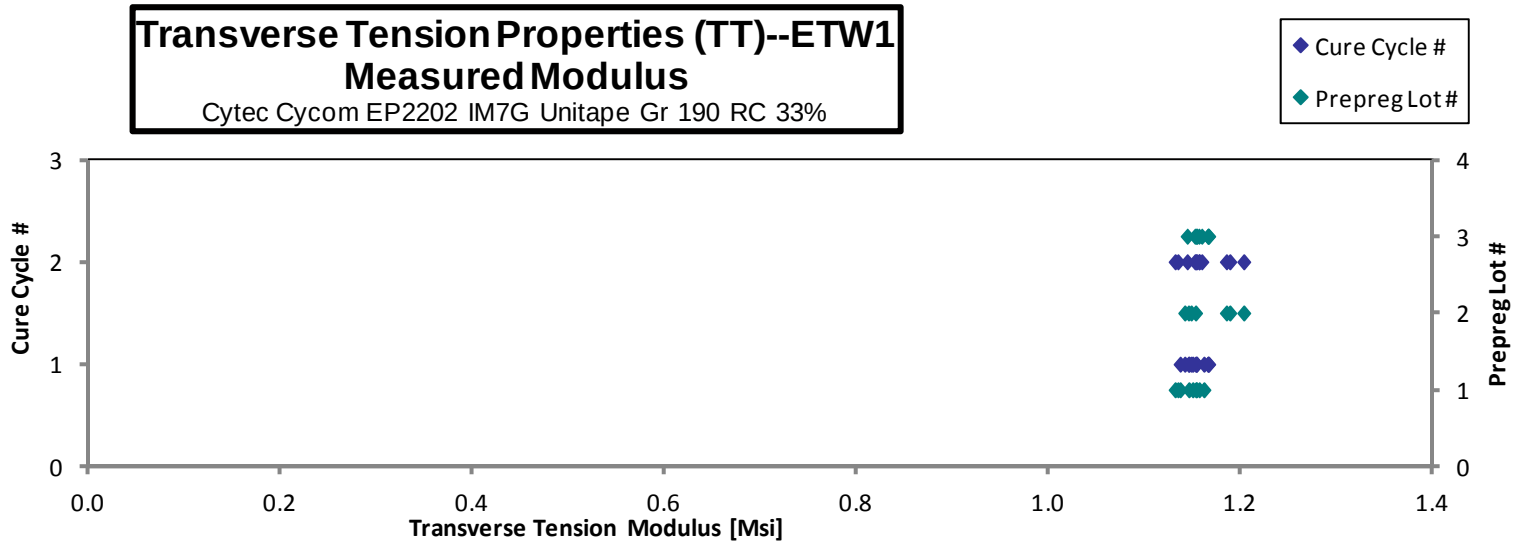
Transverse Tension Properties (TT)--ETW1
Strength & Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode
EPAUA11BD	A	C1	1	1	6.438	1.161	0.078	11	0.0071	LGT
EPAUA11CD	A	C1	1	1	5.630	1.145	0.078	11	0.0071	LGB
EPAUA11DD	A	C1	1	1	6.054	1.153	0.078	11	0.0071	LGM
EPAUA11ED*	A	C1	1	1		1.136	0.078	11	0.0071	LIB
EPAUA11FD	A	C1	1	1	6.443	1.149	0.078	11	0.0071	LGM
EPAUA219D*	A	C2	1	2		1.131	0.078	11	0.0071	LIT
EPAUA21AD	A	C2	1	2	6.150	1.156	0.077	11	0.0070	LWB
EPAUA21BD	A	C2	1	2	6.324	1.153	0.077	11	0.0070	LGT
EPAUA21CD	A	C2	1	2	5.942	1.134	0.077	11	0.0070	LGB
EPAUB11BD	B	C1	2	1	7.322	1.145	0.079	11	0.0072	LGM
EPAUB11CD	B	C1	2	1	7.392	1.141	0.079	11	0.0072	LGM
EPAUB11DD	B	C1	2	1	7.333	1.152	0.079	11	0.0072	LGM
EPAUB11ED	B	C1	2	1	7.568	1.148	0.079	11	0.0072	LGM
EPAUB219D	B	C2	2	2	7.302	1.185	0.079	11	0.0072	LWT
EPAUB21AD	B	C2	2	2	7.006	1.188	0.078	11	0.0071	LWT
EPAUB21BD	B	C2	2	2	7.553	1.203	0.078	11	0.0071	LGM
EPAUC11BD	C	C1	3	1	6.795	1.166	0.079	11	0.0071	LGM
EPAUC11CD	C	C1	3	1	6.753	1.165	0.079	11	0.0071	LGM
EPAUC11DD	C	C1	3	1	6.796	1.165	0.079	11	0.0072	LGM
EPAUC11ED	C	C1	3	1	6.492	1.153	0.079	11	0.0072	LWB
EPAUC219D	C	C2	3	2	6.873	1.153	0.079	11	0.0072	LGM
EPAUC21AD*	C	C2	3	2		1.152	0.079	11	0.0072	LIB
EPAUC21BD*	C	C2	3	2		1.156	0.079	11	0.0072	LIB
EPAUC21CD	C	C2	3	2	6.710	1.159	0.079	11	0.0072	LGM
EPAUC21DD	C	C2	3	2	6.574	1.144	0.079	11	0.0072	LGM

* Strength not reported due to unacceptable failure mode.

Average	**6.736**	**1.156**	**Average**	**0.0071**
Standard Dev.	**0.548**	**0.017**	**Standard Dev.**	
Coeff. of Var. [%]	**8.132**	**1.433**	**Coeff. of Var. [%]**	
Min.	**5.630**	**1.131**	**Min.**	**0.0070**
Max.	**7.568**	**1.203**	**Max.**	**0.0072**
Number of Spec.	**21**	**25**	**Number of Spec.**	**25**


Transverse Tension Properties (TT)--ETW1
Measured Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
Transverse Tension Strength [ksi]


Transverse Tension Properties (TT)--ETW1
Measured Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
Transverse Tension Modulus [Msi]

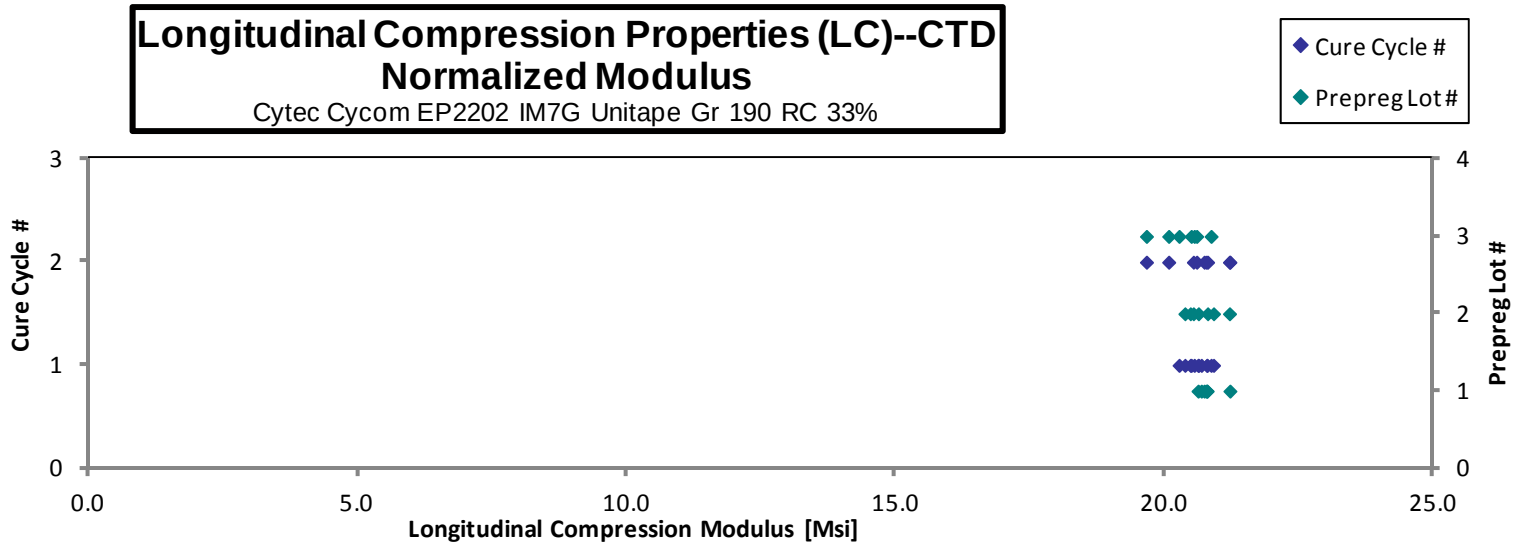
4.3 Longitudinal Compression Properties (LC)

Longitudinal Compression Properties (LC)--CTD
Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

normalizing t_{ply} [in]
0.0072

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]
EPALA117B	A	C1	1	1	21.072	0.099	14	0.0071	20.685
EPALA118B	A	C1	1	1	21.024	0.099	14	0.0071	20.624
EPALA119B	A	C1	1	1	21.146	0.099	14	0.0071	20.786
EPALA11AB	A	C1	1	1	21.139	0.099	14	0.0071	20.793
EPALA215B	A	C2	1	2	21.349	0.098	14	0.0070	20.738
EPALA216B	A	C2	1	2	21.345	0.098	14	0.0070	20.777
EPALA217B	A	C2	1	2	21.709	0.099	14	0.0070	21.217
EPALB116B	B	C1	2	1	20.543	0.101	14	0.0072	20.631
EPALB117B	B	C1	2	1	20.427	0.101	14	0.0072	20.481
EPALB118B	B	C1	2	1	20.888	0.101	14	0.0072	20.912
EPALB119B	B	C1	2	1	20.410	0.101	14	0.0072	20.379
EPALB215B	B	C2	2	2	20.788	0.101	14	0.0072	20.802
EPALB216B	B	C2	2	2	21.129	0.101	14	0.0072	21.209
EPALB217B	B	C2	2	2	20.530	0.101	14	0.0072	20.537
EPALC116B	C	C1	3	1	20.543	0.101	14	0.0072	20.496
EPALC117B	C	C1	3	1	20.349	0.100	14	0.0072	20.272
EPALC118B	C	C1	3	1	20.978	0.100	14	0.0072	20.867
EPALC119B	C	C1	3	1	20.642	0.100	14	0.0072	20.553
EPALC216B	C	C2	3	2	19.645	0.101	14	0.0072	19.665
EPALC217B	C	C2	3	2	20.074	0.101	14	0.0072	20.078
EPALC218B	C	C2	3	2	20.636	0.101	14	0.0072	20.598

Average	**20.779**	**$Average_{norm}$**	**0.0071**	**20.624**
Standard Dev.	**0.476**	**$Standard\ Dev._{norm}$**		**0.348**
Coeff. of Var. [%]	**2.291**	**$Coeff.\ of\ Var.\ [\%]_{norm}$**		**1.685**
Min.	**19.645**	**Min.**	**0.0070**	**19.665**
Max.	**21.709**	**Max.**	**0.0072**	**21.217**
Number of Spec.	**21**	**Number of Spec.**	**21**	**21**


Longitudinal Compression Properties (LC)--CTD
Normalized Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
5.0
10.0
15.0
20.0
25.0
Longitudinal Compression Modulus [Msi]

Longitudinal Compression Properties (LC)--RTD
Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

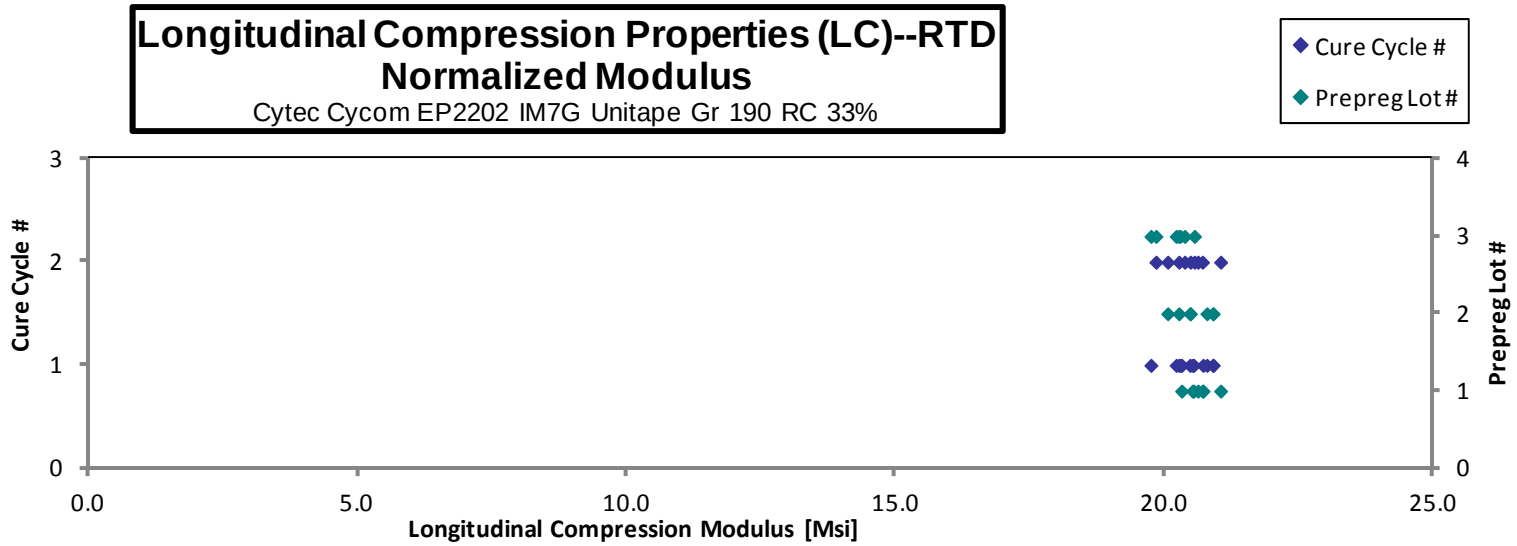
normalizing t_{ply} [in]
0.0072

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]
EPALA111A*	A	C1	1	1	21.240	0.098	14	0.0070	20.717
EPALA112A*	A	C1	1	1	21.097	0.098	14	0.0070	20.542
EPALA113A	A	C1	1	1	21.104	0.098	14	0.0070	20.521
EPALA114A	A	C1	1	1	20.864	0.098	14	0.0070	20.319
EPALA211A	A	C2	1	2	21.612	0.098	14	0.0070	21.044
EPALA212A	A	C2	1	2	21.276	0.098	14	0.0070	20.622
EPALA213A	A	C2	1	2	21.356	0.098	14	0.0070	20.706
EPALB111A	B	C1	2	1	20.813	0.099	14	0.0071	20.473
EPALB112A	B	C1	2	1	21.009	0.100	14	0.0072	20.901
EPALB113A	B	C1	2	1	20.967	0.101	14	0.0072	20.904
EPALB114A	B	C1	2	1	20.772	0.101	14	0.0072	20.789
EPALB211A	B	C2	2	2	20.442	0.099	14	0.0071	20.060
EPALB212A	B	C2	2	2	20.622	0.100	14	0.0072	20.482
EPALB213A	B	C2	2	2	20.400	0.100	14	0.0072	20.269
EPALC111A	C	C1	3	1	20.089	0.099	14	0.0071	19.747
EPALC112A	C	C1	3	1	20.359	0.100	14	0.0072	20.218
EPALC113A	C	C1	3	1	20.313	0.101	14	0.0072	20.293
EPALC114A	C	C1	3	1	20.288	0.101	14	0.0072	20.268
EPALC211A	C	C2	3	2	20.138	0.099	14	0.0071	19.841
EPALC212A	C	C2	3	2	20.691	0.100	14	0.0072	20.558
EPALC213A	C	C2	3	2	20.304	0.101	14	0.0072	20.375

* Modulus are averaged values of 2 strain gages.

Average	**20.750**	
Standard Dev.	**0.436**	
Coeff. of Var. [%]	**2.103**	
Min.	**20.089**	
Max.	**21.612**	
Number of Spec.	**21**	

$Average_{norm}$	**0.0071**	**20.459**
$Standard\ Dev._{norm}$		**0.336**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**1.640**
Min.	**0.0070**	**19.747**
Max.	**0.0072**	**21.044**
Number of Spec.	**21**	**21**


Longitudinal Compression Properties (LC)--RTD
Normalized Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
5.0
10.0
15.0
20.0
25.0
Longitudinal Compression Modulus [Msi]

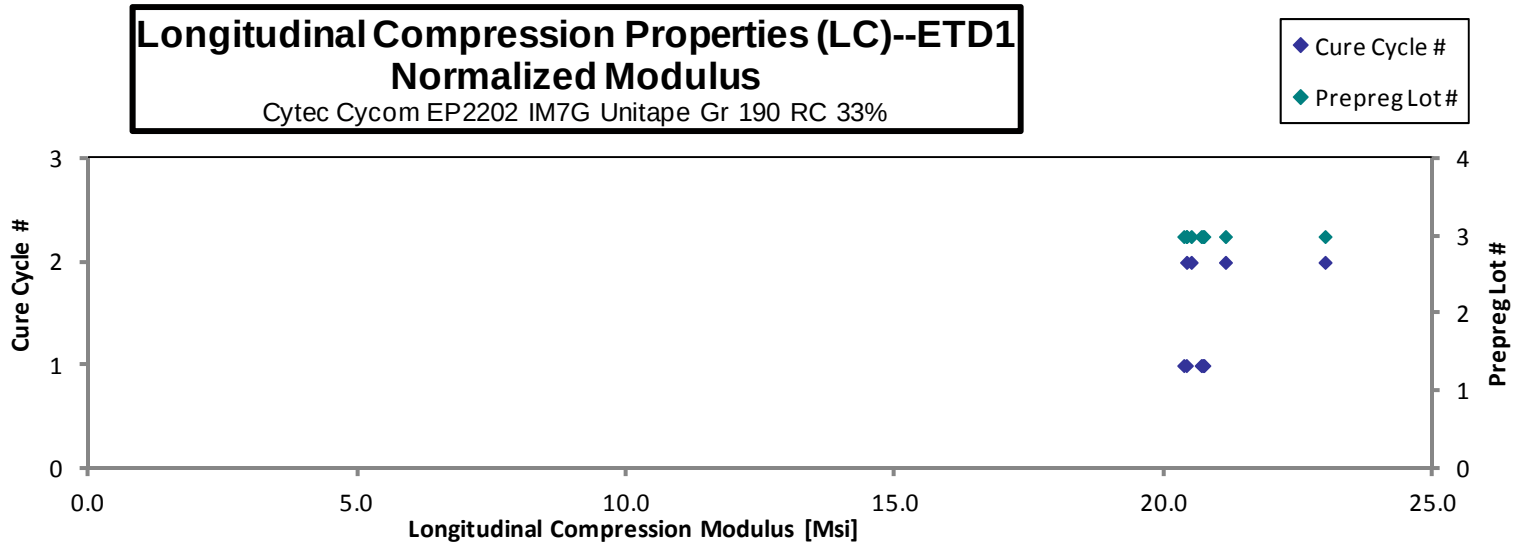
Longitudinal Compression Properties (LC)--ETD1
Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

normalizing t_{ply} [in]
0.0072

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]
EPALC11BC	C	C1	3	1	20.807	0.100	14	0.0072	20.732
EPALC11CC	C	C1	3	1	20.611	0.100	14	0.0071	20.359
EPALC11DC	C	C1	3	1	20.440	0.101	14	0.0072	20.406
EPALC11EC	C	C1	3	1	20.619	0.101	14	0.0072	20.711
EPALC11FC	C	C1	3	1	20.605	0.101	14	0.0072	20.683
EPALC219C	C	C2	3	2	20.522	0.100	14	0.0072	20.410
EPALC21AC*	C	C2	3	2	23.151	0.100	14	0.0071	22.986
EPALC21BC	C	C2	3	2	20.653	0.100	14	0.0071	20.496
EPALC21CC	C	C2	3	2	21.225	0.100	14	0.0072	21.134

*strain data reviewed, readings are valid

Average	**20.959**	**$Average_{norm}$**	**0.0072**	**20.880**
Standard Dev.	**0.852**	**$Standard\ Dev._{norm}$**		**0.826**
Coeff. of Var. [%]	**4.067**	**$Coeff.\ of\ Var.\ [\%]_{norm}$**		**3.954**
Min.	**20.440**	**Min.**	**0.0071**	**20.359**
Max.	**23.151**	**Max.**	**0.0072**	**22.986**
Number of Spec.	**9**	**Number of Spec.**	**9**	**9**

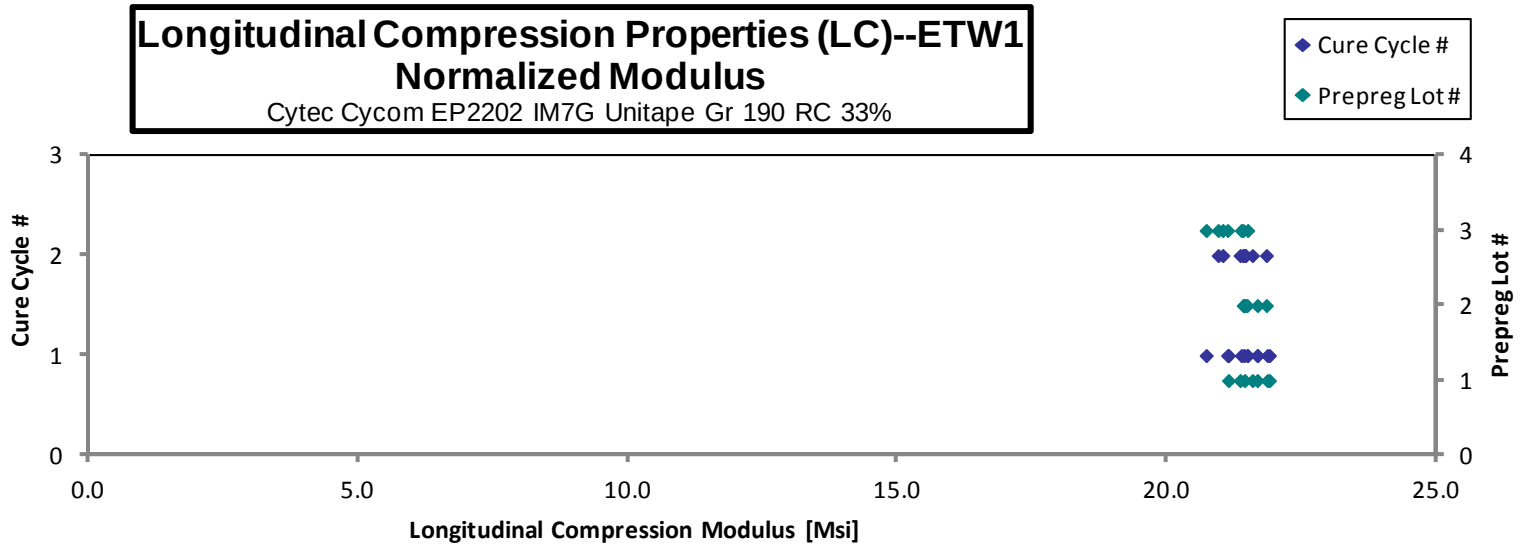

Longitudinal Compression Properties (LC)--ETD1
Normalized Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
5.0
10.0
15.0
20.0
25.0
Longitudinal Compression Modulus [Msi]

Longitudinal Compression Properties (LC)--ETW1
Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

normalizing t_{ply} [in]
0.0072

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]
EPALA11BD	A	C1	1	1	22.304	0.099	14	0.0071	21.865
EPALA11CD	A	C1	1	1	22.101	0.099	14	0.0071	21.677
EPALA11DD	A	C1	1	1	21.656	0.098	14	0.0070	21.144
EPALA11ED	A	C1	1	1	22.595	0.098	14	0.0070	21.904
EPALA219D	A	C2	1	2	22.024	0.099	14	0.0071	21.587
EPALA21AD	A	C2	1	2	21.870	0.099	14	0.0071	21.444
EPALA21BD	A	C2	1	2	21.781	0.099	14	0.0071	21.360
EPALB11BD	B	C1	2	1	21.476	0.101	14	0.0072	21.430
EPALB11CD	B	C1	2	1	21.549	0.101	14	0.0072	21.488
EPALB11DD	B	C1	2	1	21.474	0.101	14	0.0072	21.428
EPALB11ED	B	C1	2	1	21.713	0.101	14	0.0072	21.680
EPALB219D	B	C2	2	2	21.595	0.100	14	0.0071	21.417
EPALB21AD	B	C2	2	2	21.982	0.100	14	0.0072	21.847
EPALB21BD	B	C2	2	2	21.610	0.100	14	0.0072	21.460
EPALC11GD	C	C1	3	1	20.696	0.101	14	0.0072	20.731
EPALC11HD	C	C1	3	1	21.110	0.101	14	0.0072	21.127
EPALC11ID	C	C1	3	1	21.393	0.101	14	0.0072	21.382
EPALC11JD	C	C1	3	1	21.493	0.101	14	0.0072	21.500
EPALC21DD	C	C2	3	2	21.466	0.101	14	0.0072	21.413
EPALC21ED	C	C2	3	2	20.931	0.101	14	0.0072	20.952
EPALC21FD	C	C2	3	2	20.965	0.101	14	0.0072	21.038

Average	**21.609**		**Average$_{norm}$**	**0.0071**	**21.423**
Standard Dev.	**0.458**		**Standard Dev.$_{norm}$**		**0.300**
Coeff. of Var. [%]	**2.120**		**Coeff. of Var. [%]$_{norm}$**		**1.399**
Min.	**20.696**		**Min.**	**0.0070**	**20.731**
Max.	**22.595**		**Max.**	**0.0072**	**21.904**
Number of Spec.	**21**		**Number of Spec.**	**21**	**21**

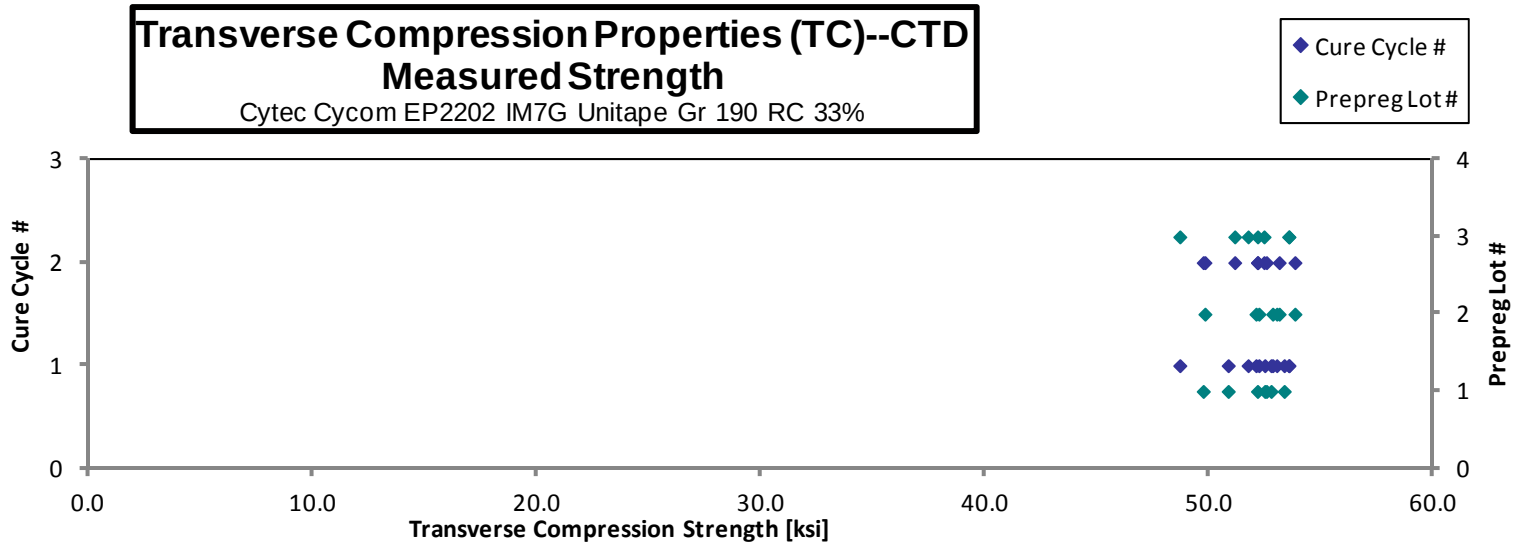

Longitudinal Compression Properties (LC)--ETW1
Normalized Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
5.0
10.0
15.0
20.0
25.0
Longitudinal Compression Modulus [Msi]

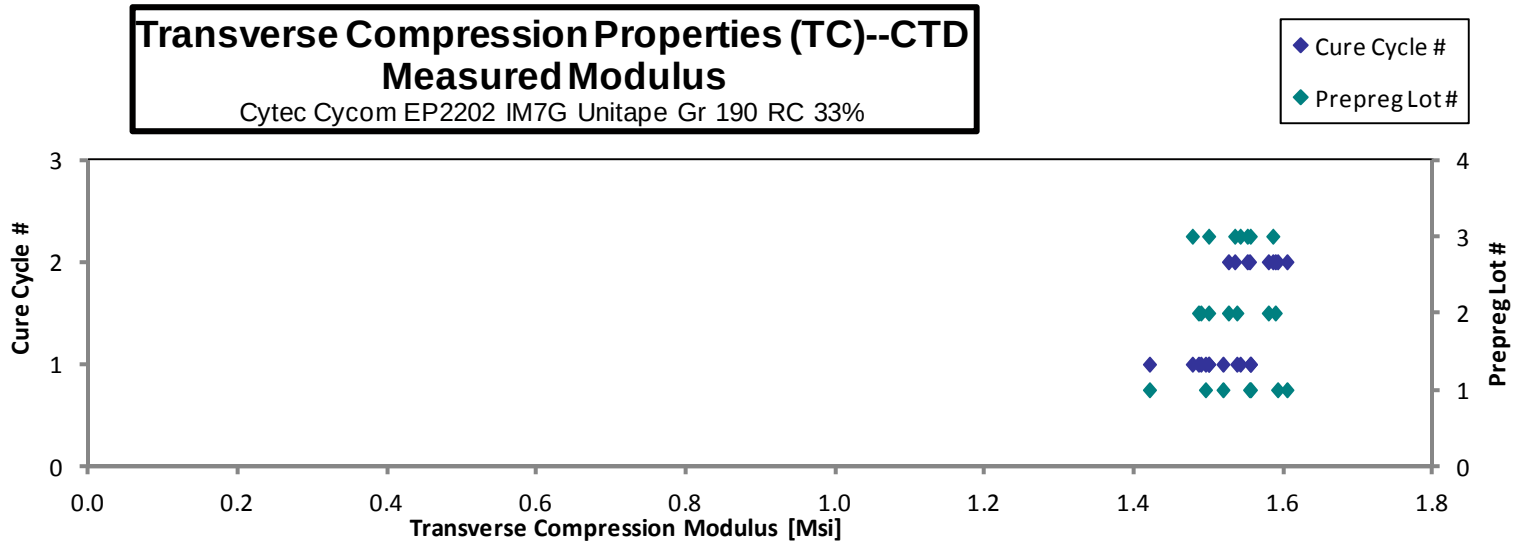
4.4 Transverse Compression Properties (TC)

Transverse Compression Properties (TC)--CTD
Strength & Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode
EPAZA117B	A	C1	1	1	53.345	1.555	0.099	14	0.0071	HGM
EPAZA118B	A	C1	1	1	50.844	1.420	0.100	14	0.0071	HGM
EPAZA119B	A	C1	1	1	52.475	1.518	0.100	14	0.0071	HGM
EPAZA11AB	A	C1	1	1	52.758	1.495	0.100	14	0.0071	HGM
EPAZA216B	A	C2	1	2	52.553	1.554	0.094	14	0.0067	HGM
EPAZA217B	A	C2	1	2	49.731	1.592	0.096	14	0.0068	HGM
EPAZA218B	A	C2	1	2	52.152	1.604	0.095	14	0.0068	HGM
EPAZB117B	B	C1	2	1	52.083	1.489	0.100	14	0.0072	HGM
EPAZB118B	B	C1	2	1	52.215	1.537	0.100	14	0.0072	HGM
EPAZB119B	B	C1	2	1	53.010	1.499	0.101	14	0.0072	HGM
EPAZB11AB	B	C1	2	1	52.828	1.486	0.101	14	0.0072	HGM
EPAZB216B	B	C2	2	2	53.821	1.588	0.109	14	0.0078	HGM
EPAZB217B	B	C2	2	2	49.805	1.526	0.109	14	0.0078	HGM
EPAZB218B	B	C2	2	2	53.120	1.579	0.109	14	0.0078	HGM
EPAZC117B	C	C1	3	1	53.553	1.555	0.101	14	0.0072	HGM
EPAZC118B	C	C1	3	1	53.547	1.477	0.101	14	0.0072	HGM
EPAZC119B	C	C1	3	1	51.731	1.541	0.101	14	0.0072	HGM
EPAZC11AB	C	C1	3	1	48.684	1.499	0.100	14	0.0072	HGM
EPAZC216B	C	C2	3	2	52.443	1.551	0.108	14	0.0077	HGM
EPAZC217B	C	C2	3	2	52.155	1.534	0.108	14	0.0077	HGM
EPAZC218B	C	C2	3	2	51.136	1.585	0.108	14	0.0077	HGM

Average	**52.095**	**1.533**	**Average**	**0.0073**
Standard Dev.	**1.364**	**0.046**	**Standard Dev.**	
Coeff. of Var. [%]	**2.619**	**3.001**	**Coeff. of Var. [%]**	
Min.	**48.684**	**1.420**	**Min.**	**0.0067**
Max.	**53.821**	**1.604**	**Max.**	**0.0078**
Number of Spec.	**21**	**21**	**Number of Spec.**	**21**


Transverse Compression Properties (TC)--CTD
Measured Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
10.0
20.0
30.0
40.0
50.0
60.0
Transverse Compression Strength [ksi]


Transverse Compression Properties (TC)--CTD
Measured Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
Transverse Compression Modulus [Msi]

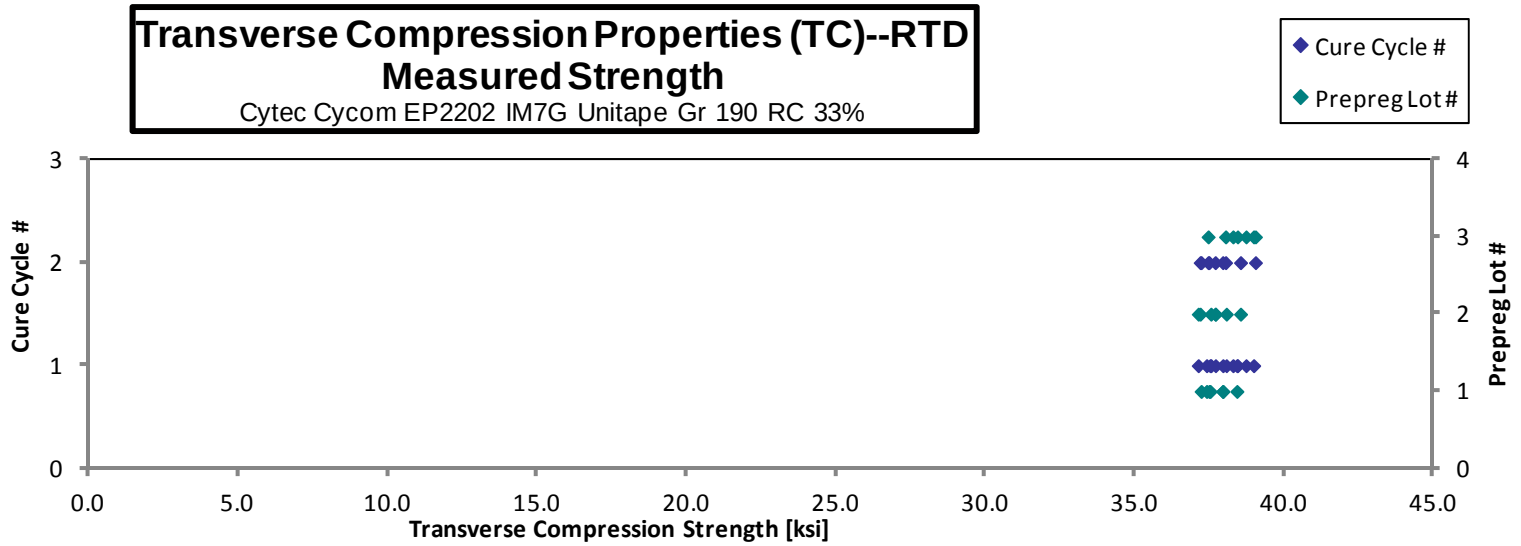
Transverse Compression Properties (TC)--RTD
Strength & Modulus

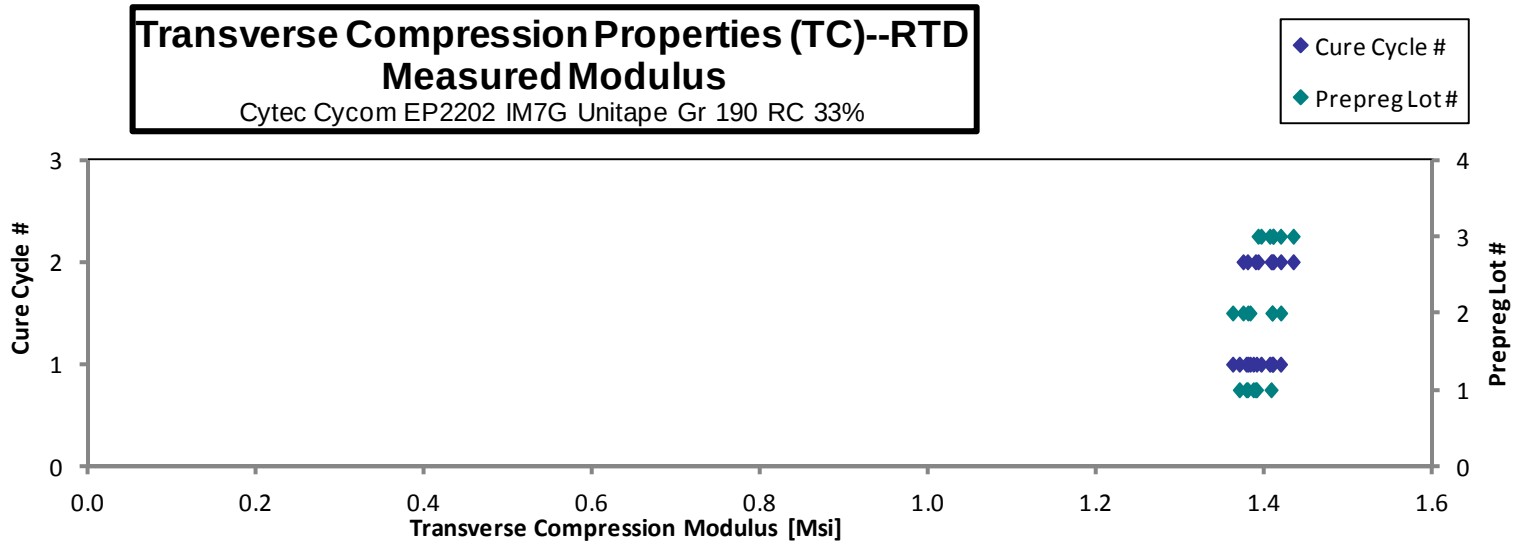
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode
EPAZA111A*	A	C1	1	1	38.424	1.390	0.099	14	0.0071	HGM
EPAZA112A*	A	C1	1	1	37.528	1.386	0.100	14	0.0071	HGM
EPAZA113A	A	C1	1	1	37.411	1.377	0.100	14	0.0072	HGM
EPAZA114A	A	C1	1	1	37.953	1.369	0.100	14	0.0071	HGM
EPAZA211A	A	C2	1	2	37.228	1.407	0.093	14	0.0067	HGM
EPAZA212A	A	C2	1	2	37.492	1.379	0.095	14	0.0068	HAB
EPAZA213A	A	C2	1	2	37.950	1.388	0.094	14	0.0067	HGM
EPAZB111A	B	C1	2	1	37.130	1.408	0.100	14	0.0071	HGM
EPAZB112A	B	C1	2	1	37.706	1.382	0.101	14	0.0072	HGM
EPAZB113A	B	C1	2	1	37.551	1.361	0.101	14	0.0072	HGM
EPAZB114A	B	C1	2	1	38.070	1.379	0.100	14	0.0072	HGM
EPAZB211A	B	C2	2	2	37.195	1.408	0.109	14	0.0078	HGM
EPAZB212A	B	C2	2	2	38.545	1.418	0.109	14	0.0078	HAT
EPAZB213A	B	C2	2	2	37.700	1.373	0.109	14	0.0078	HGM
EPAZC111A	C	C1	3	1	38.291	1.395	0.101	14	0.0072	HGM
EPAZC112A	C	C1	3	1	38.729	1.409	0.101	14	0.0072	HGM
EPAZC113A	C	C1	3	1	38.445	1.405	0.102	14	0.0073	HGM
EPAZC114A	C	C1	3	1	38.986	1.418	0.101	14	0.0072	HGM
EPAZC211A	C	C2	3	2	37.461	1.391	0.108	14	0.0077	HGM
EPAZC212A	C	C2	3	2	38.044	1.433	0.109	14	0.0078	HGM
EPAZC213A	C	C2	3	2	39.045	1.409	0.108	14	0.0077	HGM

*Modulus are average values of 2 strain gages.

Average	**37.947**	**1.395**	**Average**	**0.0073**
Standard Dev.	**0.583**	**0.019**	**Standard Dev.**	
Coeff. of Var. [%]	**1.537**	**1.340**	**Coeff. of Var. [%]**	
Min.	**37.130**	**1.361**	**Min.**	**0.0067**
Max.	**39.045**	**1.433**	**Max.**	**0.0078**
Number of Spec.	**21**	**21**	**Number of Spec.**	**21**

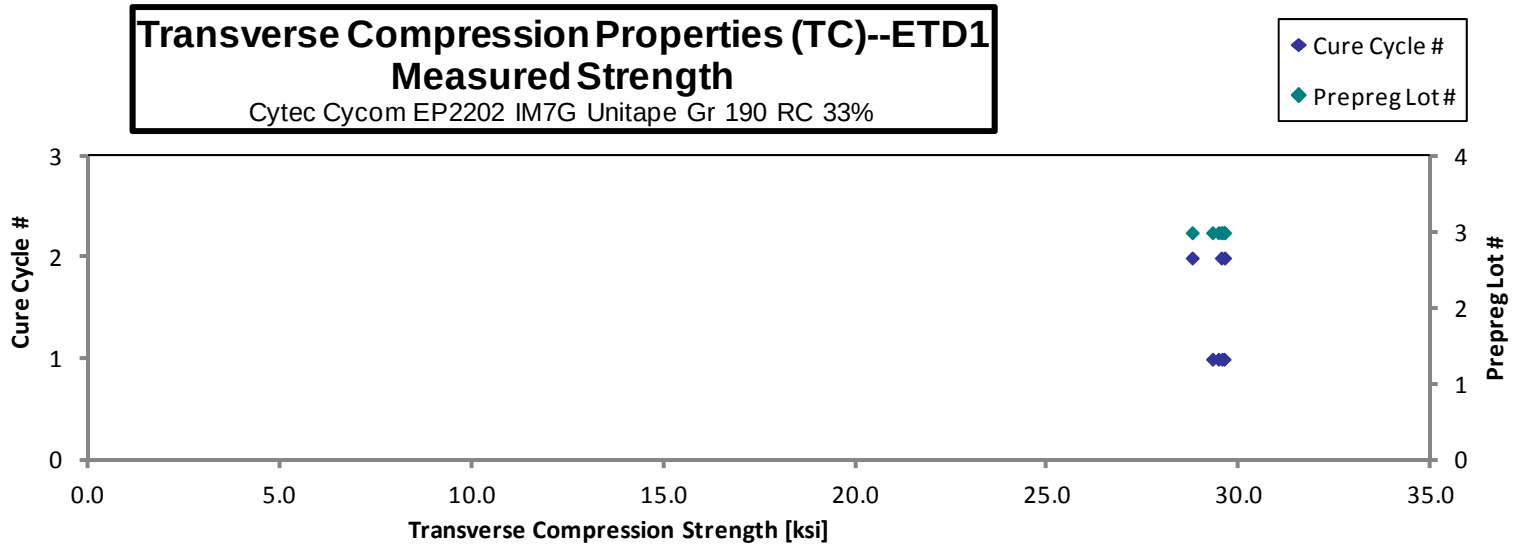

Transverse Compression Properties (TC)--RTD
Measured Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
5.0
10.0
15.0
20.0
25.0
30.0
35.0
40.0
45.0
Transverse Compression Strength [ksi]

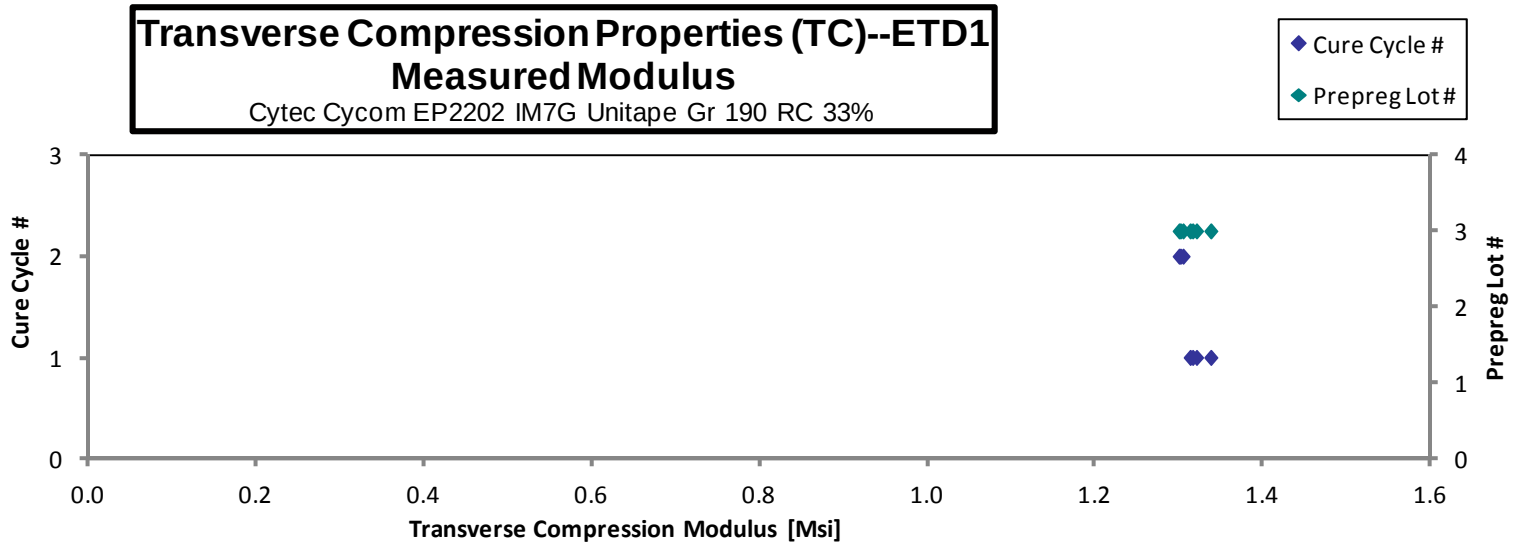

Transverse Compression Properties (TC)--RTD
Measured Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
Transverse Compression Modulus [Msi]

Transverse Compression Properties (TC)--ETD1
Strength & Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode
EPAZC11DC	C	C1	3	1	29.450	1.315	0.101	14	0.0072	HGM
EPAZC11EC	C	C1	3	1	29.543	1.313	0.101	14	0.0072	HGM
EPAZC11FC	C	C1	3	1	29.296	1.337	0.101	14	0.0072	HGM
EPAZC11GC	C	C1	3	1	29.597	1.320	0.101	14	0.0072	HGM
EPAZC21BC	C	C2	3	2	29.611	1.299	0.109	14	0.0078	HGM
EPAZC21CC	C	C2	3	2	29.525	1.304	0.109	14	0.0078	HGM
EPAZC21DC	C	C2	3	2	28.765	1.301	0.109	14	0.0078	HGM

Average	**29.398**	**1.313**	**Average**	**0.0075**	
Standard Dev.	**0.299**	**0.013**	**Standard Dev.**		
Coeff. of Var. [%]	**1.016**	**1.008**	**Coeff. of Var. [%]**		
Min.	**28.765**	**1.299**	**Min.**	**0.0072**	
Max.	**29.611**	**1.337**	**Max.**	**0.0078**	
Number of Spec.	**7**	**7**	**Number of Spec.**	**7**	

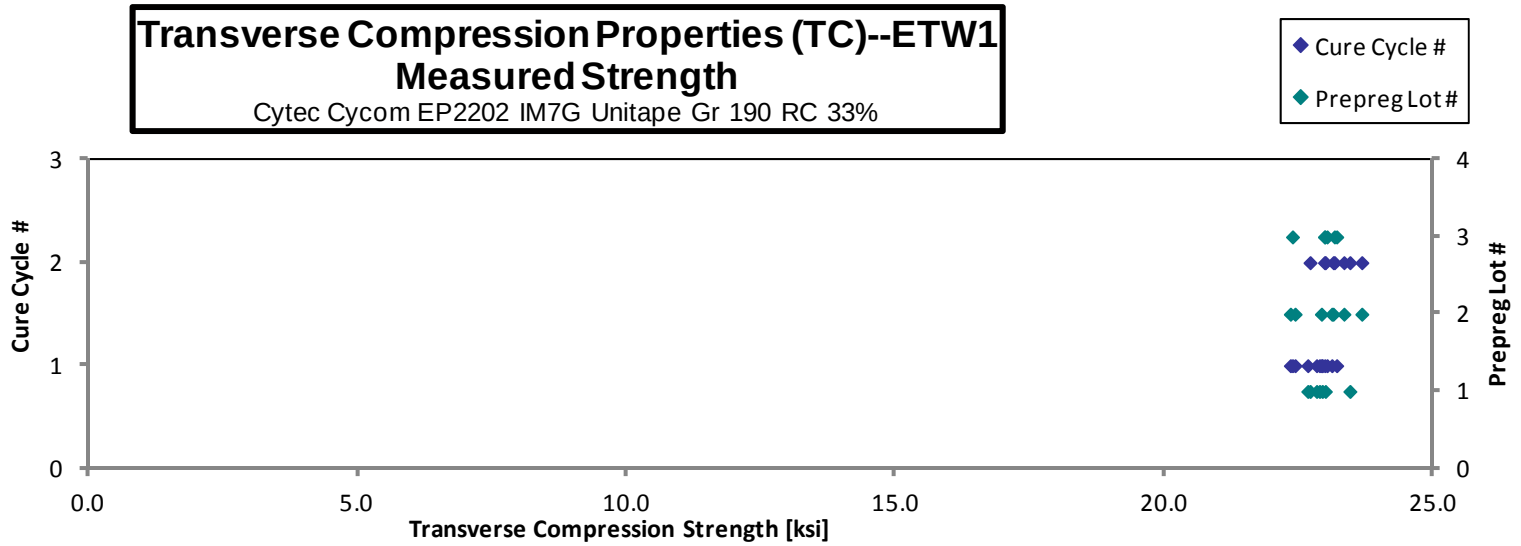

Transverse Compression Properties (TC)--ETD1
Measured Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
5.0
10.0
15.0
20.0
25.0
30.0
35.0
Transverse Compression Strength [ksi]

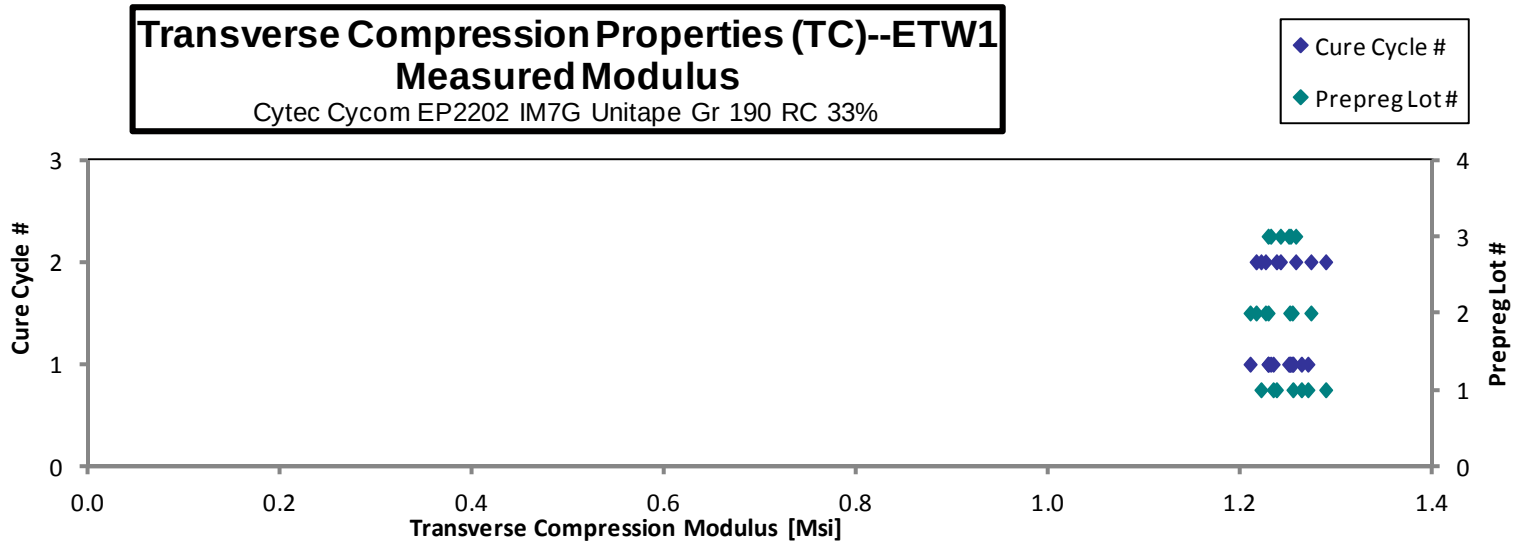

Transverse Compression Properties (TC)--ETD1
Measured Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
Transverse Compression Modulus [Msi]

Transverse Compression Properties (TC)--ETW1
Strength & Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode
EPAZA11DD	A	C1	1	1		1.254	0.099	14	0.0071	BGM
EPAZA11ED	A	C1	1	1		1.263	0.099	14	0.0071	HGM
EPAZA11FD	A	C1	1	1		1.233	0.099	14	0.0071	BGM
EPAZA11GD	A	C1	1	1		1.269	0.099	14	0.0071	HGM
EPAZA11HD	A	C1	1	1	22.665		0.099	14	0.0071	BAB
EPAZA11ID	A	C1	1	1	22.828		0.099	14	0.0071	HAB
EPAZA11JD	A	C1	1	1	22.883		0.099	14	0.0071	BGM
EPAZA11KD	A	C1	1	1	22.935		0.099	14	0.0071	HGM
EPAZA21BD	A	C2	1	2		1.237	0.099	14	0.0071	BAB
EPAZA21CD	A	C2	1	2		1.220	0.099	14	0.0071	HGM
EPAZA21DD	A	C2	1	2		1.288	0.098	14	0.0070	BGM
EPAZA21ED	A	C2	1	2	23.448		0.098	14	0.0070	BAT
EPAZA21FD	A	C2	1	2	22.707		0.098	14	0.0070	BGM
EPAZA21GD	A	C2	1	2	22.992		0.099	14	0.0071	BAT
EPAZB11DD	B	C1	2	1		1.253	0.102	14	0.0073	HGM / HAB
EPAZB11ED	B	C1	2	1		1.228	0.102	14	0.0073	HGM
EPAZB11FD	B	C1	2	1		1.209	0.101	14	0.0072	HGM / HAB
EPAZB11GD	B	C1	2	1		1.250	0.101	14	0.0072	BGM
EPAZB11HD	B	C1	2	1	23.112		0.101	14	0.0072	BGM
EPAZB11ID	B	C1	2	1	22.429		0.101	14	0.0072	HAT
EPAZB11JD	B	C1	2	1	22.918		0.101	14	0.0072	BGM
EPAZB11KD	B	C1	2	1	22.341		0.101	14	0.0072	HGM
EPAZB21BD	B	C2	2	2		1.215	0.109	14	0.0078	HGM / HAB
EPAZB21CD	B	C2	2	2		1.272	0.109	14	0.0078	HGM
EPAZB21DD	B	C2	2	2		1.225	0.109	14	0.0078	HGM
EPAZB21ED	B	C2	2	2	23.670		0.109	14	0.0078	HGM / BAB
EPAZB21FD	B	C2	2	2	23.337		0.109	14	0.0078	HGM / BAB
EPAZB21GD	B	C2	2	2	23.138		0.109	14	0.0078	BAB
EPAZC11JD	C	C1	3	1		1.251	0.101	14	0.0072	HGM / HAB
EPAZC11KD	C	C1	3	1		1.249	0.101	14	0.0072	BAB
EPAZC11LD	C	C1	3	1		1.228	0.101	14	0.0072	BAB
EPAZC11MD	C	C1	3	1		1.231	0.101	14	0.0072	HGM / BAB
EPAZC11ND	C	C1	3	1	22.980		0.101	14	0.0072	HGM / BAB
EPAZC11OD	C	C1	3	1	23.022		0.101	14	0.0072	BGM
EPAZC11PD	C	C1	3	1	22.381		0.101	14	0.0072	HAB
EPAZC11QD	C	C1	3	1	23.203		0.101	14	0.0072	BGM
EPAZC21HD	C	C2	3	2		1.241	0.109	14	0.0078	HGM
EPAZC21ID	C	C2	3	2		1.257	0.108	14	0.0077	HGM
EPAZC21JD	C	C2	3	2	23.161		0.108	14	0.0077	HAB
EPAZC21KD	C	C2	3	2	22.977		0.109	14	0.0078	HGM

Average	**22.956**	**1.244**	**Average**	**0.0073**
Standard Dev.	**0.342**	**0.021**	**Standard Dev.**	
Coeff. of Var. [%]	**1.490**	**1.650**	**Coeff. of Var. [%]**	
Min.	**22.341**	**1.209**	**Min.**	**0.0070**
Max.	**23.670**	**1.288**	**Max.**	**0.0078**
Number of Spec.	**20**	**20**	**Number of Spec.**	**40**


Transverse Compression Properties (TC)--ETW1
Measured Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
5.0
10.0
15.0
20.0
25.0
Transverse Compression Strength [ksi]


Transverse Compression Properties (TC)--ETW1
Measured Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
Transverse Compression Modulus [Msi]

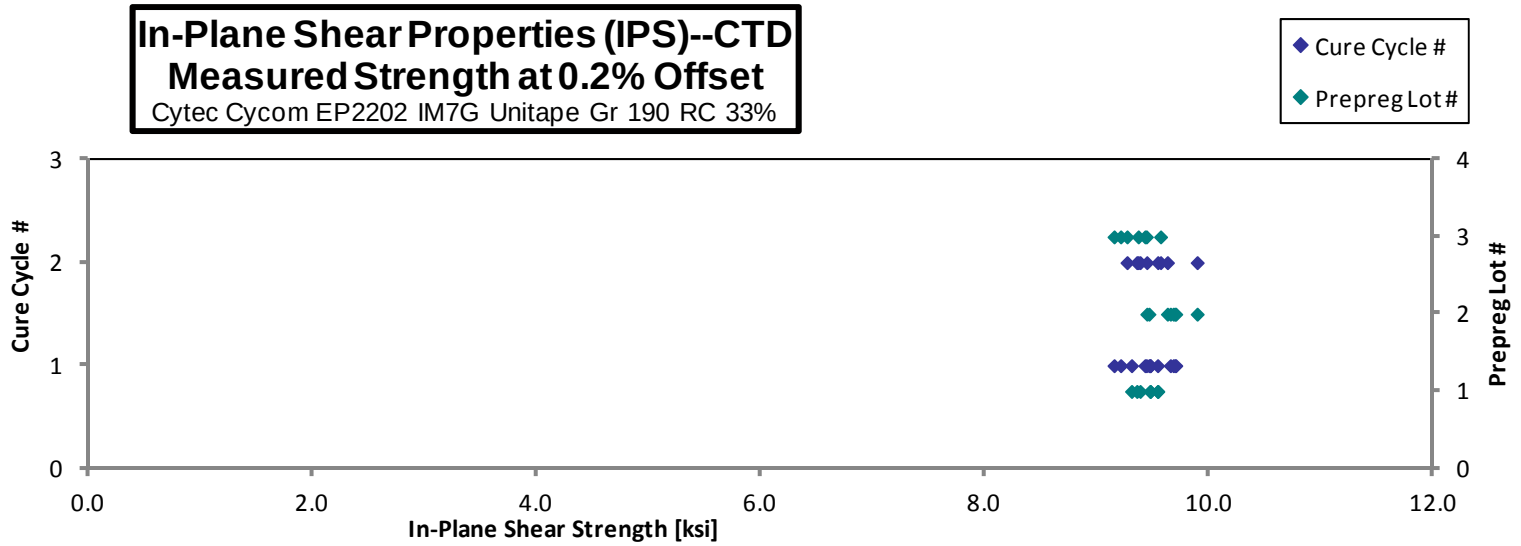
4.5 In-Plane Shear Properties (IPS)

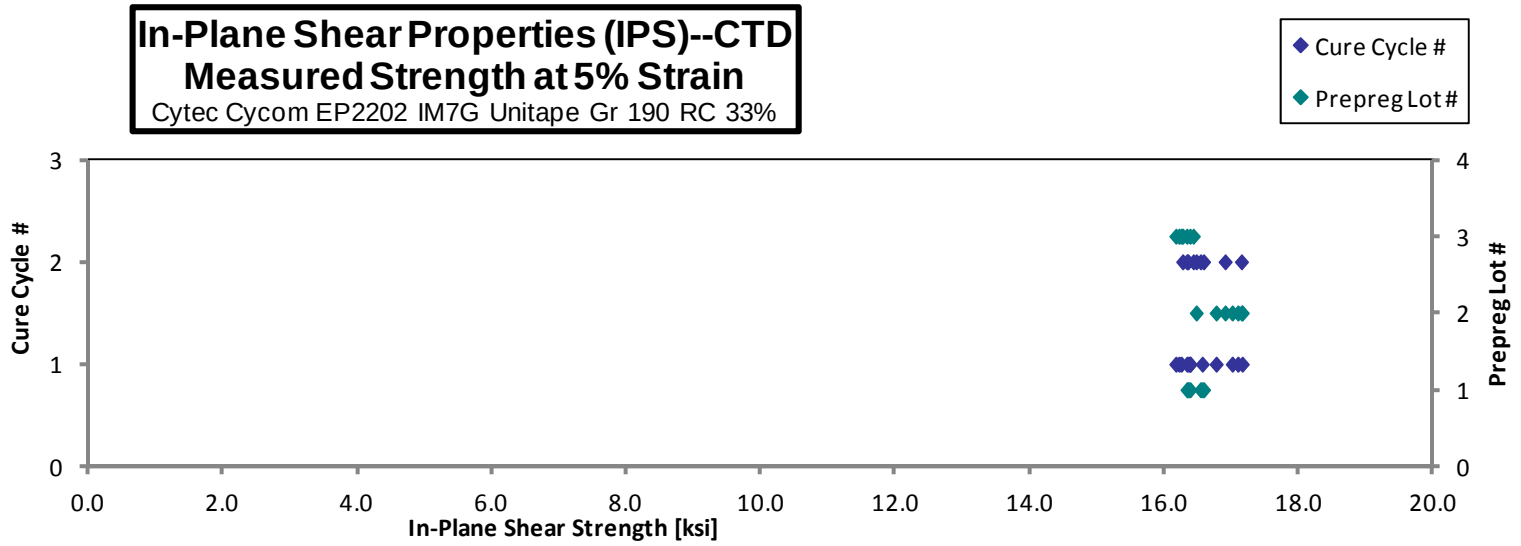
In-Plane Shear Properties (IPS)--CTD
Strength & Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

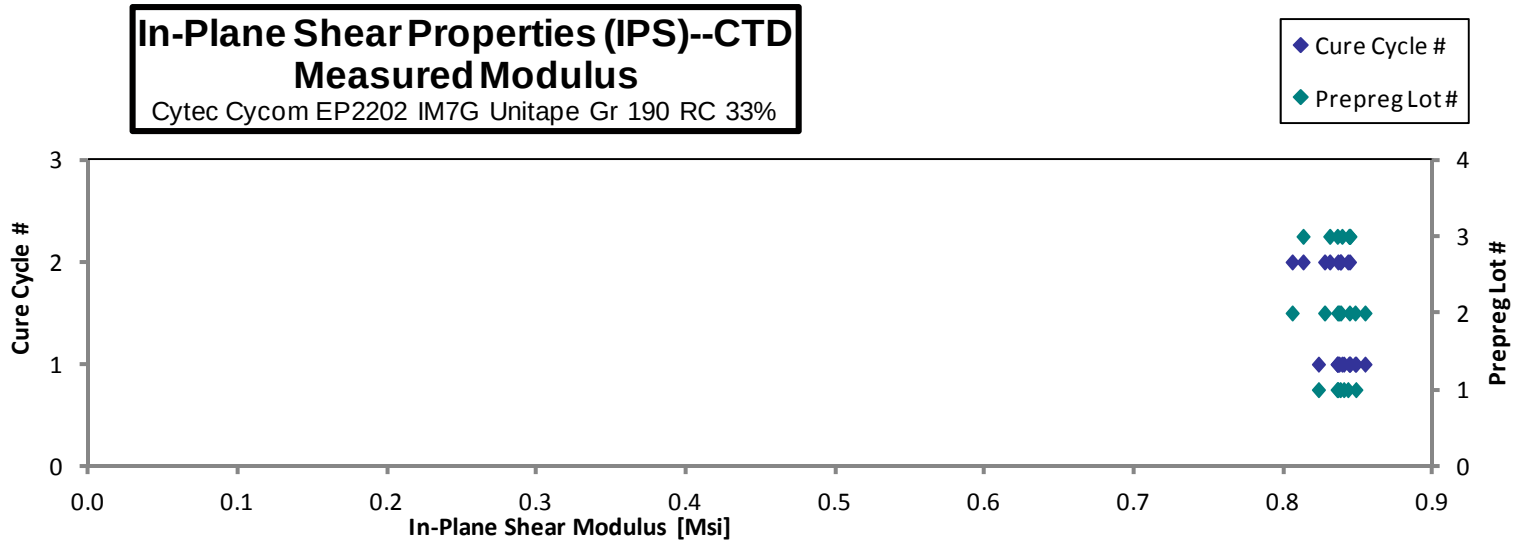
Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	0.2% Offset Strength [ksi]	Strength at 5% Strain [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode
EPANA116B	A	C1	1	1	9.538	16.562	0.848	0.113	16	0.0071	AGM
EPANA117B	A	C1	1	1	9.306	16.357	0.823	0.112	16	0.0070	AGM
EPANA118B	A	C1	1	1	9.473	16.380	0.836	0.113	16	0.0070	AGM
EPANA119B	A	C1	1	1	9.472	16.334	0.840	0.112	16	0.0070	AGM
EPANA215B	A	C2	1	2	9.382	16.537	0.836	0.113	16	0.0071	AGM
EPANA216B	A	C2	1	2	9.353	16.349	0.838	0.113	16	0.0071	AGM
EPANA217B	A	C2	1	2	9.540	16.582	0.843	0.113	16	0.0071	AGM
EPANB116B	B	C1	2	1	9.652	17.008	0.844	0.115	16	0.0072	AGM
EPANB117B	B	C1	2	1	9.700	17.092	0.854	0.115	16	0.0072	AGM
EPANB118B*	B	C1	2	1	9.461		0.836	0.116	16	0.0072	AGM
EPANB119B	B	C1	2	1	9.678	16.768	0.837	0.116	16	0.0072	AGM
EPANB11AB	B	C1	2	1	9.691	17.157	0.848	0.116	16	0.0073	AGM
EPANB215B	B	C2	2	2	9.442	16.473	0.806	0.116	16	0.0072	AGM
EPANB216B	B	C2	2	2	9.626	16.902	0.827	0.116	16	0.0072	AGM
EPANB217B	B	C2	2	2	9.892	17.145	0.838	0.116	16	0.0072	AGM
EPANC116B	C	C1	3	1	9.426	16.379	0.844	0.116	16	0.0073	AGM
EPANC117B	C	C1	3	1	9.150	16.170	0.836	0.117	16	0.0073	AWB
EPANC118B	C	C1	3	1	9.438	16.249	0.844	0.116	16	0.0072	AGM
EPANC119B	C	C1	3	1	9.209	16.216	0.839	0.116	16	0.0073	AGM
EPANC215B	C	C2	3	2	9.565	16.428	0.844	0.116	16	0.0072	AWB
EPANC216B	C	C2	3	2	9.266	16.270	0.813	0.116	16	0.0072	AGM
EPANC217B	C	C2	3	2	9.366	16.332	0.831	0.116	16	0.0072	AGM

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

Average	**9.483**	**16.557**	**0.836**	**Average**	**0.0072**
Standard Dev.	**0.179**	**0.322**	**0.011**	**Standard Dev.**	
Coeff. of Var. [%]	**1.885**	**1.945**	**1.350**	**Coeff. of Var. [%]**	
Min.	**9.150**	**16.170**	**0.806**	**Min.**	**0.0070**
Max.	**9.892**	**17.157**	**0.854**	**Max.**	**0.0073**
Number of Spec.	**22**	**21**	**22**	**Number of Spec.**	**22**


In-Plane Shear Properties (IPS)--CTD
Measured Strength at 0.2% Offset
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
In-Plane Shear Strength [ksi]
0.0
2.0
4.0
6.0
8.0
10.0
12.0
0
1
2
3
4


In-Plane Shear Properties (IPS)--CTD
Measured Strength at 5% Strain
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
In-Plane Shear Strength [ksi]
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
20.0
0
1
2
3
4

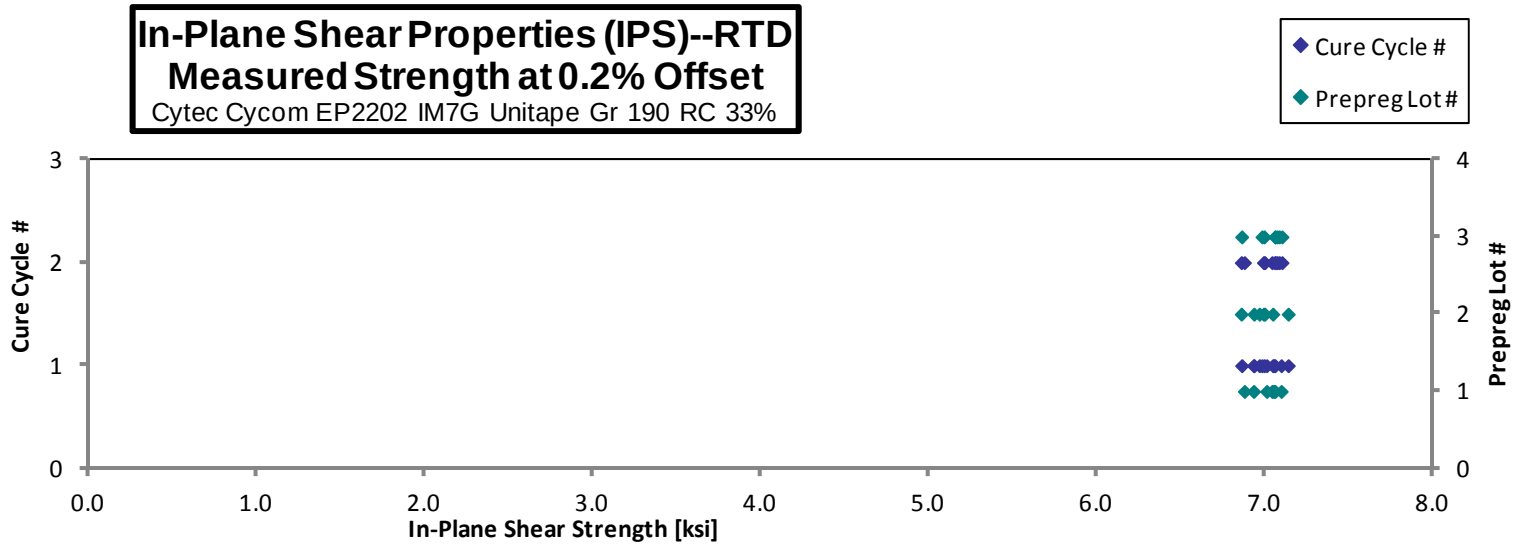

In-Plane Shear Properties (IPS)--CTD
Measured Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
In-Plane Shear Modulus [Msi]
0
1
2
3
4
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9

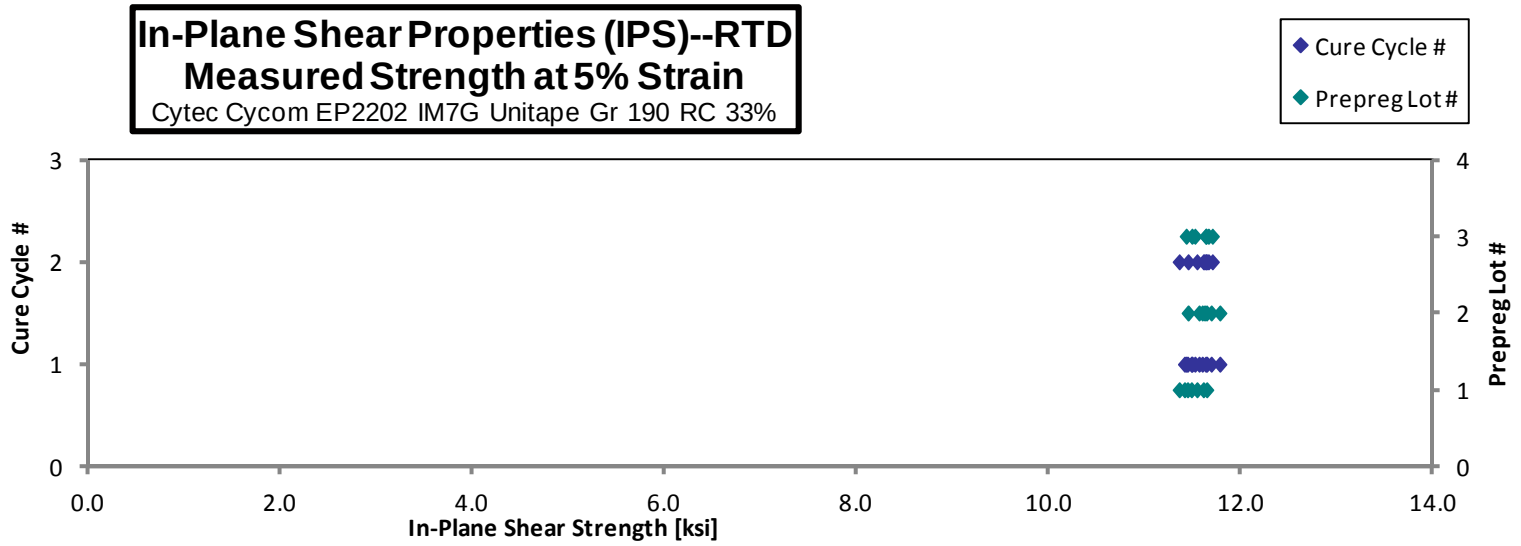
In-Plane Shear Properties (IPS)--RTD
Strength & Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

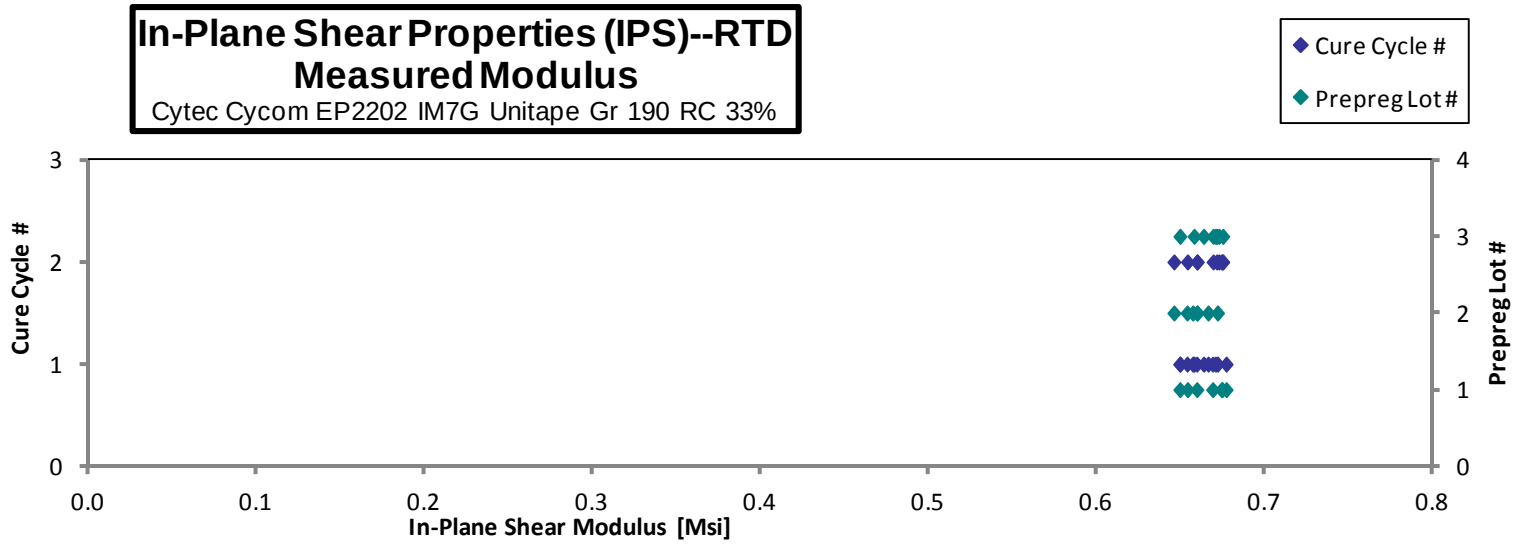
Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	0.2% Offset Strength [ksi]	Strength at 5% Strain [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode
EPANA111A	A	C1	1	1	7.095	11.640	0.677	0.113	16	0.0070	AWB
EPANA112A	A	C1	1	1	7.008	11.480	0.669	0.113	16	0.0071	AGM
EPANA113A	A	C1	1	1	6.930	11.408	0.659	0.113	16	0.0071	AGM
EPANA114A	A	C1	1	1	7.050	11.440	0.649	0.113	16	0.0070	AGM
EPANA211A	A	C2	1	2	7.057	11.605	0.674	0.113	16	0.0071	AGM
EPANA212A	A	C2	1	2	7.040	11.538	0.674	0.113	16	0.0071	AGM
EPANA213A	A	C2	1	2	6.876	11.353	0.654	0.113	16	0.0071	AGM
EPANB111A	B	C1	2	1	6.965	11.593	0.657	0.115	16	0.0072	AGM
EPANB112A	B	C1	2	1	6.933	11.560	0.653	0.116	16	0.0072	AWB
EPANB113A	B	C1	2	1	7.044	11.687	0.666	0.116	16	0.0072	AWB
EPANB114A	B	C1	2	1	7.136	11.776	0.672	0.115	16	0.0072	AGM
EPANB211A	B	C2	2	2	6.857	11.446	0.646	0.117	16	0.0073	AGM
EPANB212A	B	C2	2	2	6.989	11.617	0.659	0.116	16	0.0072	AGM
EPANB213A	B	C2	2	2	6.996	11.638	0.659	0.116	16	0.0073	AGM
EPANC111A	C	C1	3	1	7.058	11.628	0.670	0.116	16	0.0073	AGM
EPANC112A	C	C1	3	1	6.860	11.426	0.649	0.116	16	0.0072	AGM
EPANC113A	C	C1	3	1	6.980	11.485	0.658	0.116	16	0.0072	AGM
EPANC114A	C	C1	3	1	6.993	11.517	0.663	0.116	16	0.0072	AGM
EPANC211A	C	C2	3	2	7.099	11.698	0.675	0.115	16	0.0072	AWB
EPANC212A	C	C2	3	2	7.070	11.657	0.669	0.116	16	0.0072	AGM
EPANC213A*	C	C2	3	2	7.083		0.672	0.116	16	0.0072	AGM
EPANC214A	C	C2	3	2	7.059	11.633	0.671	0.116	16	0.0072	AGM

* Strength at 5% strain is not available due to non-linear strain data.

