



Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Fiber Unidirectional Slit Tape (0.25 inch) Qualification Material Property Data Report

NCAMP Project Number: NPN 052101

NCAMP Test Report Number: CAM-RP-2025-016 Rev A

Report Date: February 24, 2026

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



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REVISIONS:

| Rev | By | Date | Pages Revised or Added |
|-----|-------------|-----------|--|
| - | Vivian Voo | 1/16/2026 | Document Initial Release |
| A | Evelyn Lian | 2/24/2026 | <ul style="list-style-type: none"> • Cover Page – Distribution statement changed to public release. • Section 1.1 – Updated “proprietary use” with “general distribution”. |
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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 B-basis values is given in a separate report NIAR ATLAS Toray Cetex® TC1225 Low Melt (LM) Polyaryletherketone (PAEK) T700GC Unidirectional Tape 145 gsm 34% RC Material Allowables Statistical Analysis Report NCP-RP-2025-008 Rev A. The qualification material was procured to NCAMP Material Specification NMS 122/2 Rev Initial Release dated November 20, 2024, NMS 122/2 lists the information for procurement. The qualification test panels were consolidated in accordance with NCAMP Process Specification NPS 81225AFP Rev B using Oven Consolidation Cycle "C". The NCAMP Test Plan NTP 1226Q1 Rev C was used for this qualification program.

Part fabricators that wish to utilize the material property data, allowables, and specifications may be able to do so by demonstrating the capability to reproduce the original material properties; a process known as equivalency. More information about this equivalency process including the test statistics and its limitations can be found in Section 6 of DOT/FAA/AR-03/19 and Section 8.4.1 of CMH-17 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 122/2. NMS 122/2 may have additional requirements that are listed in its prepreg process control document (PCD), fiber specification, fiber PCD, and other raw material specifications and PCDs which impose essential quality controls on the raw materials and raw material manufacturing equipment and processes. *Aircraft companies and certifying agencies should assume that the material property data published in this report is not applicable when the material is not procured to NMS 122/2.* NMS 122/2 is a free, publicly available, non-proprietary aerospace industry material specification.

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

1.2 Symbols

| | |
|--------------------------------|--|
| 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 |
| $F_{12}^{s5\% \text{ strain}}$ | in-plane shear strength at 5% strain |
| $F_{12}^{s0.2\%}$ | in-plane shear strength at 0.2% offset |
| G_{12}^s | in-plane shear modulus |

Superscripts

| | |
|----|----------------------|
| c | compression |
| cu | compression ultimate |
| s | shear |
| 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 |
| ETA | Elevated Temperature Ambient |
| ETW | Elevated Temperature Wet |
| Gr/Ep | graphite/epoxy |
| norm | normalized |
| RTA | Room Temperature Ambient |
| SACMA | Suppliers of Advanced Composite Materials Association |
| SRM | SACMA Recommended Method |
| Tply | thickness divided by the number of plies provides the thickness average per specimen |
| wet | specimen with an “equilibrium” moisture content |
| T, RH | Temperature, Relative Humidity |

1.3 NIAR–Specimen Naming Format

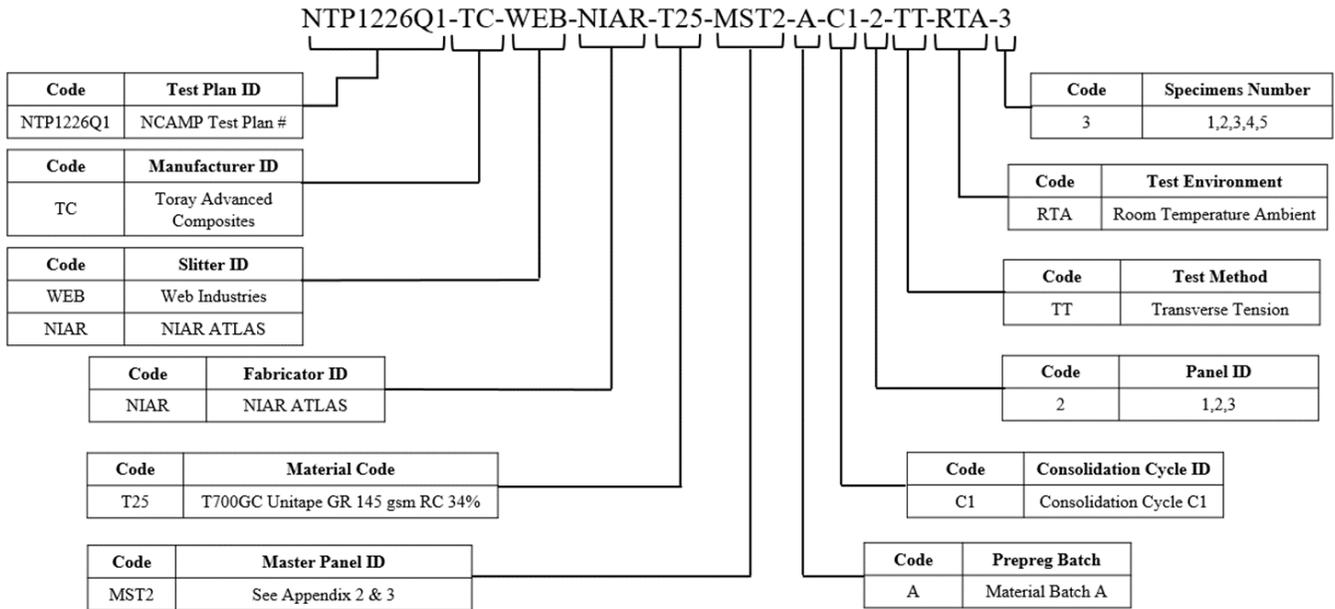


Figure 1-1: Naming Format

1.4 References

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

Consolidated Laminate Physical Testing

- 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 E1316-22a – Standard Terminology for Nondestructive Examinations
- ASTM D3418-21 – Standard Test Method for Transition Temperatures and Enthalpies of Fusion and Crystallization of Polymers by Differential Scanning Calorimetry
- ASTM D7028-07(2015) – Standard Test Method for Glass Transition Temperature (DMA T_g) of Polymer Matrix Composites by Dynamic Mechanical Analysis (DMA)
- SACMA SRM 25R-94 – SACMA Recommended Method for Onset Temperature and Peak Temperature of Composite System Resins Using Differential Scanning Calorimetry (DSC)

Lamina/Laminate Level Testing and Fluid Sensitivity Testing

- ASTM D2344/D2344M-22 – Standard Test Method for Short-Beam Strength of Polymer Matrix Composite Materials and Their Laminates
- ASTM D3039/D3039M-17 – Standard Test Method for Tensile Properties of Polymer Matrix Composite Materials
- ASTM D3518/D3518M-18 – Standard Test Method for In-Plane Shear Response of Polymer Matrix Composite Materials by Tensile Test of a $\pm 45^\circ$ Laminate
- ASTM D3846-08 (2015) – Standard Test Method for In-Plane Shear Strength of Reinforced Plastics
- ASTM D5766/D5766M-11(2018) – Standard Test Method for Open Hole Tensile Strength of Polymer Matrix Composite Laminates
- ASTM D5961/D5961-17 – Standard Test Method for Bearing Response of Polymer Matrix Composite Laminates
- ASTM D6484/D6484M-20 – Standard Test Method for Open-Hole Compressive Strength of Polymer Matrix Composite Laminates

- ASTM D6641/D6641M-16e2 – Standard Test Method for Compressive Properties of Polymer Matrix Composite Laminates Using a Combined Loading Compression (CLC) Test Fixture
- ASTM D6742/D6742M-17 – Standard Practice for Filled-Hole Tension and Compression Testing of Polymer Matrix Composite Laminates
- ASTM D7136/D7136M-20 – Standard Test Method for Measuring the Damage Resistance of a Fiber-Reinforced Polymer Matrix Composite to a Drop-Weight Impact Event
- ASTM D7137/D7137M-17 – Standard Test Method for Compressive Residual Strength Properties of Damaged Polymer Matrix Composite Plates
- ASTM D790-17 – Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
- ASTM D910-21 – Standard Specification for Leaded Aviation Gasolines

1.5 Methodology

1.5.1 Process Definition

For each combination of test, batch and condition, the specimens were selected from minimum two separate panels consolidated separately as shown in Figure 1-2 unless otherwise specified. Fabrication equipment variability assessed by fabricating panel utilizing both Electroimpact (EI) and Coriolis (C1) AFP machines. Panels 1, 2, and 3 were fabricated using EI AFP machine and panels 4, 5, and 6 were fabricated using C1 AFP machine. Unless otherwise specified, panels 1, 3, and 5 were consolidated in a single consolidation cycle. Panels 2, 4, and 6 were consolidated in a single consolidation cycle separate from panels 1, 3, and 5. The term "consolidation cycle" means a single run through the oven, with same processing parameters. The specimen selection methodology in Figure 1-2 are presented in "Number of Batches x Number of Consolidation Processes x Number of Specimens" format throughout this document. Specifically, Figure 1-2 depicts a 3x2x3 specimen selection methodology.

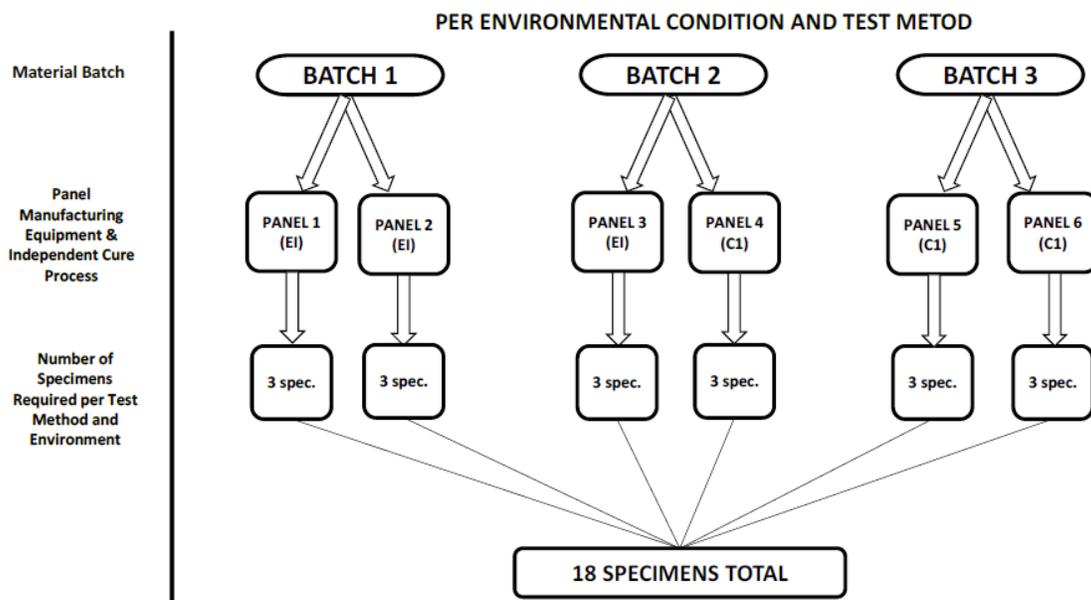


Figure 1-2: Specimen Selection Methodology

All panels were fabricated in accordance with NCAMP Process Specification NPS 81225AFP Rev B using Oven Consolidation Cycle "C".

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

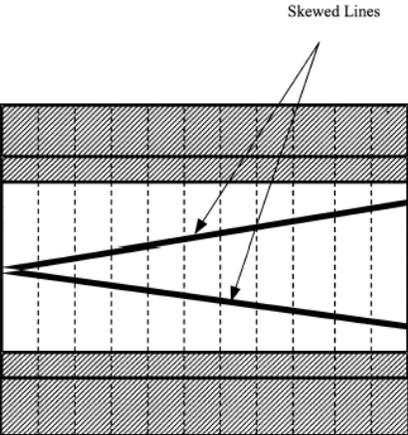


Figure 1-3: Specimen Traceability Line

1.5.2 Specimen & Testing Details

1.5.2.1 Tabbing

1.5.2.1.1 Longitudinal Tension (LT)

| Tabbing Material | Adhesive Type | Cure Temperature and Duration | Longitudinal Tension (LT) | | | | |
|--------------------------------------|--------------------------------------|--|--|--|--|--------------|--------------|
| | | | Batch No. and Consolidation Cycle No. | | | | |
| | | | CTA | RTA | ETA1 | ETA2 | ETW |
| [0/45/0/90/0/-45/0/45/0/-45]S Panels | Syensqo/Solvay FM309-1 Film Adhesive | 350°F for 1 hour | A-C1 A-C2 B-C1 B-C2 C-C1 C-C2 | A-C1 A-C2 B-C1 B-C2 C-C1 C-C2 | A-C1 A-C2 B-C1 B-C2 C-C1 C-C2 | | B-C1 B-C2 |
| [0/45/0/90/0/-45/0/45/0/-45]S Panels | Duralco 4703 Adhesive Epoxy | 250°F for 4 hours followed by a post cure of 350°F for 1.5 hours | | | | A-C1 A-C2 | |

1.5.2.2 Specimen Dimensions & Test Configuration

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

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

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

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

| Test Method | Bolt | Countersink Washer (Head-Side) | Flat Washer (Nut-Side) | Nut |
|-------------|-----------------|--------------------------------|------------------------|------------|
| FHT1 | NASM21297-04005 | MS21206-C4 | MS21206-4 | MS21084L04 |
| FHT2 | | | | |
| FHT3 | | | | |
| FHC1 | NASM21297-04005 | MS21206-C4 | MS21206-4 | MS21084L04 |
| FHC2 | | | | |
| FHC3 | | | | |
| SSB1 | NASM21297-04016 | MS21206-C4 | MS21206-4 | MS21084L04 |
| SSB2 | | | | |
| SSB3 | | | | |

Table 1-1: Fastener Identifications

1.5.2.3 Specimen Strain Device Used

Corresponding Gage ID can be obtained from Appendix 1 of NTP1226Q1 Rev C.

Uniaxial gages were used on:

- All conditions of Tension specimens except Longitudinal Tension specimens.
- All conditions of Combined Loading Compression specimens except Longitudinal Compression specimens.
- Two RTA and two ETA1 Open Hole Compression specimens for detecting buckling.
- One Compression After Impact (un-impacted) specimen for balancing.

Biaxial gages were used on:

- All conditions of In-Plane Shear specimens.
- All conditions of Longitudinal Tension specimens.
- All conditions of Longitudinal Compression specimens.

1.5.3 Test Matrix

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

| Layup | Test Type Code | Test Type and Direction | Property | Number of Batches x No. of Panels x No. of Specimens | | | | |
|------------------------|----------------|---|--|--|-----------------|-----------------|-----------------|----------------|
| | | | | Test Temperature/Moisture Condition | | | | |
| | | | | CTA (-65°F) | RTA (70°F) | ETA1 (275°F) | ETA2 (400°F) | ETW (275°F) |
| [0] ₈ | LT | ASTM D3039 0° Tension | Strength, Modulus & Poisson's Ratio | 3x2x3 | 3x2x3 (3) | 3x2x3 (3) | 1x2x3 (3) | 1x2x3 |
| [0] ₂₀ | LC | ASTM D6641 0° Compression | Modulus & Poisson's Ratio | 3x2x3 | 3x2x3 (1)(3) | 3x2x3 (1)(3) | 1x2x3 (1)(3) | 1x2x3 |
| [90] ₁₆ | TT | ASTM D3039 90° Tension | Strength & Modulus | 3x2x3 | 3x2x3 (3) | 3x2x3 (3) | 1x2x3 (3) | 1x2x3 |
| [90] ₂₀ | TC | ASTM D6641 90° Compression | Strength & Modulus | 3x2x3 | 3x2x3 (1)(3) | 3x2x3 (1)(3) | 1x2x3 (1)(3) | 1x2x3 |
| [90/0] _{4S} | UNCO | ASTM D6641 0° Compression (4) | Strength & Modulus | 3x2x3 | 3x2x3 (1)(3) | 3x2x3 | 1x2x3 | 1x2x3 |
| [45/-45] _{4S} | IPS | ASTM D3518 In-Plane Shear (2) | 0.2% Offset Strength, 5% Strain Strength & Modulus | 3x2x3 | 3x2x3 (3) | 3x2x3 (3) | 1x2x3 (3) | 1x2x3 |
| [90] ₂₂ | 90FLX | ASTM D790 Proc. A Flex | Strength | | 3x2x3 | | | |
| [0] ₃₄ | DNS | ASTM D3846 In-Plane Shear – Double Notch Shear (5) | Strength | 3x2x3 | 3x2x3 | 3x2x3 | | 1x2x3 |
| [0] ₃₄ | SBS | ASTM D2344 Short Beam Strength | Strength | 3x2x3 | 3x2x3 | 3x2x3 | | 1x2x3 |

Table 1-2: Lamina Level Test Matrix

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

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

Note 3: At least two specimens must be gaged to obtain full stress-strain curve to failure. An appropriate extensometer may be used in place of the strain gage for the remaining specimens.

Note 4: Derive the 0° lamina compressive strength $F_{0^\circ plies}^{CU}$ 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 $[0/90]_n$ s 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 5: Round notch configuration, radius target of the notch is 0.03".



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

Table 1-3 also emphasizes those properties and test condition combinations believed to constitute the worst case, which in general is cold ambient for tension and hot wet for compression and other matrix dominated properties. For the single shear bearing test, the ASTM D5961-17 stabilized single shear single fastener bearing test setup (Procedure C) shall be used.

| (%0°/%±45°/%90°) Actual Test Type | Test Type and Layup (5) | Property | Number of Batches x Number of Panels x Number of Test Specimens | | | | |
|--------------------------------------|---|---------------------------|--|------------------|------------------|-----------------|----------------|
| | | | Test Temperature/Moisture Condition | | | | |
| | | | CTA (-65°F) | RTA (70°F) | ETA1 (275°F) | ETA2 (400°F) | ETW (275°F) |
| (25/50/25 - QI) UNT1 | ASTM D3039 Un-notched Tension [45/90/-45/0]2S | Strength & Modulus | 3x2x3 | 3x2x3 (6) | 3x2x3 (6) | 1x2x3 | 1x2x3 |
| (10/80/10 - SO) UNT2 | ASTM D3039 Un-notched Tension [45/-45/0/45/-45/90/45/-45/45/-45]S | Strength & Modulus | 3x2x3 | 3x2x3 (6) | 3x2x3 (6) | | |
| (50/40/10 - HD) UNT3 | ASTM D3039 Un-notched Tension [0/45/0/90/0/-45/0/45/0/-45]S | Strength & Modulus | 3x2x3 | 3x2x3 (6) | 3x2x3 (6) | | |
| (25/50/25 - QI) UNC1 | ASTM D6641 Un-notched Compression [45/0/-45/90]3S | Strength & Modulus | | 3x2x3 (4 & 6) | 3x2x3 (4 & 6) | 1x2x3 | 1x2x3 |
| (10/80/10 - SO) UNC2 | ASTM D6641 Un-notched Compression [45/-45/0/45/-45/90/45/-45/45/-45]S | Strength & Modulus | | 3x2x3 (4 & 6) | 3x2x3 (4 & 6) | | |
| (50/40/10 - HD) UNC3 | ASTM D6641 Un-notched Compression [0/45/0/90/0/-45/0/45/0/-45]S | Strength & Modulus | | 3x2x3 (4 & 6) | 3x2x3 (4 & 6) | | |
| (25/50/25 - QI) SBS1 | ASTM D2344 Short Beam Strength [45/0/-45/90]3S | Strength | | 3x2x3 | 3x2x3 | 1x2x3 | 1x2x3 |
| (25/50/25 - QI) DNS1 | ASTM D3846 Double Notch Shear (9) [45/0/-45/90]3S | Strength | | 3x2x3 | 3x2x3 | 1x2x3 | 1x2x3 |
| (25/50/25 - QI) OHT1 | ASTM D5766 Open Hole Tension (1) [45/0/-45/90]2S | Strength | 3x2x3 | 3x2x3 | 3x2x3 | 1x2x3 | 1x2x3 |
| (10/80/10 - SO) OHT2 | ASTM D5766 Open Hole Tension (1) [45/-45/0/45/-45/90/45/-45/45/-45]S | Strength | 3x2x3 | 3x2x3 | 3x2x3 | | |
| (50/40/10 - HD) OHT3 | ASTM D5766 Open Hole Tension (1) [0/45/0/90/0/-45/0/45/0/-45]S | Strength | 3x2x3 | 3x2x3 | 3x2x3 | | |
| (25/50/25 - QI) FHT1 | ASTM D6742 Filled Hole Tension (2) [45/0/-45/90]2S | Strength | 3x2x3 | 3x2x3 | 3x2x3 | 1x2x3 | 1x2x3 |
| (10/80/10 - SO) FHT2 | ASTM D6742 Filled Hole Tension (2) [45/-45/0/45/-45/90/45/-45/45/-45]S | Strength | 3x2x3 | 3x2x3 | 3x2x3 | | |
| (50/40/10 - HD) FHT3 | ASTM D6742 Filled Hole Tension (2) [0/45/0/90/0/-45/0/45/0/-45]S | Strength | 3x2x3 | 3x2x3 | 3x2x3 | | |
| (25/50/25 - QI) OHC1 | ASTM D6484 Open Hole Compression (1) [45/0/-45/90]4S | Strength | | 3x2x3 (7) | 3x2x3 (7) | 1x2x3 | 1x2x3 |
| (10/80/10 - SO) OHC2 | ASTM D6484 Open Hole Compression (1) [45/-45/0/45/-45/90/45/-45/45/-45]2S | Strength | | 3x2x3 (7) | 3x2x3 (7) | | |
| (50/40/10 - HD) OHC3 | ASTM D6484 Open Hole Compression (1) [0/45/0/90/0/-45/0/45/0/-45]2S | Strength | | 3x2x3 (7) | 3x2x3 (7) | | |
| (25/50/25 - QI) FHC1 | ASTM D6742 Filled Hole Compression (2) [45/0/-45/90]4S | Strength | | 3x2x3 | 3x2x3 | 1x2x3 | 1x2x3 |
| (10/80/10 - SO) FHC2 | ASTM D6742 Filled Hole Compression (2) [45/-45/0/45/-45/90/45/-45/45/-45]2S | Strength | | 3x2x3 | 3x2x3 | | |
| (50/40/10 - HD) FHC3 | ASTM D6742 Filled Hole Compression (2) [0/45/0/90/0/-45/0/45/0/-45]2S | Strength | | 3x2x3 | 3x2x3 | | |
| (25/50/25 - QI) SSB1 | ASTM D5961 Proc.C Single Shear Bearing (3) [45/0/-45/90]2S | Strength & Deformation | | 3x2x3 | 3x2x3 | 1x2x3 | 1x2x3 |
| (10/80/10 - SO) SSB2 | ASTM D5961 Proc.C Single Shear Bearing (3) [45/-45/0/45/-45/90/45/-45/45/-45]S | Strength & Deformation | | 3x2x3 | 3x2x3 | | |
| (50/40/10 - HD) SSB3 | ASTM D5961 Proc.C Single Shear Bearing (3) [0/45/0/90/0/-45/0/45/0/-45]S | Strength & Deformation | | 3x2x3 | 3x2x3 | | |
| (25/50/25 - QI) CAI1 | ASTM D7136 & D7137 Compression After Impact (1500 in.lb/in) (8) [45/0/-45/90]4S | Strength | | 1x1x6 | 1x1x6 | 1x1x6 | 1x1x6 |

Table 1-3: Laminate Level Test Matrix

- Note 1:** Open-hole test configuration: 0.25-inch hole diameter, 1.50-inch width.
- Note 2:** Filled-hole test configuration: 0.25-inch hole diameter, 1.50-inch width, see section 1.5.2.2 for fastener callout.
- Note 3:** Single shear bearing test configuration: 0.25-inch hole diameter, 1.50-inch width, see section 1.5.2.2 for fastener callout, $e/D=3$, ASTM D5961-17 Procedure C
- Note 4:** Back-to-back strain gages needed on the first two specimens. If no buckling is observed, the remaining modulus specimens will require strain gage on one side of the specimens only. Appropriate extensometer may be used in place of the strain gage.
- Note 5:** Loading direction is generally along the 0-degree direction.
- Note 6:** At least two specimens must be gaged to obtain full stress-strain curve to failure, as appropriate.
- Note 7:** Back-to-back strain gages needed on the first two specimens.
- Note 8:** Back-to-back strain gages on two locations (a total of four strain gages) are needed on the first specimen. The specimen should be equivalent to the test specimens in terms of material, layup and geometry, shall be un-damaged. Alternatively, an instrumented metallic plate, equivalent in thickness to the test specimens to within ± 0.25 mm [± 0.010 in.], may be used.
- Note 9:** Round notch configuration, radius target of the notch is 0.03". Specimens may be taken from panels of similar layup.



1.5.4 Consolidated Laminate Physical Testing

The properties in Table 1-4 were determined for each panel used for test coupons with the exception of T_g by DMA which was conducted on one laminate per batch from each oven consolidation 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 |
|---|---|---|
| Consolidated Ply Thickness | ASTM D3171-22 | All data from mechanical test specimens |
| Laminate Density | ASTM D792-20 | Per Note 5 |
| Fiber Volume, % by Volume | ASTM D3171-22 (Note 2) | 3 |
| Resin Content, % by Weight | ASTM D3171-22 (Note 2) | 3 |
| Void Content, % by Volume | ASTM D3171-22 | Per Note 5 |
| Ultrasonic Through Transmission, C-Scan (panels) | ASTM E1316-22a, ASTM E2580 & NAS 410 (Note 3) | 1 |
| Differential Scanning Calorimetry (DSC) Glass Transition, T _g Melt Temp. (Peak) Cold Crystallization Temp. (Peak) Hot Crystallization Temp. (Peak) Crystallinity Percentage | ASTM D3418-21 or SACMA SRM 24R-94 | 1 Ambient (Note 4, Ambient only) |
| Dynamic Mechanical Analysis (DMA) Glass Transition, T _g | ASTM D7028-07e1 | 1 Ambient, 1 Wet (Note 4) |

Table 1-4: Consolidated Laminate 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: Method I, Procedure B.

Note 3: Five MHz is preferred for solid laminates. Panels with anomaly should be segregated. Microscopy images may be taken from questionable areas. NCAMP must be involved in the review of all C-scans.

Note 4: Minimum total of 24 ambient and 24 wet for each material system.

Note 5: Test repetitions are the same as fiber volume test.

1.5.5 Environmental Conditioning

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

Specimen dimensions were taken before moisture conditioning.

Test environments are defined as:

- CTA = -65°F±5°F, ambient (per section 1.5.5)
- RTA = 70°F±10°F, ambient (per section 1.5.5)
- ETA1 = 275°F±5°F, ambient (per section 1.5.5)
- ETA2 = 400°F±5°F, ambient (per section 1.5.5)
- ETW = 275°F±5°F, wet (equilibrium moisture content per section 1.5.5)

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

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

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

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

Where:

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

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

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

1.5.6 Non-ambient Testing

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

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

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_{-0}^{+1} 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.

1.5.7 Fluid Sensitivity Screening

Table 1-5 lists the requirements for fluid sensitivity screening, which requires ASTM D6641 unnotched compression (UNC) strength testing on $[90/0^\circ]_{4s}$ lamina level specimens. Five replicates with a single consolidation cycle per each fluid type was subjected to fluid exposure. Specimens were cleaned with a dry towel prior to the tests. In addition to unnotched compression strength, load versus displacement curves were plotted to aid in the identification of matrix/resin softening. Since load versus displacement curves are influenced by test machine and fixture compliance, all the tests were performed with the identical machine and fixture, through a single setup. It was intended that the fluid resistance testing was performed on a limited number of reinforcement types and that engineering judgement was used to determine the necessity of repetition for other reinforcement configurations.

Experience suggested that for the vast majority of epoxy resins, water is the fluid with the most deleterious effect on properties. Should screening tests for fluid sensitivity indicate this to be the case, further testing of this type 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.

| Extended Contact: | Exposure | Test Condition | Code |
|--|---|-----------------------|-------------|
| 100 Low Lead Aviation Fuel (ASTM D910) | 90 days min. @ 70°F±10°F | 70°F | FS11RT |
| | 90 days min. @ 70°F±10°F | 275°F | FS11ET |
| ASTM D1655 Jet A Fuel | 90 days min. @ 70°F±10°F | 70°F | FS12RT |
| | 90 days min. @ 70°F±10°F | 275°F | FS12ET |
| MIL-PRF-5606 Hydraulic Oil | 90 days min. @ 70°F±10°F | 70°F | FS13RT |
| | 90 days min. @ 70°F±10°F | 275°F | FS13ET |
| MIL-PRF-83282 Hydraulic Oil | 90 days min. @ 70°F±10°F | 70°F | FS14RT |
| | 90 days min. @ 70°F±10°F | 275°F | FS14ET |
| MIL-PRF-7808 Engine Oil | 90 days min. @ 70°F±10°F | 70°F | FS15RT |
| | 90 days min. @ 70°F±10°F | 275°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 | 275°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 | 275°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 | 275°F | FS18ET |
| 50% Water with 50% Skydrol LD-4 (SAE AS1241, Type IV, Class 1) | 90 days min. @ 70°F±10°F | 70°F | FS19RT |
| | 90 days min. @ 70°F±10°F | 275°F | FS19ET |
| Degreasing Solvent per MIL-PRF-680, Type III | 90 days min. @ 70°F±10°F | 70°F | FS09RT |
| | 90 days min. @ 70°F±10°F | 275°F | FS09ET |
| Preservation Oil per MIL-PRF-6081 | 90 days min. @ 70°F±10°F | 70°F | FS10RT |
| | 90 days min. @ 70°F±10°F | 275°F | FS10ET |
| Short Duration Contact: | | | |
| MEK Washing Fluid. ASTM D740 | 90 minutes min. @ 70°F±10°F | 70°F | FS21RT |
| | 90 minutes min. @ 70°F±10°F | 275°F | FS21ET |
| Polypropylene Glycol Deicer (Type I) SAE AMS 1424 | 90 minutes min. @ 70°F±10°F | 70°F | FS22RT |
| | 90 minutes min. @ 70°F±10°F | 275°F | FS22ET |
| Detergent per MIL-D-16791, Type I (1) | 90 minutes min. @ 70°F±10°F | 70°F | FS24RT |
| | 90 minutes min. @ 70°F±10°F | 275°F | FS24ET |
| Isopropyl Alcohol Deicing Agent (TT-I-735) | 48±4 hours @70°F±10°F | 70°F | FS23RT |
| | 48±4 hours @70°F±10°F | 275°F | FS23ET |
| Control Tests: | | | |
| Distilled Water | 90 days min. at 70°F±10°F | 70°F | FS31RT |
| | 90 days min. at 70°F±10°F | 275°F | FS31ET |
| Ambient (1) | Ambient condition | 70°F | FS32RT |
| | Ambient condition | 275°F | FS32ET |
| 85% Relative Humidity (1) | Per section 6.2 Test Plan NTP 1226Q1 | 70°F | FS33RT |
| | Per section 6.2 Test Plan NTP 1226Q1 | 275°F | FS33ET |

Note 1: All specimens were extracted from the MST19-C-C1 panel, with the exception of the specimens from note (1) which were extracted from MST4-C-C2 panel.

Table 1-5: Fluid Sensitivity Matrix

1.5.8 Normalization Procedures

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

- 90° tensile strength and modulus
- 90° compressive strength and modulus
- In-plane shear strength and modulus
- SBS
- SBS1
- DNS
- DNS1
- Poisson's ratio

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 theoretical calculated consolidated ply thickness of 0.0054 inches has been used as the nominal consolidated ply thickness (CPT) for normalization purpose. The following normalization formula was used (except for Flexural properties):

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

For Flexural strength, the equation was used to normalized the strength value.

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

For Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Fiber Unidirectional Slit Tape (0.25 inch) material, the defined CPT was 0.0054 inches. The average as measured CPT of the qualification panels was 0.0055 inches. The lowest and highest CPT measured were 0.0052 inches and 0.0060 inches respectively.

1.5.9 Inspection Verification

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

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

1.5.10 Material Pedigree Information

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

2. Test Results

2.1 Lamina Level Test Summary

| Prepreg Material: Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) Material Specification: NMS 122/2 Process Specification: NPS 81225 AFP Fiber: T700GC-12K Resin: TC1225 LM PAEK | | | | | | Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) Lamina Properties Summary | | | | | |
|---|------------------|--|-----------------|--|-------------------|---|---------------------|----------|------------------|----------|--|
| DMA Tg (ambient): 291.18°F DMA Tg (wet): 271.52°F | | DSC Tg (ambient): 292.66°F DSC, Melting Temperature (Peak): 590.61°F DSC, Hot Crystallization Temperature (Peak): 501.51°F | | Tg METHOD: DMA (ASTM D7028) & DSC (ASTM D3418) | | | | | | | |
| Lot #1 (Batch A) Fiber Lot: A1024D1 Date of fiber manufacture: 4/5/2024 Resin Lot: V103411 Date of resin manufacture: 3/20/2023 Prepreg Lot: 051624-1TP5 Date of prepreg manufacture: 5/16/2024 Date of composite manufacture: | | Lot #2 (Batch B) Fiber Lot: A1023A1 Date of fiber manufacture: 1/23/2023 Resin Lot: V103482 Date of resin manufacture: 3/12/2023 Prepreg Lot: 041724-1TP5 Date of prepreg manufacture: 4/17/2024 Date of composite manufacture: 7/17/2024 - 1/23/2025 | | Lot #3 (Batch C) Fiber Lot: A1024A1 Date of fiber manufacture: 1/20/2024 Resin Lot: V103265 Date of resin manufacture: 3/27/2023 Prepreg Lot: 051324-1TP5 Date of prepreg manufacture: 5/13/2024 | | Date of testing: 10/17/2024 to 7/2/2025 Date of data submittal: 7/2/2025 | | | | | |
| LAMINA MECHANICAL PROPERTY SUMMARY Data reported as: Normalized & Measured (Normalized by CPT=0.005400 inch) | | | | | | | | | | | |
| Properties | CTA (-65°F) Mean | | RTA (70°F) Mean | | ETA1 (275°F) Mean | | ETA2** (400°F) Mean | | ETW (275°F) Mean | | |
| | Normalized | Measured | Normalized | Measured | Normalized | Measured | Normalized | Measured | Normalized | Measured | |
| F ₁ ^{1W} [ksi] | 385.9 | 388.6 | 393.9 | 400.0 | 379.6 | 383.0 | 306.1 | 304.4 | 371.5 | 369.4 | |
| E ₁ ¹ [Msi] | 19.45 | 19.57 | 19.38 | 19.65 | 19.95 | 20.12 | 18.44 | 18.34 | 19.44 | 19.35 | |
| ν ₁₂ ¹ | | 0.3226 | | 0.3499 | | 0.3305 | | 0.5682 | | 0.3602 | |
| F ₂ ^{1W} [ksi] | | 16.32 | | 14.07 | | 7.274 | | 3.200 | | 6.251 | |
| E ₂ ¹ [Msi] | | 1.410 | | 1.316 | | 1.100 | | 0.2808 | | 0.8440 | |
| F ₁ ^{2W} [ksi] from UNCO* | 231.7 | 228.9 | 210.8 | 208.8 | 165.9 | 164.5 | 50.03 | 48.97 | 162.4 | 163.3 | |
| E ₁ ² [Msi] | 17.95 | 17.69 | 17.66 | 17.44 | 18.09 | 17.87 | 19.17 | 18.97 | 17.25 | 17.18 | |
| ν ₁₂ ² | | 0.3596 | | 0.3389 | | 0.3550 | | 0.5176 | | 0.3104 | |
| F ₂ ^{2W} [ksi] | | 40.47 | | 32.86 | | 16.99 | | 7.281 | | 16.09 | |
| E ₂ ² [Msi] | | 1.439 | | 1.386 | | 1.206 | | 0.3180 | | 1.059 | |
| (0/90) UNCO Strength [ksi] | 125.0 | 123.6 | 113.5 | 112.6 | 88.41 | 87.71 | 25.43 | 24.89 | 86.12 | 86.63 | |
| (0/90) UNCO Modulus [Msi] | 9.569 | 9.456 | 9.430 | 9.348 | 9.743 | 9.652 | 9.773 | 9.564 | 9.356 | 9.409 | |
| F ₁₂ ^{40.2%} [ksi] | | 7.798 | | 6.320 | | 2.994 | | 0.8975 | | 2.310 | |
| F ₁₂ ^{55%strain} [ksi] | | 13.74 | | 10.36 | | 5.365 | | 2.006 | | 4.593 | |
| G ₁₂ ² [Msi] | | 0.6923 | | 0.6157 | | 0.3030 | | 0.06281 | | 0.2168 | |
| 90 FLX Proc. A Strength [ksi] | | | 21.92 | 21.62 | | | | | | | |
| 90 FLX Proc. A Modulus [Msi] | | | 1.457 | 1.433 | | | | | | | |
| Round Notch DNS In-Plane Shear Strength [ksi] | | 17.60 | | 14.16 | | 8.692 | | | | 7.566 | |
| SBS [ksi] | | 20.27 | | 15.40 | | 8.594 | | | | 7.623 | |

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

** ETA2 data is provided for informational purposes only.

Table 2-1: Lamina Summary Data

2.2 Laminate Level Test Summary

| Prepreg Material: Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) Material Specification: NMS 122/2 Process Specification: NPS 81225 AFP Fiber: T700GC-12K | | Resin: TC1225 LM PAEK | | Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) Laminate Properties Summary | | | | |
|---|---|--|--|--|------------------------------------|-----------------|----------|-------|
| DMA Tg (ambient): 291.18°F DMA Tg (wet): 271.52°F | | DSC Tg (ambient): 292.66°F DSC, Melting Temperature (Peak): 590.61°F DSC, Hot Crystallization Temperature (Peak): 501.51°F | | Tg METHOD: DMA (ASTM D7028) & DSC (ASTM D3418) | | | | |
| Fiber Batch Date of fiber manufacture Resin Batch Date of resin manufacture Prepreg Batch Date of prepreg manufacture Date of composite manufacture | Lot #1 (Batch A) A1024D1 4/5/2024 V103411 3/20/2023 051624-1TP5 5/16/2024 | Lot #2 (Batch B) A1023A1 44949 V103482 3/12/2023 041724-1TP5 4/17/2024 | Lot #3 (Batch C) A1024A1 1/20/2024 V103265 3/27/2023 051324-1TP5 5/13/2024 | Date of testing Date of data submittal | 10/17/2024 to 7/2/2025 7/2/2025 | | | |
| LAMINATE MECHANICAL PROPERTY SUMMARY Data reported as: Normalized & Measured (Normalized by CPT=0.005400 inch) | | | | | | | | |
| Properties | Layup Test Condition | 25/50/25 (Quasi) | | 10/80/10 (Soft) | | 50/40/10 (Hard) | | |
| | | Normalized | Measured | Normalized | Measured | Normalized | Measured | |
| OHT Strength [ksi] | CTA (-65°F) | 74.44 | 73.46 | 57.90 | 57.21 | 106.1 | 104.7 | |
| | RTA (70°F) | 72.32 | 71.24 | 54.55 | 53.94 | 103.4 | 101.9 | |
| | ETA1 (275°F) | 70.01 | 68.97 | 44.83 | 44.32 | 108.1 | 106.4 | |
| | ETA2** (400°F) | 60.85 | 60.66 | | | | | |
| | ETW (275°F) | 66.30 | 66.25 | | | | | |
| OHC Strength [ksi] | RTA (70°F) | 48.46 | 47.86 | 45.38 | 45.30 | 57.56 | 56.54 | |
| | ETA1 (275°F) | 35.31 | 34.84 | 32.47 | 32.41 | 44.72 | 44.14 | |
| | ETA2** (400°F) | 20.41 | 20.34 | | | | | |
| | ETW (275°F) | 34.33 | 33.58 | | | | | |
| | CTA (-65°F) | 154.7 | 152.6 | 88.07 | 87.16 | 220.0 | 217.9 | |
| UNT Strength [ksi] | RTA (70°F) | 152.3 | 150.0 | 82.73 | 81.79 | 225.1 | 223.5 | |
| | ETA1 (275°F) | 138.2 | 136.2 | 67.18 | 66.51 | 214.8 | 212.5 | |
| | ETA2** (400°F) | 100.4 | 98.93 | | | | | |
| | ETW (275°F) | 131.5 | 131.4 | | | | | |
| | CTA (-65°F) | 7.256 | 7.161 | 4.680 | 4.633 | 11.21 | 11.10 | |
| UNT Modulus [Msi] | RTA (70°F) | 7.106 | 7.000 | 4.516 | 4.467 | 11.15 | 11.07 | |
| | ETA1 (275°F) | 6.855 | 6.757 | 3.920 | 3.881 | 11.06 | 10.94 | |
| | ETA2** (400°F) | 6.280 | 6.185 | | | | | |
| | ETW (275°F) | 6.511 | 6.507 | | | | | |
| | RTA (70°F) | 86.27 | 86.04 | 58.81 | 58.21 | 113.6 | 112.3 | |
| UNC Strength [ksi] | ETA1 (275°F) | 65.71 | 65.66 | 42.99 | 42.48 | 85.16 | 84.18 | |
| | ETA2** (400°F) | 28.63 | 28.11 | | | | | |
| | ETW (275°F) | 62.35 | 63.93 | | | | | |
| | RTA (70°F) | 6.720 | 6.700 | 4.449 | 4.403 | 10.38 | 10.25 | |
| | ETA1 (275°F) | 6.736 | 6.739 | 4.191 | 4.143 | 10.51 | 10.39 | |
| UNC Modulus [Msi] | ETA2** (400°F) | 6.038 | 5.932 | | | | | |
| | ETW (275°F) | 6.488 | 6.653 | | | | | |
| | CTA (-65°F) | 83.80 | 82.21 | 64.79 | 64.32 | 109.0 | 107.0 | |
| | FHT Strength [ksi] | RTA (70°F) | 76.73 | 75.39 | 58.42 | 57.83 | 105.0 | 103.0 |
| | | ETA1 (275°F) | 75.07 | 73.85 | 47.53 | 47.18 | 107.6 | 105.8 |
| ETA2** (400°F) | | 63.63 | 62.27 | | | | | |
| ETW (275°F) | | 72.28 | 71.76 | | | | | |
| RTA (70°F) | | 77.48 | 76.58 | 59.22* | 59.29* | 97.14 | 95.86 | |
| FHC Strength [ksi] | ETA1 (275°F) | 59.25 | 58.56 | 43.57* | 43.59* | 74.67 | 73.73 | |
| | ETA2** (400°F) | 31.58* | 31.52* | | | | | |
| | ETW (275°F) | 60.88 | 59.87 | | | | | |
| | RTA (70°F) | | 14.16 | | | | | |
| | ETA1 (275°F) | | 9.143 | | | | | |
| SBS1 Strength [ksi] | ETA2** (400°F) | | 5.935 | | | | | |
| | ETW (275°F) | | 8.361 | | | | | |
| | RTA (70°F) | | 12.92 | | | | | |
| | DNS1 Strength [ksi] | ETA1 (275°F) | | 7.503 | | | | |
| | | ETA2** (400°F) | | 3.380 | | | | |
| ETW (275°F) | | | 6.870 | | | | | |
| RTA (70°F) | | 126.7 | 125.1 | 120.8 | 119.5 | 123.3 | 121.5 | |
| SSB Proc. C 2% Offset Strength [ksi] | | ETA1 (275°F) | 104.9 | 103.5 | 96.50 | 95.75 | 98.08 | 96.66 |
| | ETA2** (400°F) | 59.28 | 58.37 | | | | | |
| | ETW (275°F) | 106.0 | 105.2 | | | | | |
| | RTA (70°F) | 140.8 | 139.1 | 144.8 | 143.3 | 143.2 | 141.2 | |
| | SSB Proc. C Ultimate Strength [ksi] | ETA1 (275°F) | 118.4 | 116.8 | 114.5 | 113.6 | 112.4 | 110.8 |
| ETA2** (400°F) | | 76.20 | 75.01 | | | | | |
| ETW (275°F) | | 119.4 | 118.4 | | | | | |
| RTA (70°F) | | 1.917 | 1.893 | 1.369 | 1.354 | 2.056 | 2.026 | |
| SSB Proc. C Stiffness [Msi] | | ETA1 (275°F) | 1.813 | 1.788 | 1.194 | 1.184 | 1.941 | 1.913 |
| | ETA2** (400°F) | 1.384 | 1.362 | | | | | |
| | ETW (275°F) | 1.732 | 1.718 | | | | | |
| | RTD (70°F) | 45.53 | 44.87 | | | | | |
| | CAI Strength [ksi] | ETA1 (275°F) | 35.42 | 34.11 | | | | |
| ETA2** (400°F) | | 15.95 | 15.42 | | | | | |
| ETW (275°F) | | 37.68 | 37.28 | | | | | |

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

** ETA2 data is provided for informational purposes only.

Table 2-2: Laminate Summary Data

2.3 Fluid Sensitivity Test Summary

| Fluid Sensitivity Screening Un-notched Compression Properties (UNCFS)--RT(70°F) Strength Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) | | | |
|--|--|------------|------------------------|
| Exposure | Type of Fluid | Fluid Code | Average Strength [ksi] |
| 90 days min @ 70°F ± 10°F | 100 Low Lead Fuel | FS11RT | 115.0 |
| | Jet A Fuel | FS12RT | 110.8 |
| | MIL-PRF-5606 Hydraulic Oil | FS13RT | 112.3 |
| | MIL-PRF-83282 Hydraulic Oil | FS14RT | 111.7 |
| | MIL-PRF-7808 Engine Oil | FS15RT | 112.4 |
| | MIL-PRF-23699 Engine Oil | FS16RT | 114.8 |
| | Sea Water | FS17RT | 112.6 |
| | Skydrol LD-4 | FS18RT | 115.4 |
| | 50% Water with 50% Skydrol LD-4 | FS19RT | 110.1 |
| | Degreasing Solvent per MIL-PRF-680, Type III | FS09RT | 110.6 |
| | Preservation Oil per MIL-PRF-6081 | FS10RT | 112.5 |
| | Distilled Water | FS31RT | 112.8 |
| 90 mins @ 70°F ± 10°F | MEK washing fluid | FS21RT | 112.1 |
| | Polypropylene Glycol Deicer | FS22RT | 115.7 |
| | Detergent per MIL-D-16791, Type I | FS24RT | 114.0 |
| 48±4 hrs @ 70°F ± 10°F | Isopropyl Alcohol Deicing | FS23RT | 108.8 |
| Per section 6.2 Test Plan NTP 1226Q1 | Ambient Condition | FS32RT | 111.1 |
| | 85% Relative Humidity | FS33RT | 115.9 |

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

| Fluid Sensitivity Screening Un-notched Compression Properties (UNCFS)--ET(275°F) Strength Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) | | | |
|---|--|------------|------------------------|
| Exposure | Type of Fluid | Fluid Code | Average Strength [ksi] |
| 90 days min @ 70°F ± 10°F | 100 Low Lead Fuel | FS11ET | 50.53 |
| | Jet A Fuel | FS12ET | 67.89 |
| | MIL-PRF-5606 Hydraulic Oil | FS13ET | 81.22 |
| | MIL-PRF-83282 Hydraulic Oil | FS14ET | 74.48 |
| | MIL-PRF-7808 Engine Oil | FS15ET | 84.52 |
| | MIL-PRF-23699 Engine Oil | FS16ET | 88.35 |
| | Sea Water | FS17ET | 76.76 |
| | Skydrol LD-4 | FS18ET | 72.70 |
| | 50% Water with 50% Skydrol LD-4 | FS19ET | 69.31 |
| | Degreasing Solvent per MIL-PRF-680, Type III | FS09ET | 81.32 |
| | Preservation Oil per MIL-PRF-6081 | FS10ET | 91.39 |
| | Distilled Water | FS31ET | 80.02 |
| 90 mins @ 70°F ± 10°F | MEK washing fluid | FS21ET | 77.47 |
| | Polypropylene Glycol Deicer | FS22ET | 86.51 |
| | Detergent per MIL-D-16791, Type I | FS24ET | 87.40 |
| 48±4 hrs @ 70°F ± 10°F | Isopropyl Alcohol Deicing | FS23ET | 79.69 |
| Per section 6.2 Test Plan NTP 1226Q1 | Ambient Condition | FS32ET | 85.87 |
| | 85% Relative Humidity | FS33ET | 79.93 |

Table 2-4: Fluid Sensitivity UNC Summary Data – ET(275°F)

2.4 Consolidated Laminate Physical Test Summary

2.4.1 DMA

| DMA Results Summary | |
|---|--|
| Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) Qualification | |

| 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 (Ambient) | 143.99 | 291.18 | 164.01 | 327.21 |
| DMA T _g (Wet) | 133.07 | 271.52 | 155.01 | 311.02 |

Table 2-5: DMA Summary Data

2.4.2 DSC

| DSC Results Summary | |
|---|--|
| Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) Qualification | |

| Mean | | | | | | | | |
|------------------------------|---------------------|--------------------------|----------------------|-----------------------|----------------------------------|----------------------|-----------------------------|-------------------------|
| Glass Transition Temperature | | Melting Peak Temperature | | Enthalpy of Melting | Crystallization Peak Temperature | | Enthalpy of Crystallization | Degree of Crystallinity |
| T _g [°C] | T _g [°F] | T _{mp} [°C] | T _{mp} [°F] | ΔH _m [J/g] | T _{cp} [°C] | T _{cp} [°F] | ΔH _c [J/g] | % |
| 144.81 | 292.66 | 310.34 | 590.61 | 12.55 | 260.84 | 501.51 | 12.30 | 28.39 |
| 2.51 | 4.51 | 0.34 | 0.62 | 0.34 | 0.49 | 0.88 | 0.41 | 0.77 |

ΔH_f° (theoretical maximum heat of fusion for a fully crystalline sample) 130 J/g

Theoretical R_c (resin content) 34 %

Table 2-6: DSC Summary Data

2.5 Individual Test Summaries

2.5.1 Longitudinal Tension Properties (LT)

| | | | | | | | | | | | |
|--|----------------------|--|-----------------|-------------------------|-----------------|-------------------------|-----------------|-------------------------|-----------------|-------------------------|-----------------|
| Material: Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) | | Tension, 1-axis Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) [0]8 | | | | | | | | | |
| Resin content: 32.36 %wt | | Comp. density: 1.587 g/cc | | | | | | | | | |
| Fiber volume: 59.98 %vol | | | | | | | | | | | |
| Ply count: 8 | | | | | | | | | | | |
| Test method: ASTM D3039-17 | | Modulus calculation: 1000-3000 microstrain | | | | | | | | | |
| Normalized by: 0.005400 in. CPT | | | | | | | | | | | |
| | | CTA | | RTA | | ETA1 | | ETA2 | | ETW | |
| Test Temperature [°F] | | -65 | | 70 | | 275 | | 400 | | 275 | |
| Moisture Conditioning | | Ambient | | Ambient | | Ambient | | Ambient | | Equilibrium | |
| Equilibrium at T, RH | | | | | | | | | | 160F, 85% | |
| Source code prefixed by: | | X-NIAR-T25-MST1-X-CX-1- | | X-NIAR-T25-MST1-X-CX-1- | | X-NIAR-T25-MST1-X-CX-1- | | X-NIAR-T25-MST1-A-CX-1- | | X-NIAR-T25-MST1-B-CX-1- | |
| NTP1226Q1-TC- | | LT-CTA-X | | LT-RTA-X | | LT-ETA1-X | | LT-ETA2-X | | LT-ETW-X | |
| | | Normalized | Measured | Normalized | Measured | Normalized | Measured | Normalized | Measured | Normalized | Measured |
| F_i^{tu} [ksi] | Mean | 385.9 | 388.6 | 393.9 | 400.0 | 379.6 | 383.0 | 306.1 | 304.4 | 371.5 | 369.4 |
| | Minimum | 348.5 | 354.9 | 354.8 | 360.6 | 325.6 | 332.5 | 289.5 | 291.6 | 329.8 | 337.2 |
| | Maximum | 426.0 | 443.1 | 443.3 | 475.6 | 426.8 | 456.0 | 321.0 | 313.2 | 408.4 | 399.6 |
| | C.V.(%) | 5.717 | 7.205 | 6.808 | 8.686 | 7.844 | 9.074 | 4.464 | 2.935 | 8.972 | 6.825 |
| | No. Specimens | 19 | | 23 | | 18 | | 6 | | 6 | |
| No. Prepreg Lots | 3 | | 3 | | 3 | | 1 | | 1 | | |
| E_iⁱ [Msi] | Mean | 19.45 | 19.57 | 19.38 | 19.65 | 19.95 | 20.12 | 18.44 | 18.34 | 19.44 | 19.35 |
| | Minimum | 18.76 | 18.73 | 18.35 | 18.71 | 18.46 | 18.09 | 16.94 | 16.53 | 18.77 | 18.85 |
| | Maximum | 20.40 | 20.79 | 20.07 | 20.83 | 20.96 | 21.24 | 19.72 | 19.84 | 20.24 | 19.72 |
| | C.V.(%) | 2.855 | 2.548 | 2.257 | 2.881 | 3.474 | 3.783 | 6.171 | 6.377 | 2.935 | 1.832 |
| | No. Specimens | 19 | | 19 | | 18 | | 6 | | 6 | |
| No. Prepreg Lots | 3 | | 3 | | 3 | | 1 | | 1 | | |
| ν₁₂^s | Mean | 0.3226 | | 0.3499 | | 0.3305 | | 0.5682 | | 0.3602 | |
| | Minimum | 0.2508 | | 0.2661 | | 0.1867 | | 0.3418 | | 0.2418 | |
| | Maximum | 0.4053 | | 0.4542 | | 0.4735 | | 1.045 | | 0.4354 | |
| | C.V.(%) | 13.23 | | 15.47 | | 24.87 | | 49.71 | | 20.44 | |
| | No. Specimens | 19 | | 19 | | 18 | | 5 | | 6 | |
| No. Prepreg Lots | 3 | | 3 | | 3 | | 1 | | 1 | | |

2.5.2 Transverse Tension Properties (TT)

| | | | | | | | | | | | |
|--|----------------------|--|-----------------|---------------------------------|-----------------|----------------------------------|-----------------|------------------------------------|-----------------|-----------------------------------|-----------------|
| Material: Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) | | Tension, 2-axis Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) [90]16 | | | | | | | | | |
| Resin content: 32.47 %wt | | Comp. density: 1.582 g/cc | | | | | | | | | |
| Fiber volume: 59.67 %vol | | | | | | | | | | | |
| Ply count: 16 | | | | | | | | | | | |
| Test method: ASTM D3039-17 | | Modulus calculation: 1000-3000 microstrain | | | | | | | | | |
| Normalized by: NA | | | | | | | | | | | |
| | | CTA | | RTA | | ETA1 | | ETA2 | | ETW | |
| Test Temperature [°F] | | -65 | | 70 | | 275 | | 400 | | 275 | |
| Moisture Conditioning Equilibrium at T, RH | | Ambient | | Ambient | | Ambient | | Ambient | | Equilibrium 160F,85% | |
| Source code prefixed by: | | X-NIAR-T25-MST2-X-CX-1-TT-CTA-X | | X-NIAR-T25-MST2-X-CX-1-TT-RTA-X | | X-NIAR-T25-MST2-X-CX-1-TT-ETA1-X | | WEB-NIAR-T25-MST2-A-CX-1-TT-ETA2-X | | WEB-NIAR-T25-MST2-B-CX-1-TT-ETW-X | |
| NTP1226Q1-TC- | | | | | | | | | | | |
| | | Normalized | Measured | Normalized | Measured | Normalized | Measured | Normalized | Measured | Normalized | Measured |
| F₂^W [ksi] | Mean | 16.32 | | 14.07 | | 7.274 | | 3.200 | | 6.251 | |
| | Minimum | 14.75 | | 12.64 | | 7.001 | | 3.061 | | 5.863 | |
| | Maximum | 17.76 | | 14.63 | | 7.661 | | 3.292 | | 6.523 | |
| | C.V.(%) | 5.018 | | 3.093 | | 2.409 | | 2.410 | | 4.160 | |
| | No. Specimens | 18 | | 18 | | 18 | | 7 | | 6 | |
| No. Prepreg Lots | 3 | | 3 | | 3 | | 1 | | 1 | | |
| E₂^t [Msj] | Mean | 1.410 | | 1.316 | | 1.100 | | 0.2808 | | 0.8440 | |
| | Minimum | 1.328 | | 1.240 | | 0.9958 | | 0.2685 | | 0.8059 | |
| | Maximum | 1.483 | | 1.396 | | 1.179 | | 0.3016 | | 0.8820 | |
| | C.V.(%) | 3.517 | | 3.338 | | 4.854 | | 3.940 | | 3.256 | |
| | No. Specimens | 18 | | 18 | | 18 | | 7 | | 6 | |
| No. Prepreg Lots | 3 | | 3 | | 3 | | 1 | | 1 | | |

2.5.3 Longitudinal Compression Properties (LC)

| | | | | | | | | | | | |
|--|----------------------|--|-----------------|------------------------------|-----------------|-------------------------------|-----------------|---------------------------------|-----------------|-----------------------------------|-----------------|
| Material: Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) | | Compression, 1-axis Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) [0]20 | | | | | | | | | |
| Resin content: 33.58 %wt | | Comp. density 1.579 g/cc | | | | | | | | | |
| Fiber volume: 58.60 %vol | | | | | | | | | | | |
| Ply count: 20 | | | | | | | | | | | |
| Test method: ASTM D6641-16e2 | | Modulus calculation: 1000-3000 microstrain (CTA, RTA, ETA1, ETW), 200-1000 microstrain (ETA2) | | | | | | | | | |
| Normalized by: 0.005400 in. CPT | | | | | | | | | | | |
| | | CTA | | RTA | | ETA1 | | ETA2 | | ETW | |
| Test Temperature [°F] | | -65 | | 70 | | 275 | | 400 | | 275 | |
| Moisture Conditioning | | Ambient | | Ambient | | Ambient | | Ambient | | Equilibrium | |
| Equilibrium at T, RH | | | | | | | | | | 160F,85% | |
| Source code prefixed by: | | X-NIAR-T25-X-X-CX-1-LC-CTA-X | | X-NIAR-T25-X-X-CX-1-LC-RTA-X | | X-NIAR-T25-X-X-CX-1-LC-ETA1-X | | WEB-NIAR-T25-X-A-CX-1-LC-ETA2-X | | WEB-NIAR-T25-MST3-B-CX-1-LC-ETW-X | |
| NTP1226Q1-TC- | | | | | | | | | | | |
| | | Normalized | Measured | Normalized | Measured | Normalized | Measured | Normalized | Measured | Normalized | Measured |
| E_c [Msi] | Mean | 17.95 | 17.69 | 17.66 | 17.44 | 18.09 | 17.87 | 19.17 | 18.97 | 17.25 | 17.18 |
| | Minimum | 16.92 | 16.78 | 16.99 | 17.03 | 17.21 | 17.22 | 18.07 | 17.32 | 17.03 | 16.93 |
| | Maximum | 19.06 | 19.00 | 18.41 | 18.08 | 18.67 | 18.35 | 22.60 | 21.67 | 17.58 | 17.51 |
| | C.V.(%) | 4.009 | 3.240 | 2.587 | 1.659 | 2.731 | 1.941 | 8.344 | 7.728 | 1.267 | 1.362 |
| | No. Specimens | 18 | | 18 | | 18 | | 7 | | 6 | |
| No. Prepreg Lots | 3 | | 3 | | 3 | | 1 | | 1 | | |
| v₁₂ ° | Mean | 0.3596 | | 0.3389 | | 0.3550 | | 0.5176 | | 0.3104 | |
| | Minimum | 0.2831 | | 0.2606 | | 0.2790 | | 0.2886 | | 0.2486 | |
| | Maximum | 0.4453 | | 0.4553 | | 0.4394 | | 0.7343 | | 0.3585 | |
| | C.V.(%) | 12.31 | | 15.13 | | 12.02 | | 46.49 | | 11.68 | |
| | No. Specimens | 18 | | 18 | | 18 | | 4 | | 6 | |
| No. Prepreg Lots | 3 | | 3 | | 3 | | 1 | | 1 | | |

2.5.4 Longitudinal Compression Back-out Factor Properties

| | | | | | | | | | | | |
|--|----------------------|---|-----------------|-----------------------------------|-----------------|------------------------------------|-----------------|--------------------------------------|-----------------|-------------------------------------|-----------------|
| Material: Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) | | Compression, 1-axis, Back-out Factor Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) UNCO Layout: [90/0]4S | | | | | | | | | |
| | | CTA | | RTA | | ETA1 | | ETA2 | | ETW | |
| Test Temperature [°F] | | -65 | | 70 | | 275 | | 400 | | 275 | |
| Moisture Conditioning | | Ambient | | Ambient | | Ambient | | Ambient | | Equilibrium | |
| Equilibrium at T, RH | | | | | | | | | | 160F,85% | |
| Source code prefixed by: | | X-NIAR-T25-MST4-X-CX-1-UNCO-CTA-X | | X-NIAR-T25-MST4-X-CX-1-UNCO-RTA-X | | X-NIAR-T25-MST4-X-CX-1-UNCO-ETA1-X | | WEB-NIAR-T25-MST4-A-CX-1-UNCO-ETA2-X | | WEB-NIAR-T25-MST4-B-CX-1-UNCO-ETW-X | |
| NTP1226Q1-TC- | | | | | | | | | | | |
| | | Normalized | Measured | Normalized | Measured | Normalized | Measured | Normalized | Measured | Normalized | Measured |
| F_t^{cu} [ksi] from UNCO | Mean | 231.7 | 228.9 | 210.8 | 208.8 | 165.9 | 164.5 | 50.03 | 48.97 | 162.4 | 163.3 |
| | Minimum | 218.7 | 215.5 | 191.8 | 191.4 | 149.2 | 143.0 | 43.05 | 41.95 | 149.9 | 150.6 |
| | Maximum | 255.5 | 258.4 | 225.6 | 227.2 | 182.8 | 183.9 | 60.32 | 58.95 | 167.6 | 169.6 |
| | C.V.(%) | 4.950 | 5.116 | 4.178 | 3.962 | 5.040 | 5.820 | 11.16 | 11.21 | 3.559 | 3.638 |
| | No. Specimens | 18 | | 20 | | 21 | | 8 | | 7 | |
| No. Prepreg Lots | 3 | | 3 | | 3 | | 1 | | 1 | | |

2.5.5 Transverse Compression Properties (TC)

| | | | | | |
|--|---|--|-------------------------------|---------------------------------|-----------------------------------|
| Material: Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) | | Compression, 2-axis Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) [90]20 | | | |
| Resin content: 33.58 %wt | Comp. density: 1.579 g/cc | | | | |
| Fiber volume: 58.60 %vol | | | | | |
| Ply count: 20 | | | | | |
| Test method: ASTM D6641-16e2 | Modulus calculation: 1000-3000 microstrain | | | | |
| Normalized by: NA | | | | | |
| | CTA | RTA | ETA1 | ETA2 | ETW |
| Test Temperature [°F] | -65 | 70 | 275 | 400 | 275 |
| Moisture Conditioning | Ambient | Ambient | Ambient | Ambient | Equilibrium |
| Equilibrium at T, RH | | | | | 160F,85% |
| Source code prefixed by: | X-NIAR-T25-X-X-CX-1-TC-CTA-X | X-NIAR-T25-X-X-CX-1-TC-RTA-X | X-NIAR-T25-X-X-CX-1-TC-ETA1-X | WEB-NIAR-T25-X-A-CX-1-TC-ETA2-X | WEB-NIAR-T25-MST3-B-CX-1-TC-ETW-X |
| NTP1226Q1-TC- | | | | | |
| | Normalized | Measured | Normalized | Measured | Normalized |
| | Measured | Normalized | Measured | Normalized | Measured |
| F₂^{cu} [ksi] | 40.47 | 32.86 | 16.99 | 7.281 | 16.09 |
| Minimum | 38.88 | 31.02 | 15.14 | 6.426 | 15.85 |
| Maximum | 41.93 | 34.85 | 17.90 | 8.530 | 16.38 |
| C.V.(%) | 2.153 | 3.551 | 3.723 | 10.65 | 1.183 |
| No. Specimens | 18 | 18 | 18 | 6 | 6 |
| No. Prepreg Lots | 3 | 3 | 3 | 1 | 1 |
| E₂^c [Msi] | 1.439 | 1.386 | 1.206 | 0.3180 | 1.059 |
| Minimum | 1.341 | 1.338 | 0.9872 | 0.2984 | 1.036 |
| Maximum | 1.504 | 1.471 | 1.317 | 0.3311 | 1.101 |
| C.V.(%) | 2.887 | 2.775 | 5.987 | 4.062 | 2.056 |
| No. Specimens | 18 | 18 | 18 | 6 | 6 |
| No. Prepreg Lots | 3 | 3 | 3 | 1 | 1 |

2.5.6 In-Plane Shear Properties (IPS)

| | | | | | | | | | | | |
|--|---|---|-------------------------------|-------------------|--------------------------------|-------------------|--------------------------------------|-------------------|------------------------------------|-------------------|-----------------|
| Material: Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) | | In-Plane Shear Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) [45/-45]4S | | | | | | | | | |
| Resin content: 33.87 %wt | Comp. density: 1.580 g/cc | | | | | | | | | | |
| Fiber volume: 58.38 %vol | | | | | | | | | | | |
| Ply count: 16 | | | | | | | | | | | |
| Test method: ASTM D3518-18 | Modulus calculation: 2000-6000 microstrain | | | | | | | | | | |
| Normalized by: NA | | | | | | | | | | | |
| | CTA | | RTA | | ETA1 | | ETA2 | | ETW | | |
| Test Temperature [°F] | -65 | | 70 | | 275 | | 400 | | 275 | | |
| Moisture Conditioning | Ambient | | Ambient | | Ambient | | Ambient | | Equilibrium | | |
| Equilibrium at T, RH | | | | | | | | | 160F,85% | | |
| Source code prefixed by: | X-NIAR-T25-X-X-CX-1-IPS-CTA-X | | X-NIAR-T25-X-X-CX-1-IPS-RTA-X | | X-NIAR-T25-X-X-CX-1-IPS-ETA1-X | | WEB-NIAR-T25-MST5R-A-CX-1-IPS-ETA2-X | | WEB-NIAR-T25-MST5-B-CX-1-IPS-ETW-X | | |
| NTP1226Q1-TC- | | | | | | | | | | | |
| | | Normalized | Measured | Normalized | Measured | Normalized | Measured | Normalized | Measured | Normalized | Measured |
| F₁₂^{50.2%} [ksi] | Mean | | 7.798 | 6.320 | 2.994 | 0.8975 | 2.310 | | | | |
| | Minimum | | 7.678 | 6.164 | 2.703 | 0.8487 | 2.220 | | | | |
| | Maximum | | 8.074 | 6.575 | 3.309 | 0.9475 | 2.387 | | | | |
| | C.V.(%) | | 1.422 | 1.859 | 5.553 | 3.698 | 2.387 | | | | |
| | No. Specimens | 18 | | | 19 | | | 6 | | | 6 |
| No. Prepreg Lots | 3 | | | 3 | | | 1 | | | 1 | |
| F₁₂^{5% strain} [ksi] | Mean | | 13.74 | 10.36 | 5.365 | 2.006 | 4.593 | | | | |
| | Minimum | | 13.53 | 10.14 | 5.052 | 1.904 | 4.541 | | | | |
| | Maximum | | 14.12 | 10.78 | 5.704 | 2.110 | 4.628 | | | | |
| | C.V.(%) | | 1.197 | 1.575 | 3.636 | 3.342 | 0.6868 | | | | |
| | No. Specimens | 18 | | | 18 | | | 6 | | | 6 |
| No. Prepreg Lots | 3 | | | 3 | | | 1 | | | 1 | |
| G₁₂⁹ [Msi] | Mean | | 0.6923 | 0.6157 | 0.3030 | 0.06281 | 0.2168 | | | | |
| | Minimum | | 0.6739 | 0.5961 | 0.2646 | 0.05955 | 0.2071 | | | | |
| | Maximum | | 0.7159 | 0.6396 | 0.3444 | 0.06575 | 0.2294 | | | | |
| | C.V.(%) | | 1.762 | 2.112 | 7.017 | 3.270 | 3.560 | | | | |
| | No. Specimens | 18 | | | 19 | | | 6 | | | 6 |
| No. Prepreg Lots | 3 | | | 3 | | | 1 | | | 1 | |

2.5.7 “25/50/25” Unnotched Tension 1 Properties (UNT1)

| | | | | | | | | | | | |
|--|---|--|-----------------------------------|-----------------|------------------------------------|-----------------|--------------------------------------|-----------------|-------------------------------------|-----------------|-------|
| Material: Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) | | Unnotched Tension 1 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) [45/0/-45/90]2S | | | | | | | | | |
| Resin content: 33.84 %wt | Comp. density: 1.574 g/cc | | | | | | | | | | |
| Fiber volume: 58.17 %vol | | | | | | | | | | | |
| Ply count: 16 | | | | | | | | | | | |
| Test method: ASTM D3039-17 | Modulus calculation: 1000-3000 microstrain | | | | | | | | | | |
| Normalized by: 0.005400 in. CPT | | | | | | | | | | | |
| | CTA | | RTA | | ETA1 | | ETA2 | | ETW | | |
| Test Temperature [°F] | -65 | | 70 | | 275 | | 400 | | 275 | | |
| Moisture Conditioning | Ambient | | Ambient | | Ambient | | Ambient | | Equilibrium | | |
| Equilibrium at T, RH | | | | | | | | | 160F,85% | | |
| Source code prefixed by: | X-NIAR-T25-MST7-X-CX-1-UNT1-CTA-X | | X-NIAR-T25-MST7-X-CX-1-UNT1-RTA-X | | X-NIAR-T25-MST7-X-CX-1-UNT1-ETA1-X | | WEB-NIAR-T25-MST7-A-CX-1-UNT1-ETA2-X | | WEB-NIAR-T25-MST7-B-CX-1-UNT1-ETW-X | | |
| NTP1226Q1-TC- | | | | | | | | | | | |
| | Normalized | Measured | Normalized | Measured | Normalized | Measured | Normalized | Measured | Normalized | Measured | |
| UNT1 Strength [ksi] | Mean | 154.7 | 152.6 | 152.3 | 150.0 | 138.2 | 136.2 | 100.4 | 98.93 | 131.5 | 131.4 |
| | Minimum | 136.8 | 136.4 | 140.8 | 136.1 | 124.5 | 124.0 | 99.13 | 95.70 | 125.8 | 127.0 |
| | Maximum | 171.5 | 164.8 | 166.6 | 160.1 | 149.7 | 144.1 | 103.2 | 104.0 | 133.6 | 134.1 |
| | C.V.(%) | 5.252 | 4.568 | 5.567 | 4.805 | 5.415 | 4.640 | 1.330 | 3.091 | 2.269 | 1.823 |
| | No. Specimens | 18 | | 18 | | 18 | | 7 | | 6 | |
| No. Prepreg Lots | 3 | | 3 | | 3 | | 1 | | 1 | | |
| UNT1 Modulus [Msi] | Mean | 7.256 | 7.161 | 7.106 | 7.000 | 6.855 | 6.757 | 6.280 | 6.185 | 6.511 | 6.507 |
| | Minimum | 6.955 | 6.730 | 6.730 | 6.504 | 6.388 | 6.186 | 6.114 | 5.923 | 6.364 | 6.328 |
| | Maximum | 7.628 | 7.359 | 7.601 | 7.255 | 7.363 | 7.089 | 6.479 | 6.402 | 6.666 | 6.694 |
| | C.V.(%) | 2.979 | 2.719 | 3.438 | 3.203 | 4.121 | 3.922 | 2.038 | 3.031 | 1.853 | 2.489 |
| | No. Specimens | 18 | | 18 | | 18 | | 7 | | 6 | |
| No. Prepreg Lots | 3 | | 3 | | 3 | | 1 | | 1 | | |

2.5.8 “10/80/10” Unnotched Tension 2 Properties (UNT2)

| | | | | | | | |
|--|---|---|-------------------|--|-------------------|-----------------|-------|
| Material: Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) | | Unnotched Tension 2 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) [45/-45/0/45/-45/90/45/-45/45/-45]S | | | | | |
| Resin content: 32.91 %wt | Comp. density: 1.576 g/cc | | | | | | |
| Fiber volume: 59.07 %vol | | | | | | | |
| Ply count: 20 | | | | | | | |
| Test method: ASTM D3039-17 | Modulus calculation: 1000-3000 microstrain | | | | | | |
| Normalized by: 0.005400 | in. CPT | | | | | | |
| | CTA | RTA | | ETA1 | | | |
| Test Temperature [°F] | -65 | 70 | | 275 | | | |
| Moisture Conditioning Equilibrium at T, RH | Ambient | Ambient | | Ambient | | | |
| Source code prefixed by: NTP1226Q1-TC- | X-NIAR-T25-MST12-X-CX-1- UNT2-CTA-X | X-NIAR-T25-MST12-X-CX-1- UNT2-RTA-X | | X-NIAR-T25-MST12-X-CX-1- UNT2-ETA 1-X | | | |
| | Normalized | Measured | Normalized | Measured | Normalized | Measured | |
| UNT2 Strength [ksi] | Mean | 88.07 | 87.16 | 82.73 | 81.79 | 67.18 | 66.51 |
| | Minimum | 83.92 | 83.43 | 78.29 | 78.17 | 59.13 | 56.99 |
| | Maximum | 92.72 | 92.31 | 87.59 | 87.00 | 71.80 | 70.30 |
| | C.V.(%) | 3.078 | 2.820 | 3.795 | 3.135 | 4.396 | 5.027 |
| | No. Specimens | 18 | | 18 | | 18 | |
| No. Prepreg Lots | 3 | | 3 | | 3 | | |
| UNT2 Modulus [Msi] | Mean | 4.680 | 4.633 | 4.516 | 4.467 | 3.920 | 3.881 |
| | Minimum | 4.523 | 4.368 | 4.407 | 4.230 | 3.675 | 3.542 |
| | Maximum | 4.871 | 4.818 | 4.677 | 4.642 | 4.236 | 4.207 |
| | C.V.(%) | 1.984 | 2.984 | 1.547 | 2.517 | 2.793 | 3.776 |
| | No. Specimens | 18 | | 18 | | 18 | |
| No. Prepreg Lots | 3 | | 3 | | 3 | | |

2.5.9 “50/40/10” Unnotched Tension 3 Properties (UNT3)

| | | | | | | | |
|--|----------------------|---|-----------------|------------------------------------|-----------------|-------------------------------------|-----------------|
| Material: Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) Resin content: 33.48 %wt Fiber volume: 58.52 %vol Ply count: 20 Comp. density: 1.575 g/cc | | Unnotched Tension 3 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) [0/45/0/90/0/-45/0/45/0/-45]S | | | | | |
| Test method: ASTM D3039-17 Modulus calculation: 1000-3000 microstrain | | | | | | | |
| Normalized by: 0.005400 in. CPT | | | | | | | |
| | | CTA | | RTA | | ETA1 | |
| Test Temperature [°F] | | -65 | | 70 | | 275 | |
| Moisture Conditioning Equilibrium at T, RH | | Ambient | | Ambient | | Ambient | |
| Source code prefixed by: NTP1226Q1-TC- | | X-NIAR-T25-MST15-X-CX-1-UNT3-CTA-X | | X-NIAR-T25-MST15-X-CX-1-UNT3-RTA-X | | X-NIAR-T25-MST15-X-CX-1-UNT3-ETA1-X | |
| | | Normalized | Measured | Normalized | Measured | Normalized | Measured |
| UNT3 Strength [ksi] | Mean | 220.0 | 217.9 | 225.1 | 223.5 | 214.8 | 212.5 |
| | Minimum | 203.3 | 197.8 | 206.3 | 200.2 | 183.9 | 184.6 |
| | Maximum | 242.9 | 240.2 | 244.0 | 243.7 | 232.1 | 230.7 |
| | C.V.(%) | 6.041 | 6.217 | 5.748 | 5.985 | 6.496 | 6.528 |
| | No. Specimens | 18 | | 18 | | 20 | |
| No. Prepreg Lots | 3 | | 3 | | 3 | | |
| UNT3 Modulus [Msi] | Mean | 11.21 | 11.10 | 11.15 | 11.07 | 11.06 | 10.94 |
| | Minimum | 10.96 | 10.69 | 10.82 | 10.51 | 10.45 | 10.14 |
| | Maximum | 11.66 | 11.66 | 11.60 | 11.65 | 11.53 | 11.49 |
| | C.V.(%) | 2.034 | 2.286 | 2.383 | 2.774 | 2.668 | 3.223 |
| | No. Specimens | 18 | | 18 | | 20 | |
| No. Prepreg Lots | 3 | | 3 | | 3 | | |

2.5.10 “50/0/50” Unnotched Compression 0/90 Properties (UNC0)

| | | | | | | | | | | | |
|--|----------------------|---|-----------------|---------------------------------------|-----------------|--|-----------------|--|-----------------|---|-----------------|
| Material: Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) | | Unnotched Compression 0/90 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) [90/0]4S | | | | | | | | | |
| Resin content: | 33.77 %wt | Comp. density: 1.575 g/cc | | | | | | | | | |
| Fiber volume: | 58.28 %vol | | | | | | | | | | |
| Ply count: | 16 | | | | | | | | | | |
| Test method: | ASTM D6641-16e2 | Modulus calculation: 1000-3000 microstrain | | | | | | | | | |
| Normalized by: | 0.005400 | in. CPT | | | | | | | | | |
| | | CTA | | RTA | | ETA1 | | ETA2 | | ETW | |
| Test Temperature [°F] | | -65 | | 70 | | 275 | | 400 | | 275 | |
| Moisture Conditioning | | Ambient | | Ambient | | Ambient | | Ambient | | Equilibrium | |
| Equilibrium at T, RH | | | | | | | | | | 160F,85% | |
| Source code prefixed by: | | X-NIAR-T25-MST4-X-CX-1- UNC0-CTA-X | | X-NIAR-T25-MST4-X-CX-1- UNC0-RTA-X | | X-NIAR-T25-MST4-X-CX-1- UNC0-ETA1-X | | WEB-NIAR-T25-MST4-A-CX-1- UNC0-ETA2-X | | WEB-NIAR-T25-MST4-B-CX-1- UNC0-ETW-X | |
| NTP1226Q1-TC- | | | | | | | | | | | |
| | | Normalized | Measured | Normalized | Measured | Normalized | Measured | Normalized | Measured | Normalized | Measured |
| (0/90) UNC0 Strength [ksi] | Mean | 125.0 | 123.6 | 113.5 | 112.6 | 88.41 | 87.71 | 25.43 | 24.89 | 86.12 | 86.63 |
| | Minimum | 118.0 | 116.4 | 103.3 | 103.2 | 79.51 | 76.23 | 21.88 | 21.32 | 79.48 | 79.88 |
| | Maximum | 137.8 | 139.5 | 121.5 | 122.5 | 97.39 | 98.05 | 30.65 | 29.97 | 88.90 | 89.99 |
| | C.V.(%) | 4.950 | 5.116 | 4.178 | 3.962 | 5.040 | 5.820 | 11.16 | 11.21 | 3.559 | 3.638 |
| | No. Specimens | 18 | | 20 | | 21 | | 8 | | 7 | |
| No. Prepreg Lots | 3 | | 3 | | 3 | | 1 | | 1 | | |
| (0/90) UNC0 Modulus [Msi] | Mean | 9.569 | 9.456 | 9.430 | 9.348 | 9.743 | 9.652 | 9.773 | 9.564 | 9.356 | 9.409 |
| | Minimum | 8.776 | 8.870 | 8.555 | 8.547 | 9.169 | 9.144 | 8.419 | 8.237 | 9.162 | 9.208 |
| | Maximum | 10.90 | 10.42 | 9.875 | 9.901 | 10.31 | 10.24 | 10.57 | 10.27 | 9.510 | 9.595 |
| | C.V.(%) | 5.075 | 3.912 | 3.484 | 3.199 | 3.255 | 2.774 | 8.797 | 8.531 | 1.301 | 1.559 |
| | No. Specimens | 18 | | 20 | | 20 | | 8 | | 6 | |
| No. Prepreg Lots | 3 | | 3 | | 3 | | 1 | | 1 | | |

2.5.11 “25/50/25” Unnotched Compression 1 Properties (UNC1)

| | | | | | | | | | |
|--|-------------------------|---|-----------------|--|-----------------|--|-----------------|---|-----------------|
| Material: Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) | | Unnotched Compression 1 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) [45/0/-45/90]3S | | | | | | | |
| Resin content: 32.63 %wt Fiber volume: 59.34 %vol Ply count: 24 | | Comp. density: 1.577 g/cc | | | | | | | |
| Test method: ASTM D6641-16e2 Normalized by: 0.005400 in. CPT | | Modulus calculation: 1000-3000 microstrain | | | | | | | |
| | | RTA | | ETA1 | | ETA2 | | ETW | |
| Test Temperature [°F] Moisture Conditioning Equilibrium at T, RH Source code prefixed by: NTP1226Q1-TC- | | 70 Ambient | | 275 Ambient | | 400 Ambient | | 275 Equilibrium 160F,85% | |
| | | X-NIAR-T25-MST9-X-CX-1- UNC1-RTA-X | | X-NIAR-T25-MST9-X-CX-1- UNC1-ETA1-X | | WEB-NIAR-T25-MST9-A-CX-1- UNC1-ETA2-X | | WEB-NIAR-T25-MST9-B-CX-1- UNC1-ETW-X | |
| | | Normalized | Measured | Normalized | Measured | Normalized | Measured | Normalized | Measured |
| UNC1 Strength [ksi] | Mean | 86.27 | 86.04 | 65.71 | 65.66 | 28.63 | 28.11 | 62.35 | 63.93 |
| | Minimum | 76.19 | 78.43 | 61.81 | 61.56 | 22.81 | 22.59 | 58.74 | 61.22 |
| | Maximum | 93.11 | 90.31 | 70.10 | 68.76 | 34.92 | 34.14 | 66.16 | 66.87 |
| | C.V.(%) | 6.110 | 4.478 | 3.947 | 3.261 | 17.70 | 17.19 | 4.150 | 3.107 |
| | No. Specimens | 19 | | 19 | | 6 | | 6 | |
| | No. Prepreg Lots | 3 | | 3 | | 1 | | 1 | |
| UNC1 Modulus [Msi] | Mean | 6.720 | 6.700 | 6.736 | 6.739 | 6.038 | 5.932 | 6.488 | 6.653 |
| | Minimum | 6.184 | 6.448 | 6.072 | 6.316 | 5.770 | 5.716 | 6.313 | 6.579 |
| | Maximum | 7.246 | 6.997 | 7.319 | 7.175 | 6.382 | 6.255 | 6.649 | 6.770 |
| | C.V.(%) | 4.165 | 2.578 | 4.613 | 3.000 | 4.067 | 3.871 | 2.129 | 1.069 |
| | No. Specimens | 18 | | 18 | | 6 | | 6 | |
| | No. Prepreg Lots | 3 | | 3 | | 1 | | 1 | |

2.5.12 “10/80/10” Unnotched Compression 2 Properties (UNC2)

| | | | | | | | |
|--|-------------------------|---|-----------------|-------------------------------------|-----------------|---|--|
| Material: Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) | | | | | | Unnotched Compression 2 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) [45/-45/0/45/-45/90/45/-45/45/-45]S | |
| Resin content: 32.91 %w t | | Comp. density: 1.576 g/cc | | | | | |
| Fiber volume: 59.07 %vol | | | | | | | |
| Ply count: 20 | | | | | | | |
| Test method: ASTM D6641-16e2 | | Modulus calculation: 1000-3000 microstrain | | | | | |
| Normalized by: 0.005400 in. CPT | | | | | | | |
| | | RTA | | ETA1 | | | |
| Test Temperature [°F] | | 70 | | 275 | | | |
| Moisture Conditioning Equilibrium at T, RH | | Ambient | | Ambient | | | |
| Source code prefixed by: NTP1226Q1-TC- | | X-NIAR-T25-MST12-X-CX-1-UNC2-RTA-X | | X-NIAR-T25-MST12-X-CX-1-UNC2-ETA1-X | | | |
| | | Normalized | Measured | Normalized | Measured | | |
| UNC2 Strength [ksi] | Mean | 58.81 | 58.21 | 42.99 | 42.48 | | |
| | Minimum | 54.51 | 53.44 | 38.73 | 38.93 | | |
| | Maximum | 63.42 | 63.15 | 45.41 | 44.96 | | |
| | C.V.(%) | 3.586 | 4.035 | 3.957 | 3.569 | | |
| | No. Specimens | 19 | | 18 | | | |
| | No. Prepreg Lots | 3 | | 3 | | | |
| UNC2 Modulus [Msi] | Mean | 4.449 | 4.403 | 4.191 | 4.143 | | |
| | Minimum | 4.293 | 4.163 | 3.963 | 3.832 | | |
| | Maximum | 4.859 | 4.746 | 4.519 | 4.431 | | |
| | C.V.(%) | 2.602 | 2.983 | 3.840 | 4.183 | | |
| | No. Specimens | 19 | | 18 | | | |
| | No. Prepreg Lots | 3 | | 3 | | | |

2.5.14 Lamina Short-Beam Strength Properties (SBS)

| | | | | | |
|--|----------------------------------|--|----------------------|---------------------------|-------------------|
| Material: Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) | | Short-Beam Strength Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) [0]34 | | | |
| Resin content: 33.40 %wt | Comp. density: 1.580 g/cc | | | | |
| Fiber volume: 58.77 %vol | | | | | |
| Ply count: 34 | | | | | |
| Test method: ASTM D2344-22 | | | | | |
| Normalized by: NA | | | | | |
| | CTA | RTA | ETA1 | ETW | |
| Test Temperature [°F] | -65 | 70 | 275 | 275 | |
| Moisture Conditioning | Ambient | Ambient | Ambient | Equilibrium | |
| Equilibrium at T, RH | | | | 160F,85% | |
| Source code prefixed by: | X-NIAR-T25-X-X-CX-1- | X-NIAR-T25-X-X-CX-1- | X-NIAR-T25-X-X-CX-1- | WEB-NIAR-T25-MST6-B-CX-1- | |
| NTP1226Q1-TC- | SBS-CTA-X | SBS-RTA-X | SBS-ETA1-X | SBS-ETW-X | |
| | Normalized | Measured | Normalized | Measured | Normalized |
| | | | | | Measured |
| SBS [ksi] | Mean | 20.27 | 15.40 | 8.594 | 7.623 |
| | Minimum | 19.61 | 14.92 | 8.029 | 7.479 |
| | Maximum | 21.27 | 16.27 | 9.162 | 7.758 |
| | C.V.(%) | 2.067 | 2.406 | 4.129 | 1.344 |
| | No. Specimens | 18 | 19 | 18 | 6 |
| No. Prepreg Lots | 3 | 3 | 3 | 1 | |

2.5.15 Laminate Short-Beam Strength Properties (SBS1)

| | | | | | | | | | |
|---|-------------------------|-----------------------------------|-----------------|---|-----------------|--------------------------------------|-----------------|-------------------------------------|-----------------|
| Material: Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) Resin content: 32.63 %wt Fiber volume: 59.34 %vol Ply count: 24 Test method: ASTM D2344-22 Normalized by: NA | | Comp. density: 1.577 g/cc | | Laminate Short-Beam Strength Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) [45/0/-45/90]3S | | | | | |
| | | RTA | | ETA1 | | ETA2 | | ETW | |
| Test Temperature [°F] | | 70 | | 275 | | 400 | | 275 | |
| Moisture Conditioning | | Ambient | | Ambient | | Ambient | | Equilibrium | |
| Equilibrium at T, RH | | | | | | | | 160F, 85% | |
| Source code prefixed by: | | X-NIAR-T25-MST9-X-CX-1-SBS1-RTA-X | | X-NIAR-T25-MST9-X-CX-1-SBS1-ETA1-X | | WEB-NIAR-T25-MST9-A-CX-1-SBS1-ETA2-X | | WEB-NIAR-T25-MST9-B-CX-1-SBS1-ETW-X | |
| NTP1226Q1-TC- | | | | | | | | | |
| | | Normalized | Measured | Normalized | Measured | Normalized | Measured | Normalized | Measured |
| SBS1 Strength [ksi] | Mean | | 14.16 | | 9.143 | | 5.935 | | 8.361 |
| | Minimum | | 13.64 | | 8.490 | | 5.710 | | 7.877 |
| | Maximum | | 14.54 | | 9.709 | | 6.225 | | 8.959 |
| | C.V.(%) | | 1.792 | | 3.982 | | 3.929 | | 5.929 |
| | No. Specimens | | 19 | | 19 | | 6 | | 6 |
| | No. Prepreg Lots | | 3 | | 3 | | 1 | | 1 |

2.5.16 In-Plane (Interlaminar) Shear, Double (Round) Notch Shear Properties (DNS)

| | | | | | | | | | | | |
|--|-------------------------|--|-----------------|---|-----------------|------------------------------------|-----------------|--|-----------------|--|--|
| Material: Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) | | In-Plane (Interlaminar) Shear, Double (Round) Notch Shear | | | | | | | | | |
| Resin content: 33.40 %w t | | Comp. density: 1.580 g/cc | | Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) | | | | | | | |
| Fiber volume: 58.77 %vol | | [0]34 | | | | | | | | | |
| Ply count: 34 | | | | | | | | | | | |
| Test method: ASTM D3846-08(2015) | | | | | | | | | | | |
| Normalized by: NA | | | | | | | | | | | |
| | | CTA | | RTA | | ETA1 | | ETW | | | |
| Test Temperature [°F] | | -65 | | 70 | | 275 | | 275 | | | |
| Moisture Conditioning Equilibrium at T, RH | | Ambient | | Ambient | | Ambient | | Equilibrium 160F,85% | | | |
| Source code prefixed by: NTP1226Q1-TC- | | X-NIAR-T25-X-X-CX-1- DNS-CTA-X | | X-NIAR-T25-X-X-CX-1- DNS-RTA-X | | X-NIAR-T25-X-X-CX-1- DNS-ETA1-X | | WEB-NIAR-T25-MST6-B-CX-1- DNS-ETW-X | | | |
| | | Normalized | Measured | Normalized | Measured | Normalized | Measured | Normalized | Measured | | |
| Round Notch DNS In-Plane (Interlaminar) Shear Strength [ksi] | Mean | 17.60 | | 14.16 | | 8.692 | | 7.566 | | | |
| | Minimum | 15.13 | | 13.23 | | 8.292 | | 7.030 | | | |
| In-Plane (Interlaminar) Shear Strength C.V.(%) | Maximum | 18.69 | | 14.88 | | 9.195 | | 8.158 | | | |
| | C.V.(%) | 4.504 | | 3.050 | | 2.862 | | 5.977 | | | |
| | No. Specimens | 18 | | 18 | | 18 | | 6 | | | |
| | No. Prepreg Lots | 3 | | 3 | | 3 | | 1 | | | |

2.5.17 Laminate In-Plane (Interlaminar) Shear, Double (Round) Notch Shear Properties (DNS1)

| | | | | | | | | | |
|--|----------------------------------|--|------------------------------------|-------------------|--------------------------------------|-------------------|-------------------------------------|-------------------|-----------------|
| Material: Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) | | Laminate In-Plane (Interlaminar) Shear, Double (Round) Notch Shear Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) [45/0/-45/90]3S | | | | | | | |
| Resin content: 32.63 %wt | Comp. density: 1.577 g/cc | | | | | | | | |
| Fiber volume: 59.34 %vol | | | | | | | | | |
| Ply count: 24 | | | | | | | | | |
| Test method: ASTM D3846-08(2015) | | | | | | | | | |
| Normalized by: NA | | | | | | | | | |
| | | RTA | ETA1 | | ETA2 | | ETW | | |
| Test Temperature [°F] | | 70 | 275 | | 400 | | 275 | | |
| Moisture Conditioning | | Ambient | Ambient | | Ambient | | Equilibrium | | |
| Equilibrium at T, RH | | | | | | | 160F,85% | | |
| Source code prefixed by: NTP1226Q1-TC- | | X-NIAR-T25-MST9-X-CX-1-DNS1-RTA-X | X-NIAR-T25-MST9-X-CX-1-DNS1-ETA1-X | | WEB-NIAR-T25-MST9-A-CX-1-DNS1-ETA2-X | | WEB-NIAR-T25-MST9-B-CX-1-DNS1-ETW-X | | |
| | | Normalized | Measured | Normalized | Measured | Normalized | Measured | Normalized | Measured |
| Round Notch DNS1 In-Plane (Interlaminar) Shear Strength [ksi] | Mean | | 12.92 | | 7.503 | | 3.380 | | 6.870 |
| | Minimum | | 12.08 | | 6.961 | | 2.999 | | 6.740 |
| | Maximum | | 13.51 | | 8.121 | | 3.750 | | 7.152 |
| | C.V.(%) | | 3.368 | | 4.166 | | 8.209 | | 2.257 |
| | No. Specimens | | 18 | | 18 | | 7 | | 6 |
| | No. Prepreg Lots | | 3 | | 3 | | 1 | | 1 |

2.5.18 90° Flexural, Proc. A Properties (90FLX)

| | | | |
|---|--|---|-------|
| Material: Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) | | 90° Flexural, Proc. A Properties Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) [90]22 | |
| Resin content: 33.31 %wt Fiber volume: 58.94 %vol Ply count: 22 | Comp. density: 1.582 g/cc | | |
| Test method: ASTM D790-17, Proc. A Modulus calculation: 1000-3000 microstrain | | | |
| Normalized by: 0.005400 in. CPT RTA | | | |
| Test Temperature [°F] Moisture Conditioning Equilibrium at T, RH Source code prefixed by: NTP1226Q1-TC- | 70 Ambient X-NIAR-T25-MST20-X-CX-1- 90FLX-RTA-X | | |
| | Normalized | Measured | |
| 90° Flexural, Proc. A Strength [ksi] | Mean | 21.92 | 21.62 |
| | Minimum | 18.01 | 16.27 |
| | Maximum | 28.31 | 27.02 |
| | C.V.(%) | 13.81 | 15.35 |
| | No. Specimens | 21 | |
| | No. Prepreg Lots | 3 | |
| 90° Flexural, Proc. A Modulus [Msi] | Mean | 1.457 | 1.433 |
| | Minimum | 1.367 | 1.334 |
| | Maximum | 1.522 | 1.564 |
| | C.V.(%) | 3.832 | 5.309 |
| | No. Specimens | 21 | |
| | No. Prepreg Lots | 3 | |

2.5.19 “25/50/25” Open-Hole Tension 1 Properties (OHT1)

| | | | | | | | | | | |
|---|-----------------------------------|--|-----------------------------------|-----------------|------------------------------------|-----------------|--------------------------------------|-----------------|-------------------------------------|-----------------|
| Material: Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitaape (0.25 inch) | | Open-Hole Tension 1 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitaape (0.25 inch) [45/0/-45/90]2S | | | | | | | | |
| Resin content: 33.84 %wt | Comp. density: 1.574 g/cc | | | | | | | | | |
| Fiber volume: 58.17 %vol | | | | | | | | | | |
| Ply count: 16 | | | | | | | | | | |
| Test method: ASTM D5766-11(2018) | | | | | | | | | | |
| Normalized by: 0.005400 in. CPT | | | | | | | | | | |
| | CTA | | RTA | | ETA1 | | ETA2 | | ETW | |
| Test Temperature [°F] | -65 | | 70 | | 275 | | 400 | | 275 | |
| Moisture Conditioning Equilibrium at T, RH | Ambient | | Ambient | | Ambient | | Ambient | | Equilibrium 160F,85% | |
| Source code prefixed by: NTP1226Q1-TC- | X-NIAR-T25-MST7-X-CX-1-OHT1-CTA-X | | X-NIAR-T25-MST7-X-CX-1-OHT1-RTA-X | | X-NIAR-T25-MST7-X-CX-1-OHT1-ETA1-X | | WEB-NIAR-T25-MST7-A-CX-1-OHT1-ETA2-X | | WEB-NIAR-T25-MST7-B-CX-1-OHT1-ETW-X | |
| | Normalized | Measured | Normalized | Measured | Normalized | Measured | Normalized | Measured | Normalized | Measured |
| OHT1 Strength [ksi] | 74.44 | 73.46 | 72.32 | 71.24 | 70.01 | 68.97 | 60.85 | 60.66 | 66.30 | 66.25 |
| Mean | 68.93 | 68.37 | 67.40 | 65.37 | 64.90 | 62.90 | 58.85 | 57.23 | 65.14 | 64.71 |
| Minimum | 82.09 | 78.50 | 81.54 | 78.03 | 80.34 | 77.55 | 62.37 | 63.90 | 67.21 | 67.57 |
| Maximum | 5.195 | 4.124 | 6.015 | 4.904 | 7.020 | 5.767 | 2.114 | 4.287 | 1.407 | 1.507 |
| C.V.(%) | | | | | | | | | | |
| No. Specimens | 18 | | 18 | | 18 | | 6 | | 6 | |
| No. Prepreg Lots | 3 | | 3 | | 3 | | 1 | | 1 | |

2.5.20 “10/80/10” Open-Hole Tension 2 Properties (OHT2)

| | | | | | | | |
|--|------------------------------------|--|-------------------|-------------------------------------|-------------------|-----------------|-------|
| Material: Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) | | Open-Hole Tension 2 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) [45/-45/0/45/-45/90/45/-45/45/-45]S | | | | | |
| Resin content: 32.91 %wt | Comp. density: 1.576 g/cc | | | | | | |
| Fiber volume: 59.07 %vol | | | | | | | |
| Ply count: 20 | | | | | | | |
| Test method: ASTM D5766-11(2018) | | | | | | | |
| Normalized by: 0.005400 in. CPT | | | | | | | |
| | CTA | RTA | | ETA1 | | | |
| Test Temperature [°F] | -65 | 70 | | 275 | | | |
| Moisture Conditioning Equilibrium at T, RH | Ambient | Ambient | | Ambient | | | |
| Source code prefixed by: NTP1226Q1-TC- | X-NIAR-T25-MST12-X-CX-1-OHT2-CTA-X | X-NIAR-T25-MST12-X-CX-1-OHT2-RTA-X | | X-NIAR-T25-MST12-X-CX-1-OHT2-ETA1-X | | | |
| | Normalized | Measured | Normalized | Measured | Normalized | Measured | |
| OHT2 Strength [ksi] | Mean | 57.90 | 57.21 | 54.55 | 53.94 | 44.83 | 44.32 |
| | Minimum | 54.03 | 53.68 | 51.48 | 51.31 | 42.81 | 42.52 |
| | Maximum | 62.15 | 59.54 | 56.89 | 56.72 | 47.15 | 46.54 |
| | C.V.(%) | 3.800 | 3.177 | 3.454 | 3.246 | 2.495 | 2.347 |
| | No. Specimens | 18 | | 18 | | 18 | |
| No. Prepreg Lots | 3 | | 3 | | 3 | | |

2.5.21 “50/40/10” Open-Hole Tension 3 Properties (OHT3)

| | | | | | | | | |
|--|------------------------------------|--|--|------------------------------------|-----------------|--|-------------------------------------|-----------------|
| Material: Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) | | Open-Hole Tension 3 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) [0/45/0/90/0/-45/0/45/0/-45]S | | | | | | |
| Resin content: 33.48 %w t | Comp. density: 1.575 g/cc | | | | | | | |
| Fiber volume: 58.52 %vol | | | | | | | | |
| Ply count: 20 | | | | | | | | |
| Test method: ASTM D5766-11(2018) | | | | | | | | |
| Normalized by: 0.005400 in. CPT | | | | | | | | |
| | CTA | | | RTA | | | ETA1 | |
| Test Temperature [°F] | -65 | | | 70 | | | 275 | |
| Moisture Conditioning Equilibrium at T, RH | Ambient | | | Ambient | | | Ambient | |
| Source code prefixed by: NTP1226Q1-TC- | X-NIAR-T25-MST15-X-CX-1-OHT3-CTA-X | | | X-NIAR-T25-MST15-X-CX-1-OHT3-RTA-X | | | X-NIAR-T25-MST15-X-CX-1-OHT3-ETA1-X | |
| | Normalized | Measured | | Normalized | Measured | | Normalized | Measured |
| OHT3 Strength [ksi] | 106.1 | 104.7 | | 103.4 | 101.9 | | 108.1 | 106.4 |
| Mean | 89.89 | 90.46 | | 93.49 | 91.71 | | 97.41 | 96.63 |
| Minimum | 120.2 | 119.3 | | 120.6 | 119.8 | | 124.9 | 124.0 |
| Maximum | 7.620 | 7.737 | | 8.335 | 8.350 | | 7.567 | 7.705 |
| C.V.(%) | | | | | | | | |
| No. Specimens | 18 | | | 19 | | | 19 | |
| No. Prepreg Lots | 3 | | | 3 | | | 3 | |

2.5.22 “25/50/25” Filled-Hole Tension 1 Properties (FHT1)

| | | | | | | | | | | | |
|--|----------------------------------|--|--------------------------------|-----------------|---------------------------------|-----------------|-----------------------------------|-----------------|-------------------------------------|-----------------|-------|
| Material: Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) | | Filled-Hole Tension 1 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) [45/0/-45/90]2S | | | | | | | | | |
| Resin content: 32.70 %wt | Comp. density: 1.575 g/cc | | | | | | | | | | |
| Fiber volume: 59.23 %vol | | | | | | | | | | | |
| Ply count: 16 | | | | | | | | | | | |
| Test method: ASTM D6742-17 | | | | | | | | | | | |
| Normalized by: 0.005400 in. CPT | | | | | | | | | | | |
| | CTA | | RTA | | ETA1 | | ETA2 | | ETW | | |
| Test Temperature [°F] | -65 | | 70 | | 275 | | 400 | | 275 | | |
| Moisture Conditioning | Ambient | | Ambient | | Ambient | | Ambient | | Equilibrium | | |
| Equilibrium at T, RH | | | | | | | | | 160F, 85% | | |
| Source code prefixed by: | X-NIAR-T25-X-X-CX-1-FHT1-CTA-X | | X-NIAR-T25-X-X-CX-1-FHT1-RTA-X | | X-NIAR-T25-X-X-CX-1-FHT1-ETA1-X | | WEB-NIAR-T25-X-A-CX-1-FHT1-ETA2-X | | WEB-NIAR-T25-MST8-B-CX-1-FHT1-ETW-X | | |
| NTP1226Q1-TC- | | | | | | | | | | | |
| | Normalized | Measured | Normalized | Measured | Normalized | Measured | Normalized | Measured | Normalized | Measured | |
| FHT1 Strength [ksi] | Mean | 83.80 | 82.21 | 76.73 | 75.39 | 75.07 | 73.85 | 63.63 | 62.27 | 72.28 | 71.76 |
| | Minimum | 79.66 | 77.73 | 72.81 | 71.83 | 71.39 | 70.18 | 62.08 | 61.04 | 71.52 | 70.13 |
| | Maximum | 89.34 | 87.44 | 81.74 | 79.91 | 80.19 | 79.24 | 64.16 | 62.83 | 73.59 | 72.90 |
| | C.V.(%) | 3.492 | 3.267 | 3.984 | 3.773 | 4.114 | 3.848 | 1.243 | 1.040 | 1.153 | 1.744 |
| | No. Specimens | 18 | | 18 | | 18 | | 6 | | 6 | |
| | No. Prepreg Lots | 3 | | 3 | | 3 | | 1 | | 1 | |

2.5.23 “10/80/10” Filled-Hole Tension 2 Properties (FHT2)

| | | | | | |
|---|------------------------------------|------------------------------------|-------------------------------------|--|-------------------|
| Material: Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) Resin content: 33.08 %wt Fiber volume: 58.85 %vol Ply count: 20 Test method: ASTM D6742-17 Normalized by: 0.005400 in. CPT | | Comp. density: 1.574 g/cc | | Filled-Hole Tension 2 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) [45/-45/0/45/-45/90/45/-45/45/-45]S | |
| | CTA | RTA | ETA1 | | |
| Test Temperature [°F] | -65 | 70 | 275 | | |
| Moisture Conditioning Equilibrium at T, RH | Ambient | Ambient | Ambient | | |
| Source code prefixed by: NTP1226Q1-TC- | X-NIAR-T25-MST13-X-CX-1-FHT2-CTA-X | X-NIAR-T25-MST13-X-CX-1-FHT2-RTA-X | X-NIAR-T25-MST13-X-CX-1-FHT2-ETA1-X | | |
| | Normalized | Measured | Normalized | Measured | Normalized |
| | Measured | | Measured | | Measured |
| FHT2 Strength [ksi] | 64.79 | 64.32 | 58.42 | 57.83 | 47.53 |
| Mean | 60.77 | 60.88 | 54.60 | 54.00 | 45.85 |
| Minimum | 67.58 | 66.50 | 62.94 | 61.77 | 50.36 |
| Maximum | 2.994 | 2.488 | 3.824 | 3.567 | 2.923 |
| C.V.(%) | | | | | 2.415 |
| No. Specimens | 18 | | 18 | | 18 |
| No. Prepreg Lots | 3 | | 3 | | 3 |

2.5.24 “50/40/10” Filled-Hole Tension 3 Properties (FHT3)

| | | | | | | | |
|--|------------------------------------|---|-----------------|-------------------------------------|-----------------|-------------------|-----------------|
| Material: Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) | | Filled-Hole Tension 3 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) [0/45/0/90/0/-45/0/45/0/-45]S | | | | | |
| Resin content: 32.88 %wt | Comp. density: 1.576 g/cc | | | | | | |
| Fiber volume: 59.11 %vol | | | | | | | |
| Ply count: 20 | | | | | | | |
| Test method: ASTM D6742-17 | | | | | | | |
| Normalized by: 0.005400 | in. CPT | | | | | | |
| | | CTA | | RTA | | ETA1 | |
| Test Temperature [°F] | -65 | 70 | | 275 | | | |
| Moisture Conditioning | Ambient | Ambient | | Ambient | | | |
| Equilibrium at T, RH | | | | | | | |
| Source code prefixed by: NTP1226Q1-TC- | X-NIAR-T25-MST16-X-CX-1-FHT3-CTA-X | X-NIAR-T25-MST16-X-CX-1-FHT3-RTA-X | | X-NIAR-T25-MST16-X-CX-1-FHT3-ETA1-X | | | |
| | | Normalized | Measured | Normalized | Measured | Normalized | Measured |
| FHT3 Strength [ksi] | | | | | | | |
| Mean | | 109.0 | 107.0 | 105.0 | 103.0 | 107.6 | 105.8 |
| Minimum | | 100.6 | 97.71 | 96.08 | 92.71 | 100.3 | 97.86 |
| Maximum | | 124.5 | 121.2 | 117.5 | 114.2 | 121.5 | 118.6 |
| C.V.(%) | | 5.413 | 5.938 | 6.226 | 6.690 | 6.291 | 6.785 |
| No. Specimens | | 18 | | 18 | | 19 | |
| No. Prepreg Lots | | 3 | | 3 | | 3 | |

2.5.25 “25/50/25” Open-Hole Compression 1 Properties (OHC1)

| | | | | | | | | | |
|--|----------------------|---|-----------------|-------------------------------------|-----------------|---------------------------------------|-----------------|--------------------------------------|-----------------|
| Material: Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) | | Open-Hole Compression 1 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) [45/0/-45/90]4S | | | | | | | |
| Resin content: 33.83 %wt | | Comp. density: 1.576 g/cc | | | | | | | |
| Fiber volume: 58.25 %vol | | | | | | | | | |
| Ply count: 32 | | | | | | | | | |
| Test method: ASTM D6484-20 | | | | | | | | | |
| Normalized by: 0.005400 in. CPT | | | | | | | | | |
| | | RTA | | ETA1 | | ETA2 | | ETW | |
| Test Temperature [°F] | | 70 | | 275 | | 400 | | 275 | |
| Moisture Conditioning Equilibrium at T, RH | | Ambient | | Ambient | | Ambient | | Equilibrium 160F,85% | |
| Source code prefixed by: NTP1226Q1-TC- | | X-NIAR-T25-MST10-X-CX-1-OHC1-RTA-X | | X-NIAR-T25-MST10-X-CX-1-OHC1-ETA1-X | | WEB-NIAR-T25-MST10-A-CX-1-OHC1-ETA2-X | | WEB-NIAR-T25-MST10-B-CX-1-OHC1-ETW-X | |
| | | Normalized | Measured | Normalized | Measured | Normalized | Measured | Normalized | Measured |
| OHC1 Strength [ksij] | Mean | 48.46 | 47.86 | 35.31 | 34.84 | 20.41 | 20.34 | 34.33 | 33.58 |
| | Minimum | 46.90 | 46.04 | 33.57 | 32.98 | 17.36 | 17.37 | 32.58 | 32.50 |
| | Maximum | 49.96 | 49.56 | 37.32 | 37.20 | 25.26 | 25.05 | 36.13 | 34.78 |
| | C.V.(%) | 1.839 | 1.873 | 3.155 | 2.995 | 14.99 | 14.47 | 4.085 | 2.198 |
| | No. Specimens | 18 | | 18 | | 6 | | 6 | |
| No. Prepreg Lots | 3 | | 3 | | 1 | | 1 | | |

2.5.27 “50/40/10” Open-Hole Compression 3 Properties (OHC3)

| | | | | | |
|--|----------------------------------|--|---------------------------------|-----------------|-------|
| Material: Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) | | Open-Hole Compression 3 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) [0/45/0/90/0/-45/0/45/0/-45]2S | | | |
| Resin content: 33.01 %w t Fiber volume: 59.07 %vol Ply count: 40 | Comp. density: 1.578 g/cc | | | | |
| Test method: ASTM D6484-20 | | | | | |
| Normalized by: 0.005400 in. CPT | | | | | |
| | RTA | | ETA1 | | |
| Test Temperature [°F] | 70 | | 275 | | |
| Moisture Conditioning Equilibrium at T, RH | Ambient | | Ambient | | |
| Source code prefixed by: NTP1226Q1-TC- | X-NIAR-T25-X-X-CX-1-OHC3-RTA-X | | X-NIAR-T25-X-X-CX-1-OHC3-ETA1-X | | |
| | Normalized | Measured | Normalized | Measured | |
| OHC3 Strength [ksi] | Mean | 57.56 | 56.54 | 44.72 | 44.14 |
| | Minimum | 52.10 | 54.09 | 42.80 | 42.13 |
| | Maximum | 60.29 | 58.59 | 46.29 | 46.56 |
| | C.V.(%) | 4.488 | 2.446 | 2.042 | 2.975 |
| | No. Specimens | 18 | | 18 | |
| No. Prepreg Lots | 3 | | 3 | | |

2.5.28 “25/50/25” Filled-Hole Compression 1 Properties (FHC1)

| | | | | | | | | | | |
|--|---|---|-----------------|-------------------------------------|-----------------|---------------------------------------|-----------------|--------------------------------------|-----------------|-------|
| Material: Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) | | Filled-Hole Compression 1 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) [45/0/-45/90]4S | | | | | | | | |
| Resin content: 33.83 %w t | | Comp. density: 1.576 g/cc | | | | | | | | |
| Fiber volume: 58.25 %vol | | | | | | | | | | |
| Ply count: 32 | | | | | | | | | | |
| Test method: ASTM D6742-17 | | | | | | | | | | |
| Normalized by: 0.005400 in. CPT | | | | | | | | | | |
| | | RTA | | ETA1 | | ETA2 | | ETW | | |
| Test Temperature [°F] | | 70 | | 275 | | 400 | | 275 | | |
| Moisture Conditioning Equilibrium at T, RH | | Ambient | | Ambient | | Ambient | | Equilibrium 160F,85% | | |
| Source code prefixed by: | | X-NIAR-T25-MST10-X-CX-1-FHC1-RTA-X | | X-NIAR-T25-MST10-X-CX-1-FHC1-ETA1-X | | WEB-NIAR-T25-MST10-A-CX-1-FHC1-ETA2-X | | WEB-NIAR-T25-MST10-B-CX-1-FHC1-ETW-X | | |
| NTP1226Q1-TC- | | | | | | | | | | |
| | | Normalized | Measured | Normalized | Measured | Normalized | Measured | Normalized | Measured | |
| FHC1 Strength [ksij] | | Mean | 77.48 | 76.58 | 59.25 | 58.56 | 31.58 | 31.52 | 60.88 | 59.87 |
| | | Minimum | 73.30 | 72.42 | 54.40 | 53.51 | 23.36 | 23.17 | 56.57 | 56.69 |
| | | Maximum | 80.32 | 79.16 | 62.34 | 62.54 | 43.70 | 43.42 | 62.96 | 62.42 |
| | | C.V.(%) | 2.976 | 2.559 | 3.240 | 3.899 | 21.69 | 21.49 | 3.819 | 3.491 |
| | | No. Specimens | 18 | | 18 | | 6 | | 6 | |
| No. Prepreg Lots | 3 | | 3 | | 1 | | 1 | | | |

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

2.5.29 “10/80/10” Filled-Hole Compression 2 Properties (FHC2)

| | | | |
|--|--|--|-------------------|
| Material: Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) | | Filled-Hole Compression 2 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) [45/-45/0/45/-45/90/45/-45/45/-45]2S | |
| Resin content: 33.50 %wt | Comp. density: 1.573 g/cc | | |
| Fiber volume: 58.45 %vol | | | |
| Ply count: 40 | | | |
| Test method: ASTM D6742-17 | | | |
| Normalized by: 0.005400 | in. CPT | | |
| | RTA | ETA1 | |
| Test Temperature [°F] | 70 | 275 | |
| Moisture Conditioning | Ambient | Ambient | |
| Equilibrium at T, RH | | | |
| Source code prefixed by: NTP1226Q1-TC- | X-NIAR-T25-MST14-X-CX-1- FHC2-RTA-X | X-NIAR-T25-MST14-X-CX-1- FHC2-ETA1-X | |
| | Normalized | Measured | Normalized |
| | | | Measured |
| FHC2 Strength [ksi] | 59.22 | 59.29 | 43.57 |
| Mean | | | 43.59 |
| Minimum | 56.46 | 57.36 | 41.11 |
| Maximum | 62.02 | 61.11 | 47.16 |
| C.V.(%) | 2.185 | 1.770 | 4.297 |
| No. Specimens | 18 | | 18 |
| No. Prepreg Lots | 3 | | 3 |

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

2.5.30 “50/40/10” Filled-Hole Compression 3 Properties (FHC3)

| | | | | | |
|--|----------------------------------|--|---------------------------------|-----------------|-------|
| Material: Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) | | Filled-Hole Compression 3 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) [0/45/0/90/0/-45/0/45/0/-45]2S | | | |
| Resin content: 33.01 %wt | Comp. density: 1.578 g/cc | | | | |
| Fiber volume: 59.07 %vol | Ply count: 40 | | | | |
| Test method: ASTM D6742-17 | | | | | |
| Normalized by: 0.005400 in. CPT | | | | | |
| | RTA | | | ETA1 | |
| Test Temperature [°F] | 70 | | 275 | | |
| Moisture Conditioning Equilibrium at T, RH | Ambient | | Ambient | | |
| Source code prefixed by: NTP1226Q1-TC- | X-NIAR-T25-X-X-CX-1-FHC3-RTA-X | | X-NIAR-T25-X-X-CX-1-FHC3-ETA1-X | | |
| | Normalized | Measured | Normalized | Measured | |
| FHC3 Strength [ksj] | Mean | 97.14 | 95.86 | 74.67 | 73.73 |
| | Minimum | 90.66 | 90.43 | 70.70 | 69.26 |
| | Maximum | 102.9 | 98.83 | 78.18 | 79.41 |
| | C.V.(%) | 3.396 | 2.221 | 2.527 | 3.626 |
| | No. Specimens | 18 | | 18 | |
| No. Prepreg Lots | 3 | | 3 | | |

2.5.31 “25/50/25” Single-Shear Bearing 1, Proc. C Properties (SSB1)

| | | | | | | | | |
|--|--------------------------------|---|-----------------------------------|-------------------------------------|-------------------|-------|-------|-------|
| Material: Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) Resin content: 32.70 %wt Fiber volume: 59.23 %vol Ply count: 16 Test method: ASTM D5961-17, Proc. C Normalized by: 0.005400 in. CPT | | Single-Shear Bearing 1 Proc. C Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) [45/0/-45/90]2S | | | | | | |
| | | RTA | ETA1 | ETA2 | ETW | | | |
| Test Temperature [°F] | 70 | 275 | 400 | 275 | | | | |
| Moisture Conditioning | Ambient | Ambient | Ambient | Equilibrium | | | | |
| Equilibrium at T, RH | | | | 160F,85% | | | | |
| Source code prefixed by: | X-NIAR-T25-X-X-CX-1-SSB1-RTA-X | X-NIAR-T25-X-X-CX-1-SSB1-ETA1-X | WEB-NIAR-T25-X-A-CX-1-SSB1-ETA2-X | WEB-NIAR-T25-MST8-B-CX-1-SSB1-ETW-X | | | | |
| NTP1226Q1-TC- | | | | | | | | |
| | Normalized | Measured | Normalized | Measured | Normalized | | | |
| | | | | | Measured | | | |
| SSB1, Proc. C | 126.7 | 125.1 | 104.9 | 103.5 | 59.28 | 58.37 | 106.0 | 105.2 |
| Mean | 117.2 | 116.2 | 93.73 | 91.04 | 54.93 | 53.60 | 101.2 | 100.5 |
| Minimum | 132.4 | 131.6 | 116.0 | 114.1 | 62.78 | 61.87 | 112.8 | 111.2 |
| Maximum | 3.601 | 3.513 | 4.933 | 5.048 | 5.023 | 5.418 | 4.856 | 4.478 |
| 2% Offset C.V.(%) | | | | | | | | |
| Strength [ksij] | | | | | | | | |
| No. Specimens | 18 | | 18 | | 6 | | 6 | |
| No. Prepreg Lots | 3 | | 3 | | 1 | | 1 | |
| SSB1, Proc. C | 140.8 | 139.1 | 118.4 | 116.8 | 76.20 | 75.01 | 119.4 | 118.4 |
| Mean | 134.8 | 134.4 | 113.6 | 110.7 | 74.69 | 74.14 | 108.8 | 108.5 |
| Minimum | 147.0 | 145.1 | 125.4 | 124.0 | 77.97 | 76.52 | 127.2 | 126.6 |
| Maximum | 2.500 | 2.372 | 2.930 | 3.051 | 1.439 | 1.274 | 5.798 | 5.486 |
| Ultimate Strength C.V.(%) | | | | | | | | |
| Strength [ksij] | | | | | | | | |
| No. Specimens | 18 | | 18 | | 6 | | 6 | |
| No. Prepreg Lots | 3 | | 3 | | 1 | | 1 | |
| SSB1, Proc. C | 1.917 | 1.893 | 1.813 | 1.788 | 1.384 | 1.362 | 1.732 | 1.718 |
| Mean | 1.788 | 1.773 | 1.663 | 1.649 | 1.357 | 1.324 | 1.639 | 1.617 |
| Minimum | 2.047 | 2.030 | 1.941 | 1.906 | 1.411 | 1.400 | 1.806 | 1.780 |
| Maximum | 4.118 | 3.924 | 4.637 | 4.330 | 1.527 | 1.816 | 3.594 | 3.515 |
| Stiffness [Msi] C.V.(%) | | | | | | | | |
| Stiffness [Msi] | | | | | | | | |
| No. Specimens | 18 | | 18 | | 6 | | 6 | |
| No. Prepreg Lots | 3 | | 3 | | 1 | | 1 | |

2.5.32 “10/80/10” Single-Shear Bearing 2, Proc. C Properties (SSB2)

| | | | | | | | |
|--|----------------------|--|-----------------|---|-----------------|--|--|
| Material: Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) Resin content: 33.08 %wt Fiber volume: 58.85 %vol Ply count: 20 Test method: ASTM D5961-17, Proc. C Normalized by: 0.005400 in. CPT | | Single-Shear Bearing 2 Proc. C Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) [45/-45/0/45/-45/90/45/-45/45/-45]S | | | | | |
| | | RTA | | ETA1 | | | |
| Test Temperature [°F] Moisture Conditioning Equilibrium at T, RH Source code prefixed by: NTP1226Q1-TC- | | 70 Ambient X-NIAR-T25-MST13-X-CX-1-SSB2-RTA-X | | 275 Ambient X-NIAR-T25-MST13-X-CX-1-SSB2-ETA1-X | | | |
| | | Normalized | Measured | Normalized | Measured | | |
| SSB2, Proc. C 2% Offset Strength [ksi] | Mean | 120.8 | 119.5 | 96.50 | 95.75 | | |
| | Minimum | 109.2 | 109.2 | 88.74 | 88.19 | | |
| | Maximum | 127.8 | 124.8 | 101.6 | 103.4 | | |
| | C.V.(%) | 3.605 | 3.131 | 3.546 | 4.431 | | |
| | No. Specimens | 18 | | 18 | | | |
| No. Prepreg Lots | 3 | | 3 | | | | |
| SSB2, Proc. C Ultimate Strength [ksi] | Mean | 144.8 | 143.3 | 114.5 | 113.6 | | |
| | Minimum | 138.5 | 137.0 | 105.6 | 105.3 | | |
| | Maximum | 153.2 | 150.1 | 119.9 | 121.3 | | |
| | C.V.(%) | 2.804 | 2.839 | 3.383 | 3.818 | | |
| | No. Specimens | 18 | | 18 | | | |
| No. Prepreg Lots | 3 | | 3 | | | | |
| SSB2, Proc. C Stiffness [Msi] | Mean | 1.369 | 1.354 | 1.194 | 1.184 | | |
| | Minimum | 1.299 | 1.302 | 1.018 | 1.011 | | |
| | Maximum | 1.425 | 1.390 | 1.273 | 1.262 | | |
| | C.V.(%) | 2.847 | 1.964 | 5.836 | 5.572 | | |
| | No. Specimens | 18 | | 18 | | | |
| No. Prepreg Lots | 3 | | 3 | | | | |

2.5.33 “50/40/10” Single-Shear Bearing 3, Proc. C Properties (SSB3)

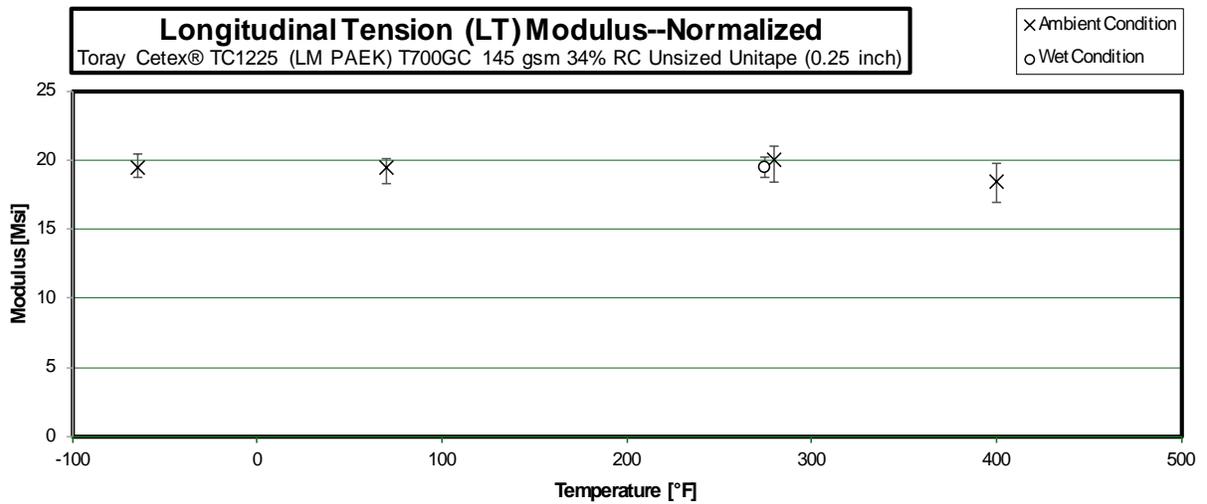
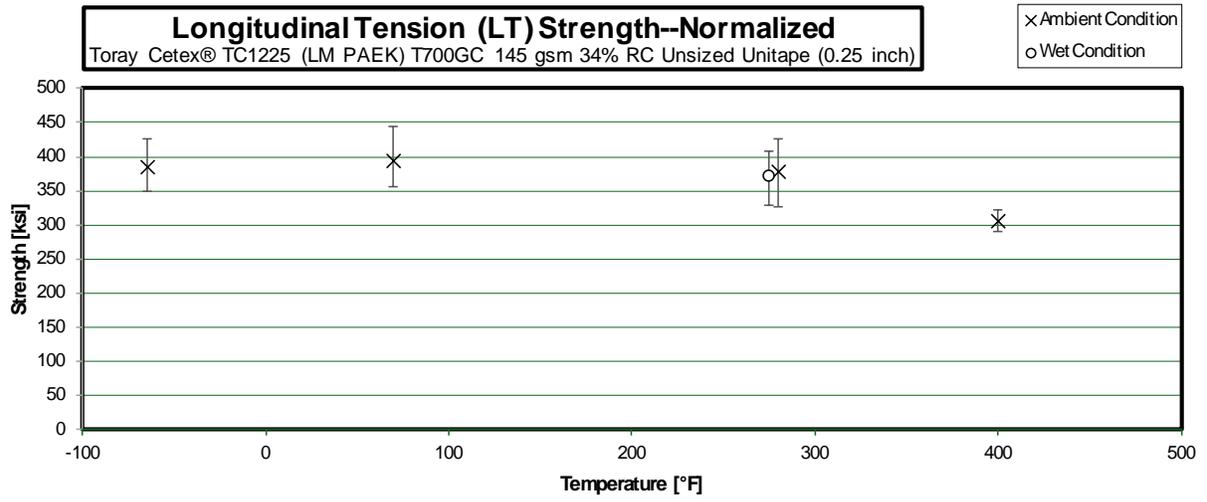
| | | | | | | | |
|---|----------------------------------|---|-----------------|---|-----------------|--|--|
| Material: Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) | | | | | | Single-Shear Bearing 3 Proc. C Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) [0/45/0/90/0/-45/0/45/0/-45]S | |
| Resin content: 32.88 %wt Fiber volume: 59.11 %vol Ply count: 20 | Comp. density: 1.576 g/cc | | | | | | |
| Test method: ASTM D5961-17, Proc. C | | | | | | | |
| Normalized by: 0.005400 in. CPT | | | | | | | |
| | | RTA | | ETA1 | | | |
| Test Temperature [°F] Moisture Conditioning Equilibrium at T, RH Source code prefixed by: NTP1226Q1-TC- | | 70 Ambient X-NIAR-T25-MST16-X-CX-1- SSB3-RTA-X | | 275 Ambient X-NIAR-T25-MST16-X-CX-1- SSB3-ETA1-X | | | |
| | | Normalized | Measured | Normalized | Measured | | |
| SSB3, Proc. C 2% Offset Strength [ksi] | | Mean | 123.3 | 121.5 | 98.08 | 96.66 | |
| | | Minimum | 112.5 | 113.9 | 91.18 | 92.11 | |
| | | Maximum | 131.0 | 127.5 | 104.8 | 107.5 | |
| | | C.V.(%) | 3.892 | 3.577 | 3.872 | 4.510 | |
| | | No. Specimens | 18 | | 18 | | |
| SSB3, Proc. C Ultimate Strength [ksi] | | Mean | 143.2 | 141.2 | 112.4 | 110.8 | |
| | | Minimum | 136.4 | 135.4 | 108.3 | 105.2 | |
| | | Maximum | 148.8 | 152.6 | 116.2 | 118.0 | |
| | | C.V.(%) | 2.545 | 2.897 | 2.075 | 2.885 | |
| | | No. Specimens | 18 | | 18 | | |
| SSB3, Proc. C Stiffness [Msi] | | Mean | 2.056 | 2.026 | 1.941 | 1.913 | |
| | | Minimum | 1.928 | 1.866 | 1.841 | 1.796 | |
| | | Maximum | 2.182 | 2.152 | 2.070 | 2.121 | |
| | | C.V.(%) | 3.187 | 3.586 | 3.593 | 4.417 | |
| | | No. Specimens | 18 | | 18 | | |
| | | No. Prepreg Lots | 3 | | 3 | | |

3. Individual Test Charts

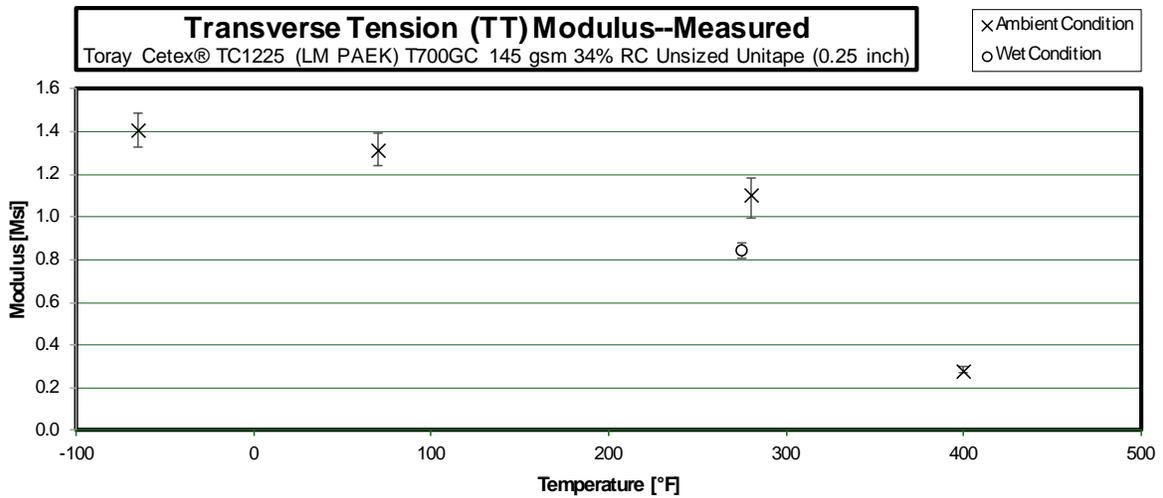
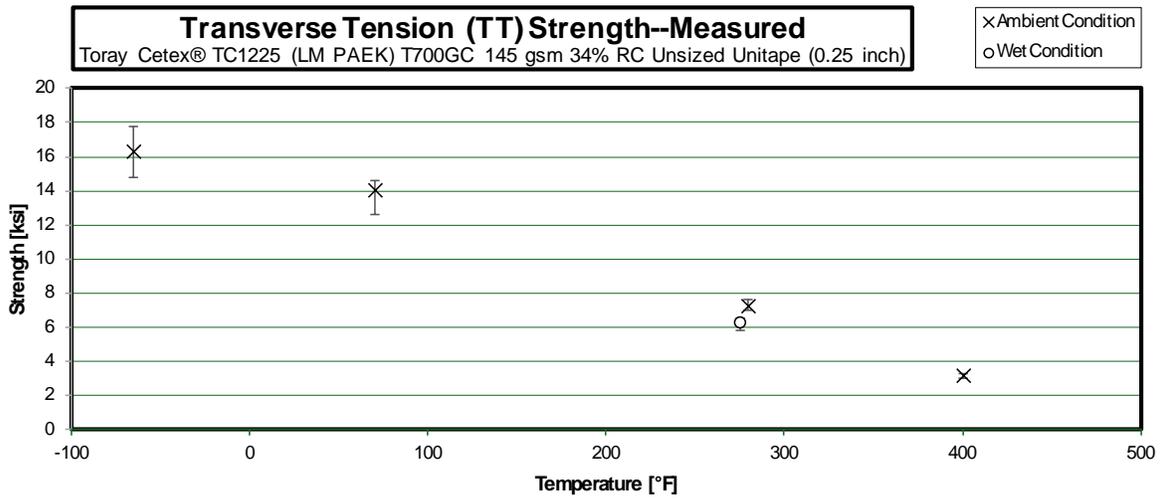
The material property test charts display a combination of all three batches and both consolidation cycles for a particular property as a function of test temperature for dry and wet test conditions. The average is plotted for each material property and the minimum to maximum range is represented by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

Plots for ETA1 have been offset to 280°F (from 275°F) to improve clarity and readability.

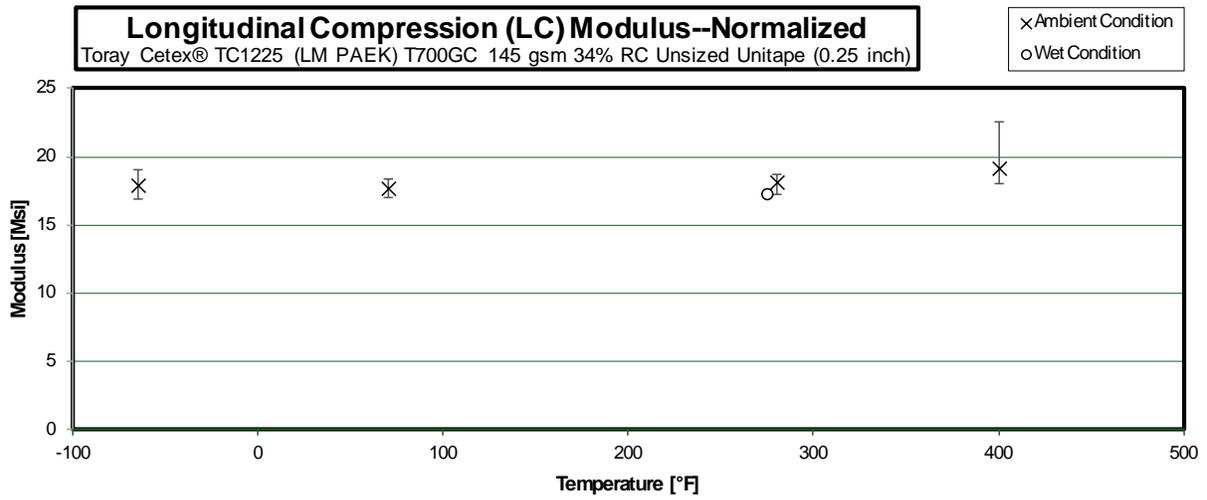
3.1 Longitudinal Tension Properties (LT)



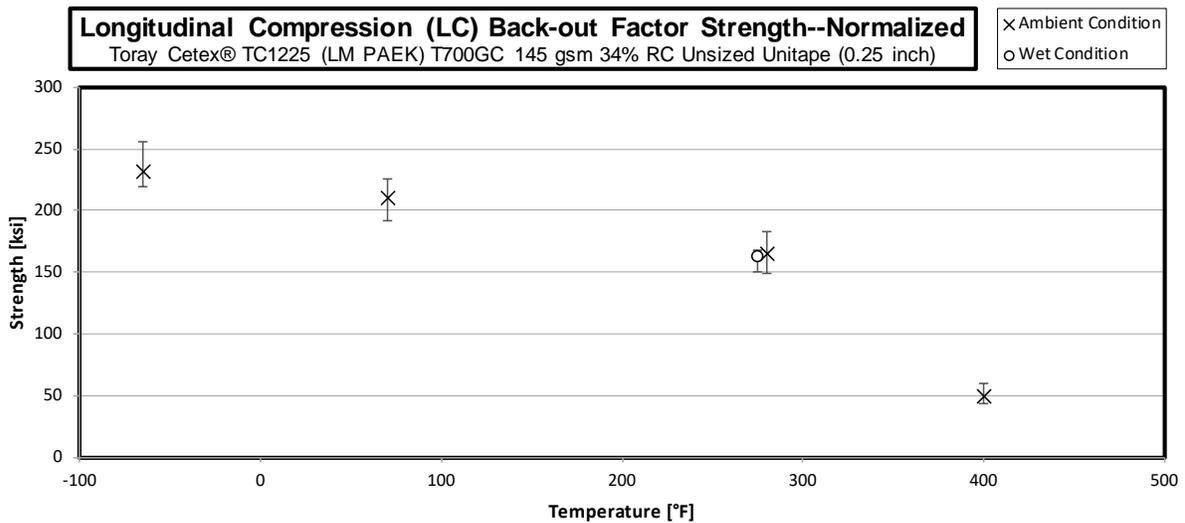
3.2 Transverse Tension Properties (TT)



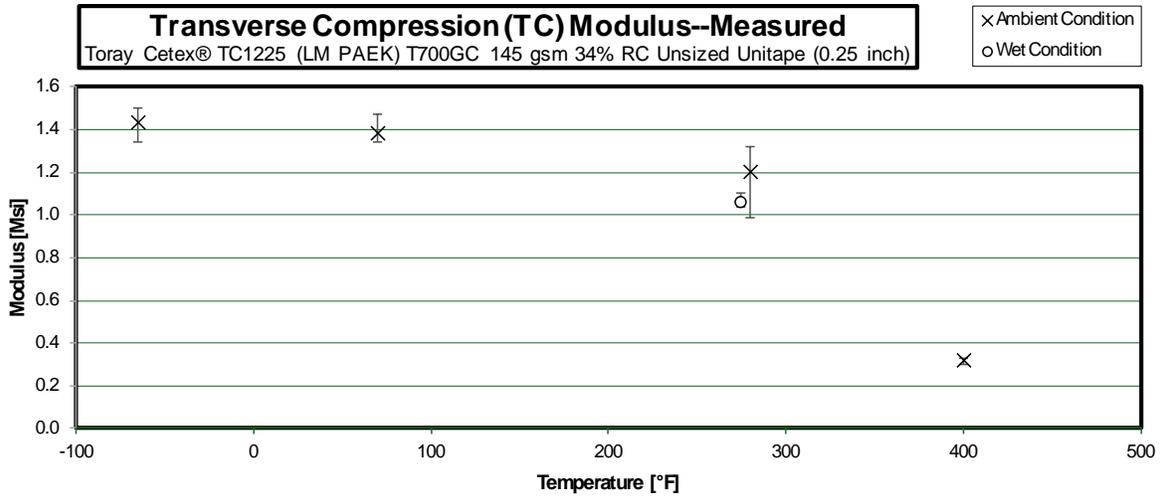
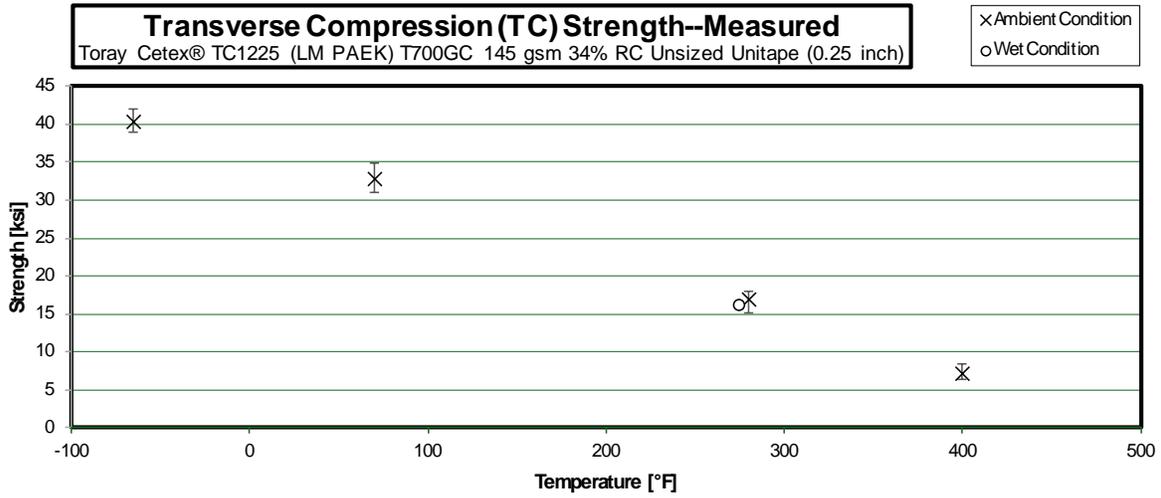
3.3 Longitudinal Compression Properties (LC)



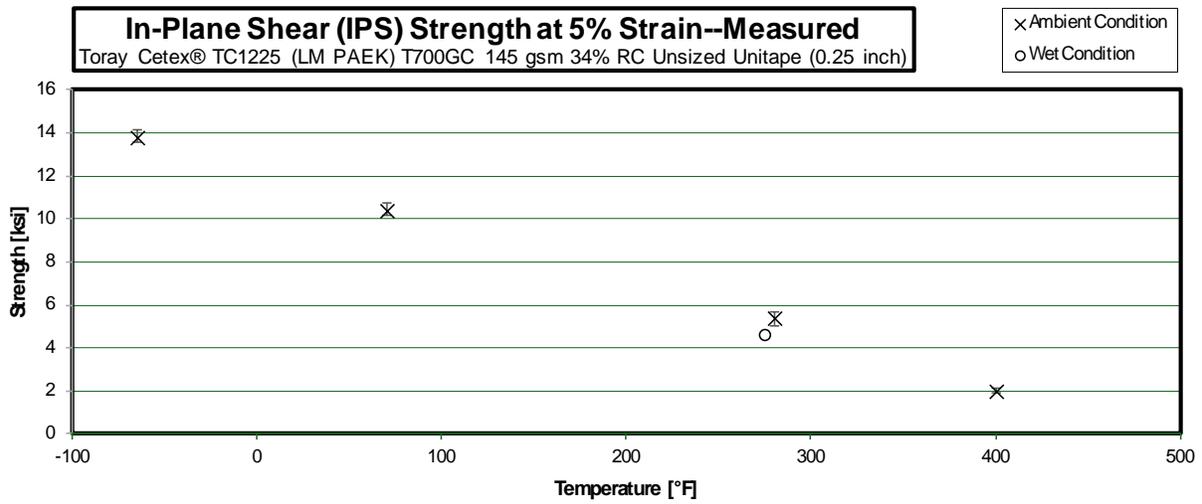
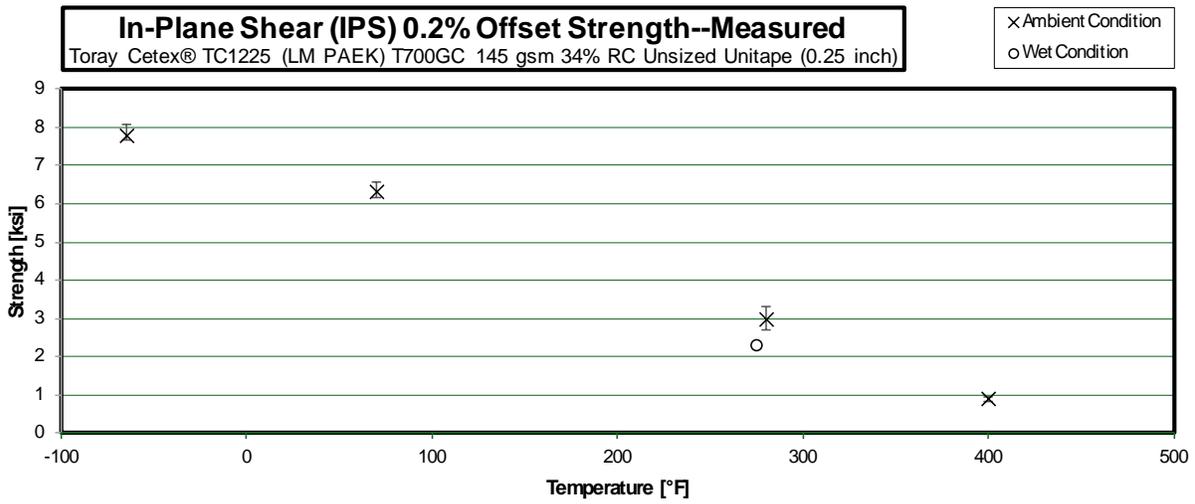
3.4 Longitudinal Compression Back-out Factor Properties

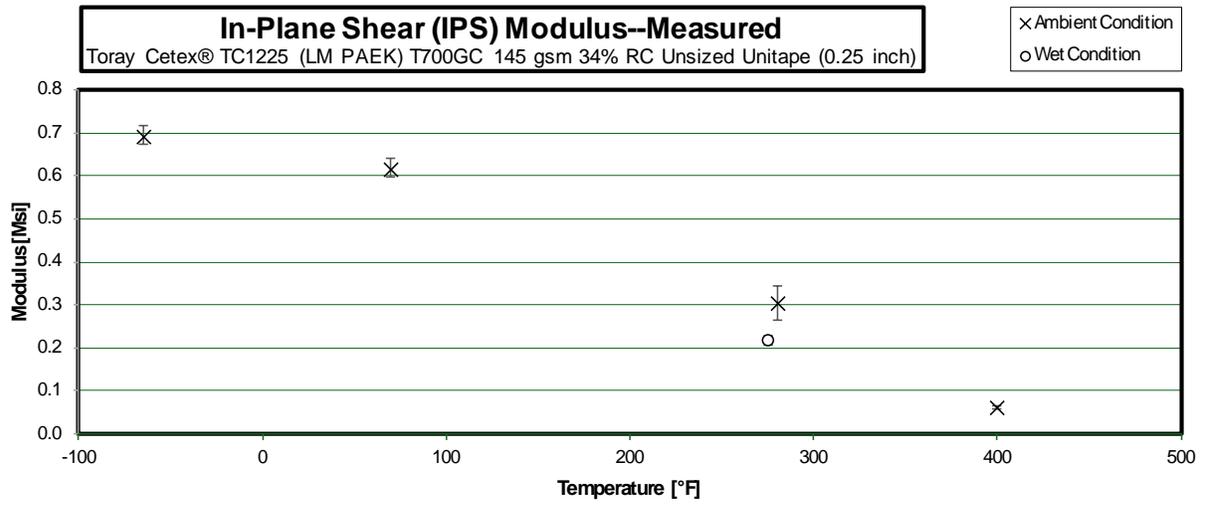


3.5 Transverse Compression Properties (TC)

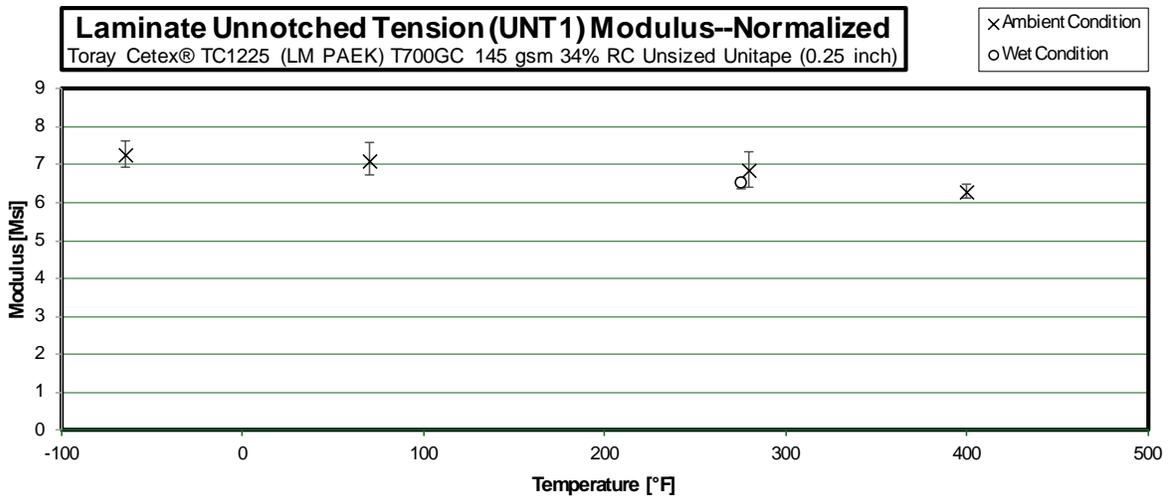
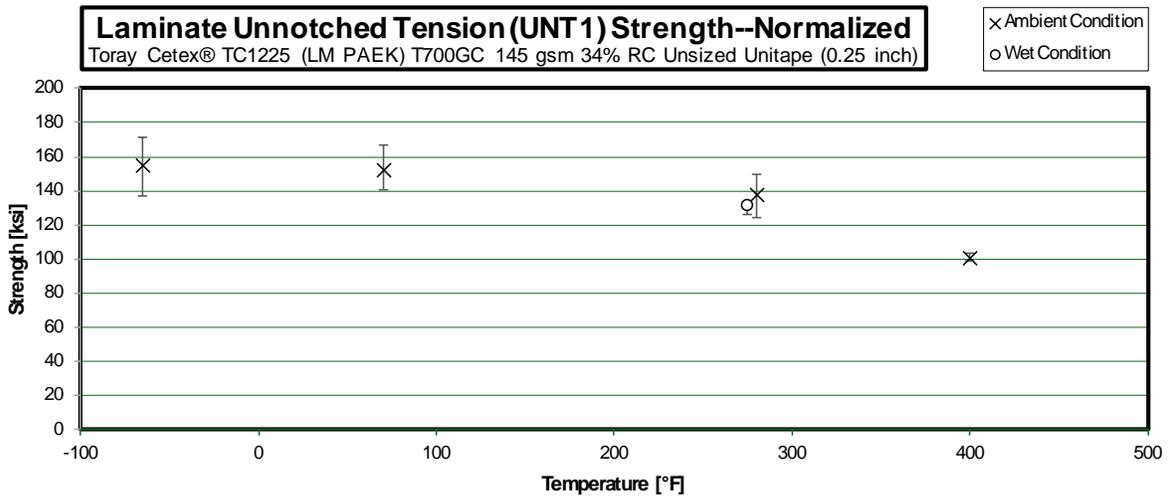


3.6 In-Plane Shear Properties (IPS)

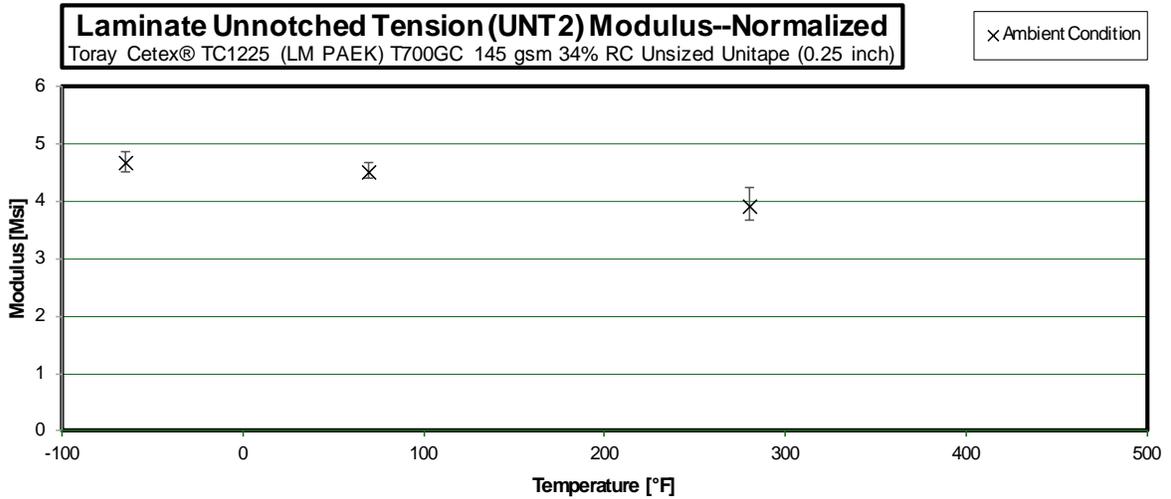
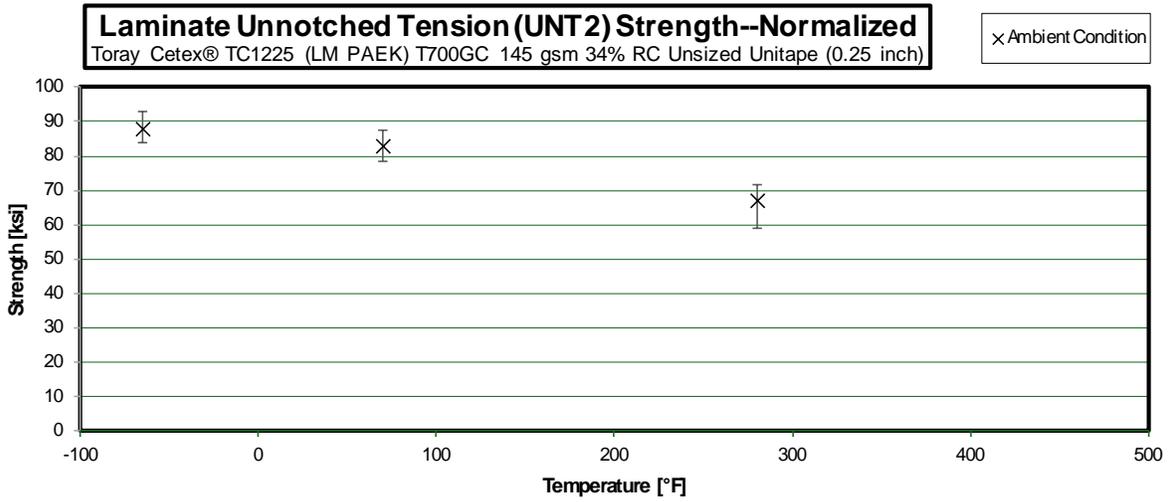




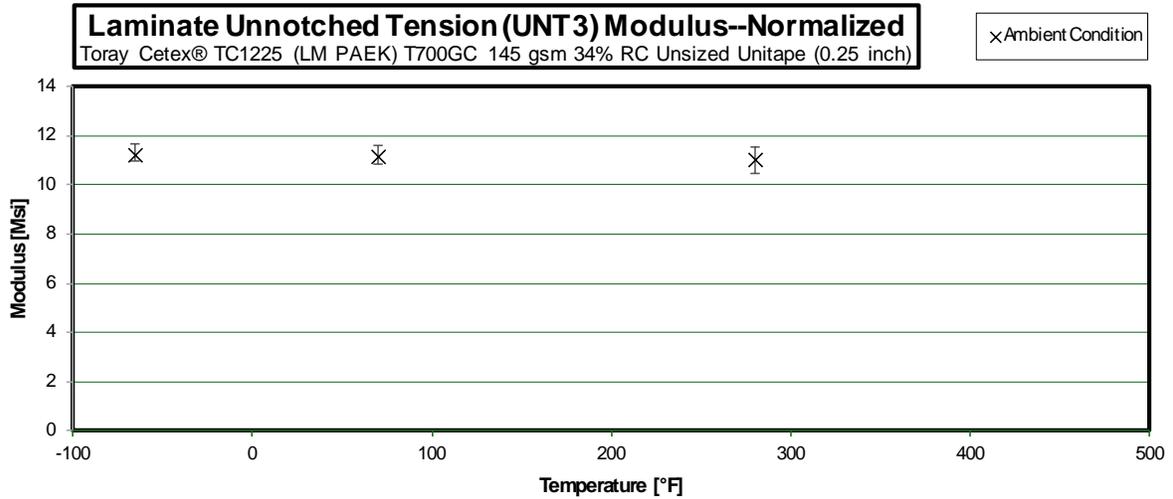
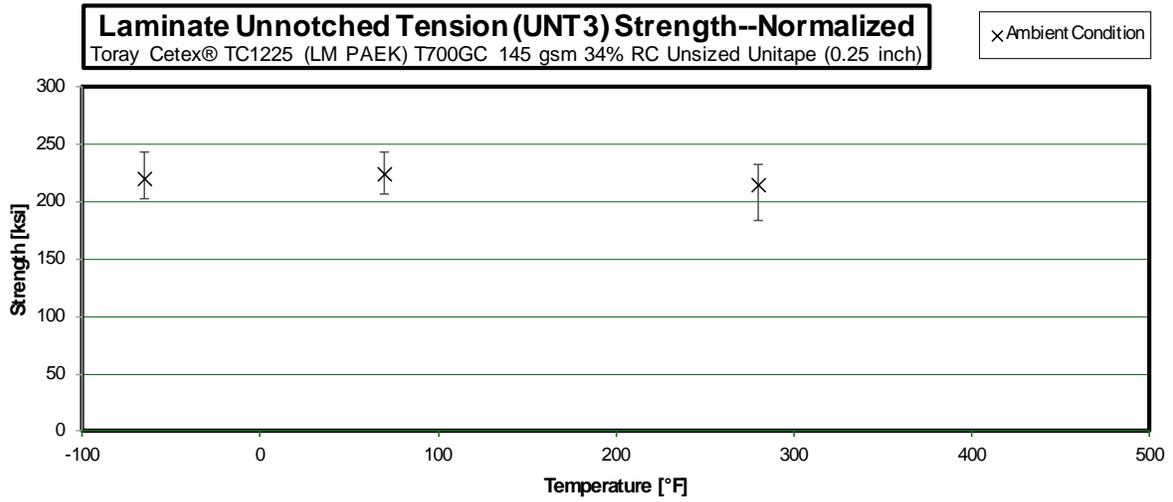
3.7 “25/50/25” Unnotched Tension 1 Properties (UNT1)



