Tenax™-E TPWF PEEK-HTA40 E13 3K 5HS Qualification Material Property Data Report

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1. Introduction

1.1 Scope

The test methods and results described in this document are intended to provide basic composite properties essential to most methods of analysis and are consistent with CMH-17-1G—Composite Materials Handbook for Polymer Matrix Composites. This report contains material property data of common usefulness to wide range of projects. The lamina and laminate material property data have been generated with NCAMP oversight in accordance with NSP 100 NCAMP Standard Operating Procedures; the test panels and test specimens have been inspected by NCAMP Authorized Inspection Representatives (AIR) and the testing has been witnessed by NCAMP Authorized Engineering Representatives (AER). However, the data may not fulfill all the needs of any specific company's program; specific properties, environments, laminate architecture, and loading situations may require additional testing.

The use of NCAMP material and process specifications does not guarantee material or structural performance. Material users should be actively involved in evaluating material performance and quality including, but not limited to, performing regular purchaser quality control tests, performing periodic equivalency/additional testing, participating in material change management activities, conducting statistical process control, and conducting regular supplier audits.

The applicability of NCAMP material property data, material allowables, and specifications must be evaluated on a case-by-case basis by aircraft companies and certifying agencies. NCAMP assumes no liability whatsoever, expressed or implied, related to the use of the material property data, material allowables, and specifications.

This report contains material property data only. Statistical analysis of the data including the calculations of b-basis values is given in a separate report, Tenax™-E TPWF PEEK-HTA40 E13 3K 5HS Fabric Qualification Statistical Analysis Report NCP-RP-2019-004 Rev N/C. The qualification material was procured to NCAMP Material Specification NMS 401 Rev B dated February 2, 2023. NCAMP Material Specification NMS 401/3 Rev A dated March 8, 2023 was created at later date as a supplement material specification for Tenax™-E TPWF/TPCL PEEK-HTA40 3K 5HS weave fabric fiber. The qualification test panels were consolidated in accordance with NCAMP Process Specification NPS 84013 Rev B dated February 1, 2023 with Baseline “M” Consolidate Cycle. The NCAMP Test Plan NTP4013Q1 Rev E 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-17-1G. 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-17-1G are adequate for the given program.

Aircraft companies should not use the data published in this report without specifying NCAMP Material Specification NMS 401/3. NMS 401/3 may have additional requirements that are listed in its prepreg process control document (PCD), fiber specification, fiber PCD, and other raw material specifications and PCDs which impose essential quality controls on the raw materials and raw material manufacturing equipment and processes. *Aircraft companies and certifying agencies should assume that the material property data published in this report is not applicable when the material is not procured to NMS 401/3.* NMS 401/3 is a free, publicly available, non-proprietary aerospace industry material specification.

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

1.2 Symbols Used

ν_{12}^{t}	major Poisson's ratio, tension
$\mu\varepsilon$	micro-strain
E_1^{c}	compressive modulus, longitudinal / warp direction
E_1^{t}	tensile modulus, longitudinal / warp direction
E_2^{c}	compressive modulus, transverse / fill direction
E_2^{t}	tensile modulus, transverse / fill direction
F_1^{cu}	ultimate compressive strength, longitudinal / warp direction
F_1^{tu}	ultimate tensile strength, longitudinal / warp direction
F_2^{cu}	ultimate compressive strength, transverse / fill direction
F_2^{tu}	ultimate tensile strength, transverse / fill direction
ν_{12}^{c}	major Poisson's Ratio, compression
ν_{21}^{c}	minor Poisson's Ratio, compression
F_{12}^{su}	in-plane shear ultimate peak strength
F_{12}^{smax}	in-plane shear peak strength before 5% strain
$F_{12}^{s5\% \text{ strain}}$	in-plane shear strength at 5% strain
$F_{12}^{s4\% \text{ strain}}$	in-plane shear strength at 4% strain
$F_{12}^{s0.2\%}$	in-plane shear strength at 0.2% offset
G_{12}^{s}	in-plane shear modulus

Superscripts

c	compression
cu	compression ultimate

s	shear
su	shear ultimate
t	tension
tu	tension ultimate

Subscripts

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

Acronyms and Definitions

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

1.3 NIAR–Specimen Naming Format

All panels and specimens shall be uniquely identified by an 10 code reference system, cross referenced with descriptive identification information as follows: This Document Number-Company ID-Material Code-Fabricator ID-Intended Test Type-Batch ID-Consolidate Cycle ID-Test Panel ID-Actual Test Type-Test Condition-Specimen Number. For example, NTP4013Q1-TTX-T40-E-WT-A-M1-2-RTD-3 denotes Company: Teijin Carbon Europe, Semipreg Name: Tenax™-E TPWF PEEK-HTA40 E13 3K 5HS semipreg, Fabricator: Porcher Industries, Intended Test Type: Warp Tension, Semipreg Batch: A, Consolidated Cycle: Baseline Temperature Cycle 1, Test Panel ID: 2, Test Condition: Room Temperature Dry, and Specimen Number: 3. The testing lab may assign a separate identification code but must reference the 10 code reference system and uniquely identify the panels and specimens.

Panels to be manufactured are listed in Appendix 2 from the test plan NTP 4013Q1 and will follow the same I.D. above, inherently omitting the actual test type, test condition and specimen number. The above parameters can have the following values:

Company ID:
TTX: Teijin Carbon Europe (Formerly known as Toho Tenax Europe)

Material ItemCode:	Semipreg Name:
T40	P30024, Tenax™-E TPWF PEEK-4-40 HTA40 E13 3K 5HS-285

Fabricator ID (Company that lays up, bags, and consolidates the test panels):
Porcher Industries: E

Intended Test Type	
WT: Warp tension	UNT1, UNT2…: Un-notched Tension Layup 1, Layup 2, etc.
FT: Fill Tension	OHT1, OHT2...: Open Hole Tension Layup 1, Layup 2, etc.
WC: Warp Compression	OHC1, OHC2...: Open Hole Compression Layup 1 etc.
FC: Fill Compression	FHT1, FHT2…: Filled Hole Tension Layup 1, Layup 2 etc.
IPS: In Plane Shear	FHC1, FHC2…: Filled Hole Compression Layup 1, Layup 2 etc.
SBS: Short Beam Strength	SSB1, SSB2…: Single Shear Pin Bearing Layup 1, Layup 2…..etc.
LT: Longitudinal Tension	CAI1: Compression After Impact Layup 1, Layup 2, … etc.
TT: Transverse Tension	

LC: Longitudinal Compression	DMA: Dynamic Mechanical Analysis
TC: Transverse Compression	DSC: Differential Scanning Calorimetry
ILT: Interlaminar Tension	TGA: Thermogravimetric Analysis
QI: Quasi Isotropic	SBS1: Short Beam Strength Layup 1

(Note that the layup numbers 1, 2 and 3 correspond to those designated as “quasi isotropic,” “soft” and “hard” respectively. In addition, the 0°/90° cross-plied laminates used for the unidirectional materials only are designated “Layup 0”).

Batch ID: A, B, C, D, E, F, etc. (to be cross referenced with semipreg batch numbers as shown in appendix 3 of the test plan NTP4013Q1)

Consolidate Cycle ID: M1, M2, M3, etc. Baseline Temp. Consolidate Cycle 1, 2, 3, etc.

Note: Consolidate Cycle numbers 1, 2, 3, etc. in Appendix 2 of the test plan NTP4013Q1 are for reference only. Actual numbers may vary depending on the actual consolidate cycle runs.

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

Actual Test Type	
WT: Warp tension	UNT1, UNT2...: Un-notched Tension Layup 1, Layup 2, etc.
FT: Fill Tension	OHT1, OHT2...: Open Hole Tension Layup 1, Layup 2, etc.
WC: Warp Compression	OHC1, OHC2...: Open Hole Compression Layup 1 etc.
FC: Fill Compression	FHT1, FHT2…: Filled Hole Tension Layup 1, Layup 2 etc.
IPS: In Plane Shear	FHC1, FHC2…: Filled Hole Compression Layup 1, Layup 2 etc.
SBS: Short Beam Strength	SSB1, SSB2…: Single Shear Pin Bearing Layup 1, Layup 2…..etc.
SBS1: Short Beam Strength Layup 1	CAI1: Compression After Impact Layup 1, Layup 2, etc.
DMA: Dynamic Mechanical Analysis	DSC: Differential Scanning Calorimetry
ILT: Interlaminar Tension Layup	TGA: Thermogravimetric Analysis
QI: Quasi Isotropic	SBS1: Short Beam Strength Layup 1

Test Condition: CTD, RTD, ETD, ETW (cold temp. dry moisture, room temp. dry moisture, etc., see section 1.5.6, if testing at more than one elevated temperature use ETD1, ETD2, etc.)
FS11RT, FS12RT, FS13RT, etc. (fluid sensitivity test - see Table 1-4)
0/1, 0/5, 0/7, 0/10, etc.
D, W (dry, wet conditions for DMA)

Specimen Number: 1,2,3,4,5,6,7,8,9,10, etc.

1.4 References

ASTM Standards

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

- ASTM D2344/D2344M-16 – Standard Test Method for Short-Beam Strength of Polymer Matrix Composite Materials and Their Laminates
- ASTM D3039/D3039M-17 – Standard Test Method for Tensile Properties of Polymer Matrix Composite Materials
- ASTM D3418-15 – Standard Test Method for Transition Temperatures and Enthalpies of Fusion and Crystallization of Polymers by Differential Scanning Calorimetry
- ASTM D3518/D3518M-17 – Standard Test Method for In-Plane Shear Response of Polymer Matrix Composite Materials by Tensile Test of a ± 45º
- ASTM D5766/D5766M-11 – Standard Test Method for Open Hole Tensile Strength of Polymer Matrix Composite Laminates
- ASTM D5961/D5961M-17 – Standard Test Method for Bearing Response of Polymer Matrix Composite Laminates
- ASTM D6415/D6415M-06a(2013) – Standard Test Method for Measuring the Curved Beam Strength of a Fiber-Reinforced Polymer-Matrix Composite
- ASTM D6484/D6484M-14 – Standard Test Method for Open-Hole Compressive Strength of Polymer Matrix Composite Laminates
- ASTM D6641/D6641M-16e1 – Standard Test Method for Determining the Compressive Properties of Polymer Matrix Composite Laminates Using a Combined Loading Compression (CLC) Test Fixture
- ASTM D6742/D6742M-12 – Standard Practice for Filled-Hole Tension and Compression Testing of Polymer Matrix Composite Laminates
- ASTM D7028-07e1 – Standard Test Method for Glass Transition Temperature (DMA Tg) of Polymer Matrix Composites by Dynamic Mechanical Analysis (DMA)
- ASTM D7136/D7136M-12 – Standard Test Method for Measuring the Damage Resistance of a Fiber-Reinforced Polymer Matrix Composite to a Drop-Weight Impact Event
- ASTM D7137/D7137M-12 – Standard Test Method for Compressive Residual Strength Properties of Damaged Polymer Matrix Composite Plates.

1.5 Methodology

1.5.1 Process Definition

For each combination of test, batch and condition, the specimens were selected from a minimum of two separate panels consolidated separately as shown in Figure 1-1 unless otherwise specified.

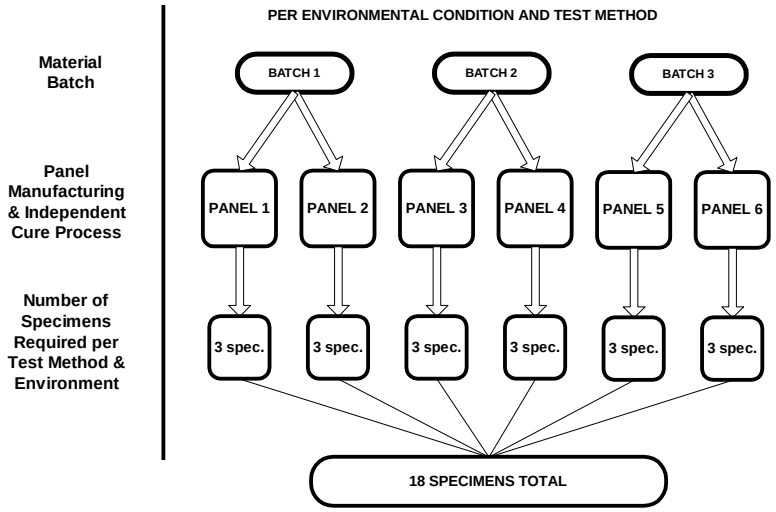


Figure 1-1: Specimen Selection Methodology

All panels were fabricated in accordance with NCAMP Process Specification NPS 84013 “M” Consolidated Cycle.

In order to facilitate individual specimen trace ability, individual specimen numbering and/or skewed lines were written or drawn across each sub-panel as shown in Figure 1-2.

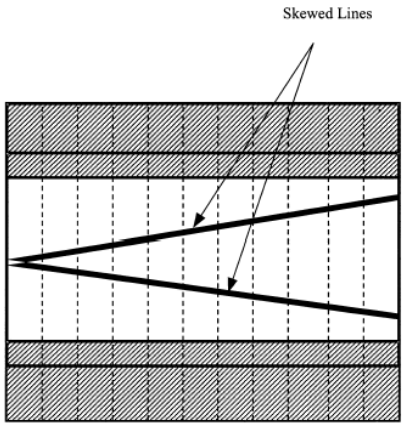


Figure 1-2: Specimen Traceability Line

1.5.2 Specimen & Testing Details

1.5.2.1 Tabbing

Fiberglass tabs was used for all tensile test in this program.

1.5.2.2 Specimen Dimensions & Test Configuration

For Lamina SBS specimens and Fluid Sensitivity SBS specimens, a span of 3.5T was used where T was the average thickness of six qualification panels. The same T was used to compute the width and length of the specimen. For the Laminate SBS1 specimens, a span of 4T was used per ASTM D2344.

For filled-hole tension tests, the fasteners were installed to 85±5 in-lb above the prevailing torque. For filled-hole compression and bearing tests, the fasteners were installed to 30±5 in-lb above the prevailing torque. Prevailing torque is the torque required to overcome drag/friction to turn the nut; none of the prevailing torque goes toward creating clamping force. For example, if the prevailing torque is 15 in-lbs, apply an additional 85±5 in-lb for a total of 100±5 in-lbs. Fasteners were installed after moisture conditioning.

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

For filled-hole and bearing tests, the hole diameter was 0.25 in -0.000 +0.003 in. The following fasteners were used:

1) NASM 21297-04003 bolts with NASM 21084 nuts and MS21206 washers for FHT and FHC
2) NASM 21297-04013 bolts with MS 21084 nuts and MS21206 washers for SSB

1.5.2.3 Specimen Strain Device Used

Uniaxial gages were used on:

One of CAI un-impacted specimen for balancing.

Biaxial gages were used on:

All condition of tensile specimens.

All conditions of combined loading compression specimens, on both sides.

All conditions of IPS specimens.

1.5.2.4 Testing Assignment

The initial mechanical and physical testing were conducted at two locations with the following assignment:

Batch A, B & C with Consolidation Cycle M1 & M2

Teijin Carbon Europe GmbH, Wuppertal, Germany

ASTM D3039 Warp Tension
ASTM D6641 Warp Compression
ASTM D3039 Fill Tension
ASTM D6641 Fill Compression
ASTM D3518 In-plane Shear
ASTM D3039 Un-notched Tension
ASTM D6641 Un-notched Compression
ASTM D5766 Open Hole Tension
ASTM D6484 Open Hole Compression
ASTM D6742 Filled Hole Tension
ASTM D6742 Filled Hole Compression
ASTM D7136/D7137 Compression After Impact

Note: All the above test data were provided by Teijin Carbon Europe GmbH

NIAR, Wichita State University, Wichita KS, USA

ASTM D2344 Short Beam Strength
ASTM D5961 Single Shear Bearing
ASTM D6415 Curve Beam Strength
ASTM D6641 Un-notched Compression Retest

During the material qualification process, it was found that there is a measurable difference in multiple material property values between the two consolidation processes that were used to generate panels for the qualification test program. A static press, labeled as “Press #1” (Consolidation Cycle M1) and a multi-step press, labeled as “Press #3” (Consolidation Cycle M2) were used, both delivering one-half of the required data. All the Press #1” (Consolidation Cycle M1) data have been removed substitute with the retest data from Batch D with the multi-step press consolidation cycle and the tests were performed at the following location:-

Batch D with Consolidation Cycle M3 & M4

NIAR, Wichita State University, Wichita KS, USA

ASTM D2344 Short Beam Strength
ASTM D5961 Single Shear Bearing
ASTM D6415 Curve Beam Strength
ASTM D6641 Un-notched Compression Retest
ASTM D3039 Warp Tension
ASTM D6641 Warp Compression
ASTM D3039 Fill Tension
ASTM D6641 Fill Compression
ASTM D3518 In-plane Shear
ASTM D3039 Un-notched Tension
ASTM D6641 Un-notched Compression
ASTM D5766 Open Hole Tension
ASTM D6484 Open Hole Compression
ASTM D6742 Filled Hole Tension
ASTM D6742 Filled Hole Compression
ASTM D7136/D7137 Compression After Impact

1.5.3 Test Matrix

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

Teijin Internal Panel Layup (5)	NCAMP Specimen Layup (5) (warp direction)	Test Type and Direction	Property	Number of Batches x Number of Panels x Number of Test Specimens			
				Test Temperature/Moisture Condition			
				CTD	RTD	ETD	ETW
[0/90°]4s	(6) [0°]4s	ASTM D3039 Warp Tension	Strength, Modulus, and Poisson's Ratio	3x2x3	3x2x3 (4)		3x2x3
[0/90°]5s	(6) [0°]5s	ASTM D6641 Warp Compression	Strength and Modulus	3x2x3	3x2x3 (1)(4)	3x2x3	3x2x3 (3)
[0/90°]4s	(7) [90°]4s	ASTM D3039 Fill Tension	Strength and Modulus	3x2x3	3x2x3 (4)		3x2x3
[0/90°]5s	(8) [90°]5s	ASTM D6641 Fill Compression	Strength and Modulus	3x2x3	3x2x3 (1)(4)	3x2x3	3x2x3 (3)
[±45°]4s	[45°]4s	ASTM D3518 In-Plane Shear (2)	Strength and Modulus	3x2x3	3x2x3 (4)		3x2x3
[0/90º]10s	[0°]10s	ASTM D2344 Short Beam	Strength	3x2x3	3x2x3	3x2x3	3x2x3

Table 1-1: Lamina Level Test Matrix

Note 1: Back-to-back strain gages are needed on the first two specimens of each environment. If no buckling is observed, the remaining modulus specimens will require a strain gage on one side of the specimens only. An appropriate extensometer may be used in place of the strain gage.
Note 2: Gripped (tab) length is 1.5±0.5" on each end of the 10" long specimen. Once the samples have reached the 5% strain level, the actuator/crosshead displacement rate can be increased by four times the initial rate. Continue testing at the higher strain rate until ultimate failure is observed.
Note 3: If strain gage is used for modulus measurement, a separate un-gaged specimen must be used for strength measurement; because the strain gage and its protective coating may prevent moisture absorption in the gage area.
Note 4: At least two specimens must be gaged to obtain full stress-strain curve to failure. An appropriate extensometer may be used in place of the strain gage for the remaining specimens.
Note 5: Both Teijin's internal panel layup and NCAMP specimen layup have identical number of ply.
Note 6: Specimen were machined in the 0 degree direction/ warp direction of the panel.
Note 7: Panels were fabricated with [0°]4s layup but specimens were machined in [90°]4s from the panel.
Note 8: Panels were fabricated with [0°]5s layup but specimens were machined in [90°]5s from the panel.

Table 1-2 below summarizes the laminate level tests carried out. The layup angles 0º, 45º, -45º, and 90º refer to the orientation of the warp/longitudinal fiber direction. The laminate stacking sequences in this program are not specific to any design. Therefore, careful consideration should be given to the validity of properties derived from this program based on the design specific laminates in a structure to be certified.

Table 1-2 also emphasizes those properties and test condition combinations believed to constitute the worst case, which in general is cold dry for tension and hot wet for compression and other matrix dominated properties.

(%0º/%±45º/%90º) Actual Test Type	Test Type and Layup (5)	Teijin Internal Panel Layup (9)	NCAMP Specimen Layup (9)	Property	Number of Batches x Number of Panels x Number of Test Specimens		
					Test Temperature/Moisture Condition		
					CTD	RTD	ETW
(25/50/25 - QI) UNT1	ASTM D3039 Un-notched Tension 1	$[0/90,\pm45]_{2S}$	$[0/45]_{2S}$	Strength & modulus	3x2x3	3x2x3 (7)	3x2x3
(10/80/10) UNT2	ASTM D3039 Un-notched Tension 2	$[(\pm45)_2,0/90,(\pm45)_2]_S$	$[(45)_2/0/(45)_2]s$	Strength & modulus	3x2x3	3x2x3 (7)	3x2x3
(40/20/40) UNT3	ASTM D3039 Un-notched Tension 3	$[(0/90)_4,\pm45]_S$	$[(0)_4/45]_S$	Strength & modulus	3x2x3	3x2x3 (7)	3x2x3
(25/50/25 - QI) UNC1	ASTM D6641 Un-notched Compression 1	$[0/90,\pm45]_{2S}$	$[0/45]_{2S}$	Strength & modulus		3x2x3 (4&7)	3x2x3 (6)
(10/80/10) UNC2	ASTM D6641 Un-notched Compression 2	$[(\pm45)_2,0/90,(\pm45)_2]s$	$[(45)_2/0/(45)_2]s$	Strength & modulus		3x2x3 (4&7)	3x2x3 (6)
(40/20/40) UNC3	ASTM D6641 Un-notched Compression 3	$[(0/90)_4,\pm45]s$	$[(0)_4/45]s$	Strength & modulus		3x2x3 (4&7)	3x2x3 (6)
(25/50/25 - QI) SBS1	ASTM D2344 Short Beam	$[0/90,\pm45]_{3S}$	$[0/45]_{3S}$	Strength		3x2x3	3x2x3
(25/50/25 - QI) OHT1	ASTM D5766 Open Hole Tension 1(1)	$[0/90,\pm45]_{2S}$	$[0/45]_{2S}$	Strength	3x2x3	3x2x3	3x2x3
(10/80/10) OHT2	ASTM D5766 Open Hole Tension 2(1)	$[(\pm45)_2,0/90,(\pm45)_2]s$	$[(45)_2/0/(45)_2]s$	Strength	3x2x3	3x2x3	3x2x3
(40/20/40) OHT3	ASTM D5766 Open Hole Tension 3(1)	$[(0/90)_4,\pm45]s$	$[(0)_4/45]s$	Strength	3x2x3	3x2x3	3x2x3
(25/50/25 - QI) FHT1	ASTM D6742 Filled Hole Tension 1(2)	$[0/90,\pm45]_{2S}$	$[0/45]_{2S}$	Strength	3x2x3	3x2x3	3x2x3
(10/80/10) FHT2	ASTM D6742 Filled Hole Tension 2(2)	$[(\pm45)_2,0/90,(\pm45)_2]s$	$[(45)_2/0/(45)_2]s$	Strength	3x2x3	3x2x3	3x2x3
(40/20/40) FHT3	ASTM D6742 Filled Hole Tension 3(2)	$[(0/90)_4,\pm45]s$	$[(0)_4/45]s$	Strength	3x2x3	3x2x3	3x2x3
(25/50/25 - QI) OHC1	ASTM D6484 Open Hole Compression 1(1)	$[0/90,\pm45]_{3S}$	$[0/45]_{3S}$	Strength		3x2x3 (4)	3x2x3
(10/80/10) OHC2	ASTM D6484 Open Hole Compression 2(1)	$[(\pm45)_2,0/90,(\pm45)_2]s$	$[(45)_2/0/(45)_2]s$	Strength		3x2x3 (4)	3x2x3
(40/20/40) OHC3	ASTM D6484 Open Hole Compression 3(1)	$[(0/90)_4,\pm45]s$	$[(0)_4/45]s$	Strength		3x2x3 (4)	3x2x3
(25/50/25 - QI) FHC1	ASTM D6742 Filled Hole Compression 1(2)	$[0/90,\pm45]_{3S}$	$[0/45]_{3S}$	Strength		3x2x3	3x2x3

(10/80/10) FHC2	ASTM D6742 Filled Hole Compression 2(2)	$[(\pm45)_2,0/90,(\pm45)_2]s$	$[(45)_2/0/(45)_2]s$	Strength		3x2x3	3x2x3
(40/20/40) FHC3	ASTM D6742 Filled Hole Compression 3(2)	$[(0/90)_4,\pm45]s$	$[(0)_4/45]s$	Strength		3x2x3	3x2x3
(25/50/25 - QI) SSB1	ASTM D5961 Single Shear Bearing 1(3)	$[0/90,\pm45]_{2S}$	$[0/45]_{2S}$	Strength & Deformation		3x2x3	3x2x3
(10/80/10) SSB2	ASTM D5961 Single Shear Bearing 2(3)	$[(\pm45)_2,0/90,(\pm45)_2]s$	$[(45)_2/0/(45)_2]s$	Strength & Deformation		3x2x3	3x2x3
(40/20/40) SSB3	ASTM D5961 Single Shear Bearing 3(3)	$[(0/90)_4,\pm45]s$	$[(0)_4/45]s$	Strength & Deformation		3x2x3	3x2x3
(50/0/50) ILT	ASTM D6415 Curved Beam Strength	$[0/90°]_{7S}$	$[0]_{7S}$	Strength	1x1x6	1x1x6	1x1x6
(25/50/25 - QI) CAI1	ASTM D7136 & D7137 Compression After Impact (1500 in.lb/in) (4) (8)	$[0/90,\pm45]_{4S}$	$[0/45]_{4S}$	Strength		1x1x6	

Table 1-2: Laminate Level Test Matrix

Note 1: Open-hole test configuration: 0.25” hole diameter, 1.5” width.

Note 2: Filled-hole test configuration: 0.25” hole diameter, see section 1.5.2.2 for fastener callout, 1.5” width.

Note 3: Single-shear bearing test configuration: 0.25” hole diameter, 1.5” width, see section 1.5.2.2 for fastener callout, e/D=3, ASTM D5961-17 Procedure C.

Note 4: Back-to-back strain gages needed on the first two specimens of each environment. If no buckling is observed, the remaining modulus specimens will require strain gage on one side of the specimens only. Appropriate extensometer may be used in place of the strain gage.

Note 5: Loading direction is generally along the 0-degree direction

Note 6: If strain gage is used for modulus measurement, a separate un-gaged specimen must be used for strength measurement, because the strain gage and its protective coating may prevent moisture absorption in the gage area.

Note 7: At least two specimens must be gaged to obtain full stress-strain curve to failure. An appropriate extensometer may be used in place of the strain gage for the remaining specimens.

Note 8: Back-to-back strain gages on two locations (a total of four strain gages) are needed on the first specimen. The specimen should be equivalent to the test specimens in terms of material, layup, and geometry, shall be un-damaged.

Note 9: Both Teijin's internal panel layup and NCAMP specimen layup have identical number of ply.

1.5.4 Layup Tables for Lamina and Laminate Panels

Test Type and Direction	Teijin's Internal Layup*	NCAMP Layup*	Total Number of plies
ASTM D3039 Warp Tension	[0/90°]4s	[0]4s	8
ASTM D6641 Warp Compression	[0/90°]5s	[0]5s	10
ASTM D3039 Fill Tension	[0/90°]4s	[90]4s	8
ASTM D6641 Fill Compression	[0/90°]5s	[90]5s	10
ASTM D3518 In-Plane Shear	[±45°]4s	[45]4s	8
ASTM D2344 Short Beam	[0/90°]10s	[0]10s	20

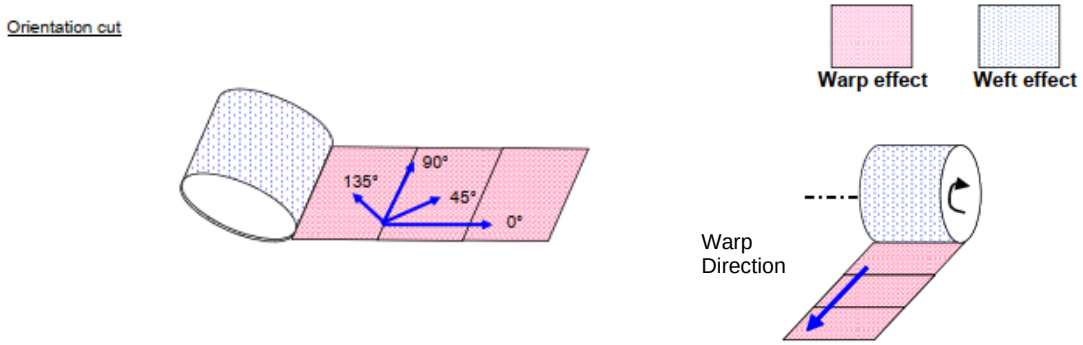
* Both Teijin's internal layup and NCAMP layup produced the identical panel, fiber direction and total number of ply.

(%0°/%±45°/%90°) Actual Test Type	Test Type and Layup	Teijin's Internal Layup*	NCAMP Layup*	Total Number of plies
(25/50/25 - QI) UNT1	ASTM D3039 Un-notched Tension 1	[0/90,±45]2s	[0/45]2s	8
(10/80/10) UNT2	ASTM D3039 Un-notched Tension 2	[(±45)2,0/90,(±45)2]s	$[(45)_2/0/(45)_2]$s	10
(40/20/40) UNT3	ASTM D3039 Un-notched Tension 3	[(0/90)4,±45]s	$[(0)_4/45]$s	10
(25/50/25 - QI) UNC1	ASTM D6641 Un-notched Compression 1	[0/90,±45]2s	[0/45]2s	8
(10/80/10) UNC2	ASTM D6641 Un-notched Compression 2	[(±45)2,0/90,(±45)2]s	$[(45)_2/0/(45)_2]$s	10
(40/20/40) UNC3	ASTM D6641 Un-notched Compression 3	[(0/90)4,±45]s	$[(0)_4/45]$s	10
(25/50/25 - QI) SBS1	ASTM D2344 Short Beam	[0/90,±45]3s	[0/45]3s	12
(25/50/25 - QI) OHT1	ASTM D5766 Open Hole Tension 1	[0/90,±45]2s	[0/45]2s	8
(10/80/10) OHT2	ASTM D5766 Open Hole Tension 2	[(±45)2,0/90,(±45)2]s	$[(45)_2/0/(45)_2]$s	10
(40/20/40) OHT3	ASTM D5766 Open Hole Tension 3	[(0/90)4,±45]s	$[(0)_4/45]$s	10
(25/50/25 - QI) FHT1	ASTM D6742 Filled Hole Tension 1	[0/90,±45]2s	[0/45]2s	8
(10/80/10) FHT2	ASTM D6742 Filled Hole Tension 2	[(±45)2,0/90,(±45)2]s	$[(45)_2/0/(45)_2]$s	10
(40/20/40) FHT3	ASTM D6742 Filled Hole Tension 3	[(0/90)4,±45]s	$[(0)_4/45]$s	10
(25/50/25 - QI) OHC1	ASTM D6484 Open Hole Compression 1	[0/90,±45]3s	[0/45]3s	12
(10/80/10) OHC2	ASTM D6484 Open Hole Compression 2	[(±45)2,0/90,(±45)2]s	$[(45)_2/0/(45)_2]$s	10
(40/20/40) OHC3	ASTM D6484 Open Hole Compression 3	[(0/90)4,±45]s	$[(0)_4/45]$s	10
(25/50/25 - QI) FHC1	ASTM D6742 Filled Hole Compression 1	[0/90,±45]3s	[0/45]3s	12
(10/80/10) FHC2	ASTM D6742 Filled Hole Compression 2	[(±45)2,0/90,(±45)2]s	$[(45)_2/0/(45)_2]$s	10
(40/20/40) FHC3	ASTM D6742 Filled Hole Compression 3	[(0/90)4,±45]s	$[(0)_4/45]$s	10
(25/50/25 - QI) SSB1	ASTM D5961 Single Shear Bearing 1	[0/90,±45]2s	[0/45]2s	8
(10/80/10) SSB2	ASTM D5961 Single Shear Bearing 2	[(±45)2,0/90,(±45)2]s	$[(45)_2/0/(45)_2]$s	10
(40/20/40) SSB3	ASTM D5961 Single Shear Bearing 3	[(0/90)4,±45]s	$[(0)_4/45]$s	10
(50/0/50) ILT	ASTM D6415 Curved Beam Strength	[0/90°]7s	[0]7s	14
(25/50/25 - QI) CAI1	ASTM D7136 & D7137 Compression After Impact	[0/90,±45]4s	[0/45]4s	16

* Both Teijin's internal layup and NCAMP layup produced the identical panel, fiber direction and total number of ply.

1.5.5 Panel Layup examples for Lamina and Laminate Panels

Roll and ply cutting orientation



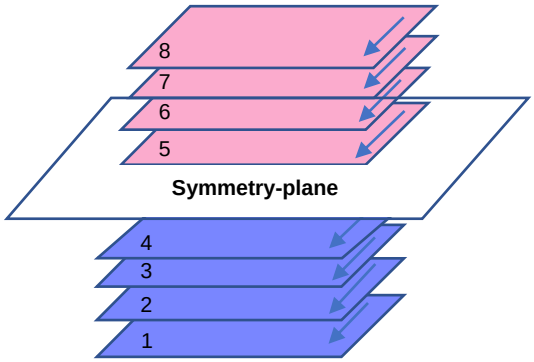
Example: Teijin internal layup of :- $[0/90]_{4S}$ total of 8 plies

Equivalent to NCAMP layup *$[0]_{4S}$ or *$[90]_{4S}$ total of 8 plies

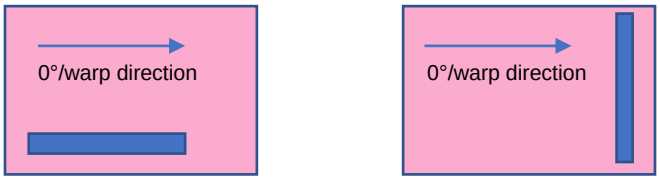
(*This is to indicator the test direction of the panel)

$[0/90]_{4S}=[(0/90)/(0/90)/(0/90)/(0,90)/(0,90)_R/(0,90)_R/(0,90)_R/(0,90)_R]$

R= (Reverse) Plies are flipped faceup to face down to insure that the satin weave is symmetric about the laminate centerline.



Example of specimen machined in 0°/warp or 90°/fill direction specimen.



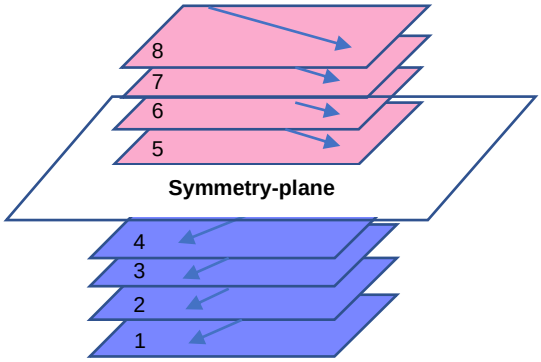
0°/warp direction coupon 90°/fill direction coupon

Example Teijin internal layup of :- $[\pm 45]_{4S}$ total of 8 plies

Equivalent to NCAMP layup $[45]_{4S}$ total of 8 plies

$[\pm 45]_{4S}=[(45)/(45)/(45)/(45)/(45)_R/(45)_R/(45)_R/(45)_R]$

R= (Reverse) Plies are flipped faceup to face down to insure that the satin weave is symmetric about the laminate centerline.

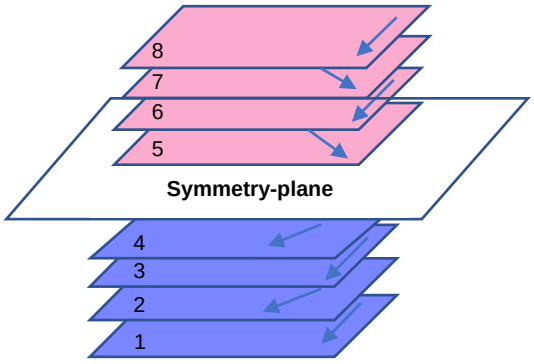


Example Teijin internal layup of :- $[0/90,\pm 45]_{2S}$ total of 8 plies

Equivalent to NCAMP layup $[0/45]_{2S}$ total of 8 plies

$[0/90,\pm 45]_{2S} = [(0/90)/(45)/(0/90)/(45)/(45)_R/(0/90)_R/(45)_R/(0/90)_R]$

R= (Reverse) Plies are flipped faceup to face down to insure that the satin weave is symmetric about the laminate centerline.



1.5.6 Consolidated Laminate Physical Testing

The properties in Table 1-3 shall be determined for each panel used for test coupons with the exception of Tg by DMA which will be conducted on one laminate per batch. The tests were be performed by the Porcher Industries/Teijin under the supervision of NCAMP. These tests may be repeated by the participating fabricators.

Property	**Condition/Method** (Note 1)	**Min Replicates per panel**
Consolidated Ply Thickness	ASTM D3171-11	All data from mechanical test specimens
Laminate Density	ASTM D792-00	Per Note 5
Fiber Volume, % by Volume	ASTM D3171-11(Note 2)	3
Resin Content, % by Weight	ASTM D3171-11(Note 2)	3
Void Content, % by Volume	ASTM D3171-11	Per Note 5
Ultrasonic Through Transmission, C-Scan	ASTM E1316, ASTM E2580 & NAS 410 (Note 3)	1
Differential Scanning Calorimetry (DSC), Melting Temperature Degree of Crystallinity	DIN EN ISO 11357-7 or ASTM D3418	1 Dry (Note 4, Dry only)
Glass Transition Temperature, Tg by DMA	Dry and Wet – ASTM D7028	1 Dry, 1 Wet (Note 4)

Table 1-3: Physical Testing Matrix

Note 1: Where the applicable standard allows variations in specimen form or test method, the specific parameters to be used will be specified in the test work instructions and reported in the final test report.

Note 2: Method II, except for laminates of materials where actual fiber weight is not accurately known prior to impregnation, as in the case for unidirectional materials. For these materials, in order to verify Method II is accurate, a minimum of 12 samples per batch shall be tested by Method I, Procedure B.

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

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

Note 5: A minimum of 4 panels per batch, 3 specimens per panel.

1.5.7 Environmental Conditioning

The following tests were performed by the NIAR Composites Laboratory of Wichita, KS and Teijin Carbon Europe GmbH Laboratory in Wuppertal, Germany under the supervision of NCAMP.

Specimen dimensions was taken before moisture conditioning.

Test environments are defined as:-

CTD = -65±5°F, dry

RTD = 70±10°F, room temperature dry

ETD = 180±5°F, dry

ETW = 180±5°F, wet

Within each test method and test environment, the failure mode was evaluated immediately after each test by an NCAMP staff engineer or NCAMP AER. All tested specimens were digitally photographed after each test in order to pictorially document failure modes.

For dry testing, specimens were dried at 160°F±10°F for at least 30 minutes, the specimen shall be kept at 70 ºF ±10 ºF, <60%RH for 72 +48/-0 hours prior to testing. After drying, specimens were kept in a desiccator until mechanical testing. Alternatively, the specimens may have been left ambient laboratory condition for a maximum of 14 days until mechanical testing (no drying was required if specimens were tested within 14 days from the date they were consolidated). Ambient laboratory condition is defined as 70°F±10°F. Since moisture absorption and desorption rate for thermoplastic is very slow at ambient temperature, there was no requirement to maintain relative humidity levels.

For wet conditioning, specimens were dried at 160°F±5°F for for 120 to 130 hours before being conditioned to equilibrium at 160°F±5°F and 85%±5%RH. Effective moisture equilibrium was achieved when the average moisture content of the traveler specimen changed by less than 0.02% for three consecutive readings 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 5 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.

1.5.8 Non-ambient Testing

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

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

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

1.5.9 Fluid Sensitivity Screening

Table 1-4 lists the requirements for fluid sensitivity screening, which requires ASTM D2344 Short Beam Strength testing on $[0°/90°]10_S$ lamina level specimens dried at 160°F±5°F for 120 to 130 hours before being subjected to the conditions indicated, five replicates per fluid and one consolidation cycle. Specimens were cleaned with a dry towel prior to the tests. In addition to short beam strength, load versus displacement curves were plotted to aid in the identification of matrix/resin softening. Since load versus displacement curves are influenced by test machine and fixture compliance, all the tests were performed with the identical machine and fixture, through a single setup. Experience suggests that for the vast majority of epoxy resins, water is the fluid with the most deleterious effect on properties. Should screening tests for fluid sensitivity indicate this to be the case, further testing of this type might be unnecessary since exposure to water moisture to equilibrium level is an inherent part of the multi batch allowables test program. However, users must evaluate the applicability of the exposure conditions and time on case-by-case basis. For example, the exposure condition for jet fuel may not fully represent the condition of integral fuel tanks.

Extended Contact:	Exposure	Test Condition	Code
100 Low Lead Aviation Fuel (ASTM D910)	90 days min. @ 70°F±10°F	70°F	FS11RT
	90 days min. @ 70°F±10°F	180°F	FS11ET
ASTM D1655 Jet A Fuel (other jet fuel may be used but its type must be reported)	90 days min. @ 70°F±10°F	70°F	FS12RT
	90 days min. @ 70°F±10°F	180°F	FS12ET
MIL-PRF-5606 Hydraulic Oil	90 days min. @ 70°F±10°F	70°F	FS13RT
	90 days min. @ 70°F±10°F	180°F	FS13ET
MIL-PRF-83282 Hydraulic Oil	90 days min. @ 70°F±10°F	70°F	FS14RT
	90 days min. @ 70°F±10°F	180°F	FS14ET
MIL-PRF-7808 Engine Oil	90 days min. @ 70°F±10°F	70°F	FS15RT
	90 days min. @ 70°F±10°F	180°F	FS15ET
MIL-PRF-23699, Class STD Engine Oil	90 days min. @ 70°F±10°F	70°F	FS16RT
	90 days min. @ 70°F±10°F	180°F	FS16ET
Salt Water (ASTM D1141 or equiv.)	90 days min. @ 70°F±10°F	70°F	FS17RT
	90 days min. @ 70°F±10°F	180°F	FS17ET
Skydrol 5, (SAE AS1241, Type V)	90 days min. @ 70°F±10°F	70°F	FS18RT
	90 days min. @ 70°F±10°F	180°F	FS18ET
50% Water with 50% Skydrol 5, (SAE AS1241, Type V)	90 days min. @ 70°F±10°F	70°F	FS19RT
	90 days min. @ 70°F±10°F	180°F	FS19ET
Short Duration Contact:			
MEK washing fluid. ASTM D740	90 minutes min. @ 70°F±10°F	70°F	FS21RT
	90 minutes min. @ 70°F±10°F	180°F	FS21ET
Polypropylene Glycol Deicer (Type I) SAE AMS 1424	90 minutes min. @ 70°F±10°F	70°F	FS22RT
	90 minutes min. @ 70°F±10°F	180°F	FS22ET
Isopropyl Alcohol Deicing Agent (TT-I-735)	48±4 hours @70°F±10°F	70°F	FS23RT
	48±4 hours @70°F±10°F	180°F	FS23ET
Control Tests:			
Distilled Water	90 days min. at 70°F±10°F	70°F	FS31RT
	90 days min. at 70°F±10°F	180°F	FS31ET
Dry	Dry per section 6.1 Test Plan NTP 4013Q1	70°F	FS32RT
	Dry per section 6.1 Test Plan NTP 4013Q1	180°F	FS32ET
85% Relative Humidity	Per section 6.1 Test Plan NTP 4013Q1	70°F	FS33RT
	Per section 6.1 Test Plan NTP 4013Q1	180°F	FS33ET

Table 1-4: Fluid Sensitivity Matrix

1.5.10 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 level properties that were not normalized, were In-Plane Shear strength and modulus, Poisson's ratio, SBS and ILT. After normalizing, data scatter reduced or remained the same. If data scatter increased significantly after normalizing, the reason was investigated. Wherever properties are normalized, both measured and normalized data were reported.

The average as measured CPT of the qualification panels was 0.01220 inches. The theoretical calculated consolidated ply thickness of 0.01226 inches has been used as the nominal consolidated ply thickness (CPT) for normalization purpose. This CPT value has been provided by Teijin. The following normalization formula was used:

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

1.5.11 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 AERs. Test setup and witnessing was delegated to NCAMP AERs. Mechanical testing was carried out at the National Institute for Aviation Research, Wichita State University and Teijin Carbon Europe GmbH in Germany. The inspection documentation with required approval signatures are stored in hard copy as well as electronically.

1.5.12 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:	Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS				**Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS Lamina Properties Summary**
Material Specification:	NMS 401/3				
Process Specification:	NPS 84013 Baseline Consolidate Cycle M				
Fabric:	HTA40 3K 5HS	**Resin:**	PEEK – Evonik Vestakeep 2000		
DMA Tg(dry):	267.64 °F	**DSC Melting Temperature (Peak):**	646.67 °F	**Tg METHOD:**	DMA (ASTM D7028)
DMA Tg(wet):	252.55 °F			**Tg METHOD:**	DSC (ASTM D3418)

Date of fiber manufacture	Feb 2015 to Oct 2019	**Date of testing**	Jan 2018 to July 2022
Date of resin manufacture	Jun 2015 to April 2020	**Date of data submittal**	Jul-22
Date of semipreg manufacture	Feb 2016 to Oct 2020		
Date of composite manufacture	Sep 2017 to July 2021		

LAMINA MECHANICAL PROPERTY SUMMARY
Data reported as: Normalized & Measured
(Normalized by CPT=0.01226 inch)

Properties	CTD (-65°F) Mean		RTD (70°F) Mean		ETD (180°F) Mean		ETW (180°F) Mean	
	Normalized	Measured	Normalized	Measured	Normalized	Measured	Normalized	Measured
F_1^{tu} (ksi)	130.7	130.6	130.6	131.5	---	---	133.1	133.6
E_1^t (Msi)	8.664	8.654	8.562	8.626	---	---	8.556	8.591
ν_{12}^t		0.04857		0.03836		---		0.03756
F_2^{tu} (ksi)	128.5	130.4	131.2	131.7	---	---	132.6	133.6
E_2^t (Msi)	8.562	8.692	8.435	8.468	---	---	8.342	8.405
F_1^{cu} (ksi)	108.3	109.5	96.01	97.16	84.72	85.21	82.61	83.50
E_1^c (Msi)	7.907	7.971	8.023	8.075	8.100	8.104	8.229	8.264
F_2^{cu} (ksi)	112.1	113.7	95.13	96.02	88.74	89.10	77.54	77.42
E_2^c (Msi)	7.906	8.007	8.070	8.126	8.132	8.161	8.240	8.253
$F_{12}^{s0.2\%}$ (ksi)		7.158		5.700		---		4.680
[1] $F_{12}^{s4\%strain}$ (ksi)		11.95		9.336		---		7.078
G_{12}^s (Msi)		0.6735		0.5950		---		0.4861
*SBS (ksi)		14.19		13.03		10.89		10.23

*SPAN TO THICKNESS RATIO: 3.5:1 WAS USED FOR ALL SBS TESTING.

[1] Reporting Strength at 4% strain instead of 5% strain

Table 2-1: Lamina Summary Data

2.2 Laminate Level Test Summary

Prepreg Material:	Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS			**Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS Laminate Properties Summary**	
Material Specification:	NMS 401/3				
Process Specification:	NPS 84013 Baseline Consolidate Cycle M				
Fabric:	HTA40 3K 5HS	**Resin:**	PEEK – Evonik Vestakeep 2000		
DMA Tg(dry):	267.64 °F	**DSC Melting Temperature (Peak):**	646.67 °F	**Tg METHOD:**	DMA (ASTM D7028)
DMA Tg(wet):	252.55 °F			**Tg METHOD:**	DSC (ASTM D3418)

Date of fiber manufacture	Feb 2015 to Oct 2019	**Date of testing**	Jan 2018 to July 2022
Date of resin manufacture	Jun 2015 to April 2020	**Date of data submittal**	Jul-22
Date of semipreg manufacture	Feb 2016 to Oct 2020		
Date of composite manufacture	Sep 2017 to July 2021		

LAMINATE MECHANICAL PROPERTY SUMMARY
Data reported as: Normalized & Measured
(Normalized by CPT=0.01226 inch)

	Layup:	25/50/25 (Quasi)		10/80/10 (Soft)		40/20/40 (Hard)	
Properties	**Test Condition**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
OHT Strength (ksi)	**CTD (-65°F)**	49.37	49.50	44.82	45.10	53.43	53.65
	RTD (70°F)	47.76	47.74	41.65	41.53	52.31	52.36
	ETW (180°F)	51.22	51.54	35.08	35.11	57.57	57.75
OHC Strength (ksi)	**RTD (70°F)**	44.32	44.36	36.80	37.03	42.47	42.87
	ETW (180°F)	37.76	37.78	30.58	30.45	37.69	37.67
UNT Strength (ksi)	**CTD (-65°F)**	90.76	90.79	58.14	58.13	113.4	113.1
	RTD (70°F)	87.91	87.86	54.73	54.38	114.9	114.0
	ETW (180°F)	84.08	83.85	50.91	50.64	113.3	112.9
UNT Modulus (Msi)	**CTD (-65°F)**	6.228	6.231	4.156	4.154	7.765	7.747
	RTD (70°F)	6.139	6.136	4.033	4.007	7.753	7.694
	ETW (180°F)	5.975	5.957	3.812	3.793	7.665	7.639
UNC Strength (ksi)	**RTD (70°F)**	68.77	68.37	49.76	50.01	86.19	87.65
	ETW (180°F)	53.38	52.81	38.54	38.92	66.51	67.33
UNC Modulus (Msi)	**RTD (70°F)**	5.743	5.708	3.834	3.854	7.055	7.154
	ETW (180°F)	5.703	5.642	3.703	3.739	7.238	7.325
FHT Strength (ksi)	**CTD (-65°F)**	55.59	55.68	47.66	47.74	57.18	57.45
	RTD (70°F)	52.11	51.95	43.05	43.02	55.05	55.01
	ETW (180°F)	54.20	54.35	36.35	36.42	58.55	58.92
FHC Strength (ksi)	**RTD (70°F)**	68.80	68.50	49.71	49.48	82.39	82.42
	ETW (180°F)	56.15	55.92	41.15	41.23	65.25	65.61
SBS1 Strength (ksi)	**RTD (70°F)**		12.10				
	ETW (180°F)		9.183				
SSB Proc. C Initial Peak Strength (ksi)	**RTD (70°F)**					95.02	96.39
	ETW (180°F)					81.50	82.36
SSB Proc. C 2% Offset Strength (ksi)	**RTD (70°F)**	107.6	108.8	103.8	104.0	94.11	94.95
	ETW (180°F)	96.31	97.12	90.39	90.89	80.76	81.56
SSB Proc. C Ultimate Strength (ksi)	**RTD (70°F)**	124.2	125.5	123.4	123.6	108.2	109.2
	ETW (180°F)	105.0	105.9	108.1	108.7	95.96	96.93
***CBS[1] (lb)**	**CTD (-65°F)**	---	685.3				
	RTD (70°F)	---	493.4				
	ETW (180°F)	---	378.0				
***ILT[1] (ksi)**	**CTD (-65°F)**	---	19.10				
	RTD (70°F)	---	13.86				
	ETW (180°F)	---	10.64				
CAI Strength (ksi) (1500 in.lb/in)	**RTD (70°F)**	45.69	46.54				

***The actual layup for ILT/CBS [0°]7S, (50/0/50)**

[1]Informational only, refer to NPS 84013 Section 4.5 for processing information.

Table 2-2: Laminate Summary Data

2.3 Individual Test Summaries

2.3.1 Warp Tension Properties (WT)

Material: Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

Tension, 1-axis
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
NCAMP Layup [0°]4s

Resin content: 41.84 % wt **Comp. density:** 1.533 g/cc
Fiber volume: 50.37 % vol
Ply count: 8

Test method: ASTM D3039-17 **Modulus calculation:** 1000 to 3000 microstrain

Normalized by: 0.01226 in. CPT

		CTD		RTD		ETW	
Test Temperature [°F]		-65		70		180	
Moisture Conditioning		Dry		Dry		Equilibrium	
Equilibrium at T, RH						160 F,85%	
Source code: Prefixed by NTP4013Q1-		TTX-T40-E-WT-X-X-CTD-X		TTX-T40-E-WT-X-X-RTD-X		TTX-T40-E-WT-X-X-ETW-X	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
F_1^{tu} [ksi]	**Mean**	130.7	130.6	130.6	131.5	133.1	133.6
	Minimum	122.8	121.6	118.5	121.4	121.4	123.0
	Maximum	138.3	136.8	140.4	146.7	142.6	142.0
	C.V.(%)	3.770	3.557	4.763	4.984	4.129	4.114
	No. Specimens	20		18		22	
	No. Semipreg Lots	4		4		4	
E_1^t [Msi]	**Mean**	8.664	8.654	8.562	8.626	8.556	8.591
	Minimum	8.303	8.421	8.404	8.339	8.396	8.410
	Maximum	8.916	8.859	8.748	8.944	8.776	8.828
	C.V.(%)	1.738	1.261	1.1094	1.899	1.337	1.590
	No. Specimens	20		18		22	
	No. Semipreg Lots	4		4		4	
ν_{12}^t	**Mean**		0.04857		0.03836		0.03756
	Minimum		0.02750		0.02542		0.02986
	Maximum		0.05615		0.07369		0.05266
	C.V.(%)		14.35		27.98		11.87
	No. Specimens	20		18		22	
	No. Semipreg Lots	4		4		4	

2.3.2 Fill Tension Properties (FT)

Material:	Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS							**Tension, 2-axis** Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS NCAMP layup [90°]4s	
Resin content:	41.84 % wt		**Comp. density:** 1.533 g/cc						
Fiber volume:	50.37 % vol								
Ply count:	8								
Test method:	ASTM D3039-17		**Modulus calculation:** 1000 to 3000 microstrain						
Normalized by:	0.01226	in. CPT							
			CTD		**RTD**		**ETW**		
Test Temperature [°F]			-65		70		180		
Moisture Conditioning			Dry		Dry		Equilibrium		
Equilibrium at T, RH							160 F,85%		
Source code: Prefixed by NTP4013Q1-			TTX-T40-E-FT-X-X-CTD-X		TTX-T40-E-FT-X-X-RTD-X		TTX-T40-E-FT-X-X-ETW-X		
			Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	
	Mean		128.5	130.4	131.2	131.7	132.6	133.6	
	Minimum		119.9	122.6	113.6	114.0	126.5	127.4	
	Maximum		138.4	138.0	144.9	144.1	138.4	140.8	
F_2^{tu} **[ksi]**	**C.V.(%)**		3.564	2.997	5.178	5.280	2.598	2.690	
	No. Specimens		19		19		22		
	No. Semipreg Lots		4		4		4		
	Mean		8.562	8.692	8.435	8.468	8.342	8.405	
	Minimum		8.204	8.187	8.138	8.251	7.410	7.391	
	Maximum		9.011	9.012	8.788	8.772	8.759	8.755	
E_2^t **[Msi]**	**C.V.(%)**		2.422	2.300	2.393	1.792	3.536	3.240	
	No. Specimens		19		19		22		
	No. Semipreg Lots		4		4		4		

2.3.3 Warp Compression Properties (WC)

Material:	Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS								
Resin content:	41.98 % wt		**Comp. density:** 1.532 g/cc						
Fiber volume:	50.22 % vol								
Ply count:	10								
Test method:	ASTM D6641-16e1		**Modulus calculation: 1000 to 3000 microstrain**						
Normalized by:	0.01226	in. CPT							

Compression, 1-axis
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
NCAMP Layup [0°]5s

		CTD		RTD		ETD		ETW	
Test Temperature [°F]		-65		70		180		180	
Moisture Conditioning		Dry		Dry		Dry		Equilibrium	
Equilibrium at T, RH								160 F,85%	
Source code: Prefixed by NTP4013Q1-		TTX-T40-E-WC-X-X-CTD-X		TTX-T40-E-WC-X-X-RTD-X		TTX-T40-E-WC-X-X-ETD-X		TTX-T40-E-WC-X-X-ETW-X	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
F_1^{cu} [ksi]	**Mean**	108.3	109.5	96.01	97.16	84.72	85.21	82.61	83.50
	Minimum	97.79	97.75	81.06	79.61	80.83	80.83	71.69	73.65
	Maximum	115.1	114.8	103.0	108.0	88.37	89.00	90.51	91.22
	C.V.(%)	4.081	4.265	5.037	5.701	3.002	3.133	4.614	4.123
	No. Specimens	19		21		19		22	
	No. Semipreg Lots	4		4		4		4	
E_1^c [Msi]	**Mean**	7.907	7.971	8.023	8.075	8.100	8.104	8.229	8.264
	Minimum	7.148	7.106	7.582	7.434	7.297	7.399	7.698	7.584
	Maximum	8.376	8.536	8.276	8.501	8.569	8.571	8.708	8.672
	C.V.(%)	5.238	6.357	2.059	3.314	3.489	4.203	2.545	3.183
	No. Specimens	22		23		24		36	
	No. Semipreg Lots	4		4		4		4	

2.3.4 Fill Compression Properties (FC)

Compression, 2-axis
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
NCAMP Layup [90°]5s

Material:	Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS								
Resin content:	41.98 % wt	**Comp. density:** 1.532g/cc							
Fiber volume:	50.22 % vol								
Ply count:	10								
Test method:	ASTM D6641-16e1	**Modulus calculation:** 1000 to 3000 microstrain							
Normalized by:	0.01226	in. CPT							
		CTD		**RTD**		**ETD**		**ETW**	
Test Temperature [°F]		-65		70		180		180	
Moisture Conditioning		Dry		Dry		Dry		Equilibrium	
Equilibrium at T, RH								160 F,85%	
Source code: Prefixed by NTP4013Q1-		TTX-T40-E-FC-X-X-CTD-X		TTX-T40-E-FC-X-X-RTD-X		TTX-T40-E-FC-X-X-ETD-X		TTX-T40-E-FC-X-X-ETW-X	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
	Mean	112.1	113.7	95.13	96.02	88.74	89.10	77.54	77.42
	Minimum	101.27	103.0	74.97	76.74	79.80	79.33	66.64	66.06
	Maximum	123.4	125.7	104.1	104.0	93.85	93.79	89.96	90.68
***F_2^{cu} [ksi]**	**C.V.(%)**	5.162	5.196	8.497	7.683	4.088	4.279	8.738	8.646
	No. Specimens	22		20		19		27	
	No. Semipreg Lots	4		4		4		4	
	Mean	7.906	8.007	8.070	8.126	8.132	8.161	8.240	8.253
	Minimum	7.148	7.100	7.379	7.316	7.633	7.679	7.450	7.350
	Maximum	8.351	8.496	8.593	8.688	8.568	8.744	9.080	9.162
E_2^c [Msi]	**C.V.(%)**	4.788	5.171	3.625	4.270	3.012	3.433	3.748	4.086
	No. Specimens	22		23		24		34	
	No. Semipreg Lots	4		4		4		4	

2.3.5 In-Plane Shear Properties (IPS)

Material: Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

In-Plane Shear
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
NCAMP Layup [45°]4s

Resin content: 40.86 % wt **Comp. density:** 1.536 g/cc
Fiber volume: 51.31 % vol
Ply count: 8

Test method: ASTM D3518-17 **Modulus calculation:** 2000 to 6000 microstrain

Normalized by: NA

		CTD		RTD		ETW	
Test Temperature [°F]		-65		70		180	
Moisture Conditioning		Dry		Dry		Equilibrium	
Equilibrium at T, RH						160 F,85%	
Source code: Prefixed by NTP4013Q1-		TTX-T40-E-IPS-X-X-CTD-X		TTX-T40-E-IPS-X-X-RTD-X		TTX-T40-E-IPS-X-X-ETW-X	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
$F_{12}^{s0.2\%}$ [ksi]	**Mean**		7.158		5.700		4.680
	Minimum		6.946		5.565		4.534
	Maximum		7.359		5.857		4.848
	C.V.(%)		1.725		1.718		2.286
	No. Specimens		20		21		22
	No. Semipreg Lots		4		4		4
*$F_{12}^{s4\% strain}$ [ksi]	**Mean**		11.95		9.336		7.078
	Minimum		11.62		9.139		6.910
	Maximum		12.30		9.739		7.488
	C.V.(%)		1.785		2.063		1.831
	No. Specimens		20		21		19
	No. Semipreg Lots		4		4		4
G_{12}^{s} [Msi]	**Mean**		0.6735		0.5950		0.4861
	Minimum		0.6585		0.5801		0.4482
	Maximum		0.6951		0.6125		0.5250
	C.V.(%)		1.638		1.641		4.744
	No. Specimens		20		21		22
	No. Semipreg Lots		4		4		4

* Reporting Strength at 4% strain instead of 5% strain.

2.3.6 "25/50/25" Unnotched Tension 1 Properties (UNT1)

Material: Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

Unnotched Tension 1
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
NCAMP Layup [0/45]2s

Resin content: 41.32 % wt **Comp. density:** 1.532 g/cc
Fiber volume: 50.80 % vol
Ply count: 8

Test method: ASTM D3039-17 **Modulus calculation:** 1000 to 3000 microstrain

Normalized by: 0.01226 in. CPT

		CTD		RTD		ETW	
Test Temperature [°F]		-65		70		180	
Moisture Conditioning		Dry		Dry		Equilibrium	
Equilibrium at T, RH						160 F,85%	
Source code: Prefixed by NTP4013Q1-		TTX-T40-E-UNT1-X-X-CTD-X		TTX-T40-E-UNT1-X-X-RTD-X		TTX-T40-E-UNT1-X-X-ETW-X	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
UNT1 Strength [ksi]	**Mean**	90.76	90.79	87.91	87.86	84.08	83.85
	Minimum	85.49	86.44	82.73	82.03	75.54	75.48
	Maximum	98.1	97.5	94.29	94.15	87.39	87.58
	C.V.(%)	3.486	2.875	3.779	3.769	3.411	3.978
	No. Specimens		22		18		20
	No. Semipreg Lots		4		4		4
UNT1 Modulus [Msi]	**Mean**	6.228	6.231	6.139	6.136	5.975	5.957
	Minimum	6.031	6.057	6.049	6.053	5.227	5.253
	Maximum	6.418	6.391	6.262	6.294	6.208	6.200
	C.V.(%)	1.464	1.227	0.823	0.974	3.239	3.350
	No. Specimens		22		18		20
	No. Semipreg Lots		4		4		4

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

Material: Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

Unnotched Tension 2
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
NCAMP Layup [(45)2/0/(45)2]s

Resin content: 41.43 % wt **Comp. density:** 1.532 g/cc
Fiber volume: 50.68 % vol
Ply count: 10

Test method: ASTM D3039-17 **Modulus calculation:** 1000 to 3000 microstrain

Normalized by: 0.01226 in. CPT

		CTD		RTD		ETW	
Test Temperature [°F]		-65		70		180	
Moisture Conditioning		Dry		Dry		Equilibrium	
Equilibrium at T, RH						160 F,85%	
Source code: Prefixed by NTP4013Q1-		TTX-T40-E-UNT2-X-X-CTD-X		TTX-T40-E-UNT2-X-X-RTD-X		TTX-T40-E-UNT2-X-X-ETW-X	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
UNT2 Strength [ksi]	**Mean**	58.14	58.13	54.73	54.38	50.91	50.64
	Minimum	55.37	54.75	51.72	50.96	47.86	47.08
	Maximum	60.50	61.07	56.76	56.60	53.97	53.63
	C.V.(%)	2.437	3.152	2.668	3.062	3.444	3.612
	No. Specimens		19		20		20
	No. Semipreg Lots		4		4		4
UNT2 Modulus [Msi]	**Mean**	4.156	4.154	4.033	4.007	3.812	3.793
	Minimum	4.061	4.081	3.919	3.890	3.711	3.678
	Maximum	4.319	4.273	4.166	4.128	4.014	4.007
	C.V.(%)	1.793	1.396	1.530	1.618	2.312	2.627
	No. Specimens		19		20		19
	No. Semipreg Lots		4		4		4

2.3.8 "40/20/40" Unnotched Tension 3 Properties (UNT3)

Material: Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

Resin content: 41.56 % wt **Comp. density:** 1.529 g/cc
Fiber volume: 50.47 % vol
Ply count: 10

Test method: ASTM D3039-17 **Modulus calculation:** 1000 to 3000 microstrain

Normalized by: 0.01226 in. CPT

Unnotched Tension 3
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
NCAMP Layup [(0)4/45]s

		CTD		RTD		ETW	
Test Temperature [°F]		-65		70		180	
Moisture Conditioning		Dry		Dry		Equilibrium	
Equilibrium at T, RH						160 F,85%	
Source code: Prefixed by NTP4013Q1-		TTX-T40-E-UNT3-X-X-CTD-X		TTX-T40-E-UNT3-X-X-RTD-X		TTX-T40-E-UNT3-X-X-ETW-X	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
UNT3 Strength [ksi]	**Mean**	113.4	113.1	114.9	114.0	113.3	112.9
	Minimum	105.9	105.8	107.7	106.9	100.9	99.9
	Maximum	119.9	119.2	121.2	121.4	119.6	120.1
	C.V.(%)	3.088	3.094	3.076	3.274	3.636	4.078
	No. Specimens		20		19		21
	No. Semipreg Lots		4		4		4
UNT3 Modulus [Msi]	**Mean**	7.765	7.747	7.753	7.694	7.665	7.639
	Minimum	7.567	7.585	7.654	7.572	7.409	7.404
	Maximum	7.894	7.897	7.890	7.897	7.988	8.132
	C.V.(%)	1.1632	1.124	0.8758	1.380	2.135	3.012
	No. Specimens		20		19		21
	No. Semipreg Lots		4		4		4

2.3.9 "25/50/25" Unnotched Compression 1 Properties (UNC1)

Material: Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

Unnotched Compression 1
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
NCAMP Layup [0/45]2s

Resin content: 41.32 % wt **Comp. density:** 1.532 g/cc
Fiber volume: 50.80 % vol
Ply count: 8

Test method: ASTM D6641-16e1 **Modulus calculation:** 1000 to 3000 microstrain

Normalized by: 0.01226 in. CPT

		RTD		ETW					
Test Temperature [°F]		70		180					
Moisture Conditioning		Dry		Equilibrium					
Equilibrium at T, RH				160 F,85%					
Source code: Prefixed by NTP4013Q1-		TTX-T40-E-UNC1-X-X-RTD-X		TTX-T40-E-UNC1-X-X-ETW-X					
		Normalized	**Measured**	**Normalized**	**Measured**				
UNC1 Strength [ksi]	**Mean**	68.77	68.37	53.38	52.81				
	Minimum	62.98	61.95	45.78	45.28				
	Maximum	72.91	71.34	63.09	62.07				
	C.V.(%)	3.858	3.462	7.871	7.995				
	No. Specimens	19		33					
	No. Semipreg Lots	4		4					
UNC1 Modulus [Msi]	**Mean**	5.743	5.708	5.703	5.642				
	Minimum	5.411	5.334	5.163	5.081				
	Maximum	5.951	5.975	6.285	6.200				
	C.V.(%)	2.378	2.918	4.279	4.513				
	No. Specimens	20		33					
	No. Semipreg Lots	4		4					

2.3.10 "10/80/10" Unnotched Compression 2 Properties (UNC2)

Material: Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

Unnotched Compression 2
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
NCAMP Layup [(45)2/0/(45)2]s

Resin content: 41.43 % wt **Comp. density:** 1.532 g/cc
Fiber volume: 50.68 % vol
Ply count: 10

Test method: ASTM D6641-16e1 **Modulus calculation:** 1000 to 3000 microstrain

Normalized by: 0.01226 in. CPT

		RTD		ETW					
Test Temperature [°F]		70		180					
Moisture Conditioning		Dry		Equilibrium					
Equilibrium at T, RH				160 F,85%					
Source code: Prefixed by NTP4013Q1-		TTX-T40-E-UNC2-X-X-RTD-X		TTX-T40-E-UNC2-X-X-ETW-X					
		Normalized	**Measured**	**Normalized**	**Measured**				
UNC2 Strength [ksi]	**Mean**	49.76	50.01	38.54	38.92				
	Minimum	47.68	47.78	34.40	34.94				
	Maximum	51.81	52.47	42.99	43.05				
	C.V.(%)	2.655	2.619	6.191	5.864				
	No. Specimens	20		34					
	No. Semipreg Lots	4		4					
UNC2 Modulus [Msi]	**Mean**	3.834	3.854	3.703	3.739				
	Minimum	3.661	3.767	3.424	3.463				
	Maximum	3.965	3.989	4.042	4.050				
	C.V.(%)	1.869	1.616	3.730	3.576				
	No. Specimens	20		34					
	No. Semipreg Lots	4		4					

2.3.11 "40/20/40" Unnotched Compression 3 Properties (UNC3)

Material:	Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS						**Unnotched Compression 3** Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS NCAMP Layup [(0)4/45]s			
Resin content:	41.56 % wt		**Comp. density:**	1.529 g/cc						
Fiber volume:	50.47 % vol									
Ply count:	10									
Test method:	ASTM D6641-16e1		**Modulus calculation:**	1000 to 3000 microstrain						
Normalized by:	0.01226	in. CPT								
			RTD		**ETW**					
Test Temperature [°F]			70		180					
Moisture Conditioning			Dry		Equilibrium					
Equilibrium at T, RH					160 F,85%					
Source code: Prefixed by NTP4013Q1-			TTX-T40-E-UNC3-X-X-RTD-X		TTX-T40-E-UNC3-X-X-ETW-X					
			Normalized	**Measured**	**Normalized**	**Measured**				
***UNC3 Strength [ksi]**	**Mean**		86.19	87.65	66.51	67.33				
	Minimum		78.72	80.65	55.77	56.51				
	Maximum		92.29	93.95	73.61	75.68				
	C.V.(%)		3.494	3.446	6.578	6.616				
	No. Specimens			20		27				
	No. Semipreg Lots			4		4				
UNC3 Modulus [Msi]	**Mean**		7.055	7.154	7.238	7.325				
	Minimum		6.348	6.443	6.753	6.844				
	Maximum		7.665	7.734	7.839	8.009				
	C.V.(%)		4.721	4.671	3.915	4.041				
	No. Specimens			23		32				
	No. Semipreg Lots			4		4				

2.3.12 Lamina Short-Beam Strength Properties (SBS)

Short-Beam Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
NCAMP Layup [0°]10s

Material:	Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS								
Resin content:	39.05 % wt	**Comp. density:**	1.534 g/cc						
Fiber volume:	52.83 % vol								
Ply count:	20								
Test method:	ASTM D2344-16								
Normalized by:	NA								
		CTD		**RTD**		**ETD**		**ETW**	
Test Temperature [°F]		-65		70		180		180	
Moisture Conditioning		Dry		Dry		Dry		Equilibrium	
Equilibrium at T, RH								160 F,85%	
Source code: Prefixed by NTP4013Q1-		TTX-T40-EXSBS-X-X-1-CTD-X		TTX-T40-EXSBS-X-X-1-RTD-X		TTX-T40-EXSBS-X-X-1-ETD-X		TTX-T40-EXSBS-X-X-1-ETW-X	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
	Mean		14.19		13.03		10.89		10.227
	Minimum		13.39		12.76		10.71		9.791
	Maximum		15.02		13.30		11.17		10.55
***SBS [ksi]**	**C.V.(%)**		3.577		1.378		1.159		2.742
	No. Specimens		19		19		19		19
	No. Semipreg Lots		4		4		4		4

***SPAN TO THICKNESS RATIO: 3.5:1 WAS USED FOR ALL SBS TESTING.**

2.3.13 Laminate Short-Beam Strength Properties (SBS1)

Laminate Short-Beam Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
NCAMP Layup [0/45]3s

Material:	Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS		
Resin content:	40.86 % wt	**Comp. density:**	1.530 g/cc
Fiber volume:	51.11 % vol		
Ply count:	12		
Test method:	ASTM D2344-16		
Normalized by:	NA		

		RTD		ETW					
Test Temperature [°F]		70		180					
Moisture Conditioning		Dry		Equilibrium					
Equilibrium at T, RH				160 F,85%					
Source code: Prefixed by NTP4013Q1-		TTX-T40-E-SBS1-X-X-1-RTD-X		TTX-T40-E-SBS1-X-X-1-ETW-X					
		Normalized	**Measured**	**Normalized**	**Measured**				
SBS1 Strength [ksi]	**Mean**		12.10		9.183				
	Minimum		11.51		8.401				
	Maximum		12.69		9.46				
	C.V.(%)		2.945		2.695				
	No. Specimens		19		19				
	No. Semipreg Lots		4		4				

2.3.14 "25/50/25" Open-Hole Tension 1 Properties (OHT1)

Material: Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

Open-Hole Tension 1
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
NCAMP Layup [0/45]2s

Resin content: 41.32 % wt **Comp. density:** 1.532 g/cc
Fiber volume: 50.80 % vol
Ply count: 8

Test method: ASTM D5766-11

Normalized by: 0.01226 in. CPT

		CTD		RTD		ETW	
Test Temperature [°F]		-65		70		180	
Moisture Conditioning		Dry		Dry		Equilibrium	
Equilibrium at T, RH						160 F,85%	
Source code: Prefixed by NTP4013Q1-		TTX-T40-E-OHT1-X-X-CTD-X		TTX-T40-E-OHT1-X-X-RTD-X		TTX-T40-E-OHT1-X-X-ETW-X	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
OHT1 Strength [ksi]	**Mean**	49.37	49.50	47.76	47.74	51.22	51.54
	Minimum	46.99	47.65	46.35	45.83	48.00	49.58
	Maximum	51.20	51.75	49.44	49.59	53.60	53.85
	C.V.(%)	2.095	2.064	1.669	1.799	2.744	2.781
	No. Specimens	20		19		22	
	No. Semipreg Lots	4		4		4	

2.3.15 "10/80/10" Open-Hole Tension 2 Properties (OHT2)

Material: Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

Resin content: 41.43 % wt **Comp. density:** 1.532 g/cc
Fiber volume: 50.68 % vol
Ply count: 10

Test method: ASTM D5766-11

Normalized by: 0.01226 in. CPT

Open-Hole Tension 2
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
NCAMP Layup [(45)2/0/(45)2]s

		CTD		RTD		ETW	
Test Temperature [°F]		-65		70		180	
Moisture Conditioning		Dry		Dry		Equilibrium	
Equilibrium at T, RH						160 F,85%	
Source code: Prefixed by NTP4013Q1-		TTX-T40-E-OHT2-X-X-CTD-X		TTX-T40-E-OHT2-X-X-RTD-X		TTX-T40-E-OHT2-X-X-ETW-X	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
OHT2 Strength [ksi]	**Mean**	44.82	45.10	41.65	41.53	35.08	35.11
	Minimum	42.93	42.79	39.55	39.77	33.98	34.03
	Maximum	46.90	47.14	44.05	43.90	36.76	37.52
	C.V.(%)	2.387	2.737	2.775	2.742	2.241	2.595
	No. Specimens	18		19		21	
	No. Semipreg Lots	4		4		4	

2.3.16 "40/20/40" Open-Hole Tension 3 Properties (OHT3)

Material: Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

Resin content: 41.56 % wt **Comp. density:** 1.529 g/cc
Fiber volume: 50.47 % vol
Ply count: 10

Test method: ASTM D5766-11

Normalized by: 0.01226 in. CPT

Open-Hole Tension 3
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
NCAMP Layup [(0)4/45]s

		CTD		RTD		ETW	
Test Temperature [°F]		-65		70		180	
Moisture Conditioning		Dry		Dry		Equilibrium	
Equilibrium at T, RH						160 F,85%	
Source code: Prefixed by NTP4013Q1-		TTX-T40-E-OHT3-X-X-CTD-X		TTX-T40-E-OHT3-X-X-RTD-X		TTX-T40-E-OHT3-X-X-ETW-X	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
OHT3 Strength [ksi]	**Mean**	53.43	53.65	52.31	52.36	57.57	57.75
	Minimum	50.11	49.83	49.30	49.57	52.96	52.91
	Maximum	56.51	56.97	56.22	56.33	60.86	61.27
	C.V.(%)	3.615	3.943	3.446	3.404	3.040	3.165
	No. Specimens	18		18		21	
	No. Semipreg Lots	4		4		4	

2.3.17 "25/50/25" Filled-Hole Tension 1 Properties (FHT1)

Material: Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

Resin content: 41.32 % wt **Comp. density:** 1.532 g/cc
Fiber volume: 50.80 % vol
Ply count: 8

Test method: ASTM D6742-12

Normalized by: 0.01226 in. CPT

Filled-Hole Tension 1
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
NCAMP Layup [0/45]2s

		CTD		RTD		ETW	
Test Temperature [°F]		-65		70		180	
Moisture Conditioning		Dry		Dry		Equilibrium	
Equilibrium at T, RH						160 F,85%	
Source code: Prefixed by NTP4013Q1-		TTX-T40-E-FHT1-X-X-CTD-X		TTX-T40-E-FHT1-X-X-RTD-X		TTX-T40-E-FHT1-X-X-ETW-X	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
FHT1 Strength [ksi]	**Mean**	55.59	55.68	52.11	51.95	54.20	54.35
	Minimum	51.46	51.50	50.74	50.79	51.73	51.56
	Maximum	59.65	60.15	53.89	53.51	56.83	56.71
	C.V.(%)	4.534	4.944	1.506	1.502	2.378	2.350
	No. Specimens	19		19		22	
	No. Semipreg Lots	4		4		4	

2.3.18 "10/80/10" Filled-Hole Tension 2 Properties (FHT2)

Material: Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

Resin content: 41.43 % wt **Comp. density:** 1.532 g/cc
Fiber volume: 50.68 % vol
Ply count: 10

Test method: ASTM D6742-12

Normalized by: 0.01226 in. CPT

Filled-Hole Tension 2
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
NCAMP Layup [(45)2/0/(45)2]s

		CTD		RTD		ETW	
Test Temperature [°F]		-65		70		180	
Moisture Conditioning		Dry		Dry		Equilibrium	
Equilibrium at T, RH						160 F,85%	
Source code: Prefixed by NTP4013Q1-		TTX-T40-E-FHT2-X-X-CTD-X		TTX-T40-E-FHT2-X-X-RTD-X		TTX-T40-E-FHT2-X-X-ETW-X	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
FHT2 Strength [ksi]	**Mean**	47.66	47.74	43.05	43.02	36.35	36.42
	Minimum	44.97	45.17	40.92	40.62	34.37	34.36
	Maximum	49.91	50.10	45.20	44.95	38.65	38.57
	C.V.(%)	2.892	2.976	3.101	2.974	2.981	3.260
	No. Specimens	18		18		21	
	No. Semipreg Lots	4		4		4	

2.3.19 "40/20/40" Filled-Hole Tension 3 Properties (FHT3)

Material: Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

Resin content: 41.56 % wt **Comp. density:** 1.529 g/cc
Fiber volume: 50.47 % vol
Ply count: 10

Test method: ASTM D6742-12

Normalized by: 0.01226 in. CPT

Filled-Hole Tension 3
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
NCAMP Layup [(0)4/45]s

		CTD		RTD		ETW	
Test Temperature [°F]		-65		70		180	
Moisture Conditioning		Dry		Dry		Equilibrium	
Equilibrium at T, RH						160 F,85%	
Source code: Prefixed by NTP4013Q1-		TTX-T40-E-FHT3-X-X-CTD-X		TTX-T40-E-FHT3-X-X-RTD-X		TTX-T40-E-FHT3-X-X-ETW-X	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
FHT3 Strength [ksi]	**Mean**	57.18	57.45	55.05	55.01	58.55	58.92
	Minimum	53.29	53.61	50.31	50.06	55.89	56.68
	Maximum	62.18	62.68	60.91	61.06	62.40	62.02
	C.V.(%)	3.425	3.519	5.890	6.199	3.043	2.495
	No. Specimens	18		18		21	
	No. Semipreg Lots	4		4		4	

2.3.20 "25/50/25" Open-Hole Compression 1 Properties (OHC1)

Material:	Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS					**Open-Hole Compression 1** Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS NCAMP Layup [0/45]3s			
Resin content:	40.83 % wt	**Comp. density:**	1.531 g/cc						
Fiber volume:	51.19 % vol								
Ply count:	12								
Test method:	ASTM D6484-14								
Normalized by:	0.01226	in. CPT							
		RTD		**ETW**					
Test Temperature [°F]		70		180					
Moisture Conditioning		Dry		Equilibrium					
Equilibrium at T, RH				160 F,85%					
Source code: Prefixed by NTP4013Q1-		TTX-T40-E-OHC1-X-X-RTD-X		TTX-T40-E-OHC1-X-X-ETW-X					
		Normalized	**Measured**	**Normalized**	**Measured**				
OHC1 Strength [ksi]	**Mean**	44.32	44.36	37.76	37.78				
	Minimum	42.22	41.92	35.78	35.87				
	Maximum	47.39	47.73	39.87	39.83				
	C.V.(%)	2.701	2.840	2.931	2.893				
	No. Specimens	19		22					
	No. Semipreg Lots	4		4					

2.3.21 "10/80/10" Open-Hole Compression 2 Properties (OHC2)

Open-Hole Compression 2
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
NCAMP Layup [(45)2/0/(45)2]s

Material:	Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS								
Resin content:	41.43 % wt	**Comp. density:**	1.532 g/cc						
Fiber volume:	50.68 % vol								
Ply count:	10								
Test method:	ASTM D6484-14								
Normalized by:	0.01226	in. CPT							
		RTD		**ETW**					
Test Temperature [°F]		70		180					
Moisture Conditioning		Dry		Equilibrium					
Equilibrium at T, RH				160 F,85%					
Source code: Prefixed by NTP4013Q1-		TTX-T40-E-OHC2-X-X-RTD-X		TTX-T40-E-OHC2-X-X-ETW-X					
		Normalized	**Measured**	**Normalized**	**Measured**				
OHC2 Strength [ksi]	**Mean**	36.80	37.03	30.58	30.45				
	Minimum	35.75	36.23	29.09	28.80				
	Maximum	37.86	37.94	31.72	31.59				
	C.V.(%)	1.545	1.512	2.955	3.254				
	No. Specimens	18		21					
	No. Semipreg Lots	4		4					

2.3.22 "40/20/40" Open-Hole Compression 3 Properties (OHC3)

Material:	Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS						**Open-Hole Compression 3** Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS NCAMP Layup [(0)4/45]s			
Resin content:	41.56 % wt		**Comp. density:**	1.529 g/cc						
Fiber volume:	50.47 % vol									
Ply count:	10									
Test method:	ASTM D6484-14									
Normalized by:	0.01226	in. CPT								
			RTD		**ETW**					
Test Temperature [°F]			70		180					
Moisture Conditioning			Dry		Equilibrium					
Equilibrium at T, RH					160 F,85%					
Source code: Prefixed by NTP4013Q1-			TTX-T40-E-OHC3-X-X-RTD-X		TTX-T40-E-OHC3-X-X-ETW-X					
			Normalized	**Measured**	**Normalized**	**Measured**				
OHC3 Strength [ksi]	**Mean**		42.47	42.87	37.69	37.67				
	Minimum		41.36	41.51	35.18	35.06				
	Maximum		44.76	44.68	40.19	40.50				
	C.V.(%)		1.986	2.021	3.570	3.821				
	No. Specimens		18		21					
	No. Semipreg Lots		4		4					

2.3.23 "25/50/25" Filled-Hole Compression 1 Properties (FHC1)

Material:	Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS						**Filled-Hole Compression 1** Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS NCAMP layup [0/45]3s		
Resin content:	40.83 % wt		**Comp. density:**	1.531 g/cc					
Fiber volume:	51.19 % vol								
Ply count:	12								
Test method:	ASTM D6742-12								
Normalized by:	0.01226	in. CPT							
			RTD		**ETW**				
Test Temperature [°F]			70		180				
Moisture Conditioning			Dry		Equilibrium				
Equilibrium at T, RH					160 F,85%				
Source code: Prefixed by NTP4013Q1-			TTX-T40-E-FHC1-X-X-RTD-X		TTX-T40-E-FHC1-X-X-ETW-X				
			Normalized	**Measured**	**Normalized**	**Measured**			
FHC1 Strength [ksi]	**Mean**		68.80	68.50	56.15	55.92			
	Minimum		65.81	64.68	50.04	50.68			
	Maximum		72.13	71.35	60.86	60.41			
	C.V.(%)		2.962	2.952	6.141	5.676			
	No. Specimens		21		21				
	No. Semipreg Lots		4		4				

2.3.24 "10/80/10" Filled-Hole Compression 2 Properties (FHC2)

Material:	Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS						**Filled-Hole Compression 2** Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS NCAMP Layup [(45)2/0/(45)2]s			
Resin content:	41.43 % wt		**Comp. density:**	1.532 g/cc						
Fiber volume:	50.68 % vol									
Ply count:	10									
Test method:	ASTM D6742-12									
Normalized by:	0.01226	in. CPT								
			RTD		**ETW**					
Test Temperature [°F]			70		180					
Moisture Conditioning			Dry		Equilibrium					
Equilibrium at T, RH					160 F,85%					
Source code: Prefixed by NTP4013Q1-			TTX-T40-E-FHC2-X-X-RTD-X		TTX-T40-E-FHC2-X-X-ETW-X					
			Normalized	**Measured**	**Normalized**	**Measured**				
FHC2 Strength [ksi]	**Mean**		49.71	49.48	41.15	41.23				
	Minimum		47.44	47.49	39.06	38.95				
	Maximum		52.34	52.02	42.93	43.17				
	C.V.(%)		2.273	2.214	2.727	3.146				
	No. Specimens		17		21					
	No. Semipreg Lots		4		4					

2.3.25 "40/20/40" Filled-Hole Compression 3 Properties (FHC3)

Material:	Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS						**Filled-Hole Compression 3** Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS NCAMP Layup [(0)4/45]s		
Resin content:	41.56 % wt		**Comp. density:** 1.529 g/cc						
Fiber volume:	50.47 % vol								
Ply count:	10								
Test method:	ASTM D6742-12								
Normalized by:	0.01226	in. CPT							
			RTD		**ETW**				
Test Temperature [°F]			70		180				
Moisture Conditioning			Dry		Equilibrium				
Equilibrium at T, RH					160 F,85%				
Source code: Prefixed by NTP4013Q1-			TTX-T40-E-FHC3-X-X-RTD-X		TTX-T40-E-FHC3-X-X-ETW-X				
			Normalized	**Measured**	**Normalized**	**Measured**			
FHC3 Strength [ksi]	**Mean**		82.39	82.42	65.25	65.61			
	Minimum		70.99	70.67	59.96	60.28			
	Maximum		89.13	88.70	71.12	71.04			
	C.V.(%)		4.719	4.945	5.022	5.203			
	No. Specimens		19		20				
	No. Semipreg Lots		4		4				

2.3.26 "25/50/25" Single-Shear Bearing 1, Proc. C Properties (SSB1)

Material: Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

Single-Shear Bearing 1
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
NCAMP Layup [0/45]2s

Resin content: 39.37 % wt **Comp. density:** 1.528 g/cc
Fiber volume: 52.34 % vol
Ply count: 8

Test method: ASTM D5961-17

Normalized by: 0.01226 in. CPT

		RTD		ETW					
Test Temperature [°F]		70		180					
Moisture Conditioning		Dry		Equilibrium					
Equilibrium at T, RH				160 F,85%					
Source code: Prefixed by NTP4013Q1-		TTX-T40-E-SSB1-X-X-1-RTD-X		TTX-T40-E-SSB1-X-X-1-ETW-X					
		Normalized	**Measured**	**Normalized**	**Measured**				
SSB1, Proc. C 2% Offset Strength [ksi]	**Mean**	107.6	108.8	96.31	97.12				
	Minimum	103.16	102.5	85.47	87.26				
	Maximum	112.5	113.3	107.49	108.11				
	C.V.(%)	2.533	2.802	7.208	6.476				
	No. Specimens		22		18				
	No. Semipreg Lots		4		4				
SSB1, Proc. C Ultimate Strength [ksi]	**Mean**	124.2	125.5	105.0	105.9				
	Minimum	119.5	118.7	95.89	96.44				
	Maximum	128.7	131.9	112.0	113.2				
	C.V.(%)	2.058	2.927	4.407	4.458				
	No. Specimens		22		18				
	No. Semipreg Lots		4		4				

2.3.27 "10/80/10" Single-Shear Bearing 2, Proc. C Properties (SSB2)

Material:	Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS							**Single-Shear Bearing 2** Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS NCAMP Layup [(45)2/0/(45)2]s	
Resin content:	39.67 % wt		**Comp. density:**	1.529 g/cc					
Fiber volume:	52.11 % vol								
Ply count:	10								
Test method:	ASTM D5961-17								
Normalized by:	0.01226	in. CPT							
			RTD		**ETW**				
Test Temperature [°F]			70		180				
Moisture Conditioning			Dry		Equilibrium				
Equilibrium at T, RH					160 F,85%				
Source code: Prefixed by NTP4013Q1-			TTX-T40-E-SSB2-X-X-1-RTD-X		TTX-T40-E-SSB2-X-X-1-ETW-X				
			Normalized	**Measured**	**Normalized**	**Measured**			
	Mean		103.8	104.0	90.39	90.89			
	Minimum		100.85	99.99	79.17	79.50			
SSB2, Proc. C	**Maximum**		108.9	109.2	102.78	102.1			
2% Offset Strength [ksi]	**C.V.(%)**		2.065	2.343	5.970	5.865			
	No. Specimens			19		19			
	No. Semipreg Lots			4		4			
	Mean		123.4	123.6	108.1	108.7			
	Minimum		117.2	116.6	101.4	103.4			
SSB2, Proc. C	**Maximum**		133.0	132.2	113.4	113.7			
Ultimate Strength [ksi]	**C.V.(%)**		3.446	3.664	2.712	2.696			
	No. Specimens			19		19			
	No. Semipreg Lots			4		4			

2.3.28 "40/20/40" Single-Shear Bearing 3, Proc. C Properties (SSB3)

Material:	Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS						**Single-Shear Bearing 3** Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS NCAMP Layup [(0)4/45]s			
Resin content:	39.46 % wt	**Comp. density:**	1.529 g/cc						
Fiber volume:	52.30 % vol								
Ply count:	10								
Test method:	ASTM D5961-17								
Normalized by:	0.01226	in. CPT							
			RTD		**ETW**				
Test Temperature [°F]			70		180				
Moisture Conditioning			Dry		Equilibrium				
Equilibrium at T, RH					160 F,85%				
Source code: Prefixed by NTP4013Q1-			TTX-T40-E-SSB3-X-X-1-RTD-X		TTX-T40-E-SSB3-X-X-1-ETW-X				
			Normalized	**Measured**	**Normalized**	**Measured**			
SSB3, Proc. C Initial Peak Bearing Strength [ksi]	**Mean**		95.02	96.39	81.50	82.36			
	Minimum		92.44	93.22	75.33	77.30			
	Maximum		97.42	99.7	90.87	90.44			
	C.V.(%)		1.772	1.845	5.267	4.768			
	No. Specimens		9		16				
	No. Semipreg Lots		4		4				
SSB3, Proc. C 2% Offset Strength [ksi]	**Mean**		94.11	94.95	80.76	81.56			
	Minimum		89.32	92.44	72.86	73.11			
	Maximum		98.34	98.7	89.22	89.75			
	C.V.(%)		2.341	2.106	5.635	5.305			
	No. Specimens		19		19				
	No. Semipreg Lots		4		4				
SSB3, Proc. C Ultimate Strength [ksi]	**Mean**		108.2	109.2	95.96	96.93			
	Minimum		104.1	104.5	91.21	91.06			
	Maximum		111.9	114.1	100.4	100.8			
	C.V.(%)		2.178	2.617	2.390	2.777			
	No. Specimens		19		19				
	No. Semipreg Lots		4		4				

2.3.29 "25/50/25" Compression After Impact 1 Properties (CAI1)

Material:	Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS									**Compression After Impact 1** Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS NCAMP Layup [0/45]4s	
Resin content:	40.38 % wt		**Comp. density:**	1.530 g/cc							
Fiber volume:	51.55 % vol										
Ply count:	16										
Test method:	ASTM D7136-12/D7137-12										
Normalized by:	0.01226	in. CPT									
				RTD							
Test Temperature [°F]				70							
Moisture Conditioning				Dry							
Equilibrium at T, RH											
Source code:											
			Normalized	**Measured**							
	Mean		45.69	46.54							
	Minimum		44.34	45.50							
CAI1 Strength [ksi] (1500 in.lb/in)	**Maximum**		47.80	48.02							
	C.V.(%)		2.373	1.824							
	No. Specimens			16							
	No. Semipreg Lots			2							

2.3.30 Interlaminar Tension Properties (ILT)[1]

Material: Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

Resin content: 39.93% wt **Comp. density:** 1.530 g/cc
Fiber volume: 51.95% vol
Ply count: 14

Test method: ASTM D6415-06a(2013)

Normalized by: NA

Interlaminar Tension
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
NCAMP Layup [0°]7s

		CTD		RTD		ETW	
Test Temperature [°F]		-65		70		180	
Moisture Conditioning		Dry		Dry		Equilibrium	
Equilibrium at T, RH						160 F, 85%	
Source code: Prefixed by NTP4013Q1-							
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
CBS [lb]	**Mean**		685.3		493.4		378.0
	Minimum		624.9		430.9		338.9
	Maximum		721.4		540.3		413.6
	C.V.(%)		5.453		9.062		6.452
	No. Specimens		9		9		9
	No. Semipreg Lots		3		3		3
ILT [ksi]	**Mean**		19.10		13.86		10.64
	Minimum		16.74		11.67		9.560
	Maximum		20.57		15.61		11.53
	C.V.(%)		7.443		11.14		6.695
	No. Specimens		9		9		9
	No. Semipreg Lots		3		3		3

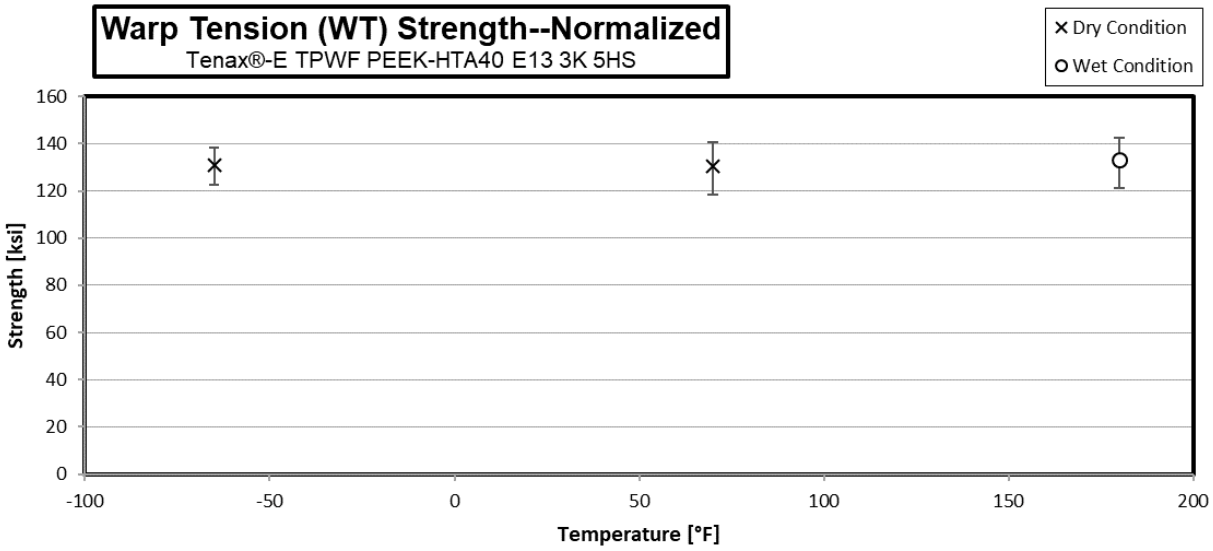
[1]For informational only, please refer to NPS 84013 section 4.5 for processing information.

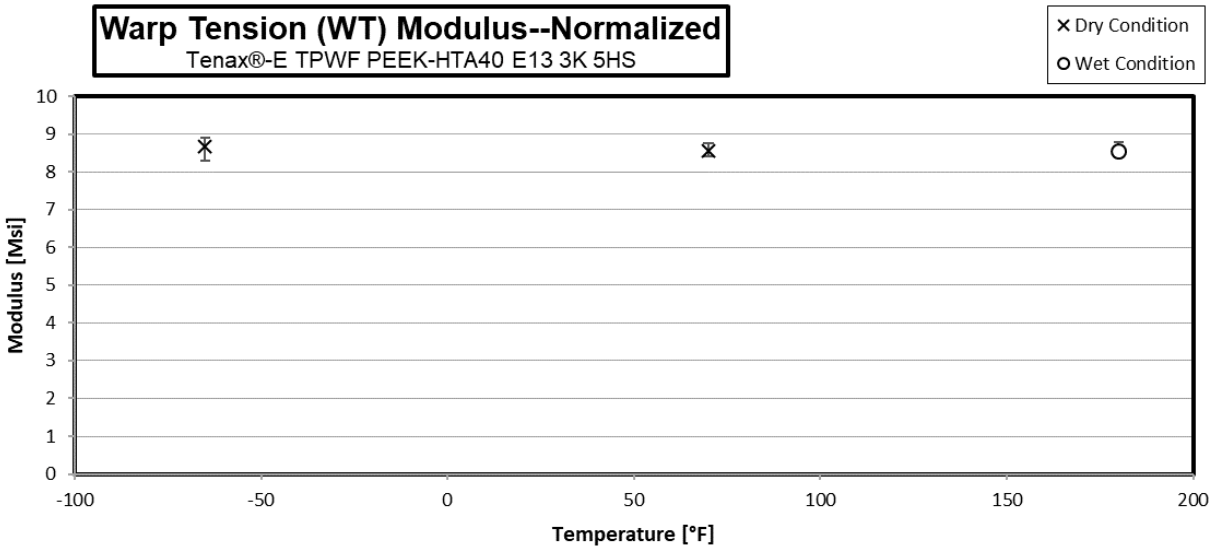
3. Individual Test Charts

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

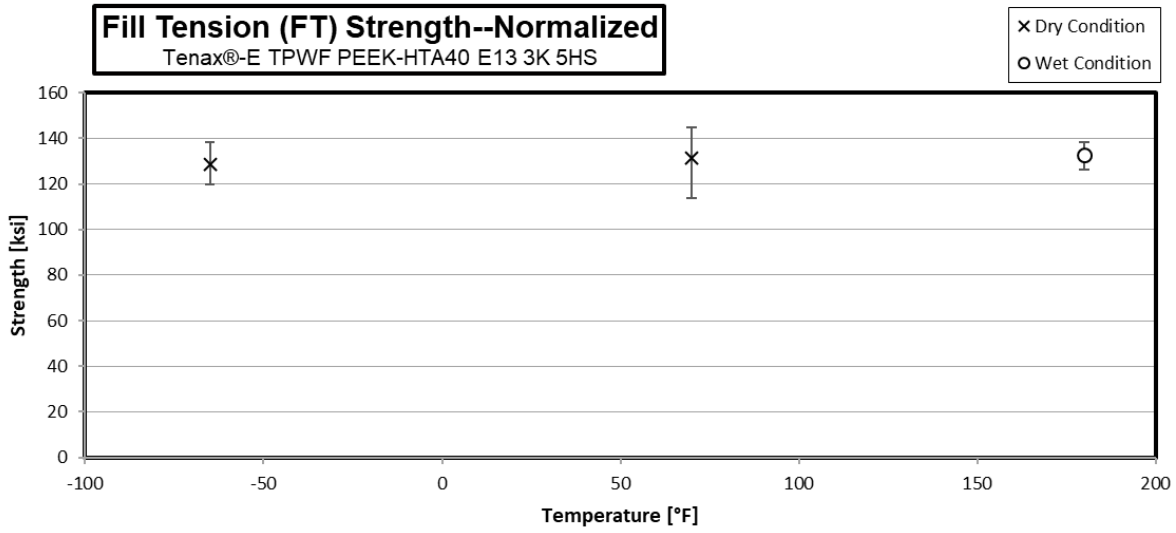
Plots for ETD have been offset to 175°F (from 180°F) to improve clarity and readability.