Average	**7.008**	**11.563**	**0.663**	**Average**	**0.0072**
Standard Dev.	**0.079**	**0.111**	**0.009**	**Standard Dev.**	
Coeff. of Var. [%]	**1.127**	**0.958**	**1.432**	**Coeff. of Var. [%]**	
Min.	**6.857**	**11.353**	**0.646**	**Min.**	**0.0070**
Max.	**7.136**	**11.776**	**0.677**	**Max.**	**0.0073**
Number of Spec.	**22**	**21**	**22**	**Number of Spec.**	**22**


In-Plane Shear Properties (IPS)--RTD
Measured Strength at 0.2% Offset
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
In-Plane Shear Strength [ksi]
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0

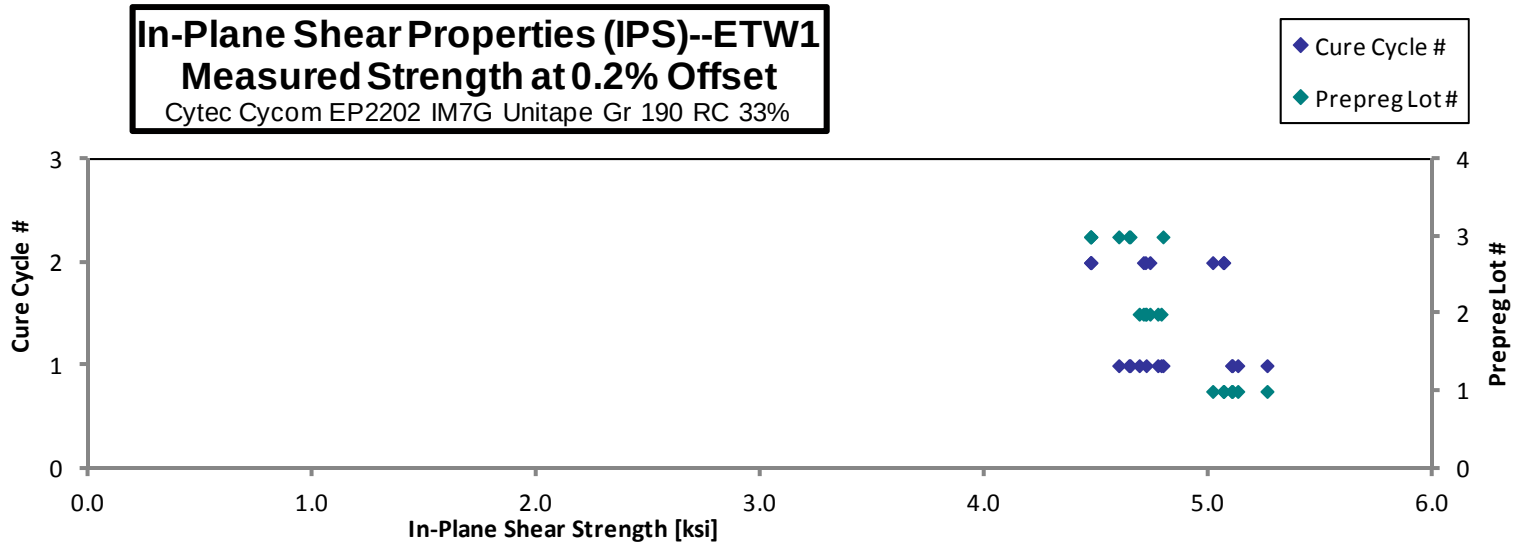

In-Plane Shear Properties (IPS)--RTD
Measured Strength at 5% Strain
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
In-Plane Shear Strength [ksi]
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0

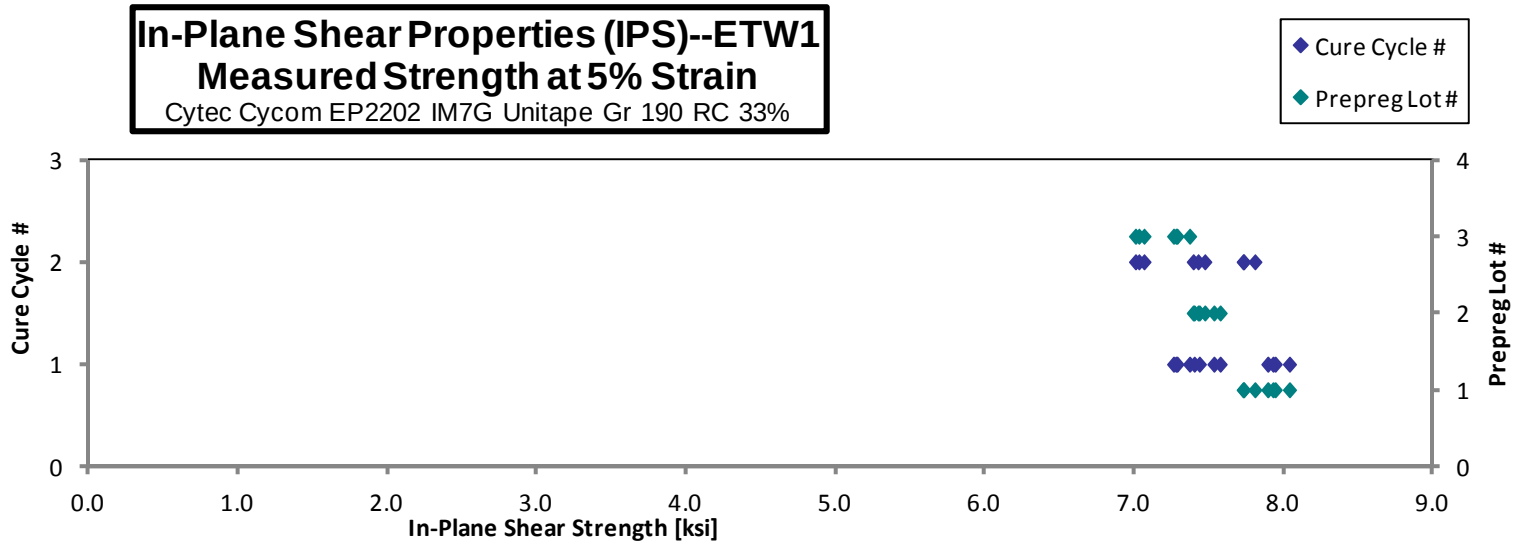

In-Plane Shear Properties (IPS)--RTD
Measured Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
In-Plane Shear Modulus [Msi]
0
1
2
3
4
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8

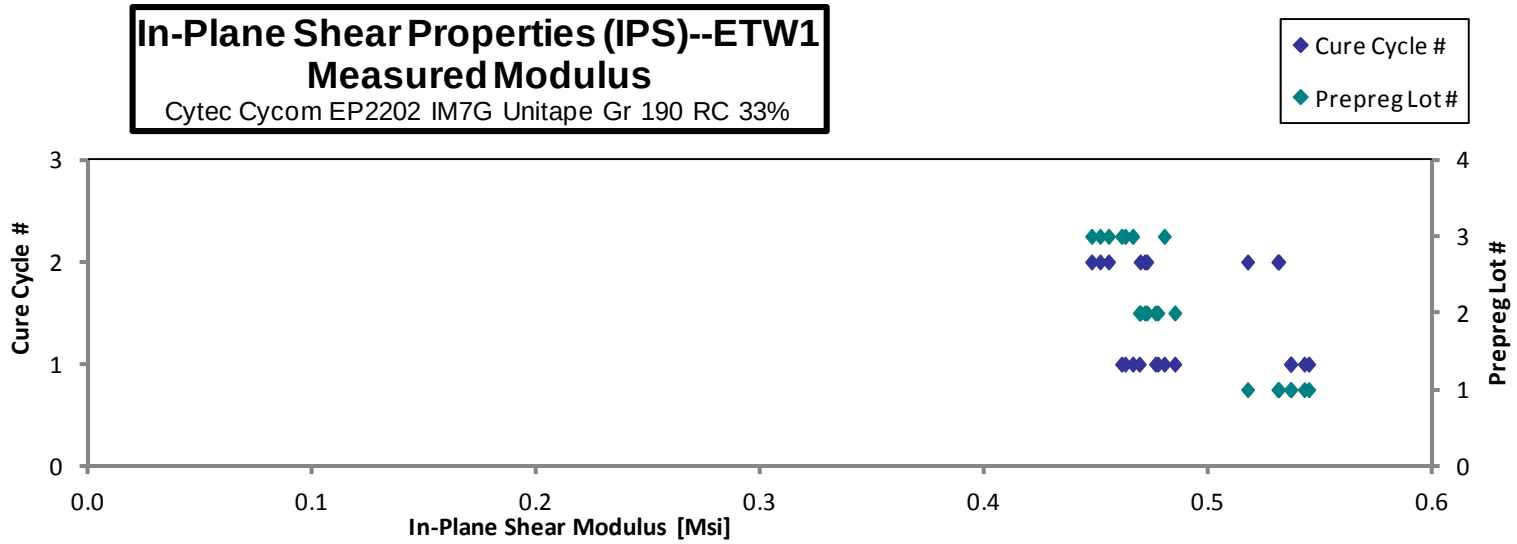
In-Plane Shear Properties (IPS)--ETW1
Strength & Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

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]	Failure Mode
EPANA11BD	A	C1	1	1	5.099	7.927	0.544	0.113	16	0.0070	AGM
EPANA11CD	A	C1	1	1	5.257	8.037	0.536	0.113	16	0.0070	AGM
EPANA11DD	A	C1	1	1	5.127	7.941	0.542	0.113	16	0.0070	AGM
EPANA11ED	A	C1	1	1	5.103	7.892	0.536	0.113	16	0.0070	AGM
EPANA219D	A	C2	1	2	5.062	7.726	0.517	0.114	16	0.0071	AGM
EPANA21AD	A	C2	1	2	5.015	7.730	0.531	0.114	16	0.0071	AGM
EPANA21BD	A	C2	1	2	5.065	7.805	0.531	0.114	16	0.0071	AGM
EPANB11BD	B	C1	2	1	4.687	7.399	0.469	0.115	16	0.0072	AGM
EPANB11CD	B	C1	2	1	4.785	7.573	0.485	0.115	16	0.0072	AGM
EPANB11DD	B	C1	2	1	4.770	7.531	0.476	0.115	16	0.0072	AGM
EPANB11ED	B	C1	2	1	4.718	7.433	0.477	0.115	16	0.0072	AGM
EPANB219D	B	C2	2	2	4.706	7.425	0.472	0.116	16	0.0072	AGM
EPANB21AD	B	C2	2	2	4.735	7.470	0.471	0.115	16	0.0072	AGM
EPANB21BD	B	C2	2	2	4.715	7.392	0.469	0.116	16	0.0073	AGM
EPANC11BD	C	C1	3	1	4.793	7.368	0.480	0.116	16	0.0073	AGM
EPANC11CD	C	C1	3	1	4.596	7.260	0.462	0.117	16	0.0073	AGM
EPANC11DD	C	C1	3	1	4.642	7.284	0.466	0.117	16	0.0073	AGM
EPANC11ED	C	C1	3	1	4.646	7.276	0.461	0.117	16	0.0073	AGM
EPANC219D	C	C2	3	2	4.472	7.028	0.451	0.116	16	0.0073	AGM
EPANC21AD	C	C2	3	2	4.471	7.006	0.447	0.116	16	0.0072	AGM
EPANC21BD	C	C2	3	2	4.470	7.063	0.455	0.116	16	0.0072	AGM

Average	**4.806**	**7.503**	**0.489**	**Average**	**0.0072**
Standard Dev.	**0.239**	**0.307**	**0.034**	**Standard Dev.**	
Coeff. of Var. [%]	**4.963**	**4.091**	**6.903**	**Coeff. of Var. [%]**	
Min.	**4.470**	**7.006**	**0.447**	**Min.**	**0.0070**
Max.	**5.257**	**8.037**	**0.544**	**Max.**	**0.0073**
Number of Spec.	**21**	**21**	**21**	**Number of Spec.**	**21**


In-Plane Shear Properties (IPS)--ETW1
Measured Strength at 0.2% Offset
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
In-Plane Shear Strength [ksi]
0.0
1.0
2.0
3.0
4.0
5.0
6.0


In-Plane Shear Properties (IPS)--ETW1
Measured Strength at 5% Strain
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
In-Plane Shear Strength [ksi]
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0


In-Plane Shear Properties (IPS)--ETW1
Measured Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
In-Plane Shear Modulus [Msi]
0
1
2
3
4
0.0
0.1
0.2
0.3
0.4
0.5
0.6

4.6 "25/50/25" Unnotched Tension 1 Properties (UNT1)

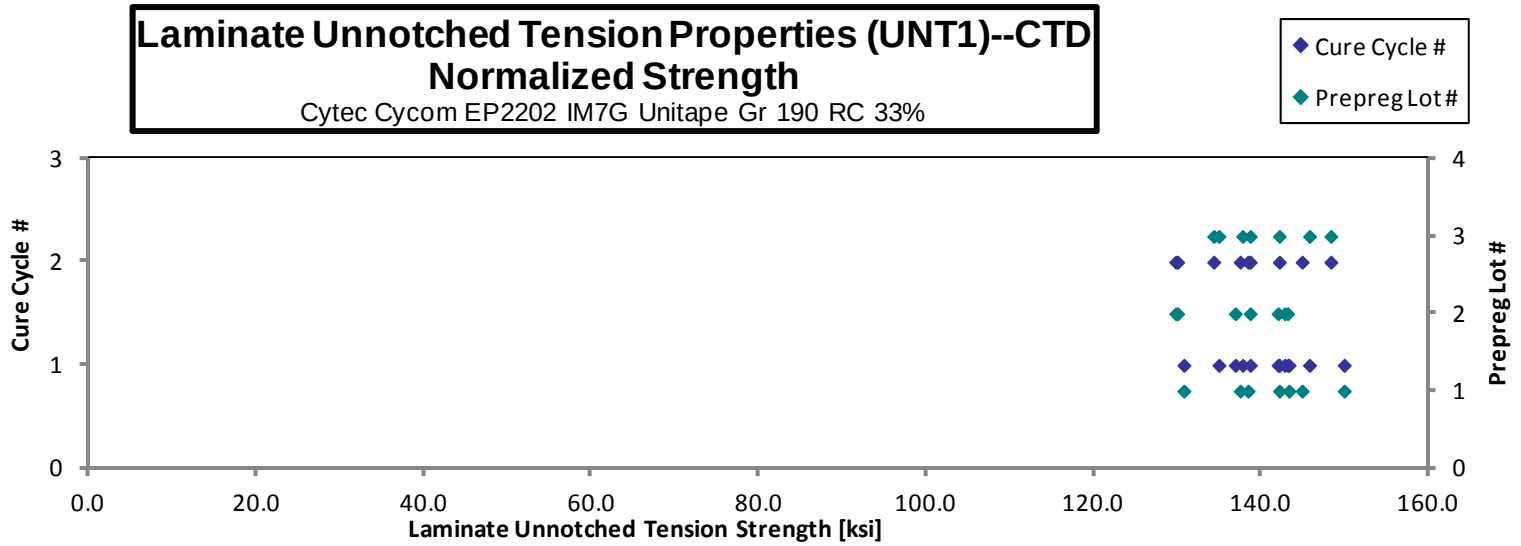
Laminate Unnotched Tension Properties (UNT1)--CTD
Strength & Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

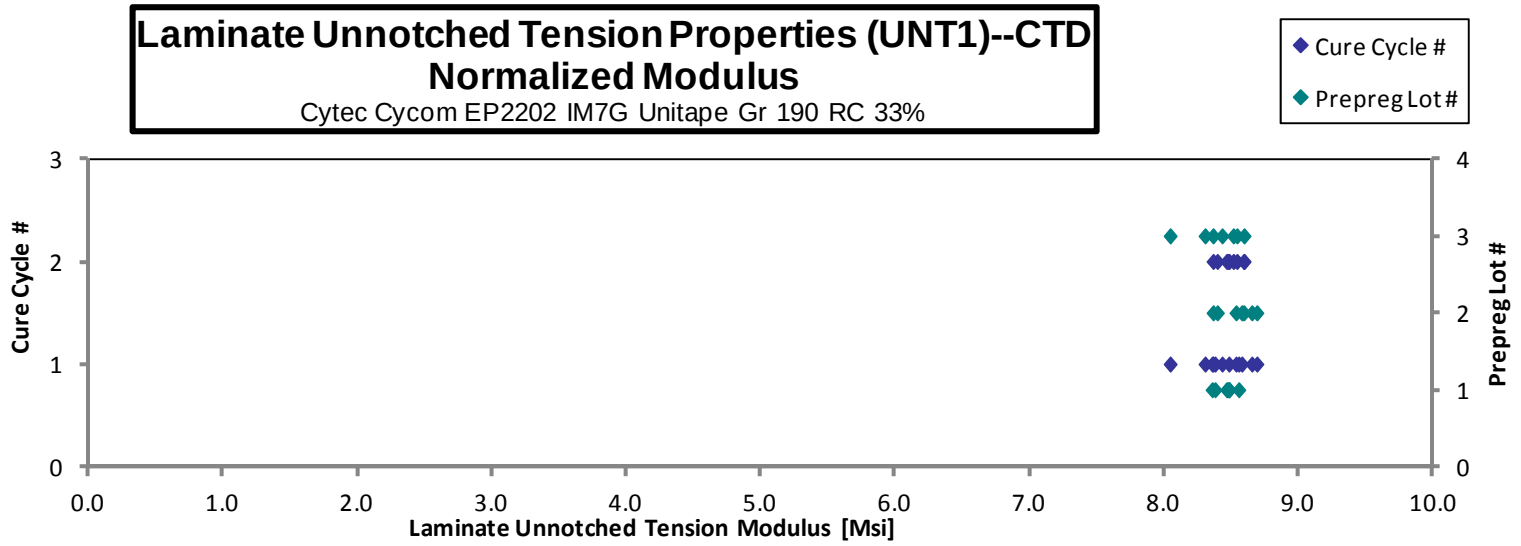
normalizing t_{ply} [in]
0.0072

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]
EPAAA116B	A	C1	1	1	151.986	8.600	0.114	16	AGM	0.0071	149.853	8.479
EPAAA117B	A	C1	1	1	145.474	8.505	0.113	16	AGM	0.0071	143.264	8.376
EPAAA118B	A	C1	1	1	144.630	8.502	0.113	16	AGM	0.0071	142.119	8.355
EPAAA119B	A	C1	1	1	133.083	8.707	0.113	16	AGM	0.0071	130.714	8.553
EPAAA215B	A	C2	1	2	140.651	8.620	0.113	16	AGM	0.0071	138.372	8.481
EPAAA216B	A	C2	1	2	147.215	8.614	0.113	16	AGM	0.0071	144.830	8.474
EPAAA217B	A	C2	1	2	139.295	8.577	0.114	16	AGM	0.0071	137.441	8.462
EPAAB116B	B	C1	2	1	141.906	8.525	0.116	16	AGM	0.0072	142.748	8.575
EPAAB117B	B	C1	2	1	140.946	8.588	0.116	16	AWT	0.0073	141.965	8.650
EPAAB118B	B	C1	2	1	136.163	8.489	0.116	16	AGM	0.0072	136.853	8.532
EPAAB119B	B	C1	2	1	143.272	8.698	0.115	16	AWT	0.0072	143.107	8.688
EPAAB215B	B	C2	2	2	137.673	8.531	0.116	16	AGM	0.0073	138.629	8.590
EPAAB216B	B	C2	2	2	129.211	8.328	0.116	16	AGM	0.0072	129.734	8.362
EPAAB217B	B	C2	2	2	129.816	8.383	0.115	16	AWB	0.0072	129.966	8.393
EPAAC116B	C	C1	3	1	144.620	7.982	0.116	16	AWT / AWB	0.0073	145.708	8.042
EPAAC117B	C	C1	3	1	134.370	8.396	0.116	16	AWT / AWB	0.0072	134.895	8.429
EPAAC118B	C	C1	3	1	137.015	8.318	0.116	16	AGM	0.0072	137.729	8.361
EPAAC119B	C	C1	3	1	138.078	8.268	0.116	16	AGM	0.0072	138.637	8.301
EPAAC215B	C	C2	3	2	146.811	8.456	0.116	16	AWB	0.0073	148.255	8.539
EPAAC216B	C	C2	3	2	133.736	8.478	0.116	16	AGM	0.0072	134.278	8.513
EPAAC217B	C	C2	3	2	141.126	8.533	0.116	16	AGM	0.0073	142.106	8.592

Average	**139.861**	**8.481**	
Standard Dev.	**5.931**	**0.164**	
Coeff. of Var. [%]	**4.241**	**1.937**	
Min.	**129.211**	**7.982**	
Max.	**151.986**	**8.707**	
Number of Spec.	**21**	**21**	

$Average_{norm}$	**0.0072**	**139.581**	**8.464**
Standard $Dev._{norm}$		**5.644**	**0.142**
Coeff. of Var. $[\%]_{norm}$		**4.044**	**1.675**
Min.	**0.0071**	**129.734**	**8.042**
Max.	**0.0073**	**149.853**	**8.688**
Number of Spec.	**21**	**21**	**21**


Laminate Unnotched Tension Properties (UNT1)--CTD
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
20.0
40.0
60.0
80.0
100.0
120.0
140.0
160.0
Laminate Unnotched Tension Strength [ksi]


Laminate Unnotched Tension Properties (UNT1)--CTD
Normalized Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
Laminate Unnotched Tension Modulus [Msi]

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

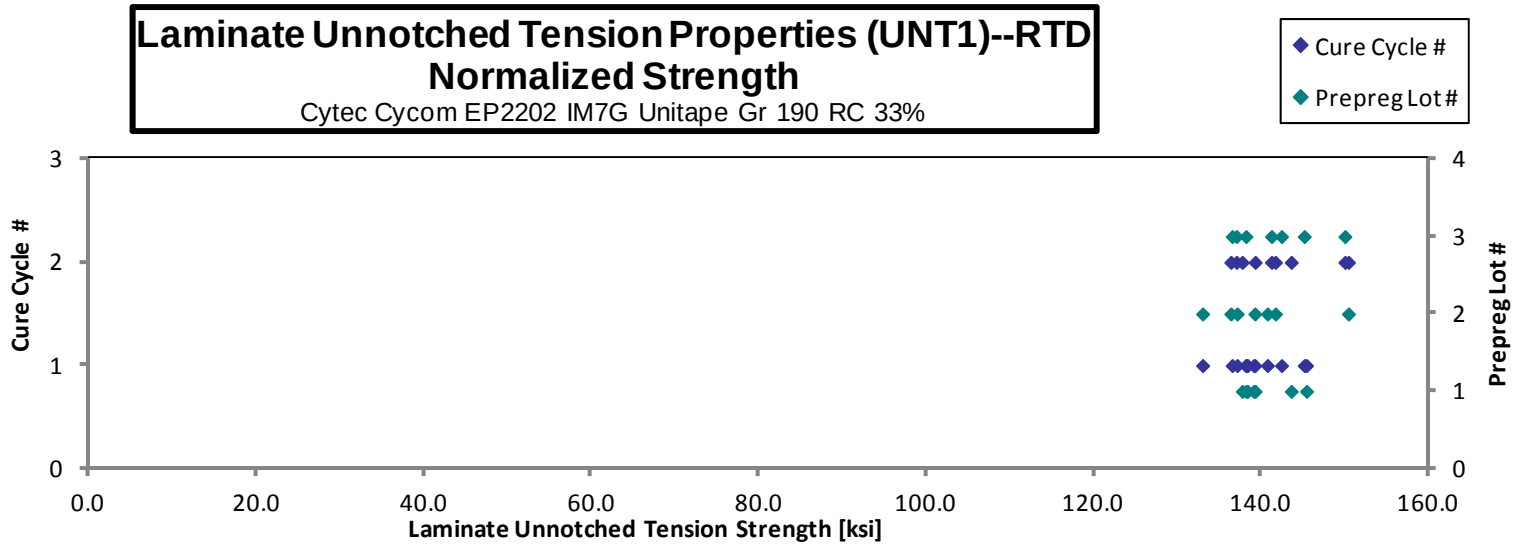
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

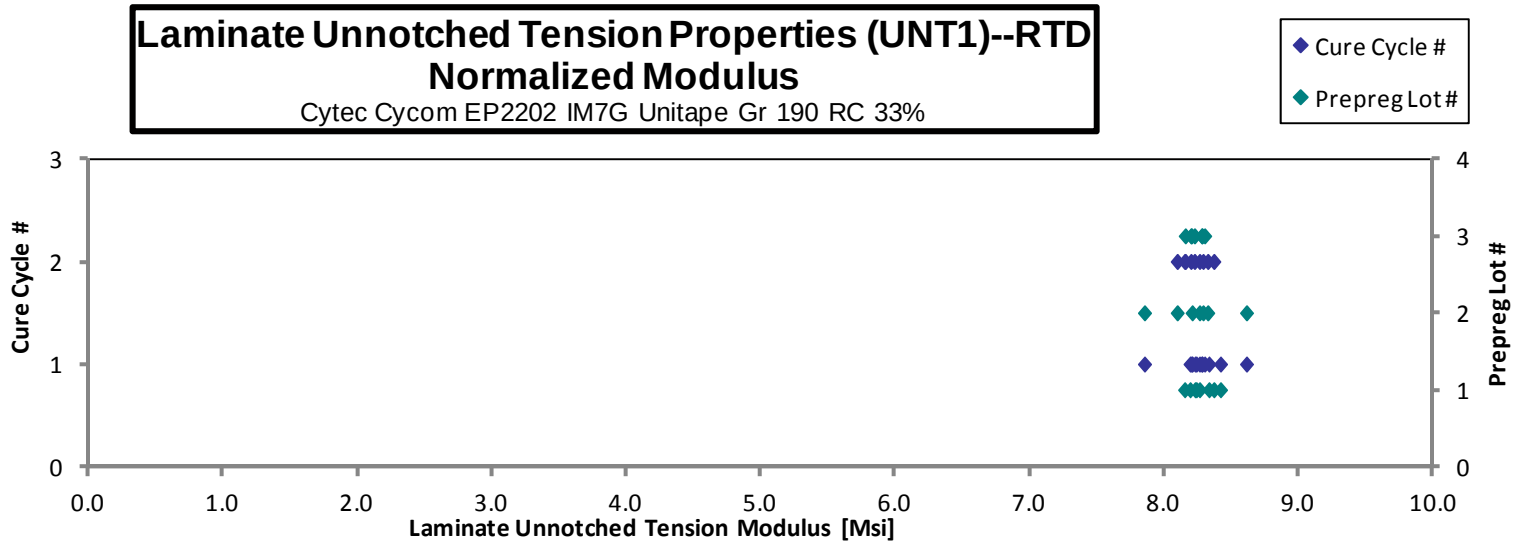
normalizing t_{ply} [in]
0.0072

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]
EPAAA111A*	A	C1	1	1	**	8.343	0.114	16	SLIPPED	0.0071		8.227
EPAAA112A*	A	C1	1	1	147.512	8.359	0.114	16	AWT / AWB	0.0071	145.356	8.237
EPAAA113A	A	C1	1	1	139.616	8.421	0.114	16	AGM	0.0071	138.121	8.331
EPAAA114A	A	C1	1	1	141.378	8.558	0.113	16	AGM / AWT	0.0071	139.046	8.417
EPAAA115A	A	C1	1	1	140.539	8.323	0.113	16	AWT / AWB	0.0071	138.302	8.190
EPAAA211A	A	C2	1	2	139.647	8.486	0.114	16	AGM	0.0071	137.687	8.367
EPAAA212A	A	C2	1	2	145.721	8.387	0.113	16	AGM	0.0071	143.528	8.260
EPAAA213A	A	C2	1	2	141.766	8.299	0.113	16	AWT	0.0071	139.223	8.150
EPAAB111A	B	C1	2	1	139.715	8.551	0.116	16	AWT / LWB	0.0073	140.685	8.610
EPAAB112A	B	C1	2	1	135.271	8.098	0.117	16	AGM	0.0073	137.071	8.206
EPAAB113A	B	C1	2	1	132.619	7.832	0.115	16	AWB	0.0072	132.945	7.851
EPAAB114A	B	C1	2	1	138.349	8.211	0.116	16	AGM	0.0072	139.189	8.261
EPAAB211A	B	C2	2	2	136.124	8.083	0.115	16	AWT / AWB	0.0072	136.321	8.095
EPAAB212A	B	C2	2	2	149.364	8.267	0.116	16	AGM	0.0072	150.358	8.322
EPAAB213A	B	C2	2	2	140.438	8.217	0.116	16	LWT / AWB	0.0073	141.637	8.287
EPAAC111A	C	C1	3	1	142.680	8.218	0.115	16	AGM	0.0072	142.370	8.200
EPAAC112A	C	C1	3	1	135.615	8.227	0.116	16	AGM / LWT	0.0072	136.478	8.280
EPAAC113A	C	C1	3	1	137.328	8.251	0.116	16	AWT / AWB	0.0072	138.122	8.298
EPAAC114A	C	C1	3	1	144.542	8.246	0.116	16	AWT / AWB	0.0072	145.085	8.277
EPAAC211A	C	C2	3	2	149.272	8.160	0.116	16	AGM	0.0072	149.942	8.196
EPAAC212A	C	C2	3	2	140.582	8.121	0.116	16	AWT	0.0072	141.172	8.155
EPAAC213A	C	C2	3	2	136.479	8.192	0.116	16	AGM / LWB	0.0072	136.992	8.223

* Strain measurement was measured with strain gauge. Extensometer used on other specimens.
** Strength not reported due to slippage during testing.

Average	**140.693**	**8.266**	**$Average_{norm}$**	**0.0072**	**140.459**	**8.247**
Standard Dev.	**4.583**	**0.165**	**Standard $Dev._{norm}$**		**4.414**	**0.139**
Coeff. of Var. [%]	**3.257**	**1.994**	**Coeff. of Var. $[\%]_{norm}$**		**3.142**	**1.680**
Min.	**132.619**	**7.832**	**Min.**	**0.0071**	**132.945**	**7.851**
Max.	**149.364**	**8.558**	**Max.**	**0.0073**	**150.358**	**8.610**
Number of Spec.	**21**	**22**	**Number of Spec.**	**22**	**21**	**22**


Laminate Unnotched Tension Properties (UNT1)--RTD
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
20.0
40.0
60.0
80.0
100.0
120.0
140.0
160.0
Laminate Unnotched Tension Strength [ksi]


Laminate Unnotched Tension Properties (UNT1)--RTD
Normalized Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
Laminate Unnotched Tension Modulus [Msi]

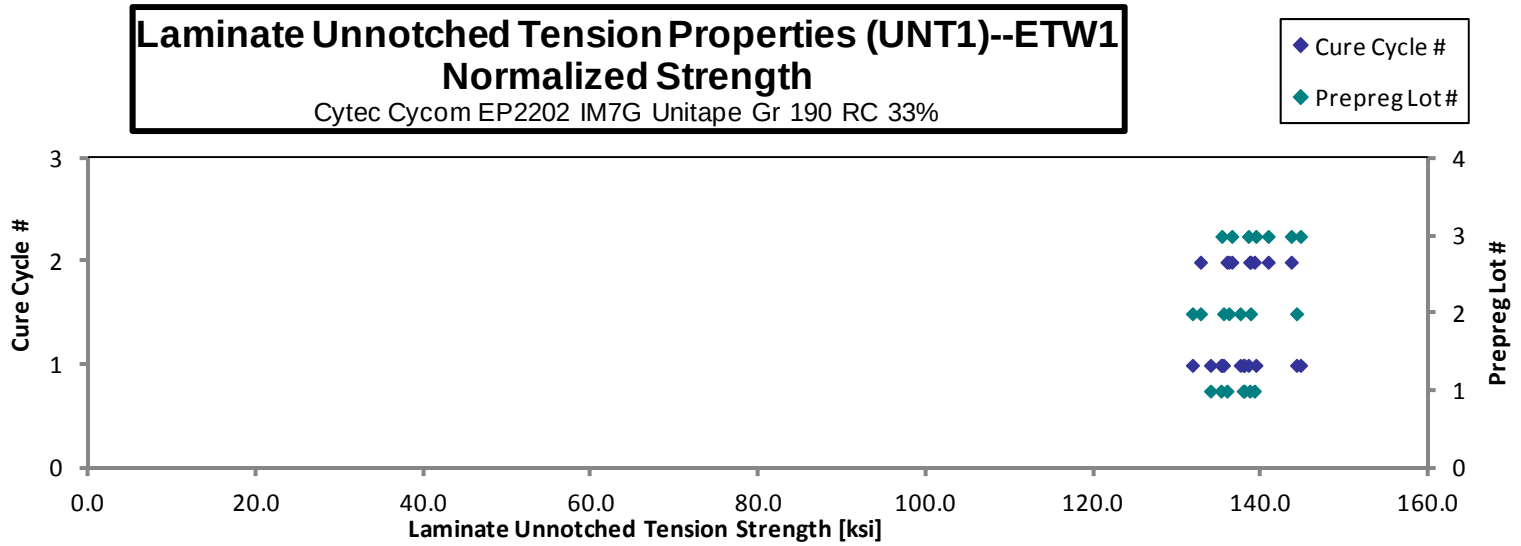
Laminate Unnotched Tension Properties (UNT1)--ETW1
Strength & Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

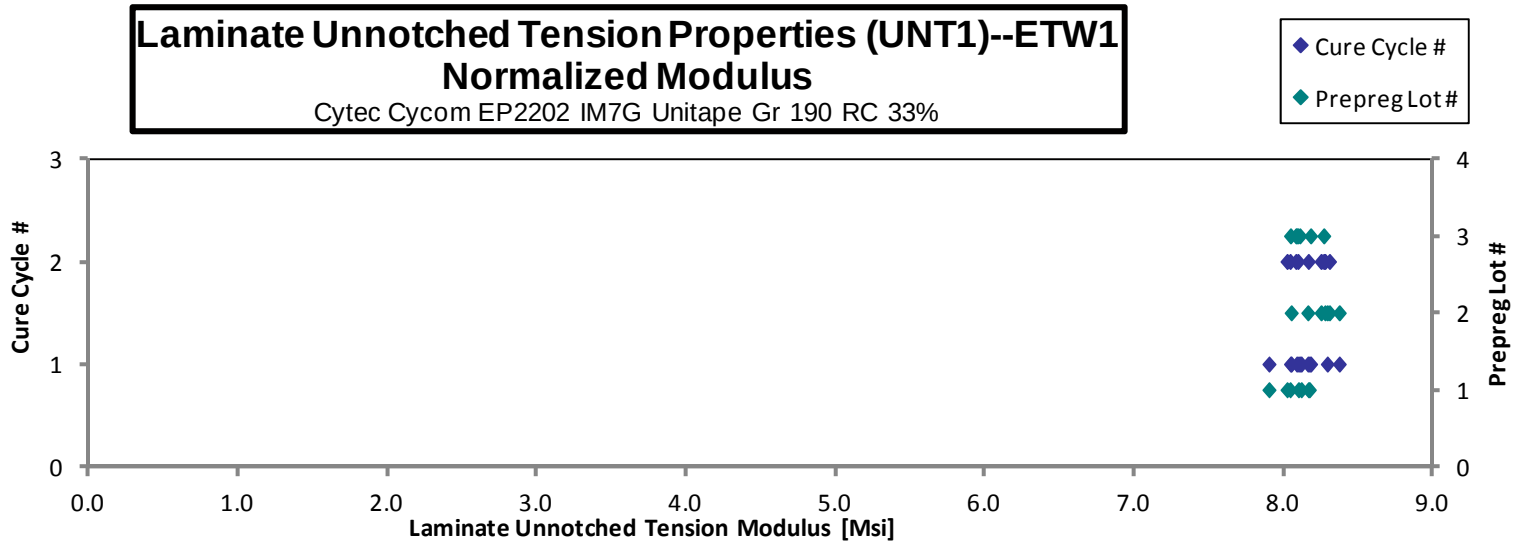
normalizing t_{ply} [in]
0.0072

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]
EPAAA11BD	A	C1	1	1	135.932	8.295	0.113	16	AGM	0.0071	133.887	8.170
EPAAA11CD	A	C1	1	1	137.048	8.230	0.114	16	AGM / LWB	0.0071	135.145	8.115
EPAAA11DD	A	C1	1	1	140.691	8.065	0.113	16	AGT / LWB	0.0071	137.800	7.899
EPAAA11ED	A	C1	1	1	140.493	8.249	0.113	16	AGM / LWT	0.0071	137.912	8.097
EPAAA219D	A	C2	1	2	141.567	8.339	0.113	16	AGM	0.0070	138.576	8.163
EPAAA21AD	A	C2	1	2	142.294	8.204	0.113	16	AGM / LWB	0.0070	139.124	8.021
EPAAA21BD	A	C2	1	2	138.110	8.175	0.113	16	AGM	0.0071	135.852	8.041
EPAAB11BD	B	C1	2	1	135.995	8.081	0.115	16	AWB / LWT	0.0072	135.444	8.049
EPAAB11CD	B	C1	2	1	137.620	8.170	0.115	16	AWB / LWT	0.0072	137.441	8.160
EPAAB11DD	B	C1	2	1	131.584	8.361	0.115	16	AWT	0.0072	131.736	8.370
EPAAB11ED	B	C1	2	1	144.326	8.299	0.115	16	AWT / LWB	0.0072	144.159	8.290
EPAAB219D	B	C2	2	2	135.359	8.205	0.116	16	AWB	0.0072	136.084	8.248
EPAAB21AD	B	C2	2	2	137.973	8.233	0.116	16	AWB / LWT	0.0072	138.672	8.275
EPAAB21BD	B	C2	2	2	131.740	8.245	0.116	16	AWT / LWB	0.0073	132.693	8.305
EPAAC11BD	C	C1	3	1	138.370	7.989	0.116	16	AGM / LWB	0.0072	139.311	8.044
EPAAC11CD	C	C1	3	1	144.115	8.056	0.116	16	AGM / LWB	0.0072	144.636	8.085
EPAAC11DD	C	C1	3	1	138.154	8.091	0.115	16	AWT / LWB	0.0072	138.414	8.106
EPAAC11ED	C	C1	3	1	134.483	8.133	0.116	16	AWB / LWT	0.0072	135.242	8.179
EPAAC219D	C	C2	3	2	143.403	8.073	0.115	16	AWT / LWB	0.0072	143.528	8.080
EPAAC21AD	C	C2	3	2	136.591	8.103	0.115	16	AWB	0.0072	136.433	8.094
EPAAC21BD	C	C2	3	2	140.007	8.221	0.116	16	AWT / LWB	0.0072	140.776	8.266

Average	**138.374**	**8.182**	
Standard Dev.	**3.630**	**0.101**	
Coeff. of Var. [%]	**2.623**	**1.236**	
Min.	**131.584**	**7.989**	
Max.	**144.326**	**8.361**	
Number of Spec.	**21**	**21**	

$Average_{norm}$	**0.0072**	**137.755**	**8.146**
$Standard\ Dev._{norm}$		**3.469**	**0.115**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**2.518**	**1.408**
Min.	**0.0070**	**131.736**	**7.899**
Max.	**0.0073**	**144.636**	**8.370**
Number of Spec.	**21**	**21**	**21**


Laminate Unnotched Tension Properties (UNT1)--ETW1
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
20.0
40.0
60.0
80.0
100.0
120.0
140.0
160.0
Laminate Unnotched Tension Strength [ksi]


Laminate Unnotched Tension Properties (UNT1)--ETW1
Normalized Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
Laminate Unnotched Tension Modulus [Msi]

4.7 "10/80/10" Unnotched Tension 2 Properties (UNT2)

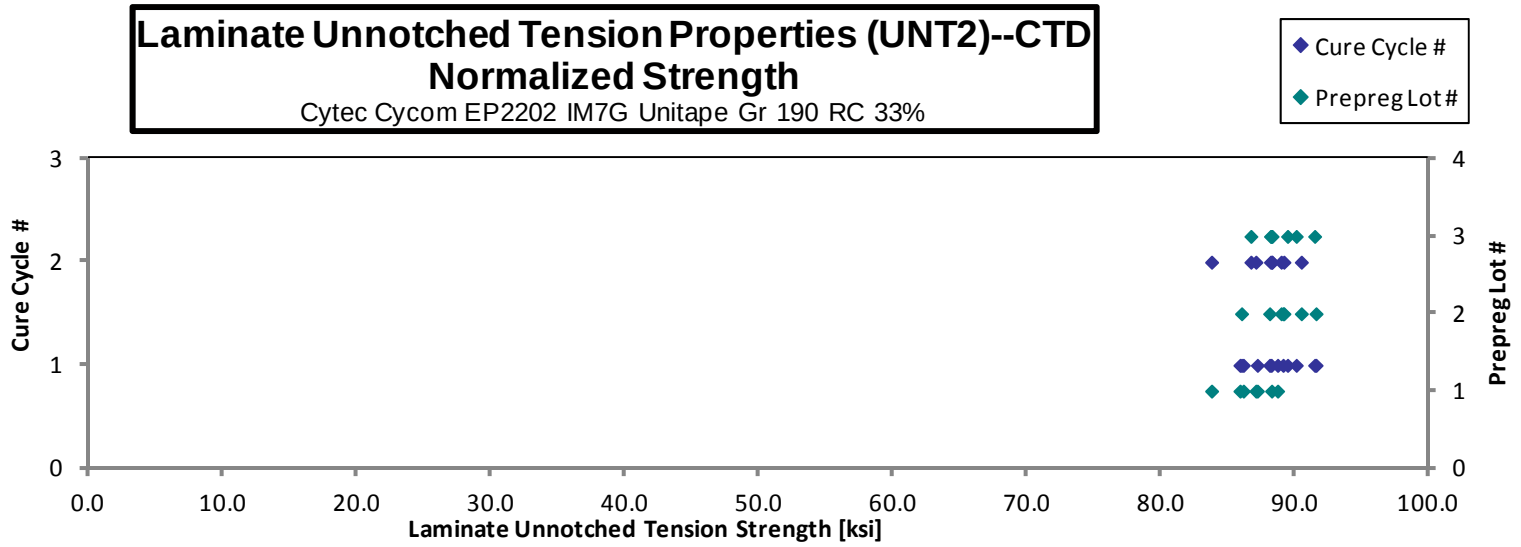
Laminate Unnotched Tension Properties (UNT2) --CTD
Strength & Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

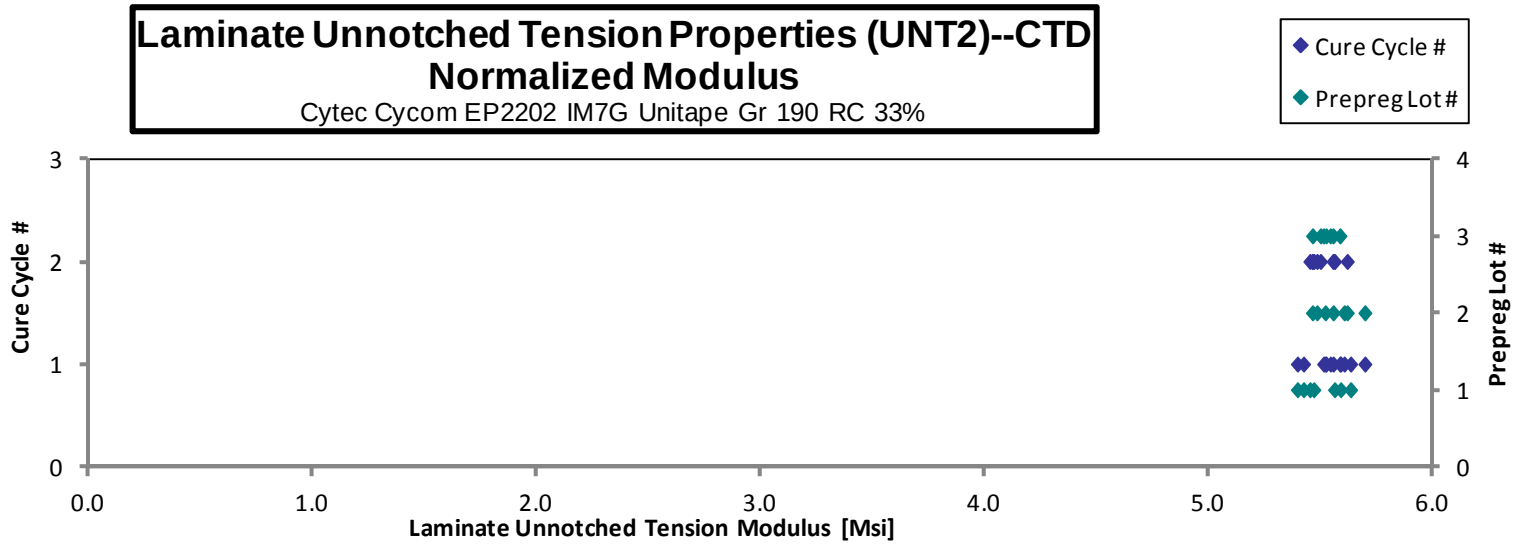
normalizing t_{ply} [in]
0.0072

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]
EPABA116B	A	C1	1	1	87.193	5.487	0.142	20	AGM	0.0071	86.133	5.421
EPABA117B	A	C1	1	1	87.478	5.736	0.141	20	AWT	0.0071	85.878	5.631
EPABA118B	A	C1	1	1	90.188	5.681	0.142	20	AWB	0.0071	88.685	5.586
EPABA119B	A	C1	1	1	88.927	5.502	0.141	20	AGM	0.0071	87.178	5.394
EPABA215B	A	C2	1	2	90.568	5.610	0.140	20	AGT	0.0070	88.241	5.466
EPABA216B	A	C2	1	2	89.334	5.591	0.140	20	AGT	0.0070	87.070	5.449
EPABA217B	A	C2	1	2	86.074	5.713	0.140	20	AGT	0.0070	83.762	5.559
EPABB116B	B	C1	2	1	87.524	5.517	0.145	20	AWT	0.0072	88.092	5.553
EPABB117B	B	C1	2	1	85.513	5.487	0.145	20	AWT	0.0072	85.998	5.518
EPABB118B	B	C1	2	1	91.061	5.572	0.145	20	AWB	0.0072	91.556	5.602
EPABB119B	B	C1	2	1	88.602	5.663	0.145	20	AWB	0.0072	89.094	5.695
EPABB215B	B	C2	2	2	88.321	5.442	0.145	20	AWB	0.0073	88.955	5.481
EPABB216B	B	C2	2	2	88.510	5.421	0.145	20	AGM	0.0073	89.155	5.460
EPABB217B	B	C2	2	2	89.886	5.580	0.145	20	AWT	0.0072	90.458	5.615
EPABC116B	C	C1	3	1	90.004	5.434	0.146	20	AWB	0.0073	91.452	5.521
EPABC117B	C	C1	3	1	88.610	5.532	0.145	20	AWT	0.0073	89.430	5.583
EPABC118B	C	C1	3	1	89.223	5.458	0.145	20	AWT	0.0073	90.080	5.510
EPABC119B	C	C1	3	1	87.756	5.512	0.145	20	AWB	0.0072	88.213	5.540
EPABC215B	C	C2	3	2	86.176	5.428	0.145	20	AWB	0.0072	86.694	5.461
EPABC216B	C	C2	3	2	87.524	5.457	0.145	20	AGT	0.0073	88.162	5.496
EPABC217B	C	C2	3	2	87.798	5.522	0.145	20	AWT	0.0072	88.276	5.552

	Strength [ksi]	Modulus [Msi]
Average	**88.394**	**5.540**
Standard Dev.	**1.500**	**0.096**
Coeff. of Var. [%]	**1.697**	**1.729**
Min.	**85.513**	**5.421**
Max.	**91.061**	**5.736**
Number of Spec.	**21**	**21**

	t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
$Average_{norm}$	**0.0072**	**88.217**	**5.528**
Standard $Dev._{norm}$		**1.915**	**0.075**
Coeff. of Var. $[\%]_{norm}$		**2.170**	**1.358**
Min.	**0.0070**	**83.762**	**5.394**
Max.	**0.0073**	**91.556**	**5.695**
Number of Spec.	**21**	**21**	**21**


Laminate Unnotched Tension Properties (UNT2)--CTD
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
80.0
90.0
100.0
Laminate Unnotched Tension Strength [ksi]


Laminate Unnotched Tension Properties (UNT2)--CTD
Normalized Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
1.0
2.0
3.0
4.0
5.0
6.0
Laminate Unnotched Tension Modulus [Msi]

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

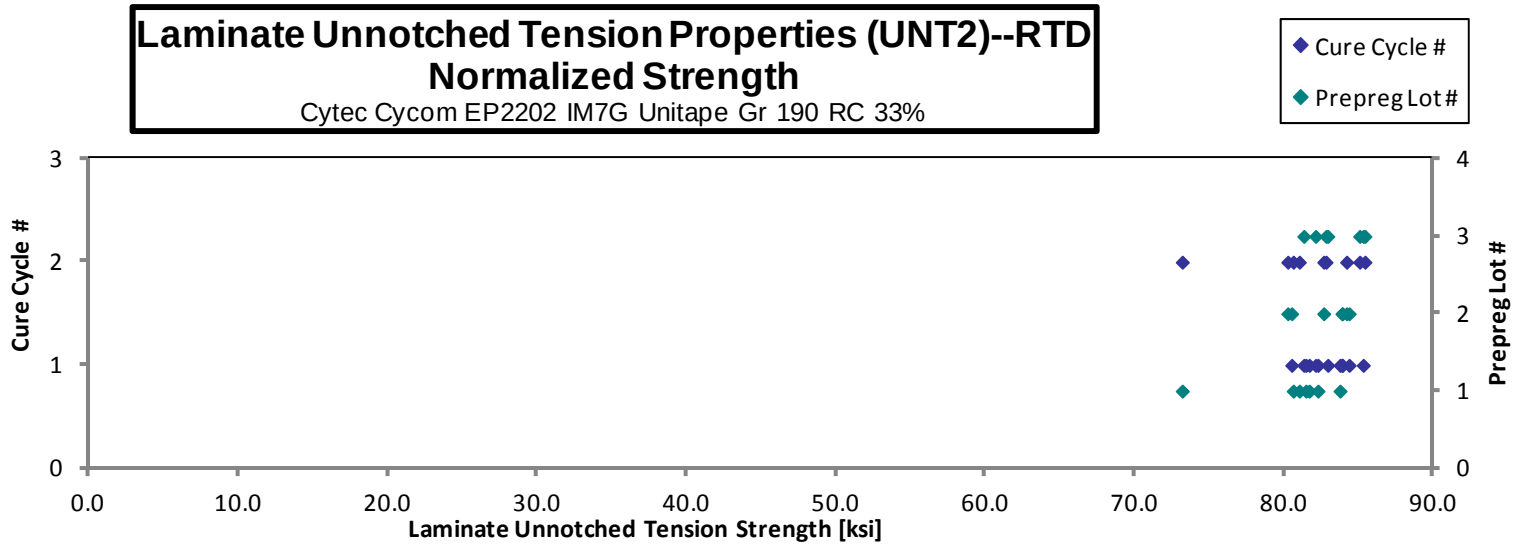
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

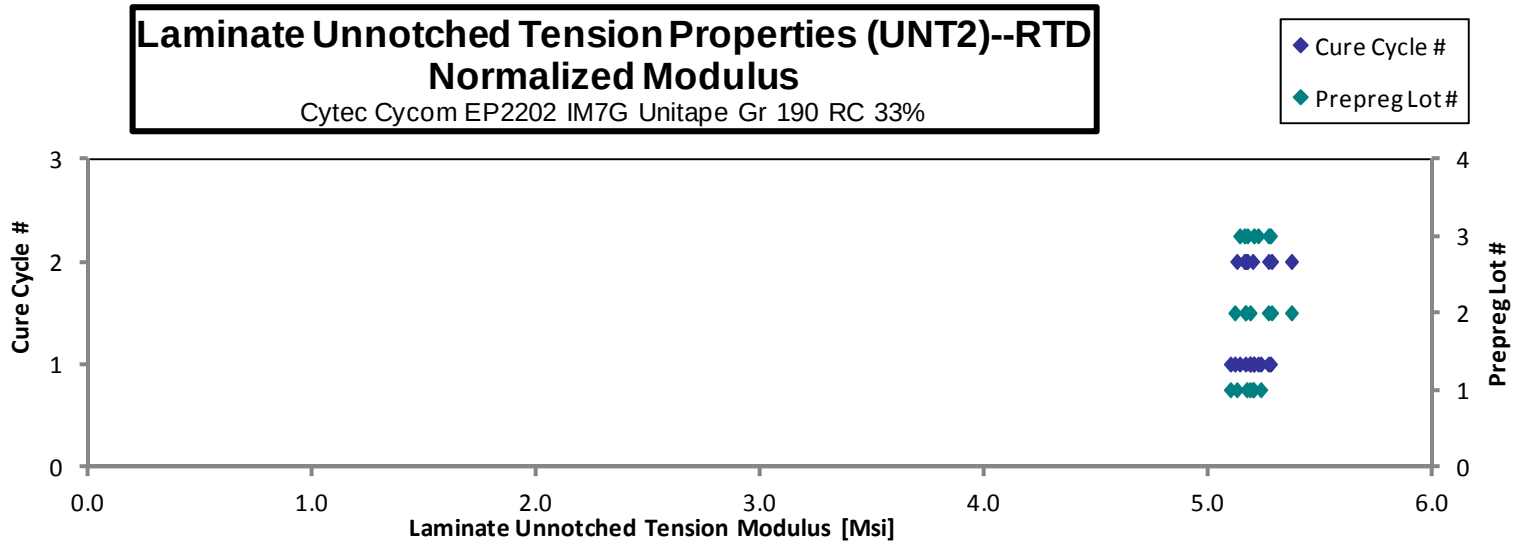
normalizing t_{ply} [in]
0.0072

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]
EPABA111A*	A	C1	1	1	85.456	5.336	0.141	20	AGM	0.0071	83.755	5.230
EPABA112A*	A	C1	1	1	83.631	5.283	0.142	20	AWB	0.0071	82.276	5.197
EPABA113A	A	C1	1	1	83.346	5.286	0.141	20	AGM	0.0071	81.697	5.181
EPABA114A	A	C1	1	1	82.931	5.185	0.141	20	AWT	0.0071	81.473	5.094
EPABA211A	A	C2	1	2	83.053	5.277	0.140	20	AGB	0.0070	80.621	5.123
EPABA212A	A	C2	1	2	83.343	5.314	0.140	20	AWB	0.0070	81.028	5.167
EPABA213A**	A	C2	1	2	75.453	5.354	0.140	20	AGB	0.0070	73.191	5.194
EPABB111A	B	C1	2	1	83.677	5.119	0.145	20	AGM	0.0073	84.364	5.161
EPABB112A	B	C1	2	1	83.352	5.148	0.145	20	AGM	0.0072	83.911	5.183
EPABB113A	B	C1	2	1	80.452	5.110	0.144	20	AWB	0.0072	80.517	5.114
EPABB114A	B	C1	2	1	83.286	5.226	0.145	20	AGT	0.0073	83.883	5.263
EPABB211A	B	C2	2	2	81.727	5.103	0.146	20	AGM	0.0073	82.663	5.161
EPABB212A	B	C2	2	2	79.317	5.216	0.146	20	AWB	0.0073	80.254	5.278
EPABB213A	B	C2	2	2	83.146	5.300	0.146	20	AWT	0.0073	84.195	5.367
EPABC111A	C	C1	3	1	81.224	5.161	0.146	20	AWB	0.0073	82.118	5.218
EPABC112A	C	C1	3	1	82.600	5.115	0.145	20	AGM	0.0072	82.935	5.136
EPABC113A	C	C1	3	1	80.480	5.145	0.146	20	AWB	0.0073	81.328	5.199
EPABC114A	C	C1	3	1	84.594	5.229	0.145	20	AGM	0.0073	85.309	5.273
EPABC211A	C	C2	3	2	84.509	5.230	0.145	20	AWB	0.0072	85.066	5.264
EPABC212A	C	C2	3	2	81.981	5.118	0.145	20	AGM	0.0073	82.816	5.170
EPABC213A	C	C2	3	2	84.852	5.122	0.145	20	AGM	0.0072	85.422	5.157

* Strain measurement was measured with strain gauge. Extensometer used on other specimens.
**investigated and no reason found to omit data.

Average	**82.496**	**5.208**	**Average$_{norm}$**	**0.0072**	**82.325**	**5.197**
Standard Dev.	**2.232**	**0.083**	**Standard Dev.$_{norm}$**		**2.637**	**0.065**
Coeff. of Var. [%]	**2.705**	**1.597**	**Coeff. of Var. [%]$_{norm}$**		**3.204**	**1.252**
Min.	**75.453**	**5.103**	**Min.**	**0.0070**	**73.191**	**5.094**
Max.	**85.456**	**5.354**	**Max.**	**0.0073**	**85.422**	**5.367**
Number of Spec.	**21**	**21**	**Number of Spec.**	**21**	**21**	**21**


Laminate Unnotched Tension Properties (UNT2)--RTD
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
80.0
90.0
Laminate Unnotched Tension Strength [ksi]


Laminate Unnotched Tension Properties (UNT2)--RTD
Normalized Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
1.0
2.0
3.0
4.0
5.0
6.0
Laminate Unnotched Tension Modulus [Msi]

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

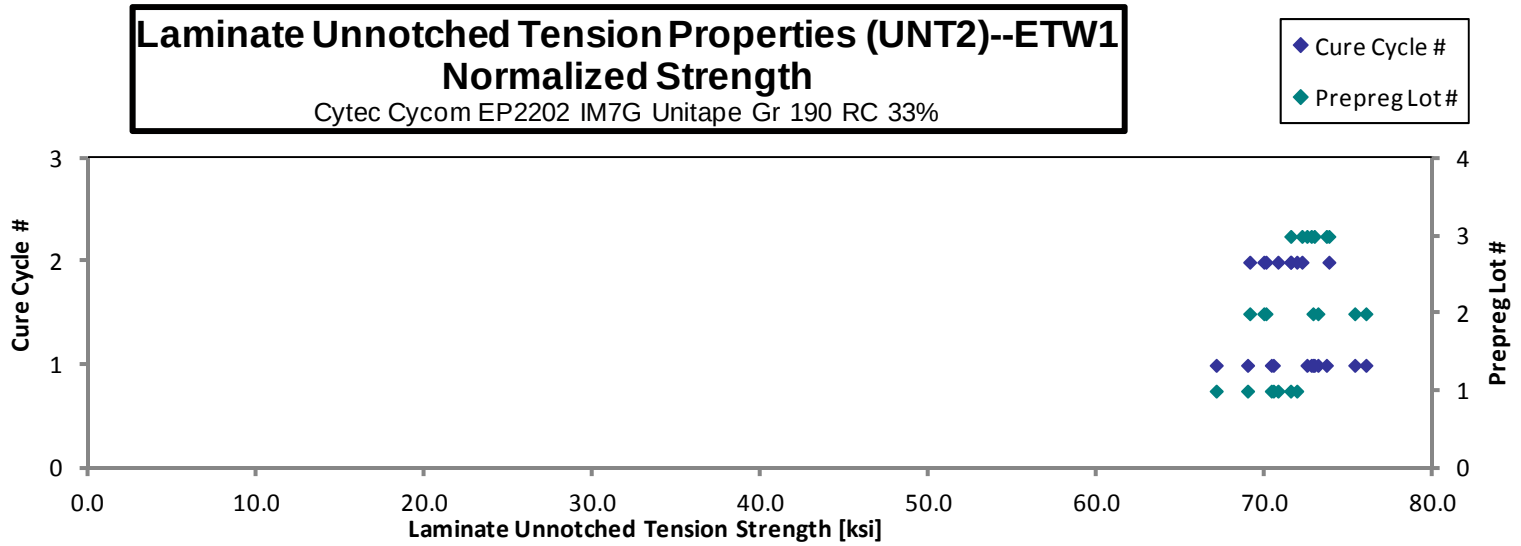
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

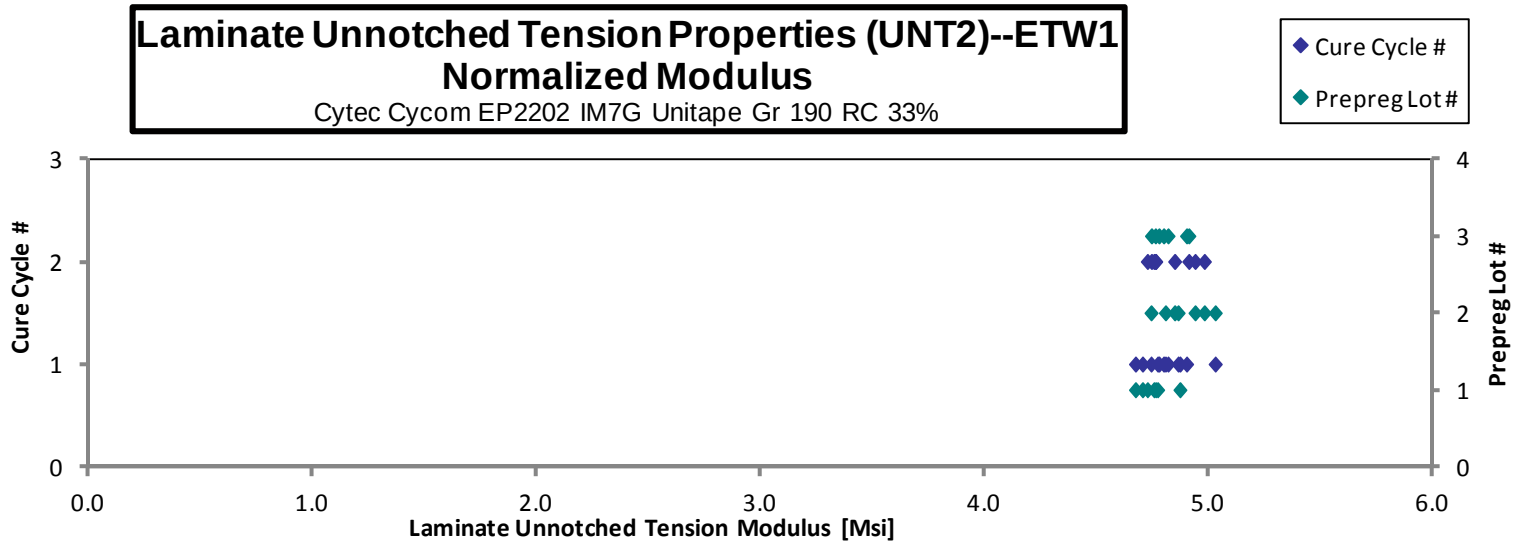
normalizing t_{ply} [in]
0.0072

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]
EPABA11BD	A	C1	1	1	70.087	4.950	0.142	20	AWB	0.0071	68.944	4.869
EPABA11CD	A	C1	1	1	71.980	4.802	0.141	20	AGM	0.0071	70.480	4.702
EPABA11DD	A	C1	1	1	71.912	4.875	0.141	20	AWB	0.0070	70.356	4.769
EPABA11ED	A	C1	1	1	68.545	4.772	0.141	20	AGM	0.0070	67.077	4.670
EPABA219D	A	C2	1	2	73.444	4.857	0.141	20	AGM	0.0070	71.871	4.753
EPABA21AD	A	C2	1	2	72.457	4.837	0.141	20	AGT	0.0070	70.755	4.724
EPABA21BD	A	C2	1	2	73.102	4.867	0.141	20	AWT	0.0070	71.503	4.761
EPABB11BD	B	C1	2	1	72.407	4.776	0.145	20	AGM	0.0072	72.834	4.804
EPABB11CD	B	C1	2	1	74.899	4.833	0.145	20	AGM	0.0072	75.324	4.861
EPABB11DD	B	C1	2	1	75.178	4.973	0.146	20	AGB	0.0073	75.987	5.026
EPABB11ED	B	C1	2	1	72.219	4.681	0.146	20	AGB	0.0073	73.130	4.740
EPABB219D	B	C2	2	2	68.916	4.907	0.146	20	AWT	0.0073	69.913	4.978
EPABB21AD	B	C2	2	2	69.366	4.889	0.145	20	AGM	0.0073	70.041	4.936
EPABB21BD	B	C2	2	2	68.347	4.794	0.146	20	AWB	0.0073	69.074	4.845
EPABC11BD	C	C1	3	1	72.331	4.872	0.145	20	AWB	0.0072	72.733	4.899
EPABC11CD	C	C1	3	1	72.012	4.745	0.145	20	AGM	0.0072	72.479	4.775
EPABC11DD	C	C1	3	1	72.319	4.757	0.145	20	AGB	0.0073	72.913	4.796
EPABC11ED	C	C1	3	1	73.044	4.777	0.145	20	AGB	0.0073	73.636	4.816
EPABC219D	C	C2	3	2	73.032	4.858	0.145	20	AGT	0.0073	73.784	4.909
EPABC21AD	C	C2	3	2	71.826	4.736	0.145	20	AGM	0.0072	72.183	4.759
EPABC21BD	C	C2	3	2	71.093	4.714	0.145	20	AGB	0.0072	71.512	4.742

Average	**71.834**	**4.822**	
Standard Dev.	**1.874**	**0.077**	
Coeff. of Var. [%]	**2.609**	**1.592**	
Min.	**68.347**	**4.681**	
Max.	**75.178**	**4.973**	
Number of Spec.	**21**	**21**	

$Average_{norm}$	**0.0072**	**71.739**	**4.816**
$Standard\ Dev._{norm}$		**2.149**	**0.093**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**2.996**	**1.941**
Min.	**0.0070**	**67.077**	**4.670**
Max.	**0.0073**	**75.987**	**5.026**
Number of Spec.	**21**	**21**	**21**


Laminate Unnotched Tension Properties (UNT2)--ETW1
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
80.0
Laminate Unnotched Tension Strength [ksi]


Laminate Unnotched Tension Properties (UNT2)--ETW1
Normalized Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
1.0
2.0
3.0
4.0
5.0
6.0
Laminate Unnotched Tension Modulus [Msi]

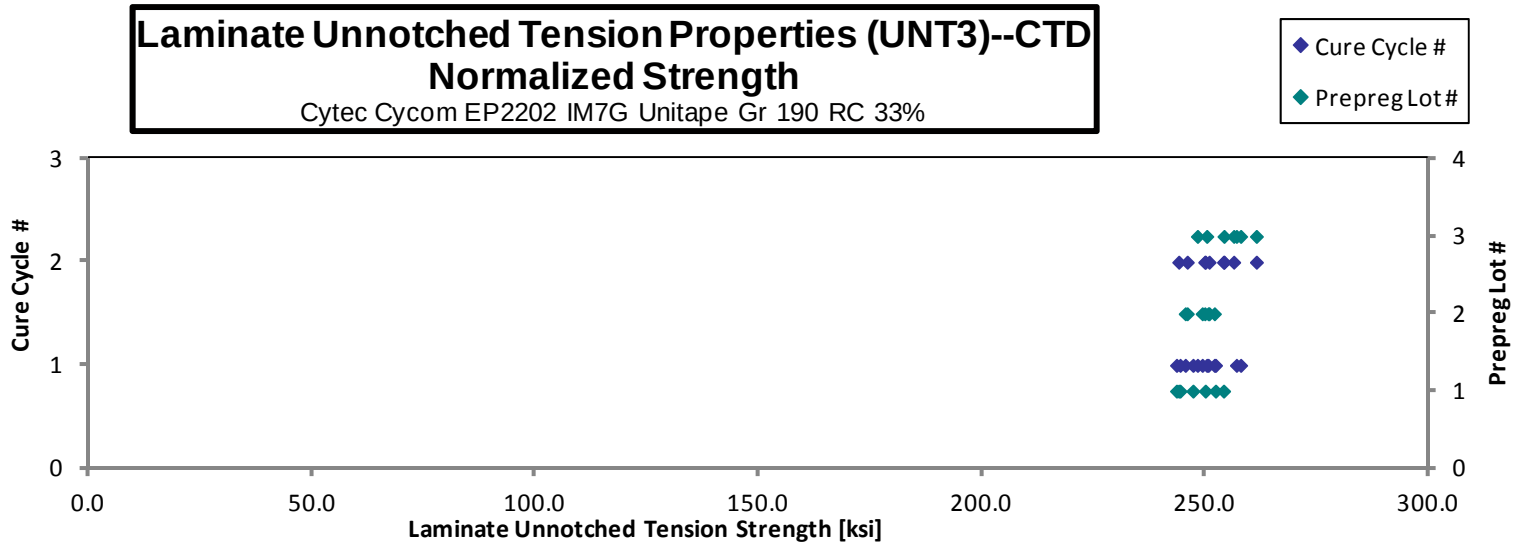
4.8 "50/40/10" Unnotched Tension 3 Properties (UNT3)

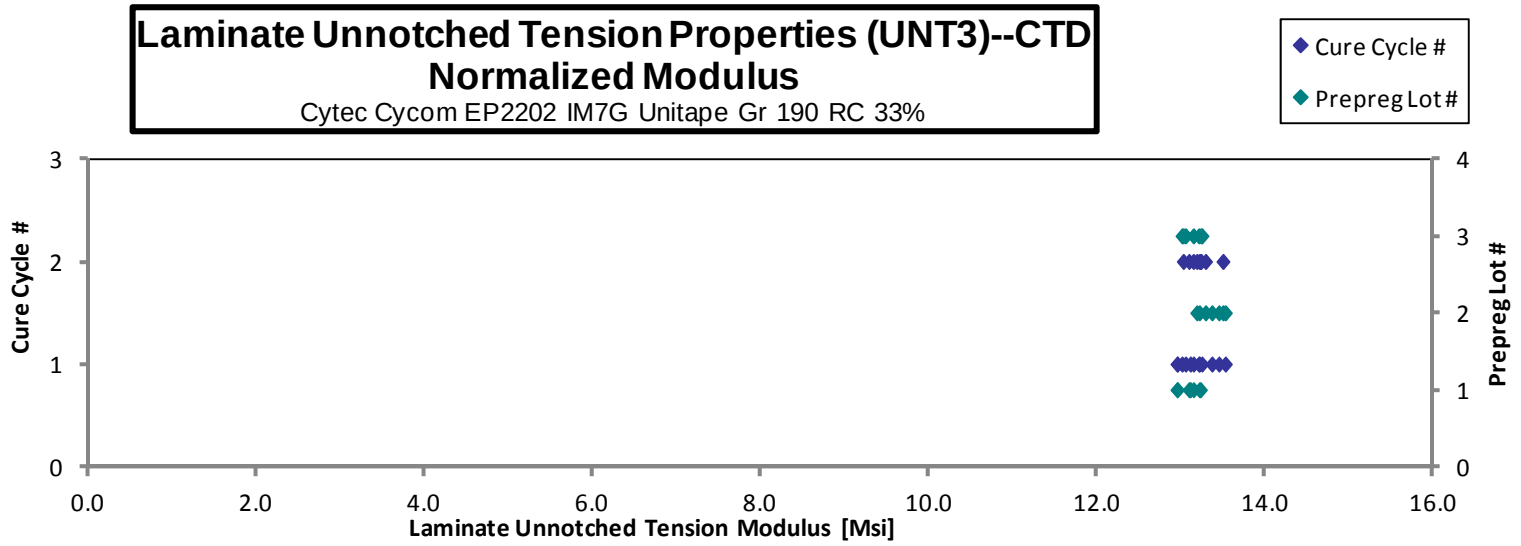
Laminate Unnotched Tension Properties (UNT3)--CTD
Strength & Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

normalizing t_{ply} [in]
0.0072

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]
EPACA116B	A	C1	1	1	247.651	13.177	0.142	20	AGM	0.0071	243.438	12.953
EPACA117B	A	C1	1	1	250.469	13.127	0.142	20	LWT / AAB	0.0071	247.106	12.951
EPACA118B	A	C1	1	1	254.164	13.212	0.143	20	AWT / AWB	0.0071	252.163	13.108
EPACA119B	A	C1	1	1	246.173	13.249	0.143	20	AWB	0.0071	244.236	13.145
EPACA215B	A	C2	1	2	256.909	13.599	0.140	20	AWT / AWB	0.0070	249.891	13.227
EPACA216B	A	C2	1	2	261.479	13.606	0.140	20	AWT	0.0070	253.974	13.215
EPACA217B	A	C2	1	2	253.069	13.582	0.139	20	AWT / AWB	0.0069	243.930	13.092
EPACB115B	B	C1	2	1	243.478	13.112	0.145	20	LWT / AWB	0.0073	245.395	13.215
EPACB116B	B	C1	2	1	249.284	13.226	0.146	20	LWT / AWB	0.0073	251.910	13.365
EPACB117B	B	C1	2	1	246.252	13.289	0.146	20	AWT / AWB	0.0073	249.188	13.448
EPACB118B	B	C1	2	1	245.356	13.246	0.147	20	AWT / AWB	0.0074	250.525	13.525
EPACB215B	B	C2	2	2	248.410	13.113	0.145	20	LWT / AWB	0.0072	249.762	13.184
EPACB216B	B	C2	2	2	248.409	13.165	0.145	20	AGM	0.0073	250.738	13.289
EPACB217B	B	C2	2	2	243.584	13.372	0.145	20	AWT / AWB	0.0073	245.839	13.496
EPACC116B	C	C1	3	1	256.430	13.225	0.144	20	AWT / AWB	0.0072	256.845	13.246
EPACC117B	C	C1	3	1	256.782	13.156	0.145	20	AWB / AWT	0.0072	257.792	13.207
EPACC118B	C	C1	3	1	246.908	12.987	0.145	20	AWT	0.0072	248.109	13.051
EPACC119B	C	C1	3	1	251.017	13.050	0.144	20	AWT / AWB	0.0072	250.204	13.008
EPACC215B	C	C2	3	2	253.621	13.001	0.144	20	AWT	0.0072	254.061	13.024
EPACC216B	C	C2	3	2	254.879	13.074	0.145	20	AWT / LWB	0.0072	256.236	13.144
EPACC217B	C	C2	3	2	260.112	13.172	0.145	20	AWT / AWB	0.0072	261.317	13.233

Average	**251.164**	**13.226**	**Average$_{norm}$**	**0.0072**	**250.603**	**13.196**
Standard Dev.	**5.292**	**0.180**	**Standard Dev.$_{norm}$**		**4.862**	**0.163**
Coeff. of Var. [%]	**2.107**	**1.360**	**Coeff. of Var. [%]$_{norm}$**		**1.940**	**1.238**
Min.	**243.478**	**12.987**	**Min.**	**0.0069**	**243.438**	**12.951**
Max.	**261.479**	**13.606**	**Max.**	**0.0074**	**261.317**	**13.525**
Number of Spec.	**21**	**21**	**Number of Spec.**	**21**	**21**	**21**


Laminate Unnotched Tension Properties (UNT3)--CTD
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
50.0
100.0
150.0
200.0
250.0
300.0
Laminate Unnotched Tension Strength [ksi]


Laminate Unnotched Tension Properties (UNT3)--CTD
Normalized Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
Laminate Unnotched Tension Modulus [Msi]

Laminate Unnotched Tension Properties (UNT3)--RTD
Strength & Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

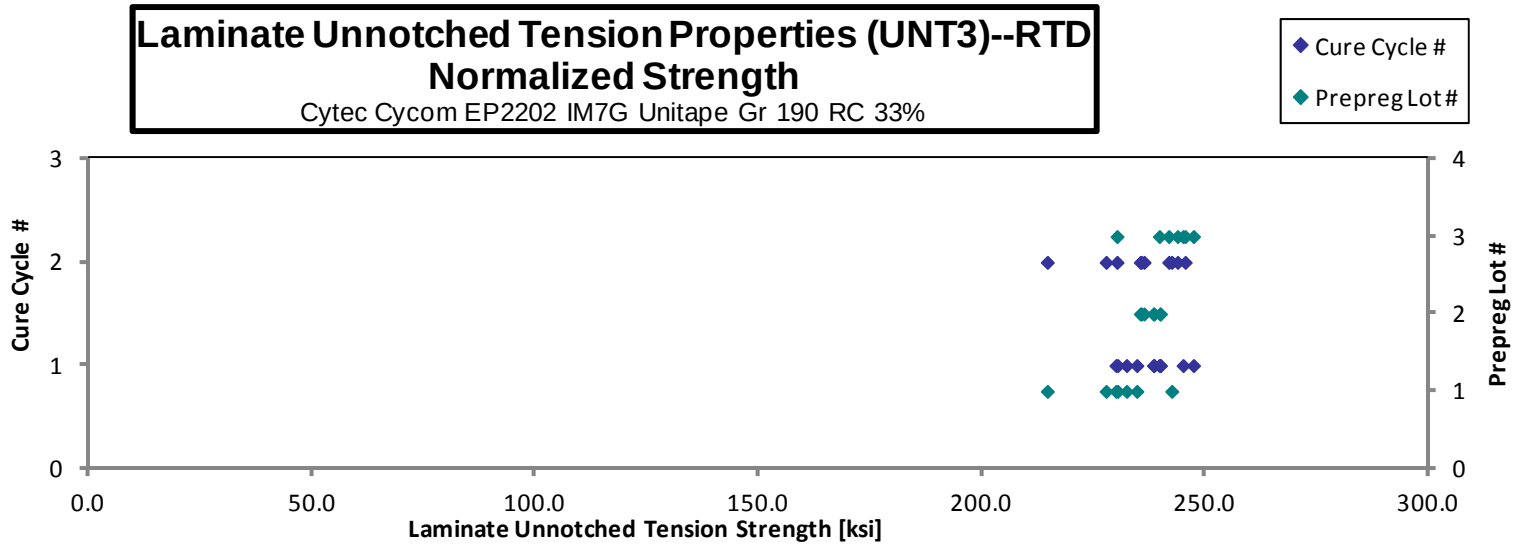
normalizing t_{ply} [in]
0.0072

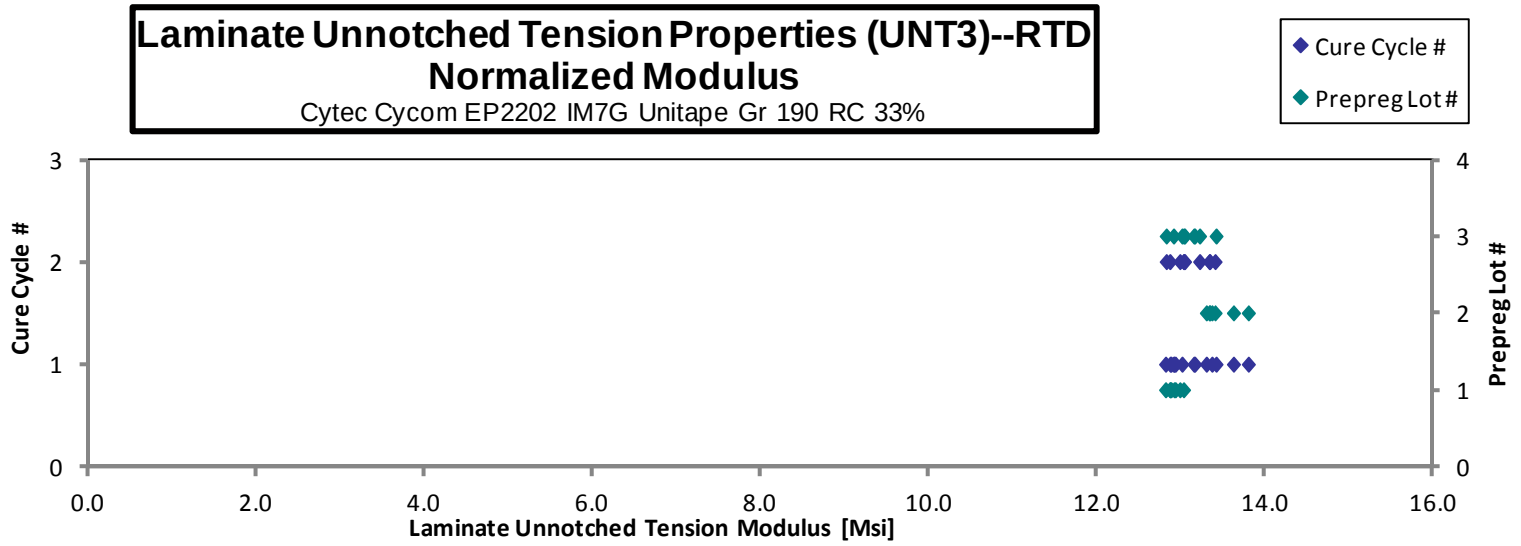
Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
EPACA111A*	A	C1	1	1	***	12.996	0.143	20	AGM	0.0071		12.867
EPACA112A*	A	C1	1	1	234.723	12.949	0.142	20	AGM	0.0071	232.250	12.813
EPACA113A	A	C1	1	1	234.774	13.168	0.141	20	AWT / LWB	0.0071	230.263	12.915
EPACA114A	A	C1	1	1	232.135	13.057	0.143	20	AGM	0.0071	229.879	12.930
EPACA115A	A	C1	1	1	237.308	13.029	0.142	20	AWT / AWB	0.0071	234.561	12.878
EPACA211A	A	C2	1	2	235.858	13.326	0.139	20	LWB	0.0070	227.669	12.863
EPACA212A	A	C2	1	2	***	13.408	0.139	20	XGM	0.0070		12.983
EPACA213A	A	C2	1	2	249.204	13.394	0.140	20	LWT / AAB	0.0070	242.368	13.026
EPACA214A	A	C2	1	2	220.533	**	0.140	20	AAT / LWB	0.0070	214.510	
EPACB111A	B	C1	2	1	236.219	13.250	0.145	20	AWT / AAB	0.0073	238.269	13.365
EPACB112A	B	C1	2	1	235.768	13.570	0.146	20	AWT / AAB	0.0073	239.725	13.798
EPACB113A	B	C1	2	1	235.781	13.153	0.146	20	AWT / AWB	0.0073	238.374	13.298
EPACB114A	B	C1	2	1	236.750	13.447	0.146	20	AWT / AWB	0.0073	239.819	13.621
EPACB211A	B	C2	2	2	232.888	13.215	0.146	20	AWB / AWT	0.0073	236.176	13.402
EPACB212A	B	C2	2	2	232.528	13.163	0.146	20	LAT / AAB	0.0073	235.542	13.333
EPACB213A	B	C2	2	2	232.651	13.186	0.146	20	LWT / AWB	0.0073	235.343	13.338
EPACC111A	C	C1	3	1	***	13.134	0.144	20	Slipped	0.0072		13.150
EPACC112A	C	C1	3	1	243.020	13.311	0.145	20	AAT / LWB	0.0073	244.905	13.415
EPACC113A	C	C1	3	1	246.779	12.884	0.144	20	AGM	0.0072	247.236	12.908
EPACC114A	C	C1	3	1	****	12.988	0.144	20	(N/A)	0.0072		13.009
EPACC115A	C	C1	3	1	238.368	13.093	0.145	20	AWT / AGM / AWB	0.0072	239.582	13.160
EPACC211A	C	C2	3	2	244.675	13.180	0.144	20	AWT / AAB	0.0072	245.383	13.218
EPACC212A	C	C2	3	2	243.631	13.027	0.144	20	LWT / AWB	0.0072	243.660	13.029
EPACC213A	C	C2	3	2	240.472	12.973	0.145	20	AWB / AAT	0.0072	241.696	13.039
EPACC214A	C	C2	3	2	229.028	12.760	0.145	20	LGM / AWT / LWB	0.0072	230.115	12.821

* Strain measurement was measured with strain gauge. Extensometer used on other specimens.
** Specimen was not gaged.
*** Strength not reported because specimen slipped.
****a gradual load drop was recorded but no clear failure more was observed, strength value was not included

Average	**236.814**	**13.153**	
Standard Dev.	**6.428**	**0.192**	
Coeff. of Var. [%]	**2.714**	**1.462**	
Min.	**220.533**	**12.760**	
Max.	**249.204**	**13.570**	
Number of Spec.	**21**	**24**	

$Average_{norm}$	**0.0072**	**236.539**	**13.132**
$Standard\ Dev._{norm}$		**7.498**	**0.265**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**3.170**	**2.022**
Min.	**0.0070**	**214.510**	**12.813**
Max.	**0.0073**	**247.236**	**13.798**
Number of Spec.	**25**	**21**	**24**


Laminate Unnotched Tension Properties (UNT3)--RTD
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
50.0
100.0
150.0
200.0
250.0
300.0
Laminate Unnotched Tension Strength [ksi]


Laminate Unnotched Tension Properties (UNT3)--RTD
Normalized Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
Laminate Unnotched Tension Modulus [Msi]

Laminate Unnotched Tension Properties (UNT3)--ETW1
Strength & Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

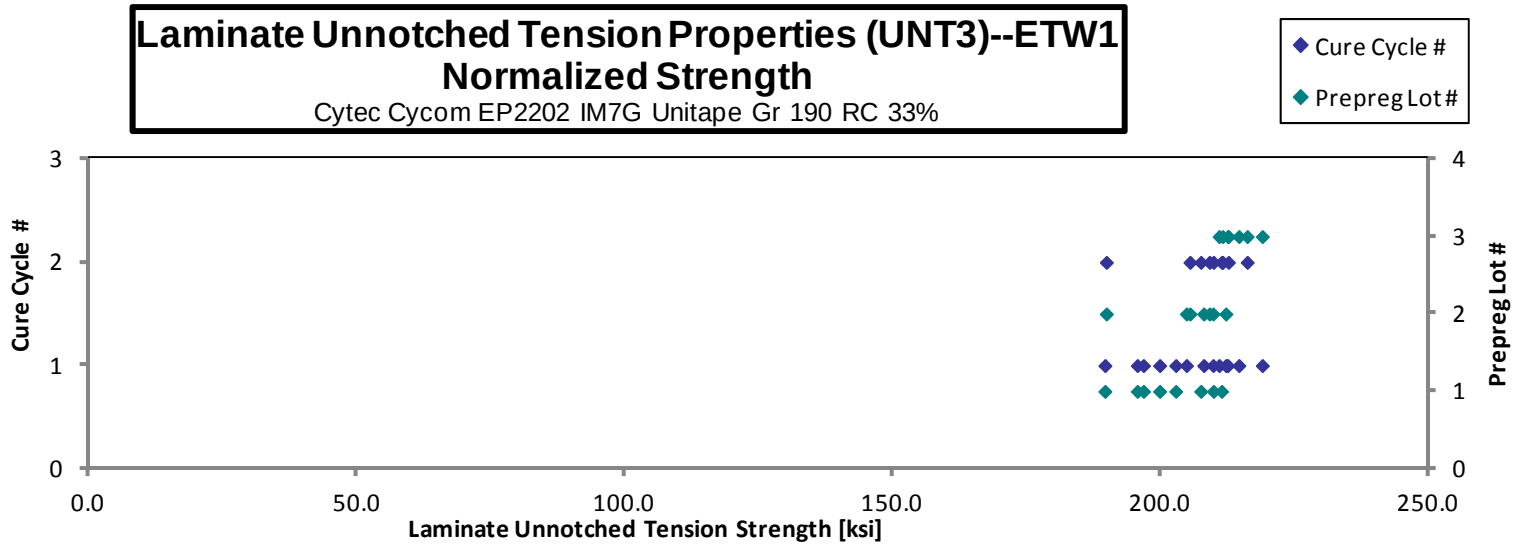
normalizing t_{ply} [in]: 0.0072

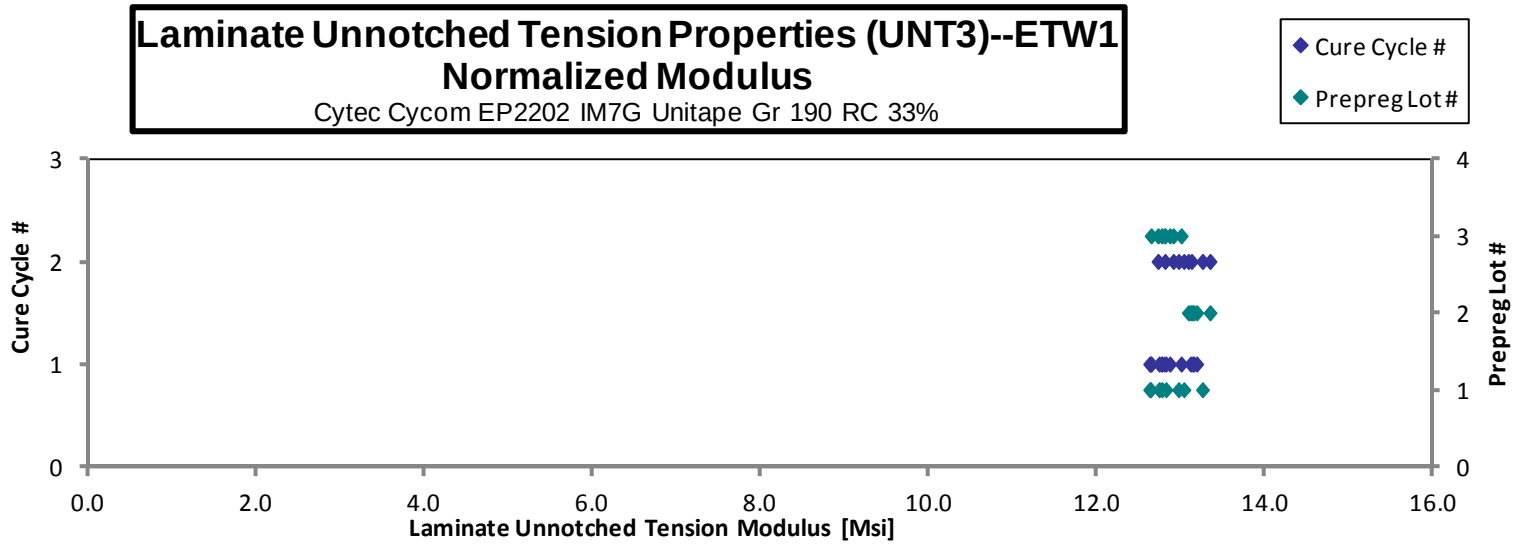
Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
EPACA11BD	A	C1	1	1	199.899	12.840	0.142	20	LAT / LWB / DGM	0.0071	196.683	12.634
EPACA11CD	A	C1	1	1	205.026	12.915	0.142	20	LGB / AIT	0.0071	202.725	12.770
EPACA11DD	A	C1	1	1	191.431	12.866	0.143	20	LAT / LWB / DGM	0.0071	189.504	12.736
EPACA11ED	A	C1	1	1	198.091	12.788	0.142	20	LAT / LGM / LWB	0.0071	195.546	12.624
EPACA11FD	A	C1	1	1	202.242	12.979	0.142	20	DGM / LWB / LAT	0.0071	199.714	12.817
EPACA219D	A	C2	1	2	217.179	13.623	0.140	20	DGM / AAB / LWT	0.0070	211.272	13.252
EPACA21AD	A	C2	1	2	215.889	13.347	0.140	20	DGM / LAT / LWB	0.0070	209.742	12.967
EPACA21BD	A	C2	1	2	213.206	13.397	0.140	20	DGM / LAT	0.0070	207.382	13.031
EPACB11BD	B	C1	2	1	208.703	12.927	0.146	20	LGM / DGM / LAT / LAB	0.0073	212.061	13.135
EPACB11CD	B	C1	2	1	206.993	12.979	0.146	20	LAT / LAB / LGM	0.0073	209.676	13.147
EPACB11DD	B	C1	2	1	205.651	13.039	0.146	20	DGM / LGM / AWT	0.0073	207.936	13.183
EPACB11ED	B	C1	2	1	202.075	12.941	0.146	20	DGM / LAT / LWB	0.0073	204.718	13.110
EPACB219D	B	C2	2	2	187.596	12.934	0.146	20	DGT / LWT	0.0073	189.767	13.084
EPACB21AD	B	C2	2	2	207.597	13.032	0.145	20	LGB / DGM	0.0072	209.014	13.121
EPACB21BD	B	C2	2	2	203.116	13.195	0.146	20	DGM / LAT / LAB	0.0073	205.373	13.342
EPACC11BD	C	C1	3	1	218.616	12.627	0.144	20	LWB / AWT	0.0072	218.869	12.641
EPACC11CD	C	C1	3	1	*	12.761	0.144	20	Slipped	0.0072		12.767
EPACC11DD	C	C1	3	1	210.906	12.709	0.145	20	DGM	0.0073	212.420	12.800
EPACC11ED	C	C1	3	1	209.833	12.939	0.145	20	DGM / LAT	0.0072	210.805	12.999
EPACC11FD	C	C1	3	1	212.475	12.743	0.145	20	DAT / DWB	0.0073	214.491	12.864
EPACC219D	C	C2	3	2	210.392	12.741	0.145	20	LAT / LAB	0.0072	211.464	12.806
EPACC21AD	C	C2	3	2	215.180	12.672	0.145	20	LAB / DGM	0.0072	216.051	12.723
EPACC21BD	C	C2	3	2	212.174	12.883	0.144	20	DGM / AWT / LWB	0.0072	212.542	12.905

* Strength not reported due to slippage during testing.