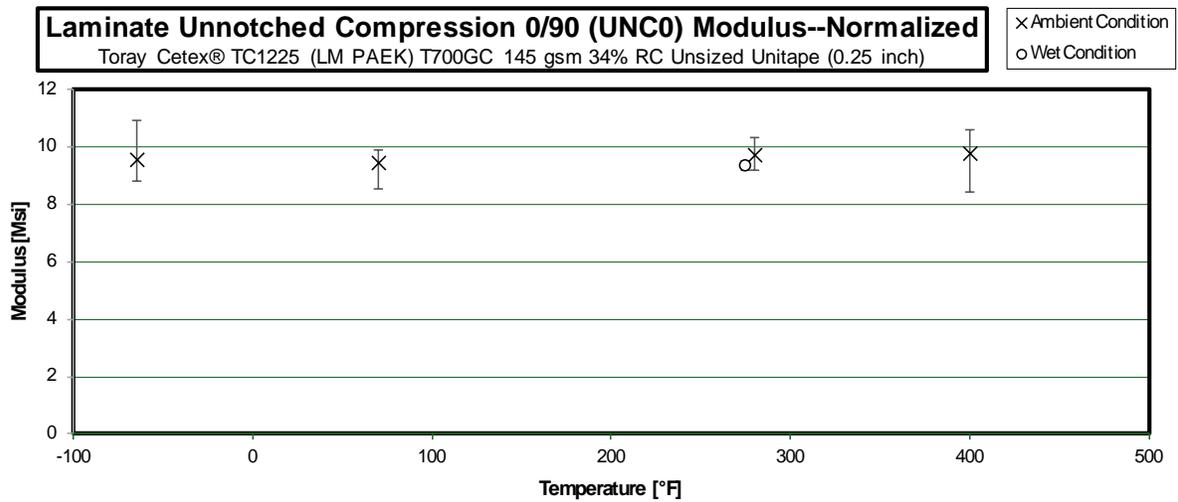
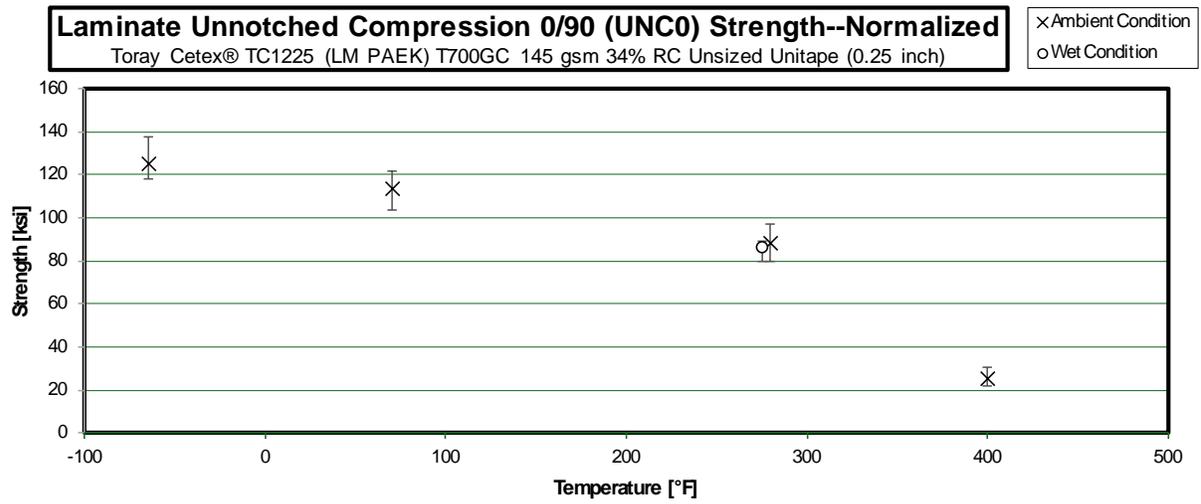
3.8 “10/80/10” Unnotched Tension 2 Properties (UNT2)



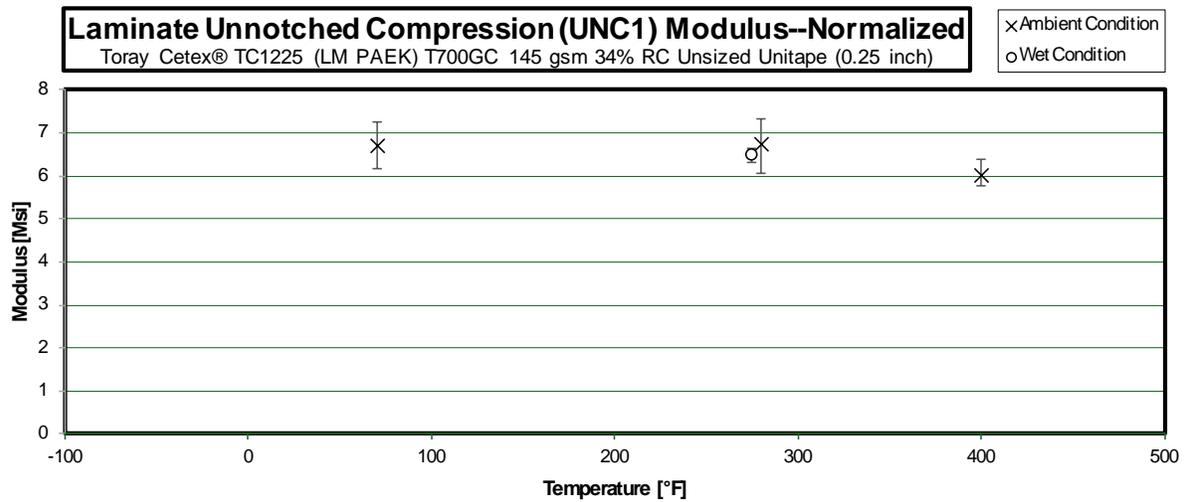
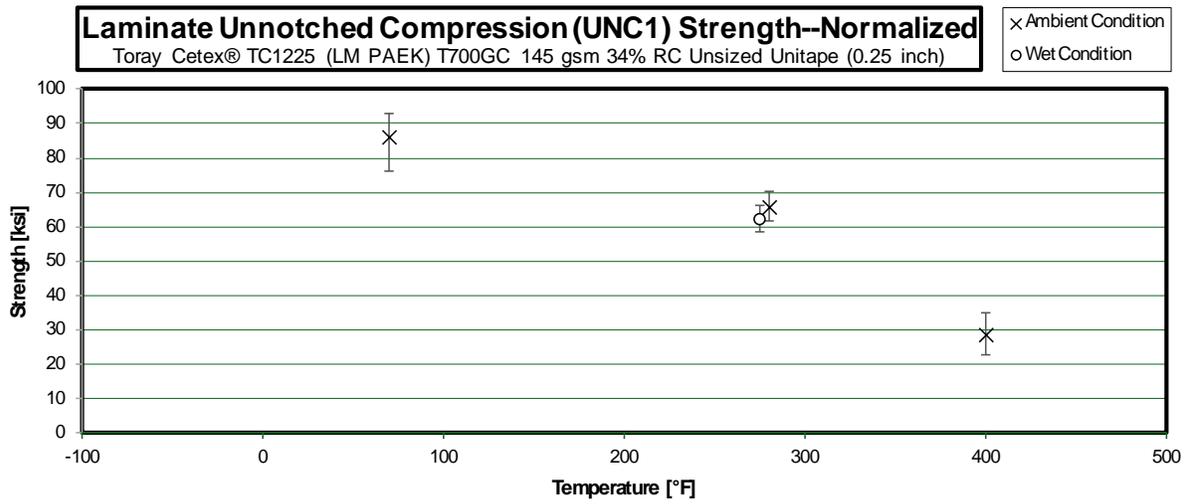
3.9 “50/40/10” Unnotched Tension 3 Properties (UNT3)



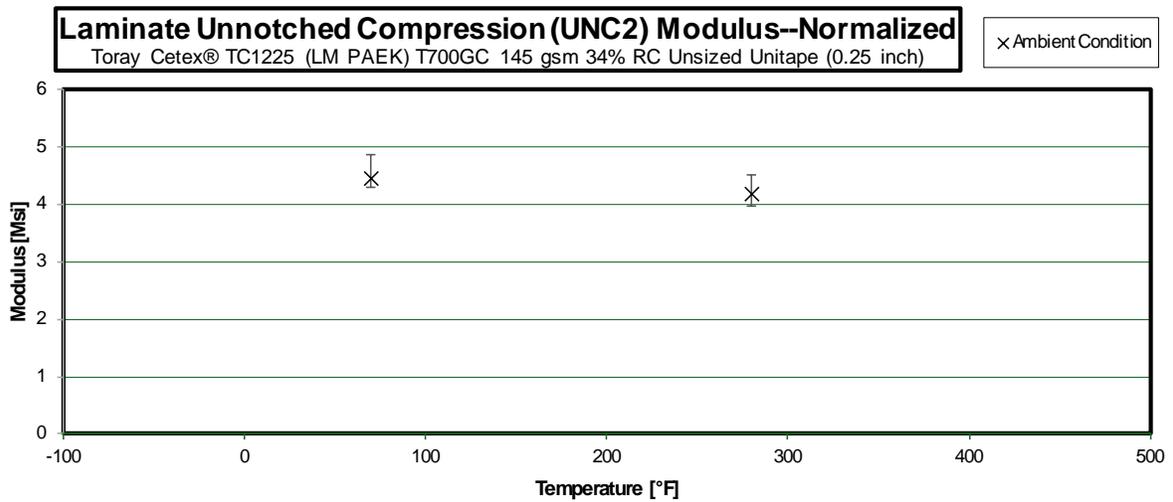
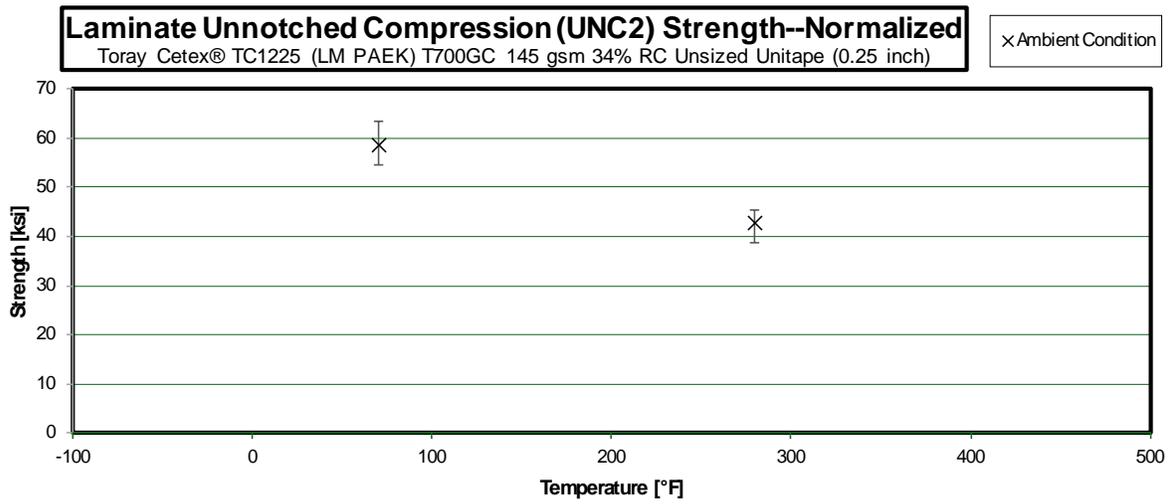
3.10 “50/0/50” Unnotched Compression 0/90 Properties (UNC0)



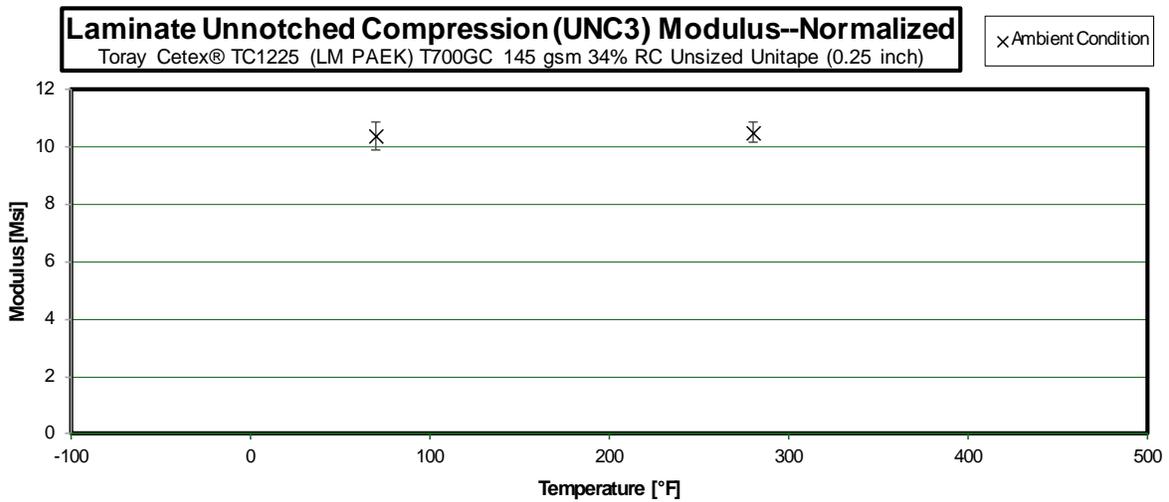
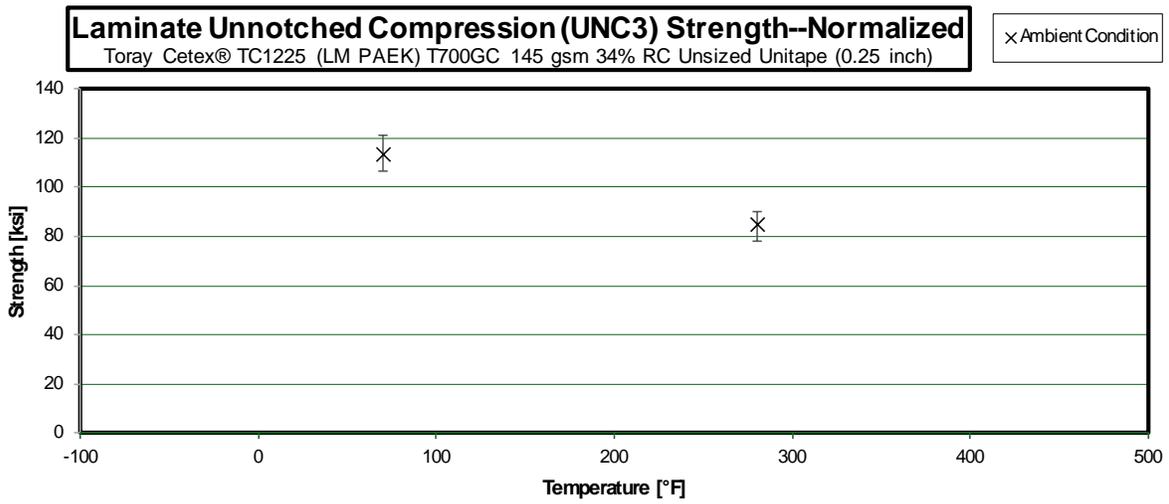
3.11 “25/50/25” Unnotched Compression 1 Properties (UNC1)



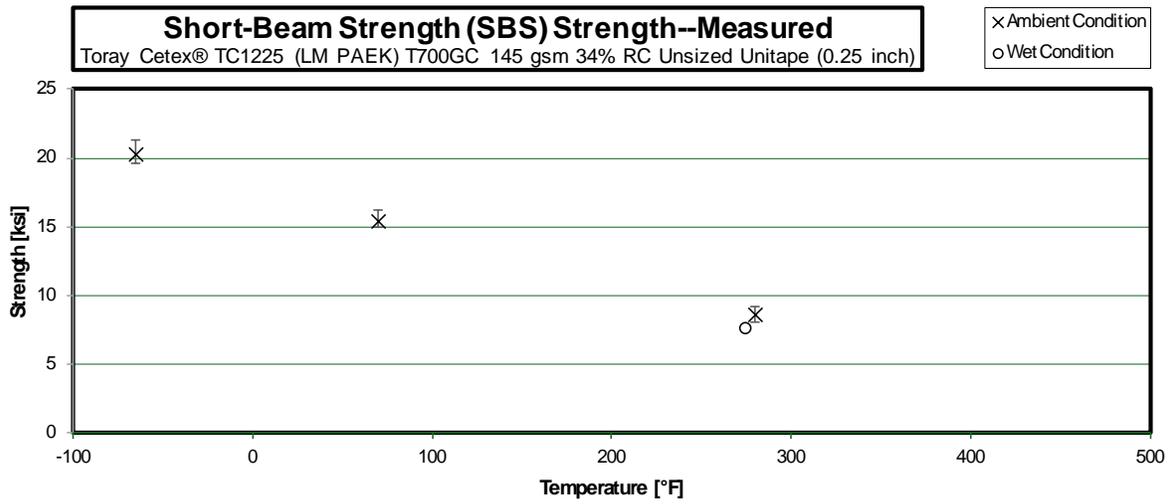
3.12 “10/80/10” Unnotched Compression 2 Properties (UNC2)



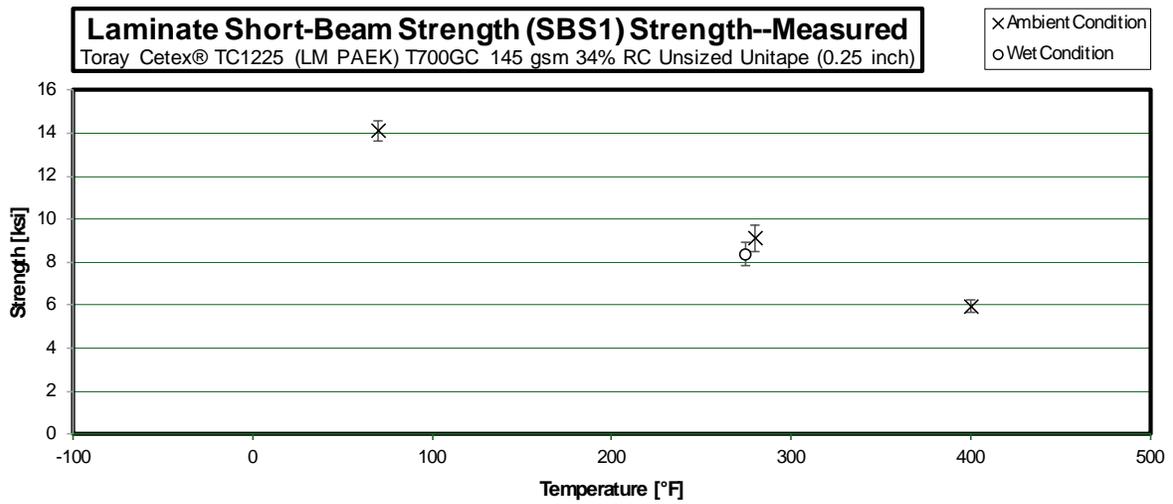
3.13 “50/40/10” Unnotched Compression 3 Properties (UNC3)



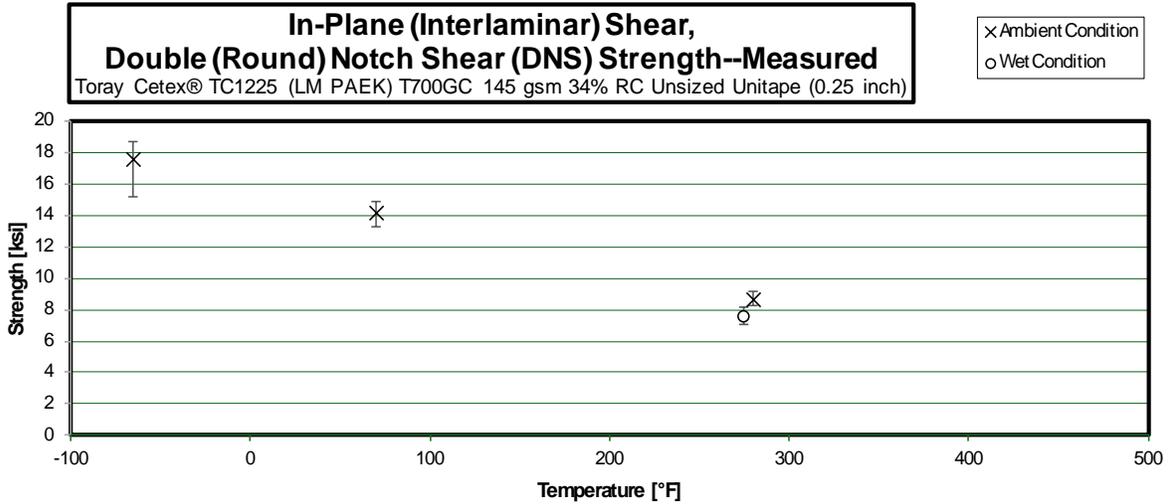
3.14 Lamina Short-Beam Strength Properties (SBS)



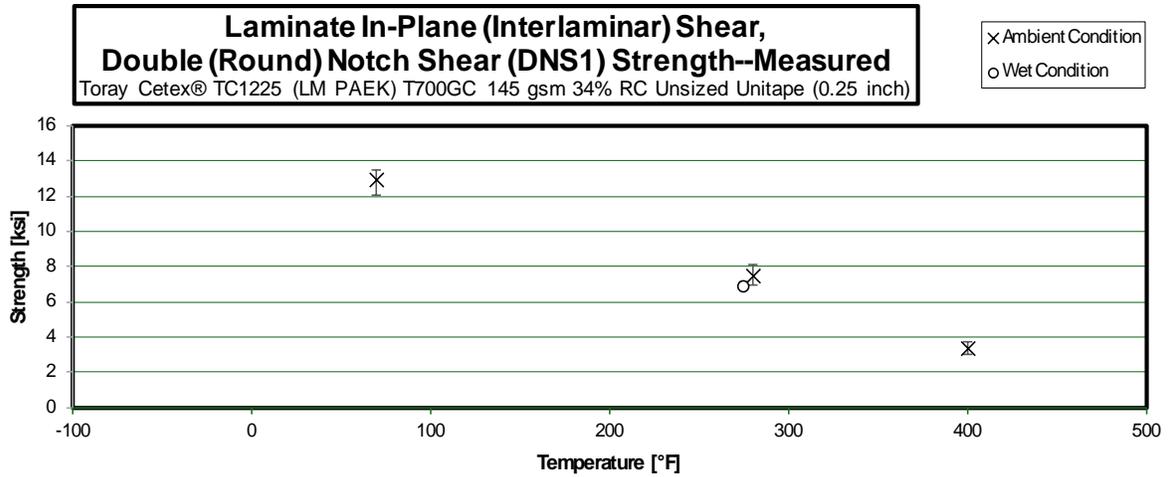
3.15 Laminate Short-Beam Strength Properties (SBS1)



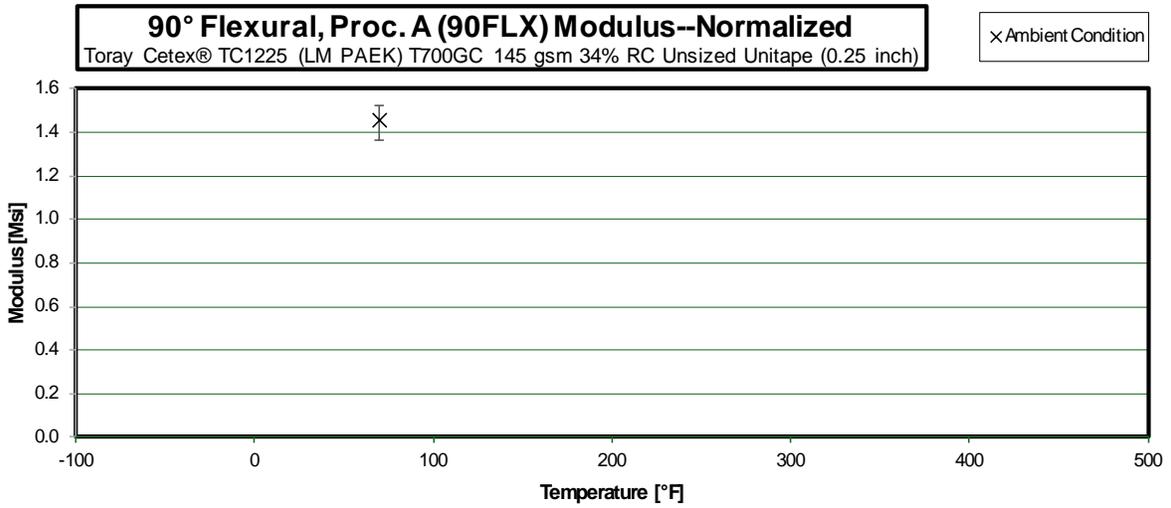
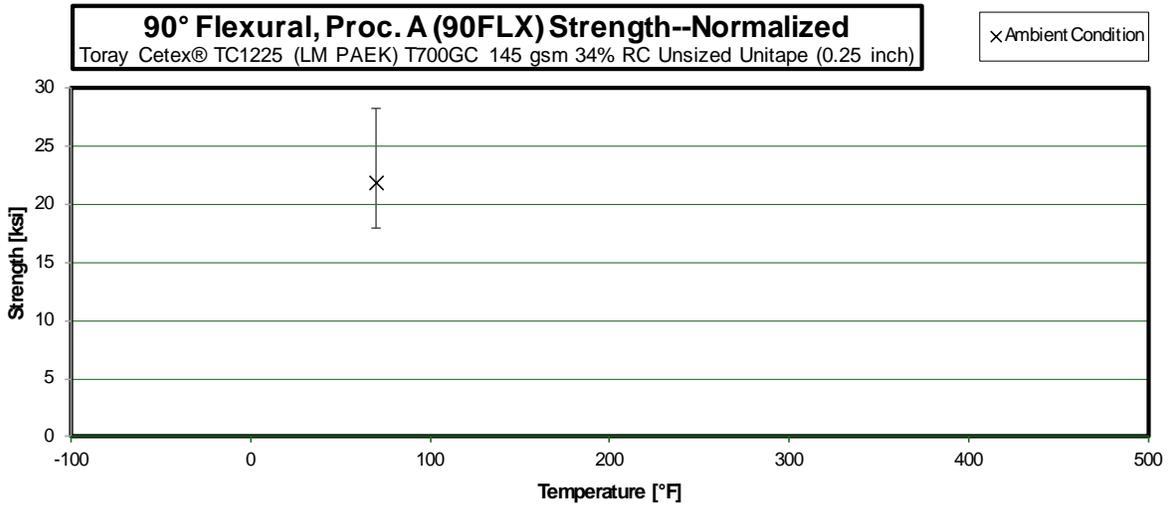
3.16 In-Plane (Interlaminar) Shear, Double (Round) Notch Shear Properties (DNS)



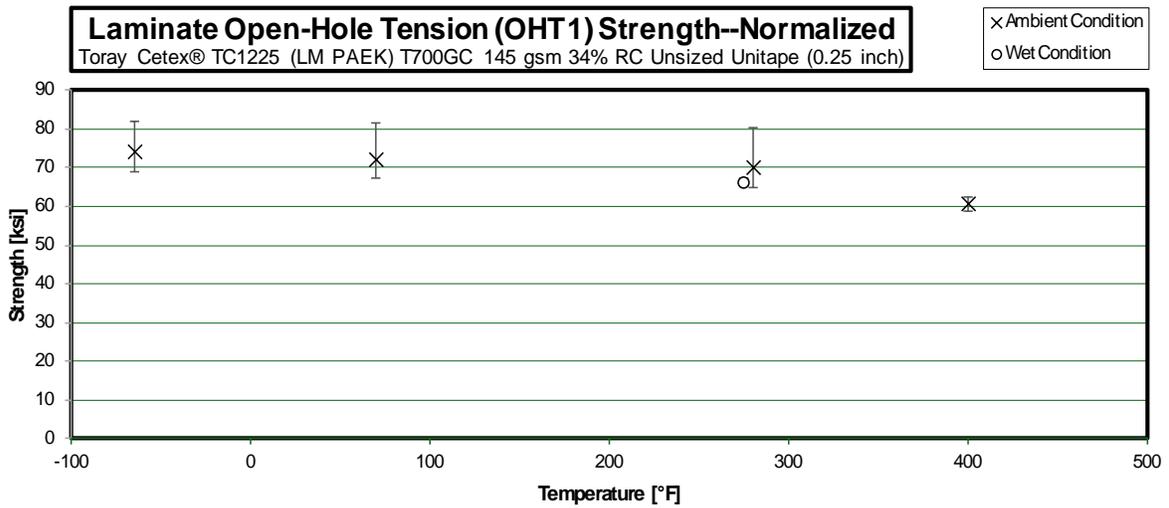
3.17 Laminate In-Plane (Interlaminar) Shear, Double (Round) Notch Shear Properties (DNS1)



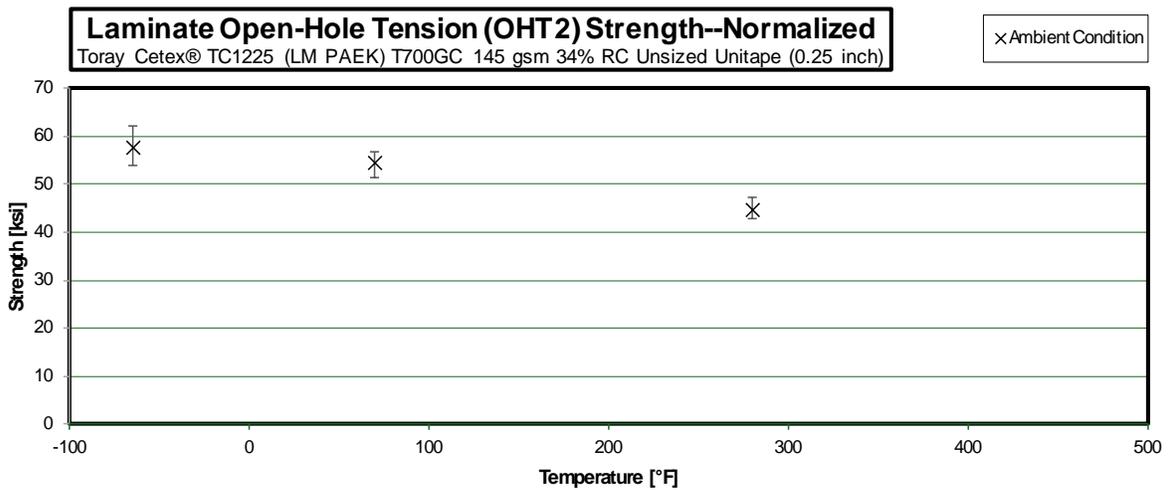
3.18 90° Flexural Strength, Proc. A Properties (90FLX)



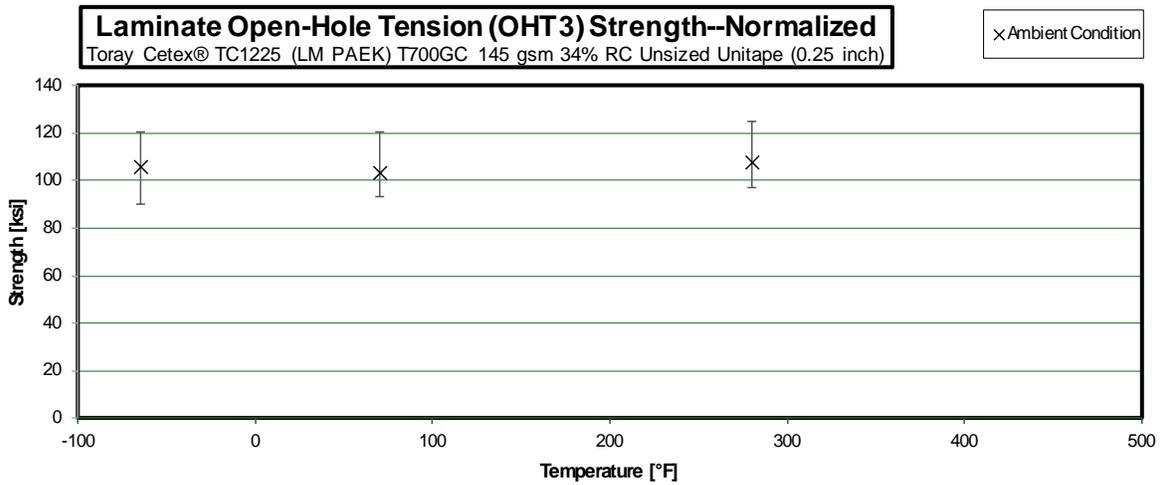
3.19 “25/50/25” Open-Hole Tension 1 Properties (OHT1)



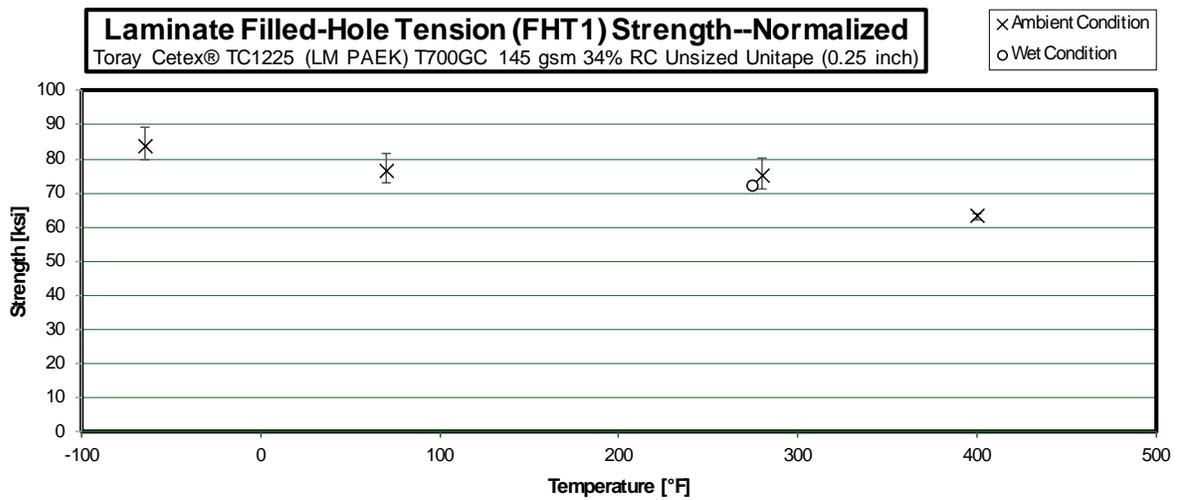
3.20 “10/80/10” Open-Hole Tension 2 Properties (OHT2)



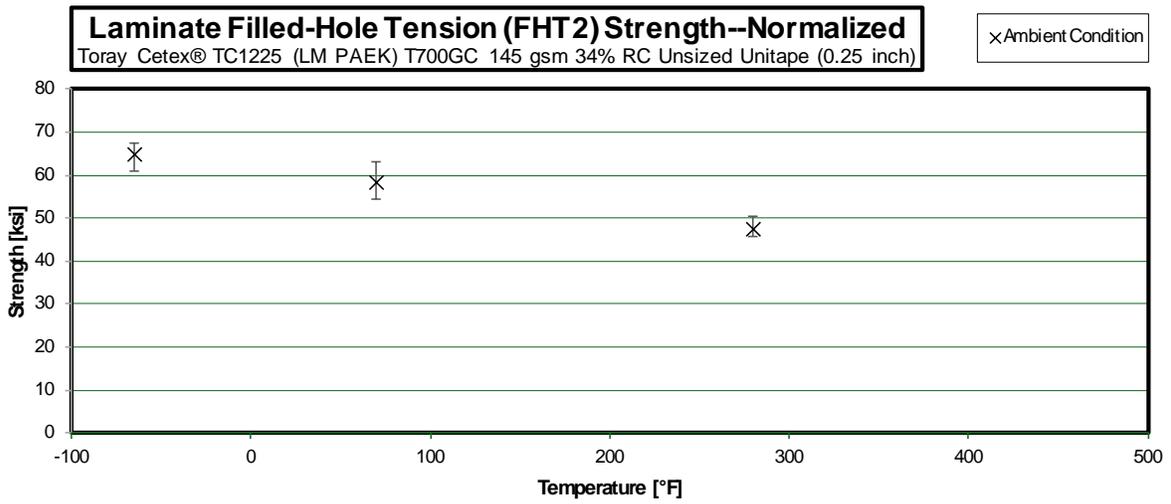
3.21 “50/40/10” Open-Hole Tension 3 Properties (OHT3)



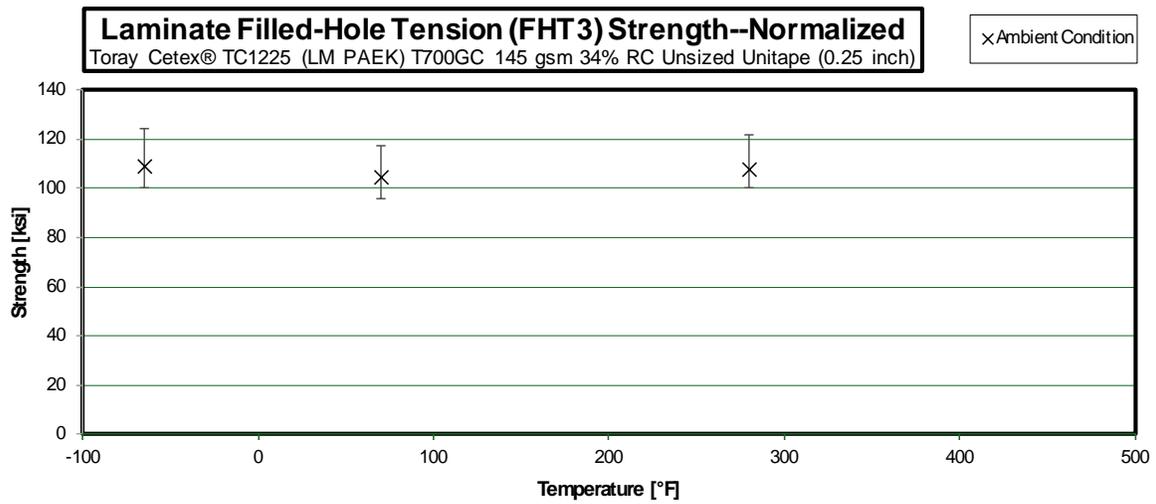
3.22 “25/50/25” Filled-Hole Tension 1 Properties (FHT1)



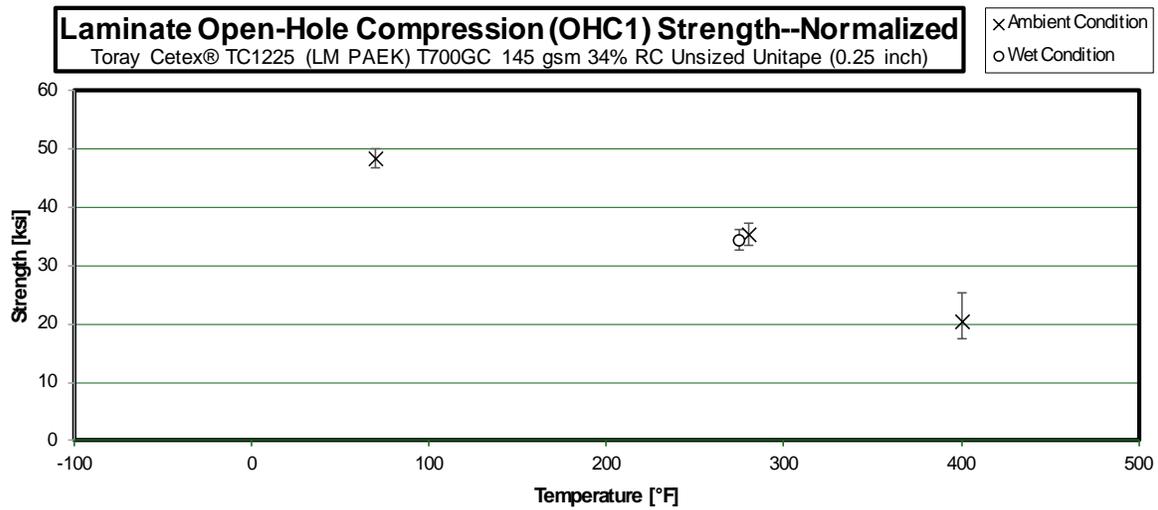
3.23 “10/80/10” Filled-Hole Tension 2 Properties (FHT2)



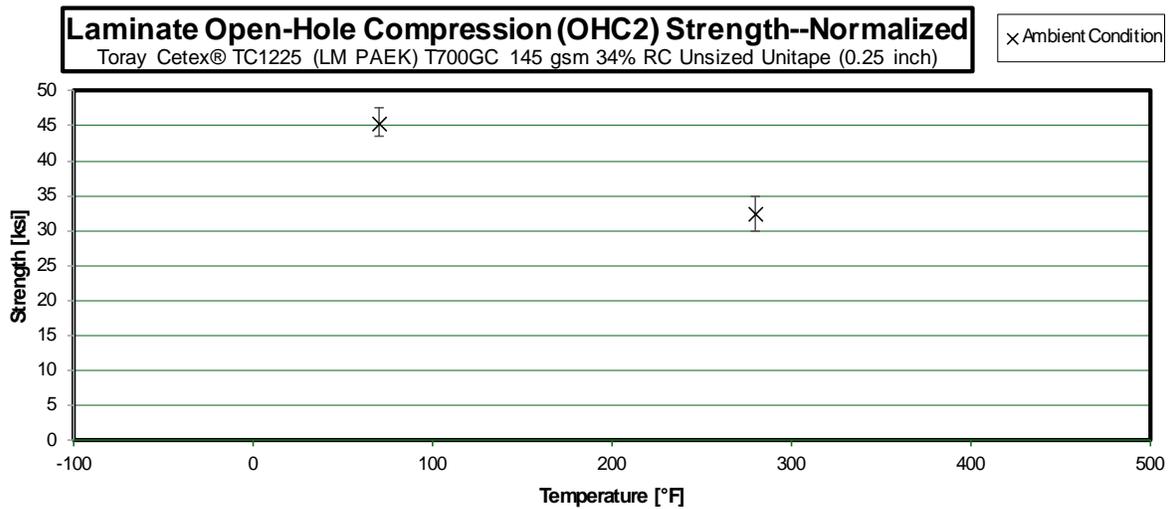
3.24 “50/40/10” Filled-Hole Tension 3 Properties (FHT3)



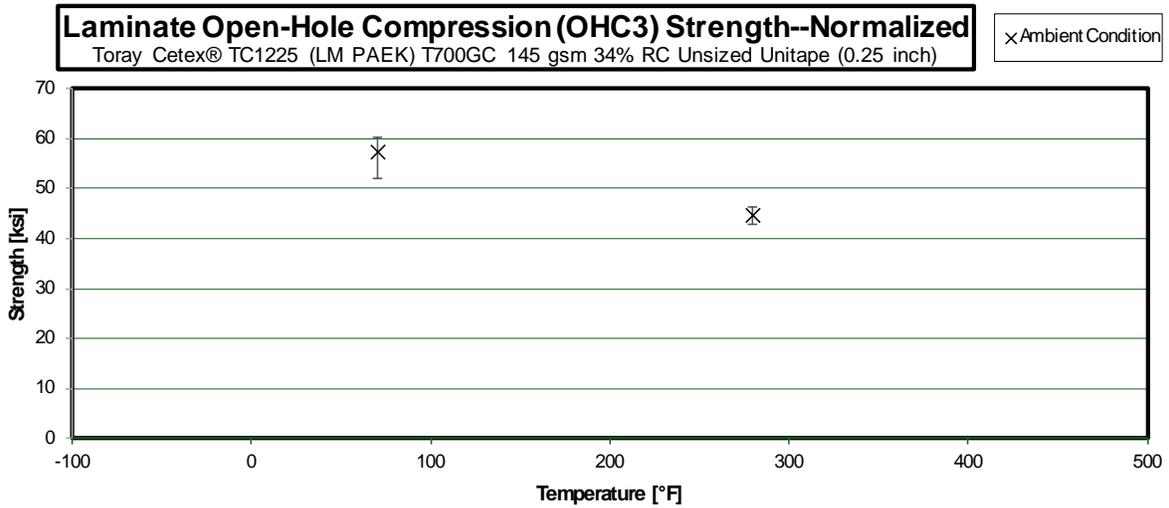
3.25 “25/50/25” Open-Hole Compression 1 Properties (OHC1)



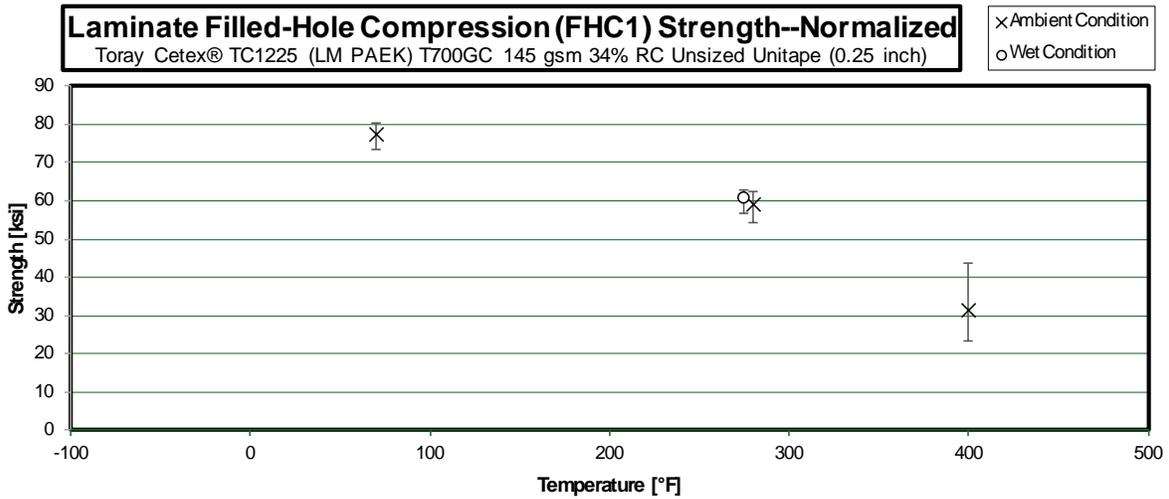
3.26 “10/80/10” Open-Hole Compression 2 Properties (OHC2)



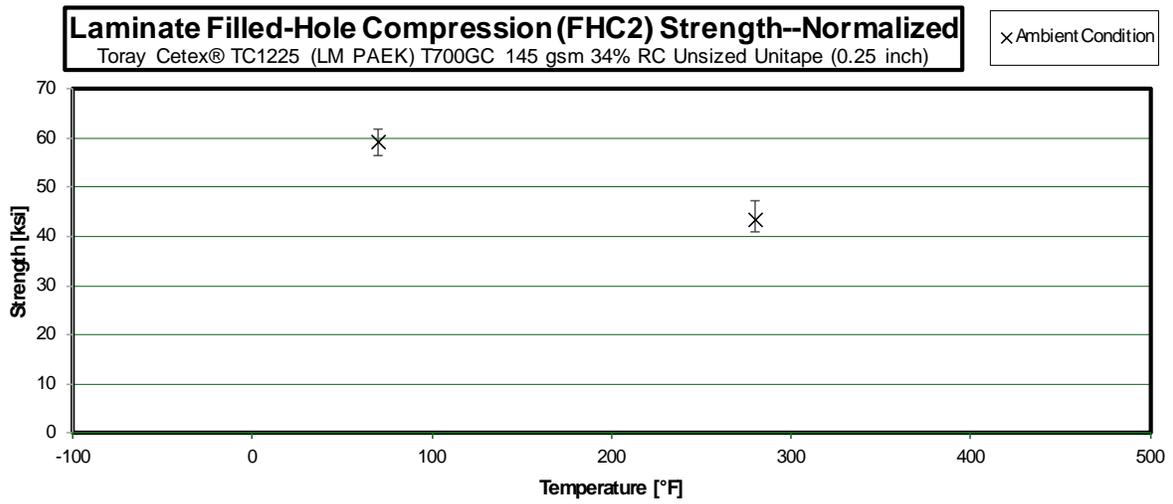
3.27 “50/40/10” Open-Hole Compression 3 Properties (OHC3)



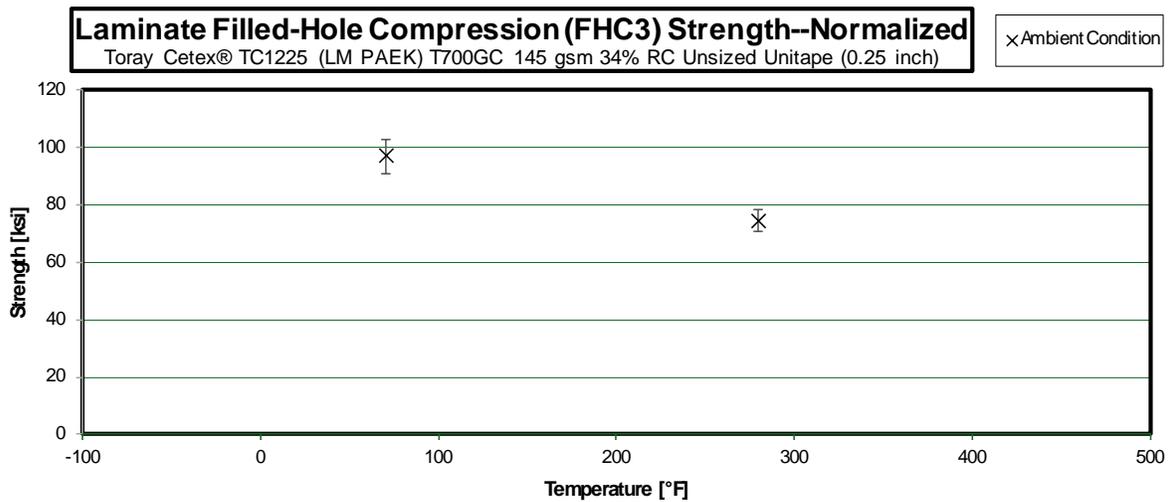
3.28 “25/50/25” Filled-Hole Compression 1 Properties (FHC1)



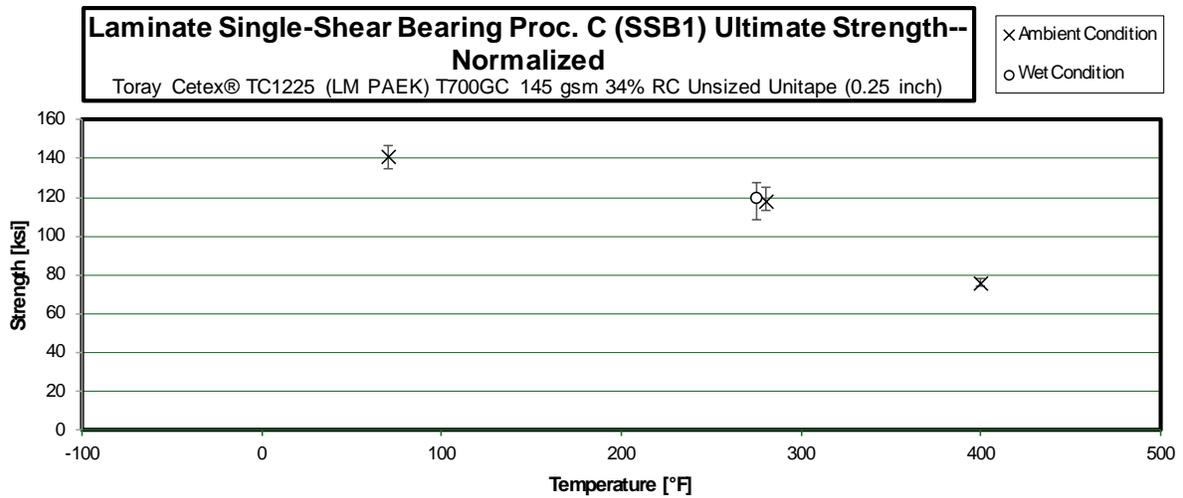
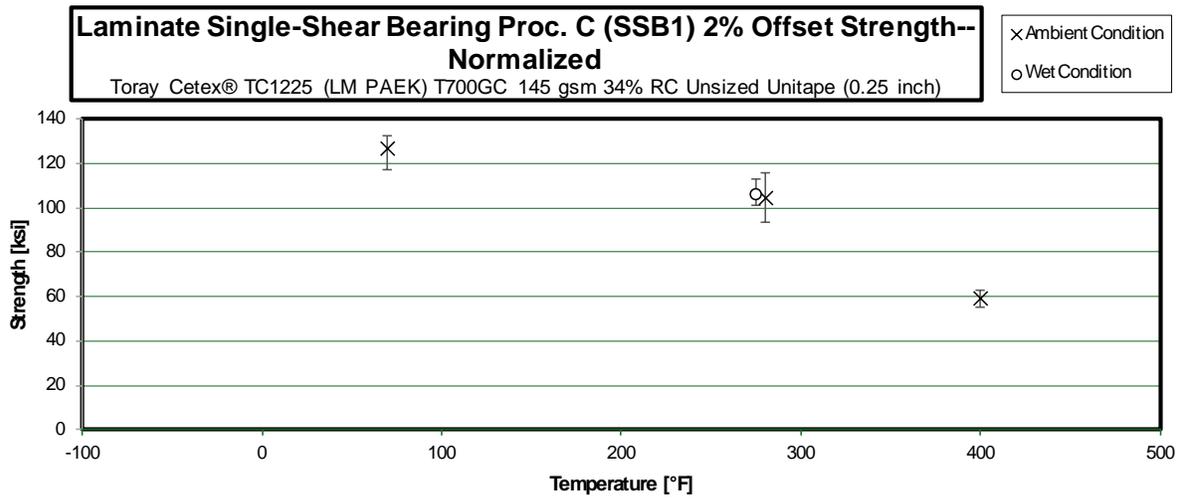
3.29 “10/80/10” Filled-Hole Compression 2 Properties (FHC2)

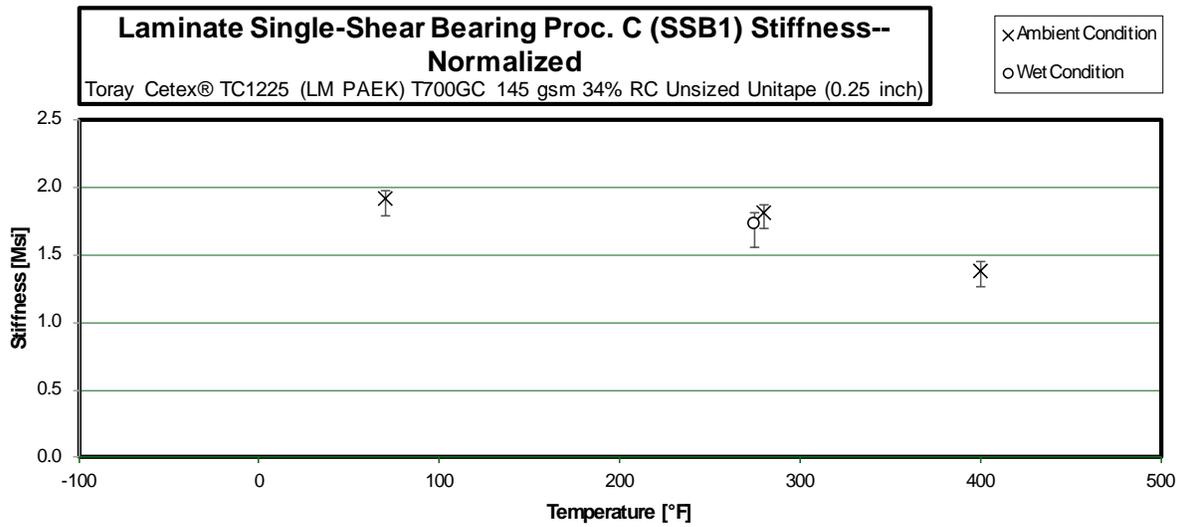


3.30 “50/40/10” Filled-Hole Compression 3 Properties (FHC3)

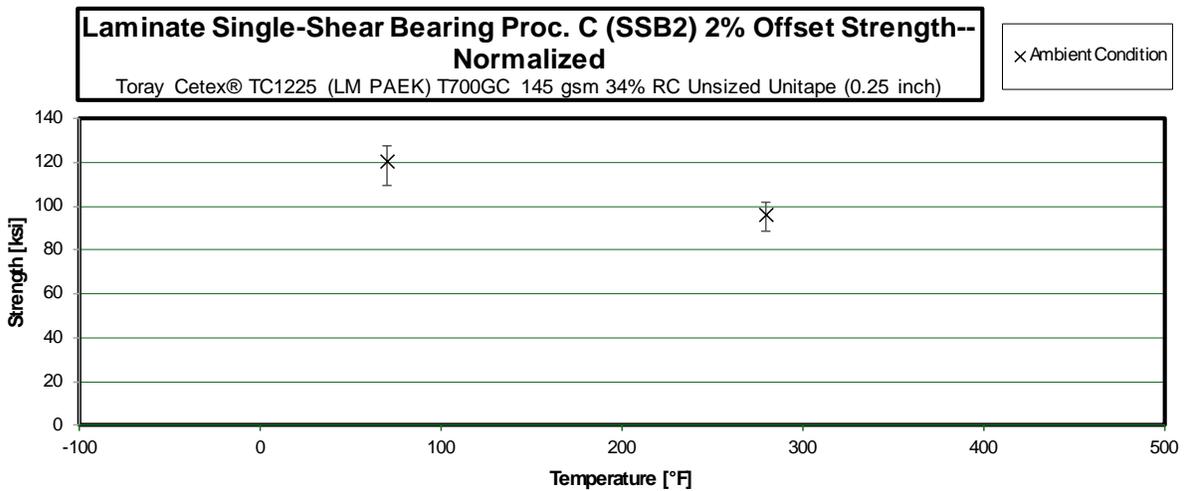


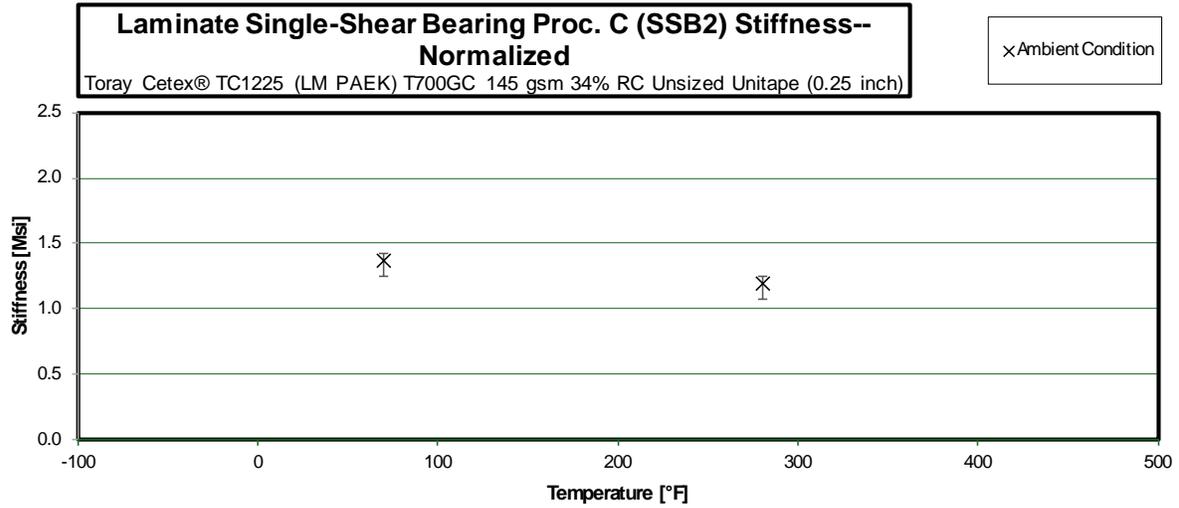
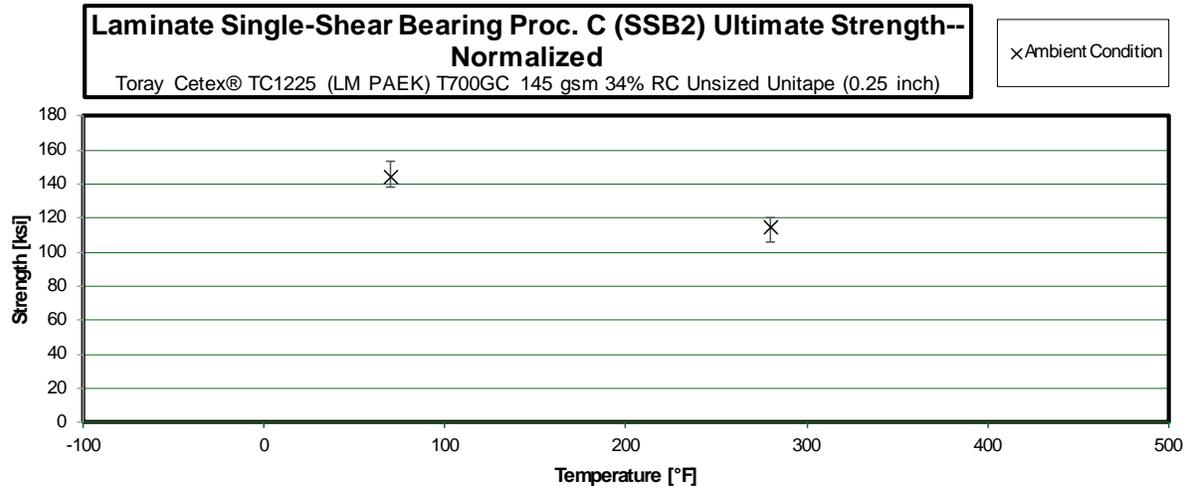
3.31 “25/50/25” Single-Shear Bearing 1, Proc. C Properties (SSB1)



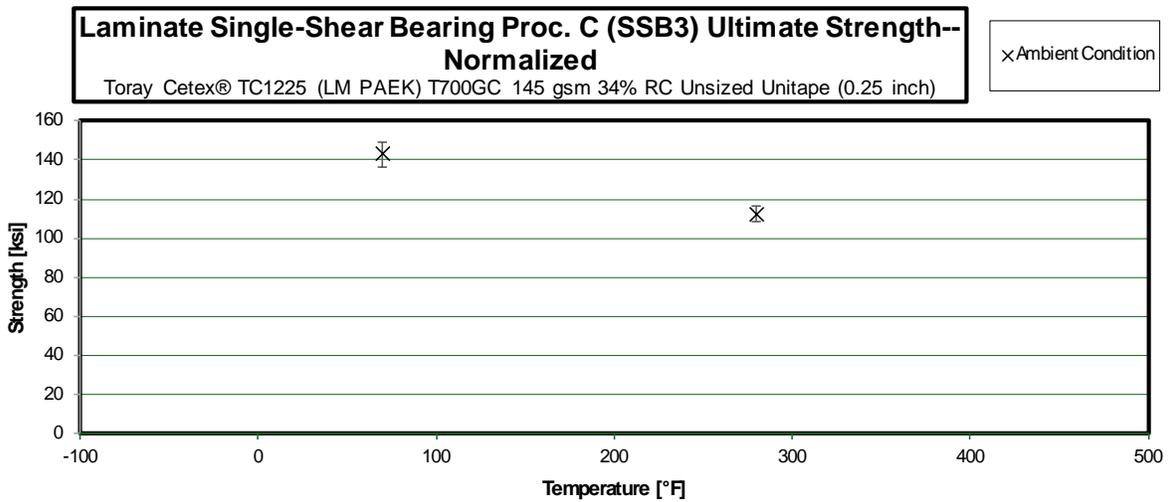
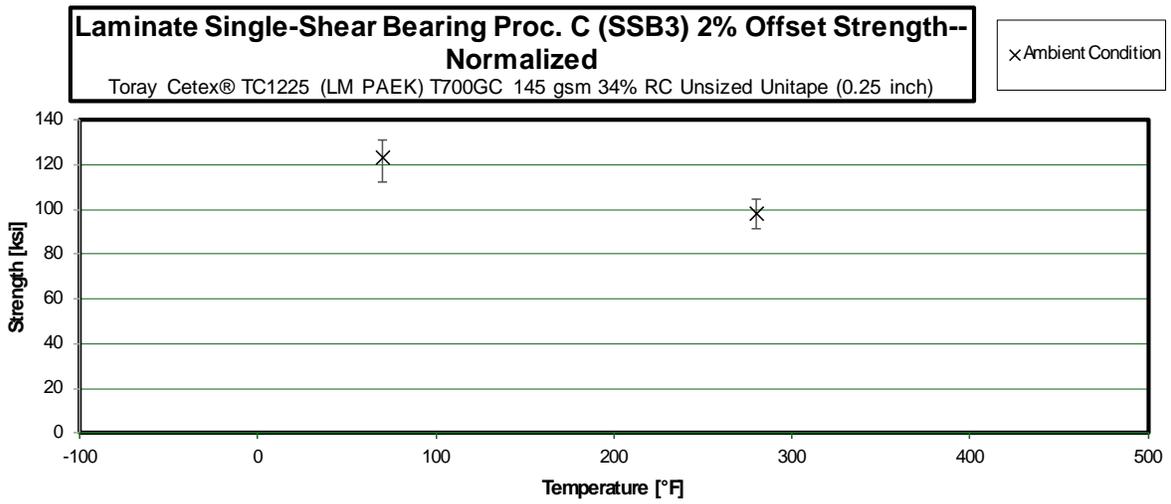


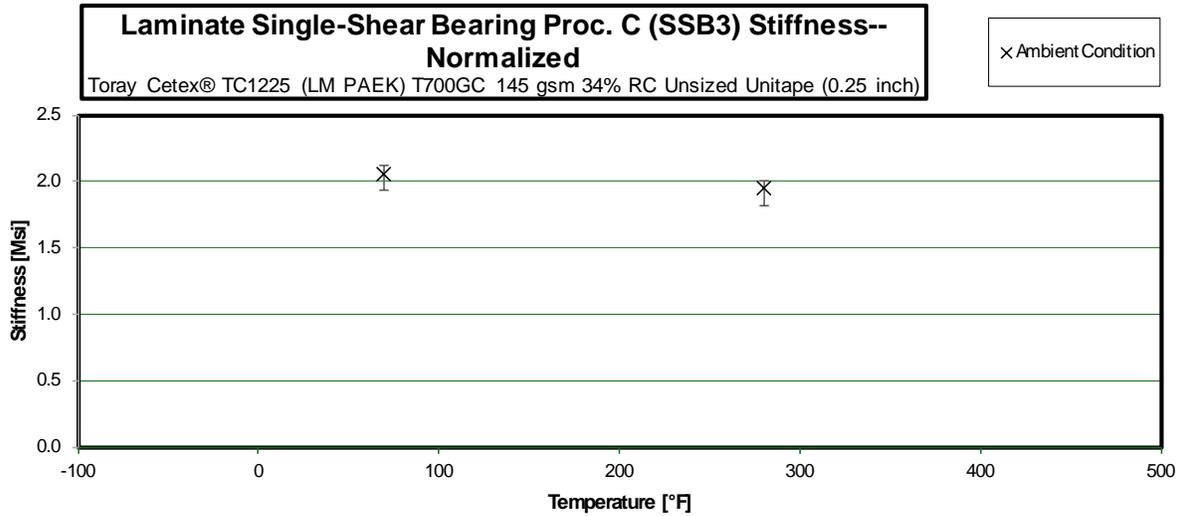
3.32 “10/80/10” Single-Shear Bearing 2, Proc. C Properties (SSB2)



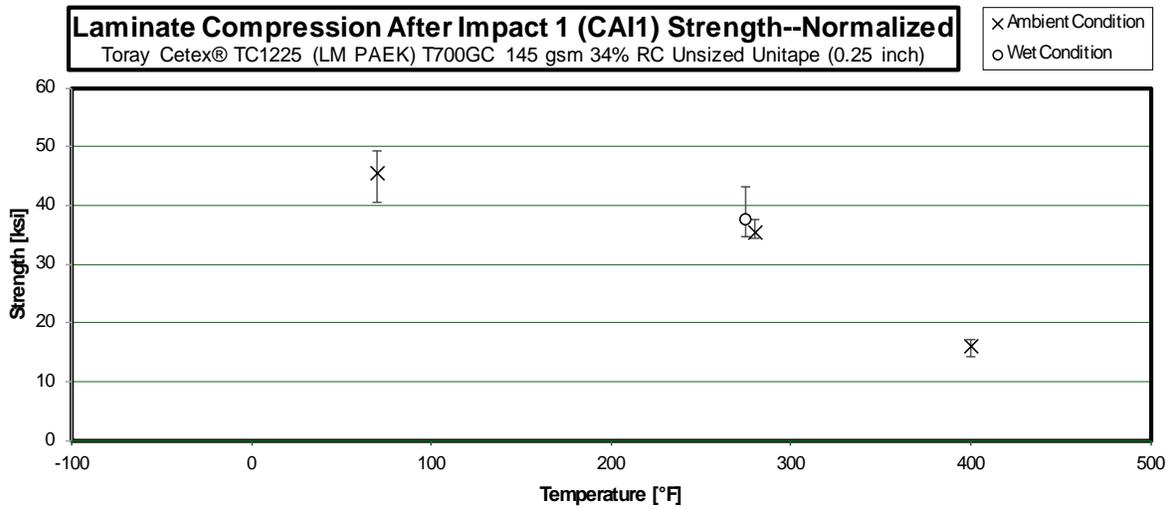


3.33 “50/40/10” Single-Shear Bearing 3, Proc. C Properties (SSB3)





3.34 “25/50/25” Compression After Impact 1 Properties (CAI1)



4. Raw Data

4.1 Longitudinal Tension Properties (LT)

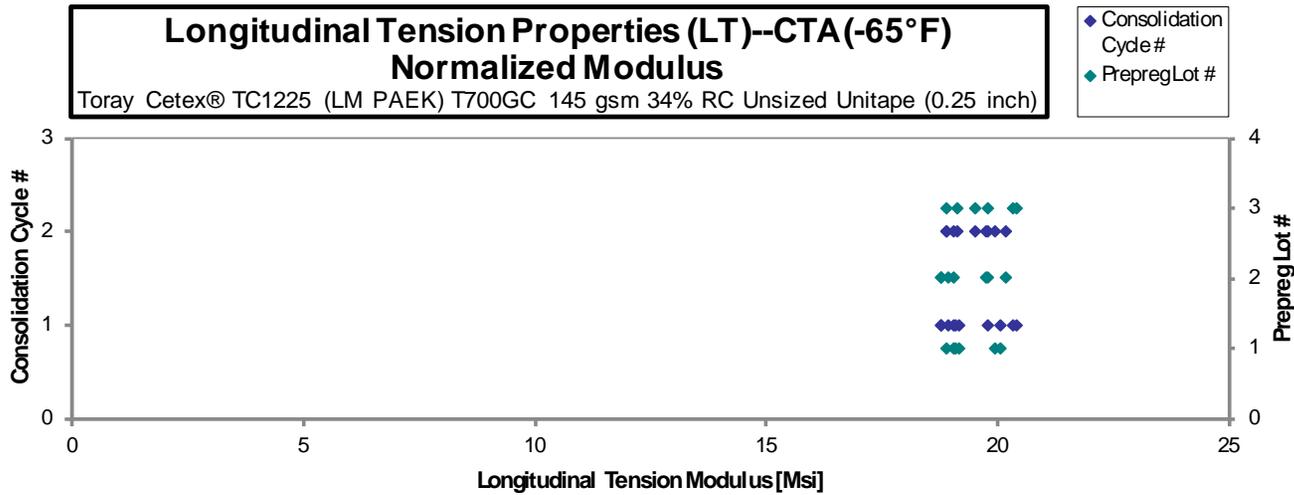
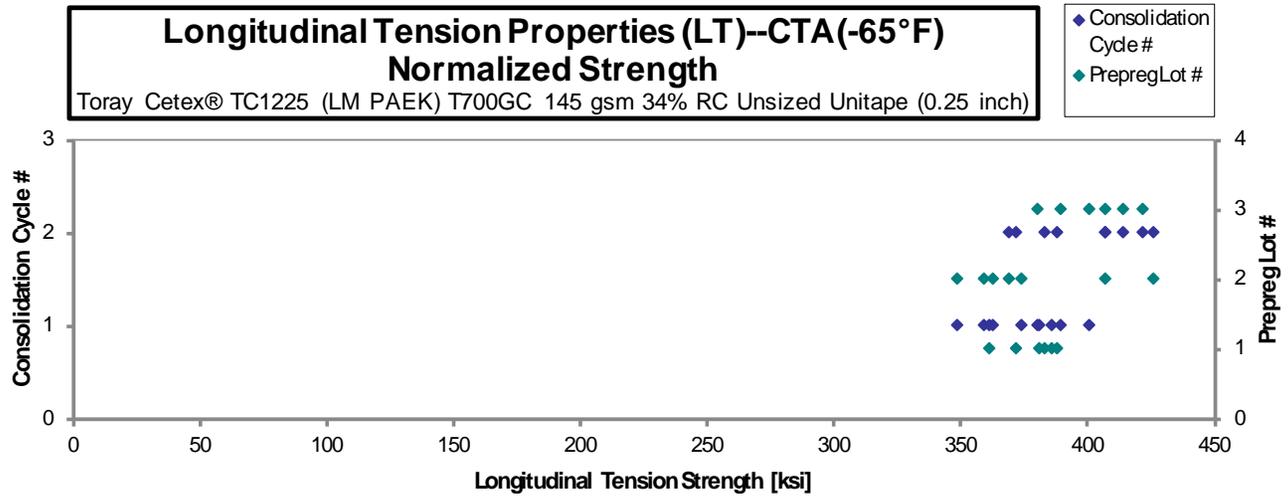
Longitudinal Tension Properties (LT)--CTA (-65°F)
Strength, Modulus & Poisson's Ratio
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Modulus [Msi] | Poisson's Ratio | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|---|---------------|--------------------------|---------------|-----------------------|----------------|---------------|-----------------|------------------------------|---------------------|--------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-A-C1-1-LT-CTA-1 | A | C1 | 1 | 1 | 354.9 | 18.86 | 0.3241 | 0.04395 | 8 | XGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-A-C1-1-LT-CTA-2 | A | C1 | 1 | 1 | 373.7 | 18.73 | 0.3214 | 0.04403 | 8 | XGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-A-C1-1-LT-CTA-3 | A | C1 | 1 | 1 | 384.0 | 19.96 | 0.2846 | 0.04340 | 8 | XGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-A-C2-1-LT-CTA-1 | A | C2 | 1 | 2 | 400.8 | 19.77 | 0.3383 | 0.04132 | 8 | XGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-A-C2-1-LT-CTA-2 | A | C2 | 1 | 2 | 366.3 | 19.68 | 0.2997 | 0.04382 | 8 | XGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-A-C2-1-LT-CTA-3 | A | C2 | 1 | 2 | 388.4 | 19.06 | 0.2642 | 0.04315 | 8 | SGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-B-C1-1-LT-CTA-1 | B | C1 | 2 | 1 | 357.8 | 19.29 | 0.2875 | 0.04208 | 8 | SGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-B-C1-1-LT-CTA-2 | B | C1 | 2 | 1 | 367.9 | 19.20 | 0.3152 | 0.04263 | 8 | XGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-B-C1-1-LT-CTA-3 | B | C1 | 2 | 1 | 380.3 | 19.37 | 0.2928 | 0.04252 | 8 | XGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-B-C1-1-LT-SP-1 | B | C1 | 2 | 1 | 366.4 | 19.13 | 0.4053 | 0.04237 | 8 | XGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-B-C2-1-LT-CTA-1 | B | C2 | 2 | 2 | 356.4 | 19.48 | 0.3962 | 0.04473 | 8 | XGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-B-C2-1-LT-CTA-2 | B | C2 | 2 | 2 | 403.0 | 19.57 | 0.3450 | 0.04362 | 8 | XGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-B-C2-1-LT-CTA-3 | B | C2 | 2 | 2 | 423.4 | 19.66 | 0.2916 | 0.04347 | 8 | XGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST1-C-C1-1-LT-CTA-1 | C | C1 | 3 | 1 | 379.1 | 19.27 | 0.3095 | 0.04442 | 8 | XGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST1-C-C1-1-LT-CTA-2 | C | C1 | 3 | 1 | 392.9 | 19.94 | 0.3242 | 0.04405 | 8 | XGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST1-C-C1-1-LT-CTA-3 | C | C1 | 3 | 1 | 374.2 | 20.05 | 0.3788 | 0.04393 | 8 | XGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST1-C-C2-1-LT-CTA-1 | C | C2 | 3 | 2 | 443.1 | 19.86 | 0.3756 | 0.04112 | 8 | XGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST1-C-C2-1-LT-CTA-2 | C | C2 | 3 | 2 | 429.0 | 20.13 | 0.2508 | 0.04102 | 8 | XGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST1-C-C2-1-LT-CTA-3 | C | C2 | 3 | 2 | 441.3 | 20.79 | 0.3242 | 0.04057 | 8 | XGM |

| Avg. t_{ply} [in] | Strength _{norm} [ksi] | Modulus _{norm} [Msi] |
|---------------------|--------------------------------|-------------------------------|
| 0.005494 | 361.1 | 19.19 |
| 0.005504 | 380.9 | 19.10 |
| 0.005425 | 385.8 | 20.05 |
| 0.005165 | 383.3 | 18.91 |
| 0.005477 | 371.6 | 19.96 |
| 0.005394 | 388.0 | 19.04 |
| 0.005260 | 348.5 | 18.79 |
| 0.005329 | 363.1 | 18.95 |
| 0.005315 | 374.3 | 19.06 |
| 0.005296 | 359.3 | 18.76 |
| 0.005592 | 369.1 | 20.18 |
| 0.005452 | 406.9 | 19.76 |
| 0.005433 | 426.0 | 19.79 |
| 0.005552 | 389.8 | 19.81 |
| 0.005506 | 400.6 | 20.33 |
| 0.005492 | 380.6 | 20.40 |
| 0.005140 | 421.7 | 18.90 |
| 0.005127 | 407.3 | 19.11 |
| 0.005071 | 414.4 | 19.52 |

| | | | | | | | |
|--------------------|-------|--------|---------|------------------------------------|----------|-------|--------|
| Average | 388.6 | 19.57 | 0.3226 | Average _{norm} | 0.005370 | 385.9 | 19.45 |
| Standard Dev. | 28.00 | 0.4986 | 0.04269 | Standard Dev. _{norm} | | 22.06 | 0.5554 |
| Coeff. of Var. [%] | 7.205 | 2.548 | 13.23 | Coeff. of Var. [%] _{norm} | | 5.717 | 2.855 |
| Min. | 354.9 | 18.73 | 0.2508 | Min. | 0.005071 | 348.5 | 18.76 |
| Max. | 443.1 | 20.79 | 0.4053 | Max. | 0.005592 | 426.0 | 20.40 |
| Number of Spec. | 19 | 19 | 19 | Number of Spec. | 19 | 19 | 19 |



Longitudinal Tension Properties (LT)--RTA (70°F)
Strength, Modulus & Poisson's Ratio
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

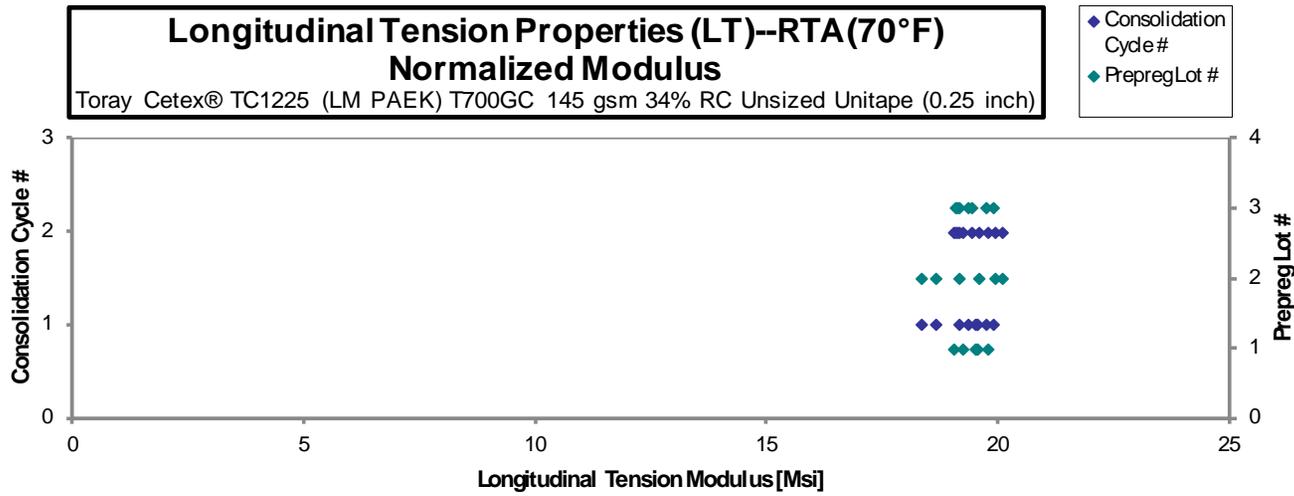
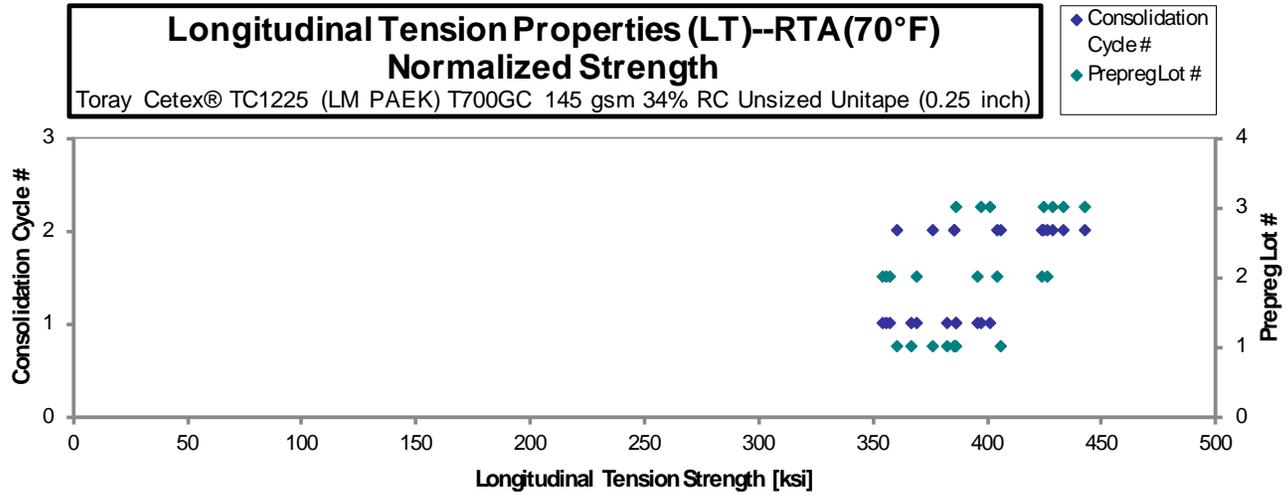
normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Modulus [Msi] | Poisson's Ratio | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|---|---------------|--------------------------|---------------|-----------------------|----------------|---------------|-----------------|------------------------------|---------------------|--------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-A-C1-1-LT-RTA-1 | A | C1 | 1 | 1 | 378.5 | 19.31 | 0.2812 | 0.04368 | 8 | LAB/LIB, LAT/LIT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-A-C1-1-LT-RTA-2 | A | C1 | 1 | 1 | 361.5 | 19.18 | 0.3401 | 0.04390 | 8 | XGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-A-C1-1-LT-RTA-3 | A | C1 | 1 | 1 | 388.1 | 19.63 | 0.3852 | 0.04305 | 8 | AGB, GIT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-A-C2-1-LT-RTA-1 | A | C2 | 1 | 2 | 379.5 | 19.21 | 0.3409 | 0.04287 | 8 | XGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-A-C2-1-LT-RTA-2 | A | C2 | 1 | 2 | 390.1 | 19.46 | 0.4267 | 0.04270 | 8 | XGM, AWB, AGT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-A-C2-1-LT-RTA-3 | A | C2 | 1 | 2 | 363.0 | 19.90 | 0.3050 | 0.04295 | 8 | XGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-A-C2-1-LT-SP-3* | A | C2 | 1 | 2 | 411.2 | | | 0.04272 | 8 | M(A,S)GM, AGB, LWB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-A-C2-1-LT-SP-4* | A | C2 | 1 | 2 | 391.1 | | | 0.04262 | 8 | XGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-B-C1-1-LT-RTA-1 | B | C1 | 2 | 1 | 360.6 | 19.28 | 0.3840 | 0.04290 | 8 | XGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-B-C1-1-LT-RTA-2 | B | C1 | 2 | 1 | 361.8 | 18.71 | 0.3912 | 0.04237 | 8 | XGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-B-C1-1-LT-RTA-3 | B | C1 | 2 | 1 | 402.4 | 18.93 | 0.3349 | 0.04255 | 8 | M(A,S)GM, AGT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-B-C1-1-LT-SP-3* | B | C1 | 2 | 1 | 364.9 | | | 0.04217 | 8 | XGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-B-C1-1-LT-SP-4* | B | C1 | 2 | 1 | 373.5 | | | 0.04273 | 8 | AAT, AGT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-B-C2-1-LT-RTA-1 | B | C2 | 2 | 2 | 423.4 | 19.88 | 0.3336 | 0.04328 | 8 | XGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-B-C2-1-LT-RTA-2 | B | C2 | 2 | 2 | 400.9 | 19.42 | 0.3870 | 0.04358 | 8 | XGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-B-C2-1-LT-RTA-3 | B | C2 | 2 | 2 | 421.2 | 19.83 | 0.4542 | 0.04372 | 8 | XGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST1-C-C1-1-LT-RTA-1 | C | C1 | 3 | 1 | 399.4 | 19.79 | 0.3100 | 0.04305 | 8 | XGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST1-C-C1-1-LT-RTA-2 | C | C1 | 3 | 1 | 380.7 | 19.58 | 0.2667 | 0.04392 | 8 | XGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST1-C-C1-1-LT-RTA-3 | C | C1 | 3 | 1 | 397.3 | 19.14 | 0.2661 | 0.04368 | 8 | M(A,S)GM, LWB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST1-C-C2-1-LT-RTA-1 | C | C2 | 3 | 2 | 462.6 | 20.44 | 0.3980 | 0.04047 | 8 | XGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST1-C-C2-1-LT-RTA-2 | C | C2 | 3 | 2 | 451.7 | 20.29 | 0.4058 | 0.04067 | 8 | XGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST1-C-C2-1-LT-RTA-3 | C | C2 | 3 | 2 | 461.3 | 20.52 | 0.3110 | 0.04020 | 8 | XGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST1-C-C2-1-LT-SP-3 | C | C2 | 3 | 2 | 475.6 | 20.83 | 0.3259 | 0.04027 | 8 | XGM |

| Avg. t_{ply} [in] | Strength _{norm} [ksi] | Modulus _{norm} [Msi] |
|---------------------|--------------------------------|-------------------------------|
| 0.005460 | 382.7 | 19.53 |
| 0.005488 | 367.3 | 19.50 |
| 0.005381 | 386.7 | 19.57 |
| 0.005358 | 376.6 | 19.06 |
| 0.005338 | 385.6 | 19.23 |
| 0.005369 | 360.9 | 19.79 |
| 0.005340 | 406.6 | |
| 0.005327 | 385.9 | |
| 0.005363 | 358.1 | 19.15 |
| 0.005296 | 354.8 | 18.35 |
| 0.005319 | 396.3 | 18.65 |
| 0.005271 | 356.2 | |
| 0.005342 | 369.5 | |
| 0.005410 | 424.2 | 19.92 |
| 0.005448 | 404.4 | 19.59 |
| 0.005465 | 426.3 | 20.07 |
| 0.005381 | 398.0 | 19.73 |
| 0.005490 | 387.0 | 19.90 |
| 0.005460 | 401.8 | 19.36 |
| 0.005058 | 433.3 | 19.14 |
| 0.005083 | 425.2 | 19.10 |
| 0.005025 | 429.3 | 19.09 |
| 0.005033 | 443.3 | 19.42 |

* Specimen was not gaged, only strength is tested.

| | | | | | | | |
|--------------------|-------|--------|---------|------------------------------------|----------|-------|--------|
| Average | 400.0 | 19.65 | 0.3499 | Average _{norm} | 0.005326 | 393.9 | 19.38 |
| Standard Dev. | 34.75 | 0.5661 | 0.05412 | Standard Dev _{norm} | | 26.82 | 0.4373 |
| Coeff. of Var. [%] | 8.686 | 2.881 | 15.47 | Coeff. of Var. [%] _{norm} | | 6.808 | 2.257 |
| Min. | 360.6 | 18.71 | 0.2661 | Min. | 0.005025 | 354.8 | 18.35 |
| Max. | 475.6 | 20.83 | 0.4542 | Max. | 0.005490 | 443.3 | 20.07 |
| Number of Spec. | 23 | 19 | 19 | Number of Spec. | 23 | 23 | 19 |



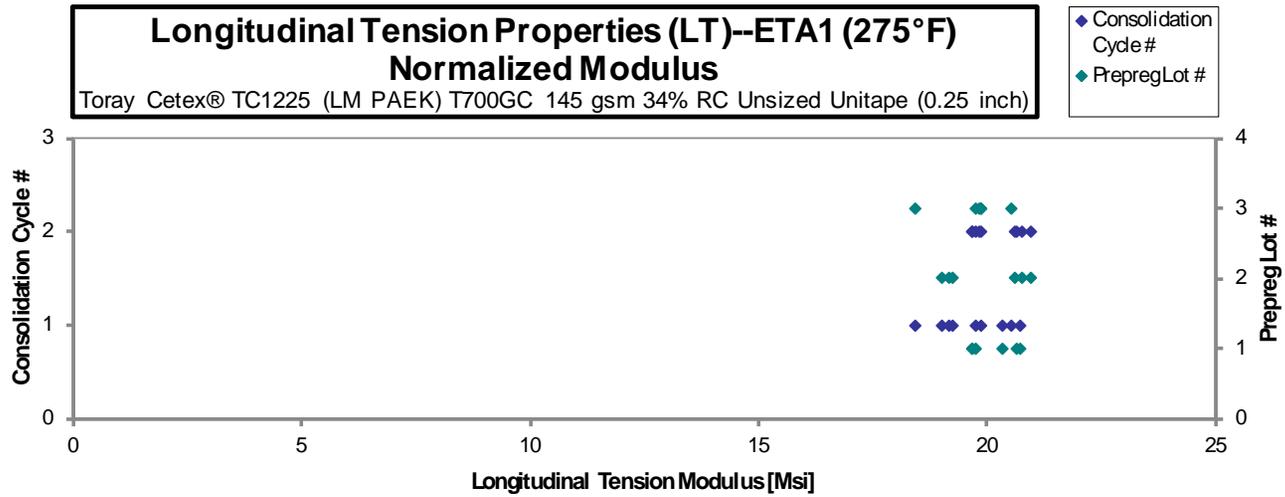
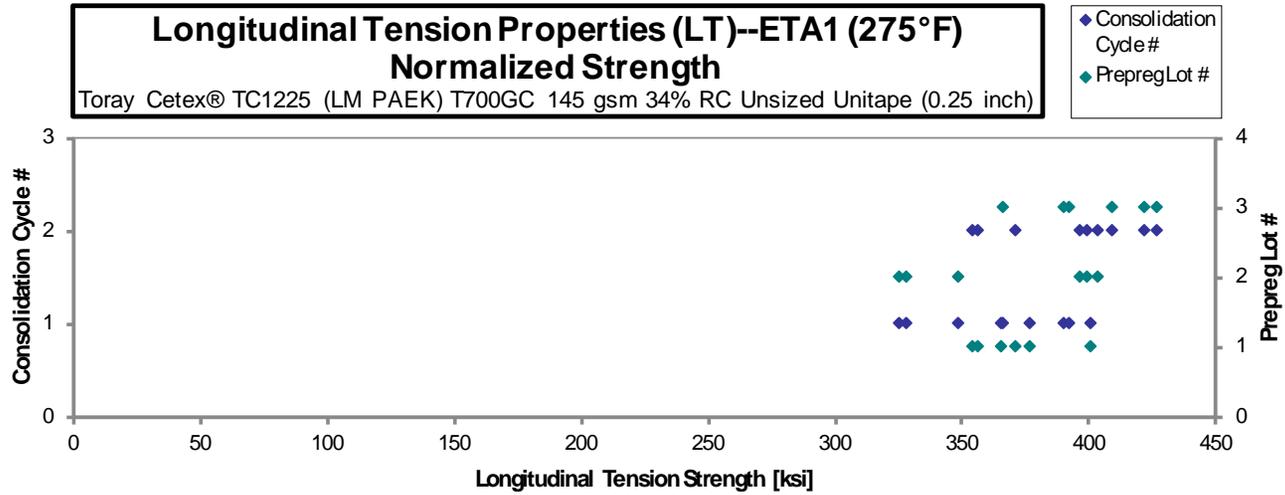
Longitudinal Tension Properties (LT)–ETA1 (275°F)
Strength, Modulus & Poisson's Ratio
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Modulus [Msi] | Poisson's Ratio | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|--|---------------|--------------------------|---------------|-----------------------|----------------|---------------|-----------------|------------------------------|---------------------|--------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-A-C1-1-LT-ETA1-1 | A | C1 | 1 | 1 | 364.4 | 19.70 | 0.1867 | 0.04332 | 8 | XGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-A-C1-1-LT-ETA1-2 | A | C1 | 1 | 1 | 370.2 | 19.98 | 0.4362 | 0.04398 | 8 | XGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-A-C1-1-LT-ETA1-3 | A | C1 | 1 | 1 | 399.2 | 20.68 | 0.2868 | 0.04335 | 8 | XGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-A-C2-1-LT-ETA1-1 | A | C2 | 1 | 2 | 353.3 | 19.53 | 0.2792 | 0.04357 | 8 | XGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-A-C2-1-LT-ETA1-2 | A | C2 | 1 | 2 | 356.3 | 20.80 | 0.2588 | 0.04292 | 8 | XGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-A-C2-1-LT-ETA1-3 | A | C2 | 1 | 2 | 379.1 | 20.10 | 0.3142 | 0.04233 | 8 | XGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-B-C1-1-LT-ETA1-1 | B | C1 | 2 | 1 | 332.5 | 19.55 | 0.3917 | 0.04260 | 8 | XGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-B-C1-1-LT-ETA1-2 | B | C1 | 2 | 1 | 335.7 | 19.63 | 0.2634 | 0.04190 | 8 | XGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-B-C1-1-LT-ETA1-3 | B | C1 | 2 | 1 | 357.2 | 19.66 | 0.3635 | 0.04213 | 8 | XGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-B-C2-1-LT-ETA1-1 | B | C2 | 2 | 2 | 396.6 | 20.62 | 0.3383 | 0.04350 | 8 | XGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-B-C2-1-LT-ETA1-2 | B | C2 | 2 | 2 | 400.1 | 20.48 | 0.3758 | 0.04355 | 8 | XGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-B-C2-1-LT-ETA1-3 | B | C2 | 2 | 2 | 392.3 | 20.74 | 0.2808 | 0.04367 | 8 | XGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST1-C-C1-1-LT-ETA1-1 | C | C1 | 3 | 1 | 382.4 | 18.09 | 0.3009 | 0.04408 | 8 | XGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST1-C-C1-1-LT-ETA1-2 | C | C1 | 3 | 1 | 381.0 | 19.97 | 0.4658 | 0.04447 | 8 | XGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST1-C-C1-1-LT-ETA1-3 | C | C1 | 3 | 1 | 359.6 | 19.55 | 0.3697 | 0.04398 | 8 | XGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST1-C-C2-1-LT-ETA1-2 | C | C2 | 3 | 2 | 456.0 | 21.24 | 0.3633 | 0.04043 | 8 | XGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST1-C-C2-1-LT-ETA1-3 | C | C2 | 3 | 2 | 434.9 | 21.00 | 0.2006 | 0.04067 | 8 | XGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST1-C-C2-1-LT-SP-5 | C | C2 | 3 | 2 | 442.7 | 20.81 | 0.4735 | 0.04117 | 8 | XGM |

| Avg. t_{ply} [in] | Strength _{norm} [ksi] | Modulus _{norm} [Msi] |
|---------------------|--------------------------------|-------------------------------|
| 0.005415 | 365.4 | 19.76 |
| 0.005498 | 377.0 | 20.34 |
| 0.005419 | 400.6 | 20.75 |
| 0.005446 | 356.3 | 19.69 |
| 0.005365 | 354.0 | 20.66 |
| 0.005292 | 371.5 | 19.70 |
| 0.005325 | 327.9 | 19.28 |
| 0.005238 | 325.6 | 19.04 |
| 0.005267 | 348.4 | 19.18 |
| 0.005438 | 399.4 | 20.77 |
| 0.005444 | 403.4 | 20.64 |
| 0.005458 | 396.5 | 20.96 |
| 0.005510 | 390.2 | 18.46 |
| 0.005558 | 392.2 | 20.55 |
| 0.005498 | 366.2 | 19.90 |
| 0.005054 | 426.8 | 19.88 |
| 0.005083 | 409.4 | 19.77 |
| 0.005146 | 421.8 | 19.83 |

| | | | | | | | |
|--------------------|-------|--------|---------|------------------------------------|----------|-------|--------|
| Average | 383.0 | 20.12 | 0.3305 | Average _{norm} | 0.005358 | 379.6 | 19.95 |
| Standard Dev. | 34.75 | 0.7611 | 0.08219 | Standard Dev. _{norm} | | 29.77 | 0.6931 |
| Coeff. of Var. [%] | 9.074 | 3.783 | 24.87 | Coeff. of Var. [%] _{norm} | | 7.844 | 3.474 |
| Min. | 332.5 | 18.09 | 0.1867 | Min. | 0.005054 | 325.6 | 18.46 |
| Max. | 456.0 | 21.24 | 0.4735 | Max. | 0.005558 | 426.8 | 20.96 |
| Number of Spec. | 18 | 18 | 18 | Number of Spec. | 18 | 18 | 18 |



Longitudinal Tension Properties (LT)–ETA2 (400°F)
Strength, Modulus & Poisson's Ratio
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

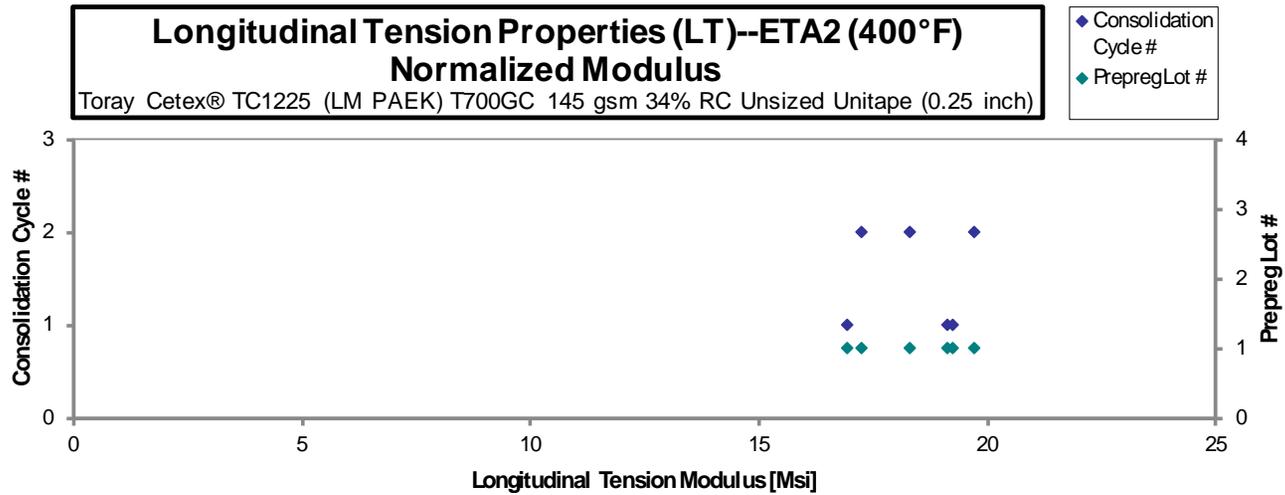
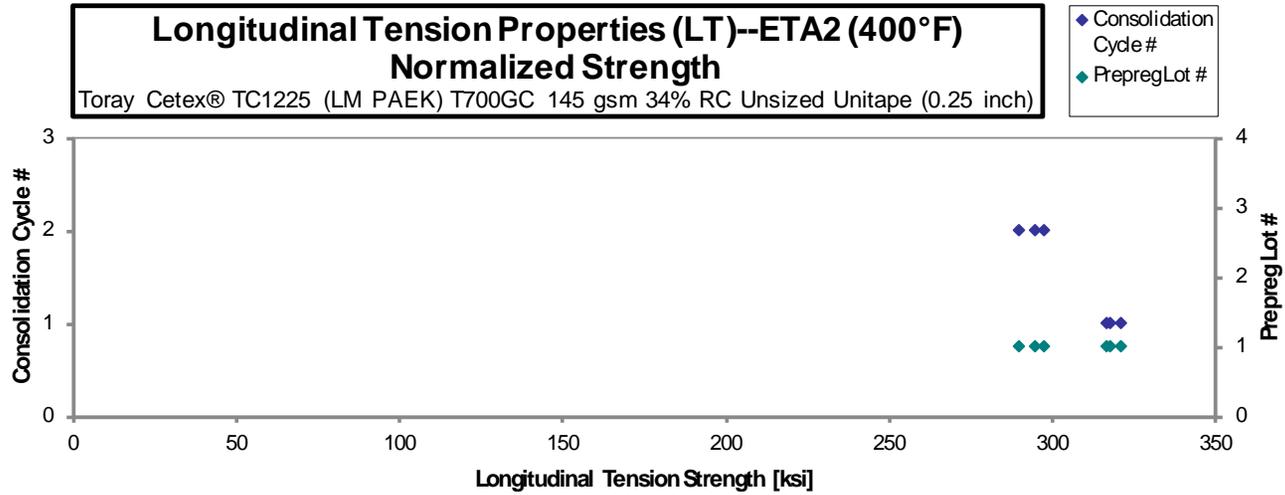
normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Modulus [Msi] | Poisson's Ratio | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|--|---------------|--------------------------|---------------|-----------------------|----------------|---------------|-----------------|------------------------------|---------------------|--------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-A-C1-1-LT-ETA2-1 | A | C1 | 1 | 1 | 310.5 | 18.91 | 0.5112 | 0.04402 | 8 | XGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-A-C1-1-LT-ETA2-2 | A | C1 | 1 | 1 | 313.2 | 16.53 | 0.3418 | 0.04428 | 8 | XGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-A-C1-1-LT-ETA2-3 | A | C1 | 1 | 1 | 312.6 | 18.85 | 0.5670 | 0.04388 | 8 | XGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-A-C2-1-LT-ETA2-1 | A | C2 | 1 | 2 | 299.5 | 19.84 | 1.045 | 0.04293 | 8 | XGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-A-C2-1-LT-ETA2-2 | A | C2 | 1 | 2 | 298.8 | 17.50 | 0.3757 | 0.04262 | 8 | XGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-A-C2-1-LT-ETA2-3* | A | C2 | 1 | 2 | 291.6 | 18.43 | | 0.04288 | 8 | XGM |

| Avg. t_{ply} [in] | Strength _{norm} [ksi] | Modulus _{norm} [Msi] |
|---------------------|--------------------------------|-------------------------------|
| 0.005502 | 316.4 | 19.26 |
| 0.005535 | 321.0 | 16.94 |
| 0.005485 | 317.5 | 19.15 |
| 0.005367 | 297.7 | 19.72 |
| 0.005327 | 294.8 | 17.26 |
| 0.005360 | 289.5 | 18.29 |

* Poisson's Ratio not reported due to non-linear strain data.

| | | | | | | | |
|---------------------------|--------------|--------------|---------------|--|-----------------|--------------|--------------|
| Average | 304.4 | 18.34 | 0.5682 | Average_{norm} | 0.005430 | 306.1 | 18.44 |
| Standard Dev. | 8.934 | 1.170 | 0.2824 | Standard Dev._{norm} | | 13.67 | 1.138 |
| Coeff. of Var. [%] | 2.935 | 6.377 | 49.71 | Coeff. of Var. [%]_{norm} | | 4.464 | 6.171 |
| Min. | 291.6 | 16.53 | 0.3418 | Min. | 0.005327 | 289.5 | 16.94 |
| Max. | 313.2 | 19.84 | 1.045 | Max. | 0.005535 | 321.0 | 19.72 |
| Number of Spec. | 6 | 6 | 5 | Number of Spec. | 6 | 6 | 6 |



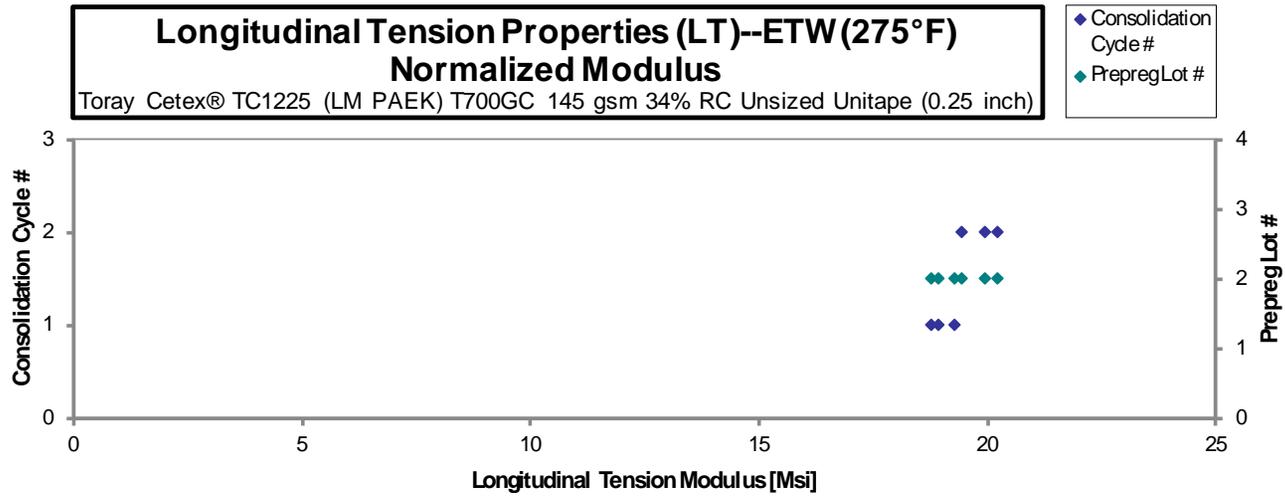
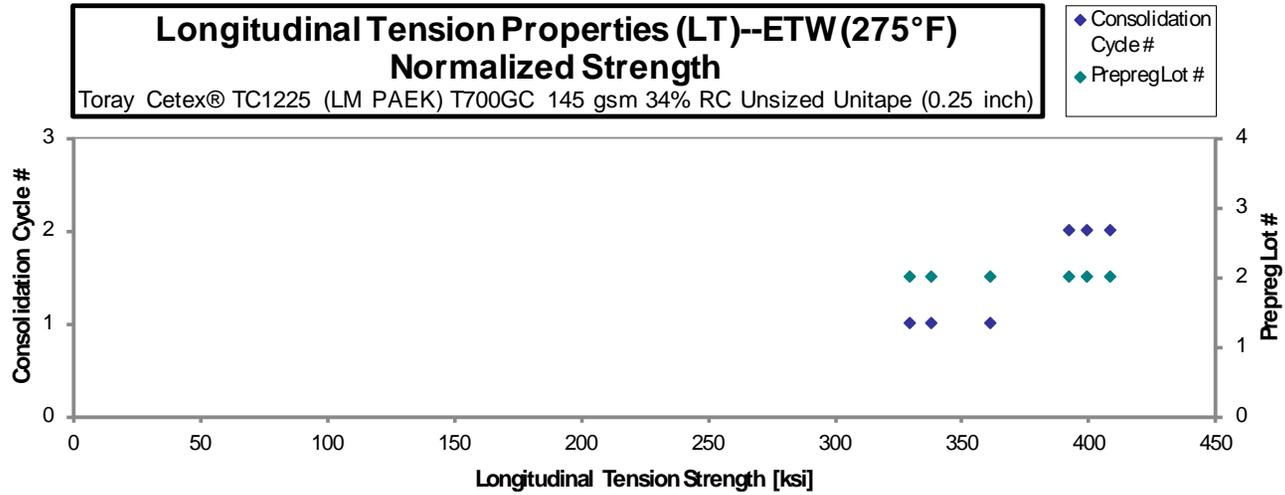
Longitudinal Tension Properties (LT)--ETW (275°F)
Strength, Modulus & Poisson's Ratio
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Modulus [Msi] | Poisson's Ratio | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|--|---------------|--------------------------|---------------|-----------------------|----------------|---------------|-----------------|------------------------------|---------------------|--------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-B-C1-1-LT-ETW-1 | B | C1 | 2 | 1 | 362.7 | 18.85 | 0.3869 | 0.04302 | 8 | XGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-B-C1-1-LT-ETW-2 | B | C1 | 2 | 1 | 344.6 | 19.32 | 0.4354 | 0.04235 | 8 | XGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-B-C1-1-LT-ETW-3 | B | C1 | 2 | 1 | 337.2 | 19.72 | 0.2418 | 0.04225 | 8 | XGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-B-C2-1-LT-ETW-1 | B | C2 | 2 | 2 | 399.6 | 19.02 | 0.3033 | 0.04415 | 8 | XGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-B-C2-1-LT-ETW-2 | B | C2 | 2 | 2 | 388.0 | 19.67 | 0.3768 | 0.04447 | 8 | XGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST1-B-C2-1-LT-ETW-3 | B | C2 | 2 | 2 | 384.4 | 19.55 | 0.4166 | 0.04410 | 8 | XGM |

| Avg. t_{ply} [in] | Strength _{norm} [ksi] | Modulus _{norm} [Msi] |
|---------------------|--------------------------------|-------------------------------|
| 0.005377 | 361.1 | 18.77 |
| 0.005294 | 337.8 | 18.94 |
| 0.005281 | 329.8 | 19.28 |
| 0.005519 | 408.4 | 19.44 |
| 0.005558 | 399.3 | 20.24 |
| 0.005513 | 392.4 | 19.95 |

| | | | | | | | |
|--------------------|-------|--------|---------|------------------------------------|----------|-------|--------|
| Average | 369.4 | 19.35 | 0.3602 | Average _{norm} | 0.005424 | 371.5 | 19.44 |
| Standard Dev. | 25.21 | 0.3547 | 0.07361 | Standard Dev. _{norm} | | 33.33 | 0.5705 |
| Coeff. of Var. [%] | 6.825 | 1.832 | 20.44 | Coeff. of Var. [%] _{norm} | | 8.972 | 2.935 |
| Min. | 337.2 | 18.85 | 0.2418 | Min. | 0.005281 | 329.8 | 18.77 |
| Max. | 399.6 | 19.72 | 0.4354 | Max. | 0.005558 | 408.4 | 20.24 |
| Number of Spec. | 6 | 6 | 6 | Number of Spec. | 6 | 6 | 6 |

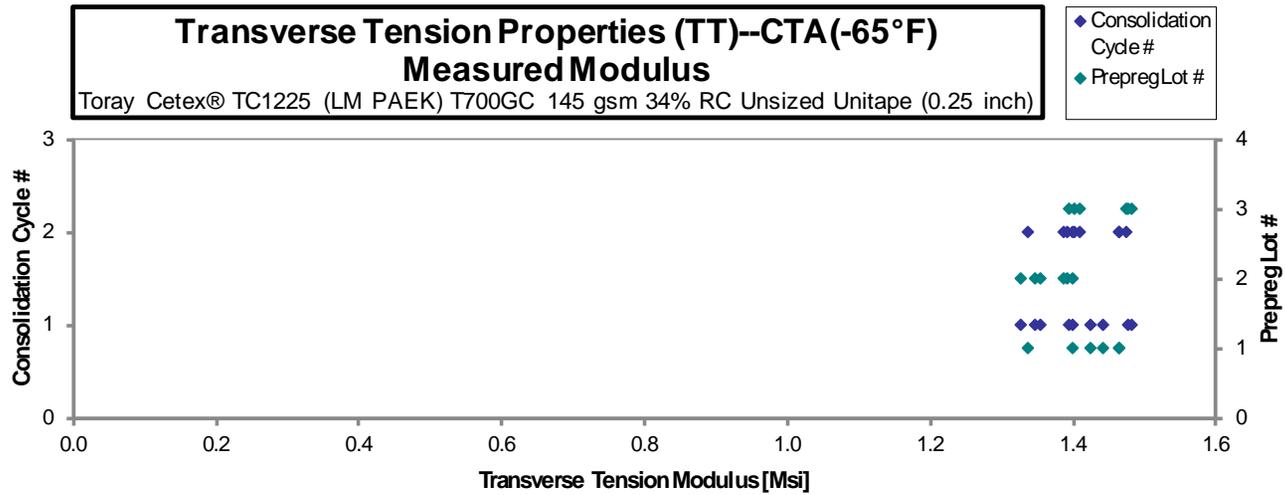
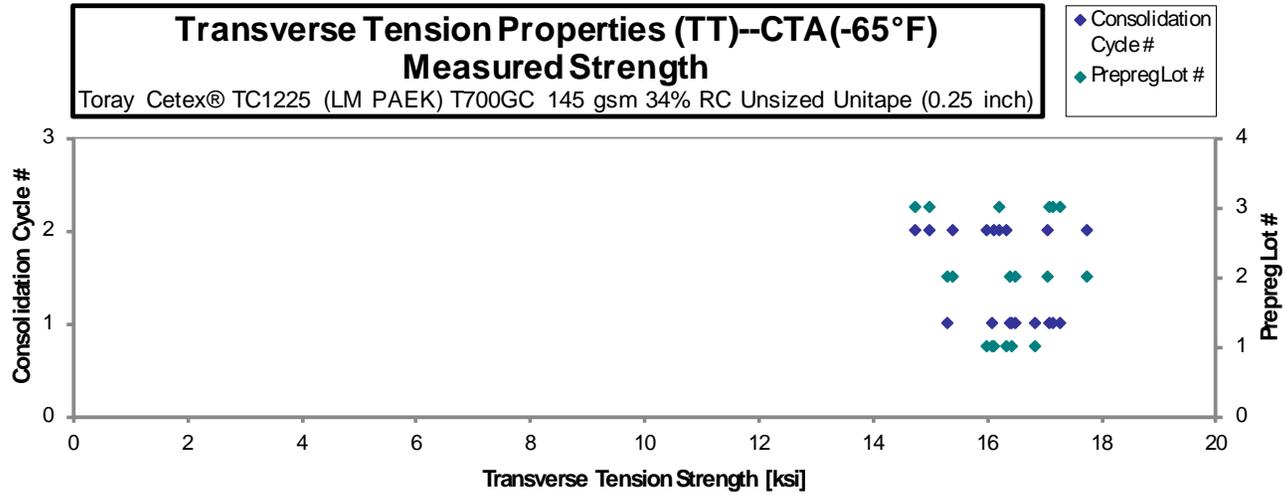


4.2 Transverse Tension Properties (TT)

Transverse Tension Properties (TT)--CTA (-65°F)
Strength & Modulus
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Modulus [Msi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Avg. t _{ply} [in] | Failure Mode |
|---|---------------|--------------------------|---------------|-----------------------|----------------|---------------|------------------------------|---------------------|----------------------------|--------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST2-A-C1-1-TT-CTA-1 | A | C1 | 1 | 1 | 16.86 | 1.442 | 0.08750 | 16 | 0.005469 | LWT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST2-A-C1-1-TT-CTA-2 | A | C1 | 1 | 1 | 16.44 | 1.425 | 0.08750 | 16 | 0.005469 | LWB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST2-A-C1-1-TT-CTA-3 | A | C1 | 1 | 1 | 16.08 | 1.401 | 0.08750 | 16 | 0.005469 | LWT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST2-A-C2-1-TT-CTA-1 | A | C2 | 1 | 2 | 16.13 | 1.337 | 0.08650 | 16 | 0.005406 | LGT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST2-A-C2-1-TT-CTA-2 | A | C2 | 1 | 2 | 16.00 | 1.464 | 0.08712 | 16 | 0.005445 | LGB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST2-A-C2-1-TT-CTA-3 | A | C2 | 1 | 2 | 16.33 | 1.465 | 0.08648 | 16 | 0.005405 | LWB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST2-B-C1-1-TT-CTA-1 | B | C1 | 2 | 1 | 16.48 | 1.328 | 0.08675 | 16 | 0.005422 | LGT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST2-B-C1-1-TT-CTA-2 | B | C1 | 2 | 1 | 15.32 | 1.347 | 0.08725 | 16 | 0.005453 | LWT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST2-B-C1-1-TT-CTA-3 | B | C1 | 2 | 1 | 16.39 | 1.355 | 0.08733 | 16 | 0.005458 | LGT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST2-B-C2-1-TT-CTA-1 | B | C2 | 2 | 2 | 15.41 | 1.391 | 0.08922 | 16 | 0.005576 | LGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST2-B-C2-1-TT-CTA-2 | B | C2 | 2 | 2 | 17.05 | 1.387 | 0.08992 | 16 | 0.005620 | LGM, LWB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST2-B-C2-1-TT-CTA-3 | B | C2 | 2 | 2 | 17.76 | 1.400 | 0.08978 | 16 | 0.005611 | LWT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST2-C-C1-1-TT-CTA-1 | C | C1 | 3 | 1 | 17.08 | 1.394 | 0.08540 | 16 | 0.005338 | LGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST2-C-C1-1-TT-CTA-2 | C | C1 | 3 | 1 | 17.15 | 1.483 | 0.08523 | 16 | 0.005327 | LWB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST2-C-C1-1-TT-CTA-3 | C | C1 | 3 | 1 | 17.26 | 1.478 | 0.08600 | 16 | 0.005375 | LGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST2-C-C2-1-TT-CTA-1 | C | C2 | 3 | 2 | 16.22 | 1.402 | 0.08915 | 16 | 0.005572 | LGM, LWT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST2-C-C2-1-TT-CTA-2 | C | C2 | 3 | 2 | 14.75 | 1.411 | 0.08792 | 16 | 0.005495 | LGT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST2-C-C2-1-TT-CTA-3 | C | C2 | 3 | 2 | 14.98 | 1.474 | 0.08877 | 16 | 0.005548 | LGM |

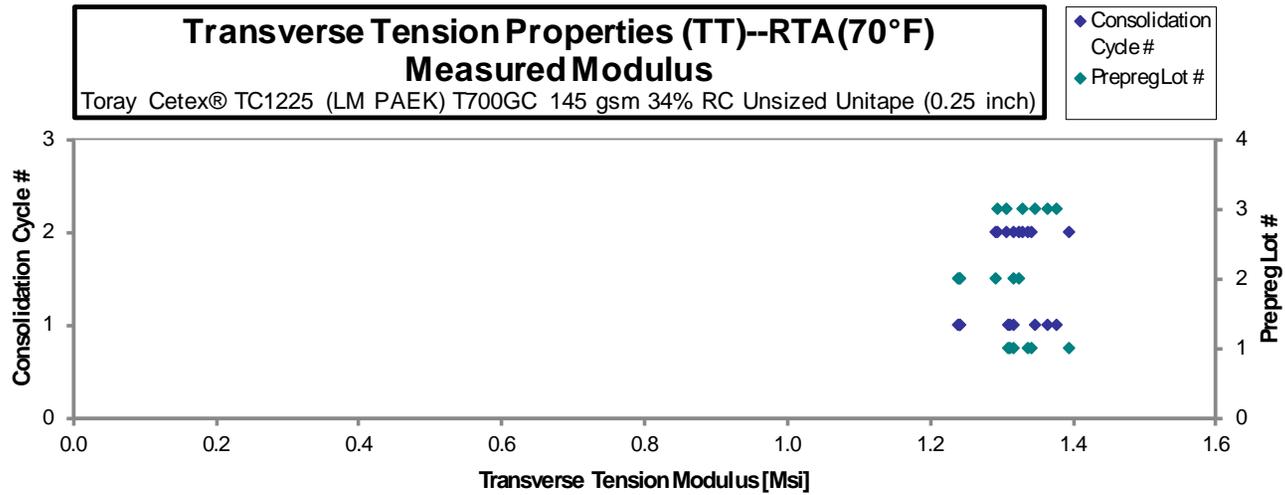
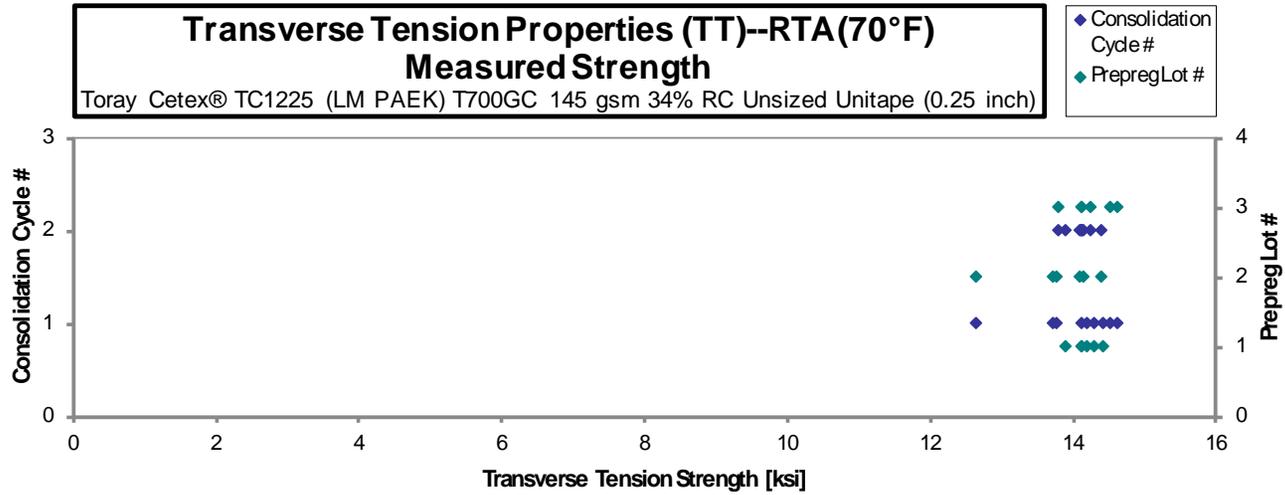
| | | | |
|---------------------------|---------------|----------------|-----------------|
| Average | 16.32 | 1.410 | 0.005470 |
| Standard Dev. | 0.8187 | 0.04960 | |
| Coeff. of Var. [%] | 5.018 | 3.517 | |
| Min. | 14.75 | 1.328 | 0.005327 |
| Max. | 17.76 | 1.483 | 0.005620 |
| Number of Spec. | 18 | 18 | 18 |



Transverse Tension Properties (TT)--RTA (70°F)
Strength & Modulus
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Modulus [Msi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Avg. t _{ply} [in] | Failure Mode |
|---|---------------|--------------------------|---------------|-----------------------|----------------|---------------|------------------------------|---------------------|----------------------------|--------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST2-A-C1-1-TT-RTA-1 | A | C1 | 1 | 1 | 14.30 | 1.317 | 0.08720 | 16 | 0.005450 | LWT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST2-A-C1-1-TT-RTA-2 | A | C1 | 1 | 1 | 14.19 | 1.309 | 0.08730 | 16 | 0.005456 | LWT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST2-A-C1-1-TT-RTA-3 | A | C1 | 1 | 1 | 14.42 | 1.311 | 0.08710 | 16 | 0.005444 | LWT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST2-A-C2-1-TT-RTA-1 | A | C2 | 1 | 2 | 13.89 | 1.396 | 0.08653 | 16 | 0.005408 | LWT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST2-A-C2-1-TT-RTA-2 | A | C2 | 1 | 2 | 14.13 | 1.336 | 0.08702 | 16 | 0.005439 | LGB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST2-A-C2-1-TT-RTA-3 | A | C2 | 1 | 2 | 14.12 | 1.341 | 0.08702 | 16 | 0.005439 | LGB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST2-B-C1-1-TT-RTA-1 | B | C1 | 2 | 1 | 13.78 | 1.240 | 0.08725 | 16 | 0.005453 | LGB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST2-B-C1-1-TT-RTA-2 | B | C1 | 2 | 1 | 12.64 | 1.241 | 0.08728 | 16 | 0.005455 | LWT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST2-B-C1-1-TT-RTA-3 | B | C1 | 2 | 1 | 13.71 | 1.242 | 0.08710 | 16 | 0.005444 | LGT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST2-B-C2-1-TT-RTA-1 | B | C2 | 2 | 2 | 14.15 | 1.292 | 0.08943 | 16 | 0.005590 | LWB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST2-B-C2-1-TT-RTA-2 | B | C2 | 2 | 2 | 14.39 | 1.325 | 0.08940 | 16 | 0.005588 | LGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST2-B-C2-1-TT-RTA-3 | B | C2 | 2 | 2 | 14.11 | 1.318 | 0.08953 | 16 | 0.005596 | LWB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST2-C-C1-1-TT-RTA-1 | C | C1 | 3 | 1 | 14.53 | 1.377 | 0.08672 | 16 | 0.005420 | LGT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST2-C-C1-1-TT-RTA-2 | C | C1 | 3 | 1 | 14.12 | 1.347 | 0.08685 | 16 | 0.005428 | LGT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST2-C-C1-1-TT-RTA-3 | C | C1 | 3 | 1 | 14.63 | 1.364 | 0.08665 | 16 | 0.005416 | LGT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST2-C-C2-1-TT-RTA-1 | C | C2 | 3 | 2 | 14.11 | 1.306 | 0.08980 | 16 | 0.005613 | LGB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST2-C-C2-1-TT-RTA-2 | C | C2 | 3 | 2 | 14.25 | 1.295 | 0.08925 | 16 | 0.005578 | LGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST2-C-C2-1-TT-RTA-3 | C | C2 | 3 | 2 | 13.80 | 1.329 | 0.08867 | 16 | 0.005542 | LWB |

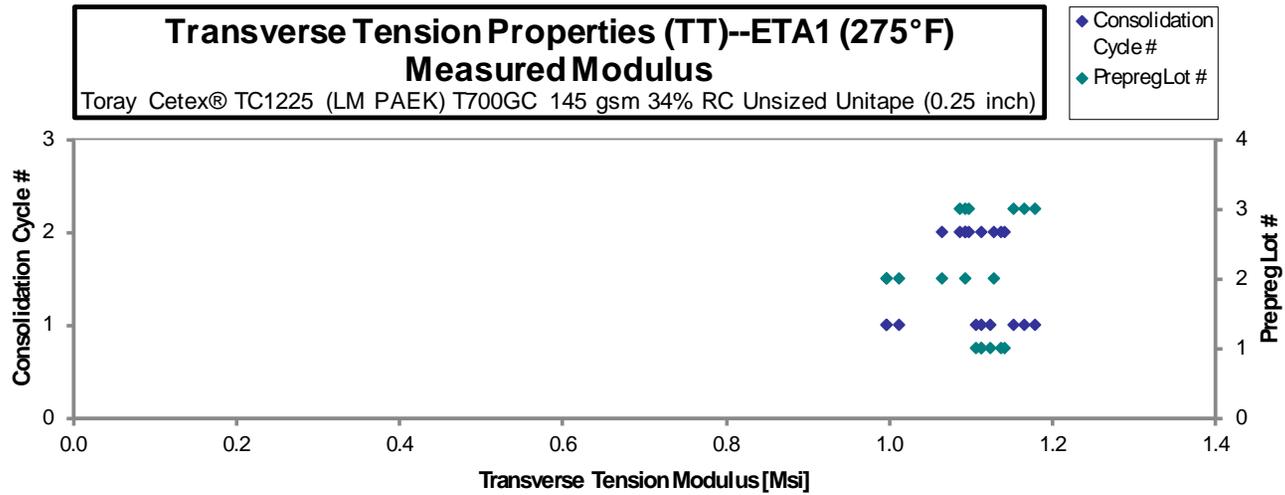
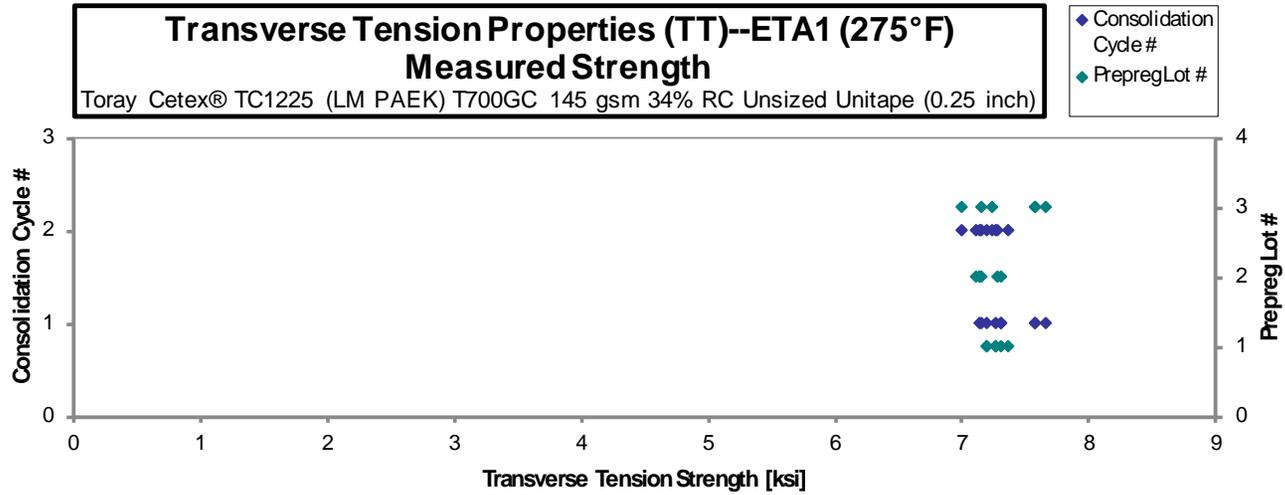
| | | | |
|--------------------|--------|---------|----------|
| Average | 14.07 | 1.316 | 0.005486 |
| Standard Dev. | 0.4352 | 0.04392 | |
| Coeff. of Var. [%] | 3.093 | 3.338 | |
| Min. | 12.64 | 1.240 | 0.005408 |
| Max. | 14.63 | 1.396 | 0.005613 |
| Number of Spec. | 18 | 18 | 18 |



Transverse Tension Properties (TT)--ETA1 (275°F)
Strength & Modulus
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Modulus [Msi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Avg. t_{ply} [in] | Failure Mode |
|--|---------------|--------------------------|---------------|-----------------------|----------------|---------------|------------------------------|---------------------|---------------------|--------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST2-A-C1-1-TT-ETA1-1 | A | C1 | 1 | 1 | 7.263 | 1.106 | 0.08720 | 16 | 0.005450 | LGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST2-A-C1-1-TT-ETA1-2 | A | C1 | 1 | 1 | 7.192 | 1.113 | 0.08730 | 16 | 0.005456 | LGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST2-A-C1-1-TT-ETA1-3 | A | C1 | 1 | 1 | 7.305 | 1.123 | 0.08760 | 16 | 0.005475 | LGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST2-A-C2-1-TT-ETA1-1 | A | C2 | 1 | 2 | 7.363 | 1.114 | 0.08745 | 16 | 0.005466 | LGB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST2-A-C2-1-TT-ETA1-2 | A | C2 | 1 | 2 | 7.200 | 1.136 | 0.08698 | 16 | 0.005436 | LGT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST2-A-C2-1-TT-ETA1-3 | A | C2 | 1 | 2 | 7.265 | 1.141 | 0.08673 | 16 | 0.005421 | LGT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST2-B-C1-1-TT-ETA1-1 | B | C1 | 2 | 1 | 7.153 | 0.9958 | 0.08702 | 16 | 0.005439 | LGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST2-B-C1-1-TT-ETA1-2 | B | C1 | 2 | 1 | 7.305 | 1.012 | 0.08703 | 16 | 0.005440 | LGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST2-B-C1-1-TT-ETA1-3 | B | C1 | 2 | 1 | 7.144 | 0.9976 | 0.08593 | 16 | 0.005371 | LGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST2-B-C2-1-TT-ETA1-1 | B | C2 | 2 | 2 | 7.107 | 1.065 | 0.08955 | 16 | 0.005597 | LGT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST2-B-C2-1-TT-ETA1-2 | B | C2 | 2 | 2 | 7.282 | 1.128 | 0.08968 | 16 | 0.005605 | LAT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST2-B-C2-1-TT-ETA1-3 | B | C2 | 2 | 2 | 7.144 | 1.093 | 0.08990 | 16 | 0.005619 | LGT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST2-C-C1-1-TT-ETA1-1 | C | C1 | 3 | 1 | 7.661 | 1.165 | 0.08677 | 16 | 0.005423 | LGT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST2-C-C1-1-TT-ETA1-2 | C | C1 | 3 | 1 | 7.574 | 1.179 | 0.08643 | 16 | 0.005402 | LGT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST2-C-C1-1-TT-ETA1-3 | C | C1 | 3 | 1 | 7.579 | 1.152 | 0.08730 | 16 | 0.005456 | LGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST2-C-C2-1-TT-ETA1-1 | C | C2 | 3 | 2 | 7.001 | 1.086 | 0.08985 | 16 | 0.005616 | LWB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST2-C-C2-1-TT-ETA1-2 | C | C2 | 3 | 2 | 7.151 | 1.093 | 0.08937 | 16 | 0.005585 | LGT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST2-C-C2-1-TT-ETA1-3 | C | C2 | 3 | 2 | 7.246 | 1.099 | 0.08825 | 16 | 0.005516 | LGT |

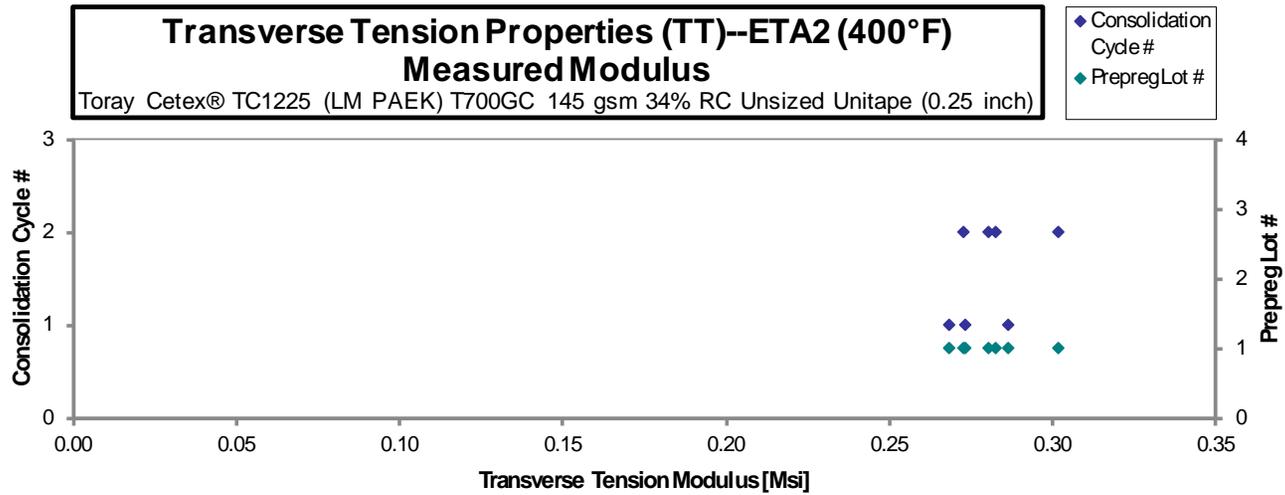
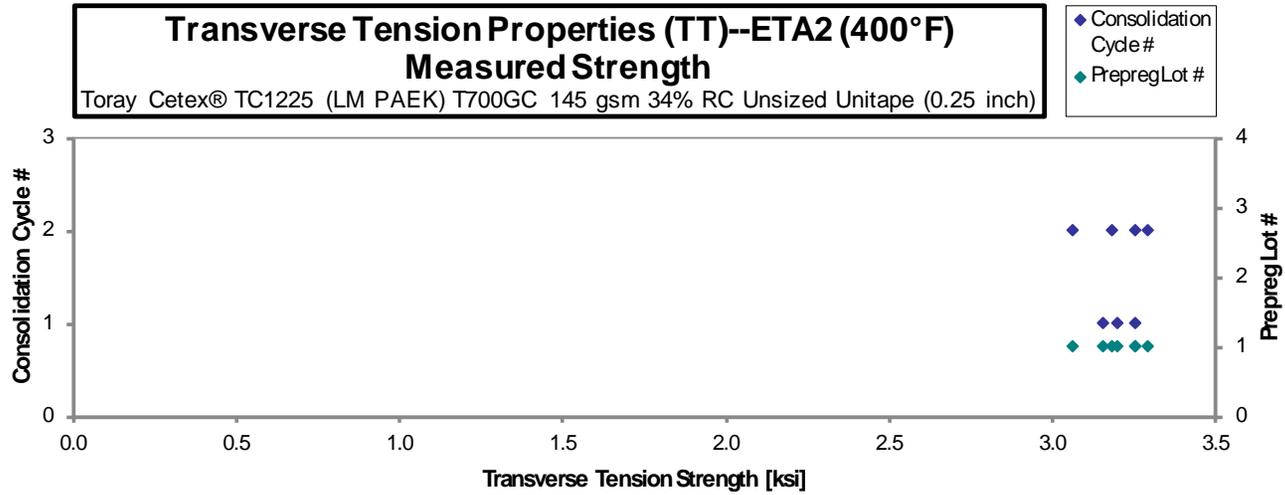
| | | | |
|---------------------------|---------------|----------------|-----------------|
| Average | 7.274 | 1.100 | 0.005487 |
| Standard Dev. | 0.1752 | 0.05339 | |
| Coeff. of Var. [%] | 2.409 | 4.854 | |
| Min. | 7.001 | 0.9958 | 0.005371 |
| Max. | 7.661 | 1.179 | 0.005619 |
| Number of Spec. | 18 | 18 | 18 |



Transverse Tension Properties (TT)--ETA2 (400°F)
Strength & Modulus
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Modulus [Msi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Avg. t_{ply} [in] | Failure Mode |
|---|---------------|--------------------------|---------------|-----------------------|----------------|---------------|------------------------------|---------------------|---------------------|--------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST2-A-C1-1-TT-ETA2-1 | A | C1 | 1 | 1 | 3.154 | 0.2734 | 0.08720 | 16 | 0.005450 | LGT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST2-A-C1-1-TT-ETA2-2 | A | C1 | 1 | 1 | 3.199 | 0.2863 | 0.08720 | 16 | 0.005450 | LGT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST2-A-C1-1-TT-ETA2-3 | A | C1 | 1 | 1 | 3.254 | 0.2685 | 0.08720 | 16 | 0.005450 | LWT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST2-A-C2-1-TT-ETA2-1 | A | C2 | 1 | 2 | 3.061 | 0.2825 | 0.08662 | 16 | 0.005414 | LGB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST2-A-C2-1-TT-ETA2-2 | A | C2 | 1 | 2 | 3.252 | 0.3016 | 0.08660 | 16 | 0.005413 | LGB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST2-A-C2-1-TT-ETA2-3 | A | C2 | 1 | 2 | 3.292 | 0.2728 | 0.08667 | 16 | 0.005417 | LGT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST2-A-C2-1-TT-SP-7 | A | C2 | 1 | 2 | 3.184 | 0.2803 | 0.08722 | 16 | 0.005451 | LGM |

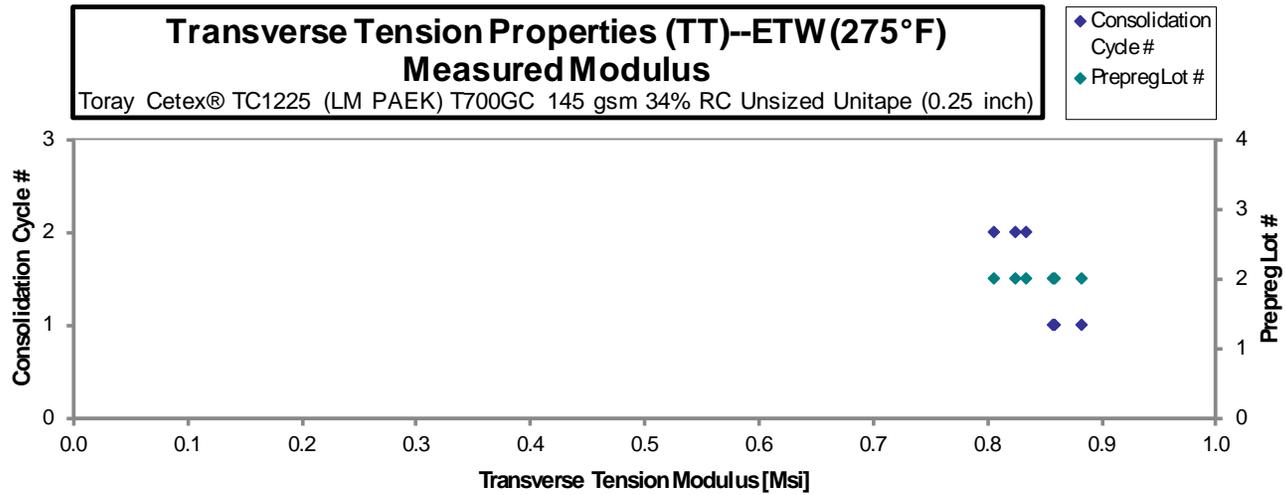
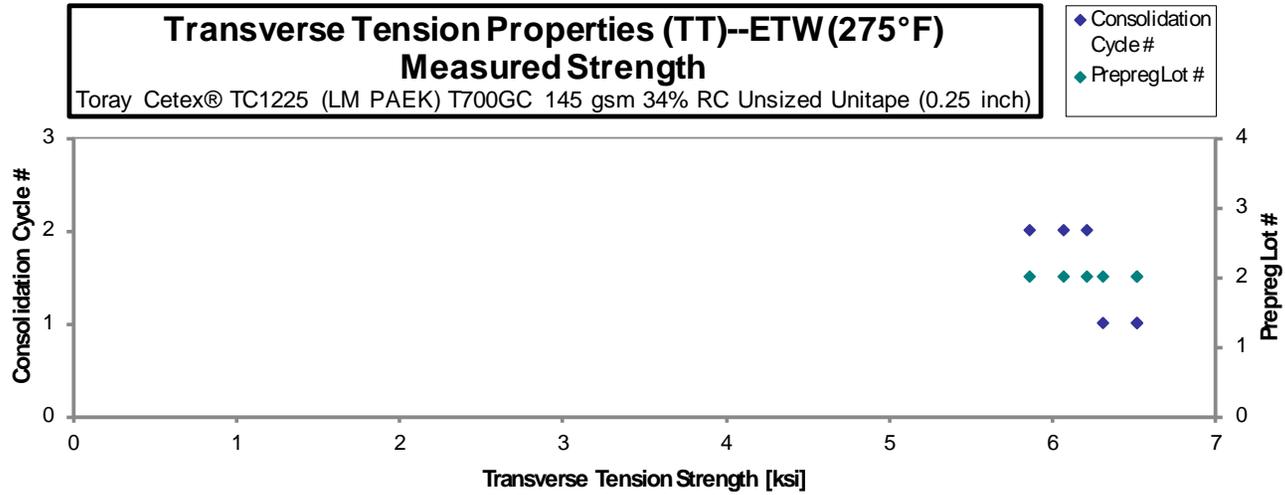
| | | | |
|---------------------------|----------------|----------------|-----------------|
| Average | 3.200 | 0.2808 | 0.005435 |
| Standard Dev. | 0.07712 | 0.01106 | |
| Coeff. of Var. [%] | 2.410 | 3.940 | |
| Min. | 3.061 | 0.2685 | 0.005413 |
| Max. | 3.292 | 0.3016 | 0.005451 |
| Number of Spec. | 7 | 7 | 7 |



| |
|--|
| Transverse Tension Properties (TT)--ETW (275°F) Strength & Modulus Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) |
|--|

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Modulus [Msi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Avg. t_{ply} [in] | Failure Mode |
|--|---------------|--------------------------|---------------|-----------------------|----------------|---------------|------------------------------|---------------------|---------------------|--------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST2-B-C1-1-TT-ETW-1 | B | C1 | 2 | 1 | 6.315 | 0.8596 | 0.08655 | 16 | 0.005409 | LGT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST2-B-C1-1-TT-ETW-2 | B | C1 | 2 | 1 | 6.523 | 0.8820 | 0.08647 | 16 | 0.005404 | LGT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST2-B-C1-1-TT-ETW-3 | B | C1 | 2 | 1 | 6.522 | 0.8573 | 0.08613 | 16 | 0.005383 | LGT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST2-B-C2-1-TT-ETW-1 | B | C2 | 2 | 2 | 5.863 | 0.8248 | 0.08968 | 16 | 0.005605 | LWT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST2-B-C2-1-TT-ETW-2 | B | C2 | 2 | 2 | 6.065 | 0.8059 | 0.08962 | 16 | 0.005601 | LWT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST2-B-C2-1-TT-ETW-3 | B | C2 | 2 | 2 | 6.217 | 0.8344 | 0.08940 | 16 | 0.005588 | LWT |

| | | | |
|---------------------------|---------------|----------------|-----------------|
| Average | 6.251 | 0.8440 | 0.005498 |
| Standard Dev. | 0.2600 | 0.02748 | |
| Coeff. of Var. [%] | 4.160 | 3.256 | |
| Min. | 5.863 | 0.8059 | 0.005383 |
| Max. | 6.523 | 0.8820 | 0.005605 |
| Number of Spec. | 6 | 6 | 6 |



4.3 Longitudinal Compression Properties (LC)

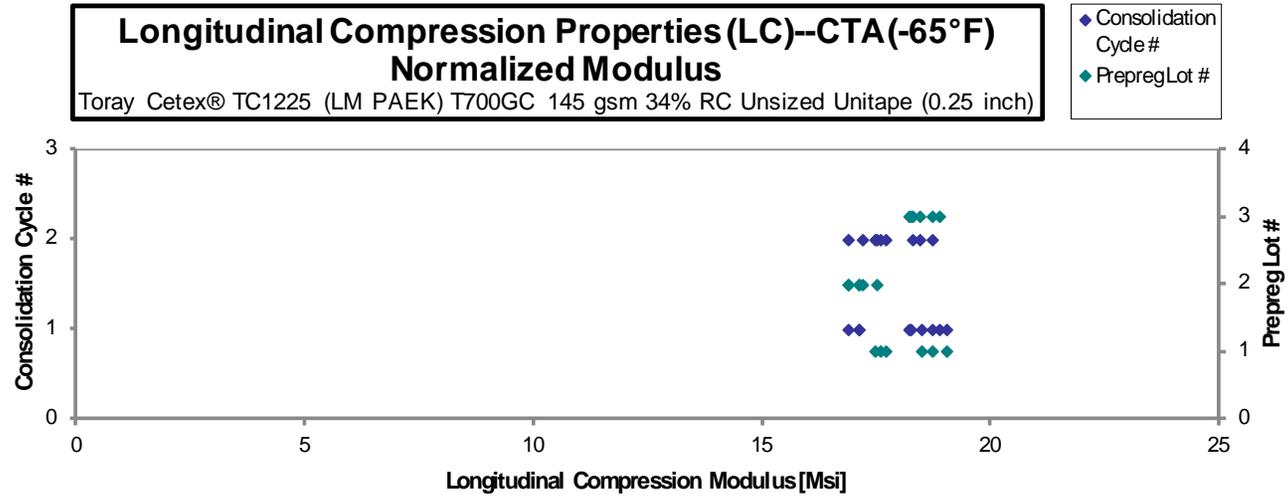
Longitudinal Compression Properties (LC)--CTA (-65°F)
Modulus & Poisson's Ratio
 Toray Cetex® TC1225 (LMPAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Modulus [Msi] | Poisson's Ratio | Avg. Specimen Thickness [in] | # Plies in Laminate |
|---|---------------|--------------------------|---------------|-----------------------|---------------|-----------------|------------------------------|---------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST3R-A-C1-1-LC-CTA-1 | A | C1 | 1 | 1 | 19.00 | 0.4027 | 0.1083 | 20 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3R-A-C1-1-LC-CTA-2 | A | C1 | 1 | 1 | 17.84 | 0.4453 | 0.1121 | 20 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3R-A-C1-1-LC-CTA-3 | A | C1 | 1 | 1 | 17.82 | 0.3734 | 0.1136 | 20 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-A-C2-1-LC-CTA-1 | A | C2 | 1 | 2 | 17.79 | 0.3593 | 0.1063 | 20 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-A-C2-1-LC-CTA-2 | A | C2 | 1 | 2 | 17.66 | 0.3748 | 0.1086 | 20 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-A-C2-1-LC-CTA-3 | A | C2 | 1 | 2 | 17.63 | 0.3158 | 0.1081 | 20 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-B-C1-1-LC-CTA-3 | B | C1 | 2 | 1 | 17.26 | 0.3956 | 0.1073 | 20 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-B-C1-1-LC-SP-1 | B | C1 | 2 | 1 | 16.88 | 0.3172 | 0.1083 | 20 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-B-C1-1-LC-SP-2 | B | C1 | 2 | 1 | 17.21 | 0.4086 | 0.1077 | 20 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-B-C2-1-LC-CTA-1 | B | C2 | 2 | 2 | 16.78 | 0.3140 | 0.1090 | 20 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-B-C2-1-LC-CTA-2 | B | C2 | 2 | 2 | 17.19 | 0.2831 | 0.1101 | 20 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-B-C2-1-LC-CTA-3 | B | C2 | 2 | 2 | 16.98 | 0.3243 | 0.1097 | 20 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST3-C-C1-1-LC-CTA-1 | C | C1 | 3 | 1 | 17.93 | 0.3658 | 0.1099 | 20 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST3-C-C1-1-LC-CTA-2 | C | C1 | 3 | 1 | 17.75 | 0.3481 | 0.1112 | 20 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST3-C-C1-1-LC-CTA-3 | C | C1 | 3 | 1 | 18.37 | 0.4037 | 0.1113 | 20 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST3-C-C2-1-LC-CTA-1 | C | C2 | 3 | 2 | 17.98 | 0.3981 | 0.1101 | 20 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST3-C-C2-1-LC-CTA-2 | C | C2 | 3 | 2 | 17.99 | 0.3396 | 0.1109 | 20 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST3-C-C2-1-LC-CTA-3 | C | C2 | 3 | 2 | 18.36 | 0.3038 | 0.1104 | 20 |

| Avg. t_{ply} [in] | Modulus _{norm} [Msi] |
|---------------------|-------------------------------|
| 0.005417 | 19.06 |
| 0.005603 | 18.51 |
| 0.005680 | 18.74 |
| 0.005317 | 17.52 |
| 0.005430 | 17.76 |
| 0.005403 | 17.64 |
| 0.005364 | 17.14 |
| 0.005413 | 16.92 |
| 0.005385 | 17.16 |
| 0.005449 | 16.93 |
| 0.005504 | 17.52 |
| 0.005483 | 17.24 |
| 0.005497 | 18.25 |
| 0.005559 | 18.27 |
| 0.005564 | 18.93 |
| 0.005507 | 18.33 |
| 0.005543 | 18.47 |
| 0.005521 | 18.77 |

| | | | | | |
|---------------------------|---------------|----------------|--|-----------------|---------------|
| Average | 17.69 | 0.3596 | Average_{norm} | 0.005480 | 17.95 |
| Standard Dev. | 0.5730 | 0.04427 | Standard Dev._{norm} | | 0.7198 |
| Coeff. of Var. [%] | 3.240 | 12.31 | Coeff. of Var. [%]_{norm} | | 4.009 |
| Min. | 16.78 | 0.2831 | Min. | 0.005317 | 16.92 |
| Max. | 19.00 | 0.4453 | Max. | 0.005680 | 19.06 |
| Number of Spec. | 18 | 18 | Number of Spec. | 18 | 18 |



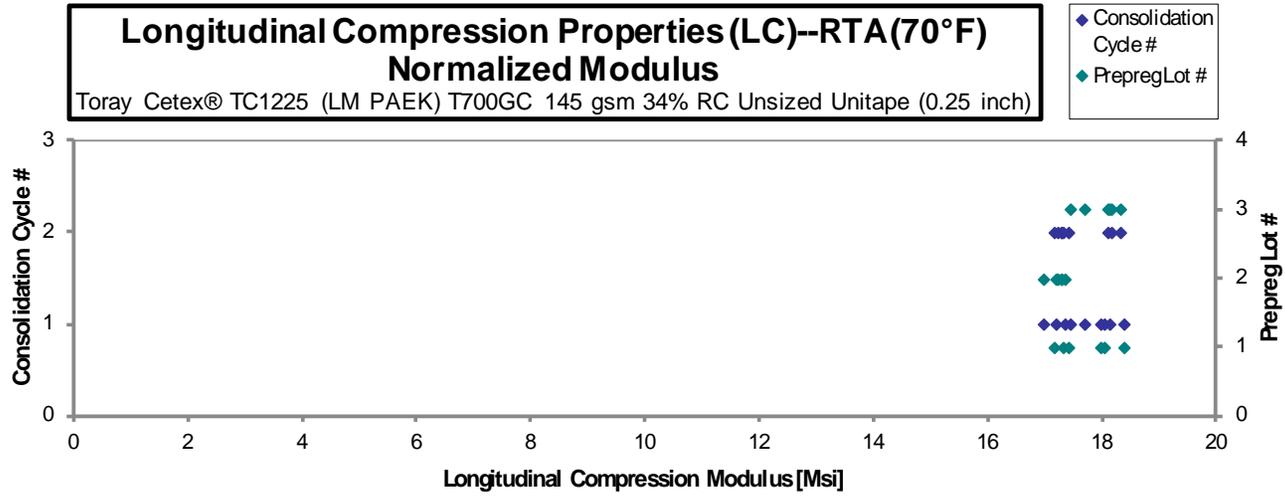
Longitudinal Compression Properties (LC)--RTA (70°F)
Modulus & Poisson's Ratio
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Modulus [Msi] | Poisson's Ratio | Avg. Specimen Thickness [in] | # Plies in Laminate | Avg. t_{ply} [in] | Modulus _{norm} [Msi] |
|---|---------------|--------------------------|---------------|-----------------------|---------------|-----------------|------------------------------|---------------------|---------------------|-------------------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST3R-A-C1-1-LC-RTA-1 | A | C1 | 1 | 1 | 17.24 | 0.3138 | 0.1132 | 20 | 0.005658 | 18.07 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3R-A-C1-1-LC-RTA-2 | A | C1 | 1 | 1 | 17.29 | 0.3323 | 0.1125 | 20 | 0.005623 | 18.00 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3R-A-C1-1-LC-RTA-3 | A | C1 | 1 | 1 | 17.72 | 0.3935 | 0.1122 | 20 | 0.005608 | 18.41 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-A-C2-1-LC-RTA-1 | A | C2 | 1 | 2 | 17.26 | 0.4553 | 0.1076 | 20 | 0.005378 | 17.19 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-A-C2-1-LC-RTA-2 | A | C2 | 1 | 2 | 17.56 | 0.2944 | 0.1073 | 20 | 0.005364 | 17.45 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-A-C2-1-LC-RTA-3 | A | C2 | 1 | 2 | 17.52 | 0.4428 | 0.1068 | 20 | 0.005339 | 17.33 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-B-C1-1-LC-RTA-3 | B | C1 | 2 | 1 | 17.03 | 0.3417 | 0.1077 | 20 | 0.005386 | 16.99 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-B-C1-1-LC-SP-3* | B | C1 | 2 | 1 | 17.43 | 0.2991 | 0.1077 | 20 | 0.005387 | 17.39 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-B-C1-1-LC-SP-4* | B | C1 | 2 | 1 | 17.27 | 0.3406 | 0.1077 | 20 | 0.005383 | 17.22 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-B-C2-1-LC-RTA-1 | B | C2 | 2 | 2 | 17.20 | 0.2606 | 0.1088 | 20 | 0.005439 | 17.33 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-B-C2-1-LC-RTA-2 | B | C2 | 2 | 2 | 17.29 | 0.3324 | 0.1081 | 20 | 0.005406 | 17.31 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-B-C2-1-LC-RTA-3 | B | C2 | 2 | 2 | 17.21 | 0.3496 | 0.1083 | 20 | 0.005414 | 17.26 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST3-C-C1-1-LC-RTA-1 | C | C1 | 3 | 1 | 17.65 | 0.3266 | 0.1110 | 20 | 0.005550 | 18.14 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST3-C-C1-1-LC-RTA-2 | C | C1 | 3 | 1 | 17.08 | 0.2833 | 0.1105 | 20 | 0.005525 | 17.47 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST3-C-C1-1-LC-RTA-3 | C | C1 | 3 | 1 | 17.35 | 0.3339 | 0.1103 | 20 | 0.005516 | 17.72 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST3-C-C2-1-LC-RTA-1 | C | C2 | 3 | 2 | 17.78 | 0.3203 | 0.1104 | 20 | 0.005521 | 18.18 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST3-C-C2-1-LC-RTA-2 | C | C2 | 3 | 2 | 18.08 | 0.3800 | 0.1095 | 20 | 0.005475 | 18.33 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST3-C-C2-1-LC-RTA-3 | C | C2 | 3 | 2 | 17.88 | 0.2998 | 0.1095 | 20 | 0.005477 | 18.13 |

* Modulus and Poisson's Ratio are averaged values from 2 strain gages.

| | | | | | |
|--------------------|--------|---------|------------------------------------|----------|--------|
| Average | 17.44 | 0.3389 | Average _{norm} | 0.005469 | 17.66 |
| Standard Dev. | 0.2893 | 0.05127 | Standard Dev. _{norm} | | 0.4570 |
| Coeff. of Var. [%] | 1.659 | 15.13 | Coeff. of Var. [%] _{norm} | | 2.587 |
| Min. | 17.03 | 0.2606 | Min. | 0.005339 | 16.99 |
| Max. | 18.08 | 0.4553 | Max. | 0.005658 | 18.41 |
| Number of Spec. | 18 | 18 | Number of Spec. | 18 | 18 |



Longitudinal Compression Properties (LC)--ETA1 (275°F)
Modulus & Poisson's Ratio
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

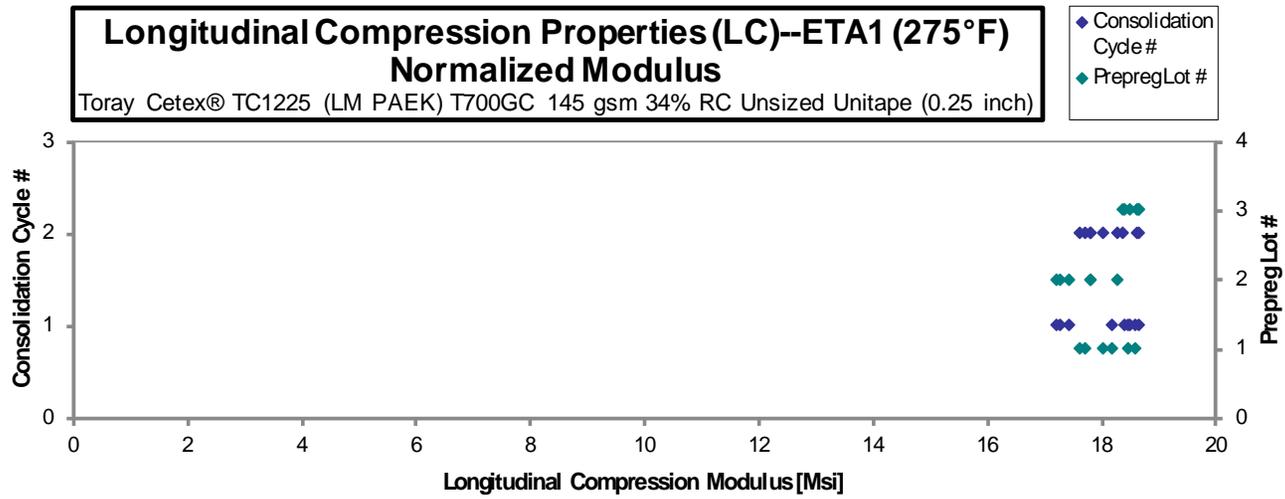
normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Modulus [Msi] | Poisson's Ratio | Avg. Specimen Thickness [in] | # Plies in Laminate |
|--|---------------|--------------------------|---------------|-----------------------|---------------|-----------------|------------------------------|---------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST3R-A-C1-1-LC-ETA1-1 | A | C1 | 1 | 1 | 17.85 | 0.3851 | 0.1118 | 20 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3R-A-C1-1-LC-ETA1-2 | A | C1 | 1 | 1 | 17.49 | 0.3475 | 0.1124 | 20 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3R-A-C1-1-LC-ETA1-3 | A | C1 | 1 | 1 | 17.82 | 0.3854 | 0.1126 | 20 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-A-C2-1-LC-ETA1-1 | A | C2 | 1 | 2 | 17.95 | 0.3054 | 0.1066 | 20 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-A-C2-1-LC-ETA1-2 | A | C2 | 1 | 2 | 18.17 | 0.3296 | 0.1071 | 20 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-A-C2-1-LC-ETA1-3 | A | C2 | 1 | 2 | 17.80 | 0.3095 | 0.1069 | 20 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-B-C1-1-LC-ETA1-3 | B | C1 | 2 | 1 | 17.49 | 0.4394 | 0.1076 | 20 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-B-C1-1-LC-SP-5* | B | C1 | 2 | 1 | 17.31 | 0.3360 | 0.1078 | 20 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-B-C1-1-LC-SP-6* | B | C1 | 2 | 1 | 17.22 | 0.3664 | 0.1080 | 20 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-B-C2-1-LC-ETA1-1 | B | C2 | 2 | 2 | 17.66 | 0.3588 | 0.1090 | 20 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-B-C2-1-LC-ETA1-2 | B | C2 | 2 | 2 | 18.04 | 0.4247 | 0.1094 | 20 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-B-C2-1-LC-ETA1-3 | B | C2 | 2 | 2 | 17.63 | 0.3085 | 0.1090 | 20 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST3-C-C1-1-LC-ETA1-1 | C | C1 | 3 | 1 | 18.27 | 0.2790 | 0.1104 | 20 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST3-C-C1-1-LC-ETA1-2 | C | C1 | 3 | 1 | 18.15 | 0.3716 | 0.1102 | 20 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST3-C-C1-1-LC-ETA1-3 | C | C1 | 3 | 1 | 18.08 | 0.3507 | 0.1100 | 20 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST3-C-C2-1-LC-ETA1-1 | C | C2 | 3 | 2 | 18.35 | 0.3692 | 0.1098 | 20 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST3-C-C2-1-LC-ETA1-2 | C | C2 | 3 | 2 | 18.35 | 0.3238 | 0.1097 | 20 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST3-C-C2-1-LC-ETA1-3 | C | C2 | 3 | 2 | 18.07 | 0.4000 | 0.1098 | 20 |

| Avg. t_{ply} [in] | Modulus _{norm} [Msi] |
|---------------------|-------------------------------|
| 0.005588 | 18.47 |
| 0.005619 | 18.20 |
| 0.005631 | 18.58 |
| 0.005329 | 17.71 |
| 0.005354 | 18.02 |
| 0.005345 | 17.62 |
| 0.005381 | 17.43 |
| 0.005389 | 17.27 |
| 0.005399 | 17.21 |
| 0.005448 | 17.82 |
| 0.005469 | 18.27 |
| 0.005451 | 17.80 |
| 0.005518 | 18.67 |
| 0.005508 | 18.51 |
| 0.005501 | 18.41 |
| 0.005489 | 18.65 |
| 0.005486 | 18.64 |
| 0.005491 | 18.37 |

* Modulus and Poisson's Ratio are averaged values from 2 strain gages.

| | | | | | |
|--------------------|--------|---------|------------------------------------|----------|--------|
| Average | 17.87 | 0.3550 | Average _{norm} | 0.005466 | 18.09 |
| Standard Dev. | 0.3469 | 0.04269 | Standard Dev. _{norm} | | 0.4941 |
| Coeff. of Var. [%] | 1.941 | 12.02 | Coeff. of Var. [%] _{norm} | | 2.731 |
| Min. | 17.22 | 0.2790 | Min. | 0.005329 | 17.21 |
| Max. | 18.35 | 0.4394 | Max. | 0.005631 | 18.67 |
| Number of Spec. | 18 | 18 | Number of Spec. | 18 | 18 |



Longitudinal Compression Properties (LC)--ETA2 (400°F)
Modulus & Poisson's Ratio
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Modulus [Msi] | Poisson's Ratio | Avg. Specimen Thickness [in] | # Plies in Laminate |
|--|---------------|--------------------------|---------------|-----------------------|---------------|-----------------|------------------------------|---------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST3R-A-C1-1-LC-ETA2-1** | A | C1 | 1 | 1 | 17.32 | | 0.1127 | 20 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3R-A-C1-1-LC-ETA2-2* | A | C1 | 1 | 1 | 17.72 | 0.7164 | 0.1129 | 20 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3R-A-C1-1-LC-ETA2-3** | A | C1 | 1 | 1 | 21.67 | | 0.1126 | 20 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-A-C2-1-LC-ETA2-1 | A | C2 | 1 | 2 | 19.83 | 0.2886 | 0.1065 | 20 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-A-C2-1-LC-ETA2-2** | A | C2 | 1 | 2 | 19.28 | | 0.1063 | 20 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-A-C2-1-LC-ETA2-3 | A | C2 | 1 | 2 | 18.41 | 0.7343 | 0.1066 | 20 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-A-C2-1-LC-SP-7 | A | C2 | 1 | 2 | 18.57 | 0.3311 | 0.1065 | 20 |

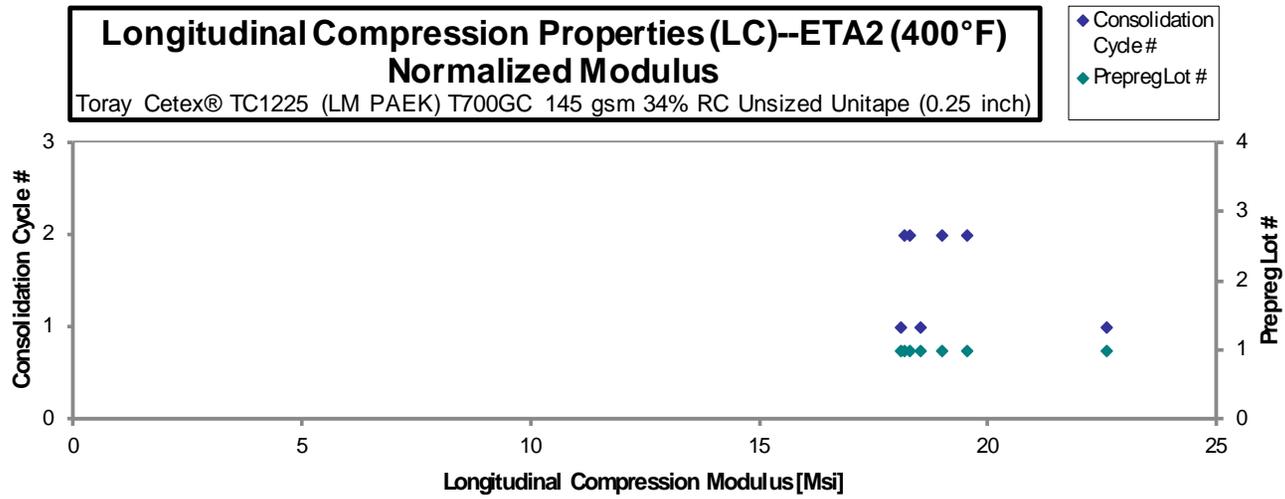
| Avg. t_{ply} [in] | Modulus _{norm} [Msi] |
|---------------------|-------------------------------|
| 0.005633 | 18.07 |
| 0.005644 | 18.52 |
| 0.005632 | 22.60 |
| 0.005323 | 19.55 |
| 0.005316 | 18.98 |
| 0.005329 | 18.17 |
| 0.005323 | 18.30 |

* Modulus are averaged values from 2 strain gages.