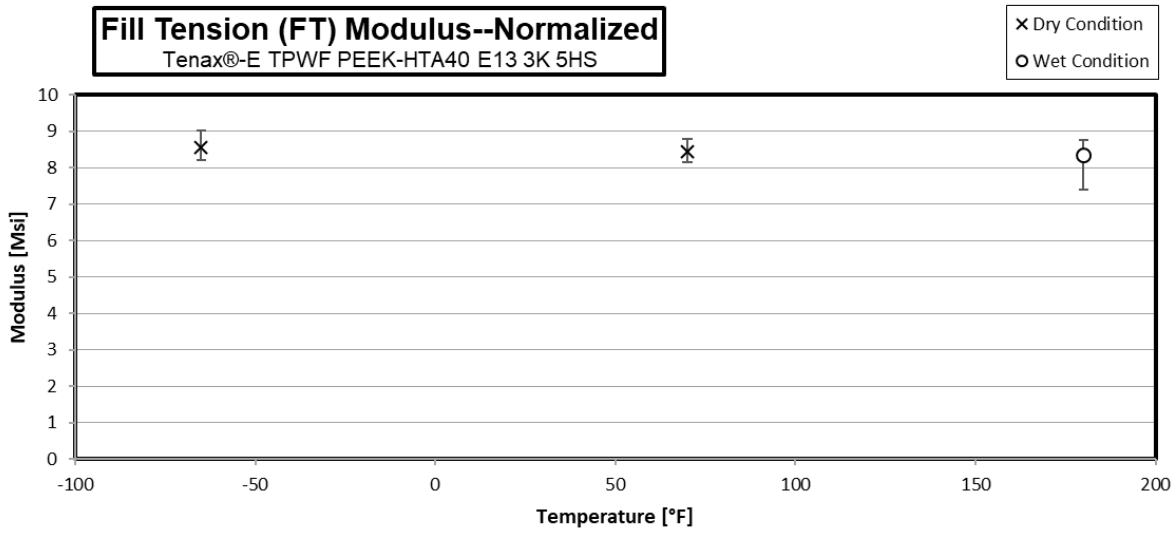
3.1 Warp Tension Properties (WT)



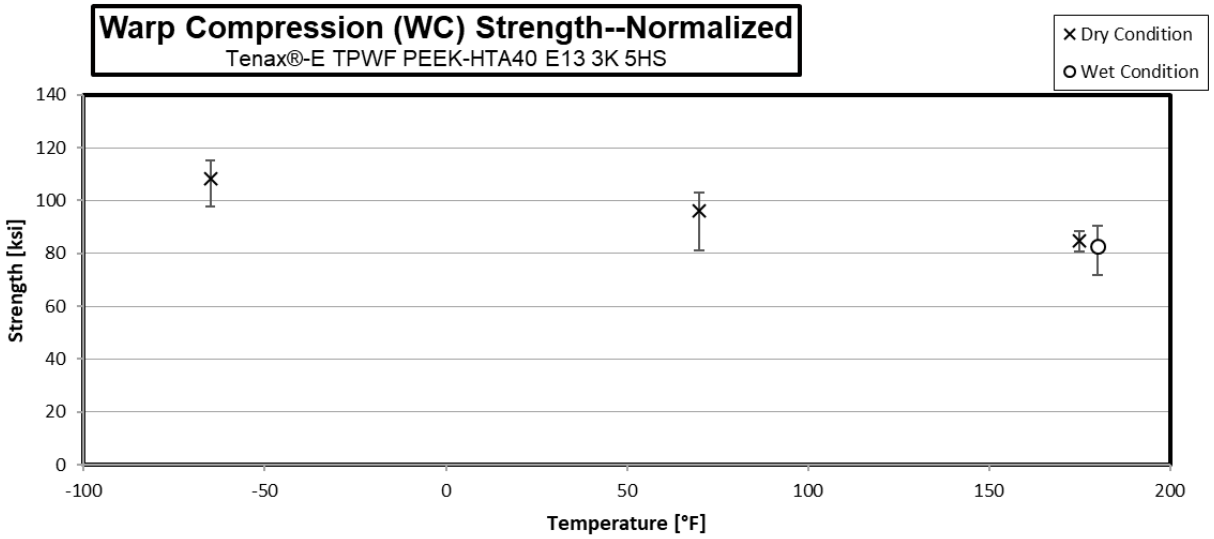


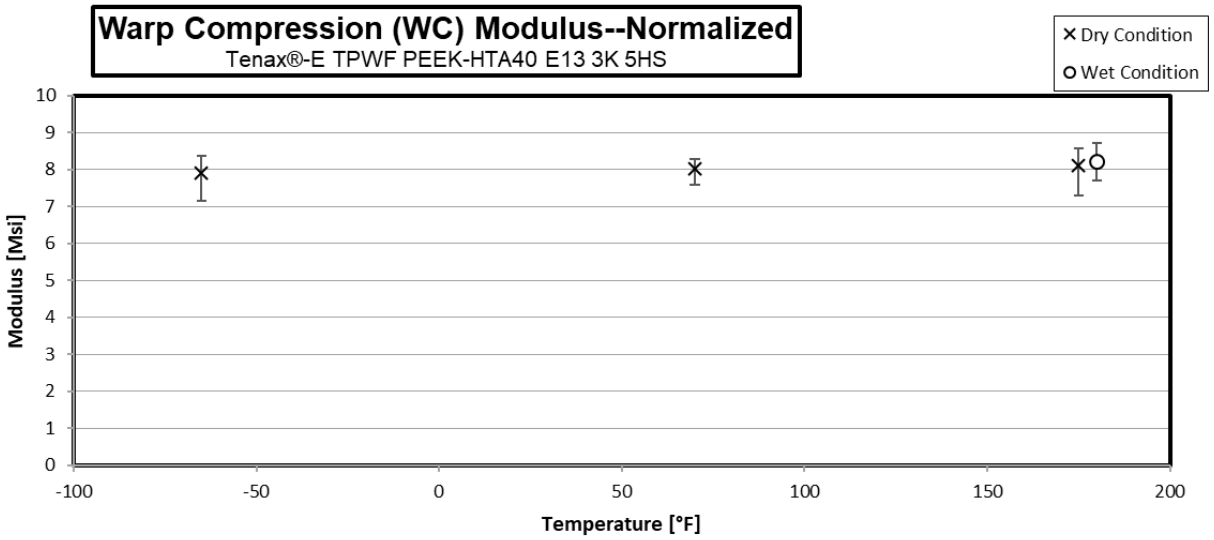
3.2 Fill Tension Properties (FT)



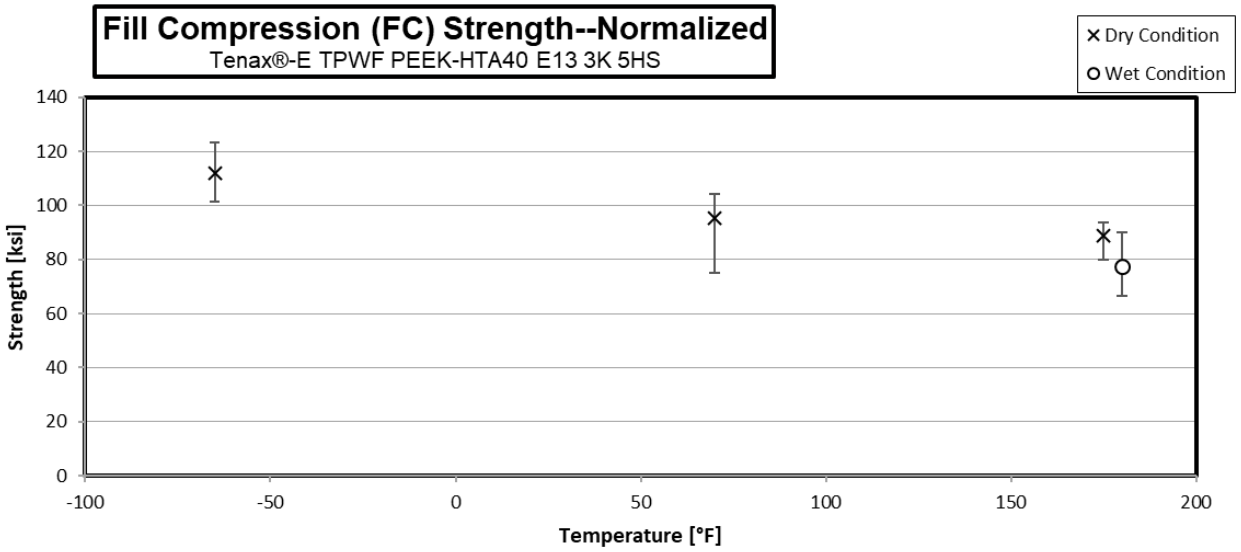


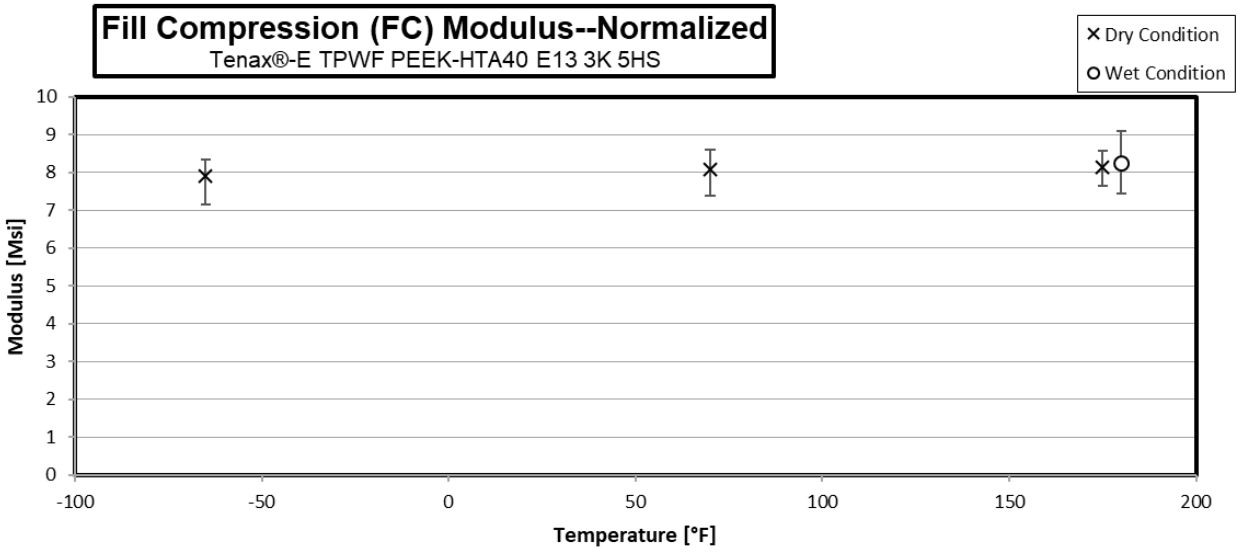
3.3 Warp Compression Properties (WC)



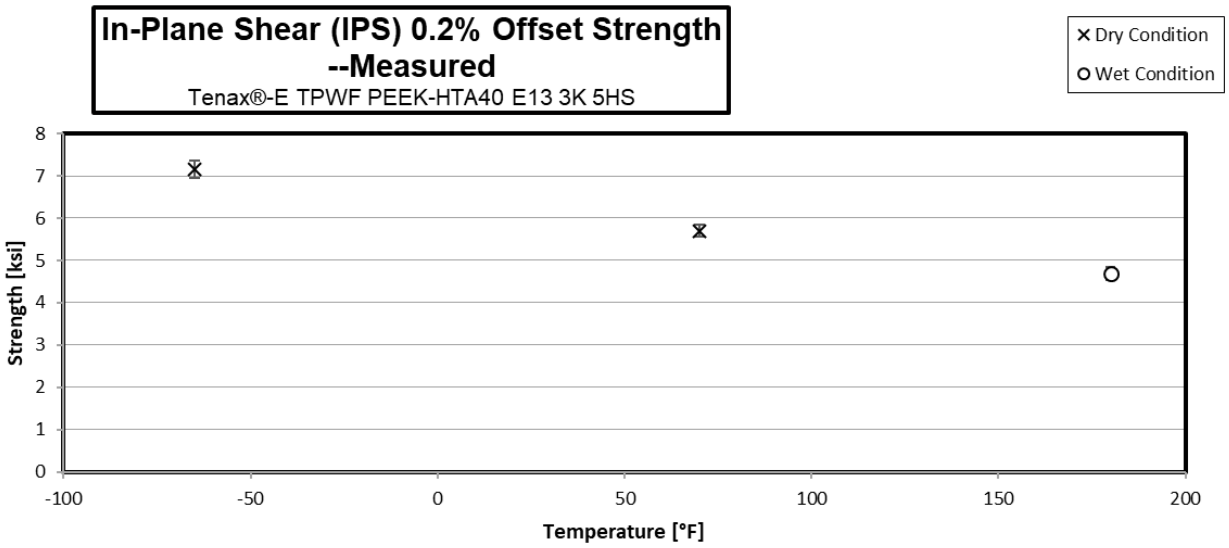


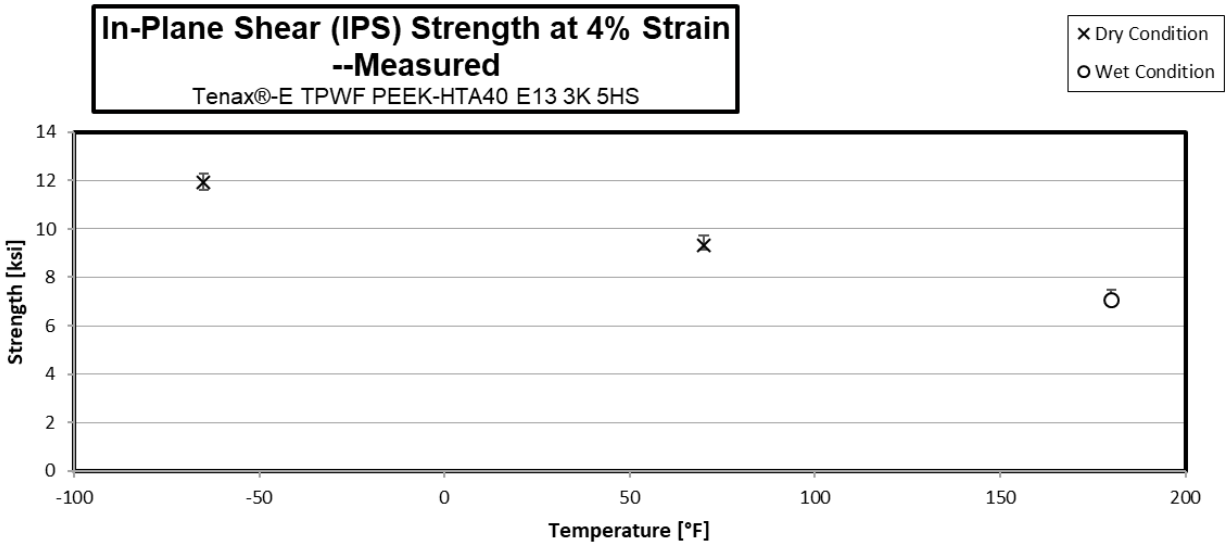
3.4 Fill Compression Properties (FC)

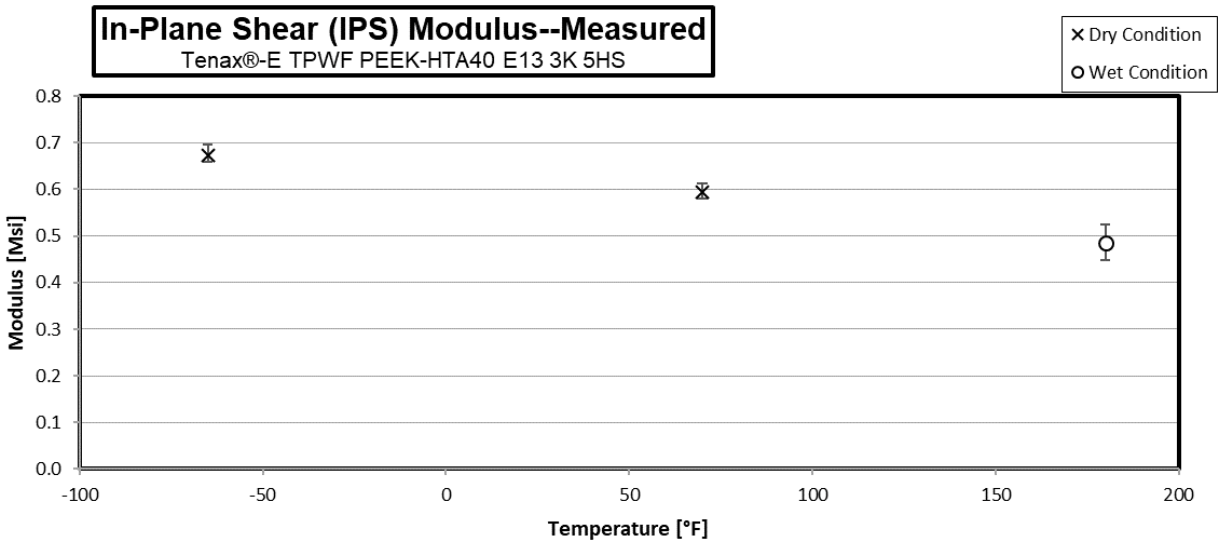




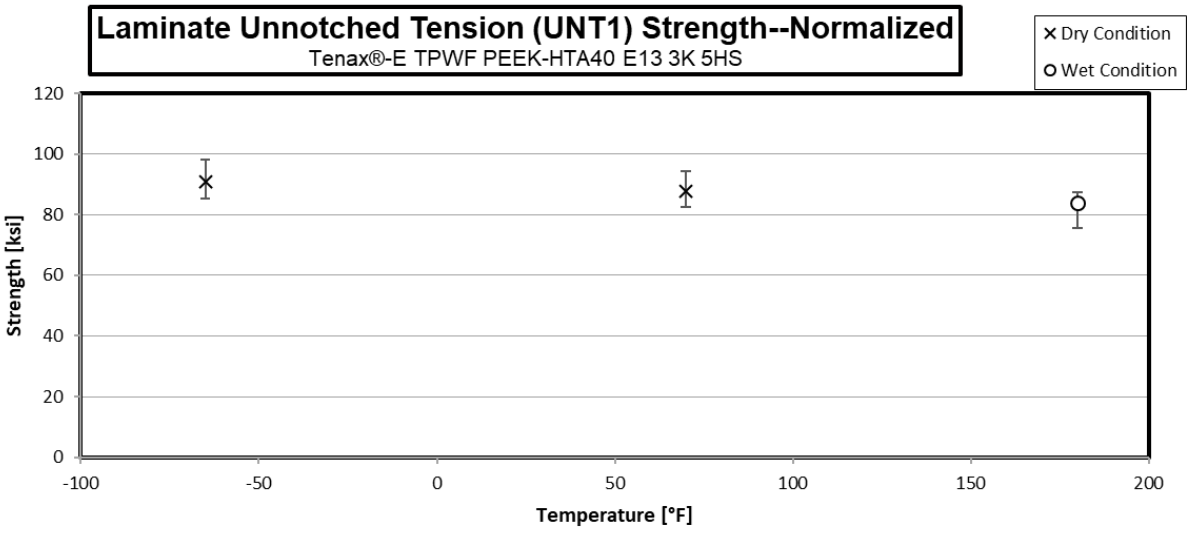
3.5 In-Plane Shear Properties (IPS)

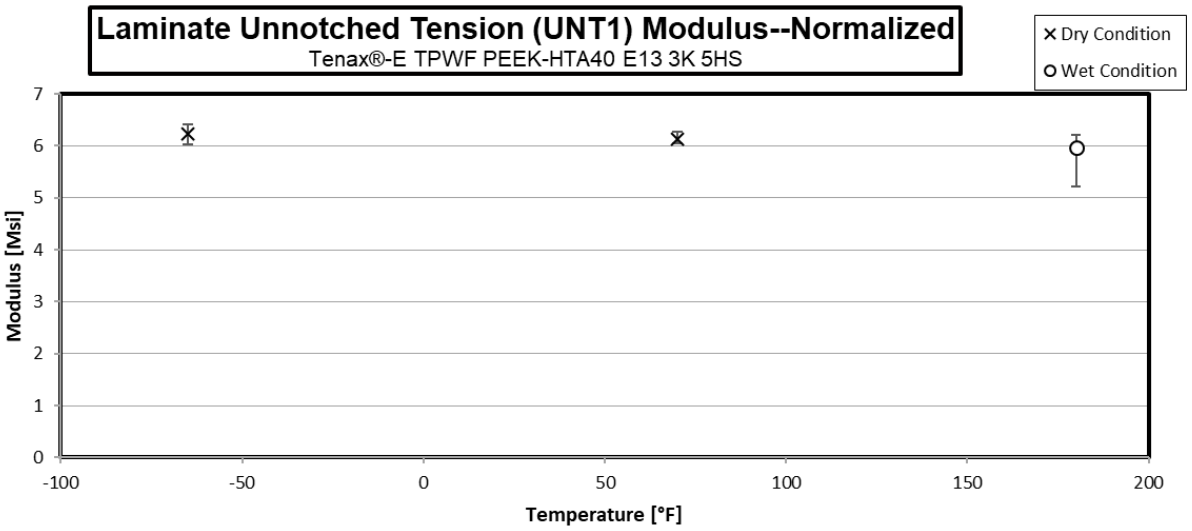




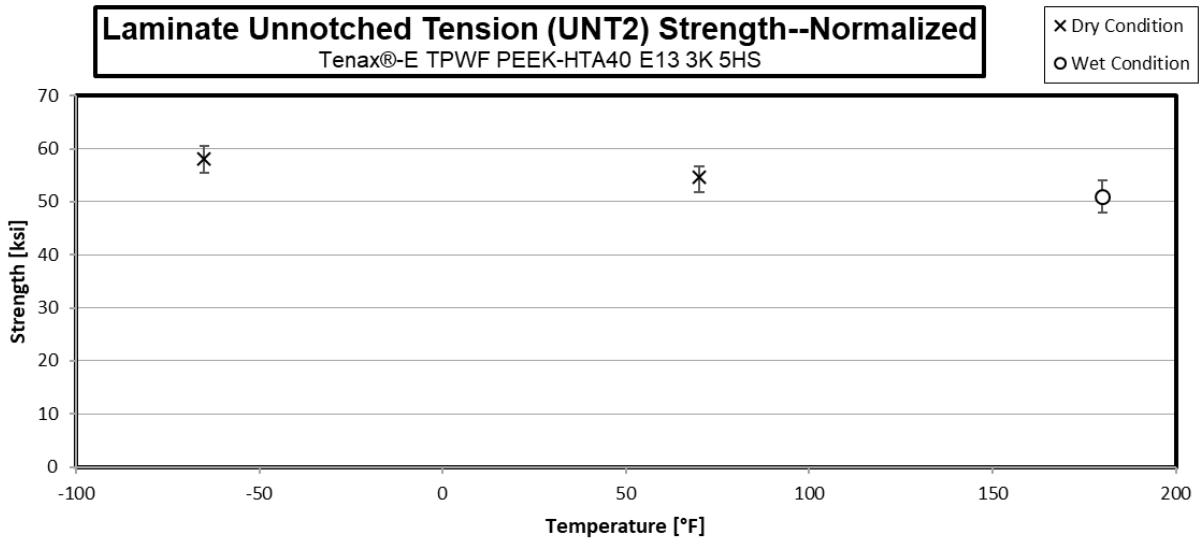

In-Plane Shear (IPS) Modulus--Measured
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Dry Condition
Wet Condition
Modulus [Msi]
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-100
-50
0
50
100
150
200
Temperature [°F]

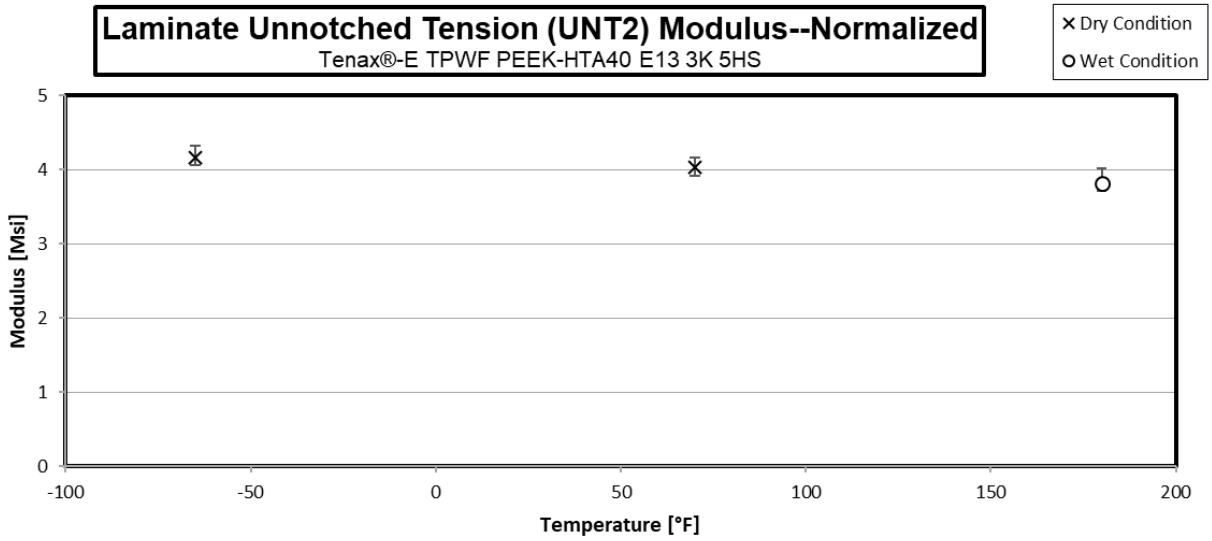
3.6 “25/50/25” Unnotched Tension 1 Properties (UNT1)



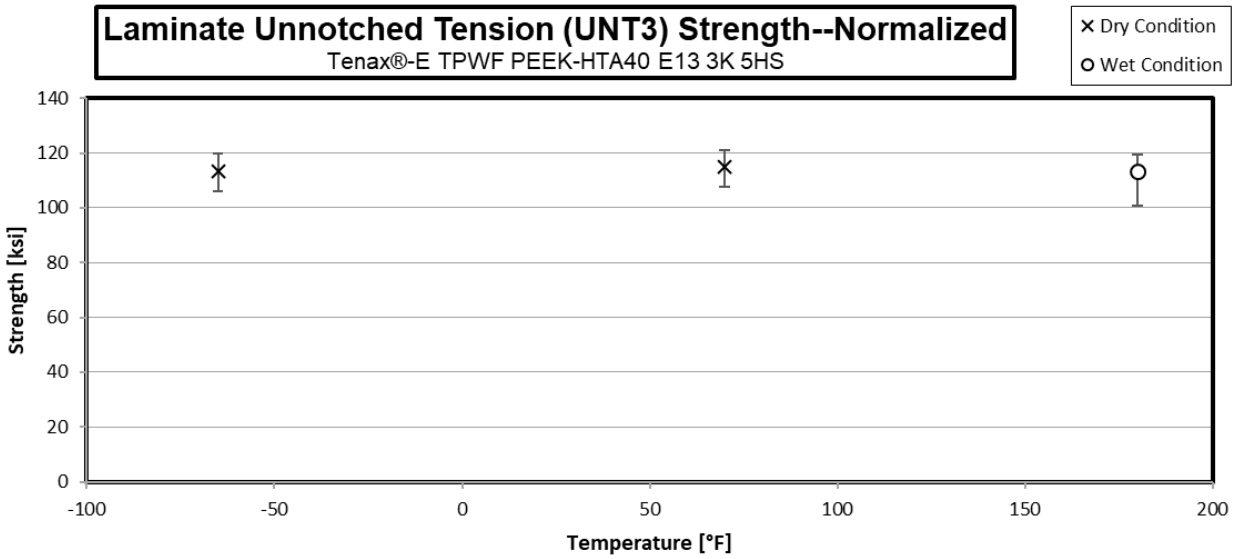


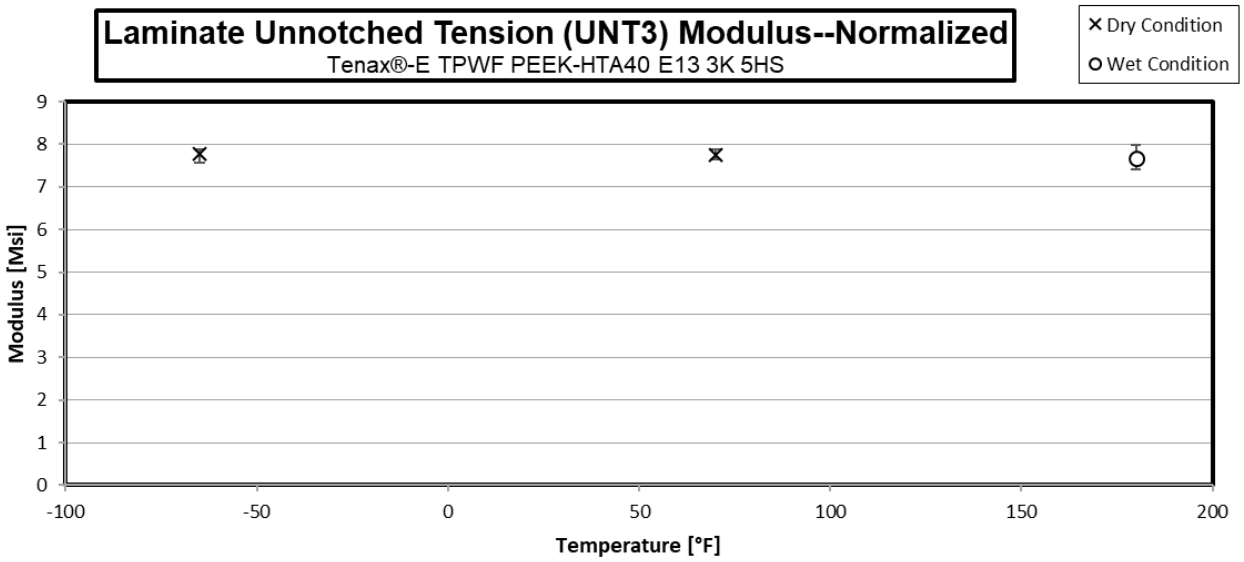
3.7 “10/80/10” Unnotched Tension 2 Properties (UNT2)



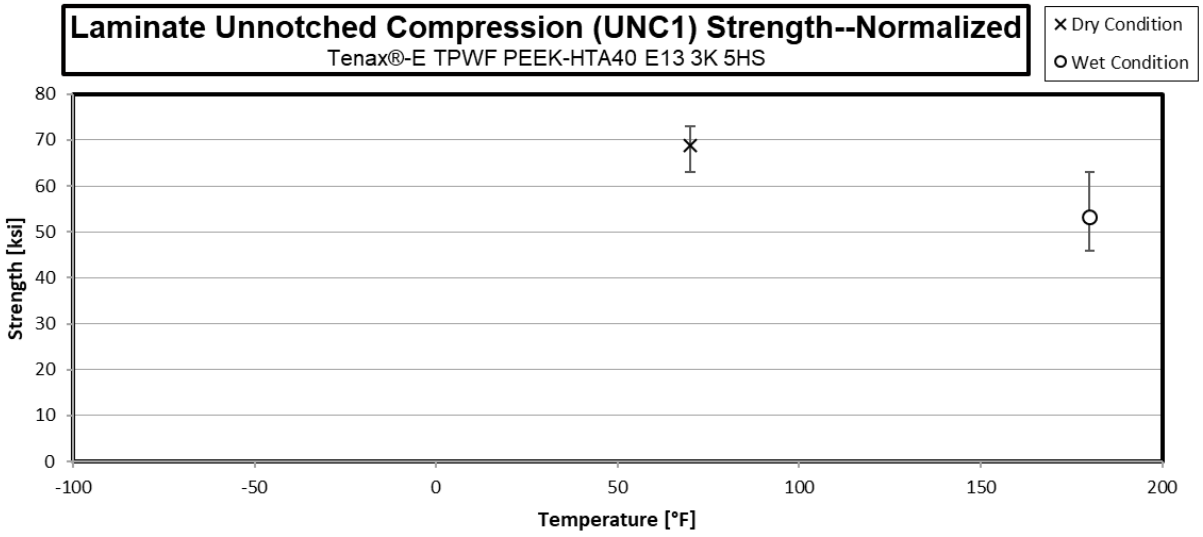


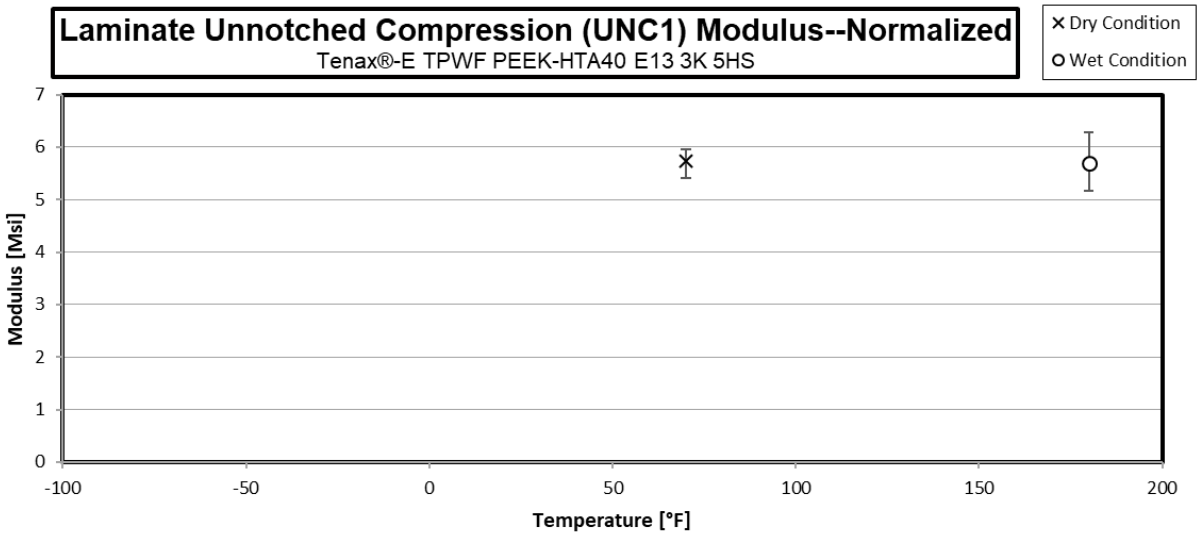
3.8 "40/20/40" Unnotched Tension 3 Properties (UNT3)



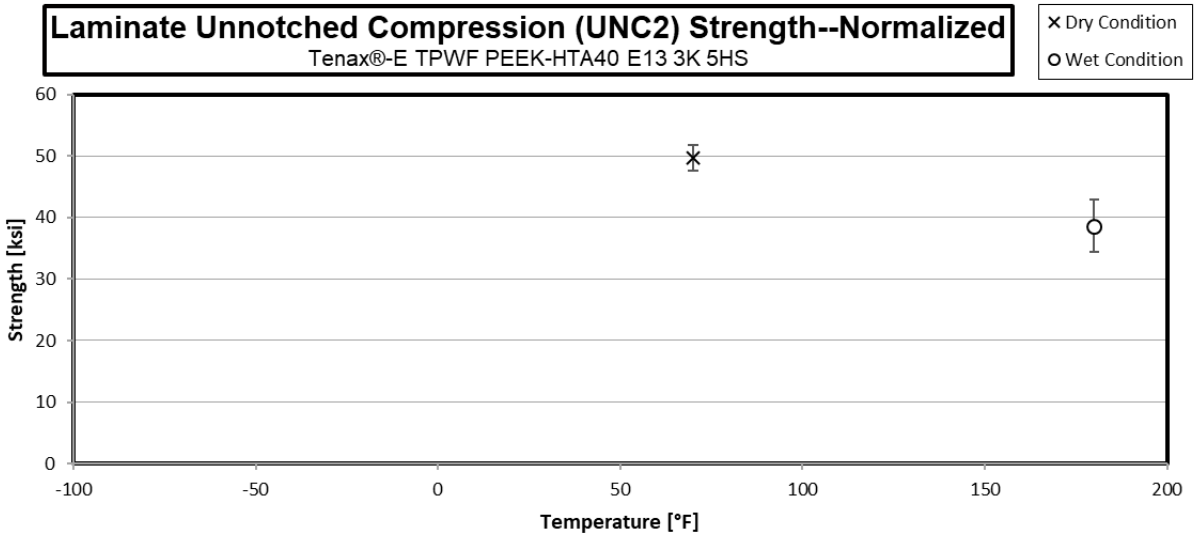


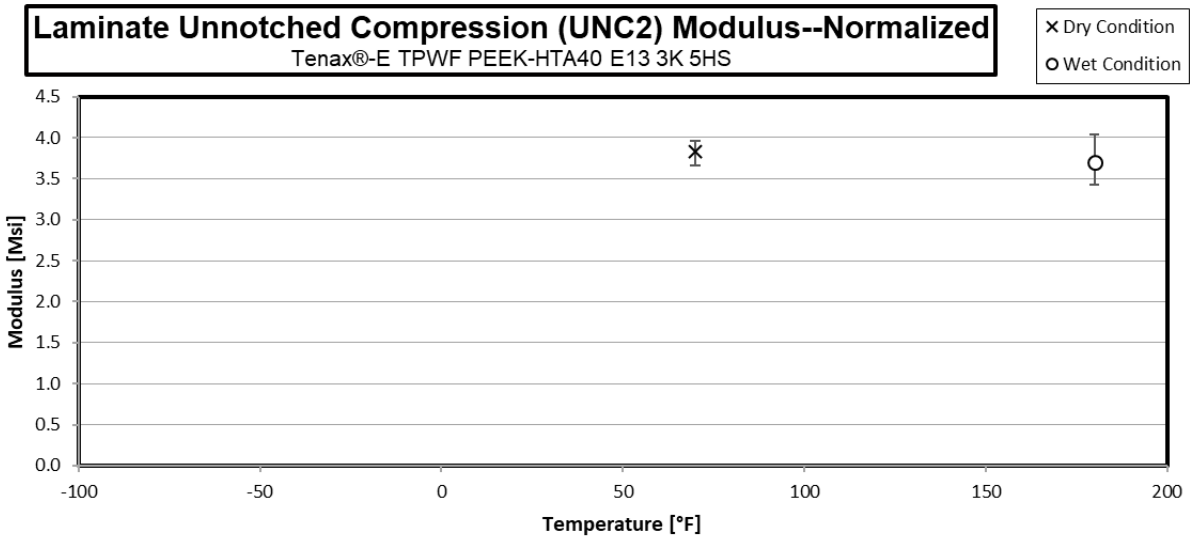
3.9 “25/50/25” Unnotched Compression 1 Properties (UNC1)



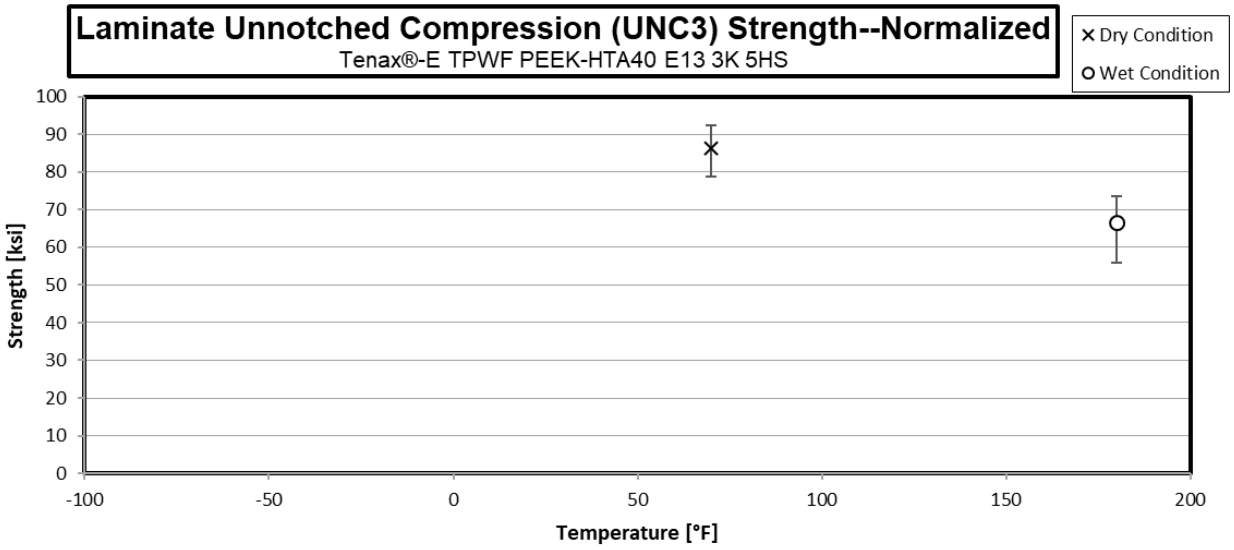


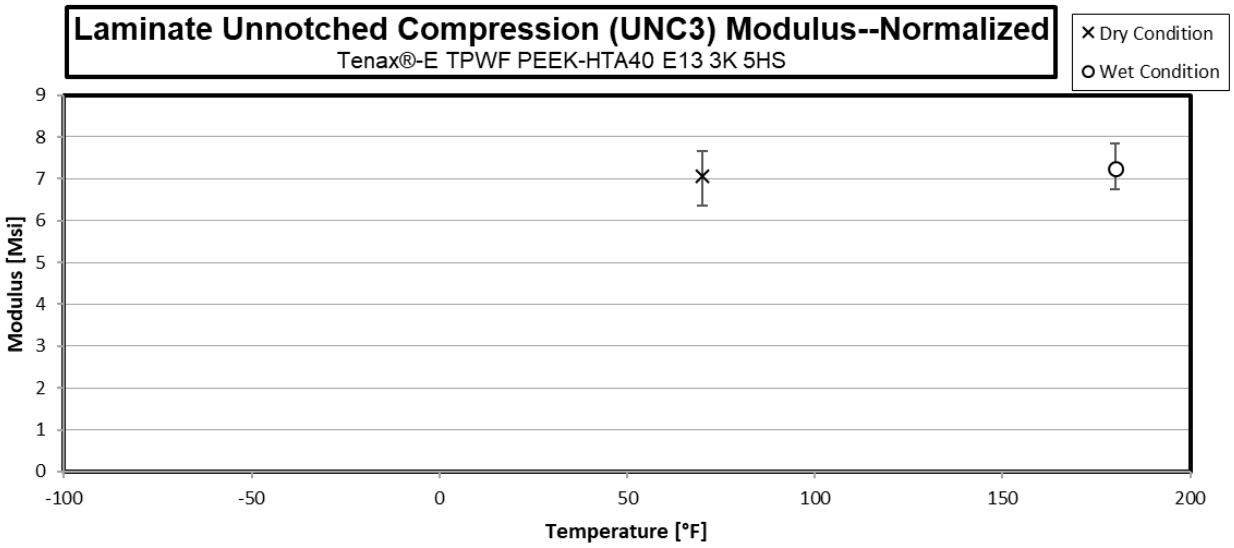
3.10 "10/80/10" Unnotched Compression 2 Properties (UNC2)



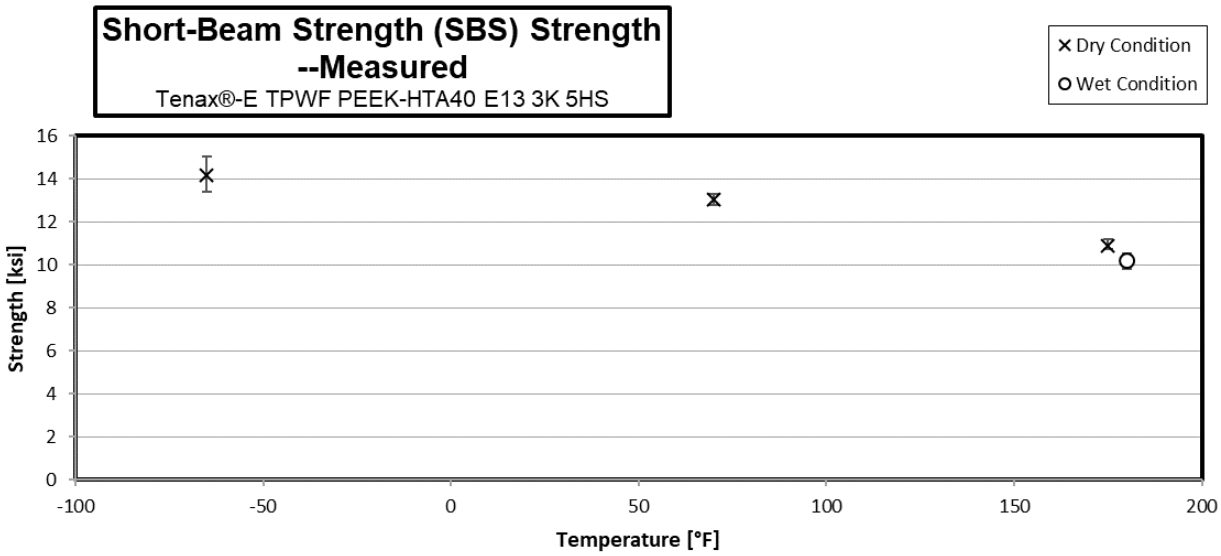


3.11 "40/20/40" Unnotched Compression 3 Properties (UNC3)

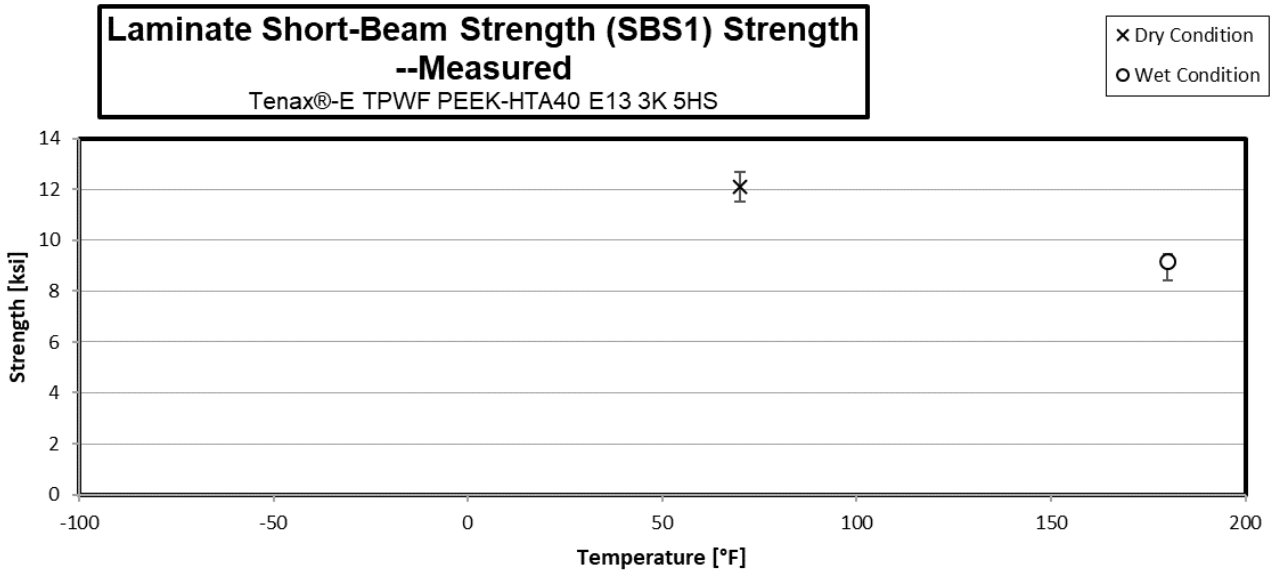




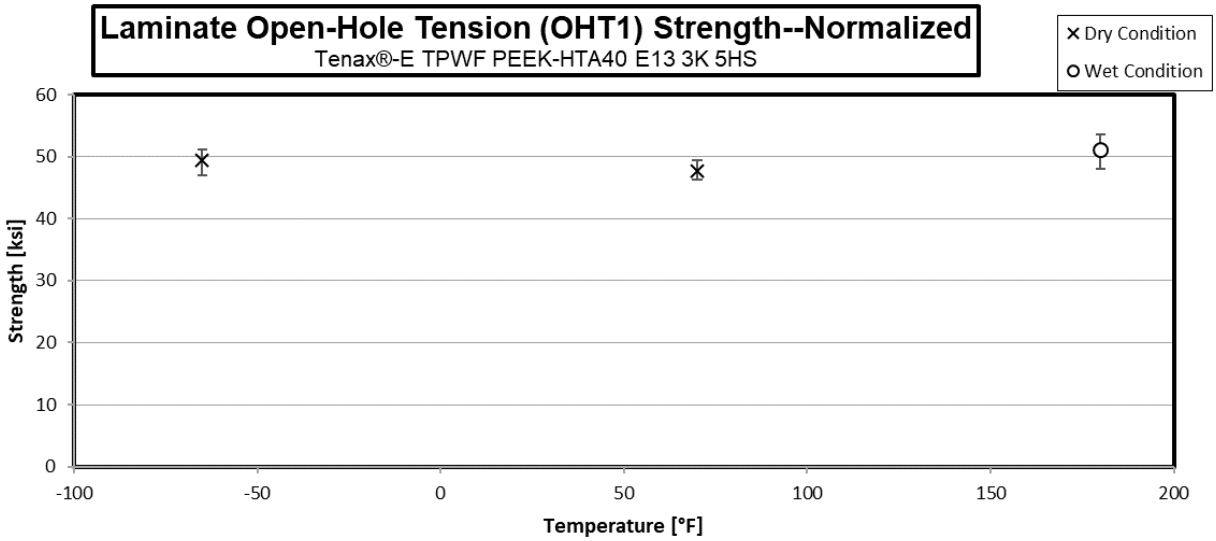
3.12 Lamina Short-Beam Strength Properties (SBS)



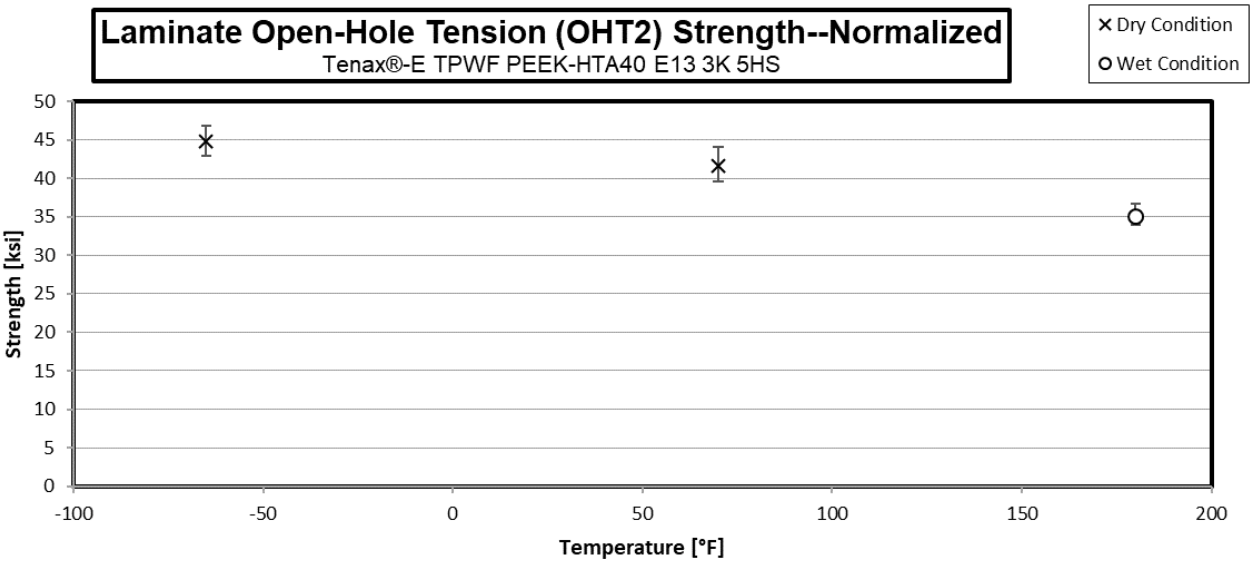
3.13 Laminate Short-Beam Strength Properties (SBS1)



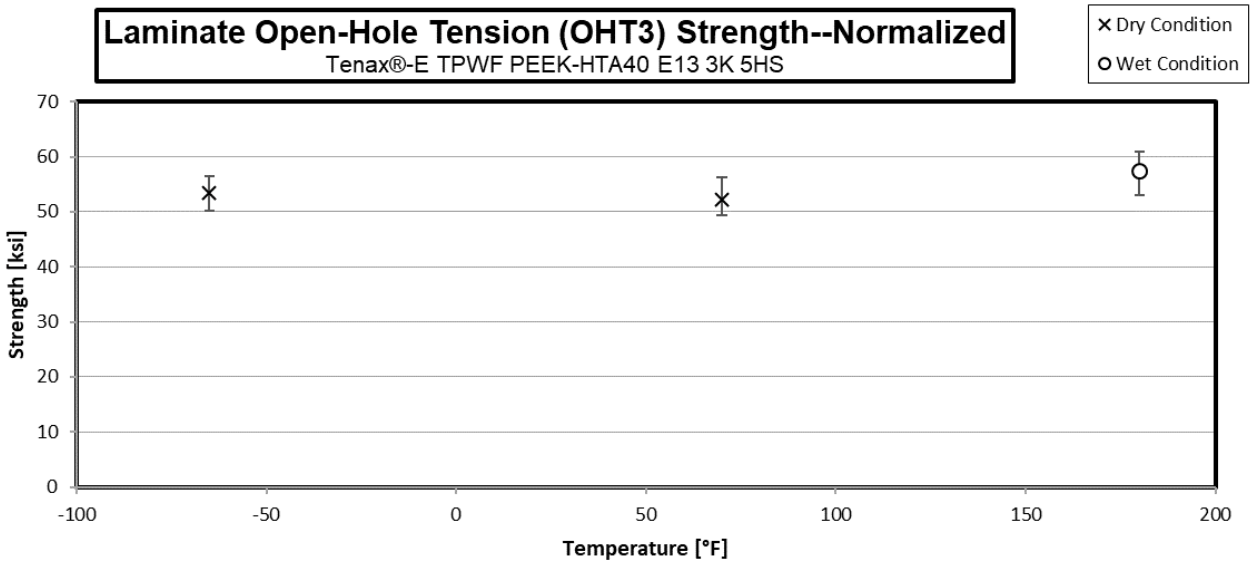
3.14 "25/50/25" Open-Hole Tension 1 Properties (OHT1)



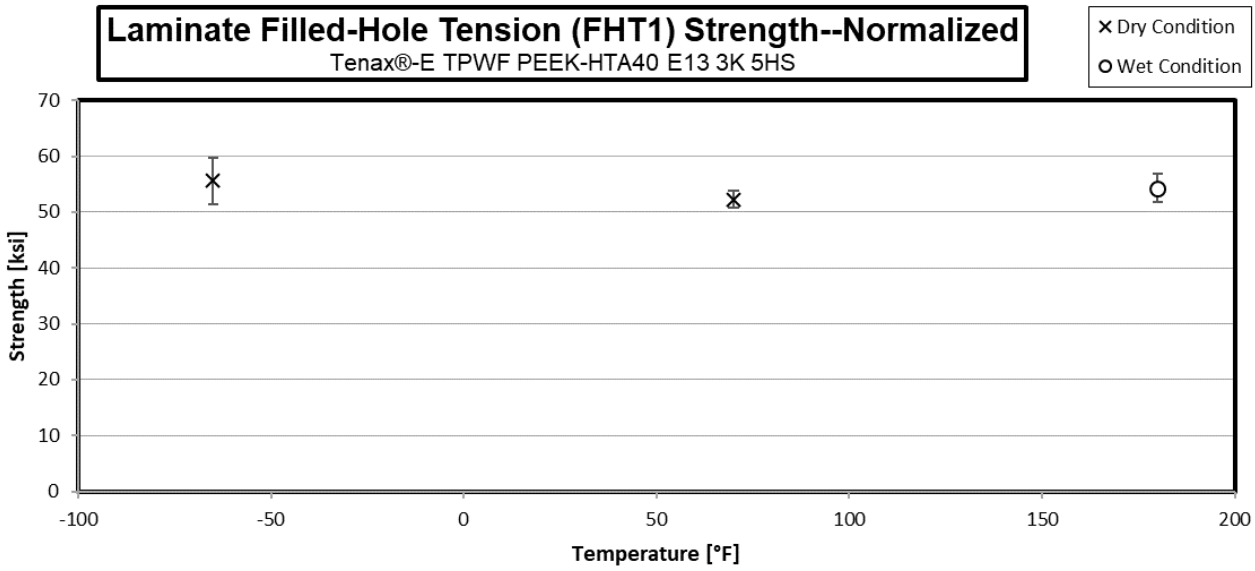
3.15 "10/80/10" Open-Hole Tension 2 Properties (OHT2)



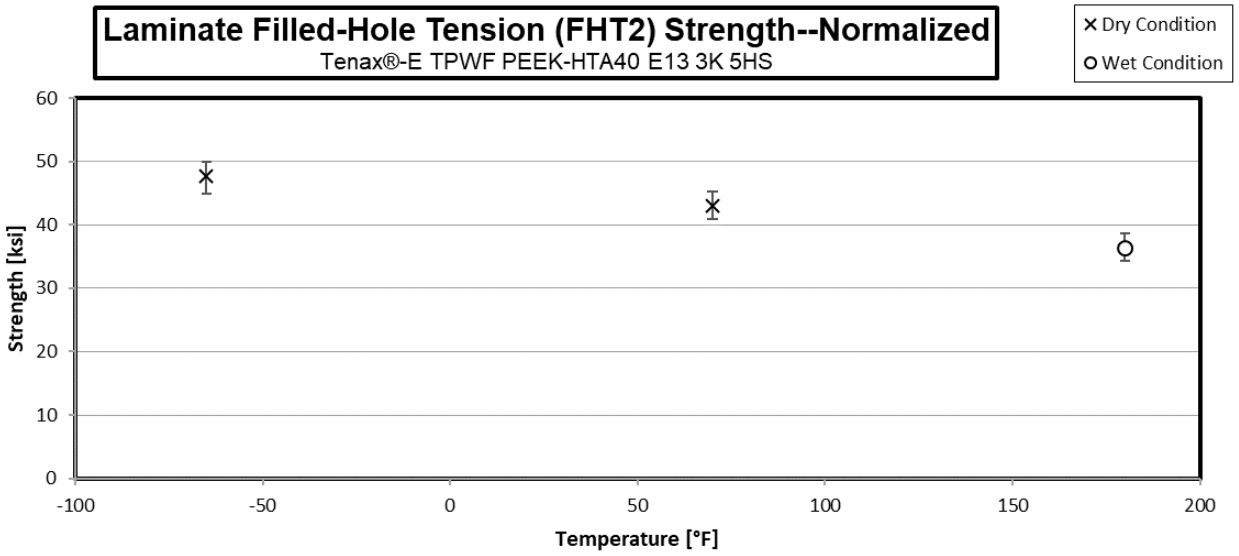
3.16 "40/20/40" Open-Hole Tension 3 Properties (OHT3)



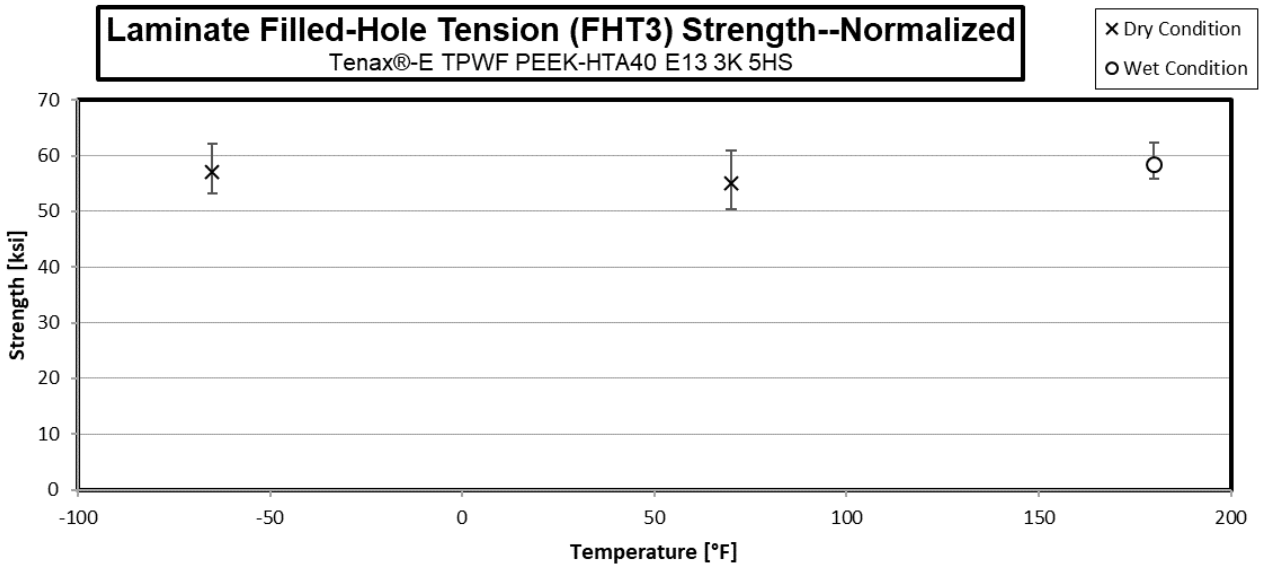
3.17 "25/50/25" Filled-Hole Tension 1 Properties (FHT1)



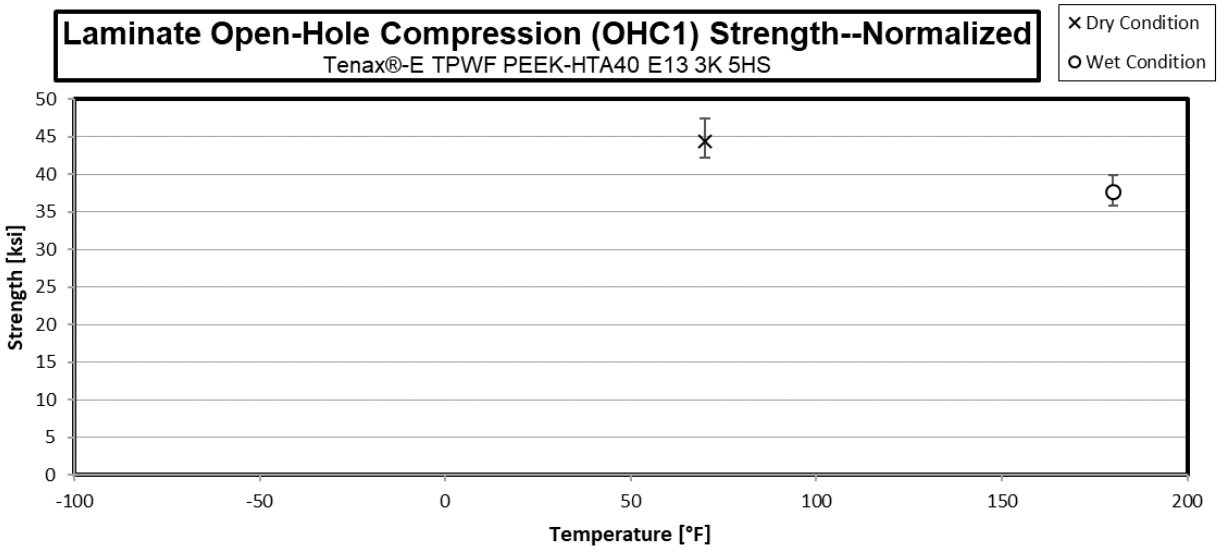
3.18 “10/80/10” Filled-Hole Tension 2 Properties (FHT2)



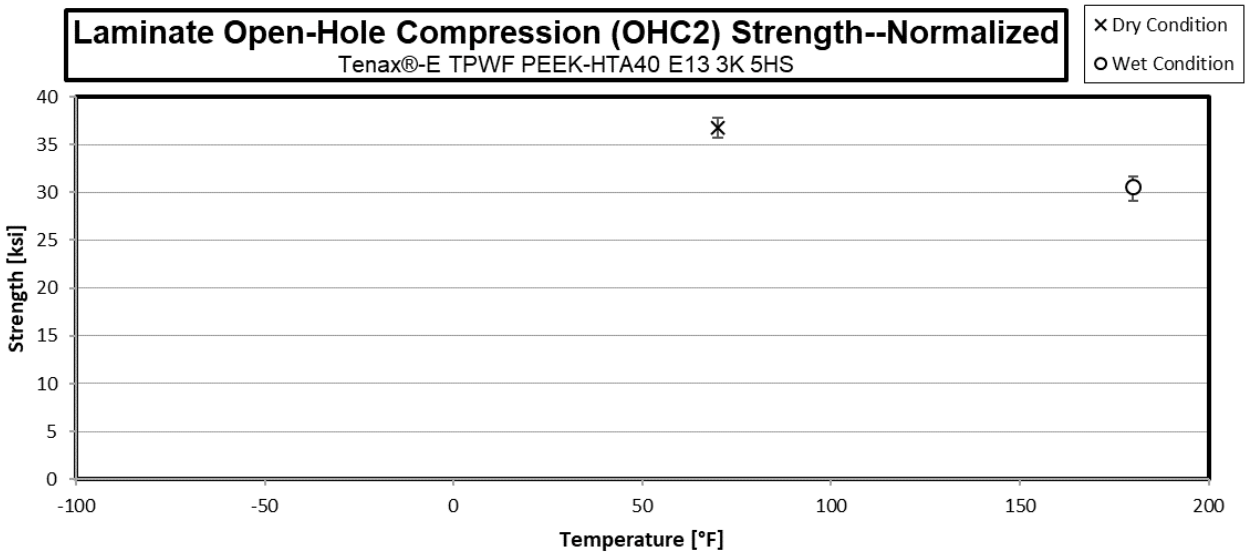
3.19 “40/20/40” Filled-Hole Tension 3 Properties (FHT3)



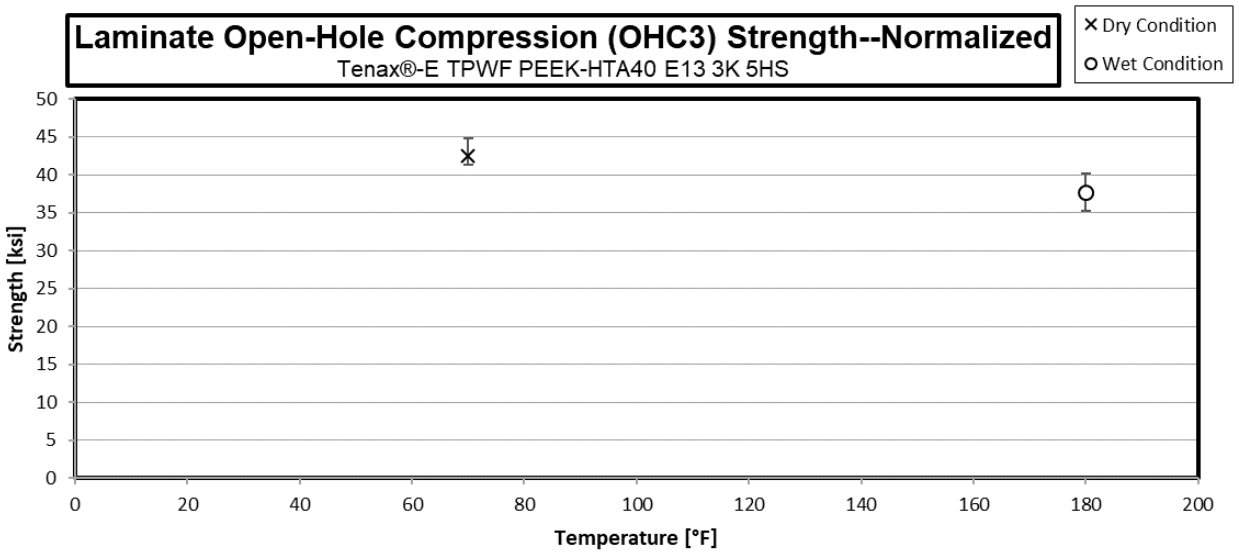
3.20 “25/50/25” Open-Hole Compression 1 Properties (OHC1)



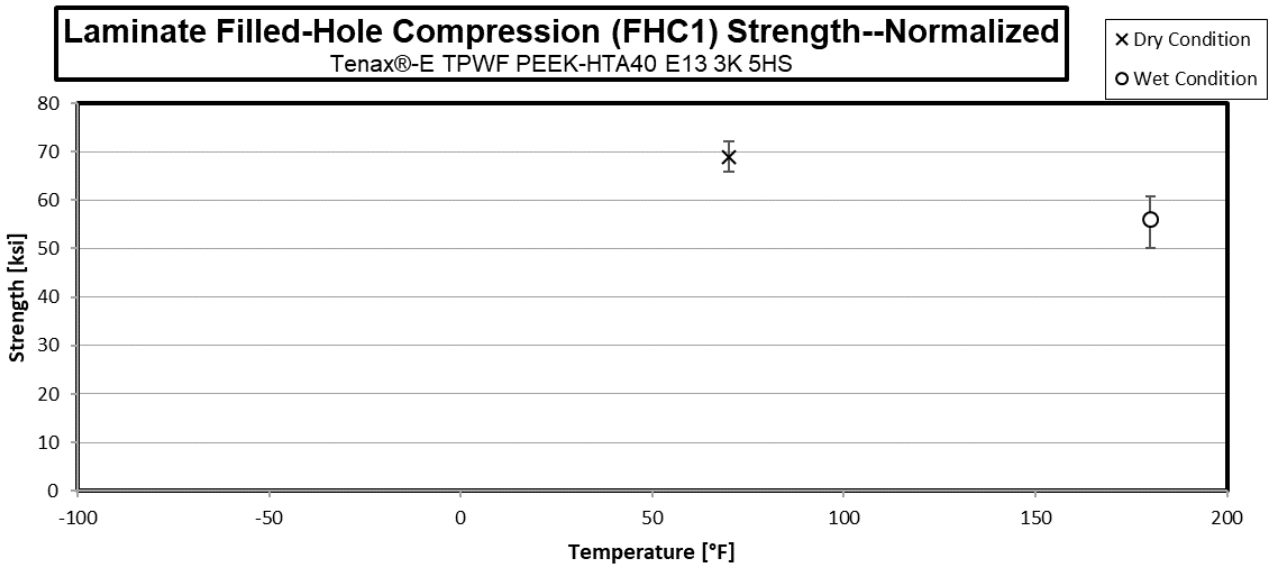
3.21 “10/80/10” Open-Hole Compression 2 Properties (OHC2)



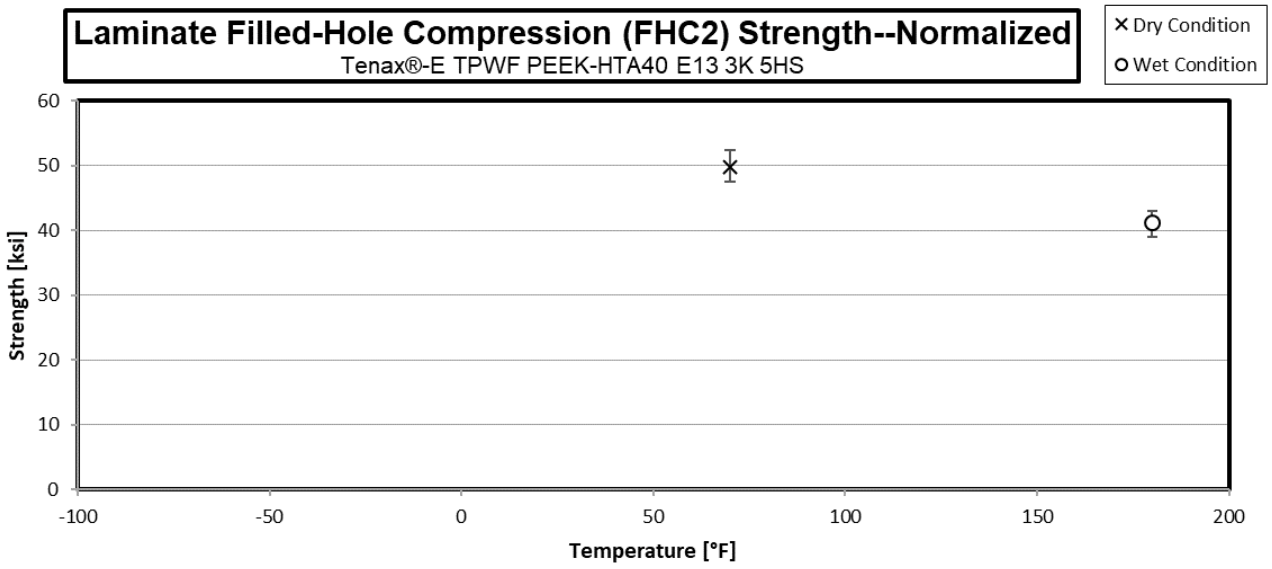
3.22 “40/20/40” Open-Hole Compression 3 Properties (OHC3)



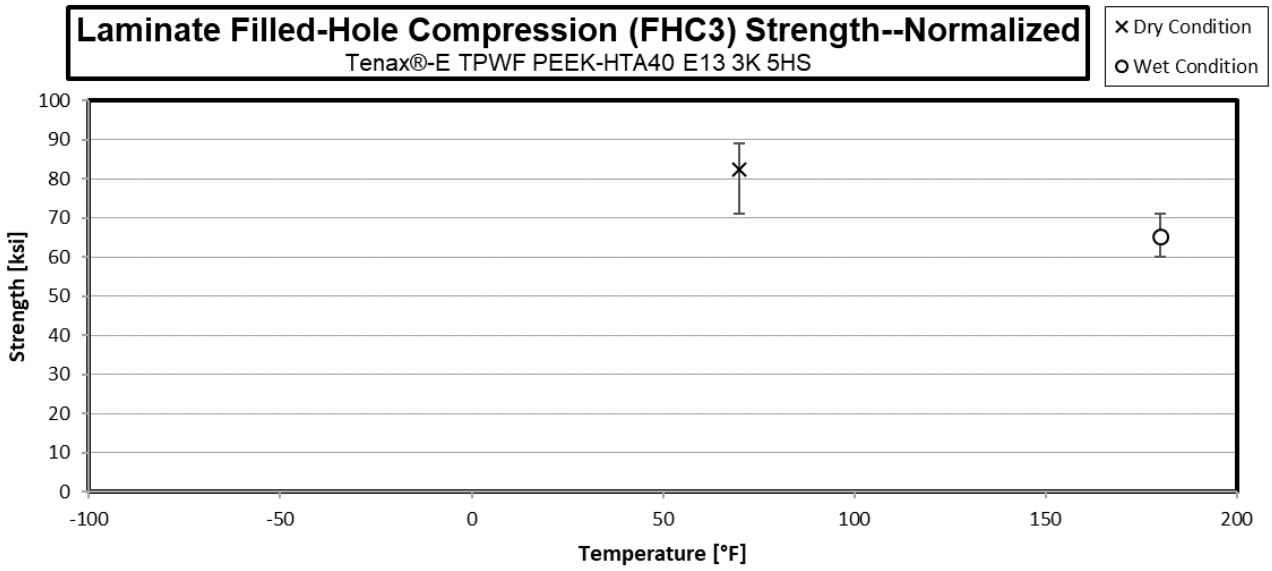
3.23 “25/50/25” Filled-Hole Compression 1 Properties (FHC1)



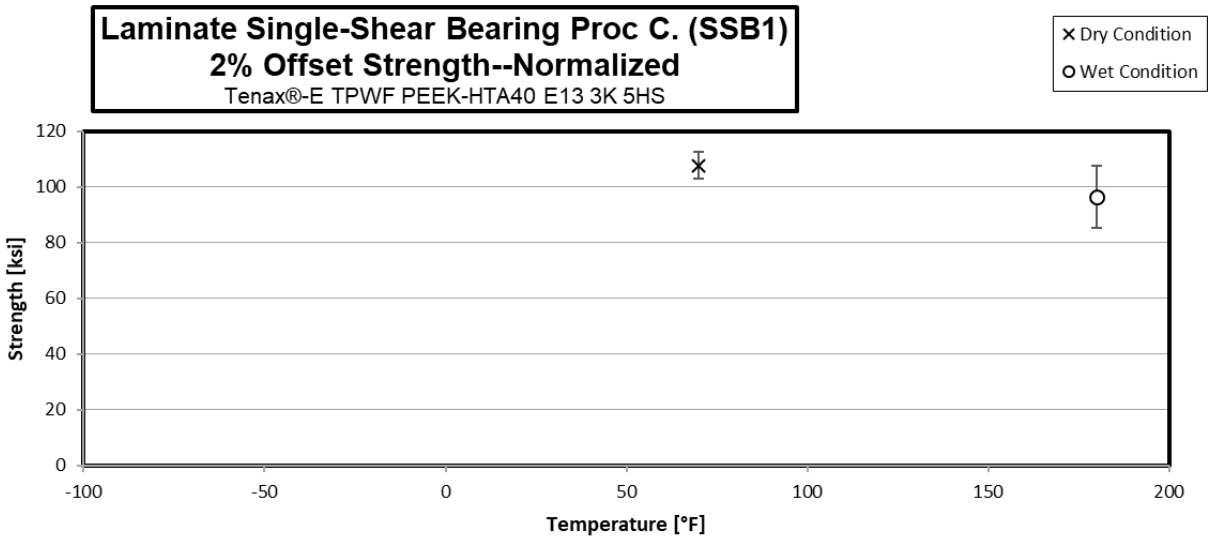
3.24 "10/80/10" Filled-Hole Compression 2 Properties (FHC2)

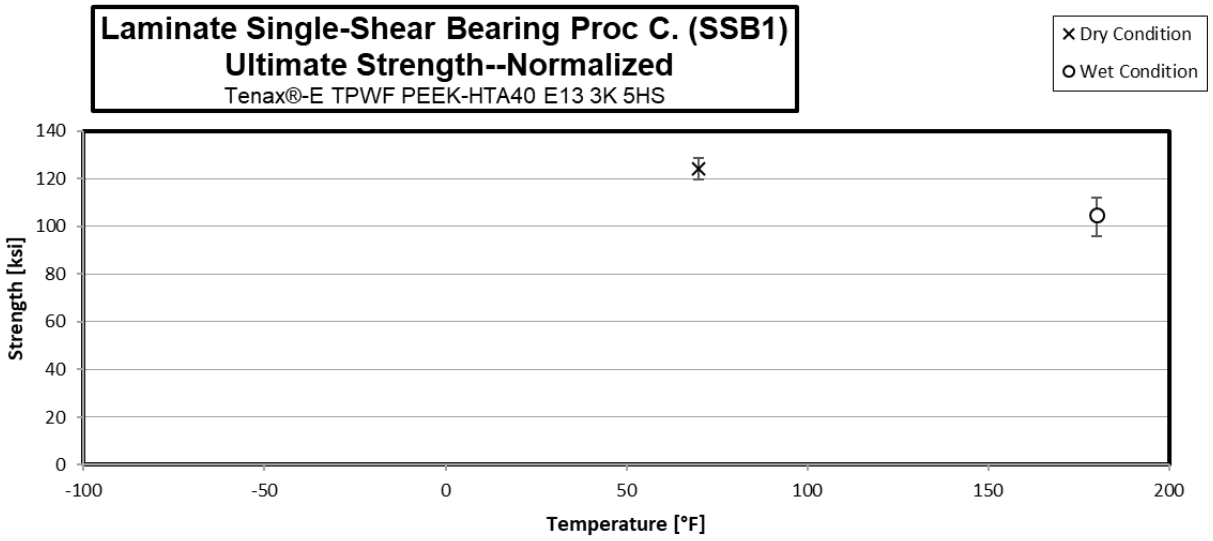


3.25 "40/20/40" Filled-Hole Compression 3 Properties (FHC3)

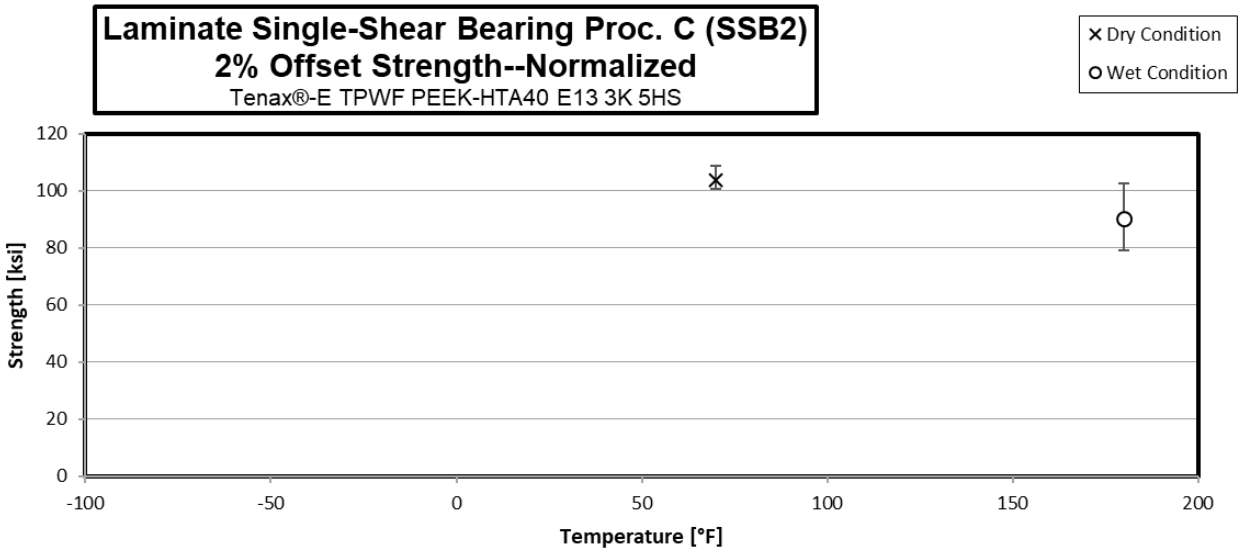


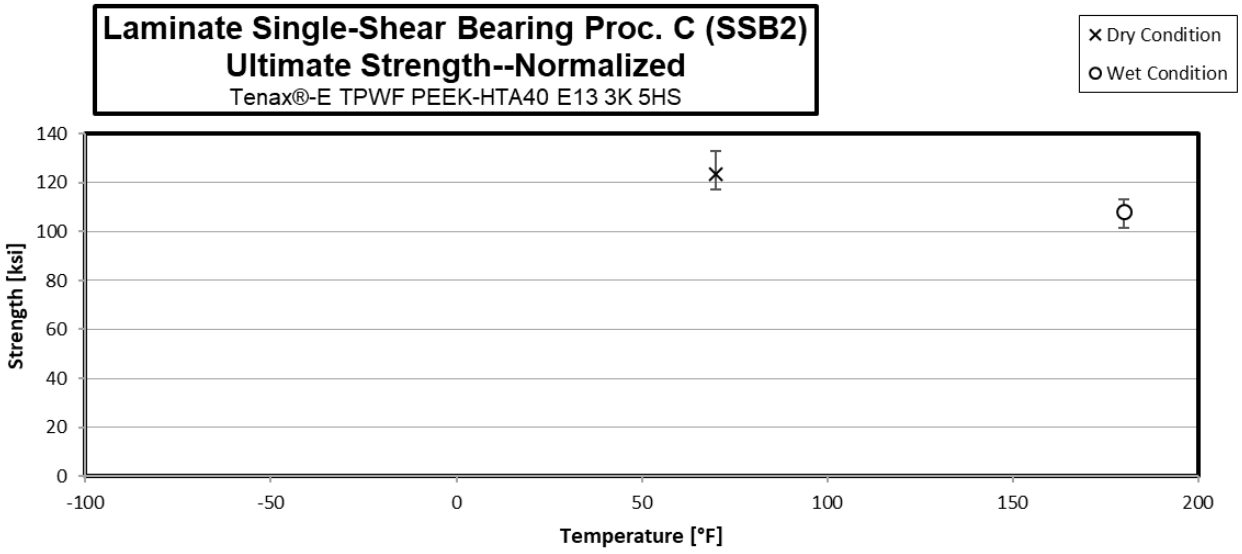
3.26 "25/50/25" Single-Shear Bearing 1, Proc. C Properties (SSB1)



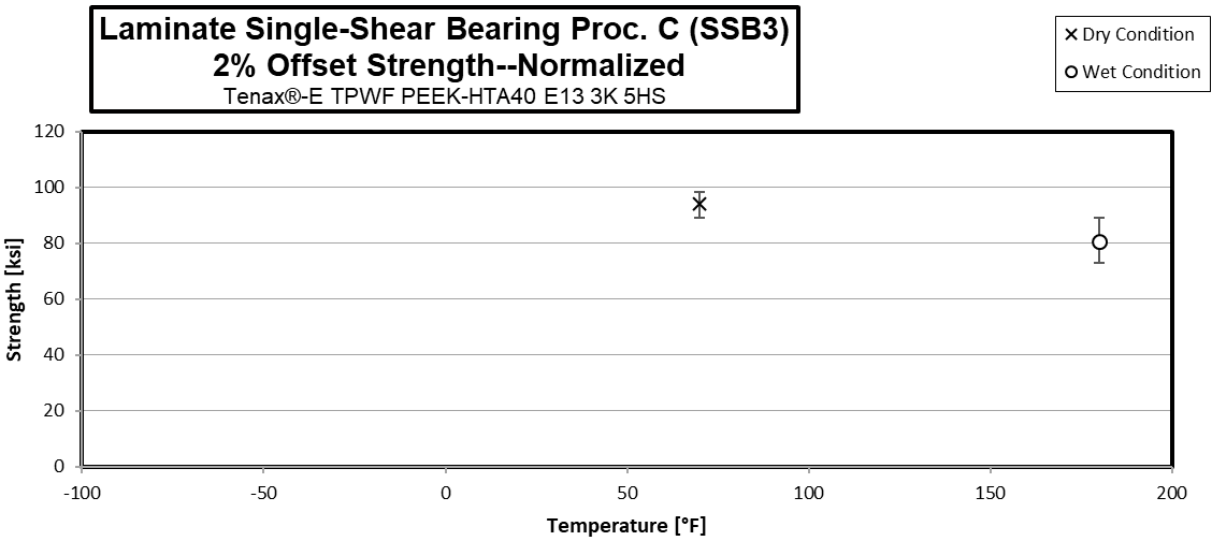


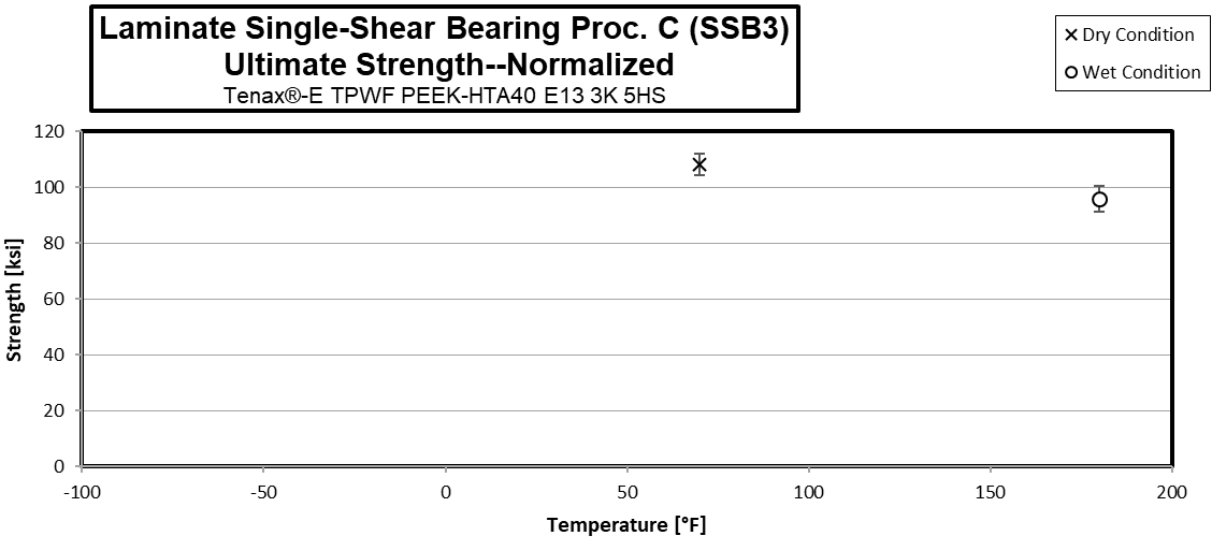
3.27 "10/80/10" Single-Shear Bearing 2, Proc. C Properties (SSB2)



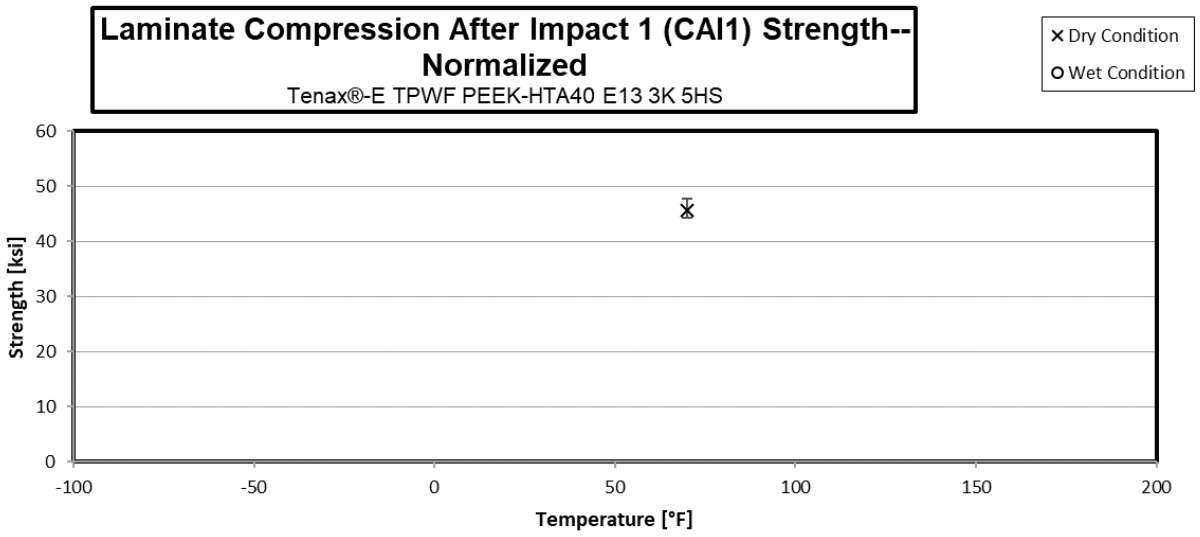


3.28 "40/20/40" Single-Shear Bearing 3, Proc. C Properties (SSB3)

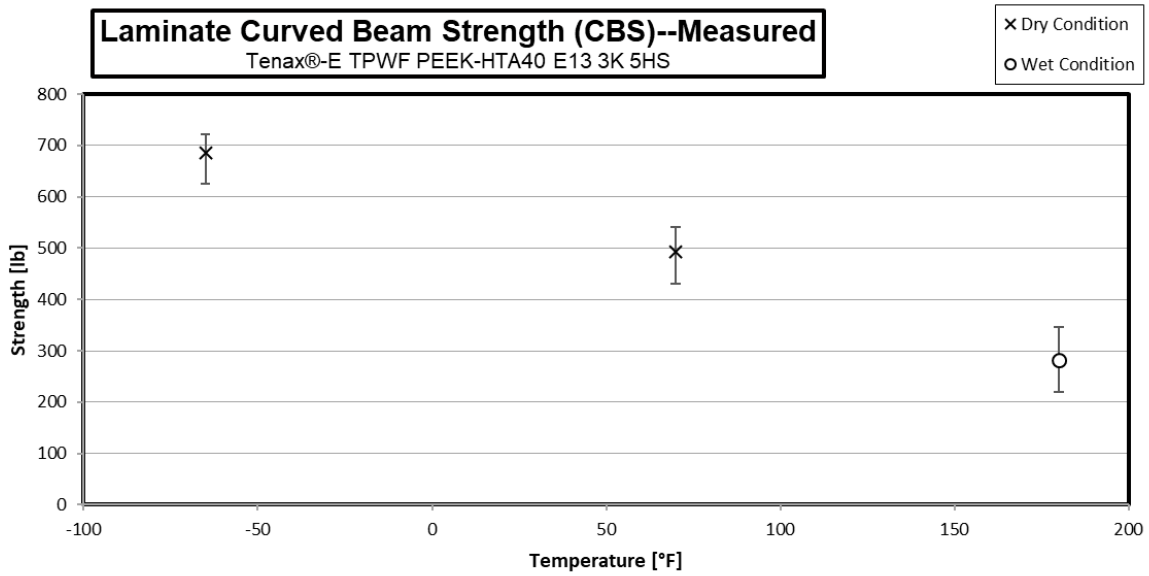


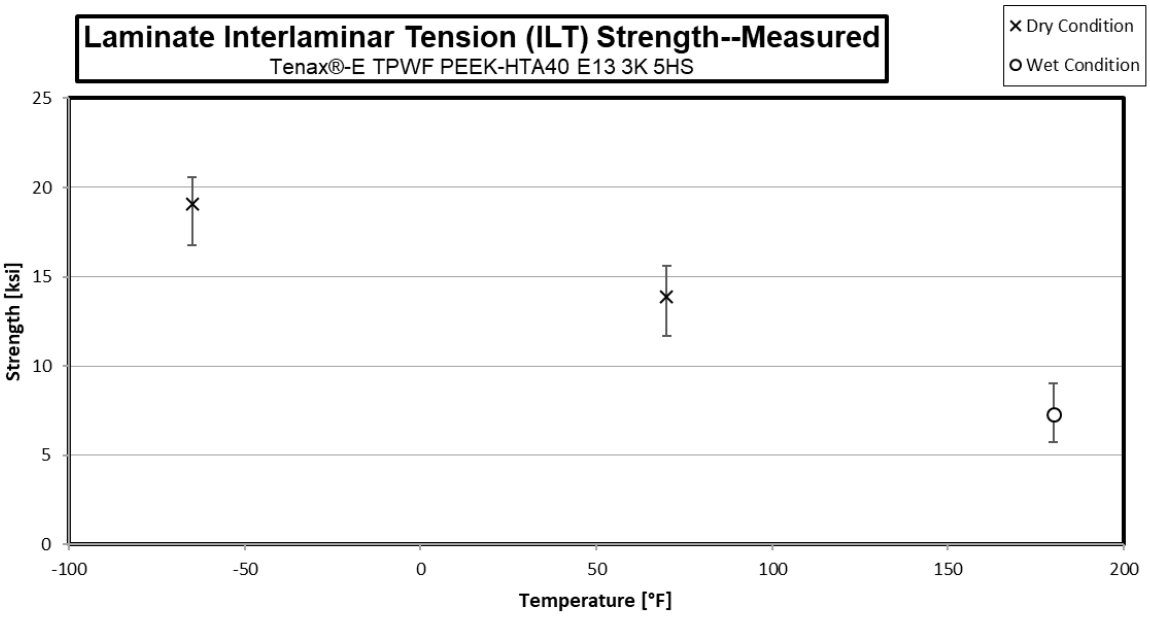


3.29 “25/50/25” Compression After Impact 1 Properties (CAI1)



3.30 Interlaminar Tension Properties (ILT)[1]





[1] For informational only, please refer to NPS 84013 section 4.5 for processing information

4. Raw Data

4.1 Warp Tension Properties (WT)

Warp Tension Properties (WT)--CTD (-65°F)
Strength & Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

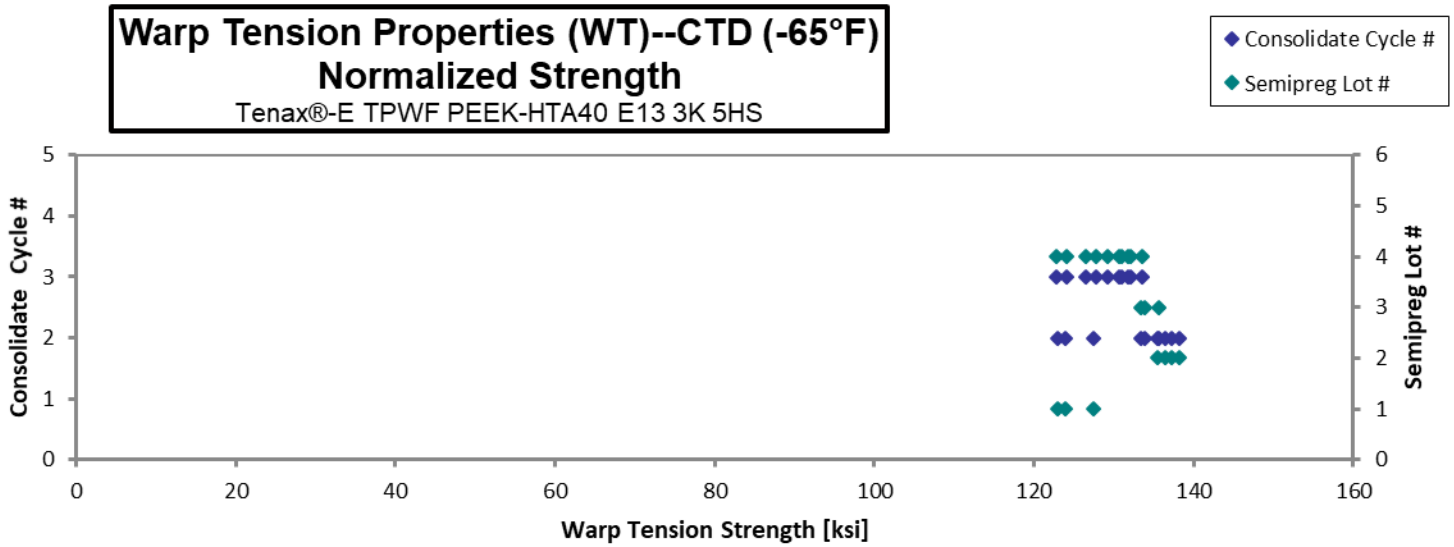
normalizing t_{ply} [in]
0.01226

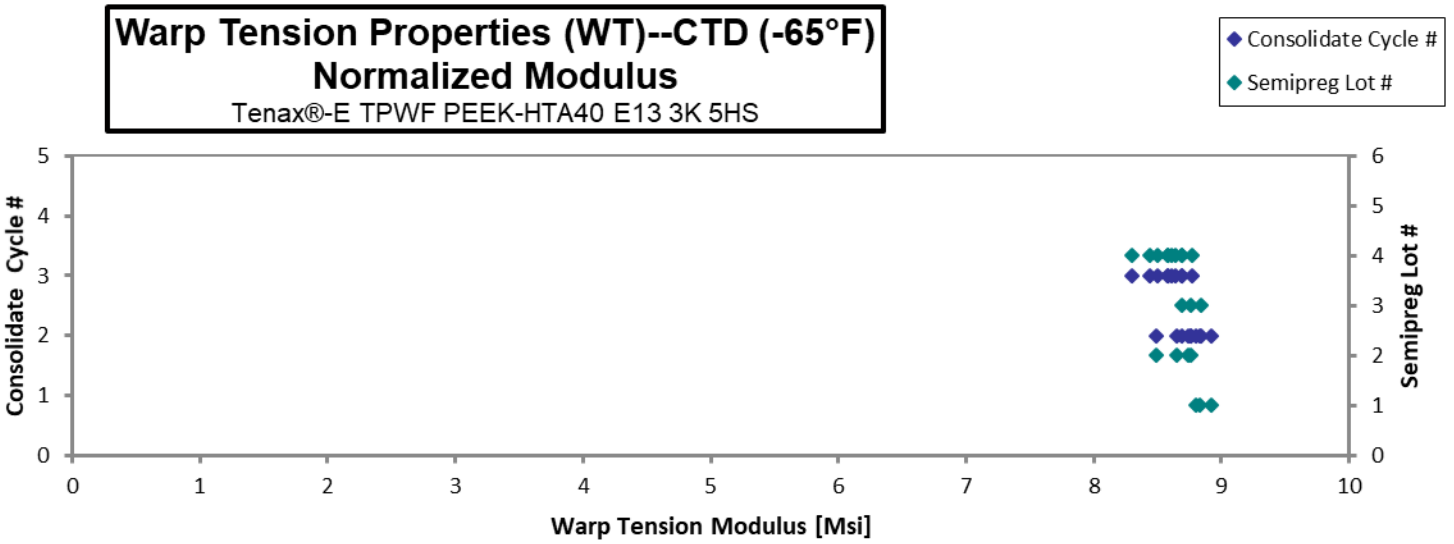
Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Poisson's Ratio	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
NTP4013Q1-TTX-T40-E-WT-D-M3-CTD-1	4	3	128.1	8.547	0.04383	0.09688	8	LWB	0.01211	126.6	8.443
NTP4013Q1-TTX-T40-E-WT-D-M3-CTD-2	4	3	125.9	8.421	0.02750	0.09670	8	LGB	0.01209	124.1	8.303
NTP4013Q1-TTX-T40-E-WT-D-M3-CTD-3	4	3	133.7	8.600	0.05217	0.09697	8	LAT	0.01212	132.1	8.503
NTP4013Q1-TTX-T40-E-WT-D-M3-CTD-4	4	3	132.5	8.677	0.04921	0.09702	8	LWT	0.01213	131.0	8.583
NTP4013Q1-TTX-T40-E-WT-D-M3-CTD-5	4	3	130.3	8.706	0.05178	0.09728	8	LAT	0.01216	129.3	8.635
NTP4013Q1-TTX-T40-E-WT-D-M3-CTD-6	4	3	132.7	8.754	0.05452	0.09737	8	LWT	0.01217	131.8	8.690
NTP4013Q1-TTX-T40-E-WT-D-M3-CTD-7	4	3	123.7	8.680	0.05488	0.09733	8	LAT	0.01217	122.8	8.613
NTP4013Q1-TTX-T40-E-WT-D-M3-CTD-8	4	3	132.0	8.859	0.05615	0.09710	8	LAB	0.01214	130.7	8.771
NTP4013Q1-TTX-T40-E-WT-D-M3-CTD-9	4	3	129.5	8.802	0.05327	0.09682	8	LAB	0.01210	127.8	8.689
NTP4013Q1-TTX-T40-E-WT-D-M3-CTD-10	4	3	135.3	8.701	0.04905	0.09675	8	LAB	0.01209	133.5	8.583
NTP4013Q1-TTX-T40-E-WT-A-M2-CTD-1	1	2	122.8	8.754	0.05198	0.09898	8	LAB	0.01237	123.9	8.834
NTP4013Q1-TTX-T40-E-WT-A-M2-CTD-2	1	2	124.9	8.737	0.04764	0.1001	8	LAT/LAB	0.01251	127.4	8.916
NTP4013Q1-TTX-T40-E-WT-A-M2-CTD-4	1	2	121.6	8.705	0.04499	0.09911	8	LAT	0.01239	122.9	8.796
NTP4013Q1-TTX-T40-E-WT-B-M2-CTD-1	2	2	134.8	8.454	0.03589	0.09850	8	LAT/LAB	0.01231	135.4	8.490
NTP4013Q1-TTX-T40-E-WT-B-M2-CTD-2	2	2	135.4	8.580	0.04521	0.09885	8	LAT/AGM	0.01236	136.5	8.647
NTP4013Q1-TTX-T40-E-WT-B-M2-CTD-3	2	2	136.8	8.649	0.04555	0.09913	8	AGM/LAB	0.01239	138.3	8.742
NTP4013Q1-TTX-T40-E-WT-B-M2-CTD-4	2	2	136.0	8.669	0.04832	0.09906	8	LAT/AGM	0.01238	137.3	8.755
NTP4013Q1-TTX-T40-E-WT-C-M2-CTD-1	3	2	130.3	8.633	0.05527	0.1004	8	LIT*	0.01256	133.4	8.841
NTP4013Q1-TTX-T40-E-WT-C-M2-CTD-2	3	2	132.8	8.581	0.05305	0.1001	8	LIT / LIB*	0.01252	135.6	8.761
NTP4013Q1-TTX-T40-E-WT-C-M2-CTD-3	3	2	132.1	8.574	0.05116	0.09937	8	LIT*	0.01242	133.9	8.687

* Note the bad failure mode data were included, the failure mode of slightly in tab was approved by NCAMP AER.