	Strength [ksi]	Modulus [Msi]
Average	**207.012**	**12.951**
Standard Dev.	**7.971**	**0.243**
Coeff. of Var. [%]	**3.850**	**1.877**
Min.	**187.596**	**12.627**
Max.	**218.616**	**13.623**
Number of Spec.	**22**	**23**

	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
$Average_{norm}$	**0.0072**	**206.716**	**12.933**
Standard $Dev._{norm}$		**8.033**	**0.211**
Coeff. of Var. $[\%]_{norm}$		**3.886**	**1.635**
Min.	**0.0070**	**189.504**	**12.624**
Max.	**0.0073**	**218.869**	**13.342**
Number of Spec.	**23**	**22**	**23**


Laminate Unnotched Tension Properties (UNT3)--ETW1
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
50.0
100.0
150.0
200.0
250.0
Laminate Unnotched Tension Strength [ksi]


Laminate Unnotched Tension Properties (UNT3)--ETW1
Normalized Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
Laminate Unnotched Tension Modulus [Msi]

4.9 "33/0/67" Unnotched Compression 0 Properties (UNC0)

Laminate Unnotched Compression Properties (UNC0)--CTD
Strength & Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

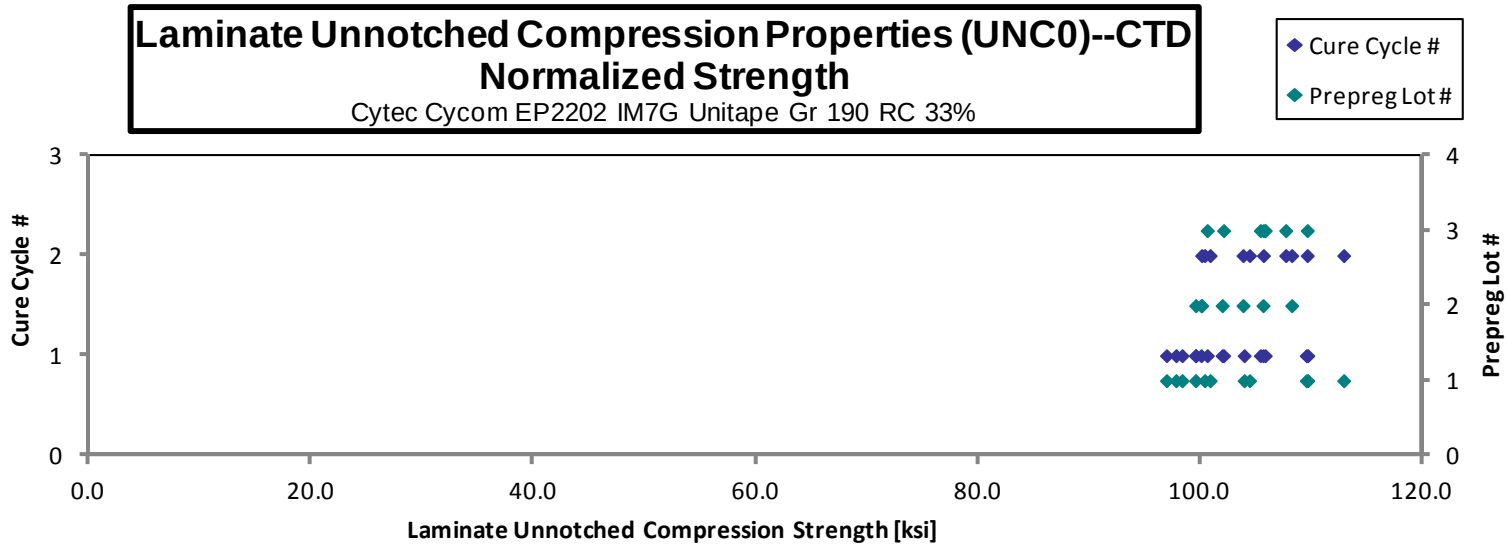
normalizing t_{ply} [in]
0.0072

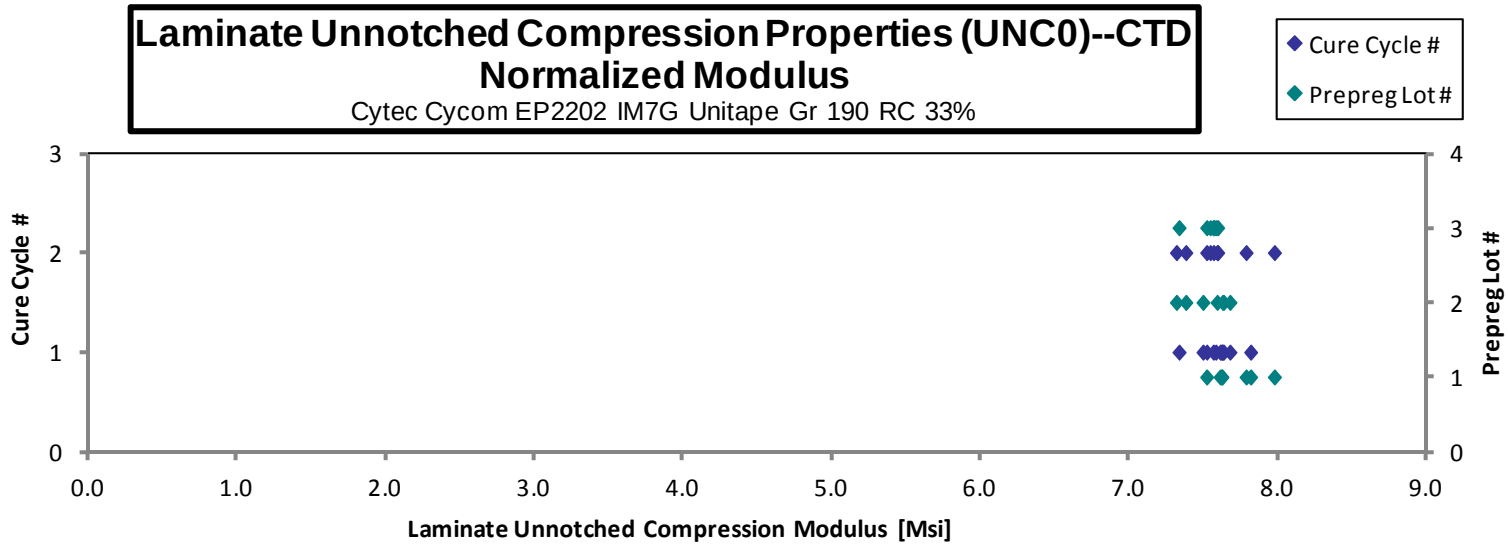
Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
EPARA117B	A	C1	1	1	99.336	7.893	0.107	15	BGM	0.0071	98.340	7.814
EPARA118B	A	C1	1	1	101.213	7.748	0.106	15	BGM	0.0071	99.558	7.622
EPARA119B	A	C1	1	1	99.518	7.752	0.106	15	HIT,BGM	0.0071	97.798	7.618
EPARA11AB	A	C1	1	1	111.808	7.759	0.106	15	HIT,BGM	0.0071	109.651	7.609
EPARA11BB	A	C1	1	1	98.741		0.106	15	BGM	0.0071	96.943	
EPARA11CB	A	C1	1	1	111.593		0.106	15	HAT,BGM	0.0071	109.526	
EPARA116A*	A	C1	1	1	105.875		0.106	15	BGM	0.0071	103.931	
EPARA216B	A	C2	1	2	102.284	7.932	0.106	15	BGM	0.0071	100.374	7.784
EPARA217B	A	C2	1	2	115.413	8.153	0.106	15	HIT,BGM	0.0070	112.884	7.974
EPARA218B	A	C2	1	2	103.228	7.694	0.106	15	BGM	0.0070	100.870	7.518
EPARA219B	A	C2	1	2	106.401		0.106	15	BGM	0.0071	104.414	
EPARB117B	B	C1	2	1	100.771	7.767	0.107	15	BGM	0.0071	99.573	7.675
EPARB118B	B	C1	2	1	107.065	7.595	0.107	15	BGM	0.0071	105.628	7.493
EPARB119B	B	C1	2	1	101.305	7.727	0.107	15	BGM	0.0071	100.055	7.632
EPARB11AB	B	C1	2	1	103.342	7.729	0.107	15	BGM	0.0071	101.954	7.626
EPARB216B	B	C2	2	2	102.923	7.522	0.109	15	BGM	0.0073	103.828	7.589
EPARB217B	B	C2	2	2	107.199	7.247	0.109	15	BGM	0.0073	108.208	7.315
EPARB218B	B	C2	2	2	99.447	7.330	0.109	15	BGM	0.0072	100.107	7.378
EPARC117B	C	C1	3	1	106.526	7.614	0.107	15	BGM	0.0072	105.819	7.563
EPARC118B	C	C1	3	1	106.110	7.383	0.107	15	BGM	0.0072	105.390	7.333
EPARC119B	C	C1	3	1	101.267	7.568	0.107	15	BGM	0.0072	100.611	7.519
EPARC11AB	C	C1	3	1	102.334	7.599	0.108	15	BGM	0.0072	102.082	7.580
EPARC216B	C	C2	3	2	106.202	7.631	0.107	15	BGM	0.0072	105.662	7.593
EPARC217B	C	C2	3	2	110.148	7.602	0.107	15	BGM	0.0072	109.604	7.565
EPARC218B	C	C2	3	2	108.254	7.584	0.107	15	BGM	0.0072	107.669	7.543

* EPARA116A was taken from room temperature set

	Strength [ksi]	Modulus [Msi]
Average	**104.732**	**7.659**
Standard Dev.	**4.411**	**0.203**
Coeff. of Var. [%]	**4.212**	**2.649**
Min.	**98.741**	**7.247**
Max.	**115.413**	**8.153**
Number of Spec.	**25**	**21**

	t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
$Average_{norm}$	**0.0071**	**103.619**	**7.588**
Standard $Dev._{norm}$	**0.0001**	**4.300**	**0.151**
Coeff. of Var. $[\%]_{norm}$	**0.9318**	**4.150**	**1.993**
Min.	**0.0070**	**96.943**	**7.315**
Max.	**0.0073**	**112.884**	**7.974**
Number of Spec.	**25**	**25**	**21**


Laminate Unnotched Compression Properties (UNC0)--CTD
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
20.0
40.0
60.0
80.0
100.0
120.0
Laminate Unnotched Compression Strength [ksi]


Laminate Unnotched Compression Properties (UNC0)--CTD
Normalized Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
Laminate Unnotched Compression Modulus [Msi]

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

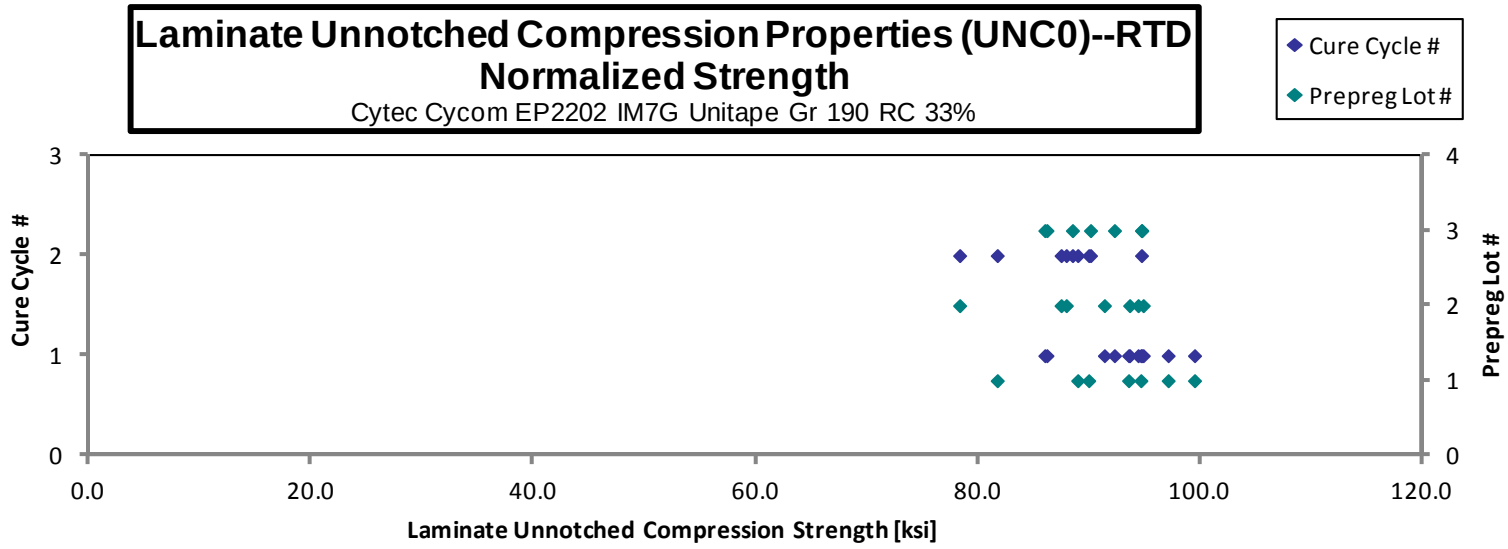
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

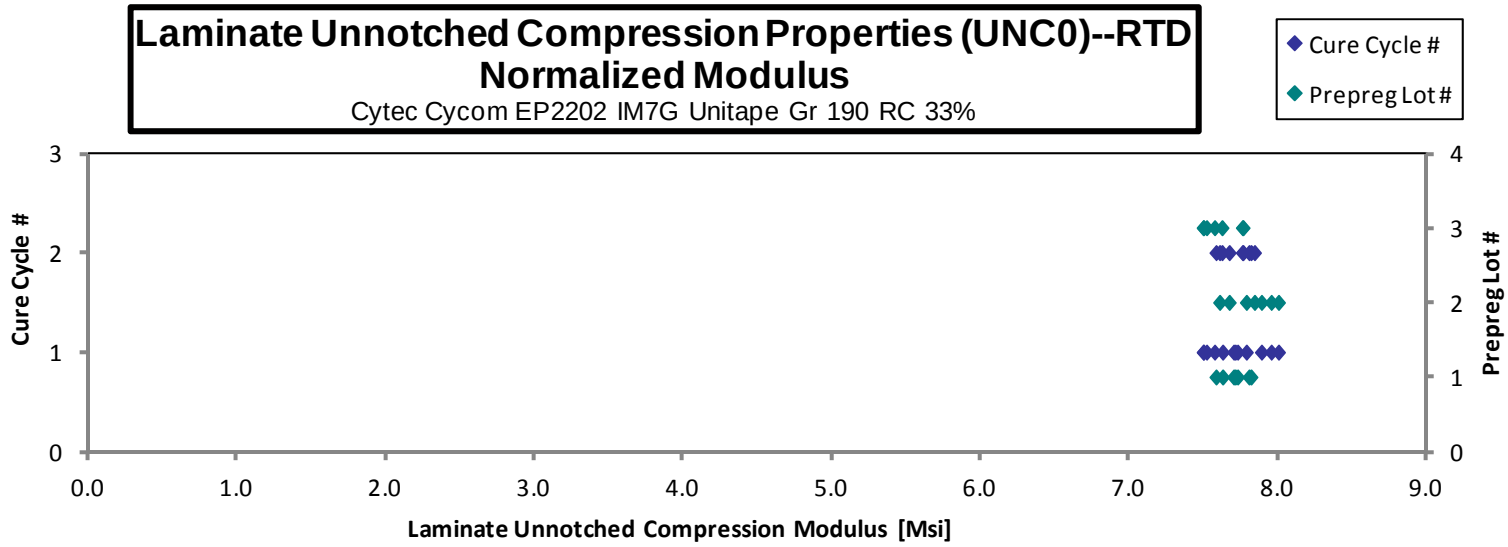
normalizing t_{ply} [in]
0.0072

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]
EPARA111A*	A	C1	1	1	99.394	7.893	0.106	15	BGT,CIB	0.0070	97.093	7.711
EPARA112A*	A	C1	1	1	96.013	7.839	0.106	15	BGT,CIB	0.0071	94.635	7.727
EPARA113A	A	C1	1	1	**	7.821	0.106	15	HIB	0.0071		7.700
EPARA114A	A	C1	1	1	95.147	7.757	0.106	15	BGM,CIB	0.0071	93.532	7.626
EPARA115A	A	C1	1	1	100.867		0.107	15	BGT	0.0071	99.466	
EPARA211A	A	C2	1	2	84.333	7.824	0.105	15	BGB	0.0070	81.717	7.581
EPARA212A	A	C2	1	2	91.049	7.986	0.106	15	HAT	0.0070	88.956	7.803
EPARA213A	A	C2	1	2	91.659	7.965	0.106	15	HAT	0.0071	89.948	7.816
EPARB111A	B	C1	2	1	95.708	8.113	0.107	15	BGM,HAB	0.0071	94.393	8.001
EPARB112A	B	C1	2	1	94.105	7.993	0.107	15	BGB,HAB	0.0072	93.625	7.952
EPARB113A	B	C1	2	1	***	7.820	0.108	15	BGB,HAB,CIT	0.0072		7.785
EPARB114A	B	C1	2	1	91.926	7.936	0.107	15	BGT,HAT	0.0072	91.359	7.887
EPARB115A	B	C1	2	1	96.023		0.107	15	BGB,HAB	0.0071	94.852	
EPARB211A	B	C2	2	2	86.605	7.491	0.110	15	BGM	0.0073	87.928	7.606
EPARB212A	B	C2	2	2	85.910	7.701	0.110	15	BGM	0.0073	87.461	7.840
EPARB213A	B	C2	2	2	77.097	7.549	0.110	15	BGM	0.0073	78.335	7.670
EPARC111A	C	C1	3	1	87.773	7.635	0.106	15	BGT,HAT	0.0071	86.188	7.497
EPARC112A	C	C1	3	1	86.226	7.515	0.108	15	BGB	0.0072	86.000	7.495
EPARC113A	C	C1	3	1	92.646	7.603	0.108	15	BGB,HAB	0.0072	92.260	7.572
EPARC114A	C	C1	3	1	95.385	7.570	0.107	15	BGM,HAB	0.0072	94.722	7.518
EPARC211A	C	C2	3	2	90.193	7.909	0.106	15	BGM	0.0071	88.481	7.759
EPARC212A	C	C2	3	2	90.697	7.671	0.107	15	BGB	0.0072	90.109	7.621
EPARC213A	C	C2	3	2	95.209	7.805	0.107	15	BGB,HIB	0.0072	94.695	7.763

* Modulus is the average of two strain gages.
** Strength not reported because of unacceptable failure
*** Strength not reported because of prominent unacceptable failure

Average	**91.617**	**7.781**		**Average$_{norm}$**	**0.0071**	**90.750**	**7.711**
Standard Dev.	**5.554**	**0.176**		**Standard Dev.$_{norm}$**	**0.0001**	**5.093**	**0.144**
Coeff. of Var. [%]	**6.063**	**2.259**		**Coeff. of Var. [%]$_{norm}$**	**1.2594**	**5.612**	**1.867**
Min.	**77.097**	**7.491**		**Min.**	**0.0070**	**78.335**	**7.495**
Max.	**100.867**	**8.113**		**Max.**	**0.0073**	**99.466**	**8.001**
Number of Spec.	**21**	**21**		**Number of Spec.**	**23**	**21**	**21**


Laminate Unnotched Compression Properties (UNC0)--RTD
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
20.0
40.0
60.0
80.0
100.0
120.0
Laminate Unnotched Compression Strength [ksi]


Laminate Unnotched Compression Properties (UNC0)--RTD
Normalized Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
Laminate Unnotched Compression Modulus [Msi]

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

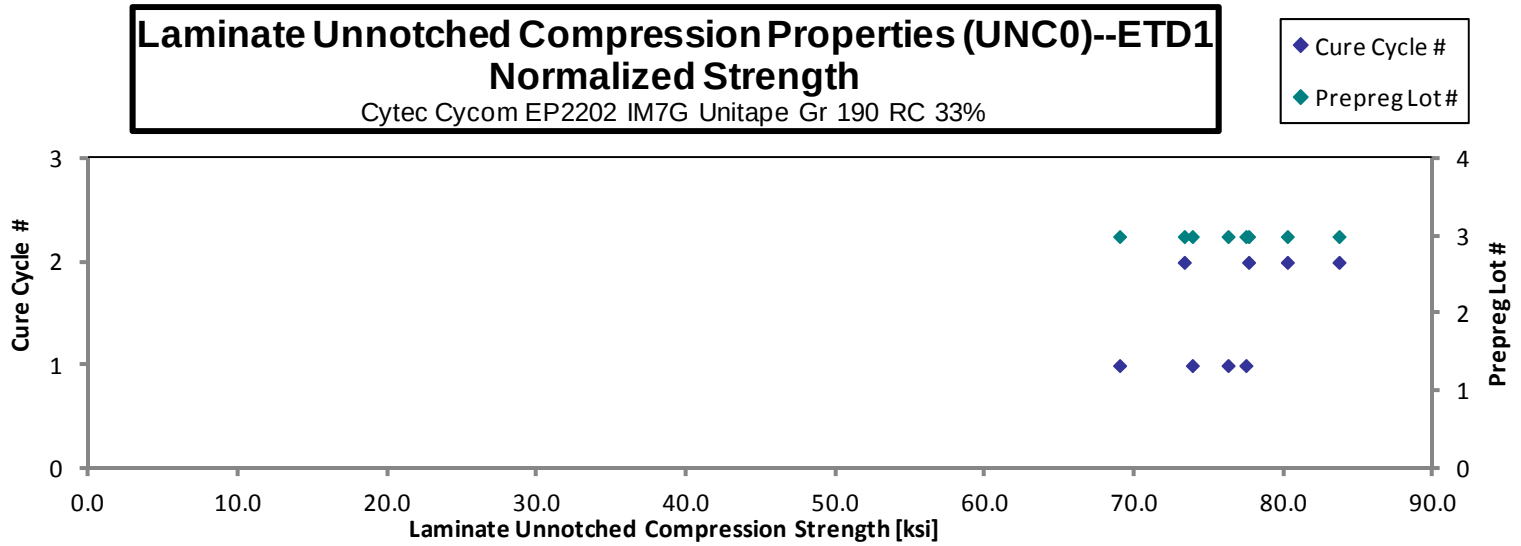
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

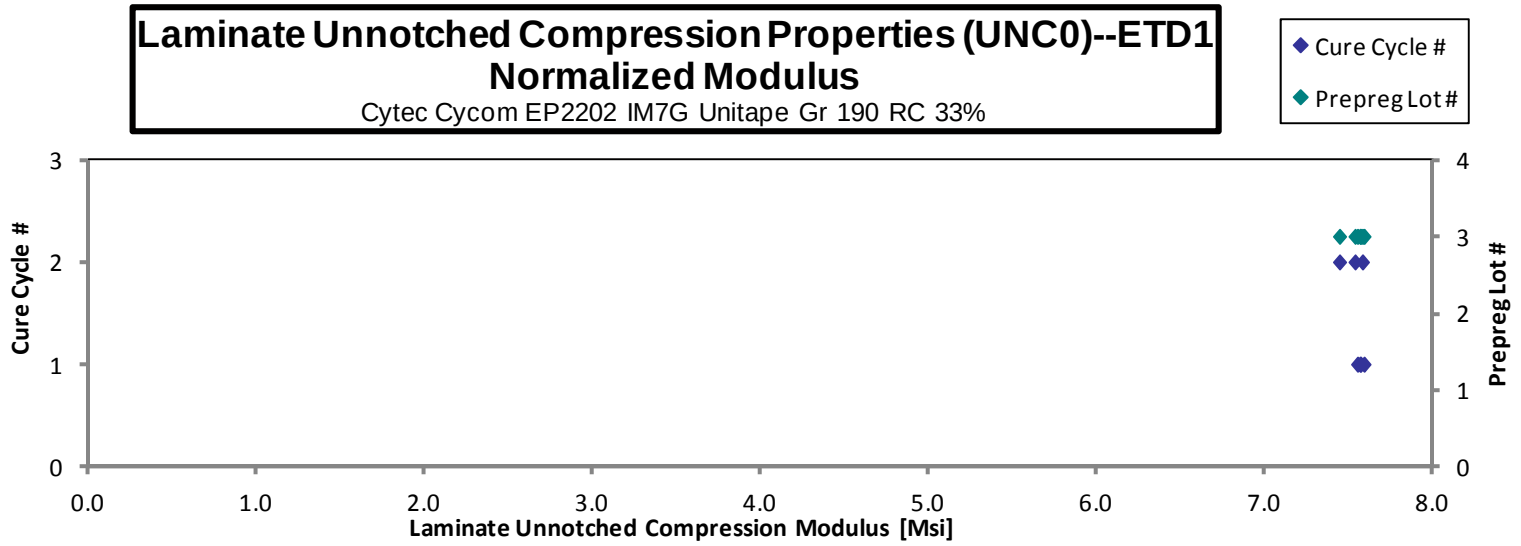
normalizing t_{ply} [in]
0.0072

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]
EPARC11DC	C	C1	3	1	69.640	7.620	0.107	15	BAB	0.0071	68.996	7.549
EPARC11EC	C	C1	3	1	76.801	7.621	0.107	15	BAB	0.0071	76.256	7.567
EPARC11FC	C	C1	3	1	*	7.644	0.107	15	HIT	0.0071		7.564
EPARC11GC	C	C1	3	1	74.115	7.614	0.108	15	BAB	0.0072	73.863	7.588
EPARC11HC	C	C1	3	1	77.799		0.108	15	BAB	0.0072	77.451	
EPARC21BC	C	C2	3	2	80.963	7.648	0.107	15	BAB,CIB	0.0071	80.226	7.578
EPARC21CC	C	C2	3	2	*	7.599	0.107	15	CIB	0.0071		7.534
EPARC21DC	C	C2	3	2	74.301	7.541	0.107	15	BAB	0.0071	73.327	7.442
EPARC21EC	C	C2	3	2	83.995		0.108	15	BAT	0.0072	83.684	
EPARC21FC	C	C2	3	2	77.883		0.108	15	BGM	0.0072	77.630	

* Strength is not reported due to unacceptable failure mode

	Strength [ksi]	Modulus [Msi]		$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
Average	**76.937**	**7.612**	**$Average_{norm}$**	**76.429**	**7.546**
Standard Dev.	**4.405**	**0.036**	**Standard $Dev._{norm}$**	**4.489**	**0.049**
Coeff. of Var. [%]	**5.725**	**0.473**	**Coeff. of Var. $[\%]_{norm}$**	**5.873**	**0.654**
Min.	**69.640**	**7.541**	**Min.**	**68.996**	**7.442**
Max.	**83.995**	**7.648**	**Max.**	**83.684**	**7.588**
Number of Spec.	**8**	**7**	**Number of Spec.**	**8**	**7**


Laminate Unnotched Compression Properties (UNC0)--ETD1
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
80.0
90.0
Laminate Unnotched Compression Strength [ksi]

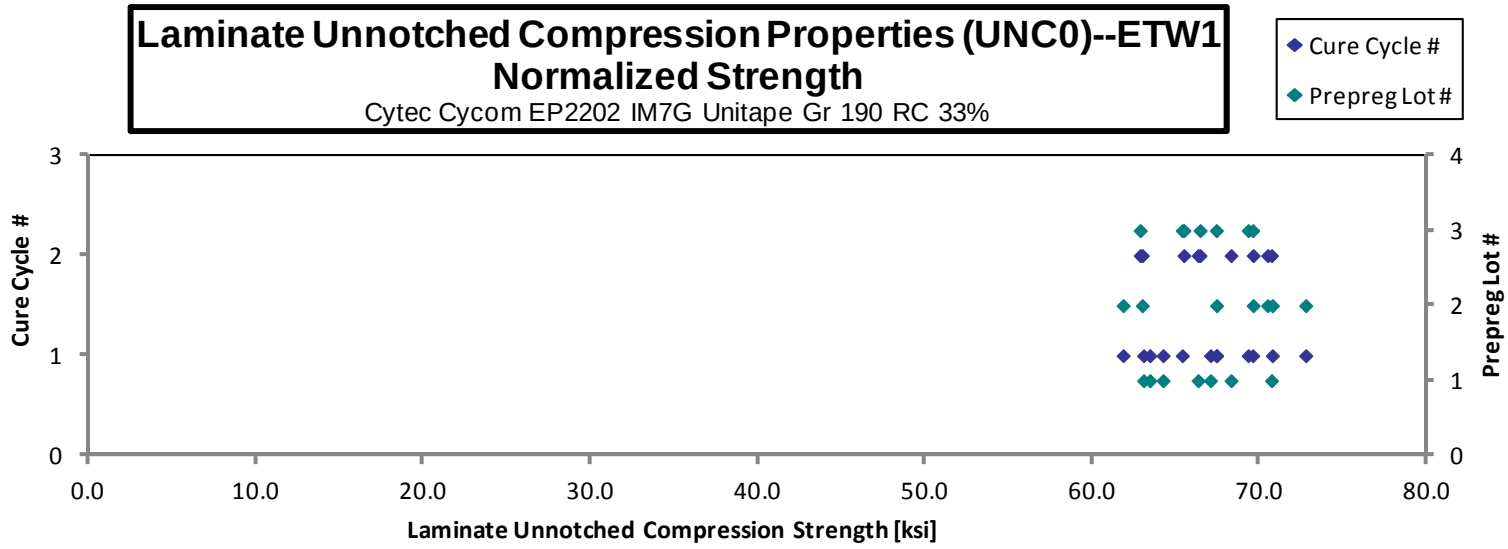

Laminate Unnotched Compression Properties (UNC0)--ETD1
Normalized Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
Laminate Unnotched Compression Modulus [Msi]

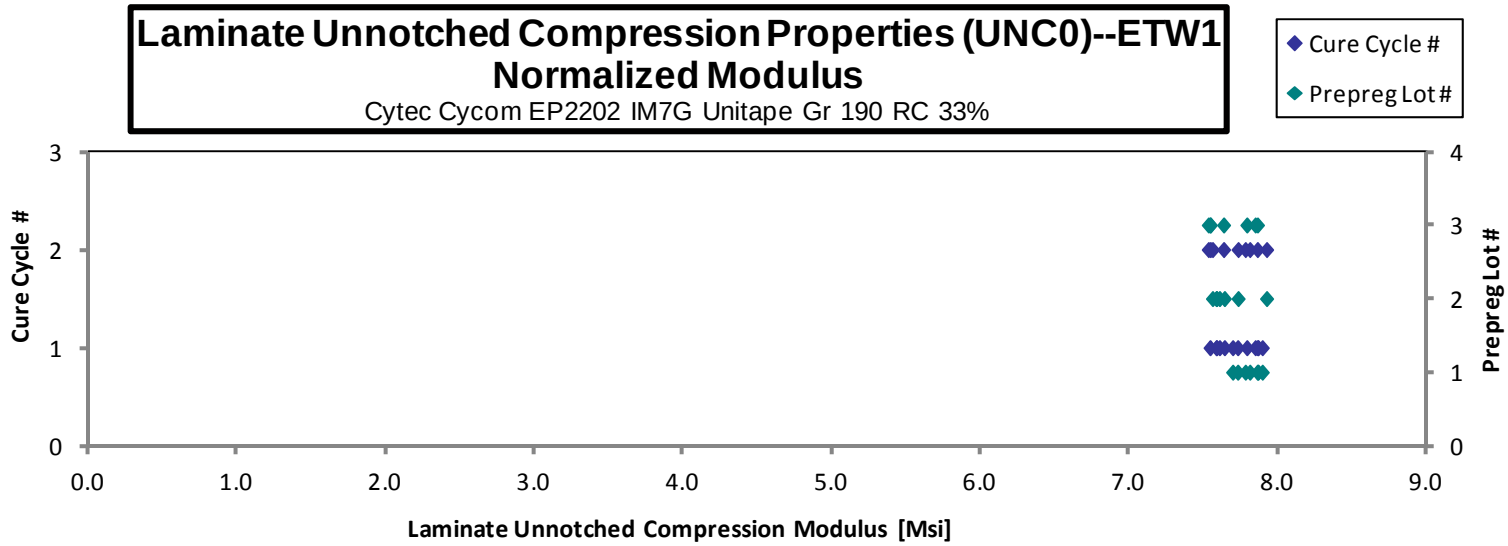
Laminate Unnotched Compression Properties (UNC0)--ETW1
Strength & Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

normalizing t_{ply} [in]
0.0072

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]
EPARA11DD	A	C1	1	1		7.957	0.107	15	BAB	0.0071		7.864
EPARA11ED	A	C1	1	1		7.766	0.107	15	BAB	0.0072		7.727
EPARA11FD	A	C1	1	1		7.767	0.107	15	BAB	0.0071		7.693
EPARA11GD	A	C1	1	1		7.971	0.107	15	BAB	0.0071		7.892
EPARA11HD	A	C1	1	1	64.097		0.107	15	BAB	0.0071	63.435	
EPARA11ID	A	C1	1	1	67.759		0.107	15	BGM	0.0071	67.059	
EPARA11JD	A	C1	1	1	63.571		0.107	15	BAB	0.0071	63.061	
EPARA11KD	A	C1	1	1	64.977		0.107	15	BAB	0.0071	64.225	
EPARA21BD	A	C2	1	2		8.024	0.105	15	BAB	0.0070		7.808
EPARA21CD	A	C2	1	2		7.852	0.107	15	BAB	0.0071		7.778
EPARA21DD	A	C2	1	2		7.918	0.107	15	BAB	0.0071		7.859
EPARA21GD	A	C2	1	2	71.559		0.107	15	BAT	0.0071	70.709	
EPARA21HD	A	C2	1	2	67.043		0.107	15	BAB	0.0071	66.318	
EPARA21ID	A	C2	1	2	68.937		0.107	15	BAB	0.0071	68.288	
EPARB11DD	B	C1	2	1		7.583	0.108	15	BAB	0.0072		7.583
EPARB11ED	B	C1	2	1		7.626	0.108	15	BAB	0.0072		7.638
EPARB11FD	B	C1	2	1		7.612	0.108	15	BAB	0.0072		7.584
EPARB11GD	B	C1	2	1		7.655	0.107	15	BAB	0.0072		7.604
EPARB11HD	B	C1	2	1	71.320		0.107	15	BAB	0.0071	70.759	
EPARB11ID	B	C1	2	1	67.927		0.107	15	BAB	0.0071	67.424	
EPARB11JD	B	C1	2	1	62.171		0.107	15	BAB	0.0072	61.835	
EPARB11KD	B	C1	2	1	73.239		0.107	15	BAB	0.0072	72.753	
EPARB21BD	B	C2	2	2		7.814	0.109	15	BAB	0.0073		7.921
EPARB21CD	B	C2	2	2		7.651	0.109	15	BAB	0.0073		7.730
EPARB21DD	B	C2	2	2		7.508	0.109	15	BAB	0.0072		7.557
EPARB21ED	B	C2	2	2	70.138		0.109	15	BAB	0.0072	70.473	
EPARB21FD	B	C2	2	2	69.291		0.109	15	BAB	0.0072	69.612	
EPARB21GD	B	C2	2	2	62.633		0.109	15	BAB	0.0072	62.981	
EPARC11JD	C	C1	3	1		7.830	0.107	15	HIB	0.0072		7.789
EPARC11KD	C	C1	3	1		7.828	0.108	15	BAB,HIT	0.0072		7.845
EPARC11LD	C	C1	3	1		7.549	0.108	15	BAB	0.0072		7.541
EPARC11MD	C	C1	3	1		7.880	0.108	15	BAB	0.0072		7.860
EPARC11ND	C	C1	3	1	69.703		0.108	15	BAT	0.0072	69.584	
EPARC11OD	C	C1	3	1	67.277		0.108	15	BAT	0.0072	67.412	
EPARC11PD	C	C1	3	1	69.623		0.108	15	BAB	0.0072	69.311	
EPARC11QD	C	C1	3	1	65.646		0.108	15	BAB	0.0072	65.372	
EPARC21GD	C	C2	3	2		7.602	0.107	15	BAB	0.0071		7.543
EPARC21HD	C	C2	3	2		7.575	0.107	15	BAB	0.0072		7.530
EPARC21ID	C	C2	3	2		7.655	0.108	15	BAB	0.0072		7.632
EPARC21JD	C	C2	3	2	63.051		0.108	15	BAB	0.0072	62.856	
EPARC21KD	C	C2	3	2	66.653		0.108	15	BGM	0.0072	66.437	
EPARC21LD	C	C2	3	2	65.772		0.108	15	BAB	0.0072	65.467	

	Strength [ksi]	Modulus [Msi]		$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
Average	**67.256**	**7.744**	**$Average_{norm}$**	**0.0072**	**66.922**	**7.713**
Standard Dev.	**3.141**	**0.155**	**Standard $Dev._{norm}$**	**0.0001**	**3.126**	**0.133**
Coeff. of Var. [%]	**4.669**	**2.000**	**Coeff. of Var. $[\%]_{norm}$**	**0.7107**	**4.672**	**1.721**
Min.	**62.171**	**7.508**	**Min.**	**0.0070**	**61.835**	**7.530**
Max.	**73.239**	**8.024**	**Max.**	**0.0073**	**72.753**	**7.921**
Number of Spec.	**21**	**21**	**Number of Spec.**	**42**	**21**	**21**


Laminate Unnotched Compression Properties (UNC0)--ETW1
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
80.0
Laminate Unnotched Compression Strength [ksi]


Laminate Unnotched Compression Properties (UNC0)--ETW1
Normalized Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
Laminate Unnotched Compression Modulus [Msi]

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

Laminate Unnotched Compression Properties (UNC1)--RTD
Strength & Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

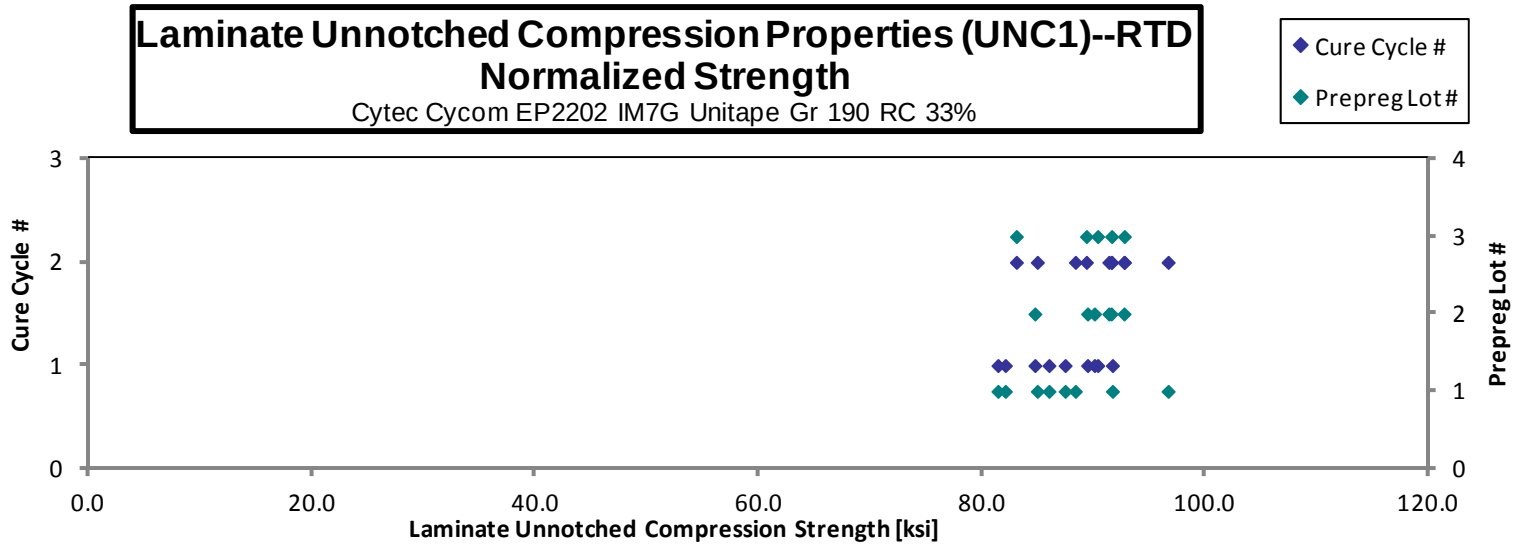
normalizing t_{ply} [in]
0.0072

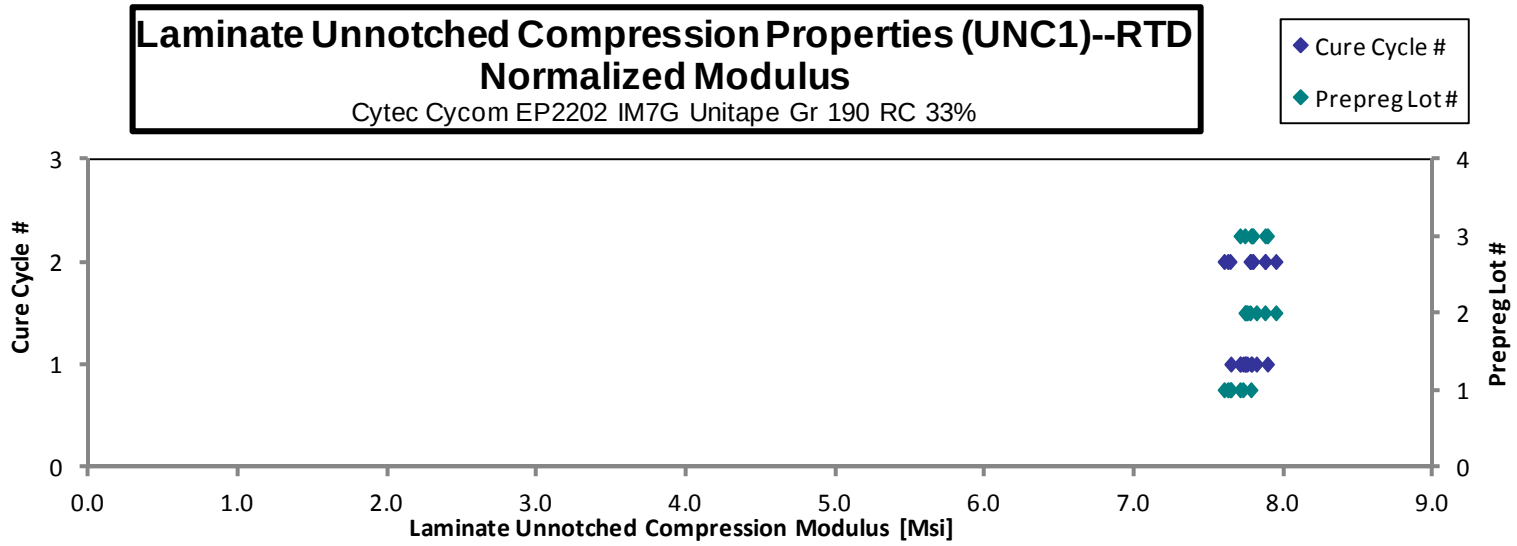
Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
EPAWA111A*	A	C1	1	1	90.286	7.961	0.112	16	BGT	0.0070	87.399	7.706
EPAWA112A*	A	C1	1	1	83.907	7.881	0.112	16	BGM	0.0070	81.382	7.644
EPAWA113A	A	C1	1	1	84.529	7.959	0.112	16	BGB	0.0070	82.047	7.725
EPAWA114A	A	C1	1	1	94.412	8.014	0.112	16	BGB,HIB	0.0070	91.639	7.779
EPAWA115A	A	C1	1	1	88.395		0.112	16	BGB	0.0070	85.952	
EPAWA211A	A	C2	1	2	87.193	7.828	0.112	16	BGT	0.0070	84.910	7.623
EPAWA212A	A	C2	1	2	**	7.825	0.112	16	BGM/CIB	0.0070		7.639
EPAWA213A	A	C2	1	2	91.098	7.838	0.112	16	BGM/CIB	0.0070	88.317	7.599
EPAWA215A	A	C2	1	2	98.635		0.113	16	BGM/CIT	0.0071	96.623	
EPAWB111A	B	C1	2	1	**	7.882	0.113	16	BGM/CIB	0.0071		7.738
EPAWB112A	B	C1	2	1	90.366	7.837	0.114	16	BGB/CIT/CIB	0.0071	89.411	7.754
EPAWB113A	B	C1	2	1	85.111	7.854	0.115	16	BGT/CIT	0.0072	84.693	7.815
EPAWB114A	B	C1	2	1	90.552	7.791	0.115	16	BGM/CIB	0.0072	90.028	7.746
EPAWB211A	B	C2	2	2	91.968	8.002	0.114	16	BGM/CIB/CIT	0.0071	91.316	7.946
EPAWB212A	B	C2	2	2	92.690	7.874	0.115	16	BGM/CIB	0.0072	92.677	7.873
EPAWB213A	B	C2	2	2	91.414	7.764	0.115	16	BGM/CIT	0.0072	91.520	7.773
EPAWC111A	C	C1	3	1	**	7.857	0.114	16	CIB,HIT	0.0071		7.784
EPAWC112A	C	C1	3	1	**	7.710	0.116	16	HIB/CIB/CIT	0.0072		7.738
EPAWC113A	C	C1	3	1	**	7.701	0.115	16	BGM,CIB,CIT	0.0072		7.706
EPAWC114A	C	C1	3	1	**	7.867	0.116	16	BGB,HIB	0.0072		7.889
EPAWC116A	C	C1	3	1	90.188		0.115	16	BGB	0.0072	90.319	
EPAWC211A	C	C2	3	2	83.107	7.799	0.115	16	BGM	0.0072	83.035	7.792
EPAWC212A	C	C2	3	2	91.223	7.845	0.116	16	BGB/CIT	0.0072	91.567	7.874
EPAWC213A	C	C2	3	2	92.814	7.788	0.115	16	BGM/CIB	0.0072	92.706	7.779
EPAWC214A	C	C2	3	2	89.266		0.115	16	BGB/CIB	0.0072	89.305	

* Modulus are averaged values of 2 strain gages.
** Strength is not reported due to prominent bad failure mode

Average	**89.850**	**7.851**	
Standard Dev.	**3.854**	**0.083**	
Coeff. of Var. [%]	**4.289**	**1.056**	
Min.	**83.107**	**7.701**	
Max.	**98.635**	**8.014**	
Number of Spec.	**19**	**21**	

$Average_{norm}$	**0.0071**	**88.676**	**7.758**
Standard $Dev._{norm}$	**0.0001**	**4.091**	**0.090**
Coeff. of Var. $[\%]_{norm}$	**1.3469**	**4.613**	**1.166**
Min.	**0.0070**	**81.382**	**7.599**
Max.	**0.0072**	**96.623**	**7.946**
Number of Spec.	**25**	**19**	**21**


Laminate Unnotched Compression Properties (UNC1)--RTD
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
20.0
40.0
60.0
80.0
100.0
120.0
Laminate Unnotched Compression Strength [ksi]


Laminate Unnotched Compression Properties (UNC1)--RTD
Normalized Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
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4
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
Laminate Unnotched Compression Modulus [Msi]

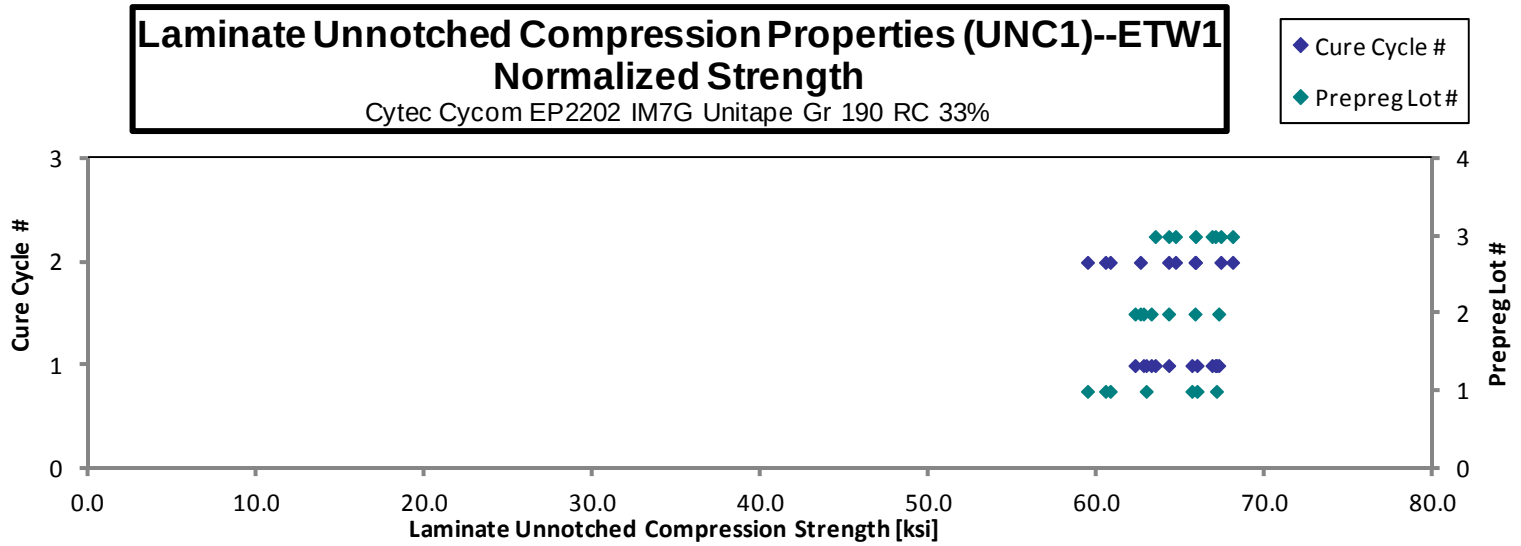
Laminate Unnotched Compression Properties (UNC1)--ETW1
Strength & Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

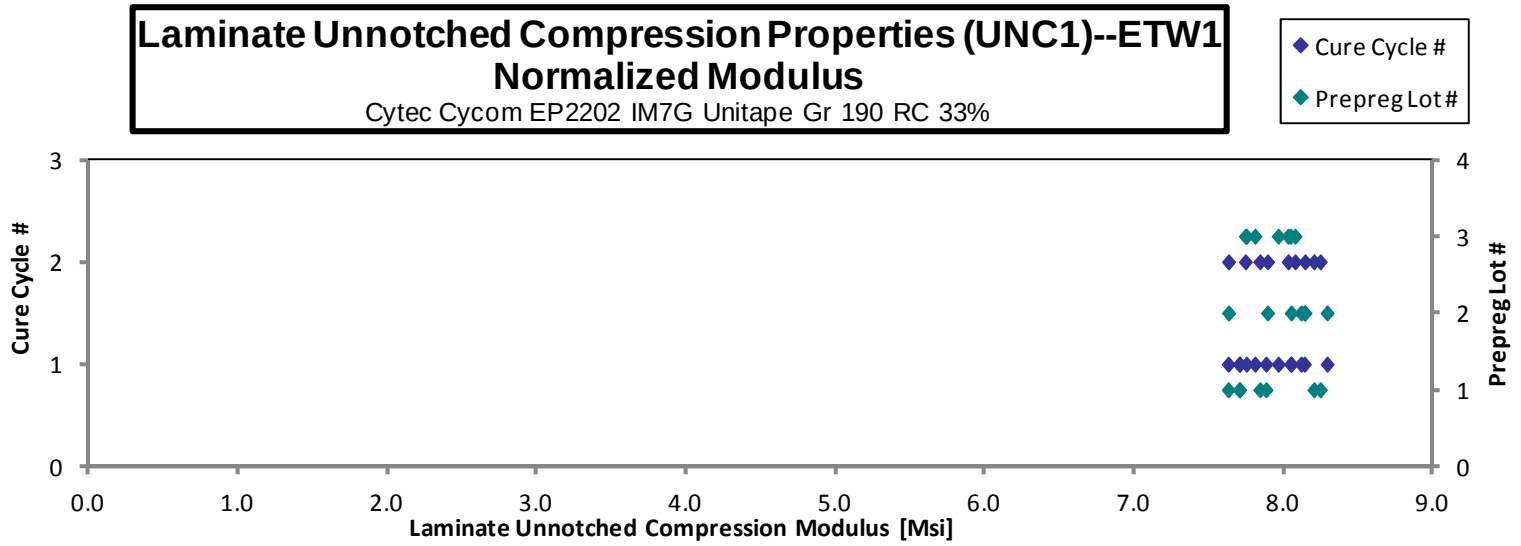
normalizing t_{ply} [in]
0.0072

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]
EPAWA117D	A	C1	1	1	67.648		0.112	16	BAB	0.0070	65.935	
EPAWA118D	A	C1	1	1	68.775		0.112	16	BAB/HIT	0.0070	67.093	
EPAWA119D	A	C1	1	1		7.818	0.112	16	BAB	0.0070		7.627
EPAWA11AD	A	C1	1	1		7.886	0.112	16	BAB	0.0070		7.700
EPAWA11BD	A	C1	1	1		8.056	0.113	16	BAB	0.0070		7.880
EPAWA11CD	A	C1	1	1		7.873	0.113	16	BGM	0.0070		7.703
EPAWA11DD	A	C1	1	1	64.315		0.113	16	BAB	0.0070	62.910	
EPAWA11ED	A	C1	1	1	67.078		0.113	16	BAB	0.0070	65.632	
EPAWA216D	A	C2	1	2		8.355	0.113	16	BAB	0.0071		8.201
EPAWA217D	A	C2	1	2		8.392	0.113	16	BGM	0.0071		8.243
EPAWA218D	A	C2	1	2		7.970	0.113	16	BAB	0.0071		7.839
EPAWA219D	A	C2	1	2	60.779		0.113	16	BAB	0.0070	59.416	
EPAWA21AD	A	C2	1	2	62.163		0.113	16	BAB	0.0070	60.769	
EPAWA21BD	A	C2	1	2	61.812		0.113	16	BAB	0.0070	60.488	
EPAWB117D	B	C1	2	1		8.376	0.114	16	HAB	0.0071		8.289
EPAWB118D	B	C1	2	1		8.141	0.114	16	BGM	0.0071		8.048
EPAWB119D	B	C1	2	1		8.202	0.114	16	HIT	0.0071		8.114
EPAWB11AD	B	C1	2	1		8.244	0.114	16	BGM	0.0071		8.137
EPAWB11BD	B	C1	2	1	63.232		0.114	16	BAB	0.0071	62.747	
EPAWB11CD	B	C1	2	1	62.679		0.114	16	BAB	0.0072	62.244	
EPAWB11DD	B	C1	2	1	67.734		0.114	16	BAT	0.0071	67.225	
EPAWB11ED	B	C1	2	1	63.676		0.114	16	BAB	0.0071	63.206	
EPAWB216D	B	C2	2	2		7.687	0.114	16	BAB	0.0071		7.629
EPAWB217D	B	C2	2	2		7.923	0.115	16	BAT	0.0072		7.890
EPAWB218D	B	C2	2	2		8.150	0.115	16	BAT	0.0072		8.140
EPAWB219D	B	C2	2	2	65.617		0.116	16	BAT	0.0072	65.816	
EPAWB21AD	B	C2	2	2	64.089		0.115	16	BAT	0.0072	64.247	
EPAWB21BD	B	C2	2	2	62.355		0.116	16	BAT	0.0072	62.563	
EPAWC117D	C	C1	3	1		7.771	0.115	16	HAB	0.0072		7.748
EPAWC118D	C	C1	3	1		8.017	0.116	16	BAB	0.0072		8.045
EPAWC119D	C	C1	3	1		7.958	0.115	16	BAB	0.0072		7.962
EPAWC11AD	C	C1	3	1		7.787	0.115	16	BAB	0.0072		7.806
EPAWC11BD	C	C1	3	1	64.206		0.115	16	BAB	0.0072	64.252	
EPAWC11CD	C	C1	3	1	66.660		0.116	16	BAB	0.0072	67.027	
EPAWC11DD	C	C1	3	1	63.366		0.115	16	BAB	0.0072	63.449	
EPAWC11ED	C	C1	3	1	66.986		0.115	16	BAB	0.0072	66.831	
EPAWC216D	C	C2	3	2		8.056	0.115	16	BAB	0.0072		8.027
EPAWC217D	C	C2	3	2		7.780	0.115	16	BAB	0.0072		7.741
EPAWC218D	C	C2	3	2		8.121	0.115	16	BAB	0.0072		8.074
EPAWC219D	C	C2	3	2	66.036		0.115	16	BAB	0.0072	65.844	
EPAWC21AD	C	C2	3	2	67.459		0.115	16	BAB,HIB	0.0072	67.352	
EPAWC21BD	C	C2	3	2	64.880		0.115	16	BAB,HAT	0.0072	64.654	
EPAWC21CD	C	C2	3	2	68.094		0.115	16	BAT	0.0072	68.055	

	Strength [ksi]	Modulus [Msi]
Average	**64.984**	**8.027**
Standard Dev.	**2.337**	**0.210**
Coeff. of Var. [%]	**3.597**	**2.622**
Min.	**60.779**	**7.687**
Max.	**68.775**	**8.392**
Number of Spec.	**22**	**21**

	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
$Average_{norm}$	**0.0071**	**64.444**	**7.945**
Standard $Dev._{norm}$	**0.0001**	**2.457**	**0.207**
Coeff. of Var. $[\%]_{norm}$	**0.9861**	**3.813**	**2.607**
Min.	**0.0070**	**59.416**	**7.627**
Max.	**0.0072**	**68.055**	**8.289**
Number of Spec.	**43**	**22**	**21**


Laminate Unnotched Compression Properties (UNC1)--ETW1
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
80.0
Laminate Unnotched Compression Strength [ksi]


Laminate Unnotched Compression Properties (UNC1)--ETW1
Normalized Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
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2
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4.0
5.0
6.0
7.0
8.0
9.0
Laminate Unnotched Compression Modulus [Msi]

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

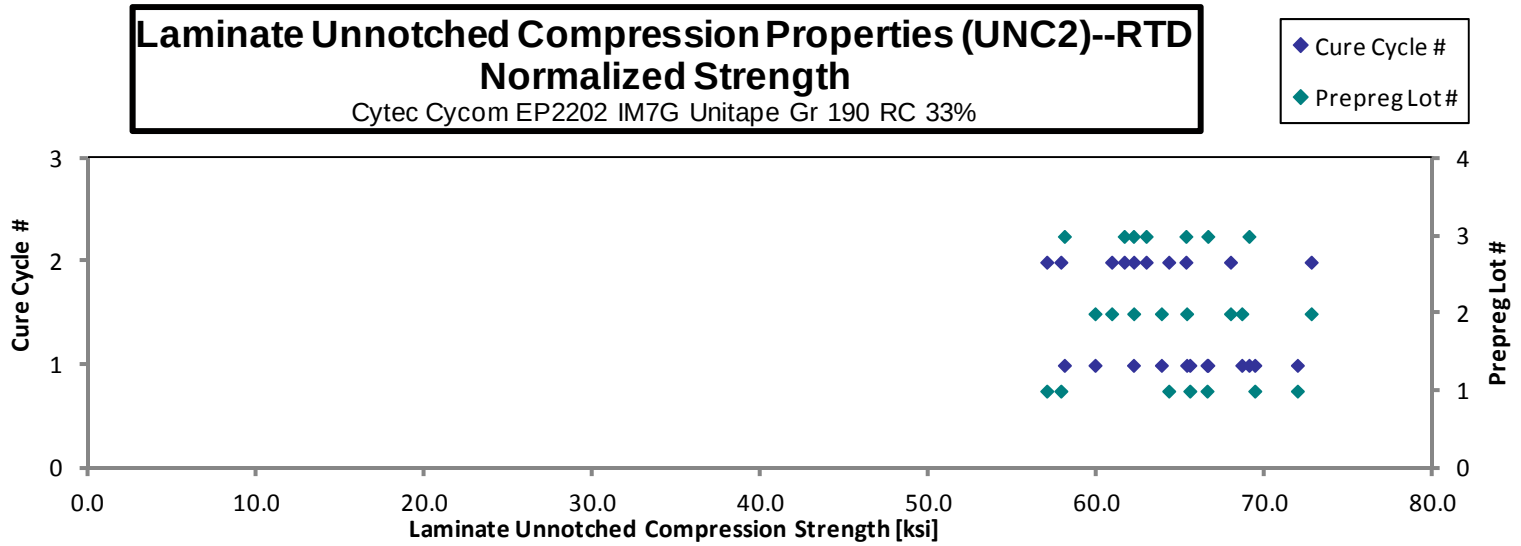
Laminate Unnotched Compression Properties (UNC2)--RTD
Strength & Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

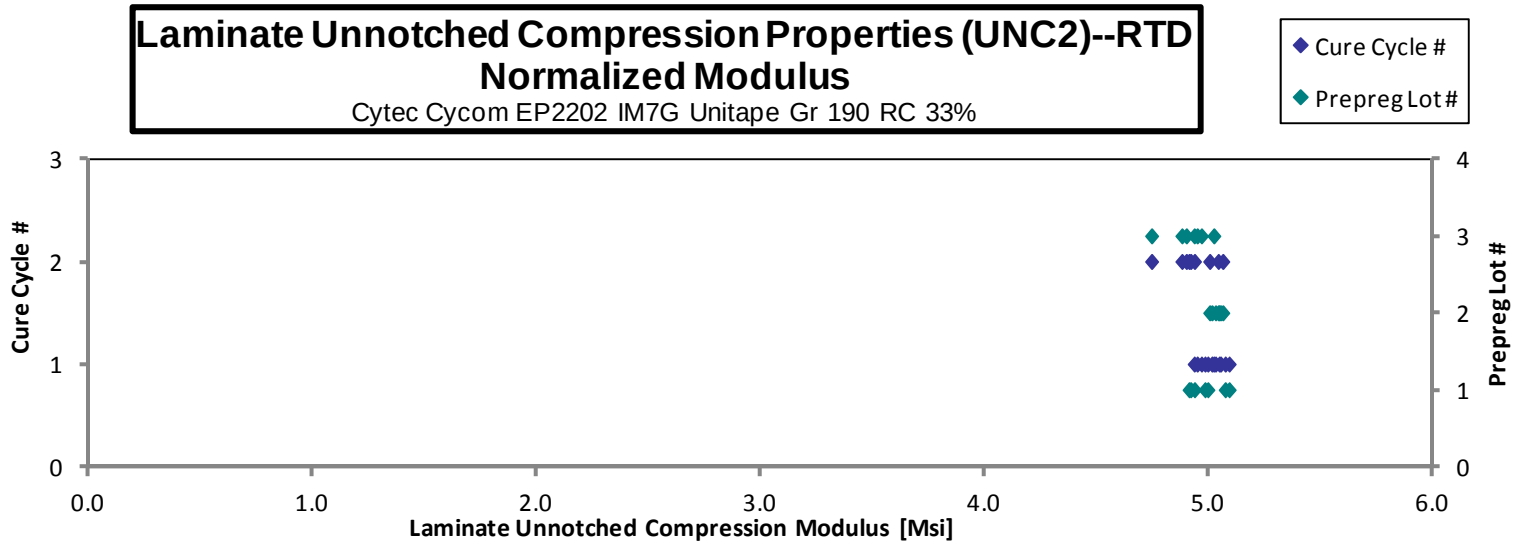
normalizing t_{ply} [in]
0.0072

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]
EPAXA111A*	A	C1	1	1	70.525	5.063	0.142	20	BGM	0.0071	69.374	4.981
EPAXA112A*	A	C1	1	1	72.938	5.065	0.142	20	BGM	0.0071	71.908	4.993
EPAXA113A	A	C1	1	1	66.446	5.161	0.142	20	BGM	0.0071	65.507	5.088
EPAXA114A	A	C1	1	1	67.787	5.167	0.141	20	BGM	0.0071	66.531	5.071
EPAXA211A	A	C2	1	2	65.899	5.036	0.140	20	BGM	0.0070	64.252	4.910
EPAXA212A	A	C2	1	2	57.907	5.013	0.142	20	BGM	0.0071	56.995	4.934
EPAXA213A	A	C2	1	2	58.959	5.013	0.141	20	BGM	0.0071	57.833	4.917
EPAXB111A	B	C1	2	1	65.638	5.075	0.143	20	BGB	0.0072	65.319	5.050
EPAXB112A	B	C1	2	1	64.014	5.060	0.144	20	BGT	0.0072	63.814	5.044
EPAXB113A	B	C1	2	1	60.355	5.053	0.143	20	HGM	0.0071	59.866	5.012
EPAXB114A	B	C1	2	1	69.430	5.089	0.142	20	BGM,HGM	0.0071	68.602	5.028
EPAXB211A	B	C2	2	2	72.647	5.054	0.144	20	BGM	0.0072	72.731	5.060
EPAXB212A	B	C2	2	2	60.764	4.994	0.144	20	BGM	0.0072	60.856	5.002
EPAXB213A	B	C2	2	2	62.239	5.046	0.144	20	BGM	0.0072	62.167	5.040
EPAXB214A	B	C2	2	2	67.842		0.144	20	BGM	0.0072	67.928	
EPAXC111A	C	C1	3	1	70.229	5.052	0.142	20	HGM	0.0071	69.026	4.965
EPAXC112A	C	C1	3	1	58.837	5.089	0.142	20	BGT	0.0071	58.040	5.020
EPAXC113A	C	C1	3	1	67.485	5.013	0.142	20	BGB	0.0071	66.579	4.946
EPAXC114A	C	C1	3	1	62.991	4.999	0.142	20	BGM,HGB	0.0071	62.153	4.933
EPAXC211A	C	C2	3	2	66.039	4.955	0.142	20	BGT	0.0071	65.275	4.898
EPAXC212A	C	C2	3	2	62.915	4.878	0.144	20	BGM	0.0072	62.907	4.878
EPAXC213A	C	C2	3	2	61.753	4.754	0.144	20	BGB	0.0072	61.602	4.742

* Modulus are averaged values of 2 strain gages.

