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Hexcel M91/IM8-GS UD Tape 145gsm with 35% RC 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-17 Volume 1—Composite Materials Handbook for Polymer Matrix Composites. This report contains material property data of common usefulness to wide range of projects. The lamina and laminate material property data have been generated with NCAMP oversight in accordance with NSP 100 NCAMP Standard Operating Procedures; the test panels and test specimens have been inspected by NCAMP Authorized Inspection Representatives (AIR) and the testing has been witnessed by NCAMP Authorized Engineering Representatives (AER). However, the data may not fulfill all the needs of any specific company's program; specific properties, environments, laminate architecture, and loading situations may require additional testing.

The use of NCAMP material and process specifications 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 a and b-basis values is given in a separate report Hexcel M91/IM8-GS UD Tape 145 gsm with 35% RC Material Allowables Statistical Analysis Report, Qualification NCP-RP-2024-012. The qualification material was procured to NCAMP Material Specification NMS 191/1 Rev A dated January 12, 2026. The qualification test panels were cured in accordance with NCAMP Process Specification NPS 81910 Rev B using baseline cure cycle “C” with a cure pressure of 90psi. The NCAMP Test Plan M910Q1 Rev B was used for this qualification program.

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

of DOT/FAA/AR-03/19 and Section 8.4.1 of CMH-17 Volume 1 are adequate for the given program.

Aircraft companies should not use the data published in this report without specifying NCAMP Material Specification NMS 191/1. NMS 191/1 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 191/1.* NMS 191/1 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
$\mu\epsilon$	micro-strain
E_1^c	compressive modulus, longitudinal / warp direction
E_1^t	tensile modulus, longitudinal / warp direction
E_2^c	compressive modulus, transverse / fill direction
E_2^t	tensile modulus, transverse / fill direction
F_1^{cu}	ultimate compressive strength, longitudinal / warp direction
F_1^{tu}	ultimate tensile strength, longitudinal / warp direction
F_2^{cu}	ultimate compressive strength, transverse / fill direction
F_2^{tu}	ultimate tensile strength, transverse / fill direction
SBS	short beam strength
ν_{12}^c	major Poisson's Ratio, compression
ν_{21}^c	minor Poisson's Ratio, compression
$F_{12}^{s5\% \text{ strain}}$	in-plane shear strength at 5% strain
F_{12}^{smax}	in-plane shear peak strength before 5% strain
F_{12}^{su}	in-plane shear ultimate peak strength
$F_{12}^{s0.2\%}$	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
CTA	cold temperature ambient
CPT	cured ply thickness
ETW	elevated temperature wet
Gr/Ep	graphite/epoxy
norm	normalized
RTA	room temperature ambient
SACMA	Suppliers of Advanced Composite Materials Association
SG	Strain Gage
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

All panels and specimens shall be uniquely identified by an 11 code reference system, cross referenced with descriptive identification information as follows: This Document Number-Prepregger ID-Material Code-Fabricator ID-Intended Test Type-Batch ID-Cure Cycle ID-Test Panel ID-Actual Test Type-Test Condition-Specimen Number.

For example, NTP M910Q1-HXL-H35-NIAR-WT-A-C1-2-FT-RTD-3] denotes Prepregger: Hexcel, Prepreg Name: Hexcel M91/IM8-GS UD 145gsm with 35% RC unidirectional prepreg, Fabricator: NIAR, Intended Test Type: Warp Tension, Prepreg Batch: A, Cure Cycle: C1, Test Panel ID: 2, Actual Test Method: Fill Tension, Test Condition: Room Temperature Dry, and Specimen Number: 3. The testing lab may assign a separate identification code but must reference the 11 code reference system and uniquely identify the panels and specimens.

Prepregger ID
Hexcel: HXL

Material Code	Prepreg Name
H35	Hexcel M91/IM8-GS-12K UD 145gsm with 35% RC

Fabricator ID (Company that layup, bag, and cure the test panels)
NIAR: National Institute for Aviation Research (Batch A, B and C)
FACC: FACC Operations GmbH (Batch D)
SKS: Sekisui Aerospace (Batch E)

Intended and Actual Test Types	
WT: Warp tension	FSL: Freezer and Out Life Verification
FT: Fill Tension	DMA: Dynamic Mechanical Analysis
WC: Warp Compression	DSC: Differential Scanning Calorimetry
FC: Fill Compression	TGA: Thermogravimetric Analysis
IPS(T): In Plane Shear (Tension)	SBSFS: Short Beam Strength for Fluid Sensitivity
IPS (V): In- Plane Shear (V-Notch)	UNC0: Unnotched Compression
SBS: Short Beam Strength	ILT: Interlaminar Tension
ILT: Interlaminar Tension	QI: Quasi Isotropic

(Note: The 0°/90° cross-plyed laminates used for the unidirectional materials only are designated "Layup 0").

Batch ID: A, B, C, D, E, F etc

Cure Cycle ID: C1, C2, C3, etc.: Cure Cycle 1, 2, 3, etc.

Note: Cure Cycle ID numbers 1, 2, 3, etc. in Appendix 2 of test plan are for reference only. Actual numbers may vary depending on the actual cure cycle runs.

Test Panel ID: 1,2,3,4,5,6,7,8,9,A,B,C..... etc. (restart from 1 for every Cure Cycle ID)

Test Condition: CTA, RTA, ETW, etc.
FS11RT, FS12RT, FS13RT, etc. (fluid sensitivity test)
D, W (dry, wet conditions for DMA)

Specimen Number: 1,2,3,4,5,6,7,8,9,A,B,C..... etc.

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 D792-20 – Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement
- ASTM D3171-22 – Standard Test Methods for Constituent Content of Composite Materials
- ASTM D2344/D2344M-16 – Standard Test Method for Short-Beam Strength of Polymer Matrix Composite Materials and Their Laminates
- ASTM D3039/D3039M-17 – Standard Test Method for Tensile Properties of Polymer Matrix Composite Materials
- ASTM D3776-20 - Standard Test Methods for Mass Per Unit Area (Weight) of Fabric
- ASTM D3529-16(2021) - Standard Test Methods for Constituent Content of Composite Prepreg
- ASTM D3530-20 - Standard Test Methods for Volatile Content of Composite Material Prepreg
- ASTM D3531/D3531M-16 - Standard Test Methods for Resin Flow of Carbon Fiber-Epoxy Prepreg
- ASTM D3532/D3532M-19 - Standard Test Methods for Gel Time of Carbon-Fiber Epoxy Prepreg
- ASTM E168-16 – Standard Practices for General Techniques of Infrared Quantitative Analysis
- ASTM D3418-21 - Standard Test Methods for Transition Temperatures and Enthalpies of Fusion and Crystallization of Polymers by Differential Scanning Calorimetry
- ASTM D5379/D5379M-19 – Standard Test Method for Shear Properties of Composite Materials by the V-Notched Beam Method
- ASTM D6415/D6415M-06a – Standard Test Method for Measuring the Curved Beam Strength of a Fiber-Reinforced Polymer-Matrix Composite
- ASTM D6641/D6641M-16e2 – Standard Test Method for Determining the Compressive Properties of Polymer Matrix Composite Laminates Using a Combined Loading Compression (CLC) Test Fixture
- ASTM D3518/D3518M-18 – Standard Test Method for In-Plane Shear Response of Polymer Matrix Composite Materials by Tensile Test of a $\pm 45^\circ$ Laminate In-Plane Shear Strength and Modulus
- ASTM D7028-07(2015) – Standard Test Method for Glass Transition Temperature (DMA T_g) of Polymer Matrix Composites by Dynamic Mechanical Analysis (DMA)

1.5 Methodology

1.5.1 Process Definition

For each combination of test, batch and condition, the specimens were selected from a minimum of two separate panels cured separately as shown in Figure 1-1. Panels 1, 3, 5, 7 and 9 were cured in a single cure cycle. Panels 2, 4, 6, 8 and 10 were cured in a single cure cycle separate from panels 1, 3, 5, 7 and 9. The term "cure cycle" means a single run through the autoclave or oven, with same processing parameters. The specimen selection methodology in Figure 1-1 presents in "Number of Batches x Number of Cure Process x Number of Specimens" format throughout this document. Specifically, Figure 1-1 represents 5x2x5/6 and Figure 1-2 depicts a 3x2x3 specimen selection methodology. The 5x2x5/6 selection method was used for all the lamina level except for the IPST test method, which utilized the 3x2x3 selection.

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. The 5x2x5/6 selection method was used for all the lamina level except for the IPST test method, which will utilize the 3x2x3 selection.

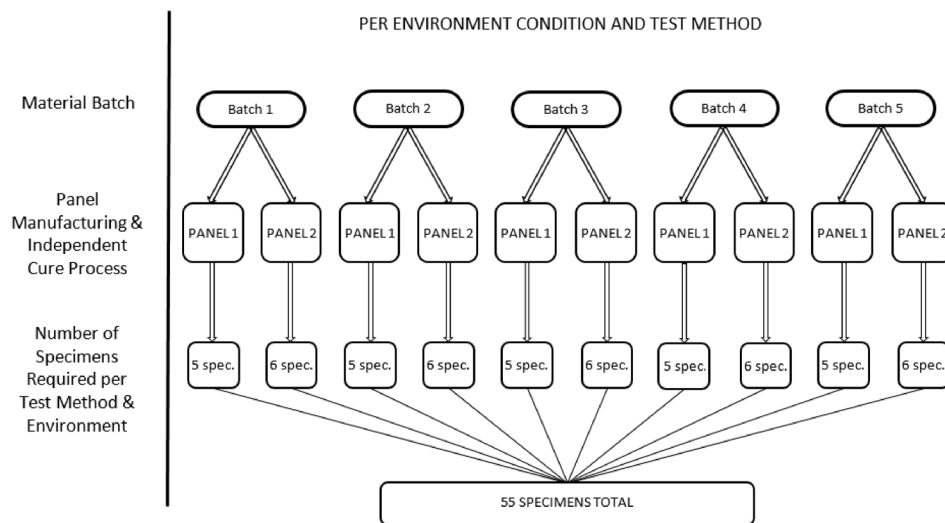


Figure 1-1: Lamina Level Specimen Selection Methodology (Except IPST)

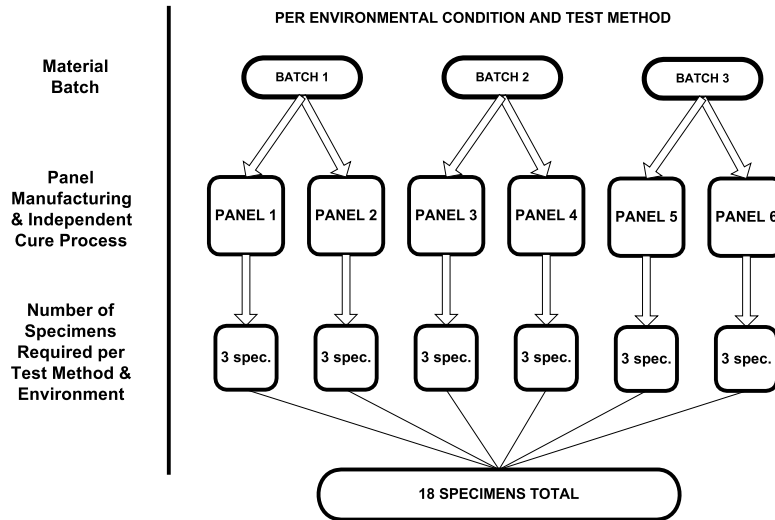


Figure 1-2: In-Plane Shear Tension (IPST) Specimen Selection Methodology

All panels were fabricated in accordance with NCAMP Process Specification NPS 81910 Rev B using baseline cure cycle “C” with a cure pressure of 90 psi.

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.

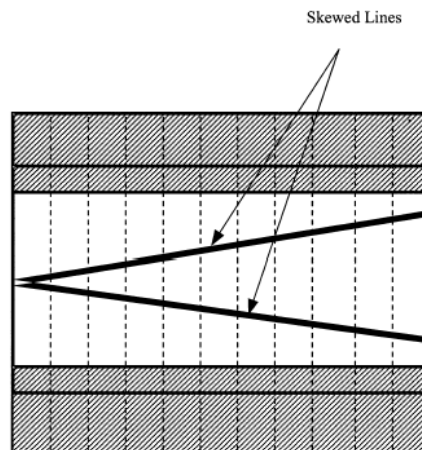


Figure 1-3: Specimen Traceability Line

1.5.2 Specimen & Testing Details

1.5.2.1 Tabbing

Longitudinal Tension (beveled tabs) and Compression (not beveled tabs) coupons were tabbed with Scotch Weld Adhesive Film FM300-2k and G10 Fiberglass tabstock, with thickness of 0.07" for LT and 0.09" for LC. Tabs were cured at 250F for 90 minutes.

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, 2T by 6T.

1.5.2.3 Specimen Strain Device Used

Corresponding Gage ID can be obtained from Appendix 1 of NTP M910Q1 Rev B.

Uniaxial gages were used on:

- RTA, CTA and ETW, Transverse Compression

- RTA, CTA and ETW of Unnotched Compression (UNC0). First 2 coupons of RTA were gaged back to back, to observe for bending.

- RTA and CTA Transverse Tension

- CTA, RTA and ETW of Longitudinal Compression. First 2 coupons of RTA were gaged back to back, to observe for bending.

Biaxial gages were used on:

- CTA, RTA and ETW conditions of IPST and IPSV specimens.

- CTA and RTA conditions of Longitudinal Tension specimens.

Uniaxial extensometer

- ETW condition of Transverse Tension

Biaxial extensometer

- ETW condition of Longitudinal Tension specimens.

1.5.3 Test Matrix

Layup	Test Type Code	Test Type and Direction	Property	Number of Batches x No. of Panels x No. of Specimens Test Temperature/Moisture Condition		
				CTA -65F	RTA 70F	ETW 180F
[0] ₈	LT	ASTM D3039 0° Tension	Strength, Modulus and Poisson's Ratio	5x2x5/6 (4)	5x2x5/6 (4)	5x2x5/6 (4)
[0] ₁₅	LC	ASTM D6641 0° Compression	Strength and Modulus	5x2x5/6 (4)	5x2x5/6 (4) (1)	5x2x5/6 (4)
[90] ₁₅	TT	ASTM D3039 90° Tension	Strength and Modulus	5x2x5/6 (4)	5x2x5/6 (4)	5x2x5/6 (4)
[90] ₁₅	TC	ASTM D6641 90° Compression	Strength and Modulus	5x2x5/6 (4)	5x2x5/6 (4)	5x2x5/6 (4)
[90/0] _{4s}	UNC0	ASTM D6641 Cross-Ply Compression (3)	Strength and Modulus	5x2x5/6 (4)	5x2x5/6 (1) (4)	5x2x5/6 (4)
[0/90] _{6s}	IPSV	ASTM D5379 In-Plane Shear V-notch	Strength and Modulus	5x2x5/6 (4)	5x2x5/6 (4)	5x2x5/6 (4)
[45/45] _{5s}	IPST	ASTM D3518 In-Plane Shear Tension (2)	Strength and Modulus	3x2x3	3x2x3	3x2x3
[0] ₂₄	SBS	ASTM D2344 Short Beam	Strength	5x2x5/6 (4)	5x2x5/6 (4)	5x2x5/6 (4)
[0] ₂₁	ILT	ASTM D6415 Interlaminar Tension	Strength	5x2x5/6 (4)	5x2x5/6 (4)	5x2x5/6 (4)

Table 1-1: Lamina Level Test Matrix

- Note 1: Back-to-back strain gages required on the first two specimens. If no buckling was observed, the remaining modulus specimens 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: Derive the 0° lamina compressive strength $F_{0^\circ \text{ plies}}^{cu}$ as follows:

$$F_{0^\circ \text{ plies}}^{cu} = BF \frac{P^f}{wh}$$

$$BF = \frac{E_1 [V_0 E_2 + (1 - V_0) E_1] - (\nu_{12} E_2)^2}{[V_0 E_1 + (1 - V_0) E_2] [V_0 E_2 + (1 - V_0) E_1] - (\nu_{12} E_2)^2}$$

Where:

BF = Back-out factor obtained using linear classical lamination theory

P^f = Peak load carried by the test specimen (usually at failure)

w = specimen gage width, mm [in.]

h = specimen gage thickness, mm [in.]

V_0 = fraction of 0° plies in the cross-ply laminate (1/2 for [0/90]_ns and 1/3 for [90/0/90]_n)

E_1 = axial tensile or compressive stiffness of 0° plies, from an average of all batches

E_2 = transverse tensile or compressive stiffness of 0° plies, from an average of all batches

ν_{12} = major Poisson's ratio of 0° plies, from an average of all batches

Note 4: The total number of specimens for the 5x2x5/6 matrix is 55 specimens, with 5 specimens from run 1 and 6 specimens from run 2.

1.5.4 Cured Laminate Physical Testing

The properties in Table 1-2 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 (10 positions)
Laminate Density	ASTM D792-08	3
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	3
Ultrasonic Through Transmission, C-Scan	MIL-HDBK-787A (Note 3)	1
Glass Transition Temperature, Tg by DMA flexural loading	Dry and Wet – ASTM D7028	1 Dry, 1 Wet (Note 4)

Table 1-2: Physical Test 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: Use Method I with solvents.
- Note 3: 5 MHz is preferred for solid laminates. Panels with anomaly should be segregated. Microscopy images and void content 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.

1.5.5 Environmental Conditioning

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

CTA = -65±5°F, ambient
RTA = 70±10°F, ambient
ETW = 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.

For ambient testing, specimens were exposed at 60°F to 80°F and 65%RH (maximum) for 48 hours minimum prior to test.

For wet conditioning, specimens were dried at 160°F±5°F for 120-130 hours minimum before being conditioned to equilibrium at 160°F±5°F and 85% ± 5%. Effective moisture equilibrium was 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 may 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 may be used to establish weight gain measurements. If the specimens or traveler coupons pass the criteria for two consecutive determinations which are 7 ±0.5 days apart, the specimens may be kept in the environmental chamber for up to an additional 60 days. Alternatively, the specimens may be 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 may be removed from the controlled environment for a maximum of 2 hours for application of gages in ambient laboratory conditions.

1.5.6 Non-ambient Testing

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

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

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

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

1.5.7 Fluid Sensitivity Screening

Table 1-3 lists the requirements for fluid sensitivity screening, which required ASTM D2344 Short Beam Strength testing on $[0^\circ]_{24}$ lamina level specimens dried at $160^\circ\text{F} \pm 5^\circ\text{F}$ for 120 to 130 hours before being subjected to the conditions indicated, five replicates per fluid and one cure cycle. Specimens were cleaned with a dry towel prior to the tests. In addition to short beam strength, load versus displacement curves were plotted to aid in the identification of matrix/resin softening. Since load versus displacement curves are influenced by test machine and fixture compliance, all the tests were performed with the identical machine and fixture, through a single setup. Experience suggests that for the vast majority of epoxy resins, water is the fluid with the most deleterious effect on properties. Should screening tests for fluid sensitivity indicate this to be the case, further testing of this type might be unnecessary since exposure to water moisture to equilibrium level is an inherent part of the multi batch allowables test program. However, users must evaluate the applicability of the exposure conditions and time on case-by-case basis. For example, the exposure condition for jet fuel may not fully represent the condition of integral fuel tanks.

<u>Extended Contact:</u>	Exposure	Test Condition	Code
100 Low Lead Aviation Fuel (ASTM D910)	90 days min. @ 70°F±10°F	70°F	FS11RT
	90 days min. @ 70°F±10°F	180°F	FS11ET
ASTM D1655 Jet A Fuel	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
Aeroshell 750 Turbine Oil	90 days min. @ 70°F±10°F	70°F	FS19RT
	90 days min. @ 70°F±10°F	180°F	FS19ET
<u>Short Duration Contact:</u>			
MEK washing fluid. ASTM D740	90 minutes min. @ 70°F±10°F	70°F	FS20RT
	90 minutes min. @ 70°F±10°F	180°F	FS20ET
Polypropylene Glycol Deicer (Type I) SAE AMS 1424	90 minutes min. @ 70°F±10°F	70°F	FS21RT
	90 minutes min. @ 70°F±10°F	180°F	FS21ET
Isopropyl Alcohol Dicing Agent (TT-I-735)	90 minutes min. @ 70°F±10°F	70°F	FS22RT
	90 minutes min. @ 70°F±10°F	180°F	FS22ET
Aeroshell 750 Turbine Oil	90 minutes min. @ 70°F±10°F	70°F	FS23RT
	90 minutes min. @ 70°F±10°F	180°F	FS23ET
<u>Control Tests:</u>			
Distilled Water	90 days min. at 70°F±10°F	70°F	FS24RT
	90 days min. at 70°F±10°F	180°F	FS24ET
Dry	Dry per section 6.1 of Test Plan NTP M910Q1	70°F	FS25RT
	Dry per section 6.1 Test Plan NTP M910Q1	180°F	FS25ET
85% Relative Humidity	Per section 6.1 Test Plan NTP M910Q1	70°F	FS26RT
	Per section 6.1 Test Plan NTP M910Q1	180°F	FS26ET

Table 1-3: Fluid Sensitivity Table

1.5.8 Normalization Procedures

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

- 90° tensile strength and modulus
- 90° compressive strength and modulus
- in-plane shear Tension and V-notch strength and modulus
- Poisson's ratio
- SBS
- ILT

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

The theoretically calculated cured ply thickness of 0.0055 inches has been used as the nominal cured ply thickness (CPT) for normalization purpose. This has been done at the request of the material supplier. The following normalization formula was used:

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

For Hexcel M91/IM8-GS UD Tape 145gsm with 35% RC prepreg material the defined CPT was 0.0055 inches. The average as measured CPT of the qualification panels was 0.005622 inches. The lowest and highest CPT measured were 0.005200 inches and 0.005908 inches respectively.

1.5.9 Inspection Verification

The 5-batch qualification panels (3-batches for the IPST) were fabricated according to the requirements of the test plan and conformed by an NCAMP AIR. The test specimens and test setup have also been conformed by an NCAMP AIR.

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

1.5.10 Material Pedigree Information

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

2. Test Results

2.1 Lamina Level Test Summary

Prepreg Material: Hexcel M91/IM8-GS UD Tape 145gsm with 35% RC Material Specification: NMS 191/1 Process Specification: NPS 81910 Fiber: IM8-GS UD TapeResin: M91				Hexcel M91/IM8 Unitape 145 gsm 35% RC Lamina Properties Summary		
DMA Tg (dry): 380.4 °F		DMA Tg (wet): 291.9 °F		Tg METHOD: DMA (ASTM D7028)		
Prepreg Batch	92M0080470	92M0080471	92M0080472	92M0095065	92M0095066	
Date of fiber manufacturing	9/25/2019	5/16/2020	5/16/2020	4/11/2022	4/11/2022	
Date of resin manufacturing	6/14/2022	6/8/2022	12/6/2022	2/12/2024	8/31/2023	
Date of prepreg manufacturing	6/30/2022	6/29/2022	12/19/2022	2/21/2024	2/19/2024	
Date of composite manufacturing	2/23/2023-2/24/2023	2/28/2023-3/1/2023	3/7/2023-3/9/2023	7/20/2023	7/28/2023	
Date of testing	5/22/2024	5/22/2024	5/22/2024	9/23/2024	9/23/2024	
Date of data submittal	5/22/2024	5/22/2024	5/22/2024	9/23/2024	9/23/2024	
LAMINA MECHANICAL PROPERTY SUMMARY Data reported as: Normalized & Measured (Normalized by CPT=0.0055 inch)						
Properties	CTA (-65°F) Mean		RTA (70°F) Mean		ETW (180°F) Mean	
	Normalized	Measured	Normalized	Measured	Normalized	Measured
F ₁ ^{tu} [ksi]	464.9	454.7	464.0	454.3	455.8	444.9
E ₁ ^t [Msi]	25.84	25.27	25.64	25.11	25.67	25.07
ν ₁₂ ^t	--	0.3308	--	0.3473	--	0.3195
F ₂ ^{tu} [ksi]	--	9.306	--	9.045	--	5.302
E ₂ ^t [Msi]	--	1.470	--	1.293	--	1.051
F ₁ ^{cu} from UNC0 [ksi] ¹	290.9	281.8	246.1	238.1	184.9	178.8
E ₁ ^c [Msi]	22.37	21.73	22.26	21.66	22.65	21.91
F ₂ ^{cu} [ksi]	--	47.19	--	35.10	--	19.69
E ₂ ^c [Msi]	--	1.533	--	1.375	--	1.234
(0/90) UNC0 Strength [ksi]	155.4	150.9	130.6	126.6	97.49	94.43
(0/90) UNC0 Modulus [Msi]	12.30	11.94	12.27	11.90	12.42	12.03
(D3518) F ₁₂ ^{s0.2%} [ksi]	--	10.16	--	7.353	--	4.587
(D3518) F ₁₂ ^{s5%strain} [ksi]	--	16.16	--	11.94	--	6.827
(D3518) G ₁₂ ^s [Msi]	--	0.8402	--	0.6903	--	0.4633
(D5379) F ₁₂ ^{s0.2%} [ksi]	--	11.30	--	8.286	--	4.765
(D5379) F ₁₂ ^{s5%strain} [ksi]	--	18.82	--	13.70	--	8.129
(D5379) F ₁₂ ^{su} [ksi]	--	31.21	--	25.30	--	15.22
(D5379) G ₁₂ ^s [Msi]	--	0.8661	--	0.7437	--	0.6431
SBS [ksi]	--	21.48	--	16.22	--	9.484
CBS [lb]	--	495.7	--	315.1	--	185.8
ILT [ksi]	--	21.47	--	13.69	--	8.065

¹ Backout factor was calculated based off the conservative assumption that the poissons ratio is 0. A new batch of sampling is being populated to obtain the actual poissons ratio. The values will be revised once the new data is available.

Table 2-1: Lamina Summary Data

2.2 Fluid Sensitivity Test Summary

2.2.1 Short Beam Strength Fluid Sensitivity Test (SBSFS)

Fluid Sensitivity Screening Short-Beam Strength Properties (SBSFS)--RT (70°F) Strength Hexcel M91/IM8-GS UD Tape 145gsm with 35% RC			
Exposure	Type of Fluid	Fluid Code	Average Strength (ksi)
90 days min @ 70°F ± 10F	100 Low Lead Fuel	FS11RT	17.04
	Jet A Fuel	FS12RT	15.94
	MIL-PRF-5606 Hydraulic Oil	FS13RT	16.89
	MIL-PRF-83282 Hydraulic Oil	FS14RT	16.67
	MIL-PRF-7808 Engine Oil	FS15RT	16.68
	MIL-PRF-23699 Engine Oil	FS16RT	17.05
	Sea Water	FS17RT	15.69
	Skydrol LD-4 (SAE AS1241, Type IV, Class 1)	FS18RT	16.70
	Aeroshell 750 turbine oil (Def Stan 91-98)	FS19RT	16.70
	Distilled Water	FS24RT	15.70
90 mins @ 70°F ± 10F	MEK washing fluid	FS20RT	16.83
	Polypropylene Glycol Deicer	FS21RT	16.95
	Isopropyl Alcohol Deicing	FS22RT	17.50
	Aeroshell 750 turbine oil (Def Stan 91-98)	FS23RT	17.10
Per section 6.1 Test Plan	Dry	FS25RT	16.81
	85% Relative Humidity	FS26RT	15.55

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

Fluid Sensitivity Screening
Short-Beam Strength Properties (SBSFS)--ET (180°F) Strength

Hexcel M91/IM8-GS UD Tape 145gsm with 35% RC

Exposure	Type of Fluid	Fluid Code	Average Strength (ksi)
90 days min @ 70°F ± 10F	100 Low Lead Fuel	FS11ET	12.74
	Jet A Fuel	FS12ET	12.48
	MIL-PRF-5606 Hydraulic Oil	FS13ET	12.98
	MIL-PRF-83282 Hydraulic Oil	FS14ET	13.10
	MIL-PRF-7808 Engine Oil	FS15ET	12.83
	MIL-PRF-23699 Engine Oil	FS16ET	12.76
	Sea Water	FS17ET	11.73
	Skydrol LD-4 (SAE AS1241, Type IV, Class 1)	FS18ET	13.04
	Aeroshell 750 turbine oil (Def Stan 91-98)	FS19ET	12.31
	Distilled Water	FS24ET	11.78
90 mins @ 70°F ± 10F	MEK washing fluid	FS20ET	12.64
	Polypropylene Glycol Deicer	FS21ET	12.43
	Isopropyl Alcohol Deicing	FS22ET	12.49
	Aeroshell 750 turbine oil (Def Stan 91-98)	FS23ET	12.26
Per section 6.1 Test Plan	Dry	FS25ET	12.81
	85% Relative Humidity	FS26ET	9.931

Table 2-3: SBS Fluid Sensitivity Summary Data – ET (180°F)

2.3 Cured Laminate Physical Test Summary

2.3.1 DMA

DMA Results Summary Hexcel M91/IM8-GS UD Tape Qualification
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Test Temperature	Mean			
	Onset Storage Modulus		Peak of Tangent Delta	
	T _g [°C]	T _g [°F]	T _g [°C]	T _g [°F]
DMA T _g (Dry)	193.6	380.4	205.8	402.5
DMA T _g (Wet)	144.4	291.9	156.7	314.1

Table 2-4: DMA Summary Data

2.4 Individual Test Summaries

2.4.1 Longitudinal Tension Properties (LT)

Material: Hexcel M91/IM8-GS UD Tape 145gsm with 35% RC		Tension, 1-axis Hexcel M91/IM8-GS UD Tape 145gsm with 35% RC [0]8					
Resin content: 42.59% wt	Comp. density: 1.563 g/cc						
Fiber volume: 57.18% vol							
Ply count: 8							
Test method: ASTM D3039-17	Modulus calculation: 1000-3000 microstrain						
Normalized by: 0.005500	in. CPT						
	CTA	RTA	ETW				
Test Temperature [°F]	-65	70	180				
Moisture Conditioning	Ambient	Ambient	Equilibrium				
Equilibrium at T, RH			160°F, 85%				
Source code Prefixed by: NTPM910Q1-HXL-H35-	LT-X-X-X-CTA-X	LT-X-X-X-RTA-X	LT-X-X-X-ETW-X				
	Normalized	Measured	Normalized	Measured	Normalized	Measured	
F_t^{tu} [ksi]	Mean	464.9	454.7	464.0	454.3	455.8	444.9
	Minimum	426.8	415.6	424.5	415.7	400.2	395.1
	Maximum	506.7	482.1	529.1	501.0	505.1	480.6
	C.V.(%)	3.545	3.631	4.517	4.082	5.156	4.660
	No. Specimens	55		55		56	
	No. Prepreg Lots	5		5		5	
E_t^t [Msi]	Mean	25.84	25.27	25.64	25.11	25.67	25.07
	Minimum	24.62	24.45	24.26	24.06	24.71	24.18
	Maximum	27.55	27.47	27.14	26.86	27.22	25.93
	C.V.(%)	1.999	2.066	1.878	2.094	1.905	1.959
	No. Specimens	55		55		56	
	No. Prepreg Lots	5		5		5	
ν₁₂^s	Mean		0.3308		0.3473		0.3195
	Minimum		0.2760		0.3247		0.3013
	Maximum		0.4533		0.3751		0.3803
	C.V.(%)		8.403		3.480		4.091
	No. Specimens	55		54		56	
	No. Prepreg Lots	5		5		5	

2.4.2 Transverse Tension Properties (TT)

Material: Hexcel M91/IM8-GS UD Tape 145gsm with 35% RC		Tension, 2-axis Hexcel M91/IM8-GS UD Tape 145gsm with 35% RC [90]15					
Resin content:	43.06% wt						
Fiber volume:	56.88% vol						
Ply count:	15						
Test method: ASTM D3039-17		Modulus calculation: 1000-3000 microstrain					
Normalized by: NA							
		CTA		RTA		ETW	
Test Temperature [°F]		-65		70		180	
Moisture Conditioning		Ambient		Ambient		Equilibrium	
Equilibrium at T, RH						160°F, 85%	
Source code Prefixed by: NTPM910Q1-HXL-H35-		TT-X-X-X-CTA-X		TT-X-X-X-RTA-X		TT-X-X-X-ETW-X	
		Normalized	Measured	Normalized	Measured	Normalized	Measured
F₂^{tu} [ksi]	Mean		9.306		9.045		5.302
	Minimum		7.124		6.085		4.584
	Maximum		13.16		13.18		5.949
	C.V.(%)		13.93		16.89		6.134
	No. Specimens		59		57		57
	No. Prepreg Lots		5		5		5
E₂^t [Msi]	Mean		1.470		1.293		1.051
	Minimum		1.253		1.244		1.010
	Maximum		1.660		1.350		1.094
	C.V.(%)		5.197		1.667		2.417
	No. Specimens		55		56		57
	No. Prepreg Lots		5		5		5

2.4.3 Longitudinal Compression Properties (LC)

Material: Hexcel M91/IM8-GS UD Tape 145gsm with 35% RC		Compression, 1-axis Hexcel M91/IM8-GS UD Tape 145gsm with 35% RC [0]15					
Resin content:	42.94% wt						
Fiber volume:	57.08% vol	Comp. density: 1.566 g/cc					
Ply count:	15						
Test method:	ASTM D6641-16e2	Modulus calculation: 1000-3000 microstrain					
Normalized by:	0.005500	in. CPT					
		CTA		RTA		ETW	
Test Temperature [°F]	-65	-65		70		180	
Moisture Conditioning	Ambient	Ambient		Ambient		Equilibrium	
Equilibrium at T, RH						160°F, 85%	
Source code Prefixed by: NTPM910Q1-HXL-H35-	LC-X-X-X-CTA-X	LC-X-X-X-RTA-X		LC-X-X-X-ETW-X			
	Normalized	Measured	Normalized	Measured	Normalized	Measured	
E₁^c [Msi]	Mean	22.37	21.73	22.26	21.66	22.65	21.91
	Minimum	20.78	20.51	20.83	20.79	21.70	21.12
	Maximum	24.94	24.03	23.07	22.65	24.06	22.73
	C.V.(%)	3.363	2.821	2.087	2.017	2.253	1.868
	No. Specimens	55		55		53	
	No. Prepreg Lots	5		5		5	

2.4.4 Longitudinal Compression Back-out Factor Properties

Material: Hexcel M91/IM8-GS UD Tape 145gsm with 35% RC		Compression, 1-axis, Back-out Factor Hexcel M91/IM8-GS UD Tape 145gsm with 35% RC UNC0 Layout: [90/0] ₄₅					
		CTA		RTA		ETW	
Test Temperature [°F]	-65	-65		70		180	
Moisture Conditioning	Ambient	Ambient		Ambient		Equilibrium	
Equilibrium at T, RH						160°F, 85%	
Source code Prefixed by: NTPM910Q1-HXL-H35-	UNC0-X-X-X-CTA-X	UNC0-X-X-X-RTA-X		UNC0-X-X-X-ETW-X			
	Normalized	Measured	Normalized	Measured	Normalized	Measured	
F₁^{CU} [ksi] from UNC0	Mean	290.9	281.8	246.1	238.1	184.9	178.8
	Minimum	251.4	243.9	193.0	187.1	163.3	154.4
	Maximum	320.9	310.9	284.1	269.7	207.0	195.9
	C.V.(%)	6.279	5.996	9.411	8.654	4.467	4.466
	No. Specimens	55		57		56	
	No. Prepreg Lots	5		5		5	

Note: Backout factor was calculated based off the conservative assumption that the poissons ratio is 0. A new batch of sampling is being populated to obtain the actual poissons ratio. The values will be revised once the new data is available.

2.4.5 Transverse Compression Properties (TC)

Material:		Hexcel M91/IM8-GS UD Tape 145gsm with 35% RC				Compression, 2-axis Hexcel M91/IM8-GS UD Tape 145gsm with 35% RC [90]15			
Resin content:	42.76% wt	Comp. density: 1.561 g/cc							
Fiber volume:	56.94% vol								
Ply count:	15								
Test method:	ASTM D6641-16e2	Modulus calculation: 1000-3000 microstrain							
Normalized by:	NA								
		CTA		RTA		ETW			
Test Temperature [°F]		-65		70		180			
Moisture Conditioning		Ambient		Ambient		Equilibrium			
Equilibrium at T, RH						160°F, 85%			
Source code Prefixed by: NTPM910Q1-HXL-H35-		TC-X-X-X-CTA-X		TC-X-X-X-RTA-X		TC-X-X-X-ETW-X			
		Normalized	Measured	Normalized	Measured	Normalized	Measured		
F ₂ ^{cu} [ksi]	Mean	47.19		35.10		19.69			
	Minimum	42.06		32.16		17.80			
	Maximum	52.01		37.51		21.48			
	C.V.(%)	3.586		3.521		3.848			
	No. Specimens	55		55		55			
	No. Prepreg Lots	5		5		5			
E ₂ ^c [Msi]	Mean	1.533		1.375		1.234			
	Minimum	1.314		1.301		1.197			
	Maximum	1.835		1.430		1.275			
	C.V.(%)	4.638		2.206		1.288			
	No. Specimens	55		55		55			
	No. Prepreg Lots	5		5		5			

2.4.6 Unnotched Compression 0/90 Properties (UNC0)

Material: Hexcel M91/IM8-GS UD Tape 145gsm with 35% RC		Unnotched Compression 0/90 Hexcel M91/IM8-GS UD Tape 145gsm with 35% RC [90/0] _{4S}					
Resin content: 42.8% wt	Comp. density: 1.559 g/cc						
Fiber volume: 56.78% vol							
Ply count: 16							
Test method: ASTM D6641-16e2	Modulus calculation: 1000-3000 microstrain						
Normalized by: 0.005500	in. CPT						
	CTA	RTA	ETW				
Test Temperature [°F]	-65	70	180				
Moisture Conditioning	Ambient	Ambient	Equilibrium				
Equilibrium at T, RH			160°F, 85%				
Source code Prefixed by: NTPM910Q1-HXL-H35-	UNC0-X-X-X-CTA-X	UNC0-X-X-X-RTA-X	UNC0-X-X-X-ETW-X				
	Normalized	Measured	Normalized	Measured	Normalized	Measured	
Mean	155.4	150.9	130.6	126.6	97.49	94.43	
Minimum	134.3	130.6	102.4	99.50	86.12	81.56	
Maximum	171.5	166.4	150.8	143.4	109.1	103.5	
C.V.(%)	6.279	5.996	9.411	8.654	4.467	4.466	
No. Specimens	55		57		56		
No. Prepreg Lots	5		5		5		
Mean	12.30	11.94	12.27	11.90	12.42	12.03	
Minimum	11.71	11.37	11.78	11.39	11.52	11.46	
Maximum	13.60	12.86	13.02	12.47	13.17	12.64	
C.V.(%)	3.139	2.769	1.965	2.046	2.722	2.106	
No. Specimens	55		55		55		
No. Prepreg Lots	5		5		5		

2.4.7 In Plane Shear V-Notch Properties (IPSV)

Material: Hexcel M91/IM8-GS UD Tape 145gsm with 35% RC		In-Plane Shear V- Notch Hexcel M91/IM8-GS UD Tape 145gsm with 35% RC [0/90] _{8s}			
Resin content: 43.14% wt	Comp. density: 1.557 g/cc				
Fiber volume: 56.44% vol					
Ply count: 12					
Test method: ASTM D5379 - 19	Modulus calculation: 2000-6000 microstrain for CTA and RTA, 1000-3000 microstrain for ETW				
Normalized by: NA					
	CTA	RTA	ETW		
Test Temperature [°F]	-65	70	180		
Moisture Conditioning	Ambient	Ambient	Equilibrium		
Equilibrium at T, RH			160°F, 85%		
Source code Prefixed by: NTPM910Q1-HXL-H35-	IPSV-X-X-X-CTA-X	IPSV-X-X-X-RTA-X	IPSV-X-X-X-ETW-X		
	Normalized	Measured	Normalized	Measured	
Mean	11.30	8.286	4.765		
Minimum	10.46	7.831	4.508		
Maximum	12.18	8.646	5.297		
(D5379) F₁₂^{s0.2%} [ksi]					
C.V.(%)	2.914	2.212	3.014		
No. Specimens	54	55	55		
No. Prepreg Lots	5	5	5		
Mean	18.82	13.70	8.129		
Minimum	17.88	13.39	7.875		
Maximum	19.63	13.98	8.433		
(D5379) F₁₂^{s5%strain} [ksi]					
C.V.(%)	2.366	0.7616	1.771		
No. Specimens	54	55	55		
No. Prepreg Lots	5	5	5		
Mean	31.21	25.30	15.22		
Minimum	28.20	24.78	14.50		
Maximum	33.63	25.79	17.94		
(D5379) F₁₂^{su} [ksi]					
C.V.(%)	3.408	0.9660	3.180		
No. Specimens	55	55	55		
No. Prepreg Lots	5	5	5		
Mean	0.8661	0.7437	0.6431		
Minimum	0.8071	0.6940	0.5427		
Maximum	0.9446	0.7815	0.7185		
(D5379) G₁₂^s [Msi]					
C.V.(%)	3.279	2.865	5.606		
No. Specimens	54	55	55		
No. Prepreg Lots	5	5	5		

2.4.8 In Plane Shear Tension Properties (IPST)

Material:		Hexcel M91/IM8-GS UD Tape 145gsm with 35% RC		In-Plane Shear Tension Hexcel M91/IM8-GS UD Tape 145gsm with 35% RC [45/-45]_{SS}			
Resin content:	43.48% wt	Comp. density: 1.561 g/cc					
Fiber volume:	56.44% vol						
Ply count:	20						
Test method:		ASTM D3518-18		Modulus calculation: 2000-6000 microstrain			
Normalized by:		NA					
		CTA		RTA		ETW	
Test Temperature [°F]		-65		70		180	
Moisture Conditioning		Ambient		Ambient		Equilibrium	
Equilibrium at T, RH						160°F, 85%	
Source code Prefixed by: NTPM910Q1-HXL-H35-		IPST-X-X-X-CTA-X		IPST-X-X-X-RTA-X		IPST-X-X-X-ETW-X	
		Normalized	Measured	Normalized	Measured	Normalized	Measured
(D3518) F ₁₂ ^{s0.2%} [ksi]	Mean		10.16		7.353		4.587
	Minimum		9.890		7.115		4.488
	Maximum		10.89		7.518		4.702
	C.V.(%)		2.499		1.515		1.663
	No. Specimens		18		18		18
	No. Prepreg Lots		3		3		3
(D3518) F ₁₂ ^{s5%strain} [ksi]	Mean		16.16		11.94		6.827
	Minimum		15.55		11.76		6.654
	Maximum		16.72		12.09		6.938
	C.V.(%)		2.063		0.6315		1.077
	No. Specimens		18		18		18
	No. Prepreg Lots		3		3		3
(D3518) G ₁₂ ^s [Msi]	Mean		0.8402		0.6903		0.4633
	Minimum		0.7990		0.6616		0.4522
	Maximum		0.8739		0.7151		0.4769
	C.V.(%)		2.625		2.162		1.775
	No. Specimens		18		18		18
	No. Prepreg Lots		3		3		3

2.4.9 Short Beam Strength Properties (SBS)

Material: Hexcel M91/IM8-GS UD Tape 145gsm with 35% RC		Short-Beam Strength Hexcel M91/IM8-GS UD Tape 145gsm with 35% RC [0] ₂₄					
Resin content:	42.89% wt	Comp. density: 1.562 g/cc					
Fiber volume:	56.89% vol						
Ply count:	24						
Test method: ASTM D2344-16							
Normalized by: NA							
		CTA		RTA		ETW	
Test Temperature [°F]		-65		70		180	
Moisture Conditioning		Ambient		Ambient		Equilibrium	
Equilibrium at T, RH						160°F, 85%	
Source code Prefixed by: NTPM910Q1-HXL-H35-		SBS-XXXCTA-X		SBS-XXXRTA-X		SBS-XXXETW-X	
		Normalized	Measured	Normalized	Measured	Normalized	Measured
SBS [ksi]	Mean	21.48		16.22		9.484	
	Minimum	20.14		15.54		9.049	
	Maximum	23.42		17.13		9.859	
	C.V.(%)	3.428		2.418		2.139	
	No. Specimens	55		55		55	
No. Prepreg Lots		5		5		5	

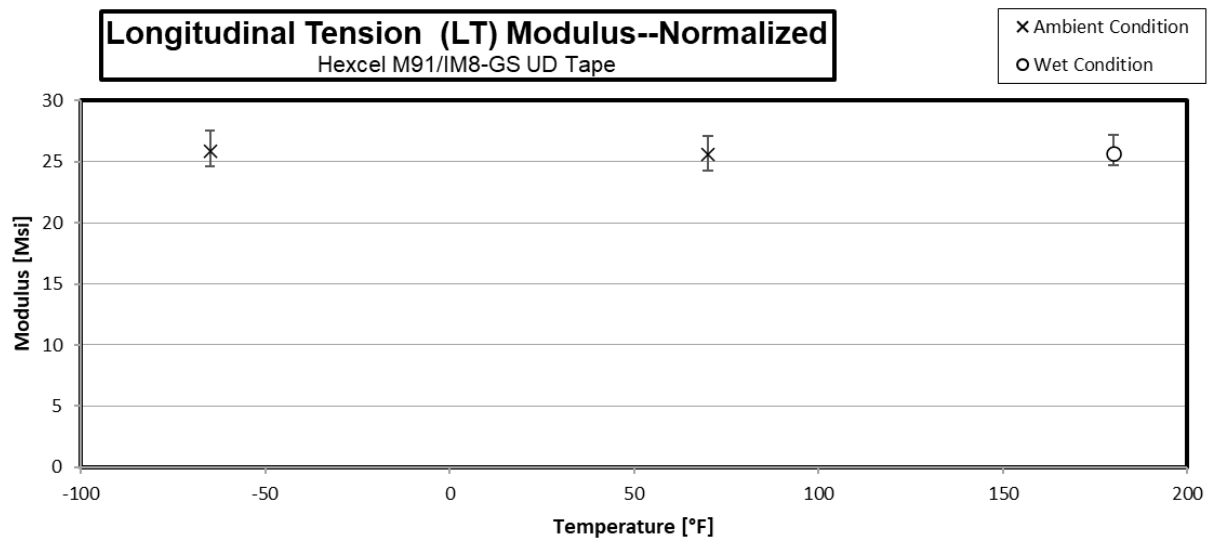
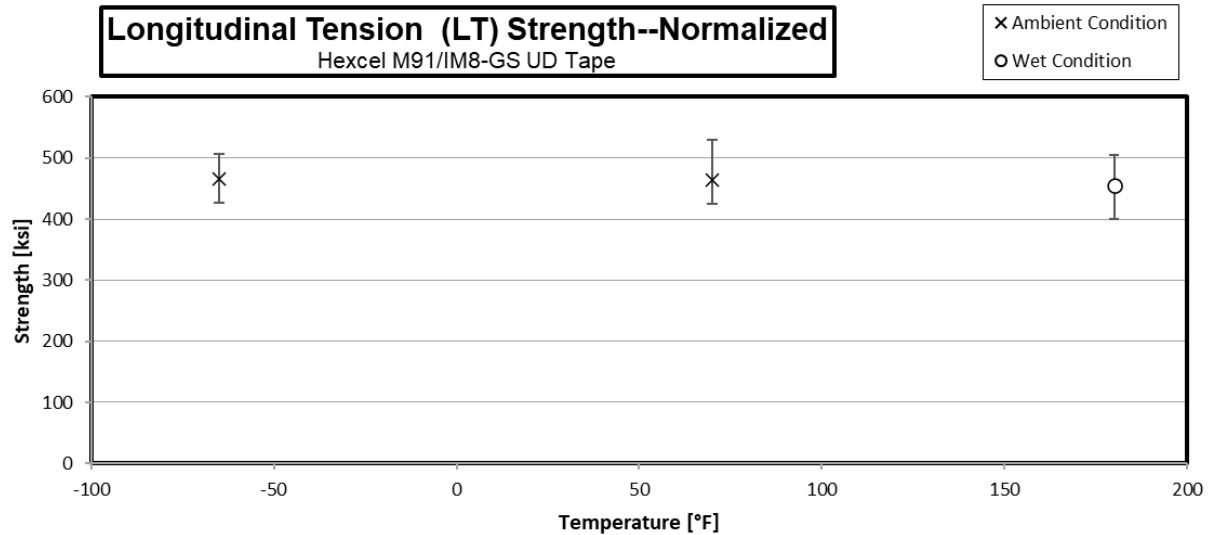
2.4.10 Interlaminar Tension Properties (ILT)

Material: Hexcel M91/IM8-GS UD Tape 145gsm with 35% RC		Interlaminar Tension Hexcel M91/IM8-GS UD Tape 145gsm with 35% RC [0] ₂₁	
Resin content: 43.11% wt	Comp. density: 1.558 g/cc		
Fiber volume: 56.5% vol			
Ply count: 21			
Test method: ASTM D6415-06a			
Normalized by: NA			
	CTA	RTA	ETW
Test Temperature [°F]	-65	70	180
Moisture Conditioning	Ambient	Ambient	Equilibrium
Equilibrium at T, RH			160°F, 85%
Source code Prefixed by: NTPM910Q1-HXL-H35-	ILT-X-X-X-CTA-X	ILT-X-X-X-RTA-X	ILT-X-X-X-ETW-X
	Normalized	Measured	Normalized
Mean	495.7	315.1	185.8
Minimum	372.7	251.5	156.2
Maximum	751.1	359.2	209.9
C.V.(%)	10.52	10.05	7.840
No. Specimens	60	55	55
No. Prepreg Lots	5	5	5
Mean	21.47	13.69	8.065
Minimum	16.18	11.26	7.063
Maximum	31.99	15.44	8.933
C.V.(%)	10.03	9.072	6.518
No. Specimens	60	55	55
No. Prepreg Lots	5	5	5

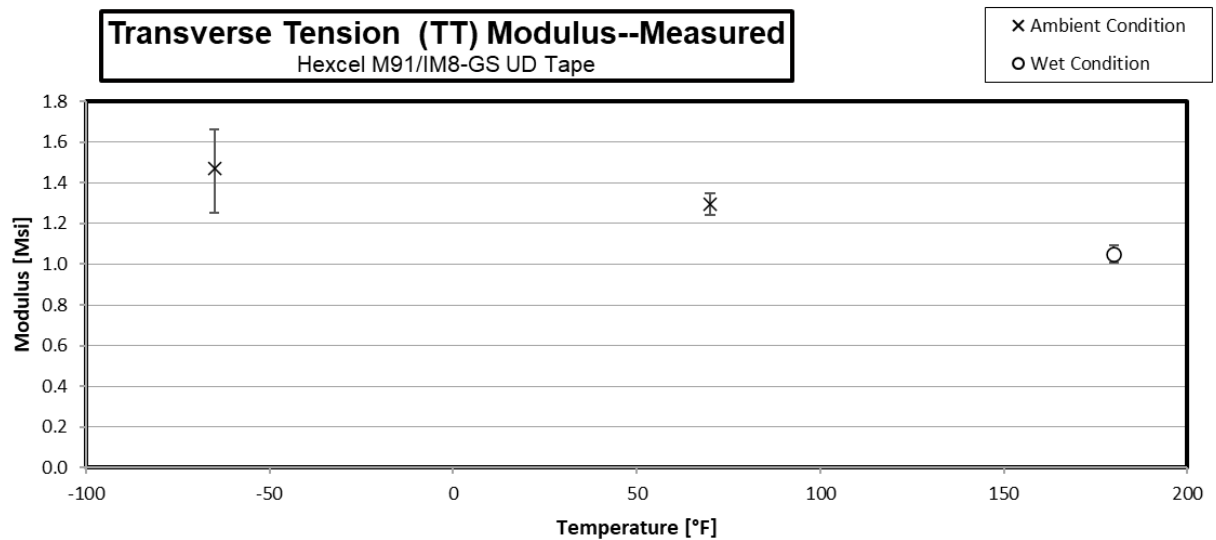
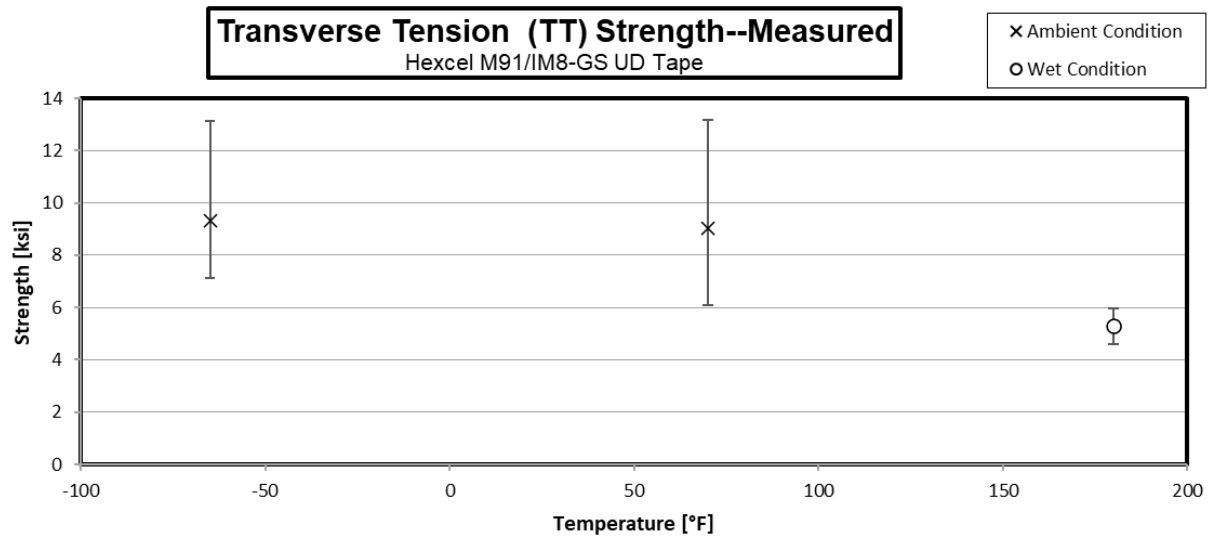
3. Individual Test Charts

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

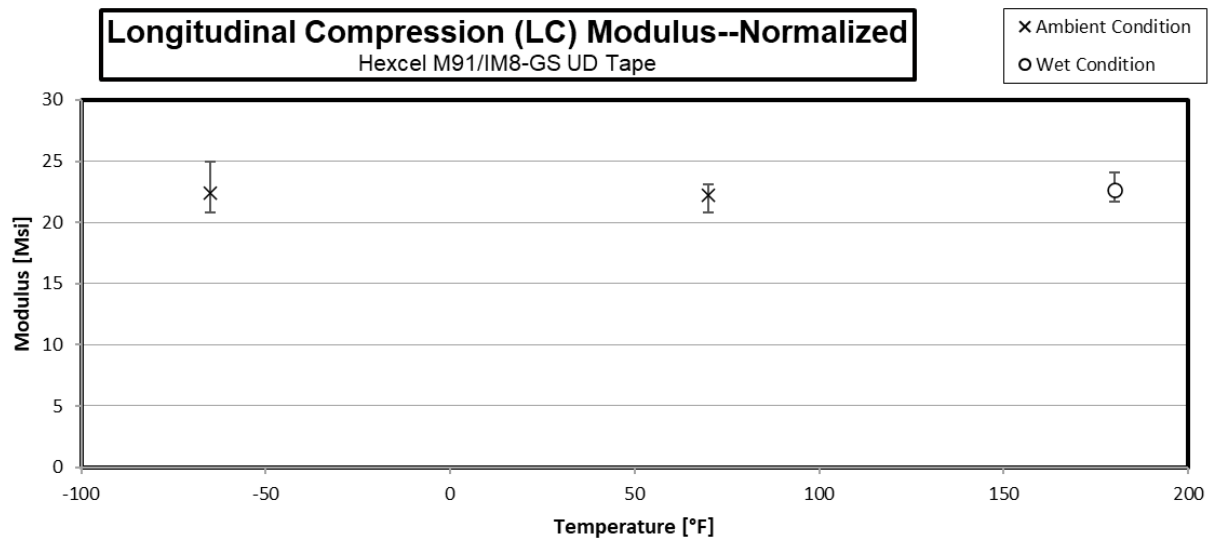
3.1 Longitudinal Tension Properties (LT)



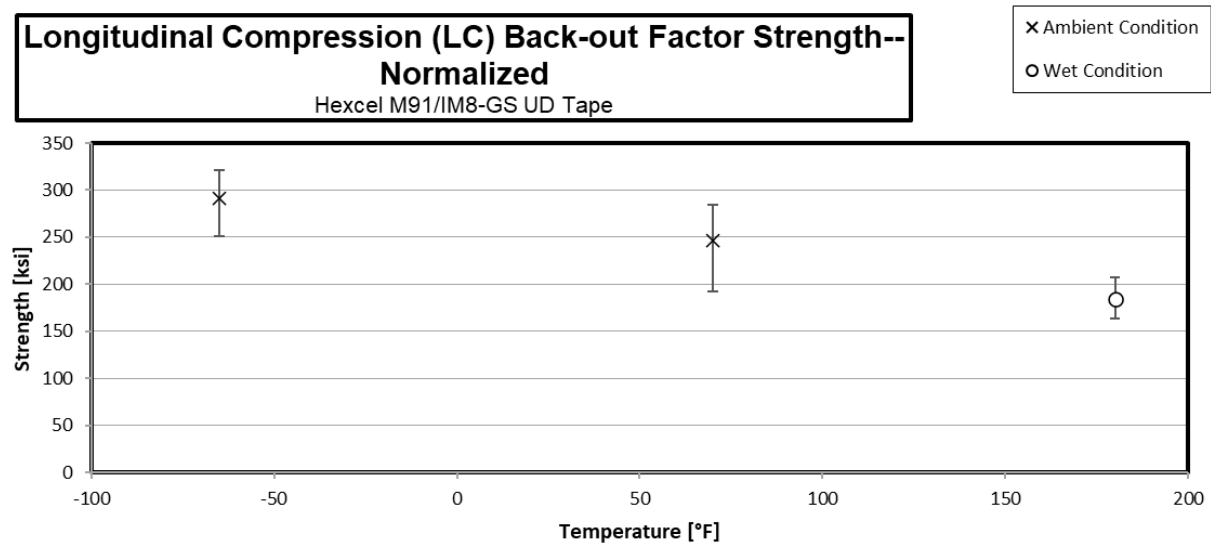
3.2 Transverse Tension Properties (TT)



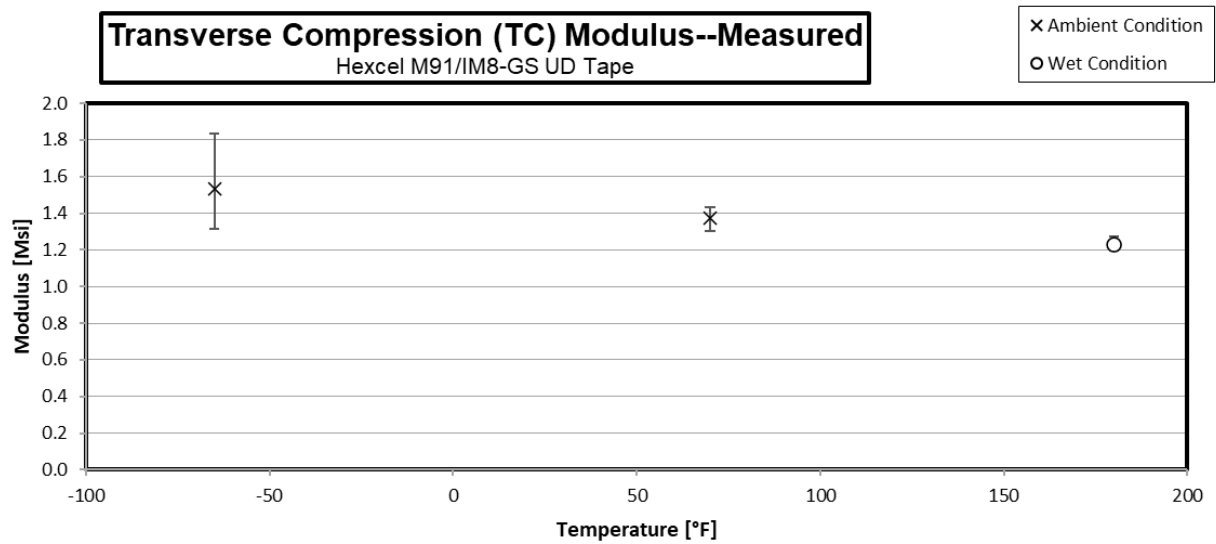
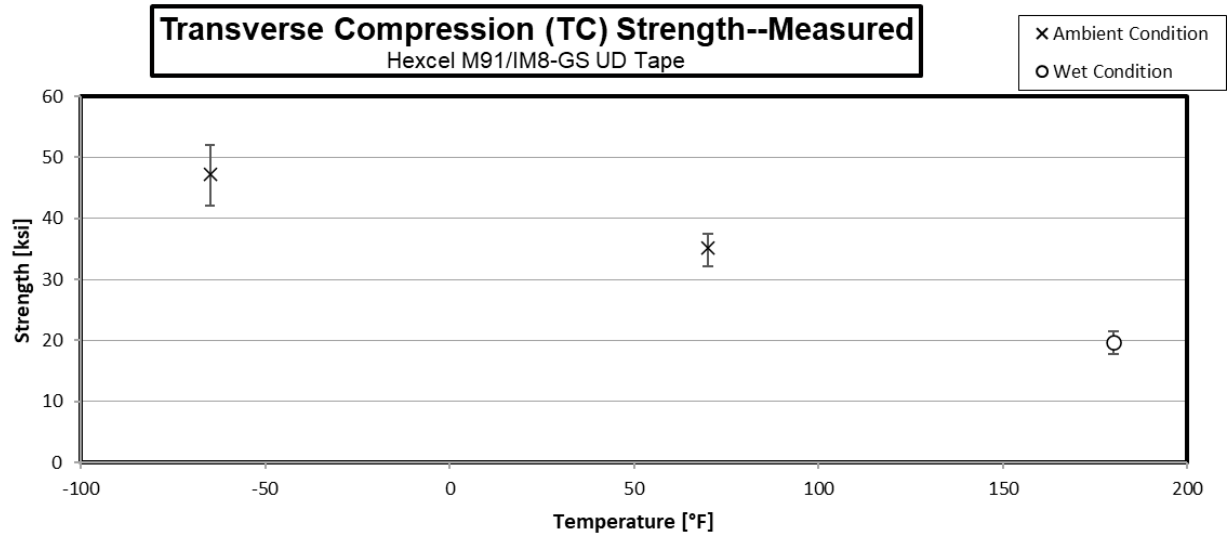
3.3 Longitudinal Compression Properties (LC)



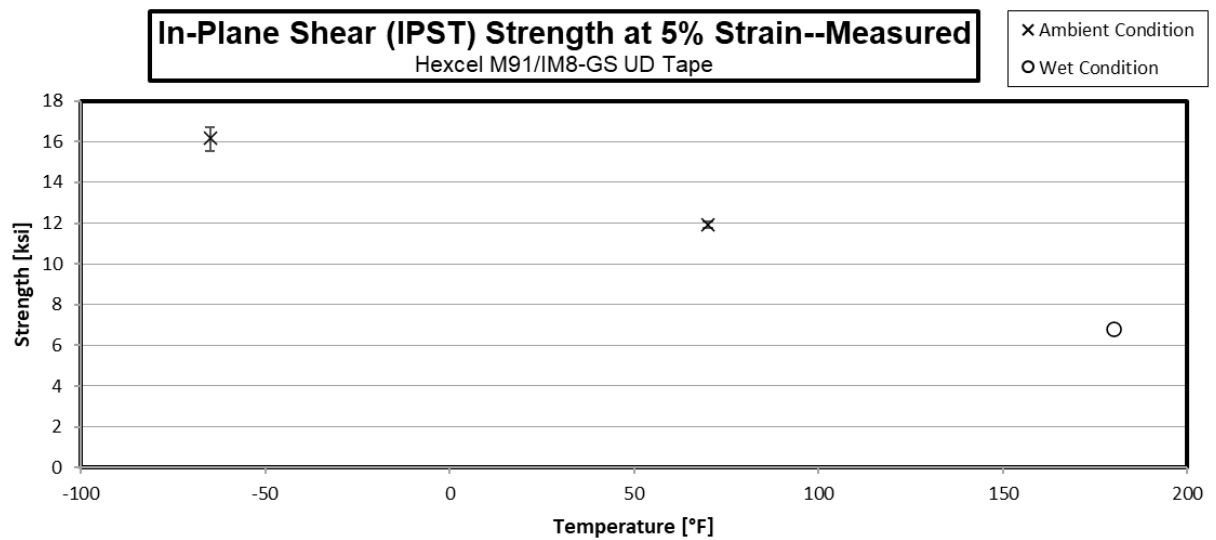
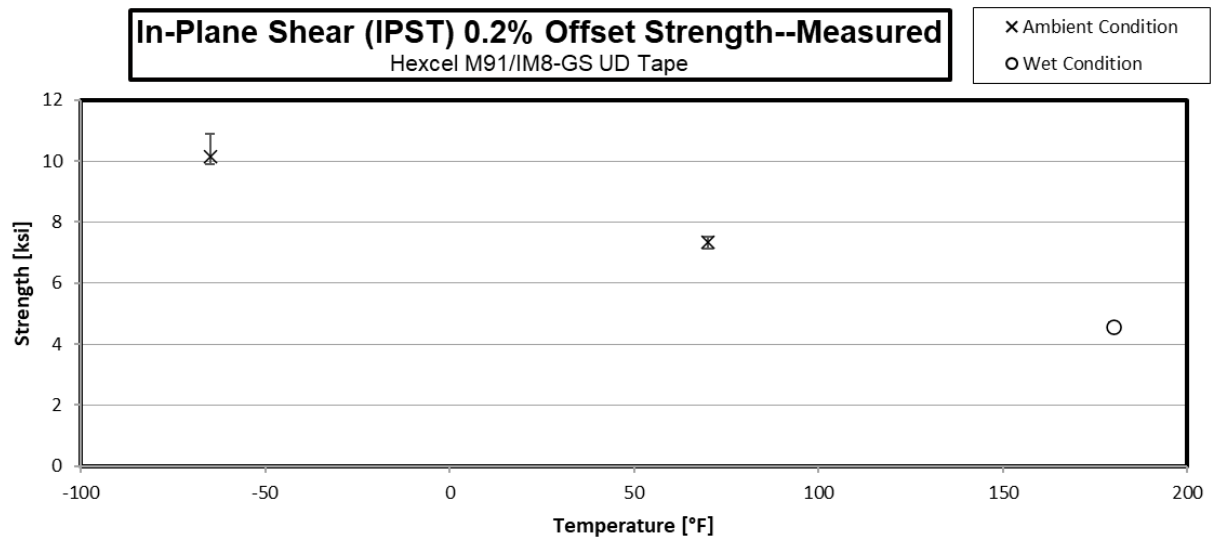
3.4 Longitudinal Compression Back-out Factor Properties

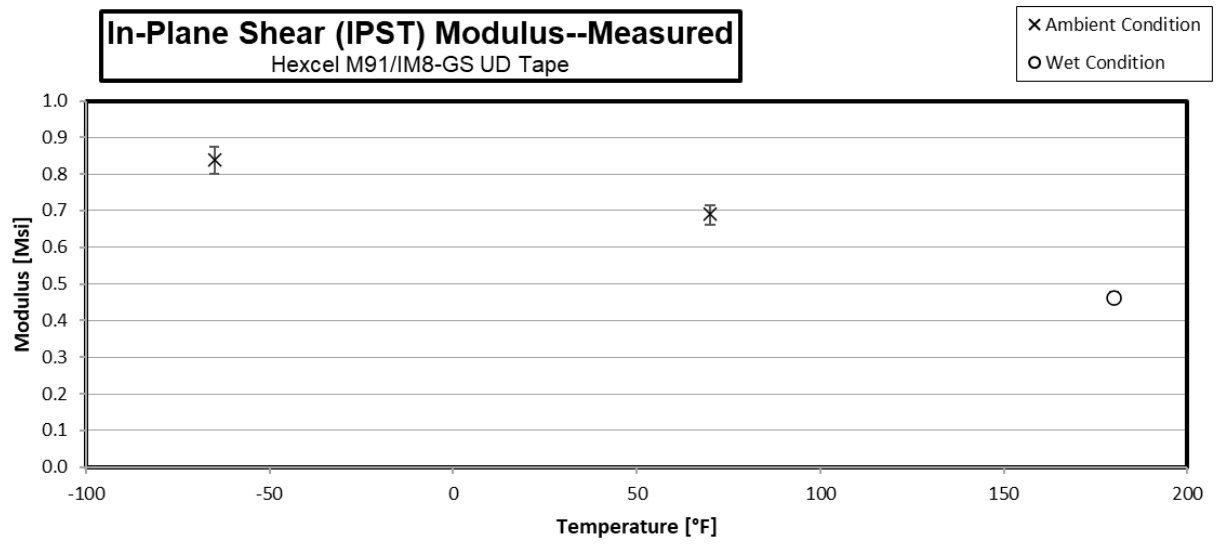


3.5 Transverse Compression Properties (TC)

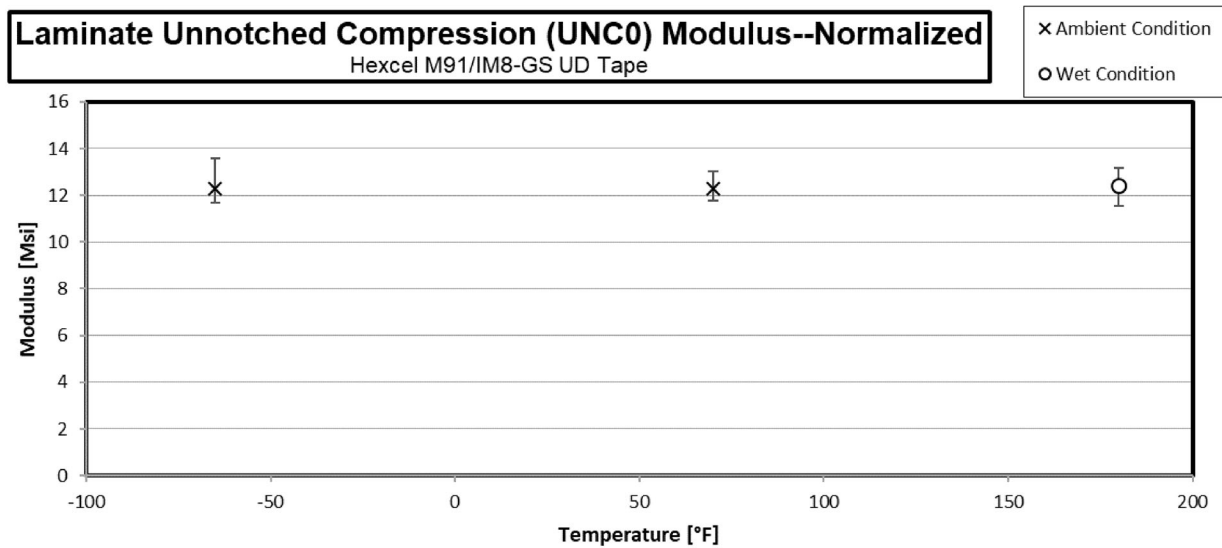
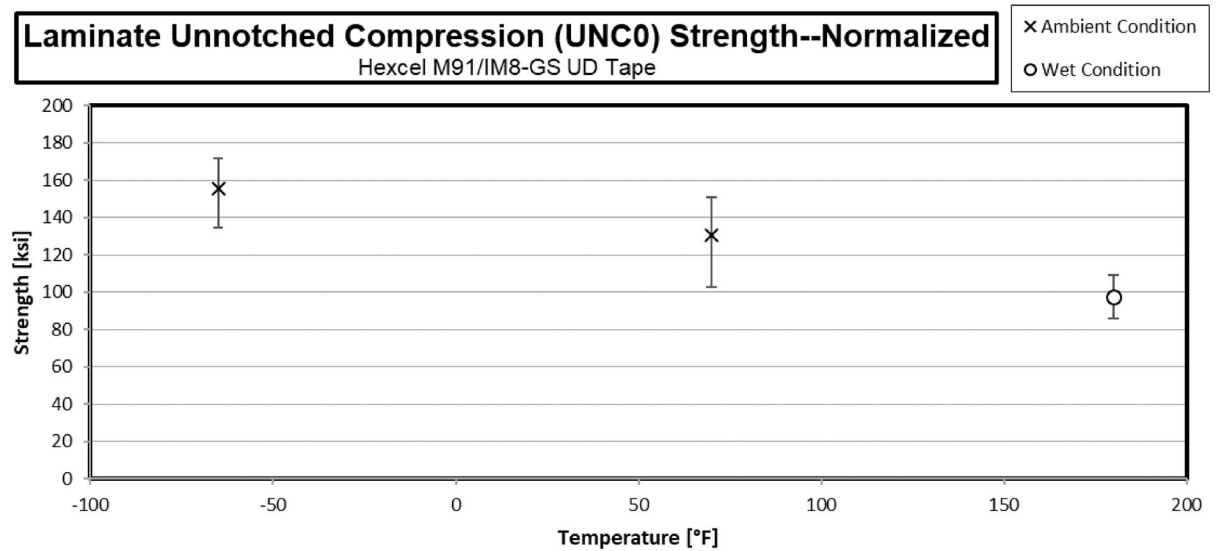


3.6 In-Plane Shear Tension Properties (IPST)

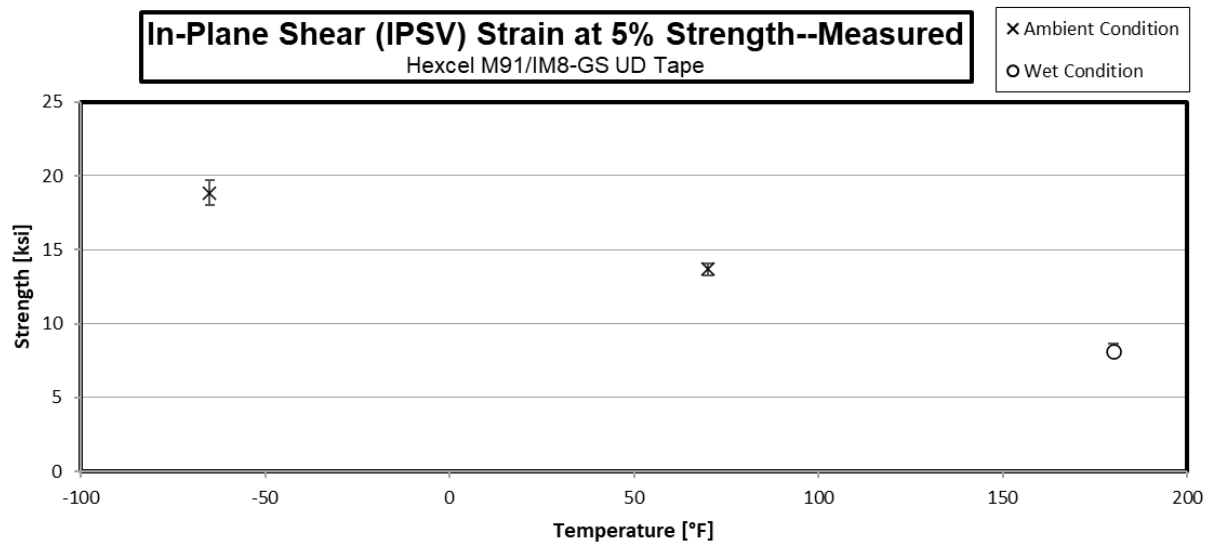
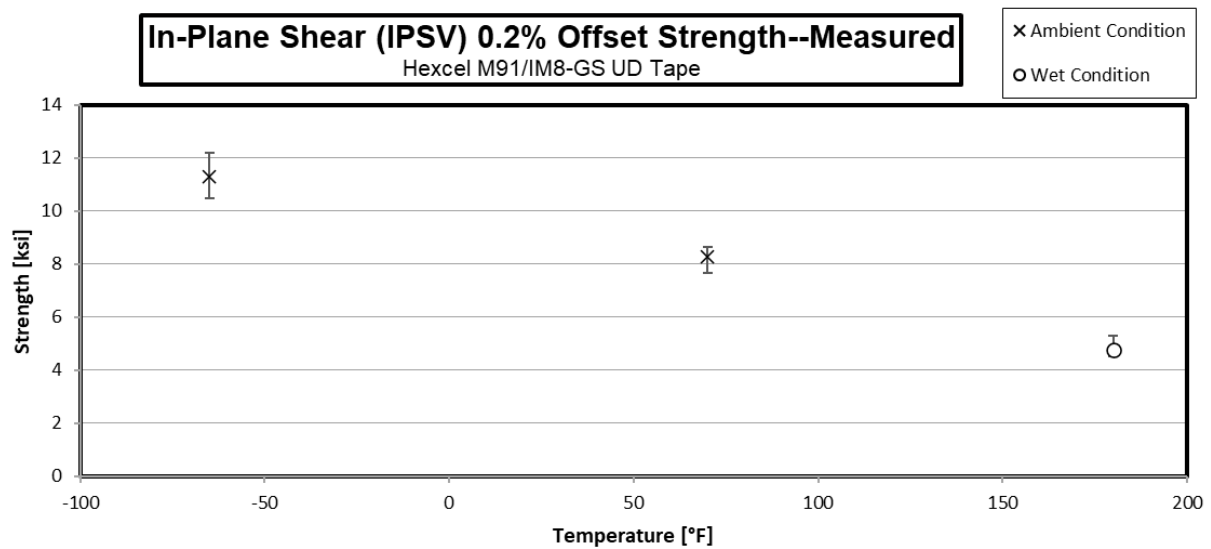


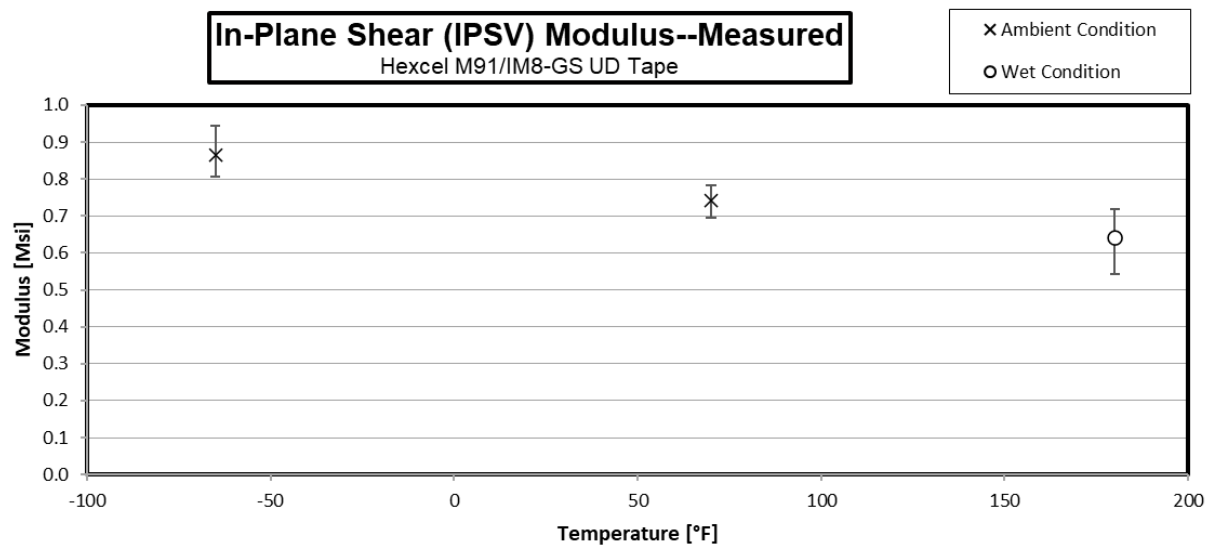
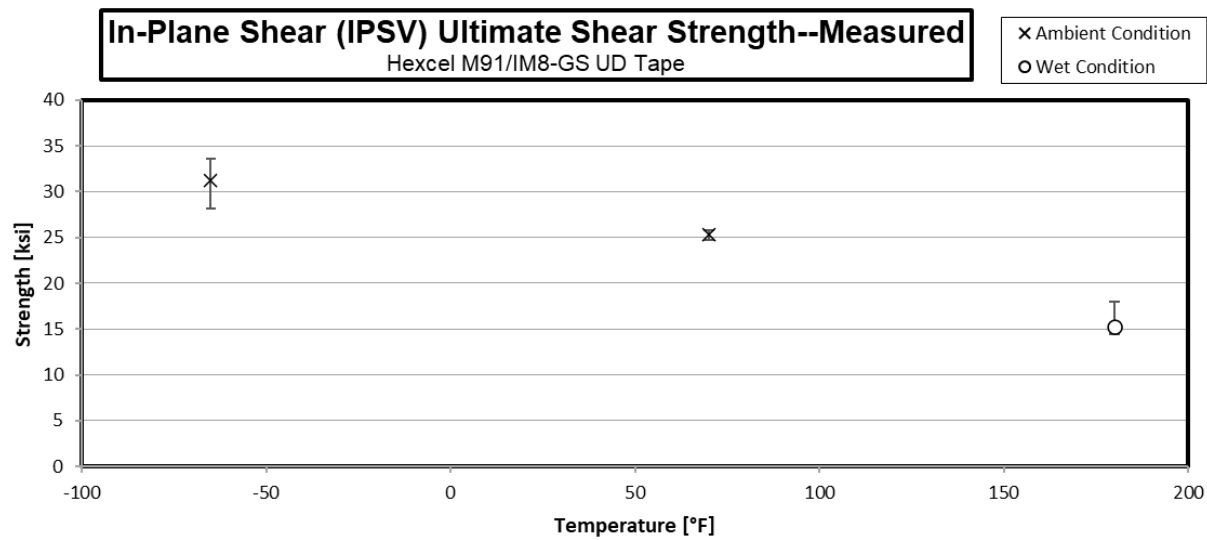