Average	**130.6**	**8.654**	**0.04857**
Standard Dev.	**4.645**	**0.1091**	**0.006972**
Coeff. of Var. [%]	**3.557**	**1.261**	**14.353**
Min.	**121.6**	**8.421**	**0.02750**
Max.	**136.8**	**8.859**	**0.05615**
Number of Spec.	**20**	**20**	**20**

$Average_{norm}$	**0.01227**	**130.7**	**8.664**
Standard $Dev._{norm}$		**4.928**	**0.1505**
Coeff. of Var. $[\%]_{norm}$		**3.770**	**1.738**
Min.	**0.01209**	**122.8**	**8.303**
Max.	**0.01256**	**138.3**	**8.916**
Number of Spec.	**20**	**20**	**20**


Warp Tension Properties (WT)--CTD (-65°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Warp Tension Strength [ksi]
0
20
40
60
80
100
120
140
160
0
1
2
3
4
5
6


Warp Tension Properties (WT)--CTD (-65°F)
Normalized Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Warp Tension Modulus [Msi]
0
1
2
3
4
5
6
7
8
9
10
0
1
2
3
4
5
6

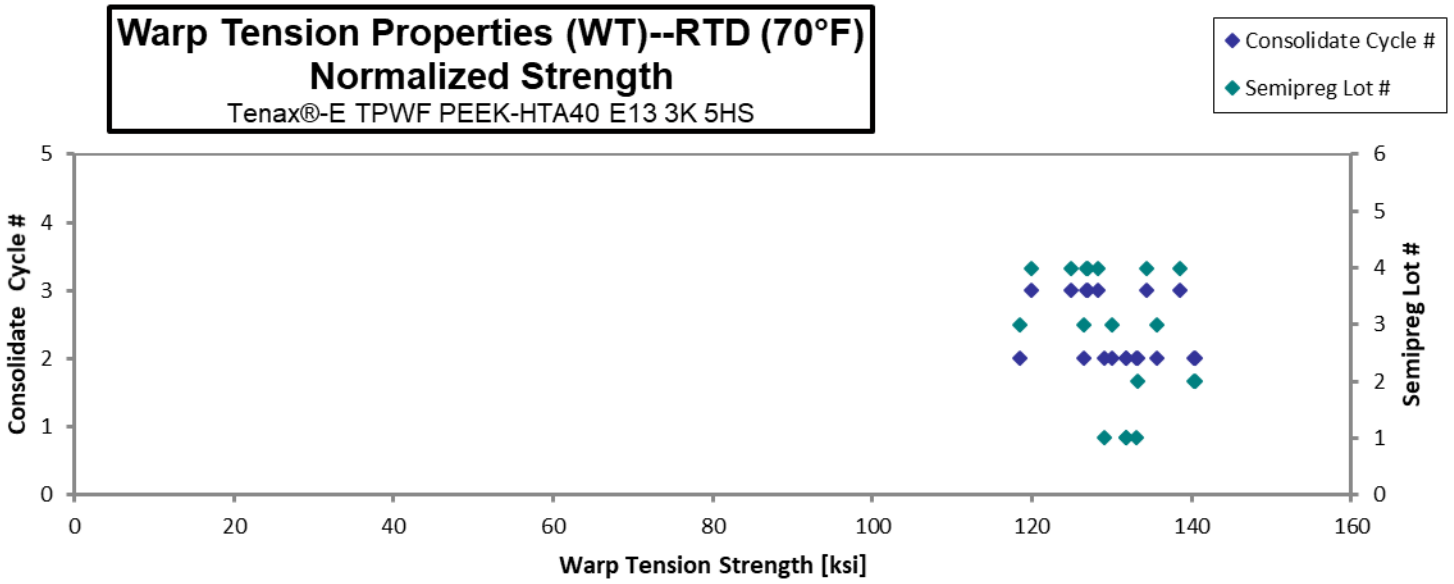
Warp Tension Properties (WT)--RTD (70°F)
Strength & Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

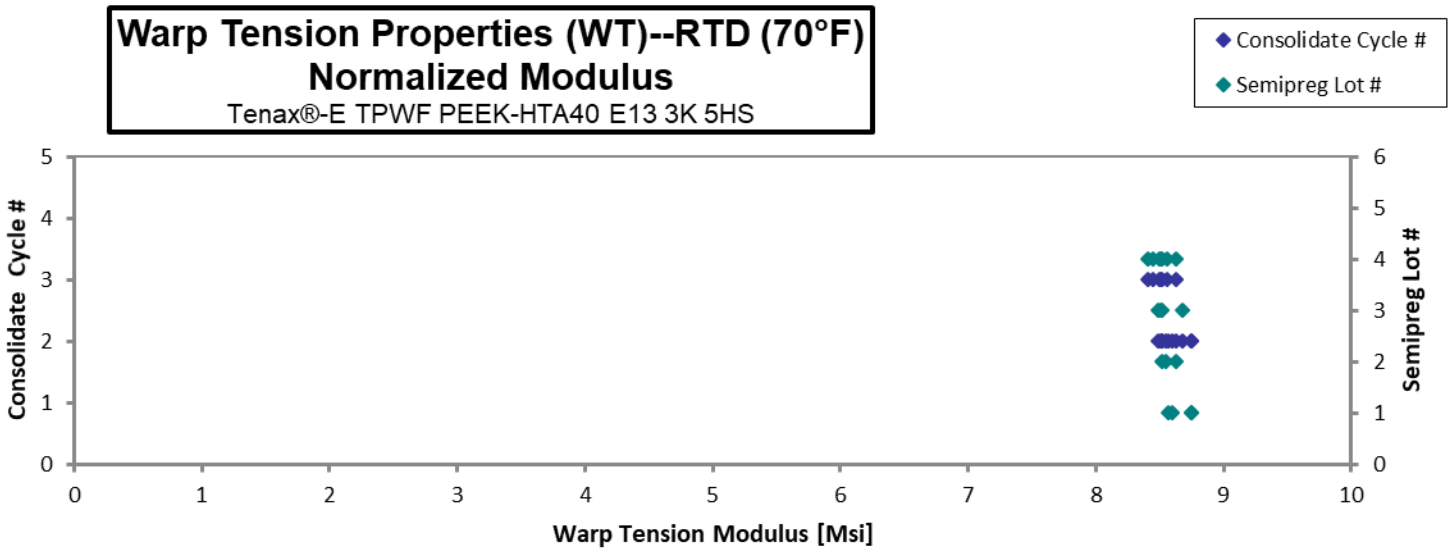
normalizing t_{ply} [in]: 0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Poisson's Ratio	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
NTP4013Q1-TTX-T40-E-WT-D-M3-RTD-4	4	3	125.1	8.874	0.04321	0.09393	8	LAB	0.01174	119.9	8.499
NTP4013Q1-TTX-T40-E-WT-D-M3-RTD-5	4	3	146.7	8.944	0.04725	0.09263	8	LGB	0.01158	138.6	8.448
NTP4013Q1-TTX-T40-E-WT-D-M3-RTD-6	4	3	126.4	8.495	0.03530	0.09838	8	LWT, LAB	0.01230	126.8	8.521
NTP4013Q1-TTX-T40-E-WT-D-M3-RTD-7	4	3	127.4	8.453	0.03804	0.09870	8	LWT, LAB	0.01234	128.2	8.507
NTP4013Q1-TTX-T40-E-WT-D-M3-RTD-8	4	3	133.3	8.339	0.03706	0.09885	8	LWB	0.01236	134.4	8.404
NTP4013Q1-TTX-T40-E-WT-D-M3-RTD-9	4	3	125.7	8.478	0.03707	0.09902	8	LWT, LAB	0.01238	126.9	8.559
NTP4013Q1-TTX-T40-E-WT-D-M3-RTD-10	4	3	123.4	8.527	0.04435	0.09930	8	LWT, LAB	0.01241	124.9	8.633
NTP4013Q1-TTX-T40-E-WT-A-M2-RTD-5	1	2	133.4	8.766	0.04320	0.09787	8	LAT/LAB	0.01223	133.1	8.747
NTP4013Q1-TTX-T40-E-WT-A-M2-RTD-6	1	2	132.0	8.612	0.03695	0.09795	8	LAT/LGB	0.01224	131.8	8.601
NTP4013Q1-TTX-T40-E-WT-A-M2-RTD-7	1	2	129.4	8.772	0.02937	0.09781	8	LAT	0.01223	129.0	8.748
NTP4013Q1-TTX-T40-E-WT-A-M2-RTD-8	1	2	133.1	8.656	0.02657	0.09714	8	LAT/LAB	0.01214	131.8	8.573
NTP4013Q1-TTX-T40-E-WT-B-M2-RTD-5	2	2	139.7	8.586	0.07369	0.09857	8	AGM/LAB	0.01232	140.4	8.629
NTP4013Q1-TTX-T40-E-WT-B-M2-RTD-6	2	2	139.6	8.505	0.02542	0.09854	8	LAT	0.01232	140.3	8.545
NTP4013Q1-TTX-T40-E-WT-B-M2-RTD-7	2	2	133.1	8.511	0.02706	0.09820	8	LAB	0.01228	133.3	8.522
NTP4013Q1-TTX-T40-E-WT-C-M2-RTD-5	3	2	126.6	8.511	0.03646	0.09802	8	AGM	0.01225	126.5	8.506
NTP4013Q1-TTX-T40-E-WT-C-M2-RTD-6	3	2	137.5	8.799	0.03553	0.09675	8	LGT / AGB	0.01209	135.7	8.679
NTP4013Q1-TTX-T40-E-WT-C-M2-RTD-7	3	2	121.4	8.723	0.03826	0.09575	8	AGM	0.01197	118.5	8.516
NTP4013Q1-TTX-T40-E-WT-C-M2-RTD-8	3	2	133.5	8.713	0.03563	0.09552	8	AGM	0.01194	130.0	8.486

Average	**131.5**	**8.626**	**0.03836**
Standard Dev.	**6.556**	**0.1638**	**0.01073**
Coeff. of Var. [%]	**4.984**	**1.899**	**27.98**
Min.	**121.4**	**8.339**	**0.02542**
Max.	**146.7**	**8.944**	**0.07369**
Number of Spec.	**18**	**18**	**18**

$Average_{norm}$	**0.01217**	**130.6**	**8.562**
Standard $Dev._{norm}$		**6.219**	**0.09499**
Coeff. of Var. $[\%]_{norm}$		**4.763**	**1.1094**
Min.	**0.01158**	**118.5**	**8.404**
Max.	**0.01241**	**140.4**	**8.748**
Number of Spec.	**18**	**18**	**18**


Warp Tension Properties (WT)--RTD (70°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
0
1
2
3
4
5
6
0
20
40
60
80
100
120
140
160
Warp Tension Strength [ksi]


Warp Tension Properties (WT)--RTD (70°F)
Normalized Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
0
1
2
3
4
5
6
0
1
2
3
4
5
6
7
8
9
10
Warp Tension Modulus [Msi]

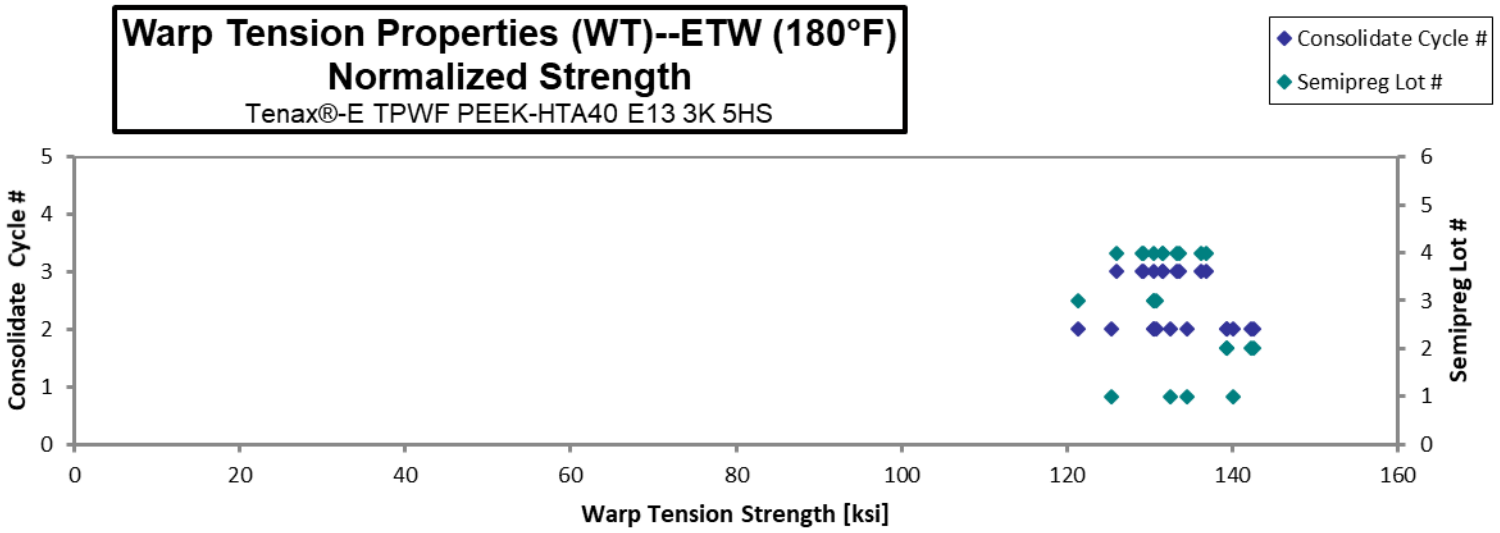
Warp Tension Properties (WT)--ETW (180°F)
Strength & Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

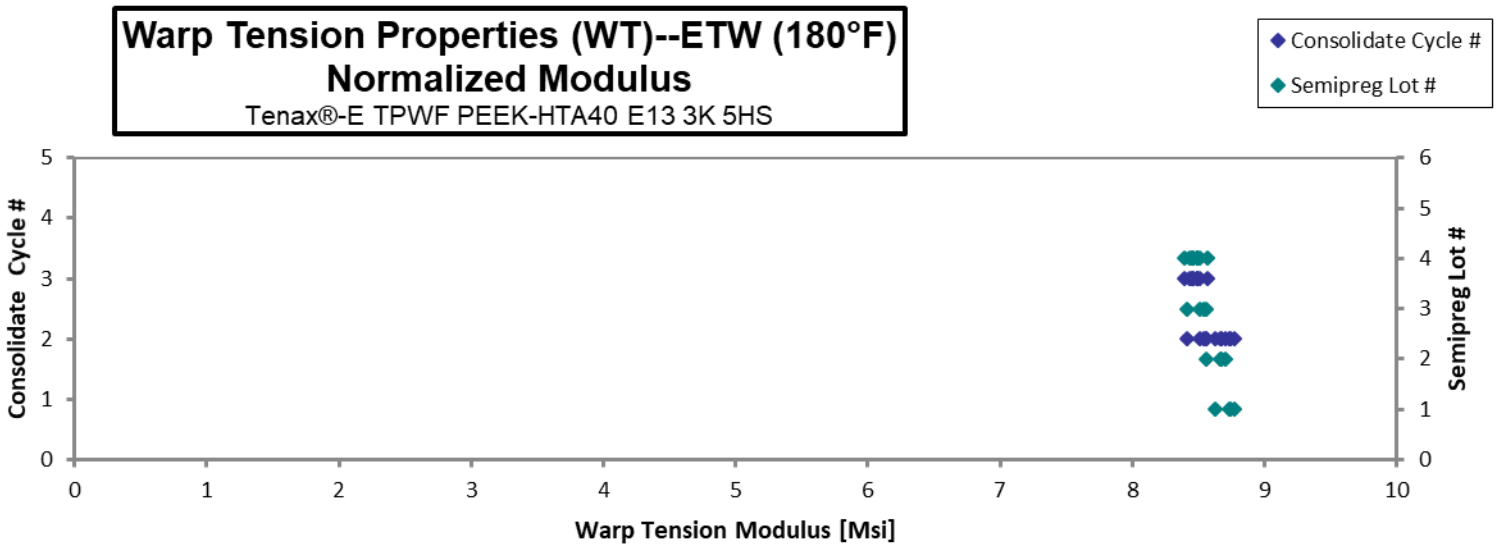
normalizing t_{ply} [in]: 0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Poisson's Ratio	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
NTP4013Q1-TTX-T40-E-WT-D-M3-ETW-1	4	3	127.5	8.410	0.03675	0.09928	8	LWT, LWB	0.01241	129.1	8.513
NTP4013Q1-TTX-T40-E-WT-D-M3-ETW-2	4	3	125.0	8.417	0.03822	0.09893	8	LWB	0.01237	126.1	8.491
NTP4013Q1-TTX-T40-E-WT-D-M3-ETW-3	4	3	135.8	8.506	0.03545	0.09878	8	LGM	0.01235	136.8	8.567
NTP4013Q1-TTX-T40-E-WT-D-M3-ETW-4	4	3	131.0	8.425	0.03818	0.09850	8	LGM	0.01231	131.5	8.461
NTP4013Q1-TTX-T40-E-WT-D-M3-ETW-5	4	3	136.3	8.458	0.03789	0.09802	8	LWT, LWB	0.01225	136.2	8.453
NTP4013Q1-TTX-T40-E-WT-D-M3-ETW-6	4	3	129.8	8.489	0.03746	0.09767	8	LGM	0.01221	129.3	8.453
NTP4013Q1-TTX-T40-E-WT-D-M3-ETW-7	4	3	133.1	8.582	0.03669	0.09702	8	LGM	0.01213	131.6	8.489
NTP4013Q1-TTX-T40-E-WT-D-M3-ETW-8	4	3	132.9	8.644	0.03821	0.09632	8	LGT	0.01204	130.5	8.489
NTP4013Q1-TTX-T40-E-WT-D-M3-ETW-9	4	3	136.9	8.622	0.03471	0.09550	8	LWT, LWB	0.01194	133.3	8.396
NTP4013Q1-TTX-T40-E-WT-D-M3-ETW-10	4	3	139.5	8.795	0.03716	0.09400	8	LAB	0.01175	133.7	8.429
NTP4013Q1-TTX-T40-E-WT-A-M2-ETW-9	1	2	133.9	8.818	0.03765	0.09709	8	AGM	0.01214	132.5	8.729
NTP4013Q1-TTX-T40-E-WT-A-M2-ETW-10	1	2	135.9	8.716	0.03917	0.09707	8	LAT / LAB	0.01213	134.5	8.627
NTP4013Q1-TTX-T40-E-WT-A-M2-ETW-11	1	2	126.6	8.828	0.03950	0.09710	8	LAT / LAB	0.01214	125.4	8.739
NTP4013Q1-TTX-T40-E-WT-A-M2-ETW-12	1	2	140.7	8.809	0.04205	0.09770	8	LAT / LAB	0.01221	140.1	8.776
NTP4013Q1-TTX-T40-E-WT-B-M2-ETW-9	2	2	141.9	8.532	0.03085	0.09833	8	AGM	0.01229	142.3	8.554
NTP4013Q1-TTX-T40-E-WT-B-M2-ETW-10	2	2	142.0	8.671	0.03196	0.09848	8	LAT/LAB	0.01231	142.6	8.707
NTP4013Q1-TTX-T40-E-WT-B-M2-ETW-11	2	2	138.6	8.630	0.04007	0.09861	8	AGM	0.01233	139.3	8.676
NTP4013Q1-TTX-T40-E-WT-B-M2-ETW-12	2	2	138.5	8.615	0.05266	0.09865	8	LIT/AGM	0.01233	139.3	8.665
NTP4013Q1-TTX-T40-E-WT-C-M2-ETW-9	3	2	123.0	8.531	0.02986	0.09677	8	AGM	0.01210	121.4	8.417
NTP4013Q1-TTX-T40-E-WT-C-M2-ETW-10	3	2	131.0	8.574	0.03727	0.09772	8	AGM	0.01221	130.6	8.542
NTP4013Q1-TTX-T40-E-WT-C-M2-ETW-11	3	2	130.1	8.487	0.03561	0.09833	8	AGM	0.01229	130.5	8.509
NTP4013Q1-TTX-T40-E-WT-C-M2-ETW-12	3	2	129.1	8.440	0.03886	0.09946	8	AGM	0.01243	130.9	8.559

Average	**133.6**	**8.591**	**0.03756**
Standard Dev.	**5.496**	**0.1366**	**0.004459**
Coeff. of Var. [%]	**4.114**	**1.590**	**11.87**
Min.	**123.0**	**8.410**	**0.030**
Max.	**142.0**	**8.828**	**0.05266**
Number of Spec.	**22**	**22**	**22**

$Average_{norm}$	**0.01221**	**133.1**	**8.556**
Standard $Dev._{norm}$		**5.495**	**0.1144**
Coeff. of $Var._{norm}$ [%]		**4.129**	**1.337**
Min.	**0.01175**	**121.4**	**8.396**
Max.	**0.01243**	**142.6**	**8.776**
Number of Spec.	**22**	**22**	**22**


Warp Tension Properties (WT)--ETW (180°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Warp Tension Strength [ksi]
0
20
40
60
80
100
120
140
160
0
1
2
3
4
5
6


Warp Tension Properties (WT)--ETW (180°F)
Normalized Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Warp Tension Modulus [Msi]
0
1
2
3
4
5
6
7
8
9
10
0
1
2
3
4
5
6

4.2 Fill Tension Properties (FT)

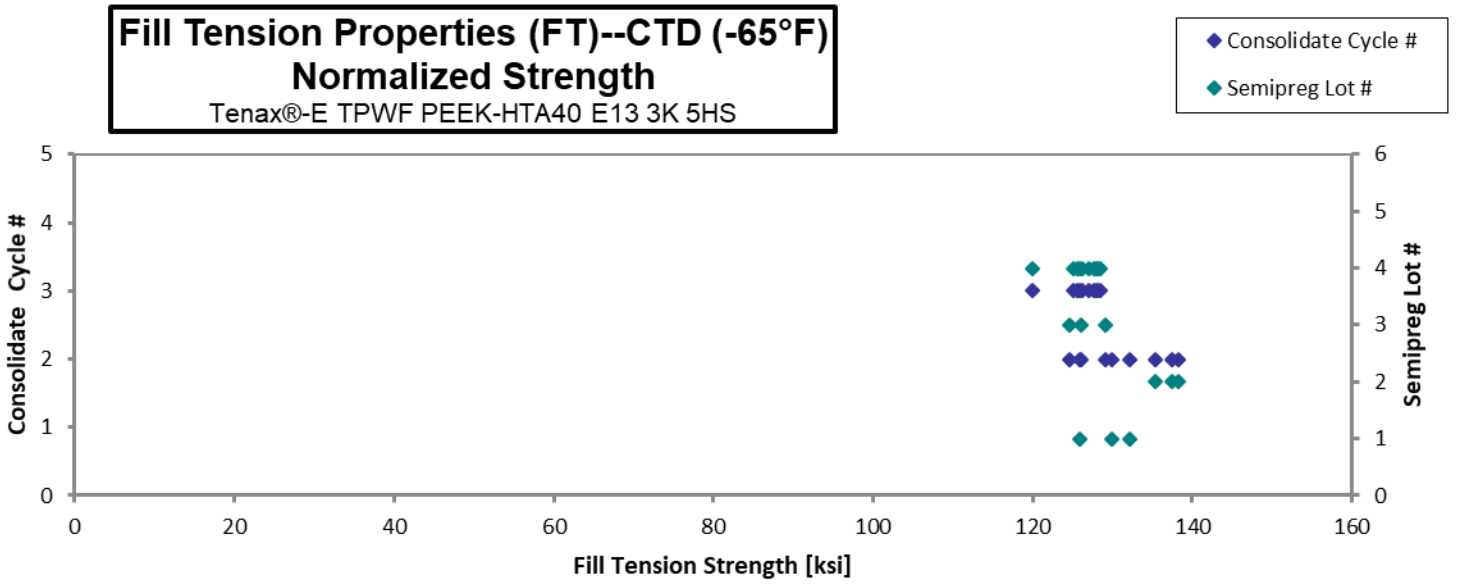
Fill Tension Properties (FT)--CTD (-65°F)
Strength & Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

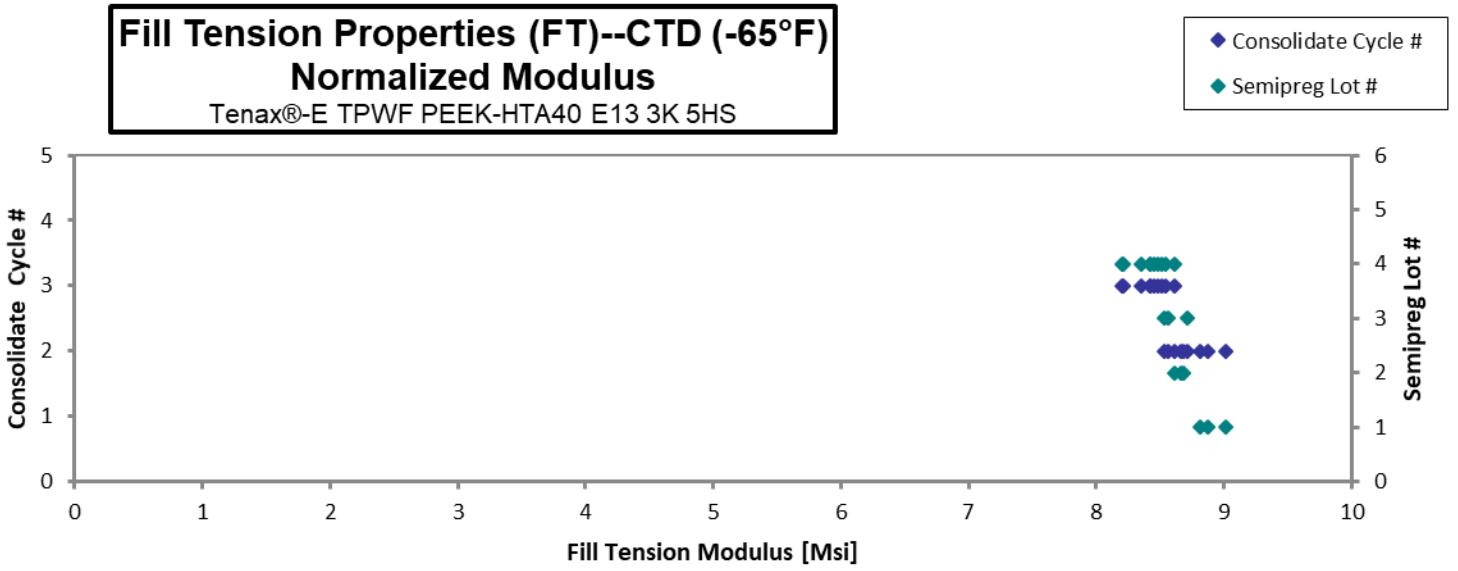
normalizing t_{ply} [in]
0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
NTP4013Q1-TTX-T40-E-FT-D-M3-CTD-1	4	3	130.5	8.546	0.09660	8	LGT	0.01208	128.5	8.417
NTP4013Q1-TTX-T40-E-FT-D-M3-CTD-2	4	3	128.4	8.608	0.09597	8	LAT	0.01200	125.6	8.422
NTP4013Q1-TTX-T40-E-FT-D-M3-CTD-3	4	3	131.3	8.413	0.09573	8	LAT	0.01197	128.2	8.212
NTP4013Q1-TTX-T40-E-FT-D-M3-CTD-4	4	3	122.6	8.533	0.09597	8	LWT	0.01200	119.9	8.349
NTP4013Q1-TTX-T40-E-FT-D-M3-CTD-5	4	3	131.2	8.720	0.09572	8	LAT	0.01196	128.0	8.510
NTP4013Q1-TTX-T40-E-FT-D-M3-CTD-6	4	3	129.9	8.747	0.09507	8	LAT	0.01188	125.9	8.479
NTP4013Q1-TTX-T40-E-FT-D-M3-CTD-7	4	3	129.2	8.892	0.09497	8	LAT	0.01187	125.1	8.610
NTP4013Q1-TTX-T40-E-FT-D-M3-CTD-8	4	3	131.0	8.766	0.09458	8	LAT	0.01182	126.3	8.454
NTP4013Q1-TTX-T40-E-FT-D-M3-CTD-9	4	3	133.1	8.950	0.09365	8	LGB	0.01171	127.1	8.546
NTP4013Q1-TTX-T40-E-FT-D-M3-CTD-10	4	3	127.5	8.187	0.09828	8	LWT, LWB	0.01229	127.8	8.204
NTP4013Q1-TTX-T40-E-FT-A-M2-CTD-13	1	2	126.9	8.947	0.09724	8	LAT	0.01216	125.9	8.870
NTP4013Q1-TTX-T40-E-FT-A-M2-CTD-15	1	2	130.4	8.847	0.09774	8	AGM	0.01222	130.0	8.817
NTP4013Q1-TTX-T40-E-FT-A-M2-CTD-16	1	2	132.2	9.012	0.09807	8	LGB	0.01226	132.2	9.011
NTP4013Q1-TTX-T40-E-FT-B-M2-CTD-14	2	2	135.9	8.695	0.09772	8	AGM	0.01221	135.4	8.663
NTP4013Q1-TTX-T40-E-FT-B-M2-CTD-15	2	2	137.6	8.622	0.09799	8	AGM	0.01225	137.5	8.615
NTP4013Q1-TTX-T40-E-FT-B-M2-CTD-16	2	2	138.0	8.665	0.09831	8	LAT /LIB	0.01229	138.4	8.685
NTP4013Q1-TTX-T40-E-FT-C-M2-CTD-13	3	2	125.6	8.628	0.09731	8	AGM / LIB	0.01216	124.6	8.560
NTP4013Q1-TTX-T40-E-FT-C-M2-CTD-14	3	2	127.0	8.601	0.09734	8	LIT / LIB*	0.01217	126.0	8.536
NTP4013Q1-TTX-T40-E-FT-C-M2-CTD-15	3	2	130.1	8.778	0.09736	8	LIT / LIB*	0.01217	129.1	8.713

* Note the bad failure mode data were included, the failure mode of slightly in tab was approved by NCAMP AER.

Average	**130.4**	**8.692**	**Average$_{norm}$**	**0.01208**	**128.5**	**8.562**
Standard Dev.	**3.909**	**0.1999**	**Standard Dev.$_{norm}$**		**4.580**	**0.2074**
Coeff. of Var. [%]	**2.997**	**2.300**	**Coeff. of Var. [%]$_{norm}$**		**3.564**	**2.422**
Min.	**122.6**	**8.187**	**Min.**	**0.01171**	**119.9**	**8.204**
Max.	**138.0**	**9.012**	**Max.**	**0.01229**	**138.4**	**9.011**
Number of Spec.	**19**	**19**	**Number of Spec.**	**19**	**19**	**19**


Fill Tension Properties (FT)--CTD (-65°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Fill Tension Strength [ksi]
0
20
40
60
80
100
120
140
160
0
1
2
3
4
5
6

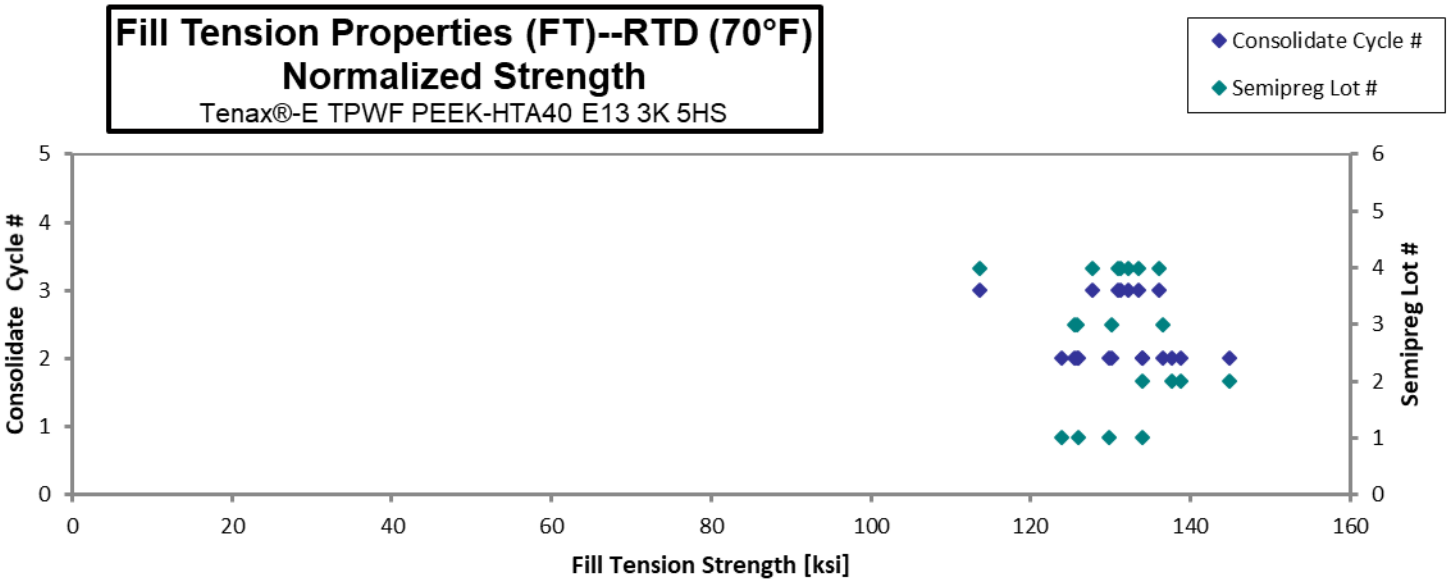

Fill Tension Properties (FT)--CTD (-65°F)
Normalized Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Fill Tension Modulus [Msi]
0
1
2
3
4
5
6
7
8
9
10
0
1
2
3
4
5
6

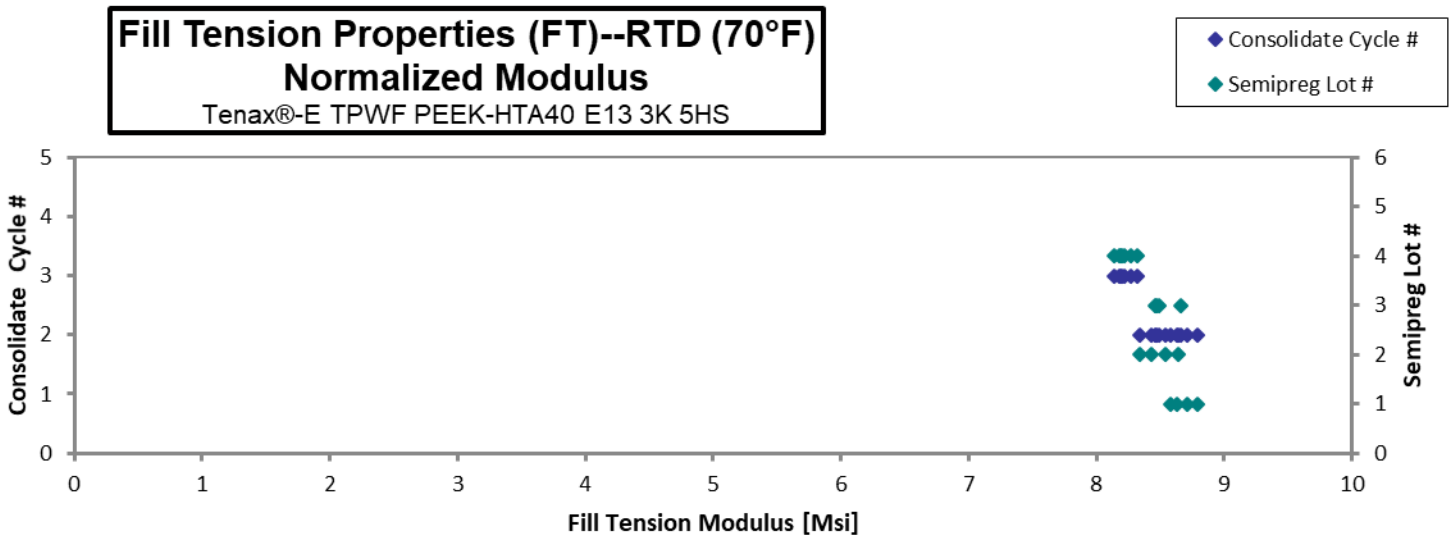
Fill Tension Properties (FT)--RTD (70°F)
Strength & Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

normalizing t_{ply} [in]
0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
NTP4013Q1-TTX-T40-E-FT-D-M3-RTD-4	4	3	133.6	8.266	0.09703	8	LGB, LWT	0.01213	132.2	8.178
NTP4013Q1-TTX-T40-E-FT-D-M3-RTD-5	4	3	133.1	8.251	0.09673	8	LGT, LAB	0.01209	131.3	8.138
NTP4013Q1-TTX-T40-E-FT-D-M3-RTD-6	4	3	133.3	8.334	0.09638	8	LWB, LAT	0.01205	131.0	8.190
NTP4013Q1-TTX-T40-E-FT-D-M3-RTD-7	4	3	140.1	8.439	0.09535	8	LGB	0.01192	136.2	8.204
NTP4013Q1-TTX-T40-E-FT-D-M3-RTD-8	4	3	137.9	8.494	0.09492	8	LGB, LWT	0.01186	133.5	8.220
NTP4013Q1-TTX-T40-E-FT-D-M3-RTD-9	4	3	114.0	8.343	0.09778	8	LAT	0.01222	113.6	8.318
NTP4013Q1-TTX-T40-E-FT-D-M3-RTD-10	4	3	127.6	8.262	0.09820	8	LAT	0.01228	127.8	8.272
NTP4013Q1-TTX-T40-E-FT-A-M2-RTD-17	1	2	132.0	8.579	0.09962	8	LGM	0.01245	134.1	8.714
NTP4013Q1-TTX-T40-E-FT-A-M2-RTD-18	1	2	123.5	8.559	0.09832	8	LGB	0.01229	123.8	8.580
NTP4013Q1-TTX-T40-E-FT-A-M2-RTD-19	1	2	125.5	8.599	0.09844	8	LMV	0.01230	126.0	8.630
NTP4013Q1-TTX-T40-E-FT-A-M2-RTD-20	1	2	129.7	8.772	0.09825	8	LMV	0.01228	129.9	8.788
NTP4013Q1-TTX-T40-E-FT-B-M2-RTD-17	2	2	138.5	8.404	0.09835	8	AGM	0.01229	138.9	8.426
NTP4013Q1-TTX-T40-E-FT-B-M2-RTD-18	2	2	133.4	8.501	0.09856	8	AGM	0.01232	134.1	8.542
NTP4013Q1-TTX-T40-E-FT-B-M2-RTD-19	2	2	136.8	8.279	0.09878	8	AGM	0.01235	137.7	8.338
NTP4013Q1-TTX-T40-E-FT-B-M2-RTD-20	2	2	144.1	8.592	0.09865	8	AGM/LAB	0.01233	144.9	8.642
NTP4013Q1-TTX-T40-E-FT-C-M2-RTD-17	3	2	126.5	8.705	0.09753	8	LAT / LGM	0.01219	125.8	8.656
NTP4013Q1-TTX-T40-E-FT-C-M2-RTD-18	3	2	126.3	8.544	0.09748	8	AGM	0.01219	125.6	8.492
NTP4013Q1-TTX-T40-E-FT-C-M2-RTD-19	3	2	137.1	8.492	0.09773	8	AGM	0.01222	136.6	8.461
NTP4013Q1-TTX-T40-E-FT-C-M2-RTD-20	3	2	130.2	8.469	0.09806	8	LIT / AGM	0.01226	130.2	8.467

Average	**131.7**	**8.468**		**$Average_{norm}$**	**0.01221**	**131.2**	**8.435**
Standard Dev.	**6.956**	**0.1517**		**$Standard\ Dev._{norm}$**		**6.794**	**0.2018**
Coeff. of Var. [%]	**5.280**	**1.792**		**Coeff. of Var. [%]$_{norm}$**		**5.178**	**2.393**
Min.	**114.0**	**8.251**		**Min.**	**0.01186**	**113.6**	**8.138**
Max.	**144.1**	**8.772**		**Max.**	**0.01245**	**144.9**	**8.788**
Number of Spec.	**19**	**19**		**Number of Spec.**	**19**	**19**	**19**


Fill Tension Properties (FT)--RTD (70°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Fill Tension Strength [ksi]
0
20
40
60
80
100
120
140
160
0
1
2
3
4
5
6

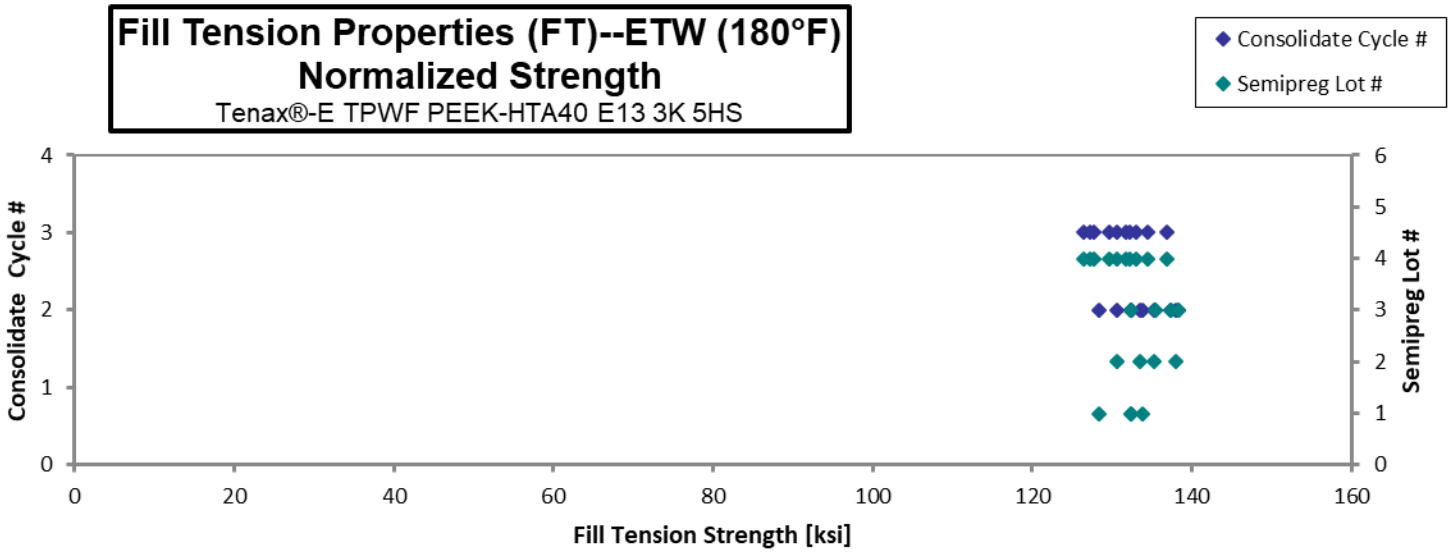

Fill Tension Properties (FT)--RTD (70°F)
Normalized Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Fill Tension Modulus [Msi]
0
1
2
3
4
5
6
7
8
9
10
0
1
2
3
4
5
6

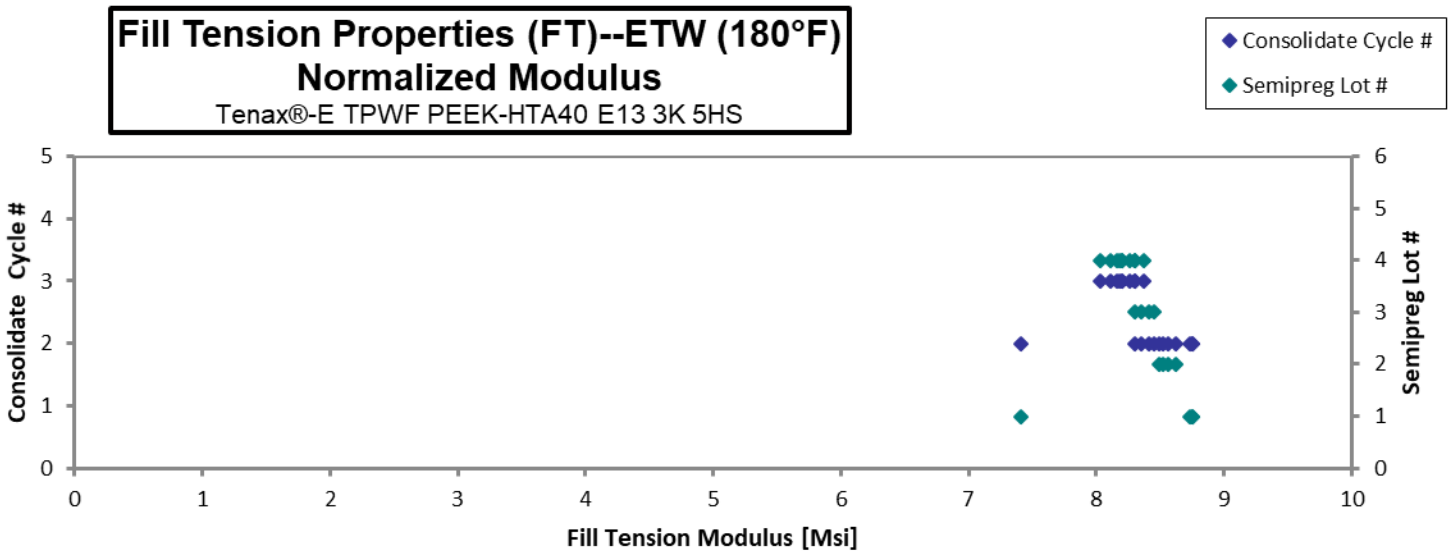
Fill Tension Properties (FT)--ETW (180°F)
Strength & Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

normalizing t_{ply} [in]: 0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
NTP4013Q1-TTX-T40-E-FT-D-M3-ETW-1	4	3	130.4	8.223	0.09755	8	LWB, LAT	0.01219	129.7	8.178
NTP4013Q1-TTX-T40-E-FT-D-M3-ETW-2	4	3	132.4	8.204	0.09758	8	LGM	0.01220	131.8	8.162
NTP4013Q1-TTX-T40-E-FT-D-M3-ETW-3	4	3	133.6	8.289	0.09707	8	LGB	0.01213	132.2	8.204
NTP4013Q1-TTX-T40-E-FT-D-M3-ETW-4	4	3	130.5	8.378	0.09607	8	LGB, LWT	0.01201	127.8	8.206
NTP4013Q1-TTX-T40-E-FT-D-M3-ETW-5	4	3	137.0	8.362	0.09518	8	LGM	0.01190	132.9	8.115
NTP4013Q1-TTX-T40-E-FT-D-M3-ETW-6	4	3	132.1	8.343	0.09442	8	LGT	0.01180	127.2	8.031
NTP4013Q1-TTX-T40-E-FT-D-M3-ETW-7	4	3	127.4	8.358	0.09738	8	LWB	0.01217	126.5	8.299
NTP4013Q1-TTX-T40-E-FT-D-M3-ETW-8	4	3	132.5	8.420	0.09668	8	LGM	0.01209	130.6	8.301
NTP4013Q1-TTX-T40-E-FT-D-M3-ETW-9	4	3	140.8	8.606	0.09540	8	LGB	0.01193	136.9	8.371
NTP4013Q1-TTX-T40-E-FT-D-M3-ETW-10	4	3	139.2	8.553	0.09475	8	LWT, LWB	0.01184	134.5	8.262
NTP4013Q1-TTX-T40-E-FT-A-M2-ETW-21	1	2	128.3	8.755	0.09812	8	LGT / LIB	0.01227	128.4	8.759
NTP4013Q1-TTX-T40-E-FT-A-M2-ETW-22	1	2	133.5	7.391	0.09833	8	LGT / LIB	0.01229	133.9	7.410
NTP4013Q1-TTX-T40-E-FT-A-M2-ETW-23	1	2	131.9	8.722	0.09844	8	AGM	0.01230	132.4	8.754
NTP4013Q1-TTX-T40-E-FT-A-M2-ETW-24	1	2	132.2	8.719	0.09825	8	AGM / LGB	0.01228	132.4	8.735
NTP4013Q1-TTX-T40-E-FT-B-M2-ETW-21	2	2	132.4	8.457	0.09891	8	AGM	0.01236	133.5	8.528
NTP4013Q1-TTX-T40-E-FT-B-M2-ETW-22	2	2	134.4	8.566	0.09870	8	AGM	0.01234	135.3	8.620
NTP4013Q1-TTX-T40-E-FT-B-M2-ETW-23	2	2	129.5	8.491	0.09891	8	AGM	0.01236	130.6	8.563
NTP4013Q1-TTX-T40-E-FT-B-M2-ETW-24	2	2	137.1	8.443	0.09871	8	LAB/AGM	0.01234	138.0	8.498
NTP4013Q1-TTX-T40-E-FT-C-M2-ETW-21	3	2	137.6	8.435	0.09786	8	AGM	0.01223	137.3	8.417
NTP4013Q1-TTX-T40-E-FT-C-M2-ETW-22	3	2	132.6	8.469	0.09793	8	MGT/MGB	0.01224	132.4	8.456
NTP4013Q1-TTX-T40-E-FT-C-M2-ETW-23	3	2	138.8	8.385	0.09774	8	AGM / LGB	0.01222	138.4	8.357
NTP4013Q1-TTX-T40-E-FT-C-M2-ETW-24	3	2	135.9	8.330	0.09777	8	AGM / LGT	0.01222	135.5	8.304

	Strength	Modulus		$Strength_{norm}$	$Modulus_{norm}$
Average	**133.6**	**8.405**	**$Average_{norm}$**	**0.01217**	**132.6**	**8.342**
Standard Dev.	**3.594**	**0.2723**	**$Standard\ Dev._{norm}$**		**3.447**	**0.2950**
Coeff. of Var. [%]	**2.690**	**3.240**	**Coeff. of Var. $[\%]_{norm}$**		**2.598**	**3.536**
Min.	**127.4**	**7.391**	**Min.**	**0.01180**	**126.5**	**7.410**
Max.	**140.8**	**8.755**	**Max.**	**0.01236**	**138.4**	**8.759**
Number of Spec.	**22**	**22**	**Number of Spec.**	**22**	**22**	**22**


Fill Tension Properties (FT)--ETW (180°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Fill Tension Strength [ksi]
0
20
40
60
80
100
120
140
160
0
1
2
3
4
5
6


Fill Tension Properties (FT)--ETW (180°F)
Normalized Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Fill Tension Modulus [Msi]
0
1
2
3
4
5
6
7
8
9
10
0
1
2
3
4
5
6

4.3 Warp Compression Properties (WC)

Warp Compression Properties (WC)--CTD (-65°F)
Strength & Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

normalizing t_{ply} [in]: 0.01226

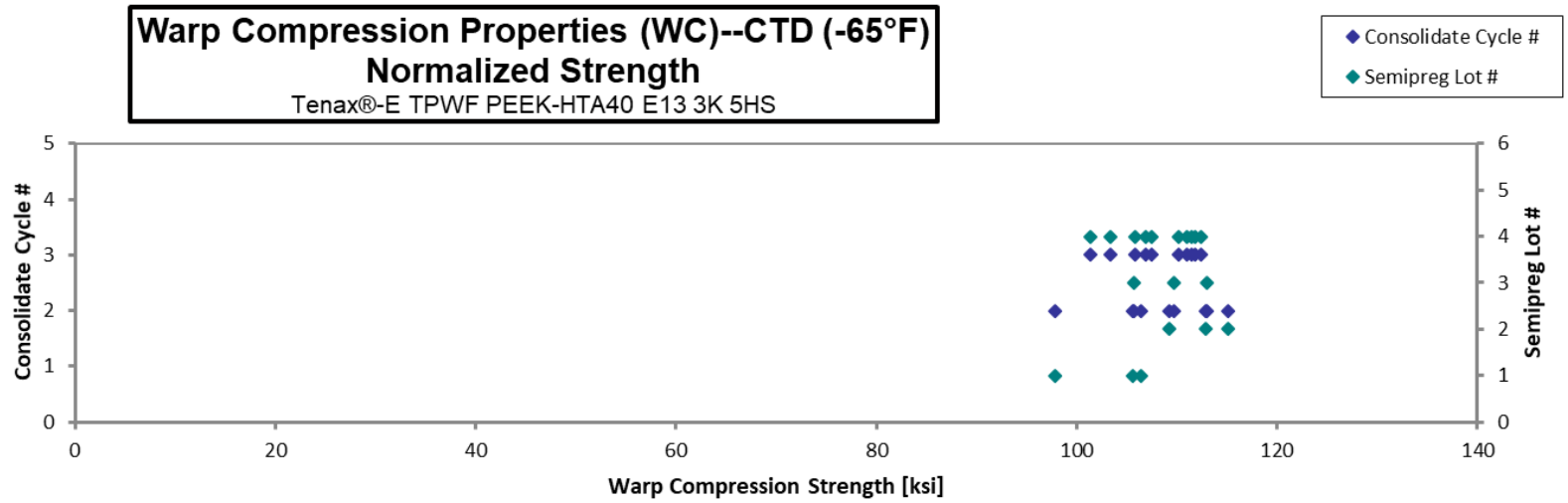
Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	*Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
NTP4013Q1-TTX-T40-E-WC-D-M3-CTD-1	4	3	114.2	8.108	0.1201	10	BAT	0.01201	111.8	7.940
NTP4013Q1-TTX-T40-E-WC-D-M3-CTD-2	4	3	114.1	8.468	0.1198	10	HAT ,HIT	0.01198	111.5	8.276
NTP4013Q1-TTX-T40-E-WC-D-M3-CTD-3	4	3	112.0	8.390	0.1207	10	BGM, HIB	0.01207	110.2	8.259
NTP4013Q1-TTX-T40-E-WC-D-M3-CTD-4	4	3	109.4	8.512	0.1199	10	BGM	0.01199	106.9	8.322
NTP4013Q1-TTX-T40-E-WC-D-M3-CTD-5	4	3	108.0	8.366	0.1202	10	BAB	0.01202	105.9	8.203
NTP4013Q1-TTX-T40-E-WC-D-M3-CTD-6	4	3	105.6	8.496	0.1200	10	BGM	0.01200	103.3	8.315
NTP4013Q1-TTX-T40-E-WC-D-M3-CTD-7	4	3	113.5	8.487	0.1200	10	BAB	0.01200	111.0	8.303
NTP4013Q1-TTX-T40-E-WC-D-M3-CTD-8	4	3	109.5	8.536	0.1203	10	BGM	0.01203	107.5	8.376
NTP4013Q1-TTX-T40-E-WC-D-M3-CTD-9	4	3	103.7	8.445	0.1198	10	BGM	0.01198	101.3	8.253
NTP4013Q1-TTX-T40-E-WC-D-M3-CTD-10	4	3	114.5	8.330	0.1204	10	BAT	0.01204	112.4	8.178
NTP4013Q1-TTX-T40-E-WC-A-M2-CTD-1	1	2	105.6	7.950	0.1236	10	BGM	0.01236	106.5	8.013
NTP4013Q1-TTX-T40-E-WC-A-M2-CTD-2*	1	2		7.335	0.1241	10	CIT	0.01241		7.426
NTP4013Q1-TTX-T40-E-WC-A-M2-CTD-3*	1	2		7.731	0.1242	10	CIB	0.01242		7.834
[R]NTP4013Q1-TTX-T40-E-WC-A-M2-CTD-1	1	2	105.6	7.976	0.1226	10	BGM	0.01226	105.6	7.976
[R]NTP4013Q1-TTX-T40-E-WC-A-M2-CTD-2[1]	1	2	97.75		0.1227	10	BGM	0.01227	97.79	
NTP4013Q1-TTX-T40-E-WC-B-M2-CTD-1	2	2	114.7	7.181	0.1231	10	BGM	0.01231	115.1	7.209
NTP4013Q1-TTX-T40-E-WC-B-M2-CTD-2*	2	2		7.191	0.1235	10	CIT	0.01235		7.242
NTP4013Q1-TTX-T40-E-WC-B-M2-CTD-3	2	2	108.6	7.106	0.1233	10	BGM	0.01233	109.2	7.148
[R]NTP4013Q1-TTX-T40-E-WC-B-M2-CTD-1	2	2	114.8	8.274	0.1206	10	BGM	0.01206	112.9	8.139
NTP4013Q1-TTX-T40-E-WC-C-M2-CTD-1	3	2	105.9	7.325	0.1224	10	BGM	0.01224	105.7	7.312
NTP4013Q1-TTX-T40-E-WC-C-M2-CTD-2	3	2	109.5	7.566	0.1229	10	BGM	0.01229	109.7	7.585
NTP4013Q1-TTX-T40-E-WC-C-M2-CTD-3*	3	2		7.562	0.1240	10	CIT	0.01240		7.645
[R]NTP4013Q1-TTX-T40-E-WC-C-M2-CTD-1	3	2	113.4	8.026	0.1221	10	BAB	0.01221	113.0	7.995

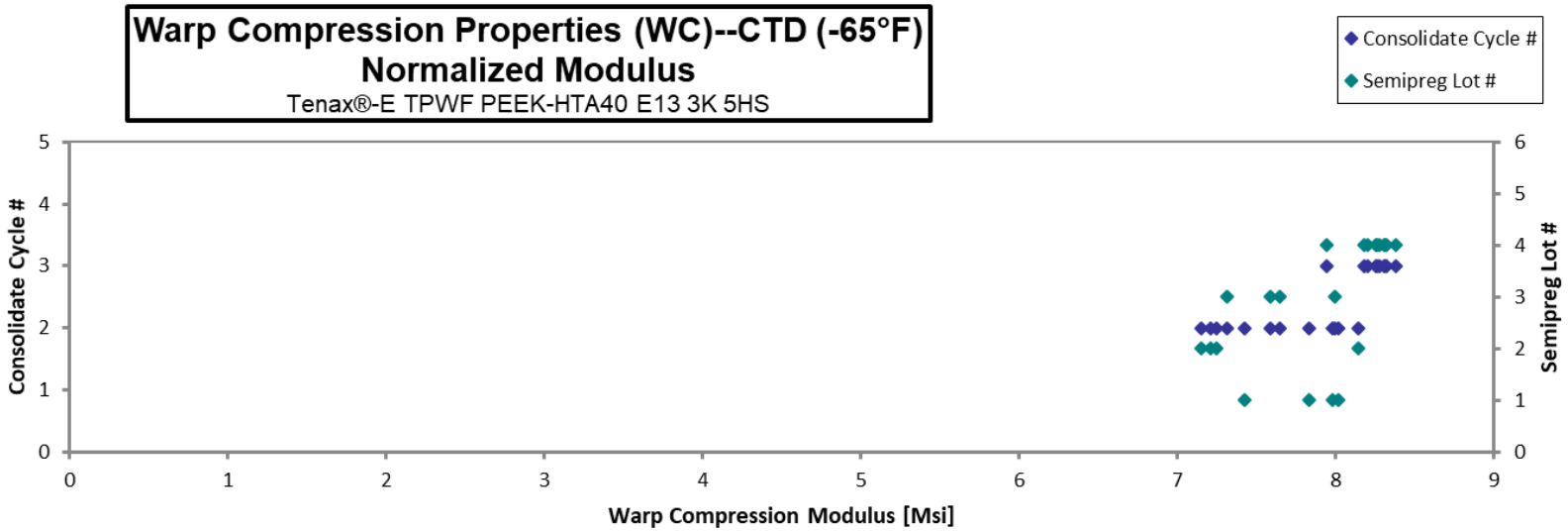
* Bad failure mode strength data were removed.

[1]Modulus data was not recorded.

[R] Retested specimen at NIAR

Average	**109.5**	**7.971**		**$Average_{norm}$**	**0.01217**	**108.3**	**7.907**
Standard Dev.	**4.669**	**0.5067**		**$Standard\ Dev._{norm}$**		**4.419**	**0.4142**
Coeff. of Var. [%]	**4.265**	**6.357**		**Coeff. of Var. [%]$_{norm}$**		**4.081**	**5.238**
Min.	**97.75**	**7.106**		**Min.**	**0.01198**	**97.79**	**7.148**
Max.	**114.8**	**8.536**		**Max.**	**0.01242**	**115.1**	**8.376**
Number of Spec.	**19**	**22**		**Number of Spec.**	**23**	**19**	**22**


Warp Compression Properties (WC)--CTD (-65°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Warp Compression Strength [ksi]
0
20
40
60
80
100
120
140
0
1
2
3
4
5
6


Warp Compression Properties (WC)--CTD (-65°F)
Normalized Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Warp Compression Modulus [Msi]
0
1
2
3
4
5
6
7
8
9
0
1
2
3
4
5
6

Warp Compression Properties (WC)--RTD (70°F)
Strength & Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

normalizing t_{ply} [in]: 0.01226

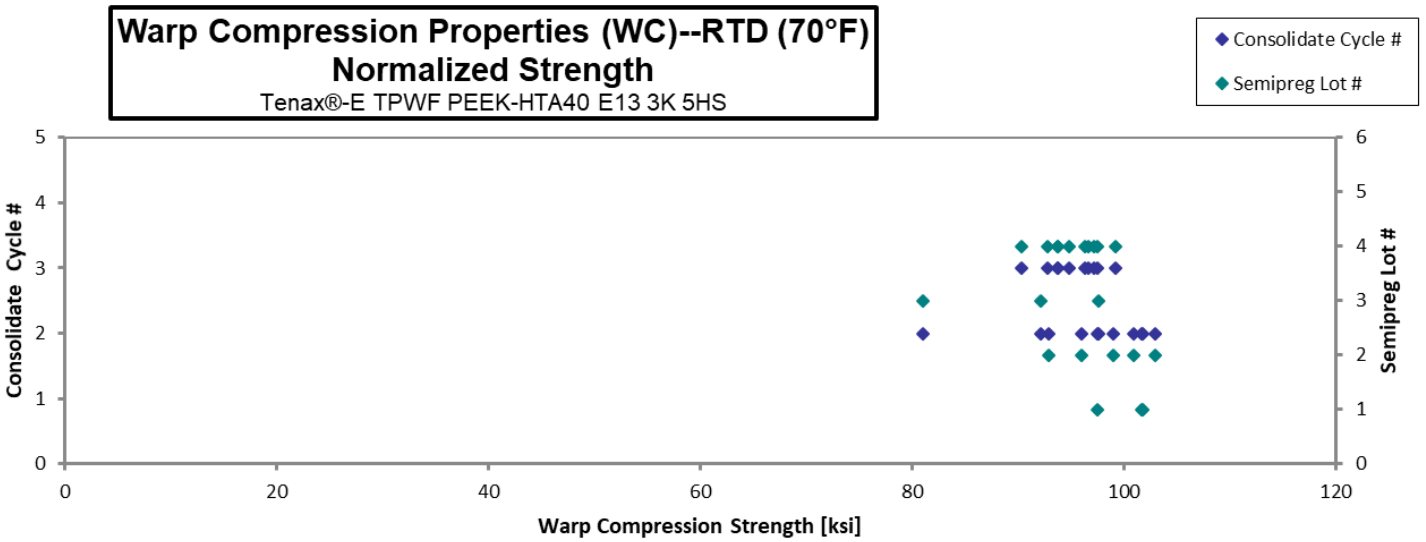
Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	*Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
NTP4013Q1-TTX-T40-E-WC-M3-RTD-1*	4	3		8.274	0.1207	10	HIB	0.01207		8.145
NTP4013Q1-TTX-T40-E-WC-M3-RTD-2	4	3	98.66	8.075	0.1208	10	M(B,H)AB	0.01208	97.24	7.958
NTP4013Q1-TTX-T40-E-WC-M3-RTD-3	4	3	95.54	8.307	0.1203	10	BGM	0.01203	93.78	8.153
NTP4013Q1-TTX-T40-E-WC-M3-RTD-4	4	3	98.45	8.311	0.1204	10	BGM	0.01204	96.64	8.159
NTP4013Q1-TTX-T40-E-WC-M3-RTD-5	4	3	99.15	8.246	0.1206	10	BAT, HIT	0.01206	97.54	8.113
NTP4013Q1-TTX-T40-E-WC-M3-RTD-6	4	3	100.9	8.029	0.1205	10	BAB	0.01205	99.18	7.891
NTP4013Q1-TTX-T40-E-WC-M3-RTD-7	4	3	94.46	8.166	0.1205	10	HAB, HIB	0.01205	92.84	8.026
NTP4013Q1-TTX-T40-E-WC-M3-RTD-8	4	3	98.07	8.166	0.1205	10	BAT, HIT	0.01205	96.35	8.023
NTP4013Q1-TTX-T40-E-WC-M3-RTD-9	4	3	95.26	8.158	0.1207	10	M(B,H)AB	0.01207	93.76	8.029
NTP4013Q1-TTX-T40-E-WC-M3-RTD-10	4	3	95.74	8.312	0.1215	10	BGM	0.01215	94.88	8.238
NTP4013Q1-TTX-T40-E-WC-M3-RTD-11[1]	4	3	91.91		0.1205	10	BGM	0.01205	90.32	
NTP4013Q1-TTX-T40-E-WC-A-M2-RTD-5	1	2	99.96	7.658	0.1247	10	BGM	0.01247	101.6	7.787
NTP4013Q1-TTX-T40-E-WC-A-M2-RTD-6*	1	2		7.621	0.1251	10	CIT/CIB	0.01251		7.774
NTP4013Q1-TTX-T40-E-WC-A-M2-RTD-7	1	2	95.56	7.434	0.1250	10	HAT	0.01250	97.46	7.582
NTP4013Q1-TTX-T40-E-WC-A-M2-RTD-8	1	2	99.67	7.787	0.1253	10	HAT	0.01253	101.8	7.956
NTP4013Q1-TTX-T40-E-WC-B-M2-RTD-5*	2	2		7.962	0.1226	10	CIT	0.01226		7.960
NTP4013Q1-TTX-T40-E-WC-B-M2-RTD-6*	2	2		8.020	0.1220	10	CIT	0.01220		7.984
NTP4013Q1-TTX-T40-E-WC-B-M2-RTD-7*	2	2		8.244	0.1221	10	CIT	0.01221		8.210
[R]NTP4013Q1-TTX-T40-E-WC-B-M2-RTD-1	2	2	108.0	8.501	0.1169	10	BGM, HIB	0.01169	103.0	8.103
[R]NTP4013Q1-TTX-T40-E-WC-B-M2-RTD-2	2	2	96.39	8.390	0.1182	10	BAB, HAB, HIB	0.01182	92.92	8.088
[R]NTP4013Q1-TTX-T40-E-WC-B-M2-RTD-3[1]	2	2	103.5		0.1196	10	HAB, HIB	0.01196	100.9	
[R]NTP4013Q1-TTX-T40-E-WC-B-M2-RTD-4[1]	2	2	101.2		0.1199	10	BAT, HAT	0.01199	98.98	
[R]NTP4013Q1-TTX-T40-E-WC-B-M2-RTD-5[1]	2	2	98.18		0.1199	10	BAB, HAB	0.01199	95.98	
NTP4013Q1-TTX-T40-E-WC-C-M2-RTD-5	3	2	90.66	8.138	0.1247	10	BGM	0.01247	92.20	8.276
NTP4013Q1-TTX-T40-E-WC-C-M2-RTD-6*	3	2		8.027	0.1250	10	CIT	0.01250		8.181
NTP4013Q1-TTX-T40-E-WC-C-M2-RTD-7	3	2	79.61	7.751	0.1248	10	BGM	0.01248	81.06	7.892
[R]NTP4013Q1-TTX-T40-E-WC-C-M2-RTD-1	3	2	99.45	8.147	0.1204	10	BAB	0.01204	97.66	8.001

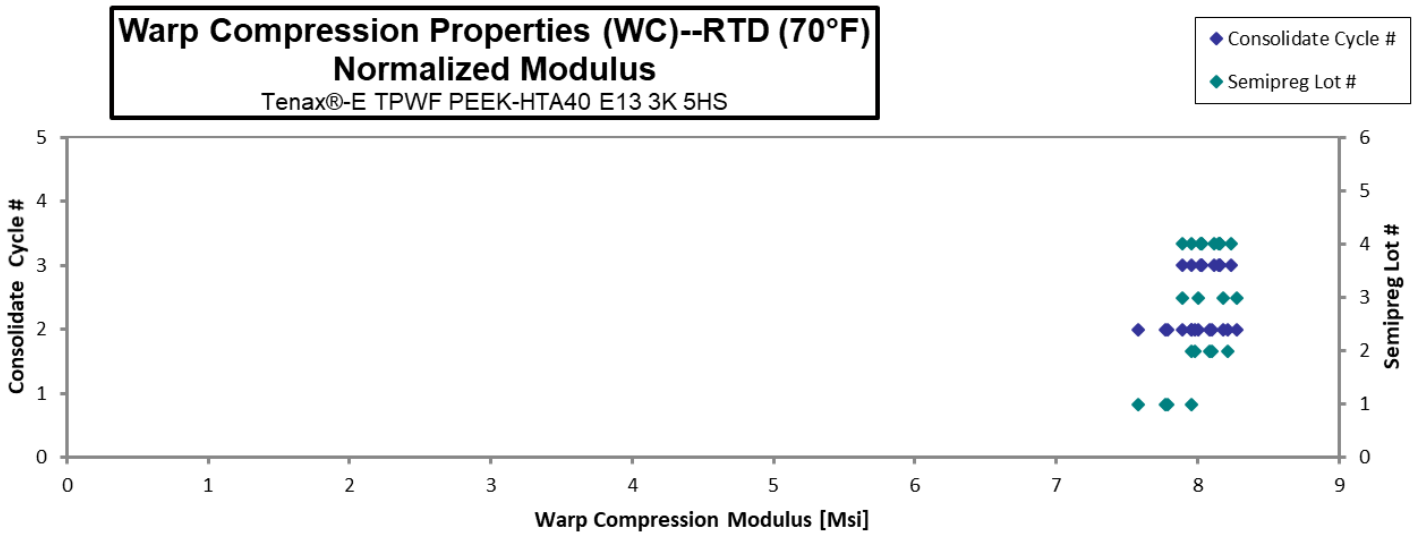
* Bad failure mode strength data were removed.

[1]Modulus data was not recorded.

[R] Retested specimen at NIAR

Average	**97.16**	**8.075**		**$Average_{norm}$**	**0.01216**	**96.01**	**8.023**
Standard Dev.	**5.539**	**0.2676**		**$Standard\ Dev._{norm}$**		**4.836**	**0.1652**
Coeff. of Var. [%]	**5.701**	**3.314**		**Coeff. of Var. $[\%]_{norm}$**		**5.037**	**2.059**
Min.	**79.61**	**7.434**		**Min.**	**0.01169**	**81.06**	**7.582**
Max.	**108.0**	**8.501**		**Max.**	**0.01253**	**103.0**	**8.276**
Number of Spec.	**21**	**23**		**Number of Spec.**	**27**	**21**	**23**


Warp Compression Properties (WC)--RTD (70°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Warp Compression Strength [ksi]
0
20
40
60
80
100
120
0
1
2
3
4
5
6


Warp Compression Properties (WC)--RTD (70°F)
Normalized Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Warp Compression Modulus [Msi]
0
1
2
3
4
5
6
7
8
9
0
1
2
3
4
5
6

Warp Compression Properties (WC)--ETD (180°F)
Strength & Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

normalizing t_{ply} [in]: 0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	*Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
NTP4013Q1-TTX-T40-E-WC-D-M3-ETD-1	4	3	87.77	8.435	0.1205	10	BGM, HAT, HIT	0.01205	86.28	8.292
NTP4013Q1-TTX-T40-E-WC-D-M3-ETD-2	4	3	84.17	8.380	0.1207	10	BAB	0.01207	82.88	8.251
NTP4013Q1-TTX-T40-E-WC-D-M3-ETD-3	4	3	84.88	8.344	0.1206	10	BAT	0.01206	83.51	8.209
NTP4013Q1-TTX-T40-E-WC-D-M3-ETD-4	4	3	83.01	8.332	0.1207	10	BAB	0.01207	81.71	8.202
NTP4013Q1-TTX-T40-E-WC-D-M3-ETD-5	4	3	88.92	8.530	0.1206	10	BGM, HIT	0.01206	87.49	8.393
NTP4013Q1-TTX-T40-E-WC-D-M3-ETD-6	4	3	83.91	8.475	0.1215	10	BGM	0.01215	83.14	8.397
NTP4013Q1-TTX-T40-E-WC-D-M3-ETD-7	4	3	82.63	8.330	0.1204	10	BAB, HAB	0.01204	81.16	8.182
NTP4013Q1-TTX-T40-E-WC-D-M3-ETD-8	4	3	89.00	8.396	0.1208	10	BAB	0.01208	87.67	8.271
NTP4013Q1-TTX-T40-E-WC-D-M3-ETD-9	4	3	88.37	8.222	0.1209	10	BAB, HIB, HIT	0.01209	87.13	8.107
NTP4013Q1-TTX-T40-E-WC-D-M3-ETD-10	4	3	87.66	8.157	0.1211	10	BAB, HAT	0.01211	86.55	8.054
NTP4013Q1-TTX-T40-E-WC-A-M2-ETD-9*	1	2		7.399	0.1209	10	CIT	0.01209		7.297
NTP4013Q1-TTX-T40-E-WC-A-M2-ETD-10*	1	2		7.746	0.1259	10	CIT	0.01259		7.952
NTP4013Q1-TTX-T40-E-WC-A-M2-ETD-11*	1	2		7.530	0.1254	10	CIT	0.01254		7.703
NTP4013Q1-TTX-T40-E-WC-A-M2-ETD-12*	1	2		7.843	0.1252	10	CIT	0.01252		8.008
[R]NTP4013Q1-TTX-T40-E-WC-A-M2-ETD-1	1	2	80.83	8.159	0.1233	10	HAB	0.01233	81.28	8.204
[R]NTP4013Q1-TTX-T40-E-WC-A-M2-ETD-2[1]	1	2	82.57		0.1230	10	HAB, HAT	0.01230	82.82	
[R]NTP4013Q1-TTX-T40-E-WC-A-M2-ETD-3[1]	1	2	85.81		0.1219	10	BGM	0.01219	85.32	
NTP4013Q1-TTX-T40-E-WC-B-M2-ETD-9*	2	2		8.571	0.1226	10	CIT	0.01226		8.569
NTP4013Q1-TTX-T40-E-WC-B-M2-ETD-10	2	2	84.92	8.348	0.1233	10	BGM	0.01233	85.41	8.396
NTP4013Q1-TTX-T40-E-WC-B-M2-ETD-11	2	2	86.79	8.193	0.1240	10	BGM	0.01240	87.77	8.285
[R]NTP4013Q1-TTX-T40-E-WC-B-M2-ETD-1	2	2	80.97	7.715	0.1224	10	BGM	0.01224	80.83	7.702
NTP4013Q1-TTX-T40-E-WC-C-M2-ETD-9*	3	2		7.608	0.1249	10	CIT	0.01249		7.750
NTP4013Q1-TTX-T40-E-WC-C-M2-ETD-10*	3	2		7.742	0.1246	10	CIT	0.01246		7.871
NTP4013Q1-TTX-T40-E-WC-C-M2-ETD-11*	3	2		7.858	0.1244	10	CIT	0.01244		7.976
NTP4013Q1-TTX-T40-E-WC-C-M2-ETD-12	3	2	82.52	8.076	0.1242	10	BGM	0.01242	83.57	8.179
[R]NTP4013Q1-TTX-T40-E-WC-C-M2-ETD-1	3	2	86.28	8.098	0.1233	10	BGM, HIT	0.01233	86.74	8.141
[R]NTP4013Q1-TTX-T40-E-WC-C-M2-ETD-2[1]	3	2	88.01		0.1231	10	BAT, HAT, HIT	0.01231	88.37	

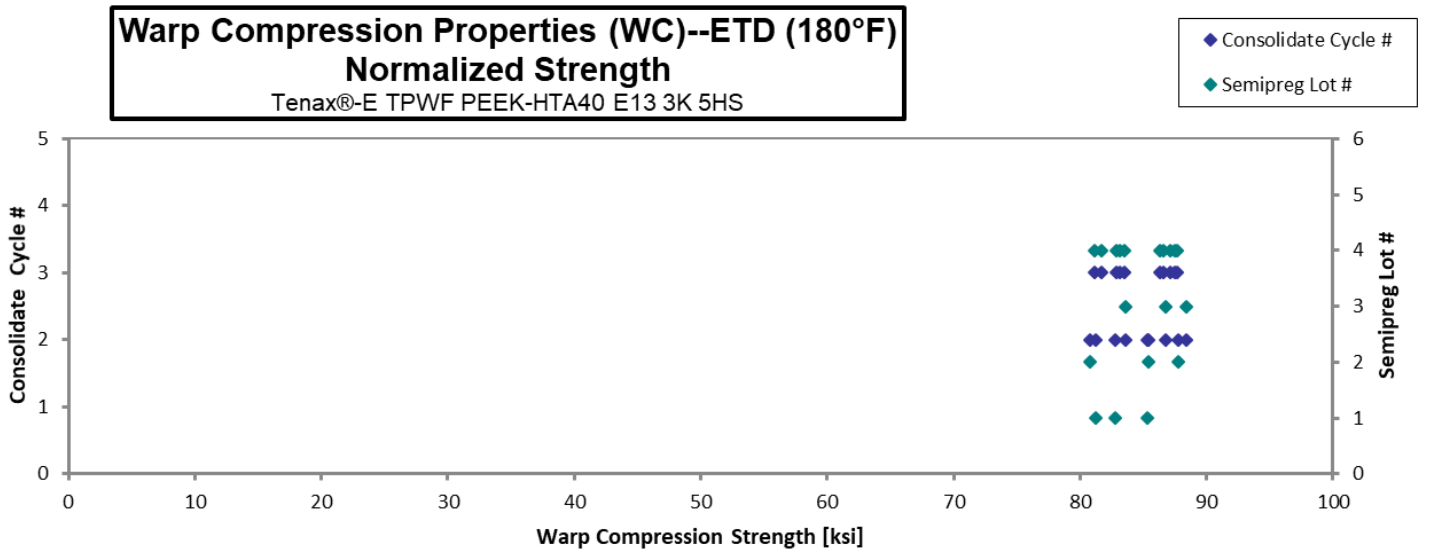
* Bad failure mode strength data were removed.

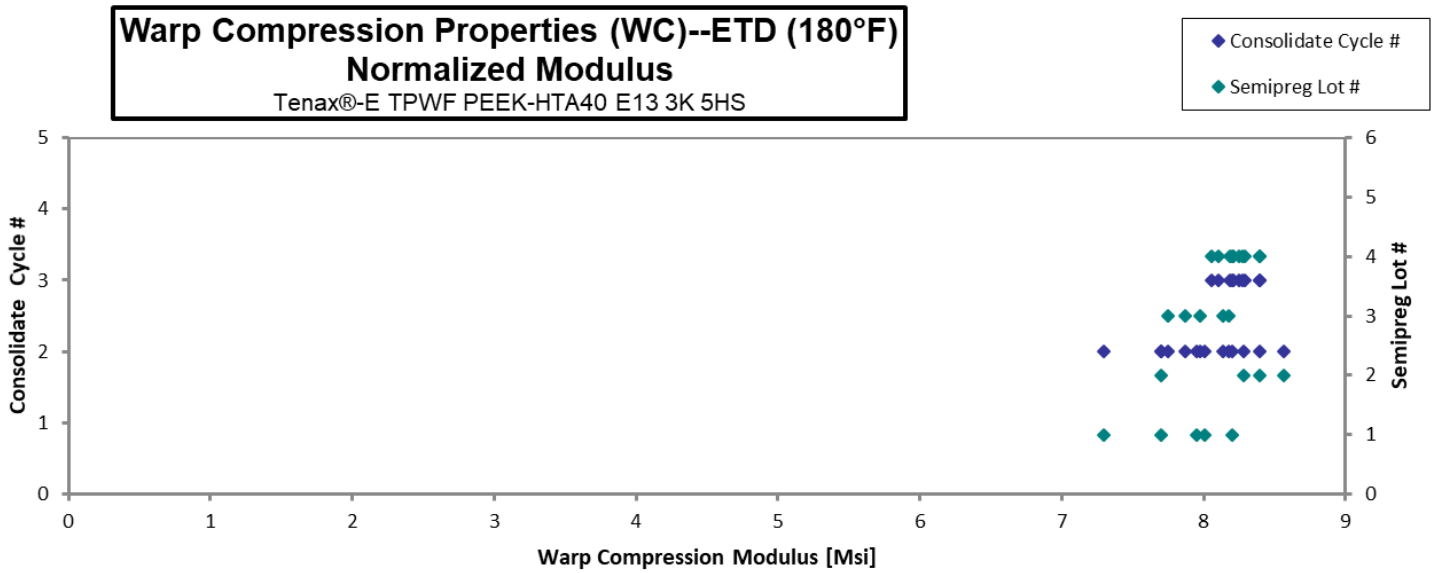
[1]Modulus data was not recorded.

[R] Retested specimen at NIAR

	Strength	Modulus
Average	85.21	8.104
Standard Dev.	2.670	0.3406
Coeff. of Var. [%]	3.133	4.203
Min.	80.83	7.399
Max.	89.00	8.571
Number of Spec.	19	24

	Avg. t_{ply}	$Strength_{norm}$	$Modulus_{norm}$
$Average_{norm}$	0.01226	84.72	8.100
$Standard\ Dev._{norm}$		2.543	0.2826
$Coeff.\ of\ Var.\ [\%]_{norm}$		3.002	3.489
Min.	0.01204	80.83	7.297
Max.	0.01259	88.37	8.569
Number of Spec.	27	19	24


Warp Compression Properties (WC)--ETD (180°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Warp Compression Strength [ksi]


Warp Compression Properties (WC)--ETD (180°F)
Normalized Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Warp Compression Modulus [Msi]

Warp Compression Properties (WC)--ETW (180°F)
Strength & Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

normalizing t_{ply} [in]: 0.01226

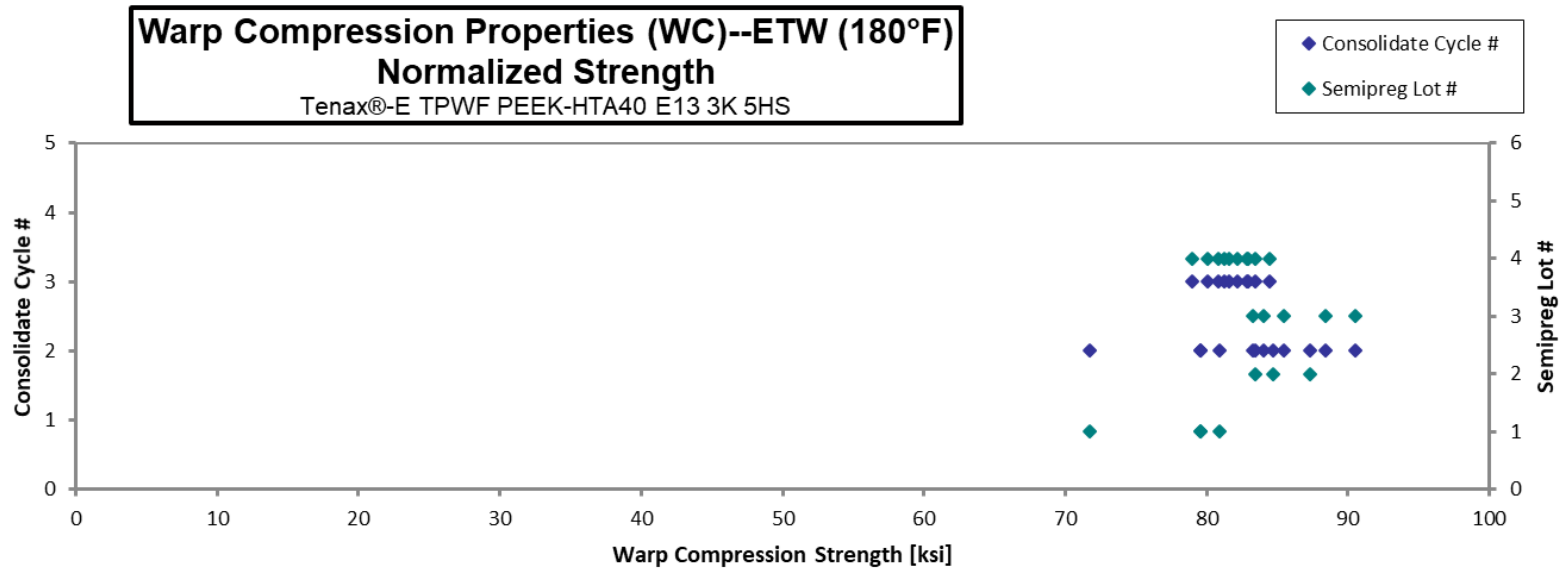
Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	*Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
NTP4013Q1-TTX-T40-E-WC-D-M3-ETW-1	4	3	84.37	8.372	0.1205	10	BAT,HIT	0.01205	82.92	8.229
NTP4013Q1-TTX-T40-E-WC-D-M3-ETW-2	4	3	80.22	8.330	0.1207	10	M(B,H)GM, HIT	0.01207	78.99	8.202
NTP4013Q1-TTX-T40-E-WC-D-M3-ETW-3	4	3	85.70	8.471	0.1208	10	M(B,H)AT	0.01208	84.42	8.344
NTP4013Q1-TTX-T40-E-WC-D-M3-ETW-4	4	3	82.14	8.471	0.1207	10	BAT, HIT	0.01207	80.86	8.339
NTP4013Q1-TTX-T40-E-WC-D-M3-ETW-5	4	3	81.37	8.408	0.1206	10	BAT	0.01206	80.04	8.271
NTP4013Q1-TTX-T40-E-WC-D-M3-ETW-6	4	3	83.05	8.367	0.1205	10	BAT	0.01205	81.60	8.221
NTP4013Q1-TTX-T40-E-WC-D-M3-ETW-7	4	3	84.39	8.593	0.1203	10	M(B,H)AT	0.01203	82.83	8.434
NTP4013Q1-TTX-T40-E-WC-D-M3-ETW-8	4	3	82.98	8.581	0.1201	10	BAT	0.01201	81.28	8.406
NTP4013Q1-TTX-T40-E-WC-D-M3-ETW-9	4	3	85.34	8.383	0.1199	10	BAT, HIT	0.01199	83.43	8.196
NTP4013Q1-TTX-T40-E-WC-D-M3-ETW-10	4	3	84.20	8.497	0.1196	10	BAT, HIT	0.01196	82.16	8.292
NTP4013Q1-TTX-T40-E-WC-A-M2-ETW-13*	1	2		8.248	0.1248	10	CIT	0.01248		8.393
NTP4013Q1-TTX-T40-E-WC-A-M2-ETW-14*	1	2		8.157	0.1239	10	CIT	0.01239		8.246
NTP4013Q1-TTX-T40-E-WC-A-M2-ETW-15*	1	2		8.156	0.1234	10	HIT	0.01234		8.208
NTP4013Q1-TTX-T40-E-WC-A-M2-ETW-16*	1	2		8.526	0.1224	10	CIB	0.01224		8.510
NTP4013Q1-TTX-T40-E-WC-A-M2-ETW-17	1	2	81.39	7.970	0.1219	10	HIT/BGM	0.01219	80.90	7.922
NTP4013Q1-TTX-T40-E-WC-A-M2-ETW-18	1	2	80.43	8.202	0.1213	10	BGM	0.01213	79.57	8.114
NTP4013Q1-TTX-T40-E-WC-A-M2-ETW-19*	1	2		8.077	0.1209	10	HIT/HIB	0.01209		7.962
NTP4013Q1-TTX-T40-E-WC-A-M2-ETW-20*	1	2		8.269	0.1205	10	HIT	0.01205		8.125
[R]NTP4013Q1-TTX-T40-E-WC-A-M2-ETW-2	1	2	81.21	8.449	0.1201	10	BAT	0.01201	79.53	8.274
[R]NTP4013Q1-TTX-T40-E-WC-A-M2-ETW-3[1]	1	2	73.65		0.1193	10	HAT	0.01193	71.69	
NTP4013Q1-TTX-T40-E-WC-B-M2-ETW-13*	2	2		7.584	0.1244	10	CIT/CIB	0.01244		7.698
NTP4013Q1-TTX-T40-E-WC-B-M2-ETW-14*	2	2		7.752	0.1248	10	CIT/CIB	0.01248		7.889
NTP4013Q1-TTX-T40-E-WC-B-M2-ETW-15*	2	2		7.617	0.1250	10	CIT/CIB	0.01250		7.767
NTP4013Q1-TTX-T40-E-WC-B-M2-ETW-16*	2	2		8.079	0.1251	10	CIT/CIB	0.01251		8.241
NTP4013Q1-TTX-T40-E-WC-B-M2-ETW-17	2	2	85.77	7.935	0.1248	10	TAT	0.01248	87.31	8.076
NTP4013Q1-TTX-T40-E-WC-B-M2-ETW-18*	2	2		8.079	0.1248	10	CIT/CIB	0.01248		8.223
NTP4013Q1-TTX-T40-E-WC-B-M2-ETW-19	2	2	82.43	8.388	0.1241	10	TAT	0.01241	83.42	8.489
NTP4013Q1-TTX-T40-E-WC-B-M2-ETW-20	2	2	83.60	8.594	0.1242	10	TAT	0.01242	84.71	8.708
NTP4013Q1-TTX-T40-E-WC-C-M2-ETW-13*	3	2		8.331	0.1239	10	CIT	0.01239		8.418
NTP4013Q1-TTX-T40-E-WC-C-M2-ETW-14*	3	2		8.242	0.1230	10	CIT	0.01230		8.271
NTP4013Q1-TTX-T40-E-WC-C-M2-ETW-15	3	2	83.22	8.210	0.1227	10	HAM	0.01227	83.30	8.218
NTP4013Q1-TTX-T40-E-WC-C-M2-ETW-16*	3	2		8.335	0.1221	10	CIB	0.01221		8.304
NTP4013Q1-TTX-T40-E-WC-C-M2-ETW-17*	3	2		8.299	0.1215	10	CIT	0.01215		8.225
NTP4013Q1-TTX-T40-E-WC-C-M2-ETW-18*	3	2		8.373	0.1209	10	CIB	0.01209		8.255
NTP4013Q1-TTX-T40-E-WC-C-M2-ETW-19*	3	2		8.672	0.1203	10	CIT/CTB	0.01203		8.510
NTP4013Q1-TTX-T40-E-WC-C-M2-ETW-20*	3	2		8.493	0.1197	10	CIT	0.01197		8.294
[R]NTP4013Q1-TTX-T40-E-WC-C-M2-ETW-1	3	2	88.82	7.997	0.1221	10	BGM/CIT	0.01221	88.44	7.963
[R]NTP4013Q1-TTX-T40-E-WC-C-M2-ETW-2[1]	3	2	91.22		0.1217	10	BAT	0.01217	90.51	
[R]NTP4013Q1-TTX-T40-E-WC-C-M2-ETW-3[1]	3	2	86.30		0.1215	10	BAT	0.01215	85.49	
[R]NTP4013Q1-TTX-T40-E-WC-C-M2-ETW-4[1]	3	2	85.16		0.1209	10	BAB/HAB/HAT/HIT	0.01209	84.00	

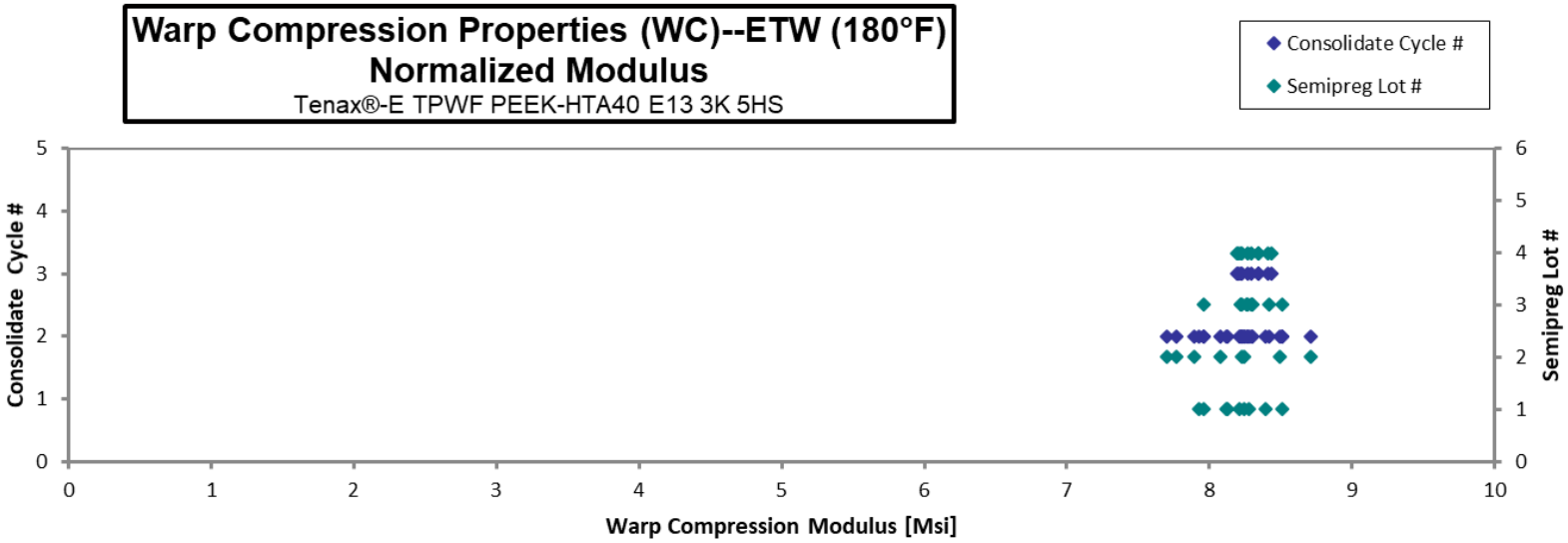
* Bad failure mode strength data were removed.

[1]Modulus data was not recorded.

[R] Retested specimen at NIAR

Average	**83.50**	**8.264**	**Average$_{norm}$**	**0.01220**	**82.61**	**8.229**
Standard Dev.	**3.442**	**0.2630**	**Standard Dev.$_{norm}$**		**3.811**	**0.2094**
Coeff. of Var. [%]	**4.123**	**3.183**	**Coeff. of Var. [%]$_{norm}$**		**4.614**	**2.545**
Min.	**73.65**	**7.584**	**Min.**	**0.01193**	**71.69**	**7.698**
Max.	**91.22**	**8.672**	**Max.**	**0.01251**	**90.51**	**8.708**
Number of Spec.	**22**	**36**	**Number of Spec.**	**40**	**22**	**36**


Warp Compression Properties (WC)--ETW (180°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Warp Compression Strength [ksi]
0
10
20
30
40
50
60
70
80
90
100
0
1
2
3
4
5
6


Warp Compression Properties (WC)--ETW (180°F)
Normalized Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Warp Compression Modulus [Msi]
0
1
2
3
4
5
6
7
8
9
10
0
1
2
3
4
5
6

4.4 Fill Compression Properties (FC)

Fill Compression Properties (FC)--CTD (-65°F)
Strength & Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

normalizing t_{ply} [in]
0.01226

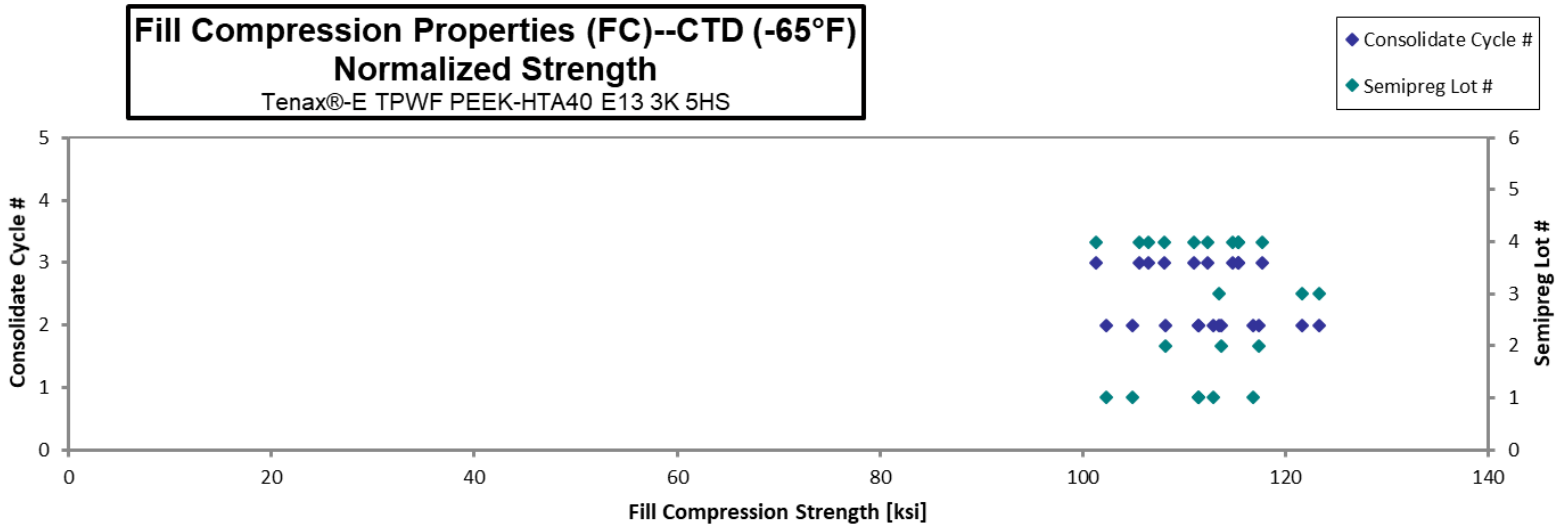
Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	*Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
NTP4013Q1-TTX-T40-E-FC-D-M3-CTD-1	4	3	118.0	8.198	0.1198	10	BGM	0.01198	115.4	8.012
NTP4013Q1-TTX-T40-E-FC-D-M3-CTD-2	4	3	108.0	8.496	0.1199	10	BAT	0.01199	105.6	8.305
NTP4013Q1-TTX-T40-E-FC-D-M3-CTD-3	4	3	108.2	8.261	0.1207	10	BGM	0.01207	106.5	8.134
NTP4013Q1-TTX-T40-E-FC-D-M3-CTD-4	4	3	103.0	8.484	0.1206	10	BGM, HAT	0.01206	101.3	8.346
NTP4013Q1-TTX-T40-E-FC-D-M3-CTD-5	4	3	116.5	8.413	0.1214	10	M(B,H)AT	0.01214	115.4	8.332
NTP4013Q1-TTX-T40-E-FC-D-M3-CTD-6	4	3	111.7	8.186	0.1219	10	BGM	0.01219	111.0	8.136
NTP4013Q1-TTX-T40-E-FC-D-M3-CTD-7	4	3	119.2	8.206	0.1211	10	BGM	0.01211	117.7	8.104
NTP4013Q1-TTX-T40-E-FC-D-M3-CTD-8	4	3	115.6	8.340	0.1218	10	M(B,H)AB, HIB	0.01218	114.8	8.283
NTP4013Q1-TTX-T40-E-FC-D-M3-CTD-9	4	3	113.2	8.414	0.1217	10	BAT	0.01217	112.4	8.351
NTP4013Q1-TTX-T40-E-FC-D-M3-CTD-10	4	3	109.0	8.27	0.1216	10	M(B,H)AT	0.01216	108.1	8.203
NTP4013Q1-TTX-T40-E-FC-A-M2-CTD-22*	1	2		7.516	0.1211	10	CIT	0.01211		7.422
NTP4013Q1-TTX-T40-E-FC-A-M2-CTD-23	1	2	118.5	7.566	0.1208	10	BGM	0.01208	116.8	7.453
NTP4013Q1-TTX-T40-E-FC-A-M2-CTD-24	1	2	112.7	7.770	0.1211	10	BGM	0.01211	111.4	7.676
[R]NTP4013Q1-TTX-T40-E-FC-A-M2-CTD-1	1	2	115.8	8.097	0.1195	10	BAB, HAB	0.01195	112.9	7.894
[R]NTP4013Q1-TTX-T40-E-FC-A-M2-CTD-2	1	2	104.8	8.496	0.1197	10	BGM	0.01197	102.4	8.297
[R]NTP4013Q1-TTX-T40-E-FC-A-M2-CTD-3[1]	1	2	114.2		0.1196	10	BGM	0.01196	111.4	
[R]NTP4013Q1-TTX-T40-E-FC-A-M2-CTD-4[1]	1	2	107.6		0.1196	10	BGM	0.01196	105.0	
NTP4013Q1-TTX-T40-E-FC-B-M2-CTD-21*	2	2		7.545	0.1230	10	CIT	0.01230		7.572
NTP4013Q1-TTX-T40-E-FC-B-M2-CTD-22*	2	2		7.351	0.1231	10	CIT	0.01231		7.378
NTP4013Q1-TTX-T40-E-FC-B-M2-CTD-23*	2	2	107.4	7.100	0.1234	10	BGM	0.01234	108.1	7.148
[R]NTP4013Q1-TTX-T40-E-FC-B-M2-CTD-1	2	2	119.1	7.756	0.1208	10	BGM	0.01208	117.4	7.644
[R]NTP4013Q1-TTX-T40-E-FC-B-M2-CTD-2[1]	2	2	114.6		0.1217	10	BGM	0.01217	113.7	
NTP4013Q1-TTX-T40-E-FC-C-M2-CTD-21	3	2	115.8	8.178	0.1201	10	BGM	0.01201	113.4	8.011
NTP4013Q1-TTX-T40-E-FC-C-M2-CTD-22	3	2	124.0	7.639	0.1203	10	BGM	0.01203	121.6	7.494
NTP4013Q1-TTX-T40-E-FC-C-M2-CTD-23	3	2	125.7	7.875	0.1203	10	BGM	0.01203	123.4	7.730

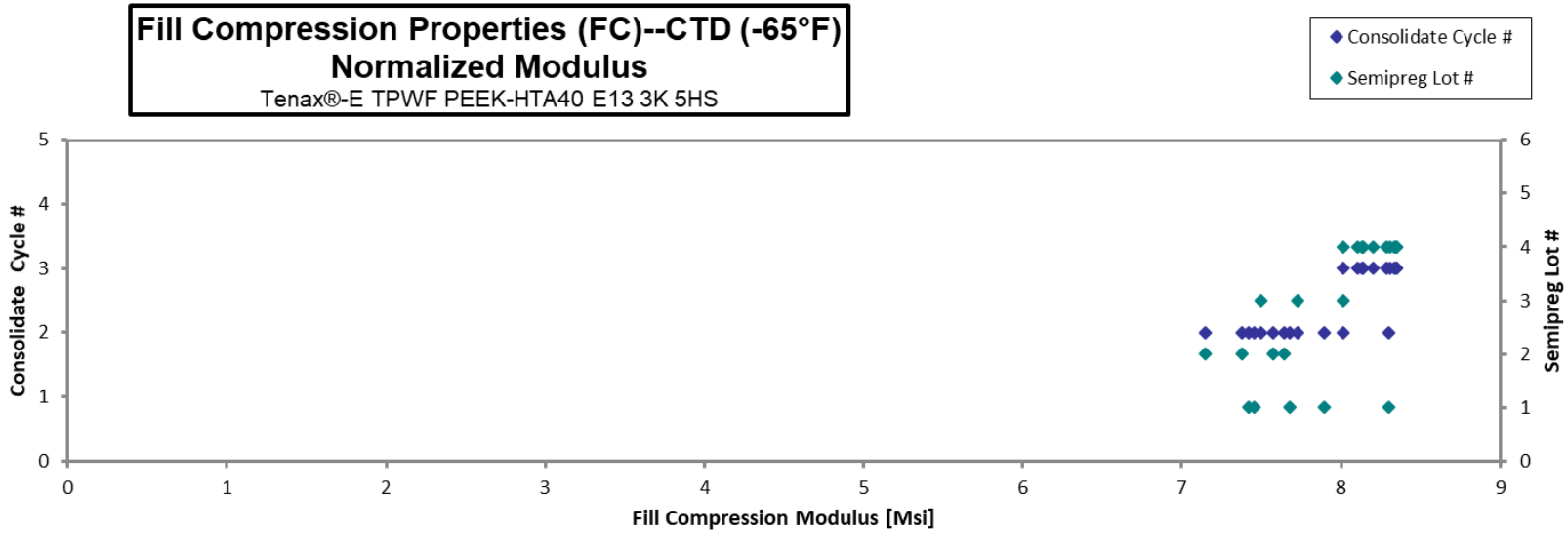
* Bad failure mode strength data were removed.

[1]Modulus data was not recorded.

[R] Retested specimen at NIAR

Average	**113.7**	**8.007**	**$Average_{norm}$**	**0.01210**	**112.1**	**7.906**
Standard Dev.	**5.911**	**0.4141**	**$Standard\ Dev._{norm}$**		**5.785**	**0.3785**
Coeff. of Var. [%]	**5.196**	**5.171**	**$Coeff.\ of\ Var.\ [\%]_{norm}$**		**5.162**	**4.788**
Min.	**103.0**	**7.100**	**Min.**	**0.01195**	**101.27**	**7.148**
Max.	**125.7**	**8.496**	**Max.**	**0.01234**	**123.4**	**8.351**
Number of Spec.	**22**	**22**	**Number of Spec.**	**25**	**22**	**22**


Fill Compression Properties (FC)--CTD (-65°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Fill Compression Strength [ksi]
0
20
40
60
80
100
120
140
0
1
2
3
4
5
6


Fill Compression Properties (FC)--CTD (-65°F)
Normalized Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Fill Compression Modulus [Msi]
0
1
2
3
4
5
6
7
8
9
0
1
2
3
4
5
6

Fill Compression Properties (FC)--RTD (70°F)
Strength & Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

normalizing t_{ply} [in]: 0.01226

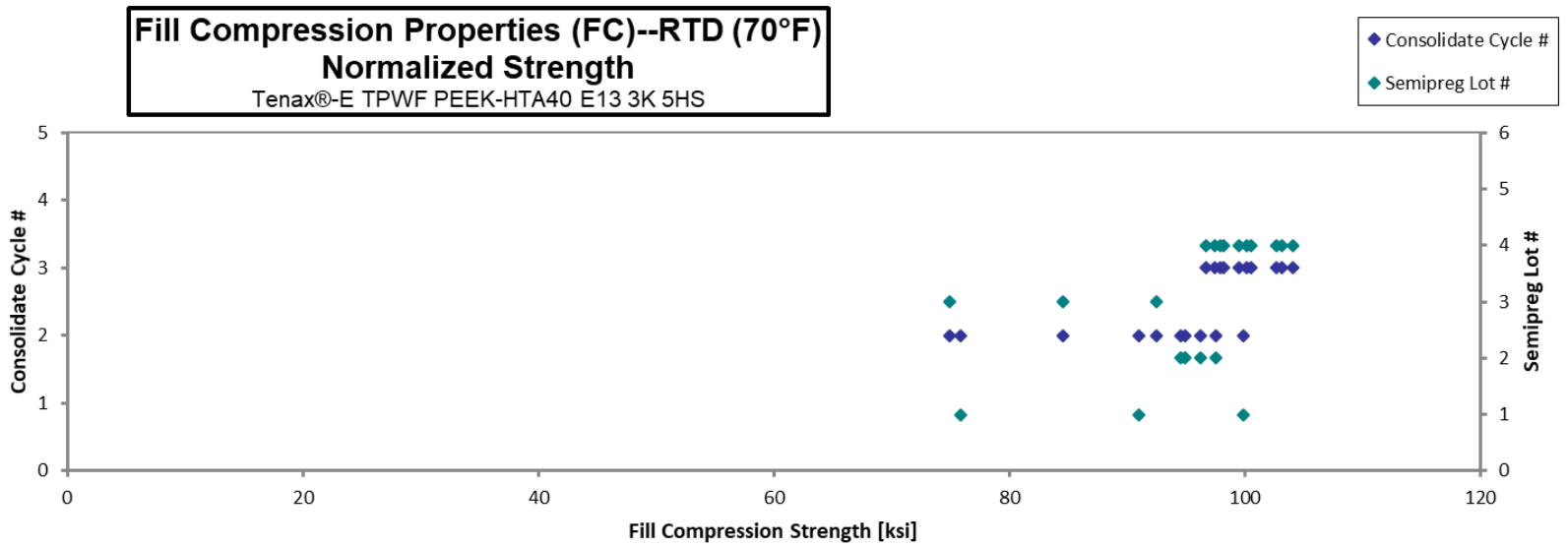
Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	*Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
NTP4013Q1-TTX-T40-E-FC-D-M3-RTD-1	4	3	104.0	8.009	0.1216	10	BAB	0.01216	103.2	7.943
NTP4013Q1-TTX-T40-E-FC-D-M3-RTD-2*	4	3		8.158	0.1216	10	HIT	0.01216		8.094
NTP4013Q1-TTX-T40-E-FC-D-M3-RTD-3	4	3	103.1	8.173	0.1221	10	BAT, HIT	0.01221	102.7	8.141
NTP4013Q1-TTX-T40-E-FC-D-M3-RTD-4	4	3	100.9	8.264	0.1221	10	BAT, HAT	0.01221	100.5	8.232
NTP4013Q1-TTX-T40-E-FC-D-M3-RTD-5	4	3	98.46	8.23	0.1223	10	BAB, HIB	0.01223	98.23	8.212
NTP4013Q1-TTX-T40-E-FC-D-M3-RTD-6	4	3	98.0	8.144	0.1225	10	BAB, HIB	0.01225	97.96	8.140
NTP4013Q1-TTX-T40-E-FC-D-M3-RTD-7	4	3	99.6	8.268	0.1225	10	BAB, HIB	0.01225	99.51	8.264
NTP4013Q1-TTX-T40-E-FC-D-M3-RTD-8	4	3	97.6	8.206	0.1224	10	BAB, HIB	0.01224	97.44	8.190
NTP4013Q1-TTX-T40-E-FC-D-M3-RTD-9	4	3	104.0	8.122	0.1227	10	HAT, HIT	0.01227	104.1	8.129
NTP4013Q1-TTX-T40-E-FC-D-M3-RTD-10	4	3	99.7	7.942	0.1232	10	BAB, HAB	0.01232	100.2	7.980
NTP4013Q1-TTX-T40-E-FC-D-M3-RTD-11[1]	4	3	96.6		0.1228	10	BAB, HIB	0.01228	96.71	
NTP4013Q1-TTX-T40-E-FC-A-M2-RTD-25	1	2	91.84	8.638	0.1215	10	BGM	0.01215	91.01	8.560
NTP4013Q1-TTX-T40-E-FC-A-M2-RTD-26	1	2	76.74	8.688	0.1213	10	BGM	0.01213	75.90	8.593
NTP4013Q1-TTX-T40-E-FC-A-M2-RTD-27*	1	2		8.313	0.1212	10	CIT	0.01212		8.216
NTP4013Q1-TTX-T40-E-FC-A-M2-RTD-28	1	2	101.0	8.419	0.1212	10	BGM	0.01212	99.86	8.325
NTP4013Q1-TTX-T40-E-FC-B-M2-RTD-25*	2	2		7.316	0.1236	10	CIB	0.01236		7.379
NTP4013Q1-TTX-T40-E-FC-B-M2-RTD-26	2	2	94.17	7.505	0.1236	10	TAB	0.01236	94.97	7.568
NTP4013Q1-TTX-T40-E-FC-B-M2-RTD-27*	2	2		7.507	0.1235	10	CIT	0.01235		7.563
NTP4013Q1-TTX-T40-E-FC-B-M2-RTD-28	2	2	93.72	7.658	0.1237	10	BGM	0.01237	94.56	7.727
[R]NTP4013Q1-TTX-T40-E-FC-B-M2-RTD-1	2	2	98.03	8.072	0.1203	10	HIT, BAT	0.01203	96.22	7.923
[R]NTP4013Q1-TTX-T40-E-FC-B-M2-RTD-2[1]	2	2	99.41		0.1204	10	BGM	0.01204	97.60	
NTP4013Q1-TTX-T40-E-FC-C-M2-RTD-25*	3	2		8.234	0.1205	10	CIT	0.01205		8.091
NTP4013Q1-TTX-T40-E-FC-C-M2-RTD-26*	3	2		8.348	0.1205	10	CIB	0.01205		8.204
NTP4013Q1-TTX-T40-E-FC-C-M2-RTD-27*	3	2		8.209	0.1202	10	CIT	0.01202		8.046
[R]NTP4013Q1-TTX-T40-E-FC-C-M2-RTD-1	3	2	88.72	8.483	0.1169	10	BGM	0.01169	84.58	8.088
[R]NTP4013Q1-TTX-T40-E-FC-C-M2-RTD-2[1]	3	2	78.64		0.1169	10	BGM	0.01169	74.97	
[R]NTP4013Q1-TTX-T40-E-FC-C-M2-RTD-3[1]	3	2	96.16		0.1180	10	BAT, HIT	0.01180	92.55	

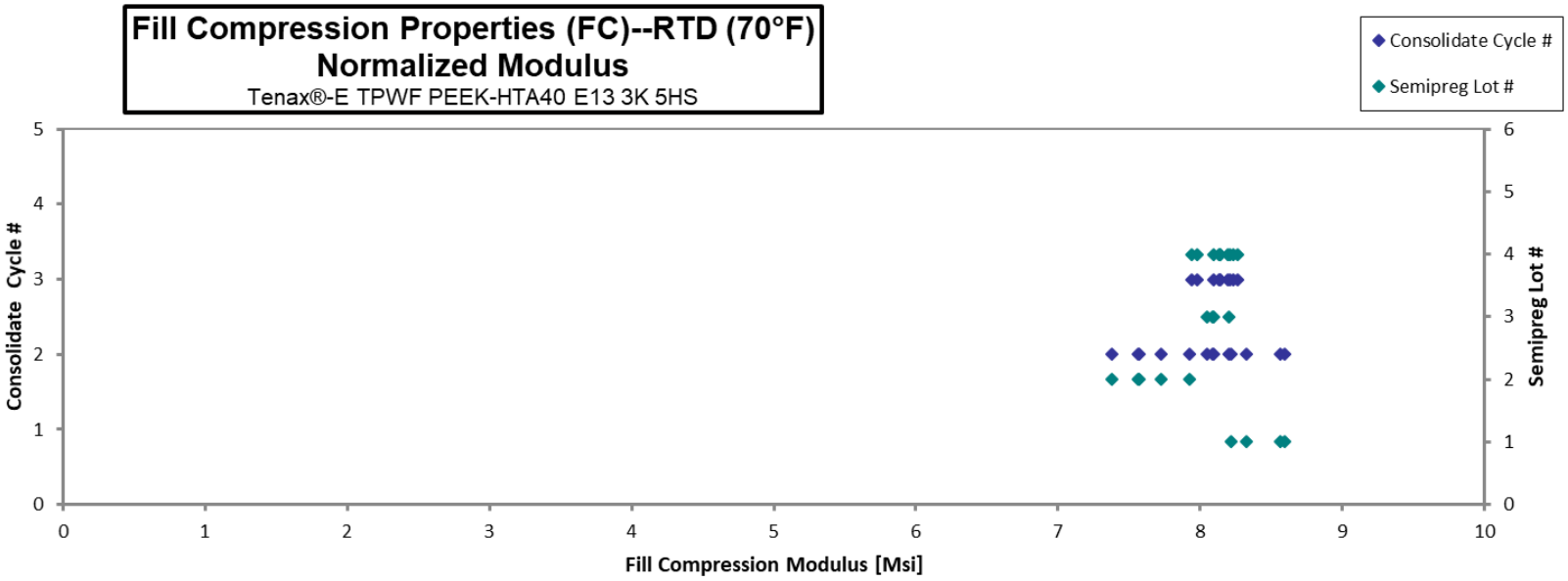
* Bad failure mode strength data were removed.

[1]Modulus data was not recorded.

[R] Retested specimen at NIAR

Average	**96.02**	**8.126**		**$Average_{norm}$**	**0.01214**	**95.13**	**8.070**
Standard Dev.	**7.377**	**0.3470**		**$Standard\ Dev._{norm}$**		**8.084**	**0.2925**
Coeff. of Var. [%]	**7.683**	**4.270**		**Coeff. of Var. $[\%]_{norm}$**		**8.497**	**3.625**
Min.	**76.74**	**7.316**		**Min.**	**0.01169**	**74.97**	**7.379**
Max.	**104.0**	**8.688**		**Max.**	**0.01237**	**104.1**	**8.593**
Number of Spec.	**20**	**23**		**Number of Spec.**	**27**	**20**	**23**


Fill Compression Properties (FC)--RTD (70°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Fill Compression Strength [ksi]
0
20
40
60
80
100
120
0
1
2
3
4
5
6


Fill Compression Properties (FC)--RTD (70°F)
Normalized Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Fill Compression Modulus [Msi]
0
1
2
3
4
5
6
7
8
9
10
0
1
2
3
4
5
6

Fill Compression Properties (FC)--ETD (180°F)
Strength & Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

normalizing t_{ply} [in]: 0.01226

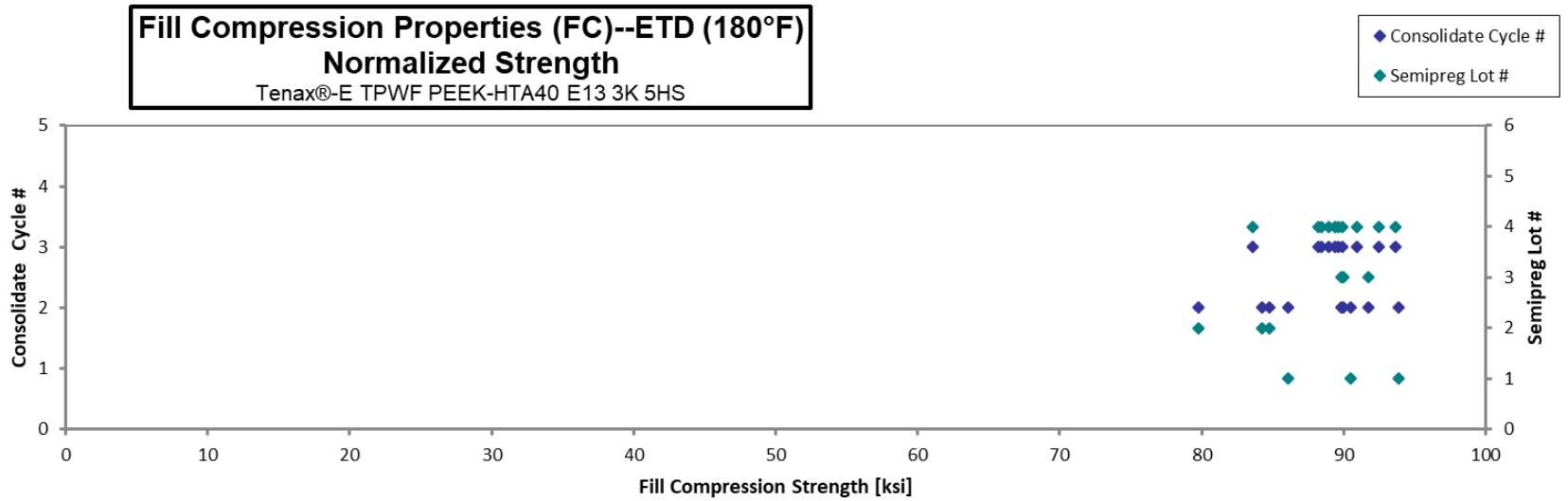
Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	*Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
NTP4013Q1-TTX-T40-E-FC-D-M3-ETD-1	4	3	92.33	8.188	0.1228	10	BAT	0.01228	92.49	8.203
NTP4013Q1-TTX-T40-E-FC-D-M3-ETD-2	4	3	93.44	8.120	0.1229	10	BAT	0.01229	93.67	8.140
NTP4013Q1-TTX-T40-E-FC-D-M3-ETD-3	4	3	90.60	8.131	0.1231	10	M(B,H)AT	0.01231	90.97	8.165
NTP4013Q1-TTX-T40-E-FC-D-M3-ETD-4	4	3	89.84	8.056	0.1227	10	BGM	0.01227	89.93	8.065
NTP4013Q1-TTX-T40-E-FC-D-M3-ETD-5	4	3	88.82	8.075	0.1228	10	M(B,H)AT	0.01228	88.98	8.089
NTP4013Q1-TTX-T40-E-FC-D-M3-ETD-6	4	3	88.05	8.192	0.1229	10	BAB	0.01229	88.23	8.208
NTP4013Q1-TTX-T40-E-FC-D-M3-ETD-7	4	3	89.18	8.141	0.1229	10	M(B,H)AT	0.01229	89.37	8.159
NTP4013Q1-TTX-T40-E-FC-D-M3-ETD-8	4	3	89.82	8.284	0.1223	10	HAT, HIT	0.01223	89.61	8.263
NTP4013Q1-TTX-T40-E-FC-D-M3-ETD-9	4	3	88.62	8.235	0.1224	10	BGM	0.01224	88.45	8.219
NTP4013Q1-TTX-T40-E-FC-D-M3-ETD-10	4	3	83.58	8.091	0.1226	10	BGM	0.01226	83.58	8.09
NTP4013Q1-TTX-T40-E-FC-A-M2-ETD-29	1	2	87.08	8.580	0.1212	10	BGM	0.01212	86.08	8.481
NTP4013Q1-TTX-T40-E-FC-A-M2-ETD-30*	1	2		8.613	0.1216	10	CIT	0.01216		8.543
NTP4013Q1-TTX-T40-E-FC-A-M2-ETD-31*	1	2		8.287	0.1220	10	CIT	0.01220		8.243
NTP4013Q1-TTX-T40-E-FC-A-M2-ETD-32	1	2	91.07	7.679	0.1219	10	BGM	0.01219	90.53	7.633
[R]NTP4013Q1-TTX-T40-E-FC-A-M1-ETD-1	1	2	92.94	7.973	0.1238	10	HAT, HIT	0.01238	93.85	8.051
NTP4013Q1-TTX-T40-E-FC-B-M2-ETD-29*	2	2		7.713	0.1231	10	CIB	0.01231		7.744
NTP4013Q1-TTX-T40-E-FC-B-M2-ETD-30*	2	2		7.838	0.1235	10	CIT	0.01235		7.897
NTP4013Q1-TTX-T40-E-FC-B-M2-ETD-31*	2	2		7.960	0.1237	10	CIT	0.01237		8.029
NTP4013Q1-TTX-T40-E-FC-B-M2-ETD-32	2	2	79.33	8.042	0.1233	10	BGM	0.01233	79.80	8.091
[R]NTP4013Q1-TTX-T40-E-FC-B-M2-ETD-1	2	2	85.27	7.891	0.1218	10	BGM	0.01218	84.74	7.841
[R]NTP4013Q1-TTX-T40-E-FC-B-M2-ETD-2[1]	2	2	84.56		0.1222	10	BAB, HIB	0.01222	84.27	
NTP4013Q1-TTX-T40-E-FC-C-M2-ETD-29*	3	2		8.712	0.1203	10	CIT	0.01203		8.549
NTP4013Q1-TTX-T40-E-FC-C-M2-ETD-30	3	2	91.68	8.744	0.1201	10	BGM	0.01201	89.83	8.568
NTP4013Q1-TTX-T40-E-FC-C-M2-ETD-31	3	2	93.79	8.254	0.1199	10	BGM	0.01199	91.76	8.075
[R]NTP4013Q1-TTX-T40-E-FC-C-M2-ETD-1	3	2	92.99	8.071	0.1186	10	BGM	0.01186	89.96	7.807

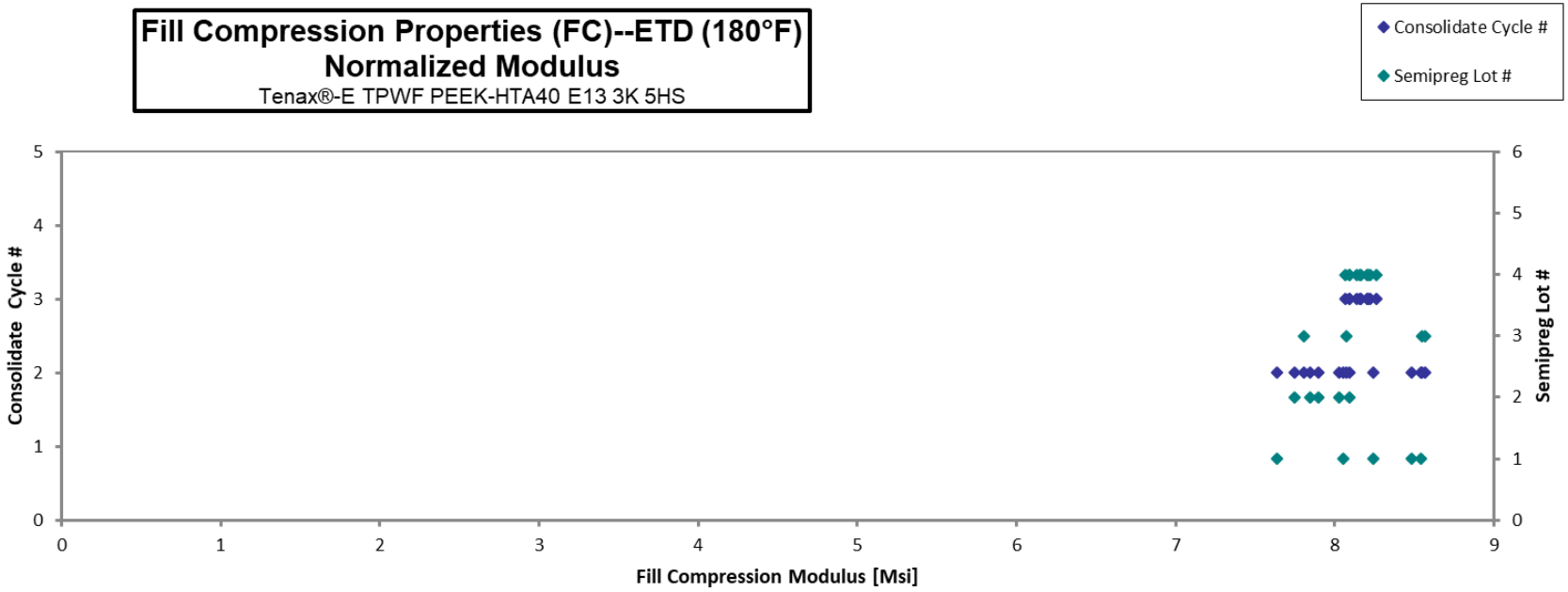
* Bad failure mode strength data were removed.