	Strength [ksi]	Modulus [Msi]		$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
Average	**65.165**	**5.030**	**$Average_{norm}$**	**64.512**	**4.977**
Standard Dev.	**4.454**	**0.089**	**Standard $Dev._{norm}$**	**4.396**	**0.081**
Coeff. of Var. [%]	**6.835**	**1.766**	**Coeff. of Var. $[\%]_{norm}$**	**6.814**	**1.637**
Min.	**57.907**	**4.754**	**Min.**	**56.995**	**4.742**
Max.	**72.938**	**5.167**	**Max.**	**72.731**	**5.088**
Number of Spec.	**22**	**21**	**Number of Spec.**	**22**	**21**


Laminate Unnotched Compression Properties (UNC2)--RTD
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
80.0
Laminate Unnotched Compression Strength [ksi]


Laminate Unnotched Compression Properties (UNC2)--RTD
Normalized Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
1.0
2.0
3.0
4.0
5.0
6.0
Laminate Unnotched Compression Modulus [Msi]

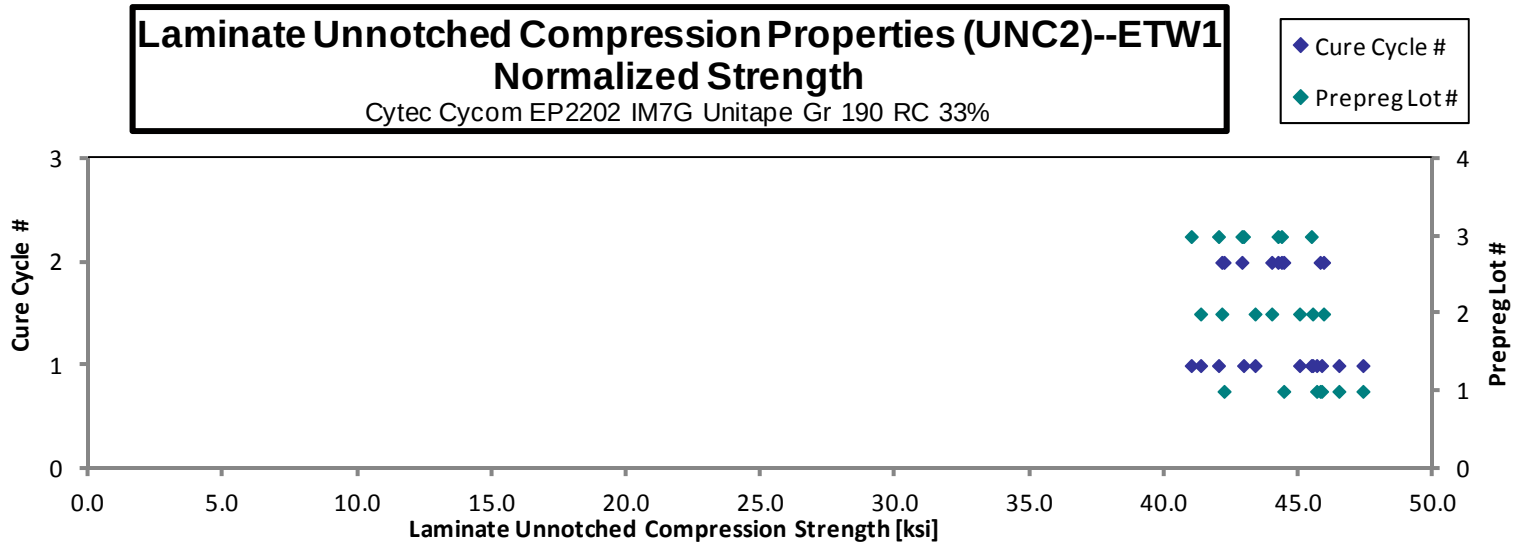
Laminate Unnotched Compression Properties (UNC2)--ETW1
Strength & Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

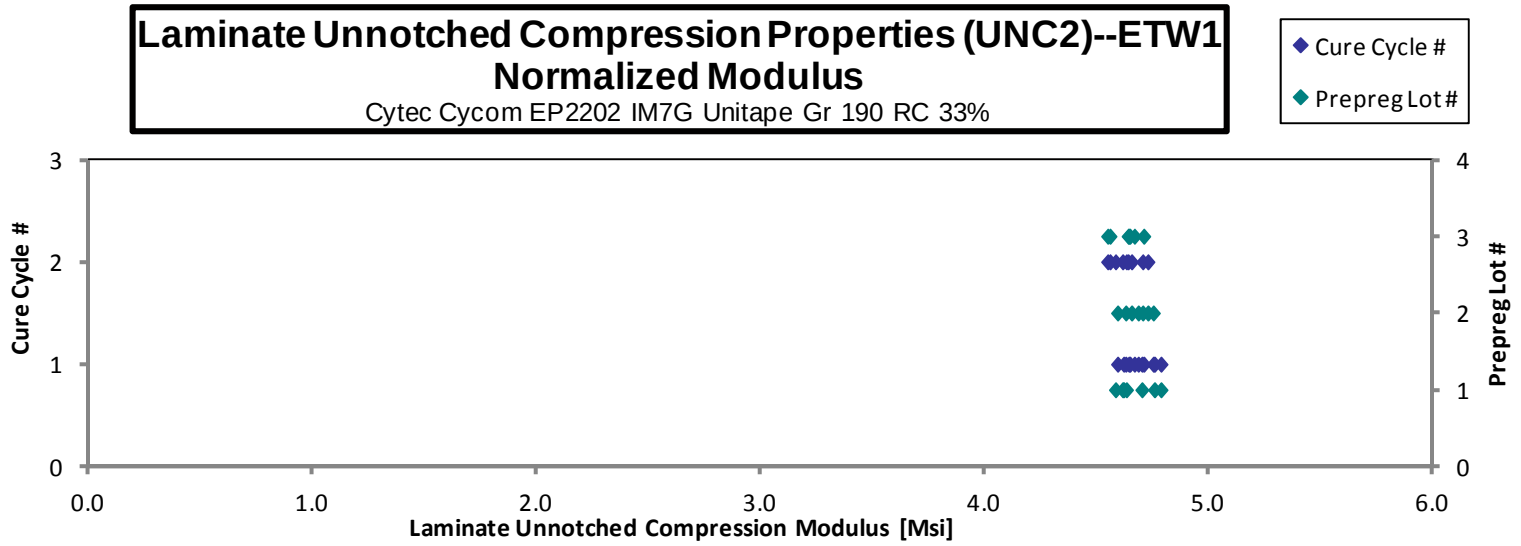
normalizing t_{ply} [in]
0.0072

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]
EPAXA118D	A	C1	1	1		4.787	0.141	20	BGM	0.0071		4.699
EPAXA119D	A	C1	1	1		4.699	0.142	20	BGM	0.0071		4.618
EPAXA11AD	A	C1	1	1		4.849	0.142	20	BGM	0.0071		4.784
EPAXA11BD	A	C1	1	1		4.821	0.142	20	DGM	0.0071		4.755
EPAXA11CD	A	C1	1	1	46.564		0.141	20	BGM	0.0071	45.659	
EPAXA11DD	A	C1	1	1	47.202		0.142	20	BAB	0.0071	46.487	
EPAXA11ED	A	C1	1	1	48.134		0.142	20	BGM	0.0071	47.382	
EPAXA11FD	A	C1	1	1	46.674		0.141	20	BGM	0.0071	45.842	
EPAXA216D	A	C2	1	2		4.721	0.141	20	BGM	0.0071		4.630
EPAXA217D	A	C2	1	2		4.698	0.141	20	BGM	0.0071		4.613
EPAXA218D	A	C2	1	2		4.630	0.143	20	BGM	0.0071		4.581
EPAXA219D	A	C2	1	2	46.394		0.142	20	BGM	0.0071	45.787	
EPAXA21AD	A	C2	1	2	42.764		0.142	20	BGM	0.0071	42.215	
EPAXA21BD	A	C2	1	2	45.056		0.142	20	BGM	0.0071	44.435	
EPAXB117D	B	C1	2	1		4.664	0.143	20	BGM	0.0071		4.627
EPAXB118D	B	C1	2	1		4.791	0.143	20	BGM	0.0071		4.750
EPAXB119D	B	C1	2	1		4.730	0.143	20	BGM	0.0071		4.683
EPAXB11AD	B	C1	2	1		4.656	0.142	20	BGM	0.0071		4.591
EPAXB11BD	B	C1	2	1	42.100		0.141	20	BGM	0.0071	41.345	
EPAXB11CD	B	C1	2	1	46.070		0.142	20	BGM	0.0071	45.510	
EPAXB11DD	B	C1	2	1	43.814		0.143	20	BGM	0.0071	43.368	
EPAXB11ED	B	C1	2	1	45.361		0.143	20	BGM	0.0071	45.025	
EPAXB216D	B	C2	2	2		4.637	0.145	20	BGM	0.0072		4.653
EPAXB217D	B	C2	2	2		4.704	0.145	20	BGM	0.0072		4.726
EPAXB218D	B	C2	2	2		4.684	0.145	20	BGM	0.0072		4.703
EPAXB219D	B	C2	2	2	45.737		0.145	20	BGM	0.0072	45.917	
EPAXB21AD	B	C2	2	2	41.961		0.145	20	BGM	0.0072	42.131	
EPAXB21BD	B	C2	2	2	43.897		0.144	20	BGM	0.0072	43.989	
EPAXC117D	C	C1	3	1		4.725	0.142	20	BGM	0.0071		4.666
EPAXC118D	C	C1	3	1		4.772	0.142	20	BGM, HAT	0.0071		4.707
EPAXC119D	C	C1	3	1		4.702	0.142	20	BGM	0.0071		4.641
EPAXC11AD	C	C1	3	1		4.706	0.142	20	BGM	0.0071		4.646
EPAXC11BD	C	C1	3	1	43.397		0.142	20	BGM	0.0071	42.940	
EPAXC11CD	C	C1	3	1	45.875		0.143	20	BGM	0.0071	45.461	
EPAXC11DD	C	C1	3	1	42.303		0.143	20	BGM	0.0072	42.009	
EPAXC11ED	C	C1	3	1	41.201		0.143	20	BGM	0.0072	40.996	
EPAXC216D	C	C2	3	2		4.547	0.144	20	BGM	0.0072		4.557
EPAXC217D	C	C2	3	2		4.624	0.144	20	BGM	0.0072		4.638
EPAXC218D	C	C2	3	2		4.534	0.144	20	BGM	0.0072		4.547
EPAXC21AD	C	C2	3	2	42.894		0.144	20	BGM	0.0072	42.879	
EPAXC21BD	C	C2	3	2	44.372		0.144	20	BGM	0.0072	44.352	
EPAXC21CD	C	C2	3	2	44.303		0.144	20	BGM	0.0072	44.221	

	Strength [ksi]	Modulus [Msi]
Average	**44.575**	**4.699**
Standard Dev.	**1.943**	**0.080**
Coeff. of Var. [%]	**4.359**	**1.709**
Min.	**41.201**	**4.534**
Max.	**48.134**	**4.849**
Number of Spec.	**21**	**21**

	t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
$Average_{norm}$	**0.0071**	**44.188**	**4.658**
Standard $Dev._{norm}$	**0.0001**	**1.806**	**0.065**
Coeff. of Var. $[\%]_{norm}$	**0.7871**	**4.087**	**1.397**
Min.	**0.0071**	**40.996**	**4.547**
Max.	**0.0072**	**47.382**	**4.784**
Number of Spec.	**42**	**21**	**21**


Laminate Unnotched Compression Properties (UNC2)--ETW1
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
5.0
10.0
15.0
20.0
25.0
30.0
35.0
40.0
45.0
50.0
Laminate Unnotched Compression Strength [ksi]


Laminate Unnotched Compression Properties (UNC2)--ETW1
Normalized Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
1.0
2.0
3.0
4.0
5.0
6.0
Laminate Unnotched Compression Modulus [Msi]

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

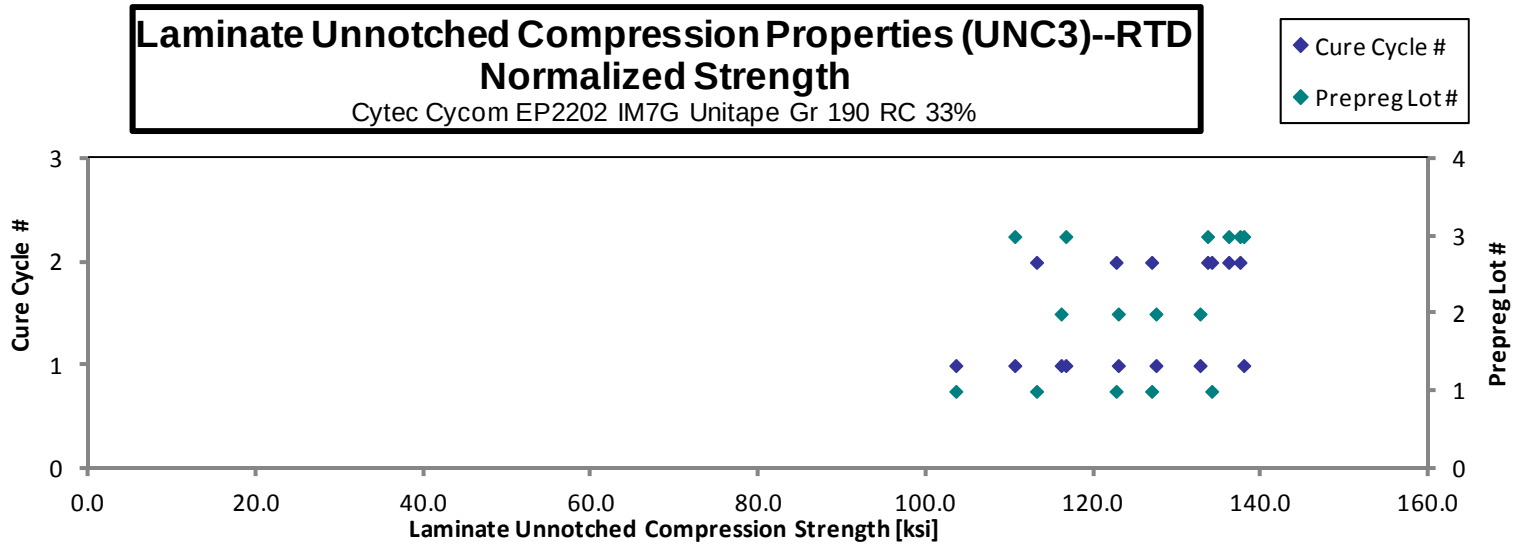
Laminate Unnotched Compression Properties (UNC3)--RTD
Strength & Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

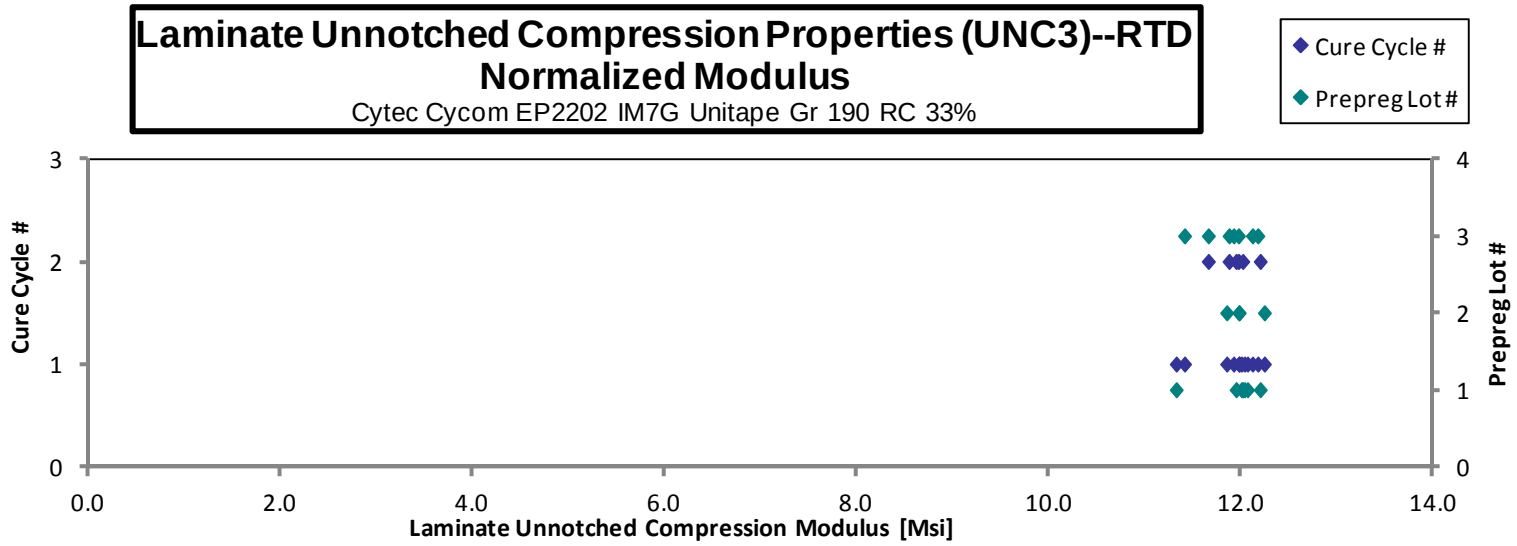
normalizing t_{ply} [in]
0.0072

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]
EPAYA111A*	A	C1	1	1	106.101	12.306	0.140	20	BGM	0.0070	103.485	12.002
EPAYA112A*	A	C1	1	1	**	12.264	0.141	20	CIB,HIB	0.0071		12.034
EPAYA113A	A	C1	1	1	**	12.298	0.141	20	BGB,CIB	0.0071		12.065
EPAYA114A	A	C1	1	1	**	11.544	0.141	20	CIB,HIB	0.0071		11.322
EPAYA211A	A	C2	1	2	124.786	12.227	0.142	20	BGB,HAB	0.0071	122.620	12.015
EPAYA212A	A	C2	1	2	114.552	12.097	0.142	20	BGB	0.0071	113.120	11.946
EPAYA213A	A	C2	1	2	127.974	12.304	0.143	20	HAT	0.0071	126.863	12.198
EPAYA214A	A	C2	1	2	135.363		0.143	20	BGM	0.0071	134.031	
EPAYB111A	B	C1	2	1	**	12.403	0.142	20	CIB,HIB	0.0071		12.241
EPAYB112A	B	C1	2	1	117.209	12.094	0.143	20	BGB,HAB	0.0071	116.056	11.975
EPAYB113A	B	C1	2	1	124.686	12.022	0.142	20	BGB,HAB	0.0071	122.882	11.848
EPAYB114A	B	C1	2	1	129.718	12.198	0.141	20	BGT,HAT	0.0071	127.376	11.977
EPAYB115A	B	C1	2	1	135.526		0.141	20	BGB,HAB	0.0070	132.640	
EPAYC111A	C	C1	3	1	138.738	12.194	0.143	20	BGB	0.0072	137.855	12.117
EPAYC112A	C	C1	3	1	**	11.363	0.145	20	BGB,HIB,CIB	0.0072		11.409
EPAYC113A	C	C1	3	1	**	11.904	0.144	20	CIB,HIB	0.0072		11.920
EPAYC114A	C	C1	3	1	**	12.162	0.144	20	CIB,CIT	0.0072		12.172
EPAYC115A	C	C1	3	1	110.213		0.144	20	BGB,HAB	0.0072	110.519	
EPAYC116A	C	C1	3	1	116.021		0.145	20	BGB,HAB	0.0072	116.612	
EPAYC211A	C	C2	3	2	137.965	12.019	0.143	20	BGB	0.0072	137.407	11.971
EPAYC212A	C	C2	3	2	136.216	11.886	0.144	20	BGB,HAB	0.0072	136.058	11.872
EPAYC213A	C	C2	3	2	134.003	11.697	0.144	20	BGT	0.0072	133.538	11.657

* Modulus are averaged values of 2 strain gages.
** Strength is not reported due to prominent bad failure mode

Average	**125.938**	**12.055**		**$Average_{norm}$**	**0.0071**	**124.738**	**11.930**
Standard Dev.	**10.778**	**0.282**		**$Standard\ Dev._{norm}$**	**0.0001**	**10.812**	**0.247**
Coeff. of Var. [%]	**8.558**	**2.341**		**$Coeff.\ of\ Var.\ [\%]_{norm}$**	**0.9185**	**8.668**	**2.068**
Min.	**106.101**	**11.363**		**Min.**	**0.0070**	**103.485**	**11.322**
Max.	**138.738**	**12.403**		**Max.**	**0.0072**	**137.855**	**12.241**
Number of Spec.	**15**	**18**		**Number of Spec.**	**22**	**15**	**18**


Laminate Unnotched Compression Properties (UNC3)--RTD
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
20.0
40.0
60.0
80.0
100.0
120.0
140.0
160.0
Laminate Unnotched Compression Strength [ksi]


Laminate Unnotched Compression Properties (UNC3)--RTD
Normalized Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
Laminate Unnotched Compression Modulus [Msi]

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

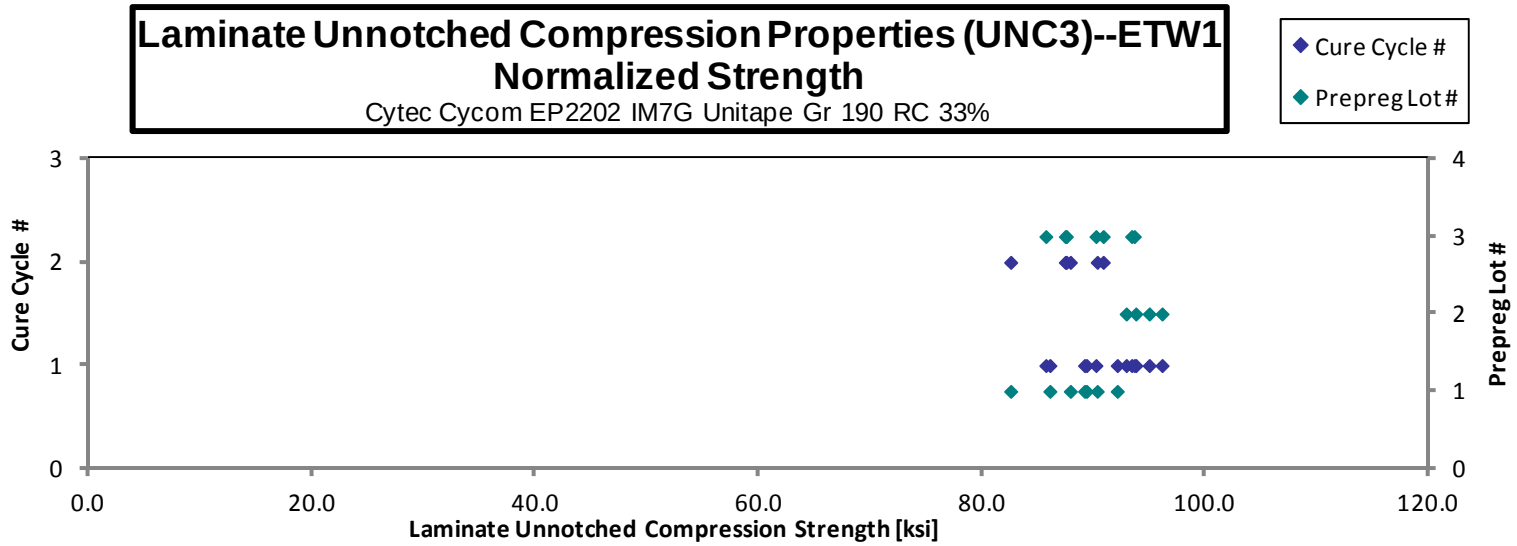
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

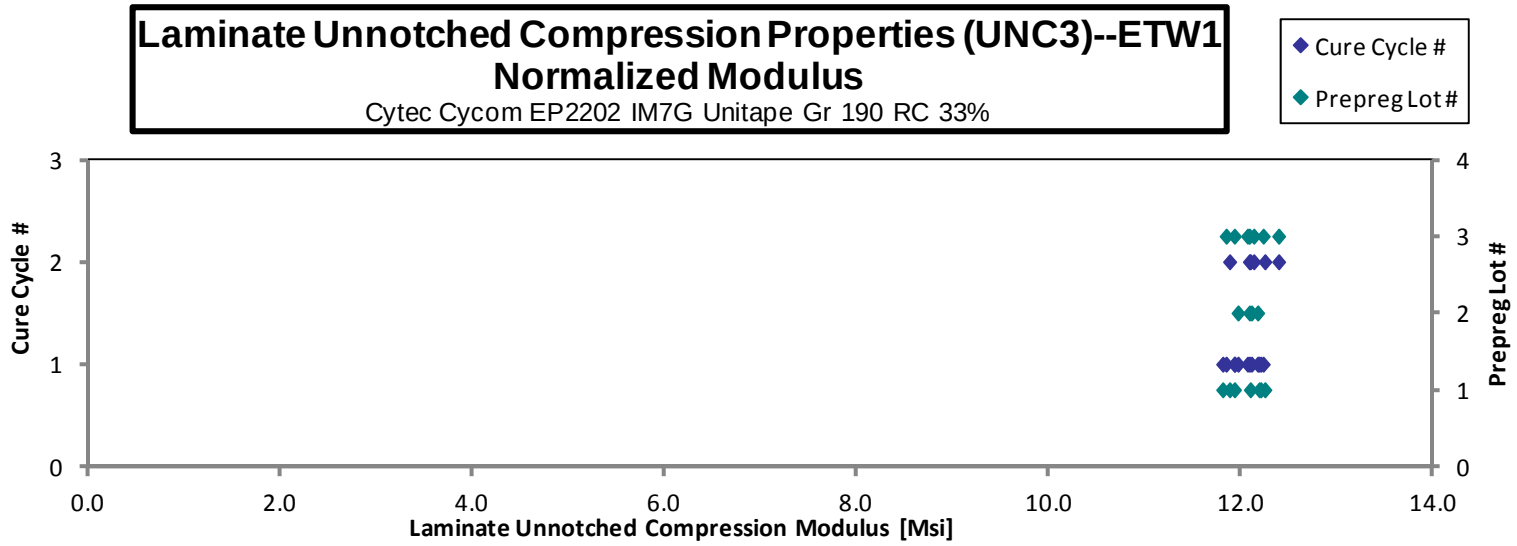
normalizing t_{ply} [in]
0.0072

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]
EPAYA117D	A	C1	1	1		12.021	0.141	20	CIT	0.0071		11.806
EPAYA118D	A	C1	1	1		12.416	0.142	20	CIT	0.0071		12.203
EPAYA119D	A	C1	1	1		12.159	0.141	20	BGM	0.0071		11.929
EPAYA11AD	A	C1	1	1		12.410	0.141	20	BAB	0.0071		12.186
EPAYA11CD	A	C1	1	1	90.937		0.141	20	BAT	0.0071	89.317	
EPAYA11DD	A	C1	1	1	94.006		0.141	20	BAB	0.0071	92.069	
EPAYA11ED	A	C1	1	1	91.401		0.140	20	BAB	0.0070	89.137	
EPAYA11GD	A	C1	1	1	87.981		0.141	20	BAT	0.0070	86.036	
EPAYA216D	A	C2	1	2		12.452	0.142	20	HAB, BGM, CIT	0.0071		12.246
EPAYA217D	A	C2	1	2		12.338	0.141	20	BAT, CIT, CIB	0.0071		12.094
EPAYA218D	A	C2	1	2		12.123	0.141	20	BGM	0.0071		11.878
EPAYA219D	A	C2	1	2	84.172		0.141	20	BAT	0.0071	82.526	
EPAYA21AD	A	C2	1	2	92.149		0.141	20	BGM	0.0071	90.272	
EPAYA21BD	A	C2	1	2	89.845		0.141	20	BAB	0.0070	87.869	
EPAYB117D	B	C1	2	1		12.186	0.141	20	BAB, HAB	0.0071		11.966
EPAYB118D	B	C1	2	1		12.263	0.142	20	BAB	0.0071		12.085
EPAYB119D	B	C1	2	1		12.294	0.142	20	BGM	0.0071		12.106
EPAYB11AD	B	C1	2	1		12.362	0.142	20	BAT, HIT	0.0071		12.171
EPAYB11BD	B	C1	2	1	94.655		0.141	20	HAT	0.0071	92.869	
EPAYB11CD	B	C1	2	1	96.746		0.141	20	BAB, HAB	0.0071	94.932	
EPAYB11DD	B	C1	2	1	97.962		0.141	20	BAB	0.0071	96.080	
EPAYB11ED	B	C1	2	1	95.277		0.142	20	BAB	0.0071	93.733	
EPAYC117D	C	C1	3	1		12.187	0.144	20	BAT	0.0072		12.228
EPAYC118D	C	C1	3	1		11.838	0.144	20	BAB	0.0072		11.842
EPAYC119D	C	C1	3	1		12.000	0.145	20	BAB	0.0072		12.065
EPAYC11AD	C	C1	3	1		11.891	0.144	20	BAB	0.0072		11.928
EPAYC11BD	C	C1	3	1	85.377		0.145	20	HIB, BAB	0.0072	85.673	
EPAYC11CD	C	C1	3	1	90.346		0.144	20	BAB	0.0072	90.158	
EPAYC11DD	C	C1	3	1	93.682		0.144	20	BAB	0.0072	93.595	
EPAYC11ED	C	C1	3	1	93.281		0.144	20	BAB, HAB	0.0072	93.357	
EPAYC216D	C	C2	3	2		12.138	0.143	20	BAT, HIT	0.0072		12.084
EPAYC217D	C	C2	3	2		12.433	0.143	20	BAB, HIB	0.0072		12.389
EPAYC218D	C	C2	3	2		12.155	0.144	20	BAB	0.0072		12.130
EPAYC219D	C	C2	3	2	88.040		0.143	20	BAB	0.0072	87.510	
EPAYC21AD	C	C2	3	2	91.449		0.143	20	BAB, HAB	0.0072	90.814	
EPAYC21BD	C	C2	3	2	88.000		0.143	20	BAB	0.0072	87.419	

	Strength [ksi]	Modulus [Msi]
Average	**91.406**	**12.204**
Standard Dev.	**3.759**	**0.185**
Coeff. of Var. [%]	**4.112**	**1.513**
Min.	**84.172**	**11.838**
Max.	**97.962**	**12.452**
Number of Spec.	**18**	**18**

	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
$Average_{norm}$	**0.0071**	**90.187**	**12.074**
Standard $Dev._{norm}$	**0.0001**	**3.605**	**0.156**
Coeff. of Var. $[\%]_{norm}$	**0.9343**	**3.998**	**1.292**
Min.	**0.0070**	**82.526**	**11.806**
Max.	**0.0072**	**96.080**	**12.389**
Number of Spec.	**36**	**18**	**18**


Laminate Unnotched Compression Properties (UNC3)--ETW1
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
20.0
40.0
60.0
80.0
100.0
120.0
Laminate Unnotched Compression Strength [ksi]

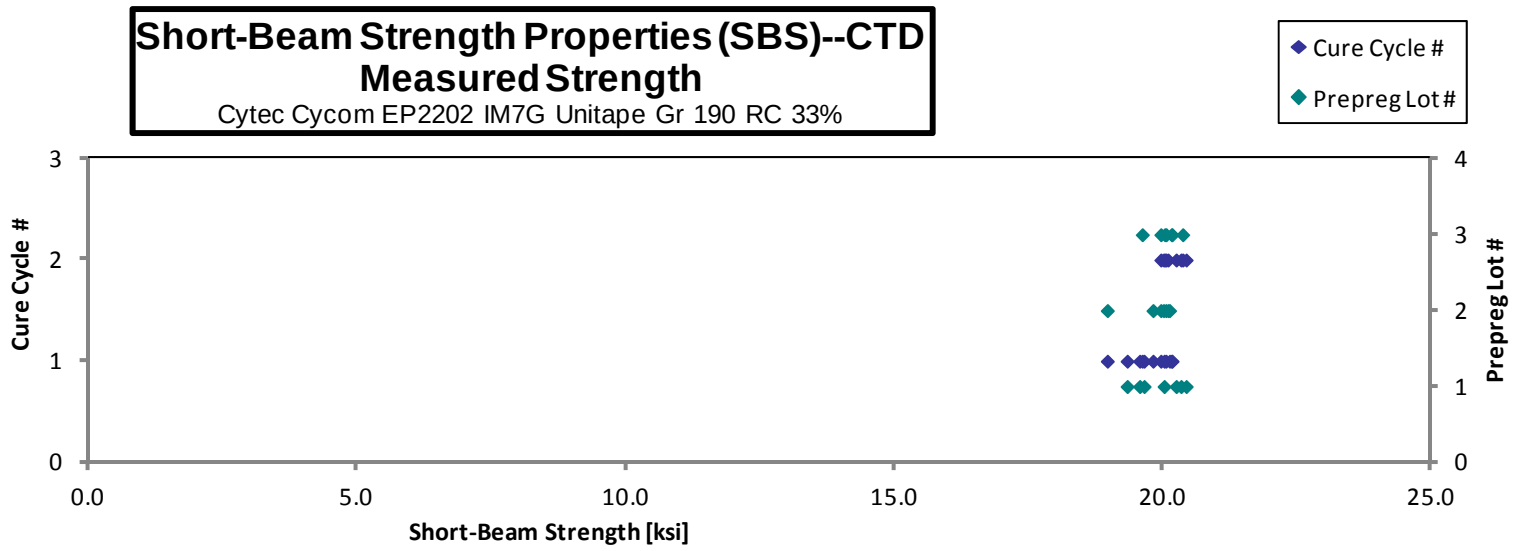

Laminate Unnotched Compression Properties (UNC3)--ETW1
Normalized Modulus
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
Laminate Unnotched Compression Modulus [Msi]

4.13 Lamina Short-Beam Strength Properties (SBS)

Short-Beam Strength Properties (SBS)--CTD
Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 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
EPAQA116B	A	C1	1	1	20.024	0.241	34	0.0071	ILS
EPAQA117B	A	C1	1	1	19.568	0.238	34	0.0070	ILS
EPAQA118B	A	C1	1	1	19.336	0.238	34	0.0070	ILS
EPAQA119B	A	C1	1	1	19.651	0.238	34	0.0070	ILS
EPAQA215B	A	C2	1	2	20.247	0.241	34	0.0071	ILS
EPAQA216B	A	C2	1	2	20.338	0.241	34	0.0071	ILS
EPAQA217B	A	C2	1	2	20.435	0.237	34	0.0070	ILS
EPAQB116B	B	C1	2	1	18.966	0.245	34	0.0072	ILS
EPAQB117B	B	C1	2	1	20.125	0.248	34	0.0073	ILS
EPAQB118B	B	C1	2	1	19.817	0.248	34	0.0073	ILS
EPAQB119B	B	C1	2	1	20.058	0.247	34	0.0073	ILS
EPAQB215B	B	C2	2	2	19.963	0.246	34	0.0072	ILS
EPAQB216B	B	C2	2	2	20.014	0.246	34	0.0072	ILS
EPAQB217B	B	C2	2	2	20.098	0.249	34	0.0073	ILS
EPAQC116B	C	C1	3	1	20.171	0.249	34	0.0073	ILS
EPAQC117B	C	C1	3	1	20.160	0.248	34	0.0073	ILS
EPAQC118B	C	C1	3	1	19.617	0.247	34	0.0073	ILS
EPAQC119B	C	C1	3	1	19.962	0.246	34	0.0072	ILS
EPAQC215B	C	C2	3	2	20.036	0.238	34	0.0070	ILS
EPAQC216B	C	C2	3	2	20.060	0.238	34	0.0070	ILS
EPAQC217B	C	C2	3	2	20.370	0.241	34	0.0071	ILS

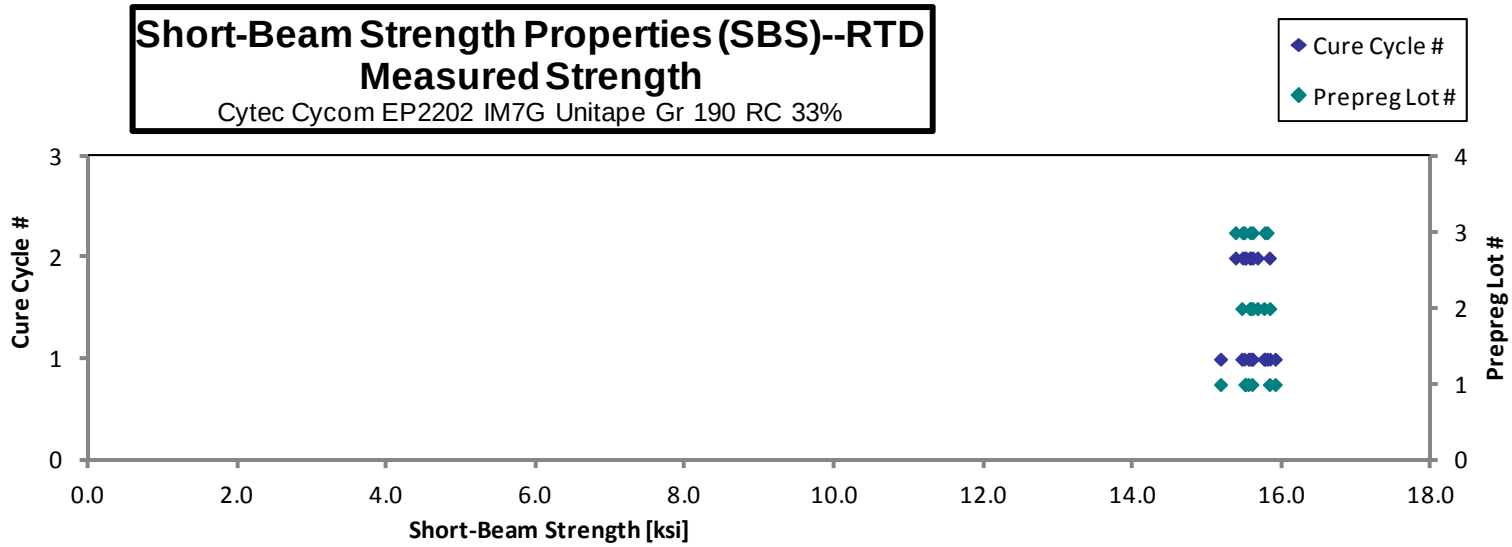
Average	**19.953**	**Average**	**0.0072**
Standard Dev.	**0.357**	**Standard Dev.**	
Coeff. of Var. [%]	**1.788**	**Coeff. of Var. [%]**	
Min.	**18.966**	**Min.**	**0.0070**
Max.	**20.435**	**Max.**	**0.0073**
Number of Spec.	**21**	**Number of Spec.**	**21**


Short-Beam Strength Properties (SBS)--CTD
Measured Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Short-Beam Strength [ksi]
0.0
5.0
10.0
15.0
20.0
25.0
0
1
2
3
4

Short-Beam Strength Properties (SBS)--RTD
Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 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
EPAQA111A	A	C1	1	1	15.174	0.238	34	0.0070	ILS
EPAQA112A	A	C1	1	1	15.596	0.238	34	0.0070	ILS
EPAQA113A	A	C1	1	1	15.548	0.239	34	0.0070	ILS
EPAQA114A	A	C1	1	1	15.908	0.240	34	0.0070	ILS
EPAQA211A	A	C2	1	2	15.829	0.238	34	0.0070	ILS
EPAQA212A	A	C2	1	2	15.500	0.238	34	0.0070	ILS
EPAQA213A	A	C2	1	2	15.510	0.239	34	0.0070	ILS
EPAQB111A	B	C1	2	1	15.603	0.248	34	0.0073	ILS
EPAQB112A	B	C1	2	1	15.756	0.247	34	0.0073	ILS
EPAQB113A	B	C1	2	1	15.834	0.246	34	0.0072	ILS
EPAQB114A	B	C1	2	1	15.459	0.246	34	0.0072	ILS
EPAQB211A	B	C2	2	2	15.566	0.248	34	0.0073	ILS
EPAQB212A	B	C2	2	2	15.574	0.248	34	0.0073	ILS
EPAQB213A	B	C2	2	2	15.669	0.247	34	0.0073	ILS
EPAQC111A	C	C1	3	1	15.571	0.249	34	0.0073	ILS
EPAQC112A	C	C1	3	1	15.492	0.248	34	0.0073	ILS
EPAQC113A	C	C1	3	1	15.800	0.247	34	0.0073	ILS
EPAQC114A	C	C1	3	1	15.768	0.247	34	0.0073	ILS
EPAQC211A	C	C2	3	2	15.604	0.241	34	0.0071	ILS
EPAQC212A	C	C2	3	2	15.375	0.243	34	0.0072	ILS
EPAQC213A	C	C2	3	2	15.470	0.239	34	0.0070	ILS

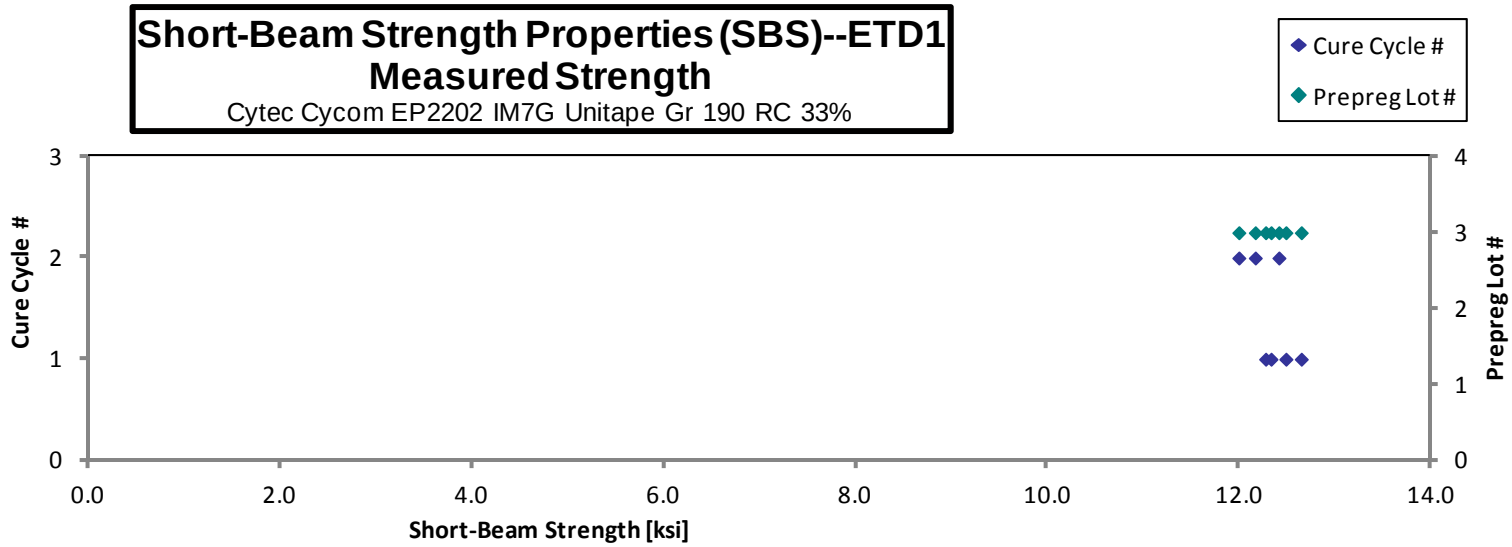
Average	**15.600**	**Average**	**0.0072**
Standard Dev.	**0.174**	**Standard Dev.**	
Coeff. of Var. [%]	**1.114**	**Coeff. of Var. [%]**	
Min.	**15.174**	**Min.**	**0.0070**
Max.	**15.908**	**Max.**	**0.0073**
Number of Spec.	**21**	**Number of Spec.**	**21**


Short-Beam Strength Properties (SBS)--RTD
Measured Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Short-Beam Strength [ksi]
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
0
1
2
3
4

Short-Beam Strength Properties (SBS)--ETD1
Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 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
EPAQC11BC	C	C1	3	1	12.644	0.248	34	0.0073	ILS
EPAQC11CC	C	C1	3	1	12.483	0.248	34	0.0073	ILS
EPAQC11DC	C	C1	3	1	12.272	0.247	34	0.0073	ILS
EPAQC11EC	C	C1	3	1	12.328	0.247	34	0.0073	ILS
EPAQC219C	C	C2	3	2	12.411	0.240	34	0.0071	ILS
EPAQC21AC	C	C2	3	2	11.993	0.238	34	0.0070	ILS
EPAQC21BC	C	C2	3	2	12.164	0.238	34	0.0070	ILS

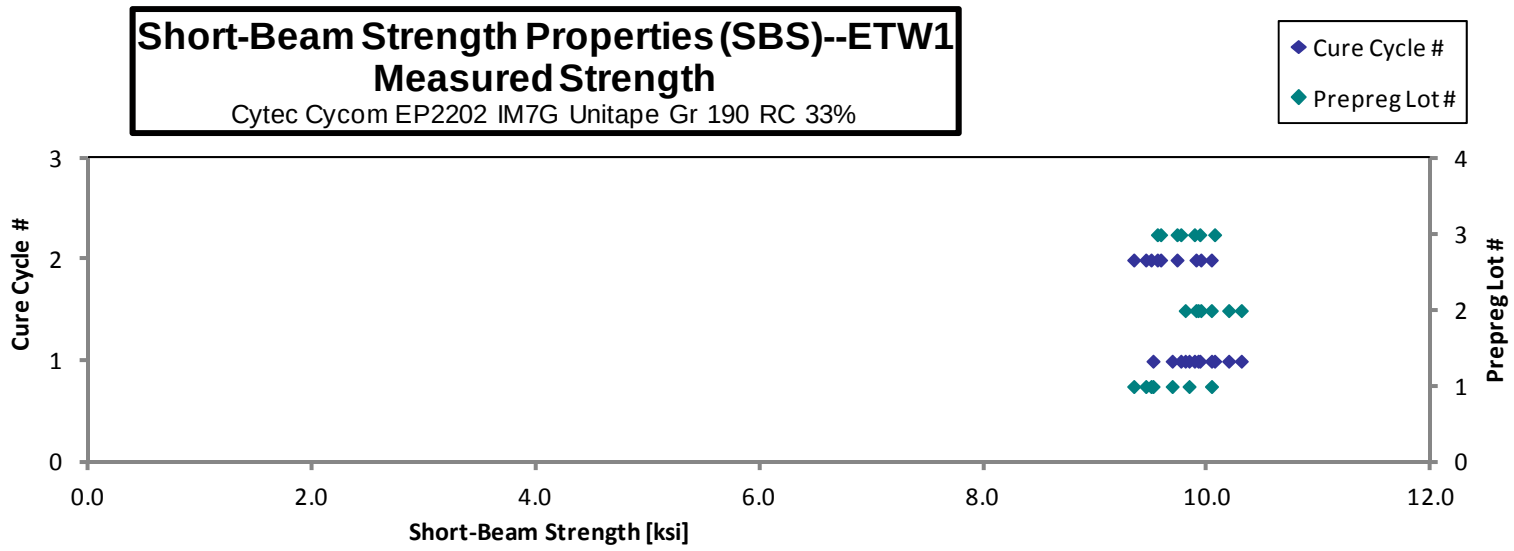
Average	**12.328**	**Average**	**0.0072**
Standard Dev.	**0.213**	**Standard Dev.**	
Coeff. of Var. [%]	**1.730**	**Coeff. of Var. [%]**	
Min.	**11.993**	**Min.**	**0.0070**
Max.	**12.644**	**Max.**	**0.0073**
Number of Spec.	**7**	**Number of Spec.**	**7**


Short-Beam Strength Properties (SBS)--ETD1
Measured Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Short-Beam Strength [ksi]
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
0
1
2
3
4

Short-Beam Strength Properties (SBS)--ETW1
Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 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
EPAQA11BD	A	C1	1	1	10.035	0.240	34	0.0071	ILS / INELASTIC
EPAQA11CD	A	C1	1	1	9.834	0.240	34	0.0071	ILS / INELASTIC
EPAQA11ED	A	C1	1	1	9.684	0.238	34	0.0070	ILS / INELASTIC
EPAQA11FD	A	C1	1	1	9.512	0.238	34	0.0070	ILS / INELASTIC
EPAQA219D	A	C2	1	2	9.340	0.239	34	0.0070	ILS / INELASTIC
EPAQA21AD	A	C2	1	2	9.494	0.240	34	0.0071	ILS / INELASTIC
EPAQA21BD	A	C2	1	2	9.448	0.241	34	0.0071	ILS / INELASTIC
EPAQB11BD	B	C1	2	1	9.800	0.245	34	0.0072	ILS / INELASTIC
EPAQB11CD	B	C1	2	1	9.915	0.245	34	0.0072	ILS / INELASTIC
EPAQB11DD	B	C1	2	1	10.301	0.249	34	0.0073	ILS / INELASTIC
EPAQB11ED	B	C1	2	1	10.189	0.248	34	0.0073	ILS / INELASTIC
EPAQB219D	B	C2	2	2	9.896	0.247	34	0.0073	ILS / INELASTIC
EPAQB21AD	B	C2	2	2	9.940	0.247	34	0.0073	ILS / INELASTIC
EPAQB21BD	B	C2	2	2	10.033	0.247	34	0.0073	ILS / INELASTIC
EPAQC11GD	C	C1	3	1	9.883	0.247	34	0.0073	ILS / INELASTIC
EPAQC11HD	C	C1	3	1	10.063	0.247	34	0.0073	ILS / INELASTIC
EPAQC11ID	C	C1	3	1	9.761	0.246	34	0.0072	ILS / INELASTIC
EPAQC11JD	C	C1	3	1	9.931	0.245	34	0.0072	ILS / INELASTIC
EPAQC21DD	C	C2	3	2	9.551	0.240	34	0.0071	ILS / INELASTIC
EPAQC21ED	C	C2	3	2	9.727	0.239	34	0.0070	ILS / INELASTIC
EPAQC21FD	C	C2	3	2	9.581	0.239	34	0.0070	ILS / INELASTIC

Average	**9.806**	**Average**	**0.0072**
Standard Dev.	**0.254**	**Standard Dev.**	
Coeff. of Var. [%]	**2.590**	**Coeff. of Var. [%]**	
Min.	**9.340**	**Min.**	**0.0070**
Max.	**10.301**	**Max.**	**0.0073**
Number of Spec.	**21**	**Number of Spec.**	**21**


Short-Beam Strength Properties (SBS)--ETW1
Measured Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Short-Beam Strength [ksi]
0.0
2.0
4.0
6.0
8.0
10.0
12.0
0
1
2
3
4

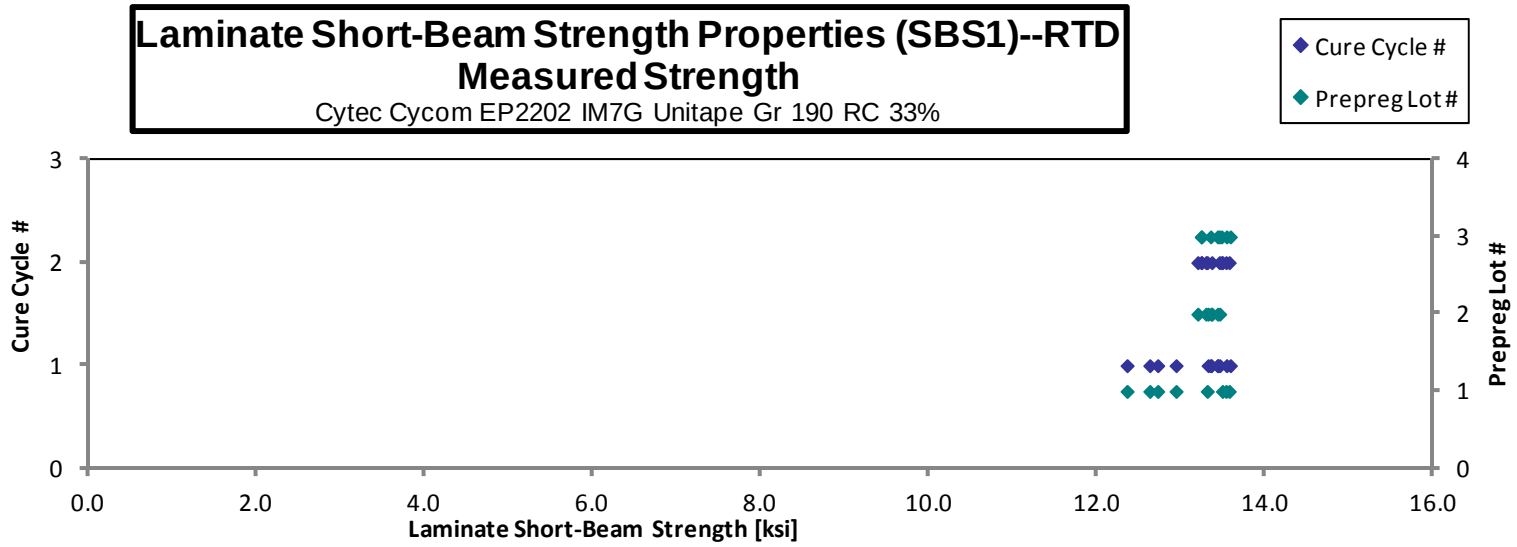
4.14 Laminate Short-Beam Strength Properties (SBS1)

Laminate Short-Beam Strength Properties (SBS1)--RTD Strength

Cytec Cycom EP2202 IM7G Unitape Gr 190 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
EPAqA1G1A	A	C1	1	1	12.355	0.169	24	0.0070	ILS
EPAqA1G2A	A	C1	1	1	12.938	0.169	24	0.0070	ILS
EPAqA1G3A	A	C1	1	1	12.625	0.169	24	0.0070	ILS
EPAqA1G4A	A	C1	1	1	12.719	0.169	24	0.0071	ILS
EPAqA2G1A	A	C2	1	2	13.571	0.168	24	0.0070	ILS
EPAqA2G2A	A	C2	1	2	13.533	0.168	24	0.0070	ILS
EPAqA2G3A	A	C2	1	2	13.309	0.169	24	0.0070	ILS
EPAqA2G4A	A	C2	1	2	13.490	0.170	24	0.0071	ILS
EPAqB1G1A	B	C1	2	1	13.432	0.174	24	0.0073	ILS
EPAqB1G2A	B	C1	2	1	13.319	0.174	24	0.0072	ILS
EPAqB1G3A	B	C1	2	1	13.457	0.174	24	0.0072	ILS
EPAqB1G4A	B	C1	2	1	13.356	0.174	24	0.0072	ILS
EPAqB2G1A	B	C2	2	2	13.294	0.175	24	0.0073	ILS
EPAqB2G2A	B	C2	2	2	13.363	0.175	24	0.0073	ILS
EPAqB2G3A	B	C2	2	2	13.197	0.175	24	0.0073	ILS
EPAqC1G1A	C	C1	3	1	13.349	0.171	24	0.0071	ILS
EPAqC1G2A	C	C1	3	1	13.584	0.171	24	0.0071	ILS
EPAqC1G3A	C	C1	3	1	13.433	0.171	24	0.0071	ILS
EPAqC1G4A	C	C1	3	1	13.540	0.171	24	0.0071	ILS
EPAqC2G1A	C	C2	3	2	13.453	0.172	24	0.0072	ILS
EPAqC2G2A	C	C2	3	2	13.240	0.172	24	0.0071	ILS
EPAqC2G3A	C	C2	3	2	13.237	0.171	24	0.0071	ILS
EPAqC2G4A	C	C2	3	2	13.479	0.172	24	0.0072	ILS

Average	**13.273**	**Average**	**0.0071**
Standard Dev.	**0.320**	**Standard Dev.**	
Coeff. of Var. [%]	**2.408**	**Coeff. of Var. [%]**	
Min.	**12.355**	**Min.**	**0.0070**
Max.	**13.584**	**Max.**	**0.0073**
Number of Spec.	**23**	**Number of Spec.**	**23**

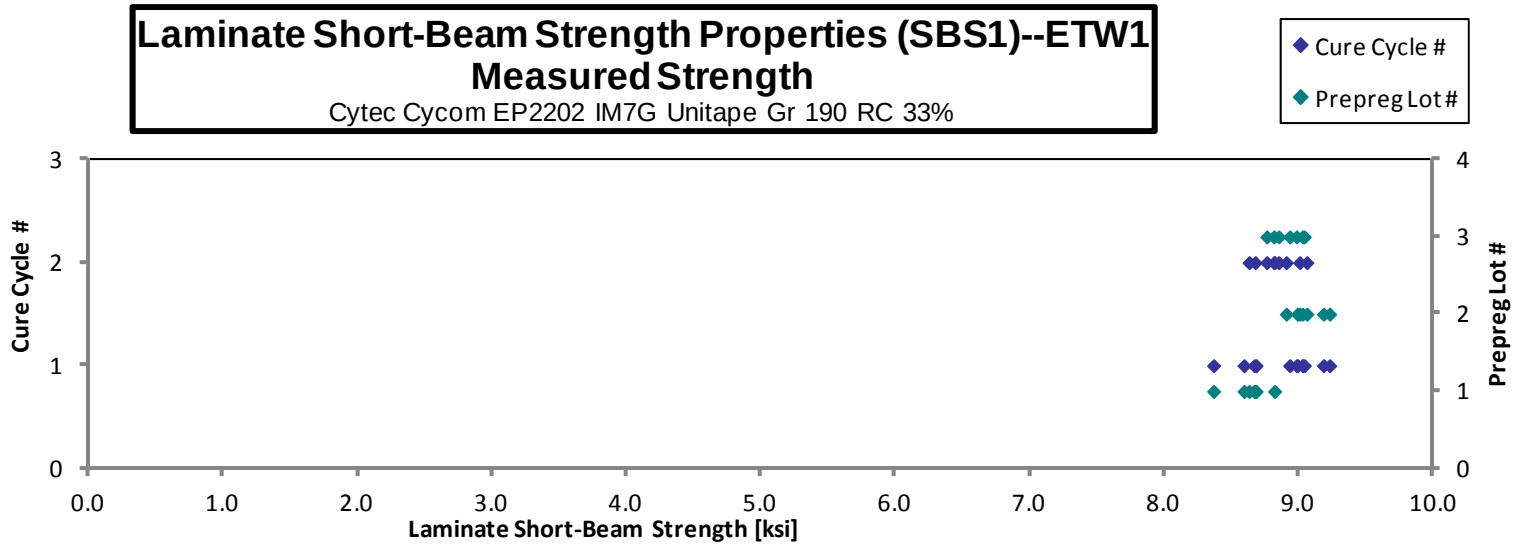

Laminate Short-Beam Strength Properties (SBS1)--RTD
Measured Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
Laminate Short-Beam Strength [ksi]

Laminate Short-Beam Strength Properties (SBS1)--ETW1
Strength

Cytec Cycom EP2202 IM7G Unitape Gr 190 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
EPAqA1G6D	A	C1	1	1	8.668	0.169	24	0.0070	ILS / INELASTIC
EPAqA1G7D	A	C1	1	1	8.591	0.169	24	0.0070	ILS / INELASTIC
EPAqA1G8D	A	C1	1	1	8.682	0.169	24	0.0070	ILS / INELASTIC
EPAqA1G9D	A	C1	1	1	8.365	0.169	24	0.0070	ILS / INELASTIC
EPAqA2G5D	A	C2	1	2	8.819	0.169	24	0.0070	ILS / INELASTIC
EPAqA2G6D	A	C2	1	2	8.675	0.169	24	0.0070	ILS / INELASTIC
EPAqA2G7D	A	C2	1	2	8.629	0.169	24	0.0070	ILS / INELASTIC
EPAqB1G6D	B	C1	2	1	8.989	0.174	24	0.0072	ILS / INELASTIC
EPAqB1G7D	B	C1	2	1	9.027	0.174	24	0.0072	ILS / INELASTIC
EPAqB1G8D	B	C1	2	1	9.229	0.174	24	0.0073	ILS / INELASTIC
EPAqB1G9D	B	C1	2	1	9.183	0.174	24	0.0073	ILS / INELASTIC
EPAqB2G5D	B	C2	2	2	8.906	0.174	24	0.0073	ILS / INELASTIC
EPAqB2G6D	B	C2	2	2	9.006	0.174	24	0.0073	ILS / INELASTIC
EPAqB2G7D	B	C2	2	2	9.059	0.174	24	0.0073	ILS / INELASTIC
EPAqC1G6D	C	C1	3	1	8.982	0.172	24	0.0072	ILS / INELASTIC
EPAqC1G7D	C	C1	3	1	9.040	0.172	24	0.0072	ILS / INELASTIC
EPAqC1G8D	C	C1	3	1	9.028	0.172	24	0.0072	ILS / INELASTIC
EPAqC1G9D	C	C1	3	1	8.932	0.172	24	0.0072	ILS / INELASTIC
EPAqC2G5D	C	C2	3	2	8.814	0.172	24	0.0072	ILS / INELASTIC
EPAqC2G6D	C	C2	3	2	8.850	0.172	24	0.0072	ILS / INELASTIC
EPAqC2G7D	C	C2	3	2	8.761	0.172	24	0.0072	ILS / INELASTIC

Average	**8.868**	**Average**	**0.0072**
Standard Dev.	**0.214**	**Standard Dev.**	
Coeff. of Var. [%]	**2.410**	**Coeff. of Var. [%]**	
Min.	**8.365**	**Min.**	**0.0070**
Max.	**9.229**	**Max.**	**0.0073**
Number of Spec.	**21**	**Number of Spec.**	**21**


Laminate Short-Beam Strength Properties (SBS1)--ETW1
Measured Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Short-Beam Strength [ksi]
0
1
2
3
4
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0

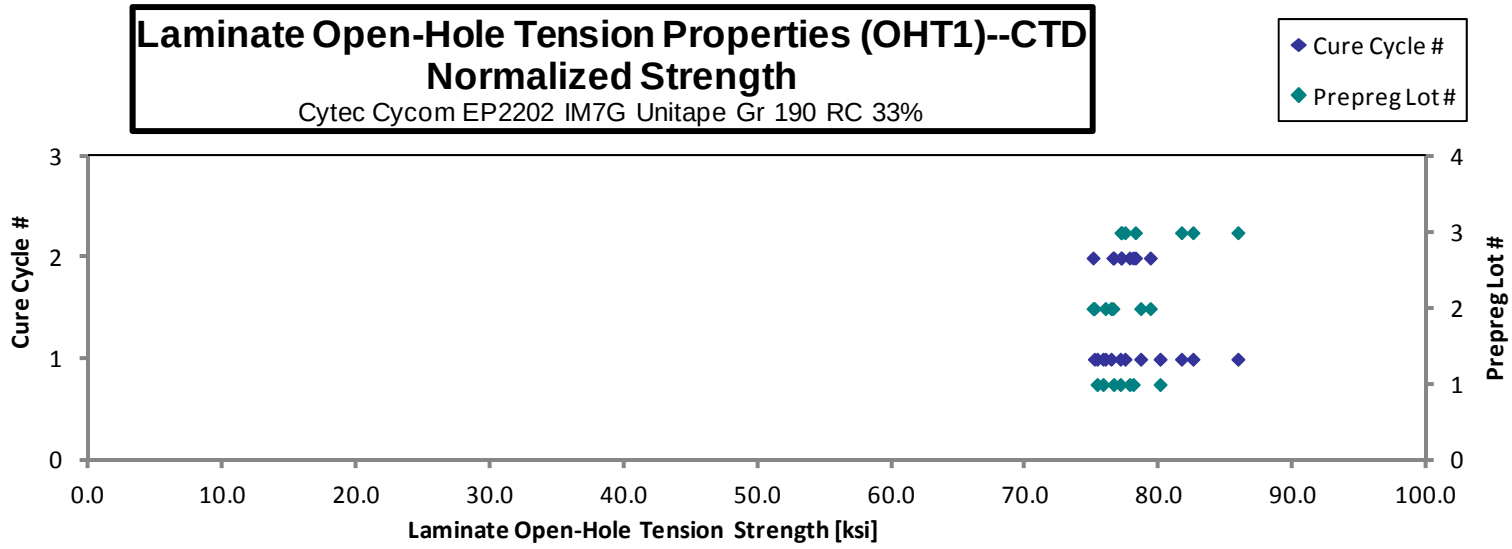
4.15 “25/50/25” Open-Hole Tension 1 Properties (OHT1)

Laminate Open-Hole Tension Properties (OHT1)--CTD
Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

normalizing t_{ply} [in]
0.0072

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]
EPADA116B	A	C1	1	1	77.160	0.113	16	AGM	0.0071	75.776
EPADA117B	A	C1	1	1	77.326	0.112	16	AGM	0.0070	75.335
EPADA118B	A	C1	1	1	78.758	0.113	16	AGM	0.0070	77.072
EPADA119B	A	C1	1	1	81.097	0.114	16	AGM	0.0071	80.042
EPADA215B	A	C2	1	2	77.652	0.114	16	AGM	0.0071	76.573
EPADA216B	A	C2	1	2	79.097	0.114	16	AGM	0.0071	78.033
EPADA217B	A	C2	1	2	78.625	0.114	16	AGM	0.0071	77.760
EPADB116B	B	C1	2	1	74.524	0.116	16	AGM	0.0073	75.128
EPADB117B	B	C1	2	1	75.439	0.116	16	AGM	0.0072	75.952
EPADB118B	B	C1	2	1	75.586	0.116	16	AGM	0.0073	76.373
EPADB119B	B	C1	2	1	77.970	0.116	16	AGM	0.0073	78.590
EPADB215B	B	C2	2	2	76.538	0.115	16	AGM	0.0072	76.516
EPADB216B	B	C2	2	2	79.046	0.116	16	AGM	0.0072	79.309
EPADB217B	B	C2	2	2	75.120	0.115	16	AGM	0.0072	75.033
EPADC116B	C	C1	3	1	78.086	0.114	16	AGM	0.0071	77.419
EPADC117B	C	C1	3	1	82.294	0.114	16	AGM	0.0071	81.639
EPADC118B	C	C1	3	1	83.000	0.115	16	AGM	0.0072	82.496
EPADC119B	C	C1	3	1	86.382	0.115	16	AGM	0.0072	85.857
EPADC215B	C	C2	3	2	78.953	0.114	16	AGM	0.0071	78.199
EPADC216B	C	C2	3	2	78.181	0.114	16	AGM	0.0071	77.140
EPADC217B	C	C2	3	2	78.055	0.114	16	AGM	0.0071	77.129

	Strength		$Strength_{norm}$
Average	**78.519**	**$Average_{norm}$**	**0.0072**	**77.970**
Standard Dev.	**2.811**	**Standard $Dev._{norm}$**		**2.687**
Coeff. of Var. [%]	**3.580**	**Coeff. of Var. $[\%]_{norm}$**		**3.446**
Min.	**74.524**	**Min.**	**0.0070**	**75.033**
Max.	**86.382**	**Max.**	**0.0073**	**85.857**
Number of Spec.	**21**	**Number of Spec.**	**21**	**21**


Laminate Open-Hole Tension Properties (OHT1)--CTD
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
80.0
90.0
100.0
Laminate Open-Hole Tension Strength [ksi]

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

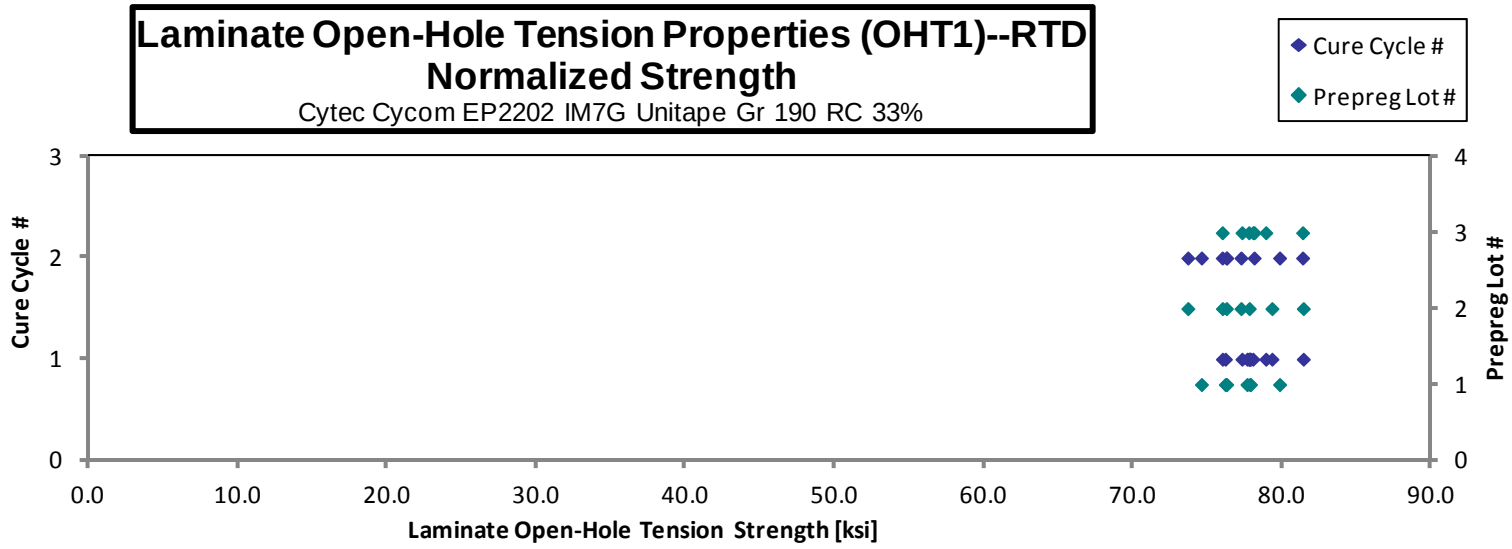
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

normalizing t_{ply} [in]
0.0072

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]
EPADA111A	A	C1	1	1	78.960	0.113	16	AGM	0.0071	77.646
EPADA112A	A	C1	1	1	79.844	0.112	16	AGM	0.0070	77.868
EPADA113A	A	C1	1	1	79.605	0.113	16	AGM	0.0070	77.843
EPADA114A	A	C1	1	1	78.123	0.112	16	AGM	0.0070	76.190
EPADA211A	A	C2	1	2	80.468	0.114	16	AGM	0.0071	79.827
EPADA212A	A	C2	1	2	77.137	0.114	16	AGM	0.0071	76.277
EPADA213A	A	C2	1	2	75.474	0.114	16	AGM	0.0071	74.590
EPADB111A	B	C1	2	1	78.801	0.116	16	AGM	0.0072	79.314
EPADB112A	B	C1	2	1	77.897	0.115	16	AGM	0.0072	77.796
EPADB113A	B	C1	2	1	75.657	0.116	16	AGM	0.0072	75.997
EPADB114A	B	C1	2	1	80.834	0.116	16	AGM	0.0073	81.418
EPADB211A	B	C2	2	2	75.798	0.116	16	AGM	0.0072	76.258
EPADB212A	B	C2	2	2	73.496	0.115	16	AGM	0.0072	73.677
EPADB213A	B	C2	2	2	76.951	0.116	16	AGM	0.0072	77.240
EPADC111A	C	C1	3	1	78.447	0.115	16	AGM	0.0072	78.038
EPADC112A	C	C1	3	1	78.398	0.114	16	AGM	0.0071	77.763
EPADC113A	C	C1	3	1	77.996	0.114	16	AGM	0.0071	77.307
EPADC114A	C	C1	3	1	79.642	0.114	16	AGM	0.0071	78.905
EPADC211A	C	C2	3	2	78.521	0.115	16	AGM	0.0072	78.123
EPADC212A	C	C2	3	2	76.708	0.114	16	AGM	0.0071	75.987
EPADC213A	C	C2	3	2	81.978	0.114	16	AGM	0.0071	81.373

Average	**78.130**	
Standard Dev.	**2.012**	
Coeff. of Var. [%]	**2.576**	
Min.	**73.496**	
Max.	**81.978**	
Number of Spec.	**21**	

$Average_{norm}$	**0.0072**	**77.592**
$Standard\ Dev._{norm}$		**1.929**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**2.487**
Min.	**0.0070**	**73.677**
Max.	**0.0073**	**81.418**
Number of Spec.	**21**	**21**


Laminate Open-Hole Tension Properties (OHT1)--RTD
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
80.0
90.0
Laminate Open-Hole Tension Strength [ksi]

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

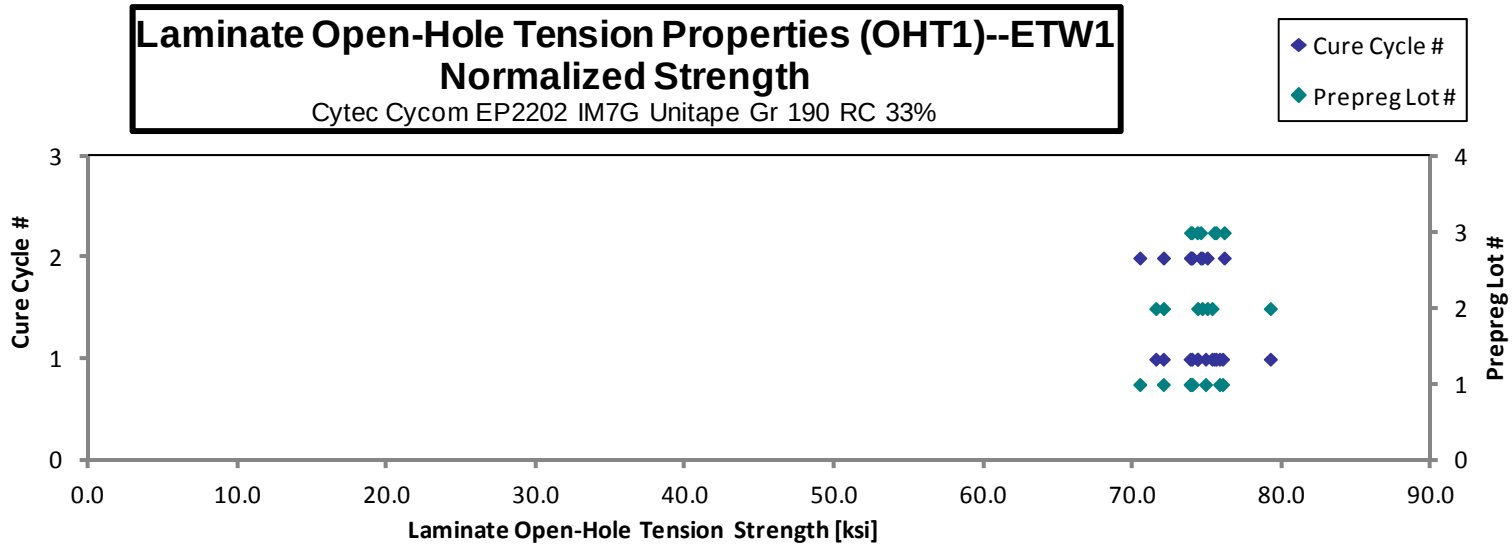
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

normalizing t_{ply} [in]
0.0072

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]
EPADA11BD	A	C1	1	1	77.327	0.113	16	AGM	0.0071	75.806
EPADA11CD	A	C1	1	1	75.299	0.113	16	AGM	0.0071	73.828
EPADA11DD	A	C1	1	1	76.773	0.112	16	AGM	0.0070	74.862
EPADA11ED	A	C1	1	1	77.919	0.112	16	AGM	0.0070	76.003
EPADA11FD	A	C1	1	1	73.869	0.112	16	AGM	0.0070	72.031
EPADA219D	A	C2	1	2	75.129	0.113	16	AGM	0.0071	73.857
EPADA21AD	A	C2	1	2	75.444	0.113	16	AGM	0.0071	73.970
EPADA21BD	A	C2	1	2	71.755	0.113	16	AGM	0.0071	70.457
EPADB11BD	B	C1	2	1	73.898	0.116	16	AGM	0.0072	74.336
EPADB11CD	B	C1	2	1	78.627	0.116	16	AGM	0.0073	79.207
EPADB11DD	B	C1	2	1	71.221	0.116	16	AGM	0.0072	71.530
EPADB11ED	B	C1	2	1	74.732	0.116	16	AGM	0.0073	75.294
EPADB219D	B	C2	2	2	72.054	0.115	16	AGM	0.0072	72.044
EPADB21AD	B	C2	2	2	74.509	0.116	16	AGM / LWB	0.0072	74.972
EPADB21BD	B	C2	2	2	73.748	0.117	16	AGM	0.0073	74.634
EPADC11BD	C	C1	3	1	74.919	0.114	16	AGM	0.0071	74.312
EPADC11CD	C	C1	3	1	74.724	0.114	16	AGM	0.0071	73.945
EPADC11DD	C	C1	3	1	76.232	0.114	16	AGM	0.0071	75.571
EPADC11ED	C	C1	3	1	76.109	0.114	16	AGM	0.0071	75.449
EPADC219D	C	C2	3	2	74.741	0.114	16	AGM	0.0071	73.854
EPADC21AD	C	C2	3	2	76.691	0.114	16	AGM	0.0071	76.114
EPADC21BD	C	C2	3	2	75.317	0.114	16	AGM	0.0071	74.532

Average	**75.047**	
Standard Dev.	**1.880**	
Coeff. of Var. [%]	**2.505**	
Min.	**71.221**	
Max.	**78.627**	
Number of Spec.	**22**	

$Average_{norm}$	**0.0071**	**74.391**
$Standard\ Dev._{norm}$		**1.835**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**2.467**
Min.	**0.0070**	**70.457**
Max.	**0.0073**	**79.207**
Number of Spec.	**22**	**22**


Laminate Open-Hole Tension Properties (OHT1)--ETW1
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Open-Hole Tension Strength [ksi]
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
80.0
90.0
0
1
2
3
4

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

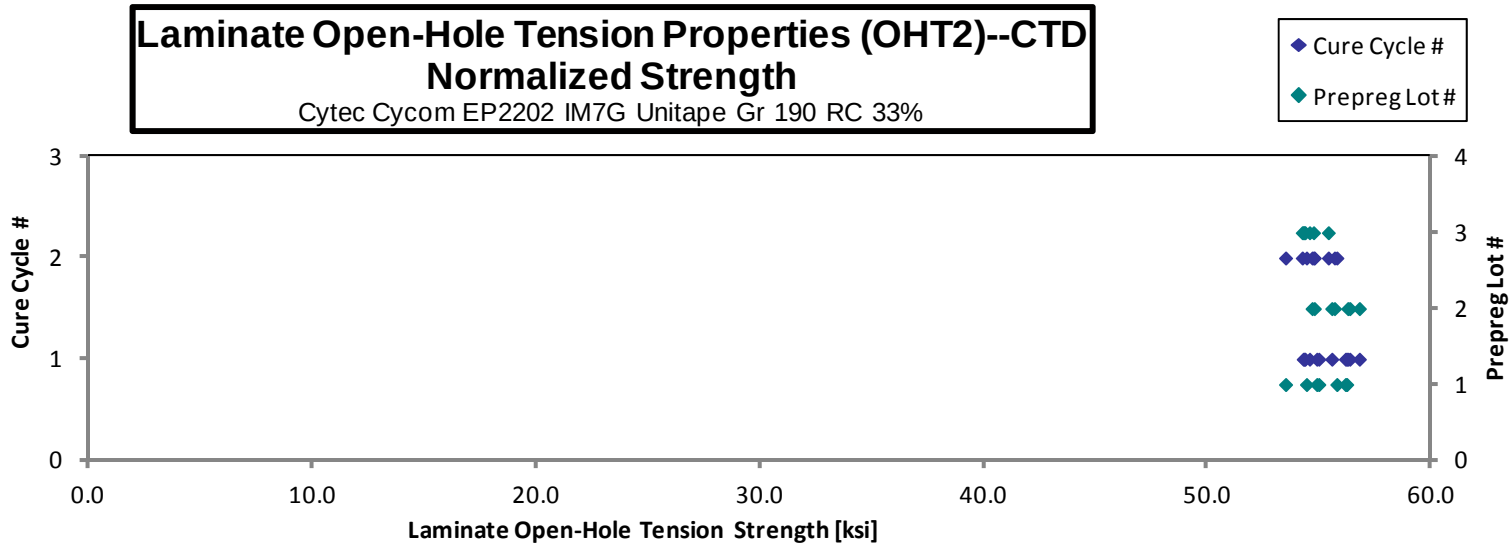
Laminate Open-Hole Tension Properties (OHT2)--CTD
Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

normalizing t_{ply} [in]
0.0072

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]
EPAEA116B	A	C1	1	1	56.003	0.141	20	AGM	0.0071	54.972
EPAEA117B	A	C1	1	1	55.890	0.141	20	AGM	0.0071	54.881
EPAEA118B	A	C1	1	1	57.245	0.141	20	AGM	0.0071	56.218
EPAEA119B	A	C1	1	1	57.116	0.142	20	AGM	0.0071	56.164
EPAEA215B	A	C2	1	2	54.630	0.141	20	AGM	0.0070	53.486
EPAEA216B	A	C2	1	2	55.488	0.141	20	AGM	0.0071	54.422
EPAEA217B	A	C2	1	2	57.120	0.141	20	AGM	0.0070	55.778
EPAEB116B	B	C1	2	1	56.511	0.145	20	AGM	0.0072	56.785
EPAEB117B	B	C1	2	1	55.384	0.146	20	AGM	0.0073	56.268
EPAEB118B	B	C1	2	1	54.284	0.147	20	AGM	0.0074	55.554
EPAEB119B	B	C1	2	1	54.922	0.148	20	AGM	0.0074	56.358
EPAEB215B	B	C2	2	2	54.703	0.144	20	AGM	0.0072	54.672
EPAEB216B	B	C2	2	2	54.519	0.145	20	AGM	0.0072	54.772
EPAEB217B	B	C2	2	2	55.206	0.145	20	AGM	0.0073	55.673
EPAEC116B	C	C1	3	1	54.823	0.143	20	AGM	0.0071	54.277
EPAEC117B	C	C1	3	1	55.184	0.142	20	AGM	0.0071	54.558
EPAEC118B	C	C1	3	1	54.883	0.143	20	AGM	0.0071	54.318
EPAEC119B	C	C1	3	1	54.397	0.144	20	AGM	0.0072	54.353
EPAEC215B	C	C2	3	2	56.290	0.142	20	AGM	0.0071	55.398
EPAEC216B	C	C2	3	2	54.817	0.142	20	AGM	0.0071	54.233
EPAEC217B	C	C2	3	2	55.157	0.143	20	AGM	0.0071	54.736

Average	**55.456**	
Standard Dev.	**0.930**	
Coeff. of Var. [%]	**1.677**	
Min.	**54.284**	
Max.	**57.245**	
Number of Spec.	**21**	

$Average_{norm}$	**0.0072**	**55.137**
$Standard\ Dev._{norm}$		**0.885**
Coeff. of Var. $[\%]_{norm}$		**1.605**
Min.	**0.0070**	**53.486**
Max.	**0.0074**	**56.785**
Number of Spec.	**21**	**21**


Laminate Open-Hole Tension Properties (OHT2)--CTD
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
10.0
20.0
30.0
40.0
50.0
60.0
Laminate Open-Hole Tension Strength [ksi]

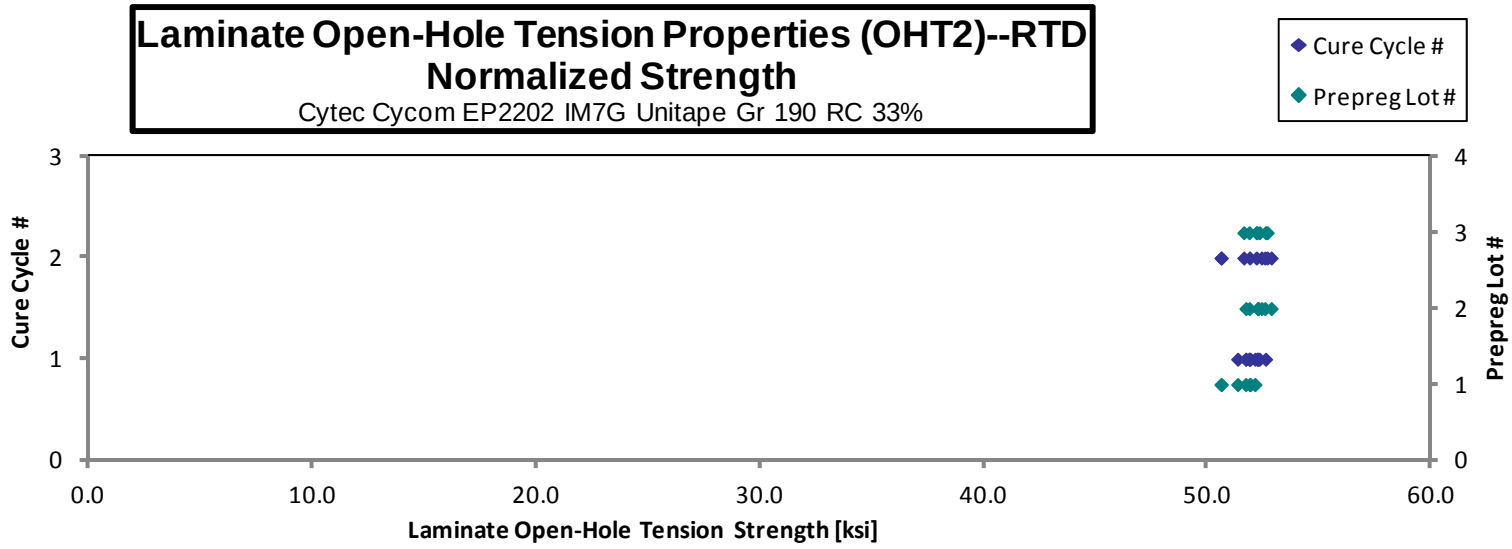
Laminate Open-Hole Tension Properties (OHT2)--RTD
Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

normalizing t_{ply} [in]
0.0072

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]
EPAEA111A	A	C1	1	1	52.882	0.142	20	AGM	0.0071	52.117
EPAEA112A	A	C1	1	1	52.066	0.142	20	AGM	0.0071	51.343
EPAEA113A	A	C1	1	1	52.548	0.142	20	AGM	0.0071	51.703
EPAEA114A	A	C1	1	1	52.811	0.142	20	AGM	0.0071	51.906
EPAEA211A	A	C2	1	2	52.952	0.141	20	AGM	0.0071	51.879
EPAEA212A	A	C2	1	2	51.711	0.141	20	AGM	0.0070	50.610
EPAEA213A	A	C2	1	2	51.600	0.141	20	AGM	0.0071	50.602
EPAEB111A	B	C1	2	1	50.449	0.148	20	AGM	0.0074	51.711
EPAEB112A	B	C1	2	1	51.841	0.145	20	AGM	0.0073	52.237
EPAEB113A	B	C1	2	1	51.356	0.147	20	AGM	0.0073	52.265
EPAEB114A	B	C1	2	1	50.749	0.147	20	AGM	0.0074	51.865
EPAEB211A	B	C2	2	2	52.509	0.145	20	AGM	0.0072	52.843
EPAEB212A	B	C2	2	2	52.027	0.145	20	AGM	0.0073	52.412
EPAEB213A	B	C2	2	2	52.076	0.145	20	AGM	0.0073	52.558
EPAEC111A	C	C1	3	1	52.849	0.143	20	AGM	0.0072	52.592
EPAEC112A	C	C1	3	1	52.800	0.141	20	AGM	0.0071	51.859
EPAEC113A	C	C1	3	1	53.231	0.142	20	AGM	0.0071	52.319
EPAEC114A	C	C1	3	1	52.755	0.143	20	AGM	0.0071	52.205
EPAEC211A	C	C2	3	2	53.285	0.142	20	AGM	0.0071	52.669
EPAEC212A	C	C2	3	2	52.480	0.143	20	AGM	0.0072	52.182
EPAEC213A	C	C2	3	2	52.076	0.143	20	AGM	0.0071	51.618