3.7 Unnotched Compression 0/90 Properties (UNC0)

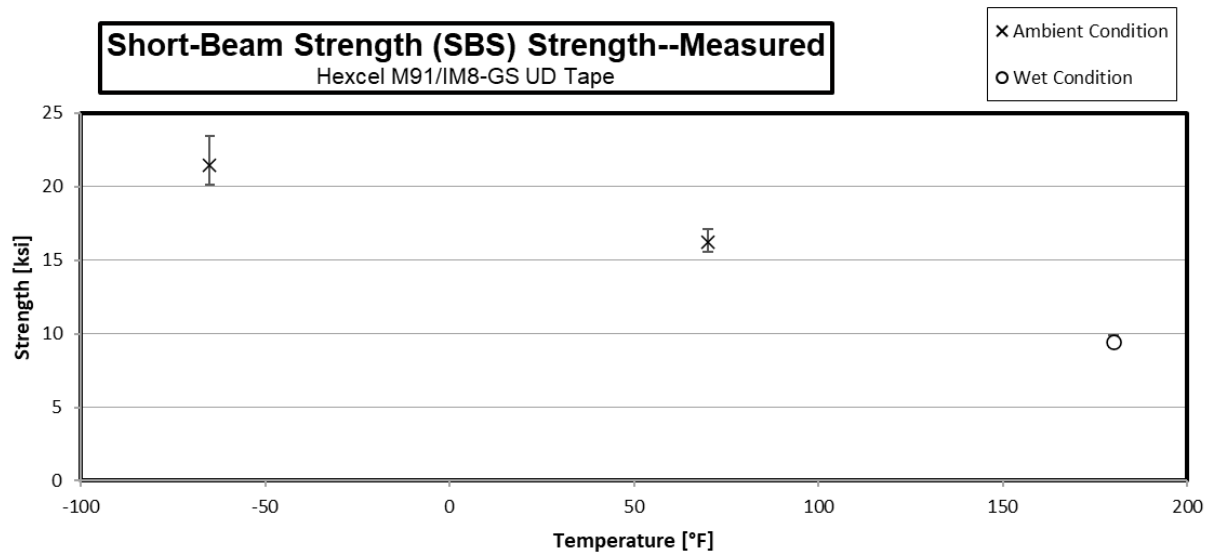


3.8 In Plane Shear V Notch Properties (IPSV)

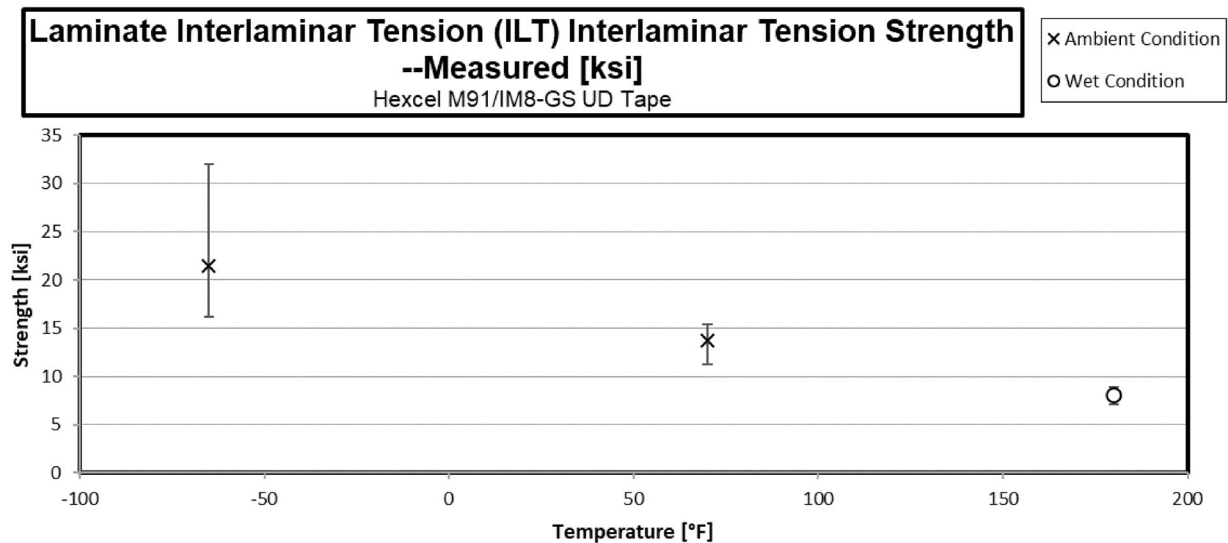
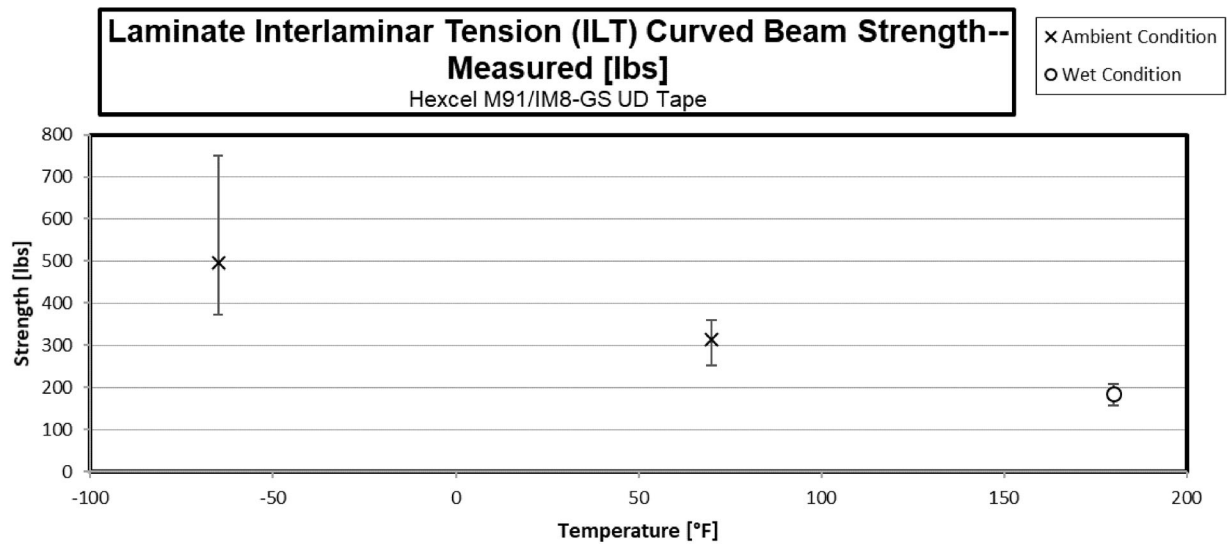




3.9 Short Beam Strength Properties (SBS)



3.10 Interlaminar Tension Properties (ILT)



4. Raw Data

4.1 Longitudinal Tension Properties (LT)

Longitudinal Tension Properties (LT)--CTA (-65°F)	
Strength & Modulus	
Hexcel M91/IM8-GS UD Tape	

normalizing
t₉₀ [in]
0.005500

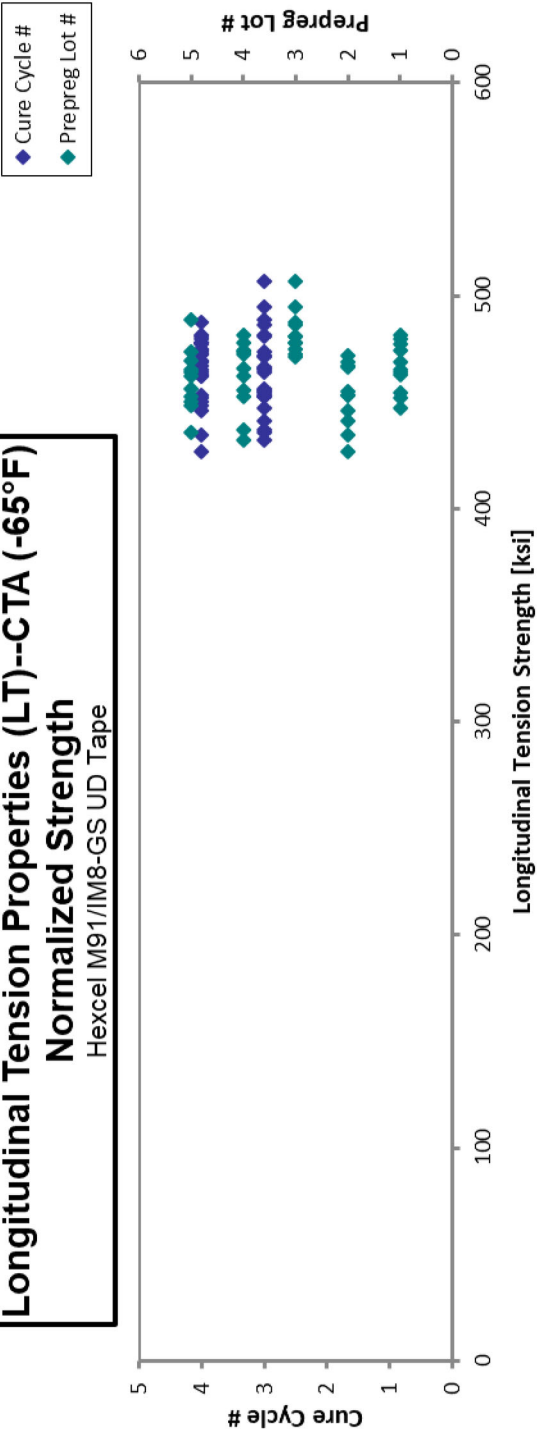
Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Poisson's Ratio	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
NTPM91001-HXL-H35-NIAR-LT-A-C3-1-CTA-1	A	C3	1	3	444.4	25.28	0.3179	0.04430	8	XGM
NTPM91001-HXL-H35-NIAR-LT-A-C3-1-CTA-2	A	C3	1	3	482.1	26.00	0.3160	0.04395	8	XGM
NTPM91001-HXL-H35-NIAR-LT-A-C3-1-CTA-3	A	C3	1	3	452.6	25.21	0.3240	0.04418	8	XGM
NTPM91001-HXL-H35-NIAR-LT-A-C3-1-CTA-4	A	C3	1	3	463.6	25.60	0.3130	0.04403	8	XGM
NTPM91001-HXL-H35-NIAR-LT-A-C3-1-CTA-5	A	C3	1	3	463.4	25.62	0.3288	0.04417	8	XGM
NTPM91001-HXL-H35-NIAR-LT-A-C4-1-CTA-1	A	C4	1	4	473.3	25.21	0.3027	0.04408	8	XGM
NTPM91001-HXL-H35-NIAR-LT-A-C4-1-CTA-2	A	C4	1	4	488.5	25.66	0.3312	0.04345	8	XGM
NTPM91001-HXL-H35-NIAR-LT-A-C4-1-CTA-3	A	C4	1	4	476.3	25.76	0.3076	0.04407	8	XGM
NTPM91001-HXL-H35-NIAR-LT-A-C4-1-CTA-4	A	C4	1	4	476.9	25.47	0.3155	0.04427	8	XGM
NTPM91001-HXL-H35-NIAR-LT-A-C4-1-CTA-5	A	C4	1	4	446.5	25.90	0.3037	0.04457	8	XGM
NTPM91001-HXL-H35-NIAR-LT-A-C4-1-CTA-6	A	C4	1	4	465.0	25.46	0.3288	0.04437	8	XGM
NTPM91001-HXL-H35-NIAR-LT-B-C3-1-CTA-1	B	C3	2	3	450.4	24.50	0.3275	0.04555	8	XGM
NTPM91001-HXL-H35-NIAR-LT-B-C3-1-CTA-2	B	C3	2	3	442.0	24.45	0.3132	0.04530	8	XGM
NTPM91001-HXL-H35-NIAR-LT-B-C3-1-CTA-3	B	C3	2	3	436.8	24.84	0.3494	0.04567	8	XGM
NTPM91001-HXL-H35-NIAR-LT-B-C3-1-CTA-4	B	C3	2	3	426.9	25.28	0.3469	0.04550	8	XGM
NTPM91001-HXL-H35-NIAR-LT-B-C3-1-CTA-5	B	C3	2	3	454.8	25.01	0.3236	0.04567	8	XGM
NTPM91001-HXL-H35-NIAR-LT-B-C4-1-CTA-1	B	C4	2	4	422.6	24.61	0.3227	0.04525	8	XGM
NTPM91001-HXL-H35-NIAR-LT-B-C4-1-CTA-2	B	C4	2	4	415.6	24.98	0.3025	0.04518	8	XGM
NTPM91001-HXL-H35-NIAR-LT-B-C4-1-CTA-3	B	C4	2	4	446.7	24.58	0.3318	0.04598	8	XGM
NTPM91001-HXL-H35-NIAR-LT-B-C4-1-CTA-4	B	C4	2	4	429.8	24.82	0.3401	0.04565	8	XGM
NTPM91001-HXL-H35-NIAR-LT-B-C4-1-CTA-5	B	C4	2	4	433.3	24.86	0.3332	0.04605	8	XGM
NTPM91001-HXL-H35-NIAR-LT-B-C4-1-CTA-6	B	C4	2	4	455.5	24.81	0.3173	0.04528	8	XGM
NTPM91001-HXL-H35-NIAR-LT-C-C3-1-CTA-1	C	C3	3	3	439.9	25.02	0.3791	0.04713	8	XGM
NTPM91001-HXL-H35-NIAR-LT-C-C3-1-CTA-2	C	C3	3	3	468.0	25.11	0.2760	0.04650	8	XGM
NTPM91001-HXL-H35-NIAR-LT-C-C3-1-CTA-3	C	C3	3	3	481.7	25.21	0.3312	0.04628	8	XGM
NTPM91001-HXL-H35-NIAR-LT-C-C3-1-CTA-4	C	C3	3	3	463.1	24.64	0.3372	0.04618	8	XGM
NTPM91001-HXL-H35-NIAR-LT-C-C3-1-CTA-5	C	C3	3	3	464.3	25.65	0.3492	0.04557	8	XGM
NTPM91001-HXL-H35-NIAR-LT-C-C4-1-CTA-1	C	C4	3	4	452.2	24.83	0.3479	0.04598	8	XGM
NTPM91001-HXL-H35-NIAR-LT-C-C4-1-CTA-2	C	C4	3	4	464.3	25.00	0.3197	0.04618	8	XGM
NTPM91001-HXL-H35-NIAR-LT-C-C4-1-CTA-3	C	C4	3	4	460.4	24.98	0.3183	0.04593	8	XGM
NTPM91001-HXL-H35-NIAR-LT-C-C4-1-CTA-4	C	C4	3	4	457.1	25.43	0.3328	0.04598	8	XGM
NTPM91001-HXL-H35-NIAR-LT-C-C4-1-CTA-5	C	C4	3	4	462.9	25.33	0.3206	0.04542	8	XGM
NTPM91001-HXL-H35-NIAR-LT-C-C4-1-CTA-6	C	C4	3	4	458.5	25.17	0.3069	0.04557	8	XGM

Avg. t ₉₀ [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.005538	447.4	25.45
0.005494	481.5	25.97
0.005523	454.5	25.32
0.005504	464.0	25.62
0.005521	465.1	25.72
0.005510	474.2	25.26
0.005431	462.6	25.34
0.005508	477.0	25.80
0.005533	479.8	25.62
0.005571	452.2	26.24
0.005546	468.9	25.68
0.005694	466.3	25.37
0.005663	455.1	25.17
0.005708	453.3	25.78
0.005688	441.4	26.14
0.005708	472.0	25.95
0.005656	434.6	25.31
0.005648	426.8	25.66
0.005748	466.9	25.69
0.005706	445.9	25.75
0.005756	453.4	26.02
0.005660	468.8	25.53
0.005892	471.2	26.80
0.005813	494.6	26.54
0.005785	506.7	26.52
0.005773	486.1	25.87
0.005696	480.8	26.56
0.005748	472.6	25.95
0.005773	487.3	26.24
0.005742	480.6	26.08
0.005748	477.7	26.58
0.005677	477.8	26.15
0.005696	474.8	26.07

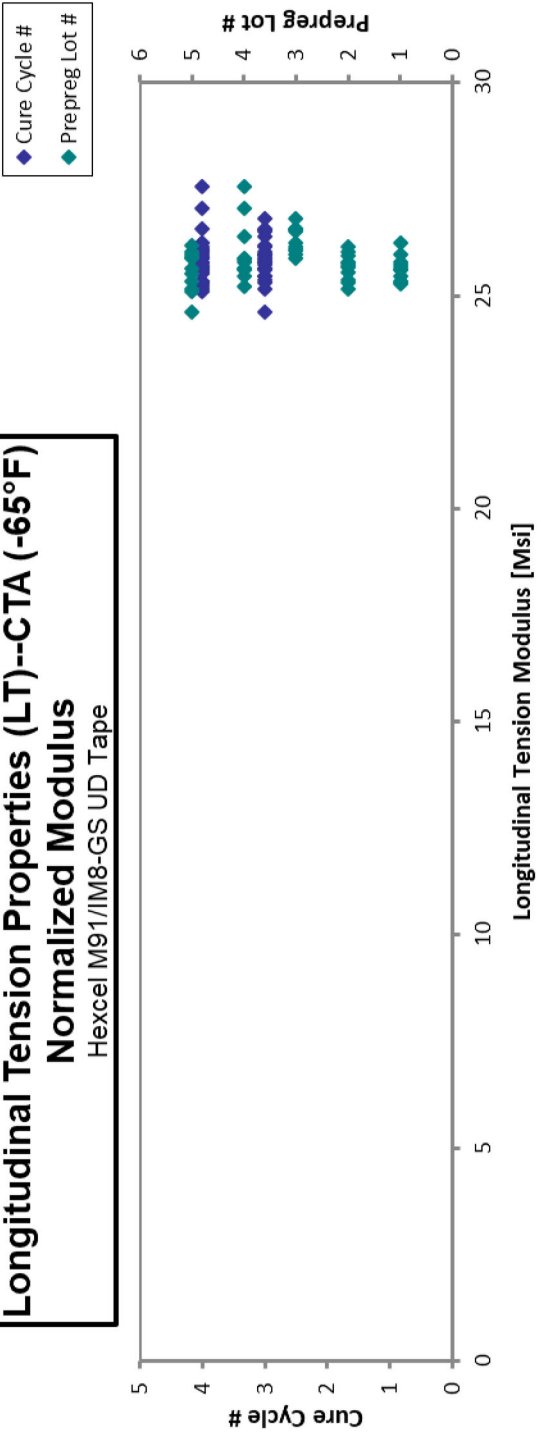
Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksj]	Modulus [Msi]	Poisson's Ratio	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
NTPM910Q1-HXL-H35-FACC-LT-D-C3-1-CTA-1	D	C3	4	3	417.3	24.97	0.2994	0.04553	8	XGM
NTPM910Q1-HXL-H35-FACC-LT-D-C3-1-CTA-2	D	C3	4	3	449.8	26.08	0.3383	0.04455	8	XGM
NTPM910Q1-HXL-H35-FACC-LT-D-C3-1-CTA-3	D	C3	4	3	480.5	25.49	0.3462	0.04450	8	XGM
NTPM910Q1-HXL-H35-FACC-LT-D-C3-1-CTA-4	D	C3	4	3	431.5	25.30	0.3301	0.04457	8	XGM
NTPM910Q1-HXL-H35-FACC-LT-D-C3-1-CTA-5	D	C3	4	3	444.4	25.00	0.3096	0.04478	8	XGM
NTPM910Q1-HXL-H35-FACC-LT-D-C4-1-CTA-1	D	C4	4	4	460.9	24.95	0.3313	0.04520	8	XGM
NTPM910Q1-HXL-H35-FACC-LT-D-C4-1-CTA-2	D	C4	4	4	470.1	25.39	0.3309	0.04440	8	XGM
NTPM910Q1-HXL-H35-FACC-LT-D-C4-1-CTA-3	D	C4	4	4	469.2	25.70	0.3456	0.04432	8	XGM
NTPM910Q1-HXL-H35-FACC-LT-D-C4-1-CTA-4	D	C4	4	4	471.0	26.68	0.4533	0.04463	8	XGM
NTPM910Q1-HXL-H35-FACC-LT-D-C4-1-CTA-5	D	C4	4	4	479.8	27.47	0.4388	0.04413	8	XGM
NTPM910Q1-HXL-H35-FACC-LT-D-C4-1-CTA-6	D	C4	4	4	457.6	24.95	0.3229	0.04445	8	XGM
NTPM910Q1-HXL-H35-SKS-LT-E-C3-1-CTA-1	E	C3	5	3	472.4	25.71	0.3160	0.04215	8	XGM
NTPM910Q1-HXL-H35-SKS-LT-E-C3-1-CTA-2	E	C3	5	3	431.5	25.39	0.3222	0.04443	8	XGM
NTPM910Q1-HXL-H35-SKS-LT-E-C3-1-CTA-3	E	C3	5	3	477.2	25.35	0.3427	0.04507	8	XGM
NTPM910Q1-HXL-H35-SKS-LT-E-C3-1-CTA-4	E	C3	5	3	458.3	25.19	0.3448	0.04548	8	XGM
NTPM910Q1-HXL-H35-SKS-LT-E-C3-1-CTA-5	E	C3	5	3	441.2	25.30	0.3291	0.04550	8	XGM
NTPM910Q1-HXL-H35-SKS-LT-E-C4-1-CTA-1	E	C4	5	4	442.4	24.88	0.3326	0.04478	8	XGM
NTPM910Q1-HXL-H35-SKS-LT-E-C4-1-CTA-2	E	C4	5	4	467.0	25.03	0.3389	0.04425	8	XGM
NTPM910Q1-HXL-H35-SKS-LT-E-C4-1-CTA-3	E	C4	5	4	440.5	25.07	0.3203	0.04477	8	XGM
NTPM910Q1-HXL-H35-SKS-LT-E-C4-1-CTA-4	E	C4	5	4	457.0	25.51	0.3290	0.04465	8	XGM
NTPM910Q1-HXL-H35-SKS-LT-E-C4-1-CTA-5	E	C4	5	4	454.5	24.68	0.3214	0.04475	8	XGM
NTPM910Q1-HXL-H35-SKS-LT-E-C4-1-CTA-6	E	C4	5	4	454.1	25.31	0.3318	0.04505	8	XGM

Average	454.7	25.27	0.3308	Average _{norm}	464.9	25.84
Standard Dev.	16.51	0.5221	0.02779	Standard Dev _{norm}	16.48	0.5166
Coeff. of Var. [%]	3.631	2.066	8.403	Coeff. of Var. [%] _{norm}	3.545	1.999
Min.	415.6	24.45	0.2760	Min.	426.8	24.62
Max.	482.1	27.47	0.4533	Max.	506.7	27.55
Number of Spec.	55	55	55	Number of Spec.	55	55

Longitudinal Tension Properties (LT)--CTA (-65°F)
Normalized Strength
Hexcel M91/IM8-GS UD Tape



Longitudinal Tension Properties (LT)--CTA (-65°F)
Normalized Modulus
Hexcel M91/IM8-GS UD Tape



Longitudinal Tension Properties (LT)--RTA (70°F) □

Strength & Modulus □

Hexcel M91/IM8-GS UD Tape

normalizing

t₉₀ [in]

0.005500

Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Poisson's Ratio	Avg. Specimen Thickness [in]	# Piles in Laminates	Failure Mode
NTPM91001-HXL-H35-NIAR-LT-A-C3-1-RTA-1	A	C3	1	3	426.2	25.58	0.3369	0.04408	8	XGM
NTPM91001-HXL-H35-NIAR-LT-A-C3-1-RTA-2	A	C3	1	3	429.0	25.44	0.3626	0.04408	8	XGM
NTPM91001-HXL-H35-NIAR-LT-A-C3-1-RTA-3	A	C3	1	3	454.0	25.40	0.3263	0.04372	8	XGM
NTPM91001-HXL-H35-NIAR-LT-A-C3-1-RTA-4	A	C3	1	3	463.4	25.27	0.3402	0.04380	8	XGM
NTPM91001-HXL-H35-NIAR-LT-A-C3-1-RTA-5	A	C3	1	3	491.0	25.64	0.3543	0.04410	8	XGM
NTPM91001-HXL-H35-NIAR-LT-A-C4-1-RTA-1	A	C4	1	4	462.5	25.44	0.3561	0.04428	8	XGM
NTPM91001-HXL-H35-NIAR-LT-A-C4-1-RTA-2	A	C4	1	4	460.7	26.86	0.3575	0.04445	8	XGM
NTPM91001-HXL-H35-NIAR-LT-A-C4-1-RTA-3	A	C4	1	4	440.6	25.31	0.3368	0.04450	8	XGM
NTPM91001-HXL-H35-NIAR-LT-A-C4-1-RTA-4	A	C4	1	4	472.4	26.14	0.3751	0.04350	8	XGM
NTPM91001-HXL-H35-NIAR-LT-A-C4-1-RTA-5	A	C4	1	4	479.2	25.73	0.3634	0.04337	8	XGM
NTPM91001-HXL-H35-NIAR-LT-A-C4-1-RTA-6	A	C4	1	4	449.1	25.30	0.3576	0.04415	8	XGM
NTPM91001-HXL-H35-NIAR-LT-B-C3-1-RTA-1	B	C3	2	3	457.9	24.94	0.3603	0.04533	8	XGM
NTPM91001-HXL-H35-NIAR-LT-B-C3-1-RTA-2	B	C3	2	3	445.3	24.58	0.3500	0.04555	8	XGM
NTPM91001-HXL-H35-NIAR-LT-B-C3-1-RTA-3	B	C3	2	3	472.1	25.01	0.3511	0.04540	8	XGM
NTPM91001-HXL-H35-NIAR-LT-B-C3-1-RTA-4*	B	C3	2	3	419.3	24.61	0.04577	0.04577	8	XGM
NTPM91001-HXL-H35-NIAR-LT-B-C3-1-RTA-5	B	C3	2	3	457.2	24.37	0.3489	0.04650	8	XGM
NTPM91001-HXL-H35-NIAR-LT-B-C4-1-RTA-1	B	C4	2	4	433.6	24.39	0.3462	0.04547	8	XGM
NTPM91001-HXL-H35-NIAR-LT-B-C4-1-RTA-2	B	C4	2	4	461.8	24.64	0.3389	0.04635	8	XGM
NTPM91001-HXL-H35-NIAR-LT-B-C4-1-RTA-3	B	C4	2	4	450.5	25.00	0.3509	0.04583	8	XGM
NTPM91001-HXL-H35-NIAR-LT-B-C4-1-RTA-4	B	C4	2	4	461.0	24.94	0.3608	0.04458	8	XGM
NTPM91001-HXL-H35-NIAR-LT-B-C4-1-RTA-5	B	C4	2	4	433.9	24.59	0.3402	0.04555	8	XGM
NTPM91001-HXL-H35-NIAR-LT-B-C4-1-RTA-6	B	C4	2	4	434.8	24.64	0.3540	0.04573	8	XGM
NTPM91001-HXL-H35-NIAR-LT-C-C3-1-RTA-1	C	C3	3	3	479.2	24.47	0.3328	0.04607	8	XGM
NTPM91001-HXL-H35-NIAR-LT-C-C3-1-RTA-2	C	C3	3	3	469.5	24.59	0.3247	0.04658	8	XGM
NTPM91001-HXL-H35-NIAR-LT-C-C3-1-RTA-3	C	C3	3	3	431.9	24.06	0.3478	0.04617	8	XGM
NTPM91001-HXL-H35-NIAR-LT-C-C3-1-RTA-4	C	C3	3	3	459.6	24.90	0.3523	0.04575	8	XGM
NTPM91001-HXL-H35-NIAR-LT-C-C3-1-RTA-5	C	C3	3	3	470.1	24.73	0.3510	0.04625	8	XGM
NTPM91001-HXL-H35-NIAR-LT-C-C4-1-RTA-1	C	C4	3	4	501.0	25.24	0.3380	0.04647	8	XGM
NTPM91001-HXL-H35-NIAR-LT-C-C4-1-RTA-2	C	C4	3	4	459.1	24.68	0.3748	0.04705	8	XGM
NTPM91001-HXL-H35-NIAR-LT-C-C4-1-RTA-3	C	C4	3	4	442.4	24.69	0.3460	0.04648	8	XGM
NTPM91001-HXL-H35-NIAR-LT-C-C4-1-RTA-4	C	C4	3	4	462.8	24.57	0.3306	0.04477	8	XGM
NTPM91001-HXL-H35-NIAR-LT-C-C4-1-RTA-5	C	C4	3	4	416.4	25.12	0.3372	0.04553	8	XGM
NTPM91001-HXL-H35-NIAR-LT-C-C4-1-RTA-6	C	C4	3	4	450.4	25.37	0.3574	0.04547	8	XGM

Avg. t ₉₀ [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.005510	427.0	25.63
0.005510	429.8	25.49
0.005465	451.1	25.24
0.005475	461.3	25.16
0.005513	492.1	25.70
0.005535	465.5	25.60
0.005556	465.4	27.14
0.005563	445.6	25.60
0.005438	467.0	25.85
0.005421	472.3	25.35
0.005519	450.6	25.38
0.005667	471.8	25.69
0.005694	461.0	25.45
0.005675	487.1	25.81
0.005721	436.1	25.60
0.005813	483.1	25.75
0.005683	448.1	25.20
0.005794	486.5	25.95
0.005729	469.2	26.04
0.005573	467.1	25.27
0.005694	449.2	25.46
0.005717	451.9	25.61
0.005758	501.7	25.62
0.005823	497.0	26.03
0.005771	453.2	25.24
0.005719	477.9	25.89
0.005781	494.2	25.99
0.005808	529.1	26.65
0.005881	490.9	26.39
0.005810	467.3	26.08
0.005596	470.8	25.00
0.005692	431.0	25.99
0.005683	465.4	26.22

Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Poisson's Ratio	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
NTPM91001-HXL-H35-FACC-LT-D-C3-1-RTA-1	D	C3	4	3	493.9	25.37	0.3366	0.04475	8	XGM
NTPM91001-HXL-H35-FACC-LT-D-C3-1-RTA-2	D	C3	4	3	446.2	24.69	0.3379	0.04512	8	XGM
NTPM91001-HXL-H35-FACC-LT-D-C3-1-RTA-3	D	C3	4	3	415.7	25.57	0.3453	0.04493	8	XGM
NTPM91001-HXL-H35-FACC-LT-D-C3-1-RTA-4	D	C3	4	3	439.5	25.65	0.3417	0.04455	8	XGM
NTPM91001-HXL-H35-FACC-LT-D-C3-1-RTA-6	D	C3	4	3	448.2	24.90	0.3387	0.04487	8	XGM
NTPM91001-HXL-H35-FACC-LT-D-C4-1-RTA-1	D	C4	4	4	473.2	24.99	0.3399	0.04425	8	XGM
NTPM91001-HXL-H35-FACC-LT-D-C4-1-RTA-2	D	C4	4	4	435.7	24.92	0.3550	0.04458	8	XGM
NTPM91001-HXL-H35-FACC-LT-D-C4-1-RTA-3	D	C4	4	4	448.6	25.50	0.3536	0.04488	8	XGM
NTPM91001-HXL-H35-FACC-LT-D-C4-1-RTA-4	D	C4	4	4	459.1	26.01	0.3627	0.04397	8	XGM
NTPM91001-HXL-H35-FACC-LT-D-C4-1-RTA-5	D	C4	4	4	452.6	25.14	0.3484	0.04442	8	XGM
NTPM91001-HXL-H35-FACC-LT-D-C4-1-RTA-6	D	C4	4	4	454.2	25.39	0.3721	0.04445	8	XGM
NTPM91001-HXL-H35-SKS-LT-E-C3-1-RTA-1	E	C3	5	3	455.2	24.65	0.3270	0.04543	8	XGM
NTPM91001-HXL-H35-SKS-LT-E-C3-1-RTA-2	E	C3	5	3	459.4	25.03	0.3432	0.04520	8	XGM
NTPM91001-HXL-H35-SKS-LT-E-C3-1-RTA-3	E	C3	5	3	431.7	24.21	0.3448	0.04487	8	XGM
NTPM91001-HXL-H35-SKS-LT-E-C3-1-RTA-4	E	C3	5	3	453.4	25.01	0.3384	0.04465	8	XGM
NTPM91001-HXL-H35-SKS-LT-E-C3-1-RTA-5	E	C3	5	3	461.0	25.25	0.3460	0.04427	8	XGM
NTPM91001-HXL-H35-SKS-LT-E-C4-1-RTA-1	E	C4	5	4	447.2	25.42	0.3480	0.04543	8	XGM
NTPM91001-HXL-H35-SKS-LT-E-C4-1-RTA-2	E	C4	5	4	481.4	25.35	0.3297	0.04445	8	XGM
NTPM91001-HXL-H35-SKS-LT-E-C4-1-RTA-3	E	C4	5	4	465.6	25.54	0.3513	0.04335	8	XGM
NTPM91001-HXL-H35-SKS-LT-E-C4-1-RTA-4	E	C4	5	4	455.5	25.66	0.3250	0.04160	8	XGM
NTPM91001-HXL-H35-SKS-LT-E-C4-1-RTA-5	E	C4	5	4	452.4	24.69	0.3392	0.04437	8	XGM
NTPM91001-HXL-H35-SKS-LT-E-C4-1-RTA-6	E	C4	5	4	441.9	25.92	0.3483	0.04462	8	XGM

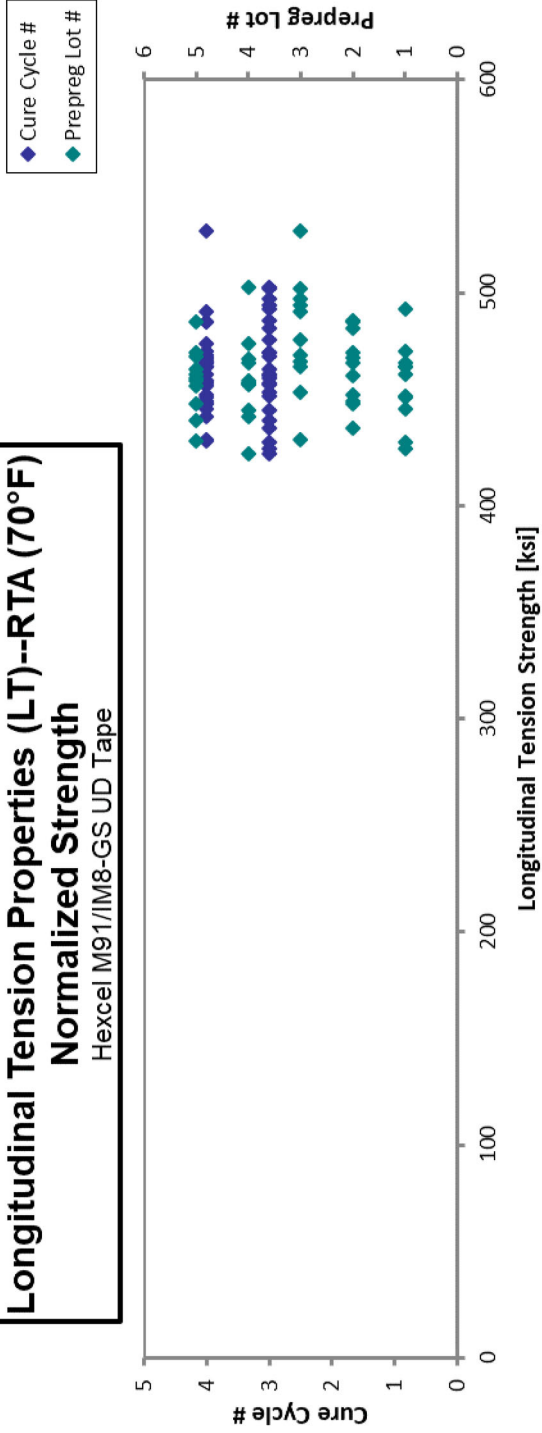
Avg. ϵ_{xy} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.005594	502.3	25.81
0.005640	457.5	25.32
0.005617	424.5	26.11
0.005569	445.0	25.97
0.005608	457.0	25.39
0.005531	475.9	25.14
0.005573	441.5	25.25
0.005510	457.6	26.01
0.005496	458.7	25.99
0.005552	466.9	25.37
0.005556	468.9	25.65
0.005679	470.0	25.46
0.005650	471.9	25.71
0.005608	440.2	24.69
0.005581	460.1	25.38
0.005533	463.8	25.40
0.005679	461.8	26.24
0.005556	486.4	25.61
0.005419	458.7	25.16
0.005200	430.6	24.26
0.005546	456.2	24.90
0.005577	448.0	26.28

*Poisson's ratio not reported due to erratic transverse strain data

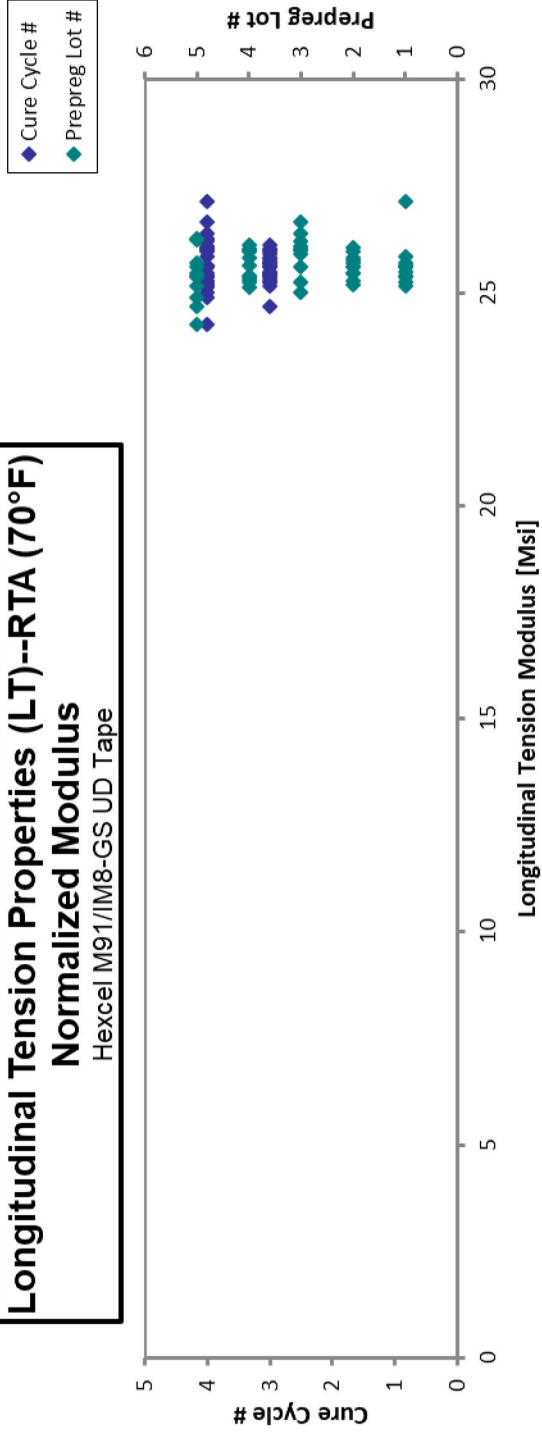
Average	454.3	25.11	0.3473
Standard Dev.	18.55	0.5258	0.01208
Coeff. of Var. [%]	4.082	2.094	3.480
Min.	415.7	24.06	0.3247
Max.	501.0	26.86	0.3751
Number of Spec.	55	55	54

Average _{norm}	464.0	25.64
Standard Dev _{norm}	20.96	0.4815
Coeff. of Var. [%] _{norm}	4.517	1.878
Min.	424.5	24.26
Max.	529.1	27.14
Number of Spec.	55	55

Longitudinal Tension Properties (LT)--RTA (70°F)
Normalized Strength
Hexcel M91/IM8-GS UD Tape



Longitudinal Tension Properties (LT)--RTA (70°F)
Normalized Modulus
Hexcel M91/IM8-GS UD Tape



Longitudinal Tension Properties (LT)--ETW (180°F)

Strength & Modulus
Hexcel M91/IM8-GS UD Tape

normalizing

t₉₀ [in]

0.005500

Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Poisson's Ratio	Avg. Specimen Thickness [in]	# Piles in Laminate	Failure Mode
NTPM910Q1-HXL-H35-NIAR-LT-A-C3-1-ETW-1	A	C3	1	3	453.4	25.28	0.3085	0.04345	8	XGM
NTPM910Q1-HXL-H35-NIAR-LT-A-C3-1-ETW-2	A	C3	1	3	475.8	24.92	0.3121	0.04477	8	XGM
NTPM910Q1-HXL-H35-NIAR-LT-A-C3-1-ETW-3	A	C3	1	3	463.5	24.86	0.3145	0.04460	8	XGM
NTPM910Q1-HXL-H35-NIAR-LT-A-C3-1-ETW-4	A	C3	1	3	465.9	25.35	0.3077	0.04423	8	XGM
NTPM910Q1-HXL-H35-NIAR-LT-A-C3-1-ETW-5	A	C3	1	3	468.8	25.42	0.3193	0.04435	8	XGM
NTPM910Q1-HXL-H35-NIAR-LT-A-C4-1-ETW-1	A	C4	1	4	455.6	25.58	0.3130	0.04417	8	XGM
NTPM910Q1-HXL-H35-NIAR-LT-A-C4-1-ETW-2	A	C4	1	4	456.1	25.48	0.3062	0.04430	8	XGM
NTPM910Q1-HXL-H35-NIAR-LT-A-C4-1-ETW-3	A	C4	1	4	459.2	25.18	0.3013	0.04457	8	XGM
NTPM910Q1-HXL-H35-NIAR-LT-A-C4-1-ETW-4	A	C4	1	4	480.6	25.68	0.3070	0.04437	8	XGM
NTPM910Q1-HXL-H35-NIAR-LT-A-C4-1-ETW-5	A	C4	1	4	465.3	25.59	0.3178	0.04423	8	XGM
NTPM910Q1-HXL-H35-NIAR-LT-A-C4-1-ETW-6	A	C4	1	4	470.5	25.12	0.3112	0.04418	8	XGM
NTPM910Q1-HXL-H35-NIAR-LT-B-C3-1-ETW-1	B	C3	2	3	415.6	24.18	0.3226	0.04497	8	XGM
NTPM910Q1-HXL-H35-NIAR-LT-B-C3-1-ETW-2	B	C3	2	3	417.7	24.31	0.3073	0.04545	8	XGM
NTPM910Q1-HXL-H35-NIAR-LT-B-C3-1-ETW-3	B	C3	2	3	415.5	24.23	0.3141	0.04572	8	XGM
NTPM910Q1-HXL-H35-NIAR-LT-B-C3-1-ETW-4	B	C3	2	3	411.5	24.36	0.3137	0.04572	8	XGM
NTPM910Q1-HXL-H35-NIAR-LT-B-C3-1-ETW-5	B	C3	2	3	429.6	24.41	0.3135	0.04597	8	XGM
NTPM910Q1-HXL-H35-NIAR-LT-B-C4-1-ETW-1	B	C4	2	4	421.4	24.34	0.3197	0.04605	8	XGM
NTPM910Q1-HXL-H35-NIAR-LT-B-C4-1-ETW-2	B	C4	2	4	439.9	24.74	0.3094	0.04583	8	XGM
NTPM910Q1-HXL-H35-NIAR-LT-B-C4-1-ETW-3	B	C4	2	4	437.7	24.65	0.3176	0.04562	8	XGM
NTPM910Q1-HXL-H35-NIAR-LT-B-C4-1-ETW-4	B	C4	2	4	432.2	24.95	0.3042	0.04565	8	XGM
NTPM910Q1-HXL-H35-NIAR-LT-B-C4-1-ETW-5	B	C4	2	4	415.7	24.58	0.3141	0.04547	8	XGM
NTPM910Q1-HXL-H35-NIAR-LT-B-C4-1-ETW-6	B	C4	2	4	424.3	24.23	0.3209	0.04632	8	XGM
NTPM910Q1-HXL-H35-NIAR-LT-C-C3-1-ETW-1	C	C3	3	3	445.7	25.04	0.3136	0.04600	8	XGM
NTPM910Q1-HXL-H35-NIAR-LT-C-C3-1-ETW-2	C	C3	3	3	448.9	24.30	0.3195	0.04630	8	XGM
NTPM910Q1-HXL-H35-NIAR-LT-C-C3-1-ETW-3	C	C3	3	3	469.5	25.18	0.3140	0.04657	8	XGM
NTPM910Q1-HXL-H35-NIAR-LT-C-C3-1-ETW-4	C	C3	3	3	476.6	25.29	0.3269	0.04663	8	XGM
NTPM910Q1-HXL-H35-NIAR-LT-C-C3-1-ETW-5	C	C3	3	3	456.8	24.47	0.3089	0.04705	8	XGM
NTPM910Q1-HXL-H35-NIAR-LT-C-C4-1-ETW-1	C	C4	3	4	438.1	24.89	0.3177	0.04575	8	XGM
NTPM910Q1-HXL-H35-NIAR-LT-C-C4-1-ETW-2	C	C4	3	4	466.7	25.15	0.3276	0.04568	8	XGM
NTPM910Q1-HXL-H35-NIAR-LT-C-C4-1-ETW-3	C	C4	3	4	466.3	25.03	0.3078	0.04552	8	XGM
NTPM910Q1-HXL-H35-NIAR-LT-C-C4-1-ETW-4	C	C4	3	4	465.4	25.80	0.3260	0.04642	8	XGM
NTPM910Q1-HXL-H35-NIAR-LT-C-C4-1-ETW-5	C	C4	3	4	452.2	25.01	0.3137	0.04672	8	XGM
NTPM910Q1-HXL-H35-NIAR-LT-C-C4-1-ETW-6	C	C4	3	4	464.8	25.08	0.3217	0.04615	8	XGM

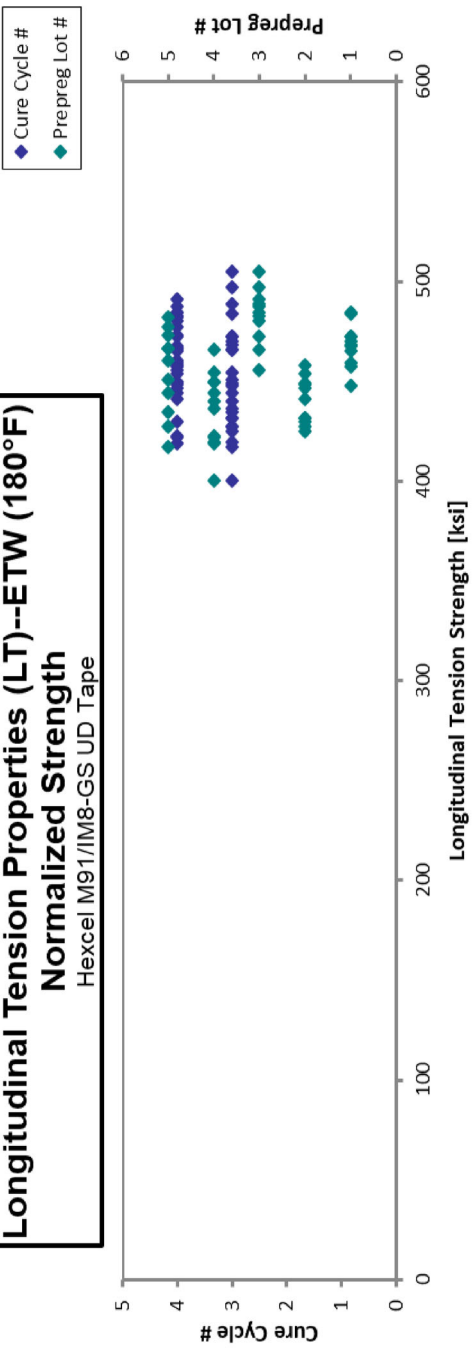
Avg. t ₉₀ [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.005431	447.8	24.97
0.005596	484.1	25.35
0.005575	469.8	25.20
0.005529	468.4	25.48
0.005544	472.5	25.62
0.005521	457.3	25.68
0.005538	459.2	25.65
0.005571	465.1	25.50
0.005546	484.6	25.89
0.005529	467.7	25.73
0.005523	472.5	25.22
0.005621	424.7	24.71
0.005681	431.5	25.11
0.005715	431.7	25.17
0.005715	427.6	25.33
0.005746	448.8	25.50
0.005756	441.0	25.48
0.005729	458.2	25.77
0.005702	453.8	25.56
0.005706	448.4	25.89
0.005683	429.6	25.40
0.005790	446.7	25.50
0.005750	465.9	26.18
0.005788	472.4	25.57
0.005821	496.9	26.65
0.005829	505.1	26.81
0.005881	488.5	26.16
0.005719	455.6	25.88
0.005710	484.5	26.11
0.005690	482.4	25.89
0.005802	491.0	27.22
0.005840	480.2	26.56
0.005769	487.5	26.31

Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Poisson's Ratio	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
NTPM91001-HXL-H35-FACC-LT-D-C3-1-ETW-1	D	C3	4	3	395.1	25.34	0.3372	0.04457	8	XGM
NTPM91001-HXL-H35-FACC-LT-D-C3-1-ETW-2	D	C3	4	3	451.0	25.21	0.3334	0.04435	8	XGM
NTPM91001-HXL-H35-FACC-LT-D-C3-1-ETW-3	D	C3	4	3	438.2	25.24	0.3186	0.04418	8	XGM
NTPM91001-HXL-H35-FACC-LT-D-C3-1-ETW-4	D	C3	4	3	460.2	25.55	0.3427	0.04452	8	XGM
NTPM91001-HXL-H35-FACC-LT-D-C3-1-ETW-5	D	C3	4	3	430.8	25.80	0.3368	0.04458	8	XGM
NTPM91001-HXL-H35-FACC-LT-D-C3-1-ETW-6	D	C3	4	3	416.7	25.68	0.3237	0.04430	8	XGM
NTPM91001-HXL-H35-FACC-LT-D-C4-1-ETW-1	D	C4	4	4	443.9	25.93	0.3026	0.04400	8	XGM
NTPM91001-HXL-H35-FACC-LT-D-C4-1-ETW-2	D	C4	4	4	448.4	25.87	0.3391	0.04412	8	XGM
NTPM91001-HXL-H35-FACC-LT-D-C4-1-ETW-3	D	C4	4	4	425.0	25.87	0.3803	0.04373	8	XGM
NTPM91001-HXL-H35-FACC-LT-D-C4-1-ETW-4	D	C4	4	4	451.3	25.67	0.3307	0.04383	8	XGM
NTPM91001-HXL-H35-FACC-LT-D-C4-1-ETW-5	D	C4	4	4	415.6	25.70	0.3374	0.04437	8	XGM
NTPM91001-HXL-H35-FACC-LT-D-C4-1-ETW-6	D	C4	4	4	419.4	25.41	0.3352	0.04428	8	XGM
NTPM91001-HXL-H35-SKS-LT-E-C3-1-ETW-1	E	C3	5	3	428.8	24.70	0.3251	0.04460	8	XGM
NTPM91001-HXL-H35-SKS-LT-E-C3-1-ETW-2	E	C3	5	3	414.6	24.63	0.3150	0.04425	8	XGM
NTPM91001-HXL-H35-SKS-LT-E-C3-1-ETW-3	E	C3	5	3	444.0	24.39	0.3296	0.04470	8	XGM
NTPM91001-HXL-H35-SKS-LT-E-C3-1-ETW-4	E	C3	5	3	420.1	24.63	0.3256	0.04477	8	XGM
NTPM91001-HXL-H35-SKS-LT-E-C3-1-ETW-5	E	C3	5	3	434.1	25.08	0.3026	0.04500	8	XGM
NTPM91001-HXL-H35-SKS-LT-E-C4-1-ETW-1	E	C4	5	4	458.0	25.13	0.3064	0.04478	8	XGM
NTPM91001-HXL-H35-SKS-LT-E-C4-1-ETW-2	E	C4	5	4	450.1	24.53	0.3184	0.04558	8	XGM
NTPM91001-HXL-H35-SKS-LT-E-C4-1-ETW-3	E	C4	5	4	466.4	25.10	0.3150	0.04547	8	XGM
NTPM91001-HXL-H35-SKS-LT-E-C4-1-ETW-4	E	C4	5	4	461.9	25.11	0.3216	0.04545	8	XGM
NTPM91001-HXL-H35-SKS-LT-E-C4-1-ETW-5	E	C4	5	4	458.8	25.30	0.3156	0.04535	8	XGM
NTPM91001-HXL-H35-SKS-LT-E-C4-1-ETW-6	E	C4	5	4	457.6	25.20	0.3231	0.04428	8	XGM

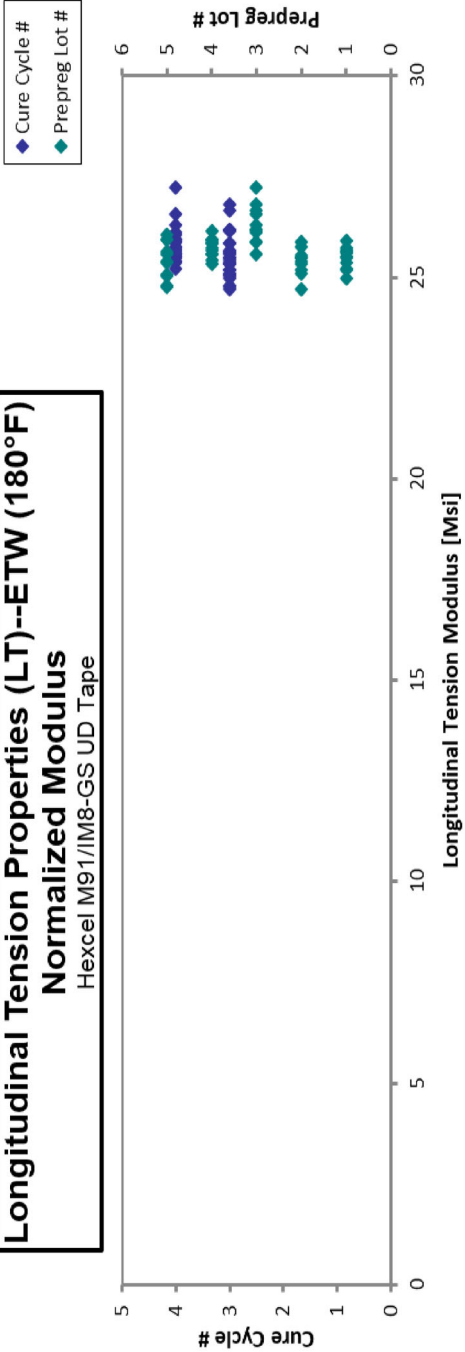
Average	444.9	25.07	0.3195	Average _{norm}	455.8	25.67
Standard Dev.	20.73	0.4911	0.01307	Standard Dev. _{norm}	23.50	0.4890
Coeff. of Var. [%]	4.660	1.959	4.091	Coeff. of Var. [%] _{norm}	5.156	1.905
Min.	395.1	24.18	0.3013	Min.	400.2	24.71
Max.	480.6	25.93	0.3803	Max.	505.1	27.22
Number of Spec.	56	56	56	Number of Spec.	56	56

0.005571	400.2	Modulus _{norm}	25.66
0.005544	454.5	[Msi]	25.41
0.005523	440.0		25.34
0.005565	465.6		25.85
0.005573	436.6		26.14
0.005538	419.6		25.85
0.005500	443.9		25.93
0.005515	449.6		25.94
0.005467	422.4		25.72
0.005479	449.5		25.57
0.005546	419.0		25.91
0.005535	422.1		25.57
0.005575	434.6		25.03
0.005531	417.0		24.77
0.005588	451.0		24.78
0.005596	427.4		25.06
0.005625	443.9		25.65
0.005598	466.2		25.57
0.005598	466.3		25.41
0.005683	481.9		25.93
0.005681	477.2		25.94
0.005669	472.9		26.07
0.005535	460.6		25.37

Longitudinal Tension Properties (LT)--ETW (180°F)
Normalized Strength
Hexcel M91/IM8-GS UD Tape



Longitudinal Tension Properties (LT)--ETW (180°F)
Normalized Modulus
Hexcel M91/IM8-GS UD Tape



4.2 Transverse Tension Properties (TT)

Transverse Tension Properties (TT)--CTA (-65°F)	
Strength & Modulus	
Hexcel M91/IM8-GS UD Tape	

Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Piles in Laminates	Avg. t_{pi} [in]	Failure Mode
NTPM910Q1-HXL-H35-NIAR-TT-A-C1-1-CTA-1	A	C1	1	1	8.781	1.496	0.08222	15	0.005481	LAT
NTPM910Q1-HXL-H35-NIAR-TT-A-C1-1-CTA-2	A	C1	1	1	7.994	1.484	0.08322	15	0.005548	LAB
NTPM910Q1-HXL-H35-NIAR-TT-A-C1-1-CTA-3	A	C1	1	1	8.855	1.490	0.08333	15	0.005556	LAB
NTPM910Q1-HXL-H35-NIAR-TT-A-C1-1-CTA-4	A	C1	1	1	8.661	1.515	0.08342	15	0.005561	LAT
NTPM910Q1-HXL-H35-NIAR-TT-A-C1-1-CTA-5	A	C1	1	1	8.604	1.479	0.08323	15	0.005549	LAT
NTPM910Q1-HXL-H35-NIAR-TT-A-C2-1-CTA-1	A	C2	1	2	9.098	1.493	0.08322	15	0.005548	LAB
NTPM910Q1-HXL-H35-NIAR-TT-A-C2-1-CTA-2	A	C2	1	2	10.31	1.482	0.08308	15	0.005539	LAB
NTPM910Q1-HXL-H35-NIAR-TT-A-C2-1-CTA-3	A	C2	1	2	9.333	1.471	0.08310	15	0.005540	LAT
NTPM910Q1-HXL-H35-NIAR-TT-A-C2-1-CTA-4	A	C2	1	2	9.808	1.493	0.08250	15	0.005500	LAB
NTPM910Q1-HXL-H35-NIAR-TT-A-C2-1-CTA-5	A	C2	1	2	11.84	1.431	0.08372	15	0.005581	LAB
NTPM910Q1-HXL-H35-NIAR-TT-A-C2-1-CTA-6	A	C2	1	2	11.41	1.482	0.08365	15	0.005577	LAB
NTPM910Q1-HXL-H35-NIAR-TT-A-C2-1-CTA-7*	A	C2	1	2	9.397	1.482	0.08275	15	0.005517	LAB
NTPM910Q1-HXL-H35-NIAR-TT-B-C1-1-CTA-1	B	C1	2	1	9.297	1.528	0.08627	15	0.005751	LAT
NTPM910Q1-HXL-H35-NIAR-TT-B-C1-1-CTA-2	B	C1	2	1	11.48	1.529	0.08667	15	0.005778	LAB
NTPM910Q1-HXL-H35-NIAR-TT-B-C1-1-CTA-3	B	C1	2	1	10.97	1.416	0.08663	15	0.005776	LAB
NTPM910Q1-HXL-H35-NIAR-TT-B-C1-1-CTA-4	B	C1	2	1	13.16	1.364	0.08650	15	0.005767	LAB
NTPM910Q1-HXL-H35-NIAR-TT-B-C1-1-CTA-5	B	C1	2	1	11.41	1.515	0.08668	15	0.005779	LGM
NTPM910Q1-HXL-H35-NIAR-TT-B-C1-1-CTA-6*	B	C1	2	1	12.81	1.515	0.08565	15	0.005710	LAB
NTPM910Q1-HXL-H35-NIAR-TT-B-C2-1-CTA-1	B	C2	2	2	10.37	1.303	0.08508	15	0.005672	LAB
NTPM910Q1-HXL-H35-NIAR-TT-B-C2-1-CTA-2	B	C2	2	2	10.90	1.253	0.08622	15	0.005748	LAB
NTPM910Q1-HXL-H35-NIAR-TT-B-C2-1-CTA-3	B	C2	2	2	8.497	1.283	0.08592	15	0.005728	LAT
NTPM910Q1-HXL-H35-NIAR-TT-B-C2-1-CTA-4	B	C2	2	2	9.689	1.282	0.08562	15	0.005708	LAB
NTPM910Q1-HXL-H35-NIAR-TT-B-C2-1-CTA-5	B	C2	2	2	9.102	1.459	0.08618	15	0.005746	LAT
NTPM910Q1-HXL-H35-NIAR-TT-B-C2-1-CTA-6	B	C2	2	2	8.689	1.544	0.08602	15	0.005734	LAB
NTPM910Q1-HXL-H35-NIAR-TT-C-C1-1-CTA-1	C	C1	3	1	9.283	1.466	0.08562	15	0.005708	LAB
NTPM910Q1-HXL-H35-NIAR-TT-C-C1-1-CTA-2	C	C1	3	1	10.35	1.470	0.08597	15	0.005731	LAB
NTPM910Q1-HXL-H35-NIAR-TT-C-C1-1-CTA-3	C	C1	3	1	10.90	1.428	0.08610	15	0.005740	LAT
NTPM910Q1-HXL-H35-NIAR-TT-C-C1-1-CTA-4	C	C1	3	1	9.361	1.406	0.08585	15	0.005723	LAT
NTPM910Q1-HXL-H35-NIAR-TT-C-C1-1-CTA-5	C	C1	3	1	9.313	1.462	0.08630	15	0.005753	LAB
NTPM910Q1-HXL-H35-NIAR-TT-C-C2-1-CTA-1	C	C2	3	2	8.493	1.506	0.08717	15	0.005811	LAB
NTPM910Q1-HXL-H35-NIAR-TT-C-C2-1-CTA-2	C	C2	3	2	9.000	1.660	0.08762	15	0.005841	LAB
NTPM910Q1-HXL-H35-NIAR-TT-C-C2-1-CTA-3	C	C2	3	2	8.818	1.459	0.08702	15	0.005801	LAT
NTPM910Q1-HXL-H35-NIAR-TT-C-C2-1-CTA-4	C	C2	3	2	8.822	1.458	0.08658	15	0.005772	LAT
NTPM910Q1-HXL-H35-NIAR-TT-C-C2-1-CTA-5	C	C2	3	2	7.511	1.555	0.08712	15	0.005808	LAB
NTPM910Q1-HXL-H35-NIAR-TT-C-C2-1-CTA-6	C	C2	3	2	9.478	1.491	0.08685	15	0.005790	LAB

Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t _{pl} [in]	Failure Mode
NTPM910Q1-HXL-H35-FACC-TT-D-C1-1-CTA-1	D	C1	4	1	8.097	1.481	0.08415	15	0.005610	LAB
NTPM910Q1-HXL-H35-FACC-TT-D-C1-1-CTA-2	D	C1	4	1	8.840	1.265	0.08473	15	0.005649	LAB
NTPM910Q1-HXL-H35-FACC-TT-D-C1-1-CTA-3	D	C1	4	1	9.443	1.513	0.08503	15	0.005669	LAB
NTPM910Q1-HXL-H35-FACC-TT-D-C1-1-CTA-4	D	C1	4	1	9.440	1.565	0.08495	15	0.005663	LAT
NTPM910Q1-HXL-H35-FACC-TT-D-C1-1-CTA-5	D	C1	4	1	7.124	1.459	0.08478	15	0.005652	LAB
NTPM910Q1-HXL-H35-FACC-TT-D-C1-1-CTA-6*	D	C1	4	1	9.914		0.08498	15	0.005666	LAB
NTPM910Q1-HXL-H35-FACC-TT-D-C2-1-CTA-1	D	C2	4	2	8.644	1.486	0.08390	15	0.005593	LAT, LAB
NTPM910Q1-HXL-H35-FACC-TT-D-C2-1-CTA-2	D	C2	4	2	7.717	1.518	0.08455	15	0.005637	LAB
NTPM910Q1-HXL-H35-FACC-TT-D-C2-1-CTA-3	D	C2	4	2	7.667	1.468	0.08448	15	0.005632	LAB
NTPM910Q1-HXL-H35-FACC-TT-D-C2-1-CTA-4	D	C2	4	2	8.348	1.446	0.08422	15	0.005614	LAT, LAB
NTPM910Q1-HXL-H35-FACC-TT-D-C2-1-CTA-5	D	C2	4	2	7.640	1.442	0.08445	15	0.005630	LAB
NTPM910Q1-HXL-H35-FACC-TT-D-C2-1-CTA-6	D	C2	4	2	7.647	1.454	0.08428	15	0.005619	LAT, LAB
NTPM910Q1-HXL-H35-SKS-TT-E-C1-1-CTA-1	E	C1	5	1	9.016	1.481	0.08497	15	0.005664	LAB
NTPM910Q1-HXL-H35-SKS-TT-E-C1-1-CTA-2	E	C1	5	1	7.777	1.453	0.08518	15	0.005679	LAT
NTPM910Q1-HXL-H35-SKS-TT-E-C1-1-CTA-3	E	C1	5	1	9.798	1.521	0.08433	15	0.005622	LAT
NTPM910Q1-HXL-H35-SKS-TT-E-C1-1-CTA-4	E	C1	5	1	10.11	1.511	0.08442	15	0.005628	LAT
NTPM910Q1-HXL-H35-SKS-TT-E-C1-1-CTA-5	E	C1	5	1	8.668	1.560	0.08407	15	0.005604	LAT
NTPM910Q1-HXL-H35-SKS-TT-E-C2-1-CTA-1	E	C2	5	2	7.221	1.525	0.08107	15	0.005404	LAT
NTPM910Q1-HXL-H35-SKS-TT-E-C2-1-CTA-2	E	C2	5	2	8.279	1.503	0.08362	15	0.005574	LAB
NTPM910Q1-HXL-H35-SKS-TT-E-C2-1-CTA-3	E	C2	5	2	8.390	1.493	0.08400	15	0.005600	LAB
NTPM910Q1-HXL-H35-SKS-TT-E-C2-1-CTA-4	E	C2	5	2	9.195	1.535	0.08402	15	0.005601	LAT
NTPM910Q1-HXL-H35-SKS-TT-E-C2-1-CTA-5	E	C2	5	2	8.545	1.491	0.08402	15	0.005601	LAB
NTPM910Q1-HXL-H35-SKS-TT-E-C2-1-CTA-6	E	C2	5	2	9.999	1.537	0.08375	15	0.005583	LAT
NTPM910Q1-HXL-H35-SKS-TT-E-C2-1-CTA-7*	E	C2	5	2	9.756		0.08348	15	0.005566	LAT

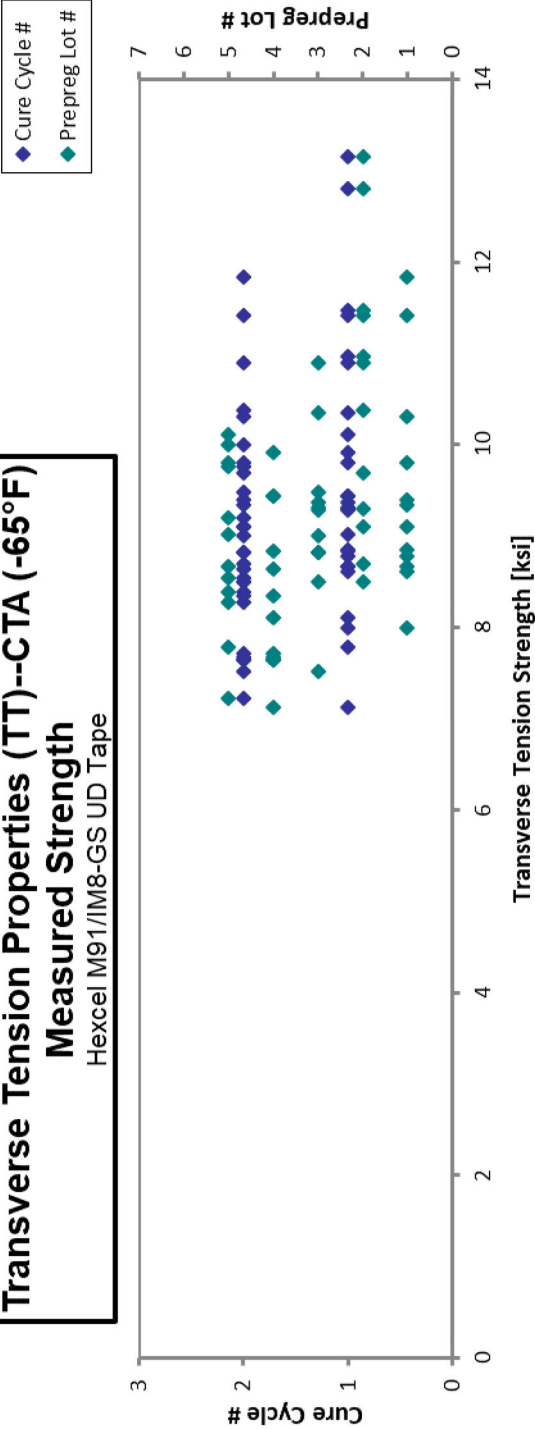
0.005655

Average 9.306 1.470
Standard Dev. 1.296 0.07641
Coeff. of Var. [%] 13.93 5.197

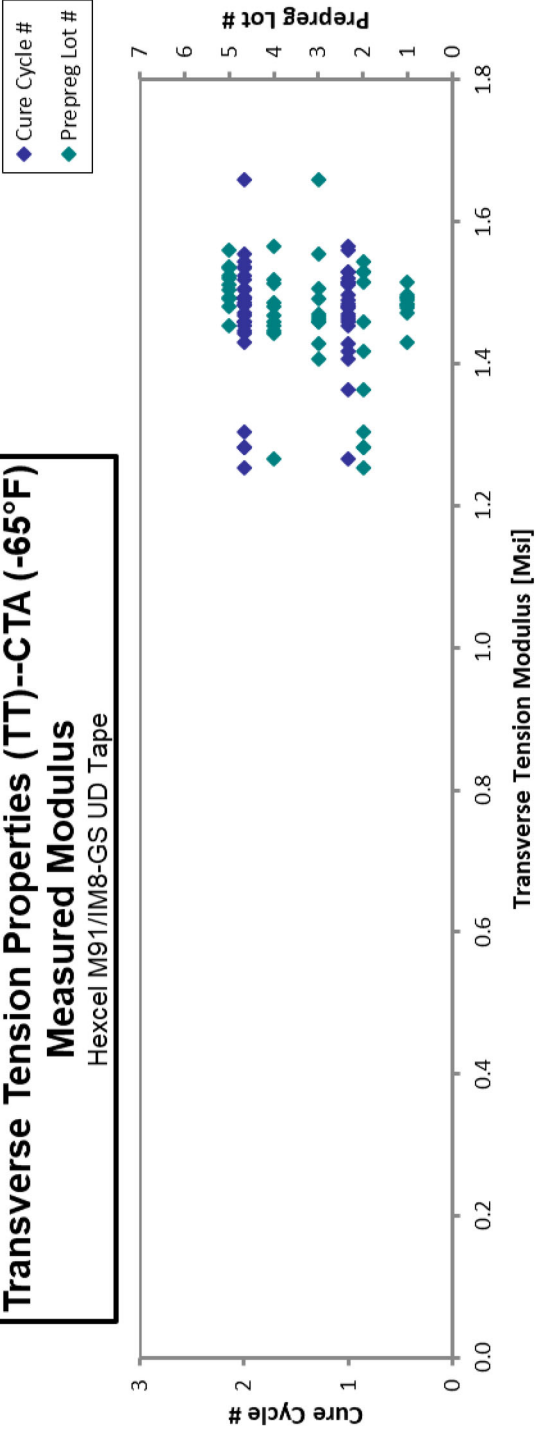
Min. 7.124 1.253
Max. 13.16 1.660
Number of Spec. 59 55

*Extra coupon tested only for strength, no SG was used

Transverse Tension Properties (TT)--CTA (-65°F)
Measured Strength
Hexcel M91/IM8-GS UD Tape



Transverse Tension Properties (TT)--CTA (-65°F)
Measured Modulus
Hexcel M91/IM8-GS UD Tape



Transverse Tension Properties (TT)--RTA (70°F) □

Strength & Modulus □

Hexcel IM91/IM8-GS UD Tape

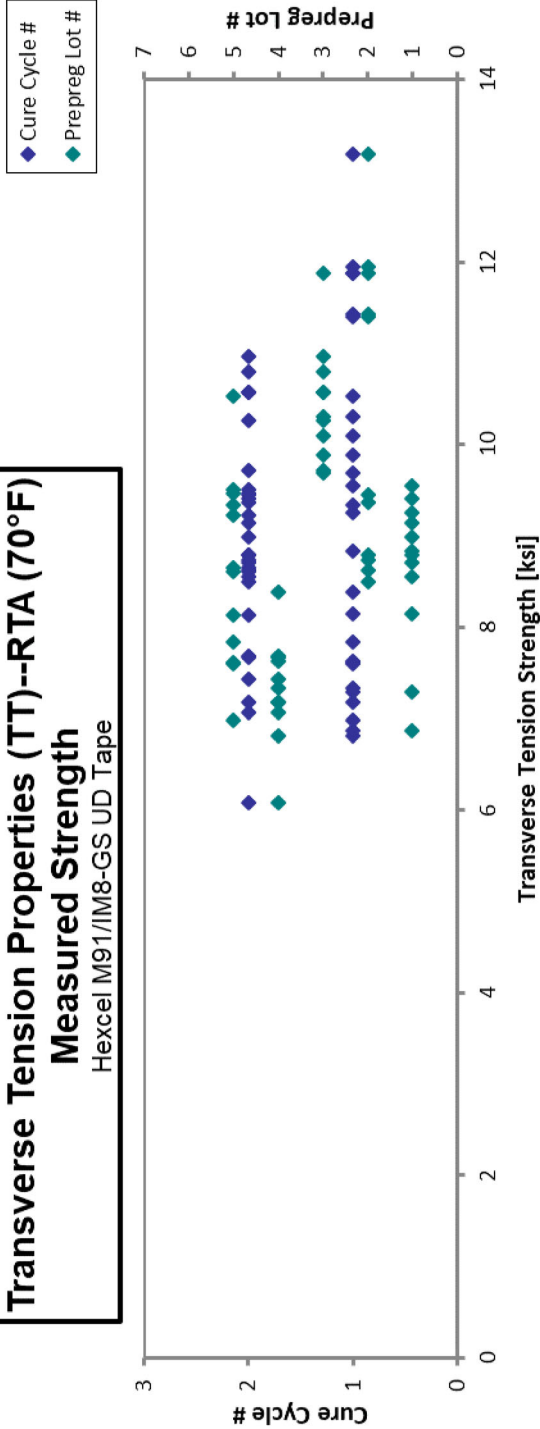
Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode
NTPM910Q1-HXL-H35-NIAR-TT-A-C1-1-RTA-1	A	C1	1	1	9.254	1.318	0.08323	15	0.005549	LAB
NTPM910Q1-HXL-H35-NIAR-TT-A-C1-1-RTA-2	A	C1	1	1	6.865	1.305	0.08327	15	0.005551	LAB
NTPM910Q1-HXL-H35-NIAR-TT-A-C1-1-RTA-3	A	C1	1	1	9.550	1.298	0.08362	15	0.005574	LAT
NTPM910Q1-HXL-H35-NIAR-TT-A-C1-1-RTA-4	A	C1	1	1	7.284	1.350	0.08048	15	0.005366	LAT
NTPM910Q1-HXL-H35-NIAR-TT-A-C1-1-RTA-5	A	C1	1	1	8.150	1.331	0.08192	15	0.005461	LAB
NTPM910Q1-HXL-H35-NIAR-TT-A-C1-1-RTA-6*	A	C1	1	1	8.839		0.08382	15	0.005588	LAT
NTPM910Q1-HXL-H35-NIAR-TT-A-C2-1-RTA-1	A	C2	1	2	8.987	1.332	0.08353	15	0.005569	LAB
NTPM910Q1-HXL-H35-NIAR-TT-A-C2-1-RTA-2	A	C2	1	2	8.708	1.336	0.08308	15	0.005539	LAT
NTPM910Q1-HXL-H35-NIAR-TT-A-C2-1-RTA-3	A	C2	1	2	8.787	1.321	0.08363	15	0.005576	LAB
NTPM910Q1-HXL-H35-NIAR-TT-A-C2-1-RTA-4	A	C2	1	2	9.416	1.312	0.08363	15	0.005576	LAB
NTPM910Q1-HXL-H35-NIAR-TT-A-C2-1-RTA-5	A	C2	1	2	8.548	1.323	0.08342	15	0.005561	LAT
NTPM910Q1-HXL-H35-NIAR-TT-A-C2-1-RTA-6	A	C2	1	2	9.140	1.314	0.08368	15	0.005579	LGT
NTPM910Q1-HXL-H35-NIAR-TT-B-C1-1-RTA-1	B	C1	2	1	13.18	1.281	0.08637	15	0.005758	LAB
NTPM910Q1-HXL-H35-NIAR-TT-B-C1-1-RTA-2	B	C1	2	1	11.88	1.276	0.08630	15	0.005753	LAT
NTPM910Q1-HXL-H35-NIAR-TT-B-C1-1-RTA-3	B	C1	2	1	11.40	1.276	0.08600	15	0.005733	LAB, LAT
NTPM910Q1-HXL-H35-NIAR-TT-B-C1-1-RTA-4	B	C1	2	1	11.43	1.269	0.08583	15	0.005722	LAT
NTPM910Q1-HXL-H35-NIAR-TT-B-C1-1-RTA-5	B	C1	2	1	11.95	1.268	0.08685	15	0.005790	LAT
NTPM910Q1-HXL-H35-NIAR-TT-B-C2-1-RTA-1	B	C2	2	2	9.452	1.279	0.08628	15	0.005752	LAB
NTPM910Q1-HXL-H35-NIAR-TT-B-C2-1-RTA-2	B	C2	2	2	9.372	1.283	0.08592	15	0.005728	LAT
NTPM910Q1-HXL-H35-NIAR-TT-B-C2-1-RTA-3	B	C2	2	2	8.740	1.266	0.08657	15	0.005771	LAT
NTPM910Q1-HXL-H35-NIAR-TT-B-C2-1-RTA-4	B	C2	2	2	8.629	1.268	0.08662	15	0.005774	LAT
NTPM910Q1-HXL-H35-NIAR-TT-B-C2-1-RTA-5	B	C2	2	2	8.491	1.294	0.08583	15	0.005722	LAB
NTPM910Q1-HXL-H35-NIAR-TT-B-C2-1-RTA-6	B	C2	2	2	8.787	1.282	0.08603	15	0.005736	LAB
NTPM910Q1-HXL-H35-NIAR-TT-C-C1-1-RTA-1	C	C1	3	1	11.88	1.276	0.08678	15	0.005786	LAB
NTPM910Q1-HXL-H35-NIAR-TT-C-C1-1-RTA-2	C	C1	3	1	9.697	1.277	0.08712	15	0.005808	LAB
NTPM910Q1-HXL-H35-NIAR-TT-C-C1-1-RTA-3	C	C1	3	1	10.10	1.285	0.08702	15	0.005801	LAT
NTPM910Q1-HXL-H35-NIAR-TT-C-C1-1-RTA-4	C	C1	3	1	10.31	1.282	0.08690	15	0.005793	LAT
NTPM910Q1-HXL-H35-NIAR-TT-C-C1-1-RTA-5	C	C1	3	1	9.888	1.283	0.08735	15	0.005823	LAB
NTPM910Q1-HXL-H35-NIAR-TT-C-C2-1-RTA-1	C	C2	3	2	10.57	1.290	0.08727	15	0.005818	LAB
NTPM910Q1-HXL-H35-NIAR-TT-C-C2-1-RTA-2	C	C2	3	2	10.58	1.301	0.08593	15	0.005729	LAB
NTPM910Q1-HXL-H35-NIAR-TT-C-C2-1-RTA-3	C	C2	3	2	9.722	1.299	0.08543	15	0.005696	LAB, LAT
NTPM910Q1-HXL-H35-NIAR-TT-C-C2-1-RTA-4	C	C2	3	2	10.97	1.283	0.08720	15	0.005813	LAT
NTPM910Q1-HXL-H35-NIAR-TT-C-C2-1-RTA-5	C	C2	3	2	10.26	1.285	0.08697	15	0.005798	LAT
NTPM910Q1-HXL-H35-NIAR-TT-C-C2-1-RTA-6	C	C2	3	2	10.80	1.279	0.08702	15	0.005801	LAT

Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Piles in Laminate	Avg. t _{pi} [in]	Failure Mode
NTPM910Q1-HXL-H35-FACC-TT-D-C1-1-RTA-1	D	C1	4	1	8.387	1.259	0.08505	15	0.005670	LAB
NTPM910Q1-HXL-H35-FACC-TT-D-C1-1-RTA-2	D	C1	4	1	7.172	1.244	0.08495	15	0.005663	LAB
NTPM910Q1-HXL-H35-FACC-TT-D-C1-1-RTA-3	D	C1	4	1	7.337	1.272	0.08470	15	0.005647	LAB
NTPM910Q1-HXL-H35-FACC-TT-D-C1-1-RTA-4	D	C1	4	1	7.625	1.271	0.08465	15	0.005643	LAB
NTPM910Q1-HXL-H35-FACC-TT-D-C1-1-RTA-5	D	C1	4	1	6.807	1.302	0.08427	15	0.005618	LAB
NTPM910Q1-HXL-H35-FACC-TT-D-C2-1-RTA-1	D	C2	4	2	7.680	1.267	0.08472	15	0.005648	LAT,LAB
NTPM910Q1-HXL-H35-FACC-TT-D-C2-1-RTA-2	D	C2	4	2	7.180	1.269	0.08443	15	0.005629	LAB
NTPM910Q1-HXL-H35-FACC-TT-D-C2-1-RTA-3	D	C2	4	2	6.085	1.279	0.08430	15	0.005620	LAB
NTPM910Q1-HXL-H35-FACC-TT-D-C2-1-RTA-4	D	C2	4	2	7.662	1.280	0.08427	15	0.005618	LAB
NTPM910Q1-HXL-H35-FACC-TT-D-C2-1-RTA-5	D	C2	4	2	7.431	1.286	0.08488	15	0.005659	LAB
NTPM910Q1-HXL-H35-FACC-TT-D-C2-1-RTA-6	D	C2	4	2	7.063	1.291	0.08380	15	0.005587	LAT,LAB
NTPM910Q1-HXL-H35-SKS-TT-E-C1-1-RTA-1	E	C1	5	1	7.600	1.299	0.08413	15	0.005609	LAB
NTPM910Q1-HXL-H35-SKS-TT-E-C1-1-RTA-2	E	C1	5	1	6.988	1.298	0.08412	15	0.005608	LAB
NTPM910Q1-HXL-H35-SKS-TT-E-C1-1-RTA-3	E	C1	5	1	7.608	1.288	0.08433	15	0.005622	LAB
NTPM910Q1-HXL-H35-SKS-TT-E-C1-1-RTA-4	E	C1	5	1	9.343	1.311	0.08427	15	0.005618	LAB
NTPM910Q1-HXL-H35-SKS-TT-E-C1-1-RTA-5	E	C1	5	1	10.53	1.307	0.08407	15	0.005604	LAB
NTPM910Q1-HXL-H35-SKS-TT-E-C1-1-RTA-6	E	C1	5	1	7.834	1.314	0.08415	15	0.005610	LAT
NTPM910Q1-HXL-H35-SKS-TT-E-C2-1-RTA-1	E	C2	5	2	8.612	1.276	0.08403	15	0.005602	LAT
NTPM910Q1-HXL-H35-SKS-TT-E-C2-1-RTA-2	E	C2	5	2	8.139	1.306	0.08375	15	0.005583	LAT
NTPM910Q1-HXL-H35-SKS-TT-E-C2-1-RTA-3	E	C2	5	2	9.509	1.311	0.08373	15	0.005582	LGB
NTPM910Q1-HXL-H35-SKS-TT-E-C2-1-RTA-4	E	C2	5	2	9.224	1.308	0.08393	15	0.005596	LAB
NTPM910Q1-HXL-H35-SKS-TT-E-C2-1-RTA-5	E	C2	5	2	8.655	1.315	0.08390	15	0.005593	LGT
NTPM910Q1-HXL-H35-SKS-TT-E-C2-1-RTA-6	E	C2	5	2	9.462	1.313	0.08375	15	0.005583	LGT