[1]Modulus data was not recorded.

[R] Retested specimen at NIAR

Average	**89.10**	**8.161**		**$Average_{norm}$**	**0.01222**	**88.74**	**8.132**
Standard Dev.	**3.813**	**0.2801**		**$Standard\ Dev._{norm}$**		**3.628**	**0.2449**
Coeff. of Var. [%]	**4.279**	**3.433**		**Coeff. of Var. $[\%]_{norm}$**		**4.088**	**3.012**
Min.	**79.33**	**7.679**		**Min.**	**0.01186**	**79.80**	**7.633**
Max.	**93.79**	**8.744**		**Max.**	**0.01238**	**93.85**	**8.568**
Number of Spec.	**19**	**24**		**Number of Spec.**	**25**	**19**	**24**


Fill Compression Properties (FC)--ETD (180°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Fill Compression Strength [ksi]
0
10
20
30
40
50
60
70
80
90
100
0
1
2
3
4
5
6


Fill Compression Properties (FC)--ETD (180°F)
Normalized Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Fill Compression Modulus [Msi]
0
1
2
3
4
5
6
7
8
9
0
1
2
3
4
5
6

Fill Compression Properties (FC)--ETW (180°F)
Strength & Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

normalizing t_{ply} [in]: 0.01226

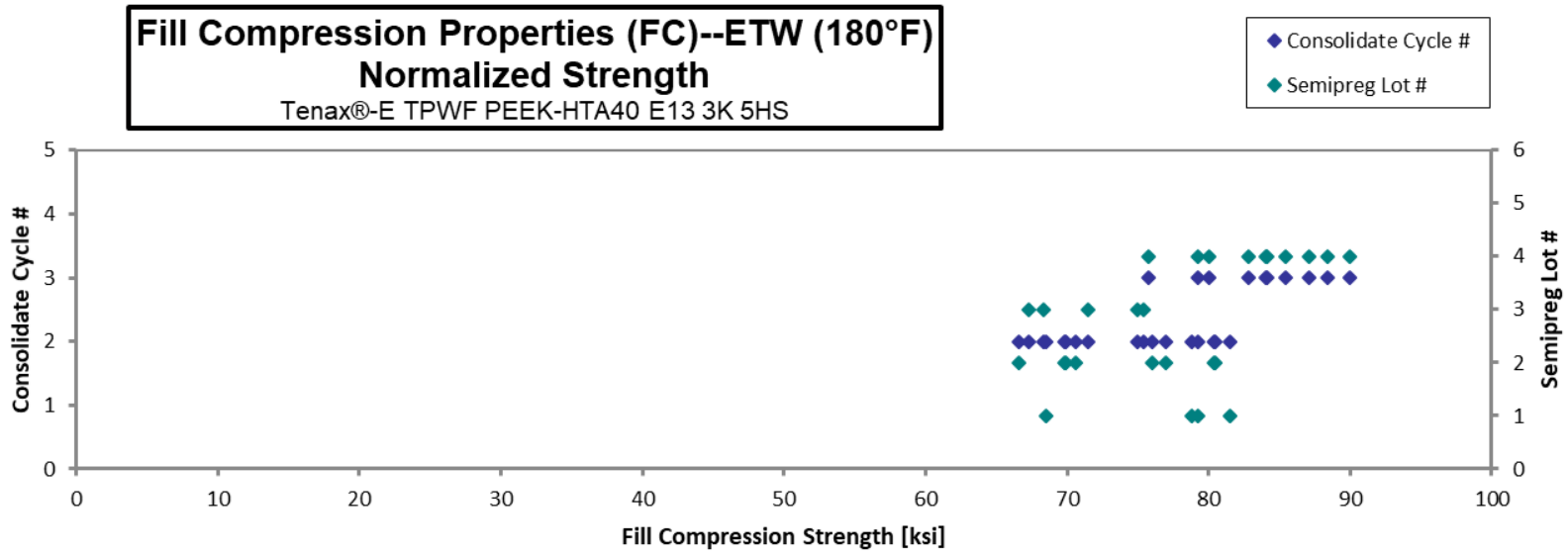
Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	*Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
NTP4013Q1-TTX-T40-E-FC-D-M3-ETW-1	4	3	84.37	8.298	0.1222	10	BGM, HAT	0.01222	84.07	8.269
NTP4013Q1-TTX-T40-E-FC-D-M3-ETW-2	4	3	90.68	8.199	0.1216	10	BAB	0.01216	89.96	8.133
NTP4013Q1-TTX-T40-E-FC-D-M3-ETW-3	4	3	85.96	8.214	0.1218	10	HAT	0.01218	85.40	8.161
NTP4013Q1-TTX-T40-E-FC-D-M3-ETW-4	4	3	89.04	8.196	0.1217	10	BAB	0.01217	88.40	8.137
NTP4013Q1-TTX-T40-E-FC-D-M3-ETW-5	4	3	81.24	8.033	0.1250	10	BGM	0.01250	82.83	8.190
NTP4013Q1-TTX-T40-E-FC-D-M3-ETW-6	4	3	74.31	8.056	0.1251	10	BAT	0.01251	75.80	8.217
NTP4013Q1-TTX-T40-E-FC-D-M3-ETW-7	4	3	82.82	8.019	0.1245	10	BAT	0.01245	84.13	8.145
NTP4013Q1-TTX-T40-E-FC-D-M3-ETW-8	4	3	78.73	8.028	0.1247	10	M(B,H)GM	0.01247	80.04	8.162
NTP4013Q1-TTX-T40-E-FC-D-M3-ETW-9	4	3	78.04	8.041	0.1245	10	BAT	0.01245	79.23	8.165
NTP4013Q1-TTX-T40-E-FC-D-M3-ETW-10	4	3	85.73	8.154	0.1246	10	BAT	0.01246	87.11	8.285
NTP4013Q1-TTX-T40-E-FC-A-M2-ETW-33	1	2	79.96	8.612	0.1215	10	BGM	0.01215	79.27	8.539
NTP4013Q1-TTX-T40-E-FC-A-M2-ETW-34*	1	2		8.491	0.1216	10	CIT	0.01216		8.423
NTP4013Q1-TTX-T40-E-FC-A-M2-ETW-35*	1	2		8.504	0.1217	10	CIT	0.01217		8.442
NTP4013Q1-TTX-T40-E-FC-A-M2-ETW-36	1	2	69.16	7.809	0.1215	10	BGM	0.01215	68.53	7.738
NTP4013Q1-TTX-T40-E-FC-A-M2-ETW-37	1	2	79.26	8.813	0.1219	10	BGM	0.01219	78.81	8.762
NTP4013Q1-TTX-T40-E-FC-A-M2-ETW-38*	1	2		8.272	0.1218	10	CIT	0.01218		8.217
NTP4013Q1-TTX-T40-E-FC-A-M2-ETW-39*	1	2		9.162	0.1215	10	CIT	0.01215		9.080
NTP4013Q1-TTX-T40-E-FC-A-M2-ETW-40	1	2	82.04	8.635	0.1218	10	BGM	0.01218	81.49	8.577
NTP4013Q1-TTX-T40-E-FC-B-M2-ETW-33	2	2	79.96	8.422	0.1232	10	TAT	0.01232	80.38	8.467
NTP4013Q1-TTX-T40-E-FC-B-M2-ETW-34	2	2	69.13	8.451	0.1240	10	BGM	0.01240	69.90	8.545
NTP4013Q1-TTX-T40-E-FC-B-M2-ETW-35	2	2	79.24	8.543	0.1244	10	TAT	0.01244	80.44	8.672
NTP4013Q1-TTX-T40-E-FC-B-M2-ETW-36	2	2	75.17	8.148	0.1240	10	BGM	0.01240	76.04	8.243
NTP4013Q1-TTX-T40-E-FC-B-M2-ETW-37	2	2	76.35	7.870	0.1237	10	BGM	0.01237	77.02	7.939
NTP4013Q1-TTX-T40-E-FC-B-M2-ETW-38	2	2	66.06	7.759	0.1237	10	BGM	0.01237	66.64	7.827
NTP4013Q1-TTX-T40-E-FC-B-M2-ETW-39	2	2	69.64	7.350	0.1243	10	BGM	0.01243	70.58	7.450
NTP4013Q1-TTX-T40-E-FC-B-M2-ETW-40	2	2	68.88	8.075	0.1243	10	BGM	0.01243	69.84	8.187
NTP4013Q1-TTX-T40-E-FC-C-M2-ETW-33*	3	2		8.537	0.1201	10	CIT	0.01201		8.365
NTP4013Q1-TTX-T40-E-FC-C-M2-ETW-34	3	2	68.56	8.055	0.1204	10	BGM	0.01204	67.30	7.907
NTP4013Q1-TTX-T40-E-FC-C-M2-ETW-35	3	2	72.80	8.311	0.1204	10	BGM	0.01204	71.49	8.161
NTP4013Q1-TTX-T40-E-FC-C-M2-ETW-36	3	2	76.65	8.480	0.1199	10	BGM	0.01199	74.99	8.296
NTP4013Q1-TTX-T40-E-FC-C-M2-ETW-37*	3	2		8.357	0.1202	10	CAT	0.01202		8.192
NTP4013Q1-TTX-T40-E-FC-C-M2-ETW-38	3	2	76.86	8.572	0.1203	10	BGM	0.01203	75.44	8.414
NTP4013Q1-TTX-T40-E-FC-C-M2-ETW-39*	3	2		8.025	0.1207	10	CIT	0.01207		7.903
NTP4013Q1-TTX-T40-E-FC-C-M2-ETW-40	3	2	69.64	8.100	0.1204	10	BGM	0.01204	68.36	7.951

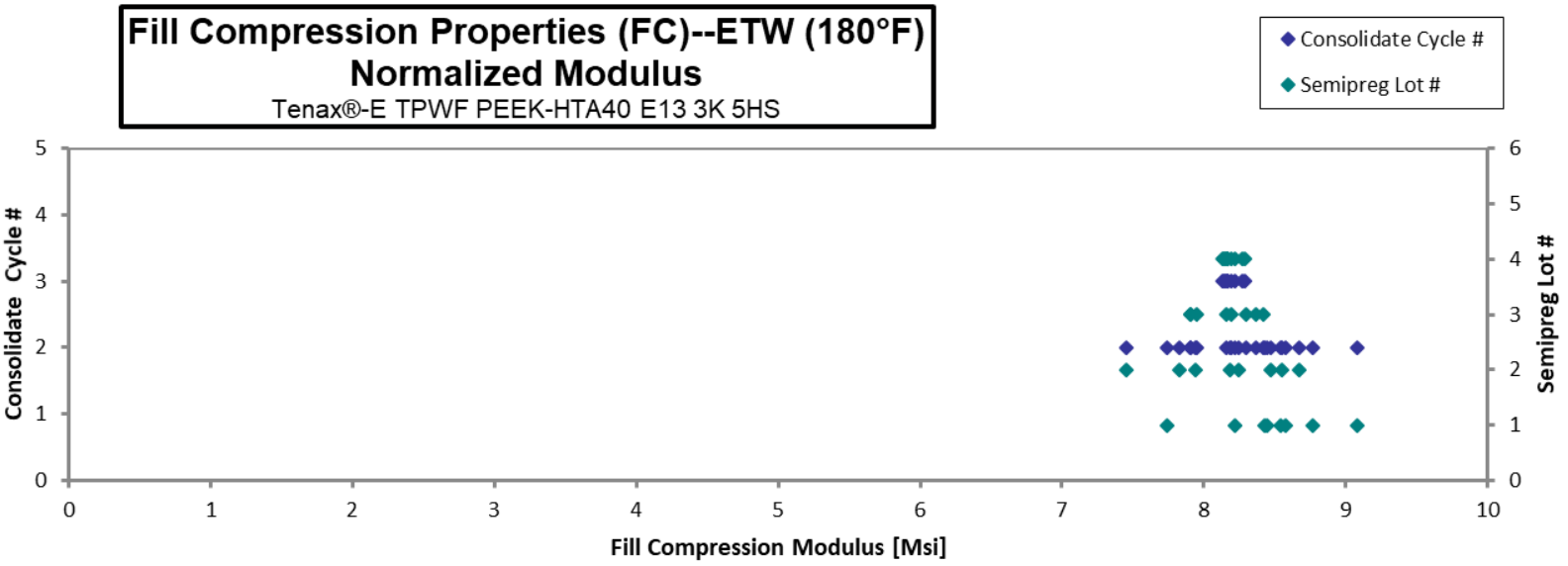
* Bad failure mode strength data were removed.

[1]Modulus data was not recorded.

[R] Retested specimen at NIAR

	Strength [ksi]	Modulus [Msi]		$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
Average	**77.42**	**8.253**	**$Average_{norm}$**	**0.01224**	**77.54**	**8.240**
Standard Dev.	**6.693**	**0.3372**	**$Standard\ Dev._{norm}$**		**6.775**	**0.3088**
Coeff. of Var. [%]	**8.646**	**4.086**	**Coeff. of Var. $[\%]_{norm}$**		**8.738**	**3.748**
Min.	**66.06**	**7.350**	**Min.**	**0.01199**	**66.64**	**7.450**
Max.	**90.68**	**9.162**	**Max.**	**0.01251**	**89.96**	**9.080**
Number of Spec.	**27**	**34**	**Number of Spec.**	**34**	**27**	**34**

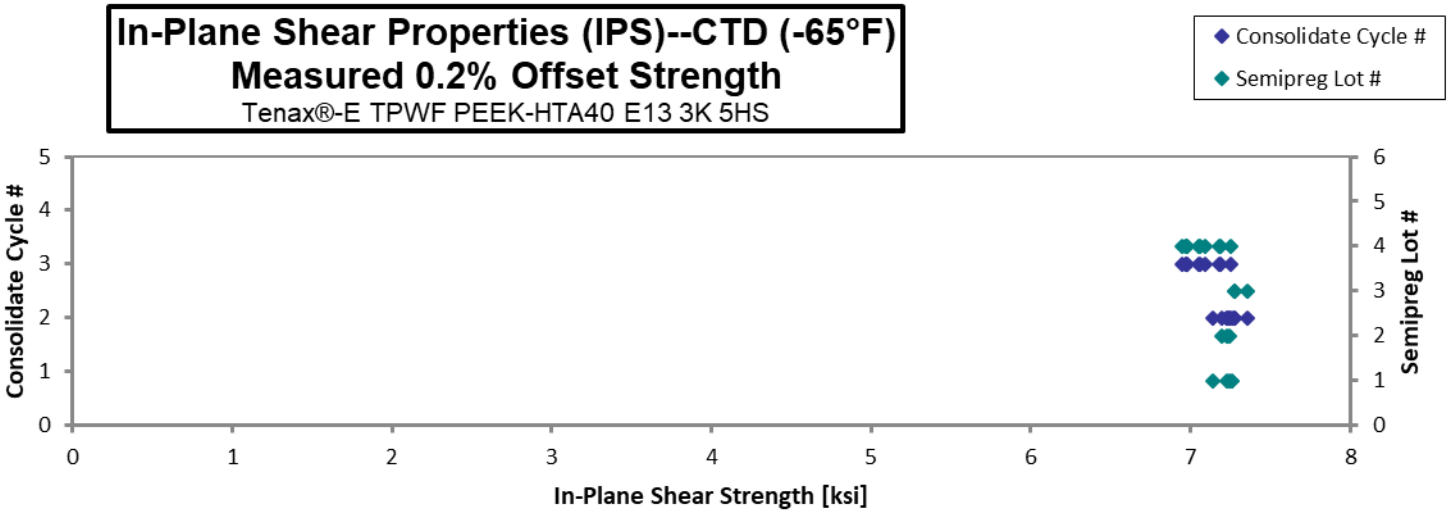

Fill Compression Properties (FC)--ETW (180°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Fill Compression Strength [ksi]
0
10
20
30
40
50
60
70
80
90
100
0
1
2
3
4
5
6

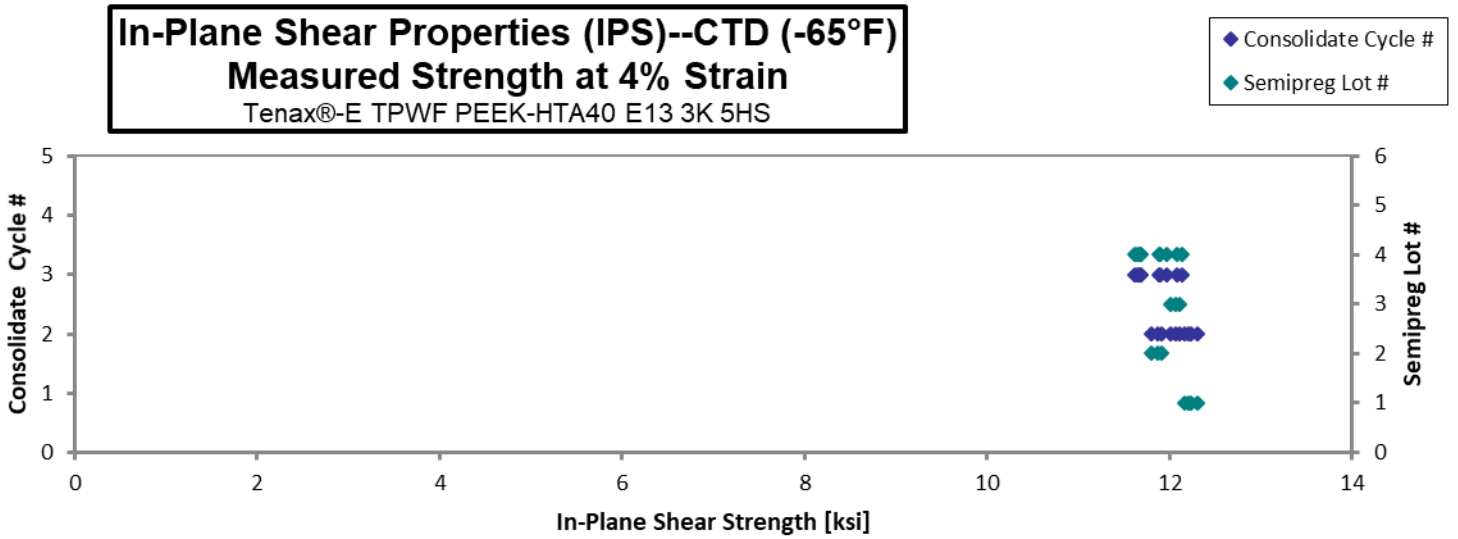

Fill Compression Properties (FC)--ETW (180°F)
Normalized Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Fill Compression Modulus [Msi]
0
1
2
3
4
5
6
7
8
9
10
0
1
2
3
4
5
6

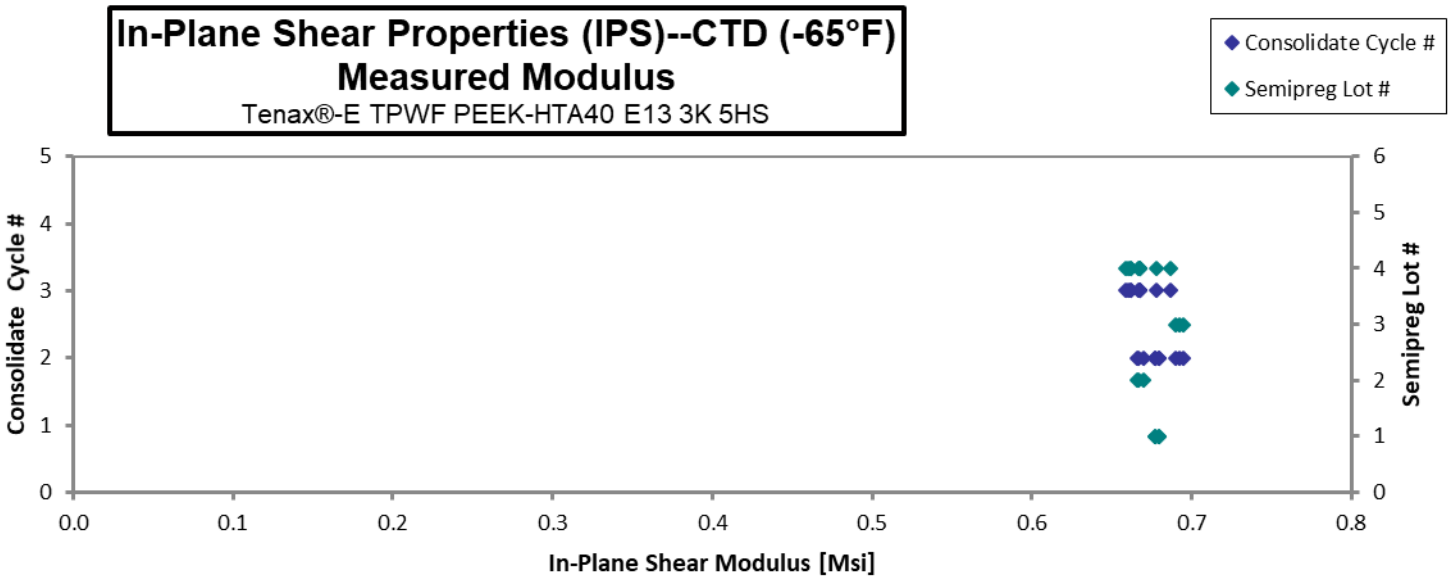
4.5 In-Plane Shear Properties (IPS)

In-Plane Shear Properties (IPS)--CTD (-65°F)
Strength & Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

Specimen Number	Semipreg Lot #	Consolidate Cycle #	0.2% Offset Strength [ksi]	Strength at 4% Strain [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]
NTP4013Q1-TTX-T40-E-IPS-D-M3-CTD-1	4	3	7.252	12.14	0.6872	0.09478	8	0.01185
NTP4013Q1-TTX-T40-E-IPS-D-M3-CTD-2	4	3	7.188	12.07	0.6779	0.09570	8	0.01196
NTP4013Q1-TTX-T40-E-IPS-D-M3-CTD-3	4	3	7.050	11.97	0.6674	0.09693	8	0.01212
NTP4013Q1-TTX-T40-E-IPS-D-M3-CTD-4	4	3	7.057	11.90	0.6676	0.09695	8	0.01212
NTP4013Q1-TTX-T40-E-IPS-D-M3-CTD-5	4	3	7.095	11.88	0.6620	0.09728	8	0.01216
NTP4013Q1-TTX-T40-E-IPS-D-M3-CTD-6	4	3	6.946	11.68	0.6585	0.09735	8	0.01217
NTP4013Q1-TTX-T40-E-IPS-D-M3-CTD-7	4	3	6.981	11.69	0.6608	0.09733	8	0.01217
NTP4013Q1-TTX-T40-E-IPS-D-M3-CTD-8	4	3	6.975	11.65	0.6671	0.09722	8	0.01215
NTP4013Q1-TTX-T40-E-IPS-D-M3-CTD-9	4	3	7.183	11.67	0.6672	0.09670	8	0.01209
NTP4013Q1-TTX-T40-E-IPS-D-M3-CTD-10	4	3	6.968	11.62	0.6618	0.09655	8	0.01207
NTP4013Q1-TTX-T40-E-IPS-A-M2-CTD-1	1	2	7.141	12.16	0.6794	0.09669	8	0.01209
NTP4013Q1-TTX-T40-E-IPS-A-M2-CTD-2	1	2	7.246	12.21	0.6794	0.09718	8	0.01215
NTP4013Q1-TTX-T40-E-IPS-A-M2-CTD-3	1	2	7.232	12.23	0.6772	0.09735	8	0.01217
NTP4013Q1-TTX-T40-E-IPS-A-M2-CTD-4	1	2	7.259	12.30	0.6773	0.09740	8	0.01218
NTP4013Q1-TTX-T40-E-IPS-B-M2-CTD-2	2	2	7.197	11.80	0.6670	0.09845	8	0.01231
NTP4013Q1-TTX-T40-E-IPS-B-M2-CTD-3	2	2	7.246	11.91	0.6657	0.09848	8	0.01231
NTP4013Q1-TTX-T40-E-IPS-B-M2-CTD-4	2	2	7.230	11.87	0.6699	0.09857	8	0.01232
NTP4013Q1-TTX-T40-E-IPS-C-M2-CTD-1	3	2	7.359	12.10	0.6921	0.09785	8	0.01223
NTP4013Q1-TTX-T40-E-IPS-C-M2-CTD-2	3	2	7.279	12.01	0.6900	0.09801	8	0.01225
NTP4013Q1-TTX-T40-E-IPS-C-M2-CTD-4	3	2	7.278	12.06	0.6951	0.09806	8	0.01226
Average			**7.158**	**11.95**	**0.6735**			**0.01216**
Standard Dev.			**0.1235**	**0.2132**	**0.01104**			
Coeff. of Var. [%]			**1.725**	**1.785**	**1.638**			
Min.			**6.946**	**11.62**	**0.6585**			**0.01185**
Max.			**7.359**	**12.30**	**0.6951**			**0.01232**
Number of Spec.			**20**	**20**	**20**			**20**

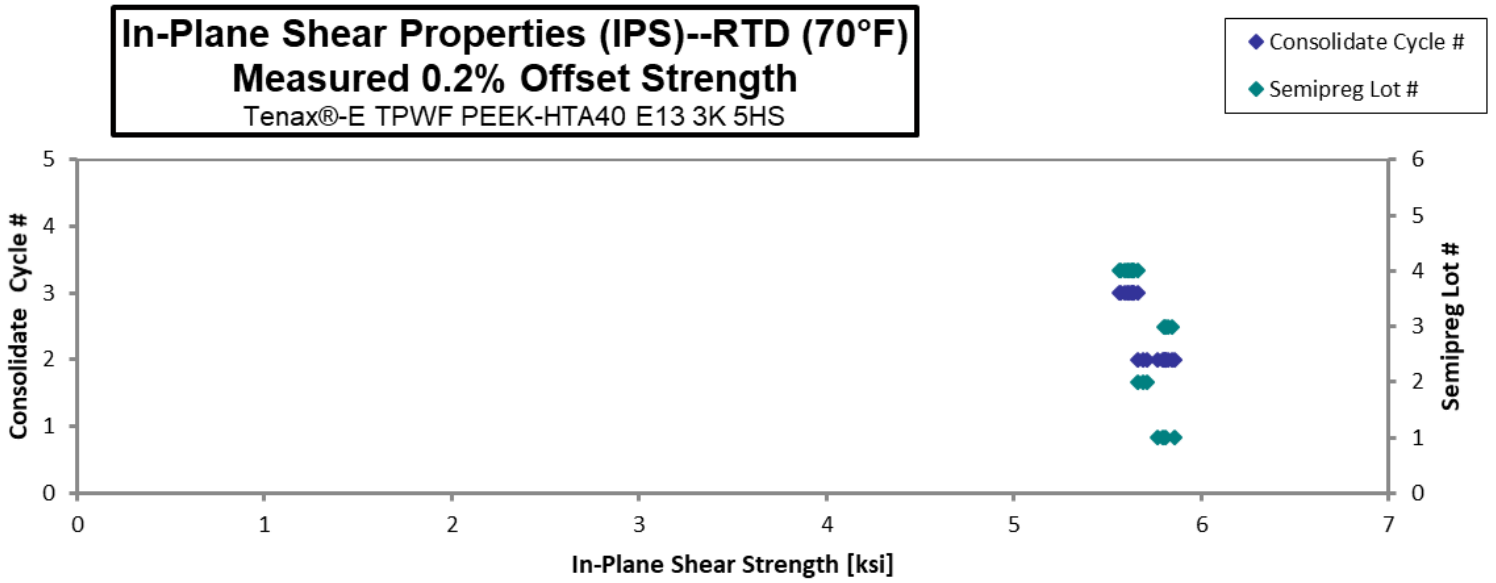

In-Plane Shear Properties (IPS)--CTD (-65°F)
Measured 0.2% Offset Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
In-Plane Shear Strength [ksi]

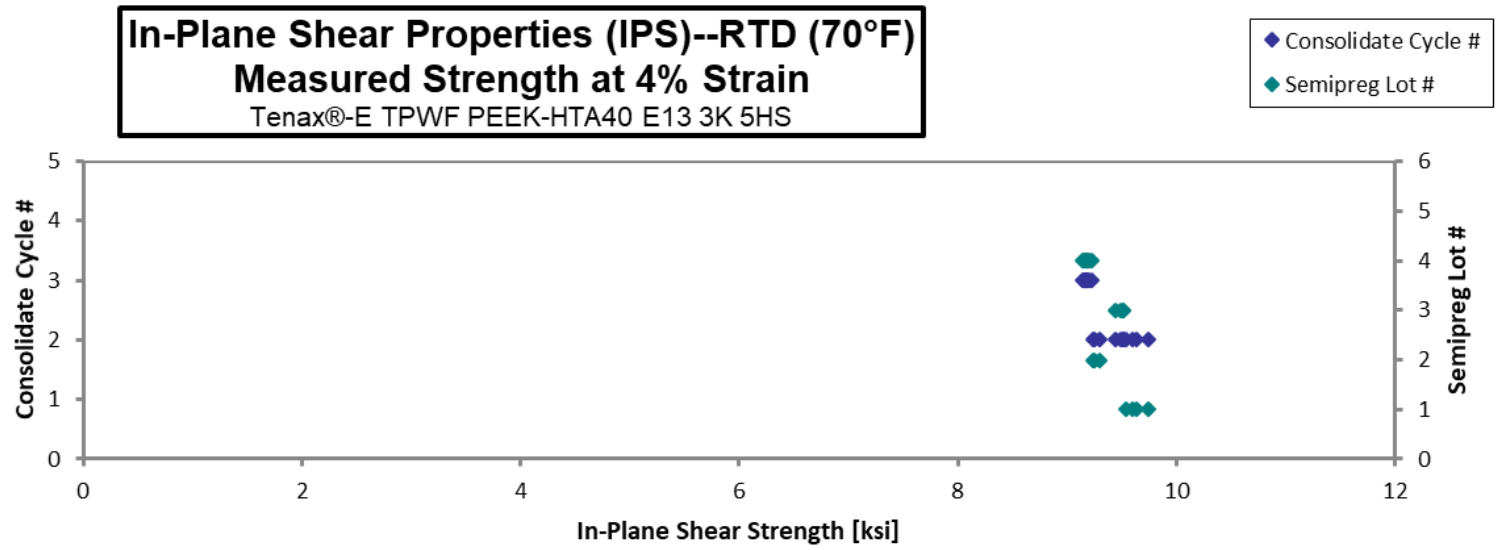

In-Plane Shear Properties (IPS)--CTD (-65°F)
Measured Strength at 4% Strain
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
In-Plane Shear Strength [ksi]

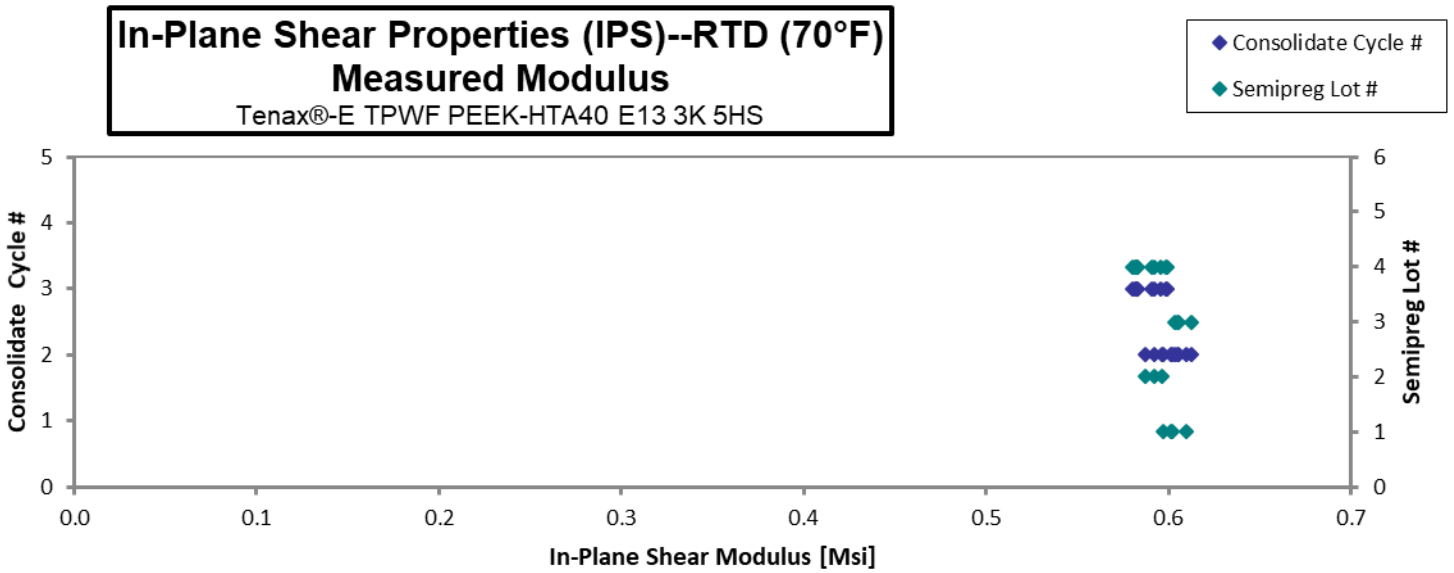

In-Plane Shear Properties (IPS)--CTD (-65°F)
Measured Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
In-Plane Shear Modulus [Msi]
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0
1
2
3
4
5
6

In-Plane Shear Properties (IPS)--RTD (70°F)
Strength & Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

Specimen Number	Semipreg Lot #	Consolidate Cycle #	0.2% Offset Strength [ksi]	Strength at 4% Strain [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]
NTP4013Q1-TTX-T40-E-IPS-D-M3-RTD-1	4	3	5.631	9.197	0.5952	0.09638	8	0.01205
NTP4013Q1-TTX-T40-E-IPS-D-M3-RTD-2	4	3	5.638	9.179	0.5993	0.09657	8	0.01207
NTP4013Q1-TTX-T40-E-IPS-D-M3-RTD-3	4	3	5.662	9.225	0.5986	0.09645	8	0.01206
NTP4013Q1-TTX-T40-E-IPS-D-M3-RTD-4	4	3	5.635	9.175	0.5922	0.09713	8	0.01214
NTP4013Q1-TTX-T40-E-IPS-D-M3-RTD-5	4	3	5.626	9.207	0.5904	0.09840	8	0.01230
NTP4013Q1-TTX-T40-E-IPS-D-M3-RTD-6	4	3	5.614	9.184	0.5821	0.09895	8	0.01237
NTP4013Q1-TTX-T40-E-IPS-D-M3-RTD-7	4	3	5.602	9.149	0.5828	0.09960	8	0.01245
NTP4013Q1-TTX-T40-E-IPS-D-M3-RTD-8	4	3	5.593	9.168	0.5812	0.09955	8	0.01244
NTP4013Q1-TTX-T40-E-IPS-D-M3-RTD-9	4	3	5.572	9.139	0.5823	0.09992	8	0.01249
NTP4013Q1-TTX-T40-E-IPS-D-M3-RTD-10	4	3	5.565	9.157	0.5801	0.09978	8	0.01247
NTP4013Q1-TTX-T40-E-IPS-A-M2-RTD-5	1	2	5.791	9.641	0.6012	0.09823	8	0.01228
NTP4013Q1-TTX-T40-E-IPS-A-M2-RTD-6	1	2	5.857	9.739	0.6095	0.09819	8	0.01227
NTP4013Q1-TTX-T40-E-IPS-A-M2-RTD-7	1	2	5.812	9.599	0.6019	0.09807	8	0.01226
NTP4013Q1-TTX-T40-E-IPS-A-M2-RTD-8	1	2	5.764	9.542	0.5967	0.09772	8	0.01221
NTP4013Q1-TTX-T40-E-IPS-B-M2-RTD-5	2	2	5.690	9.245	0.5923	0.09878	8	0.01235
NTP4013Q1-TTX-T40-E-IPS-B-M2-RTD-6	2	2	5.708	9.302	0.5961	0.09874	8	0.01234
NTP4013Q1-TTX-T40-E-IPS-B-M2-RTD-7	2	2	5.664	9.237	0.5870	0.09950	8	0.01244
NTP4013Q1-TTX-T40-E-IPS-C-M2-RTD-5	3	2	5.843	9.492	0.6125	0.09781	8	0.01223
NTP4013Q1-TTX-T40-E-IPS-C-M2-RTD-6	3	2	5.801	9.449	0.6048	0.09839	8	0.01230
NTP4013Q1-TTX-T40-E-IPS-C-M2-RTD-7	3	2	5.824	9.514	0.6057	0.09827	8	0.01228
NTP4013Q1-TTX-T40-E-IPS-C-M2-RTD-8	3	2	5.808	9.510	0.6032	0.09835	8	0.01229
		Average	**5.700**	**9.336**	**0.5950**			**0.01229**
		Standard Dev.	**0.09793**	**0.1926**	**0.00977**			
		Coeff. of Var. [%]	**1.718**	**2.063**	**1.641**			
		Min.	**5.565**	**9.139**	**0.5801**			**0.01205**
		Max.	**5.857**	**9.739**	**0.6125**			**0.01249**
		Number of Spec.	**21**	**21**	**21**			**21**


In-Plane Shear Properties (IPS)--RTD (70°F)
Measured 0.2% Offset Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
In-Plane Shear Strength [ksi]


In-Plane Shear Properties (IPS)--RTD (70°F)
Measured Strength at 4% Strain
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
In-Plane Shear Strength [ksi]

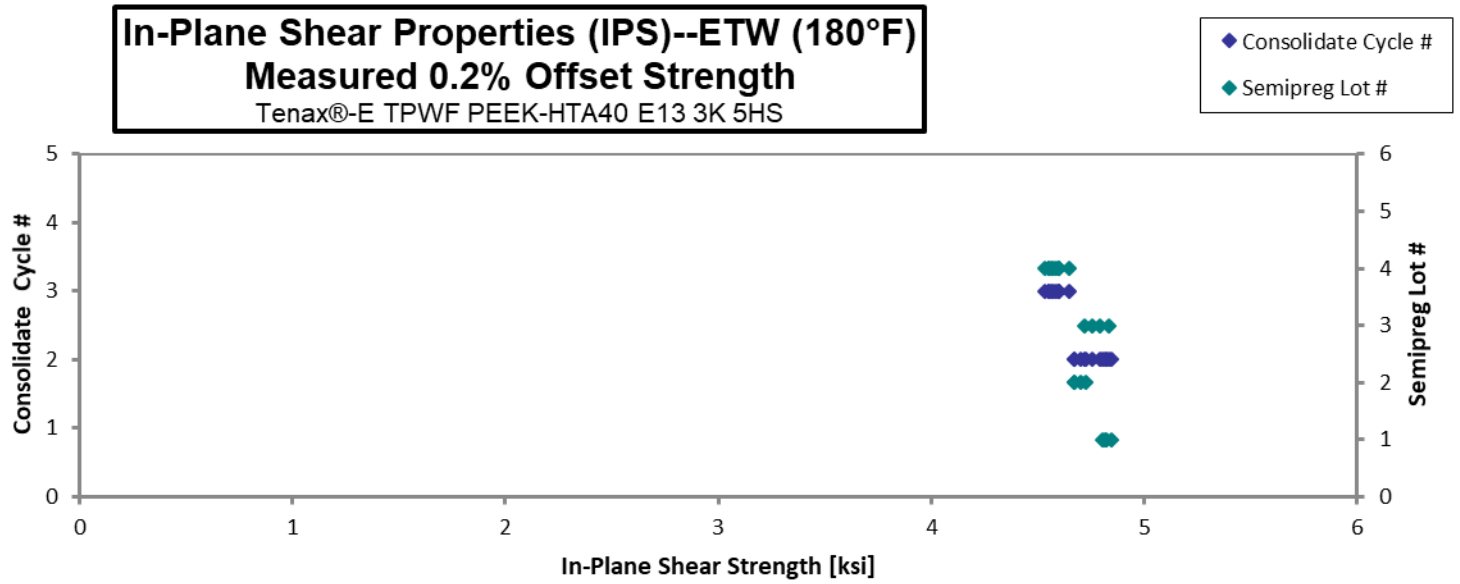

In-Plane Shear Properties (IPS)--RTD (70°F)
Measured Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
In-Plane Shear Modulus [Msi]
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0
1
2
3
4
5
6

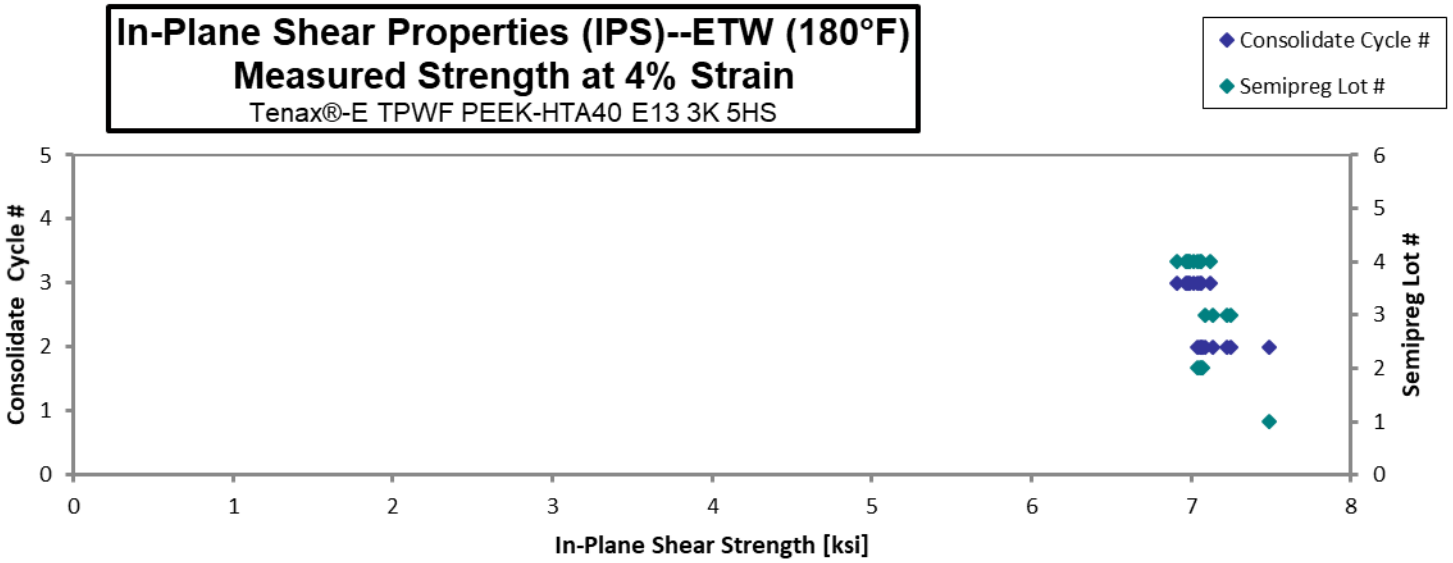
In-Plane Shear Properties (IPS)--ETW (180°F)
Strength & Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

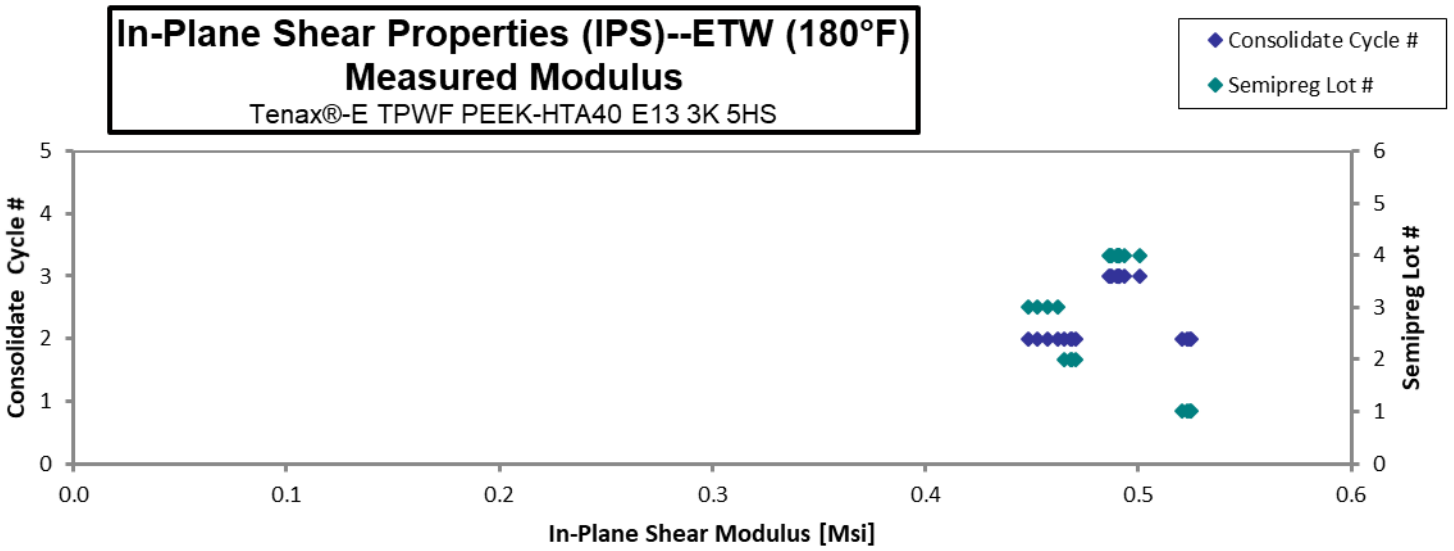
Specimen Number	Semipreg Lot #	Consolidate Cycle #	0.2% Offset Strength [ksi]	Strength at 4% Strain [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]
NTP4013Q1-TTX-T40-E-IPS-D-M3-ETW-1	4	3	4.596	7.065	0.5005	0.09837	8	0.01230
NTP4013Q1-TTX-T40-E-IPS-D-M3-ETW-2	4	3	4.571	6.978	0.4914	0.09913	8	0.01239
NTP4013Q1-TTX-T40-E-IPS-D-M3-ETW-3	4	3	4.601	7.036	0.4932	0.09942	8	0.01243
NTP4013Q1-TTX-T40-E-IPS-D-M3-ETW-4	4	3	4.602	7.052	0.4904	0.09988	8	0.01249
NTP4013Q1-TTX-T40-E-IPS-D-M3-ETW-5	4	3	4.551	6.962	0.4865	0.10010	8	0.01251
NTP4013Q1-TTX-T40-E-IPS-D-M3-ETW-6	4	3	4.549	7.015	0.4874	0.10003	8	0.01250
NTP4013Q1-TTX-T40-E-IPS-D-M3-ETW-7	4	3	4.584	6.988	0.4912	0.09878	8	0.01235
NTP4013Q1-TTX-T40-E-IPS-D-M3-ETW-8	4	3	4.647	7.117	0.4906	0.09950	8	0.01244
NTP4013Q1-TTX-T40-E-IPS-D-M3-ETW-9	4	3	4.534	6.910	0.4868	0.09892	8	0.01236
NTP4013Q1-TTX-T40-E-IPS-D-M3-ETW-10	4	3	4.562	6.973	0.4898	0.09840	8	0.01230
NTP4013Q1-TTX-T40-E-IPS-A-M2-ETW-9	1	2	4.803	7.488	0.5205	0.09757	8	0.01220
NTP4013Q1-TTX-T40-E-IPS-A-M2-ETW-10*	1	2	4.816		0.5242	0.09736	8	0.01217
NTP4013Q1-TTX-T40-E-IPS-A-M2-ETW-11*	1	2	4.848		0.5250	0.09707	8	0.01213
NTP4013Q1-TTX-T40-E-IPS-A-M2-ETW-12*	1	2	4.825		0.5233	0.09689	8	0.01211
NTP4013Q1-TTX-T40-E-IPS-B-M2-ETW-9	2	2	4.727	7.058	0.4651	0.09941	8	0.01243
NTP4013Q1-TTX-T40-E-IPS-B-M2-ETW-10	2	2	4.674	7.051	0.4688	0.09940	8	0.01242
NTP4013Q1-TTX-T40-E-IPS-B-M2-ETW-11	2	2	4.701	7.072	0.4704	0.09911	8	0.01239
NTP4013Q1-TTX-T40-E-IPS-B-M2-ETW-12	2	2	4.672	7.036	0.4680	0.09913	8	0.01239
NTP4013Q1-TTX-T40-E-IPS-C-M2-ETW-9	3	2	4.791	7.226	0.4620	0.09815	8	0.01227
NTP4013Q1-TTX-T40-E-IPS-C-M2-ETW-10	3	2	4.835	7.245	0.4572	0.09823	8	0.01228
NTP4013Q1-TTX-T40-E-IPS-C-M2-ETW-11	3	2	4.757	7.135	0.4528	0.09823	8	0.01228
NTP4013Q1-TTX-T40-E-IPS-C-M2-ETW-12	3	2	4.721	7.083	0.4482	0.09843	8	0.01230

* Strength at 4% strain not available

Average	**4.680**	**7.078**	**0.4861**		**0.01234**
Standard Dev.	**0.10700**	**0.1296**	**0.02306**		
Coeff. of Var. [%]	**2.286**	**1.831**	**4.744**		
Min.	**4.534**	**6.910**	**0.4482**		**0.01211**
Max.	**4.848**	**7.488**	**0.5250**		**0.01251**
Number of Spec.	**22**	**19**	**22**		**22**


In-Plane Shear Properties (IPS)--ETW (180°F)
Measured 0.2% Offset Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
In-Plane Shear Strength [ksi]


In-Plane Shear Properties (IPS)--ETW (180°F)
Measured Strength at 4% Strain
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
In-Plane Shear Strength [ksi]


In-Plane Shear Properties (IPS)--ETW (180°F)
Measured Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
In-Plane Shear Modulus [Msi]
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0
1
2
3
4
5
6

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

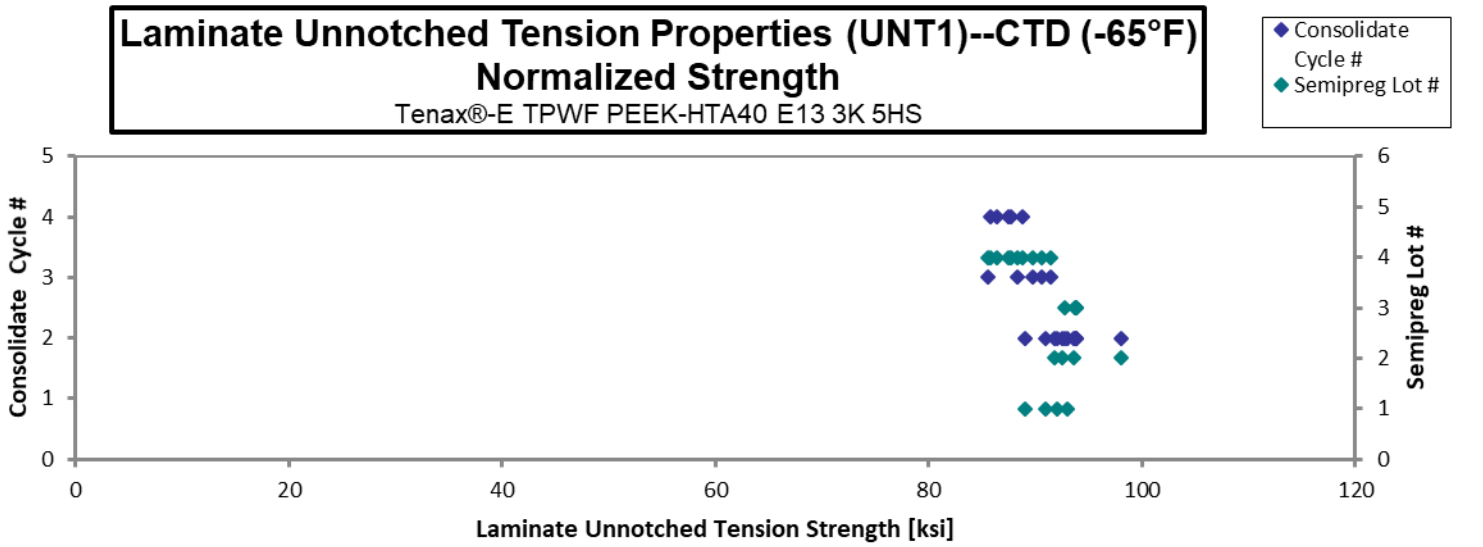
Laminate Unnotched Tension Properties (UNT1)--CTD (-65°F)
Strength & Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

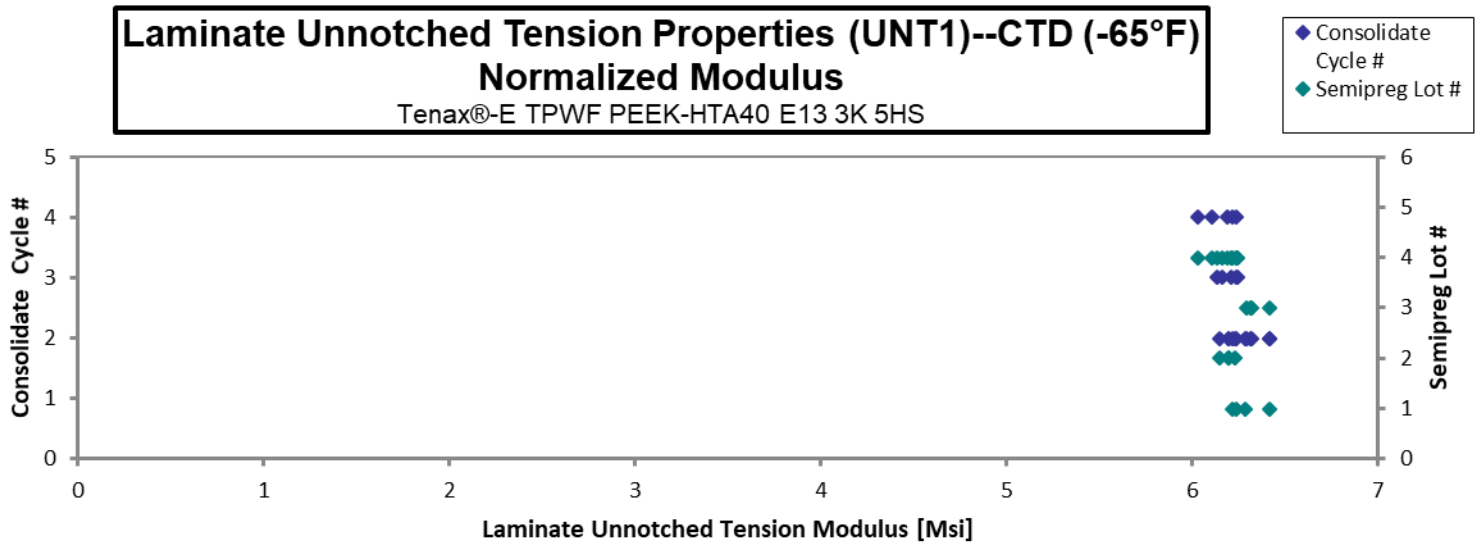
normalizing t_{ply} [in]: 0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
NTP4013Q1-TTX-T40-E-UNT1-D-M3-CTD-1	4	3	92.82	6.230	0.09657	8	LWT, LWB	0.01207	91.39	6.134
NTP4013Q1-TTX-T40-E-UNT1-D-M3-CTD-2	4	3	86.67	6.296	0.09675	8	M(A,L)WB	0.01209	85.49	6.210
NTP4013Q1-TTX-T40-E-UNT1-D-M3-CTD-3	4	3	89.26	6.315	0.09700	8	M(A,L)AB	0.01213	88.28	6.246
NTP4013Q1-TTX-T40-E-UNT1-D-M3-CTD-4	4	3	90.51	6.209	0.09728	8	M(A,L)WB	0.01216	89.78	6.159
NTP4013Q1-TTX-T40-E-UNT1-D-M3-CTD-5	4	3	90.79	6.248	0.09788	8	M(A,L)WT	0.01224	90.61	6.236
NTP4013Q1-TTX-T40-E-UNT1-D-M4-CTD-1	4	4	89.09	6.336	0.09653	8	M(A,L)AT	0.01207	87.69	6.236
NTP4013Q1-TTX-T40-E-UNT1-D-M4-CTD-2	4	4	86.44	6.149	0.09733	8	M(A,L)WB	0.01217	85.79	6.102
NTP4013Q1-TTX-T40-E-UNT1-D-M4-CTD-3	4	4	88.19	6.261	0.09732	8	M(A,L)AB, M(A,L)WT	0.01216	87.50	6.212
NTP4013Q1-TTX-T40-E-UNT1-D-M4-CTD-4	4	4	89.69	6.250	0.09715	8	M(A,L)GM	0.01214	88.84	6.191
NTP4013Q1-TTX-T40-E-UNT1-D-M4-CTD-5	4	4	86.72	6.057	0.09767	8	M(A,L)WT, M(A,L)AB	0.01221	86.36	6.031
NTP4013Q1-TTX-T40-E-UNT1-A-M2-CTD-1	1	2	91.55	6.208	0.09858	8	LGB	0.01232	92.02	6.239
NTP4013Q1-TTX-T40-E-UNT1-A-M2-CTD-2	1	2	88.61	6.391	0.09850	8	LGV	0.01231	88.99	6.418
NTP4013Q1-TTX-T40-E-UNT1-A-M2-CTD-3	1	2	91.01	6.292	0.09799	8	LGV	0.01225	90.93	6.287
NTP4013Q1-TTX-T40-E-UNT1-A-M2-CTD-4	1	2	93.22	6.232	0.09786	8	LVV	0.01223	93.01	6.218
NTP4013Q1-TTX-T40-E-UNT1-B-M2-CTD-1	2	2	93.24	6.118	0.09850	8	XGM	0.01231	93.64	6.145
NTP4013Q1-TTX-T40-E-UNT1-B-M2-CTD-2	2	2	92.11	6.163	0.09854	8	XGM	0.01232	92.54	6.192
NTP4013Q1-TTX-T40-E-UNT1-B-M2-CTD-3	2	2	91.39	6.167	0.09852	8	XGM	0.01231	91.79	6.194
NTP4013Q1-TTX-T40-E-UNT1-B-M2-CTD-4	2	2	97.48	6.190	0.09867	8	XGM	0.01233	98.07	6.227
NTP4013Q1-TTX-T40-E-UNT1-C-M2-CTD-1	3	2	91.17	6.209	0.09972	8	AGM	0.01247	92.70	6.313
NTP4013Q1-TTX-T40-E-UNT1-C-M2-CTD-2	3	2	92.24	6.309	0.09975	8	AGB	0.01247	93.81	6.417
NTP4013Q1-TTX-T40-E-UNT1-C-M2-CTD-3	3	2	92.35	6.197	0.09957	8	AGB	0.01245	93.75	6.291
NTP4013Q1-TTX-T40-E-UNT1-C-M2-CTD-4	3	2	92.89	6.259	0.09902	8	AGT	0.01238	93.78	6.319

Average	**90.79**	**6.231**	
Standard Dev.	**2.611**	**0.0765**	
Coeff. of Var. [%]	**2.875**	**1.227**	
Min.	**86.44**	**6.057**	
Max.	**97.5**	**6.391**	
Number of Spec.	**22**	**22**	

$Average_{norm}$	**0.01225**	**90.76**	**6.228**
$Standard\ Dev._{norm}$		**3.164**	**0.09120**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**3.486**	**1.464**
Min.	**0.01207**	**85.49**	**6.031**
Max.	**0.01247**	**98.1**	**6.418**
Number of Spec.	**22**	**22**	**22**


Laminate Unnotched Tension Properties (UNT1)--CTD (-65°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Unnotched Tension Strength [ksi]
0
20
40
60
80
100
120


Laminate Unnotched Tension Properties (UNT1)--CTD (-65°F)
Normalized Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Unnotched Tension Modulus [Msi]
0
1
2
3
4
5
6
7

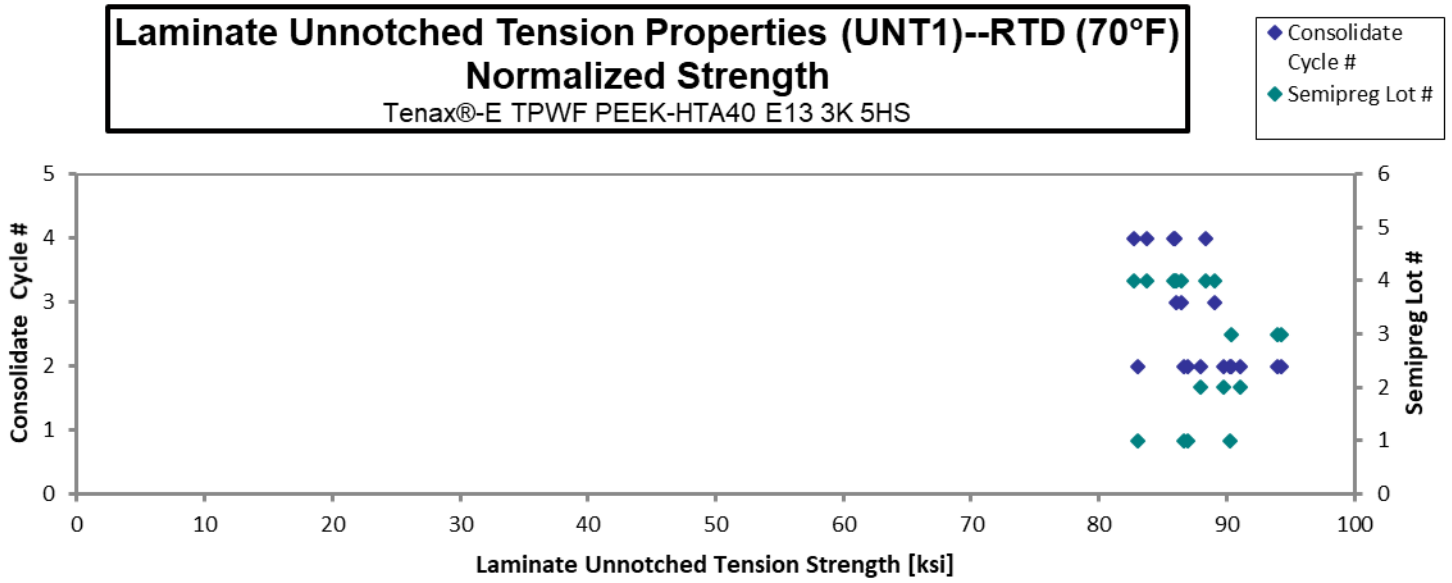
Laminate Unnotched Tension Properties (UNT1)--RTD (70°F)
Strength & Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

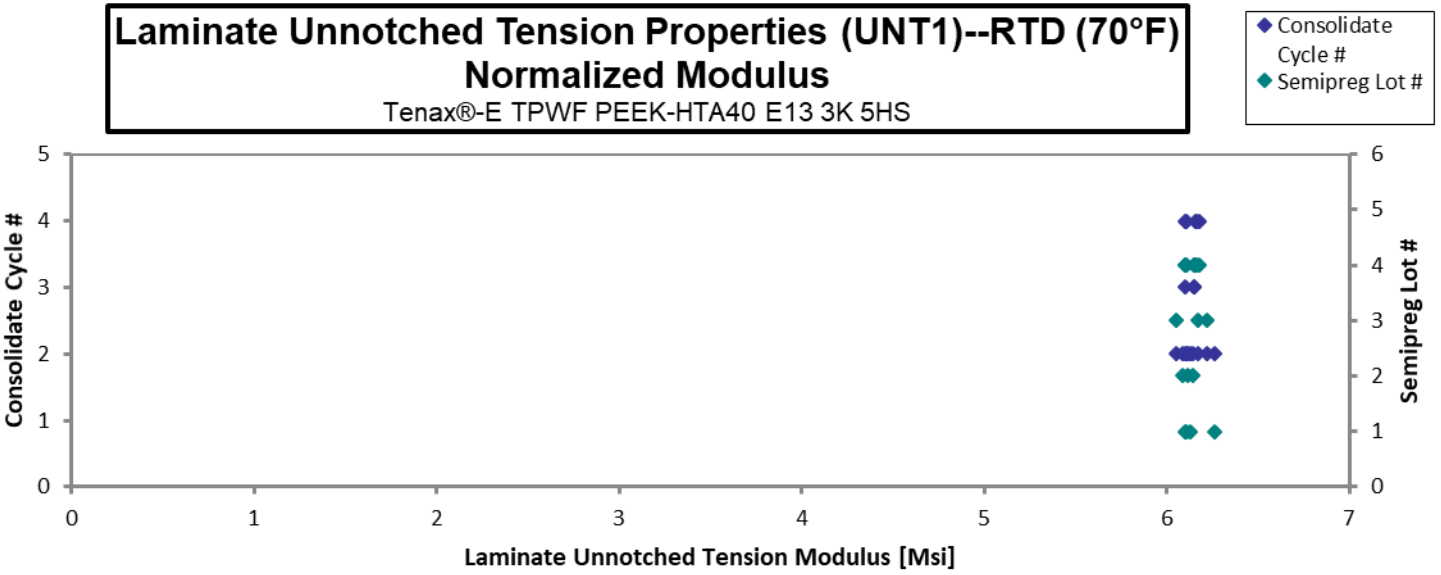
normalizing t_{ply} [in]: 0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
NTP4013Q1-TTX-T40-E-UNT1-D-M3-RTD-3	4	3	86.46	6.147	0.09810	8	M(A,L)WB	0.01226	86.48	6.149
NTP4013Q1-TTX-T40-E-UNT1-D-M3-RTD-4	4	3	85.83	6.088	0.09830	8	M(A,L)WB	0.01229	86.03	6.101
NTP4013Q1-TTX-T40-E-UNT1-D-M3-RTD-5	4	3	89.00	6.149	0.09808	8	M(A,L)WB	0.01226	89.00	6.149
NTP4013Q1-TTX-T40-E-UNT1-D-M4-RTD-1	4	4	89.05	6.150	0.09735	8	M(A,L)WB	0.01217	88.39	6.104
NTP4013Q1-TTX-T40-E-UNT1-D-M4-RTD-2	4	4	86.66	6.218	0.09717	8	M(A,L)GB	0.01215	85.85	6.160
NTP4013Q1-TTX-T40-E-UNT1-D-M4-RTD-3	4	4	86.50	6.151	0.09742	8	M(A,L)WB	0.01218	85.92	6.109
NTP4013Q1-TTX-T40-E-UNT1-D-M4-RTD-4	4	4	82.67	6.098	0.09938	8	M(A,L)WB	0.01242	83.77	6.180
NTP4013Q1-TTX-T40-E-UNT1-D-M4-RTD-5	4	4	82.03	6.113	0.09892	8	M(A,L)GM	0.01236	82.73	6.165
NTP4013Q1-TTX-T40-E-UNT1-A-M2-RTD-5	1	2	83.50	6.141	0.09751	8	AMV	0.01219	83.01	6.105
NTP4013Q1-TTX-T40-E-UNT1-A-M2-RTD-6	1	2	90.68	6.131	0.09759	8	AMV	0.01220	90.22	6.100
NTP4013Q1-TTX-T40-E-UNT1-A-M2-RTD-7	1	2	87.06	6.155	0.09764	8	LMV	0.01220	86.66	6.127
NTP4013Q1-TTX-T40-E-UNT1-A-M2-RTD-8	1	2	87.42	6.294	0.09759	8	AMV	0.01220	86.98	6.262
NTP4013Q1-TTX-T40-E-UNT1-B-M2-RTD-5	2	2	90.52	6.053	0.09864	8	AAT / AGB	0.01233	91.04	6.087
NTP4013Q1-TTX-T40-E-UNT1-B-M2-RTD-6	2	2	87.20	6.069	0.09887	8	AGM	0.01236	87.90	6.118
NTP4013Q1-TTX-T40-E-UNT1-B-M2-RTD-7	2	2	88.90	6.084	0.09899	8	AGM / AGB	0.01237	89.72	6.140
NTP4013Q1-TTX-T40-E-UNT1-C-M2-RTD-5	3	2	93.43	6.184	0.09867	8	AGB / AGT	0.01233	93.99	6.222
NTP4013Q1-TTX-T40-E-UNT1-C-M2-RTD-6	3	2	94.15	6.160	0.09823	8	AGB / LGB	0.01228	94.29	6.170
NTP4013Q1-TTX-T40-E-UNT1-C-M2-RTD-7	3	2	90.41	6.054	0.09801	8	AGM	0.01225	90.34	6.049

	Strength [ksi]	Modulus [Msi]
Average	**87.86**	**6.136**
Standard Dev.	**3.311**	**0.0598**
Coeff. of Var. [%]	**3.769**	**0.974**
Min.	**82.03**	**6.053**
Max.	**94.15**	**6.294**
Number of Spec.	**18**	**18**

	t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
$Average_{norm}$	**0.01227**	**87.91**	**6.139**
$Standard\ Dev._{norm}$		**3.322**	**0.0505**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**3.779**	**0.823**
Min.	**0.01215**	**82.73**	**6.049**
Max.	**0.01242**	**94.29**	**6.262**
Number of Spec.	**18**	**18**	**18**


Laminate Unnotched Tension Properties (UNT1)--RTD (70°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Unnotched Tension Strength [ksi]

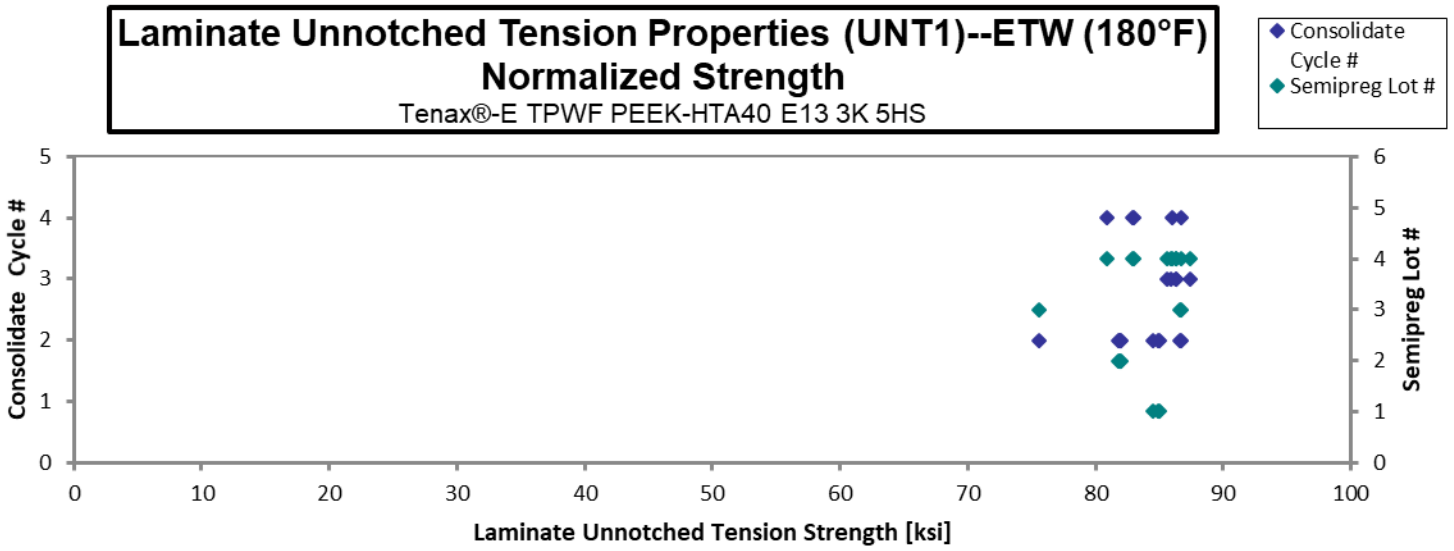

Laminate Unnotched Tension Properties (UNT1)--RTD (70°F)
Normalized Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Unnotched Tension Modulus [Msi]

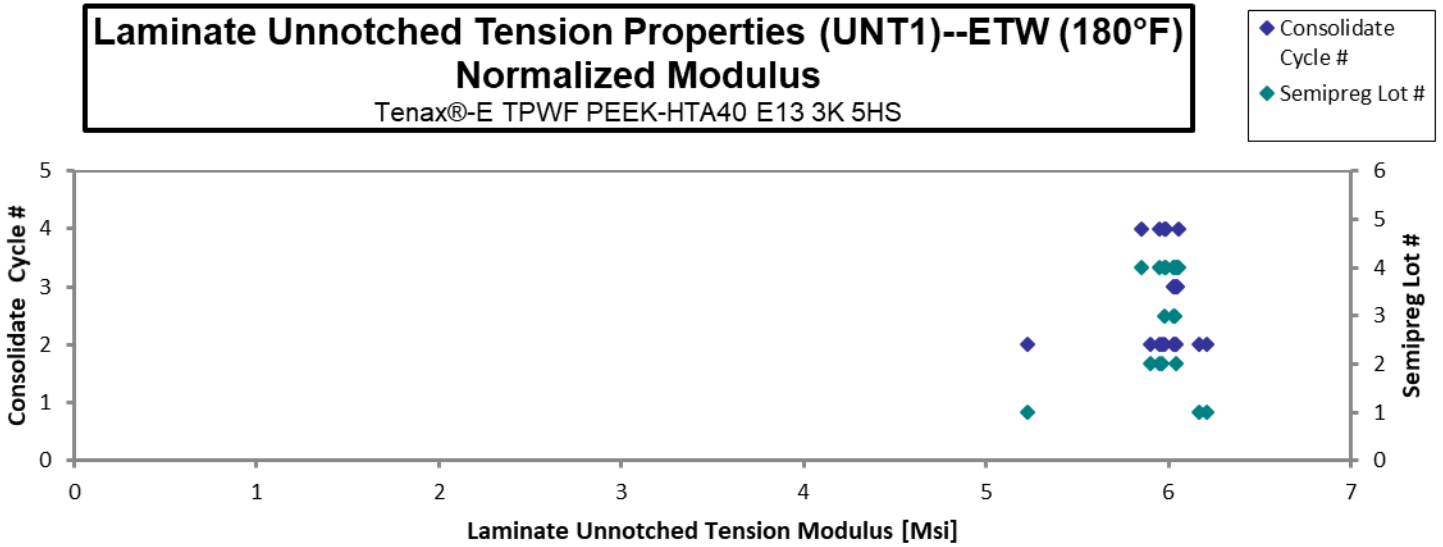
Laminate Unnotched Tension Properties (UNT1)--ETW (180°F)
Strength & Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

normalizing t_{ply} [in]
0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
NTP4013Q1-TTX-T40-E-UNT1-D-M3-ETW-1	4	3	87.58	6.052	0.09787	8	AGB	0.01223	87.39	6.039
NTP4013Q1-TTX-T40-E-UNT1-D-M3-ETW-2	4	3	86.54	6.068	0.09775	8	AWT	0.01222	86.25	6.048
NTP4013Q1-TTX-T40-E-UNT1-D-M3-ETW-3	4	3	86.89	6.071	0.09740	8	AWT	0.01218	86.29	6.029
NTP4013Q1-TTX-T40-E-UNT1-D-M3-ETW-4	4	3	86.66	6.082	0.09725	8	M(A,L)GM	0.01216	85.93	6.030
NTP4013Q1-TTX-T40-E-UNT1-D-M3-ETW-5	4	3	86.26	6.087	0.09737	8	LWB, M(A,L)WT	0.01217	85.64	6.043
NTP4013Q1-TTX-T40-E-UNT1-D-M4-ETW-1	4	4	79.63	5.894	0.09962	8	M(A,L)GM	0.01245	80.88	5.986
NTP4013Q1-TTX-T40-E-UNT1-D-M4-ETW-2	4	4	81.95	5.876	0.09928	8	M(A,L)WB	0.01241	82.96	5.948
NTP4013Q1-TTX-T40-E-UNT1-D-M4-ETW-3	4	4	85.94	5.924	0.09892	8	LWB, LWT	0.01236	86.67	5.975
NTP4013Q1-TTX-T40-E-UNT1-D-M4-ETW-4	4	4	85.74	6.038	0.09833	8	M(A,L)WB, M(A,L)WT	0.01229	85.97	6.054
NTP4013Q1-TTX-T40-E-UNT1-D-M4-ETW-5	4	4	82.64	5.833	0.09833	8	M(A,L)WB, M(A,L)WT	0.01229	82.85	5.848
NTP4013Q1-TTX-T40-E-UNT1-A-M2-ETW-10	1	2	84.95	5.253	0.09760	8	AGT / LGT	0.01220	84.53	5.227
NTP4013Q1-TTX-T40-E-UNT1-A-M2-ETW-11	1	2	84.91	6.164	0.09815	8	AGM	0.01227	84.97	6.169
NTP4013Q1-TTX-T40-E-UNT1-A-M2-ETW-12	1	2	84.79	6.200	0.09820	8	AGT / LGT	0.01228	84.89	6.208
NTP4013Q1-TTX-T40-E-UNT1-B-M2-ETW-9	2	2	80.44	5.937	0.09982	8	XGM	0.01248	81.86	6.042
NTP4013Q1-TTX-T40-E-UNT1-B-M2-ETW-10	2	2	80.68	5.872	0.09957	8	XGM	0.01245	81.90	5.961
NTP4013Q1-TTX-T40-E-UNT1-B-M2-ETW-11	2	2	80.66	5.814	0.09950	8	XGM	0.01244	81.83	5.898
NTP4013Q1-TTX-T40-E-UNT1-B-M2-ETW-12	2	2	80.82	5.861	0.09953	8	XGM	0.01244	82.02	5.947
NTP4013Q1-TTX-T40-E-UNT1-C-M2-ETW-10	3	2	87.25	6.073	0.09736	8	LGM	0.01217	86.61	6.028
NTP4013Q1-TTX-T40-E-UNT1-C-M2-ETW-11	3	2	87.08	6.006	0.09760	8	LGM	0.01220	86.65	5.977
NTP4013Q1-TTX-T40-E-UNT1-C-M2-ETW-12	3	2	75.48	6.031	0.09816	8	LGM	0.01227	75.54	6.036

Average	**83.85**	**5.957**	**Average$_{norm}$**	**0.01230**	**84.08**	**5.975**
Standard Dev.	**3.335**	**0.1995**	**Standard Dev.$_{norm}$**		**2.868**	**0.1935**
Coeff. of Var. [%]	**3.978**	**3.350**	**Coeff. of Var. [%]$_{norm}$**		**3.411**	**3.239**
Min.	**75.48**	**5.253**	**Min.**	**0.01216**	**75.54**	**5.227**
Max.	**87.58**	**6.200**	**Max.**	**0.01248**	**87.39**	**6.208**
Number of Spec.	**20**	**20**	**Number of Spec.**	**20**	**20**	**20**


Laminate Unnotched Tension Properties (UNT1)--ETW (180°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Unnotched Tension Strength [ksi]
0
10
20
30
40
50
60
70
80
90
100
0
1
2
3
4
5
6


Laminate Unnotched Tension Properties (UNT1)--ETW (180°F)
Normalized Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Unnotched Tension Modulus [Msi]
0
1
2
3
4
5
6
7
0
1
2
3
4
5
6

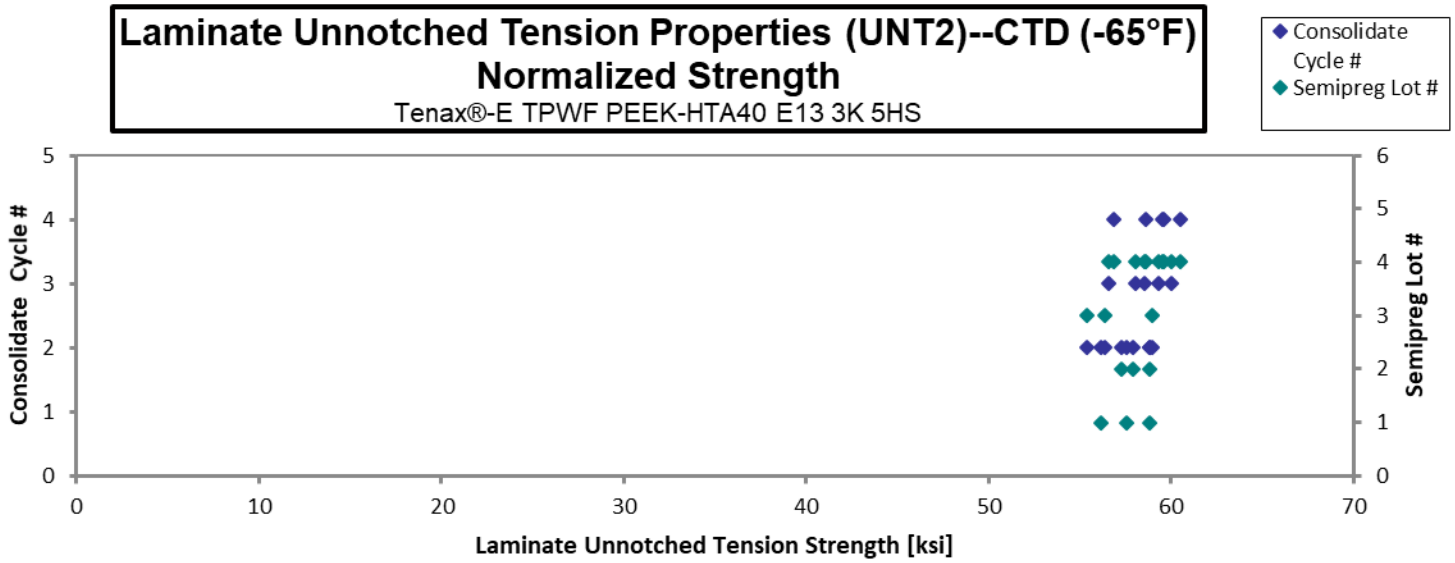
4.7 "10/80/10" Unnotched Tension 2 Properties (UNT2)

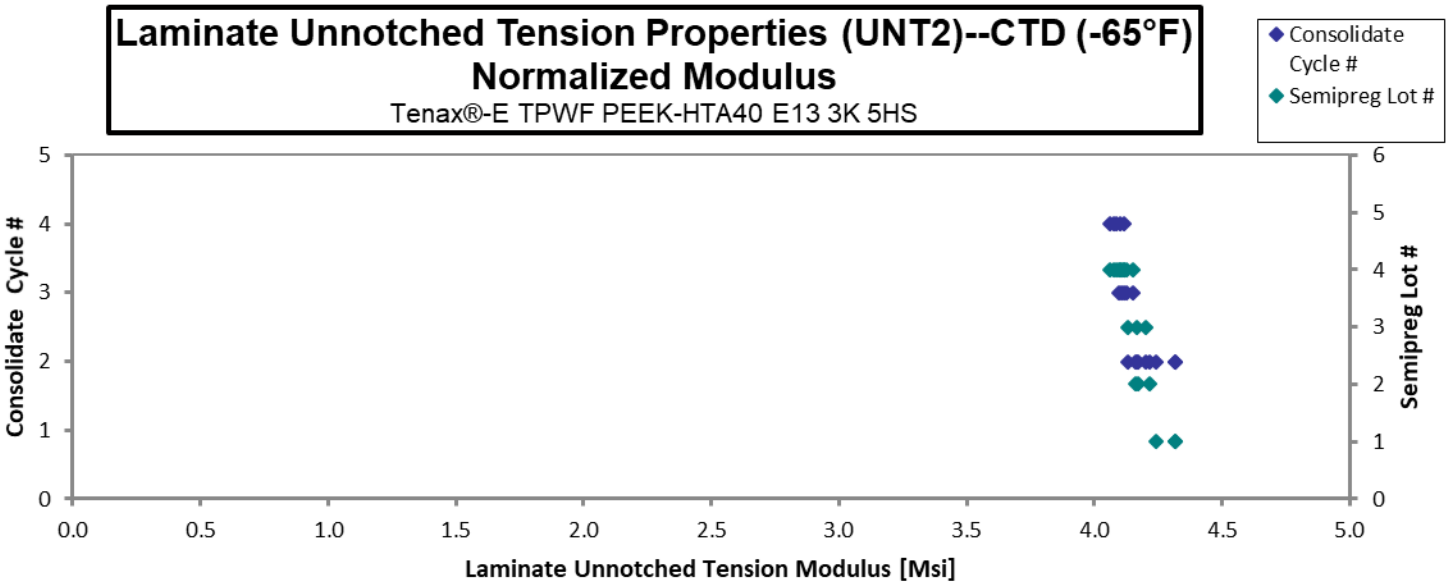
Laminate Unnotched Tension Properties (UNT2)--CTD (-65°F)
Strength & Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

normalizing t_{ply} [in]: 0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
NTP4013Q1-TTX-T40-E-UNT2-D-M3-CTD-1	4	3	59.82	4.208	0.1199	10	AGB	0.01199	58.50	4.114
NTP4013Q1-TTX-T40-E-UNT2-D-M3-CTD-2	4	3	60.45	4.232	0.1202	10	AWT	0.01202	59.27	4.150
NTP4013Q1-TTX-T40-E-UNT2-D-M3-CTD-3	4	3	60.92	4.161	0.1207	10	AWT	0.01207	59.97	4.097
NTP4013Q1-TTX-T40-E-UNT2-D-M3-CTD-4	4	3	58.69	4.171	0.1212	10	AGT	0.01212	58.03	4.124
NTP4013Q1-TTX-T40-E-UNT2-D-M3-CTD-5	4	3	57.14	4.146	0.1214	10	AGM	0.01214	56.59	4.106
NTP4013Q1-TTX-T40-E-UNT2-D-M4-CTD-1	4	4	58.15	4.153	0.1199	10	AGM	0.01199	56.86	4.061
NTP4013Q1-TTX-T40-E-UNT2-D-M4-CTD-2	4	4	61.07	4.140	0.1215	10	AGM	0.01215	60.50	4.101
NTP4013Q1-TTX-T40-E-UNT2-D-M4-CTD-3	4	4	58.69	4.083	0.1224	10	AGB	0.01224	58.59	4.077
NTP4013Q1-TTX-T40-E-UNT2-D-M4-CTD-4	4	4	59.44	4.081	0.1228	10	AGB	0.01228	59.52	4.086
NTP4013Q1-TTX-T40-E-UNT2-D-M4-CTD-5	4	4	59.53	4.112	0.1227	10	AWT	0.01227	59.59	4.116
NTP4013Q1-TTX-T40-E-UNT2-A-M2-CTD-1	1	2	55.37	4.261	0.1243	10	AGB	0.01243	56.12	4.319
NTP4013Q1-TTX-T40-E-UNT2-A-M2-CTD-2	1	2	57.01	4.273	0.1238	10	AGM	0.01238	57.57	4.315
NTP4013Q1-TTX-T40-E-UNT2-A-M2-CTD-3	1	2	58.21	4.197	0.1239	10	AGM	0.01239	58.84	4.243
NTP4013Q1-TTX-T40-E-UNT2-B-M2-CTD-1	2	2	56.98	4.103	0.1246	10	LGM	0.01246	57.91	4.170
NTP4013Q1-TTX-T40-E-UNT2-B-M2-CTD-2	2	2	58.08	4.110	0.1242	10	LGM	0.01242	58.81	4.162
NTP4013Q1-TTX-T40-E-UNT2-B-M2-CTD-3	2	2	56.30	4.145	0.1248	10	LGM	0.01248	57.29	4.218
NTP4013Q1-TTX-T40-E-UNT2-C-M2-CTD-1	3	2	55.79	4.158	0.1239	10	DGM	0.01239	56.39	4.203
NTP4013Q1-TTX-T40-E-UNT2-C-M2-CTD-2	3	2	54.75	4.085	0.1240	10	DGM	0.01240	55.37	4.132
NTP4013Q1-TTX-T40-E-UNT2-C-M2-CTD-3	3	2	58.12	4.108	0.1244	10	DGM	0.01244	58.97	4.169

Average	**58.13**	**4.154**	**Average$_{norm}$**	**0.01227**	**58.14**	**4.156**
Standard Dev.	**1.832**	**0.0580**	**Standard Dev.$_{norm}$**		**1.417**	**0.07450**
Coeff. of Var. [%]	**3.152**	**1.396**	**Coeff. of Var. [%]$_{norm}$**		**2.437**	**1.793**
Min.	**54.75**	**4.081**	**Min.**	**0.01199**	**55.37**	**4.061**
Max.	**61.07**	**4.273**	**Max.**	**0.01248**	**60.50**	**4.319**
Number of Spec.	**19**	**19**	**Number of Spec.**	**19**	**19**	**19**


Laminate Unnotched Tension Properties (UNT2)--CTD (-65°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
0
1
2
3
4
5
6
0
10
20
30
40
50
60
70
Laminate Unnotched Tension Strength [ksi]


Laminate Unnotched Tension Properties (UNT2)--CTD (-65°F)
Normalized Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
0
1
2
3
4
5
6
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
Laminate Unnotched Tension Modulus [Msi]

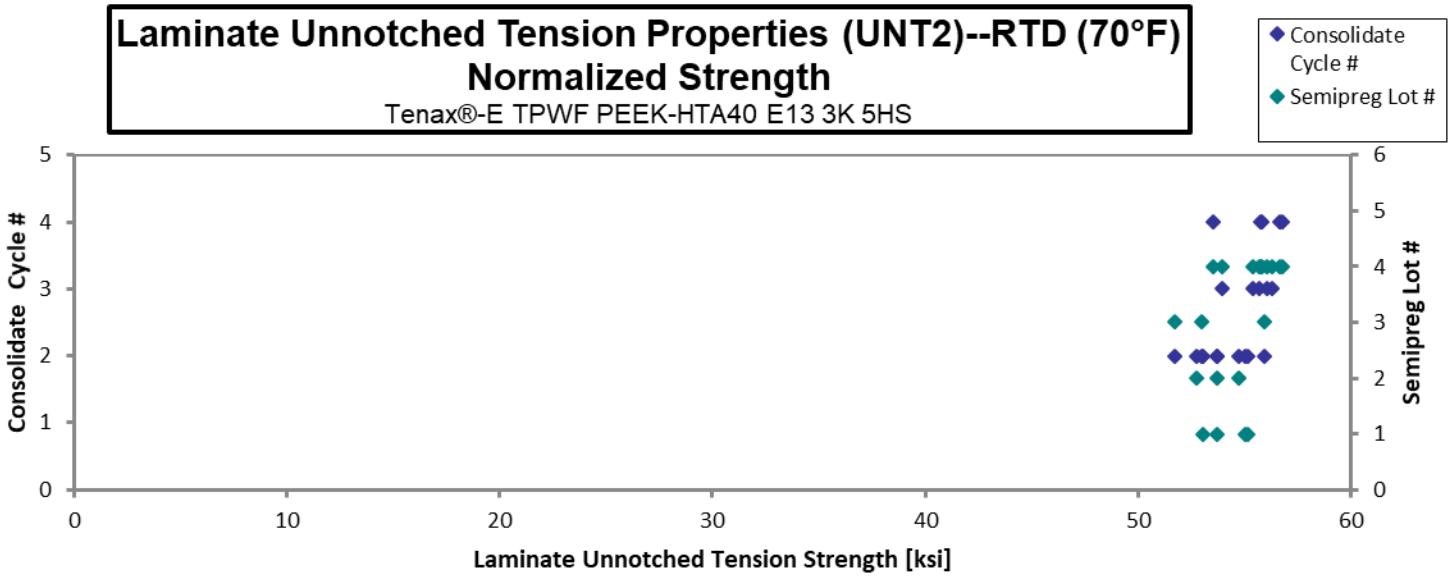
Laminate Unnotched Tension Properties (UNT2)--RTD (70°F)
Strength & Modulus

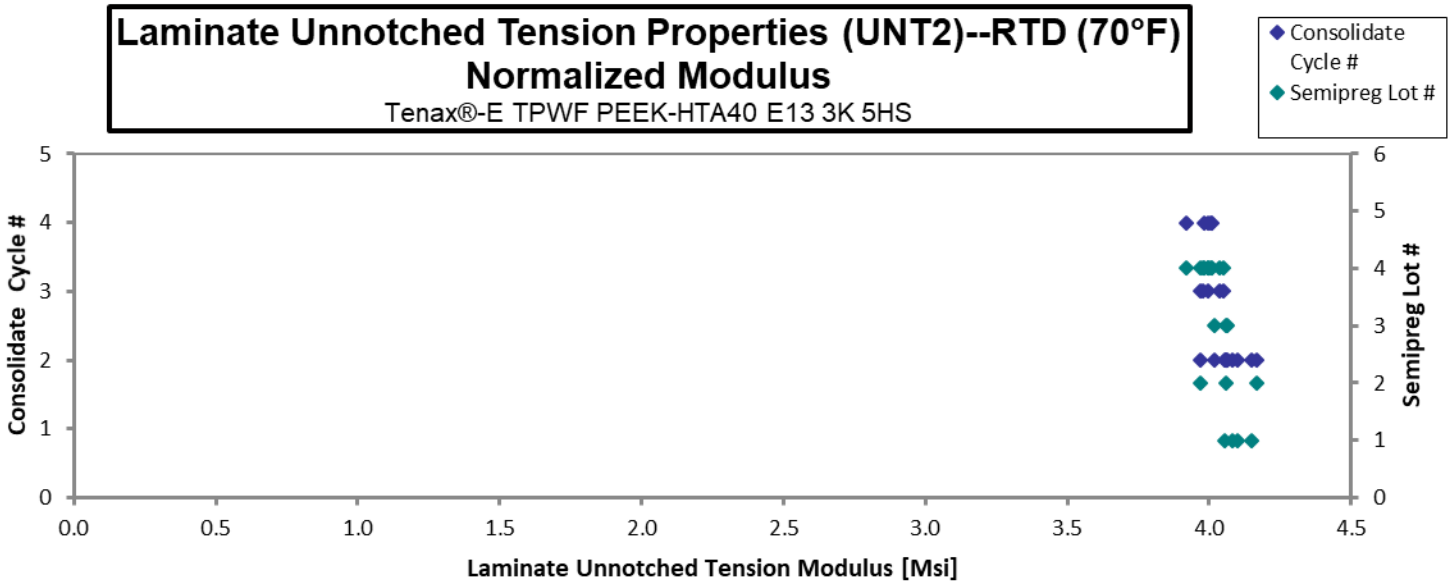
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

normalizing t_{ply} [in]
0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
NTP4013Q1-TTX-T40-E-UNT2-D-M3-RTD-1	4	3	55.93	4.089	0.1215	10	M(A,L)GT, AWT	0.01215	55.40	4.051
NTP4013Q1-TTX-T40-E-UNT2-D-M3-RTD-2	4	3	56.37	4.062	0.1218	10	AGB	0.01218	56.02	4.037
NTP4013Q1-TTX-T40-E-UNT2-D-M3-RTD-3	4	3	54.30	3.998	0.1218	10	AGM	0.01218	53.92	3.970
NTP4013Q1-TTX-T40-E-UNT2-D-M3-RTD-4	4	3	56.60	4.002	0.1219	10	AWT	0.01219	56.27	3.978
NTP4013Q1-TTX-T40-E-UNT2-D-M3-RTD-5	4	3	55.72	3.998	0.1226	10	AWB	0.01226	55.71	3.998
NTP4013Q1-TTX-T40-E-UNT2-D-M4-RTD-1	4	4	56.34	3.890	0.1235	10	AGT	0.01235	56.76	3.919
NTP4013Q1-TTX-T40-E-UNT2-D-M4-RTD-2	4	4	55.41	3.974	0.1235	10	AGB	0.01235	55.82	4.003
NTP4013Q1-TTX-T40-E-UNT2-D-M4-RTD-3	4	4	55.22	3.970	0.1238	10	AWT	0.01238	55.74	4.008
NTP4013Q1-TTX-T40-E-UNT2-D-M4-RTD-4	4	4	55.99	3.950	0.1241	10	AWT	0.01241	56.66	3.998
NTP4013Q1-TTX-T40-E-UNT2-D-M4-RTD-5	4	4	52.90	3.936	0.1240	10	AGM	0.01240	53.51	3.981
NTP4013Q1-TTX-T40-E-UNT2-A-M2-RTD-5	1	2	52.57	4.019	0.1237	10	LGM	0.01237	53.06	4.056
NTP4013Q1-TTX-T40-E-UNT2-A-M2-RTD-6	1	2	54.56	4.044	0.1237	10	LGM	0.01237	55.05	4.080
NTP4013Q1-TTX-T40-E-UNT2-A-M2-RTD-7	1	2	54.88	4.128	0.1232	10	LGM	0.01232	55.17	4.149
NTP4013Q1-TTX-T40-E-UNT2-A-M2-RTD-8	1	2	53.54	4.089	0.1230	10	AGM	0.01230	53.69	4.101
NTP4013Q1-TTX-T40-E-UNT2-B-M2-RTD-5	2	2	52.02	4.111	0.1243	10	AGM	0.01243	52.72	4.166
NTP4013Q1-TTX-T40-E-UNT2-B-M2-RTD-6	2	2	52.90	3.909	0.1244	10	AGM	0.01244	53.70	3.968
NTP4013Q1-TTX-T40-E-UNT2-B-M2-RTD-7	2	2	54.02	4.005	0.1242	10	AGM	0.01242	54.74	4.058
NTP4013Q1-TTX-T40-E-UNT2-C-M2-RTD-5	3	2	52.21	4.006	0.1244	10	DGM	0.01244	52.99	4.066
NTP4013Q1-TTX-T40-E-UNT2-C-M2-RTD-6	3	2	50.96	3.960	0.1244	10	DGM	0.01244	51.72	4.019
NTP4013Q1-TTX-T40-E-UNT2-C-M2-RTD-7	3	2	55.20	4.004	0.1243	10	AGM	0.01243	55.96	4.059

	Strength [ksi]	Modulus [Msi]				
Average	**54.38**	**4.007**	**$Average_{norm}$**	**0.01234**	**54.73**	**4.033**
Standard Dev.	**1.665**	**0.06483**	**Standard $Dev._{norm}$**		**1.460**	**0.06172**
Coeff. of Var. [%]	**3.062**	**1.618**	**Coeff. of Var. $[\%]_{norm}$**		**2.668**	**1.530**
Min.	**50.96**	**3.890**	**Min.**	**0.01215**	**51.72**	**3.919**
Max.	**56.60**	**4.128**	**Max.**	**0.01244**	**56.76**	**4.166**
Number of Spec.	**20**	**20**	**Number of Spec.**	**20**	**20**	**20**


Laminate Unnotched Tension Properties (UNT2)--RTD (70°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Unnotched Tension Strength [ksi]
0
10
20
30
40
50
60


Laminate Unnotched Tension Properties (UNT2)--RTD (70°F)
Normalized Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Unnotched Tension Modulus [Msi]
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5

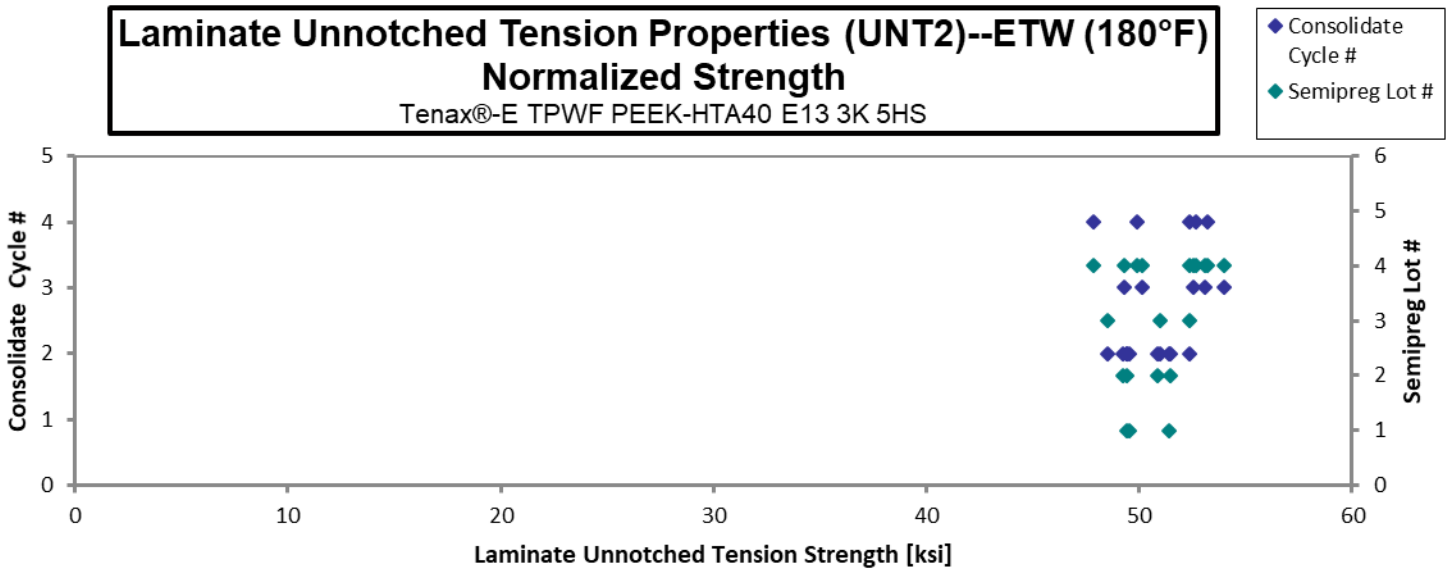
Laminate Unnotched Tension Properties (UNT2)--ETW (180°F)
Strength & Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

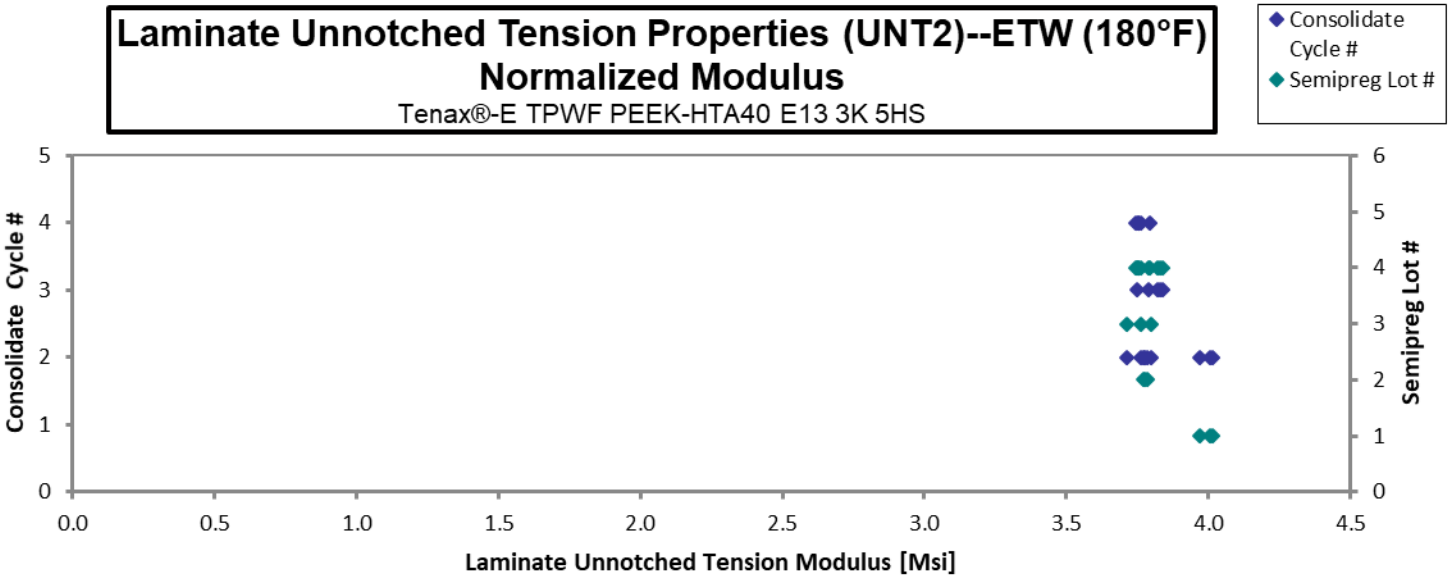
normalizing t_{ply} [in]: 0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
NTP4013Q1-TTX-T40-E-UNT2-M3-D-ETW-1	4	3	52.88	3.826	0.1231	10	AGT	0.01231	53.09	3.841
NTP4013Q1-TTX-T40-E-UNT2-M3-D-ETW-2	4	3	49.87	3.798	0.1233	10	AWT	0.01233	50.15	3.820
NTP4013Q1-TTX-T40-E-UNT2-M3-D-ETW-3	4	3	53.63	3.765	0.1234	10	AGB	0.01234	53.97	3.789
NTP4013Q1-TTX-T40-E-UNT2-M3-D-ETW-4	4	3	52.17	3.804	0.1235	10	AWT	0.01235	52.54	3.831
NTP4013Q1-TTX-T40-E-UNT2-M3-D-ETW-5	4	3	48.92	3.722	0.1235	10	AWB	0.01235	49.29	3.749
NTP4013Q1-TTX-T40-E-UNT2-D-M4-ETW-1	4	4	49.27	3.713	0.1242	10	AWT	0.01242	49.89	3.761
NTP4013Q1-TTX-T40-E-UNT2-D-M4-ETW-2	4	4	47.08	3.733	0.1246	10	AWB	0.01246	47.86	3.795
NTP4013Q1-TTX-T40-E-UNT2-D-M4-ETW-3	4	4	51.64	3.703	0.1243	10	AWT	0.01243	52.35	3.754
NTP4013Q1-TTX-T40-E-UNT2-D-M4-ETW-4	4	4	52.52	3.705	0.1242	10	AGB	0.01242	53.20	3.753
NTP4013Q1-TTX-T40-E-UNT2-D-M4-ETW-5	4	4	52.12	3.704	0.1239	10	AGM	0.01239	52.67	3.743
NTP4013Q1-TTX-T40-E-UNT2-A-M2-ETW-10	1	2	51.25	3.996	0.1229	10	OVM	0.01229	51.38	4.006
NTP4013Q1-TTX-T40-E-UNT2-A-M2-ETW-11	1	2	49.31	4.007	0.1228	10	OVM	0.01228	49.39	4.014
NTP4013Q1-TTX-T40-E-UNT2-A-M2-ETW-12	1	2	49.56	3.972	0.1225	10	OVM	0.01225	49.53	3.970
NTP4013Q1-TTX-T40-E-UNT2-B-M2-ETW-9	2	2	50.58	3.764	0.1233	10	DGM	0.01233	50.89	3.786
NTP4013Q1-TTX-T40-E-UNT2-B-M2-ETW-10	2	2	51.11	3.747	0.1234	10	DGM	0.01234	51.45	3.772
NTP4013Q1-TTX-T40-E-UNT2-B-M2-ETW-11*	2	2	48.94		0.1234	10	DGM	0.01234	49.25	
NTP4013Q1-TTX-T40-E-UNT2-B-M2-ETW-12	2	2	49.55	3.787	0.1223	10	DGM	0.01223	49.42	3.776
NTP4013Q1-TTX-T40-E-UNT2-C-M2-ETW-9	3	2	48.06	3.678	0.1237	10	DGM	0.01237	48.49	3.711
NTP4013Q1-TTX-T40-E-UNT2-C-M2-ETW-10	3	2	50.86	3.789	0.1229	10	DGM	0.01229	50.99	3.799
NTP4013Q1-TTX-T40-E-UNT2-C-M2-ETW-12	3	2	53.49	3.844	0.1200	10	DGM	0.01200	52.37	3.764

*Modulus outlier removed

Average	**50.64**	**3.793**	**Average$_{norm}$**	**0.01233**	**50.91**	**3.812**
Standard Dev.	**1.829**	**0.0996**	**Standard Dev.$_{norm}$**		**1.753**	**0.08813**
Coeff. of Var. [%]	**3.612**	**2.627**	**Coeff. of Var. [%]$_{norm}$**		**3.444**	**2.312**
Min.	**47.08**	**3.678**	**Min.**	**0.01200**	**47.86**	**3.711**
Max.	**53.63**	**4.007**	**Max.**	**0.01246**	**53.97**	**4.014**
Number of Spec.	**20**	**19**	**Number of Spec.**	**20**	**20**	**19**


Laminate Unnotched Tension Properties (UNT2)--ETW (180°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Unnotched Tension Strength [ksi]
0
10
20
30
40
50
60
0
1
2
3
4
5
6


Laminate Unnotched Tension Properties (UNT2)--ETW (180°F)
Normalized Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Unnotched Tension Modulus [Msi]
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
0
1
2
3
4
5
6

4.8 "40/20/40" Unnotched Tension 3 Properties (UNT3)

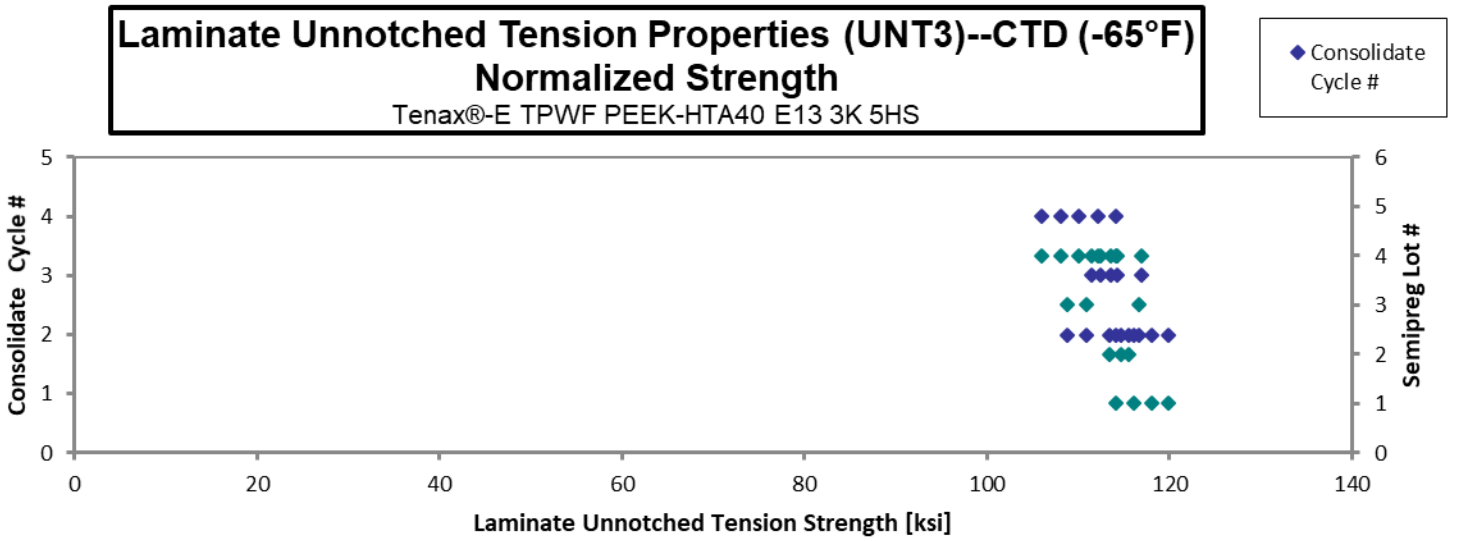
Laminate Unnotched Tension Properties (UNT3)--CTD (-65°F)
Strength & Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

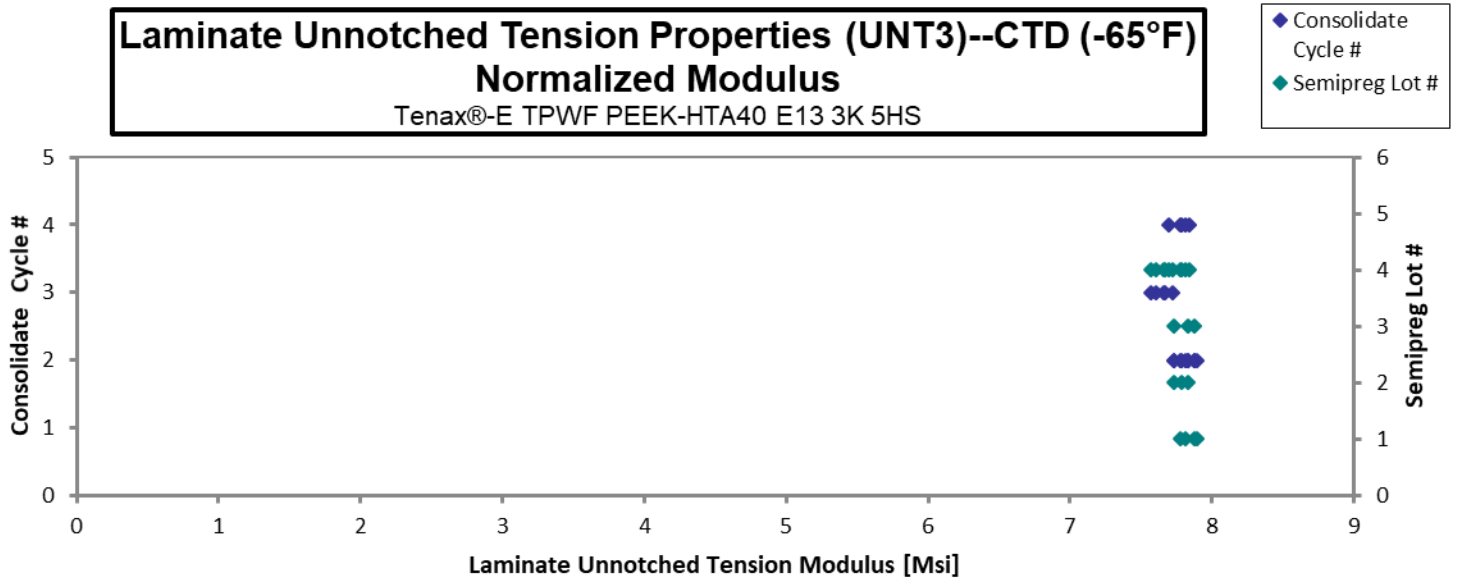
normalizing t_{ply} [in]: 0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
NTP4013Q1-TTX-T40-E-UNT3-D-M3-CTD-1	4	3	117.6	7.645	0.1220	10	M(A,L)WB	0.01220	117.0	7.608
NTP4013Q1-TTX-T40-E-UNT3-D-M3-CTD-2	4	3	114.1	7.698	0.1221	10	M(A,L)GT, M(A,L)WB	0.01221	113.6	7.665
NTP4013Q1-TTX-T40-E-UNT3-D-M3-CTD-3	4	3	114.5	7.585	0.1223	10	M(A,L)WT	0.01223	114.3	7.567
NTP4013Q1-TTX-T40-E-UNT3-D-M3-CTD-4	4	3	111.8	7.624	0.1233	10	M(A,L)AT	0.01233	112.4	7.667
NTP4013Q1-TTX-T40-E-UNT3-D-M3-CTD-5	4	3	110.7	7.671	0.1234	10	M(A,L)AB	0.01234	111.5	7.722
NTP4013Q1-TTX-T40-E-UNT3-D-M4-CTD-1	4	4	113.3	7.773	0.1215	10	M(A,L)WT	0.01215	112.2	7.700
NTP4013Q1-TTX-T40-E-UNT3-D-M4-CTD-2	4	4	110.3	7.830	0.1223	10	M(A,L)WT	0.01223	110.0	7.809
NTP4013Q1-TTX-T40-E-UNT3-D-M4-CTD-3	4	4	105.8	7.832	0.1228	10	M(A,L)WB	0.01228	105.9	7.841
NTP4013Q1-TTX-T40-E-UNT3-D-M4-CTD-4	4	4	107.5	7.736	0.1232	10	M(A,L)WT	0.01232	108.1	7.775
NTP4013Q1-TTX-T40-E-UNT3-D-M4-CTD-5	4	4	113.2	7.726	0.1236	10	M(A,L)WT, LWB	0.01236	114.1	7.787
NTP4013Q1-TTX-T40-E-UNT3-A-M2-CTD-1	1	2	119.2	7.828	0.1234	10	LVV	0.01234	119.9	7.878
NTP4013Q1-TTX-T40-E-UNT3-A-M2-CTD-2	1	2	113.7	7.750	0.1230	10	LVV	0.01230	114.1	7.777
NTP4013Q1-TTX-T40-E-UNT3-A-M2-CTD-3	1	2	115.8	7.796	0.1229	10	LVV	0.01229	116.1	7.818
NTP4013Q1-TTX-T40-E-UNT3-A-M2-CTD-4	1	2	118.0	7.889	0.1227	10	LVV	0.01227	118.0	7.894
NTP4013Q1-TTX-T40-E-UNT3-B-M2-CTD-1	2	2	112.1	7.741	0.1240	10	XGM/LAB	0.01240	113.4	7.830
NTP4013Q1-TTX-T40-E-UNT3-B-M2-CTD-2	2	2	114.3	7.707	0.1239	10	XGM/LIB	0.01239	115.5	7.788
NTP4013Q1-TTX-T40-E-UNT3-B-M2-CTD-3	2	2	113.4	7.644	0.1240	10	XGM	0.01240	114.7	7.730
NTP4013Q1-TTX-T40-E-UNT3-C-M2-CTD-1	3	2	116.9	7.897	0.1223	10	LIB*	0.01223	116.7	7.880
NTP4013Q1-TTX-T40-E-UNT3-C-M2-CTD-2	3	2	111.1	7.744	0.1225	10	XGM/LIT	0.01225	110.9	7.734
NTP4013Q1-TTX-T40-E-UNT3-C-M2-CTD-3	3	2	108.5	7.818	0.1228	10	DGM	0.01228	108.7	7.832

* Note the bad failure mode data were included, the failure mode of slightly in tab was approved by NCAMP AER.