Average	**52.241**	
Standard Dev.	**0.764**	
Coeff. of Var. [%]	**1.463**	
Min.	**50.449**	
Max.	**53.285**	
Number of Spec.	**21**	

$Average_{norm}$	**0.0072**	**51.976**
Standard $Dev._{norm}$		**0.591**
Coeff. of Var. $[\%]_{norm}$		**1.138**
Min.	**0.0070**	**50.602**
Max.	**0.0074**	**52.843**
Number of Spec.	**21**	**21**


Laminate Open-Hole Tension Properties (OHT2)--RTD
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
10.0
20.0
30.0
40.0
50.0
60.0
Laminate Open-Hole Tension Strength [ksi]

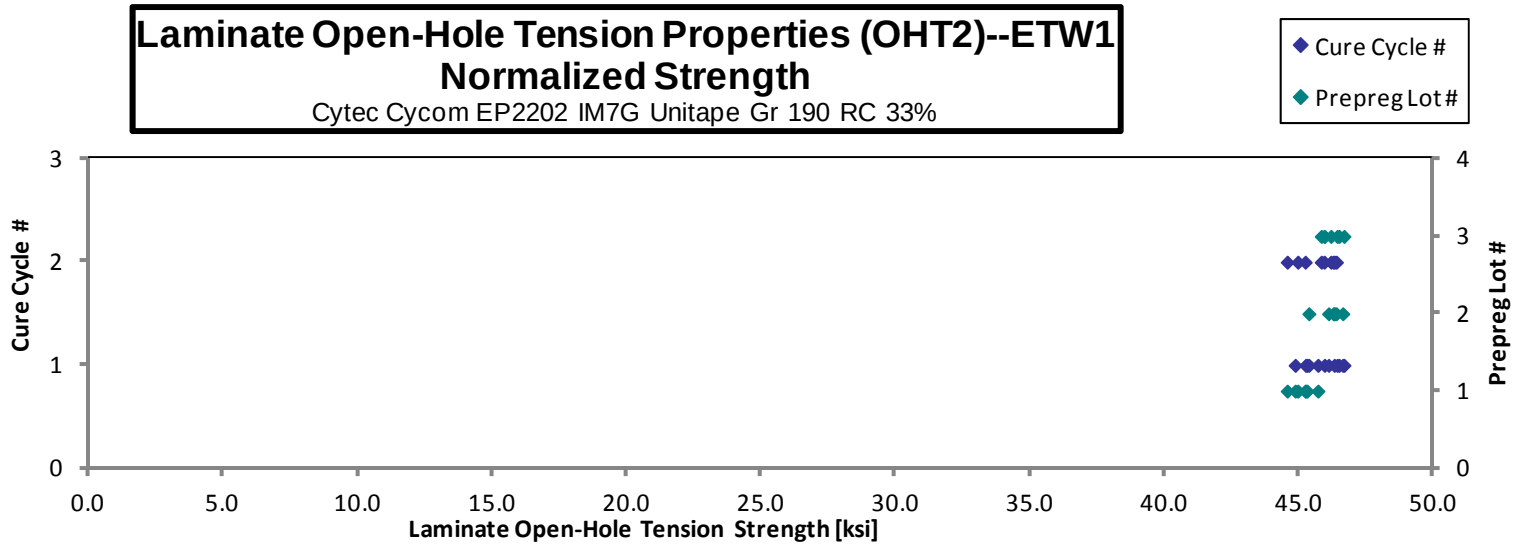
Laminate Open-Hole Tension Properties (OHT2)--ETW1
Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

normalizing t_{ply} [in]
0.0072

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]
EPAEA11BD	A	C1	1	1	45.636	0.142	20	AGM	0.0071	44.860
EPAEA11CD	A	C1	1	1	45.903	0.142	20	AGM	0.0071	45.250
EPAEA11DD	A	C1	1	1	46.049	0.142	20	AGM	0.0071	45.303
EPAEA11ED	A	C1	1	1	46.568	0.141	20	AGM	0.0071	45.705
EPAEA219D	A	C2	1	2	45.475	0.141	20	AGM	0.0071	44.565
EPAEA21AD	A	C2	1	2	45.726	0.142	20	AGM	0.0071	44.958
EPAEA21BD	A	C2	1	2	46.230	0.141	20	AGM	0.0070	45.235
EPAEB11BD	B	C1	2	1	45.544	0.146	20	AGM	0.0073	46.103
EPAEB11CD	B	C1	2	1	44.357	0.147	20	AGM	0.0074	45.369
EPAEB11DD	B	C1	2	1	45.581	0.146	20	AGM	0.0073	46.314
EPAEB11ED	B	C1	2	1	45.993	0.146	20	AGM	0.0073	46.631
EPAEB219D	B	C2	2	2	45.970	0.145	20	AGM	0.0072	46.278
EPAEB21AD	B	C2	2	2	45.767	0.146	20	AGM	0.0073	46.392
EPAEB21BD	B	C2	2	2	45.684	0.146	20	AGM	0.0073	46.318
EPAEC11BD	C	C1	3	1	47.097	0.142	20	AGM	0.0071	46.492
EPAEC11CD	C	C1	3	1	46.461	0.142	20	AGM	0.0071	45.951
EPAEC11DD	C	C1	3	1	47.346	0.142	20	AGM	0.0071	46.677
EPAEC11ED	C	C1	3	1	47.048	0.142	20	AGM	0.0071	46.421
EPAEC219D	C	C2	3	2	46.351	0.142	20	AGM	0.0071	45.831
EPAEC21AD	C	C2	3	2	46.645	0.143	20	AGM	0.0071	46.191
EPAEC21BD	C	C2	3	2	46.479	0.142	20	AGM	0.0071	45.941

Average	**46.091**	
Standard Dev.	**0.672**	
Coeff. of Var. [%]	**1.458**	
Min.	**44.357**	
Max.	**47.346**	
Number of Spec.	**21**	

$Average_{norm}$	**0.0072**	**45.847**
Standard $Dev._{norm}$		**0.627**
Coeff. of Var. $[\%]_{norm}$		**1.368**
Min.	**0.0070**	**44.565**
Max.	**0.0074**	**46.677**
Number of Spec.	**21**	**21**


Laminate Open-Hole Tension Properties (OHT2)--ETW1
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
5.0
10.0
15.0
20.0
25.0
30.0
35.0
40.0
45.0
50.0
Laminate Open-Hole Tension Strength [ksi]

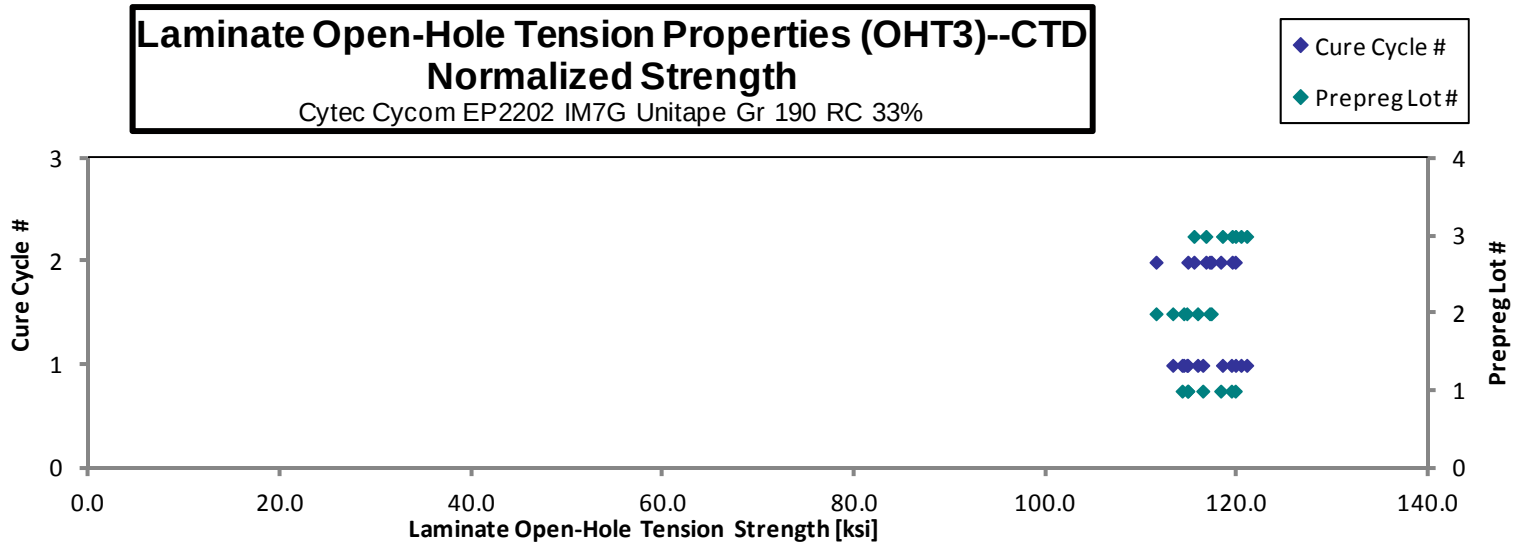
4.17 "50/40/10" Open-Hole Tension 3 Properties (OHT3)

Laminate Open-Hole Tension Properties (OHT3)--CTD
Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

normalizing t_{ply} [in]
0.0072

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]
EPAFA116B	A	C1	1	1	114.743	0.144	20	AGM	0.0072	114.756
EPAFA117B	A	C1	1	1	115.137	0.143	20	AGM	0.0071	114.191
EPAFA118B	A	C1	1	1	120.228	0.143	20	AGM	0.0071	119.338
EPAFA119B	A	C1	1	1	116.833	0.143	20	AGM	0.0072	116.347
EPAFA215B	A	C2	1	2	116.371	0.142	20	AGM	0.0071	114.781
EPAFA216B	A	C2	1	2	119.334	0.143	20	AGM	0.0071	118.215
EPAFA217B	A	C2	1	2	121.553	0.142	20	AGM	0.0071	119.738
EPAFB116B	B	C1	2	1	114.385	0.146	20	MGM	0.0073	115.801
EPAFB117B	B	C1	2	1	112.054	0.145	20	AGM	0.0073	113.208
EPAFB118B	B	C1	2	1	110.756	0.149	20	AGM	0.0075	114.679
EPAFB119B	B	C1	2	1	111.669	0.147	20	AGM / LGM	0.0074	114.358
EPAFB215B	B	C2	2	2	116.089	0.145	20	MGM	0.0073	117.057
EPAFB216B	B	C2	2	2	116.398	0.145	20	AGM	0.0073	117.233
EPAFB217B	B	C2	2	2	110.846	0.145	20	AGM	0.0072	111.462
EPAFC116B	C	C1	3	1	119.375	0.145	20	AGM	0.0073	120.342
EPAFC117B	C	C1	3	1	119.091	0.145	20	AGM	0.0072	119.767
EPAFC118B	C	C1	3	1	119.006	0.143	20	AGM	0.0072	118.400
EPAFC119B	C	C1	3	1	119.399	0.146	20	AGM	0.0073	120.933
EPAFC215B	C	C2	3	2	116.547	0.143	20	AGM	0.0071	115.428
EPAFC216B	C	C2	3	2	120.512	0.143	20	AGM	0.0071	119.410
EPAFC217B	C	C2	3	2	117.311	0.143	20	AGM	0.0072	116.673

	Strength		$Strength_{norm}$
Average	**116.554**	**$Average_{norm}$**	**116.767**
Standard Dev.	**3.253**	**$Standard\ Dev._{norm}$**	**2.599**
Coeff. of Var. [%]	**2.791**	**$Coeff.\ of\ Var.\ [\%]_{norm}$**	**2.226**
Min.	**110.756**	**Min.**	**111.462**
Max.	**121.553**	**Max.**	**120.933**
Number of Spec.	**21**	**Number of Spec.**	**21**


Laminate Open-Hole Tension Properties (OHT3)--CTD
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
20.0
40.0
60.0
80.0
100.0
120.0
140.0
Laminate Open-Hole Tension Strength [ksi]

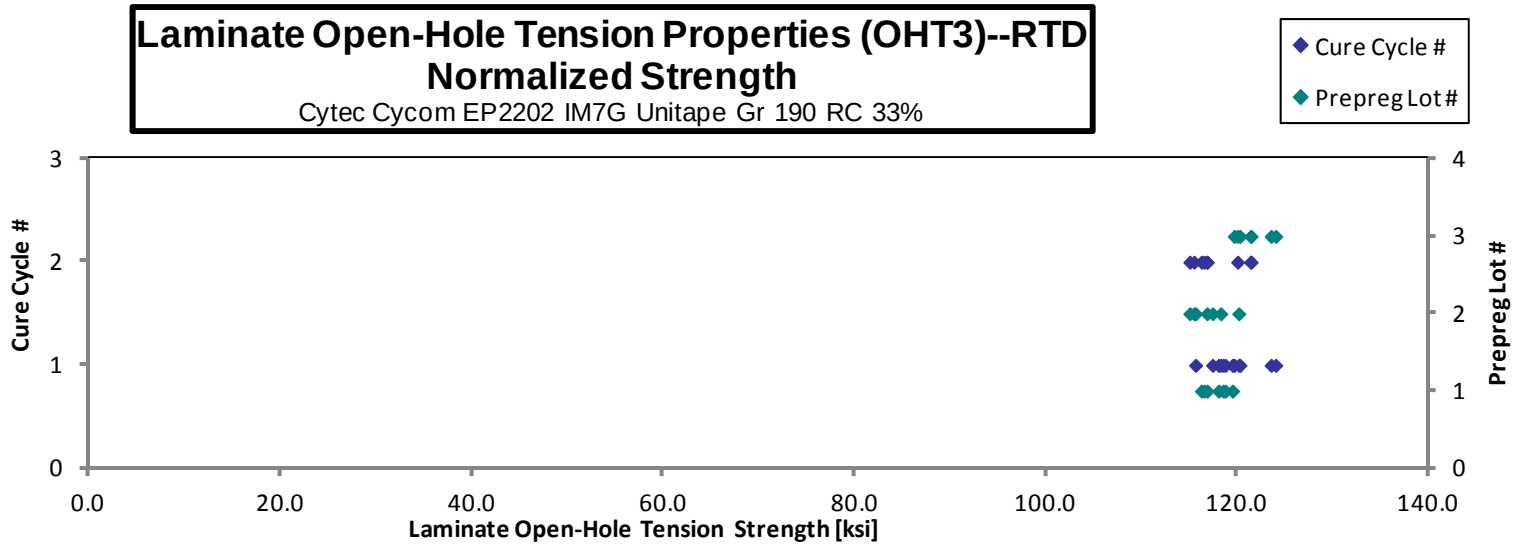
Laminate Open-Hole Tension Properties (OHT3)--RTD
Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

normalizing t_{ply} [in]
0.0072

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]
EPAFA112A	A	C1	1	1	120.941	0.142	20	AGM	0.0071	119.457
EPAFA113A	A	C1	1	1	119.779	0.143	20	AGM	0.0071	118.698
EPAFA114A	A	C1	1	1	117.349	0.145	20	AGM	0.0072	118.001
EPAFA115A	A	C1	1	1	120.113	0.142	20	AGM	0.0071	118.473
EPAFA211A	A	C2	1	2	117.955	0.142	20	AGM	0.0071	116.480
EPAFA212A	A	C2	1	2	117.805	0.142	20	AGM	0.0071	116.210
EPAFA213A	A	C2	1	2	118.356	0.142	20	AGM	0.0071	116.795
EPAFB111A	B	C1	2	1	112.734	0.148	20	AGM	0.0074	115.592
EPAFB112A	B	C1	2	1	115.603	0.146	20	AGM	0.0073	117.369
EPAFB113A	B	C1	2	1	118.114	0.146	20	AGM	0.0073	120.110
EPAFB114A	B	C1	2	1	116.687	0.146	20	AGM	0.0073	118.227
EPAFB211A	B	C2	2	2	115.357	0.146	20	AGM	0.0073	116.786
EPAFB212A	B	C2	2	2	113.950	0.145	20	AGM	0.0073	114.991
EPAFB213A	B	C2	2	2	114.990	0.145	20	AGM	0.0072	115.429
EPAFC111A	C	C1	3	1	120.440	0.143	20	AGM	0.0072	119.631
EPAFC112A	C	C1	3	1	123.371	0.145	20	AGM	0.0072	123.971
EPAFC113A	C	C1	3	1	124.516	0.143	20	AGM	0.0071	123.478
EPAFC115A	C	C1	3	1	121.786	0.142	20	AGM	0.0071	120.236
EPAFC211A	C	C2	3	2	122.308	0.143	20	AGM	0.0071	121.388
EPAFC212A	C	C2	3	2	119.945	0.144	20	AGM	0.0072	119.987
EPAFC213A	C	C2	3	2	122.059	0.143	20	AGM	0.0072	121.353

Average	**118.769**	
Standard Dev.	**3.182**	
Coeff. of Var. [%]	**2.679**	
Min.	**112.734**	
Max.	**124.516**	
Number of Spec.	**21**	

$Average_{norm}$	**0.0072**	**118.698**
$Standard\ Dev._{norm}$		**2.524**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**2.126**
Min.	**0.0071**	**114.991**
Max.	**0.0074**	**123.971**
Number of Spec.	**21**	**21**


Laminate Open-Hole Tension Properties (OHT3)--RTD
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
20.0
40.0
60.0
80.0
100.0
120.0
140.0
Laminate Open-Hole Tension Strength [ksi]

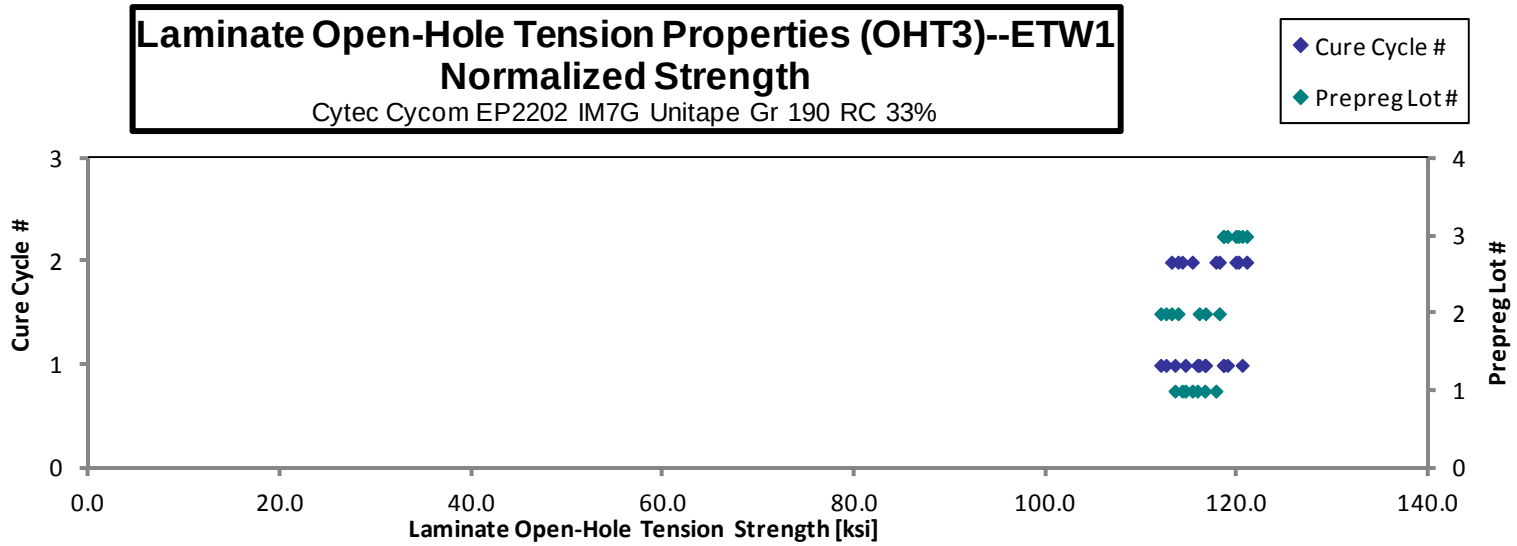
Laminate Open-Hole Tension Properties (OHT3)--ETW1
Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

normalizing t_{ply} [in]
0.0072

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]
EPAFA11CD	A	C1	1	1	117.909	0.141	20	AGM	0.0071	115.780
EPAFA11DD	A	C1	1	1	118.452	0.142	20	AGM	0.0071	116.560
EPAFA11ED	A	C1	1	1	116.176	0.142	20	AGM	0.0071	114.522
EPAFA11FD	A	C1	1	1	113.824	0.144	20	AGM	0.0072	113.442
EPAFA219D	A	C2	1	2	115.680	0.142	20	AGM	0.0071	114.194
EPAFA21AD	A	C2	1	2	119.540	0.142	20	AGM	0.0071	117.714
EPAFA21BD	A	C2	1	2	116.681	0.142	20	AGM	0.0071	115.250
EPAFB11BD	B	C1	2	1	114.894	0.145	20	AGM	0.0073	115.972
EPAFB11CD	B	C1	2	1	115.379	0.146	20	AGM	0.0073	116.634
EPAFB11DD	B	C1	2	1	111.589	0.145	20	AGM	0.0073	112.506
EPAFB11ED	B	C1	2	1	110.872	0.145	20	AGM	0.0073	111.950
EPAFB219D	B	C2	2	2	112.851	0.145	20	AGM	0.0073	113.765
EPAFB21AD	B	C2	2	2	112.298	0.145	20	AGM	0.0073	113.077
EPAFB21BD	B	C2	2	2	116.643	0.146	20	AGM	0.0073	118.074
EPAFC11BD	C	C1	3	1	119.572	0.143	20	AGM	0.0072	118.921
EPAFC11CD	C	C1	3	1	120.219	0.142	20	AGM	0.0071	118.508
EPAFC11DD	C	C1	3	1	120.238	0.144	20	AGM	0.0072	120.461
EPAFC11ED	C	C1	3	1	117.407	0.145	20	AGM	0.0073	118.494
EPAFC219D	C	C2	3	2	120.807	0.143	20	AGM	0.0071	119.801
EPAFC21AD	C	C2	3	2	120.978	0.143	20	AGM	0.0071	120.082
EPAFC21BD	C	C2	3	2	121.423	0.143	20	AGM	0.0072	120.932

Average	**116.830**	
Standard Dev.	**3.258**	
Coeff. of Var. [%]	**2.788**	
Min.	**110.872**	
Max.	**121.423**	
Number of Spec.	**21**	

$Average_{norm}$	**0.0072**	**116.507**
$Standard\ Dev._{norm}$		**2.772**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**2.379**
Min.	**0.0071**	**111.950**
Max.	**0.0073**	**120.932**
Number of Spec.	**21**	**21**


Laminate Open-Hole Tension Properties (OHT3)--ETW1
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
20.0
40.0
60.0
80.0
100.0
120.0
140.0
Laminate Open-Hole Tension Strength [ksi]

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

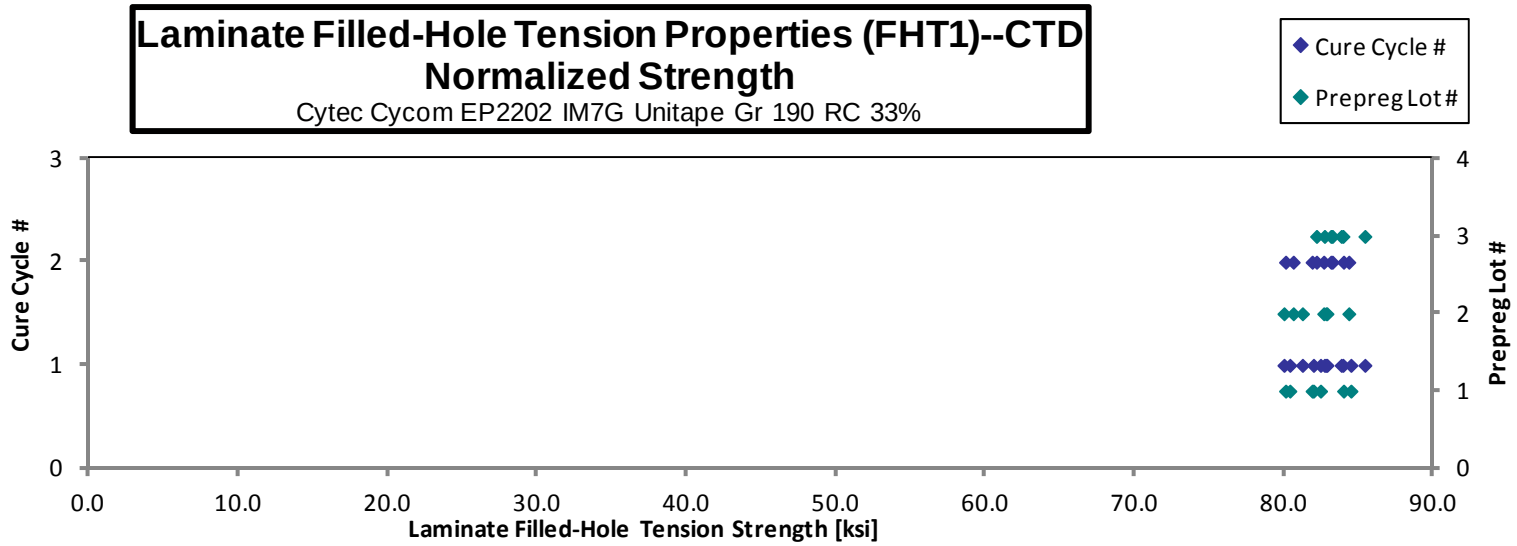
Laminate Filled-Hole Tension Properties (FHT1)--CTD
Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

normalizing t_{ply} [in]
0.0072

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]
EPA4A116B	A	C1	1	1	82.164	0.113	16	AGM	0.0070	80.393
EPA4A117B	A	C1	1	1	83.818	0.113	16	AGM	0.0071	82.448
EPA4A118B	A	C1	1	1	83.339	0.113	16	AGM	0.0071	81.976
EPA4A119B	A	C1	1	1	85.599	0.114	16	AGM	0.0071	84.484
EPA4A215B	A	C2	1	2	83.749	0.113	16	AGM	0.0070	81.883
EPA4A216B	A	C2	1	2	85.497	0.113	16	AGM	0.0071	83.988
EPA4A217B	A	C2	1	2	81.943	0.113	16	AGM	0.0070	80.105
EPA4B116B	B	C1	2	1	78.067	0.118	16	AGM	0.0074	79.999
EPA4B117B	B	C1	2	1	81.507	0.117	16	AGM	0.0073	82.804
EPA4B118B	B	C1	2	1	81.268	0.117	16	AGM	0.0073	82.879
EPA4B119B	B	C1	2	1	78.534	0.119	16	AGM	0.0074	81.238
EPA4B215B	B	C2	2	2	79.199	0.117	16	AGM	0.0073	80.619
EPA4B216B	B	C2	2	2	81.322	0.117	16	AGM	0.0073	82.663
EPA4B217B	B	C2	2	2	83.055	0.117	16	AGM	0.0073	84.341
EPA4C116B	C	C1	3	1	84.577	0.114	16	AGM	0.0071	83.831
EPA4C117B	C	C1	3	1	83.447	0.114	16	AGM	0.0071	82.710
EPA4C118B	C	C1	3	1	85.528	0.115	16	AGM	0.0072	85.417
EPA4C119B	C	C1	3	1	84.619	0.114	16	AGM	0.0071	83.946
EPA4C215B	C	C2	3	2	83.723	0.114	16	AGM	0.0072	83.142
EPA4C216B	C	C2	3	2	83.156	0.114	16	AGM	0.0071	82.181
EPA4C217B	C	C2	3	2	84.457	0.114	16	AGM	0.0071	83.235

Average	**82.789**	
Standard Dev.	**2.195**	
Coeff. of Var. [%]	**2.651**	
Min.	**78.067**	
Max.	**85.599**	
Number of Spec.	**21**	

$Average_{norm}$	**0.0072**	**82.585**
$Standard\ Dev._{norm}$		**1.506**
Coeff. of Var. $[\%]_{norm}$		**1.823**
Min.	**0.0070**	**79.999**
Max.	**0.0074**	**85.417**
Number of Spec.	**21**	**21**


Laminate Filled-Hole Tension Properties (FHT1)--CTD
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
80.0
90.0
Laminate Filled-Hole Tension Strength [ksi]

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

Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

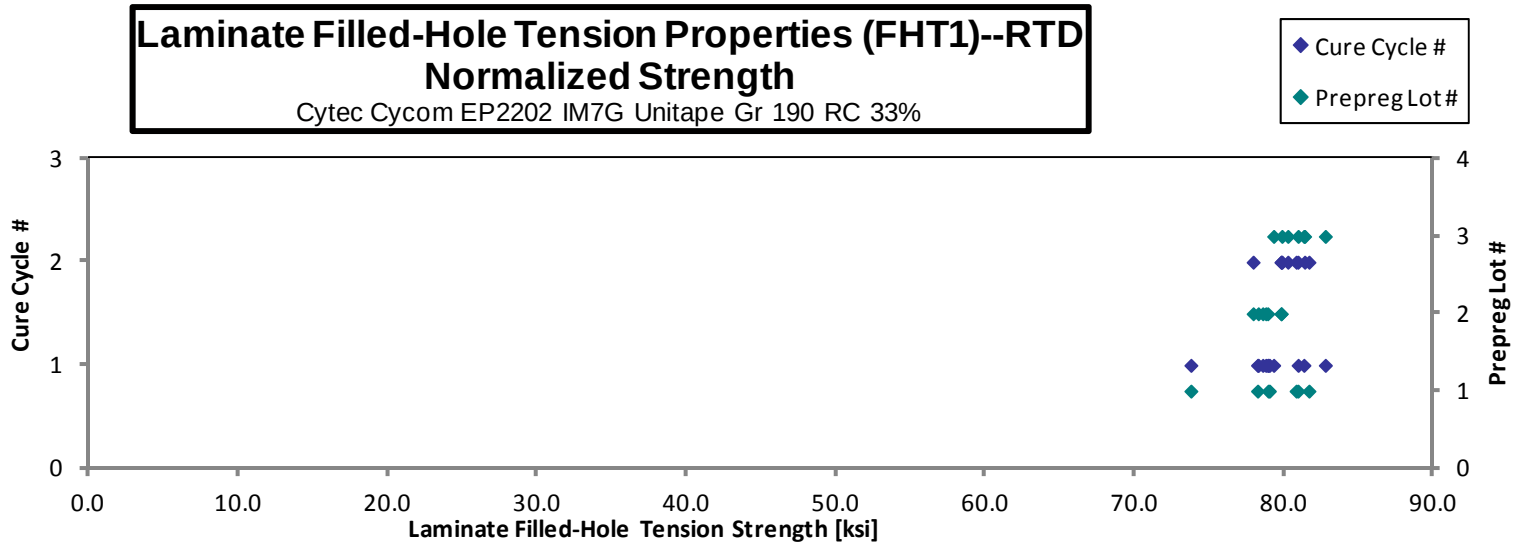
normalizing t_{ply} [in]
0.0072

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]
EPA4A111A	A	C1	1	1	79.980	0.113	16	AGM	0.0070	78.233
EPA4A112A*	A	C1	1	1	75.226	0.113	16	AGM	0.0071	73.768
EPA4A113A	A	C1	1	1	80.541	0.113	16	AGM	0.0071	78.944
EPA4A114A	A	C1	1	1	80.717	0.113	16	AGM	0.0070	79.023
EPA4A211A	A	C2	1	2	81.272	0.115	16	AGM	0.0072	80.814
EPA4A212A	A	C2	1	2	81.873	0.114	16	AGM	0.0071	80.938
EPA4A213A	A	C2	1	2	82.868	0.114	16	AGM	0.0071	81.670
EPA4B111A	B	C1	2	1	76.416	0.119	16	AGM	0.0074	78.781
EPA4B112A	B	C1	2	1	77.259	0.118	16	AGM	0.0074	78.914
EPA4B113A	B	C1	2	1	76.423	0.118	16	AGM	0.0074	78.281
EPA4B114A	B	C1	2	1	76.960	0.118	16	AGM	0.0074	78.574
EPA4B211A	B	C2	2	2	76.420	0.117	16	AGM	0.0073	77.935
EPA4B212A	B	C2	2	2	78.503	0.117	16	AGM	0.0073	79.809
EPA4B213A	B	C2	2	2	78.388	0.117	16	AGM	0.0073	79.806
EPA4C111A	C	C1	3	1	79.665	0.115	16	AGM	0.0072	79.307
EPA4C112A	C	C1	3	1	81.171	0.115	16	AGM	0.0072	80.948
EPA4C113A	C	C1	3	1	82.250	0.114	16	AGM	0.0071	81.334
EPA4C114A	C	C1	3	1	83.567	0.114	16	AGM	0.0071	82.769
EPA4C211A	C	C2	3	2	80.327	0.115	16	AGM	0.0072	79.863
EPA4C212A	C	C2	3	2	80.879	0.114	16	AGM	0.0071	80.259
EPA4C213A	C	C2	3	2	82.433	0.114	16	AGM	0.0071	81.384

*data point has been investigated, no reason found to drop data

Average	**79.673**	
Standard Dev.	**2.458**	
Coeff. of Var. [%]	**3.085**	
Min.	**75.226**	
Max.	**83.567**	
Number of Spec.	**21**	

$Average_{norm}$	**0.0072**	**79.588**
$Standard\ Dev._{norm}$		**1.866**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**2.344**
Min.	**0.0070**	**73.768**
Max.	**0.0074**	**82.769**
Number of Spec.	**21**	**21**

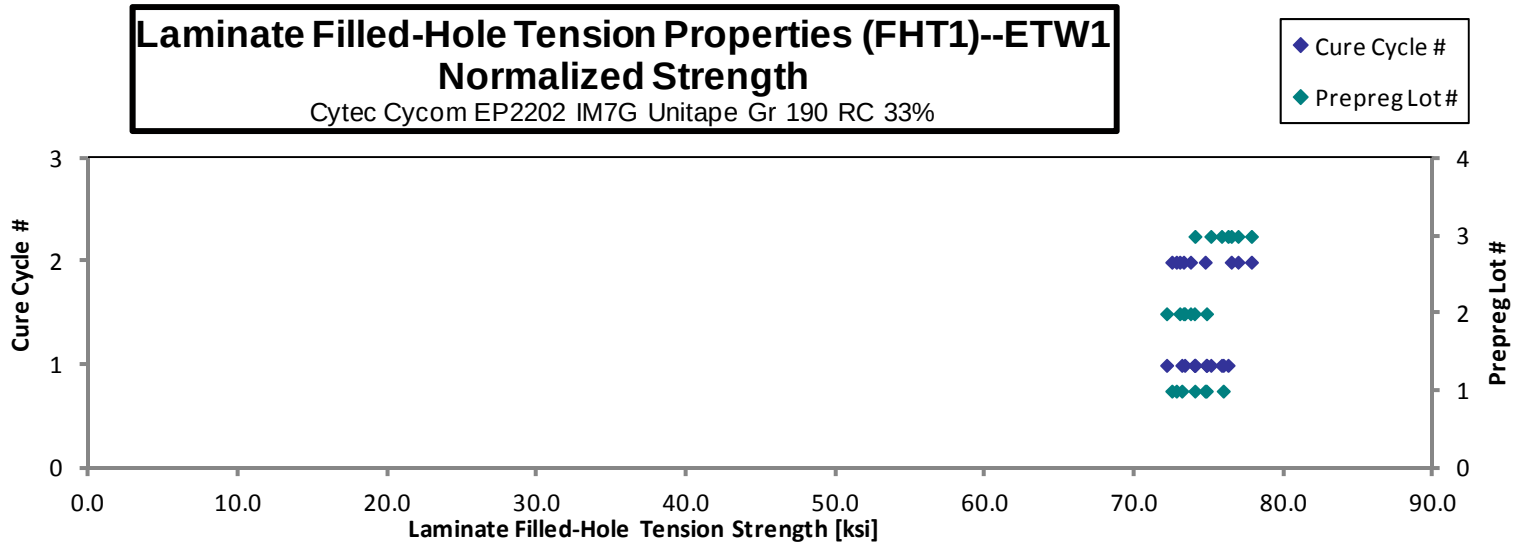

Laminate Filled-Hole Tension Properties (FHT1)--RTD
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
80.0
90.0
Laminate Filled-Hole Tension Strength [ksi]

Laminate Filled-Hole Tension Properties (FHT1)--ETW1
Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

normalizing t_{ply} [in]
0.0072

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]
EPA4A11BD	A	C1	1	1	76.824	0.114	16	AGM	0.0071	75.935
EPA4A11CD	A	C1	1	1	75.083	0.114	16	AGM	0.0071	74.030
EPA4A11DD	A	C1	1	1	75.920	0.114	16	AGM	0.0071	74.800
EPA4A11ED	A	C1	1	1	74.268	0.113	16	AGM	0.0071	73.161
EPA4A219D	A	C2	1	2	76.428	0.113	16	AGM	0.0070	74.725
EPA4A21AD	A	C2	1	2	74.251	0.113	16	AGM	0.0071	72.790
EPA4A21BD	A	C2	1	2	74.012	0.113	16	AGM	0.0071	72.491
EPA4B11BD	B	C1	2	1	73.062	0.118	16	AGM	0.0074	74.817
EPA4B11CD	B	C1	2	1	72.139	0.117	16	AGM	0.0073	73.350
EPA4B11DD	B	C1	2	1	71.287	0.117	16	AGM	0.0073	72.143
EPA4B11ED	B	C1	2	1	73.142	0.117	16	AGM	0.0073	73.999
EPA4B219D	B	C2	2	2	73.191	0.116	16	AGM	0.0073	73.741
EPA4B21AD	B	C2	2	2	72.527	0.116	16	AGM	0.0073	73.272
EPA4B21BD	B	C2	2	2	72.164	0.117	16	AGM	0.0073	73.020
EPA4C11BD	C	C1	3	1	76.763	0.114	16	AGM	0.0071	75.819
EPA4C11CD	C	C1	3	1	74.883	0.114	16	AGM	0.0071	74.038
EPA4C11DD	C	C1	3	1	77.081	0.114	16	AGM	0.0071	76.256
EPA4C11ED	C	C1	3	1	75.837	0.114	16	AGM	0.0071	75.102
EPA4C219D	C	C2	3	2	77.618	0.114	16	AGM	0.0071	76.922
EPA4C21AD	C	C2	3	2	78.479	0.114	16	AGM	0.0071	77.821
EPA4C21BD	C	C2	3	2	77.513	0.114	16	AGM	0.0071	76.470

	Strength		$Strength_{norm}$
Average	**74.880**	**$Average_{norm}$**	**74.510**
Standard Dev.	**2.098**	**$Standard\ Dev._{norm}$**	**1.563**
Coeff. of Var. [%]	**2.802**	**$Coeff.\ of\ Var.\ [\%]_{norm}$**	**2.097**
Min.	**71.287**	**Min.**	**72.143**
Max.	**78.479**	**Max.**	**77.821**
Number of Spec.	**21**	**Number of Spec.**	**21**


Laminate Filled-Hole Tension Properties (FHT1)--ETW1
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
80.0
90.0
Laminate Filled-Hole Tension Strength [ksi]

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

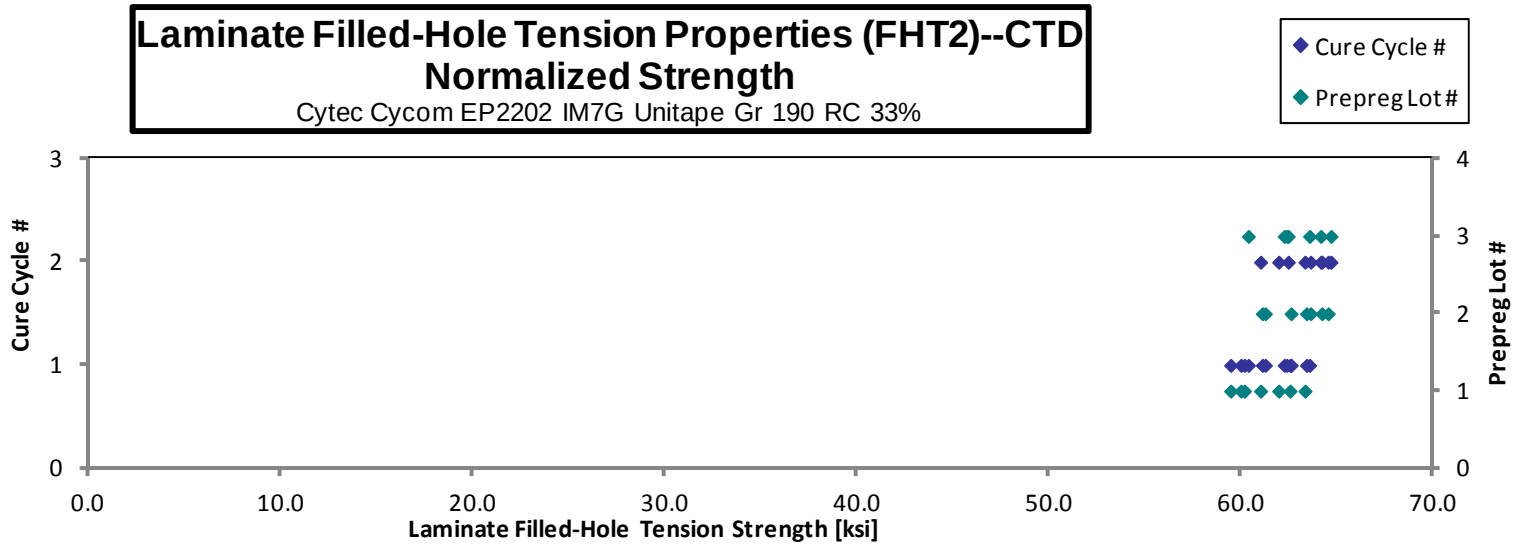
Laminate Filled-Hole Tension Properties (FHT2)--CTD
Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

normalizing t_{ply} [in]
0.0072

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]
EPA5A116B	A	C1	1	1	61.182	0.140	20	AGM	0.0070	59.447
EPA5A117B	A	C1	1	1	62.052	0.140	20	AGM	0.0070	60.163
EPA5A118B	A	C1	1	1	61.301	0.141	20	AGM	0.0070	59.982
EPA5A119B	A	C1	1	1	63.907	0.141	20	AGM	0.0070	62.538
EPA5A215B	A	C2	1	2	61.720	0.142	20	AGM	0.0071	61.006
EPA5A216B	A	C2	1	2	62.673	0.142	20	AGM	0.0071	61.948
EPA5A217B	A	C2	1	2	63.909	0.143	20	AGM	0.0071	63.317
EPA5B116B	B	C1	2	1	60.017	0.147	20	AGM	0.0073	61.253
EPA5B117B	B	C1	2	1	61.601	0.146	20	AGM	0.0073	62.592
EPA5B118B	B	C1	2	1	59.087	0.149	20	AGM	0.0074	61.097
EPA5B119B	B	C1	2	1	61.838	0.148	20	AGM	0.0074	63.398
EPA5B215B	B	C2	2	2	62.031	0.148	20	AGM	0.0074	63.611
EPA5B216B	B	C2	2	2	62.608	0.148	20	AGM	0.0074	64.202
EPA5B217B	B	C2	2	2	63.498	0.146	20	AGM	0.0073	64.526
EPA5C116B	C	C1	3	1	60.336	0.144	20	AGM	0.0072	60.370
EPA5C118B	C	C1	3	1	62.492	0.143	20	AGM	0.0072	62.239
EPA5C119B	C	C1	3	1	62.327	0.144	20	AGM	0.0072	62.370
EPA5C11AB	C	C1	3	1	63.739	0.144	20	AGM	0.0072	63.554
EPA5C215B	C	C2	3	2	65.584	0.142	20	AGM	0.0071	64.673
EPA5C216B	C	C2	3	2	65.040	0.142	20	AGM	0.0071	64.137
EPA5C217B	C	C2	3	2	63.475	0.142	20	AGM	0.0071	62.446

Average	**62.401**	
Standard Dev.	**1.600**	
Coeff. of Var. [%]	**2.565**	
Min.	**59.087**	
Max.	**65.584**	
Number of Spec.	**21**	

$Average_{norm}$	**0.0072**	**62.327**
Standard $Dev._{norm}$		**1.572**
Coeff. of Var. $[\%]_{norm}$		**2.522**
Min.	**0.0070**	**59.447**
Max.	**0.0074**	**64.673**
Number of Spec.	**21**	**21**


Laminate Filled-Hole Tension Properties (FHT2)--CTD
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
Laminate Filled-Hole Tension Strength [ksi]

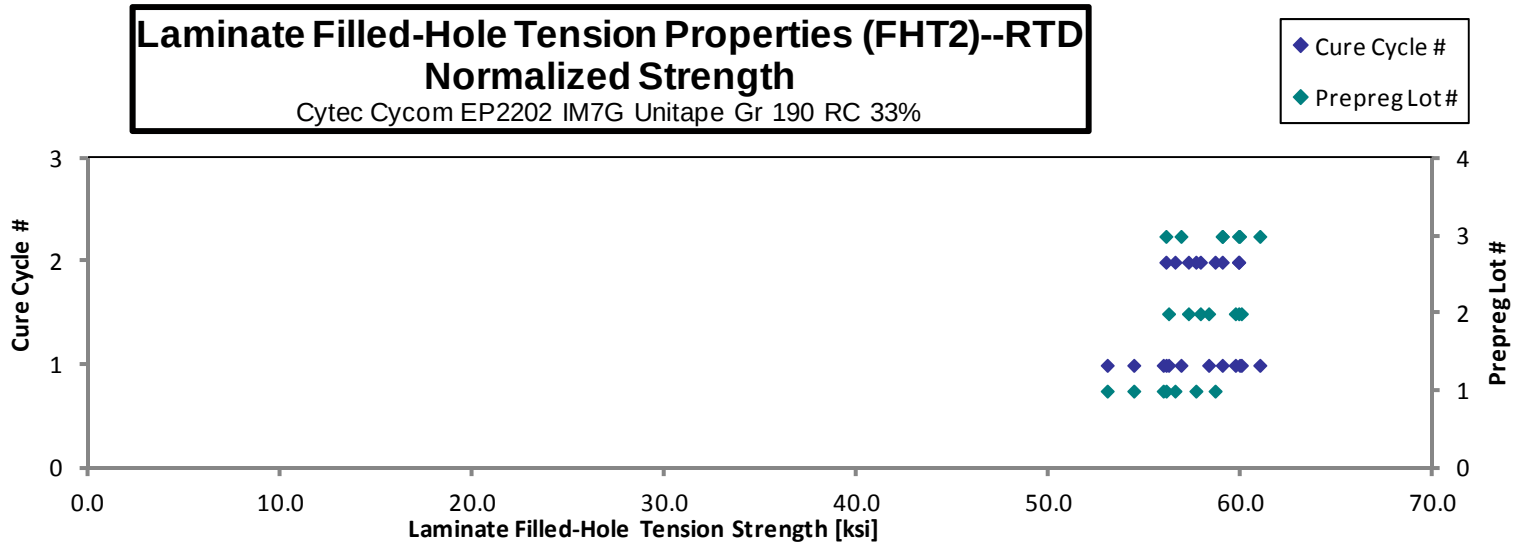
Laminate Filled-Hole Tension Properties (FHT2)--RTD
Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

normalizing t_{ply} [in]
0.0072

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]
EPA5A111A	A	C1	1	1	55.479	0.141	20	AGM	0.0071	54.400
EPA5A112A	A	C1	1	1	57.812	0.140	20	AGM	0.0070	56.085
EPA5A113A	A	C1	1	1	57.941	0.139	20	AGM	0.0070	55.936
EPA5A114A	A	C1	1	1	54.241	0.141	20	AGM	0.0070	53.017
EPA5A211A	A	C2	1	2	58.304	0.142	20	AGM	0.0071	57.635
EPA5A212A	A	C2	1	2	57.295	0.142	20	AGM	0.0071	56.545
EPA5A213A	A	C2	1	2	59.314	0.142	20	AGM	0.0071	58.635
EPA5B111A	B	C1	2	1	54.631	0.148	20	AGM	0.0074	56.212
EPA5B112A	B	C1	2	1	57.265	0.147	20	AGM	0.0073	58.299
EPA5B113A	B	C1	2	1	59.030	0.146	20	AGM	0.0073	60.001
EPA5B114A	B	C1	2	1	58.485	0.147	20	AGM	0.0073	59.690
EPA5B212A	B	C2	2	2	56.178	0.148	20	AGM	0.0074	57.869
EPA5B213A	B	C2	2	2	55.824	0.148	20	AGM	0.0074	57.246
EPA5B214A	B	C2	2	2	58.246	0.148	20	AGM	0.0074	59.864
EPA5C111A	C	C1	3	1	56.766	0.144	20	AGM	0.0072	56.858
EPA5C112A	C	C1	3	1	60.044	0.144	20	AGM	0.0072	59.911
EPA5C113A	C	C1	3	1	58.722	0.145	20	AGM	0.0072	59.007
EPA5C114A	C	C1	3	1	60.752	0.145	20	AGM	0.0072	60.963
EPA5C211A	C	C2	3	2	59.419	0.143	20	AGM	0.0072	59.006
EPA5C212A	C	C2	3	2	61.130	0.141	20	AGM	0.0071	59.856
EPA5C213A	C	C2	3	2	56.996	0.142	20	AGM	0.0071	56.073

Average	**57.804**	
Standard Dev.	**1.870**	
Coeff. of Var. [%]	**3.235**	
Min.	**54.241**	
Max.	**61.130**	
Number of Spec.	**21**	

$Average_{norm}$	**0.0072**	**57.767**
$Standard\ Dev._{norm}$		**2.054**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**3.555**
Min.	**0.0070**	**53.017**
Max.	**0.0074**	**60.963**
Number of Spec.	**21**	**21**


Laminate Filled-Hole Tension Properties (FHT2)--RTD
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
Laminate Filled-Hole Tension Strength [ksi]

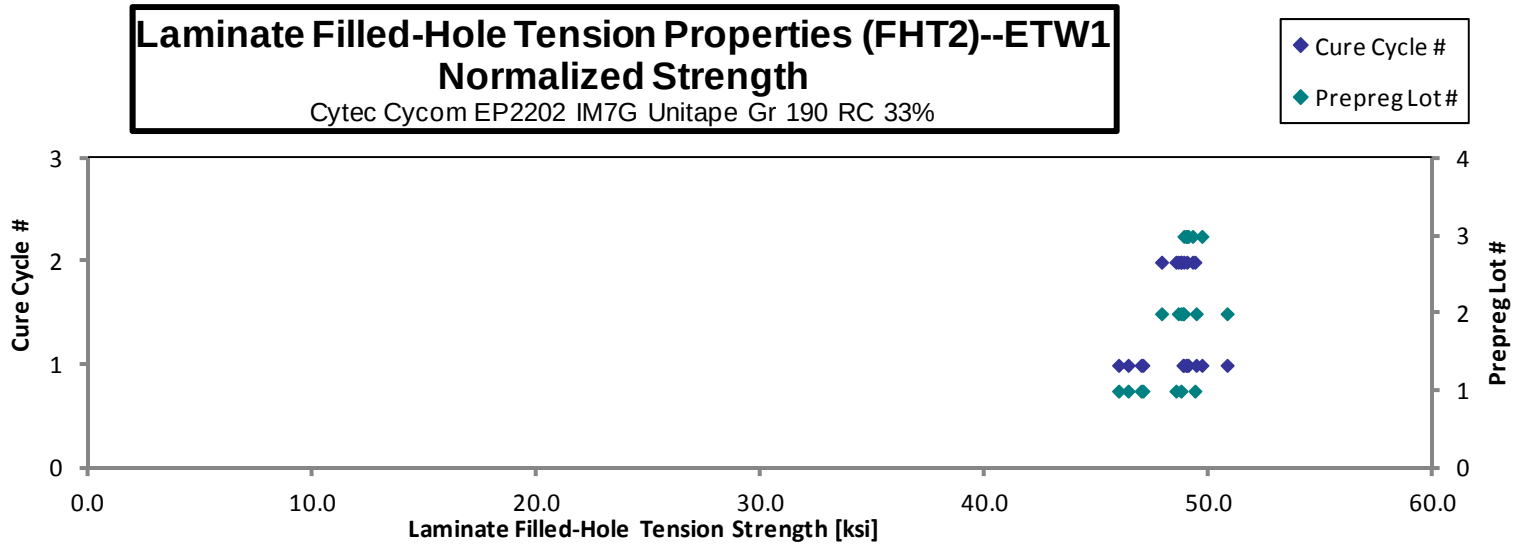
Laminate Filled-Hole Tension Properties (FHT2)--ETW1
Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

normalizing t_{ply} [in]
0.0072

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]
EPA5A11BD	A	C1	1	1	48.014	0.141	20	AGM	0.0070	46.959
EPA5A11CD	A	C1	1	1	48.524	0.140	20	AGM	0.0070	47.035
EPA5A11DD	A	C1	1	1	48.021	0.139	20	AGM	0.0070	46.376
EPA5A11ED	A	C1	1	1	47.092	0.141	20	AGM	0.0070	45.953
EPA5A219D	A	C2	1	2	49.539	0.142	20	AGM	0.0071	48.736
EPA5A21AD	A	C2	1	2	49.196	0.142	20	AGM	0.0071	48.513
EPA5A21BD	A	C2	1	2	49.934	0.142	20	AGM	0.0071	49.356
EPA5B11BD	B	C1	2	1	48.001	0.146	20	AGM	0.0073	48.823
EPA5B11CD	B	C1	2	1	49.962	0.146	20	AGM	0.0073	50.795
EPA5B11DD	B	C1	2	1	47.915	0.147	20	AGM	0.0073	48.852
EPA5B11ED	B	C1	2	1	48.590	0.146	20	AGM	0.0073	49.416
EPA5B219D	B	C2	2	2	46.686	0.148	20	AGM	0.0074	47.870
EPA5B21AD	B	C2	2	2	47.803	0.147	20	AGM	0.0073	48.738
EPA5B21BD	B	C2	2	2	47.629	0.147	20	AGM	0.0073	48.615
EPA5C11BD	C	C1	3	1	49.175	0.143	20	AGM	0.0072	48.970
EPA5C11CD	C	C1	3	1	49.121	0.144	20	AGM	0.0072	48.967
EPA5C11DD	C	C1	3	1	49.169	0.144	20	AGM	0.0072	49.056
EPA5C11ED	C	C1	3	1	49.663	0.144	20	AGM	0.0072	49.669
EPA5C219D	C	C2	3	2	49.925	0.141	20	AGM	0.0071	49.001
EPA5C21AD	C	C2	3	2	49.554	0.142	20	AGM	0.0071	48.866
EPA5C21BD	C	C2	3	2	49.948	0.142	20	AGM	0.0071	49.254

Average	**48.736**	
Standard Dev.	**1.001**	
Coeff. of Var. [%]	**2.054**	
Min.	**46.686**	
Max.	**49.962**	
Number of Spec.	**21**	

$Average_{norm}$	**0.0072**	**48.563**
$Standard\ Dev._{norm}$		**1.142**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**2.352**
Min.	**0.0070**	**45.953**
Max.	**0.0074**	**50.795**
Number of Spec.	**21**	**21**


Laminate Filled-Hole Tension Properties (FHT2)--ETW1
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
10.0
20.0
30.0
40.0
50.0
60.0
Laminate Filled-Hole Tension Strength [ksi]

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

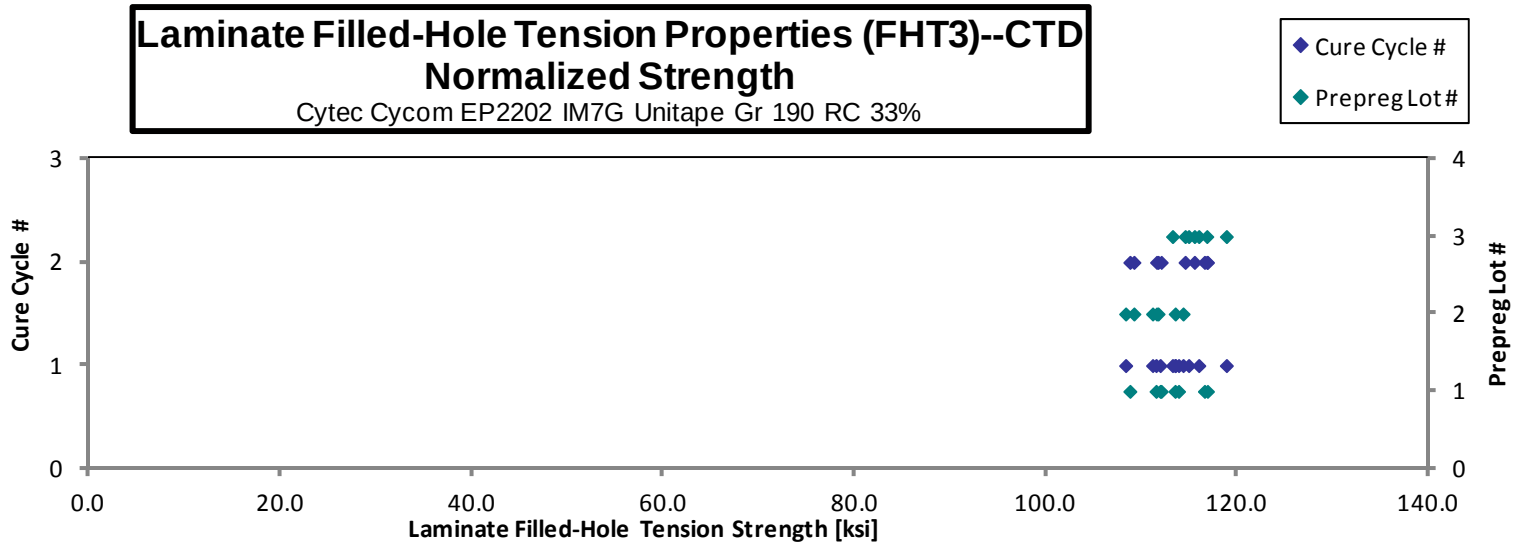
Laminate Filled-Hole Tension Properties (FHT3)--CTD
Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

normalizing t_{ply} [in]
0.0072

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]
EPA6A117B	A	C1	1	1	115.140	0.140	20	AGM	0.0070	111.889
EPA6A118B	A	C1	1	1	116.049	0.141	20	MGM	0.0070	113.443
EPA6A119B	A	C1	1	1	113.485	0.141	20	MGM	0.0071	111.462
EPA6A11AB	A	C1	1	1	116.927	0.140	20	MGM	0.0070	113.814
EPA6A215B	A	C2	1	2	111.043	0.141	20	MGM	0.0071	108.729
EPA6A216B	A	C2	1	2	118.719	0.141	20	MGM	0.0071	116.521
EPA6A217B	A	C2	1	2	119.602	0.141	20	AGM	0.0070	116.834
EPA6A218B	A	C2	1	2	113.580	0.142	20	AGM	0.0071	112.003
EPA6B116B	B	C1	2	1	109.106	0.147	20	MGM	0.0073	111.101
EPA6B117B	B	C1	2	1	107.147	0.146	20	MGM	0.0073	108.288
EPA6B118B	B	C1	2	1	111.175	0.147	20	MGM	0.0073	113.466
EPA6B119B	B	C1	2	1	112.724	0.146	20	MGM	0.0073	114.289
EPA6B215B	B	C2	2	2	110.395	0.146	20	AGM	0.0073	111.673
EPA6B216B	B	C2	2	2	109.740	0.146	20	MGM	0.0073	111.518
EPA6B217B	B	C2	2	2	107.899	0.146	20	AGM	0.0073	109.148
EPA6C116B	C	C1	3	1	119.751	0.143	20	AGM	0.0071	118.808
EPA6C117B	C	C1	3	1	116.235	0.144	20	MGM	0.0072	115.925
EPA6C118B	C	C1	3	1	115.268	0.144	20	MGM	0.0072	114.868
EPA6C119B	C	C1	3	1	113.084	0.144	20	AGM	0.0072	113.188
EPA6C215B	C	C2	3	2	115.301	0.143	20	AGM	0.0072	114.501
EPA6C216B	C	C2	3	2	117.312	0.143	20	MGM	0.0072	116.768
EPA6C217B	C	C2	3	2	116.009	0.143	20	AGM	0.0072	115.472

Average	**113.895**	
Standard Dev.	**3.669**	
Coeff. of Var. [%]	**3.222**	
Min.	**107.147**	
Max.	**119.751**	
Number of Spec.	**22**	

$Average_{norm}$	**0.0072**	**113.350**
$Standard\ Dev._{norm}$		**2.786**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**2.458**
Min.	**0.0070**	**108.288**
Max.	**0.0073**	**118.808**
Number of Spec.	**22**	**22**


Laminate Filled-Hole Tension Properties (FHT3)--CTD
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
20.0
40.0
60.0
80.0
100.0
120.0
140.0
Laminate Filled-Hole Tension Strength [ksi]

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

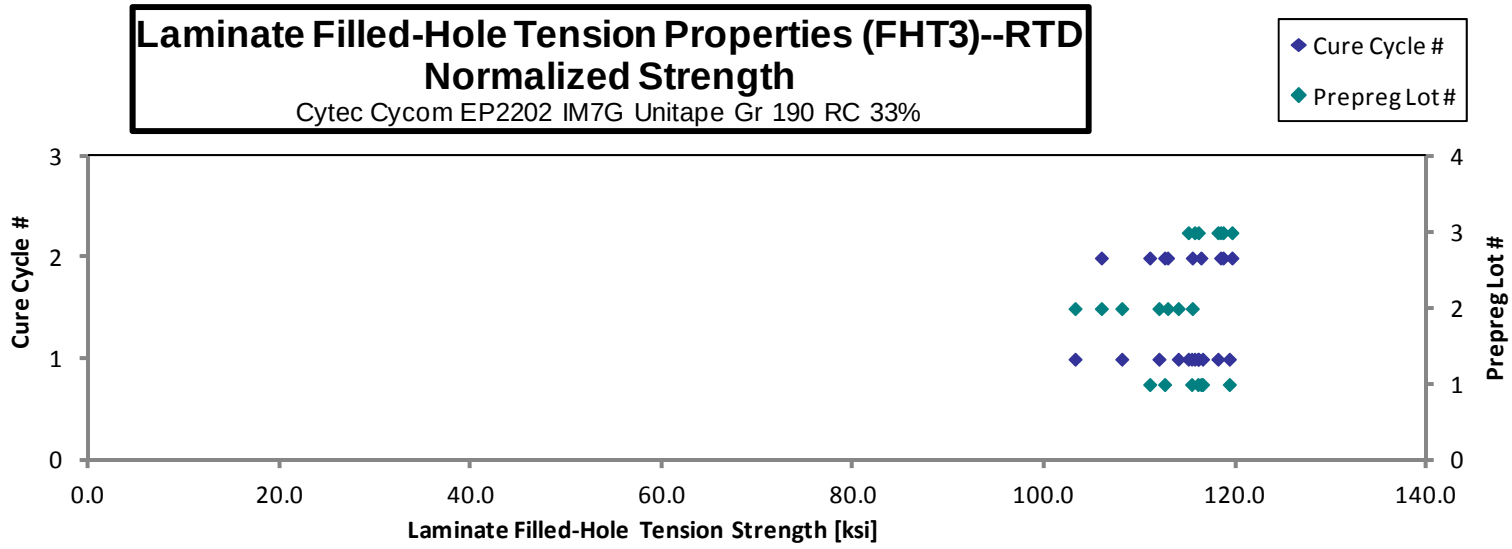
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

normalizing t_{ply} [in]
0.0072

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]
EPA6A112A	A	C1	1	1	118.983	0.141	20	MGM	0.0071	116.504
EPA6A113A	A	C1	1	1	117.868	0.141	20	MGM	0.0070	115.358
EPA6A114A	A	C1	1	1	119.106	0.140	20	MGM	0.0070	116.018
EPA6A115A	A	C1	1	1	121.628	0.141	20	MGM	0.0071	119.306
EPA6A211A	A	C2	1	2	114.119	0.142	20	MGM	0.0071	112.534
EPA6A212A	A	C2	1	2	119.090	0.141	20	MGM	0.0070	116.333
EPA6A213A	A	C2	1	2	113.069	0.141	20	AGM	0.0071	110.975
EPA6B111A	B	C1	2	1	112.272	0.146	20	MGM	0.0073	113.961
EPA6B112A	B	C1	2	1	106.619	0.146	20	AGM	0.0073	108.051
EPA6B113A	B	C1	2	1	110.846	0.145	20	MGM	0.0073	111.936
EPA6B114A	B	C1	2	1	102.699	0.145	20	AGM	0.0072	103.163
EPA6B211A	B	C2	2	2	110.044	0.148	20	MGM	0.0074	112.846
EPA6B212A	B	C2	2	2	104.704	0.146	20	AGM	0.0073	105.916
EPA6B213A	B	C2	2	2	113.332	0.147	20	MGM	0.0073	115.431
EPA6C111A	C	C1	3	1	117.850	0.144	20	AGM	0.0072	118.109
EPA6C112A	C	C1	3	1	116.904	0.143	20	MGM	0.0071	116.065
EPA6C113A	C	C1	3	1	115.544	0.143	20	AGM	0.0072	115.010
EPA6C114A	C	C1	3	1	116.264	0.143	20	AGM	0.0072	115.672
EPA6C211A	C	C2	3	2	117.302	0.145	20	MGM	0.0073	118.388
EPA6C212A	C	C2	3	2	120.414	0.143	20	MGM	0.0072	119.578
EPA6C213A	C	C2	3	2	119.204	0.143	20	MGM	0.0072	118.652

Average	**114.660**	
Standard Dev.	**5.240**	
Coeff. of Var. [%]	**4.570**	
Min.	**102.699**	
Max.	**121.628**	
Number of Spec.	**21**	

$Average_{norm}$	**0.0072**	**114.276**
$Standard\ Dev._{norm}$		**4.349**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**3.806**
Min.	**0.0070**	**103.163**
Max.	**0.0074**	**119.578**
Number of Spec.	**21**	**21**


Laminate Filled-Hole Tension Properties (FHT3)--RTD
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
20.0
40.0
60.0
80.0
100.0
120.0
140.0
Laminate Filled-Hole Tension Strength [ksi]

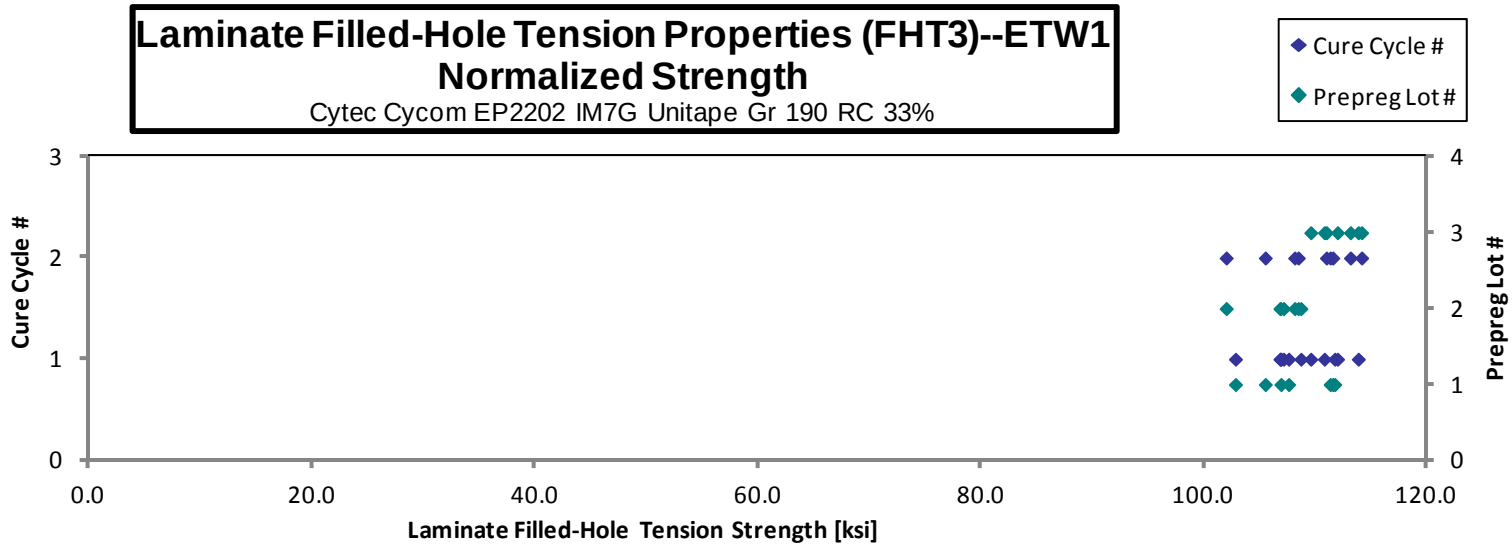
Laminate Filled-Hole Tension Properties (FHT3)--ETW1
Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

normalizing t_{ply} [in]
0.0072

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]
EPA6A11BD	A	C1	1	1	114.102	0.141	20	AGM	0.0070	111.711
EPA6A11CD	A	C1	1	1	109.670	0.140	20	AGM	0.0070	106.890
EPA6A11DD	A	C1	1	1	110.026	0.141	20	AGM	0.0070	107.581
EPA6A11ED	A	C1	1	1	104.663	0.141	20	AGM / DGM	0.0071	102.809
EPA6A219D	A	C2	1	2	113.642	0.141	20	AGM	0.0071	111.537
EPA6A21AD	A	C2	1	2	107.476	0.141	20	AGM / DGM	0.0071	105.486
EPA6A21BD	A	C2	1	2	113.677	0.141	20	AGM	0.0071	111.309
EPA6B11BD	B	C1	2	1	106.128	0.145	20	AGM	0.0073	107.123
EPA6B11CD	B	C1	2	1	106.313	0.145	20	AGM	0.0072	106.855
EPA6B11DD	B	C1	2	1	108.415	0.144	20	AGM	0.0072	108.679
EPA6B11ED	B	C1	2	1	105.292	0.146	20	AGM	0.0073	106.803
EPA6B219D	B	C2	2	2	101.046	0.145	20	AGM	0.0073	101.982
EPA6B21AD	B	C2	2	2	106.394	0.146	20	AGM	0.0073	108.118
EPA6B21BD	B	C2	2	2	106.959	0.146	20	AGM	0.0073	108.444
EPA6C11BD	C	C1	3	1	112.666	0.143	20	AGM	0.0072	111.962
EPA6C11CD	C	C1	3	1	111.451	0.143	20	AGM	0.0072	110.780
EPA6C11DD	C	C1	3	1	114.715	0.143	20	AGM	0.0071	113.825
EPA6C11ED	C	C1	3	1	110.216	0.143	20	AGM	0.0072	109.565
EPA6C219D	C	C2	3	2	114.394	0.144	20	AGM	0.0072	114.129
EPA6C21AD	C	C2	3	2	113.914	0.143	20	AGM	0.0072	113.123
EPA6C21BD	C	C2	3	2	111.743	0.143	20	AGM	0.0072	110.967

Average	**109.662**	
Standard Dev.	**3.880**	
Coeff. of Var. [%]	**3.538**	
Min.	**101.046**	
Max.	**114.715**	
Number of Spec.	**21**	

$Average_{norm}$	**0.0072**	**109.032**
$Standard\ Dev._{norm}$		**3.334**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**3.058**
Min.	**0.0070**	**101.982**
Max.	**0.0073**	**114.129**
Number of Spec.	**21**	**21**


Laminate Filled-Hole Tension Properties (FHT3)--ETW1
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
20.0
40.0
60.0
80.0
100.0
120.0
Laminate Filled-Hole Tension Strength [ksi]

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

Laminate Open-Hole Compression Properties (OHC1)--RTD Strength

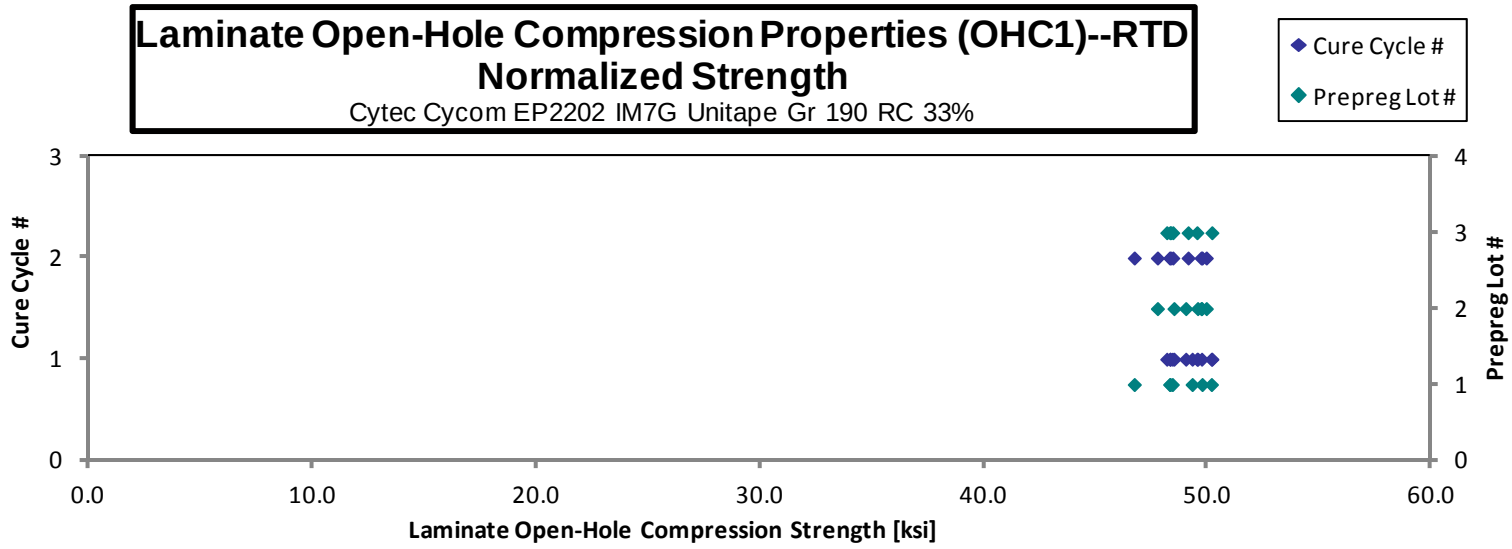
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

normalizing t_{ply} [in]
0.0072

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]
EPAGA111A	A	C1	1	1	49.587	0.169	24	LGM	0.0070	48.425
EPAGA112A	A	C1	1	1	49.380	0.169	24	LGM	0.0070	48.327
EPAGA113A	A	C1	1	1	50.333	0.169	24	AGM	0.0071	49.309
EPAGA114A	A	C1	1	1	51.238	0.169	24	AGM	0.0071	50.171
EPAGA211A	A	C2	1	2	51.028	0.168	24	AGM	0.0070	49.754
EPAGA212A	A	C2	1	2	48.110	0.168	24	MGM	0.0070	46.723
EPAGA213A	A	C2	1	2	49.294	0.169	24	AGM	0.0071	48.305
EPAGB111A	B	C1	2	1	48.606	0.174	24	MGM	0.0073	49.023
EPAGB112A	B	C1	2	1	48.258	0.178	24	LGM	0.0074	49.733
EPAGB113A	B	C1	2	1	47.306	0.177	24	LGM	0.0074	48.497
EPAGB114A	B	C1	2	1	47.009	0.182	24	LGM	0.0076	49.553
EPAGB211A	B	C2	2	2	49.058	0.176	24	LGM	0.0073	49.943
EPAGB212A	B	C2	2	2	47.256	0.175	24	LGM	0.0073	47.757
EPAGB213A	B	C2	2	2	49.053	0.175	24	LGM	0.0073	49.711
EPAGC111A	C	C1	3	1	49.818	0.172	24	AGM	0.0072	49.525
EPAGC112A	C	C1	3	1	48.807	0.171	24	AGM	0.0071	48.317
EPAGC113A	C	C1	3	1	50.727	0.171	24	LGM	0.0071	50.194
EPAGC114A	C	C1	3	1	48.574	0.171	24	AGM	0.0071	48.176
EPAGC211A	C	C2	3	2	48.495	0.172	24	AGM	0.0072	48.350
EPAGC212A	C	C2	3	2	49.430	0.172	24	AGM	0.0072	49.130
EPAGC213A	C	C2	3	2	48.667	0.172	24	AGM	0.0072	48.446

Average	**49.049**	
Standard Dev.	**1.167**	
Coeff. of Var. [%]	**2.379**	
Min.	**47.009**	
Max.	**51.238**	
Number of Spec.	**21**	

$Average_{norm}$	**0.0072**	**48.922**
$Standard\ Dev._{norm}$		**0.894**
Coeff. of Var. $[\%]_{norm}$		**1.827**
Min.	**0.0070**	**46.723**
Max.	**0.0076**	**50.194**
Number of Spec.	**21**	**21**


Laminate Open-Hole Compression Properties (OHC1)--RTD
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
10.0
20.0
30.0
40.0
50.0
60.0
Laminate Open-Hole Compression Strength [ksi]