** Poisson's Ratio not reported due to non-linear transverse strain was observed.

ETA2 Modulus and Poisson's Ratio calculation is obtained from 200-1000 microstrain.

| | | | | | |
|---------------------------|--------------|---------------|--|-----------------|--------------|
| Average | 18.97 | 0.5176 | Average_{norm} | 0.005457 | 19.17 |
| Standard Dev. | 1.466 | 0.2406 | Standard Dev._{norm} | | 1.600 |
| Coeff. of Var. [%] | 7.728 | 46.49 | Coeff. of Var. [%]_{norm} | | 8.344 |
| Min. | 17.32 | 0.2886 | Min. | 0.005316 | 18.07 |
| Max. | 21.67 | 0.7343 | Max. | 0.005644 | 22.60 |
| Number of Spec. | 7 | 4 | Number of Spec. | 7 | 7 |



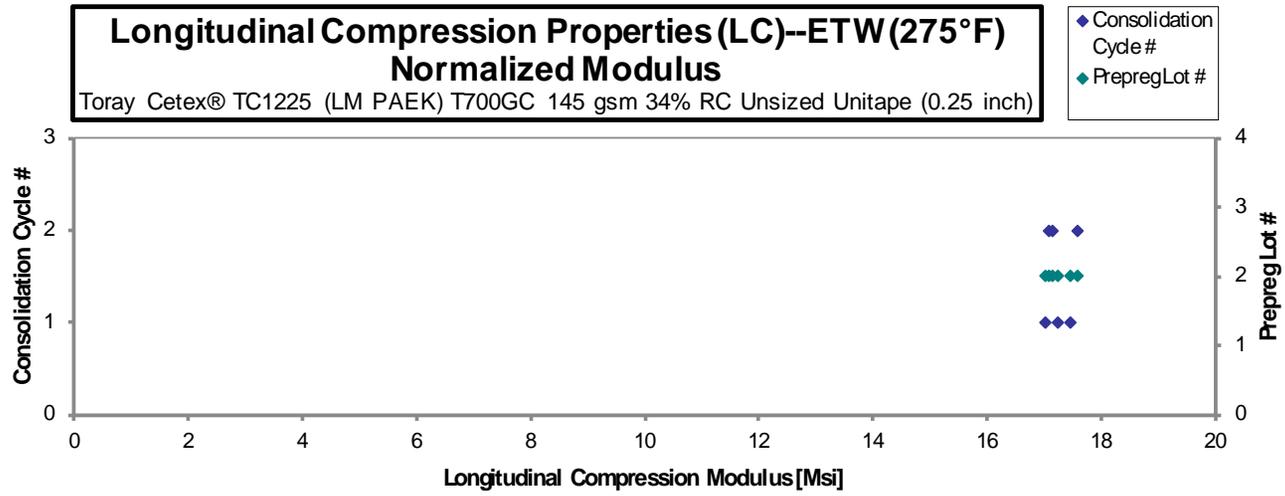
Longitudinal Compression Properties (LC)--ETW (275°F)
Modulus & Poisson's Ratio
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Modulus [Msi] | Poisson's Ratio | Avg. Specimen Thickness [in] | # Plies in Laminate |
|--|---------------|--------------------------|---------------|-----------------------|---------------|-----------------|------------------------------|---------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-B-C1-1-LC-ETW-1 | B | C1 | 2 | 1 | 16.98 | 0.3585 | 0.1083 | 20 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-B-C1-1-LC-ETW-2 | B | C1 | 2 | 1 | 17.40 | 0.3034 | 0.1083 | 20 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-B-C1-1-LC-ETW-3 | B | C1 | 2 | 1 | 17.20 | 0.3212 | 0.1083 | 20 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-B-C2-1-LC-ETW-1 | B | C2 | 2 | 2 | 16.93 | 0.2486 | 0.1089 | 20 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-B-C2-1-LC-ETW-2 | B | C2 | 2 | 2 | 17.51 | 0.3047 | 0.1084 | 20 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-B-C2-1-LC-ETW-3 | B | C2 | 2 | 2 | 17.05 | 0.3258 | 0.1086 | 20 |

| Avg. t_{ply} [in] | Modulus _{norm} [Msi] |
|---------------------|-------------------------------|
| 0.005415 | 17.03 |
| 0.005417 | 17.45 |
| 0.005415 | 17.25 |
| 0.005444 | 17.07 |
| 0.005421 | 17.58 |
| 0.005431 | 17.15 |

| | | | | | |
|---------------------------|---------------|----------------|--|-----------------|---------------|
| Average | 17.18 | 0.3104 | Average_{norm} | 0.005424 | 17.25 |
| Standard Dev. | 0.2341 | 0.03625 | Standard Dev._{norm} | | 0.2187 |
| Coeff. of Var. [%] | 1.362 | 11.68 | Coeff. of Var. [%]_{norm} | | 1.267 |
| Min. | 16.93 | 0.2486 | Min. | 0.005415 | 17.03 |
| Max. | 17.51 | 0.3585 | Max. | 0.005444 | 17.58 |
| Number of Spec. | 6 | 6 | Number of Spec. | 6 | 6 |



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 were calculated using E_1^c , v_{12}^c and E_2^c values from each corresponding test condition, as shown in Table 1-2. 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.

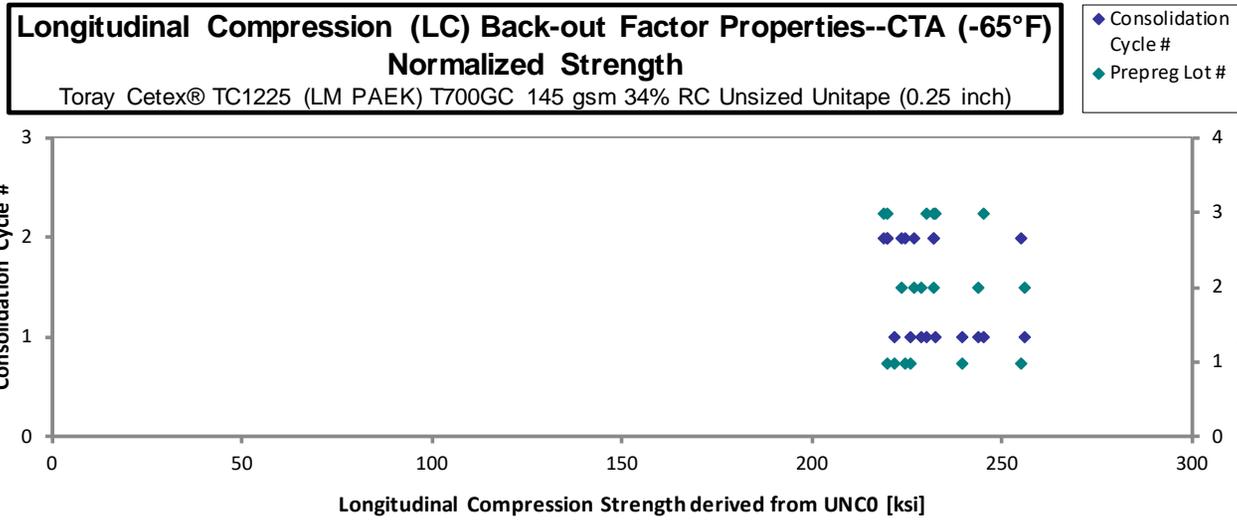
Longitudinal Compression (LC) Back-out Factor Properties--CTA (-65°F)
Strength
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

| UNC0 Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | $F_1^{cu}_{meas}$ [ksi] from UNC0* | $F_1^{cu}_{norm}$ [ksi] from UNC0** |
|---|---------------|--------------------------|---------------|-----------------------|------------------------------------|-------------------------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C1-1-UNC0-CTA-1 | A | C1 | 1 | 1 | 232.7 | 239.1 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C1-1-UNC0-CTA-2 | A | C1 | 1 | 1 | 222.5 | 225.7 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C1-1-UNC0-CTA-3 | A | C1 | 1 | 1 | 218.7 | 221.6 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C2-1-UNC0-CTA-1 | A | C2 | 1 | 2 | 222.1 | 224.1 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C2-1-UNC0-CTA-2 | A | C2 | 1 | 2 | 249.3 | 254.8 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C2-1-UNC0-CTA-3 | A | C2 | 1 | 2 | 215.9 | 219.5 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C1-1-UNC0-CTA-1 | B | C1 | 2 | 1 | 242.9 | 243.4 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C1-1-UNC0-CTA-2 | B | C1 | 2 | 1 | 230.7 | 228.5 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C1-1-UNC0-CTA-3 | B | C1 | 2 | 1 | 258.4 | 255.5 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C2-1-UNC0-CTA-1 | B | C2 | 2 | 2 | 231.2 | 231.6 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C2-1-UNC0-CTA-2 | B | C2 | 2 | 2 | 223.2 | 223.4 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C2-1-UNC0-CTA-3 | B | C2 | 2 | 2 | 226.6 | 226.8 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C1-1-UNC0-CTA-1 | C | C1 | 3 | 1 | 219.3 | 229.8 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C1-1-UNC0-CTA-2 | C | C1 | 3 | 1 | 224.1 | 232.4 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C1-1-UNC0-CTA-3 | C | C1 | 3 | 1 | 235.6 | 244.8 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C2-1-UNC0-CTA-1 | C | C2 | 3 | 2 | 215.5 | 218.7 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C2-1-UNC0-CTA-2 | C | C2 | 3 | 2 | 231.2 | 231.9 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C2-1-UNC0-CTA-3 | C | C2 | 3 | 2 | 219.7 | 219.5 |

* CTA Back-out factor_{meas} = 1.852

** CTA Back-out factor_{norm} = 1.854

| | | |
|---------------------------|--------------|--------------|
| Average | 228.9 | 231.7 |
| Standard Dev. | 11.71 | 11.47 |
| Coeff. of Var. [%] | 5.116 | 4.950 |
| Min. | 215.5 | 218.7 |
| Max. | 258.4 | 255.5 |
| Number of Spec. | 18 | 18 |



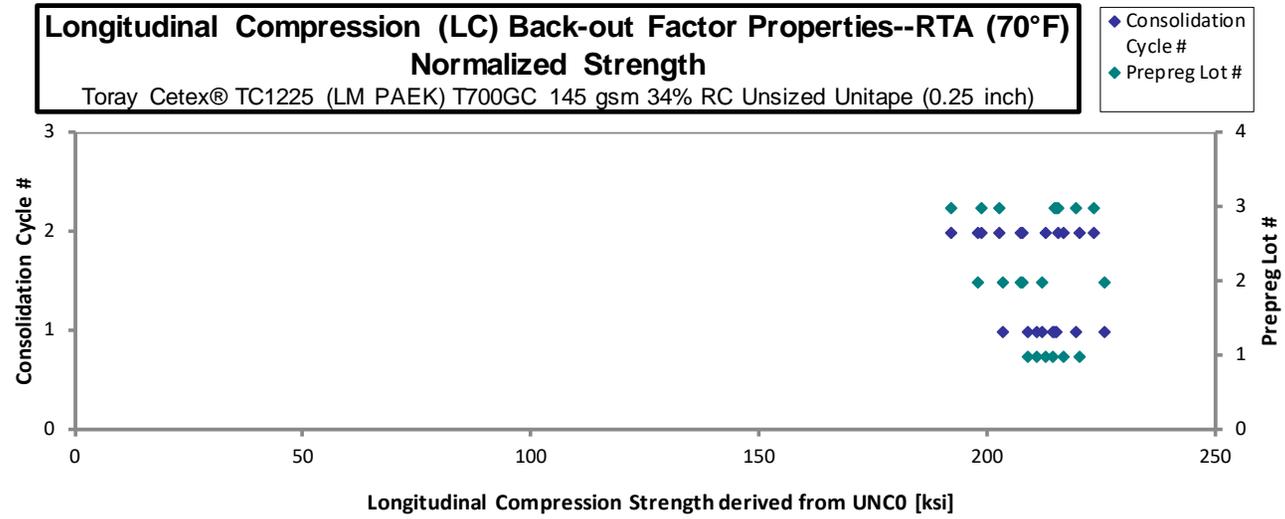
Longitudinal Compression (LC) Back-out Factor Properties--RTA (70°F)
Strength
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

| UNC0 Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | F _{1^{cu}} _{meas} [ksi] from UNC0* | F _{1^{cu}} _{norm} [ksi] from UNC0** |
|---|---------------|--------------------------|---------------|-----------------------|--|---|
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C1-1-UNC0-RTA-1 | A | C1 | 1 | 1 | 210.9 | 214.0 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C1-1-UNC0-RTA-2 | A | C1 | 1 | 1 | 204.8 | 208.7 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C1-1-UNC0-RTA-3 | A | C1 | 1 | 1 | 207.5 | 210.8 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C2-1-UNC0-RTA-1 | A | C2 | 1 | 2 | 215.1 | 219.9 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C2-1-UNC0-RTA-2 | A | C2 | 1 | 2 | 212.5 | 216.7 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C2-1-UNC0-RTA-3 | A | C2 | 1 | 2 | 208.1 | 212.6 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C1-1-UNC0-RTA-2 | B | C1 | 2 | 1 | 227.2 | 225.6 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C1-1-UNC0-RTA-3 | B | C1 | 2 | 1 | 213.5 | 211.9 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C1-1-UNC0-SP-3 | B | C1 | 2 | 1 | 204.4 | 203.1 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C2-1-UNC0-RTA-1 | B | C2 | 2 | 2 | 198.1 | 197.8 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C2-1-UNC0-RTA-2 | B | C2 | 2 | 2 | 208.1 | 207.2 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C2-1-UNC0-RTA-3 | B | C2 | 2 | 2 | 208.5 | 207.4 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C1-1-UNC0-RTA-1 | C | C1 | 3 | 1 | 211.7 | 219.2 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C1-1-UNC0-RTA-2 | C | C1 | 3 | 1 | 208.9 | 215.1 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C1-1-UNC0-RTA-3 | C | C1 | 3 | 1 | 206.5 | 214.6 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C2-1-UNC0-RTA-1 | C | C2 | 3 | 2 | 198.0 | 198.4 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C2-1-UNC0-RTA-2 | C | C2 | 3 | 2 | 214.8 | 215.5 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C2-1-UNC0-RTA-3 | C | C2 | 3 | 2 | 223.6 | 223.3 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C2-1-UNC0-RTA-4 | C | C2 | 3 | 2 | 191.4 | 191.8 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C2-1-UNC0-RTA-5 | C | C2 | 3 | 2 | 202.2 | 202.5 |

* RTA Back-out factor_{meas} = 1.855

** RTA Back-out factor_{norm} = 1.857

| | | |
|---------------------------|--------------|--------------|
| Average | 208.8 | 210.8 |
| Standard Dev. | 8.273 | 8.807 |
| Coeff. of Var. [%] | 3.962 | 4.178 |
| Min. | 191.4 | 191.8 |
| Max. | 227.2 | 225.6 |
| Number of Spec. | 20 | 20 |



**Longitudinal Compression (LC) Back-out Factor Properties--ETA1 (275°F)
Strength**
Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

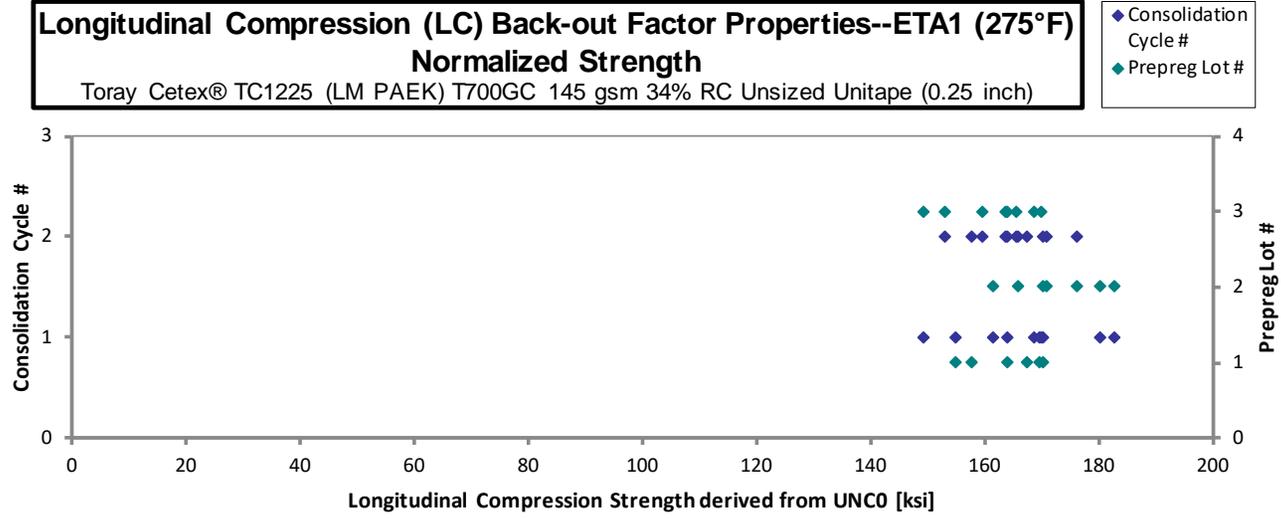
| UNC0 Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | F ₁ ^{cu} _{meas} [ksi] from UNC0** | F ₁ ^{cu} _{norm} [ksi] from UNC0*** |
|--|---------------|--------------------------|---------------|-----------------------|--|---|
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C1-1-UNC0-ETA1-1 | A | C1 | 1 | 1 | 161.3 | 163.9 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C1-1-UNC0-ETA1-2 | A | C1 | 1 | 1 | 167.0 | 169.6 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C1-1-UNC0-ETA1-3 | A | C1 | 1 | 1 | 152.4 | 154.8 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C2-1-UNC0-ETA1-1 | A | C2 | 1 | 2 | 154.2 | 157.6 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C2-1-UNC0-ETA1-2 | A | C2 | 1 | 2 | 167.6 | 170.3 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C2-1-UNC0-ETA1-3 | A | C2 | 1 | 2 | 163.9 | 167.5 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C1-1-UNC0-ETA1-1 | B | C1 | 2 | 1 | 181.0 | 180.2 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C1-1-UNC0-ETA1-2 | B | C1 | 2 | 1 | 183.9 | 182.8 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C1-1-UNC0-ETA1-3 | B | C1 | 2 | 1 | 171.8 | 170.2 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C1-1-UNC0-SP-5 | B | C1 | 2 | 1 | 163.4 | 161.5 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C2-1-UNC0-ETA1-1 | B | C2 | 2 | 2 | 171.5 | 170.8 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C2-1-UNC0-ETA1-2 | B | C2 | 2 | 2 | 166.3 | 165.7 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C2-1-UNC0-ETA1-3* | B | C2 | 2 | 2 | | |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C2-1-UNC0-SP-6 | B | C2 | 2 | 2 | 176.2 | 176.1 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C1-1-UNC0-ETA1-1 | C | C1 | 3 | 1 | 163.9 | 169.9 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C1-1-UNC0-ETA1-2 | C | C1 | 3 | 1 | 161.7 | 168.7 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C1-1-UNC0-ETA1-3 | C | C1 | 3 | 1 | 143.0 | 149.2 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C2-1-UNC0-ETA1-1 | C | C2 | 3 | 2 | 163.9 | 163.9 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C2-1-UNC0-ETA1-2 | C | C2 | 3 | 2 | 164.2 | 163.6 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C2-1-UNC0-ETA1-3 | C | C2 | 3 | 2 | 166.0 | 165.5 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C2-1-UNC0-ETA1-4 | C | C2 | 3 | 2 | 152.0 | 153.2 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C2-1-UNC0-ETA1-5 | C | C2 | 3 | 2 | 159.1 | 159.6 |

* Compression strength is not reported due to unacceptable failure mode.

** ETA1 Back-out factor_{meas} = 1.875

*** ETA1 Back-out factor_{norm} = 1.877

| | | |
|---------------------------|--------------|--------------|
| Average | 164.5 | 165.9 |
| Standard Dev. | 9.574 | 8.363 |
| Coeff. of Var. [%] | 5.820 | 5.040 |
| Min. | 143.0 | 149.2 |
| Max. | 183.9 | 182.8 |
| Number of Spec. | 21 | 21 |



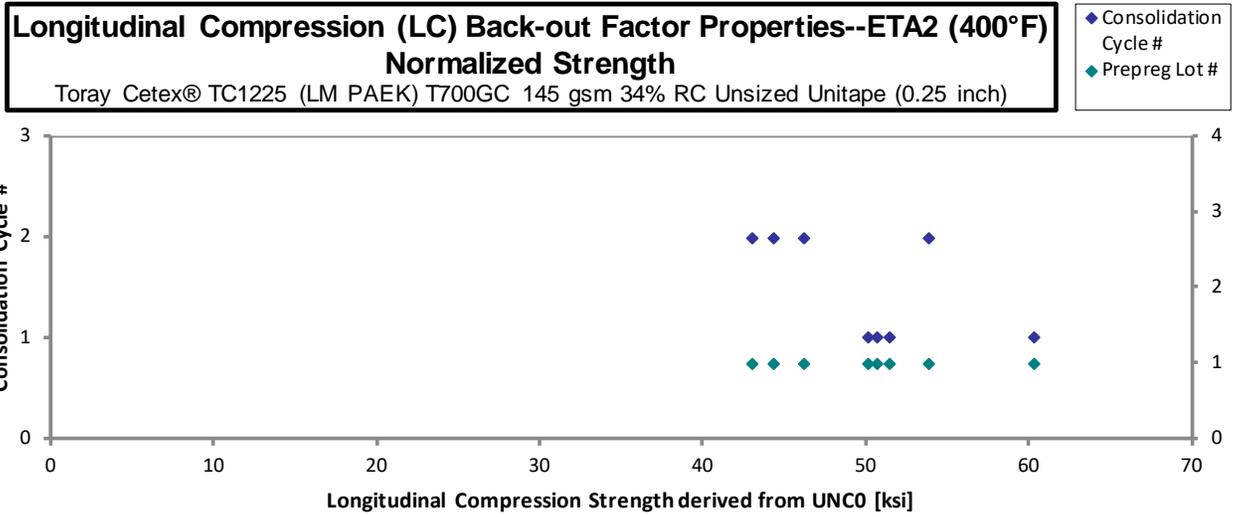
Longitudinal Compression (LC) Back-out Factor Properties--ETA2 (400°F)
Strength
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

| UNC0 Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | F ₁ ^{CU} _{meas} [ksi] from UNC0* | F ₁ ^{CU} _{norm} [ksi] from UNC0** |
|---|---------------|--------------------------|---------------|-----------------------|---|--|
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C1-1-UNC0-ETA2-1 | A | C1 | 1 | 1 | 49.18 | 50.17 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C1-1-UNC0-ETA2-2 | A | C1 | 1 | 1 | 58.95 | 60.32 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C1-1-UNC0-ETA2-3 | A | C1 | 1 | 1 | 49.82 | 50.70 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C1-1-UNC0-SP-7 | A | C1 | 1 | 1 | 50.98 | 51.49 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C2-1-UNC0-ETA2-1 | A | C2 | 1 | 2 | 52.30 | 53.87 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C2-1-UNC0-ETA2-2 | A | C2 | 1 | 2 | 45.28 | 46.29 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C2-1-UNC0-ETA2-3 | A | C2 | 1 | 2 | 41.95 | 43.05 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C2-1-UNC0-SP-7 | A | C2 | 1 | 2 | 43.29 | 44.35 |

* ETA2 Back-out factor_{meas} = 1.967

** ETA2 Back-out factor_{norm} = 1.968

| | | |
|---------------------------|--------------|--------------|
| Average | 48.97 | 50.03 |
| Standard Dev. | 5.487 | 5.583 |
| Coeff. of Var. [%] | 11.21 | 11.16 |
| Min. | 41.95 | 43.05 |
| Max. | 58.95 | 60.32 |
| Number of Spec. | 8 | 8 |



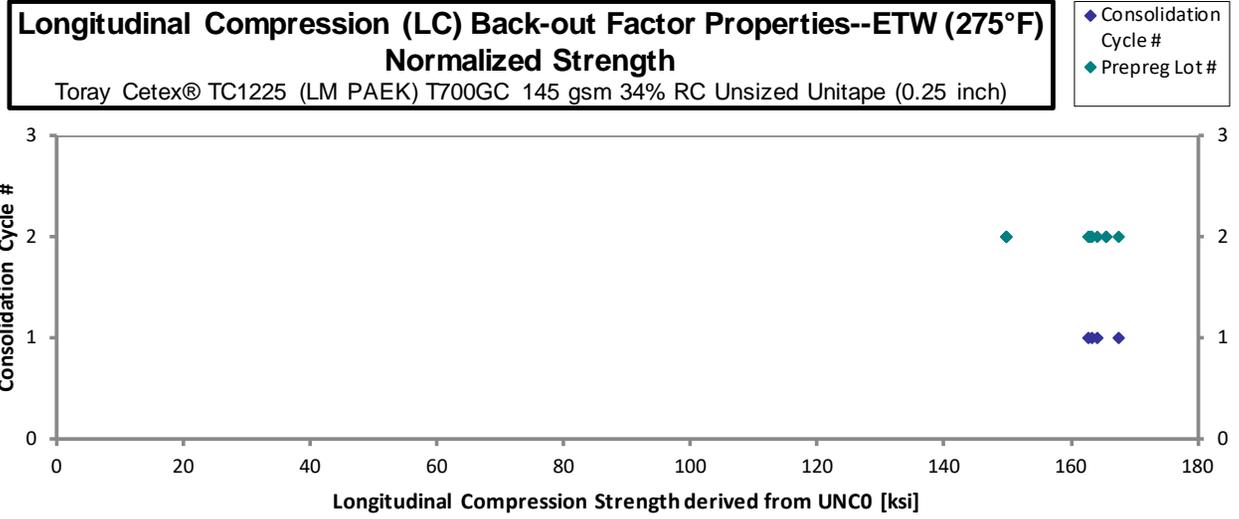
**Longitudinal Compression (LC) Back-out Factor Properties--ETW (275°F)
Strength**
Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

| UNC0 Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | F _{1^{CU} meas} [ksi] from UNC0* | F _{1^{CU} norm} [ksi] from UNC0** |
|--|---------------|--------------------------|---------------|-----------------------|---|--|
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C1-1-UNC0-ETW-1 | B | C1 | 2 | 1 | 164.1 | 162.7 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C1-1-UNC0-ETW-2 | B | C1 | 2 | 1 | 164.3 | 163.2 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C1-1-UNC0-ETW-3 | B | C1 | 2 | 1 | 169.6 | 167.6 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C1-1-UNC0-SP-8 | B | C1 | 2 | 1 | 165.4 | 164.3 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C2-1-UNC0-ETW-1 | B | C2 | 2 | 2 | 165.1 | 165.7 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C2-1-UNC0-ETW-2 | B | C2 | 2 | 2 | 163.8 | 163.2 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C2-1-UNC0-ETW-3 | B | C2 | 2 | 2 | 150.6 | 149.9 |

* ETW Back-out factor_{meas} = 1.885

** ETW Back-out factor_{norm} = 1.885

| | | |
|---------------------------|--------------|--------------|
| Average | 163.3 | 162.4 |
| Standard Dev. | 5.941 | 5.779 |
| Coeff. of Var. [%] | 3.638 | 3.559 |
| Min. | 150.6 | 149.9 |
| Max. | 169.6 | 167.6 |
| Number of Spec. | 7 | 7 |

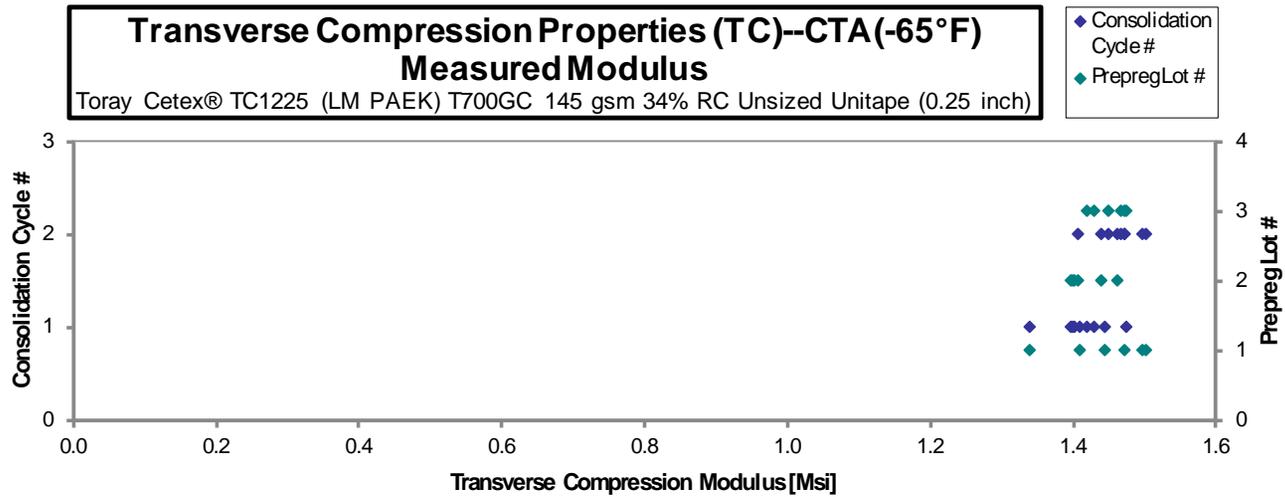
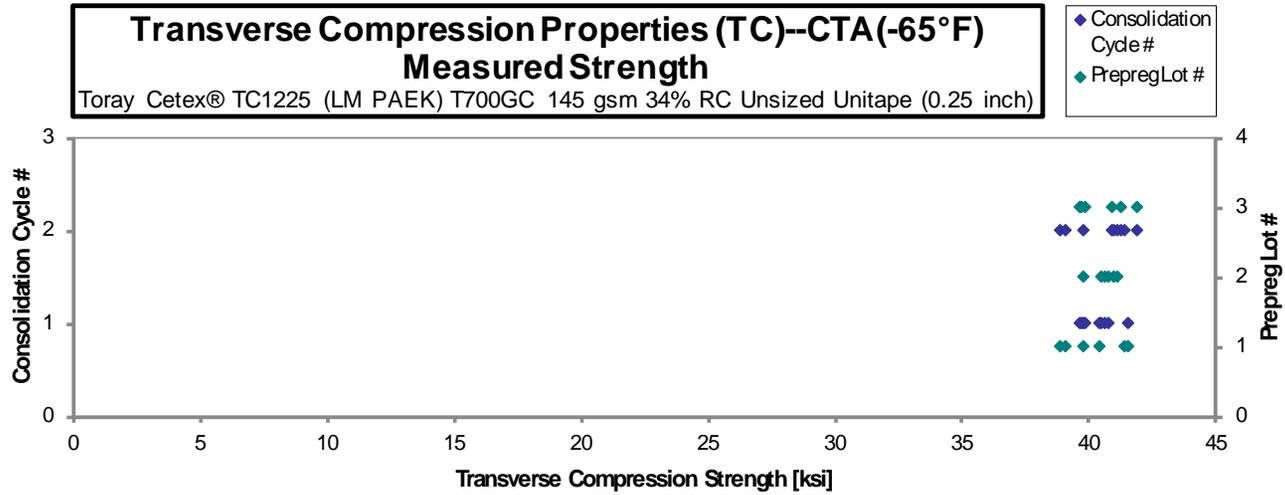


4.5 Transverse Compression Properties (TC)

Transverse Compression Properties (TC)--CTA (-65°F)
Strength & Modulus
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Modulus [Msi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Avg. t _{ply} [in] | Failure Mode |
|---|---------------|--------------------------|---------------|-----------------------|----------------|---------------|------------------------------|---------------------|----------------------------|---------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST3R-A-C1-1-TC-CTA-4 | A | C1 | 1 | 1 | 40.40 | 1.341 | 0.1124 | 20 | 0.005618 | M(B,H)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3R-A-C1-1-TC-CTA-5 | A | C1 | 1 | 1 | 41.55 | 1.446 | 0.1139 | 20 | 0.005693 | M(B,H)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3R-A-C1-1-TC-CTA-6 | A | C1 | 1 | 1 | 39.77 | 1.411 | 0.1145 | 20 | 0.005723 | M(B,H)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-A-C2-1-TC-CTA-1 | A | C2 | 1 | 2 | 38.88 | 1.474 | 0.1068 | 20 | 0.005338 | BGM, HAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-A-C2-1-TC-CTA-2 | A | C2 | 1 | 2 | 39.06 | 1.504 | 0.1065 | 20 | 0.005323 | HGM, BAT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-A-C2-1-TC-CTA-3 | A | C2 | 1 | 2 | 41.43 | 1.499 | 0.1064 | 20 | 0.005322 | HGM, BAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-B-C1-1-TC-CTA-1 | B | C1 | 2 | 1 | 40.80 | 1.400 | 0.1077 | 20 | 0.005383 | HGM, HAT, HAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-B-C1-1-TC-CTA-2 | B | C1 | 2 | 1 | 40.64 | 1.397 | 0.1078 | 20 | 0.005390 | HAT, HAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-B-C1-1-TC-CTA-3 | B | C1 | 2 | 1 | 40.52 | 1.404 | 0.1084 | 20 | 0.005422 | HAT, HAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-B-C2-1-TC-CTA-1 | B | C2 | 2 | 2 | 41.14 | 1.463 | 0.1088 | 20 | 0.005438 | HGM, BAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-B-C2-1-TC-CTA-2 | B | C2 | 2 | 2 | 40.99 | 1.408 | 0.1087 | 20 | 0.005436 | HGM, BAB, HAT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-B-C2-1-TC-CTA-3 | B | C2 | 2 | 2 | 39.81 | 1.441 | 0.1087 | 20 | 0.005436 | HAB, BAT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST3-C-C1-1-TC-CTA-1 | C | C1 | 3 | 1 | 39.68 | 1.474 | 0.1100 | 20 | 0.005498 | HGM, BAT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST3-C-C1-1-TC-CTA-2 | C | C1 | 3 | 1 | 39.89 | 1.419 | 0.1101 | 20 | 0.005506 | HGM, BAT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST3-C-C1-1-TC-CTA-3 | C | C1 | 3 | 1 | 39.73 | 1.431 | 0.1106 | 20 | 0.005528 | M(B,H)GM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST3-C-C2-1-TC-CTA-1 | C | C2 | 3 | 2 | 41.93 | 1.474 | 0.1091 | 20 | 0.005453 | M(B,H)GM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST3-C-C2-1-TC-CTA-2 | C | C2 | 3 | 2 | 41.29 | 1.451 | 0.1087 | 20 | 0.005437 | HGM, BAT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST3-C-C2-1-TC-CTA-3 | C | C2 | 3 | 2 | 40.93 | 1.467 | 0.1089 | 20 | 0.005445 | HGM, BAT |

| | | | |
|--------------------|--------|---------|----------|
| Average | 40.47 | 1.439 | 0.005466 |
| Standard Dev. | 0.8713 | 0.04155 | |
| Coeff. of Var. [%] | 2.153 | 2.887 | |
| Min. | 38.88 | 1.341 | 0.005322 |
| Max. | 41.93 | 1.504 | 0.005723 |
| Number of Spec. | 18 | 18 | 18 |

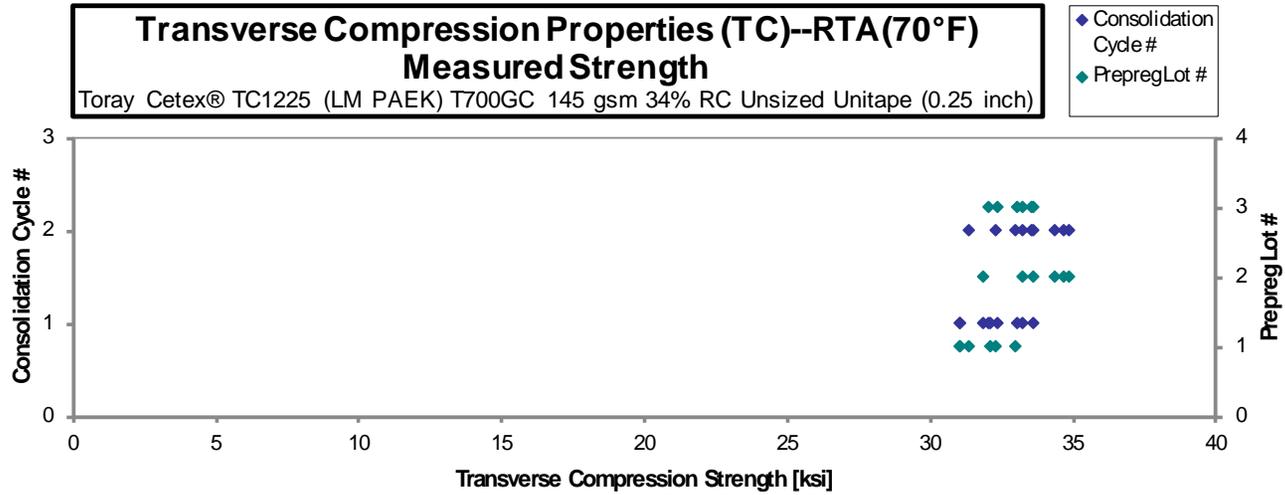


Transverse Compression Properties (TC)--RTA (70°F)
Strength & Modulus
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Modulus [Msi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Avg. t _{ply} [in] | Failure Mode |
|---|---------------|--------------------------|---------------|-----------------------|----------------|---------------|------------------------------|---------------------|----------------------------|---------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST3R-A-C1-1-TC-RTA-4 | A | C1 | 1 | 1 | 31.02 | 1.343 | 0.1140 | 20 | 0.005698 | HGM, BAT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3R-A-C1-1-TC-RTA-5 | A | C1 | 1 | 1 | 31.07 | 1.358 | 0.1133 | 20 | 0.005666 | HGM, BAT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3R-A-C1-1-TC-RTA-6 | A | C1 | 1 | 1 | 32.14 | 1.375 | 0.1124 | 20 | 0.005618 | HGM, BAT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-A-C2-1-TC-RTA-1 | A | C2 | 1 | 2 | 31.37 | 1.434 | 0.1065 | 20 | 0.005326 | BAB, HAT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-A-C2-1-TC-RTA-2 | A | C2 | 1 | 2 | 32.33 | 1.464 | 0.1068 | 20 | 0.005339 | BGM, HAT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-A-C2-1-TC-RTA-3 | A | C2 | 1 | 2 | 33.00 | 1.471 | 0.1066 | 20 | 0.005328 | HAB, HAT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-B-C1-1-TC-RTA-1* | B | C1 | 2 | 1 | 33.65 | 1.341 | 0.1075 | 20 | 0.005376 | HGM, HAT, HAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-B-C1-1-TC-RTA-2* | B | C1 | 2 | 1 | 33.25 | 1.338 | 0.1072 | 20 | 0.005358 | HGM, HAT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-B-C1-1-TC-RTA-3 | B | C1 | 2 | 1 | 31.86 | 1.371 | 0.1075 | 20 | 0.005374 | HGM, HAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-B-C2-1-TC-RTA-1 | B | C2 | 2 | 2 | 34.34 | 1.404 | 0.1088 | 20 | 0.005438 | HGM, BAT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-B-C2-1-TC-RTA-2 | B | C2 | 2 | 2 | 34.85 | 1.385 | 0.1089 | 20 | 0.005443 | HGM, BAT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-B-C2-1-TC-RTA-3 | B | C2 | 2 | 2 | 34.70 | 1.397 | 0.1087 | 20 | 0.005433 | HGM, BAB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST3-C-C1-1-TC-RTA-1 | C | C1 | 3 | 1 | 32.06 | 1.377 | 0.1104 | 20 | 0.005522 | HGM, BAT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST3-C-C1-1-TC-RTA-2 | C | C1 | 3 | 1 | 32.36 | 1.375 | 0.1102 | 20 | 0.005512 | HGM, BAT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST3-C-C1-1-TC-RTA-3 | C | C1 | 3 | 1 | 33.07 | 1.357 | 0.1103 | 20 | 0.005516 | M(B,H)GM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST3-C-C2-1-TC-RTA-1 | C | C2 | 3 | 2 | 33.25 | 1.405 | 0.1092 | 20 | 0.005462 | HGM, BAT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST3-C-C2-1-TC-RTA-2 | C | C2 | 3 | 2 | 33.58 | 1.368 | 0.1100 | 20 | 0.005502 | HGM, BAT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST3-C-C2-1-TC-RTA-3 | C | C2 | 3 | 2 | 33.62 | 1.389 | 0.1098 | 20 | 0.005490 | HGM, BAT |

* Modulus are averaged values from 2 strain gages.

| | | | |
|--------------------|-------|---------|----------|
| Average | 32.86 | 1.386 | 0.005467 |
| Standard Dev. | 1.167 | 0.03847 | |
| Coeff. of Var. [%] | 3.551 | 2.775 | |
| Min. | 31.02 | 1.338 | 0.005326 |
| Max. | 34.85 | 1.471 | 0.005698 |
| Number of Spec. | 18 | 18 | 18 |

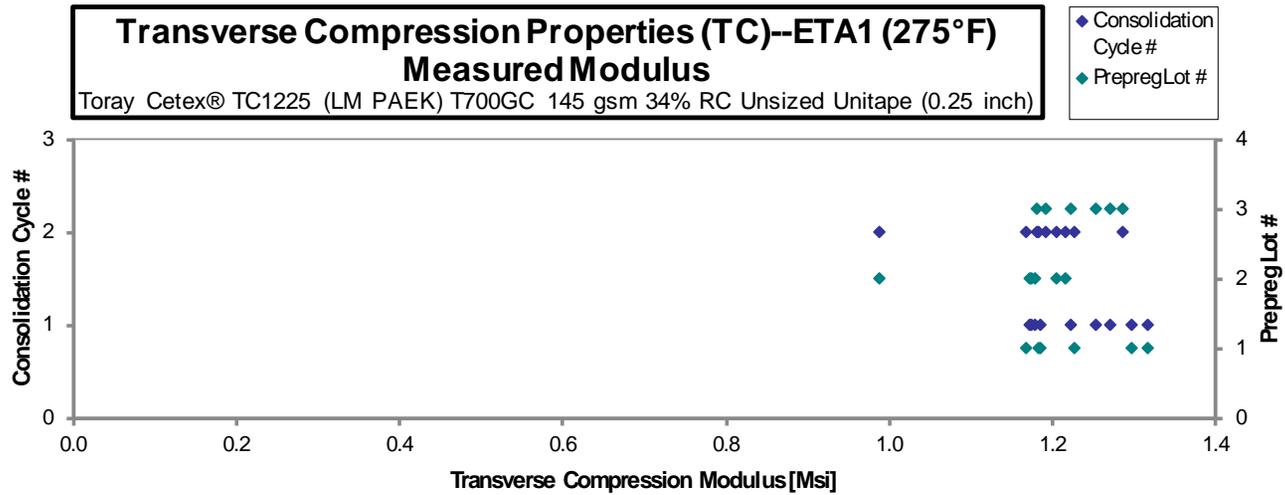
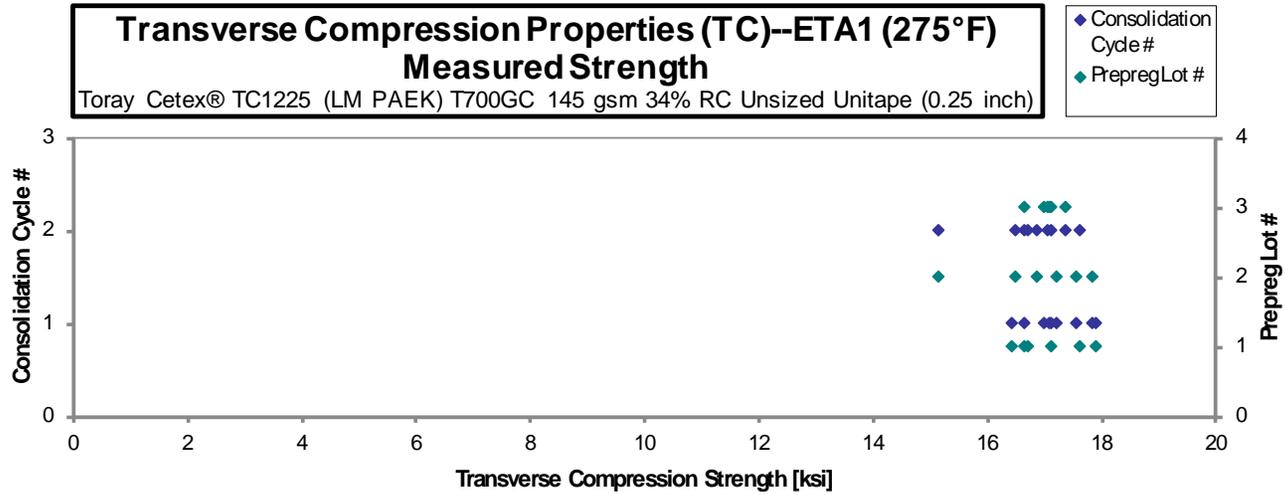


Transverse Compression Properties (TC)--ETA1 (275°F)
Strength & Modulus
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Modulus [Msi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Avg. t _{ply} [in] | Failure Mode |
|--|---------------|--------------------------|---------------|-----------------------|----------------|---------------|------------------------------|---------------------|----------------------------|---------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST3R-A-C1-1-TC-ETA1-4 | A | C1 | 1 | 1 | 16.44 | 1.186 | 0.1142 | 20 | 0.005709 | EGM, HAT, HAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3R-A-C1-1-TC-ETA1-5 | A | C1 | 1 | 1 | 17.12 | 1.317 | 0.1138 | 20 | 0.005690 | EGM, HAT, HAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3R-A-C1-1-TC-ETA1-6 | A | C1 | 1 | 1 | 17.90 | 1.297 | 0.1136 | 20 | 0.005678 | M(E,H)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-A-C2-1-TC-ETA1-1 | A | C2 | 1 | 2 | 16.67 | 1.226 | 0.1062 | 20 | 0.005311 | HAT, HAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-A-C2-1-TC-ETA1-2 | A | C2 | 1 | 2 | 16.70 | 1.167 | 0.1060 | 20 | 0.005298 | HAT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-A-C2-1-TC-ETA1-3 | A | C2 | 1 | 2 | 17.62 | 1.184 | 0.1064 | 20 | 0.005319 | HAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-B-C1-1-TC-ETA1-1* | B | C1 | 2 | 1 | 17.83 | 1.172 | 0.1078 | 20 | 0.005389 | HAT, HGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-B-C1-1-TC-ETA1-2* | B | C1 | 2 | 1 | 17.20 | 1.178 | 0.1076 | 20 | 0.005378 | HAT, HGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-B-C1-1-TC-ETA1-3 | B | C1 | 2 | 1 | 17.56 | 1.173 | 0.1077 | 20 | 0.005387 | HGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-B-C2-1-TC-ETA1-1 | B | C2 | 2 | 2 | 15.14 | 0.9872 | 0.1087 | 20 | 0.005433 | HAT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-B-C2-1-TC-ETA1-2 | B | C2 | 2 | 2 | 16.50 | 1.216 | 0.1087 | 20 | 0.005433 | HAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-B-C2-1-TC-ETA1-3 | B | C2 | 2 | 2 | 16.87 | 1.205 | 0.1091 | 20 | 0.005453 | HAB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST3-C-C1-1-TC-ETA1-1 | C | C1 | 3 | 1 | 17.00 | 1.224 | 0.1101 | 20 | 0.005506 | M(E,H)GM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST3-C-C1-1-TC-ETA1-2 | C | C1 | 3 | 1 | 16.64 | 1.254 | 0.1101 | 20 | 0.005506 | M(E,H)GM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST3-C-C1-1-TC-ETA1-3 | C | C1 | 3 | 1 | 17.09 | 1.272 | 0.1104 | 20 | 0.005522 | M(E,H)GM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST3-C-C2-1-TC-ETA1-1 | C | C2 | 3 | 2 | 17.39 | 1.180 | 0.1105 | 20 | 0.005523 | EGM, HAT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST3-C-C2-1-TC-ETA1-2 | C | C2 | 3 | 2 | 17.11 | 1.192 | 0.1095 | 20 | 0.005476 | EGM, HAT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST3-C-C2-1-TC-ETA1-3 | C | C2 | 3 | 2 | 17.06 | 1.287 | 0.1095 | 20 | 0.005473 | EGM, HAT |

* Modulus are averaged values from 2 strain gages.

| | | | |
|--------------------|--------|---------|----------|
| Average | 16.99 | 1.206 | 0.005471 |
| Standard Dev. | 0.6326 | 0.07223 | |
| Coeff. of Var. [%] | 3.723 | 5.987 | |
| Min. | 15.14 | 0.9872 | 0.005298 |
| Max. | 17.90 | 1.317 | 0.005709 |
| Number of Spec. | 18 | 18 | 18 |



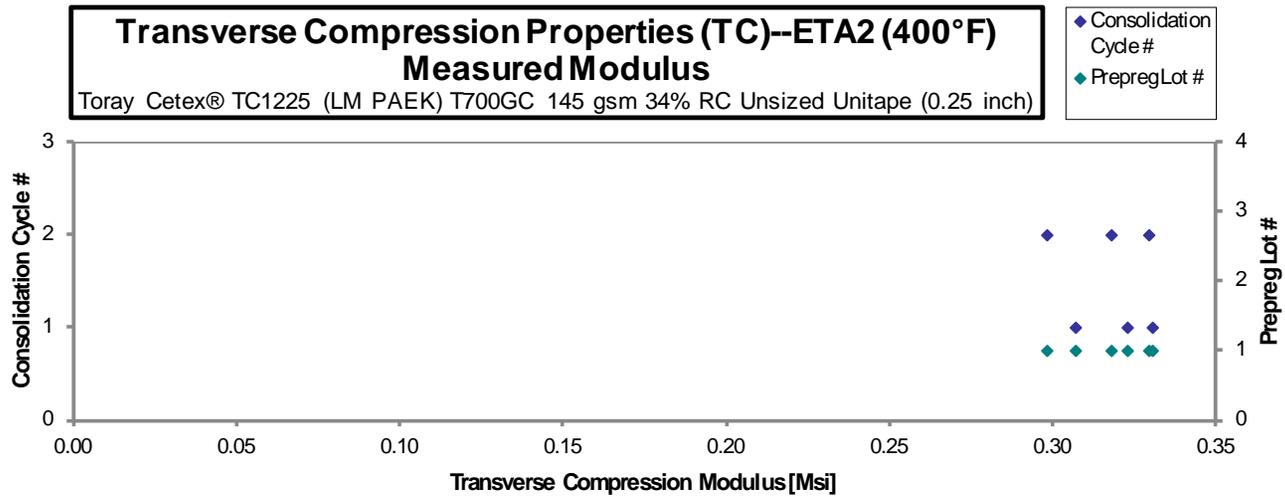
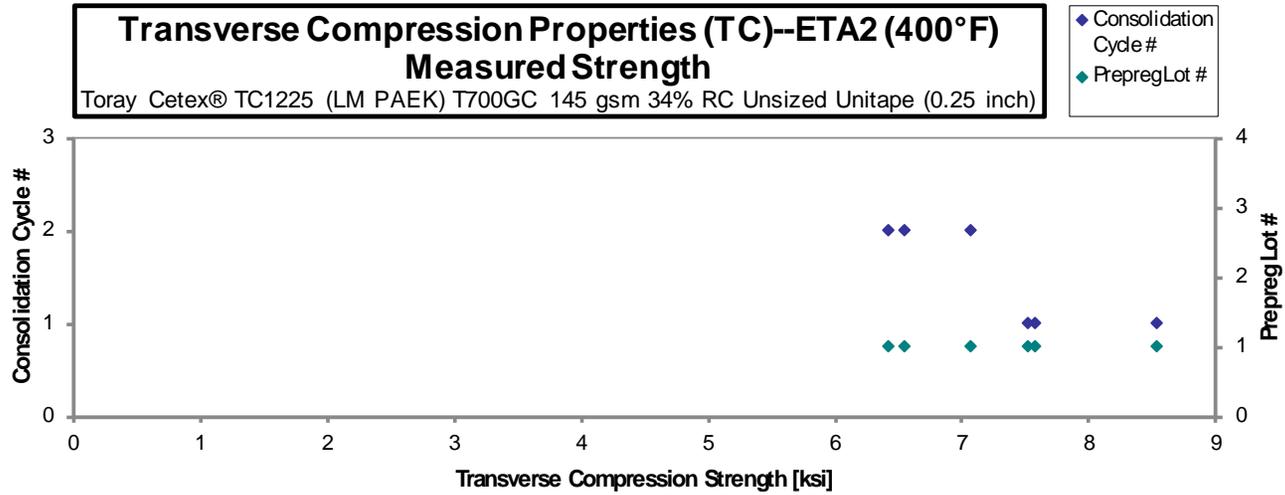
Transverse Compression Properties (TC)--ETA2 (400°F)
Strength & Modulus
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Modulus [Msi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Avg. t _{ply} [in] | Failure Mode |
|---|---------------|--------------------------|---------------|-----------------------|----------------|---------------|------------------------------|---------------------|----------------------------|--------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST3R-A-C1-1-TC-ETA2-4* | A | C1 | 1 | 1 | 7.580 | 0.3231 | 0.1127 | 20 | 0.005637 | EGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3R-A-C1-1-TC-ETA2-5* | A | C1 | 1 | 1 | 8.530 | 0.3311 | 0.1128 | 20 | 0.005638 | EGM, HAT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3R-A-C1-1-TC-ETA2-6 | A | C1 | 1 | 1 | 7.522 | 0.3073 | 0.1140 | 20 | 0.005700 | EGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-A-C2-1-TC-ETA2-1 | A | C2 | 1 | 2 | 6.426 | 0.2984 | 0.1067 | 20 | 0.005333 | EGM, HAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-A-C2-1-TC-ETA2-2 | A | C2 | 1 | 2 | 6.555 | 0.3181 | 0.1066 | 20 | 0.005328 | EGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-A-C2-1-TC-ETA2-3 | A | C2 | 1 | 2 | 7.072 | 0.3298 | 0.1065 | 20 | 0.005323 | EGM |

* Modulus are averaged values from 2 strain gages.

ETA2 Strength is calculated based on max load, no significant load drop was observed.

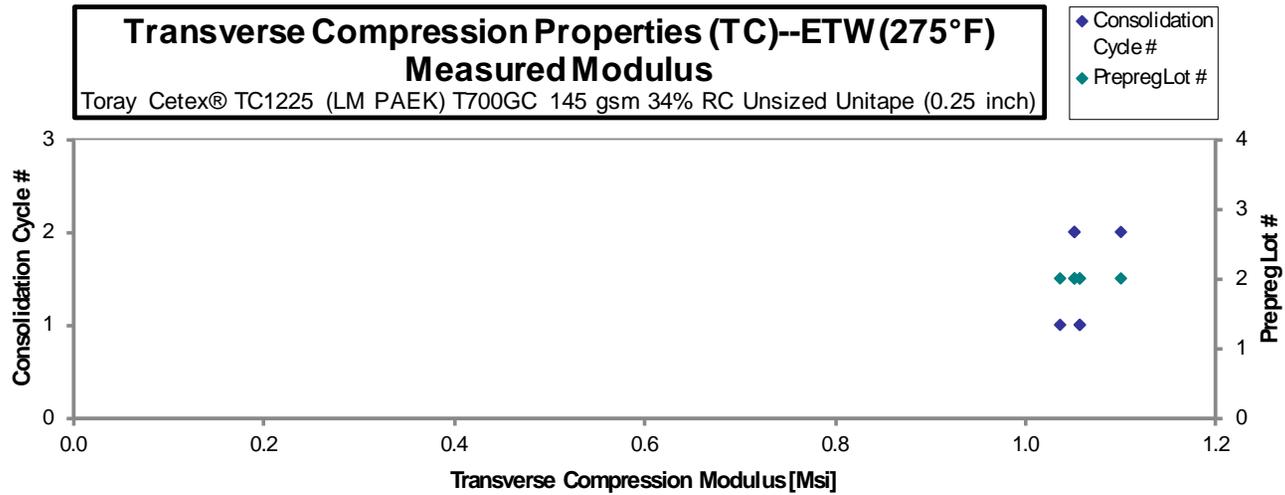
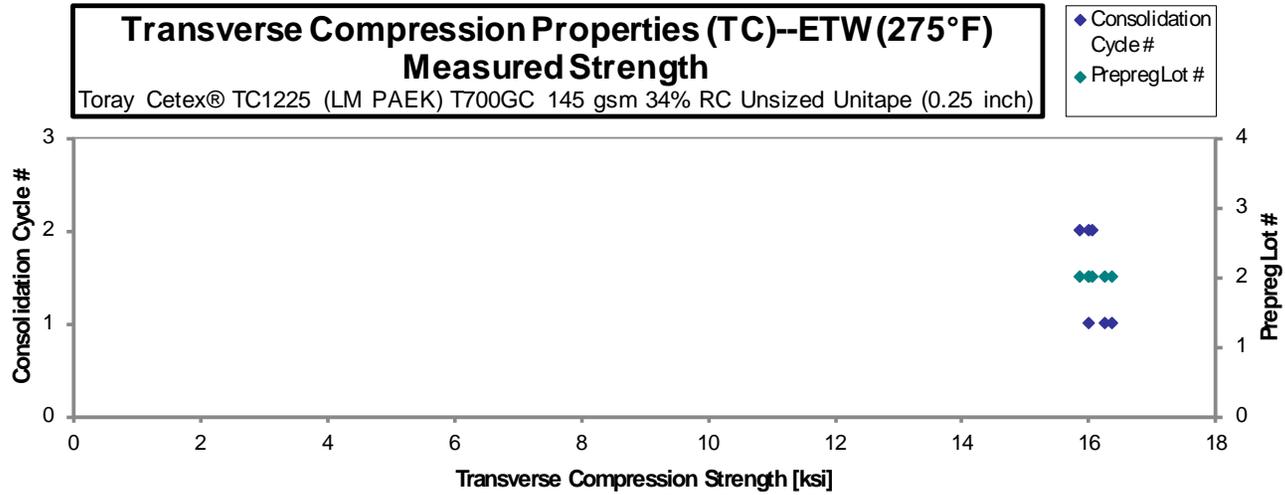
| | | | |
|---------------------------|---------------|----------------|-----------------|
| Average | 7.281 | 0.3180 | 0.005493 |
| Standard Dev. | 0.7756 | 0.01292 | |
| Coeff. of Var. [%] | 10.65 | 4.062 | |
| Min. | 6.426 | 0.2984 | 0.005323 |
| Max. | 8.530 | 0.3311 | 0.005700 |
| Number of Spec. | 6 | 6 | 6 |



**Transverse Compression Properties (TC)--ETW (275°F)
Strength & Modulus**
Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Modulus [Msi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Avg. t_{ply} [in] | Failure Mode |
|--|---------------|--------------------------|---------------|-----------------------|----------------|---------------|------------------------------|---------------------|---------------------|--------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-B-C1-1-TC-ETW-1 | B | C1 | 2 | 1 | 16.38 | 1.036 | 0.1083 | 20 | 0.005416 | HAT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-B-C1-1-TC-ETW-2 | B | C1 | 2 | 1 | 16.25 | 1.058 | 0.1079 | 20 | 0.005396 | HAT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-B-C1-1-TC-ETW-3 | B | C1 | 2 | 1 | 16.00 | 1.057 | 0.1074 | 20 | 0.005371 | HAT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-B-C2-1-TC-ETW-1 | B | C2 | 2 | 2 | 15.85 | 1.053 | 0.1089 | 20 | 0.005443 | HAT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-B-C2-1-TC-ETW-2 | B | C2 | 2 | 2 | 16.05 | 1.052 | 0.1089 | 20 | 0.005443 | HAT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST3-B-C2-1-TC-ETW-3 | B | C2 | 2 | 2 | 16.00 | 1.101 | 0.1087 | 20 | 0.005433 | HAT |

| | | | |
|---------------------------|---------------|----------------|-----------------|
| Average | 16.09 | 1.059 | 0.005417 |
| Standard Dev. | 0.1904 | 0.02179 | |
| Coeff. of Var. [%] | 1.183 | 2.056 | |
| Min. | 15.85 | 1.036 | 0.005371 |
| Max. | 16.38 | 1.101 | 0.005443 |
| Number of Spec. | 6 | 6 | 6 |

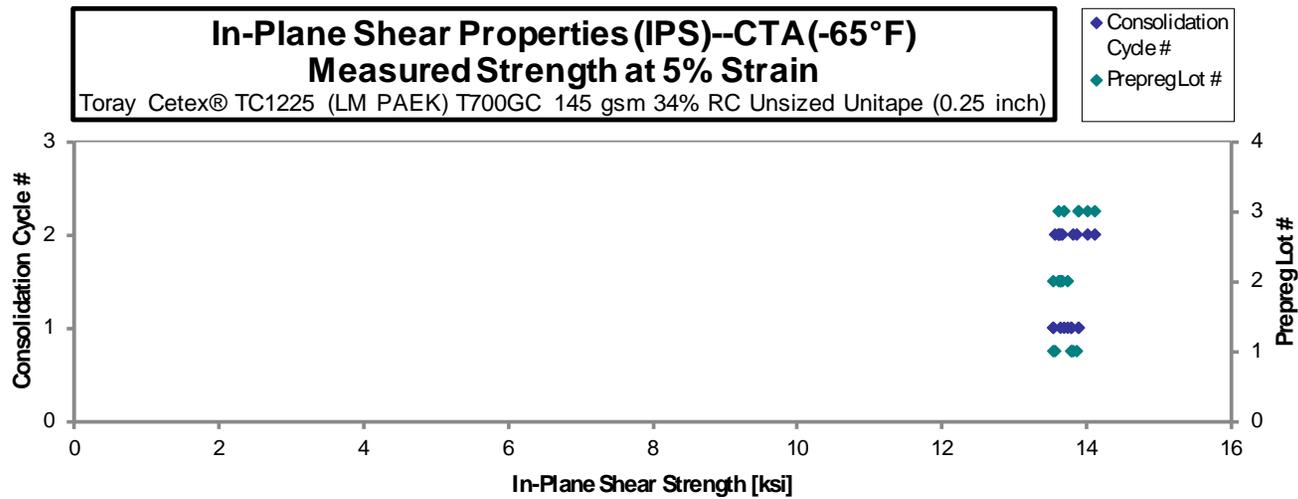
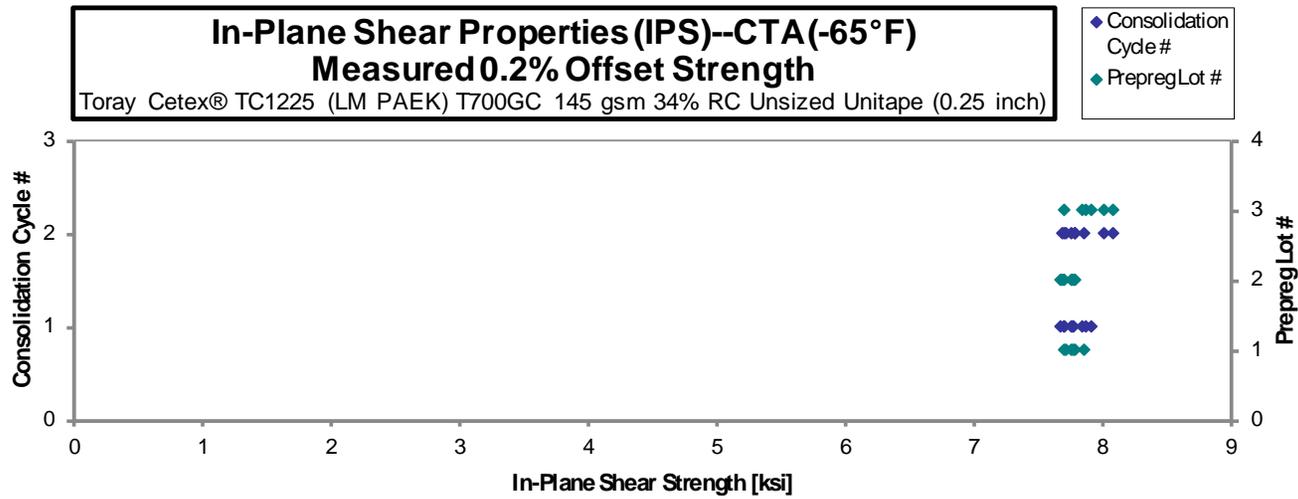


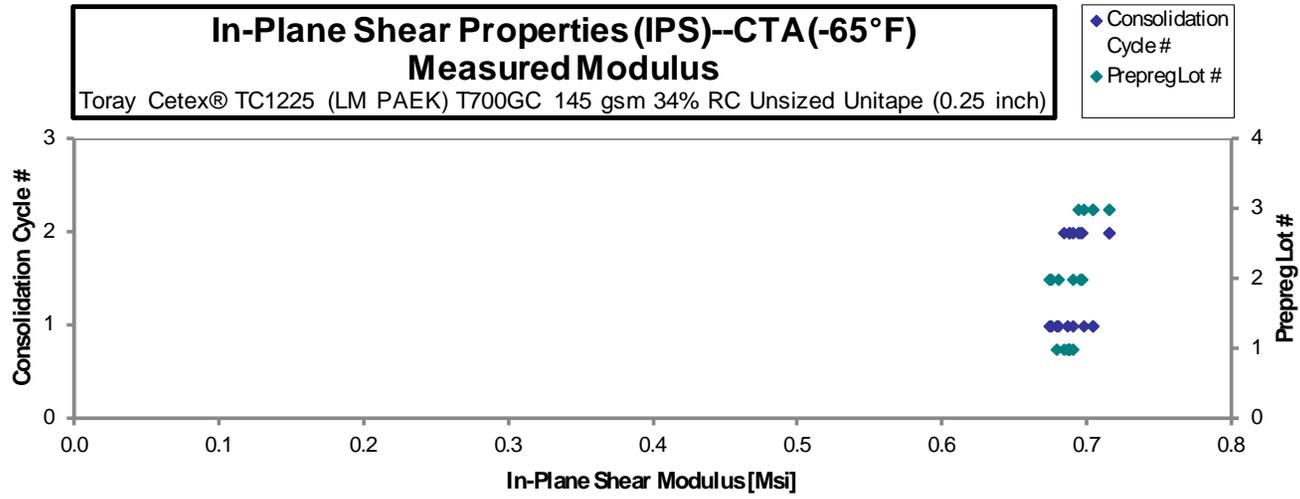
4.6 In-Plane Shear Properties (IPS)

In-Plane Shear Properties (IPS)--CTA (-65°F)
Strength & Modulus
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | 0.2% Offset Strength [ksi] | Strength at 5% Strain [ksi] | Modulus [Msi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Avg. t_{ply} [in] |
|--|---------------|--------------------------|---------------|-----------------------|----------------------------|-----------------------------|---------------|------------------------------|---------------------|---------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST5R-A-C1-1-IPS-CTA-1 | A | C1 | 1 | 1 | 7.761 | 13.78 | 0.6909 | 0.09043 | 16 | 0.005652 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5R-A-C1-1-IPS-CTA-2 | A | C1 | 1 | 1 | 7.702 | 13.53 | 0.6793 | 0.09042 | 16 | 0.005651 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5R-A-C1-1-IPS-CTA-3 | A | C1 | 1 | 1 | 7.769 | 13.78 | 0.6866 | 0.09013 | 16 | 0.005633 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5R-A-C2-1-IPS-CTA-1 | A | C2 | 1 | 2 | 7.790 | 13.81 | 0.6875 | 0.09015 | 16 | 0.005634 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5R-A-C2-1-IPS-CTA-2 | A | C2 | 1 | 2 | 7.849 | 13.87 | 0.6886 | 0.09010 | 16 | 0.005631 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5R-A-C2-1-IPS-CTA-3 | A | C2 | 1 | 2 | 7.718 | 13.56 | 0.6843 | 0.09053 | 16 | 0.005658 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5-B-C1-1-IPS-CTA-1 | B | C1 | 2 | 1 | 7.766 | 13.73 | 0.6803 | 0.08467 | 16 | 0.005292 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5-B-C1-1-IPS-CTA-2 | B | C1 | 2 | 1 | 7.698 | 13.53 | 0.6739 | 0.08515 | 16 | 0.005322 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5-B-C1-1-IPS-CTA-3 | B | C1 | 2 | 1 | 7.678 | 13.64 | 0.6753 | 0.08553 | 16 | 0.005346 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5-B-C2-1-IPS-CTA-1 | B | C2 | 2 | 2 | 7.787 | 13.61 | 0.6954 | 0.08368 | 16 | 0.005230 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5-B-C2-1-IPS-CTA-2 | B | C2 | 2 | 2 | 7.758 | 13.67 | 0.6964 | 0.08403 | 16 | 0.005252 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5-B-C2-1-IPS-CTA-3 | B | C2 | 2 | 2 | 7.685 | 13.65 | 0.6901 | 0.08422 | 16 | 0.005264 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST5-C-C1-1-IPS-CTA-1 | C | C1 | 3 | 1 | 7.840 | 13.70 | 0.6976 | 0.08820 | 16 | 0.005513 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST5-C-C1-1-IPS-CTA-2 | C | C1 | 3 | 1 | 7.910 | 13.88 | 0.7047 | 0.08753 | 16 | 0.005471 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST5-C-C1-1-IPS-CTA-3 | C | C1 | 3 | 1 | 7.869 | 13.88 | 0.7048 | 0.08777 | 16 | 0.005485 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST5-C-C2-1-IPS-CTA-1 | C | C2 | 3 | 2 | 7.701 | 13.61 | 0.6941 | 0.08450 | 16 | 0.005281 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST5-C-C2-1-IPS-CTA-2 | C | C2 | 3 | 2 | 8.006 | 14.02 | 0.7153 | 0.08468 | 16 | 0.005293 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST5-C-C2-1-IPS-CTA-3 | C | C2 | 3 | 2 | 8.074 | 14.12 | 0.7159 | 0.08468 | 16 | 0.005293 |

| | | | | |
|---------------------------|---------------|---------------|----------------|-----------------|
| Average | 7.798 | 13.74 | 0.6923 | 0.005439 |
| Standard Dev. | 0.1109 | 0.1645 | 0.01220 | |
| Coeff. of Var. [%] | 1.422 | 1.197 | 1.762 | |
| Min. | 7.678 | 13.53 | 0.6739 | 0.005230 |
| Max. | 8.074 | 14.12 | 0.7159 | 0.005658 |
| Number of Spec. | 18 | 18 | 18 | 18 |



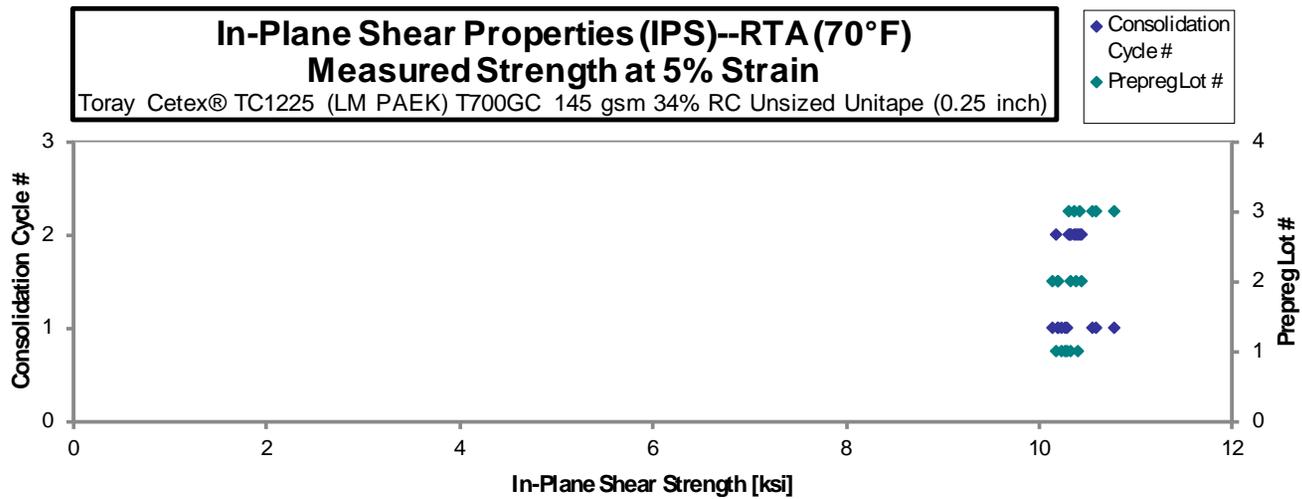
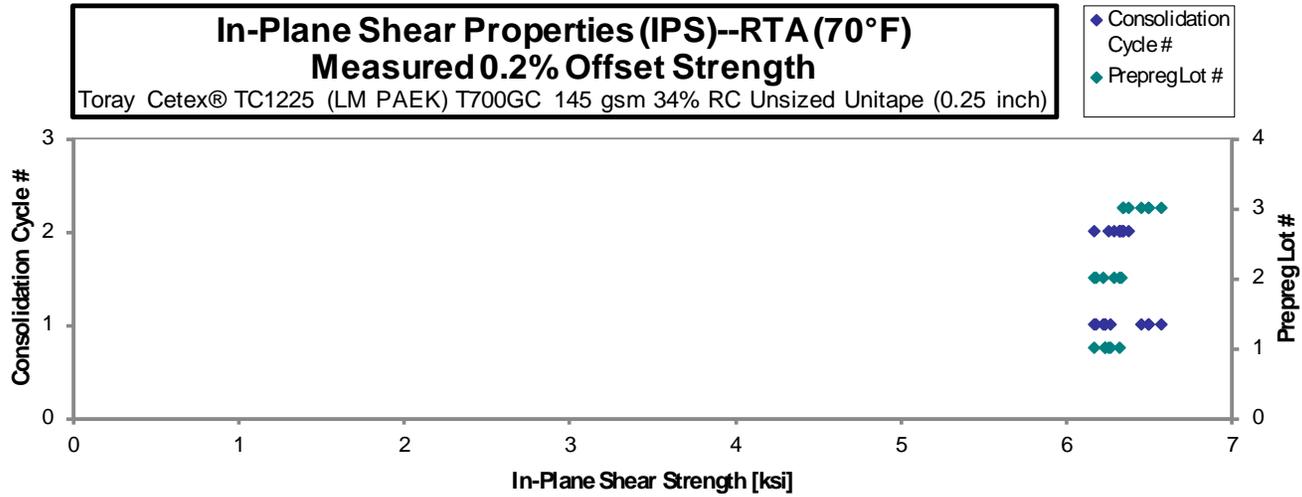


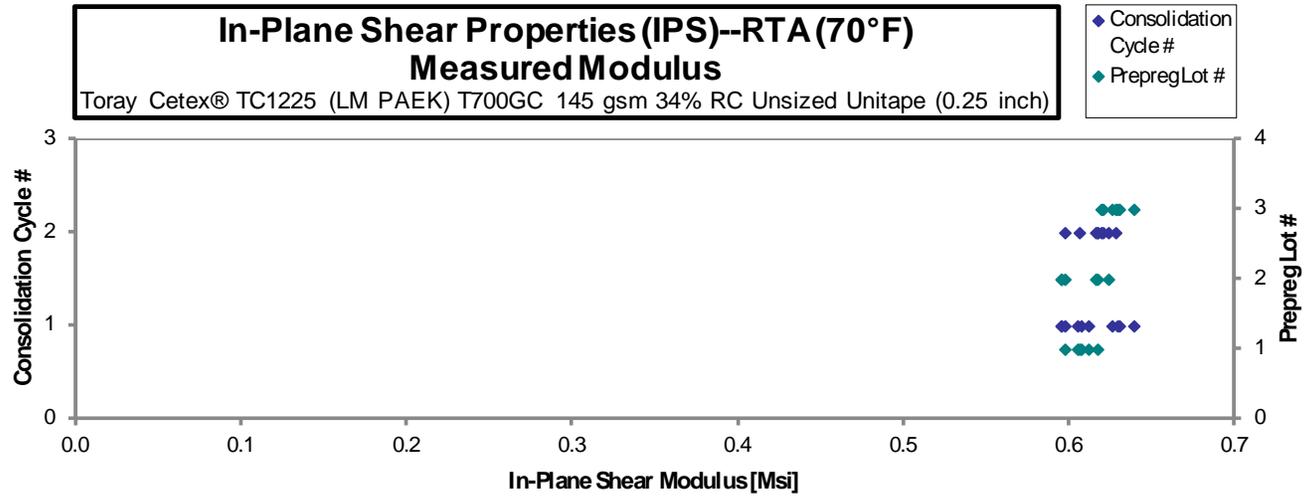
In-Plane Shear Properties (IPS)--RTA (70°F)
Strength & Modulus
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | 0.2% Offset Strength [ksi] | Strength at 5% Strain [ksi] | Modulus [Msi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Avg. t _{ply} [in] |
|---|---------------|--------------------------|---------------|-----------------------|----------------------------|-----------------------------|---------------|------------------------------|---------------------|----------------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST5R-A-C1-1-IPS-RTA-1 | A | C1 | 1 | 1 | 6.236 | 10.28 | 0.6084 | 0.09035 | 16 | 0.005647 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5R-A-C1-1-IPS-RTA-2 | A | C1 | 1 | 1 | 6.263 | 10.28 | 0.6125 | 0.08987 | 16 | 0.005617 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5R-A-C1-1-IPS-RTA-3 | A | C1 | 1 | 1 | 6.236 | 10.23 | 0.6055 | 0.08983 | 16 | 0.005615 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5R-A-C2-1-IPS-RTA-1 | A | C2 | 1 | 2 | 6.256 | 10.33 | 0.6074 | 0.08988 | 16 | 0.005618 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5R-A-C2-1-IPS-RTA-2 | A | C2 | 1 | 2 | 6.325 | 10.40 | 0.6180 | 0.08947 | 16 | 0.005592 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5R-A-C2-1-IPS-RTA-3 | A | C2 | 1 | 2 | 6.164 | 10.18 | 0.5986 | 0.09052 | 16 | 0.005657 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5-B-C1-1-IPS-RTA-1 | B | C1 | 2 | 1 | 6.181 | 10.14 | 0.5961 | 0.08513 | 16 | 0.005321 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5-B-C1-1-IPS-RTA-2 | B | C1 | 2 | 1 | 6.227 | 10.19 | 0.5962 | 0.08505 | 16 | 0.005316 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5-B-C1-1-IPS-RTA-3 | B | C1 | 2 | 1 | 6.164 | 10.20 | 0.5979 | 0.08527 | 16 | 0.005329 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5-B-C2-1-IPS-RTA-1 | B | C2 | 2 | 2 | 6.285 | 10.34 | 0.6173 | 0.08413 | 16 | 0.005258 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5-B-C2-1-IPS-RTA-2 | B | C2 | 2 | 2 | 6.335 | 10.45 | 0.6249 | 0.08398 | 16 | 0.005249 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5-B-C2-1-IPS-RTA-3 | B | C2 | 2 | 2 | 6.324 | 10.38 | 0.6178 | 0.08417 | 16 | 0.005260 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST5-C-C1-1-IPS-RTA-1* | C | C1 | 3 | 1 | 6.500 | | 0.6310 | 0.08803 | 16 | 0.005502 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST5-C-C1-1-IPS-RTA-2 | C | C1 | 3 | 1 | 6.453 | 10.56 | 0.6296 | 0.08797 | 16 | 0.005498 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST5-C-C1-1-IPS-RTA-3 | C | C1 | 3 | 1 | 6.575 | 10.78 | 0.6396 | 0.08748 | 16 | 0.005468 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST5-C-C1-1-IPS-SP-3 | C | C1 | 3 | 1 | 6.492 | 10.60 | 0.6265 | 0.08753 | 16 | 0.005471 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST5-C-C2-1-IPS-RTA-1 | C | C2 | 3 | 2 | 6.340 | 10.32 | 0.6205 | 0.08442 | 16 | 0.005276 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST5-C-C2-1-IPS-RTA-2 | C | C2 | 3 | 2 | 6.380 | 10.38 | 0.6287 | 0.08422 | 16 | 0.005264 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST5-C-C2-1-IPS-RTA-3 | C | C2 | 3 | 2 | 6.339 | 10.43 | 0.6214 | 0.08465 | 16 | 0.005291 |

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

| | | | | |
|---------------------------|---------------|---------------|----------------|-----------------|
| Average | 6.320 | 10.36 | 0.6157 | 0.005434 |
| Standard Dev. | 0.1175 | 0.1632 | 0.01301 | |
| Coeff. of Var. [%] | 1.859 | 1.575 | 2.112 | |
| Min. | 6.164 | 10.14 | 0.5961 | 0.005249 |
| Max. | 6.575 | 10.78 | 0.6396 | 0.005657 |
| Number of Spec. | 19 | 18 | 19 | 19 |



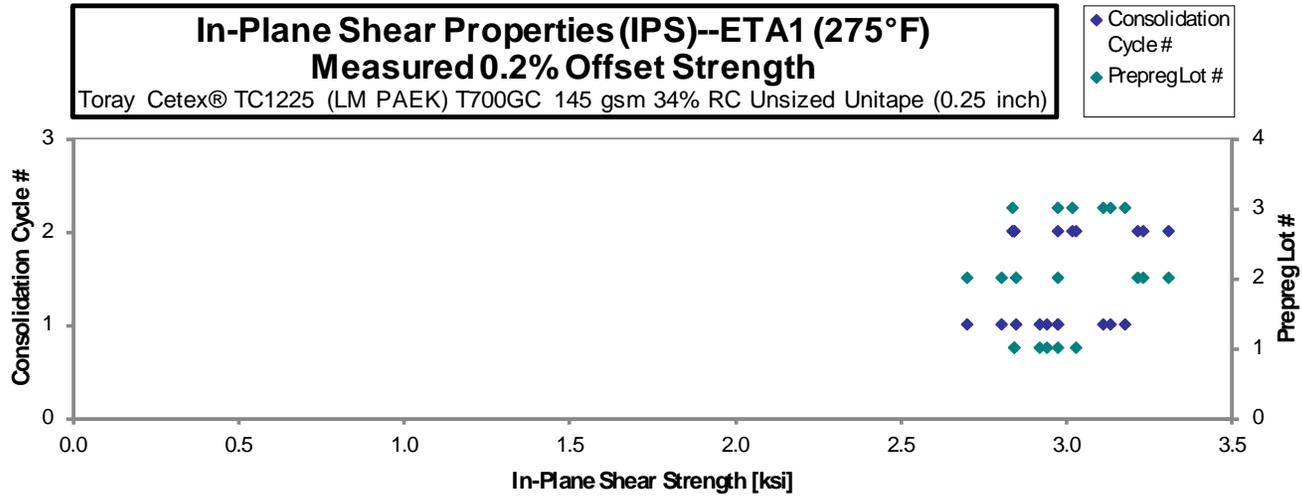


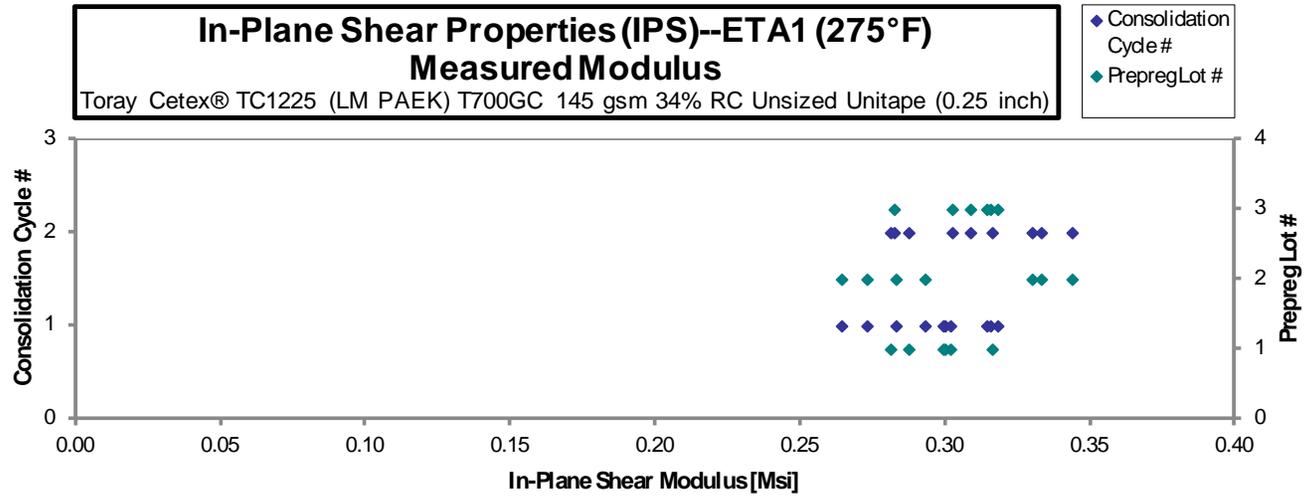
In-Plane Shear Properties (IPS)--ETA1 (275°F)
Strength & Modulus
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | 0.2% Offset Strength [ksi] | Strength at 5% Strain [ksi] | Modulus [Msi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Avg. t _{ply} [in] |
|---|---------------|--------------------------|---------------|-----------------------|----------------------------|-----------------------------|---------------|------------------------------|---------------------|----------------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST5R-A-C1-1-IPS-ETA1-1 | A | C1 | 1 | 1 | 2.972 | 5.331 | 0.2996 | 0.09000 | 16 | 0.005625 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5R-A-C1-1-IPS-ETA1-2 | A | C1 | 1 | 1 | 2.920 | 5.275 | 0.3021 | 0.09028 | 16 | 0.005643 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5R-A-C1-1-IPS-ETA1-3 | A | C1 | 1 | 1 | 2.941 | 5.358 | 0.3002 | 0.08985 | 16 | 0.005616 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5R-A-C2-1-IPS-ETA1-1 | A | C2 | 1 | 2 | 3.032 | 5.444 | 0.3169 | 0.09010 | 16 | 0.005631 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5R-A-C2-1-IPS-ETA1-2 | A | C2 | 1 | 2 | 2.840 | 5.186 | 0.2877 | 0.09062 | 16 | 0.005664 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5R-A-C2-1-IPS-ETA1-3 | A | C2 | 1 | 2 | 2.841 | 5.117 | 0.2817 | 0.09093 | 16 | 0.005683 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5-B-C1-1-IPS-ETA1-1* | B | C1 | 2 | 1 | 2.805 | | 0.2735 | 0.08537 | 16 | 0.005335 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5-B-C1-1-IPS-ETA1-2 | B | C1 | 2 | 1 | 2.848 | 5.166 | 0.2836 | 0.08498 | 16 | 0.005311 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5-B-C1-1-IPS-ETA1-3 | B | C1 | 2 | 1 | 2.703 | 5.052 | 0.2646 | 0.08518 | 16 | 0.005324 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5-B-C1-1-IPS-SP-5 | B | C1 | 2 | 1 | 2.977 | 5.350 | 0.2935 | 0.08487 | 16 | 0.005304 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5-B-C2-1-IPS-ETA1-1 | B | C2 | 2 | 2 | 3.233 | 5.588 | 0.3340 | 0.08408 | 16 | 0.005255 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5-B-C2-1-IPS-ETA1-2 | B | C2 | 2 | 2 | 3.309 | 5.704 | 0.3444 | 0.08468 | 16 | 0.005293 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5-B-C2-1-IPS-ETA1-3 | B | C2 | 2 | 2 | 3.218 | 5.576 | 0.3305 | 0.08425 | 16 | 0.005266 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST5-C-C1-1-IPS-ETA1-1 | C | C1 | 3 | 1 | 3.136 | 5.585 | 0.3184 | 0.08767 | 16 | 0.005479 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST5-C-C1-1-IPS-ETA1-2 | C | C1 | 3 | 1 | 3.114 | 5.543 | 0.3163 | 0.08760 | 16 | 0.005475 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST5-C-C1-1-IPS-ETA1-3 | C | C1 | 3 | 1 | 3.175 | 5.544 | 0.3151 | 0.08755 | 16 | 0.005472 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST5-C-C2-1-IPS-ETA1-1 | C | C2 | 3 | 2 | 3.017 | 5.409 | 0.3090 | 0.08440 | 16 | 0.005275 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST5-C-C2-1-IPS-ETA1-2 | C | C2 | 3 | 2 | 2.838 | 5.180 | 0.2831 | 0.08473 | 16 | 0.005296 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST5-C-C2-1-IPS-ETA1-3 | C | C2 | 3 | 2 | 2.974 | 5.160 | 0.3027 | 0.08415 | 16 | 0.005259 |

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

| | | | | |
|---------------------------|---------------|---------------|----------------|-----------------|
| Average | 2.994 | 5.365 | 0.3030 | 0.005432 |
| Standard Dev. | 0.1663 | 0.1951 | 0.02126 | |
| Coeff. of Var. [%] | 5.553 | 3.636 | 7.017 | |
| Min. | 2.703 | 5.052 | 0.2646 | 0.005255 |
| Max. | 3.309 | 5.704 | 0.3444 | 0.005683 |
| Number of Spec. | 19 | 18 | 19 | 19 |

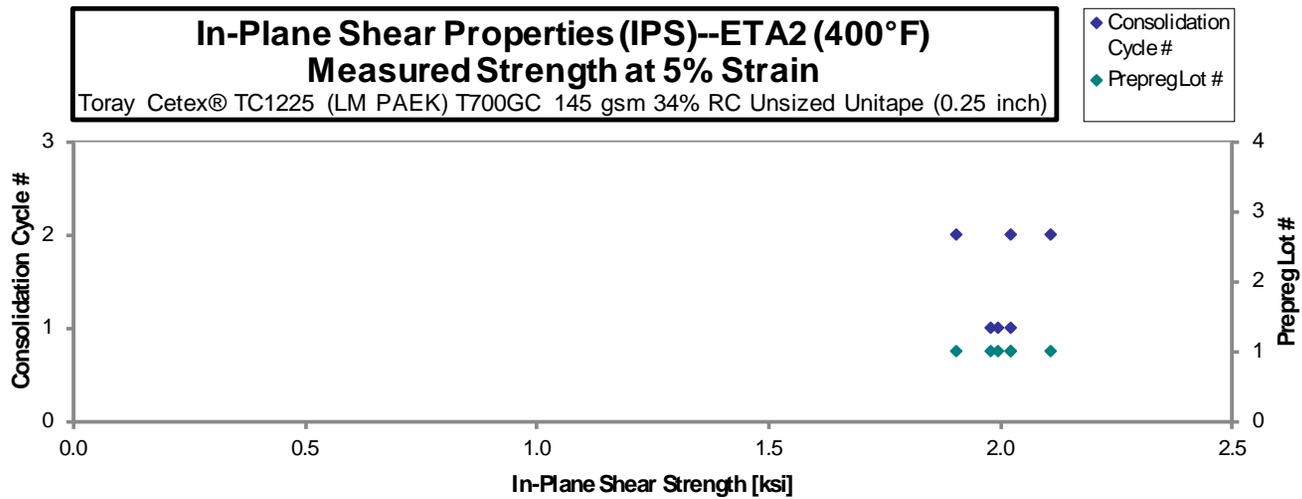
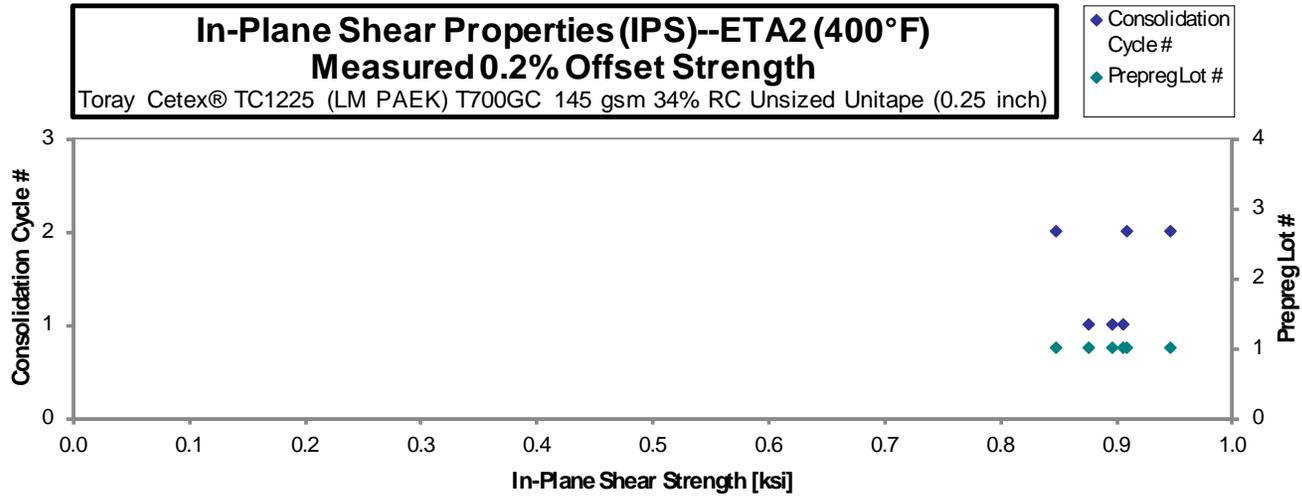


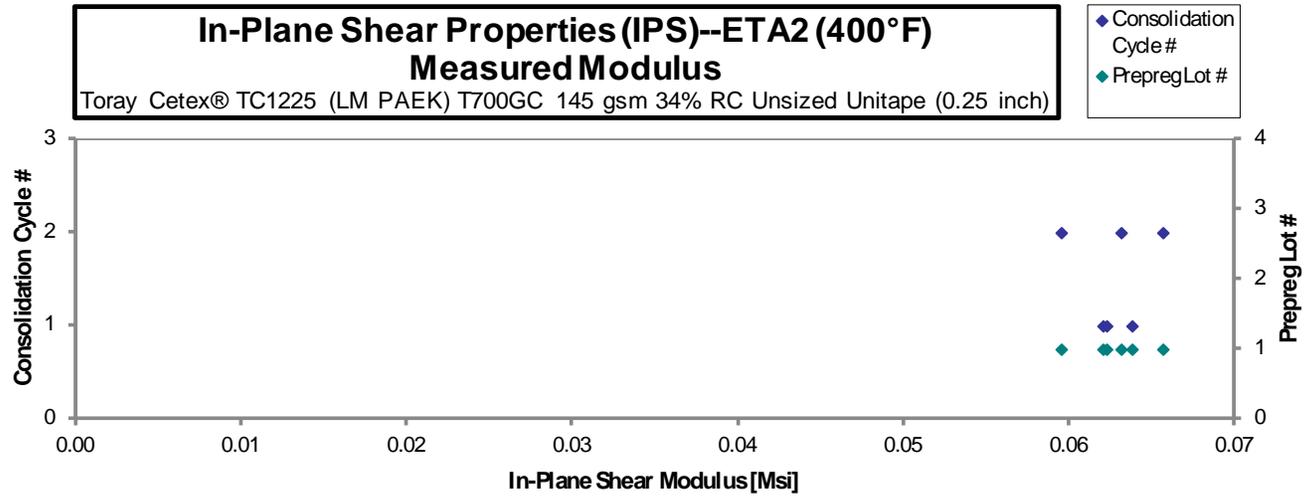


In-Plane Shear Properties (IPS)--ETA2 (400°F)
Strength & Modulus
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | 0.2% Offset Strength [ksi] | Strength at 5% Strain [ksi] | Modulus [Msi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Avg. t _{ply} [in] |
|---|---------------|--------------------------|---------------|-----------------------|----------------------------|-----------------------------|---------------|------------------------------|---------------------|----------------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST5R-A-C1-1-IPS-ETA2-1 | A | C1 | 1 | 1 | 0.8769 | 1.981 | 0.06217 | 0.08995 | 16 | 0.005622 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5R-A-C1-1-IPS-ETA2-2 | A | C1 | 1 | 1 | 0.9058 | 2.024 | 0.06384 | 0.09107 | 16 | 0.005692 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5R-A-C1-1-IPS-ETA2-3 | A | C1 | 1 | 1 | 0.8973 | 1.996 | 0.06237 | 0.09197 | 16 | 0.005748 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5R-A-C2-1-IPS-ETA2-1 | A | C2 | 1 | 2 | 0.8487 | 1.904 | 0.05955 | 0.08993 | 16 | 0.005621 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5R-A-C2-1-IPS-ETA2-2 | A | C2 | 1 | 2 | 0.9087 | 2.022 | 0.06319 | 0.09042 | 16 | 0.005651 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5R-A-C2-1-IPS-ETA2-3 | A | C2 | 1 | 2 | 0.9475 | 2.110 | 0.06575 | 0.09048 | 16 | 0.005655 |

| | | | | |
|---------------------------|----------------|----------------|-----------------|-----------------|
| Average | 0.8975 | 2.006 | 0.06281 | 0.005665 |
| Standard Dev. | 0.03319 | 0.06707 | 0.002054 | |
| Coeff. of Var. [%] | 3.698 | 3.342 | 3.270 | |
| Min. | 0.8487 | 1.904 | 0.05955 | 0.005621 |
| Max. | 0.9475 | 2.110 | 0.06575 | 0.005748 |
| Number of Spec. | 6 | 6 | 6 | 6 |

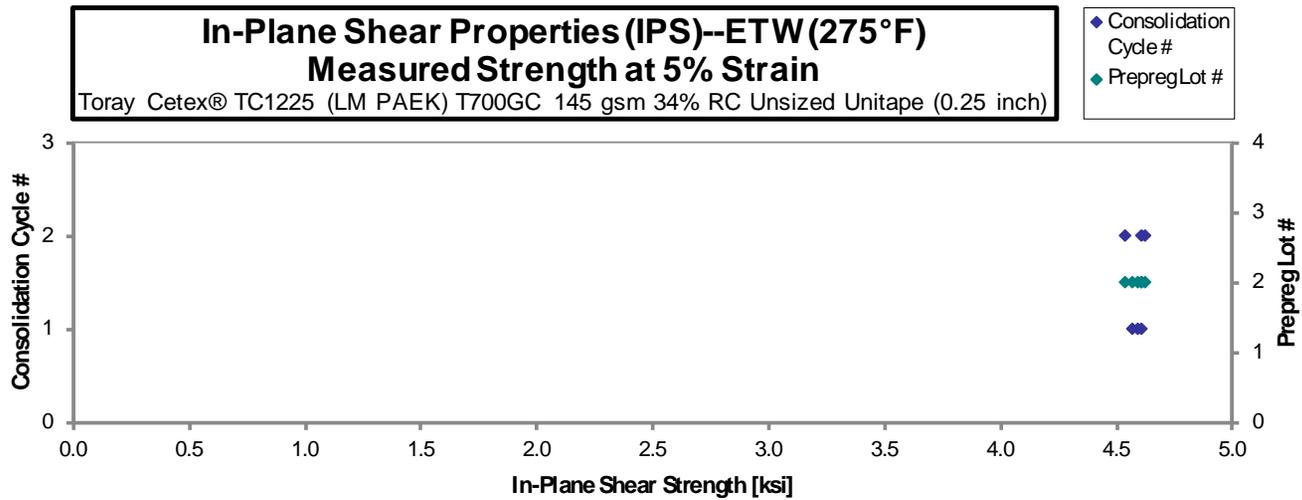
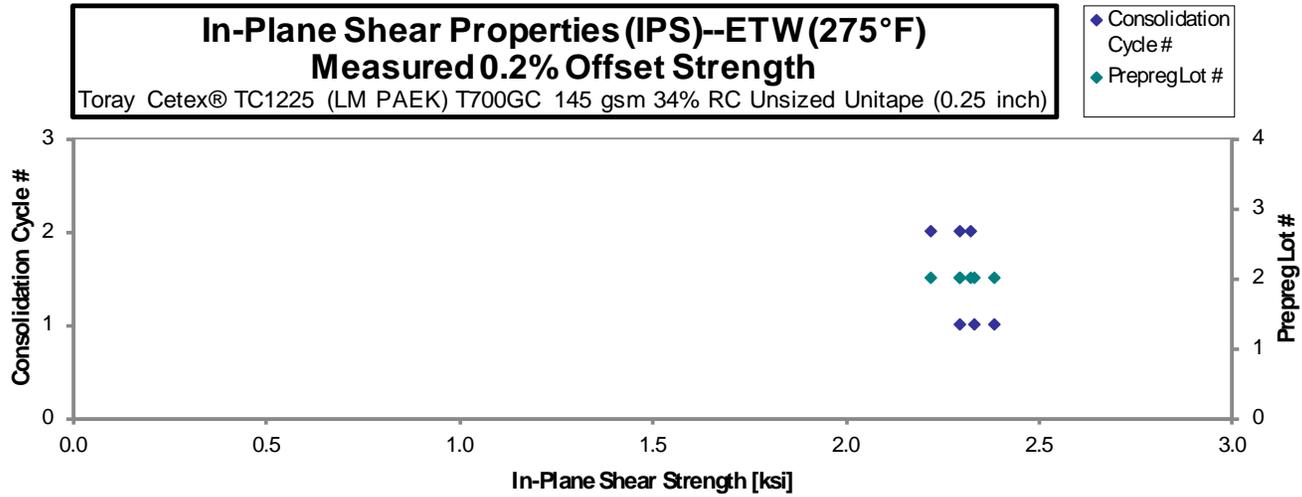


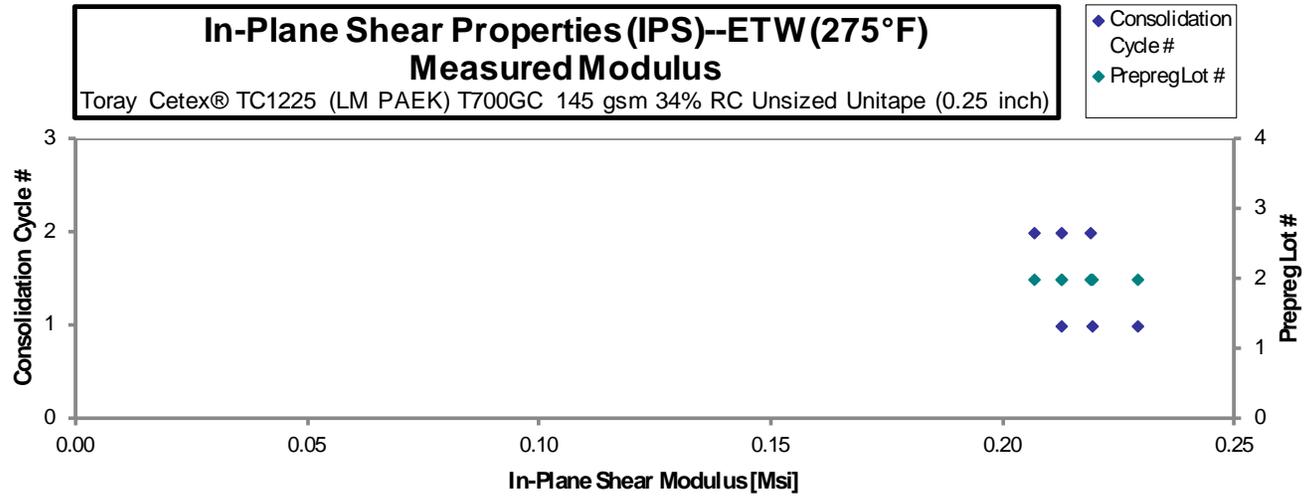


| |
|---|
| In-Plane Shear Properties (IPS)--ETW (275°F) Strength & Modulus Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) |
|---|

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | 0.2% Offset Strength [ksi] | Strength at 5% Strain [ksi] | Modulus [Msi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Avg. t _{ply} [in] |
|---|---------------|--------------------------|---------------|-----------------------|----------------------------|-----------------------------|---------------|------------------------------|---------------------|----------------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST5-B-C1-1-IPS-ETW-1 | B | C1 | 2 | 1 | 2.387 | 4.593 | 0.2294 | 0.08543 | 16 | 0.005340 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5-B-C1-1-IPS-ETW-2 | B | C1 | 2 | 1 | 2.334 | 4.610 | 0.2196 | 0.08532 | 16 | 0.005332 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5-B-C1-1-IPS-ETW-3 | B | C1 | 2 | 1 | 2.297 | 4.572 | 0.2129 | 0.08532 | 16 | 0.005332 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5-B-C2-1-IPS-ETW-1 | B | C2 | 2 | 2 | 2.324 | 4.611 | 0.2191 | 0.08450 | 16 | 0.005281 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5-B-C2-1-IPS-ETW-2 | B | C2 | 2 | 2 | 2.294 | 4.628 | 0.2129 | 0.08447 | 16 | 0.005279 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5-B-C2-1-IPS-ETW-3 | B | C2 | 2 | 2 | 2.220 | 4.541 | 0.2071 | 0.08465 | 16 | 0.005291 |

| | | | | |
|---------------------------|----------------|----------------|-----------------|-----------------|
| Average | 2.310 | 4.593 | 0.2168 | 0.005309 |
| Standard Dev. | 0.05512 | 0.03154 | 0.007720 | |
| Coeff. of Var. [%] | 2.387 | 0.6868 | 3.560 | |
| Min. | 2.220 | 4.541 | 0.2071 | 0.005279 |
| Max. | 2.387 | 4.628 | 0.2294 | 0.005340 |
| Number of Spec. | 6 | 6 | 6 | 6 |





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

Laminate Unnotched Tension Properties (UNT1)--CTA (-65°F)
Strength & Modulus
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

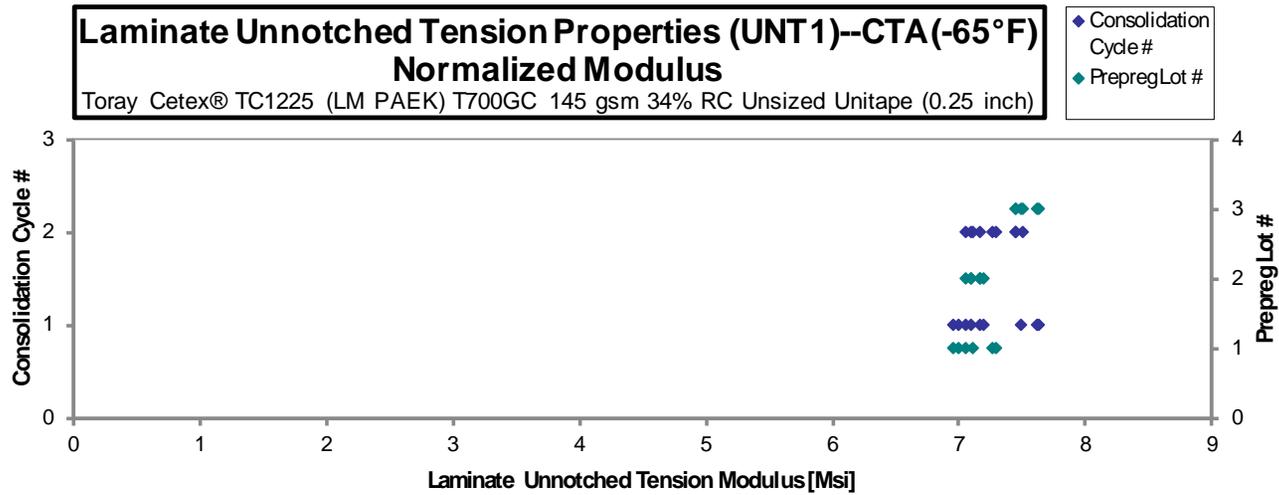
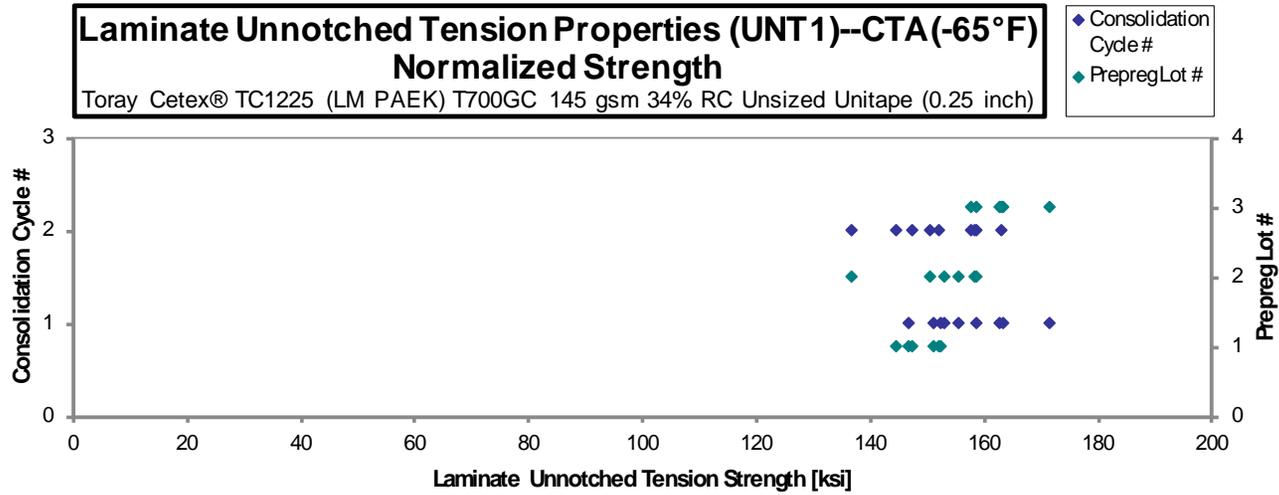
normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Modulus [Msi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|---|---------------|--------------------------|---------------|-----------------------|----------------|---------------|------------------------------|---------------------|--------------------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C1-1-UNT1-CTA-1 | A | C1 | 1 | 1 | 148.1 | 6.811 | 0.08887 | 16 | M(A,D)WT, M(A,D)GT, M(A,D,L)WB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C1-1-UNT1-CTA-2 | A | C1 | 1 | 1 | 142.2 | 6.730 | 0.08928 | 16 | M(A,D)GM, M(D,L)WT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C1-1-UNT1-CTA-3 | A | C1 | 1 | 1 | 147.0 | 6.850 | 0.08893 | 16 | M(A,D)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C2-1-UNT1-CTA-1 | A | C2 | 1 | 2 | 153.5 | 7.359 | 0.08562 | 16 | M(D,A)GT, LAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C2-1-UNT1-CTA-2 | A | C2 | 1 | 2 | 146.1 | 7.177 | 0.08555 | 16 | M(D,A)GB, LWT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C2-1-UNT1-CTA-3 | A | C2 | 1 | 2 | 148.7 | 7.333 | 0.08570 | 16 | M(A,L)WT, M(A,L)WB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C1-1-UNT1-CTA-1 | B | C1 | 2 | 1 | 158.7 | 7.172 | 0.08638 | 16 | M(A,D)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C1-1-UNT1-CTA-2 | B | C1 | 2 | 1 | 153.3 | 7.205 | 0.08628 | 16 | M(A,D)GT, M(D,L)WB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C1-1-UNT1-CTA-3 | B | C1 | 2 | 1 | 156.0 | 7.121 | 0.08612 | 16 | M(A,D)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C2-1-UNT1-CTA-1 | B | C2 | 2 | 2 | 136.4 | 7.038 | 0.08665 | 16 | M(A,D)WB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C2-1-UNT1-CTA-2 | B | C2 | 2 | 2 | 157.9 | 7.078 | 0.08658 | 16 | M(A,D)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C2-1-UNT1-CTA-3 | B | C2 | 2 | 2 | 149.9 | 7.137 | 0.08672 | 16 | M(A,D)GT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST7-C-C1-1-UNT1-CTA-1 | C | C1 | 3 | 1 | 164.8 | 7.332 | 0.08988 | 16 | M(D,A)GB, LWT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST7-C-C1-1-UNT1-CTA-2 | C | C1 | 3 | 1 | 158.4 | 7.301 | 0.08872 | 16 | M(D,A)GM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST7-C-C1-1-UNT1-CTA-3 | C | C1 | 3 | 1 | 157.0 | 7.315 | 0.08997 | 16 | AGB, LWT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST7-C-C2-1-UNT1-CTA-1 | C | C2 | 3 | 2 | 155.7 | 7.312 | 0.08803 | 16 | M(D,A)WB, LWT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST7-C-C2-1-UNT1-CTA-2 | C | C2 | 3 | 2 | 159.5 | 7.287 | 0.08835 | 16 | M(D,A)GT, LWB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST7-C-C2-1-UNT1-CTA-3 | C | C2 | 3 | 2 | 154.4 | 7.342 | 0.08832 | 16 | M(D,A)GM, M(D,A)WT |

| Avg. t_{ply} [in] | Strength _{norm} [ksi] | Modulus _{norm} [Msi] |
|---------------------|--------------------------------|-------------------------------|
| 0.005554 | 152.3 | 7.005 |
| 0.005580 | 146.9 | 6.955 |
| 0.005558 | 151.3 | 7.051 |
| 0.005351 | 152.1 | 7.293 |
| 0.005347 | 144.7 | 7.106 |
| 0.005356 | 147.5 | 7.274 |
| 0.005399 | 158.6 | 7.171 |
| 0.005393 | 153.0 | 7.195 |
| 0.005382 | 155.5 | 7.098 |
| 0.005416 | 136.8 | 7.059 |
| 0.005411 | 158.2 | 7.093 |
| 0.005420 | 150.5 | 7.163 |
| 0.005618 | 171.5 | 7.628 |
| 0.005545 | 162.6 | 7.497 |
| 0.005623 | 163.5 | 7.617 |
| 0.005502 | 158.6 | 7.450 |
| 0.005522 | 163.1 | 7.451 |
| 0.005520 | 157.8 | 7.505 |

Average 152.6 7.161
 Standard Dev. 6.972 0.1947
 Coeff. of Var. [%] 4.568 2.719
 Min. 136.4 6.730
 Max. 164.8 7.359
 Number of Spec. 18 18

Average_{norm} 0.005472 154.7 7.256
 Standard Dev_{norm} 8.126 0.2162
 Coeff. of Var. [%]_{norm} 5.252 2.979
 Min. 0.005347 136.8 6.955
 Max. 0.005623 171.5 7.628
 Number of Spec. 18 18 18



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

Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

normalizing

t_{ply} [in]

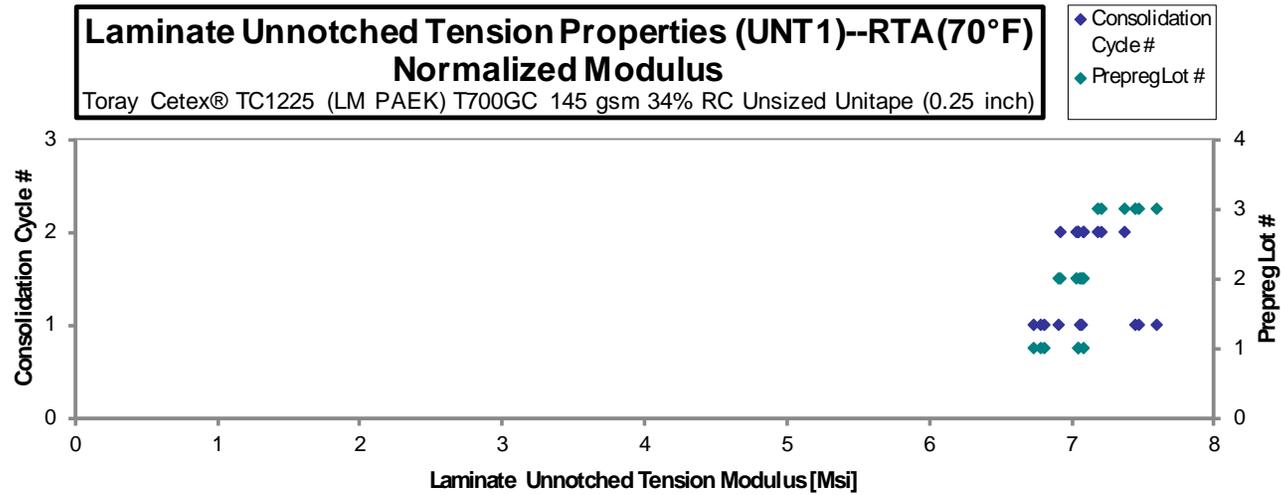
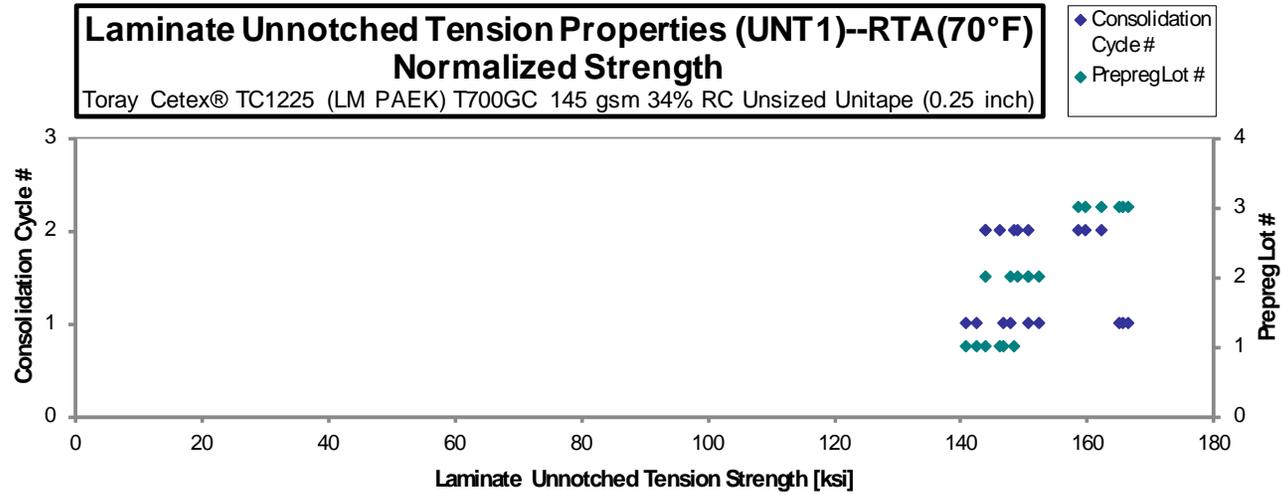
0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Modulus [Msi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|---|---------------|--------------------------|---------------|-----------------------|----------------|---------------|------------------------------|---------------------|------------------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C1-1-UNT1-RTA-1 | A | C1 | 1 | 1 | 137.8 | 6.504 | 0.08940 | 16 | M(A,D)GT, LWB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C1-1-UNT1-RTA-2 | A | C1 | 1 | 1 | 136.1 | 6.556 | 0.08940 | 16 | M(A,D)GT, LWB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C1-1-UNT1-RTA-3 | A | C1 | 1 | 1 | 142.3 | 6.608 | 0.08912 | 16 | M(A,D)GT, LWB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C2-1-UNT1-RTA-1 | A | C2 | 1 | 2 | 147.3 | 7.143 | 0.08573 | 16 | LWT, M(A,D)WB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C2-1-UNT1-RTA-2 | A | C2 | 1 | 2 | 145.3 | 7.114 | 0.08555 | 16 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C2-1-UNT1-RTA-3 | A | C2 | 1 | 2 | 148.8 | 7.070 | 0.08613 | 16 | LWB, M(D,A)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C1-1-UNT1-RTA-1 | B | C1 | 2 | 1 | 151.5 | 6.940 | 0.08598 | 16 | M(A,D)GM, M(A,L)WB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C1-1-UNT1-RTA-2 | B | C1 | 2 | 1 | 152.9 | 7.090 | 0.08612 | 16 | M(A,D)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C1-1-UNT1-RTA-3 | B | C1 | 2 | 1 | 149.1 | 7.125 | 0.08575 | 16 | M(A,D)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C2-1-UNT1-RTA-1 | B | C2 | 2 | 2 | 147.9 | 6.984 | 0.08698 | 16 | M(A,D)GB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C2-1-UNT1-RTA-2 | B | C2 | 2 | 2 | 150.5 | 6.914 | 0.08652 | 16 | M(A,D)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C2-1-UNT1-RTA-3 | B | C2 | 2 | 2 | 142.9 | 7.034 | 0.08698 | 16 | M(A,D)WT, M(D,L)WB, M(A,D)GT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST7-C-C1-1-UNT1-RTA-1 | C | C1 | 3 | 1 | 157.5 | 7.255 | 0.09052 | 16 | M(D,A)GM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST7-C-C1-1-UNT1-RTA-2 | C | C1 | 3 | 1 | 158.5 | 7.137 | 0.09025 | 16 | M(D,A)GT, LWB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST7-C-C1-1-UNT1-RTA-3 | C | C1 | 3 | 1 | 160.1 | 7.186 | 0.08990 | 16 | M(D,A)WB, M(D,A)WT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST7-C-C2-1-UNT1-RTA-1 | C | C2 | 3 | 2 | 155.6 | 7.080 | 0.08807 | 16 | M(D,A)GM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST7-C-C2-1-UNT1-RTA-2 | C | C2 | 3 | 2 | 159.3 | 7.244 | 0.08797 | 16 | M(D,A)GB, LWT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST7-C-C2-1-UNT1-RTA-3 | C | C2 | 3 | 2 | 155.9 | 7.021 | 0.08850 | 16 | M(D,A)GM, LWT |

| Avg. t_{ply} [in] | Strength _{norm} [ksi] | Modulus _{norm} [Msi] |
|---------------------|--------------------------------|-------------------------------|
| 0.005588 | 142.6 | 6.730 |
| 0.005588 | 140.8 | 6.784 |
| 0.005570 | 146.7 | 6.816 |
| 0.005358 | 146.1 | 7.088 |
| 0.005347 | 143.8 | 7.044 |
| 0.005383 | 148.4 | 7.048 |
| 0.005374 | 150.8 | 6.907 |
| 0.005382 | 152.4 | 7.066 |
| 0.005359 | 148.0 | 7.071 |
| 0.005436 | 148.9 | 7.031 |
| 0.005407 | 150.7 | 6.924 |
| 0.005436 | 143.9 | 7.081 |
| 0.005657 | 165.0 | 7.601 |
| 0.005641 | 165.5 | 7.455 |
| 0.005619 | 166.6 | 7.477 |
| 0.005504 | 158.6 | 7.216 |
| 0.005498 | 162.2 | 7.375 |
| 0.005531 | 159.7 | 7.192 |

Average 150.0 7.000
 Standard Dev. 7.206 0.2242
 Coeff. of Var. [%] 4.805 3.203
 Min. 136.1 6.504
 Max. 160.1 7.255
 Number of Spec. 18 18

Average_{norm} 0.005482 152.3 7.106
 Standard Dev_{norm} 8.477 0.2443
 Coeff. of Var. [%]_{norm} 5.567 3.438
 Min. 0.005347 140.8 6.730
 Max. 0.005657 166.6 7.601
 Number of Spec. 18 18 18



**Laminate Unnotched Tension Properties (UNT1)--ETA1 (275°F)
Strength & Modulus**

Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

normalizing

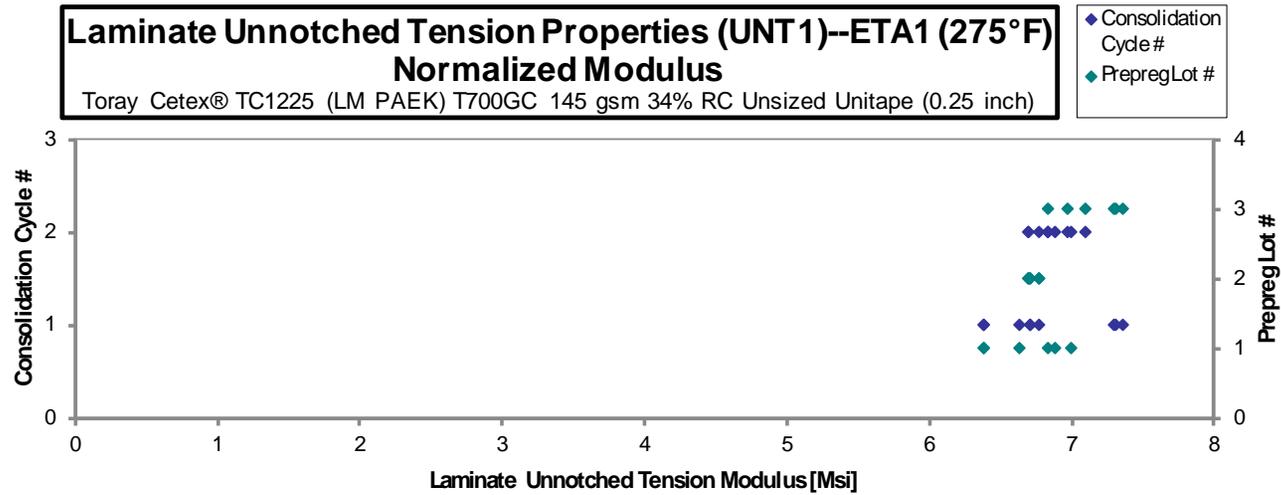
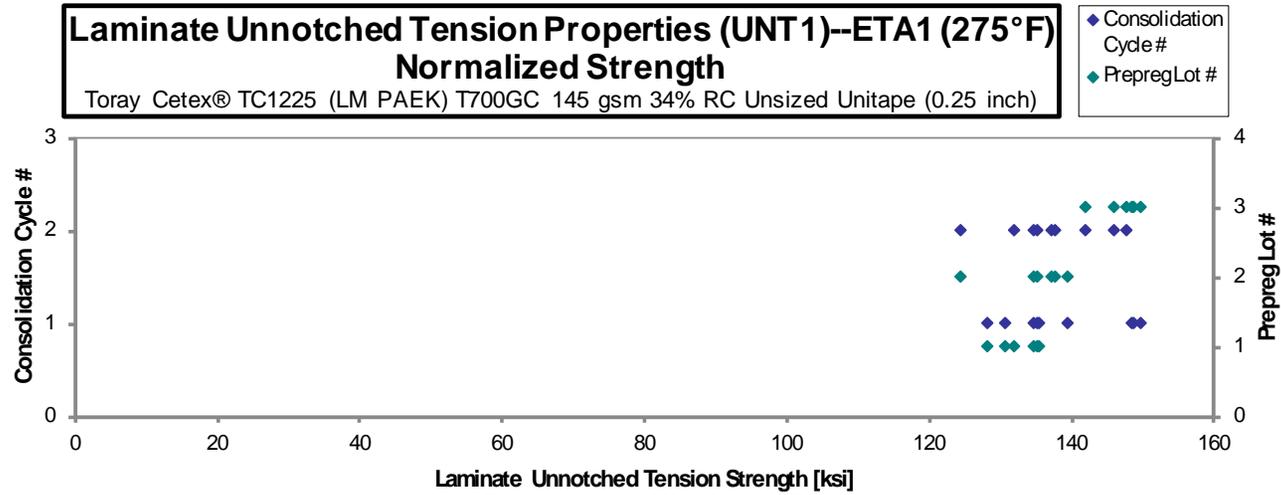
t_{ply} [in]
0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Modulus [Msi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|--|---------------|--------------------------|---------------|-----------------------|----------------|---------------|------------------------------|---------------------|-----------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C1-1-UNT1-ETA1-1 | A | C1 | 1 | 1 | 131.3 | 6.430 | 0.08913 | 16 | DGM, M(A,D)GT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C1-1-UNT1-ETA1-2 | A | C1 | 1 | 1 | 124.0 | 6.186 | 0.08922 | 16 | LWT, M(A,D)GB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C1-1-UNT1-SP-5 | A | C1 | 1 | 1 | 126.9 | 6.205 | 0.08897 | 16 | M(D,A,L)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C2-1-UNT1-ETA1-1 | A | C2 | 1 | 2 | 136.6 | 6.961 | 0.08548 | 16 | M(D,A)GB, M(D,L)WJT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C2-1-UNT1-ETA1-2 | A | C2 | 1 | 2 | 135.3 | 6.863 | 0.08608 | 16 | M(D,A)GM, LWT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C2-1-UNT1-ETA1-3 | A | C2 | 1 | 2 | 133.8 | 7.089 | 0.08532 | 16 | M(D,A)GB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C1-1-UNT1-ETA1-1 | B | C1 | 2 | 1 | 139.9 | 6.735 | 0.08608 | 16 | M(A,D)GT, M(D,L)WJB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C1-1-UNT1-ETA1-2 | B | C1 | 2 | 1 | 135.7 | 6.822 | 0.08582 | 16 | M(A,D)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C1-1-UNT1-ETA1-3 | B | C1 | 2 | 1 | 135.5 | 6.723 | 0.08618 | 16 | M(A,D)GT, M(D,L)WJB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C2-1-UNT1-ETA1-1 | B | C2 | 2 | 2 | 137.0 | 6.665 | 0.08682 | 16 | M(A,D)GM, M(D,L)AT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C2-1-UNT1-ETA1-2 | B | C2 | 2 | 2 | 124.0 | 6.753 | 0.08672 | 16 | DGM, M(A,D)GB, LWB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C2-1-UNT1-ETA1-3 | B | C2 | 2 | 2 | 136.7 | 6.677 | 0.08668 | 16 | M(A,D)GT, M(A,D,L)WJB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST7-C-C1-1-UNT1-ETA1-1 | C | C1 | 3 | 1 | 143.0 | 7.041 | 0.08977 | 16 | M(D,A)WJT, M(A,L)WJB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST7-C-C1-1-UNT1-ETA1-2 | C | C1 | 3 | 1 | 142.3 | 7.045 | 0.09030 | 16 | M(D,A)GM, LWT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST7-C-C1-1-UNT1-ETA1-3 | C | C1 | 3 | 1 | 143.5 | 7.000 | 0.09012 | 16 | M(D,A)GB, LWT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST7-C-C2-1-UNT1-ETA1-1 | C | C2 | 3 | 2 | 144.1 | 6.663 | 0.08860 | 16 | M(D,A)WJT, LWB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST7-C-C2-1-UNT1-ETA1-2 | C | C2 | 3 | 2 | 142.8 | 6.826 | 0.08827 | 16 | M(D,A)GT, LWB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST7-C-C2-1-UNT1-ETA1-3 | C | C2 | 3 | 2 | 138.9 | 6.948 | 0.08833 | 16 | M(D,A)GT, LWB |

| Avg. t_{ply} [in] | Strength _{norm} [ksi] | Modulus _{norm} [Msi] |
|---------------------|--------------------------------|-------------------------------|
| 0.005571 | 135.4 | 6.633 |
| 0.005576 | 128.1 | 6.388 |
| 0.005560 | 130.7 | 6.389 |
| 0.005343 | 135.1 | 6.887 |
| 0.005380 | 134.8 | 6.838 |
| 0.005332 | 132.1 | 7.000 |
| 0.005380 | 139.4 | 6.711 |
| 0.005364 | 134.8 | 6.776 |
| 0.005386 | 135.1 | 6.706 |
| 0.005426 | 137.6 | 6.697 |
| 0.005420 | 124.5 | 6.777 |
| 0.005418 | 137.2 | 6.699 |
| 0.005610 | 148.5 | 7.315 |
| 0.005644 | 148.7 | 7.363 |
| 0.005632 | 149.7 | 7.302 |
| 0.005538 | 147.7 | 6.832 |
| 0.005517 | 145.9 | 6.973 |
| 0.005521 | 142.0 | 7.104 |

| | | |
|--------------------|-------|--------|
| Average | 136.2 | 6.757 |
| Standard Dev. | 6.319 | 0.2650 |
| Coeff. of Var. [%] | 4.640 | 3.922 |
| Min. | 124.0 | 6.186 |
| Max. | 144.1 | 7.089 |
| Number of Spec. | 18 | 18 |

| | | | |
|------------------------------------|----------|-------|--------|
| Average _{norm} | 0.005479 | 138.2 | 6.855 |
| Standard Dev. _{norm} | | 7.483 | 0.2825 |
| Coeff. of Var. [%] _{norm} | | 5.415 | 4.121 |
| Min. | 0.005332 | 124.5 | 6.388 |
| Max. | 0.005644 | 149.7 | 7.363 |
| Number of Spec. | 18 | 18 | 18 |



**Laminate Unnotched Tension Properties (UNT1)--ETA2 (400°F)
Strength & Modulus**
Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

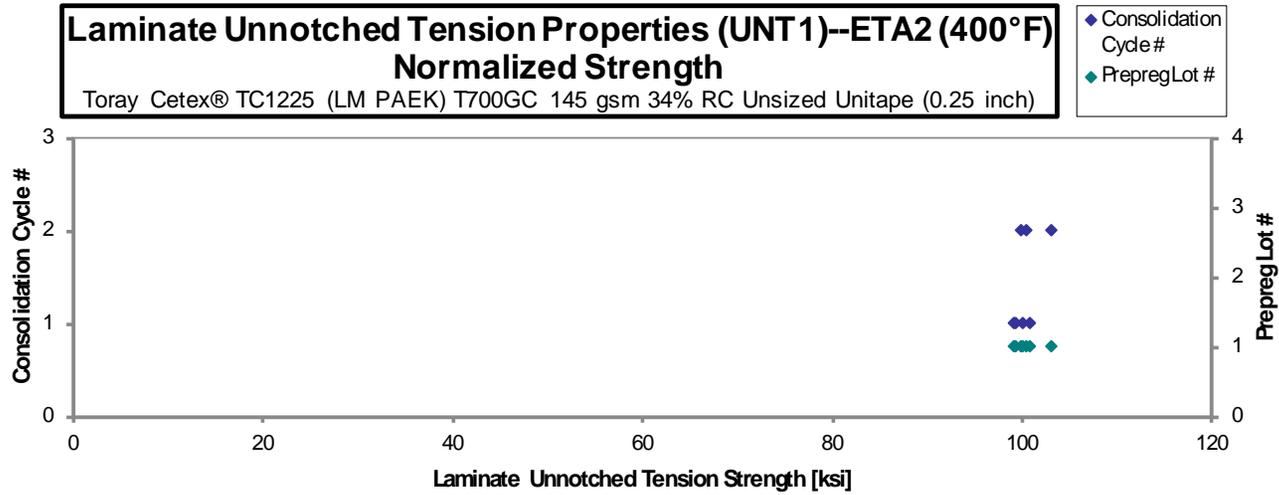
normalizing
t_{ply} [in]
0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Modulus [Msi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|---|---------------|--------------------------|---------------|-----------------------|----------------|---------------|------------------------------|---------------------|--------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C1-1-UNT1-ETA2-1 | A | C1 | 1 | 1 | 97.06 | 5.923 | 0.08918 | 16 | M(A,D)GM, M(D,L)WB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C1-1-UNT1-ETA2-2 | A | C1 | 1 | 1 | 96.16 | 6.271 | 0.08927 | 16 | M(A,D)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C1-1-UNT1-ETA2-3 | A | C1 | 1 | 1 | 97.86 | 5.956 | 0.08898 | 16 | M(A,D)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C1-1-UNT1-SP-7 | A | C1 | 1 | 1 | 95.70 | 6.125 | 0.08950 | 16 | M(A,D)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C2-1-UNT1-ETA2-1 | A | C2 | 1 | 2 | 100.7 | 6.334 | 0.08577 | 16 | M(D,A)GT, LWB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C2-1-UNT1-ETA2-2 | A | C2 | 1 | 2 | 104.0 | 6.402 | 0.08567 | 16 | M(D,A)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C2-1-UNT1-ETA2-3 | A | C2 | 1 | 2 | 101.0 | 6.283 | 0.08592 | 16 | M(D,A)GM |

| Avg. t _{ply} [in] | Strength _{norm} [ksi] | Modulus _{norm} [Msi] |
|----------------------------|--------------------------------|-------------------------------|
| 0.005574 | 100.2 | 6.114 |
| 0.005579 | 99.35 | 6.479 |
| 0.005561 | 100.79 | 6.135 |
| 0.005594 | 99.13 | 6.345 |
| 0.005360 | 99.96 | 6.288 |
| 0.005354 | 103.2 | 6.348 |
| 0.005370 | 100.4 | 6.248 |

Average 98.93 6.185
Standard Dev. 3.058 0.1874
Coeff. of Var. [%] 3.091 3.031
Min. 95.70 5.923
Max. 104.0 6.402
Number of Spec. 7 7

Average_{norm} 0.005485 100.4 6.280
Standard Dev._{norm} 1.336 0.1280
Coeff. of Var. [%]_{norm} 1.330 2.038
Min. 0.005354 99.13 6.114
Max. 0.005594 103.2 6.479
Number of Spec. 7 7 7



Laminate Unnotched Tension Properties (UNT1)--ETW (275°F)
Strength & Modulus
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

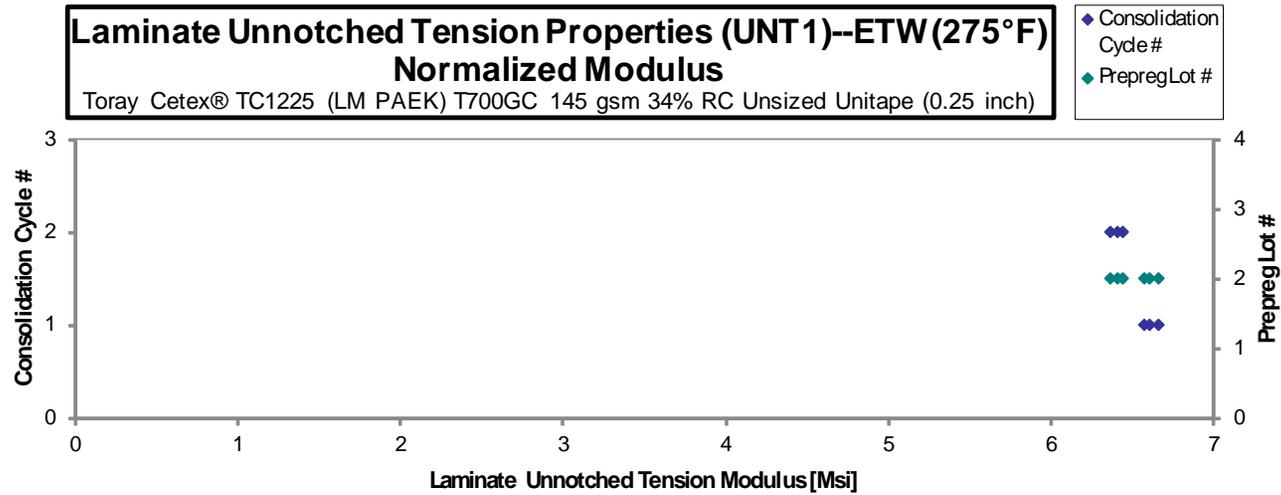
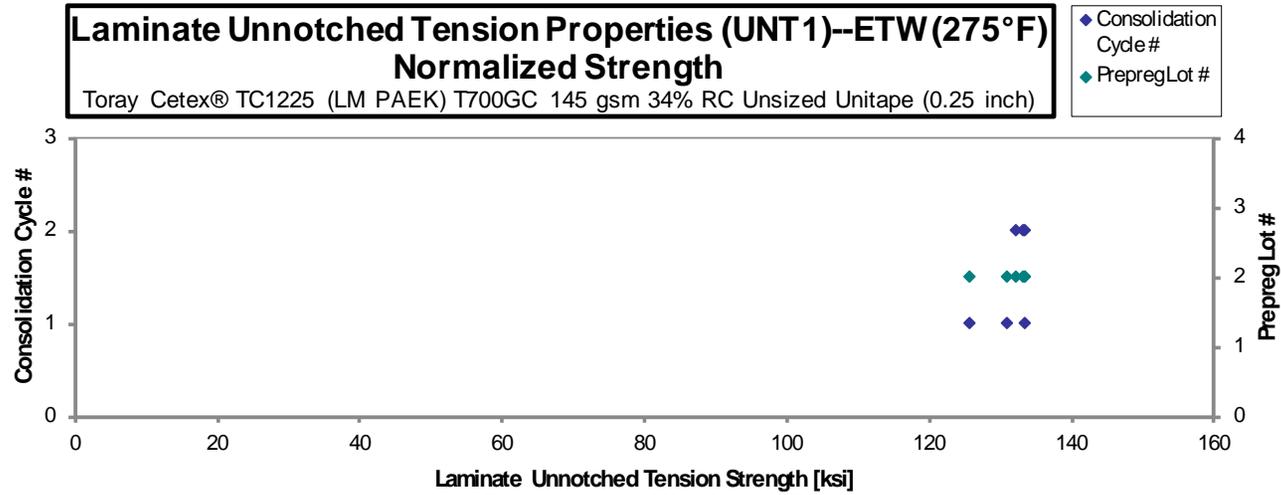
normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Modulus [Msi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|--|---------------|--------------------------|---------------|-----------------------|----------------|---------------|------------------------------|---------------------|--------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C1-1-UNT1-ETW-1 | B | C1 | 2 | 1 | 127.0 | 6.642 | 0.08555 | 16 | M(A,D)WB, LGT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C1-1-UNT1-ETW-2 | B | C1 | 2 | 1 | 134.1 | 6.694 | 0.08605 | 16 | M(A,D)GB, LWT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C1-1-UNT1-ETW-3 | B | C1 | 2 | 1 | 131.4 | 6.620 | 0.08615 | 16 | M(A,D)WB, LWT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C2-1-UNT1-ETW-1 | B | C2 | 2 | 2 | 132.9 | 6.382 | 0.08682 | 16 | M(A,D)GM, LWT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C2-1-UNT1-ETW-2 | B | C2 | 2 | 2 | 131.7 | 6.375 | 0.08732 | 16 | M(A,D)GM, M(A,L)WB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C2-1-UNT1-ETW-3 | B | C2 | 2 | 2 | 131.5 | 6.328 | 0.08688 | 16 | M(A,D)GM |

| Avg. t_{ply} [in] | Strength _{norm} [ksi] | Modulus _{norm} [Msi] |
|---------------------|--------------------------------|-------------------------------|
| 0.005347 | 125.8 | 6.577 |
| 0.005378 | 133.5 | 6.666 |
| 0.005384 | 131.0 | 6.601 |
| 0.005426 | 133.6 | 6.413 |
| 0.005457 | 133.1 | 6.442 |
| 0.005430 | 132.2 | 6.364 |

Average 131.4 6.507
 Standard Dev. 2.395 0.1620
 Coeff. of Var. [%] 1.823 2.489
 Min. 127.0 6.328
 Max. 134.1 6.694
 Number of Spec. 6 6

Average_{norm} 0.005404 131.5 6.511
 Standard Dev._{norm} 2.984 0.1207
 Coeff. of Var. [%]_{norm} 2.269 1.853
 Min. 0.005347 125.8 6.364
 Max. 0.005457 133.6 6.666
 Number of Spec. 6 6 6



4.8 “10/80/10” Unnotched Tension 2 Properties (UNT2)

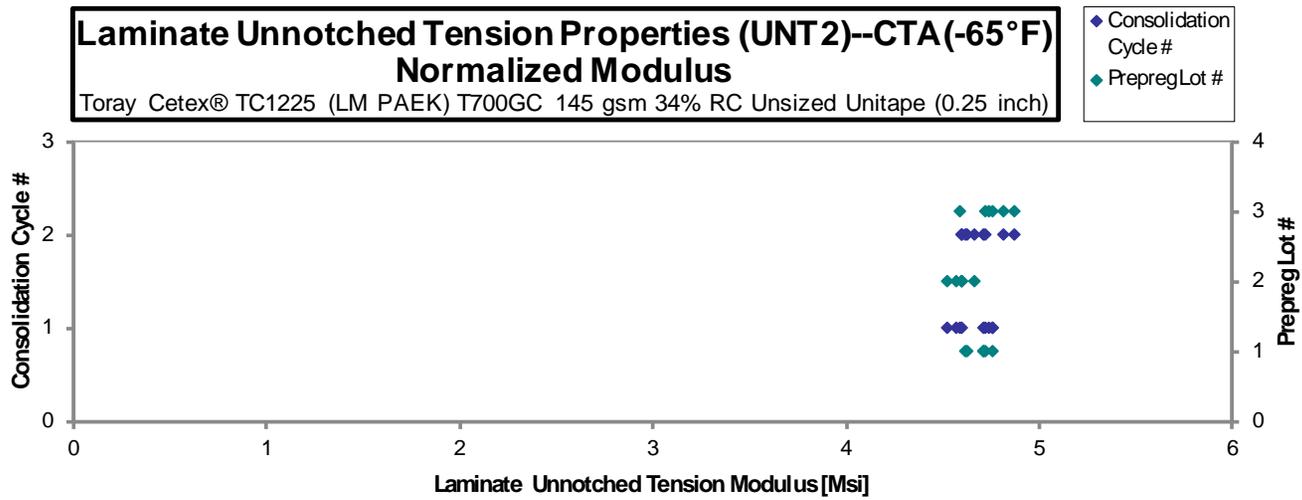
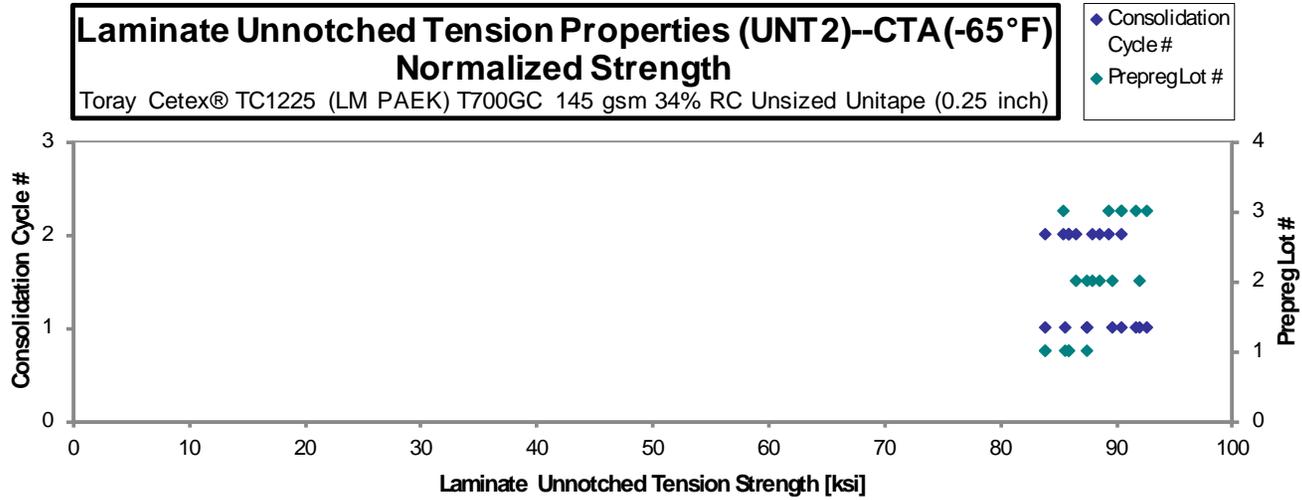
Laminate Unnotched Tension Properties (UNT2)--CTA (-65°F)
Strength & Modulus
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Modulus [Msi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|--|---------------|--------------------------|---------------|-----------------------|----------------|---------------|------------------------------|---------------------|--------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C1-1-UNT2-CTA-1 | A | C1 | 1 | 1 | 87.81 | 4.735 | 0.1076 | 20 | M(A,D)GT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C1-1-UNT2-CTA-2 | A | C1 | 1 | 1 | 84.99 | 4.779 | 0.1067 | 20 | M(A,D)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C1-1-UNT2-CTA-3 | A | C1 | 1 | 1 | 86.54 | 4.818 | 0.1068 | 20 | M(A,D)WT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C2-1-UNT2-CTA-1 | A | C2 | 1 | 2 | 83.43 | 4.685 | 0.1086 | 20 | M(D,A)WB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C2-1-UNT2-CTA-2 | A | C2 | 1 | 2 | 85.66 | 4.611 | 0.1084 | 20 | M(D,A)WB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C2-1-UNT2-CTA-3 | A | C2 | 1 | 2 | 85.56 | 4.595 | 0.1085 | 20 | M(D,A)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C1-1-UNT2-CTA-1 | B | C1 | 2 | 1 | 84.12 | 4.400 | 0.1124 | 20 | M(A,D)GT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C1-1-UNT2-CTA-2 | B | C1 | 2 | 1 | 86.58 | 4.368 | 0.1118 | 20 | M(A,D)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C1-1-UNT2-CTA-3 | B | C1 | 2 | 1 | 88.25 | 4.414 | 0.1126 | 20 | M(A,D)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C2-1-UNT2-CTA-1 | B | C2 | 2 | 2 | 87.91 | 4.631 | 0.1089 | 20 | M(A,D)GB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C2-1-UNT2-CTA-2 | B | C2 | 2 | 2 | 85.50 | 4.544 | 0.1094 | 20 | M(A,D)GT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C2-1-UNT2-CTA-3 | B | C2 | 2 | 2 | 87.01 | 4.551 | 0.1093 | 20 | M(A,D)WT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST12-C-C1-1-UNT2-CTA-1 | C | C1 | 3 | 1 | 92.31 | 4.573 | 0.1085 | 20 | M(D,A)GT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST12-C-C1-1-UNT2-CTA-2 | C | C1 | 3 | 1 | 91.31 | 4.723 | 0.1084 | 20 | M(D,A)WT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST12-C-C1-1-UNT2-CTA-3 | C | C1 | 3 | 1 | 90.10 | 4.742 | 0.1084 | 20 | M(D,A)WT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST12-C-C2-1-UNT2-CTA-1 | C | C2 | 3 | 2 | 88.96 | 4.790 | 0.1098 | 20 | M(A,D)GB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST12-C-C2-1-UNT2-CTA-2 | C | C2 | 3 | 2 | 84.48 | 4.673 | 0.1092 | 20 | M(A,D)WB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST12-C-C2-1-UNT2-CTA-3 | C | C2 | 3 | 2 | 88.39 | 4.766 | 0.1092 | 20 | M(A,D)GB |

| Avg. t_{ply} [in] | Strength _{norm} [ksi] | Modulus _{norm} [Msi] |
|---------------------|--------------------------------|-------------------------------|
| 0.005378 | 87.45 | 4.716 |
| 0.005334 | 83.96 | 4.721 |
| 0.005338 | 85.55 | 4.763 |
| 0.005432 | 83.92 | 4.712 |
| 0.005420 | 85.98 | 4.628 |
| 0.005426 | 85.97 | 4.616 |
| 0.005618 | 87.51 | 4.578 |
| 0.005591 | 89.64 | 4.523 |
| 0.005629 | 92.00 | 4.601 |
| 0.005444 | 88.63 | 4.668 |
| 0.005469 | 86.59 | 4.603 |
| 0.005463 | 88.02 | 4.604 |
| 0.005424 | 92.72 | 4.594 |
| 0.005422 | 91.68 | 4.742 |
| 0.005421 | 90.45 | 4.760 |
| 0.005491 | 90.46 | 4.871 |
| 0.005462 | 85.45 | 4.727 |
| 0.005460 | 89.38 | 4.819 |

| | | | | | | |
|--------------------|-------|--------|------------------------------------|----------|-------|---------|
| Average | 87.16 | 4.633 | Average _{norm} | 0.005457 | 88.07 | 4.680 |
| Standard Dev. | 2.458 | 0.1382 | Standard Dev. _{norm} | | 2.711 | 0.09285 |
| Coeff. of Var. [%] | 2.820 | 2.984 | Coeff. of Var. [%] _{norm} | | 3.078 | 1.984 |
| Min. | 83.43 | 4.368 | Min. | 0.005334 | 83.92 | 4.523 |
| Max. | 92.31 | 4.818 | Max. | 0.005629 | 92.72 | 4.871 |
| Number of Spec. | 18 | 18 | Number of Spec. | 18 | 18 | 18 |