Average	**113.1**	**7.747**	**$Average_{norm}$**	**0.01229**	**113.4**	**7.765**
Standard Dev.	**3.499**	**0.0871**	**$Standard\ Dev._{norm}$**		**3.500**	**0.09032**
Coeff. of Var. [%]	**3.094**	**1.124**	**Coeff. of Var. $[\%]_{norm}$**		**3.088**	**1.1632**
Min.	**105.8**	**7.585**	**Min.**	**0.01215**	**105.9**	**7.567**
Max.	**119.2**	**7.897**	**Max.**	**0.01240**	**119.9**	**7.894**
Number of Spec.	**20**	**20**	**Number of Spec.**	**20**	**20**	**20**


Laminate Unnotched Tension Properties (UNT3)--CTD (-65°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Consolidate Cycle #
Semipreg Lot #
0
1
2
3
4
5
6
0
20
40
60
80
100
120
140
Laminate Unnotched Tension Strength [ksi]


Laminate Unnotched Tension Properties (UNT3)--CTD (-65°F)
Normalized Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
0
1
2
3
4
5
6
0
1
2
3
4
5
6
7
8
9
Laminate Unnotched Tension Modulus [Msi]

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

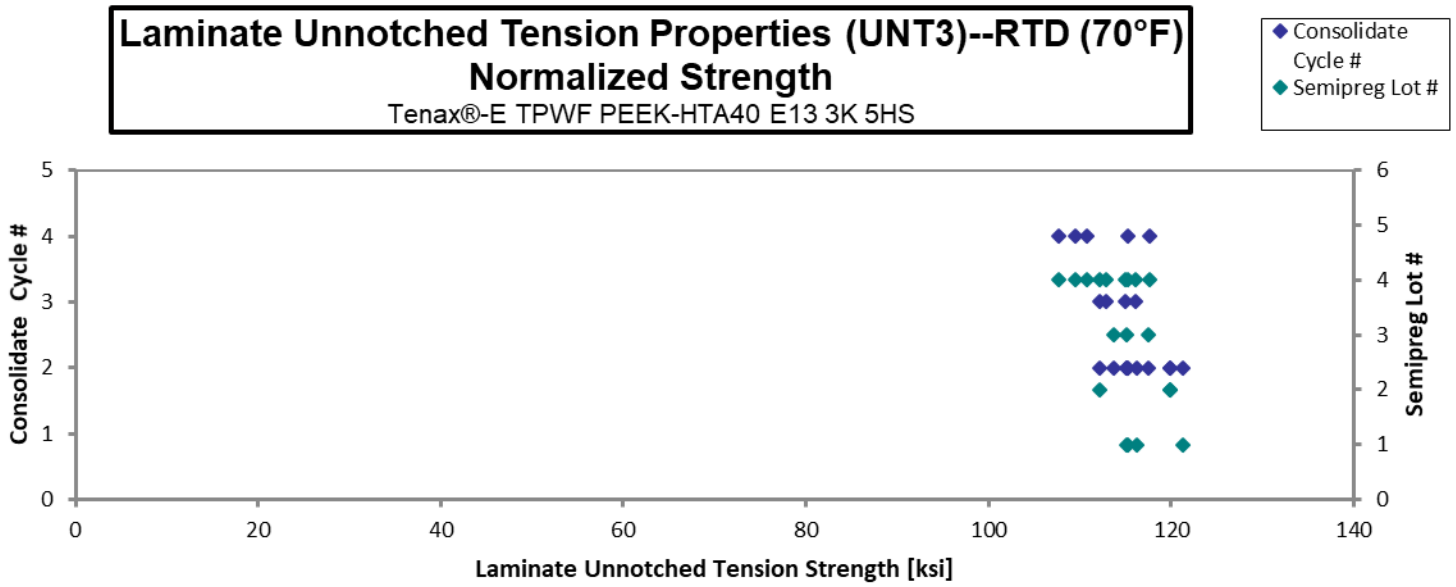
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

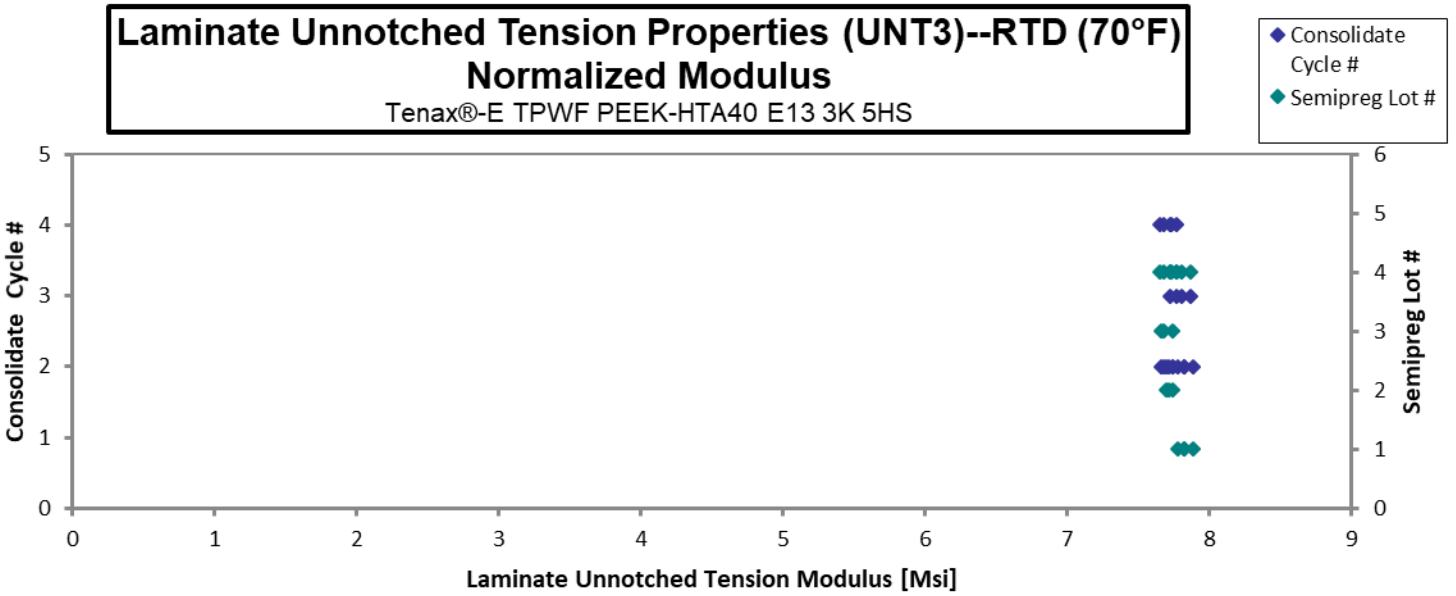
normalizing t_{ply} [in]
0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
NTP4013Q1-TTX-T40-E-UNT3-D-M3-RTD-2	4	3	111.7	7.644	0.1239	10	M(A,L)WT	0.01239	112.9	7.723
NTP4013Q1-TTX-T40-E-UNT3-D-M3-RTD-3	4	3	113.7	7.720	0.1240	10	M(A,L)WB	0.01240	115.0	7.806
NTP4013Q1-TTX-T40-E-UNT3-D-M3-RTD-4	4	3	114.8	7.786	0.1240	10	M(A,L)WT, LWB	0.01240	116.1	7.872
NTP4013Q1-TTX-T40-E-UNT3-D-M3-RTD-5	4	3	110.8	7.683	0.1240	10	M(A,L)WT	0.01240	112.1	7.773
NTP4013Q1-TTX-T40-E-UNT3-D-M4-RTD-1	4	4	114.2	7.703	0.1237	10	M(A,L)WB	0.01237	115.2	7.773
NTP4013Q1-TTX-T40-E-UNT3-D-M4-RTD-2	4	4	106.9	7.617	0.1236	10	M(A,L)GT	0.01236	107.7	7.676
NTP4013Q1-TTX-T40-E-UNT3-D-M4-RTD-3	4	4	116.4	7.572	0.1239	10	M(A,L)WB	0.01239	117.6	7.654
NTP4013Q1-TTX-T40-E-UNT3-D-M4-RTD-4	4	4	108.2	7.641	0.1242	10	M(A,L)WT	0.01242	109.5	7.738
NTP4013Q1-TTX-T40-E-UNT3-D-M4-RTD-5	4	4	109.2	7.617	0.1244	10	AWB, LAB	0.01244	110.8	7.727
NTP4013Q1-TTX-T40-E-UNT3-A-M2-RTD-5	1	2	121.4	7.897	0.1225	10	AGM	0.01225	121.2	7.890
NTP4013Q1-TTX-T40-E-UNT3-A-M2-RTD-6	1	2	116.6	7.846	0.1223	10	AGM	0.01223	116.3	7.825
NTP4013Q1-TTX-T40-E-UNT3-A-M2-RTD-7	1	2	115.9	7.872	0.1219	10	AGV	0.01219	115.2	7.828
NTP4013Q1-TTX-T40-E-UNT3-A-M2-RTD-8	1	2	116.3	7.854	0.1214	10	AGM	0.01214	115.1	7.778
NTP4013Q1-TTX-T40-E-UNT3-B-M2-RTD-5	2	2	118.4	7.625	0.1241	10	LAT / AGM	0.01241	119.8	7.716
NTP4013Q1-TTX-T40-E-UNT3-B-M2-RTD-6	2	2	110.9	7.656	0.1240	10	AGM / AGB	0.01240	112.2	7.745
NTP4013Q1-TTX-T40-E-UNT3-B-M2-RTD-7	2	2	118.2	7.584	0.1244	10	LAT / AGM	0.01244	119.9	7.695
NTP4013Q1-TTX-T40-E-UNT3-C-M2-RTD-5	3	2	112.9	7.691	0.1235	10	LIT / AGM	0.01235	113.7	7.747
NTP4013Q1-TTX-T40-E-UNT3-C-M2-RTD-6	3	2	113.8	7.593	0.1241	10	AGM / LGT	0.01241	115.2	7.684
NTP4013Q1-TTX-T40-E-UNT3-C-M2-RTD-7	3	2	116.2	7.584	0.1239	10	LGT / LGB	0.01239	117.5	7.666

Average	**114.0**	**7.694**	
Standard Dev.	**3.733**	**0.1062**	
Coeff. of Var. [%]	**3.274**	**1.380**	
Min.	**106.9**	**7.572**	
Max.	**121.4**	**7.897**	
Number of Spec.	**19**	**19**	

$Average_{norm}$	**0.01236**	**114.9**	**7.753**
$Standard\ Dev._{norm}$		**3.534**	**0.06791**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**3.076**	**0.8758**
Min.	**0.01214**	**107.7**	**7.654**
Max.	**0.01244**	**121.2**	**7.890**
Number of Spec.	**19**	**19**	**19**


Laminate Unnotched Tension Properties (UNT3)--RTD (70°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
0
1
2
3
4
5
6
0
20
40
60
80
100
120
140
Laminate Unnotched Tension Strength [ksi]


Laminate Unnotched Tension Properties (UNT3)--RTD (70°F)
Normalized Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
0
1
2
3
4
5
6
0
1
2
3
4
5
6
7
8
9
Laminate Unnotched Tension Modulus [Msi]

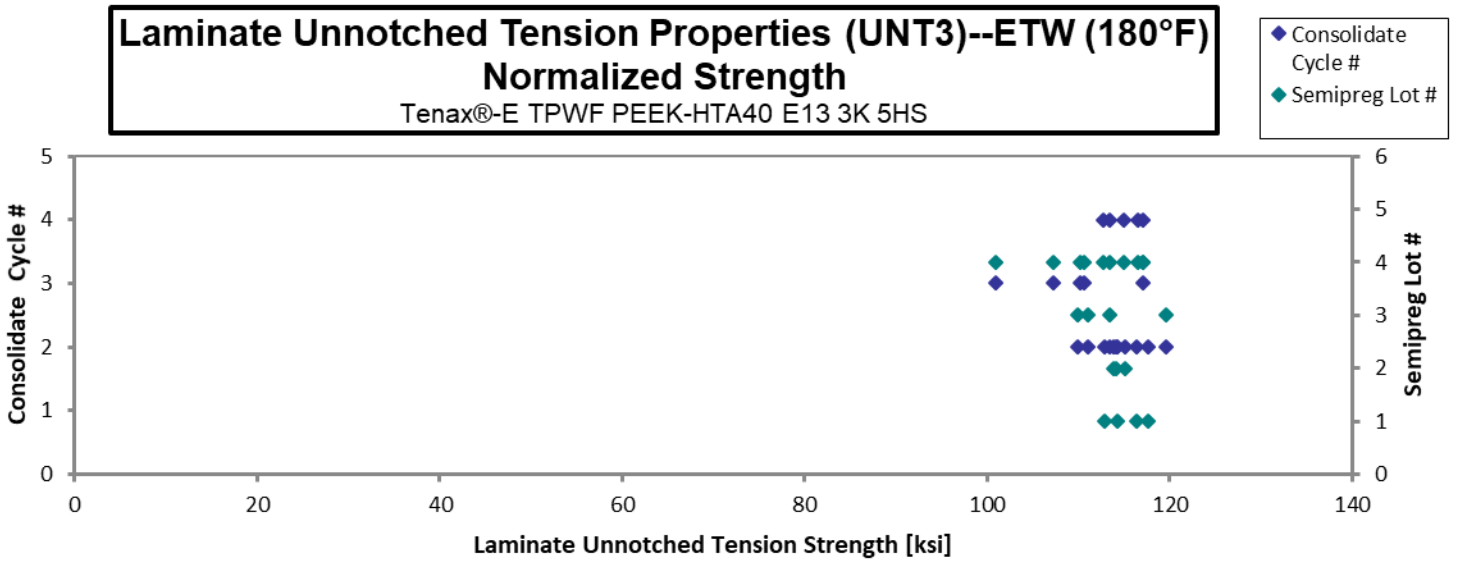
Laminate Unnotched Tension Properties (UNT3)--ETW (180°F)
Strength & Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

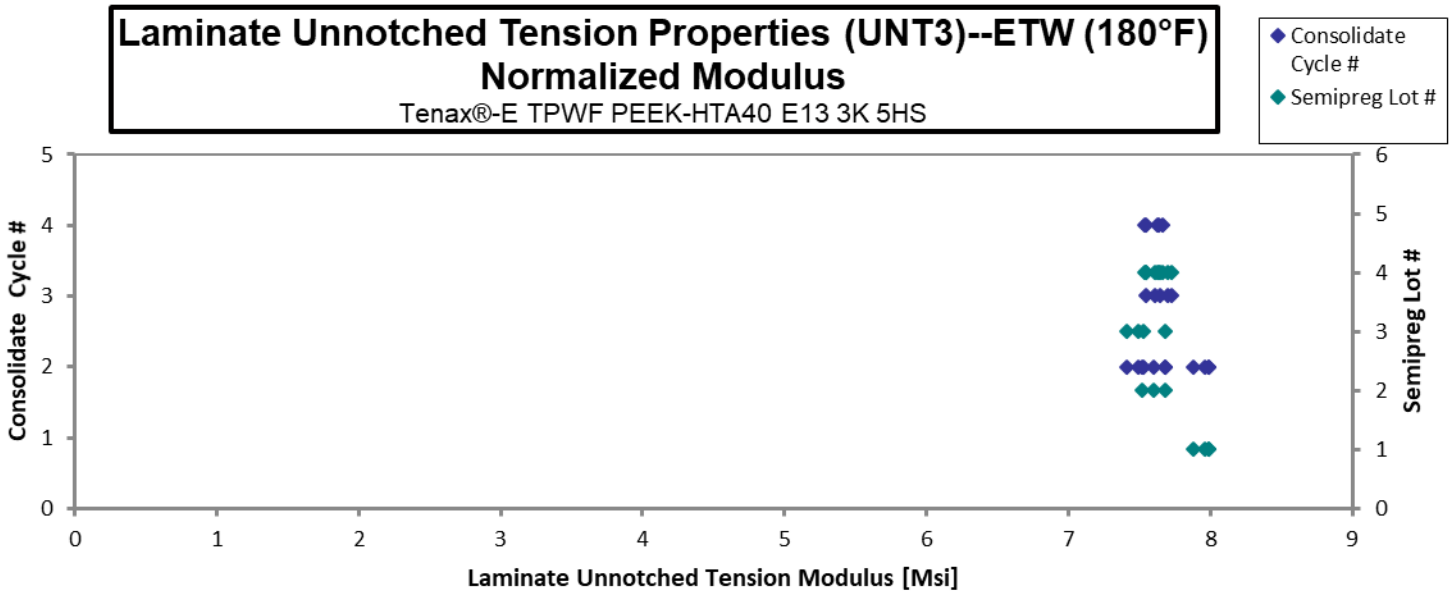
normalizing t_{ply} [in]
0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
NTP4013Q1-TTX-T40-E-UNT3-D-M3-ETW-1	4	3	116.0	7.632	0.1236	10	LWB, LGT	0.01236	117.0	7.696
NTP4013Q1-TTX-T40-E-UNT3-D-M3-ETW-2	4	3	106.3	7.487	0.1236	10	LWB, M(A,L)WT	0.01236	107.2	7.548
NTP4013Q1-TTX-T40-E-UNT3-D-M3-ETW-3	4	3	109.6	7.541	0.1238	10	M(A,L)WT	0.01238	110.6	7.612
NTP4013Q1-TTX-T40-E-UNT3-D-M3-ETW-4	4	3	99.92	7.649	0.1238	10	AWB	0.01238	100.9	7.724
NTP4013Q1-TTX-T40-E-UNT3-D-M3-ETW-5	4	3	108.9	7.557	0.1241	10	M(A,L)GT	0.01241	110.2	7.647
NTP4013Q1-TTX-T40-E-UNT3-D-M4-ETW-1	4	4	113.3	7.438	0.1244	10	M(A,L)WB	0.01244	115.0	7.548
NTP4013Q1-TTX-T40-E-UNT3-D-M4-ETW-2	4	4	115.3	7.562	0.1239	10	M(A,L)GB	0.01239	116.4	7.639
NTP4013Q1-TTX-T40-E-UNT3-D-M4-ETW-3	4	4	116.3	7.486	0.1234	10	M(D,A,L)GM	0.01234	117.1	7.537
NTP4013Q1-TTX-T40-E-UNT3-D-M4-ETW-4	4	4	112.7	7.576	0.1234	10	M(D,A,L)GB	0.01234	113.4	7.623
NTP4013Q1-TTX-T40-E-UNT3-D-M4-ETW-5	4	4	112.0	7.610	0.1234	10	LGB, M(A,L)WT	0.01234	112.8	7.662
NTP4013Q1-TTX-T40-E-UNT3-A-M2-ETW-9	1	2	115.5	8.076	0.1213	10	LGT / LGB	0.01213	114.2	7.988
NTP4013Q1-TTX-T40-E-UNT3-A-M2-ETW-10	1	2	114.3	8.069	0.1210	10	XGM	0.01210	112.8	7.961
NTP4013Q1-TTX-T40-E-UNT3-A-M2-ETW-11	1	2	118.5	8.132	0.1204	10	LGT / AGB	0.01204	116.4	7.984
NTP4013Q1-TTX-T40-E-UNT3-A-M2-ETW-12*	1	2	120.1	8.040	0.1201	10	LIT*	0.01201	117.6	7.877
NTP4013Q1-TTX-T40-E-UNT3-B-M2-ETW-9	2	2	112.5	7.500	0.1243	10	LWB	0.01243	114.0	7.602
NTP4013Q1-TTX-T40-E-UNT3-B-M2-ETW-10	2	2	112.9	7.621	0.1235	10	LGM/AGM	0.01235	113.8	7.679
NTP4013Q1-TTX-T40-E-UNT3-B-M2-ETW-11	2	2	114.4	7.471	0.1234	10	LWB/AGM	0.01234	115.2	7.518
NTP4013Q1-TTX-T40-E-UNT3-C-M2-ETW-9	3	2	110.3	7.629	0.1235	10	LGM	0.01235	111.1	7.685
NTP4013Q1-TTX-T40-E-UNT3-C-M2-ETW-10	3	2	112.6	7.436	0.1235	10	LGM	0.01235	113.4	7.488
NTP4013Q1-TTX-T40-E-UNT3-C-M2-ETW-11	3	2	109.4	7.498	0.1231	10	LGM	0.01231	109.9	7.527
NTP4013Q1-TTX-T40-E-UNT3-C-M2-ETW-12	3	2	119.5	7.404	0.1227	10	LGM	0.01227	119.6	7.409

* Note the bad failure mode data were included, the failure mode of slightly in tab was approved by NCAMP AER.

Average	**112.9**	**7.639**	**$Average_{norm}$**	**0.01230**	**113.3**	**7.665**
Standard Dev.	**4.603**	**0.2301**	**$Standard\ Dev._{norm}$**		**4.119**	**0.1636**
Coeff. of Var. [%]	**4.078**	**3.012**	**$Coeff.\ of\ Var.\ [\%]_{norm}$**		**3.636**	**2.135**
Min.	**99.9**	**7.404**	**Min.**	**0.01201**	**100.9**	**7.409**
Max.	**120.1**	**8.132**	**Max.**	**0.01244**	**119.6**	**7.988**
Number of Spec.	**21**	**21**	**Number of Spec.**	**21**	**21**	**21**


Laminate Unnotched Tension Properties (UNT3)--ETW (180°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Unnotched Tension Strength [ksi]
0
20
40
60
80
100
120
140


Laminate Unnotched Tension Properties (UNT3)--ETW (180°F)
Normalized Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Unnotched Tension Modulus [Msi]
0
1
2
3
4
5
6
7
8
9

4.9 "25/50/25" Unnotched Compression 1 Properties (UNC1)

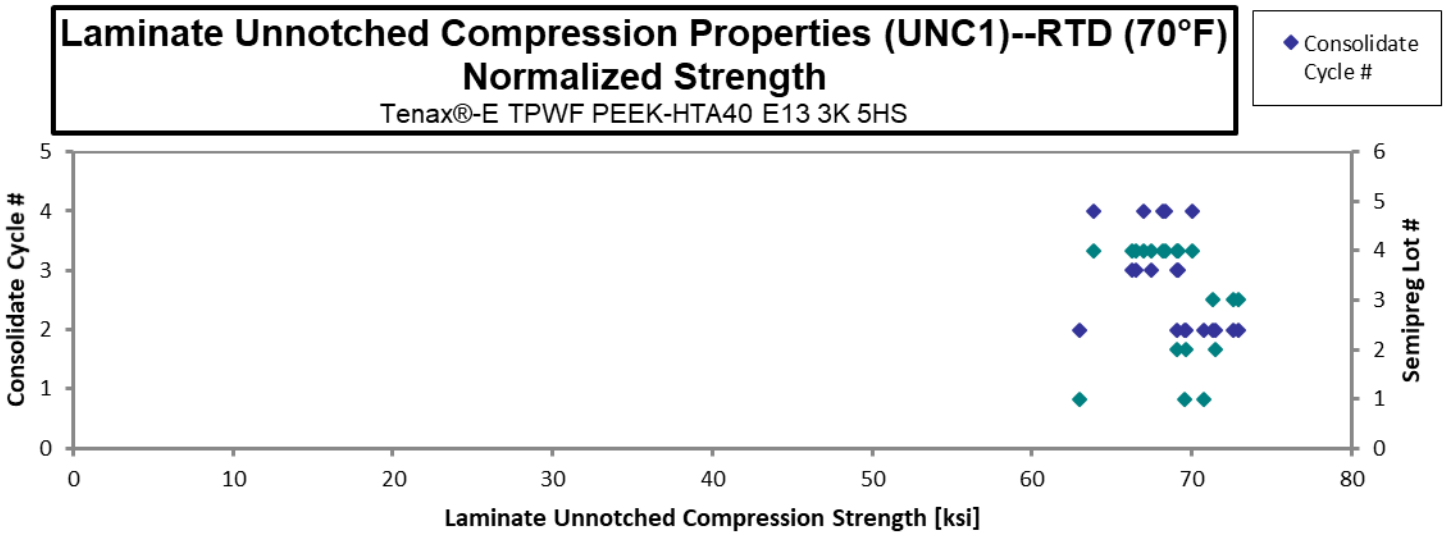
Laminate Unnotched Compression Properties (UNC1)--RTD (70°F)
Strength & Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

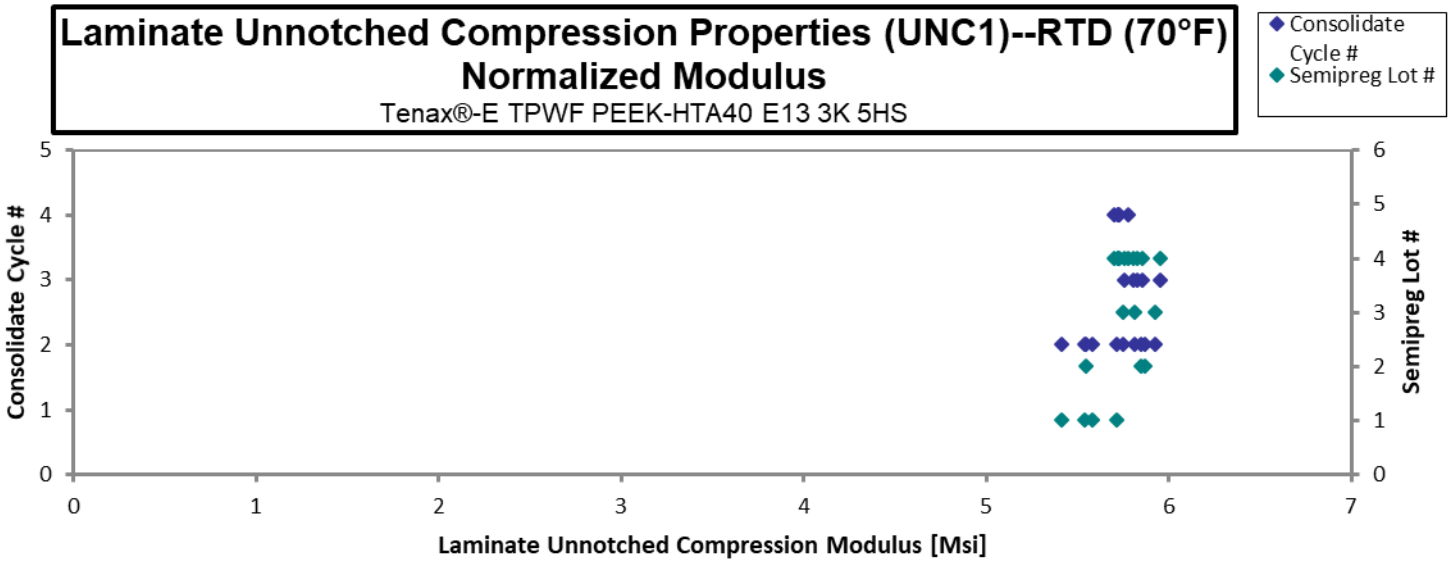
normalizing t_{ply} [in]
0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
NTP4013Q1-TTX-T40-E-UNC1-D-M3-RTD-1	4	3	66.61	5.765	0.09800	8	BAT	0.01225	66.55	5.760
NTP4013Q1-TTX-T40-E-UNC1-D-M3-RTD-2	4	3	69.04	5.802	0.09815	8	BAT	0.01227	69.09	5.806
NTP4013Q1-TTX-T40-E-UNC1-D-M3-RTD-3	4	3	67.46	5.826	0.09812	8	BGM	0.01226	67.48	5.828
NTP4013Q1-TTX-T40-E-UNC1-D-M3-RTD-4	4	3	69.14	5.854	0.09813	8	BAB	0.01227	69.18	5.857
NTP4013Q1-TTX-T40-E-UNC1-D-M3-RTD-5	4	3	66.56	5.975	0.09768	8	BAB	0.01221	66.29	5.951
NTP4013Q1-TTX-T40-E-UNC1-D-M4-RTD-1	4	4	68.04	5.787	0.09663	8	BGM	0.01208	67.04	5.702
NTP4013Q1-TTX-T40-E-UNC1-D-M4-RTD-2	4	4	69.47	5.818	0.09647	8	BAT	0.01206	68.33	5.722
NTP4013Q1-TTX-T40-E-UNC1-D-M4-RTD-3	4	4	69.31	5.817	0.09650	8	BGM	0.01206	68.19	5.724
NTP4013Q1-TTX-T40-E-UNC1-D-M4-RTD-4	4	4	71.02	5.811	0.09673	8	BAB	0.01209	70.04	5.731
NTP4013Q1-TTX-T40-E-UNC1-D-M4-RTD-5	4	4	64.00	5.787	0.09795	8	BGM	0.01224	63.91	5.779
NTP4013Q1-TTX-T40-E-UNC1-A-M2-RTD-13	1	2	61.95	5.447	0.09970	8	BGM	0.01246	62.98	5.537
NTP4013Q1-TTX-T40-E-UNC1-A-M2-RTD-14*	1	2		5.626	0.09970	8	CIB	0.01246		5.719
NTP4013Q1-TTX-T40-E-UNC1-A-M2-RTD-15	1	2	68.35	5.487	0.09979	8	BGM	0.01247	69.54	5.582
NTP4013Q1-TTX-T40-E-UNC1-A-M2-RTD-16	1	2	69.78	5.334	0.09950	8	BGM	0.01244	70.79	5.411
NTP4013Q1-TTX-T40-E-UNC1-B-M2-RTD-13	2	2	68.22	5.429	0.1002	8	BGM	0.01252	69.68	5.545
NTP4013Q1-TTX-T40-E-UNC1-B-M2-RTD-14	2	2	70.27	5.770	0.09982	8	BGM	0.01248	71.52	5.872
NTP4013Q1-TTX-T40-E-UNC1-B-M2-RTD-15	2	2	67.80	5.735	0.10000	8	BGM	0.01250	69.13	5.848
NTP4013Q1-TTX-T40-E-UNC1-C-M2-RTD-13	3	2	70.95	5.789	0.1003	8	BGM	0.01254	72.59	5.922
NTP4013Q1-TTX-T40-E-UNC1-C-M2-RTD-14	3	2	69.66	5.619	0.1004	8	BGM	0.01255	71.33	5.754
NTP4013Q1-TTX-T40-E-UNC1-C-M2-RTD-15	3	2	71.34	5.685	0.1002	8	BGM	0.01253	72.91	5.810

* Strength data removed due to bad failure mode

Average	**68.37**	**5.708**	**Average$_{norm}$**	**0.01234**	**68.77**	**5.743**
Standard Dev.	**2.367**	**0.1665**	**Standard Dev.$_{norm}$**		**2.653**	**0.1366**
Coeff. of Var. [%]	**3.462**	**2.918**	**Coeff. of Var. [%]$_{norm}$**		**3.858**	**2.378**
Min.	**61.95**	**5.334**	**Min.**	**0.01206**	**62.98**	**5.411**
Max.	**71.34**	**5.975**	**Max.**	**0.01255**	**72.91**	**5.951**
Number of Spec.	**19**	**20**	**Number of Spec.**	**20**	**19**	**20**


Laminate Unnotched Compression Properties (UNC1)--RTD (70°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Consolidate Cycle #
Semipreg Lot #
0
1
2
3
4
5
6
0
10
20
30
40
50
60
70
80
Laminate Unnotched Compression Strength [ksi]

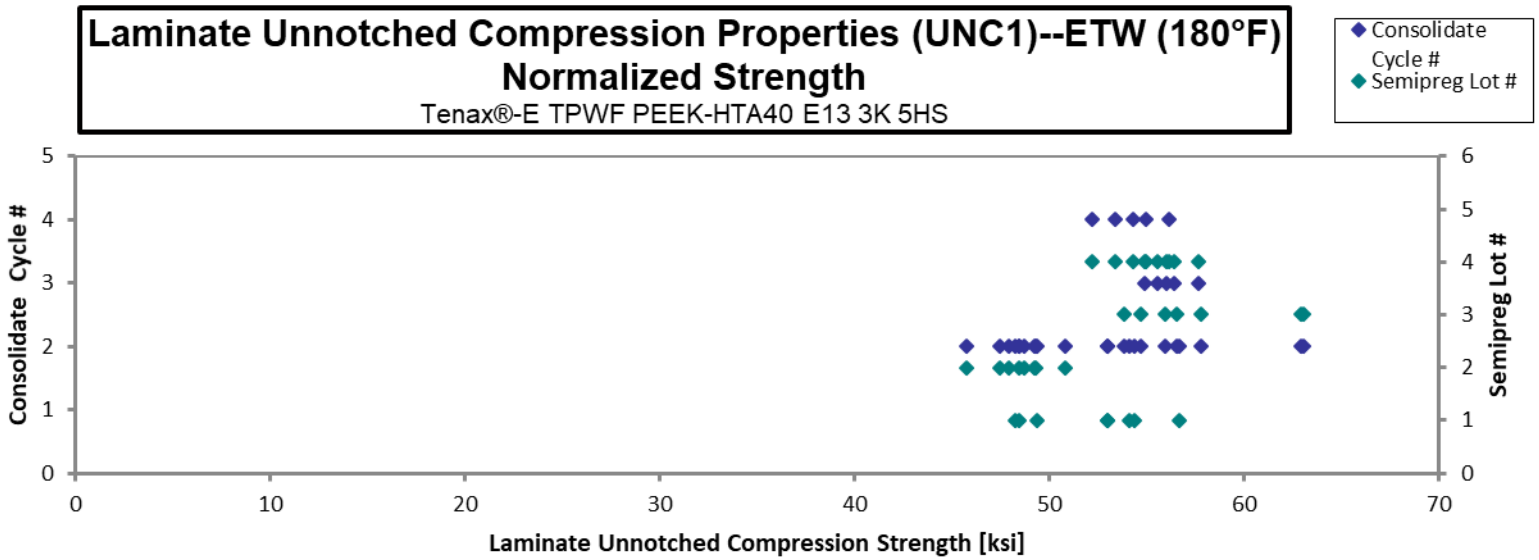

Laminate Unnotched Compression Properties (UNC1)--RTD (70°F)
Normalized Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
0
1
2
3
4
5
6
7
Laminate Unnotched Compression Modulus [Msi]

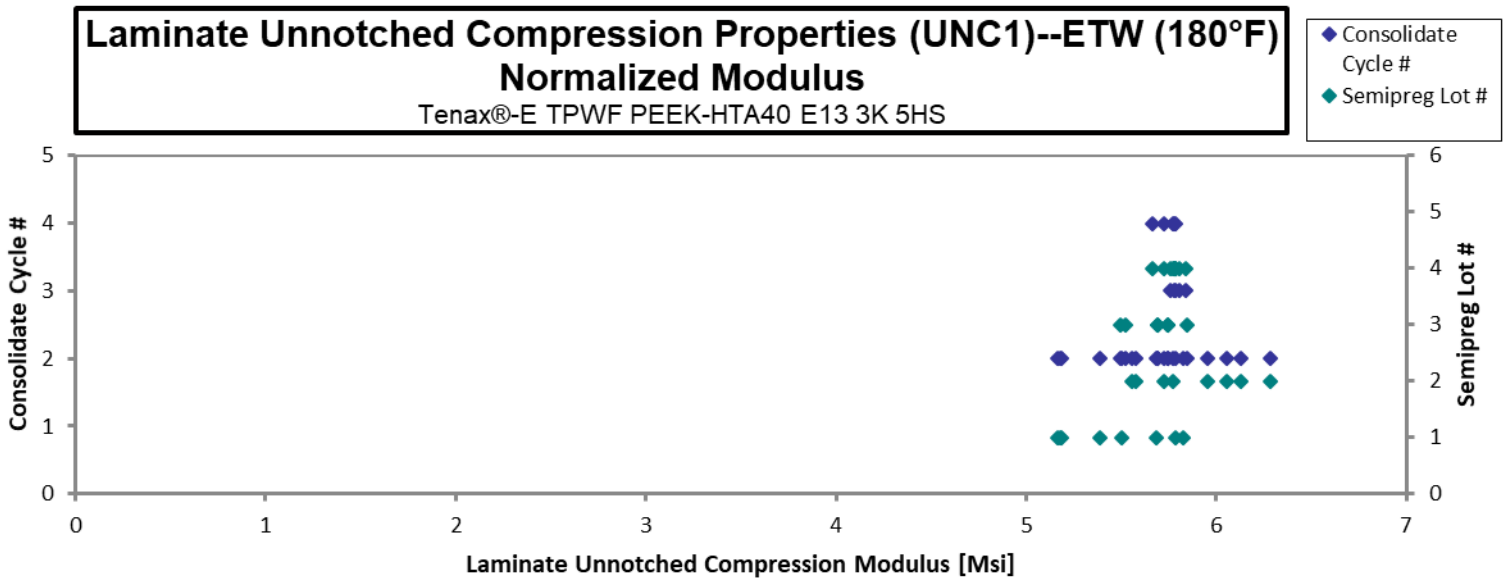
Laminate Unnotched Compression Properties (UNC1)--ETW (180°F)
Strength & Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

normalizing t_{ply} [in]: 0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
NTP4013Q1-TTX-T40-E-UNC1-D-M3-ETW-1	4	3	56.16	5.858	0.09780	8	BAB	0.01223	56.00	5.841
NTP4013Q1-TTX-T40-E-UNC1-D-M3-ETW-2	4	3	57.92	5.813	0.09763	8	M(B,H)GM	0.01220	57.65	5.787
NTP4013Q1-TTX-T40-E-UNC1-D-M3-ETW-3	4	3	55.86	5.809	0.09757	8	M(B,H)GM	0.01220	55.57	5.779
NTP4013Q1-TTX-T40-E-UNC1-D-M3-ETW-4	4	3	55.14	5.786	0.09765	8	BGM	0.01221	54.90	5.760
NTP4013Q1-TTX-T40-E-UNC1-D-M3-ETW-5	4	3	56.83	5.852	0.09733	8	M(B,H)GM	0.01217	56.40	5.808
NTP4013Q1-TTX-T40-E-UNC1-D-M4-ETW-1	4	4	53.34	5.770	0.09818	8	BAT	0.01227	53.40	5.776
NTP4013Q1-TTX-T40-E-UNC1-D-M4-ETW-2	4	4	54.44	5.794	0.09792	8	M(B,H)GM	0.01224	54.35	5.784
NTP4013Q1-TTX-T40-E-UNC1-D-M4-ETW-3	4	4	51.48	5.591	0.09942	8	BGM	0.01243	52.18	5.667
NTP4013Q1-TTX-T40-E-UNC1-D-M4-ETW-4	4	4	55.40	5.690	0.09948	8	BGM	0.01244	56.19	5.771
NTP4013Q1-TTX-T40-E-UNC1-D-M4-ETW-5	4	4	54.01	5.623	0.09985	8	M(B,H)GM	0.01248	54.98	5.724
NTP4013Q1-TTX-T40-E-UNC1-A-M2-ETW-17	1	2	55.66	5.091	0.09987	8	BGM	0.01248	56.68	5.183
NTP4013Q1-TTX-T40-E-UNC1-A-M2-ETW-18	1	2	48.56	5.300	0.09975	8	BGM	0.01247	49.39	5.390
NTP4013Q1-TTX-T40-E-UNC1-A-M2-ETW-19	1	2	47.68	5.098	0.09969	8	BGM	0.01246	48.46	5.182
NTP4013Q1-TTX-T40-E-UNC1-A-M2-ETW-20	1	2	47.51	5.081	0.09966	8	BGM	0.01246	48.28	5.163
NTP4013Q1-TTX-T40-E-UNC1-A-M2-ETW-21	1	2	53.40	5.608	0.09944	8	BGM	0.01243	54.14	5.685
NTP4013Q1-TTX-T40-E-UNC1-A-M2-ETW-22	1	2	52.34	5.713	0.09928	8	BGM	0.01241	52.98	5.783
NTP4013Q1-TTX-T40-E-UNC1-A-M2-ETW-23	1	2	52.40	5.764	0.09917	8	BGM	0.01240	52.98	5.828
NTP4013Q1-TTX-T40-E-UNC1-A-M2-ETW-24	1	2	53.81	5.447	0.09907	8	BGM	0.01238	54.35	5.502
NTP4013Q1-TTX-T40-E-UNC1-B-M2-ETW-17	2	2	46.65	6.021	0.09979	8	BGM	0.01247	47.47	6.126
NTP4013Q1-TTX-T40-E-UNC1-B-M2-ETW-18	2	2	50.08	5.870	0.09950	8	BGM	0.01244	50.81	5.955
NTP4013Q1-TTX-T40-E-UNC1-B-M2-ETW-19	2	2	48.59	5.968	0.09949	8	BGM	0.01244	49.28	6.053
NTP4013Q1-TTX-T40-E-UNC1-B-M2-ETW-20	2	2	47.30	6.200	0.09942	8	BGM	0.01243	47.95	6.285
NTP4013Q1-TTX-T40-E-UNC1-B-M2-ETW-21	2	2	45.28	5.708	0.09916	8	BGM	0.01240	45.78	5.770
NTP4013Q1-TTX-T40-E-UNC1-B-M2-ETW-22	2	2	48.76	5.497	0.09919	8	BGM	0.01240	49.31	5.559
NTP4013Q1-TTX-T40-E-UNC1-B-M2-ETW-23	2	2	48.02	5.677	0.09895	8	BGM	0.01237	48.45	5.728
NTP4013Q1-TTX-T40-E-UNC1-B-M2-ETW-24	2	2	48.33	5.528	0.09892	8	BGM	0.01237	48.75	5.575
NTP4013Q1-TTX-T40-E-UNC1-C-M2-ETW-17	3	2	54.94	5.419	0.09992	8	BGM	0.01249	55.97	5.520
NTP4013Q1-TTX-T40-E-UNC1-C-M2-ETW-18	3	2	52.74	5.627	0.1002	8	BGM	0.01252	53.85	5.747
NTP4013Q1-TTX-T40-E-UNC1-C-M2-ETW-19	3	2	53.55	5.722	0.1002	8	BGM	0.01252	54.70	5.845
NTP4013Q1-TTX-T40-E-UNC1-C-M2-ETW-20	3	2	55.59	5.595	0.09975	8	BGM	0.01247	56.54	5.690
NTP4013Q1-TTX-T40-E-UNC1-C-M2-ETW-21	3	2	62.07	5.653	0.09970	8	BGM	0.01246	63.09	5.746
NTP4013Q1-TTX-T40-E-UNC1-C-M2-ETW-22	3	2	61.86	5.404	0.09978	8	BGM	0.01247	62.93	5.497
NTP4013Q1-TTX-T40-E-UNC1-C-M2-ETW-23	3	2	56.92	5.601	0.09961	8	BGM	0.01245	57.81	5.688

	Strength [ksi]	Modulus [Msi]		$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
Average	52.81	5.642	$Average_{norm}$	53.38	5.703
Standard Dev.	4.222	0.2546	$Standard\ Dev._{norm}$	4.202	0.2440
Coeff. of Var. [%]	8.00	4.513	$Coeff.\ of\ Var.\ [\%]_{norm}$	7.871	4.279
Min.	45.28	5.081	Min.	45.78	5.163
Max.	62.07	6.200	Max.	63.09	6.285
Number of Spec.	33	33	Number of Spec.	33	33


Laminate Unnotched Compression Properties (UNC1)--ETW (180°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Unnotched Compression Strength [ksi]
0
10
20
30
40
50
60
70
0
1
2
3
4
5
6


Laminate Unnotched Compression Properties (UNC1)--ETW (180°F)
Normalized Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Unnotched Compression Modulus [Msi]
0
1
2
3
4
5
6
7
0
1
2
3
4
5
6

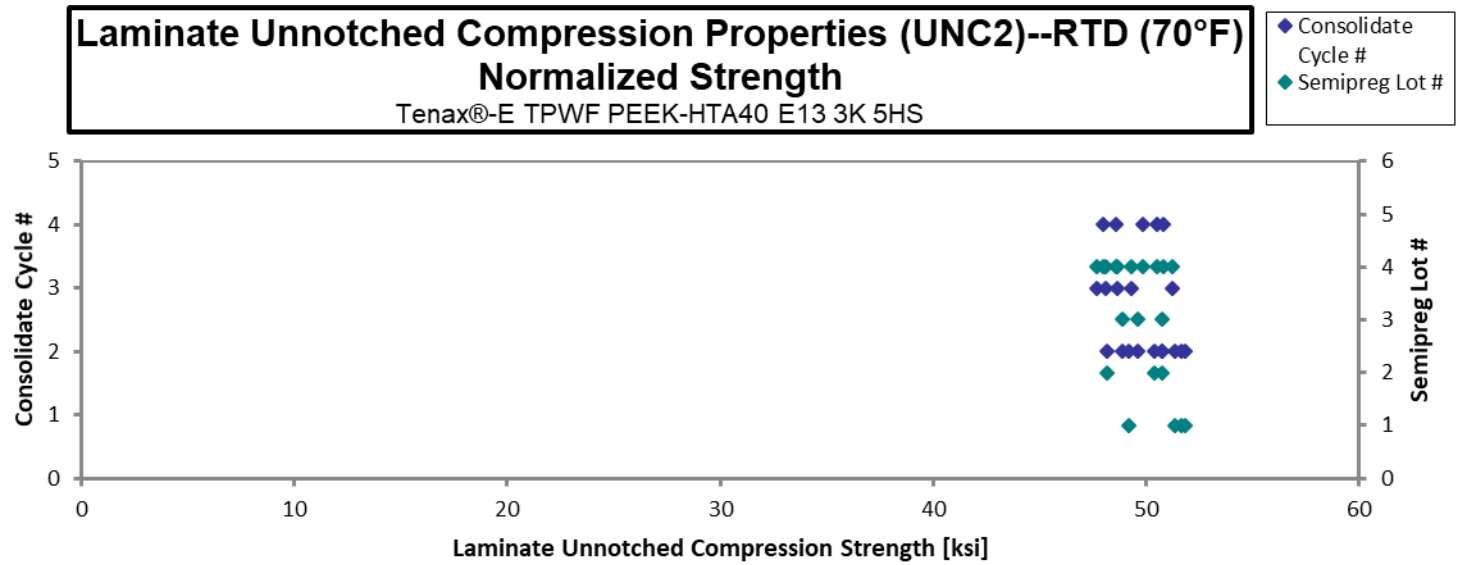
4.10 "10/80/10" Unnotched Compression 2 Properties (UNC2)

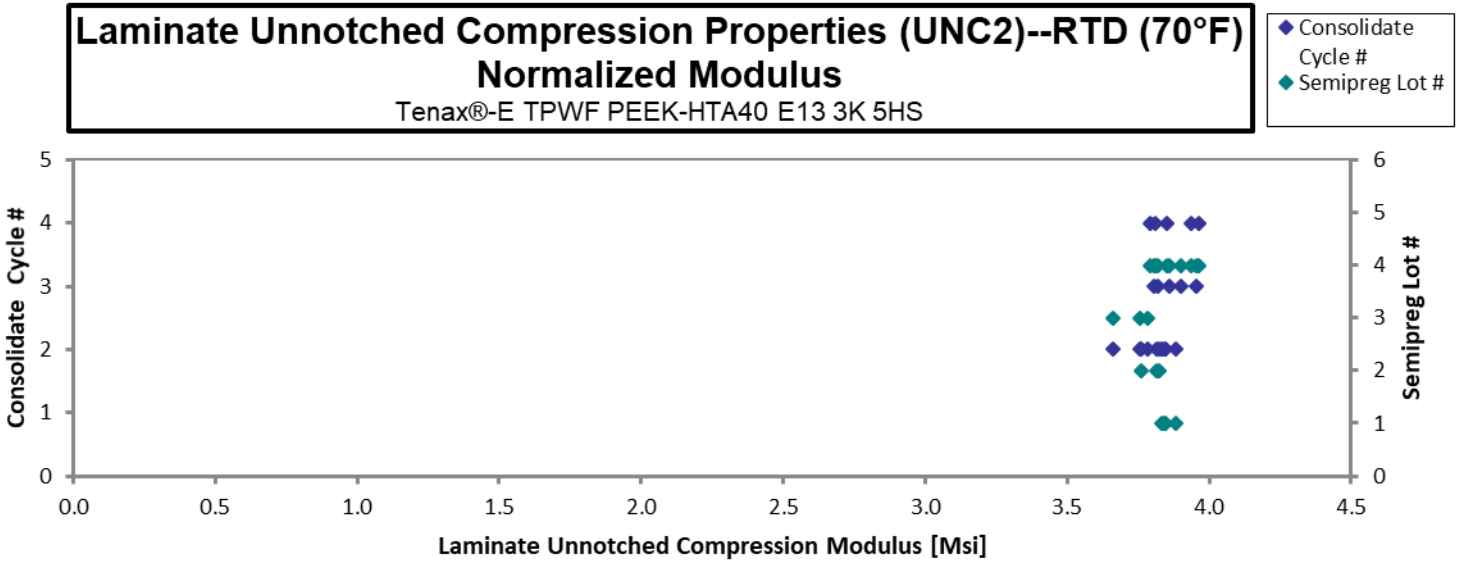
Laminate Unnotched Compression Properties (UNC2)--RTD (70°F)
Strength & Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

normalizing t_{ply} [in]: 0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
NTP4013Q1-TTX-T40-E-UNC2-D-M3-RTD-1	4	3	51.29	3.868	0.1224	10	BGM	0.01224	51.20	3.861
NTP4013Q1-TTX-T40-E-UNC2-D-M3-RTD-2	4	3	47.78	3.811	0.1224	10	BGM	0.01224	47.68	3.804
NTP4013Q1-TTX-T40-E-UNC2-D-M3-RTD-3	4	3	48.24	3.966	0.1222	10	BGM	0.01222	48.07	3.952
NTP4013Q1-TTX-T40-E-UNC2-D-M3-RTD-4	4	3	48.99	3.929	0.1218	10	BGM	0.01218	48.65	3.901
NTP4013Q1-TTX-T40-E-UNC2-D-M3-RTD-5	4	3	49.83	3.856	0.1214	10	BGM	0.01214	49.33	3.817
NTP4013Q1-TTX-T40-E-UNC2-D-M4-RTD-1	4	4	50.86	3.814	0.1225	10	BGM	0.01225	50.82	3.811
NTP4013Q1-TTX-T40-E-UNC2-D-M4-RTD-2	4	4	50.83	3.816	0.1218	10	BGM	0.01218	50.51	3.792
NTP4013Q1-TTX-T40-E-UNC2-D-M4-RTD-3	4	4	48.13	3.945	0.1223	10	BGM	0.01223	48.00	3.935
NTP4013Q1-TTX-T40-E-UNC2-D-M4-RTD-4	4	4	50.01	3.867	0.1221	10	BGM	0.01221	49.82	3.852
NTP4013Q1-TTX-T40-E-UNC2-D-M4-RTD-5	4	4	48.87	3.989	0.1219	10	BGM	0.01219	48.58	3.965
NTP4013Q1-TTX-T40-E-UNC2-A-M2-RTD-13	1	2	48.80	3.802	0.1236	10	BGM	0.01236	49.18	3.832
NTP4013Q1-TTX-T40-E-UNC2-A-M2-RTD-14	1	2	51.43	3.853	0.1235	10	BGM	0.01235	51.81	3.881
NTP4013Q1-TTX-T40-E-UNC2-A-M2-RTD-15	1	2	51.00	3.816	0.1234	10	BGM	0.01234	51.33	3.840
NTP4013Q1-TTX-T40-E-UNC2-A-M2-RTD-16	1	2	51.39	3.826	0.1233	10	BGM	0.01233	51.67	3.847
NTP4013Q1-TTX-T40-E-UNC2-B-M2-RTD-13	2	2	50.30	3.817	0.1228	10	BGM	0.01228	50.38	3.824
NTP4013Q1-TTX-T40-E-UNC2-B-M2-RTD-14	2	2	50.94	3.829	0.1221	10	BGM	0.01221	50.73	3.813
NTP4013Q1-TTX-T40-E-UNC2-B-M2-RTD-15	2	2	48.59	3.796	0.1215	10	BGM	0.01215	48.14	3.761
NTP4013Q1-TTX-T40-E-UNC2-C-M2-RTD-13	3	2	50.23	3.801	0.1211	10	BGM	0.01211	49.63	3.755
NTP4013Q1-TTX-T40-E-UNC2-C-M2-RTD-14	3	2	50.30	3.767	0.1192	10	BGM	0.01192	48.89	3.661
NTP4013Q1-TTX-T40-E-UNC2-C-M2-RTD-15	3	2	52.47	3.910	0.1186	10	BGM	0.01186	50.75	3.782

Average	**50.01**	**3.854**	**Average$_{norm}$**	**0.01220**	**49.76**	**3.834**
Standard Dev.	**1.310**	**0.0623**	**Standard Dev.$_{norm}$**		**1.321**	**0.07167**
Coeff. of Var. [%]	**2.619**	**1.616**	**Coeff. of Var. [%]$_{norm}$**		**2.655**	**1.869**
Min.	**47.78**	**3.767**	**Min.**	**0.01186**	**47.68**	**3.661**
Max.	**52.47**	**3.989**	**Max.**	**0.01236**	**51.81**	**3.965**
Number of Spec.	**20**	**20**	**Number of Spec.**	**20**	**20**	**20**


Laminate Unnotched Compression Properties (UNC2)--RTD (70°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Unnotched Compression Strength [ksi]

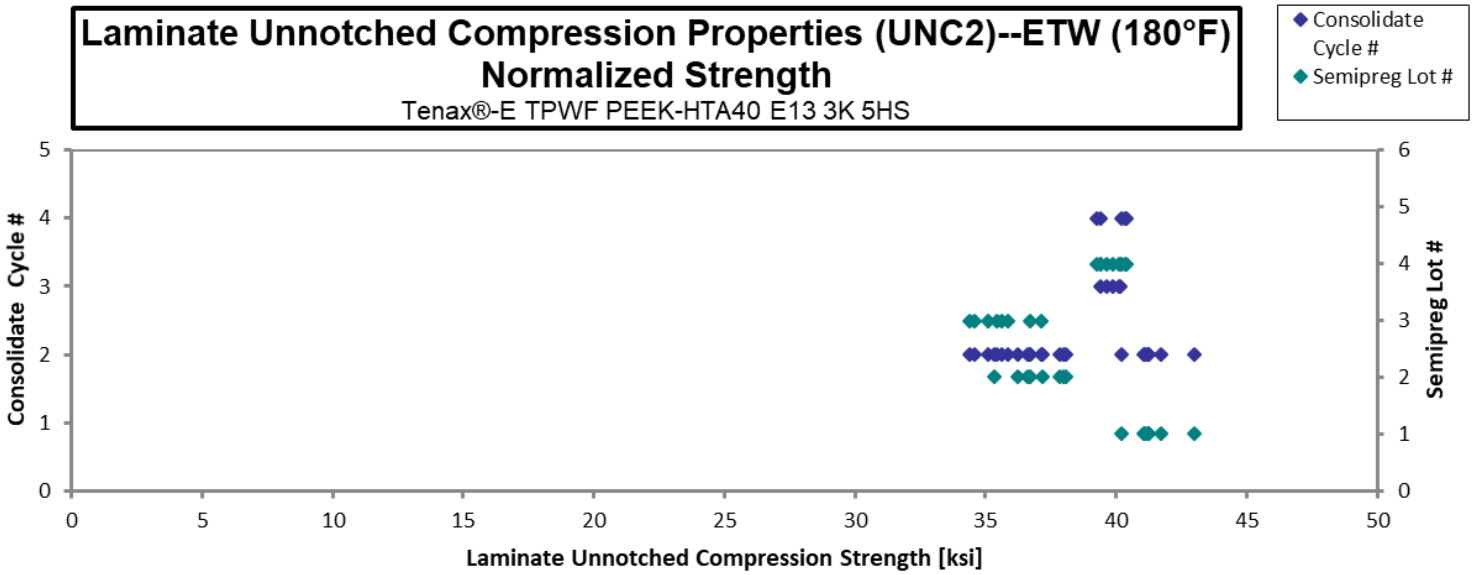

Laminate Unnotched Compression Properties (UNC2)--RTD (70°F)
Normalized Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Unnotched Compression Modulus [Msi]

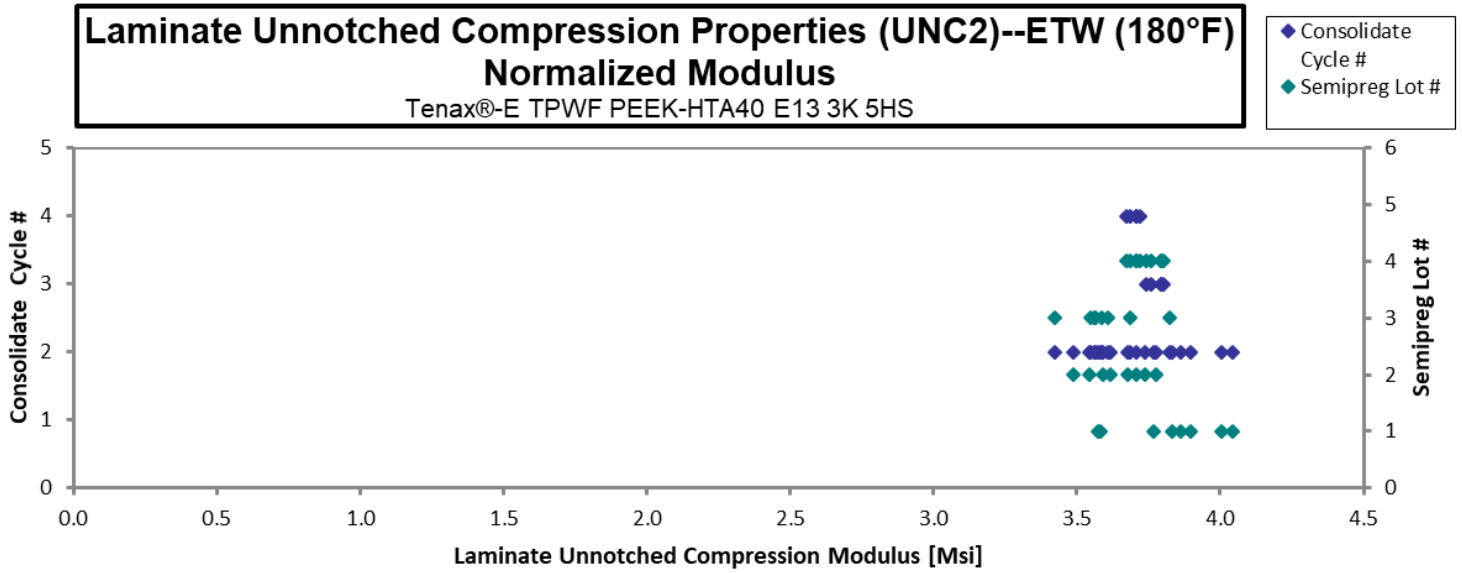
Laminate Unnotched Compression Properties (UNC2)--ETW (180°F)
Strength & Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

normalizing t_{ply} [in]: 0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
NTP4013Q1-TTX-T40-E-UNC2-D-M3-ETW-1	4	3	40.17	3.844	0.1210	10	BGM	0.01210	39.63	3.792
NTP4013Q1-TTX-T40-E-UNC2-D-M3-ETW-2	4	3	39.99	3.855	0.1209	10	BGM	0.01209	39.42	3.800
NTP4013Q1-TTX-T40-E-UNC2-D-M3-ETW-3	4	3	40.93	3.864	0.1204	10	BGM	0.01204	40.18	3.793
NTP4013Q1-TTX-T40-E-UNC2-D-M3-ETW-4	4	3	41.15	3.837	0.1195	10	BGM	0.01195	40.11	3.740
NTP4013Q1-TTX-T40-E-UNC2-D-M3-ETW-5	4	3	41.02	3.866	0.1192	10	BGM	0.01192	39.86	3.757
NTP4013Q1-TTX-T40-E-UNC2-D-M4-ETW-1	4	4	39.48	3.729	0.1219	10	BGM	0.01219	39.24	3.707
NTP4013Q1-TTX-T40-E-UNC2-D-M4-ETW-2	4	4	40.45	3.698	0.1223	10	BGM	0.01223	40.33	3.687
NTP4013Q1-TTX-T40-E-UNC2-D-M4-ETW-3	4	4	40.69	3.746	0.1217	10	BGM	0.01217	40.40	3.719
NTP4013Q1-TTX-T40-E-UNC2-D-M4-ETW-4	4	4	40.60	3.709	0.1214	10	BGM	0.01214	40.21	3.674
NTP4013Q1-TTX-T40-E-UNC2-D-M4-ETW-5	4	4	39.72	3.738	0.1216	10	BGM	0.01216	39.41	3.709
NTP4013Q1-TTX-T40-E-UNC2-A-M2-ETW-17	1	2	41.10	3.558	0.1231	10	BGM	0.01231	41.27	3.573
NTP4013Q1-TTX-T40-E-UNC2-A-M2-ETW-18	1	2	40.92	3.884	0.1230	10	BGM	0.01230	41.06	3.897
NTP4013Q1-TTX-T40-E-UNC2-A-M2-ETW-19	1	2	41.04	3.579	0.1228	10	BGM	0.01228	41.10	3.583
NTP4013Q1-TTX-T40-E-UNC2-A-M2-ETW-20	1	2	43.05	3.837	0.1225	10	BGM	0.01225	42.99	3.833
NTP4013Q1-TTX-T40-E-UNC2-A-M2-ETW-21	1	2	41.33	4.050	0.1224	10	BGM	0.01224	41.25	4.042
NTP4013Q1-TTX-T40-E-UNC2-A-M2-ETW-22	1	2	41.79	4.012	0.1224	10	BGM	0.01224	41.73	4.006
NTP4013Q1-TTX-T40-E-UNC2-A-M2-ETW-23	1	2	40.38	3.784	0.1221	10	BGM	0.01221	40.22	3.769
NTP4013Q1-TTX-T40-E-UNC2-A-M2-ETW-24	1	2	41.38	3.878	0.1221	10	BGM	0.01221	41.20	3.862
NTP4013Q1-TTX-T40-E-UNC2-B-M2-ETW-17	2	2	38.34	3.666	0.1210	10	BGM	0.01210	37.84	3.618
NTP4013Q1-TTX-T40-E-UNC2-B-M2-ETW-18	2	2	38.63	3.596	0.1209	10	BGM	0.01209	38.08	3.545
NTP4013Q1-TTX-T40-E-UNC2-B-M2-ETW-19	2	2	36.47	3.463	0.1235	10	BGM	0.01235	36.73	3.489
NTP4013Q1-TTX-T40-E-UNC2-B-M2-ETW-20	2	2	35.09	3.749	0.1234	10	BGM	0.01234	35.32	3.774
NTP4013Q1-TTX-T40-E-UNC2-B-M2-ETW-21	2	2	36.10	3.578	0.1230	10	BGM	0.01230	36.23	3.591
NTP4013Q1-TTX-T40-E-UNC2-B-M2-ETW-22	2	2	36.62	3.677	0.1226	10	SGM	0.01226	36.63	3.678
NTP4013Q1-TTX-T40-E-UNC2-B-M2-ETW-23	2	2	37.99	3.738	0.1225	10	BGM	0.01225	37.97	3.737
NTP4013Q1-TTX-T40-E-UNC2-B-M2-ETW-24	2	2	37.38	3.728	0.1219	10	BGM	0.01219	37.18	3.708
NTP4013Q1-TTX-T40-E-UNC2-C-M2-ETW-17	3	2	36.78	3.656	0.1195	10	BGM	0.01195	35.86	3.565
NTP4013Q1-TTX-T40-E-UNC2-C-M2-ETW-18	3	2	37.41	3.675	0.1203	10	BGM	0.01203	36.72	3.607
NTP4013Q1-TTX-T40-E-UNC2-C-M2-ETW-19	3	2	34.94	3.597	0.1214	10	BGM	0.01214	34.60	3.562
NTP4013Q1-TTX-T40-E-UNC2-C-M2-ETW-20	3	2	35.48	3.658	0.1189	10	BGM	0.01189	34.40	3.547
NTP4013Q1-TTX-T40-E-UNC2-C-M2-ETW-21	3	2	36.32	3.543	0.1185	10	BGM	0.01185	35.10	3.424
NTP4013Q1-TTX-T40-E-UNC2-C-M2-ETW-22	3	2	38.15	3.686	0.1194	10	BGM	0.01194	37.14	3.588
NTP4013Q1-TTX-T40-E-UNC2-C-M2-ETW-23	3	2	36.21	3.910	0.1199	10	BGM	0.01199	35.43	3.825
NTP4013Q1-TTX-T40-E-UNC2-C-M2-ETW-24	3	2	36.25	3.752	0.1204	10	BGM	0.01204	35.61	3.685

Average	**38.92**	**3.739**	**Average$_{norm}$**	**0.01214**	**38.54**	**3.703**
Standard Dev.	**2.283**	**0.1337**	**Standard Dev.$_{norm}$**		**2.386**	**0.1381**
Coeff. of Var. [%]	**5.864**	**3.576**	**Coeff. of Var. [%]$_{norm}$**		**6.191**	**3.730**
Min.	**34.94**	**3.463**	**Min.**	**0.01185**	**34.40**	**3.424**
Max.	**43.05**	**4.050**	**Max.**	**0.01235**	**42.99**	**4.042**
Number of Spec.	**34**	**34**	**Number of Spec.**	**34**	**34**	**34**


Laminate Unnotched Compression Properties (UNC2)--ETW (180°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Unnotched Compression Strength [ksi]


Laminate Unnotched Compression Properties (UNC2)--ETW (180°F)
Normalized Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Unnotched Compression Modulus [Msi]

4.11 "40/20/40" Unnotched Compression 3 Properties (UNC3)

Laminate Unnotched Compression Properties (UNC3)--RTD (70°F)
Strength & Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

normalizing t_{ply} [in]
0.01226

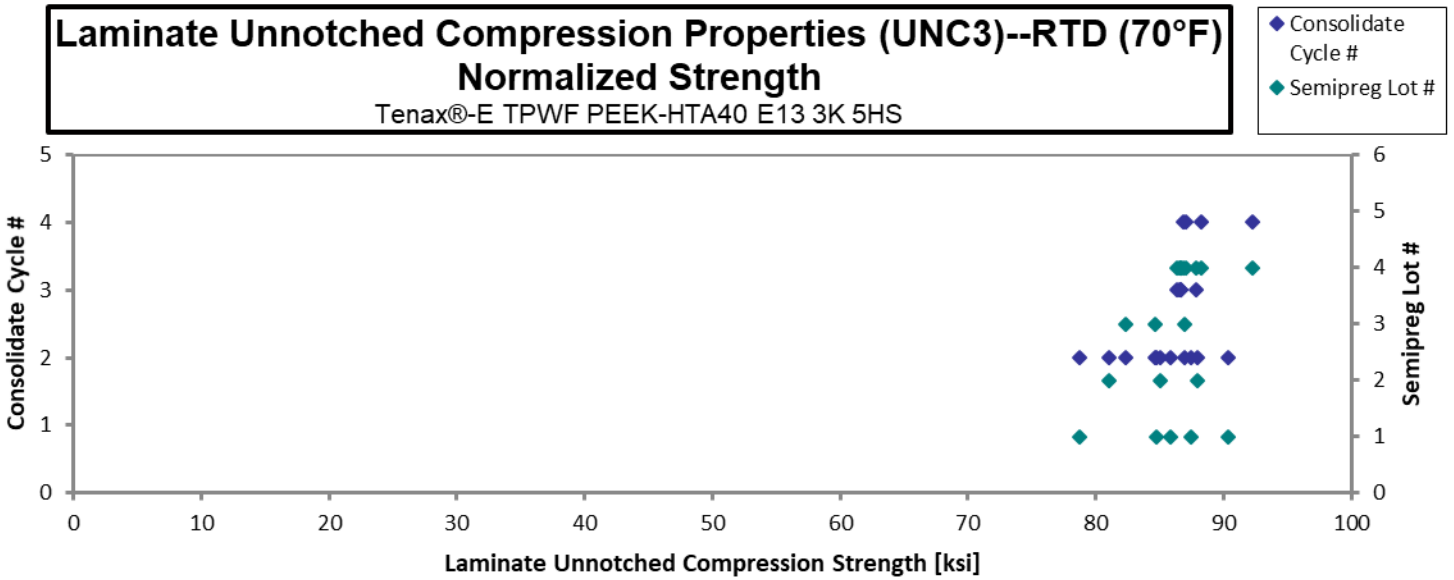
Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	*Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
NTP4013Q1-TTX-T40-E-UNC3-D-M3-RTD-1	4	3	87.15	7.258	0.1217	10	M(B,H)AB	0.01217	86.51	7.204
NTP4013Q1-TTX-T40-E-UNC3-D-M3-RTD-2	4	3	88.65	7.306	0.1215	10	BAB	0.01215	87.86	7.240
NTP4013Q1-TTX-T40-E-UNC3-D-M3-RTD-3	4	3	87.79	7.332	0.1210	10	BAB	0.01210	86.65	7.237
NTP4013Q1-TTX-T40-E-UNC3-D-M3-RTD-4	4	3	87.27	7.314	0.1213	10	M(B,H)AT	0.01213	86.34	7.236
NTP4013Q1-TTX-T40-E-UNC3-D-M3-RTD-5	4	3	87.72	7.170	0.1211	10	M(B,H)GM	0.01211	86.66	7.083
NTP4013Q1-TTX-T40-E-UNC3-D-M4-RTD-1	4	4	87.49	7.374	0.1217	10	BAB	0.01217	86.81	7.317
NTP4013Q1-TTX-T40-E-UNC3-D-M4-RTD-2	4	4	93.17	7.161	0.1215	10	BGM	0.01215	92.29	7.094
NTP4013Q1-TTX-T40-E-UNC3-D-M4-RTD-3	4	4	87.88	7.734	0.1215	10	BAT	0.01215	87.09	7.665
NTP4013Q1-TTX-T40-E-UNC3-D-M4-RTD-4	4	4	88.86	7.330	0.1218	10	M(B,H)AT	0.01218	88.28	7.282
NTP4013Q1-TTX-T40-E-UNC3-D-M4-RTD-5*	4	4		7.131	0.1216	10	HIT	0.01216		7.072
NTP4013Q1-TTX-T40-E-UNC3-A-M2-RTD-13	1	2	88.76	6.443	0.1208	10	BGM	0.01208	87.45	6.348
NTP4013Q1-TTX-T40-E-UNC3-A-M2-RTD-14*	1	2		6.602	0.1206	10	CIB	0.01206		6.495
NTP4013Q1-TTX-T40-E-UNC3-A-M2-RTD-15*	1	2		7.141	0.1197	10	CIT	0.01197		6.972
NTP4013Q1-TTX-T40-E-UNC3-A-M2-RTD-16	1	2	80.65	6.727	0.1197	10	BGM	0.01197	78.72	6.566
[R]NTP4013Q1-TTX-T40-E-UNC3-A-M2-RTD-1	1	2	93.95	7.447	0.1180	10	HAB	0.01180	90.42	7.166
[R]NTP4013Q1-TTX-T40-E-UNC3-A-M2-RTD-2*	1	2		7.271	0.1185	10	HIT	0.01185		7.026
[R]NTP4013Q1-TTX-T40-E-UNC3-A-M2-RTD-3[1]	1	2	88.67		0.1188	10	BGM	0.01188	85.89	
[R]NTP4013Q1-TTX-T40-E-UNC3-A-M2-RTD-4[1]	1	2	86.97		0.1195	10	BGM	0.01195	84.79	
NTP4013Q1-TTX-T40-E-UNC3-B-M2-RTD-13*	2	2		6.725	0.1233	10	CIT	0.01233		6.764
NTP4013Q1-TTX-T40-E-UNC3-B-M2-RTD-15	2	2	85.30	7.465	0.1222	10	BGM	0.01222	85.04	7.442
NTP4013Q1-TTX-T40-E-UNC3-B-M2-RTD-16*	2	2		7.517	0.1221	10	CIT	0.01221		7.488
[R]NTP4013Q1-TTX-T40-E-UNC3-B-M2-RTD-1	2	2	90.90	7.523	0.1186	10	BGM	0.01186	87.92	7.277
[R]NTP4013Q1-TTX-T40-E-UNC3-B-M2-RTD-2[1]	2	2	83.06		0.1196	10	BGM	0.01196	81.02	
NTP4013Q1-TTX-T40-E-UNC3-C-M2-RTD-13	3	2	85.51	6.694	0.1214	10	BGM	0.01214	84.64	6.625
NTP4013Q1-TTX-T40-E-UNC3-C-M2-RTD-14	3	2	88.20	6.920	0.1209	10	BGM	0.01209	86.98	6.825
NTP4013Q1-TTX-T40-E-UNC3-C-M2-RTD-15*	3	2		6.951	0.1208	10	CIT	0.01208		6.849
[R]NTP4013Q1-TTX-T40-E-UNC3-C-M2-RTD-1[1]	3	2	85.11		0.1186	10	BGM	0.01186	82.35	

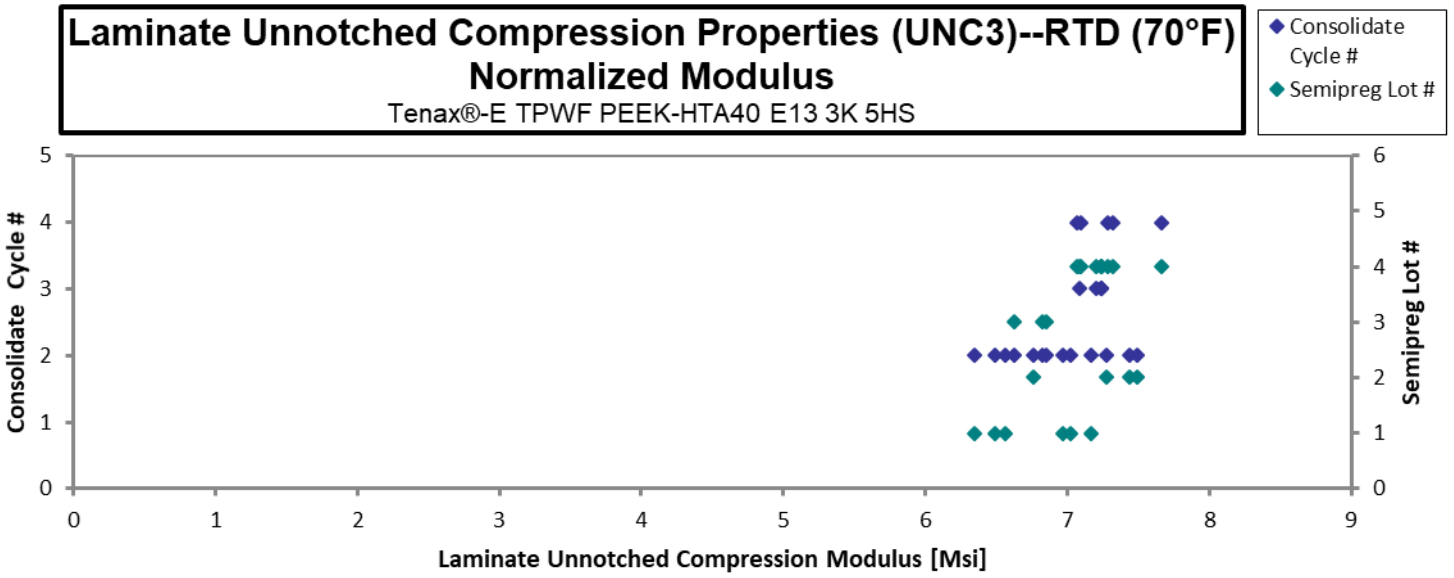
* Bad failure mode strength data were removed.

[1]Modulus data was not recorded.

[R] Retested specimen at NIAR

	Strength [ksi]	Modulus [Msi]			$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
Average	**87.65**	**7.154**		**$Average_{norm}$**	**0.01207**	**86.19**	**7.055**
Standard Dev.	**3.021**	**0.3342**		**Standard $Dev._{norm}$**		**3.011**	**0.3331**
Coeff. of Var. [%]	**3.446**	**4.671**		**Coeff. of Var. $[\%]_{norm}$**		**3.494**	**4.721**
Min.	**80.65**	**6.443**		**Min.**	**0.01180**	**78.72**	**6.348**
Max.	**93.95**	**7.734**		**Max.**	**0.01233**	**92.29**	**7.665**
Number of Spec.	**20**	**23**		**Number of Spec.**	**27**	**20**	**23**


Laminate Unnotched Compression Properties (UNC3)--RTD (70°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Unnotched Compression Strength [ksi]


Laminate Unnotched Compression Properties (UNC3)--RTD (70°F)
Normalized Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Unnotched Compression Modulus [Msi]

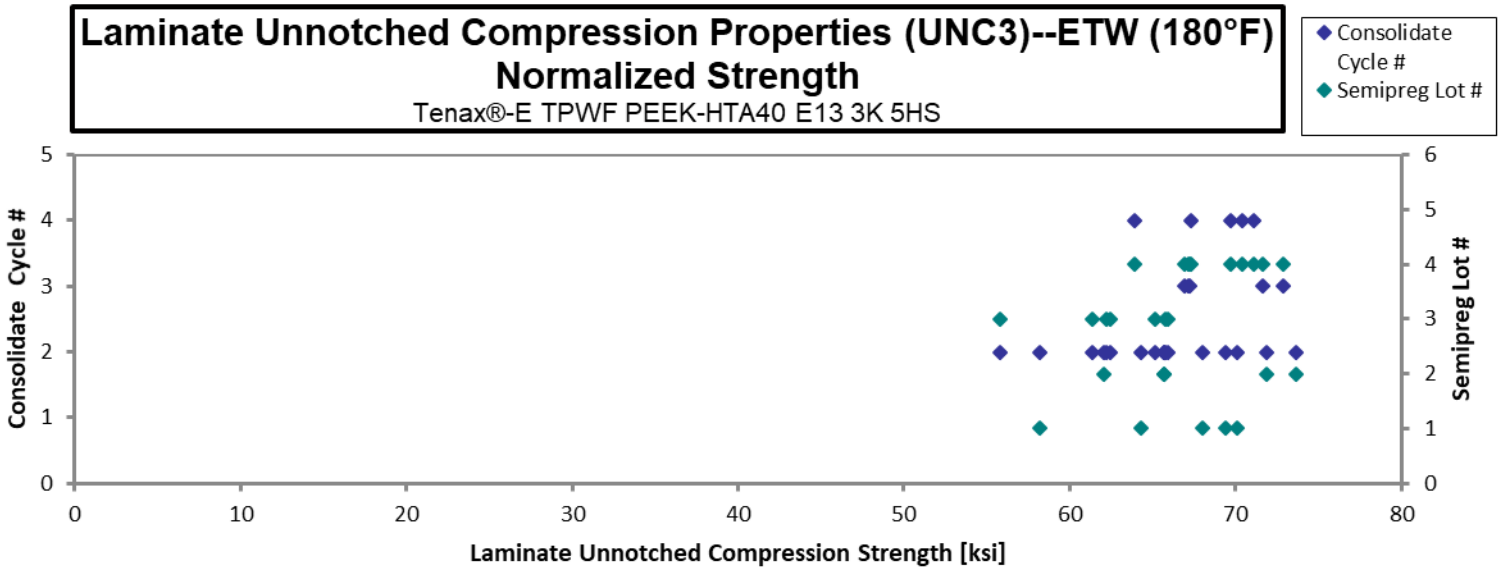
Laminate Unnotched Compression Properties (UNC3)--ETW (180°F)
Strength & Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

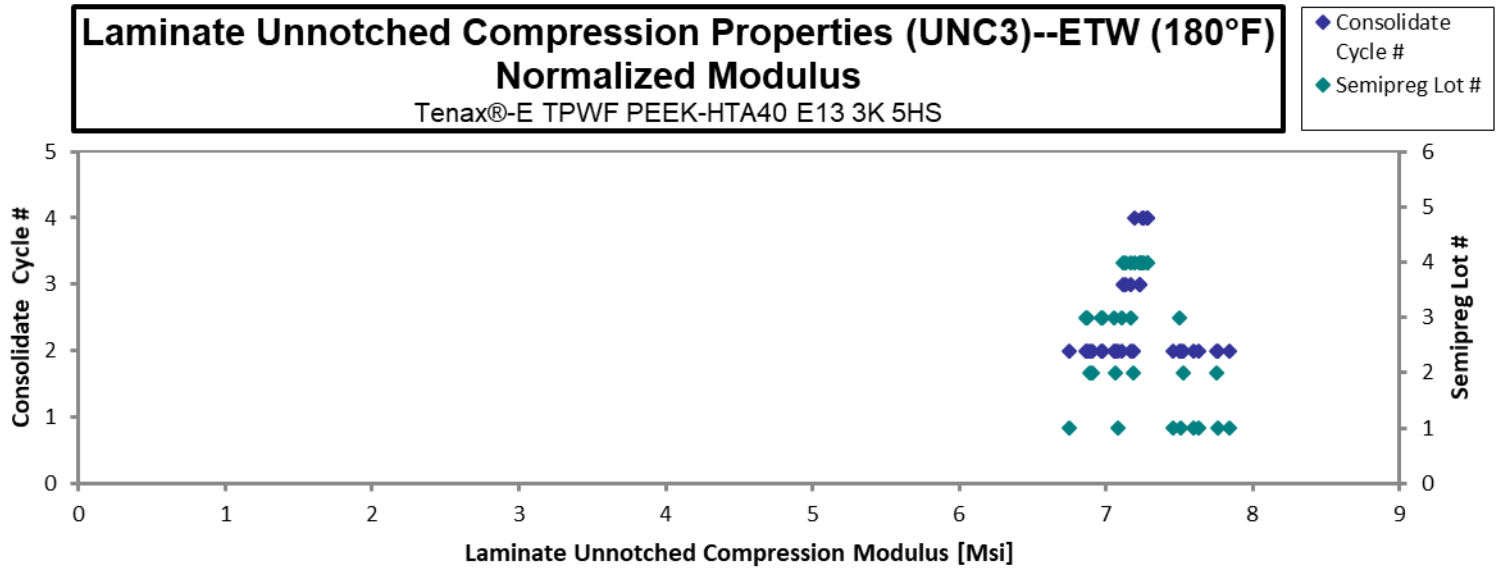
normalizing t_{ply} [in]: 0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	*Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
NTP4013Q1-TTX-T40-E-UNC3-D-M3-ETW-1	4	3	68.08	7.330	0.1209	10	M(B,H)AT	0.01209	67.16	7.230
NTP4013Q1-TTX-T40-E-UNC3-D-M3-ETW-2	4	3	68.25	7.377	0.1202	10	M(B,H)AT	0.01202	66.91	7.233
NTP4013Q1-TTX-T40-E-UNC3-D-M3-ETW-3	4	3	73.37	7.341	0.1197	10	BAB	0.01197	71.65	7.168
NTP4013Q1-TTX-T40-E-UNC3-D-M3-ETW-4	4	3	69.39	7.362	0.1188	10	M(B,H)GM	0.01188	67.22	7.132
NTP4013Q1-TTX-T40-E-UNC3-D-M3-ETW-5	4	3	75.68	7.383	0.1181	10	BGM	0.01181	72.91	7.113
NTP4013Q1-TTX-T40-E-UNC3-D-M4-ETW-1	4	4	70.15	7.293	0.1218	10	BGM	0.01218	69.71	7.247
NTP4013Q1-TTX-T40-E-UNC3-D-M4-ETW-2	4	4	70.71	7.318	0.1220	10	BGM	0.01220	70.38	7.285
NTP4013Q1-TTX-T40-E-UNC3-D-M4-ETW-3	4	4	67.41	7.213	0.1224	10	BGM	0.01224	67.27	7.199
NTP4013Q1-TTX-T40-E-UNC3-D-M4-ETW-4	4	4	64.19	7.313	0.1221	10	M(B,H)GM	0.01221	63.92	7.283
NTP4013Q1-TTX-T40-E-UNC3-D-M4-ETW-5	4	4	71.17	7.264	0.1224	10	M(B,H)GM	0.01224	71.07	7.253
NTP4013Q1-TTX-T40-E-UNC3-A-M2-ETW-17	1	2	72.32	6.968	0.1188	10	BGM	0.01188	70.08	6.753
NTP4013Q1-TTX-T40-E-UNC3-A-M2-ETW-18	1	2	66.51	7.324	0.1186	10	BGM	0.01186	64.33	7.083
NTP4013Q1-TTX-T40-E-UNC3-A-M2-ETW-19*	1	2		7.562	0.1217	10	CIB	0.01217		7.506
NTP4013Q1-TTX-T40-E-UNC3-A-M2-ETW-20	1	2	70.10	7.535	0.1213	10	BGM	0.01213	69.37	7.456
NTP4013Q1-TTX-T40-E-UNC3-A-M2-ETW-21	1	2	68.80	7.691	0.1212	10	BGM	0.01212	67.99	7.601
NTP4013Q1-TTX-T40-E-UNC3-A-M2-ETW-22*	1	2		7.798	0.1200	10	CIT	0.01200		7.631
NTP4013Q1-TTX-T40-E-UNC3-A-M2-ETW-23*	1	2		7.901	0.1205	10	CIT	0.01205		7.766
NTP4013Q1-TTX-T40-E-UNC3-A-M2-ETW-24	1	2	59.45	8.009	0.1200	10	BGM	0.01200	58.19	7.839
NTP4013Q1-TTX-T40-E-UNC3-B-M2-ETW-18	2	2	66.18	7.234	0.1217	10	BGM	0.01217	65.72	7.184
NTP4013Q1-TTX-T40-E-UNC3-B-M2-ETW-19	2	2	73.09	6.844	0.1235	10	BGM	0.01235	73.61	6.892
NTP4013Q1-TTX-T40-E-UNC3-B-M2-ETW-20	2	2	71.31	6.857	0.1235	10	BGM	0.01235	71.84	6.908
NTP4013Q1-TTX-T40-E-UNC3-B-M2-ETW-21*	2	2		7.027	0.1233	10	CIT	0.01233		7.068
NTP4013Q1-TTX-T40-E-UNC3-B-M2-ETW-22	2	2	65.39	7.716	0.1231	10	BGM	0.01231	65.68	7.750
NTP4013Q1-TTX-T40-E-UNC3-B-M2-ETW-24	2	2	61.84	7.499	0.1231	10	BGM	0.01231	62.09	7.529
NTP4013Q1-TTX-T40-E-UNC3-C-M2-ETW-17	3	2	66.80	7.094	0.1206	10	BGM	0.01206	65.73	6.980
NTP4013Q1-TTX-T40-E-UNC3-C-M2-ETW-18	3	2	63.34	7.634	0.1204	10	BGM	0.01204	62.22	7.499
NTP4013Q1-TTX-T40-E-UNC3-C-M2-ETW-19	3	2	66.48	7.169	0.1215	10	BGM	0.01215	65.88	7.104
NTP4013Q1-TTX-T40-E-UNC3-C-M2-ETW-20*	3	2		6.933	0.1213	10	HIT	0.01213		6.860
NTP4013Q1-TTX-T40-E-UNC3-C-M2-ETW-21	3	2	63.20	7.055	0.1211	10	BGM	0.01211	62.44	6.970
NTP4013Q1-TTX-T40-E-UNC3-C-M2-ETW-22	3	2	62.29	7.272	0.1208	10	BGM	0.01208	61.38	7.166
NTP4013Q1-TTX-T40-E-UNC3-C-M2-ETW-23	3	2	56.51	7.148	0.1210	10	BGM	0.01210	55.77	7.055
NTP4013Q1-TTX-T40-E-UNC3-C-M2-ETW-24	3	2	65.90	6.949	0.1212	10	BGM	0.01212	65.17	6.872

* Bad failure mode strength data removed

	Strength [ksi]	Modulus [Msi]		t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
Average	**67.33**	**7.325**	**$Average_{norm}$**	**0.01211**	**66.51**	**7.238**
Standard Dev.	**4.454**	**0.2960**	**Standard $Dev._{norm}$**		**4.375**	**0.2834**
Coeff. of Var. [%]	**6.616**	**4.041**	**Coeff. of Var. $[\%]_{norm}$**		**6.578**	**3.915**
Min.	**56.51**	**6.844**	**Min.**	**0.01181**	**55.77**	**6.753**
Max.	**75.68**	**8.009**	**Max.**	**0.01235**	**73.61**	**7.839**
Number of Spec.	**27**	**32**	**Number of Spec.**	**32**	**27**	**32**


Laminate Unnotched Compression Properties (UNC3)--ETW (180°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Unnotched Compression Strength [ksi]


Laminate Unnotched Compression Properties (UNC3)--ETW (180°F)
Normalized Modulus
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Unnotched Compression Modulus [Msi]

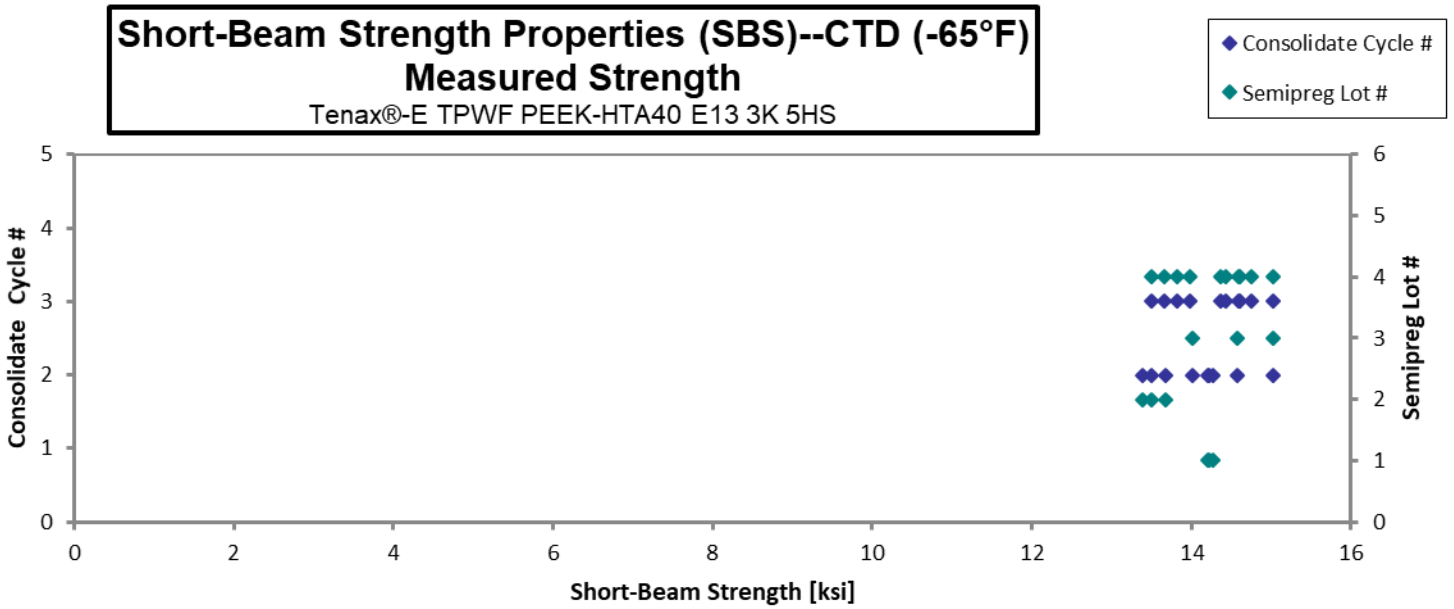
4.12 Lamina Short-Beam Strength Properties (SBS)

Short-Beam Strength Properties (SBS)--CTD (-65°F)
Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode
NTP4013Q1-TTX-T40-E-SBS-D-M3-CTD-1	4	3	13.98	0.2387	20	0.01193	INTERLAMINAR SHEAR, COMPRESSION
NTP4013Q1-TTX-T40-E-SBS-D-M3-CTD-2	4	3	14.60	0.2388	20	0.01194	INTERLAMINAR SHEAR, COMPRESSION, TENSION
NTP4013Q1-TTX-T40-E-SBS-D-M3-CTD-3	4	3	13.66	0.2389	20	0.01195	COMPRESSION
NTP4013Q1-TTX-T40-E-SBS-D-M3-CTD-4	4	3	14.43	0.2388	20	0.01194	INTERLAMINAR SHEAR, COMPRESSION, TENSION
NTP4013Q1-TTX-T40-E-SBS-D-M3-CTD-5	4	3	15.02	0.2388	20	0.01194	INTERLAMINAR SHEAR, COMPRESSION
NTP4013Q1-TTX-T40-E-SBS-D-M3-CTD-6	4	3	14.36	0.2386	20	0.01193	INTERLAMINAR SHEAR, COMPRESSION, TENSION
NTP4013Q1-TTX-T40-E-SBS-D-M3-CTD-7	4	3	13.82	0.2389	20	0.01195	INTERLAMINAR SHEAR, COMPRESSION
NTP4013Q1-TTX-T40-E-SBS-D-M3-CTD-8	4	3	14.75	0.2383	20	0.01192	INTERLAMINAR SHEAR, COMPRESSION
NTP4013Q1-TTX-T40-E-SBS-D-M3-CTD-9	4	3	13.50	0.2378	20	0.01189	INTERLAMINAR SHEAR, COMPRESSION
NTP4013Q1-TTX-T40-E-SBS-D-M3-CTD-10	4	3	14.60	0.2373	20	0.01187	INTERLAMINAR SHEAR, COMPRESSION
NTP4013Q1-TTX-T40-E-SBS-A-M2-1-CTD-1	1	2	14.20	0.2380	20	0.01190	INTERLAMINAR SHEAR, COMPRESSION
NTP4013Q1-TTX-T40-E-SBS-A-M2-1-CTD-3	1	2	14.23	0.2390	20	0.01195	INTERLAMINAR SHEAR, COMPRESSION
NTP4013Q1-TTX-T40-E-SBS-A-M2-1-CTD-4	1	2	14.26	0.2371	20	0.01185	INTERLAMINAR SHEAR
NTP4013Q1-TTX-T40-E-SBS-B-M2-1-CTD-1	2	2	13.49	0.2378	20	0.01189	INTERLAMINAR SHEAR, COMPRESSION
NTP4013Q1-TTX-T40-E-SBS-B-M2-1-CTD-2	2	2	13.68	0.2388	20	0.01194	INTERLAMINAR SHEAR, COMPRESSION
NTP4013Q1-TTX-T40-E-SBS-B-M2-1-CTD-3	2	2	13.39	0.2368	20	0.01184	INTERLAMINAR SHEAR, COMPRESSION
NTP4013Q1-TTX-T40-E-SBS-C-M2-1-CTD-1	3	2	14.57	0.2402	20	0.01201	INTERLAMINAR SHEAR, COMPRESSION
NTP4013Q1-TTX-T40-E-SBS-C-M2-1-CTD-2	3	2	14.01	0.2389	20	0.01195	INTERLAMINAR SHEAR, COMPRESSION
NTP4013Q1-TTX-T40-E-SBS-C-M2-1-CTD-3	3	2	15.02	0.2405	20	0.01203	INTERLAMINAR SHEAR, COMPRESSION, TENSION

Note: SPAN TO THICKNESS RATIO: 3.5:1 WAS USED FOR ALL SBS TESTING.