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

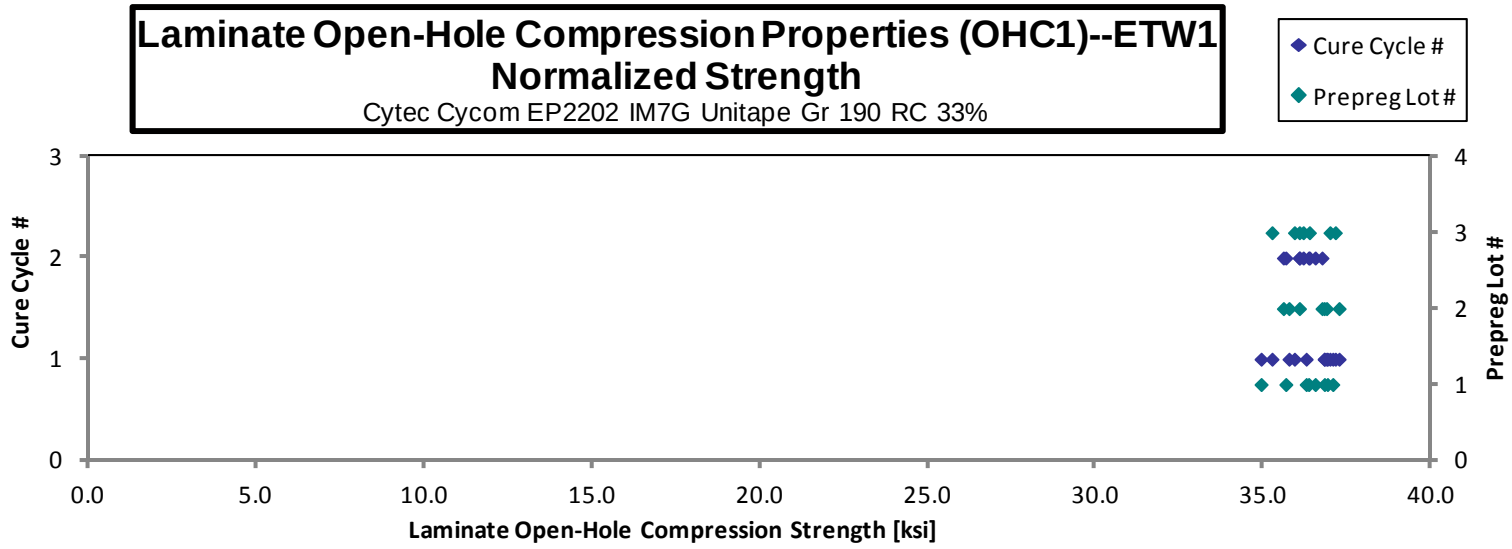
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

normalizing t_{ply} [in]
0.0072

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]
EPAGA117D	A	C1	1	1	37.278	0.168	24	LGM	0.0070	36.271
EPAGA118D	A	C1	1	1	37.901	0.169	24	LGM	0.0070	37.064
EPAGA119D	A	C1	1	1	35.671	0.169	24	LGM	0.0071	34.928
EPAGA11AD	A	C1	1	1	37.713	0.169	24	LGM	0.0070	36.906
EPAGA11BD	A	C1	1	1	37.661	0.169	24	LGM	0.0070	36.815
EPAGA216D	A	C2	1	2	37.173	0.169	24	LGM	0.0070	36.345
EPAGA217D	A	C2	1	2	37.617	0.168	24	LGM	0.0070	36.540
EPAGA218D	A	C2	1	2	36.381	0.169	24	LGM	0.0071	35.665
EPAGB117D	B	C1	2	1	35.906	0.179	24	LGM	0.0075	37.253
EPAGB118D	B	C1	2	1	34.773	0.178	24	LGM	0.0074	35.759
EPAGB119D	B	C1	2	1	35.989	0.177	24	LGM	0.0074	36.878
EPAGB11AD	B	C1	2	1	34.803	0.183	24	LGM	0.0076	36.807
EPAGB216D	B	C2	2	2	35.794	0.174	24	LGM	0.0073	36.070
EPAGB217D	B	C2	2	2	35.338	0.174	24	LGM	0.0073	35.593
EPAGB218D	B	C2	2	2	36.082	0.176	24	LGM	0.0073	36.743
EPAGC117D	C	C1	3	1	37.313	0.172	24	LGM	0.0072	37.141
EPAGC118D	C	C1	3	1	35.466	0.172	24	LGM	0.0072	35.254
EPAGC119D	C	C1	3	1	36.078	0.172	24	LGM	0.0072	35.921
EPAGC11AD	C	C1	3	1	37.289	0.171	24	LGM	0.0071	36.980
EPAGC216D	C	C2	3	2	36.245	0.173	24	LGM	0.0072	36.368
EPAGC217D	C	C2	3	2	36.465	0.171	24	LGM	0.0071	36.068
EPAGC218D	C	C2	3	2	36.441	0.172	24	LGM	0.0071	36.184

Average	**36.426**	
Standard Dev.	**0.946**	
Coeff. of Var. [%]	**2.596**	
Min.	**34.773**	
Max.	**37.901**	
Number of Spec.	**22**	

$Average_{norm}$	**0.0072**	**36.343**
$Standard\ Dev._{norm}$		**0.638**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**1.755**
Min.	**0.0070**	**34.928**
Max.	**0.0076**	**37.253**
Number of Spec.	**22**	**22**


Laminate Open-Hole Compression Properties (OHC1)--ETW1
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
5.0
10.0
15.0
20.0
25.0
30.0
35.0
40.0
Laminate Open-Hole Compression Strength [ksi]

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

Laminate Open-Hole Compression Properties (OHC2)--RTD Strength

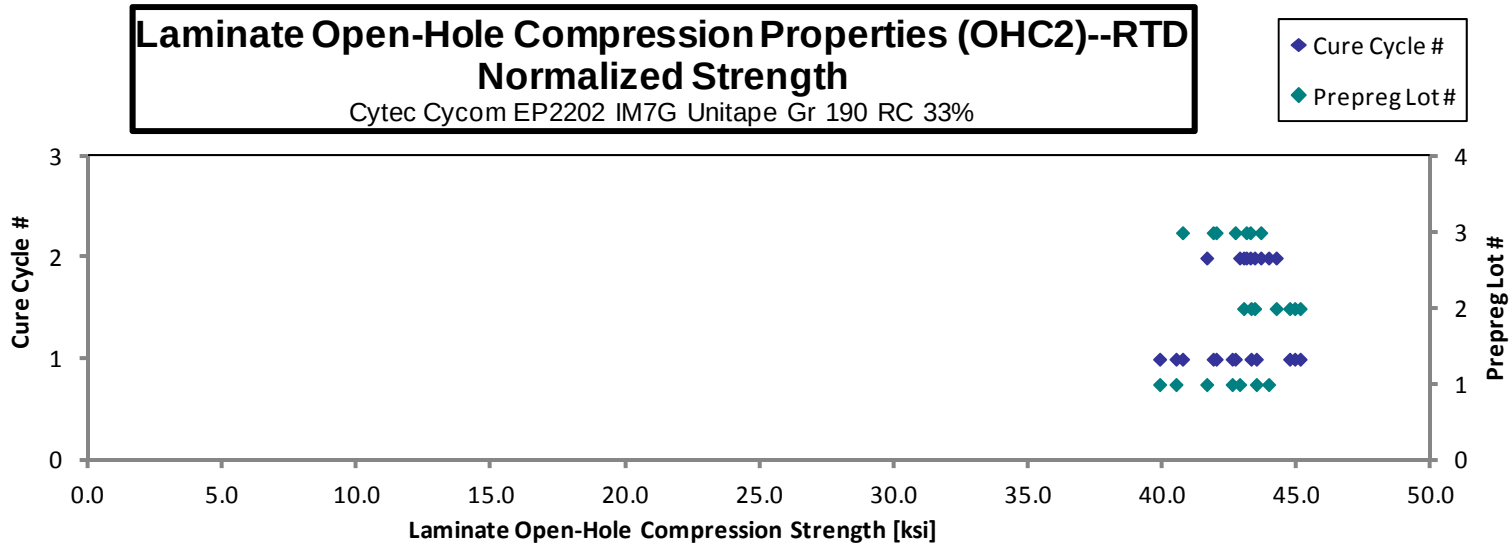
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

normalizing t_{ply} [in]
0.0072

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]
EPAHA111A	A	C1	1	1	41.216	0.141	20	AGM	0.0071	40.490
EPAHA112A	A	C1	1	1	43.305	0.142	20	AGM	0.0071	42.583
EPAHA113A	A	C1	1	1	44.230	0.142	20	AGM	0.0071	43.483
EPAHA114A	A	C1	1	1	40.490	0.142	20	AGM	0.0071	39.881
EPAHA211A	A	C2	1	2	42.840	0.140	20	AGM	0.0070	41.635
EPAHA212A	A	C2	1	2	43.761	0.141	20	AGM	0.0071	42.860
EPAHA213A	A	C2	1	2	44.743	0.141	20	AGM	0.0071	43.940
EPAHB111A	B	C1	2	1	42.282	0.147	20	AGM	0.0074	43.285
EPAHB112A	B	C1	2	1	43.959	0.148	20	AGM	0.0074	45.114
EPAHB113A	B	C1	2	1	43.359	0.149	20	AGM	0.0074	44.724
EPAHB114A	B	C1	2	1	43.645	0.148	20	AGM	0.0074	44.913
EPAHB211A	B	C2	2	2	42.776	0.146	20	AGM	0.0073	43.419
EPAHB212A	B	C2	2	2	43.747	0.146	20	AGM	0.0073	44.223
EPAHB213A	B	C2	2	2	42.416	0.146	20	AGM	0.0073	43.010
EPAHC111A	C	C1	3	1	42.493	0.142	20	AGM	0.0071	41.986
EPAHC112A	C	C1	3	1	42.290	0.143	20	AGM	0.0071	41.874
EPAHC113A	C	C1	3	1	41.216	0.142	20	AGM	0.0071	40.735
EPAHC114A	C	C1	3	1	43.107	0.143	20	AGM	0.0071	42.698
EPAHC211A	C	C2	3	2	43.664	0.143	20	AGM / LGM	0.0071	43.255
EPAHC212A	C	C2	3	2	43.644	0.142	20	AGM	0.0071	43.108
EPAHC213A	C	C2	3	2	44.326	0.142	20	AGM / LGM	0.0071	43.649

Average	**43.024**	
Standard Dev.	**1.101**	
Coeff. of Var. [%]	**2.558**	
Min.	**40.490**	
Max.	**44.743**	
Number of Spec.	**21**	

$Average_{norm}$	**0.0072**	**42.898**
$Standard\ Dev._{norm}$		**1.412**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**3.291**
Min.	**0.0070**	**39.881**
Max.	**0.0074**	**45.114**
Number of Spec.	**21**	**21**


Laminate Open-Hole Compression Properties (OHC2)--RTD
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
5.0
10.0
15.0
20.0
25.0
30.0
35.0
40.0
45.0
50.0
Laminate Open-Hole Compression Strength [ksi]

Laminate Open-Hole Compression Properties (OHC2)--ETW1
Strength

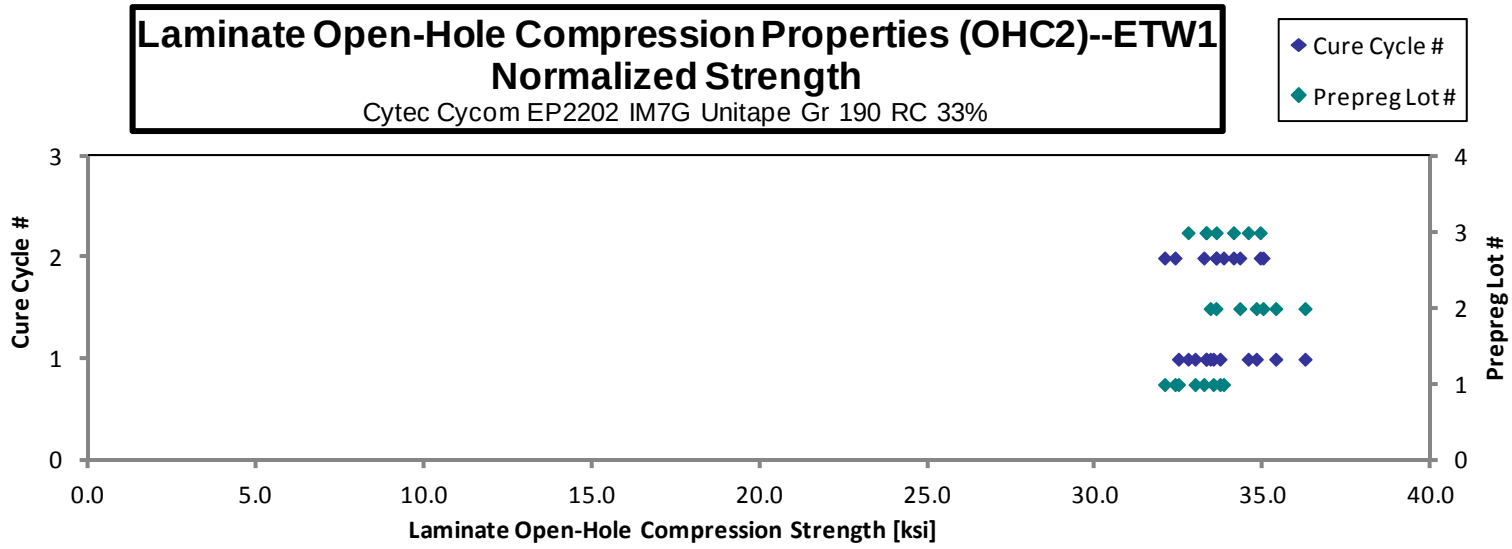
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

normalizing t_{ply} [in]
0.0072

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]
EPAHA117D	A	C1	1	1	33.618	0.141	20	LGM	0.0071	32.961
EPAHA118D	A	C1	1	1	34.134	0.141	20	LGM	0.0071	33.502
EPAHA119D	A	C1	1	1	34.324	0.141	20	AGM	0.0071	33.704
EPAHA11AD	A	C1	1	1	33.071	0.141	20	LGM	0.0071	32.466
EPAHA216D	A	C2	1	2	32.774	0.141	20	LGM	0.0070	32.054
EPAHA217D	A	C2	1	2	33.912	0.141	20	LGM	0.0071	33.221
EPAHA218D	A	C2	1	2	32.989	0.141	20	LGM	0.0071	32.363
EPAHA219D	A	C2	1	2	34.580	0.141	20	MGM	0.0070	33.808
EPAHB117D	B	C1	2	1	32.564	0.148	20	LGM	0.0074	33.412
EPAHB118D	B	C1	2	1	34.506	0.148	20	LGM	0.0074	35.364
EPAHB119D	B	C1	2	1	34.203	0.146	20	LGM	0.0073	34.785
EPAHB11AD	B	C1	2	1	35.817	0.146	20	LGM	0.0073	36.236
EPAHB216D	B	C2	2	2	34.314	0.147	20	LGM	0.0073	34.986
EPAHB217D	B	C2	2	2	32.884	0.147	20	LGM	0.0074	33.584
EPAHB218D	B	C2	2	2	33.544	0.147	20	LGM	0.0074	34.293
EPAHC117D	C	C1	3	1	33.043	0.143	20	AGM	0.0071	32.752
EPAHC118D	C	C1	3	1	33.671	0.142	20	LGM	0.0071	33.289
EPAHC119D	C	C1	3	1	33.688	0.142	20	LGM	0.0071	33.291
EPAHC11AD	C	C1	3	1	34.802	0.143	20	AGM	0.0071	34.545
EPAHC216D	C	C2	3	2	34.337	0.143	20	LGM	0.0072	34.106
EPAHC217D	C	C2	3	2	33.985	0.142	20	MGM	0.0071	33.592
EPAHC218D	C	C2	3	2	35.319	0.142	20	LGM	0.0071	34.902

Average	**33.913**	
Standard Dev.	**0.836**	
Coeff. of Var. [%]	**2.464**	
Min.	**32.564**	
Max.	**35.817**	
Number of Spec.	**22**	

$Average_{norm}$	**0.0072**	**33.782**
$Standard\ Dev._{norm}$		**1.041**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**3.081**
Min.	**0.0070**	**32.054**
Max.	**0.0074**	**36.236**
Number of Spec.	**22**	**22**


Laminate Open-Hole Compression Properties (OHC2)--ETW1
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
5.0
10.0
15.0
20.0
25.0
30.0
35.0
40.0
Laminate Open-Hole Compression Strength [ksi]

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

Laminate Open-Hole Compression Properties (OHC3)--RTD Strength

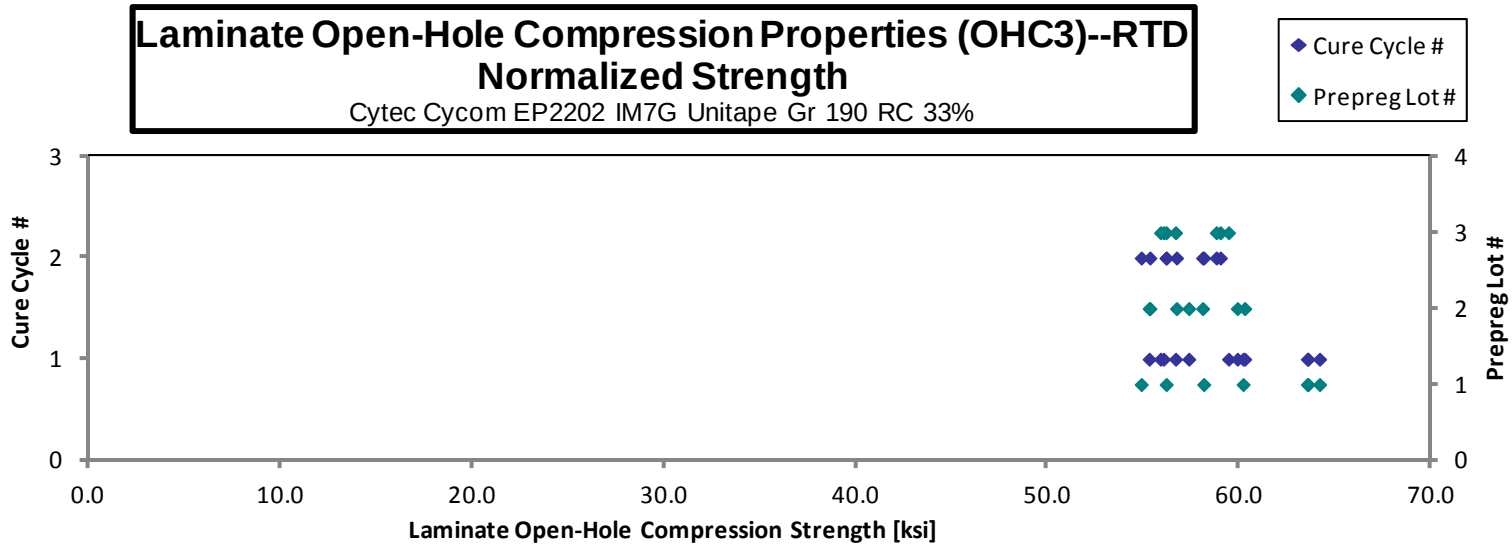
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

normalizing t_{ply} [in]
0.0072

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]
EPAIA111A	A	C1	1	1	64.632	0.142	20	LGM	0.0071	63.540
EPAIA112A	A	C1	1	1	65.395	0.140	20	LGM	0.0070	63.571
EPAIA113A	A	C1	1	1	61.628	0.141	20	AGM	0.0070	60.187
EPAIA114A	A	C1	1	1	65.625	0.141	20	AGM	0.0070	64.175
EPAIA211A	A	C2	1	2	56.088	0.141	20	LGM	0.0070	54.874
EPAIA212A	A	C2	1	2	57.679	0.140	20	AGM / LGM	0.0070	56.176
EPAIA213A	A	C2	1	2	59.215	0.141	20	LGM	0.0071	58.132
EPAIB111A	B	C1	2	1	55.893	0.148	20	LGM	0.0074	57.355
EPAIB112A	B	C1	2	1	59.118	0.147	20	LGM	0.0073	60.268
EPAIB113A	B	C1	2	1	58.925	0.146	20	LGM	0.0073	59.887
EPAIB114A	B	C1	2	1	54.294	0.147	20	AGM	0.0073	55.287
EPAIB211A	B	C2	2	2	54.531	0.150	20	AGM	0.0075	56.715
EPAIB212A	B	C2	2	2	53.614	0.149	20	LGM	0.0074	55.327
EPAIB213A	B	C2	2	2	56.576	0.148	20	LGM	0.0074	58.075
EPAIC111A	C	C1	3	1	56.883	0.143	20	MGM	0.0072	56.665
EPAIC112A	C	C1	3	1	56.653	0.142	20	LGM	0.0071	56.037
EPAIC113A	C	C1	3	1	56.467	0.143	20	MGM	0.0071	55.879
EPAIC114A	C	C1	3	1	59.991	0.143	20	LGM	0.0071	59.428
EPAIC211A	C	C2	3	2	59.275	0.143	20	LGM	0.0072	59.001
EPAIC212A	C	C2	3	2	59.331	0.143	20	LGM	0.0071	58.788
EPAIC213A	C	C2	3	2	57.104	0.142	20	LGM	0.0071	56.172

Average	**58.520**	
Standard Dev.	**3.440**	
Coeff. of Var. [%]	**5.878**	
Min.	**53.614**	
Max.	**65.625**	
Number of Spec.	**21**	

$Average_{norm}$	**0.0072**	**58.359**
$Standard\ Dev._{norm}$		**2.806**
Coeff. of Var. $[\%]_{norm}$		**4.808**
Min.	**0.0070**	**54.874**
Max.	**0.0075**	**64.175**
Number of Spec.	**21**	**21**


Laminate Open-Hole Compression Properties (OHC3)--RTD
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
Laminate Open-Hole Compression Strength [ksi]

Laminate Open-Hole Compression Properties (OHC3)--ETW1
Strength

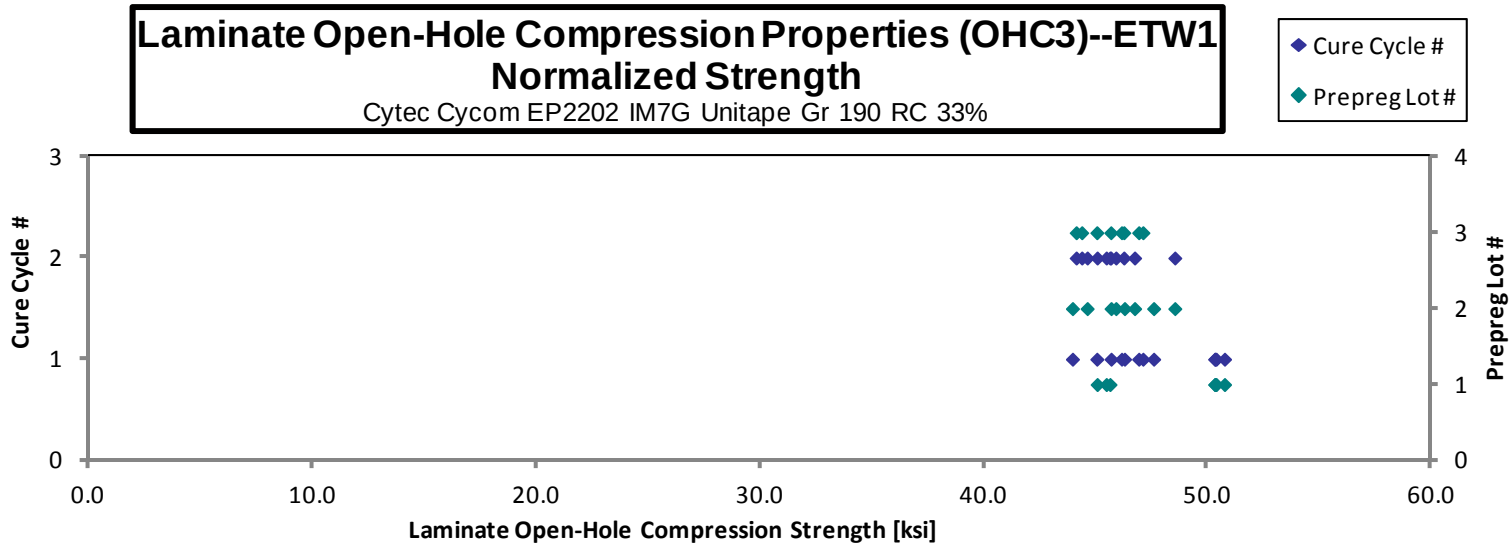
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

normalizing t_{ply} [in]
0.0072

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]
EPAIA117D	A	C1	1	1	51.253	0.142	20	LGM	0.0071	50.381
EPAIA118D	A	C1	1	1	51.489	0.141	20	LGM	0.0070	50.321
EPAIA119D	A	C1	1	1	51.685	0.141	20	LGM	0.0071	50.758
EPAIA11AD	A	C1	1	1	51.429	0.141	20	LGM	0.0070	50.328
EPAIA216D	A	C2	1	2	46.325	0.140	20	LGM	0.0070	45.065
EPAIA217D	A	C2	1	2	46.953	0.140	20	LGM	0.0070	45.638
EPAIA218D	A	C2	1	2	46.594	0.141	20	LGM	0.0070	45.473
EPAIB117D	B	C1	2	1	46.460	0.148	20	LGM	0.0074	47.589
EPAIB118D	B	C1	2	1	44.953	0.146	20	LGM	0.0073	45.686
EPAIB119D	B	C1	2	1	45.453	0.147	20	LGM	0.0073	46.289
EPAIB11AD	B	C1	2	1	43.063	0.147	20	LGM	0.0074	43.960
EPAIB216D	B	C2	2	2	46.719	0.150	20	LGM	0.0075	48.536
EPAIB217D	B	C2	2	2	44.525	0.148	20	LGM	0.0074	45.901
EPAIB218D	B	C2	2	2	43.475	0.148	20	LGM	0.0074	44.617
EPAIB219D	B	C2	2	2	45.546	0.148	20	LGM	0.0074	46.738
EPAIC117D	C	C1	3	1	46.678	0.145	20	LGM	0.0073	47.110
EPAIC118D	C	C1	3	1	47.542	0.142	20	LGM	0.0071	46.920
EPAIC119D	C	C1	3	1	46.776	0.142	20	LGM	0.0071	46.154
EPAIC11AD	C	C1	3	1	45.534	0.142	20	LGM	0.0071	45.049
EPAIC216D	C	C2	3	2	44.452	0.143	20	LGM	0.0071	44.128
EPAIC217D	C	C2	3	2	46.775	0.142	20	LGM	0.0071	46.255
EPAIC218D	C	C2	3	2	45.160	0.142	20	LGM	0.0071	44.376
EPAIC219D	C	C2	3	2	46.091	0.143	20	LGM	0.0071	45.675

Average	**46.736**	
Standard Dev.	**2.480**	
Coeff. of Var. [%]	**5.306**	
Min.	**43.063**	
Max.	**51.685**	
Number of Spec.	**23**	

$Average_{norm}$	**0.0072**	**46.650**
$Standard\ Dev._{norm}$		**2.088**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**4.475**
Min.	**0.0070**	**43.960**
Max.	**0.0075**	**50.758**
Number of Spec.	**23**	**23**


Laminate Open-Hole Compression Properties (OHC3)--ETW1
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
10.0
20.0
30.0
40.0
50.0
60.0
Laminate Open-Hole Compression Strength [ksi]

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

Laminate Filled-Hole Compression Properties (FHC1)--RTD Strength

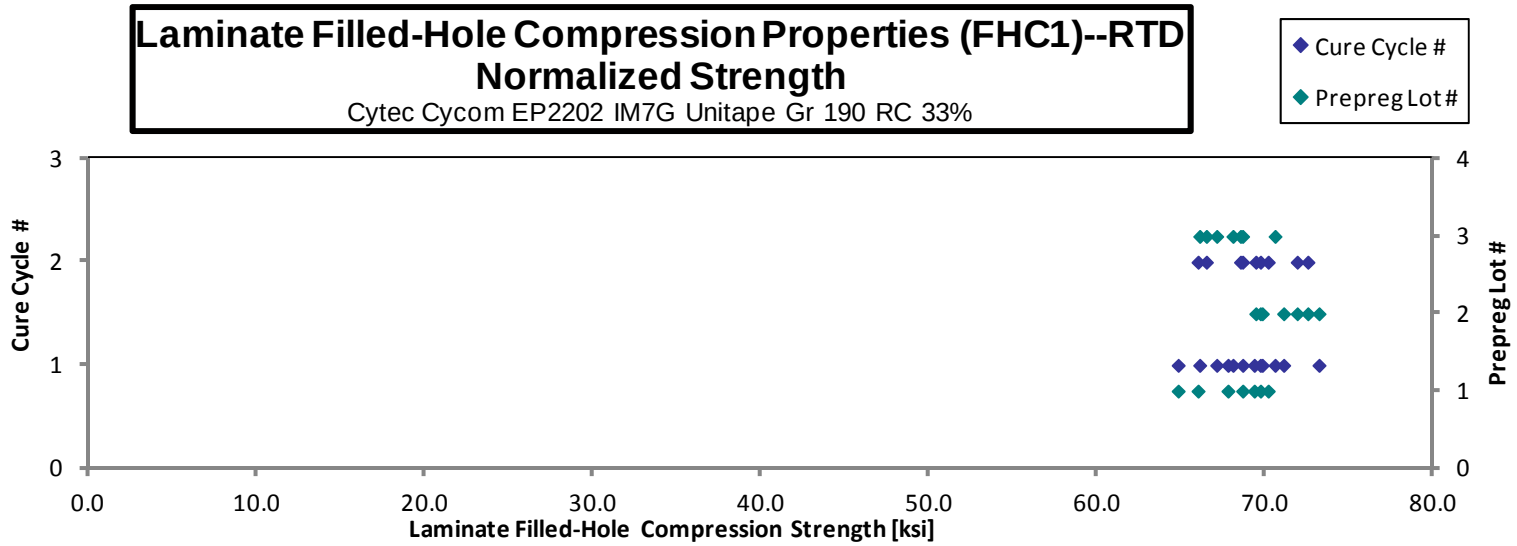
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

normalizing t_{ply} [in]
0.0072

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]
EPA7A111A	A	C1	1	1	71.087	0.169	24	LGM / LGF	0.0070	69.345
EPA7A112A	A	C1	1	1	66.455	0.169	24	LGF	0.0070	64.814
EPA7A113A	A	C1	1	1	69.335	0.169	24	LGF	0.0070	67.777
EPA7A114A	A	C1	1	1	70.030	0.169	24	LGF	0.0071	68.652
EPA7A211A	A	C2	1	2	67.303	0.169	24	LGF	0.0071	65.998
EPA7A212A	A	C2	1	2	71.174	0.169	24	LGF	0.0071	69.711
EPA7A213A	A	C2	1	2	71.616	0.169	24	LGF	0.0071	70.172
EPA7B111A	B	C1	2	1	71.648	0.177	24	LGF	0.0074	73.196
EPA7B112A	B	C1	2	1	69.423	0.177	24	MGF	0.0074	71.091
EPA7B113A	B	C1	2	1	68.300	0.177	24	LGF	0.0074	69.822
EPA7B114A	B	C1	2	1	68.283	0.176	24	MGF	0.0074	69.706
EPA7B211A	B	C2	2	2	70.477	0.176	24	LGF	0.0073	71.898
EPA7B212A	B	C2	2	2	71.411	0.176	24	MGF	0.0073	72.534
EPA7B213A	B	C2	2	2	67.987	0.176	24	LGF	0.0074	69.436
EPA7C111A	C	C1	3	1	70.984	0.172	24	LGF	0.0072	70.580
EPA7C112A	C	C1	3	1	67.763	0.171	24	LGF	0.0071	67.109
EPA7C113A	C	C1	3	1	66.582	0.172	24	LGF	0.0071	66.094
EPA7C114A	C	C1	3	1	68.804	0.171	24	LGF	0.0071	68.074
EPA7C211A	C	C2	3	2	66.731	0.172	24	LGF / AGF	0.0072	66.493
EPA7C212A	C	C2	3	2	69.052	0.171	24	MGF	0.0071	68.526
EPA7C213A	C	C2	3	2	68.961	0.172	24	LGF	0.0072	68.649

Average	**69.210**	
Standard Dev.	**1.721**	
Coeff. of Var. [%]	**2.487**	
Min.	**66.455**	
Max.	**71.648**	
Number of Spec.	**21**	

$Average_{norm}$	**0.0072**	**69.032**
$Standard\ Dev._{norm}$		**2.195**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**3.180**
Min.	**0.0070**	**64.814**
Max.	**0.0074**	**73.196**
Number of Spec.	**21**	**21**


Laminate Filled-Hole Compression Properties (FHC1)--RTD
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
80.0
Laminate Filled-Hole Compression Strength [ksi]

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

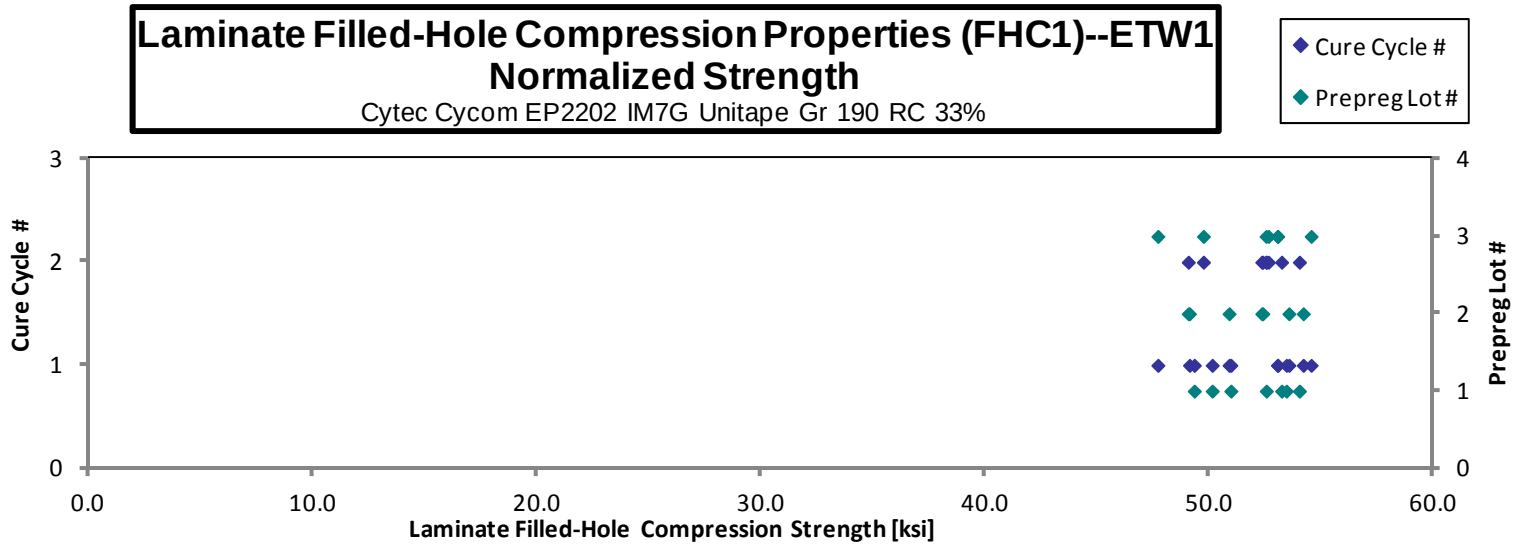
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

normalizing t_{ply} [in]
0.0072

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]
EPA7A117D	A	C1	1	1	52.190	0.169	24	MGF	0.0070	50.962
EPA7A118D	A	C1	1	1	51.278	0.169	24	LGF	0.0070	50.131
EPA7A119D	A	C1	1	1	50.448	0.169	24	MGF	0.0070	49.329
EPA7A11AD	A	C1	1	1	54.425	0.170	24	MGF	0.0071	53.439
EPA7A216D	A	C2	1	2	53.794	0.169	24	MGF	0.0070	52.544
EPA7A217D	A	C2	1	2	55.144	0.169	24	MGF	0.0071	54.022
EPA7A218D	A	C2	1	2	54.565	0.169	24	MGF	0.0070	53.228
EPA7B117D	B	C1	2	1	53.275	0.176	24	MGF	0.0073	54.195
EPA7B118D	B	C1	2	1	50.086	0.176	24	AGF	0.0073	50.883
EPA7B119D	B	C1	2	1	48.400	0.175	24	LGF	0.0073	49.115
EPA7B11AD	B	C1	2	1	52.670	0.176	24	MGF	0.0073	53.554
EPA7B216D	B	C2	2	2	51.552	0.175	24	LGF	0.0073	52.343
EPA7B217D	B	C2	2	2	48.478	0.175	24	LGF	0.0073	49.062
EPA7B218D	B	C2	2	2	51.705	0.175	24	LGF	0.0073	52.389
EPA7C117D	C	C1	3	1	54.820	0.172	24	MGF	0.0072	54.545
EPA7C118D	C	C1	3	1	53.431	0.172	24	MGF	0.0071	53.050
EPA7C119D	C	C1	3	1	53.408	0.172	24	MGF	0.0072	53.048
EPA7C11AD	C	C1	3	1	48.081	0.171	24	LGF	0.0071	47.705
EPA7C216D	C	C2	3	2	52.724	0.172	24	MGF	0.0072	52.531
EPA7C217D	C	C2	3	2	50.178	0.171	24	AGF	0.0071	49.737
EPA7C218D	C	C2	3	2	52.915	0.172	24	MGF	0.0072	52.639

Average	**52.075**	
Standard Dev.	**2.143**	
Coeff. of Var. [%]	**4.115**	
Min.	**48.081**	
Max.	**55.144**	
Number of Spec.	**21**	

$Average_{norm}$	**0.0072**	**51.831**
$Standard\ Dev._{norm}$		**1.971**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**3.803**
Min.	**0.0070**	**47.705**
Max.	**0.0073**	**54.545**
Number of Spec.	**21**	**21**


Laminate Filled-Hole Compression Properties (FHC1)--ETW1
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
10.0
20.0
30.0
40.0
50.0
60.0
Laminate Filled-Hole Compression Strength [ksi]

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

Laminate Filled-Hole Compression Properties (FHC2)--RTD Strength

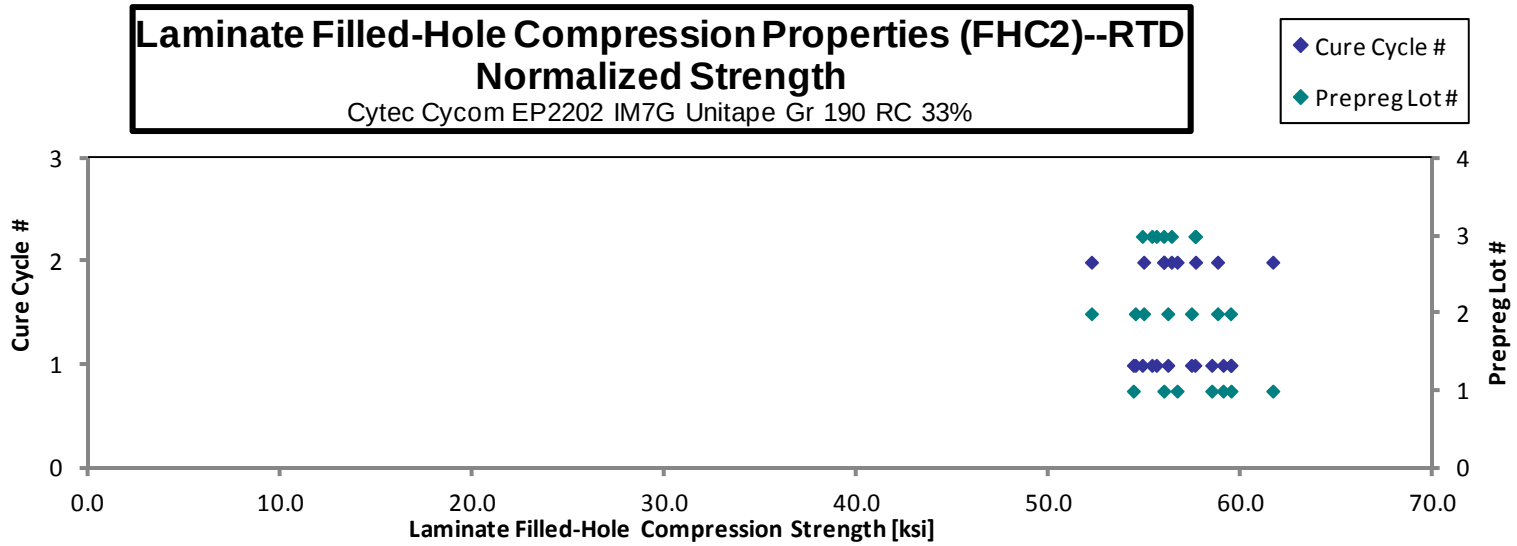
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

normalizing t_{ply} [in]
0.0072

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]
EPA8A111A	A	C1	1	1	59.111	0.142	20	AGM / LGF	0.0071	58.461
EPA8A112A	A	C1	1	1	60.309	0.142	20	AGM	0.0071	59.464
EPA8A113A	A	C1	1	1	55.259	0.142	20	LGF	0.0071	54.376
EPA8A114A	A	C1	1	1	59.883	0.142	20	AGF	0.0071	59.051
EPA8A211A	A	C2	1	2	57.550	0.142	20	MGF	0.0071	56.657
EPA8A212A	A	C2	1	2	56.752	0.142	20	LGF	0.0071	55.964
EPA8A213A	A	C2	1	2	62.389	0.142	20	LGF	0.0071	61.638
EPA8B111A	B	C1	2	1	56.410	0.147	20	AGF	0.0073	57.402
EPA8B112A	B	C1	2	1	58.494	0.146	20	AGF	0.0073	59.442
EPA8B113A	B	C1	2	1	55.257	0.146	20	AGF	0.0073	56.172
EPA8B114A	B	C1	2	1	53.492	0.147	20	AGF / LGF	0.0073	54.483
EPA8B211A	B	C2	2	2	54.525	0.145	20	MGF	0.0073	54.917
EPA8B212A	B	C2	2	2	58.765	0.144	20	AGF	0.0072	58.765
EPA8B213A	B	C2	2	2	51.979	0.145	20	MGF	0.0072	52.196
EPA8C111A	C	C1	3	1	55.849	0.143	20	LGF	0.0071	55.344
EPA8C112A	C	C1	3	1	56.269	0.142	20	LGF	0.0071	55.572
EPA8C113A	C	C1	3	1	55.174	0.143	20	LGF	0.0072	54.842
EPA8C114A	C	C1	3	1	58.201	0.142	20	MGF	0.0071	57.581
EPA8C211A	C	C2	3	2	56.473	0.143	20	LGF	0.0071	55.957
EPA8C212A	C	C2	3	2	56.868	0.143	20	LGF	0.0071	56.361
EPA8C213A	C	C2	3	2	58.014	0.143	20	MGF	0.0072	57.617

Average	**57.001**	
Standard Dev.	**2.413**	
Coeff. of Var. [%]	**4.234**	
Min.	**51.979**	
Max.	**62.389**	
Number of Spec.	**21**	

$Average_{norm}$	**0.0072**	**56.774**
$Standard\ Dev._{norm}$		**2.194**
Coeff. of Var. $[\%]_{norm}$		**3.864**
Min.	**0.0071**	**52.196**
Max.	**0.0073**	**61.638**
Number of Spec.	**21**	**21**


Laminate Filled-Hole Compression Properties (FHC2)--RTD
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
Laminate Filled-Hole Compression Strength [ksi]

Laminate Filled-Hole Compression Properties (FHC2)--ETW1
Strength

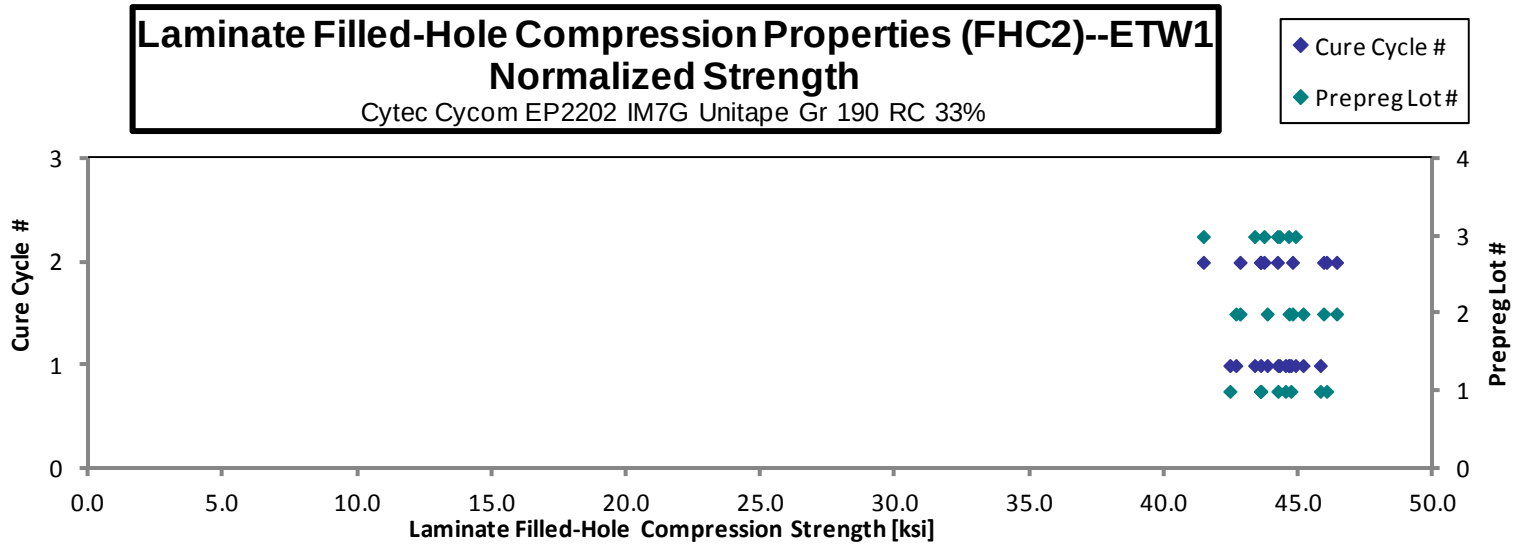
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

normalizing t_{ply} [in]
0.0072

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]
EPA8A117D	A	C1	1	1	45.013	0.142	20	MGF	0.0071	44.497
EPA8A118D	A	C1	1	1	45.474	0.142	20	MGF	0.0071	44.700
EPA8A119D	A	C1	1	1	46.678	0.141	20	AGF	0.0071	45.797
EPA8A11AD	A	C1	1	1	44.353	0.141	20	MGF	0.0071	43.577
EPA8A11BD	A	C1	1	1	44.867	0.142	20	AGF	0.0071	44.218
EPA8A11CD	A	C1	1	1	43.030	0.142	20	AGF / LGF	0.0071	42.432
EPA8A216D	A	C2	1	2	46.694	0.142	20	MGF	0.0071	46.030
EPA8A217D	A	C2	1	2	44.213	0.142	20	AGF	0.0071	43.578
EPA8A218D	A	C2	1	2	44.299	0.142	20	AGF	0.0071	43.565
EPA8B117D	B	C1	2	1	42.917	0.147	20	LGF / AGF	0.0074	43.821
EPA8B118D	B	C1	2	1	41.732	0.147	20	LGF / AGF	0.0074	42.654
EPA8B119D	B	C1	2	1	44.313	0.147	20	LGF / AGF	0.0073	45.154
EPA8B11AD	B	C1	2	1	44.069	0.146	20	MGF	0.0073	44.635
EPA8B217D	B	C2	2	2	44.447	0.145	20	AGF	0.0073	44.761
EPA8B218D	B	C2	2	2	45.807	0.146	20	MGF	0.0073	46.401
EPA8B219D	B	C2	2	2	42.296	0.146	20	MGF	0.0073	42.810
EPA8B21AD	B	C2	2	2	45.711	0.145	20	MGF	0.0072	45.918
EPA8C117D	C	C1	3	1	43.874	0.142	20	MGF	0.0071	43.351
EPA8C118D	C	C1	3	1	45.186	0.142	20	AGF / LGF	0.0071	44.615
EPA8C119D	C	C1	3	1	44.774	0.142	20	AGF	0.0071	44.277
EPA8C11AD	C	C1	3	1	45.222	0.143	20	AGF / LGF	0.0071	44.871
EPA8C216D	C	C2	3	2	44.510	0.143	20	AGF	0.0072	44.201
EPA8C217D	C	C2	3	2	41.570	0.144	20	AGF	0.0072	41.445
EPA8C218D	C	C2	3	2	44.144	0.143	20	AGF	0.0071	43.704

	Strength [ksi]
Average	**44.383**
Standard Dev.	**1.343**
Coeff. of Var. [%]	**3.026**
Min.	**41.570**
Max.	**46.694**
Number of Spec.	**24**

	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
$Average_{norm}$	**0.0072**	**44.209**
$Standard\ Dev._{norm}$		**1.205**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**2.726**
Min.	**0.0071**	**41.445**
Max.	**0.0074**	**46.401**
Number of Spec.	**24**	**24**


Laminate Filled-Hole Compression Properties (FHC2)--ETW1
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
5.0
10.0
15.0
20.0
25.0
30.0
35.0
40.0
45.0
50.0
Laminate Filled-Hole Compression Strength [ksi]

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

Laminate Filled-Hole Compression Properties (FHC3)--RTD Strength

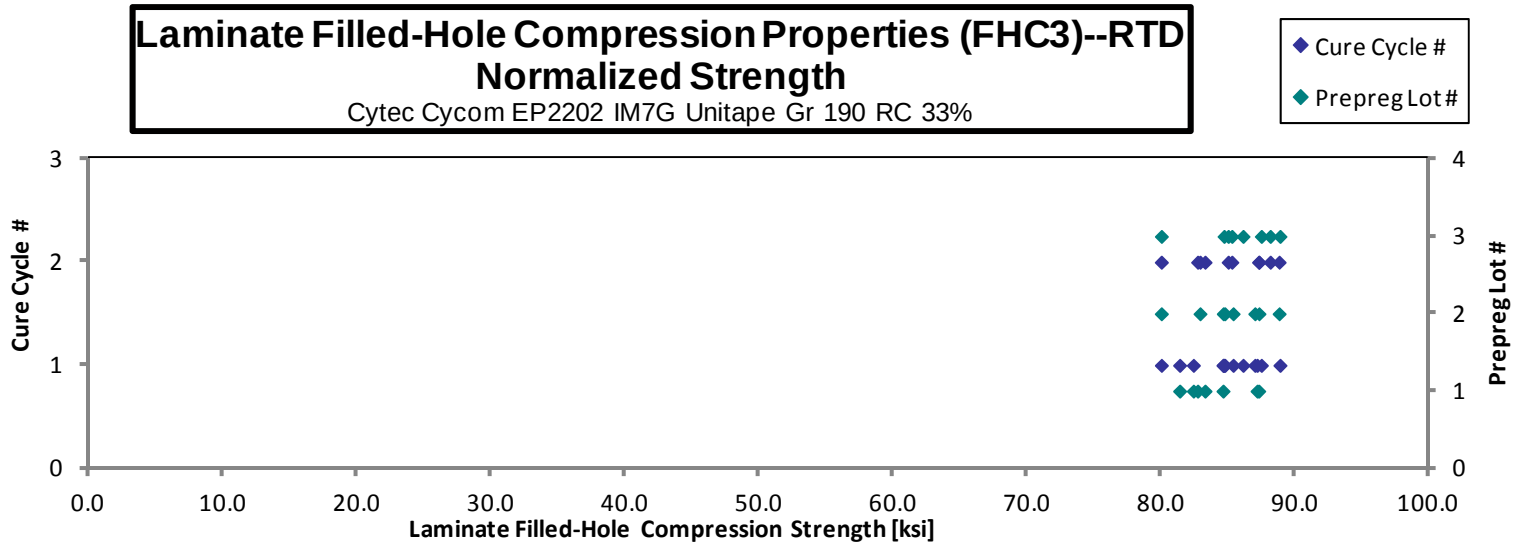
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

normalizing t_{ply} [in]
0.0072

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]
EPA9A111A	A	C1	1	1	84.565	0.140	20	LGF	0.0070	82.402
EPA9A112A	A	C1	1	1	87.523	0.139	20	LGF	0.0070	84.616
EPA9A113A	A	C1	1	1	83.705	0.140	20	AGM / LGF	0.0070	81.380
EPA9A114A	A	C1	1	1	89.213	0.141	20	LGM / LGF	0.0070	87.159
EPA9A211A	A	C2	1	2	85.276	0.141	20	LGF	0.0070	83.272
EPA9A212A	A	C2	1	2	89.207	0.141	20	LGF	0.0070	87.276
EPA9A213A	A	C2	1	2	84.659	0.141	20	LGF	0.0070	82.719
EPA9B111A	B	C1	2	1	85.650	0.146	20	LGF	0.0073	86.989
EPA9B112A	B	C1	2	1	83.612	0.146	20	LGF	0.0073	84.744
EPA9B113A	B	C1	2	1	83.771	0.145	20	LGF	0.0073	84.634
EPA9B114A	B	C1	2	1	84.634	0.145	20	LGF	0.0073	85.368
EPA9B211A	B	C2	2	2	86.576	0.145	20	LGF	0.0073	87.298
EPA9B212A	B	C2	2	2	80.667	0.148	20	LGF	0.0074	82.898
EPA9B213A	B	C2	2	2	77.902	0.148	20	LGF	0.0074	80.011
EPA9B214A	B	C2	2	2	86.990	0.147	20	LGF	0.0074	88.802
EPA9C111A	C	C1	3	1	86.658	0.143	20	LGF	0.0072	86.106
EPA9C112A	C	C1	3	1	80.697	0.143	20	LGF	0.0071	80.015
EPA9C113A	C	C1	3	1	89.938	0.142	20	LGF	0.0071	88.866
EPA9C114A	C	C1	3	1	85.431	0.143	20	LGF	0.0071	84.689
EPA9C115A	C	C1	3	1	88.613	0.142	20	MGF	0.0071	87.475
EPA9C211A	C	C2	3	2	88.919	0.143	20	LGF	0.0071	88.137
EPA9C212A	C	C2	3	2	86.606	0.142	20	LGF	0.0071	85.273
EPA9C213A	C	C2	3	2	85.765	0.143	20	LGF	0.0071	85.001

Average	**85.503**	
Standard Dev.	**2.978**	
Coeff. of Var. [%]	**3.483**	
Min.	**77.902**	
Max.	**89.938**	
Number of Spec.	**23**	

$Average_{norm}$	**0.0072**	**85.006**
$Standard\ Dev._{norm}$		**2.598**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**3.056**
Min.	**0.0070**	**80.011**
Max.	**0.0074**	**88.866**
Number of Spec.	**23**	**23**


Laminate Filled-Hole Compression Properties (FHC3)--RTD
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
80.0
90.0
100.0
Laminate Filled-Hole Compression Strength [ksi]

Laminate Filled-Hole Compression Properties (FHC3)--ETW1
Strength

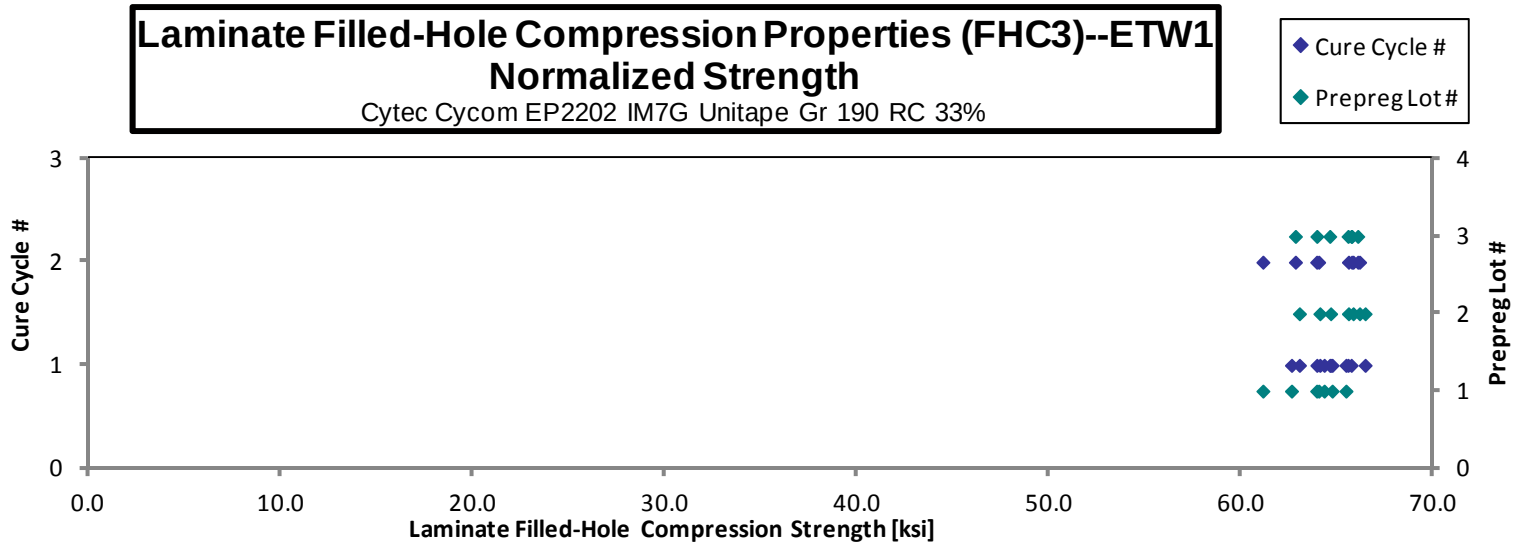
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

normalizing t_{ply} [in]
0.0072

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]
EPA9A117D	A	C1	1	1	64.204	0.140	20	MGF	0.0070	62.614
EPA9A118D	A	C1	1	1	67.448	0.140	20	AGF / LGF	0.0070	65.450
EPA9A119D	A	C1	1	1	66.699	0.140	20	MGF	0.0070	64.730
EPA9A11AD	A	C1	1	1	66.079	0.140	20	MGF	0.0070	64.312
EPA9A216D	A	C2	1	2	62.387	0.141	20	MGF	0.0071	61.124
EPA9A217D	A	C2	1	2	65.302	0.141	20	MGF	0.0070	63.926
EPA9A218D	A	C2	1	2	65.353	0.141	20	AGF	0.0071	64.029
EPA9B117D	B	C1	2	1	62.884	0.148	20	MGF	0.0074	64.652
EPA9B118D	B	C1	2	1	63.606	0.145	20	LGF	0.0073	64.092
EPA9B119D	B	C1	2	1	66.028	0.145	20	LGF	0.0072	66.449
EPA9B11AD	B	C1	2	1	62.742	0.145	20	AGF	0.0072	63.025
EPA9B216D	B	C2	2	2	64.555	0.146	20	MGF	0.0073	65.579
EPA9B217D	B	C2	2	2	65.549	0.145	20	MGF	0.0072	65.822
EPA9B218D	B	C2	2	2	64.786	0.147	20	LGF	0.0074	66.158
EPA9C117D	C	C1	3	1	66.111	0.143	20	MGF	0.0072	65.721
EPA9C118D	C	C1	3	1	66.366	0.142	20	MGF	0.0071	65.559
EPA9C119D	C	C1	3	1	65.417	0.142	20	MGF	0.0071	64.607
EPA9C11AD	C	C1	3	1	64.210	0.143	20	AGF	0.0072	63.935
EPA9C216D	C	C2	3	2	66.303	0.143	20	AGF	0.0072	66.065
EPA9C217D	C	C2	3	2	66.685	0.142	20	AGF	0.0071	65.751
EPA9C218D	C	C2	3	2	63.687	0.142	20	AGM	0.0071	62.818

Average	**65.067**	
Standard Dev.	**1.430**	
Coeff. of Var. [%]	**2.198**	
Min.	**62.387**	
Max.	**67.448**	
Number of Spec.	**21**	

$Average_{norm}$	**0.0071**	**64.591**
$Standard\ Dev._{norm}$		**1.377**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**2.132**
Min.	**0.0070**	**61.124**
Max.	**0.0074**	**66.449**
Number of Spec.	**21**	**21**


Laminate Filled-Hole Compression Properties (FHC3)--ETW1
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
Laminate Filled-Hole Compression Strength [ksi]

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

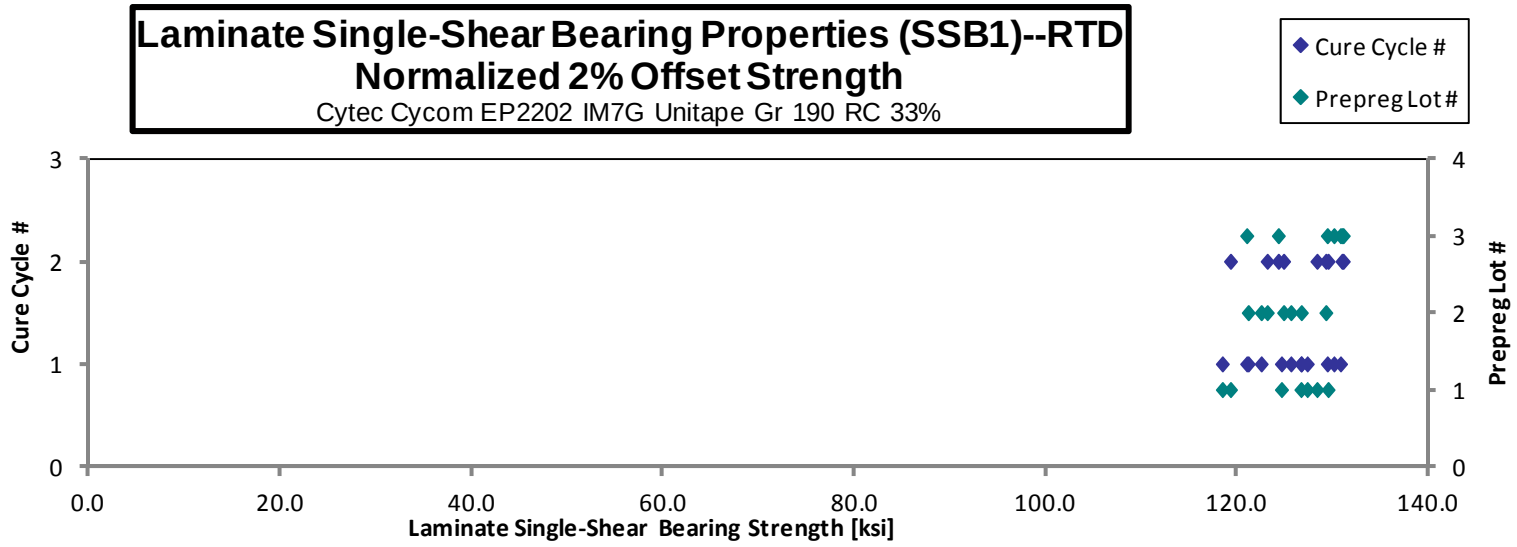
Laminate Single-Shear Bearing Properties (SSB1)--RTD Strength

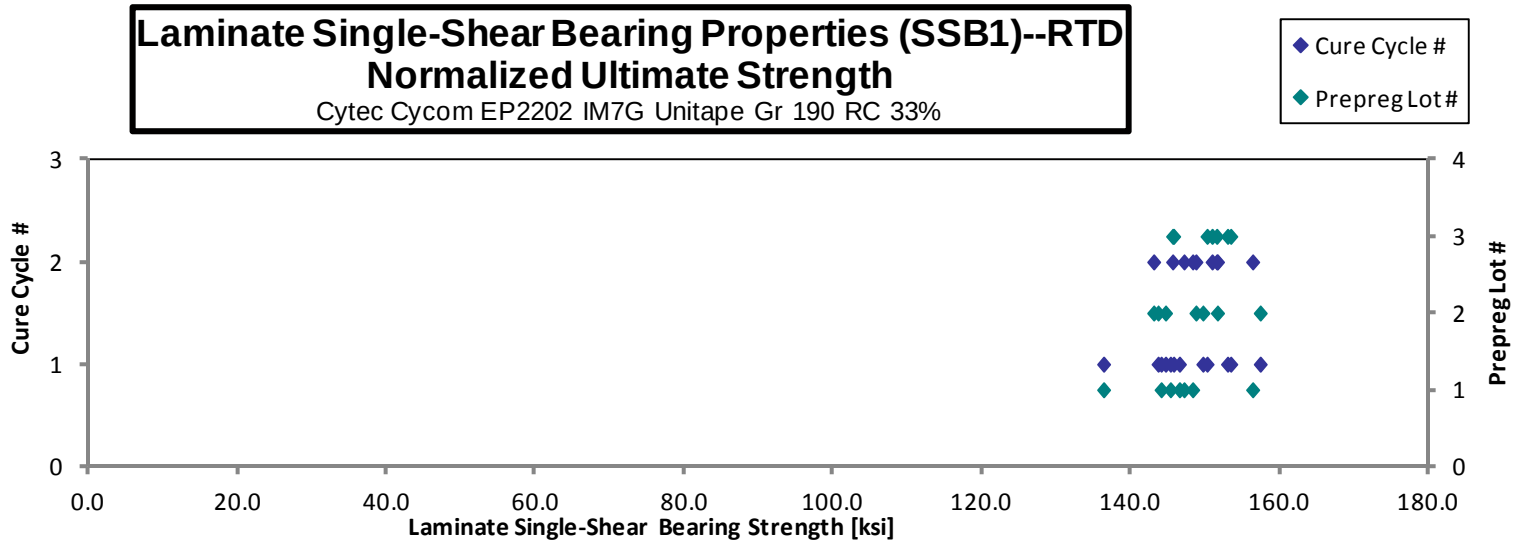
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

normalizing t_{ply} [in]
0.0072

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]
EPA1A111A	A	C1	1	1	121.504	139.845	0.112	16	B1I	0.0070	118.393	136.264
EPA1A112A	A	C1	1	1	128.895	149.109	0.113	16	B1I	0.0071	126.601	146.455
EPA1A113A	A	C1	1	1	129.216	146.218	0.113	16	B1I	0.0071	127.253	143.996
EPA1A114A	A	C1	1	1	126.452	147.435	0.113	16	B1I	0.0071	124.567	145.238
EPA1A211A	A	C2	1	2	131.762	149.711	0.113	16	B1I	0.0071	129.436	147.069
EPA1A212A	A	C2	1	2	131.371	160.066	0.112	16	B1I	0.0070	128.273	156.291
EPA1A213A	A	C2	1	2	121.452	150.977	0.113	16	B1I	0.0071	119.238	148.225
EPA1B111A	B	C1	2	1	119.693	142.913	0.117	16	B1I	0.0073	121.096	144.588
EPA1B112A	B	C1	2	1	124.237	142.085	0.116	16	B1I	0.0073	125.549	143.585
EPA1B113A	B	C1	2	1	121.589	148.547	0.116	16	B1I	0.0073	122.451	149.600
EPA1B114A	B	C1	2	1	125.026	155.306	0.117	16	B1I	0.0073	126.635	157.306
EPA1B211A	B	C2	2	2	128.461	147.815	0.116	16	B1I	0.0072	129.204	148.670
EPA1B212A	B	C2	2	2	123.330	143.289	0.115	16	B1I	0.0072	123.080	142.998
EPA1B213A	B	C2	2	2	124.518	151.233	0.115	16	B1I	0.0072	124.788	151.561
EPA1C111A	C	C1	3	1	120.257	144.857	0.116	16	B1I	0.0072	120.936	145.675
EPA1C112A	C	C1	3	1	130.335	152.881	0.116	16	B1I	0.0072	130.731	153.345
EPA1C113A	C	C1	3	1	129.024	151.708	0.116	16	B1I	0.0073	130.050	152.915
EPA1C114A	C	C1	3	1	128.571	149.254	0.116	16	B1I	0.0072	129.352	150.161
EPA1C211A	C	C2	3	2	122.468	143.462	0.117	16	B1I	0.0073	124.240	145.538
EPA1C212A	C	C2	3	2	129.820	149.602	0.116	16	B1I	0.0073	130.891	150.835
EPA1C213A	C	C2	3	2	129.167	149.321	0.117	16	B1I	0.0073	131.017	151.460

Average	**126.055**	**148.363**	**Average$_{norm}$**	**0.0072**	**125.894**	**148.180**
Standard Dev.	**3.906**	**4.728**	**Standard Dev.$_{norm}$**		**3.935**	**4.899**
Coeff. of Var. [%]	**3.098**	**3.186**	**Coeff. of Var. [%]$_{norm}$**		**3.126**	**3.306**
Min.	**119.693**	**139.845**	**Min.**	**0.0070**	**118.393**	**136.264**
Max.	**131.762**	**160.066**	**Max.**	**0.0073**	**131.017**	**157.306**
Number of Spec.	**21**	**21**	**Number of Spec.**	**21**	**21**	**21**


Laminate Single-Shear Bearing Properties (SSB1)--RTD
Normalized 2% Offset Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Single-Shear Bearing Strength [ksi]
0.0
20.0
40.0
60.0
80.0
100.0
120.0
140.0


Laminate Single-Shear Bearing Properties (SSB1)--RTD
Normalized Ultimate Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Single-Shear Bearing Strength [ksi]
0.0
20.0
40.0
60.0
80.0
100.0
120.0
140.0
160.0
180.0

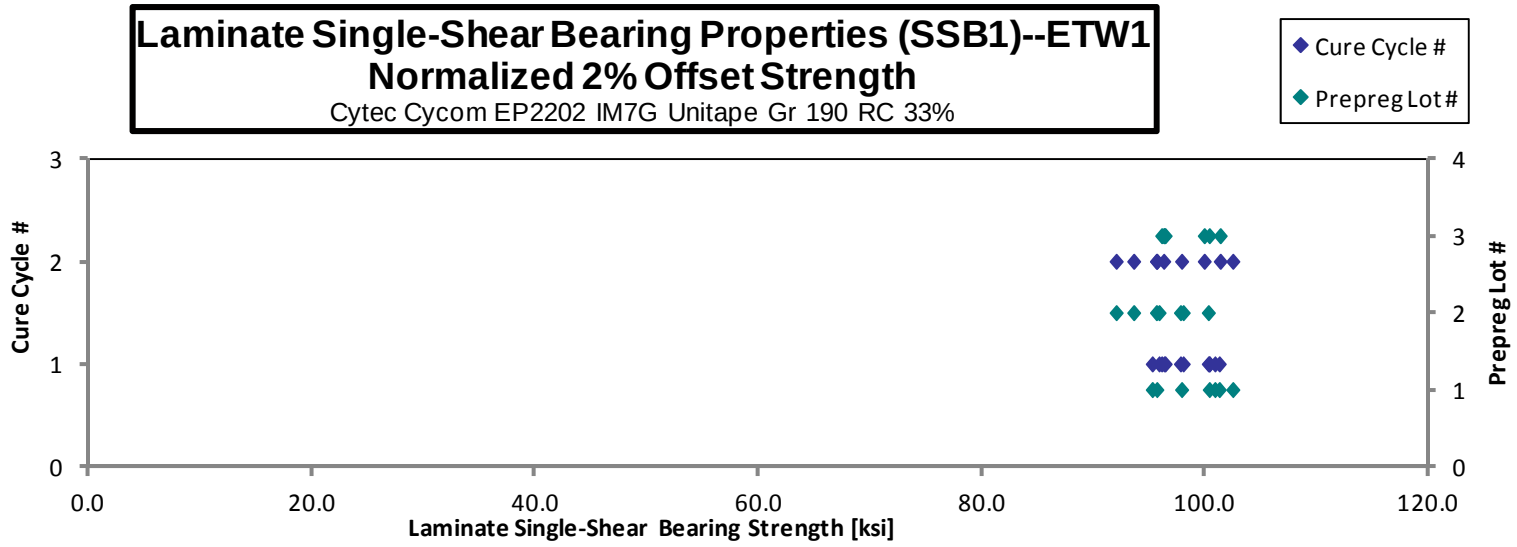
Laminate Single-Shear Bearing Properties (SSB1)--ETW1 Strength

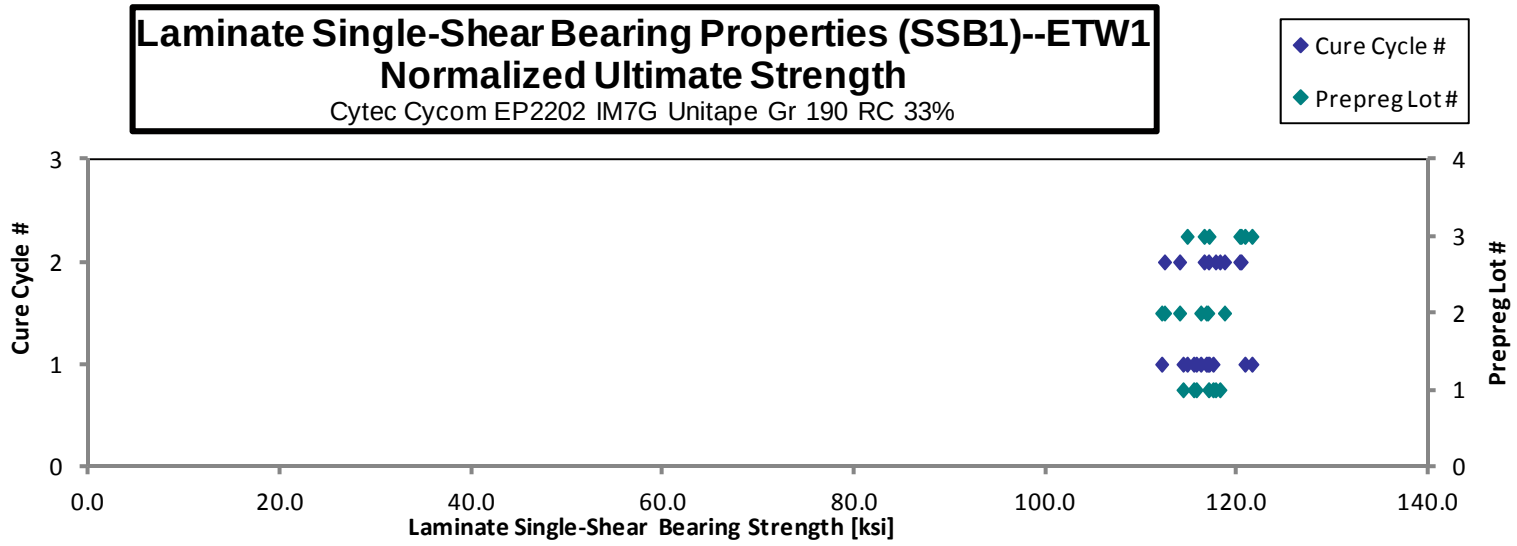
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

normalizing t_{ply} [in]
0.0072

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]
EPA1A116D	A	C1	1	1	98.315	118.026	0.112	16	B1I	0.0070	95.200	114.287
EPA1A117D	A	C1	1	1	103.569	118.374	0.113	16	B1I	0.0070	101.201	115.668
EPA1A118D	A	C1	1	1	103.093	118.013	0.113	16	B1I	0.0070	100.811	115.401
EPA1A119D	A	C1	1	1	102.687	120.206	0.113	16	B1I	0.0070	100.310	117.423
EPA1A215D	A	C2	1	2	97.933	119.798	0.112	16	B1I	0.0070	95.610	116.956
EPA1A216D	A	C2	1	2	104.238	120.235	0.113	16	B1I	0.0071	102.413	118.130
EPA1A217D	A	C2	1	2	100.191	120.521	0.112	16	B1I	0.0070	97.829	117.679
EPA1B116D	B	C1	2	1	97.136	116.151	0.116	16	B1I	0.0072	97.726	116.857
EPA1B117D	B	C1	2	1	100.149	111.971	0.115	16	B1I	0.0072	100.221	112.052
EPA1B118D	B	C1	2	1	98.013	116.759	0.115	16	B1I	0.0072	97.971	116.708
EPA1B119D	B	C1	2	1	94.838	114.952	0.116	16	B1I	0.0073	95.812	116.133
EPA1B215D	B	C2	2	2	94.995	117.900	0.116	16	B1I	0.0072	95.572	118.616
EPA1B216D	B	C2	2	2	92.024	113.990	0.115	16	B1I	0.0072	91.971	113.924
EPA1B217D	B	C2	2	2	94.004	112.900	0.115	16	B1I	0.0072	93.542	112.344
EPA1C116D	C	C1	3	1	95.726	121.079	0.116	16	B1I	0.0072	96.044	121.481
EPA1C117D	C	C1	3	1	96.215	114.549	0.115	16	B1I	0.0072	96.355	114.715
EPA1C118D	C	C1	3	1	95.841	120.210	0.116	16	B1I	0.0072	96.271	120.749
EPA1C119D	C	C1	3	1	99.477	116.029	0.116	16	B1I	0.0073	100.311	117.003
EPA1C215D	C	C2	3	2	98.826	118.970	0.116	16	B1I	0.0073	99.855	120.210
EPA1C216D	C	C2	3	2	100.092	118.926	0.117	16	B1I	0.0073	101.293	120.354
EPA1C217D	C	C2	3	2	95.139	115.166	0.117	16	B1I	0.0073	96.226	116.482

Average	**98.214**	**117.368**	**Average$_{norm}$**	**0.0072**	**97.740**	**116.818**
Standard Dev.	**3.364**	**2.682**	**Standard Dev.$_{norm}$**		**2.823**	**2.581**
Coeff. of Var. [%]	**3.425**	**2.285**	**Coeff. of Var. [%]$_{norm}$**		**2.888**	**2.209**
Min.	**92.024**	**111.971**	**Min.**	**0.0070**	**91.971**	**112.052**
Max.	**104.238**	**121.079**	**Max.**	**0.0073**	**102.413**	**121.481**
Number of Spec.	**21**	**21**	**Number of Spec.**	**21**	**21**	**21**


Laminate Single-Shear Bearing Properties (SSB1)--ETW1
Normalized 2% Offset Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
20.0
40.0
60.0
80.0
100.0
120.0
Laminate Single-Shear Bearing Strength [ksi]


Laminate Single-Shear Bearing Properties (SSB1)--ETW1
Normalized Ultimate Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
20.0
40.0
60.0
80.0
100.0
120.0
140.0
Laminate Single-Shear Bearing Strength [ksi]

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

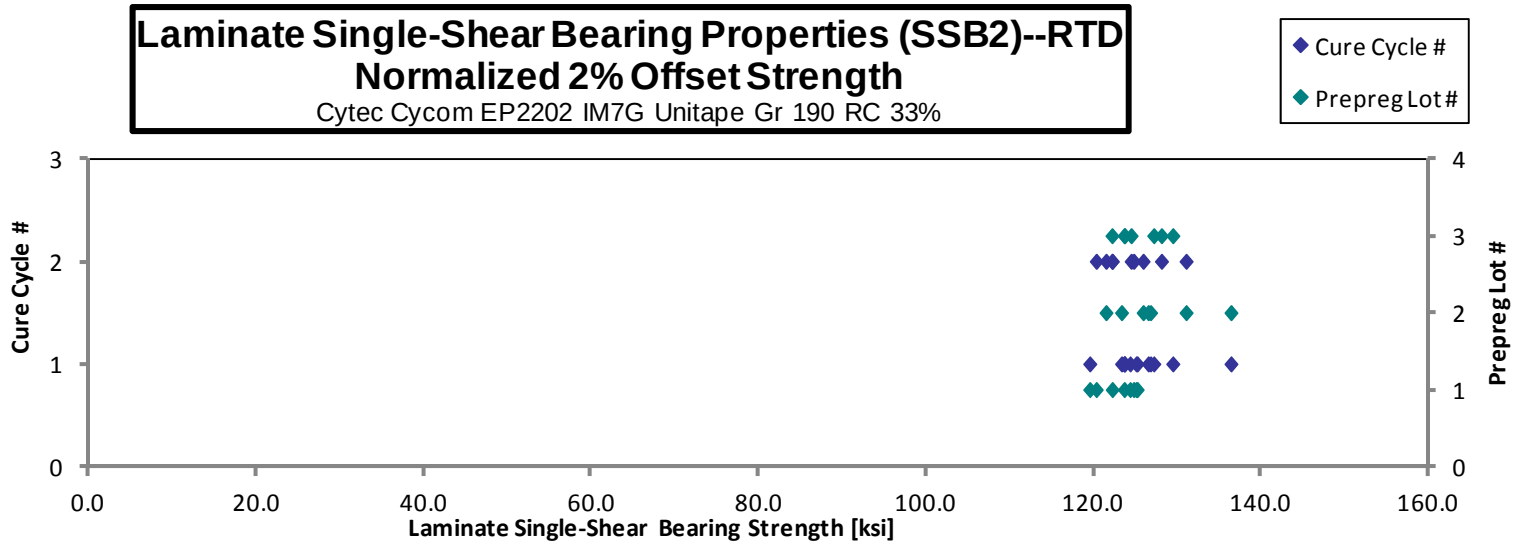
Laminate Single-Shear Bearing Properties (SSB2)--RTD Strength