Laminate Unnotched Tension Properties (UNT2)--RTA (70°F)
Strength & Modulus
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

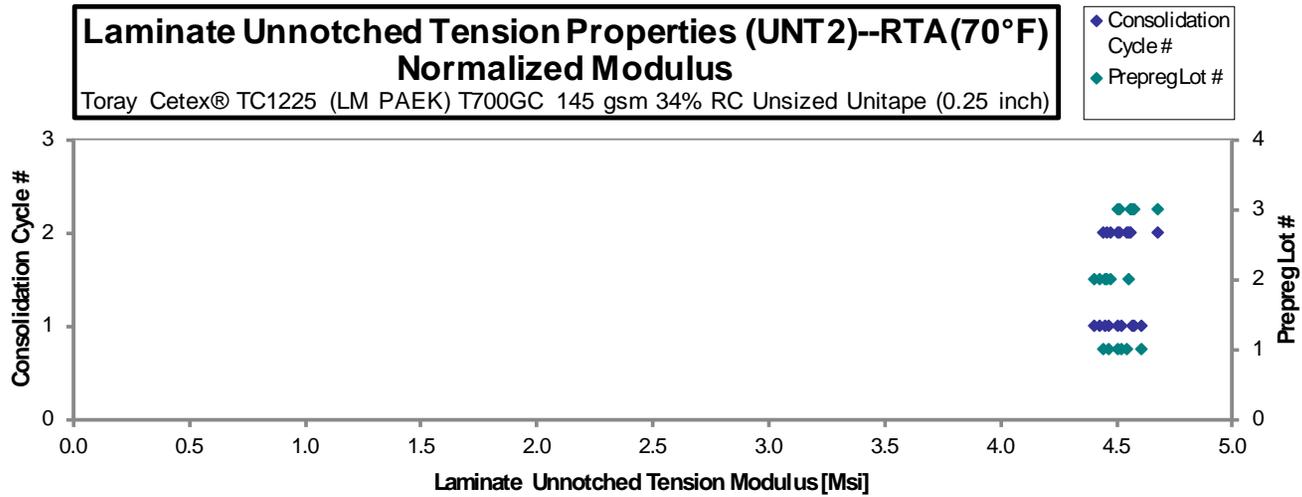
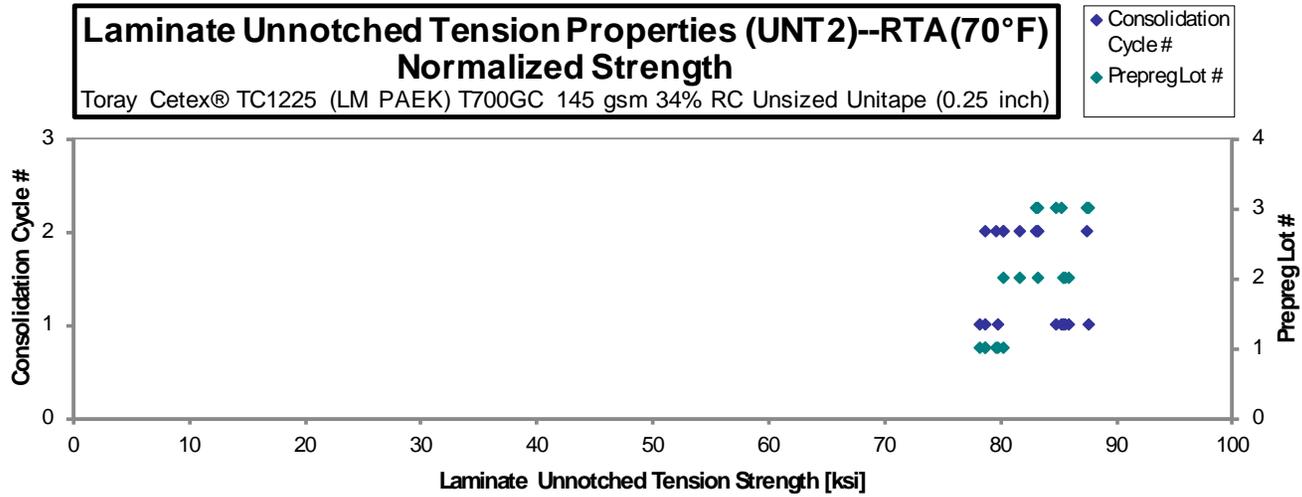
normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Modulus [Msi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|--|---------------|--------------------------|---------------|-----------------------|----------------|---------------|------------------------------|---------------------|--------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C1-1-UNT2-RTA-1 | A | C1 | 1 | 1 | 80.56 | 4.569 | 0.1070 | 20 | M(A,D)GB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C1-1-UNT2-RTA-2 | A | C1 | 1 | 1 | 78.80 | 4.642 | 0.1073 | 20 | M(A,D)GB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C1-1-UNT2-RTA-3 | A | C1 | 1 | 1 | 79.43 | 4.508 | 0.1070 | 20 | M(A,D)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C2-1-UNT2-RTA-1 | A | C2 | 1 | 2 | 79.32 | 4.530 | 0.1084 | 20 | M(D,A)GB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C2-1-UNT2-RTA-2 | A | C2 | 1 | 2 | 78.17 | 4.479 | 0.1088 | 20 | M(D,A)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C2-1-UNT2-RTA-3 | A | C2 | 1 | 2 | 80.03 | 4.424 | 0.1085 | 20 | M(D,A)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C1-1-UNT2-RTA-1 | B | C1 | 2 | 1 | 82.46 | 4.230 | 0.1125 | 20 | M(A,D)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C1-1-UNT2-RTA-2 | B | C1 | 2 | 1 | 82.21 | 4.260 | 0.1124 | 20 | M(A,D)GT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C1-1-UNT2-RTA-3 | B | C1 | 2 | 1 | 82.53 | 4.292 | 0.1120 | 20 | M(A,D)GT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C2-1-UNT2-RTA-1 | B | C2 | 2 | 2 | 80.63 | 4.402 | 0.1094 | 20 | M(A,D)GT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C2-1-UNT2-RTA-2 | B | C2 | 2 | 2 | 79.34 | 4.426 | 0.1093 | 20 | M(A,D)WB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C2-1-UNT2-RTA-3 | B | C2 | 2 | 2 | 82.43 | 4.509 | 0.1091 | 20 | M(A,D)GT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST12-C-C1-1-UNT2-RTA-1 | C | C1 | 3 | 1 | 84.07 | 4.467 | 0.1090 | 20 | M(D,A)GT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST12-C-C1-1-UNT2-RTA-2 | C | C1 | 3 | 1 | 84.78 | 4.553 | 0.1086 | 20 | M(D,A)GB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST12-C-C1-1-UNT2-RTA-3 | C | C1 | 3 | 1 | 87.00 | 4.542 | 0.1087 | 20 | M(D,A)GB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST12-C-C2-1-UNT2-RTA-1 | C | C2 | 3 | 2 | 82.37 | 4.470 | 0.1092 | 20 | M(A,D)GB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST12-C-C2-1-UNT2-RTA-2 | C | C2 | 3 | 2 | 86.57 | 4.512 | 0.1092 | 20 | M(A,D)GB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST12-C-C2-1-UNT2-RTA-3 | C | C2 | 3 | 2 | 81.47 | 4.584 | 0.1102 | 20 | M(A,D)GT |

| Avg. t_{ply} [in] | Strength _{norm} [ksi] | Modulus _{norm} [Msi] |
|---------------------|--------------------------------|-------------------------------|
| 0.005348 | 79.79 | 4.525 |
| 0.005365 | 78.29 | 4.612 |
| 0.005348 | 78.67 | 4.465 |
| 0.005420 | 79.61 | 4.547 |
| 0.005438 | 78.71 | 4.511 |
| 0.005423 | 80.36 | 4.443 |
| 0.005625 | 85.90 | 4.407 |
| 0.005618 | 85.52 | 4.432 |
| 0.005601 | 85.60 | 4.451 |
| 0.005469 | 81.66 | 4.459 |
| 0.005463 | 80.26 | 4.477 |
| 0.005454 | 83.25 | 4.554 |
| 0.005448 | 84.82 | 4.507 |
| 0.005428 | 85.22 | 4.577 |
| 0.005437 | 87.59 | 4.573 |
| 0.005458 | 83.24 | 4.518 |
| 0.005460 | 87.53 | 4.562 |
| 0.005510 | 83.13 | 4.677 |

Average 81.79 4.467
 Standard Dev. 2.564 0.1124
 Coeff. of Var. [%] 3.135 2.517
 Min. 78.17 4.230
 Max. 87.00 4.642
 Number of Spec. 18 18

Average_{norm} 0.005462 82.73 4.516
 Standard Dev._{norm} 3.140 0.06989
 Coeff. of Var. [%]_{norm} 3.795 1.547
 Min. 0.005348 78.29 4.407
 Max. 0.005625 87.59 4.677
 Number of Spec. 18 18 18



**Laminate Unnotched Tension Properties (UNT2)--ETA1 (275°F)
Strength & Modulus**

Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

normalizing

t_{ply} [in]

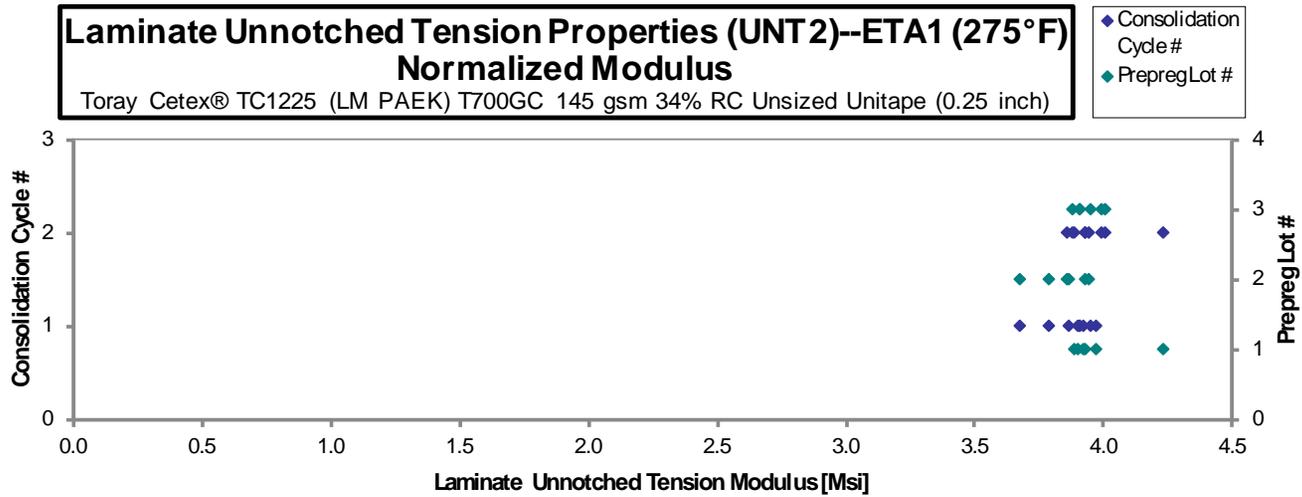
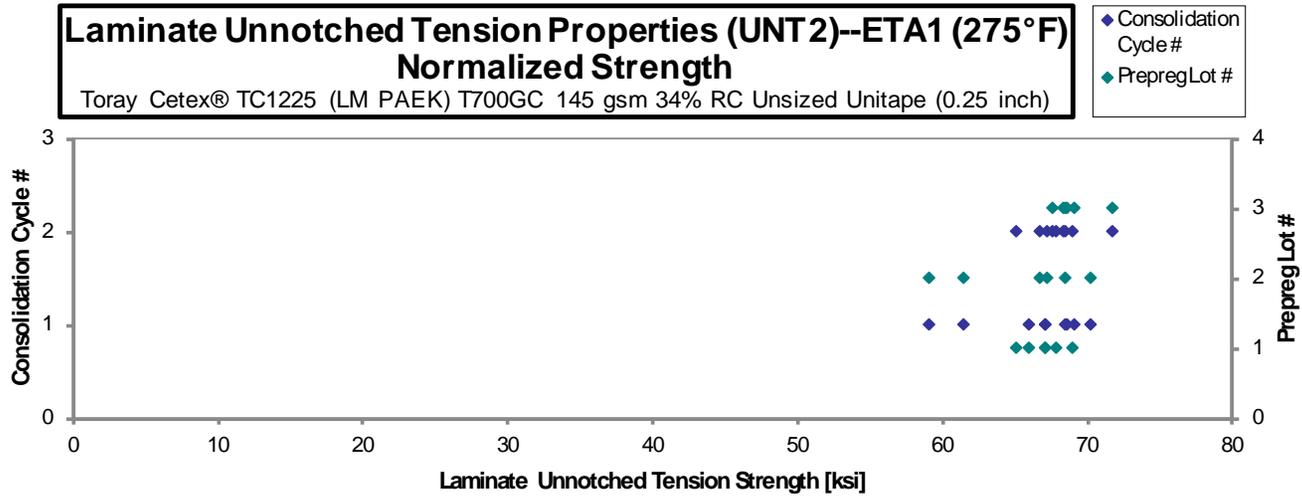
0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Modulus [Msi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|---|---------------|--------------------------|---------------|-----------------------|----------------|---------------|------------------------------|---------------------|--------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C1-1-UNT2-ETA1-1 | A | C1 | 1 | 1 | 67.78 | 3.942 | 0.1069 | 20 | DGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C1-1-UNT2-ETA1-2 | A | C1 | 1 | 1 | 66.23 | 3.938 | 0.1076 | 20 | DGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C1-1-UNT2-ETA1-3 | A | C1 | 1 | 1 | 68.24 | 4.041 | 0.1062 | 20 | DGB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C2-1-UNT2-ETA1-1 | A | C2 | 1 | 2 | 67.60 | 3.877 | 0.1083 | 20 | DGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C2-1-UNT2-ETA1-2 | A | C2 | 1 | 2 | 64.71 | 3.905 | 0.1087 | 20 | DGT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C2-1-UNT2-ETA1-3 | A | C2 | 1 | 2 | 68.51 | 4.207 | 0.1087 | 20 | DGT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C1-1-UNT2-ETA1-1 | B | C1 | 2 | 1 | 67.55 | 3.717 | 0.1123 | 20 | DGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C1-1-UNT2-ETA1-2 | B | C1 | 2 | 1 | 56.99 | 3.542 | 0.1121 | 20 | DWT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C1-1-UNT2-ETA1-3 | B | C1 | 2 | 1 | 59.10 | 3.645 | 0.1123 | 20 | DWT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C2-1-UNT2-ETA1-1 | B | C2 | 2 | 2 | 66.48 | 3.901 | 0.1092 | 20 | DGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C2-1-UNT2-ETA1-2 | B | C2 | 2 | 2 | 65.72 | 3.873 | 0.1096 | 20 | DGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C2-1-UNT2-ETA1-3 | B | C2 | 2 | 2 | 67.82 | 3.825 | 0.1090 | 20 | DGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST12-C-C1-1-UNT2-ETA1-1 | C | C1 | 3 | 1 | 68.55 | 3.954 | 0.1080 | 20 | DGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST12-C-C1-1-UNT2-ETA1-2 | C | C1 | 3 | 1 | 68.14 | 3.891 | 0.1085 | 20 | DGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST12-C-C1-1-UNT2-ETA1-3 | C | C1 | 3 | 1 | 68.86 | 3.889 | 0.1085 | 20 | DGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST12-C-C2-1-UNT2-ETA1-1 | C | C2 | 3 | 2 | 67.55 | 3.946 | 0.1092 | 20 | DGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST12-C-C2-1-UNT2-ETA1-2 | C | C2 | 3 | 2 | 66.99 | 3.968 | 0.1090 | 20 | DGT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST12-C-C2-1-UNT2-ETA1-3 | C | C2 | 3 | 2 | 70.30 | 3.797 | 0.1103 | 20 | DGM |

| Avg. t_{ply} [in] | Strength _{norm} [ksi] | Modulus _{norm} [Msi] |
|---------------------|--------------------------------|-------------------------------|
| 0.005346 | 67.10 | 3.903 |
| 0.005378 | 65.95 | 3.921 |
| 0.005312 | 67.12 | 3.975 |
| 0.005417 | 67.81 | 3.889 |
| 0.005437 | 65.15 | 3.932 |
| 0.005437 | 68.98 | 4.236 |
| 0.005613 | 70.22 | 3.864 |
| 0.005603 | 59.13 | 3.675 |
| 0.005615 | 61.46 | 3.790 |
| 0.005459 | 67.21 | 3.944 |
| 0.005479 | 66.68 | 3.930 |
| 0.005451 | 68.46 | 3.861 |
| 0.005400 | 68.55 | 3.954 |
| 0.005425 | 68.45 | 3.909 |
| 0.005424 | 69.17 | 3.906 |
| 0.005462 | 68.32 | 3.991 |
| 0.005449 | 67.60 | 4.004 |
| 0.005515 | 71.80 | 3.878 |

Average 66.51 3.881
 Standard Dev. 3.343 0.1466
 Coeff. of Var. [%] 5.027 3.776
 Min. 56.99 3.542
 Max. 70.30 4.207
 Number of Spec. 18 18

Average_{norm} 0.005457 67.18 3.920
 Standard Dev_{norm} 2.953 0.1095
 Coeff. of Var. [%]_{norm} 4.396 2.793
 Min. 0.005312 59.13 3.675
 Max. 0.005615 71.80 4.236
 Number of Spec. 18 18 18



4.9 “50/40/10” Unnotched Tension 3 Properties (UNT3)

Laminate Unnotched Tension Properties (UNT3)--CTA (-65°F)
Strength & Modulus
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

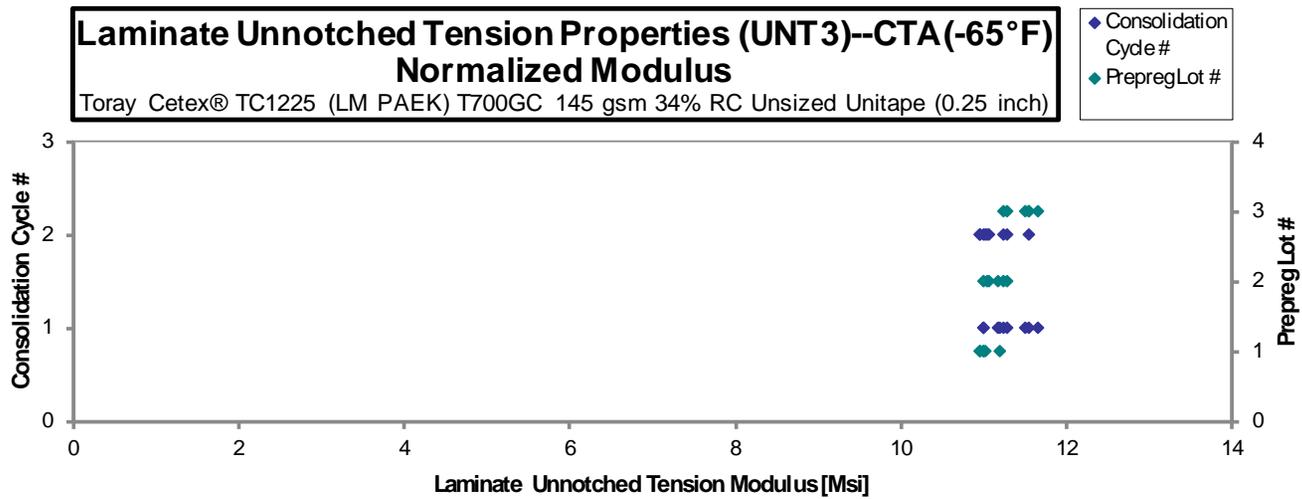
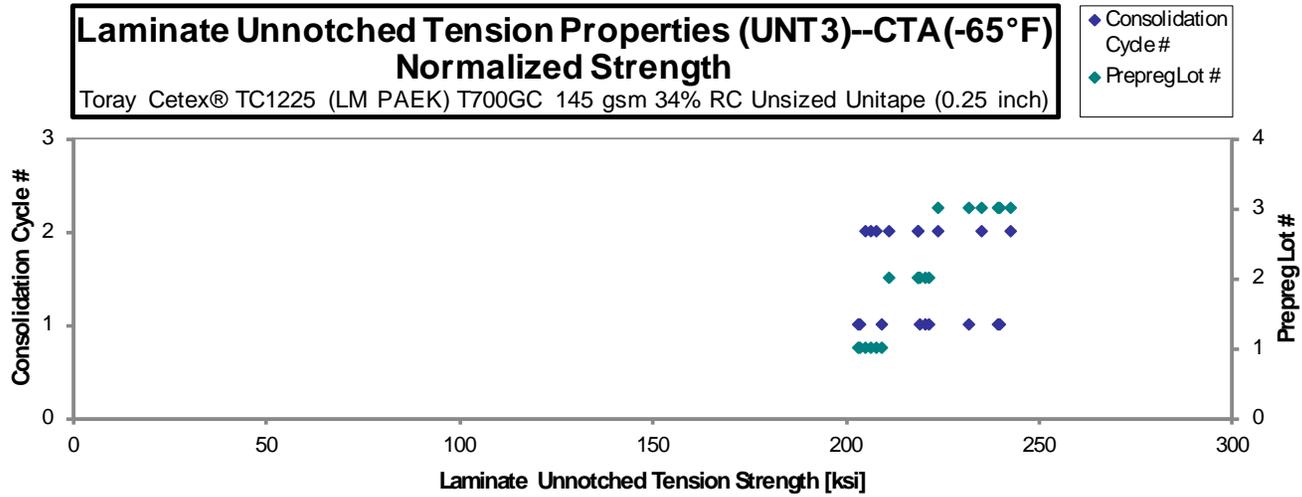
normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Modulus [Msi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|--|---------------|--------------------------|---------------|-----------------------|----------------|---------------|------------------------------|---------------------|--------------------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C1-1-UNT3-CTA-1 | A | C1 | 1 | 1 | 203.1 | 10.69 | 0.1112 | 20 | M(A,D)GM, AGB, M(A,D)WT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C1-1-UNT3-CTA-2 | A | C1 | 1 | 1 | 198.9 | 10.75 | 0.1106 | 20 | DGM, M(A,D)WT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C1-1-UNT3-CTA-3 | A | C1 | 1 | 1 | 197.8 | 10.90 | 0.1110 | 20 | DGM, M(A,D)GT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C2-1-UNT3-CTA-1 | A | C2 | 1 | 2 | 205.9 | 11.08 | 0.1076 | 20 | M(D,S)GM, AWB, M(A,L)WT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C2-1-UNT3-CTA-2 | A | C2 | 1 | 2 | 210.2 | 11.07 | 0.1069 | 20 | DGM, AWB, M(A,L)WT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C2-1-UNT3-CTA-3 | A | C2 | 1 | 2 | 206.9 | 10.97 | 0.1079 | 20 | DGM, AAB, M(A,L)GT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C1-1-UNT3-CTA-1 | B | C1 | 2 | 1 | 222.1 | 11.20 | 0.1078 | 20 | M(A,D)GM, M(A,D)WB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C1-1-UNT3-CTA-2 | B | C1 | 2 | 1 | 217.6 | 11.20 | 0.1089 | 20 | DGM, M(D,L)GB, M(A,D)WT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C1-1-UNT3-CTA-3 | B | C1 | 2 | 1 | 218.9 | 11.15 | 0.1088 | 20 | M(A,D)GM, M(A,D,L)GB, M(D,L)WT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C2-1-UNT3-CTA-1 | B | C2 | 2 | 2 | 215.6 | 10.84 | 0.1095 | 20 | DGM, M(A,D,L)GT, M(A,D,L)WB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C2-1-UNT3-CTA-2 | B | C2 | 2 | 2 | 209.4 | 10.97 | 0.1089 | 20 | M(D,L)WB, M(A,D)AT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C2-1-UNT3-CTA-3 | B | C2 | 2 | 2 | 216.6 | 10.93 | 0.1091 | 20 | M(A,D)GM, M(A,D,L)WB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C1-1-UNT3-CTA-1 | C | C1 | 3 | 1 | 238.3 | 11.50 | 0.1086 | 20 | M(D,A,S)GM, AWT, AWB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C1-1-UNT3-CTA-2 | C | C1 | 3 | 1 | 228.1 | 11.32 | 0.1099 | 20 | M(D,A,S)GM, AGB, AAT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C1-1-UNT3-CTA-3 | C | C1 | 3 | 1 | 240.2 | 11.66 | 0.1080 | 20 | M(D,A,S)GM, AGB, AWT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C2-1-UNT3-CTA-1 | C | C2 | 3 | 2 | 221.0 | 11.08 | 0.1095 | 20 | M(A,D)GM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C2-1-UNT3-CTA-2 | C | C2 | 3 | 2 | 240.1 | 11.16 | 0.1093 | 20 | DGM, M(D,L)WB, LGB, M(A,D)WT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C2-1-UNT3-CTA-3 | C | C2 | 3 | 2 | 231.9 | 11.38 | 0.1096 | 20 | DGM, M(A,D)GT, M(D,L)WB |

| Avg. t_{ply} [in] | Strength _{norm} [ksi] | Modulus _{norm} [Msi] |
|---------------------|--------------------------------|-------------------------------|
| 0.005561 | 209.2 | 11.00 |
| 0.005528 | 203.6 | 11.00 |
| 0.005550 | 203.3 | 11.20 |
| 0.005378 | 205.1 | 11.03 |
| 0.005346 | 208.1 | 10.96 |
| 0.005393 | 206.7 | 10.96 |
| 0.005390 | 221.6 | 11.18 |
| 0.005443 | 219.3 | 11.29 |
| 0.005441 | 220.5 | 11.23 |
| 0.005475 | 218.6 | 10.99 |
| 0.005447 | 211.2 | 11.07 |
| 0.005457 | 218.9 | 11.05 |
| 0.005429 | 239.6 | 11.56 |
| 0.005493 | 232.0 | 11.51 |
| 0.005398 | 240.1 | 11.66 |
| 0.005473 | 224.0 | 11.23 |
| 0.005464 | 242.9 | 11.29 |
| 0.005479 | 235.3 | 11.55 |

| | | |
|--------------------|-------|--------|
| Average | 217.9 | 11.10 |
| Standard Dev. | 13.55 | 0.2539 |
| Coeff. of Var. [%] | 6.217 | 2.286 |
| Min. | 197.8 | 10.69 |
| Max. | 240.2 | 11.66 |
| Number of Spec. | 18 | 18 |

| | | | |
|------------------------------------|----------|-------|--------|
| Average _{norm} | 0.005452 | 220.0 | 11.21 |
| Standard Dev. _{norm} | | 13.29 | 0.2280 |
| Coeff. of Var. [%] _{norm} | | 6.041 | 2.034 |
| Min. | 0.005346 | 203.3 | 10.96 |
| Max. | 0.005561 | 242.9 | 11.66 |
| Number of Spec. | 18 | 18 | 18 |



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

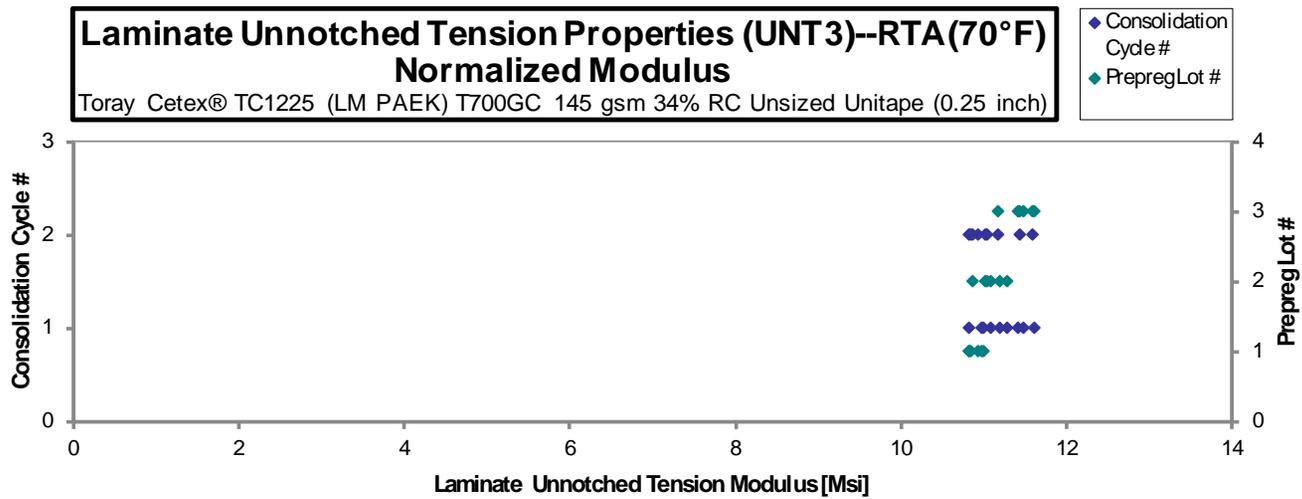
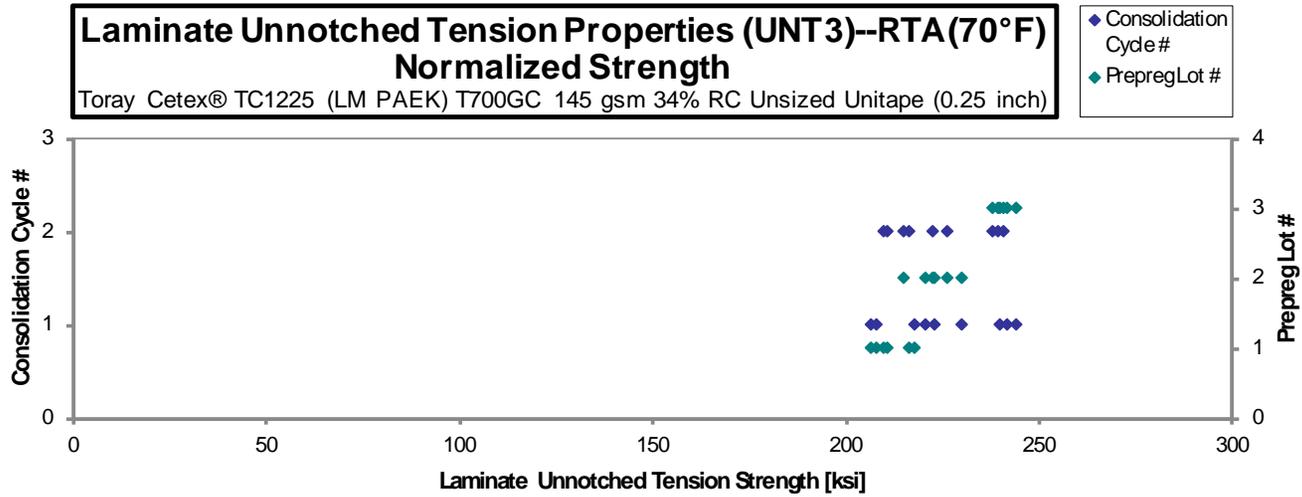
Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

normalizing
t_{ply} [in]
0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Modulus [Msi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode | Avg. t _{ply} [in] | Strength _{norm} [ksi] | Modulus _{norm} [Msi] |
|--|---------------|--------------------------|---------------|-----------------------|----------------|---------------|------------------------------|---------------------|-----------------------------|----------------------------|--------------------------------|-------------------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C1-1-UNT3-RTA-1 | A | C1 | 1 | 1 | 200.2 | 10.51 | 0.1113 | 20 | DGM, AGB, M(D,L)WT | 0.005565 | 206.3 | 10.83 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C1-1-UNT3-RTA-2 | A | C1 | 1 | 1 | 211.6 | 10.67 | 0.1112 | 20 | M(D,S)GM, AGT, LWB | 0.005562 | 217.9 | 10.99 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C1-1-UNT3-RTA-3 | A | C1 | 1 | 1 | 202.6 | 10.69 | 0.1110 | 20 | M(D,S)GM, AGT, AWB | 0.005548 | 208.2 | 10.98 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C2-1-UNT3-RTA-1 | A | C2 | 1 | 2 | 212.0 | 10.94 | 0.1068 | 20 | M(D,A,L)WB, M(D,A)AT | 0.005341 | 209.7 | 10.82 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C2-1-UNT3-RTA-2 | A | C2 | 1 | 2 | 217.5 | 10.89 | 0.1076 | 20 | M(D,S)GM, M(A,L)WT, AAB | 0.005378 | 216.6 | 10.85 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C2-1-UNT3-RTA-3 | A | C2 | 1 | 2 | 213.8 | 11.09 | 0.1064 | 20 | M(D,S)GM, AWT, AAB | 0.005322 | 210.7 | 10.93 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C1-1-UNT3-RTA-1 | B | C1 | 2 | 1 | 219.7 | 11.04 | 0.1085 | 20 | DGM, M(A,D)WT, M(A,D)WB | 0.005424 | 220.7 | 11.09 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C1-1-UNT3-RTA-2 | B | C1 | 2 | 1 | 230.0 | 11.20 | 0.1080 | 20 | DGM, M(A,D,L)GB, M(A,D)AT | 0.005400 | 230.0 | 11.20 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C1-1-UNT3-RTA-3 | B | C1 | 2 | 1 | 223.4 | 11.29 | 0.1079 | 20 | DGM, M(A,D)WT, M(A,D,L)WB | 0.005396 | 223.2 | 11.28 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C2-1-UNT3-RTA-1 | B | C2 | 2 | 2 | 224.3 | 10.96 | 0.1089 | 20 | M(A,D)GM | 0.005447 | 226.2 | 11.05 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C2-1-UNT3-RTA-2 | B | C2 | 2 | 2 | 220.9 | 10.94 | 0.1089 | 20 | DGM, M(A,D,L)WT, M(A,D)WB | 0.005443 | 222.7 | 11.02 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C2-1-UNT3-RTA-3 | B | C2 | 2 | 2 | 213.1 | 10.78 | 0.1090 | 20 | M(A,D)GM | 0.005448 | 215.0 | 10.88 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C1-1-UNT3-RTA-1 | C | C1 | 3 | 1 | 243.7 | 11.47 | 0.1081 | 20 | M(D,S)GM, AWT, AWB | 0.005407 | 244.0 | 11.48 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C1-1-UNT3-RTA-2 | C | C1 | 3 | 1 | 240.9 | 11.65 | 0.1075 | 20 | M(D,A,S)GM, AWT, AWB | 0.005377 | 239.8 | 11.60 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C1-1-UNT3-RTA-3 | C | C1 | 3 | 1 | 241.3 | 11.38 | 0.1083 | 20 | SGM, M(D,A)WT, M(D,A)WB | 0.005417 | 242.0 | 11.42 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C2-1-UNT3-RTA-1 | C | C2 | 3 | 2 | 235.4 | 11.26 | 0.1098 | 20 | DGM, M(A,D,L)GB, M(S,D,L)WT | 0.005488 | 239.2 | 11.44 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C2-1-UNT3-RTA-2 | C | C2 | 3 | 2 | 237.3 | 11.42 | 0.1097 | 20 | M(A,D)GM, M(A,D)WB | 0.005486 | 241.1 | 11.60 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C2-1-UNT3-RTA-3 | C | C2 | 3 | 2 | 234.8 | 11.03 | 0.1095 | 20 | M(A,D,L)WB, M(A,D)WT | 0.005474 | 238.0 | 11.18 |

| | | |
|--------------------|-------|--------|
| Average | 223.5 | 11.07 |
| Standard Dev. | 13.37 | 0.3070 |
| Coeff. of Var. [%] | 5.985 | 2.774 |
| Min. | 200.2 | 10.51 |
| Max. | 243.7 | 11.65 |
| Number of Spec. | 18 | 18 |

| | | | |
|------------------------------------|----------|-------|--------|
| Average _{norm} | 0.005440 | 225.1 | 11.15 |
| Standard Dev _{norm} | | 12.94 | 0.2657 |
| Coeff. of Var. [%] _{norm} | | 5.748 | 2.383 |
| Min. | 0.005322 | 206.3 | 10.82 |
| Max. | 0.005565 | 244.0 | 11.60 |
| Number of Spec. | 18 | 18 | 18 |



Laminate Unnotched Tension Properties (UNT3)--ETA1 (275°F)
Strength & Modulus
 Toray Cetex® TC1225 (LMPAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

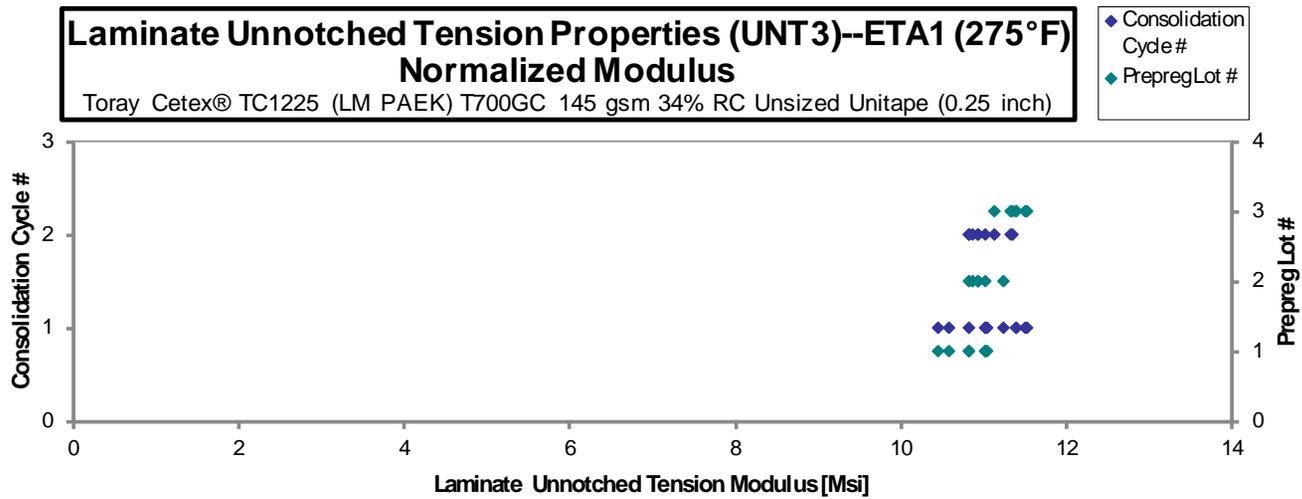
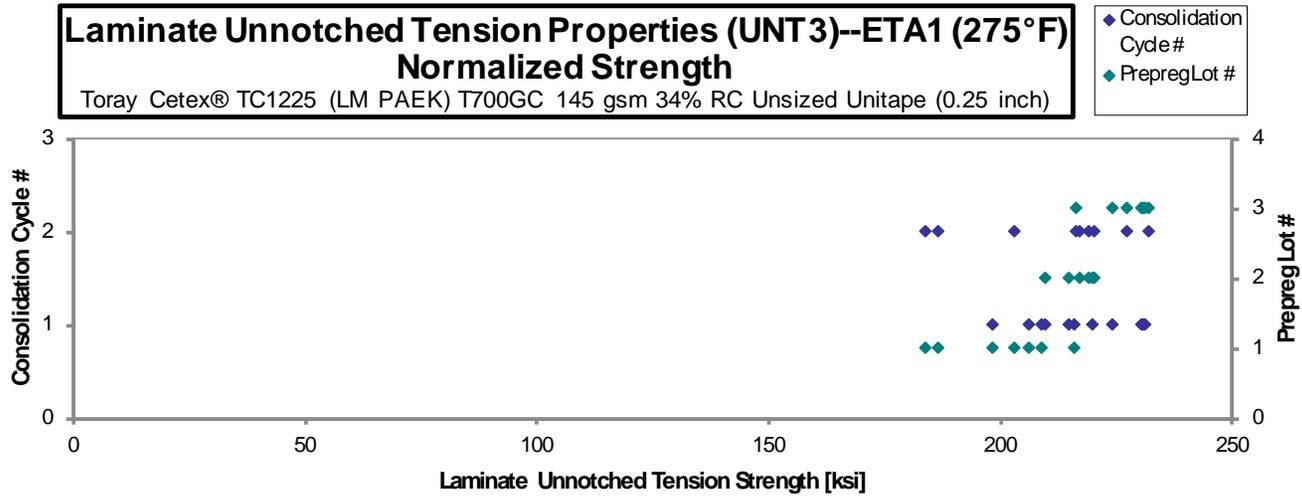
normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Modulus [Msi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|---|---------------|--------------------------|---------------|-----------------------|----------------|---------------|------------------------------|---------------------|------------------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C1-1-UNT3-ETA1-1 | A | C1 | 1 | 1 | 204.2 | 10.75 | 0.1106 | 20 | M(A,D)GM, LGT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C1-1-UNT3-ETA1-2 | A | C1 | 1 | 1 | 209.6 | 10.27 | 0.1113 | 20 | M(A,L)GB, M(D,A,L)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C1-1-UNT3-ETA1-3 | A | C1 | 1 | 1 | 192.4 | 10.14 | 0.1112 | 20 | M(D,S)GM, AGT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C1-1-UNT3-SP-5 | A | C1 | 1 | 1 | 199.6 | 10.69 | 0.1116 | 20 | M(D,S)GM, AGT, LGB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C2-1-UNT3-ETA1-1 | A | C2 | 1 | 2 | 187.7 | 11.09 | 0.1073 | 20 | M(D,A,S)GM, LWT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C2-1-UNT3-ETA1-2 | A | C2 | 1 | 2 | 184.6 | 10.86 | 0.1076 | 20 | DGM, AGT, LWB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C2-1-UNT3-ETA1-3 | A | C2 | 1 | 2 | 204.5 | 10.89 | 0.1074 | 20 | M(D,A)GM, AWT, AAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C1-1-UNT3-ETA1-1 | B | C1 | 2 | 1 | 208.2 | 11.16 | 0.1088 | 20 | M(A,D,L)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C1-1-UNT3-ETA1-2 | B | C1 | 2 | 1 | 219.6 | 10.82 | 0.1081 | 20 | DGM, M(A,D)GT, M(A,D,L)GB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C1-1-UNT3-ETA1-3 | B | C1 | 2 | 1 | 212.8 | 10.92 | 0.1091 | 20 | DGM, M(A,D)WT, M(A,D)GB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C2-1-UNT3-ETA1-1 | B | C2 | 2 | 2 | 214.4 | 10.80 | 0.1094 | 20 | DGM, M(D,L)GT, M(A,D)GB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C2-1-UNT3-ETA1-2 | B | C2 | 2 | 2 | 217.1 | 10.84 | 0.1090 | 20 | M(D,L)GM, M(A,D)GB, M(A,D)GT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C2-1-UNT3-ETA1-3 | B | C2 | 2 | 2 | 216.5 | 10.69 | 0.1098 | 20 | DGM, M(A,D)WB, M(A,D)WT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C1-1-UNT3-ETA1-1 | C | C1 | 3 | 1 | 230.7 | 11.37 | 0.1083 | 20 | DGM, M(D,A,S)GT, AWB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C1-1-UNT3-ETA1-2 | C | C1 | 3 | 1 | 222.3 | 11.43 | 0.1089 | 20 | M(D,S)GM, AWT, AWB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C1-1-UNT3-ETA1-3 | C | C1 | 3 | 1 | 230.6 | 11.49 | 0.1081 | 20 | M(D,S)GM, AWT, AWB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C1-1-UNT3-SP-5 | C | C1 | 3 | 1 | 229.5 | 11.34 | 0.1085 | 20 | M(D,S)GM, AAB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C2-1-UNT3-ETA1-1 | C | C2 | 3 | 2 | 229.0 | 11.21 | 0.1095 | 20 | DGM, M(A,D,L)WB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C2-1-UNT3-ETA1-2 | C | C2 | 3 | 2 | 213.0 | 11.16 | 0.1097 | 20 | DGM, M(D,L)WB, M(A,D,L)WT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C2-1-UNT3-ETA1-3 | C | C2 | 3 | 2 | 223.7 | 10.95 | 0.1098 | 20 | M(A,D)GM, M(A,D)GT, M(D,L)WB |

| Avg. t_{ply} [in] | Strength _{norm} [ksi] | Modulus _{norm} [Msi] |
|---------------------|--------------------------------|-------------------------------|
| 0.005532 | 209.1 | 11.01 |
| 0.005567 | 216.1 | 10.59 |
| 0.005562 | 198.2 | 10.45 |
| 0.005579 | 206.2 | 11.04 |
| 0.005364 | 186.5 | 11.01 |
| 0.005379 | 183.9 | 10.81 |
| 0.005368 | 203.2 | 10.83 |
| 0.005438 | 209.7 | 11.24 |
| 0.005406 | 219.8 | 10.83 |
| 0.005453 | 214.9 | 11.02 |
| 0.005472 | 217.2 | 10.94 |
| 0.005450 | 219.1 | 10.94 |
| 0.005490 | 220.2 | 10.87 |
| 0.005413 | 231.2 | 11.39 |
| 0.005445 | 224.2 | 11.53 |
| 0.005405 | 230.8 | 11.50 |
| 0.005423 | 230.5 | 11.38 |
| 0.005473 | 232.1 | 11.36 |
| 0.005483 | 216.3 | 11.33 |
| 0.005489 | 227.4 | 11.13 |

Average 212.5 10.94
 Standard Dev. 13.87 0.3526
 Coeff. of Var. [%] 6.528 3.223
 Min. 184.6 10.14
 Max. 230.7 11.49
 Number of Spec. 20 20

Average_{norm} 0.005459 214.8 11.06
 Standard Dev._{norm} 13.95 0.2950
 Coeff. of Var. [%]_{norm} 6.496 2.668
 Min. 0.005364 183.9 10.45
 Max. 0.005579 232.1 11.53
 Number of Spec. 20 20 20



4.10 “50/0/50” Unnotched Compression 0/90 Properties (UNC0)

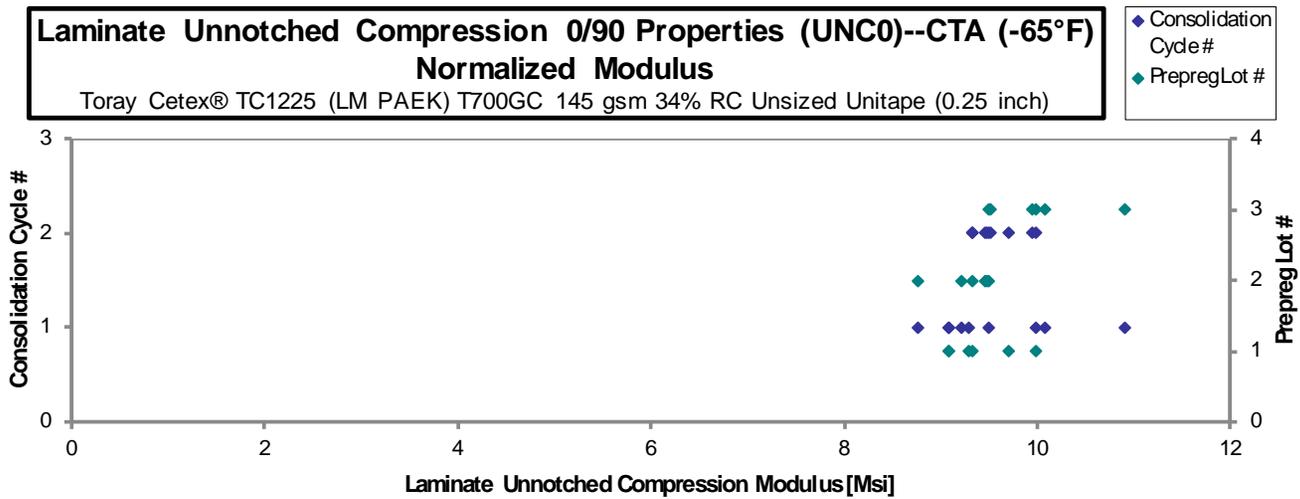
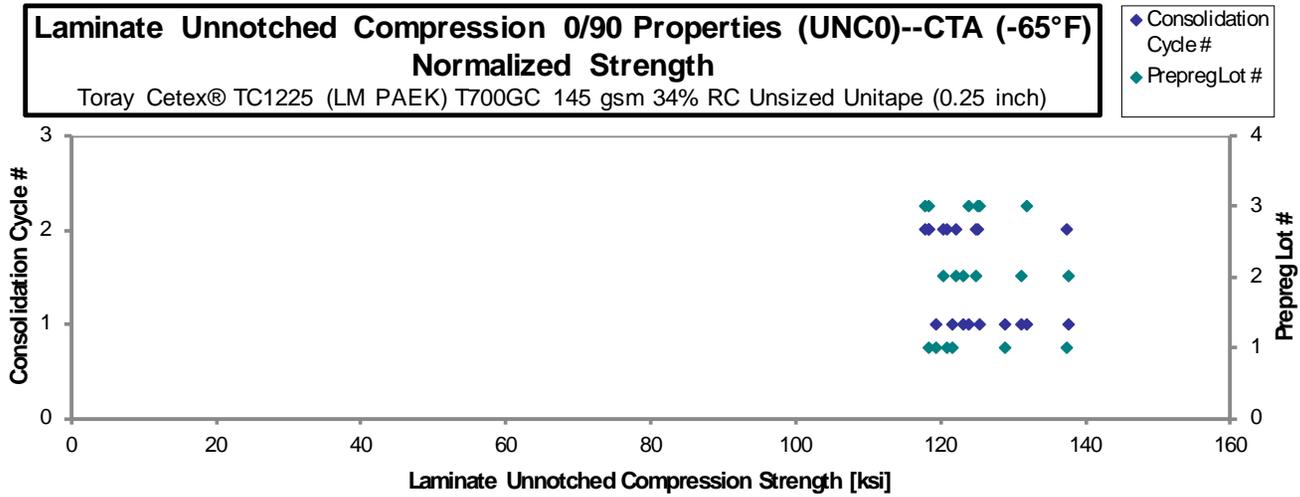
Laminate Unnotched Compression 0/90 Properties (UNC0)--CTA (-65°F)
Strength & Modulus
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Modulus [Msi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|---|---------------|--------------------------|---------------|-----------------------|----------------|---------------|------------------------------|---------------------|--------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C1-1-UNC0-CTA-1 | A | C1 | 1 | 1 | 125.7 | 9.058 | 0.08867 | 16 | BAT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C1-1-UNC0-CTA-2 | A | C1 | 1 | 1 | 120.1 | 8.965 | 0.08755 | 16 | BAT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C1-1-UNC0-CTA-3 | A | C1 | 1 | 1 | 118.1 | 8.980 | 0.08743 | 16 | BAT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C2-1-UNC0-CTA-1 | A | C2 | 1 | 2 | 119.9 | 9.270 | 0.08707 | 16 | M(B, H)AB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C2-1-UNC0-CTA-2 | A | C2 | 1 | 2 | 134.6 | 9.779 | 0.08822 | 16 | BGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C2-1-UNC0-CTA-3 | A | C2 | 1 | 2 | 116.6 | 9.561 | 0.08775 | 16 | M(B, H)AB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C1-1-UNC0-CTA-1 | B | C1 | 2 | 1 | 131.2 | 9.489 | 0.08648 | 16 | BAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C1-1-UNC0-CTA-2 | B | C1 | 2 | 1 | 124.6 | 8.870 | 0.08548 | 16 | BAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C1-1-UNC0-CTA-3 | B | C1 | 2 | 1 | 139.5 | 9.337 | 0.08537 | 16 | BGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C2-1-UNC0-CTA-1 | B | C2 | 2 | 2 | 124.8 | 9.472 | 0.08648 | 16 | BAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C2-1-UNC0-CTA-2 | B | C2 | 2 | 2 | 120.5 | 9.339 | 0.08638 | 16 | BAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C2-1-UNC0-CTA-3 | B | C2 | 2 | 2 | 122.3 | 9.466 | 0.08637 | 16 | BAB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C1-1-UNC0-CTA-1 | C | C1 | 3 | 1 | 118.4 | 10.42 | 0.09043 | 16 | BAB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C1-1-UNC0-CTA-2 | C | C1 | 3 | 1 | 121.0 | 9.739 | 0.08950 | 16 | BAB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C1-1-UNC0-CTA-3 | C | C1 | 3 | 1 | 127.2 | 9.634 | 0.08967 | 16 | BAB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C2-1-UNC0-CTA-1 | C | C2 | 3 | 2 | 116.4 | 9.820 | 0.08760 | 16 | BAB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C2-1-UNC0-CTA-2 | C | C2 | 3 | 2 | 124.8 | 9.473 | 0.08660 | 16 | BAB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C2-1-UNC0-CTA-3 | C | C2 | 3 | 2 | 118.6 | 9.535 | 0.08622 | 16 | BAB |

| Avg. t_{ply} [in] | Strength _{norm} [ksi] | Modulus _{norm} [Msi] |
|---------------------|--------------------------------|-------------------------------|
| 0.005542 | 129.0 | 9.296 |
| 0.005472 | 121.7 | 9.084 |
| 0.005465 | 119.5 | 9.088 |
| 0.005442 | 120.9 | 9.341 |
| 0.005514 | 137.4 | 9.984 |
| 0.005484 | 118.4 | 9.711 |
| 0.005405 | 131.3 | 9.498 |
| 0.005343 | 123.3 | 8.776 |
| 0.005335 | 137.8 | 9.225 |
| 0.005405 | 124.9 | 9.481 |
| 0.005399 | 120.5 | 9.337 |
| 0.005398 | 122.3 | 9.462 |
| 0.005652 | 123.9 | 10.90 |
| 0.005594 | 125.4 | 10.09 |
| 0.005604 | 132.0 | 9.999 |
| 0.005475 | 118.0 | 9.957 |
| 0.005413 | 125.1 | 9.495 |
| 0.005389 | 118.4 | 9.514 |

| | | | | | | |
|---------------------------|--------------|---------------|--|-----------------|--------------|---------------|
| Average | 123.6 | 9.456 | Average_{norm} | 0.005463 | 125.0 | 9.569 |
| Standard Dev. | 6.321 | 0.3699 | Standard Dev._{norm} | | 6.186 | 0.4856 |
| Coeff. of Var. [%] | 5.116 | 3.912 | Coeff. of Var. [%]_{norm} | | 4.950 | 5.075 |
| Min. | 116.4 | 8.870 | Min. | 0.005335 | 118.0 | 8.776 |
| Max. | 139.5 | 10.42 | Max. | 0.005652 | 137.8 | 10.90 |
| Number of Spec. | 18 | 18 | Number of Spec. | 18 | 18 | 18 |



Laminate Unnotched Compression 0/90 Properties (UNC0)--RTA (70°F)
Strength & Modulus
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

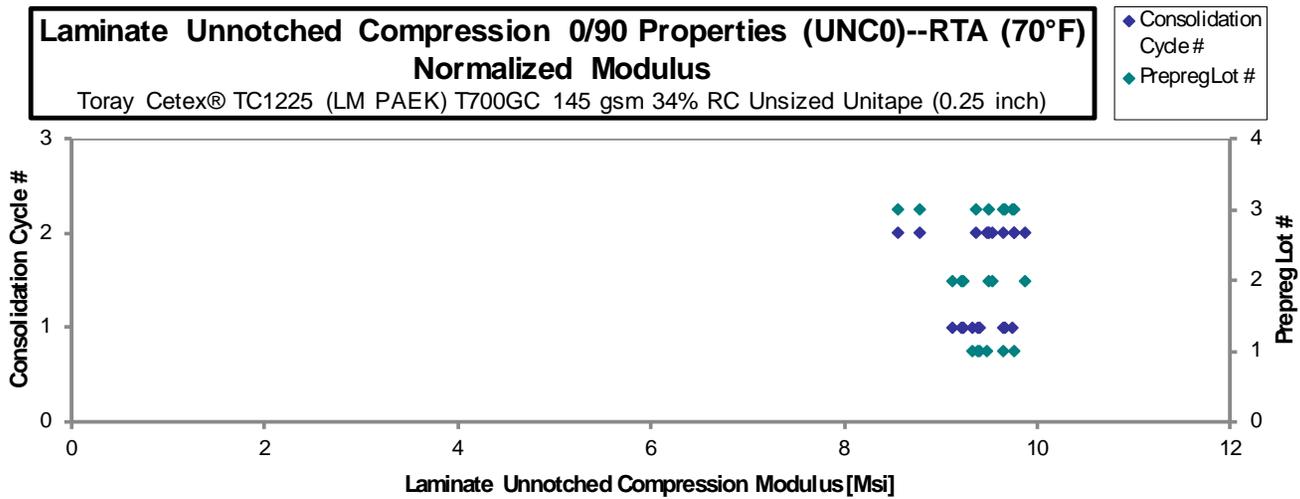
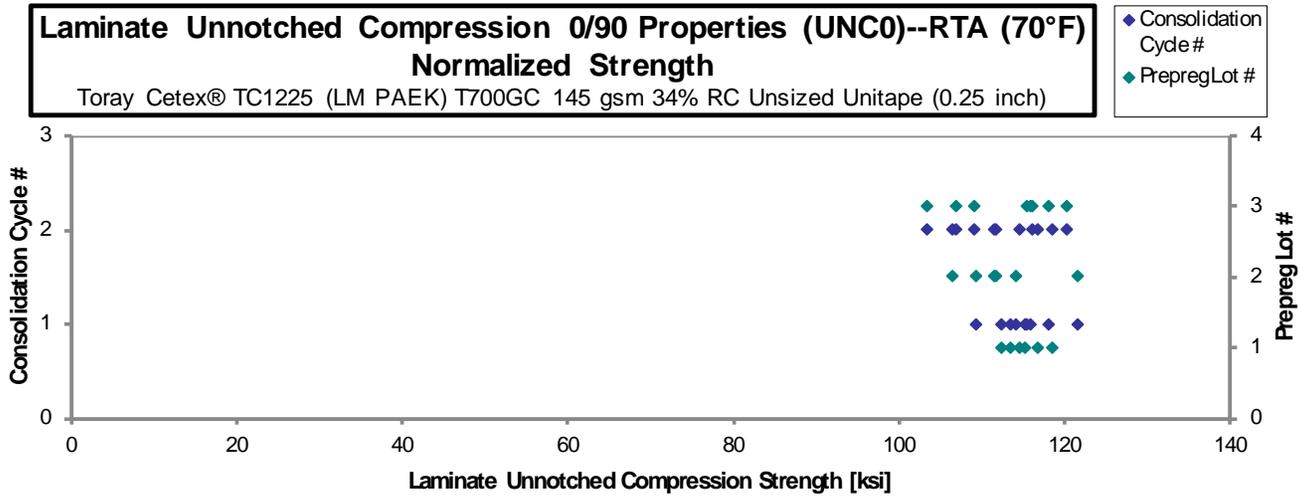
normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Modulus [Msi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|---|---------------|--------------------------|---------------|-----------------------|----------------|---------------|------------------------------|---------------------|--------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C1-1-UNC0-RTA-1 | A | C1 | 1 | 1 | 113.7 | 9.284 | 0.08762 | 16 | BAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C1-1-UNC0-RTA-2 | A | C1 | 1 | 1 | 110.4 | 9.161 | 0.08795 | 16 | BAT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C1-1-UNC0-RTA-3 | A | C1 | 1 | 1 | 111.9 | 9.246 | 0.08770 | 16 | BAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C2-1-UNC0-RTA-1 | A | C2 | 1 | 2 | 116.0 | 9.280 | 0.08825 | 16 | BAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C2-1-UNC0-RTA-2 | A | C2 | 1 | 2 | 114.5 | 9.466 | 0.08805 | 16 | BAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C2-1-UNC0-RTA-3 | A | C2 | 1 | 2 | 112.2 | 9.568 | 0.08818 | 16 | BAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C1-1-UNC0-RTA-2* | B | C1 | 2 | 1 | 122.5 | 9.300 | 0.08572 | 16 | HAT, HIT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C1-1-UNC0-RTA-3 | B | C1 | 2 | 1 | 115.1 | 9.321 | 0.08567 | 16 | BAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C1-1-UNC0-SP-3* | B | C1 | 2 | 1 | 110.2 | 9.197 | 0.08578 | 16 | BAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C2-1-UNC0-RTA-1 | B | C2 | 2 | 2 | 106.8 | 9.901 | 0.08617 | 16 | BAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C2-1-UNC0-RTA-2 | B | C2 | 2 | 2 | 112.2 | 9.593 | 0.08592 | 16 | BAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C2-1-UNC0-RTA-3 | B | C2 | 2 | 2 | 112.4 | 9.559 | 0.08587 | 16 | BAT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C1-1-UNC0-RTA-1 | C | C1 | 3 | 1 | 114.1 | 9.417 | 0.08938 | 16 | BAB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C1-1-UNC0-RTA-2 | C | C1 | 3 | 1 | 112.6 | 9.374 | 0.08892 | 16 | BAB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C1-1-UNC0-RTA-3 | C | C1 | 3 | 1 | 111.3 | 9.323 | 0.08970 | 16 | BAB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C2-1-UNC0-RTA-1 | C | C2 | 3 | 2 | 106.7 | 9.750 | 0.08653 | 16 | BAB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C2-1-UNC0-RTA-2 | C | C2 | 3 | 2 | 115.8 | 9.483 | 0.08660 | 16 | BAB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C2-1-UNC0-RTA-3 | C | C2 | 3 | 2 | 120.5 | 9.400 | 0.08622 | 16 | BAB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C2-1-UNC0-RTA-4 | C | C2 | 3 | 2 | 103.2 | 8.787 | 0.08648 | 16 | BAB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C2-1-UNC0-RTA-5 | C | C2 | 3 | 2 | 109.0 | 8.547 | 0.08648 | 16 | BAB |

| Avg. t_{ply} [in] | Strength _{norm} [ksi] | Modulus _{norm} [Msi] |
|---------------------|--------------------------------|-------------------------------|
| 0.005476 | 115.3 | 9.415 |
| 0.005497 | 112.4 | 9.326 |
| 0.005481 | 113.6 | 9.386 |
| 0.005516 | 118.5 | 9.479 |
| 0.005503 | 116.7 | 9.647 |
| 0.005511 | 114.5 | 9.766 |
| 0.005357 | 121.5 | 9.226 |
| 0.005354 | 114.1 | 9.242 |
| 0.005361 | 109.4 | 9.132 |
| 0.005385 | 106.5 | 9.875 |
| 0.005370 | 111.6 | 9.540 |
| 0.005367 | 111.7 | 9.500 |
| 0.005586 | 118.1 | 9.742 |
| 0.005557 | 115.9 | 9.647 |
| 0.005606 | 115.6 | 9.679 |
| 0.005408 | 106.9 | 9.765 |
| 0.005413 | 116.1 | 9.505 |
| 0.005389 | 120.3 | 9.380 |
| 0.005405 | 103.3 | 8.795 |
| 0.005405 | 109.1 | 8.555 |

* Modulus are averaged values from 2 strain gages.

| | | | | | | |
|---------------------------|--------------|---------------|--|-----------------|--------------|---------------|
| Average | 112.6 | 9.348 | Average_{norm} | 0.005447 | 113.5 | 9.430 |
| Standard Dev. | 4.460 | 0.2990 | Standard Dev_{v.norm} | | 4.744 | 0.3286 |
| Coeff. of Var. [%] | 3.962 | 3.199 | Coeff. of Var. [%]_{norm} | | 4.178 | 3.484 |
| Min. | 103.2 | 8.547 | Min. | 0.005354 | 103.3 | 8.555 |
| Max. | 122.5 | 9.901 | Max. | 0.005606 | 121.5 | 9.875 |
| Number of Spec. | 20 | 20 | Number of Spec. | 20 | 20 | 20 |



**Laminate Unnotched Compression 0/90 Properties (UNC0)--ETA1 (275°F)
Strength & Modulus**

Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

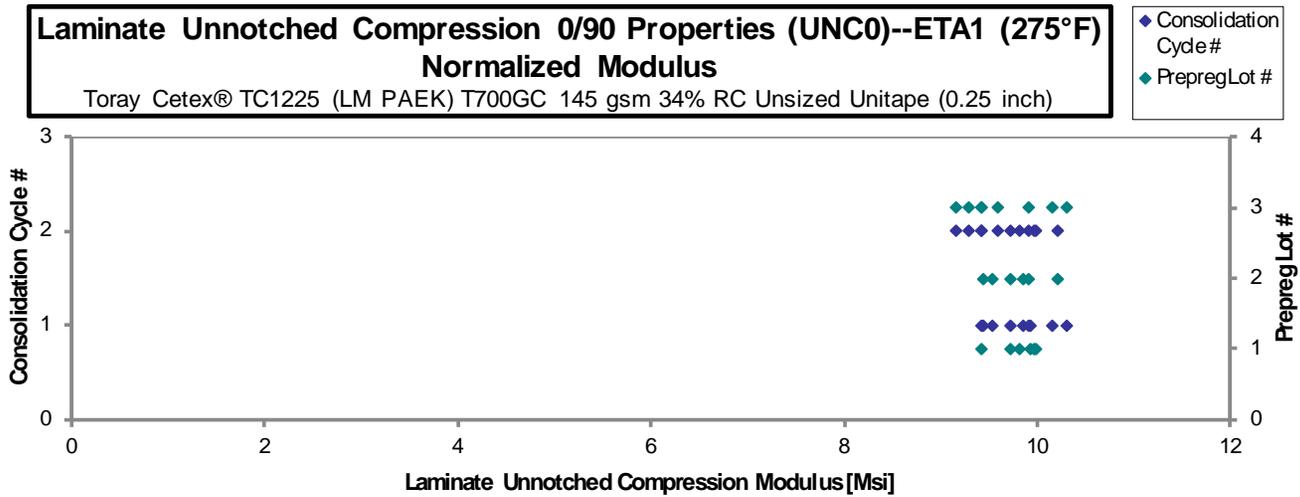
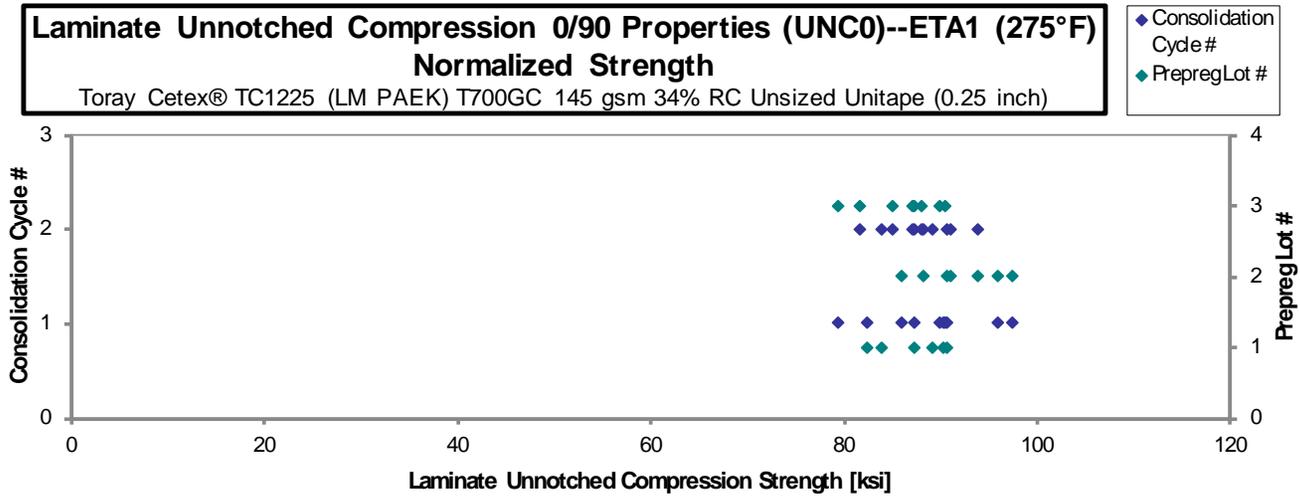
normalizing
t_{ply} [in]
0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Modulus [Msi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|---|---------------|--------------------------|---------------|-----------------------|----------------|---------------|------------------------------|---------------------|-------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C1-1-UNC0-ETA1-1 | A | C1 | 1 | 1 | 86.04 | 9.285 | 0.08768 | 16 | M(B,H)AB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C1-1-UNC0-ETA1-2 | A | C1 | 1 | 1 | 89.08 | 9.586 | 0.08767 | 16 | BAT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C1-1-UNC0-ETA1-3 | A | C1 | 1 | 1 | 81.26 | 9.778 | 0.08772 | 16 | BAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C2-1-UNC0-ETA1-1 | A | C2 | 1 | 2 | 82.23 | 9.780 | 0.08825 | 16 | M(B,H)AB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C2-1-UNC0-ETA1-2 | A | C2 | 1 | 2 | 89.38 | 9.672 | 0.08772 | 16 | M(B,H)AB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C2-1-UNC0-ETA1-3 | A | C2 | 1 | 2 | 87.42 | 9.767 | 0.08822 | 16 | BAB, HIB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C1-1-UNC0-ETA1-1 | B | C1 | 2 | 1 | 96.53 | 9.497 | 0.08592 | 16 | BAT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C1-1-UNC0-ETA1-2 | B | C1 | 2 | 1 | 98.05 | 9.607 | 0.08582 | 16 | BAT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C1-1-UNC0-ETA1-3 | B | C1 | 2 | 1 | 91.62 | 9.953 | 0.08553 | 16 | CIT, M(C,H)B, HAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C1-1-UNC0-SP-5* | B | C1 | 2 | 1 | 87.11 | | 0.08535 | 16 | BAB, HAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C2-1-UNC0-ETA1-1 | B | C2 | 2 | 2 | 91.45 | 9.774 | 0.08597 | 16 | BGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C2-1-UNC0-ETA1-2 | B | C2 | 2 | 2 | 88.70 | 9.961 | 0.08602 | 16 | HAT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C2-1-UNC0-ETA1-3** | B | C2 | 2 | 2 | | 10.24 | 0.08615 | 16 | HIB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C2-1-UNC0-SP-6* | B | C2 | 2 | 2 | 93.96 | | 0.08628 | 16 | HAB/HIB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C1-1-UNC0-ETA1-1 | C | C1 | 3 | 1 | 87.38 | 9.797 | 0.08953 | 16 | BAB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C1-1-UNC0-ETA1-2 | C | C1 | 3 | 1 | 86.21 | 9.512 | 0.09008 | 16 | HAB, HIB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C1-1-UNC0-ETA1-3 | C | C1 | 3 | 1 | 76.23 | 9.888 | 0.09012 | 16 | BGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C2-1-UNC0-ETA1-1 | C | C2 | 3 | 2 | 87.41 | 9.446 | 0.08630 | 16 | BAB, CIT, CIB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C2-1-UNC0-ETA1-2 | C | C2 | 3 | 2 | 87.54 | 9.466 | 0.08605 | 16 | HAB, HIB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C2-1-UNC0-ETA1-3 | C | C2 | 3 | 2 | 88.52 | 9.641 | 0.08605 | 16 | BAB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C2-1-UNC0-ETA1-4 | C | C2 | 3 | 2 | 81.06 | 9.237 | 0.08698 | 16 | BAB, HIB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C2-1-UNC0-ETA1-5 | C | C2 | 3 | 2 | 84.82 | 9.144 | 0.08663 | 16 | BAB |

| Avg. t _{ply} [in] | Strength _{norm} [ksi] | Modulus _{norm} [Msi] |
|----------------------------|--------------------------------|-------------------------------|
| 0.005480 | 87.32 | 9.423 |
| 0.005479 | 90.39 | 9.726 |
| 0.005482 | 82.50 | 9.927 |
| 0.005516 | 83.99 | 9.990 |
| 0.005482 | 90.74 | 9.820 |
| 0.005514 | 89.26 | 9.972 |
| 0.005370 | 95.99 | 9.444 |
| 0.005364 | 97.39 | 9.542 |
| 0.005346 | 90.70 | 9.853 |
| 0.005334 | 86.05 | |
| 0.005373 | 90.99 | 9.725 |
| 0.005376 | 88.31 | 9.917 |
| 0.005384 | | 10.21 |
| 0.005393 | 93.84 | |
| 0.005596 | 90.55 | 10.15 |
| 0.005630 | 89.89 | 9.917 |
| 0.005632 | 79.51 | 10.31 |
| 0.005394 | 87.31 | 9.435 |
| 0.005378 | 87.18 | 9.428 |
| 0.005378 | 88.16 | 9.602 |
| 0.005436 | 81.61 | 9.299 |
| 0.005415 | 85.05 | 9.169 |

* Specimen was not gaged, only strength is tested.
** Strength is not reported due to unacceptable failure mode.

| | | | | | | |
|---------------------------|--------------|---------------|--|-----------------|--------------|---------------|
| Average | 87.71 | 9.652 | Average_{norm} | 0.005443 | 88.41 | 9.743 |
| Standard Dev. | 5.105 | 0.2678 | Standard Dev_{v-norm} | | 4.456 | 0.3171 |
| Coeff. of Var. [%] | 5.820 | 2.774 | Coeff. of Var. [%]_{norm} | | 5.040 | 3.255 |
| Min. | 76.23 | 9.144 | Min. | 0.005334 | 79.51 | 9.169 |
| Max. | 98.05 | 10.24 | Max. | 0.005632 | 97.39 | 10.31 |
| Number of Spec. | 21 | 20 | Number of Spec. | 22 | 21 | 20 |



**Laminate Unnotched Compression 0/90 Properties (UNC0)--ETA2 (400°F)
Strength & Modulus**

Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

normalizing

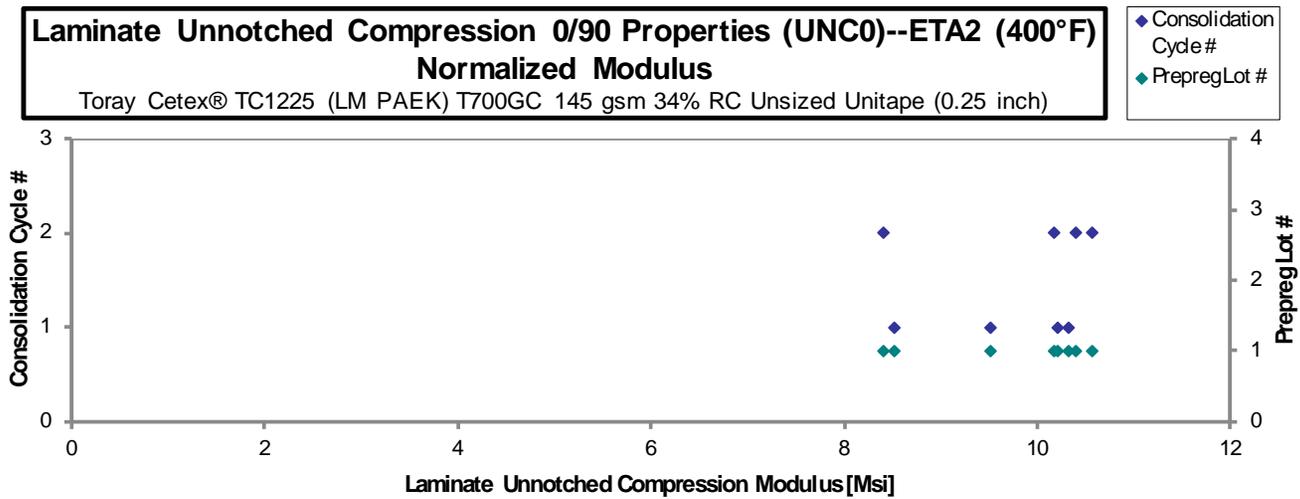
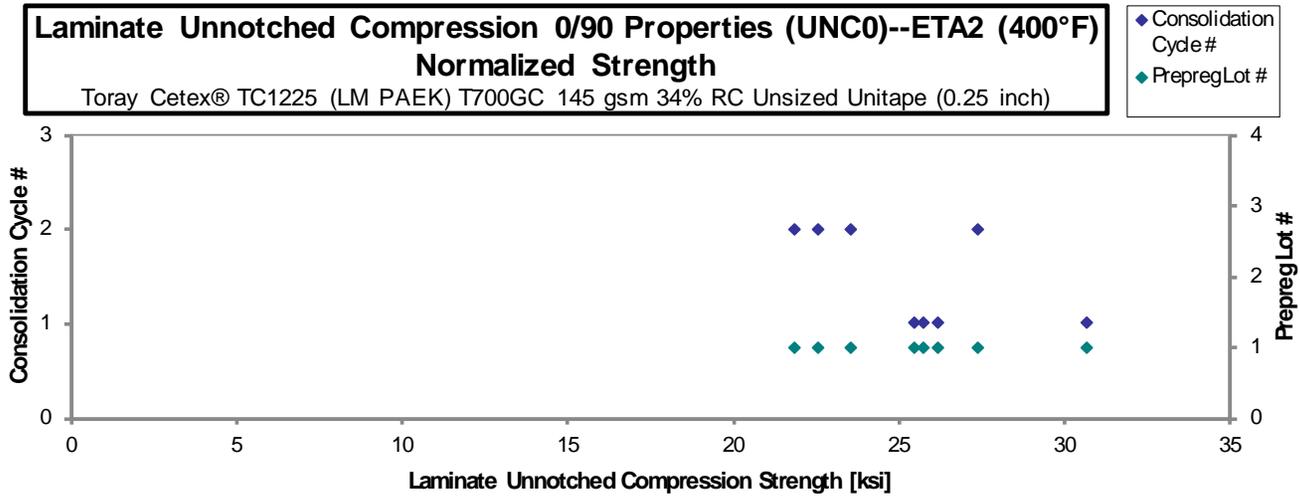
t_{ply} [in]
0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Modulus [Msi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|---|---------------|--------------------------|---------------|-----------------------|----------------|---------------|------------------------------|---------------------|--------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C1-1-UNC0-ETA2-1 | A | C1 | 1 | 1 | 25.00 | 10.13 | 0.08812 | 16 | HAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C1-1-UNC0-ETA2-2 | A | C1 | 1 | 1 | 29.97 | 9.996 | 0.08838 | 16 | HAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C1-1-UNC0-ETA2-3 | A | C1 | 1 | 1 | 25.32 | 8.377 | 0.08792 | 16 | HGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C1-1-UNC0-SP-7 | A | C1 | 1 | 1 | 25.91 | 9.432 | 0.08725 | 16 | HAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C2-1-UNC0-ETA2-1 | A | C2 | 1 | 2 | 26.59 | 10.27 | 0.08898 | 16 | HAT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C2-1-UNC0-ETA2-2 | A | C2 | 1 | 2 | 23.02 | 8.237 | 0.08832 | 16 | HGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C2-1-UNC0-ETA2-3 | A | C2 | 1 | 2 | 21.32 | 10.14 | 0.08865 | 16 | HGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-A-C2-1-UNC0-SP-7 | A | C2 | 1 | 2 | 22.00 | 9.937 | 0.08850 | 16 | HGM |

| Avg. t_{ply} [in] | Strength _{norm} [ksi] | Modulus _{norm} [Msi] |
|---------------------|--------------------------------|-------------------------------|
| 0.005507 | 25.50 | 10.33 |
| 0.005524 | 30.65 | 10.23 |
| 0.005495 | 25.77 | 8.524 |
| 0.005453 | 26.17 | 9.525 |
| 0.005561 | 27.38 | 10.57 |
| 0.005520 | 23.53 | 8.419 |
| 0.005541 | 21.88 | 10.40 |
| 0.005531 | 22.54 | 10.18 |

Average 24.89 9.564
 Standard Dev. 2.789 0.8159
 Coeff. of Var. [%] 11.21 8.531
 Min. 21.32 8.237
 Max. 29.97 10.27
 Number of Spec. 8 8

Average_{norm} 0.005517 25.43 9.773
 Standard Dev._{norm} 2.837 0.8597
 Coeff. of Var. [%]_{norm} 11.16 8.797
 Min. 0.005453 21.88 8.419
 Max. 0.005561 30.65 10.57
 Number of Spec. 8 8 8



Laminate Unnotched Compression 0/90 Properties (UNC0)--ETW (275°F)
Strength & Modulus
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

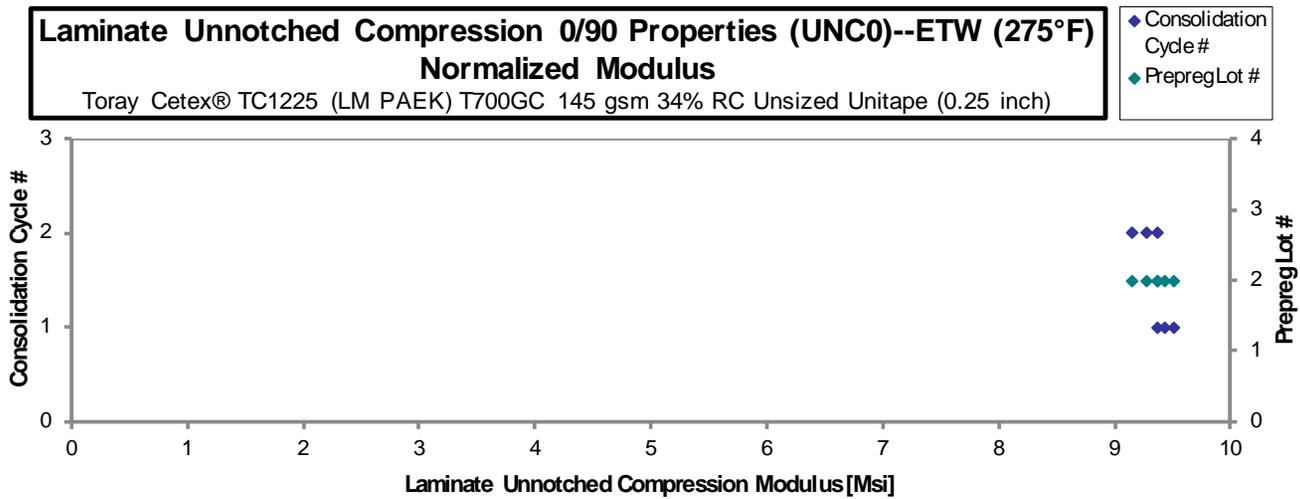
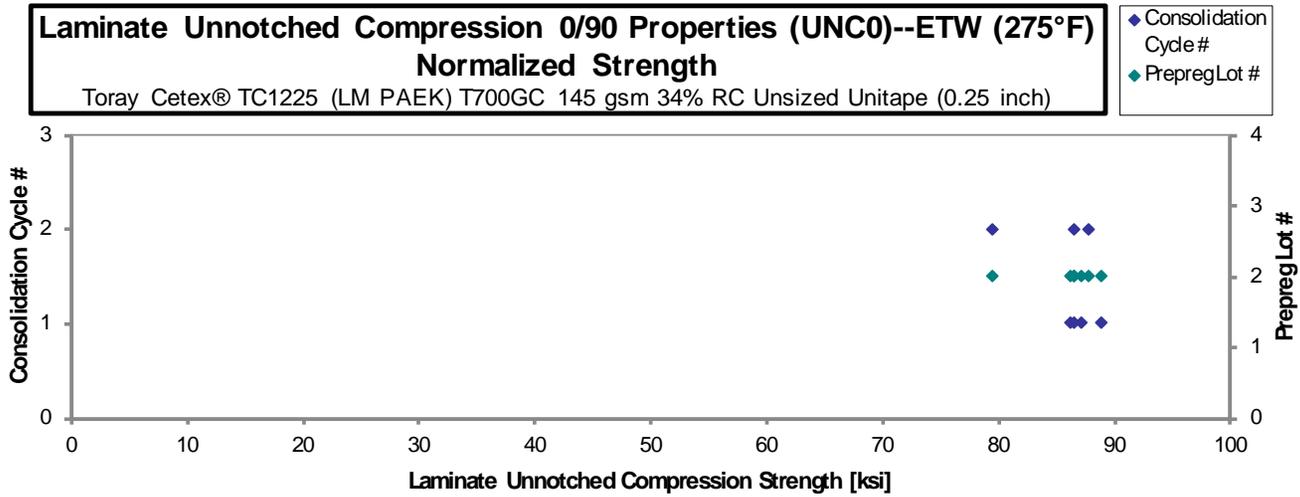
normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Modulus [Msi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|--|---------------|--------------------------|---------------|-----------------------|----------------|---------------|------------------------------|---------------------|--------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C1-1-UNC0-ETW-1 | B | C1 | 2 | 1 | 87.08 | 9.595 | 0.08563 | 16 | HAT, HIT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C1-1-UNC0-ETW-2 | B | C1 | 2 | 1 | 87.16 | 9.436 | 0.08582 | 16 | BAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C1-1-UNC0-ETW-3 | B | C1 | 2 | 1 | 89.99 | 9.549 | 0.08535 | 16 | BAT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C1-1-UNC0-SP-8* | B | C1 | 2 | 1 | 87.77 | | 0.08580 | 16 | M(B,H)AB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C2-1-UNC0-ETW-1 | B | C2 | 2 | 2 | 87.59 | 9.347 | 0.08668 | 16 | M(B,H)AB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C2-1-UNC0-ETW-2 | B | C2 | 2 | 2 | 86.92 | 9.318 | 0.08603 | 16 | BGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST4-B-C2-1-UNC0-ETW-3 | B | C2 | 2 | 2 | 79.88 | 9.208 | 0.08597 | 16 | BGM |

| Avg. t_{ply} [in] | Strength _{norm} [ksi] | Modulus _{norm} [Msi] |
|---------------------|--------------------------------|-------------------------------|
| 0.005352 | 86.31 | 9.510 |
| 0.005364 | 86.58 | 9.373 |
| 0.005334 | 88.90 | 9.433 |
| 0.005363 | 87.16 | |
| 0.005418 | 87.88 | 9.377 |
| 0.005377 | 86.55 | 9.279 |
| 0.005373 | 79.48 | 9.162 |

* Specimen was not gaged, only strength is tested.

| | | | | | | |
|---------------------------|--------------|---------------|--|-----------------|--------------|---------------|
| Average | 86.63 | 9.409 | Average_{norm} | 0.005369 | 86.12 | 9.356 |
| Standard Dev. | 3.152 | 0.1467 | Standard Dev._{norm} | | 3.065 | 0.1217 |
| Coeff. of Var. [%] | 3.638 | 1.559 | Coeff. of Var. [%]_{norm} | | 3.559 | 1.301 |
| Min. | 79.88 | 9.208 | Min. | 0.005334 | 79.48 | 9.162 |
| Max. | 89.99 | 9.595 | Max. | 0.005418 | 88.90 | 9.510 |
| Number of Spec. | 7 | 6 | Number of Spec. | 7 | 7 | 6 |



4.11 “25/50/25” Unnotched Compression 1 Properties (UNC1)

Laminate Unnotched Compression Properties (UNC1)--RTA (70°F)
Strength & Modulus
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

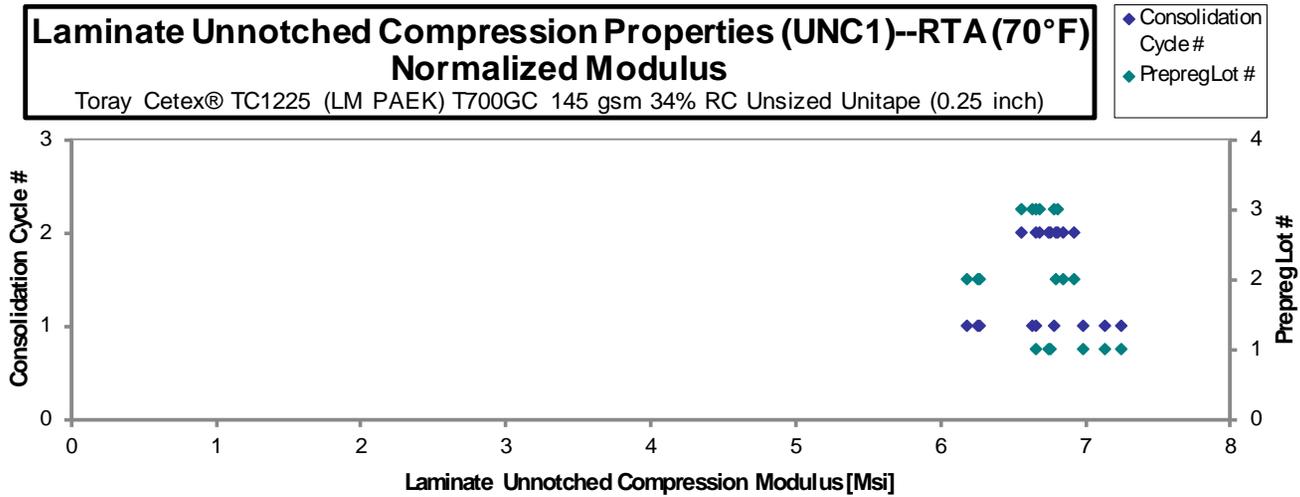
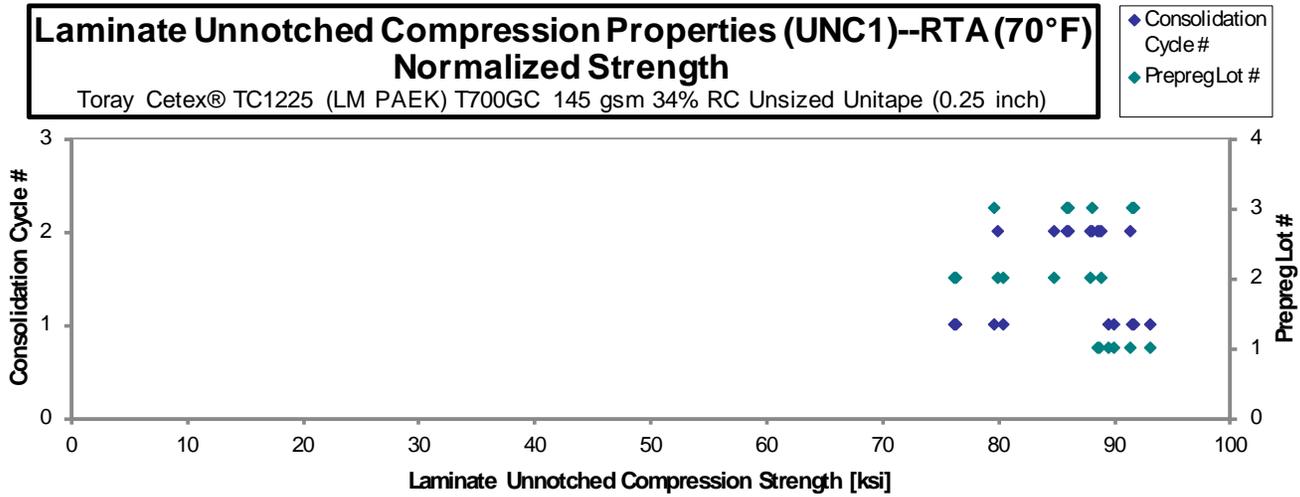
normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Modulus [Msj] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|---|---------------|--------------------------|---------------|-----------------------|----------------|---------------|------------------------------|---------------------|--------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C1-1-UNC1-RTA-1 | A | C1 | 1 | 1 | 89.90 | 6.997 | 0.1342 | 24 | BGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C1-1-UNC1-RTA-2 | A | C1 | 1 | 1 | 87.26 | 6.916 | 0.1337 | 24 | BGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C1-1-UNC1-RTA-3 | A | C1 | 1 | 1 | 87.35 | 6.818 | 0.1327 | 24 | BGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C2-1-UNC1-RTA-1 | A | C2 | 1 | 2 | 86.01 | 6.554 | 0.1337 | 24 | BGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C2-1-UNC1-RTA-2 | A | C2 | 1 | 2 | 89.55 | 6.523 | 0.1323 | 24 | BGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C2-1-UNC1-RTA-3 | A | C2 | 1 | 2 | 87.30 | 6.653 | 0.1316 | 24 | BGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C1-1-UNC1-RTA-1* | B | C1 | 2 | 1 | 79.45 | 6.448 | 0.1243 | 24 | BAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C1-1-UNC1-RTA-2* | B | C1 | 2 | 1 | 83.99 | 6.546 | 0.1242 | 24 | BAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C1-1-UNC1-RTA-3 | B | C1 | 2 | 1 | 79.48 | 6.515 | 0.1245 | 24 | BGM, HAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C2-1-UNC1-RTA-1 | B | C2 | 2 | 2 | 87.86 | 6.840 | 0.1297 | 24 | BAB, HIB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C2-1-UNC1-RTA-2 | B | C2 | 2 | 2 | 88.84 | 6.798 | 0.1296 | 24 | BAT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C2-1-UNC1-RTA-3 | B | C2 | 2 | 2 | 85.15 | 6.945 | 0.1291 | 24 | BAT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C2-1-UNC1-SP-1** | B | C2 | 2 | 2 | 80.75 | | 0.1283 | 24 | BGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST9-C-C1-1-UNC1-RTA-1 | C | C1 | 3 | 1 | 90.17 | 6.675 | 0.1317 | 24 | BGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST9-C-C1-1-UNC1-RTA-2 | C | C1 | 3 | 1 | 90.31 | 6.561 | 0.1317 | 24 | BGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST9-C-C1-1-UNC1-RTA-3 | C | C1 | 3 | 1 | 78.43 | 6.531 | 0.1316 | 24 | BGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST9-C-C2-1-UNC1-RTA-1 | C | C2 | 3 | 2 | 89.21 | 6.890 | 0.1281 | 24 | BGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST9-C-C2-1-UNC1-RTA-2 | C | C2 | 3 | 2 | 86.91 | 6.627 | 0.1284 | 24 | BGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST9-C-C2-1-UNC1-RTA-3 | C | C2 | 3 | 2 | 86.85 | 6.757 | 0.1282 | 24 | BGM |

| Avg. t_{ply} [in] | Strength _{norm} [ksi] | Modulus _{norm} [Msj] |
|---------------------|--------------------------------|-------------------------------|
| 0.005592 | 93.11 | 7.246 |
| 0.005572 | 90.03 | 7.136 |
| 0.005530 | 89.45 | 6.982 |
| 0.005570 | 88.72 | 6.761 |
| 0.005512 | 91.41 | 6.658 |
| 0.005482 | 88.62 | 6.754 |
| 0.005178 | 76.19 | 6.184 |
| 0.005176 | 80.50 | 6.274 |
| 0.005189 | 76.37 | 6.261 |
| 0.005404 | 87.93 | 6.845 |
| 0.005401 | 88.85 | 6.799 |
| 0.005379 | 84.82 | 6.918 |
| 0.005344 | 79.91 | |
| 0.005486 | 91.61 | 6.781 |
| 0.005487 | 91.77 | 6.666 |
| 0.005483 | 79.63 | 6.631 |
| 0.005338 | 88.18 | 6.811 |
| 0.005349 | 86.10 | 6.565 |
| 0.005342 | 85.93 | 6.685 |

* Modulus are averaged values from 2 strain gages.
 ** Specimen was not gaged, only strength is tested.

| | | | | | | |
|---------------------------|--------------|---------------|--|-----------------|--------------|---------------|
| Average | 86.04 | 6.700 | Average_{norm} | 0.005411 | 86.27 | 6.720 |
| Standard Dev. | 3.853 | 0.1727 | Standard Dev_{V, norm} | | 5.271 | 0.2799 |
| Coeff. of Var. [%] | 4.478 | 2.578 | Coeff. of Var. [%]_{norm} | | 6.110 | 4.165 |
| Min. | 78.43 | 6.448 | Min. | 0.005176 | 76.19 | 6.184 |
| Max. | 90.31 | 6.997 | Max. | 0.005592 | 93.11 | 7.246 |
| Number of Spec. | 19 | 18 | Number of Spec. | 19 | 19 | 18 |



**Laminate Unnotched Compression Properties (UNC1)--ETA1 (275°F)
Strength & Modulus**

Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

normalizing

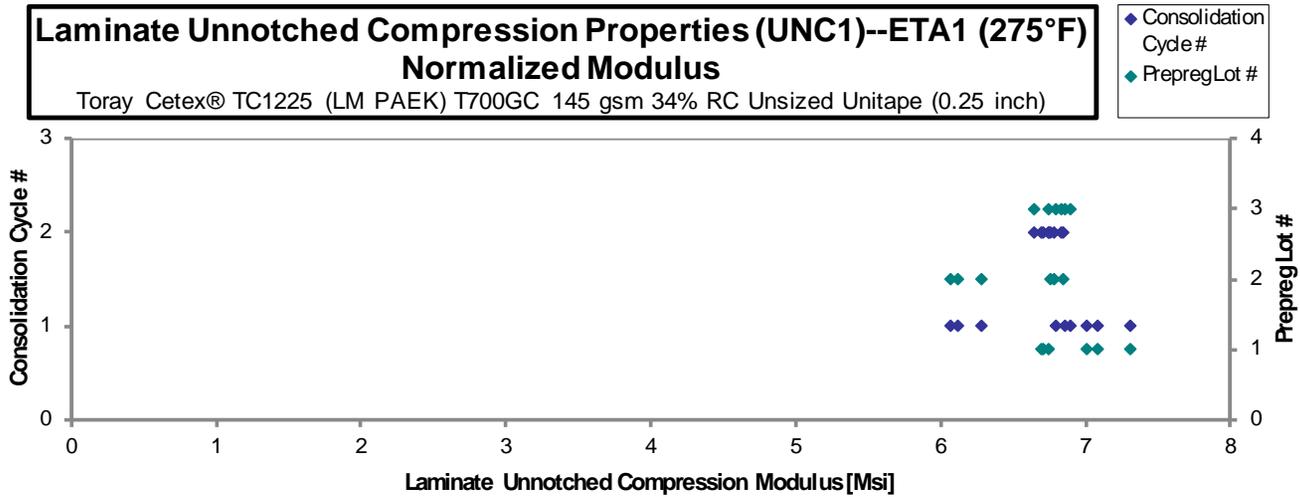
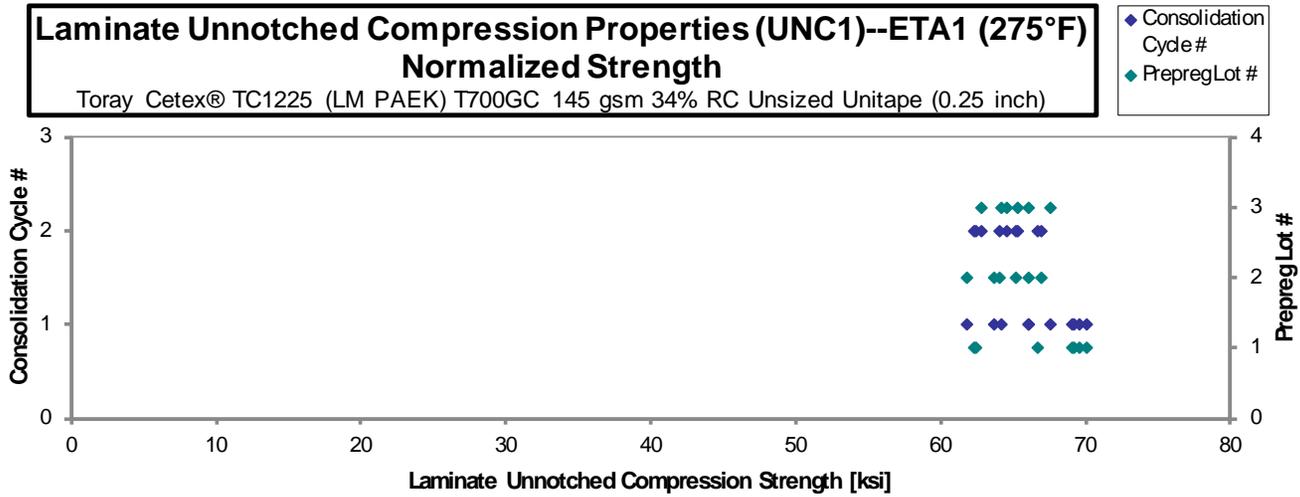
t_{ply} [in]
0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Modulus [Msi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode | Avg. t_{ply} [in] | Strength _{norm} [ksi] | Modulus _{norm} [Msi] |
|--|---------------|--------------------------|---------------|-----------------------|----------------|---------------|------------------------------|---------------------|--------------|---------------------|--------------------------------|-------------------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C1-1-UNC1-ETA1-1 | A | C1 | 1 | 1 | 68.19 | 7.175 | 0.1322 | 24 | BAT, HAT/HIT | 0.005508 | 69.56 | 7.319 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C1-1-UNC1-ETA1-2 | A | C1 | 1 | 1 | 67.80 | 6.936 | 0.1324 | 24 | M(B,H)AB | 0.005518 | 69.29 | 7.087 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C1-1-UNC1-ETA1-3 | A | C1 | 1 | 1 | 67.55 | 6.858 | 0.1326 | 24 | M(B,H)GM | 0.005525 | 69.12 | 7.017 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C1-1-UNC1-SP-3** | A | C1 | 1 | 1 | 68.12 | | 0.1334 | 24 | BGM | 0.005557 | 70.10 | |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C2-1-UNC1-ETA1-1 | A | C2 | 1 | 2 | 66.16 | 6.691 | 0.1308 | 24 | BGM | 0.005451 | 66.79 | 6.754 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C2-1-UNC1-ETA1-2 | A | C2 | 1 | 2 | 61.77 | 6.622 | 0.1311 | 24 | BGM | 0.005462 | 62.48 | 6.698 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C2-1-UNC1-ETA1-3 | A | C2 | 1 | 2 | 61.56 | 6.637 | 0.1312 | 24 | BGM | 0.005465 | 62.31 | 6.717 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C1-1-UNC1-ETA1-1* | B | C1 | 2 | 1 | 68.76 | 6.538 | 0.1245 | 24 | BGM | 0.005188 | 66.06 | 6.282 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C1-1-UNC1-ETA1-2* | B | C1 | 2 | 1 | 66.37 | 6.380 | 0.1244 | 24 | BGM | 0.005184 | 63.72 | 6.125 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C1-1-UNC1-ETA1-3 | B | C1 | 2 | 1 | 64.29 | 6.316 | 0.1246 | 24 | BGM | 0.005192 | 61.81 | 6.072 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C2-1-UNC1-ETA1-1 | B | C2 | 2 | 2 | 65.70 | 6.809 | 0.1287 | 24 | BGM | 0.005363 | 65.25 | 6.762 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C2-1-UNC1-ETA1-2 | B | C2 | 2 | 2 | 64.56 | 6.891 | 0.1288 | 24 | BAB | 0.005367 | 64.16 | 6.848 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C2-1-UNC1-ETA1-3 | B | C2 | 2 | 2 | 67.41 | 6.831 | 0.1288 | 24 | BAT | 0.005367 | 67.00 | 6.789 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST9-C-C1-1-UNC1-ETA1-1 | C | C1 | 3 | 1 | 64.88 | 6.728 | 0.1321 | 24 | BAB | 0.005506 | 66.15 | 6.859 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST9-C-C1-1-UNC1-ETA1-2 | C | C1 | 3 | 1 | 66.53 | 6.780 | 0.1318 | 24 | BAB | 0.005492 | 67.66 | 6.895 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST9-C-C1-1-UNC1-ETA1-3 | C | C1 | 3 | 1 | 63.10 | 6.682 | 0.1318 | 24 | BAB | 0.005492 | 64.18 | 6.796 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST9-C-C2-1-UNC1-ETA1-1 | C | C2 | 3 | 2 | 66.01 | 6.906 | 0.1282 | 24 | BGM | 0.005342 | 65.29 | 6.831 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST9-C-C2-1-UNC1-ETA1-2 | C | C2 | 3 | 2 | 65.37 | 6.820 | 0.1282 | 24 | BGM | 0.005340 | 64.65 | 6.745 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST9-C-C2-1-UNC1-ETA1-3 | C | C2 | 3 | 2 | 63.35 | 6.705 | 0.1286 | 24 | BGM | 0.005357 | 62.84 | 6.651 |

* Modulus are averaged values from 2 strain gages.

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

| | | | | | | |
|---------------------------|--------------|---------------|--|-----------------|--------------|---------------|
| Average | 65.66 | 6.739 | Average_{norm} | 0.005404 | 65.71 | 6.736 |
| Standard Dev. | 2.141 | 0.2022 | Standard Dev._{norm} | | 2.593 | 0.3107 |
| Coeff. of Var. [%] | 3.261 | 3.000 | Coeff. of Var. [%]_{norm} | | 3.947 | 4.613 |
| Min. | 61.56 | 6.316 | Min. | 0.005184 | 61.81 | 6.072 |
| Max. | 68.76 | 7.175 | Max. | 0.005557 | 70.10 | 6.719 |
| Number of Spec. | 19 | 18 | Number of Spec. | 19 | 19 | 18 |



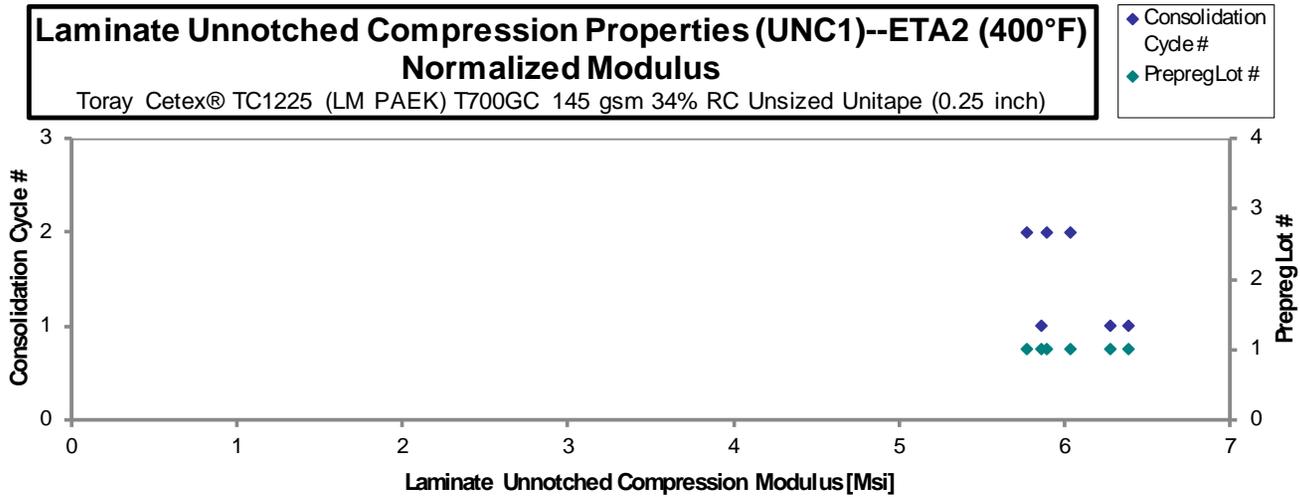
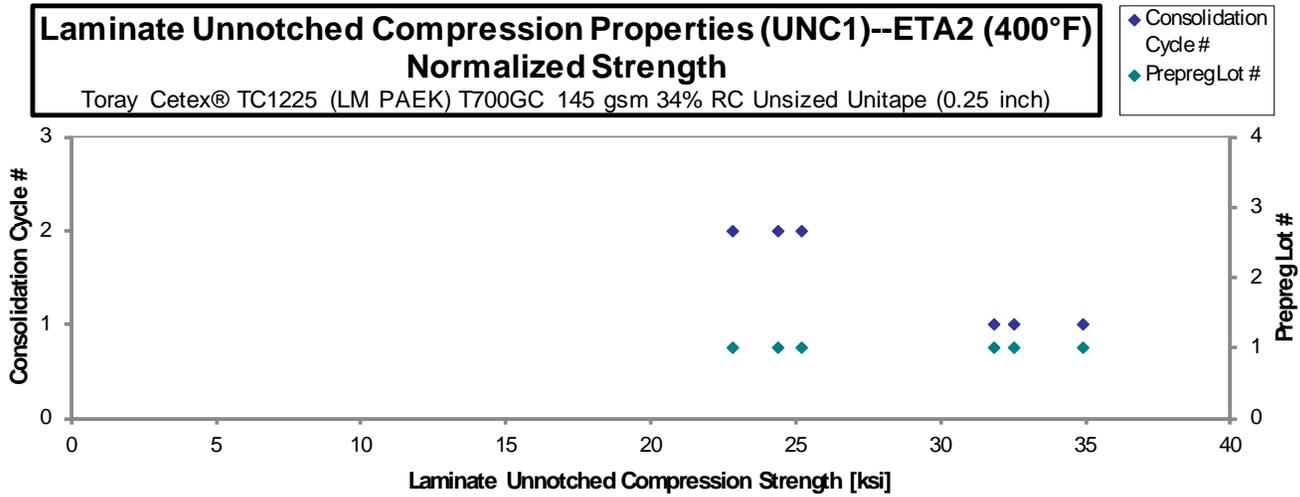
Laminate Unnotched Compression Properties (UNC1)--ETA2 (400°F)
Strength & Modulus
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Modulus [Msi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|---|---------------|--------------------------|---------------|-----------------------|----------------|---------------|------------------------------|---------------------|--------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C1-1-UNC1-ETA2-1 | A | C1 | 1 | 1 | 34.14 | 6.140 | 0.1326 | 24 | HAT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C1-1-UNC1-ETA2-2 | A | C1 | 1 | 1 | 31.91 | 6.255 | 0.1322 | 24 | HGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C1-1-UNC1-ETA2-3 | A | C1 | 1 | 1 | 31.10 | 5.724 | 0.1328 | 24 | HAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C2-1-UNC1-ETA2-1 | A | C2 | 1 | 2 | 24.19 | 5.716 | 0.1308 | 24 | HAT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C2-1-UNC1-ETA2-2 | A | C2 | 1 | 2 | 22.59 | 5.979 | 0.1309 | 24 | HAT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C2-1-UNC1-ETA2-3 | A | C2 | 1 | 2 | 24.76 | 5.778 | 0.1321 | 24 | HAT |

| Avg. t_{ply} [in] | Strength _{norm} [ksi] | Modulus _{norm} [Msi] |
|---------------------|--------------------------------|-------------------------------|
| 0.005524 | 34.92 | 6.281 |
| 0.005510 | 32.55 | 6.382 |
| 0.005532 | 31.86 | 5.864 |
| 0.005451 | 24.41 | 5.770 |
| 0.005454 | 22.81 | 6.039 |
| 0.005506 | 25.25 | 5.891 |

| | | | | | | |
|--------------------|-------|--------|------------------------------------|----------|-------|--------|
| Average | 28.11 | 5.932 | Average _{norm} | 0.005496 | 28.63 | 6.038 |
| Standard Dev. | 4.832 | 0.2296 | Standard Dev. _{norm} | | 5.068 | 0.2455 |
| Coeff. of Var. [%] | 17.19 | 3.871 | Coeff. of Var. [%] _{norm} | | 17.70 | 4.067 |
| Min. | 22.59 | 5.716 | Min. | 0.005451 | 22.81 | 5.770 |
| Max. | 34.14 | 6.255 | Max. | 0.005532 | 34.92 | 6.382 |
| Number of Spec. | 6 | 6 | Number of Spec. | 6 | 6 | 6 |



**Laminate Unnotched Compression Properties (UNC1)--ETW (275°F)
Strength & Modulus**

Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

normalizing

t_{ply} [in]

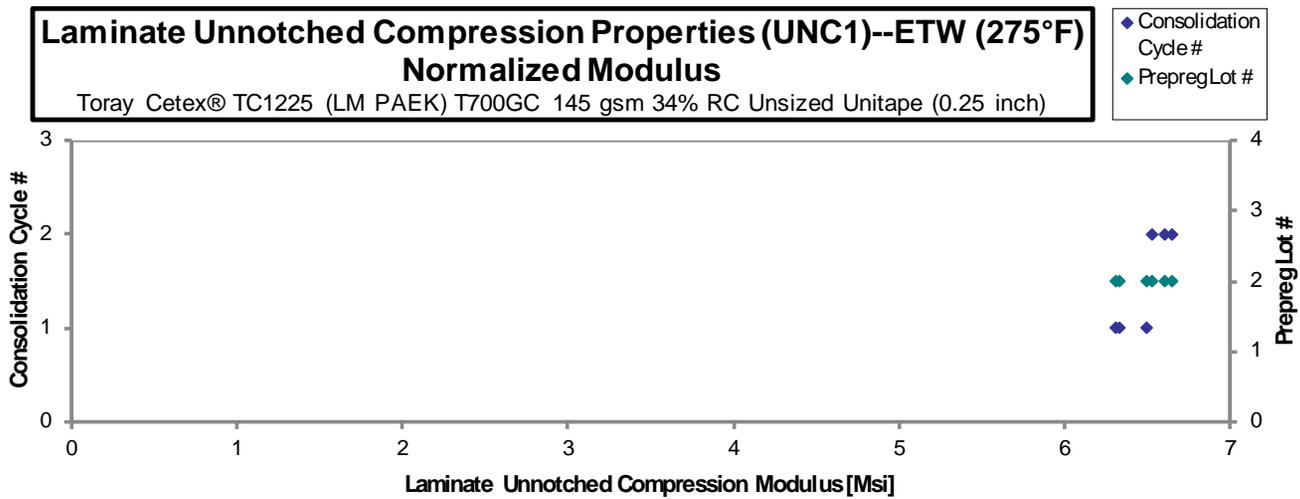
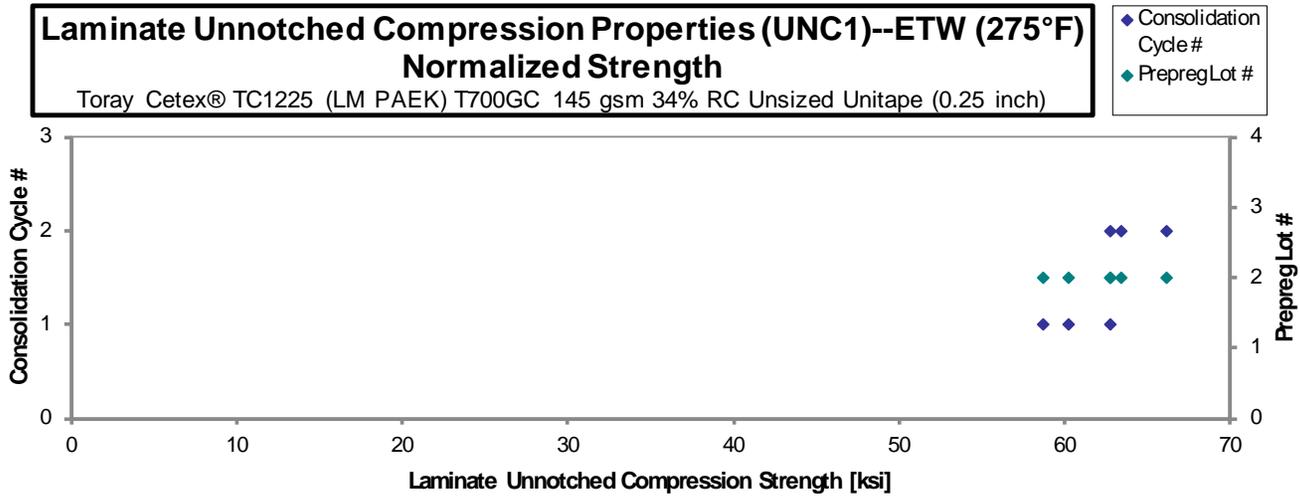
0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Modulus [Msi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|--|---------------|--------------------------|---------------|-----------------------|----------------|---------------|------------------------------|---------------------|--------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C1-1-UNC1-ETW-1 | B | C1 | 2 | 1 | 61.22 | 6.579 | 0.1244 | 24 | BAT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C1-1-UNC1-ETW-2 | B | C1 | 2 | 1 | 62.88 | 6.611 | 0.1242 | 24 | BGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C1-1-UNC1-ETW-3 | B | C1 | 2 | 1 | 65.43 | 6.770 | 0.1243 | 24 | BAT, HIT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C2-1-UNC1-ETW-1 | B | C2 | 2 | 2 | 66.87 | 6.603 | 0.1282 | 24 | BAT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C2-1-UNC1-ETW-2 | B | C2 | 2 | 2 | 63.88 | 6.697 | 0.1287 | 24 | BAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C2-1-UNC1-ETW-3 | B | C2 | 2 | 2 | 63.31 | 6.660 | 0.1285 | 24 | BGM |

| Avg. t_{ply} [in] | Strength _{norm} [ksi] | Modulus _{norm} [Msi] |
|---------------------|--------------------------------|-------------------------------|
| 0.005181 | 58.74 | 6.313 |
| 0.005174 | 60.25 | 6.335 |
| 0.005180 | 62.77 | 6.494 |
| 0.005343 | 66.16 | 6.534 |
| 0.005362 | 63.43 | 6.649 |
| 0.005353 | 62.77 | 6.603 |

Average 63.93 6.653
 Standard Dev. 1.986 0.07114
 Coeff. of Var. [%] 3.107 1.069
 Min. 61.22 6.579
 Max. 66.87 6.770
 Number of Spec. 6 6

Average_{norm} 0.005266 62.35 6.488
 Standard Dev_{norm} 2.588 0.1381
 Coeff. of Var. [%]_{norm} 4.150 2.129
 Min. 0.005174 58.74 6.313
 Max. 0.005362 66.16 6.649
 Number of Spec. 6 6 6



4.12 “10/80/10” Unnotched Compression 2 Properties (UNC2)

Laminate Unnotched Compression Properties (UNC2)--RTA (70°F)
Strength & Modulus
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

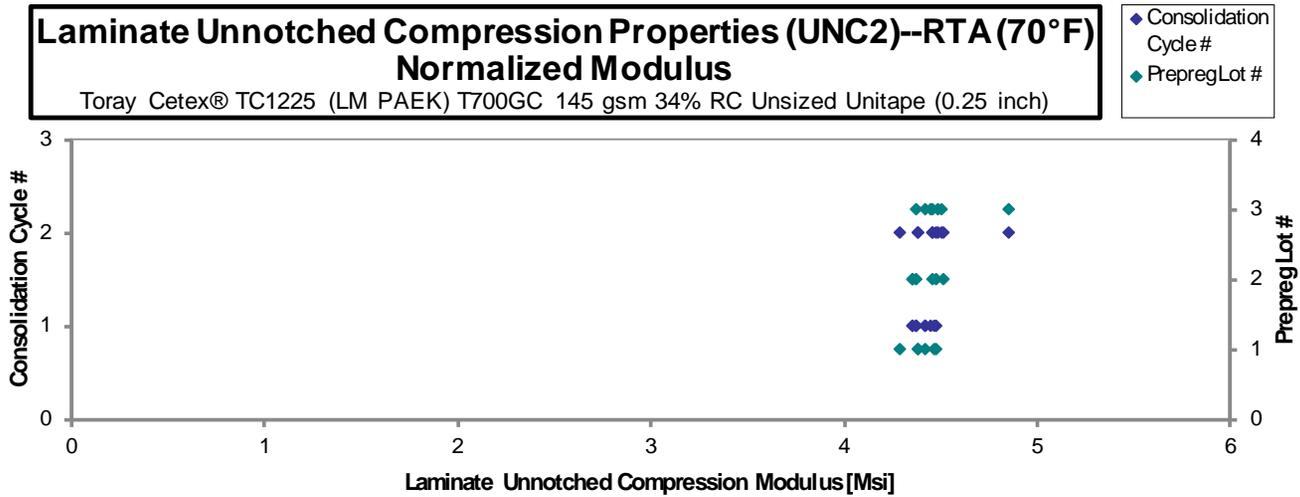
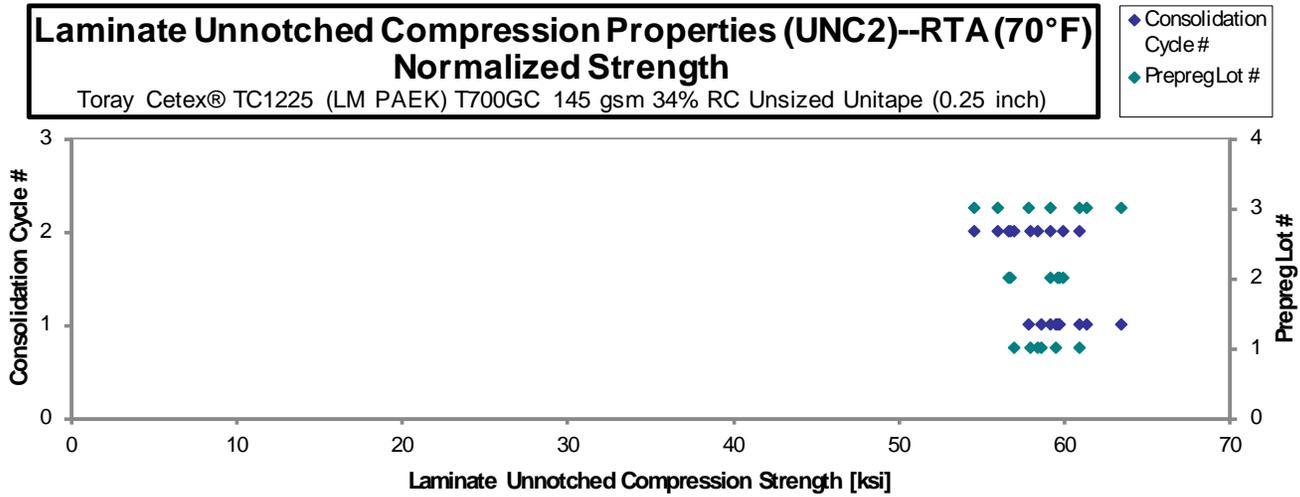
normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Modulus [Msi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|--|---------------|--------------------------|---------------|-----------------------|----------------|---------------|------------------------------|---------------------|--------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C1-1-UNC2-RTA-1 | A | C1 | 1 | 1 | 61.35 | 4.510 | 0.1072 | 20 | BGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C1-1-UNC2-RTA-2 | A | C1 | 1 | 1 | 60.06 | 4.464 | 0.1070 | 20 | BGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C1-1-UNC2-RTA-3 | A | C1 | 1 | 1 | 59.21 | 4.509 | 0.1070 | 20 | BGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C2-1-UNC2-RTA-1 | A | C2 | 1 | 2 | 58.71 | 4.407 | 0.1074 | 20 | BGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C2-1-UNC2-RTA-2 | A | C2 | 1 | 2 | 57.65 | 4.433 | 0.1068 | 20 | BGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C2-1-UNC2-RTA-3 | A | C2 | 1 | 2 | 58.30 | 4.318 | 0.1074 | 20 | BGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C1-1-UNC2-RTA-1* | B | C1 | 2 | 1 | 56.55 | 4.163 | 0.1130 | 20 | BGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C1-1-UNC2-RTA-2* | B | C1 | 2 | 1 | 57.25 | 4.204 | 0.1125 | 20 | BGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C1-1-UNC2-RTA-3 | B | C1 | 2 | 1 | 57.27 | 4.180 | 0.1126 | 20 | BGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C2-1-UNC2-RTA-1 | B | C2 | 2 | 2 | 59.06 | 4.420 | 0.1095 | 20 | BGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C2-1-UNC2-RTA-2 | B | C2 | 2 | 2 | 55.53 | 4.360 | 0.1104 | 20 | BGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C2-1-UNC2-RTA-3 | B | C2 | 2 | 2 | 55.89 | 4.453 | 0.1095 | 20 | BGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST12-C-C1-1-UNC2-RTA-1 | C | C1 | 3 | 1 | 58.03 | 4.464 | 0.1076 | 20 | BGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST12-C-C1-1-UNC2-RTA-2 | C | C1 | 3 | 1 | 63.15 | 4.360 | 0.1085 | 20 | BGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST12-C-C1-1-UNC2-RTA-3 | C | C1 | 3 | 1 | 61.28 | 4.418 | 0.1081 | 20 | BGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST12-C-C2-1-UNC2-RTA-1 | C | C2 | 3 | 2 | 58.34 | 4.425 | 0.1095 | 20 | M(B,H)GM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST12-C-C2-1-UNC2-RTA-2 | C | C2 | 3 | 2 | 53.44 | 4.422 | 0.1102 | 20 | M(B,H)GM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST12-C-C2-1-UNC2-RTA-3 | C | C2 | 3 | 2 | 59.51 | 4.746 | 0.1106 | 20 | BGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST12-C-C2-1-UNC2-SP-2 | C | C2 | 3 | 2 | 55.34 | 4.409 | 0.1093 | 20 | BGM |

| Avg. t_{ply} [in] | Strength _{norm} [ksi] | Modulus _{norm} [Msi] |
|---------------------|--------------------------------|-------------------------------|
| 0.005361 | 60.91 | 4.477 |
| 0.005350 | 59.51 | 4.423 |
| 0.005348 | 58.65 | 4.466 |
| 0.005370 | 58.39 | 4.383 |
| 0.005341 | 57.01 | 4.384 |
| 0.005369 | 57.97 | 4.293 |
| 0.005651 | 59.18 | 4.357 |
| 0.005626 | 59.64 | 4.379 |
| 0.005628 | 59.69 | 4.357 |
| 0.005476 | 59.89 | 4.482 |
| 0.005520 | 56.77 | 4.457 |
| 0.005475 | 56.66 | 4.514 |
| 0.005378 | 57.79 | 4.446 |
| 0.005423 | 63.42 | 4.378 |
| 0.005403 | 61.32 | 4.420 |
| 0.005476 | 59.16 | 4.487 |
| 0.005508 | 54.51 | 4.510 |
| 0.005528 | 60.92 | 4.859 |
| 0.005465 | 56.01 | 4.462 |

* Modulus are averaged values from 2 strain gages.

| | | | | | | |
|--------------------|-------|--------|------------------------------------|----------|-------|--------|
| Average | 58.21 | 4.403 | Average _{norm} | 0.005458 | 58.81 | 4.449 |
| Standard Dev. | 2.349 | 0.1314 | Standard Dev. _{V, norm} | | 2.109 | 0.1158 |
| Coeff. of Var. [%] | 4.035 | 2.983 | Coeff. of Var. [%] _{norm} | | 3.586 | 2.602 |
| Min. | 53.44 | 4.163 | Min. | 0.005341 | 54.51 | 4.293 |
| Max. | 63.15 | 4.746 | Max. | 0.005651 | 63.42 | 4.859 |
| Number of Spec. | 19 | 19 | Number of Spec. | 19 | 19 | 19 |



**Laminate Unnotched Compression Properties (UNC2)--ETA1 (275°F)
Strength & Modulus**

Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

normalizing

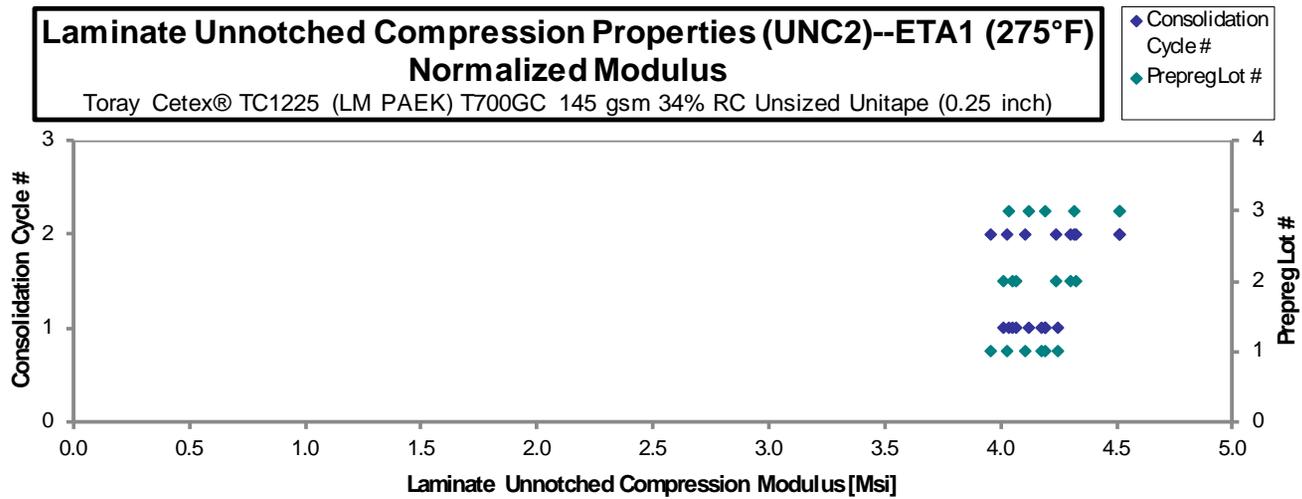
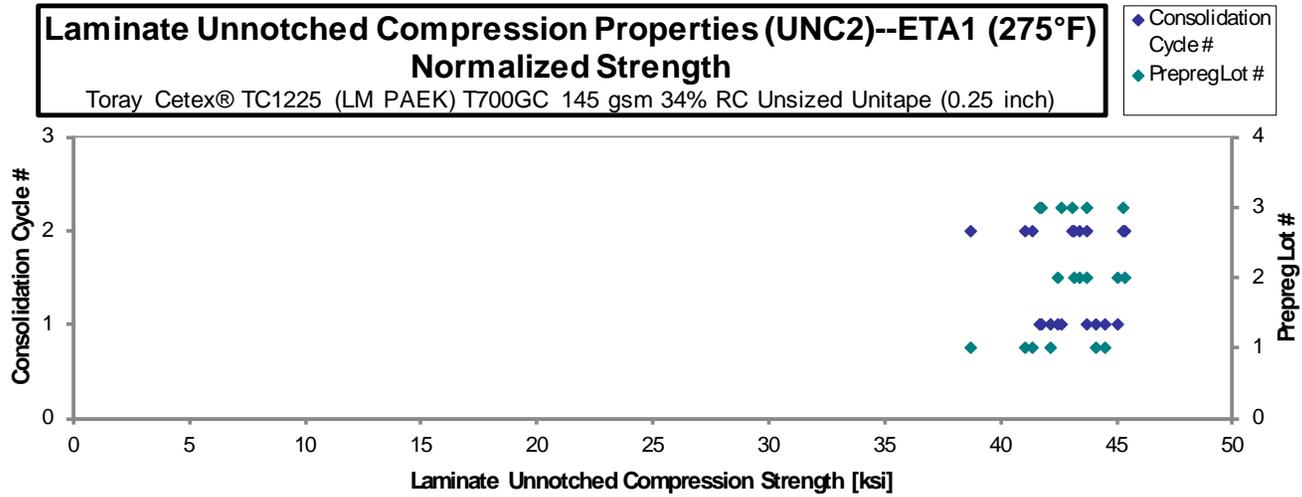
t_{ply} [in]
0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Modulus [Msi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|---|---------------|--------------------------|---------------|-----------------------|----------------|---------------|------------------------------|---------------------|--------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C1-1-UNC2-ETA1-1 | A | C1 | 1 | 1 | 42.60 | 4.226 | 0.1069 | 20 | M(B,H)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C1-1-UNC2-ETA1-2 | A | C1 | 1 | 1 | 44.96 | 4.233 | 0.1070 | 20 | BGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C1-1-UNC2-ETA1-3 | A | C1 | 1 | 1 | 44.51 | 4.286 | 0.1072 | 20 | BGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C2-1-UNC2-ETA1-1 | A | C2 | 1 | 2 | 41.80 | 4.147 | 0.1070 | 20 | BGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C2-1-UNC2-ETA1-2 | A | C2 | 1 | 2 | 38.93 | 4.054 | 0.1074 | 20 | BGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C2-1-UNC2-ETA1-3 | A | C2 | 1 | 2 | 41.40 | 3.991 | 0.1073 | 20 | BGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C1-1-UNC2-ETA1-1* | B | C1 | 2 | 1 | 43.12 | 3.891 | 0.1130 | 20 | BGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C1-1-UNC2-ETA1-2* | B | C1 | 2 | 1 | 40.60 | 3.832 | 0.1131 | 20 | BGM, BAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C1-1-UNC2-ETA1-3 | B | C1 | 2 | 1 | 41.78 | 3.871 | 0.1132 | 20 | BGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C2-1-UNC2-ETA1-1 | B | C2 | 2 | 2 | 44.60 | 4.224 | 0.1100 | 20 | BGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C2-1-UNC2-ETA1-2 | B | C2 | 2 | 2 | 42.33 | 4.157 | 0.1101 | 20 | BAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C2-1-UNC2-ETA1-3 | B | C2 | 2 | 2 | 42.53 | 4.239 | 0.1102 | 20 | M(B,H)GM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST12-C-C1-1-UNC2-ETA1-1 | C | C1 | 3 | 1 | 42.61 | 4.192 | 0.1081 | 20 | BGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST12-C-C1-1-UNC2-ETA1-2 | C | C1 | 3 | 1 | 41.50 | 4.021 | 0.1086 | 20 | BGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST12-C-C1-1-UNC2-ETA1-3 | C | C1 | 3 | 1 | 41.70 | 4.111 | 0.1083 | 20 | BGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST12-C-C2-1-UNC2-ETA1-1 | C | C2 | 3 | 2 | 44.44 | 4.431 | 0.1102 | 20 | BGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST12-C-C2-1-UNC2-ETA1-2 | C | C2 | 3 | 2 | 42.34 | 4.244 | 0.1099 | 20 | M(B,H)GM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST12-C-C2-1-UNC2-ETA1-3 | C | C2 | 3 | 2 | 42.93 | 4.430 | 0.1100 | 20 | BAT |

| Avg. t_{ply} [in] | Strength _{norm} [ksi] | Modulus _{norm} [Msi] |
|---------------------|--------------------------------|-------------------------------|
| 0.005344 | 42.16 | 4.182 |
| 0.005351 | 44.56 | 4.195 |
| 0.005358 | 44.16 | 4.252 |
| 0.005348 | 41.40 | 4.108 |
| 0.005372 | 38.73 | 4.033 |
| 0.005363 | 41.11 | 3.963 |
| 0.005648 | 45.11 | 4.070 |
| 0.005653 | 42.51 | 4.012 |
| 0.005658 | 43.77 | 4.055 |
| 0.005498 | 45.41 | 4.301 |
| 0.005507 | 43.17 | 4.239 |
| 0.005511 | 43.41 | 4.326 |
| 0.005405 | 42.65 | 4.195 |
| 0.005428 | 41.71 | 4.041 |
| 0.005415 | 41.81 | 4.122 |
| 0.005508 | 45.32 | 4.519 |
| 0.005495 | 43.09 | 4.318 |
| 0.005501 | 43.73 | 4.513 |

* Modulus are averaged values from 2 strain gages.

| | | | | | | |
|---------------------------|--------------|---------------|--|-----------------|--------------|---------------|
| Average | 42.48 | 4.143 | Average_{norm} | 0.005464 | 42.99 | 4.191 |
| Standard Dev. | 1.516 | 0.1733 | Standard Dev._{norm} | | 1.701 | 0.1610 |
| Coeff. of Var. [%] | 3.569 | 4.183 | Coeff. of Var. [%]_{norm} | | 3.957 | 3.840 |
| Min. | 38.93 | 3.832 | Min. | 0.005344 | 38.73 | 3.963 |
| Max. | 44.96 | 4.431 | Max. | 0.005658 | 45.41 | 4.519 |
| Number of Spec. | 18 | 18 | Number of Spec. | 18 | 18 | 18 |



4.13 “50/40/10” Unnotched Compression 3 Properties (UNC3)

Laminate Unnotched Compression Properties (UNC3)--RTA (70°F)
Strength & Modulus
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Modulus [Msi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|--|---------------|--------------------------|---------------|-----------------------|----------------|---------------|------------------------------|---------------------|--------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C1-1-UNC3-RTA-17** | A | C1 | 1 | 1 | | 9.849 | 0.1123 | 20 | HIB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C1-1-UNC3-RTA-2* | A | C1 | 1 | 1 | 110.9 | 9.934 | 0.1116 | 20 | BGM, BAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C1-1-UNC3-RTA-3 | A | C1 | 1 | 1 | 112.3 | 9.922 | 0.1117 | 20 | BAT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C1-1-UNC3-SP-1*** | A | C1 | 1 | 1 | 108.4 | | 0.1121 | 20 | BGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C2-1-UNC3-RTA-1 | A | C2 | 1 | 2 | 113.9 | 10.23 | 0.1070 | 20 | BAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C2-1-UNC3-RTA-2 | A | C2 | 1 | 2 | 107.8 | 9.939 | 0.1076 | 20 | BGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C2-1-UNC3-RTA-3 | A | C2 | 1 | 2 | 117.5 | 10.08 | 0.1069 | 20 | BGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C1-1-UNC3-RTA-1 | B | C1 | 2 | 1 | 110.2 | 10.31 | 0.1095 | 20 | BGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C1-1-UNC3-RTA-2 | B | C1 | 2 | 1 | 110.1 | 10.20 | 0.1087 | 20 | HAT/HIT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C1-1-UNC3-RTA-3 | B | C1 | 2 | 1 | 106.4 | 10.34 | 0.1085 | 20 | BGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C1-1-UNC3-SP-1*** | B | C1 | 2 | 1 | 108.7 | | 0.1082 | 20 | BAT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C2-1-UNC3-RTA-1 | B | C2 | 2 | 2 | 111.4 | 10.22 | 0.1091 | 20 | BAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C2-1-UNC3-RTA-2 | B | C2 | 2 | 2 | 109.8 | 10.20 | 0.1096 | 20 | BAT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C2-1-UNC3-RTA-3 | B | C2 | 2 | 2 | 106.0 | 10.23 | 0.1096 | 20 | BGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C1-1-UNC3-RTA-1 | C | C1 | 3 | 1 | 120.5 | 10.49 | 0.1089 | 20 | BAB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C1-1-UNC3-RTA-2 | C | C1 | 3 | 1 | 118.4 | 10.59 | 0.1088 | 20 | BGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C1-1-UNC3-RTA-3 | C | C1 | 3 | 1 | 117.4 | 10.33 | 0.1094 | 20 | HAT, HIT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C1-1-UNC3-SP-1*** | C | C1 | 3 | 1 | 109.9 | | 0.1091 | 20 | BGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C2-1-UNC3-RTA-1 | C | C2 | 3 | 2 | 116.8 | 10.65 | 0.1101 | 20 | BAB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C2-1-UNC3-RTA-2 | C | C2 | 3 | 2 | 115.3 | 10.59 | 0.1097 | 20 | BGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C2-1-UNC3-RTA-3 | C | C2 | 3 | 2 | 113.3 | 10.45 | 0.1094 | 20 | BAB |

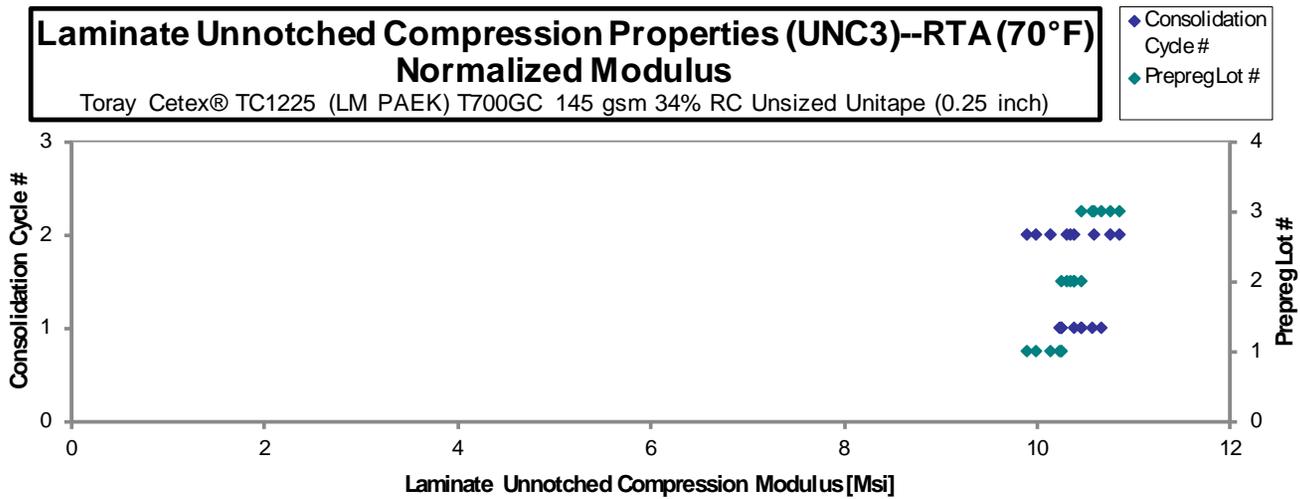
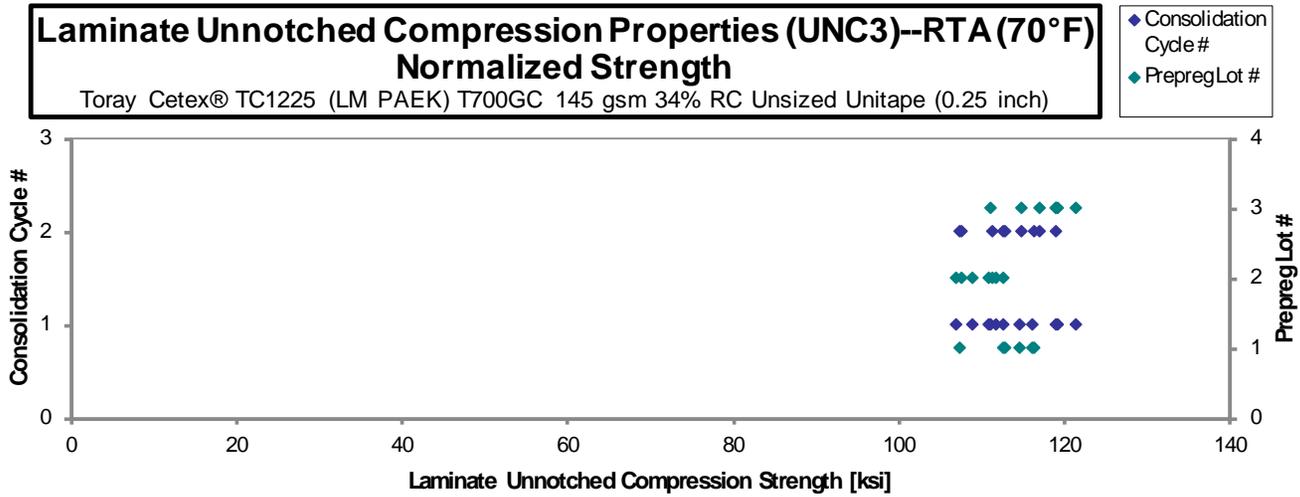
| Avg. t_{ply} [in] | Strength _{norm} [ksi] | Modulus _{norm} [Msi] |
|---------------------|--------------------------------|-------------------------------|
| 0.005614 | | 10.24 |
| 0.005579 | 114.6 | 10.26 |
| 0.005584 | 116.1 | 10.26 |
| 0.005606 | 112.6 | |
| 0.005352 | 112.9 | 10.14 |
| 0.005379 | 107.4 | 9.901 |
| 0.005347 | 116.4 | 9.983 |
| 0.005475 | 111.7 | 10.46 |
| 0.005433 | 110.8 | 10.26 |
| 0.005427 | 106.9 | 10.39 |
| 0.005408 | 108.9 | |
| 0.005454 | 112.5 | 10.32 |
| 0.005478 | 111.4 | 10.34 |
| 0.005478 | 107.6 | 10.38 |
| 0.005443 | 121.4 | 10.58 |
| 0.005440 | 119.3 | 10.67 |
| 0.005471 | 119.0 | 10.47 |
| 0.005453 | 111.0 | |
| 0.005505 | 119.0 | 10.86 |
| 0.005483 | 117.1 | 10.76 |
| 0.005472 | 114.8 | 10.59 |

* Modulus are averaged values from 2 strain gages.