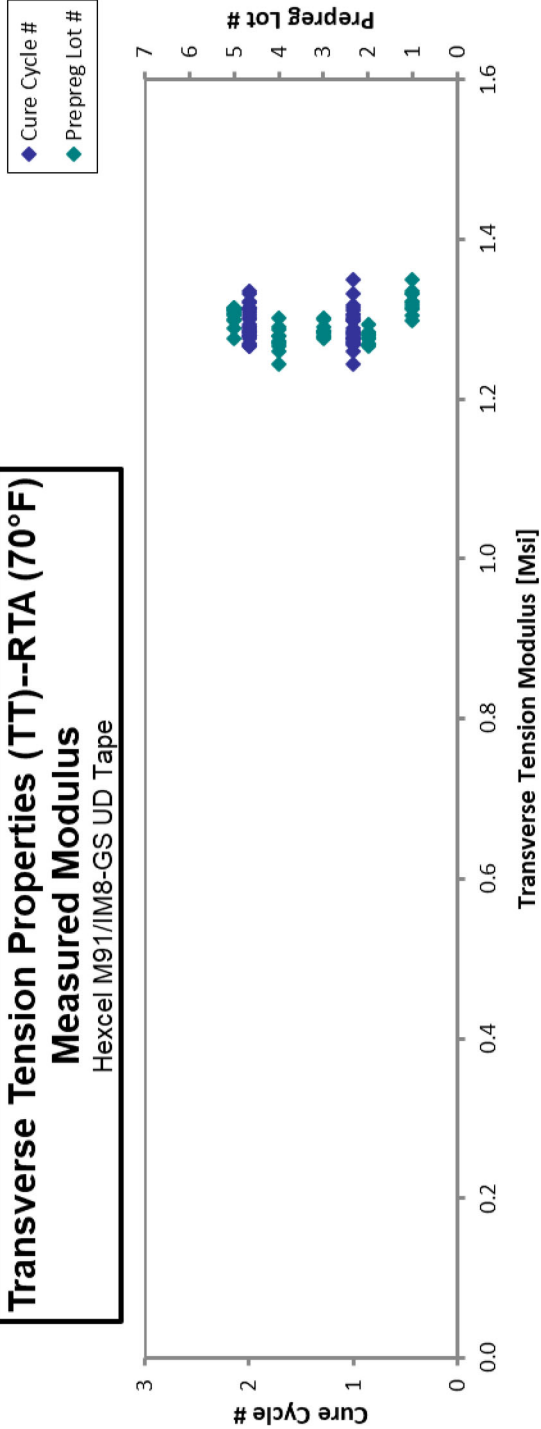
*Extra coupon tested only for strength, no SG was used

Average	9.045	1.293	0.005660
Standard Dev.	1.528	0.02155	
Coeff. of Var. [%]	16.89	1.667	
Min.	6.085	1.244	0.005366
Max.	13.18	1.350	0.005823
Number of Spec.	57	56	57

Transverse Tension Properties (TT)--RTA (70°F)
Measured Strength
Hexcel M91/IM8-GS UD Tape



Transverse Tension Properties (TT)--RTA (70°F)
Measured Modulus
Hexcel M91/IM8-GS UD Tape



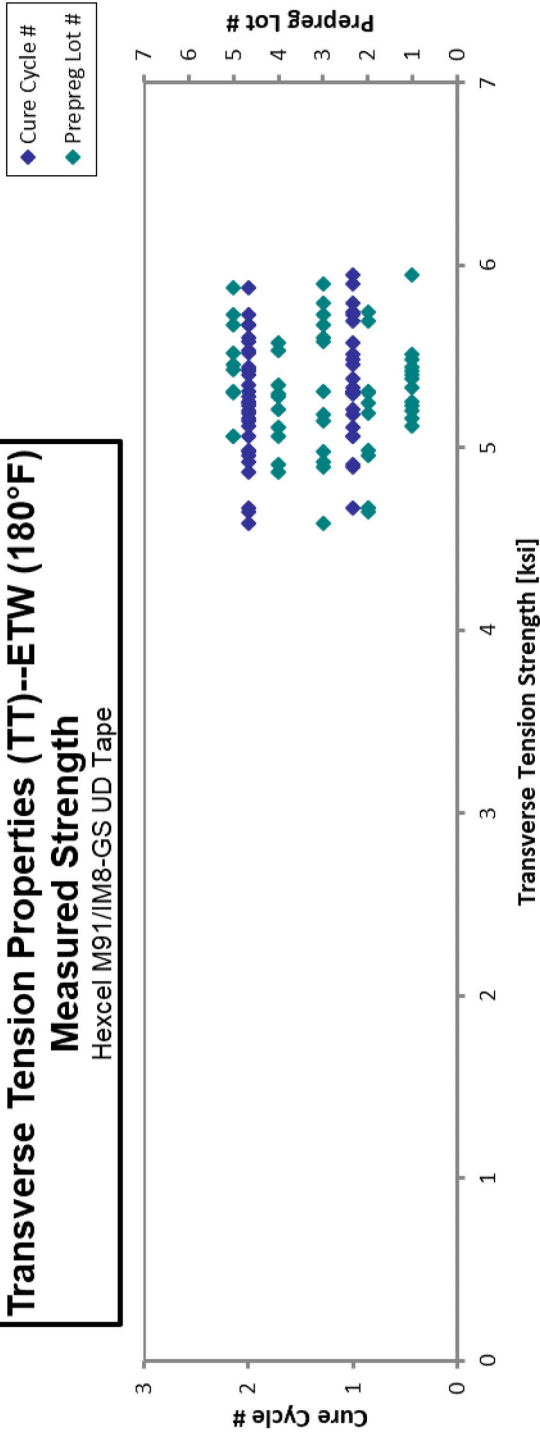
Transverse Tension Properties (TT)--ETW (180°F) □
Strength & Modulus □
Hexcel M91/IM8-GS UD Tape

Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{pi} [in]	Failure Mode
NTPM910Q1-HXL-H35-NIAR-TT-A-C1-1-ETW-1	A	C1	1	1	5.949	1.031	0.08338	15	0.005559	LGT
NTPM910Q1-HXL-H35-NIAR-TT-A-C1-1-ETW-2	A	C1	1	1	5.378	1.049	0.08315	15	0.005543	LGB
NTPM910Q1-HXL-H35-NIAR-TT-A-C1-1-ETW-3	A	C1	1	1	5.481	1.057	0.08352	15	0.005568	LAT
NTPM910Q1-HXL-H35-NIAR-TT-A-C1-1-ETW-4	A	C1	1	1	5.333	1.037	0.08350	15	0.005567	LAT
NTPM910Q1-HXL-H35-NIAR-TT-A-C1-1-ETW-5	A	C1	1	1	5.514	1.040	0.08355	15	0.005570	LWT
NTPM910Q1-HXL-H35-NIAR-TT-A-C2-1-ETW-1	A	C2	1	2	5.420	1.049	0.08388	15	0.005592	LAT
NTPM910Q1-HXL-H35-NIAR-TT-A-C2-1-ETW-2	A	C2	1	2	5.401	1.049	0.08315	15	0.005543	LGT
NTPM910Q1-HXL-H35-NIAR-TT-A-C2-1-ETW-3	A	C2	1	2	5.440	1.056	0.08282	15	0.005521	LAT
NTPM910Q1-HXL-H35-NIAR-TT-A-C2-1-ETW-4	A	C2	1	2	5.158	1.052	0.08357	15	0.005571	LWT
NTPM910Q1-HXL-H35-NIAR-TT-A-C2-1-ETW-5	A	C2	1	2	5.234	1.062	0.08312	15	0.005541	LGM
NTPM910Q1-HXL-H35-NIAR-TT-A-C2-1-ETW-6	A	C2	1	2	5.251	1.061	0.08332	15	0.005554	LAT
NTPM910Q1-HXL-H35-NIAR-TT-A-C2-1-ETW-7	A	C2	1	2	5.122	1.049	0.08360	15	0.005573	LAT
NTPM910Q1-HXL-H35-NIAR-TT-A-C2-1-ETW-8	A	C2	1	2	5.203	1.051	0.08352	15	0.005568	LAB
NTPM910Q1-HXL-H35-NIAR-TT-B-C1-1-ETW-1	B	C1	2	1	5.742	1.025	0.08612	15	0.005741	LGT
NTPM910Q1-HXL-H35-NIAR-TT-B-C1-1-ETW-2	B	C1	2	1	5.307	1.034	0.08597	15	0.005731	LWT
NTPM910Q1-HXL-H35-NIAR-TT-B-C1-1-ETW-3	B	C1	2	1	5.697	1.060	0.08288	15	0.005526	LAT
NTPM910Q1-HXL-H35-NIAR-TT-B-C1-1-ETW-4	B	C1	2	1	4.669	1.031	0.08653	15	0.005769	LWT
NTPM910Q1-HXL-H35-NIAR-TT-B-C1-1-ETW-5	B	C1	2	1	5.304	1.025	0.08643	15	0.005762	LWB
NTPM910Q1-HXL-H35-NIAR-TT-B-C2-1-ETW-1	B	C2	2	2	5.243	1.018	0.08637	15	0.005758	LAT
NTPM910Q1-HXL-H35-NIAR-TT-B-C2-1-ETW-2	B	C2	2	2	4.956	1.025	0.08648	15	0.005766	LAT
NTPM910Q1-HXL-H35-NIAR-TT-B-C2-1-ETW-3	B	C2	2	2	5.186	1.021	0.08667	15	0.005778	LAT
NTPM910Q1-HXL-H35-NIAR-TT-B-C2-1-ETW-4	B	C2	2	2	4.987	1.027	0.08537	15	0.005691	LAB
NTPM910Q1-HXL-H35-NIAR-TT-B-C2-1-ETW-5	B	C2	2	2	4.649	1.033	0.08582	15	0.005721	LWT
NTPM910Q1-HXL-H35-NIAR-TT-B-C2-1-ETW-6	B	C2	2	2	4.667	1.016	0.08698	15	0.005799	LAT
NTPM910Q1-HXL-H35-NIAR-TT-C-C1-1-ETW-1	C	C1	3	1	5.181	1.026	0.08673	15	0.005782	LAT
NTPM910Q1-HXL-H35-NIAR-TT-C-C1-1-ETW-2	C	C1	3	1	5.899	1.018	0.08772	15	0.005848	LGM
NTPM910Q1-HXL-H35-NIAR-TT-C-C1-1-ETW-3	C	C1	3	1	4.897	1.038	0.08573	15	0.005716	LAT
NTPM910Q1-HXL-H35-NIAR-TT-C-C1-1-ETW-4	C	C1	3	1	5.793	1.089	0.08233	15	0.005489	LWT
NTPM910Q1-HXL-H35-NIAR-TT-C-C1-1-ETW-5	C	C1	3	1	5.733	1.027	0.08697	15	0.005798	LGB
NTPM910Q1-HXL-H35-NIAR-TT-C-C2-1-ETW-1	C	C2	3	2	5.674	1.046	0.08670	15	0.005780	LGB
NTPM910Q1-HXL-H35-NIAR-TT-C-C2-1-ETW-2	C	C2	3	2	5.579	1.030	0.08650	15	0.005767	LGB
NTPM910Q1-HXL-H35-NIAR-TT-C-C2-1-ETW-3	C	C2	3	2	4.584	1.016	0.08742	15	0.005828	LAT
NTPM910Q1-HXL-H35-NIAR-TT-C-C2-1-ETW-4	C	C2	3	2	4.976	1.010	0.08708	15	0.005806	LAT
NTPM910Q1-HXL-H35-NIAR-TT-C-C2-1-ETW-5	C	C2	3	2	5.601	1.034	0.08437	15	0.005624	LAT
NTPM910Q1-HXL-H35-NIAR-TT-C-C2-1-ETW-6	C	C2	3	2	4.920	1.010	0.08663	15	0.005776	LAT
NTPM910Q1-HXL-H35-NIAR-TT-C-C2-1-ETW-7	C	C2	3	2	5.150	1.021	0.08613	15	0.005742	LAT, LAB
NTPM910Q1-HXL-H35-NIAR-TT-C-C2-1-ETW-8	C	C2	3	2	5.311	1.025	0.08562	15	0.005708	LAB

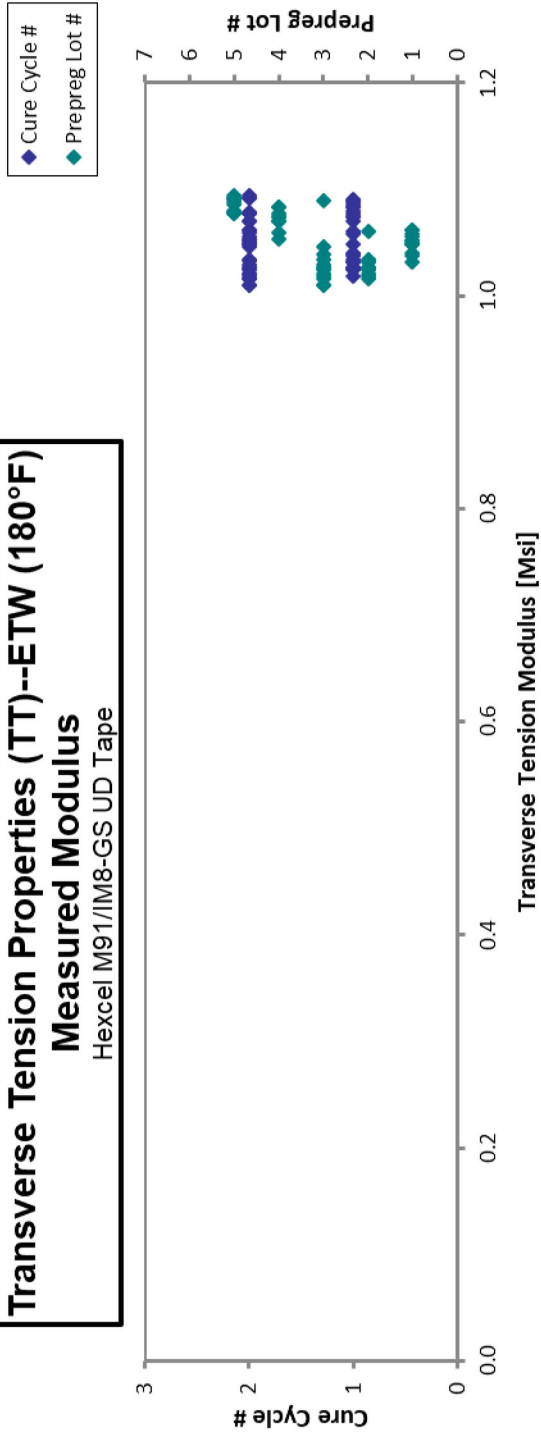
Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{pi} [in]	Failure Mode
NTPM910Q1-HXL-H35-FACC-TT-D-C1-1-ETW-1	D	C1	4	1	5,210	1.084	0.08470	15	0.005647	LAT
NTPM910Q1-HXL-H35-FACC-TT-D-C1-1-ETW-2	D	C1	4	1	4,906	1.075	0.08472	15	0.005648	LAB
NTPM910Q1-HXL-H35-FACC-TT-D-C1-1-ETW-3	D	C1	4	1	5,575	1.074	0.08472	15	0.005648	LAT
NTPM910Q1-HXL-H35-FACC-TT-D-C1-1-ETW-4	D	C1	4	1	5,113	1.069	0.08493	15	0.005662	LAT
NTPM910Q1-HXL-H35-FACC-TT-D-C1-1-ETW-5	D	C1	4	1	5,293	1.084	0.08480	15	0.005653	LAB
NTPM910Q1-HXL-H35-FACC-TT-D-C2-1-ETW-1	D	C2	4	2	5,064	1.059	0.08495	15	0.005663	LAT
NTPM910Q1-HXL-H35-FACC-TT-D-C2-1-ETW-2	D	C2	4	2	4,865	1.053	0.08437	15	0.005624	LAT
NTPM910Q1-HXL-H35-FACC-TT-D-C2-1-ETW-3	D	C2	4	2	5,342	1.077	0.08477	15	0.005651	LAT, LAB
NTPM910Q1-HXL-H35-FACC-TT-D-C2-1-ETW-4	D	C2	4	2	5,281	1.070	0.08483	15	0.005656	LAT
NTPM910Q1-HXL-H35-FACC-TT-D-C2-1-ETW-5	D	C2	4	2	5,529	1.071	0.08445	15	0.005630	LWT, LAB
NTPM910Q1-HXL-H35-SKS-TT-E-C1-1-ETW-1	E	C1	5	1	5,303	1.090	0.08455	15	0.005637	LAB
NTPM910Q1-HXL-H35-SKS-TT-E-C1-1-ETW-2	E	C1	5	1	5,062	1.088	0.08422	15	0.005614	LAB
NTPM910Q1-HXL-H35-SKS-TT-E-C1-1-ETW-3	E	C1	5	1	5,310	1.086	0.08370	15	0.005580	LAT
NTPM910Q1-HXL-H35-SKS-TT-E-C1-1-ETW-4	E	C1	5	1	5,456	1.080	0.08403	15	0.005602	LAT
NTPM910Q1-HXL-H35-SKS-TT-E-C1-1-ETW-5	E	C1	5	1	5,059	1.077	0.08400	15	0.005600	LAT
NTPM910Q1-HXL-H35-SKS-TT-E-C2-1-ETW-1	E	C2	5	2	5,426	1.094	0.08433	15	0.005622	LAT
NTPM910Q1-HXL-H35-SKS-TT-E-C2-1-ETW-2	E	C2	5	2	5,518	1.092	0.08377	15	0.005584	LAB
NTPM910Q1-HXL-H35-SKS-TT-E-C2-1-ETW-3	E	C2	5	2	5,879	1.079	0.08380	15	0.005587	LWT
NTPM910Q1-HXL-H35-SKS-TT-E-C2-1-ETW-4	E	C2	5	2	5,729	1.091	0.08387	15	0.005591	LAB
NTPM910Q1-HXL-H35-SKS-TT-E-C2-1-ETW-5	E	C2	5	2	5,676	1.077	0.08398	15	0.005599	LWT

Average	5.302	1.051	0.005657
Standard Dev.	0.3252	0.02540	
Coeff. of Var. [%]	6.134	2.417	
Min.	4.584	1.010	0.005489
Max.	5.949	1.094	0.005848
Number of Spec.	57	57	57

Transverse Tension Properties (TT)--ETW (180°F)
Measured Strength
Hexcel M91/IM8-GS UD Tape



Transverse Tension Properties (TT)--ETW (180°F)
Measured Modulus
Hexcel M91/IM8-GS UD Tape



4.3 Longitudinal Compression Properties (LC)

Longitudinal Compression Properties (LC)--CTA (-65°F)	
Modulus	
Hexcel M91/IM8-GS UD Tape	

normalizing
t_{ply} [in]
0.005500

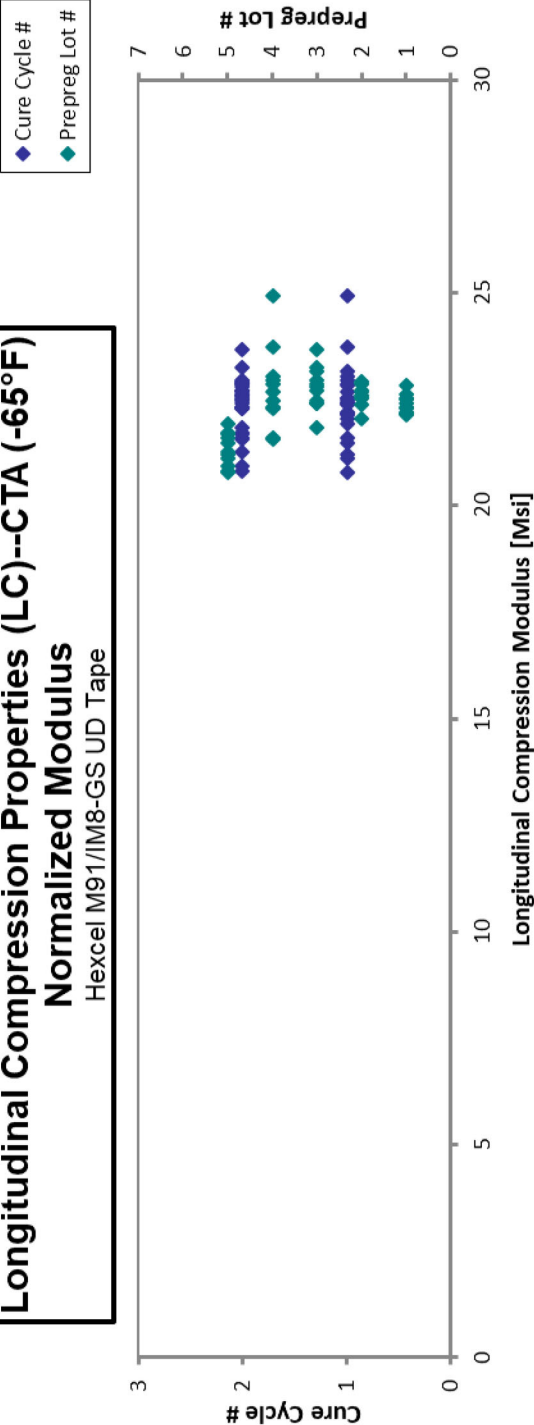
Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
NTPM910Q1-HXL-H35-NIAR-LC-A-C1-1-CTA-1	A	C1	1	1	21.81	0.08382	15	M(B,T)AB
NTPM910Q1-HXL-H35-NIAR-LC-A-C1-1-CTA-2	A	C1	1	1	21.82	0.08378	15	M(B,T)GM
NTPM910Q1-HXL-H35-NIAR-LC-A-C1-1-CTA-3	A	C1	1	1	21.87	0.08375	15	M(B,T)AB
NTPM910Q1-HXL-H35-NIAR-LC-A-C1-1-CTA-4	A	C1	1	1	21.84	0.08362	15	M(B,T)GM
NTPM910Q1-HXL-H35-NIAR-LC-A-C1-1-CTA-5	A	C1	1	1	22.55	0.08355	15	M(B,T)AB
NTPM910Q1-HXL-H35-NIAR-LC-A-C2-1-CTA-1	A	C2	1	2	22.33	0.08313	15	M(B,T)GM
NTPM910Q1-HXL-H35-NIAR-LC-A-C2-1-CTA-2	A	C2	1	2	22.07	0.08343	15	M(B,T)AB
NTPM910Q1-HXL-H35-NIAR-LC-A-C2-1-CTA-3	A	C2	1	2	22.27	0.08343	15	M(B,T)AB
NTPM910Q1-HXL-H35-NIAR-LC-A-C2-1-CTA-4	A	C2	1	2	22.37	0.08345	15	M(B,T)GM
NTPM910Q1-HXL-H35-NIAR-LC-A-C2-1-CTA-5	A	C2	1	2	22.12	0.08317	15	M(B,T)AB
NTPM910Q1-HXL-H35-NIAR-LC-A-C2-1-CTA-6	A	C2	1	2	22.25	0.08307	15	M(B,T)AB
NTPM910Q1-HXL-H35-NIAR-LC-B-C1-1-CTA-1	B	C1	2	1	21.21	0.08580	15	M(B,T)AB
NTPM910Q1-HXL-H35-NIAR-LC-B-C1-1-CTA-2	B	C1	2	1	21.65	0.08642	15	M(B,T)AB
NTPM910Q1-HXL-H35-NIAR-LC-B-C1-1-CTA-3	B	C1	2	1	21.22	0.08697	15	M(B,T)AT
NTPM910Q1-HXL-H35-NIAR-LC-B-C1-1-CTA-4	B	C1	2	1	21.48	0.08648	15	M(B,T)AT
NTPM910Q1-HXL-H35-NIAR-LC-B-C1-1-CTA-5	B	C1	2	1	21.52	0.08638	15	TAB
NTPM910Q1-HXL-H35-NIAR-LC-B-C2-1-CTA-1	B	C2	2	2	22.20	0.08438	15	M(B,T)AB
NTPM910Q1-HXL-H35-NIAR-LC-B-C2-1-CTA-2	B	C2	2	2	21.87	0.08628	15	M(B,T)AB
NTPM910Q1-HXL-H35-NIAR-LC-B-C2-1-CTA-3	B	C2	2	2	21.51	0.08667	15	M(B,T)AB
NTPM910Q1-HXL-H35-NIAR-LC-B-C2-1-CTA-4	B	C2	2	2	21.79	0.08668	15	M(B,T)GM
NTPM910Q1-HXL-H35-NIAR-LC-B-C2-1-CTA-5	B	C2	2	2	21.83	0.08663	15	M(B,T)AT
NTPM910Q1-HXL-H35-NIAR-LC-B-C2-1-CTA-6	B	C2	2	2	21.55	0.08645	15	M(B,T)AT
NTPM910Q1-HXL-H35-NIAR-LC-C-C1-1-CTA-1	C	C1	3	1	21.46	0.08618	15	M(B,T)GM
NTPM910Q1-HXL-H35-NIAR-LC-C-C1-1-CTA-2	C	C1	3	1	21.52	0.08758	15	M(B,T)AB
NTPM910Q1-HXL-H35-NIAR-LC-C-C1-1-CTA-3	C	C1	3	1	21.67	0.08810	15	BAB
NTPM910Q1-HXL-H35-NIAR-LC-C-C1-1-CTA-4	C	C1	3	1	21.03	0.08792	15	M(B,T)GM
NTPM910Q1-HXL-H35-NIAR-LC-C-C1-1-CTA-5	C	C1	3	1	21.63	0.08755	15	M(B,T)AB
NTPM910Q1-HXL-H35-NIAR-LC-C-C2-1-CTA-1	C	C2	3	2	21.31	0.08453	15	TAB
NTPM910Q1-HXL-H35-NIAR-LC-C-C2-1-CTA-2	C	C2	3	2	21.19	0.08745	15	M(B,T)AB
NTPM910Q1-HXL-H35-NIAR-LC-C-C2-1-CTA-3	C	C2	3	2	21.13	0.08862	15	TAB
NTPM910Q1-HXL-H35-NIAR-LC-C-C2-1-CTA-4	C	C2	3	2	21.23	0.08855	15	M(B,T)AB
NTPM910Q1-HXL-H35-NIAR-LC-C-C2-1-CTA-5	C	C2	3	2	21.76	0.08817	15	M(B,T)GM
NTPM910Q1-HXL-H35-NIAR-LC-C-C2-1-CTA-6	C	C2	3	2	22.33	0.08740	15	M(B,T)AB

Avg. t _{ply} [in]	Modulus _{norm} [Msi]
0.005588	22.16
0.005586	22.16
0.005583	22.20
0.005574	22.13
0.005570	22.83
0.005542	22.50
0.005562	22.32
0.005562	22.52
0.005563	22.62
0.005544	22.30
0.005538	22.40
0.005720	22.05
0.005761	22.68
0.005798	22.37
0.005766	22.52
0.005759	22.54
0.005626	22.71
0.005752	22.87
0.005778	22.59
0.005779	22.90
0.005776	22.93
0.005763	22.58
0.005746	22.41
0.005839	22.84
0.005873	23.14
0.005861	22.41
0.005837	22.96
0.005636	21.83
0.005830	22.46
0.005908	22.70
0.005903	22.78
0.005878	23.25
0.005827	23.66

Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
NTPM910Q1-HXL-H35-FACC-LC-D-C1-1-CTA-1	D	C1	4	1	22.93	0.08535	15	BGM
NTPM910Q1-HXL-H35-FACC-LC-D-C1-1-CTA-2	D	C1	4	1	24.03	0.08560	15	BAT
NTPM910Q1-HXL-H35-FACC-LC-D-C1-1-CTA-3	D	C1	4	1	21.02	0.08478	15	BGM
NTPM910Q1-HXL-H35-FACC-LC-D-C1-1-CTA-4	D	C1	4	1	22.58	0.08423	15	BAT
NTPM910Q1-HXL-H35-FACC-LC-D-C1-1-CTA-5	D	C1	4	1	22.00	0.08425	15	BAT
NTPM910Q1-HXL-H35-FACC-LC-D-C2-1-CTA-1	D	C2	4	2	22.24	0.08508	15	BGM
NTPM910Q1-HXL-H35-FACC-LC-D-C2-1-CTA-2	D	C2	4	2	22.01	0.08567	15	BAT
NTPM910Q1-HXL-H35-FACC-LC-D-C2-1-CTA-3	D	C2	4	2	20.73	0.08573	15	BAT
NTPM910Q1-HXL-H35-FACC-LC-D-C2-1-CTA-4	D	C2	4	2	22.02	0.08493	15	BAT
NTPM910Q1-HXL-H35-FACC-LC-D-C2-1-CTA-5	D	C2	4	2	21.66	0.08503	15	BAT
NTPM910Q1-HXL-H35-FACC-LC-D-C2-1-CTA-6	D	C2	4	2	21.57	0.08525	15	BAT
NTPM910Q1-HXL-H35-SKS-LC-E-C1-1-CTA-1	E	C1	5	1	21.69	0.08025	15	M(B,T)AT
NTPM910Q1-HXL-H35-SKS-LC-E-C1-1-CTA-2	E	C1	5	1	22.23	0.08133	15	M(B,T)AT
NTPM910Q1-HXL-H35-SKS-LC-E-C1-1-CTA-3	E	C1	5	1	20.59	0.08327	15	M(B,T)AT
NTPM910Q1-HXL-H35-SKS-LC-E-C1-1-CTA-4	E	C1	5	1	21.20	0.08360	15	TAT
NTPM910Q1-HXL-H35-SKS-LC-E-C1-1-CTA-5	E	C1	5	1	20.79	0.08412	15	TAT
NTPM910Q1-HXL-H35-SKS-LC-E-C2-1-CTA-1	E	C2	5	2	22.63	0.07873	15	TAT
NTPM910Q1-HXL-H35-SKS-LC-E-C2-1-CTA-2	E	C2	5	2	21.36	0.08033	15	TAT
NTPM910Q1-HXL-H35-SKS-LC-E-C2-1-CTA-3	E	C2	5	2	21.38	0.08208	15	TAT
NTPM910Q1-HXL-H35-SKS-LC-E-C2-1-CTA-4	E	C2	5	2	21.49	0.08320	15	BAT
NTPM910Q1-HXL-H35-SKS-LC-E-C2-1-CTA-5	E	C2	5	2	20.51	0.08417	15	TAT,SGM
NTPM910Q1-HXL-H35-SKS-LC-E-C2-1-CTA-6	E	C2	5	2	21.34	0.08392	15	TAT

Average	21.73	Average _{norm}	22.37
Standard Dev.	0.6130	Standard Dev _{norm}	0.7521
Coeff. of Var. [%]	2.821	Coeff. of Var. [%] _{norm}	3.363
Mln.	20.51	Mln.	20.78
Max.	24.03	Max.	24.94
Number of Spec.	55	Number of Spec.	55

Longitudinal Compression Properties (LC)--CTA (-65°F)
Normalized Modulus
Hexcel M91/IM8-GS UD Tape



Longitudinal Compression Properties (LC)--RTA (70°F)

Modulus

Hexcel M91/IM8-GS UD Tape

normalizing

t₉₀ [in]

0.005500

Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
NTPM910Q1-HXL-H35-NIAR-LC-A-C1-1-RTA-1*	A	C1	1	1	22.21	0.08392	15	TAB
NTPM910Q1-HXL-H35-NIAR-LC-A-C1-1-RTA-2*	A	C1	1	1	22.13	0.08427	15	BAT
NTPM910Q1-HXL-H35-NIAR-LC-A-C1-1-RTA-3	A	C1	1	1	21.86	0.08402	15	BAB
NTPM910Q1-HXL-H35-NIAR-LC-A-C1-1-RTA-4	A	C1	1	1	22.03	0.08248	15	M(B,T)AB
NTPM910Q1-HXL-H35-NIAR-LC-A-C1-1-RTA-5	A	C1	1	1	22.03	0.08377	15	M(B,T)AB
NTPM910Q1-HXL-H35-NIAR-LC-A-C2-1-RTA-1*	A	C2	1	2	22.26	0.08382	15	M(B,T)AB
NTPM910Q1-HXL-H35-NIAR-LC-A-C2-1-RTA-2*	A	C2	1	2	22.14	0.08422	15	M(B,T)AT
NTPM910Q1-HXL-H35-NIAR-LC-A-C2-1-RTA-3	A	C2	1	2	21.89	0.08365	15	M(B,T)GM
NTPM910Q1-HXL-H35-NIAR-LC-A-C2-1-RTA-4	A	C2	1	2	22.20	0.08147	15	M(B,T)AT
NTPM910Q1-HXL-H35-NIAR-LC-A-C2-1-RTA-5	A	C2	1	2	22.06	0.08313	15	M(B,T)GM
NTPM910Q1-HXL-H35-NIAR-LC-A-C2-1-RTA-6	A	C2	1	2	21.70	0.08307	15	M(B,T)AT
NTPM910Q1-HXL-H35-NIAR-LC-B-C1-1-RTA-1*	B	C1	2	1	21.19	0.08653	15	TAT
NTPM910Q1-HXL-H35-NIAR-LC-B-C1-1-RTA-2*	B	C1	2	1	21.46	0.08602	15	TAB
NTPM910Q1-HXL-H35-NIAR-LC-B-C1-1-RTA-3	B	C1	2	1	21.11	0.08593	15	M(B,T)AB
NTPM910Q1-HXL-H35-NIAR-LC-B-C1-1-RTA-4	B	C1	2	1	21.02	0.08552	15	TAT
NTPM910Q1-HXL-H35-NIAR-LC-B-C1-1-RTA-5	B	C1	2	1	21.19	0.08628	15	TAT
NTPM910Q1-HXL-H35-NIAR-LC-B-C2-1-RTA-1*	B	C2	2	2	21.56	0.08562	15	M(B,T)AB
NTPM910Q1-HXL-H35-NIAR-LC-B-C2-1-RTA-2*	B	C2	2	2	21.49	0.08548	15	M(B,T)AB
NTPM910Q1-HXL-H35-NIAR-LC-B-C2-1-RTA-3	B	C2	2	2	21.67	0.08612	15	M(B,T)AT
NTPM910Q1-HXL-H35-NIAR-LC-B-C2-1-RTA-4	B	C2	2	2	21.55	0.08605	15	M(B,T)AT
NTPM910Q1-HXL-H35-NIAR-LC-B-C2-1-RTA-5	B	C2	2	2	21.63	0.08430	15	M(B,T)AB
NTPM910Q1-HXL-H35-NIAR-LC-B-C2-1-RTA-6	B	C2	2	2	21.14	0.08628	15	TAB
NTPM910Q1-HXL-H35-NIAR-LC-C-C1-1-RTA-1*	C	C1	3	1	21.49	0.08658	15	M(B,T)GM
NTPM910Q1-HXL-H35-NIAR-LC-C-C1-1-RTA-2*	C	C1	3	1	22.01	0.08648	15	M(B,T)AT
NTPM910Q1-HXL-H35-NIAR-LC-C-C1-1-RTA-3	C	C1	3	1	21.52	0.08723	15	M(B,T)AT
NTPM910Q1-HXL-H35-NIAR-LC-C-C1-1-RTA-4	C	C1	3	1	21.50	0.08743	15	M(B,T)GM
NTPM910Q1-HXL-H35-NIAR-LC-C-C1-1-RTA-5	C	C1	3	1	20.94	0.08742	15	M(B,T)AT
NTPM910Q1-HXL-H35-NIAR-LC-C-C2-1-RTA-1*	C	C2	3	2	21.44	0.08710	15	TAT
NTPM910Q1-HXL-H35-NIAR-LC-C-C2-1-RTA-2*	C	C2	3	2	21.78	0.08725	15	M(B,T)GM
NTPM910Q1-HXL-H35-NIAR-LC-C-C2-1-RTA-3	C	C2	3	2	21.00	0.08737	15	M(B,T)GM
NTPM910Q1-HXL-H35-NIAR-LC-C-C2-1-RTA-4	C	C2	3	2	21.07	0.08737	15	M(B,T)GM
NTPM910Q1-HXL-H35-NIAR-LC-C-C2-1-RTA-5	C	C2	3	2	21.32	0.08398	15	M(B,T)AB
NTPM910Q1-HXL-H35-NIAR-LC-C-C2-1-RTA-6	C	C2	3	2	20.85	0.08702	15	M(B,T)AB

Avg. t _{ply} [in]	Modulus _{norm} [Msi]
0.005594	22.59
0.005618	22.60
0.005601	22.26
0.005499	22.03
0.005584	22.37
0.005588	22.61
0.005614	22.60
0.005577	22.19
0.005431	21.92
0.005542	22.23
0.005538	21.85
0.005769	22.22
0.005734	22.38
0.005729	21.99
0.005701	21.79
0.005752	22.16
0.005708	22.37
0.005699	22.26
0.005741	22.62
0.005737	22.48
0.005620	22.10
0.005752	22.11
0.005772	22.55
0.005766	23.07
0.005816	22.75
0.005829	22.79
0.005828	22.19
0.005807	22.64
0.005817	23.03
0.005824	22.24
0.005824	22.31
0.005599	21.71
0.005801	21.99

Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
NTPM910Q1-HXL-H35-FACC-LC-D-C1-1-RTA-1*	D	C1	4	1	22.65	0.08387	15	M(B,T)AT
NTPM910Q1-HXL-H35-FACC-LC-D-C1-1-RTA-2*	D	C1	4	1	22.45	0.08392	15	TAB
NTPM910Q1-HXL-H35-FACC-LC-D-C1-1-RTA-3	D	C1	4	1	21.63	0.08398	15	M(B,T)AB
NTPM910Q1-HXL-H35-FACC-LC-D-C1-1-RTA-4	D	C1	4	1	21.95	0.08385	15	M(B,T)AB
NTPM910Q1-HXL-H35-FACC-LC-D-C1-1-RTA-5	D	C1	4	1	21.70	0.08350	15	TAT
NTPM910Q1-HXL-H35-FACC-LC-D-C2-1-RTA-1*	D	C2	4	2	22.30	0.08513	15	M(B,T)AT
NTPM910Q1-HXL-H35-FACC-LC-D-C2-1-RTA-2*	D	C2	4	2	22.35	0.08493	15	M(B,T)AB
NTPM910Q1-HXL-H35-FACC-LC-D-C2-1-RTA-3	D	C2	4	2	21.38	0.08503	15	M(B,T)AB
NTPM910Q1-HXL-H35-FACC-LC-D-C2-1-RTA-4	D	C2	4	2	21.92	0.08465	15	TAB
NTPM910Q1-HXL-H35-FACC-LC-D-C2-1-RTA-5	D	C2	4	2	21.38	0.08478	15	M(B,T)AT
NTPM910Q1-HXL-H35-FACC-LC-D-C2-1-RTA-6	D	C2	4	2	21.64	0.08555	15	M(B,T)AT
NTPM910Q1-HXL-H35-SKS-LC-E-C1-1-RTA-1*	E	C1	5	1	21.95	0.08373	15	M(B,T)AT
NTPM910Q1-HXL-H35-SKS-LC-E-C1-1-RTA-2*	E	C1	5	1	21.96	0.08370	15	M(B,T)AT
NTPM910Q1-HXL-H35-SKS-LC-E-C1-1-RTA-3	E	C1	5	1	21.48	0.08373	15	M(B,T)AB
NTPM910Q1-HXL-H35-SKS-LC-E-C1-1-RTA-4	E	C1	5	1	21.25	0.08403	15	M(B,T)AB
NTPM910Q1-HXL-H35-SKS-LC-E-C1-1-RTA-5	E	C1	5	1	20.79	0.08337	15	M(B,T)AB
NTPM910Q1-HXL-H35-SKS-LC-E-C2-1-RTA-1*	E	C2	5	2	22.00	0.08440	15	TAT
NTPM910Q1-HXL-H35-SKS-LC-E-C2-1-RTA-2*	E	C2	5	2	21.75	0.08437	15	M(B,T)AB
NTPM910Q1-HXL-H35-SKS-LC-E-C2-1-RTA-3	E	C2	5	2	21.63	0.08467	15	M(B,T)AT
NTPM910Q1-HXL-H35-SKS-LC-E-C2-1-RTA-4	E	C2	5	2	21.33	0.08495	15	TAT
NTPM910Q1-HXL-H35-SKS-LC-E-C2-1-RTA-5	E	C2	5	2	22.14	0.07903	15	TAT
NTPM910Q1-HXL-H35-SKS-LC-E-C2-1-RTA-6	E	C2	5	2	21.30	0.08067	15	M(B,T)AB

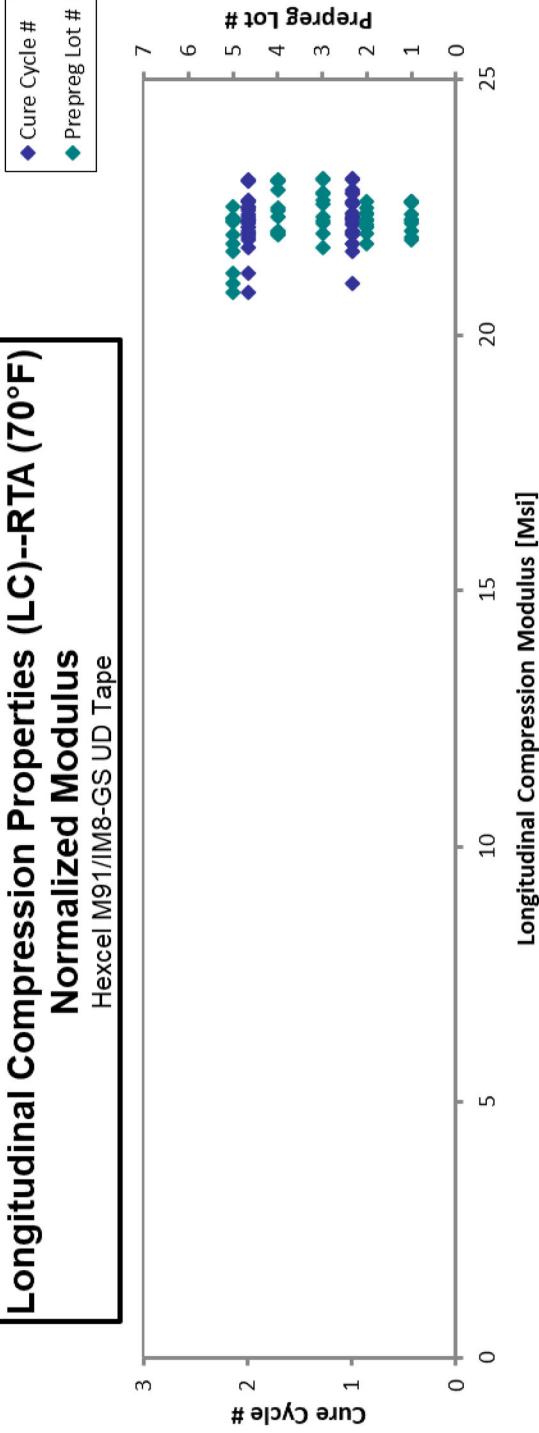
*Modulus are averaged values of 2 strain gages

Average	21.66	Average _{norm}	22.26
Standard Dev.	0.4370	Standard Dev _{norm}	0.4645
Coeff. of Var. [%]	2.017	Coeff. of Var. [%] _{norm}	2.087
Min.	20.79	Min.	20.83
Max.	22.65	Max.	23.07
Number of Spec.	55	Number of Spec.	55

Longitudinal Compression Properties (LC)--RTA (70°F)

Normalized Modulus

Hexcel M91/IM8-GS UD Tape



Longitudinal Compression Properties (LC)--ETW (180°F)

Modulus

Hexcel M91/IM8-GS UD Tape

normalizing

t_{ply} [in]

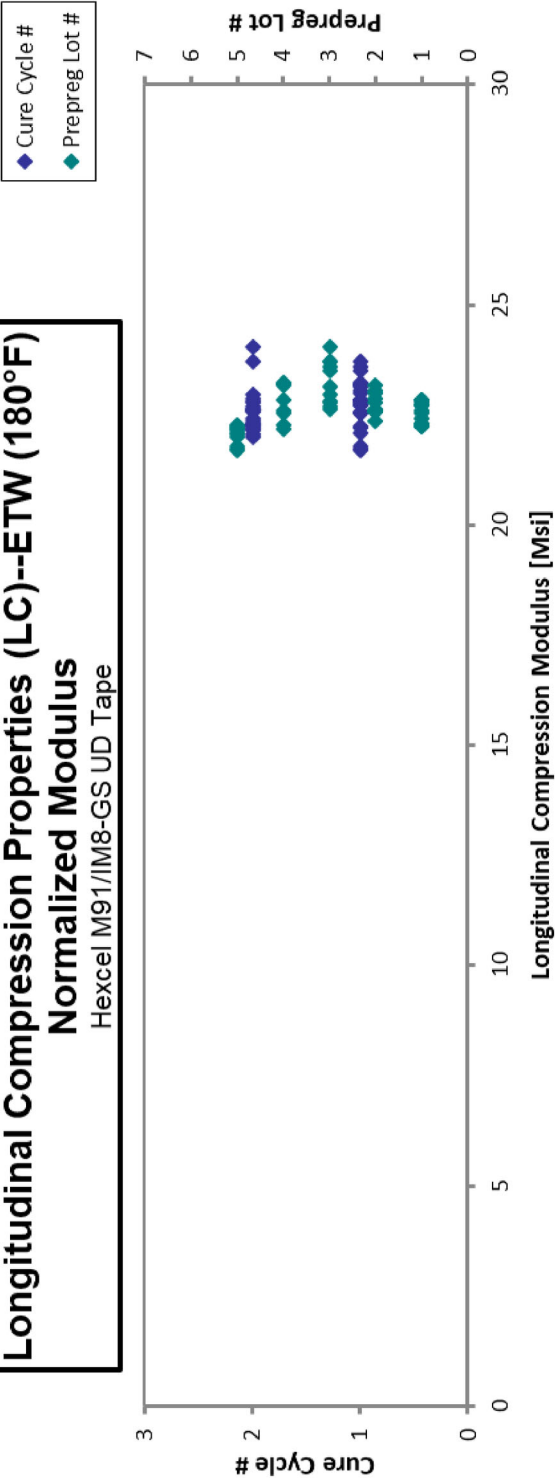
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Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	Modulus _{norm} [Msi]
NTPM910Q1-HXL-H35-NIAR-LC-A-C1-1-ETW-1	A	C1	1	1	22.50	0.08378	15	BAT	0.005586	22.85
NTPM910Q1-HXL-H35-NIAR-LC-A-C1-1-ETW-2	A	C1	1	1	22.53	0.08323	15	BAB, CIB	0.005549	22.73
NTPM910Q1-HXL-H35-NIAR-LC-A-C1-1-ETW-3	A	C1	1	1	21.97	0.08345	15	BAB	0.005563	22.23
NTPM910Q1-HXL-H35-NIAR-LC-A-C1-1-ETW-4	A	C1	1	1	22.21	0.08375	15	BAB	0.005583	22.55
NTPM910Q1-HXL-H35-NIAR-LC-A-C1-1-ETW-5	A	C1	1	1	22.36	0.08425	15	BAT	0.005617	22.83
NTPM910Q1-HXL-H35-NIAR-LC-A-C1-1-ETW-6	A	C1	1	1	22.51	0.08328	15	BAB	0.005552	22.73
NTPM910Q1-HXL-H35-NIAR-LC-A-C2-1-ETW-1	A	C2	1	2	22.03	0.08352	15	M(B,T)AT	0.005568	22.30
NTPM910Q1-HXL-H35-NIAR-LC-A-C2-1-ETW-2	A	C2	1	2	22.26	0.08315	15	M(B,T)AT	0.005543	22.43
NTPM910Q1-HXL-H35-NIAR-LC-A-C2-1-ETW-3	A	C2	1	2	22.07	0.08315	15	M(B,T)AT	0.005543	22.24
NTPM910Q1-HXL-H35-NIAR-LC-A-C2-1-ETW-4	A	C2	1	2	22.08	0.08333	15	M(B,T)AT	0.005556	22.31
NTPM910Q1-HXL-H35-NIAR-LC-A-C2-1-ETW-5	A	C2	1	2	22.45	0.08368	15	M(B,T)AT	0.005579	22.78
NTPM910Q1-HXL-H35-NIAR-LC-A-C2-1-ETW-6	A	C2	1	2	22.17	0.08410	15	M(B,T)AT	0.005607	22.60
NTPM910Q1-HXL-H35-NIAR-LC-B-C1-1-ETW-1	B	C1	2	1	22.01	0.08685	15	M(B,T)AB	0.005790	23.17
NTPM910Q1-HXL-H35-NIAR-LC-B-C1-1-ETW-2	B	C1	2	1	21.67	0.08668	15	TAB	0.005779	22.77
NTPM910Q1-HXL-H35-NIAR-LC-B-C1-1-ETW-3	B	C1	2	1	21.96	0.08660	15	M(B,T)AB	0.005773	23.05
NTPM910Q1-HXL-H35-NIAR-LC-B-C1-1-ETW-4	B	C1	2	1	21.86	0.08675	15	M(B,T)AB	0.005783	22.98
NTPM910Q1-HXL-H35-NIAR-LC-B-C1-1-ETW-5	B	C1	2	1	21.58	0.08623	15	M(B,T)AB	0.005749	22.56
NTPM910Q1-HXL-H35-NIAR-LC-B-C2-1-ETW-1	B	C2	2	2	21.35	0.08715	15	M(B,T)AB	0.005810	22.56
NTPM910Q1-HXL-H35-NIAR-LC-B-C2-1-ETW-2	B	C2	2	2	21.50	0.08678	15	M(B,T)AT	0.005786	22.61
NTPM910Q1-HXL-H35-NIAR-LC-B-C2-1-ETW-3	B	C2	2	2	21.88	0.08620	15	M(B,T)AT	0.005747	22.86
NTPM910Q1-HXL-H35-NIAR-LC-B-C2-1-ETW-4	B	C2	2	2	21.44	0.08600	15	M(B,T)AT	0.005733	22.35
NTPM910Q1-HXL-H35-NIAR-LC-B-C2-1-ETW-5	B	C2	2	2	21.33	0.08735	15	M(B,T)AB	0.005823	22.59
NTPM910Q1-HXL-H35-NIAR-LC-B-C2-1-ETW-6	B	C2	2	2	21.75	0.08587	15	M(B,T)AT	0.005724	22.64
NTPM910Q1-HXL-H35-NIAR-LC-C-C1-1-ETW-1	C	C1	3	1	21.67	0.08807	15	M(B,T)AT	0.005871	23.14
NTPM910Q1-HXL-H35-NIAR-LC-C-C1-1-ETW-2	C	C1	3	1	22.32	0.08765	15	M(B,T)AT	0.005843	23.71
NTPM910Q1-HXL-H35-NIAR-LC-C-C1-1-ETW-3	C	C1	3	1	21.54	0.08720	15	M(B,T)AT	0.005813	22.77
NTPM910Q1-HXL-H35-NIAR-LC-C-C1-1-ETW-4	C	C1	3	1	22.27	0.08738	15	M(B,T)AT	0.005826	23.59
NTPM910Q1-HXL-H35-NIAR-LC-C-C1-1-ETW-5	C	C1	3	1	22.27	0.08703	15	M(B,T)AT	0.005802	23.49
NTPM910Q1-HXL-H35-NIAR-LC-C-C2-1-ETW-1	C	C2	3	2	21.50	0.08753	15	M(B,T)AB	0.005836	22.81
NTPM910Q1-HXL-H35-NIAR-LC-C-C2-1-ETW-2	C	C2	3	2	22.73	0.08733	15	M(B,T)AT	0.005822	24.06
NTPM910Q1-HXL-H35-NIAR-LC-C-C2-1-ETW-3	C	C2	3	2	22.45	0.08713	15	M(B,T)AB	0.005809	23.71
NTPM910Q1-HXL-H35-NIAR-LC-C-C2-1-ETW-4	C	C2	3	2	21.48	0.08710	15	M(B,T)AB	0.005807	22.68
NTPM910Q1-HXL-H35-NIAR-LC-C-C2-1-ETW-5	C	C2	3	2	21.41	0.08725	15	M(B,T)AT	0.005817	22.64
NTPM910Q1-HXL-H35-NIAR-LC-C-C2-1-ETW-6	C	C2	3	2	21.70	0.08728	15	M(B,T)AT	0.005819	22.96

Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	Modulus _{norm} [Msi]
NTPM910Q1-HXL-H35-FACC-LC-D-C1-1-ETW-1	D	C1	4	1	21.74	0.08557	15	TAT	0.005704	22.54
NTPM910Q1-HXL-H35-FACC-LC-D-C1-1-ETW-2	D	C1	4	1	22.09	0.08532	15	TAT	0.005688	22.85
NTPM910Q1-HXL-H35-FACC-LC-D-C1-1-ETW-3	D	C1	4	1	22.46	0.08505	15	TAB	0.005670	23.16
NTPM910Q1-HXL-H35-FACC-LC-D-C1-1-ETW-4	D	C1	4	1	22.54	0.08488	15	BAT	0.005659	23.19
NTPM910Q1-HXL-H35-FACC-LC-D-C1-1-ETW-5	D	C1	4	1	22.49	0.08527	15	BAT	0.005684	23.24
NTPM910Q1-HXL-H35-FACC-LC-D-C2-1-ETW-1	D	C2	4	2	21.42	0.08570	15	BAT	0.005713	22.26
NTPM910Q1-HXL-H35-FACC-LC-D-C2-1-ETW-2	D	C2	4	2	21.51	0.08508	15	TAB	0.005672	22.18
NTPM910Q1-HXL-H35-FACC-LC-D-C2-1-ETW-3	D	C2	4	2	21.87	0.08528	15	BAT	0.005686	22.61
NTPM910Q1-HXL-H35-SKS-LC-E-C1-1-ETW-1	E	C1	5	1	22.43	0.08017	15	BAT	0.005344	21.80
NTPM910Q1-HXL-H35-SKS-LC-E-C1-1-ETW-2	E	C1	5	1	21.35	0.08395	15	BAT	0.005597	21.73
NTPM910Q1-HXL-H35-SKS-LC-E-C1-1-ETW-3	E	C1	5	1	21.70	0.08437	15	M(B,H)AT	0.005624	22.19
NTPM910Q1-HXL-H35-SKS-LC-E-C1-1-ETW-4	E	C1	5	1	21.12	0.08475	15	TAT	0.005650	21.70
NTPM910Q1-HXL-H35-SKS-LC-E-C1-1-ETW-5	E	C1	5	1	21.57	0.08448	15	TAT	0.005632	22.09
NTPM910Q1-HXL-H35-SKS-LC-E-C2-1-ETW-1	E	C2	5	2	21.71	0.08355	15	BAT	0.005570	21.99
NTPM910Q1-HXL-H35-SKS-LC-E-C2-1-ETW-2	E	C2	5	2	21.71	0.08415	15	TAB	0.005610	22.15
NTPM910Q1-HXL-H35-SKS-LC-E-C2-1-ETW-3	E	C2	5	2	21.80	0.08423	15	BAB	0.005616	22.26
NTPM910Q1-HXL-H35-SKS-LC-E-C2-1-ETW-4	E	C2	5	2	21.62	0.08488	15	M(B,H)AT	0.005659	22.24
NTPM910Q1-HXL-H35-SKS-LC-E-C2-1-ETW-5	E	C2	5	2	21.46	0.08483	15	BAT	0.005656	22.07
NTPM910Q1-HXL-H35-SKS-LC-E-C2-1-ETW-6	E	C2	5	2	21.65	0.08450	15	TAB	0.005633	22.18

Average	21.91	Average _{norm}	22.65
Standard Dev.	0.4093	Standard Dev. _{norm}	0.5105
Coeff. of Var. [%]	1.868	Coeff. of Var. [%] _{norm}	2.253
Min.	21.12	Min.	21.70
Max.	22.73	Max.	24.06
Number of Spec.	53	Number of Spec.	53

Longitudinal Compression Properties (LC)--ETW (180°F)
Normalized Modulus
Hexcel M91/IM8-GS UD Tape



4.4 Longitudinal Compression Back-out Factor Properties

Note: For each test condition, $F_{1^{cu}}$ [ksi] derived from cross-ply compression (UNC0) was calculated using back-out factor values. The back-out factor values are calculated using E_{1^c} , v_{12^c} and E_{2^c} values from each corresponding test condition, as shown in Table 1-1. For example, CTA $F_{1^{cu}}$ [ksi] derived from CTA UNC0 was calculated using CTA E_{1^c} , v_{12^c} and E_{2^c} , RTA $F_{1^{cu}}$ [ksi] derived from RTA UNC0 was calculated using RTA E_{1^c} , v_{12^c} and E_{2^c} , etc. Compressive Poisson's ratio was not available at the initial release of this document so a backout factor was calculated based upon a conservative assumption that the Poisson's ratio is 0. Follow-on testing is underway to obtain compressive Poisson's ratio. This report and the corresponding compressive data will be revised once this testing is complete.

Longitudinal Compression (LC) Back-out Factor Properties--CTA (-65°F)

Strength

Hexcel M91/IM8-GS UD Tape

UNC0 Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	F ₁ ^{CU meas} [ksi] from UNC0*
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C2-1-CTA-1	A	C2	1	2	298.3
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C2-1-CTA-2	A	C2	1	2	298.3
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C2-1-CTA-3	A	C2	1	2	310.9
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C2-1-CTA-4	A	C2	1	2	297.1
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C2-1-CTA-5	A	C2	1	2	299.8
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C2-1-CTA-6	A	C2	1	2	308.0
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C3-1-CTA-1	A	C3	1	3	270.9
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C3-1-CTA-2	A	C3	1	3	305.0
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C3-1-CTA-3	A	C3	1	3	305.4
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C3-1-CTA-4	A	C3	1	3	303.4
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C3-1-CTA-5	A	C3	1	3	294.5
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C1-1-CTA-1	B	C1	2	1	299.3
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C1-1-CTA-2	B	C1	2	1	299.0
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C1-1-CTA-3	B	C1	2	1	305.6
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C1-1-CTA-4	B	C1	2	1	297.5
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C1-1-CTA-5	B	C1	2	1	292.9
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C2-1-CTA-1	B	C2	2	2	295.2
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C2-1-CTA-2	B	C2	2	2	273.2
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C2-1-CTA-3	B	C2	2	2	294.7
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C2-1-CTA-4	B	C2	2	2	289.1
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C2-1-CTA-5	B	C2	2	2	297.3
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C2-1-CTA-6	B	C2	2	2	291.5
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C1-1-CTA-2	C	C1	3	1	270.4
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C1-1-CTA-3	C	C1	3	1	274.5
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C1-1-CTA-4	C	C1	3	1	279.1
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C1-1-CTA-5	C	C1	3	1	285.4
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C1-1-CTA-6	C	C1	3	1	289.1
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C2-1-CTA-1	C	C2	3	2	301.1
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C2-1-CTA-2	C	C2	3	2	259.1
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C2-1-CTA-3	C	C2	3	2	246.1
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C2-1-CTA-5	C	C2	3	2	286.1
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C2-1-CTA-6	C	C2	3	2	278.5
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C2-1-CTA-7	C	C2	3	2	279.2

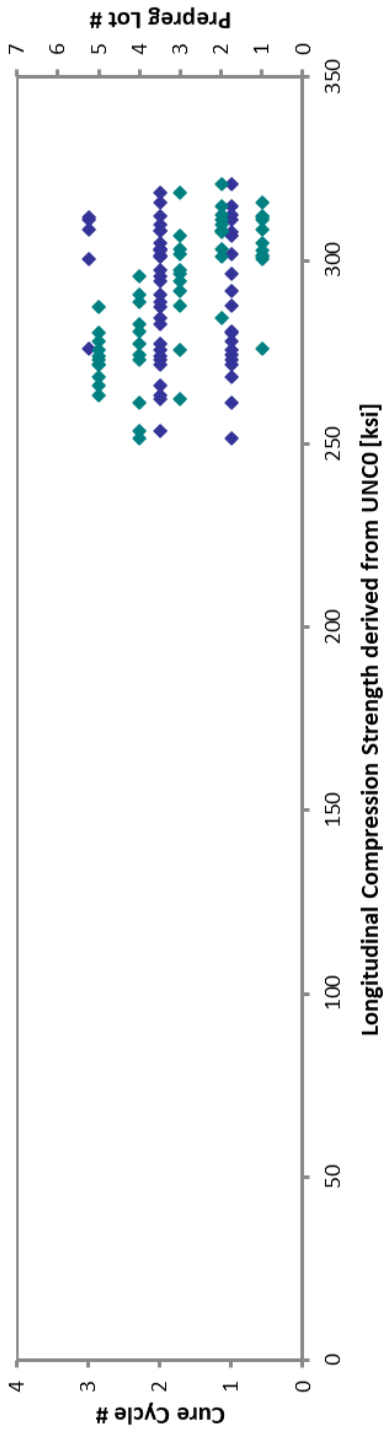
F ₁ ^{CU norm} [ksi] from UNC0**
301.0
302.8
315.8
301.4
304.7
312.0
275.8
311.1
311.6
308.5
300.4
314.7
312.5
320.9
311.0
307.6
308.1
284.2
308.0
300.9
309.9
303.0
287.7
291.6
296.5
301.7
306.8
318.6
275.7
262.1
303.1
294.2
297.3

UNC0 Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	F ₁ ^{CU meas} [ksi] from UNC0*	F ₁ ^{CU norm} [ksi] from UNC0**
NTPM910Q1-HXL-H35-FACC-UNC0-D-C1-1-CTA-1	D	C1	4	1	265.2	272.9
NTPM910Q1-HXL-H35-FACC-UNC0-D-C1-1-CTA-2	D	C1	4	1	243.9	251.4
NTPM910Q1-HXL-H35-FACC-UNC0-D-C1-1-CTA-3	D	C1	4	1	253.7	261.3
NTPM910Q1-HXL-H35-FACC-UNC0-D-C1-1-CTA-4	D	C1	4	1	266.1	274.2
NTPM910Q1-HXL-H35-FACC-UNC0-D-C1-1-CTA-5	D	C1	4	1	273.3	280.6
NTPM910Q1-HXL-H35-FACC-UNC0-D-C2-1-CTA-1	D	C2	4	2	282.4	290.8
NTPM910Q1-HXL-H35-FACC-UNC0-D-C2-1-CTA-2	D	C2	4	2	287.7	295.7
NTPM910Q1-HXL-H35-FACC-UNC0-D-C2-1-CTA-3	D	C2	4	2	280.4	288.7
NTPM910Q1-HXL-H35-FACC-UNC0-D-C2-1-CTA-4	D	C2	4	2	246.0	253.6
NTPM910Q1-HXL-H35-FACC-UNC0-D-C2-1-CTA-5	D	C2	4	2	274.9	282.7
NTPM910Q1-HXL-H35-FACC-UNC0-D-C2-1-CTA-6	D	C2	4	2	269.1	277.1
NTPM910Q1-HXL-H35-SKS-UNC0-E-C1-1-CTA-1	E	C1	5	1	268.5	268.1
NTPM910Q1-HXL-H35-SKS-UNC0-E-C1-1-CTA-2	E	C1	5	1	280.5	280.4
NTPM910Q1-HXL-H35-SKS-UNC0-E-C1-1-CTA-3	E	C1	5	1	268.5	271.4
NTPM910Q1-HXL-H35-SKS-UNC0-E-C1-1-CTA-4	E	C1	5	1	271.8	278.1
NTPM910Q1-HXL-H35-SKS-UNC0-E-C1-1-CTA-5	E	C1	5	1	270.4	275.5
NTPM910Q1-HXL-H35-SKS-UNC0-E-C2-1-CTA-1	E	C2	5	2	268.4	263.2
NTPM910Q1-HXL-H35-SKS-UNC0-E-C2-1-CTA-2	E	C2	5	2	287.8	287.3
NTPM910Q1-HXL-H35-SKS-UNC0-E-C2-1-CTA-3	E	C2	5	2	271.1	273.9
NTPM910Q1-HXL-H35-SKS-UNC0-E-C2-1-CTA-4	E	C2	5	2	266.2	271.6
NTPM910Q1-HXL-H35-SKS-UNC0-E-C2-1-CTA-5	E	C2	5	2	268.8	272.8
NTPM910Q1-HXL-H35-SKS-UNC0-E-C2-1-CTA-6	E	C2	5	2	260.4	265.7

*CTA Back-out factor_{meas} = 1.868**CTA Back-out factor_{norm} = 1.872

Average	281.8	Average_{norm}	290.9
Standard Dev.	16.90	Standard Dev_{norm}	18.26
Coeff. of Var. [%]	5.996	Coeff. of Var. [%]_{norm}	6.279
Min.	243.9	Min.	251.4
Max.	310.9	Max.	320.9
Number of Spec.	55	Number of Spec.	55

Longitudinal Compression (LC) Backout Factor Properties--
CTA (-65°F)
Normalized Strength
Hexcel M91/IM8-GS UD Tape



Longitudinal Compression (LC) Back-out Factor Properties--RTA (70°F)

Strength

Hexcel M91/IM8-GS UD Tape

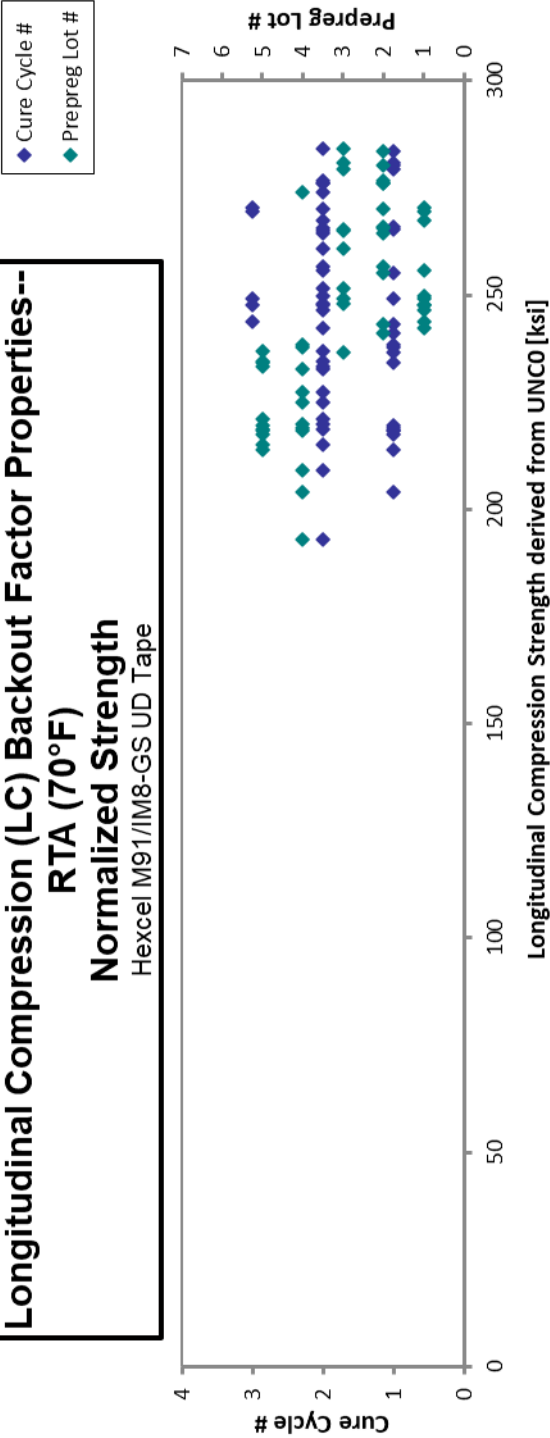
UNC0 Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	F ₁ ^{CU meas} [ksi] from UNC0*	F ₁ ^{CU norm} [ksi] from UNC0**
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C2-1-RTA-1	A	C2	1	2	253.2	255.7
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C2-1-RTA-2	A	C2	1	2	244.5	247.6
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C2-1-RTA-3	A	C2	1	2	263.6	267.5
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C2-1-RTA-4	A	C2	1	2	241.7	242.3
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C2-1-RTA-6	A	C2	1	2	247.7	249.8
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C2-1-RTA-7	A	C2	1	2	243.0	246.3
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C3-1-RTA-1	A	C3	1	3	243.7	247.6
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C3-1-RTA-3	A	C3	1	3	244.0	249.2
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C3-1-RTA-4	A	C3	1	3	264.3	269.5
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C3-1-RTA-5	A	C3	1	3	267.5	270.5
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C3-1-RTA-6	A	C3	1	3	240.2	243.9
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C1-1-RTA-1	B	C1	2	1	266.9	280.4
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C1-1-RTA-2	B	C1	2	1	242.0	255.1
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C1-1-RTA-3	B	C1	2	1	267.8	283.6
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C1-1-RTA-4	B	C1	2	1	232.2	241.2
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C1-1-RTA-5	B	C1	2	1	252.9	265.9
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C1-1-RTA-6	B	C1	2	1	231.7	243.3
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C2-1-RTA-1	B	C2	2	2	254.6	265.6
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C2-1-RTA-2	B	C2	2	2	257.7	270.2
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C2-1-RTA-3	B	C2	2	2	263.0	276.0
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C2-1-RTA-4	B	C2	2	2	264.7	275.9
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C2-1-RTA-5	B	C2	2	2	265.2	276.6
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C2-1-RTA-6	B	C2	2	2	253.1	264.5
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C2-1-RTA-7	B	C2	2	2	245.3	256.6
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C1-1-RTA-1	C	C1	3	1	248.8	265.2
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C1-1-RTA-3	C	C1	3	1	263.7	280.9
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C1-1-RTA-4	C	C1	3	1	223.7	236.6
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C1-1-RTA-5	C	C1	3	1	236.7	249.2
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C1-1-RTA-6	C	C1	3	1	262.2	279.4
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C2-1-RTA-3	C	C2	3	2	238.3	251.5
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C2-1-RTA-4	C	C2	3	2	269.7	284.1
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C2-1-RTA-5	C	C2	3	2	235.0	248.1
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C2-1-RTA-6	C	C2	3	2	250.5	265.1
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C2-1-RTA-7	C	C2	3	2	245.2	260.8

UNC0 Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	$F_1^{CU\ meas}$ [ksij] from UNC0*	$F_1^{CU\ norm}$ [ksij] from UNC0**
NTPM910Q1-HXL-H35-FACC-UNC0-D-C1-1-RTA-1	D	C1	4	1	199.6	204.0
NTPM910Q1-HXL-H35-FACC-UNC0-D-C1-1-RTA-2	D	C1	4	1	212.9	218.4
NTPM910Q1-HXL-H35-FACC-UNC0-D-C1-1-RTA-3	D	C1	4	1	211.1	219.1
NTPM910Q1-HXL-H35-FACC-UNC0-D-C1-1-RTA-4	D	C1	4	1	232.6	237.9
NTPM910Q1-HXL-H35-FACC-UNC0-D-C1-1-RTA-5	D	C1	4	1	234.3	238.3
NTPM910Q1-HXL-H35-FACC-UNC0-D-C2-1-RTA-1	D	C2	4	2	267.9	274.1
NTPM910Q1-HXL-H35-FACC-UNC0-D-C2-1-RTA-2	D	C2	4	2	227.9	232.7
NTPM910Q1-HXL-H35-FACC-UNC0-D-C2-1-RTA-3	D	C2	4	2	187.12	193.0
NTPM910Q1-HXL-H35-FACC-UNC0-D-C2-1-RTA-4	D	C2	4	2	217.8	224.8
NTPM910Q1-HXL-H35-FACC-UNC0-D-C2-1-RTA-5	D	C2	4	2	215.3	219.8
NTPM910Q1-HXL-H35-FACC-UNC0-D-C2-1-RTA-6	D	C2	4	2	218.3	227.3
NTPM910Q1-HXL-H35-FACC-UNC0-D-C2-1-RTA-7	D	C2	4	2	204.4	209.1
NTPM910Q1-HXL-H35-SKS-UNC0-E-C1-1-RTA-1	E	C1	5	1	215.9	219.6
NTPM910Q1-HXL-H35-SKS-UNC0-E-C1-1-RTA-2	E	C1	5	1	214.8	218.3
NTPM910Q1-HXL-H35-SKS-UNC0-E-C1-1-RTA-3	E	C1	5	1	212.8	217.3
NTPM910Q1-HXL-H35-SKS-UNC0-E-C1-1-RTA-4	E	C1	5	1	209.3	213.9
NTPM910Q1-HXL-H35-SKS-UNC0-E-C1-1-RTA-5	E	C1	5	1	229.6	234.3
NTPM910Q1-HXL-H35-SKS-UNC0-E-C2-1-RTA-1	E	C2	5	2	230.7	234.5
NTPM910Q1-HXL-H35-SKS-UNC0-E-C2-1-RTA-2	E	C2	5	2	211.2	215.1
NTPM910Q1-HXL-H35-SKS-UNC0-E-C2-1-RTA-3	E	C2	5	2	217.0	221.0
NTPM910Q1-HXL-H35-SKS-UNC0-E-C2-1-RTA-4	E	C2	5	2	217.3	218.7
NTPM910Q1-HXL-H35-SKS-UNC0-E-C2-1-RTA-5	E	C2	5	2	232.6	236.8
NTPM910Q1-HXL-H35-SKS-UNC0-E-C2-1-RTA-6	E	C2	5	2	227.9	233.4

*RTA Back-out factor_{meas} = 1.881**RTA Back-out factor_{norm} = 1.884

Average	238.1	Average_{norm}	246.1
Standard Dev.	20.61	Standard Dev_{norm}	23.16
Coeff. of Var. [%]	8.654	Coeff. of Var. [%]_{norm}	9.411
Min.	187.1	Min.	193.0
Max.	269.7	Max.	284.1
Number of Spec.	57	Number of Spec.	57

Longitudinal Compression (LC) Backout Factor Properties--
RTA (70°F)
Normalized Strength
Hexcel M91/IM8-GS UD Tape



Longitudinal Compression (LC) Back-out Factor Properties--ETW (180°F)

Strength

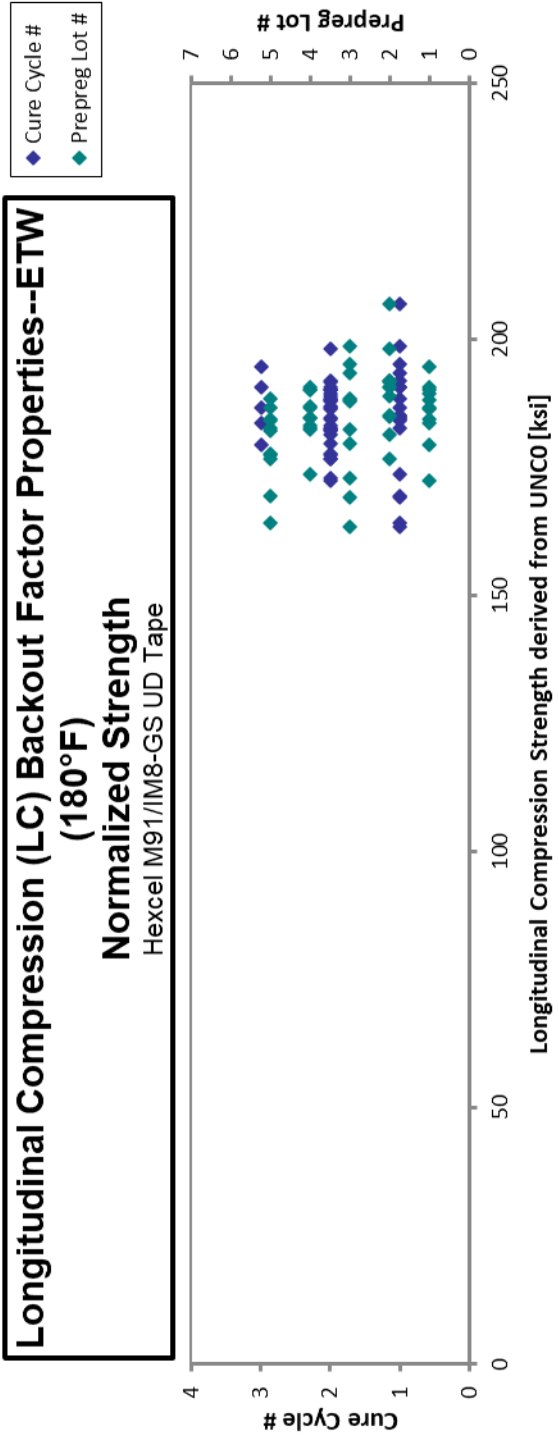
Hexcel M91/IM8-GS UD Tape

UNC0 Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	F ₁ ^{CU meas} [ksj] from UNC0*	F ₁ ^{CU norm} [ksj] from UNC0**
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C2-1-ETW-1	A	C2	1	2	183.8	186.3
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C2-1-ETW-2	A	C2	1	2	187.9	189.5
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C2-1-ETW-3	A	C2	1	2	188.0	190.0
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C2-1-ETW-4	A	C2	1	2	170.8	172.3
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C2-1-ETW-5	A	C2	1	2	186.6	188.2
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C2-1-ETW-6	A	C2	1	2	182.0	184.4
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C3-1-ETW-1	A	C3	1	3	191.1	194.6
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C3-1-ETW-2	A	C3	1	3	180.9	183.6
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C3-1-ETW-3	A	C3	1	3	187.7	190.6
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C3-1-ETW-4	A	C3	1	3	176.6	179.4
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C3-1-ETW-5	A	C3	1	3	183.4	186.6
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C1-1-ETW-1	B	C1	2	1	175.9	184.9
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C1-1-ETW-2	B	C1	2	1	180.6	190.7
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C1-1-ETW-3	B	C1	2	1	175.7	185.1
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C1-1-ETW-4	B	C1	2	1	195.9	207.0
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C1-1-ETW-5	B	C1	2	1	182.5	192.0
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C2-1-ETW-1	B	C2	2	2	168.4	176.6
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C2-1-ETW-2	B	C2	2	2	183.2	192.0
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C2-1-ETW-3	B	C2	2	2	181.2	190.7
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C2-1-ETW-4	B	C2	2	2	189.1	198.2
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C2-1-ETW-5	B	C2	2	2	179.7	188.9
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C2-1-ETW-6	B	C2	2	2	172.6	181.4
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C2-1-ETW-7	B	C2	2	2	182.1	191.6
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C1-1-ETW-1	C	C1	3	1	181.5	193.5
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C1-1-ETW-2	C	C1	3	1	186.4	198.7
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C1-1-ETW-3	C	C1	3	1	183.0	195.3
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C1-1-ETW-4	C	C1	3	1	154.4	163.3
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C1-1-ETW-5	C	C1	3	1	164.4	169.3
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C2-1-ETW-1	C	C2	3	2	171.6	182.3
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C2-1-ETW-2	C	C2	3	2	179.1	188.1
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C2-1-ETW-3	C	C2	3	2	176.7	188.3
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C2-1-ETW-4	C	C2	3	2	162.1	173.0
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C2-1-ETW-5	C	C2	3	2	168.8	179.8
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C2-1-ETW-6	C	C2	3	2	177.9	188.0

UNC0 Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	$F_1^{CU\ meas}$ [ksi] from UNC0*	$F_1^{CU\ norm}$ [ksi] from UNC0**
NTPM910Q1-HXL-H35-FACC-UNC0-D-C1-1-ETW-1	D	C1	4	1	168.2	173.6
NTPM910Q1-HXL-H35-FACC-UNC0-D-C1-1-ETW-2	D	C1	4	1	181.0	186.7
NTPM910Q1-HXL-H35-FACC-UNC0-D-C1-1-ETW-3	D	C1	4	1	179.6	184.8
NTPM910Q1-HXL-H35-FACC-UNC0-D-C1-1-ETW-4	D	C1	4	1	176.9	182.7
NTPM910Q1-HXL-H35-FACC-UNC0-D-C1-1-ETW-5	D	C1	4	1	184.7	190.8
NTPM910Q1-HXL-H35-FACC-UNC0-D-C2-1-ETW-1	D	C2	4	2	177.6	182.3
NTPM910Q1-HXL-H35-FACC-UNC0-D-C2-1-ETW-2	D	C2	4	2	177.3	183.1
NTPM910Q1-HXL-H35-FACC-UNC0-D-C2-1-ETW-3	D	C2	4	2	180.7	184.7
NTPM910Q1-HXL-H35-FACC-UNC0-D-C2-1-ETW-4	D	C2	4	2	184.3	190.1
NTPM910Q1-HXL-H35-FACC-UNC0-D-C2-1-ETW-5	D	C2	4	2	186.0	190.1
NTPM910Q1-HXL-H35-FACC-UNC0-D-C2-1-ETW-6	D	C2	4	2	181.4	186.9
NTPM910Q1-HXL-H35-SKS-UNC0-E-C1-1-ETW-1	E	C1	5	1	159.6	164.3
NTPM910Q1-HXL-H35-SKS-UNC0-E-C1-1-ETW-2	E	C1	5	1	179.0	184.4
NTPM910Q1-HXL-H35-SKS-UNC0-E-C1-1-ETW-3	E	C1	5	1	163.7	169.4
NTPM910Q1-HXL-H35-SKS-UNC0-E-C1-1-ETW-4	E	C1	5	1	180.5	184.3
NTPM910Q1-HXL-H35-SKS-UNC0-E-C1-1-ETW-5	E	C1	5	1	183.0	188.5
NTPM910Q1-HXL-H35-SKS-UNC0-E-C2-1-ETW-1	E	C2	5	2	176.9	182.2
NTPM910Q1-HXL-H35-SKS-UNC0-E-C2-1-ETW-2	E	C2	5	2	172.9	176.6
NTPM910Q1-HXL-H35-SKS-UNC0-E-C2-1-ETW-3	E	C2	5	2	183.9	186.7
NTPM910Q1-HXL-H35-SKS-UNC0-E-C2-1-ETW-4	E	C2	5	2	178.1	177.8
NTPM910Q1-HXL-H35-SKS-UNC0-E-C2-1-ETW-5	E	C2	5	2	184.8	177.5
NTPM910Q1-HXL-H35-SKS-UNC0-E-C2-1-ETW-6	E	C2	5	2	180.3	182.8

*ETW Back-out factor_{meas} = 1.893**ETW Back-out factor_{norm} = 1.897

Average	178.8	Average_{norm}	184.9
Standard Dev.	7.984	Standard Dev_{norm}	8.259
Coeff. of Var. [%]	4.466	Coeff. of Var. [%]_{norm}	4.467
Min.	154.4	Min.	163.3
Max.	195.9	Max.	207.0
Number of Spec.	56	Number of Spec.	56



4.5 Transverse Compression Properties (TC)

Transverse Compression Properties (TC)--CTA (-65°F) ☐	
Strength & Modulus ☐	
Hexcel M91/IM8-GS UD Tape	

Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t _{ply} [in]	Failure Mode
NTPM910Q1-HXL-H35-NIAR-TC-A-C1-1-CTA-1	A	C1	1	1	47.48	1.489	0.08377	15	0.005584	BGM
NTPM910Q1-HXL-H35-NIAR-TC-A-C1-1-CTA-2	A	C1	1	1	49.13	1.559	0.08430	15	0.005620	BGM
NTPM910Q1-HXL-H35-NIAR-TC-A-C1-1-CTA-3	A	C1	1	1	45.25	1.565	0.08432	15	0.005621	BGM
NTPM910Q1-HXL-H35-NIAR-TC-A-C1-1-CTA-4	A	C1	1	1	44.22	1.551	0.08433	15	0.005622	BGM
NTPM910Q1-HXL-H35-NIAR-TC-A-C1-1-CTA-5	A	C1	1	1	47.31	1.534	0.08388	15	0.005592	BGM
NTPM910Q1-HXL-H35-NIAR-TC-A-C2-1-CTA-1	A	C2	1	2	46.67	1.531	0.08270	15	0.005513	BGM
NTPM910Q1-HXL-H35-NIAR-TC-A-C2-1-CTA-2	A	C2	1	2	49.15	1.559	0.08383	15	0.005589	BGM
NTPM910Q1-HXL-H35-NIAR-TC-A-C2-1-CTA-3	A	C2	1	2	47.60	1.586	0.08418	15	0.005612	BGM
NTPM910Q1-HXL-H35-NIAR-TC-A-C2-1-CTA-4	A	C2	1	2	46.93	1.586	0.08415	15	0.005610	BGM
NTPM910Q1-HXL-H35-NIAR-TC-A-C2-1-CTA-5	A	C2	1	2	46.89	1.537	0.08378	15	0.005586	BGM
NTPM910Q1-HXL-H35-NIAR-TC-A-C2-1-CTA-6	A	C2	1	2	46.80	1.637	0.08362	15	0.005574	BGM
NTPM910Q1-HXL-H35-NIAR-TC-B-C1-1-CTA-1	B	C1	2	1	48.26	1.529	0.08618	15	0.005746	BGM
NTPM910Q1-HXL-H35-NIAR-TC-B-C1-1-CTA-2	B	C1	2	1	47.75	1.547	0.08740	15	0.005827	HGM
NTPM910Q1-HXL-H35-NIAR-TC-B-C1-1-CTA-3	B	C1	2	1	48.08	1.516	0.08668	15	0.005779	BGM
NTPM910Q1-HXL-H35-NIAR-TC-B-C1-1-CTA-4	B	C1	2	1	46.21	1.548	0.08665	15	0.005777	BGM
NTPM910Q1-HXL-H35-NIAR-TC-B-C1-1-CTA-5	B	C1	2	1	46.21	1.581	0.08668	15	0.005779	BGM
NTPM910Q1-HXL-H35-NIAR-TC-B-C2-1-CTA-1	B	C2	2	2	48.47	1.531	0.08588	15	0.005726	BGM
NTPM910Q1-HXL-H35-NIAR-TC-B-C2-1-CTA-2	B	C2	2	2	46.38	1.511	0.08685	15	0.005790	BGM
NTPM910Q1-HXL-H35-NIAR-TC-B-C2-1-CTA-3	B	C2	2	2	47.84	1.564	0.08720	15	0.005813	BGM
NTPM910Q1-HXL-H35-NIAR-TC-B-C2-1-CTA-4	B	C2	2	2	47.70	1.561	0.08717	15	0.005811	BGM
NTPM910Q1-HXL-H35-NIAR-TC-B-C2-1-CTA-5	B	C2	2	2	49.67	1.538	0.08692	15	0.005794	BGM
NTPM910Q1-HXL-H35-NIAR-TC-B-C2-1-CTA-6	B	C2	2	2	47.13	1.560	0.08680	15	0.005787	BGM
NTPM910Q1-HXL-H35-NIAR-TC-C-C1-1-CTA-1	C	C1	3	1	48.59	1.518	0.08588	15	0.005726	BGM
NTPM910Q1-HXL-H35-NIAR-TC-C-C1-1-CTA-2	C	C1	3	1	46.99	1.560	0.08747	15	0.005831	BGM
NTPM910Q1-HXL-H35-NIAR-TC-C-C1-1-CTA-3	C	C1	3	1	46.34	1.555	0.08745	15	0.005830	HGM
NTPM910Q1-HXL-H35-NIAR-TC-C-C1-1-CTA-4	C	C1	3	1	46.30	1.529	0.08777	15	0.005851	BGM
NTPM910Q1-HXL-H35-NIAR-TC-C-C1-1-CTA-5	C	C1	3	1	46.83	1.571	0.08735	15	0.005823	BGM
NTPM910Q1-HXL-H35-NIAR-TC-C-C2-1-CTA-1	C	C2	3	2	47.86	1.478	0.08615	15	0.005743	HGM
NTPM910Q1-HXL-H35-NIAR-TC-C-C2-1-CTA-2	C	C2	3	2	47.49	1.573	0.08672	15	0.005781	HGM
NTPM910Q1-HXL-H35-NIAR-TC-C-C2-1-CTA-3	C	C2	3	2	46.34	1.594	0.08710	15	0.005807	BGM
NTPM910Q1-HXL-H35-NIAR-TC-C-C2-1-CTA-4	C	C2	3	2	46.19	1.474	0.08682	15	0.005788	BGM
NTPM910Q1-HXL-H35-NIAR-TC-C-C2-1-CTA-5	C	C2	3	2	48.88	1.569	0.08630	15	0.005753	BGM
NTPM910Q1-HXL-H35-NIAR-TC-C-C2-1-CTA-6	C	C2	3	2	47.18	1.475	0.08603	15	0.005736	HGM

Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{pi} [in]	Failure Mode
NTPM910Q1-HXL-H35-FACC-TC-D-C1-1-CTA-1	D	C1	4	1	42.06	1.567	0.08448	15	0.005632	BGM
NTPM910Q1-HXL-H35-FACC-TC-D-C1-1-CTA-2	D	C1	4	1	43.01	1.424	0.08472	15	0.005648	BGM
NTPM910Q1-HXL-H35-FACC-TC-D-C1-1-CTA-3	D	C1	4	1	48.23	1.489	0.08410	15	0.005607	BGM
NTPM910Q1-HXL-H35-FACC-TC-D-C1-1-CTA-4	D	C1	4	1	47.26	1.314	0.08482	15	0.005654	BGM
NTPM910Q1-HXL-H35-FACC-TC-D-C1-1-CTA-5	D	C1	4	1	46.69	1.508	0.08485	15	0.005657	BGM
NTPM910Q1-HXL-H35-FACC-TC-D-C3-1-CTA-1	D	C3	4	3	47.59	1.554	0.08405	15	0.005603	M(B,H)GM
NTPM910Q1-HXL-H35-FACC-TC-D-C3-1-CTA-2	D	C3	4	3	46.34	1.536	0.08493	15	0.005662	M(B,H)GM
NTPM910Q1-HXL-H35-FACC-TC-D-C3-1-CTA-3	D	C3	4	3	45.12	1.521	0.08560	15	0.005707	BGM
NTPM910Q1-HXL-H35-FACC-TC-D-C3-1-CTA-4	D	C3	4	3	49.64	1.543	0.08457	15	0.005638	M(B,H)GM
NTPM910Q1-HXL-H35-FACC-TC-D-C3-1-CTA-5	D	C3	4	3	49.12	1.550	0.08438	15	0.005626	BAB
NTPM910Q1-HXL-H35-FACC-TC-D-C3-1-CTA-6	D	C3	4	3	48.93	1.529	0.08390	15	0.005593	M(B,H)GM
NTPM910Q1-HXL-H35-SKS-TC-E-C1-1-CTA-1	E	C1	5	1	46.15	1.503	0.08408	15	0.005606	BGM
NTPM910Q1-HXL-H35-SKS-TC-E-C1-1-CTA-2	E	C1	5	1	43.55	1.493	0.08445	15	0.005630	BGM
NTPM910Q1-HXL-H35-SKS-TC-E-C1-1-CTA-3	E	C1	5	1	48.45	1.489	0.08443	15	0.005629	BGM
NTPM910Q1-HXL-H35-SKS-TC-E-C1-1-CTA-4	E	C1	5	1	47.09	1.463	0.08438	15	0.005626	BGM
NTPM910Q1-HXL-H35-SKS-TC-E-C1-1-CTA-5	E	C1	5	1	48.62	1.531	0.08262	15	0.005508	BGM,HAT
NTPM910Q1-HXL-H35-SKS-TC-E-C2-1-CTA-1	E	C2	5	2	47.95	1.835	0.07962	15	0.005308	HAB, HAT
NTPM910Q1-HXL-H35-SKS-TC-E-C2-1-CTA-2	E	C2	5	2	48.74	1.679	0.08237	15	0.005491	BGM
NTPM910Q1-HXL-H35-SKS-TC-E-C2-1-CTA-3	E	C2	5	2	45.97	1.399	0.08228	15	0.005486	BGM, HAT
NTPM910Q1-HXL-H35-SKS-TC-E-C2-1-CTA-4	E	C2	5	2	52.01	1.504	0.08232	15	0.005488	BGM
NTPM910Q1-HXL-H35-SKS-TC-E-C2-1-CTA-5	E	C2	5	2	47.41	1.424	0.08317	15	0.005544	BGM
NTPM910Q1-HXL-H35-SKS-TC-E-C2-1-CTA-6	E	C2	5	2	45.51	1.436	0.08328	15	0.005552	BGM, HAB

0.005668

1.533

Average

47.19

1.692

0.07109

Standard Dev.