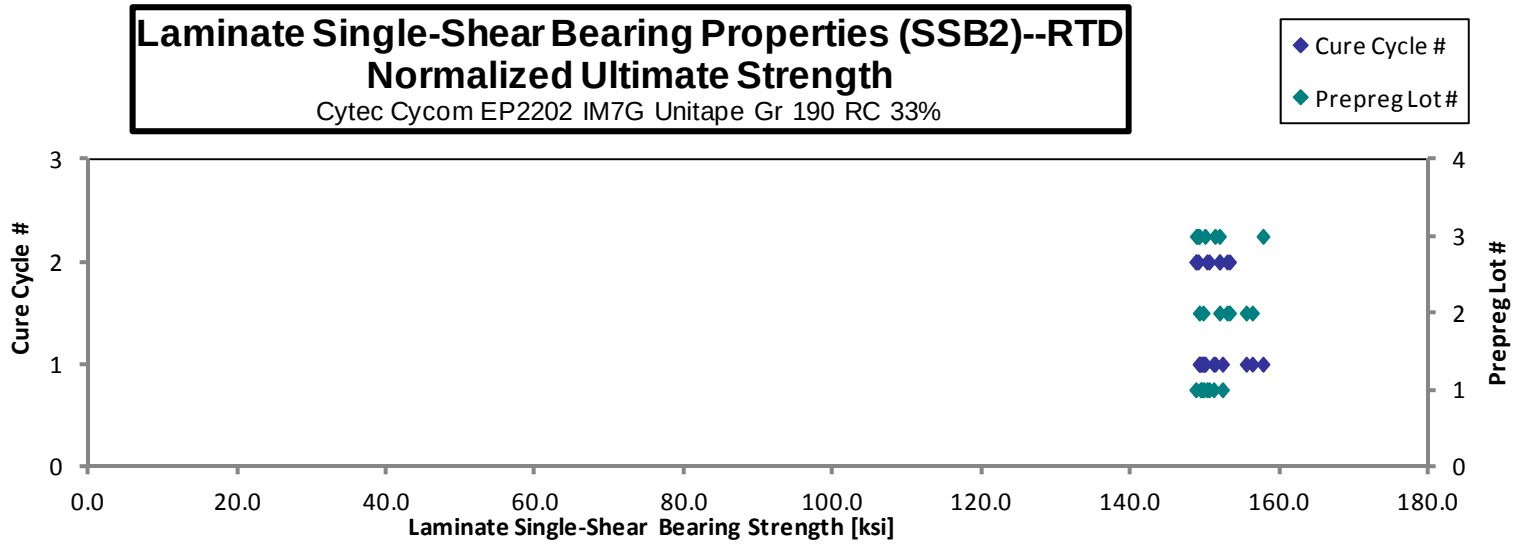
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

normalizing t_{ply} [in]
0.0072

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]
EPA2A111A	A	C1	1	1	126.132	151.498	0.142	20	B1I	0.0071	124.293	149.288
EPA2A112A	A	C1	1	1	121.668	153.824	0.141	20	B1I	0.0071	119.471	151.046
EPA2A113A	A	C1	1	1	126.605	151.456	0.142	20	B1I	0.0071	125.140	149.703
EPA2A114A	A	C1	1	1	125.507	151.751	0.142	20	B1I	0.0071	123.590	149.432
EPA2A115A	A	C1	1	1	126.642	154.219	0.142	20	B1I	0.0071	125.015	152.238
EPA2A211A	A	C2	1	2	125.319	154.323	0.140	20	B1I	0.0070	122.157	150.429
EPA2A212A	A	C2	1	2	127.674	153.705	0.141	20	B1I	0.0070	124.719	150.147
EPA2A213A	A	C2	1	2	123.800	153.036	0.140	20	B1I	0.0070	120.246	148.643
EPA2B111A	B	C1	2	1	127.502	150.027	0.143	20	B1I	0.0072	126.735	149.125
EPA2B112A	B	C1	2	1	128.480	157.899	0.142	20	B1I	0.0071	126.457	155.414
EPA2B113A	B	C1	2	1	124.292	150.868	0.143	20	B1I	0.0071	123.271	149.628
EPA2B114A	B	C1	2	1	137.707	157.811	0.143	20	B1I	0.0071	136.337	156.241
EPA2B211A	B	C2	2	2	126.755	153.968	0.143	20	B1I	0.0071	125.845	152.864
EPA2B212A	B	C2	2	2	121.808	153.674	0.144	20	B1I	0.0072	121.413	153.176
EPA2B213A	B	C2	2	2	131.466	152.412	0.143	20	B1I	0.0072	130.979	151.848
EPA2C111A	C	C1	3	1	122.126	149.424	0.146	20	B1I	0.0073	123.596	151.222
EPA2C112A	C	C1	3	1	127.896	155.848	0.146	20	B1I	0.0073	129.391	157.670
EPA2C113A	C	C1	3	1	122.946	149.060	0.145	20	B1I	0.0072	123.629	149.888
EPA2C114A	C	C1	3	1	126.491	148.364	0.145	20	B1I	0.0072	127.120	149.102
EPA2C211A	C	C2	3	2	127.117	147.907	0.145	20	B1I	0.0073	128.030	148.968
EPA2C212A	C	C2	3	2	121.719	148.216	0.144	20	B1I	0.0072	122.127	148.714
EPA2C213A	C	C2	3	2	123.801	151.078	0.145	20	B1I	0.0072	124.417	151.830

Average	**126.066**	**152.289**	**$Average_{norm}$**	**0.0071**	**125.181**	**151.210**
Standard Dev.	**3.631**	**2.864**	**$Standard\ Dev._{norm}$**		**3.745**	**2.535**
Coeff. of Var. [%]	**2.880**	**1.880**	**$Coeff.\ of\ Var.\ [\%]_{norm}$**		**2.992**	**1.676**
Min.	**121.668**	**147.907**	**Min.**	**0.0070**	**119.471**	**148.643**
Max.	**137.707**	**157.899**	**Max.**	**0.0073**	**136.337**	**157.670**
Number of Spec.	**22**	**22**	**Number of Spec.**	**22**	**22**	**22**


Laminate Single-Shear Bearing Properties (SSB2)--RTD
Normalized 2% Offset Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
20.0
40.0
60.0
80.0
100.0
120.0
140.0
160.0
Laminate Single-Shear Bearing Strength [ksi]


Laminate Single-Shear Bearing Properties (SSB2)--RTD
Normalized Ultimate Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
20.0
40.0
60.0
80.0
100.0
120.0
140.0
160.0
180.0
Laminate Single-Shear Bearing Strength [ksi]

Laminate Single-Shear Bearing Properties (SSB2)--ETW1 Strength

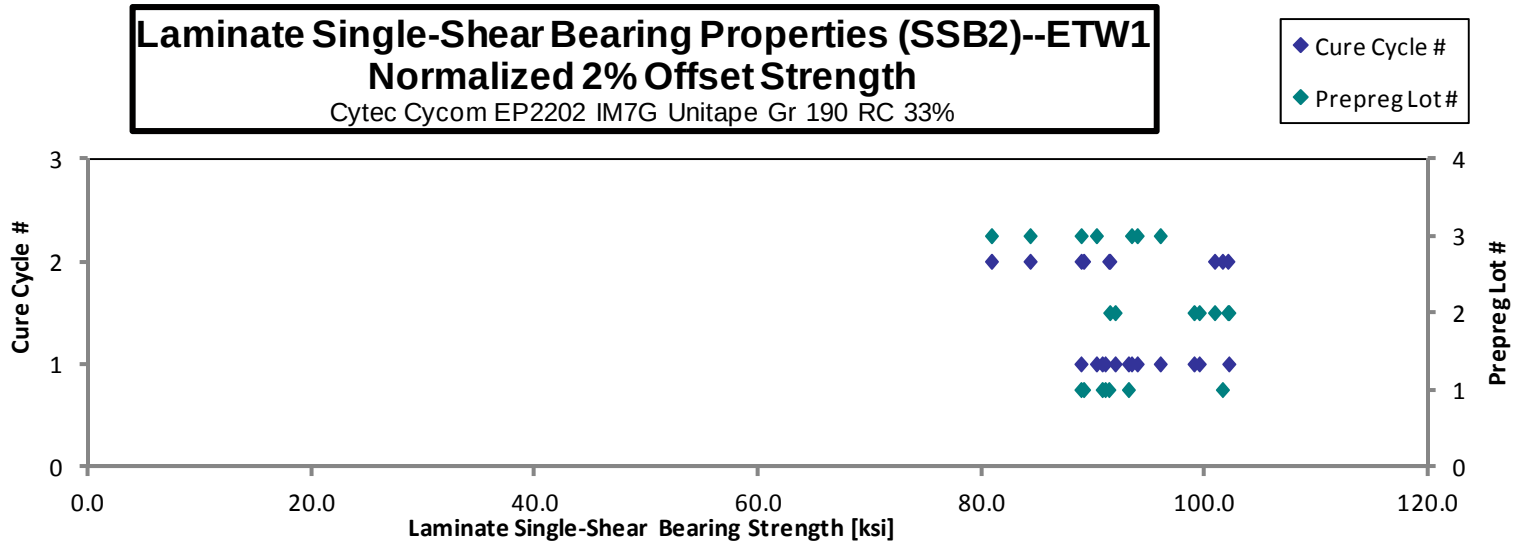
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

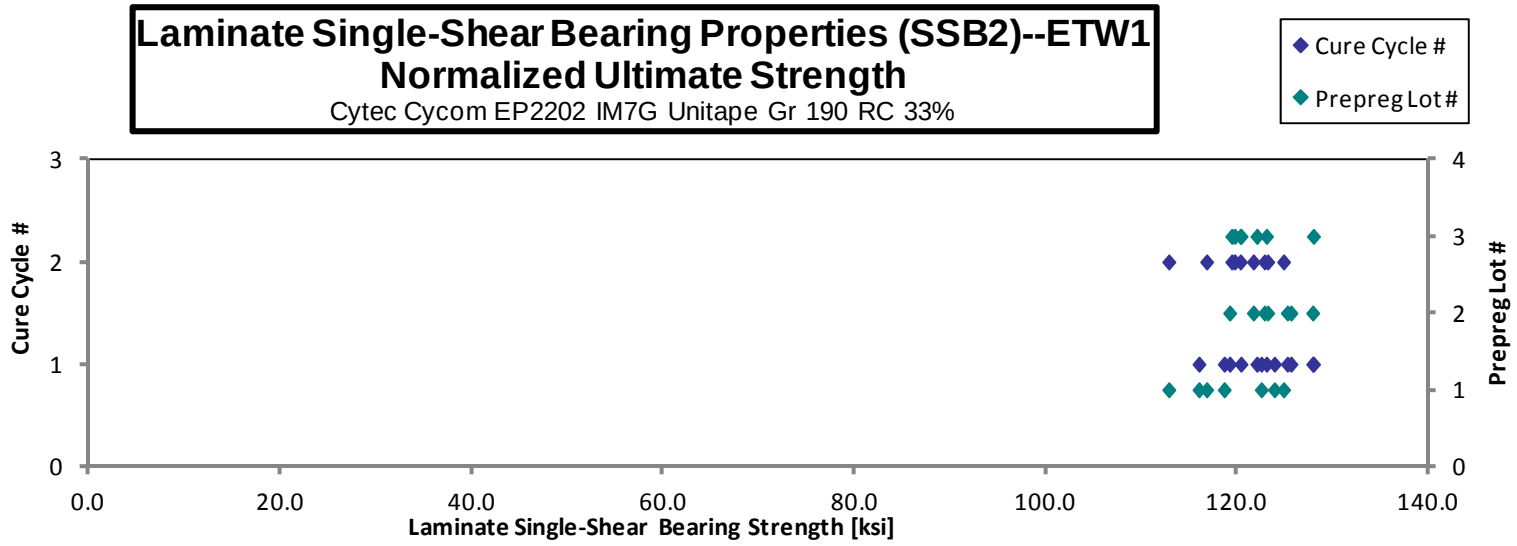
normalizing t_{ply} [in]: 0.0072

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]
EPA2A116D	A	C1	1	1	92.165	124.417	0.142	20	B1I	0.0071	90.714	122.459
EPA2A117D	A	C1	1	1	94.313	125.485	0.142	20	B1I	0.0071	93.068	123.829
EPA2A118D	A	C1	1	1	90.206	117.758	0.142	20	B1I	0.0071	88.817	115.945
EPA2A119D	A	C1	1	1	93.024	121.259	0.141	20	B1I	0.0070	90.978	118.593
EPA2A215D	A	C2	1	2	94.000	116.115	0.140	20	B1I	0.0070	91.312	112.796
EPA2A216D	A	C2	1	2	103.312	127.044	0.141	20	B1I	0.0071	101.483	124.794
EPA2A217D	A	C2	1	2	91.194	119.561	0.141	20	B1I	0.0070	89.051	116.752
EPA2B116D	B	C1	2	1	100.288	126.884	0.142	20	B1I	0.0071	98.941	125.180
EPA2B117D	B	C1	2	1	102.757	126.424	0.143	20	B1I	0.0072	102.055	125.561
EPA2B118D	B	C1	2	1	99.681	128.192	0.144	20	B1I	0.0072	99.405	127.836
EPA2B119D	B	C1	2	1	91.739	118.981	0.144	20	B1I	0.0072	91.877	119.160
EPA2B215D	B	C2	2	2	102.914	123.924	0.143	20	B1I	0.0071	101.973	122.791
EPA2B216D	B	C2	2	2	101.663	124.208	0.143	20	B1I	0.0071	100.781	123.130
EPA2B217D	B	C2	2	2	92.740	123.417	0.142	20	B1I	0.0071	91.398	121.631
EPA2C116D	C	C1	3	1	89.131	126.387	0.146	20	B1I	0.0073	90.204	127.908
EPA2C117D	C	C1	3	1	92.205	120.507	0.146	20	B1I	0.0073	93.347	122.000
EPA2C118D	C	C1	3	1	94.796	118.935	0.146	20	B1I	0.0073	95.915	120.339
EPA2C119D	C	C1	3	1	92.580	121.329	0.146	20	B1I	0.0073	93.855	123.000
EPA2C215D	C	C2	3	2	80.774	120.237	0.144	20	B1I	0.0072	80.802	120.279
EPA2C216D	C	C2	3	2	83.756	118.963	0.145	20	B1I	0.0072	84.260	119.679
EPA2C217D	C	C2	3	2	88.121	118.416	0.145	20	B1I	0.0073	88.835	119.376

Average	**93.874**	**122.307**	
Standard Dev.	**6.126**	**3.595**	
Coeff. of Var. [%]	**6.525**	**2.940**	
Min.	**80.774**	**116.115**	
Max.	**103.312**	**128.192**	
Number of Spec.	**21**	**21**	

$Average_{norm}$	**0.0072**	**93.289**	**121.573**
Standard $Dev._{norm}$		**5.824**	**3.801**
Coeff. of Var. $[\%]_{norm}$		**6.243**	**3.126**
Min.	**0.0070**	**80.802**	**112.796**
Max.	**0.0073**	**102.055**	**127.908**
Number of Spec.	**21**	**21**	**21**


Laminate Single-Shear Bearing Properties (SSB2)--ETW1
Normalized 2% Offset Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
20.0
40.0
60.0
80.0
100.0
120.0
Laminate Single-Shear Bearing Strength [ksi]


Laminate Single-Shear Bearing Properties (SSB2)--ETW1
Normalized Ultimate Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
20.0
40.0
60.0
80.0
100.0
120.0
140.0
Laminate Single-Shear Bearing Strength [ksi]

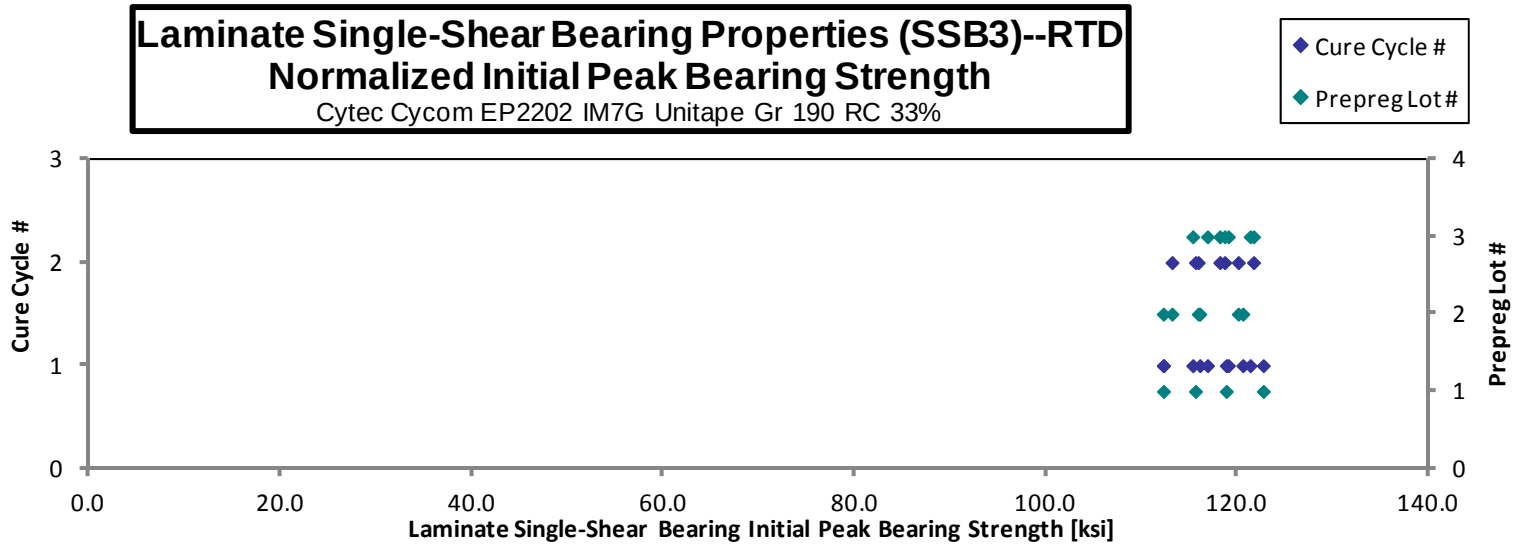
4.29 "50/40/10" Single-Shear Bearing 3 Properties (SSB3)

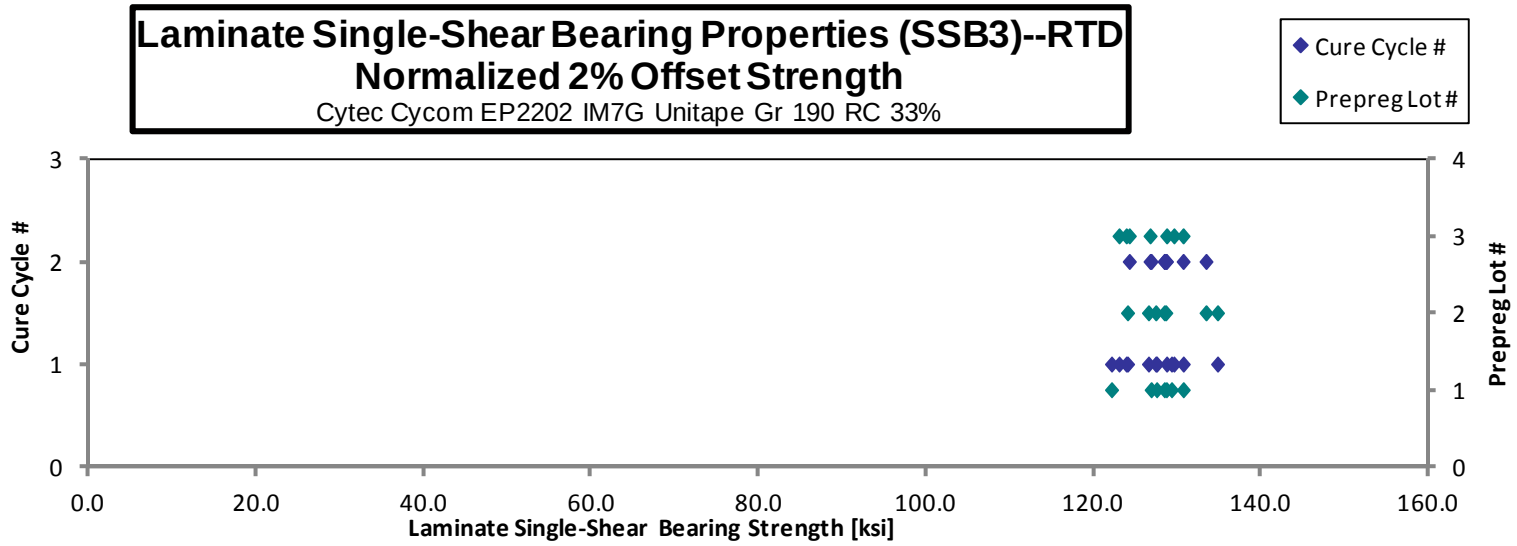
Laminate Single-Shear Bearing Properties (SSB3)--RTD Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

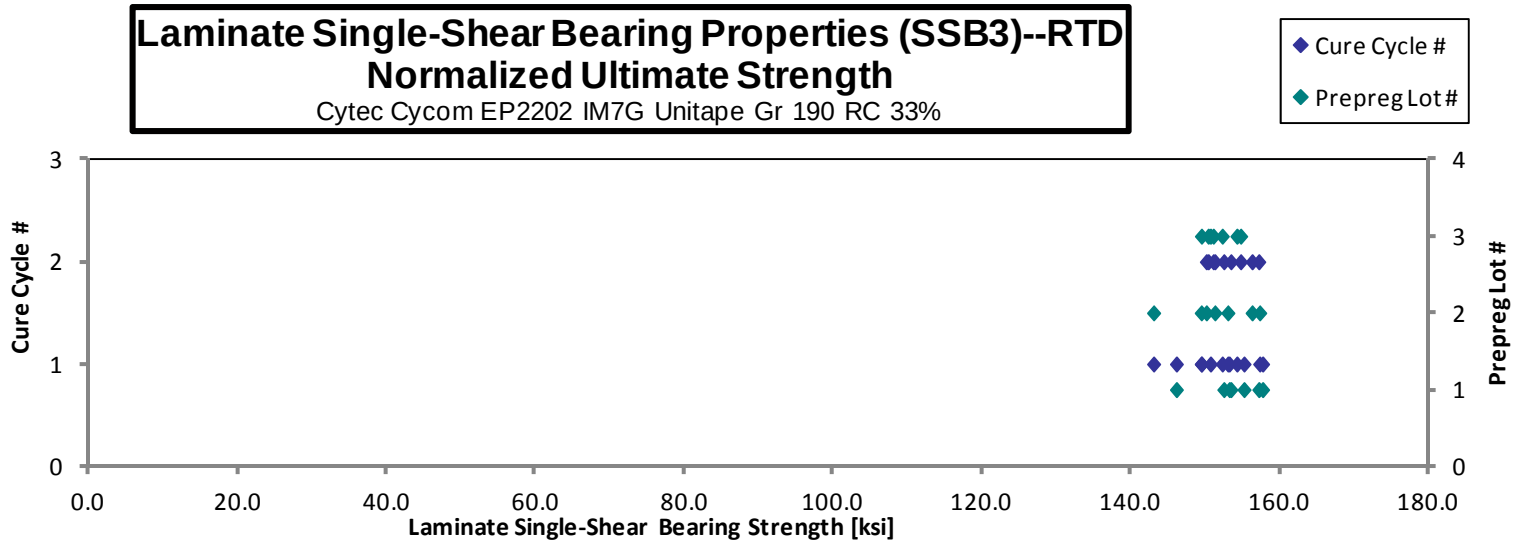
normalizing t_{ply} [in]
0.0072

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	Avg. t_{ply} [in]	Initial Peak Bearing $Strength_{norm}$ [ksi]	2% Offset $Strength_{norm}$ [ksi]	Ultimate $Strength_{norm}$ [ksi]
EPA3A111A	A	C1	1	1		124.332	148.751	0.141	20	B1I	0.0071		122.072	146.048
EPA3A112A	A	C1	1	1	124.763	132.868	160.317	0.142	20	B1I	0.0071	122.669	130.638	157.627
EPA3A113A	A	C1	1	1	113.808	129.244	155.291	0.142	20	B1I	0.0071	112.240	127.464	153.152
EPA3A114A	A	C1	1	1	120.914	131.532	157.883	0.141	20	B1I	0.0071	118.800	129.233	155.123
EPA3A211A	A	C2	1	2		130.419	154.833	0.142	20	B1I	0.0071		128.381	152.414
EPA3A212A	A	C2	1	2		129.333	156.424	0.141	20	B1I	0.0071		126.804	153.364
EPA3A213A	A	C2	1	2	117.767	131.054	160.080	0.141	20	B1I	0.0071	115.586	128.627	157.116
EPA3B111A	B	C1	2	1	120.572	134.775	157.291	0.144	20	B1I	0.0072	120.531	134.728	157.236
EPA3B112A	B	C1	2	1	111.603	123.298	142.197	0.145	20	B1I	0.0072	112.223	123.983	142.987
EPA3B113A	B	C1	2	1	115.947	127.249	152.832	0.144	20	B1I	0.0072	116.041	127.352	152.956
EPA3B114A	B	C1	2	1		125.915	148.718	0.145	20	B1I	0.0072		126.484	149.389
EPA3B211A	B	C2	2	2	112.728	127.920	155.656	0.145	20	B1I	0.0072	113.133	128.379	156.215
EPA3B212A	B	C2	2	2	115.234	127.835	149.239	0.145	20	B1I	0.0072	115.874	128.545	150.068
EPA3B213A	B	C2	2	2	119.833	133.111	150.932	0.144	20	B1I	0.0072	120.055	133.358	151.211
EPA3C111A	C	C1	3	1	120.270	128.421	152.864	0.145	20	B1I	0.0073	121.300	129.521	154.173
EPA3C112A	C	C1	3	1	114.850	123.345	148.825	0.145	20	B1I	0.0072	115.302	123.830	149.411
EPA3C114A	C	C1	3	1	117.443	126.948	148.625	0.146	20	B1I	0.0073	119.019	128.652	150.621
EPA3C115A	C	C1	3	1	116.249	122.345	151.437	0.145	20	B1I	0.0072	116.841	122.968	152.208
EPA3C211A	C	C2	3	2	117.589	129.472	153.314	0.145	20	B1I	0.0073	118.637	130.626	154.680
EPA3C212A	C	C2	3	2	120.359	125.330	148.722	0.146	20	B1I	0.0073	121.655	126.679	150.322
EPA3C213A	C	C2	3	2	117.205	123.226	149.821	0.145	20	B1I	0.0073	118.128	124.196	151.000

Average	**117.479**	**127.999**	**152.574**	**$Average_{norm}$**	**0.0072**	**117.532**	**127.739**	**152.253**
Standard Dev.	**3.378**	**3.565**	**4.520**	**$Standard\ Dev._{norm}$**		**3.241**	**3.212**	**3.660**
Coeff. of Var. [%]	**2.876**	**2.786**	**2.962**	**Coeff. of Var. $[\%]_{norm}$**		**2.758**	**2.514**	**2.404**
Min.	**111.603**	**122.345**	**142.197**	**Min.**	**0.0071**	**112.223**	**122.072**	**142.987**
Max.	**124.763**	**134.775**	**160.317**	**Max.**	**0.0073**	**122.669**	**134.728**	**157.627**
Number of Spec.	**17**	**21**	**21**	**Number of Spec.**	**21**	**17**	**21**	**21**


Laminate Single-Shear Bearing Properties (SSB3)--RTD
Normalized Initial Peak Bearing Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
20.0
40.0
60.0
80.0
100.0
120.0
140.0
Laminate Single-Shear Bearing Initial Peak Bearing Strength [ksi]


Laminate Single-Shear Bearing Properties (SSB3)--RTD
Normalized 2% Offset Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
20.0
40.0
60.0
80.0
100.0
120.0
140.0
160.0
Laminate Single-Shear Bearing Strength [ksi]


Laminate Single-Shear Bearing Properties (SSB3)--RTD
Normalized Ultimate Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
20.0
40.0
60.0
80.0
100.0
120.0
140.0
160.0
180.0
Laminate Single-Shear Bearing Strength [ksi]

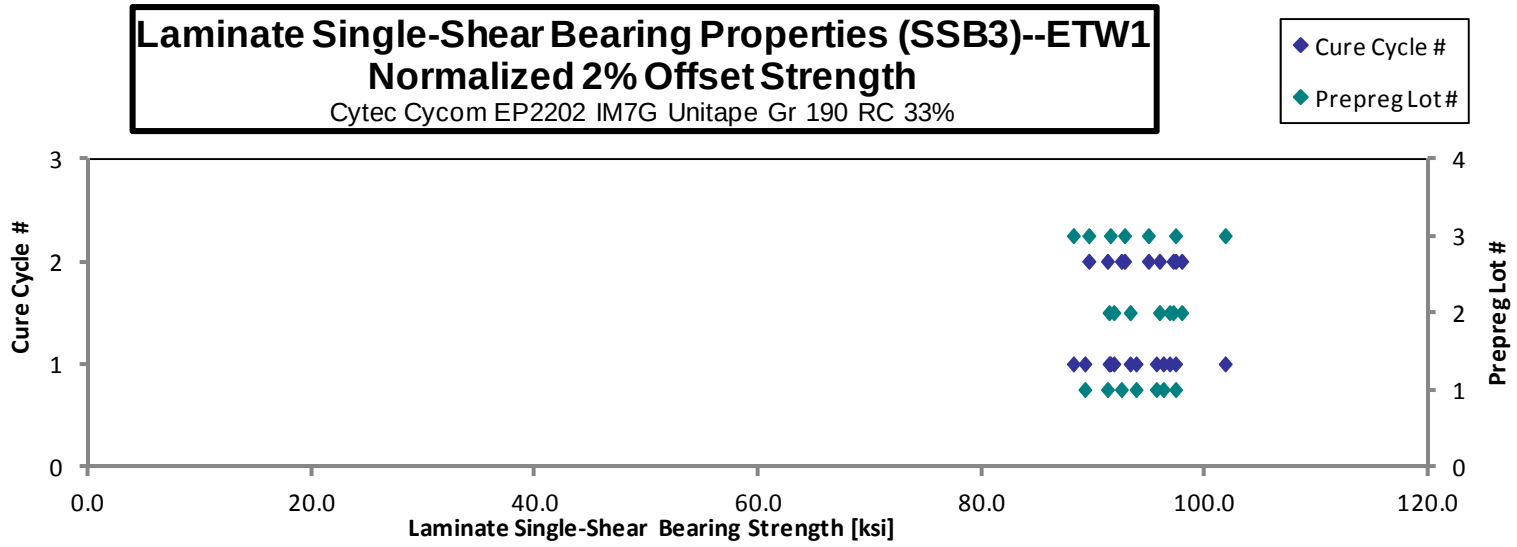
Laminate Single-Shear Bearing Properties (SSB3)--ETW1 Strength

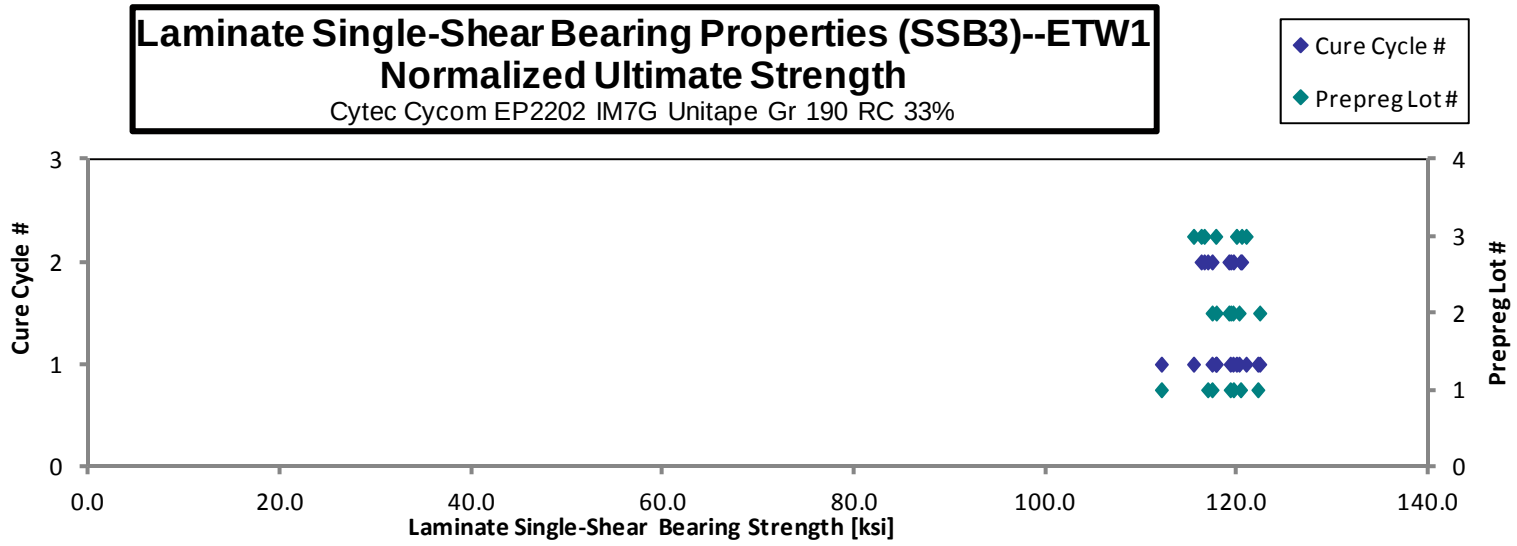
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

normalizing t_{ply} [in]
0.0072

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]
EPA3A116D	A	C1	1	1	95.321	124.144	0.142	20	B1I	0.0071	93.755	122.103
EPA3A117D	A	C1	1	1	97.290	114.043	0.141	20	B1I	0.0071	95.567	112.024
EPA3A118D	A	C1	1	1	90.178	120.572	0.142	20	B1I	0.0071	89.166	119.218
EPA3A119D	A	C1	1	1	97.866	119.355	0.142	20	B1I	0.0071	96.190	117.310
EPA3A215D	A	C2	1	2	93.928	122.232	0.142	20	B1I	0.0071	92.439	120.294
EPA3A216D	A	C2	1	2	93.276	122.274	0.141	20	B1I	0.0070	91.192	119.542
EPA3A217D	A	C2	1	2	99.268	119.237	0.141	20	B1I	0.0071	97.292	116.863
EPA3B116D	B	C1	2	1	91.436	119.639	0.144	20	B1I	0.0072	91.330	119.500
EPA3B117D	B	C1	2	1	95.757	121.030	0.146	20	B1I	0.0073	96.754	122.291
EPA3B118D	B	C1	2	1	91.131	116.945	0.145	20	B1I	0.0073	91.764	117.757
EPA3B119D	B	C1	2	1	92.625	119.365	0.145	20	B1I	0.0072	93.225	120.139
EPA3B215D	B	C2	2	2	97.534	119.640	0.143	20	B1I	0.0072	97.072	119.072
EPA3B216D	B	C2	2	2	97.333	116.713	0.145	20	B1I	0.0072	97.840	117.321
EPA3B217D	B	C2	2	2	95.415	118.743	0.145	20	B1I	0.0072	95.846	119.279
EPA3C116D	C	C1	3	1	100.524	116.306	0.146	20	B1I	0.0073	101.734	117.706
EPA3C117D	C	C1	3	1	96.929	119.421	0.145	20	B1I	0.0072	97.288	119.863
EPA3C118D	C	C1	3	1	86.894	113.749	0.146	20	B1I	0.0073	88.141	115.381
EPA3C119D	C	C1	3	1	90.700	119.884	0.145	20	B1I	0.0073	91.446	120.869
EPA3C215D	C	C2	3	2	93.694	118.930	0.146	20	B1I	0.0073	94.854	120.402
EPA3C216D	C	C2	3	2	91.598	114.769	0.146	20	B1I	0.0073	92.722	116.178
EPA3C217D	C	C2	3	2	88.507	115.170	0.146	20	B1I	0.0073	89.521	116.490

Average	**94.153**	**118.674**	**$Average_{norm}$**	**0.0072**	**94.054**	**118.553**
Standard Dev.	**3.632**	**2.789**	**$Standard\ Dev._{norm}$**		**3.418**	**2.404**
Coeff. of Var. [%]	**3.858**	**2.350**	**$Coeff.\ of\ Var.\ [\%]_{norm}$**		**3.634**	**2.028**
Min.	**86.894**	**113.749**	**Min.**	**0.0070**	**88.141**	**112.024**
Max.	**100.524**	**124.144**	**Max.**	**0.0073**	**101.734**	**122.291**
Number of Spec.	**21**	**21**	**Number of Spec.**	**21**	**21**	**21**


Laminate Single-Shear Bearing Properties (SSB3)--ETW1
Normalized 2% Offset Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
20.0
40.0
60.0
80.0
100.0
120.0
Laminate Single-Shear Bearing Strength [ksi]


Laminate Single-Shear Bearing Properties (SSB3)--ETW1
Normalized Ultimate Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
20.0
40.0
60.0
80.0
100.0
120.0
140.0
Laminate Single-Shear Bearing Strength [ksi]

4.30 Compression After Impact 1 Properties (CAI1)

Laminate Compression After Impact Properties (CAI1)--RTD Strength

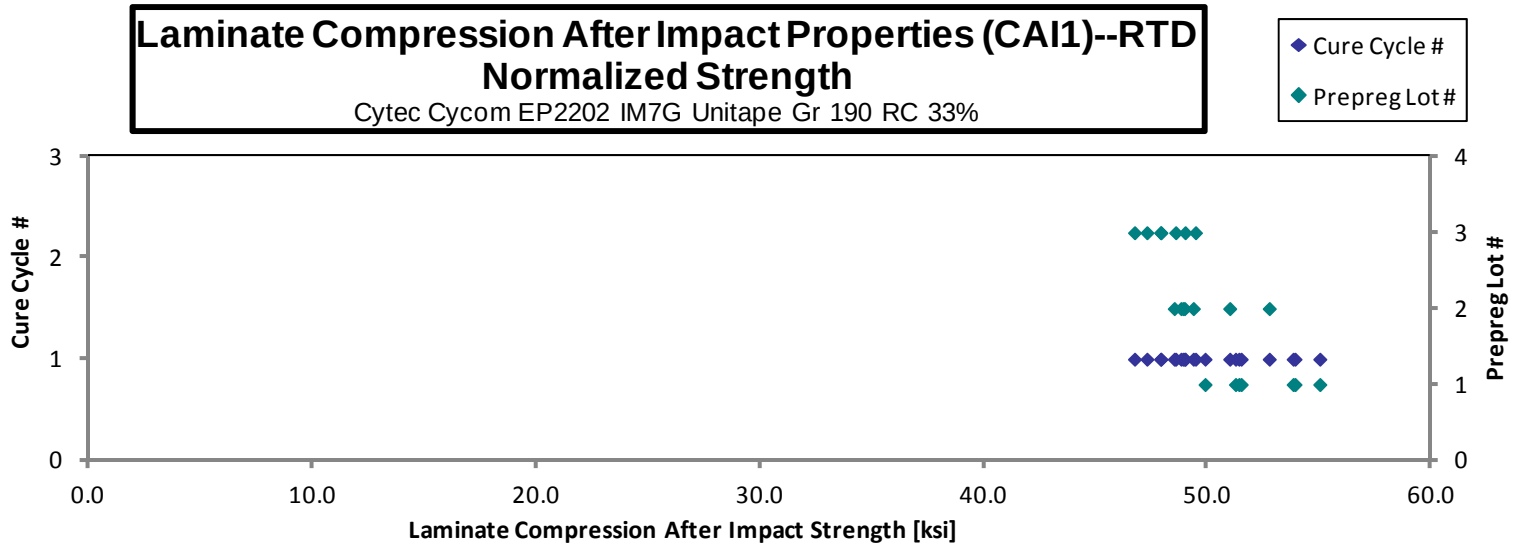
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

normalizing t_{ply} [in]
0.0072

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	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
EPAKA111A	A	C1	1	1	51.875	347.250	0.228	32	LDM	0.0071	51.247
EPAKA112A	A	C1	1	1	56.153	348.320	0.226	32	LDM	0.0071	55.016
EPAKA113A	A	C1	1	1	51.927	350.110	0.229	32	LDM	0.0071	51.501
EPAKA114A	A	C1	1	1	54.874	347.080	0.226	32	LDM	0.0071	53.909
EPAKA115A	A	C1	1	1	51.911	345.950	0.228	32	LDM	0.0071	51.402
EPAKA116A	A	C1	1	1	54.785	344.200	0.226	32	LDM	0.0071	53.825
EPAKA117A	A	C1	1	1	50.518	346.940	0.228	32	LDM	0.0071	49.887
EPAKB111A	B	C1	2	1	50.572	353.140	0.232	32	LDM	0.0073	50.989
EPAKB112A	B	C1	2	1	48.237	351.600	0.233	32	LDM	0.0073	48.812
EPAKB113A	B	C1	2	1	48.499	352.850	0.232	32	LDM	0.0073	48.901
EPAKB114A	B	C1	2	1	48.165	353.310	0.232	32	LDM	0.0073	48.510
EPAKB115A	B	C1	2	1	49.139	351.140	0.231	32	LDM	0.0072	49.363
EPAKB116A	B	C1	2	1	52.369	353.030	0.232	32	LDM	0.0073	52.758
EPAKB117A	B	C1	2	1	48.742	352.130	0.231	32	LDM	0.0072	48.969
EPAKC111A	C	C1	3	1	48.121	335.270	0.229	32	LDM	0.0072	47.904
EPAKC112A	C	C1	3	1	48.335	346.840	0.228	32	LDM	0.0071	47.913
EPAKC113A	C	C1	3	1	49.580	351.340	0.230	32	LDM	0.0072	49.461
EPAKC114A	C	C1	3	1	48.935	349.140	0.229	32	LDM	0.0071	48.574
EPAKC115A	C	C1	3	1	47.721	346.500	0.228	32	LDM	0.0071	47.288
EPAKC116A	C	C1	3	1	46.887	351.600	0.230	32	LDM	0.0072	46.734
EPAKC117A	C	C1	3	1	49.221	349.720	0.229	32	LDM	0.0072	48.997

Average	**50.313**	
Standard Dev.	**2.586**	
Coeff. of Var. [%]	**5.139**	
Min.	**46.887**	
Max.	**56.153**	
Number of Spec.	**21**	

$Average_{norm}$	**0.0072**	**50.093**
$Standard\ Dev._{norm}$		**2.299**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**4.589**
Min.	**0.0071**	**46.734**
Max.	**0.0073**	**55.016**
Number of Spec.	**21**	**21**


Laminate Compression After Impact Properties (CAI1)--RTD
Normalized Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
10.0
20.0
30.0
40.0
50.0
60.0
Laminate Compression After Impact Strength [ksi]

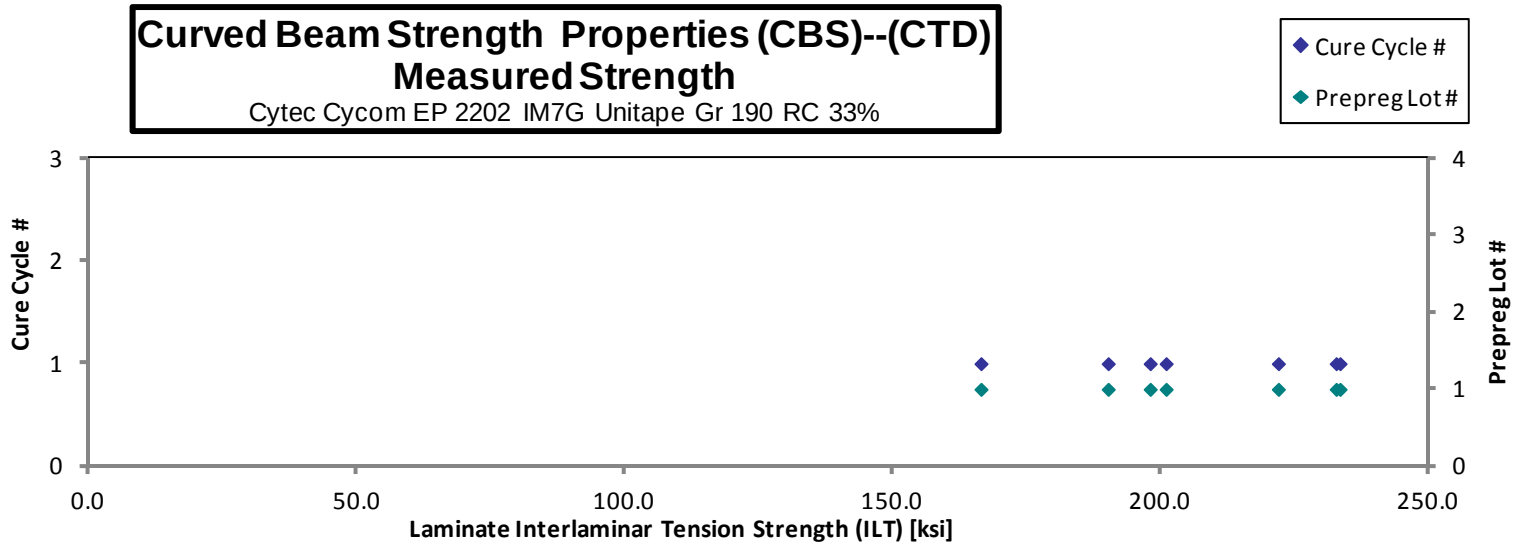
4.31 Interlaminar Tension Properties (ILT)

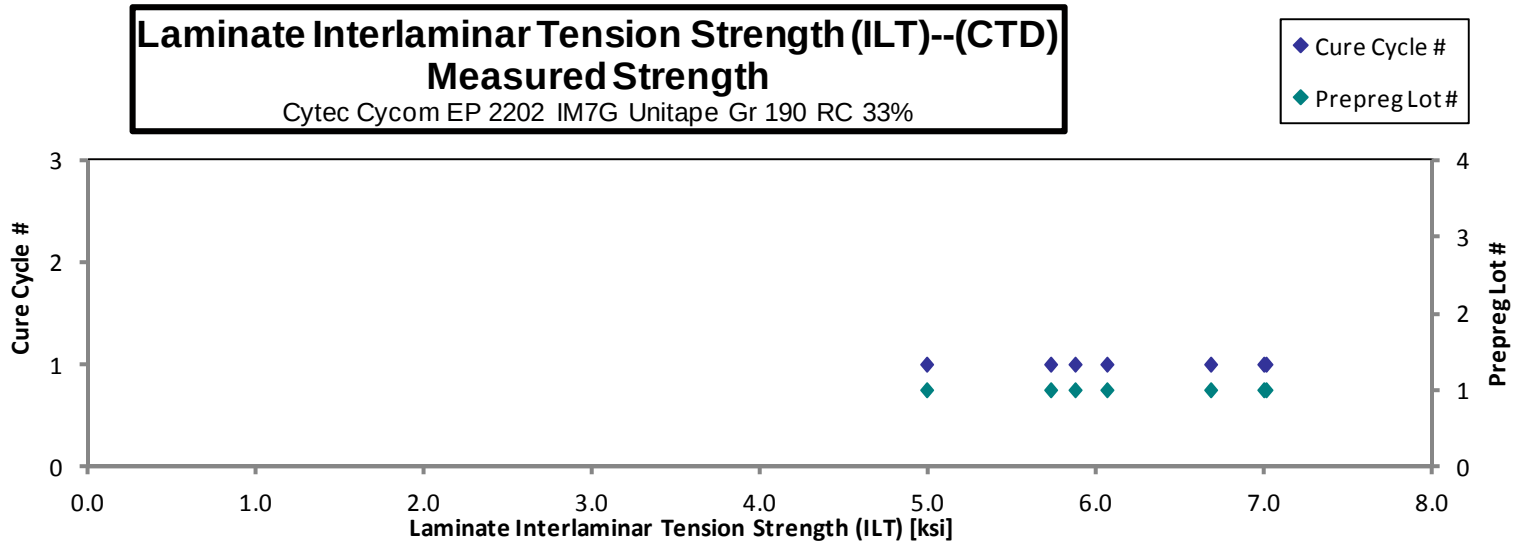
Interlaminar Tension Properties (ILT)--CTD Strength

Cytec Cycom EP 2202 IM7G Unitape Gr 190 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
EPAMA121B	A	C1	1	1	166.393	4.985	0.156	22	0.0071	ILT
EPAMA122B	A	C1	1	1	233.365	7.004	0.156	22	0.0071	ILT
EPAMA123B	A	C1	1	1	197.951	5.868	0.156	22	0.0071	ILT
EPAMA124B	A	C1	1	1	190.120	5.723	0.155	22	0.0071	ILT
EPAMA125B	A	C1	1	1	200.930	6.057	0.154	22	0.0070	ILT
EPAMA126B	A	C1	1	1	221.868	6.675	0.156	22	0.0071	ILT
EPAMA127B	A	C1	1	1	232.657	6.991	0.158	22	0.0072	ILT

Average	**206.183**	**6.186**	**Average**	**0.0071**
Standard Dev.	**24.571**	**0.745**	**Standard Dev.**	**0.0000**
Coeff. of Var. [%]	**11.917**	**12.047**	**Coeff. of Var. [%]**	**0.6486**
Min.	**166.393**	**4.985**	**Min.**	**0.0070**
Max.	**233.365**	**7.004**	**Max.**	**0.0072**
Number of Spec.	**7**	**7**	**Number of Spec.**	**7**


Curved Beam Strength Properties (CBS)--(CTD)
Measured Strength
Cytec Cycom EP 2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
50.0
100.0
150.0
200.0
250.0
Laminate Interlaminar Tension Strength (ILT) [ksi]

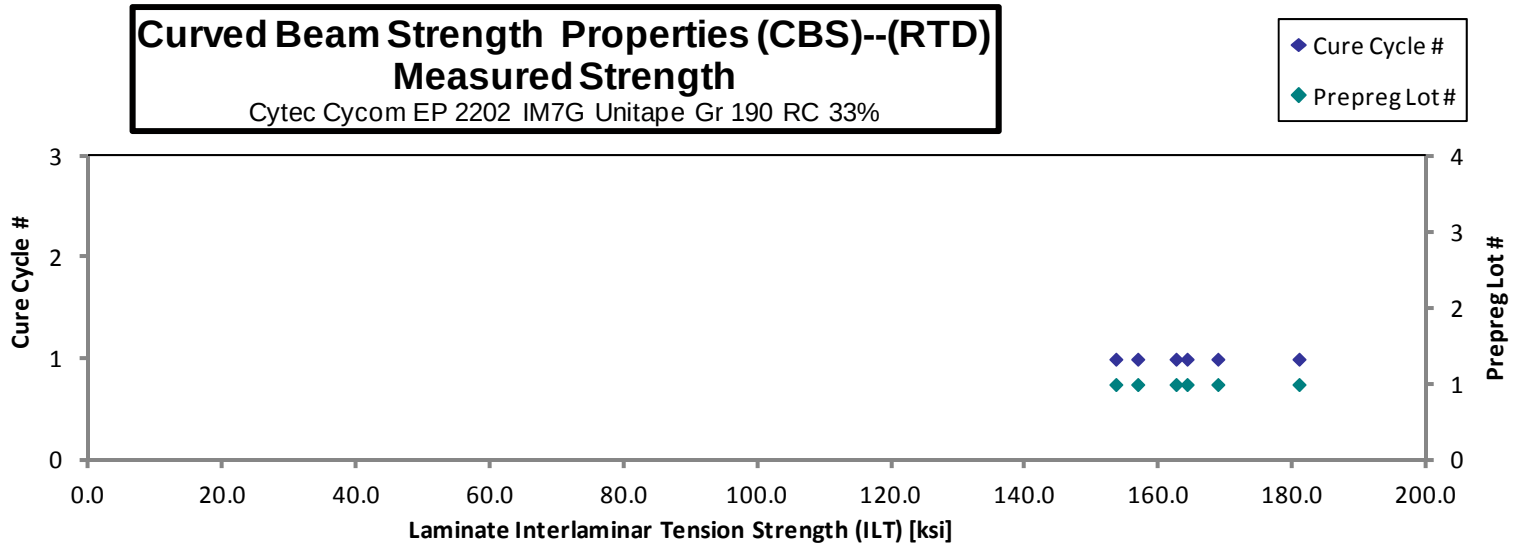

Laminate Interlaminar Tension Strength (ILT)--(CTD)
Measured Strength
Cytec Cycom EP 2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
Laminate Interlaminar Tension Strength (ILT) [ksi]

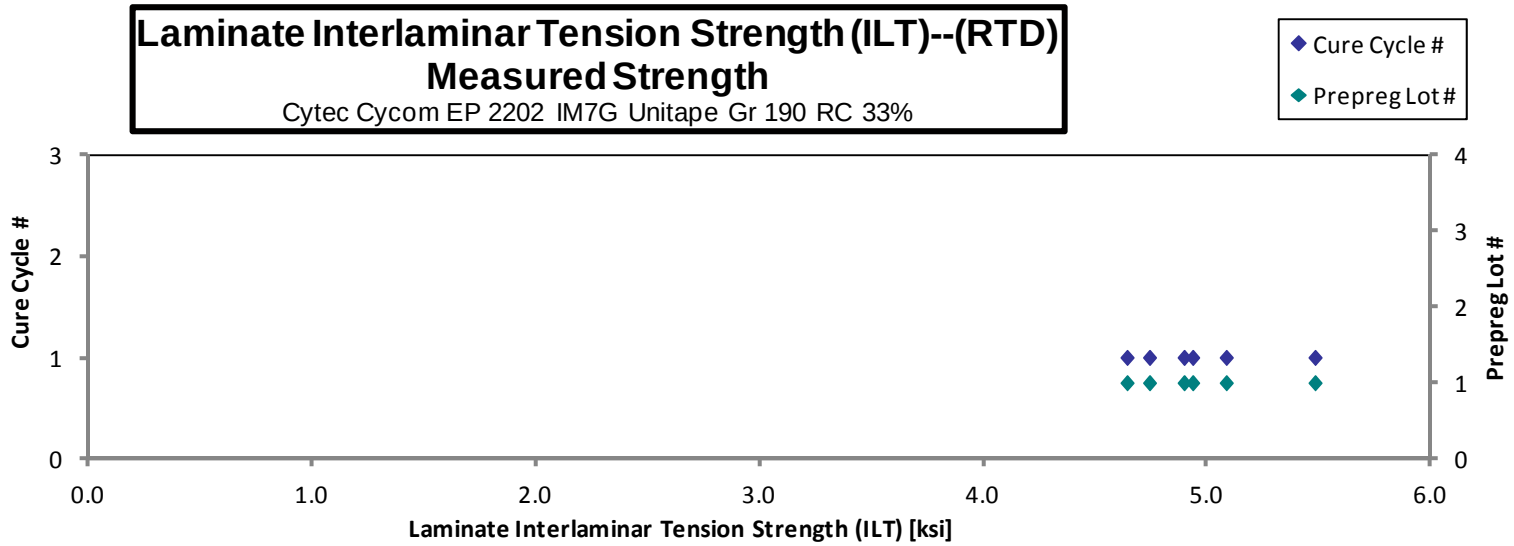
Interlaminar Tension Properties (ILT)--RTD Strength

Cytec Cycom EP 2202 IM7G Unitape Gr 190 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
EPAMA111A	A	C1	1	1	180.852	5.480	0.155	22	0.0071	ILT
EPAMA112A	A	C1	1	1	153.475	4.640	0.156	22	0.0071	ILT
EPAMA113A	A	C1	1	1	156.745	4.741	0.156	22	0.0071	ILT
EPAMA114A	A	C1	1	1	164.124	4.934	0.156	22	0.0071	ILT
EPAMA115A	A	C1	1	1	162.473	4.895	0.156	22	0.0071	ILT
EPAMA116A	A	C1	1	1	168.720	5.083	0.156	22	0.0071	ILT

Average	**164.398**	**4.962**	**Average**	**0.0071**
Standard Dev.	**9.706**	**0.297**	**Standard Dev.**	**0.0000**
Coeff. of Var. [%]	**5.904**	**5.987**	**Coeff. of Var. [%]**	**0.1278**
Min.	**153.475**	**4.640**	**Min.**	**0.0071**
Max.	**180.852**	**5.480**	**Max.**	**0.0071**
Number of Spec.	**6**	**6**	**Number of Spec.**	**6**

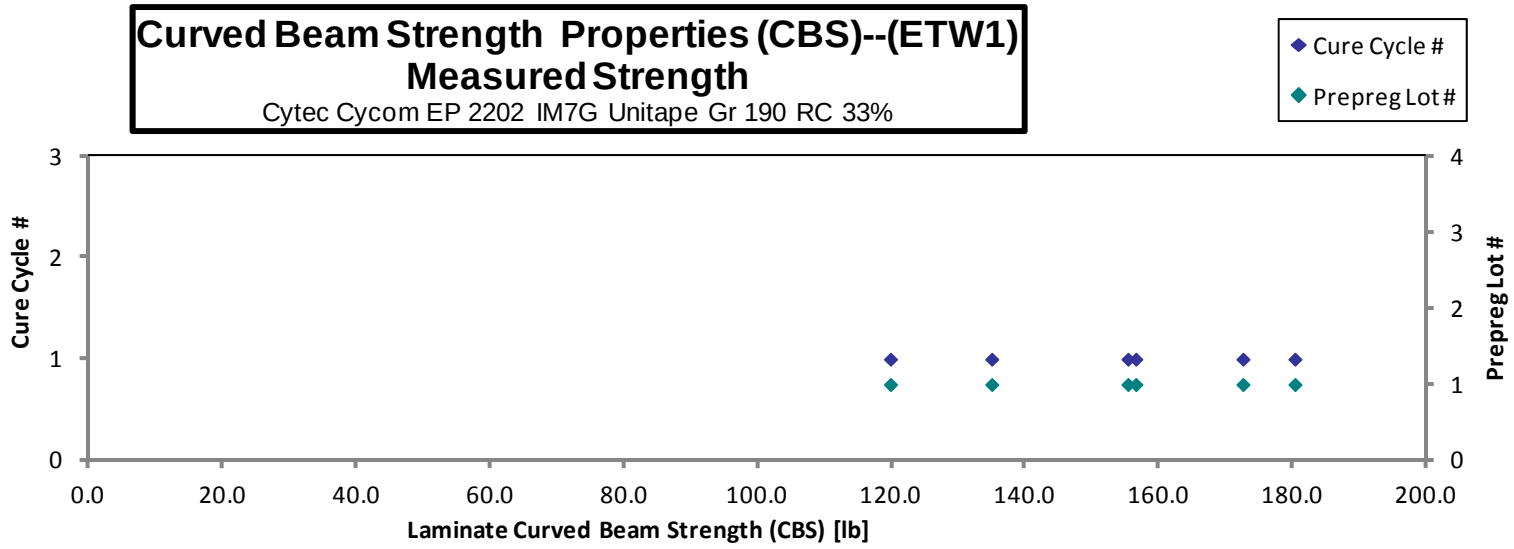

Curved Beam Strength Properties (CBS)--(RTD)
Measured Strength
Cytec Cycom EP 2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
20.0
40.0
60.0
80.0
100.0
120.0
140.0
160.0
180.0
200.0
Laminate Interlaminar Tension Strength (ILT) [ksi]

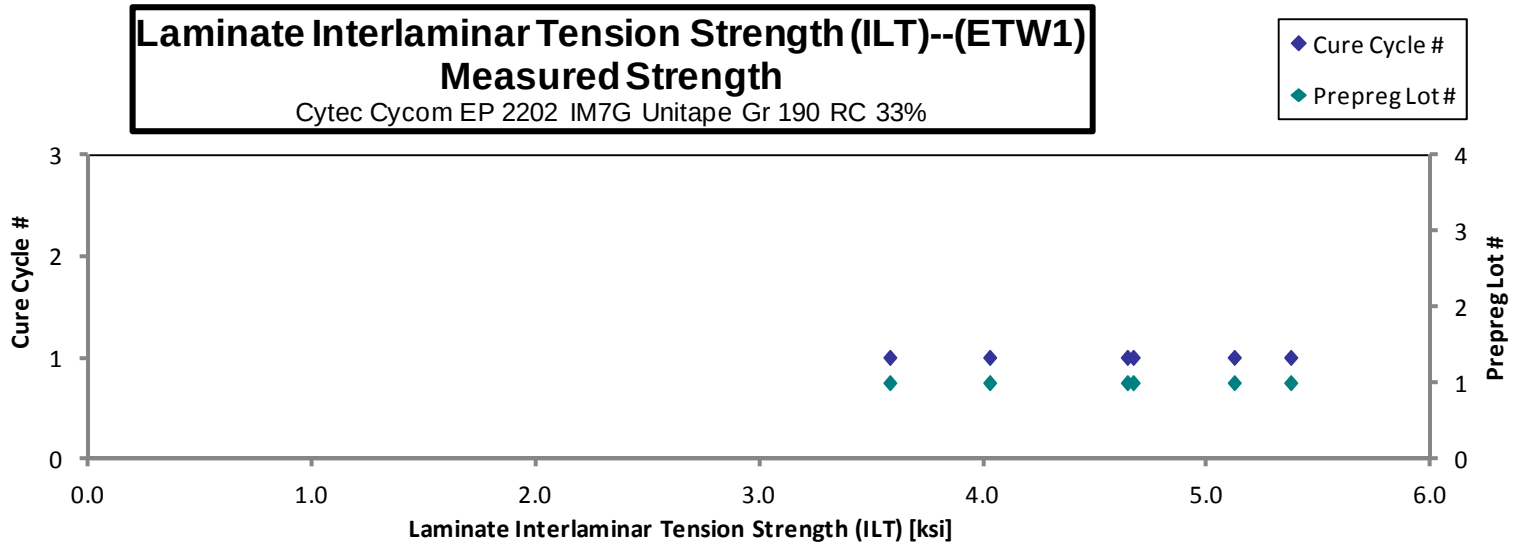

Laminate Interlaminar Tension Strength (ILT)--(RTD)
Measured Strength
Cytec Cycom EP 2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
1.0
2.0
3.0
4.0
5.0
6.0
Laminate Interlaminar Tension Strength (ILT) [ksi]

Interlaminar Tension Properties (ILT)--ETW1
Strength
Cytec Cycom EP 2202 IM7G Unitape Gr 190 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
EPAMA131D	A	C1	1	1	180.235	5.372	0.156	22	0.0071	ILT
EPAMA132D	A	C1	1	1	172.472	5.119	0.158	22	0.0072	ILT
EPAMA133D	A	C1	1	1	155.278	4.641	0.156	22	0.0071	ILT
EPAMA134D	A	C1	1	1	134.928	4.026	0.155	22	0.0070	ILT
EPAMA135D	A	C1	1	1	119.791	3.580	0.156	22	0.0071	ILT
EPAMA136D	A	C1	1	1	156.456	4.668	0.156	22	0.0071	ILT

Average	**153.193**	**4.568**	**Average**	**0.0071**
Standard Dev.	**22.659**	**0.669**	**Standard Dev.**	**0.0000**
Coeff. of Var. [%]	**14.791**	**14.639**	**Coeff. of Var. [%]**	**0.6960**
Min.	**119.791**	**3.580**	**Min.**	**0.0070**
Max.	**180.235**	**5.372**	**Max.**	**0.0072**
Number of Spec.	**6**	**6**	**Number of Spec.**	**6**

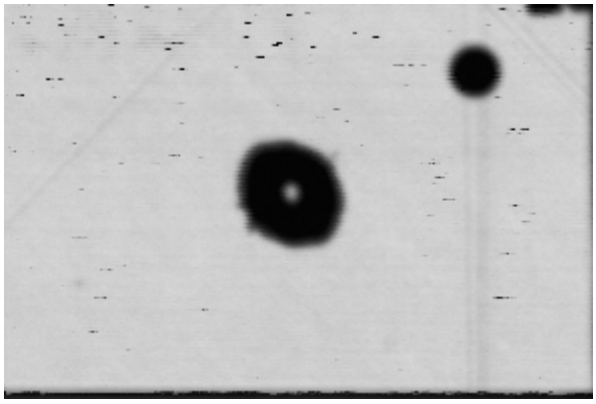

Curved Beam Strength Properties (CBS)--(ETW1)
Measured Strength
Cytec Cycom EP 2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
20.0
40.0
60.0
80.0
100.0
120.0
140.0
160.0
180.0
200.0
Laminate Curved Beam Strength (CBS) [lb]


Laminate Interlaminar Tension Strength (ILT)--(ETW1)
Measured Strength
Cytec Cycom EP 2202 IM7G Unitape Gr 190 RC 33%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
1.0
2.0
3.0
4.0
5.0
6.0
Laminate Interlaminar Tension Strength (ILT) [ksi]

5. Additional Compression after Impact Data

Impactor Diameter: 0.625”

Representative of Damage Area:

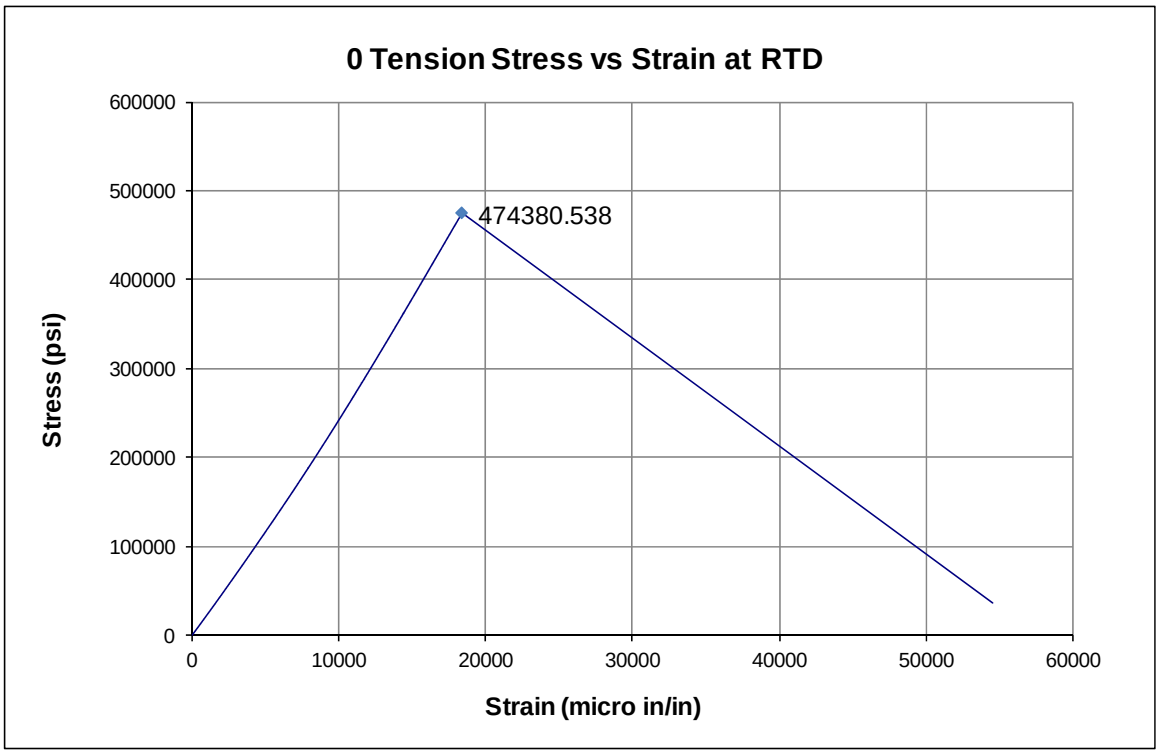


Damage Area and Dent Depth Summary:

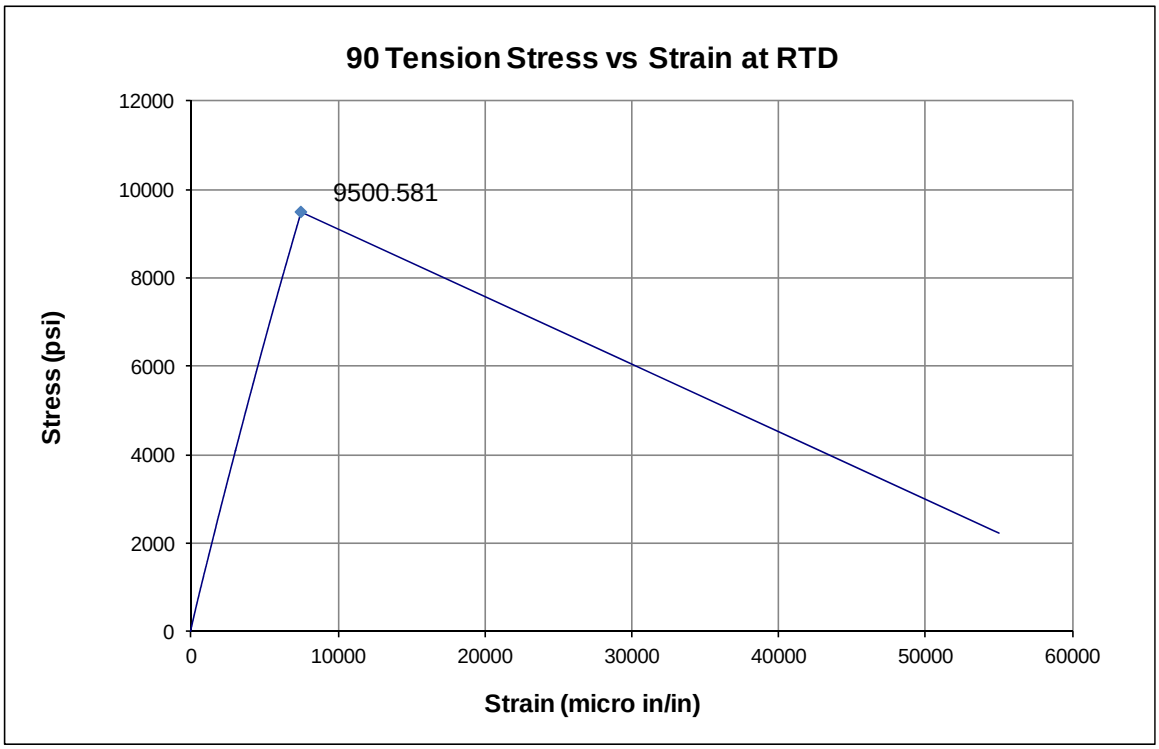
Specimen ID	Damage Area (inch^2)	Dent Depth (inch)
EPAKA111A	0.850	0.013
EPAKA112A	0.861	0.012
EPAKA113A	0.726	0.011
EPAKA114A	0.758	0.012
EPAKA115A	0.771	0.013
EPAKA116A	0.746	0.013
EPAKA117A	0.802	0.013
EPAKB111A	0.968	0.012
EPAKB112A	0.963	0.012
EPAKB113A	0.948	0.011
EPAKB114A	0.955	0.011
EPAKB115A	1.038	0.012
EPAKB116A	0.922	0.012
EPAKB117A	0.978	0.012
EPAKC111A	0.936	0.012
EPAKC112A	0.957	0.013
EPAKC113A	1.015	0.013
EPAKC114A	0.998	0.012
EPAKC115A	1.014	0.012
EPAKC116A	0.992	0.013
EPAKC117A	1.058	0.012

6. Full Stress vs. Strain Curves

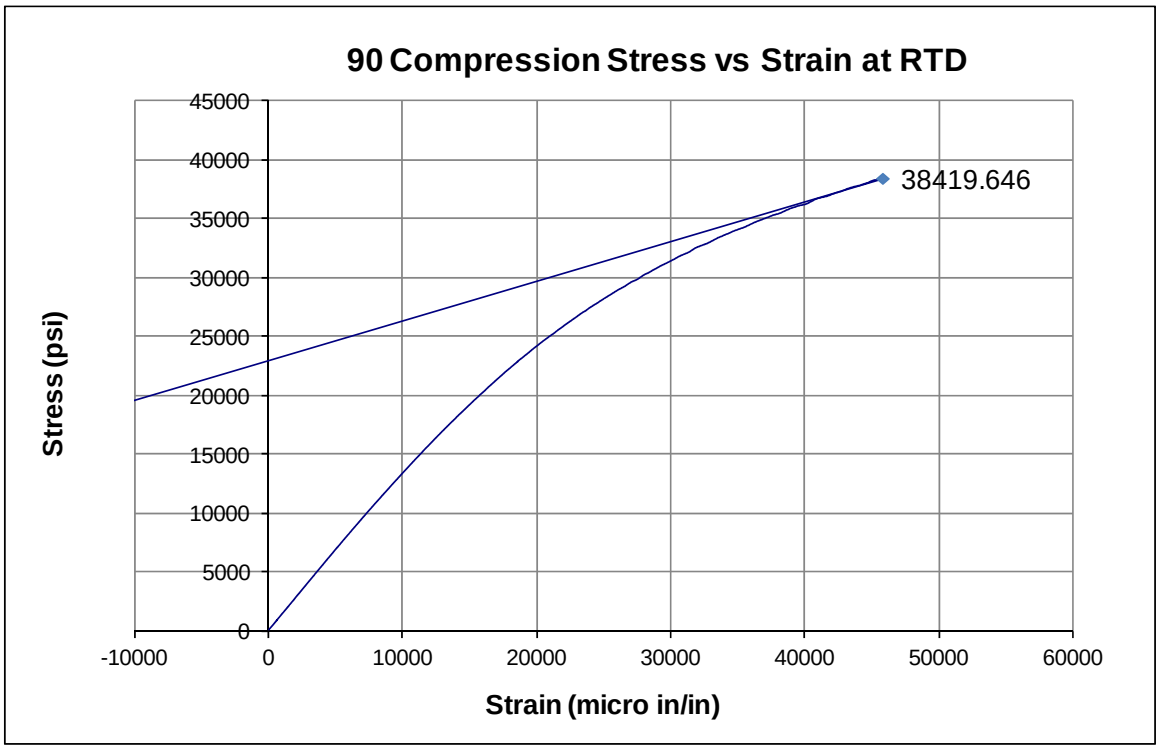
6.1 Longitudinal Tension



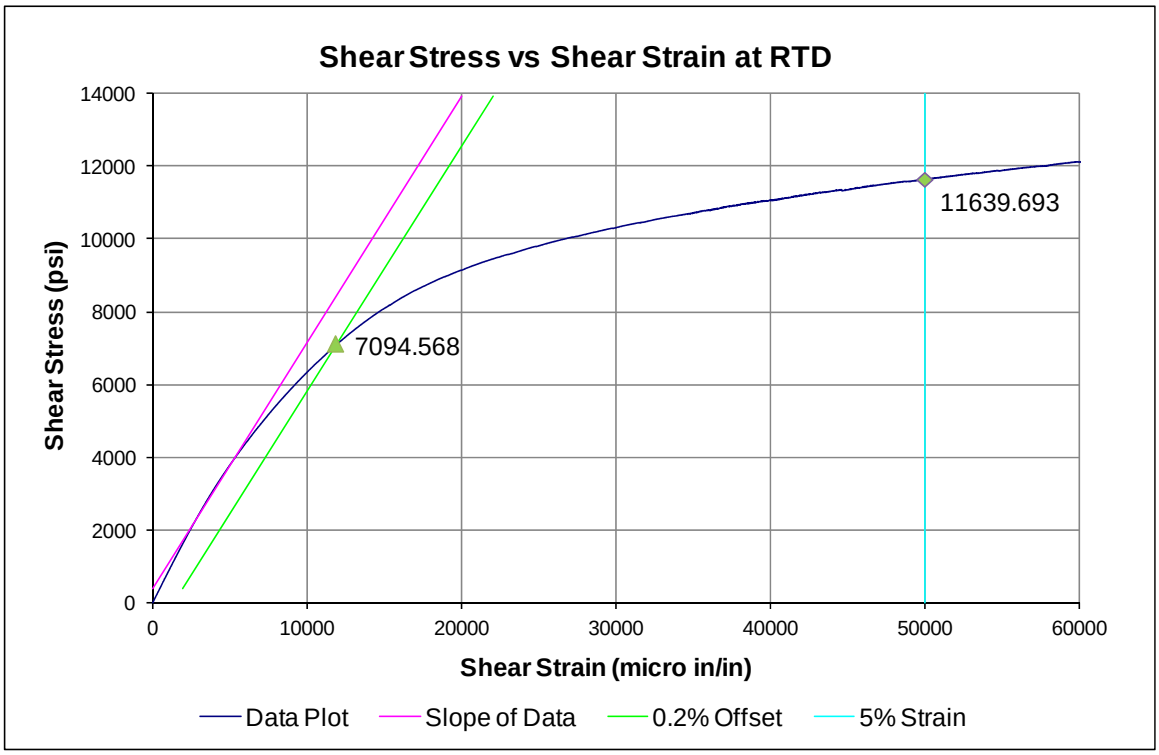
6.2 Transverse Tension



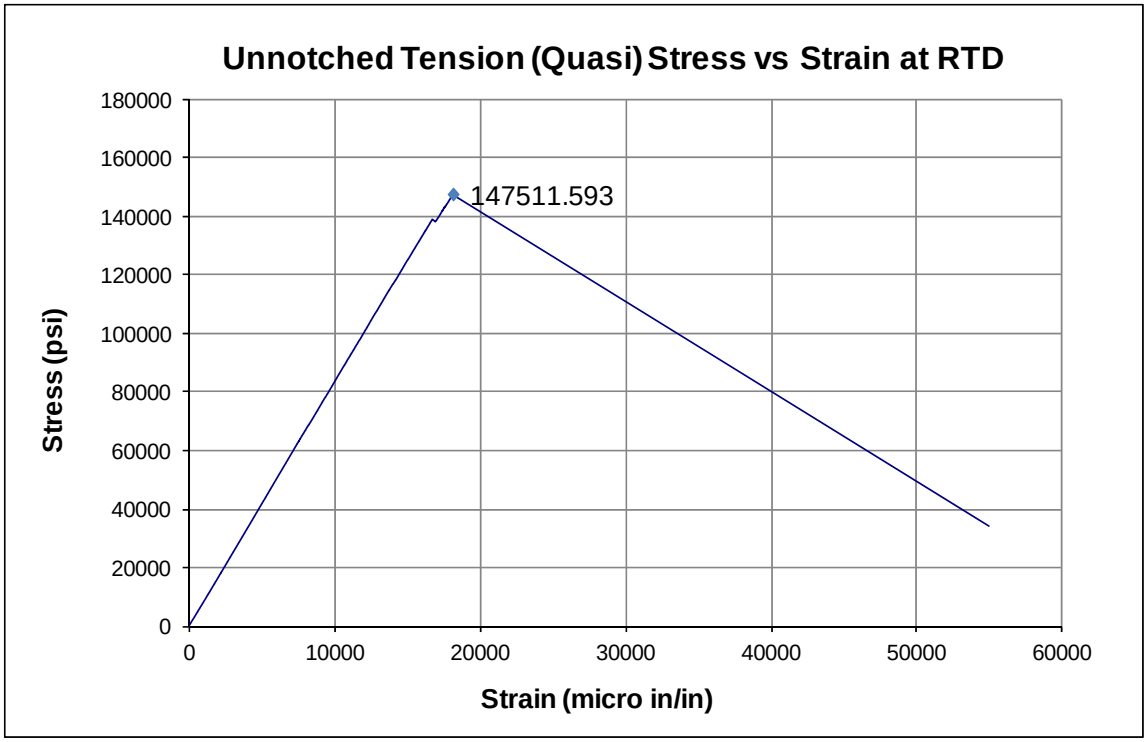
6.3 Transverse Compression

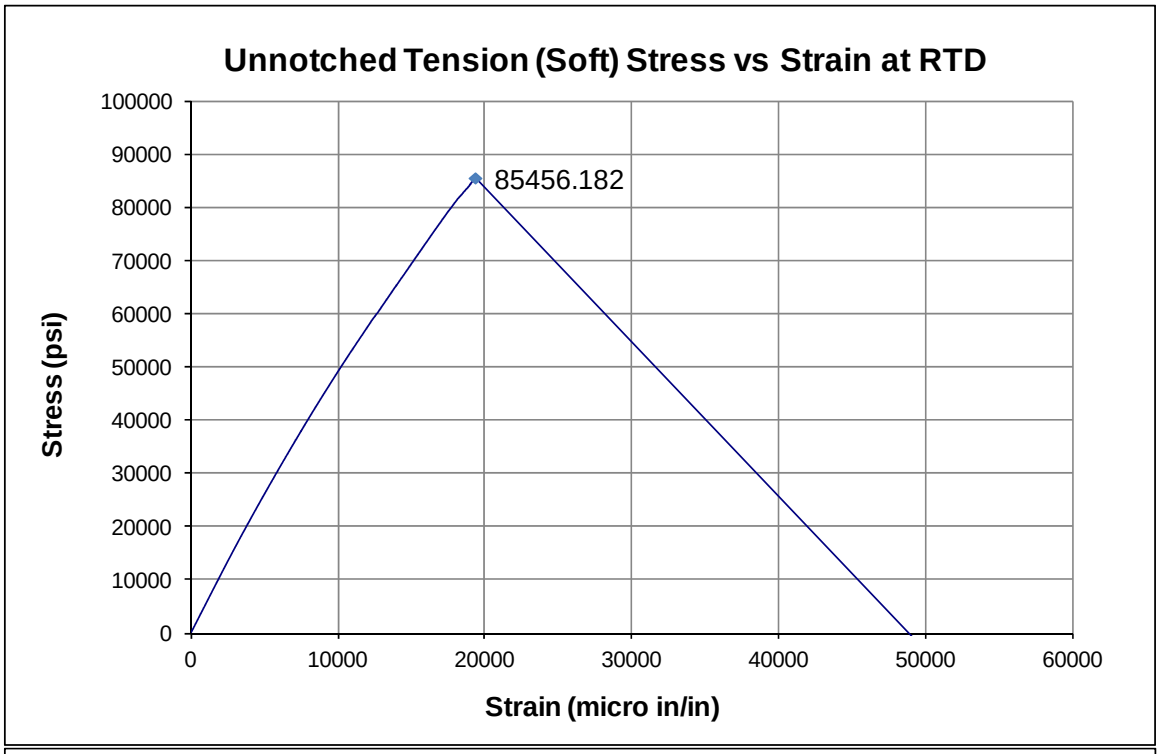


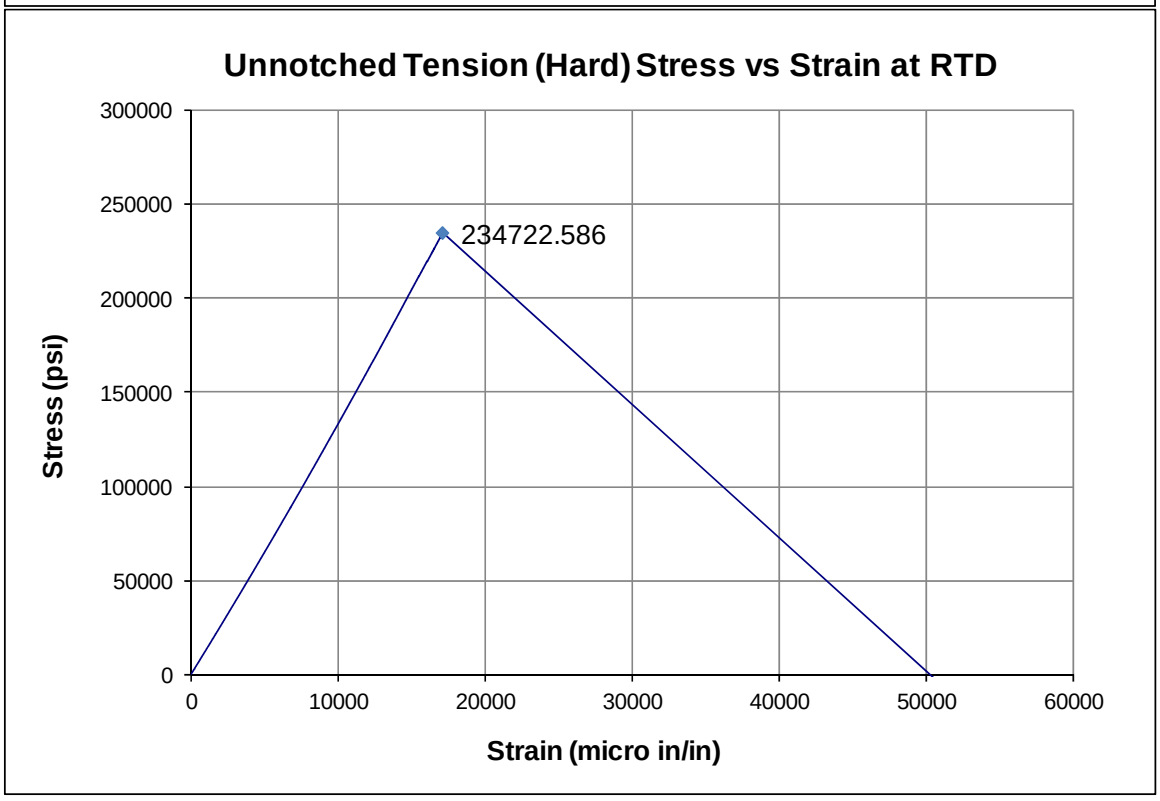
6.4 In-Plane Shear



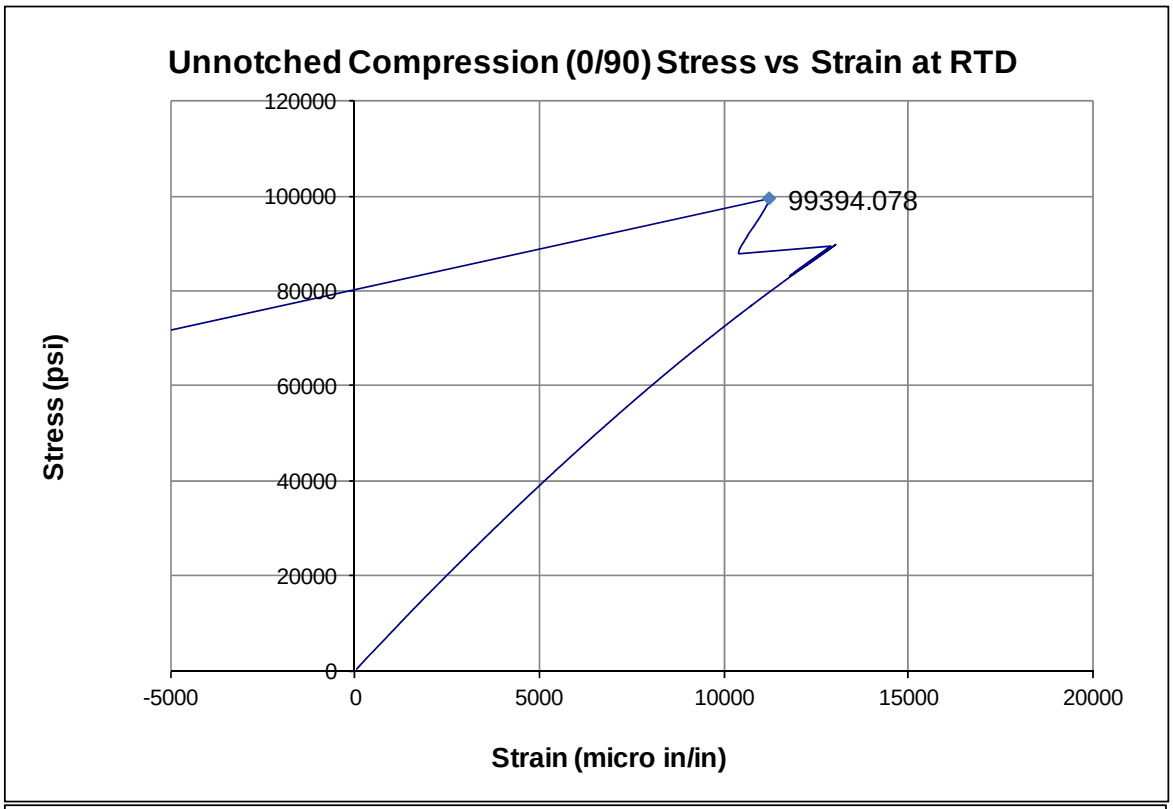
6.5 Unnotched Tension

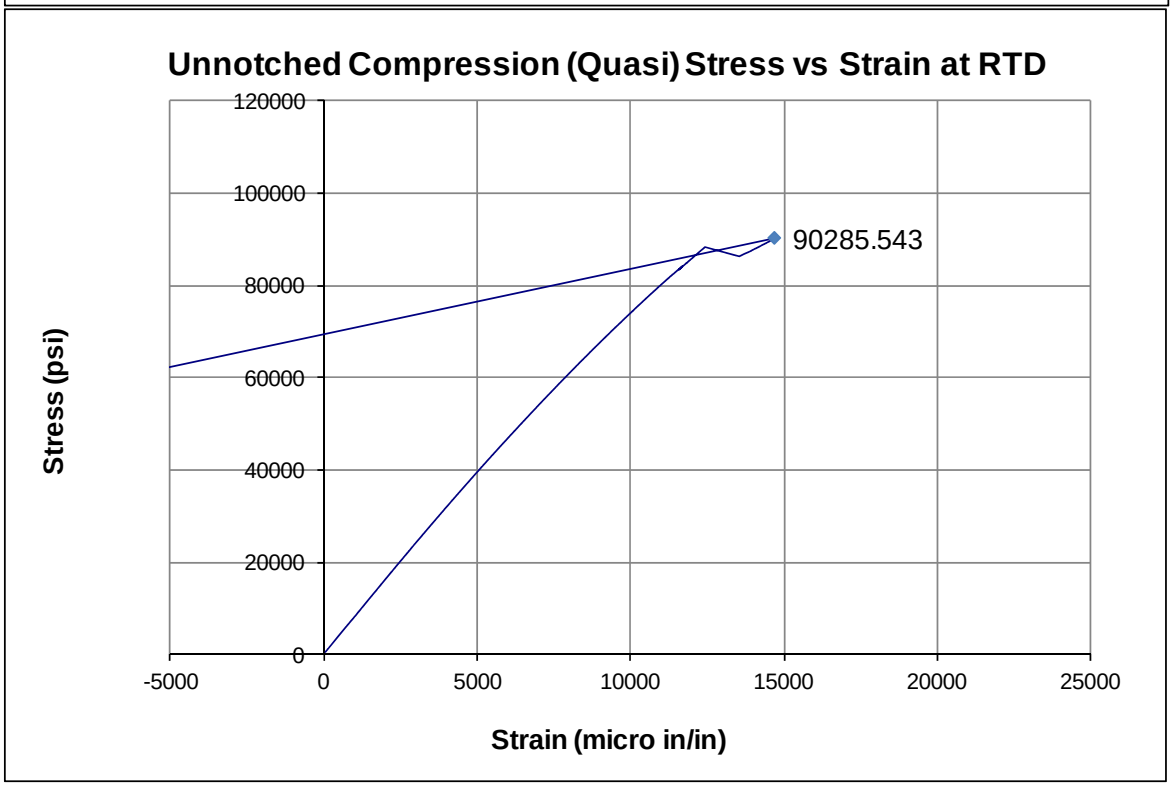


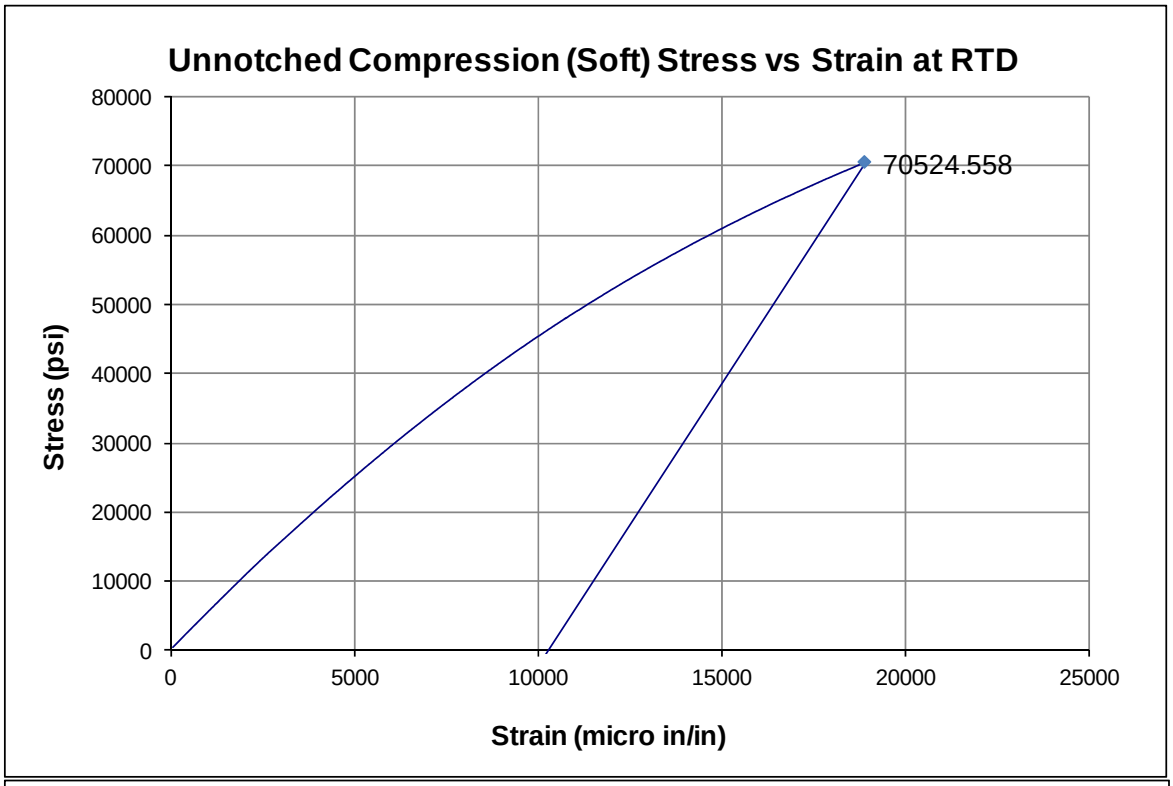

Unnotched Tension (Soft) Stress vs Strain at RTD
Stress (psi)
100000
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
85456.182
0
10000
20000
30000
40000
50000
60000
Strain (micro in/in)