** Strength not reported due to unacceptable failure mode.

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

| | | | | | | |
|---------------------------|--------------|---------------|--|-----------------|--------------|---------------|
| Average | 112.3 | 10.25 | Average_{norm} | 0.005470 | 113.6 | 10.38 |
| Standard Dev. | 4.210 | 0.2439 | Standard Dev._{norm} | | 4.283 | 0.2496 |
| Coeff. of Var. [%] | 3.750 | 2.378 | Coeff. of Var. [%]_{norm} | | 3.771 | 2.404 |
| Min. | 106.0 | 9.849 | Min. | 0.005347 | 106.9 | 9.901 |
| Max. | 120.5 | 10.65 | Max. | 0.005614 | 121.4 | 10.86 |
| Number of Spec. | 20 | 18 | Number of Spec. | 21 | 20 | 18 |



**Laminate Unnotched Compression Properties (UNC3)--ETA1 (275°F)
Strength & Modulus**

Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

normalizing

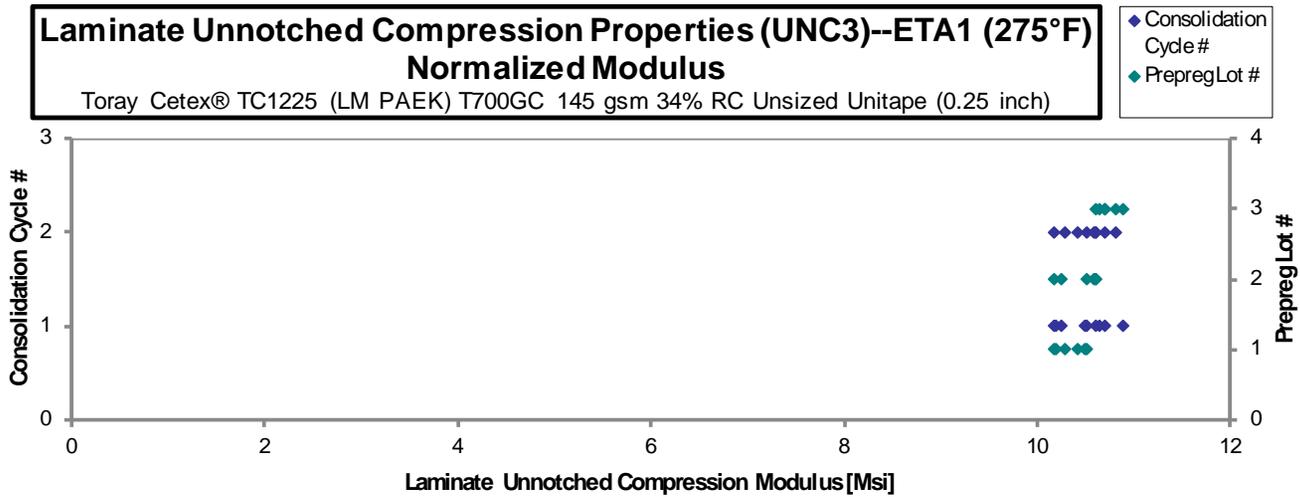
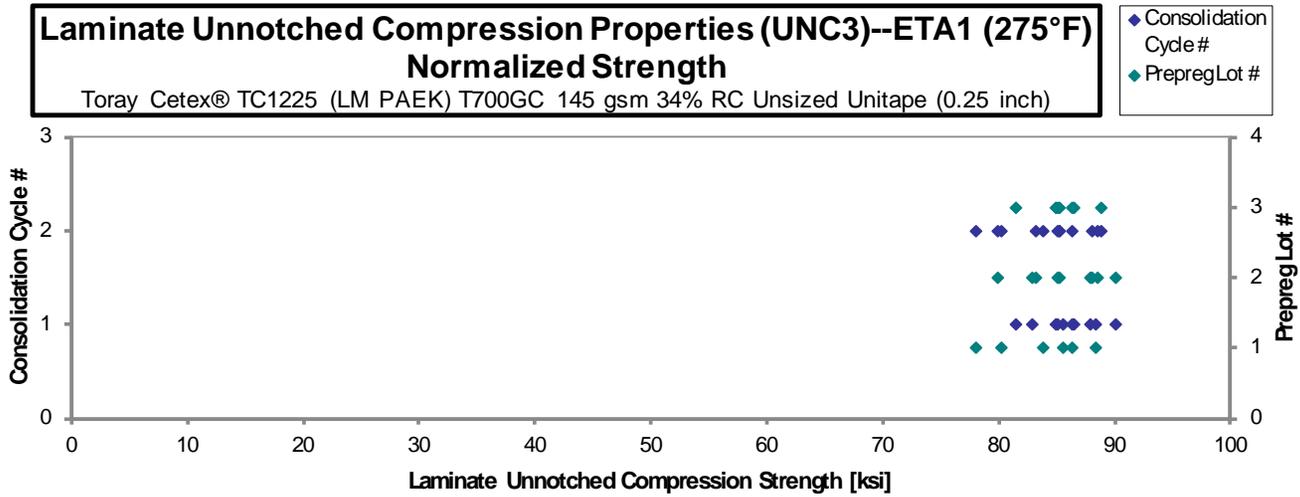
t_{ply} [in]
0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Modulus [Msi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|--|---------------|--------------------------|---------------|-----------------------|----------------|---------------|------------------------------|---------------------|--------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C1-1-UNC3-ETA1-1-1** | A | C1 | 1 | 1 | | 9.832 | 0.1120 | 20 | CIT, CIB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C1-1-UNC3-ETA1-2* | A | C1 | 1 | 1 | 85.31 | 10.12 | 0.1119 | 20 | BAB, HIB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C1-1-UNC3-ETA1-3 | A | C1 | 1 | 1 | 83.34 | 9.812 | 0.1120 | 20 | BAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C1-1-UNC3-SP-3*** | A | C1 | 1 | 1 | 82.43 | | 0.1123 | 20 | BAT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C2-1-UNC3-ETA1-1 | A | C2 | 1 | 2 | 84.58 | 10.61 | 0.1072 | 20 | BAB, HIB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C2-1-UNC3-ETA1-2 | A | C2 | 1 | 2 | 79.37 | 10.46 | 0.1063 | 20 | HAB, HIB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C2-1-UNC3-ETA1-3 | A | C2 | 1 | 2 | 81.21 | 10.55 | 0.1068 | 20 | BAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C1-1-UNC3-ETA1-1 | B | C1 | 2 | 1 | 89.31 | 10.15 | 0.1091 | 20 | BAT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C1-1-UNC3-ETA1-2 | B | C1 | 2 | 1 | 81.98 | 10.47 | 0.1094 | 20 | HAT/HIT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C1-1-UNC3-ETA1-3 | B | C1 | 2 | 1 | 84.71 | 10.45 | 0.1086 | 20 | BAT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C1-1-UNC3-SP-3*** | B | C1 | 2 | 1 | 88.10 | | 0.1078 | 20 | BAT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C2-1-UNC3-ETA1-1 | B | C2 | 2 | 2 | 84.20 | 10.45 | 0.1095 | 20 | CIT, BAT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C2-1-UNC3-ETA1-2 | B | C2 | 2 | 2 | 78.84 | 10.05 | 0.1095 | 20 | BAT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C2-1-UNC3-ETA1-3 | B | C2 | 2 | 2 | 86.93 | 10.47 | 0.1095 | 20 | BGM, CIT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C2-1-UNC3-SP-3*** | B | C2 | 2 | 2 | 88.03 | | 0.1087 | 20 | BAT |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C2-1-UNC3-SP-4*** | B | C2 | 2 | 2 | 82.00 | | 0.1096 | 20 | M(B,H)GM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C1-1-UNC3-ETA1-1 | C | C1 | 3 | 1 | 83.87 | 10.75 | 0.1095 | 20 | BAB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C1-1-UNC3-ETA1-2 | C | C1 | 3 | 1 | 80.60 | 10.53 | 0.1093 | 20 | BAB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C1-1-UNC3-ETA1-3 | C | C1 | 3 | 1 | 85.75 | 10.59 | 0.1091 | 20 | BAB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C2-1-UNC3-ETA1-1 | C | C2 | 3 | 2 | 83.96 | 10.54 | 0.1096 | 20 | HAT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C2-1-UNC3-ETA1-2 | C | C2 | 3 | 2 | 87.76 | 10.67 | 0.1095 | 20 | HAT, HIT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C2-1-UNC3-ETA1-3 | C | C2 | 3 | 2 | 85.45 | 10.49 | 0.1093 | 20 | BGM, HIT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C2-1-UNC3-SP-3*** | C | C2 | 3 | 2 | 84.33 | | 0.1093 | 20 | BAT |

| Avg. t_{ply} [in] | Strength _{norm} [ksi] | Modulus _{norm} [Msi] |
|---------------------|--------------------------------|-------------------------------|
| 0.005598 | | 10.19 |
| 0.005596 | 88.40 | 10.49 |
| 0.005598 | 86.41 | 10.17 |
| 0.005613 | 85.67 | |
| 0.005358 | 83.93 | 10.52 |
| 0.005313 | 78.08 | 10.29 |
| 0.005338 | 80.28 | 10.43 |
| 0.005455 | 90.22 | 10.25 |
| 0.005468 | 83.02 | 10.61 |
| 0.005432 | 85.21 | 10.51 |
| 0.005388 | 87.91 | |
| 0.005475 | 85.37 | 10.59 |
| 0.005474 | 79.93 | 10.19 |
| 0.005473 | 88.09 | 10.61 |
| 0.005433 | 88.56 | |
| 0.005479 | 83.21 | |
| 0.005473 | 85.01 | 10.90 |
| 0.005466 | 81.58 | 10.66 |
| 0.005453 | 86.59 | 10.70 |
| 0.005480 | 85.20 | 10.70 |
| 0.005473 | 88.93 | 10.82 |
| 0.005464 | 86.47 | 10.62 |
| 0.005464 | 85.34 | |

* Modulus are averaged values from 2 strain gages.
** Strength not reported due to unacceptable failure mode.
*** Specimen was not gaged, only strength is tested.

| | | | | | | |
|---------------------------|--------------|---------------|--|-----------------|--------------|---------------|
| Average | 84.18 | 10.39 | Average_{norm} | 0.005468 | 85.16 | 10.51 |
| Standard Dev. | 2.840 | 0.2763 | Standard Dev._{norm} | | 3.145 | 0.2195 |
| Coeff. of Var. [%] | 3.374 | 2.659 | Coeff. of Var. [%]_{norm} | | 3.693 | 2.088 |
| Min. | 78.84 | 9.812 | Min. | 0.005313 | 78.08 | 10.17 |
| Max. | 89.31 | 10.75 | Max. | 0.005613 | 90.22 | 10.90 |
| Number of Spec. | 22 | 18 | Number of Spec. | 23 | 22 | 18 |

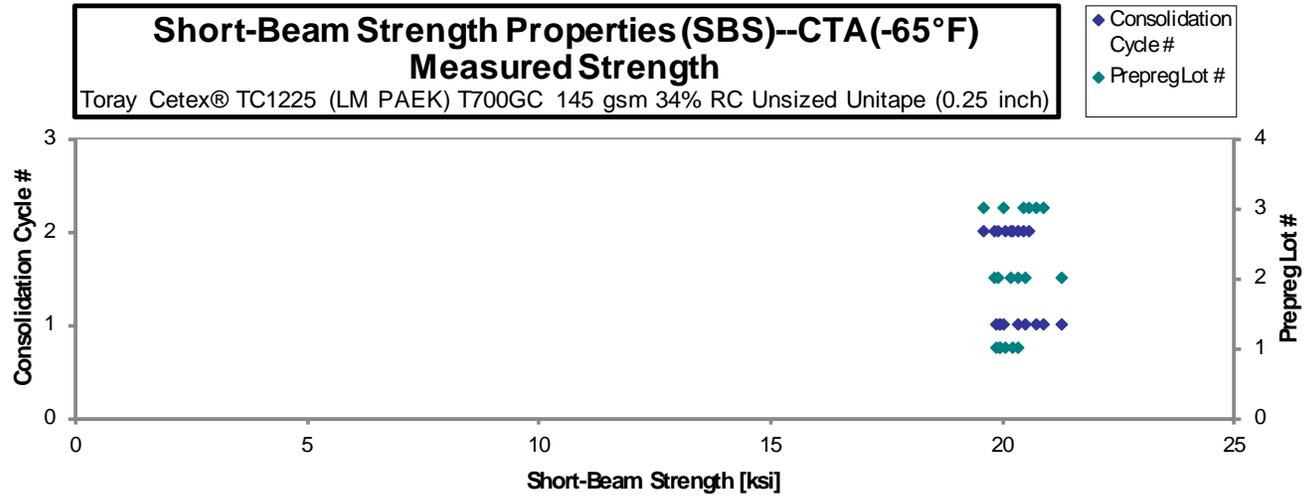


4.14 Lamina Short-Beam Strength Properties (SBS)

Short-Beam Strength Properties (SBS)--CTA (-65°F)
Strength
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Avg. t_{ply} [in] | Failure Mode |
|--|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|---------------------|--|
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-A-C1-1-SBS-CTA-1 | A | C1 | 1 | 1 | 19.87 | 0.1836 | 34 | 0.005400 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-A-C1-1-SBS-CTA-2 | A | C1 | 1 | 1 | 19.97 | 0.1840 | 34 | 0.005412 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-A-C1-1-SBS-CTA-3 | A | C1 | 1 | 1 | 19.96 | 0.1848 | 34 | 0.005435 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6R-A-C2-1-SBS-CTA-1 | A | C2 | 1 | 2 | 20.21 | 0.1887 | 34 | 0.005551 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6R-A-C2-1-SBS-CTA-2 | A | C2 | 1 | 2 | 20.08 | 0.1899 | 34 | 0.005584 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6R-A-C2-1-SBS-CTA-3 | A | C2 | 1 | 2 | 20.33 | 0.1908 | 34 | 0.005611 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-B-C1-1-SBS-CTA-1 | B | C1 | 2 | 1 | 20.49 | 0.1815 | 34 | 0.005337 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-B-C1-1-SBS-CTA-2 | B | C1 | 2 | 1 | 20.35 | 0.1838 | 34 | 0.005405 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-B-C1-1-SBS-CTA-3 | B | C1 | 2 | 1 | 21.27 | 0.1842 | 34 | 0.005417 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-B-C2-1-SBS-CTA-2 | B | C2 | 2 | 2 | 19.93 | 0.1847 | 34 | 0.005431 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-B-C2-1-SBS-CTA-3 | B | C2 | 2 | 2 | 20.18 | 0.1863 | 34 | 0.005480 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-B-C2-1-SBS-SP-1 | B | C2 | 2 | 2 | 19.83 | 0.1867 | 34 | 0.005491 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST6-C-C1-1-SBS-CTA-1 | C | C1 | 3 | 1 | 20.04 | 0.1914 | 34 | 0.005628 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST6-C-C1-1-SBS-CTA-2 | C | C1 | 3 | 1 | 20.89 | 0.1924 | 34 | 0.005659 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST6-C-C1-1-SBS-CTA-3 | C | C1 | 3 | 1 | 20.72 | 0.1923 | 34 | 0.005656 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST6-C-C2-1-SBS-CTA-1 | C | C2 | 3 | 2 | 20.48 | 0.1903 | 34 | 0.005598 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST6-C-C2-1-SBS-CTA-2 | C | C2 | 3 | 2 | 19.61 | 0.1900 | 34 | 0.005588 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST6-C-C2-1-SBS-CTA-3 | C | C2 | 3 | 2 | 20.59 | 0.1888 | 34 | 0.005551 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION |

| | | |
|--------------------|--------|----------|
| Average | 20.27 | 0.005513 |
| Standard Dev. | 0.4189 | |
| Coeff. of Var. [%] | 2.067 | |
| Min. | 19.61 | 0.005337 |
| Max. | 21.27 | 0.005659 |
| Number of Spec. | 18 | 18 |



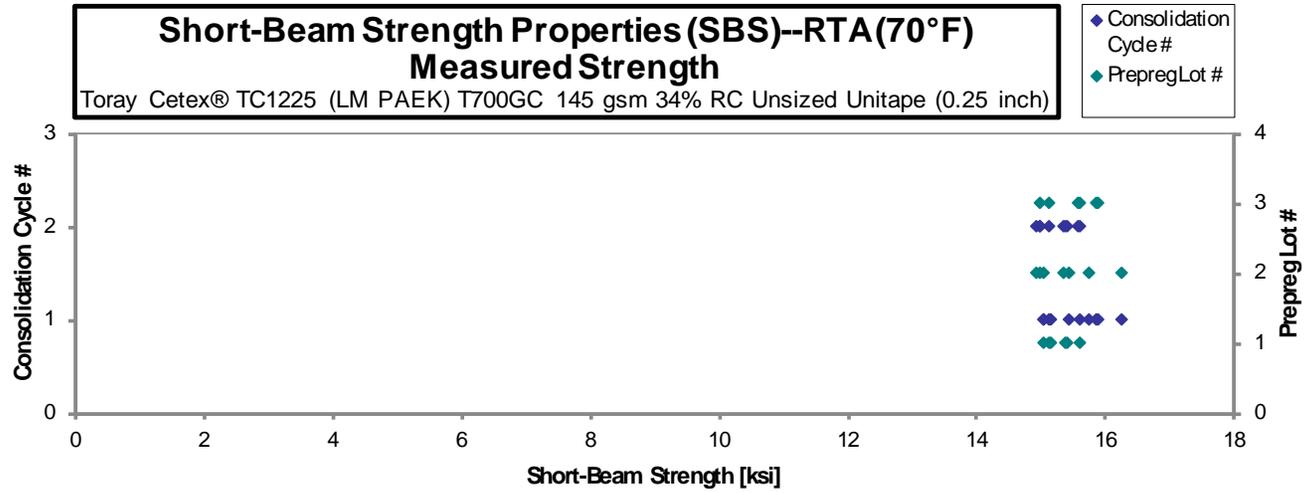
**Short-Beam Strength Properties (SBS)--RTA (70°F)
Strength**

Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Avg. t _{ply} [in] | Failure Mode |
|--|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|----------------------------|--|
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-A-C1-1-SBS-RTA-1 | A | C1 | 1 | 1 | 15.13 | 0.1859 | 34 | 0.005468 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-A-C1-1-SBS-RTA-2 | A | C1 | 1 | 1 | 15.04 | 0.1868 | 34 | 0.005494 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-A-C1-1-SBS-RTA-3 | A | C1 | 1 | 1 | 15.16 | 0.1872 | 34 | 0.005506 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6R-A-C2-1-SBS-RTA-1 | A | C2 | 1 | 2 | 15.60 | 0.1916 | 34 | 0.005634 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6R-A-C2-1-SBS-RTA-2 | A | C2 | 1 | 2 | 15.37 | 0.1917 | 34 | 0.005637 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6R-A-C2-1-SBS-RTA-3 | A | C2 | 1 | 2 | 15.41 | 0.1911 | 34 | 0.005620 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-B-C1-1-SBS-RTA-1 | B | C1 | 2 | 1 | 16.27 | 0.1835 | 34 | 0.005397 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-B-C1-1-SBS-RTA-2 | B | C1 | 2 | 1 | 15.44 | 0.1835 | 34 | 0.005396 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-B-C1-1-SBS-RTA-3 | B | C1 | 2 | 1 | 15.74 | 0.1833 | 34 | 0.005390 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-B-C1-1-SBS-SP-3 | B | C1 | 2 | 1 | 15.04 | 0.1846 | 34 | 0.005428 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-B-C2-1-SBS-RTA-1 | B | C2 | 2 | 2 | 15.36 | 0.1862 | 34 | 0.005476 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-B-C2-1-SBS-RTA-2 | B | C2 | 2 | 2 | 14.99 | 0.1859 | 34 | 0.005468 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-B-C2-1-SBS-RTA-3 | B | C2 | 2 | 2 | 14.92 | 0.1843 | 34 | 0.005421 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST6-C-C1-1-SBS-RTA-1 | C | C1 | 3 | 1 | 15.62 | 0.1933 | 34 | 0.005685 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST6-C-C1-1-SBS-RTA-2 | C | C1 | 3 | 1 | 15.88 | 0.1931 | 34 | 0.005680 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST6-C-C1-1-SBS-RTA-3 | C | C1 | 3 | 1 | 15.87 | 0.1927 | 34 | 0.005668 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST6-C-C2-1-SBS-RTA-1 | C | C2 | 3 | 2 | 15.12 | 0.1879 | 34 | 0.005526 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST6-C-C2-1-SBS-RTA-2 | C | C2 | 3 | 2 | 15.00 | 0.1869 | 34 | 0.005498 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST6-C-C2-1-SBS-RTA-3 | C | C2 | 3 | 2 | 15.58 | 0.1868 | 34 | 0.005493 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION |

RTA Strength is calculated based on max load, no significant load drop was observed.

| | | |
|--------------------|--------|----------|
| Average | 15.40 | 0.005520 |
| Standard Dev. | 0.3705 | |
| Coeff. of Var. [%] | 2.406 | |
| Min. | 14.92 | 0.005390 |
| Max. | 16.27 | 0.005685 |
| Number of Spec. | 19 | 19 |

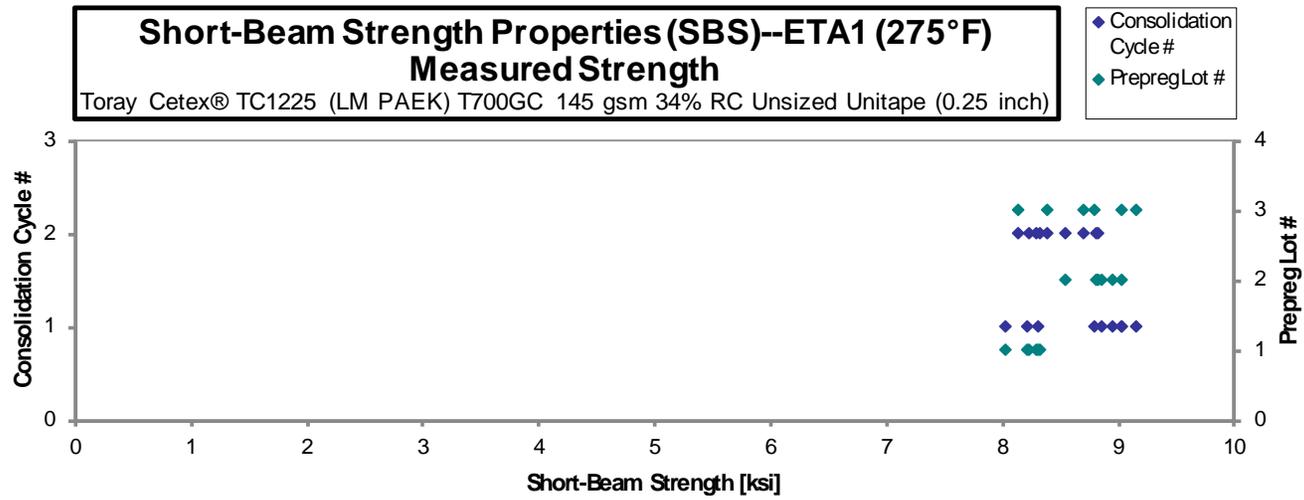


Short-Beam Strength Properties (SBS)--ETA1 (275°F)
Strength
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Avg. t _{ply} [in] | Failure Mode |
|---|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|----------------------------|--|
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-A-C1-1-SBS-ETA1-1 | A | C1 | 1 | 1 | 8.029 | 0.1867 | 34 | 0.005491 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-A-C1-1-SBS-SP-5 | A | C1 | 1 | 1 | 8.211 | 0.1864 | 34 | 0.005482 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-A-C1-1-SBS-SP-6 | A | C1 | 1 | 1 | 8.318 | 0.1861 | 34 | 0.005474 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6R-A-C2-1-SBS-ETA1-1 | A | C2 | 1 | 2 | 8.300 | 0.1909 | 34 | 0.005613 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6R-A-C2-1-SBS-ETA1-2 | A | C2 | 1 | 2 | 8.328 | 0.1882 | 34 | 0.005534 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6R-A-C2-1-SBS-ETA1-3 | A | C2 | 1 | 2 | 8.234 | 0.1902 | 34 | 0.005594 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-B-C1-1-SBS-ETA1-1 | B | C1 | 2 | 1 | 8.866 | 0.1833 | 34 | 0.005391 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-B-C1-1-SBS-ETA1-2 | B | C1 | 2 | 1 | 8.960 | 0.1822 | 34 | 0.005360 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-B-C1-1-SBS-ETA1-3 | B | C1 | 2 | 1 | 9.032 | 0.1817 | 34 | 0.005343 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-B-C2-1-SBS-ETA1-1 | B | C2 | 2 | 2 | 8.821 | 0.1832 | 34 | 0.005388 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-B-C2-1-SBS-ETA1-2 | B | C2 | 2 | 2 | 8.819 | 0.1830 | 34 | 0.005383 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-B-C2-1-SBS-ETA1-3 | B | C2 | 2 | 2 | 8.546 | 0.1832 | 34 | 0.005388 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST6-C-C1-1-SBS-ETA1-1 | C | C1 | 3 | 1 | 8.793 | 0.1919 | 34 | 0.005643 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST6-C-C1-1-SBS-ETA1-2 | C | C1 | 3 | 1 | 9.027 | 0.1904 | 34 | 0.005600 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST6-C-C1-1-SBS-ETA1-3 | C | C1 | 3 | 1 | 9.162 | 0.1915 | 34 | 0.005632 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST6-C-C2-1-SBS-ETA1-1 | C | C2 | 3 | 2 | 8.710 | 0.1870 | 34 | 0.005500 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST6-C-C2-1-SBS-ETA1-3 | C | C2 | 3 | 2 | 8.389 | 0.1866 | 34 | 0.005487 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST6-C-C2-1-SBS-SP-5 | C | C2 | 3 | 2 | 8.142 | 0.1868 | 34 | 0.005493 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION |

ETA1 Strength is calculated based on max load, no significant load drop was observed.

| | | |
|--------------------|--------|----------|
| Average | 8.594 | 0.005489 |
| Standard Dev. | 0.3549 | |
| Coeff. of Var. [%] | 4.129 | |
| Min. | 8.029 | 0.005343 |
| Max. | 9.162 | 0.005643 |
| Number of Spec. | 18 | 18 |

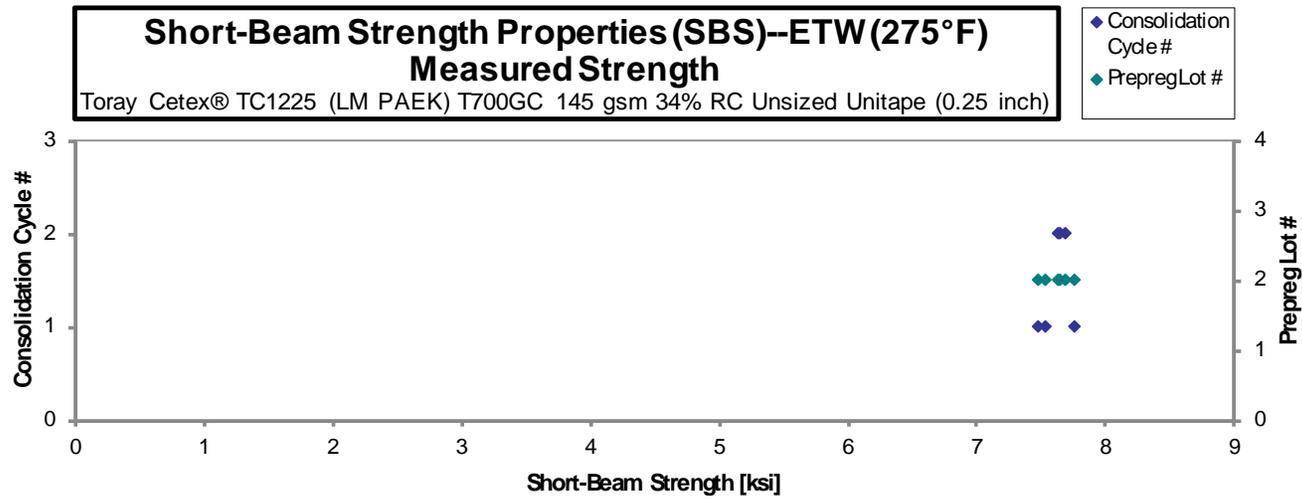


Short-Beam Strength Properties (SBS)--ETW (275°F)
Strength
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Avg. t_{ply} [in] | Failure Mode |
|---|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|---------------------|--|
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-B-C1-1-SBS-ETW-1 | B | C1 | 2 | 1 | 7.532 | 0.1799 | 34 | 0.005290 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-B-C1-1-SBS-ETW-2 | B | C1 | 2 | 1 | 7.479 | 0.1798 | 34 | 0.005288 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-B-C1-1-SBS-ETW-3 | B | C1 | 2 | 1 | 7.758 | 0.1830 | 34 | 0.005382 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-B-C2-1-SBS-ETW-1 | B | C2 | 2 | 2 | 7.688 | 0.1838 | 34 | 0.005405 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-B-C2-1-SBS-ETW-2 | B | C2 | 2 | 2 | 7.632 | 0.1811 | 34 | 0.005325 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-B-C2-1-SBS-ETW-3 | B | C2 | 2 | 2 | 7.652 | 0.1843 | 34 | 0.005419 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION |

ETW Strength is calculated based on max load, no significant load drop was observed.

| | | |
|--------------------|--------|----------|
| Average | 7.623 | 0.005352 |
| Standard Dev. | 0.1024 | |
| Coeff. of Var. [%] | 1.344 | |
| Min. | 7.479 | 0.005288 |
| Max. | 7.758 | 0.005419 |
| Number of Spec. | 6 | 6 |

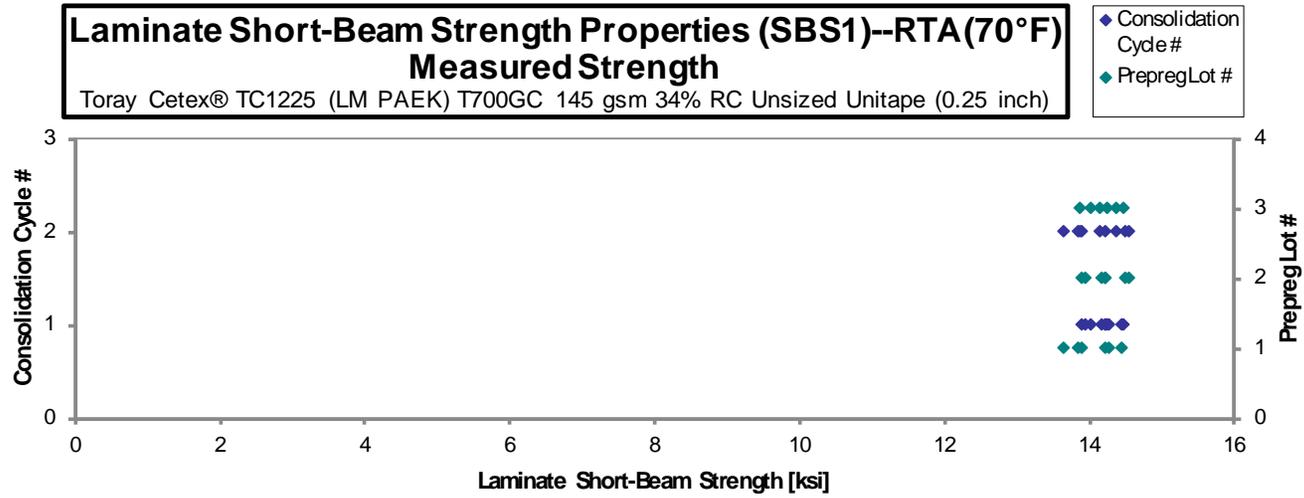


4.15 Laminate Short-Beam Strength Properties (SBS1)

Laminate Short-Beam Strength Properties (SBS1)–RTA (70°F)
Strength
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Avg. t_{ply} [in] | Failure Mode |
|---|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|---------------------|--|
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C1-1-SBS1-RTA-1 | A | C1 | 1 | 1 | 14.27 | 0.1338 | 24 | 0.005574 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C1-1-SBS1-RTA-2 | A | C1 | 1 | 1 | 14.44 | 0.1335 | 24 | 0.005560 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C1-1-SBS1-RTA-3 | A | C1 | 1 | 1 | 14.22 | 0.1327 | 24 | 0.005530 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C2-1-SBS1-RTA-1 | A | C2 | 1 | 2 | 13.85 | 0.1316 | 24 | 0.005483 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C2-1-SBS1-RTA-2 | A | C2 | 1 | 2 | 13.64 | 0.1310 | 24 | 0.005458 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C2-1-SBS1-RTA-3 | A | C2 | 1 | 2 | 13.90 | 0.1307 | 24 | 0.005446 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C1-1-SBS1-RTA-1 | B | C1 | 2 | 1 | 14.17 | 0.1248 | 24 | 0.005201 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C1-1-SBS1-RTA-2 | B | C1 | 2 | 1 | 13.90 | 0.1251 | 24 | 0.005211 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C1-1-SBS1-RTA-3 | B | C1 | 2 | 1 | 13.96 | 0.1248 | 24 | 0.005198 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C1-1-SBS1-SP-1 | B | C1 | 2 | 1 | 14.22 | 0.1245 | 24 | 0.005187 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C2-1-SBS1-RTA-1 | B | C2 | 2 | 2 | 14.49 | 0.1306 | 24 | 0.005442 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C2-1-SBS1-RTA-2 | B | C2 | 2 | 2 | 14.22 | 0.1309 | 24 | 0.005456 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C2-1-SBS1-RTA-3 | B | C2 | 2 | 2 | 14.54 | 0.1299 | 24 | 0.005413 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST9-C-C1-1-SBS1-RTA-1 | C | C1 | 3 | 1 | 14.47 | 0.1319 | 24 | 0.005497 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST9-C-C1-1-SBS1-RTA-2 | C | C1 | 3 | 1 | 14.01 | 0.1321 | 24 | 0.005503 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST9-C-C1-1-SBS1-RTA-3 | C | C1 | 3 | 1 | 14.26 | 0.1321 | 24 | 0.005504 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST9-C-C2-1-SBS1-RTA-1 | C | C2 | 3 | 2 | 13.87 | 0.1277 | 24 | 0.005321 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST9-C-C2-1-SBS1-RTA-2 | C | C2 | 3 | 2 | 14.38 | 0.1281 | 24 | 0.005338 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST9-C-C2-1-SBS1-RTA-3 | C | C2 | 3 | 2 | 14.15 | 0.1280 | 24 | 0.005331 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION |

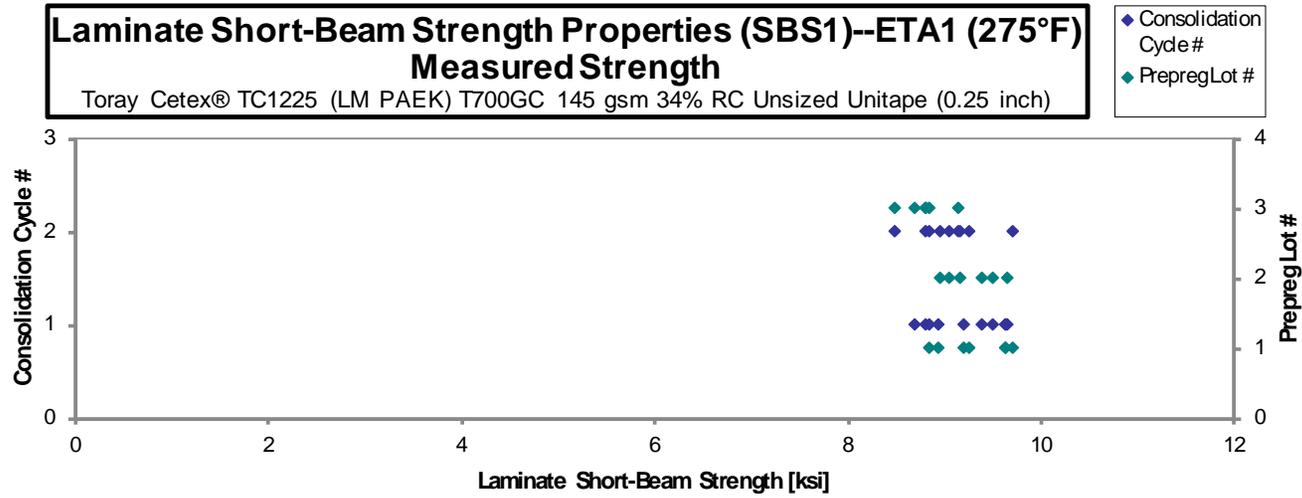
| | | |
|---------------------------|---------------|-----------------|
| Average | 14.16 | 0.005403 |
| Standard Dev. | 0.2536 | |
| Coeff. of Var. [%] | 1.792 | |
| Min. | 13.64 | 0.005187 |
| Max. | 14.54 | 0.005574 |
| Number of Spec. | 19 | 19 |



Laminate Short-Beam Strength Properties (SBS1)-ETA1 (275°F)
Strength
 Toray Cetex® TC1225 (LMPAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Avg. t _{ply} [in] | Failure Mode |
|--|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|----------------------------|--|
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C1-1-SBS1-ETA1-1 | A | C1 | 1 | 1 | 9.639 | 0.1334 | 24 | 0.005556 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C1-1-SBS1-ETA1-2 | A | C1 | 1 | 1 | 9.625 | 0.1322 | 24 | 0.005509 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C1-1-SBS1-ETA1-3 | A | C1 | 1 | 1 | 8.939 | 0.1332 | 24 | 0.005548 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C1-1-SBS1-SP-3 | A | C1 | 1 | 1 | 9.198 | 0.1327 | 24 | 0.005528 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C2-1-SBS1-ETA1-1 | A | C2 | 1 | 2 | 9.255 | 0.1306 | 24 | 0.005442 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C2-1-SBS1-ETA1-2 | A | C2 | 1 | 2 | 9.709 | 0.1303 | 24 | 0.005431 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C2-1-SBS1-ETA1-3 | A | C2 | 1 | 2 | 8.837 | 0.1307 | 24 | 0.005446 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C1-1-SBS1-ETA1-1 | B | C1 | 2 | 1 | 9.499 | 0.1245 | 24 | 0.005188 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C1-1-SBS1-ETA1-2 | B | C1 | 2 | 1 | 9.662 | 0.1246 | 24 | 0.005192 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C1-1-SBS1-ETA1-3 | B | C1 | 2 | 1 | 9.381 | 0.1245 | 24 | 0.005187 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C2-1-SBS1-ETA1-1 | B | C2 | 2 | 2 | 9.169 | 0.1292 | 24 | 0.005383 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C2-1-SBS1-ETA1-2 | B | C2 | 2 | 2 | 8.956 | 0.1291 | 24 | 0.005379 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C2-1-SBS1-ETA1-3 | B | C2 | 2 | 2 | 9.056 | 0.1294 | 24 | 0.005390 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST9-C-C1-1-SBS1-ETA1-1 | C | C1 | 3 | 1 | 8.805 | 0.1314 | 24 | 0.005473 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST9-C-C1-1-SBS1-ETA1-2 | C | C1 | 3 | 1 | 8.843 | 0.1315 | 24 | 0.005480 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST9-C-C1-1-SBS1-ETA1-3 | C | C1 | 3 | 1 | 8.694 | 0.1307 | 24 | 0.005445 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST9-C-C2-1-SBS1-ETA1-1 | C | C2 | 3 | 2 | 8.813 | 0.1277 | 24 | 0.005322 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST9-C-C2-1-SBS1-ETA1-2 | C | C2 | 3 | 2 | 9.149 | 0.1277 | 24 | 0.005320 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION, COMPRESSION |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST9-C-C2-1-SBS1-SP-3 | C | C2 | 3 | 2 | 8.490 | 0.1287 | 24 | 0.005360 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |

| | | |
|---------------------------|---------------|-----------------|
| Average | 9.143 | 0.005399 |
| Standard Dev. | 0.3641 | |
| Coeff. of Var. [%] | 3.982 | |
| Min. | 8.490 | 0.005187 |
| Max. | 9.709 | 0.005556 |
| Number of Spec. | 19 | 19 |

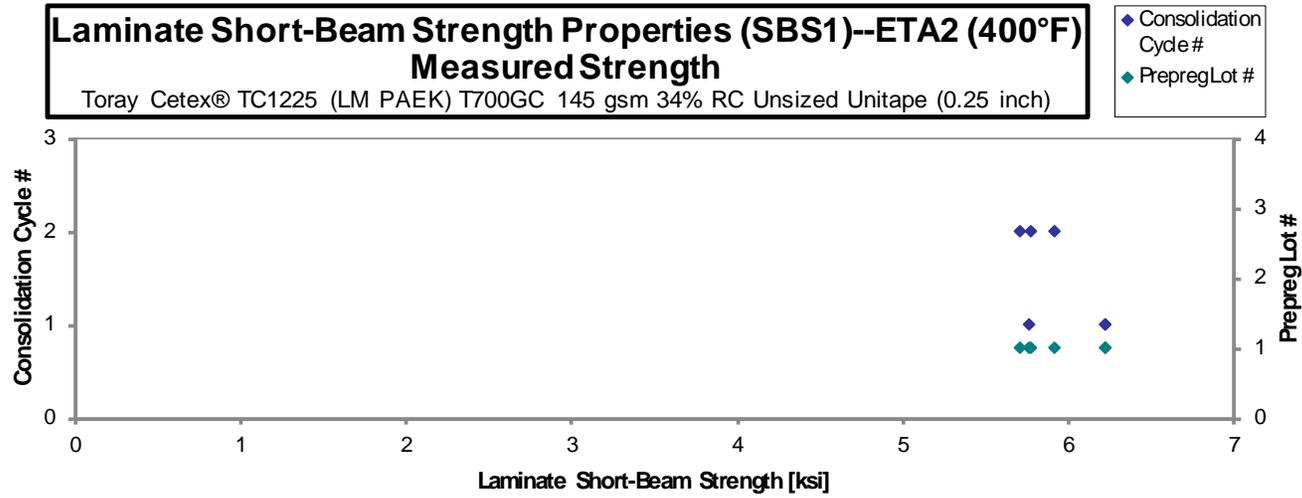


Laminate Short-Beam Strength Properties (SBS1)--ETA2 (400°F)
Strength
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Avg. t _{ply} [in] | Failure Mode |
|---|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|----------------------------|---|
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C1-1-SBS1-ETA2-1 | A | C1 | 1 | 1 | 6.219 | 0.1326 | 24 | 0.005526 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C1-1-SBS1-ETA2-2 | A | C1 | 1 | 1 | 5.763 | 0.1332 | 24 | 0.005548 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C1-1-SBS1-ETA2-3 | A | C1 | 1 | 1 | 6.225 | 0.1331 | 24 | 0.005544 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C2-1-SBS1-ETA2-1 | A | C2 | 1 | 2 | 5.921 | 0.1306 | 24 | 0.005440 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C2-1-SBS1-ETA2-2 | A | C2 | 1 | 2 | 5.710 | 0.1308 | 24 | 0.005449 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C2-1-SBS1-ETA2-3 | A | C2 | 1 | 2 | 5.772 | 0.1311 | 24 | 0.005461 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |

ETA2 Strength is calculated based on max load after a slight load drop (before maxing out test fixture), no significant load drop was observed.

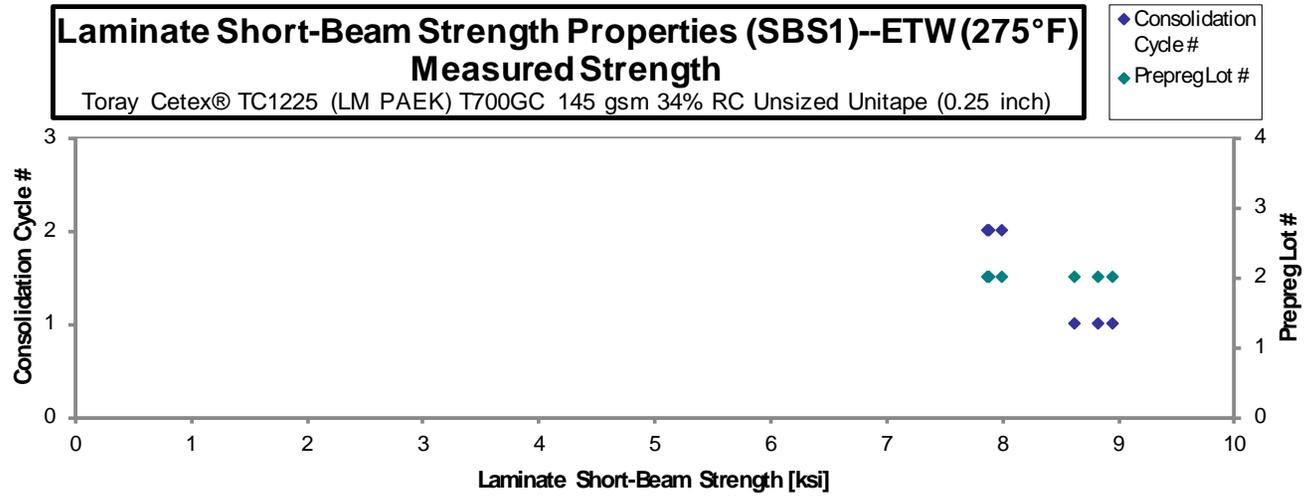
| | | |
|--------------------|--------|----------|
| Average | 5.935 | 0.005495 |
| Standard Dev. | 0.2332 | |
| Coeff. of Var. [%] | 3.929 | |
| Min. | 5.710 | 0.005440 |
| Max. | 6.225 | 0.005548 |
| Number of Spec. | 6 | 6 |



Laminate Short-Beam Strength Properties (SBS1)--ETW (275°F)
Strength
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Avg. t_{ply} [in] | Failure Mode |
|--|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|---------------------|---|
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C1-1-SBS1-ETW-1 | B | C1 | 2 | 1 | 8.627 | 0.1243 | 24 | 0.005180 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C1-1-SBS1-ETW-2 | B | C1 | 2 | 1 | 8.819 | 0.1241 | 24 | 0.005169 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C1-1-SBS1-ETW-3 | B | C1 | 2 | 1 | 8.959 | 0.1242 | 24 | 0.005176 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C2-1-SBS1-ETW-1 | B | C2 | 2 | 2 | 7.877 | 0.1295 | 24 | 0.005397 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C2-1-SBS1-ETW-2 | B | C2 | 2 | 2 | 7.996 | 0.1296 | 24 | 0.005398 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C2-1-SBS1-ETW-3 | B | C2 | 2 | 2 | 7.889 | 0.1293 | 24 | 0.005385 | INTERLAMINAR SHEAR, INELASTIC DEFORMATION |

| | | |
|--------------------|--------|----------|
| Average | 8.361 | 0.005284 |
| Standard Dev. | 0.4957 | |
| Coeff. of Var. [%] | 5.929 | |
| Min. | 7.877 | 0.005169 |
| Max. | 8.959 | 0.005398 |
| Number of Spec. | 6 | 6 |



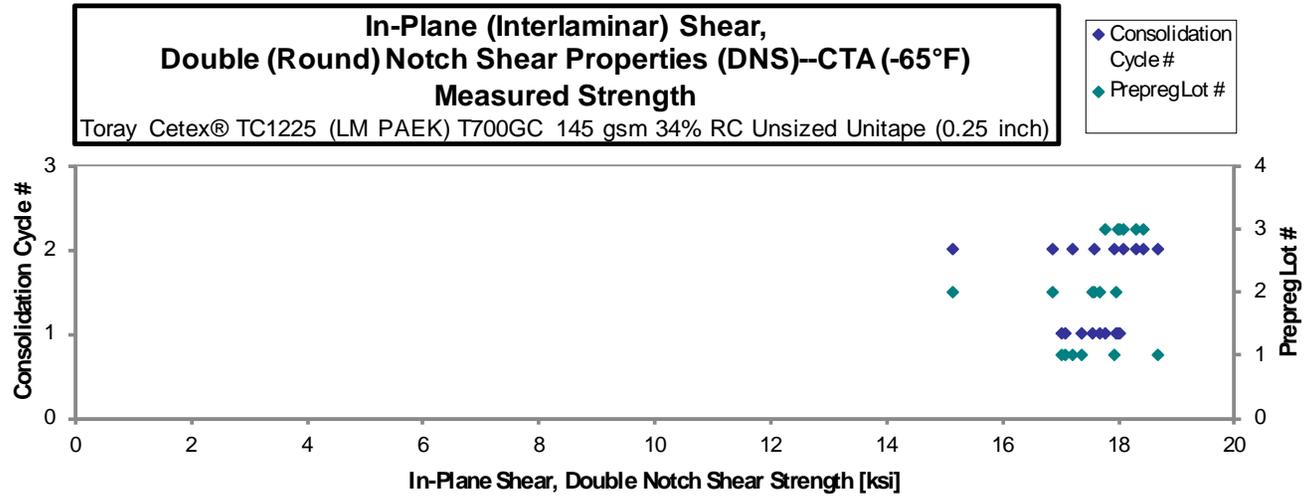
4.16 In-Plane (Interlaminar) Shear, Double (Round) Notch Shear Properties (DNS)

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

Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Avg. t_{ply} [in] | Failure Mode |
|--|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|---------------------|--------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-A-C1-1-DNS-CTA-1 | A | C1 | 1 | 1 | 17.02 | 0.1823 | 34 | 0.005360 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-A-C1-1-DNS-CTA-2 | A | C1 | 1 | 1 | 17.08 | 0.1820 | 34 | 0.005353 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-A-C1-1-DNS-CTA-3 | A | C1 | 1 | 1 | 17.36 | 0.1823 | 34 | 0.005362 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6R-A-C2-1-DNS-CTA-1 | A | C2 | 1 | 2 | 18.69 | 0.1893 | 34 | 0.005567 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6R-A-C2-1-DNS-CTA-2 | A | C2 | 1 | 2 | 17.93 | 0.1890 | 34 | 0.005559 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6R-A-C2-1-DNS-CTA-3 | A | C2 | 1 | 2 | 17.23 | 0.1912 | 34 | 0.005625 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-B-C1-1-DNS-CTA-1 | B | C1 | 2 | 1 | 17.98 | 0.1795 | 34 | 0.005280 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-B-C1-1-DNS-CTA-2 | B | C1 | 2 | 1 | 17.68 | 0.1824 | 34 | 0.005364 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-B-C1-1-DNS-CTA-3 | B | C1 | 2 | 1 | 17.57 | 0.1832 | 34 | 0.005388 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-B-C2-1-DNS-CTA-1 | B | C2 | 2 | 2 | 17.60 | 0.1815 | 34 | 0.005338 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-B-C2-1-DNS-CTA-2 | B | C2 | 2 | 2 | 15.13 | 0.1858 | 34 | 0.005466 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-B-C2-1-DNS-CTA-3 | B | C2 | 2 | 2 | 16.87 | 0.1874 | 34 | 0.005510 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST6-C-C1-1-DNS-CTA-1 | C | C1 | 3 | 1 | 17.79 | 0.1922 | 34 | 0.005652 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST6-C-C1-1-DNS-CTA-2 | C | C1 | 3 | 1 | 18.03 | 0.1916 | 34 | 0.005634 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST6-C-C1-1-DNS-CTA-3 | C | C1 | 3 | 1 | 17.99 | 0.1919 | 34 | 0.005644 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST6-C-C2-1-DNS-CTA-1 | C | C2 | 3 | 2 | 18.43 | 0.1863 | 34 | 0.005478 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST6-C-C2-1-DNS-CTA-2 | C | C2 | 3 | 2 | 18.10 | 0.1884 | 34 | 0.005540 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST6-C-C2-1-DNS-CTA-3 | C | C2 | 3 | 2 | 18.30 | 0.1881 | 34 | 0.005532 | GAGE SECTION SHEAR |

| | | |
|---------------------------|---------------|-----------------|
| Average | 17.60 | 0.005481 |
| Standard Dev. | 0.7927 | |
| Coeff. of Var. [%] | 4.504 | |
| Min. | 15.13 | 0.005280 |
| Max. | 18.69 | 0.005652 |
| Number of Spec. | 18 | 18 |

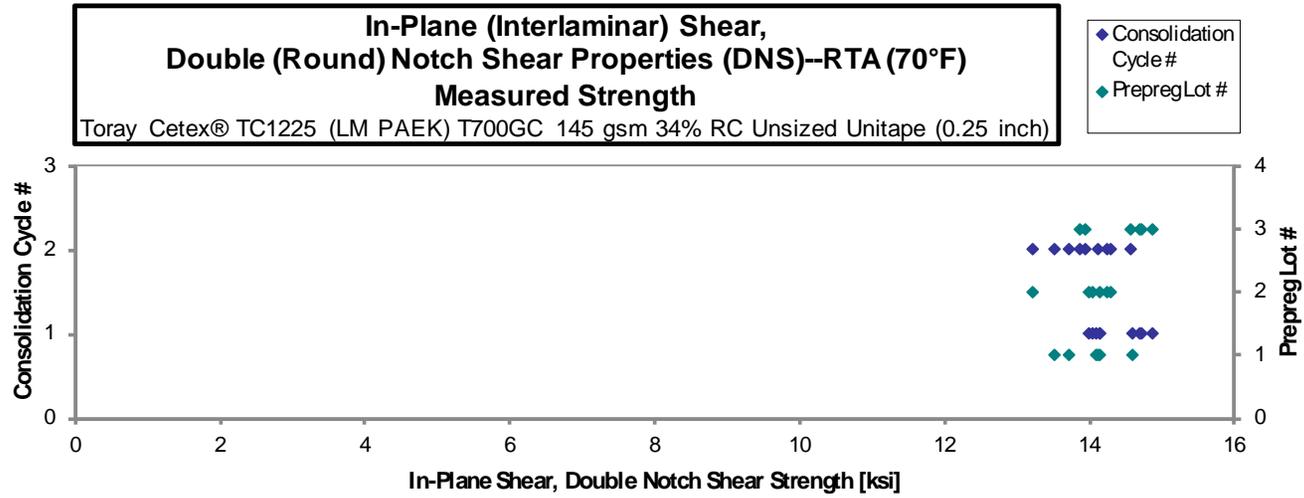


**In-Plane (Interlaminar) Shear, Double (Round) Notch Shear Properties (DNS)--RTA (70°F)
Strength**

Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Avg. t_{ply} [in] | Failure Mode |
|--|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|---------------------|--------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-A-C1-1-DNS-RTA-1 | A | C1 | 1 | 1 | 14.16 | 0.1837 | 34 | 0.005402 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-A-C1-1-DNS-RTA-2 | A | C1 | 1 | 1 | 14.59 | 0.1847 | 34 | 0.005432 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-A-C1-1-DNS-RTA-3 | A | C1 | 1 | 1 | 14.09 | 0.1852 | 34 | 0.005448 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6R-A-C2-1-DNS-RTA-1 | A | C2 | 1 | 2 | 13.52 | 0.1926 | 34 | 0.005663 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6R-A-C2-1-DNS-RTA-2 | A | C2 | 1 | 2 | 14.14 | 0.1927 | 34 | 0.005667 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6R-A-C2-1-DNS-RTA-3 | A | C2 | 1 | 2 | 13.71 | 0.1921 | 34 | 0.005650 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-B-C1-1-DNS-RTA-1 | B | C1 | 2 | 1 | 14.01 | 0.1839 | 34 | 0.005409 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-B-C1-1-DNS-RTA-2 | B | C1 | 2 | 1 | 14.15 | 0.1839 | 34 | 0.005409 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-B-C1-1-DNS-RTA-3 | B | C1 | 2 | 1 | 14.04 | 0.1827 | 34 | 0.005374 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-B-C2-1-DNS-RTA-1 | B | C2 | 2 | 2 | 13.23 | 0.1870 | 34 | 0.005501 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-B-C2-1-DNS-RTA-2 | B | C2 | 2 | 2 | 14.30 | 0.1855 | 34 | 0.005455 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-B-C2-1-DNS-RTA-3 | B | C2 | 2 | 2 | 14.26 | 0.1843 | 34 | 0.005420 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST6-C-C1-1-DNS-RTA-1 | C | C1 | 3 | 1 | 14.73 | 0.1922 | 34 | 0.005652 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST6-C-C1-1-DNS-RTA-2 | C | C1 | 3 | 1 | 14.88 | 0.1929 | 34 | 0.005673 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST6-C-C1-1-DNS-RTA-3 | C | C1 | 3 | 1 | 14.70 | 0.1922 | 34 | 0.005653 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST6-C-C2-1-DNS-RTA-1 | C | C2 | 3 | 2 | 14.58 | 0.1877 | 34 | 0.005520 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST6-C-C2-1-DNS-RTA-2 | C | C2 | 3 | 2 | 13.88 | 0.1875 | 34 | 0.005514 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST6-C-C2-1-DNS-RTA-3 | C | C2 | 3 | 2 | 13.96 | 0.1872 | 34 | 0.005507 | GAGE SECTION SHEAR |

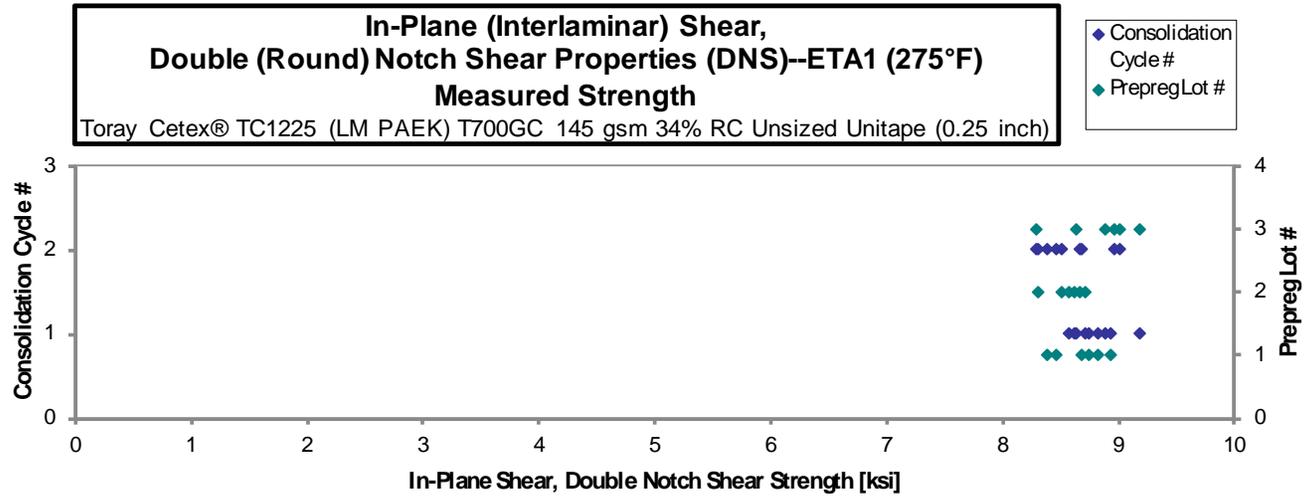
| | | |
|--------------------|--------|----------|
| Average | 14.16 | 0.005519 |
| Standard Dev. | 0.4320 | |
| Coeff. of Var. [%] | 3.050 | |
| Min. | 13.23 | 0.005374 |
| Max. | 14.88 | 0.005673 |
| Number of Spec. | 18 | 18 |



**In-Plane (Interlaminar) Shear, Double (Round) Notch Shear Properties (DNS)--ETA1 (275°F)
Strength**
Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Avg. t _{ply} [in] | Failure Mode |
|---|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|----------------------------|--------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-A-C1-1-DNS-ETA1-1 | A | C1 | 1 | 1 | 8.750 | 0.1845 | 34 | 0.005425 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-A-C1-1-DNS-ETA1-2 | A | C1 | 1 | 1 | 8.933 | 0.1832 | 34 | 0.005388 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-A-C1-1-DNS-ETA1-3 | A | C1 | 1 | 1 | 8.821 | 0.1830 | 34 | 0.005382 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6R-A-C2-1-DNS-ETA1-1 | A | C2 | 1 | 2 | 8.471 | 0.1915 | 34 | 0.005631 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6R-A-C2-1-DNS-ETA1-2 | A | C2 | 1 | 2 | 8.394 | 0.1883 | 34 | 0.005537 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6R-A-C2-1-DNS-ETA1-3 | A | C2 | 1 | 2 | 8.691 | 0.1916 | 34 | 0.005636 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-B-C1-1-DNS-ETA1-1 | B | C1 | 2 | 1 | 8.623 | 0.1819 | 34 | 0.005350 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-B-C1-1-DNS-ETA1-2 | B | C1 | 2 | 1 | 8.725 | 0.1813 | 34 | 0.005332 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-B-C1-1-DNS-ETA1-3 | B | C1 | 2 | 1 | 8.570 | 0.1814 | 34 | 0.005336 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-B-C2-1-DNS-ETA1-1 | B | C2 | 2 | 2 | 8.666 | 0.1835 | 34 | 0.005398 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-B-C2-1-DNS-ETA1-2 | B | C2 | 2 | 2 | 8.307 | 0.1833 | 34 | 0.005392 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-B-C2-1-DNS-ETA1-3 | B | C2 | 2 | 2 | 8.506 | 0.1841 | 34 | 0.005415 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST6-C-C1-1-DNS-ETA1-1 | C | C1 | 3 | 1 | 9.195 | 0.1923 | 34 | 0.005655 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST6-C-C1-1-DNS-ETA1-2 | C | C1 | 3 | 1 | 8.645 | 0.1931 | 34 | 0.005678 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST6-C-C1-1-DNS-ETA1-3 | C | C1 | 3 | 1 | 8.895 | 0.1929 | 34 | 0.005673 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST6-C-C2-1-DNS-ETA1-1 | C | C2 | 3 | 2 | 9.011 | 0.1871 | 34 | 0.005501 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST6-C-C2-1-DNS-ETA1-2 | C | C2 | 3 | 2 | 8.963 | 0.1872 | 34 | 0.005505 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST6-C-C2-1-DNS-ETA1-3 | C | C2 | 3 | 2 | 8.292 | 0.1892 | 34 | 0.005563 | GAGE SECTION SHEAR |

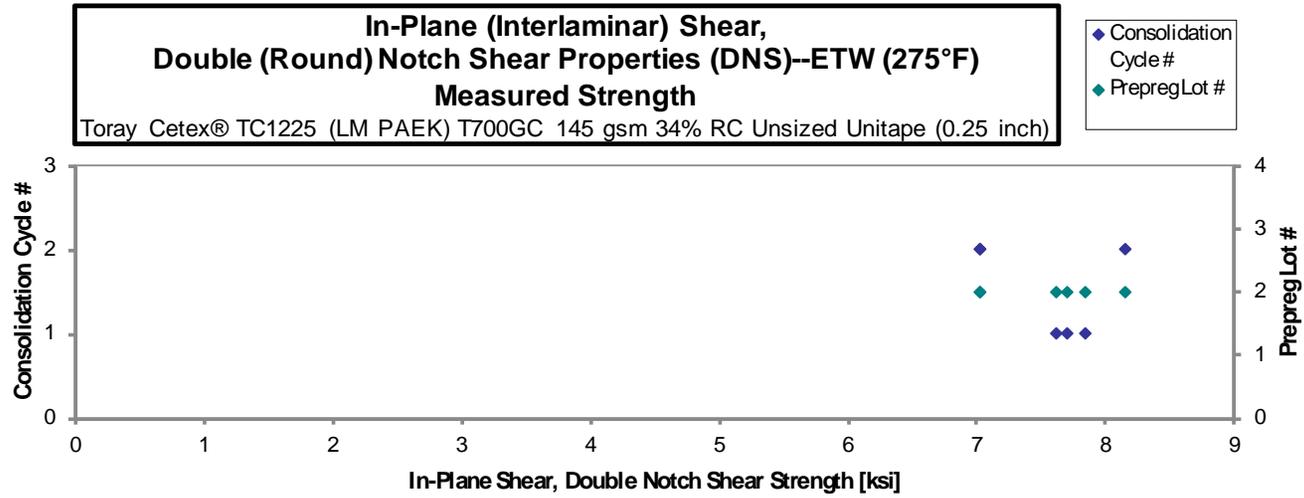
| | | |
|---------------------------|---------------|-----------------|
| Average | 8.692 | 0.005489 |
| Standard Dev. | 0.2487 | |
| Coeff. of Var. [%] | 2.862 | |
| Min. | 8.292 | 0.005332 |
| Max. | 9.195 | 0.005678 |
| Number of Spec. | 18 | 18 |



**In-Plane (Interlaminar) Shear, Double (Round) Notch Shear Properties (DNS)--ETW (275°F)
Strength**
Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Avg. t _{ply} [in] | Failure Mode |
|---|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|----------------------------|--------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-B-C1-1-DNS-ETW-1 | B | C1 | 2 | 1 | 7.702 | 0.1810 | 34 | 0.005323 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-B-C1-1-DNS-ETW-2 | B | C1 | 2 | 1 | 7.625 | 0.1809 | 34 | 0.005319 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-B-C1-1-DNS-ETW-3 | B | C1 | 2 | 1 | 7.849 | 0.1844 | 34 | 0.005424 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-B-C2-1-DNS-ETW-1 | B | C2 | 2 | 2 | 7.034 | 0.1848 | 34 | 0.005435 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-B-C2-1-DNS-ETW-2 | B | C2 | 2 | 2 | 8.158 | 0.1822 | 34 | 0.005359 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST6-B-C2-1-DNS-ETW-3 | B | C2 | 2 | 2 | 7.030 | 0.1864 | 34 | 0.005481 | GAGE SECTION SHEAR |

| | | |
|--------------------|--------|----------|
| Average | 7.566 | 0.005390 |
| Standard Dev. | 0.4523 | |
| Coeff. of Var. [%] | 5.977 | |
| Min. | 7.030 | 0.005319 |
| Max. | 8.158 | 0.005481 |
| Number of Spec. | 6 | 6 |

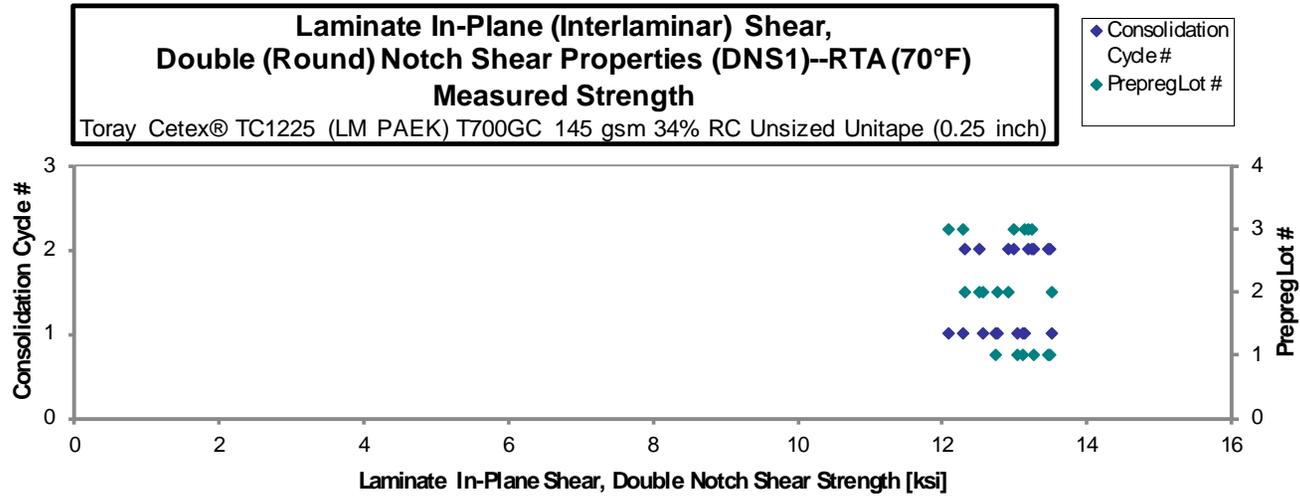


4.17 Laminate In-Plane (Interlaminar) Shear, Double (Round) Notch Shear Properties (DNS1)

Laminate In-Plane (Interlaminar) Shear, Double (Round) Notch Shear Properties (DNS1)--RTA (70°F)
Strength
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Avg. t_{ply} [in] | Failure Mode |
|---|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|---------------------|--------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C1-1-DNS1-RTA-1 | A | C1 | 1 | 1 | 12.73 | 0.1341 | 24 | 0.005588 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C1-1-DNS1-RTA-2 | A | C1 | 1 | 1 | 13.11 | 0.1341 | 24 | 0.005585 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C1-1-DNS1-RTA-3 | A | C1 | 1 | 1 | 13.03 | 0.1335 | 24 | 0.005563 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C2-1-DNS1-RTA-1 | A | C2 | 1 | 2 | 13.45 | 0.1324 | 24 | 0.005518 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C2-1-DNS1-RTA-2 | A | C2 | 1 | 2 | 13.25 | 0.1318 | 24 | 0.005492 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C2-1-DNS1-RTA-3 | A | C2 | 1 | 2 | 13.49 | 0.1317 | 24 | 0.005488 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C1-1-DNS1-RTA-1 | B | C1 | 2 | 1 | 12.74 | 0.1248 | 24 | 0.005199 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C1-1-DNS1-RTA-2 | B | C1 | 2 | 1 | 13.51 | 0.1248 | 24 | 0.005199 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C1-1-DNS1-RTA-3 | B | C1 | 2 | 1 | 12.55 | 0.1245 | 24 | 0.005187 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C2-1-DNS1-RTA-1 | B | C2 | 2 | 2 | 12.31 | 0.1310 | 24 | 0.005458 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C2-1-DNS1-RTA-2 | B | C2 | 2 | 2 | 12.50 | 0.1310 | 24 | 0.005459 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C2-1-DNS1-RTA-3 | B | C2 | 2 | 2 | 12.91 | 0.1295 | 24 | 0.005396 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST9-C-C1-1-DNS1-RTA-1 | C | C1 | 3 | 1 | 12.27 | 0.1319 | 24 | 0.005497 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST9-C-C1-1-DNS1-RTA-2 | C | C1 | 3 | 1 | 12.08 | 0.1325 | 24 | 0.005521 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST9-C-C1-1-DNS1-RTA-3 | C | C1 | 3 | 1 | 13.14 | 0.1319 | 24 | 0.005496 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST9-C-C2-1-DNS1-RTA-1 | C | C2 | 3 | 2 | 13.23 | 0.1278 | 24 | 0.005323 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST9-C-C2-1-DNS1-RTA-2 | C | C2 | 3 | 2 | 13.19 | 0.1278 | 24 | 0.005326 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST9-C-C2-1-DNS1-RTA-3 | C | C2 | 3 | 2 | 12.98 | 0.1279 | 24 | 0.005329 | GAGE SECTION SHEAR |

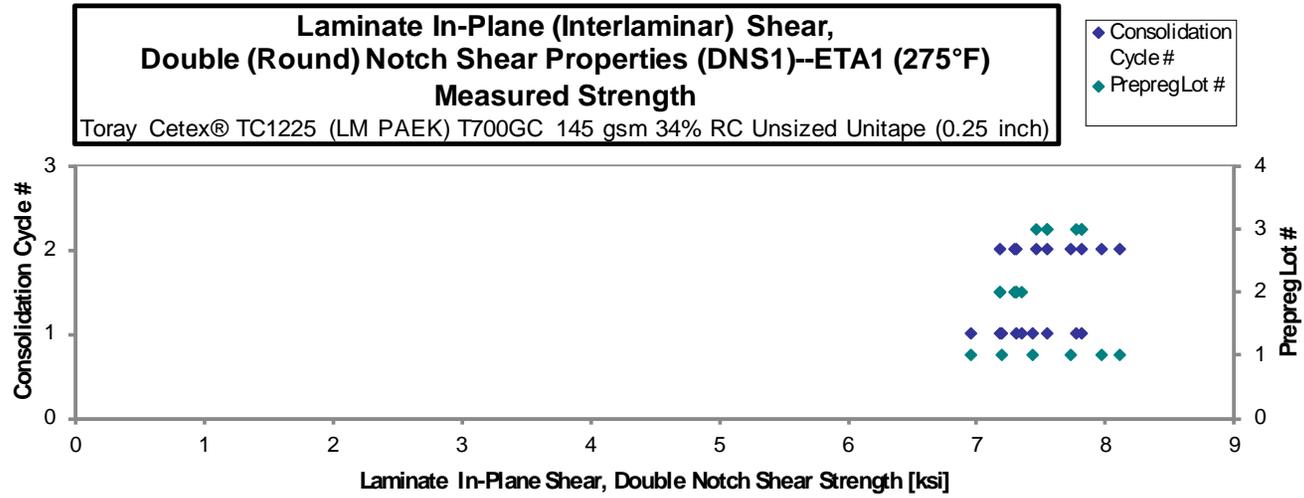
| | | |
|---------------------------|---------------|-----------------|
| Average | 12.92 | 0.005423 |
| Standard Dev. | 0.4349 | |
| Coeff. of Var. [%] | 3.368 | |
| Min. | 12.08 | 0.005187 |
| Max. | 13.51 | 0.005521 |
| Number of Spec. | 18 | 18 |



**Laminate In-Plane (Interlaminar) Shear, Double (Round) Notch Shear Properties (DNS1)--ETA1 (275°F)
Strength**
Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Avg. t _{ply} [in] | Failure Mode |
|--|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|----------------------------|--------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C1-1-DNS1-ETA1-1 | A | C1 | 1 | 1 | 7.431 | 0.1334 | 24 | 0.005558 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C1-1-DNS1-ETA1-2 | A | C1 | 1 | 1 | 6.961 | 0.1335 | 24 | 0.005563 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C1-1-DNS1-ETA1-3 | A | C1 | 1 | 1 | 7.202 | 0.1334 | 24 | 0.005560 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C2-1-DNS1-ETA1-1 | A | C2 | 1 | 2 | 7.733 | 0.1321 | 24 | 0.005503 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C2-1-DNS1-ETA1-2 | A | C2 | 1 | 2 | 7.979 | 0.1316 | 24 | 0.005481 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C2-1-DNS1-ETA1-3 | A | C2 | 1 | 2 | 8.121 | 0.1320 | 24 | 0.005498 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C1-1-DNS1-ETA1-1 | B | C1 | 2 | 1 | 7.314 | 0.1244 | 24 | 0.005181 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C1-1-DNS1-ETA1-2 | B | C1 | 2 | 1 | 7.190 | 0.1248 | 24 | 0.005198 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C1-1-DNS1-ETA1-3 | B | C1 | 2 | 1 | 7.348 | 0.1248 | 24 | 0.005198 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C2-1-DNS1-ETA1-1 | B | C2 | 2 | 2 | 7.301 | 0.1292 | 24 | 0.005384 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C2-1-DNS1-ETA1-2 | B | C2 | 2 | 2 | 7.304 | 0.1297 | 24 | 0.005403 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C2-1-DNS1-ETA1-3 | B | C2 | 2 | 2 | 7.190 | 0.1295 | 24 | 0.005397 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST9-C-C1-1-DNS1-ETA1-1 | C | C1 | 3 | 1 | 7.812 | 0.1317 | 24 | 0.005488 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST9-C-C1-1-DNS1-ETA1-2 | C | C1 | 3 | 1 | 7.555 | 0.1318 | 24 | 0.005492 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST9-C-C1-1-DNS1-ETA1-3 | C | C1 | 3 | 1 | 7.772 | 0.1319 | 24 | 0.005496 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST9-C-C2-1-DNS1-ETA1-1 | C | C2 | 3 | 2 | 7.557 | 0.1278 | 24 | 0.005326 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST9-C-C2-1-DNS1-ETA1-2 | C | C2 | 3 | 2 | 7.469 | 0.1285 | 24 | 0.005355 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST9-C-C2-1-DNS1-ETA1-3 | C | C2 | 3 | 2 | 7.817 | 0.1283 | 24 | 0.005347 | GAGE SECTION SHEAR |

| | | |
|---------------------------|---------------|-----------------|
| Average | 7.503 | 0.005413 |
| Standard Dev. | 0.3126 | |
| Coeff. of Var. [%] | 4.166 | |
| Min. | 6.961 | 0.005181 |
| Max. | 8.121 | 0.005563 |
| Number of Spec. | 18 | 18 |

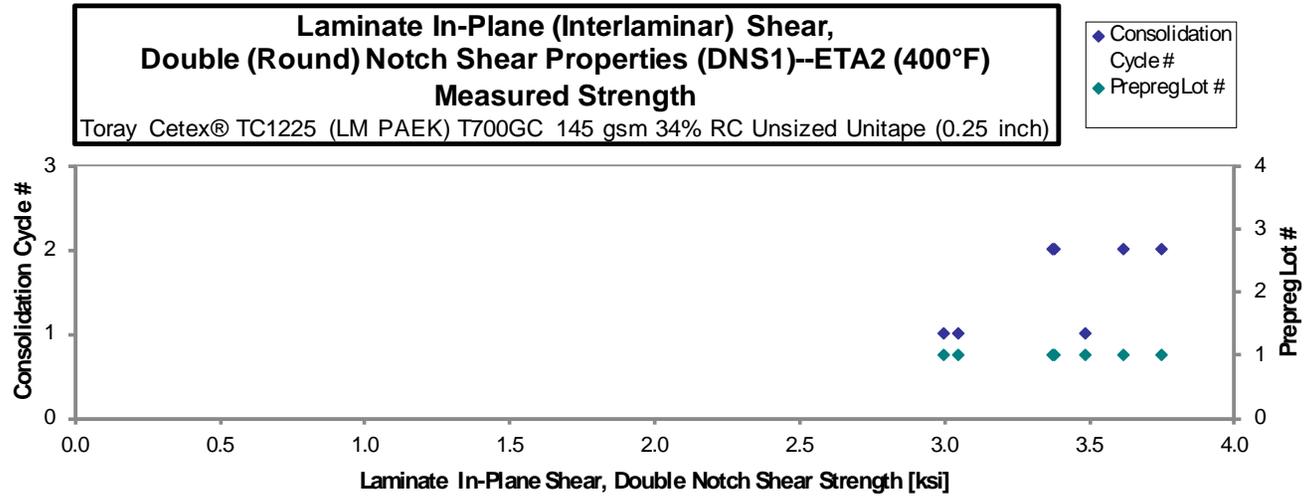


**Laminate In-Plane (Interlaminar) Shear, Double (Round) Notch Shear Properties (DNS1)--ETA2 (400°F)
Strength**
Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Avg. t_{ply} [in] | Failure Mode |
|---|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|---------------------|--------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C1-1-DNS1-ETA2-1 | A | C1 | 1 | 1 | 3.486 | 0.1332 | 24 | 0.005549 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C1-1-DNS1-ETA2-2 | A | C1 | 1 | 1 | 3.047 | 0.1334 | 24 | 0.005558 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C1-1-DNS1-ETA2-3 | A | C1 | 1 | 1 | 2.999 | 0.1336 | 24 | 0.005565 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C2-1-DNS1-ETA2-1 | A | C2 | 1 | 2 | 3.620 | 0.1320 | 24 | 0.005499 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C2-1-DNS1-ETA2-2 | A | C2 | 1 | 2 | 3.750 | 0.1322 | 24 | 0.005507 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C2-1-DNS1-ETA2-3 | A | C2 | 1 | 2 | 3.374 | 0.1321 | 24 | 0.005502 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C2-1-DNS1-SP-5 | A | C2 | 1 | 2 | 3.382 | 0.1323 | 24 | 0.005512 | GAGE SECTION SHEAR |

ETA2 Strength is calculated based on max load on the first load drop.

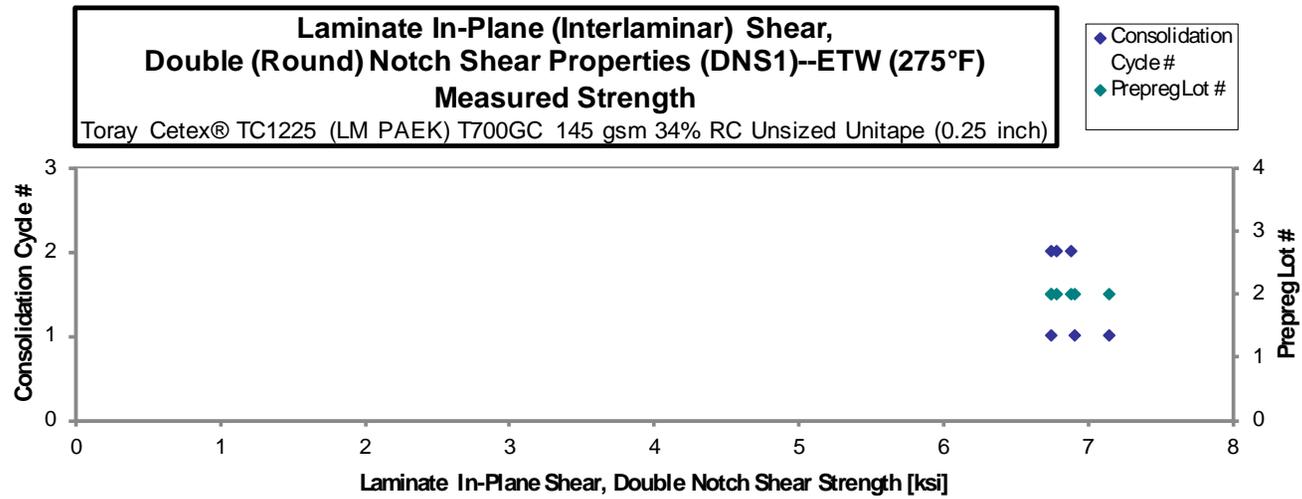
| | | |
|---------------------------|---------------|-----------------|
| Average | 3.380 | 0.005527 |
| Standard Dev. | 0.2774 | |
| Coeff. of Var. [%] | 8.209 | |
| Min. | 2.999 | 0.005499 |
| Max. | 3.750 | 0.005565 |
| Number of Spec. | 7 | 7 |



**Laminate In-Plane (Interlaminar) Shear, Double (Round) Notch Shear Properties (DNS1)--ETW (275°F)
Strength**
Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Avg. t _{ply} [in] | Failure Mode |
|--|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|----------------------------|--------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C1-1-DNS1-ETW-1 | B | C1 | 2 | 1 | 6.740 | 0.1247 | 24 | 0.005194 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C1-1-DNS1-ETW-2 | B | C1 | 2 | 1 | 7.152 | 0.1246 | 24 | 0.005190 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C1-1-DNS1-ETW-3 | B | C1 | 2 | 1 | 6.913 | 0.1246 | 24 | 0.005191 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C2-1-DNS1-ETW-1 | B | C2 | 2 | 2 | 6.786 | 0.1297 | 24 | 0.005404 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C2-1-DNS1-ETW-2 | B | C2 | 2 | 2 | 6.747 | 0.1297 | 24 | 0.005405 | GAGE SECTION SHEAR |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C2-1-DNS1-ETW-3 | B | C2 | 2 | 2 | 6.879 | 0.1294 | 24 | 0.005392 | GAGE SECTION SHEAR |

| | | |
|---------------------------|---------------|-----------------|
| Average | 6.870 | 0.005296 |
| Standard Dev. | 0.1550 | |
| Coeff. of Var. [%] | 2.257 | |
| Min. | 6.740 | 0.005190 |
| Max. | 7.152 | 0.005405 |
| Number of Spec. | 6 | 6 |



4.18 90° Flexural Strength, Proc. A Properties (90FLX)

90° Flexural, Proc. A Properties (90FLX)--RTA (70°F)
Strength & Modulus
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

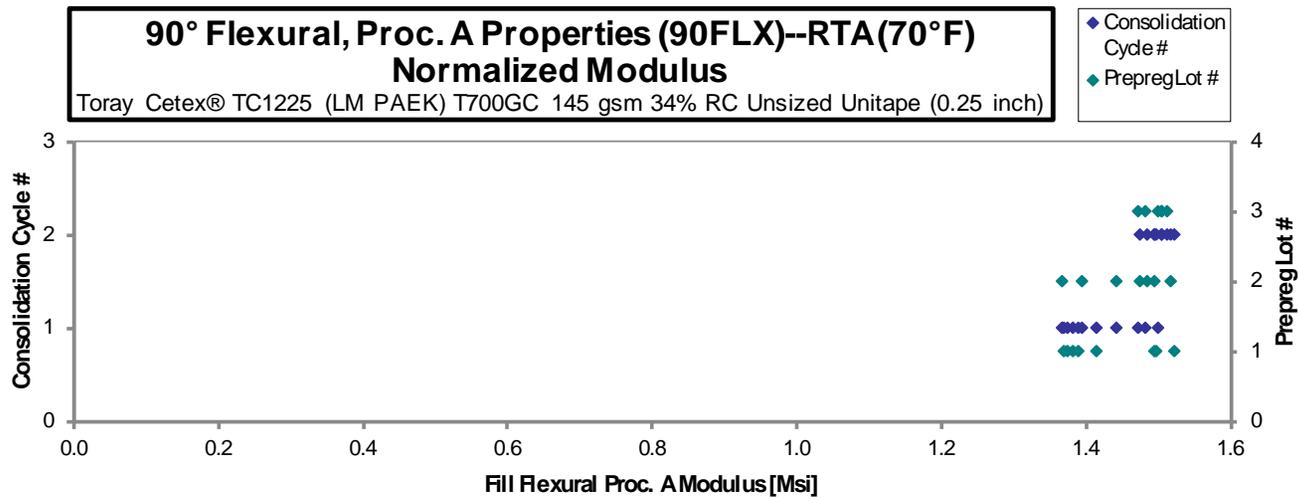
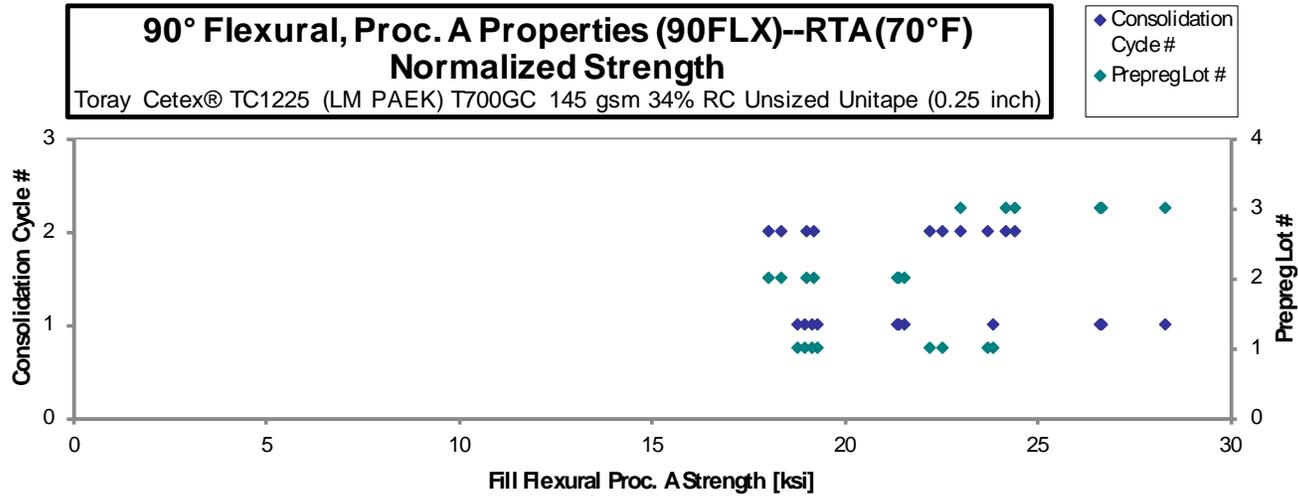
normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Modulus [Msi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|---|---------------|--------------------------|---------------|-----------------------|----------------|---------------|------------------------------|---------------------|--------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST20-A-C1-1-90FLX-RTA-1 | A | C1 | 1 | 1 | 18.77 | 1.400 | 0.1194 | 22 | CAT, TAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST20-A-C1-1-90FLX-RTA-2 | A | C1 | 1 | 1 | 23.48 | 1.367 | 0.1198 | 22 | CAT, TAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST20-A-C1-1-90FLX-RTA-3 | A | C1 | 1 | 1 | 18.49 | 1.348 | 0.1198 | 22 | CAT, TAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST20-A-C1-1-90FLX-SP-1 | A | C1 | 1 | 1 | 19.01 | 1.354 | 0.1197 | 22 | CAT, TAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST20-A-C1-1-90FLX-SP-2 | A | C1 | 1 | 1 | 18.89 | 1.363 | 0.1196 | 22 | CAT, TAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST20-A-C2-1-90FLX-RTA-1 | A | C2 | 1 | 2 | 24.04 | 1.544 | 0.1179 | 22 | CAT, TAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST20-A-C2-1-90FLX-RTA-2 | A | C2 | 1 | 2 | 22.23 | 1.497 | 0.1187 | 22 | CAT, TAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST20-A-C2-1-90FLX-RTA-3 | A | C2 | 1 | 2 | 22.49 | 1.493 | 0.1189 | 22 | CAT, TAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST20-B-C1-1-90FLX-RTA-1 | B | C1 | 2 | 1 | 23.03 | 1.475 | 0.1144 | 22 | SLL, SLR, CAT, TAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST20-B-C1-1-90FLX-RTA-2 | B | C1 | 2 | 1 | 23.47 | 1.522 | 0.1138 | 22 | SLL, SLR, CAT, TAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST20-B-C1-1-90FLX-RTA-3 | B | C1 | 2 | 1 | 23.20 | 1.564 | 0.1141 | 22 | SLL, SLR, CAT, TAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST20-B-C2-1-90FLX-RTA-1 | B | C2 | 2 | 2 | 17.18 | 1.335 | 0.1249 | 22 | SLL, SLR, CAT, TAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST20-B-C2-1-90FLX-RTA-2 | B | C2 | 2 | 2 | 17.32 | 1.369 | 0.1250 | 22 | SLL, SLR, TAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST20-B-C2-1-90FLX-RTA-3 | B | C2 | 2 | 2 | 16.48 | 1.334 | 0.1254 | 22 | SLL, SLR, TAB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST20-B-C2-1-90FLX-SP-1 | B | C2 | 2 | 2 | 16.27 | 1.351 | 0.1250 | 22 | SLL, SLR, TAB, CAT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST20-C-C1-1-90FLX-RTA-1 | C | C1 | 3 | 1 | 25.88 | 1.454 | 0.1206 | 22 | CAT, TAB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST20-C-C1-1-90FLX-RTA-2 | C | C1 | 3 | 1 | 25.48 | 1.421 | 0.1214 | 22 | CAT, TAB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST20-C-C1-1-90FLX-RTA-3 | C | C1 | 3 | 1 | 27.02 | 1.406 | 0.1216 | 22 | CAT, TAB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST20-C-C2-1-90FLX-RTA-1 | C | C2 | 3 | 2 | 23.03 | 1.513 | 0.1188 | 22 | CAT, TAB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST20-C-C2-1-90FLX-RTA-2 | C | C2 | 3 | 2 | 24.24 | 1.495 | 0.1192 | 22 | CAT, TAB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST20-C-C2-1-90FLX-RTA-3 | C | C2 | 3 | 2 | 23.93 | 1.491 | 0.1193 | 22 | CAT, TAB |

| Avg. t_{ply} [in] | Strength _{norm} [ksi] | Modulus _{norm} [Msi] |
|---------------------|--------------------------------|-------------------------------|
| 0.005427 | 18.96 | 1.414 |
| 0.005444 | 23.87 | 1.390 |
| 0.005444 | 18.79 | 1.370 |
| 0.005439 | 19.29 | 1.374 |
| 0.005435 | 19.13 | 1.381 |
| 0.005361 | 23.69 | 1.522 |
| 0.005395 | 22.20 | 1.494 |
| 0.005405 | 22.53 | 1.496 |
| 0.005199 | 21.35 | 1.367 |
| 0.005171 | 21.52 | 1.396 |
| 0.005186 | 21.40 | 1.442 |
| 0.005677 | 18.99 | 1.476 |
| 0.005683 | 19.18 | 1.517 |
| 0.005699 | 18.35 | 1.486 |
| 0.005680 | 18.01 | 1.495 |
| 0.005483 | 26.68 | 1.500 |
| 0.005517 | 26.60 | 1.483 |
| 0.005527 | 28.31 | 1.473 |
| 0.005398 | 23.01 | 1.512 |
| 0.005419 | 24.41 | 1.506 |
| 0.005424 | 24.15 | 1.505 |

Note: Normalized = Measured * (Avg. t_{ply})² / (Normalizing t_{ply})²

| | | | | | | |
|---------------------------|--------------|----------------|--|-----------------|--------------|----------------|
| Average | 21.62 | 1.433 | Average_{norm} | 0.005448 | 21.92 | 1.457 |
| Standard Dev. | 3.318 | 0.07608 | Standard Dev._{norm} | | 3.027 | 0.05584 |
| Coeff. of Var. [%] | 15.35 | 5.309 | Coeff. of Var. [%]_{norm} | | 13.81 | 3.832 |
| Min. | 16.27 | 1.334 | Min. | 0.005171 | 18.01 | 1.367 |
| Max. | 27.02 | 1.564 | Max. | 0.005699 | 28.31 | 1.522 |
| Number of Spec. | 21 | 21 | Number of Spec. | 21 | 21 | 21 |



4.19 “25/50/25” Open-Hole Tension 1 Properties (OHT1)

**Laminate Open-Hole Tension Properties (OHT1)--CTA (-65°F)
Strength**
Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

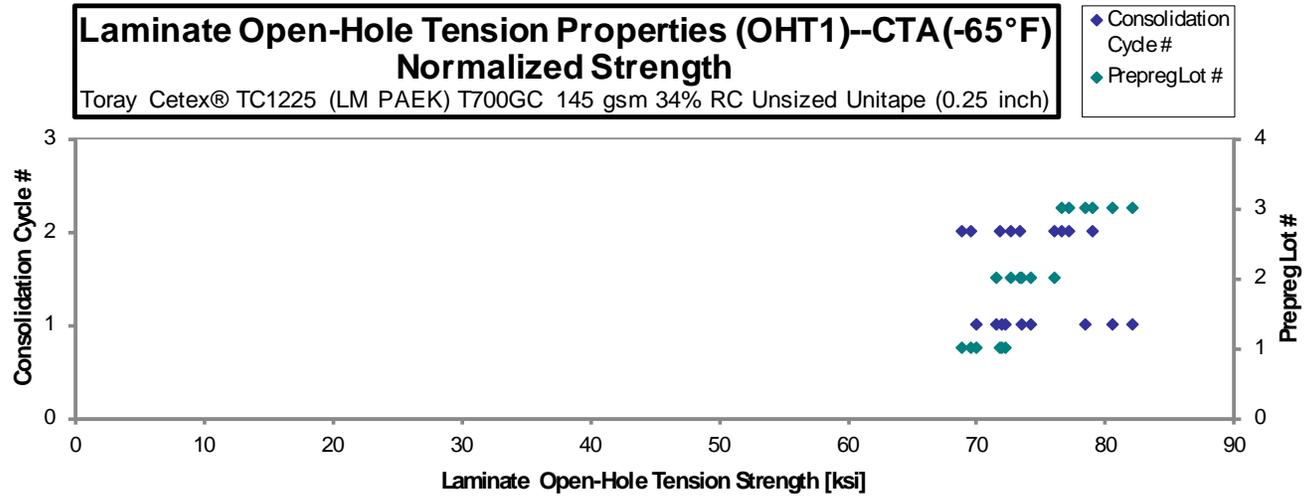
normalizing
t_{ply} [in]
0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|---|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|---------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C1-1-OHT1-CTA-1 | A | C1 | 1 | 1 | 69.29 | 0.08973 | 16 | AGM, AWB, DWB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C1-1-OHT1-CTA-2 | A | C1 | 1 | 1 | 70.00 | 0.08910 | 16 | AGM, AWB, DWB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C1-1-OHT1-CTA-3 | A | C1 | 1 | 1 | 68.37 | 0.08850 | 16 | AGM, AWB, DWB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C2-1-OHT1-CTA-1 | A | C2 | 1 | 2 | 70.52 | 0.08517 | 16 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C2-1-OHT1-CTA-2 | A | C2 | 1 | 2 | 72.89 | 0.08523 | 16 | AGM, LWB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C2-1-OHT1-CTA-3 | A | C2 | 1 | 2 | 70.16 | 0.08488 | 16 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C1-1-OHT1-CTA-1 | B | C1 | 2 | 1 | 74.27 | 0.08630 | 16 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C1-1-OHT1-CTA-2 | B | C1 | 2 | 1 | 73.81 | 0.08607 | 16 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C1-1-OHT1-CTA-3 | B | C1 | 2 | 1 | 71.56 | 0.08633 | 16 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C2-1-OHT1-CTA-1 | B | C2 | 2 | 2 | 72.77 | 0.08705 | 16 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C2-1-OHT1-CTA-2 | B | C2 | 2 | 2 | 76.16 | 0.08633 | 16 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C2-1-OHT1-CTA-3 | B | C2 | 2 | 2 | 72.75 | 0.08637 | 16 | AGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST7-C-C1-1-OHT1-CTA-1 | C | C1 | 3 | 1 | 78.50 | 0.09035 | 16 | AGM, LWT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST7-C-C1-1-OHT1-CTA-2 | C | C1 | 3 | 1 | 75.58 | 0.08973 | 16 | AGM, LWT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST7-C-C1-1-OHT1-CTA-3 | C | C1 | 3 | 1 | 77.43 | 0.08987 | 16 | AGM, LWT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST7-C-C2-1-OHT1-CTA-1 | C | C2 | 3 | 2 | 75.02 | 0.08817 | 16 | AGM, LWT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST7-C-C2-1-OHT1-CTA-2 | C | C2 | 3 | 2 | 76.00 | 0.08783 | 16 | AGM, LWT |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST7-C-C2-1-OHT1-CTA-3 | C | C2 | 3 | 2 | 77.16 | 0.08855 | 16 | AGM, LWT |

| Avg. t _{ply} [in] | Strength _{norm} [ksi] |
|----------------------------|--------------------------------|
| 0.005608 | 71.96 |
| 0.005569 | 72.19 |
| 0.005531 | 70.03 |
| 0.005323 | 69.52 |
| 0.005327 | 71.90 |
| 0.005305 | 68.93 |
| 0.005394 | 74.18 |
| 0.005379 | 73.53 |
| 0.005396 | 71.51 |
| 0.005441 | 73.32 |
| 0.005396 | 76.10 |
| 0.005398 | 72.72 |
| 0.005647 | 82.09 |
| 0.005608 | 78.49 |
| 0.005617 | 80.54 |
| 0.005510 | 76.56 |
| 0.005490 | 77.26 |
| 0.005534 | 79.08 |

Average 73.46
Standard Dev. 3.029
Coeff. of Var. [%] 4.124
Min. 68.37
Max. 78.50
Number of Spec. 18

Average_{norm} 0.005471 74.44
Standard Dev_{norm} 3.867
Coeff. of Var. [%]_{norm} 5.195
Min. 0.005305 68.93
Max. 0.005647 82.09
Number of Spec. 18 18



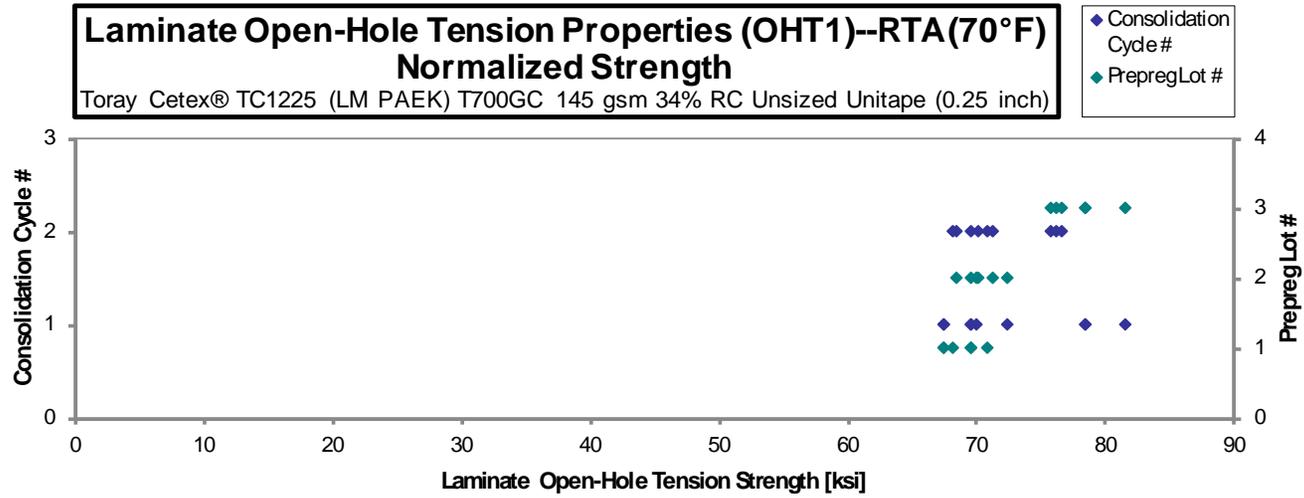
Laminate Open-Hole Tension Properties (OHT1)--RTA (70°F)
Strength
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode | Avg. t_{ply} [in] | Strength _{norm} [ksi] |
|---|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|--------------|---------------------|--------------------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C1-1-OHT1-RTA-1 | A | C1 | 1 | 1 | 65.40 | 0.08903 | 16 | M(A,D)GM | 0.005565 | 67.40 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C1-1-OHT1-RTA-2 | A | C1 | 1 | 1 | 67.76 | 0.08870 | 16 | M(A,D)GM | 0.005544 | 69.57 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C1-1-OHT1-RTA-3 | A | C1 | 1 | 1 | 65.37 | 0.08922 | 16 | M(A,D)GM | 0.005576 | 67.50 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C2-1-OHT1-RTA-1 | A | C2 | 1 | 2 | 70.41 | 0.08530 | 16 | M(A,D)GM | 0.005331 | 69.51 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C2-1-OHT1-RTA-2 | A | C2 | 1 | 2 | 71.79 | 0.08528 | 16 | M(A,D)GM | 0.005330 | 70.87 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C2-1-OHT1-RTA-3 | A | C2 | 1 | 2 | 69.99 | 0.08407 | 16 | M(A,D)GM | 0.005254 | 68.10 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C1-1-OHT1-RTA-1 | B | C1 | 2 | 1 | 69.90 | 0.08607 | 16 | AGM | 0.005379 | 69.63 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C1-1-OHT1-RTA-2 | B | C1 | 2 | 1 | 70.01 | 0.08643 | 16 | AGM | 0.005402 | 70.03 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C1-1-OHT1-RTA-3 | B | C1 | 2 | 1 | 72.96 | 0.08567 | 16 | AGM | 0.005354 | 72.35 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C2-1-OHT1-RTA-1 | B | C2 | 2 | 2 | 67.57 | 0.08752 | 16 | AGM | 0.005470 | 68.44 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C2-1-OHT1-RTA-2 | B | C2 | 2 | 2 | 69.50 | 0.08722 | 16 | AGM | 0.005451 | 70.15 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C2-1-OHT1-RTA-3 | B | C2 | 2 | 2 | 71.21 | 0.08640 | 16 | AGM | 0.005400 | 71.21 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST7-C-C1-1-OHT1-RTA-1 | C | C1 | 3 | 1 | 75.17 | 0.09020 | 16 | M(A,D)GM | 0.005638 | 78.48 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST7-C-C1-1-OHT1-RTA-2 | C | C1 | 3 | 1 | 75.20 | 0.09008 | 16 | M(A,D)GM | 0.005630 | 78.41 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST7-C-C1-1-OHT1-RTA-3 | C | C1 | 3 | 1 | 78.03 | 0.09028 | 16 | M(A,D)GM | 0.005643 | 81.54 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST7-C-C2-1-OHT1-RTA-1 | C | C2 | 3 | 2 | 73.76 | 0.08872 | 16 | M(A,D)GM | 0.005545 | 75.74 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST7-C-C2-1-OHT1-RTA-2 | C | C2 | 3 | 2 | 73.41 | 0.08967 | 16 | M(A,D)GM | 0.005604 | 76.18 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST7-C-C2-1-OHT1-RTA-3 | C | C2 | 3 | 2 | 74.87 | 0.08847 | 16 | M(A,D)GM | 0.005529 | 76.66 |

Average 71.24
 Standard Dev. 3.494
 Coeff. of Var. [%] 4.904
 Min. 65.37
 Max. 78.03
 Number of Spec. 18

Average_{norm} 0.005480 72.32
 Standard Dev._{norm} 4.350
 Coeff. of Var. [%]_{norm} 6.015
 Min. 0.005254 67.40
 Max. 0.005643 81.54
 Number of Spec. 18



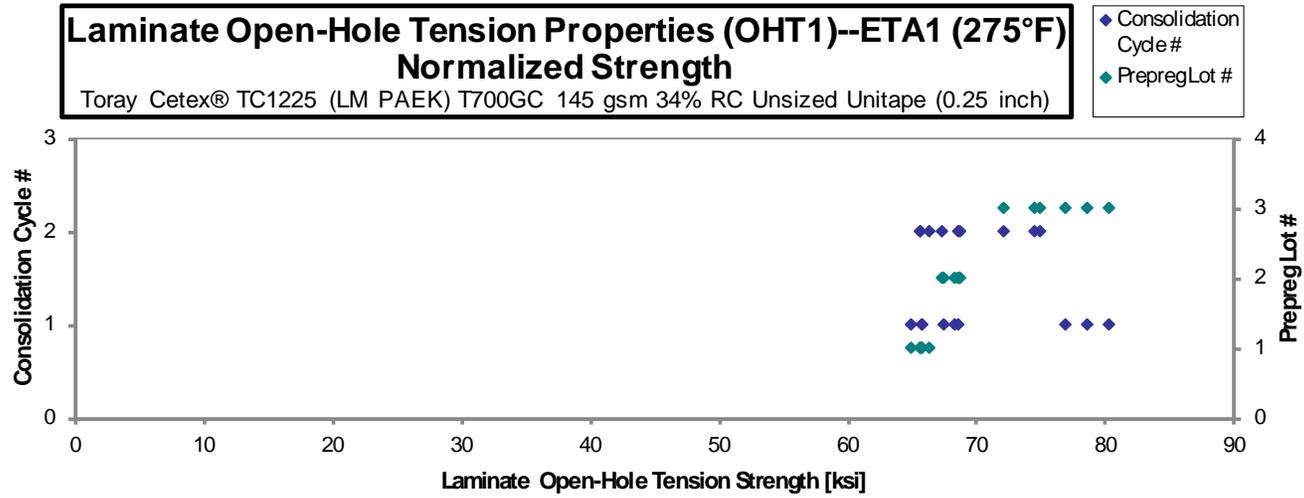
Laminate Open-Hole Tension Properties (OHT1)--ETA1 (275°F)
Strength
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode | Avg. t_{ply} [in] | Strength _{norm} [ksi] |
|--|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|--------------|---------------------|--------------------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C1-1-OHT1-ETA1-1 | A | C1 | 1 | 1 | 64.03 | 0.08880 | 16 | M(A,D)GM | 0.005550 | 65.81 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C1-1-OHT1-ETA1-2 | A | C1 | 1 | 1 | 63.99 | 0.08887 | 16 | M(A,D)GM | 0.005554 | 65.82 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C1-1-OHT1-ETA1-3 | A | C1 | 1 | 1 | 62.90 | 0.08915 | 16 | M(A,D)GM | 0.005572 | 64.90 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C2-1-OHT1-ETA1-1 | A | C2 | 1 | 2 | 66.09 | 0.08575 | 16 | AGM | 0.005359 | 65.59 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C2-1-OHT1-ETA1-2 | A | C2 | 1 | 2 | 67.25 | 0.08527 | 16 | AGM | 0.005329 | 66.37 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C2-1-OHT1-ETA1-3 | A | C2 | 1 | 2 | 67.09 | 0.08453 | 16 | AGM | 0.005283 | 65.64 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C1-1-OHT1-ETA1-1 | B | C1 | 2 | 1 | 69.03 | 0.08593 | 16 | AGM | 0.005371 | 68.66 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C1-1-OHT1-ETA1-2 | B | C1 | 2 | 1 | 68.30 | 0.08637 | 16 | AGM | 0.005398 | 68.27 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C1-1-OHT1-ETA1-3 | B | C1 | 2 | 1 | 67.49 | 0.08630 | 16 | AGM | 0.005394 | 67.41 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C2-1-OHT1-ETA1-1 | B | C2 | 2 | 2 | 68.14 | 0.08688 | 16 | AGM | 0.005430 | 68.52 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C2-1-OHT1-ETA1-2 | B | C2 | 2 | 2 | 67.71 | 0.08773 | 16 | AGM | 0.005483 | 68.75 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C2-1-OHT1-ETA1-3 | B | C2 | 2 | 2 | 67.98 | 0.08548 | 16 | AGM | 0.005343 | 67.26 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST7-C-C1-1-OHT1-ETA1-1 | C | C1 | 3 | 1 | 73.67 | 0.09013 | 16 | AGM, LWT | 0.005633 | 76.85 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST7-C-C1-1-OHT1-ETA1-2 | C | C1 | 3 | 1 | 75.39 | 0.09000 | 16 | AGM, LWT | 0.005625 | 78.53 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST7-C-C1-1-OHT1-ETA1-3 | C | C1 | 3 | 1 | 77.55 | 0.08950 | 16 | AGM, LWT | 0.005594 | 80.34 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST7-C-C2-1-OHT1-ETA1-1 | C | C2 | 3 | 2 | 72.39 | 0.08892 | 16 | AGM, LWT | 0.005557 | 74.50 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST7-C-C2-1-OHT1-ETA1-2 | C | C2 | 3 | 2 | 69.90 | 0.08917 | 16 | AGM, LWT | 0.005573 | 72.13 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST7-C-C2-1-OHT1-ETA1-3 | C | C2 | 3 | 2 | 72.52 | 0.08920 | 16 | AGM | 0.005575 | 74.87 |

Average 68.97
 Standard Dev. 3.977
 Coeff. of Var. [%] 5.767
 Min. 62.90
 Max. 77.55
 Number of Spec. 18

Average_{norm} 0.005479 70.01
 Standard Dev._{norm} 4.915
 Coeff. of Var. [%]_{norm} 7.020
 Min. 0.005283 64.90
 Max. 0.005633 80.34
 Number of Spec. 18



**Laminate Open-Hole Tension Properties (OHT1)--ETA2 (400°F)
Strength**
Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

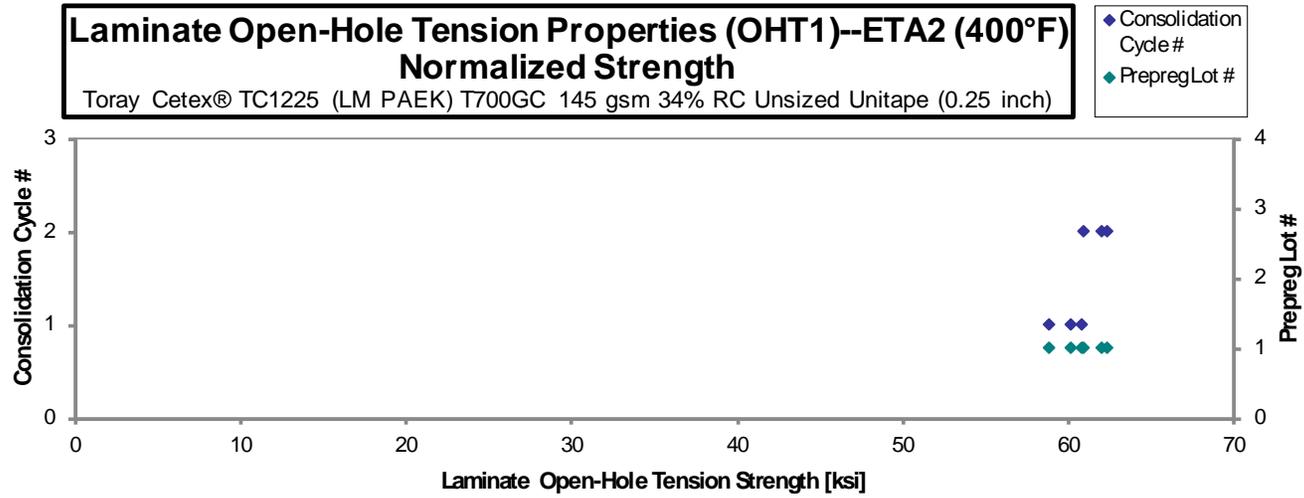
normalizing
t_{ply} [in]
0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|---|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|--------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C1-1-OHT1-ETA2-1 | A | C1 | 1 | 1 | 59.45 | 0.08835 | 16 | M(A,D)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C1-1-OHT1-ETA2-2 | A | C1 | 1 | 1 | 58.67 | 0.08855 | 16 | M(A,D)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C1-1-OHT1-ETA2-3 | A | C1 | 1 | 1 | 57.23 | 0.08883 | 16 | M(A,D)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C2-1-OHT1-ETA2-1 | A | C2 | 1 | 2 | 63.90 | 0.08433 | 16 | M(A,D)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C2-1-OHT1-ETA2-2 | A | C2 | 1 | 2 | 62.76 | 0.08540 | 16 | M(A,D)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C2-1-OHT1-ETA2-3 | A | C2 | 1 | 2 | 61.97 | 0.08495 | 16 | M(A,D)GM |

| Avg. t _{ply} [in] | Strength _{norm} [ksi] |
|----------------------------|--------------------------------|
| 0.005522 | 60.79 |
| 0.005534 | 60.12 |
| 0.005552 | 58.85 |
| 0.005271 | 62.37 |
| 0.005338 | 62.04 |
| 0.005309 | 60.93 |

Average 60.66
Standard Dev. 2.601
Coeff. of Var. [%] 4.287
Min. 57.23
Max. 63.90
Number of Spec. 6

Average_{norm} 0.005421 60.85
Standard Dev_{norm} 1.286
Coeff. of Var. [%]_{norm} 2.114
Min. 0.005271 58.85
Max. 0.005552 62.37
Number of Spec. 6 6



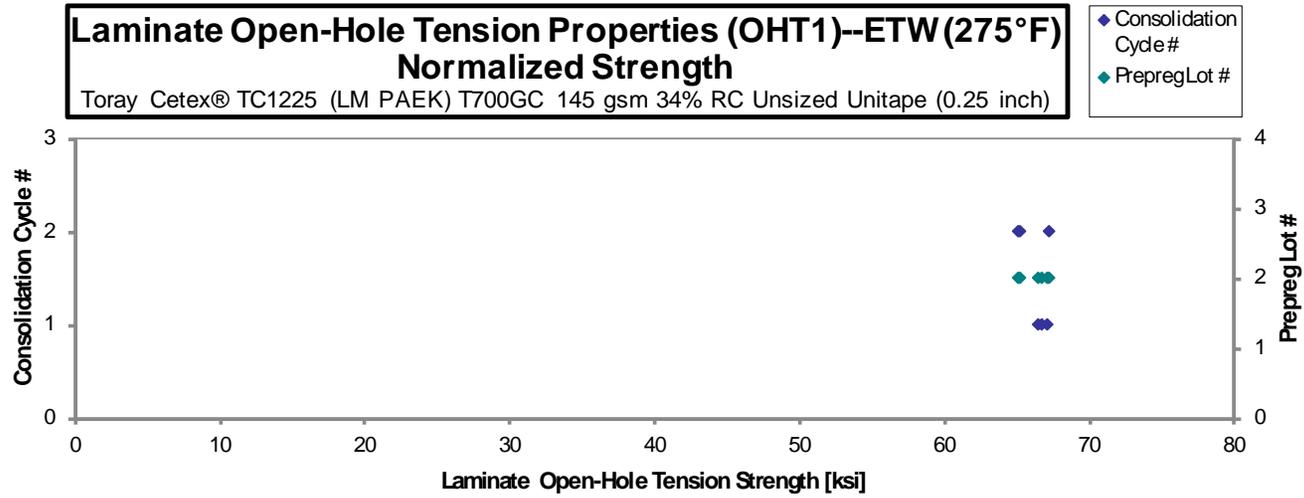
Laminate Open-Hole Tension Properties (OHT1)--ETW (275°F)
Strength
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|--|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|--------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C1-1-OHT1-ETW-1 | B | C1 | 2 | 1 | 67.57 | 0.08587 | 16 | M(A,D)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C1-1-OHT1-ETW-2 | B | C1 | 2 | 1 | 66.70 | 0.08643 | 16 | M(A,D)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C1-1-OHT1-ETW-3 | B | C1 | 2 | 1 | 66.61 | 0.08617 | 16 | M(A,D)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C2-1-OHT1-ETW-1 | B | C2 | 2 | 2 | 66.40 | 0.08745 | 16 | M(A,D)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C2-1-OHT1-ETW-2 | B | C2 | 2 | 2 | 65.52 | 0.08590 | 16 | M(A,D)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C2-1-OHT1-ETW-3 | B | C2 | 2 | 2 | 64.71 | 0.08702 | 16 | M(A,D)GM |

| Avg. t_{ply} [in] | Strength _{norm} [ksi] |
|---------------------|--------------------------------|
| 0.005367 | 67.15 |
| 0.005402 | 66.72 |
| 0.005385 | 66.43 |
| 0.005466 | 67.21 |
| 0.005369 | 65.14 |
| 0.005439 | 65.17 |

| | | | | |
|---------------------------|---------------|--|-----------------|---------------|
| Average | 66.25 | Average_{norm} | 0.005405 | 66.30 |
| Standard Dev. | 0.9987 | Standard Dev._{norm} | | 0.9330 |
| Coeff. of Var. [%] | 1.507 | Coeff. of Var. [%]_{norm} | | 1.407 |
| Min. | 64.71 | Min. | 0.005367 | 65.14 |
| Max. | 67.57 | Max. | 0.005466 | 67.21 |
| Number of Spec. | 6 | Number of Spec. | 6 | 6 |



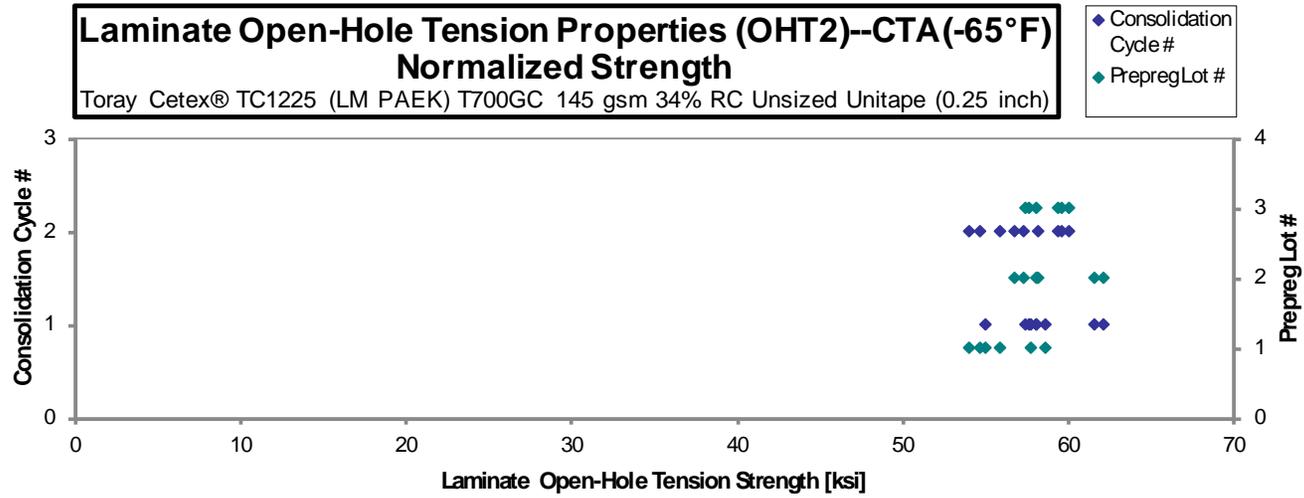
4.20 “10/80/10” Open-Hole Tension 2 Properties (OHT2)

**Laminate Open-Hole Tension Properties (OHT2)--CTA (-65°F)
Strength**
Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

normalizing
t_{ply} [in]
0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode | Avg. t _{ply} [in] | Strength _{norm} [ksi] |
|--|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|--------------|----------------------------|--------------------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C1-1-OHT2-CTA-1 | A | C1 | 1 | 1 | 55.57 | 0.1069 | 20 | AGM | 0.005346 | 55.02 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C1-1-OHT2-CTA-2 | A | C1 | 1 | 1 | 58.42 | 0.1068 | 20 | AGM | 0.005338 | 57.75 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C1-1-OHT2-CTA-3 | A | C1 | 1 | 1 | 58.97 | 0.1073 | 20 | AGM | 0.005367 | 58.60 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C2-1-OHT2-CTA-1 | A | C2 | 1 | 2 | 54.60 | 0.1080 | 20 | AGM | 0.005401 | 54.61 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C2-1-OHT2-CTA-2 | A | C2 | 1 | 2 | 53.68 | 0.1087 | 20 | AGM | 0.005436 | 54.03 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C2-1-OHT2-CTA-3 | A | C2 | 1 | 2 | 55.81 | 0.1081 | 20 | AGM | 0.005403 | 55.84 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C1-1-OHT2-CTA-1 | B | C1 | 2 | 1 | 59.54 | 0.1127 | 20 | AGM, DWB | 0.005637 | 62.15 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C1-1-OHT2-CTA-2 | B | C1 | 2 | 1 | 58.99 | 0.1127 | 20 | AGM, DWB | 0.005633 | 61.54 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C1-1-OHT2-CTA-3 | B | C1 | 2 | 1 | 55.72 | 0.1126 | 20 | AGM, DWB | 0.005632 | 58.12 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C2-1-OHT2-CTA-1 | B | C2 | 2 | 2 | 54.98 | 0.1115 | 20 | AGM | 0.005576 | 56.77 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C2-1-OHT2-CTA-2 | B | C2 | 2 | 2 | 57.22 | 0.1098 | 20 | AGM | 0.005491 | 58.18 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C2-1-OHT2-CTA-3 | B | C2 | 2 | 2 | 56.39 | 0.1097 | 20 | AGM | 0.005484 | 57.27 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST12-C-C1-1-OHT2-CTA-1 | C | C1 | 3 | 1 | 57.26 | 0.1084 | 20 | AGM | 0.005418 | 57.46 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST12-C-C1-1-OHT2-CTA-2 | C | C1 | 3 | 1 | 57.95 | 0.1082 | 20 | AGM | 0.005410 | 58.06 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST12-C-C1-1-OHT2-CTA-3 | C | C1 | 3 | 1 | 57.45 | 0.1084 | 20 | AGM | 0.005420 | 57.67 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST12-C-C2-1-OHT2-CTA-1 | C | C2 | 3 | 2 | 58.88 | 0.1094 | 20 | AGM | 0.005468 | 59.63 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST12-C-C2-1-OHT2-CTA-2 | C | C2 | 3 | 2 | 58.91 | 0.1089 | 20 | AGM | 0.005445 | 59.40 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST12-C-C2-1-OHT2-CTA-3 | C | C2 | 3 | 2 | 59.43 | 0.1092 | 20 | AGM | 0.005460 | 60.09 |

| | | | | |
|---------------------------|--------------|--|-----------------|--------------|
| Average | 57.21 | Average_{norm} | 0.005465 | 57.90 |
| Standard Dev. | 1.818 | Standard Dev._{norm} | | 2.200 |
| Coeff. of Var. [%] | 3.177 | Coeff. of Var. [%]_{norm} | | 3.800 |
| Min. | 53.68 | Min. | 0.005338 | 54.03 |
| Max. | 59.54 | Max. | 0.005637 | 62.15 |
| Number of Spec. | 18 | Number of Spec. | 18 | 18 |



Laminate Open-Hole Tension Properties (OHT2)--RTA (70°F)
Strength
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

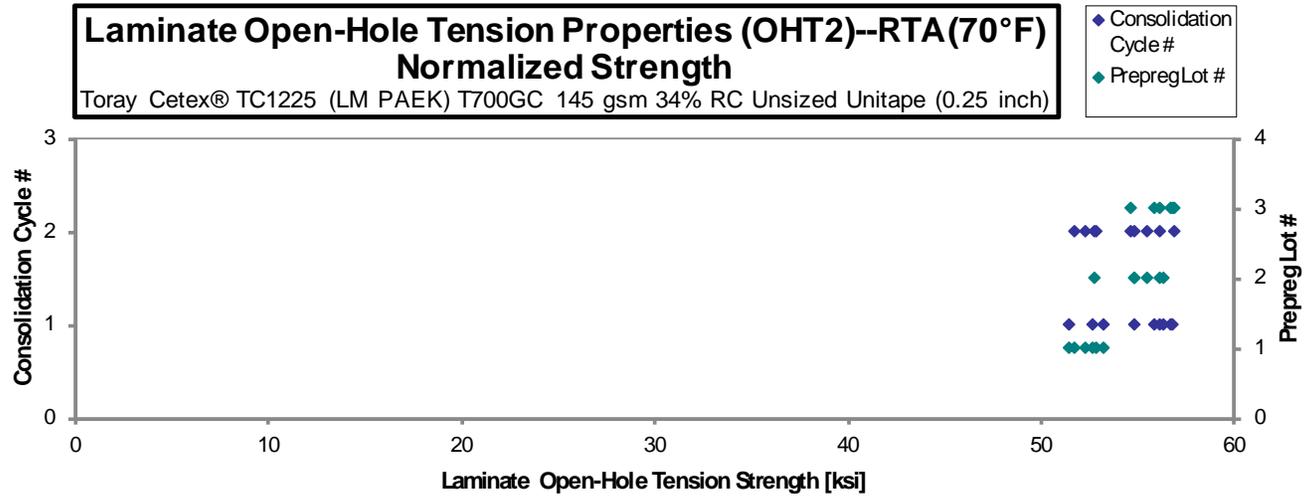
normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|--|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|--------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C1-1-OHT2-RTA-1 | A | C1 | 1 | 1 | 52.02 | 0.1069 | 20 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C1-1-OHT2-RTA-2 | A | C1 | 1 | 1 | 53.07 | 0.1071 | 20 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C1-1-OHT2-RTA-3 | A | C1 | 1 | 1 | 53.49 | 0.1075 | 20 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C2-1-OHT2-RTA-1 | A | C2 | 1 | 2 | 52.37 | 0.1078 | 20 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C2-1-OHT2-RTA-2 | A | C2 | 1 | 2 | 51.57 | 0.1084 | 20 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C2-1-OHT2-RTA-3 | A | C2 | 1 | 2 | 52.64 | 0.1085 | 20 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C1-1-OHT2-RTA-1 | B | C1 | 2 | 1 | 54.14 | 0.1125 | 20 | M(A,D)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C1-1-OHT2-RTA-2 | B | C1 | 2 | 1 | 52.43 | 0.1129 | 20 | M(A,D)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C1-1-OHT2-RTA-3 | B | C1 | 2 | 1 | 53.91 | 0.1125 | 20 | M(A,D)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C2-1-OHT2-RTA-1 | B | C2 | 2 | 2 | 51.31 | 0.1112 | 20 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C2-1-OHT2-RTA-2 | B | C2 | 2 | 2 | 54.14 | 0.1094 | 20 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C2-1-OHT2-RTA-3 | B | C2 | 2 | 2 | 54.35 | 0.1104 | 20 | AGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST12-C-C1-1-OHT2-RTA-1 | C | C1 | 3 | 1 | 56.72 | 0.1082 | 20 | M(A,D)GM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST12-C-C1-1-OHT2-RTA-2 | C | C1 | 3 | 1 | 56.52 | 0.1084 | 20 | M(A,D)GM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST12-C-C1-1-OHT2-RTA-3 | C | C1 | 3 | 1 | 56.04 | 0.1076 | 20 | M(A,D)GM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST12-C-C2-1-OHT2-RTA-1 | C | C2 | 3 | 2 | 56.34 | 0.1091 | 20 | AGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST12-C-C2-1-OHT2-RTA-2 | C | C2 | 3 | 2 | 53.95 | 0.1094 | 20 | AGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST12-C-C2-1-OHT2-RTA-3 | C | C2 | 3 | 2 | 55.87 | 0.1086 | 20 | AGM |

| Avg. t_{ply} [in] | Strength _{norm} [ksi] |
|---------------------|--------------------------------|
| 0.005344 | 51.48 |
| 0.005357 | 52.65 |
| 0.005377 | 53.26 |
| 0.005390 | 52.27 |
| 0.005418 | 51.75 |
| 0.005425 | 52.88 |
| 0.005623 | 56.38 |
| 0.005647 | 54.82 |
| 0.005627 | 56.17 |
| 0.005558 | 52.81 |
| 0.005470 | 54.84 |
| 0.005518 | 55.54 |
| 0.005410 | 56.82 |
| 0.005418 | 56.71 |
| 0.005380 | 55.83 |
| 0.005453 | 56.89 |
| 0.005468 | 54.63 |
| 0.005432 | 56.20 |

Average 53.94
 Standard Dev. 1.751
 Coeff. of Var. [%] 3.246
 Min. 51.31
 Max. 56.72
 Number of Spec. 18

Average_{norm} 0.005462 54.55
 Standard Dev._{norm} 1.884
 Coeff. of Var. [%]_{norm} 3.454
 Min. 0.005344 51.48
 Max. 0.005647 56.89
 Number of Spec. 18 18

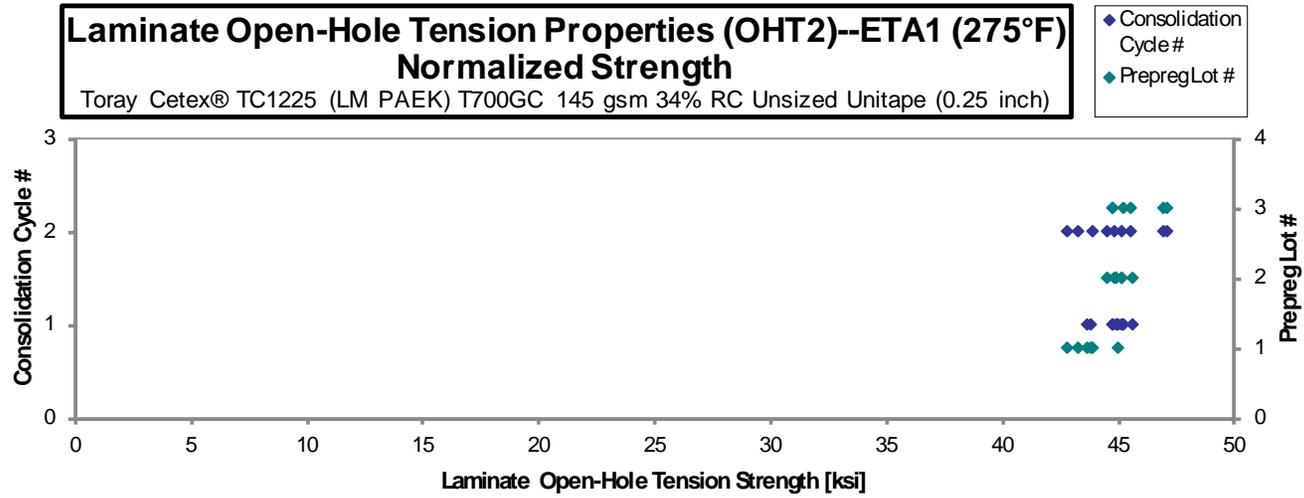


**Laminate Open-Hole Tension Properties (OHT2)--ETA1 (275°F)
Strength**
Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

normalizing
t_{ply} [in]
0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode | Avg. t _{ply} [in] | Strength _{norm} [ksi] |
|---|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|--------------|----------------------------|--------------------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C1-1-OHT2-ETA1-1 | A | C1 | 1 | 1 | 43.92 | 0.1074 | 20 | AGM | 0.005368 | 43.66 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C1-1-OHT2-ETA1-2 | A | C1 | 1 | 1 | 44.04 | 0.1075 | 20 | AGM | 0.005375 | 43.84 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C1-1-OHT2-ETA1-3 | A | C1 | 1 | 1 | 45.15 | 0.1077 | 20 | AGM | 0.005383 | 45.00 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C2-1-OHT2-ETA1-1 | A | C2 | 1 | 2 | 43.23 | 0.1081 | 20 | AGM | 0.005403 | 43.25 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C2-1-OHT2-ETA1-2 | A | C2 | 1 | 2 | 43.80 | 0.1083 | 20 | AGM | 0.005413 | 43.91 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C2-1-OHT2-ETA1-3 | A | C2 | 1 | 2 | 42.52 | 0.1087 | 20 | AGM | 0.005436 | 42.81 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C1-1-OHT2-ETA1-1 | B | C1 | 2 | 1 | 43.28 | 0.1121 | 20 | M(A,D)GM | 0.005605 | 44.92 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C1-1-OHT2-ETA1-2 | B | C1 | 2 | 1 | 43.55 | 0.1120 | 20 | M(A,D)GM | 0.005599 | 45.16 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C1-1-OHT2-ETA1-3 | B | C1 | 2 | 1 | 43.79 | 0.1124 | 20 | M(A,D)GM | 0.005622 | 45.59 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C2-1-OHT2-ETA1-1 | B | C2 | 2 | 2 | 44.03 | 0.1091 | 20 | AGM | 0.005456 | 44.49 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C2-1-OHT2-ETA1-2 | B | C2 | 2 | 2 | 43.43 | 0.1115 | 20 | AGM | 0.005573 | 44.83 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C2-1-OHT2-ETA1-3 | B | C2 | 2 | 2 | 44.66 | 0.1091 | 20 | AGM | 0.005457 | 45.13 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST12-C-C1-1-OHT2-ETA1-1 | C | C1 | 3 | 1 | 45.01 | 0.1085 | 20 | AGM | 0.005427 | 45.23 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST12-C-C1-1-OHT2-ETA1-2 | C | C1 | 3 | 1 | 44.57 | 0.1084 | 20 | AGM | 0.005420 | 44.73 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST12-C-C1-1-OHT2-ETA1-3 | C | C1 | 3 | 1 | 44.89 | 0.1077 | 20 | AGM | 0.005385 | 44.76 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST12-C-C2-1-OHT2-ETA1-1 | C | C2 | 3 | 2 | 45.23 | 0.1087 | 20 | AGM | 0.005437 | 45.53 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST12-C-C2-1-OHT2-ETA1-2 | C | C2 | 3 | 2 | 46.54 | 0.1094 | 20 | AGM | 0.005470 | 47.15 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST12-C-C2-1-OHT2-ETA1-3 | C | C2 | 3 | 2 | 46.11 | 0.1100 | 20 | AGM | 0.005498 | 46.95 |

| | | | | |
|--------------------|-------|------------------------------------|----------|-------|
| Average | 44.32 | Average _{norm} | 0.005463 | 44.83 |
| Standard Dev. | 1.040 | Standard Dev. _{norm} | | 1.119 |
| Coeff. of Var. [%] | 2.347 | Coeff. of Var. [%] _{norm} | | 2.495 |
| Min. | 42.52 | Min. | 0.005368 | 42.81 |
| Max. | 46.54 | Max. | 0.005622 | 47.15 |
| Number of Spec. | 18 | Number of Spec. | 18 | 18 |



4.21 “50/40/10” Open-Hole Tension 3 Properties (OHT3)

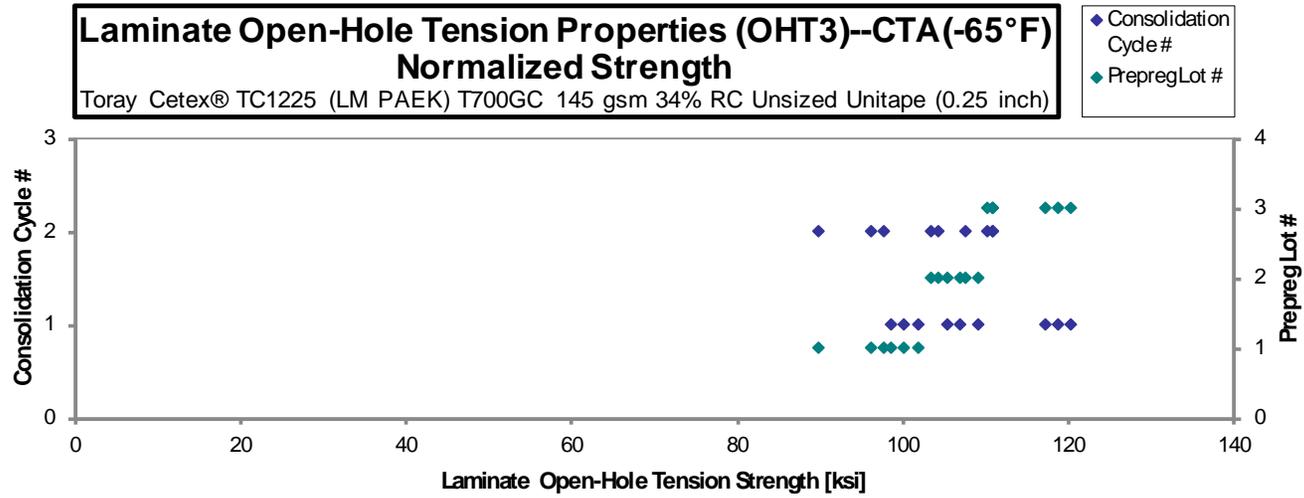
**Laminate Open-Hole Tension Properties (OHT3)--CTA (-65°F)
Strength**
Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

normalizing
t_{ply} [in]
0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode | Avg. t _{ply} [in] | Strength _{norm} [ksi] |
|--|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|--------------|----------------------------|--------------------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C1-1-OHT3-CTA-1 | A | C1 | 1 | 1 | 98.33 | 0.1120 | 20 | AGM | 0.005598 | 101.9 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C1-1-OHT3-CTA-2 | A | C1 | 1 | 1 | 94.31 | 0.1129 | 20 | AGM | 0.005643 | 98.55 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C1-1-OHT3-CTA-3 | A | C1 | 1 | 1 | 96.94 | 0.1116 | 20 | AGM | 0.005582 | 100.2 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C2-1-OHT3-CTA-1 | A | C2 | 1 | 2 | 90.46 | 0.1073 | 20 | AGM | 0.005366 | 89.89 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C2-1-OHT3-CTA-2 | A | C2 | 1 | 2 | 97.63 | 0.1081 | 20 | AGM | 0.005404 | 97.71 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C2-1-OHT3-CTA-3 | A | C2 | 1 | 2 | 96.67 | 0.1075 | 20 | AGM | 0.005374 | 96.21 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C1-1-OHT3-CTA-1 | B | C1 | 2 | 1 | 108.4 | 0.1088 | 20 | AGM | 0.005441 | 109.2 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C1-1-OHT3-CTA-2 | B | C1 | 2 | 1 | 104.5 | 0.1088 | 20 | AGM | 0.005440 | 105.3 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C1-1-OHT3-CTA-3 | B | C1 | 2 | 1 | 106.7 | 0.1083 | 20 | AGM | 0.005414 | 107.0 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C2-1-OHT3-CTA-1 | B | C2 | 2 | 2 | 103.2 | 0.1091 | 20 | AGM | 0.005453 | 104.2 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C2-1-OHT3-CTA-2 | B | C2 | 2 | 2 | 106.4 | 0.1092 | 20 | AGM | 0.005462 | 107.7 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C2-1-OHT3-CTA-3 | B | C2 | 2 | 2 | 102.0 | 0.1096 | 20 | AGM | 0.005478 | 103.5 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C1-1-OHT3-CTA-1 | C | C1 | 3 | 1 | 117.3 | 0.1094 | 20 | AGM | 0.005468 | 118.8 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C1-1-OHT3-CTA-2 | C | C1 | 3 | 1 | 116.5 | 0.1087 | 20 | AGM | 0.005433 | 117.3 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C1-1-OHT3-CTA-3 | C | C1 | 3 | 1 | 119.3 | 0.1088 | 20 | AGM | 0.005441 | 120.2 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C2-1-OHT3-CTA-1 | C | C2 | 3 | 2 | 108.6 | 0.1096 | 20 | AGM | 0.005478 | 110.2 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C2-1-OHT3-CTA-2 | C | C2 | 3 | 2 | 108.9 | 0.1100 | 20 | AGM | 0.005498 | 110.9 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C2-1-OHT3-CTA-3 | C | C2 | 3 | 2 | 108.4 | 0.1104 | 20 | AGM | 0.005518 | 110.8 |

Average 104.7
Standard Dev. 8.101
Coeff. of Var. [%] 7.737
Min. 90.46
Max. 119.3
Number of Spec. 18

Average_{norm} 0.005472 106.1
Standard Dev._{norm} 8.083
Coeff. of Var. [%]_{norm} 7.620
Min. 0.005366 89.89
Max. 0.005643 120.2
Number of Spec. 18 18



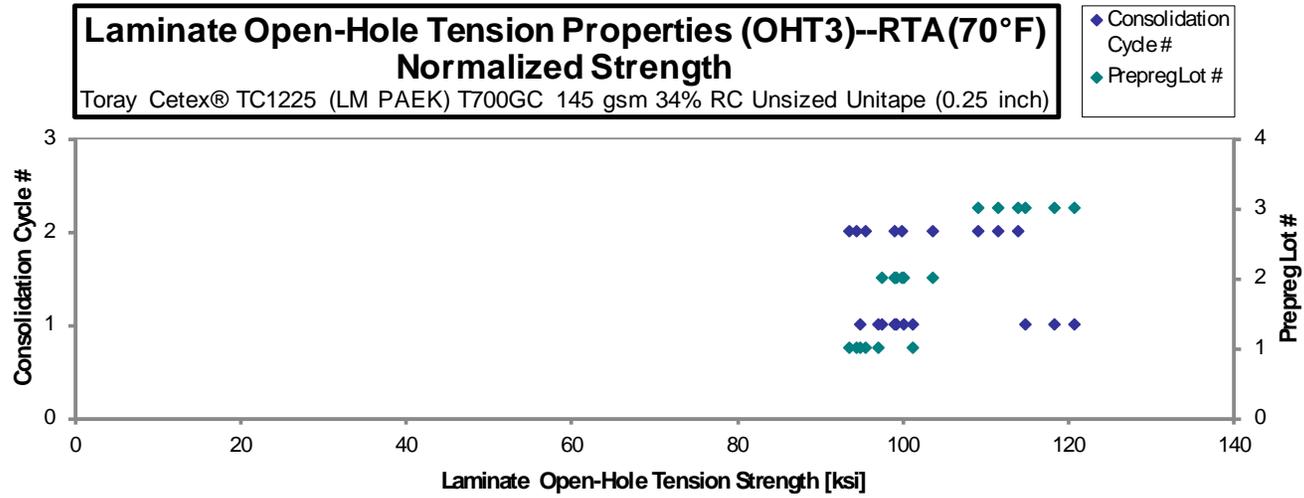
Laminate Open-Hole Tension Properties (OHT3)--RTA (70°F)
Strength
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode | Avg. t_{ply} [in] | Strength _{norm} [ksi] |
|--|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|--------------|---------------------|--------------------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C1-1-OHT3-RTA-1 | A | C1 | 1 | 1 | 91.71 | 0.1116 | 20 | M(A,D)GM | 0.005582 | 94.79 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C1-1-OHT3-RTA-2 | A | C1 | 1 | 1 | 98.28 | 0.1113 | 20 | M(A,D)GM | 0.005566 | 101.3 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C1-1-OHT3-RTA-3 | A | C1 | 1 | 1 | 93.66 | 0.1119 | 20 | M(A,D)GM | 0.005595 | 97.04 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C2-1-OHT3-RTA-1 | A | C2 | 1 | 2 | 94.73 | 0.1075 | 20 | M(A,D)GM | 0.005377 | 94.32 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C2-1-OHT3-RTA-2 | A | C2 | 1 | 2 | 95.80 | 0.1076 | 20 | M(A,D)GM | 0.005380 | 95.44 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C2-1-OHT3-RTA-3 | A | C2 | 1 | 2 | 94.18 | 0.1072 | 20 | M(A,D)GM | 0.005361 | 93.49 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C1-1-OHT3-RTA-1 | B | C1 | 2 | 1 | 99.99 | 0.1082 | 20 | AGM | 0.005412 | 100.2 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C1-1-OHT3-RTA-2 | B | C1 | 2 | 1 | 97.17 | 0.1085 | 20 | AGM | 0.005423 | 97.59 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C1-1-OHT3-RTA-3 | B | C1 | 2 | 1 | 98.61 | 0.1086 | 20 | AGM | 0.005428 | 99.13 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-B-C1-1-FHT3-RTA-1* | B | C1 | 2 | 1 | 96.59 | 0.1111 | 20 | M(A,D)GM | 0.005553 | 99.32 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C2-1-OHT3-RTA-1 | B | C2 | 2 | 2 | 102.0 | 0.1098 | 20 | AGM | 0.005488 | 103.6 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C2-1-OHT3-RTA-2 | B | C2 | 2 | 2 | 98.42 | 0.1097 | 20 | AGM | 0.005487 | 100.0 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C2-1-OHT3-RTA-3 | B | C2 | 2 | 2 | 96.50 | 0.1108 | 20 | AGM | 0.005538 | 98.98 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C1-1-OHT3-RTA-1 | C | C1 | 3 | 1 | 117.1 | 0.1091 | 20 | M(A,D)GM | 0.005455 | 118.3 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C1-1-OHT3-RTA-2 | C | C1 | 3 | 1 | 113.1 | 0.1097 | 20 | M(A,D)GM | 0.005485 | 114.9 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C1-1-OHT3-RTA-3 | C | C1 | 3 | 1 | 119.8 | 0.1088 | 20 | M(A,D)GM | 0.005438 | 120.6 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C2-1-OHT3-RTA-1 | C | C2 | 3 | 2 | 112.4 | 0.1095 | 20 | AGM | 0.005477 | 114.0 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C2-1-OHT3-RTA-2 | C | C2 | 3 | 2 | 109.0 | 0.1106 | 20 | AGM | 0.005528 | 111.6 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C2-1-OHT3-RTA-3 | C | C2 | 3 | 2 | 106.9 | 0.1102 | 20 | AGM | 0.005510 | 109.0 |

*FHT specimen was tested for OHT.

| | | | | |
|---------------------------|--------------|--|-----------------|--------------|
| Average | 101.9 | Average_{norm} | 0.005478 | 103.4 |
| Standard Dev. | 8.508 | Standard Dev._{norm} | | 8.615 |
| Coeff. of Var. [%] | 8.350 | Coeff. of Var. [%]_{norm} | | 8.335 |
| Min. | 91.71 | Min. | 0.005361 | 93.49 |
| Max. | 119.8 | Max. | 0.005595 | 120.6 |
| Number of Spec. | 19 | Number of Spec. | 19 | 19 |

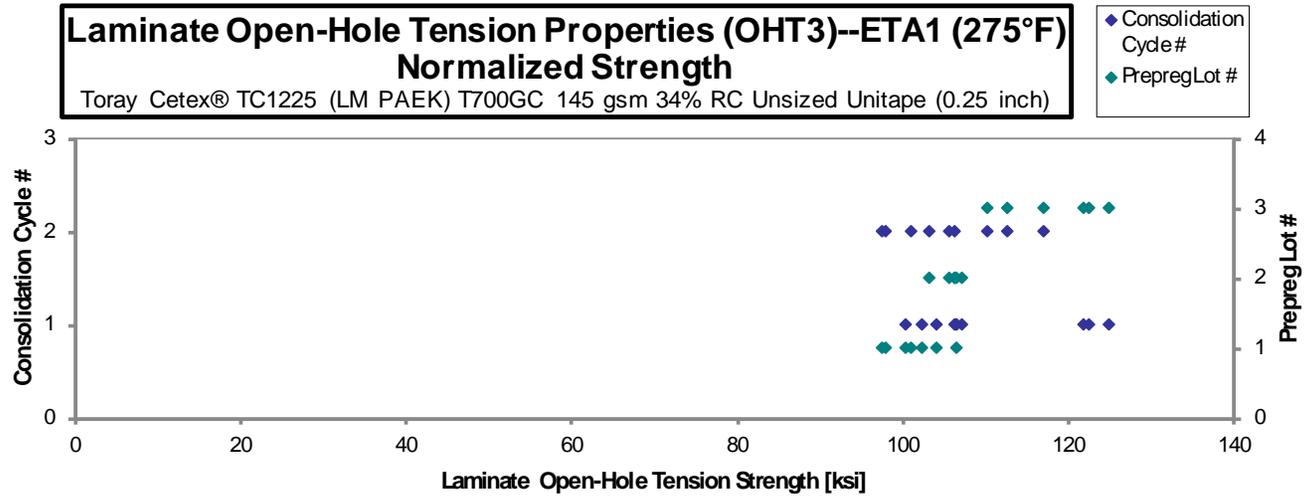


Laminate Open-Hole Tension Properties (OHT3)--ETA1 (275°F)
Strength
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode | Avg. t_{ply} [in] | Strength _{norm} [ksi] |
|---|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|--------------|---------------------|--------------------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C1-1-OHT3-ETA1-1 | A | C1 | 1 | 1 | 100.4 | 0.1119 | 20 | M(A,D)GM | 0.005594 | 104.0 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C1-1-OHT3-ETA1-2 | A | C1 | 1 | 1 | 102.9 | 0.1117 | 20 | M(A,D)GM | 0.005584 | 106.4 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C1-1-OHT3-ETA1-3 | A | C1 | 1 | 1 | 98.24 | 0.1126 | 20 | M(A,D)GM | 0.005628 | 102.4 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C1-1-OHT3-SP-5 | A | C1 | 1 | 1 | 96.63 | 0.1122 | 20 | M(A,D)GM | 0.005611 | 100.4 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C2-1-OHT3-ETA1-1 | A | C2 | 1 | 2 | 98.10 | 0.1072 | 20 | AGM | 0.005362 | 97.41 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C2-1-OHT3-ETA1-2 | A | C2 | 1 | 2 | 101.8 | 0.1072 | 20 | AGM | 0.005358 | 101.0 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-A-C2-1-OHT3-ETA1-3 | A | C2 | 1 | 2 | 97.44 | 0.1085 | 20 | AGM | 0.005423 | 97.85 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C1-1-OHT3-ETA1-1 | B | C1 | 2 | 1 | 106.1 | 0.1082 | 20 | AGM | 0.005409 | 106.3 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C1-1-OHT3-ETA1-2 | B | C1 | 2 | 1 | 106.8 | 0.1083 | 20 | AGM | 0.005416 | 107.1 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C1-1-OHT3-ETA1-3 | B | C1 | 2 | 1 | 104.4 | 0.1101 | 20 | AGM | 0.005505 | 106.5 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C2-1-OHT3-ETA1-1 | B | C2 | 2 | 2 | 101.9 | 0.1094 | 20 | AGM | 0.005471 | 103.3 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C2-1-OHT3-ETA1-2 | B | C2 | 2 | 2 | 104.1 | 0.1095 | 20 | AGM | 0.005476 | 105.6 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST15-B-C2-1-OHT3-ETA1-3 | B | C2 | 2 | 2 | 104.8 | 0.1094 | 20 | AGM | 0.005468 | 106.2 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C1-1-OHT3-ETA1-1 | C | C1 | 3 | 1 | 124.0 | 0.1088 | 20 | AGM | 0.005440 | 124.9 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C1-1-OHT3-ETA1-2 | C | C1 | 3 | 1 | 120.9 | 0.1089 | 20 | AGM | 0.005443 | 121.8 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C1-1-OHT3-ETA1-3 | C | C1 | 3 | 1 | 120.1 | 0.1102 | 20 | AGM | 0.005508 | 122.5 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C2-1-OHT3-ETA1-1 | C | C2 | 3 | 2 | 110.3 | 0.1103 | 20 | AGM | 0.005513 | 112.6 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C2-1-OHT3-ETA1-2 | C | C2 | 3 | 2 | 108.6 | 0.1097 | 20 | AGM | 0.005483 | 110.2 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST15-C-C2-1-OHT3-ETA1-3 | C | C2 | 3 | 2 | 114.9 | 0.1100 | 20 | AGM | 0.005498 | 117.0 |

| | | | | |
|---------------------------|--------------|--|-----------------|--------------|
| Average | 106.4 | Average_{norm} | 0.005484 | 108.1 |
| Standard Dev. | 8.201 | Standard Dev._{norm} | | 8.178 |
| Coeff. of Var. [%] | 7.705 | Coeff. of Var. [%]_{norm} | | 7.567 |
| Min. | 96.63 | Min. | 0.005358 | 97.41 |
| Max. | 124.0 | Max. | 0.005628 | 124.9 |
| Number of Spec. | 19 | Number of Spec. | 19 | 19 |



4.22 “25/50/25” Filled-Hole Tension 1 Properties (FHT1)

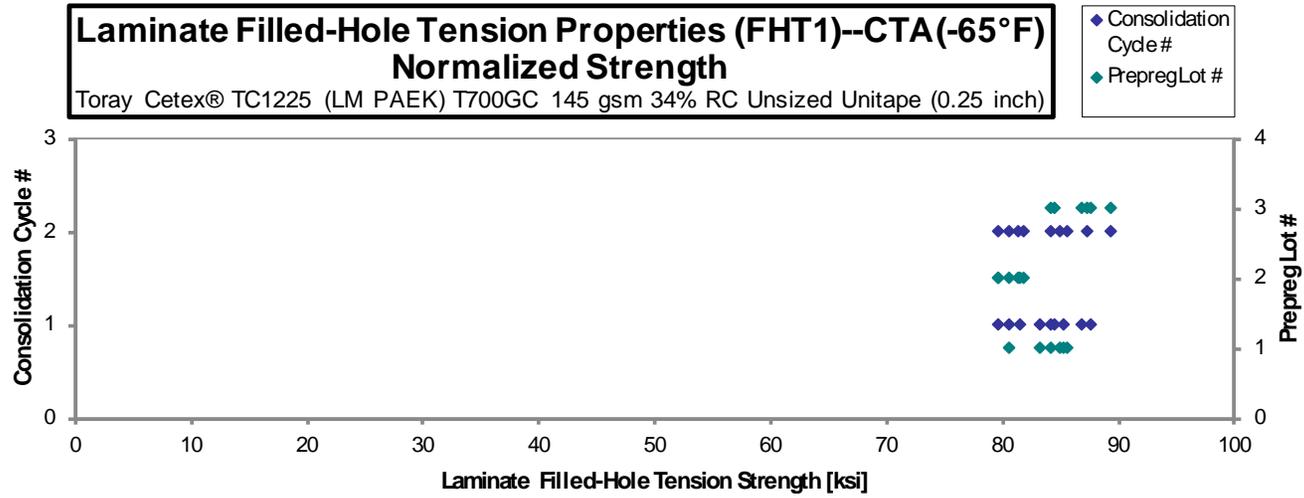
**Laminate Filled-Hole Tension Properties (FHT1)--CTA (-65°F)
Strength**

Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode | Avg. t_{ply} [in] | Strength ^{norm} [ksi] |
|---|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|--------------|---------------------|--------------------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST8R-A-C1-1-FHT1-CTA-1 | A | C1 | 1 | 1 | 83.93 | 0.08667 | 16 | AGM | 0.005417 | 84.19 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8R-A-C1-1-FHT1-CTA-2 | A | C1 | 1 | 1 | 81.71 | 0.08800 | 16 | AGM | 0.005500 | 83.22 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8R-A-C1-1-FHT1-CTA-3 | A | C1 | 1 | 1 | 84.28 | 0.08747 | 16 | AGM | 0.005467 | 85.32 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-A-C2-1-FHT1-CTA-1 | A | C2 | 1 | 2 | 84.15 | 0.08783 | 16 | AGM, LWT | 0.005490 | 85.55 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-A-C2-1-FHT1-CTA-2 | A | C2 | 1 | 2 | 77.73 | 0.08953 | 16 | AGM, LWT | 0.005596 | 80.55 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-A-C2-1-FHT1-CTA-3 | A | C2 | 1 | 2 | 82.27 | 0.08927 | 16 | AGM | 0.005579 | 85.00 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-B-C1-1-FHT1-CTA-1 | B | C1 | 2 | 1 | 77.96 | 0.08832 | 16 | AGM, DWT | 0.005520 | 79.69 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-B-C1-1-FHT1-CTA-2 | B | C1 | 2 | 1 | 79.85 | 0.08815 | 16 | AGM, DWT | 0.005509 | 81.46 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-B-C1-1-FHT1-CTA-3 | B | C1 | 2 | 1 | 78.91 | 0.08820 | 16 | AGM, DWT | 0.005513 | 80.56 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-B-C2-1-FHT1-CTA-1 | B | C2 | 2 | 2 | 80.82 | 0.08698 | 16 | AGM | 0.005436 | 81.37 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-B-C2-1-FHT1-CTA-2 | B | C2 | 2 | 2 | 81.78 | 0.08648 | 16 | AGM | 0.005405 | 81.86 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-B-C2-1-FHT1-CTA-3 | B | C2 | 2 | 2 | 79.71 | 0.08635 | 16 | AGM | 0.005397 | 79.66 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST8-C-C1-1-FHT1-CTA-1 | C | C1 | 3 | 1 | 83.46 | 0.08753 | 16 | AGM, LWT | 0.005471 | 84.55 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST8-C-C1-1-FHT1-CTA-2 | C | C1 | 3 | 1 | 85.87 | 0.08733 | 16 | AGM, LWT | 0.005458 | 86.80 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST8-C-C1-1-FHT1-CTA-3 | C | C1 | 3 | 1 | 87.44 | 0.08663 | 16 | AGM, LWT | 0.005415 | 87.67 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST8-C-C2-1-FHT1-CTA-1 | C | C2 | 3 | 2 | 82.06 | 0.08867 | 16 | AGM, LWT | 0.005542 | 84.21 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST8-C-C2-1-FHT1-CTA-2 | C | C2 | 3 | 2 | 83.78 | 0.09008 | 16 | AGM, LWT | 0.005630 | 87.36 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST8-C-C2-1-FHT1-CTA-3 | C | C2 | 3 | 2 | 84.12 | 0.09177 | 16 | AGM, LWT | 0.005735 | 89.34 |

| | | | | |
|---------------------------|--------------|--|-----------------|--------------|
| Average | 82.21 | Average^{norm} | 0.005504 | 83.80 |
| Standard Dev. | 2.686 | Standard Dev^{v.norm} | | 2.927 |
| Coeff. of Var. [%] | 3.267 | Coeff. of Var. [%]^{norm} | | 3.492 |
| Min. | 77.73 | Min. | 0.005397 | 79.66 |
| Max. | 87.44 | Max. | 0.005735 | 89.34 |
| Number of Spec. | 18 | Number of Spec. | 18 | 18 |

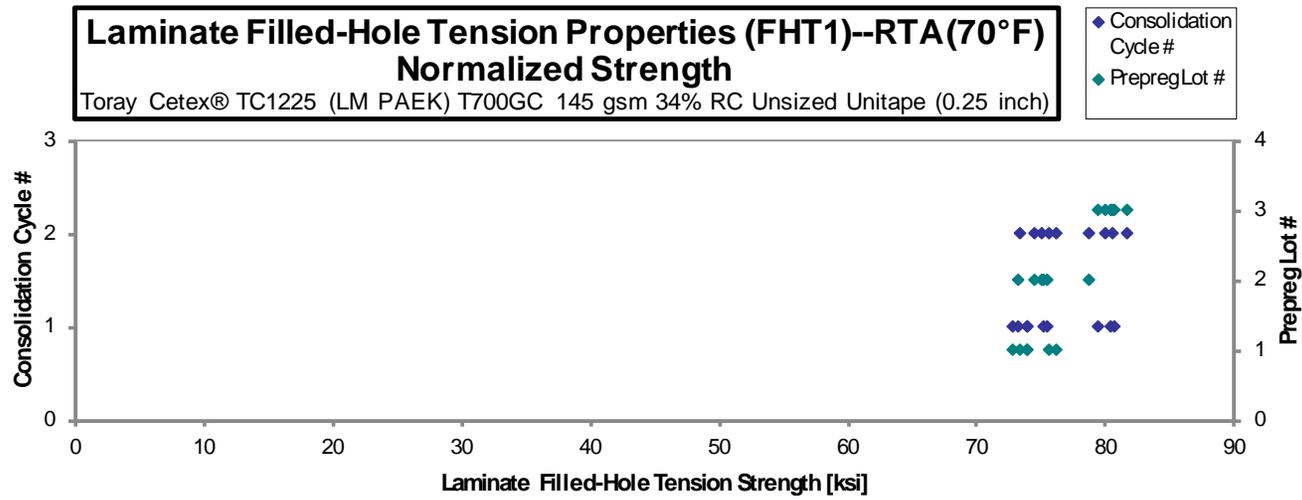


Laminate Filled-Hole Tension Properties (FHT1)--RTA (70°F)
Strength
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode | Avg. t_{ply} [in] | Strength _{norm} [ksi] |
|---|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|--------------|---------------------|--------------------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST8R-A-C1-1-FHT1-RTA-1 | A | C1 | 1 | 1 | 73.04 | 0.08747 | 16 | M(A,D)GM | 0.005467 | 73.94 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8R-A-C1-1-FHT1-RTA-2 | A | C1 | 1 | 1 | 73.16 | 0.08740 | 16 | M(A,D)GM | 0.005463 | 74.01 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8R-A-C1-1-FHT1-RTA-3 | A | C1 | 1 | 1 | 71.84 | 0.08757 | 16 | M(A,D)GM | 0.005473 | 72.81 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-A-C2-1-FHT1-RTA-1 | A | C2 | 1 | 2 | 71.83 | 0.08827 | 16 | M(A,D)GM | 0.005517 | 73.38 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-A-C2-1-FHT1-RTA-2 | A | C2 | 1 | 2 | 74.40 | 0.08843 | 16 | M(A,D)GM | 0.005527 | 76.15 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-A-C2-1-FHT1-RTA-3 | A | C2 | 1 | 2 | 73.58 | 0.08877 | 16 | M(A,D)GM | 0.005548 | 75.59 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-B-C1-1-FHT1-RTA-1 | B | C1 | 2 | 1 | 74.06 | 0.08803 | 16 | M(A,D)GM | 0.005502 | 75.46 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-B-C1-1-FHT1-RTA-2 | B | C1 | 2 | 1 | 71.84 | 0.08808 | 16 | M(A,D)GM | 0.005505 | 73.24 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-B-C1-1-FHT1-RTA-3 | B | C1 | 2 | 1 | 73.43 | 0.08852 | 16 | M(A,D)GM | 0.005532 | 75.23 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-B-C2-1-FHT1-RTA-1 | B | C2 | 2 | 2 | 75.26 | 0.08612 | 16 | AGM | 0.005382 | 75.01 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-B-C2-1-FHT1-RTA-2 | B | C2 | 2 | 2 | 74.69 | 0.08627 | 16 | AGM | 0.005392 | 74.58 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-B-C2-1-FHT1-RTA-3 | B | C2 | 2 | 2 | 79.25 | 0.08587 | 16 | AGM | 0.005367 | 78.76 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST8-C-C1-1-FHT1-RTA-1 | C | C1 | 3 | 1 | 78.44 | 0.08748 | 16 | M(A,D)GM | 0.005468 | 79.43 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST8-C-C1-1-FHT1-RTA-2 | C | C1 | 3 | 1 | 79.91 | 0.08695 | 16 | M(A,D)GM | 0.005434 | 80.42 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST8-C-C1-1-FHT1-RTA-3 | C | C1 | 3 | 1 | 79.76 | 0.08748 | 16 | M(A,D)GM | 0.005468 | 80.76 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST8-C-C2-1-FHT1-RTA-1 | C | C2 | 3 | 2 | 76.85 | 0.08993 | 16 | M(A,D)GM | 0.005621 | 80.00 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST8-C-C2-1-FHT1-RTA-2 | C | C2 | 3 | 2 | 78.40 | 0.09008 | 16 | M(A,D)GM | 0.005630 | 81.74 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST8-C-C2-1-FHT1-RTA-3 | C | C2 | 3 | 2 | 77.36 | 0.09000 | 16 | M(A,D)GM | 0.005625 | 80.58 |

| | | | | |
|--------------------|-------|------------------------------------|----------|-------|
| Average | 75.39 | Average _{norm} | 0.005496 | 76.73 |
| Standard Dev. | 2.845 | Standard Dev. _{norm} | | 3.057 |
| Coeff. of Var. [%] | 3.773 | Coeff. of Var. [%] _{norm} | | 3.984 |
| Min. | 71.83 | Min. | 0.005367 | 72.81 |
| Max. | 79.91 | Max. | 0.005630 | 81.74 |
| Number of Spec. | 18 | Number of Spec. | 18 | 18 |

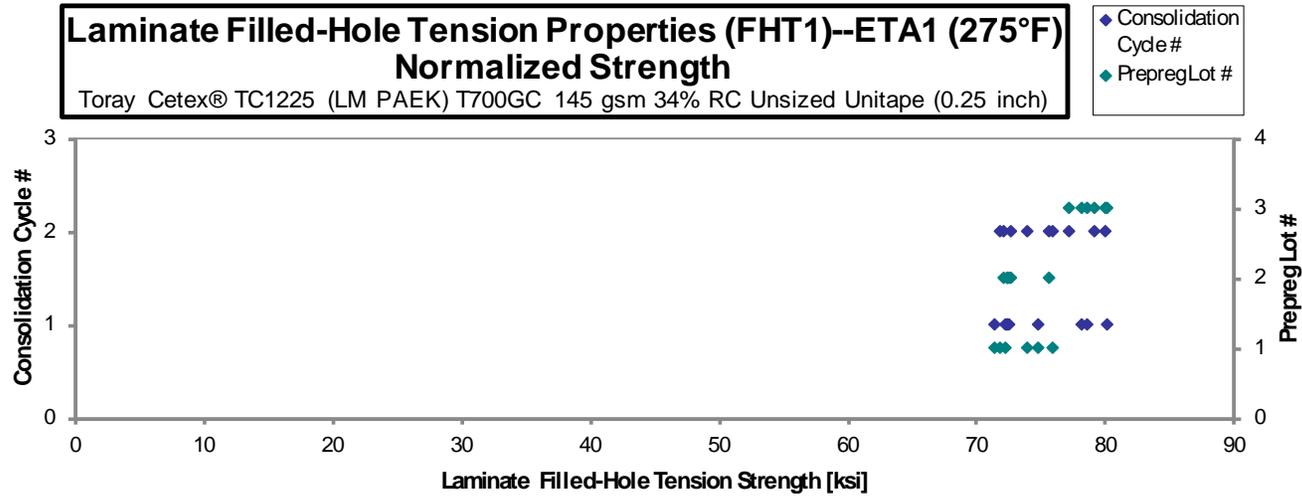


Laminate Filled-Hole Tension Properties (FHT1)--ETA1 (275°F)
Strength
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode | Avg. t_{ply} [in] | Strength _{norm} [ksi] |
|--|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|--------------|---------------------|--------------------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST8R-A-C1-1-FHT1-ETA1-1 | A | C1 | 1 | 1 | 73.81 | 0.08750 | 16 | AGM | 0.005469 | 74.75 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8R-A-C1-1-FHT1-ETA1-2 | A | C1 | 1 | 1 | 71.30 | 0.08750 | 16 | AGM | 0.005469 | 72.20 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8R-A-C1-1-FHT1-ETA1-3 | A | C1 | 1 | 1 | 70.84 | 0.08707 | 16 | AGM | 0.005442 | 71.39 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-A-C2-1-FHT1-ETA1-1 | A | C2 | 1 | 2 | 71.52 | 0.08938 | 16 | AGM, LWT | 0.005586 | 73.99 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-A-C2-1-FHT1-ETA1-2 | A | C2 | 1 | 2 | 74.23 | 0.08845 | 16 | AGM | 0.005528 | 75.99 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-A-C2-1-FHT1-ETA1-3 | A | C2 | 1 | 2 | 70.18 | 0.08852 | 16 | AGM, LWT | 0.005532 | 71.90 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-B-C1-1-FHT1-ETA1-1 | B | C1 | 2 | 1 | 71.02 | 0.08803 | 16 | M(A,D)GM | 0.005502 | 72.36 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-B-C1-1-FHT1-ETA1-2 | B | C1 | 2 | 1 | 71.02 | 0.08825 | 16 | M(A,D)GM | 0.005516 | 72.54 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-B-C1-1-FHT1-ETA1-3 | B | C1 | 2 | 1 | 71.09 | 0.08805 | 16 | M(A,D)GM | 0.005503 | 72.45 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-B-C2-1-FHT1-ETA1-1 | B | C2 | 2 | 2 | 76.25 | 0.08577 | 16 | AGM | 0.005360 | 75.69 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-B-C2-1-FHT1-ETA1-2 | B | C2 | 2 | 2 | 72.81 | 0.08563 | 16 | AGM | 0.005352 | 72.16 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-B-C2-1-FHT1-ETA1-3 | B | C2 | 2 | 2 | 73.34 | 0.08560 | 16 | AGM | 0.005350 | 72.66 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST8-C-C1-1-FHT1-ETA1-1 | C | C1 | 3 | 1 | 77.42 | 0.08767 | 16 | AGM, LWT | 0.005479 | 78.55 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST8-C-C1-1-FHT1-ETA1-2 | C | C1 | 3 | 1 | 77.38 | 0.08722 | 16 | AGM | 0.005451 | 78.11 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST8-C-C1-1-FHT1-ETA1-3 | C | C1 | 3 | 1 | 79.24 | 0.08743 | 16 | AGM, LWT | 0.005465 | 80.19 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST8-C-C2-1-FHT1-ETA1-1 | C | C2 | 3 | 2 | 74.32 | 0.08972 | 16 | AGM | 0.005607 | 77.18 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST8-C-C2-1-FHT1-ETA1-2 | C | C2 | 3 | 2 | 76.53 | 0.08938 | 16 | AGM, LWT | 0.005586 | 79.17 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST8-C-C2-1-FHT1-ETA1-3 | C | C2 | 3 | 2 | 77.07 | 0.08967 | 16 | AGM, LWT | 0.005604 | 79.98 |

| | | | | |
|--------------------|-------|------------------------------------|----------|-------|
| Average | 73.85 | Average _{norm} | 0.005489 | 75.07 |
| Standard Dev. | 2.842 | Standard Dev. _{norm} | | 3.088 |
| Coeff. of Var. [%] | 3.848 | Coeff. of Var. [%] _{norm} | | 4.114 |
| Min. | 70.18 | Min. | 0.005350 | 71.39 |
| Max. | 79.24 | Max. | 0.005607 | 80.19 |
| Number of Spec. | 18 | Number of Spec. | 18 | 18 |