Average	**14.19**	**0.01193**
Standard Dev.	**0.5075**	
Coeff. of Var. [%]	**3.577**	
Min.	**13.39**	**0.01184**
Max.	**15.02**	**0.01203**
Number of Spec.	**19**	**19**

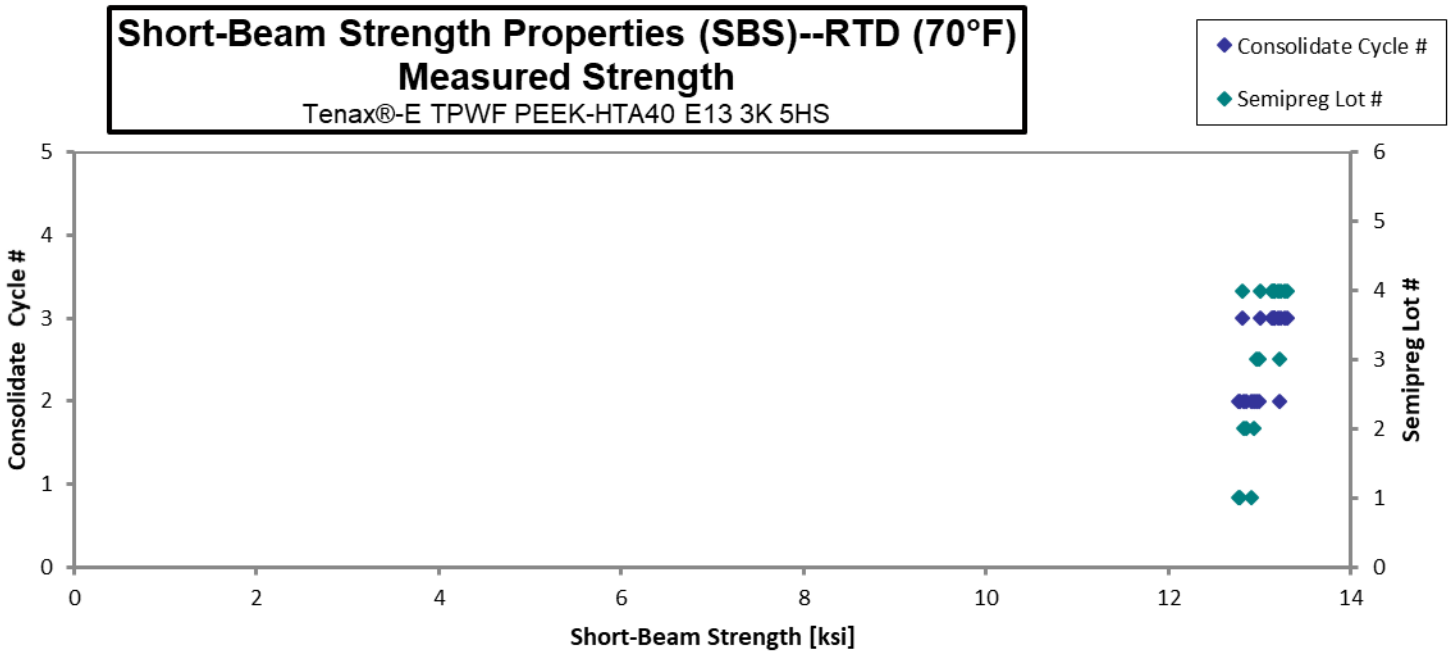

Short-Beam Strength Properties (SBS)--CTD (-65°F)
Measured Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Short-Beam Strength [ksi]
0
1
2
3
4
5
6
0
2
4
6
8
10
12
14
16

Short-Beam Strength Properties (SBS)--RTD (70°F)
Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode
NTP4013Q1-TTX-T40-E-SBS-D-M3-RTD-1	4	3	13.00	0.2359	20	0.01179	INTERLAMINAR SHEAR, TENSION, COMPRESSION
NTP4013Q1-TTX-T40-E-SBS-D-M3-RTD-2	4	3	12.81	0.2352	20	0.01176	INTERLAMINAR SHEAR, TENSION, COMPRESSION
NTP4013Q1-TTX-T40-E-SBS-D-M3-RTD-3	4	3	13.30	0.2343	20	0.01172	INTERLAMINAR SHEAR, TENSION, COMPRESSION
NTP4013Q1-TTX-T40-E-SBS-D-M3-RTD-4	4	3	13.16	0.2333	20	0.01166	INTERLAMINAR SHEAR, TENSION, COMPRESSION
NTP4013Q1-TTX-T40-E-SBS-D-M3-RTD-5	4	3	13.23	0.2413	20	0.01207	INTERLAMINAR SHEAR, TENSION, COMPRESSION
NTP4013Q1-TTX-T40-E-SBS-D-M3-RTD-6	4	3	13.27	0.2412	20	0.01206	INTERLAMINAR SHEAR, TENSION, COMPRESSION
NTP4013Q1-TTX-T40-E-SBS-D-M3-RTD-7	4	3	13.15	0.2413	20	0.01207	INTERLAMINAR SHEAR, TENSION, COMPRESSION
NTP4013Q1-TTX-T40-E-SBS-D-M3-RTD-8	4	3	13.20	0.2412	20	0.01206	INTERLAMINAR SHEAR, TENSION, COMPRESSION
NTP4013Q1-TTX-T40-E-SBS-D-M3-RTD-9	4	3	13.13	0.2410	20	0.01205	INTERLAMINAR SHEAR, TENSION, COMPRESSION
NTP4013Q1-TTX-T40-E-SBS-D-M3-RTD-10	4	3	13.16	0.2408	20	0.01204	INTERLAMINAR SHEAR, TENSION, COMPRESSION
NTP4013Q1-TTX-T40-E-SBS-A-M2-1-RTD-1	1	2	12.91	0.2380	20	0.01190	INTERLAMINAR SHEAR, TENSION, COMPRESSION
NTP4013Q1-TTX-T40-E-SBS-A-M2-1-RTD-2	1	2	12.77	0.2382	20	0.01191	INTERLAMINAR SHEAR, TENSION, COMPRESSION
NTP4013Q1-TTX-T40-E-SBS-A-M2-1-RTD-4	1	2	12.76	0.2381	20	0.01190	INTERLAMINAR SHEAR, TENSION, COMPRESSION
NTP4013Q1-TTX-T40-E-SBS-B-M2-1-RTD-1	2	2	12.86	0.2367	20	0.01183	INTERLAMINAR SHEAR, TENSION, COMPRESSION
NTP4013Q1-TTX-T40-E-SBS-B-M2-1-RTD-3	2	2	12.82	0.2378	20	0.01189	INTERLAMINAR SHEAR, TENSION, COMPRESSION
NTP4013Q1-TTX-T40-E-SBS-B-M2-1-RTD-4	2	2	12.93	0.2376	20	0.01188	INTERLAMINAR SHEAR, TENSION, COMPRESSION
NTP4013Q1-TTX-T40-E-SBS-C-M2-1-RTD-1	3	2	12.99	0.2412	20	0.01206	INTERLAMINAR SHEAR, TENSION, COMPRESSION
NTP4013Q1-TTX-T40-E-SBS-C-M2-1-RTD-2	3	2	13.22	0.2387	20	0.01194	INTERLAMINAR SHEAR, TENSION, COMPRESSION
NTP4013Q1-TTX-T40-E-SBS-C-M2-1-RTD-4	3	2	12.96	0.2399	20	0.01200	INTERLAMINAR SHEAR, TENSION, COMPRESSION

Note: SPAN TO THICKNESS RATIO: 3.5:1 WAS USED FOR ALL SBS TESTING.

Average	**13.03**	**0.01193**
Standard Dev.	**0.1796**	
Coeff. of Var. [%]	**1.378**	
Min.	**12.76**	**0.01166**
Max.	**13.30**	**0.01207**
Number of Spec.	**19**	**19**

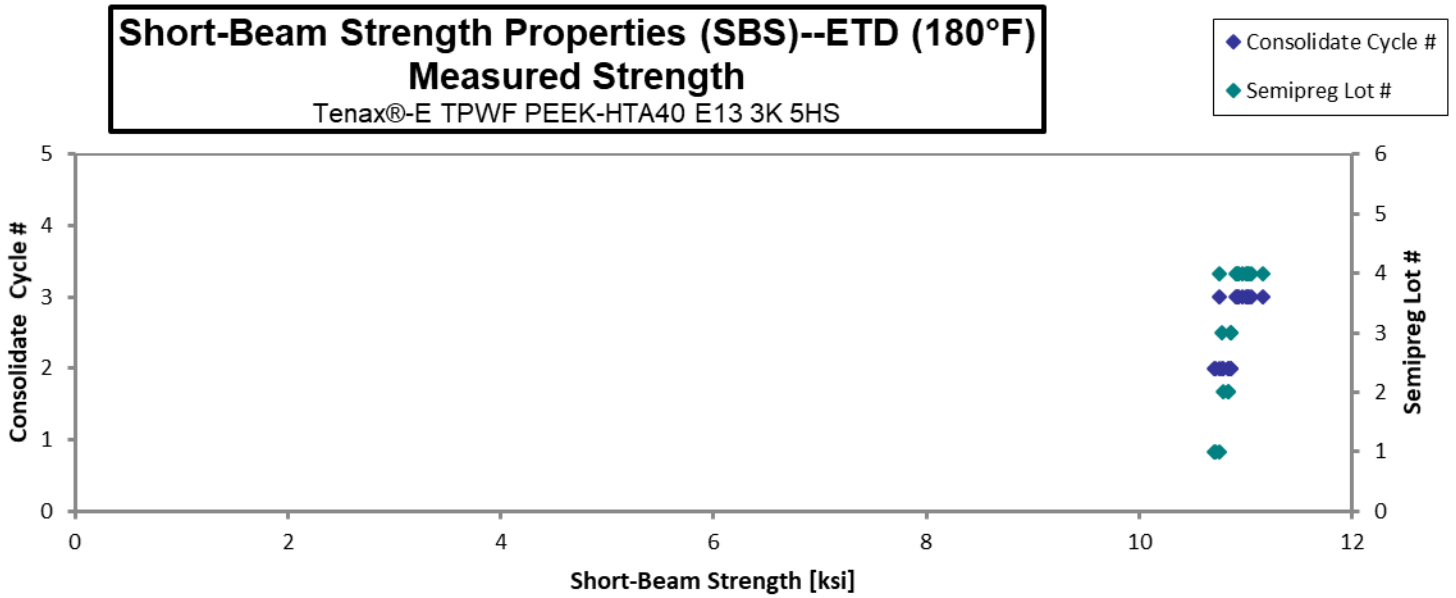

Short-Beam Strength Properties (SBS)--RTD (70°F)
Measured Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Short-Beam Strength [ksi]
0
1
2
3
4
5
6
0
2
4
6
8
10
12
14

Short-Beam Strength Properties (SBS)--ETD (180°F)
Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode
NTP4013Q1-TTX-T40-E-SBS-D-M3-ETD-1	4	3	11.17	0.2402	20	0.01201	INTERLAMINAR SHEAR, TENSION, COMPRESSION, INELASTIC DEFORMATION
NTP4013Q1-TTX-T40-E-SBS-D-M3-ETD-2	4	3	11.06	0.2400	20	0.01200	INTERLAMINAR SHEAR, TENSION, COMPRESSION, INELASTIC DEFORMATION
NTP4013Q1-TTX-T40-E-SBS-D-M3-ETD-3	4	3	11.00	0.2394	20	0.01197	INTERLAMINAR SHEAR, TENSION, COMPRESSION, INELASTIC DEFORMATION
NTP4013Q1-TTX-T40-E-SBS-D-M3-ETD-4	4	3	11.03	0.2389	20	0.01194	INTERLAMINAR SHEAR, TENSION, COMPRESSION, INELASTIC DEFORMATION
NTP4013Q1-TTX-T40-E-SBS-D-M3-ETD-5	4	3	11.01	0.2384	20	0.01192	INTERLAMINAR SHEAR, TENSION, COMPRESSION, INELASTIC DEFORMATION
NTP4013Q1-TTX-T40-E-SBS-D-M3-ETD-6	4	3	10.93	0.2377	20	0.01188	INTERLAMINAR SHEAR, TENSION, COMPRESSION, INELASTIC DEFORMATION
NTP4013Q1-TTX-T40-E-SBS-D-M3-ETD-7	4	3	10.92	0.2362	20	0.01181	INTERLAMINAR SHEAR, TENSION, COMPRESSION, INELASTIC DEFORMATION
NTP4013Q1-TTX-T40-E-SBS-D-M3-ETD-8	4	3	10.76	0.2356	20	0.01178	INTERLAMINAR SHEAR, TENSION, COMPRESSION, INELASTIC DEFORMATION
NTP4013Q1-TTX-T40-E-SBS-D-M3-ETD-9	4	3	10.97	0.2432	20	0.01216	INTERLAMINAR SHEAR, TENSION, COMPRESSION, INELASTIC DEFORMATION
NTP4013Q1-TTX-T40-E-SBS-D-M3-ETD-10	4	3	10.92	0.2431	20	0.01215	INTERLAMINAR SHEAR, TENSION, COMPRESSION, INELASTIC DEFORMATION
NTP4013Q1-TTX-T40-E-SBS-A-M2-1-ETD-1	1	2	10.72	0.2387	20	0.01193	INTERLAMINAR SHEAR, TENSION, COMPRESSION, INELASTIC DEFORMATION
NTP4013Q1-TTX-T40-E-SBS-A-M2-1-ETD-2	1	2	10.76	0.2393	20	0.01196	INTERLAMINAR SHEAR, TENSION, COMPRESSION, INELASTIC DEFORMATION
NTP4013Q1-TTX-T40-E-SBS-A-M2-1-ETD-3	1	2	10.71	0.2394	20	0.01197	INTERLAMINAR SHEAR, TENSION, COMPRESSION, INELASTIC DEFORMATION
NTP4013Q1-TTX-T40-E-SBS-B-M2-1-ETD-1	2	2	10.79	0.2384	20	0.01192	INTERLAMINAR SHEAR, TENSION, COMPRESSION
NTP4013Q1-TTX-T40-E-SBS-B-M2-1-ETD-2	2	2	10.84	0.2387	20	0.01194	INTERLAMINAR SHEAR, TENSION, COMPRESSION
NTP4013Q1-TTX-T40-E-SBS-B-M2-1-ETD-3	2	2	10.84	0.2383	20	0.01191	INTERLAMINAR SHEAR, TENSION, COMPRESSION
NTP4013Q1-TTX-T40-E-SBS-C-M2-1-ETD-1	3	2	10.86	0.2409	20	0.01204	INTERLAMINAR SHEAR, TENSION, COMPRESSION, INELASTIC DEFORMATION
NTP4013Q1-TTX-T40-E-SBS-C-M2-1-ETD-2	3	2	10.87	0.2415	20	0.01208	INTERLAMINAR SHEAR, TENSION, COMPRESSION, INELASTIC DEFORMATION
NTP4013Q1-TTX-T40-E-SBS-C-M2-1-ETD-3	3	2	10.78	0.2415	20	0.01208	INTERLAMINAR SHEAR, TENSION, COMPRESSION, INELASTIC DEFORMATION

Note: SPAN TO THICKNESS RATIO: 3.5:1 WAS USED FOR ALL SBS TESTING.

Average	**10.89**	**0.01197**
Standard Dev.	**0.1263**	
Coeff. of Var. [%]	**1.159**	
Min.	**10.71**	**0.01178**
Max.	**11.17**	**0.01216**
Number of Spec.	**19**	**19**

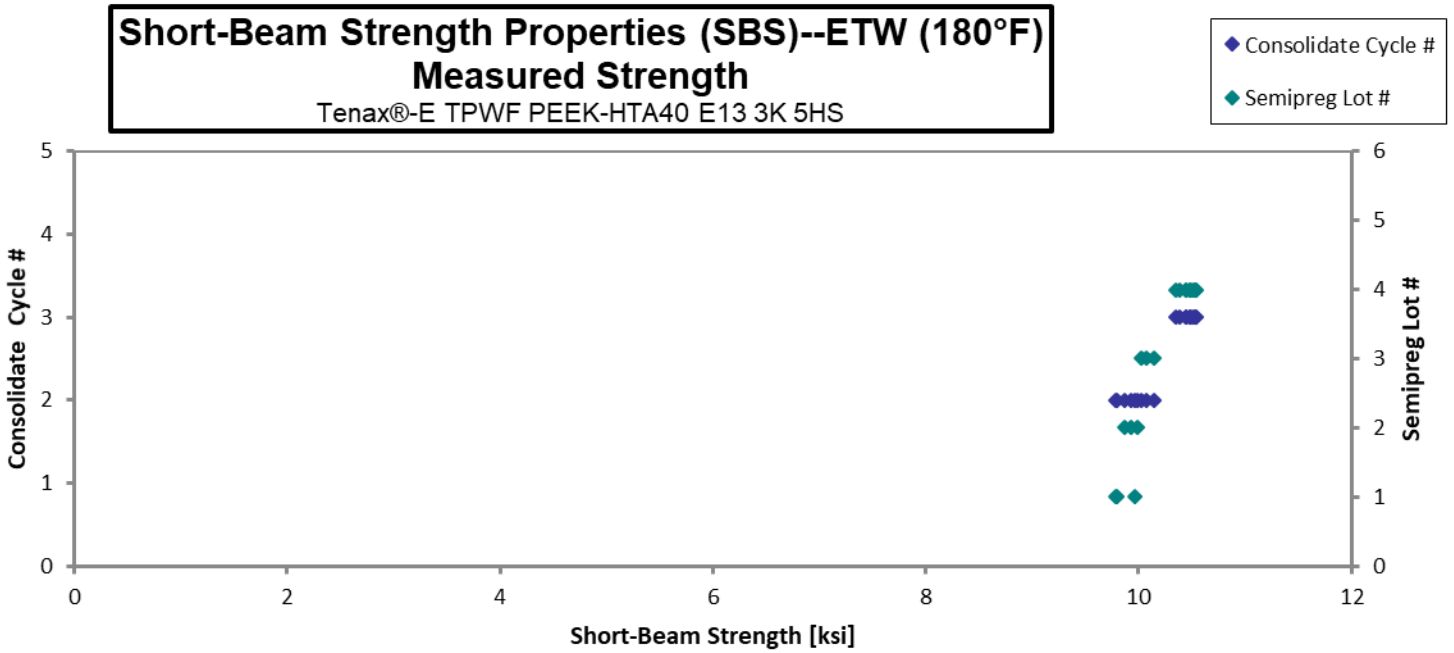

Short-Beam Strength Properties (SBS)--ETD (180°F)
Measured Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Short-Beam Strength [ksi]
0
1
2
3
4
5
6
0
2
4
6
8
10
12

Short-Beam Strength Properties (SBS)--ETW (180°F)
Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode
NTP4013Q1-TTX-T40-E-SBS-D-M3-ETW-1	4	3	10.351	0.2429	20	0.01215	INTERLAMINAR SHEAR, COMPRESSION, INELASTIC DEFORMATION
NTP4013Q1-TTX-T40-E-SBS-D-M3-ETW-2	4	3	10.453	0.2425	20	0.01212	INTERLAMINAR SHEAR, COMPRESSION, INELASTIC DEFORMATION
NTP4013Q1-TTX-T40-E-SBS-D-M3-ETW-3	4	3	10.480	0.2421	20	0.01211	INTERLAMINAR SHEAR, COMPRESSION, INELASTIC DEFORMATION
NTP4013Q1-TTX-T40-E-SBS-D-M3-ETW-4	4	3	10.533	0.2419	20	0.01210	INTERLAMINAR SHEAR, COMPRESSION, INELASTIC DEFORMATION
NTP4013Q1-TTX-T40-E-SBS-D-M3-ETW-5	4	3	10.478	0.2421	20	0.01210	INTERLAMINAR SHEAR, COMPRESSION, INELASTIC DEFORMATION
NTP4013Q1-TTX-T40-E-SBS-D-M3-ETW-6	4	3	10.536	0.2413	20	0.01206	INTERLAMINAR SHEAR, COMPRESSION, INELASTIC DEFORMATION
NTP4013Q1-TTX-T40-E-SBS-D-M3-ETW-7	4	3	10.548	0.2409	20	0.01204	INTERLAMINAR SHEAR, COMPRESSION, INELASTIC DEFORMATION
NTP4013Q1-TTX-T40-E-SBS-D-M3-ETW-8	4	3	10.502	0.2400	20	0.01200	INTERLAMINAR SHEAR, COMPRESSION, INELASTIC DEFORMATION
NTP4013Q1-TTX-T40-E-SBS-D-M3-ETW-9	4	3	10.448	0.2391	20	0.01196	INTERLAMINAR SHEAR, COMPRESSION, INELASTIC DEFORMATION
NTP4013Q1-TTX-T40-E-SBS-D-M3-ETW-10	4	3	10.385	0.2395	20	0.01198	INTERLAMINAR SHEAR, COMPRESSION, INELASTIC DEFORMATION
NTP4013Q1-TTX-T40-E-SBS-A-M2-1-ETW-1	1	2	9.970	0.2371	20	0.01186	INTERLAMINAR SHEAR, COMPRESSION, INELASTIC DEFORMATION
NTP4013Q1-TTX-T40-E-SBS-A-M2-1-ETW-2	1	2	9.791	0.2379	20	0.01189	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTP4013Q1-TTX-T40-E-SBS-A-M2-1-ETW-3	1	2	9.794	0.2389	20	0.01194	INTERLAMINAR SHEAR, COMPRESSION, INELASTIC DEFORMATION
NTP4013Q1-TTX-T40-E-SBS-B-M2-1-ETW-2	2	2	9.932	0.2381	20	0.01190	INTERLAMINAR SHEAR, COMPRESSION, INELASTIC DEFORMATION
NTP4013Q1-TTX-T40-E-SBS-B-M2-1-ETW-3	2	2	9.874	0.2388	20	0.01194	INTERLAMINAR SHEAR, COMPRESSION, INELASTIC DEFORMATION
NTP4013Q1-TTX-T40-E-SBS-B-M2-1-ETW-4	2	2	9.987	0.2365	20	0.01183	INTERLAMINAR SHEAR, COMPRESSION, INELASTIC DEFORMATION
NTP4013Q1-TTX-T40-E-SBS-C-M2-1-ETW-1	3	2	10.08	0.2401	20	0.01200	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTP4013Q1-TTX-T40-E-SBS-C-M2-1-ETW-2	3	2	10.03	0.2405	20	0.01202	INTERLAMINAR SHEAR, COMPRESSION, INELASTIC DEFORMATION
NTP4013Q1-TTX-T40-E-SBS-C-M2-1-ETW-3	3	2	10.14	0.2407	20	0.01203	INTERLAMINAR SHEAR, COMPRESSION, INELASTIC DEFORMATION

Note: SPAN TO THICKNESS RATIO: 3.5:1 WAS USED FOR ALL SBS TESTING.

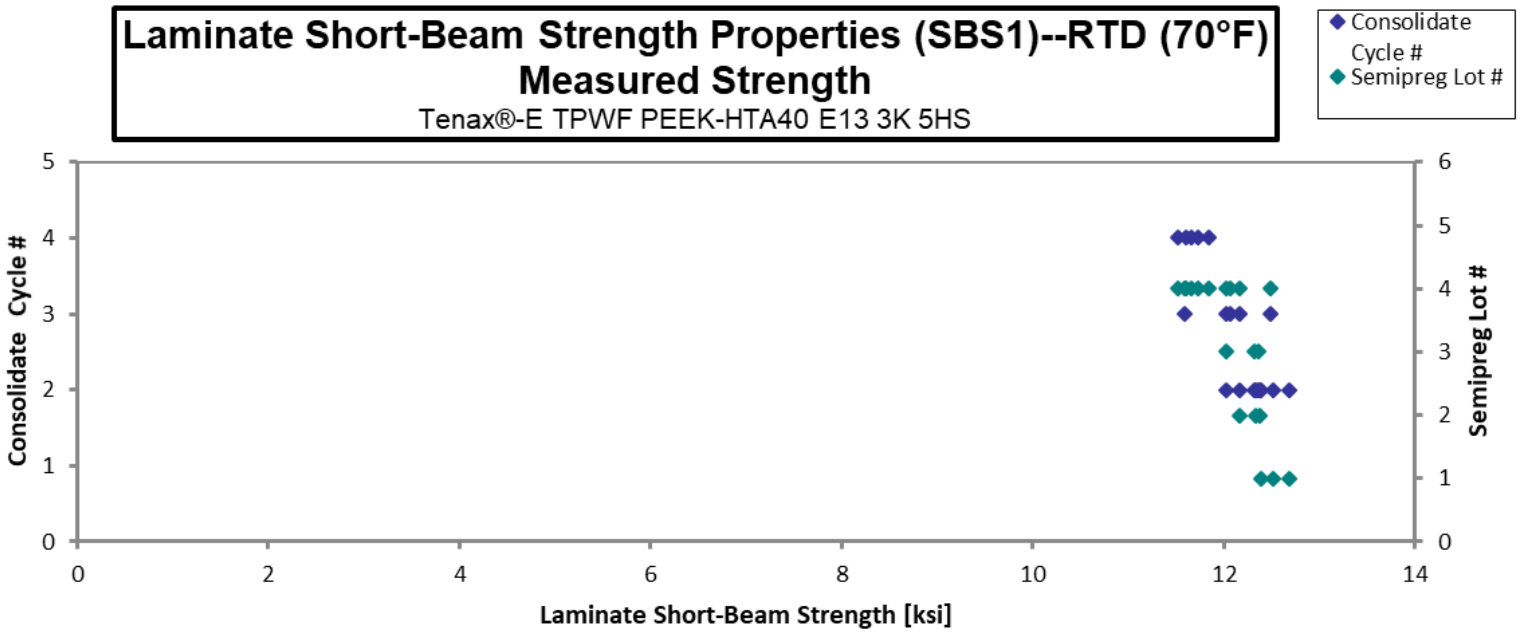
Average	**10.227**	**0.01200**
Standard Dev.	**0.2804**	
Coeff. of Var. [%]	**2.742**	
Min.	**9.791**	**0.01183**
Max.	**10.55**	**0.01215**
Number of Spec.	**19**	**19**


Short-Beam Strength Properties (SBS)--ETW (180°F)
Measured Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Short-Beam Strength [ksi]
0
1
2
3
4
5
6
0
2
4
6
8
10
12

4.13 Laminate Short-Beam Strength Properties (SBS1)

Laminate Short-Beam Strength Properties (SBS1)--RTD (70°F)
Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

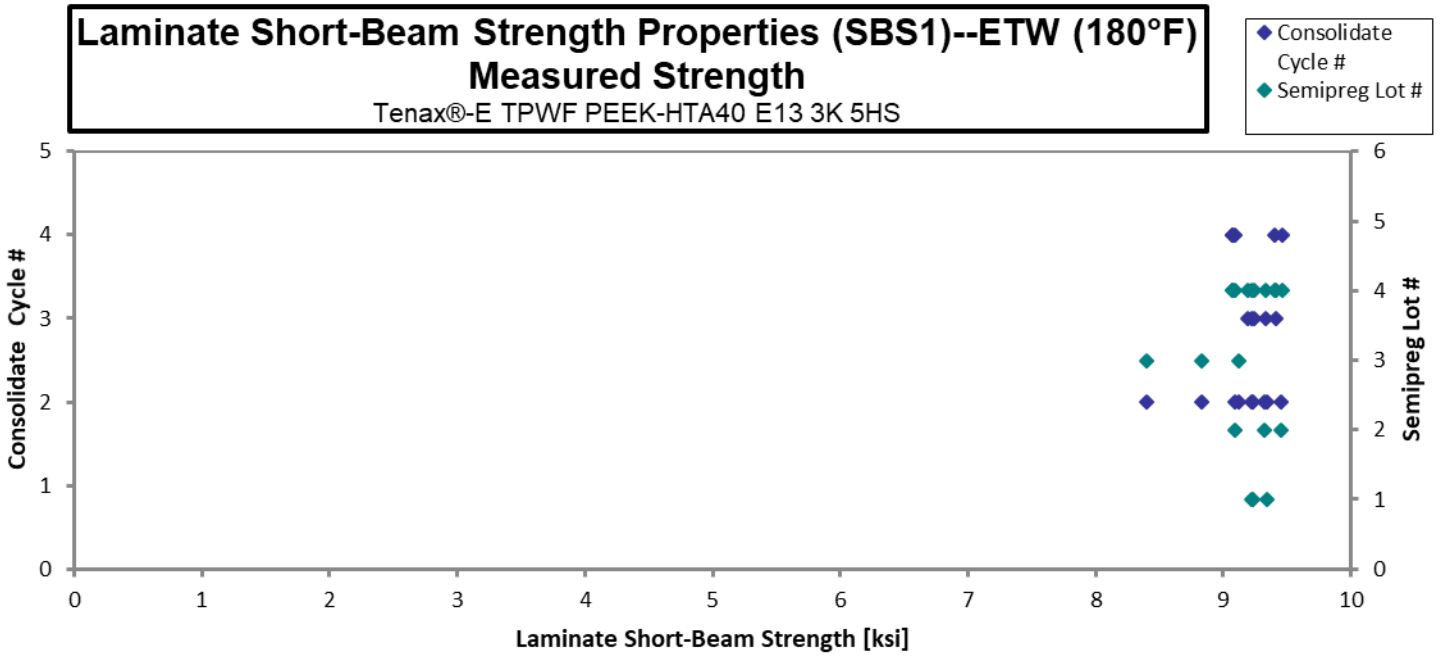
Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode
NTP4013Q1-TTX-T40-E-SBS1-D-M3-RTD-1	4	3	12.48	0.1458	12	0.01215	INTERLAMINAR SHEAR, TENSION
NTP4013Q1-TTX-T40-E-SBS1-D-M3-RTD-2	4	3	12.02	0.1455	12	0.01213	INTERLAMINAR SHEAR, TENSION
NTP4013Q1-TTX-T40-E-SBS1-D-M3-RTD-3	4	3	12.07	0.1457	12	0.01214	INTERLAMINAR SHEAR, COMPRESSION, TENSION
NTP4013Q1-TTX-T40-E-SBS1-D-M3-RTD-4	4	3	12.17	0.1459	12	0.01216	INTERLAMINAR SHEAR, COMPRESSION, TENSION
NTP4013Q1-TTX-T40-E-SBS1-D-M3-RTD-5	4	3	11.59	0.1460	12	0.01216	INTERLAMINAR SHEAR
NTP4013Q1-TTX-T40-E-SBS1-D-M4-RTD-1	4	4	11.51	0.1476	12	0.01230	INTERLAMINAR SHEAR, COMPRESSION, TENSION
NTP4013Q1-TTX-T40-E-SBS1-D-M4-RTD-2	4	4	11.66	0.1472	12	0.01226	INTERLAMINAR SHEAR, TENSION
NTP4013Q1-TTX-T40-E-SBS1-D-M4-RTD-3	4	4	11.73	0.1468	12	0.01223	INTERLAMINAR SHEAR
NTP4013Q1-TTX-T40-E-SBS1-D-M4-RTD-4	4	4	11.84	0.1468	12	0.01223	INTERLAMINAR SHEAR, COMPRESSION, TENSION
NTP4013Q1-TTX-T40-E-SBS1-D-M4-RTD-5	4	4	11.60	0.1469	12	0.01224	INTERLAMINAR SHEAR, COMPRESSION, TENSION
NTP4013Q1-TTX-T40-E-SBS1-A-M2-1-RTD-1	1	2	12.69	0.1425	12	0.01187	INTERLAMINAR SHEAR, TENSION
NTP4013Q1-TTX-T40-E-SBS1-A-M2-1-RTD-2	1	2	12.39	0.1422	12	0.01185	INTERLAMINAR SHEAR, TENSION, COMPRESSION
NTP4013Q1-TTX-T40-E-SBS1-A-M2-1-RTD-3	1	2	12.52	0.1422	12	0.01185	INTERLAMINAR SHEAR, TENSION, COMPRESSION
NTP4013Q1-TTX-T40-E-SBS1-B-M2-1-RTD-1	2	2	12.34	0.1431	12	0.01192	INTERLAMINAR SHEAR, TENSION, COMPRESSION
NTP4013Q1-TTX-T40-E-SBS1-B-M2-1-RTD-2	2	2	12.38	0.1431	12	0.01193	INTERLAMINAR SHEAR, TENSION, COMPRESSION
NTP4013Q1-TTX-T40-E-SBS1-B-M2-1-RTD-3	2	2	12.17	0.1438	12	0.01198	INTERLAMINAR SHEAR, TENSION, COMPRESSION
NTP4013Q1-TTX-T40-E-SBS1-C-M2-1-RTD-1	3	2	12.03	0.1426	12	0.01188	INTERLAMINAR SHEAR, TENSION
NTP4013Q1-TTX-T40-E-SBS1-C-M2-1-RTD-2	3	2	12.32	0.1435	12	0.01195	INTERLAMINAR SHEAR, TENSION, COMPRESSION
NTP4013Q1-TTX-T40-E-SBS1-C-M2-1-RTD-3	3	2	12.36	0.1432	12	0.01193	INTERLAMINAR SHEAR, TENSION, COMPRESSION
Average			**12.10**			**0.01206**	
Standard Dev.			**0.3563**				
Coeff. of Var. [%]			**2.945**				
Min.			**11.51**			**0.01185**	
Max.			**12.69**			**0.01230**	
Number of Spec.			**19**			**19**	


Laminate Short-Beam Strength Properties (SBS1)--RTD (70°F)
Measured Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Short-Beam Strength [ksi]
0
1
2
3
4
5
6
0
2
4
6
8
10
12
14

Laminate Short-Beam Strength Properties (SBS1)--ETW (180°F)
Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode
NTP4013Q1-TTX-T40-E-SBS1-D-M3-ETW-1	4	3	9.328	0.1459	12	0.01215	COMPRESSION, INELASTIC DEFORMATION
NTP4013Q1-TTX-T40-E-SBS1-D-M3-ETW-2	4	3	9.218	0.1467	12	0.01222	COMPRESSION, INELASTIC DEFORMATION
NTP4013Q1-TTX-T40-E-SBS1-D-M3-ETW-3	4	3	9.186	0.1464	12	0.01220	COMPRESSION, INELASTIC DEFORMATION
NTP4013Q1-TTX-T40-E-SBS1-D-M3-ETW-4	4	3	9.411	0.1456	12	0.01213	COMPRESSION, INELASTIC DEFORMATION
NTP4013Q1-TTX-T40-E-SBS1-D-M3-ETW-5	4	3	9.240	0.1454	12	0.01212	COMPRESSION, INELASTIC DEFORMATION
NTP4013Q1-TTX-T40-E-SBS1-D-M4-ETW-1	4	4	9.066	0.1468	12	0.01223	COMPRESSION, TENSION, INELASTIC DEFORMATION
NTP4013Q1-TTX-T40-E-SBS1-D-M4-ETW-2	4	4	9.094	0.1483	12	0.01236	COMPRESSION, TENSION, INELASTIC DEFORMATION
NTP4013Q1-TTX-T40-E-SBS1-D-M4-ETW-3	4	4	9.070	0.1481	12	0.01234	COMPRESSION, TENSION, INELASTIC DEFORMATION
NTP4013Q1-TTX-T40-E-SBS1-D-M4-ETW-4	4	4	9.400	0.1476	12	0.01230	COMPRESSION
NTP4013Q1-TTX-T40-E-SBS1-D-M4-ETW-5	4	4	9.457	0.1477	12	0.01230	COMPRESSION
NTP4013Q1-TTX-T40-E-SBS1-A-M2-1-ETW-1	1	2	9.230	0.1422	12	0.01185	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTP4013Q1-TTX-T40-E-SBS1-A-M2-1-ETW-2	1	2	9.346	0.1413	12	0.01177	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTP4013Q1-TTX-T40-E-SBS1-A-M2-1-ETW-3	1	2	9.222	0.1409	12	0.01174	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTP4013Q1-TTX-T40-E-SBS1-B-M2-1-ETW-1	2	2	9.319	0.1439	12	0.01199	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTP4013Q1-TTX-T40-E-SBS1-B-M2-1-ETW-2	2	2	9.094	0.1423	12	0.01186	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTP4013Q1-TTX-T40-E-SBS1-B-M2-1-ETW-3	2	2	9.448	0.1427	12	0.01189	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTP4013Q1-TTX-T40-E-SBS1-C-M2-1-ETW-1	3	2	9.117	0.1432	12	0.01193	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTP4013Q1-TTX-T40-E-SBS1-C-M2-1-ETW-2	3	2	8.829	0.1429	12	0.01191	INTERLAMINAR SHEAR, INELASTIC DEFORMATION
NTP4013Q1-TTX-T40-E-SBS1-C-M2-1-ETW-3	3	2	8.401	0.1426	12	0.01189	INTERLAMINAR SHEAR, INELASTIC DEFORMATION

Average	**9.183**	**0.01206**
Standard Dev.	**0.2475**	
Coeff. of Var. [%]	**2.695**	
Min.	**8.401**	**0.01174**
Max.	**9.46**	**0.01236**
Number of Spec.	**19**	**19**


Laminate Short-Beam Strength Properties (SBS1)--ETW (180°F)
Measured Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Short-Beam Strength [ksi]
0
1
2
3
4
5
6
7
8
9
10

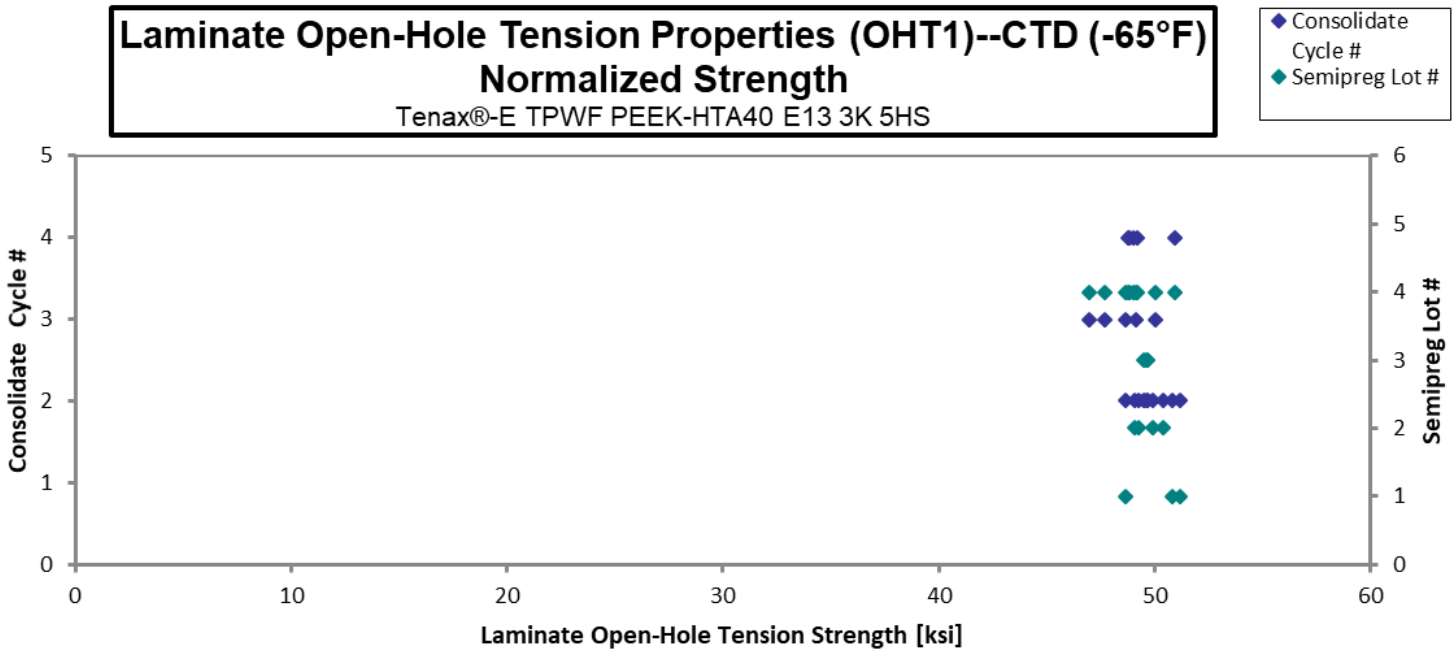
4.14 "25/50/25" Open-Hole Tension 1 Properties (OHT1)

Laminate Open-Hole Tension Properties (OHT1)--CTD (-65°F)
Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

normalizing t_{ply} [in]
0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
NTP4013Q1-TTX-T40-E-OHT1-D-M3-CTD-1	4	3	50.70	0.09680	8	M(A,L)GM	0.01210	50.04
NTP4013Q1-TTX-T40-E-OHT1-D-M3-CTD-2	4	3	48.99	0.09737	8	M(A,L)GM	0.01217	48.63
NTP4013Q1-TTX-T40-E-OHT1-D-M3-CTD-3	4	3	49.31	0.09772	8	M(A,L)GM	0.01221	49.13
NTP4013Q1-TTX-T40-E-OHT1-D-M3-CTD-4	4	3	47.65	0.09672	8	M(A,L)GM	0.01209	46.99
NTP4013Q1-TTX-T40-E-OHT1-D-M3-CTD-5	4	3	48.43	0.09662	8	M(A,L)GM	0.01208	47.71
NTP4013Q1-TTX-T40-E-OHT1-D-M4-CTD-1	4	4	51.08	0.09782	8	M(A,L)GM	0.01223	50.94
NTP4013Q1-TTX-T40-E-OHT1-D-M4-CTD-2	4	4	49.65	0.09720	8	M(A,L)GM	0.01215	49.21
NTP4013Q1-TTX-T40-E-OHT1-D-M4-CTD-3	4	4	49.43	0.09727	8	M(A,L)GM	0.01216	49.02
NTP4013Q1-TTX-T40-E-OHT1-D-M4-CTD-4	4	4	48.75	0.09825	8	M(A,L)GM	0.01228	48.83
NTP4013Q1-TTX-T40-E-OHT1-D-M4-CTD-5	4	4	48.77	0.09813	8	M(A,L)GM	0.01227	48.79
NTP4013Q1-TTX-T40-E-OHT1-A-M2-CTD-25	1	2	51.75	0.09705	8	LGM	0.01213	51.20
NTP4013Q1-TTX-T40-E-OHT1-A-M2-CTD-26	1	2	48.82	0.09776	8	LGM	0.01222	48.66
NTP4013Q1-TTX-T40-E-OHT1-A-M2-CTD-27	1	2	51.04	0.09768	8	LGM	0.01221	50.83
NTP4013Q1-TTX-T40-E-OHT1-B-M2-CTD-25	2	2	49.92	0.09806	8	LGM	0.01226	49.91
NTP4013Q1-TTX-T40-E-OHT1-B-M2-CTD-26	2	2	50.21	0.09844	8	LGM	0.01230	50.39
NTP4013Q1-TTX-T40-E-OHT1-B-M2-CTD-27	2	2	48.70	0.09881	8	LGM	0.01235	49.06
NTP4013Q1-TTX-T40-E-OHT1-B-M2-CTD-28	2	2	48.71	0.09921	8	LGM	0.01240	49.27
NTP4013Q1-TTX-T40-E-OHT1-C-M2-CTD-25	3	2	49.42	0.09825	8	AGM	0.01228	49.51
NTP4013Q1-TTX-T40-E-OHT1-C-M2-CTD-26	3	2	49.28	0.09871	8	AGM	0.01234	49.60
NTP4013Q1-TTX-T40-E-OHT1-C-M2-CTD-27	3	2	49.32	0.09885	8	AGM	0.01236	49.70

Average	**49.50**		**$Average_{norm}$**	**0.01223**	**49.37**
Standard Dev.	**1.021**		**$Standard\ Dev._{norm}$**		**1.034**
Coeff. of Var. [%]	**2.064**		**$Coeff.\ of\ Var.\ [\%]_{norm}$**		**2.095**
Min.	**47.65**		**Min.**	**0.01208**	**46.99**
Max.	**51.75**		**Max.**	**0.01240**	**51.20**
Number of Spec.	**20**		**Number of Spec.**	**20**	**20**


Laminate Open-Hole Tension Properties (OHT1)--CTD (-65°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
0
1
2
3
4
5
6
0
10
20
30
40
50
60
Laminate Open-Hole Tension Strength [ksi]

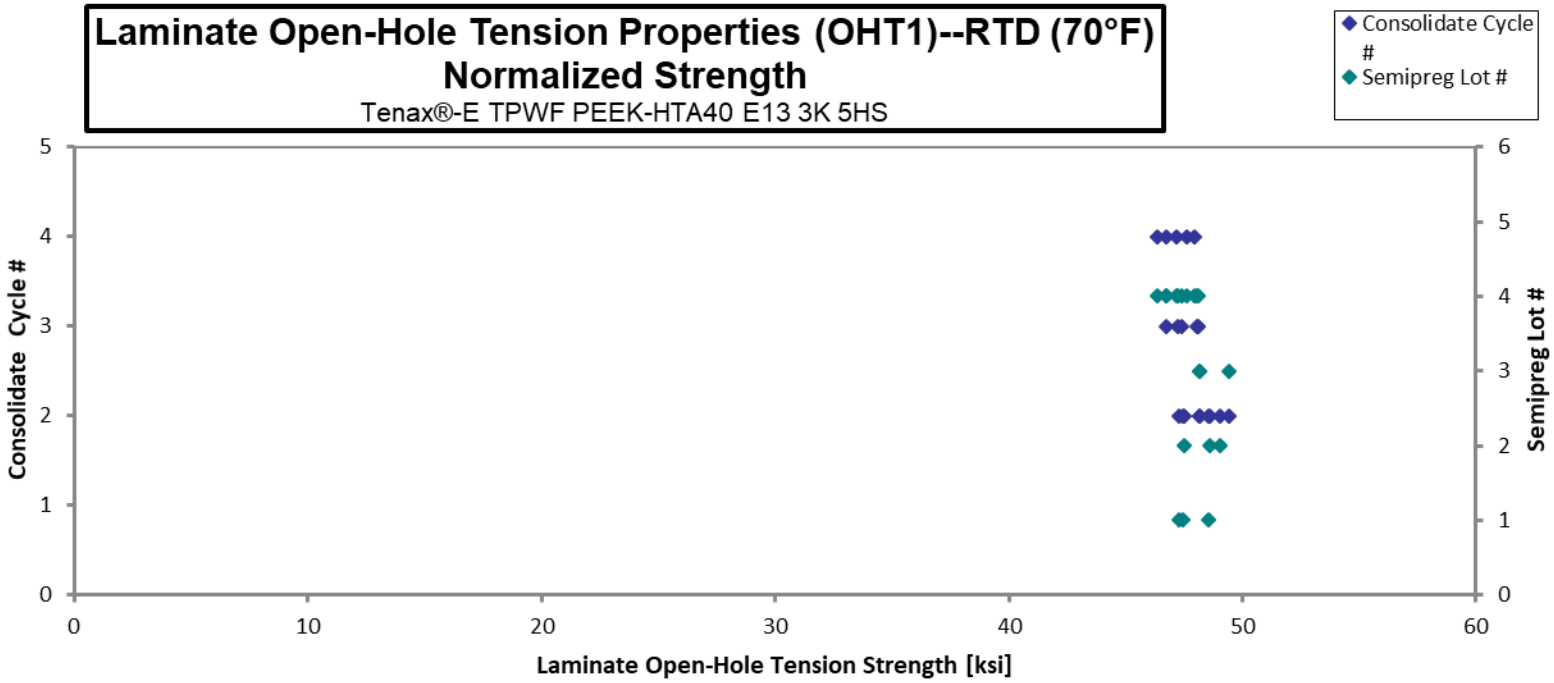
Laminate Open-Hole Tension Properties (OHT1)--RTD(70°F)
Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

normalizing t_{ply} [in]
0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
NTP4013Q1-TTX-T40-E-OHT1-D-M3-RTD-1	4	3	47.69	0.09715	8	M(A,L)GM	0.01214	47.24
NTP4013Q1-TTX-T40-E-OHT1-D-M3-RTD-2	4	3	48.28	0.09757	8	M(A,L)GM	0.01220	48.03
NTP4013Q1-TTX-T40-E-OHT1-D-M3-RTD-3	4	3	46.84	0.09785	8	M(A,L)GM	0.01223	46.73
NTP4013Q1-TTX-T40-E-OHT1-D-M3-RTD-4	4	3	48.33	0.09763	8	M(A,L)GM	0.01220	48.11
NTP4013Q1-TTX-T40-E-OHT1-D-M3-RTD-5	4	3	47.79	0.09732	8	M(A,L)GM	0.01216	47.41
NTP4013Q1-TTX-T40-E-OHT1-D-M4-RTD-1	4	4	47.81	0.09832	8	M(A,L)GM	0.01229	47.93
NTP4013Q1-TTX-T40-E-OHT1-D-M4-RTD-2	4	4	47.26	0.09793	8	M(A,L)GM	0.01224	47.19
NTP4013Q1-TTX-T40-E-OHT1-D-M4-RTD-3	4	4	45.83	0.09920	8	M(A,L)GM	0.01240	46.35
NTP4013Q1-TTX-T40-E-OHT1-D-M4-RTD-4	4	4	46.55	0.09853	8	M(A,L)GM	0.01232	46.76
NTP4013Q1-TTX-T40-E-OHT1-D-M4-RTD-5	4	4	47.56	0.09815	8	M(A,L)GM	0.01227	47.59
NTP4013Q1-TTX-T40-E-OHT1-A-M2-RTD-29	1	2	47.18	0.09827	8	LGM	0.01228	47.27
NTP4013Q1-TTX-T40-E-OHT1-A-M2-RTD-30	1	2	47.33	0.09837	8	LGM	0.01230	47.47
NTP4013Q1-TTX-T40-E-OHT1-A-M2-RTD-31	1	2	48.65	0.09782	8	LGM	0.01223	48.52
NTP4013Q1-TTX-T40-E-OHT1-B-M2-RTD-29	2	2	48.19	0.09895	8	AGM	0.01237	48.62
NTP4013Q1-TTX-T40-E-OHT1-B-M2-RTD-30	2	2	47.17	0.09879	8	AGM	0.01235	47.51
NTP4013Q1-TTX-T40-E-OHT1-B-M2-RTD-31	2	2	48.55	0.09903	8	AGM	0.01238	49.02
NTP4013Q1-TTX-T40-E-OHT1-C-M2-RTD-29	3	2	48.03	0.09837	8	LGM	0.01230	48.17
NTP4013Q1-TTX-T40-E-OHT1-C-M2-RTD-30	3	2	49.59	0.09780	8	LGM	0.01222	49.44
NTP4013Q1-TTX-T40-E-OHT1-C-M2-RTD-31	3	2	48.44	0.09749	8	LGM	0.01219	48.15

Average	**47.74**	
Standard Dev.	**0.859**	
Coeff. of Var. [%]	**1.799**	
Min.	**45.83**	
Max.	**49.59**	
Number of Spec.	**19**	

$Average_{norm}$	**0.01227**	**47.76**
$Standard\ Dev._{norm}$		**0.797**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**1.669**
Min.	**0.01214**	**46.35**
Max.	**0.01240**	**49.44**
Number of Spec.	**19**	**19**


Laminate Open-Hole Tension Properties (OHT1)--RTD (70°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Open-Hole Tension Strength [ksi]
0
10
20
30
40
50
60
0
1
2
3
4
5
6

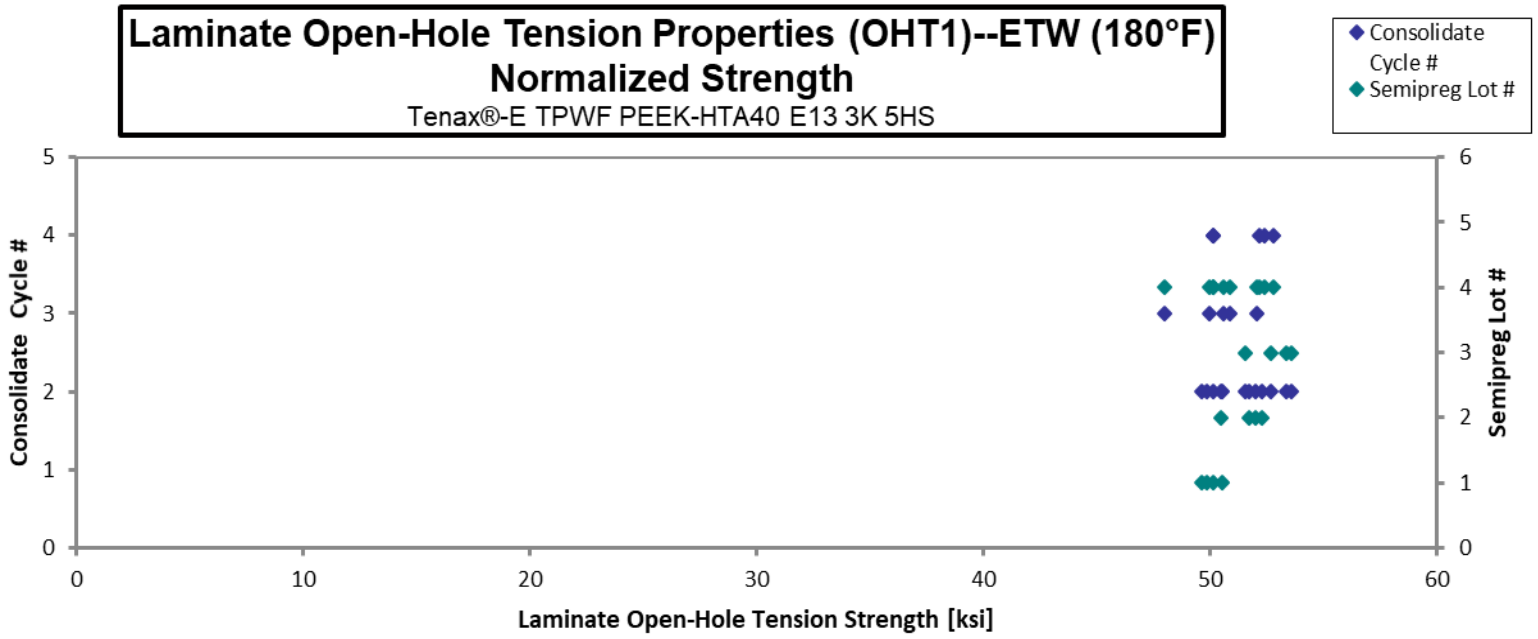
Laminate Open-Hole Tension Properties (OHT1)--ETW (180°F)
Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

normalizing t_{ply} [in]
0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
NTP4013Q1-TTX-T40-E-OHT1-D-M3-ETW-1	4	3	51.26	0.09732	8	M(A,L)GM	0.01216	50.86
NTP4013Q1-TTX-T40-E-OHT1-D-M3-ETW-2	4	3	51.33	0.09662	8	M(A,L)GM	0.01208	50.57
NTP4013Q1-TTX-T40-E-OHT1-D-M3-ETW-3	4	3	53.00	0.09633	8	M(A,L)GM	0.01204	52.06
NTP4013Q1-TTX-T40-E-OHT1-D-M3-ETW-4	4	3	50.99	0.09615	8	M(A,L)GM	0.01202	49.99
NTP4013Q1-TTX-T40-E-OHT1-D-M3-ETW-5	4	3	49.70	0.09473	8	M(A,L)GM	0.01184	48.00
NTP4013Q1-TTX-T40-E-OHT1-D-M4-ETW-1	4	4	50.00	0.09830	8	M(A,L)GM	0.01229	50.11
NTP4013Q1-TTX-T40-E-OHT1-D-M4-ETW-2	4	4	52.23	0.09802	8	M(A,L)GM	0.01225	52.19
NTP4013Q1-TTX-T40-E-OHT1-D-M4-ETW-3	4	4	50.30	0.09772	8	M(A,L)GM	0.01221	50.11
NTP4013Q1-TTX-T40-E-OHT1-D-M4-ETW-4	4	4	53.45	0.09683	8	M(A,L)GM	0.01210	52.78
NTP4013Q1-TTX-T40-E-OHT1-D-M4-ETW-5	4	4	53.60	0.09590	8	M(A,L)GM	0.01199	52.41
NTP4013Q1-TTX-T40-E-OHT1-A-M2-ETW-33	1	2	50.51	0.09812	8	AGM	0.01227	50.53
NTP4013Q1-TTX-T40-E-OHT1-A-M2-ETW-34	1	2	49.58	0.09822	8	AGM	0.01228	49.65
NTP4013Q1-TTX-T40-E-OHT1-A-M2-ETW-35	1	2	50.07	0.09818	8	AGM	0.01227	50.12
NTP4013Q1-TTX-T40-E-OHT1-A-M2-ETW-36	1	2	49.82	0.09811	8	AGM	0.01226	49.84
NTP4013Q1-TTX-T40-E-OHT1-B-M2-ETW-33	2	2	49.95	0.09906	8	AGM	0.01238	50.45
NTP4013Q1-TTX-T40-E-OHT1-B-M2-ETW-34	2	2	52.02	0.09852	8	AGM	0.01231	52.25
NTP4013Q1-TTX-T40-E-OHT1-B-M2-ETW-35	2	2	51.56	0.09836	8	AGM	0.01229	51.71
NTP4013Q1-TTX-T40-E-OHT1-B-M2-ETW-36	2	2	51.92	0.09827	8	AGM	0.01228	52.02
NTP4013Q1-TTX-T40-E-OHT1-C-M2-ETW-33	3	2	53.85	0.09762	8	AGM	0.01220	53.60
NTP4013Q1-TTX-T40-E-OHT1-C-M2-ETW-34	3	2	53.64	0.09759	8	AGM	0.01220	53.37
NTP4013Q1-TTX-T40-E-OHT1-C-M2-ETW-35	3	2	52.08	0.09705	8	AGM	0.01213	51.53
NTP4013Q1-TTX-T40-E-OHT1-C-M2-ETW-36	3	2	52.94	0.09761	8	AGM	0.01220	52.68

Average	**51.54**	
Standard Dev.	**1.433**	
Coeff. of Var. [%]	**2.781**	
Min.	**49.58**	
Max.	**53.85**	
Number of Spec.	**22**	

$Average_{norm}$	**0.01219**	**51.22**
Standard $Dev._{norm}$		**1.406**
Coeff. of Var. $[\%]_{norm}$		**2.744**
Min.	**0.01184**	**48.00**
Max.	**0.01238**	**53.60**
Number of Spec.	**22**	**22**


Laminate Open-Hole Tension Properties (OHT1)--ETW (180°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Open-Hole Tension Strength [ksi]
0
10
20
30
40
50
60
0
1
2
3
4
5
6

4.15 "10/80/10" Open-Hole Tension 2 Properties (OHT2)

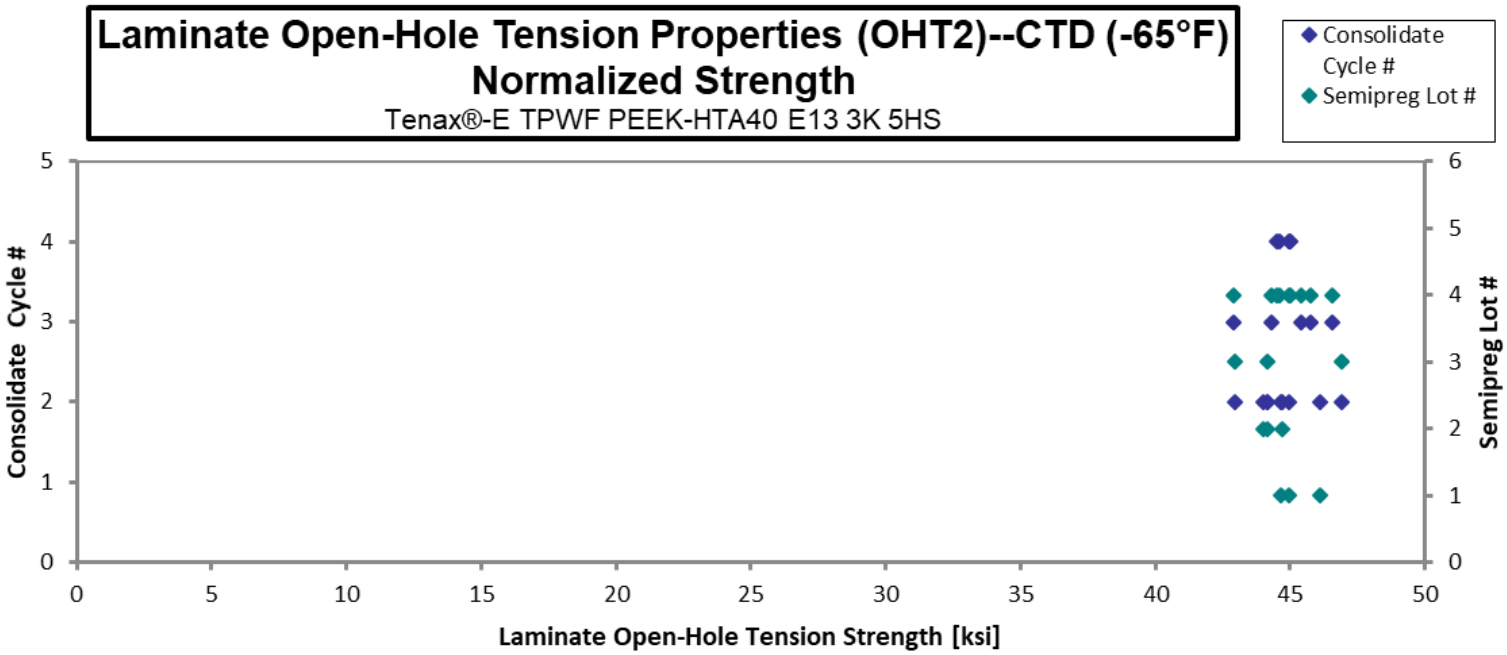
Laminate Open-Hole Tension Properties (OHT2)--CTD (-65°F)
Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

normalizing t_{ply} [in]
0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
NTP4013Q1-TTX-T40-E-OHT2-D-M3-CTD-1	4	3	45.15	0.1233	10	AGM	0.01233	45.42
NTP4013Q1-TTX-T40-E-OHT2-D-M3-CTD-2	4	3	43.21	0.1218	10	AGM	0.01218	42.93
NTP4013Q1-TTX-T40-E-OHT2-D-M3-CTD-3	4	3	44.40	0.1223	10	AGM	0.01223	44.30
NTP4013Q1-TTX-T40-E-OHT2-D-M3-CTD-4	4	3	46.31	0.1233	10	AGM	0.01233	46.57
NTP4013Q1-TTX-T40-E-OHT2-D-M3-CTD-5	4	3	45.56	0.1231	10	AGM	0.01231	45.76
NTP4013Q1-TTX-T40-E-OHT2-D-M4-CTD-1	4	4	45.67	0.1207	10	AGM	0.01207	44.96
NTP4013Q1-TTX-T40-E-OHT2-D-M4-CTD-2	4	4	45.12	0.1210	10	AGM	0.01210	44.52
NTP4013Q1-TTX-T40-E-OHT2-D-M4-CTD-3	4	4	45.64	0.1209	10	AGM	0.01209	45.00
NTP4013Q1-TTX-T40-E-OHT2-D-M4-CTD-4	4	4	45.02	0.1215	10	AGM	0.01215	44.62
NTP4013Q1-TTX-T40-E-OHT2-A-M2-CTD-25	1	2	46.30	0.1183	10	AGM	0.01183	44.67
NTP4013Q1-TTX-T40-E-OHT2-A-M2-CTD-26	1	2	47.14	0.1200	10	AGM	0.01200	46.13
NTP4013Q1-TTX-T40-E-OHT2-A-M2-CTD-27	1	2	45.72	0.1205	10	AGM	0.01205	44.94
NTP4013Q1-TTX-T40-E-OHT2-B-M2-CTD-25	2	2	44.78	0.1225	10	AGM	0.01225	44.73
NTP4013Q1-TTX-T40-E-OHT2-B-M2-CTD-26	2	2	43.91	0.1229	10	AGM	0.01229	44.03
NTP4013Q1-TTX-T40-E-OHT2-B-M2-CTD-27	2	2	43.90	0.1233	10	AGM	0.01233	44.15
NTP4013Q1-TTX-T40-E-OHT2-C-M2-CTD-29	3	2	47.12	0.1220	10	AGM	0.01220	46.90
NTP4013Q1-TTX-T40-E-OHT2-C-M2-CTD-30	3	2	42.79	0.1230	10	AGM	0.01230	42.93
NTP4013Q1-TTX-T40-E-OHT2-C-M2-CTD-31	3	2	44.01	0.1231	10	AGM	0.01231	44.18

Average	**45.10**	
Standard Dev.	**1.234**	
Coeff. of Var. [%]	**2.737**	
Min.	**42.79**	
Max.	**47.14**	
Number of Spec.	**18**	

$Average_{norm}$	**0.01219**	**44.82**
Standard $Dev._{norm}$		**1.070**
Coeff. of Var. $[\%]_{norm}$		**2.387**
Min.	**0.01183**	**42.93**
Max.	**0.01233**	**46.90**
Number of Spec.	**18**	**18**


Laminate Open-Hole Tension Properties (OHT2)--CTD (-65°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Open-Hole Tension Strength [ksi]
0
5
10
15
20
25
30
35
40
45
50
0
1
2
3
4
5
6

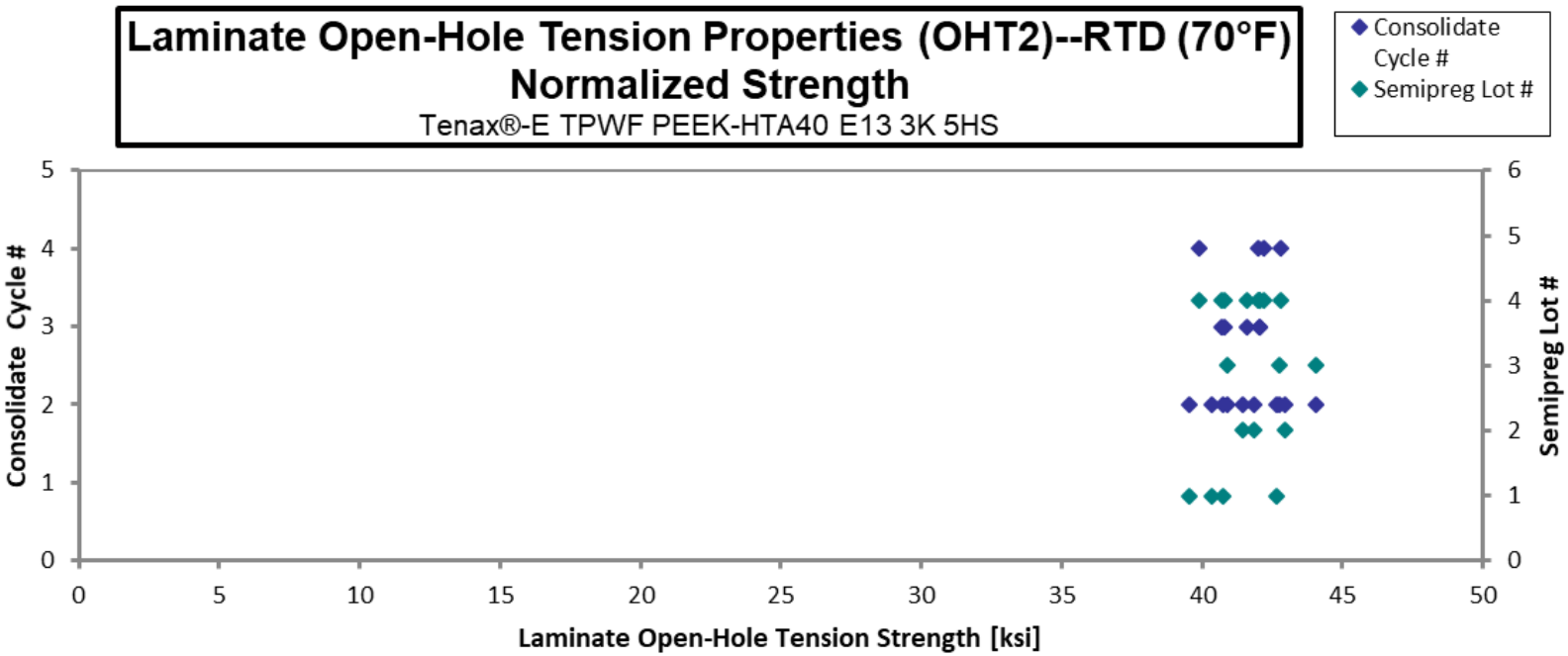
Laminate Open-Hole Tension Properties (OHT2)--RTD (70°F)
Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

normalizing t_{ply} [in]
0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
NTP4013Q1-TTX-T40-E-OHT2-D-M3-RTD-1	4	3	40.56	0.1234	10	M(A,L)GM	0.01234	40.81
NTP4013Q1-TTX-T40-E-OHT2-D-M3-RTD-2	4	3	41.31	0.1235	10	M(A,L)GM	0.01235	41.59
NTP4013Q1-TTX-T40-E-OHT2-D-M3-RTD-3	4	3	40.43	0.1235	10	M(A,L)GM	0.01235	40.71
NTP4013Q1-TTX-T40-E-OHT2-D-M3-RTD-4	4	3	41.68	0.1237	10	M(A,L)GM	0.01237	42.06
NTP4013Q1-TTX-T40-E-OHT2-D-M3-RTD-5	4	3	41.64	0.1238	10	M(A,L)GM	0.01238	42.06
NTP4013Q1-TTX-T40-E-OHT2-D-M4-RTD-1	4	4	42.34	0.1222	10	M(A,L)GM	0.01222	42.18
NTP4013Q1-TTX-T40-E-OHT2-D-M4-RTD-2	4	4	39.86	0.1228	10	M(A,L)GM	0.01228	39.91
NTP4013Q1-TTX-T40-E-OHT2-D-M4-RTD-3	4	4	42.66	0.1230	10	M(A,L)GM	0.01230	42.79
NTP4013Q1-TTX-T40-E-OHT2-D-M4-RTD-4	4	4	42.07	0.1224	10	M(A,L)GM	0.01224	42.00
NTP4013Q1-TTX-T40-E-OHT2-A-M2-RTD-29	1	2	43.00	0.1217	10	AGM	0.01217	42.67
NTP4013Q1-TTX-T40-E-OHT2-A-M2-RTD-30	1	2	39.77	0.1219	10	AGM	0.01219	39.55
NTP4013Q1-TTX-T40-E-OHT2-A-M2-RTD-31	1	2	40.50	0.1221	10	AGM	0.01221	40.33
NTP4013Q1-TTX-T40-E-OHT2-A-M2-RTD-32	1	2	40.77	0.1225	10	AGM	0.01225	40.74
NTP4013Q1-TTX-T40-E-OHT2-B-M2-RTD-29	2	2	41.42	0.1239	10	AGM	0.01239	41.87
NTP4013Q1-TTX-T40-E-OHT2-B-M2-RTD-30	2	2	42.59	0.1237	10	AGM	0.01237	42.98
NTP4013Q1-TTX-T40-E-OHT2-B-M2-RTD-31	2	2	41.09	0.1237	10	AGM	0.01237	41.46
NTP4013Q1-TTX-T40-E-OHT2-C-M2-RTD-25	3	2	40.63	0.1234	10	AGM	0.01234	40.89
NTP4013Q1-TTX-T40-E-OHT2-C-M2-RTD-26	3	2	43.90	0.1230	10	AGM	0.01230	44.05
NTP4013Q1-TTX-T40-E-OHT2-C-M2-RTD-27	3	2	42.74	0.1226	10	AGM	0.01226	42.73

Average	**41.53**	
Standard Dev.	**1.139**	
Coeff. of Var. [%]	**2.742**	
Min.	**39.77**	
Max.	**43.90**	
Number of Spec.	**19**	

$Average_{norm}$	**0.01230**	**41.65**
$Standard\ Dev._{norm}$		**1.156**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**2.775**
Min.	**0.01217**	**39.55**
Max.	**0.01239**	**44.05**
Number of Spec.	**19**	**19**

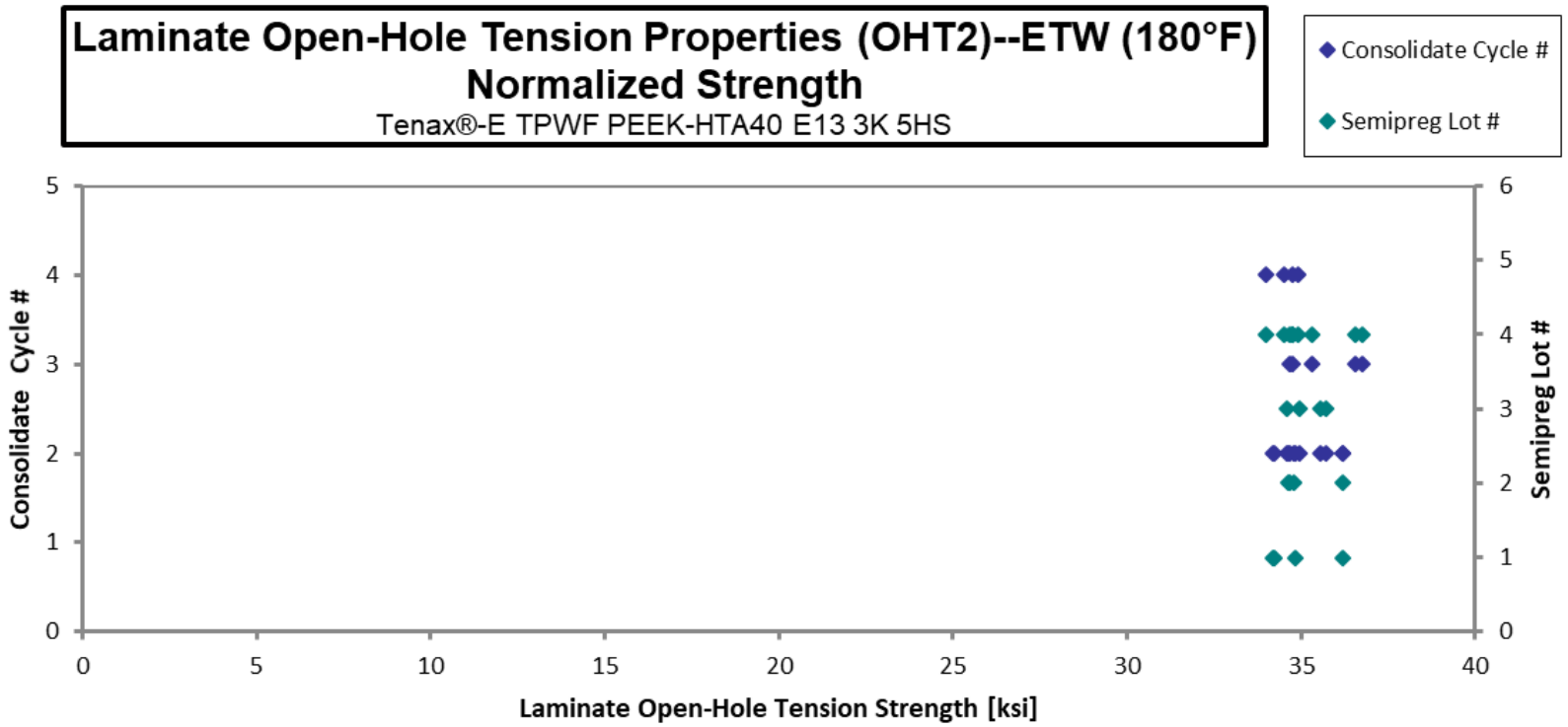

Laminate Open-Hole Tension Properties (OHT2)--RTD (70°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Open-Hole Tension Strength [ksi]
0
1
2
3
4
5
6
0
5
10
15
20
25
30
35
40
45
50

Laminate Open-Hole Tension Properties (OHT2)--ETW (180°F)
Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

normalizing t_{ply} [in]
0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
NTP4013Q1-TTX-T40-E-OHT2-D-M3-ETW-1	4	3	34.44	0.1237	10	AGM	0.01237	34.74
NTP4013Q1-TTX-T40-E-OHT2-D-M3-ETW-2	4	3	36.35	0.1233	10	M(A,L)GM	0.01233	36.56
NTP4013Q1-TTX-T40-E-OHT2-D-M3-ETW-3	4	3	34.71	0.1225	10	M(A,L)GM	0.01225	34.68
NTP4013Q1-TTX-T40-E-OHT2-D-M3-ETW-4	4	3	35.63	0.1215	10	AGM	0.01215	35.31
NTP4013Q1-TTX-T40-E-OHT2-D-M3-ETW-5	4	3	37.52	0.1201	10	AGM	0.01201	36.76
NTP4013Q1-TTX-T40-E-OHT2-D-M4-ETW-1	4	4	34.03	0.1224	10	AGM	0.01224	33.98
NTP4013Q1-TTX-T40-E-OHT2-D-M4-ETW-2	4	4	34.69	0.1228	10	AGM	0.01228	34.74
NTP4013Q1-TTX-T40-E-OHT2-D-M4-ETW-3	4	4	34.33	0.1233	10	AGM	0.01233	34.51
NTP4013Q1-TTX-T40-E-OHT2-D-M4-ETW-4	4	4	34.69	0.1233	10	AGM	0.01233	34.90
NTP4013Q1-TTX-T40-E-OHT2-A-M2-ETW-33	1	2	34.23	0.1226	10	AGM	0.01226	34.24
NTP4013Q1-TTX-T40-E-OHT2-A-M2-ETW-34	1	2	34.31	0.1222	10	AGM	0.01222	34.21
NTP4013Q1-TTX-T40-E-OHT2-A-M2-ETW-35	1	2	34.93	0.1222	10	AGM	0.01222	34.83
NTP4013Q1-TTX-T40-E-OHT2-A-M2-ETW-36	1	2	36.24	0.1225	10	AGM	0.01225	36.20
NTP4013Q1-TTX-T40-E-OHT2-B-M2-ETW-33	2	2	34.45	0.1237	10	AGM	0.01237	34.77
NTP4013Q1-TTX-T40-E-OHT2-B-M2-ETW-34	2	2	34.56	0.1230	10	AGM	0.01230	34.67
NTP4013Q1-TTX-T40-E-OHT2-B-M2-ETW-35	2	2	34.50	0.1231	10	AGM	0.01231	34.63
NTP4013Q1-TTX-T40-E-OHT2-B-M2-ETW-36	2	2	36.24	0.1224	10	AGM	0.01224	36.18
NTP4013Q1-TTX-T40-E-OHT2-C-M2-ETW-33	3	2	34.70	0.1223	10	AGM	0.01223	34.60
NTP4013Q1-TTX-T40-E-OHT2-C-M2-ETW-34	3	2	35.12	0.1220	10	AGM	0.01220	34.95
NTP4013Q1-TTX-T40-E-OHT2-C-M2-ETW-35	3	2	35.72	0.1220	10	AGM	0.01220	35.56
NTP4013Q1-TTX-T40-E-OHT2-C-M2-ETW-36	3	2	35.90	0.1220	10	AGM	0.01220	35.72

Average	**35.11**		**Average$_{norm}$**	**0.01225**	**35.08**
Standard Dev.	**0.911**		**Standard Dev.$_{norm}$**		**0.7863**
Coeff. of Var. [%]	**2.595**		**Coeff. of Var. [%]$_{norm}$**		**2.241**
Min.	**34.03**		**Min.**	**0.01201**	**33.98**
Max.	**37.52**		**Max.**	**0.01237**	**36.76**
Number of Spec.	**21**		**Number of Spec.**	**21**	**21**


Laminate Open-Hole Tension Properties (OHT2)--ETW (180°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Open-Hole Tension Strength [ksi]
0
1
2
3
4
5
6
0
5
10
15
20
25
30
35
40

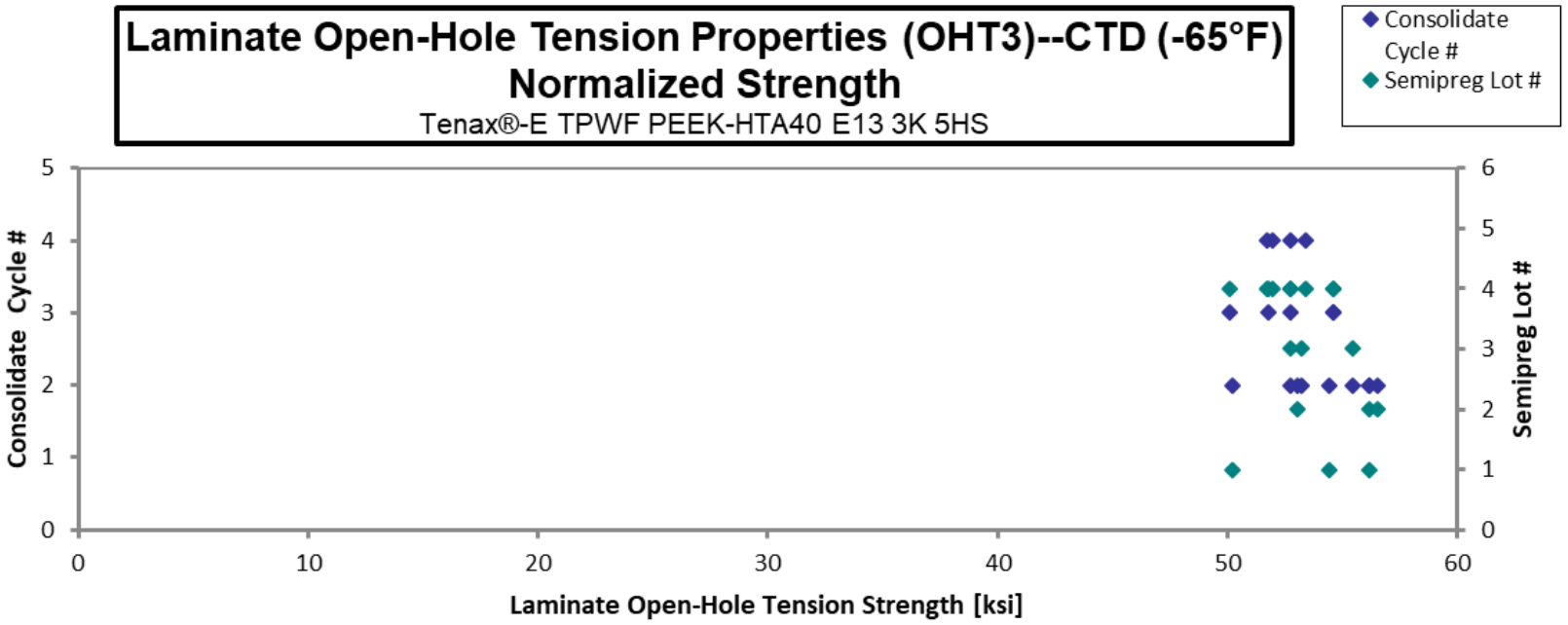
4.16 "40/20/40" Open-Hole Tension 3 Properties (OHT3)

Laminate Open-Hole Tension Properties (OHT3)--CTD (-65°F)
Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

normalizing t_{ply} [in]
0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
NTP4013Q1-TTX-T40-E-OHT3-D-M3-CTD-1	4	3	55.11	0.1215	10	LGM	0.01215	54.61
NTP4013Q1-TTX-T40-E-OHT3-D-M3-CTD-2	4	3	54.77	0.1223	10	M(A,L)GM	0.01223	54.61
NTP4013Q1-TTX-T40-E-OHT3-D-M3-CTD-3	4	3	52.84	0.1224	10	LGM	0.01224	52.76
NTP4013Q1-TTX-T40-E-OHT3-D-M3-CTD-4	4	3	51.65	0.1229	10	LGM	0.01229	51.76
NTP4013Q1-TTX-T40-E-OHT3-D-M3-CTD-5	4	3	49.83	0.1233	10	M(A,L)GM	0.01233	50.11
NTP4013Q1-TTX-T40-E-OHT3-D-M4-CTD-1	4	4	52.68	0.1227	10	LGM	0.01227	52.72
NTP4013Q1-TTX-T40-E-OHT3-D-M4-CTD-2	4	4	51.93	0.1227	10	LGM	0.01227	51.96
NTP4013Q1-TTX-T40-E-OHT3-D-M4-CTD-3	4	4	51.71	0.1227	10	LGM	0.01227	51.75
NTP4013Q1-TTX-T40-E-OHT3-D-M4-CTD-4	4	4	53.40	0.1226	10	LGM	0.01226	53.39
NTP4013Q1-TTX-T40-E-OHT3-A-M2-CTD-25	1	2	56.97	0.1209	10	LGM	0.01209	56.19
NTP4013Q1-TTX-T40-E-OHT3-A-M2-CTD-26	1	2	50.82	0.1211	10	LGM	0.01211	50.21
NTP4013Q1-TTX-T40-E-OHT3-A-M2-CTD-27	1	2	54.90	0.1216	10	LGM	0.01216	54.44
NTP4013Q1-TTX-T40-E-OHT3-B-M2-CTD-25	2	2	56.61	0.1217	10	LGM	0.01217	56.19
NTP4013Q1-TTX-T40-E-OHT3-B-M2-CTD-26	2	2	56.65	0.1223	10	LGM	0.01223	56.51
NTP4013Q1-TTX-T40-E-OHT3-B-M2-CTD-27	2	2	53.08	0.1225	10	LGM	0.01225	53.05
NTP4013Q1-TTX-T40-E-OHT3-C-M2-CTD-25	3	2	56.27	0.1208	10	AGM	0.01208	55.45
NTP4013Q1-TTX-T40-E-OHT3-C-M2-CTD-26	3	2	53.16	0.1217	10	AGM	0.01217	52.77
NTP4013Q1-TTX-T40-E-OHT3-C-M2-CTD-27	3	2	53.41	0.1222	10	AGM	0.01222	53.24

Average	**53.65**	**Average$_{norm}$**	**0.01221**	**53.43**
Standard Dev.	**2.116**	**Standard Dev.$_{norm}$**		**1.931**
Coeff. of Var. [%]	**3.943**	**Coeff. of Var. [%]$_{norm}$**		**3.615**
Min.	**49.83**	**Min.**	**0.01208**	**50.11**
Max.	**56.97**	**Max.**	**0.01233**	**56.51**
Number of Spec.	**18**	**Number of Spec.**	**18**	**18**


Laminate Open-Hole Tension Properties (OHT3)--CTD (-65°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Open-Hole Tension Strength [ksi]
0
10
20
30
40
50
60
0
1
2
3
4
5
6

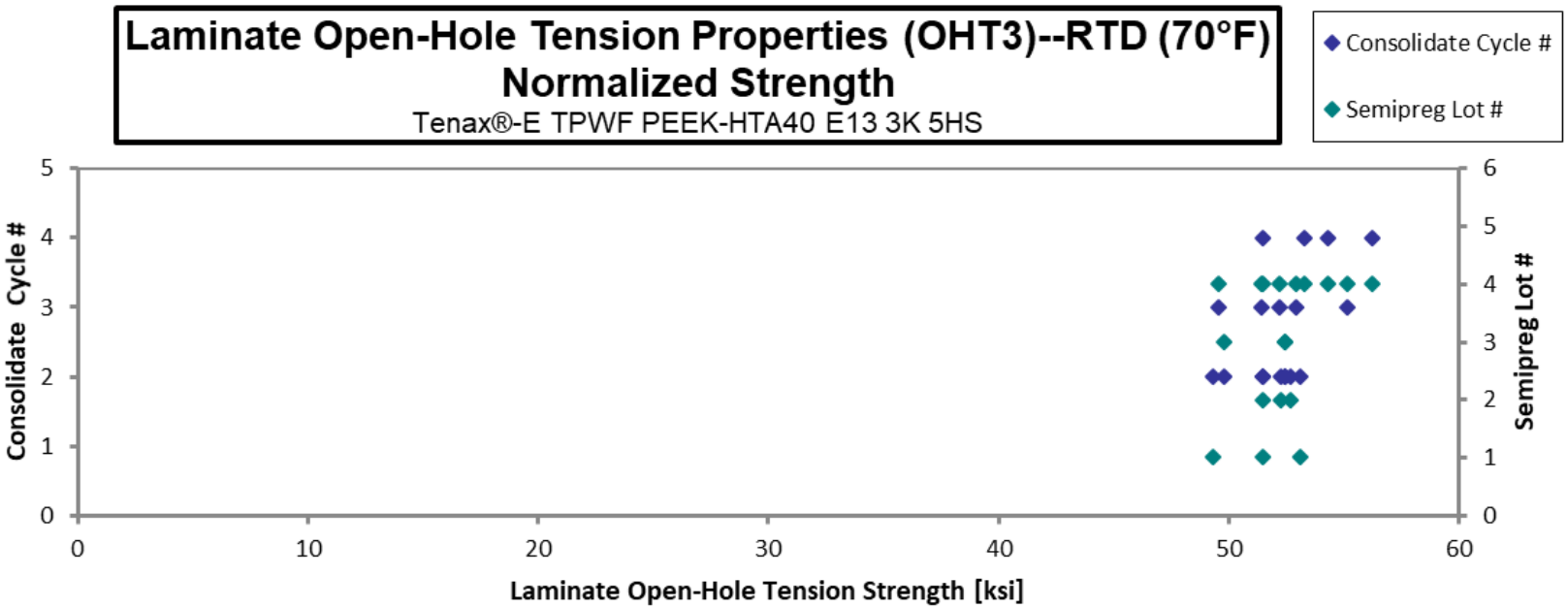
Laminate Open-Hole Tension Properties (OHT3)--RTD (70°F)
Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

normalizing t_{ply} [in]
0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
NTP4013Q1-TTX-T40-E-OHT3-D-M3-RTD-1	4	3	54.96	0.1230	10	LGM	0.01230	55.15
NTP4013Q1-TTX-T40-E-OHT3-D-M3-RTD-2	4	3	52.88	0.1227	10	LGM	0.01227	52.94
NTP4013Q1-TTX-T40-E-OHT3-D-M3-RTD-3	4	3	52.07	0.1229	10	M(A,L)GM	0.01229	52.19
NTP4013Q1-TTX-T40-E-OHT3-D-M3-RTD-4	4	3	51.34	0.1228	10	M(A,L)GM	0.01228	51.42
NTP4013Q1-TTX-T40-E-OHT3-D-M3-RTD-5	4	3	49.80	0.1220	10	LGM	0.01220	49.57
NTP4013Q1-TTX-T40-E-OHT3-D-M4-RTD-1	4	4	56.33	0.1224	10	LGM	0.01224	56.22
NTP4013Q1-TTX-T40-E-OHT3-D-M4-RTD-2	4	4	51.74	0.1220	10	M(A,L)GM	0.01220	51.48
NTP4013Q1-TTX-T40-E-OHT3-D-M4-RTD-3	4	4	53.54	0.1221	10	M(A,L)GM	0.01221	53.31
NTP4013Q1-TTX-T40-E-OHT3-D-M4-RTD-4	4	4	54.53	0.1221	10	M(A,L)GM	0.01221	54.28
NTP4013Q1-TTX-T40-E-OHT3-A-M2-RTD-29	1	2	53.56	0.1216	10	AGM	0.01216	53.12
NTP4013Q1-TTX-T40-E-OHT3-A-M2-RTD-30	1	2	49.57	0.1219	10	AGM	0.01219	49.30
NTP4013Q1-TTX-T40-E-OHT3-A-M2-RTD-31	1	2	51.64	0.1222	10	AGM	0.01222	51.46
NTP4013Q1-TTX-T40-E-OHT3-B-M2-RTD-29	2	2	52.12	0.1229	10	AGM	0.01229	52.26
NTP4013Q1-TTX-T40-E-OHT3-B-M2-RTD-30	2	2	51.29	0.1231	10	AGM	0.01231	51.51
NTP4013Q1-TTX-T40-E-OHT3-B-M2-RTD-31	2	2	52.30	0.1235	10	AGM	0.01235	52.68
NTP4013Q1-TTX-T40-E-OHT3-C-M2-RTD-29	3	2	49.88	0.1224	10	LGM	0.01224	49.80
NTP4013Q1-TTX-T40-E-OHT3-C-M2-RTD-30	3	2	52.53	0.1225	10	LGM	0.01225	52.46
NTP4013Q1-TTX-T40-E-OHT3-C-M2-RTD-31	3	2	52.47	0.1225	10	LGM	0.01225	52.45

Average	**52.36**	
Standard Dev.	**1.783**	
Coeff. of Var. [%]	**3.404**	
Min.	**49.57**	
Max.	**56.33**	
Number of Spec.	**18**	

$Average_{norm}$	**0.01225**	**52.31**
Standard $Dev._{norm}$		**1.803**
Coeff. of Var. $[\%]_{norm}$		**3.446**
Min.	**0.01216**	**49.30**
Max.	**0.01235**	**56.22**
Number of Spec.	**18**	**18**

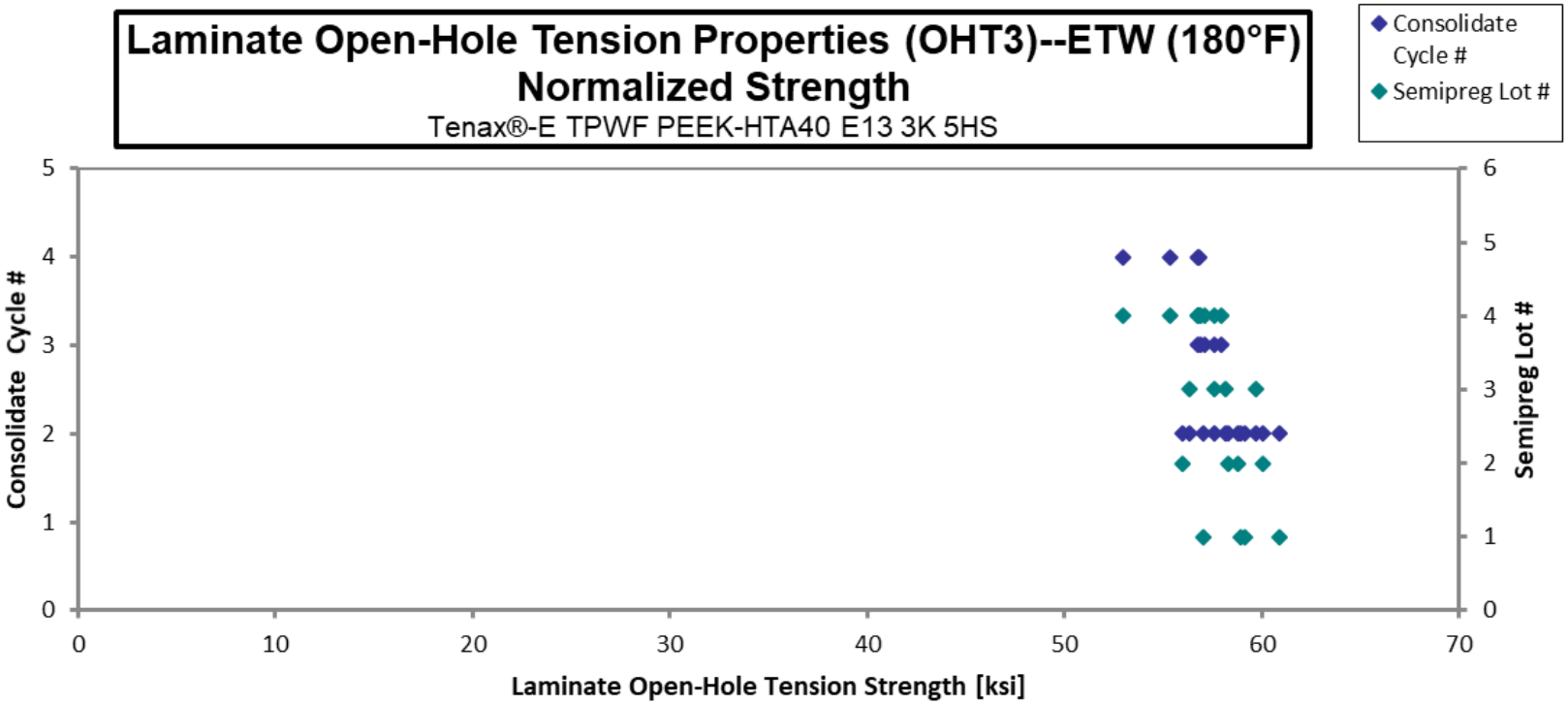

Laminate Open-Hole Tension Properties (OHT3)--RTD (70°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Open-Hole Tension Strength [ksi]
0
10
20
30
40
50
60
0
1
2
3
4
5
6

Laminate Open-Hole Tension Properties (OHT3)--ETW (180°F)
Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

normalizing t_{ply} [in]
0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
NTP4013Q1-TTX-T40-E-OHT3-D-M3-ETW-1	4	3	56.91	0.1222	10	M(A,L)GM	0.01222	56.73
NTP4013Q1-TTX-T40-E-OHT3-D-M3-ETW-2	4	3	57.77	0.1222	10	M(A,L)GM	0.01222	57.60
NTP4013Q1-TTX-T40-E-OHT3-D-M3-ETW-3	4	3	57.04	0.1223	10	M(A,L)GM	0.01223	56.89
NTP4013Q1-TTX-T40-E-OHT3-D-M3-ETW-4	4	3	57.26	0.1223	10	M(A,L)GM	0.01223	57.12
NTP4013Q1-TTX-T40-E-OHT3-D-M3-ETW-5	4	3	58.12	0.1223	10	M(A,L)GM	0.01223	57.95
NTP4013Q1-TTX-T40-E-OHT3-D-M4-ETW-1	4	4	56.82	0.1224	10	M(A,L)GM	0.01224	56.73
NTP4013Q1-TTX-T40-E-OHT3-D-M4-ETW-2	4	4	55.40	0.1225	10	M(A,L)GM	0.01225	55.35
NTP4013Q1-TTX-T40-E-OHT3-D-M4-ETW-3	4	4	52.91	0.1227	10	M(A,L)GM	0.01227	52.96
NTP4013Q1-TTX-T40-E-OHT3-D-M4-ETW-4	4	4	56.91	0.1224	10	M(A,L)GM	0.01224	56.81
NTP4013Q1-TTX-T40-E-OHT3-A-M2-ETW-33	1	2	57.16	0.1223	10	AGM	0.01223	57.01
NTP4013Q1-TTX-T40-E-OHT3-A-M2-ETW-34	1	2	59.08	0.1223	10	AGM	0.01223	58.92
NTP4013Q1-TTX-T40-E-OHT3-A-M2-ETW-35	1	2	59.40	0.1220	10	AGM	0.01220	59.11
NTP4013Q1-TTX-T40-E-OHT3-A-M2-ETW-36	1	2	61.27	0.1218	10	AGM	0.01218	60.86
NTP4013Q1-TTX-T40-E-OHT3-B-M2-ETW-33	2	2	59.84	0.1230	10	LGM	0.01230	60.02
NTP4013Q1-TTX-T40-E-OHT3-B-M2-ETW-34	2	2	55.89	0.1228	10	LGM	0.01228	55.99
NTP4013Q1-TTX-T40-E-OHT3-B-M2-ETW-35	2	2	58.67	0.1229	10	LGM	0.01229	58.80
NTP4013Q1-TTX-T40-E-OHT3-B-M2-ETW-36	2	2	58.28	0.1227	10	LGM	0.01227	58.32
NTP4013Q1-TTX-T40-E-OHT3-C-M2-ETW-33	3	2	57.95	0.1219	10	LGM	0.01219	57.63
NTP4013Q1-TTX-T40-E-OHT3-C-M2-ETW-34	3	2	56.95	0.1213	10	LGM	0.01213	56.33
NTP4013Q1-TTX-T40-E-OHT3-C-M2-ETW-35	3	2	58.81	0.1212	10	LGM	0.01212	58.16
NTP4013Q1-TTX-T40-E-OHT3-C-M2-ETW-36	3	2	60.34	0.1213	10	LGM	0.01213	59.71

Average	**57.75**	**Average$_{norm}$**	**0.01222**	**57.57**
Standard Dev.	**1.828**	**Standard Dev.$_{norm}$**		**1.750**
Coeff. of Var. [%]	**3.165**	**Coeff. of Var. [%]$_{norm}$**		**3.040**
Min.	**52.91**	**Min.**	**0.01212**	**52.96**
Max.	**61.27**	**Max.**	**0.01230**	**60.86**
Number of Spec.	**21**	**Number of Spec.**	**21**	**21**


Laminate Open-Hole Tension Properties (OHT3)--ETW (180°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Open-Hole Tension Strength [ksi]
0
10
20
30
40
50
60
70
0
1
2
3
4
5
6

4.17 "25/50/25" Filled-Hole Tension 1 Properties (FHT1)

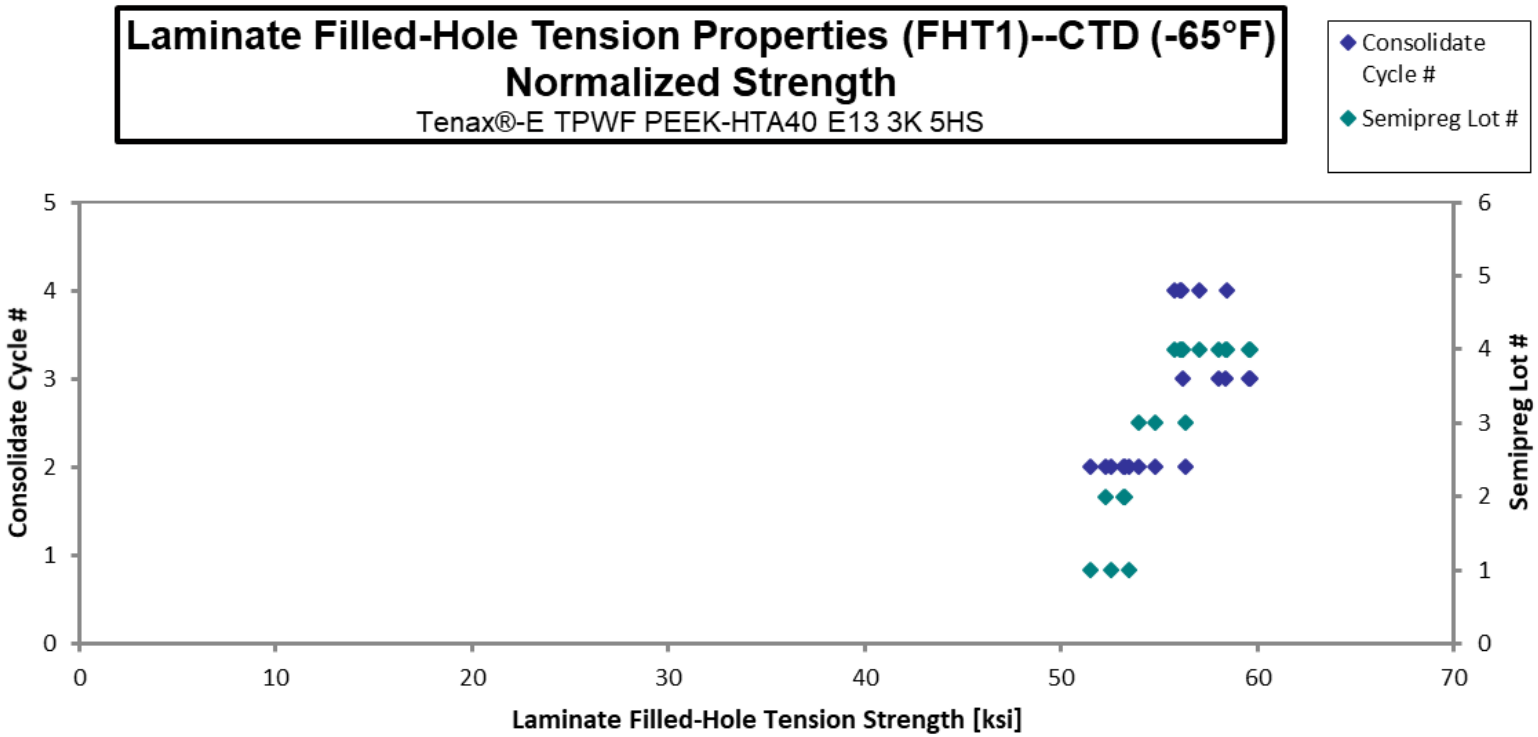
Laminate Filled-Hole Tension Properties (FHT1)--CTD (-65°F)
Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

normalizing t_{ply} [in]
0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
NTP4013Q1-TTX-T40-E-FHT1-D-M3-CTD-1	4	3	60.15	0.09708	8	M(A,L)GM	0.01214	59.54
NTP4013Q1-TTX-T40-E-FHT1-D-M3-CTD-2	4	3	59.80	0.09783	8	M(A,L)GM	0.01223	59.65
NTP4013Q1-TTX-T40-E-FHT1-D-M3-CTD-3	4	3	58.59	0.09768	8	M(A,L)GM	0.01221	58.36
NTP4013Q1-TTX-T40-E-FHT1-D-M3-CTD-4	4	3	58.03	0.09807	8	M(A,L)GM	0.01226	58.03
NTP4013Q1-TTX-T40-E-FHT1-D-M3-CTD-5	4	3	56.53	0.09743	8	M(A,L)GM	0.01218	56.16
NTP4013Q1-TTX-T40-E-FHT1-D-M4-CTD-1	4	4	58.81	0.09743	8	M(A,L)GM	0.01218	58.43
NTP4013Q1-TTX-T40-E-FHT1-D-M4-CTD-2	4	4	56.60	0.09708	8	M(A,L)GM	0.01214	56.03
NTP4013Q1-TTX-T40-E-FHT1-D-M4-CTD-3	4	4	57.63	0.09708	8	M(A,L)GM	0.01214	57.04
NTP4013Q1-TTX-T40-E-FHT1-D-M4-CTD-4	4	4	56.32	0.09713	8	M(A,L)GM	0.01214	55.78
NTP4013Q1-TTX-T40-E-FHT1-D-M4-CTD-5	4	4	56.51	0.09740	8	M(A,L)GM	0.01218	56.12
NTP4013Q1-TTX-T40-E-FHT1-A-M2-CTD-37	1	2	53.49	0.09802	8	LGM	0.01225	53.46
NTP4013Q1-TTX-T40-E-FHT1-A-M2-CTD-38	1	2	51.50	0.09801	8	LGM	0.01225	51.46
NTP4013Q1-TTX-T40-E-FHT1-A-M2-CTD-39	1	2	52.44	0.09827	8	LGM	0.01228	52.54
NTP4013Q1-TTX-T40-E-FHT1-B-M2-CTD-37	2	2	53.04	0.09846	8	LGM	0.01231	53.25
NTP4013Q1-TTX-T40-E-FHT1-B-M2-CTD-38	2	2	52.00	0.09853	8	LGM	0.01232	52.24
NTP4013Q1-TTX-T40-E-FHT1-B-M2-CTD-39	2	2	52.77	0.09878	8	LGM	0.01235	53.14
NTP4013Q1-TTX-T40-E-FHT1-C-M2-CTD-37	3	2	54.40	0.09870	8	LGM	0.01234	54.75
NTP4013Q1-TTX-T40-E-FHT1-C-M2-CTD-38	3	2	56.02	0.09860	8	AGM	0.01232	56.31
NTP4013Q1-TTX-T40-E-FHT1-C-M2-CTD-39	3	2	53.31	0.09919	8	LGM	0.01240	53.91

Average	**55.68**	
Standard Dev.	**2.753**	
Coeff. of Var. [%]	**4.944**	
Min.	**51.50**	
Max.	**60.15**	
Number of Spec.	**19**	

$Average_{norm}$	**0.01224**	**55.59**
$Standard\ Dev._{norm}$		**2.520**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**4.534**
Min.	**0.01214**	**51.46**
Max.	**0.01240**	**59.65**
Number of Spec.	**19**	**19**

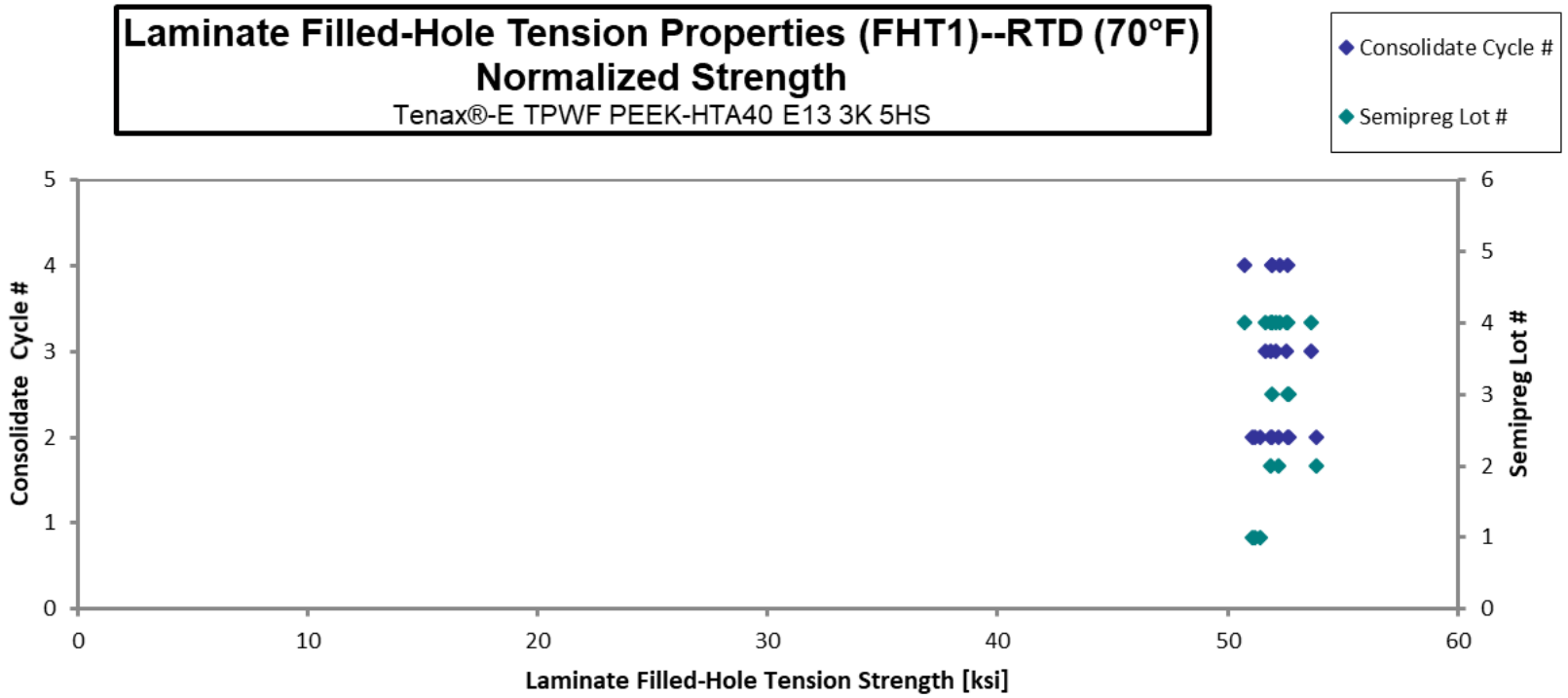

Laminate Filled-Hole Tension Properties (FHT1)--CTD (-65°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Filled-Hole Tension Strength [ksi]
0
10
20
30
40
50
60
70
0
1
2
3
4
5
6

Laminate Filled-Hole Tension Properties (FHT1)--RTD (70°F)
Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

normalizing t_{ply} [in]
0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
NTP4013Q1-TTX-T40-E-FHT1-D-M3-RTD-1	4	3	52.00	0.09830	8	M(A,L)GM	0.01229	52.11
NTP4013Q1-TTX-T40-E-FHT1-D-M3-RTD-2	4	3	53.51	0.09827	8	M(A,L)GM	0.01228	53.62
NTP4013Q1-TTX-T40-E-FHT1-D-M3-RTD-3	4	3	52.18	0.09752	8	M(A,L)GM	0.01219	51.88
NTP4013Q1-TTX-T40-E-FHT1-D-M3-RTD-4	4	3	51.50	0.09840	8	M(A,L)GM	0.01230	51.67
NTP4013Q1-TTX-T40-E-FHT1-D-M3-RTD-5	4	3	52.37	0.09838	8	M(A,L)GM	0.01230	52.53
NTP4013Q1-TTX-T40-E-FHT1-D-M4-RTD-1	4	4	52.89	0.09757	8	M(A,L)GM	0.01220	52.62
NTP4013Q1-TTX-T40-E-FHT1-D-M4-RTD-2	4	4	52.82	0.09708	8	M(A,L)GM	0.01214	52.28
NTP4013Q1-TTX-T40-E-FHT1-D-M4-RTD-3	4	4	50.92	0.09773	8	M(A,L)GM	0.01222	50.74
NTP4013Q1-TTX-T40-E-FHT1-D-M4-RTD-4	4	4	51.94	0.09807	8	M(A,L)GM	0.01226	51.93
NTP4013Q1-TTX-T40-E-FHT1-D-M4-RTD-5	4	4	52.13	0.09767	8	M(A,L)GM	0.01221	51.91
NTP4013Q1-TTX-T40-E-FHT1-A-M2-RTD-41	1	2	50.79	0.09867	8	LGM	0.01233	51.10
NTP4013Q1-TTX-T40-E-FHT1-A-M2-RTD-42	1	2	51.11	0.09864	8	LGM	0.01233	51.40
NTP4013Q1-TTX-T40-E-FHT1-A-M2-RTD-43	1	2	51.01	0.09845	8	LGM	0.01231	51.20
NTP4013Q1-TTX-T40-E-FHT1-B-M2-RTD-41	2	2	53.25	0.09927	8	LGM	0.01241	53.89
NTP4013Q1-TTX-T40-E-FHT1-B-M2-RTD-42	2	2	51.35	0.09907	8	LGM	0.01238	51.87
NTP4013Q1-TTX-T40-E-FHT1-B-M2-RTD-43	2	2	51.57	0.09930	8	LGM	0.01241	52.21
NTP4013Q1-TTX-T40-E-FHT1-C-M2-RTD-41	3	2	51.90	0.09940	8	LGM	0.01242	52.60
NTP4013Q1-TTX-T40-E-FHT1-C-M2-RTD-42	3	2	52.26	0.09883	8	LGM	0.01235	52.66
NTP4013Q1-TTX-T40-E-FHT1-C-M2-RTD-43	3	2	51.59	0.09873	8	LGM	0.01234	51.93