0.005308

4.638

Coeff. of Var. [%]

3.586

42.06

Min.

52.01

Max.

0.005851

1.835

Number of Spec.

55

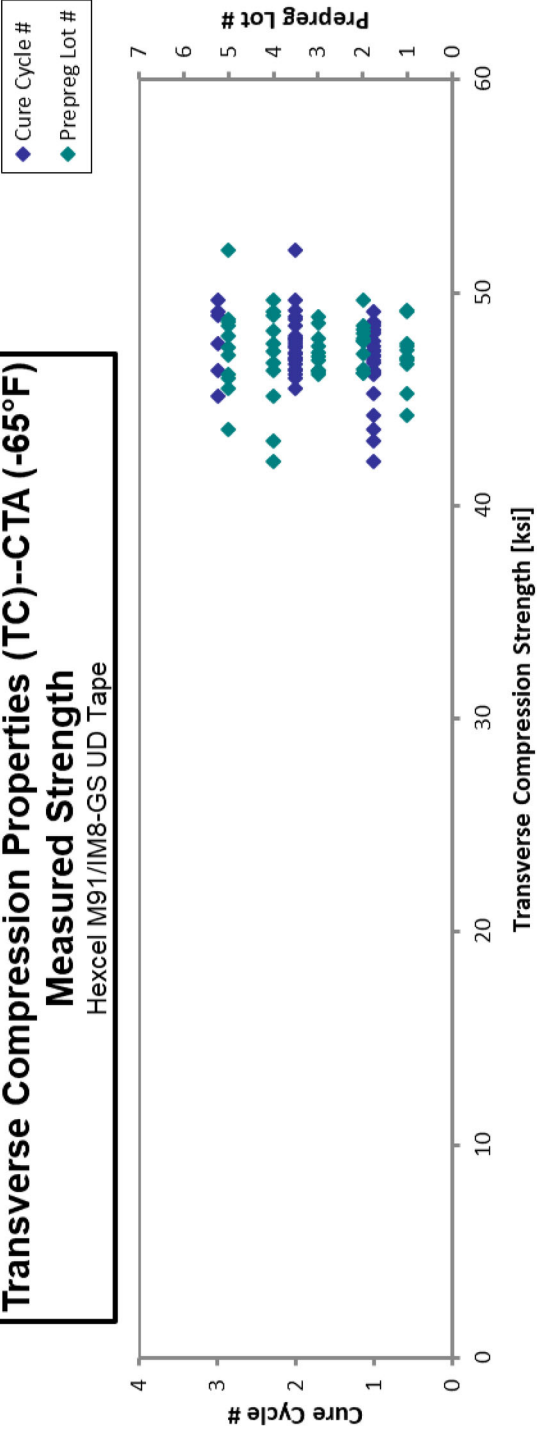
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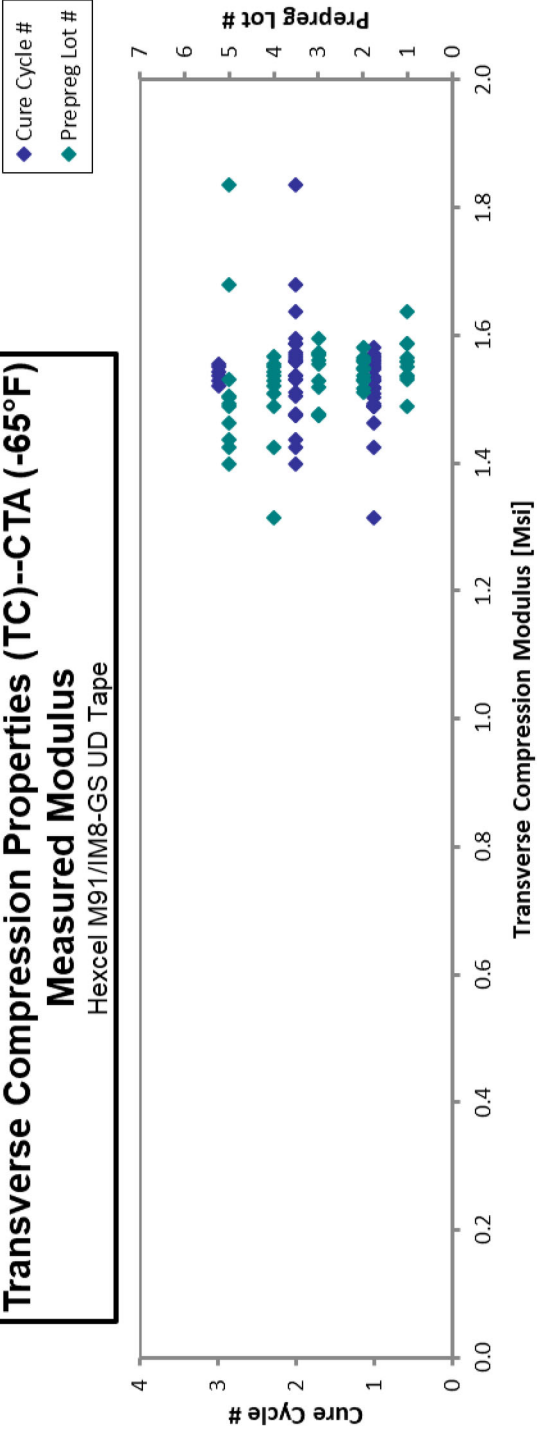
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Transverse Compression Properties (TC)--CTA (-65°F)
Measured Strength
Hexcel M91/IM8-GS UD Tape



Transverse Compression Properties (TC)--CTA (-65°F)
Measured Modulus
Hexcel M91/IM8-GS UD Tape



Transverse Compression Properties (TC)--RTA (70°F) ☐
Strength & Modulus ☐
Hexcel M91/IM8-GS UD Tape

Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t _{ply} [in]	Failure Mode
NTPM910Q1-HXL-H35-NIAR-TC-A-C1-1-RTA-1	A	C1	1	1	34.43	1.430	0.08445	15	0.005630	BGM
NTPM910Q1-HXL-H35-NIAR-TC-A-C1-1-RTA-2	A	C1	1	1	34.79	1.384	0.08440	15	0.005627	BGM
NTPM910Q1-HXL-H35-NIAR-TC-A-C1-1-RTA-3	A	C1	1	1	35.73	1.364	0.08432	15	0.005621	HGM
NTPM910Q1-HXL-H35-NIAR-TC-A-C1-1-RTA-4	A	C1	1	1	34.56	1.404	0.08447	15	0.005631	BGM
NTPM910Q1-HXL-H35-NIAR-TC-A-C1-1-RTA-5	A	C1	1	1	35.86	1.359	0.08415	15	0.005610	HGM, HAT
NTPM910Q1-HXL-H35-NIAR-TC-A-C2-1-RTA-1	A	C2	1	2	33.77	1.391	0.08403	15	0.005602	BGM
NTPM910Q1-HXL-H35-NIAR-TC-A-C2-1-RTA-2	A	C2	1	2	34.19	1.388	0.08388	15	0.005592	BGM, HAB
NTPM910Q1-HXL-H35-NIAR-TC-A-C2-1-RTA-3	A	C2	1	2	34.64	1.425	0.08370	15	0.005580	BGM
NTPM910Q1-HXL-H35-NIAR-TC-A-C2-1-RTA-4	A	C2	1	2	32.51	1.425	0.08363	15	0.005576	BGM, HAB
NTPM910Q1-HXL-H35-NIAR-TC-A-C2-1-RTA-5	A	C2	1	2	33.79	1.392	0.08365	15	0.005577	BGM
NTPM910Q1-HXL-H35-NIAR-TC-A-C2-1-RTA-6	A	C2	1	2	34.63	1.375	0.08347	15	0.005564	HGM, HAB
NTPM910Q1-HXL-H35-NIAR-TC-B-C1-1-RTA-1	B	C1	2	1	35.98	1.360	0.08648	15	0.005766	BGM
NTPM910Q1-HXL-H35-NIAR-TC-B-C1-1-RTA-2	B	C1	2	1	35.33	1.353	0.08715	15	0.005810	BGM
NTPM910Q1-HXL-H35-NIAR-TC-B-C1-1-RTA-3	B	C1	2	1	35.68	1.356	0.08660	15	0.005773	BGM
NTPM910Q1-HXL-H35-NIAR-TC-B-C1-1-RTA-4	B	C1	2	1	34.87	1.371	0.08637	15	0.005758	BGM
NTPM910Q1-HXL-H35-NIAR-TC-B-C1-1-RTA-5	B	C1	2	1	35.03	1.389	0.08677	15	0.005784	BGM, HAB
NTPM910Q1-HXL-H35-NIAR-TC-B-C2-1-RTA-1	B	C2	2	2	35.55	1.387	0.08720	15	0.005813	BGM, HAB
NTPM910Q1-HXL-H35-NIAR-TC-B-C2-1-RTA-2	B	C2	2	2	35.39	1.406	0.08690	15	0.005793	BGM, HAT
NTPM910Q1-HXL-H35-NIAR-TC-B-C2-1-RTA-3	B	C2	2	2	34.65	1.401	0.08692	15	0.005794	BGM
NTPM910Q1-HXL-H35-NIAR-TC-B-C2-1-RTA-4	B	C2	2	2	35.48	1.408	0.08680	15	0.005787	BGM
NTPM910Q1-HXL-H35-NIAR-TC-B-C2-1-RTA-5	B	C2	2	2	34.82	1.415	0.08655	15	0.005770	HAT, HAB
NTPM910Q1-HXL-H35-NIAR-TC-B-C2-1-RTA-6	B	C2	2	2	35.54	1.375	0.08658	15	0.005772	HGM, HAB
NTPM910Q1-HXL-H35-NIAR-TC-C-C1-1-RTA-1	C	C1	3	1	34.65	1.405	0.08695	15	0.005797	BGM, HAB
NTPM910Q1-HXL-H35-NIAR-TC-C-C1-1-RTA-2	C	C1	3	1	33.63	1.382	0.08693	15	0.005796	BGM
NTPM910Q1-HXL-H35-NIAR-TC-C-C1-1-RTA-3	C	C1	3	1	34.41	1.346	0.08732	15	0.005821	BGM
NTPM910Q1-HXL-H35-NIAR-TC-C-C1-1-RTA-4	C	C1	3	1	33.42	1.418	0.08708	15	0.005806	BGM, HAB
NTPM910Q1-HXL-H35-NIAR-TC-C-C1-1-RTA-5	C	C1	3	1	34.59	1.383	0.08682	15	0.005788	BGM, HAT
NTPM910Q1-HXL-H35-NIAR-TC-C-C2-1-RTA-1	C	C2	3	2	34.80	1.301	0.08643	15	0.005762	BGM
NTPM910Q1-HXL-H35-NIAR-TC-C-C2-1-RTA-2	C	C2	3	2	33.96	1.344	0.08660	15	0.005773	BGM
NTPM910Q1-HXL-H35-NIAR-TC-C-C2-1-RTA-3	C	C2	3	2	34.46	1.388	0.08668	15	0.005779	BGM
NTPM910Q1-HXL-H35-NIAR-TC-C-C2-1-RTA-4	C	C2	3	2	33.23	1.410	0.08640	15	0.005760	BGM
NTPM910Q1-HXL-H35-NIAR-TC-C-C2-1-RTA-5	C	C2	3	2	35.30	1.364	0.08633	15	0.005756	BGM, HAT
NTPM910Q1-HXL-H35-NIAR-TC-C-C2-1-RTA-6	C	C2	3	2	33.65	1.386	0.08627	15	0.005751	BGM, HAT

Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{pi} [in]	Failure Mode
NTPM910Q1-HXL-H35-FACC-TC-D-C1-1-RTA-1	D	C1	4	1	36.23	1.344	0.08520	15	0.005680	BGM,HAT
NTPM910Q1-HXL-H35-FACC-TC-D-C1-1-RTA-2	D	C1	4	1	37.39	1.346	0.08510	15	0.005673	BGM
NTPM910Q1-HXL-H35-FACC-TC-D-C1-1-RTA-3	D	C1	4	1	35.99	1.365	0.08473	15	0.005649	BGM
NTPM910Q1-HXL-H35-FACC-TC-D-C1-1-RTA-4	D	C1	4	1	35.79	1.308	0.08465	15	0.005643	BAB,HAT
NTPM910Q1-HXL-H35-FACC-TC-D-C1-1-RTA-5	D	C1	4	1	34.77	1.353	0.08510	15	0.005673	BGM
NTPM910Q1-HXL-H35-FACC-TC-D-C3-1-RTA-1	D	C3	4	3	37.24	1.366	0.08468	15	0.005646	M(B,H)GM
NTPM910Q1-HXL-H35-FACC-TC-D-C3-1-RTA-2	D	C3	4	3	37.51	1.391	0.08492	15	0.005661	M(B,H)GM
NTPM910Q1-HXL-H35-FACC-TC-D-C3-1-RTA-3	D	C3	4	3	37.12	1.375	0.08508	15	0.005672	M(B,H)AB
NTPM910Q1-HXL-H35-FACC-TC-D-C3-1-RTA-4	D	C3	4	3	37.16	1.352	0.08452	15	0.005634	M(B,H)GM
NTPM910Q1-HXL-H35-FACC-TC-D-C3-1-RTA-5	D	C3	4	3	36.82	1.382	0.08430	15	0.005620	M(B,H)GM
NTPM910Q1-HXL-H35-FACC-TC-D-C3-1-RTA-6	D	C3	4	3	36.33	1.410	0.08295	15	0.005530	BGM
NTPM910Q1-HXL-H35-SKS-TC-E-C1-1-RTA-1	E	C1	5	1	32.77	1.306	0.08353	15	0.005569	HGM,HAT
NTPM910Q1-HXL-H35-SKS-TC-E-C1-1-RTA-2	E	C1	5	1	32.16	1.303	0.08455	15	0.005637	BAB
NTPM910Q1-HXL-H35-SKS-TC-E-C1-1-RTA-3	E	C1	5	1	35.37	1.353	0.08332	15	0.005554	BGM
NTPM910Q1-HXL-H35-SKS-TC-E-C1-1-RTA-4	E	C1	5	1	35.36	1.372	0.08328	15	0.005552	BGM
NTPM910Q1-HXL-H35-SKS-TC-E-C1-1-RTA-5	E	C1	5	1	35.91	1.348	0.08270	15	0.005513	BGM
NTPM910Q1-HXL-H35-SKS-TC-E-C2-1-RTA-1	E	C2	5	2	36.92	1.362	0.08268	15	0.005512	BGM,HAT
NTPM910Q1-HXL-H35-SKS-TC-E-C2-1-RTA-2	E	C2	5	2	34.83	1.351	0.08357	15	0.005571	HGM
NTPM910Q1-HXL-H35-SKS-TC-E-C2-1-RTA-3	E	C2	5	2	34.02	1.404	0.08192	15	0.005461	BGM
NTPM910Q1-HXL-H35-SKS-TC-E-C2-1-RTA-4	E	C2	5	2	34.83	1.378	0.08258	15	0.005506	HAB,HAT
NTPM910Q1-HXL-H35-SKS-TC-E-C2-1-RTA-5	E	C2	5	2	36.76	1.388	0.08193	15	0.005462	BGM
NTPM910Q1-HXL-H35-SKS-TC-E-C2-1-RTA-6	E	C2	5	2	35.66	1.371	0.08228	15	0.005486	BGM,HAT

0.005668

35.10

Average

1.375

0.030

0.005461

0.005821

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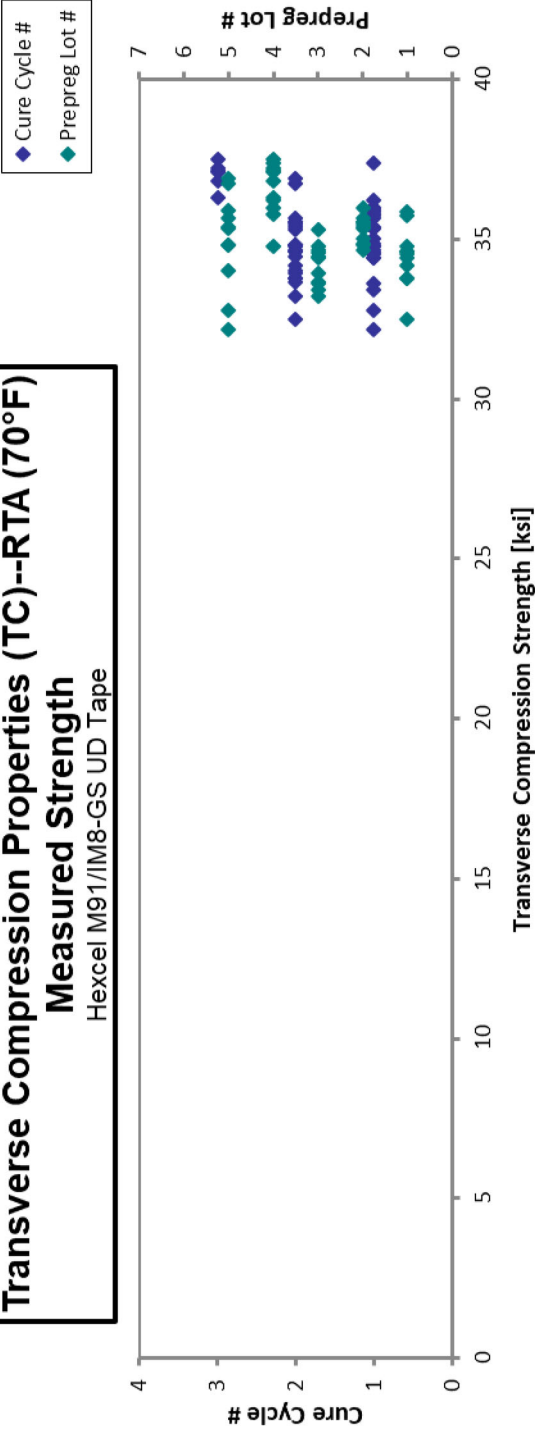
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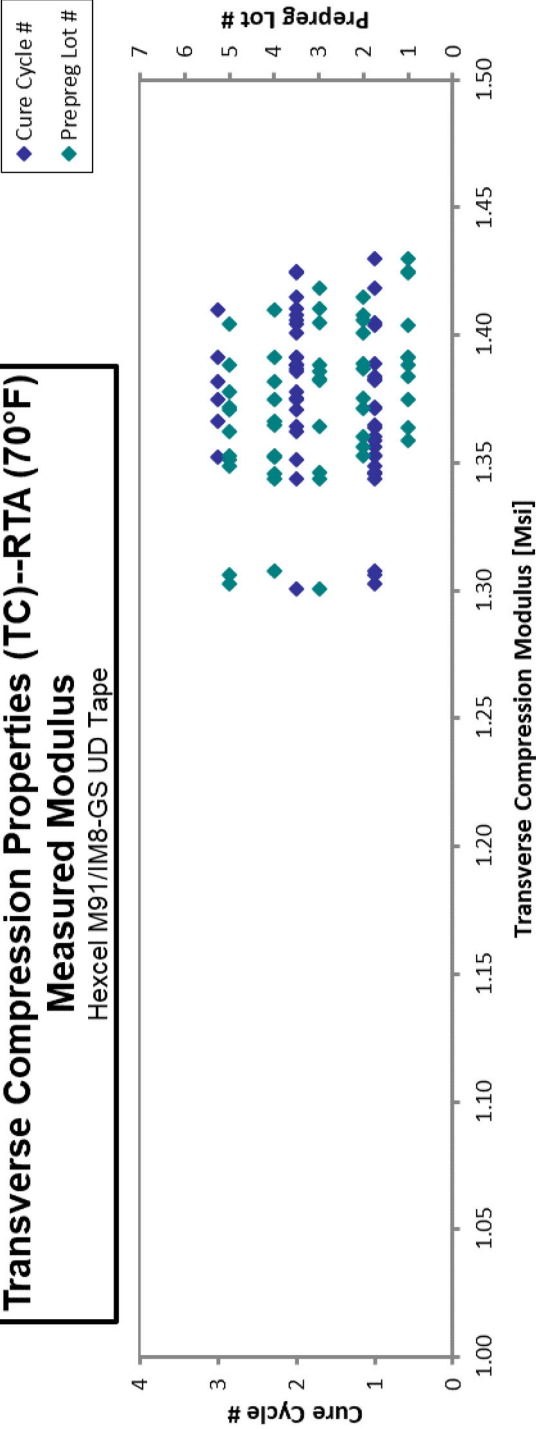
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Transverse Compression Properties (TC)--RTA (70°F)
Measured Strength
Hexcel M91/IM8-GS UD Tape



Transverse Compression Properties (TC)--RTA (70°F)
Measured Modulus
Hexcel M91/IM8-GS UD Tape



Transverse Compression Properties (TC)--ETW (180°F) □

Strength & Modulus □

Hexcel IM91/IM8-GS UD Tape

Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksf]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{p0} [in]	Failure Mode
NTPM910Q1-HXL-H35-NIAR-TC-A-C1-1-ETW-1	A	C1	1	1	20.28	1.243	0.08402	15	0.005601	HGM
NTPM910Q1-HXL-H35-NIAR-TC-A-C1-1-ETW-2	A	C1	1	1	20.20	1.252	0.08358	15	0.005572	HGM
NTPM910Q1-HXL-H35-NIAR-TC-A-C1-1-ETW-3	A	C1	1	1	20.56	1.226	0.08413	15	0.005609	HGM
NTPM910Q1-HXL-H35-NIAR-TC-A-C1-1-ETW-4	A	C1	1	1	20.15	1.262	0.08448	15	0.005632	HGM
NTPM910Q1-HXL-H35-NIAR-TC-A-C1-1-ETW-5	A	C1	1	1	20.06	1.238	0.08387	15	0.005591	HGM
NTPM910Q1-HXL-H35-NIAR-TC-A-C2-1-ETW-1	A	C2	1	2	20.10	1.270	0.08400	15	0.005600	HGM
NTPM910Q1-HXL-H35-NIAR-TC-A-C2-1-ETW-2	A	C2	1	2	19.67	1.245	0.08393	15	0.005596	HGM
NTPM910Q1-HXL-H35-NIAR-TC-A-C2-1-ETW-3	A	C2	1	2	19.81	1.250	0.08348	15	0.005566	HGM
NTPM910Q1-HXL-H35-NIAR-TC-A-C2-1-ETW-4	A	C2	1	2	20.27	1.245	0.08222	15	0.005481	HGM
NTPM910Q1-HXL-H35-NIAR-TC-A-C2-1-ETW-5	A	C2	1	2	20.46	1.237	0.08303	15	0.005536	HGM
NTPM910Q1-HXL-H35-NIAR-TC-A-C2-1-ETW-6	A	C2	1	2	19.82	1.241	0.08335	15	0.005557	HGM
NTPM910Q1-HXL-H35-NIAR-TC-B-C1-1-ETW-1	B	C1	2	1	19.36	1.213	0.08652	15	0.005768	HGM
NTPM910Q1-HXL-H35-NIAR-TC-B-C1-1-ETW-2	B	C1	2	1	20.69	1.219	0.08730	15	0.005820	HGM
NTPM910Q1-HXL-H35-NIAR-TC-B-C1-1-ETW-3	B	C1	2	1	19.85	1.209	0.08728	15	0.005819	HGM
NTPM910Q1-HXL-H35-NIAR-TC-B-C1-1-ETW-4	B	C1	2	1	20.58	1.216	0.08728	15	0.005819	HGM
NTPM910Q1-HXL-H35-NIAR-TC-B-C1-1-ETW-5	B	C1	2	1	20.53	1.226	0.08693	15	0.005796	HGM
NTPM910Q1-HXL-H35-NIAR-TC-B-C2-1-ETW-1	B	C2	2	2	20.11	1.197	0.08720	15	0.005813	HGM
NTPM910Q1-HXL-H35-NIAR-TC-B-C2-1-ETW-2	B	C2	2	2	20.67	1.224	0.08697	15	0.005798	HGM
NTPM910Q1-HXL-H35-NIAR-TC-B-C2-1-ETW-3	B	C2	2	2	20.33	1.235	0.08667	15	0.005778	HGM
NTPM910Q1-HXL-H35-NIAR-TC-B-C2-1-ETW-4	B	C2	2	2	20.88	1.243	0.08485	15	0.005657	HGM
NTPM910Q1-HXL-H35-NIAR-TC-B-C2-1-ETW-5	B	C2	2	2	20.62	1.222	0.08588	15	0.005726	HGM
NTPM910Q1-HXL-H35-NIAR-TC-B-C2-1-ETW-6	B	C2	2	2	20.05	1.209	0.08657	15	0.005771	HGM
NTPM910Q1-HXL-H35-NIAR-TC-C-C1-1-ETW-1	C	C1	3	1	19.77	1.234	0.08708	15	0.005806	HGM
NTPM910Q1-HXL-H35-NIAR-TC-C-C1-1-ETW-2	C	C1	3	1	19.64	1.222	0.08735	15	0.005823	HGM
NTPM910Q1-HXL-H35-NIAR-TC-C-C1-1-ETW-3	C	C1	3	1	19.34	1.229	0.08713	15	0.005809	HGM
NTPM910Q1-HXL-H35-NIAR-TC-C-C1-1-ETW-4	C	C1	3	1	20.00	1.229	0.08712	15	0.005808	HGM
NTPM910Q1-HXL-H35-NIAR-TC-C-C1-1-ETW-5	C	C1	3	1	19.94	1.247	0.08675	15	0.005783	HGM
NTPM910Q1-HXL-H35-NIAR-TC-C-C2-1-ETW-1	C	C2	3	2	21.48	1.233	0.08687	15	0.005791	HGM
NTPM910Q1-HXL-H35-NIAR-TC-C-C2-1-ETW-2	C	C2	3	2	20.86	1.244	0.08710	15	0.005807	HGM
NTPM910Q1-HXL-H35-NIAR-TC-C-C2-1-ETW-3	C	C2	3	2	19.89	1.247	0.08680	15	0.005787	HGM
NTPM910Q1-HXL-H35-NIAR-TC-C-C2-1-ETW-4	C	C2	3	2	20.53	1.228	0.08578	15	0.005719	HGM
NTPM910Q1-HXL-H35-NIAR-TC-C-C2-1-ETW-5	C	C2	3	2	19.60	1.222	0.08728	15	0.005819	HGM
NTPM910Q1-HXL-H35-NIAR-TC-C-C2-1-ETW-6	C	C2	3	2	20.07	1.217	0.08722	15	0.005814	HGM

Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{pi} [in]	Failure Mode
NTPM910Q1-HXL-H35-FACC-TC-D-C1-1-ETW-1	D	C1	4	1	19.19	1.217	0.08465	15	0.005643	HGM
NTPM910Q1-HXL-H35-FACC-TC-D-C1-1-ETW-2	D	C1	4	1	19.32	1.226	0.08467	15	0.005644	HGM
NTPM910Q1-HXL-H35-FACC-TC-D-C1-1-ETW-3	D	C1	4	1	19.39	1.236	0.08492	15	0.005661	HGM
NTPM910Q1-HXL-H35-FACC-TC-D-C1-1-ETW-4	D	C1	4	1	18.80	1.211	0.08527	15	0.005684	HGM
NTPM910Q1-HXL-H35-FACC-TC-D-C1-1-ETW-5	D	C1	4	1	19.19	1.229	0.08527	15	0.005684	HAB, HGT
NTPM910Q1-HXL-H35-FACC-TC-D-C3-1-ETW-1	D	C3	4	3	19.07	1.228	0.08530	15	0.005687	HGM
NTPM910Q1-HXL-H35-FACC-TC-D-C3-1-ETW-2	D	C3	4	3	19.57	1.237	0.08460	15	0.005640	HGM
NTPM910Q1-HXL-H35-FACC-TC-D-C3-1-ETW-3	D	C3	4	3	18.94	1.237	0.08337	15	0.005558	HGM, HAB
NTPM910Q1-HXL-H35-FACC-TC-D-C3-1-ETW-4	D	C3	4	3	18.99	1.268	0.08340	15	0.005560	BGM
NTPM910Q1-HXL-H35-FACC-TC-D-C3-1-ETW-5	D	C3	4	3	19.33	1.229	0.08350	15	0.005567	HGM, HAB
NTPM910Q1-HXL-H35-FACC-TC-D-C3-1-ETW-6	D	C3	4	3	19.30	1.251	0.08332	15	0.005554	BGM
NTPM910Q1-HXL-H35-SKS-TC-E-C1-1-ETW-1	E	C1	5	1	19.05	1.213	0.08445	15	0.005630	HGM
NTPM910Q1-HXL-H35-SKS-TC-E-C1-1-ETW-2	E	C1	5	1	19.25	1.251	0.08358	15	0.005572	HGM
NTPM910Q1-HXL-H35-SKS-TC-E-C1-1-ETW-3	E	C1	5	1	17.80	1.228	0.08448	15	0.005632	HGM, HAB
NTPM910Q1-HXL-H35-SKS-TC-E-C1-1-ETW-4	E	C1	5	1	18.94	1.228	0.08493	15	0.005662	HGM
NTPM910Q1-HXL-H35-SKS-TC-E-C1-1-ETW-5	E	C1	5	1	18.69	1.251	0.08313	15	0.005542	HAT
NTPM910Q1-HXL-H35-SKS-TC-E-C2-1-ETW-1	E	C2	5	2	18.80	1.233	0.08372	15	0.005581	HAT, HAB
NTPM910Q1-HXL-H35-SKS-TC-E-C2-1-ETW-2	E	C2	5	2	18.87	1.221	0.08430	15	0.005620	HGM, HAT
NTPM910Q1-HXL-H35-SKS-TC-E-C2-1-ETW-3	E	C2	5	2	18.21	1.235	0.08377	15	0.005584	HGM
NTPM910Q1-HXL-H35-SKS-TC-E-C2-1-ETW-4	E	C2	5	2	18.44	1.240	0.08345	15	0.005563	HAT
NTPM910Q1-HXL-H35-SKS-TC-E-C2-1-ETW-5	E	C2	5	2	18.95	1.242	0.08223	15	0.005482	HGM
NTPM910Q1-HXL-H35-SKS-TC-E-C2-1-ETW-6	E	C2	5	2	18.68	1.275	0.08182	15	0.005454	HAT

0.005670

1.234

19.69

Average

Standard Dev.

Coeff. of Var. [%]

Min.

Max.

Number of Spec.

55

0.01589

0.7577

3.848

17.80

21.48

0.005454

1.288

0.7577

1.288

1.197

1.197

1.275

55

0.005823

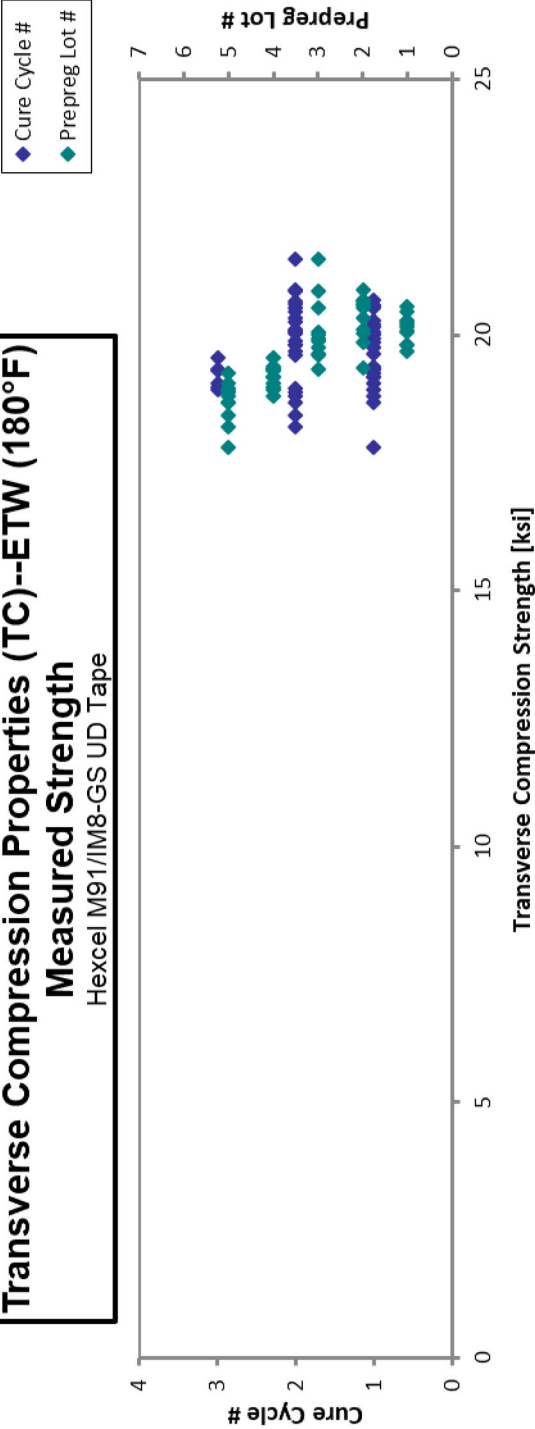
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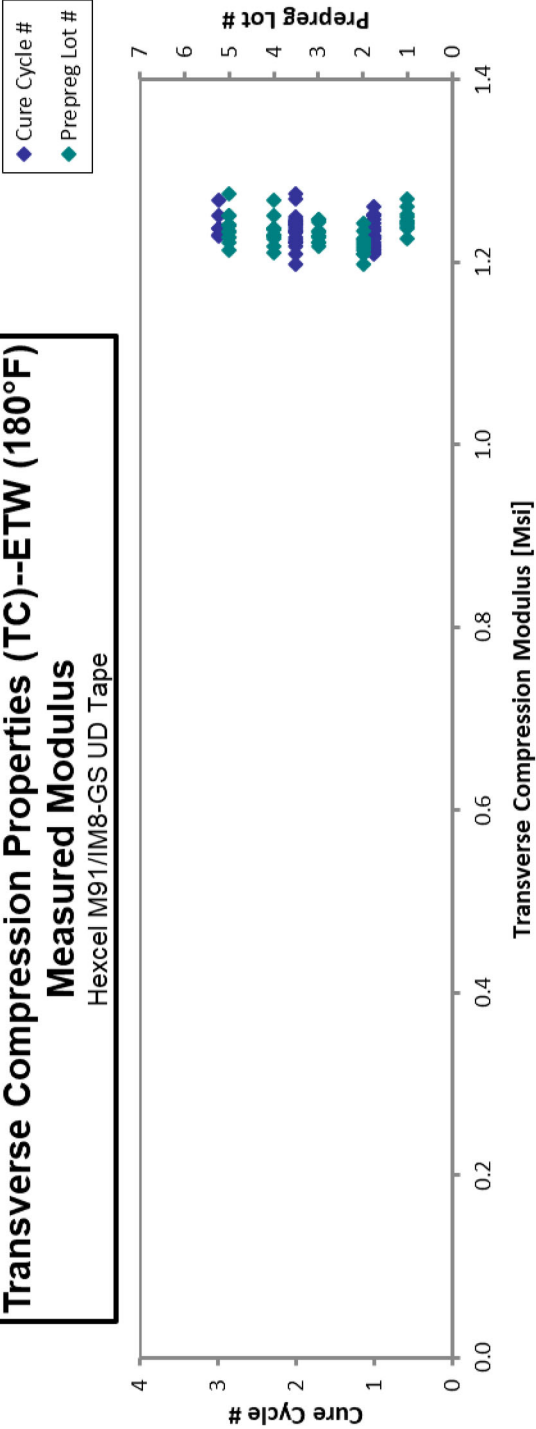
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Transverse Compression Properties (TC)--ETW (180°F)
Measured Strength
Hexcel M91/IM8-GS UD Tape



Transverse Compression Properties (TC)--ETW (180°F)
Measured Modulus
Hexcel M91/IM8-GS UD Tape



4.6 In-Plane Shear Tension Properties (IPST)

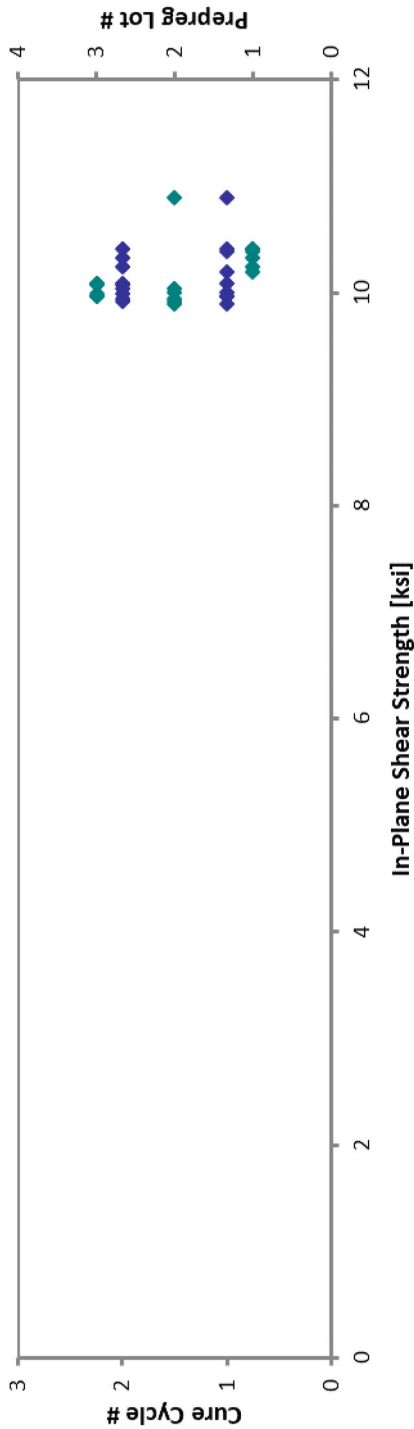
In-Plane Shear Properties (IPST)--CTA (-65°F)□	
Strength & Modulus □	
Hexcel IM91/IM8-GS UD Tape	

Specimen Number	Hexcel Batch	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]
NTPM910Q1-HXL-H35-NIAR-IPST-A-C1-1-CTA-1	A	C1	1	1	10.20	15.69	0.8535	0.1114	20	0.005568
NTPM910Q1-HXL-H35-NIAR-IPST-A-C1-1-CTA-2	A	C1	1	1	10.42	15.76	0.8542	0.1131	20	0.005656
NTPM910Q1-HXL-H35-NIAR-IPST-A-C1-1-CTA-3	A	C1	1	1	10.38	16.07	0.8739	0.1118	20	0.005590
NTPM910Q1-HXL-H35-NIAR-IPST-A-C2-1-CTA-1	A	C2	1	2	10.33	15.55	0.8714	0.1115	20	0.005573
NTPM910Q1-HXL-H35-NIAR-IPST-A-C2-1-CTA-2	A	C2	1	2	10.24	15.94	0.8695	0.1122	20	0.005611
NTPM910Q1-HXL-H35-NIAR-IPST-A-C2-1-CTA-3	A	C2	1	2	10.41	15.97	0.8725	0.1114	20	0.005572
NTPM910Q1-HXL-H35-NIAR-IPST-B-C1-1-CTA-1	B	C1	2	1	10.01	16.56	0.8308	0.1156	20	0.005782
NTPM910Q1-HXL-H35-NIAR-IPST-B-C1-1-CTA-2	B	C1	2	1	9.890	16.33	0.8103	0.1159	20	0.005796
NTPM910Q1-HXL-H35-NIAR-IPST-B-C1-1-CTA-3	B	C1	2	1	10.89	16.72	0.7990	0.1147	20	0.005736
NTPM910Q1-HXL-H35-NIAR-IPST-B-C2-1-CTA-1	B	C2	2	2	9.913	16.49	0.8196	0.1151	20	0.005754
NTPM910Q1-HXL-H35-NIAR-IPST-B-C2-1-CTA-2	B	C2	2	2	9.938	16.43	0.8191	0.1155	20	0.005774
NTPM910Q1-HXL-H35-NIAR-IPST-B-C2-1-CTA-3	B	C2	2	2	10.04	16.64	0.8389	0.1151	20	0.005756
NTPM910Q1-HXL-H35-NIAR-IPST-C-C1-1-CTA-1	C	C1	3	1	9.972	16.12	0.8269	0.1160	20	0.005799
NTPM910Q1-HXL-H35-NIAR-IPST-C-C1-1-CTA-2	C	C1	3	1	9.971	16.24	0.8309	0.1162	20	0.005810
NTPM910Q1-HXL-H35-NIAR-IPST-C-C1-1-CTA-3	C	C1	3	1	10.09	16.37	0.8409	0.1161	20	0.005806
NTPM910Q1-HXL-H35-NIAR-IPST-C-C2-1-CTA-1	C	C2	3	2	10.09	15.92	0.8427	0.1161	20	0.005805
NTPM910Q1-HXL-H35-NIAR-IPST-C-C2-1-CTA-2	C	C2	3	2	10.07	15.99	0.8356	0.1161	20	0.005803
NTPM910Q1-HXL-H35-NIAR-IPST-C-C2-1-CTA-3	C	C2	3	2	9.991	16.10	0.8335	0.1156	20	0.005778

Average	10.16	16.16	0.8402	0.005720
Standard Dev.	0.2539	0.3334	0.02206	
Coeff. of Var. [%]	2.499	2.063	2.625	
Min.	9.890	15.55	0.7990	0.005568
Max.	10.89	16.72	0.8739	0.005810
Number of Spec.	18	18	18	18

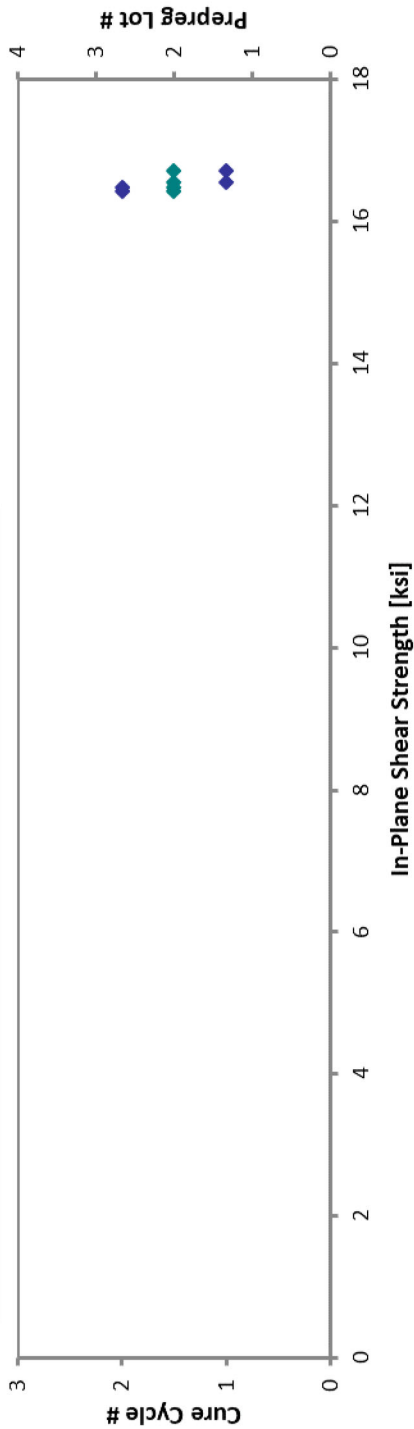
**In-Plane Shear Properties (IPST)--CTA (-65°F)
Measured 0.2% Offset Strength**

Hexcel M91/IM8-GS UD Tape

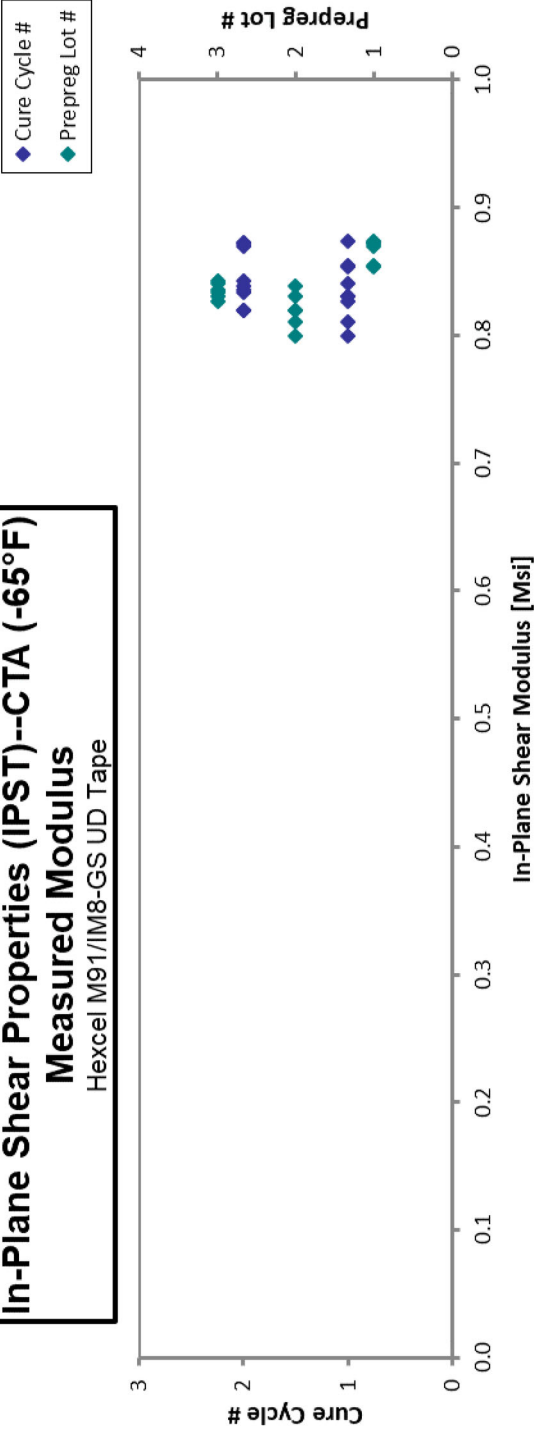


**In-Plane Shear Properties (IPST)--CTA (-65°F)
Measured Strength at 5% Strain**

Hexcel M91/IM8-GS UD Tape



In-Plane Shear Properties (IPST)--CTA (-65°F)
Measured Modulus
Hexcel M91/IM8-GS UD Tape



In-Plane Shear Properties (IPST)--RTA (70°F) ☐

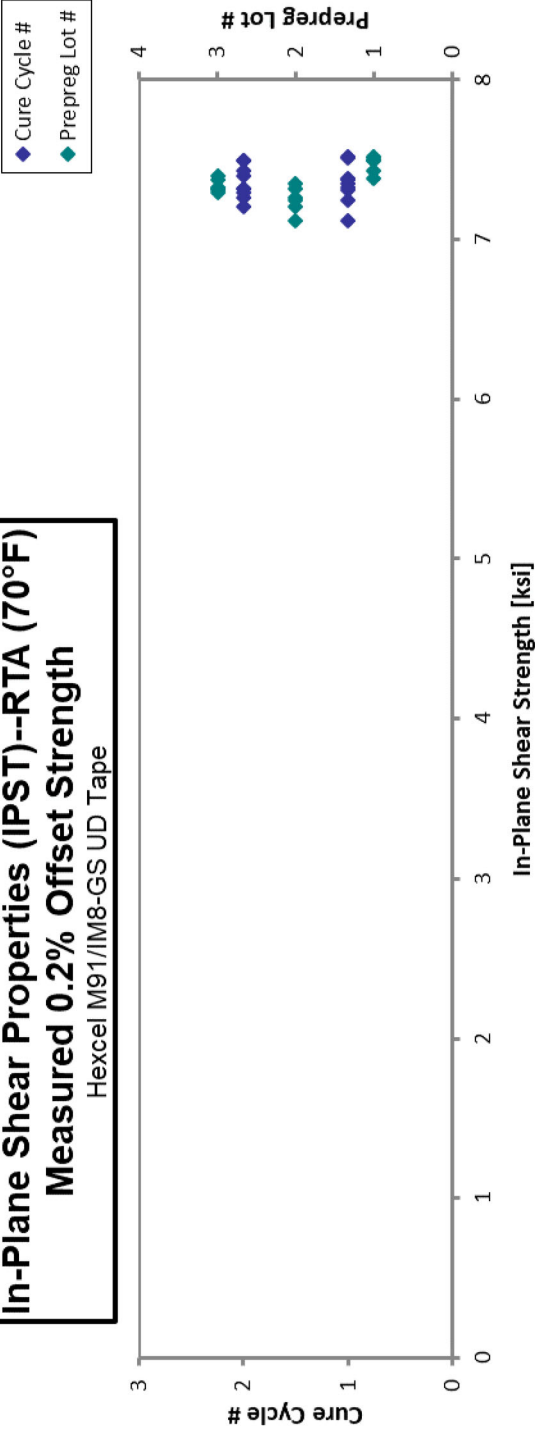
Strength & Modulus ☐

Hexcel IM91/IM8-GS UD Tape

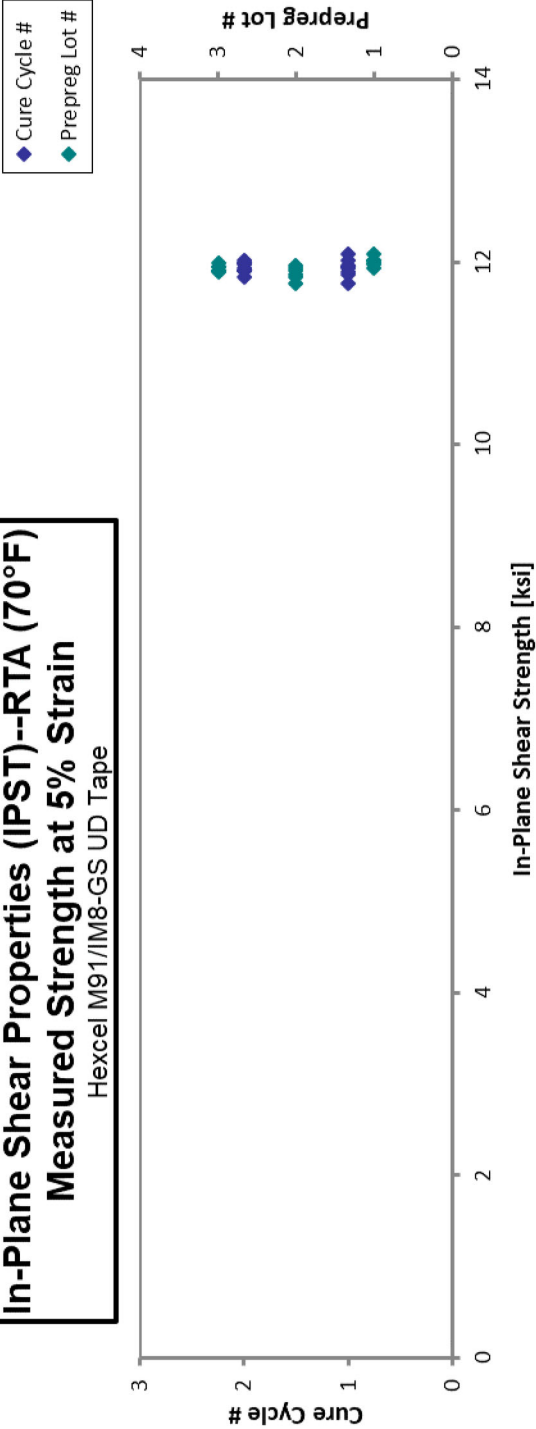
Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	0.2% Offset Strength [ksi]	Strength at 5% Strain [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t _{PI} [in]
NTPM910Q1-HXL-H35-NIAR-IPST-A-C1-1-RTA-1	A	C1	1	1	7.381	11.93	0.6962	0.1127	20	0.005636
NTPM910Q1-HXL-H35-NIAR-IPST-A-C1-1-RTA-2	A	C1	1	1	7.514	12.03	0.7151	0.1126	20	0.005629
NTPM910Q1-HXL-H35-NIAR-IPST-A-C1-1-RTA-3	A	C1	1	1	7.518	12.09	0.7108	0.1117	20	0.005586
NTPM910Q1-HXL-H35-NIAR-IPST-A-C2-1-RTA-1	A	C2	1	2	7.495	11.99	0.7096	0.1115	20	0.005576
NTPM910Q1-HXL-H35-NIAR-IPST-A-C2-1-RTA-2	A	C2	1	2	7.496	12.02	0.7097	0.1114	20	0.005568
NTPM910Q1-HXL-H35-NIAR-IPST-A-C2-1-RTA-3	A	C2	1	2	7.429	11.98	0.7020	0.1116	20	0.005579
NTPM910Q1-HXL-H35-NIAR-IPST-B-C1-1-RTA-1	B	C1	2	1	7.350	11.96	0.6866	0.1147	20	0.005734
NTPM910Q1-HXL-H35-NIAR-IPST-B-C1-1-RTA-2	B	C1	2	1	7.244	11.87	0.6773	0.1147	20	0.005734
NTPM910Q1-HXL-H35-NIAR-IPST-B-C1-1-RTA-3	B	C1	2	1	7.115	11.76	0.6616	0.1151	20	0.005756
NTPM910Q1-HXL-H35-NIAR-IPST-B-C2-1-RTA-1	B	C2	2	2	7.319	11.94	0.6793	0.1152	20	0.005760
NTPM910Q1-HXL-H35-NIAR-IPST-B-C2-1-RTA-2	B	C2	2	2	7.260	11.90	0.6801	0.1155	20	0.005777
NTPM910Q1-HXL-H35-NIAR-IPST-B-C2-1-RTA-3	B	C2	2	2	7.204	11.84	0.6697	0.1153	20	0.005767
NTPM910Q1-HXL-H35-NIAR-IPST-C-C1-1-RTA-1	C	C1	3	1	7.374	11.95	0.6938	0.1159	20	0.005795
NTPM910Q1-HXL-H35-NIAR-IPST-C-C1-1-RTA-2	C	C1	3	1	7.307	11.90	0.6838	0.1162	20	0.005809
NTPM910Q1-HXL-H35-NIAR-IPST-C-C1-1-RTA-3	C	C1	3	1	7.323	11.94	0.6893	0.1157	20	0.005787
NTPM910Q1-HXL-H35-NIAR-IPST-C-C2-1-RTA-1	C	C2	3	2	7.318	11.91	0.6867	0.1160	20	0.005801
NTPM910Q1-HXL-H35-NIAR-IPST-C-C2-1-RTA-2	C	C2	3	2	7.297	11.90	0.6806	0.1157	20	0.005787
NTPM910Q1-HXL-H35-NIAR-IPST-C-C2-1-RTA-3	C	C2	3	2	7.400	11.99	0.6939	0.1157	20	0.005786

Average	7.353	11.94	0.6903	0.005715
Standard Dev.	0.1114	0.07540	0.01493	
Coeff. of Var. [%]	1.515	0.6315	2.162	
Min.	7.115	11.76	0.6616	0.005568
Max.	7.518	12.09	0.7151	0.005809
Number of Spec.	18	18	18	18

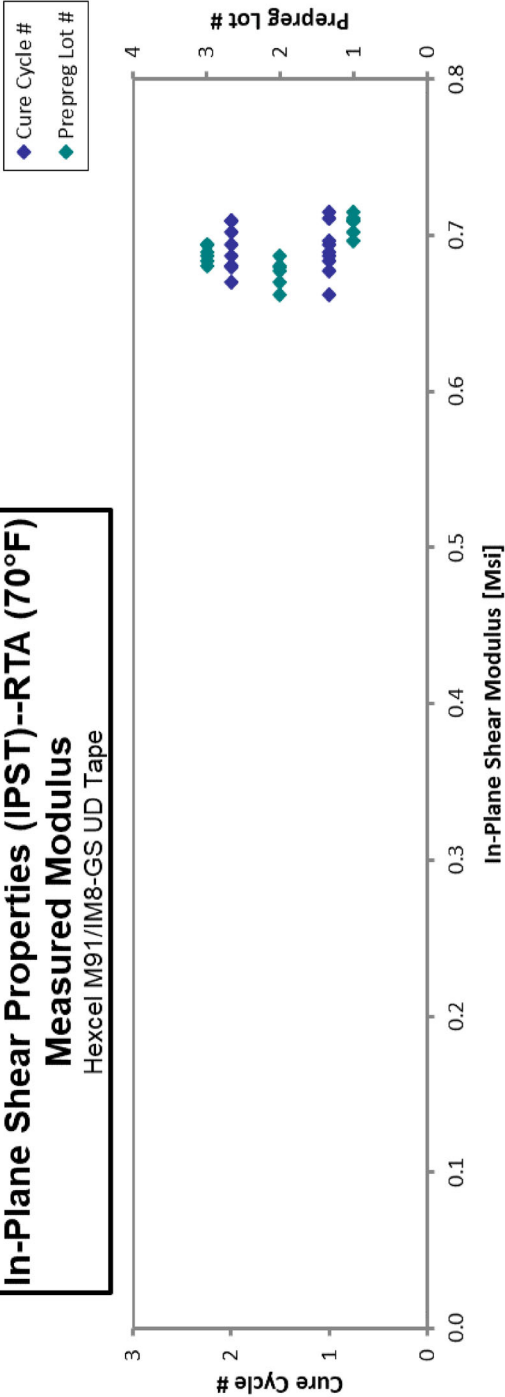
**In-Plane Shear Properties (IPST)--RTA (70°F)
Measured 0.2% Offset Strength**
Hexcel M91/IM8-GS UD Tape



**In-Plane Shear Properties (IPST)--RTA (70°F)
Measured Strength at 5% Strain**
Hexcel M91/IM8-GS UD Tape



In-Plane Shear Properties (IPST)--RTA (70°F)
Measured Modulus
Hexcel M91/IM8-GS UD Tape



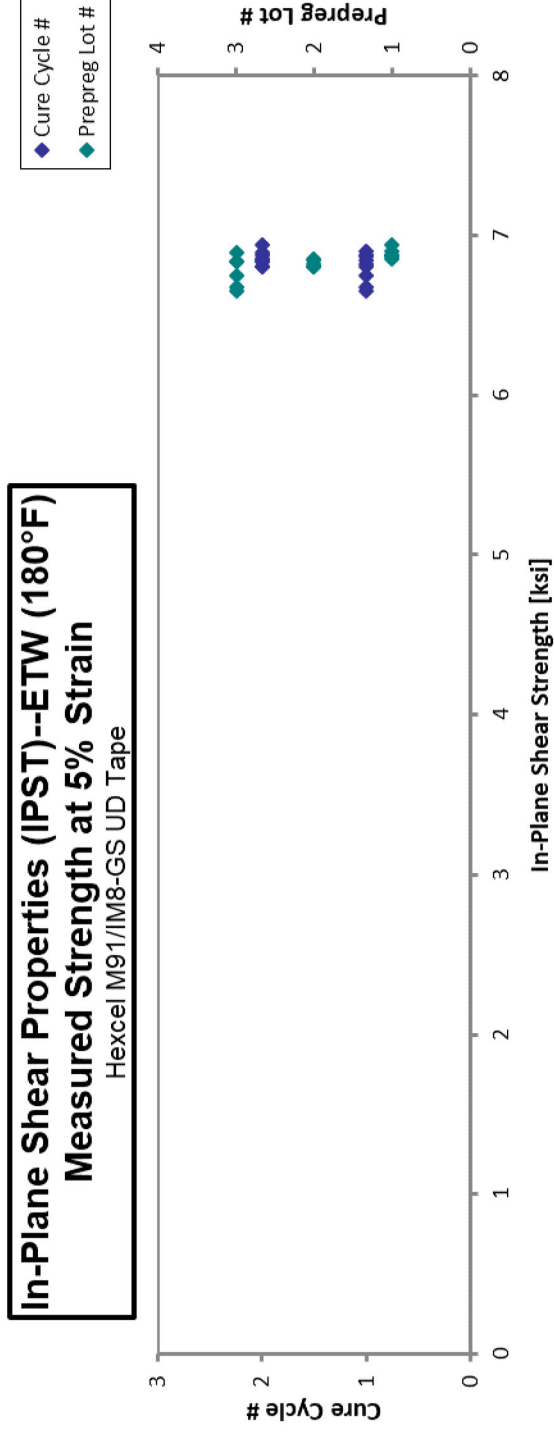
In-Plane Shear Properties (IPST)--ETW (180°F)

Strength & Modulus

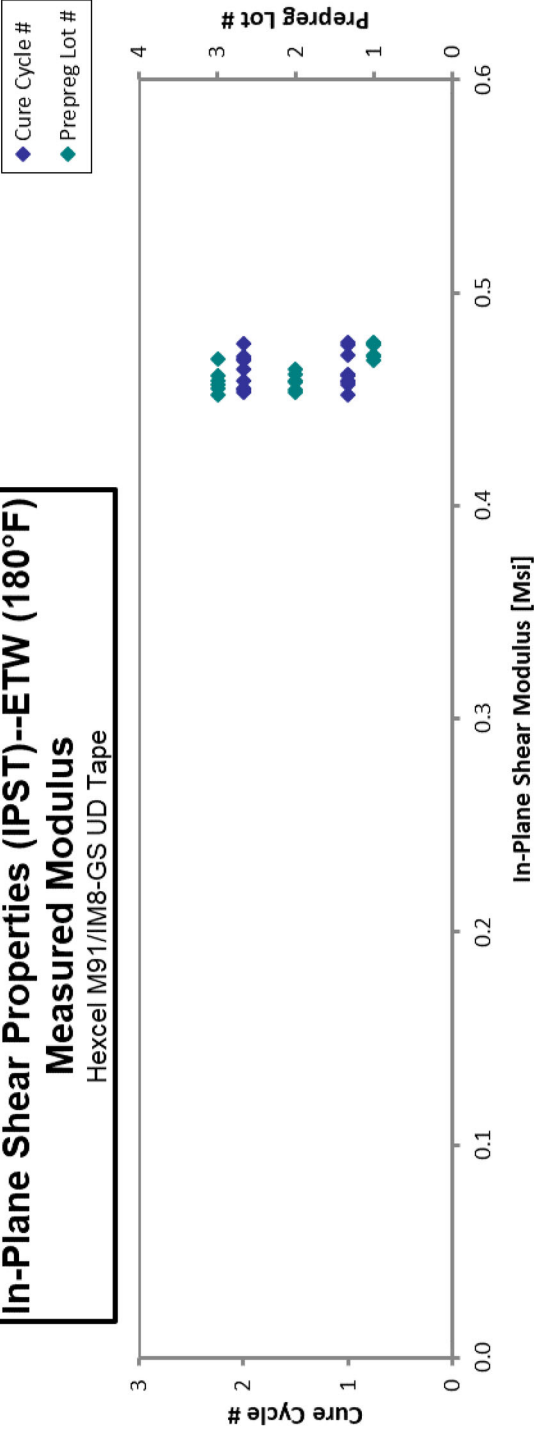
Hexcel M91/IM8-GS UD Tape

Specimen Number	Hexcel Batch	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_{pl} [in]
NTPM910Q1-HXL-H35-NIAR-IPST-A-C1-1-ETW-1	A	C1	1	1	4.681	6.874	0.4704	0.1110	20	0.005548
NTPM910Q1-HXL-H35-NIAR-IPST-A-C1-1-ETW-2	A	C1	1	1	4.702	6.871	0.4769	0.1112	20	0.005558
NTPM910Q1-HXL-H35-NIAR-IPST-A-C1-1-ETW-3	A	C1	1	1	4.690	6.902	0.4753	0.1112	20	0.005558
NTPM910Q1-HXL-H35-NIAR-IPST-A-C2-1-ETW-1	A	C2	1	2	4.644	6.851	0.4703	0.1119	20	0.005597
NTPM910Q1-HXL-H35-NIAR-IPST-A-C2-1-ETW-2	A	C2	1	2	4.663	6.880	0.4682	0.1118	20	0.005588
NTPM910Q1-HXL-H35-NIAR-IPST-A-C2-1-ETW-3	A	C2	1	2	4.695	6.938	0.4762	0.1112	20	0.005562
NTPM910Q1-HXL-H35-NIAR-IPST-B-C1-1-ETW-1	B	C1	2	1	4.551	6.822	0.4584	0.1158	20	0.005788
NTPM910Q1-HXL-H35-NIAR-IPST-B-C1-1-ETW-2	B	C1	2	1	4.514	6.807	0.4577	0.1155	20	0.005775
NTPM910Q1-HXL-H35-NIAR-IPST-B-C1-1-ETW-3	B	C1	2	1	4.572	6.847	0.4617	0.1150	20	0.005750
NTPM910Q1-HXL-H35-NIAR-IPST-B-C2-1-ETW-1	B	C2	2	2	4.501	6.801	0.4534	0.1154	20	0.005769
NTPM910Q1-HXL-H35-NIAR-IPST-B-C2-1-ETW-2	B	C2	2	2	4.605	6.852	0.4639	0.1157	20	0.005784
NTPM910Q1-HXL-H35-NIAR-IPST-B-C2-1-ETW-3	B	C2	2	2	4.505	6.801	0.4543	0.1156	20	0.005781
NTPM910Q1-HXL-H35-NIAR-IPST-C-C1-1-ETW-1	C	C1	3	1	4.559	6.752	0.4608	0.1160	20	0.005798
NTPM910Q1-HXL-H35-NIAR-IPST-C-C1-1-ETW-2	C	C1	3	1	4.488	6.654	0.4522	0.1164	20	0.005822
NTPM910Q1-HXL-H35-NIAR-IPST-C-C1-1-ETW-3	C	C1	3	1	4.495	6.673	0.4570	0.1161	20	0.005807
NTPM910Q1-HXL-H35-NIAR-IPST-C-C2-1-ETW-1	C	C2	3	2	4.566	6.892	0.4584	0.1163	20	0.005813
NTPM910Q1-HXL-H35-NIAR-IPST-C-C2-1-ETW-2	C	C2	3	2	4.522	6.833	0.4549	0.1162	20	0.005812
NTPM910Q1-HXL-H35-NIAR-IPST-C-C2-1-ETW-3	C	C2	3	2	4.610	6.840	0.4687	0.1156	20	0.005782

Average	4.587	6.827	0.4633	0.005716
Standard Dev.	0.0763	0.07355	0.00822	
Coeff. of Var. [%]	1.663	1.077	1.77	
Min.	4.488	6.654	0.4522	0.005548
Max.	4.702	6.938	0.4769	0.005822
Number of Spec.	18	18	18	18



In-Plane Shear Properties (IPST)--ETW (180°F)
Measured Modulus
Hexcel M91/IM8-GS UD Tape



4.7 Unnotched Compression 0/90 Properties (UNC0)

Laminate Unnotched Compression Properties (UNC0)--CTA (-65°F) ☐	
Strength & Modulus ☐	
Hexcel M91/IM8-GS UD Tape	

normalizing
 t_{90} [in]
0.005500

Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C2-1-CTA-1	A	C2	1	2	159.7	12.25	0.08863	16	BGM
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C2-1-CTA-2	A	C2	1	2	159.7	12.18	0.08918	16	BGM
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C2-1-CTA-3	A	C2	1	2	166.4	11.97	0.08922	16	BGM
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C2-1-CTA-4	A	C2	1	2	159.0	12.61	0.08910	16	BGM
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C2-1-CTA-5	A	C2	1	2	160.5	12.15	0.08927	16	HAB
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C2-1-CTA-6	A	C2	1	2	164.9	12.22	0.08897	16	BGM
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C3-1-CTA-1	A	C3	1	3	145.0	12.39	0.08943	16	BGM
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C3-1-CTA-2	A	C3	1	3	163.3	11.85	0.08958	16	BGM
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C3-1-CTA-3	A	C3	1	3	163.5	12.07	0.08962	16	BGM
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C3-1-CTA-4	A	C3	1	3	162.4	11.93	0.08933	16	BGM
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C3-1-CTA-5	A	C3	1	3	157.7	11.93	0.08958	16	BAB
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C1-1-CTA-1	B	C1	2	1	160.2	11.42	0.09237	16	BGM
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C1-1-CTA-2	B	C1	2	1	160.1	11.71	0.09178	16	BGM, HAB
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C1-1-CTA-3	B	C1	2	1	163.6	11.80	0.09223	16	BGM
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C1-1-CTA-4	B	C1	2	1	159.2	11.68	0.09183	16	BAB
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C1-1-CTA-5	B	C1	2	1	156.8	11.77	0.09225	16	BAB
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C2-1-CTA-1	B	C2	2	2	158.0	11.71	0.09165	16	BAT
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C2-1-CTA-2	B	C2	2	2	146.2	11.85	0.09138	16	BAB
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C2-1-CTA-3	B	C2	2	2	157.8	11.78	0.09178	16	BGM
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C2-1-CTA-4	B	C2	2	2	154.7	11.69	0.09143	16	BGM
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C2-1-CTA-5	B	C2	2	2	159.2	11.71	0.09153	16	BAB
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C2-1-CTA-6	B	C2	2	2	156.0	11.90	0.09132	16	BAB
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C1-1-CTA-1*	C	C1	3	1	11.71	11.71	0.09323	16	CIB
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C1-1-CTA-2	C	C1	3	1	144.7	11.46	0.09343	16	BGM
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C1-1-CTA-3	C	C1	3	1	146.9	12.18	0.09330	16	BAB
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C1-1-CTA-4	C	C1	3	1	149.4	11.78	0.09330	16	BGM
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C1-1-CTA-5	C	C1	3	1	152.8	11.50	0.09283	16	BGM
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C1-1-CTA-6**	C	C1	3	1	154.8		0.09320	16	BGM
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C2-1-CTA-1	C	C2	3	2	161.2	12.71	0.09293	16	BGM
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C2-1-CTA-2	C	C2	3	2	138.7	11.92	0.09347	16	BGM, HIB
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C2-1-CTA-3	C	C2	3	2	131.7	12.13	0.09355	16	BAB
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C2-1-CTA-4*	C	C2	3	2		12.71	0.09338	16	HIB
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C2-1-CTA-5	C	C2	3	2	153.1	12.86	0.09307	16	BGM
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C2-1-CTA-6	C	C2	3	2	149.1	11.75	0.09280	16	BAB
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C2-1-CTA-7**	C	C2	3	2	149.4		0.09352	16	BGM

Avg. t_{90} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.005540	160.8	12.34
0.005574	161.8	12.34
0.005576	161.7	12.14
0.005569	161.0	12.76
0.005579	162.8	12.33
0.005560	166.7	12.36
0.005590	147.4	12.60
0.005599	166.2	12.07
0.005601	166.5	12.29
0.005583	164.8	12.11
0.005599	160.5	12.15
0.005773	168.1	11.99
0.005736	166.9	12.21
0.005765	171.5	12.37
0.005740	166.2	12.19
0.005766	164.4	12.34
0.005728	164.6	12.19
0.005711	151.8	12.31
0.005736	164.5	12.28
0.005715	160.8	12.14
0.005721	165.5	12.18
0.005707	161.9	12.34
0.005827		12.40
0.005840	153.7	12.16
0.005831	155.8	12.92
0.005831	158.4	12.49
0.005802	161.2	12.13
0.005825	163.9	
0.005808	170.2	13.42
0.005842	147.3	12.66
0.005847	140.0	12.89
0.005836		13.49
0.005817	161.9	13.60
0.005800	157.2	12.39
0.005845	158.8	

Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
NTPM910Q1-HXL-H35-FACC-UNCO-D-C1-1-CTA-1	D	C1	4	1	142.0	11.65	0.09040	16	BGM
NTPM910Q1-HXL-H35-FACC-UNCO-D-C1-1-CTA-2	D	C1	4	1	130.6	11.57	0.09053	16	BAT
NTPM910Q1-HXL-H35-FACC-UNCO-D-C1-1-CTA-3	D	C1	4	1	135.8	11.91	0.09047	16	BAT
NTPM910Q1-HXL-H35-FACC-UNCO-D-C1-1-CTA-4	D	C1	4	1	142.5	12.12	0.09048	16	BGM
NTPM910Q1-HXL-H35-FACC-UNCO-D-C1-1-CTA-5	D	C1	4	1	146.3	11.92	0.09017	16	BGM
NTPM910Q1-HXL-H35-FACC-UNCO-D-C2-1-CTA-1	D	C2	4	2	151.2	11.82	0.09043	16	HAB
NTPM910Q1-HXL-H35-FACC-UNCO-D-C2-1-CTA-2	D	C2	4	2	154.0	11.64	0.09028	16	BGM
NTPM910Q1-HXL-H35-FACC-UNCO-D-C2-1-CTA-3	D	C2	4	2	150.1	12.26	0.09045	16	BGM
NTPM910Q1-HXL-H35-FACC-UNCO-D-C2-1-CTA-4	D	C2	4	2	131.6	11.37	0.09057	16	BGM
NTPM910Q1-HXL-H35-FACC-UNCO-D-C2-1-CTA-5	D	C2	4	2	147.1	11.53	0.09033	16	BGM
NTPM910Q1-HXL-H35-FACC-UNCO-D-C2-1-CTA-6	D	C2	4	2	144.0	11.84	0.09047	16	BGM
NTPM910Q1-HXL-H35-SKS-UNCO-E-C1-1-CTA-1	E	C1	5	1	143.7	12.37	0.08768	16	BGM,HAB
NTPM910Q1-HXL-H35-SKS-UNCO-E-C1-1-CTA-2	E	C1	5	1	150.1	12.04	0.08780	16	BGM
NTPM910Q1-HXL-H35-SKS-UNCO-E-C1-1-CTA-3	E	C1	5	1	143.7	12.09	0.08878	16	BGM
NTPM910Q1-HXL-H35-SKS-UNCO-E-C1-1-CTA-4	E	C1	5	1	145.5	11.80	0.08985	16	BGM
NTPM910Q1-HXL-H35-SKS-UNCO-E-C1-1-CTA-5	E	C1	5	1	144.8	12.04	0.08947	16	BGM,HAB
NTPM910Q1-HXL-H35-SKS-UNCO-E-C2-1-CTA-1	E	C2	5	2	143.6	12.29	0.08613	16	BGM
NTPM910Q1-HXL-H35-SKS-UNCO-E-C2-1-CTA-2	E	C2	5	2	154.0	11.87	0.08768	16	BAT
NTPM910Q1-HXL-H35-SKS-UNCO-E-C2-1-CTA-3	E	C2	5	2	145.1	12.27	0.08875	16	BGM
NTPM910Q1-HXL-H35-SKS-UNCO-E-C2-1-CTA-4	E	C2	5	2	142.5	11.67	0.08962	16	BAT
NTPM910Q1-HXL-H35-SKS-UNCO-E-C2-1-CTA-5	E	C2	5	2	143.9	11.73	0.08915	16	BAT
NTPM910Q1-HXL-H35-SKS-UNCO-E-C2-1-CTA-6	E	C2	5	2	139.4	11.70	0.08963	16	BAT

Avg. t _{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.005650	145.8	11.97
0.005658	134.3	11.91
0.005654	139.6	12.24
0.005655	146.5	12.46
0.005635	149.9	12.21
0.005652	155.4	12.15
0.005643	158.0	11.94
0.005653	154.3	12.60
0.005660	135.5	11.71
0.005646	151.0	11.84
0.005654	148.1	12.17
0.005480	143.2	12.33
0.005488	149.8	12.01
0.005549	145.0	12.20
0.005616	148.6	12.05
0.005592	147.2	12.24
0.005383	140.6	12.03
0.005480	153.5	11.82
0.005547	146.3	12.37
0.005601	145.1	11.88
0.005572	145.7	11.88
0.005602	142.0	11.91

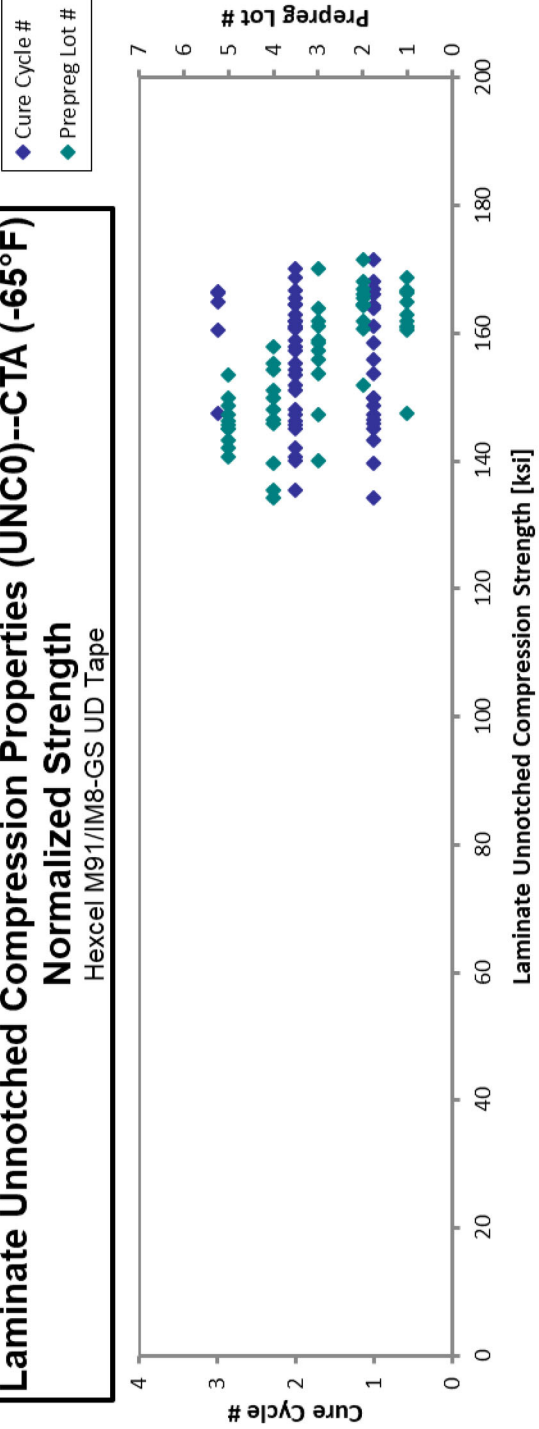
*Strength was not reported due to an unacceptable failure mode

**Extra coupon tested only for strength, no SG was used

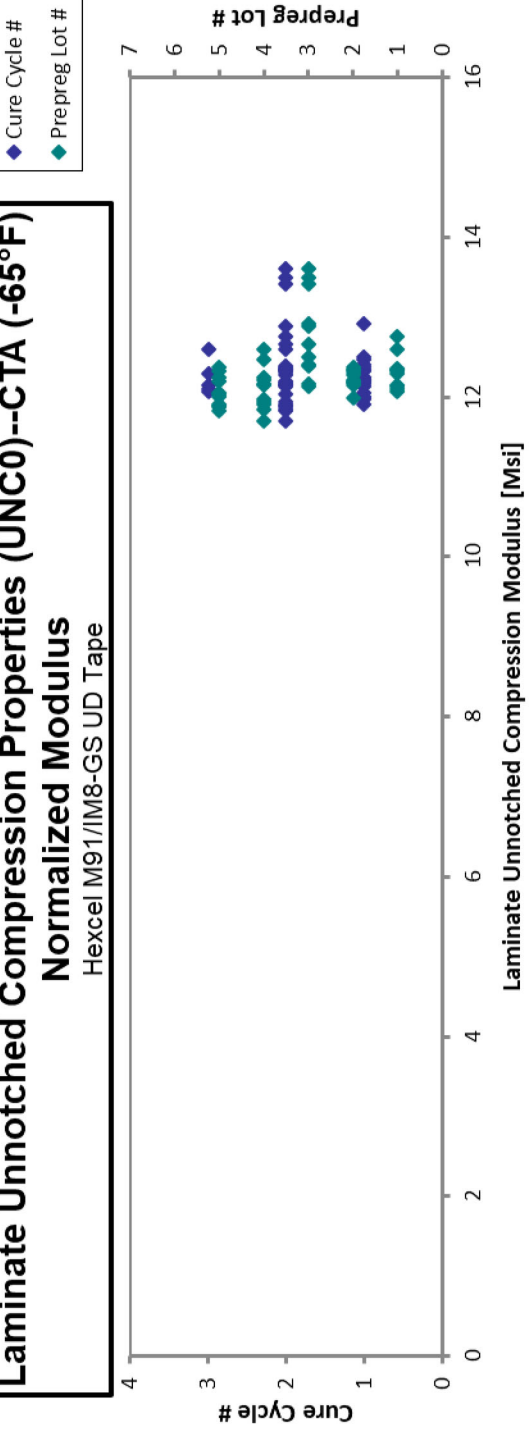
Average	150.9	11.94	Average _{norm}
Standard Dev.	9.046	0.3306	Standard Dev _{norm}
Coeff. of Var. [%]	5.996	2.769	Coeff. of Var. [%] _{norm}
Min.	130.6	11.37	Min.
Max.	166.4	12.86	Max.
Number of Spec.	55		Number of Spec.