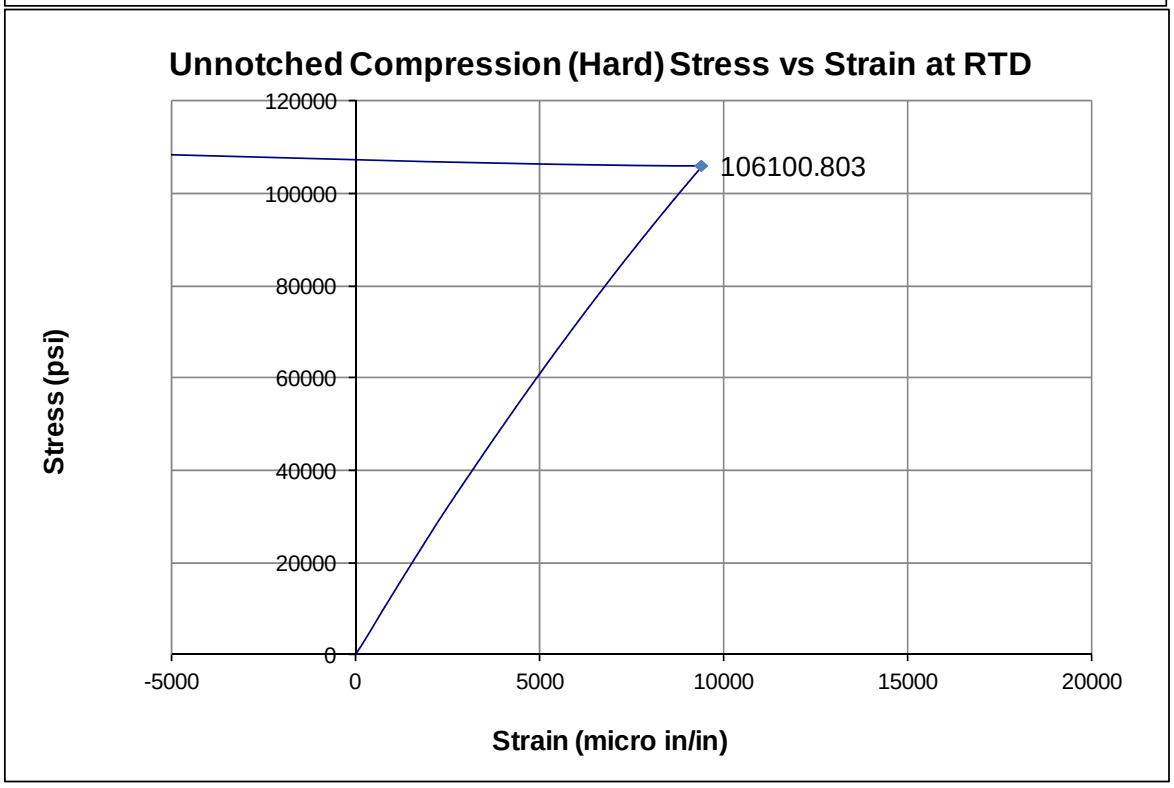

Unnotched Tension (Hard) Stress vs Strain at RTD
Stress (psi)
300000
250000
200000
150000
100000
50000
0
234722.586
0
10000
20000
30000
40000
50000
60000
Strain (micro in/in)

6.6 Unnotched Compression






Unnotched Compression (Soft) Stress vs Strain at RTD
Stress (psi)
80000
70000
60000
50000
40000
30000
20000
10000
0
0
5000
10000
15000
20000
25000
70524.558
Strain (micro in/in)


Unnotched Compression (Hard) Stress vs Strain at RTD
Stress (psi)
120000
100000
80000
60000
40000
20000
0
-5000
0
5000
10000
15000
20000
106100.803
Strain (micro in/in)

7. Fluid Sensitivity Comparison

7.1 Room Temperature Test 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	
t	Isopropyl Alcohol Deicing	48±4 hrs @ 70°F ± 10F
A	Dry	Per section 6.1 Test Plan
M	85% Relative Humidity	

Fluid	Average Short-Beam Strength With Fluid (ksi)	Same Environment Short-Beam Strength Without Fluid (ksi) (RTD)	Worst Case Environment Short-Beam Strength (ksi) (RTW)	% Strength Reduction With Respect to RTD
a	17.129	17.465	15.759	1.923
b	17.099	17.465	15.759	2.100
c	16.797	17.465	15.759	3.826
d	17.197	17.465	15.759	1.538
e	17.338	17.465	15.759	0.727
f	17.313	17.465	15.759	0.874
g	16.374	17.465	15.759	6.250
h	16.832	17.465	15.759	3.628
i	16.109	17.465	15.759	7.764
j	17.676	17.465	15.759	-1.204
k	16.545	17.465	15.759	5.269
t	16.586	17.465	15.759	5.036
r	16.365	17.465	15.759	6.300
A	17.465	17.465	15.759	0.000
M	15.759	17.465	15.759	9.772

Fluid Sensitivity Screening
Short-Beam Strength Properties (FSSBS)--RT Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 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
EPAQB121a	B	C1	2	a	17.199	0.104	14	0.0075	Interlaminar Shear, Inelastic Deformation	17.129
EPAQB122a	B	C1	2	a	16.978	0.104	14	0.0075		
EPAQB123a	B	C1	2	a	17.038	0.104	14	0.0075		
EPAQB124a	B	C1	2	a	17.023	0.104	14	0.0075		
EPAQB125a	B	C1	2	a	17.409	0.105	14	0.0075		
EPAQB121b	B	C1	2	b	16.943	0.104	14	0.0075	Interlaminar Shear, Inelastic Deformation	17.099
EPAQB122b	B	C1	2	b	16.941	0.104	14	0.0075		
EPAQB123b	B	C1	2	b	17.086	0.104	14	0.0075		
EPAQB124b	B	C1	2	b	17.084	0.105	14	0.0075		
EPAQB125b	B	C1	2	b	17.439	0.105	14	0.0075		
EPAQB121c	B	C1	2	c	17.229	0.105	14	0.0075	Interlaminar Shear, Inelastic Deformation	16.797
EPAQB122c	B	C1	2	c	16.338	0.105	14	0.0075		
EPAQB123c	B	C1	2	c	17.092	0.105	14	0.0075		
EPAQB124c	B	C1	2	c	16.980	0.105	14	0.0075		
EPAQB125c	B	C1	2	c	16.347	0.104	14	0.0075		
EPAQB121d	B	C1	2	d	16.876	0.104	14	0.0075	Interlaminar Shear, Inelastic Deformation	17.197
EPAQB122d	B	C1	2	d	17.184	0.104	14	0.0074		
EPAQB123d	B	C1	2	d	17.542	0.104	14	0.0075		
EPAQB124d	B	C1	2	d	17.047	0.104	14	0.0075		
EPAQB125d	B	C1	2	d	17.334	0.105	14	0.0075		
EPAQB121e	B	C1	2	e	17.513	0.105	14	0.0075	Interlaminar Shear, Inelastic Deformation	17.338
EPAQB122e	B	C1	2	e	17.082	0.105	14	0.0075		
EPAQB123e	B	C1	2	e	17.459	0.105	14	0.0075		
EPAQB124e	B	C1	2	e	17.368	0.105	14	0.0075		
EPAQB125e	B	C1	2	e	17.270	0.105	14	0.0075		
EPAQB121f	B	C1	2	f	17.568	0.105	14	0.0075	Interlaminar Shear, Inelastic Deformation	17.313
EPAQB122f	B	C1	2	f	17.587	0.104	14	0.0075		
EPAQB123f	B	C1	2	f	17.245	0.104	14	0.0074		
EPAQB124f	B	C1	2	f	17.025	0.104	14	0.0074		
EPAQB125f	B	C1	2	f	17.139	0.104	14	0.0074		
EPAQB121g	B	C1	2	g	15.943	0.105	14	0.0075	Interlaminar Shear, Inelastic Deformation	16.374
EPAQB122g	B	C1	2	g	16.762	0.105	14	0.0075		
EPAQB123g	B	C1	2	g	16.613	0.104	14	0.0074		
EPAQB124g	B	C1	2	g	16.401	0.104	14	0.0074		
EPAQB125g	B	C1	2	g	16.149	0.104	14	0.0074		
EPAQB121h	B	C1	2	h	15.759	0.105	14	0.0075	Interlaminar Shear, Inelastic Deformation	16.832
EPAQB122h	B	C1	2	h	16.187	0.104	14	0.0075		
EPAQB123h	B	C1	2	h	17.278	0.104	14	0.0074		
EPAQB124h	B	C1	2	h	17.388	0.104	14	0.0074		
EPAQB125h	B	C1	2	h	17.546	0.104	14	0.0074		

EPAQB121i	B	C1	2	i	16.421	0.105	14	0.0075	Interlaminar Shear, Inelastic Deformation	16.109
EPAQB122i	B	C1	2	i	16.604	0.104	14	0.0074		
EPAQB123i	B	C1	2	i	14.590	0.104	14	0.0075		
EPAQB124i	B	C1	2	i	16.413	0.104	14	0.0074		
EPAQB125i	B	C1	2	i	16.518	0.104	14	0.0074		
EPAQB121j	B	C1	2	j	17.572	0.105	14	0.0075	Interlaminar Shear, Inelastic Deformation	17.676
EPAQB122j	B	C1	2	j	17.728	0.105	14	0.0075		
EPAQB123j	B	C1	2	j	17.829	0.105	14	0.0075		
EPAQB124j	B	C1	2	j	17.693	0.105	14	0.0075		
EPAQB125j	B	C1	2	j	17.557	0.104	14	0.0074		
EPAQB121k	B	C1	2	k	17.052	0.103	14	0.0074	Interlaminar Shear, Inelastic Deformation	16.545
EPAQB122k	B	C1	2	k	16.353	0.103	14	0.0073		
EPAQB123k	B	C1	2	k	16.740	0.103	14	0.0074		
EPAQB124k	B	C1	2	k	16.479	0.103	14	0.0073		
EPAQB125k	B	C1	2	k	16.103	0.103	14	0.0074		
EPAQB121t	B	C1	2	t	16.405	0.103	14	0.0074	Interlaminar Shear, Inelastic Deformation	16.586
EPAQB122t	B	C1	2	t	15.814	0.103	14	0.0073		
EPAQB123t	B	C1	2	t	16.204	0.103	14	0.0074		
EPAQB124t	B	C1	2	t	16.774	0.103	14	0.0074		
EPAQB125t	B	C1	2	t	17.731	0.103	14	0.0073		
EPAQB121r	B	C1	2	r	16.418	0.104	14	0.0074	Interlaminar Shear, Inelastic Deformation	16.365
EPAQB122r	B	C1	2	r	16.234	0.103	14	0.0074		
EPAQB123r	B	C1	2	r	16.380	0.103	14	0.0074		
EPAQB124r	B	C1	2	r	16.422	0.103	14	0.0074		
EPAQB125r	B	C1	2	r	16.371	0.103	14	0.0074		
EPAQB121A	B	C1	2	A	17.700	0.103	14	0.0074	Interlaminar Shear, Inelastic Deformation	17.465
EPAQB122A	B	C1	2	A	17.412	0.103	14	0.0074		
EPAQB123A	B	C1	2	A	17.373	0.103	14	0.0074		
EPAQB124A	B	C1	2	A	17.415	0.103	14	0.0074		
EPAQB125A	B	C1	2	A	17.426	0.103	14	0.0074		
EPAQB121M	B	C1	2	M	15.010	0.104	14	0.0074	Interlaminar Shear, Inelastic Deformation	15.759
EPAQB122M	B	C1	2	M	15.843	0.103	14	0.0074		
EPAQB123M	B	C1	2	M	15.974	0.104	14	0.0074		
EPAQB124M	B	C1	2	M	16.042	0.103	14	0.0074		
EPAQB125M	B	C1	2	M	15.925	0.103	14	0.0074		

Average	**16.839**
Standard Dev.	**0.656**
Coeff. of Var. [%]	**3.893**
Min.	**14.590**
Max.	**17.829**
Number of Spec.	**75**

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
L	Dry	Per section 6.1 Test Plan
N	85% Relative Humidity	

Fluid	Average Short-Beam Strength With Fluid (ksi)	Same Environment Short-Beam Strength Without Fluid (ksi) (ETD)	Worst Case Environment Short-Beam Strength (ksi) (ETW)	% Strength Reduction With Respect to ETD
1	13.781	14.241	11.915	3.230
2	13.761	14.241	11.915	3.365
3	13.747	14.241	11.915	3.465
4	13.906	14.241	11.915	2.349
5	14.077	14.241	11.915	1.147
6	14.287	14.241	11.915	-0.325
7	12.889	14.241	11.915	9.489
8	14.553	14.241	11.915	-2.197
9	12.692	14.241	11.915	10.872
m	13.751	14.241	11.915	3.436
n	14.292	14.241	11.915	-0.358
p	14.329	14.241	11.915	-0.623
s	12.863	14.241	11.915	9.670
L	14.241	14.241	11.915	0.000
N	11.915	14.241	11.915	16.328

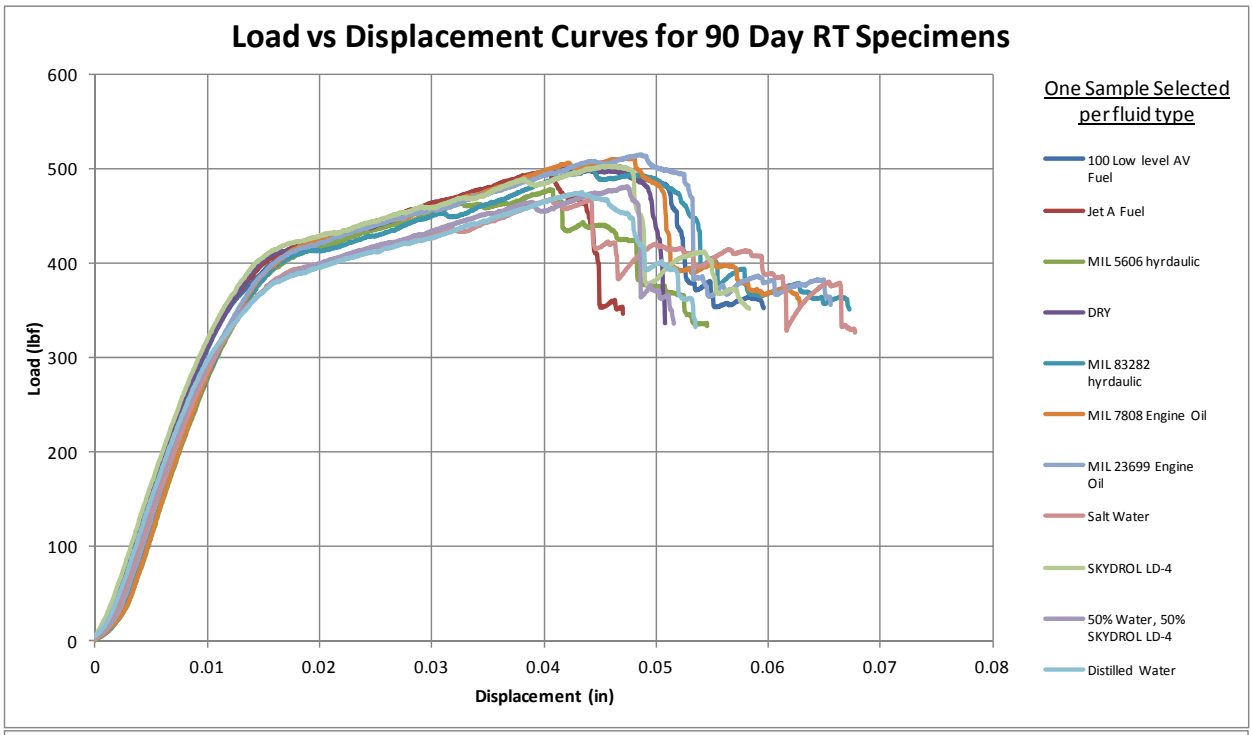
Fluid Sensitivity Screening
Short-Beam Strength Properties (FSSBS)--ET Strength
Cytec Cycom EP2202 IM7G Unitape Gr 190 RC 33%

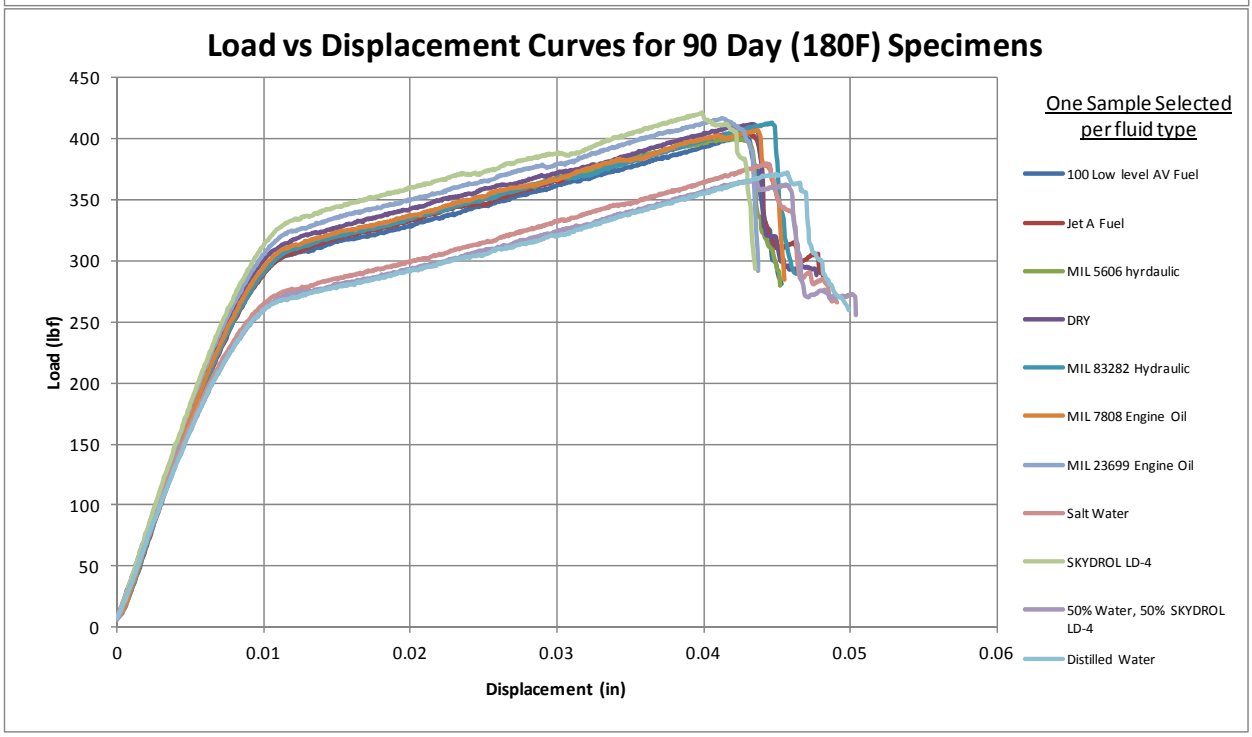
Specimen Number	Cytec Batch #	Cytec Cure Cycle	Prepreg Lot #	Fluid	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode	Average
EPAQB1211	B	C1	2	1	13.728	0.105	14	0.0075	Interlaminar Shear, Inelastic Deformation	13.781
EPAQB1221	B	C1	2	1	13.410	0.105	14	0.0075		
EPAQB1231	B	C1	2	1	14.053	0.105	14	0.0075		
EPAQB1241	B	C1	2	1	13.831	0.104	14	0.0075		
EPAQB1251	B	C1	2	1	13.881	0.105	14	0.0075		
EPAQB1212	B	C1	2	2	13.935	0.105	14	0.0075	Interlaminar Shear, Inelastic Deformation	13.761
EPAQB1222	B	C1	2	2	13.955	0.104	14	0.0075		
EPAQB1232	B	C1	2	2	13.453	0.104	14	0.0074		
EPAQB1242	B	C1	2	2	13.918	0.104	14	0.0075		
EPAQB1252	B	C1	2	2	13.544	0.105	14	0.0075		
EPAQB1213	B	C1	2	3	13.971	0.105	14	0.0075	Interlaminar Shear, Inelastic Deformation	13.747
EPAQB1223	B	C1	2	3	13.694	0.104	14	0.0075		
EPAQB1233	B	C1	2	3	13.636	0.105	14	0.0075		
EPAQB1243	B	C1	2	3	13.765	0.105	14	0.0075		
EPAQB1253	B	C1	2	3	13.669	0.105	14	0.0075		
EPAQB1214	B	C1	2	4	14.160	0.104	14	0.0074	Interlaminar Shear, Inelastic Deformation	13.906
EPAQB1224	B	C1	2	4	13.931	0.105	14	0.0075		
EPAQB1234	B	C1	2	4	13.751	0.104	14	0.0075		
EPAQB1244	B	C1	2	4	13.954	0.105	14	0.0075		
EPAQB1254	B	C1	2	4	13.734	0.105	14	0.0075		
EPAQB1215	B	C1	2	5	14.025	0.104	14	0.0074	Interlaminar Shear, Inelastic Deformation	14.077
EPAQB1225	B	C1	2	5	14.001	0.104	14	0.0074		
EPAQB1235	B	C1	2	5	14.228	0.104	14	0.0074		
EPAQB1245	B	C1	2	5	14.050	0.104	14	0.0074		
EPAQB1255	B	C1	2	5	14.083	0.104	14	0.0074		
EPAQB1216	B	C1	2	6	14.234	0.105	14	0.0075	Interlaminar Shear, Inelastic Deformation	14.287
EPAQB1226	B	C1	2	6	14.223	0.104	14	0.0075		
EPAQB1246	B	C1	2	6	14.265	0.104	14	0.0074		
EPAQB1256	B	C1	2	6	14.392	0.104	14	0.0074		
EPAQB1266	B	C1	2	6	14.319	0.103	14	0.0074		
EPAQB1217	B	C1	2	7	12.945	0.105	14	0.0075	Interlaminar Shear, Inelastic Deformation	12.889
EPAQB1227	B	C1	2	7	12.955	0.105	14	0.0075		
EPAQB1237	B	C1	2	7	12.904	0.104	14	0.0075		
EPAQB1247	B	C1	2	7	12.783	0.105	14	0.0075		
EPAQB1257	B	C1	2	7	12.859	0.104	14	0.0074		
EPAQB1218	B	C1	2	8	14.392	0.105	14	0.0075	Interlaminar Shear, Inelastic Deformation	14.553
EPAQB1228	B	C1	2	8	14.557	0.105	14	0.0075		
EPAQB1238	B	C1	2	8	14.842	0.105	14	0.0075		
EPAQB1248	B	C1	2	8	14.623	0.104	14	0.0075		
EPAQB1258	B	C1	2	8	14.353	0.104	14	0.0074		

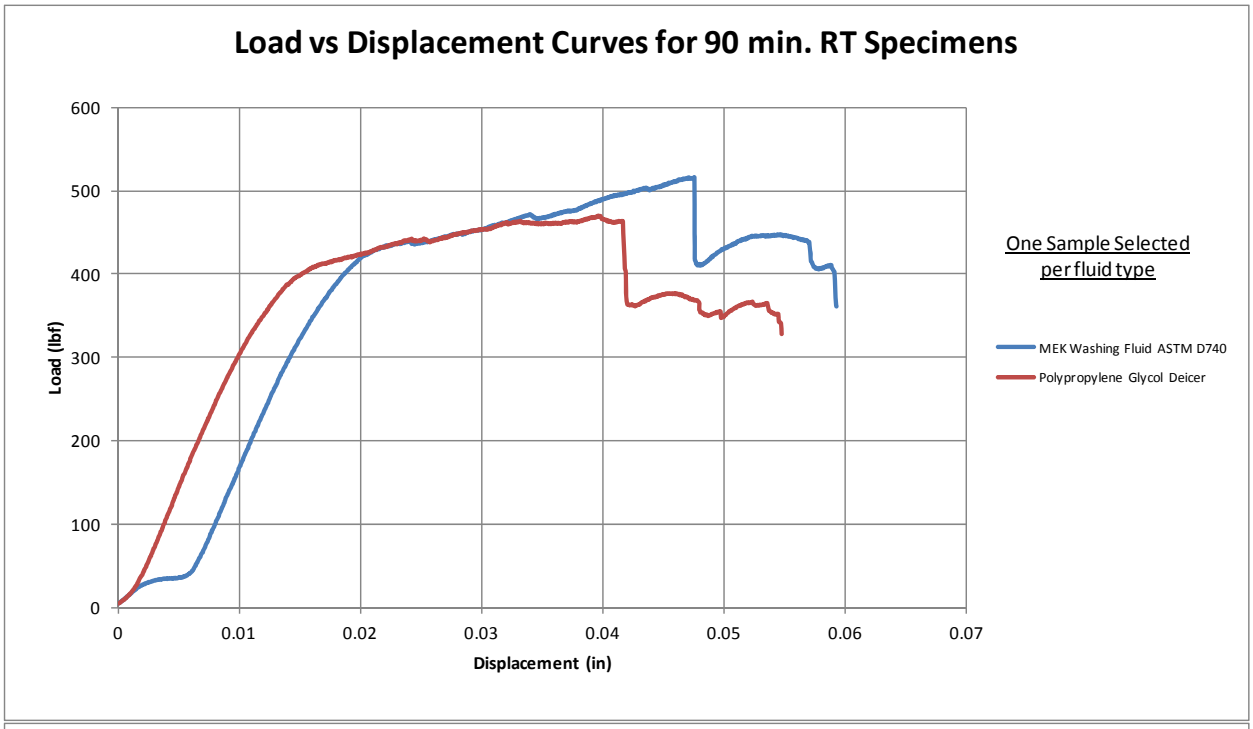
EPAQB1219	B	C1	2	9	12.507	0.104	14	0.0075	Interlaminar Shear, Inelastic Deformation	12.692
EPAQB1229	B	C1	2	9	12.633	0.104	14	0.0075		
EPAQB1239	B	C1	2	9	12.776	0.104	14	0.0074		
EPAQB1249	B	C1	2	9	12.734	0.104	14	0.0074		
EPAQB1259	B	C1	2	9	12.812	0.105	14	0.0075		
EPAQB121m	B	C1	2	m	11.605	0.104	14	0.0074	Interlaminar Shear, Inelastic Deformation	13.751
EPAQB122m	B	C1	2	m	14.017	0.104	14	0.0074		
EPAQB123m	B	C1	2	m	14.464	0.104	14	0.0074		
EPAQB124m	B	C1	2	m	14.347	0.103	14	0.0074		
EPAQB125m	B	C1	2	m	14.100	0.103	14	0.0074		
EPAQB126m	B	C1	2	m	13.976	0.103	14	0.0074		
EPAQB121n	B	C1	2	n	14.307	0.103	14	0.0074	Interlaminar Shear, Inelastic Deformation	14.292
EPAQB122n	B	C1	2	n	14.415	0.103	14	0.0073		
EPAQB123n	B	C1	2	n	14.229	0.103	14	0.0073		
EPAQB124n	B	C1	2	n	14.184	0.103	14	0.0073		
EPAQB125n	B	C1	2	n	14.322	0.103	14	0.0073		
EPAQB121p	B	C1	2	p	14.608	0.103	14	0.0074	Interlaminar Shear, Inelastic Deformation	14.329
EPAQB122p	B	C1	2	p	14.353	0.103	14	0.0074		
EPAQB123p	B	C1	2	p	14.346	0.103	14	0.0073		
EPAQB124p	B	C1	2	p	14.205	0.104	14	0.0074		
EPAQB125p	B	C1	2	p	14.133	0.103	14	0.0074		
EPAQB121s	B	C1	2	s	12.881	0.103	14	0.0074	Interlaminar Shear, Inelastic Deformation	12.863
EPAQB122s	B	C1	2	s	13.019	0.103	14	0.0074		
EPAQB123s	B	C1	2	s	12.893	0.103	14	0.0074		
EPAQB124s	B	C1	2	s	12.896	0.103	14	0.0073		
EPAQB125s	B	C1	2	s	12.628	0.103	14	0.0074		
EPAQB121L	B	C1	2	L	14.298	0.103	14	0.0074	Interlaminar Shear, Inelastic Deformation	14.241
EPAQB122L	B	C1	2	L	14.270	0.103	14	0.0074		
EPAQB123L	B	C1	2	L	14.021	0.103	14	0.0074		
EPAQB124L	B	C1	2	L	14.193	0.103	14	0.0074		
EPAQB125L	B	C1	2	L	14.420	0.103	14	0.0073		
EPAQB121N	B	C1	2	N	11.748	0.103	14	0.0073	Interlaminar Shear, Inelastic Deformation	11.915
EPAQB122N	B	C1	2	N	11.951	0.102	14	0.0073		
EPAQB123N	B	C1	2	N	12.055	0.102	14	0.0073		
EPAQB124N	B	C1	2	N	11.851	0.102	14	0.0073		
EPAQB125N	B	C1	2	N	11.972	0.102	14	0.0073		

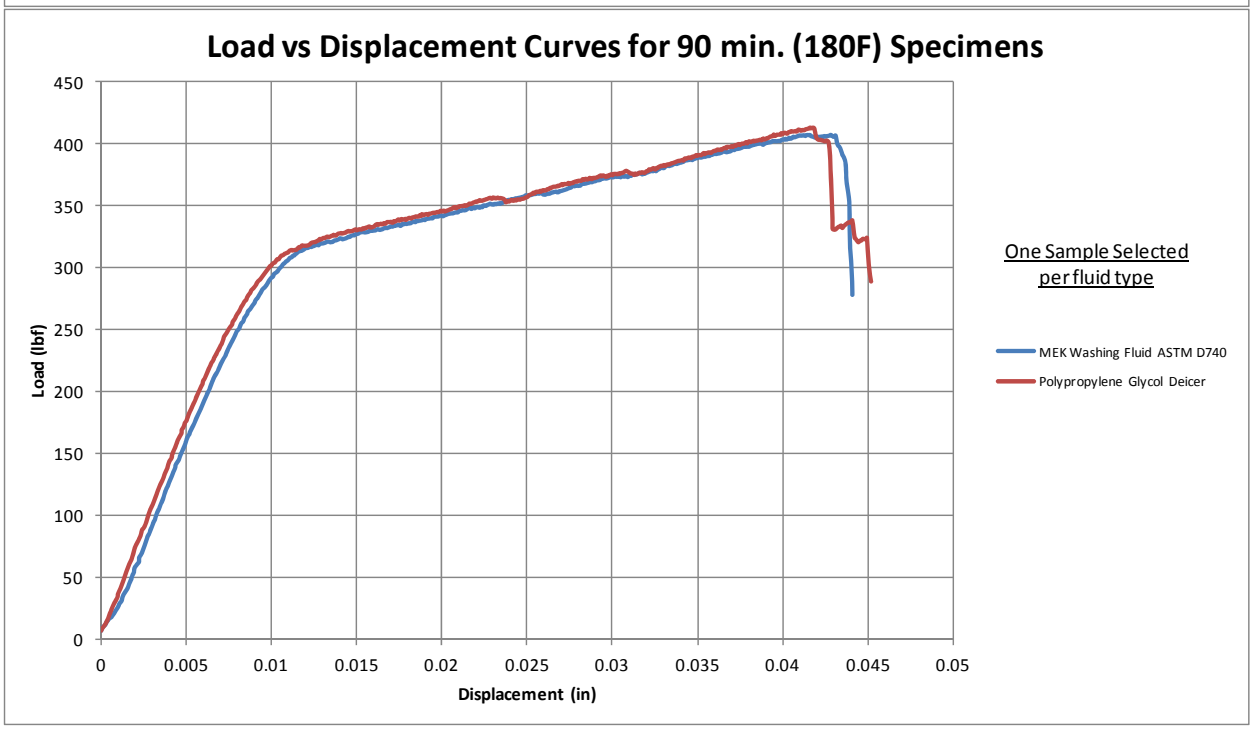
Average	**13.673**
Standard Dev.	**0.786**
Coeff. of Var. [%]	**5.748**
Min.	**11.605**
Max.	**14.842**
Number of Spec.	**76**

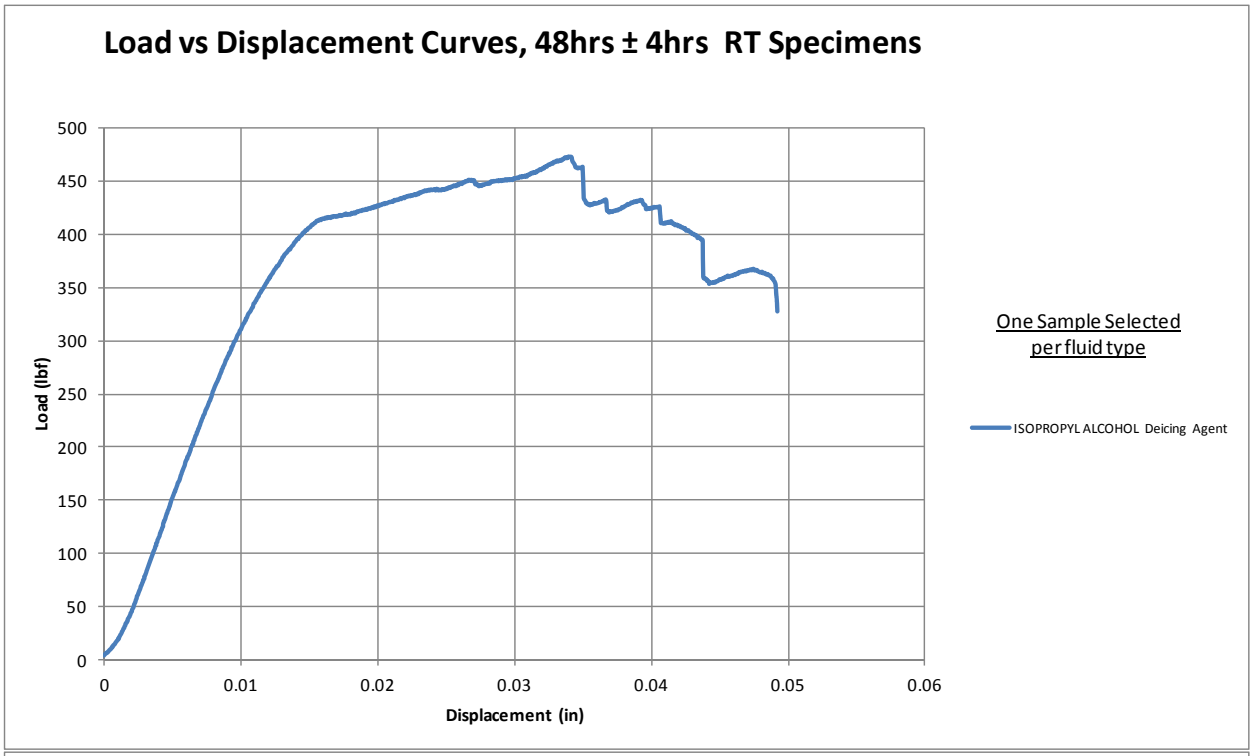
7.3 Load Displacement Curves

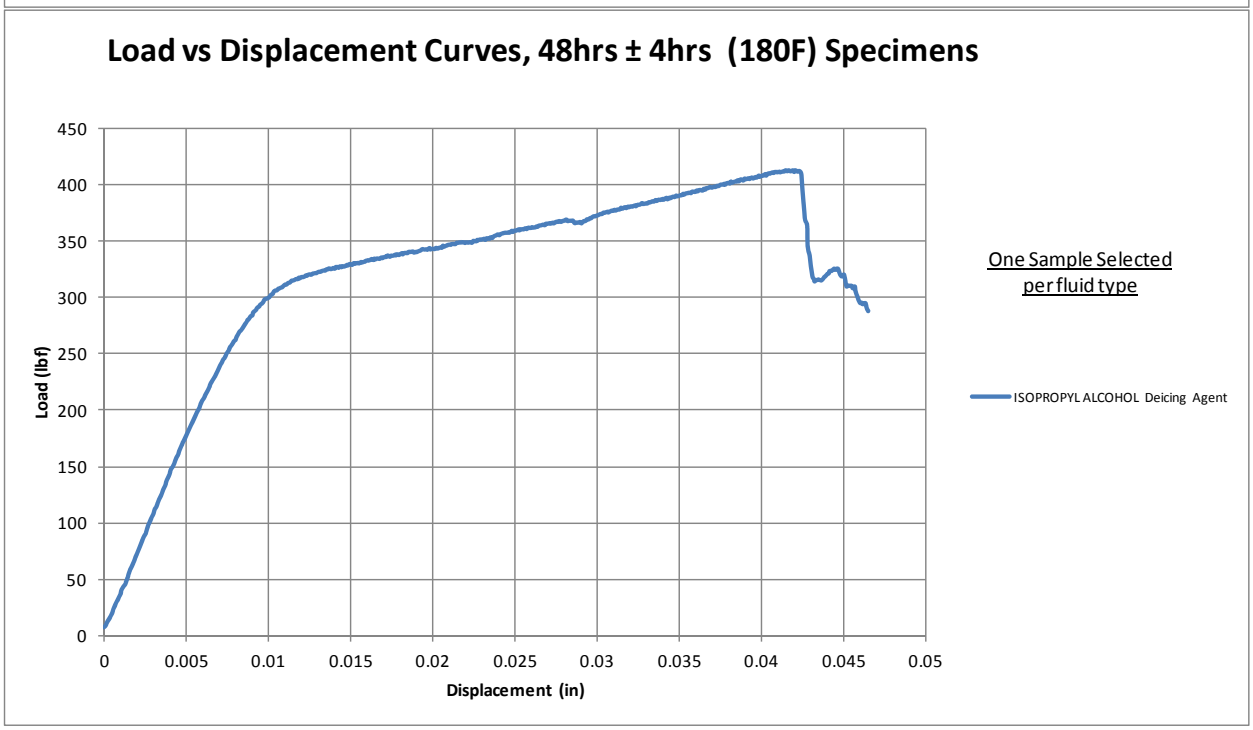


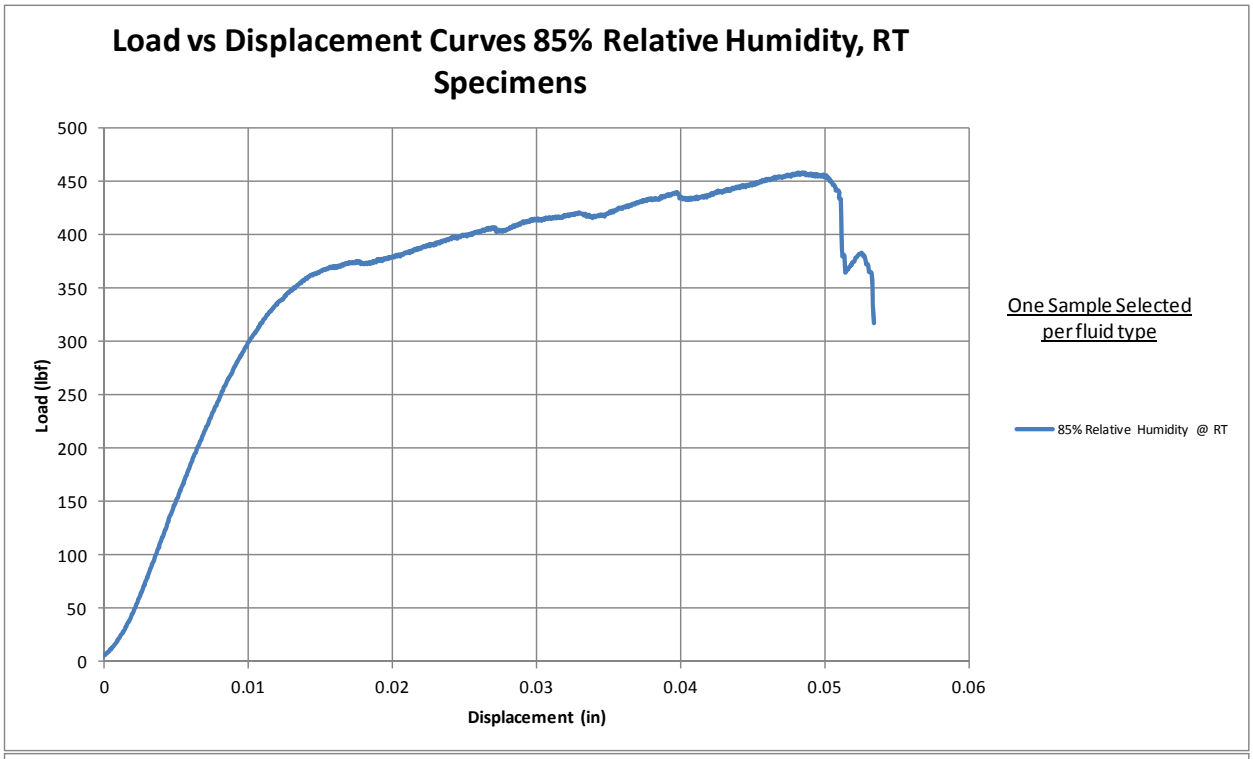


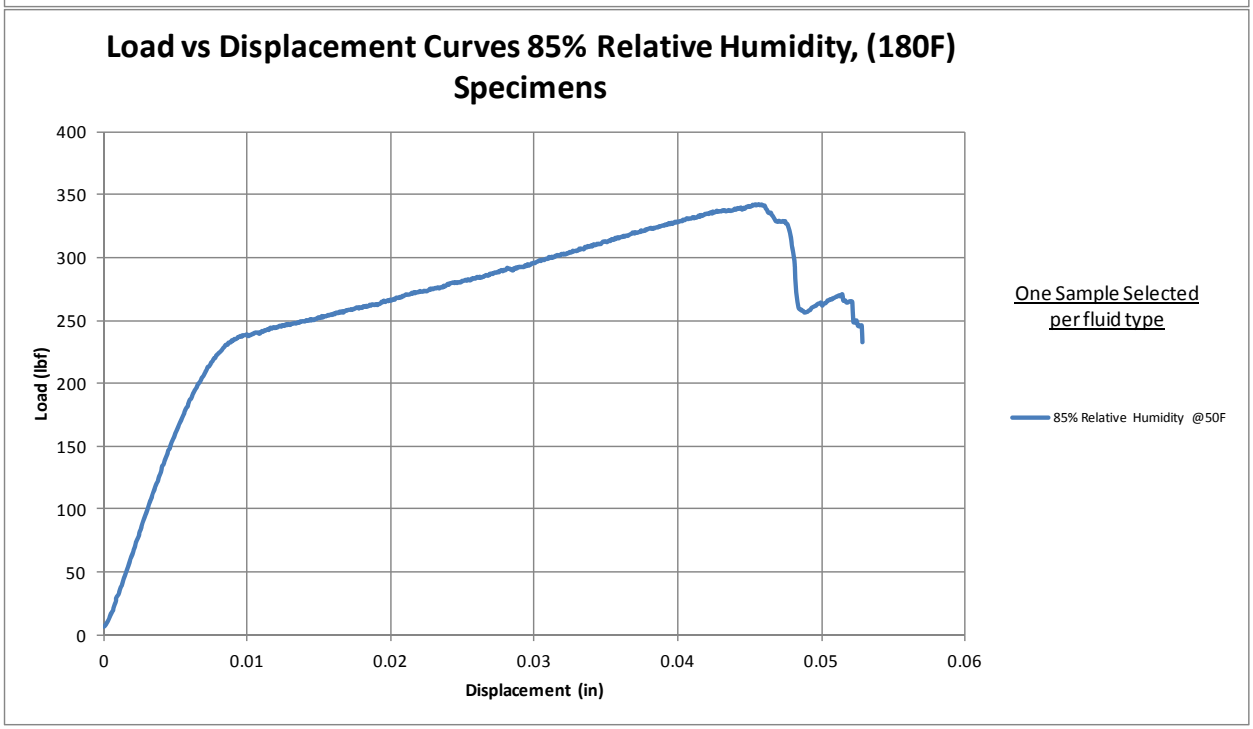

Load vs Displacement Curves for 90 min. RT Specimens
Load (lbf)
600
500
400
300
200
100
0
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
Displacement (in)
One Sample Selected per fluid type
MEK Washing Fluid ASTM D740
Polypropylene Glycol Deicer


Load vs Displacement Curves for 90 min. (180F) Specimens
Load (lbf)
450
400
350
300
250
200
150
100
50
0
0
0.005
0.01
0.015
0.02
0.025
0.03
0.035
0.04
0.045
0.05
Displacement (in)
One Sample Selected per fluid type
MEK Washing Fluid ASTM D740
Polypropylene Glycol Deicer


Load vs Displacement Curves, 48hrs ± 4hrs RT Specimens
Load (lbf)
500
450
400
350
300
250
200
150
100
50
0
0
0.01
0.02
0.03
0.04
0.05
0.06
Displacement (in)
One Sample Selected per fluid type
ISOPROPYL ALCOHOL Deicing Agent

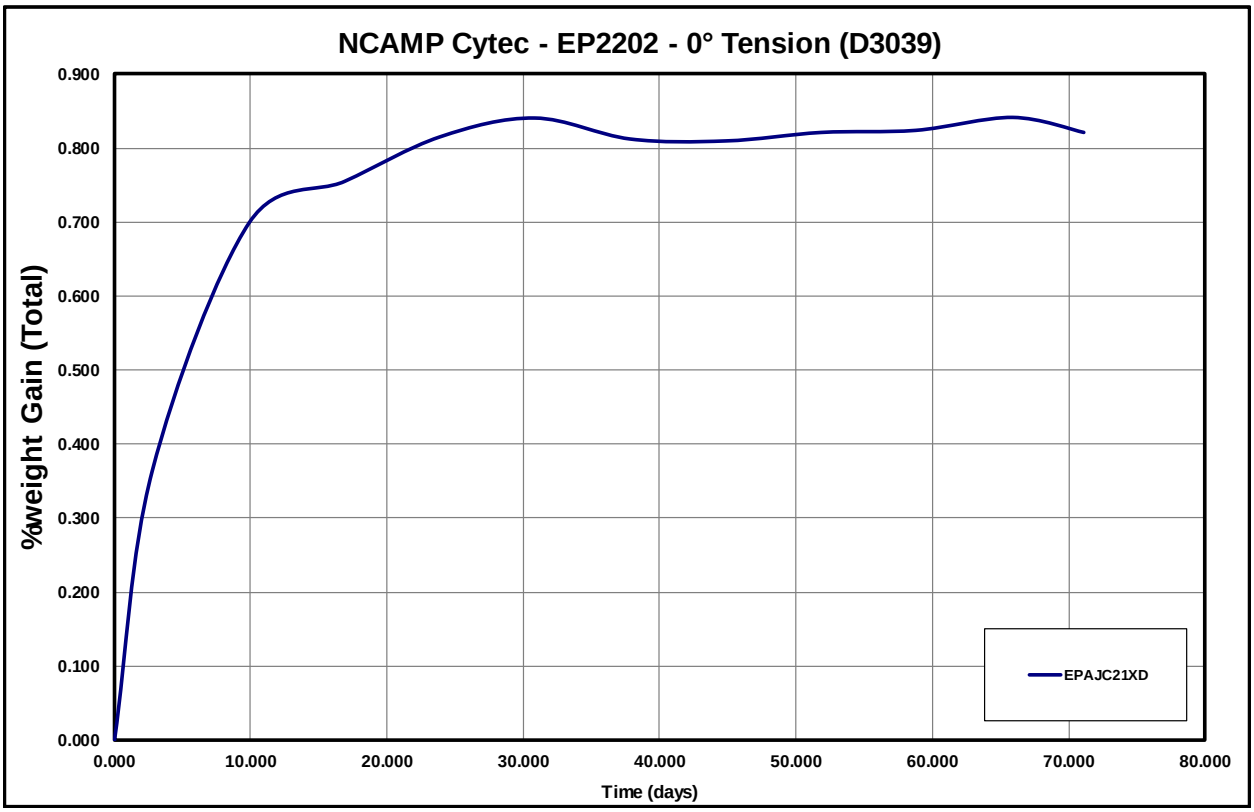

Load vs Displacement Curves, 48hrs ± 4hrs (180F) Specimens
Load (lbf)
450
400
350
300
250
200
150
100
50
0
0
0.005
0.01
0.015
0.02
0.025
0.03
0.035
0.04
0.045
0.05
Displacement (in)
One Sample Selected per fluid type
ISOPROPYL ALCOHOL Deicing Agent


Load vs Displacement Curves 85% Relative Humidity, RT Specimens
Load (lbf)
500
450
400
350
300
250
200
150
100
50
0
0
0.01
0.02
0.03
0.04
0.05
0.06
Displacement (in)
One Sample Selected per fluid type
85% Relative Humidity @ RT

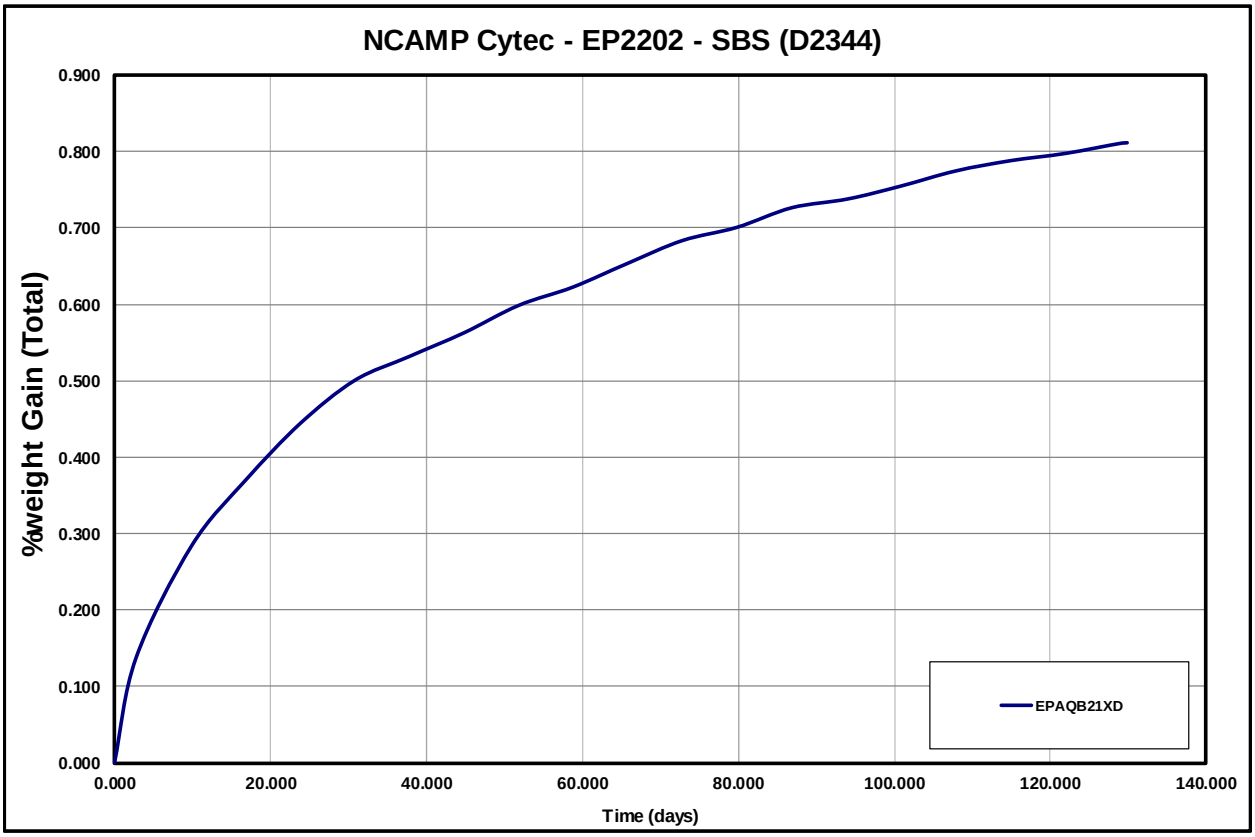

Load vs Displacement Curves 85% Relative Humidity, (180F) Specimens
Load (lbf)
400
350
300
250
200
150
100
50
0
0
0.01
0.02
0.03
0.04
0.05
0.06
Displacement (in)
One Sample Selected per fluid type
85% Relative Humidity @50F

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

NCAMP Cytec EP2202 CP-C41-XXX-X-XX EPAXXX1 DRY DMA

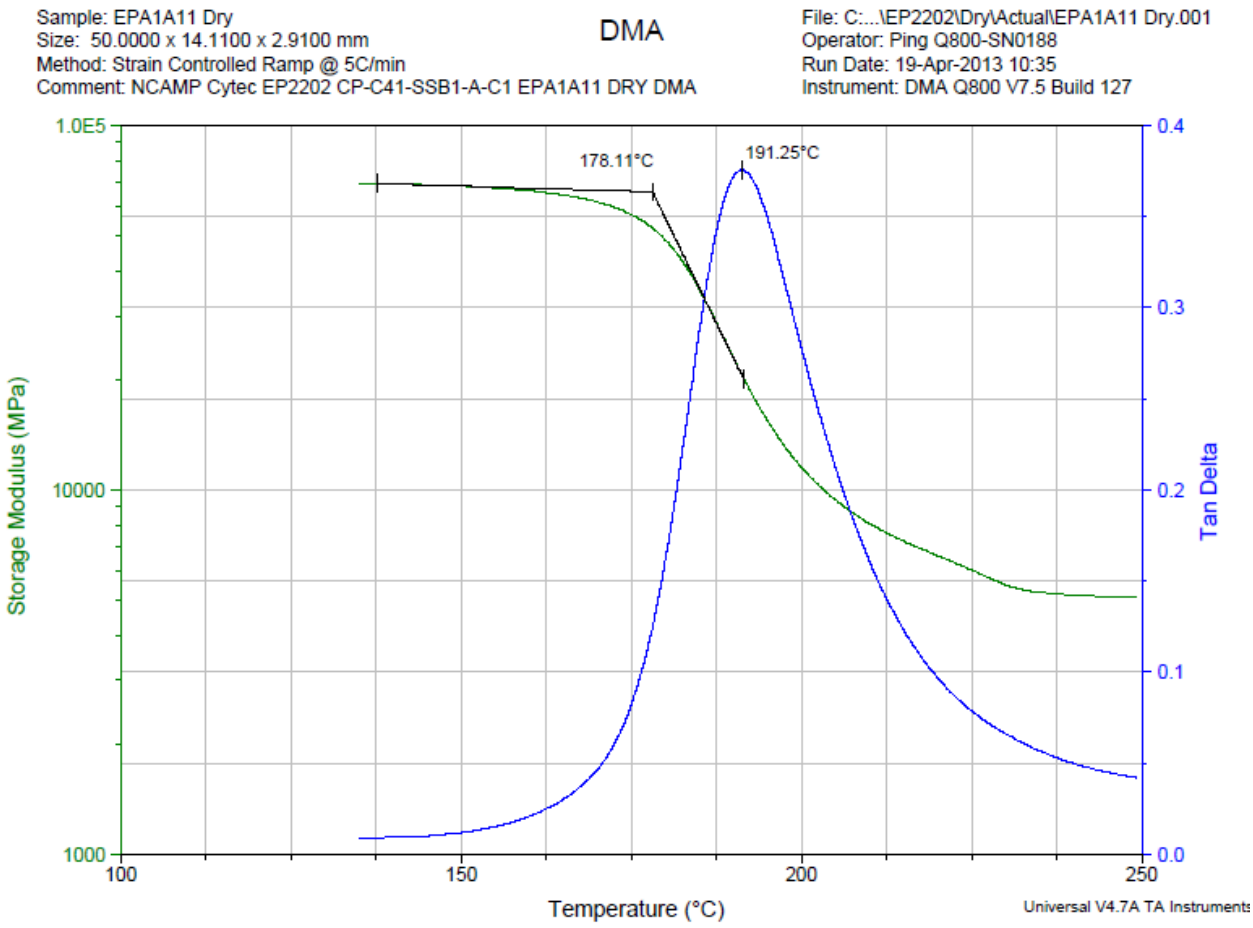
Sample #	Onset Storage Modulus		Peak of Tangent Delta	
	Tg [°C]	Tg [°F]	Tg [°C]	Tg [°F]
EPA1A11 Dry (CP-C41-SSB1-A-C1)	178.11	352.60	191.25	376.25
EPA1A21 Dry (CP-C41-SSB1-A-C2)	181.26	358.27	194.89	382.80
EPA1C11 Dry (CP-C41-SSB1-C-C1)	190.99	375.78	203.13	397.63
EPA2C11 Dry (CP-C41-SSB2-C-C1)	190.74	375.33	203.83	398.89
EPA3C11 Dry (CP-C41-SSB3-C-C1)	191.71	377.08	202.87	397.17
EPA3C21 Dry (CP-C41-SSB3-C-C2)	193.61	380.50	204.22	399.60
EPA4C11 Dry (CP-C41-FHT1-C-C1)	191.62	376.92	204.70	400.46
EPA4C21 Dry (CP-C41-FHT1-C-C2)	191.53	376.75	204.32	399.78
EPA5A11 Dry (EP-C41-FHT2-A-C1)	185.75	366.35	198.79	389.82
EPA6C11 Dry (CP-C41-FHT3-C-C1)	189.65	373.37	201.48	394.66
EPA6C21 Dry (CP-C41-FHT3-C-C2)	191.44	376.59	202.24	396.03
EPA9A11 Dry (CP-C41-FHC3-A-C1)	179.36	354.85	191.93	377.47
EPA9A21 Dry (CP-C41-FHC3-A-C2)	181.25	358.25	193.79	380.82
EPA9C21 Dry (CP-C41-FHC3-C-C2)	187.81	370.06	198.44	389.19
EPAAA11 Dry (CP-C41-UNT1-A-C1)	175.94	348.69	190.04	374.07
EPAAA21 Dry (CP-C41-UNT1-A-C2)	176.48	349.66	190.38	374.68
EPAAC11 Dry (CP-C41-UNT1-C-C1)	190.56	375.01	202.91	397.24
EPAAC21 Dry (CP-C41-UNT1-C-C2)	192.06	377.71	204.77	400.59
EPABA21 Dry (EP-C41-UNT2-A-C2)	184.30	363.74	197.47	387.45
EPADA11 Dry (CP-C41-OHT1-A-C1)	179.39	354.90	192.57	378.63
EPADA21 Dry (CP-C41-OHT1-A-C2)	182.47	360.45	195.26	383.47
EPADB11 Dry (CP-C41-OHT1-B-C1)	184.49	364.08	197.52	387.54
EPADB21 Dry (CP-C41-OHT1-B-C2)	183.20	361.76	196.37	385.47
EPADC11 Dry (CP-C41-OHT1-C-C1)	191.61	376.90	203.84	398.91
EPADC21 Dry (CP-C41-OHT1-C-C2)	191.31	376.36	203.36	398.05
EPAFC11 Dry (CP-C41-OHT3-C-C1)	190.79	375.42	203.21	397.78
EPAFC21 Dry (CP-C41-OHT3-C-C2)	190.55	374.99	202.98	397.36
EPAGC11 Dry (CP-C41-OHC1-C-C1)	190.12	374.22	202.19	395.94
EPAGC21 Dry (CP-C41-OHC1-C-C2)	190.27	374.49	201.89	395.40
EPAIA11 Dry (EP-C41-OHC3-A-C1)	183.92	363.06	196.44	385.59
EPAIC21 Dry (CP-C41-OHC3-C-C2)	189.02	372.24	200.54	392.97
EPAJA11 Dry (CP-C41-LT-A-C1)	186.74	368.13	198.70	389.66
EPAJA21 Dry (CP-C41-LT-A-C2)	183.09	361.56	195.57	384.03
EPAJB11 Dry (CP-C41-LT-B-C1)	188.45	371.21	200.95	393.71
EPAJB21 Dry (CP-C41-LT-B-C2)	189.70	373.46	201.75	395.15
EPAJC11 Dry (CP-C41-LT-C-C1)	188.51	371.32	200.13	392.23
EPAJC21 Dry (CP-C41-LT-C-C2)	188.67	371.61	200.45	392.81
EPAKA11 Dry (CP-C41-CAI1-A-C1)	181.98	359.56	194.71	382.48
EPAMA11 Dry (CP-C41-ILT-A-C1-A)	180.62	357.12	193.47	380.25
EPAMA12 Dry (CP-C41-ILT-A-C1-B)	178.02	352.44	191.80	377.24
EPAMA13 Dry (CP-C41-ILT-A-C1-C)	177.47	351.45	191.58	376.84
EPARB21 Dry (EP-C41-UNC0-B-C2)	180.10	356.18	193.67	380.61
EPAUC11 Dry (CP-C41-TT-C-C1)	188.87	371.97	200.23	392.41
EPAUC21 Dry (CP-C41-TT-C-C2)	186.87	368.37	197.79	388.02
EPAWB11 Dry (CP-C41-UNC1-B-C1)	181.09	357.96	194.56	382.21
EPAWB21 Dry (CP-C41-UNC1-B-C2)	181.90	359.42	195.57	384.03
EPAWC11 Dry (CP-C41-UNC1-C-C1)	189.43	372.97	200.80	393.44
EPAXC11 Dry (EP-C41-UNC2-C-C1)	183.59	362.46	197.69	387.84
Average	185.97	366.74	198.48	389.26
Standard Deviation	5.04	9.07	4.44	7.99

DMA Results Summary

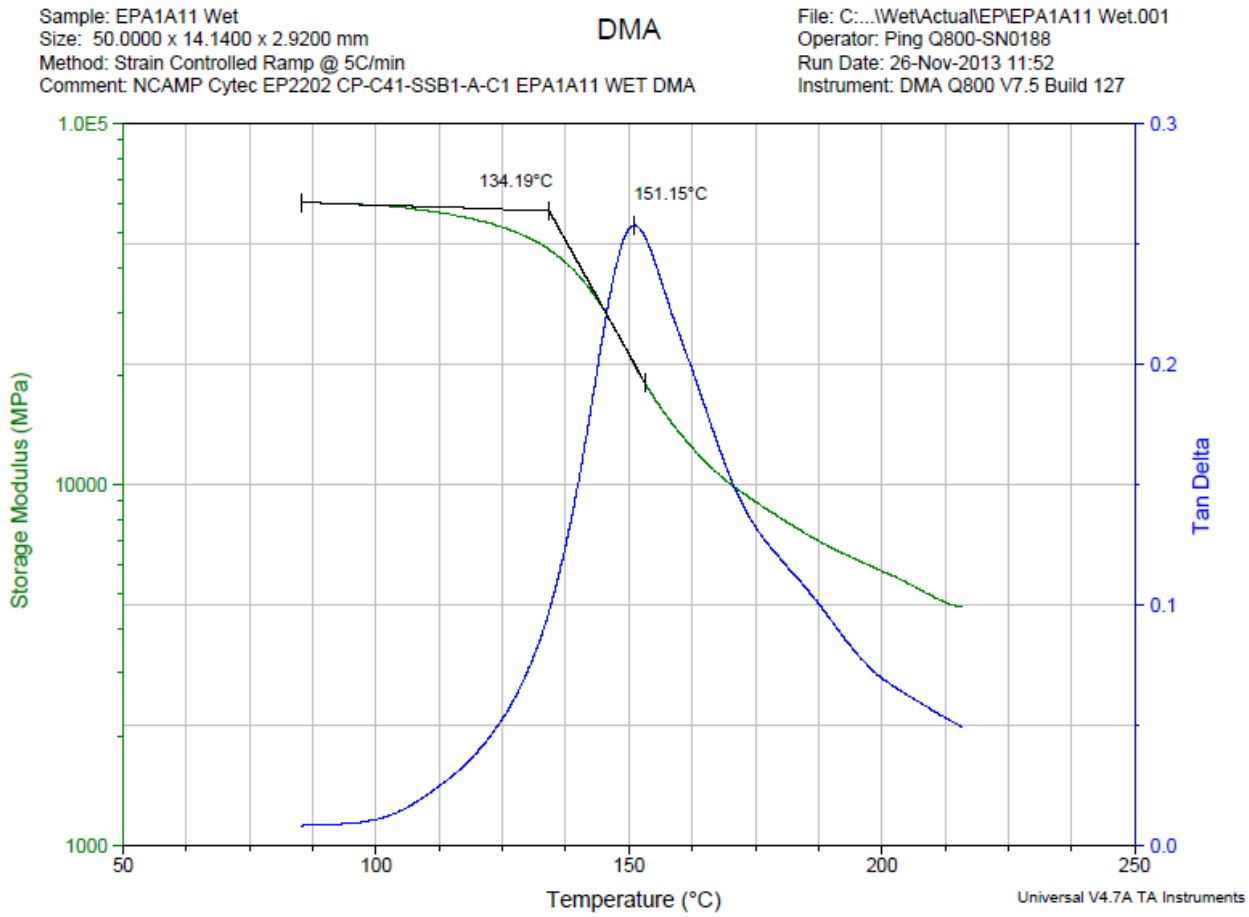
NCAMP Cytec EP2202 CP-C41-XXX-X-XX EPAXXX1 WET DMA

Sample #	Onset Storage Modulus		Peak of Tangent Delta	
	T_g [°C]	T_g [°F]	T_g [°C]	T_g [°F]
EPA1A11 Wet (CP-C41-SSB1-A-C1)	134.19	273.54	151.15	304.07
EPA1A21 Wet (CP-C41-SSB1-A-C2)	138.83	281.89	153.56	308.41
EPA1C11 Wet (CP-C41-SSB1-C-C1)	145.97	294.75	157.68	315.82
EPA2C11 Wet (CP-C41-SSB2-C-C1)	146.24	295.23	158.69	317.64
EPA3C11 Wet (CP-C41-SSB3-C-C1)	145.56	294.01	157.74	315.93
EPA3C21 Wet (CP-C41-SSB3-C-C2)	147.09	296.76	158.95	318.11
EPA4C11 Wet (CP-C41-FHT1-C-C1)	147.80	298.04	159.49	319.08
EPA4C21 Wet (CP-C41-FHT1-C-C2)	147.59	297.66	159.32	318.78
EPA5A11 Wet (EP-C41-FHT2-A-C1)	138.05	280.49	154.80	310.64
EPA6C11 Wet (CP-C41-FHT3-C-C1)	145.71	294.28	157.11	314.80
EPA6C21 Wet (CP-C41-FHT3-C-C2)	146.29	295.32	157.77	315.99
EPA9A11 Wet (CP-C41-FHC3-A-C1)	137.35	279.23	152.41	306.34
EPA9A21 Wet (CP-C41-FHC3-A-C2)	138.42	281.16	153.19	307.74
EPA9C21 Wet (CP-C41-FHC3-C-C2)	145.69	294.24	158.02	316.44
EPAAA11 Wet (CP-C41-UNT1-A-C1)	133.24	271.83	150.32	302.58
EPAAA21 Wet (CP-C41-UNT1-A-C2)	132.92	271.26	150.28	302.50
EPAAC11 Wet (CP-C41-UNT1-C-C1)	145.54	293.97	157.54	315.57
EPAAC21 Wet (CP-C41-UNT1-C-C2)	146.87	296.37	158.76	317.77
EPABA21 Wet (EP-C41-UNT2-A-C2)	134.32	273.78	152.75	306.95
EPADA11 Wet (CP-C41-OHT1-A-C1)	137.57	279.63	152.74	306.93
EPADA21 Wet (CP-C41-OHT1-A-C2)	140.64	285.15	155.16	311.29
EPADB11 Wet (CP-C41-OHT1-B-C1)	145.21	293.38	157.45	315.41
EPADB21 Wet (CP-C41-OHT1-B-C2)	143.02	289.44	156.10	312.98
EPADC11 Wet (CP-C41-OHT1-C-C1)	147.73	297.91	159.50	319.10
EPADC21 Wet (CP-C41-OHT1-C-C2)	146.79	296.22	158.79	317.82
EPAFC11 Wet (CP-C41-OHT3-C-C1)	147.72	297.90	158.81	317.86
EPAFC21 Wet (CP-C41-OHT3-C-C2)	147.06	296.71	158.31	316.96
EPAGC11 Wet (CP-C41-OHC1-C-C1)	146.84	296.31	159.06	318.31
EPAGC21 Wet (CP-C41-OHC1-C-C2)	148.43	299.17	159.00	318.20
EPAIA11 Wet (EP-C41-OHC3-A-C1)	137.07	278.73	153.38	308.08
EPAIC21 Wet (CP-C41-OHC3-C-C2)	145.86	294.55	157.82	316.08
EPAJA11 Wet (CP-C41-LT-A-C1)	145.74	294.33	158.09	316.56
EPAJA21 Wet (CP-C41-LT-A-C2)	141.75	287.15	155.78	312.40
EPAJB11 Wet (CP-C41-LT-B-C1)	146.14	295.05	158.56	317.41
EPAJB21 Wet (CP-C41-LT-B-C2)	147.59	297.66	159.64	319.35
EPAJC11 Wet (CP-C41-LT-C-C1)	144.10	291.38	156.80	314.24
EPAJC21 Wet (CP-C41-LT-C-C2)	145.83	294.49	157.49	315.48
EPAKA11 Wet (CP-C41-CAI1-A-C1)	132.12	269.82	152.49	306.48
EPAMA11 Wet (CP-C41-ILT-A-C1-A)	139.45	283.01	152.94	307.29
EPAMA12 Wet (CP-C41-ILT-A-C1-B)	133.87	272.97	152.12	305.82
EPAMA13 Wet (CP-C41-ILT-A-C1-C)	136.15	277.07	153.05	307.49
EPARB21 Wet (EP-C41-UNC0-B-C2)	130.18	266.32	148.70	299.66
EPAUC11 Wet (CP-C41-TT-C-C1)	146.15	295.07	157.06	314.71
EPAUC21 Wet (CP-C41-TT-C-C2)	143.66	290.59	155.60	312.08
EPAWB11 Wet (CP-C41-UNC1-B-C1)	142.15	287.87	155.21	311.38
EPAWB21 Wet (CP-C41-UNC1-B-C2)	142.35	288.23	155.36	311.65
EPAWC11 Wet (CP-C41-UNC1-C-C1)	144.96	292.93	156.50	313.70
EPAXC11 Wet (EP-C41-UNC2-C-C1)	134.05	273.29	152.42	306.36
Average	142.25	288.04	155.91	312.63
Standard Deviation	5.31	9.55	2.94	5.29

9.1 DMA Dry Batch A



9.2 DMA Wet Batch A



10. Deviations

1. Panel NTP2201Q1-CYT-C41-SPI-UNC3-B-C2 had incorrect lay up and was not replaced because there was insufficient material.