Average	**51.95**	**Average$_{norm}$**	**0.01230**	**52.11**
Standard Dev.	**0.780**	**Standard Dev.$_{norm}$**		**0.785**
Coeff. of Var. [%]	**1.502**	**Coeff. of Var. [%]$_{norm}$**		**1.506**
Min.	**50.79**	**Min.**	**0.01214**	**50.74**
Max.	**53.51**	**Max.**	**0.01242**	**53.89**
Number of Spec.	**19**	**Number of Spec.**	**19**	**19**

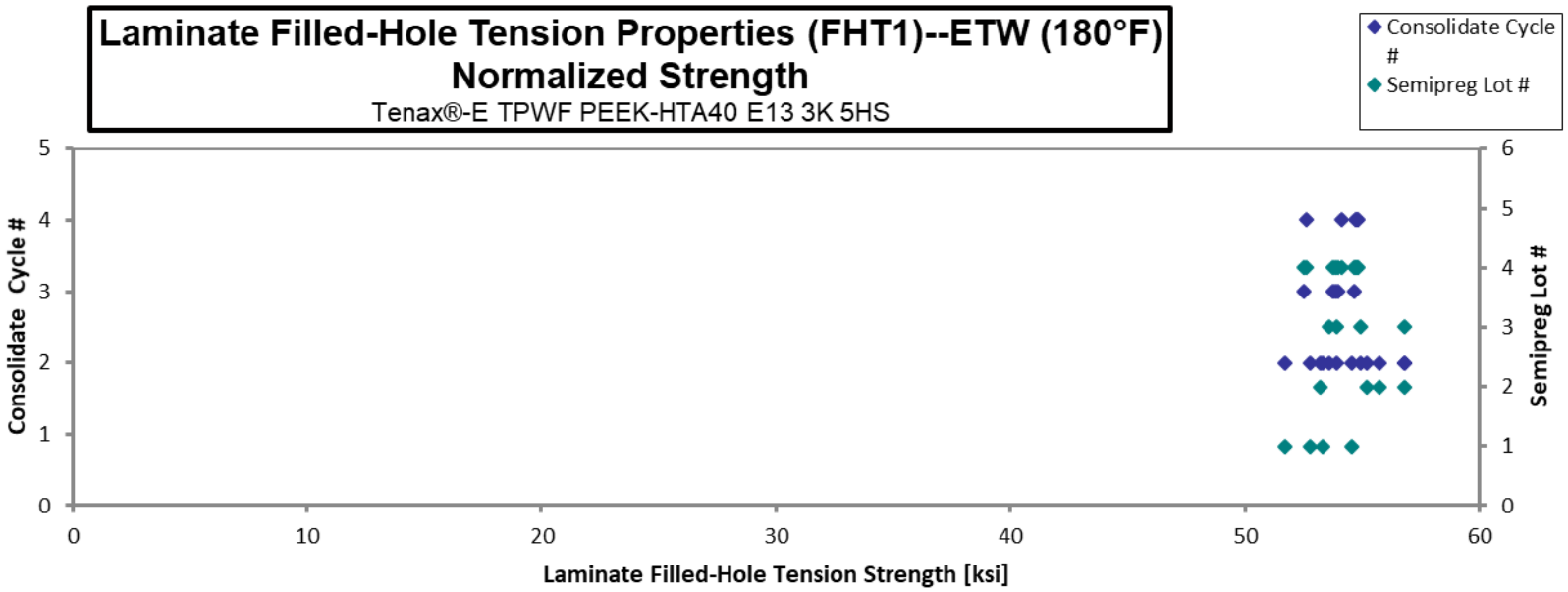

Laminate Filled-Hole Tension Properties (FHT1)--RTD (70°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Filled-Hole Tension Strength [ksi]
0
10
20
30
40
50
60
0
1
2
3
4
5
6

Laminate Filled-Hole Tension Properties (FHT1)--ETW (180°F)
Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

normalizing t_{ply} [in]
0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
NTP4013Q1-TTX-T40-E-FHT1-D-M3-ETW-1	4	3	53.64	0.09848	8	M(A,L)GM	0.01231	53.86
NTP4013Q1-TTX-T40-E-FHT1-D-M3-ETW-2	4	3	54.03	0.09757	8	M(A,L)GM	0.01220	53.75
NTP4013Q1-TTX-T40-E-FHT1-D-M3-ETW-3	4	3	52.88	0.09742	8	AGM	0.01218	52.52
NTP4013Q1-TTX-T40-E-FHT1-D-M3-ETW-4	4	3	55.21	0.09710	8	AGM	0.01214	54.66
NTP4013Q1-TTX-T40-E-FHT1-D-M3-ETW-5	4	3	55.28	0.09573	8	AGM	0.01197	53.96
NTP4013Q1-TTX-T40-E-FHT1-D-M4-ETW-1	4	4	55.16	0.09750	8	M(A,L)GM	0.01219	54.83
NTP4013Q1-TTX-T40-E-FHT1-D-M4-ETW-2	4	4	54.99	0.09758	8	M(A,L)GM	0.01220	54.71
NTP4013Q1-TTX-T40-E-FHT1-D-M4-ETW-3	4	4	55.40	0.09695	8	M(A,L)GM	0.01212	54.76
NTP4013Q1-TTX-T40-E-FHT1-D-M4-ETW-4	4	4	54.94	0.09658	8	M(A,L)GM	0.01207	54.10
NTP4013Q1-TTX-T40-E-FHT1-D-M4-ETW-5	4	4	53.82	0.09590	8	M(A,L)GM	0.01199	52.63
NTP4013Q1-TTX-T40-E-FHT1-A-M2-ETW-45	1	2	51.56	0.09840	8	MGF	0.01230	51.73
NTP4013Q1-TTX-T40-E-FHT1-A-M2-ETW-46	1	2	53.03	0.09862	8	MGF	0.01233	53.32
NTP4013Q1-TTX-T40-E-FHT1-A-M2-ETW-47	1	2	52.85	0.09795	8	MGF	0.01224	52.78
NTP4013Q1-TTX-T40-E-FHT1-A-M2-ETW-48	1	2	54.83	0.09762	8	MGF	0.01220	54.58
NTP4013Q1-TTX-T40-E-FHT1-B-M2-ETW-45	2	2	52.47	0.09942	8	AGM	0.01243	53.19
NTP4013Q1-TTX-T40-E-FHT1-B-M2-ETW-46	2	2	55.10	0.09919	8	AGM	0.01240	55.73
NTP4013Q1-TTX-T40-E-FHT1-B-M2-ETW-47	2	2	54.73	0.09890	8	AGM	0.01236	55.18
NTP4013Q1-TTX-T40-E-FHT1-B-M2-ETW-48	2	2	56.41	0.09874	8	AGM	0.01234	56.79
NTP4013Q1-TTX-T40-E-FHT1-C-M2-ETW-45	3	2	56.71	0.09828	8	AGM	0.01229	56.83
NTP4013Q1-TTX-T40-E-FHT1-C-M2-ETW-46	3	2	54.94	0.09807	8	AGM	0.01226	54.93
NTP4013Q1-TTX-T40-E-FHT1-C-M2-ETW-47	3	2	53.54	0.09814	8	AGM	0.01227	53.58
NTP4013Q1-TTX-T40-E-FHT1-C-M2-ETW-48	3	2	54.24	0.09745	8	AGM	0.01218	53.90

Average	**54.35**	**Average$_{norm}$**	**0.01223**	**54.20**
Standard Dev.	**1.277**	**Standard Dev.$_{norm}$**		**1.289**
Coeff. of Var. [%]	**2.350**	**Coeff. of Var. [%]$_{norm}$**		**2.378**
Min.	**51.56**	**Min.**	**0.01197**	**51.73**
Max.	**56.71**	**Max.**	**0.01243**	**56.83**
Number of Spec.	**22**	**Number of Spec.**	**22**	**22**


Laminate Filled-Hole Tension Properties (FHT1)--ETW (180°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Filled-Hole Tension Strength [ksi]
0
10
20
30
40
50
60
0
1
2
3
4
5
6

4.18 "10/80/10" Filled-Hole Tension 2 Properties (FHT2)

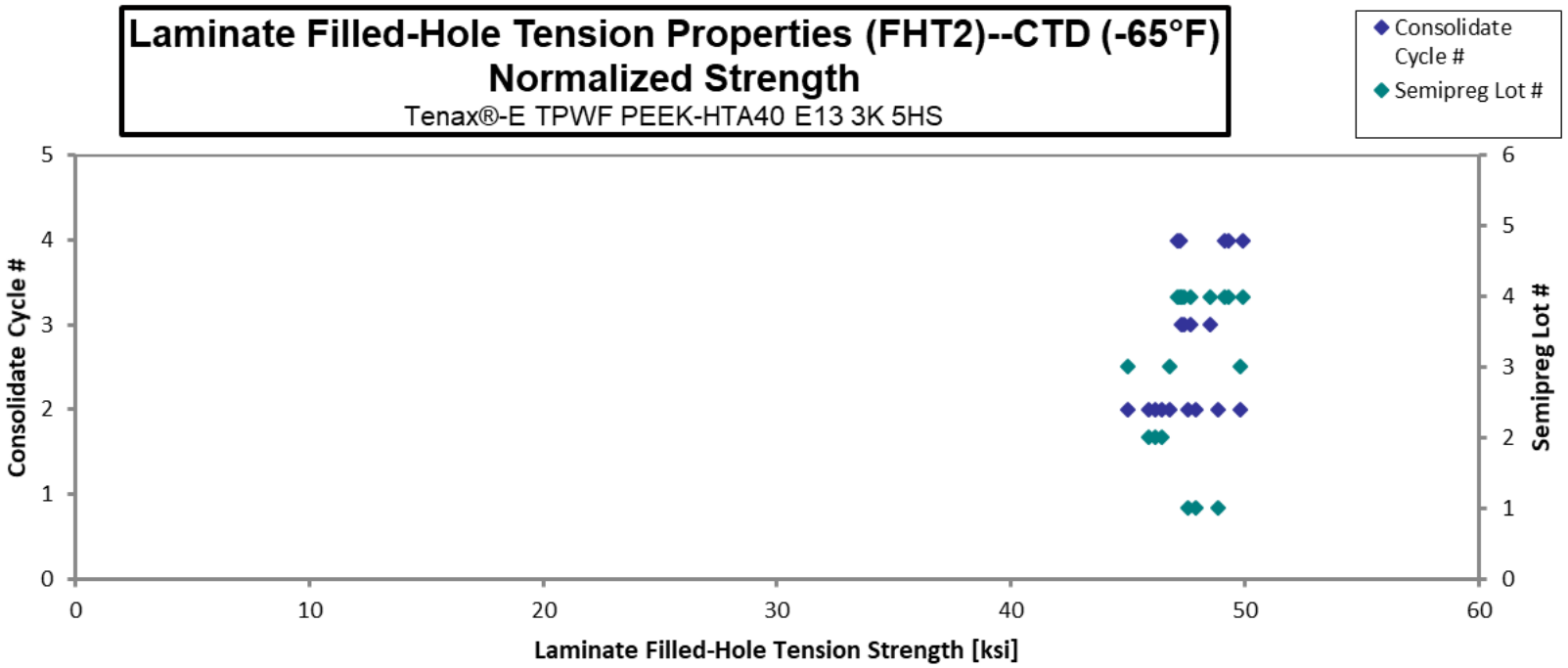
Laminate Filled-Hole Tension Properties (FHT2)--CTD (-65°F)
Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

normalizing t_{ply} [in]
0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
NTP4013Q1-TTX-T40-E-FHT2-D-M3-CTD-1	4	3	47.46	0.1221	10	AGM	0.01221	47.27
NTP4013Q1-TTX-T40-E-FHT2-D-M3-CTD-2	4	3	47.62	0.1220	10	AGM	0.01220	47.38
NTP4013Q1-TTX-T40-E-FHT2-D-M3-CTD-3	4	3	47.74	0.1224	10	AGM	0.01224	47.66
NTP4013Q1-TTX-T40-E-FHT2-D-M3-CTD-4	4	3	48.36	0.1230	10	AGM	0.01230	48.50
NTP4013Q1-TTX-T40-E-FHT2-D-M4-CTD-1	4	4	50.10	0.1221	10	AGM	0.01221	49.91
NTP4013Q1-TTX-T40-E-FHT2-D-M4-CTD-2	4	4	47.71	0.1214	10	AGM	0.01214	47.25
NTP4013Q1-TTX-T40-E-FHT2-D-M4-CTD-3	4	4	49.41	0.1219	10	AGM	0.01219	49.13
NTP4013Q1-TTX-T40-E-FHT2-D-M4-CTD-4	4	4	47.24	0.1222	10	AGM	0.01222	47.10
NTP4013Q1-TTX-T40-E-FHT2-D-M4-CTD-5	4	4	49.25	0.1227	10	AGM	0.01227	49.28
NTP4013Q1-TTX-T40-E-FHT2-A-M2-CTD-37	1	2	48.89	0.1225	10	MGO	0.01225	48.84
NTP4013Q1-TTX-T40-E-FHT2-A-M2-CTD-38	1	2	48.15	0.1219	10	MGO	0.01219	47.90
NTP4013Q1-TTX-T40-E-FHT2-A-M2-CTD-39	1	2	47.36	0.1231	10	MGO	0.01231	47.56
NTP4013Q1-TTX-T40-E-FHT2-B-M2-CTD-37	2	2	45.97	0.1231	10	AGM	0.01231	46.15
NTP4013Q1-TTX-T40-E-FHT2-B-M2-CTD-38	2	2	46.52	0.1224	10	AGM	0.01224	46.46
NTP4013Q1-TTX-T40-E-FHT2-B-M2-CTD-39	2	2	45.74	0.1230	10	AGM	0.01230	45.88
NTP4013Q1-TTX-T40-E-FHT2-C-M2-CTD-37	3	2	45.17	0.1221	10	AGM	0.01221	44.97
NTP4013Q1-TTX-T40-E-FHT2-C-M2-CTD-38	3	2	49.96	0.1222	10	AGM	0.01222	49.82
NTP4013Q1-TTX-T40-E-FHT2-C-M2-CTD-39	3	2	46.66	0.1229	10	AGM	0.01229	46.76

Average	**47.74**	
Standard Dev.	**1.421**	
Coeff. of Var. [%]	**2.976**	
Min.	**45.17**	
Max.	**50.10**	
Number of Spec.	**18**	

$Average_{norm}$	**0.01224**	**47.66**
$Standard\ Dev._{norm}$		**1.378**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**2.892**
Min.	**0.01214**	**44.97**
Max.	**0.01231**	**49.91**
Number of Spec.	**18**	**18**


Laminate Filled-Hole Tension Properties (FHT2)--CTD (-65°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
0
1
2
3
4
5
6
0
10
20
30
40
50
60
Laminate Filled-Hole Tension Strength [ksi]

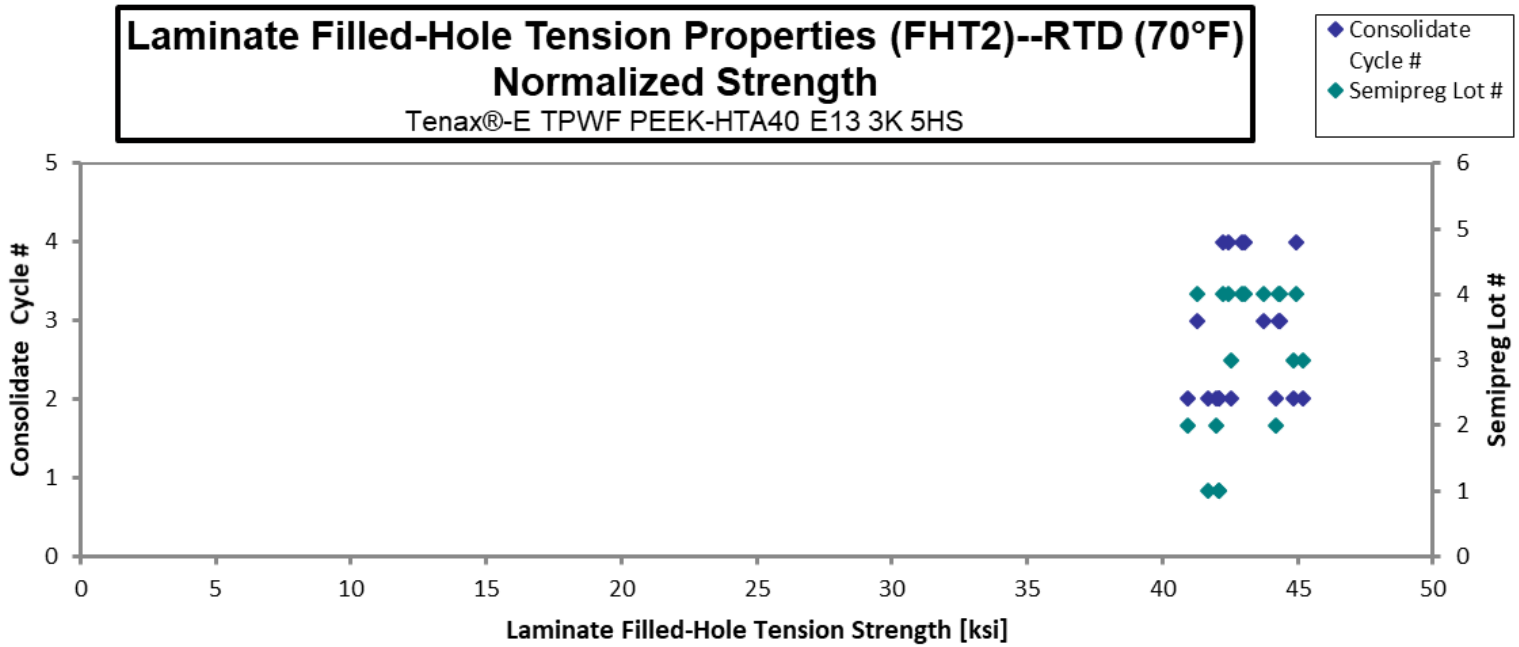
Laminate Filled-Hole Tension Properties (FHT2)--RTD(70°F)
Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

normalizing t_{ply} [in]
0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
NTP4013Q1-TTX-T40-E-FHT2-D-M3-RTD-1	4	3	44.38	0.1226	10	AGM	0.01226	44.37
NTP4013Q1-TTX-T40-E-FHT2-D-M3-RTD-2	4	3	43.97	0.1220	10	M(A,L)GM	0.01220	43.76
NTP4013Q1-TTX-T40-E-FHT2-D-M3-RTD-3	4	3	41.84	0.1210	10	M(A,L)GM	0.01210	41.29
NTP4013Q1-TTX-T40-E-FHT2-D-M3-RTD-4	4	3	44.73	0.1214	10	AGM	0.01214	44.29
NTP4013Q1-TTX-T40-E-FHT2-D-M4-RTD-1	4	4	42.53	0.1223	10	AGM	0.01223	42.43
NTP4013Q1-TTX-T40-E-FHT2-D-M4-RTD-2	4	4	44.95	0.1226	10	AGM	0.01226	44.95
NTP4013Q1-TTX-T40-E-FHT2-D-M4-RTD-3	4	4	43.08	0.1222	10	AGM	0.01222	42.92
NTP4013Q1-TTX-T40-E-FHT2-D-M4-RTD-4	4	4	42.34	0.1224	10	M(A,L)GM	0.01224	42.26
NTP4013Q1-TTX-T40-E-FHT2-D-M4-RTD-5	4	4	43.01	0.1227	10	AGM	0.01227	43.03
NTP4013Q1-TTX-T40-E-FHT2-A-M2-RTD-41	1	2	42.21	0.1223	10	LGM	0.01223	42.10
NTP4013Q1-TTX-T40-E-FHT2-A-M2-RTD-42	1	2	41.82	0.1222	10	LGM	0.01222	41.69
NTP4013Q1-TTX-T40-E-FHT2-A-M2-RTD-43	1	2	42.18	0.1224	10	LGM	0.01224	42.10
NTP4013Q1-TTX-T40-E-FHT2-B-M2-RTD-41	2	2	43.87	0.1235	10	AGM	0.01235	44.20
NTP4013Q1-TTX-T40-E-FHT2-B-M2-RTD-42	2	2	41.68	0.1235	10	AGM	0.01235	41.98
NTP4013Q1-TTX-T40-E-FHT2-B-M2-RTD-43	2	2	40.62	0.1235	10	AGM	0.01235	40.92
NTP4013Q1-TTX-T40-E-FHT2-C-M2-RTD-41	3	2	42.14	0.1238	10	LGM	0.01238	42.54
NTP4013Q1-TTX-T40-E-FHT2-C-M2-RTD-42	3	2	44.34	0.1240	10	LGM	0.01240	44.84
NTP4013Q1-TTX-T40-E-FHT2-C-M2-RTD-43	3	2	44.67	0.1241	10	LGM	0.01241	45.20

Average	**43.02**	
Standard Dev.	**1.280**	
Coeff. of Var. [%]	**2.974**	
Min.	**40.62**	
Max.	**44.95**	
Number of Spec.	**18**	

$Average_{norm}$	**0.01227**	**43.05**
Standard $Dev._{norm}$		**1.335**
Coeff. of Var. $[\%]_{norm}$		**3.101**
Min.	**0.01210**	**40.92**
Max.	**0.01241**	**45.20**
Number of Spec.	**18**	**18**

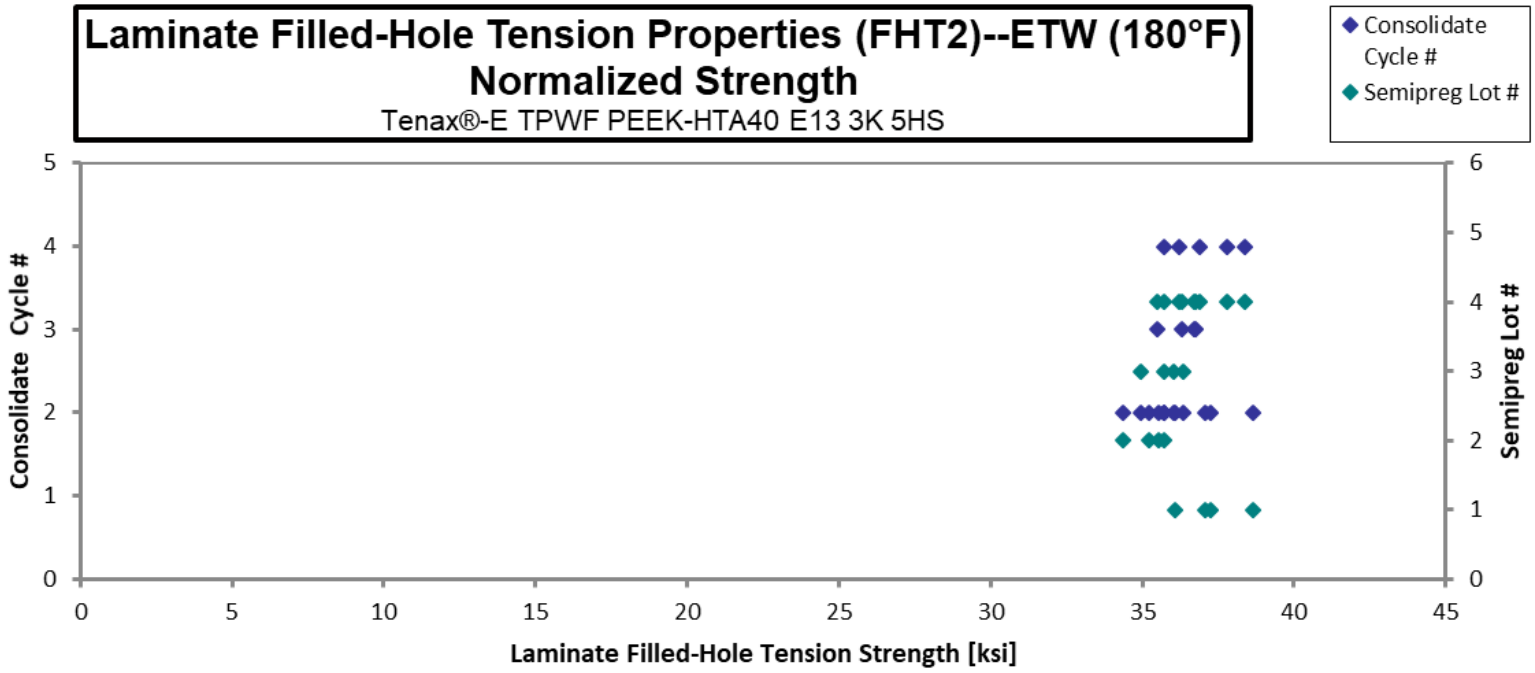

Laminate Filled-Hole Tension Properties (FHT2)--RTD (70°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Filled-Hole Tension Strength [ksi]
0
5
10
15
20
25
30
35
40
45
50
0
1
2
3
4
5
6

Laminate Filled-Hole Tension Properties (FHT2)--ETW (180°F)
Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

normalizing t_{ply} [in]
0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
NTP4013Q1-TTX-T40-E-FHT2-D-M3-ETW-1	4	3	35.83	0.1214	10	M(A,L)GM	0.01214	35.49
NTP4013Q1-TTX-T40-E-FHT2-D-M3-ETW-2	4	3	36.86	0.1222	10	M(A,L)GM	0.01222	36.72
NTP4013Q1-TTX-T40-E-FHT2-D-M3-ETW-3	4	3	36.72	0.1212	10	M(A,L)GM	0.01212	36.29
NTP4013Q1-TTX-T40-E-FHT2-D-M3-ETW-4	4	3	37.33	0.1208	10	M(A,L)GM	0.01208	36.78
NTP4013Q1-TTX-T40-E-FHT2-D-M4-ETW-1	4	4	35.81	0.1223	10	M(A,L)GM	0.01223	35.71
NTP4013Q1-TTX-T40-E-FHT2-D-M4-ETW-2	4	4	38.47	0.1224	10	M(A,L)GM	0.01224	38.40
NTP4013Q1-TTX-T40-E-FHT2-D-M4-ETW-3	4	4	38.14	0.1216	10	M(A,L)GM	0.01216	37.82
NTP4013Q1-TTX-T40-E-FHT2-D-M4-ETW-4	4	4	37.49	0.1207	10	M(A,L)GM	0.01207	36.91
NTP4013Q1-TTX-T40-E-FHT2-D-M4-ETW-5	4	4	36.90	0.1204	10	M(A,L)GM	0.01204	36.24
NTP4013Q1-TTX-T40-E-FHT2-A-M2-ETW-45	1	2	37.25	0.1227	10	MGF	0.01227	37.26
NTP4013Q1-TTX-T40-E-FHT2-A-M2-ETW-46	1	2	37.03	0.1227	10	MGF	0.01227	37.06
NTP4013Q1-TTX-T40-E-FHT2-A-M2-ETW-47	1	2	35.93	0.1231	10	MGF	0.01231	36.07
NTP4013Q1-TTX-T40-E-FHT2-A-M2-ETW-48	1	2	38.57	0.1229	10	MGF	0.01229	38.65
NTP4013Q1-TTX-T40-E-FHT2-B-M2-ETW-45	2	2	35.17	0.1239	10	LGM	0.01239	35.55
NTP4013Q1-TTX-T40-E-FHT2-B-M2-ETW-46	2	2	35.43	0.1235	10	LGM	0.01235	35.71
NTP4013Q1-TTX-T40-E-FHT2-B-M2-ETW-47	2	2	34.36	0.1226	10	LGM	0.01226	34.37
NTP4013Q1-TTX-T40-E-FHT2-B-M2-ETW-48	2	2	35.08	0.1231	10	LGM	0.01231	35.24
NTP4013Q1-TTX-T40-E-FHT2-C-M2-ETW-45	3	2	36.05	0.1236	10	AGM	0.01236	36.34
NTP4013Q1-TTX-T40-E-FHT2-C-M2-ETW-46	3	2	35.83	0.1233	10	AGM	0.01233	36.03
NTP4013Q1-TTX-T40-E-FHT2-C-M2-ETW-47	3	2	34.84	0.1230	10	AGM	0.01230	34.95
NTP4013Q1-TTX-T40-E-FHT2-C-M2-ETW-48	3	2	35.82	0.1223	10	AGM	0.01223	35.74

Average	**36.42**	**$Average_{norm}$**	**0.01224**	**36.35**
Standard Dev.	**1.187**	**$Standard\ Dev._{norm}$**		**1.084**
Coeff. of Var. [%]	**3.260**	**$Coeff.\ of\ Var.\ [\%]_{norm}$**		**2.981**
Min.	**34.36**	**Min.**	**0.01204**	**34.37**
Max.	**38.57**	**Max.**	**0.01239**	**38.65**
Number of Spec.	**21**	**Number of Spec.**	**21**	**21**


Laminate Filled-Hole Tension Properties (FHT2)--ETW (180°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Filled-Hole Tension Strength [ksi]
0
5
10
15
20
25
30
35
40
45
0
1
2
3
4
5
6

4.19 "40/20/40" Filled-Hole Tension 3 Properties (FHT3)

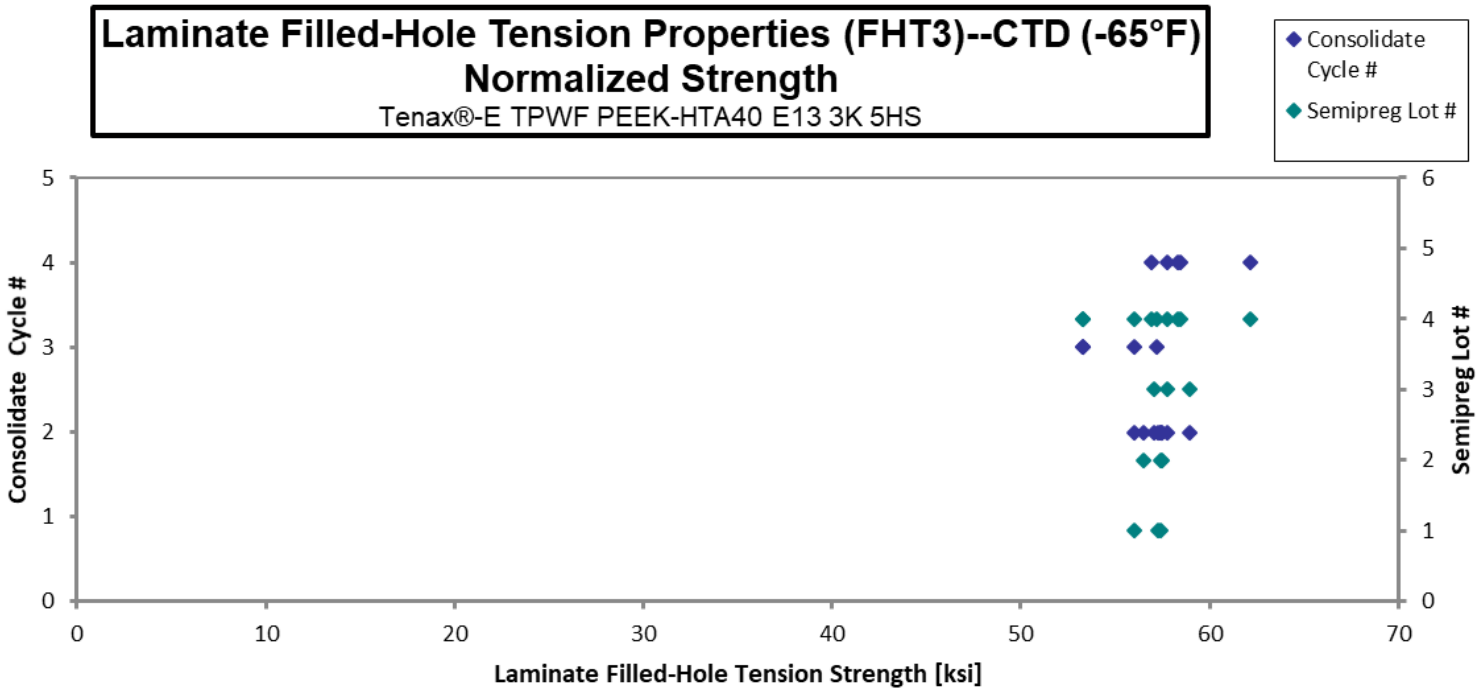
Laminate Filled-Hole Tension Properties (FHT3)--CTD (-65°F)
Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

normalizing t_{ply} [in]
0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
NTP4013Q1-TTX-T40-E-FHT3-D-M3-CTD-1	4	3	53.61	0.1219	10	LGM	0.01219	53.29
NTP4013Q1-TTX-T40-E-FHT3-D-M3-CTD-2	4	3	53.73	0.1217	10	LGM	0.01217	53.32
NTP4013Q1-TTX-T40-E-FHT3-D-M3-CTD-3	4	3	57.37	0.1223	10	LGM	0.01223	57.21
NTP4013Q1-TTX-T40-E-FHT3-D-M3-CTD-4	4	3	55.83	0.1230	10	LGM	0.01230	55.99
NTP4013Q1-TTX-T40-E-FHT3-D-M4-CTD-1	4	4	62.68	0.1216	10	LGM	0.01216	62.18
NTP4013Q1-TTX-T40-E-FHT3-D-M4-CTD-2	4	4	57.14	0.1222	10	LGM	0.01222	56.93
NTP4013Q1-TTX-T40-E-FHT3-D-M4-CTD-3	4	4	58.48	0.1222	10	LGM	0.01222	58.28
NTP4013Q1-TTX-T40-E-FHT3-D-M4-CTD-4	4	4	58.07	0.1220	10	LGM	0.01220	57.76
NTP4013Q1-TTX-T40-E-FHT3-D-M4-CTD-5	4	4	58.29	0.1229	10	LGM	0.01229	58.43
NTP4013Q1-TTX-T40-E-FHT3-A-M2-CTD-37	1	2	57.74	0.1216	10	LGM	0.01216	57.25
NTP4013Q1-TTX-T40-E-FHT3-A-M2-CTD-38	1	2	56.39	0.1218	10	LGM	0.01218	56.01
NTP4013Q1-TTX-T40-E-FHT3-A-M2-CTD-39	1	2	58.00	0.1214	10	LGM	0.01214	57.44
NTP4013Q1-TTX-T40-E-FHT3-B-M2-CTD-37	2	2	57.28	0.1229	10	LGM	0.01229	57.41
NTP4013Q1-TTX-T40-E-FHT3-B-M2-CTD-38	2	2	57.59	0.1223	10	LGM	0.01223	57.45
NTP4013Q1-TTX-T40-E-FHT3-B-M2-CTD-39	2	2	56.40	0.1227	10	LGM	0.01227	56.47
NTP4013Q1-TTX-T40-E-FHT3-C-M2-CTD-37	3	2	59.76	0.1210	10	LGM	0.01210	58.96
NTP4013Q1-TTX-T40-E-FHT3-C-M2-CTD-38	3	2	58.27	0.1215	10	LGM	0.01215	57.74
NTP4013Q1-TTX-T40-E-FHT3-C-M2-CTD-39	3	2	57.55	0.1216	10	LGM	0.01216	57.07

Average	**57.45**	
Standard Dev.	**2.022**	
Coeff. of Var. [%]	**3.519**	
Min.	**53.61**	
Max.	**62.68**	
Number of Spec.	**18**	

$Average_{norm}$	**0.01220**	**57.18**
$Standard\ Dev._{norm}$		**1.958**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**3.425**
Min.	**0.01210**	**53.29**
Max.	**0.01230**	**62.18**
Number of Spec.	**18**	**18**


Laminate Filled-Hole Tension Properties (FHT3)--CTD (-65°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Filled-Hole Tension Strength [ksi]
0
10
20
30
40
50
60
70
0
1
2
3
4
5
6

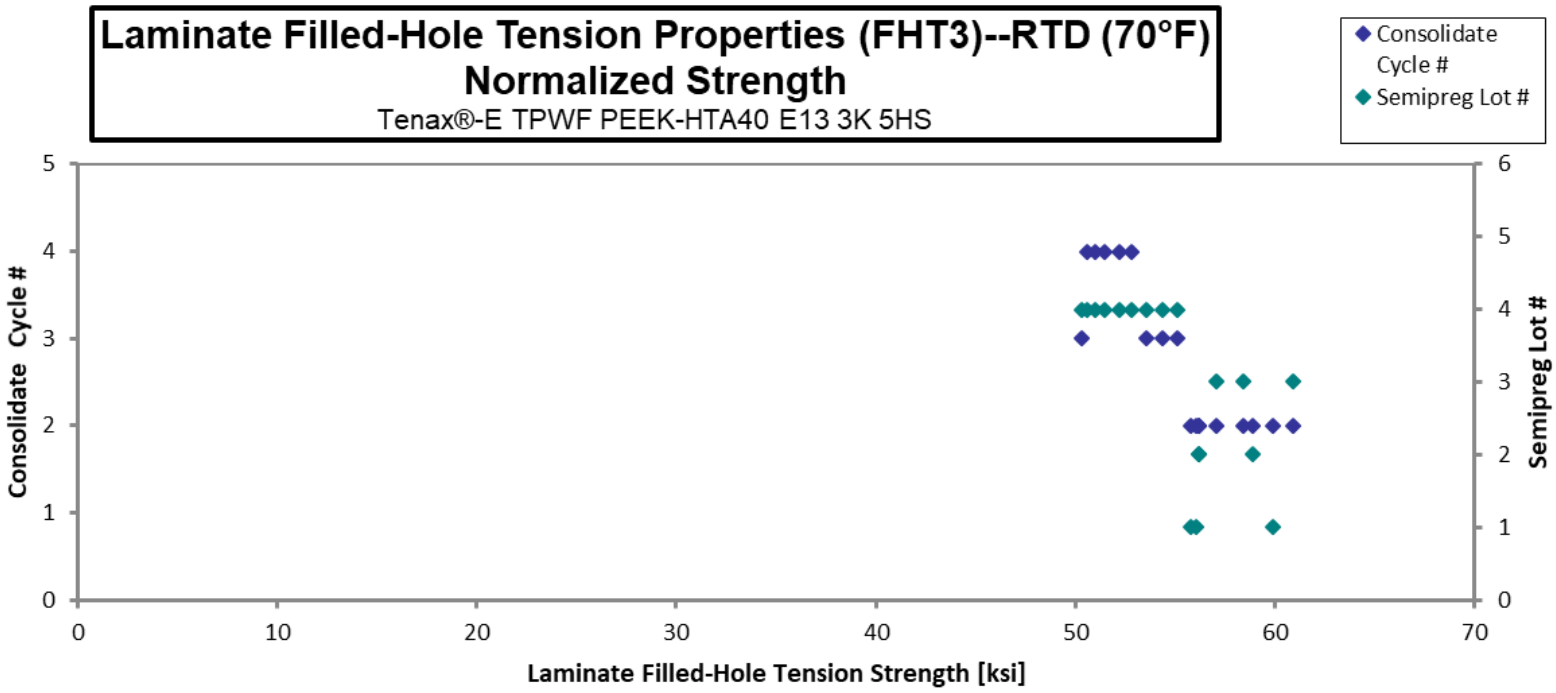
Laminate Filled-Hole Tension Properties (FHT3)--RTD(70°F)
Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

normalizing t_{ply} [in]
0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
NTP4013Q1-TTX-T40-E-FHT3-D-M3-RTD-1	4	3	53.61	0.1225	10	M(A,L)GM	0.01225	53.56
NTP4013Q1-TTX-T40-E-FHT3-D-M3-RTD-2	4	3	50.47	0.1222	10	M(A,L)GM	0.01222	50.31
NTP4013Q1-TTX-T40-E-FHT3-D-M3-RTD-3	4	3	55.55	0.1216	10	M(A,L)GM	0.01216	55.09
NTP4013Q1-TTX-T40-E-FHT3-D-M3-RTD-4	4	3	54.77	0.1217	10	LGM	0.01217	54.36
NTP4013Q1-TTX-T40-E-FHT3-D-M4-RTD-1	4	4	51.19	0.1234	10	LGM	0.01234	51.50
NTP4013Q1-TTX-T40-E-FHT3-D-M4-RTD-2	4	4	50.59	0.1236	10	LGM	0.01236	51.00
NTP4013Q1-TTX-T40-E-FHT3-D-M4-RTD-3	4	4	52.22	0.1240	10	LGM	0.01240	52.83
NTP4013Q1-TTX-T40-E-FHT3-D-M4-RTD-4	4	4	50.06	0.1240	10	LGM	0.01240	50.63
NTP4013Q1-TTX-T40-E-FHT3-D-M4-RTD-5	4	4	51.92	0.1233	10	LGM	0.01233	52.24
NTP4013Q1-TTX-T40-E-FHT3-A-M2-RTD-41	1	2	60.18	0.1220	10	LGM	0.01220	59.89
NTP4013Q1-TTX-T40-E-FHT3-A-M2-RTD-42	1	2	56.05	0.1221	10	LGM	0.01221	55.83
NTP4013Q1-TTX-T40-E-FHT3-A-M2-RTD-43	1	2	55.94	0.1228	10	LGM	0.01228	56.05
NTP4013Q1-TTX-T40-E-FHT3-B-M2-RTD-41	2	2	56.07	0.1229	10	LGM	0.01229	56.19
NTP4013Q1-TTX-T40-E-FHT3-B-M2-RTD-42	2	2	58.70	0.1230	10	LGM	0.01230	58.88
NTP4013Q1-TTX-T40-E-FHT3-B-M2-RTD-43	2	2	55.94	0.1231	10	LGM	0.01231	56.18
NTP4013Q1-TTX-T40-E-FHT3-C-M2-RTD-41	3	2	57.18	0.1223	10	LGM	0.01223	57.04
NTP4013Q1-TTX-T40-E-FHT3-C-M2-RTD-42	3	2	61.06	0.1223	10	LGM	0.01223	60.91
NTP4013Q1-TTX-T40-E-FHT3-C-M2-RTD-43	3	2	58.65	0.1222	10	LGM	0.01222	58.45

Average	**55.01**	
Standard Dev.	**3.410**	
Coeff. of Var. [%]	**6.199**	
Min.	**50.06**	
Max.	**61.06**	
Number of Spec.	**18**	

$Average_{norm}$	**0.01227**	**55.05**
$Standard\ Dev._{norm}$		**3.243**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**5.890**
Min.	**0.01216**	**50.31**
Max.	**0.01240**	**60.91**
Number of Spec.	**18**	**18**


Laminate Filled-Hole Tension Properties (FHT3)--RTD (70°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
0
1
2
3
4
5
6
0
10
20
30
40
50
60
70
Laminate Filled-Hole Tension Strength [ksi]

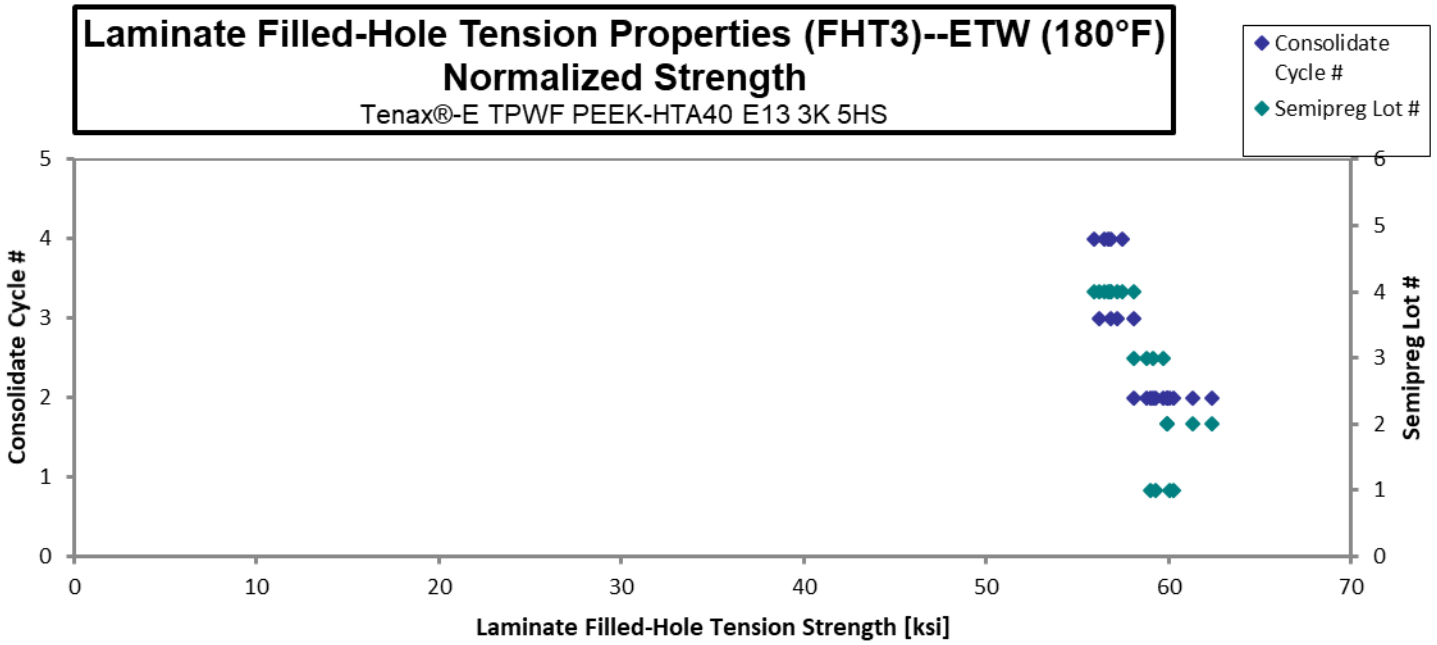
Laminate Filled-Hole Tension Properties (FHT3)--ETW (180°F)
Strength

Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

normalizing t_{ply} [in]
0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
NTP4013Q1-TTX-T40-E-FHT3-D-M3-ETW-1	4	3	58.46	0.1218	10	M(A,L)GM	0.01218	58.06
NTP4013Q1-TTX-T40-E-FHT3-D-M3-ETW-2	4	3	57.98	0.1209	10	M(A,L)GM	0.01209	57.19
NTP4013Q1-TTX-T40-E-FHT3-D-M3-ETW-3	4	3	57.99	0.1202	10	LGM	0.01202	56.84
NTP4013Q1-TTX-T40-E-FHT3-D-M3-ETW-4	4	3	58.45	0.1179	10	LGM	0.01179	56.21
NTP4013Q1-TTX-T40-E-FHT3-D-M4-ETW-1	4	4	57.24	0.1230	10	LGM	0.01230	57.45
NTP4013Q1-TTX-T40-E-FHT3-D-M4-ETW-2	4	4	56.89	0.1225	10	LGM	0.01225	56.86
NTP4013Q1-TTX-T40-E-FHT3-D-M4-ETW-3	4	4	56.68	0.1222	10	M(A,L)GM	0.01222	56.48
NTP4013Q1-TTX-T40-E-FHT3-D-M4-ETW-4	4	4	57.44	0.1210	10	M(A,L)GM	0.01210	56.68
NTP4013Q1-TTX-T40-E-FHT3-D-M4-ETW-5	4	4	56.80	0.1206	10	LGM	0.01206	55.89
NTP4013Q1-TTX-T40-E-FHT3-A-M2-ETW-45	1	2	59.30	0.1220	10	LGM	0.01220	59.03
NTP4013Q1-TTX-T40-E-FHT3-A-M2-ETW-46	1	2	60.33	0.1221	10	LGM	0.01221	60.06
NTP4013Q1-TTX-T40-E-FHT3-A-M2-ETW-47	1	2	60.58	0.1219	10	LGM	0.01219	60.24
NTP4013Q1-TTX-T40-E-FHT3-A-M2-ETW-48	1	2	59.67	0.1218	10	LGM	0.01218	59.29
NTP4013Q1-TTX-T40-E-FHT3-B-M2-ETW-45	2	2	61.07	0.1231	10	LGF	0.01231	61.32
NTP4013Q1-TTX-T40-E-FHT3-B-M2-ETW-46	2	2	62.02	0.1233	10	LGF	0.01233	62.40
NTP4013Q1-TTX-T40-E-FHT3-B-M2-ETW-47	2	2	59.58	0.1233	10	LGF	0.01233	59.94
NTP4013Q1-TTX-T40-E-FHT3-B-M2-ETW-48	2	2	59.59	0.1233	10	LGF	0.01233	59.90
NTP4013Q1-TTX-T40-E-FHT3-C-M2-ETW-45	3	2	59.83	0.1223	10	LGM	0.01223	59.68
NTP4013Q1-TTX-T40-E-FHT3-C-M2-ETW-46	3	2	59.14	0.1219	10	LGM	0.01219	58.79
NTP4013Q1-TTX-T40-E-FHT3-C-M2-ETW-47	3	2	58.48	0.1218	10	LGM	0.01218	58.10
NTP4013Q1-TTX-T40-E-FHT3-C-M2-ETW-48	3	2	59.82	0.1213	10	LGM	0.01213	59.18

Average	**58.92**		**$Average_{norm}$**	**0.01218**	**58.55**
Standard Dev.	**1.470**		**$Standard\ Dev._{norm}$**		**1.782**
Coeff. of Var. [%]	**2.495**		**$Coeff.\ of\ Var.\ [\%]_{norm}$**		**3.043**
Min.	**56.68**		**Min.**	**0.01179**	**55.89**
Max.	**62.02**		**Max.**	**0.01233**	**62.40**
Number of Spec.	**21**		**Number of Spec.**	**21**	**21**


Laminate Filled-Hole Tension Properties (FHT3)--ETW (180°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Filled-Hole Tension Strength [ksi]
0
10
20
30
40
50
60
70
0
1
2
3
4
5
6

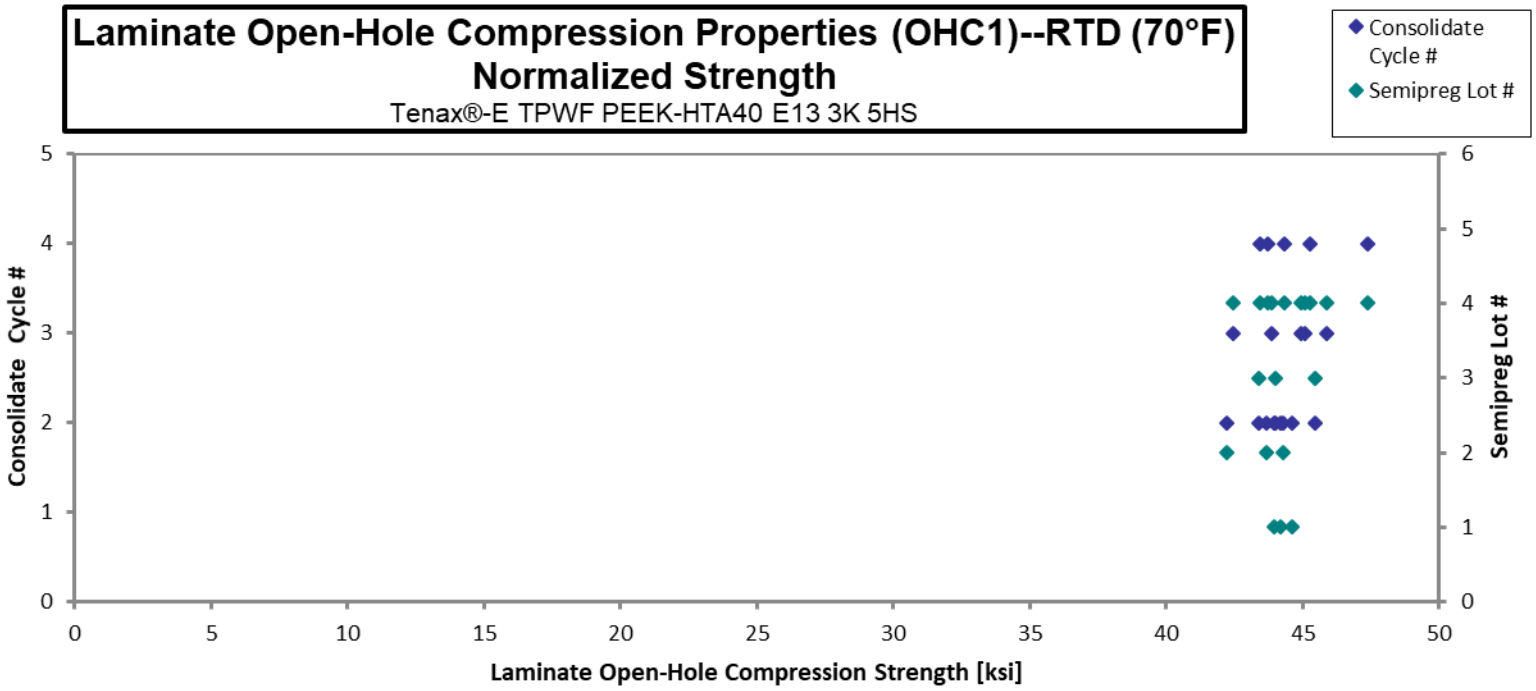
4.20 "25/50/25" Open-Hole Compression 1 Properties (OHC1)

Laminate Open-Hole Compression Properties (OHC1)--RTD (70°F)
Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

normalizing t_{ply} [in]
0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
NTP4013Q1-TTX-T40-E-OHC1-D-M3-RTD-1	4	3	44.94	0.1471	12	M(A,L)GM	0.01226	44.93
NTP4013Q1-TTX-T40-E-OHC1-D-M3-RTD-2	4	3	45.78	0.1474	12	M(A,L)GM	0.01228	45.87
NTP4013Q1-TTX-T40-E-OHC1-D-M3-RTD-3	4	3	43.85	0.1472	12	M(A,L)GM	0.01227	43.88
NTP4013Q1-TTX-T40-E-OHC1-D-M3-RTD-4	4	3	45.00	0.1473	12	M(A,L)GM	0.01228	45.06
NTP4013Q1-TTX-T40-E-OHC1-D-M3-RTD-5	4	3	42.43	0.1472	12	M(A,L)GM	0.01227	42.46
NTP4013Q1-TTX-T40-E-OHC1-D-M4-RTD-1	4	4	47.73	0.1461	12	M(A,L)GM	0.01217	47.39
NTP4013Q1-TTX-T40-E-OHC1-D-M4-RTD-2	4	4	43.64	0.1464	12	M(A,L)GM	0.01220	43.41
NTP4013Q1-TTX-T40-E-OHC1-D-M4-RTD-3	4	4	45.26	0.1472	12	M(A,L)GM	0.01226	45.27
NTP4013Q1-TTX-T40-E-OHC1-D-M4-RTD-4	4	4	43.86	0.1467	12	M(A,L)GM	0.01222	43.73
NTP4013Q1-TTX-T40-E-OHC1-D-M4-RTD-5	4	4	44.39	0.1469	12	M(A,L)GM	0.01224	44.32
NTP4013Q1-TTX-T40-E-OHC1-A-M2-RTD-1	1	2	44.36	0.1465	12	LGM	0.01221	44.17
NTP4013Q1-TTX-T40-E-OHC1-A-M2-RTD-2	1	2	43.94	0.1472	12	LGM	0.01227	43.96
NTP4013Q1-TTX-T40-E-OHC1-A-M2-RTD-3	1	2	44.56	0.1472	12	LGM	0.01227	44.60
NTP4013Q1-TTX-T40-E-OHC1-B-M2-RTD-1	2	2	41.92	0.1482	12	LGM	0.01235	42.22
NTP4013Q1-TTX-T40-E-OHC1-B-M2-RTD-2	2	2	43.47	0.1479	12	LGM	0.01232	43.69
NTP4013Q1-TTX-T40-E-OHC1-B-M2-RTD-3	2	2	44.18	0.1475	12	LGM	0.01229	44.30
NTP4013Q1-TTX-T40-E-OHC1-C-M2-RTD-1	3	2	43.69	0.1461	12	LGM	0.01217	43.38
NTP4013Q1-TTX-T40-E-OHC1-C-M2-RTD-2	3	2	44.22	0.1464	12	LGM	0.01220	44.01
NTP4013Q1-TTX-T40-E-OHC1-C-M2-RTD-3	3	2	45.55	0.1468	12	LGM	0.01223	45.44

Average	**44.36**	**Average$_{norm}$**	**0.01225**	**44.32**
Standard Dev.	**1.260**	**Standard Dev.$_{norm}$**		**1.1969**
Coeff. of Var. [%]	**2.840**	**Coeff. of Var. [%]$_{norm}$**		**2.701**
Min.	**41.92**	**Min.**	**0.01217**	**42.22**
Max.	**47.73**	**Max.**	**0.01235**	**47.39**
Number of Spec.	**19**	**Number of Spec.**	**19**	**19**


Laminate Open-Hole Compression Properties (OHC1)--RTD (70°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
0
1
2
3
4
5
6
0
5
10
15
20
25
30
35
40
45
50
Laminate Open-Hole Compression Strength [ksi]

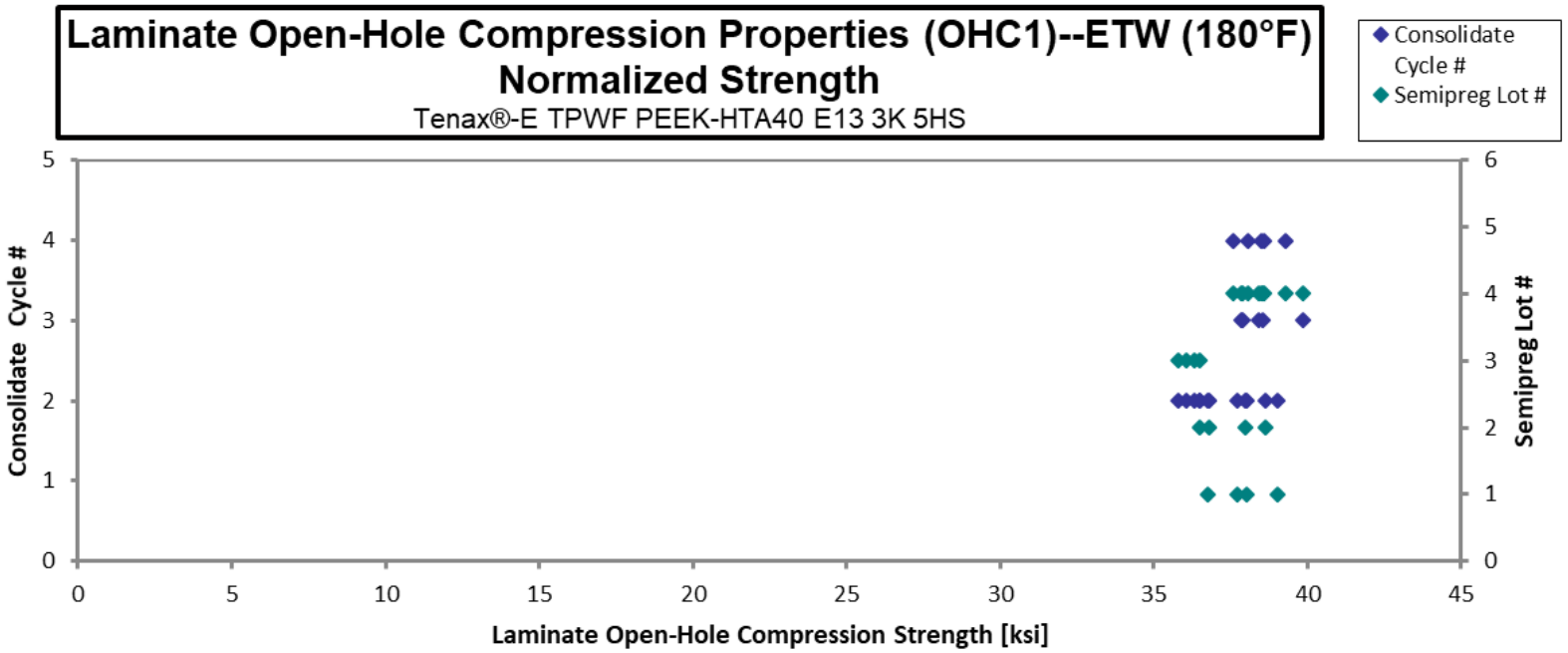
Laminate Open-Hole Compression Properties (OHC1)--ETW (180°F)
Strength

Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

normalizing t_{ply} [in]
0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
NTP4013Q1-TTX-T40-E-OHC1-D-M3-ETW-1	4	3	37.84	0.1473	12	LGM	0.01227	37.88
NTP4013Q1-TTX-T40-E-OHC1-D-M3-ETW-2	4	3	39.83	0.1473	12	LGM	0.01227	39.87
NTP4013Q1-TTX-T40-E-OHC1-D-M3-ETW-3	4	3	37.72	0.1476	12	LGM	0.01230	37.85
NTP4013Q1-TTX-T40-E-OHC1-D-M3-ETW-4	4	3	38.20	0.1479	12	LGM	0.01233	38.42
NTP4013Q1-TTX-T40-E-OHC1-D-M3-ETW-5	4	3	38.50	0.1473	12	LGM	0.01227	38.54
NTP4013Q1-TTX-T40-E-OHC1-D-M4-ETW-1	4	4	39.28	0.1471	12	M(A,L)GM	0.01226	39.28
NTP4013Q1-TTX-T40-E-OHC1-D-M4-ETW-2	4	4	38.65	0.1469	12	M(A,L)GM	0.01224	38.59
NTP4013Q1-TTX-T40-E-OHC1-D-M4-ETW-3	4	4	38.80	0.1460	12	M(A,L)GM	0.01217	38.50
NTP4013Q1-TTX-T40-E-OHC1-D-M4-ETW-4	4	4	38.39	0.1458	12	M(A,L)GM	0.01215	38.05
NTP4013Q1-TTX-T40-E-OHC1-D-M4-ETW-5	4	4	38.22	0.1447	12	M(A,L)GM	0.01206	37.59
NTP4013Q1-TTX-T40-E-OHC1-A-M2-ETW-5	1	2	37.60	0.1476	12	LGM	0.01230	37.71
NTP4013Q1-TTX-T40-E-OHC1-A-M2-ETW-6	1	2	38.87	0.1477	12	LGM	0.01231	39.03
NTP4013Q1-TTX-T40-E-OHC1-A-M2-ETW-7	1	2	36.62	0.1476	12	LGM	0.01230	36.75
NTP4013Q1-TTX-T40-E-OHC1-A-M2-ETW-8	1	2	37.96	0.1474	12	LGM	0.01229	38.04
NTP4013Q1-TTX-T40-E-OHC1-B-M2-ETW-5	2	2	38.55	0.1474	12	LGM	0.01228	38.62
NTP4013Q1-TTX-T40-E-OHC1-B-M2-ETW-6	2	2	36.36	0.1476	12	LGM	0.01230	36.48
NTP4013Q1-TTX-T40-E-OHC1-B-M2-ETW-7	2	2	36.72	0.1475	12	LGM	0.01229	36.82
NTP4013Q1-TTX-T40-E-OHC1-B-M2-ETW-8	2	2	37.81	0.1478	12	LGM	0.01232	38.00
NTP4013Q1-TTX-T40-E-OHC1-C-M2-ETW-5	3	2	35.87	0.1468	12	LGM	0.01223	35.78
NTP4013Q1-TTX-T40-E-OHC1-C-M2-ETW-6	3	2	36.10	0.1469	12	LGM	0.01224	36.05
NTP4013Q1-TTX-T40-E-OHC1-C-M2-ETW-7	3	2	36.47	0.1465	12	LGM	0.01221	36.33
NTP4013Q1-TTX-T40-E-OHC1-C-M2-ETW-8	3	2	36.74	0.1460	12	LGM	0.01217	36.48

Average	**37.78**	**$Average_{norm}$**	**0.01225**	**37.76**
Standard Dev.	**1.093**	**$Standard\ Dev._{norm}$**		**1.107**
Coeff. of Var. [%]	**2.893**	**$Coeff.\ of\ Var.\ [\%]_{norm}$**		**2.931**
Min.	**35.87**	**Min.**	**0.01206**	**35.78**
Max.	**39.83**	**Max.**	**0.01233**	**39.87**
Number of Spec.	**22**	**Number of Spec.**	**22**	**22**


Laminate Open-Hole Compression Properties (OHC1)--ETW (180°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Open-Hole Compression Strength [ksi]
0
5
10
15
20
25
30
35
40
45
0
1
2
3
4
5
6

4.21 "10/80/10" Open-Hole Compression 2 Properties (OHC2)

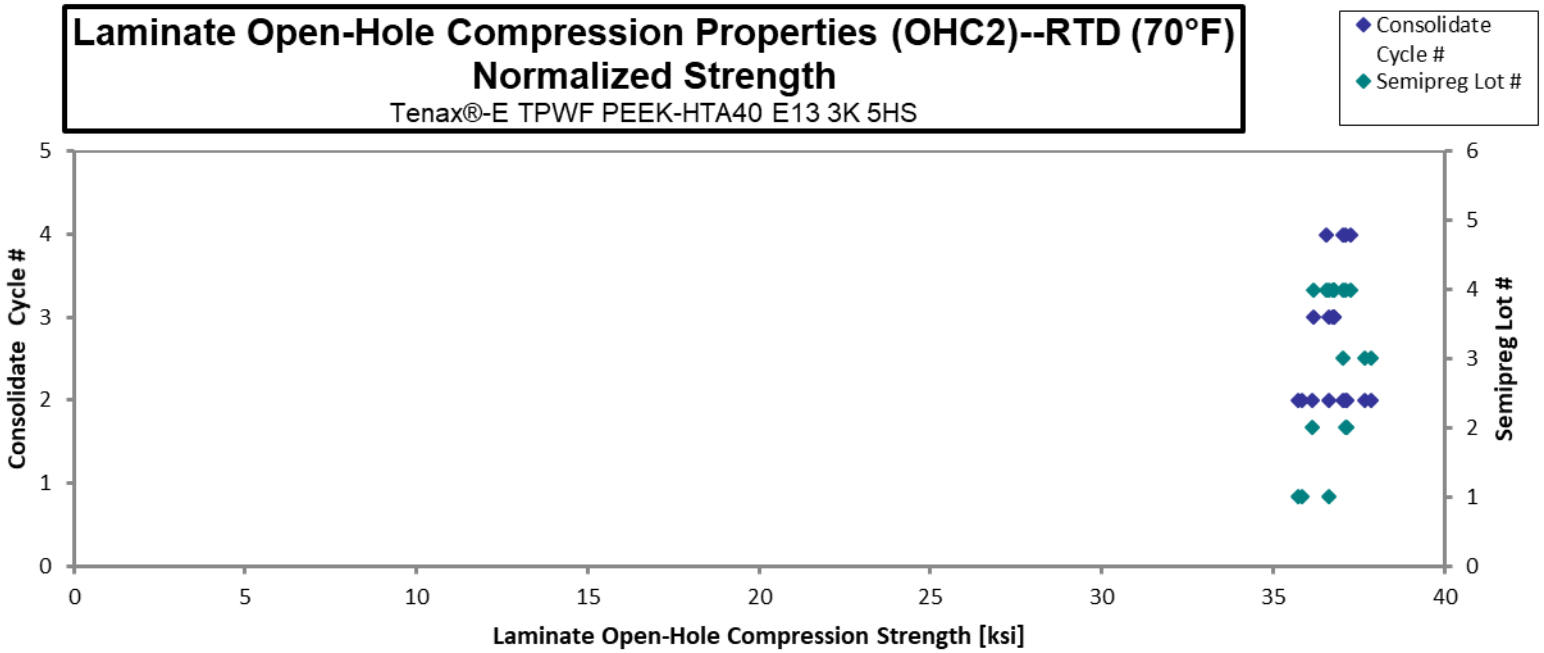
Laminate Open-Hole Compression Properties (OHC2)--RTD (70°F)
Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

normalizing t_{ply} [in]
0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
NTP4013Q1-TTX-T40-E-OHC2-D-M3-RTD-1	4	3	37.13	0.1210	10	M(A,L)GM	0.01210	36.63
NTP4013Q1-TTX-T40-E-OHC2-D-M3-RTD-2	4	3	37.59	0.1199	10	M(A,L)GM	0.01199	36.77
NTP4013Q1-TTX-T40-E-OHC2-D-M3-RTD-3	4	3	37.71	0.1177	10	M(A,L)GM	0.01177	36.19
NTP4013Q1-TTX-T40-E-OHC2-D-M3-RTD-4	4	3	36.60	0.1232	10	M(A,L)GM	0.01232	36.79
NTP4013Q1-TTX-T40-E-OHC2-D-M3-RTD-5	4	3	36.37	0.1239	10	M(A,L)GM	0.01239	36.76
NTP4013Q1-TTX-T40-E-OHC2-D-M4-RTD-1	4	4	36.92	0.1238	10	M(A,L)GM	0.01238	37.28
NTP4013Q1-TTX-T40-E-OHC2-D-M4-RTD-2	4	4	36.77	0.1236	10	M(A,L)GM	0.01236	37.06
NTP4013Q1-TTX-T40-E-OHC2-D-M4-RTD-3	4	4	37.15	0.1225	10	M(A,L)GM	0.01225	37.11
NTP4013Q1-TTX-T40-E-OHC2-D-M4-RTD-4	4	4	36.79	0.1218	10	M(A,L)GM	0.01218	36.54
NTP4013Q1-TTX-T40-E-OHC2-A-M2-RTD-49	1	2	37.94	0.1183	10	LGM	0.01183	36.62
NTP4013Q1-TTX-T40-E-OHC2-A-M2-RTD-50	1	2	36.23	0.1210	10	LGM	0.01210	35.75
NTP4013Q1-TTX-T40-E-OHC2-A-M2-RTD-51	1	2	36.24	0.1213	10	LGM	0.01213	35.85
NTP4013Q1-TTX-T40-E-OHC2-B-M2-RTD-49	2	2	36.39	0.1218	10	LGM	0.01218	36.15
NTP4013Q1-TTX-T40-E-OHC2-B-M2-RTD-50	2	2	37.08	0.1227	10	LGM	0.01227	37.11
NTP4013Q1-TTX-T40-E-OHC2-B-M2-RTD-51	2	2	36.98	0.1232	10	LGM	0.01232	37.16
NTP4013Q1-TTX-T40-E-OHC2-C-M2-RTD-49	3	2	37.88	0.1220	10	LGM	0.01220	37.68
NTP4013Q1-TTX-T40-E-OHC2-C-M2-RTD-50	3	2	37.78	0.1228	10	LGM	0.01228	37.86
NTP4013Q1-TTX-T40-E-OHC2-C-M2-RTD-51	3	2	36.96	0.1228	10	LGM	0.01228	37.03

Average	**37.03**	
Standard Dev.	**0.560**	
Coeff. of Var. [%]	**1.512**	
Min.	**36.23**	
Max.	**37.94**	
Number of Spec.	**18**	

$Average_{norm}$	**0.01218**	**36.80**
Standard $Dev._{norm}$		**0.5685**
Coeff. of Var. $[\%]_{norm}$		**1.545**
Min.	**0.01177**	**35.75**
Max.	**0.01239**	**37.86**
Number of Spec.	**18**	**18**

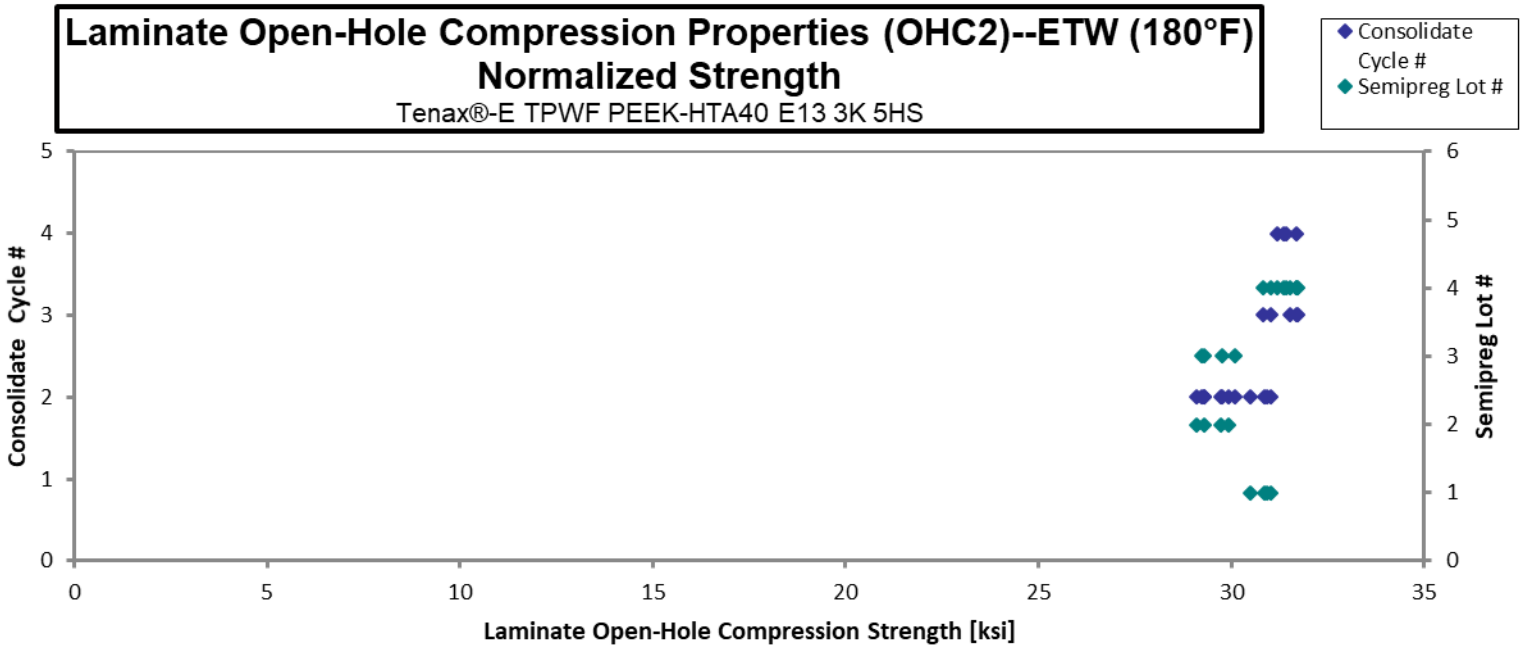

Laminate Open-Hole Compression Properties (OHC2)--RTD (70°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Open-Hole Compression Strength [ksi]
0
5
10
15
20
25
30
35
40
0
1
2
3
4
5
6

Laminate Open-Hole Compression Properties (OHC2)--ETW (180°F)
Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

normalizing t_{ply} [in]
0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
NTP4013Q1-TTX-T40-E-OHC2-D-M3-ETW-1	4	3	30.87	0.1233	10	M(A,L)GM	0.01233	31.04
NTP4013Q1-TTX-T40-E-OHC2-D-M3-ETW-2	4	3	30.85	0.1226	10	M(A,L)GM	0.01226	30.84
NTP4013Q1-TTX-T40-E-OHC2-D-M3-ETW-3	4	3	31.36	0.1240	10	M(A,L)GM	0.01240	31.72
NTP4013Q1-TTX-T40-E-OHC2-D-M3-ETW-4	4	3	31.59	0.1224	10	M(A,L)GM	0.01224	31.53
NTP4013Q1-TTX-T40-E-OHC2-D-M3-ETW-5	4	3	31.59	0.1230	10	M(A,L)GM	0.01230	31.70
NTP4013Q1-TTX-T40-E-OHC2-D-M4-ETW-1	4	4	31.55	0.1231	10	AGM	0.01231	31.68
NTP4013Q1-TTX-T40-E-OHC2-D-M4-ETW-2	4	4	30.97	0.1234	10	M(A,L)GM	0.01234	31.18
NTP4013Q1-TTX-T40-E-OHC2-D-M4-ETW-3	4	4	31.39	0.1226	10	M(A,L)GM	0.01226	31.37
NTP4013Q1-TTX-T40-E-OHC2-D-M4-ETW-4	4	4	31.39	0.1228	10	AGM	0.01228	31.43
NTP4013Q1-TTX-T40-E-OHC2-A-M2-ETW-53	1	2	31.24	0.1218	10	LGM	0.01218	31.04
NTP4013Q1-TTX-T40-E-OHC2-A-M2-ETW-54	1	2	30.95	0.1224	10	LGM	0.01224	30.91
NTP4013Q1-TTX-T40-E-OHC2-A-M2-ETW-55	1	2	30.88	0.1226	10	LGM	0.01226	30.87
NTP4013Q1-TTX-T40-E-OHC2-A-M2-ETW-56	1	2	30.47	0.1227	10	LGM	0.01227	30.49
NTP4013Q1-TTX-T40-E-OHC2-B-M2-ETW-53	2	2	29.73	0.1235	10	LGM	0.01235	29.94
NTP4013Q1-TTX-T40-E-OHC2-B-M2-ETW-54	2	2	28.80	0.1238	10	AGM	0.01238	29.09
NTP4013Q1-TTX-T40-E-OHC2-B-M2-ETW-55	2	2	28.96	0.1240	10	LGM	0.01240	29.29
NTP4013Q1-TTX-T40-E-OHC2-B-M2-ETW-56	2	2	29.42	0.1239	10	LGM	0.01239	29.74
NTP4013Q1-TTX-T40-E-OHC2-C-M2-ETW-53	3	2	29.06	0.1234	10	LGM	0.01234	29.25
NTP4013Q1-TTX-T40-E-OHC2-C-M2-ETW-54	3	2	29.89	0.1234	10	LGM	0.01234	30.08
NTP4013Q1-TTX-T40-E-OHC2-C-M2-ETW-55	3	2	29.05	0.1237	10	LGM	0.01237	29.31
NTP4013Q1-TTX-T40-E-OHC2-C-M2-ETW-56	3	2	29.54	0.1236	10	LGM	0.01236	29.78

Average	**30.45**		**$Average_{norm}$**	**0.01231**	**30.58**
Standard Dev.	**0.991**		**$Standard\ Dev._{norm}$**		**0.904**
Coeff. of Var. [%]	**3.254**		**$Coeff.\ of\ Var.\ [\%]_{norm}$**		**2.955**
Min.	**28.80**		**Min.**	**0.01218**	**29.09**
Max.	**31.59**		**Max.**	**0.01240**	**31.72**
Number of Spec.	**21**		**Number of Spec.**	**21**	**21**


Laminate Open-Hole Compression Properties (OHC2)--ETW (180°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Open-Hole Compression Strength [ksi]
0
5
10
15
20
25
30
35
0
1
2
3
4
5
6

4.22 "40/20/40" Open-Hole Compression 3 Properties (OHC3)

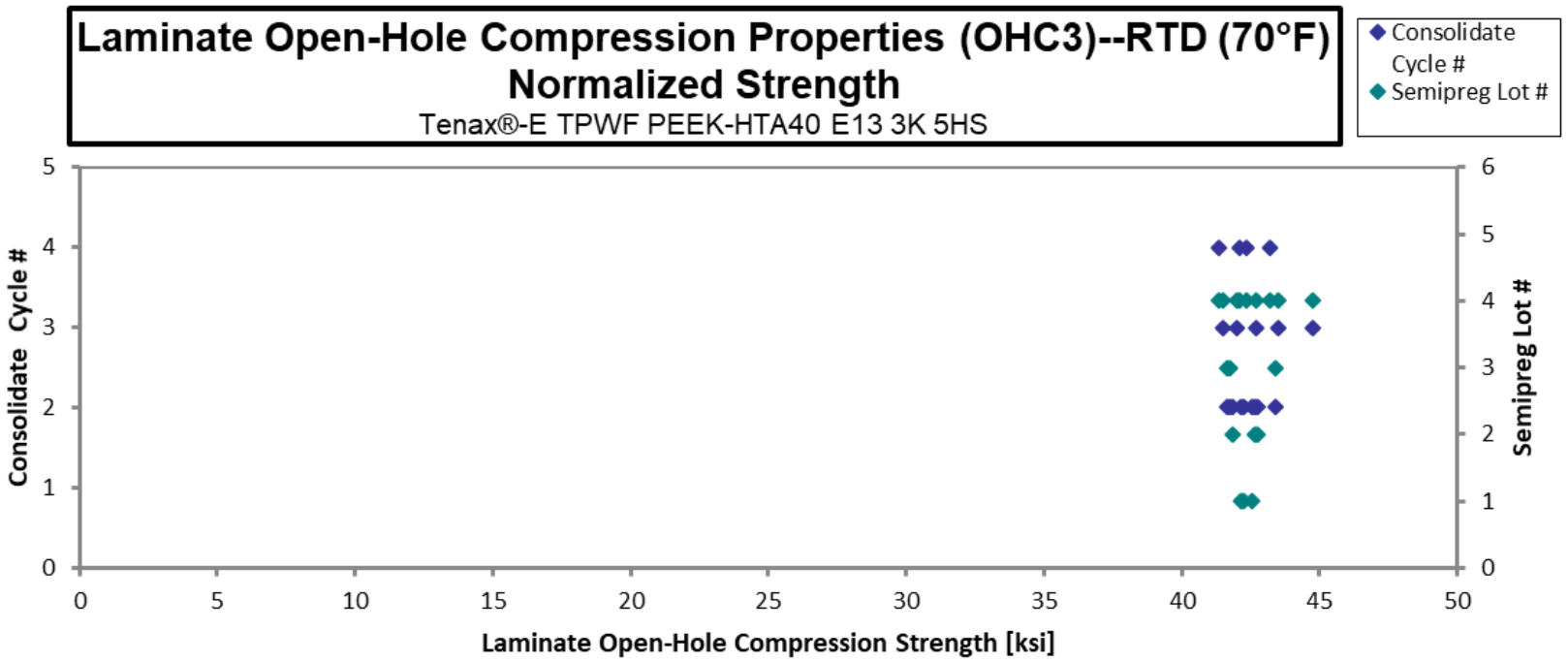
Laminate Open-Hole Compression Properties (OHC3)--RTD (70°F)
Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

normalizing t_{ply} [in]
0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
NTP4013Q1-TTX-T40-E-OHC3-D-M3-RTD-1	4	3	41.51	0.1226	10	LGM	0.01226	41.51
NTP4013Q1-TTX-T40-E-OHC3-D-M3-RTD-2	4	3	43.73	0.1219	10	LGM	0.01219	43.48
NTP4013Q1-TTX-T40-E-OHC3-D-M3-RTD-3	4	3	44.68	0.1228	10	LGM	0.01228	44.76
NTP4013Q1-TTX-T40-E-OHC3-D-M3-RTD-4	4	3	42.25	0.1219	10	LGM	0.01219	42.01
NTP4013Q1-TTX-T40-E-OHC3-D-M3-RTD-5	4	3	43.27	0.1210	10	LGM	0.01210	42.71
NTP4013Q1-TTX-T40-E-OHC3-D-M4-RTD-1	4	4	43.27	0.1193	10	LGM	0.01193	42.09
NTP4013Q1-TTX-T40-E-OHC3-D-M4-RTD-2	4	4	44.16	0.1200	10	LGM	0.01200	43.22
NTP4013Q1-TTX-T40-E-OHC3-D-M4-RTD-3	4	4	42.97	0.1208	10	M(A,L)GM	0.01208	42.34
NTP4013Q1-TTX-T40-E-OHC3-D-M4-RTD-4	4	4	41.84	0.1212	10	M(A,L)GM	0.01212	41.36
NTP4013Q1-TTX-T40-E-OHC3-A-M2-RTD-49	1	2	43.03	0.1213	10	LGM	0.01213	42.56
NTP4013Q1-TTX-T40-E-OHC3-A-M2-RTD-50	1	2	42.53	0.1218	10	LGM	0.01218	42.26
NTP4013Q1-TTX-T40-E-OHC3-A-M2-RTD-51	1	2	42.20	0.1224	10	LGM	0.01224	42.15
NTP4013Q1-TTX-T40-E-OHC3-B-M2-RTD-49	2	2	42.87	0.1220	10	LGM	0.01220	42.64
NTP4013Q1-TTX-T40-E-OHC3-B-M2-RTD-50	2	2	41.96	0.1222	10	LGM	0.01222	41.83
NTP4013Q1-TTX-T40-E-OHC3-B-M2-RTD-51	2	2	42.68	0.1228	10	LGM	0.01228	42.74
NTP4013Q1-TTX-T40-E-OHC3-C-M2-RTD-49	3	2	42.49	0.1202	10	LGM	0.01202	41.67
NTP4013Q1-TTX-T40-E-OHC3-C-M2-RTD-50	3	2	44.05	0.1208	10	LGM	0.01208	43.40
NTP4013Q1-TTX-T40-E-OHC3-C-M2-RTD-51	3	2	42.21	0.1213	10	LGM	0.01213	41.75

Average	**42.87**	
Standard Dev.	**0.866**	
Coeff. of Var. [%]	**2.021**	
Min.	**41.51**	
Max.	**44.68**	
Number of Spec.	**18**	

$Average_{norm}$	**0.01215**	**42.47**
Standard $Dev._{norm}$		**0.8436**
Coeff. of $Var.[\%]_{norm}$		**1.986**
Min.	**0.01193**	**41.36**
Max.	**0.01228**	**44.76**
Number of Spec.	**18**	**18**

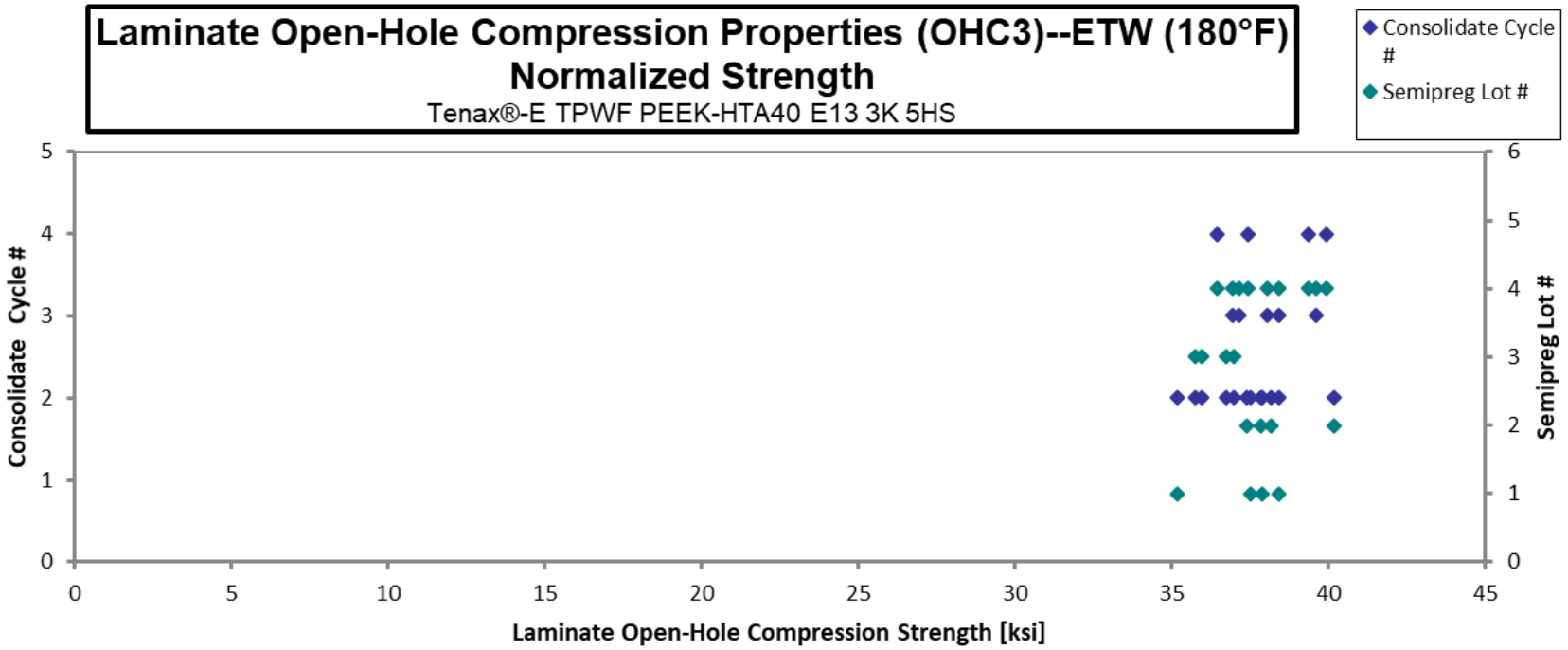

Laminate Open-Hole Compression Properties (OHC3)--RTD (70°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Open-Hole Compression Strength [ksi]
0
5
10
15
20
25
30
35
40
45
50
0
1
2
3
4
5
6

Laminate Open-Hole Compression Properties (OHC3)--ETW (180°F)
Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

normalizing t_{ply} [in]
0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
NTP4013Q1-TTX-T40-E-OHC3-D-M3-ETW-1	4	3	39.80	0.1220	10	LGM	0.01220	39.60
NTP4013Q1-TTX-T40-E-OHC3-D-M3-ETW-2	4	3	36.82	0.1230	10	LGM	0.01230	36.95
NTP4013Q1-TTX-T40-E-OHC3-D-M3-ETW-3	4	3	38.07	0.1226	10	LGM	0.01226	38.07
NTP4013Q1-TTX-T40-E-OHC3-D-M3-ETW-4	4	3	38.50	0.1224	10	LGM	0.01224	38.42
NTP4013Q1-TTX-T40-E-OHC3-D-M3-ETW-5	4	3	36.98	0.1231	10	LGM	0.01231	37.14
NTP4013Q1-TTX-T40-E-OHC3-D-M4-ETW-1	4	4	40.50	0.1209	10	LGM	0.01209	39.93
NTP4013Q1-TTX-T40-E-OHC3-D-M4-ETW-2	4	4	39.80	0.1213	10	LGM	0.01213	39.37
NTP4013Q1-TTX-T40-E-OHC3-D-M4-ETW-3	4	4	37.80	0.1215	10	LGM	0.01215	37.45
NTP4013Q1-TTX-T40-E-OHC3-D-M4-ETW-4	4	4	36.56	0.1223	10	LGM	0.01223	36.45
NTP4013Q1-TTX-T40-E-OHC3-A-M2-ETW-53	1	2	37.75	0.1231	10	LGM	0.01231	37.90
NTP4013Q1-TTX-T40-E-OHC3-A-M2-ETW-54	1	2	37.32	0.1232	10	LGM	0.01232	37.52
NTP4013Q1-TTX-T40-E-OHC3-A-M2-ETW-55	1	2	38.27	0.1231	10	LGM	0.01231	38.42
NTP4013Q1-TTX-T40-E-OHC3-A-M2-ETW-56	1	2	35.06	0.1230	10	LGM	0.01230	35.18
NTP4013Q1-TTX-T40-E-OHC3-B-M2-ETW-53	2	2	37.59	0.1234	10	LGM	0.01234	37.83
NTP4013Q1-TTX-T40-E-OHC3-B-M2-ETW-54	2	2	37.19	0.1233	10	LGM	0.01233	37.40
NTP4013Q1-TTX-T40-E-OHC3-B-M2-ETW-55	2	2	39.91	0.1234	10	LGM	0.01234	40.19
NTP4013Q1-TTX-T40-E-OHC3-B-M2-ETW-56	2	2	37.88	0.1235	10	LGM	0.01235	38.16
NTP4013Q1-TTX-T40-E-OHC3-C-M2-ETW-53	3	2	35.95	0.1227	10	LGM	0.01227	35.97
NTP4013Q1-TTX-T40-E-OHC3-C-M2-ETW-54	3	2	36.73	0.1227	10	LGM	0.01227	36.76
NTP4013Q1-TTX-T40-E-OHC3-C-M2-ETW-55	3	2	36.83	0.1231	10	LGM	0.01231	36.97
NTP4013Q1-TTX-T40-E-OHC3-C-M2-ETW-56	3	2	35.69	0.1228	10	LGM	0.01228	35.75

Average	**37.67**		**Average$_{norm}$**	**0.01227**	**37.69**
Standard Dev.	**1.439**		**Standard Dev.$_{norm}$**		**1.345**
Coeff. of Var. [%]	**3.821**		**Coeff. of Var. [%]$_{norm}$**		**3.570**
Min.	**35.06**		**Min.**	**0.01209**	**35.18**
Max.	**40.50**		**Max.**	**0.01235**	**40.19**
Number of Spec.	**21**		**Number of Spec.**	**21**	**21**


Laminate Open-Hole Compression Properties (OHC3)--ETW (180°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Open-Hole Compression Strength [ksi]
0
5
10
15
20
25
30
35
40
45
0
1
2
3
4
5
6

4.23 "25/50/25" Filled-Hole Compression 1 Properties (FHC1)

Laminate Filled-Hole Compression Properties (FHC1)--RTD (70°F)
Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

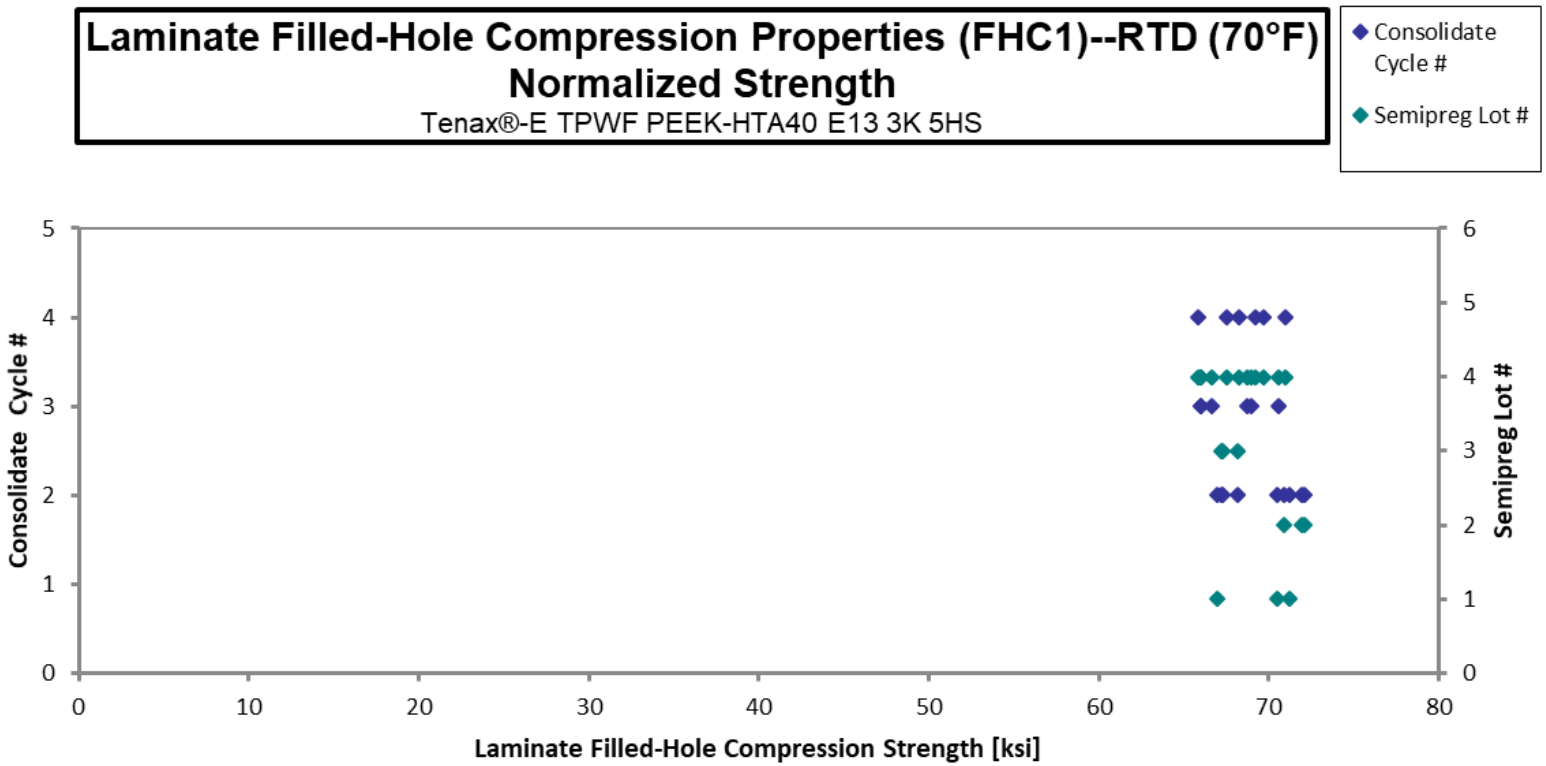
normalizing t_{ply} [in]
0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
NTP4013Q1-TTX-T40-E-FHC1-D-M3-RTD-1	4	3	65.79	0.1490	12	LGF	0.01241	66.61
NTP4013Q1-TTX-T40-E-FHC1-D-M3-RTD-2	4	3	69.71	0.1490	12	LGF	0.01242	70.60
NTP4013Q1-TTX-T40-E-FHC1-D-M3-RTD-3	4	3	67.88	0.1491	12	M(A,L)GF	0.01242	68.77
NTP4013Q1-TTX-T40-E-FHC1-D-M3-RTD-4*	4	3	65.31	0.1487	12	LWT	0.01239	66.03
NTP4013Q1-TTX-T40-E-FHC1-D-M3-RTD-5*	4	3	64.68	0.1501	12	LWT	0.01251	65.98
NTP4013Q1-TTX-T40-E-FHC1-D-M3-RTD-6	4	3	68.03	0.1491	12	M(A,L)GF	0.01243	68.96
NTP4013Q1-TTX-T40-E-FHC1-D-M4-RTD-1*	4	4	70.92	0.1472	12	LWT	0.01227	70.96
NTP4013Q1-TTX-T40-E-FHC1-D-M4-RTD-2*	4	4	69.77	0.1469	12	LWT	0.01224	69.65
NTP4013Q1-TTX-T40-E-FHC1-D-M4-RTD-3*	4	4	68.19	0.1472	12	LWT	0.01227	68.23
NTP4013Q1-TTX-T40-E-FHC1-D-M4-RTD-4	4	4	68.77	0.1480	12	LGF	0.01233	69.18
NTP4013Q1-TTX-T40-E-FHC1-D-M4-RTD-5	4	4	67.49	0.1473	12	M(A,L)GO	0.01227	67.56
NTP4013Q1-TTX-T40-E-FHC1-D-M4-RTD-6*	4	4	65.58	0.1476	12	LWT	0.01230	65.81
NTP4013Q1-TTX-T40-E-FHC1-A-M2-RTD-9	1	2	71.03	0.1475	12	MGF	0.01230	71.24
NTP4013Q1-TTX-T40-E-FHC1-A-M2-RTD-10	1	2	70.37	0.1474	12	MGF	0.01229	70.52
NTP4013Q1-TTX-T40-E-FHC1-A-M2-RTD-11	1	2	67.15	0.1468	12	MGF	0.01223	66.99
NTP4013Q1-TTX-T40-E-FHC1-B-M2-RTD-10	2	2	71.35	0.1487	12	LGF	0.01239	72.13
NTP4013Q1-TTX-T40-E-FHC1-B-M2-RTD-11	2	2	70.10	0.1488	12	LGO	0.01240	70.91
NTP4013Q1-TTX-T40-E-FHC1-B-M2-RTD-12	2	2	71.19	0.1487	12	LGO	0.01240	71.97
NTP4013Q1-TTX-T40-E-FHC1-C-M2-RTD-9	3	2	67.90	0.1458	12	LGF	0.01215	67.28
NTP4013Q1-TTX-T40-E-FHC1-C-M2-RTD-10	3	2	69.12	0.1450	12	LGF	0.01209	68.14
NTP4013Q1-TTX-T40-E-FHC1-C-M2-RTD-11	3	2	68.12	0.1452	12	LGF	0.01210	67.21

*Unacceptable failure modes were included, this is approved by NCAMP AER

Average	**68.50**	
Standard Dev.	**2.022**	
Coeff. of Var. [%]	**2.952**	
Min.	**64.68**	
Max.	**71.35**	
Number of Spec.	**21**	

$Average_{norm}$	**0.01231**	**68.80**
Standard $Dev._{norm}$		**2.037**
Coeff. of $Var._{norm}$ [%]		**2.962**
Min.	**0.01209**	**65.81**
Max.	**0.01251**	**72.13**
Number of Spec.	**21**	**21**


Laminate Filled-Hole Compression Properties (FHC1)--RTD (70°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Filled-Hole Compression Strength [ksi]
0
10
20
30
40
50
60
70
80
0
1
2
3
4
5
6

Laminate Filled-Hole Compression Properties (FHC1)--ETW (180°F)
Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

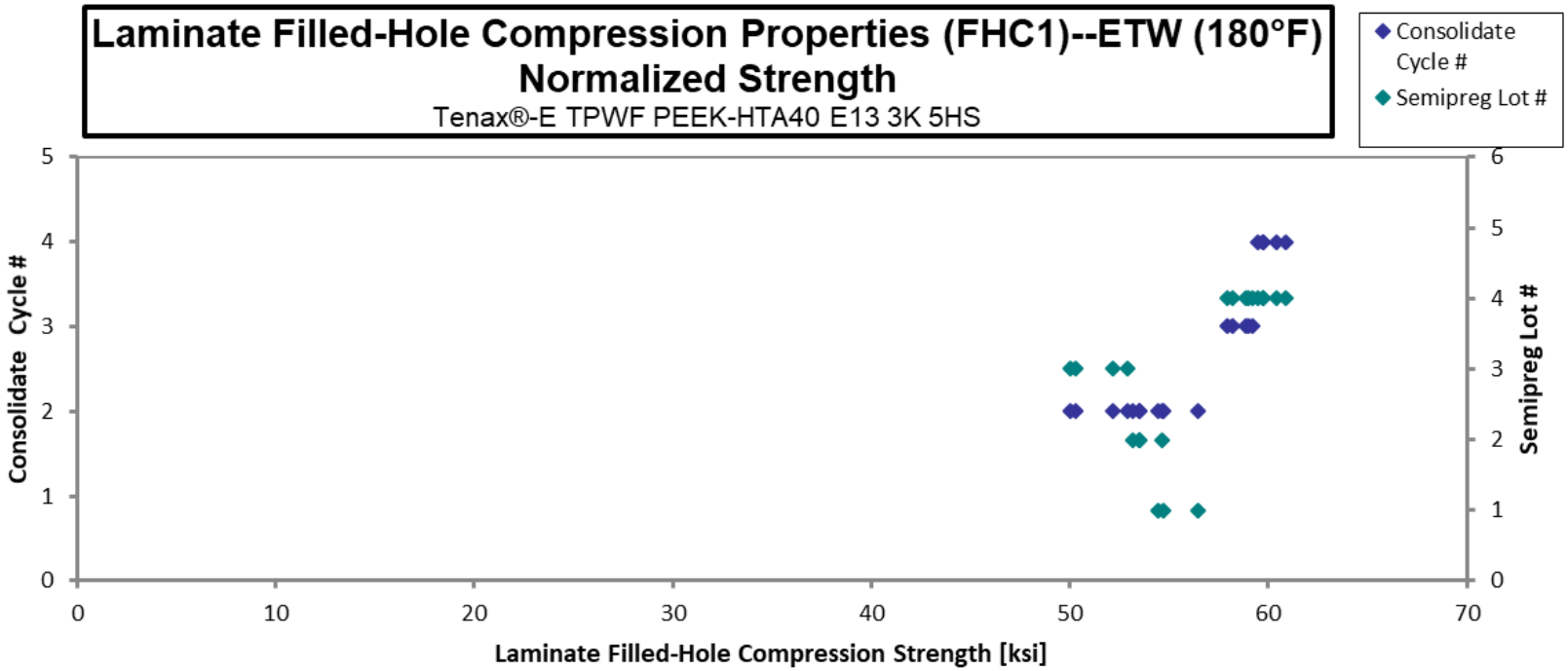
normalizing t_{ply} [in]
0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
NTP4013Q1-TTX-T40-E-FHC1-D-M3-ETW-1	4	3	57.83	0.1497	12	LGF	0.01248	58.85
NTP4013Q1-TTX-T40-E-FHC1-D-M3-ETW-2	4	3	57.18	0.1498	12	LGF	0.01248	58.21
NTP4013Q1-TTX-T40-E-FHC1-D-M3-ETW-3	4	3	58.82	0.1480	12	LGF	0.01233	59.17
NTP4013Q1-TTX-T40-E-FHC1-D-M3-ETW-4	4	3	58.46	0.1485	12	LGF	0.01238	59.02
NTP4013Q1-TTX-T40-E-FHC1-D-M3-ETW-5	4	3	57.52	0.1481	12	LGF	0.01234	57.90
NTP4013Q1-TTX-T40-E-FHC1-D-M4-ETW-1*	4	4	59.37	0.1480	12	LWB	0.01234	59.74
NTP4013Q1-TTX-T40-E-FHC1-D-M4-ETW-2*	4	4	60.41	0.1482	12	LWB	0.01235	60.86
NTP4013Q1-TTX-T40-E-FHC1-D-M4-ETW-3	4	4	60.13	0.1478	12	LGF	0.01232	60.41
NTP4013Q1-TTX-T40-E-FHC1-D-M4-ETW-4	4	4	59.42	0.1478	12	LGF	0.01232	59.71
NTP4013Q1-TTX-T40-E-FHC1-D-M4-ETW-5*	4	4	59.25	0.1477	12	LWB	0.01231	59.50
NTP4013Q1-TTX-T40-E-FHC1-A-M2-ETW-13	1	2	56.46	0.1472	12	LGF	0.01226	56.48
NTP4013Q1-TTX-T40-E-FHC1-A-M2-ETW-15	1	2	54.79	0.1469	12	LGF	0.01224	54.70
NTP4013Q1-TTX-T40-E-FHC1-A-M2-ETW-16	1	2	54.39	0.1472	12	LGF	0.01227	54.42
NTP4013Q1-TTX-T40-E-FHC1-B-M2-ETW-13	2	2	52.55	0.1488	12	LGF	0.01240	53.15
NTP4013Q1-TTX-T40-E-FHC1-B-M2-ETW-14	2	2	54.11	0.1486	12	LGF	0.01239	54.66
NTP4013Q1-TTX-T40-E-FHC1-B-M2-ETW-15	2	2	52.98	0.1485	12	LGF	0.01238	53.48
NTP4013Q1-TTX-T40-E-FHC1-B-M2-ETW-16	2	2	53.14	0.1482	12	LGF	0.01235	53.52
NTP4013Q1-TTX-T40-E-FHC1-C-M2-ETW-13	3	2	50.68	0.1453	12	LGF	0.01211	50.04
NTP4013Q1-TTX-T40-E-FHC1-C-M2-ETW-14	3	2	52.70	0.1456	12	LGF	0.01213	52.14
NTP4013Q1-TTX-T40-E-FHC1-C-M2-ETW-15	3	2	53.42	0.1457	12	LGF	0.01215	52.92
NTP4013Q1-TTX-T40-E-FHC1-C-M2-ETW-16	3	2	50.77	0.1457	12	LGF	0.01214	50.27

*Unacceptable failure modes were included, this is approved by NCAMP AER

Average	**55.92**	
Standard Dev.	**3.174**	
Coeff. of Var. [%]	**5.676**	
Min.	**50.68**	
Max.	**60.41**	
Number of Spec.	**21**	

$Average_{norm}$	**0.01231**	**56.15**
Standard $Dev._{norm}$		**3.448**
Coeff. of Var. $[\%]_{norm}$		**6.141**
Min.	**0.01211**	**50.04**
Max.	**0.01248**	**60.86**
Number of Spec.	**21**	**21**


Laminate Filled-Hole Compression Properties (FHC1)--ETW (180°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Filled-Hole Compression Strength [ksi]
0
10
20
30
40
50
60
70
0
1
2
3
4
5
6

4.24 "10/80/10" Filled-Hole Compression 2 Properties (FHC2)