0.005672	155.4	12.30
	9.757	0.3861
	6.279	3.139
0.005383	134.3	11.71
0.005847	171.5	13.60
57	55	55

Laminate Unnotched Compression Properties (UNC0)--CTA (-65°F)
Hexcel M91/IM8-GS UD Tape



Laminate Unnotched Compression Properties (UNC0)--CTA (-65°F)
Hexcel M91/IM8-GS UD Tape



Laminate Unnotched Compression Properties (UNC0)--RTA (70°F) □

Strength & Modulus □

Hexcel M91/IM8-GS UD Tape

normalizing

t_{918} [in]

0.005500

Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksf]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Piles in Laminate	Failure Mode
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C2-1-RTA-1***	A	C2	1	2	134.6	11.97	0.08672	16	BAT, CIT, CIB
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C2-1-RTA-2***	A	C2	1	2	130.0	11.99	0.08897	16	HAB
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C2-1-RTA-3	A	C2	1	2	140.2	12.15	0.08913	16	HAT, CIT
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C2-1-RTA-4	A	C2	1	2	128.5	12.37	0.08808	16	BAB
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C2-1-RTA-5*	A	C2	1	2	120.0	12.00	0.08862	16	CIT
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C2-1-RTA-6	A	C2	1	2	131.7	11.70	0.08862	16	HAT, HIT
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C2-1-RTA-7**	A	C2	1	2	129.2	11.70	0.08905	16	M(B,H)AB
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C3-1-RTA-1***	A	C3	1	3	129.6	12.15	0.08927	16	M(B,H)AT
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C3-1-RTA-2*/***	A	C3	1	3	11.86	11.86	0.08955	16	CIT
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C3-1-RTA-3	A	C3	1	3	129.7	11.96	0.08972	16	HAT, HIT
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C3-1-RTA-4	A	C3	1	3	140.5	11.85	0.08958	16	BAT
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C3-1-RTA-5	A	C3	1	3	142.2	12.04	0.08883	16	BAT, CIT, CIB
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C3-1-RTA-6**	A	C3	1	3	127.7	11.74	0.08918	16	BAT
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C1-1-RTA-1***	B	C1	2	1	141.9	11.60	0.09228	16	HAB
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C1-1-RTA-2***	B	C1	2	1	128.7	11.60	0.09262	16	M(B,H)AT
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C1-1-RTA-3	B	C1	2	1	142.4	11.66	0.09303	16	HAT, HIT
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C1-1-RTA-4	B	C1	2	1	123.5	11.89	0.09125	16	HAT, HIT
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C1-1-RTA-5	B	C1	2	1	134.5	11.48	0.09240	16	BAB
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C1-1-RTA-6**	B	C1	2	1	123.2	11.83	0.09225	16	BAB
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C2-1-RTA-1***	B	C2	2	2	135.4	11.83	0.09163	16	HAB, HIB
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C2-1-RTA-2***	B	C2	2	2	137.0	11.65	0.09212	16	BAB, CIB, CIT
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C2-1-RTA-3	B	C2	2	2	139.8	11.57	0.09222	16	BAT
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C2-1-RTA-4	B	C2	2	2	140.8	11.64	0.09157	16	BAB
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C2-1-RTA-5	B	C2	2	2	141.0	11.59	0.09165	16	M(C,H)IB, HAB, CIT
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C2-1-RTA-6	B	C2	2	2	134.6	11.91	0.09182	16	BAB
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C2-1-RTA-7**	B	C2	2	2	130.4	11.91	0.09190	16	BAB
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C1-1-RTA-1***	C	C1	3	1	132.3	11.56	0.09365	16	BAB
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C1-1-RTA-2*/***	C	C1	3	1	11.81	11.81	0.09345	16	CIB
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C1-1-RTA-3	C	C1	3	1	140.2	11.57	0.09360	16	M(C,H)IB, CIT, HAB
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C1-1-RTA-4	C	C1	3	1	118.9	11.39	0.09292	16	BGM
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C1-1-RTA-5	C	C1	3	1	125.9	11.44	0.09250	16	BAB
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C1-1-RTA-6**	C	C1	3	1	139.4	11.88	0.09362	16	HAB, HIB
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C2-1-RTA-1***	C	C2	3	2	126.7	11.82	0.09283	16	CIT, CIB
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C2-1-RTA-2*/***	C	C2	3	2	126.7	11.82	0.09352	16	CIT, CIB
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C2-1-RTA-3	C	C2	3	2	143.4	11.99	0.09273	16	HAB, HIB
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C2-1-RTA-4	C	C2	3	2	124.9	12.35	0.09255	16	HAB, HIB
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C2-1-RTA-5	C	C2	3	2	133.2	11.99	0.09275	16	BAB
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C2-1-RTA-6	C	C2	3	2	130.4	11.99	0.09297	16	BAB
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C2-1-RTA-7**	C	C2	3	2	130.4	11.99	0.09345	16	BGM

Avg. t_{918} [in]	Strength _{norm} [ksf]	Modulus _{norm} [Msi]
0.005545	135.7	12.07
0.005560	131.5	12.12
0.005571	142.0	12.30
0.005505	128.6	12.38
0.005539	132.6	12.08
0.005539	132.6	11.78
0.005566	130.8	
0.005579	131.5	12.32
0.005597	132.3	12.07
0.005607	132.3	12.20
0.005599	143.1	12.06
0.005552	143.6	12.15
0.005574	129.5	
0.005768	148.8	12.31
0.005789	135.4	12.21
0.005815	150.6	12.33
0.005703	128.0	12.33
0.005775	141.2	12.05
0.005766	129.1	
0.005727	141.0	12.32
0.005757	143.4	12.20
0.005764	146.5	12.13
0.005723	146.5	12.12
0.005728	146.8	12.07
0.005739	140.4	12.43
0.005744	136.2	
0.005853	140.8	12.30
0.005841	149.2	12.54
0.005850	125.6	12.30
0.005807	132.3	12.03
0.005781	132.3	12.02
0.005851	148.3	
0.005802		12.53
0.005845		12.56
0.005796	133.5	12.83
0.005784	150.8	12.62
0.005797	131.7	13.02
0.005810	140.7	12.67
0.005841	138.4	

Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode
NTPM910Q1-HXL-H35-FACC-UNC0-D-C1-1-RTA-1***	D	C1	4	1	106.1	12.17	0.08982	16	BAT
NTPM910Q1-HXL-H35-FACC-UNC0-D-C1-1-RTA-2***	D	C1	4	1	113.2	12.03	0.09012	16	BGM
NTPM910Q1-HXL-H35-FACC-UNC0-D-C1-1-RTA-3	D	C1	4	1	112.2	12.15	0.09120	16	MB-HJAB
NTPM910Q1-HXL-H35-FACC-UNC0-D-C1-1-RTA-4	D	C1	4	1	123.7	12.25	0.08987	16	MB-HJAT
NTPM910Q1-HXL-H35-FACC-UNC0-D-C1-1-RTA-5	D	C1	4	1	124.6	12.18	0.08937	16	HAT
NTPM910Q1-HXL-H35-FACC-UNC0-D-C2-1-RTA-1***	D	C2	4	2	142.4	11.91	0.08988	16	BAT
NTPM910Q1-HXL-H35-FACC-UNC0-D-C2-1-RTA-2***	D	C2	4	2	121.2	12.18	0.08968	16	BGM, CIB
NTPM910Q1-HXL-H35-FACC-UNC0-D-C2-1-RTA-3	D	C2	4	2	99.50	11.94	0.09060	16	MB-HJAB
NTPM910Q1-HXL-H35-FACC-UNC0-D-C2-1-RTA-4	D	C2	4	2	115.8	12.08	0.09068	16	MB-HJAB
NTPM910Q1-HXL-H35-FACC-UNC0-D-C2-1-RTA-5	D	C2	4	2	114.5	12.04	0.08972	16	BAB
NTPM910Q1-HXL-H35-FACC-UNC0-D-C2-1-RTA-6	D	C2	4	2	116.1	12.00	0.09150	16	HAB
NTPM910Q1-HXL-H35-FACC-UNC0-D-C2-1-RTA-7**	D	C2	4	2	108.7	12.00	0.08987	16	BAT
NTPM910Q1-HXL-H35-SKS-UNC0-E-C1-1-RTA-1***	E	C1	5	1	114.8	12.11	0.08937	16	MB-HJAB
NTPM910Q1-HXL-H35-SKS-UNC0-E-C1-1-RTA-2***	E	C1	5	1	114.2	12.09	0.08927	16	MB-HJAB
NTPM910Q1-HXL-H35-SKS-UNC0-E-C1-1-RTA-3	E	C1	5	1	113.1	11.66	0.08975	16	MB-HJAT
NTPM910Q1-HXL-H35-SKS-UNC0-E-C1-1-RTA-4	E	C1	5	1	111.3	11.78	0.08980	16	MB-HJAB
NTPM910Q1-HXL-H35-SKS-UNC0-E-C1-1-RTA-5	E	C1	5	1	122.1	11.82	0.08965	16	MB-HJAB
NTPM910Q1-HXL-H35-SKS-UNC0-E-C2-1-RTA-1***	E	C2	5	2	122.7	11.91	0.08933	16	MB-HJAB
NTPM910Q1-HXL-H35-SKS-UNC0-E-C2-1-RTA-2***	E	C2	5	2	112.3	11.84	0.08952	16	HAB
NTPM910Q1-HXL-H35-SKS-UNC0-E-C2-1-RTA-3	E	C2	5	2	115.4	11.80	0.08950	16	HAB
NTPM910Q1-HXL-H35-SKS-UNC0-E-C2-1-RTA-4	E	C2	5	2	115.6	12.47	0.08940	16	HAT
NTPM910Q1-HXL-H35-SKS-UNC0-E-C2-1-RTA-5	E	C2	5	2	123.7	11.76	0.08947	16	BAT
NTPM910Q1-HXL-H35-SKS-UNC0-E-C2-1-RTA-6	E	C2	5	2	121.2	11.65	0.08997	16	BAT

*Strength was not reported due to an unacceptable failure mode

**Extra coupon tested only for strength, no SG was used

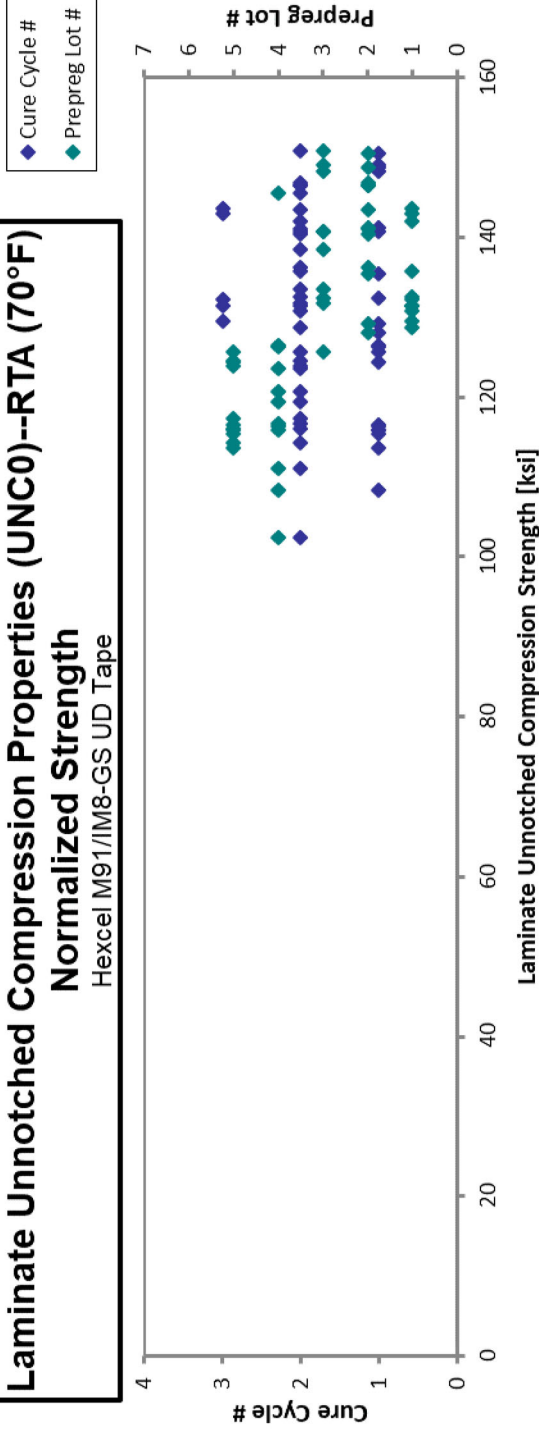
***Modulus are averaged values of 2 strain gages

Avg. t _{xy} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.005614	108.3	12.42
0.005632	115.9	12.32
0.005700	116.3	12.59
0.005617	126.3	12.51
0.005585	126.5	12.37
0.005618	145.5	12.17
0.005605	123.5	12.41
0.005663	102.4	12.30
0.005668	119.3	12.45
0.005607	116.7	12.27
0.005719	120.7	12.48
0.005617	111.0	
0.005585	116.6	12.29
0.005579	115.9	12.27
0.005609	115.4	11.90
0.005613	113.6	12.02
0.005603	124.4	12.04
0.005583	124.5	12.09
0.005595	114.2	12.04
0.005594	117.3	12.00
0.005525	116.1	12.52
0.005592	125.7	11.95
0.005623	123.9	11.91

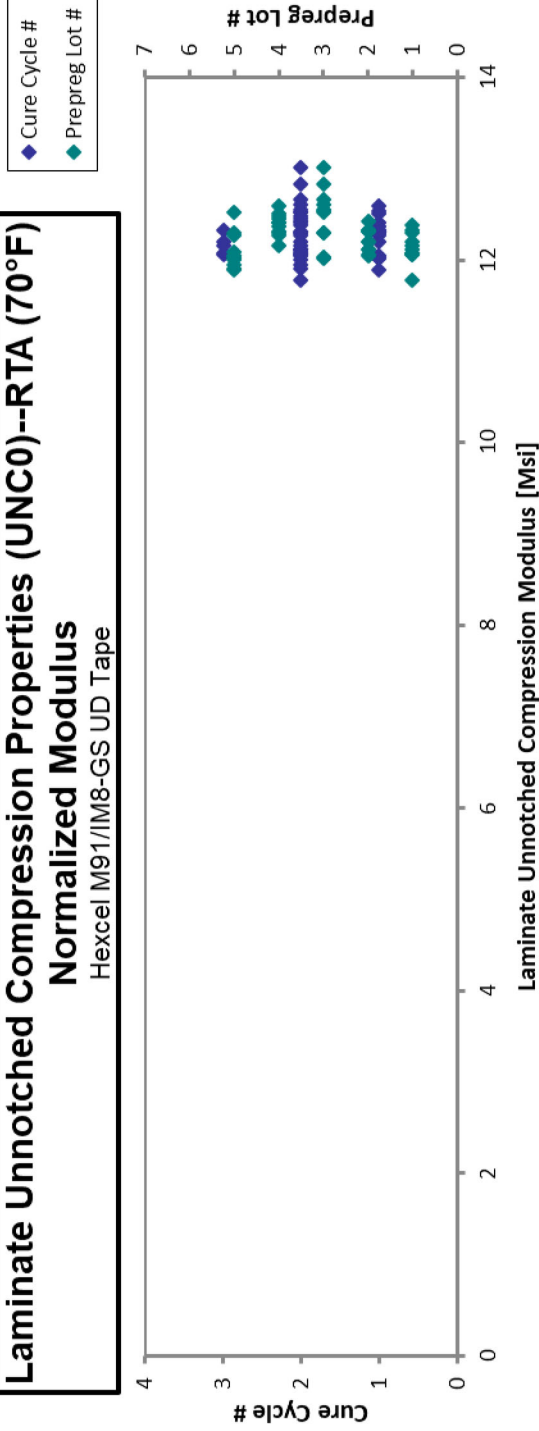
Average _{norm}	Standard Dev. _{norm}	Coeff. of Var. [%] _{norm}
0.005676	130.6	12.27
	12.29	0.2411
0.005505	9.411	1.965
0.005853	102.4	11.78
62	150.8	13.02
57	57	55
		Number of Spec.

Average	Standard Dev.	Coeff. of Var. [%]
126.6	10.96	8.654
	2.046	11.39
11.90	0.2435	2.046
11.39	11.39	99.50
12.47	143.4	143.4
55	57	57
		Number of Spec.

Laminate Unnotched Compression Properties (UNC0)--RTA (70°F)
Normalized Strength
Hexcel M91/IM8-GS UD Tape



Laminate Unnotched Compression Properties (UNC0)--RTA (70°F)
Normalized Modulus
Hexcel M91/IM8-GS UD Tape



Laminate Unnotched Compression Properties (UNC0)--ETW (180°F) ☐
Strength & Modulus ☐
Hexcel IM91/IM8-GS UD Tape

normalizing
 t_{avg} [in]
0.005500

Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Piles in Laminate	Failure Mode
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C2-1-ETW-1	A	C2	1	2	97.07	12.10	0.08905	16	BAB
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C2-1-ETW-2	A	C2	1	2	99.26	12.07	0.08857	16	BAB
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C2-1-ETW-3	A	C2	1	2	99.32	12.15	0.08878	16	M(B,H)AT
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C2-1-ETW-4	A	C2	1	2	90.19	12.04	0.08865	16	M(B,H)AT
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C2-1-ETW-5	A	C2	1	2	98.58	12.00	0.08857	16	M(B,H)AB
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C2-1-ETW-6	A	C2	1	2	96.11	11.70	0.08902	16	M(B,H)AB
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C3-1-ETW-1	A	C3	1	3	100.9	12.10	0.08945	16	M(B,H)AT
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C3-1-ETW-2	A	C3	1	3	95.56	11.73	0.08915	16	M(B,H)AT
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C3-1-ETW-3	A	C3	1	3	99.11	12.25	0.08923	16	M(B,H)AT
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C3-1-ETW-4	A	C3	1	3	93.28	12.21	0.08923	16	M(B,H)AB
NTPM910Q1-HXL-H35-NIAR-UNC0-A-C3-1-ETW-5	A	C3	1	3	96.84	12.09	0.08940	16	M(B,H)AB
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C1-1-ETW-1	B	C1	2	1	92.91	11.96	0.09232	16	M(B,H)AT
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C1-1-ETW-2	B	C1	2	1	95.36	11.83	0.09280	16	M(B,H)AT
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C1-1-ETW-3	B	C1	2	1	92.79	11.92	0.09255	16	M(B,H)AB
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C1-1-ETW-4	B	C1	2	1	103.5	11.88	0.09282	16	M(B,H)AT
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C1-1-ETW-5	B	C1	2	1	96.36	11.62	0.09243	16	M(B,H)AT
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C2-1-ETW-1	B	C2	2	2	88.92	11.89	0.09213	16	M(B,H)AT
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C2-1-ETW-2	B	C2	2	2	96.77	12.12	0.09205	16	M(B,H)AT
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C2-1-ETW-3	B	C2	2	2	95.71	11.92	0.09245	16	M(B,H)AT
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C2-1-ETW-4	B	C2	2	2	99.89	11.98	0.09207	16	M(B,H)AT C:IT
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C2-1-ETW-5	B	C2	2	2	94.92	12.12	0.09233	16	M(B,H)AT
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C2-1-ETW-6	B	C2	2	2	91.15	11.72	0.09235	16	M(B,H)AT
NTPM910Q1-HXL-H35-NIAR-UNC0-B-C2-1-ETW-7*	B	C2	2	2	96.18	11.56	0.09245	16	M(B,H)AT
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C1-1-ETW-1	C	C1	3	1	95.88	11.56	0.09365	16	M(B,H)AT
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C1-1-ETW-2	C	C1	3	1	98.43	11.60	0.09367	16	M(B,H)AT
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C1-1-ETW-3	C	C1	3	1	96.66	11.68	0.09373	16	HAB, HIB
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C1-1-ETW-4	C	C1	3	1	81.56	11.46	0.09292	16	M(B,H)AT
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C1-1-ETW-5	C	C1	3	1	86.80	11.92	0.09047	16	M(B,H)AT
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C2-1-ETW-1	C	C2	3	2	90.63	12.06	0.09333	16	M(B,H)AT
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C2-1-ETW-2	C	C2	3	2	94.61	12.31	0.09223	16	BAB
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C2-1-ETW-3	C	C2	3	2	93.31	12.38	0.09365	16	BAB
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C2-1-ETW-4	C	C2	3	2	85.61	12.05	0.09378	16	BAT
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C2-1-ETW-5	C	C2	3	2	89.14	12.38	0.09357	16	M(B,H)AB
NTPM910Q1-HXL-H35-NIAR-UNC0-C-C2-1-ETW-6	C	C2	3	2	93.95	12.45	0.09287	16	M(B,H)AT

Avg. t_{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.005566	98.23	12.24
0.005535	99.90	12.14
0.005549	100.2	12.26
0.005541	90.85	12.13
0.005535	99.21	12.08
0.005564	97.22	11.84
0.005591	102.6	12.30
0.005572	96.81	11.88
0.005577	100.5	12.42
0.005577	94.58	12.38
0.005588	98.38	12.28
0.005770	97.47	12.55
0.005800	100.6	12.48
0.005784	97.59	12.54
0.005801	109.1	12.53
0.005777	101.2	12.21
0.005758	93.09	12.45
0.005753	101.2	12.68
0.005778	100.5	12.53
0.005754	104.5	12.53
0.005771	99.59	12.72
0.005772	95.66	12.30
0.005778	101.0	12.30
0.005853	102.0	12.30
0.005854	104.8	12.35
0.005858	103.0	12.44
0.005807	86.12	12.10
0.005654	89.24	12.25
0.005833	96.13	12.79
0.005765	99.16	12.90
0.005853	99.30	13.17
0.005861	91.24	12.84
0.005848	94.78	13.16
0.005804	99.14	13.14

Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Piles in Laminate	Failure Mode
NTPM910Q1-HXL-H35-FACC-UNCO-D-C1-1-ETW-1	D	C1	4	1	88.83	12.29	0.09067	16	HAT/HIT
NTPM910Q1-HXL-H35-FACC-UNCO-D-C1-1-ETW-2	D	C1	4	1	95.62	12.08	0.09057	16	BAT, HIT
NTPM910Q1-HXL-H35-FACC-UNCO-D-C1-1-ETW-3	D	C1	4	1	94.86	12.64	0.09038	16	BAB
NTPM910Q1-HXL-H35-FACC-UNCO-D-C1-1-ETW-4	D	C1	4	1	93.41	12.63	0.09077	16	M(B,H)/AB
NTPM910Q1-HXL-H35-FACC-UNCO-D-C1-1-ETW-5	D	C1	4	1	97.54	12.53	0.09073	16	HAT/HIT
NTPM910Q1-HXL-H35-FACC-UNCO-D-C2-1-ETW-1	D	C2	4	2	93.81	12.14	0.09017	16	BAB, HAB/HIB
NTPM910Q1-HXL-H35-FACC-UNCO-D-C2-1-ETW-2	D	C2	4	2	93.62	12.19	0.09075	16	BAB, HIB
NTPM910Q1-HXL-H35-FACC-UNCO-D-C2-1-ETW-3	D	C2	4	2	95.43	12.33	0.08982	16	BAB
NTPM910Q1-HXL-H35-FACC-UNCO-D-C2-1-ETW-4	D	C2	4	2	97.36	12.08	0.09060	16	BAB
NTPM910Q1-HXL-H35-FACC-UNCO-D-C2-1-ETW-5	D	C2	4	2	98.25	11.98	0.08977	16	BAT, HAT/HIT
NTPM910Q1-HXL-H35-FACC-UNCO-D-C2-1-ETW-6	D	C2	4	2	95.78	12.14	0.09052	16	HAB, HIB
NTPM910Q1-HXL-H35-SKS-UNCO-E-C1-1-ETW-1	E	C1	5	1	84.28	12.08	0.09042	16	BAB
NTPM910Q1-HXL-H35-SKS-UNCO-E-C1-1-ETW-2	E	C1	5	1	94.56	11.88	0.09048	16	HAB/HIB
NTPM910Q1-HXL-H35-SKS-UNCO-E-C1-1-ETW-3	E	C1	5	1	86.44	12.01	0.09095	16	BAB
NTPM910Q1-HXL-H35-SKS-UNCO-E-C1-1-ETW-4	E	C1	5	1	95.32	11.95	0.08970	16	HAT/HIT
NTPM910Q1-HXL-H35-SKS-UNCO-E-C1-1-ETW-5	E	C1	5	1	96.64	11.73	0.09052	16	BAT, HAT/HIT
NTPM910Q1-HXL-H35-SKS-UNCO-E-C2-1-ETW-1	E	C2	5	2	93.46	11.99	0.09047	16	BAT
NTPM910Q1-HXL-H35-SKS-UNCO-E-C2-1-ETW-2	E	C2	5	2	91.33	11.88	0.08972	16	BAB
NTPM910Q1-HXL-H35-SKS-UNCO-E-C2-1-ETW-3	E	C2	5	2	97.15	11.84	0.08917	16	BAB
NTPM910Q1-HXL-H35-SKS-UNCO-E-C2-1-ETW-4	E	C2	5	2	94.08	12.19	0.08767	16	M(B,H)/AB
NTPM910Q1-HXL-H35-SKS-UNCO-E-C2-1-ETW-5	E	C2	5	2	97.59	12.02	0.08437	16	M(B,H)/AB
NTPM910Q1-HXL-H35-SKS-UNCO-E-C2-1-ETW-6	E	C2	5	2	95.22	12.01	0.08905	16	HAB/HIB

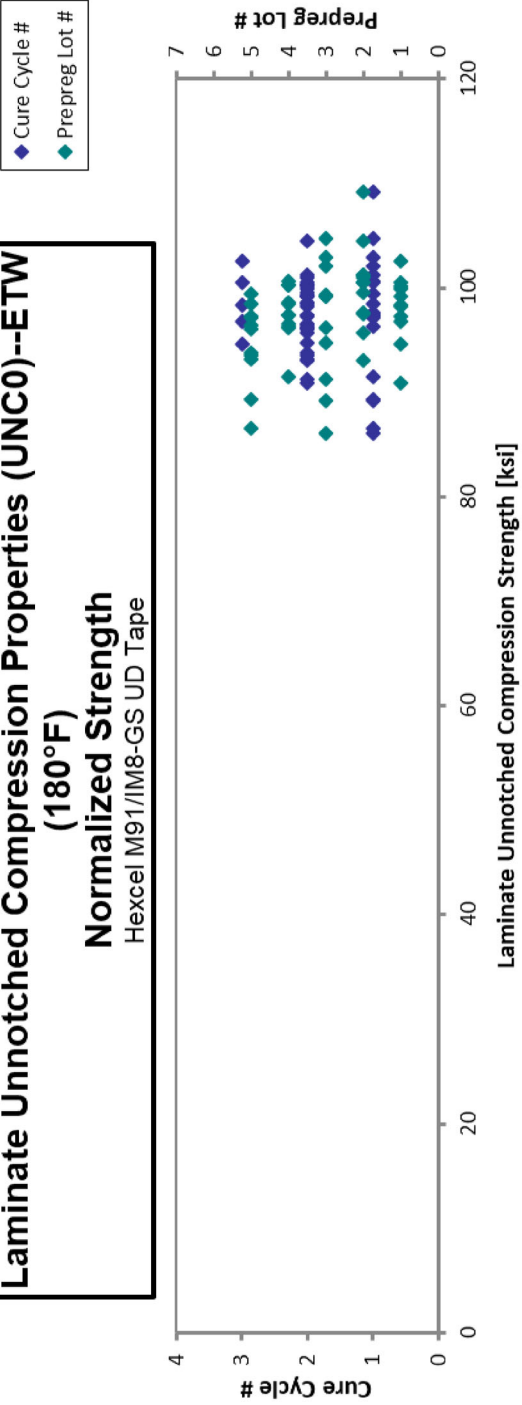
Avg. t _{ply} [in]	Strength _{norm} [ksi]	Modulus _{norm} [Msi]
0.005667	91.53	12.66
0.005660	98.41	12.43
0.005649	97.43	12.98
0.005673	96.34	13.03
0.005671	100.6	12.92
0.005635	96.12	12.44
0.005672	96.55	12.57
0.005614	97.40	12.58
0.005663	100.2	12.44
0.005610	100.2	12.22
0.005657	98.52	12.48
0.005651	86.60	12.41
0.005655	97.23	12.21
0.005684	89.33	12.41
0.005606	97.16	12.18
0.005657	99.40	12.07
0.005654	96.08	12.33
0.005607	93.11	12.11
0.005573	98.44	11.99
0.005479	93.73	12.14
0.005273	93.56	11.52
0.005566	96.36	12.15

*Extra coupon tested only for strength, no SG was used

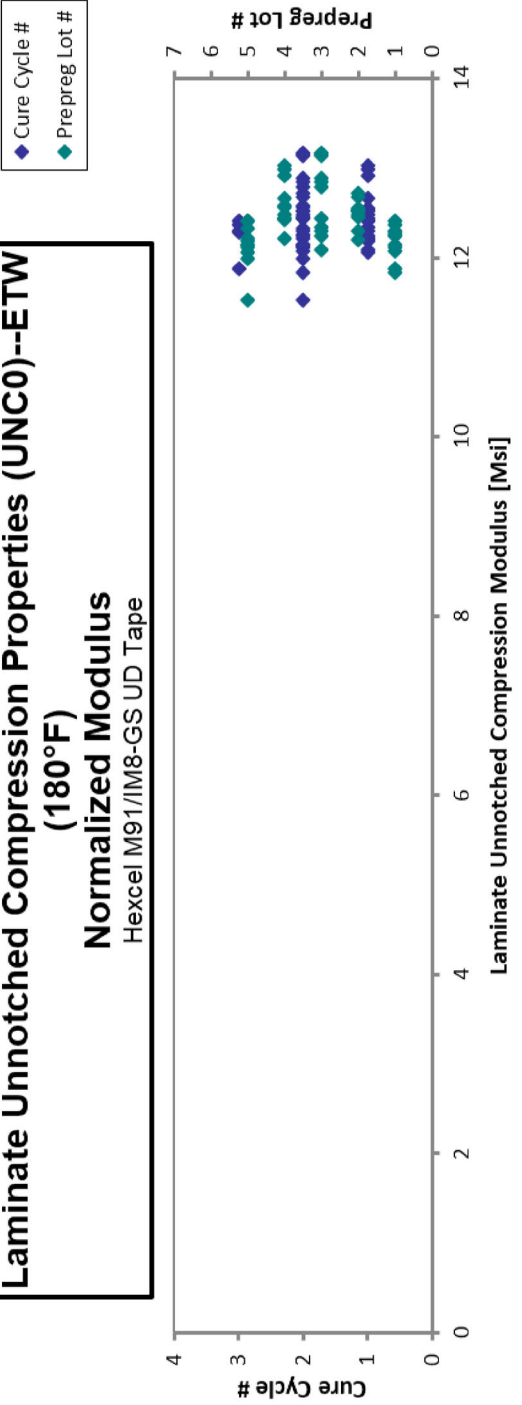
Average	12.03	Average _{norm}	0.005680
Standard Dev.	0.2534	Standard Dev _{norm}	0.005680
Coeff. of Var. [%]	4.217	Coeff. of Var. [%] _{norm}	4.355
Min.	81.56	Min.	86.12
Max.	103.5	Max.	109.1
Number of Spec.	56	Number of Spec.	56

97.49	12.42
4.355	0.3381
4.467	2.722
86.12	11.52
109.1	13.17
56	55

Laminate Unnotched Compression Properties (UNC0)--ETW
(180°F)
Normalized Strength
Hexcel M91/IM8-GS UD Tape



Laminate Unnotched Compression Properties (UNC0)--ETW
(180°F)
Normalized Modulus
Hexcel M91/IM8-GS UD Tape



4.8 In Plane Shear V-Notch Properties (IPSV)

In-Plane Shear Properties (IPSV)--CTA (-65°F) □	
Strength & Modulus □	
Hexcel IM91/IM8-GS UD Tape	

Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	0.2% Offset Strength [ksi]	Strain at 5% Strength [ksi]	Ultimate Shear Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode
NTPM910Q1-HXL-H35-NIAR-IPSV-A-C1-1-CTA-1	A	C1	1	1	11.37	18.13	30.20	0.8745	0.1345	24	0.005606	HGN, HNA
NTPM910Q1-HXL-H35-NIAR-IPSV-A-C1-1-CTA-2	A	C1	1	1	11.65	18.08	31.11	0.8693	0.1339	24	0.005577	HGN, HNA
NTPM910Q1-HXL-H35-NIAR-IPSV-A-C1-1-CTA-3	A	C1	1	1	11.20	17.88	30.62	0.8868	0.1344	24	0.005600	HGN, HNA
NTPM910Q1-HXL-H35-NIAR-IPSV-A-C1-1-CTA-4	A	C1	1	1	11.44	17.94	33.05	0.8770	0.1347	24	0.005611	HGN, HNA
NTPM910Q1-HXL-H35-NIAR-IPSV-A-C1-1-CTA-5	A	C1	1	1	11.40	17.92	31.00	0.8646	0.1353	24	0.005639	HGN, HNA
NTPM910Q1-HXL-H35-NIAR-IPSV-A-C2-1-CTA-1	A	C2	1	2	11.63	18.18	31.72	0.8851	0.1346	24	0.005607	HGN, HNA
NTPM910Q1-HXL-H35-NIAR-IPSV-A-C2-1-CTA-2	A	C2	1	2	11.30	18.35	31.68	0.9184	0.1342	24	0.005590	HGN, HNA
NTPM910Q1-HXL-H35-NIAR-IPSV-A-C2-1-CTA-3	A	C2	1	2	11.26	18.43	32.38	0.9138	0.1342	24	0.005593	HGN, HNA
NTPM910Q1-HXL-H35-NIAR-IPSV-A-C2-1-CTA-4	A	C2	1	2	11.54	18.49	33.63	0.8652	0.1343	24	0.005597	HGN, HNA
NTPM910Q1-HXL-H35-NIAR-IPSV-A-C2-1-CTA-5	A	C2	1	2	11.46	18.19	31.35	0.8845	0.1344	24	0.005601	HGN, HNA
NTPM910Q1-HXL-H35-NIAR-IPSV-A-C2-1-CTA-6	A	C2	1	2	11.61	18.15	31.34	0.8723	0.1349	24	0.005622	HGN, HNA
NTPM910Q1-HXL-H35-NIAR-IPSV-B-C1-1-CTA-1	B	C1	2	1	10.97	18.51	31.39	0.8656	0.1389	24	0.005788	HGN, HNA
NTPM910Q1-HXL-H35-NIAR-IPSV-B-C1-1-CTA-2	B	C1	2	1	10.82	18.54	31.86	0.8582	0.1391	24	0.005794	HGN, HNA
NTPM910Q1-HXL-H35-NIAR-IPSV-B-C1-1-CTA-3	B	C1	2	1	11.39	18.70	31.23	0.8071	0.1387	24	0.005779	HGN, HNA
NTPM910Q1-HXL-H35-NIAR-IPSV-B-C1-1-CTA-4	B	C1	2	1	11.04	18.58	31.04	0.8399	0.1396	24	0.005815	HGN, HNA
NTPM910Q1-HXL-H35-NIAR-IPSV-B-C1-1-CTA-5	B	C1	2	1	11.04	18.73	30.64	0.8519	0.1397	24	0.005820	HGN, HNA
NTPM910Q1-HXL-H35-NIAR-IPSV-B-C2-1-CTA-1	B	C2	2	2	10.95	19.12	30.35	0.8625	0.1386	24	0.005776	HGN
NTPM910Q1-HXL-H35-NIAR-IPSV-B-C2-1-CTA-2	B	C2	2	2	10.93	18.80	29.31	0.8209	0.1394	24	0.005808	HGN
NTPM910Q1-HXL-H35-NIAR-IPSV-B-C2-1-CTA-3	B	C2	2	2	10.94	18.58	31.37	0.8524	0.1391	24	0.005797	HGN
NTPM910Q1-HXL-H35-NIAR-IPSV-B-C2-1-CTA-4	B	C2	2	2	10.98	18.80	31.15	0.8443	0.1387	24	0.005777	HGN
NTPM910Q1-HXL-H35-NIAR-IPSV-B-C2-1-CTA-5	B	C2	2	2	10.94	18.79	29.76	0.8576	0.1385	24	0.005769	HGN
NTPM910Q1-HXL-H35-NIAR-IPSV-B-C2-1-CTA-6	B	C2	2	2	11.06	18.72	29.18	0.8543	0.1390	24	0.005790	HGN
NTPM910Q1-HXL-H35-NIAR-IPSV-C-C1-1-CTA-1	C	C1	3	1	11.09	18.52	32.80	0.8280	0.1398	24	0.005824	HGN
NTPM910Q1-HXL-H35-NIAR-IPSV-C-C1-1-CTA-2	C	C1	3	1	11.17	18.51	31.78	0.8479	0.1405	24	0.005853	HGN
NTPM910Q1-HXL-H35-NIAR-IPSV-C-C1-1-CTA-3	C	C1	3	1	10.82	18.55	31.88	0.8778	0.1401	24	0.005837	HGN
NTPM910Q1-HXL-H35-NIAR-IPSV-C-C1-1-CTA-4	C	C1	3	1	11.74	18.65	32.60	0.8160	0.1397	24	0.005819	HGN
NTPM910Q1-HXL-H35-NIAR-IPSV-C-C1-1-CTA-5	C	C1	3	1	10.46	18.66	30.33	0.9446	0.1396	24	0.005815	HGN
NTPM910Q1-HXL-H35-NIAR-IPSV-C-C2-1-CTA-1	C	C2	3	2	11.09	18.87	31.89	0.8786	0.1396	24	0.005816	HGN
NTPM910Q1-HXL-H35-NIAR-IPSV-C-C2-1-CTA-2	C	C2	3	2	11.31	19.20	31.82	0.8700	0.1401	24	0.005838	HGN
NTPM910Q1-HXL-H35-NIAR-IPSV-C-C2-1-CTA-3	C	C2	3	2	10.98	19.04	32.40	0.8354	0.1399	24	0.005829	HGN
NTPM910Q1-HXL-H35-NIAR-IPSV-C-C2-1-CTA-4	C	C2	3	2	11.02	19.41	28.20	0.8711	0.1401	24	0.005838	HGN
NTPM910Q1-HXL-H35-NIAR-IPSV-C-C2-1-CTA-5	C	C2	3	2	11.34	19.10	31.59	0.8542	0.1399	24	0.005827	HGN
NTPM910Q1-HXL-H35-NIAR-IPSV-C-C2-1-CTA-6	C	C2	3	2	10.72	18.89	29.74	0.8743	0.1397	24	0.005822	HGN

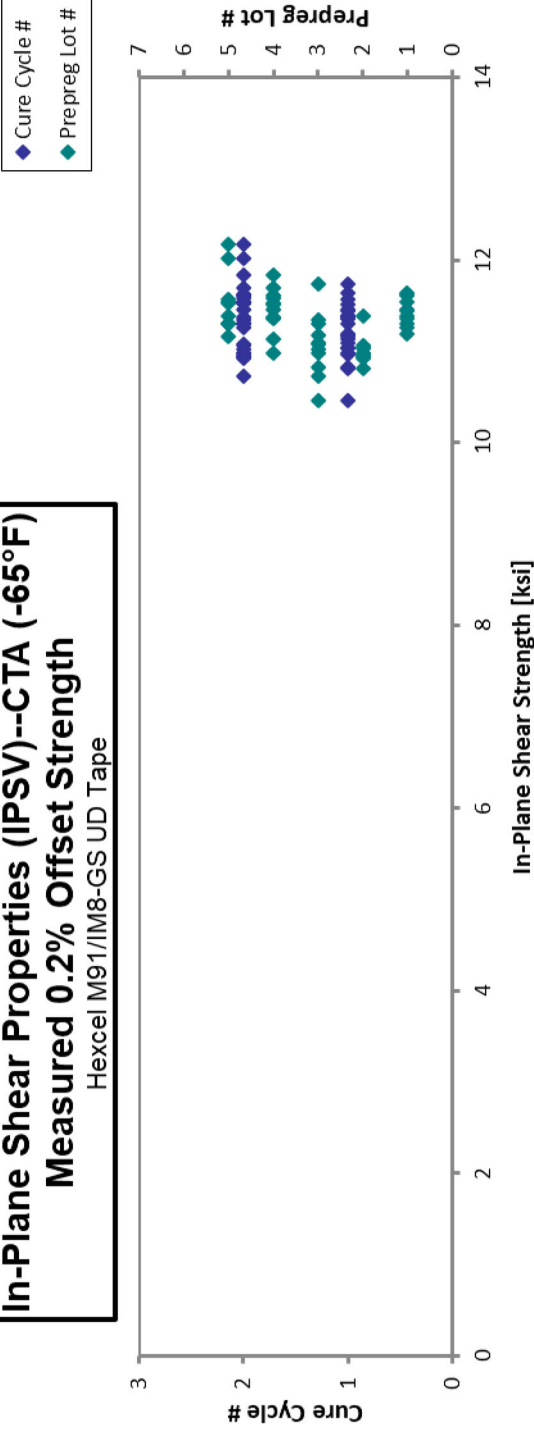
Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	0.2% Offset Strength [ksi]	Strain at 5% Strength [ksi]	Ultimate Shear Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Piles in Laminate	Avg. t_{pi} [in]	Failure Mode
NTPM910Q1-HXL-H35-FACC-IPSV-D-C1-1-CTA-1	D	C1	4	1	11.14	19.20	32.32	0.8899	0.1356	24	0.005651	HGN, HNA
NTPM910Q1-HXL-H35-FACC-IPSV-D-C1-1-CTA-2	D	C1	4	1	10.98	19.04	32.49	0.8615	0.1359	24	0.005663	HGN, HNA
NTPM910Q1-HXL-H35-FACC-IPSV-D-C1-1-CTA-3	D	C1	4	1	11.52	19.31	30.46	0.8739	0.1346	24	0.005609	HGN, HNA
NTPM910Q1-HXL-H35-FACC-IPSV-D-C1-1-CTA-4	D	C1	4	1	11.46	19.63	31.94	0.8884	0.1353	24	0.005636	HGN, HNA
NTPM910Q1-HXL-H35-FACC-IPSV-D-C1-1-CTA-5	D	C1	4	1	11.36	19.36	32.88	0.8809	0.1352	24	0.005633	HGN, HNA
NTPM910Q1-HXL-H35-FACC-IPSV-D-C2-1-CTA-1	D	C2	4	2	11.59	19.10	29.84	0.8536	0.1364	24	0.005683	HGN, HNA
NTPM910Q1-HXL-H35-FACC-IPSV-D-C2-1-CTA-2	D	C2	4	2	11.53	19.22	30.68	0.8518	0.1356	24	0.005649	HGN, HNA
NTPM910Q1-HXL-H35-FACC-IPSV-D-C2-1-CTA-3	D	C2	4	2	11.61	19.12	32.32	0.8512	0.1360	24	0.005667	HGN, HNA
NTPM910Q1-HXL-H35-FACC-IPSV-D-C2-1-CTA-4	D	C2	4	2	11.37	19.36	30.78	0.8813	0.1358	24	0.005658	HGN, HNA
NTPM910Q1-HXL-H35-FACC-IPSV-D-C2-1-CTA-5	D	C2	4	2	11.84	19.27	30.31	0.8513	0.1356	24	0.005651	HGN, HNA
NTPM910Q1-HXL-H35-FACC-IPSV-D-C2-1-CTA-6	D	C2	4	2	11.69	19.48	31.12	0.8548	0.1348	24	0.005618	HGN, HNA
NTPM910Q1-HXL-H35-SKS-IPSV-E-C1-1-CTA-1	E	C1	5	1	11.57	19.17	30.09	0.9299	0.1298	24	0.005406	HGN, HNA
NTPM910Q1-HXL-H35-SKS-IPSV-E-C1-1-CTA-2*	E	C1	5	1	30.72	30.72	30.72	0.1326	0.1326	24	0.005524	HGN, HNA
NTPM910Q1-HXL-H35-SKS-IPSV-E-C1-1-CTA-3	E	C1	5	1	11.16	19.04	31.42	0.9239	0.1345	24	0.005603	HGN, HNA
NTPM910Q1-HXL-H35-SKS-IPSV-E-C1-1-CTA-4	E	C1	5	1	11.30	19.18	30.62	0.8768	0.1348	24	0.005616	HGN, HNA
NTPM910Q1-HXL-H35-SKS-IPSV-E-C1-1-CTA-5	E	C1	5	1	11.39	19.39	30.00	0.9053	0.1337	24	0.005572	HGN, HNA
NTPM910Q1-HXL-H35-SKS-IPSV-E-C2-1-CTA-1	E	C2	5	2	12.02	19.23	30.57	0.8778	0.1298	24	0.005410	HGN, HNA
NTPM910Q1-HXL-H35-SKS-IPSV-E-C2-1-CTA-2	E	C2	5	2	12.18	19.01	31.53	0.8092	0.1341	24	0.005585	HGN, HNA
NTPM910Q1-HXL-H35-SKS-IPSV-E-C2-1-CTA-3	E	C2	5	2	11.54	19.15	30.97	0.8481	0.1358	24	0.005659	HGN, HNA
NTPM910Q1-HXL-H35-SKS-IPSV-E-C2-1-CTA-4	E	C2	5	2	11.30	19.12	30.95	0.8304	0.1361	24	0.005672	HGN, HNA
NTPM910Q1-HXL-H35-SKS-IPSV-E-C2-1-CTA-5	E	C2	5	2	11.53	19.30	31.46	0.8448	0.1359	24	0.005661	HGN, HNA
NTPM910Q1-HXL-H35-SKS-IPSV-E-C2-1-CTA-6	E	C2	5	2	11.30	18.83	32.73	0.8600	0.1354	24	0.005641	HGN, HNA

*Not reported due to strain gage error

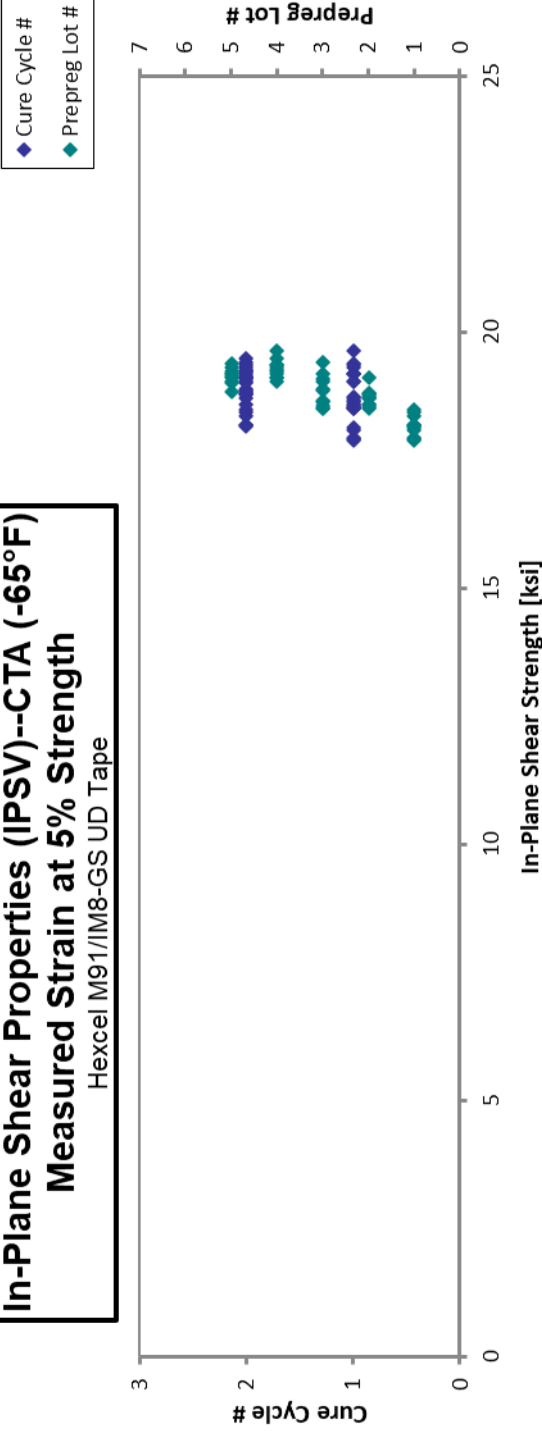
Modulus calculation was obtained from 2000 to 6000 microstrain

Average	11.30	18.82	31.21	0.8661	0.005690
Standard Dev.	0.3292	0.4453	1.064	0.02839	
Coeff. of Var. [%]	2.914	2.366	3.408	3.279	
Min.	10.46	17.88	28.20	0.8071	0.005406
Max.	12.18	19.63	33.63	0.9446	0.005853
Number of Spec.	54	54	55	54	55

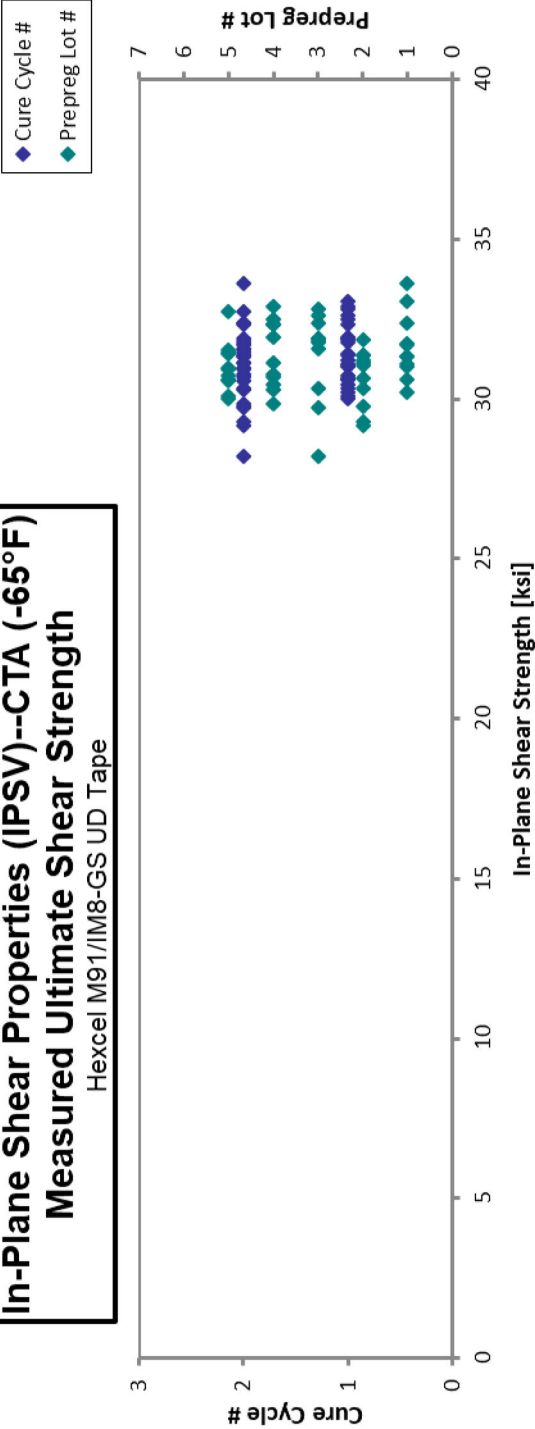
**In-Plane Shear Properties (IPSV)--CTA (-65°F)
Measured 0.2% Offset Strength**
Hexcel M91/IM8-GS UD Tape



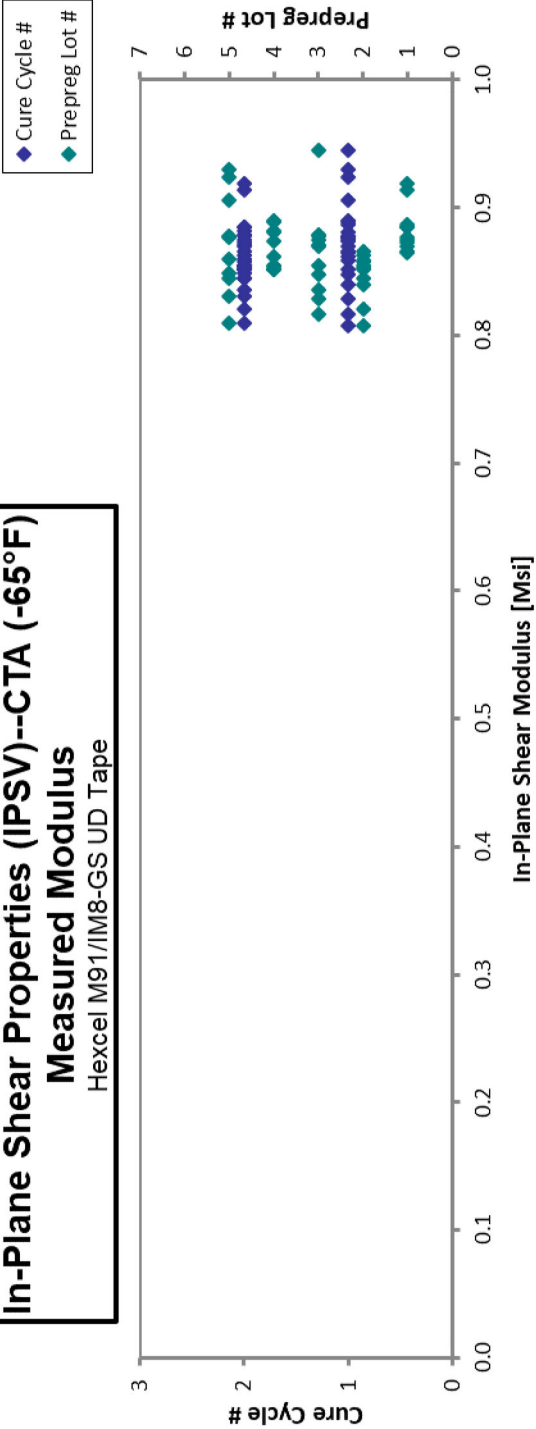
**In-Plane Shear Properties (IPSV)--CTA (-65°F)
Measured Strain at 5% Strength**
Hexcel M91/IM8-GS UD Tape



**In-Plane Shear Properties (IPSV)--CTA (-65°F)
Measured Ultimate Shear Strength**
Hexcel M91/IM8-GS UD Tape



**In-Plane Shear Properties (IPSV)--CTA (-65°F)
Measured Modulus**
Hexcel M91/IM8-GS UD Tape



In-Plane Shear Properties (IPSV)--RTA (70°F) ☐
Strength & Modulus ☐
Hexcel M91/IM8-GS UD Tape

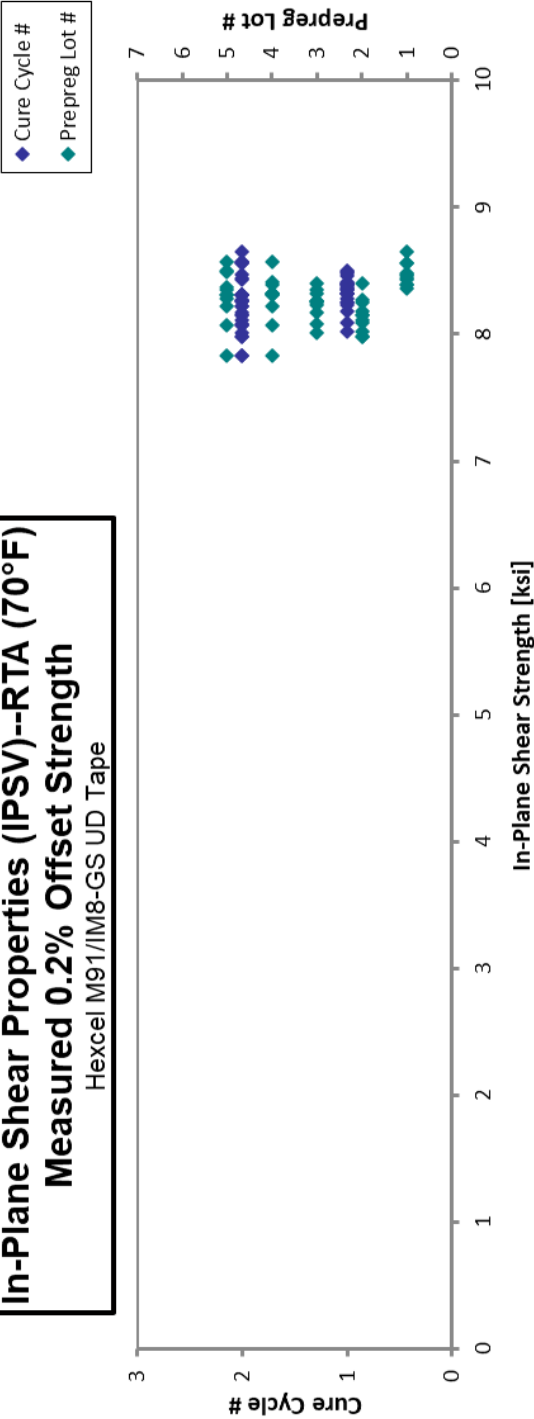
Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	0.2% Offset Strength [ksi]	Strain at 5% Strength [ksi]	Ultimate Shear Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Piles in Laminate	Avg. t_{ply} [in]	Failure Mode
NTPM910Q1-HXL-H35-NIAR-IPSV-A-C1-1-RTA-1	A	C1	1	1	8.460	13.89	25.13	0.7697	0.1338	24	0.005575	HGN
NTPM910Q1-HXL-H35-NIAR-IPSV-A-C1-1-RTA-2	A	C1	1	1	8.385	13.70	24.93	0.7488	0.1338	24	0.005576	HGN
NTPM910Q1-HXL-H35-NIAR-IPSV-A-C1-1-RTA-3	A	C1	1	1	8.480	13.78	24.94	0.7587	0.1337	24	0.005569	HGN
NTPM910Q1-HXL-H35-NIAR-IPSV-A-C1-1-RTA-4	A	C1	1	1	8.387	13.78	25.00	0.7655	0.1339	24	0.005578	HGN
NTPM910Q1-HXL-H35-NIAR-IPSV-A-C1-1-RTA-5	A	C1	1	1	8.359	13.75	25.24	0.7744	0.1343	24	0.005594	HGN
NTPM910Q1-HXL-H35-NIAR-IPSV-A-C2-1-RTA-1	A	C2	1	2	8.646	13.84	25.01	0.7728	0.1340	24	0.005583	HGN
NTPM910Q1-HXL-H35-NIAR-IPSV-A-C2-1-RTA-2	A	C2	1	2	8.472	13.80	24.98	0.7718	0.1335	24	0.005563	HGN
NTPM910Q1-HXL-H35-NIAR-IPSV-A-C2-1-RTA-3	A	C2	1	2	8.441	13.84	25.32	0.7630	0.1339	24	0.005578	HGN
NTPM910Q1-HXL-H35-NIAR-IPSV-A-C2-1-RTA-4	A	C2	1	2	8.559	13.85	25.04	0.7731	0.1336	24	0.005568	HGN
NTPM910Q1-HXL-H35-NIAR-IPSV-A-C2-1-RTA-5	A	C2	1	2	8.564	13.98	25.27	0.7815	0.1334	24	0.005559	HGN
NTPM910Q1-HXL-H35-NIAR-IPSV-A-C2-1-RTA-6	A	C2	1	2	8.427	13.87	25.21	0.7580	0.1342	24	0.005590	HGN
NTPM910Q1-HXL-H35-NIAR-IPSV-B-C1-1-RTA-1	B	C1	2	1	8.022	13.39	24.78	0.7032	0.1393	24	0.005806	HGN
NTPM910Q1-HXL-H35-NIAR-IPSV-B-C1-1-RTA-2	B	C1	2	1	8.396	13.69	25.41	0.7133	0.1381	24	0.005753	HGN
NTPM910Q1-HXL-H35-NIAR-IPSV-B-C1-1-RTA-3	B	C1	2	1	8.181	13.58	25.15	0.7193	0.1383	24	0.005761	HGN
NTPM910Q1-HXL-H35-NIAR-IPSV-B-C1-1-RTA-4	B	C1	2	1	8.091	13.55	25.13	0.7259	0.1388	24	0.005784	HGN
NTPM910Q1-HXL-H35-NIAR-IPSV-B-C1-1-RTA-5	B	C1	2	1	8.247	13.58	24.96	0.7352	0.1389	24	0.005788	HGN
NTPM910Q1-HXL-H35-NIAR-IPSV-B-C2-1-RTA-1	B	C2	2	2	8.271	13.65	25.74	0.7151	0.1388	24	0.005782	HGM
NTPM910Q1-HXL-H35-NIAR-IPSV-B-C2-1-RTA-2	B	C2	2	2	8.145	13.61	25.47	0.7497	0.1388	24	0.005781	HGM
NTPM910Q1-HXL-H35-NIAR-IPSV-B-C2-1-RTA-3	B	C2	2	2	8.150	13.62	25.41	0.7111	0.1398	24	0.005826	HGM
NTPM910Q1-HXL-H35-NIAR-IPSV-B-C2-1-RTA-4	B	C2	2	2	7.982	13.57	25.38	0.7357	0.1396	24	0.005817	HGM
NTPM910Q1-HXL-H35-NIAR-IPSV-B-C2-1-RTA-5	B	C2	2	2	8.107	13.69	25.43	0.7521	0.1380	24	0.005750	HGM
NTPM910Q1-HXL-H35-NIAR-IPSV-B-C2-1-RTA-6	B	C2	2	2	7.983	13.61	25.30	0.7576	0.1384	24	0.005767	HGM
NTPM910Q1-HXL-H35-NIAR-IPSV-C-C1-1-RTA-1	C	C1	3	1	8.402	13.67	25.22	0.7438	0.1397	24	0.005821	HGN
NTPM910Q1-HXL-H35-NIAR-IPSV-C-C1-1-RTA-2	C	C1	3	1	8.250	13.79	25.26	0.7507	0.1399	24	0.005829	HGN
NTPM910Q1-HXL-H35-NIAR-IPSV-C-C1-1-RTA-3	C	C1	3	1	8.321	13.74	25.36	0.7635	0.1398	24	0.005824	HGN
NTPM910Q1-HXL-H35-NIAR-IPSV-C-C1-1-RTA-4	C	C1	3	1	8.232	13.77	25.05	0.7468	0.1401	24	0.005837	HGN
NTPM910Q1-HXL-H35-NIAR-IPSV-C-C1-1-RTA-5	C	C1	3	1	8.353	13.70	25.23	0.7375	0.1401	24	0.005838	HGN
NTPM910Q1-HXL-H35-NIAR-IPSV-C-C2-1-RTA-1	C	C2	3	2	8.169	13.68	25.47	0.7317	0.1405	24	0.005852	HGN
NTPM910Q1-HXL-H35-NIAR-IPSV-C-C2-1-RTA-2	C	C2	3	2	8.265	13.65	25.25	0.7092	0.1398	24	0.005826	HGN
NTPM910Q1-HXL-H35-NIAR-IPSV-C-C2-1-RTA-3	C	C2	3	2	8.258	13.63	25.32	0.7215	0.1414	24	0.005891	HGN
NTPM910Q1-HXL-H35-NIAR-IPSV-C-C2-1-RTA-4	C	C2	3	2	8.079	13.62	25.42	0.7220	0.1406	24	0.005857	HGN
NTPM910Q1-HXL-H35-NIAR-IPSV-C-C2-1-RTA-5	C	C2	3	2	8.005	13.69	25.51	0.7164	0.1401	24	0.005838	HGN
NTPM910Q1-HXL-H35-NIAR-IPSV-C-C2-1-RTA-6	C	C2	3	2	8.263	13.62	25.24	0.7295	0.1389	24	0.005786	HGN

Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	0.2% Offset Strength [ksi]	Strain at 5% Strength [ksi]	Ultimate Shear Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Piles in Laminate	Avg. t ₉₅ [in]	Failure Mode
NTPM910Q1-HXL-H35-FACC-IPSV-D-C1-1-RTA-1	D	C1	4	1	8.321	13.75	25.49	0.7776	0.1352	24	0.005632	M/V,H GN
NTPM910Q1-HXL-H35-FACC-IPSV-D-C1-1-RTA-2	D	C1	4	1	8.320	13.68	25.77	0.7614	0.1361	24	0.005670	M/V,H GN
NTPM910Q1-HXL-H35-FACC-IPSV-D-C1-1-RTA-3	D	C1	4	1	8.390	13.75	25.57	0.7572	0.1346	24	0.005606	M/V,H GN
NTPM910Q1-HXL-H35-FACC-IPSV-D-C1-1-RTA-4	D	C1	4	1	8.406	13.72	25.79	0.7585	0.1346	24	0.005608	M/V,H GN
NTPM910Q1-HXL-H35-FACC-IPSV-D-C1-1-RTA-5	D	C1	4	1	8.316	13.75	25.68	0.7456	0.1362	24	0.005674	M/V,H GN
NTPM910Q1-HXL-H35-FACC-IPSV-D-C2-1-RTA-1	D	C2	4	2	8.218	13.72	25.07	0.7265	0.1357	24	0.005656	M/V,H GN
NTPM910Q1-HXL-H35-FACC-IPSV-D-C2-1-RTA-2	D	C2	4	2	8.310	13.75	25.56	0.7512	0.1353	24	0.005638	M/V,H GN
NTPM910Q1-HXL-H35-FACC-IPSV-D-C2-1-RTA-3	D	C2	4	2	8.309	13.75	25.60	0.7424	0.1349	24	0.005622	M/V,H GN
NTPM910Q1-HXL-H35-FACC-IPSV-D-C2-1-RTA-4	D	C2	4	2	8.573	13.68	25.55	0.7319	0.1354	24	0.005641	M/V,H GN
NTPM910Q1-HXL-H35-FACC-IPSV-D-C2-1-RTA-5	D	C2	4	2	8.067	13.75	25.36	0.7304	0.1353	24	0.005637	HGN
NTPM910Q1-HXL-H35-FACC-IPSV-D-C2-1-RTA-6	D	C2	4	2	7.831	13.72	25.50	0.7330	0.1361	24	0.005672	M/V,H GN
NTPM910Q1-HXL-H35-SKS-IPSV-E-C1-1-RTA-1	E	C1	5	1	8.371	13.71	24.99	0.7764	0.1345	24	0.005602	M/V,H GN
NTPM910Q1-HXL-H35-SKS-IPSV-E-C1-1-RTA-2	E	C1	5	1	8.499	13.56	25.24	0.6940	0.1343	24	0.005595	M/V,H GN
NTPM910Q1-HXL-H35-SKS-IPSV-E-C1-1-RTA-3	E	C1	5	1	8.280	13.61	25.12	0.7378	0.1345	24	0.005605	M/V,H GN
NTPM910Q1-HXL-H35-SKS-IPSV-E-C1-1-RTA-4	E	C1	5	1	8.346	13.66	24.84	0.7652	0.1343	24	0.005597	M/V,H GN
NTPM910Q1-HXL-H35-SKS-IPSV-E-C1-1-RTA-5	E	C1	5	1	8.491	13.79	25.10	0.7697	0.1335	24	0.005563	M/V,H GN
NTPM910Q1-HXL-H35-SKS-IPSV-E-C2-1-RTA-1	E	C2	5	2	8.218	13.52	25.07	0.7265	0.1350	24	0.005625	M/V,H GN
NTPM910Q1-HXL-H35-SKS-IPSV-E-C2-1-RTA-2	E	C2	5	2	8.310	13.74	25.56	0.7512	0.1352	24	0.005633	M/V,H GN
NTPM910Q1-HXL-H35-SKS-IPSV-E-C2-1-RTA-3	E	C2	5	2	8.309	13.62	25.60	0.7424	0.1356	24	0.005651	M/V,H GN
NTPM910Q1-HXL-H35-SKS-IPSV-E-C2-1-RTA-4	E	C2	5	2	8.573	13.74	25.55	0.7319	0.1360	24	0.005668	M/V,H GN
NTPM910Q1-HXL-H35-SKS-IPSV-E-C2-1-RTA-5	E	C2	5	2	8.067	13.65	25.36	0.7304	0.1350	24	0.005626	M/V,H GN
NTPM910Q1-HXL-H35-SKS-IPSV-E-C2-1-RTA-6	E	C2	5	2	7.831	13.50	25.50	0.7330	0.1324	24	0.005515	M/V,H GN

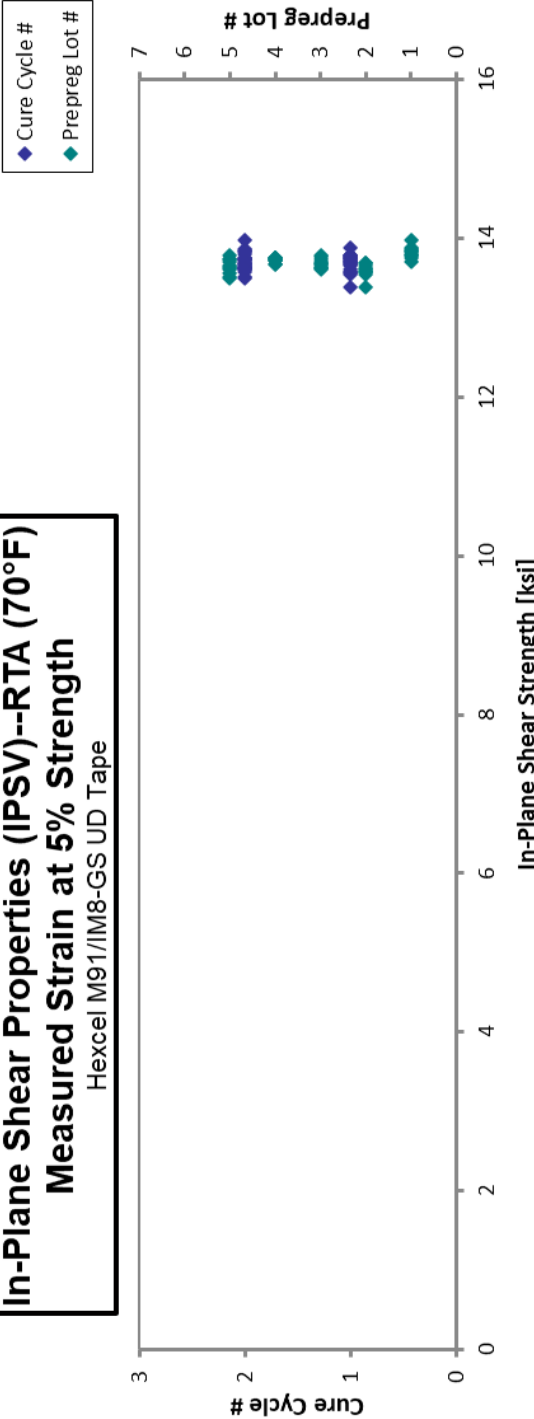
Modulus calculation was obtained from 2000 to 6000 microstrain

Average	8.286	13.70	25.30	0.7437	0.005689
Standard Dev.	0.1833	0.1043	0.2444	0.02131	
Coeff. of Var. [%]	2.212	0.762	0.9660	2.865	
Min.	7.831	13.39	24.78	0.6940	0.005515
Max.	8.646	13.98	25.79	0.7815	0.005891
Number of Spec.	55	55	55	55	55

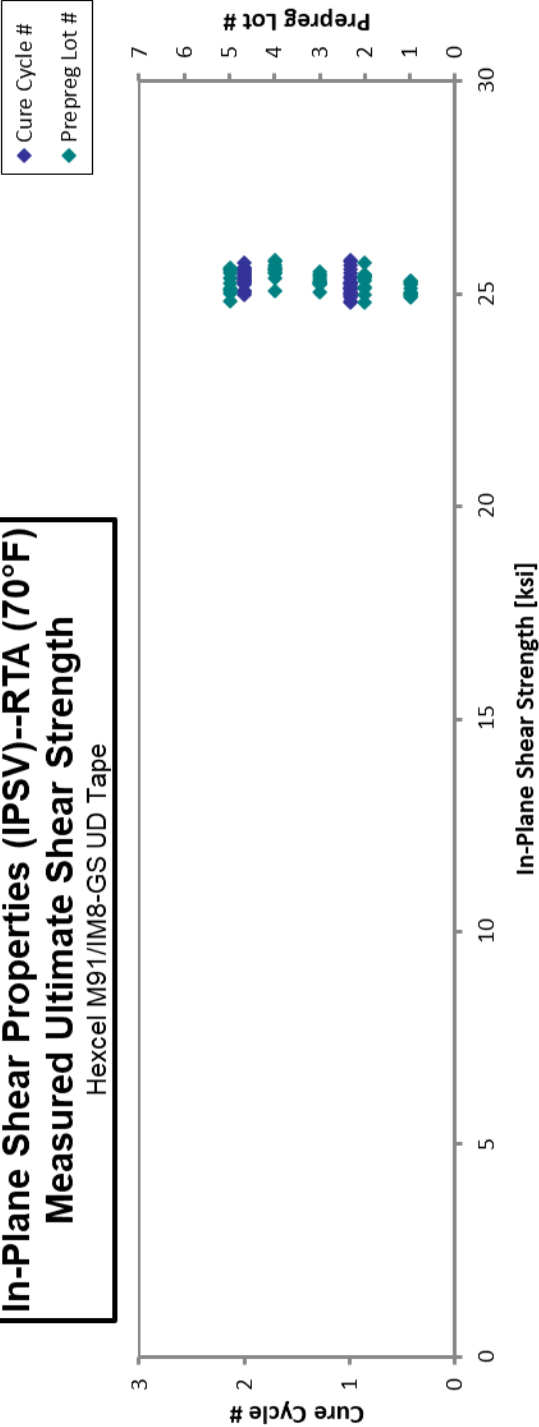
**In-Plane Shear Properties (IPSV)--RTA (70°F)
Measured 0.2% Offset Strength**
Hexcel M91/IM8-GS UD Tape