Laminate Filled-Hole Tension Properties (FHT1)--ETA2 (400°F)
Strength
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

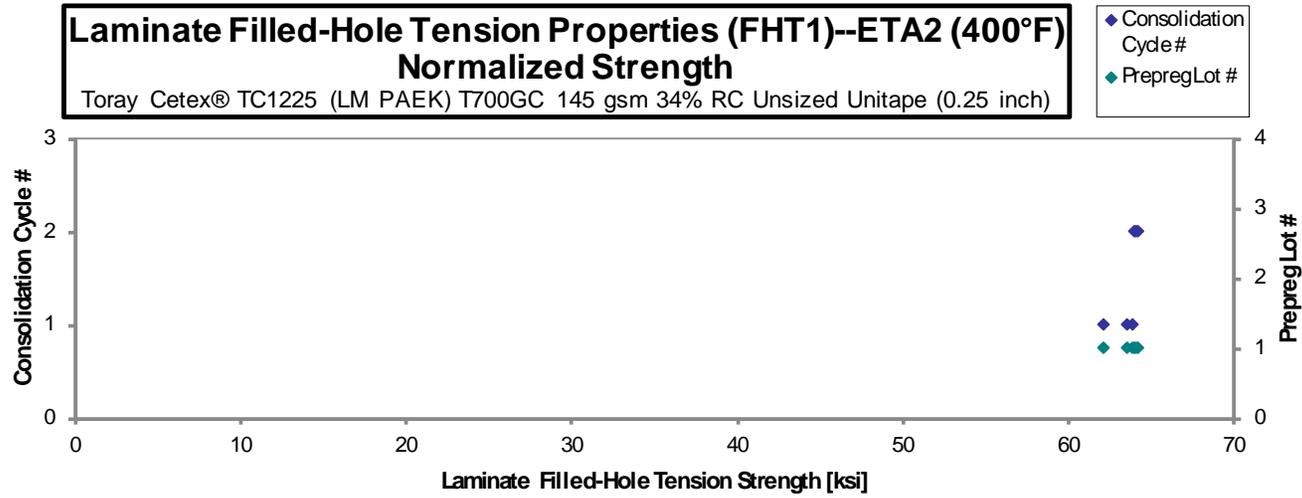
normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|--|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|--------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST8R-A-C1-1-FHT1-ETA2-1 | A | C1 | 1 | 1 | 62.45 | 0.08793 | 16 | M(A,D)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8R-A-C1-1-FHT1-ETA2-2 | A | C1 | 1 | 1 | 61.04 | 0.08787 | 16 | M(A,D)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8R-A-C1-1-FHT1-ETA2-3 | A | C1 | 1 | 1 | 62.60 | 0.08813 | 16 | M(A,D)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-A-C2-1-FHT1-ETA2-1 | A | C2 | 1 | 2 | 62.09 | 0.08920 | 16 | M(A,D)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-A-C2-1-FHT1-ETA2-2 | A | C2 | 1 | 2 | 62.83 | 0.08823 | 16 | M(A,D)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-A-C2-1-FHT1-ETA2-3 | A | C2 | 1 | 2 | 62.59 | 0.08838 | 16 | M(A,D)GM |

| Avg. t_{ply} [in] | Strength _{norm} [ksi] |
|---------------------|--------------------------------|
| 0.005496 | 63.56 |
| 0.005492 | 62.08 |
| 0.005508 | 63.85 |
| 0.005575 | 64.10 |
| 0.005515 | 64.16 |
| 0.005524 | 64.02 |

Average 62.27
 Standard Dev. 0.6474
 Coeff. of Var. [%] 1.040
 Min. 61.04
 Max. 62.83
 Number of Spec. 6

Average_{norm} 0.005518 63.63
 Standard Dev._{norm} 0.7909
 Coeff. of Var. [%]_{norm} 1.243
 Min. 0.005492 62.08
 Max. 0.005575 64.16
 Number of Spec. 6 6



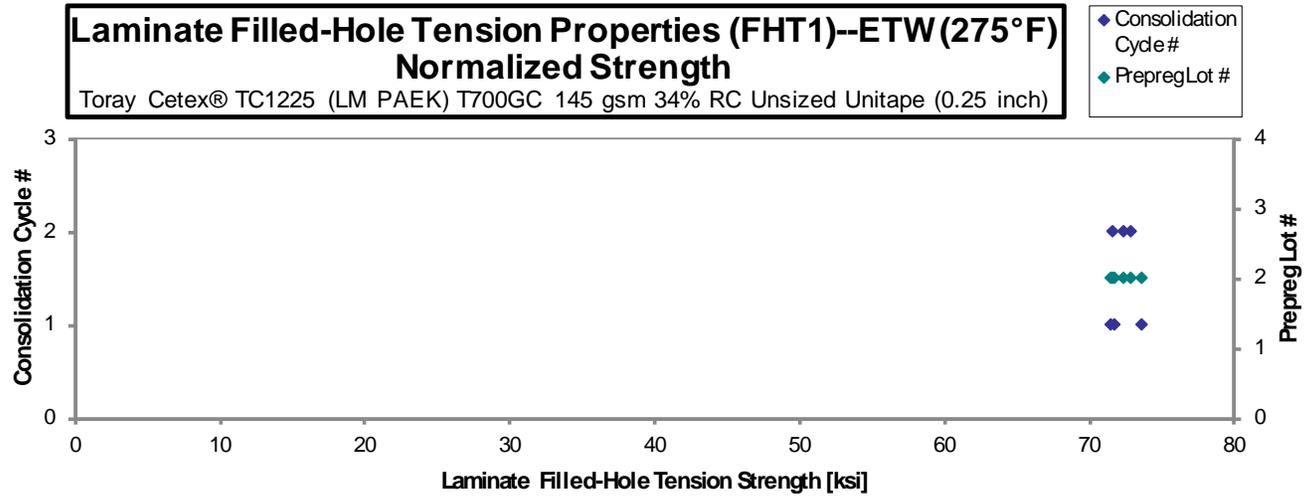
Laminate Filled-Hole Tension Properties (FHT1)--ETW (275°F)
Strength
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|--|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|--------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-B-C1-1-FHT1-ETW-1 | B | C1 | 2 | 1 | 72.72 | 0.08743 | 16 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-B-C1-1-FHT1-ETW-2 | B | C1 | 2 | 1 | 70.13 | 0.08812 | 16 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-B-C1-1-FHT1-ETW-3 | B | C1 | 2 | 1 | 70.22 | 0.08827 | 16 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-B-C2-1-FHT1-ETW-1 | B | C2 | 2 | 2 | 72.36 | 0.08548 | 16 | M(A,D)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-B-C2-1-FHT1-ETW-2 | B | C2 | 2 | 2 | 72.90 | 0.08642 | 16 | M(A,D)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-B-C2-1-FHT1-ETW-3 | B | C2 | 2 | 2 | 72.21 | 0.08652 | 16 | M(A,D)GM |

| Avg. t_{ply} [in] | Strength _{norm} [ksi] |
|---------------------|--------------------------------|
| 0.005465 | 73.59 |
| 0.005507 | 71.52 |
| 0.005517 | 71.74 |
| 0.005343 | 71.59 |
| 0.005401 | 72.91 |
| 0.005407 | 72.31 |

| | | | | |
|---------------------------|--------------|--|-----------------|---------------|
| Average | 71.76 | Average_{norm} | 0.005440 | 72.28 |
| Standard Dev. | 1.252 | Standard Dev_{norm} | | 0.8333 |
| Coeff. of Var. [%] | 1.744 | Coeff. of Var. [%]_{norm} | | 1.153 |
| Min. | 70.13 | Min. | 0.005343 | 71.52 |
| Max. | 72.90 | Max. | 0.005517 | 73.59 |
| Number of Spec. | 6 | Number of Spec. | 6 | 6 |



4.23 “10/80/10” Filled-Hole Tension 2 Properties (FHT2)

Laminate Filled-Hole Tension Properties (FHT2)--CTA (-65°F)
Strength
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

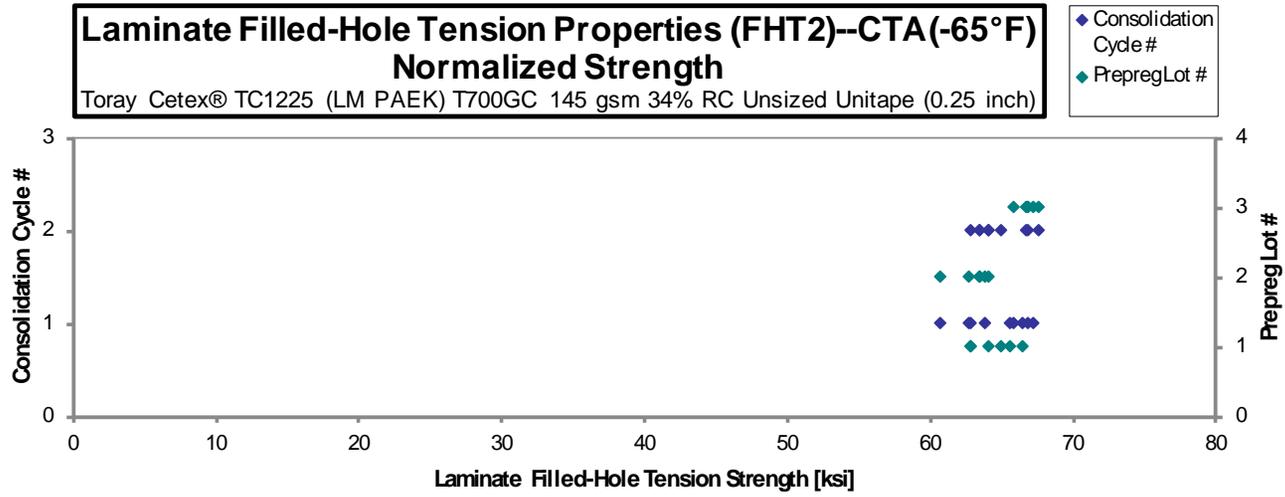
normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|--|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|--------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-A-C1-1-FHT2-CTA-1 | A | C1 | 1 | 1 | 62.64 | 0.1084 | 20 | AGM, DWB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-A-C1-1-FHT2-CTA-2 | A | C1 | 1 | 1 | 64.86 | 0.1092 | 20 | AGM, DWB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-A-C1-1-FHT2-CTA-3 | A | C1 | 1 | 1 | 65.88 | 0.1090 | 20 | AGM, DWB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-A-C2-1-FHT2-CTA-1 | A | C2 | 1 | 2 | 62.10 | 0.1093 | 20 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-A-C2-1-FHT2-CTA-2 | A | C2 | 1 | 2 | 63.91 | 0.1099 | 20 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-A-C2-1-FHT2-CTA-3 | A | C2 | 1 | 2 | 63.03 | 0.1098 | 20 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-B-C1-1-FHT2-CTA-1 | B | C1 | 2 | 1 | 60.88 | 0.1078 | 20 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-B-C1-1-FHT2-CTA-2 | B | C1 | 2 | 1 | 62.80 | 0.1078 | 20 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-B-C1-1-FHT2-CTA-3 | B | C1 | 2 | 1 | 63.70 | 0.1082 | 20 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-B-C2-1-FHT2-CTA-1 | B | C2 | 2 | 2 | 64.01 | 0.1071 | 20 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-B-C2-1-FHT2-CTA-2 | B | C2 | 2 | 2 | 64.09 | 0.1070 | 20 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-B-C2-1-FHT2-CTA-3 | B | C2 | 2 | 2 | 64.36 | 0.1076 | 20 | AGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST13-C-C1-1-FHT2-CTA-1 | C | C1 | 3 | 1 | 64.97 | 0.1094 | 20 | AGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST13-C-C1-1-FHT2-CTA-2 | C | C1 | 3 | 1 | 66.00 | 0.1093 | 20 | AGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST13-C-C1-1-FHT2-CTA-3 | C | C1 | 3 | 1 | 66.37 | 0.1094 | 20 | AGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST13-C-C2-1-FHT2-CTA-1 | C | C2 | 3 | 2 | 66.50 | 0.1098 | 20 | AGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST13-C-C2-1-FHT2-CTA-2 | C | C2 | 3 | 2 | 65.73 | 0.1099 | 20 | AGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST13-C-C2-1-FHT2-CTA-3 | C | C2 | 3 | 2 | 65.88 | 0.1094 | 20 | AGM |

| Avg. t_{ply} [in] | Strength _{norm} [ksi] |
|---------------------|--------------------------------|
| 0.005420 | 62.87 |
| 0.005462 | 65.60 |
| 0.005450 | 66.49 |
| 0.005463 | 62.83 |
| 0.005493 | 65.01 |
| 0.005488 | 64.06 |
| 0.005390 | 60.77 |
| 0.005391 | 62.70 |
| 0.005408 | 63.79 |
| 0.005353 | 63.46 |
| 0.005348 | 63.47 |
| 0.005378 | 64.10 |
| 0.005471 | 65.83 |
| 0.005467 | 66.82 |
| 0.005468 | 67.21 |
| 0.005488 | 67.58 |
| 0.005493 | 66.86 |
| 0.005469 | 66.72 |

Average 64.32
 Standard Dev. 1.600
 Coeff. of Var. [%] 2.488
 Min. 60.88
 Max. 66.50
 Number of Spec. 18

Average_{norm} 0.005439 64.79
 Standard Dev._{norm} 1.940
 Coeff. of Var. [%]_{norm} 2.994
 Min. 0.005348 60.77
 Max. 0.005493 67.58
 Number of Spec. 18 18



Laminate Filled-Hole Tension Properties (FHT2)–RTA (70°F)
Strength
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

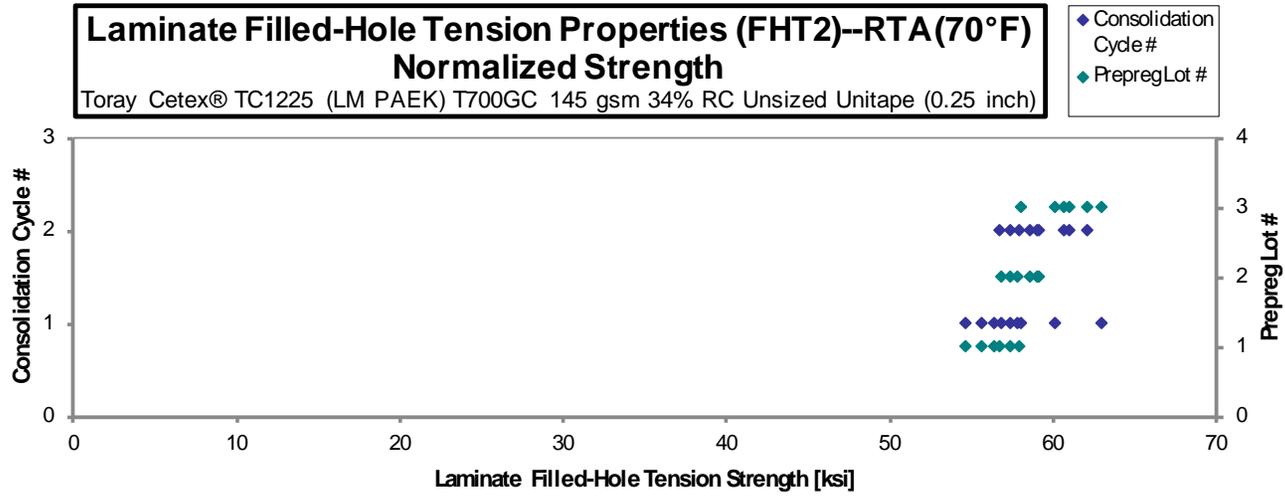
normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|--|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|--------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-A-C1-1-FHT2-RTA-1 | A | C1 | 1 | 1 | 55.75 | 0.1091 | 20 | M(A,D)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-A-C1-1-FHT2-RTA-2 | A | C1 | 1 | 1 | 54.00 | 0.1092 | 20 | M(A,D)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-A-C1-1-FHT2-RTA-3 | A | C1 | 1 | 1 | 55.04 | 0.1091 | 20 | M(A,D)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-A-C2-1-FHT2-RTA-1 | A | C2 | 1 | 2 | 55.68 | 0.1100 | 20 | M(A,D)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-A-C2-1-FHT2-RTA-2 | A | C2 | 1 | 2 | 56.37 | 0.1098 | 20 | M(A,D)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-A-C2-1-FHT2-RTA-3 | A | C2 | 1 | 2 | 57.04 | 0.1096 | 20 | M(A,D)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-B-C1-1-FHT2-RTA-1 | B | C1 | 2 | 1 | 57.60 | 0.1083 | 20 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-B-C1-1-FHT2-RTA-2 | B | C1 | 2 | 1 | 57.28 | 0.1081 | 20 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-B-C1-1-FHT2-RTA-3 | B | C1 | 2 | 1 | 56.87 | 0.1078 | 20 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-B-C2-1-FHT2-RTA-1 | B | C2 | 2 | 2 | 59.12 | 0.1077 | 20 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-B-C2-1-FHT2-RTA-2 | B | C2 | 2 | 2 | 58.75 | 0.1076 | 20 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-B-C2-1-FHT2-RTA-3 | B | C2 | 2 | 2 | 59.18 | 0.1078 | 20 | AGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST13-C-C1-1-FHT2-RTA-1 | C | C1 | 3 | 1 | 58.96 | 0.1101 | 20 | M(A,D)GM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST13-C-C1-1-FHT2-RTA-2 | C | C1 | 3 | 1 | 61.77 | 0.1101 | 20 | M(A,D)GM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST13-C-C1-1-FHT2-RTA-3 | C | C1 | 3 | 1 | 57.39 | 0.1091 | 20 | M(A,D)GM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST13-C-C2-1-FHT2-RTA-1 | C | C2 | 3 | 2 | 60.60 | 0.1106 | 20 | AGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST13-C-C2-1-FHT2-RTA-2 | C | C2 | 3 | 2 | 59.62 | 0.1099 | 20 | AGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST13-C-C2-1-FHT2-RTA-3 | C | C2 | 3 | 2 | 60.00 | 0.1098 | 20 | AGM |

| Avg. t_{ply} [in] | Strength _{norm} [ksi] |
|---------------------|--------------------------------|
| 0.005455 | 56.32 |
| 0.005460 | 54.60 |
| 0.005453 | 55.59 |
| 0.005498 | 56.69 |
| 0.005490 | 57.31 |
| 0.005482 | 57.90 |
| 0.005413 | 57.74 |
| 0.005405 | 57.33 |
| 0.005392 | 56.79 |
| 0.005387 | 58.98 |
| 0.005382 | 58.55 |
| 0.005392 | 59.08 |
| 0.005504 | 60.10 |
| 0.005503 | 62.94 |
| 0.005453 | 57.95 |
| 0.005530 | 62.06 |
| 0.005493 | 60.65 |
| 0.005488 | 60.98 |

Average 57.83
 Standard Dev. 2.063
 Coeff. of Var. [%] 3.567
 Min. 54.00
 Max. 61.77
 Number of Spec. 18

Average_{norm} 0.005454 58.42
 Standard Dev._{norm} 2.234
 Coeff. of Var. [%]_{norm} 3.824
 Min. 0.005382 54.60
 Max. 0.005530 62.94
 Number of Spec. 18 18



Laminate Filled-Hole Tension Properties (FHT2)--ETA1 (275°F)
Strength
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

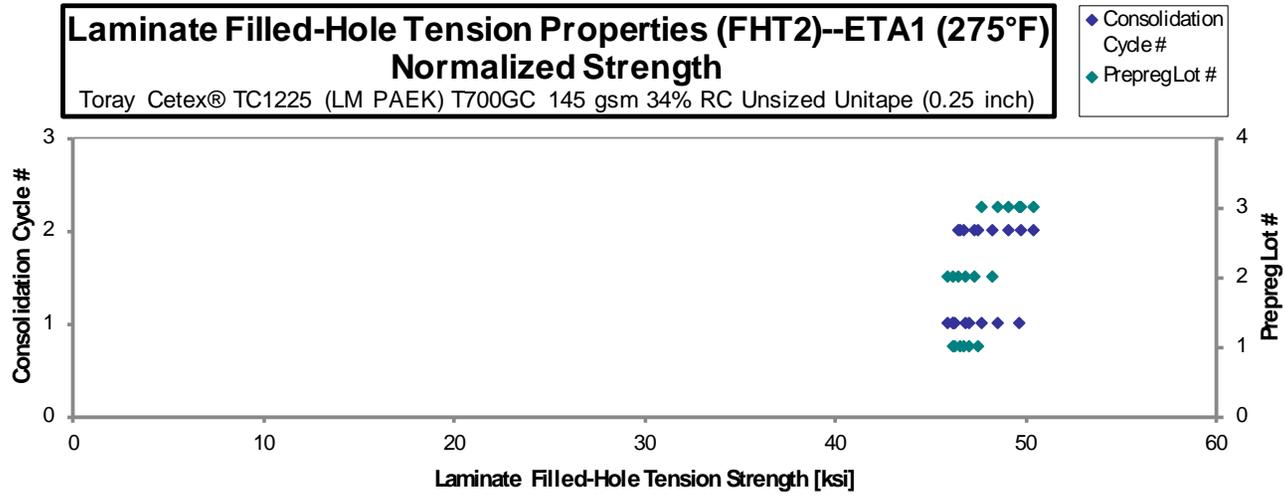
normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|---|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|--------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-A-C1-1-FHT2-ETA1-1 | A | C1 | 1 | 1 | 45.92 | 0.1088 | 20 | M(A,D)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-A-C1-1-FHT2-ETA1-2 | A | C1 | 1 | 1 | 45.89 | 0.1087 | 20 | M(A,D)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-A-C1-1-FHT2-ETA1-3 | A | C1 | 1 | 1 | 46.81 | 0.1084 | 20 | M(A,D)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-A-C2-1-FHT2-ETA1-1 | A | C2 | 1 | 2 | 45.72 | 0.1099 | 20 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-A-C2-1-FHT2-ETA1-2 | A | C2 | 1 | 2 | 45.83 | 0.1100 | 20 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-A-C2-1-FHT2-ETA1-3 | A | C2 | 1 | 2 | 46.92 | 0.1092 | 20 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-B-C1-1-FHT2-ETA1-1 | B | C1 | 2 | 1 | 46.39 | 0.1075 | 20 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-B-C1-1-FHT2-ETA1-2 | B | C1 | 2 | 1 | 47.08 | 0.1073 | 20 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-B-C1-1-FHT2-ETA1-3 | B | C1 | 2 | 1 | 46.18 | 0.1072 | 20 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-B-C2-1-FHT2-ETA1-1 | B | C2 | 2 | 2 | 48.32 | 0.1077 | 20 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-B-C2-1-FHT2-ETA1-2 | B | C2 | 2 | 2 | 47.65 | 0.1072 | 20 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-B-C2-1-FHT2-ETA1-3 | B | C2 | 2 | 2 | 47.00 | 0.1067 | 20 | AGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST13-C-C1-1-FHT2-ETA1-1 | C | C1 | 3 | 1 | 49.09 | 0.1093 | 20 | AGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST13-C-C1-1-FHT2-ETA1-2 | C | C1 | 3 | 1 | 46.78 | 0.1099 | 20 | AGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST13-C-C1-1-FHT2-ETA1-3 | C | C1 | 3 | 1 | 47.69 | 0.1099 | 20 | AGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST13-C-C2-1-FHT2-ETA1-1 | C | C2 | 3 | 2 | 49.41 | 0.1101 | 20 | AGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST13-C-C2-1-FHT2-ETA1-2 | C | C2 | 3 | 2 | 48.31 | 0.1097 | 20 | AGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST13-C-C2-1-FHT2-ETA1-3 | C | C2 | 3 | 2 | 48.24 | 0.1112 | 20 | AGM |

| Avg. t_{ply} [in] | Strength _{norm} [ksi] |
|---------------------|--------------------------------|
| 0.005442 | 46.27 |
| 0.005434 | 46.18 |
| 0.005419 | 46.98 |
| 0.005497 | 46.54 |
| 0.005498 | 46.67 |
| 0.005460 | 47.45 |
| 0.005375 | 46.17 |
| 0.005363 | 46.76 |
| 0.005362 | 45.85 |
| 0.005387 | 48.20 |
| 0.005358 | 47.27 |
| 0.005334 | 46.43 |
| 0.005463 | 49.66 |
| 0.005494 | 47.60 |
| 0.005493 | 48.52 |
| 0.005503 | 50.36 |
| 0.005483 | 49.05 |
| 0.005559 | 49.67 |

Average 47.18
Standard Dev. 1.139
Coeff. of Var. [%] 2.415
Min. 45.72
Max. 49.41
Number of Spec. 18

Average_{norm} 0.005440 **47.53**
Standard Dev._{norm} 1.389
Coeff. of Var. [%]_{norm} 2.923
Min. 0.005334 **45.85**
Max. 0.005559 **50.36**
Number of Spec. 18 **18**



4.24 “50/40/10” Filled-Hole Tension 3 Properties (FHT3)

Laminate Filled-Hole Tension Properties (FHT3)--CTA (-65°F)
Strength
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

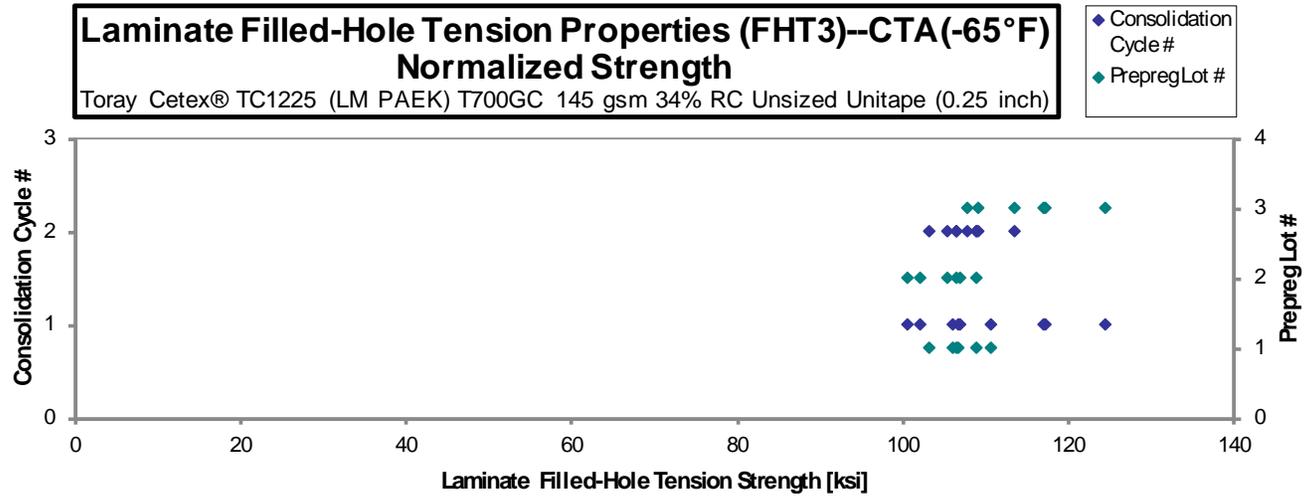
normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|--|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|--------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-A-C1-1-FHT3-CTA-1 | A | C1 | 1 | 1 | 104.9 | 0.1092 | 20 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-A-C1-1-FHT3-CTA-2 | A | C1 | 1 | 1 | 105.7 | 0.1090 | 20 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-A-C1-1-FHT3-CTA-3 | A | C1 | 1 | 1 | 109.0 | 0.1097 | 20 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-A-C2-1-FHT3-CTA-1 | A | C2 | 1 | 2 | 99.49 | 0.1120 | 20 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-A-C2-1-FHT3-CTA-2 | A | C2 | 1 | 2 | 103.2 | 0.1114 | 20 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-A-C2-1-FHT3-CTA-3 | A | C2 | 1 | 2 | 105.5 | 0.1115 | 20 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-B-C1-1-FHT3-CTA-1 | B | C1 | 2 | 1 | 99.00 | 0.1114 | 20 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-B-C1-1-FHT3-CTA-2 | B | C1 | 2 | 1 | 97.71 | 0.1112 | 20 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-B-C1-1-FHT3-CTA-3 | B | C1 | 2 | 1 | 103.5 | 0.1116 | 20 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-B-C2-1-FHT3-CTA-1 | B | C2 | 2 | 2 | 103.6 | 0.1110 | 20 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-B-C2-1-FHT3-CTA-2 | B | C2 | 2 | 2 | 102.4 | 0.1113 | 20 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-B-C2-1-FHT3-CTA-3 | B | C2 | 2 | 2 | 105.7 | 0.1114 | 20 | AGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST16-C-C1-1-FHT3-CTA-1 | C | C1 | 3 | 1 | 113.6 | 0.1116 | 20 | AGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST16-C-C1-1-FHT3-CTA-2 | C | C1 | 3 | 1 | 113.6 | 0.1111 | 20 | AGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST16-C-C1-1-FHT3-CTA-3 | C | C1 | 3 | 1 | 121.2 | 0.1110 | 20 | AGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST16-C-C2-1-FHT3-CTA-1 | C | C2 | 3 | 2 | 111.5 | 0.1057 | 20 | AGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST16-C-C2-1-FHT3-CTA-2 | C | C2 | 3 | 2 | 110.8 | 0.1051 | 20 | AGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST16-C-C2-1-FHT3-CTA-3 | C | C2 | 3 | 2 | 116.2 | 0.1055 | 20 | AGM |

| Avg. t_{ply} [in] | Strength ^{norm} [ksi] |
|---------------------|--------------------------------|
| 0.005460 | 106.1 |
| 0.005450 | 106.7 |
| 0.005485 | 110.7 |
| 0.005600 | 103.2 |
| 0.005570 | 106.5 |
| 0.005575 | 109.0 |
| 0.005571 | 102.1 |
| 0.005560 | 100.6 |
| 0.005581 | 107.0 |
| 0.005549 | 106.5 |
| 0.005563 | 105.5 |
| 0.005569 | 109.0 |
| 0.005578 | 117.3 |
| 0.005555 | 116.9 |
| 0.005550 | 124.5 |
| 0.005284 | 109.1 |
| 0.005255 | 107.8 |
| 0.005273 | 113.5 |

Average 107.0
 Standard Dev. 6.356
 Coeff. of Var. [%] 5.938
 Min. 97.71
 Max. 121.2
 Number of Spec. 18

Average^{norm} 0.005502 109.0
 Standard Dev.^{norm} 5.900
 Coeff. of Var. [%]^{norm} 5.413
 Min. 0.005255 100.6
 Max. 0.005600 124.5
 Number of Spec. 18 18



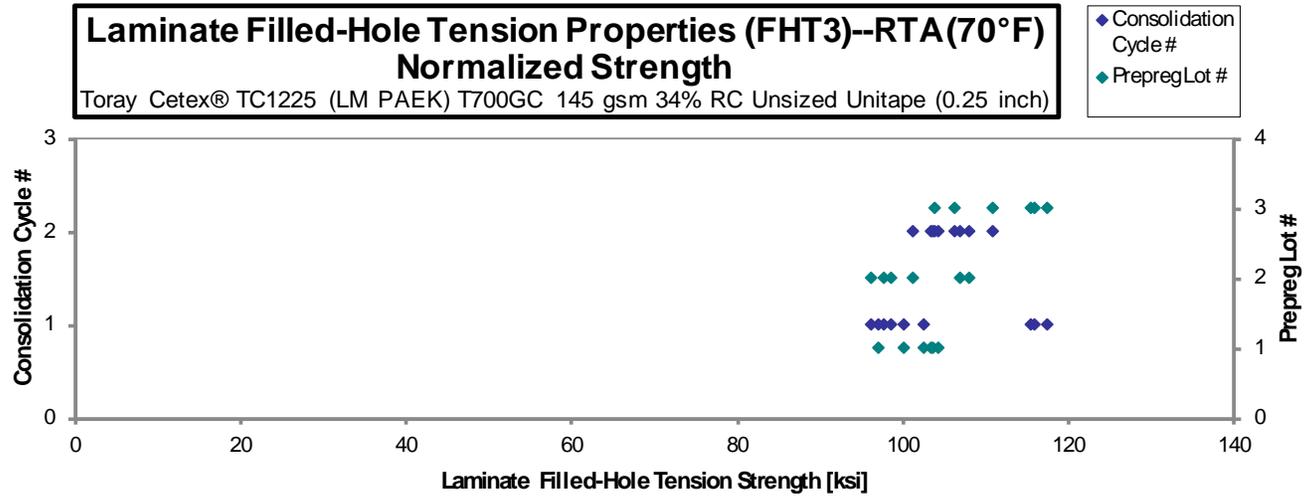
Laminate Filled-Hole Tension Properties (FHT3)--RTA (70°F)
Strength
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode | Avg. t_{ply} [in] | Strength _{norm} [ksi] |
|--|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|--------------|---------------------|--------------------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-A-C1-1-FHT3-RTA-1 | A | C1 | 1 | 1 | 98.46 | 0.1098 | 20 | M(A,D)GM | 0.005490 | 100.1 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-A-C1-1-FHT3-RTA-2 | A | C1 | 1 | 1 | 95.60 | 0.1097 | 20 | M(A,D)GM | 0.005485 | 97.10 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-A-C1-1-FHT3-RTA-3 | A | C1 | 1 | 1 | 100.1 | 0.1105 | 20 | M(A,D)GM | 0.005525 | 102.4 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-A-C2-1-FHT3-RTA-1 | A | C2 | 1 | 2 | 101.3 | 0.1112 | 20 | M(A,D)GM | 0.005560 | 104.3 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-A-C2-1-FHT3-RTA-2 | A | C2 | 1 | 2 | 101.1 | 0.1108 | 20 | M(A,D)GM | 0.005540 | 103.7 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-A-C2-1-FHT3-RTA-3 | A | C2 | 1 | 2 | 100.8 | 0.1107 | 20 | M(A,D)GM | 0.005535 | 103.3 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-B-C1-1-FHT3-RTA-2 | B | C1 | 2 | 1 | 92.71 | 0.1119 | 20 | M(A,D)GM | 0.005597 | 96.08 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-B-C1-1-FHT3-RTA-3 | B | C1 | 2 | 1 | 94.56 | 0.1115 | 20 | M(A,D)GM | 0.005577 | 97.66 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-B-C1-1-FHT3-SP-3 | B | C1 | 2 | 1 | 95.61 | 0.1113 | 20 | M(A,D)GM | 0.005566 | 98.55 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-B-C2-1-FHT3-RTA-1 | B | C2 | 2 | 2 | 103.9 | 0.1111 | 20 | AGM | 0.005554 | 106.9 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-B-C2-1-FHT3-RTA-2 | B | C2 | 2 | 2 | 104.5 | 0.1118 | 20 | AGM | 0.005588 | 108.1 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-B-C2-1-FHT3-RTA-3 | B | C2 | 2 | 2 | 97.98 | 0.1115 | 20 | AGM | 0.005575 | 101.2 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST16-C-C1-1-FHT3-RTA-1 | C | C1 | 3 | 1 | 111.8 | 0.1116 | 20 | M(A,D)GM | 0.005581 | 115.5 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST16-C-C1-1-FHT3-RTA-2 | C | C1 | 3 | 1 | 114.2 | 0.1111 | 20 | M(A,D)GM | 0.005556 | 117.5 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST16-C-C1-1-FHT3-RTA-3 | C | C1 | 3 | 1 | 112.4 | 0.1114 | 20 | M(A,D)GM | 0.005570 | 115.9 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST16-C-C2-1-FHT3-RTA-1 | C | C2 | 3 | 2 | 108.6 | 0.1056 | 20 | AGM | 0.005278 | 106.2 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST16-C-C2-1-FHT3-RTA-2 | C | C2 | 3 | 2 | 107.1 | 0.1048 | 20 | AGM | 0.005239 | 103.9 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST16-C-C2-1-FHT3-RTA-3 | C | C2 | 3 | 2 | 113.6 | 0.1055 | 20 | AGM | 0.005273 | 110.9 |

Average **103.0**
 Standard Dev. **6.891**
 Coeff. of Var. [%] **6.690**
 Min. **92.71**
 Max. **114.2**
 Number of Spec. **18**

Average_{norm} **0.005505** **105.0**
 Standard Dev._{norm} **6.535**
 Coeff. of Var. [%]_{norm} **6.226**
 Min. **0.005239** **96.08**
 Max. **0.005597** **117.5**
 Number of Spec. **18** **18**



Laminate Filled-Hole Tension Properties (FHT3)--ETA1 (275°F)
Strength
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

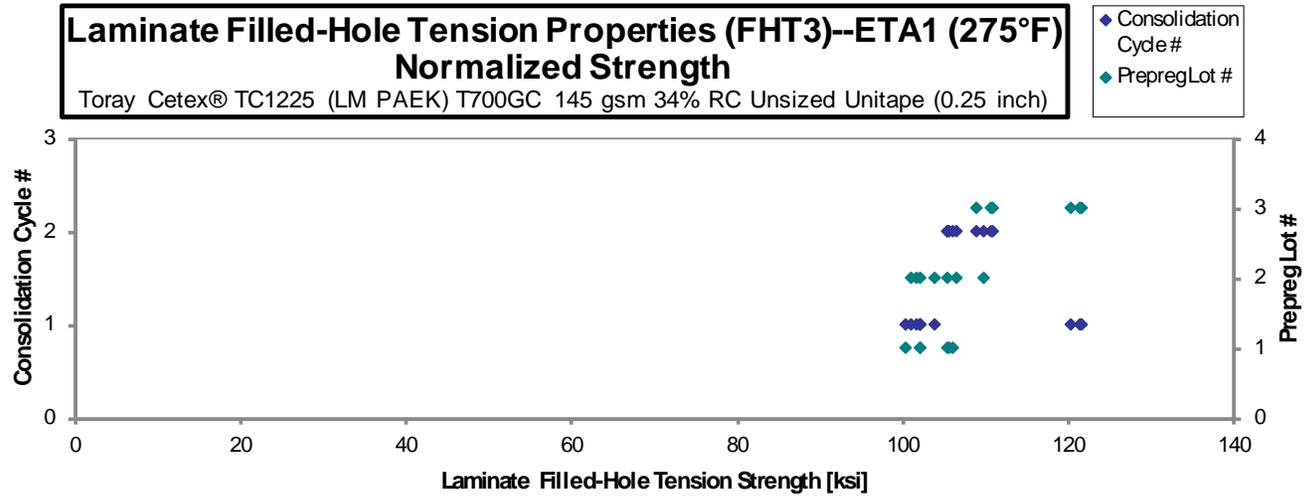
normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|---|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|--------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-A-C1-1-FHT3-ETA1-1 | A | C1 | 1 | 1 | 100.5 | 0.1097 | 20 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-A-C1-1-FHT3-ETA1-2 | A | C1 | 1 | 1 | 98.30 | 0.1102 | 20 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-A-C1-1-FHT3-ETA1-3 | A | C1 | 1 | 1 | 100.4 | 0.1097 | 20 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-A-C2-1-FHT3-ETA1-1 | A | C2 | 1 | 2 | 103.1 | 0.1111 | 20 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-A-C2-1-FHT3-ETA1-2 | A | C2 | 1 | 2 | 103.0 | 0.1108 | 20 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-A-C2-1-FHT3-ETA1-3 | A | C2 | 1 | 2 | 102.0 | 0.1115 | 20 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-B-C1-1-FHT3-ETA1-1 | B | C1 | 2 | 1 | 97.86 | 0.1116 | 20 | M(A,D)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-B-C1-1-FHT3-ETA1-2 | B | C1 | 2 | 1 | 99.77 | 0.1104 | 20 | M(A,D)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-B-C1-1-FHT3-ETA1-3 | B | C1 | 2 | 1 | 99.49 | 0.1104 | 20 | M(A,D)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-B-C1-1-FHT3-SP-5 | B | C1 | 2 | 1 | 99.91 | 0.1123 | 20 | M(A,D)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-B-C2-1-FHT3-ETA1-1 | B | C2 | 2 | 2 | 106.3 | 0.1115 | 20 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-B-C2-1-FHT3-ETA1-2 | B | C2 | 2 | 2 | 102.4 | 0.1111 | 20 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-B-C2-1-FHT3-ETA1-3 | B | C2 | 2 | 2 | 103.6 | 0.1110 | 20 | AGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST16-C-C1-1-FHT3-ETA1-1 | C | C1 | 3 | 1 | 117.3 | 0.1118 | 20 | AGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST16-C-C1-1-FHT3-ETA1-2 | C | C1 | 3 | 1 | 116.4 | 0.1115 | 20 | AGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST16-C-C1-1-FHT3-ETA1-3 | C | C1 | 3 | 1 | 118.6 | 0.1106 | 20 | AGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST16-C-C2-1-FHT3-ETA1-1 | C | C2 | 3 | 2 | 114.4 | 0.1046 | 20 | AGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST16-C-C2-1-FHT3-ETA1-2 | C | C2 | 3 | 2 | 113.9 | 0.1050 | 20 | AGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST16-C-C2-1-FHT3-ETA1-3 | C | C2 | 3 | 2 | 112.5 | 0.1046 | 20 | AGM |

| Avg. t_{ply} [in] | Strength _{norm} [ksi] |
|---------------------|--------------------------------|
| 0.005485 | 102.1 |
| 0.005510 | 100.3 |
| 0.005485 | 102.0 |
| 0.005555 | 106.1 |
| 0.005540 | 105.7 |
| 0.005575 | 105.3 |
| 0.005578 | 101.1 |
| 0.005522 | 102.0 |
| 0.005519 | 101.7 |
| 0.005614 | 103.9 |
| 0.005576 | 109.8 |
| 0.005553 | 105.3 |
| 0.005549 | 106.5 |
| 0.005588 | 121.4 |
| 0.005577 | 120.2 |
| 0.005532 | 121.5 |
| 0.005232 | 110.8 |
| 0.005248 | 110.7 |
| 0.005230 | 109.0 |

Average 105.8
 Standard Dev. 7.177
 Coeff. of Var. [%] 6.785
 Min. 97.86
 Max. 118.6
 Number of Spec. 19

Average_{norm} 0.005498 107.6
 Standard Dev_{norm} 6.772
 Coeff. of Var. [%]_{norm} 6.291
 Min. 0.005230 100.3
 Max. 0.005614 121.5
 Number of Spec. 19 19



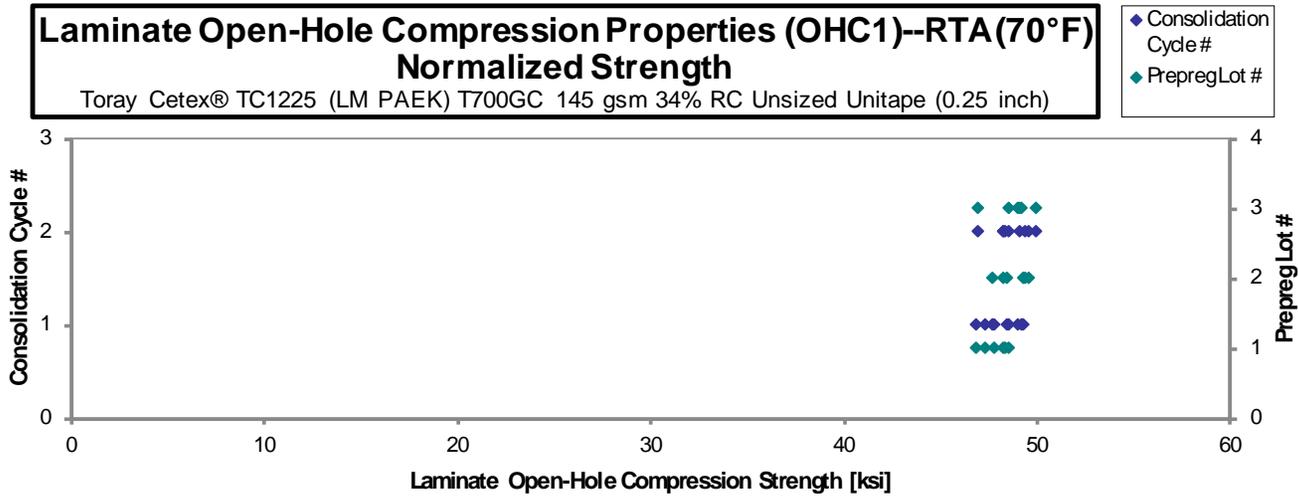
4.25 “25/50/25” Open-Hole Compression 1 Properties (OHC1)

Laminate Open-Hole Compression Properties (OHC1)--RTA (70°F)
Strength
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode | Avg. t_{ply} [in] | Strength _{norm} [ksi] |
|--|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|--------------|---------------------|--------------------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-A-C1-1-OHC1-RTA-1 | A | C1 | 1 | 1 | 47.67 | 0.1732 | 32 | LGM | 0.005412 | 47.77 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-A-C1-1-OHC1-RTA-2 | A | C1 | 1 | 1 | 47.25 | 0.1729 | 32 | LGM | 0.005403 | 47.28 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-A-C1-1-OHC1-RTA-3 | A | C1 | 1 | 1 | 46.77 | 0.1733 | 32 | LGM | 0.005415 | 46.90 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-A-C2-1-OHC1-RTA-1 | A | C2 | 1 | 2 | 48.34 | 0.1735 | 32 | LGM | 0.005422 | 48.54 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-A-C2-1-OHC1-RTA-2 | A | C2 | 1 | 2 | 48.02 | 0.1739 | 32 | M(A,L)GM | 0.005434 | 48.32 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-A-C2-1-OHC1-RTA-3 | A | C2 | 1 | 2 | 47.91 | 0.1742 | 32 | M(A,L)GM | 0.005445 | 48.31 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-B-C1-1-OHC1-RTA-1 | B | C1 | 2 | 1 | 48.43 | 0.1727 | 32 | M(A,L)GM | 0.005398 | 48.41 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-B-C1-1-OHC1-RTA-2 | B | C1 | 2 | 1 | 47.78 | 0.1726 | 32 | LGM | 0.005395 | 47.73 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-B-C1-1-OHC1-RTA-3 | B | C1 | 2 | 1 | 49.17 | 0.1731 | 32 | LGM | 0.005410 | 49.26 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-B-C2-1-OHC1-RTA-1 | B | C2 | 2 | 2 | 47.63 | 0.1799 | 32 | M(A,L)GM | 0.005622 | 49.59 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-B-C2-1-OHC1-RTA-2 | B | C2 | 2 | 2 | 47.46 | 0.1798 | 32 | M(A,L)GM | 0.005619 | 49.38 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-B-C2-1-OHC1-RTA-3 | B | C2 | 2 | 2 | 46.37 | 0.1798 | 32 | M(A,L)GM | 0.005618 | 48.25 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST10-C-C1-1-OHC1-RTA-1 | C | C1 | 3 | 1 | 48.54 | 0.1751 | 32 | M(A,L)GM | 0.005472 | 49.19 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST10-C-C1-1-OHC1-RTA-2 | C | C1 | 3 | 1 | 48.31 | 0.1752 | 32 | M(A,L)GM | 0.005476 | 48.98 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST10-C-C1-1-OHC1-RTA-3 | C | C1 | 3 | 1 | 47.76 | 0.1755 | 32 | M(A,L)GM | 0.005483 | 48.50 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST10-C-C2-1-OHC1-RTA-1 | C | C2 | 3 | 2 | 49.56 | 0.1742 | 32 | M(A,L)GM | 0.005444 | 49.96 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST10-C-C2-1-OHC1-RTA-2 | C | C2 | 3 | 2 | 46.04 | 0.1761 | 32 | M(A,L)GM | 0.005503 | 46.91 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST10-C-C2-1-OHC1-RTA-3 | C | C2 | 3 | 2 | 48.54 | 0.1747 | 32 | LGM | 0.005459 | 49.07 |

| | | | | |
|---------------------------|---------------|--|-----------------|---------------|
| Average | 47.86 | Average_{norm} | 0.005468 | 48.46 |
| Standard Dev. | 0.8967 | Standard Dev._{norm} | | 0.8912 |
| Coeff. of Var. [%] | 1.873 | Coeff. of Var. [%]_{norm} | | 1.839 |
| Min. | 46.04 | Min. | 0.005395 | 46.90 |
| Max. | 49.56 | Max. | 0.005622 | 49.96 |
| Number of Spec. | 18 | Number of Spec. | 18 | 18 |



**Laminate Open-Hole Compression Properties (OHC1)--ETA1 (275°F)
Strength**

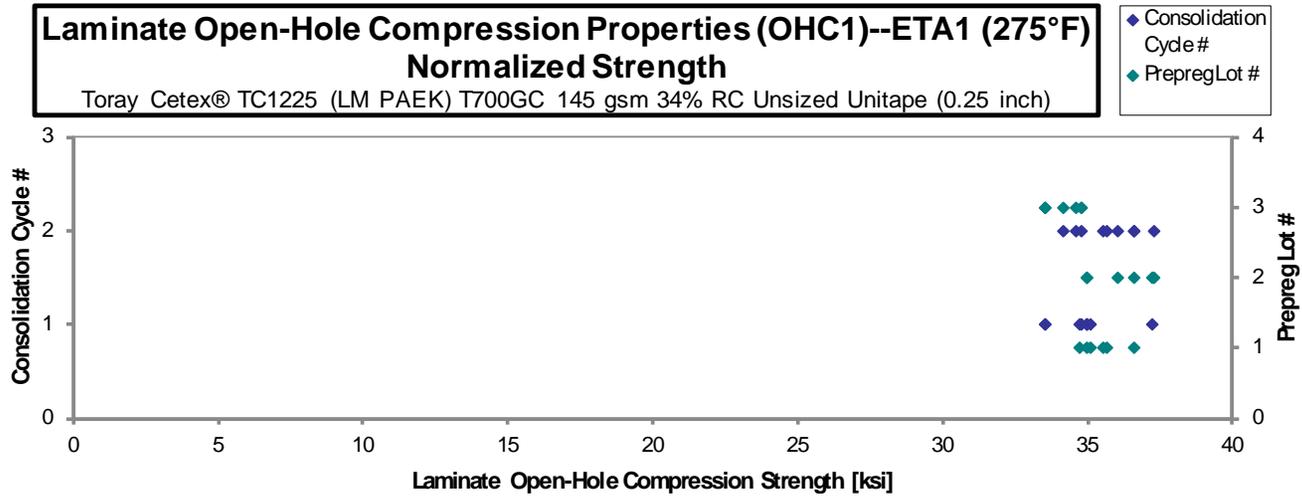
Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

normalizing
t_{ply} [in]
0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode | Avg. t _{ply} [in] | Strength _{norm} [ksi] |
|---|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|--------------|----------------------------|--------------------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-A-C1-1-OHC1-ETA1-1 | A | C1 | 1 | 1 | 34.67 | 0.1732 | 32 | LGM | 0.005411 | 34.74 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-A-C1-1-OHC1-ETA1-2 | A | C1 | 1 | 1 | 35.06 | 0.1726 | 32 | LGM | 0.005395 | 35.03 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-A-C1-1-OHC1-SP-3 | A | C1 | 1 | 1 | 35.22 | 0.1723 | 32 | LGM | 0.005383 | 35.10 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-A-C2-1-OHC1-ETA1-1 | A | C2 | 1 | 2 | 35.38 | 0.1744 | 32 | LGM | 0.005450 | 35.71 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-A-C2-1-OHC1-ETA1-2 | A | C2 | 1 | 2 | 36.27 | 0.1745 | 32 | LGM | 0.005452 | 36.62 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-A-C2-1-OHC1-ETA1-3 | A | C2 | 1 | 2 | 35.08 | 0.1751 | 32 | LGM | 0.005472 | 35.54 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-B-C1-1-OHC1-ETA1-1 | B | C1 | 2 | 1 | 37.20 | 0.1732 | 32 | LGM | 0.005411 | 37.28 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-B-C1-1-OHC1-ETA1-2 | B | C1 | 2 | 1 | 34.98 | 0.1728 | 32 | LGM | 0.005400 | 34.98 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-B-C1-1-OHC1-ETA1-3 | B | C1 | 2 | 1 | 35.04 | 0.1726 | 32 | LGM | 0.005394 | 35.00 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-B-C2-1-OHC1-ETA1-1 | B | C2 | 2 | 2 | 35.80 | 0.1801 | 32 | LGM | 0.005628 | 37.32 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-B-C2-1-OHC1-ETA1-2 | B | C2 | 2 | 2 | 34.74 | 0.1793 | 32 | LGM | 0.005602 | 36.04 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-B-C2-1-OHC1-ETA1-3 | B | C2 | 2 | 2 | 35.23 | 0.1798 | 32 | LGM | 0.005617 | 36.64 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST10-C-C1-1-OHC1-ETA1-1 | C | C1 | 3 | 1 | 34.17 | 0.1761 | 32 | LGM | 0.005503 | 34.82 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST10-C-C1-1-OHC1-ETA1-2 | C | C1 | 3 | 1 | 32.98 | 0.1759 | 32 | LGM | 0.005497 | 33.57 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST10-C-C1-1-OHC1-ETA1-3 | C | C1 | 3 | 1 | 33.02 | 0.1757 | 32 | LGM | 0.005491 | 33.57 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST10-C-C2-1-OHC1-ETA1-1 | C | C2 | 3 | 2 | 33.71 | 0.1752 | 32 | LGM | 0.005476 | 34.18 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST10-C-C2-1-OHC1-ETA1-2 | C | C2 | 3 | 2 | 34.29 | 0.1753 | 32 | LGM | 0.005478 | 34.79 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST10-C-C2-1-OHC1-ETA1-3 | C | C2 | 3 | 2 | 34.21 | 0.1748 | 32 | LGM | 0.005463 | 34.61 |

Average 34.84
Standard Dev. 1.044
Coeff. of Var. [%] 2.995
Min. 32.98
Max. 37.20
Number of Spec. 18

Average_{norm} 0.005473 35.31
Standard Dev._{norm} 1.114
Coeff. of Var. [%]_{norm} 3.155
Min. 0.005383 33.57
Max. 0.005628 37.32
Number of Spec. 18 18



Laminate Open-Hole Compression Properties (OHC1)--ETA2 (400°F)
Strength
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

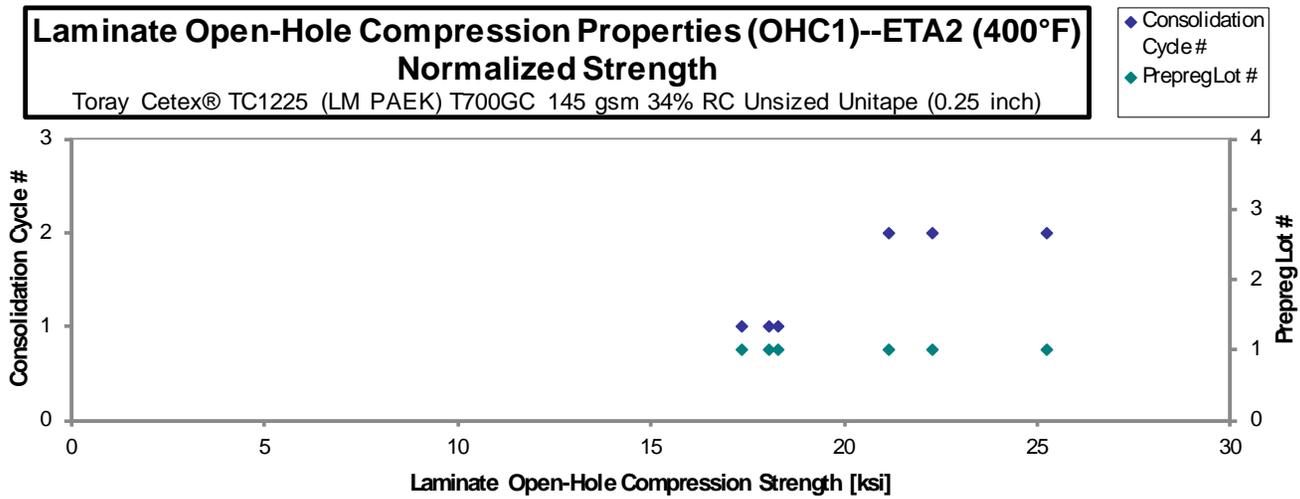
normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|--|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|--------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-A-C1-1-OHC1-ETA2-1 | A | C1 | 1 | 1 | 17.37 | 0.1727 | 32 | LGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-A-C1-1-OHC1-ETA2-2 | A | C1 | 1 | 1 | 18.14 | 0.1722 | 32 | LGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-A-C1-1-OHC1-ETA2-3 | A | C1 | 1 | 1 | 18.36 | 0.1721 | 32 | LGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-A-C2-1-OHC1-ETA2-1 | A | C2 | 1 | 2 | 25.05 | 0.1742 | 32 | LGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-A-C2-1-OHC1-ETA2-2 | A | C2 | 1 | 2 | 22.09 | 0.1743 | 32 | LGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-A-C2-1-OHC1-ETA2-3 | A | C2 | 1 | 2 | 21.03 | 0.1741 | 32 | LGM |

| Avg. t_{ply} [in] | Strength _{norm} [ksi] |
|---------------------|--------------------------------|
| 0.005397 | 17.36 |
| 0.005381 | 18.08 |
| 0.005379 | 18.29 |
| 0.005445 | 25.26 |
| 0.005446 | 22.28 |
| 0.005440 | 21.19 |

Average 20.34
 Standard Dev. 2.943
 Coeff. of Var. [%] 14.47
 Min. 17.37
 Max. 25.05
 Number of Spec. 6

Average_{norm} 0.005415 20.41
 Standard Dev._{norm} 3.060
 Coeff. of Var. [%]_{norm} 14.99
 Min. 0.005379 17.36
 Max. 0.005446 25.26
 Number of Spec. 6 6



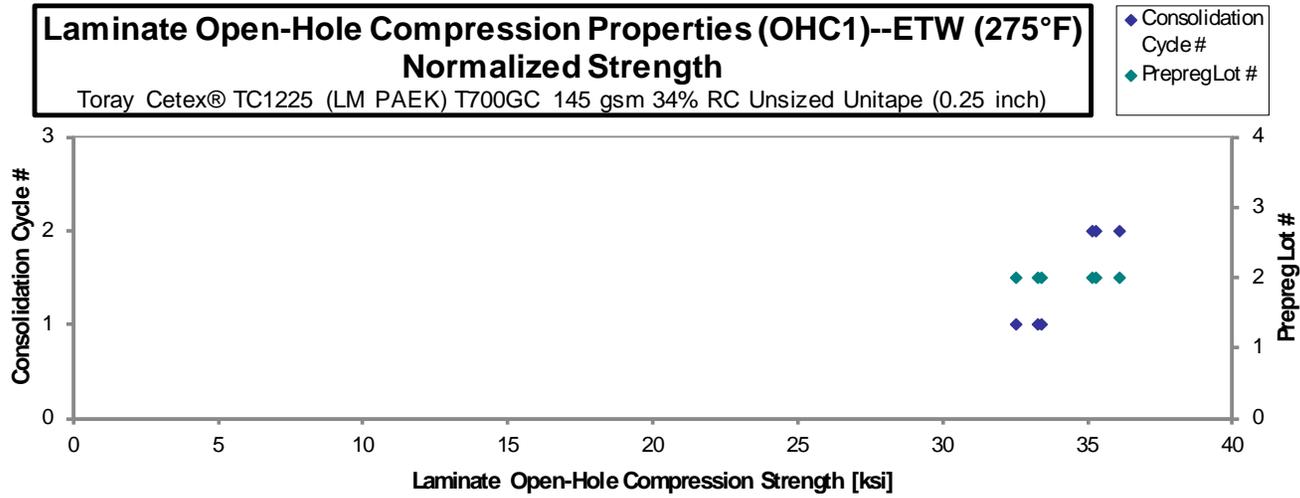
Laminate Open-Hole Compression Properties (OHC1)--ETW (275°F)
Strength
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode | Avg. t_{ply} [in] | Strength _{norm} [ksi] |
|---|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|--------------|---------------------|--------------------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-B-C1-1-OHC1-ETW-1 | B | C1 | 2 | 1 | 32.50 | 0.1732 | 32 | M(A,L)GM | 0.005414 | 32.58 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-B-C1-1-OHC1-ETW-2 | B | C1 | 2 | 1 | 33.44 | 0.1728 | 32 | M(A,L)GM | 0.005399 | 33.43 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-B-C1-1-OHC1-ETW-3 | B | C1 | 2 | 1 | 33.37 | 0.1726 | 32 | LGM | 0.005393 | 33.32 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-B-C2-1-OHC1-ETW-1 | B | C2 | 2 | 2 | 34.78 | 0.1795 | 32 | LGM | 0.005609 | 36.13 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-B-C2-1-OHC1-ETW-2 | B | C2 | 2 | 2 | 33.76 | 0.1808 | 32 | LGM | 0.005650 | 35.33 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-B-C2-1-OHC1-ETW-3 | B | C2 | 2 | 2 | 33.64 | 0.1807 | 32 | M(A,L)GM | 0.005646 | 35.17 |

Average 33.58
 Standard Dev. 0.7380
 Coeff. of Var. [%] 2.198
 Min. 32.50
 Max. 34.78
 Number of Spec. 6

Average_{norm} 0.005518 34.33
 Standard Dev._{norm} 1.402
 Coeff. of Var. [%]_{norm} 4.085
 Min. 0.005393 32.58
 Max. 0.005650 36.13
 Number of Spec. 6 6



4.26 “10/80/10” Open-Hole Compression 2 Properties (OHC2)

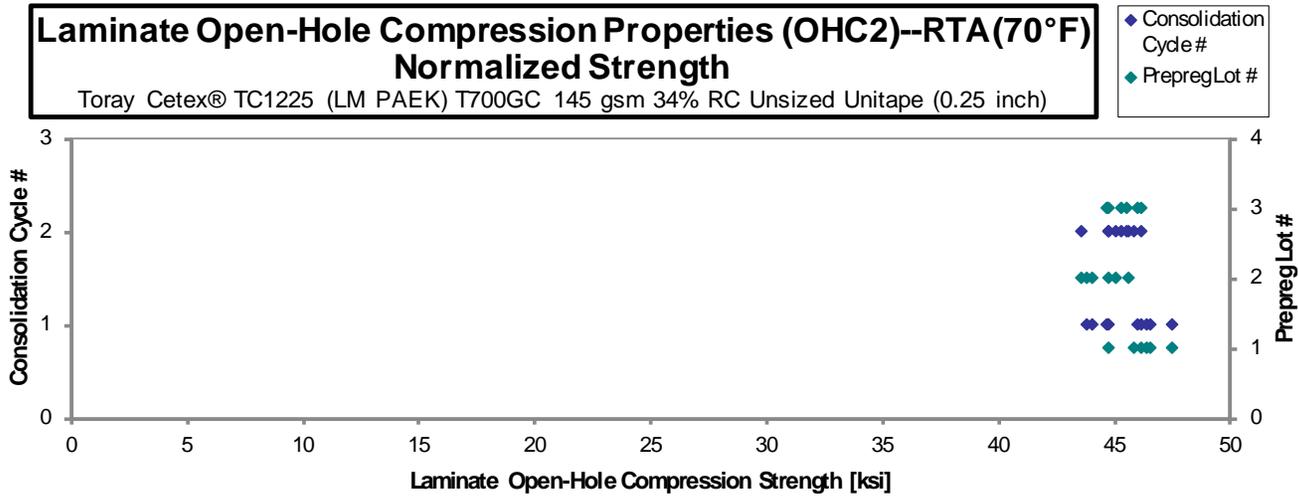
Laminate Open-Hole Compression Properties (OHC2)--RTA (70°F)
Strength
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode | Avg. t_{ply} [in] | Strength _{norm} [ksi] |
|--|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|--------------|---------------------|--------------------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST14-A-C1-1-OHC2-RTA-1 | A | C1 | 1 | 1 | 45.81 | 0.2240 | 40 | M(A,L)GM | 0.005599 | 47.50 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST14-A-C1-1-OHC2-RTA-2 | A | C1 | 1 | 1 | 45.00 | 0.2226 | 40 | M(A,L)GM | 0.005565 | 46.38 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST14-A-C1-1-OHC2-RTA-3 | A | C1 | 1 | 1 | 45.50 | 0.2211 | 40 | M(A,L)GM | 0.005527 | 46.57 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST14-A-C2-1-OHC2-RTA-1 | A | C2 | 1 | 2 | 45.50 | 0.2194 | 40 | M(A,L)GM | 0.005484 | 46.21 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST14-A-C2-1-OHC2-RTA-2 | A | C2 | 1 | 2 | 45.27 | 0.2189 | 40 | AGM | 0.005472 | 45.88 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST14-A-C2-1-OHC2-RTA-3 | A | C2 | 1 | 2 | 44.20 | 0.2189 | 40 | AGM | 0.005472 | 44.79 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST14-B-C1-1-OHC2-RTA-1 | B | C1 | 2 | 1 | 44.57 | 0.2125 | 40 | LGM | 0.005312 | 43.85 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST14-B-C1-1-OHC2-RTA-2 | B | C1 | 2 | 1 | 45.59 | 0.2119 | 40 | LGM | 0.005298 | 44.73 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST14-B-C1-1-OHC2-RTA-3 | B | C1 | 2 | 1 | 44.51 | 0.2140 | 40 | LGM | 0.005350 | 44.10 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST14-B-C2-1-OHC2-RTA-1 | B | C2 | 2 | 2 | 45.53 | 0.2138 | 40 | M(A,L)GM | 0.005346 | 45.08 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST14-B-C2-1-OHC2-RTA-2 | B | C2 | 2 | 2 | 44.09 | 0.2136 | 40 | M(A,L)GM | 0.005341 | 43.61 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST14-B-C2-1-OHC2-RTA-3 | B | C2 | 2 | 2 | 46.03 | 0.2141 | 40 | M(A,L)GM | 0.005353 | 45.63 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST14-C-C1-1-OHC2-RTA-1 | C | C1 | 3 | 1 | 46.18 | 0.2161 | 40 | M(A,L)GM | 0.005403 | 46.21 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST14-C-C1-1-OHC2-RTA-2 | C | C1 | 3 | 1 | 45.94 | 0.2163 | 40 | M(A,L)GM | 0.005407 | 46.00 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST14-C-C1-1-OHC2-RTA-3 | C | C1 | 3 | 1 | 44.79 | 0.2155 | 40 | M(A,L)GM | 0.005386 | 44.68 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST14-C-C2-1-OHC2-RTA-1 | C | C2 | 3 | 2 | 46.06 | 0.2136 | 40 | AGM | 0.005339 | 45.54 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST14-C-C2-1-OHC2-RTA-2 | C | C2 | 3 | 2 | 45.59 | 0.2145 | 40 | AGM | 0.005363 | 45.28 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST14-C-C2-1-OHC2-RTA-3 | C | C2 | 3 | 2 | 45.23 | 0.2137 | 40 | AGM | 0.005342 | 44.74 |

Average 45.30
 Standard Dev. 0.6436
 Coeff. of Var. [%] 1.421
 Min. 44.09
 Max. 46.18
 Number of Spec. 18

Average_{norm} 0.005409 45.38
 Standard Dev._{norm} 1.026
 Coeff. of Var. [%]_{norm} 2.262
 Min. 0.005298 43.61
 Max. 0.005599 47.50
 Number of Spec. 18 18



**Laminate Open-Hole Compression Properties (OHC2)--ETA1 (275°F)
Strength**

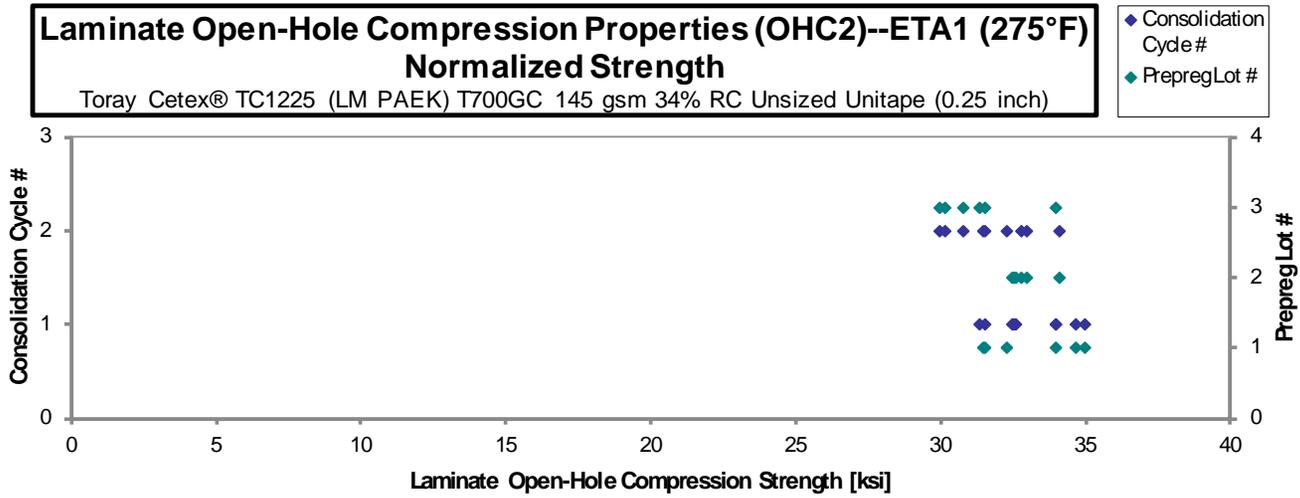
Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

normalizing
t_{ply} [in]
0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode | Avg. t _{ply} [in] | Strength _{norm} [ksi] |
|---|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|--------------|----------------------------|--------------------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST14-A-C1-1-OHC2-ETA1-1 | A | C1 | 1 | 1 | 33.99 | 0.2226 | 40 | M(A,L)GM | 0.005564 | 35.02 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST14-A-C1-1-OHC2-ETA1-2 | A | C1 | 1 | 1 | 33.68 | 0.2224 | 40 | M(A,L)GM | 0.005559 | 34.67 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST14-A-C1-1-OHC2-ETA1-3 | A | C1 | 1 | 1 | 32.96 | 0.2229 | 40 | M(A,L)GM | 0.005571 | 34.01 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST14-A-C2-1-OHC2-ETA1-1 | A | C2 | 1 | 2 | 31.92 | 0.2187 | 40 | AGM | 0.005468 | 32.32 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST14-A-C2-1-OHC2-ETA1-2 | A | C2 | 1 | 2 | 31.12 | 0.2189 | 40 | AGM | 0.005472 | 31.53 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST14-A-C2-1-OHC2-ETA1-3 | A | C2 | 1 | 2 | 31.04 | 0.2192 | 40 | AGM | 0.005480 | 31.51 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST14-B-C1-1-OHC2-ETA1-1 | B | C1 | 2 | 1 | 33.20 | 0.2123 | 40 | M(A,L)GM | 0.005308 | 32.64 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST14-B-C1-1-OHC2-ETA1-2 | B | C1 | 2 | 1 | 32.90 | 0.2132 | 40 | AGM | 0.005329 | 32.46 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST14-B-C1-1-OHC2-ETA1-3 | B | C1 | 2 | 1 | 33.01 | 0.2131 | 40 | M(A,L)GM | 0.005327 | 32.56 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST14-B-C2-1-OHC2-ETA1-1 | B | C2 | 2 | 2 | 33.26 | 0.2141 | 40 | M(A,L)GM | 0.005353 | 32.97 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST14-B-C2-1-OHC2-ETA1-2 | B | C2 | 2 | 2 | 34.41 | 0.2141 | 40 | M(A,L)GM | 0.005353 | 34.11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST14-B-C2-1-OHC2-ETA1-3 | B | C2 | 2 | 2 | 33.01 | 0.2144 | 40 | M(A,L)GM | 0.005361 | 32.77 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST14-C-C1-1-OHC2-ETA1-1 | C | C1 | 3 | 1 | 34.12 | 0.2152 | 40 | M(A,L)GM | 0.005380 | 33.99 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST14-C-C1-1-OHC2-ETA1-2 | C | C1 | 3 | 1 | 31.46 | 0.2166 | 40 | AGM | 0.005415 | 31.54 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST14-C-C1-1-OHC2-ETA1-3 | C | C1 | 3 | 1 | 31.44 | 0.2155 | 40 | AGM | 0.005387 | 31.37 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST14-C-C2-1-OHC2-ETA1-1 | C | C2 | 3 | 2 | 31.06 | 0.2144 | 40 | M(A,L)GM | 0.005360 | 30.83 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST14-C-C2-1-OHC2-ETA1-2 | C | C2 | 3 | 2 | 30.33 | 0.2134 | 40 | M(A,L)GM | 0.005335 | 29.97 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST14-C-C2-1-OHC2-ETA1-3 | C | C2 | 3 | 2 | 30.48 | 0.2140 | 40 | M(A,L)GM | 0.005350 | 30.20 |

Average 32.41
Standard Dev. 1.309
Coeff. of Var. [%] 4.037
Min. 30.33
Max. 34.41
Number of Spec. 18

Average_{norm} 0.005409 32.47
Standard Dev._{norm} 1.478
Coeff. of Var. [%]_{norm} 4.551
Min. 0.005308 29.97
Max. 0.005571 35.02
Number of Spec. 18



4.27 “50/40/10” Open-Hole Compression 3 Properties (OHC3)

Laminate Open-Hole Compression Properties (OHC3)--RTA (70°F)
Strength
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

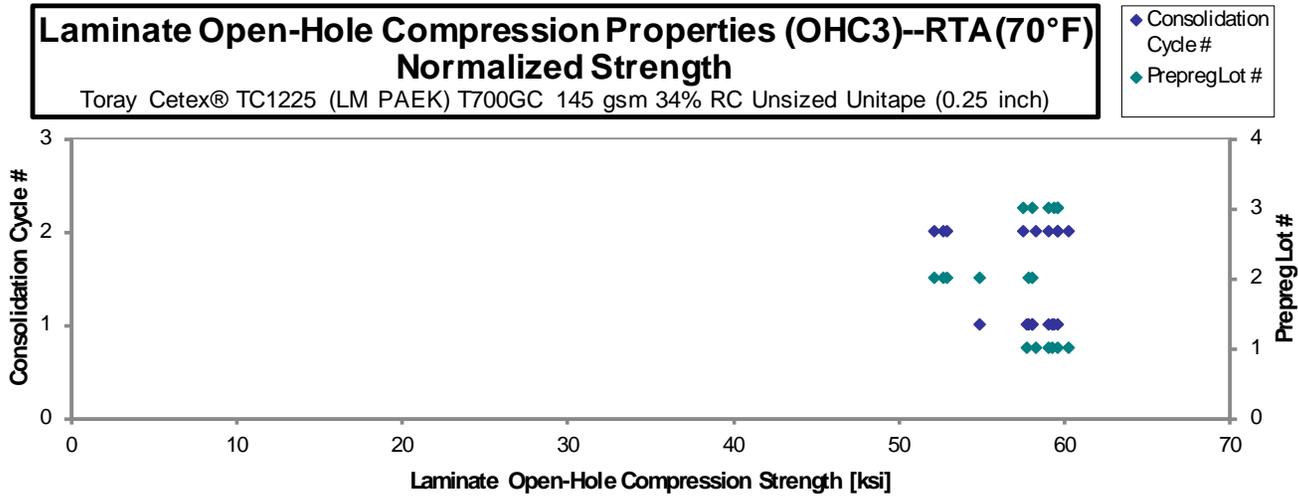
normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|--|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|--------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST17-A-C1-1-OHC3-RTA-1 | A | C1 | 1 | 1 | 57.38 | 0.2223 | 40 | LGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST17-A-C1-1-OHC3-RTA-2 | A | C1 | 1 | 1 | 56.81 | 0.2193 | 40 | LGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST17-A-C1-1-OHC3-RTA-3 | A | C1 | 1 | 1 | 58.30 | 0.2198 | 40 | LGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST17R-A-C2-1-OHC3-RTA-1 | A | C2 | 1 | 2 | 57.10 | 0.2254 | 40 | LGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST17R-A-C2-1-OHC3-RTA-2 | A | C2 | 1 | 2 | 58.59 | 0.2223 | 40 | LGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST17R-A-C2-1-OHC3-RTA-3 | A | C2 | 1 | 2 | 56.50 | 0.2228 | 40 | LGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST17-B-C1-1-OHC3-RTA-1 | B | C1 | 2 | 1 | 56.76 | 0.2202 | 40 | LGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST17-B-C1-1-OHC3-RTA-2 | B | C1 | 2 | 1 | 57.21 | 0.2193 | 40 | LGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST17-B-C1-1-OHC3-RTA-3 | B | C1 | 2 | 1 | 54.10 | 0.2192 | 40 | LGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST17-B-C2-1-OHC3-RTA-1 | B | C2 | 2 | 2 | 54.40 | 0.2092 | 40 | LGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST17-B-C2-1-OHC3-RTA-2 | B | C2 | 2 | 2 | 55.02 | 0.2079 | 40 | LGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST17-B-C2-1-OHC3-RTA-3 | B | C2 | 2 | 2 | 54.09 | 0.2081 | 40 | LGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST17-C-C1-1-OHC3-RTA-1 | C | C1 | 3 | 1 | 57.62 | 0.2234 | 40 | LGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST17-C-C1-1-OHC3-RTA-2 | C | C1 | 3 | 1 | 57.44 | 0.2232 | 40 | LGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST17-C-C1-1-OHC3-RTA-3 | C | C1 | 3 | 1 | 55.73 | 0.2252 | 40 | LGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST17-C-C2-1-OHC3-RTA-1 | C | C2 | 3 | 2 | 57.53 | 0.2239 | 40 | LGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST17-C-C2-1-OHC3-RTA-2 | C | C2 | 3 | 2 | 55.84 | 0.2225 | 40 | LGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST17-C-C2-1-OHC3-RTA-3 | C | C2 | 3 | 2 | 57.36 | 0.2222 | 40 | LGM |

| Avg. t_{ply} [in] | Strength _{norm} [ksi] |
|---------------------|--------------------------------|
| 0.005558 | 59.05 |
| 0.005483 | 57.69 |
| 0.005494 | 59.31 |
| 0.005635 | 59.58 |
| 0.005556 | 60.29 |
| 0.005570 | 58.27 |
| 0.005506 | 57.88 |
| 0.005483 | 58.09 |
| 0.005481 | 54.91 |
| 0.005231 | 52.70 |
| 0.005197 | 52.95 |
| 0.005202 | 52.10 |
| 0.005585 | 59.60 |
| 0.005579 | 59.34 |
| 0.005630 | 58.10 |
| 0.005597 | 59.63 |
| 0.005562 | 57.52 |
| 0.005555 | 59.00 |

Average 56.54
 Standard Dev. 1.383
 Coeff. of Var. [%] 2.446
 Min. 54.09
 Max. 58.59
 Number of Spec. 18

Average_{norm} 0.005495 57.56
 Standard Dev._{norm} 2.583
 Coeff. of Var. [%]_{norm} 4.488
 Min. 0.005197 52.10
 Max. 0.005635 60.29
 Number of Spec. 18 18



**Laminate Open-Hole Compression Properties (OHC3)--ETA1 (275°F)
Strength**

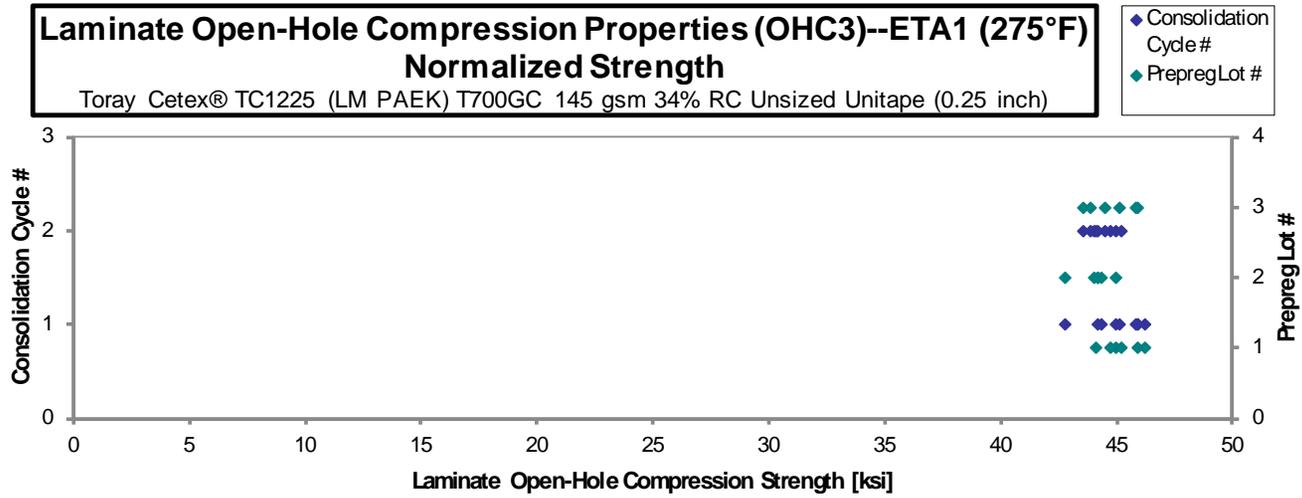
Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

normalizing
t_{ply} [in]
0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode | Avg. t _{ply} [in] | Strength _{norm} [ksi] |
|---|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|--------------|----------------------------|--------------------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST17-A-C1-1-OHC3-ETA1-1 | A | C1 | 1 | 1 | 44.20 | 0.2198 | 40 | LGM | 0.005494 | 44.97 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST17-A-C1-1-OHC3-ETA1-2 | A | C1 | 1 | 1 | 45.12 | 0.2198 | 40 | LGM | 0.005494 | 45.91 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST17-A-C1-1-OHC3-ETA1-3 | A | C1 | 1 | 1 | 45.42 | 0.2201 | 40 | LGM | 0.005503 | 46.29 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST17R-A-C2-1-OHC3-ETA1-1 | A | C2 | 1 | 2 | 43.48 | 0.2224 | 40 | LGM | 0.005559 | 44.76 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST17R-A-C2-1-OHC3-ETA1-2 | A | C2 | 1 | 2 | 42.84 | 0.2227 | 40 | LGM | 0.005567 | 44.16 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST17R-A-C2-1-OHC3-ETA1-3 | A | C2 | 1 | 2 | 43.87 | 0.2226 | 40 | LGM | 0.005564 | 45.20 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST17-B-C1-1-OHC3-ETA1-1 | B | C1 | 2 | 1 | 43.67 | 0.2197 | 40 | LGM | 0.005492 | 44.41 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST17-B-C1-1-OHC3-ETA1-2 | B | C1 | 2 | 1 | 42.13 | 0.2195 | 40 | LGM | 0.005487 | 42.80 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST17-B-C1-1-OHC3-SP-3 | B | C1 | 2 | 1 | 43.47 | 0.2195 | 40 | M(A,L)GM | 0.005488 | 44.18 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST17-B-C2-1-OHC3-ETA1-1 | B | C2 | 2 | 2 | 46.56 | 0.2088 | 40 | LGM | 0.005219 | 45.00 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST17-B-C2-1-OHC3-ETA1-2 | B | C2 | 2 | 2 | 45.90 | 0.2074 | 40 | LGM | 0.005185 | 44.07 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST17-B-C2-1-OHC3-ETA1-3 | B | C2 | 2 | 2 | 45.87 | 0.2082 | 40 | LGM | 0.005205 | 44.21 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST17-C-C1-1-OHC3-ETA1-1 | C | C1 | 3 | 1 | 43.98 | 0.2217 | 40 | LGM | 0.005542 | 45.13 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST17-C-C1-1-OHC3-ETA1-2 | C | C1 | 3 | 1 | 44.92 | 0.2209 | 40 | LGM | 0.005521 | 45.93 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST17-C-C1-1-OHC3-ETA1-3 | C | C1 | 3 | 1 | 44.95 | 0.2204 | 40 | LGM | 0.005510 | 45.86 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST17-C-C2-1-OHC3-ETA1-1 | C | C2 | 3 | 2 | 42.41 | 0.2221 | 40 | LGM | 0.005553 | 43.61 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST17-C-C2-1-OHC3-ETA1-2 | C | C2 | 3 | 2 | 42.51 | 0.2231 | 40 | LGM | 0.005576 | 43.90 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST17-C-C2-1-OHC3-ETA1-3 | C | C2 | 3 | 2 | 43.18 | 0.2228 | 40 | LGM | 0.005571 | 44.55 |

Average 44.14
Standard Dev. 1.313
Coeff. of Var. [%] 2.975
Min. 42.13
Max. 46.56
Number of Spec. 18

Average_{norm} 0.005474 44.72
Standard Dev._{norm} 0.9131
Coeff. of Var. [%]_{norm} 2.042
Min. 0.005185 42.80
Max. 0.005576 46.29
Number of Spec. 18 18



4.28 “25/50/25” Filled-Hole Compression 1 Properties (FHC1)

Laminate Filled-Hole Compression Properties (FHC1)--RTA (70°F)
Strength
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

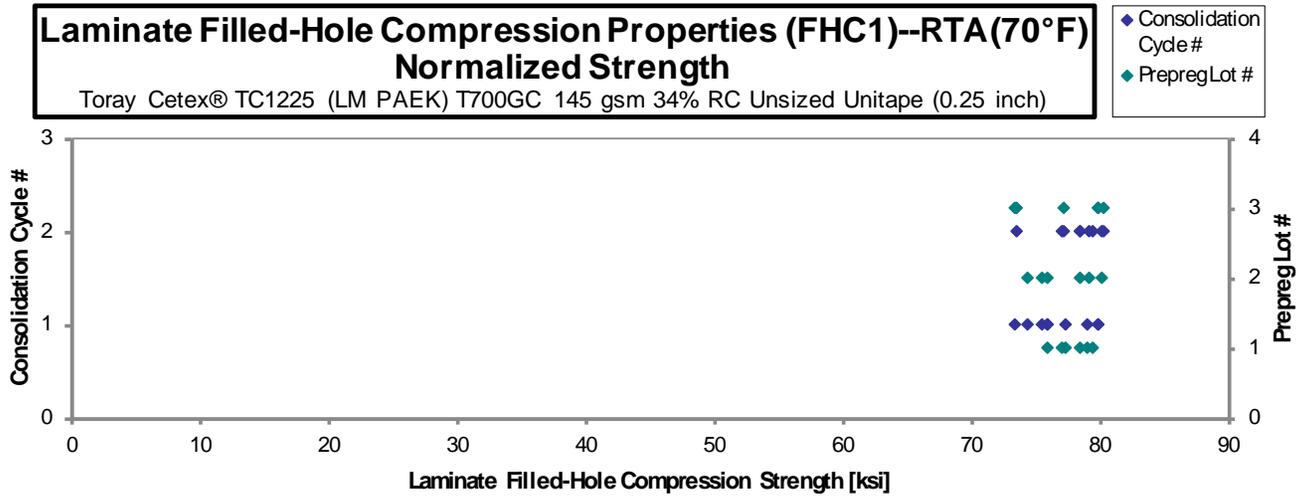
normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|--|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|--------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-A-C1-1-FHC1-RTA-1 | A | C1 | 1 | 1 | 77.04 | 0.1734 | 32 | M(A,L)GF |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-A-C1-1-FHC1-RTA-2 | A | C1 | 1 | 1 | 79.16 | 0.1726 | 32 | M(A,L)GF |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-A-C1-1-FHC1-RTA-3 | A | C1 | 1 | 1 | 76.16 | 0.1723 | 32 | M(A,L)GF |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-A-C2-1-FHC1-RTA-1 | A | C2 | 1 | 2 | 78.56 | 0.1748 | 32 | M(A,L)GF |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-A-C2-1-FHC1-RTA-2 | A | C2 | 1 | 2 | 78.04 | 0.1737 | 32 | M(A,L)GF |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-A-C2-1-FHC1-RTA-3 | A | C2 | 1 | 2 | 76.84 | 0.1732 | 32 | M(A,L)GF |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-B-C1-1-FHC1-RTA-1 | B | C1 | 2 | 1 | 75.80 | 0.1721 | 32 | M(A,L)GF |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-B-C1-1-FHC1-RTA-2 | B | C1 | 2 | 1 | 76.02 | 0.1726 | 32 | M(A,L)GF, LGO |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-B-C1-1-FHC1-RTA-3 | B | C1 | 2 | 1 | 74.78 | 0.1717 | 32 | M(A,L)GF, LGO |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-B-C2-1-FHC1-RTA-1 | B | C2 | 2 | 2 | 75.39 | 0.1798 | 32 | M(A,L)GF, M(A,L)WB |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-B-C2-1-FHC1-RTA-2 | B | C2 | 2 | 2 | 77.38 | 0.1790 | 32 | M(A,L)GF |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-B-C2-1-FHC1-RTA-3 | B | C2 | 2 | 2 | 76.31 | 0.1792 | 32 | M(A,L)GF |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST10-C-C1-1-FHC1-RTA-1 | C | C1 | 3 | 1 | 78.53 | 0.1757 | 32 | M(A,L)GF |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST10-C-C1-1-FHC1-RTA-2 | C | C1 | 3 | 1 | 72.42 | 0.1749 | 32 | M(A,L)GF |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST10-C-C1-1-FHC1-RTA-3 | C | C1 | 3 | 1 | 78.26 | 0.1762 | 32 | M(A,L)GF |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST10-C-C2-1-FHC1-RTA-1 | C | C2 | 3 | 2 | 72.64 | 0.1747 | 32 | M(A,L)GF |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST10-C-C2-1-FHC1-RTA-2 | C | C2 | 3 | 2 | 79.07 | 0.1755 | 32 | M(A,L)GF |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST10-C-C2-1-FHC1-RTA-3 | C | C2 | 3 | 2 | 76.10 | 0.1752 | 32 | M(A,L)GF |

| Avg. t_{ply} [in] | Strength _{norm} [ksi] |
|---------------------|--------------------------------|
| 0.005418 | 77.30 |
| 0.005392 | 79.05 |
| 0.005383 | 75.92 |
| 0.005464 | 79.48 |
| 0.005429 | 78.46 |
| 0.005412 | 77.01 |
| 0.005379 | 75.51 |
| 0.005393 | 75.92 |
| 0.005366 | 74.31 |
| 0.005618 | 78.43 |
| 0.005594 | 80.16 |
| 0.005600 | 79.14 |
| 0.005491 | 79.86 |
| 0.005466 | 73.30 |
| 0.005507 | 79.80 |
| 0.005459 | 73.44 |
| 0.005485 | 80.32 |
| 0.005474 | 77.15 |

Average 76.58
 Standard Dev. 1.960
 Coeff. of Var. [%] 2.559
 Min. 72.42
 Max. 79.16
 Number of Spec. 18

Average_{norm} 0.005463 77.48
 Standard Dev._{norm} 2.305
 Coeff. of Var. [%]_{norm} 2.976
 Min. 0.005366 73.30
 Max. 0.005618 80.32
 Number of Spec. 18 18



**Laminate Filled-Hole Compression Properties (FHC1)--ETA1 (275°F)
Strength**

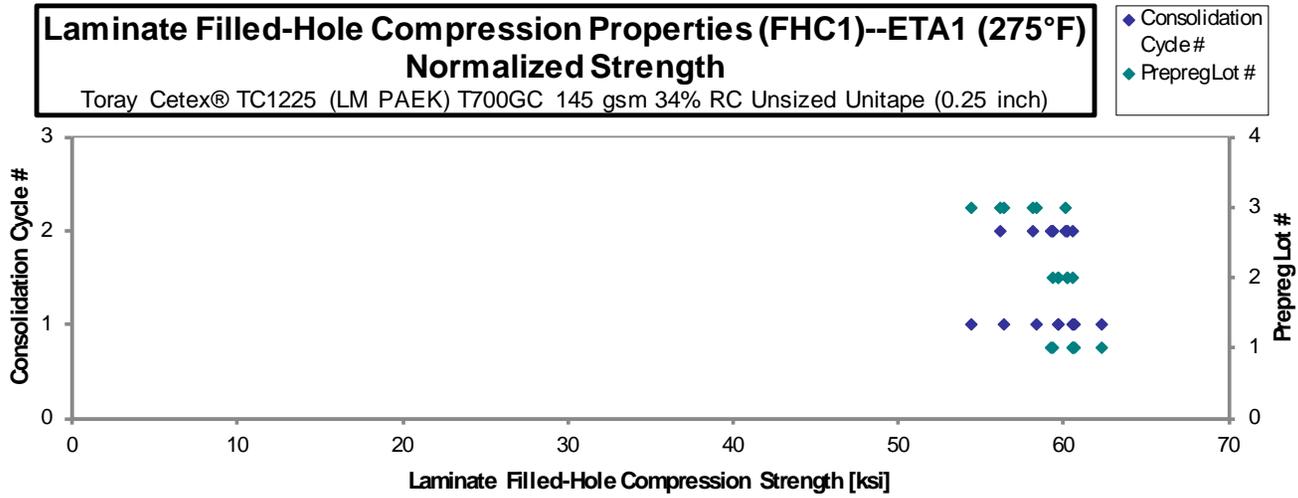
Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

normalizing
t_{ply} [in]
0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode | Avg. t _{ply} [in] | Strength _{norm} [ksi] |
|---|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|--------------|----------------------------|--------------------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-A-C1-1-FHC1-ETA1-1 | A | C1 | 1 | 1 | 62.54 | 0.1722 | 32 | LGF | 0.005382 | 62.34 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-A-C1-1-FHC1-ETA1-2 | A | C1 | 1 | 1 | 60.85 | 0.1724 | 32 | LGF | 0.005386 | 60.70 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-A-C1-1-FHC1-ETA1-3 | A | C1 | 1 | 1 | 60.66 | 0.1724 | 32 | LGF | 0.005388 | 60.52 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-A-C2-1-FHC1-ETA1-1 | A | C2 | 1 | 2 | 60.08 | 0.1742 | 32 | M(A,L)GF | 0.005443 | 60.56 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-A-C2-1-FHC1-ETA1-2 | A | C2 | 1 | 2 | 59.37 | 0.1727 | 32 | M(A,L)GF | 0.005398 | 59.34 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-A-C2-1-FHC1-ETA1-3 | A | C2 | 1 | 2 | 59.21 | 0.1730 | 32 | M(A,L)GF | 0.005407 | 59.29 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-B-C1-1-FHC1-ETA1-1 | B | C1 | 2 | 1 | 60.03 | 0.1718 | 32 | M(A,L)GF | 0.005369 | 59.69 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-B-C1-1-FHC1-ETA1-2 | B | C1 | 2 | 1 | 60.21 | 0.1740 | 32 | M(A,L)GF | 0.005436 | 60.61 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-B-C1-1-FHC1-ETA1-3 | B | C1 | 2 | 1 | 60.16 | 0.1716 | 32 | M(A,L)GF | 0.005362 | 59.74 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-B-C2-1-FHC1-ETA1-1 | B | C2 | 2 | 2 | 57.89 | 0.1798 | 32 | M(A,L)GF | 0.005618 | 60.23 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-B-C2-1-FHC1-ETA1-2 | B | C2 | 2 | 2 | 57.93 | 0.1797 | 32 | M(A,L)GF | 0.005615 | 60.24 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-B-C2-1-FHC1-ETA1-3 | B | C2 | 2 | 2 | 56.82 | 0.1807 | 32 | M(A,L)GF | 0.005646 | 59.41 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST10-C-C1-1-FHC1-ETA1-1 | C | C1 | 3 | 1 | 57.38 | 0.1759 | 32 | M(A,L)GF | 0.005497 | 58.41 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST10-C-C1-1-FHC1-ETA1-2 | C | C1 | 3 | 1 | 55.47 | 0.1758 | 32 | M(A,L)GF | 0.005494 | 56.44 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST10-C-C1-1-FHC1-ETA1-3 | C | C1 | 3 | 1 | 53.51 | 0.1757 | 32 | M(A,L)GF | 0.005490 | 54.40 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST10-C-C2-1-FHC1-ETA1-1 | C | C2 | 3 | 2 | 59.19 | 0.1756 | 32 | M(A,L)GF | 0.005488 | 60.16 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST10-C-C2-1-FHC1-ETA1-2 | C | C2 | 3 | 2 | 55.36 | 0.1755 | 32 | M(A,L)GF | 0.005483 | 56.21 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST10-C-C2-1-FHC1-ETA1-3 | C | C2 | 3 | 2 | 57.41 | 0.1750 | 32 | M(A,L)GF | 0.005468 | 58.13 |

Average 58.56
Standard Dev. 2.283
Coeff. of Var. [%] 3.899
Min. 53.51
Max. 62.54
Number of Spec. 18

Average_{norm} 0.005465 59.25
Standard Dev._{norm} 1.919
Coeff. of Var. [%]_{norm} 3.240
Min. 0.005362 54.40
Max. 0.005646 62.34
Number of Spec. 18 18



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

Laminate Filled-Hole Compression Properties (FHC1)--ETA2 (400°F)
Strength
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

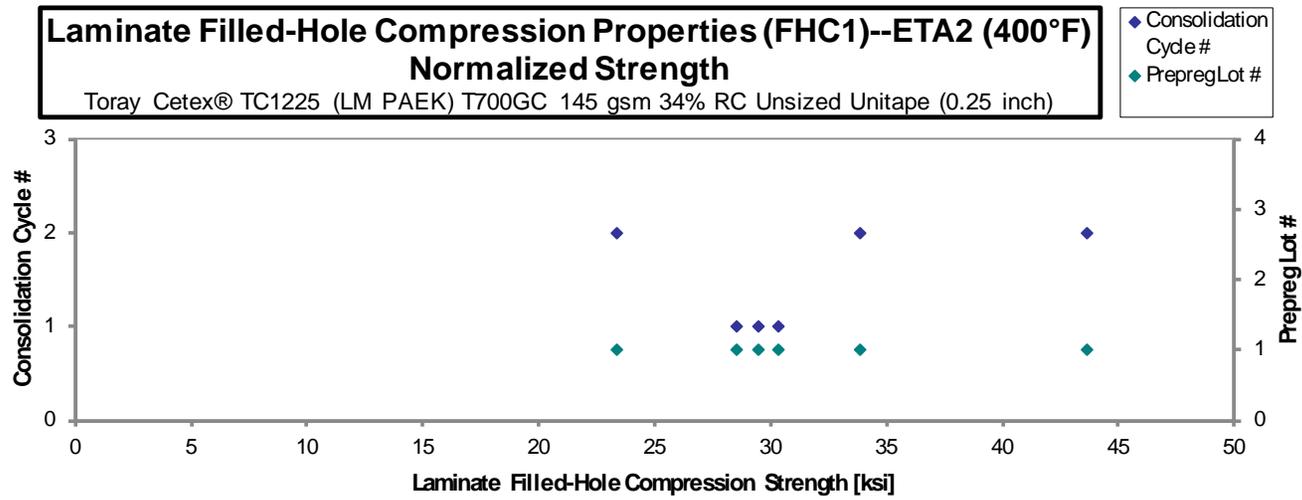
normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|--|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|--------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-A-C1-1-FHC1-ETA2-1 | A | C1 | 1 | 1 | 30.41 | 0.1726 | 32 | LGF |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-A-C1-1-FHC1-ETA2-2 | A | C1 | 1 | 1 | 29.69 | 0.1719 | 32 | LGF |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-A-C1-1-FHC1-ETA2-3 | A | C1 | 1 | 1 | 28.62 | 0.1726 | 32 | LGF |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-A-C2-1-FHC1-ETA2-2 | A | C2 | 1 | 2 | 43.42 | 0.1740 | 32 | M(A,L)GF |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-A-C2-1-FHC1-SP-3 | A | C2 | 1 | 2 | 23.17 | 0.1742 | 32 | LGF |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-A-C2-1-FHC1-SP-5 | A | C2 | 1 | 2 | 33.81 | 0.1734 | 32 | M(A,L)GF |

| Avg. t_{ply} [in] | Strength _{norm} [ksi] |
|---------------------|--------------------------------|
| 0.005395 | 30.38 |
| 0.005372 | 29.53 |
| 0.005395 | 28.59 |
| 0.005436 | 43.70 |
| 0.005445 | 23.36 |
| 0.005419 | 33.93 |

| | |
|--------------------|-------|
| Average | 31.52 |
| Standard Dev. | 6.774 |
| Coeff. of Var. [%] | 21.49 |
| Min. | 23.17 |
| Max. | 43.42 |
| Number of Spec. | 6 |

| | | |
|------------------------------------|----------|-------|
| Average _{norm} | 0.005410 | 31.58 |
| Standard Dev. _{norm} | | 6.849 |
| Coeff. of Var. [%] _{norm} | | 21.69 |
| Min. | 0.005372 | 23.36 |
| Max. | 0.005445 | 43.70 |
| Number of Spec. | 6 | 6 |



Laminate Filled-Hole Compression Properties (FHC1)--ETW (275°F)
Strength
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

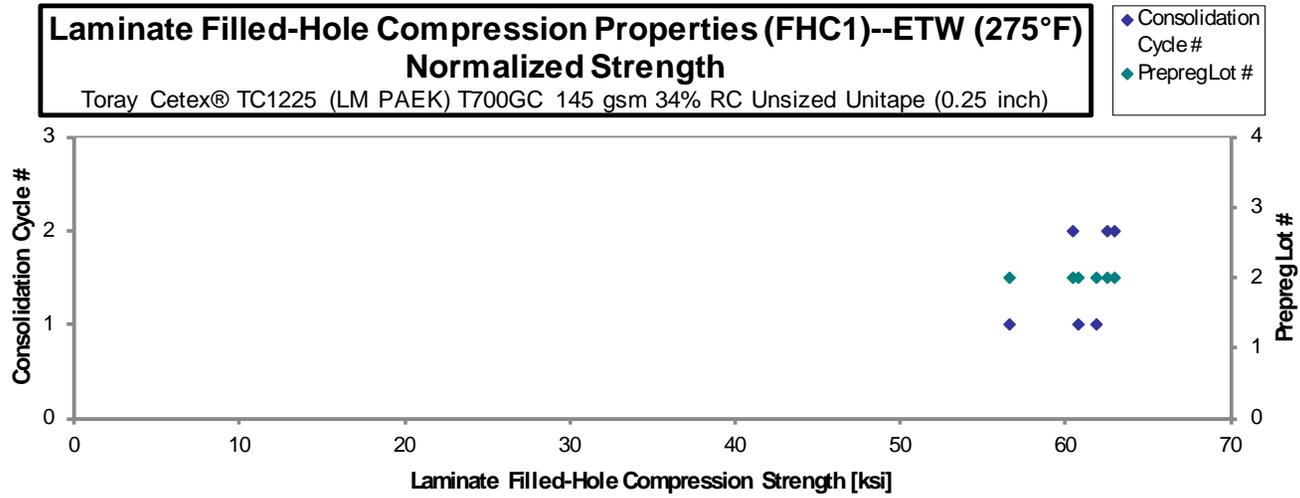
normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|---|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|--------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-B-C1-1-FHC1-ETW-1 | B | C1 | 2 | 1 | 61.15 | 0.1717 | 32 | M(A,L)GF |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-B-C1-1-FHC1-ETW-2 | B | C1 | 2 | 1 | 62.42 | 0.1714 | 32 | M(A,L)GF |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-B-C1-1-FHC1-ETW-3 | B | C1 | 2 | 1 | 56.69 | 0.1724 | 32 | LGF |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-B-C2-1-FHC1-ETW-1 | B | C2 | 2 | 2 | 60.73 | 0.1791 | 32 | M(A,L)GF |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-B-C2-1-FHC1-ETW-2 | B | C2 | 2 | 2 | 58.19 | 0.1797 | 32 | M(A,L)GF |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-B-C2-1-FHC1-ETW-3 | B | C2 | 2 | 2 | 60.00 | 0.1803 | 32 | M(A,L)GF |

| Avg. t_{ply} [in] | Strength _{norm} [ksi] |
|---------------------|--------------------------------|
| 0.005365 | 60.75 |
| 0.005357 | 61.93 |
| 0.005389 | 56.57 |
| 0.005598 | 62.96 |
| 0.005615 | 60.50 |
| 0.005633 | 62.58 |

Average 59.87
 Standard Dev. 2.090
 Coeff. of Var. [%] 3.491
 Min. 56.69
 Max. 62.42
 Number of Spec. 6

Average_{norm} 0.005493 60.88
 Standard Dev_{norm} 2.325
 Coeff. of Var. [%]_{norm} 3.819
 Min. 0.005357 56.57
 Max. 0.005633 62.96
 Number of Spec. 6 6



4.29 “10/80/10” Filled-Hole Compression 2 Properties (FHC2)

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

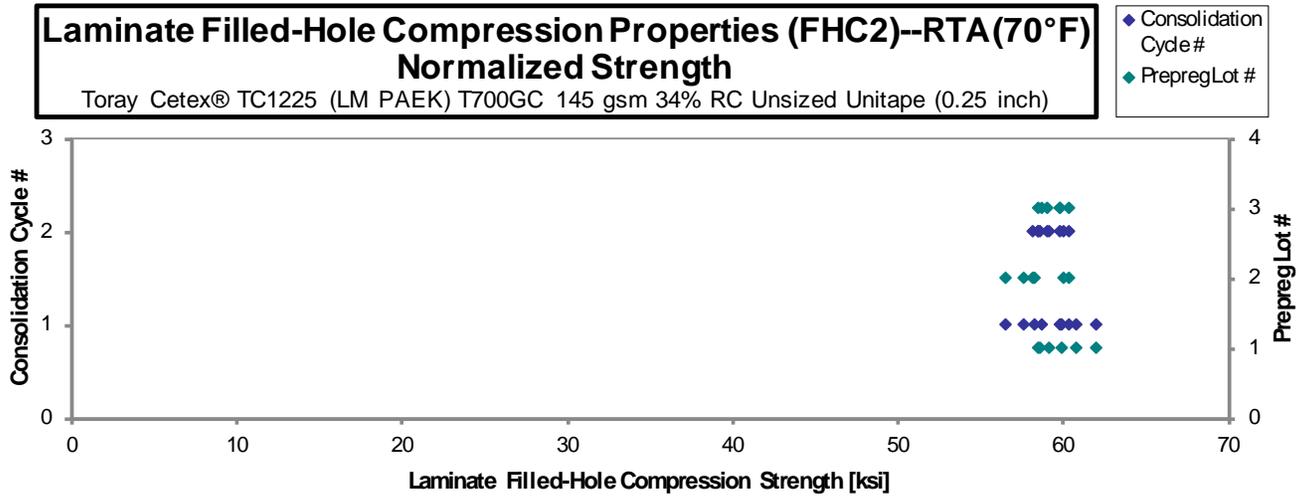
**Laminate Filled-Hole Compression Properties (FHC2)--RTA (70°F)
Strength**
Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

normalizing
t_{ply} [in]
0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode | Avg. t _{ply} [in] | Strength _{norm} [ksi] |
|--|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|--------------------|----------------------------|--------------------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST14-A-C1-1-FHC2-RTA-1 | A | C1 | 1 | 1 | 59.99 | 0.2233 | 40 | M(A,L)GF | 0.005582 | 62.02 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST14-A-C1-1-FHC2-RTA-2 | A | C1 | 1 | 1 | 59.17 | 0.2219 | 40 | M(A,L)GF | 0.005548 | 60.79 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST14-A-C1-1-FHC2-RTA-3 | A | C1 | 1 | 1 | 58.21 | 0.2221 | 40 | M(A,L)GF, M(A,L)WB | 0.005553 | 59.86 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST14-A-C2-1-FHC2-RTA-1 | A | C2 | 1 | 2 | 58.93 | 0.2169 | 40 | M(A,L)GF | 0.005423 | 59.17 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST14-A-C2-1-FHC2-RTA-2 | A | C2 | 1 | 2 | 58.21 | 0.2174 | 40 | M(A,L)GF | 0.005435 | 58.59 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST14-A-C2-1-FHC2-RTA-3 | A | C2 | 1 | 2 | 57.90 | 0.2182 | 40 | M(A,L)GF | 0.005455 | 58.48 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST14-B-C1-1-FHC2-RTA-1 | B | C1 | 2 | 1 | 58.44 | 0.2130 | 40 | M(A,L)GF, AWB | 0.005325 | 57.62 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST14-B-C1-1-FHC2-RTA-2 | B | C1 | 2 | 1 | 59.44 | 0.2119 | 40 | AGF | 0.005298 | 58.32 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST14-B-C1-1-FHC2-RTA-3 | B | C1 | 2 | 1 | 57.36 | 0.2126 | 40 | AGF | 0.005315 | 56.46 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST14-B-C2-1-FHC2-RTA-1 | B | C2 | 2 | 2 | 60.77 | 0.2133 | 40 | M(A,L)GF, M(A,L)WT | 0.005331 | 59.99 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST14-B-C2-1-FHC2-RTA-2 | B | C2 | 2 | 2 | 58.92 | 0.2132 | 40 | M(A,L)GF | 0.005329 | 58.15 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST14-B-C2-1-FHC2-RTA-3 | B | C2 | 2 | 2 | 61.11 | 0.2135 | 40 | M(A,L)GF | 0.005337 | 60.39 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST14-C-C1-1-FHC2-RTA-1 | C | C1 | 3 | 1 | 58.93 | 0.2153 | 40 | M(A,L)GF | 0.005383 | 58.74 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST14-C-C1-1-FHC2-RTA-2 | C | C1 | 3 | 1 | 59.72 | 0.2162 | 40 | M(A,L)GF | 0.005404 | 59.77 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST14-C-C1-1-FHC2-RTA-3 | C | C1 | 3 | 1 | 60.46 | 0.2157 | 40 | M(A,L)GF | 0.005391 | 60.37 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST14-C-C2-1-FHC2-RTA-1 | C | C2 | 3 | 2 | 59.23 | 0.2133 | 40 | M(A,L)GF | 0.005333 | 58.49 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST14-C-C2-1-FHC2-RTA-2 | C | C2 | 3 | 2 | 60.63 | 0.2129 | 40 | M(A,L)GF | 0.005323 | 59.76 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST14-C-C2-1-FHC2-SP-1 | C | C2 | 3 | 2 | 59.74 | 0.2134 | 40 | AGF | 0.005335 | 59.02 |

Average **59.29**
Standard Dev. 1.049
Coeff. of Var. [%] 1.770
Min. 57.36
Max. 61.11
Number of Spec. 18

Average_{norm} **0.005394** **59.22**
Standard Dev._{norm} 1.294
Coeff. of Var. [%]_{norm} 2.185
Min. 0.005298 56.46
Max. 0.005582 62.02
Number of Spec. 18 18



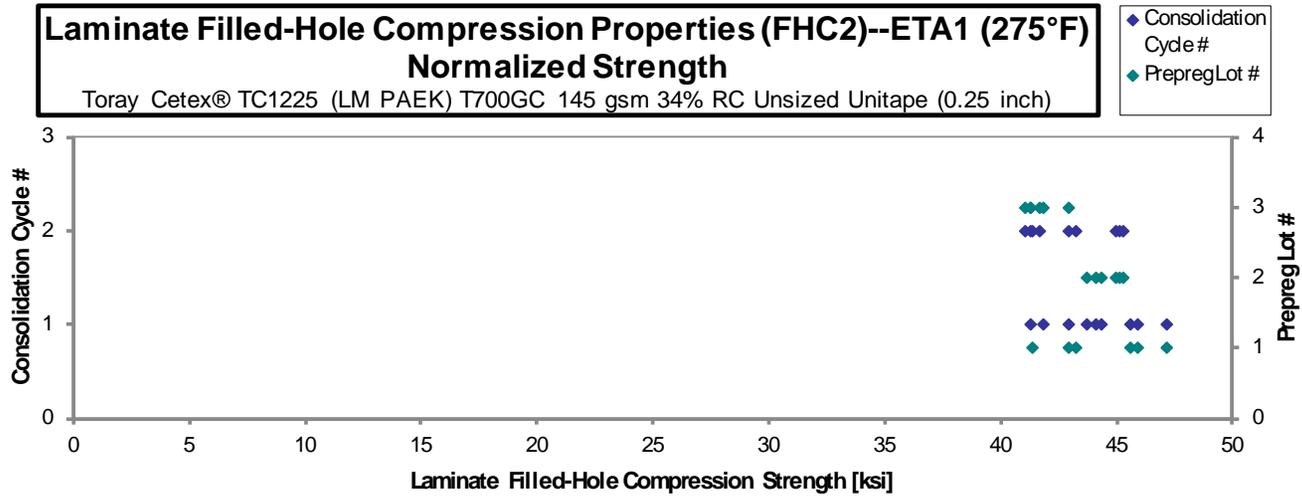
In some cases of FHC1>UNC1, UNC1 data is recommended for design. The FHC1 data is for informational purposes only and is not appropriate to be used for design. Shaded values indicated FHC1>UNC1.

Laminate Filled-Hole Compression Properties (FHC2)--ETA1 (275°F)
Strength
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode | Avg. t_{ply} [in] | Strength _{norm} [ksi] |
|---|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|--------------|---------------------|--------------------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST14-A-C1-1-FHC2-ETA1-1 | A | C1 | 1 | 1 | 45.91 | 0.2219 | 40 | M(A,L)GF | 0.005548 | 47.16 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST14-A-C1-1-FHC2-ETA1-2 | A | C1 | 1 | 1 | 44.83 | 0.2215 | 40 | M(A,L)GF | 0.005538 | 45.97 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST14-A-C1-1-FHC2-ETA1-3 | A | C1 | 1 | 1 | 44.32 | 0.2222 | 40 | M(A,L)GF | 0.005556 | 45.60 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST14-A-C2-1-FHC2-ETA1-1 | A | C2 | 1 | 2 | 42.93 | 0.2176 | 40 | M(A,L)GF | 0.005440 | 43.25 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST14-A-C2-1-FHC2-ETA1-2 | A | C2 | 1 | 2 | 42.57 | 0.2179 | 40 | M(A,L)GF | 0.005448 | 42.95 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST14-A-C2-1-FHC2-SP-1 | A | C2 | 1 | 2 | 41.02 | 0.2180 | 40 | AGF | 0.005450 | 41.40 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST14-B-C1-1-FHC2-ETA1-1 | B | C1 | 2 | 1 | 44.55 | 0.2120 | 40 | AGF | 0.005301 | 43.73 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST14-B-C1-1-FHC2-ETA1-3 | B | C1 | 2 | 1 | 44.86 | 0.2123 | 40 | AGF | 0.005308 | 44.10 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST14-B-C1-1-FHC2-SP-3 | B | C1 | 2 | 1 | 45.31 | 0.2115 | 40 | M(A,L)GF | 0.005287 | 44.36 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST14-B-C2-1-FHC2-ETA1-1 | B | C2 | 2 | 2 | 45.36 | 0.2149 | 40 | M(A,L)GF | 0.005373 | 45.13 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST14-B-C2-1-FHC2-ETA1-2 | B | C2 | 2 | 2 | 45.39 | 0.2141 | 40 | M(A,L)GF | 0.005353 | 45.00 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST14-B-C2-1-FHC2-ETA1-3 | B | C2 | 2 | 2 | 45.55 | 0.2149 | 40 | M(A,L)GF | 0.005373 | 45.32 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST14-C-C1-1-FHC2-ETA1-1 | C | C1 | 3 | 1 | 41.37 | 0.2158 | 40 | M(A,L)GF | 0.005395 | 41.33 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST14-C-C1-1-FHC2-ETA1-2 | C | C1 | 3 | 1 | 43.08 | 0.2155 | 40 | M(A,L)GF | 0.005387 | 42.98 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST14-C-C1-1-FHC2-ETA1-3 | C | C1 | 3 | 1 | 41.83 | 0.2162 | 40 | M(A,L)GF | 0.005405 | 41.86 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST14-C-C2-1-FHC2-ETA1-1 | C | C2 | 3 | 2 | 41.61 | 0.2134 | 40 | M(A,L)GF | 0.005335 | 41.11 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST14-C-C2-1-FHC2-ETA1-2 | C | C2 | 3 | 2 | 41.98 | 0.2124 | 40 | M(A,L)GF | 0.005310 | 41.28 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST14-C-C2-1-FHC2-ETA1-3 | C | C2 | 3 | 2 | 42.18 | 0.2135 | 40 | M(A,L)GF | 0.005338 | 41.69 |

| | | | | |
|--------------------|-------|------------------------------------|----------|-------|
| Average | 43.59 | Average _{norm} | 0.005397 | 43.57 |
| Standard Dev. | 1.681 | Standard Dev _{V, norm} | | 1.872 |
| Coeff. of Var. [%] | 3.857 | Coeff. of Var. [%] _{norm} | | 4.297 |
| Min. | 41.02 | Min. | 0.005287 | 41.11 |
| Max. | 45.91 | Max. | 0.005556 | 47.16 |
| Number of Spec. | 18 | Number of Spec. | 18 | 18 |



4.30 “50/40/10” Filled-Hole Compression 3 Properties (FHC3)

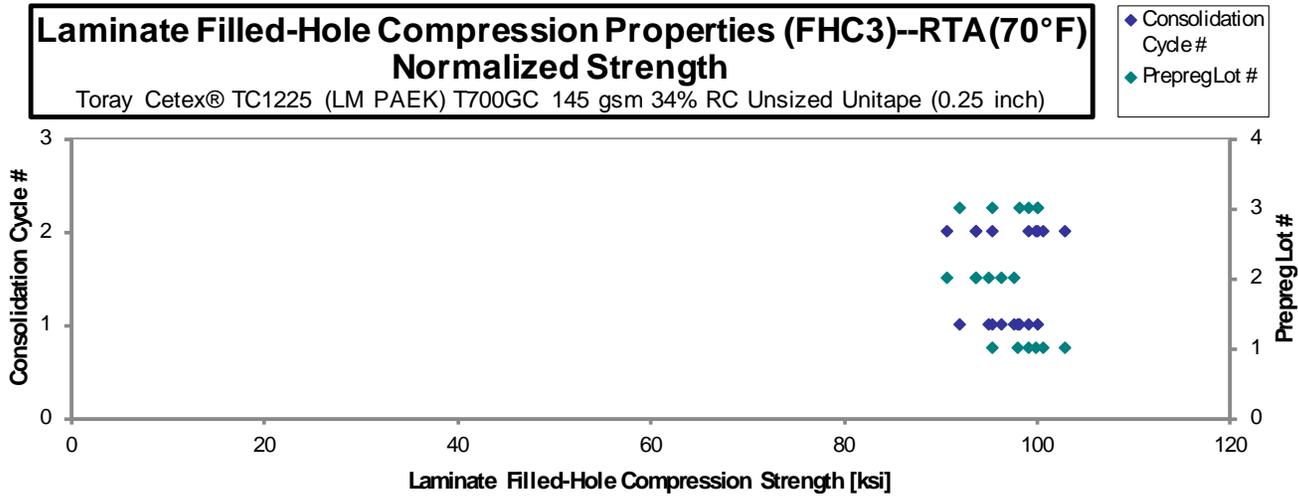
**Laminate Filled-Hole Compression Properties (FHC3)–RTA (70°F)
Strength**
Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

normalizing
t_{ply} [in]
0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|--|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|--------------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST17-A-C1-1-FHC3-RTA-1 | A | C1 | 1 | 1 | 95.67 | 0.2216 | 40 | M(A,L)GF |
| NTP1226Q1-TC-WEB-NIAR-T25-MST17-A-C1-1-FHC3-RTA-2 | A | C1 | 1 | 1 | 98.39 | 0.2179 | 40 | M(A,L)GF, LGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST17-A-C1-1-FHC3-RTA-3 | A | C1 | 1 | 1 | 94.48 | 0.2183 | 40 | M(A,L)GM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST17R-A-C2-1-FHC3-RTA-1 | A | C2 | 1 | 2 | 98.83 | 0.2250 | 40 | AGF |
| NTP1226Q1-TC-WEB-NIAR-T25-MST17R-A-C2-1-FHC3-RTA-2 | A | C2 | 1 | 2 | 97.16 | 0.2219 | 40 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST17R-A-C2-1-FHC3-RTA-3 | A | C2 | 1 | 2 | 97.41 | 0.2234 | 40 | AGM |
| NTP1226Q1-TC-WEB-NIAR-T25-MST17-B-C1-1-FHC3-RTA-2 | B | C1 | 2 | 1 | 96.52 | 0.2187 | 40 | M(A,L)GF, LGO |
| NTP1226Q1-TC-WEB-NIAR-T25-MST17-B-C1-1-FHC3-RTA-3 | B | C1 | 2 | 1 | 93.83 | 0.2188 | 40 | M(A,L)GO |
| NTP1226Q1-TC-WEB-NIAR-T25-MST17-B-C1-1-FHC3-SP-1 | B | C1 | 2 | 1 | 95.30 | 0.2182 | 40 | M(A,L)GF, LGO |
| NTP1226Q1-TC-WEB-NIAR-T25-MST17-B-C2-1-FHC3-RTA-1 | B | C2 | 2 | 2 | 96.58 | 0.2097 | 40 | M(A,L)GF |
| NTP1226Q1-TC-WEB-NIAR-T25-MST17-B-C2-1-FHC3-RTA-2 | B | C2 | 2 | 2 | 94.45 | 0.2073 | 40 | M(A,L)GF |
| NTP1226Q1-TC-WEB-NIAR-T25-MST17-B-C2-1-FHC3-RTA-3 | B | C2 | 2 | 2 | 96.71 | 0.2092 | 40 | M(A,L)GO |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST17-C-C1-1-FHC3-RTA-1 | C | C1 | 3 | 1 | 97.88 | 0.2207 | 40 | M(A,L)GF |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST17-C-C1-1-FHC3-RTA-2 | C | C1 | 3 | 1 | 96.21 | 0.2205 | 40 | M(A,L)GF, M(A,L)GO |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST17-C-C1-1-FHC3-RTA-3 | C | C1 | 3 | 1 | 90.43 | 0.2198 | 40 | M(A,L)GF |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST17-C-C2-1-FHC3-RTA-1 | C | C2 | 3 | 2 | 95.97 | 0.2233 | 40 | AGM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST17-C-C2-1-FHC3-RTA-2 | C | C2 | 3 | 2 | 97.23 | 0.2225 | 40 | AGO |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST17-C-C2-1-FHC3-RTA-3 | C | C2 | 3 | 2 | 92.38 | 0.2232 | 40 | M(A,L)GF |

| Avg. t _{ply} [in] | Strength _{norm} [ksi] |
|----------------------------|--------------------------------|
| 0.005539 | 98.13 |
| 0.005446 | 99.23 |
| 0.005456 | 95.47 |
| 0.005625 | 102.9 |
| 0.005548 | 99.83 |
| 0.005585 | 100.7 |
| 0.005466 | 97.71 |
| 0.005470 | 95.04 |
| 0.005456 | 96.29 |
| 0.005243 | 93.77 |
| 0.005183 | 90.66 |
| 0.005229 | 93.64 |
| 0.005518 | 100.0 |
| 0.005513 | 98.23 |
| 0.005495 | 92.01 |
| 0.005583 | 99.22 |
| 0.005563 | 100.2 |
| 0.005580 | 95.46 |

| | | | | |
|---------------------------|--------------|--|-----------------|--------------|
| Average | 95.86 | Average_{norm} | 0.005472 | 97.14 |
| Standard Dev. | 2.129 | Standard Dev._{norm} | | 3.299 |
| Coeff. of Var. [%] | 2.221 | Coeff. of Var. [%]_{norm} | | 3.396 |
| Min. | 90.43 | Min. | 0.005183 | 90.66 |
| Max. | 98.83 | Max. | 0.005625 | 102.9 |
| Number of Spec. | 18 | Number of Spec. | 18 | 18 |



Laminate Filled-Hole Compression Properties (FHC3)--ETA1 (275°F)
Strength
 Toray Cetex® TC1225 (LMPAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

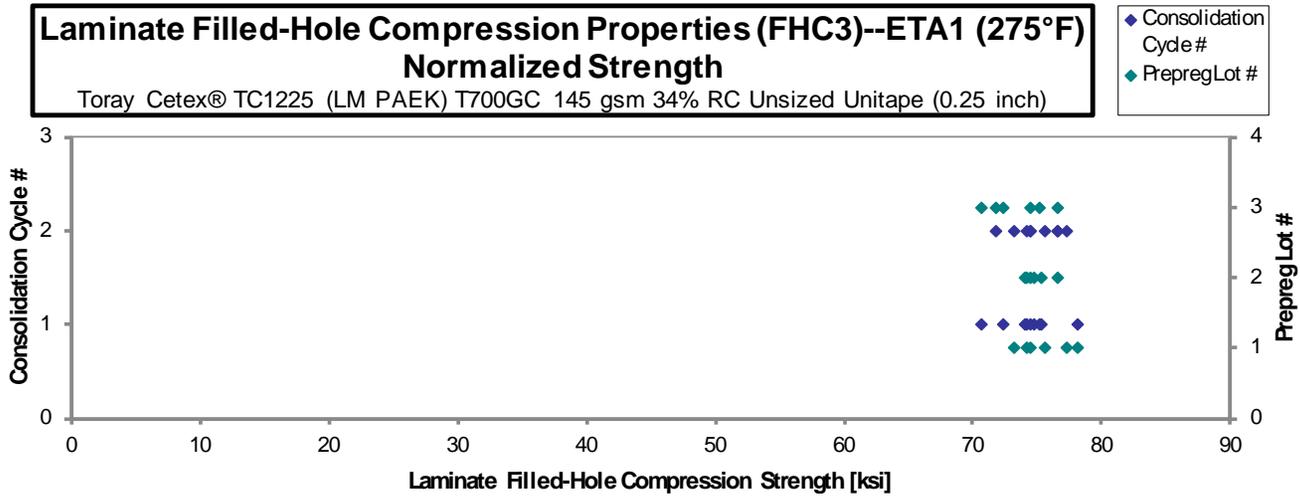
normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|---|---------------|--------------------------|---------------|-----------------------|----------------|------------------------------|---------------------|---------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST17-A-C1-1-FHC3-ETA1-1 | A | C1 | 1 | 1 | 73.22 | 0.2189 | 40 | M(A,L)GF, LGO |
| NTP1226Q1-TC-WEB-NIAR-T25-MST17-A-C1-1-FHC3-ETA1-2 | A | C1 | 1 | 1 | 77.32 | 0.2184 | 40 | M(A,L)GF, LGO |
| NTP1226Q1-TC-WEB-NIAR-T25-MST17-A-C1-1-FHC3-ETA1-3 | A | C1 | 1 | 1 | 73.81 | 0.2182 | 40 | M(A,L)GF |
| NTP1226Q1-TC-WEB-NIAR-T25-MST17R-A-C2-1-FHC3-ETA1-1 | A | C2 | 1 | 2 | 73.51 | 0.2221 | 40 | M(A,L)GO |
| NTP1226Q1-TC-WEB-NIAR-T25-MST17R-A-C2-1-FHC3-ETA1-2 | A | C2 | 1 | 2 | 75.26 | 0.2219 | 40 | M(A,L)GF |
| NTP1226Q1-TC-WEB-NIAR-T25-MST17R-A-C2-1-FHC3-ETA1-3 | A | C2 | 1 | 2 | 70.89 | 0.2231 | 40 | M(A,L)GF |
| NTP1226Q1-TC-WEB-NIAR-T25-MST17-B-C1-1-FHC3-ETA1-1 | B | C1 | 2 | 1 | 72.99 | 0.2191 | 40 | M(A,L)GF, LGO |
| NTP1226Q1-TC-WEB-NIAR-T25-MST17-B-C1-1-FHC3-ETA1-2 | B | C1 | 2 | 1 | 74.01 | 0.2185 | 40 | M(A,L)GF, LGO |
| NTP1226Q1-TC-WEB-NIAR-T25-MST17-B-C1-1-FHC3-ETA1-3 | B | C1 | 2 | 1 | 74.36 | 0.2190 | 40 | M(A,L)GF, LGO |
| NTP1226Q1-TC-WEB-NIAR-T25-MST17-B-C2-1-FHC3-ETA1-1 | B | C2 | 2 | 2 | 75.80 | 0.2115 | 40 | M(A,L)GF |
| NTP1226Q1-TC-WEB-NIAR-T25-MST17-B-C2-1-FHC3-ETA1-2 | B | C2 | 2 | 2 | 77.20 | 0.2085 | 40 | M(A,L)GF |
| NTP1226Q1-TC-WEB-NIAR-T25-MST17-B-C2-1-FHC3-ETA1-3 | B | C2 | 2 | 2 | 79.41 | 0.2085 | 40 | M(A,L)GF |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST17-C-C1-1-FHC3-ETA1-1 | C | C1 | 3 | 1 | 69.26 | 0.2205 | 40 | M(A,L)GF |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST17-C-C1-1-FHC3-ETA1-2 | C | C1 | 3 | 1 | 73.51 | 0.2210 | 40 | M(A,L)GF |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST17-C-C1-1-FHC3-ETA1-3 | C | C1 | 3 | 1 | 70.63 | 0.2215 | 40 | M(A,L)GF |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST17-C-C2-1-FHC3-ETA1-1 | C | C2 | 3 | 2 | 72.14 | 0.2229 | 40 | M(A,L)GF |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST17-C-C2-1-FHC3-ETA1-2 | C | C2 | 3 | 2 | 74.07 | 0.2235 | 40 | M(A,L)GF |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST17-C-C2-1-FHC3-ETA1-3 | C | C2 | 3 | 2 | 69.73 | 0.2227 | 40 | M(A,L)GF |

| Avg. t_{ply} [in] | Strength _{norm} [ksi] |
|---------------------|--------------------------------|
| 0.005471 | 74.19 |
| 0.005460 | 78.18 |
| 0.005455 | 74.56 |
| 0.005553 | 75.59 |
| 0.005548 | 77.33 |
| 0.005576 | 73.20 |
| 0.005477 | 74.02 |
| 0.005461 | 74.85 |
| 0.005475 | 75.40 |
| 0.005287 | 74.20 |
| 0.005212 | 74.51 |
| 0.005212 | 76.64 |
| 0.005513 | 70.70 |
| 0.005524 | 75.20 |
| 0.005536 | 72.41 |
| 0.005573 | 74.45 |
| 0.005588 | 76.64 |
| 0.005568 | 71.90 |

Average 73.73
 Standard Dev. 2.673
 Coeff. of Var. [%] 3.626
 Min. 69.26
 Max. 79.41
 Number of Spec. 18

Average_{norm} 0.005472 74.67
 Standard Dev._{norm} 1.887
 Coeff. of Var. [%]_{norm} 2.527
 Min. 0.005212 70.70
 Max. 0.005588 78.18
 Number of Spec. 18 18



4.31 “25/50/25” Single-Shear Bearing 1, Proc. C Properties (SSB1)

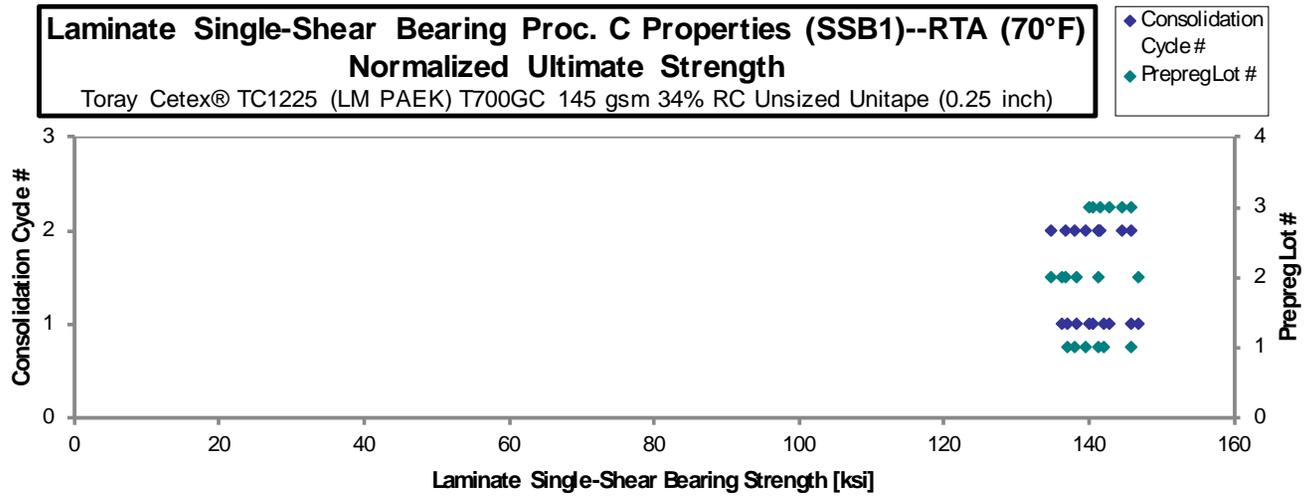
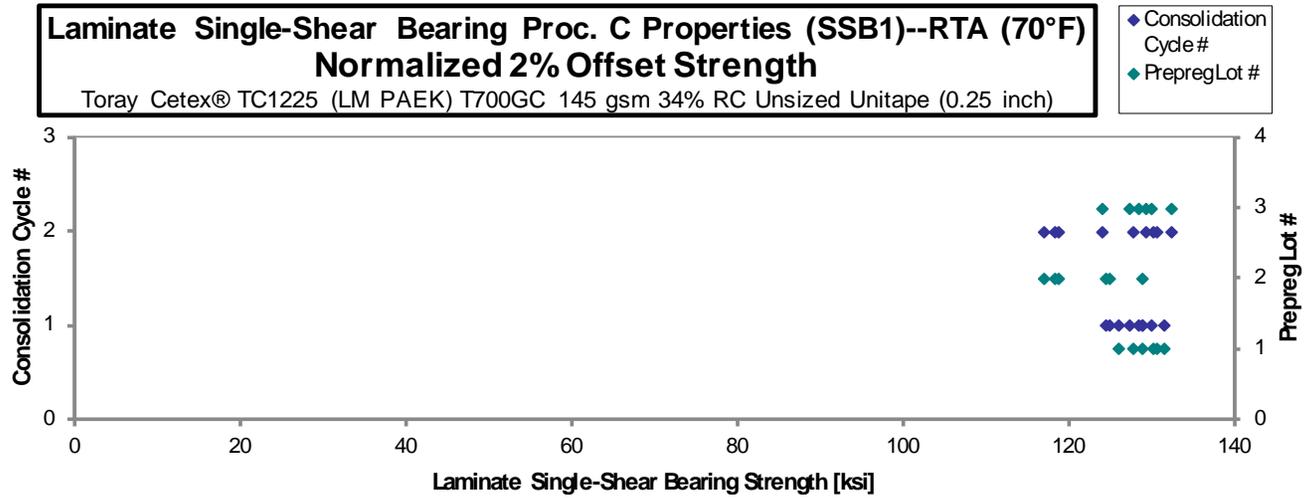
Laminate Single-Shear Bearing Proc. C Properties (SSB1)–RTA (70°F)
Strength & Deformation
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

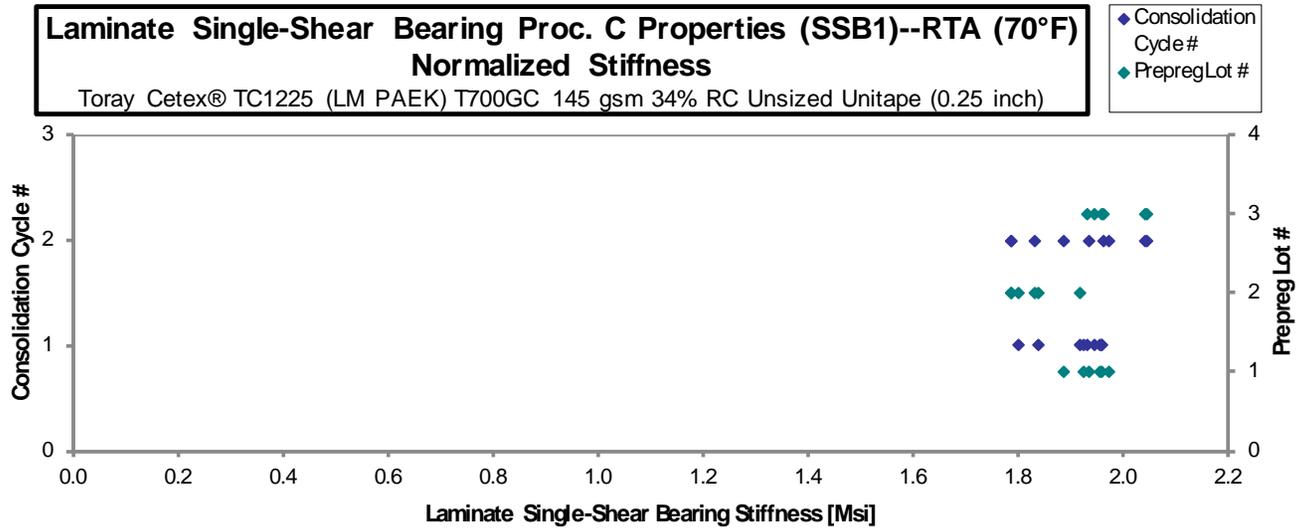
normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | 2% Offset Strength [ksi] | Ultimate Strength [ksi] | Stiffness [Msi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|---|---------------|--------------------------|---------------|-----------------------|--------------------------|-------------------------|-----------------|------------------------------|---------------------|--------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST8R-A-C1-1-SSB1-RTA-1 | A | C1 | 1 | 1 | 129.0 | 143.0 | 1.920 | 0.08810 | 16 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8R-A-C1-1-SSB1-RTA-2 | A | C1 | 1 | 1 | 127.3 | 140.2 | 1.935 | 0.08757 | 16 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8R-A-C1-1-SSB1-RTA-3 | A | C1 | 1 | 1 | 124.2 | 135.0 | 1.895 | 0.08777 | 16 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-A-C2-1-SSB1-RTA-1 | A | C2 | 1 | 2 | 126.3 | 136.6 | 1.865 | 0.08745 | 16 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-A-C2-1-SSB1-RTA-2 | A | C2 | 1 | 2 | 128.8 | 139.7 | 1.951 | 0.08747 | 16 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-A-C2-1-SSB1-RTA-3 | A | C2 | 1 | 2 | 126.8 | 135.4 | 1.878 | 0.08903 | 16 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-B-C1-1-SSB1-RTA-1 | B | C1 | 2 | 1 | 124.2 | 137.6 | 1.828 | 0.08692 | 16 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-B-C1-1-SSB1-RTA-2 | B | C1 | 2 | 1 | 122.8 | 134.6 | 1.777 | 0.08758 | 16 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-B-C1-1-SSB1-RTA-3 | B | C1 | 2 | 1 | 127.2 | 145.1 | 1.896 | 0.08752 | 16 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-B-C2-1-SSB1-RTA-1 | B | C2 | 2 | 2 | 117.6 | 135.4 | 1.812 | 0.08737 | 16 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-B-C2-1-SSB1-RTA-2 | B | C2 | 2 | 2 | 116.2 | 140.2 | 1.773 | 0.08715 | 16 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-B-C2-1-SSB1-RTA-3 | B | C2 | 2 | 2 | 118.0 | 134.4 | 1.784 | 0.08668 | 16 | B11 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST8-C-C1-1-SSB1-RTA-1 | C | C1 | 3 | 1 | 129.6 | 140.2 | 1.924 | 0.08673 | 16 | B11 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST8-C-C1-1-SSB1-RTA-2 | C | C1 | 3 | 1 | 127.4 | 138.8 | 1.943 | 0.08723 | 16 | B11 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST8-C-C1-1-SSB1-RTA-3 | C | C1 | 3 | 1 | 127.4 | 142.8 | 1.944 | 0.08643 | 16 | B11 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST8-C-C2-1-SSB1-RTA-1 | C | C2 | 3 | 2 | 131.6 | 140.8 | 2.030 | 0.08695 | 16 | B11 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST8-C-C2-1-SSB1-RTA-2 | C | C2 | 3 | 2 | 121.0 | 142.3 | 1.994 | 0.08668 | 16 | B11 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST8-C-C2-1-SSB1-RTA-3 | C | C2 | 3 | 2 | 126.8 | 141.8 | 1.927 | 0.08812 | 16 | B11 |

| Avg. t_{ply} [in] | 2% Offset Strength _{norm} [ksi] | Ultimate Strength _{norm} [ksi] | Stiffness _{norm} [Msi] |
|---------------------|--|---|---------------------------------|
| 0.005506 | 131.6 | 145.8 | 1.958 |
| 0.005473 | 129.0 | 142.1 | 1.961 |
| 0.005485 | 126.1 | 137.1 | 1.925 |
| 0.005466 | 127.8 | 138.2 | 1.887 |
| 0.005467 | 130.4 | 141.5 | 1.975 |
| 0.005565 | 130.6 | 139.5 | 1.936 |
| 0.005432 | 125.0 | 138.4 | 1.839 |
| 0.005474 | 124.5 | 136.5 | 1.801 |
| 0.005470 | 128.9 | 147.0 | 1.920 |
| 0.005460 | 118.9 | 136.9 | 1.832 |
| 0.005447 | 117.2 | 141.4 | 1.788 |
| 0.005418 | 118.4 | 134.8 | 1.789 |
| 0.005421 | 130.1 | 140.7 | 1.931 |
| 0.005452 | 128.6 | 140.1 | 1.962 |
| 0.005402 | 127.5 | 142.9 | 1.945 |
| 0.005434 | 132.4 | 141.7 | 2.043 |
| 0.005543 | 124.2 | 146.0 | 2.047 |
| 0.005507 | 129.3 | 144.6 | 1.965 |

| | | | | | | | | |
|--------------------|-------|-------|---------|------------------------------------|----------|-------|-------|---------|
| Average | 125.1 | 139.1 | 1.893 | Average _{norm} | 0.005468 | 126.7 | 140.8 | 1.917 |
| Standard Dev. | 4.395 | 3.300 | 0.07429 | Standard Dev _{norm} | | 4.562 | 3.521 | 0.07893 |
| Coeff. of Var. [%] | 3.513 | 2.372 | 3.924 | Coeff. of Var. [%] _{norm} | | 3.601 | 2.500 | 4.118 |
| Min. | 116.2 | 134.4 | 1.773 | Min. | 0.005402 | 117.2 | 134.8 | 1.788 |
| Max. | 131.6 | 145.1 | 2.030 | Max. | 0.005565 | 132.4 | 147.0 | 2.047 |
| Number of Spec. | 18 | 18 | 18 | Number of Spec. | 18 | 18 | 18 | 18 |





**Laminate Single-Shear Bearing Proc. C Properties (SSB1)–ETA1 (275°F)
Strength & Deformation**

Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

normalizing

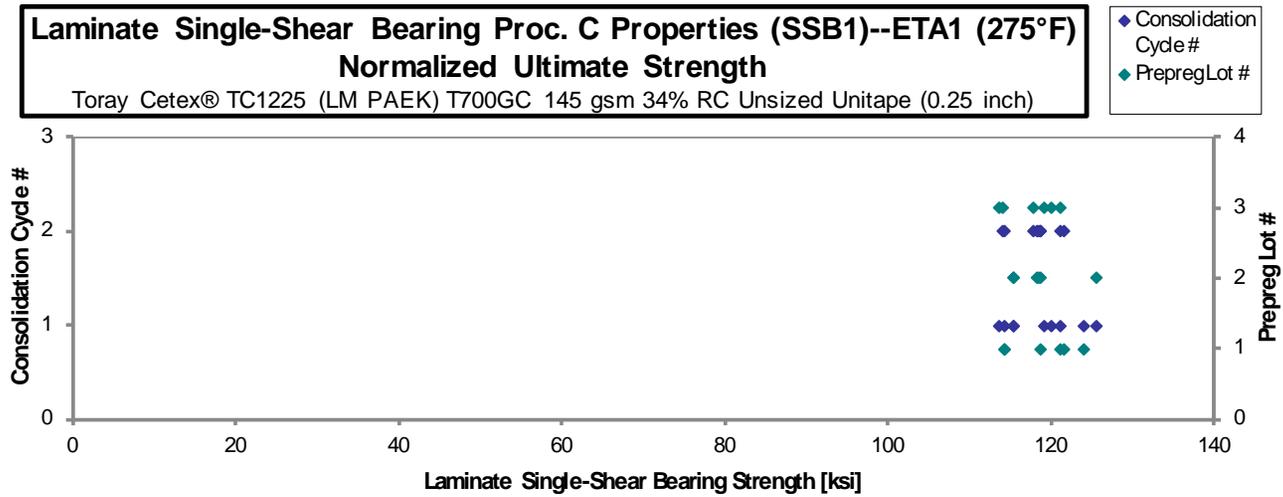
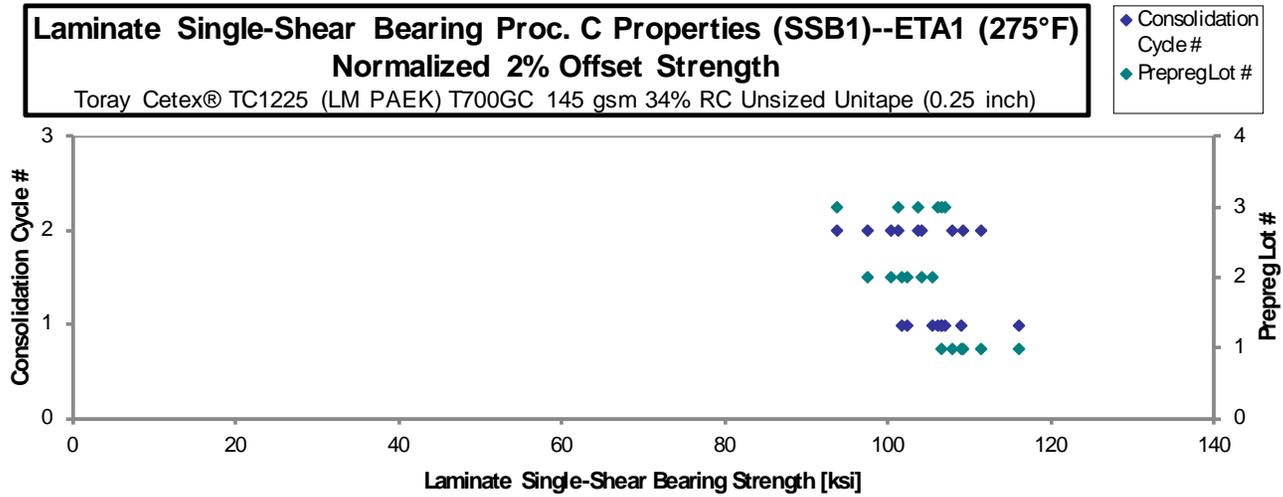
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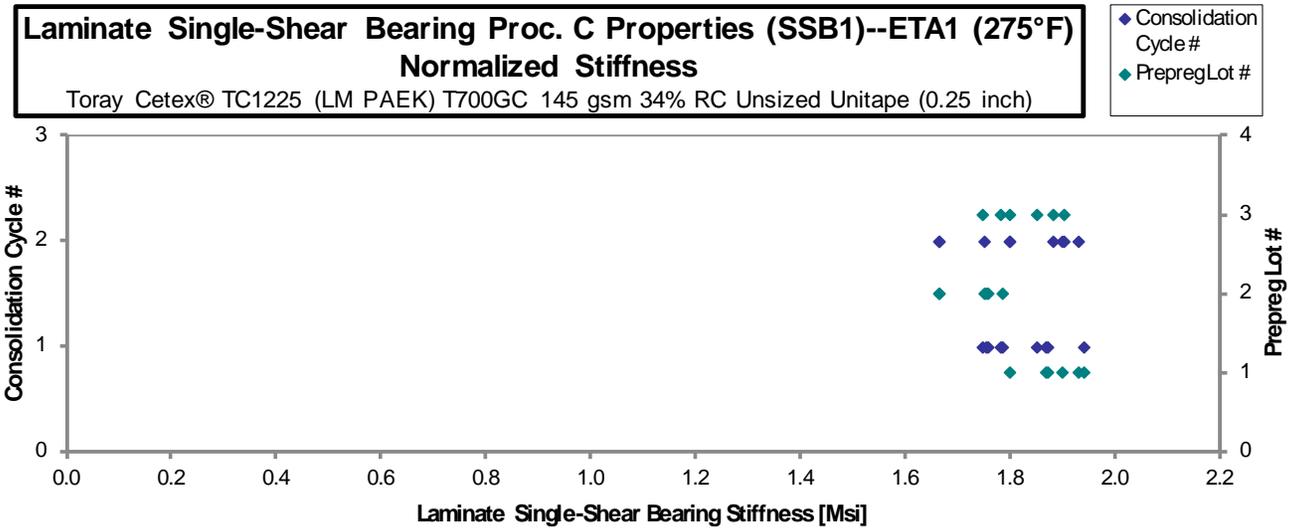
| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | 2% Offset Strength [ksi] | Ultimate Strength [ksi] | Stiffness [Msi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|--|---------------|--------------------------|---------------|-----------------------|--------------------------|-------------------------|-----------------|------------------------------|---------------------|--------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST8R-A-C1-1-SSB1-ETA1-1 | A | C1 | 1 | 1 | 114.1 | 119.2 | 1.837 | 0.08780 | 16 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8R-A-C1-1-SSB1-ETA1-2 | A | C1 | 1 | 1 | 104.5 | 112.1 | 1.834 | 0.08807 | 16 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8R-A-C1-1-SSB1-ETA1-3 | A | C1 | 1 | 1 | 107.1 | 121.7 | 1.906 | 0.08797 | 16 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-A-C2-1-SSB1-ETA1-1 | A | C2 | 1 | 2 | 106.0 | 112.3 | 1.898 | 0.08788 | 16 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-A-C2-1-SSB1-ETA1-2 | A | C2 | 1 | 2 | 107.3 | 116.6 | 1.866 | 0.08785 | 16 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-A-C2-1-SSB1-ETA1-3 | A | C2 | 1 | 2 | 108.9 | 118.8 | 1.759 | 0.08835 | 16 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-B-C1-1-SSB1-ETA1-1 | B | C1 | 2 | 1 | 104.2 | 114.0 | 1.736 | 0.08740 | 16 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-B-C1-1-SSB1-ETA1-2 | B | C1 | 2 | 1 | 100.2 | 113.8 | 1.728 | 0.08760 | 16 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-B-C1-1-SSB1-ETA1-3 | B | C1 | 2 | 1 | 101.3 | 124.0 | 1.766 | 0.08735 | 16 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-B-C2-1-SSB1-ETA1-1 | B | C2 | 2 | 2 | 96.51 | 117.4 | 1.649 | 0.08715 | 16 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-B-C2-1-SSB1-ETA1-2 | B | C2 | 2 | 2 | 102.7 | 117.3 | 1.728 | 0.08747 | 16 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-B-C2-1-SSB1-ETA1-3 | B | C2 | 2 | 2 | 99.66 | 117.3 | 1.651 | 0.08702 | 16 | B11 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST8-C-C1-1-SSB1-ETA1-1 | C | C1 | 3 | 1 | 105.8 | 113.2 | 1.844 | 0.08667 | 16 | B11 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST8-C-C1-1-SSB1-ETA1-2 | C | C1 | 3 | 1 | 107.3 | 119.4 | 1.786 | 0.08620 | 16 | B11 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST8-C-C1-1-SSB1-ETA1-3 | C | C1 | 3 | 1 | 106.3 | 119.7 | 1.743 | 0.08657 | 16 | B11 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST8-C-C2-1-SSB1-ETA1-1 | C | C2 | 3 | 2 | 91.04 | 110.7 | 1.747 | 0.08895 | 16 | B11 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST8-C-C2-1-SSB1-ETA1-2 | C | C2 | 3 | 2 | 98.87 | 118.3 | 1.858 | 0.08847 | 16 | B11 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST8-C-C2-1-SSB1-ETA1-3 | C | C2 | 3 | 2 | 101.9 | 115.8 | 1.852 | 0.08778 | 16 | B11 |

| Avg. t_{ply} [in] | 2% Offset Strength _{norm} [ksi] | Ultimate Strength _{norm} [ksi] | Stiffness _{norm} [Msi] |
|---------------------|--|---|---------------------------------|
| 0.005488 | 116.0 | 121.1 | 1.866 |
| 0.005504 | 106.5 | 114.3 | 1.870 |
| 0.005498 | 109.0 | 123.9 | 1.941 |
| 0.005493 | 107.8 | 114.2 | 1.931 |
| 0.005491 | 109.1 | 118.6 | 1.897 |
| 0.005522 | 111.4 | 121.4 | 1.799 |
| 0.005463 | 105.4 | 115.3 | 1.756 |
| 0.005475 | 101.5 | 115.4 | 1.752 |
| 0.005459 | 102.4 | 125.4 | 1.785 |
| 0.005447 | 97.35 | 118.4 | 1.663 |
| 0.005467 | 104.0 | 118.7 | 1.749 |
| 0.005439 | 100.4 | 118.1 | 1.663 |
| 0.005417 | 106.1 | 113.6 | 1.849 |
| 0.005388 | 107.0 | 119.1 | 1.782 |
| 0.005410 | 106.5 | 120.0 | 1.746 |
| 0.005559 | 93.73 | 113.9 | 1.799 |
| 0.005529 | 101.2 | 121.2 | 1.903 |
| 0.005486 | 103.5 | 117.7 | 1.882 |

| | | | |
|--------------------|-------|-------|---------|
| Average | 103.5 | 116.8 | 1.788 |
| Standard Dev. | 5.226 | 3.562 | 0.07744 |
| Coeff. of Var. [%] | 5.048 | 3.051 | 4.330 |
| Min. | 91.04 | 110.7 | 1.649 |
| Max. | 114.1 | 124.0 | 1.906 |
| Number of Spec. | 18 | 18 | 18 |

| | | | | |
|------------------------------------|----------|-------|-------|---------|
| Average _{norm} | 0.005474 | 104.9 | 118.4 | 1.813 |
| Standard Dev. _{norm} | | 5.176 | 3.468 | 0.08406 |
| Coeff. of Var. [%] _{norm} | | 4.933 | 2.930 | 4.637 |
| Min. | 0.005388 | 93.73 | 113.6 | 1.663 |
| Max. | 0.005559 | 116.0 | 125.4 | 1.941 |
| Number of Spec. | 18 | 18 | 18 | 18 |





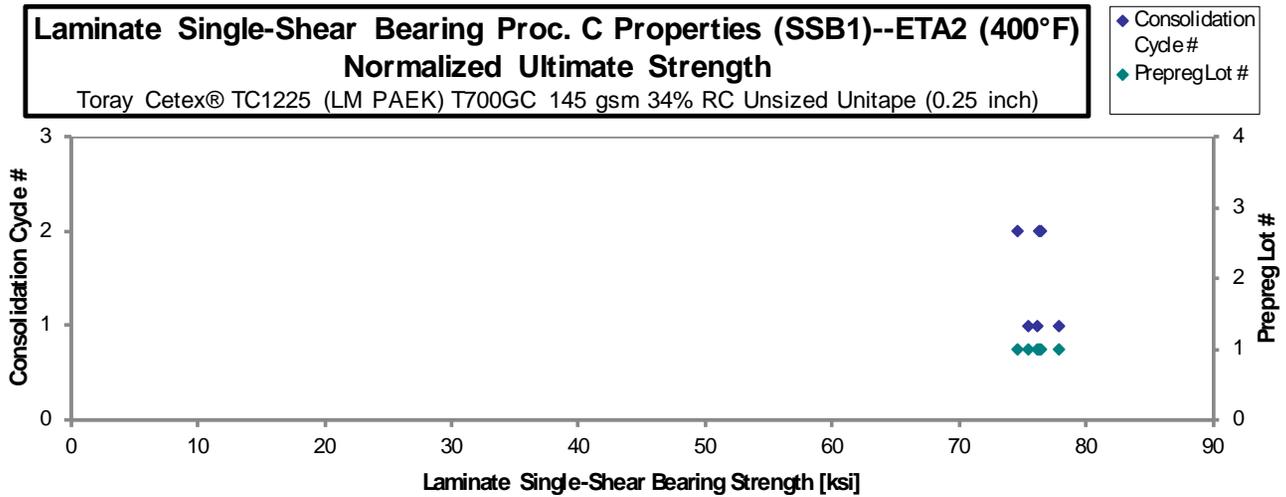
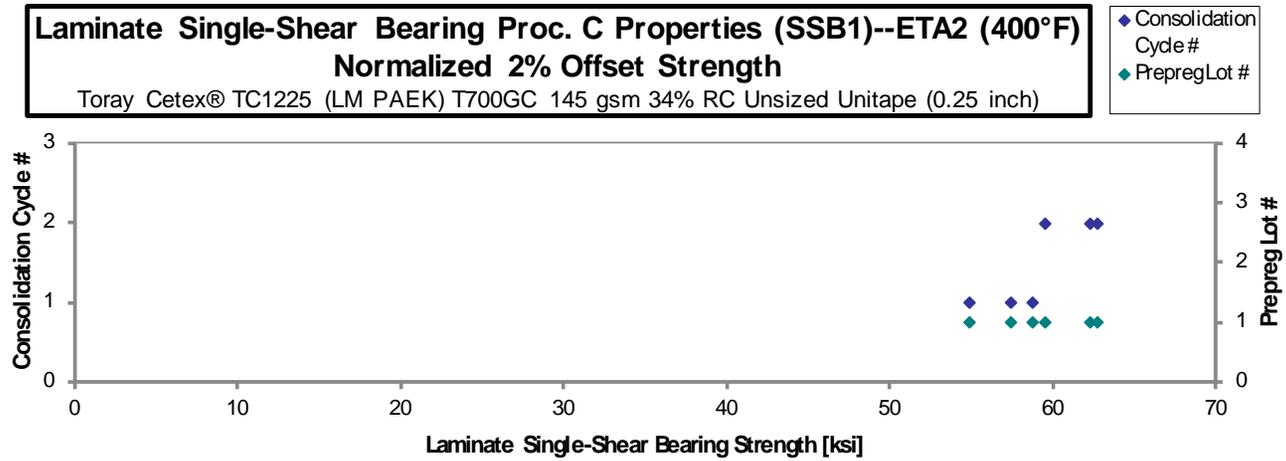
Laminate Single-Shear Bearing Proc. C Properties (SSB1)--ETA2 (400°F)
Strength & Deformation
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

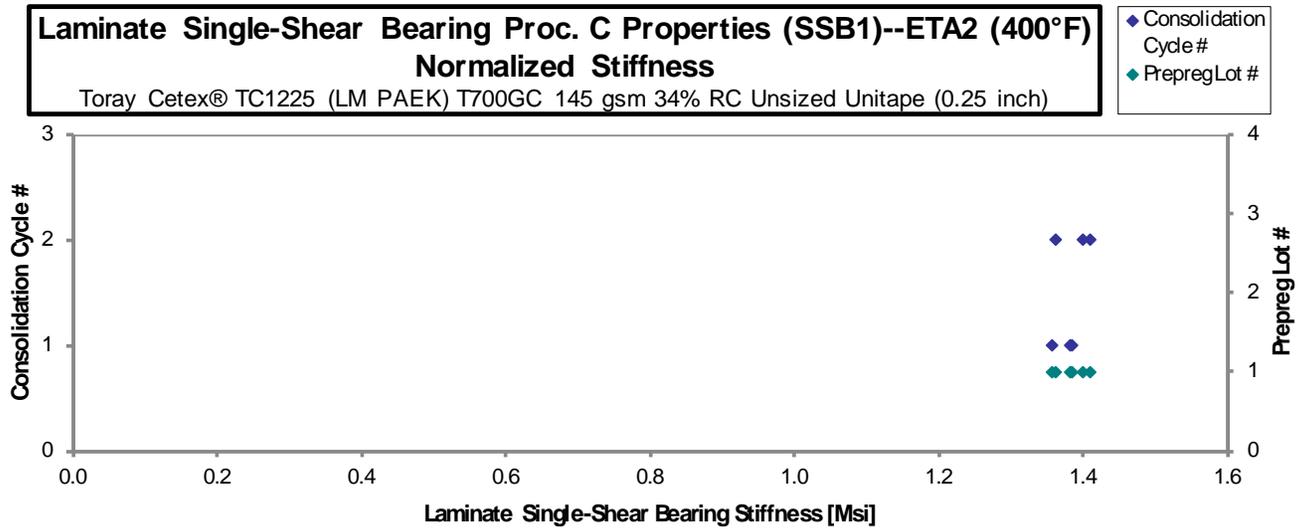
normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | 2% Offset Strength [ksi] | Ultimate Strength [ksi] | Stiffness [Msi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|--|---------------|--------------------------|---------------|-----------------------|--------------------------|-------------------------|-----------------|------------------------------|---------------------|--------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST8R-A-C1-1-SSB1-ETA2-1 | A | C1 | 1 | 1 | 53.60 | 74.38 | 1.324 | 0.08853 | 16 | B1I, C1I |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8R-A-C1-1-SSB1-ETA2-2 | A | C1 | 1 | 1 | 57.82 | 74.28 | 1.362 | 0.08780 | 16 | B1I, L1I |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8R-A-C1-1-SSB1-ETA2-3 | A | C1 | 1 | 1 | 56.33 | 76.52 | 1.361 | 0.08803 | 16 | B1I, C1I |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-A-C2-1-SSB1-ETA2-1 | A | C2 | 1 | 2 | 61.55 | 74.94 | 1.374 | 0.08812 | 16 | B1I, C1I |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-A-C2-1-SSB1-ETA2-2 | A | C2 | 1 | 2 | 59.03 | 75.79 | 1.400 | 0.08712 | 16 | B1I, C1I |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-A-C2-1-SSB1-ETA2-3 | A | C2 | 1 | 2 | 61.87 | 74.14 | 1.352 | 0.08703 | 16 | B1I, C1I |

| Avg. t_{ply} [in] | 2% Offset Strength _{norm} [ksi] | Ultimate Strength _{norm} [ksi] | Stiffness _{norm} [Msi] |
|---------------------|--|---|---------------------------------|
| 0.005533 | 54.93 | 76.21 | 1.357 |
| 0.005488 | 58.76 | 75.49 | 1.384 |
| 0.005502 | 57.40 | 77.97 | 1.387 |
| 0.005507 | 62.78 | 76.43 | 1.401 |
| 0.005445 | 59.52 | 76.42 | 1.411 |
| 0.005440 | 62.33 | 74.69 | 1.362 |

| | | | | | | | | |
|--------------------|-------|--------|--------|------------------------------------|----------|-------|-------|---------|
| Average | 58.37 | 75.01 | 1.362 | Average _{norm} | 0.005486 | 59.28 | 76.20 | 1.384 |
| Standard Dev. | 3.163 | 0.9553 | 0.0247 | Standard Dev. _{norm} | | 2.978 | 1.096 | 0.02113 |
| Coeff. of Var. [%] | 5.418 | 1.274 | 1.816 | Coeff. of Var. [%] _{norm} | | 5.023 | 1.439 | 1.527 |
| Min. | 53.60 | 74.14 | 1.324 | Min. | 0.005440 | 54.93 | 74.69 | 1.357 |
| Max. | 61.87 | 76.52 | 1.400 | Max. | 0.005533 | 62.78 | 77.97 | 1.411 |
| Number of Spec. | 6 | 6 | 6 | Number of Spec. | 6 | 6 | 6 | 6 |





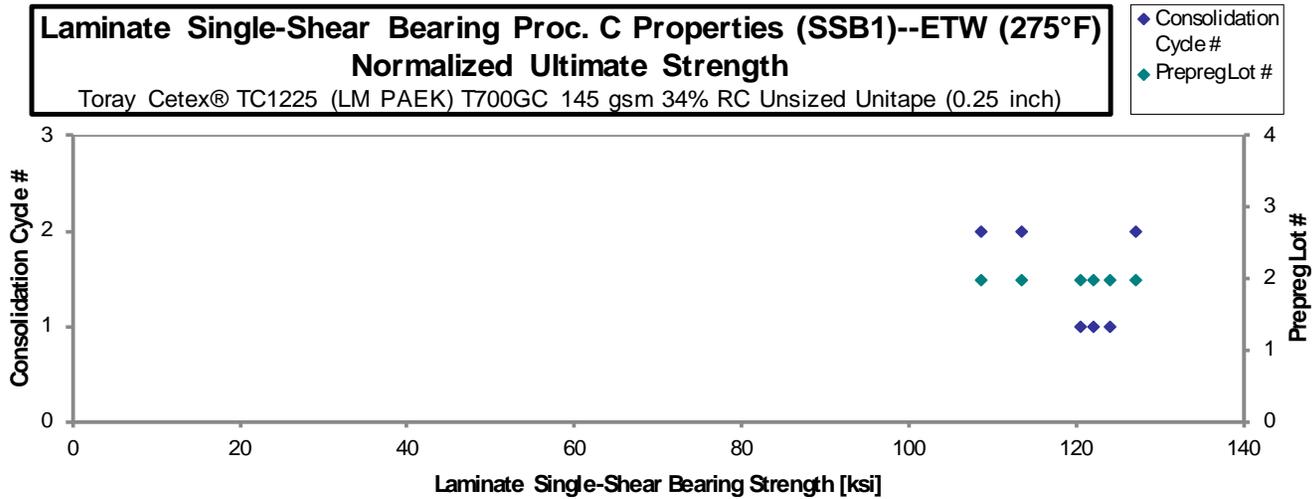
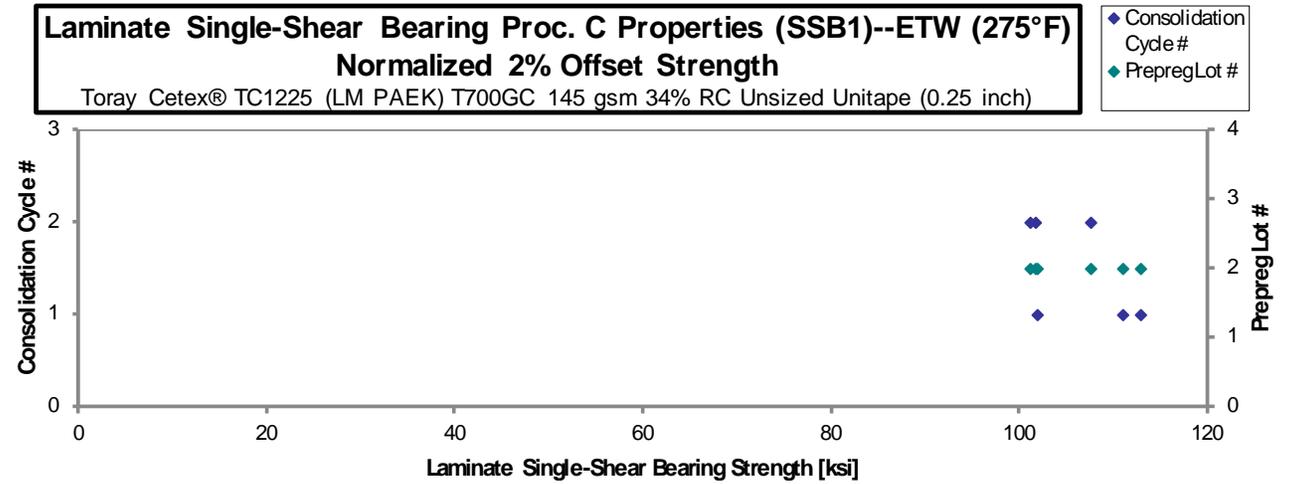
Laminate Single-Shear Bearing Proc. C Properties (SSB1)--ETW (275°F)
Strength & Deformation
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

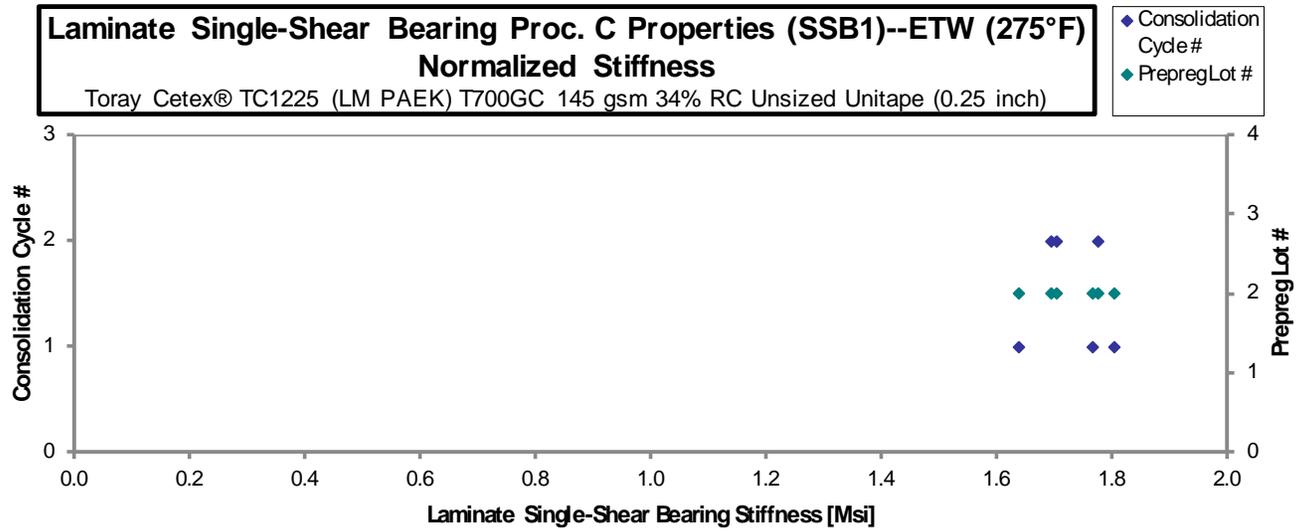
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 t_{ply} [in]
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| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | 2% Offset Strength [ksi] | Ultimate Strength [ksi] | Stiffness [Msi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|--|---------------|--------------------------|---------------|-----------------------|--------------------------|-------------------------|-----------------|------------------------------|---------------------|--------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-B-C1-1-SSB1-ETW-1 | B | C1 | 2 | 1 | 109.5 | 122.6 | 1.745 | 0.08753 | 16 | B1I |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-B-C1-1-SSB1-ETW-2 | B | C1 | 2 | 1 | 111.2 | 120.4 | 1.780 | 0.08765 | 16 | B1I |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-B-C1-1-SSB1-ETW-3 | B | C1 | 2 | 1 | 100.5 | 118.8 | 1.617 | 0.08762 | 16 | B1I |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-B-C2-1-SSB1-ETW-1 | B | C2 | 2 | 2 | 107.1 | 126.6 | 1.769 | 0.08678 | 16 | B1I |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-B-C2-1-SSB1-ETW-2 | B | C2 | 2 | 2 | 101.3 | 113.6 | 1.697 | 0.08633 | 16 | B1I |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-B-C2-1-SSB1-ETW-3 | B | C2 | 2 | 2 | 101.4 | 108.5 | 1.701 | 0.08665 | 16 | B1I |

| Avg. t_{ply} [in] | 2% Offset Strength _{norm} [ksi] | Ultimate Strength _{norm} [ksi] | Stiffness _{norm} [Msi] |
|---------------------|--|---|---------------------------------|
| 0.005471 | 111.0 | 124.2 | 1.768 |
| 0.005478 | 112.8 | 122.1 | 1.806 |
| 0.005476 | 101.9 | 120.5 | 1.639 |
| 0.005424 | 107.6 | 127.2 | 1.777 |
| 0.005396 | 101.2 | 113.5 | 1.695 |
| 0.005416 | 101.7 | 108.8 | 1.706 |

| | | | | | | | | |
|---------------------------|--------------|--------------|----------------|--|-----------------|--------------|--------------|----------------|
| Average | 105.2 | 118.4 | 1.718 | Average_{norm} | 0.005443 | 106.0 | 119.4 | 1.732 |
| Standard Dev. | 4.710 | 6.496 | 0.06039 | Standard Dev_{norm} | | 5.149 | 6.922 | 0.06225 |
| Coeff. of Var. [%] | 4.478 | 5.486 | 3.515 | Coeff. of Var. [%]_{norm} | | 4.856 | 5.798 | 3.594 |
| Min. | 100.5 | 108.5 | 1.617 | Min. | 0.005396 | 101.2 | 108.8 | 1.639 |
| Max. | 111.2 | 126.6 | 1.780 | Max. | 0.005478 | 112.8 | 127.2 | 1.806 |
| Number of Spec. | 6 | 6 | 6 | Number of Spec. | 6 | 6 | 6 | 6 |





4.32 “10/80/10” Single-Shear Bearing 2, Proc. C Properties (SSB2)

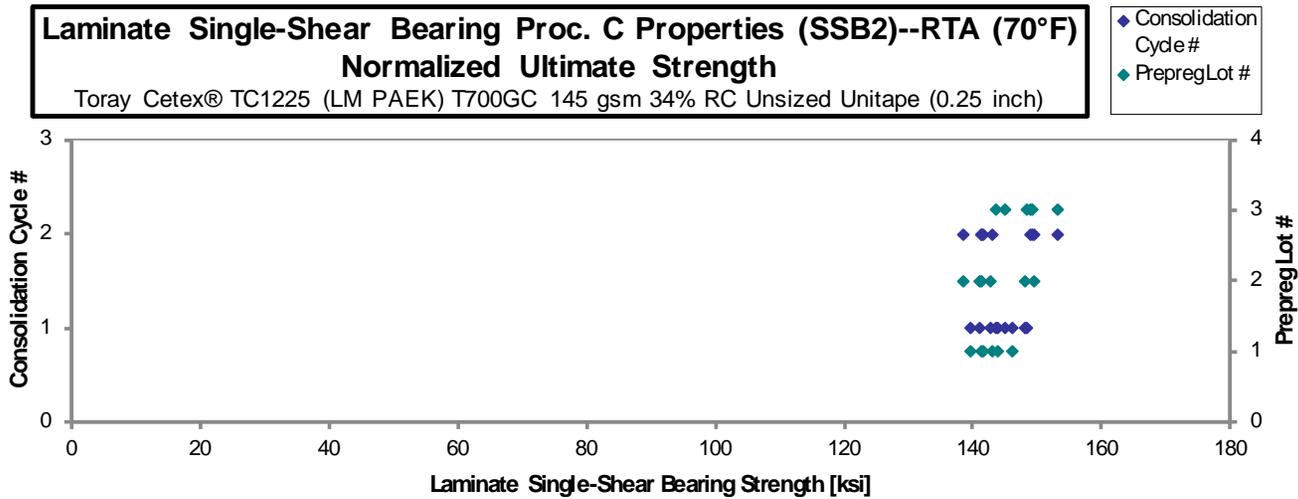
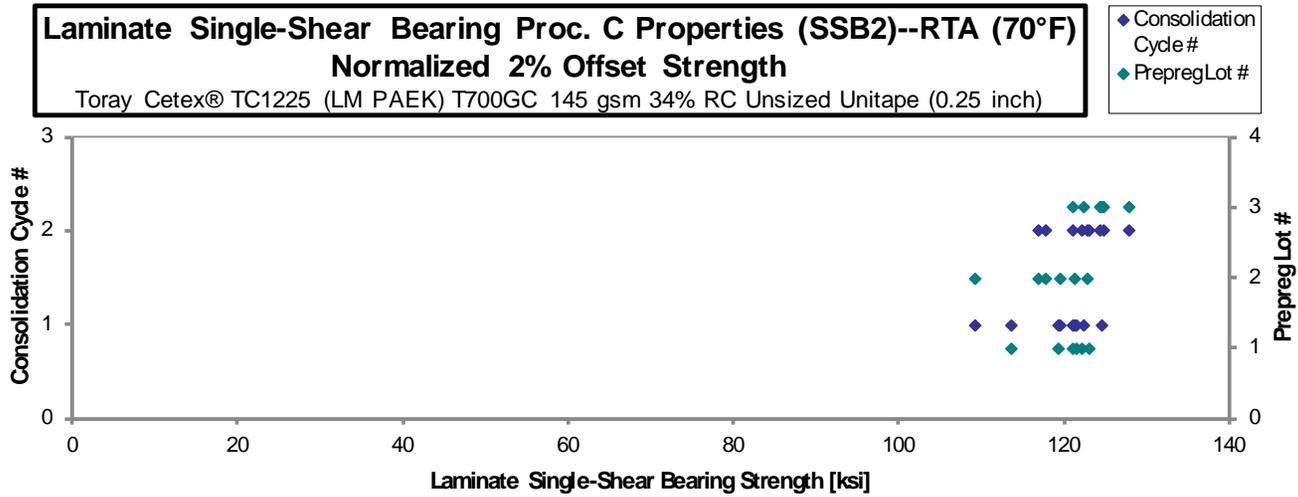
Laminate Single-Shear Bearing Proc. C Properties (SSB2)–RTA (70°F)
Strength & Deformation
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

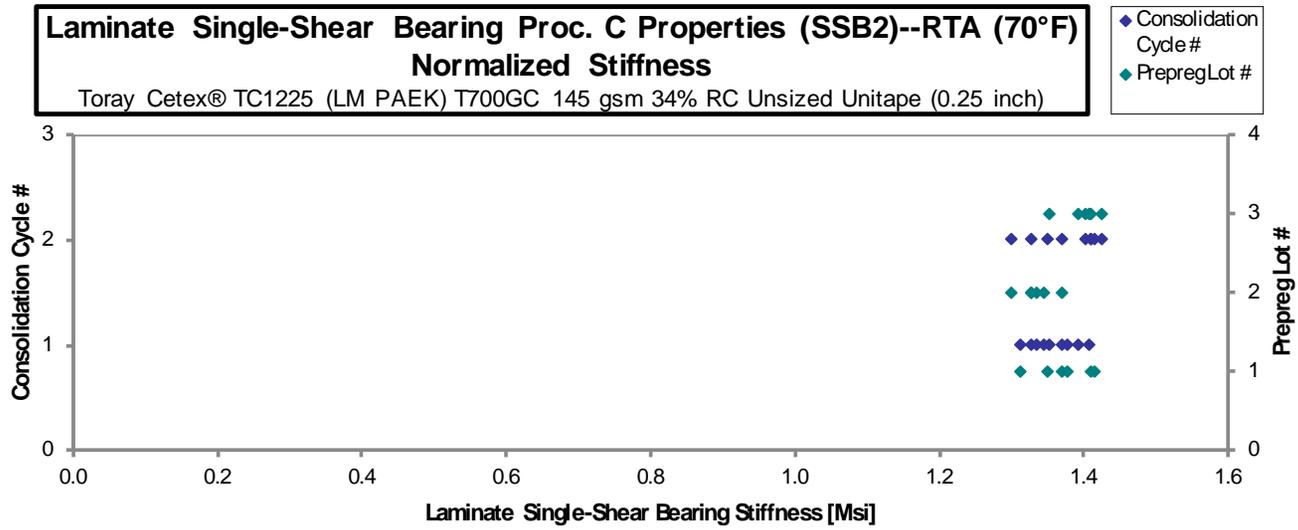
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 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | 2% Offset Strength [ksi] | Ultimate Strength [ksi] | Stiffness [Msi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|--|---------------|--------------------------|---------------|-----------------------|--------------------------|-------------------------|-----------------|------------------------------|---------------------|--------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-A-C1-1-SSB2-RTA-1 | A | C1 | 1 | 1 | 118.2 | 144.8 | 1.359 | 0.1090 | 20 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-A-C1-1-SSB2-RTA-2 | A | C1 | 1 | 1 | 112.7 | 138.4 | 1.302 | 0.1090 | 20 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-A-C1-1-SSB2-RTA-3 | A | C1 | 1 | 1 | 119.6 | 141.9 | 1.357 | 0.1097 | 20 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-A-C2-1-SSB2-RTA-1 | A | C2 | 1 | 2 | 119.4 | 137.0 | 1.368 | 0.1114 | 20 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-A-C2-1-SSB2-RTA-2 | A | C2 | 1 | 2 | 119.4 | 138.4 | 1.320 | 0.1106 | 20 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-A-C2-1-SSB2-RTA-3 | A | C2 | 1 | 2 | 118.0 | 139.3 | 1.378 | 0.1109 | 20 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-B-C1-1-SSB2-RTA-1 | B | C1 | 2 | 1 | 120.8 | 142.7 | 1.349 | 0.1069 | 20 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-B-C1-1-SSB2-RTA-2 | B | C1 | 2 | 1 | 109.2 | 142.9 | 1.347 | 0.1080 | 20 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-B-C1-1-SSB2-RTA-3 | B | C1 | 2 | 1 | 122.7 | 150.0 | 1.343 | 0.1067 | 20 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-B-C2-1-SSB2-RTA-1 | B | C2 | 2 | 2 | 118.5 | 139.4 | 1.308 | 0.1073 | 20 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-B-C2-1-SSB2-RTA-2 | B | C2 | 2 | 2 | 117.3 | 150.1 | 1.333 | 0.1076 | 20 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-B-C2-1-SSB2-RTA-3 | B | C2 | 2 | 2 | 123.3 | 141.9 | 1.376 | 0.1076 | 20 | B11 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST13-C-C1-1-SSB2-RTA-1 | C | C1 | 3 | 1 | 120.9 | 141.9 | 1.376 | 0.1094 | 20 | B11 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST13-C-C1-1-SSB2-RTA-2 | C | C1 | 3 | 1 | 119.7 | 143.4 | 1.336 | 0.1093 | 20 | B11 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST13-C-C1-1-SSB2-RTA-3 | C | C1 | 3 | 1 | 122.9 | 146.3 | 1.390 | 0.1095 | 20 | B11 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST13-C-C2-1-SSB2-RTA-1 | C | C2 | 3 | 2 | 121.8 | 149.9 | 1.381 | 0.1103 | 20 | B11 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST13-C-C2-1-SSB2-RTA-2 | C | C2 | 3 | 2 | 124.8 | 145.7 | 1.371 | 0.1106 | 20 | B11 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST13-C-C2-1-SSB2-RTA-3 | C | C2 | 3 | 2 | 121.4 | 145.2 | 1.385 | 0.1111 | 20 | B11 |

| Avg. t_{ply} [in] | 2% Offset Strength _{norm} [ksi] | Ultimate Strength _{norm} [ksi] | Stiffness _{norm} [Msi] |
|---------------------|--|---|---------------------------------|
| 0.005449 | 119.3 | 146.1 | 1.371 |
| 0.005448 | 113.7 | 139.6 | 1.313 |
| 0.005483 | 121.5 | 144.0 | 1.378 |
| 0.005568 | 123.1 | 141.3 | 1.411 |
| 0.005529 | 122.3 | 141.7 | 1.352 |
| 0.005543 | 121.1 | 143.0 | 1.415 |
| 0.005343 | 119.5 | 141.2 | 1.334 |
| 0.005398 | 109.2 | 142.8 | 1.346 |
| 0.005336 | 121.3 | 148.2 | 1.327 |
| 0.005365 | 117.7 | 138.5 | 1.299 |
| 0.005380 | 116.9 | 149.6 | 1.329 |
| 0.005380 | 122.8 | 141.4 | 1.370 |
| 0.005468 | 122.4 | 143.7 | 1.394 |
| 0.005467 | 121.2 | 145.1 | 1.353 |
| 0.005475 | 124.6 | 148.4 | 1.409 |
| 0.005516 | 124.4 | 153.2 | 1.411 |
| 0.005530 | 127.8 | 149.2 | 1.404 |
| 0.005554 | 124.9 | 149.3 | 1.425 |

| | | | | | | | | |
|--------------------|-------|-------|---------|------------------------------------|----------|-------|-------|---------|
| Average | 119.5 | 143.3 | 1.354 | Average _{norm} | 0.005457 | 120.8 | 144.8 | 1.369 |
| Standard Dev. | 3.741 | 4.069 | 0.02660 | Standard Dev _{norm} | | 4.353 | 4.061 | 0.03897 |
| Coeff. of Var. [%] | 3.131 | 2.839 | 1.964 | Coeff. of Var. [%] _{norm} | | 3.605 | 2.804 | 2.847 |
| Min. | 109.2 | 137.0 | 1.302 | Min. | 0.005336 | 109.2 | 138.5 | 1.299 |
| Max. | 124.8 | 150.1 | 1.390 | Max. | 0.005568 | 127.8 | 153.2 | 1.425 |
| Number of Spec. | 18 | 18 | 18 | Number of Spec. | 18 | 18 | 18 | 18 |





**Laminate Single-Shear Bearing Proc. C Properties (SSB2)-ETA1 (275°F)
Strength & Deformation**

Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

normalizing

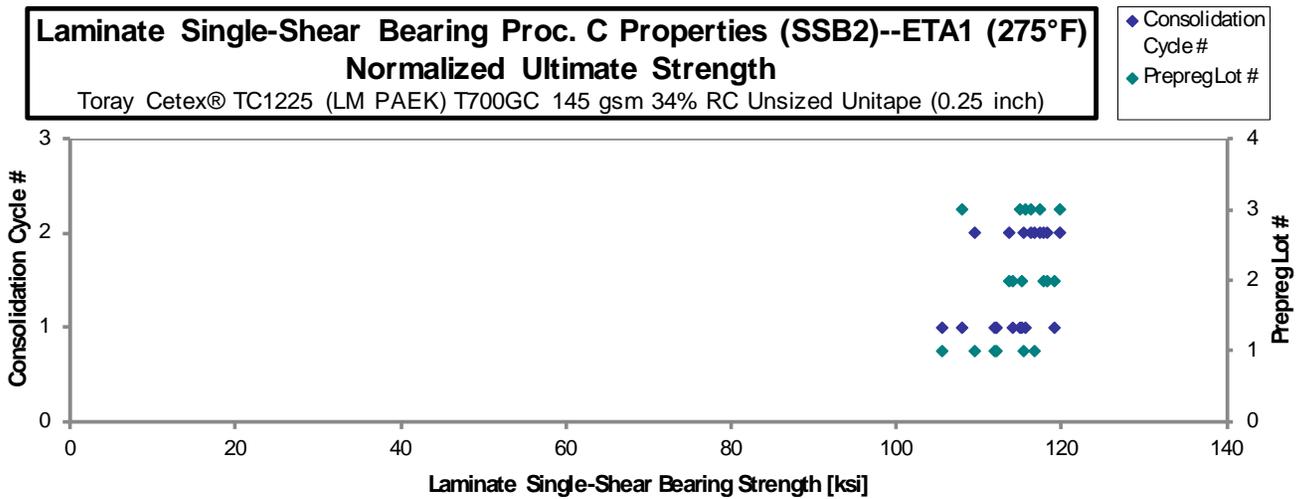
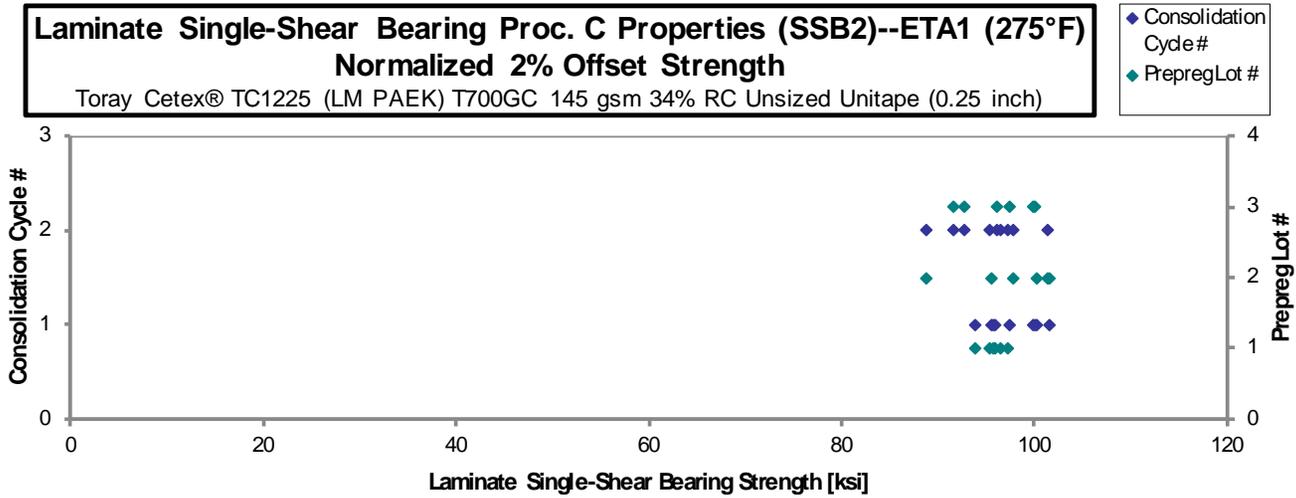
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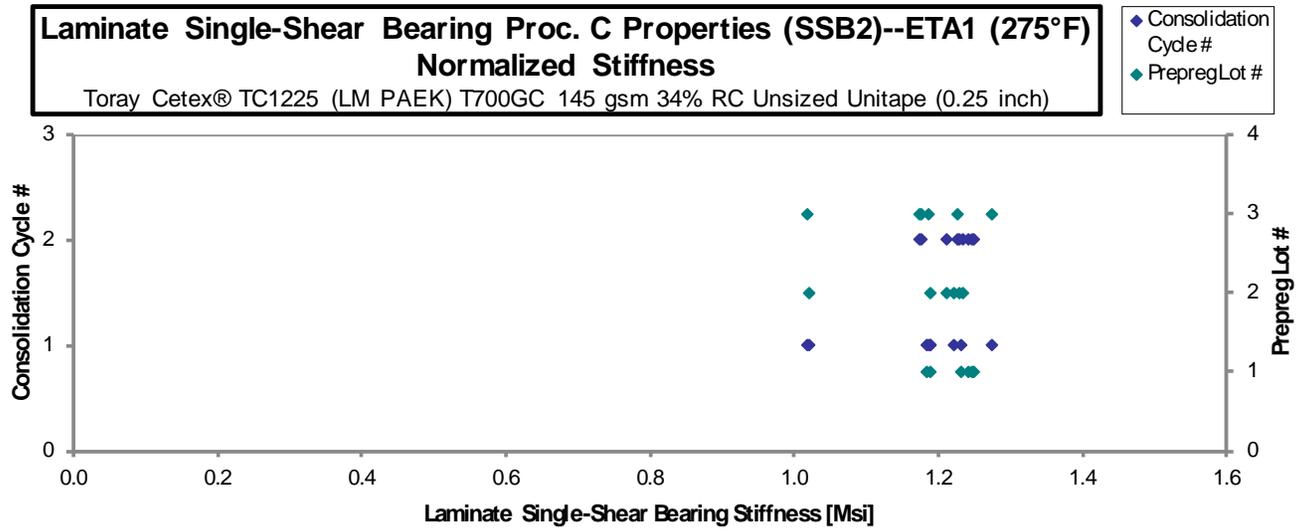
| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | 2% Offset Strength [ksi] | Ultimate Strength [ksi] | Stiffness [Msi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|---|---------------|--------------------------|---------------|-----------------------|--------------------------|-------------------------|-----------------|------------------------------|---------------------|--------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-A-C1-1-SSB2-ETA1-1 | A | C1 | 1 | 1 | 95.07 | 111.3 | 1.175 | 0.1087 | 20 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-A-C1-1-SSB2-ETA1-2 | A | C1 | 1 | 1 | 92.47 | 110.3 | 1.212 | 0.1097 | 20 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-A-C1-1-SSB2-ETA1-3 | A | C1 | 1 | 1 | 95.54 | 105.3 | 1.186 | 0.1083 | 20 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-A-C2-1-SSB2-ETA1-1 | A | C2 | 1 | 2 | 93.91 | 113.8 | 1.230 | 0.1096 | 20 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-A-C2-1-SSB2-ETA1-2 | A | C2 | 1 | 2 | 94.31 | 107.1 | 1.214 | 0.1104 | 20 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-A-C2-1-SSB2-ETA1-3 | A | C2 | 1 | 2 | 95.17 | 114.3 | 1.221 | 0.1102 | 20 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-B-C1-1-SSB2-ETA1-1 | B | C1 | 2 | 1 | 96.03 | 115.8 | 1.228 | 0.1074 | 20 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-B-C1-1-SSB2-ETA1-2 | B | C1 | 2 | 1 | 101.7 | 115.8 | 1.207 | 0.1065 | 20 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-B-C1-1-SSB2-ETA1-3 | B | C1 | 2 | 1 | 103.4 | 121.3 | 1.039 | 0.1061 | 20 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-B-C2-1-SSB2-ETA1-1 | B | C2 | 2 | 2 | 98.23 | 118.3 | 1.240 | 0.1075 | 20 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-B-C2-1-SSB2-ETA1-2 | B | C2 | 2 | 2 | 88.19 | 113.0 | 1.204 | 0.1087 | 20 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST13-B-C2-1-SSB2-ETA1-3 | B | C2 | 2 | 2 | 101.9 | 118.9 | 1.235 | 0.1075 | 20 | B11 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST13-C-C1-1-SSB2-ETA1-1 | C | C1 | 3 | 1 | 98.07 | 106.1 | 1.164 | 0.1100 | 20 | B11 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST13-C-C1-1-SSB2-ETA1-2 | C | C1 | 3 | 1 | 99.34 | 114.2 | 1.011 | 0.1087 | 20 | B11 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST13-C-C1-1-SSB2-ETA1-3 | C | C1 | 3 | 1 | 96.56 | 114.6 | 1.262 | 0.1089 | 20 | B11 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST13-C-C2-1-SSB2-ETA1-1 | C | C2 | 3 | 2 | 89.24 | 114.4 | 1.194 | 0.1109 | 20 | B11 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST13-C-C2-1-SSB2-ETA1-2 | C | C2 | 3 | 2 | 90.37 | 113.5 | 1.144 | 0.1107 | 20 | B11 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST13-C-C2-1-SSB2-ETA1-3 | C | C2 | 3 | 2 | 93.97 | 117.3 | 1.150 | 0.1104 | 20 | B11 |

| Avg. t_{ply} [in] | 2% Offset Strength _{norm} [ksi] | Ultimate Strength _{norm} [ksi] | Stiffness _{norm} [Msi] |
|---------------------|--|---|---------------------------------|
| 0.005434 | 95.67 | 112.1 | 1.183 |
| 0.005483 | 93.90 | 112.0 | 1.231 |
| 0.005416 | 95.82 | 105.6 | 1.189 |
| 0.005478 | 95.26 | 115.5 | 1.248 |
| 0.005518 | 96.37 | 109.4 | 1.241 |
| 0.005510 | 97.11 | 116.7 | 1.246 |
| 0.005370 | 95.50 | 115.2 | 1.221 |
| 0.005323 | 100.2 | 114.2 | 1.189 |
| 0.005303 | 101.6 | 119.1 | 1.021 |
| 0.005375 | 97.78 | 117.8 | 1.235 |
| 0.005433 | 88.74 | 113.7 | 1.212 |
| 0.005373 | 101.4 | 118.4 | 1.229 |
| 0.005498 | 99.85 | 108.1 | 1.185 |
| 0.005433 | 99.95 | 114.9 | 1.018 |
| 0.005447 | 97.39 | 115.6 | 1.273 |
| 0.005545 | 91.64 | 117.5 | 1.226 |
| 0.005537 | 92.66 | 116.4 | 1.173 |
| 0.005519 | 96.04 | 119.9 | 1.176 |

| | | | |
|--------------------|-------|-------|---------|
| Average | 95.75 | 113.6 | 1.184 |
| Standard Dev. | 4.243 | 4.340 | 0.06599 |
| Coeff. of Var. [%] | 4.431 | 3.818 | 5.572 |
| Min. | 88.19 | 105.3 | 1.011 |
| Max. | 103.4 | 121.3 | 1.262 |
| Number of Spec. | 18 | 18 | 18 |

| | | | | |
|------------------------------------|----------|-------|-------|---------|
| Average _{norm} | 0.005444 | 96.50 | 114.5 | 1.194 |
| Standard Dev. _{norm} | | 3.422 | 3.875 | 0.06968 |
| Coeff. of Var. [%] _{norm} | | 3.546 | 3.383 | 5.836 |
| Min. | 0.005303 | 88.74 | 105.6 | 1.018 |
| Max. | 0.005545 | 101.6 | 119.9 | 1.273 |
| Number of Spec. | 18 | 18 | 18 | 18 |





4.33 “50/40/10” Single-Shear Bearing 3, Proc. C Properties (SSB3)

Laminate Single-Shear Bearing Proc. C Properties (SSB3)–RTA (70°F)
Strength & Deformation
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

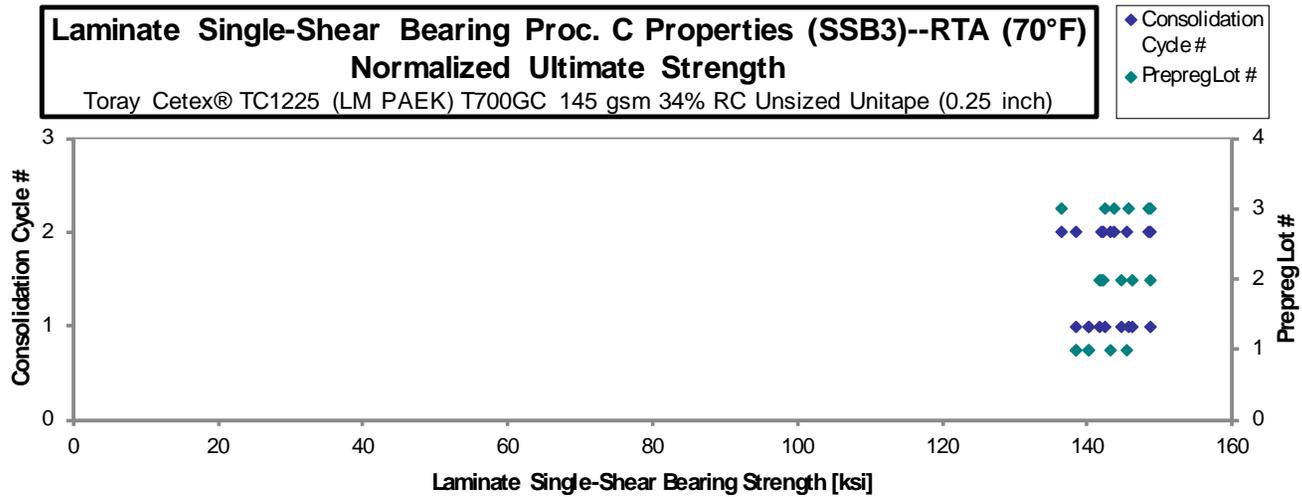
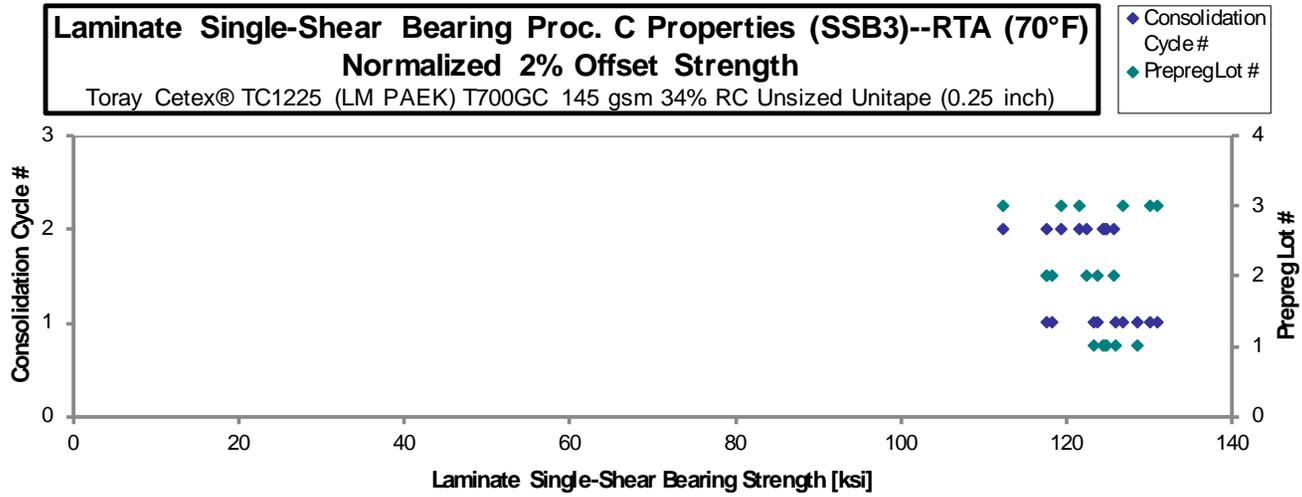
normalizing
 t_{ply} [in]
 0.005400

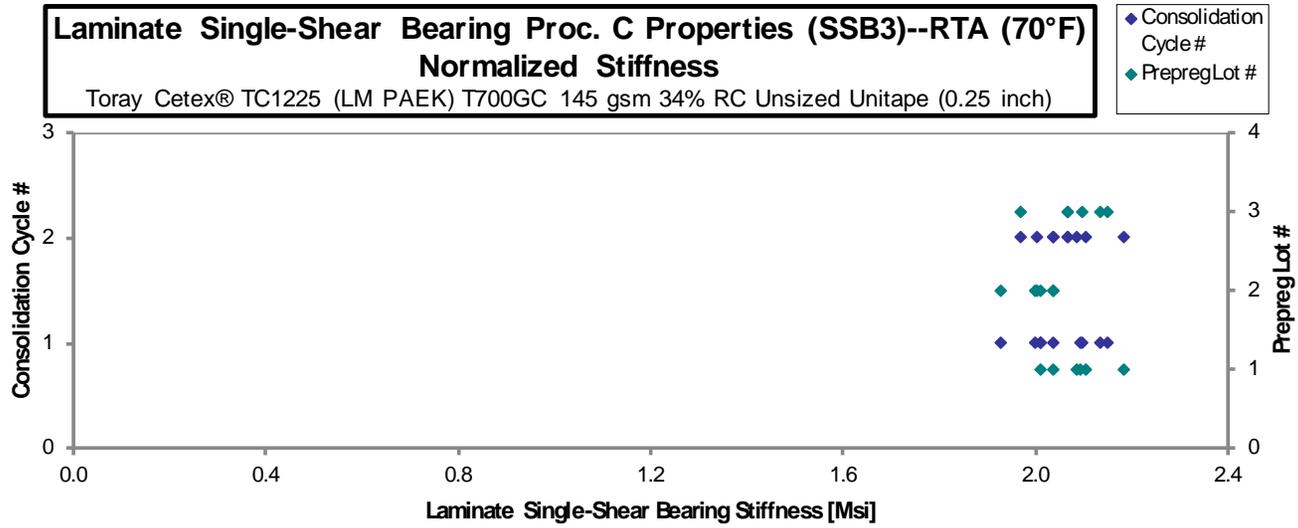
| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | 2% Offset Strength [ksi] | Ultimate Strength [ksi] | Stiffness [Msi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|---|---------------|--------------------------|---------------|-----------------------|--------------------------|-------------------------|-----------------|------------------------------|---------------------|--------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-A-C1-1-SSB3-RTA-1 | A | C1 | 1 | 1 | 122.7 | 137.7 | 1.997 | 0.1087 | 20 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-A-C1-1-SSB3-RTA-2 | A | C1 | 1 | 1 | 127.5 | 139.1 | 2.020 | 0.1089 | 20 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-A-C1-1-SSB3-RTA-3 | A | C1 | 1 | 1 | 124.9 | 139.1 | 2.076 | 0.1089 | 20 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-A-C2-1-SSB3-RTA-1 | A | C2 | 1 | 2 | 122.1 | 135.4 | 2.056 | 0.1106 | 20 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-A-C2-1-SSB3-RTA-2 | A | C2 | 1 | 2 | 123.1 | 141.2 | 2.152 | 0.1095 | 20 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-A-C2-1-SSB3-RTA-3 | A | C2 | 1 | 2 | 122.1 | 142.8 | 2.048 | 0.1101 | 20 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-B-C1-1-SSB3-RTA-1 | B | C1 | 2 | 1 | 114.7 | 137.6 | 1.939 | 0.1113 | 20 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-B-C1-1-SSB3-RTA-2 | B | C1 | 2 | 1 | 113.9 | 141.5 | 1.866 | 0.1116 | 20 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-B-C1-1-SSB3-RTA-3 | B | C1 | 2 | 1 | 120.9 | 141.3 | 1.961 | 0.1106 | 20 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-B-C2-1-SSB3-RTA-1 | B | C2 | 2 | 2 | 119.2 | 138.4 | 1.982 | 0.1110 | 20 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-B-C2-1-SSB3-RTA-2 | B | C2 | 2 | 2 | 122.7 | 145.0 | 1.986 | 0.1107 | 20 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-B-C2-1-SSB3-RTA-3 | B | C2 | 2 | 2 | 114.7 | 138.3 | 1.951 | 0.1108 | 20 | B11 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST16-C-1-1-SSB3-RTA-1 | C | C1 | 3 | 1 | 123.2 | 144.5 | 2.086 | 0.1112 | 20 | B11 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST16-C-1-1-SSB3-RTA-2 | C | C1 | 3 | 1 | 126.1 | 141.3 | 2.030 | 0.1115 | 20 | B11 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST16-C-1-1-SSB3-RTA-3 | C | C1 | 3 | 1 | 127.4 | 138.4 | 2.073 | 0.1111 | 20 | B11 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST16-C-2-1-SSB3-RTA-1 | C | C2 | 3 | 2 | 124.8 | 152.6 | 2.122 | 0.1052 | 20 | B11 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST16-C-2-1-SSB3-RTA-2 | C | C2 | 3 | 2 | 115.0 | 146.9 | 2.010 | 0.1057 | 20 | B11 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST16-C-2-1-SSB3-RTA-3 | C | C2 | 3 | 2 | 122.1 | 139.5 | 2.112 | 0.1056 | 20 | B11 |

| Avg. t_{ply} [in] | 2% Offset Strength _{norm} [ksi] | Ultimate Strength _{norm} [ksi] | Stiffness _{norm} [Msi] |
|---------------------|--|---|---------------------------------|
| 0.005433 | 123.5 | 138.6 | 2.009 |
| 0.005444 | 128.6 | 140.3 | 2.036 |
| 0.005445 | 125.9 | 140.3 | 2.094 |
| 0.005529 | 125.0 | 138.6 | 2.105 |
| 0.005475 | 124.8 | 143.2 | 2.182 |
| 0.005503 | 124.4 | 145.5 | 2.087 |
| 0.005565 | 118.3 | 141.8 | 1.999 |
| 0.005579 | 117.7 | 146.2 | 1.928 |
| 0.005531 | 123.8 | 144.7 | 2.009 |
| 0.005552 | 122.6 | 142.3 | 2.038 |
| 0.005537 | 125.8 | 148.7 | 2.036 |
| 0.005539 | 117.7 | 141.9 | 2.002 |
| 0.005562 | 126.9 | 148.8 | 2.149 |
| 0.005576 | 130.2 | 145.9 | 2.096 |
| 0.005555 | 131.0 | 142.4 | 2.133 |
| 0.005260 | 121.5 | 148.6 | 2.067 |
| 0.005285 | 112.5 | 143.8 | 1.968 |
| 0.005282 | 119.4 | 136.4 | 2.065 |

Average 121.5 141.2 2.026
 Standard Dev. 4.347 4.089 0.07266
 Coeff. of Var. [%] 3.577 2.897 3.586
 Min. 113.9 135.4 1.866
 Max. 127.5 152.6 2.152
 Number of Spec. 18 18 18

Average_{norm} 0.005481 123.3 143.2 2.056
 Standard Dev_{norm} 4.799 3.645 3.655 0.06551
 Coeff. of Var. [%]_{norm} 3.892 2.545 3.187
 Min. 0.005260 112.5 136.4 1.928
 Max. 0.005579 131.0 148.8 2.182
 Number of Spec. 18 18 18 18





**Laminate Single-Shear Bearing Proc. C Properties (SSB3)-ETA1 (275°F)
Strength & Deformation**

Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

normalizing

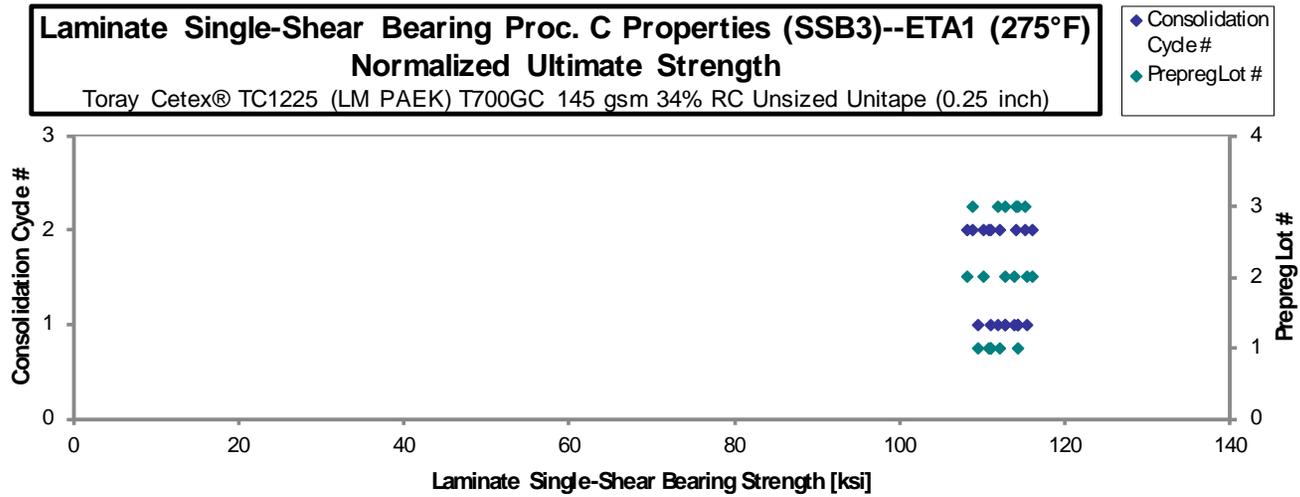
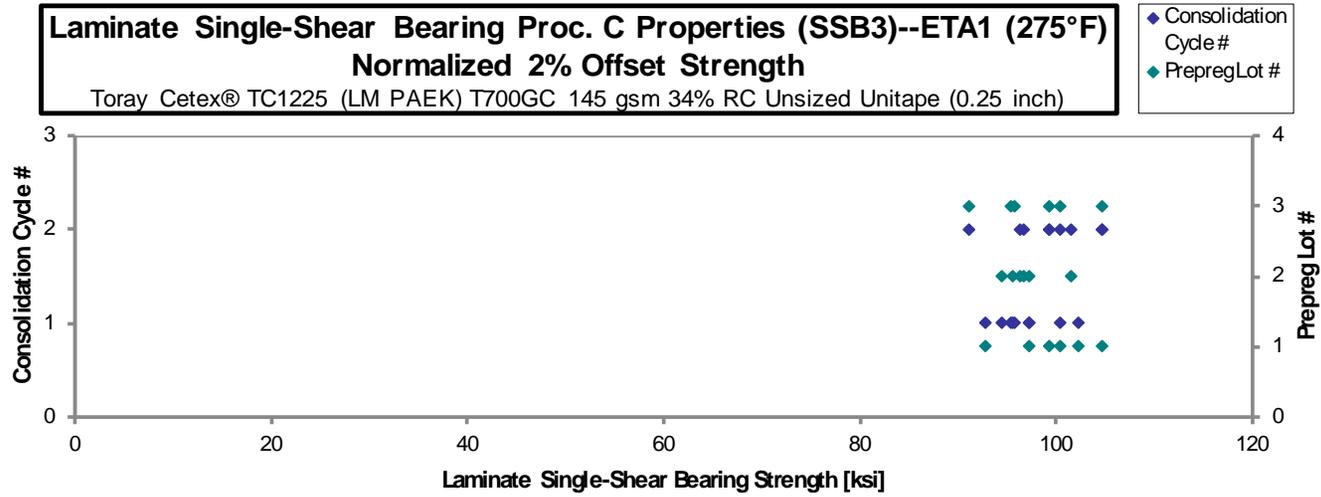
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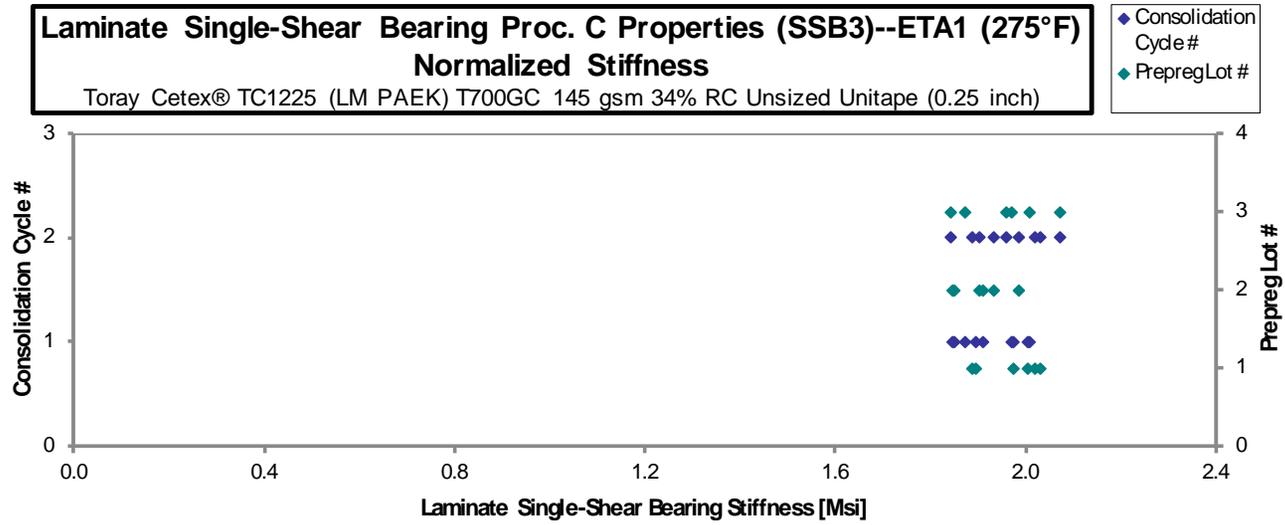
| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | 2% Offset Strength [ksi] | Ultimate Strength [ksi] | Stiffness [Msi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|---|---------------|--------------------------|---------------|-----------------------|--------------------------|-------------------------|-----------------|------------------------------|---------------------|--------------|
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-A-C1-1-SSB3-ETA1-1 | A | C1 | 1 | 1 | 101.2 | 109.7 | 1.980 | 0.1092 | 20 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-A-C1-1-SSB3-ETA1-2 | A | C1 | 1 | 1 | 96.64 | 113.6 | 1.882 | 0.1088 | 20 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-A-C1-1-SSB3-ETA1-3 | A | C1 | 1 | 1 | 92.11 | 108.8 | 1.959 | 0.1088 | 20 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-A-C2-1-SSB3-ETA1-1 | A | C2 | 1 | 2 | 97.86 | 108.0 | 1.838 | 0.1108 | 20 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-A-C2-1-SSB3-ETA1-2 | A | C2 | 1 | 2 | 102.9 | 110.2 | 1.995 | 0.1098 | 20 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-A-C2-1-SSB3-ETA1-3 | A | C2 | 1 | 2 | 97.02 | 108.5 | 1.972 | 0.1105 | 20 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-B-C1-1-SSB3-ETA1-1 | B | C1 | 2 | 1 | 92.74 | 109.5 | 1.796 | 0.1113 | 20 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-B-C1-1-SSB3-ETA1-2 | B | C1 | 2 | 1 | 92.60 | 111.6 | 1.806 | 0.1103 | 20 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-B-C1-1-SSB3-ETA1-3 | B | C1 | 2 | 1 | 94.66 | 112.3 | 1.859 | 0.1110 | 20 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-B-C2-1-SSB3-ETA1-1 | B | C2 | 2 | 2 | 98.71 | 105.2 | 1.927 | 0.1111 | 20 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-B-C2-1-SSB3-ETA1-2 | B | C2 | 2 | 2 | 94.06 | 113.1 | 1.849 | 0.1110 | 20 | B11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST16-B-C2-1-SSB3-ETA1-3 | B | C2 | 2 | 2 | 94.36 | 108.1 | 1.893 | 0.1102 | 20 | B11 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST16-C-C1-1-SSB3-ETA1-1 | C | C1 | 3 | 1 | 92.15 | 108.1 | 1.808 | 0.1118 | 20 | B11 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST16-C-C1-1-SSB3-ETA1-2 | C | C1 | 3 | 1 | 97.42 | 109.4 | 1.946 | 0.1113 | 20 | B11 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST16-C-C1-1-SSB3-ETA1-3 | C | C1 | 3 | 1 | 92.88 | 110.9 | 1.911 | 0.1113 | 20 | B11 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST16-C-C2-1-SSB3-ETA1-1 | C | C2 | 3 | 2 | 93.40 | 116.9 | 2.008 | 0.1054 | 20 | B11 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST16-C-C2-1-SSB3-ETA1-2 | C | C2 | 3 | 2 | 107.5 | 111.8 | 1.889 | 0.1053 | 20 | B11 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST16-C-C2-1-SSB3-ETA1-3 | C | C2 | 3 | 2 | 101.8 | 118.0 | 2.121 | 0.1054 | 20 | B11 |

| Avg. t_{ply} [in] | 2% Offset Strength _{norm} [ksi] | Ultimate Strength _{norm} [ksi] | Stiffness _{norm} [Msi] |
|---------------------|--|---|---------------------------------|
| 0.005462 | 102.4 | 111.0 | 2.003 |
| 0.005439 | 97.34 | 114.4 | 1.895 |
| 0.005442 | 92.82 | 109.6 | 1.974 |
| 0.005541 | 100.4 | 110.8 | 1.886 |
| 0.005491 | 104.6 | 112.1 | 2.028 |
| 0.005523 | 99.22 | 111.0 | 2.017 |
| 0.005563 | 95.53 | 112.8 | 1.850 |
| 0.005513 | 94.54 | 113.9 | 1.844 |
| 0.005551 | 97.30 | 115.4 | 1.911 |
| 0.005557 | 101.6 | 108.3 | 1.983 |
| 0.005549 | 96.66 | 116.2 | 1.900 |
| 0.005512 | 96.31 | 110.3 | 1.932 |
| 0.005588 | 95.35 | 111.9 | 1.871 |
| 0.005565 | 100.4 | 112.7 | 2.006 |
| 0.005566 | 95.73 | 114.3 | 1.970 |
| 0.005272 | 91.18 | 114.1 | 1.960 |
| 0.005263 | 104.8 | 108.9 | 1.841 |
| 0.005270 | 99.32 | 115.2 | 2.070 |

| | | | |
|--------------------|-------|-------|---------|
| Average | 96.66 | 110.8 | 1.913 |
| Standard Dev. | 4.359 | 3.196 | 0.08450 |
| Coeff. of Var. [%] | 4.510 | 2.885 | 4.417 |
| Min. | 92.11 | 105.2 | 1.796 |
| Max. | 107.5 | 118.0 | 2.121 |
| Number of Spec. | 18 | 18 | 18 |

| | | | | |
|------------------------------------|----------|-------|-------|---------|
| Average _{norm} | 0.005481 | 98.08 | 112.4 | 1.941 |
| Standard Dev. _{norm} | | 3.798 | 2.332 | 0.06974 |
| Coeff. of Var. [%] _{norm} | | 3.872 | 2.075 | 3.593 |
| Min. | 0.005263 | 91.18 | 108.3 | 1.841 |
| Max. | 0.005588 | 104.8 | 116.2 | 2.070 |
| Number of Spec. | 18 | 18 | 18 | 18 |





4.34 “25/50/25” Compression After Impact 1 Properties (CAI1)

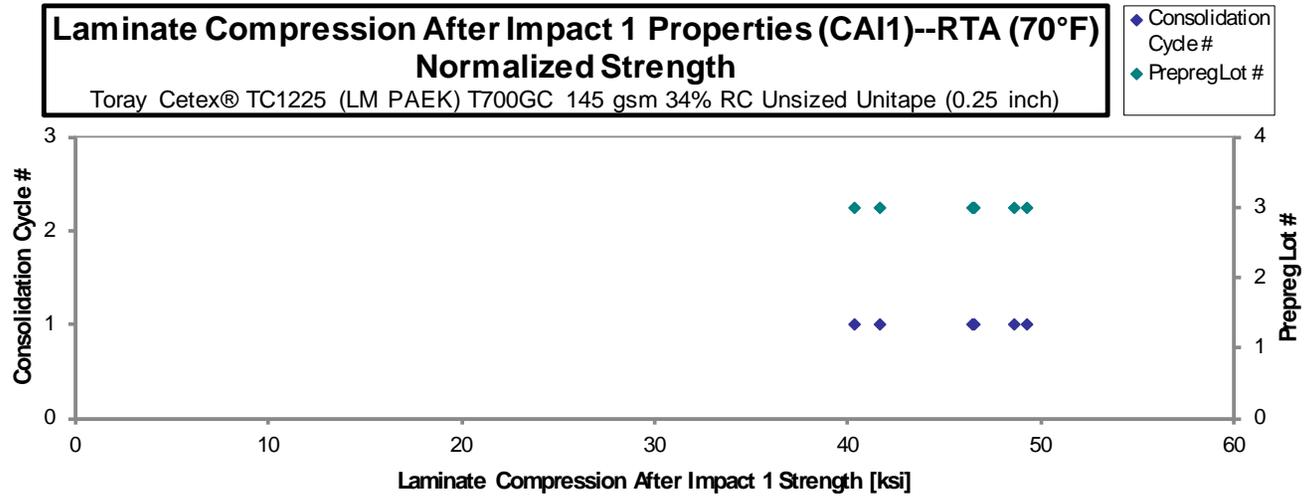
Laminate Compression After Impact 1 Properties (CAI1)--RTA (70°F)
Strength
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Measured Impact Energy [in-lbf] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode | Avg. t_{ply} [in] | Strength _{norm} [ksi] |
|--|---------------|--------------------------|---------------|-----------------------|----------------|---------------------------------|------------------------------|---------------------|--------------|---------------------|--------------------------------|
| NTP1226Q1-TC-NIAR-NIAR-T25-MST11-C-C1-1-CAI1-RTA-1 | C | C1 | 3 | 1 | 41.03 | 263.4 | 0.1757 | 32 | LDM | 0.005489 | 41.70 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST11-C-C1-1-CAI1-RTA-2 | C | C1 | 3 | 1 | 45.71 | 263.1 | 0.1759 | 32 | LDM | 0.005497 | 46.53 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST11-C-C1-1-CAI1-RTA-3 | C | C1 | 3 | 1 | 47.93 | 262.7 | 0.1754 | 32 | LDM | 0.005480 | 48.64 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST11-C-C1-1-CAI1-RTA-4 | C | C1 | 3 | 1 | 46.00 | 264.6 | 0.1751 | 32 | LDM | 0.005472 | 46.61 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST11-C-C1-1-CAI1-RTA-5 | C | C1 | 3 | 1 | 48.61 | 263.6 | 0.1752 | 32 | LDM | 0.005476 | 49.30 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST11-C-C1-1-CAI1-RTA-6 | C | C1 | 3 | 1 | 39.92 | 260.8 | 0.1749 | 32 | LDM | 0.005464 | 40.39 |

Average 44.87
 Standard Dev. 3.596
 Coeff. of Var. [%] 8.015
 Min. 39.92
 Max. 48.61
 Number of Spec. 6

Average_{norm} 0.005480 45.53
 Standard Dev._{norm} 3.664
 Coeff. of Var. [%]_{norm} 8.047
 Min. 0.005464 40.39
 Max. 0.005497 49.30
 Number of Spec. 6 6



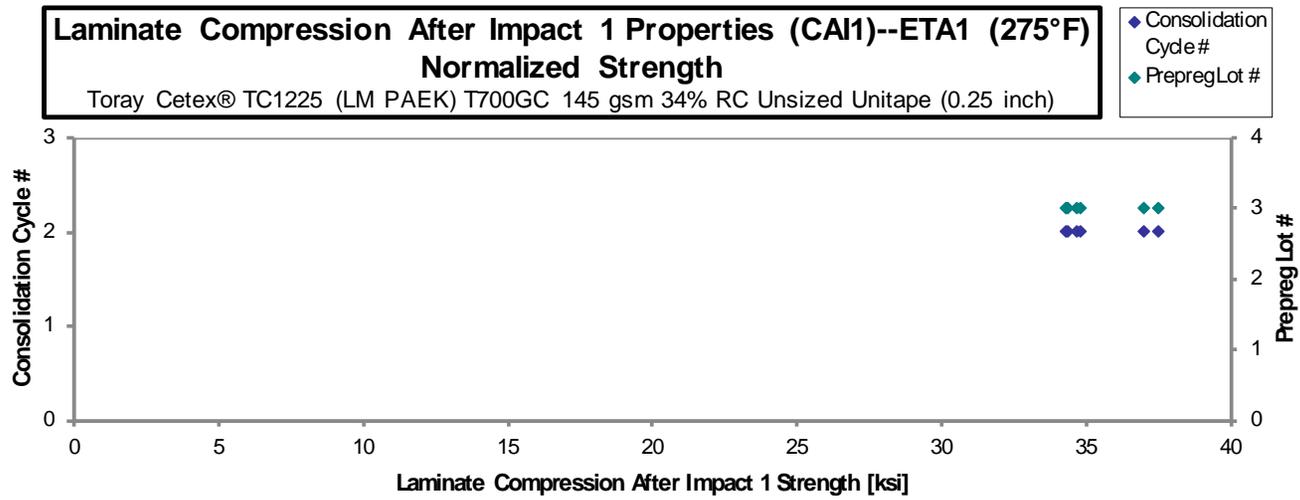
Laminate Compression After Impact 1 Properties (CAI1)--ETA1 (275°F)
Strength
 Toray Cetex® TC1225 (LMPAЕК) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Measured Impact Energy [in-lbf] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode | Avg. t_{ply} [in] | Strength _{norm} [ksi] |
|---|---------------|--------------------------|---------------|-----------------------|----------------|---------------------------------|------------------------------|---------------------|--------------|---------------------|--------------------------------|
| NTP1226Q1-TC-NIAR-NIAR-T25-MST11-C-C2-1-CAI1-ETA1-1 | C | C2 | 3 | 2 | 32.95 | 270.6 | 0.1799 | 32 | LDM | 0.005621 | 34.30 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST11-C-C2-1-CAI1-ETA1-2 | C | C2 | 3 | 2 | 36.05 | 267.8 | 0.1796 | 32 | LDM | 0.005611 | 37.46 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST11-C-C2-1-CAI1-ETA1-3 | C | C2 | 3 | 2 | 33.50 | 269.8 | 0.1795 | 32 | LDM | 0.005609 | 34.80 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST11-C-C2-1-CAI1-ETA1-4 | C | C2 | 3 | 2 | 35.42 | 269.6 | 0.1805 | 32 | LDM | 0.005640 | 37.00 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST11-C-C2-1-CAI1-ETA1-5 | C | C2 | 3 | 2 | 33.22 | 269.3 | 0.1785 | 32 | LDM | 0.005579 | 34.32 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST11-C-C2-1-CAI1-ETA1-6 | C | C2 | 3 | 2 | 33.51 | 269.7 | 0.1787 | 32 | LDM | 0.005585 | 34.65 |

Average 34.11
 Standard Dev. 1.293
 Coeff. of Var. [%] 3.789
 Min. 32.95
 Max. 36.05
 Number of Spec. 6

Average_{norm} 0.005607 35.42
 Standard Dev._{norm} 1.421
 Coeff. of Var. [%]_{norm} 4.011
 Min. 0.005579 34.30
 Max. 0.005640 37.46
 Number of Spec. 6 6

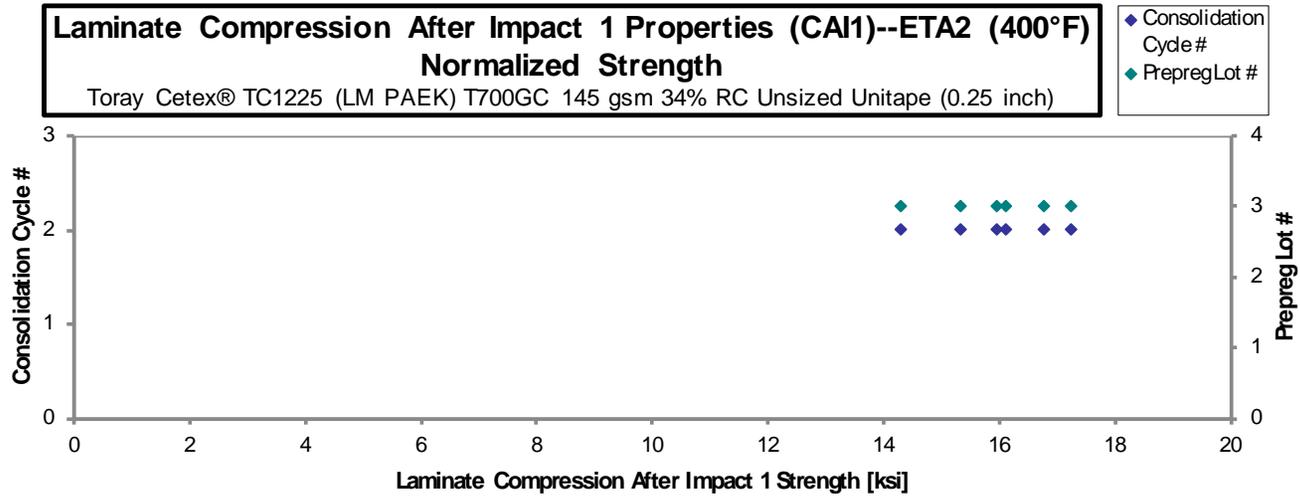


Laminate Compression After Impact 1 Properties (CAI1)--ETA2 (400°F)
Strength
 Toray Cetex® TC1225 (LMPAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

normalizing
 t_{ply} [in]
 0.005400

| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Measured Impact Energy [in-lbf] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode | Avg. t_{ply} [in] | Strength _{norm} [ksi] |
|---|---------------|--------------------------|---------------|-----------------------|----------------|---------------------------------|------------------------------|---------------------|--------------|---------------------|--------------------------------|
| NTP1226Q1-TC-NIAR-NIAR-T25-MST11-C-C2-1-CAI1-ETA2-1 | C | C2 | 3 | 2 | 14.83 | 268.2 | 0.1786 | 32 | LDM | 0.005582 | 15.33 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST11-C-C2-1-CAI1-ETA2-2 | C | C2 | 3 | 2 | 15.37 | 267.1 | 0.1795 | 32 | LDM | 0.005610 | 15.97 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST11-C-C2-1-CAI1-ETA2-3 | C | C2 | 3 | 2 | 13.82 | 265.4 | 0.1786 | 32 | LDM | 0.005581 | 14.28 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST11-C-C2-1-CAI1-ETA2-5 | C | C2 | 3 | 2 | 16.23 | 268.0 | 0.1784 | 32 | LDM | 0.005575 | 16.76 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST11-C-C2-1-CAI1-ETA2-6 | C | C2 | 3 | 2 | 16.62 | 269.7 | 0.1794 | 32 | LDM | 0.005607 | 17.25 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST11-C-C2-1-CAI1-SP-4 | C | C2 | 3 | 2 | 15.63 | 268.5 | 0.1782 | 32 | LDM | 0.005570 | 16.12 |

| | | | | |
|---------------------------|--------------|--|-----------------|--------------|
| Average | 15.42 | Average_{norm} | 0.005587 | 15.95 |
| Standard Dev. | 1.004 | Standard Dev._{norm} | | 1.052 |
| Coeff. of Var. [%] | 6.511 | Coeff. of Var. [%]_{norm} | | 6.597 |
| Min. | 13.82 | Min. | 0.005570 | 14.28 |
| Max. | 16.62 | Max. | 0.005610 | 17.25 |
| Number of Spec. | 6 | Number of Spec. | 6 | 6 |



Laminate Compression After Impact 1 Properties (CAI1)--ETW (275°F)
Strength
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

normalizing
 t_{ply} [in]
 0.005400

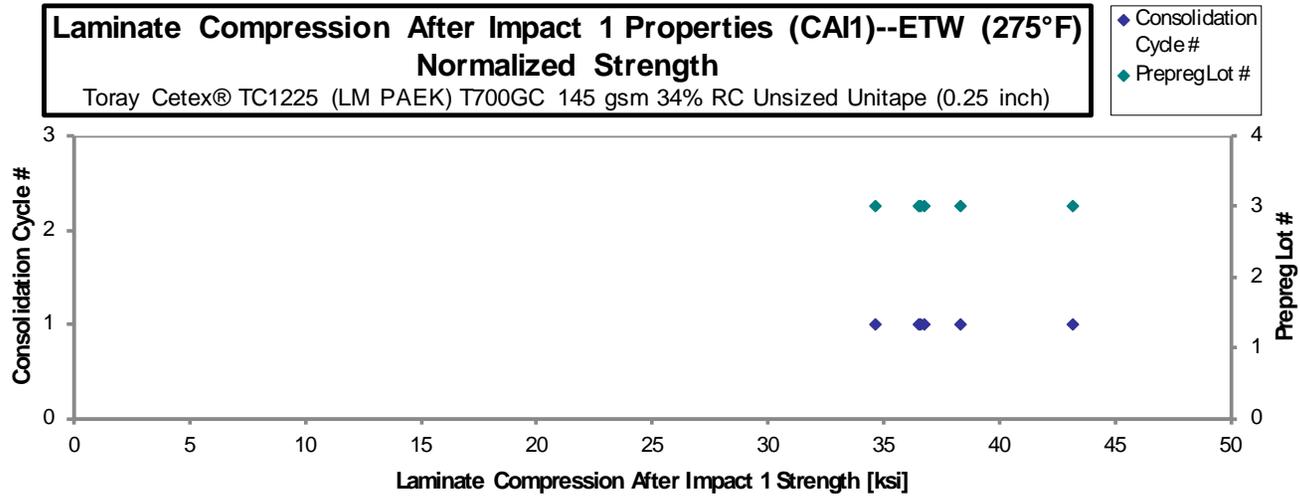
| Specimen Number | Toray Batch # | NIAR Consolidation Cycle | Prepreg Lot # | Consolidation Cycle # | Strength [ksi] | Measured Impact Energy [in-lbf] | Avg. Specimen Thickness [in] | # Plies in Laminate | Failure Mode |
|---|---------------|--------------------------|---------------|-----------------------|----------------|---------------------------------|------------------------------|---------------------|--------------|
| NTP1226Q1-TC-NIAR-NIAR-T25-MST11-C-C1-1-CAI1-ETW-1* | C | C1 | 3 | 1 | | 263.5 | 0.1748 | 32 | CAB |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST11-C-C1-1-CAI1-ETW-2 | C | C1 | 3 | 1 | 37.74 | 262.5 | 0.1756 | 32 | LDM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST11-C-C1-1-CAI1-ETW-3 | C | C1 | 3 | 1 | 36.28 | 262.3 | 0.1741 | 32 | LDM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST11-C-C1-1-CAI1-ETW-4 | C | C1 | 3 | 1 | 42.80 | 262.8 | 0.1743 | 32 | LDM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST11-C-C1-1-CAI1-ETW-5 | C | C1 | 3 | 1 | 36.47 | 264.7 | 0.1742 | 32 | LDM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST11-C-C1-1-CAI1-ETW-6 | C | C1 | 3 | 1 | 36.16 | 263.2 | 0.1750 | 32 | LDM |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST11-C-C1-1-CAI1-SP-1 | C | C1 | 3 | 1 | 34.21 | 262.6 | 0.1749 | 32 | LDM |

| Avg. t_{ply} [in] | Strength _{norm} [ksi] |
|---------------------|--------------------------------|
| 0.005461 | |
| 0.005488 | 38.36 |
| 0.005440 | 36.55 |
| 0.005446 | 43.17 |
| 0.005443 | 36.76 |
| 0.005468 | 36.61 |
| 0.005464 | 34.62 |

* Strength not reported due to unacceptable failure mode.

Average 37.28
 Standard Dev. 2.934
 Coeff. of Var. [%] 7.872
 Min. 34.21
 Max. 42.80
 Number of Spec. 6

Average_{norm} 0.005459 37.68
 Standard Dev_{norm} 2.940
 Coeff. of Var. [%]_{norm} 7.801
 Min. 0.005440 34.62
 Max. 0.005488 43.17
 Number of Spec. 7 6

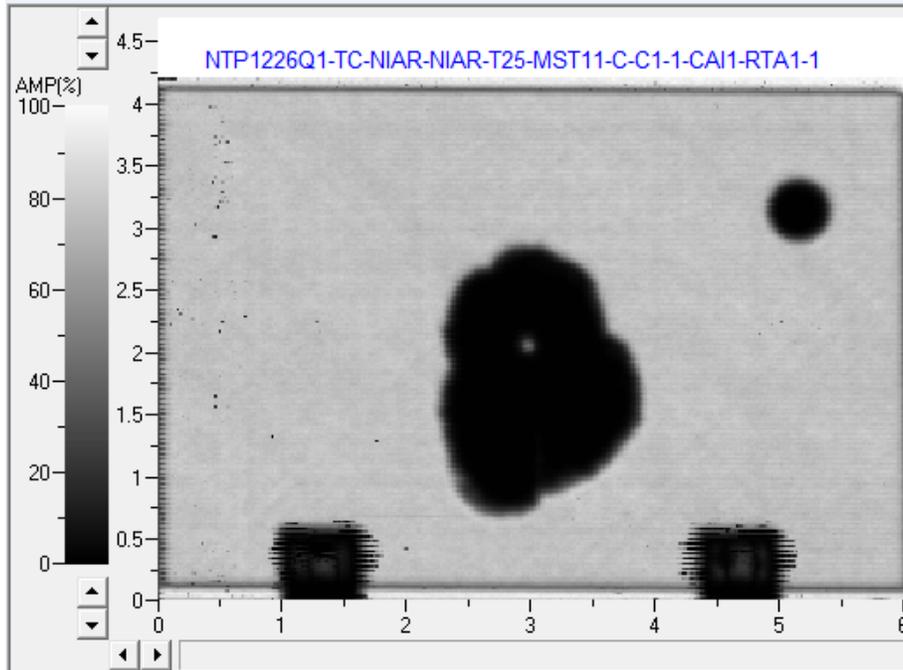


5. Additional Compression After Impact Data

Target Impact Energy Level: 1500 in-lb/in

Impactor Diameter: 0.625"

Representative of Damage Area:

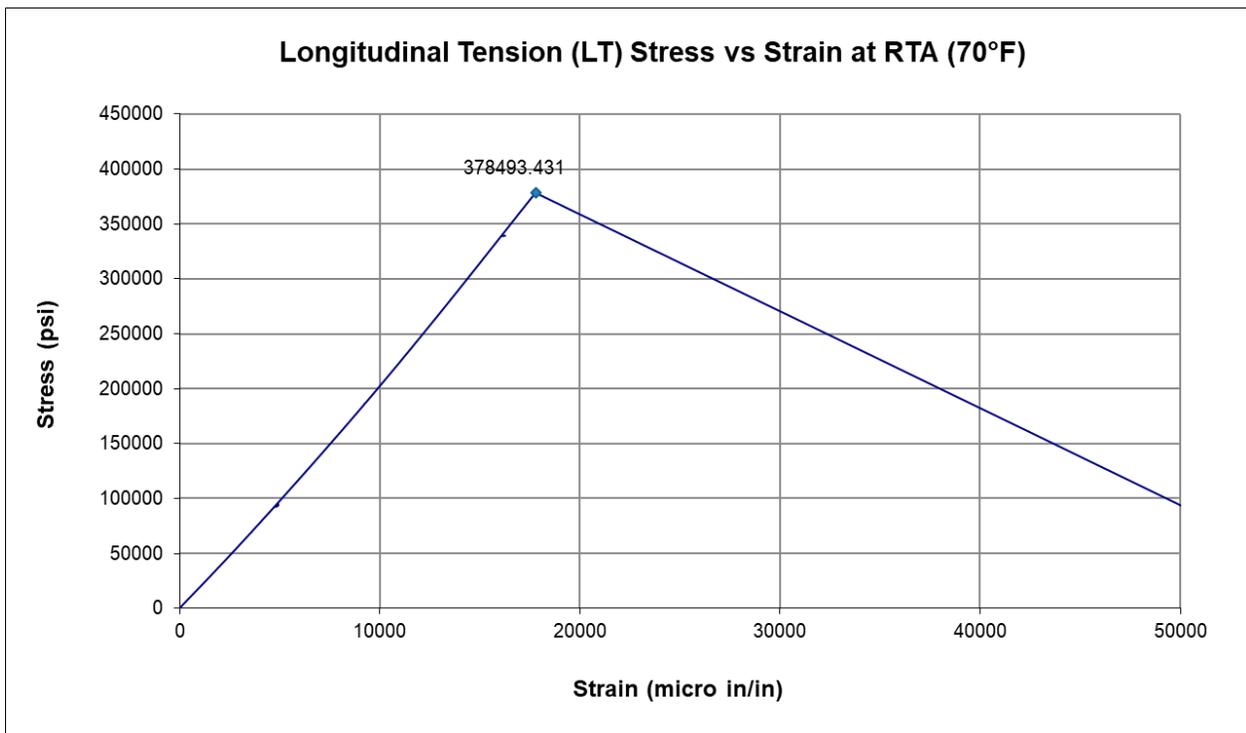
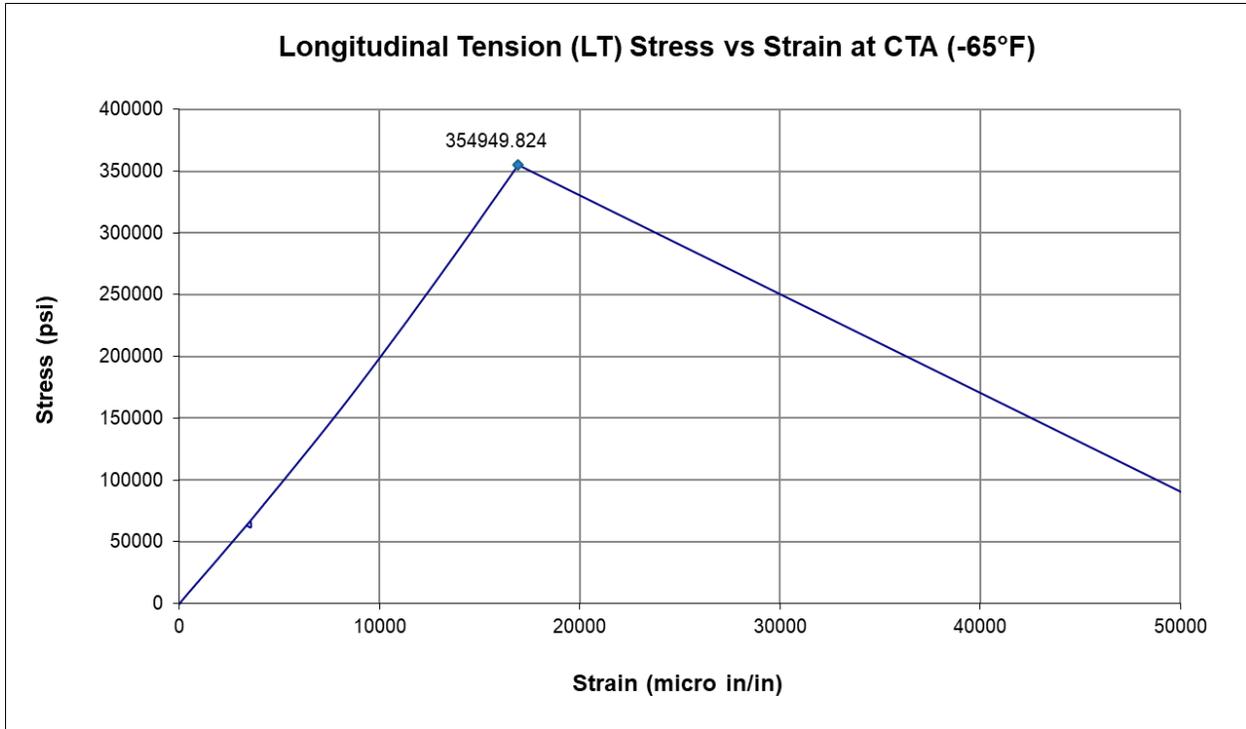


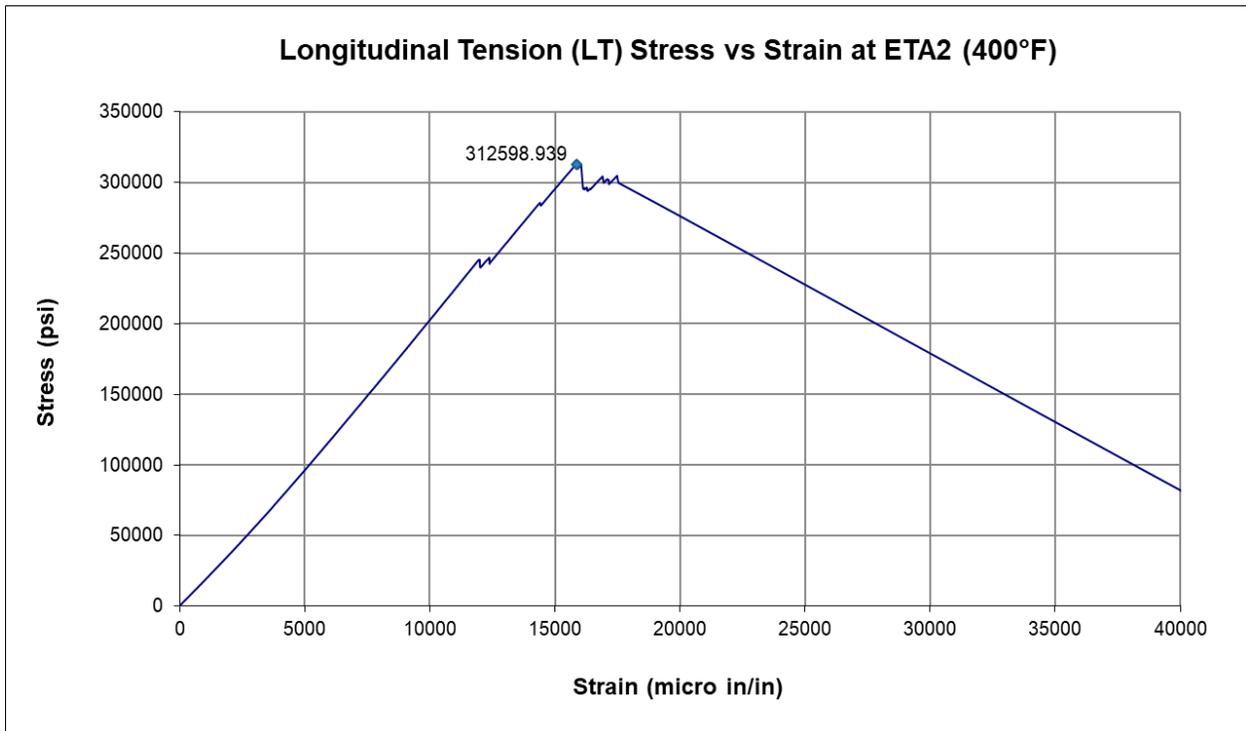
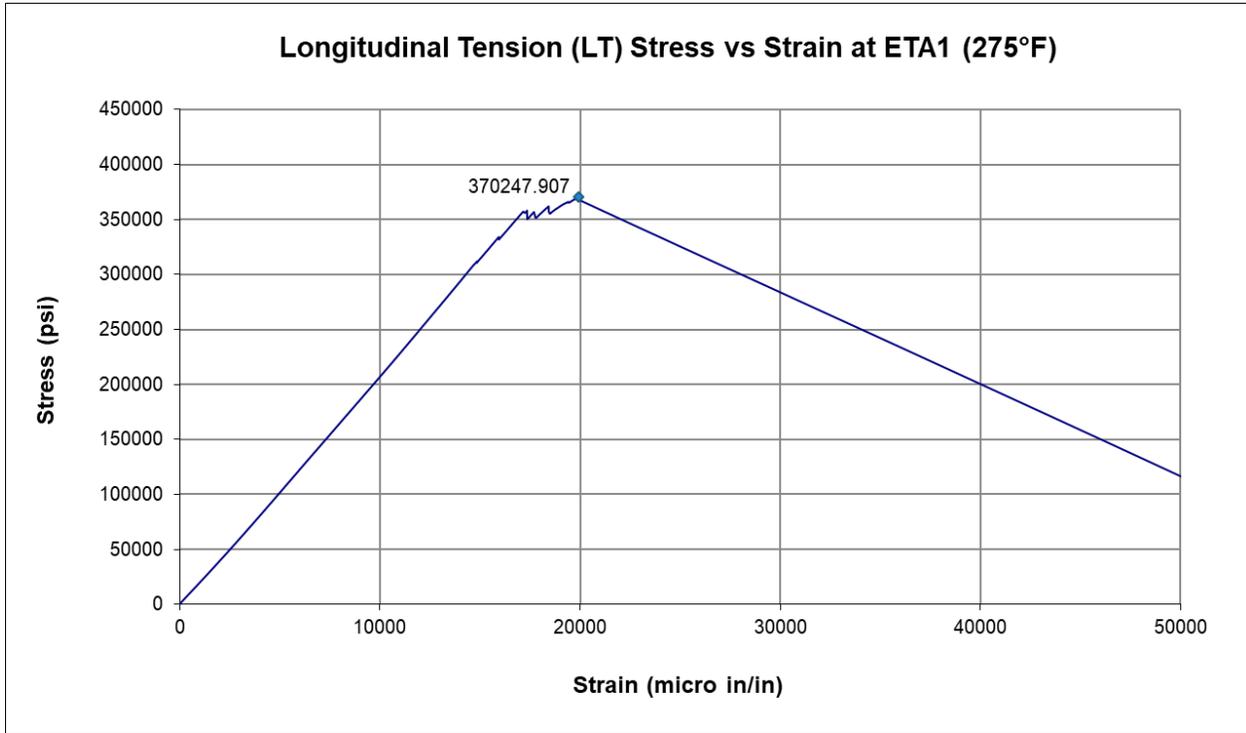
Damage Area and Dent Depth Summary:

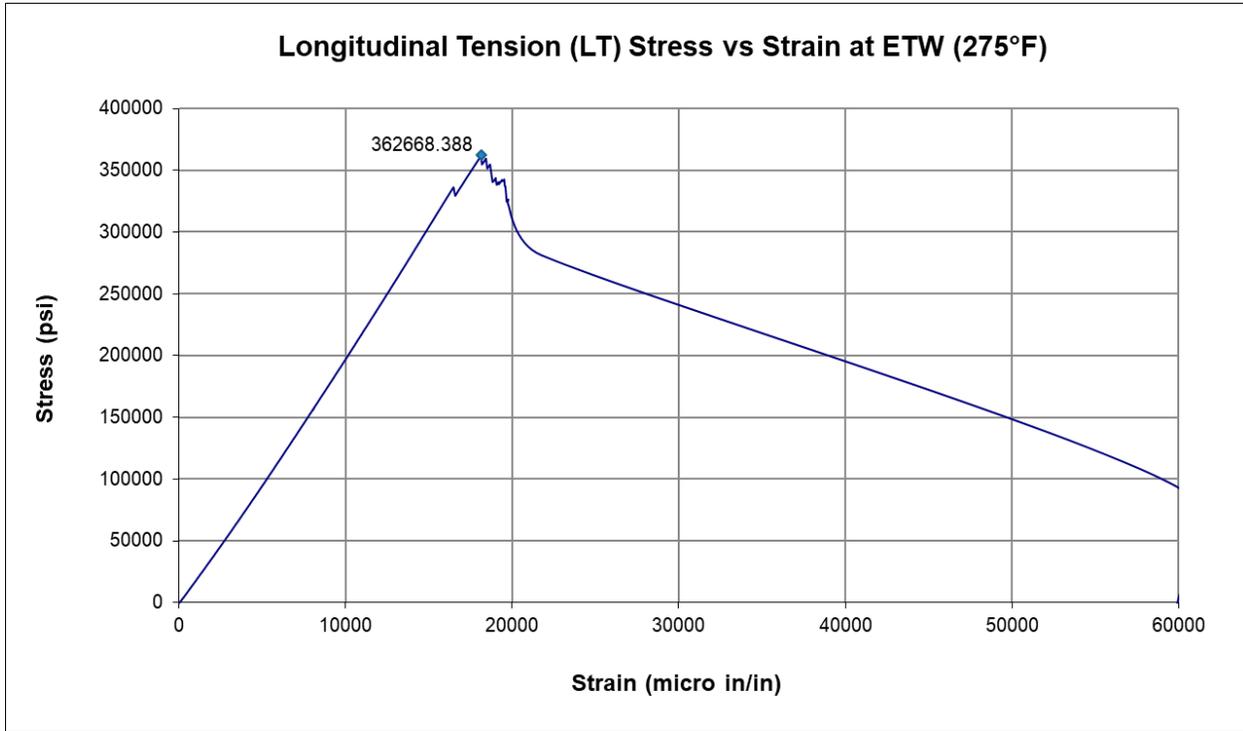
| Specimen ID | Damage Area (inch ²) | Dent Depth (inch) |
|---|----------------------------------|-------------------|
| NTP1226Q1-TC-NIAR-NIAR-T25-MST11-C-C1-1-CAI1-RTA1-1 | 2.5864 | 0.0140 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST11-C-C1-1-CAI1-RTA1-2 | 1.8216 | 0.0140 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST11-C-C1-1-CAI1-RTA1-3 | 1.3000 | 0.0140 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST11-C-C1-1-CAI1-RTA1-4 | 1.4828 | 0.0140 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST11-C-C1-1-CAI1-RTA1-5 | 2.5956 | 0.0135 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST11-C-C1-1-CAI1-RTA1-6 | 2.7808 | 0.0150 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST11-C-C2-1-CAI1-ETA1-1 | 3.2636 | 0.0140 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST11-C-C2-1-CAI1-ETA1-2 | 1.3280 | 0.0135 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST11-C-C2-1-CAI1-ETA1-3 | 1.7940 | 0.0140 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST11-C-C2-1-CAI1-ETA1-4 | 1.3520 | 0.0140 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST11-C-C2-1-CAI1-ETA1-5 | 1.6116 | 0.0145 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST11-C-C2-1-CAI1-ETA1-6 | 1.5440 | 0.0140 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST11-C-C2-1-CAI1-ETA2-1 | 1.5744 | 0.0140 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST11-C-C2-1-CAI1-ETA2-2 | 2.4044 | 0.0130 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST11-C-C2-1-CAI1-ETA2-3 | 2.2188 | 0.0150 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST11-C-C2-1-CAI1-ETA2-5 | 1.3468 | 0.0145 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST11-C-C2-1-CAI1-ETA2-6 | 2.5468 | 0.0150 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST11-C-C2-1-CAI1-SP-4 | 1.7192 | 0.0150 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST11-C-C1-1-CAI1-ETW-1 | 1.5172 | 0.0150 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST11-C-C1-1-CAI1-ETW-2 | 1.4980 | 0.0140 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST11-C-C1-1-CAI1-ETW-3 | 1.5392 | 0.0125 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST11-C-C1-1-CAI1-ETW-4 | 2.4368 | 0.0130 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST11-C-C1-1-CAI1-ETW-5 | 1.5140 | 0.0135 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST11-C-C1-1-CAI1-ETW-6 | 2.6000 | 0.0140 |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST11-C-C1-1-CAI1-ETW-SP-1 | 4.0936 | 0.0140 |

6. Full Stress vs. Strain Curve

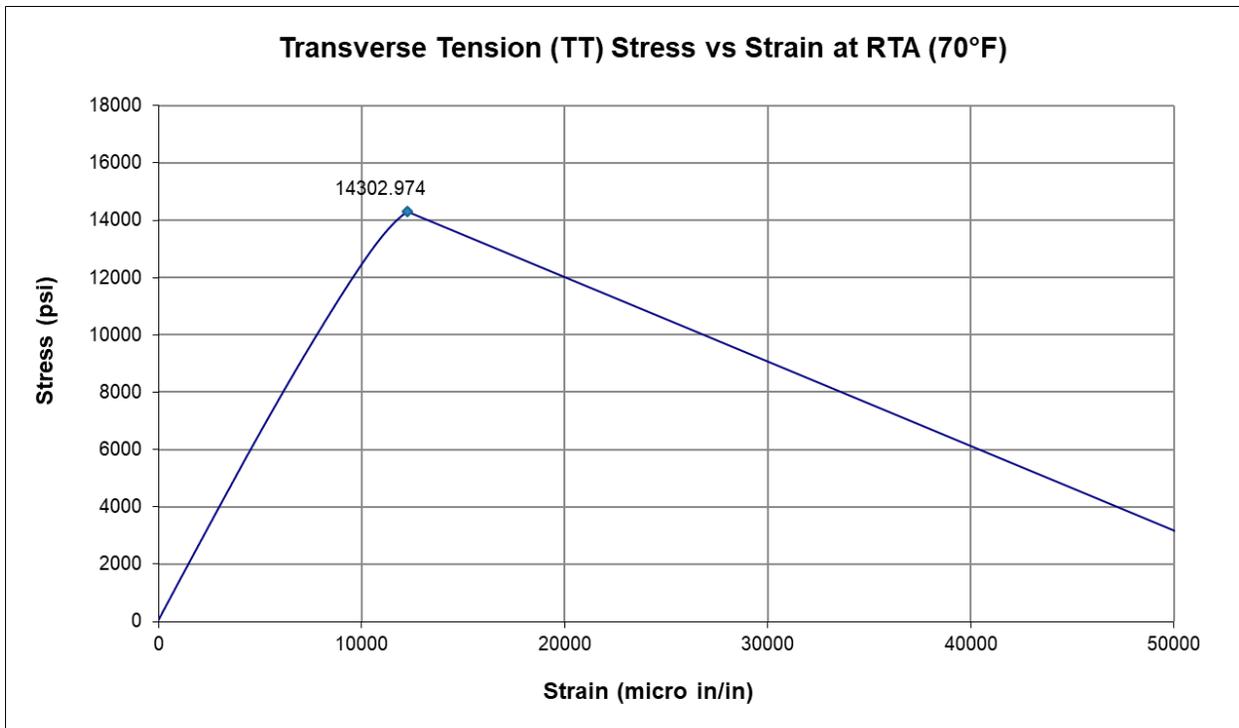
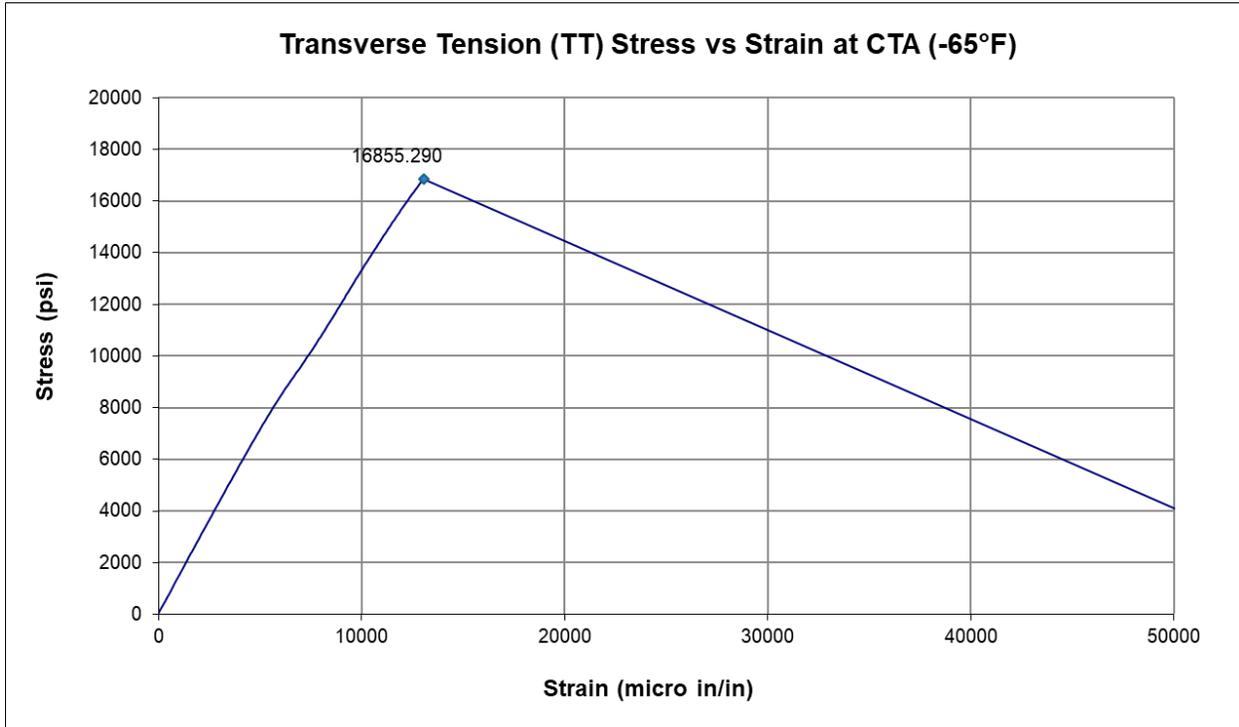
6.1 Longitudinal Tension (LT)

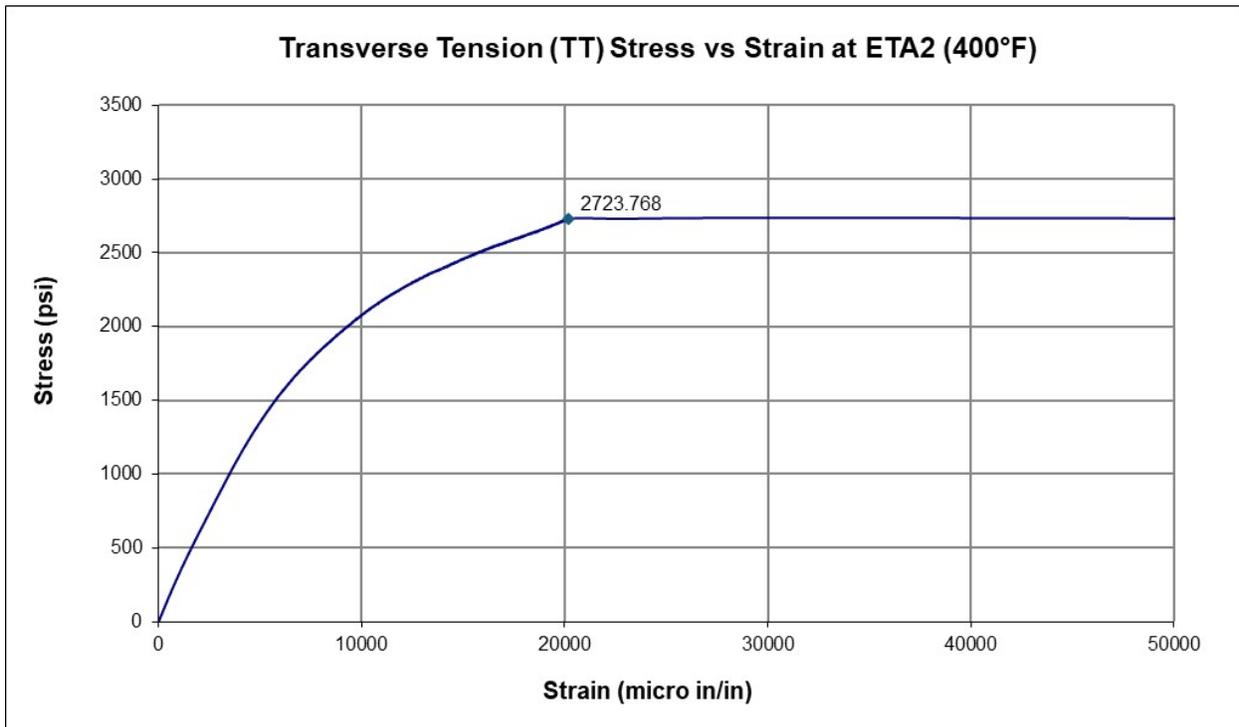
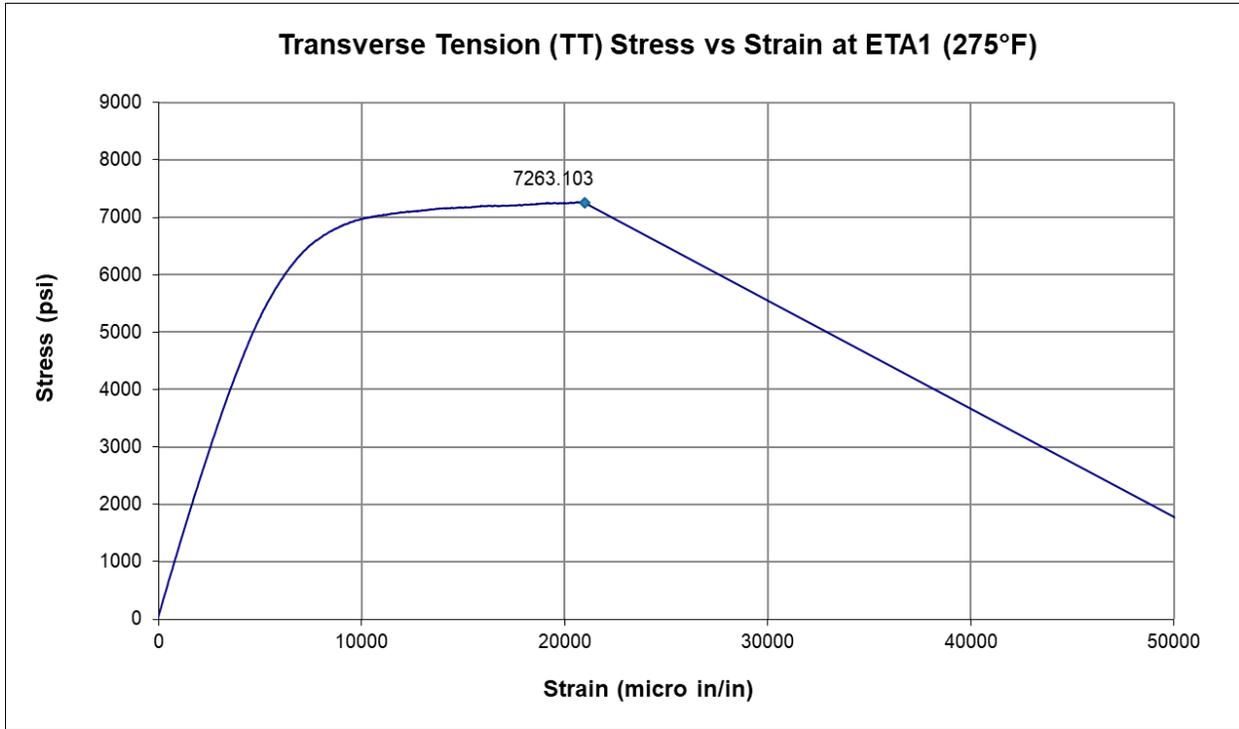


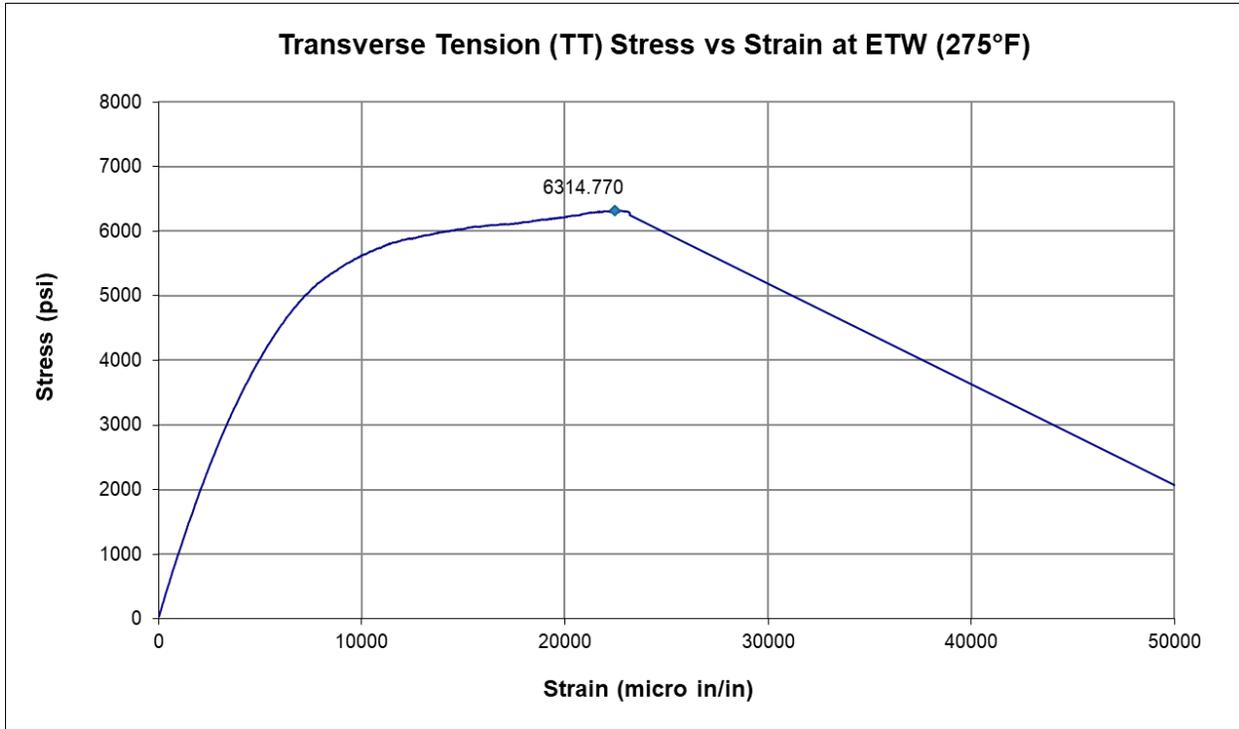




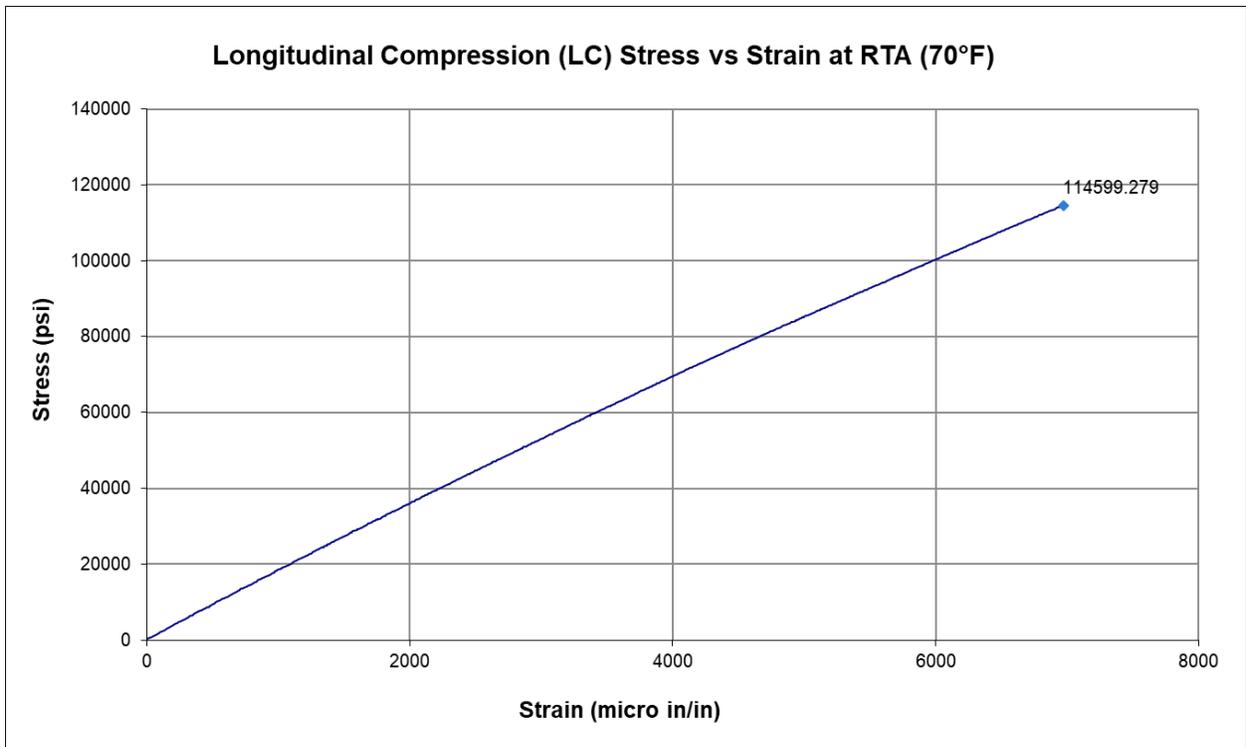
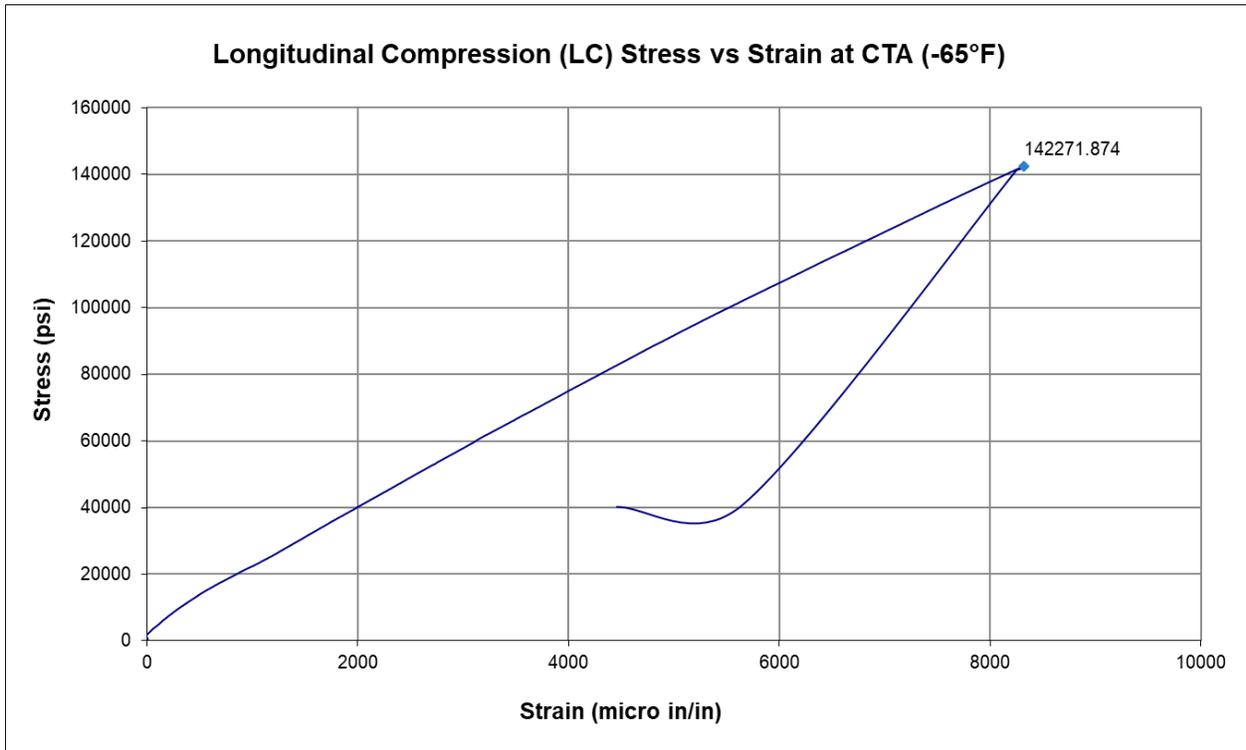
6.2 Transverse Tension (TT)

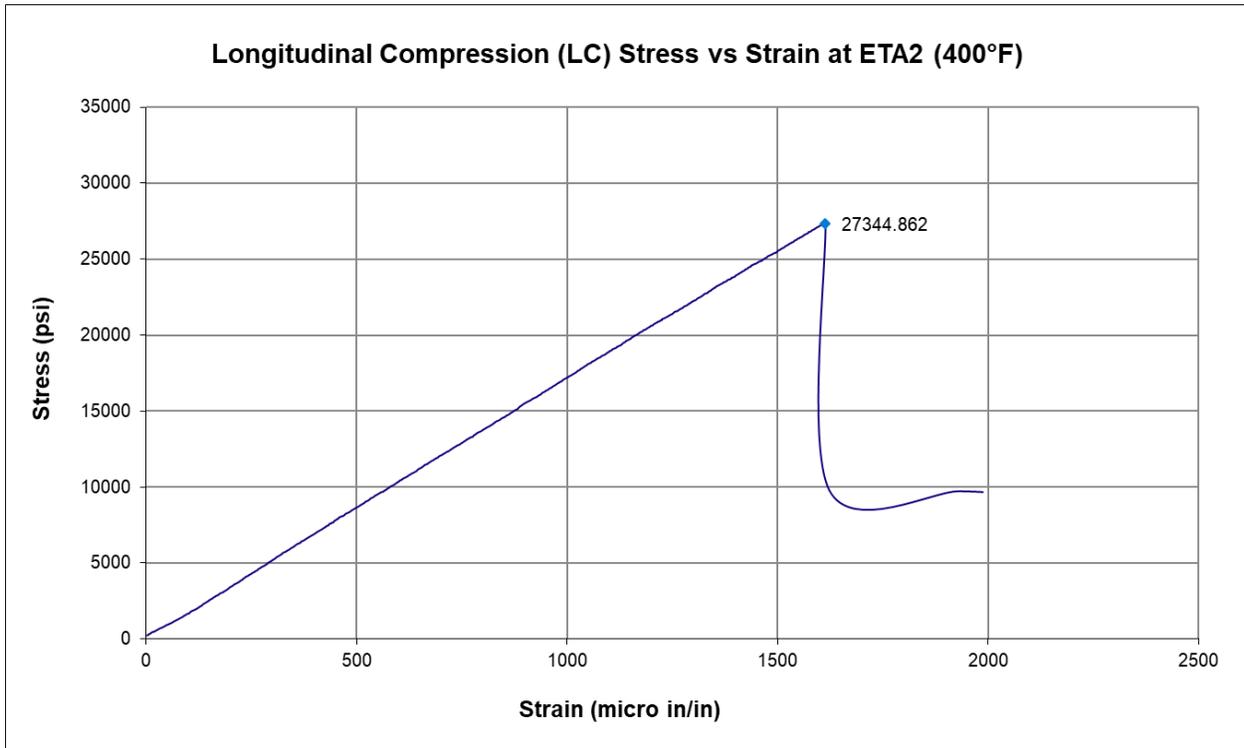
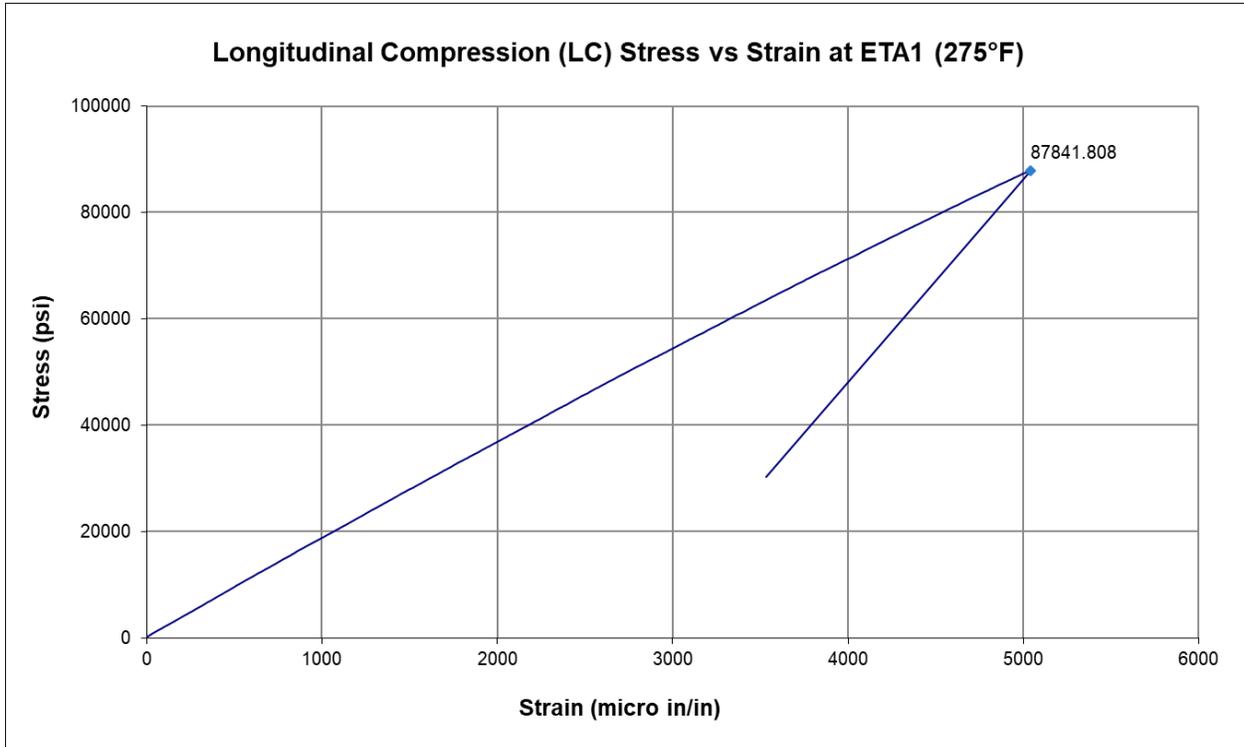


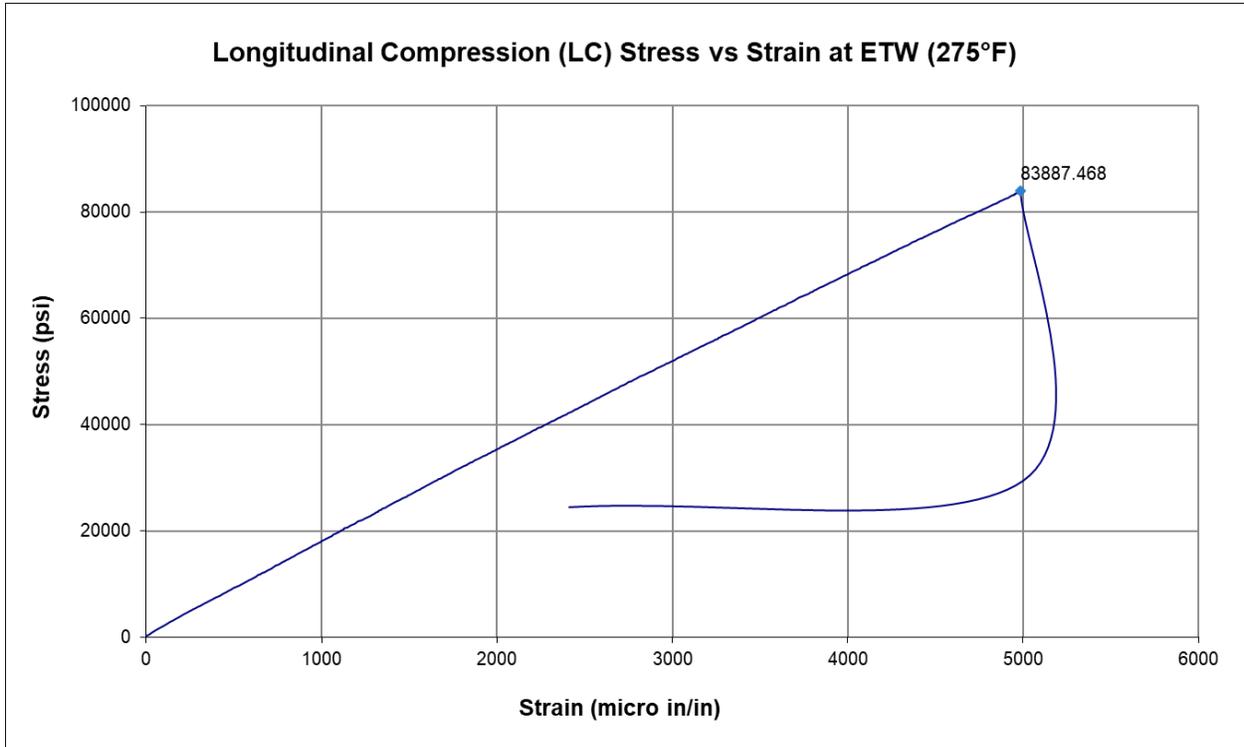




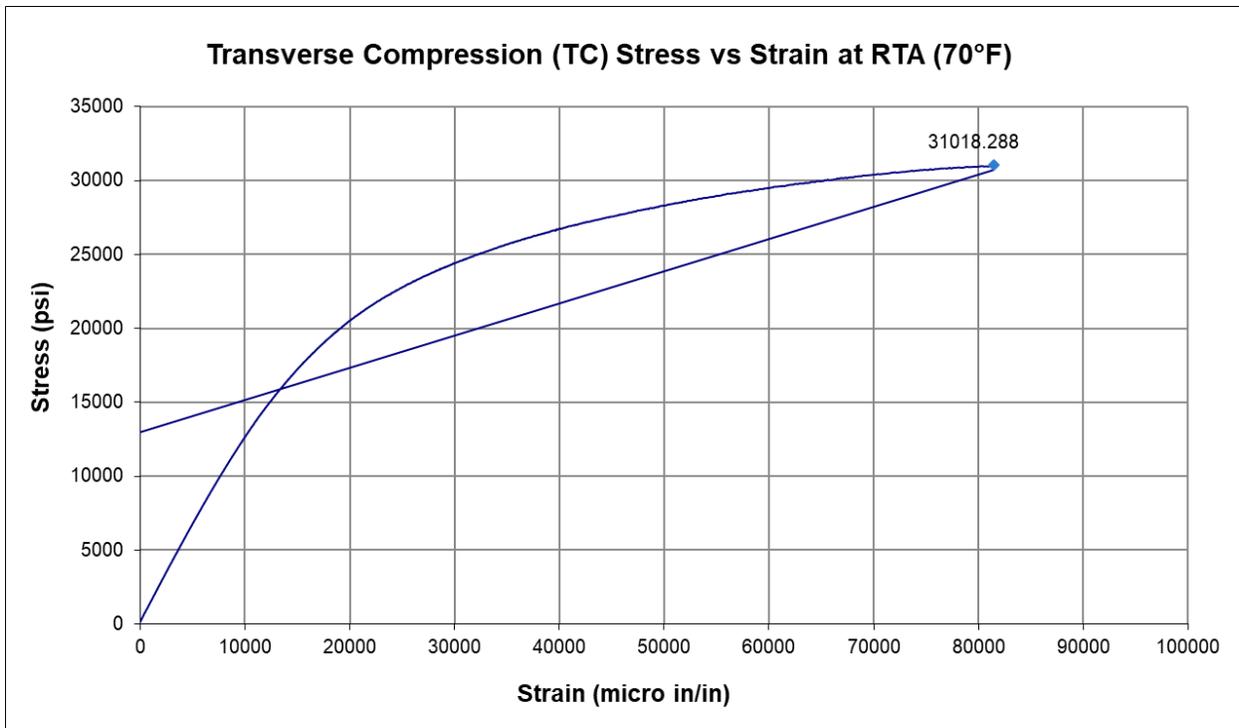
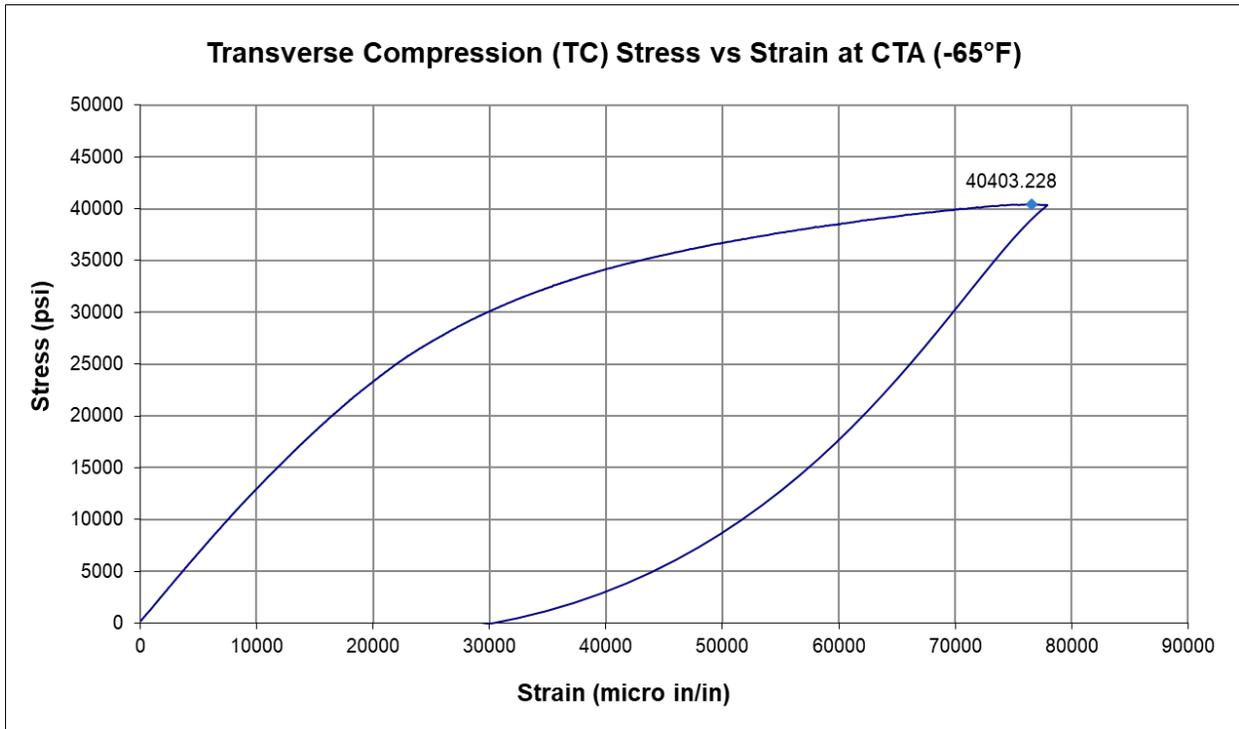
6.3 Longitudinal Compression (LC)

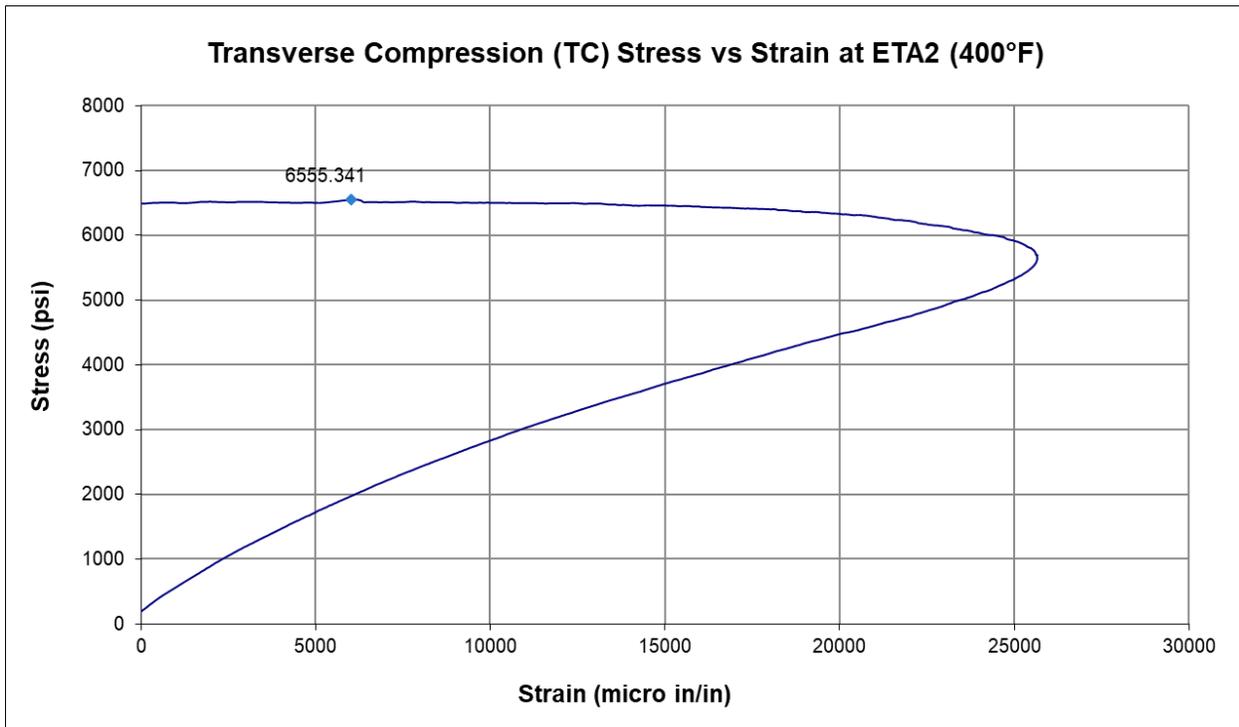
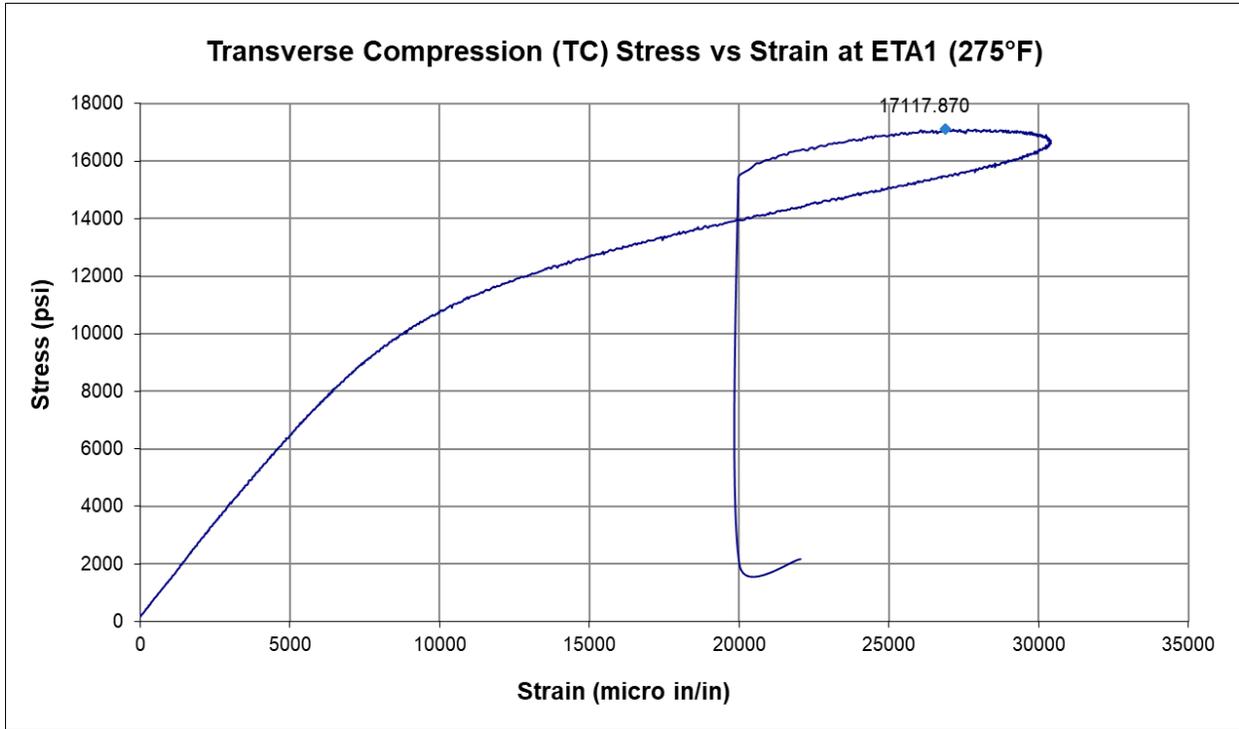


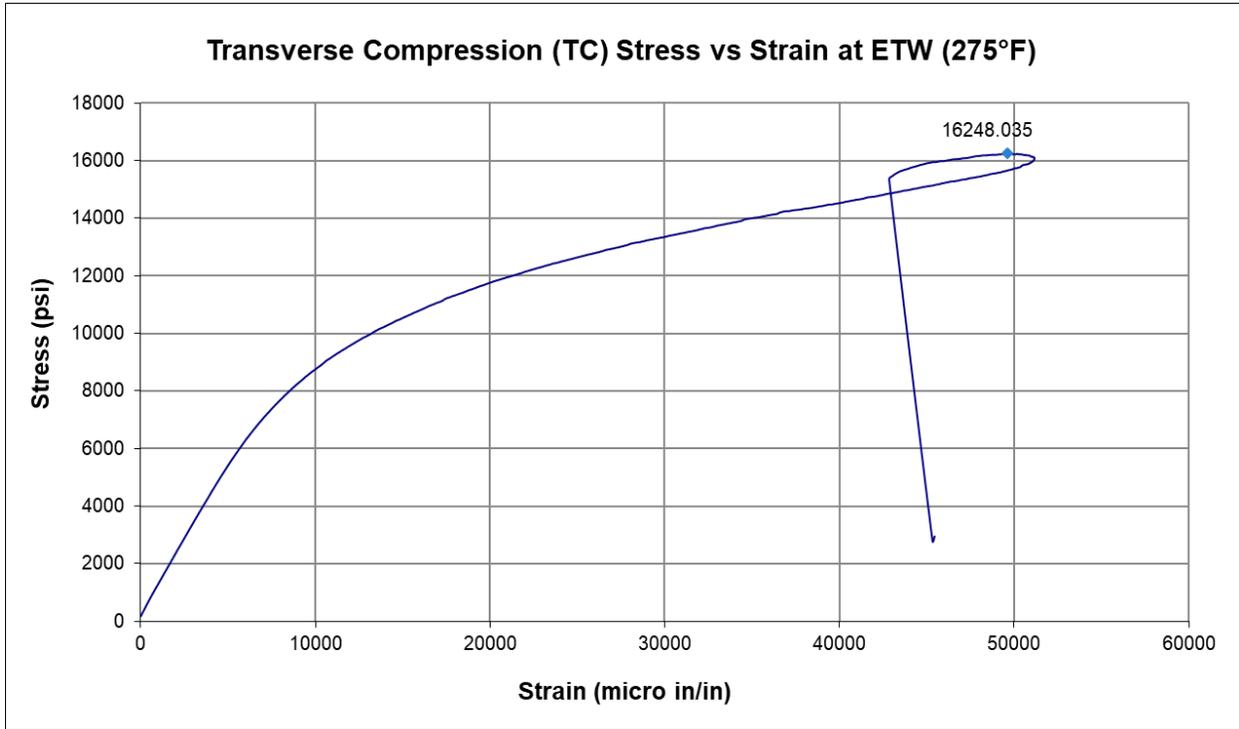




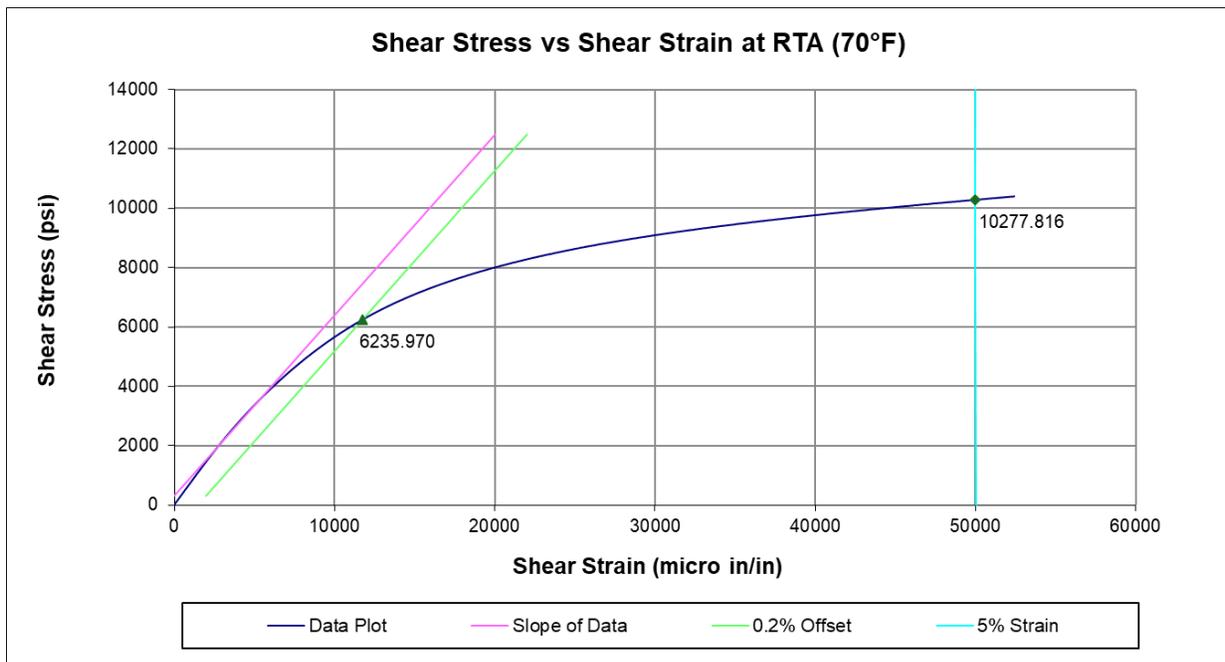
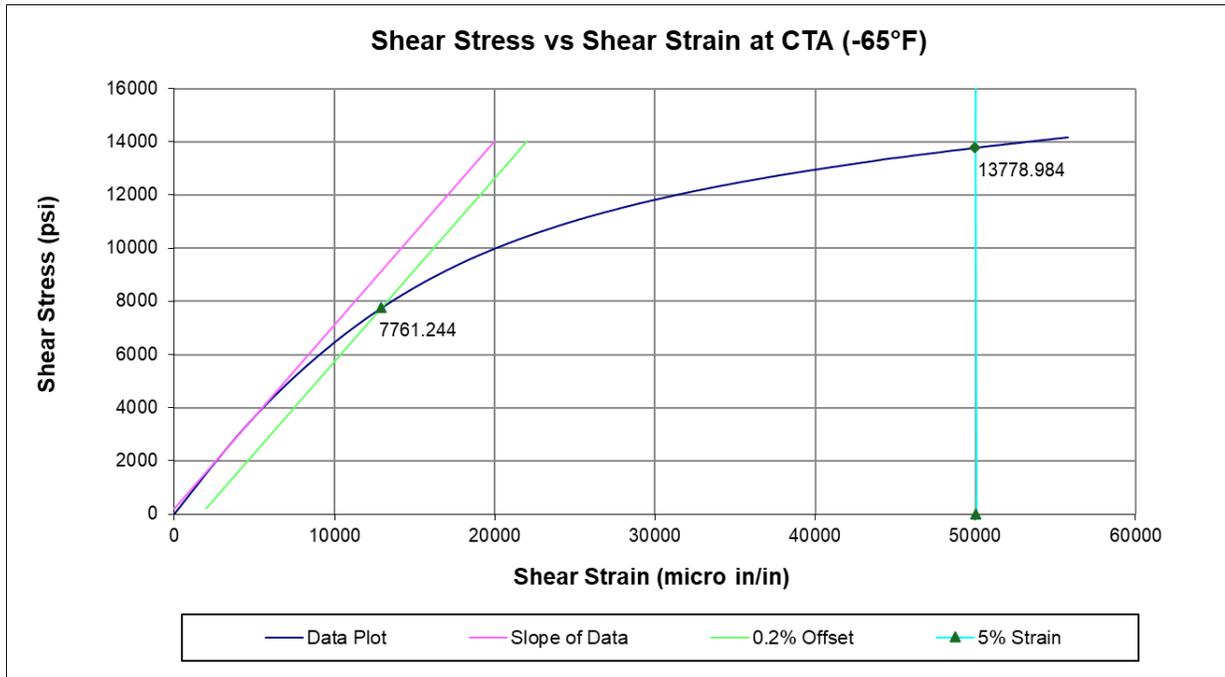
6.4 Transverse Compression (TC)

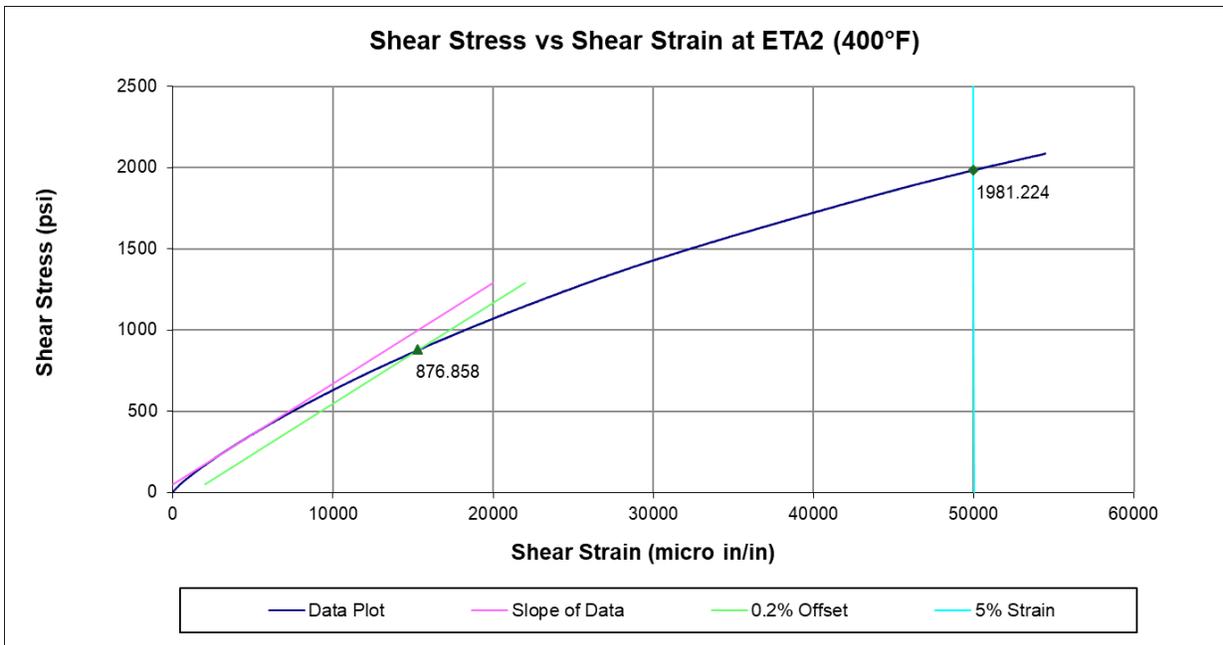
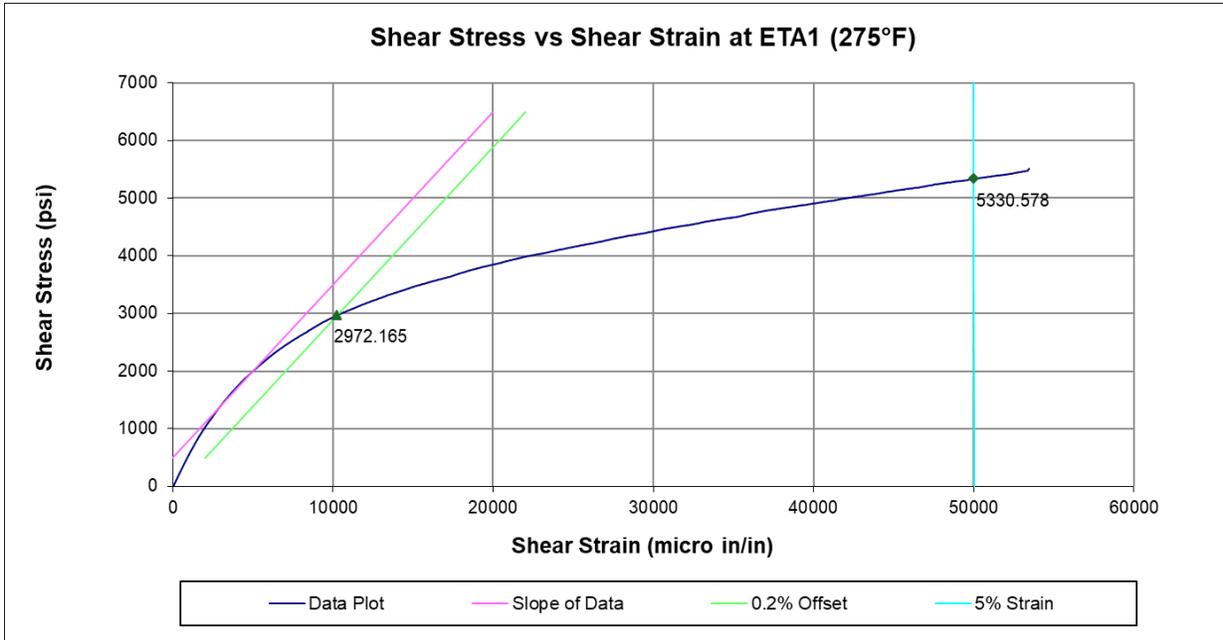


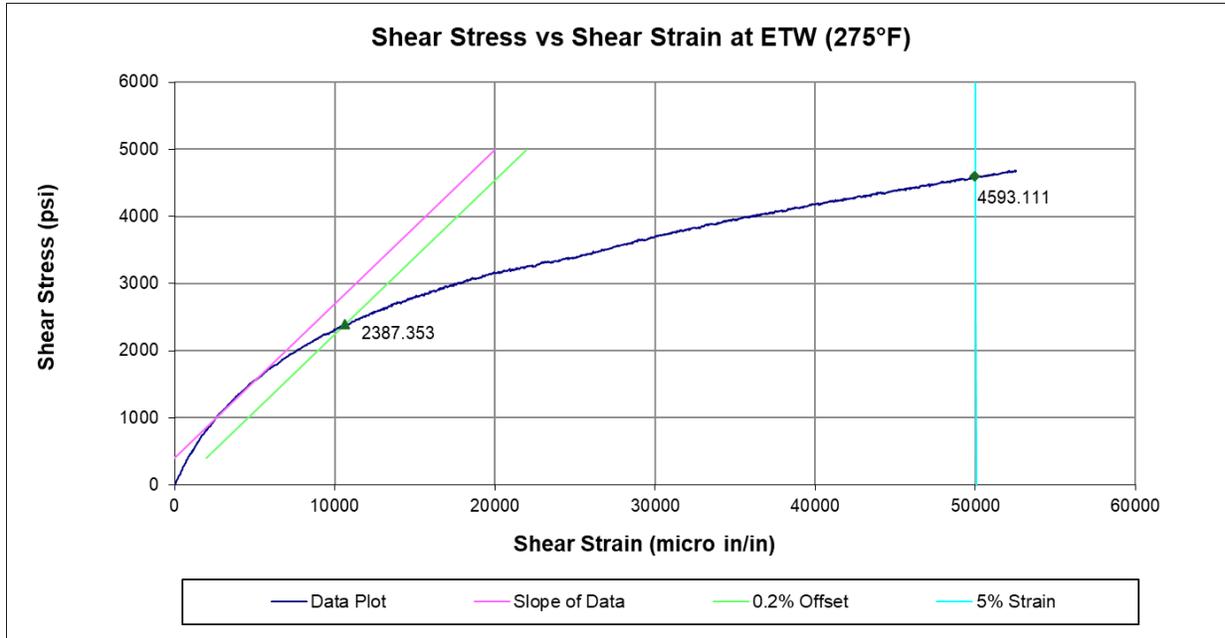




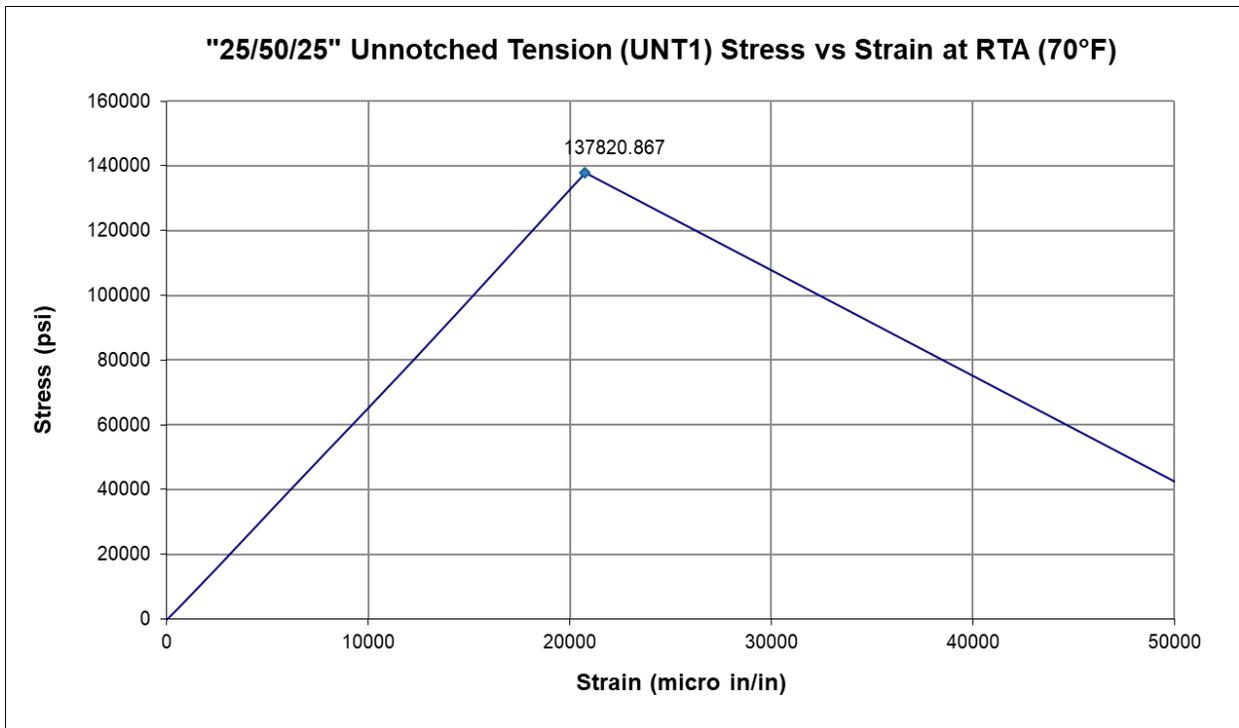
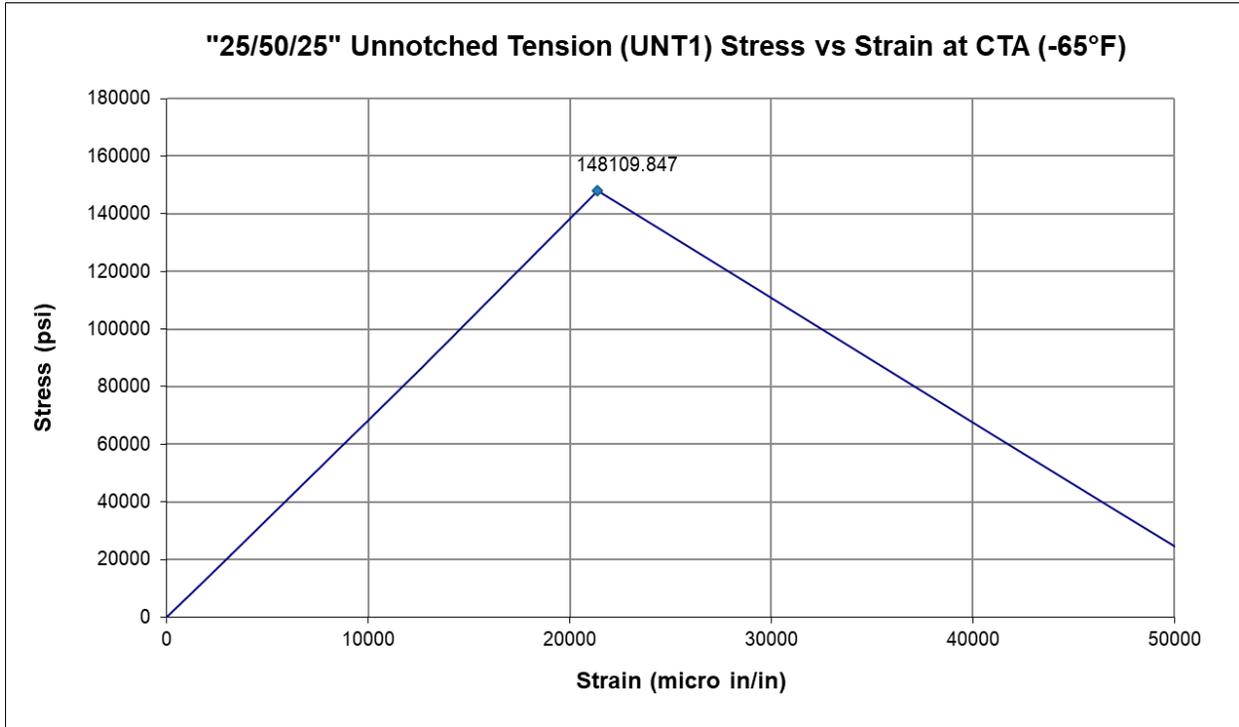
6.5 In-Plane Shear (IPS)