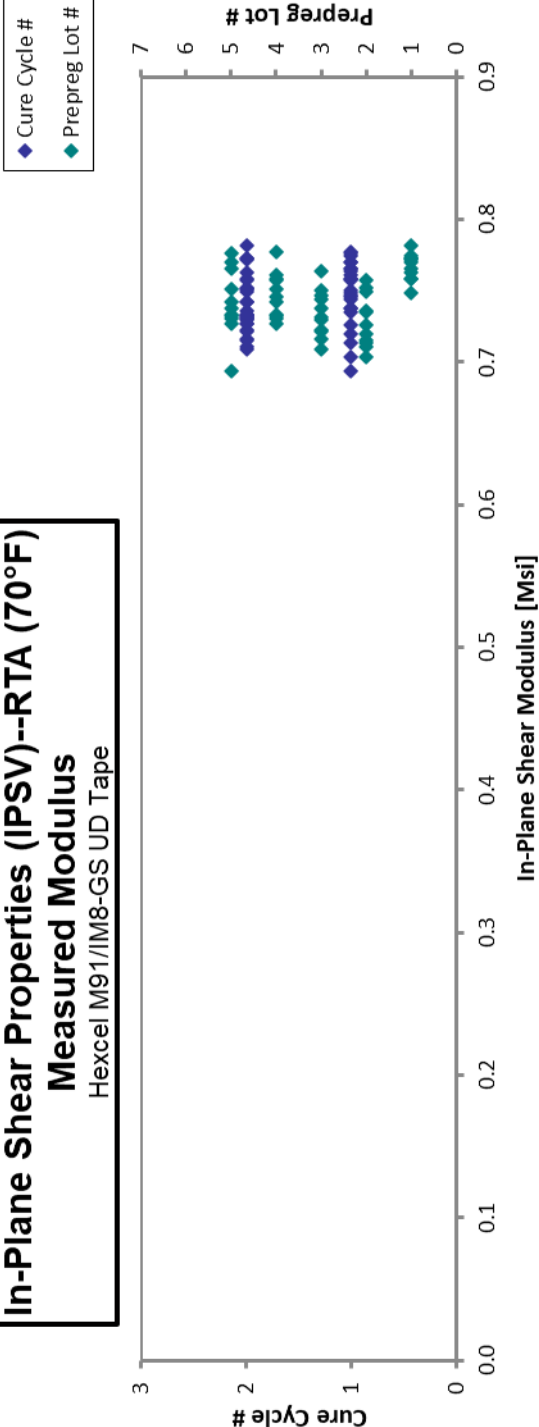
**In-Plane Shear Properties (IPSV)--RTA (70°F)
Measured Strain at 5% Strength**
Hexcel M91/IM8-GS UD Tape



In-Plane Shear Properties (IPSV)--RTA (70°F)
Measured Ultimate Shear Strength
Hexcel M91/IM8-GS UD Tape



In-Plane Shear Properties (IPSV)--RTA (70°F)
Measured Modulus
Hexcel M91/IM8-GS UD Tape



In-Plane Shear Properties (IPSV)--ETW (180°F) ☐
Strength & Modulus ☐
Hexcel M91/IM8-GS UD Tape

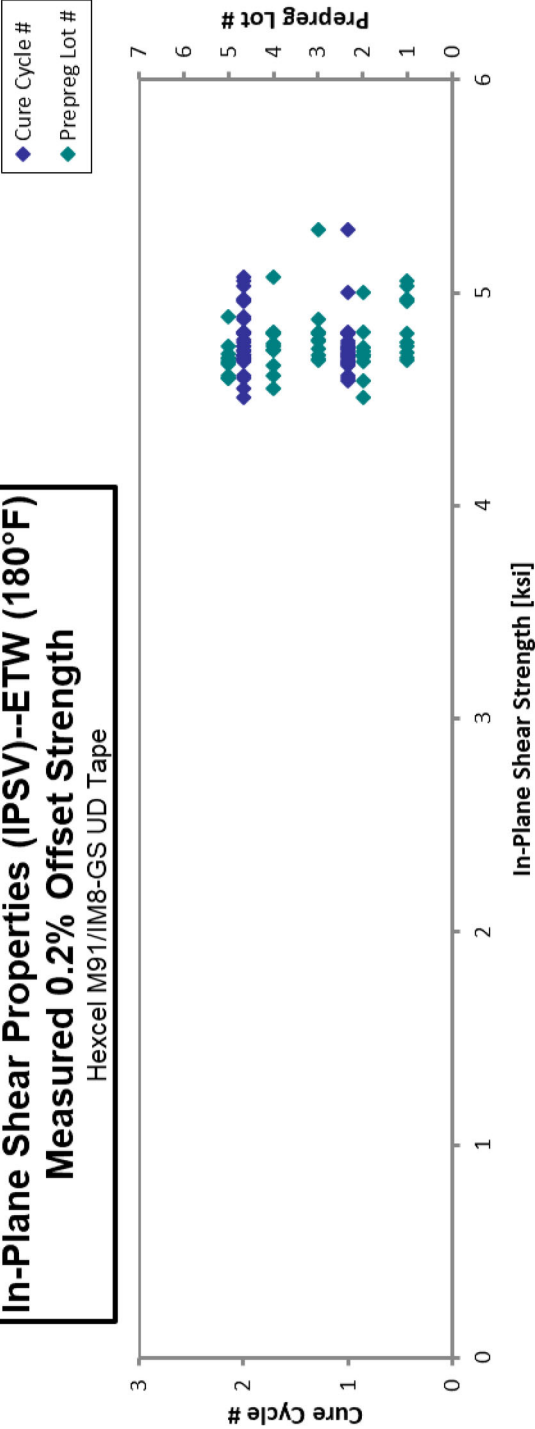
Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	0.2% Offset Strength [ksi]	Strain at 5% Strength [ksi]	Ultimate Shear Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Piles in Laminate	Avg. t_{ply} [in]	Failure Mode
NTPM910Q1-HXL-H35-NIAR-IPSV-A-C1-1-ETW-1	A	C1	1	1	4.751	8.044	14.70	0.6555	0.1345	24	0.005605	M(H,V)GN
NTPM910Q1-HXL-H35-NIAR-IPSV-A-C1-1-ETW-2	A	C1	1	1	4.811	8.082	14.53	0.6627	0.1338	24	0.005576	M(H,V)GN
NTPM910Q1-HXL-H35-NIAR-IPSV-A-C1-1-ETW-3	A	C1	1	1	4.720	8.072	14.63	0.6490	0.1337	24	0.005569	M(H,V)GN
NTPM910Q1-HXL-H35-NIAR-IPSV-A-C1-1-ETW-4	A	C1	1	1	4.691	8.071	14.50	0.6661	0.1336	24	0.005565	M(H,V)GN
NTPM910Q1-HXL-H35-NIAR-IPSV-A-C1-1-ETW-5	A	C1	1	1	4.683	8.097	14.65	0.6760	0.1336	24	0.005567	M(H,V)GN
NTPM910Q1-HXL-H35-NIAR-IPSV-A-C2-1-ETW-1	A	C2	1	2	5.031	8.433	14.72	0.6920	0.1334	24	0.005558	M(H,V)GN
NTPM910Q1-HXL-H35-NIAR-IPSV-A-C2-1-ETW-2	A	C2	1	2	4.967	8.363	14.80	0.6960	0.1337	24	0.005570	M(H,V)GN
NTPM910Q1-HXL-H35-NIAR-IPSV-A-C2-1-ETW-3	A	C2	1	2	4.764	8.182	14.66	0.6915	0.1335	24	0.005562	M(H,V)GN
NTPM910Q1-HXL-H35-NIAR-IPSV-A-C2-1-ETW-4	A	C2	1	2	4.972	8.378	14.91	0.6833	0.1337	24	0.005569	M(H,V)GN
NTPM910Q1-HXL-H35-NIAR-IPSV-A-C2-1-ETW-5	A	C2	1	2	5.057	8.394	14.86	0.6683	0.1335	24	0.005562	M(H,V)GN
NTPM910Q1-HXL-H35-NIAR-IPSV-A-C2-1-ETW-6	A	C2	1	2	4.960	8.391	15.03	0.6597	0.1341	24	0.005586	M(H,V)GN
NTPM910Q1-HXL-H35-NIAR-IPSV-B-C1-1-ETW-1	B	C1	2	1	5.003	8.190	15.39	0.5819	0.1389	24	0.005788	M(H,V)GN
NTPM910Q1-HXL-H35-NIAR-IPSV-B-C1-1-ETW-2	B	C1	2	1	4.585	8.216	15.46	0.6763	0.1389	24	0.005787	M(H,V)GN
NTPM910Q1-HXL-H35-NIAR-IPSV-B-C1-1-ETW-3	B	C1	2	1	4.741	8.309	15.60	0.6417	0.1384	24	0.005765	M(H,V)GN
NTPM910Q1-HXL-H35-NIAR-IPSV-B-C1-1-ETW-4	B	C1	2	1	4.703	8.127	15.42	0.6380	0.1384	24	0.005765	M(H,V)GN
NTPM910Q1-HXL-H35-NIAR-IPSV-B-C1-1-ETW-5	B	C1	2	1	4.815	8.243	15.33	0.6524	0.1392	24	0.005799	M(H,V)GN
NTPM910Q1-HXL-H35-NIAR-IPSV-B-C2-1-ETW-1	B	C2	2	2	4.508	8.189	14.84	0.7185	0.1382	24	0.005760	M(H,V)GN
NTPM910Q1-HXL-H35-NIAR-IPSV-B-C2-1-ETW-2	B	C2	2	2	4.722	8.232	15.15	0.6641	0.1392	24	0.005801	M(H,V)GN
NTPM910Q1-HXL-H35-NIAR-IPSV-B-C2-1-ETW-3	B	C2	2	2	4.708	8.219	14.99	0.6717	0.1383	24	0.005764	M(H,V)GN
NTPM910Q1-HXL-H35-NIAR-IPSV-B-C2-1-ETW-4	B	C2	2	2	4.709	8.228	15.46	0.6692	0.1386	24	0.005776	M(H,V)GN
NTPM910Q1-HXL-H35-NIAR-IPSV-B-C2-1-ETW-5	B	C2	2	2	4.679	8.217	15.43	0.6795	0.1380	24	0.005749	M(H,V)GN
NTPM910Q1-HXL-H35-NIAR-IPSV-B-C2-1-ETW-6	B	C2	2	2	4.705	8.210	15.46	0.6559	0.1383	24	0.005764	M(H,V)GN
NTPM910Q1-HXL-H35-NIAR-IPSV-C-C1-1-ETW-1	C	C1	3	1	4.772	8.238	15.31	0.6469	0.1405	24	0.005856	M(H,V)GN
NTPM910Q1-HXL-H35-NIAR-IPSV-C-C1-1-ETW-2	C	C1	3	1	5.297	8.269	15.35	0.5427	0.1400	24	0.005831	M(H,V)GN
NTPM910Q1-HXL-H35-NIAR-IPSV-C-C1-1-ETW-3	C	C1	3	1	4.811	8.255	15.27	0.6499	0.1395	24	0.005812	M(H,V)GN
NTPM910Q1-HXL-H35-NIAR-IPSV-C-C1-1-ETW-4	C	C1	3	1	4.706	8.204	15.28	0.6494	0.1393	24	0.005806	M(H,V)GN
NTPM910Q1-HXL-H35-NIAR-IPSV-C-C1-1-ETW-5	C	C1	3	1	4.739	8.240	15.26	0.6628	0.1396	24	0.005817	M(H,V)GN
NTPM910Q1-HXL-H35-NIAR-IPSV-C-C2-1-ETW-1	C	C2	3	2	4.777	8.201	14.97	0.6533	0.1399	24	0.005831	M(H,V)GN
NTPM910Q1-HXL-H35-NIAR-IPSV-C-C2-1-ETW-2	C	C2	3	2	4.814	8.240	15.10	0.6376	0.1391	24	0.005797	M(H,V)GN
NTPM910Q1-HXL-H35-NIAR-IPSV-C-C2-1-ETW-3	C	C2	3	2	4.688	8.189	14.87	0.6626	0.1386	24	0.005774	M(H,V)GN
NTPM910Q1-HXL-H35-NIAR-IPSV-C-C2-1-ETW-4	C	C2	3	2	4.808	8.264	15.02	0.6471	0.1388	24	0.005781	M(H,V)GN
NTPM910Q1-HXL-H35-NIAR-IPSV-C-C2-1-ETW-5	C	C2	3	2	4.683	8.201	14.91	0.6886	0.1392	24	0.005800	M(H,V)GN
NTPM910Q1-HXL-H35-NIAR-IPSV-C-C2-1-ETW-6	C	C2	3	2	4.878	8.205	14.95	0.6497	0.1390	24	0.005791	M(H,V)GN

Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	0.2% Offset Strength [ksi]	Strain at 5% Strength [ksi]	Ultimate Shear Strength [ksi]	Modulus [Ms]	Avg. Specimen Thickness [in]	# Piles in Laminate	Avg. t_{pi} [in]	Failure Mode
NTPM910Q1-HXL-H35-FACC-IPSV-D-C1-1-ETW-1	D	C1	4	1	4.809	8.023	15.62	0.5927	0.1348	24	0.005618	HGN
NTPM910Q1-HXL-H35-FACC-IPSV-D-C1-1-ETW-2	D	C1	4	1	4.762	7.968	15.70	0.6120	0.1354	24	0.005642	HGN
NTPM910Q1-HXL-H35-FACC-IPSV-D-C1-1-ETW-3	D	C1	4	1	4.610	7.875	15.24	0.5957	0.1360	24	0.005667	M/V,H)GN
NTPM910Q1-HXL-H35-FACC-IPSV-D-C1-1-ETW-4	D	C1	4	1	4.656	7.960	15.50	0.6170	0.1346	24	0.005608	M/V,H)GN
NTPM910Q1-HXL-H35-FACC-IPSV-D-C1-1-ETW-5	D	C1	4	1	4.730	8.052	15.30	0.6336	0.1349	24	0.005619	HGN
NTPM910Q1-HXL-H35-FACC-IPSV-D-C2-1-ETW-1	D	C2	4	2	4.746	8.042	15.68	0.6224	0.1354	24	0.005642	HGN
NTPM910Q1-HXL-H35-FACC-IPSV-D-C2-1-ETW-2	D	C2	4	2	5.071	7.937	15.56	0.5461	0.1348	24	0.005617	M/V,H)GN
NTPM910Q1-HXL-H35-FACC-IPSV-D-C2-1-ETW-3	D	C2	4	2	4.808	8.062	15.63	0.6422	0.1351	24	0.005631	HGN
NTPM910Q1-HXL-H35-FACC-IPSV-D-C2-1-ETW-4	D	C2	4	2	4.728	7.931	15.50	0.6260	0.1356	24	0.005649	M/V,H)GN
NTPM910Q1-HXL-H35-FACC-IPSV-D-C2-1-ETW-5	D	C2	4	2	4.816	8.019	17.94	0.6168	0.1360	24	0.005668	HGN
NTPM910Q1-HXL-H35-FACC-IPSV-D-C2-1-ETW-6	D	C2	4	2	4.551	7.978	15.39	0.6976	0.1355	24	0.005644	M/V,H)GN
NTPM910Q1-HXL-H35-SKS-IPSV-E-C1-1-ETW-1	E	C1	5	1	4.667	8.051	15.19	0.6608	0.1313	24	0.005471	M/V,H)GN
NTPM910Q1-HXL-H35-SKS-IPSV-E-C1-1-ETW-2	E	C1	5	1	4.670	7.882	15.02	0.6175	0.1313	24	0.005472	HGN
NTPM910Q1-HXL-H35-SKS-IPSV-E-C1-1-ETW-3	E	C1	5	1	4.712	7.949	15.26	0.6060	0.1335	24	0.005561	M/V,H)GN
NTPM910Q1-HXL-H35-SKS-IPSV-E-C1-1-ETW-4	E	C1	5	1	4.597	7.899	15.25	0.6027	0.1355	24	0.005644	HGN
NTPM910Q1-HXL-H35-SKS-IPSV-E-C1-1-ETW-5	E	C1	5	1	4.679	7.905	15.28	0.5943	0.1356	24	0.005648	M/V,H)GN
NTPM910Q1-HXL-H35-SKS-IPSV-E-C2-1-ETW-1	E	C2	5	2	4.695	8.065	15.02	0.6303	0.1346	24	0.005608	HGN
NTPM910Q1-HXL-H35-SKS-IPSV-E-C2-1-ETW-2	E	C2	5	2	4.612	7.995	15.06	0.6324	0.1366	24	0.005690	HGN
NTPM910Q1-HXL-H35-SKS-IPSV-E-C2-1-ETW-3	E	C2	5	2	4.598	7.998	15.25	0.6269	0.1366	24	0.005691	HGN
NTPM910Q1-HXL-H35-SKS-IPSV-E-C2-1-ETW-4	E	C2	5	2	4.888	8.010	15.27	0.5856	0.1357	24	0.005655	M/V,H)GN
NTPM910Q1-HXL-H35-SKS-IPSV-E-C2-1-ETW-5	E	C2	5	2	4.746	8.049	15.35	0.6376	0.1351	24	0.005629	HGN
NTPM910Q1-HXL-H35-SKS-IPSV-E-C2-1-ETW-6	E	C2	5	2	4.688	8.027	15.22	0.6333	0.1345	24	0.005603	M/V,H)GN

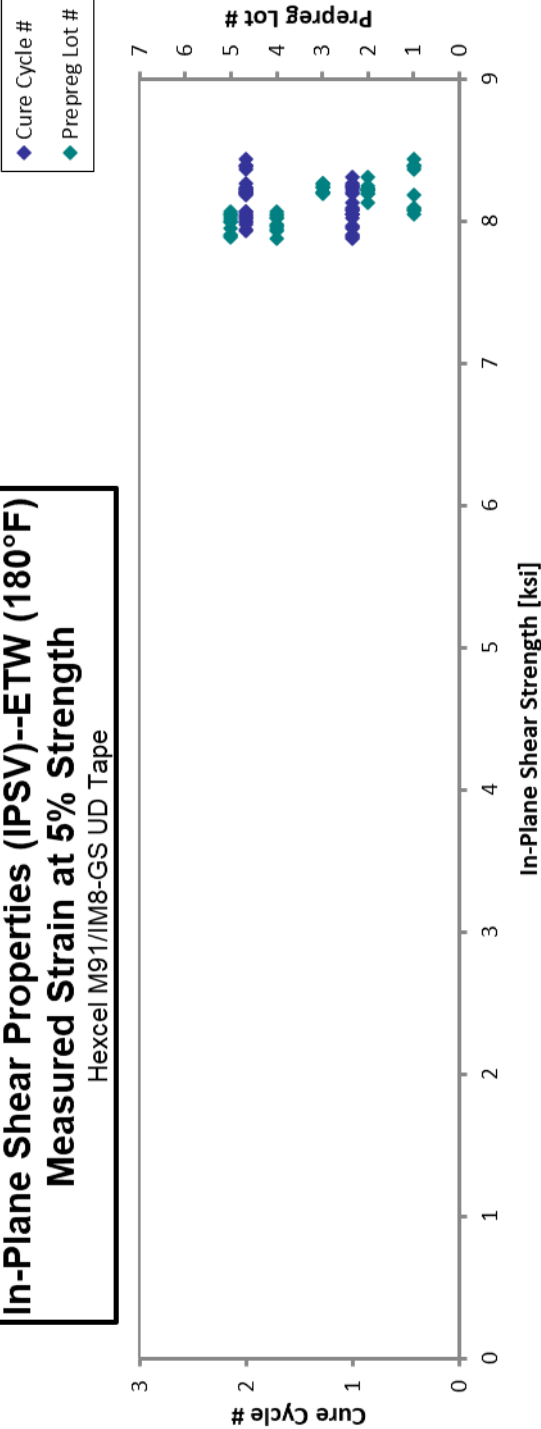
Modulus calculation was obtained from 1000 to 3000 microstrain

Average	4.765	8.129	15.22	0.6431	0.005680
Standard Dev.	0.1436	0.1439	0.4839	0.03605	
Coeff. of Var. [%]	3.014	1.771	3.180	5.606	
Min.	4.508	7.875	14.50	0.5427	0.005471
Max.	5.297	8.433	17.94	0.7185	0.005856
Number of Spec.	55	55	55	55	55

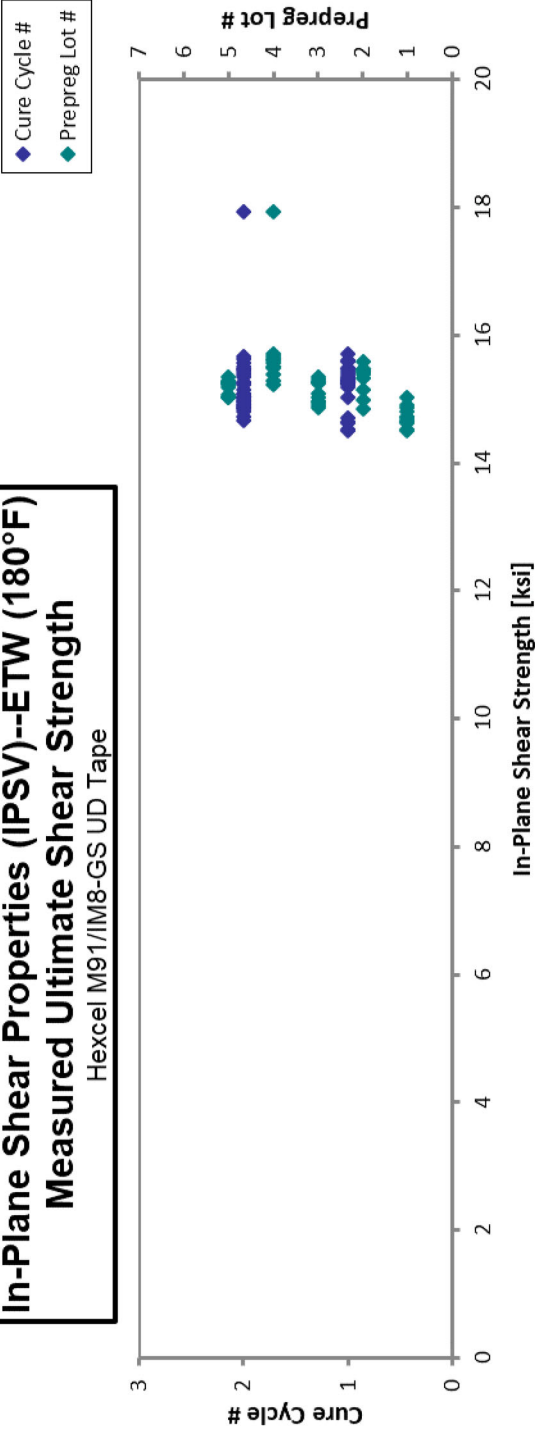
**In-Plane Shear Properties (IPSV)--ETW (180°F)
Measured 0.2% Offset Strength**
Hexcel M91/IM8-GS UD Tape



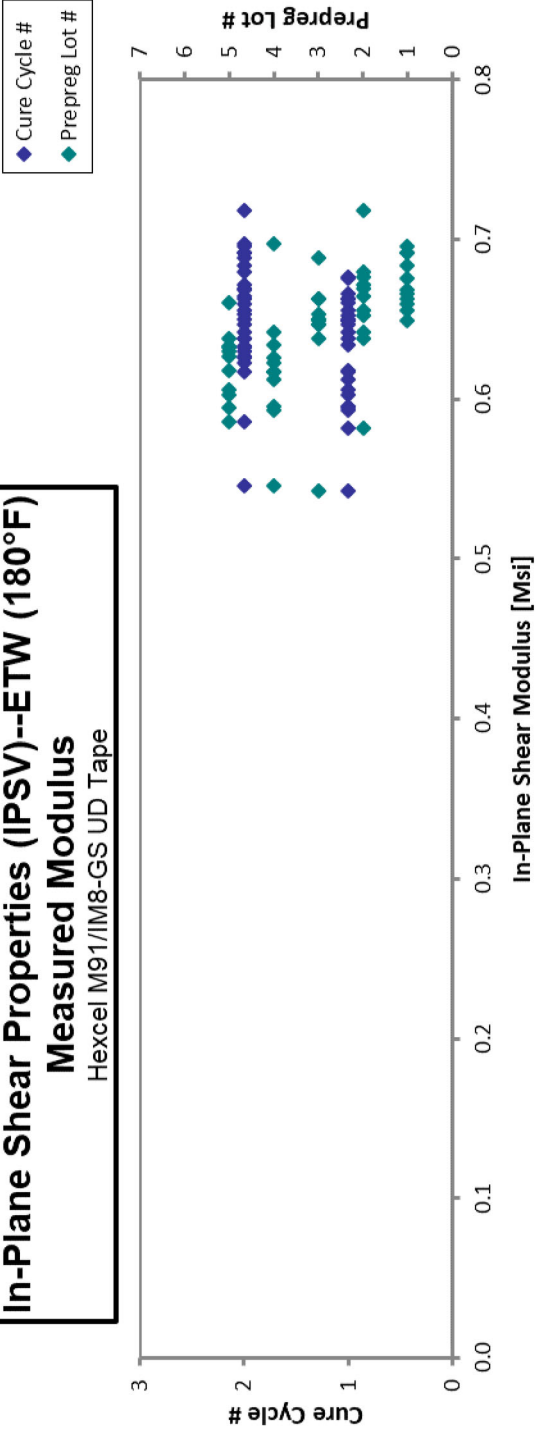
**In-Plane Shear Properties (IPSV)--ETW (180°F)
Measured Strain at 5% Strength**
Hexcel M91/IM8-GS UD Tape



In-Plane Shear Properties (IPSV)--ETW (180°F)
Measured Ultimate Shear Strength
Hexcel M91/IM8-GS UD Tape



In-Plane Shear Properties (IPSV)--ETW (180°F)
Measured Modulus
Hexcel M91/IM8-GS UD Tape



4.9 Interlaminar Tension Properties (ILT)

Laminate Interlaminar Tension Properties (ILT)--CTA (-65°F) □	
Strength □	
Hexcel M91/IM8-GS UD Tape	

Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	Curved Beam Strength [lb]	Interlaminar Tension Strength [ksi]	Avg. Specimen Thickness [in]	# Piles in Laminate	Avg. t ₉₀ [in]	Failure Mode
NTPM91001-HXL-H35-NIAR-ILT-A-C1-1-CTA-1	A	C1	1	1	487.8	20.85	0.1160	21	0.005525	INTERLAMINAR TENSILE FAILURE
NTPM91001-HXL-H35-NIAR-ILT-A-C1-1-CTA-2	A	C1	1	1	439.1	18.93	0.1152	21	0.005483	INTERLAMINAR TENSILE FAILURE
NTPM91001-HXL-H35-NIAR-ILT-A-C1-1-CTA-3	A	C1	1	1	372.7	16.18	0.1145	21	0.005450	INTERLAMINAR TENSILE FAILURE
NTPM91001-HXL-H35-NIAR-ILT-A-C1-1-CTA-4	A	C1	1	1	500.4	21.75	0.1144	21	0.005446	INTERLAMINAR TENSILE FAILURE AT INNER CURVE
NTPM91001-HXL-H35-NIAR-ILT-A-C1-1-CTA-5	A	C1	1	1	500.7	21.95	0.1135	21	0.005405	INTERLAMINAR TENSILE FAILURE
NTPM91001-HXL-H35-NIAR-ILT-A-C1-1-CTA-6	A	C1	1	1	505.5	22.31	0.1129	21	0.005374	INTERLAMINAR TENSILE FAILURE AT INNER CURVE
NTPM91001-HXL-H35-NIAR-ILT-A-C2-1-CTA-1	A	C2	1	2	474.0	19.87	0.1160	21	0.005617	INTERLAMINAR TENSILE FAILURE
NTPM91001-HXL-H35-NIAR-ILT-A-C2-1-CTA-2	A	C2	1	2	536.2	22.74	0.1168	21	0.005563	INTERLAMINAR TENSILE FAILURE
NTPM91001-HXL-H35-NIAR-ILT-A-C2-1-CTA-3	A	C2	1	2	751.1	31.99	0.1164	21	0.005496	INTERLAMINAR TENSILE FAILURE
NTPM91001-HXL-H35-NIAR-ILT-A-C2-1-CTA-4	A	C2	1	2	544.3	23.40	0.1154	21	0.005496	INTERLAMINAR TENSILE FAILURE
NTPM91001-HXL-H35-NIAR-ILT-A-C2-1-CTA-5	A	C2	1	2	568.1	24.57	0.1149	21	0.005469	INTERLAMINAR TENSILE FAILURE
NTPM91001-HXL-H35-NIAR-ILT-A-C2-1-CTA-6	A	C2	1	2	528.4	22.63	0.1158	21	0.005514	INTERLAMINAR TENSILE FAILURE
NTPM91001-HXL-H35-NIAR-ILT-A-C2-1-CTA-7	A	C2	1	2	519.9	22.54	0.1146	21	0.005457	INTERLAMINAR TENSILE FAILURE AT LEG
NTPM91001-HXL-H35-NIAR-ILT-B-C1-1-CTA-1	B	C1	2	1	492.5	21.04	0.1161	21	0.005526	INTERLAMINAR TENSILE FAILURE, TENSILE FAILURE AT INNER CURVE
NTPM91001-HXL-H35-NIAR-ILT-B-C1-1-CTA-2	B	C1	2	1	500.9	21.69	0.1147	21	0.005463	INTERLAMINAR TENSILE FAILURE, TENSILE FAILURE AT INNER CURVE
NTPM91001-HXL-H35-NIAR-ILT-B-C1-1-CTA-3	B	C1	2	1	489.7	21.19	0.1148	21	0.005467	INTERLAMINAR TENSILE FAILURE
NTPM91001-HXL-H35-NIAR-ILT-B-C1-1-CTA-4	B	C1	2	1	535.9	23.22	0.1147	21	0.005461	INTERLAMINAR TENSILE FAILURE
NTPM91001-HXL-H35-NIAR-ILT-B-C1-1-CTA-5	B	C1	2	1	551.1	23.61	0.1158	21	0.005514	INTERLAMINAR TENSILE FAILURE
NTPM91001-HXL-H35-NIAR-ILT-B-C2-1-CTA-1	B	C2	2	2	560.8	23.69	0.1172	21	0.005580	INTERLAMINAR TENSILE FAILURE
NTPM91001-HXL-H35-NIAR-ILT-B-C2-1-CTA-2	B	C2	2	2	550.2	23.41	0.1165	21	0.005546	INTERLAMINAR TENSILE FAILURE
NTPM91001-HXL-H35-NIAR-ILT-B-C2-1-CTA-3	B	C2	2	2	504.1	21.60	0.1156	21	0.005513	INTERLAMINAR TENSILE FAILURE
NTPM91001-HXL-H35-NIAR-ILT-B-C2-1-CTA-4	B	C2	2	2	512.6	21.95	0.1158	21	0.005515	INTERLAMINAR TENSILE FAILURE
NTPM91001-HXL-H35-NIAR-ILT-B-C2-1-CTA-5	B	C2	2	2	535.6	22.97	0.1157	21	0.005508	INTERLAMINAR TENSILE FAILURE
NTPM91001-HXL-H35-NIAR-ILT-B-C2-1-CTA-6	B	C2	2	2	598.2	25.58	0.1160	21	0.005523	INTERLAMINAR TENSILE FAILURE
NTPM91001-HXL-H35-NIAR-ILT-C-C1-1-CTA-1	C	C1	3	1	466.7	19.73	0.1172	21	0.005579	INTERLAMINAR TENSILE FAILURE
NTPM91001-HXL-H35-NIAR-ILT-C-C1-1-CTA-2	C	C1	3	1	517.1	21.70	0.1179	21	0.005612	INTERLAMINAR TENSILE FAILURE
NTPM91001-HXL-H35-NIAR-ILT-C-C1-1-CTA-3	C	C1	3	1	535.8	22.45	0.1181	21	0.005621	INTERLAMINAR TENSILE FAILURE
NTPM91001-HXL-H35-NIAR-ILT-C-C1-1-CTA-4	C	C1	3	1	510.7	21.42	0.1180	21	0.005617	INTERLAMINAR TENSILE FAILURE
NTPM91001-HXL-H35-NIAR-ILT-C-C1-1-CTA-5	C	C1	3	1	512.6	21.53	0.1178	21	0.005608	INTERLAMINAR TENSILE FAILURE
NTPM91001-HXL-H35-NIAR-ILT-C-C2-1-CTA-1	C	C2	3	2	488.2	20.51	0.1178	21	0.005608	INTERLAMINAR TENSILE FAILURE
NTPM91001-HXL-H35-NIAR-ILT-C-C2-1-CTA-2	C	C2	3	2	483.8	20.35	0.1176	21	0.005601	INTERLAMINAR TENSILE FAILURE
NTPM91001-HXL-H35-NIAR-ILT-C-C2-1-CTA-3	C	C2	3	2	464.7	19.54	0.1177	21	0.005604	INTERLAMINAR TENSILE FAILURE
NTPM91001-HXL-H35-NIAR-ILT-C-C2-1-CTA-4	C	C2	3	2	414.5	17.66	0.1164	21	0.005542	INTERLAMINAR TENSILE FAILURE
NTPM91001-HXL-H35-NIAR-ILT-C-C2-1-CTA-5	C	C2	3	2	471.4	19.94	0.1171	21	0.005575	INTERLAMINAR TENSILE FAILURE
NTPM91001-HXL-H35-NIAR-ILT-C-C2-1-CTA-6	C	C2	3	2	511.9	21.74	0.1167	21	0.005555	INTERLAMINAR TENSILE FAILURE

Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	Curved Beam Strength [lb]	Interlaminar Tension Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{xy} [in]	Failure Mode
NTPM910Q1-HXL-H35-FACC-ILT-D-C1-1-CTA-1	D	C1	4	1	530.9	23.26	0.1136	21	0.005408	INTERLAMINAR TENSILE FAILURE, COMPRESSION FAILURE AT LEG
NTPM910Q1-HXL-H35-FACC-ILT-D-C1-1-CTA-2	D	C1	4	1	444.4	19.46	0.1136	21	0.005410	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-FACC-ILT-D-C1-1-CTA-3	D	C1	4	1	455.9	19.93	0.1138	21	0.005419	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-FACC-ILT-D-C1-2-CTA-4	D	C1	4	1	480.1	21.03	0.1136	21	0.005410	INTERLAMINAR TENSILE FAILURE, COMPRESSION FAILURE AT LEG
NTPM910Q1-HXL-H35-FACC-ILT-D-C1-2-CTA-5	D	C1	4	1	473.9	20.92	0.1128	21	0.005373	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-FACC-ILT-D-C1-2-CTA-6	D	C1	4	1	470.6	20.54	0.1140	21	0.005426	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-FACC-ILT-D-C2-1-CTA-1	D	C2	4	2	429.6	18.89	0.1143	21	0.005442	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-FACC-ILT-D-C2-1-CTA-2	D	C2	4	2	456.1	19.48	0.1161	21	0.005527	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-FACC-ILT-D-C2-1-CTA-3	D	C2	4	2	439.5	18.61	0.1170	21	0.005570	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-FACC-ILT-D-C2-2-CTA-4	D	C2	4	2	470.9	20.71	0.1132	21	0.005390	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-FACC-ILT-D-C2-2-CTA-5	D	C2	4	2	487.6	21.44	0.1132	21	0.005390	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-FACC-ILT-D-C2-2-CTA-6	D	C2	4	2	485.1	21.25	0.1136	21	0.005410	INTERLAMINAR TENSILE FAILURE, FAILURE AT LEG
NTPM910Q1-HXL-H35-FACC-ILT-D-C2-2-CTA-7	D	C2	4	2	472.2	20.60	0.1140	21	0.005427	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-SKS-ILT-E-C1-1-CTA-1	E	C1	5	1	441.9	20.04	0.1102	21	0.005249	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-SKS-ILT-E-C1-1-CTA-2	E	C1	5	1	449.3	20.29	0.1106	21	0.005268	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-SKS-ILT-E-C1-1-CTA-3	E	C1	5	1	484.6	21.81	0.1110	21	0.005283	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-SKS-ILT-E-C1-1-CTA-4	E	C1	5	1	485.6	21.81	0.1111	21	0.005292	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-SKS-ILT-E-C1-1-CTA-5	E	C1	5	1	474.3	21.36	0.1109	21	0.005281	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-SKS-ILT-E-C2-1-CTA-1	E	C2	5	2	485.7	21.39	0.1131	21	0.005385	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-SKS-ILT-E-C2-1-CTA-2	E	C2	5	2	437.2	19.84	0.1101	21	0.005244	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-SKS-ILT-E-C2-1-CTA-3	E	C2	5	2	489.8	22.10	0.1107	21	0.005273	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-SKS-ILT-E-C2-1-CTA-4	E	C2	5	2	454.8	20.42	0.1112	21	0.005294	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-SKS-ILT-E-C2-1-CTA-5	E	C2	5	2	514.1	23.10	0.1111	21	0.005292	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-SKS-ILT-E-C2-1-CTA-6	E	C2	5	2	509.1	22.64	0.1121	21	0.005339	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-SKS-ILT-E-C2-1-CTA-7	E	C2	5	2	481.2	21.57	0.1113	21	0.005301	INTERLAMINAR TENSILE FAILURE

Cross head displacement exceeds 0.2 inches for all specimens

0.005460

21.47

495.7

Average

Standard Dev.

Coeff. of Var. [%]

Min.

Max.

Number of Spec.

52.16

10.52

372.7

751.1

60

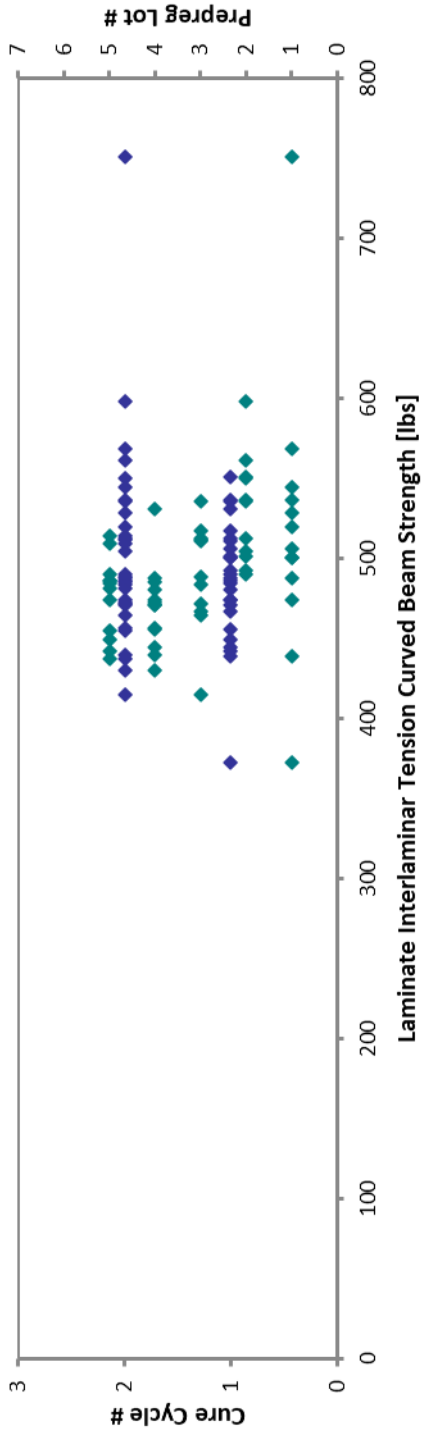
0.005244

0.005621

60

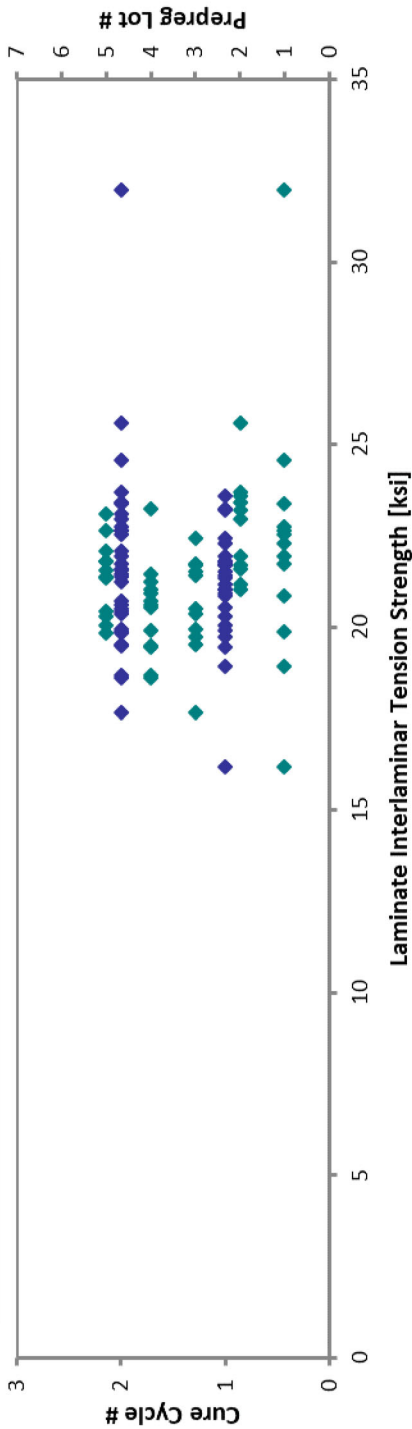
**Laminate Interlaminar Tension Properties (ILT)--CTA (-65°F)
Measured Curved Beam Strength [lbs]**

Hexcel M91/IM8-GS UD Tape



**Laminate Interlaminar Tension Properties (ILT)--CTA (-65°F)
Measured Interlaminar Tension Strength**

Hexcel M91/IM8-GS UD Tape



Laminate Interlaminar Tension Properties (ILT)--RTA (70°F)

Strength

Hexcel M91/M8-CS UD Tape

Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	Curved Beam Strength [lb]	Interlaminar Tension Strength [ksf]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode
NTPM910Q1-HXL-H35-NIAR-ILT-A-C1-1-RTA-1	A	C1	1	1	333.6	14.64	0.1134	21	0.005399	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-A-C1-1-RTA-2	A	C1	1	1	343.6	15.06	0.1135	21	0.005406	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-A-C1-1-RTA-3	A	C1	1	1	332.0	14.38	0.1147	21	0.005461	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-A-C1-1-RTA-4	A	C1	1	1	324.3	14.23	0.1134	21	0.005401	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-A-C1-1-RTA-5	A	C1	1	1	337.9	14.48	0.1157	21	0.005511	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-A-C2-1-RTA-1	A	C2	1	2	349.1	15.11	0.1148	21	0.005465	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-A-C2-1-RTA-2	A	C2	1	2	326.9	14.26	0.1140	21	0.005427	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-A-C2-1-RTA-3	A	C2	1	2	341.7	14.99	0.1134	21	0.005400	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-A-C2-1-RTA-4	A	C2	1	2	345.6	14.94	0.1149	21	0.005469	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-A-C2-1-RTA-5	A	C2	1	2	333.3	14.68	0.1130	21	0.005382	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-A-C2-1-RTA-6	A	C2	1	2	334.7	14.70	0.1134	21	0.005398	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-B-C1-1-RTA-1	B	C1	2	1	334.5	14.36	0.1156	21	0.005506	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-B-C1-1-RTA-2	B	C1	2	1	354.4	15.24	0.1154	21	0.005496	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-B-C1-1-RTA-3	B	C1	2	1	348.3	14.98	0.1154	21	0.005494	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-B-C1-1-RTA-4	B	C1	2	1	359.2	15.44	0.1155	21	0.005498	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-B-C1-1-RTA-5	B	C1	2	1	357.7	15.33	0.1158	21	0.005512	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-B-C2-1-RTA-1	B	C2	2	2	350.8	15.13	0.1152	21	0.005483	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-B-C2-1-RTA-2	B	C2	2	2	352.3	15.15	0.1154	21	0.005496	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-B-C2-1-RTA-3	B	C2	2	2	328.0	14.10	0.1155	21	0.005499	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-B-C2-1-RTA-4	B	C2	2	2	358.5	15.34	0.1159	21	0.005518	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-B-C2-1-RTA-5	B	C2	2	2	357.5	15.35	0.1156	21	0.005502	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-B-C2-1-RTA-6	B	C2	2	2	349.9	15.05	0.1154	21	0.005494	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-C-C1-1-RTA-1	C	C1	3	1	334.1	14.08	0.1174	21	0.005590	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-C-C1-1-RTA-2	C	C1	3	1	333.6	14.11	0.1171	21	0.005574	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-C-C1-1-RTA-3	C	C1	3	1	339.1	14.42	0.1166	21	0.005551	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-C-C1-1-RTA-4	C	C1	3	1	322.8	13.80	0.1160	21	0.005525	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-C-C1-1-RTA-5	C	C1	3	1	320.6	13.60	0.1168	21	0.005560	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-C-C2-1-RTA-1	C	C2	3	2	330.8	14.03	0.1168	21	0.005562	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-C-C2-1-RTA-2	C	C2	3	2	319.6	13.65	0.1161	21	0.005527	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-C-C2-1-RTA-3	C	C2	3	2	335.6	14.38	0.1158	21	0.005514	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-C-C2-1-RTA-4	C	C2	3	2	323.6	13.80	0.1163	21	0.005536	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-C-C2-1-RTA-5	C	C2	3	2	331.5	14.28	0.1152	21	0.005487	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-C-C2-1-RTA-6	C	C2	3	2	330.4	14.10	0.1162	21	0.005531	INTERLAMINAR TENSILE FAILURE

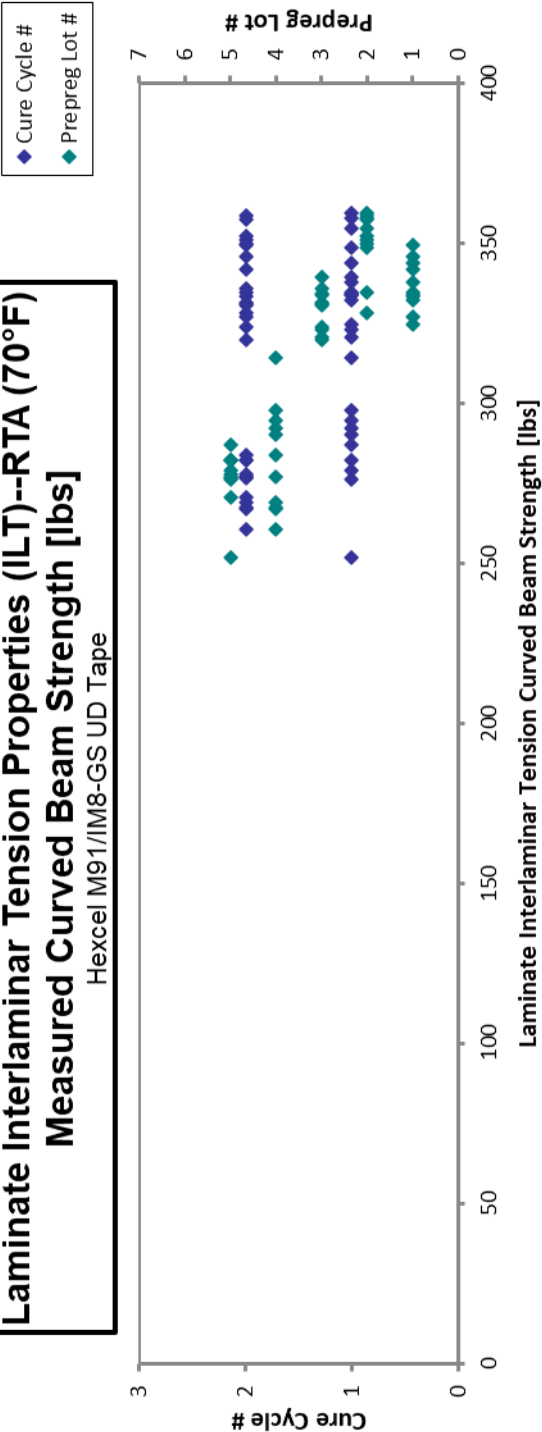
Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	Curved Beam Strength [lb]	Interlaminar Tension Strength [ksj]	Avg. Specimen Thickness [in]	# Piles in Laminate	Avg. t_{ply} [in]	Failure Mode
NTPM910Q1-HXL-H35-FACC-ILT-D-C1-1-RTA-1	D	C1	4	1	297.9	12.86	0.1151	21	0.005479	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-FACC-ILT-D-C1-1-RTA-2	D	C1	4	1	314.3	13.71	0.1140	21	0.005427	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-FACC-ILT-D-C1-1-RTA-3	D	C1	4	1	292.0	12.71	0.1142	21	0.005439	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-FACC-ILT-D-C1-2-RTA-4	D	C1	4	1	290.0	12.80	0.1129	21	0.005374	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-FACC-ILT-D-C1-2-RTA-5	D	C1	4	1	294.3	12.87	0.1138	21	0.005418	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-FACC-ILT-D-C2-1-RTA-1	D	C2	4	2	260.7	11.53	0.1127	21	0.005365	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-FACC-ILT-D-C2-1-RTA-2	D	C2	4	2	266.9	11.33	0.1167	21	0.005558	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-FACC-ILT-D-C2-1-RTA-3	D	C2	4	2	267.4	11.26	0.1175	21	0.005595	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-FACC-ILT-D-C2-2-RTA-5	D	C2	4	2	276.9	12.08	0.1140	21	0.005429	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-FACC-ILT-D-C2-2-RTA-6	D	C2	4	2	269.0	11.71	0.1142	21	0.005438	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-FACC-ILT-D-C2-2-RTA-7	D	C2	4	2	283.6	12.36	0.1141	21	0.005432	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-SKS-ILT-E-C1-1-RTA-1	E	C1	5	1	276.0	12.53	0.1101	21	0.005244	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-SKS-ILT-E-C1-1-RTA-2	E	C1	5	1	286.8	12.96	0.1106	21	0.005267	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-SKS-ILT-E-C1-1-RTA-3	E	C1	5	1	251.5	11.32	0.1110	21	0.005285	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-SKS-ILT-E-C1-1-RTA-4	E	C1	5	1	282.2	12.72	0.1108	21	0.005276	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-SKS-ILT-E-C1-1-RTA-5	E	C1	5	1	278.9	12.56	0.1109	21	0.005279	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-SKS-ILT-E-C2-1-RTA-1	E	C2	5	2	277.6	12.17	0.1135	21	0.005405	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-SKS-ILT-E-C2-1-RTA-2	E	C2	5	2	276.4	12.28	0.1122	21	0.005343	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-SKS-ILT-E-C2-1-RTA-3	E	C2	5	2	277.0	12.55	0.1103	21	0.005254	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-SKS-ILT-E-C2-1-RTA-4	E	C2	5	2	270.4	12.13	0.1113	21	0.005298	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-SKS-ILT-E-C2-1-RTA-5	E	C2	5	2	282.0	12.64	0.1114	21	0.005302	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-SKS-ILT-E-C2-1-RTA-7	E	C2	5	2	282.2	12.66	0.1113	21	0.005299	INTERLAMINAR TENSILE FAILURE

Cross head displacement exceeds 0.2 inches for all specimens

Average	315.1	13.69	0.005443
Standard Dev.	31.67	1.242	
Coeff. of Var. [%]	10.05	9.072	
Min.	251.5	11.26	0.005244
Max.	359.2	15.44	0.005595
Number of Spec.	55	55	55

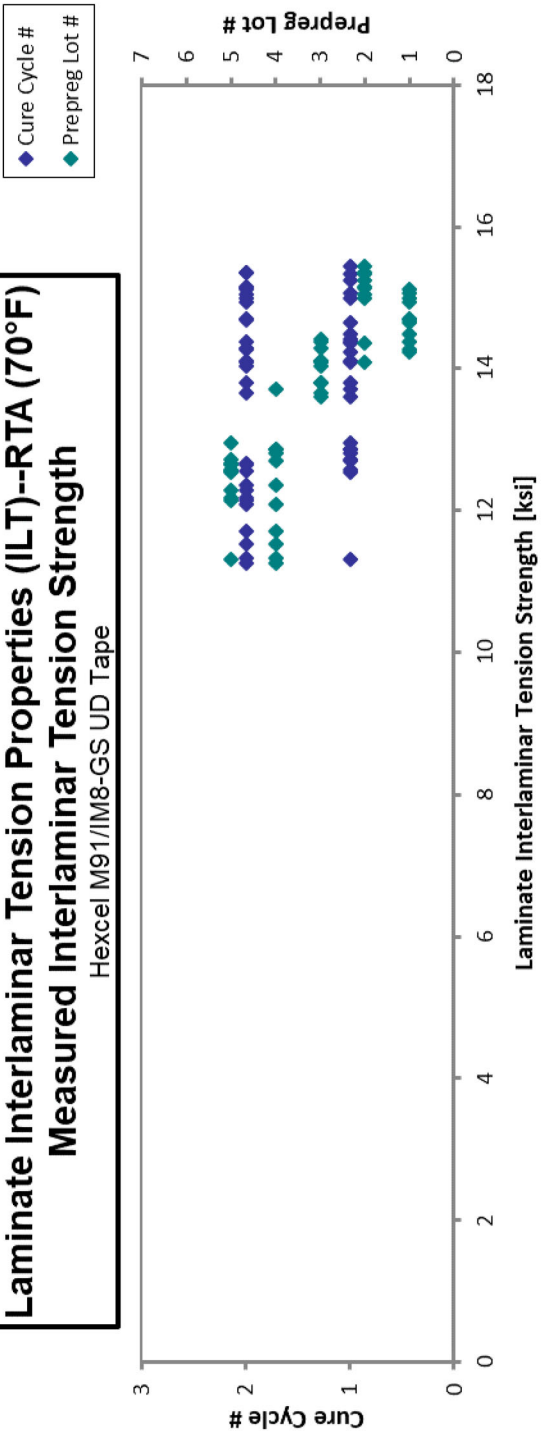
Laminate Interlaminar Tension Properties (ILT)--RTA (70°F)
Measured Curved Beam Strength [lbs]

Hexcel M91/IM8-GS UD Tape



Laminate Interlaminar Tension Properties (ILT)--RTA (70°F)
Measured Interlaminar Tension Strength

Hexcel M91/IM8-GS UD Tape



Laminate Interlaminar Tension Properties (ILT)--ETW (180°F) ☐ Strength ☐

Hexcel M91/M8-GS UD Tape

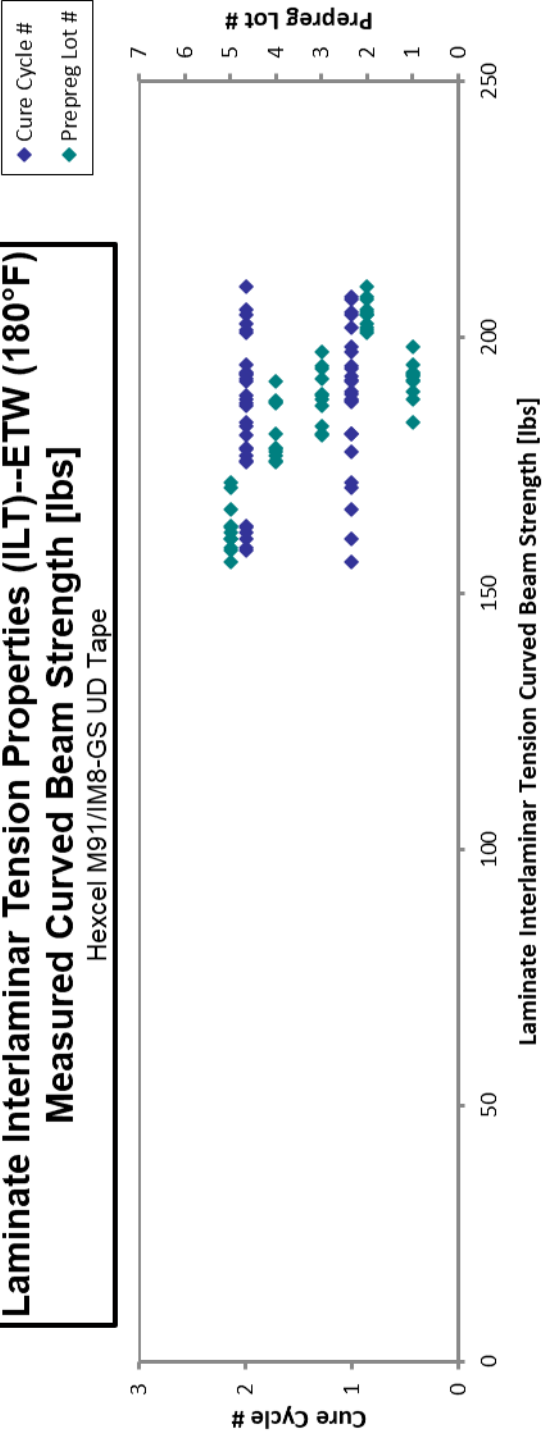
Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle	Curved Beam Strength [lb]	Interlaminar Tension Strength [ksf]	Avg. Specimen Thickness [in]	# Piles in Laminate	Avg. t_{ply} [in]	Failure Mode
NTPM910Q1-HXL-H35-NIAR-ILT-A-C1-1-ETW-1	A	C1	1	1	191.6	8.242	0.1154	21	0.005493	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-A-C1-1-ETW-2*	A	C1	1	1	198.1	8.524	0.1153	21	0.005492	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-A-C1-1-ETW-3	A	C1	1	1	187.9	8.159	0.1145	21	0.005450	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-A-C1-1-ETW-4	A	C1	1	1	189.3	8.286	0.1137	21	0.005413	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-A-C1-1-ETW-5*	A	C1	1	1	192.4	8.287	0.1153	21	0.005488	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-A-C2-1-ETW-1	A	C2	1	2	192.9	8.553	0.1124	21	0.005352	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-A-C2-1-ETW-2	A	C2	1	2	191.4	8.477	0.1125	21	0.005358	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-A-C2-1-ETW-3	A	C2	1	2	192.6	8.504	0.1128	21	0.005371	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-A-C2-1-ETW-4*	A	C2	1	2	194.6	8.633	0.1124	21	0.005350	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-A-C2-1-ETW-5	A	C2	1	2	183.4	8.118	0.1126	21	0.005361	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-A-C2-1-ETW-6	A	C2	1	2	193.2	8.573	0.1123	21	0.005349	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-B-C1-1-ETW-1	B	C1	2	1	204.9	8.764	0.1159	21	0.005520	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-B-C1-1-ETW-2*	B	C1	2	1	207.5	8.888	0.1158	21	0.005514	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-B-C1-1-ETW-3*	B	C1	2	1	207.9	8.860	0.1163	21	0.005539	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-B-C1-1-ETW-4	B	C1	2	1	201.9	8.500	0.1176	21	0.005598	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-B-C1-1-ETW-5	B	C1	2	1	204.3	8.578	0.1178	21	0.005610	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-B-C2-1-ETW-1	B	C2	2	2	204.3	8.797	0.1153	21	0.005489	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-B-C2-1-ETW-2	B	C2	2	2	202.6	8.698	0.1156	21	0.005502	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-B-C2-1-ETW-3*	B	C2	2	2	205.5	8.817	0.1156	21	0.005506	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-B-C2-1-ETW-4	B	C2	2	2	201.4	8.594	0.1162	21	0.005532	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-B-C2-1-ETW-5*	B	C2	2	2	209.9	8.933	0.1165	21	0.005545	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-B-C2-1-ETW-6	B	C2	2	2	200.8	8.521	0.1168	21	0.005560	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-C-C1-1-ETW-1	C	C1	3	1	197.2	8.352	0.1170	21	0.005569	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-C-C1-1-ETW-2	C	C1	3	1	188.8	8.048	0.1163	21	0.005538	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-C-C1-1-ETW-3	C	C1	3	1	194.3	8.274	0.1164	21	0.005543	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-C-C1-1-ETW-4	C	C1	3	1	193.9	8.229	0.1167	21	0.005558	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-C-C1-1-ETW-5	C	C1	3	1	181.0	7.670	0.1169	21	0.005567	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-C-C2-1-ETW-1	C	C2	3	2	187.8	7.984	0.1165	21	0.005549	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-C-C2-1-ETW-2	C	C2	3	2	180.8	7.725	0.1161	21	0.005526	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-C-C2-1-ETW-3	C	C2	3	2	188.7	8.076	0.1159	21	0.005519	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-C-C2-1-ETW-4	C	C2	3	2	191.9	8.200	0.1161	21	0.005526	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-C-C2-1-ETW-5	C	C2	3	2	182.6	7.746	0.1168	21	0.005560	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-NIAR-ILT-C-C2-1-ETW-6	C	C2	3	2	186.7	7.901	0.1170	21	0.005573	INTERLAMINAR TENSILE FAILURE

Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	Curved Beam Strength [lb]	Interlaminar Tension Strength [ksj]	Avg. Specimen Thickness [in]	# Piles in Laminate	Avg. t_{ply} [in]	Failure Mode
NTPM910Q1-HXL-H35-FACC-ILT-D-C1-1-ETW-1	D	C1	4	1	191.5	8.334	0.1142	21	0.005439	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-FACC-ILT-D-C1-1-ETW-2	D	C1	4	1	187.5	8.106	0.1149	21	0.005471	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-FACC-ILT-D-C1-1-ETW-3	D	C1	4	1	181.1	7.864	0.1144	21	0.005449	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-FACC-ILT-D-C1-2-ETW-4	D	C1	4	1	187.5	8.239	0.1133	21	0.005393	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-FACC-ILT-D-C1-2-ETW-5	D	C1	4	1	177.6	7.712	0.1144	21	0.005449	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-FACC-ILT-D-C2-1-ETW-1	D	C2	4	2	175.9	7.628	0.1146	21	0.005456	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-FACC-ILT-D-C2-1-ETW-2	D	C2	4	2	176.8	7.577	0.1158	21	0.005512	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-FACC-ILT-D-C2-1-ETW-3	D	C2	4	2	178.4	7.620	0.1161	21	0.005529	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-FACC-ILT-D-C2-1-ETW-4	D	C2	4	2	187.2	7.987	0.1162	21	0.005532	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-FACC-ILT-D-C2-2-ETW-5	D	C2	4	2	178.0	7.836	0.1131	21	0.005386	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-FACC-ILT-D-C2-2-ETW-6	D	C2	4	2	175.5	7.594	0.1148	21	0.005467	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-SKS-ILT-E-C1-1-ETW-1	E	C1	5	1	171.6	7.751	0.1106	21	0.005288	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-SKS-ILT-E-C1-1-ETW-2	E	C1	5	1	170.5	7.755	0.1100	21	0.005236	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-SKS-ILT-E-C1-1-ETW-3	E	C1	5	1	156.2	7.142	0.1094	21	0.005211	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-SKS-ILT-E-C1-1-ETW-4	E	C1	5	1	160.6	7.236	0.1109	21	0.005279	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-SKS-ILT-E-C1-1-ETW-5	E	C1	5	1	166.3	7.485	0.1110	21	0.005283	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-SKS-ILT-E-C2-1-ETW-1	E	C2	5	2	161.9	7.345	0.1102	21	0.005248	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-SKS-ILT-E-C2-1-ETW-2	E	C2	5	2	158.3	7.063	0.1118	21	0.005321	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-SKS-ILT-E-C2-1-ETW-3	E	C2	5	2	160.7	7.194	0.1115	21	0.005308	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-SKS-ILT-E-C2-1-ETW-4	E	C2	5	2	163.2	7.245	0.1123	21	0.005345	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-SKS-ILT-E-C2-1-ETW-5	E	C2	5	2	158.9	7.065	0.1121	21	0.005338	INTERLAMINAR TENSILE FAILURE
NTPM910Q1-HXL-H35-SKS-ILT-E-C2-1-ETW-6	E	C2	5	2	162.8	7.278	0.1116	21	0.005314	INTERLAMINAR TENSILE FAILURE

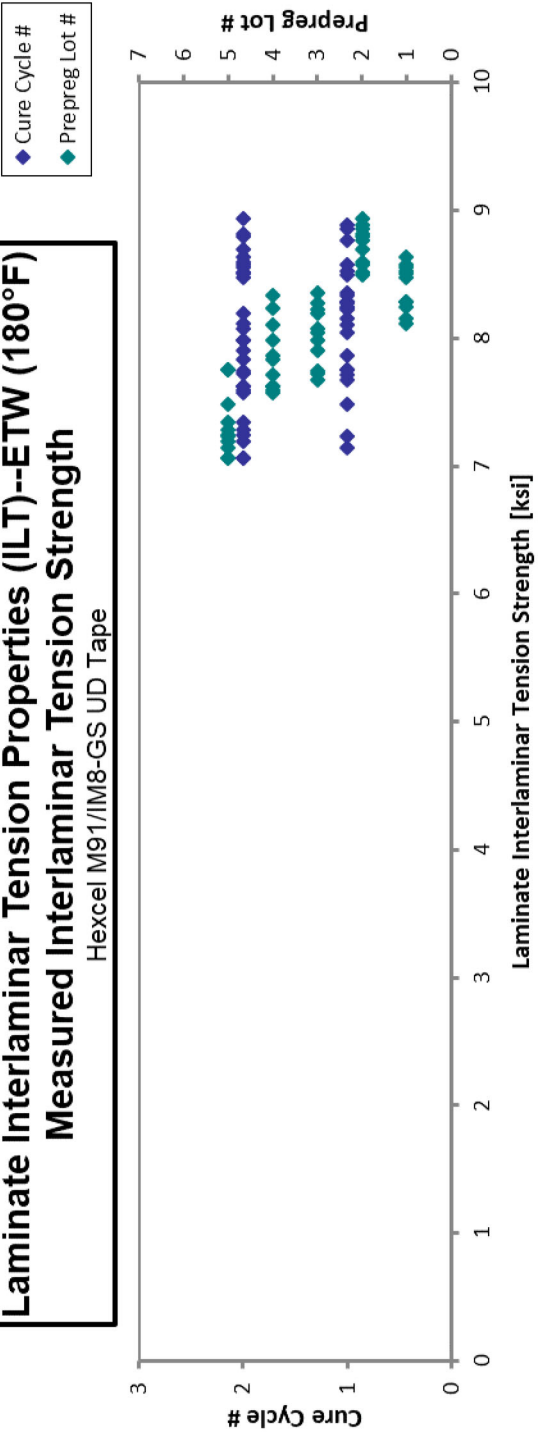
*Cross head displacement exceeds 0.2 inches

Average	185.8	8.065	0.005448
Standard Dev.	14.57	0.5257	
Coeff. of Var. [%]	7.840	6.518	
Min.	156.2	7.063	0.005211
Max.	209.9	8.933	0.005610
Number of Spec.	55	55	55

Laminate Interlaminar Tension Properties (ILT)--ETW (180°F)
Measured Curved Beam Strength [lbs]
Hexcel M91/IM8-GS UD Tape



Laminate Interlaminar Tension Properties (ILT)--ETW (180°F)
Measured Interlaminar Tension Strength
Hexcel M91/IM8-GS UD Tape



4.10 Short Beam Strength Properties (SBS)

Short-Beam Strength Properties (SBS)--CTA (-65°F) ☐	
Strength ☐	
Hexcel M91/IM8-GS UD Tape	

Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksj]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t _{ply} [in]	Failure Mode
NTPM910Q1-HXL-H35-NIAR-SBS-A-C1-1-CTA-1	A	C1	1	1	20.78	0.1335	24	0.005563	INTERLAMINAR SHEAR, COMPRESSION, TENSION
NTPM910Q1-HXL-H35-NIAR-SBS-A-C1-1-CTA-2	A	C1	1	1	20.51	0.1340	24	0.005583	INTERLAMINAR SHEAR, COMPRESSION
NTPM910Q1-HXL-H35-NIAR-SBS-A-C1-1-CTA-3	A	C1	1	1	21.54	0.1333	24	0.005553	INTERLAMINAR SHEAR, COMPRESSION
NTPM910Q1-HXL-H35-NIAR-SBS-A-C1-1-CTA-4	A	C1	1	1	22.46	0.1342	24	0.005592	INTERLAMINAR SHEAR, COMPRESSION
NTPM910Q1-HXL-H35-NIAR-SBS-A-C1-1-CTA-5	A	C1	1	1	22.00	0.1333	24	0.005554	INTERLAMINAR SHEAR, COMPRESSION
NTPM910Q1-HXL-H35-NIAR-SBS-A-C2-1-CTA-1	A	C2	1	2	21.28	0.1332	24	0.005549	INTERLAMINAR SHEAR, COMPRESSION
NTPM910Q1-HXL-H35-NIAR-SBS-A-C2-1-CTA-2	A	C2	1	2	21.37	0.1345	24	0.005603	INTERLAMINAR SHEAR, COMPRESSION
NTPM910Q1-HXL-H35-NIAR-SBS-A-C2-1-CTA-3	A	C2	1	2	21.31	0.1330	24	0.005542	INTERLAMINAR SHEAR, COMPRESSION
NTPM910Q1-HXL-H35-NIAR-SBS-A-C2-1-CTA-4	A	C2	1	2	21.64	0.1345	24	0.005603	INTERLAMINAR SHEAR, COMPRESSION
NTPM910Q1-HXL-H35-NIAR-SBS-A-C2-1-CTA-5	A	C2	1	2	22.17	0.1328	24	0.005533	INTERLAMINAR SHEAR, COMPRESSION
NTPM910Q1-HXL-H35-NIAR-SBS-A-C2-1-CTA-6	A	C2	1	2	20.80	0.1344	24	0.005601	INTERLAMINAR SHEAR, COMPRESSION
NTPM910Q1-HXL-H35-NIAR-SBS-B-C1-1-CTA-1	B	C1	2	1	22.04	0.1370	24	0.005708	INTERLAMINAR SHEAR, COMPRESSION
NTPM910Q1-HXL-H35-NIAR-SBS-B-C1-1-CTA-2	B	C1	2	1	23.28	0.1375	24	0.005727	INTERLAMINAR SHEAR, COMPRESSION
NTPM910Q1-HXL-H35-NIAR-SBS-B-C1-1-CTA-3	B	C1	2	1	23.35	0.1392	24	0.005799	INTERLAMINAR SHEAR, COMPRESSION, TENSION
NTPM910Q1-HXL-H35-NIAR-SBS-B-C1-1-CTA-4	B	C1	2	1	21.11	0.1371	24	0.005714	INTERLAMINAR SHEAR, COMPRESSION
NTPM910Q1-HXL-H35-NIAR-SBS-B-C1-1-CTA-5	B	C1	2	1	21.41	0.1378	24	0.005740	INTERLAMINAR SHEAR, COMPRESSION
NTPM910Q1-HXL-H35-NIAR-SBS-B-C2-1-CTA-1	B	C2	2	2	21.38	0.1370	24	0.005708	INTERLAMINAR SHEAR, COMPRESSION, TENSION
NTPM910Q1-HXL-H35-NIAR-SBS-B-C2-1-CTA-2	B	C2	2	2	23.42	0.1388	24	0.005782	INTERLAMINAR SHEAR, COMPRESSION, TENSION
NTPM910Q1-HXL-H35-NIAR-SBS-B-C2-1-CTA-3	B	C2	2	2	22.00	0.1388	24	0.005784	INTERLAMINAR SHEAR, COMPRESSION
NTPM910Q1-HXL-H35-NIAR-SBS-B-C2-1-CTA-4	B	C2	2	2	22.59	0.1388	24	0.005785	INTERLAMINAR SHEAR, COMPRESSION
NTPM910Q1-HXL-H35-NIAR-SBS-B-C2-1-CTA-5	B	C2	2	2	21.83	0.1370	24	0.005708	INTERLAMINAR SHEAR
NTPM910Q1-HXL-H35-NIAR-SBS-B-C2-1-CTA-6	B	C2	2	2	21.96	0.1367	24	0.005697	INTERLAMINAR SHEAR, COMPRESSION
NTPM910Q1-HXL-H35-NIAR-SBS-C-C1-1-CTA-1	C	C1	3	1	21.18	0.1374	24	0.005724	INTERLAMINAR SHEAR, COMPRESSION
NTPM910Q1-HXL-H35-NIAR-SBS-C-C1-1-CTA-2	C	C1	3	1	21.72	0.1398	24	0.005824	INTERLAMINAR SHEAR, COMPRESSION
NTPM910Q1-HXL-H35-NIAR-SBS-C-C1-1-CTA-3	C	C1	3	1	21.97	0.1374	24	0.005724	INTERLAMINAR SHEAR, COMPRESSION
NTPM910Q1-HXL-H35-NIAR-SBS-C-C1-1-CTA-4	C	C1	3	1	22.61	0.1398	24	0.005823	INTERLAMINAR SHEAR, COMPRESSION
NTPM910Q1-HXL-H35-NIAR-SBS-C-C1-1-CTA-5	C	C1	3	1	22.30	0.1397	24	0.005822	INTERLAMINAR SHEAR, COMPRESSION
NTPM910Q1-HXL-H35-NIAR-SBS-C-C2-1-CTA-1	C	C2	3	2	21.75	0.1383	24	0.005762	INTERLAMINAR SHEAR, COMPRESSION
NTPM910Q1-HXL-H35-NIAR-SBS-C-C2-1-CTA-2	C	C2	3	2	21.62	0.1378	24	0.005742	INTERLAMINAR SHEAR, COMPRESSION
NTPM910Q1-HXL-H35-NIAR-SBS-C-C2-1-CTA-3	C	C2	3	2	21.11	0.1376	24	0.005732	INTERLAMINAR SHEAR, COMPRESSION
NTPM910Q1-HXL-H35-NIAR-SBS-C-C2-1-CTA-4	C	C2	3	2	21.63	0.1381	24	0.005752	INTERLAMINAR SHEAR, COMPRESSION
NTPM910Q1-HXL-H35-NIAR-SBS-C-C2-1-CTA-5	C	C2	3	2	20.81	0.1382	24	0.005758	INTERLAMINAR SHEAR, COMPRESSION
NTPM910Q1-HXL-H35-NIAR-SBS-C-C2-1-CTA-6	C	C2	3	2	20.69	0.1401	24	0.005837	INTERLAMINAR SHEAR, COMPRESSION

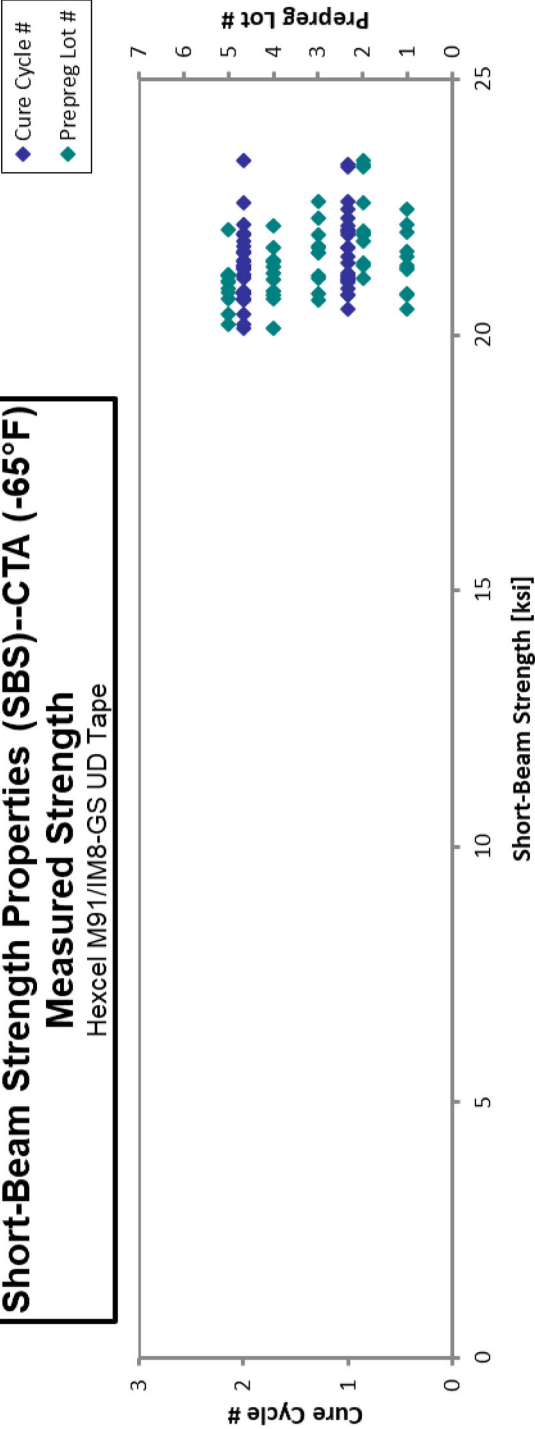
Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode
NTPM910Q1-HXL-H35-FACC-SBS-D-C1-1-CTA-1	D	C1	4	1	20.79	0.1343	24	0.005596	INTERLAMINAR SHEAR
NTPM910Q1-HXL-H35-FACC-SBS-D-C1-1-CTA-2	D	C1	4	1	21.09	0.1340	24	0.005582	INTERLAMINAR SHEAR
NTPM910Q1-HXL-H35-FACC-SBS-D-C1-1-CTA-3	D	C1	4	1	21.22	0.1349	24	0.005621	INTERLAMINAR SHEAR
NTPM910Q1-HXL-H35-FACC-SBS-D-C1-1-CTA-4	D	C1	4	1	21.71	0.1357	24	0.005656	INTERLAMINAR SHEAR, COMPRESSION
NTPM910Q1-HXL-H35-FACC-SBS-D-C1-1-CTA-5	D	C1	4	1	22.15	0.1355	24	0.005647	INTERLAMINAR SHEAR
NTPM910Q1-HXL-H35-FACC-SBS-D-C2-1-CTA-1	D	C2	4	2	20.14	0.1338	24	0.005574	INTERLAMINAR SHEAR, COMPRESSION
NTPM910Q1-HXL-H35-FACC-SBS-D-C2-1-CTA-2	D	C2	4	2	21.44	0.1340	24	0.005583	INTERLAMINAR SHEAR, COMPRESSION
NTPM910Q1-HXL-H35-FACC-SBS-D-C2-1-CTA-3	D	C2	4	2	21.34	0.1343	24	0.005594	INTERLAMINAR SHEAR
NTPM910Q1-HXL-H35-FACC-SBS-D-C2-1-CTA-4	D	C2	4	2	20.72	0.1351	24	0.005630	INTERLAMINAR SHEAR, COMPRESSION
NTPM910Q1-HXL-H35-FACC-SBS-D-C2-1-CTA-5	D	C2	4	2	20.86	0.1349	24	0.005621	INTERLAMINAR SHEAR, COMPRESSION
NTPM910Q1-HXL-H35-FACC-SBS-D-C2-1-CTA-6	D	C2	4	2	21.45	0.1352	24	0.005635	INTERLAMINAR SHEAR
NTPM910Q1-HXL-H35-SKS-SBS-E-C1-1-CTA-1	E	C1	5	1	21.07	0.1324	24	0.005515	INTERLAMINAR SHEAR, COMPRESSION
NTPM910Q1-HXL-H35-SKS-SBS-E-C1-1-CTA-2	E	C1	5	1	20.90	0.1333	24	0.005556	INTERLAMINAR SHEAR, COMPRESSION
NTPM910Q1-HXL-H35-SKS-SBS-E-C1-1-CTA-3	E	C1	5	1	21.03	0.1341	24	0.005589	INTERLAMINAR SHEAR, COMPRESSION
NTPM910Q1-HXL-H35-SKS-SBS-E-C1-1-CTA-4	E	C1	5	1	21.15	0.1347	24	0.005613	INTERLAMINAR SHEAR, COMPRESSION
NTPM910Q1-HXL-H35-SKS-SBS-E-C1-1-CTA-5	E	C1	5	1	22.07	0.1349	24	0.005622	INTERLAMINAR SHEAR
NTPM910Q1-HXL-H35-SKS-SBS-E-C2-1-CTA-1	E	C2	5	2	21.19	0.1328	24	0.005535	INTERLAMINAR SHEAR
NTPM910Q1-HXL-H35-SKS-SBS-E-C2-1-CTA-2	E	C2	5	2	20.42	0.1341	24	0.005588	INTERLAMINAR SHEAR, COMPRESSION
NTPM910Q1-HXL-H35-SKS-SBS-E-C2-1-CTA-3	E	C2	5	2	20.85	0.1348	24	0.005618	INTERLAMINAR SHEAR, COMPRESSION
NTPM910Q1-HXL-H35-SKS-SBS-E-C2-1-CTA-4	E	C2	5	2	20.70	0.1351	24	0.005628	INTERLAMINAR SHEAR, COMPRESSION
NTPM910Q1-HXL-H35-SKS-SBS-E-C2-1-CTA-5	E	C2	5	2	21.16	0.1347	24	0.005612	INTERLAMINAR SHEAR, COMPRESSION
NTPM910Q1-HXL-H35-SKS-SBS-E-C2-1-CTA-6	E	C2	5	2	20.21	0.1339	24	0.005577	INTERLAMINAR SHEAR, COMPRESSION

Average	21.48	0.005657
Standard Dev.	0.7362	
Coeff. of Var. [%]	3.428	0.005515
Min.	20.14	0.005837
Max.	23.42	55
Number of Spec.	55	

Short-Beam Strength Properties (SBS)--CTA (-65°F)

Measured Strength

Hexcel M91/IM8-GS UD Tape



Short-Beam Strength Properties (SBS)--RTA (70°F) ☐
Strength ☐
Hexcel IM91/IM8-GS UD Tape

Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t _{ply} [in]	Failure Mode
NTPM910Q1-HXL-H35-NIAR-SBS-A-C1-1-RTA-1	A	C1	1	1	15.91	0.1334	24	0.005559	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-A-C1-1-RTA-2	A	C1	1	1	15.89	0.1339	24	0.005580	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-A-C1-1-RTA-3	A	C1	1	1	15.84	0.1335	24	0.005563	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-A-C1-1-RTA-4	A	C1	1	1	15.84	0.1341	24	0.005589	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-A-C1-1-RTA-5	A	C1	1	1	15.85	0.1335	24	0.005560	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-A-C2-1-RTA-1	A	C2	1	2	15.97	0.1346	24	0.005608	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-A-C2-1-RTA-2	A	C2	1	2	15.86	0.1342	24	0.005592	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-A-C2-1-RTA-3	A	C2	1	2	16.26	0.1331	24	0.005544	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-A-C2-1-RTA-4	A	C2	1	2	15.83	0.1333	24	0.005552	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-A-C2-1-RTA-5	A	C2	1	2	15.95	0.1345	24	0.005603	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-A-C2-1-RTA-6	A	C2	1	2	15.91	0.1345	24	0.005605	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-B-C1-1-RTA-1	B	C1	2	1	16.90	0.1373	24	0.005722	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-B-C1-1-RTA-2	B	C1	2	1	17.13	0.1390	24	0.005790	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-B-C1-1-RTA-3	B	C1	2	1	16.42	0.1390	24	0.005790	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-B-C1-1-RTA-4	B	C1	2	1	16.85	0.1375	24	0.005729	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-B-C1-1-RTA-5	B	C1	2	1	15.97	0.1390	24	0.005792	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-B-C2-1-RTA-1	B	C2	2	2	17.13	0.1388	24	0.005785	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-B-C2-1-RTA-2	B	C2	2	2	16.69	0.1390	24	0.005792	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-B-C2-1-RTA-3	B	C2	2	2	16.27	0.1372	24	0.005717	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-B-C2-1-RTA-4	B	C2	2	2	17.04	0.1390	24	0.005792	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-B-C2-1-RTA-5	B	C2	2	2	16.33	0.1389	24	0.005786	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-B-C2-1-RTA-6	B	C2	2	2	15.95	0.1368	24	0.005701	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-C-C1-1-RTA-1	C	C1	3	1	15.81	0.1376	24	0.005733	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-C-C1-1-RTA-2	C	C1	3	1	15.56	0.1397	24	0.005820	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-C-C1-1-RTA-3	C	C1	3	1	15.77	0.1377	24	0.005736	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-C-C1-1-RTA-4	C	C1	3	1	15.70	0.1379	24	0.005746	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-C-C1-1-RTA-5	C	C1	3	1	15.88	0.1375	24	0.005728	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-C-C2-1-RTA-1	C	C2	3	2	16.01	0.1377	24	0.005737	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-C-C2-1-RTA-2	C	C2	3	2	16.31	0.1373	24	0.005722	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-C-C2-1-RTA-3	C	C2	3	2	15.99	0.1375	24	0.005728	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-C-C2-1-RTA-4	C	C2	3	2	15.86	0.1374	24	0.005726	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-C-C2-1-RTA-5	C	C2	3	2	15.89	0.1382	24	0.005757	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-C-C2-1-RTA-6	C	C2	3	2	16.44	0.1392	24	0.005801	INTERLAMINAR SHEAR, INELASTIC DEFORMATION

Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Piles in Laminate	Avg. t _{py} [in]	Failure Mode
NTPM910Q1-HXL-H35-FACC-SBS-D-C1-1-RTA-1	D	C1	4	1	16.61	0.1362	24	0.005674	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-FACC-SBS-D-C1-1-RTA-2	D	C1	4	1	16.69	0.1390	24	0.005793	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-FACC-SBS-D-C1-1-RTA-3	D	C1	4	1	16.66	0.1356	24	0.005651	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-FACC-SBS-D-C1-1-RTA-4	D	C1	4	1	16.58	0.1371	24	0.005714	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-FACC-SBS-D-C1-1-RTA-5	D	C1	4	1	16.55	0.1354	24	0.005642	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-FACC-SBS-D-C2-1-RTA-1	D	C2	4	2	16.58	0.1356	24	0.005648	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-FACC-SBS-D-C2-1-RTA-2	D	C2	4	2	16.19	0.1349	24	0.005622	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-FACC-SBS-D-C2-1-RTA-3	D	C2	4	2	16.44	0.1356	24	0.005649	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-FACC-SBS-D-C2-1-RTA-4	D	C2	4	2	16.45	0.1351	24	0.005628	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-FACC-SBS-D-C2-1-RTA-5	D	C2	4	2	16.72	0.1358	24	0.005658	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-FACC-SBS-D-C2-1-RTA-6	D	C2	4	2	16.42	0.1350	24	0.005624	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-SKS-SBS-E-C1-1-RTA-1	E	C1	5	1	16.26	0.1347	24	0.005613	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-SKS-SBS-E-C1-1-RTA-2	E	C1	5	1	16.15	0.1341	24	0.005588	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-SKS-SBS-E-C1-1-RTA-3	E	C1	5	1	16.08	0.1332	24	0.005560	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-SKS-SBS-E-C1-1-RTA-4	E	C1	5	1	16.07	0.1320	24	0.005500	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-SKS-SBS-E-C1-1-RTA-5	E	C1	5	1	15.94	0.1332	24	0.005549	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-SKS-SBS-E-C2-1-RTA-1	E	C2	5	2	16.27	0.1358	24	0.005657	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-SKS-SBS-E-C2-1-RTA-2	E	C2	5	2	16.09	0.1338	24	0.005574	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-SKS-SBS-E-C2-1-RTA-3	E	C2	5	2	16.52	0.1351	24	0.005630	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-SKS-SBS-E-C2-1-RTA-4	E	C2	5	2	16.32	0.1357	24	0.005656	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-SKS-SBS-E-C2-1-RTA-5	E	C2	5	2	15.97	0.1360	24	0.005666	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-SKS-SBS-E-C2-1-RTA-6	E	C2	5	2	16.12	0.1323	24	0.005513	INTERLAMINAR SHEAR, INELASTIC DEFORMATION

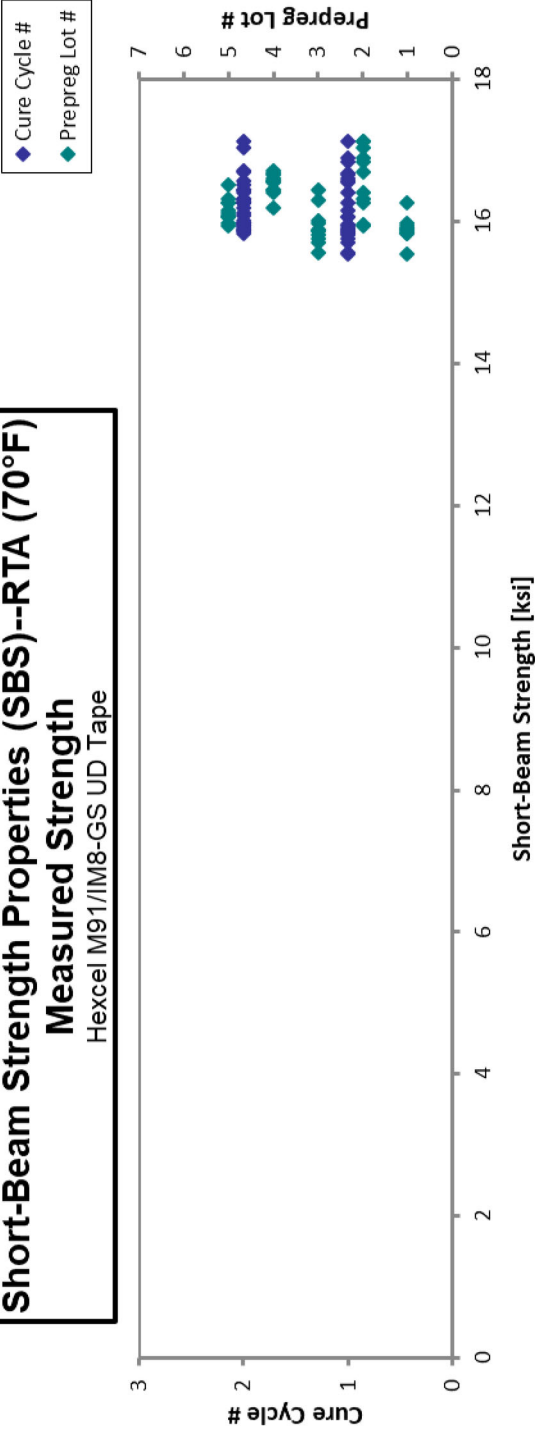
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Average 16.22
Standard Dev. 0.3923
Coeff. of Var. [%] 2.418
Min. 15.54
Max. 17.13
Number of Spec. 55

0.0055500

0.0055820
55

Short-Beam Strength Properties (SBS)--RTA (70°F)
Measured Strength
Hexcel M91/IM8-GS UD Tape



Short-Beam Strength Properties (SBS)--ETW (180°F) ☐
Strength ☐
Hexcel M91/M8-GS UD Tape

Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Piles in Laminate	Avg. t ₉₀ [in]	Failure Mode
NTPM910Q1-HXL-H35-NIAR-SBS-A-C1-1-ETW-1	A	C1	1	1	9.583	0.1332	24	0.005548	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-A-C1-1-ETW-2	A	C1	1	1	9.581	0.1329	24	0.005537	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-A-C1-1-ETW-3	A	C1	1	1	9.231	0.1334	24	0.005556	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-A-C1-1-ETW-4	A	C1	1	1	9.540	0.1338	24	0.005576	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-A-C1-1-ETW-5	A	C1	1	1	9.342	0.1339	24	0.005579	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-A-C2-1-ETW-1	A	C2	1	2	9.287	0.1331	24	0.005545	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-A-C2-1-ETW-2	A	C2	1	2	9.363	0.1332	24	0.005549	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-A-C2-1-ETW-3	A	C2	1	2	9.436	0.1331	24	0.005545	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-A-C2-1-ETW-4	A	C2	1	2	9.648	0.1342	24	0.005593	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-A-C2-1-ETW-5	A	C2	1	2	9.326	0.1332	24	0.005551	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-A-C2-1-ETW-6	A	C2	1	2	9.309	0.1341	24	0.005587	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-B-C1-1-ETW-1	B	C1	2	1	9.650	0.1373	24	0.005719	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-B-C1-1-ETW-2	B	C1	2	1	9.633	0.1372	24	0.005715	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-B-C1-1-ETW-3	B	C1	2	1	9.859	0.1391	24	0.005794	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-B-C1-1-ETW-4	B	C1	2	1	9.747	0.1370	24	0.005710	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-B-C1-1-ETW-5	B	C1	2	1	9.637	0.1375	24	0.005730	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-B-C2-1-ETW-1	B	C2	2	2	9.773	0.1383	24	0.005763	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-B-C2-1-ETW-2	B	C2	2	2	9.546	0.1365	24	0.005688	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-B-C2-1-ETW-3	B	C2	2	2	9.816	0.1391	24	0.005797	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-B-C2-1-ETW-4	B	C2	2	2	9.805	0.1368	24	0.005700	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-B-C2-1-ETW-5	B	C2	2	2	9.839	0.1391	24	0.005796	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-B-C2-1-ETW-6	B	C2	2	2	9.509	0.1368	24	0.005698	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-C-C1-1-ETW-1	C	C1	3	1	9.276	0.1397	24	0.005819	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-C-C1-1-ETW-2	C	C1	3	1	9.168	0.1397	24	0.005822	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-C-C1-1-ETW-3	C	C1	3	1	9.339	0.1376	24	0.005733	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-C-C1-1-ETW-4	C	C1	3	1	9.257	0.1390	24	0.005792	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-C-C1-1-ETW-5	C	C1	3	1	9.049	0.1395	24	0.005813	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-C-C2-1-ETW-1	C	C2	3	2	9.208	0.1403	24	0.005845	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-C-C2-1-ETW-2	C	C2	3	2	9.187	0.1398	24	0.005823	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-C-C2-1-ETW-3	C	C2	3	2	9.246	0.1397	24	0.005819	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-C-C2-1-ETW-4	C	C2	3	2	9.303	0.1394	24	0.005808	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-C-C2-1-ETW-5	C	C2	3	2	9.226	0.1397	24	0.005819	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-NIAR-SBS-C-C2-1-ETW-6	C	C2	3	2	9.306	0.1395	24	0.005811	INTERLAMINAR SHEAR, INELASTIC DEFORMATION

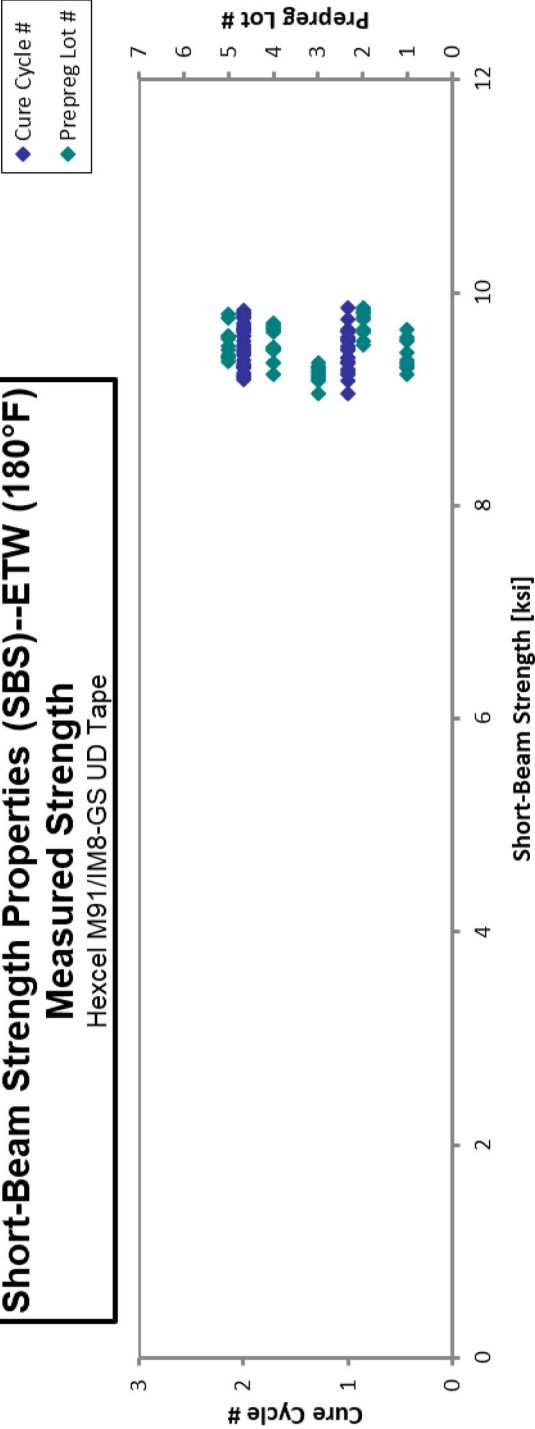
Specimen Number	Hexcel Batch	Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t _{ply} [in]	Failure Mode
NTPM910Q1-HXL-H35-FACC-SBS-D-C1-1-ETW-1	D	C1	4	1	9,226	0.1354	24	0.005642	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-FACC-SBS-D-C1-1-ETW-2	D	C1	4	1	9,480	0.1348	24	0.005617	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-FACC-SBS-D-C1-1-ETW-3	D	C1	4	1	9,462	0.1352	24	0.005635	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-FACC-SBS-D-C1-1-ETW-4	D	C1	4	1	9,464	0.1346	24	0.005608	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-FACC-SBS-D-C1-1-ETW-5	D	C1	4	1	9,340	0.1349	24	0.005620	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-FACC-SBS-D-C2-1-ETW-1	D	C2	4	2	9,487	0.1348	24	0.005616	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-FACC-SBS-D-C2-1-ETW-2	D	C2	4	2	9,671	0.1355	24	0.005645	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-FACC-SBS-D-C2-1-ETW-3	D	C2	4	2	9,625	0.1348	24	0.005617	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-FACC-SBS-D-C2-1-ETW-4	D	C2	4	2	9,695	0.1351	24	0.005629	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-FACC-SBS-D-C2-1-ETW-5	D	C2	4	2	9,650	0.1344	24	0.005599	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-FACC-SBS-D-C2-1-ETW-6	D	C2	4	2	9,715	0.1350	24	0.005623	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-SKS-SBS-E-C1-1-ETW-1	E	C1	5	1	9,356	0.1355	24	0.005647	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION
NTPM910Q1-HXL-H35-SKS-SBS-E-C1-1-ETW-2	E	C1	5	1	9,389	0.1363	24	0.005680	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-SKS-SBS-E-C1-1-ETW-3	E	C1	5	1	9,568	0.1367	24	0.005696	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-SKS-SBS-E-C1-1-ETW-4	E	C1	5	1	9,386	0.1366	24	0.005691	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-SKS-SBS-E-C1-1-ETW-5	E	C1	5	1	9,493	0.1363	24	0.005680	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-SKS-SBS-E-C2-1-ETW-1	E	C2	5	2	9,413	0.1345	24	0.005602	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-SKS-SBS-E-C2-1-ETW-2	E	C2	5	2	9,596	0.1342	24	0.005592	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-SKS-SBS-E-C2-1-ETW-3	E	C2	5	2	9,763	0.1357	24	0.005652	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-SKS-SBS-E-C2-1-ETW-4	E	C2	5	2	9,801	0.1368	24	0.005698	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-SKS-SBS-E-C2-1-ETW-5	E	C2	5	2	9,460	0.1367	24	0.005695	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTPM910Q1-HXL-H35-SKS-SBS-E-C2-1-ETW-6	E	C2	5	2	9,588	0.1365	24	0.005689	INTERLAMINAR SHEAR, INELASTIC DEFORMATION

0.005679

Average 9.484
Standard Dev. 0.2029
Coeff. of Var. [%] 2.139
Min. 9.049
Max. 9.859
Number of Spec. 55

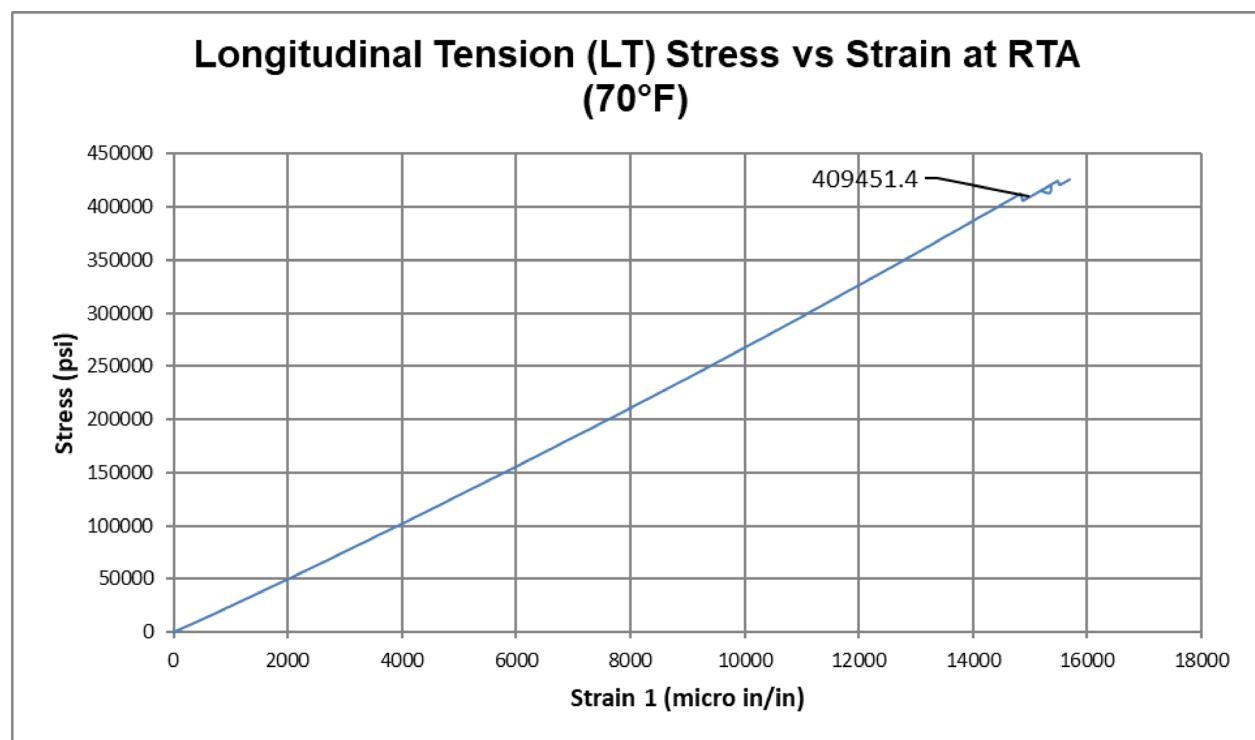
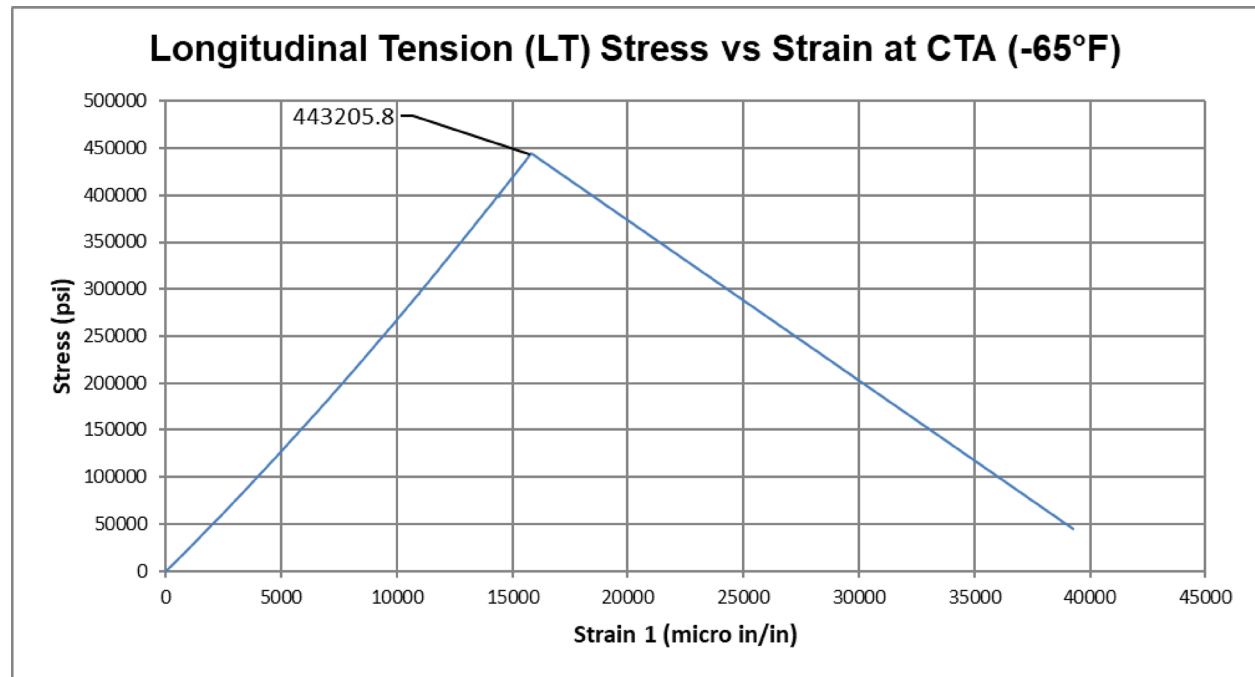
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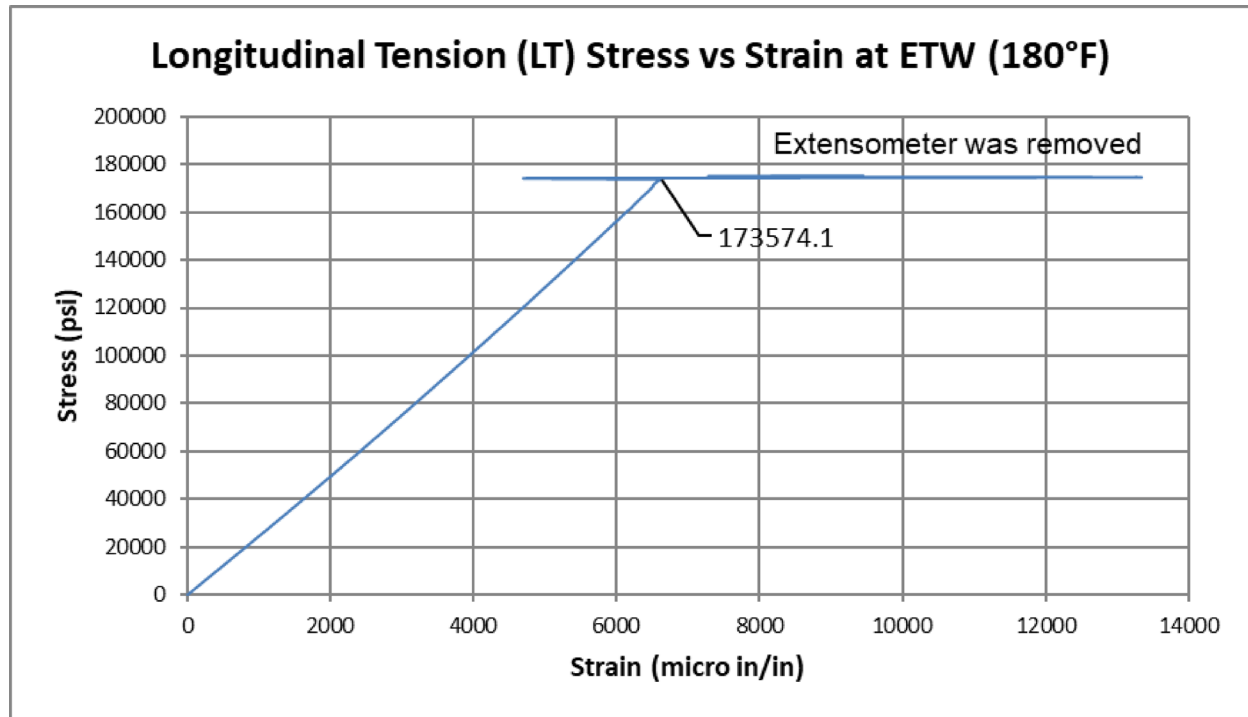
Short-Beam Strength Properties (SBS)--ETW (180°F)
Measured Strength
Hexcel M91/IM8-GS UD Tape



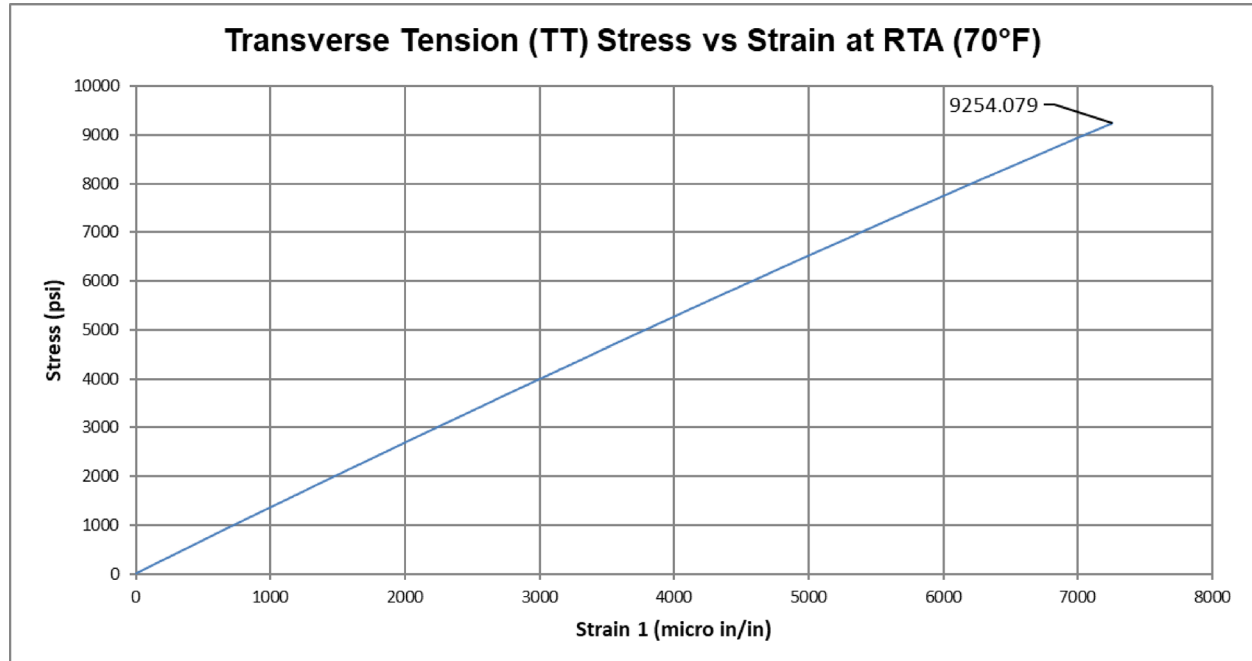
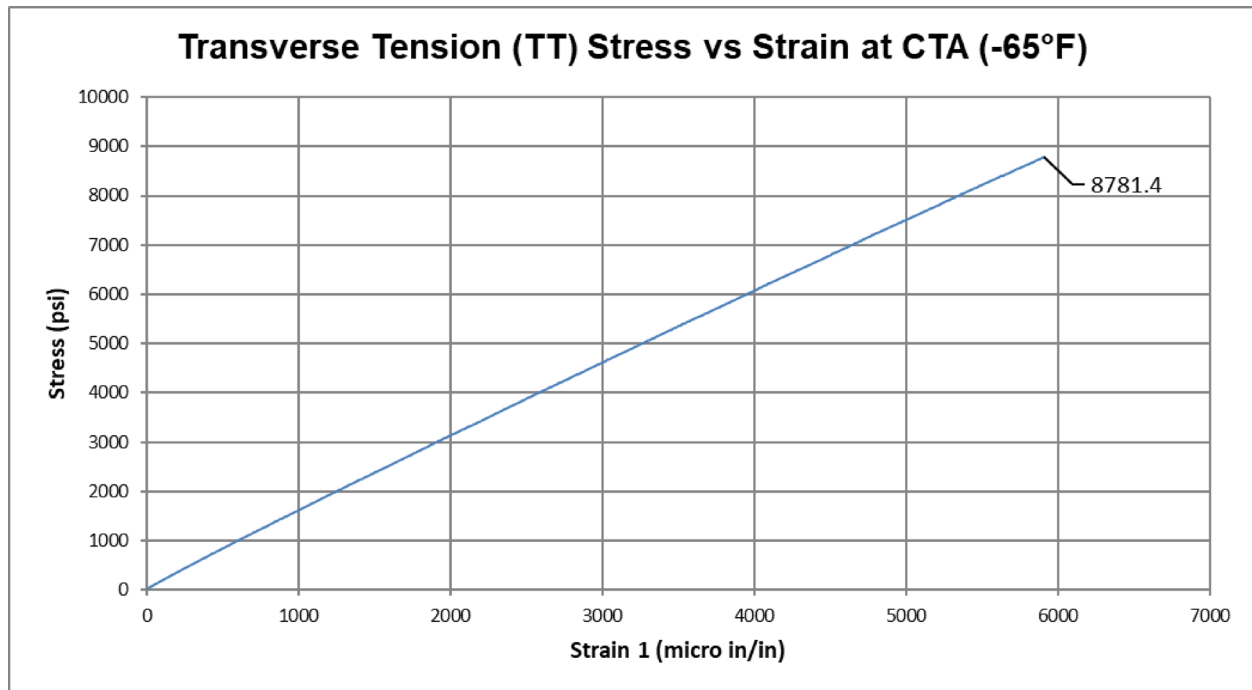
5. Full Stress vs. Strain Curve

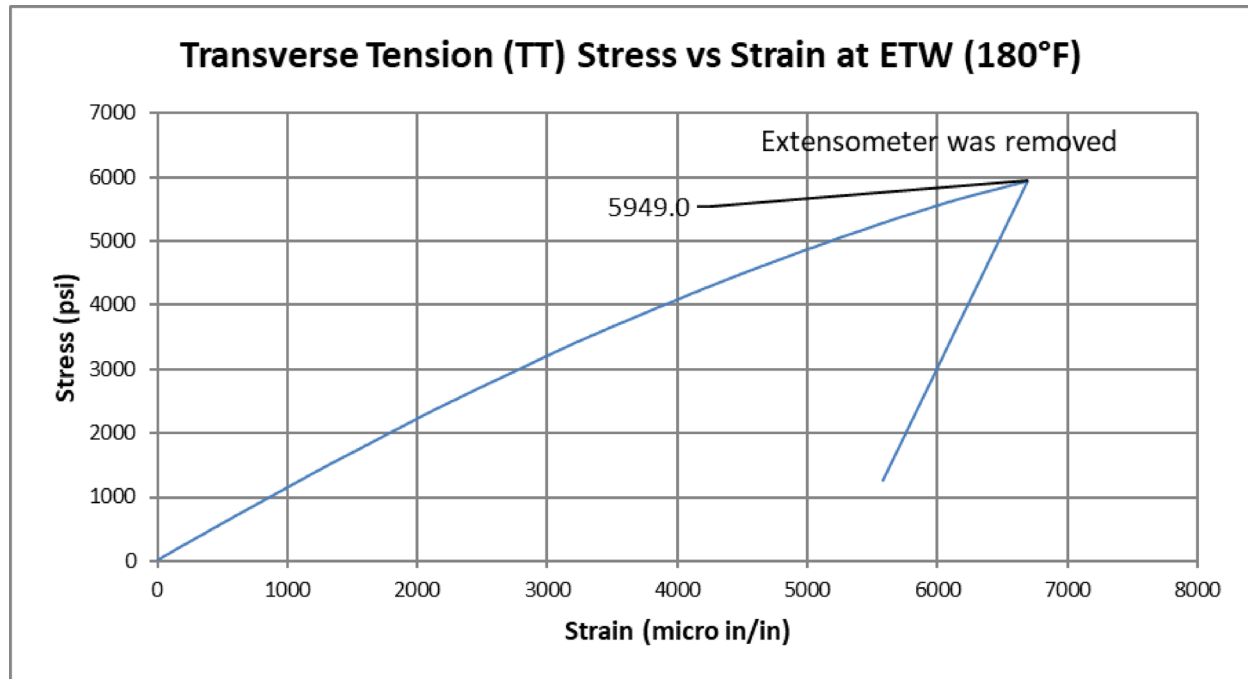
5.1 Longitudinal Tension Properties (LT) – RTA, CTA and ETW



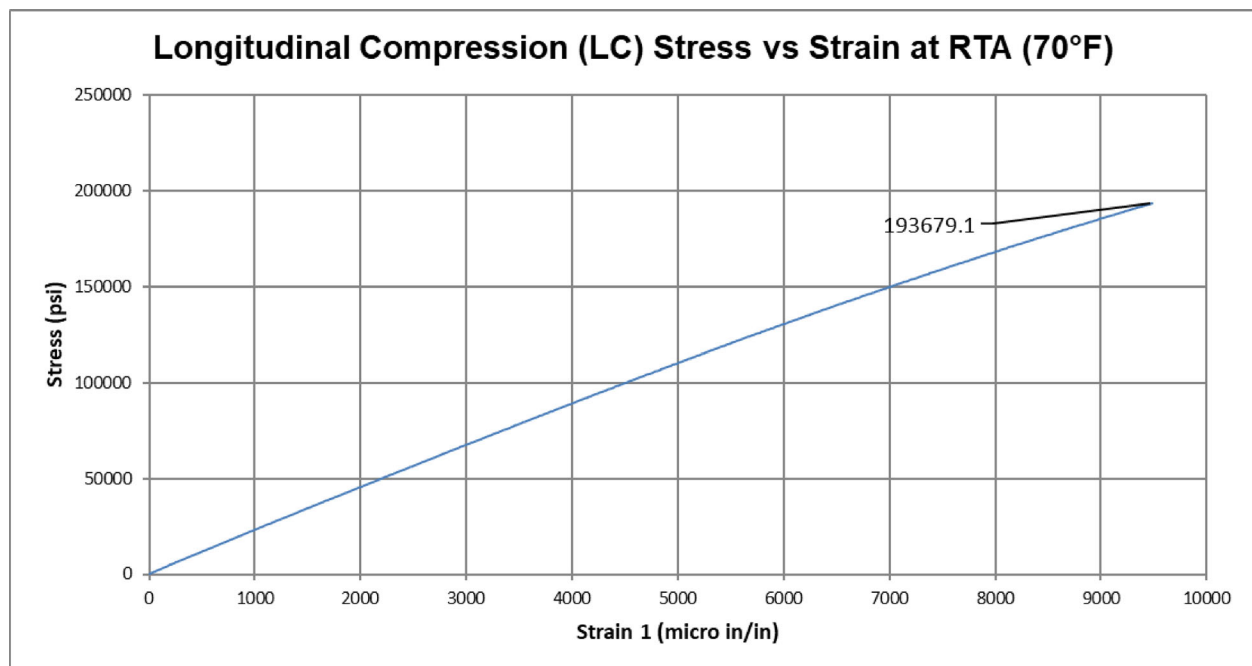
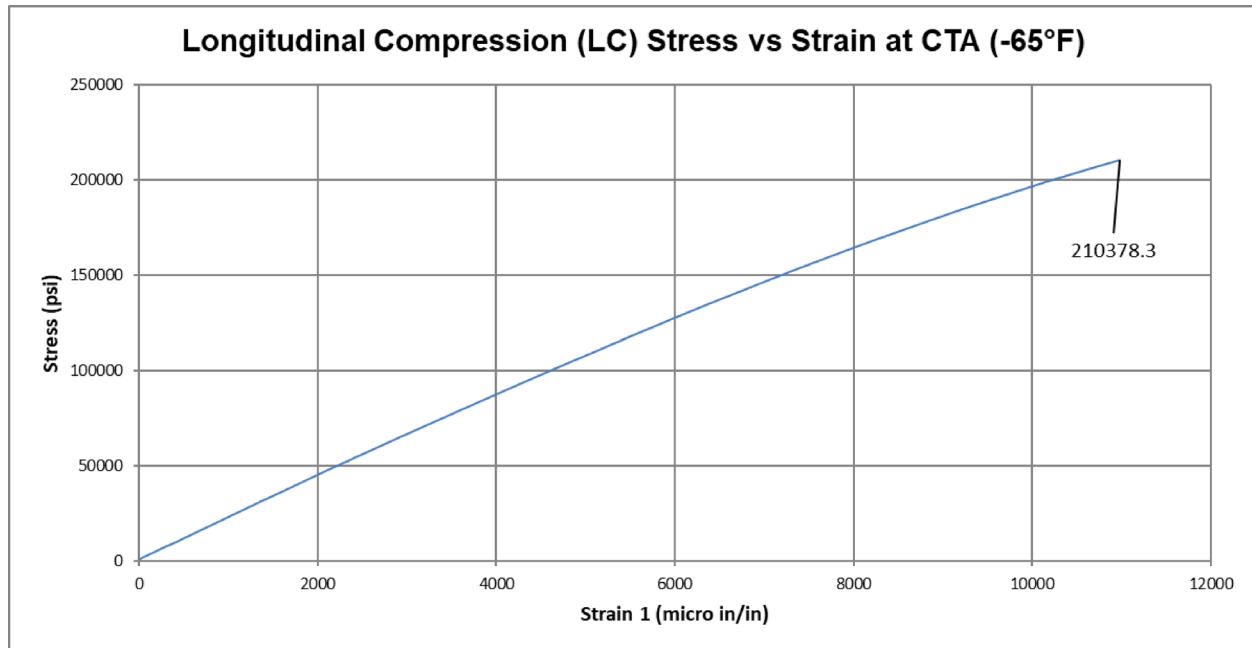


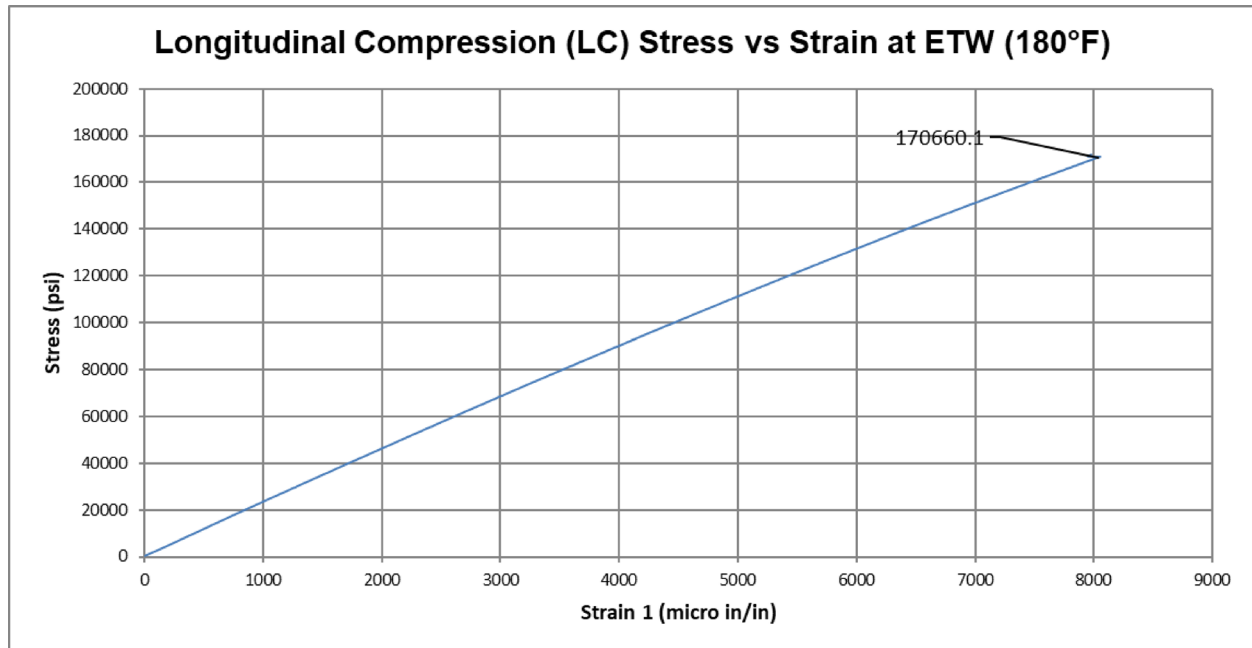
5.2 Transverse Tension Properties (TT)– CTA, RTA and ETW



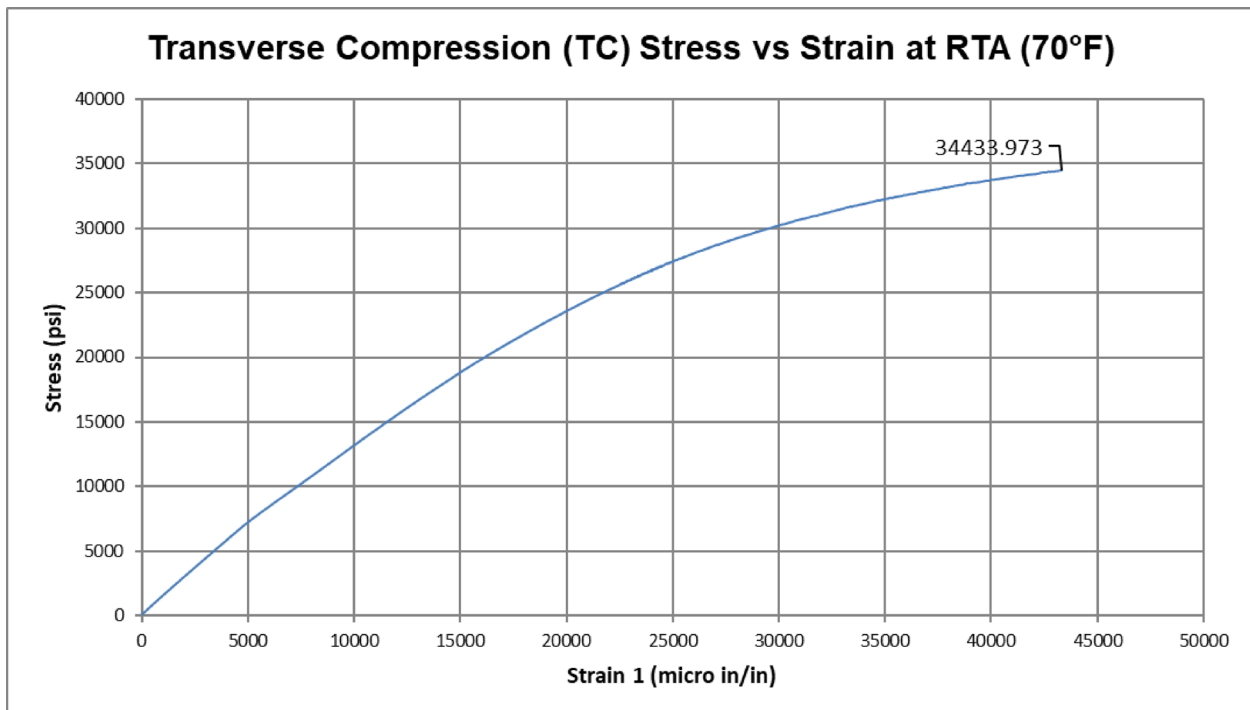
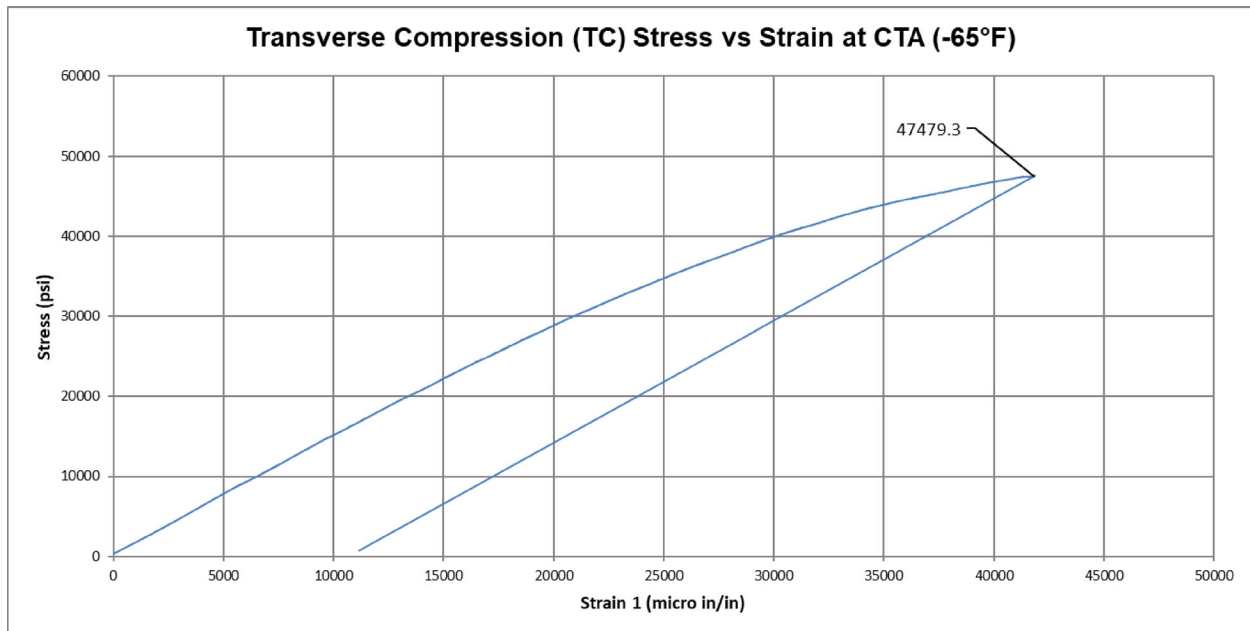


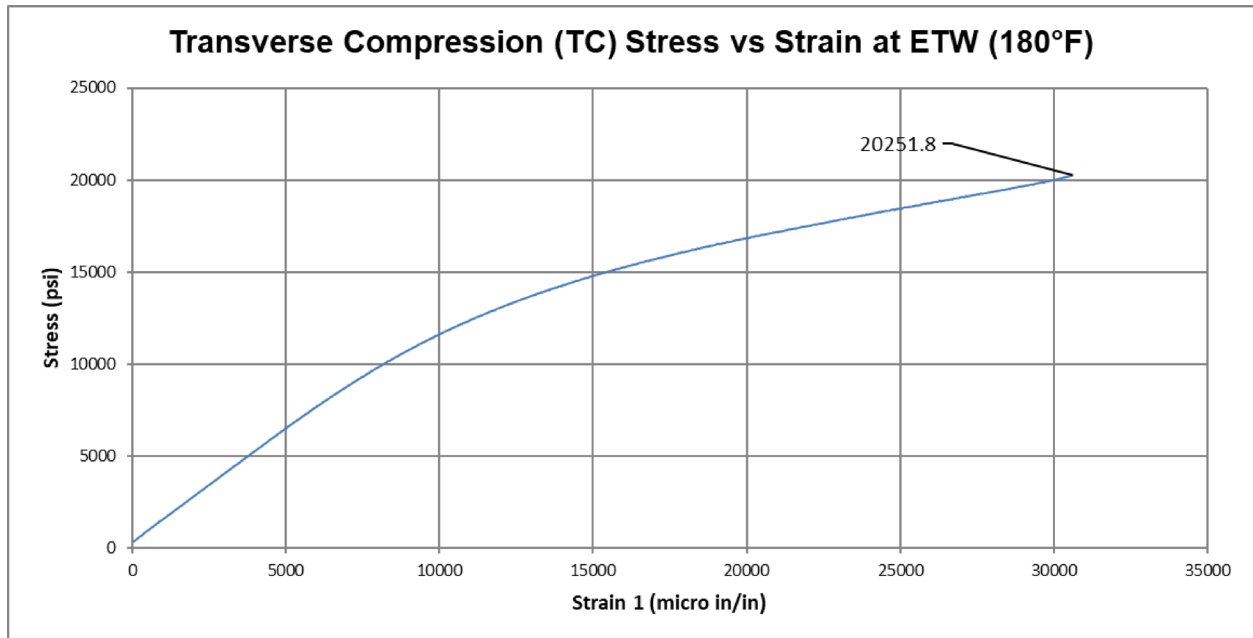
5.3 Longitudinal Compression (LC) Properties – CTA, RTA and ETW



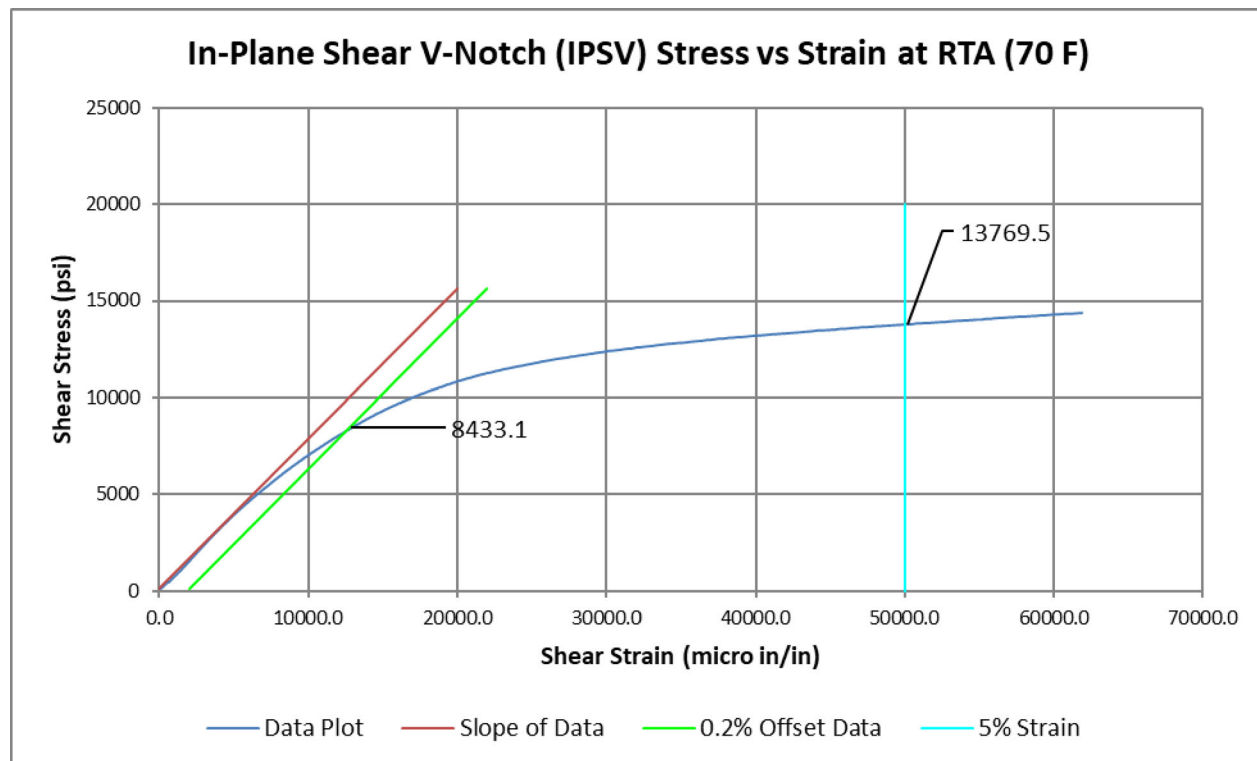
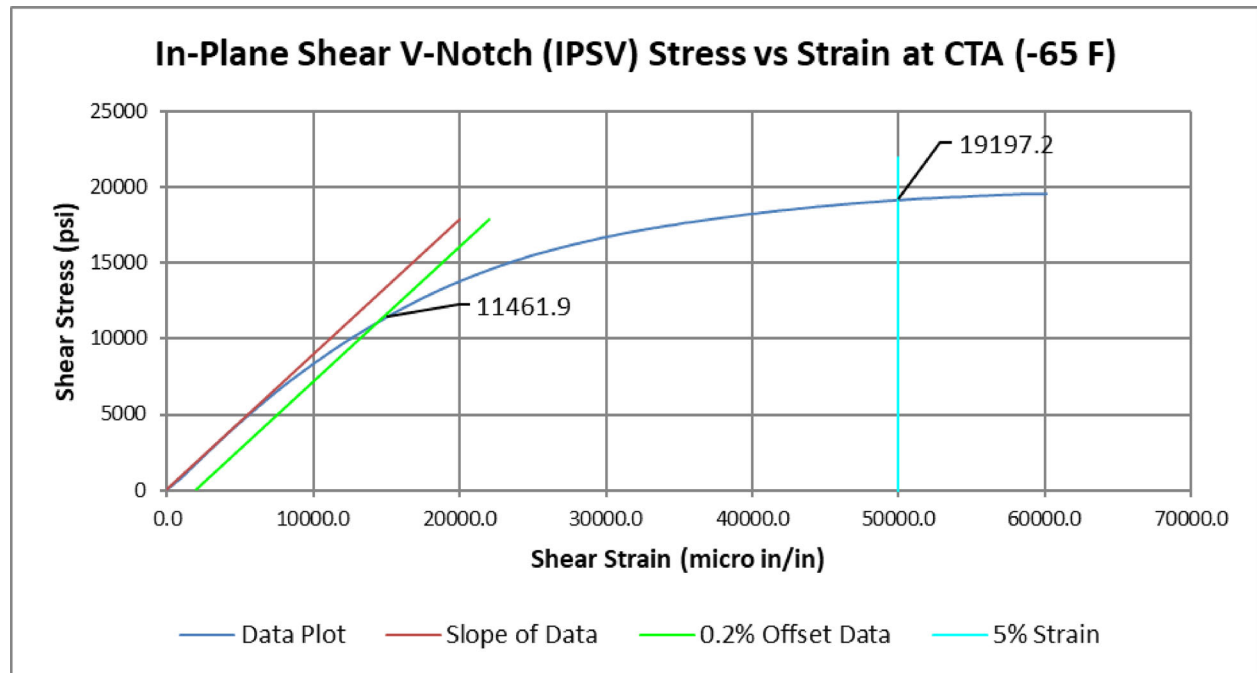


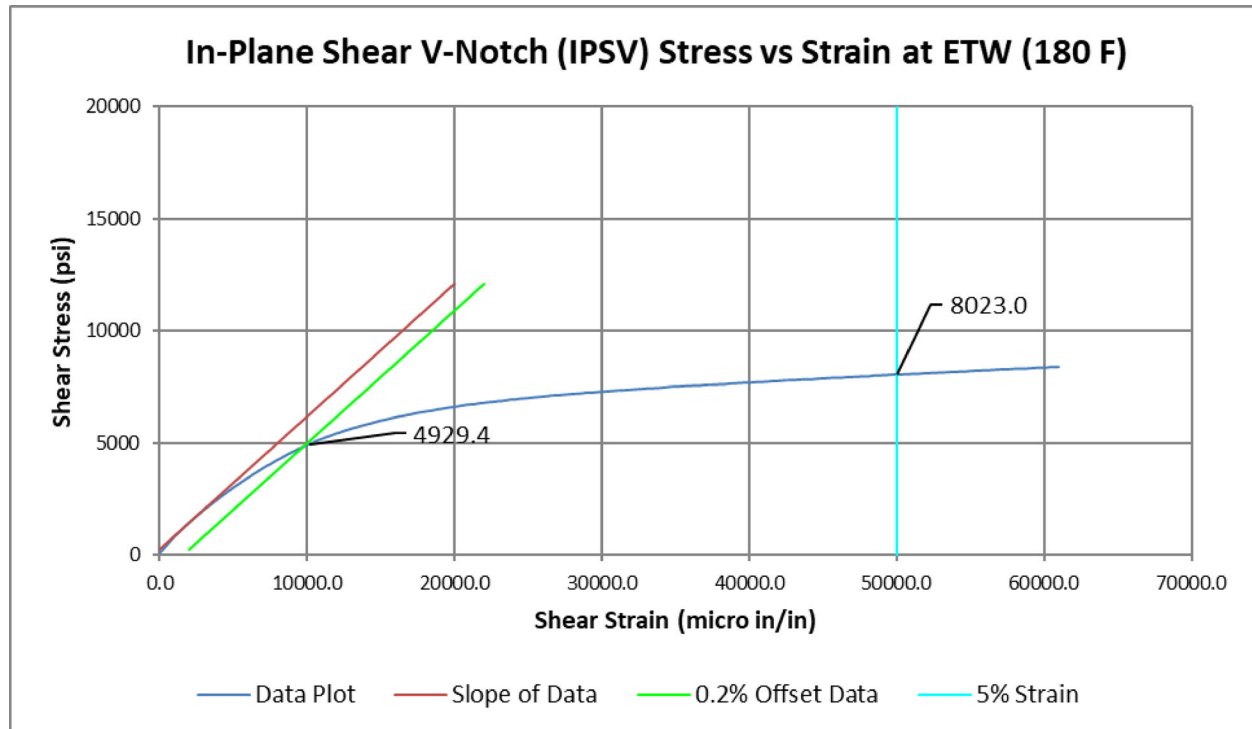
5.4 Transverse Compression (TC) Properties – RTA, CTA and ETW



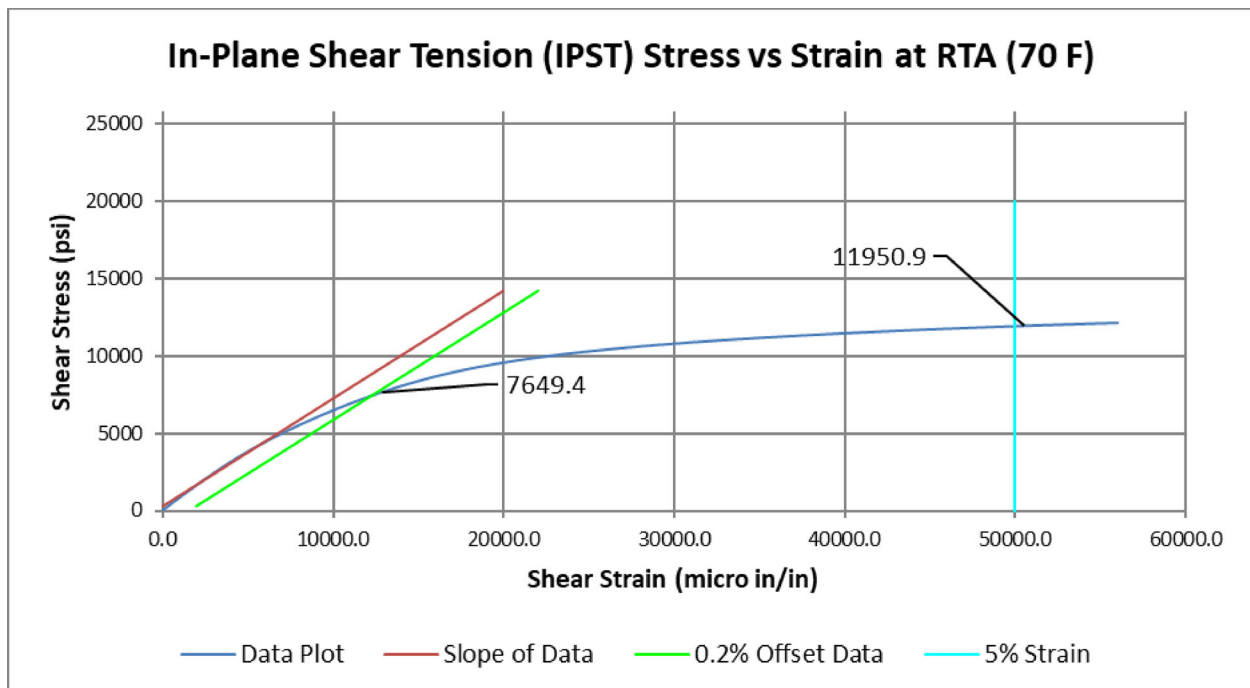
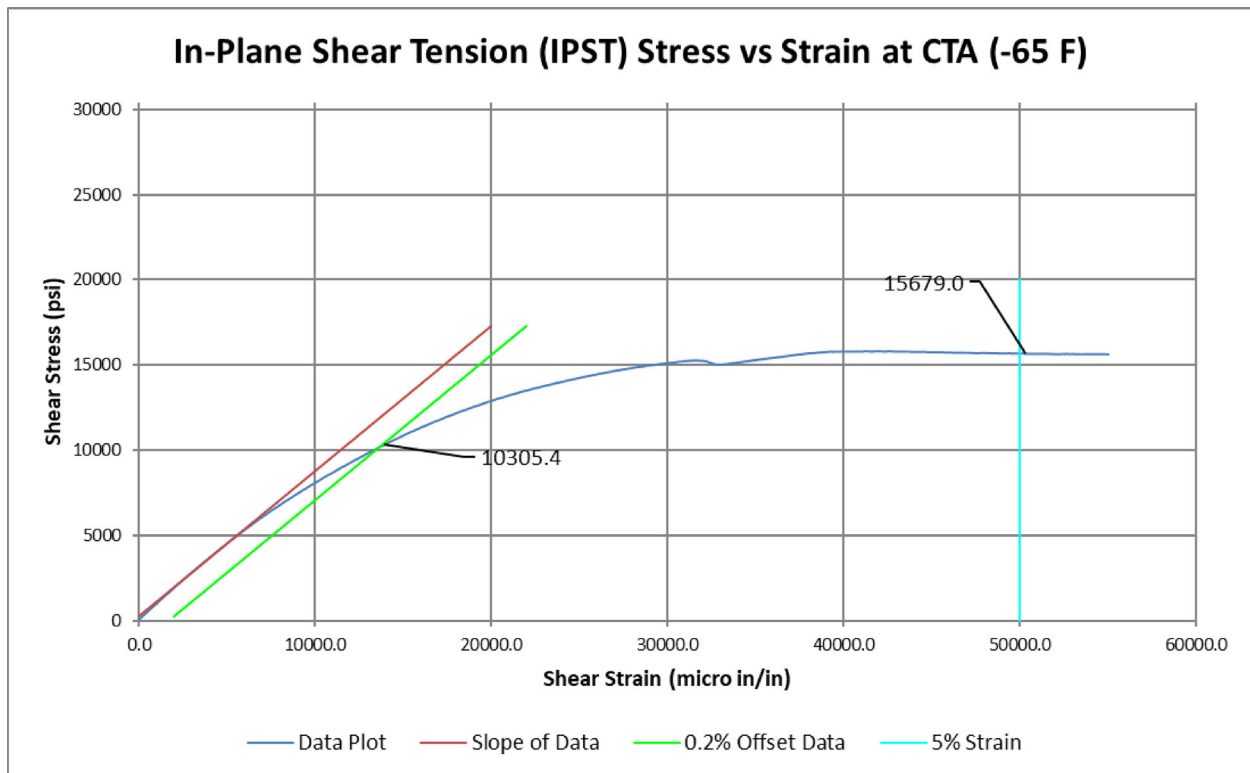


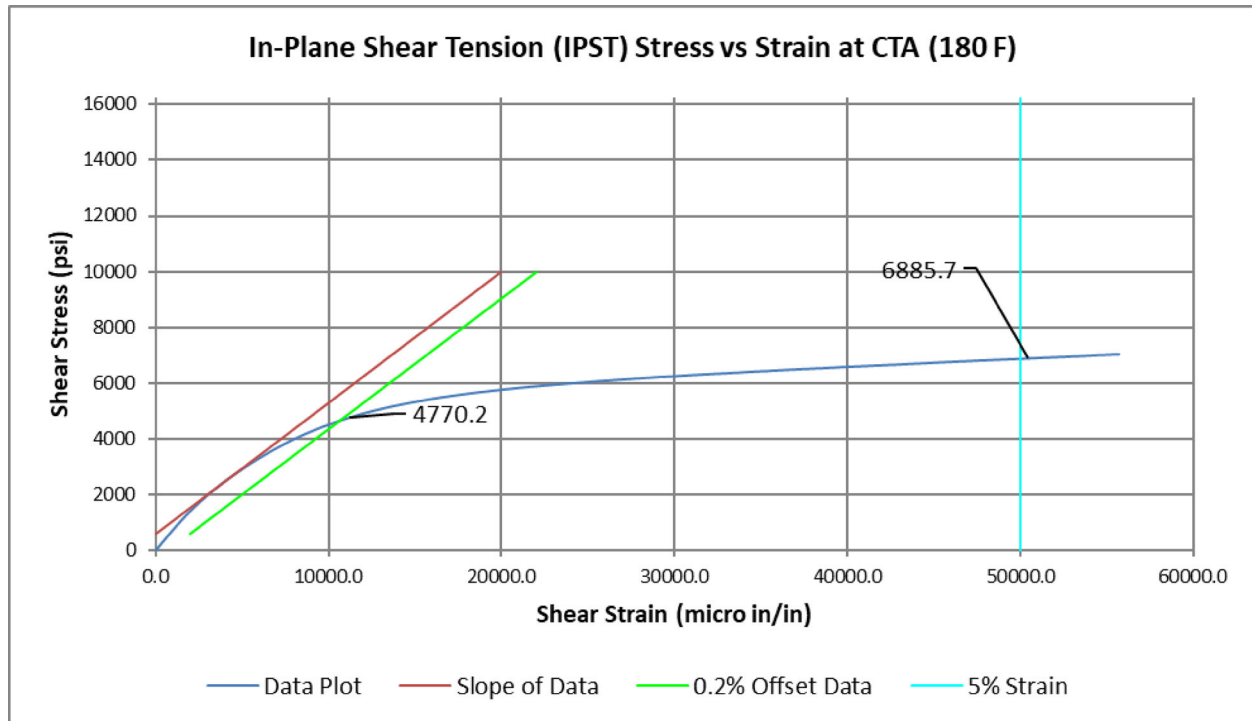
5.5 In Plane Shear V-Notch (IPSV) Properties – RTA, CTA and ETW





5.6 In-Plane Shear Tension (IPST) Properties – RTA, CTA and ETW





6. Fluid Sensitivity Comparison

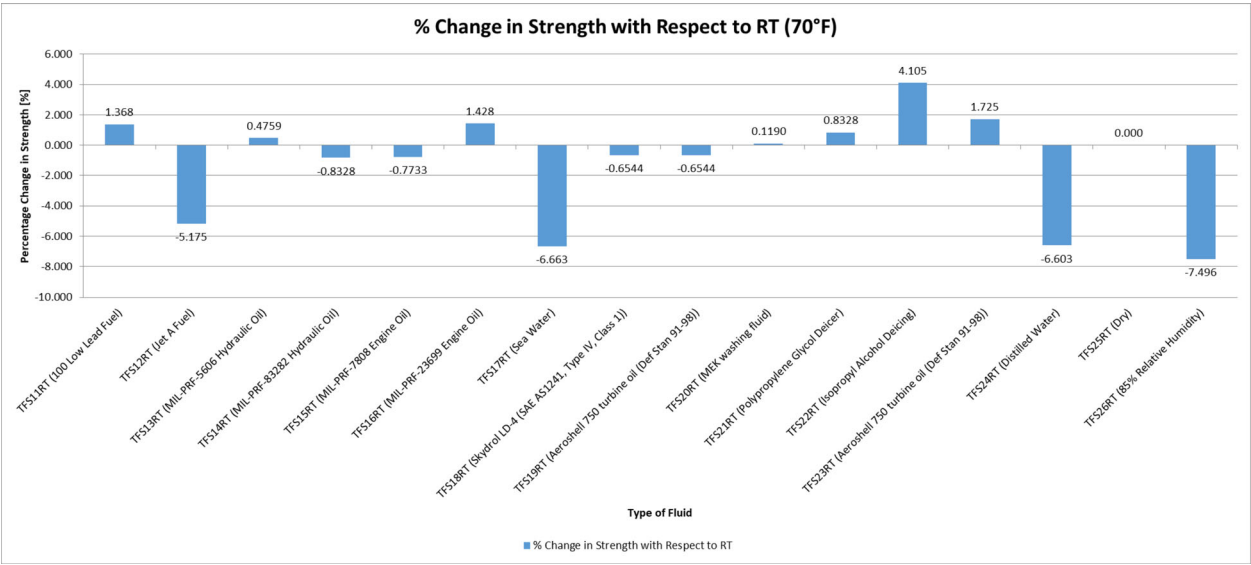
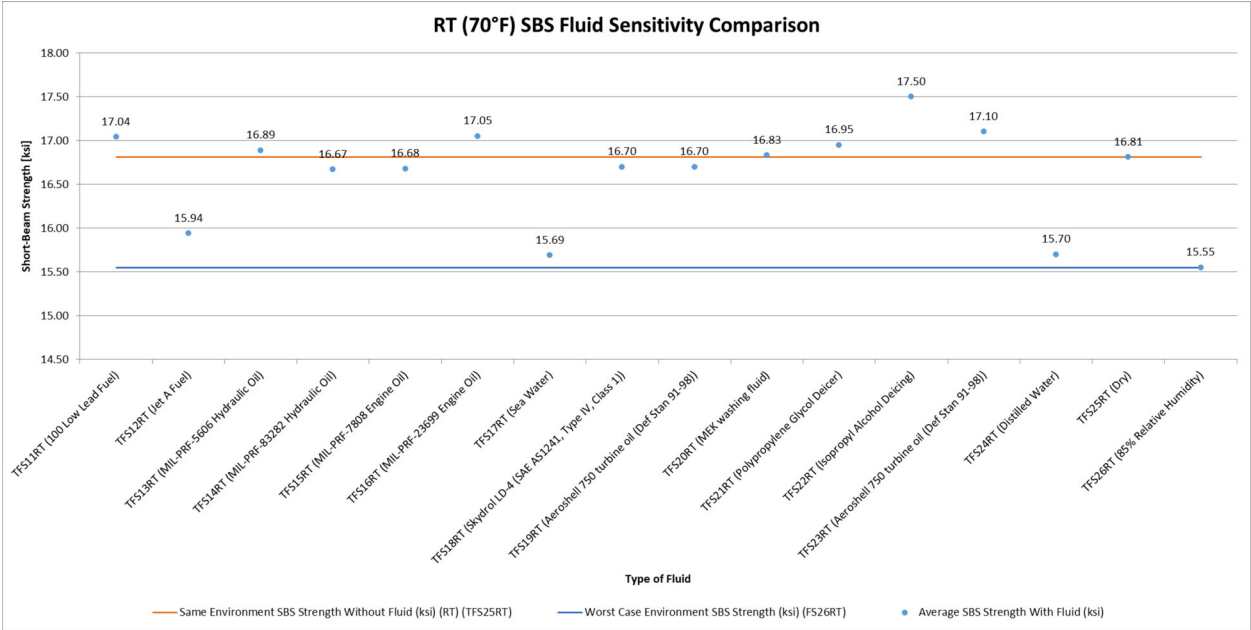
6.1 Room Temperature Test Data

Code	Type of Fluid	Exposure
FS11RT	100 Low Lead Fuel	90 days min @ 70°F ± 10F
FS12RT	Jet A Fuel	
FS13RT	MIL-PRF-5606 Hydraulic Oil	
FS14RT	MIL-PRF-83282 Hydraulic Oil	
FS15RT	MIL-PRF-7808 Engine Oil	
FS16RT	MIL-PRF-23699 Engine Oil	
FS17RT	Sea Water	
FS18RT	Skydrol LD-4 (SAE AS1241, Type IV, Class 1)	
FS19RT	Aeroshell 750 turbine oil (Def Stan 91-98)	
FS24RT	Distilled Water	
FS20RT	MEK washing fluid	90 mins @ 70°F ± 10F
FS21RT	Polypropylene Glycol Deicer	
FS22RT	Isopropyl Alcohol Deicing	
FS23RT	Aeroshell 750 turbine oil (Def Stan 91-98)	
FS25RT	Dry	Per section 6.1 Test Plan
FS26RT	85% Relative Humidity	

Fluid Sensitivity Screening
Short-Beam Strength Properties (SBSFS)--RT (70°F) Strength
 Hexcel M91/M8-GS UD Tape 145gsm with 35% RC

Fluid Code	Specimen Number	Batch #	Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Piles in Laminate	Avg. t_{ply} [in]	Failure Mode	Average Strength [ksi]
FS11RT	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS11RT-1	B	C1	2	1	17.07	0.1367	24	0.005777	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	17.04
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS11RT-2	B	C1	2	1	17.28	0.1389	24	0.005788	INTERLAMINAR SHEAR, INELASTIC DEFORMATION	
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS11RT-3	B	C1	2	1	16.71	0.1382	24	0.005758	INTERLAMINAR SHEAR, INELASTIC DEFORMATION	
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS11RT-4	B	C1	2	1	17.33	0.1379	24	0.005747	INTERLAMINAR SHEAR, INELASTIC DEFORMATION	
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS11RT-5	B	C1	2	1	16.80	0.1383	24	0.005763	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
FS12RT	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS12RT-1	B	C1	2	1	15.04	0.1365	24	0.005689	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	15.94
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS12RT-2	B	C1	2	1	16.23	0.1342	24	0.005593	INTERLAMINAR SHEAR, INELASTIC DEFORMATION	
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS12RT-3	B	C1	2	1	16.11	0.1352	24	0.005635	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS12RT-4	B	C1	2	1	15.35	0.1380	24	0.005751	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS12RT-5	B	C1	2	1	16.98	0.1386	24	0.005773	INTERLAMINAR SHEAR, INELASTIC DEFORMATION	
FS13RT	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS13RT-1	B	C1	2	1	17.51	0.1376	24	0.005733	INTERLAMINAR SHEAR, INELASTIC DEFORMATION	16.89
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS13RT-2	B	C1	2	1	17.72	0.1381	24	0.005753	INTERLAMINAR SHEAR, INELASTIC DEFORMATION	
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS13RT-3	B	C1	2	1	16.42	0.1380	24	0.005749	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS13RT-4	B	C1	2	1	15.85	0.1383	24	0.005762	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS13RT-5	B	C1	2	1	16.95	0.1382	24	0.005759	INTERLAMINAR SHEAR, INELASTIC DEFORMATION	
FS14RT	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS14RT-1	B	C1	2	1	16.74	0.1381	24	0.005756	INTERLAMINAR SHEAR, INELASTIC DEFORMATION	16.67
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS14RT-2	B	C1	2	1	16.68	0.1387	24	0.005779	INTERLAMINAR SHEAR, INELASTIC DEFORMATION	
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS14RT-3	B	C1	2	1	15.43	0.1387	24	0.005779	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS14RT-4	B	C1	2	1	16.97	0.1387	24	0.005781	INTERLAMINAR SHEAR, INELASTIC DEFORMATION	
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS14RT-5	B	C1	2	1	17.53	0.1362	24	0.005756	INTERLAMINAR SHEAR, INELASTIC DEFORMATION	
FS15RT	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS15RT-1	B	C1	2	1	16.21	0.1358	24	0.005658	INTERLAMINAR SHEAR, INELASTIC DEFORMATION	16.68
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS15RT-2	B	C1	2	1	17.21	0.1375	24	0.005731	INTERLAMINAR SHEAR, INELASTIC DEFORMATION	
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS15RT-3	B	C1	2	1	16.50	0.1362	24	0.005757	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS15RT-4	B	C1	2	1	16.50	0.1388	24	0.005785	INTERLAMINAR SHEAR, INELASTIC DEFORMATION	
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS15RT-5	B	C1	2	1	16.97	0.1387	24	0.005778	INTERLAMINAR SHEAR, INELASTIC DEFORMATION	
FS16RT	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS16RT-1	B	C1	2	1	15.93	0.1374	24	0.005726	INTERLAMINAR SHEAR, INELASTIC DEFORMATION	17.05
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS16RT-2	B	C1	2	1	17.36	0.1377	24	0.005737	INTERLAMINAR SHEAR, INELASTIC DEFORMATION	
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS16RT-3	B	C1	2	1	17.05	0.1375	24	0.005728	INTERLAMINAR SHEAR, INELASTIC DEFORMATION	
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS16RT-4	B	C1	2	1	17.61	0.1377	24	0.005731	INTERLAMINAR SHEAR, INELASTIC DEFORMATION	
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS16RT-5	B	C1	2	1	17.22	0.1376	24	0.005733	INTERLAMINAR SHEAR, INELASTIC DEFORMATION	
FS17RT	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS17RT-1	B	C1	2	1	15.68	0.1387	24	0.005779	INTERLAMINAR SHEAR, INELASTIC DEFORMATION	15.69
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS17RT-2	B	C1	2	1	16.11	0.1385	24	0.005772	INTERLAMINAR SHEAR, INELASTIC DEFORMATION	
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS17RT-3	B	C1	2	1	15.26	0.1386	24	0.005776	INTERLAMINAR SHEAR, INELASTIC DEFORMATION	
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS17RT-4	B	C1	2	1	16.27	0.1384	24	0.005766	INTERLAMINAR SHEAR, INELASTIC DEFORMATION	
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS17RT-5	B	C1	2	1	15.13	0.1379	24	0.005744	INTERLAMINAR SHEAR, INELASTIC DEFORMATION	
FS18RT	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS18RT-1	B	C1	2	1	15.43	0.1387	24	0.005781	INTERLAMINAR SHEAR, INELASTIC DEFORMATION	16.70
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS18RT-2	B	C1	2	1	17.21	0.1386	24	0.005776	INTERLAMINAR SHEAR, INELASTIC DEFORMATION	
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS18RT-3	B	C1	2	1	17.33	0.1381	24	0.005755	INTERLAMINAR SHEAR, INELASTIC DEFORMATION	
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS18RT-4	B	C1	2	1	16.55	0.1373	24	0.005720	INTERLAMINAR SHEAR, INELASTIC DEFORMATION	
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS18RT-5	B	C1	2	1	17.01	0.1358	24	0.005658	INTERLAMINAR SHEAR, INELASTIC DEFORMATION	
FS19RT	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS19RT-1	B	C1	2	1	16.26	0.1351	24	0.005628	INTERLAMINAR SHEAR, COMPRESSION	16.70
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS19RT-2	B	C1	2	1	16.94	0.1342	24	0.005592	INTERLAMINAR SHEAR, COMPRESSION	
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS19RT-3	B	C1	2	1	16.66	0.1350	24	0.005626	INTERLAMINAR SHEAR, COMPRESSION	
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS19RT-4	B	C1	2	1	16.46	0.1363	24	0.005678	INTERLAMINAR SHEAR, COMPRESSION	
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS19RT-5	B	C1	2	1	16.98	0.1357	24	0.005652	INTERLAMINAR SHEAR, COMPRESSION	
FS20RT	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS20RT-1	B	C1	2	1	17.44	0.1349	24	0.005622	INTERLAMINAR SHEAR, INELASTIC DEFORMATION	16.83
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS20RT-2	B	C1	2	1	17.51	0.1350	24	0.005623	INTERLAMINAR SHEAR, INELASTIC DEFORMATION	
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS20RT-3	B	C1	2	1	15.47	0.1351	24	0.005627	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS20RT-4	B	C1	2	1	16.17	0.1353	24	0.005637	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS20RT-5	B	C1	2	1	17.58	0.1357	24	0.005653	INTERLAMINAR SHEAR, INELASTIC DEFORMATION	
FS21RT	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS21RT-1	B	C1	2	1	17.15	0.1390	24	0.005792	INTERLAMINAR SHEAR, INELASTIC DEFORMATION	16.95
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS21RT-2	B	C1	2	1	16.79	0.1395	24	0.005814	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS21RT-3	B	C1	2	1	17.21	0.1387	24	0.005780	INTERLAMINAR SHEAR, INELASTIC DEFORMATION	
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS21RT-4	B	C1	2	1	17.16	0.1383	24	0.005760	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS21RT-5	B	C1	2	1	16.45	0.1379	24	0.005744	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
FS22RT	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS22RT-1	B	C1	2	1	17.53	0.1388	24	0.005783	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	17.50
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS22RT-2	B	C1	2	1	17.70	0.1385	24	0.005772	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS22RT-3	B	C1	2	1	17.48	0.1382	24	0.005759	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS22RT-4	B	C1	2	1	17.26	0.1368	24	0.005699	INTERLAMINAR SHEAR, INELASTIC DEFORMATION	
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS22RT-5	B	C1	2	1	17.56	0.1359	24	0.005662	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
FS23RT	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS23RT-1	B	C1	2	1	17.34	0.1382	24	0.005758	INTERLAMINAR SHEAR, COMPRESSION	17.10
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS23RT-2	B	C1	2	1	17.08	0.1334	24	0.005556	INTERLAMINAR SHEAR, COMPRESSION	
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS23RT-3	B	C1	2	1	17.07	0.1385	24	0.005770	INTERLAMINAR SHEAR, COMPRESSION	
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS23RT-4	B	C1	2	1	16.80	0.1353	24	0.005638	INTERLAMINAR SHEAR, COMPRESSION	
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS23RT-5	B	C1	2	1	17.22	0.1390	24	0.005792	INTERLAMINAR SHEAR, COMPRESSION	
FS24RT	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS24RT-1	B	C1	2	1	15.37	0.1371	24	0.005711	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	15.70
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS24RT-2	B	C1	2	1	16.25	0.1380	24	0.005748	INTERLAMINAR SHEAR, INELASTIC DEFORMATION	
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS24RT-3	B	C1	2	1	15.97	0.1382	24	0.005756	INTERLAMINAR SHEAR, INELASTIC DEFORMATION	
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS24RT-4	B	C1	2	1	15.78	0.1382	24	0.005757	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS24RT-5	B	C1	2	1	15.11	0.1376	24	0.005735	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
FS25RT	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS25RT-1	B	C1	2	1	15.82	0.1375	24	0.005728	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	16.81
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS25RT-2	B	C1	2	1	17.05	0.1392	24	0.005801	INTERLAMINAR SHEAR, INELASTIC DEFORMATION	
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS25RT-3	B	C1	2	1	17.04	0.1390	24	0.005792	INTERLAMINAR SHEAR, INELASTIC DEFORMATION	
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS25RT-4	B	C1	2	1	16.71	0.1389	24	0.005785	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS25RT-5	B	C1	2	1	17.42	0.1379	24	0.005747	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
FS26RT	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS26RT-1	B	C1	2	1	15.23	0.1376	24	0.005733	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	15.55
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS26RT-2	B	C1	2	1	15.49	0.1386	24	0.005775	INTERLAMINAR SHEAR, INELASTIC DEFORMATION	
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS26RT-3	B	C1	2	1	15.58	0.1383	24	0.005780	INTERLAMINAR SHEAR, INELASTIC DEFORMATION	
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS26RT-4	B	C1	2	1	15.62	0.1385	24	0.005770	INTERLAMINAR SHEAR, INELASTIC DEFORMATION	
	NTPM10Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS26RT-5	B	C1	2	1	15.84	0.1383	24	0.005763	INTERLAMINAR SHEAR, INELASTIC DEFORMATION	