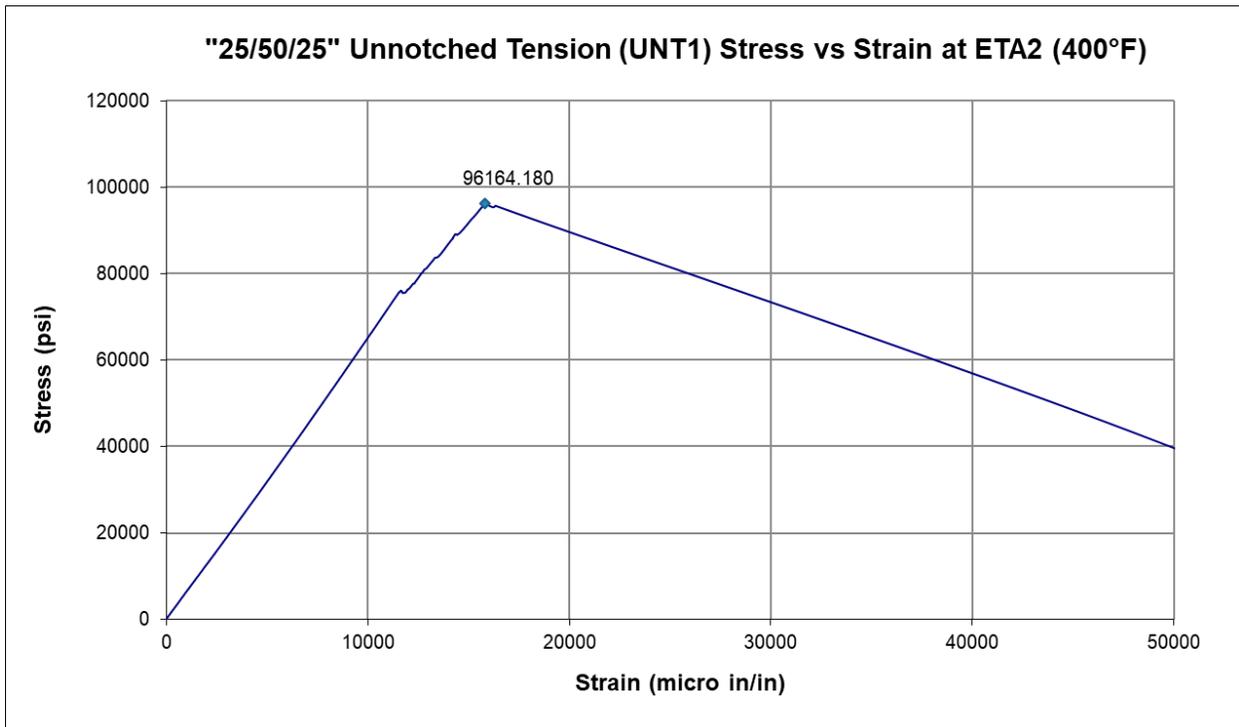
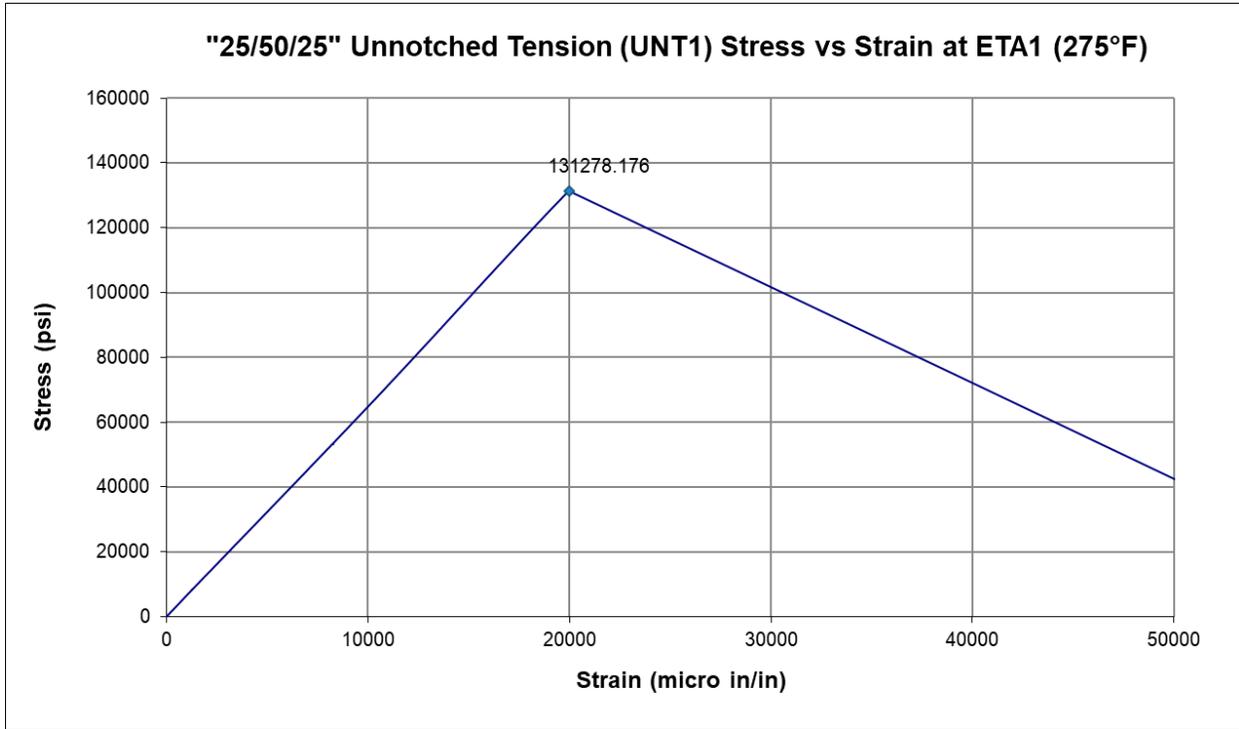


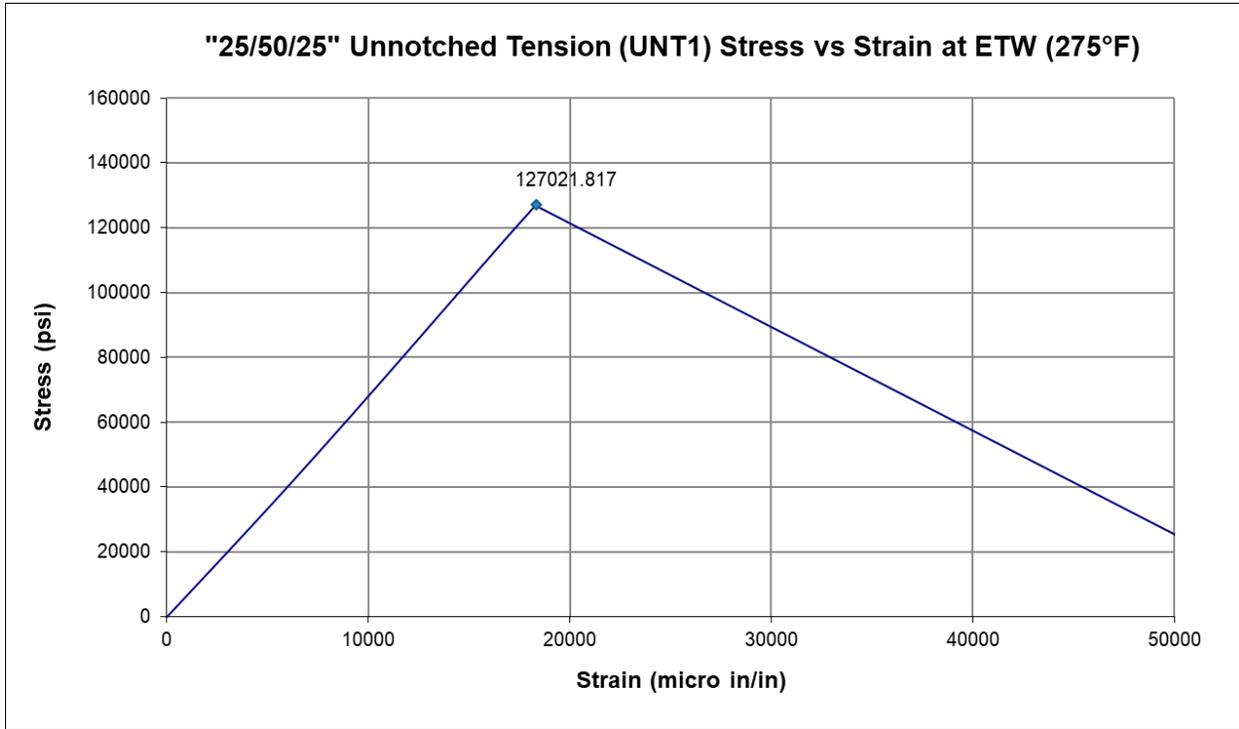




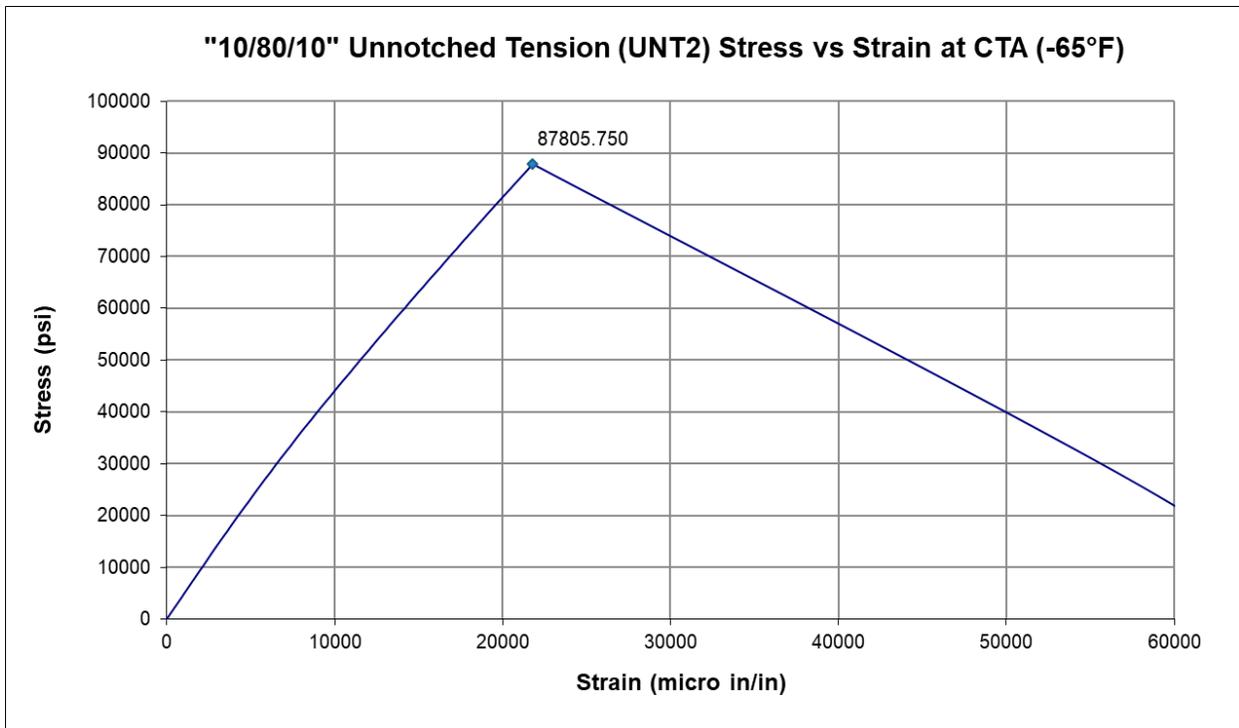
6.6 "25/50/25" Unnotched Tension 1 (UNT1)

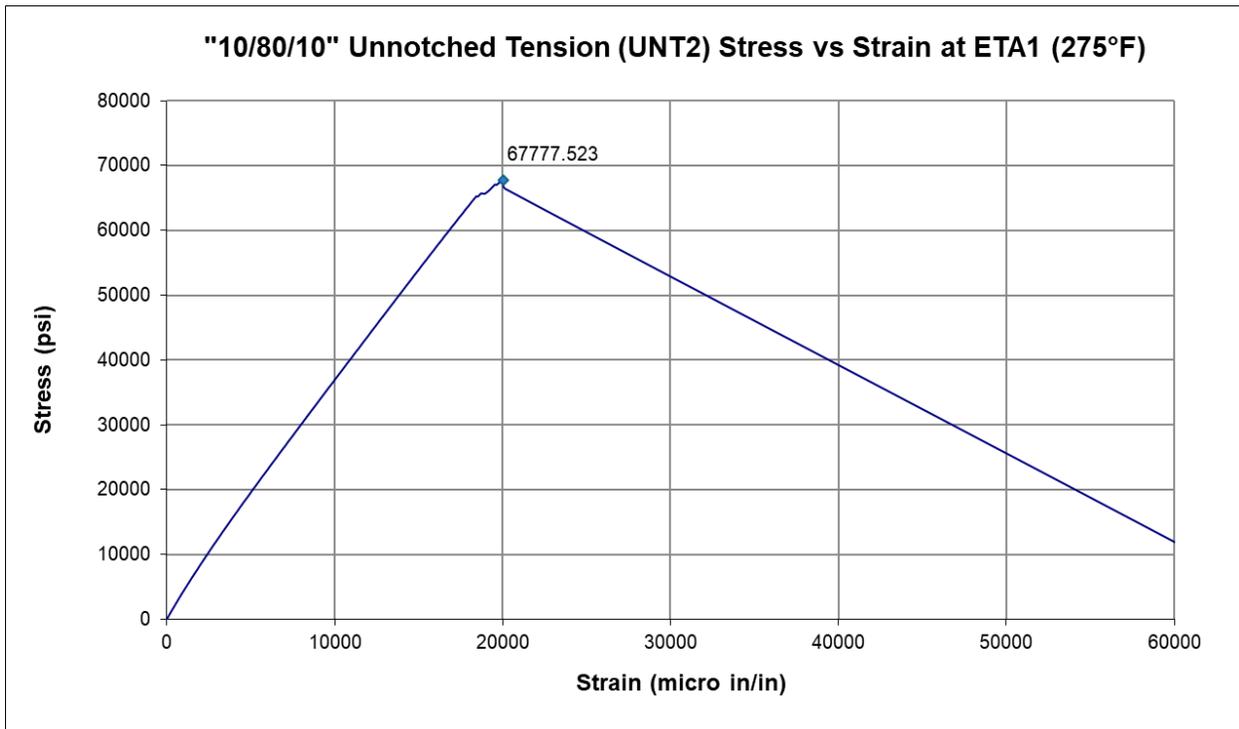
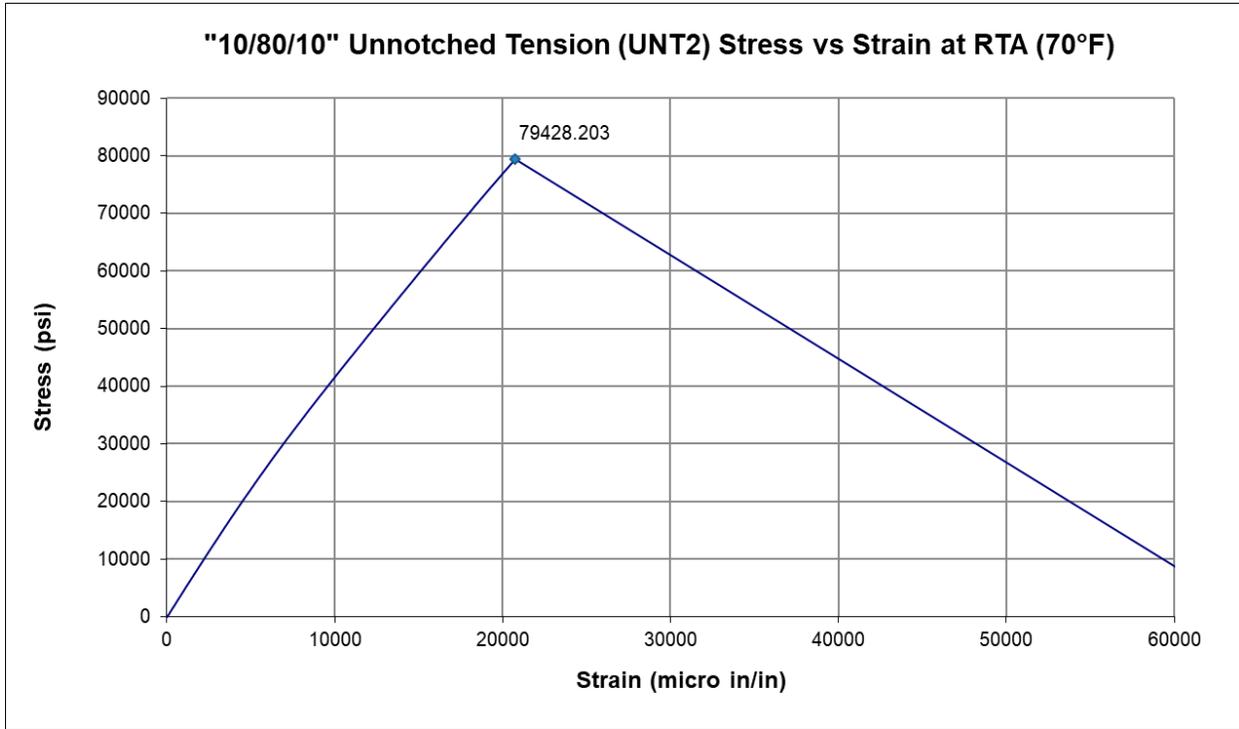




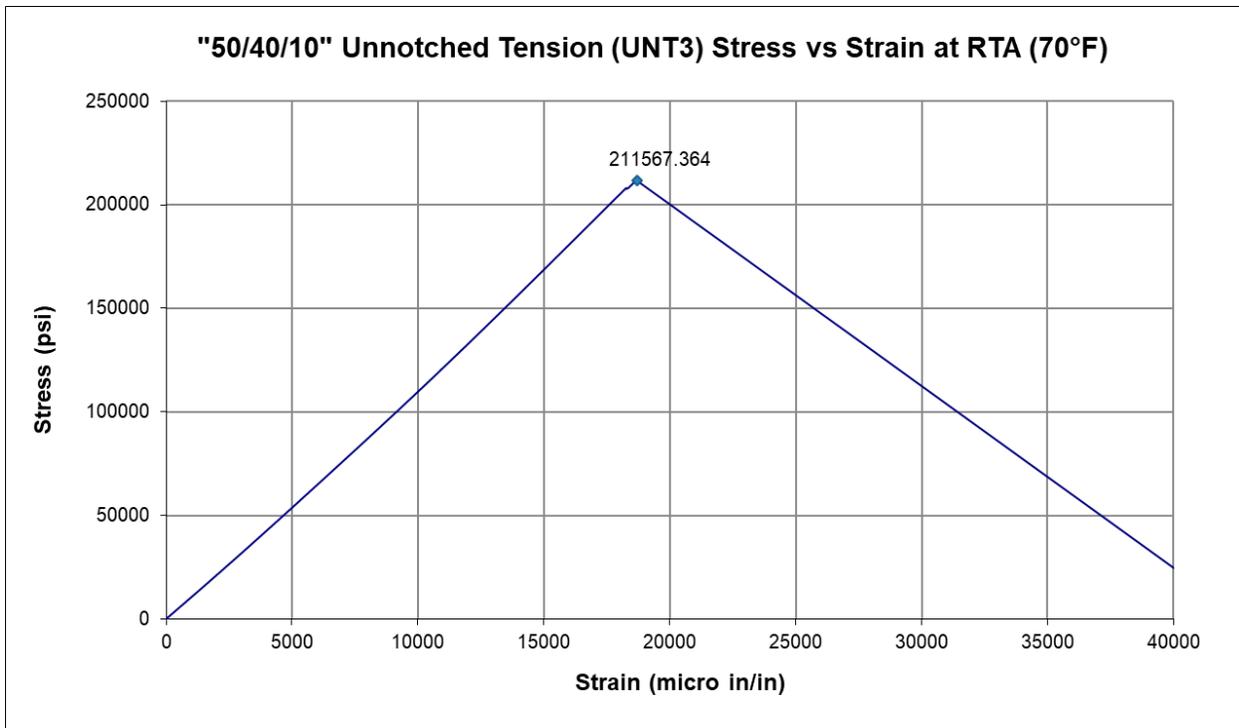
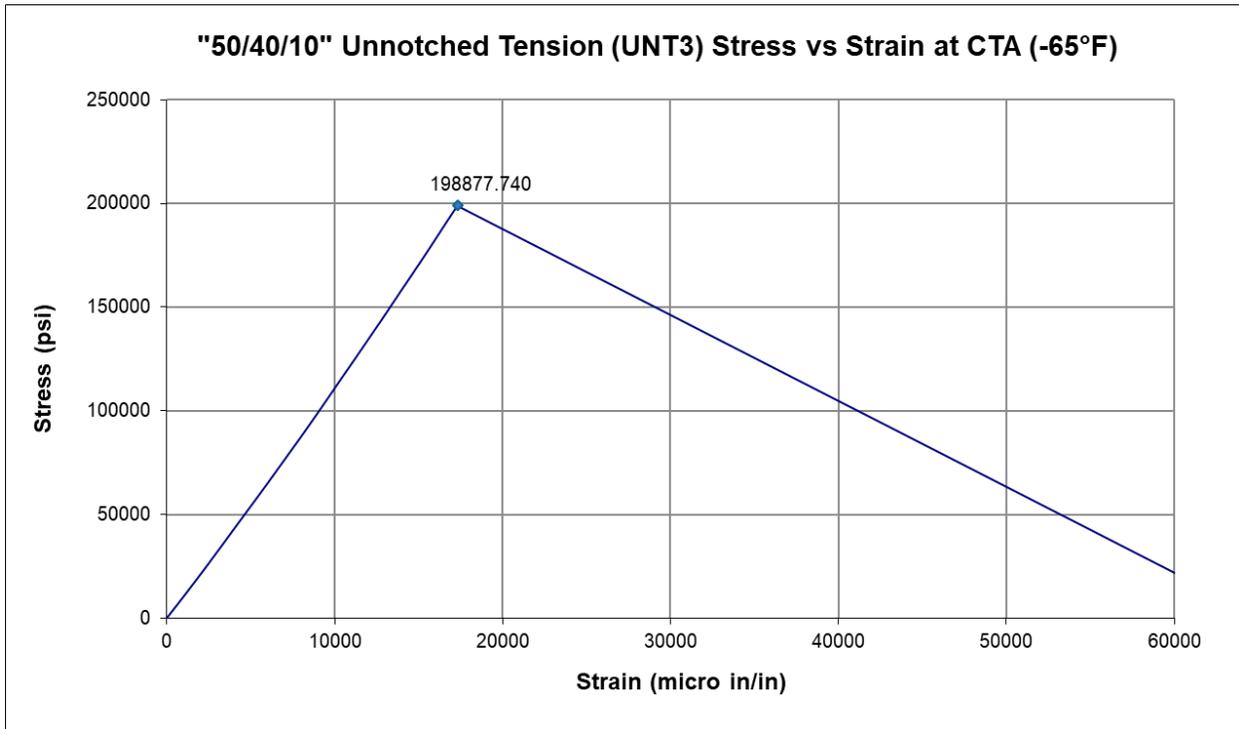


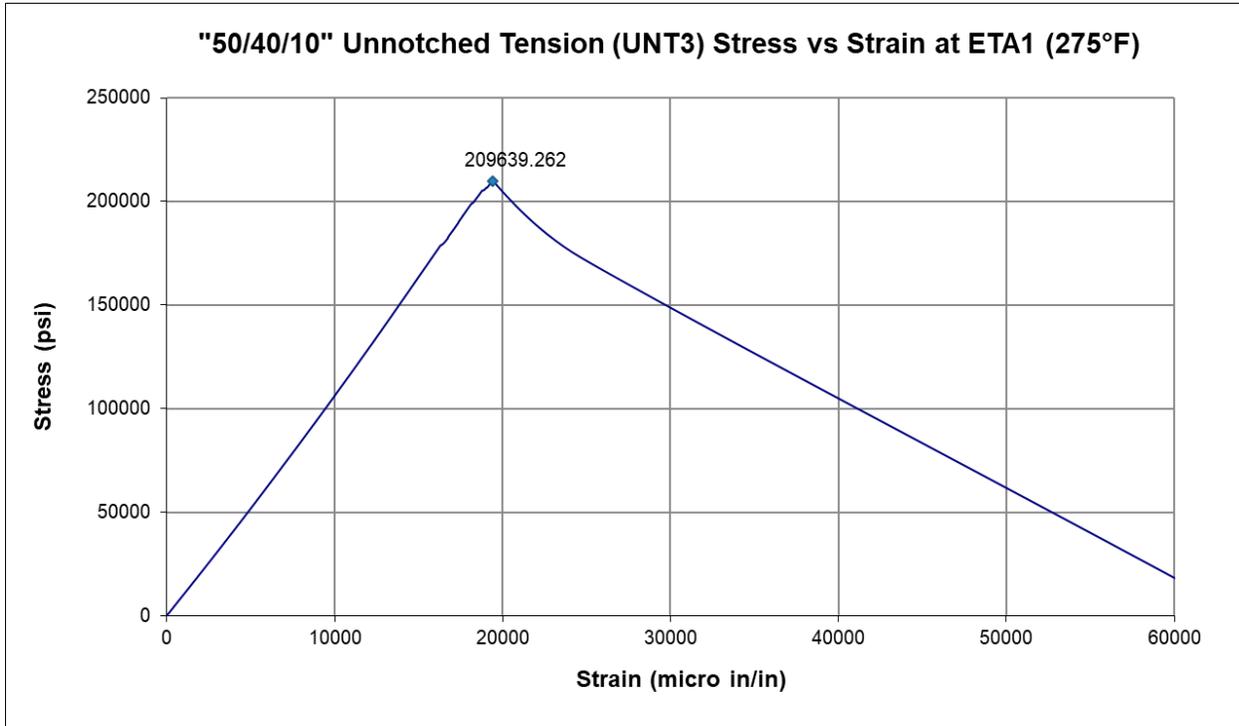
6.7 "10/80/10" Unnotched Tension 2 (UNT2)



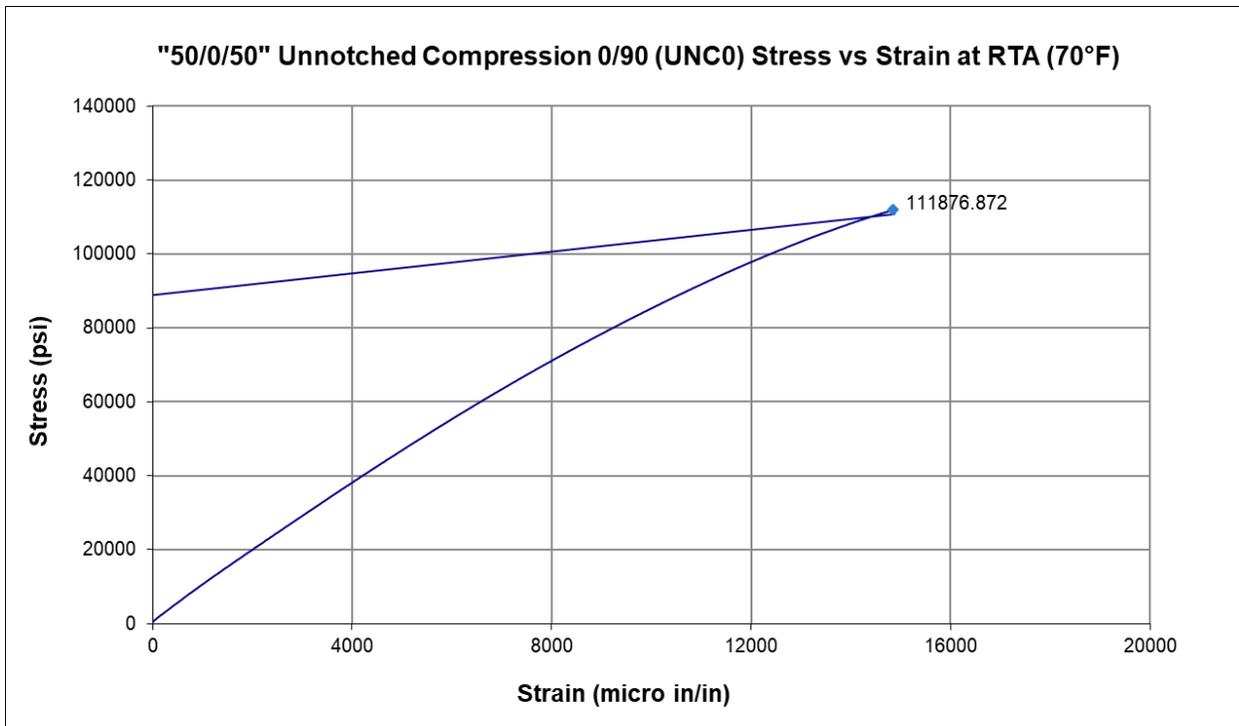
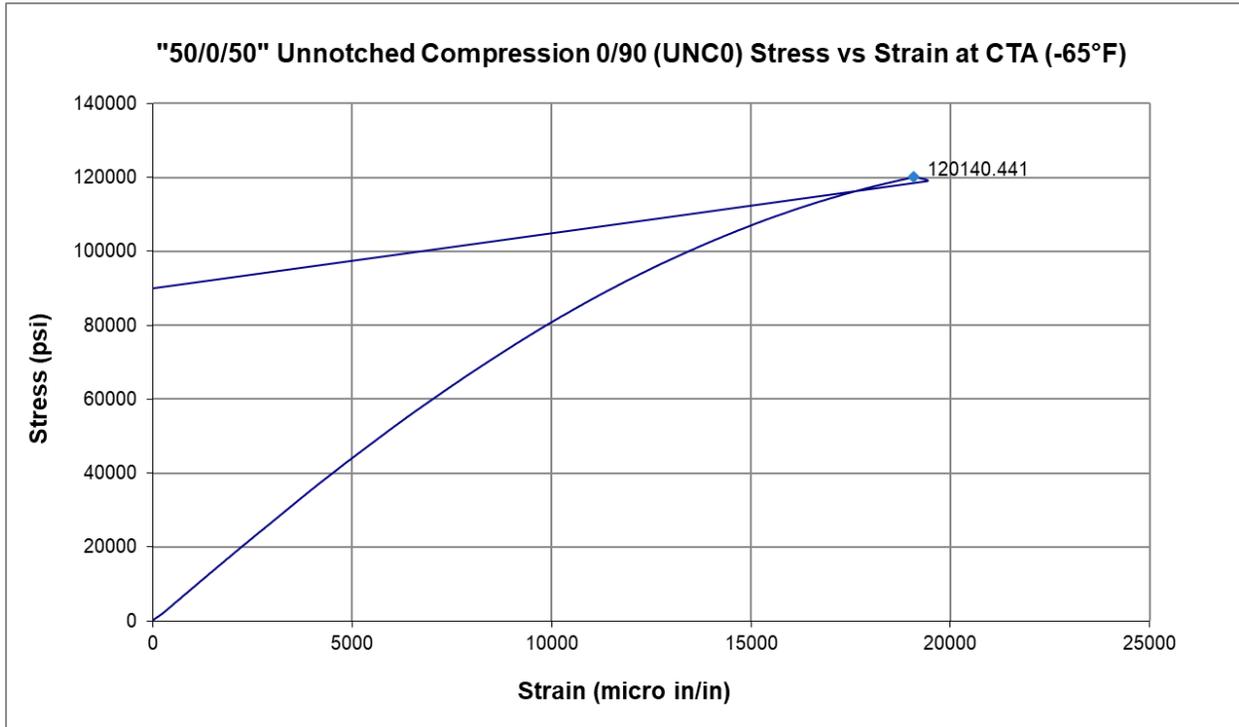


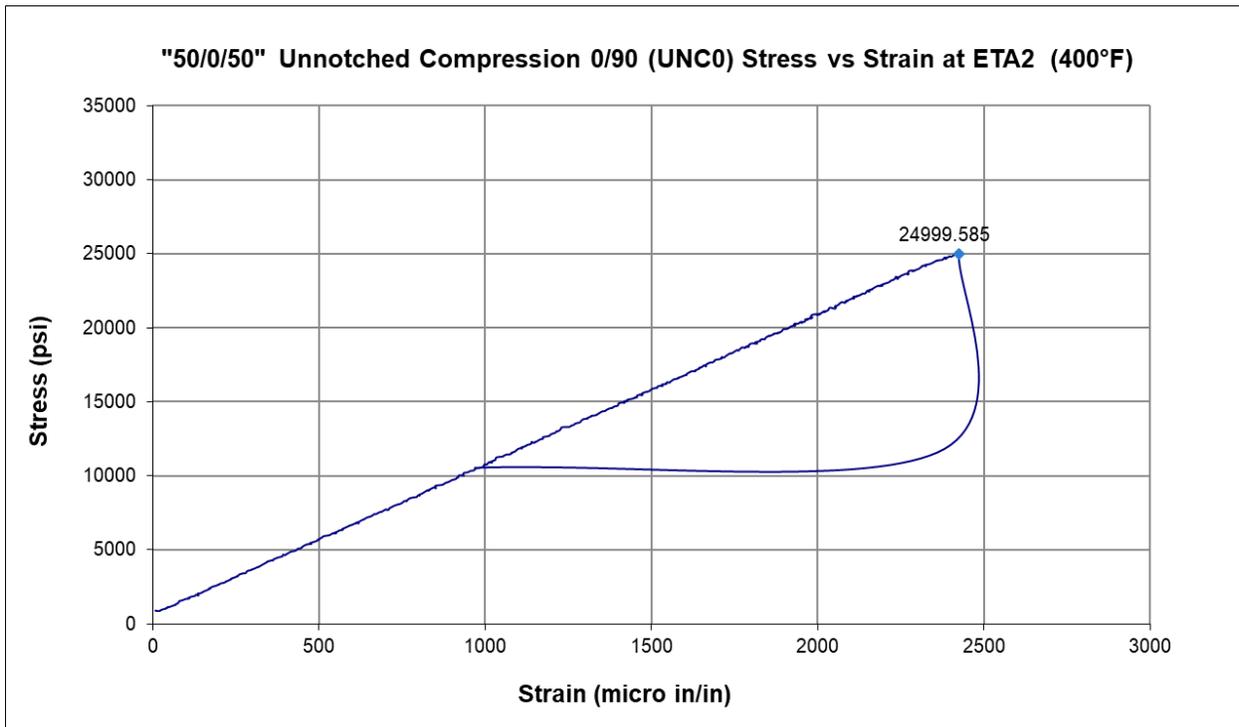
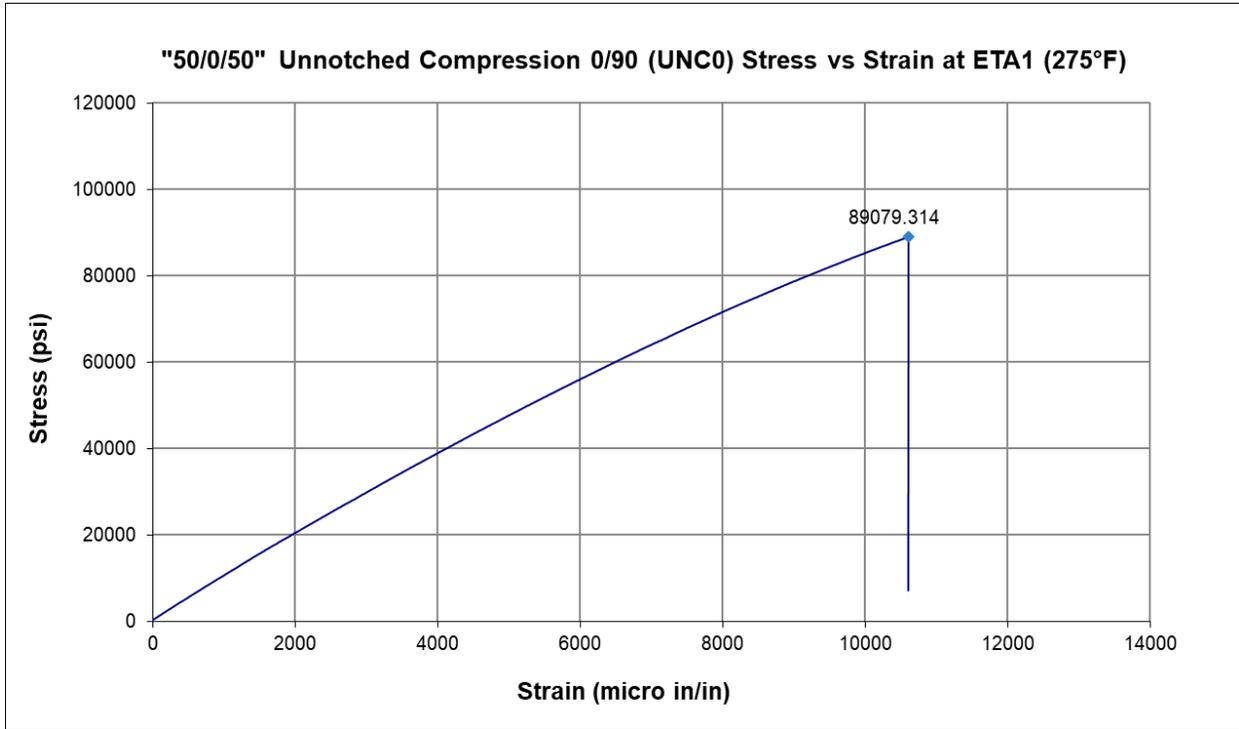
6.8 "50/40/10" Unnotched Tension 3 (UNT3)

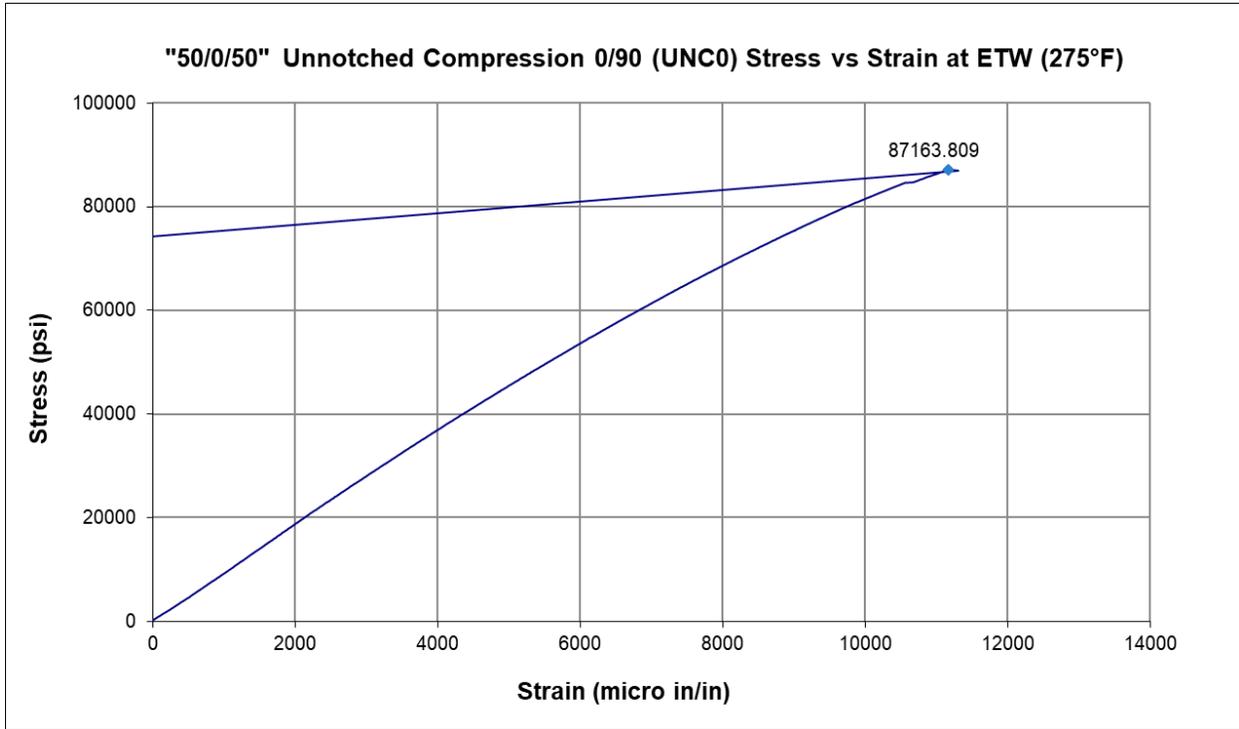




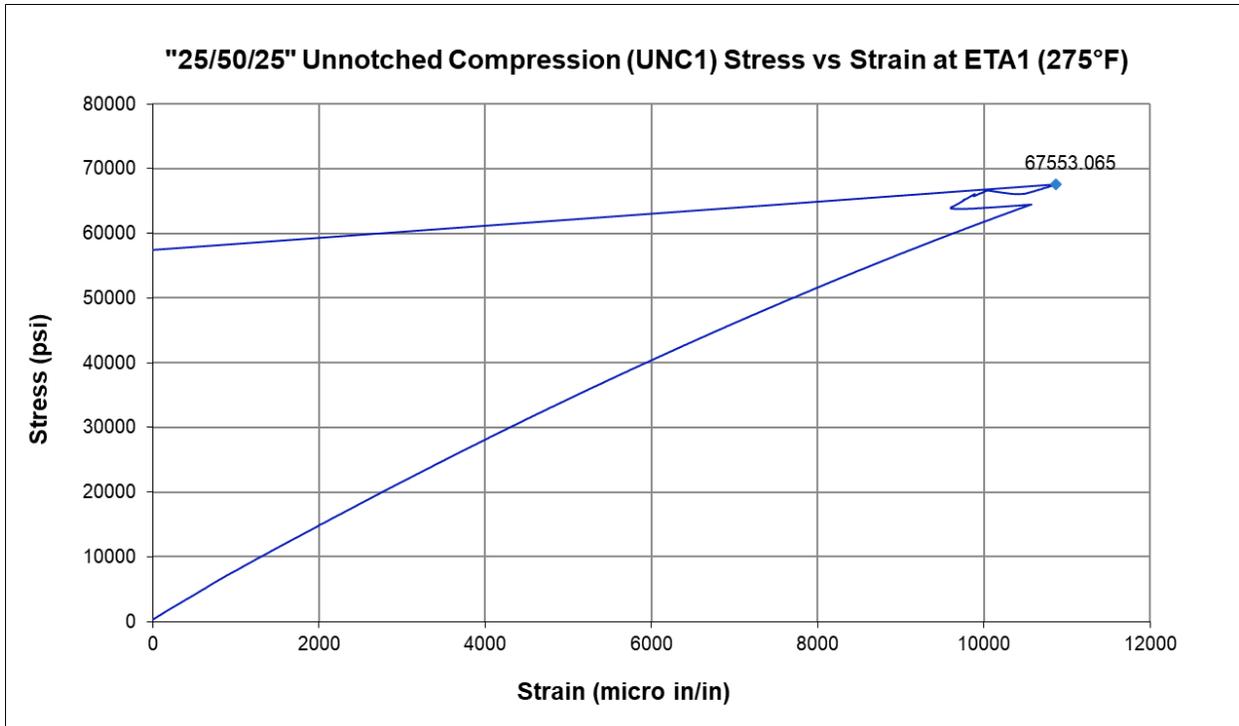
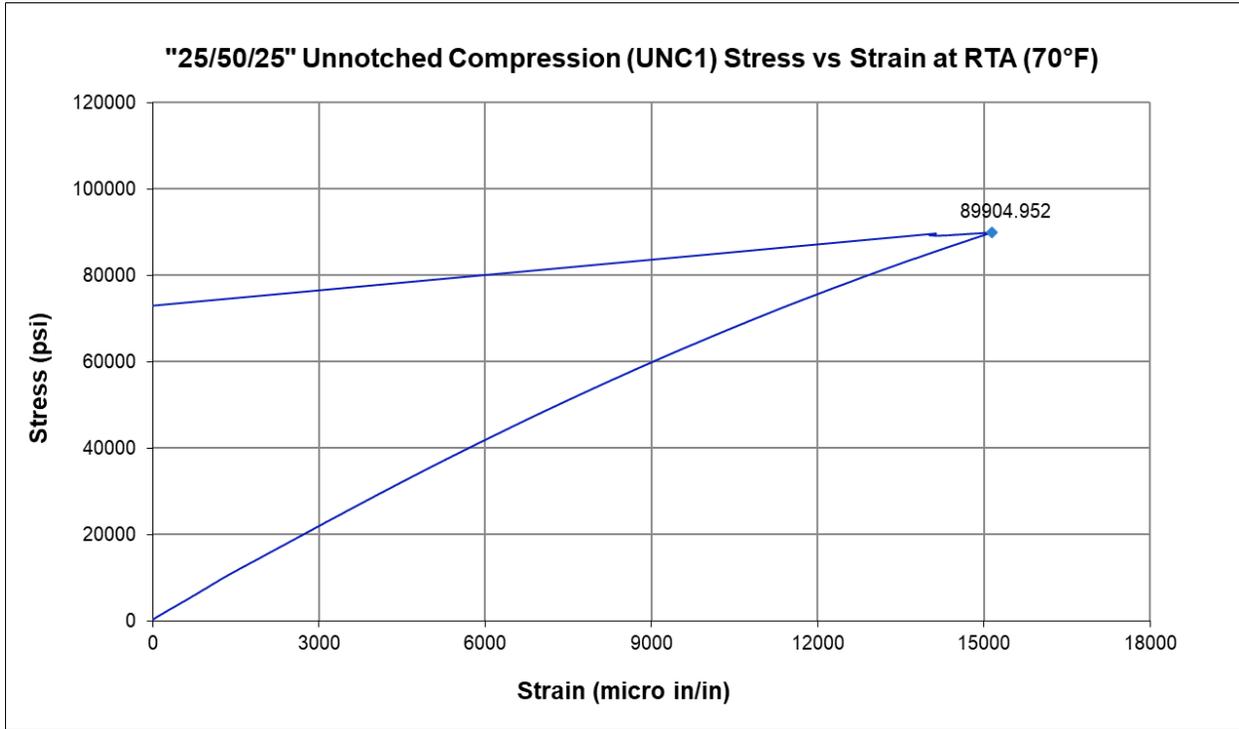
6.9 "50/0/50" Unnotched Compression 0/90 (UNC0)

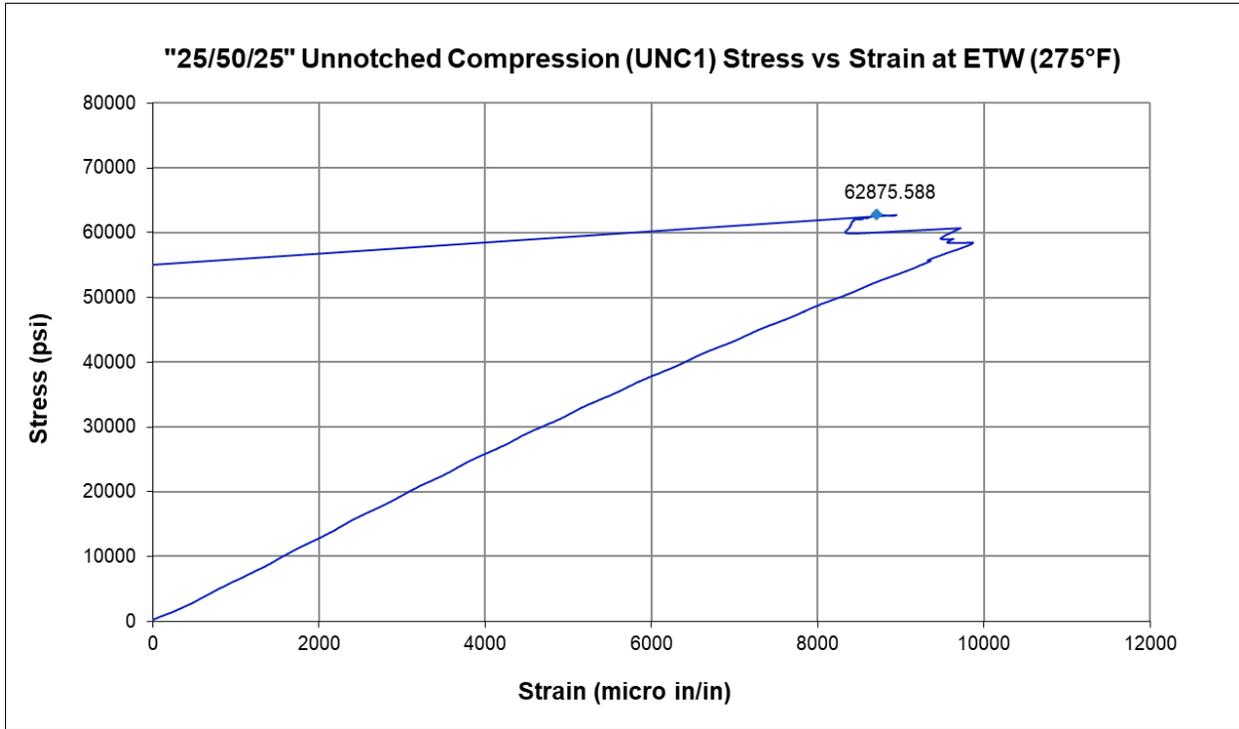




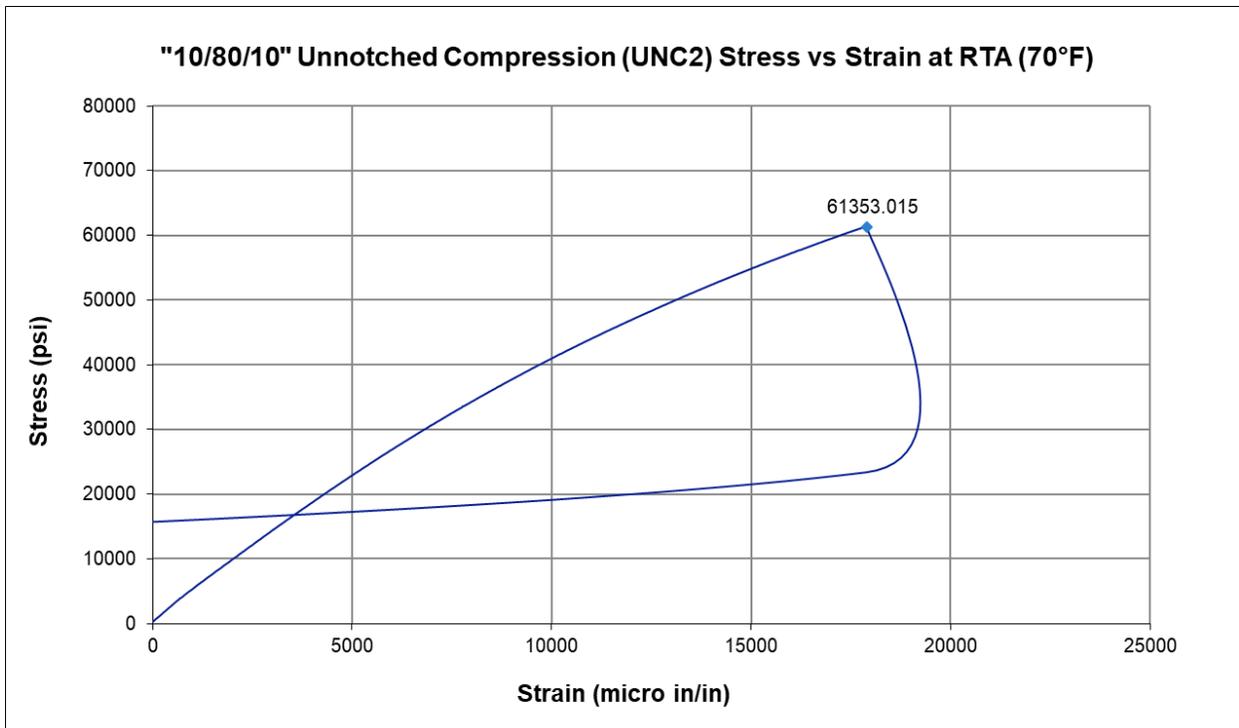


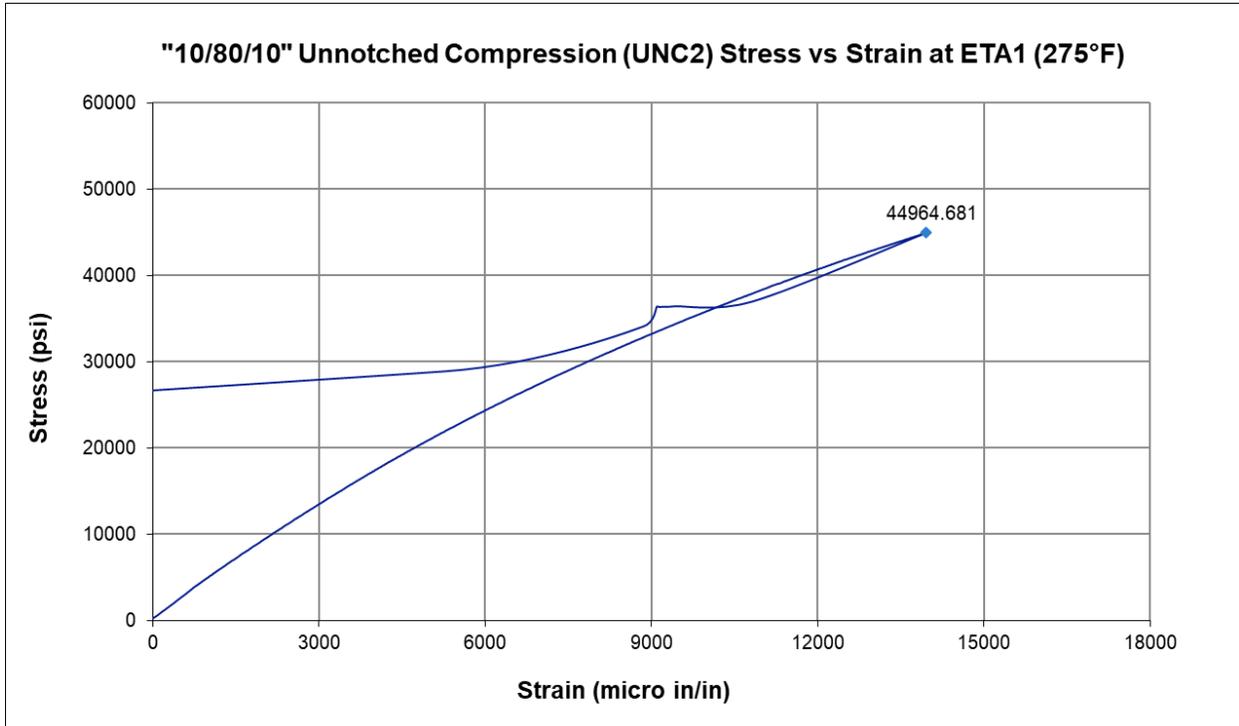
6.10 "25/50/25" Unnotched Compression 1 (UNC1)



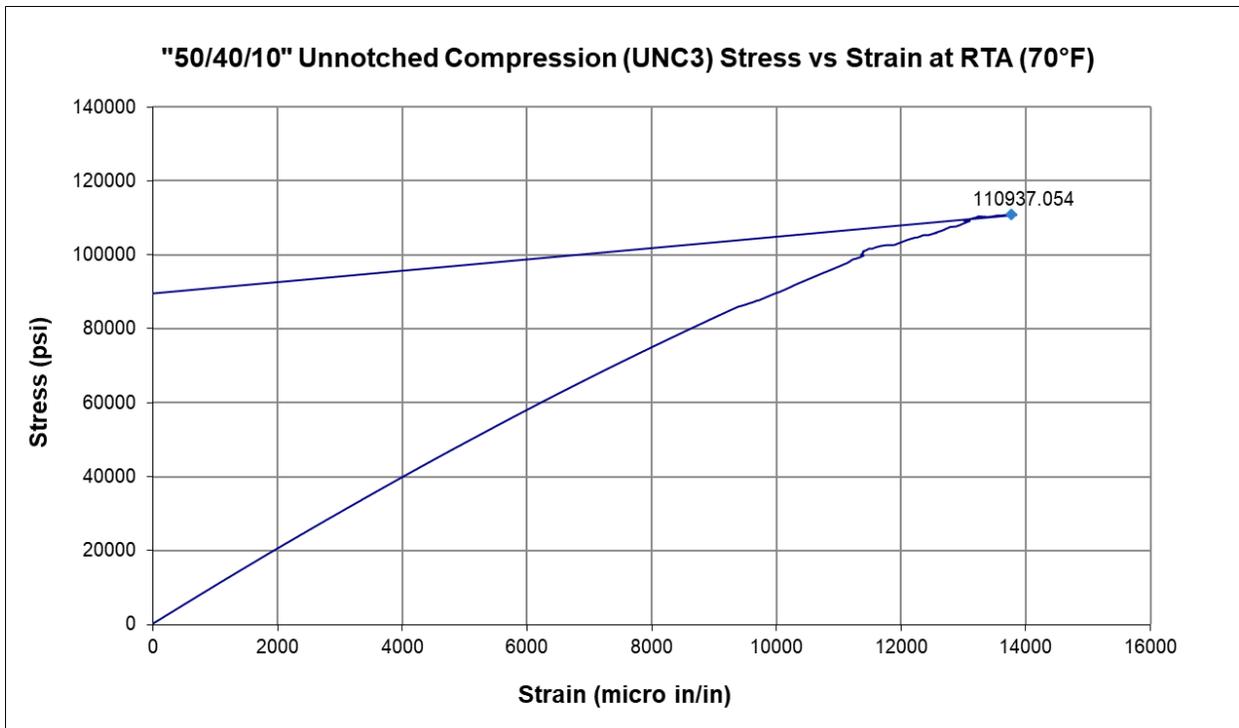


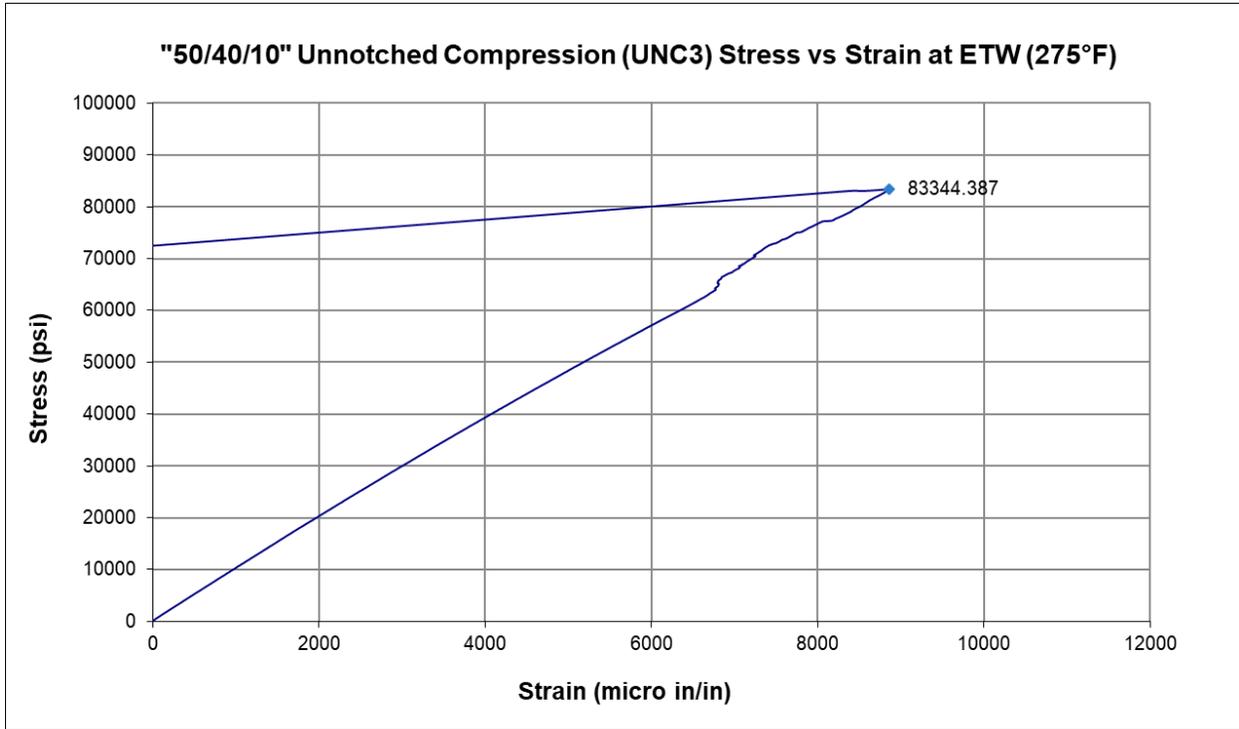
6.11 "10/80/10" Unnotched Compression 2 (UNC2)





6.12 "50/40/10" Unnotched Compression 3 (UNC3)



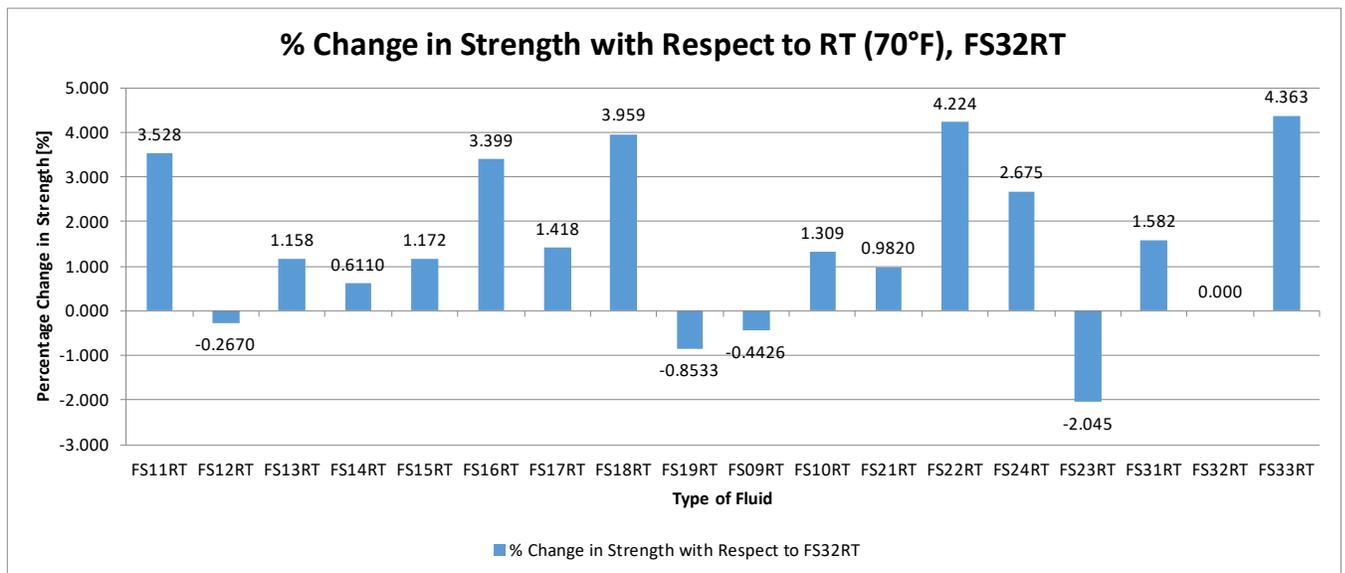
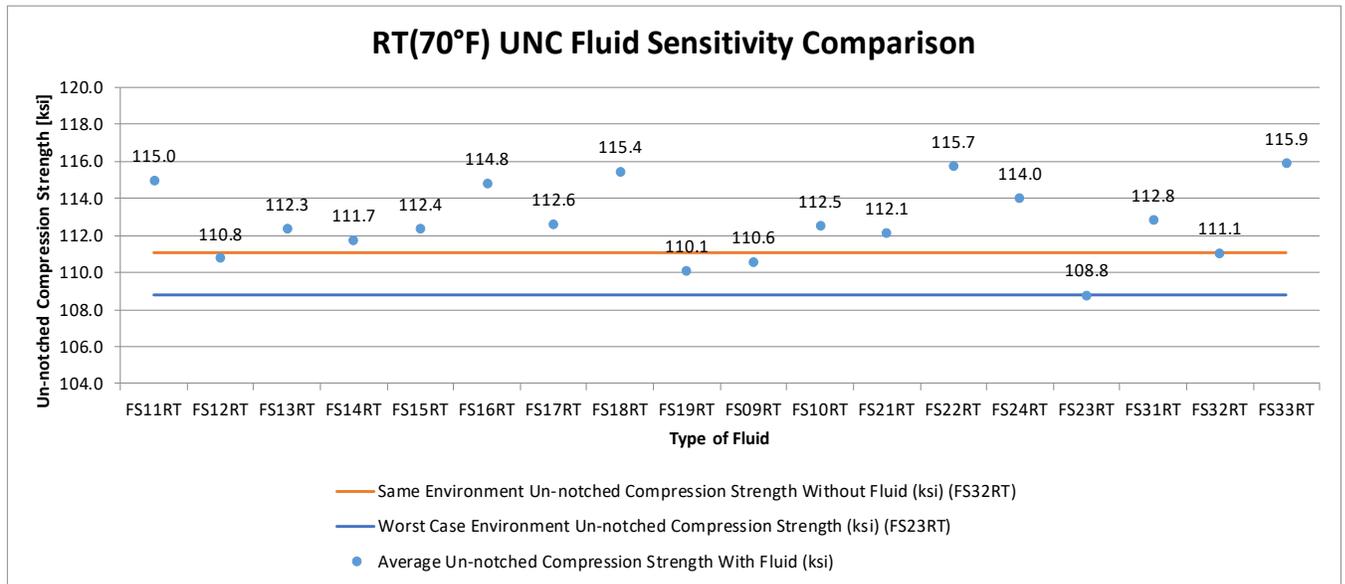


7. Fluid Sensitivity Comparison

7.1 Unnotched Compression (UNC) Fluid Sensitivity

7.1.1 UNC Fluid Sensitivity Room Temperature Test Data

| Code | Type of Fluid | Exposure |
|--------|--|---|
| FS11RT | 100 Low Lead Fuel | 90 days min @ 70°F ± 10°F |
| FS12RT | Jet A Fuel | |
| FS13RT | MIL-PRF-5606 Hydraulic Oil | |
| FS14RT | MIL-PRF-83282 Hydraulic Oil | |
| FS15RT | MIL-PRF-7808 Engine Oil | |
| FS16RT | MIL-PRF-23699 Engine Oil | |
| FS17RT | Sea Water | |
| FS18RT | Skydrol LD-4 | |
| FS19RT | 50% Water w/ 50% Skydrol | |
| FS09RT | Degreasing Solvent per MIL-PRF-680, Type III | |
| FS10RT | Preservation Oil per MIL-PRF-6081 | |
| FS31RT | Distilled Water | |
| FS21RT | MEK washing fluid | 90 mins @ 70°F ± 10°F |
| FS22RT | Polypropylene Glycol Deicer | |
| FS24RT | Detergent per MIL-D-16791, Type I | |
| FS23RT | Isopropyl Alcohol Deicing | 48±4 hrs @ 70°F ± 10°F |
| FS32RT | Ambient Condition | Per section 6.2 Test Plan NTP 1226Q1 |
| FS33RT | 85% Relative Humidity | |

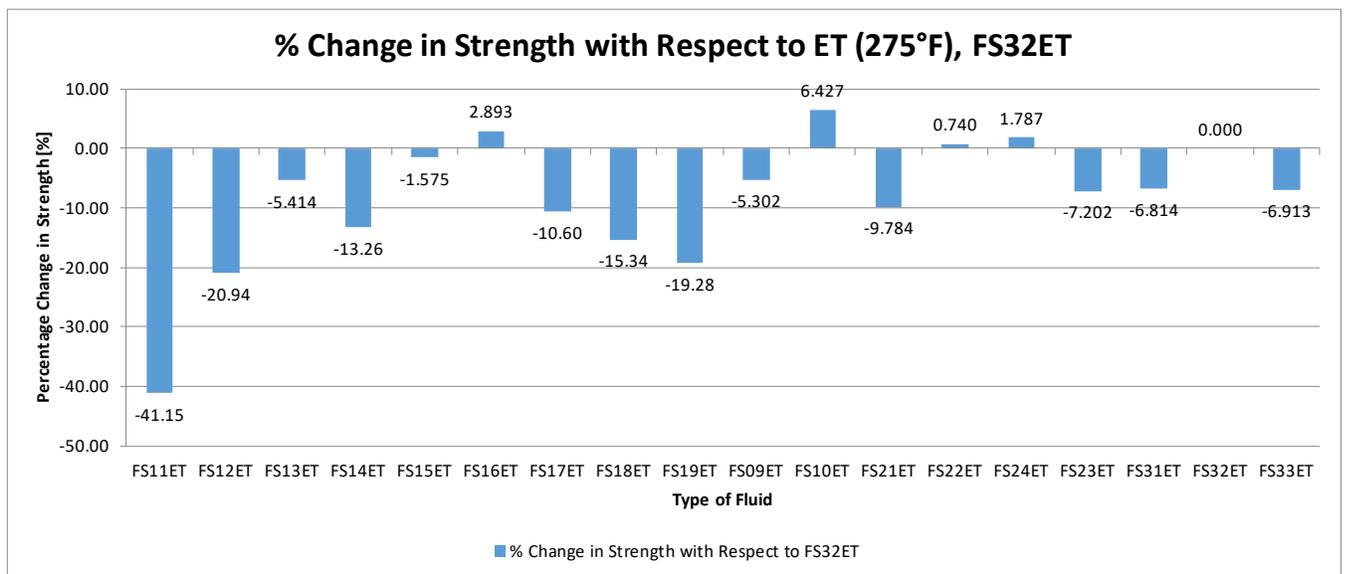
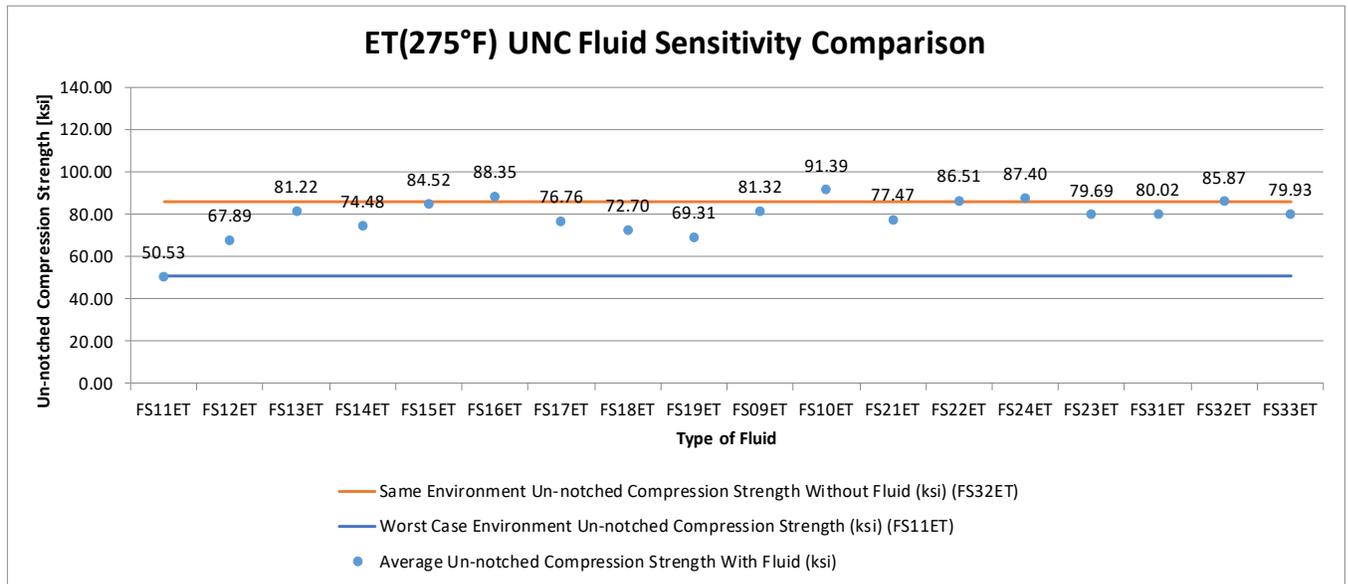


Fluid Sensitivity Screening
Un-notched Compression Properties (UNCFS)--RT(70°F) Strength
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch)

| Fluid Code | Specimen Number | Toray Batch # | Prepreg Lot # | NIAR Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Avg. t_{p1} [in] | Failure Mode | Average Strength [ksi] |
|--|--|---------------|---------------|----------------------------|----------------|------------------------------|---------------------|--------------------|--------------|------------------------|
| FS11RT | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS11-RT-1 | C | 3 | 1 | 122.5 | 0.08813 | 16 | 0.005508 | BGM | 115.0 |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS11-RT-2 | C | 3 | 1 | 117.4 | 0.08747 | 16 | 0.005467 | BAB | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS11-RT-3 | C | 3 | 1 | 109.4 | 0.08712 | 16 | 0.005445 | BGM | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS11-RT-4 | C | 3 | 1 | 114.4 | 0.08758 | 16 | 0.005474 | BGM | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS11-RT-5 | C | 3 | 1 | 111.2 | 0.08787 | 16 | 0.005492 | BAB, HIB | |
| FS12RT | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS12-RT-1 | C | 3 | 1 | 112.8 | 0.08762 | 16 | 0.005476 | BGM | 110.8 |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS12-RT-2 | C | 3 | 1 | 106.7 | 0.08737 | 16 | 0.005460 | BAB | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS12-RT-3 | C | 3 | 1 | 115.7 | 0.08793 | 16 | 0.005490 | BAB | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS12-RT-4 | C | 3 | 1 | 112.2 | 0.08760 | 16 | 0.005475 | HAB | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS12-SP-1 | C | 3 | 1 | 107.2 | 0.08803 | 16 | 0.005502 | BAT | |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS12-SP-2 | C | 3 | 1 | 110.5 | 0.08807 | 16 | 0.005504 | BAB | | |
| FS13RT | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS13-RT-1 | C | 3 | 1 | 113.6 | 0.08783 | 16 | 0.005490 | BAB | 112.3 |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS13-RT-2 | C | 3 | 1 | 113.9 | 0.08772 | 16 | 0.005482 | BAB, HIB | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS13-RT-3 | C | 3 | 1 | 107.8 | 0.08777 | 16 | 0.005485 | BAB | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS13-RT-4 | C | 3 | 1 | 115.4 | 0.08773 | 16 | 0.005483 | BAB | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS13-SP-1 | C | 3 | 1 | 113.2 | 0.08663 | 16 | 0.005415 | HAB, HIB | |
| NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS13-SP-2 | C | 3 | 1 | 110.1 | 0.08763 | 16 | 0.005477 | HAB | | |
| FS14RT | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS14-RT-1 | C | 3 | 1 | 110.7 | 0.08797 | 16 | 0.005498 | BAT | 111.7 |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS14-RT-2 | C | 3 | 1 | 109.3 | 0.08762 | 16 | 0.005476 | BGM | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS14-RT-3 | C | 3 | 1 | 114.9 | 0.08772 | 16 | 0.005482 | BAB | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS14-RT-4 | C | 3 | 1 | 112.9 | 0.08825 | 16 | 0.005516 | BGM | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS14-RT-5 | C | 3 | 1 | 110.8 | 0.08715 | 16 | 0.005447 | BGM | |
| FS15RT | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS15-RT-1 | C | 3 | 1 | 114.0 | 0.08880 | 16 | 0.005550 | BAB | 112.4 |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS15-RT-2 | C | 3 | 1 | 111.9 | 0.08757 | 16 | 0.005473 | BAB, HIB | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS15-RT-3 | C | 3 | 1 | 106.2 | 0.08690 | 16 | 0.005431 | BAT | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS15-RT-4 | C | 3 | 1 | 113.2 | 0.08698 | 16 | 0.005436 | BGM | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS15-RT-5 | C | 3 | 1 | 116.4 | 0.08773 | 16 | 0.005483 | M(B,H)AB | |
| FS16RT | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS16-RT-1 | C | 3 | 1 | 116.1 | 0.08755 | 16 | 0.005472 | BAB | 114.8 |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS16-RT-2 | C | 3 | 1 | 119.0 | 0.08737 | 16 | 0.005460 | BAT | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS16-RT-3 | C | 3 | 1 | 108.7 | 0.08792 | 16 | 0.005489 | M(B,H)AT | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS16-RT-4 | C | 3 | 1 | 116.7 | 0.08842 | 16 | 0.005526 | HAB | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS16-RT-5 | C | 3 | 1 | 116.0 | 0.08727 | 16 | 0.005454 | HAT, HIT | |
| FS17RT | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS17-RT-1 | C | 3 | 1 | 112.4 | 0.08773 | 16 | 0.005483 | BAB | 112.6 |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS17-RT-2 | C | 3 | 1 | 114.3 | 0.08795 | 16 | 0.005497 | BGM | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS17-RT-3 | C | 3 | 1 | 114.7 | 0.08748 | 16 | 0.005468 | BGM, HAB | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS17-RT-4 | C | 3 | 1 | 110.2 | 0.08698 | 16 | 0.005436 | HAT | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS17-RT-5 | C | 3 | 1 | 107.6 | 0.08697 | 16 | 0.005435 | BGM | |
| FS18RT | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS18-RT-1 | C | 3 | 1 | 118.0 | 0.08752 | 16 | 0.005470 | HAT, HIT | 115.4 |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS18-RT-2 | C | 3 | 1 | 110.9 | 0.08692 | 16 | 0.005432 | BAB | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS18-RT-3 | C | 3 | 1 | 112.7 | 0.08737 | 16 | 0.005460 | BGM | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS18-RT-4 | C | 3 | 1 | 113.7 | 0.08753 | 16 | 0.005471 | BAT | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS18-RT-5 | C | 3 | 1 | 115.0 | 0.08743 | 16 | 0.005465 | BAT | |
| FS19RT | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS19-RT-1 | C | 3 | 1 | 114.4 | 0.08715 | 16 | 0.005447 | BAB | 110.1 |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS19-RT-2 | C | 3 | 1 | 118.4 | 0.08747 | 16 | 0.005467 | M(B,H)AT | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS19-RT-3 | C | 3 | 1 | 115.8 | 0.08720 | 16 | 0.005450 | BAB | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS19-RT-4 | C | 3 | 1 | 110.9 | 0.08892 | 16 | 0.005557 | BGM | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS19-RT-5 | C | 3 | 1 | 109.3 | 0.08817 | 16 | 0.005510 | BAB | |
| FS09RT | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS09-RT-1 | C | 3 | 1 | 109.8 | 0.08708 | 16 | 0.005443 | HAB, HIB | 110.6 |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS09-RT-2 | C | 3 | 1 | 113.0 | 0.08693 | 16 | 0.005433 | HAT | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS09-RT-3 | C | 3 | 1 | 112.2 | 0.08732 | 16 | 0.005457 | M(B,H)AB | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS09-RT-4 | C | 3 | 1 | 106.3 | 0.08772 | 16 | 0.005482 | BGM | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS09-RT-5 | C | 3 | 1 | 109.2 | 0.08795 | 16 | 0.005497 | M(B,H)AB | |
| FS10RT | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS10-RT-1 | C | 3 | 1 | 113.2 | 0.08898 | 16 | 0.005561 | M(B,H)AT | 112.5 |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS10-RT-2 | C | 3 | 1 | 113.2 | 0.08898 | 16 | 0.005561 | M(B,H)AT | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS10-RT-3 | C | 3 | 1 | 116.0 | 0.08763 | 16 | 0.005477 | BAT | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS10-RT-4 | C | 3 | 1 | 120.1 | 0.08772 | 16 | 0.005482 | BAB | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS10-RT-5 | C | 3 | 1 | 93.8 | 0.08815 | 16 | 0.005509 | BGM | |
| FS21RT | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS21-RT-1 | C | 3 | 1 | 109.6 | 0.08768 | 16 | 0.005480 | BAB, CIB | 112.1 |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS21-RT-2 | C | 3 | 1 | 116.9 | 0.08715 | 16 | 0.005447 | BGM | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS21-RT-3 | C | 3 | 1 | 109.9 | 0.08780 | 16 | 0.005488 | BGM | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS21-RT-4 | C | 3 | 1 | 112.3 | 0.08758 | 16 | 0.005474 | BAB | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS21-RT-5 | C | 3 | 1 | 110.8 | 0.08715 | 16 | 0.005447 | BAB | |
| FS22RT | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS22-RT-1 | C | 3 | 1 | 112.5 | 0.08755 | 16 | 0.005472 | BAB | 115.7 |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS22-RT-2 | C | 3 | 1 | 117.5 | 0.08728 | 16 | 0.005455 | BAB | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS22-RT-3 | C | 3 | 1 | 112.3 | 0.08775 | 16 | 0.005484 | BGM | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS22-RT-4 | C | 3 | 1 | 106.2 | 0.08780 | 16 | 0.005488 | M(B,H)AT | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS22-RT-5 | C | 3 | 1 | 105.0 | 0.08740 | 16 | 0.005463 | BAT, HIT | |
| FS24RT | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS24-RT-1 | C | 3 | 1 | 119.7 | 0.08690 | 16 | 0.005431 | BGM | 114.0 |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS24-RT-2 | C | 3 | 1 | 118.1 | 0.08805 | 16 | 0.005503 | BGM, HIB | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS24-RT-3 | C | 3 | 1 | 119.0 | 0.08742 | 16 | 0.005464 | BAB, CIB | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS24-RT-4 | C | 3 | 1 | 112.7 | 0.08698 | 16 | 0.005436 | BGM | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS24-RT-5 | C | 3 | 1 | 118.4 | 0.08668 | 16 | 0.005418 | BAT | |
| FS23RT | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS23-RT-1 | C | 3 | 1 | 110.6 | 0.08737 | 16 | 0.005460 | BAB | 108.8 |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS23-RT-2 | C | 3 | 1 | 118.8 | 0.08850 | 16 | 0.005531 | BAT | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS23-RT-3 | C | 3 | 1 | 110.3 | 0.08758 | 16 | 0.005474 | BAB | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS23-RT-4 | C | 3 | 1 | 114.6 | 0.08715 | 16 | 0.005447 | M(B,H)AB | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS23-RT-5 | C | 3 | 1 | 115.2 | 0.08753 | 16 | 0.005471 | BAT | |
| FS31RT | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS31-RT-1 | C | 3 | 1 | 111.2 | 0.08790 | 16 | 0.005494 | BGM, HAB | 112.8 |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS31-RT-2 | C | 3 | 1 | 104.2 | 0.08737 | 16 | 0.005460 | BAB, HIB | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS31-RT-3 | C | 3 | 1 | 106.1 | 0.08747 | 16 | 0.005467 | M(B,H)AB | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS31-RT-4 | C | 3 | 1 | 112.4 | 0.08783 | 16 | 0.005490 | BAB | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS31-RT-5 | C | 3 | 1 | 110.1 | 0.08765 | 16 | 0.005478 | BAB, HIB | |
| FS32RT | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS32-RT-1 | C | 3 | 1 | 111.2 | 0.08722 | 16 | 0.005451 | BAB, HIB | 111.1 |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS32-RT-2 | C | 3 | 1 | 114.8 | 0.08807 | 16 | 0.005504 | HAB, HIB | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS32-RT-3 | C | 3 | 1 | 116.8 | 0.08742 | 16 | 0.005464 | BGM | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS32-RT-4 | C | 3 | 1 | 112.1 | 0.08747 | 16 | 0.005467 | BGM | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS32-RT-5 | C | 3 | 1 | 107.4 | 0.08748 | 16 | 0.005468 | BAB | |
| FS33RT | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS33-RT-1 | C | 3 | 1 | 111.9 | 0.08695 | 16 | 0.005434 | BAB | 115.9 |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS33-RT-2 | C | 3 | 1 | 114.0 | 0.08763 | 16 | 0.005477 | BGM | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS33-RT-3 | C | 3 | 2 | 106.7 | 0.08653 | 16 | 0.005408 | BAB | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS33-RT-4 | C | 3 | 2 | 115.8 | 0.08660 | 16 | 0.005413 | BAB | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS33-RT-5 | C | 3 | 2 | 120.5 | 0.08622 | 16 | 0.005389 | BAB | |
| FS33RT | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS33-RT-1 | C | 3 | 2 | 103.2 | 0.08648 | 16 | 0.005405 | BAB | 115.9 |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS33-RT-2 | C | 3 | | | | | | | |

7.1.2 UNC Fluid Sensitivity Elevated Temperature Test Data

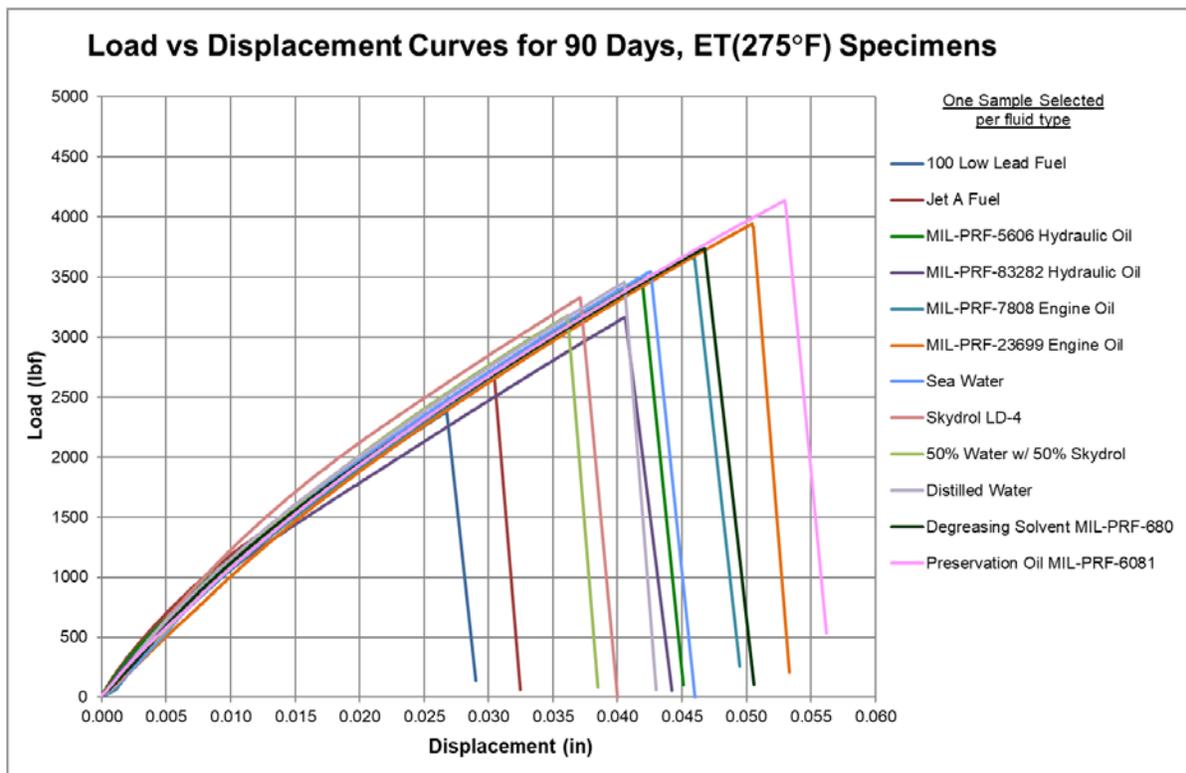
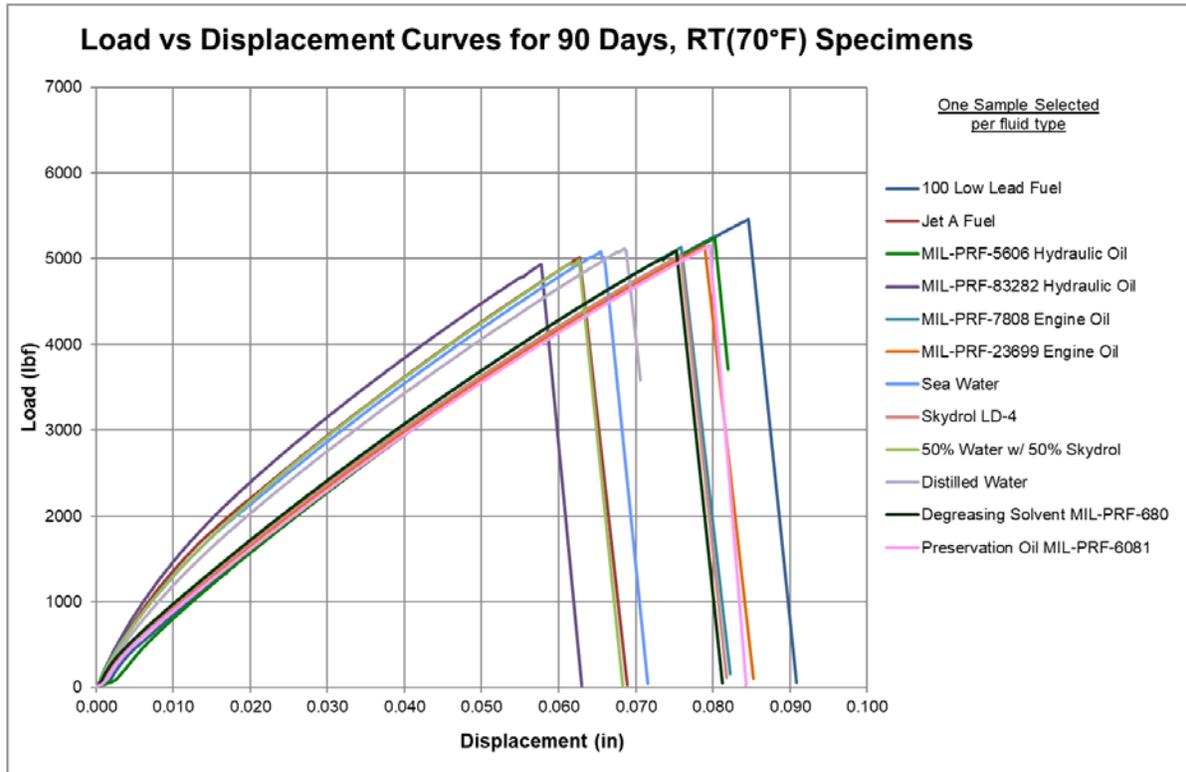
| Code | Type of Fluid | Exposure |
|--------|--|---|
| FS11ET | 100 Low lead Fuel | 90 days min @ 70°F ± 10°F |
| FS12ET | Jet A Fuel | |
| FS13ET | MIL-PRF-5606 Hydraulic Oil | |
| FS14ET | MIL-PRF-83282 Hydraulic Oil | |
| FS15ET | MIL-PRF-7808 Engine Oil | |
| FS16ET | MIL-PRF-23699 Engine Oil | |
| FS17ET | Sea Water | |
| FS18ET | Skydrol LD-4 | |
| FS19ET | 50% Water w/ 50% Skydrol | |
| FS09ET | Degreasing Solvent per MIL-PRF-680, Type III | |
| FS10ET | Preservation Oil per MIL-PRF-6081 | |
| FS31ET | Distilled Water | |
| FS21ET | MEK washing fluid | 90 mins @ 70°F ± 10°F |
| FS22ET | Polypropylene Glycol Deicer | |
| FS24ET | Detergent per MIL-D-16791, Type I | |
| FS23ET | Isopropyl Alcohol Deicing | 48±4 hrs @ 70°F ± 10°F |
| FS32ET | Ambient Condition | Per section 6.2 Test Plan NTP 1226Q1 |
| FS33ET | 85% Relative Humidity | |

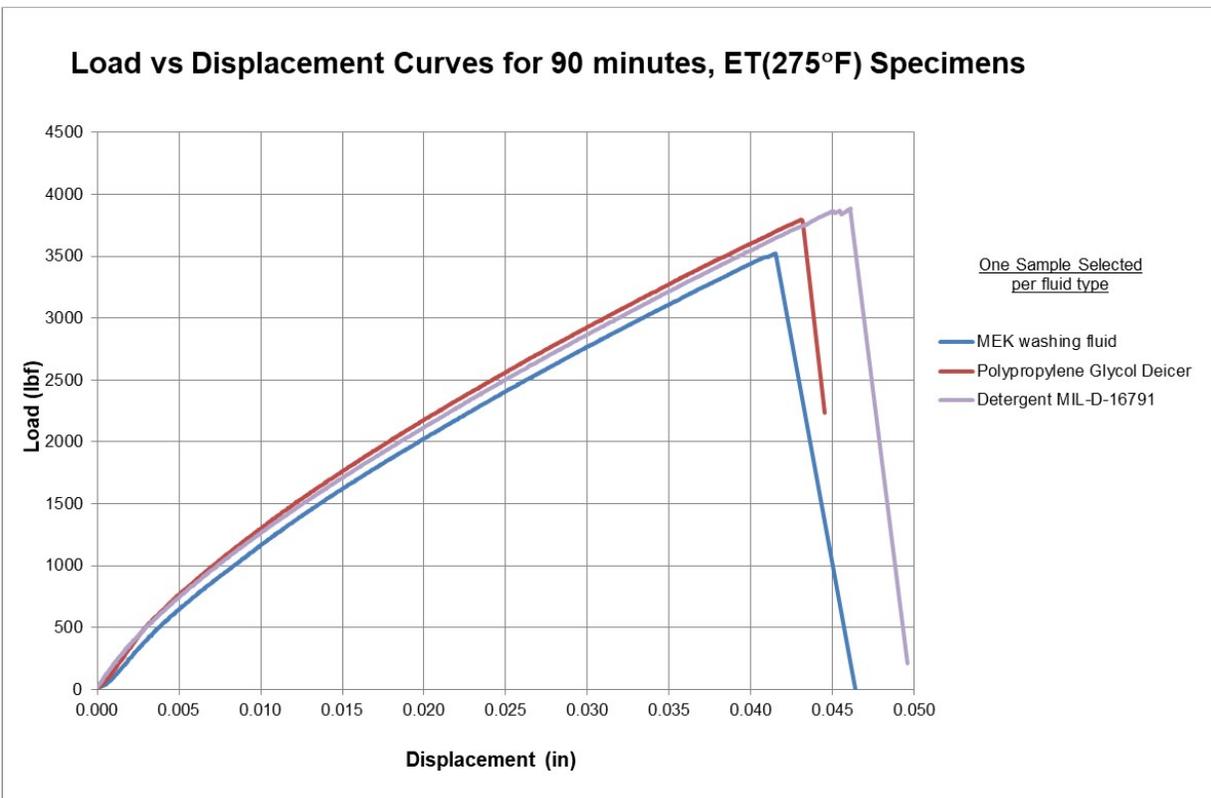
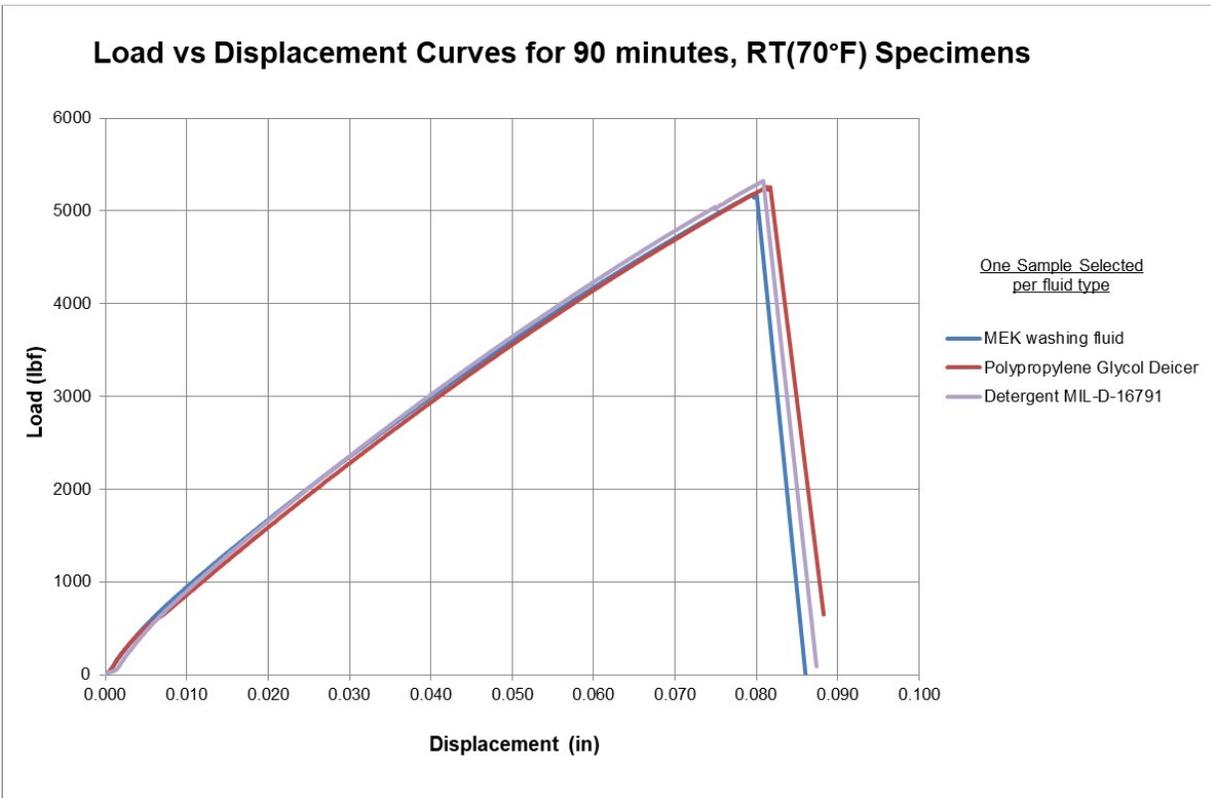


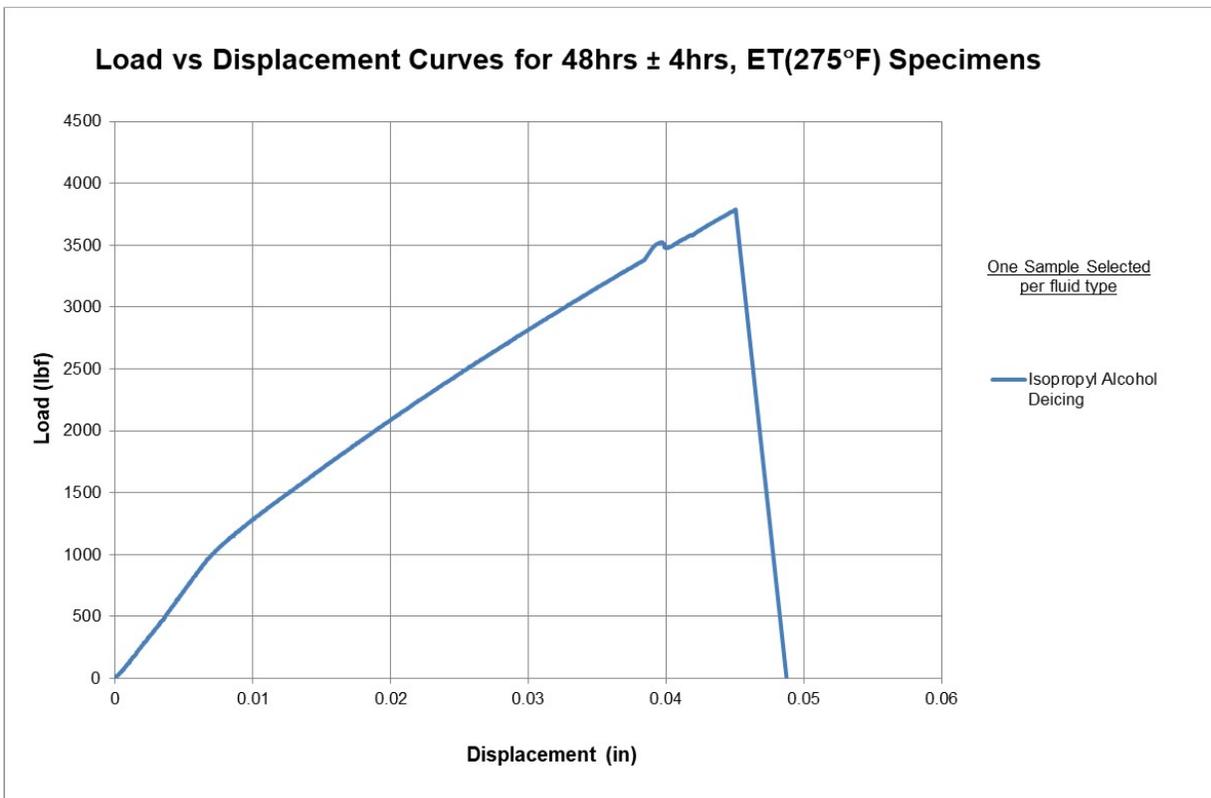
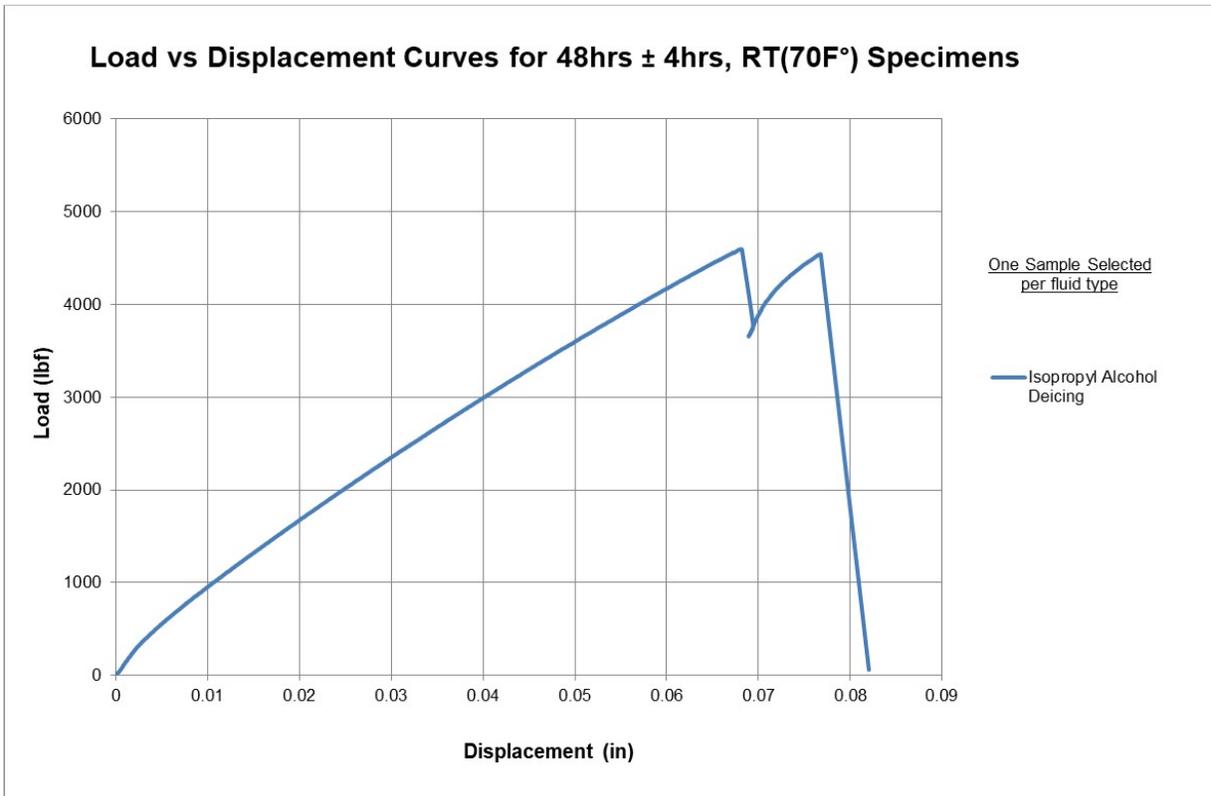
Fluid Sensitivity Screening
Un-notched Compression Properties (UNCFS)–ET(275°F) Strength
 Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unized Unilate (0.25 inch)

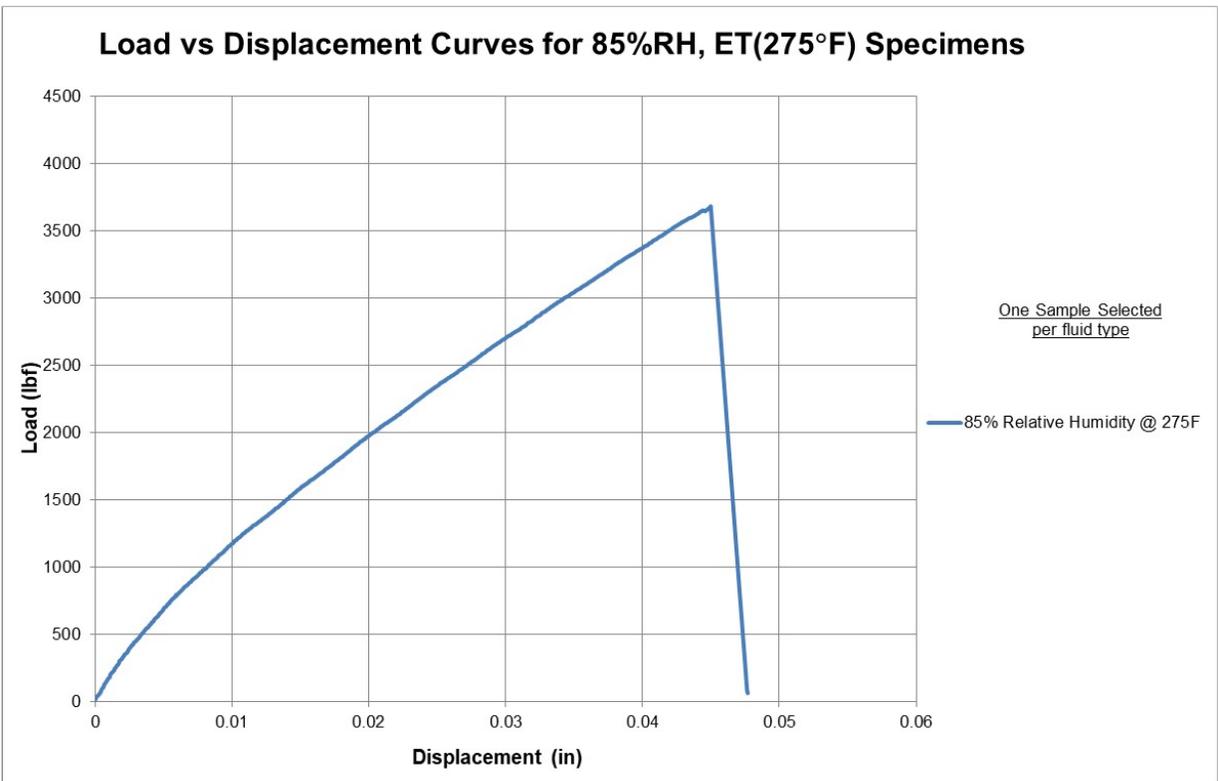
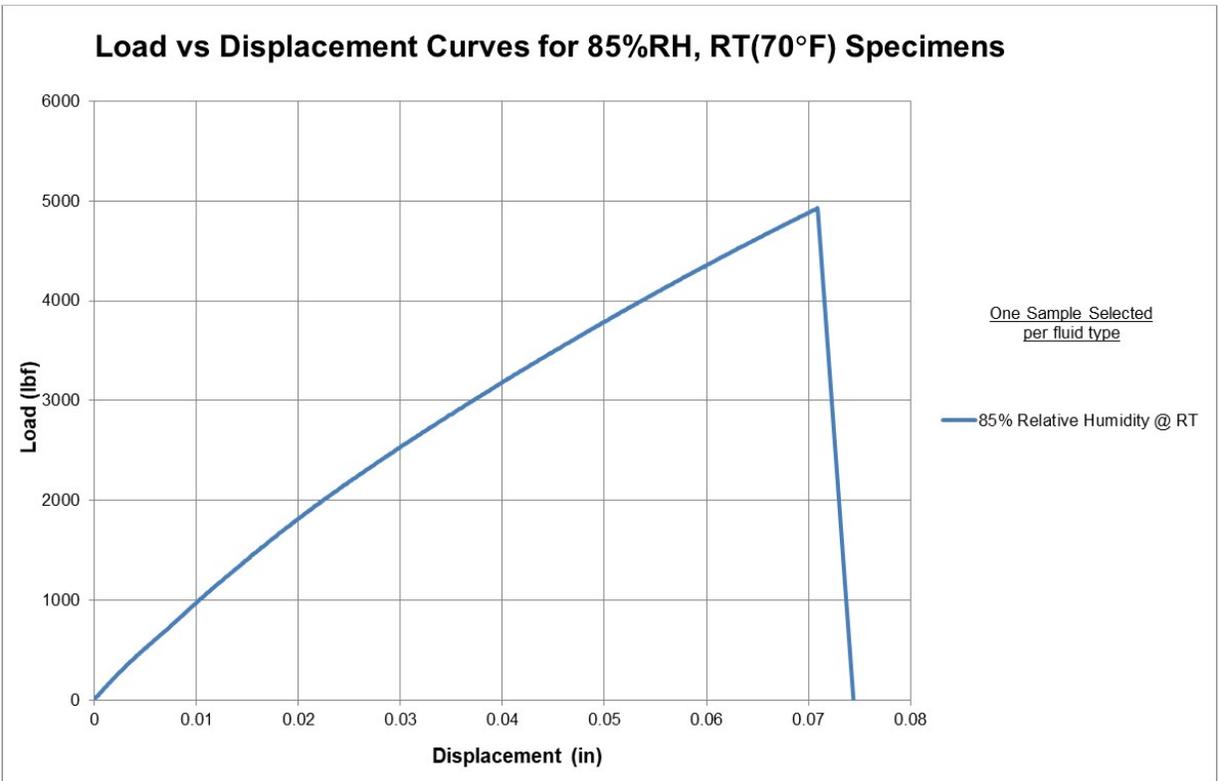
| Fluid Code | Specimen Number | Toray Batch # | Prepreg Lot # | NIAR Consolidation Cycle # | Strength [ksi] | Avg. Specimen Thickness [in] | # Plies in Laminate | Avg. t _{ply} [in] | Failure Mode | Average Strength [ksi] |
|------------|--|---------------|---------------|----------------------------|----------------|------------------------------|---------------------|----------------------------|--------------|------------------------|
| FS11ET | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS11-ET-1 | C | 3 | 1 | 53.66 | 0.08755 | 16 | 0.005472 | BAB | 50.53 |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS11-ET-2 | C | 3 | 1 | 52.88 | 0.08735 | 16 | 0.005459 | BAT | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS11-ET-3 | C | 3 | 1 | 48.73 | 0.08828 | 16 | 0.005518 | HGM | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS11-ET-4 | C | 3 | 1 | 45.27 | 0.08823 | 16 | 0.005515 | HAT | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS11-ET-5 | C | 3 | 1 | 52.13 | 0.08748 | 16 | 0.005468 | HAT | |
| FS12ET | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS12-ET-1 | C | 3 | 1 | 60.48 | 0.08830 | 16 | 0.005519 | BGM | 67.89 |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS12-ET-2 | C | 3 | 1 | 73.82 | 0.08822 | 16 | 0.005514 | BGM | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS12-ET-3 | C | 3 | 1 | 66.99 | 0.08713 | 16 | 0.005446 | BAT | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS12-ET-4 | C | 3 | 1 | 68.65 | 0.08747 | 16 | 0.005467 | BGM | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS12-ET-5 | C | 3 | 1 | 69.52 | 0.08835 | 16 | 0.005522 | BGM | |
| FS13ET | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS13-ET-1 | C | 3 | 1 | 77.74 | 0.08820 | 16 | 0.005513 | BGM | 81.22 |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS13-ET-2 | C | 3 | 1 | 80.85 | 0.08703 | 16 | 0.005440 | M(B,H)AB | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS13-ET-3 | C | 3 | 1 | 85.06 | 0.08767 | 16 | 0.005479 | HAT, HIT | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS13-ET-4 | C | 3 | 1 | 81.22 | 0.08803 | 16 | 0.005502 | BGM | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS13-ET-5 | C | 3 | 1 | 89.18 | 0.08835 | 16 | 0.005522 | HAB, HIB | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS13-SP-3 | C | 3 | 1 | 82.06 | 0.08768 | 16 | 0.005480 | BGM | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS13-SP-4 | C | 3 | 1 | 72.42 | 0.08757 | 16 | 0.005473 | BGM | |
| FS14ET | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS14-ET-1 | C | 3 | 1 | 71.39 | 0.08760 | 16 | 0.005475 | BGM | 74.48 |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS14-ET-2 | C | 3 | 1 | 81.41 | 0.08770 | 16 | 0.005481 | BGM | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS14-ET-3 | C | 3 | 1 | 72.15 | 0.08755 | 16 | 0.005472 | BAB | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS14-ET-4 | C | 3 | 1 | 66.91 | 0.08775 | 16 | 0.005484 | BGM | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS14-ET-5 | C | 3 | 1 | 80.53 | 0.08745 | 16 | 0.005466 | BGM | |
| FS15ET | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS15-ET-1 | C | 3 | 1 | 82.57 | 0.08770 | 16 | 0.005481 | BGM | 84.52 |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS15-ET-2 | C | 3 | 1 | 87.56 | 0.08752 | 16 | 0.005470 | BAT | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS15-ET-3 | C | 3 | 1 | 87.16 | 0.08762 | 16 | 0.005476 | BAT | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS15-ET-4 | C | 3 | 1 | 79.51 | 0.08790 | 16 | 0.005494 | M(B,H)AT | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS15-ET-5 | C | 3 | 1 | 85.79 | 0.08783 | 16 | 0.005490 | HAT, HIT | |
| FS16ET | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS16-ET-1 | C | 3 | 1 | 88.47 | 0.08793 | 16 | 0.005496 | BAT | 88.35 |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS16-ET-2 | C | 3 | 1 | 87.13 | 0.08710 | 16 | 0.005444 | BAT | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS16-ET-3 | C | 3 | 1 | 87.06 | 0.08738 | 16 | 0.005461 | HAB, HIB | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS16-ET-4 | C | 3 | 1 | 93.58 | 0.08708 | 16 | 0.005443 | BAT | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS16-ET-5 | C | 3 | 1 | 85.54 | 0.08757 | 16 | 0.005473 | BGM | |
| FS17ET | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS17-ET-1 | C | 3 | 1 | 80.16 | 0.08755 | 16 | 0.005472 | BGM | 76.76 |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS17-ET-2 | C | 3 | 1 | 69.26 | 0.08747 | 16 | 0.005467 | BAT | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS17-ET-3 | C | 3 | 1 | 77.93 | 0.08742 | 16 | 0.005464 | BAT, HIT | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS17-ET-4 | C | 3 | 1 | 78.91 | 0.08682 | 16 | 0.005426 | BAT | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS17-ET-5 | C | 3 | 1 | 77.57 | 0.08660 | 16 | 0.005413 | BGM | |
| FS18ET | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS18-ET-1 | C | 3 | 1 | 70.66 | 0.08737 | 16 | 0.005460 | BAT, HIT | 72.70 |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS18-ET-2 | C | 3 | 1 | 74.98 | 0.08778 | 16 | 0.005486 | BGM | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS18-ET-3 | C | 3 | 1 | 77.16 | 0.08765 | 16 | 0.005478 | BAB, HIB | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS18-ET-4 | C | 3 | 1 | 71.14 | 0.08775 | 16 | 0.005484 | BGM | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS18-ET-5 | C | 3 | 1 | 69.54 | 0.08793 | 16 | 0.005496 | BAB | |
| FS19ET | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS19-ET-1 | C | 3 | 1 | 71.81 | 0.08752 | 16 | 0.005470 | BGM | 69.31 |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS19-ET-2 | C | 3 | 1 | 67.32 | 0.08763 | 16 | 0.005477 | BGM | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS19-ET-3 | C | 3 | 1 | 70.90 | 0.08728 | 16 | 0.005455 | BGM | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS19-ET-4 | C | 3 | 1 | 68.48 | 0.08769 | 16 | 0.005443 | BGM | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS19-ET-5 | C | 3 | 1 | 68.05 | 0.08727 | 16 | 0.005454 | BGM | |
| FS09ET | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS09-ET-1 | C | 3 | 1 | 80.58 | 0.08805 | 16 | 0.005503 | BAB, HIB | 81.32 |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS09-ET-2 | C | 3 | 1 | 84.43 | 0.08763 | 16 | 0.005477 | BAT | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS09-ET-3 | C | 3 | 1 | 84.74 | 0.08765 | 16 | 0.005478 | M(B,H)AT | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS09-ET-4 | C | 3 | 1 | 79.45 | 0.08857 | 16 | 0.005535 | BAT | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS09-ET-5 | C | 3 | 1 | 77.39 | 0.08818 | 16 | 0.005511 | BAT, HIT | |
| FS10ET | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS10-ET-1 | C | 3 | 1 | 93.65 | 0.08748 | 16 | 0.005468 | BAT | 91.39 |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS10-ET-2 | C | 3 | 1 | 90.28 | 0.08793 | 16 | 0.005496 | M(B,H)AT | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS10-ET-3 | C | 3 | 1 | 85.96 | 0.08762 | 16 | 0.005476 | HAB, HIB | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS10-ET-4 | C | 3 | 1 | 93.66 | 0.08740 | 16 | 0.005463 | BAB, HIB | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS10-ET-5 | C | 3 | 1 | 93.39 | 0.08772 | 16 | 0.005482 | BAT | |
| FS21ET | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS21-ET-1 | C | 3 | 1 | 80.04 | 0.08692 | 16 | 0.005432 | BGM | 77.47 |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS21-ET-2 | C | 3 | 1 | 73.44 | 0.08797 | 16 | 0.005498 | BAT | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS21-ET-3 | C | 3 | 1 | 80.57 | 0.08752 | 16 | 0.005470 | BAB | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS21-ET-4 | C | 3 | 1 | 74.15 | 0.08763 | 16 | 0.005477 | BAT | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS21-ET-5 | C | 3 | 1 | 79.14 | 0.08652 | 16 | 0.005407 | M(B,H)AT | |
| FS22ET | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS22-ET-1 | C | 3 | 1 | 86.53 | 0.08665 | 16 | 0.005416 | HAT, HIT | 86.51 |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS22-ET-2 | C | 3 | 1 | 83.55 | 0.08692 | 16 | 0.005432 | BAT | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS22-ET-3 | C | 3 | 1 | 91.76 | 0.08722 | 16 | 0.005451 | BGM | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS22-ET-4 | C | 3 | 1 | 89.08 | 0.08757 | 16 | 0.005473 | BAB | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS22-ET-5 | C | 3 | 1 | 90.42 | 0.08707 | 16 | 0.005442 | HAB, HIB | |
| FS24ET | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS24-ET-1 | C | 3 | 1 | 87.22 | 0.08808 | 16 | 0.005505 | BAB | 87.40 |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS24-ET-2 | C | 3 | 1 | 88.68 | 0.08738 | 16 | 0.005461 | M(B,H)AB | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS24-ET-3 | C | 3 | 1 | 82.44 | 0.08788 | 16 | 0.005493 | M(B,H)AT | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS24-ET-4 | C | 3 | 1 | 90.12 | 0.08808 | 16 | 0.005505 | BGM | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS24-ET-5 | C | 3 | 1 | 88.56 | 0.08733 | 16 | 0.005458 | BAT, HIT | |
| FS23ET | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS23-ET-1 | C | 3 | 1 | 86.03 | 0.08702 | 16 | 0.005439 | BGM | 79.69 |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS23-ET-2 | C | 3 | 1 | 92.78 | 0.08748 | 16 | 0.005468 | BGM | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS23-ET-3 | C | 3 | 1 | 69.48 | 0.08650 | 16 | 0.005406 | BGM | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS23-ET-4 | C | 3 | 1 | 74.30 | 0.08775 | 16 | 0.005484 | M(B,H)AT | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS23-ET-5 | C | 3 | 1 | 81.60 | 0.08732 | 16 | 0.005457 | M(B,H)AT | |
| FS31ET | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS23-SP-3 | C | 3 | 1 | 78.98 | 0.08772 | 16 | 0.005482 | BAB | 80.02 |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS23-SP-4 | C | 3 | 1 | 74.63 | 0.08827 | 16 | 0.005517 | BGM | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS31-ET-1 | C | 3 | 1 | 78.09 | 0.08748 | 16 | 0.005468 | BGM | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS31-ET-2 | C | 3 | 1 | 84.65 | 0.08765 | 16 | 0.005478 | BGM | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS31-ET-3 | C | 3 | 1 | 71.38 | 0.08707 | 16 | 0.005442 | BGM | |
| FS32ET | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS31-SP-3 | C | 3 | 1 | 78.74 | 0.08745 | 16 | 0.005486 | BGM | 85.87 |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST19-C-C1-1-UNCFS31-SP-4 | C | 3 | 1 | 87.24 | 0.08722 | 16 | 0.005451 | BAB | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C2-1-UNC0-ETA1-1 | C | 3 | 2 | 87.41 | 0.08630 | 16 | 0.005394 | BAB, CT, CIB | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C2-1-UNC0-ETA1-2 | C | 3 | 2 | 87.54 | 0.08605 | 16 | 0.005378 | HAB, HIB | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C2-1-UNC0-ETA1-3 | C | 3 | 2 | 88.52 | 0.08605 | 16 | 0.005378 | BAB | |
| FS33ET | NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C2-1-UNC0-ETA1-4 | C | 3 | 2 | 81.06 | 0.08698 | 16 | 0.005438 | BAB, HIB | 79.93 |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C2-1-UNC0-ETA1-5 | C | 3 | 2 | 84.82 | 0.08663 | 16 | 0.005415 | BAB | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C2-1-UNCFS33-ET-1 | C | 3 | 2 | 83.72 | 0.08695 | 16 | 0.005434 | BGM | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C2-1-UNCFS33-ET-2 | C | 3 | 2 | 85.99 | 0.08682 | 16 | 0.005426 | HAB, HIB | |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C2-1-UNCFS33-ET-3 | C | 3 | 2 | 80.91 | 0.08608 | 16 | 0.005380 | HAB, HIB | |
| FS33ET | NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C2-1-UNCFS33-ET-4 | C | 3 | 2 | 77.07 | 0.08600 | 16 | 0.005375 | BGM | 79.93 |
| | NTP1226Q1-TC-NIAR-NIAR-T25-MST4-C-C2-1-UNCFS33-ET-5 | C | 3 | 2 | | | | | | |

7.1.3 UNC Fluid Sensitivity Load Displacement Curves



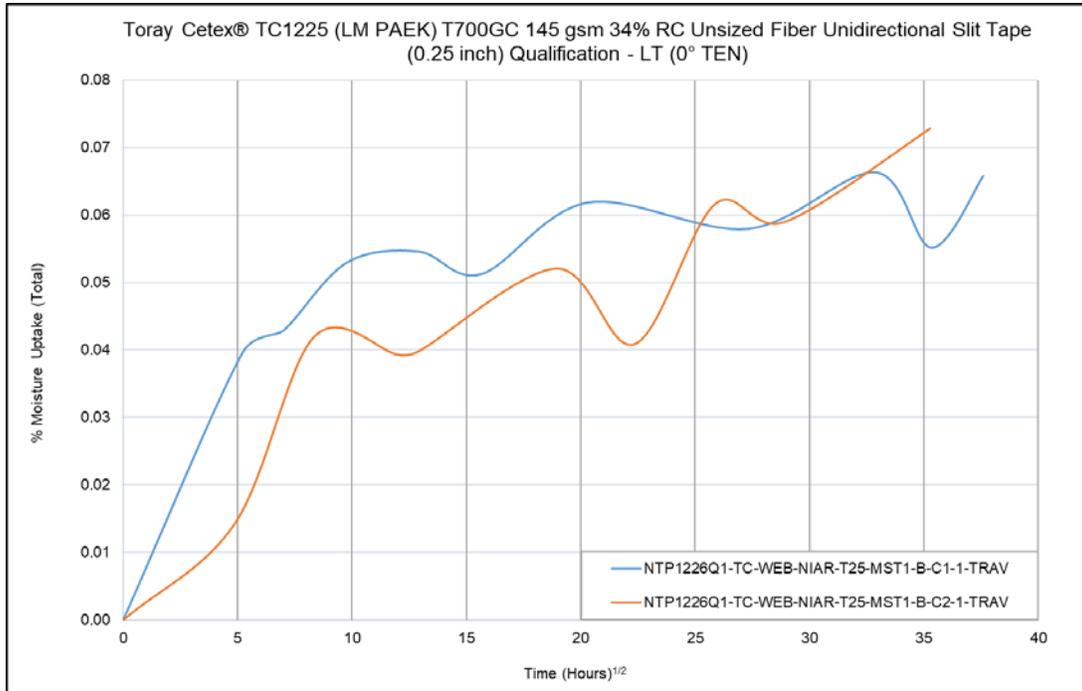




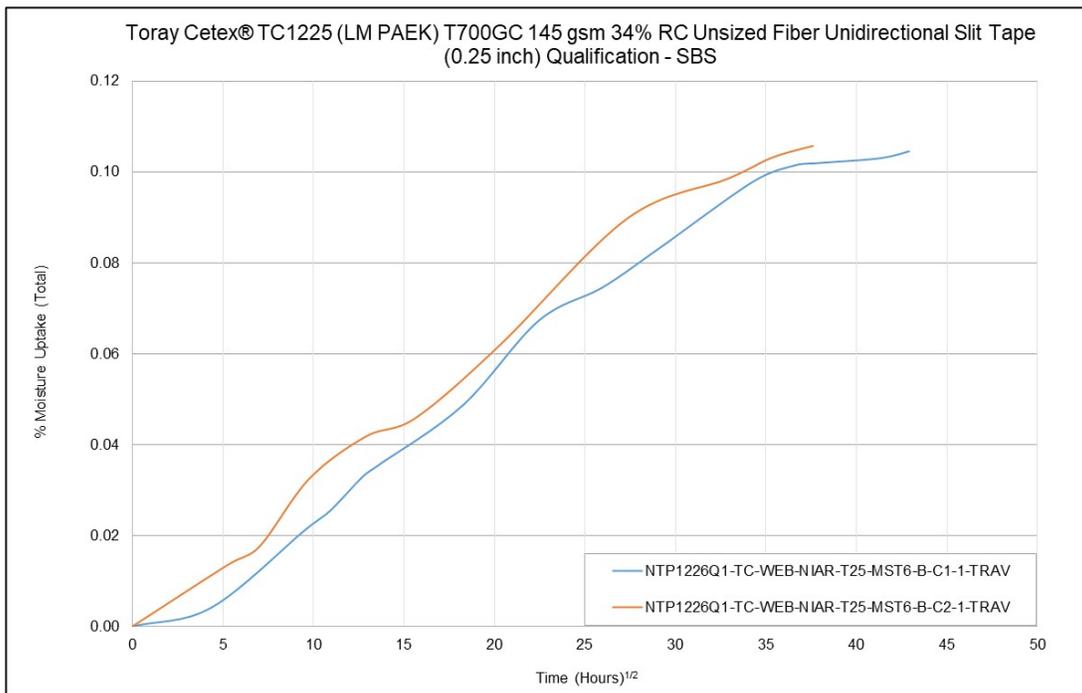


Moisture Conditioning Charts

7.2 Longitudinal Tension (LT) – Thinnest Panel



7.3 Short Beam Shear (SBS) – Thickest Panel



8. DMA Results

8.1 DMA Ambient Data

| DMA Results Summary | | | | |
|---|-----------------------|---------------------|-----------------------|---------------------|
| Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) Qualification DMA Ambient | | | | |
| Sample # | Onset Storage Modulus | | Peak of Tangent Delta | |
| | T _g [°C] | T _g [°F] | T _g [°C] | T _g [°F] |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5-C-C1-1-DMA-D-1 | 141.90 | 287.42 | 161.36 | 322.45 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5-C-C1-1-DMA-D-2 | 142.00 | 287.60 | 161.25 | 322.25 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5-C-C1-1-DMA-D-3 | 142.40 | 288.32 | 161.96 | 323.53 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C1-1-DMA-D | 144.40 | 291.92 | 164.99 | 328.98 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C2-1-DMA-D | 143.15 | 289.67 | 163.91 | 327.04 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C1-1-DMA-D | 142.85 | 289.13 | 163.21 | 325.78 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C2-1-DMA-D | 143.58 | 290.44 | 164.26 | 327.67 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-C-C1-1-DMA-D | 143.85 | 290.93 | 164.69 | 328.44 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-C-C2-1-DMA-D | 144.28 | 291.70 | 164.70 | 328.46 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8R-A-C1-1-DMA-D | 144.12 | 291.42 | 164.41 | 327.94 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-A-C2-1-DMA-D | 143.90 | 291.02 | 164.35 | 327.83 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-B-C1-1-DMA-D | 143.62 | 290.52 | 163.91 | 327.04 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-B-C2-1-DMA-D | 143.28 | 289.90 | 163.46 | 326.23 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-C-C1-1-DMA-D | 143.42 | 290.16 | 163.91 | 327.04 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-C-C2-1-DMA-D | 143.48 | 290.26 | 164.06 | 327.31 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C1-1-DMA-D | 144.96 | 292.93 | 165.38 | 329.68 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C2-1-DMA-D | 145.79 | 294.42 | 166.27 | 331.29 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C1-1-DMA-D | 144.73 | 292.51 | 164.82 | 328.68 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C2-1-DMA-D | 145.37 | 293.67 | 165.66 | 330.19 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-C-C1-1-DMA-D | 145.15 | 293.27 | 164.95 | 328.91 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-C-C2-1-DMA-D | 144.66 | 292.39 | 166.00 | 330.80 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-A-C1-1-DMA-D | 146.43 | 295.57 | 166.46 | 331.63 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-A-C2-1-DMA-D | 145.79 | 294.42 | 165.44 | 329.79 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-B-C1-1-DMA-D | 145.71 | 294.28 | 166.53 | 331.75 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-B-C2-1-DMA-D | 145.13 | 293.23 | 164.60 | 328.28 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-C-C1-1-DMA-D | 145.69 | 294.24 | 165.81 | 330.46 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-C-C2-1-DMA-D | 144.92 | 292.86 | 164.44 | 327.99 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C1-1-DMA-D | 143.13 | 289.63 | 161.89 | 323.40 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C2-1-DMA-D | 142.47 | 288.45 | 161.38 | 322.48 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C1-1-DMA-D | 142.24 | 288.03 | 161.60 | 322.88 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C2-1-DMA-D | 143.54 | 290.37 | 162.76 | 324.97 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-C-C1-1-DMA-D | 143.21 | 289.78 | 162.00 | 323.60 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-C-C2-1-DMA-D | 142.57 | 288.63 | 161.78 | 323.20 |
| Average | 143.99 | 291.18 | 164.01 | 327.21 |
| Standard Deviation | 1.24 | 2.23 | 1.61 | 2.90 |

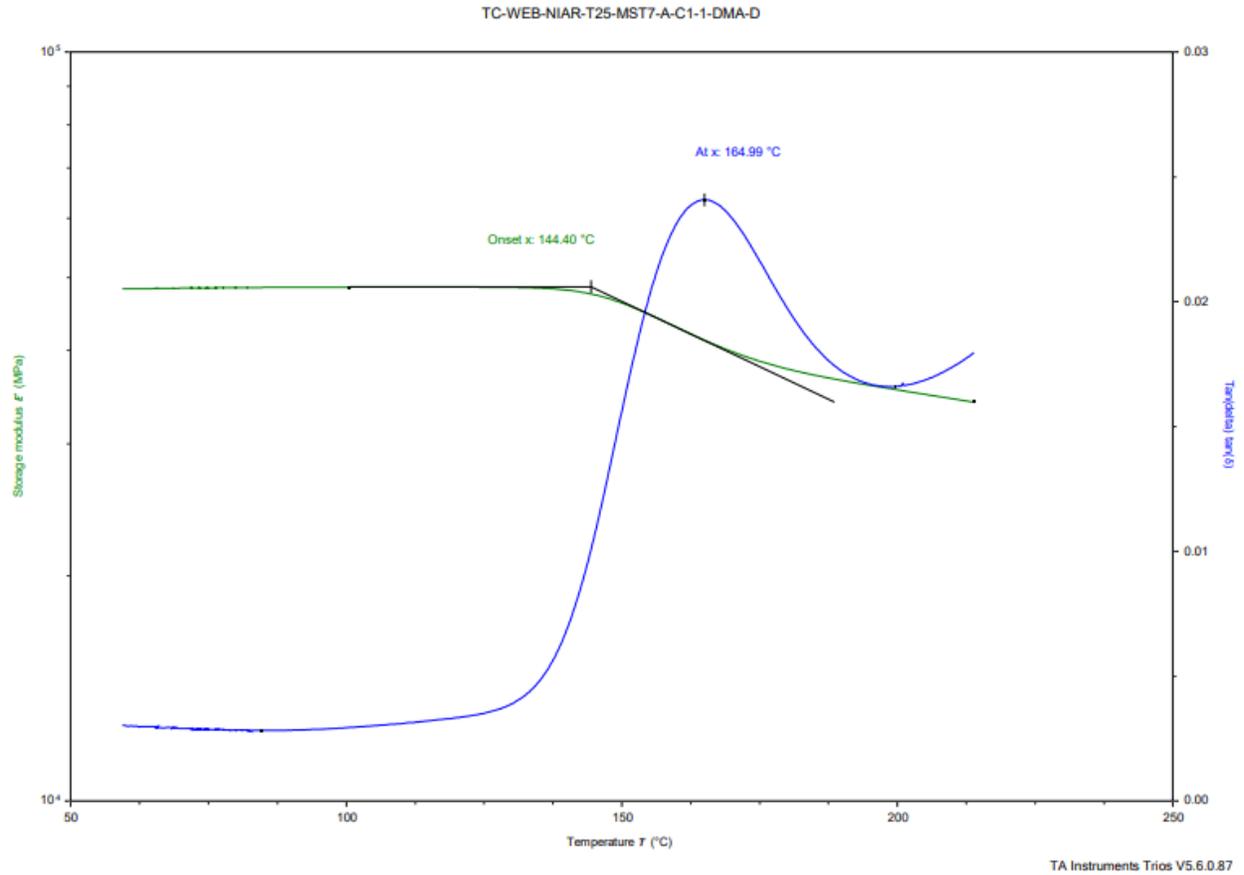
8.2 DMA Wet Data

| DMA Results Summary | | | | |
|---|-----------------------|---------------------|-----------------------|---------------------|
| Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) Qualification DMA Wet | | | | |
| Sample # | Onset Storage Modulus | | Peak of Tangent Delta | |
| | T _g [°C] | T _g [°F] | T _g [°C] | T _g [°F] |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5-C-C1-1-DMA-W-1 | 130.76 | 267.37 | 155.12 | 311.22 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5-C-C1-1-DMA-W-2 | 131.13 | 268.03 | 154.08 | 309.34 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5-C-C1-1-DMA-W-3 | 130.78 | 267.40 | 154.02 | 309.24 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C1-1-DMA-W | 133.45 | 272.21 | 155.37 | 311.67 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C2-1-DMA-W | 133.65 | 272.57 | 156.15 | 313.07 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C1-1-DMA-W | 132.79 | 271.02 | 155.09 | 311.16 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C2-1-DMA-W | 133.75 | 272.75 | 155.78 | 312.40 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-C-C1-1-DMA-W | 132.77 | 270.99 | 154.81 | 310.66 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-C-C2-1-DMA-W | 133.57 | 272.43 | 155.70 | 312.26 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8R-A-C1-1-DMA-W | 133.81 | 272.86 | 155.90 | 312.62 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-A-C2-1-DMA-W | 133.72 | 272.70 | 155.97 | 312.75 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-B-C1-1-DMA-W | 132.73 | 270.91 | 154.69 | 310.44 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-B-C2-1-DMA-W | 133.59 | 272.46 | 155.74 | 312.33 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-C-C1-1-DMA-W | 132.88 | 271.18 | 155.39 | 311.70 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-C-C2-1-DMA-W | 132.96 | 271.33 | 155.48 | 311.86 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C1-1-DMA-W | 133.09 | 271.56 | 155.01 | 311.02 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C2-1-DMA-W | 134.24 | 273.63 | 156.49 | 313.68 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C1-1-DMA-W | 134.65 | 274.37 | 155.36 | 311.65 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C2-1-DMA-W | 135.33 | 275.59 | 156.14 | 313.05 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-C-C1-1-DMA-W | 132.64 | 270.75 | 155.37 | 311.67 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-C-C2-1-DMA-W | 133.75 | 272.75 | 155.01 | 311.02 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-A-C1-1-DMA-W | 134.69 | 274.44 | 156.79 | 314.22 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-A-C2-1-DMA-W | 134.83 | 274.69 | 155.87 | 312.57 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-B-C1-1-DMA-W | 134.32 | 273.78 | 156.19 | 313.14 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-B-C2-1-DMA-W | 134.48 | 274.06 | 154.91 | 310.84 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-C-C1-1-DMA-W | 133.47 | 272.25 | 155.61 | 312.10 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-C-C2-1-DMA-W | 133.91 | 273.04 | 155.94 | 312.69 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C1-1-DMA-W | 131.94 | 269.49 | 152.96 | 307.33 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C2-1-DMA-W | 132.65 | 270.77 | 154.09 | 309.36 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C1-1-DMA-W | 131.25 | 268.25 | 152.40 | 306.32 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C2-1-DMA-W | 131.91 | 269.44 | 152.87 | 307.17 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-C-C1-1-DMA-W | 130.62 | 267.12 | 152.35 | 306.23 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-C-C2-1-DMA-W | 131.11 | 268.00 | 152.63 | 306.73 |
| Average | 133.07 | 271.52 | 155.01 | 311.02 |
| Standard Deviation | 1.28 | 2.31 | 1.21 | 2.17 |

8.3 DMA Ambient Batch A

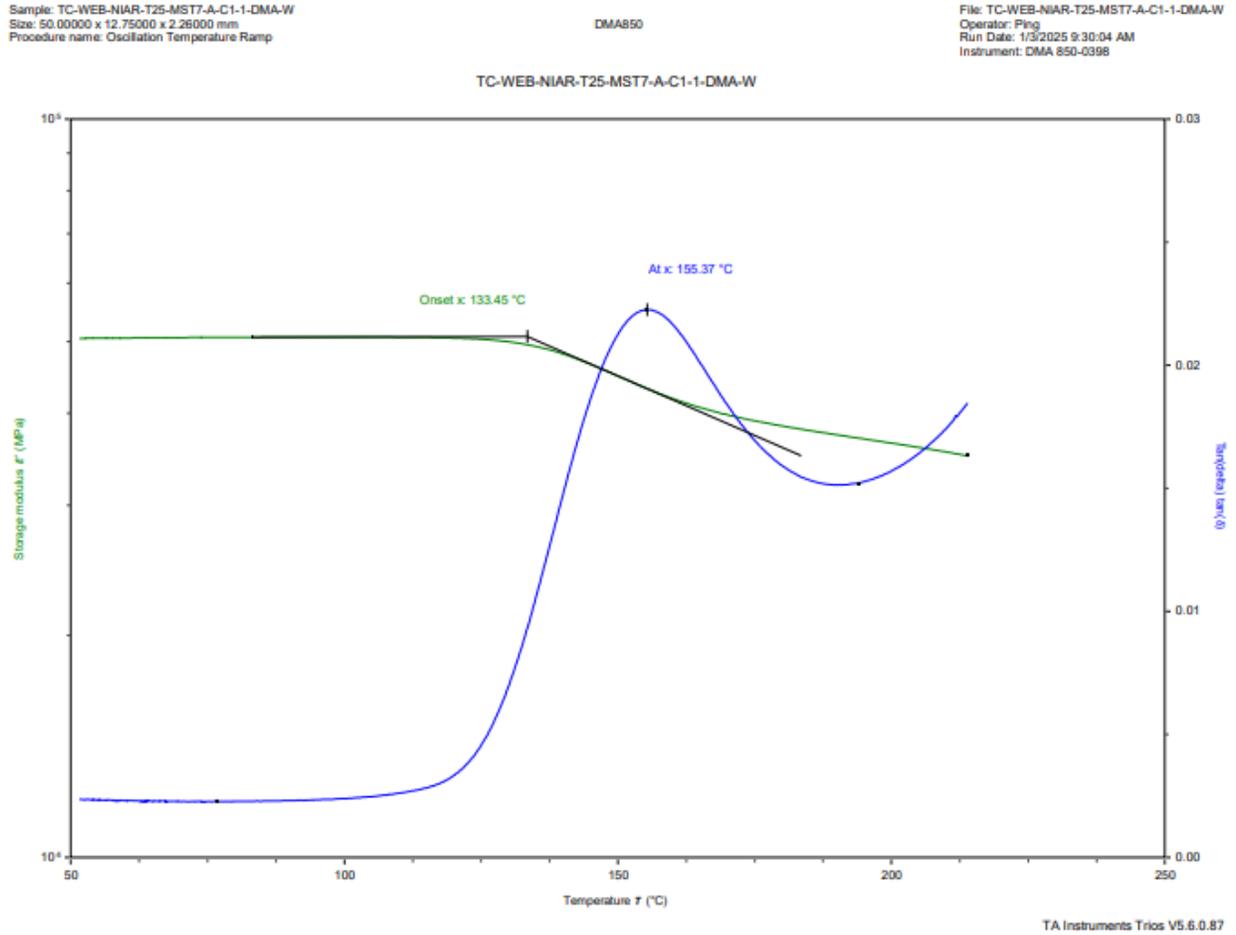
A representative of DMA Ambient profile from Batch A is provided below.

Sample: TC-WEB-NIAR-T25-MST7-A-C1-1-DMA-D
Size: 50.00000 x 12.72000 x 2.26000 mm
Procedure name: Oscillation Temperature Ramp
DMA850
File: TC-WEB-NIAR-T25-MST7-A-C1-1-DMA-D
Operator: Ping
Run Date: 9/14/2024 3:22:35 PM
Instrument: DMA 850-0398



8.4 DMA Wet Batch A

A representative of DMA Wet profile from Batch A is provided below.



9. DSC Results

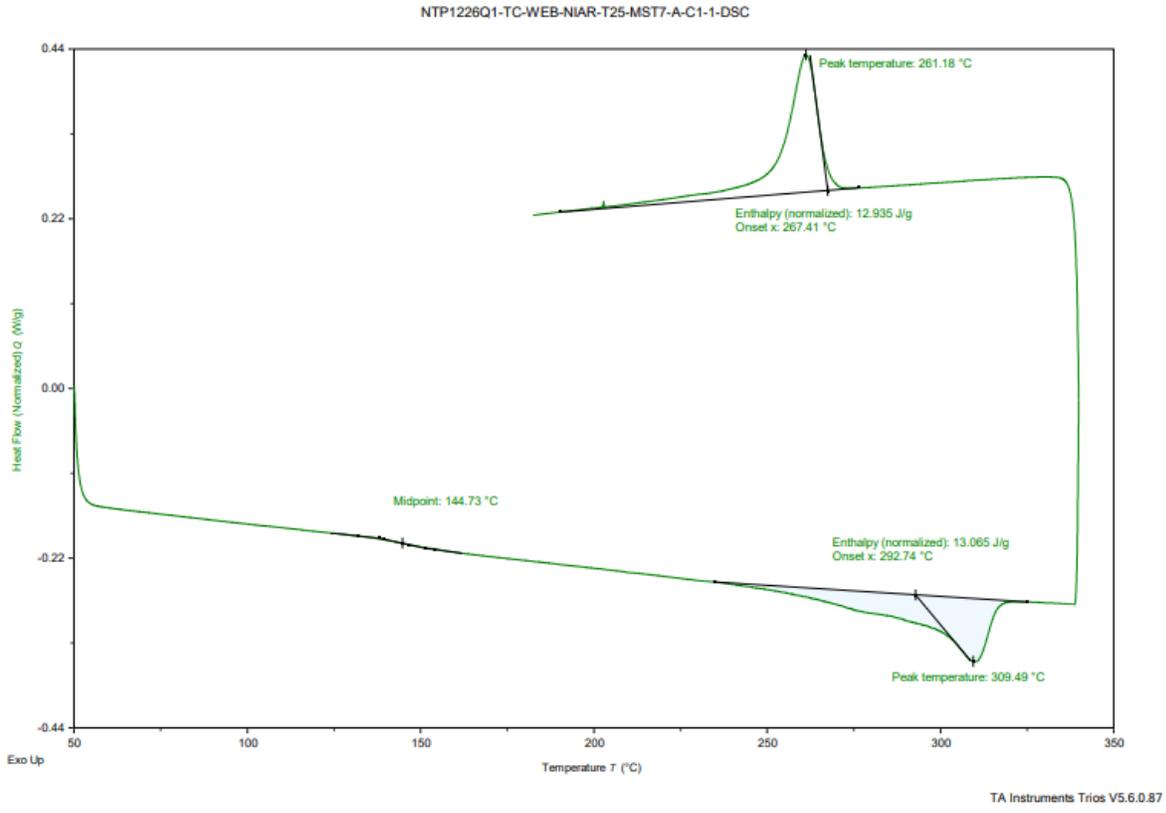
| DSC Results | | | | | | | | | |
|---|------------------------------|------------|--------------------------|---------------|---|----------------------------------|---------------|---|------------------------------|
| Toray Cetex® TC1225 (LM PAEK) T700GC 145 gsm 34% RC Unsized Unitape (0.25 inch) Qualification | | | | | | | | | |
| Sample # | Glass Transition Temperature | | Melting Peak Temperature | | Enthalpy of Melting ΔH_m [J/g] | Crystallization Peak Temperature | | Enthalpy of Crystallization ΔH_c [J/g] | Degree of Crystallinity % |
| | T_g [°C] | T_g [°F] | T_{mp} [°C] | T_{mp} [°F] | | T_{cp} [°C] | T_{cp} [°F] | | |
| NTP1226Q1-TC-WEB-NIAR-T25-MST5-C-C1-1-DSC | 144.83 | 292.69 | 310.36 | 590.65 | 11.981 | 260.26 | 500.47 | 11.59 | 27.11 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C1-1-DSC | 144.73 | 292.51 | 309.49 | 589.08 | 13.065 | 261.18 | 502.12 | 12.94 | 29.56 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C2-1-DSC | 147.36 | 297.25 | 310.17 | 590.31 | 12.078 | 260.61 | 501.10 | 11.81 | 27.33 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C1-1-DSC | 145.91 | 294.64 | 309.97 | 589.95 | 12.140 | 260.13 | 500.23 | 12.01 | 27.47 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-B-C2-1-DSC | 144.10 | 291.38 | 310.40 | 590.72 | 12.715 | 260.50 | 500.90 | 12.33 | 28.77 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-C-C1-1-DSC | 150.79 | 303.42 | 310.71 | 591.28 | 12.821 | 261.42 | 502.56 | 12.65 | 29.01 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST7-C-C2-1-DSC | 144.49 | 292.08 | 310.50 | 590.90 | 12.801 | 261.29 | 502.32 | 12.97 | 28.96 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-A-C1-1-DSC | 147.81 | 298.06 | 310.65 | 591.17 | 12.569 | 261.23 | 502.21 | 11.673 | 28.44 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-A-C2-1-DSC | 146.99 | 296.58 | 310.40 | 590.72 | 12.895 | 261.47 | 502.65 | 12.125 | 29.17 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-B-C1-1-DSC | 143.65 | 290.57 | 310.06 | 590.11 | 12.639 | 260.13 | 500.23 | 12.51 | 28.60 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-B-C2-1-DSC | 144.81 | 292.66 | 310.30 | 590.54 | 12.985 | 260.49 | 500.88 | 12.913 | 29.38 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-C-C1-1-DSC | 147.30 | 297.14 | 310.43 | 590.77 | 12.560 | 261.12 | 502.02 | 12.36 | 28.42 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST8-C-C2-1-DSC | 142.33 | 288.19 | 310.58 | 591.04 | 12.359 | 261.02 | 501.84 | 12.368 | 27.96 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C1-1-DSC | 143.03 | 289.45 | 309.96 | 589.93 | 11.722 | 261.14 | 502.05 | 11.54 | 26.52 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-A-C2-1-DSC | 150.52 | 302.94 | 310.29 | 590.52 | 12.706 | 260.93 | 501.67 | 12.217 | 28.75 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C1-1-DSC | 143.70 | 290.66 | 310.41 | 590.74 | 12.841 | 260.15 | 500.27 | 12.47 | 29.05 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-B-C2-1-DSC | 143.30 | 289.94 | 310.06 | 590.11 | 12.938 | 260.24 | 500.43 | 12.70 | 29.27 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-C-C1-1-DSC | 143.20 | 289.76 | 310.55 | 590.99 | 12.870 | 261.16 | 502.09 | 12.68 | 29.12 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST9-C-C2-1-DSC | 147.89 | 298.20 | 311.23 | 592.21 | 12.943 | 261.16 | 502.09 | 12.463 | 29.28 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-A-C1-1-DSC | 143.04 | 289.47 | 310.21 | 590.38 | 12.170 | 261.26 | 502.27 | 11.944 | 27.53 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-A-C2-1-DSC | 143.71 | 290.68 | 310.08 | 590.14 | 12.463 | 261.25 | 502.25 | 12.615 | 28.20 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-B-C1-1-DSC | 140.91 | 285.64 | 310.61 | 591.10 | 12.326 | 260.34 | 500.61 | 12.362 | 27.89 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-B-C2-1-DSC | 141.69 | 287.04 | 310.10 | 590.18 | 12.695 | 260.18 | 500.32 | 12.406 | 28.72 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-C-C1-1-DSC | 142.69 | 288.84 | 310.68 | 591.22 | 12.180 | 261.02 | 501.84 | 12.055 | 27.56 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST10-C-C2-1-DSC | 142.49 | 288.48 | 309.88 | 589.78 | 12.373 | 260.66 | 501.19 | 11.432 | 27.99 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C1-1-DSC | 143.86 | 290.95 | 309.95 | 589.91 | 12.801 | 261.71 | 503.08 | 11.985 | 28.96 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-A-C2-1-DSC | 147.64 | 297.75 | 310.31 | 590.56 | 11.999 | 261.30 | 502.34 | 12.041 | 27.15 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C1-1-DSC | 142.89 | 289.20 | 310.08 | 590.14 | 12.678 | 259.96 | 499.93 | 12.553 | 28.68 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-B-C2-1-DSC | 147.51 | 297.52 | 310.74 | 591.33 | 12.522 | 260.47 | 500.85 | 12.43 | 28.33 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-C-C1-1-DSC | 143.13 | 289.63 | 310.83 | 591.49 | 12.694 | 261.05 | 501.89 | 12.73 | 28.72 |
| NTP1226Q1-TC-WEB-NIAR-T25-MST12-C-C2-1-DSC | 142.82 | 289.08 | 310.45 | 590.81 | 12.484 | 261.18 | 502.12 | 12.434 | 28.24 |
| Average | 144.81 | 292.66 | 310.34 | 590.61 | 12.55 | 260.84 | 501.51 | 12.30 | 28.39 |
| Standard Deviation | 2.51 | 4.51 | 0.34 | 0.62 | 0.342 | 0.49 | 0.88 | 0.413 | 0.77 |

ΔH_f^0 (theoretical maximum heat of fusion for a fully crystalline sample) 130 J/g
 Theoretical R_c (resin content) 34 %

9.1 DSC Graph

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

Sample: NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C1-1-DSC
Method: Heat & Cool @ 10C/min
Operator: Ping
File: X:\Data\DSC\Air Force Research Laboratory\2024\MASC TC1225 VBO Qualification\NTP1226Q1-TC-WEB-NIAR-T25-MST7-A-C1-1-DSC.txi
Instrument/Date: DSC2500,10/9/2024 2:56:27 PM
Sample Mass: 33.07 mg
Pan type: Tzero Aluminium
Project: AFRL MASC TC1225 VBO Qualification DSC



10. Moisture Loss

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

| Layup | Test Type | Test Temperature | Specimen ID | Weight Pre-Test (g) | Weight Post-Test (g) | Moisture Loss (g) |
|-----------------|-----------|------------------|---------------------------|---------------------|----------------------|-------------------|
| [0]8 | LT | ETW (275°F) | T25-MST1-B-C1-1-Trav | 17.95 | 17.94 | 0.004700 |
| [90]16 | TT | ETW (275°F) | T25-MST2-B-C1-1-TT-SP-7 | 22.60 | 22.60 | 0.005100 |
| [0]20 | TC | ETW (275°F) | MST3-B-C1-1-TC-SP-7 | 7.846 | 7.845 | 0.0006000 |
| | LC | ETW (275°F) | T25-MST3-B-C1-1-Trav | 17.78 | 17.78 | 0.002400 |
| [90/0]4s | UNC0 | ETW (275°F) | T25-MST4-B-C1-1-UNC0-SP-7 | 6.142 | 6.140 | 0.001100 |
| | UNCFS | ETW (275°F) | T25-MST4-C-C2-1-Trav | 20.55 | 20.54 | 0.007200 |
| [+45/-45]4s | IPS | ETW (275°F) | T25-MST5-B-C1-IPS-SP-7 | 22.23 | 22.22 | 0.007500 |
| [0]34 | SBS | ETW (275°F) | T25-MST6-B-C2-1-Trav | 19.41 | 19.41 | 0.002900 |
| | DNS | ETW (275°F) | T25-MST6-B-C1-1-Trav | 19.34 | 19.33 | 0.005800 |
| [45/0/-45/90]2S | UNT1 | ETW (275°F) | T25-MST7-B-C2-1-UNT1-SP-7 | 22.67 | 22.66 | 0.003100 |
| | OHT1 | ETW (275°F) | T25-MST7-B-C1-1-OHT1-SP-7 | 40.47 | 40.43 | 0.03320 |
| | SSB1 | ETW (275°F) | T25-MST8-B-C1-1-SSB1-SP-5 | 18.99 | 18.98 | 0.009000 |
| | FHT1 | ETW (275°F) | T25-MST8-B-C1-1-FHT1-SP-7 | 41.41 | 41.40 | 0.005500 |
| [45/0/-45/90]3S | SBS1 | ETW (275°F) | T25-MST9-B-C2-1-Trav | 21.38 | 21.37 | 0.005500 |
| | DNS1 | ETW (275°F) | T25-MST9-B-C2-1-DNS1-SP-6 | 5.211 | 5.208 | 0.002500 |
| | UNC1 | ETW (275°F) | T25-MST9-B-C1-1-UNC1-SP-6 | 9.039 | 9.037 | 0.001200 |
| [45/0/-45/90]4S | OHC1 | ETW (275°F) | T25-MST10-B-C2-OHC1-SP-5 | 83.71 | 83.70 | 0.01180 |
| | FHC1 | ETW (275°F) | T25-MST10-B-C2-FHC1-SP-5 | 83.56 | 83.54 | 0.01540 |
| | CAI1 | ETW (275°F) | T25-MST11-C-C1-CAI1-SP-2 | 109.4 | 109.4 | 0.03290 |

11. Deviations

N/A