Number of Spec. 80



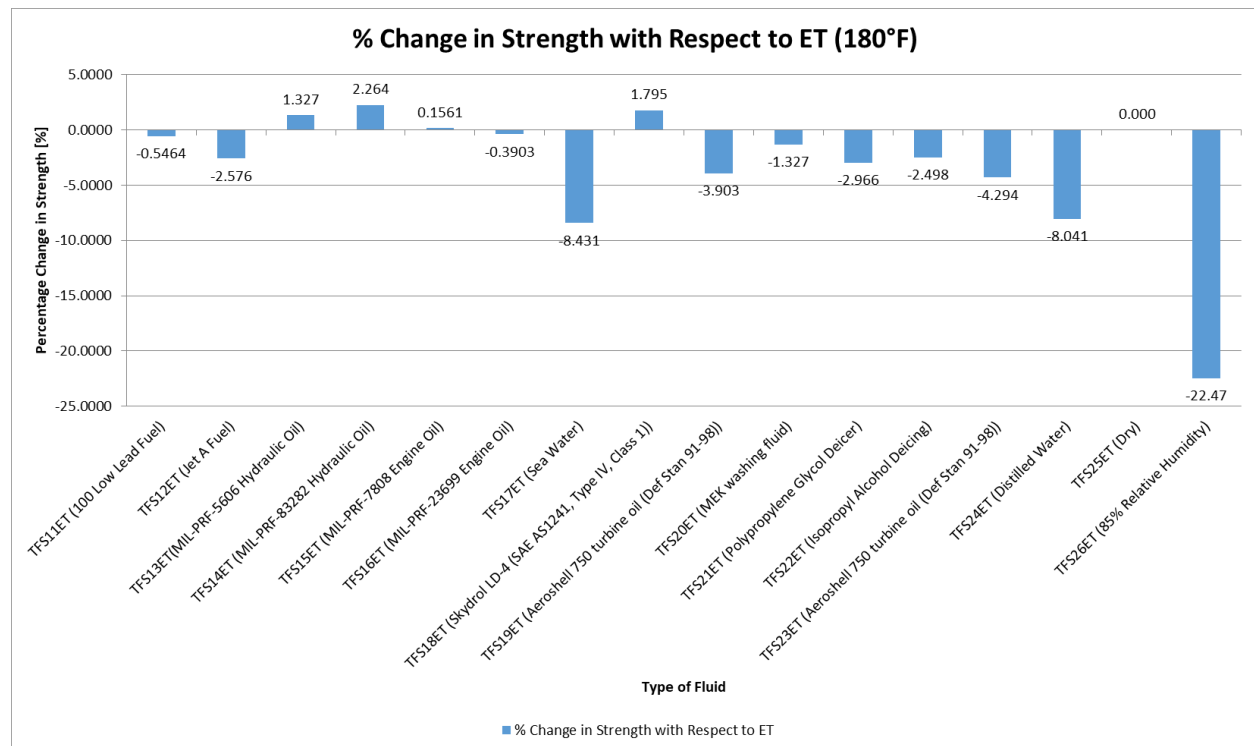
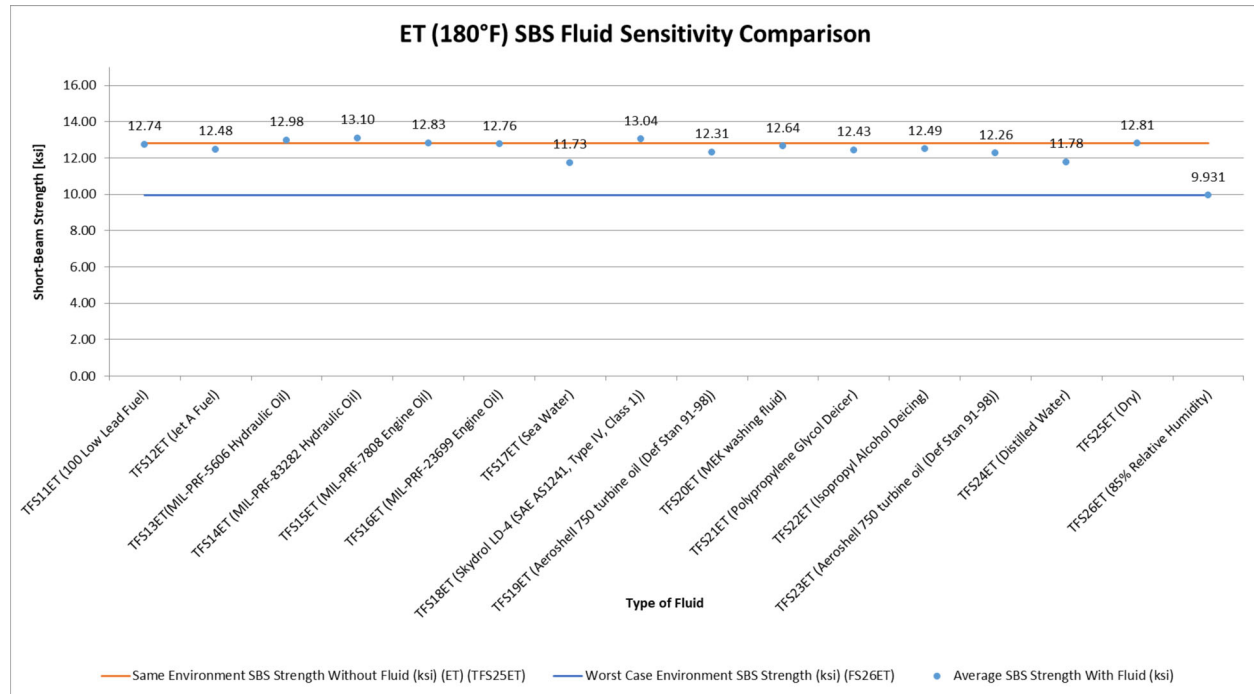
6.2 Elevated Temperature Test Data

Code	Type of Fluid	Exposure
FS11ET	100 Low Lead Fuel	90 days min @ 70°F ± 10F
FS12ET	Jet A Fuel	
FS13ET	MIL-PRF-5606 Hydraulic Oil	
FS14ET	MIL-PRF-83282 Hydraulic Oil	
FS15ET	MIL-PRF-7808 Engine Oil	
FS16ET	MIL-PRF-23699 Engine Oil	
FS17ET	Sea Water	
FS18ET	Skydrol LD-4 (SAE AS1241, Type IV, Class 1)	
FS19ET	Aeroshell 750 turbine oil (Def Stan 91-98)	
FS24ET	Distilled Water	
FS20ET	MEK washing fluid	90 mins @ 70°F ± 10F
FS21ET	Polypropylene Glycol Deicer	
FS22ET	Isopropyl Alcohol Deicing	
FS23ET	Aeroshell 750 turbine oil (Def Stan 91-98)	
FS25ET	Dry	Per section 6.1 Test Plan
FS26ET	85% Relative Humidity	

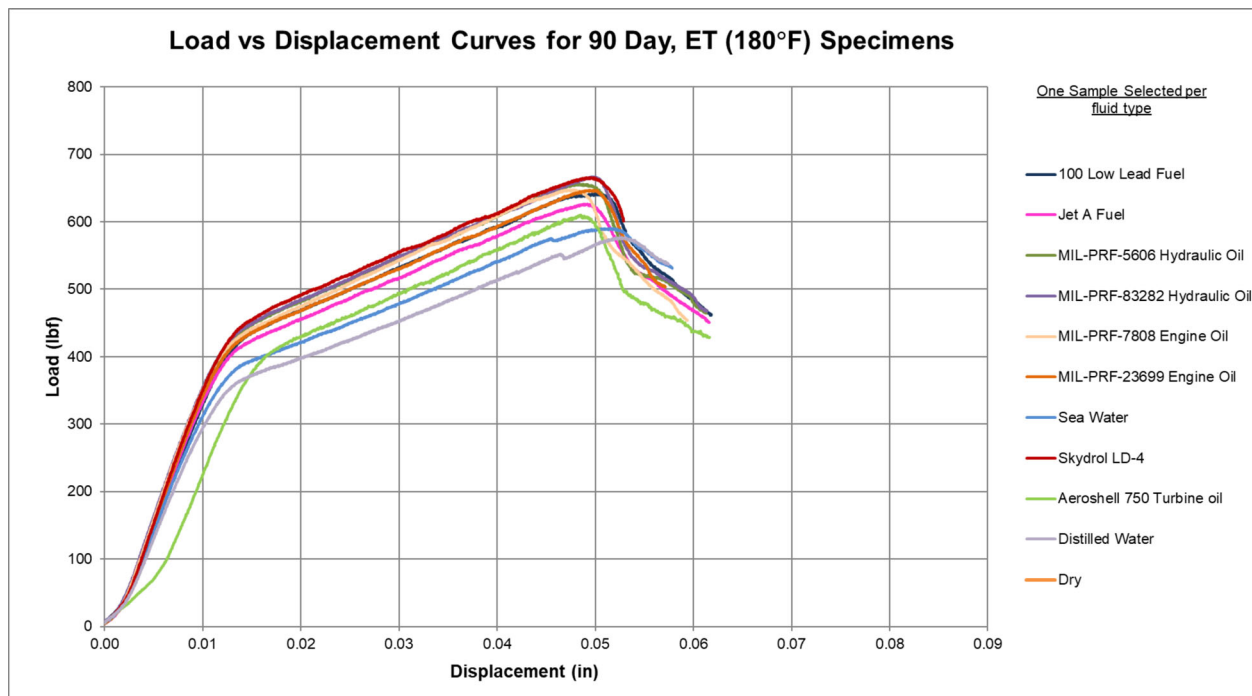
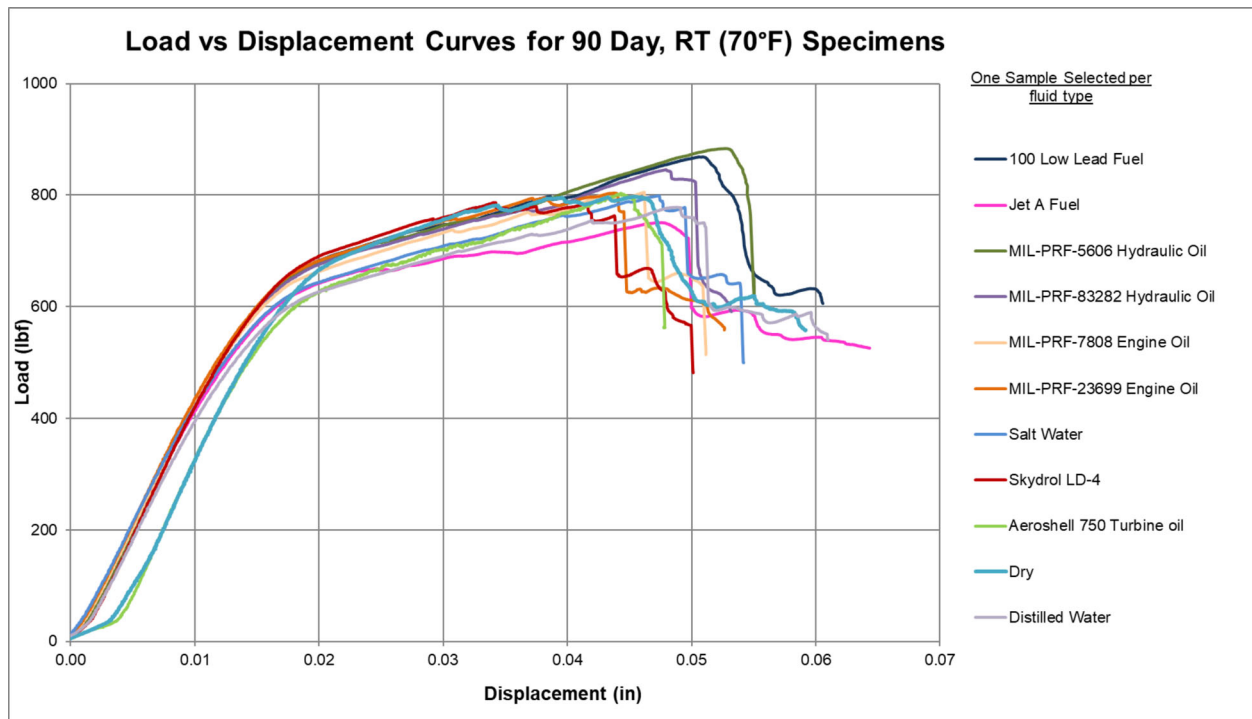
Fluid Sensitivity Screening
Short-Beam Strength Properties (SBSFS)--ET (180°F) Strength
 Hexcel M91/IM8-GS UD Tape 145gsm with 35% RC

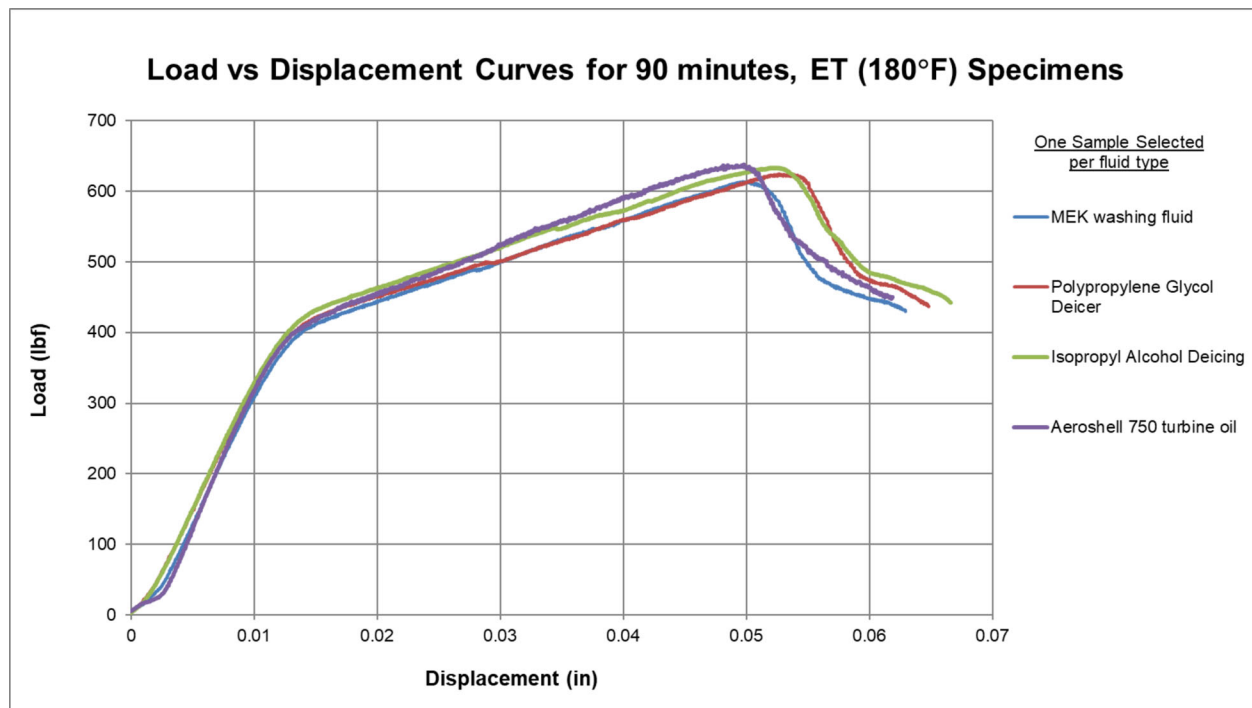
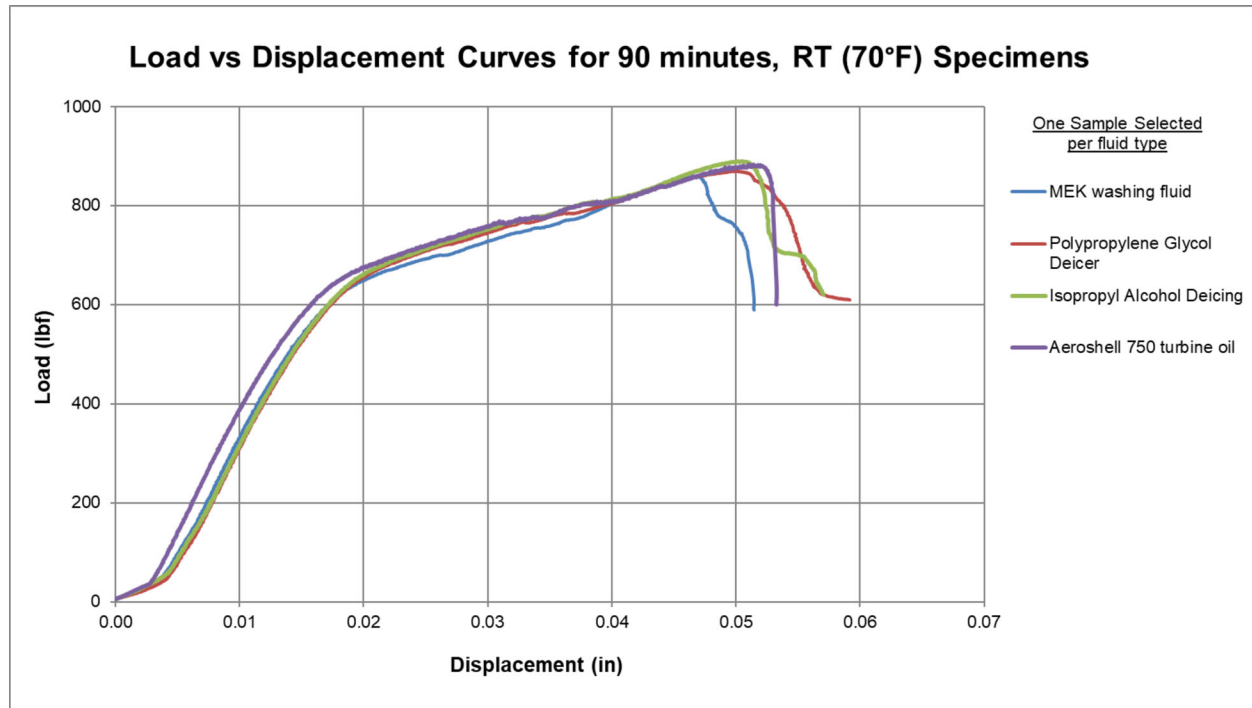
Fluid Code	Specimen Number	Batch #	Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{90} [in]	Failure Mode	Average Strength [ksi]
FS11ET	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS11ET-1	B	C1	2	1	12.63	0.1389	24	0.005788	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	12.74
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS11ET-2	B	C1	2	1	12.71	0.1388	24	0.005784	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS11ET-3	B	C1	2	1	12.80	0.1389	24	0.005787	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS11ET-4	B	C1	2	1	12.82	0.1391	24	0.005795	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS11ET-5	B	C1	2	1	12.73	0.1383	24	0.005764	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
FS12ET	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS12ET-1	B	C1	2	1	12.29	0.1393	24	0.005804	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	12.48
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS12ET-2	B	C1	2	1	12.52	0.1386	24	0.005774	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS12ET-3	B	C1	2	1	12.41	0.1385	24	0.005770	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS12ET-4	B	C1	2	1	12.65	0.1378	24	0.005742	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS12ET-5	B	C1	2	1	12.55	0.1378	24	0.005740	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
FS13ET	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS13ET-1	B	C1	2	1	12.97	0.1383	24	0.005763	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	12.98
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS13ET-2	B	C1	2	1	12.97	0.1381	24	0.005754	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS13ET-3	B	C1	2	1	12.91	0.1373	24	0.005722	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS13ET-4	B	C1	2	1	12.92	0.1354	24	0.005640	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS13ET-5	B	C1	2	1	13.15	0.1335	24	0.005563	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
FS14ET	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS14ET-1	B	C1	2	1	13.29	0.1370	24	0.005709	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	13.10
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS14ET-2	B	C1	2	1	12.82	0.1371	24	0.005711	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS14ET-3	B	C1	2	1	13.20	0.1372	24	0.005718	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS14ET-4	B	C1	2	1	13.10	0.1376	24	0.005733	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS14ET-5	B	C1	2	1	13.10	0.1380	24	0.005749	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
FS15ET	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS15ET-1	B	C1	2	1	12.78	0.1377	24	0.005738	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	12.83
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS15ET-2	B	C1	2	1	12.86	0.1375	24	0.005730	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS15ET-3	B	C1	2	1	12.74	0.1373	24	0.005722	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS15ET-4	B	C1	2	1	12.66	0.1371	24	0.005710	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS15ET-5	B	C1	2	1	12.75	0.1372	24	0.005715	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
FS16ET	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS16ET-1	B	C1	2	1	12.83	0.1389	24	0.005703	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	12.76
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS16ET-2	B	C1	2	1	12.74	0.1356	24	0.005649	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS16ET-3	B	C1	2	1	12.94	0.1335	24	0.005563	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS16ET-4	B	C1	2	1	12.67	0.1357	24	0.005654	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS16ET-5	B	C1	2	1	12.62	0.1372	24	0.005717	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
FS17ET	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS17ET-1	B	C1	2	1	11.64	0.1379	24	0.005747	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	11.73
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS17ET-2	B	C1	2	1	11.93	0.1379	24	0.005746	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS17ET-3	B	C1	2	1	11.75	0.1383	24	0.005778	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS17ET-4	B	C1	2	1	11.63	0.1382	24	0.005760	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS17ET-5	B	C1	2	1	11.70	0.1383	24	0.005781	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
FS18ET	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS18ET-1	B	C1	2	1	13.04	0.1389	24	0.005786	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	13.04
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS18ET-2	B	C1	2	1	12.94	0.1383	24	0.005762	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS18ET-3	B	C1	2	1	12.88	0.1389	24	0.005788	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS18ET-4	B	C1	2	1	13.11	0.1388	24	0.005763	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS18ET-5	B	C1	2	1	13.14	0.1380	24	0.005780	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
FS19ET	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS19ET-1	B	C1	2	1	12.35	0.1349	24	0.005619	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	12.31
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS19ET-2	B	C1	2	1	12.37	0.1346	24	0.005607	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS19ET-3	B	C1	2	1	12.31	0.1346	24	0.005609	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS19ET-4	B	C1	2	1	12.23	0.1345	24	0.005604	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS19ET-5	B	C1	2	1	12.28	0.1342	24	0.005591	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
FS20ET	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS20ET-1	B	C1	2	1	12.63	0.1328	24	0.005533	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	12.64
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS20ET-2	B	C1	2	1	12.64	0.1336	24	0.005568	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS20ET-3	B	C1	2	1	12.70	0.1356	24	0.005567	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS20ET-4	B	C1	2	1	12.82	0.1374	24	0.005724	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS20ET-5	B	C1	2	1	12.39	0.1359	24	0.005681	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
FS21ET	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS21ET-1	B	C1	2	1	12.33	0.1383	24	0.005763	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	12.43
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS21ET-2	B	C1	2	1	12.41	0.1384	24	0.005766	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS21ET-3	B	C1	2	1	12.47	0.1384	24	0.005767	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS21ET-4	B	C1	2	1	12.53	0.1384	24	0.005765	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS21ET-5	B	C1	2	1	12.41	0.1384	24	0.005765	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
FS22ET	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS22ET-1	B	C1	2	1	12.45	0.1389	24	0.005786	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	12.49
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS22ET-2	B	C1	2	1	12.54	0.1392	24	0.005801	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS22ET-3	B	C1	2	1	12.61	0.1393	24	0.005805	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS22ET-4	B	C1	2	1	12.35	0.1395	24	0.005811	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS22ET-5	B	C1	2	1	12.52	0.1388	24	0.005783	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
FS23ET	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS23ET-1	B	C1	2	1	12.59	0.1383	24	0.005762	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	12.26
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS23ET-2	B	C1	2	1	12.47	0.1354	24	0.005643	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS23ET-3	B	C1	2	1	12.31	0.1378	24	0.005741	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS23ET-4	B	C1	2	1	11.95	0.1373	24	0.005721	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS23ET-5	B	C1	2	1	11.97	0.1376	24	0.005734	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
FS24ET	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS24ET-1	B	C1	2	1	11.83	0.1330	24	0.005542	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	11.78
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS24ET-2	B	C1	2	1	11.81	0.1327	24	0.005530	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS24ET-3	B	C1	2	1	11.70	0.1384	24	0.005768	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS24ET-4	B	C1	2	1	11.82	0.1382	24	0.005758	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS24ET-5	B	C1	2	1	11.72	0.1375	24	0.005731	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
FS25ET	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS25ET-1	B	C1	2	1	13.06	0.1375	24	0.005729	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	12.81
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS25ET-2	B	C1	2	1	13.00	0.1384	24	0.005768	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS25ET-3	B	C1	2	1	12.83	0.1367	24	0.005694	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS25ET-4	B	C1	2	1	12.55	0.1369	24	0.005703	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS25ET-5	B	C1	2	1	12.60	0.1372	24	0.005718	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
FS26ET	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS26ET-1	B	C1	2	1	10.04	0.1369	24	0.005704	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	9.931
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS26ET-2	B	C1	2	1	9.927	0.1392	24	0.005801	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS26ET-3	B	C1	2	1	9.847	0.1393	24	0.005806	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS26ET-4	B	C1	2	1	9.909	0.1381	24	0.005756	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	
	NTPM910Q1-HXL-H35-NIAR-SBSFS-B-C1-1-FS26ET-5	B	C1	2	1	9.932	0.1391	24	0.005796	INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION	

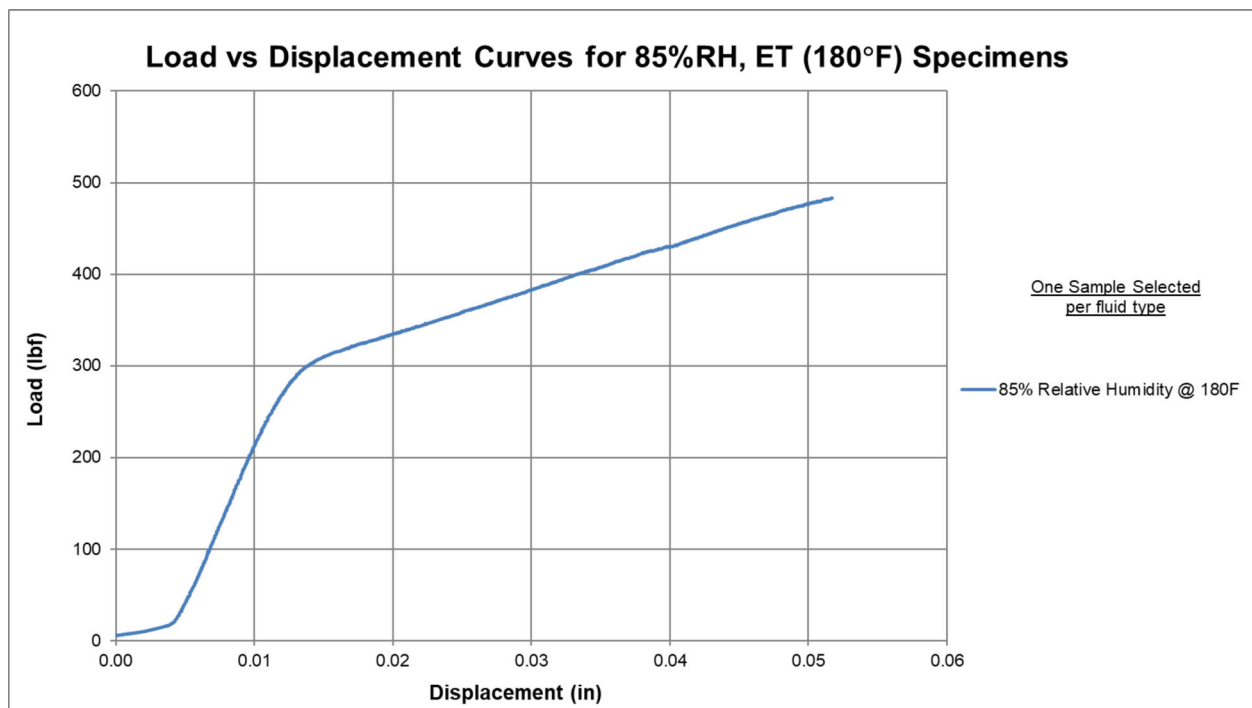
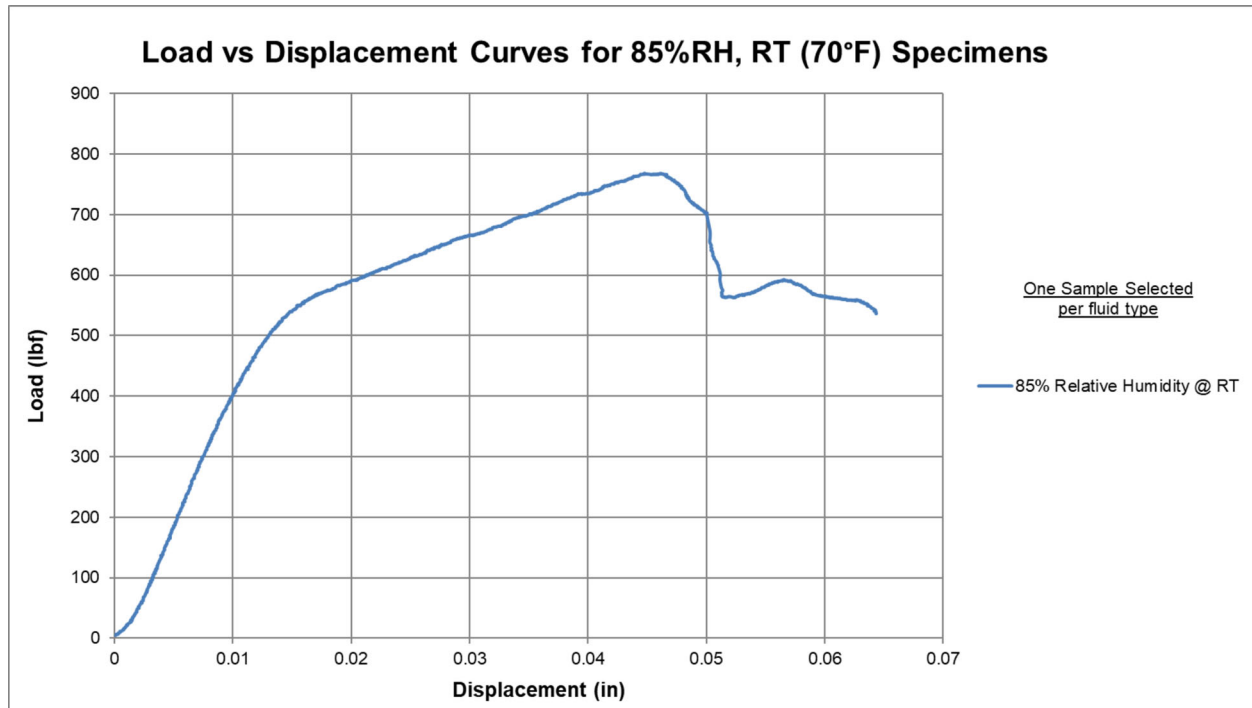
Number of Spec. 80



6.3 Load Displacement Curves

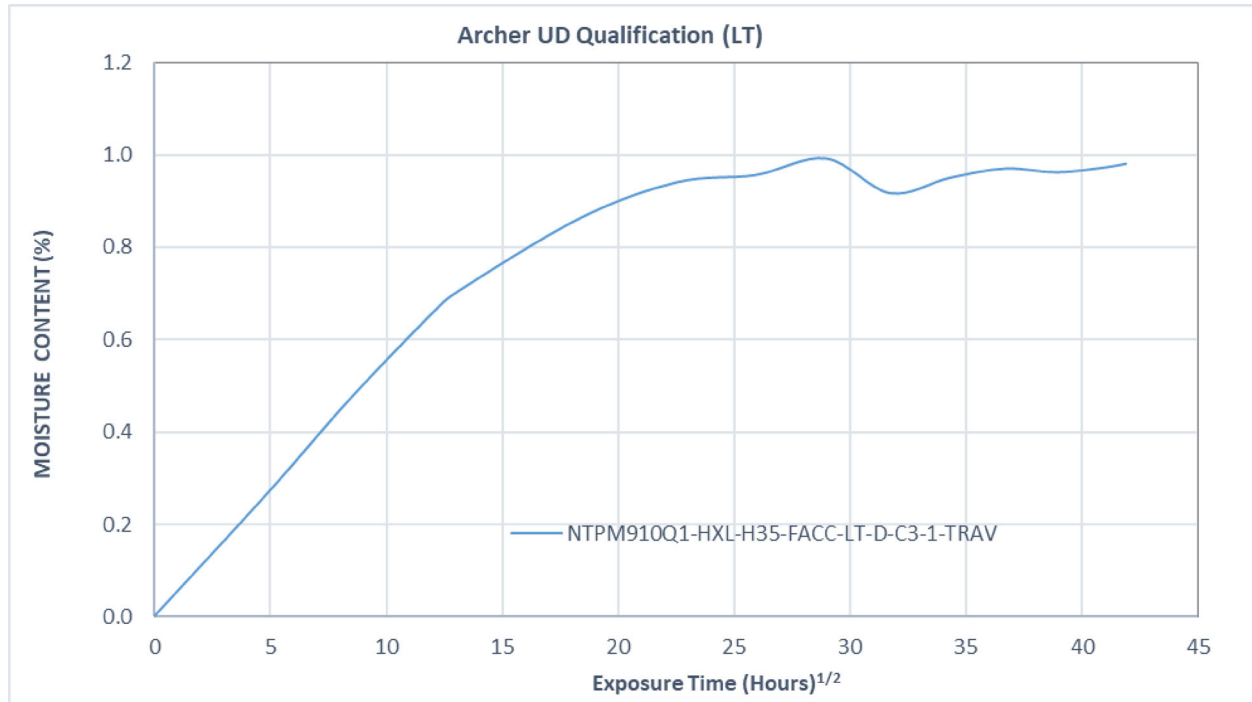




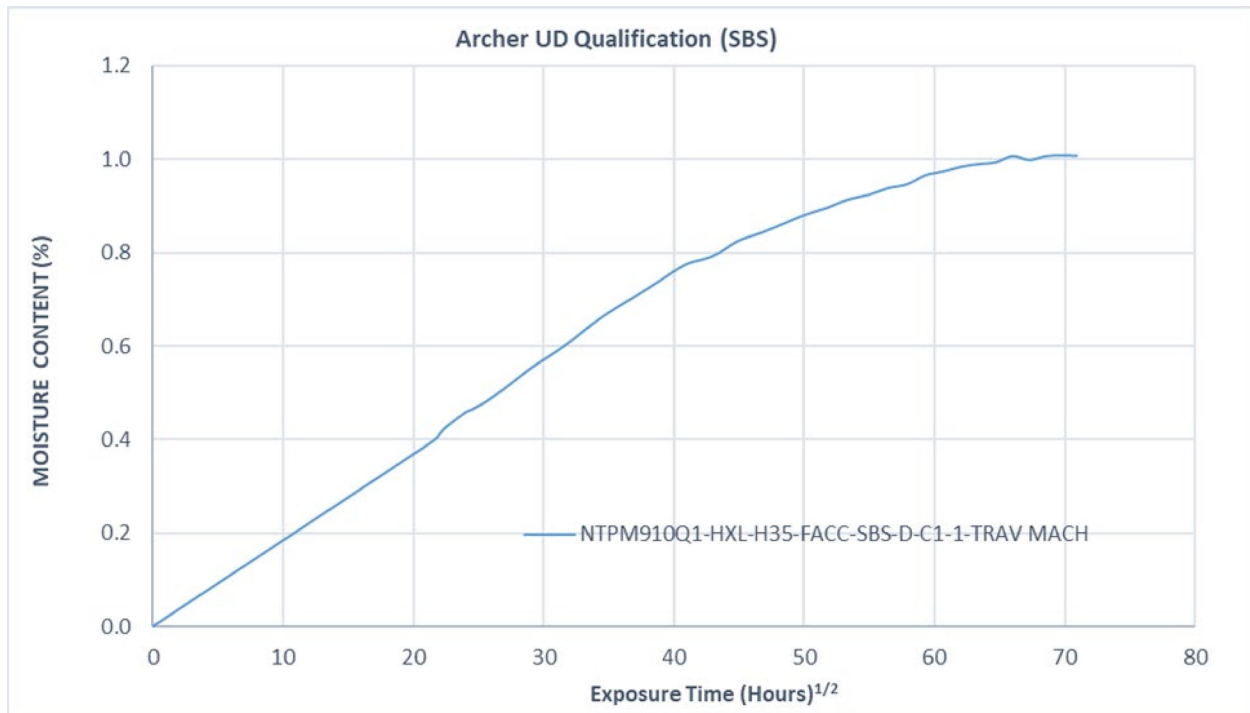


7. Moisture Conditioning Charts

7.1 Longitudinal Tension (LT) – Thinnest Panel



7.2 Short Beam Shear (SBS) - Thickest Panel



8. DMA Results

8.1 DMA Dry

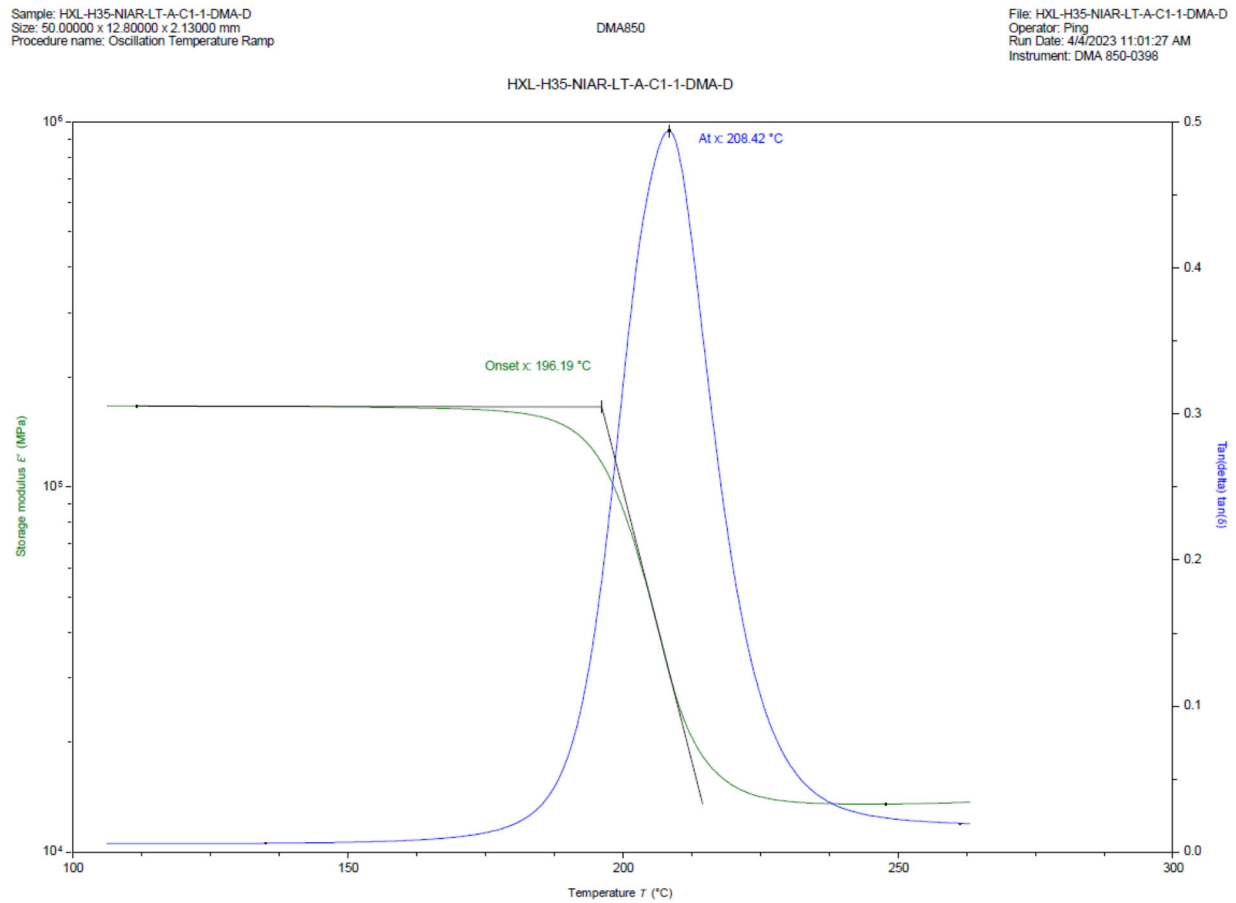
DMA Results Summary				
Hexcel M91/IM8-GS UD Tape Qualification DMA Dry				
Sample ID	Onset Storage Modulus		Peak of Tangent Delta	
	T _g [°C]	T _g [°F]	T _g [°C]	T _g [°F]
HXL-H35-NIAR-LT-A-C1-1-DMA-D	196.2	385.1	208.4	407.2
HXL-H35-NIAR-LT-A-C2-1-DMA-D	196.3	385.4	208.6	407.4
HXL-H35-NIAR-LT-B-C1-1-DMA-D	196.1	385.0	208.5	407.3
HXL-H35-NIAR-LT-B-C2-1-DMA-D	196.1	385.0	208.5	407.4
HXL-H35-NIAR-LT-C-C1-1-DMA-D	193.7	380.7	205.3	401.5
HXL-H35-NIAR-LT-C-C2-1-DMA-D	195.1	383.1	207.2	404.9
HXL-H35-NIAR-TC-A-C1-1-DMA-D	196.8	386.3	208.6	407.5
HXL-H35-NIAR-TC-A-C2-1-DMA-D	196.6	386.0	208.6	407.5
HXL-H35-NIAR-TC-B-C1-1-DMA-D	196.1	385.0	208.3	407.0
HXL-H35-NIAR-TC-B-C2-1-DMA-D	196.6	385.9	208.7	407.7
HXL-H35-NIAR-TC-C-C1-1-DMA-D	195.1	383.2	206.6	403.8
HXL-H35-NIAR-TC-C-C2-1-DMA-D	195.2	383.4	207.0	404.7
HXL-H35-NIAR-UNC0-A-C2-1-DMA-D	197.2	387.0	209.0	408.2
HXL-H35-NIAR-UNC0-A-C3-1-DMA-D	196.9	386.5	208.9	408.0
HXL-H35-NIAR-UNC0-B-C1-1-DMA-D	196.6	386.0	208.5	407.4
HXL-H35-NIAR-UNC0-B-C2-1-DMA-D	197.0	386.7	208.9	408.0
HXL-H35-NIAR-UNC0-C-C1-1-DMA-D	196.3	385.3	208.2	406.8
HXL-H35-NIAR-UNC0-C-C2-1-DMA-D	196.1	385.0	208.0	406.3
HXL-H35-FACC-LT-D-C1-1-DMA-D	188.1	370.5	200.7	393.2
HXL-H35-FACC-LT-D-C2-1-DMA-D	187.9	370.2	200.8	393.4
HXL-H35-FACC-UNC0-D-C1-1-DMA-D	186.9	368.5	200.6	393.0
HXL-H35-FACC-UNC0-D-C2-1-DMA-D	188.4	371.1	201.9	395.5
HXL-H35-SKS-LT-E-C1-1-DMA-D	186.4	367.6	198.7	389.6
HXL-H35-SKS-LT-E-C2-1-DMA-D	188.1	370.5	199.8	391.6
HXL-H35-SKS-UNC0-E-C1-1-DMA-D	188.6	371.5	201.8	395.2
HXL-H35-SKS-UNC0-E-C2-1-DMA-D	188.1	370.5	201.1	394.0
Average	193.6	380.4	205.8	402.5
Standard Deviation	4.002	7.204	3.630	6.536

8.2 DMA Wet

DMA Results Summary				
Hexcel M91/IM8-GS UD Tape Qualification DMA Wet				
Sample ID	Onset Storage Modulus		Peak of Tangent Delta	
	T _g [°C]	T _g [°F]	T _g [°C]	T _g [°F]
HXL-H35-NIAR-LT-A-C1-1-DMA-W	145.0	293.0	156.5	313.8
HXL-H35-NIAR-LT-A-C2-1-DMA-W	144.3	291.8	156.8	314.2
HXL-H35-NIAR-LT-B-C1-1-DMA-W	145.0	293.0	157.2	314.9
HXL-H35-NIAR-LT-B-C2-1-DMA-W	145.6	294.0	157.6	315.7
HXL-H35-NIAR-LT-C-C1-1-DMA-W	142.1	287.9	154.5	310.2
HXL-H35-NIAR-LT-C-C2-1-DMA-W	142.8	289.0	154.8	310.6
HXL-H35-NIAR-TC-A-C1-1-DMA-W	144.3	291.7	156.4	313.6
HXL-H35-NIAR-TC-A-C2-1-DMA-W	145.3	293.5	157.2	314.9
HXL-H35-NIAR-TC-B-C1-1-DMA-W	145.4	293.8	157.7	315.9
HXL-H35-NIAR-TC-B-C2-1-DMA-W	146.3	295.4	158.4	317.1
HXL-H35-NIAR-TC-C-C1-1-DMA-W	143.2	289.7	155.1	311.2
HXL-H35-NIAR-TC-C-C2-1-DMA-W	143.2	289.7	155.0	311.0
HXL-H35-NIAR-UNC0-A-C2-1-DMA-W	144.7	292.5	157.5	315.4
HXL-H35-NIAR-UNC0-A-C3-1-DMA-W	144.6	292.3	157.7	315.8
HXL-H35-NIAR-UNC0-B-C1-1-DMA-W	145.2	293.3	158.5	317.4
HXL-H35-NIAR-UNC0-B-C2-1-DMA-W	145.3	293.6	158.1	316.6
HXL-H35-NIAR-UNC0-C-C1-1-DMA-W	142.7	288.8	155.6	312.0
HXL-H35-NIAR-UNC0-C-C2-1-DMA-W	142.9	289.2	156.0	312.8
HXL-H35-FACC-LT-D-C1-1-DMA-W	144.5	292.0	156.0	312.7
HXL-H35-FACC-LT-D-C2-1-DMA-W	145.0	293.0	156.8	314.2
HXL-H35-FACC-UNC0-D-C1-1-DMA-W	145.0	292.9	157.3	315.2
HXL-H35-FACC-UNC0-D-C2-1-DMA-W	144.0	291.2	156.8	314.3
HXL-H35-SKS-LT-E-C1-1-DMA-W	145.1	293.2	156.9	314.4
HXL-H35-SKS-LT-E-C2-1-DMA-W	145.0	293.0	156.8	314.3
HXL-H35-SKS-UNC0-E-C1-1-DMA-W	144.0	291.2	156.6	313.9
HXL-H35-SKS-UNC0-E-C2-1-DMA-W	144.5	292.0	156.8	314.2
Average	144.4	291.9	156.7	314.1
Standard Deviation	1.039	1.872	1.072	1.930

8.3 DMA Dry Batch A, B, C, D and E

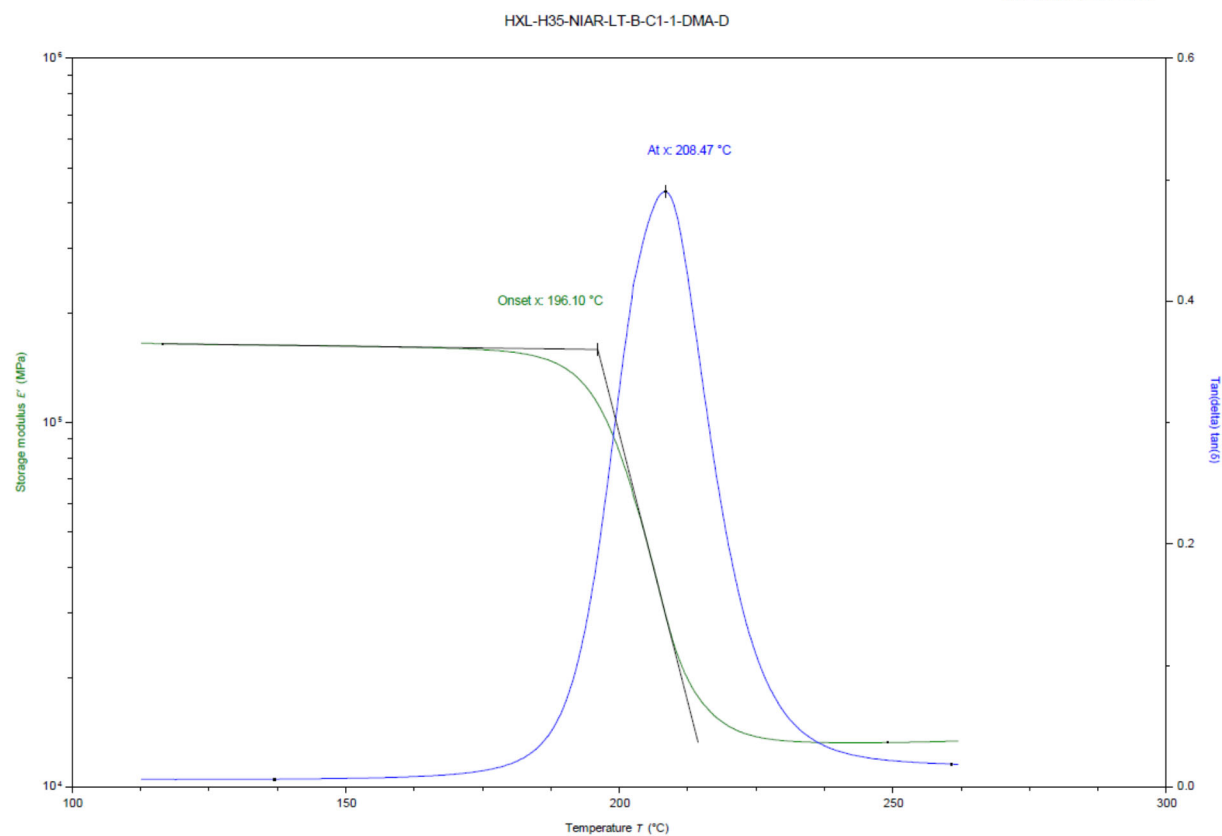
A representative of DMA Dry profile is provided below.



Sample: HXL-H35-NIAR-LT-B-C1-1-DMA-D
Size: 50.00000 x 12.79000 x 2.18000 mm
Procedure name: Oscillation Temperature Ramp

DMA850

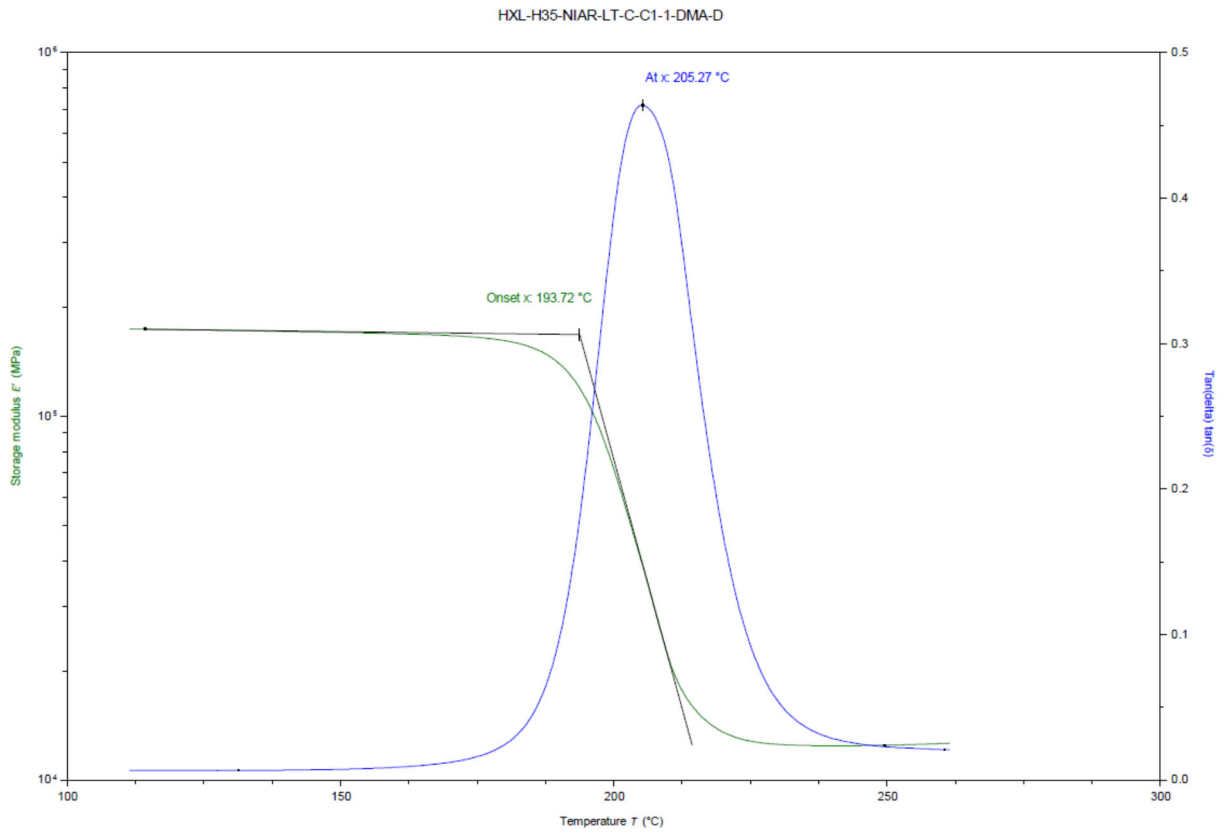
File: HXL-H35-NIAR-LT-B-C1-1-DMA-D
Operator: Ping
Run Date: 4/11/2023 9:23:25 AM
Instrument: DMA 850-0398



Sample: HXL-H35-NIAR-LT-C-C1-1-DMA-D
Size: 50.00000 x 12.79000 x 2.21000 mm
Procedure name: Oscillation Temperature Ramp

DMA850

File: HXL-H35-NIAR-LT-C-C1-1-DMA-D
Operator: Ping
Run Date: 4/11/2023 10:57:11 AM
Instrument: DMA 850-0398

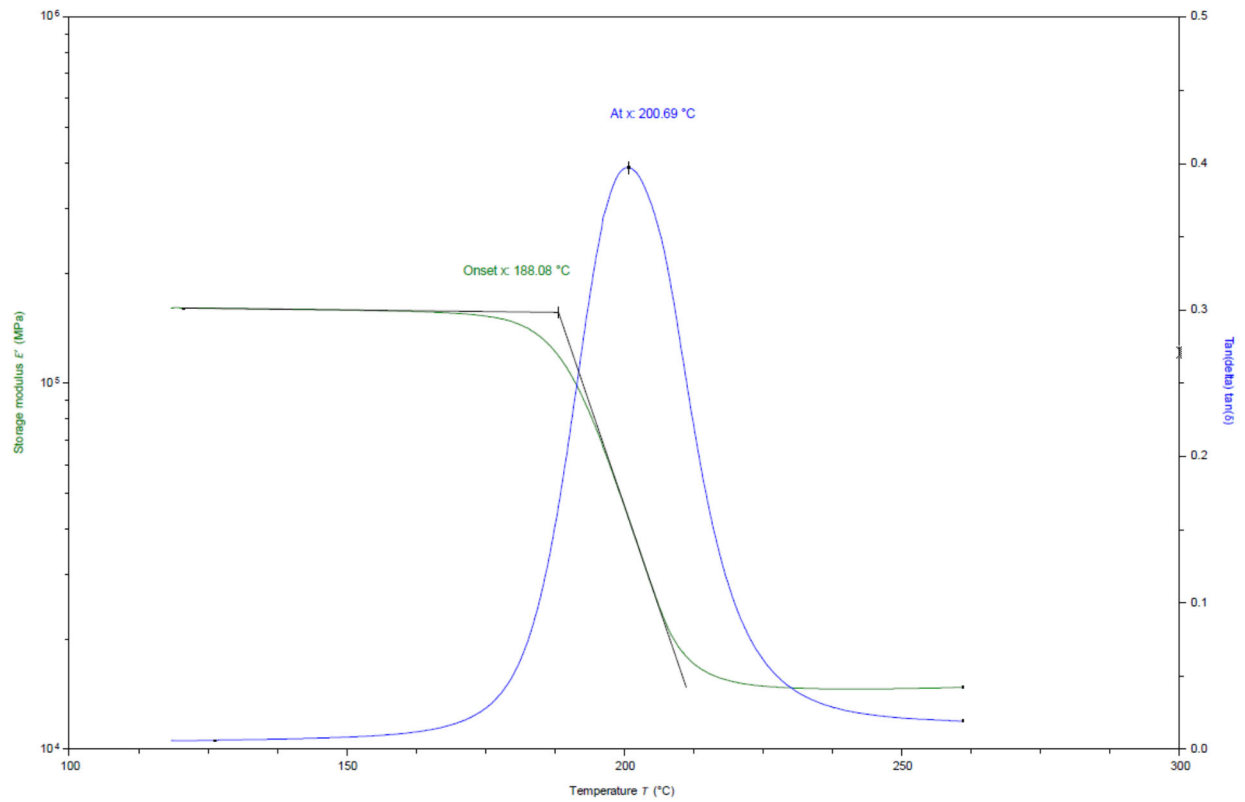


Sample: HXL-H35-FACC-LT-D-C1-1-DMA-D
Size: 50.00000 x 12.77000 x 2.15000 mm
Procedure name: Oscillation Temperature Ramp

DMA850

File: HXL-H35-FACC-LT-D-C1-1-DMA-D
Operator: Ping
Run Date: 8/3/2023 2:54:37 PM
Instrument: DMA 850-0398

HXL-H35-FACC-LT-D-C1-1-DMA-D

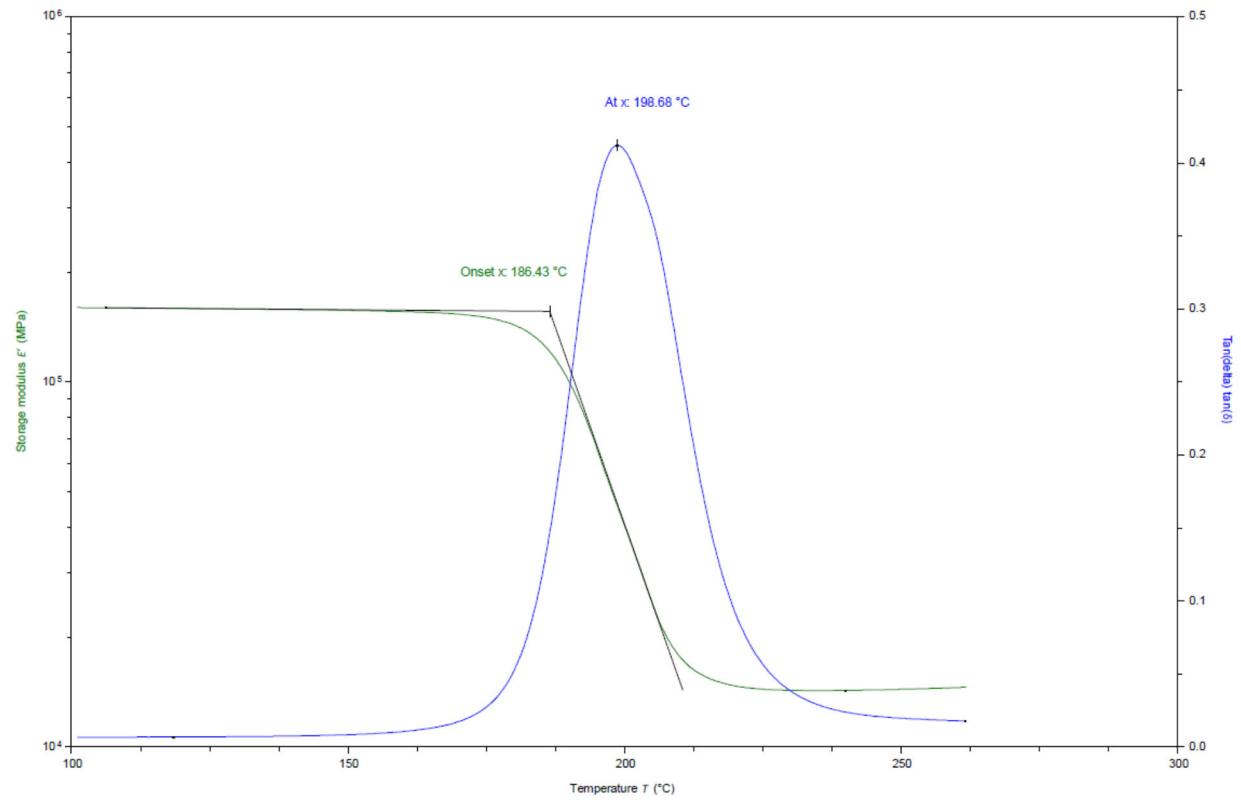


Sample: HXL-H35-SKS-LT-E-C1-1-DMA-D
Size: 50.00000 x 12.73000 x 2.18000 mm
Procedure name: Oscillation Temperature Ramp

DMA850

File: HXL-H35-SKS-LT-E-C1-1-DMA-D
Operator: Ping
Run Date: 8/29/2023 5:14:33 PM
Instrument: DMA 850-0398

HXL-H35-SKS-LT-E-C1-1-DMA-D

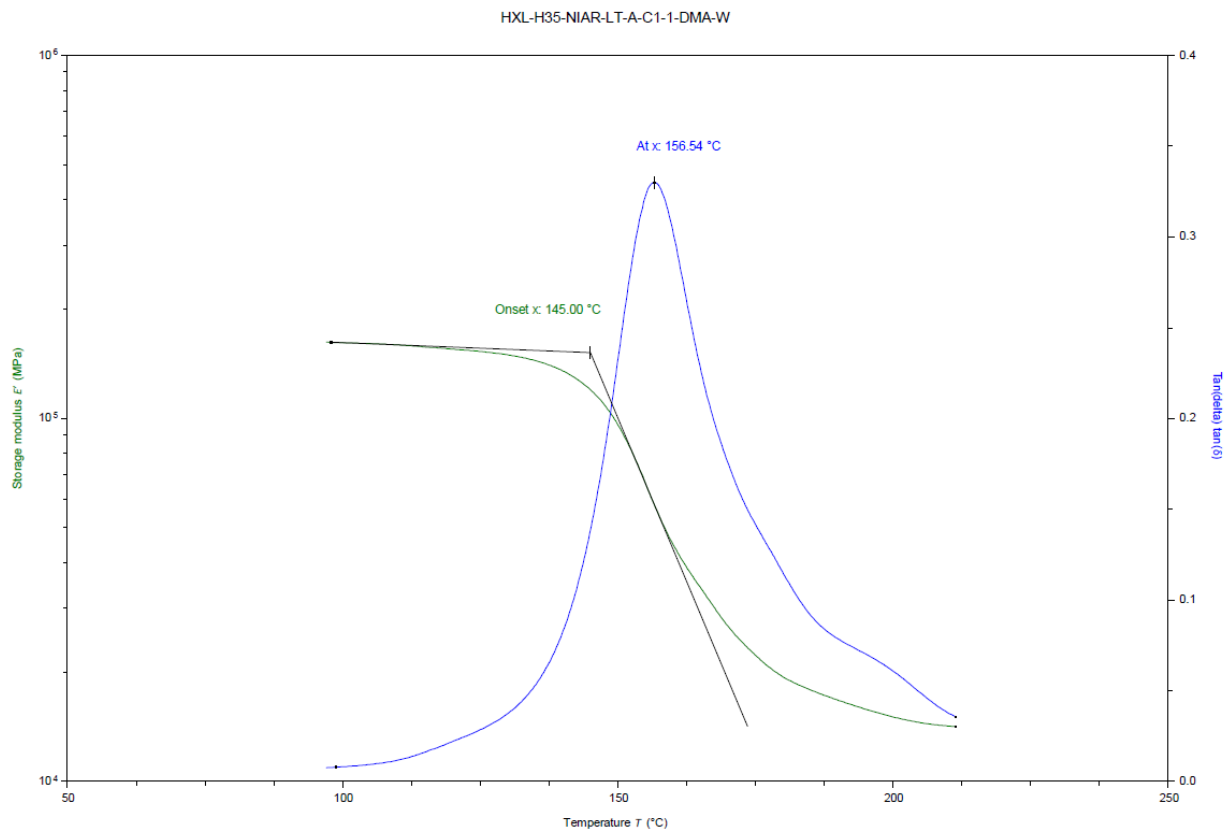


8.4 DMA Wet Batch A, B, C, D and E

Sample: HXL-H35-NIAR-LT-A-C1-1-DMA-W
Size: 50.00000 x 12.84000 x 2.15000 mm
Procedure name: Oscillation Temperature Ramp

DMA850

File: HXL-H35-NIAR-LT-A-C1-1-DMA-W
Operator: Ping
Run Date: 12/8/2023 12:35:34 PM
Instrument: DMA 850-0398

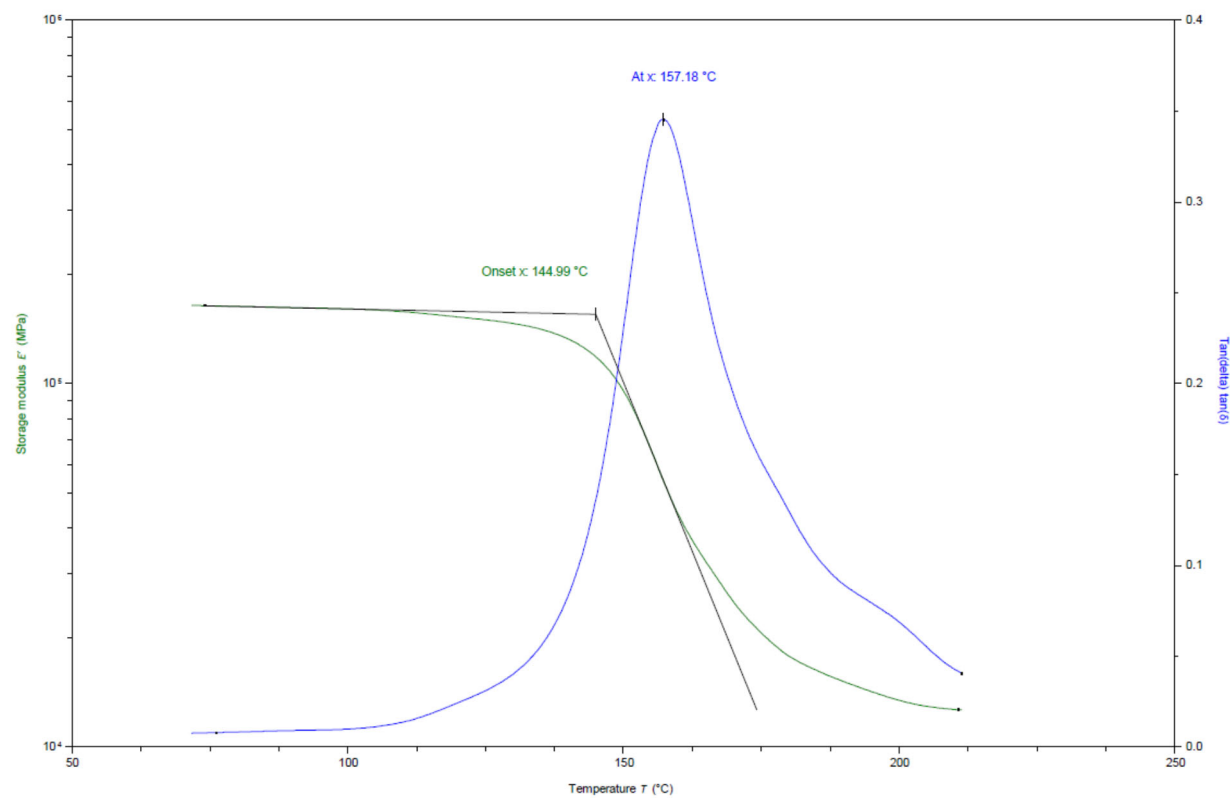


Sample: HXL-H35-NIAR-LT-B-C1-1-DMA-W
Size: 50.00000 x 12.83000 x 2.23000 mm
Procedure name: Oscillation Temperature Ramp

DMA850

File: HXL-H35-NIAR-LT-B-C1-1-DMA-W
Operator: Ping
Run Date: 12/8/2023 1:59:12 PM
Instrument: DMA 850-0398

HXL-H35-NIAR-LT-B-C1-1-DMA-W

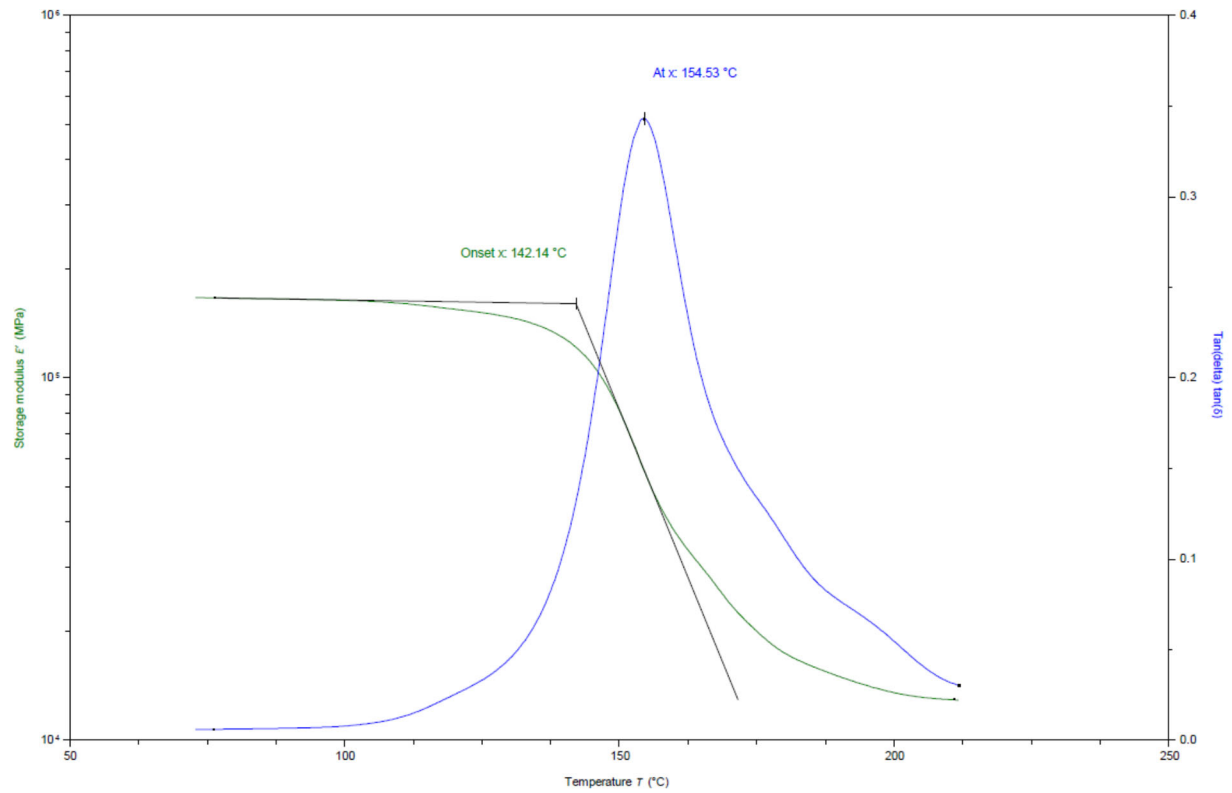


Sample: HXL-H35-NIAR-LT-C-C1-1-DMA-W
Size: 50.00000 x 12.85000 x 2.23000 mm
Procedure name: Oscillation Temperature Ramp

DMA850

File: HXL-H35-NIAR-LT-C-C1-1-DMA-W
Operator: Ping
Run Date: 12/8/2023 3:27:02 PM
Instrument: DMA 850-0398

HXL-H35-NIAR-LT-C-C1-1-DMA-W

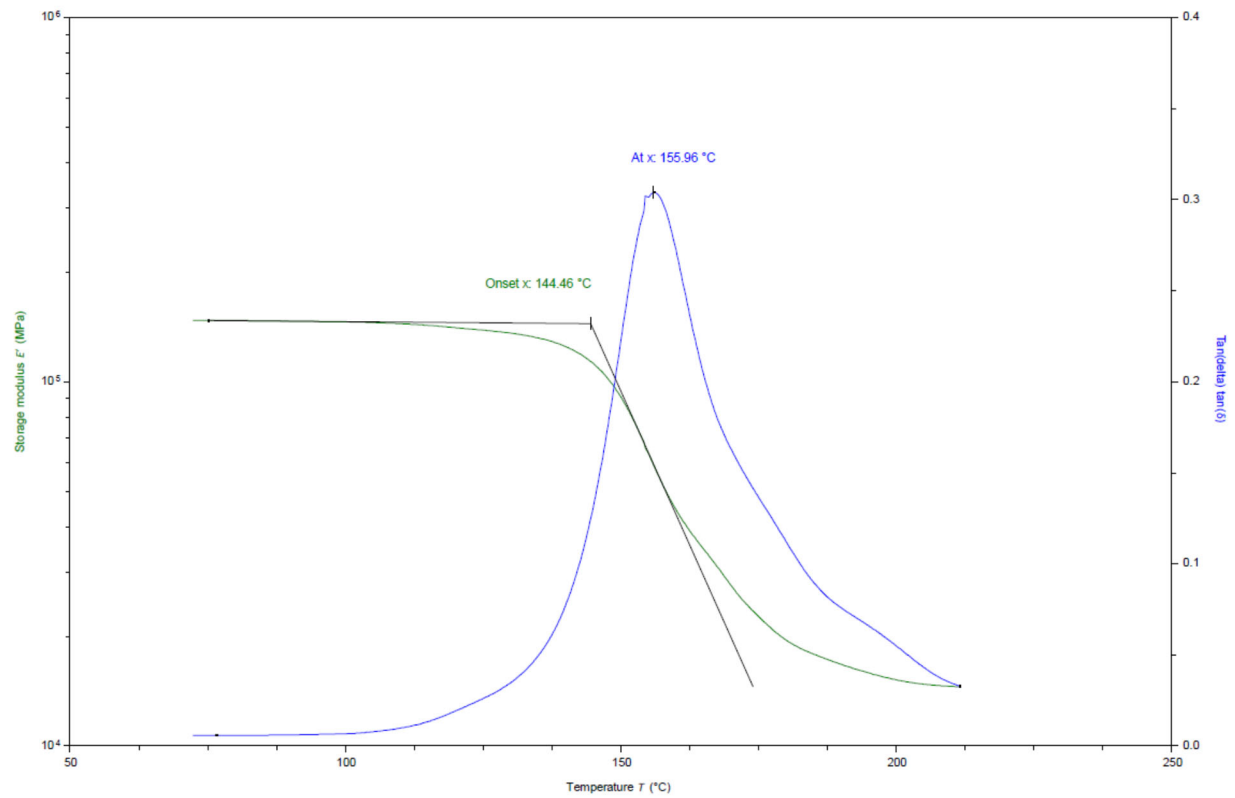


Sample: HXL-H35-FACC-LT-D-C1-1-DMA-W
Size: 50.00000 x 12.81000 x 2.18000 mm
Procedure name: Oscillation Temperature Ramp

DMA850

File: HXL-H35-FACC-LT-D-C1-1-DMA-W
Operator: Ping
Run Date: 5/31/2024 3:27:26 PM
Instrument: DMA 850-0398

HXL-H35-FACC-LT-D-C1-1-DMA-W

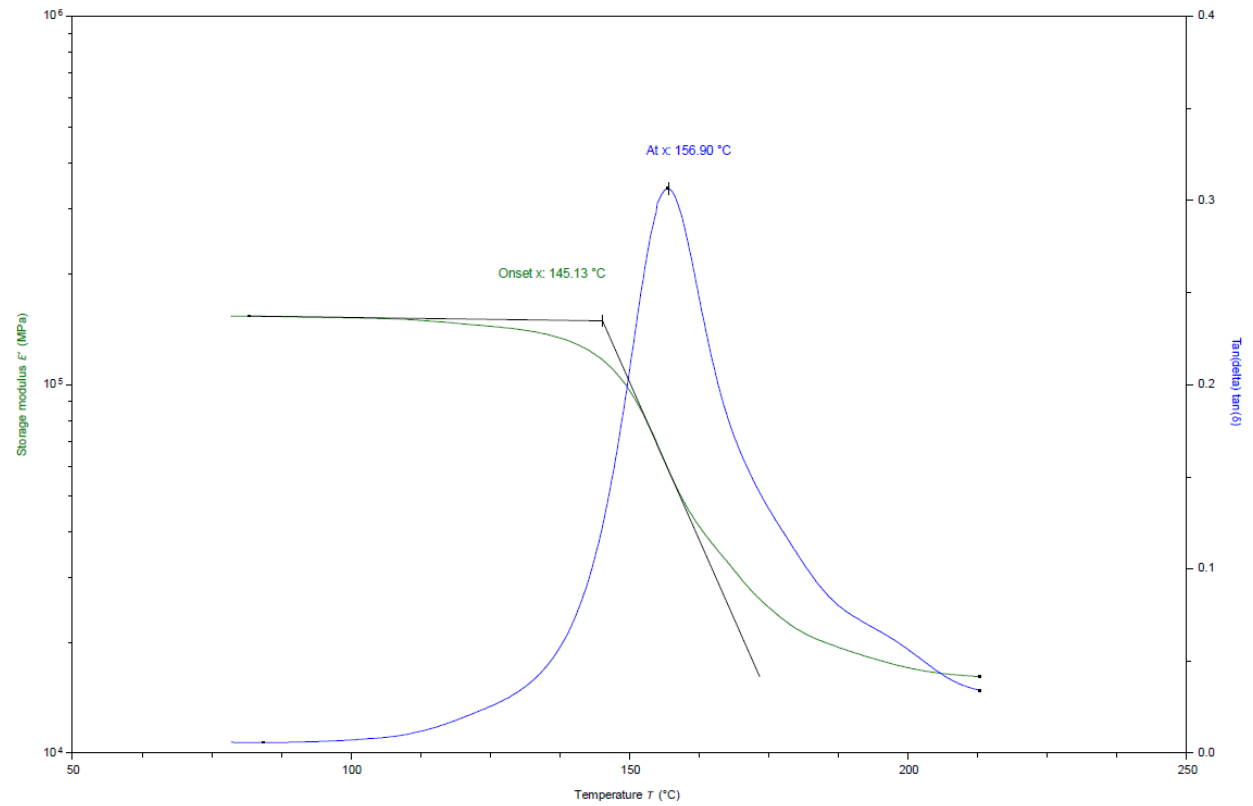


Sample: HXL-H35-SKS-LT-E-C1-1-DMA-W
Size: 50.00000 x 12.75000 x 2.16000 mm
Procedure name: Oscillation Temperature Ramp

DMA850

File: HXL-H35-SKS-LT-E-C1-1-DMA-W
Operator: Ping
Run Date: 5/31/2024 4:48:04 PM
Instrument: DMA 850-0398

HXL-H35-SKS-LT-E-C1-1-DMA-W



9. Moisture Loss

A representative specimen was used to measure the moisture loss for every combination of test temperature and stacking sequence.

Layup	Test Type	Test Temperature	Specimen ID	Weight Pre-Test (g)	Weight Post-Test (g)	Moisture Loss (g)
[0]8	LT	ETW(180F)	NTPM910Q1-HXL-H35-NIAR-LT-A-C3-1-TRAV	18.5153	18.4924	0.02290
[90]15	TT	ETW(180F)	NTPM910Q1-HXL-H35-NIAR-TT-A-C2-1-TRAV	19.8457	19.8257	0.02000
[0]15	LC	ETW(180F)	NTPM910Q1-HXL-H35-NIAR-LC-A-C1-1-TRV	19.6552	19.6388	0.01640
[90]15	TC	ETW(180F)	NTPM910Q1-HXL-H35-FACC-TC-E-C1-1-TRAV	19.3017	19.2848	0.01690
[90/0]4s	UNC0	ETW(180F)	NTPM910Q1-HXL-H35-NIAR-UNC0-A-C2-1-TRV	21.1223	21.1046	0.01770
[90/0]6s	IPSV	ETW(180F)	NTPM910Q1-HXL-H35-NIAR-IPSV-A-C1-1-TRV	22.1878	22.1724	0.01540
[0]24	SBS	ETW(180F)	NTPM910Q1-HXL-H35-NIAR-SBS-A-C1-1-TRAV	22.0322	22.011	0.02120
[0]21	ILT	ETW(180F)	NTPM910Q1-HXL-H35-NIAR-ILT-A-C1-1-ETW-7	24.5914	24.574	0.01740

10. Deviations

N/A