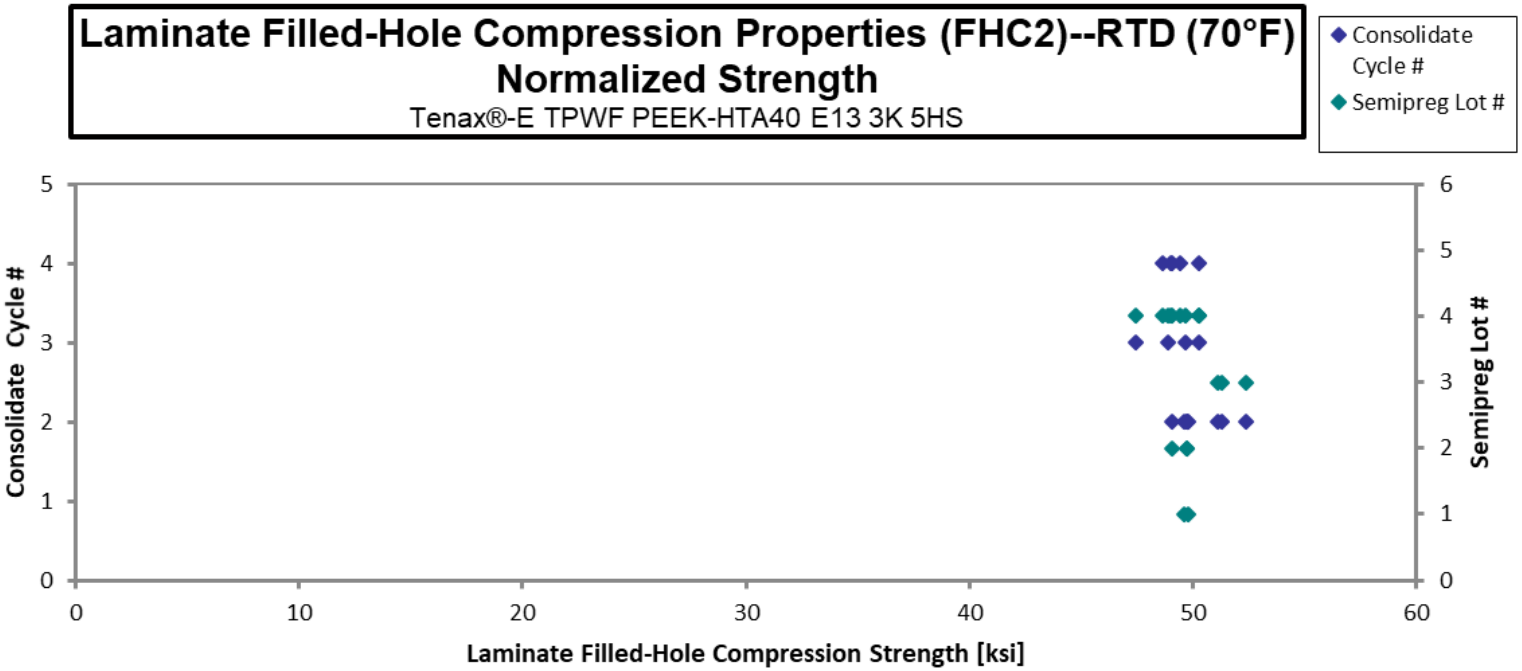
Laminate Filled-Hole Compression Properties (FHC2)--RTD (70°F)
Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

normalizing t_{ply} [in]
0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
NTP4013Q1-TTX-T40-E-FHC2-D-M3-RTD-1	4	3	49.89	0.1221	10	M(A,L)GF	0.01221	49.67
NTP4013Q1-TTX-T40-E-FHC2-D-M3-RTD-2	4	3	47.49	0.1225	10	M(A,L)GF	0.01225	47.44
NTP4013Q1-TTX-T40-E-FHC2-D-M3-RTD-3*	4	3	50.21	0.1227	10	M(A,L)WT	0.01227	50.25
NTP4013Q1-TTX-T40-E-FHC2-D-M3-RTD-4	4	3	48.93	0.1225	10	M(A,L)GF	0.01225	48.90
NTP4013Q1-TTX-T40-E-FHC2-D-M4-RTD-1	4	4	49.31	0.1229	10	M(A,L)GF	0.01229	49.41
NTP4013Q1-TTX-T40-E-FHC2-D-M4-RTD-2	4	4	48.52	0.1240	10	M(A,L)GF	0.01240	49.06
NTP4013Q1-TTX-T40-E-FHC2-D-M4-RTD-3	4	4	49.68	0.1241	10	M(A,L)GF	0.01241	50.28
NTP4013Q1-TTX-T40-E-FHC2-D-M4-RTD-4	4	4	48.16	0.1237	10	M(A,L)GF	0.01237	48.61
NTP4013Q1-TTX-T40-E-FHC2-D-M4-RTD-5	4	4	48.81	0.1231	10	AGF	0.01231	49.01
NTP4013Q1-TTX-T40-E-FHC2-A-M2-RTD-58	1	2	49.58	0.1231	10	AGM	0.01231	49.77
NTP4013Q1-TTX-T40-E-FHC2-A-M2-RTD-60	1	2	49.64	0.1225	10	AGM	0.01225	49.59
NTP4013Q1-TTX-T40-E-FHC2-B-M2-RTD-57	2	2	49.13	0.1241	10	LGF	0.01241	49.71
NTP4013Q1-TTX-T40-E-FHC2-B-M2-RTD-58	2	2	49.35	0.1235	10	MGF	0.01235	49.69
NTP4013Q1-TTX-T40-E-FHC2-B-M2-RTD-59	2	2	48.75	0.1233	10	MGF	0.01233	49.03
NTP4013Q1-TTX-T40-E-FHC2-C-M2-RTD-57	3	2	50.81	0.1233	10	LGF	0.01233	51.11
NTP4013Q1-TTX-T40-E-FHC2-C-M2-RTD-58	3	2	50.94	0.1234	10	LGF	0.01234	51.27
NTP4013Q1-TTX-T40-E-FHC2-C-M2-RTD-59	3	2	52.02	0.1234	10	LGF	0.01234	52.34

*Unacceptable failure modes were included, this is approved by NCAMP AER

Average	**49.48**	**Average$_{norm}$**	**0.01232**	**49.71**
Standard Dev.	**1.096**	**Standard Dev.$_{norm}$**		**1.1298**
Coeff. of Var. [%]	**2.214**	**Coeff. of Var. [%]$_{norm}$**		**2.273**
Min.	**47.49**	**Min.**	**0.01221**	**47.44**
Max.	**52.02**	**Max.**	**0.01241**	**52.34**
Number of Spec.	**17**	**Number of Spec.**	**17**	**17**


Laminate Filled-Hole Compression Properties (FHC2)--RTD (70°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Filled-Hole Compression Strength [ksi]
0
10
20
30
40
50
60
0
1
2
3
4
5
6

Laminate Filled-Hole Compression Properties (FHC2)--ETW (180°F)
Strength

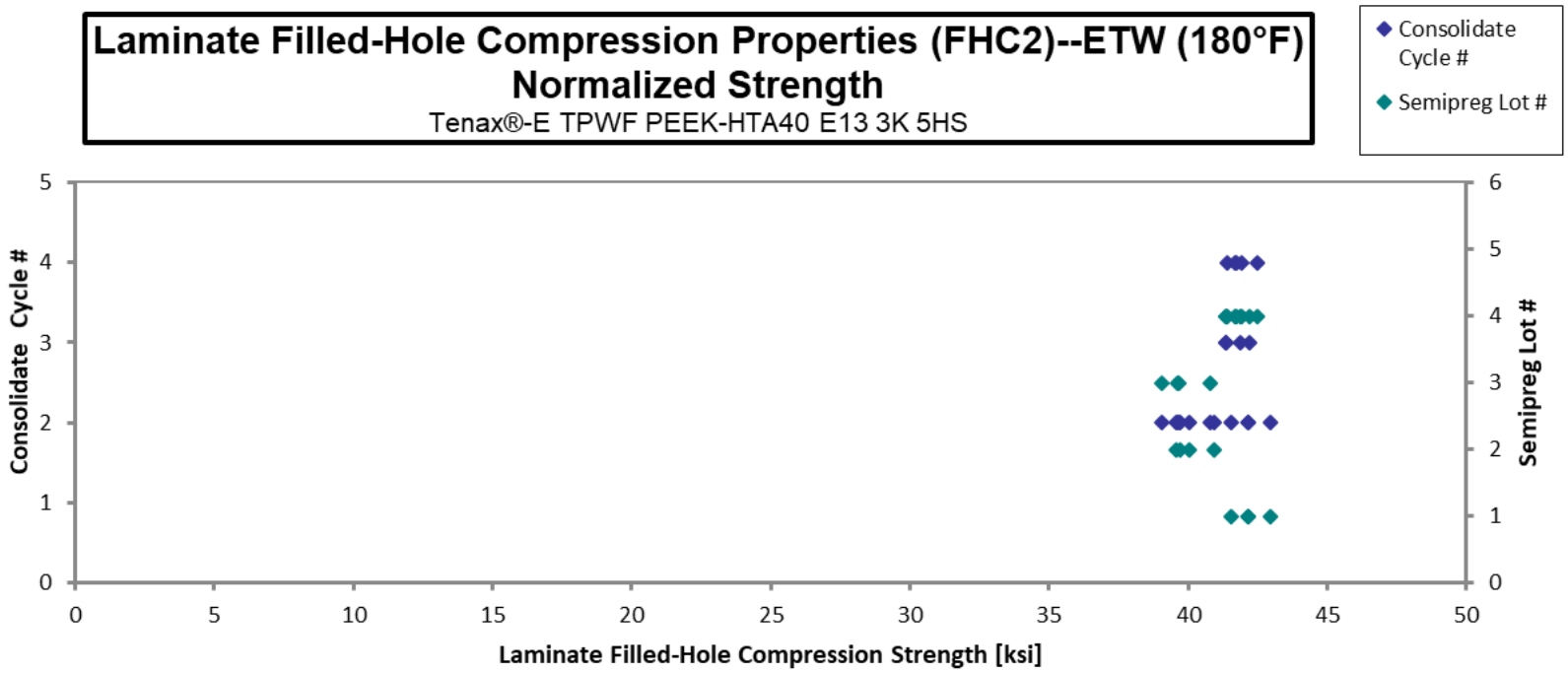
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

normalizing t_{ply} [in]
0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
NTP4013Q1-TTX-T40-E-FHC2-D-M3-ETW-1	4	3	41.30	0.1227	10	M(A,L)GF	0.01227	41.33
NTP4013Q1-TTX-T40-E-FHC2-D-M3-ETW-2*	4	3	41.50	0.1222	10	M(A,L)WT	0.01222	41.34
NTP4013Q1-TTX-T40-E-FHC2-D-M3-ETW-3	4	3	42.16	0.1218	10	AGF	0.01218	41.87
NTP4013Q1-TTX-T40-E-FHC2-D-M3-ETW-4	4	3	42.53	0.1217	10	AGF	0.01217	42.22
NTP4013Q1-TTX-T40-E-FHC2-D-M4-ETW-1	4	4	42.43	0.1228	10	AGF	0.01228	42.49
NTP4013Q1-TTX-T40-E-FHC2-D-M4-ETW-2	4	4	41.98	0.1219	10	AGF	0.01219	41.75
NTP4013Q1-TTX-T40-E-FHC2-D-M4-ETW-3*	4	4	42.01	0.1216	10	AWT	0.01216	41.67
NTP4013Q1-TTX-T40-E-FHC2-D-M4-ETW-4	4	4	41.87	0.1213	10	AGF	0.01213	41.41
NTP4013Q1-TTX-T40-E-FHC2-D-M4-ETW-5	4	4	42.64	0.1205	10	AGF	0.01205	41.92
NTP4013Q1-TTX-T40-E-FHC2-A-M2-ETW-61	1	2	42.30	0.1221	10	LGF	0.01221	42.14
NTP4013Q1-TTX-T40-E-FHC2-A-M2-ETW-62	1	2	41.72	0.1221	10	LGF	0.01221	41.56
NTP4013Q1-TTX-T40-E-FHC2-A-M2-ETW-63	1	2	43.17	0.1219	10	LGF	0.01219	42.93
NTP4013Q1-TTX-T40-E-FHC2-A-M2-ETW-64	1	2	42.13	0.1227	10	LGF	0.01227	42.17
NTP4013Q1-TTX-T40-E-FHC2-B-M2-ETW-61	2	2	39.47	0.1228	10	LGF	0.01228	39.55
NTP4013Q1-TTX-T40-E-FHC2-B-M2-ETW-62	2	2	39.46	0.1234	10	LGF	0.01234	39.73
NTP4013Q1-TTX-T40-E-FHC2-B-M2-ETW-63	2	2	40.70	0.1233	10	LGF	0.01233	40.93
NTP4013Q1-TTX-T40-E-FHC2-B-M2-ETW-64	2	2	39.85	0.1232	10	LGF	0.01232	40.04
NTP4013Q1-TTX-T40-E-FHC2-C-M2-ETW-61	3	2	39.41	0.1231	10	LGF	0.01231	39.59
NTP4013Q1-TTX-T40-E-FHC2-C-M2-ETW-62	3	2	38.95	0.1230	10	LGF	0.01230	39.06
NTP4013Q1-TTX-T40-E-FHC2-C-M2-ETW-63	3	2	39.52	0.1230	10	LGF	0.01230	39.66
NTP4013Q1-TTX-T40-E-FHC2-C-M2-ETW-64	3	2	40.78	0.1226	10	LGF	0.01226	40.77

*Unacceptable failure modes were included, this is approved by NCAMP AER

Average	**41.23**	**$Average_{norm}$**	**0.01224**	**41.15**
Standard Dev.	**1.297**	**$Standard\ Dev._{norm}$**		**1.122**
Coeff. of Var. [%]	**3.146**	**$Coeff.\ of\ Var.\ [\%]_{norm}$**		**2.727**
Min.	**38.95**	**Min.**	**0.01205**	**39.06**
Max.	**43.17**	**Max.**	**0.01234**	**42.93**
Number of Spec.	**21**	**Number of Spec.**	**21**	**21**


Laminate Filled-Hole Compression Properties (FHC2)--ETW (180°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Filled-Hole Compression Strength [ksi]
0
1
2
3
4
5
6
0
5
10
15
20
25
30
35
40
45
50

4.25 "40/20/40" Filled-Hole Compression 3 Properties (FHC3)

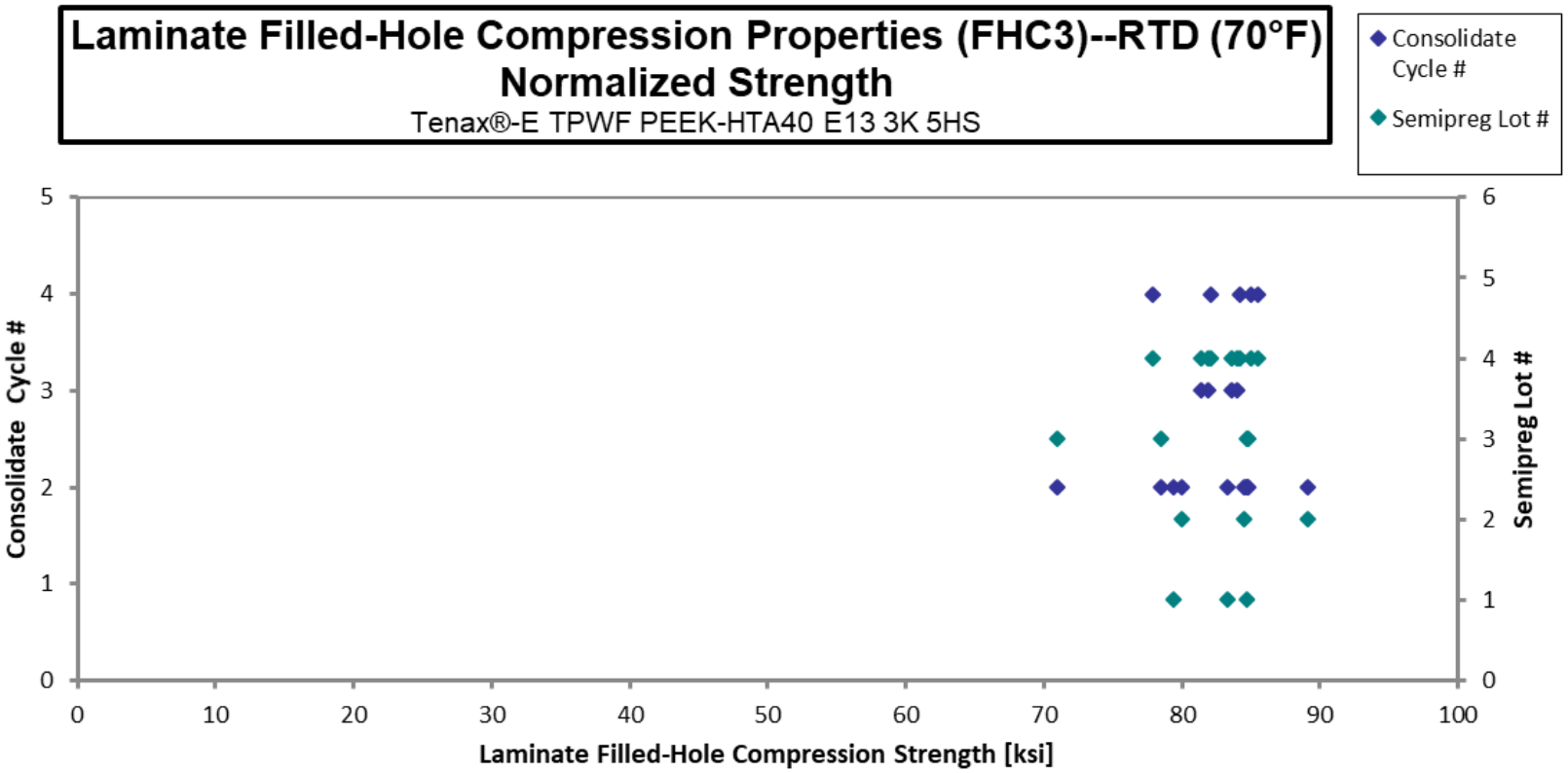
Laminate Filled-Hole Compression Properties (FHC3)--RTD (70°F)
Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

normalizing t_{ply} [in]
0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
NTP4013Q1-TTX-T40-E-FHC3-D-M3-RTD-1	4	3	83.47	0.1234	10	LGF	0.01234	84.00
NTP4013Q1-TTX-T40-E-FHC3-D-M3-RTD-2*	4	3	82.67	0.1239	10	LWT	0.01239	83.57
NTP4013Q1-TTX-T40-E-FHC3-D-M3-RTD-3*	4	3	81.17	0.1237	10	LWB	0.01237	81.92
NTP4013Q1-TTX-T40-E-FHC3-D-M3-RTD-4*	4	3	80.78	0.1236	10	M(A,L)AB	0.01236	81.41
NTP4013Q1-TTX-T40-E-FHC3-D-M4-RTD-1*	4	4	78.21	0.1220	10	M(A,L)WT	0.01220	77.84
NTP4013Q1-TTX-T40-E-FHC3-D-M4-RTD-2*	4	4	85.02	0.1233	10	M(A,L)WT	0.01233	85.50
NTP4013Q1-TTX-T40-E-FHC3-D-M4-RTD-3*	4	4	85.14	0.1224	10	M(A,L)WB	0.01224	84.97
NTP4013Q1-TTX-T40-E-FHC3-D-M4-RTD-4*	4	4	82.50	0.1220	10	LWT	0.01220	82.06
NTP4013Q1-TTX-T40-E-FHC3-D-M4-RTD-5	4	4	84.74	0.1218	10	M(A,L)GF	0.01218	84.16
NTP4013Q1-TTX-T40-E-FHC3-A-M2-RTD-71	1	2	87.63	0.1185	10	LGF	0.01185	84.73
NTP4013Q1-TTX-T40-E-FHC3-A-M2-RTD-72	1	2	79.47	0.1225	10	MGF	0.01225	79.41
NTP4013Q1-TTX-T40-E-FHC3-A-M2-RTD-73	1	2	84.54	0.1208	10	LGF	0.01208	83.29
NTP4013Q1-TTX-T40-E-FHC3-B-M2-RTD-57	2	2	88.70	0.1232	10	LGF	0.01232	89.13
NTP4013Q1-TTX-T40-E-FHC3-B-M2-RTD-58	2	2	84.15	0.1231	10	LGF	0.01231	84.53
NTP4013Q1-TTX-T40-E-FHC3-B-M2-RTD-59	2	2	79.64	0.1232	10	LGF	0.01232	80.01
NTP4013Q1-TTX-T40-E-FHC3-C-M2-RTD-57	3	2	78.20	0.1231	10	LGF	0.01231	78.52
NTP4013Q1-TTX-T40-E-FHC3-C-M2-RTD-58	3	2	70.67	0.1231	10	LGF	0.01231	70.99
NTP4013Q1-TTX-T40-E-FHC3-C-M2-RTD-59	3	2	84.57	0.1229	10	LGF	0.01229	84.78
NTP4013Q1-TTX-T40-E-FHC3-C-M2-RTD-60	3	2	84.78	0.1224	10	LGF	0.01224	84.67

*Unacceptable failure modes were included, this is approved by NCAMP AER

Average	**82.42**	**Average$_{norm}$**	**0.01226**	**82.39**
Standard Dev.	**4.076**	**Standard Dev.$_{norm}$**		**3.888**
Coeff. of Var. [%]	**4.945**	**Coeff. of Var. [%]$_{norm}$**		**4.719**
Min.	**70.67**	**Min.**	**0.01185**	**70.99**
Max.	**88.70**	**Max.**	**0.01239**	**89.13**
Number of Spec.	**19**	**Number of Spec.**	**19**	**19**


Laminate Filled-Hole Compression Properties (FHC3)--RTD (70°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Filled-Hole Compression Strength [ksi]
0
10
20
30
40
50
60
70
80
90
100
0
1
2
3
4
5
6

Laminate Filled-Hole Compression Properties (FHC3)--ETW (180°F)
Strength

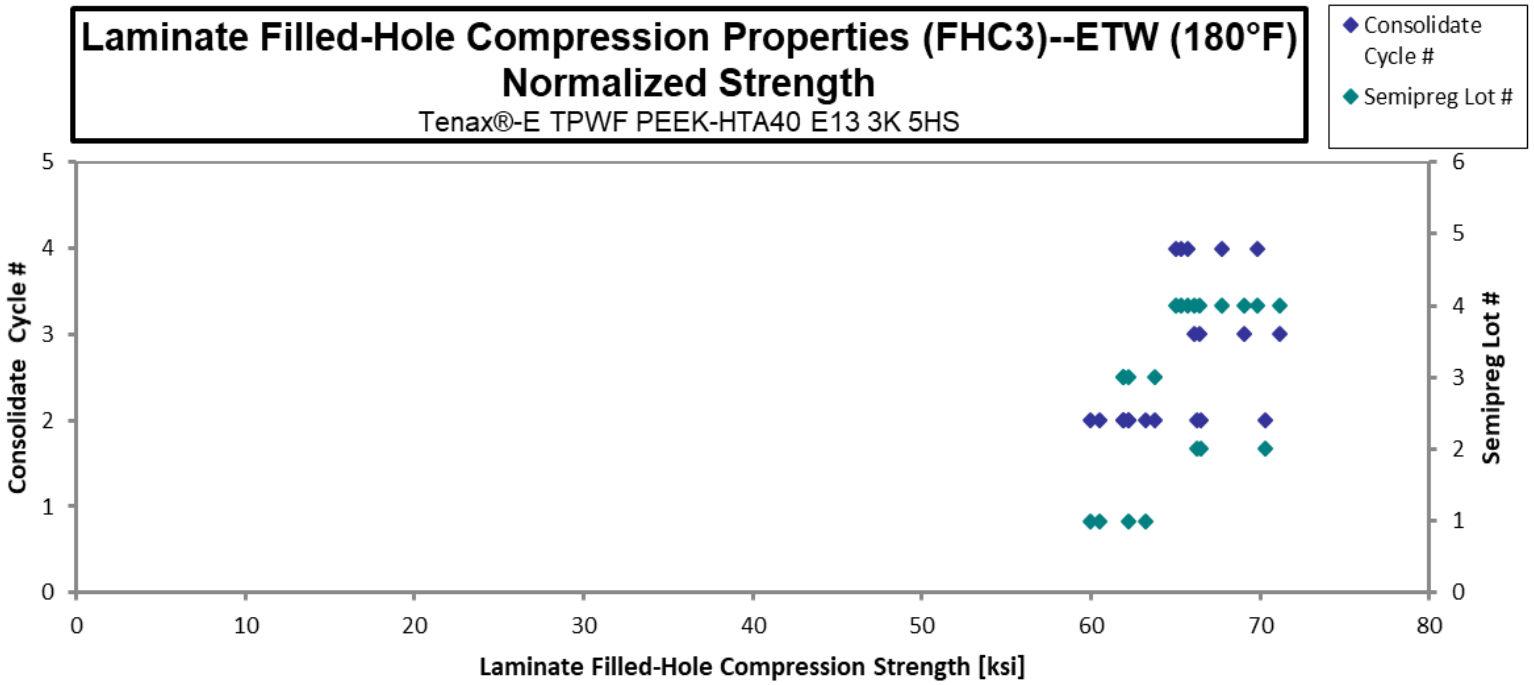
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

normalizing t_{ply} [in]
0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
NTP4013Q1-TTX-T40-E-FHC3-D-M3-ETW-1*	4	3	71.03	0.1228	10	M(A,L)WB	0.01228	71.12
NTP4013Q1-TTX-T40-E-FHC3-D-M3-ETW-2	4	3	66.40	0.1227	10	M(A,L)GF	0.01227	66.44
NTP4013Q1-TTX-T40-E-FHC3-D-M3-ETW-3*	4	3	66.64	0.1216	10	M(A,L)WB	0.01216	66.09
NTP4013Q1-TTX-T40-E-FHC3-D-M3-ETW-4	4	3	70.74	0.1198	10	M(A,L)GF	0.01198	69.09
NTP4013Q1-TTX-T40-E-FHC3-D-M4-ETW-1	4	4	68.43	0.1213	10	M(A,L)GF	0.01213	67.71
NTP4013Q1-TTX-T40-E-FHC3-D-M4-ETW-2	4	4	66.88	0.1205	10	M(A,L)GF	0.01205	65.70
NTP4013Q1-TTX-T40-E-FHC3-D-M4-ETW-3	4	4	71.04	0.1206	10	M(A,L)WB	0.01206	69.87
NTP4013Q1-TTX-T40-E-FHC3-D-M4-ETW-4	4	4	65.60	0.1221	10	M(A,L)GF	0.01221	65.32
NTP4013Q1-TTX-T40-E-FHC3-D-M4-ETW-5	4	4	65.59	0.1215	10	M(A,L)GF	0.01215	65.00
NTP4013Q1-TTX-T40-E-FHC3-A-M2-ETW-61	1	2	60.89	0.1219	10	LGF	0.01219	60.53
NTP4013Q1-TTX-T40-E-FHC3-A-M2-ETW-62	1	2	60.28	0.1219	10	LGF	0.01219	59.96
NTP4013Q1-TTX-T40-E-FHC3-A-M2-ETW-63	1	2	63.05	0.1229	10	LGF	0.01229	63.19
NTP4013Q1-TTX-T40-E-FHC3-A-M2-ETW-64	1	2	62.01	0.1229	10	LGF	0.01229	62.18
NTP4013Q1-TTX-T40-E-FHC3-B-M2-ETW-61	2	2	66.15	0.1232	10	LGF	0.01232	66.45
NTP4013Q1-TTX-T40-E-FHC3-B-M2-ETW-63	2	2	66.12	0.1228	10	LGF	0.01228	66.25
NTP4013Q1-TTX-T40-E-FHC3-B-M2-ETW-64	2	2	70.07	0.1229	10	LGF	0.01229	70.26
NTP4013Q1-TTX-T40-E-FHC3-C-M2-ETW-61	3	2	62.03	0.1224	10	LFG	0.01224	61.93
NTP4013Q1-TTX-T40-E-FHC3-C-M2-ETW-62	3	2	62.48	0.1221	10	LFG	0.01221	62.23
NTP4013Q1-TTX-T40-E-FHC3-C-M2-ETW-63	3	2	64.35	0.1214	10	LFG	0.01214	63.74
NTP4013Q1-TTX-T40-E-FHC3-C-M2-ETW-64	3	2	62.43	0.1216	10	LFG	0.01216	61.92

*Unacceptable failure modes were included, this is approved by NCAMP AER

Average	**65.61**		**$Average_{norm}$**	**0.01219**	**65.25**
Standard Dev.	**3.414**		**$Standard\ Dev._{norm}$**		**3.277**
Coeff. of Var. [%]	**5.203**		**$Coeff.\ of\ Var.\ [\%]_{norm}$**		**5.022**
Min.	**60.28**		**Min.**	**0.01198**	**59.96**
Max.	**71.04**		**Max.**	**0.01232**	**71.12**
Number of Spec.	**20**		**Number of Spec.**	**20**	**20**


Laminate Filled-Hole Compression Properties (FHC3)--ETW (180°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Filled-Hole Compression Strength [ksi]
0
10
20
30
40
50
60
70
80
0
1
2
3
4
5
6

4.26 "25/50/25" Single-Shear Bearing 1 Properties (SSB1)

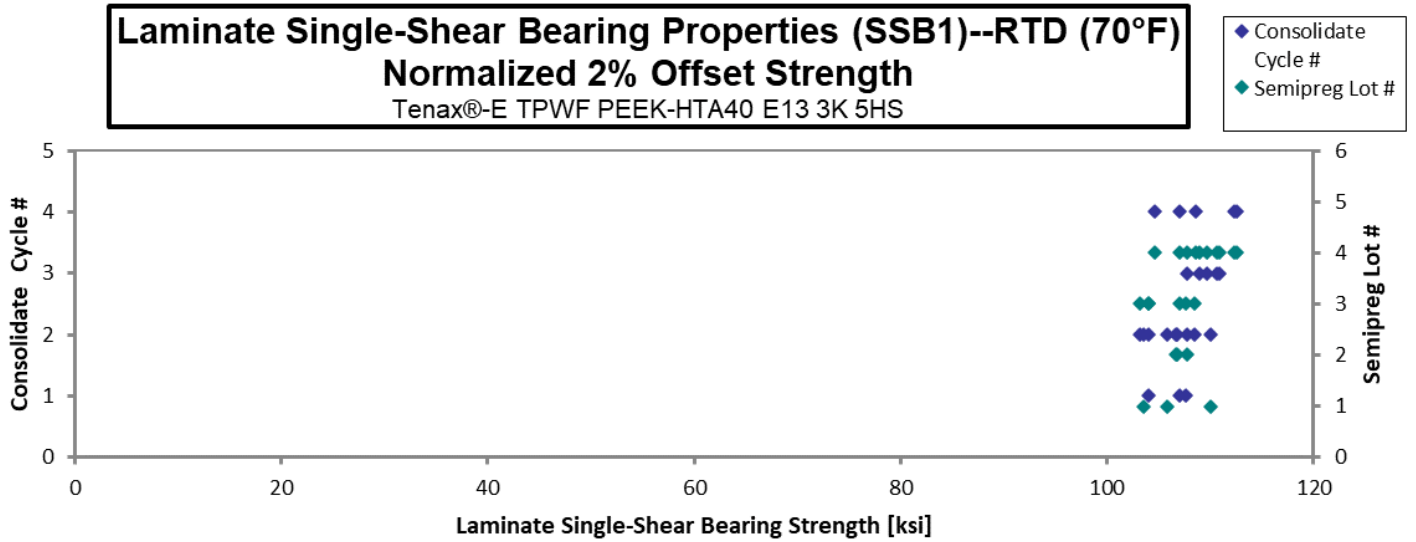
Laminate Single-Shear Bearing Properties (SSB1)--RTD (70°F)
Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

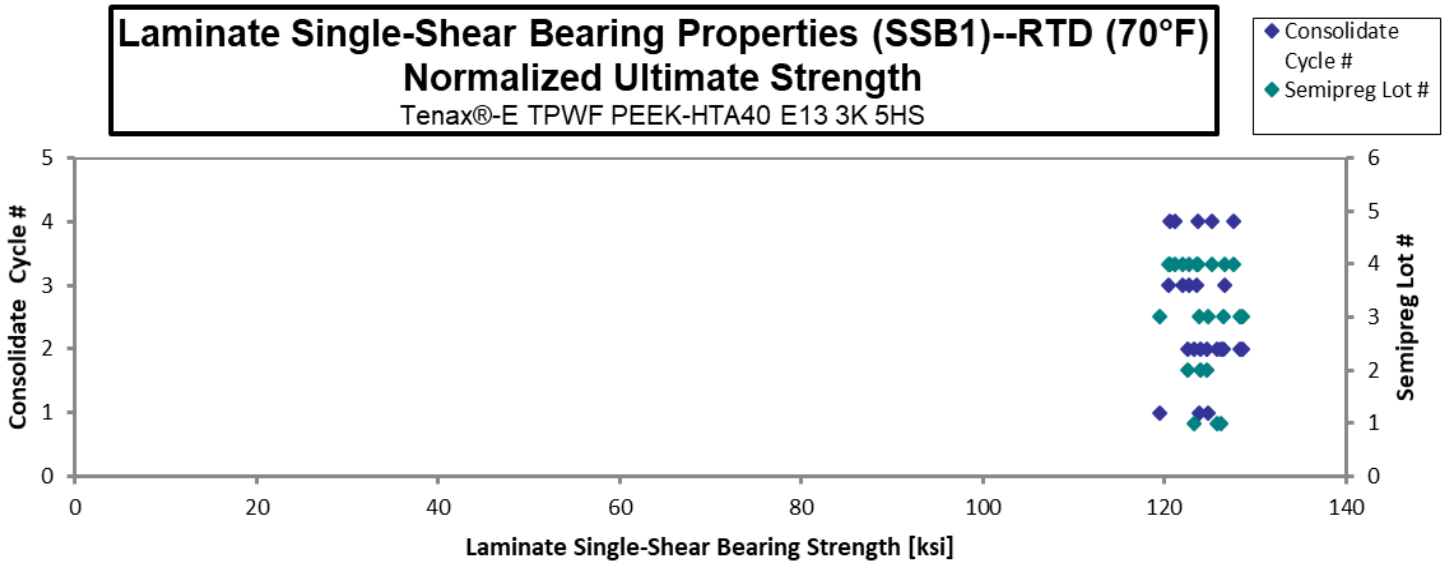
normalizing t_{ply} [in]
0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	2% Offset Strength [ksi]	Ultimate Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Comments	Avg. t_{ply} [in]	2% Offset $Strength_{norm}$ [ksi]	Ultimate $Strength_{norm}$ [ksi]
NTP4013Q1-TTX-T40-E-SSB1-D-M3-RTD-1	4	3	108.7	123.3	0.09830	8	B1I	0.01229	109.0	123.6
NTP4013Q1-TTX-T40-E-SSB1-D-M3-RTD-2	4	3	109.7	125.7	0.09885	8	B1I	0.01236	110.6	126.6
NTP4013Q1-TTX-T40-E-SSB1-D-M3-RTD-3	4	3	106.3	120.4	0.09943	8	B1I	0.01243	107.7	122.1
NTP4013Q1-TTX-T40-E-SSB1-D-M3-RTD-4	4	3	109.3	118.7	0.09952	8	B1I	0.01244	110.9	120.5
NTP4013Q1-TTX-T40-E-SSB1-D-M3-RTD-5	4	3	108.3	121.2	0.09928	8	B1I	0.01241	109.7	122.7
NTP4013Q1-TTX-T40-E-SSB1-D-M4-RTD-1	4	4	112.0	124.7	0.09853	8	B1I	0.01232	112.5	125.3
NTP4013Q1-TTX-T40-E-SSB1-D-M4-RTD-2	4	4	111.8	127.0	0.09850	8	B1I	0.01231	112.3	127.6
NTP4013Q1-TTX-T40-E-SSB1-D-M4-RTD-3	4	4	108.4	123.4	0.09828	8	B1I	0.01229	108.6	123.6
NTP4013Q1-TTX-T40-E-SSB1-D-M4-RTD-4	4	4	104.4	120.9	0.09832	8	B1I	0.01229	104.6	121.2
NTP4013Q1-TTX-T40-E-SSB1-D-M4-RTD-5	4	4	106.1	119.6	0.09893	8	B1I	0.01237	107.0	120.6
NTP4013Q1-TTX-T40-E-SSB1-A-M2-1-RTD-1	1	2	108.1	131.9	0.09395	8	B1I	0.01174	103.5	126.3
NTP4013Q1-TTX-T40-E-SSB1-A-M2-1-RTD-2	1	2	109.8	127.9	0.09457	8	B1I	0.01182	105.9	123.3
NTP4013Q1-TTX-T40-E-SSB1-A-M2-1-RTD-3	1	2	113.3	129.6	0.09523	8	B1I	0.01190	110.0	125.8
NTP4013Q1-TTX-T40-E-SSB1-B-M2-1-RTD-1	2	2	113.0	128.6	0.09352	8	B1I	0.01169	107.7	122.6
NTP4013Q1-TTX-T40-E-SSB1-B-M2-1-RTD-2	2	2	110.1	127.8	0.09510	8	B1I	0.01189	106.7	123.9
NTP4013Q1-TTX-T40-E-SSB1-B-M2-1-RTD-3	2	2	108.9	127.3	0.09603	8	B1I	0.01200	106.6	124.6
NTP4013Q1-TTX-T40-E- SSB1-C-M1-1-RTD-1	3	1	108.4	124.6	0.09408	8	B1I	0.01176	104.0	119.5
NTP4013Q1-TTX-T40-E- SSB1-C-M1-1-RTD-2	3	1	112.4	129.4	0.09390	8	B1I	0.01174	107.6	123.8
NTP4013Q1-TTX-T40-E- SSB1-C-M1-1-RTD-3	3	1	111.8	130.3	0.09395	8	B1I	0.01174	107.1	124.8
NTP4013Q1-TTX-T40-E-SSB1-C-M2-1-RTD-1	3	2	106.9	126.8	0.09952	8	B1I	0.01244	108.5	128.7
NTP4013Q1-TTX-T40-E-SSB1-C-M2-1-RTD-2	3	2	102.5	127.5	0.09875	8	B1I	0.01234	103.2	128.4
NTP4013Q1-TTX-T40-E-SSB1-C-M2-1-RTD-3	3	2	102.9	125.1	0.09915	8	B1I	0.01239	104.0	126.5

Average	**108.8**	**125.5**	
Standard Dev.	**3.048**	**3.675**	
Coeff. of Var. [%]	**2.802**	**2.927**	
Min.	**102.5**	**118.7**	
Max.	**113.3**	**131.9**	
Number of Spec.	**22**	**22**	

$Average_{norm}$	**0.01213**	**107.6**	**124.2**
$Standard\ Dev._{norm}$		**2.726**	**2.555**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**2.533**	**2.058**
Min.	**0.01169**	**103.16**	**119.5**
Max.	**0.01244**	**112.5**	**128.7**
Number of Spec.	**22**	**22**	**22**


Laminate Single-Shear Bearing Properties (SSB1)--RTD (70°F)
Normalized 2% Offset Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Single-Shear Bearing Strength [ksi]


Laminate Single-Shear Bearing Properties (SSB1)--RTD (70°F)
Normalized Ultimate Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Single-Shear Bearing Strength [ksi]

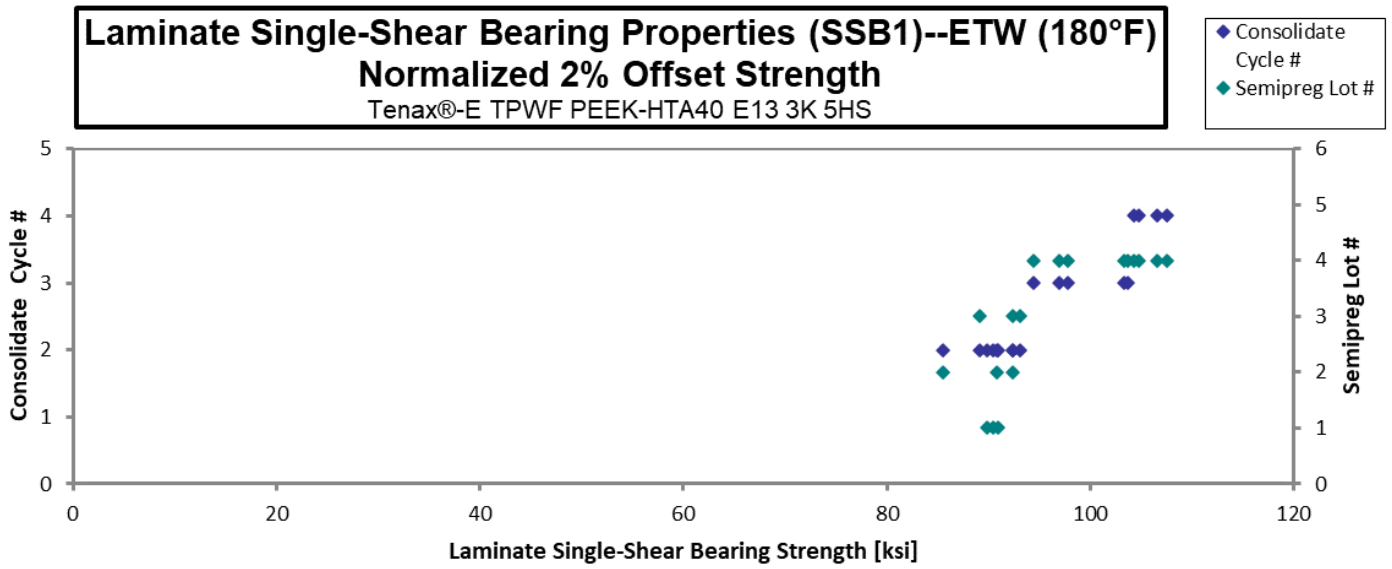
Laminate Single-Shear Bearing Properties (SSB1)--ETW (180°F)
Strength

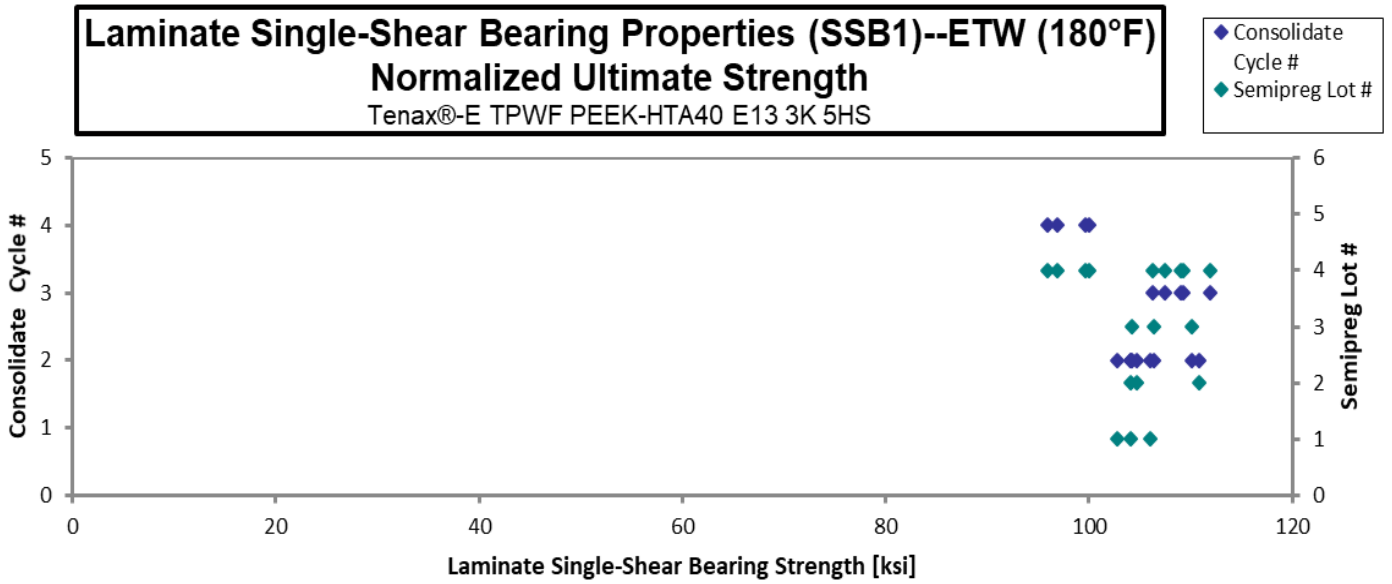
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

normalizing t_{ply} [in]
0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	2% Offset Strength [ksi]	Ultimate Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Comments	Avg. t_{ply} [in]	2% Offset $Strength_{norm}$ [ksi]	Ultimate $Strength_{norm}$ [ksi]
NTP4013Q1-TTX-T40-E-SSB1-D-M3-ETW-1	4	3	93.00	110.4	0.09953	8	B1I	0.01244	94.38	112.0
NTP4013Q1-TTX-T40-E-SSB1-D-M3-ETW-2	4	3	102.9	108.7	0.09842	8	B1I	0.01230	103.3	109.0
NTP4013Q1-TTX-T40-E-SSB1-D-M3-ETW-3	4	3	103.4	109.0	0.09837	8	B1I	0.01230	103.7	109.3
NTP4013Q1-TTX-T40-E-SSB1-D-M3-ETW-4	4	3	97.77	106.3	0.09805	8	B1I	0.01226	97.74	106.3
NTP4013Q1-TTX-T40-E-SSB1-D-M3-ETW-5	4	3	96.80	107.3	0.09823	8	B1I	0.01228	96.95	107.4
NTP4013Q1-TTX-T40-E-SSB1-D-M4-ETW-2	4	4	104.22	96.8	0.09817	8	B1I	0.01227	104.3	96.93
NTP4013Q1-TTX-T40-E-SSB1-D-M4-ETW-3	4	4	106.82	100.0	0.09783	8	B1I	0.01223	106.5	99.72
NTP4013Q1-TTX-T40-E-SSB1-D-M4-ETW-4	4	4	104.86	100.1	0.09795	8	B1I	0.01224	104.7	100.0
NTP4013Q1-TTX-T40-E-SSB1-D-M4-ETW-5	4	4	108.11	96.4	0.09752	8	B1I	0.01219	107.5	95.89
NTP4013Q1-TTX-T40-E-SSB1-A-M2-1-ETW-1	1	2	92.34	107.1	0.09538	8	B1I	0.01192	89.80	104.1
NTP4013Q1-TTX-T40-E-SSB1-A-M2-1-ETW-2	1	2	93.12	108.6	0.09578	8	B1I	0.01197	90.94	106.1
NTP4013Q1-TTX-T40-E-SSB1-A-M2-1-ETW-3	1	2	92.28	104.8	0.09613	8	B1I	0.01202	90.45	102.8
NTP4013Q1-TTX-T40-E-SSB1-B-M2-1-ETW-1	2	2	94.68	107.3	0.09570	8	B1I	0.01196	92.38	104.7
NTP4013Q1-TTX-T40-E-SSB1-B-M2-1-ETW-2	2	2	92.99	106.6	0.09580	8	B1I	0.01198	90.83	104.1
NTP4013Q1-TTX-T40-E-SSB1-B-M2-1-ETW-3	2	2	87.26	113.2	0.09607	8	B1I	0.01201	85.47	110.9
NTP4013Q1-TTX-T40-E-SSB1-C-M2-1-ETW-1	3	2	89.81	105.0	0.09737	8	B1I	0.01217	89.15	104.3
NTP4013Q1-TTX-T40-E-SSB1-C-M2-1-ETW-2	3	2	93.31	111.3	0.09710	8	B1I	0.01214	92.38	110.2
NTP4013Q1-TTX-T40-E-SSB1-C-M2-1-ETW-3	3	2	94.55	108.1	0.09655	8	B1I	0.01207	93.08	106.4

Average	**97.12**	**105.9**		**$Average_{norm}$**	**0.01215**	**96.31**	**105.0**
Standard Dev.	**6.290**	**4.723**		**$Standard\ Dev._{norm}$**		**6.942**	**4.627**
Coeff. of Var. [%]	**6.476**	**4.458**		**$Coeff.\ of\ Var.\ [\%]_{norm}$**		**7.208**	**4.407**
Min.	**87.26**	**96.4**		**Min.**	**0.01192**	**85.47**	**95.9**
Max.	**108.11**	**113.2**		**Max.**	**0.01244**	**107.49**	**112.0**
Number of Spec.	**18**	**18**		**Number of Spec.**	**18**	**18**	**18**


Laminate Single-Shear Bearing Properties (SSB1)--ETW (180°F)
Normalized 2% Offset Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Single-Shear Bearing Strength [ksi]
0
20
40
60
80
100
120
0
1
2
3
4
5
6


Laminate Single-Shear Bearing Properties (SSB1)--ETW (180°F)
Normalized Ultimate Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Single-Shear Bearing Strength [ksi]
0
20
40
60
80
100
120
0
1
2
3
4
5
6

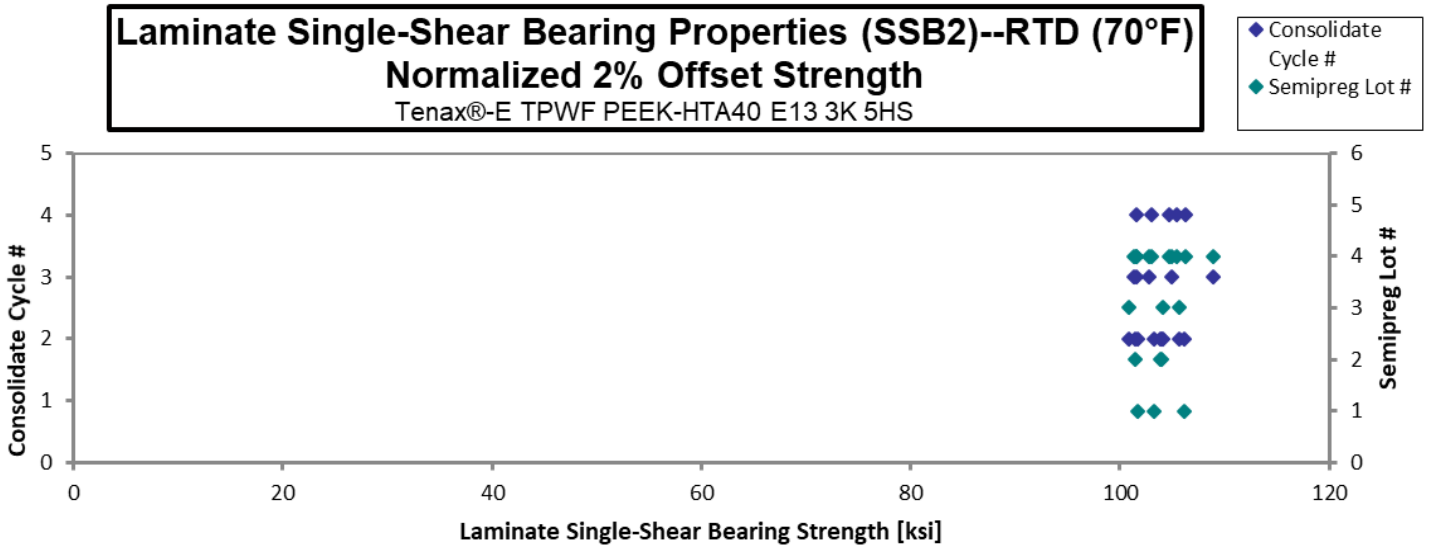
4.27 "10/80/10" Single-Shear Bearing 2 Properties (SSB2)

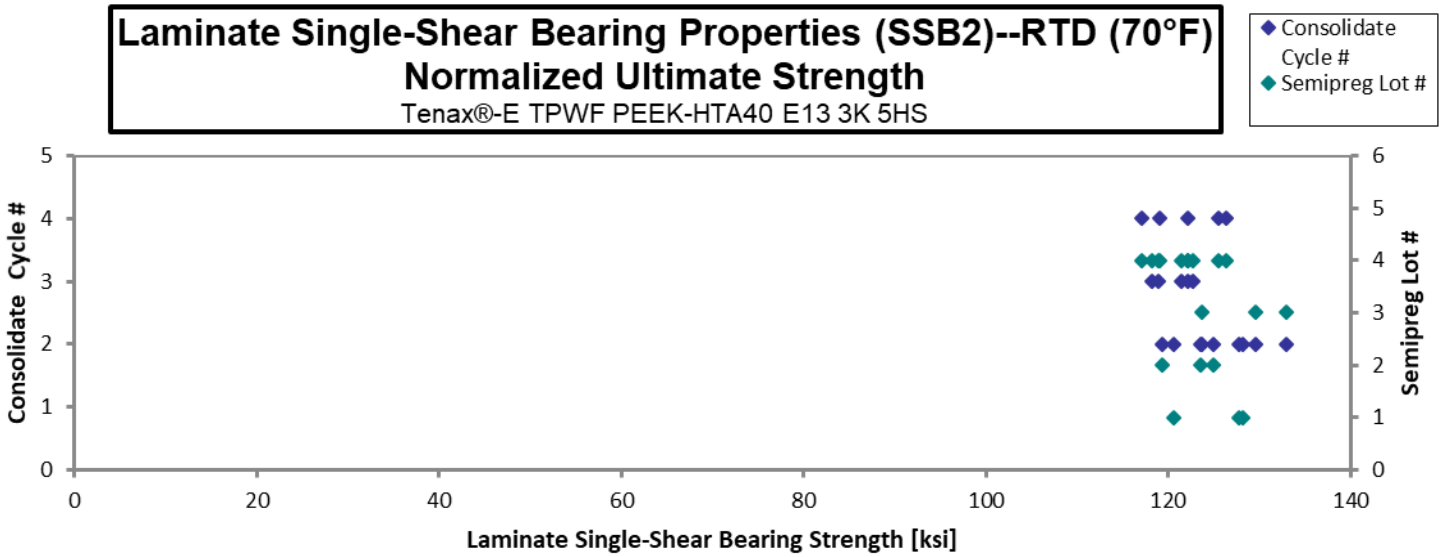
Laminate Single-Shear Bearing Properties (SSB2)--RTD (70°F)
Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

normalizing t_{ply} [in]: 0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	2% Offset Strength [ksi]	Ultimate Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Comments	Avg. t_{ply} [in]	2% Offset $Strength_{norm}$ [ksi]	Ultimate $Strength_{norm}$ [ksi]
NTP4013Q1-TTX-T40-E-SSB2-D-M3-RTD-1	4	3	105.3	123.2	0.1222	10	B1I	0.01222	105.0	122.8
NTP4013Q1-TTX-T40-E-SSB2-D-M3-RTD-2	4	3	102.9	119.1	0.1224	10	B1I	0.01224	102.7	119.0
NTP4013Q1-TTX-T40-E-SSB2-D-M3-RTD-3	4	3	109.2	122.5	0.1223	10	B1I	0.01223	108.9	122.2
NTP4013Q1-TTX-T40-E-SSB2-D-M3-RTD-4	4	3	101.3	121.2	0.1228	10	B1I	0.01228	101.5	121.4
NTP4013Q1-TTX-T40-E-SSB2-D-M3-RTD-5	4	3	100.5	117.2	0.1236	10	B1I	0.01236	101.3	118.2
NTP4013Q1-TTX-T40-E-SSB2-D-M4-RTD-1	4	4	102.8	118.7	0.1229	10	B1I	0.01229	103.0	119.0
NTP4013Q1-TTX-T40-E-SSB2-D-M4-RTD-2	4	4	106.2	122.0	0.1227	10	B1I	0.01227	106.3	122.1
NTP4013Q1-TTX-T40-E-SSB2-D-M4-RTD-3	4	4	104.4	125.2	0.1229	10	B1I	0.01229	104.7	125.5
NTP4013Q1-TTX-T40-E-SSB2-D-M4-RTD-4	4	4	101.1	116.6	0.1232	10	B1I	0.01232	101.6	117.2
NTP4013Q1-TTX-T40-E-SSB2-D-M4-RTD-5	4	4	105.2	126.2	0.1228	10	B1I	0.01228	105.4	126.4
NTP4013Q1-TTX-T40-E-SSB2-A-M2-1-RTD-1	1	2	105.3	130.3	0.1203	10	B1I	0.01203	103.3	127.8
NTP4013Q1-TTX-T40-E-SSB2-A-M2-1-RTD-2	1	2	107.6	129.9	0.1210	10	B1I	0.01210	106.2	128.2
NTP4013Q1-TTX-T40-E-SSB2-A-M2-1-RTD-3	1	2	104.1	123.3	0.1198	10	B1I	0.01198	101.7	120.6
NTP4013Q1-TTX-T40-E-SSB2-B-M2-1-RTD-1	2	2	105.1	125.1	0.1211	10	B1I	0.01211	103.8	123.6
NTP4013Q1-TTX-T40-E-SSB2-B-M2-1-RTD-2	2	2	104.0	124.9	0.1227	10	B1I	0.01227	104.0	125.0
NTP4013Q1-TTX-T40-E-SSB2-B-M2-1-RTD-3	2	2	101.3	119.1	0.1228	10	B1I	0.01228	101.4	119.3
NTP4013Q1-TTX-T40-E-SSB2-C-M2-1-RTD-1	3	2	105.4	129.3	0.1229	10	B1I	0.01229	105.7	129.6
NTP4013Q1-TTX-T40-E-SSB2-C-M2-1-RTD-2	3	2	103.6	132.2	0.1233	10	B1I	0.01233	104.2	133.0
NTP4013Q1-TTX-T40-E-SSB2-C-M2-1-RTD-3	3	2	99.99	122.7	0.1237	10	B1I	0.01237	100.8	123.8

Average	**104.0**	**123.6**		**$Average_{norm}$**	**0.01224**	**103.8**	**123.4**
Standard Dev.	**2.436**	**4.529**		**$Standard\ Dev._{norm}$**		**2.143**	**4.253**
Coeff. of Var. [%]	**2.343**	**3.664**		**$Coeff.\ of\ Var.\ [\%]_{norm}$**		**2.065**	**3.446**
Min.	**99.99**	**116.6**		**Min.**	**0.01198**	**100.85**	**117.2**
Max.	**109.2**	**132.2**		**Max.**	**0.01237**	**108.9**	**133.0**
Number of Spec.	**19**	**19**		**Number of Spec.**	**19**	**19**	**19**


Laminate Single-Shear Bearing Properties (SSB2)--RTD (70°F)
Normalized 2% Offset Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Single-Shear Bearing Strength [ksi]
0
20
40
60
80
100
120
0
1
2
3
4
5
6


Laminate Single-Shear Bearing Properties (SSB2)--RTD (70°F)
Normalized Ultimate Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Single-Shear Bearing Strength [ksi]
0
20
40
60
80
100
120
140
0
1
2
3
4
5
6

Laminate Single-Shear Bearing Properties (SSB2)--ETW (180°F)
Strength

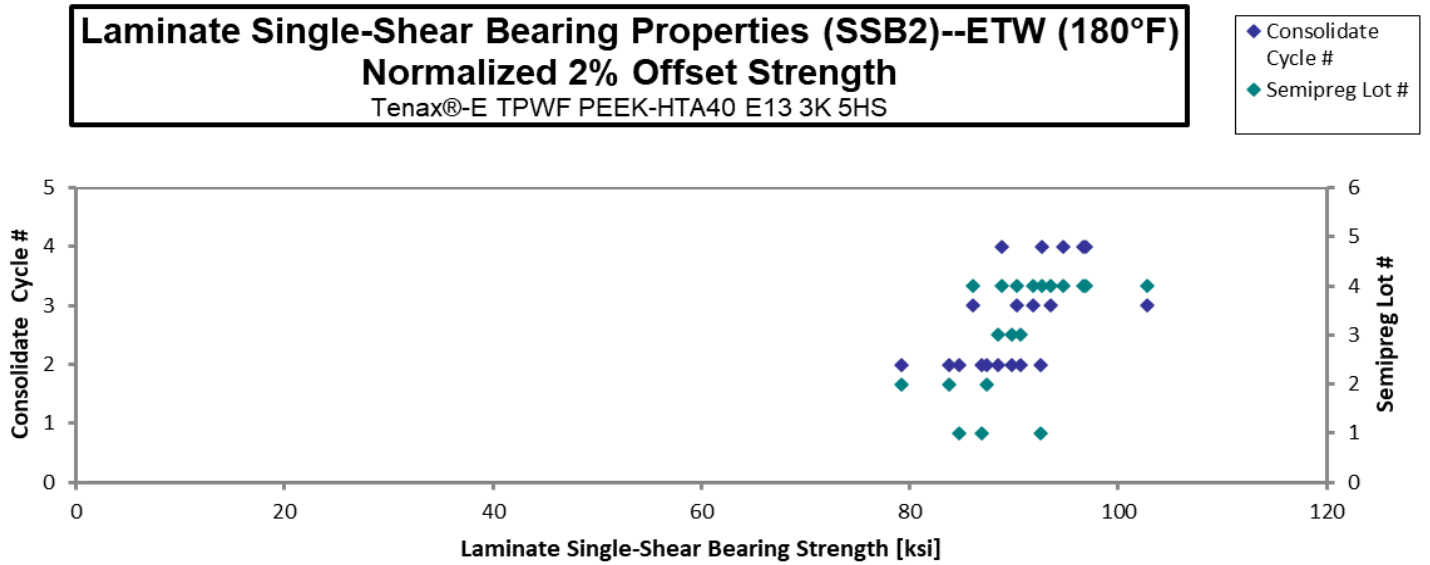
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

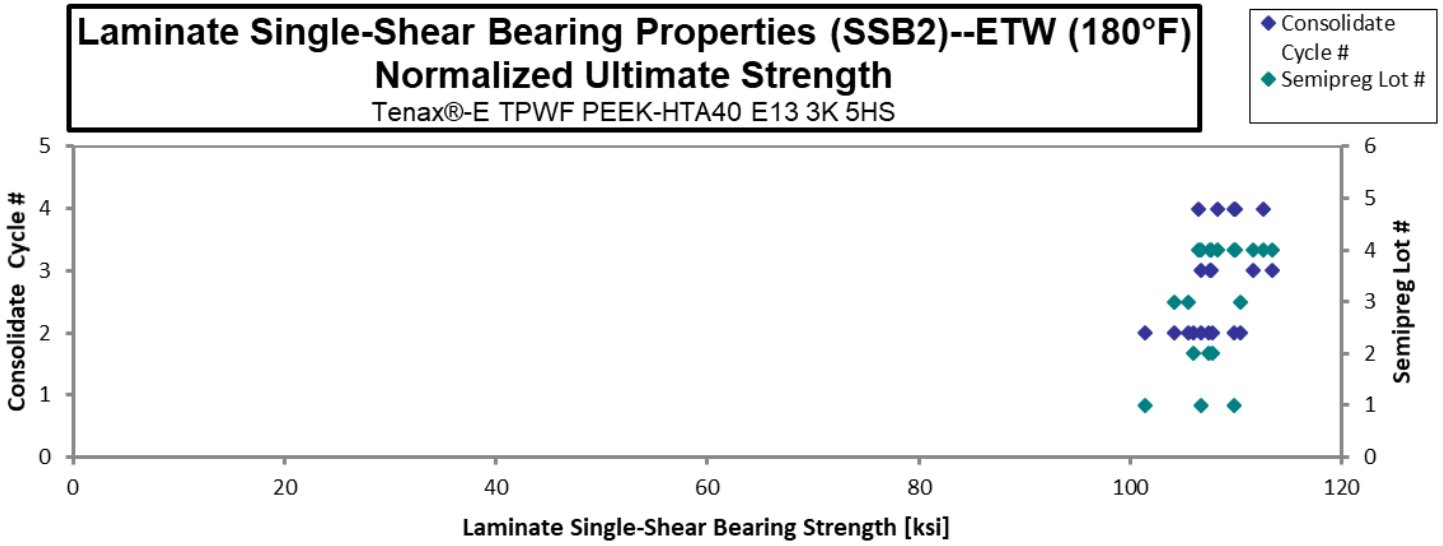
normalizing t_{ply} [in]
0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	2% Offset Strength [ksi]	Ultimate Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Comments	Avg. t_{ply} [in]	2% Offset $Strength_{norm}$ [ksi]	Ultimate $Strength_{norm}$ [ksi]
NTP4013Q1-TTX-T40-E-SSB2-D-M3-ETW-1	4	3	92.74	106.8	0.1236	10	B1I	0.01236	93.52	107.7
NTP4013Q1-TTX-T40-E-SSB2-D-M3-ETW-2	4	3	102.06	112.6	0.1235	10	B1I	0.01235	102.78	113.4
NTP4013Q1-TTX-T40-E-SSB2-D-M3-ETW-3	4	3	91.27	111.0	0.1233	10	B1I	0.01233	91.79	111.7
NTP4013Q1-TTX-T40-E-SSB2-D-M3-ETW-4	4	3	89.74	106.9	0.1233	10	B1I	0.01233	90.22	107.5
NTP4013Q1-TTX-T40-E-SSB2-D-M3-ETW-5	4	3	85.52	106.1	0.1233	10	B1I	0.01233	86.01	106.7
NTP4013Q1-TTX-T40-E-SSB2-D-M4-ETW-1	4	4	96.91	109.9	0.1225	10	B1I	0.01225	96.85	109.8
NTP4013Q1-TTX-T40-E-SSB2-D-M4-ETW-2	4	4	93.09	107.0	0.1220	10	B1I	0.01220	92.64	106.5
NTP4013Q1-TTX-T40-E-SSB2-D-M4-ETW-3	4	4	89.58	109.1	0.1216	10	B1I	0.01216	88.88	108.2
NTP4013Q1-TTX-T40-E-SSB2-D-M4-ETW-4	4	4	95.67	113.7	0.1213	10	B1I	0.01213	94.68	112.6
NTP4013Q1-TTX-T40-E-SSB2-D-M4-ETW-5	4	4	98.06	111.5	0.1209	10	B1I	0.01209	96.68	109.9
NTP4013Q1-TTX-T40-E-SSB2-A-M2-1-ETW-1	1	2	95.50	104.6	0.1188	10	B1I	0.01188	92.57	101.4
NTP4013Q1-TTX-T40-E-SSB2-A-M2-1-ETW-2	1	2	89.15	112.7	0.1195	10	B1I	0.01195	86.90	109.8
NTP4013Q1-TTX-T40-E-SSB2-A-M2-1-ETW-3	1	2	86.95	109.6	0.1194	10	B1I	0.01194	84.69	106.8
NTP4013Q1-TTX-T40-E-SSB2-B-M2-1-ETW-1	2	2	79.50	106.4	0.1221	10	B1I	0.01221	79.17	105.9
NTP4013Q1-TTX-T40-E-SSB2-B-M2-1-ETW-2	2	2	83.86	107.6	0.1224	10	B1I	0.01224	83.75	107.4
NTP4013Q1-TTX-T40-E-SSB2-B-M2-1-ETW-3	2	2	87.89	108.4	0.1219	10	B1I	0.01219	87.40	107.8
NTP4013Q1-TTX-T40-E-SSB2-C-M2-1-ETW-1	3	2	89.09	103.4	0.1236	10	B1I	0.01236	89.80	104.2
NTP4013Q1-TTX-T40-E-SSB2-C-M2-1-ETW-2	3	2	88.84	106.0	0.1220	10	B1I	0.01220	88.43	105.5
NTP4013Q1-TTX-T40-E-SSB2-C-M2-1-ETW-3	3	2	91.37	111.3	0.1216	10	B1I	0.01216	90.65	110.5

Average	**90.89**	**108.7**	
Standard Dev.	**5.330**	**2.929**	
Coeff. of Var. [%]	**5.865**	**2.696**	
Min.	**79.50**	**103.4**	
Max.	**102.1**	**113.7**	
Number of Spec.	**19**	**19**	

$Average_{norm}$	**0.01219**	**90.39**	**108.1**
$Standard\ Dev._{norm}$		**5.396**	**2.931**
Coeff. of Var. $[\%]_{norm}$		**5.970**	**2.712**
Min.	**0.01188**	**79.17**	**101.4**
Max.	**0.01236**	**102.78**	**113.4**
Number of Spec.	**19**	**19**	**19**


Laminate Single-Shear Bearing Properties (SSB2)--ETW (180°F)
Normalized 2% Offset Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Single-Shear Bearing Strength [ksi]


Laminate Single-Shear Bearing Properties (SSB2)--ETW (180°F)
Normalized Ultimate Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Single-Shear Bearing Strength [ksi]

4.28 "40/20/40" Single-Shear Bearing 3 Properties (SSB3)

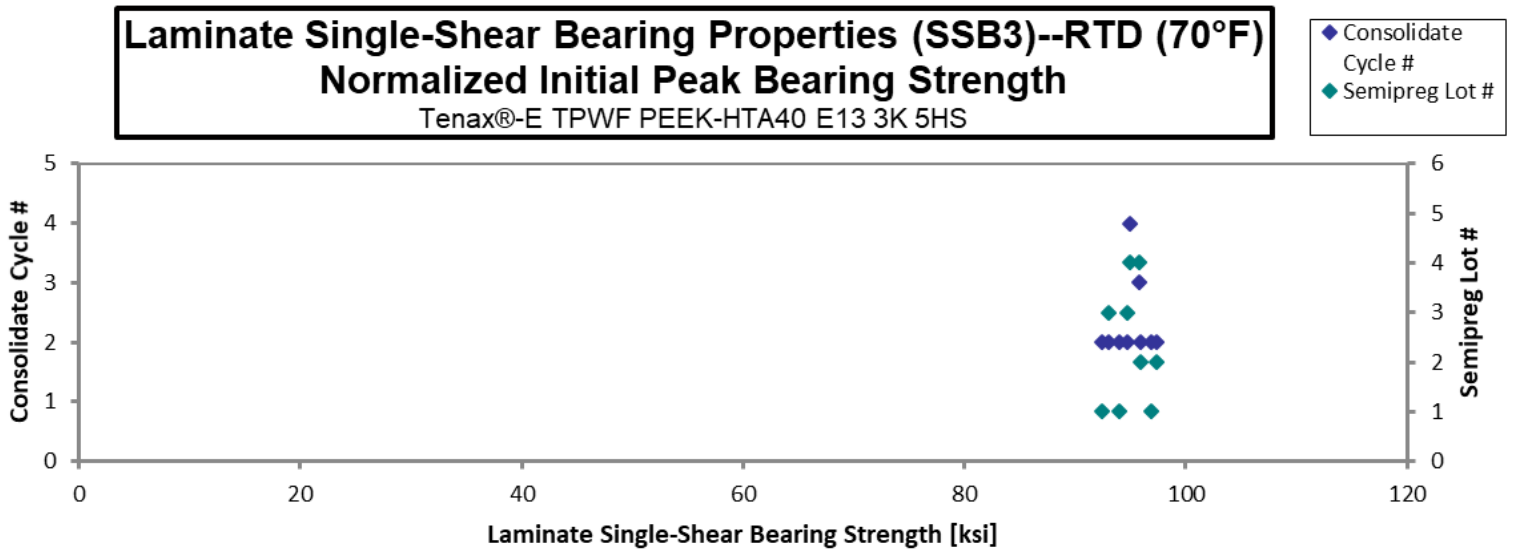
Laminate Single-Shear Bearing Properties (SSB3)--RTD (70°F)
Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

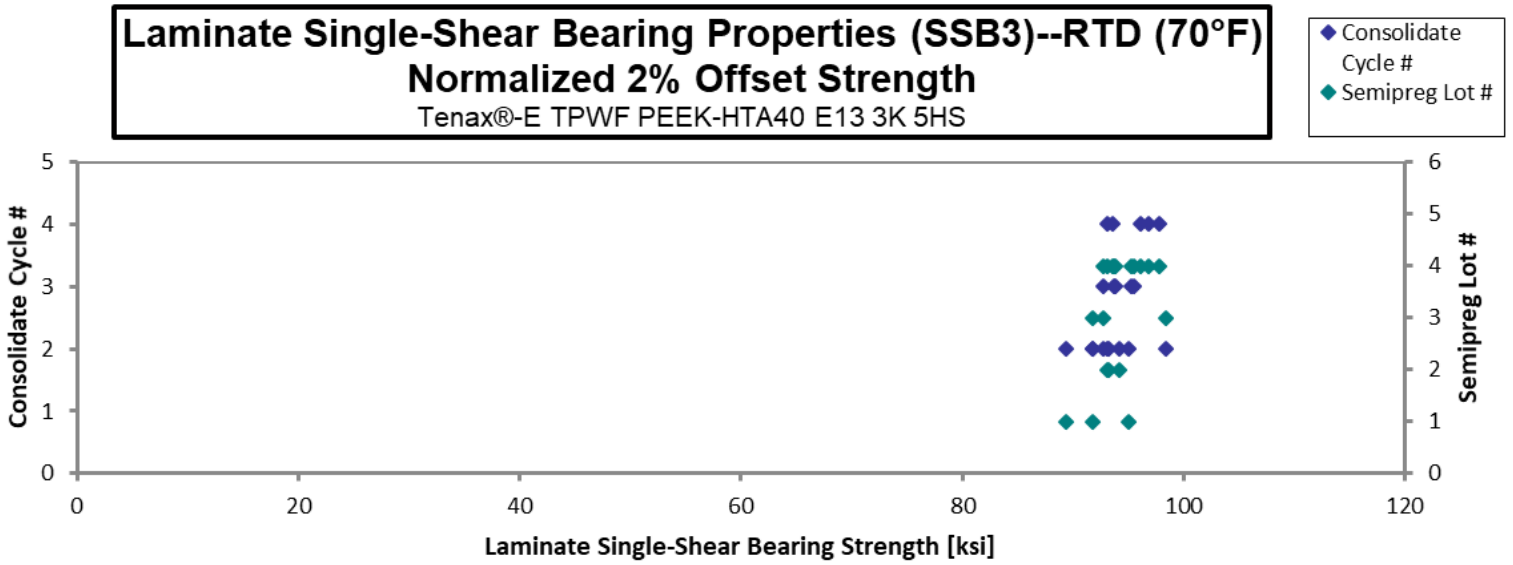
normalizing t_{ply} [in]
0.01226

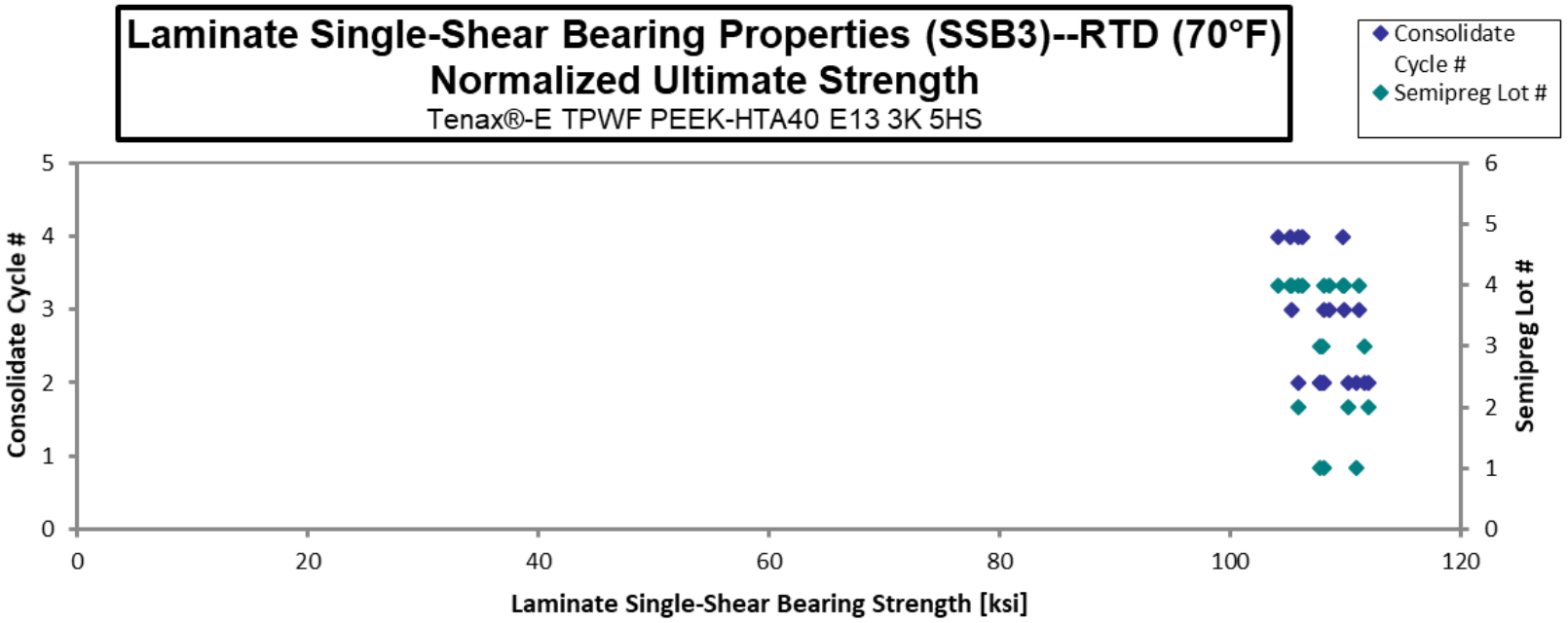
Specimen Number	Semipreg Lot #	Consolidate Cycle #	Initial Peak Bearing Strength [ksi]	2% Offset Strength [ksi]	Ultimate Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Comments	Avg. t_{ply} [in]	Initial Peak Bearing $Strength_{norm}$ [ksi]	2% Offset $Strength_{norm}$ [ksi]	Ultimate $Strength_{norm}$ [ksi]
NTP4013Q1-TTX-T40-E-SSB3-D-M3-RTD-1*	4	3		97.20	111.8	0.1205	10	B1I	0.01205		95.52	109.9
NTP4013Q1-TTX-T40-E-SSB3-D-M3-RTD-2*	4	3		94.63	106.2	0.1216	10	B1I	0.01216		93.87	105.4
NTP4013Q1-TTX-T40-E-SSB3-D-M3-RTD-3	4	3	96.43	94.20	108.7	0.1219	10	B1I	0.01219	95.86	93.65	108.1
NTP4013Q1-TTX-T40-E-SSB3-D-M3-RTD-4*	4	3		92.44	108.1	0.1230	10	B1I	0.01230		92.77	108.5
NTP4013Q1-TTX-T40-E-SSB3-D-M3-RTD-5*	4	3		95.73	111.7	0.1221	10	B1I	0.01221		95.30	111.2
NTP4013Q1-TTX-T40-E-SSB3-D-M4-RTD-1	4	4	95.30	93.97	104.5	0.1221	10	B1I	0.01221	94.94	93.61	104.1
NTP4013Q1-TTX-T40-E-SSB3-D-M4-RTD-2*	4	4		93.39	106.1	0.1223	10	B1I	0.01223		93.13	105.8
NTP4013Q1-TTX-T40-E-SSB3-D-M4-RTD-3*	4	4		97.17	105.6	0.1221	10	B1I	0.01221		96.78	105.2
NTP4013Q1-TTX-T40-E-SSB3-D-M4-RTD-4*	4	4		96.06	106.3	0.1226	10	B1I	0.01226		96.08	106.3
NTP4013Q1-TTX-T40-E-SSB3-D-M4-RTD-5*	4	4		98.10	110.0	0.1223	10	B1I	0.01223		97.85	109.7
NTP4013Q1-TTX-T40-E-SSB3-A-M2-1-RTD-1	1	2	96.33	93.08	112.2	0.1177	10	B1I	0.01177	92.44	89.32	107.7
NTP4013Q1-TTX-T40-E-SSB3-A-M2-1-RTD-2	1	2	97.48	95.17	112.1	0.1183	10	B1I	0.01183	94.04	91.82	108.2
NTP4013Q1-TTX-T40-E-SSB3-A-M2-1-RTD-3	1	2	99.68	97.69	114.1	0.1192	10	B1I	0.01192	96.93	94.99	110.9
NTP4013Q1-TTX-T40-E-SSB3-B-M2-1-RTD-1	2	2	96.16	93.53	112.3	0.1223	10	B1I	0.01223	95.89	93.26	111.9
NTP4013Q1-TTX-T40-E-SSB3-B-M2-1-RTD-2	2	2	97.47	93.19	110.3	0.1225	10	B1I	0.01225	97.42	93.14	110.3
NTP4013Q1-TTX-T40-E-SSB3-B-M2-1-RTD-3*	2	2		94.34	106.2	0.1223	10	B1I	0.01223		94.13	105.9
NTP4013Q1-TTX-T40-E-SSB3-C-M2-1-RTD-1	3	2	95.49	92.58	108.6	0.1216	10	B1I	0.01216	94.67	91.78	107.7
NTP4013Q1-TTX-T40-E-SSB3-C-M2-1-RTD-2	3	2	93.22	92.99	108.3	0.1223	10	B1I	0.01223	93.00	92.78	108.0
NTP4013Q1-TTX-T40-E-SSB3-C-M2-1-RTD-3*	3	2		98.68	112.0	0.1222	10	B1I	0.01222		98.34	111.6

*Initial peak strength was not reported because not observed.

Average	**96.39**	**94.95**	**109.2**	**Average$_{norm}$**	**0.01215**	**95.02**	**94.11**	**108.2**
Standard Dev.	**1.778**	**2.000**	**2.858**	**Standard Dev.$_{norm}$**		**1.684**	**2.203**	**2.357**
Coeff. of Var. [%]	**1.845**	**2.106**	**2.617**	**Coeff. of Var. [%]$_{norm}$**		**1.772**	**2.341**	**2.178**
Min.	**93.22**	**92.44**	**104.5**	**Min.**	**0.01177**	**92.44**	**89.32**	**104.1**
Max.	**99.7**	**98.7**	**114.1**	**Max.**	**0.01230**	**97.42**	**98.34**	**111.9**
Number of Spec.	**9**	**19**	**19**	**Number of Spec.**	**19**	**9**	**19**	**19**


Laminate Single-Shear Bearing Properties (SSB3)--RTD (70°F)
Normalized Initial Peak Bearing Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Single-Shear Bearing Strength [ksi]
0
20
40
60
80
100
120
0
1
2
3
4
5
6


Laminate Single-Shear Bearing Properties (SSB3)--RTD (70°F)
Normalized 2% Offset Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Single-Shear Bearing Strength [ksi]
0
20
40
60
80
100
120
0
1
2
3
4
5
6


Laminate Single-Shear Bearing Properties (SSB3)--RTD (70°F)
Normalized Ultimate Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Single-Shear Bearing Strength [ksi]
0
20
40
60
80
100
120
0
1
2
3
4
5
6

Laminate Single-Shear Bearing Properties (SSB3)--ETW (180°F)
Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

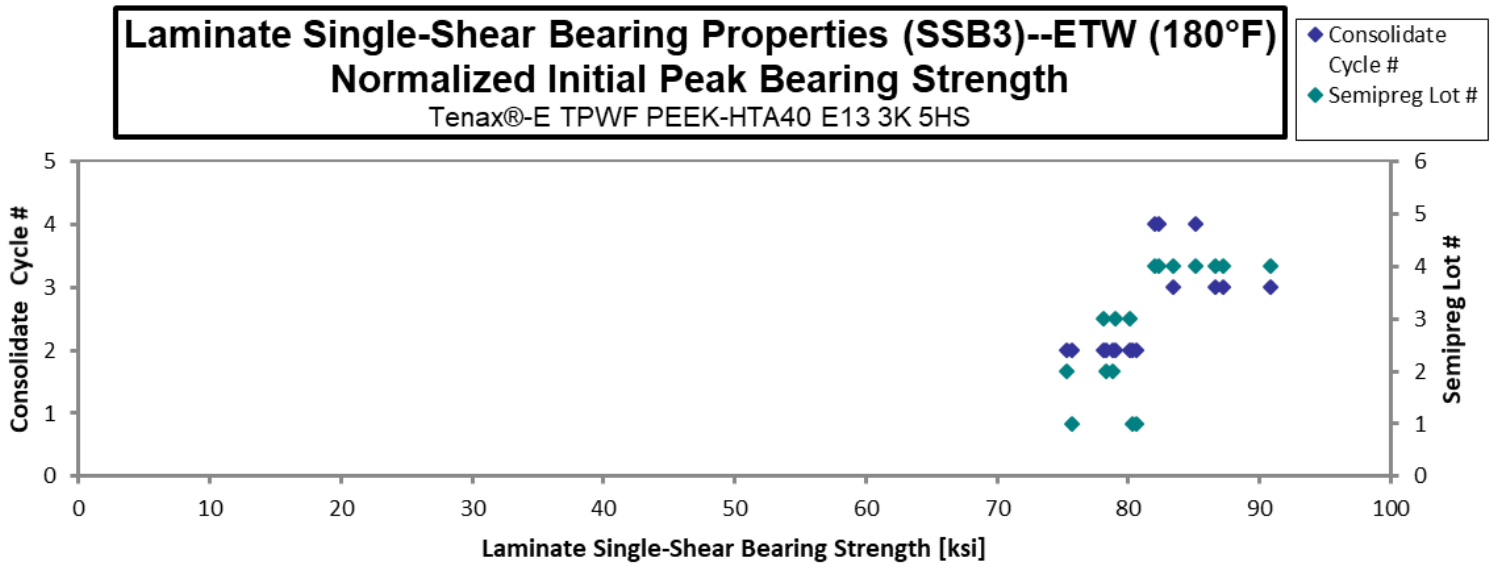
normalizing t_{ply} [in]: 0.01226

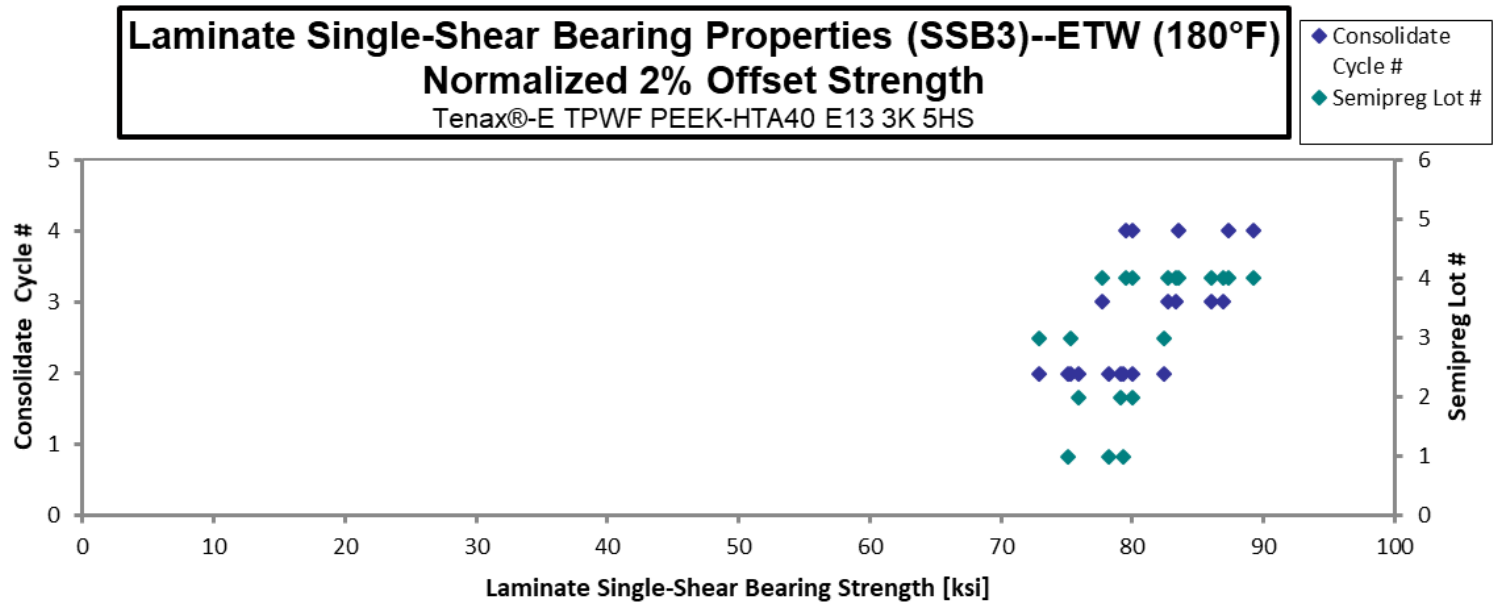
Specimen Number	Semipreg Lot #	Consolidate Cycle #	Initial Peak Bearing Strength [ksi]	2% Offset Strength [ksi]	Ultimate Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Comments	Avg. t_{ply} [in]	Initial Peak Bearing $Strength_{norm}$ [ksi]	2% Offset $Strength_{norm}$ [ksi]	Ultimate $Strength_{norm}$ [ksi]
NTP4013Q1-TTX-T40-E-SSB3-D-M3-ETW-1	4	3	90.44	86.50	95.51	0.1232	10	B1I	0.01232	90.87	86.91	95.97
NTP4013Q1-TTX-T40-E-SSB3-D-M3-ETW-2	4	3	87.14	85.90	91.06	0.1228	10	B1I	0.01228	87.29	86.04	91.21
NTP4013Q1-TTX-T40-E-SSB3-D-M3-ETW-3*	4	3		83.18	95.48	0.1219	10	B1I	0.01219		82.72	94.95
NTP4013Q1-TTX-T40-E-SSB3-D-M3-ETW-4	4	3	86.50	83.22	93.25	0.1228	10	B1I	0.01228	86.66	83.36	93.42
NTP4013Q1-TTX-T40-E-SSB3-D-M3-ETW-5	4	3	83.37	77.61	95.08	0.1227	10	B1I	0.01227	83.43	77.66	95.14
NTP4013Q1-TTX-T40-E-SSB3-D-M4-ETW-1*	4	4		89.75	94.55	0.1219	10	B1I	0.01219		89.22	94.0
NTP4013Q1-TTX-T40-E-SSB3-D-M4-ETW-2*	4	4		87.95	98.78	0.1217	10	B1I	0.01217		87.29	98.0
NTP4013Q1-TTX-T40-E-SSB3-D-M4-ETW-3	4	4	83.35	80.58	97.52	0.1210	10	B1I	0.01210	82.29	79.55	96.3
NTP4013Q1-TTX-T40-E-SSB3-D-M4-ETW-4	4	4	83.84	81.77	99.65	0.1200	10	B1I	0.01200	82.04	80.02	97.5
NTP4013Q1-TTX-T40-E-SSB3-D-M4-ETW-5	4	4	87.11	85.45	100.6	0.1198	10	B1I	0.01198	85.14	83.51	98.33
NTP4013Q1-TTX-T40-E-SSB3-A-M2-1-ETW-1	1	2	77.30	80.97	100.7	0.1201	10	B1I	0.01201	75.72	79.31	98.60
NTP4013Q1-TTX-T40-E-SSB3-A-M2-1-ETW-2	1	2	82.72	80.22	95.87	0.1195	10	B1I	0.01195	80.61	78.17	93.42
NTP4013Q1-TTX-T40-E-SSB3-A-M2-1-ETW-3	1	2	82.15	76.85	97.51	0.1198	10	B1I	0.01198	80.30	75.12	95.31
NTP4013Q1-TTX-T40-E-SSB3-B-M2-1-ETW-1	2	2	78.94	80.11	94.90	0.1224	10	B1I	0.01224	78.83	80.00	94.77
NTP4013Q1-TTX-T40-E-SSB3-B-M2-1-ETW-2	2	2	78.58	79.42	100.8	0.1222	10	B1I	0.01222	78.29	79.13	100.4
NTP4013Q1-TTX-T40-E-SSB3-B-M2-1-ETW-3	2	2	77.87	78.43	98.22	0.1186	10	B1I	0.01186	75.33	75.87	95.01
NTP4013Q1-TTX-T40-E-SSB3-C-M2-1-ETW-1	3	2	79.27	73.11	99.66	0.1222	10	B1I	0.01222	79.00	72.86	99.32
NTP4013Q1-TTX-T40-E-SSB3-C-M2-1-ETW-2	3	2	80.53	75.66	96.38	0.1220	10	B1I	0.01220	80.10	75.26	95.87
NTP4013Q1-TTX-T40-E-SSB3-C-M2-1-ETW-3	3	2	78.56	82.87	96.22	0.1219	10	B1I	0.01219	78.13	82.42	95.70

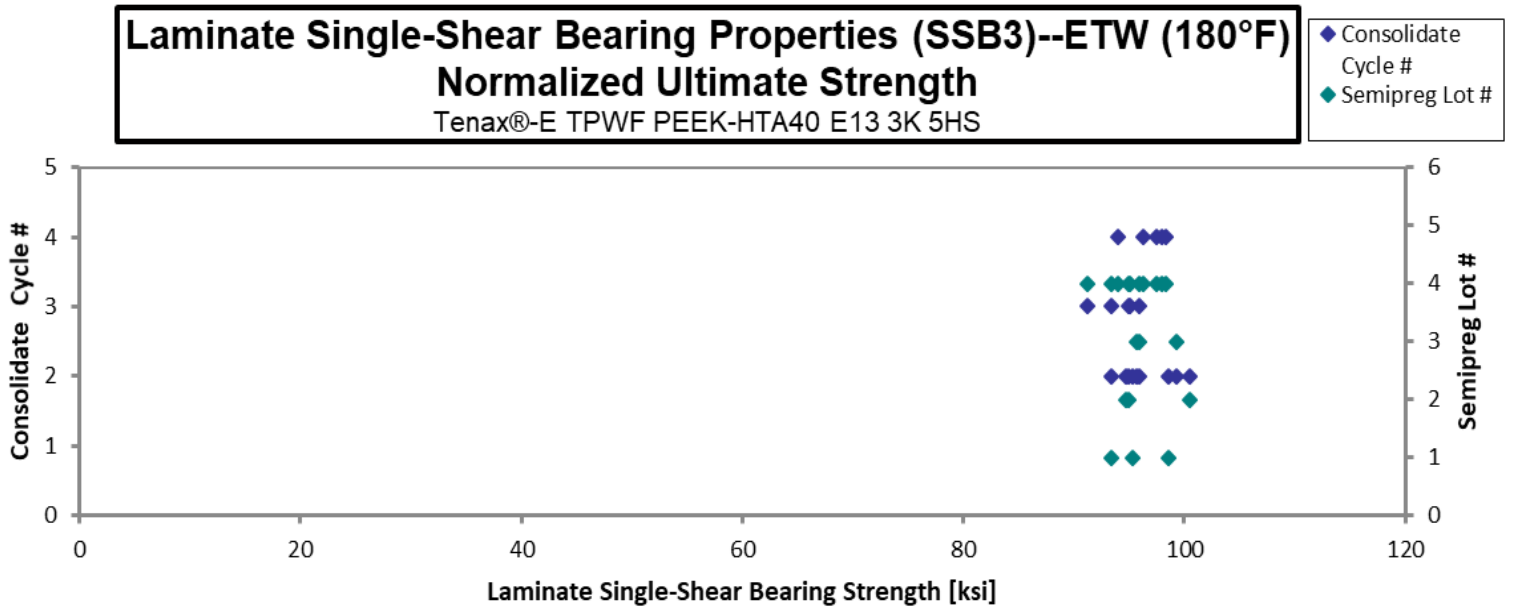
*Initial peak strength was not reported because not observed.

Average	**82.36**	**81.56**	**96.93**
Standard Dev.	**3.927**	**4.326**	**2.692**
Coeff. of Var. [%]	**4.768**	**5.305**	**2.777**
Min.	**77.30**	**73.11**	**91.06**
Max.	**90.44**	**89.75**	**100.8**
Number of Spec.	**16**	**19**	**19**

$Average_{norm}$	**0.01214**	**81.50**	**80.76**	**95.96**
Standard $Dev._{norm}$		**4.293**	**4.551**	**2.294**
Coeff. of Var. $[\%]_{norm}$		**5.267**	**5.635**	**2.390**
Min.	**0.01186**	**75.33**	**72.86**	**91.21**
Max.	**0.01232**	**90.87**	**89.22**	**100.4**
Number of Spec.	**19**	**16**	**19**	**19**


Laminate Single-Shear Bearing Properties (SSB3)--ETW (180°F)
Normalized Initial Peak Bearing Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Single-Shear Bearing Strength [ksi]


Laminate Single-Shear Bearing Properties (SSB3)--ETW (180°F)
Normalized 2% Offset Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Single-Shear Bearing Strength [ksi]


Laminate Single-Shear Bearing Properties (SSB3)--ETW (180°F)
Normalized Ultimate Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Single-Shear Bearing Strength [ksi]
0
20
40
60
80
100
120
0
1
2
3
4
5
6

4.29 "25/50/25" Compression After Impact 1 Properties (CAI1)

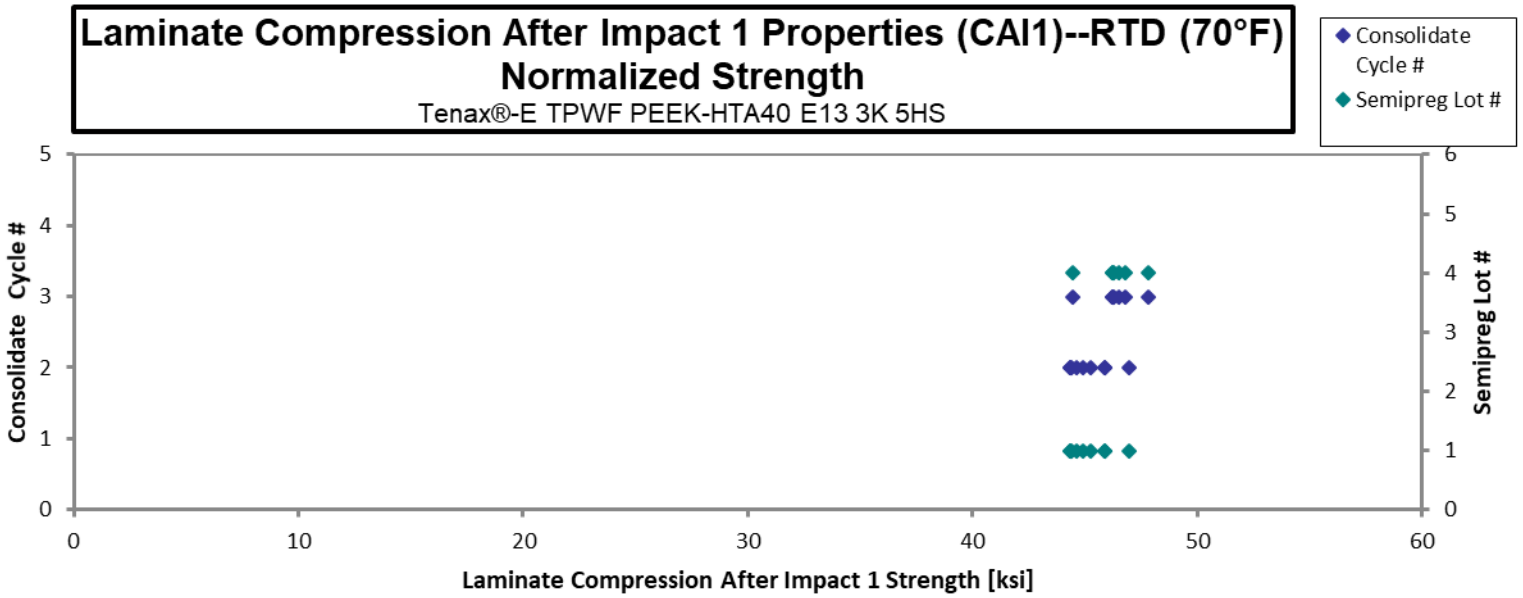
Laminate Compression After Impact 1 Properties (CAI1)--RTD (70°F)
Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

normalizing t_{ply} [in]
0.01226

Specimen Number	Semipreg Lot #	Consolidate Cycle #	Strength [ksi]	Measured Impact Energy [in-lbf]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
NTP4013Q1-TTX-T40-E-CAI1-D-M3-RTD-1	4	3	47.08	311.1	0.1927	16	LDM	0.01204	46.24
NTP4013Q1-TTX-T40-E-CAI1-D-M3-RTD-2	4	3	47.87	320.3	0.1959	16	LDM	0.01224	47.80
NTP4013Q1-TTX-T40-E-CAI1-D-M3-RTD-3	4	3	46.64	320.9	0.1956	16	LDM	0.01223	46.50
NTP4013Q1-TTX-T40-E-CAI1-D-M3-RTD-4	4	3	46.47	320.2	0.1953	16	LDM	0.01221	46.27
NTP4013Q1-TTX-T40-E-CAI1-D-M3-RTD-5	4	3	46.09	307.2	0.1893	16	LDM	0.01183	44.48
NTP4013Q1-TTX-T40-E-CAI1-D-M3-RTD-6	4	3	48.02	312.2	0.1912	16	LDM	0.01195	46.80
NTP4013Q1-TTX-T40-E-CAI1-D-M3-RTD-7	4	3	47.27	310.4	0.1919	16	LDM	0.01199	46.23
NTP4013Q1-TTX-T40-E-CAI1-A-M2-RTD-1	1	2	47.64	265.5	0.1934	16	LDM	0.01208	46.96
NTP4013Q1-TTX-T40-E-CAI1-A-M2-RTD-2	1	2	46.06	265.5	0.1928	16	LDM	0.01205	45.26
NTP4013Q1-TTX-T40-E-CAI1-A-M2-RTD-4	1	2	45.76	265.5	0.1926	16	LDM	0.01204	44.93
NTP4013Q1-TTX-T40-E-CAI1-A-M2-RTD-5	1	2	46.96	265.5	0.1918	16	LDM	0.01198	45.91
NTP4013Q1-TTX-T40-E-CAI1-A-M2-RTD-6	1	2	45.59	265.5	0.1921	16	LDM	0.01201	44.64
NTP4013Q1-TTX-T40-E-CAI1-A-M2-RTD-7	1	2	45.50	265.5	0.1913	16	LDM	0.01195	44.37
NTP4013Q1-TTX-T40-E-CAI1-A-M2-RTD-8	1	2	45.59	265.5	0.1909	16	LDM	0.01193	44.37
NTP4013Q1-TTX-T40-E-CAI1-A-M2-RTD-9	1	2	45.72	265.5	0.1902	16	LDM	0.01189	44.34
NTP4013Q1-TTX-T40-E-CAI1-A-M2-RTD-13	1	2	46.39	265.5	0.1940	16	LDM	0.01212	45.87

Average	**46.54**	
Standard Dev.	**0.849**	
Coeff. of Var. [%]	**1.824**	
Min.	**45.50**	
Max.	**48.02**	
Number of Spec.	**16**	

$Average_{norm}$	**0.01203**	**45.69**
$Standard\ Dev._{norm}$		**1.084**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**2.373**
Min.	**0.01183**	**44.34**
Max.	**0.01224**	**47.80**
Number of Spec.	**16**	**16**


Laminate Compression After Impact 1 Properties (CAI1)--RTD (70°F)
Normalized Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Compression After Impact 1 Strength [ksi]
0
10
20
30
40
50
60
0
1
2
3
4
5
6

4.30 Interlaminar Tension Properties (ILT)[1]

Laminate Interlaminar Tension Properties (ILT)[1]--CTD (-65°F) Strength

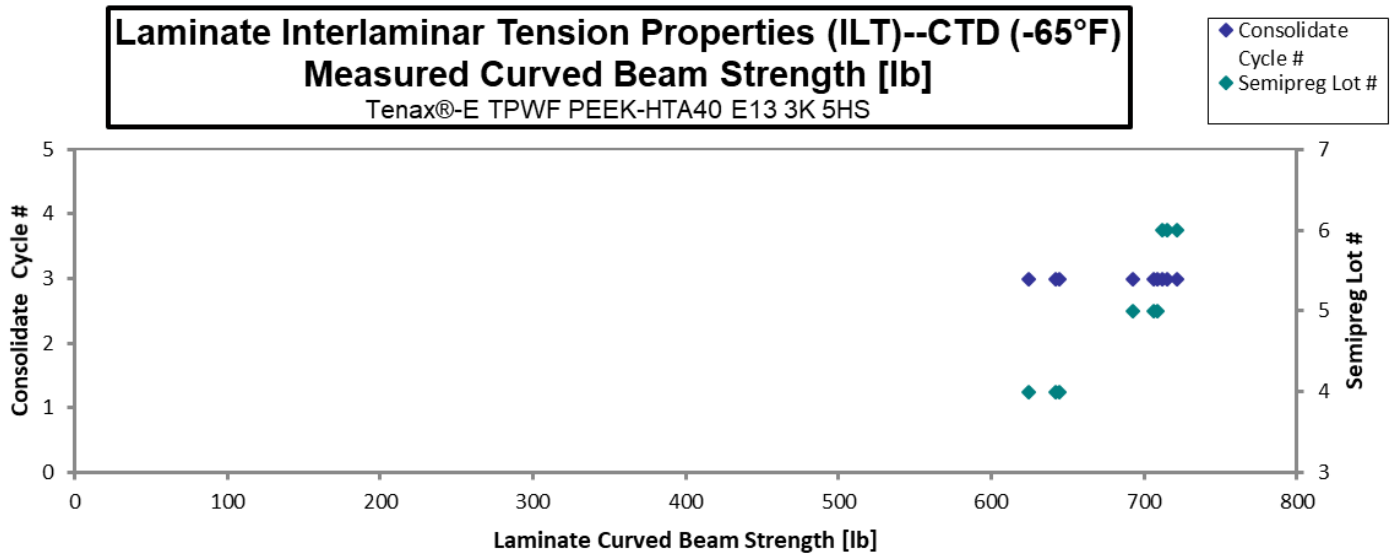
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

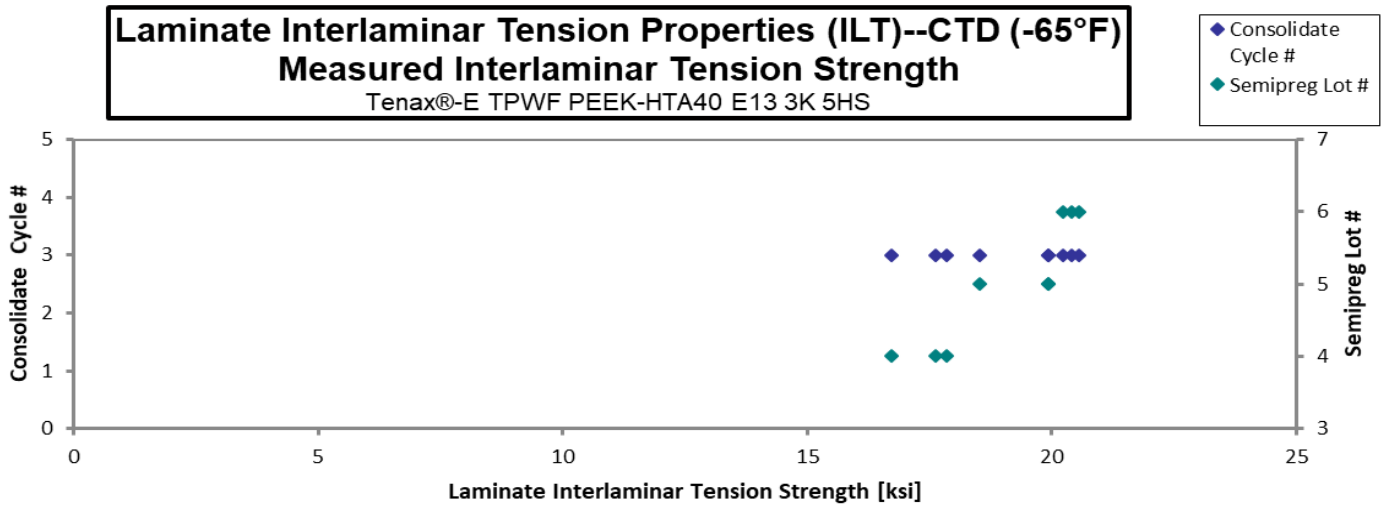
Specimen Number	Semipreg Lot #	Consolidate Cycle #	Curved Beam Strength [lb]	Interlaminar Tension Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode
NTP4013Q1-TTX-T40-E-ILT-D-M3-CTD-1*	4	3	642.1	17.63	0.1706	14	0.01219	ILT
NTP4013Q1-TTX-T40-E-ILT-D-M3-CTD-2*	4	3	624.9	16.74	0.1705	14	0.01218	ILT
NTP4013Q1-TTX-T40-E-ILT-D-M3-CTD-3*	4	3	644.3	17.85	0.1696	14	0.01212	ILT
NTP4013Q1-TTX-T40-E-ILT-E-M3-CTD-1*	5	3	706.2	19.94	0.1681	14	0.01201	ILT
NTP4013Q1-TTX-T40-E-ILT-E-M3-CTD-2*	5	3	709.1	19.94	0.1695	14	0.01211	ILT
NTP4013Q1-TTX-T40-E-ILT-E-M3-CTD-4*	5	3	692.5	18.54	0.1700	14	0.01214	ILT
NTP4013Q1-TTX-T40-E-ILT-F-M3-CTD-1*	6	3	715.5	20.57	0.1672	14	0.01195	ILT
NTP4013Q1-TTX-T40-E-ILT-F-M3-CTD-2*	6	3	711.9	20.24	0.1687	14	0.01205	ILT
NTP4013Q1-TTX-T40-E-ILT-F-M3-CTD-3*	6	3	721.4	20.41	0.1686	14	0.01205	ILT

[1] For informational only, please refer to NPS 84013 section 4.5 for processing information

* Cross head displacement exceed 5mm [0.2 in] prior to failure.

Average	**685.3**	**19.10**		**0.01209**
Standard Dev.	**37.37**	**1.421**		
Coeff. of Var. [%]	**5.453**	**7.443**		
Min.	**624.9**	**16.74**		**0.01195**
Max.	**721.4**	**20.57**		**0.01219**
Number of Spec.	**9**	**9**		**9**


Laminate Interlaminar Tension Properties (ILT)--CTD (-65°F)
Measured Curved Beam Strength [lb]
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Curved Beam Strength [lb]
0
100
200
300
400
500
600
700
800
0
1
2
3
4
5
3
4
5
6
7


Laminate Interlaminar Tension Properties (ILT)--CTD (-65°F)
Measured Interlaminar Tension Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Interlaminar Tension Strength [ksi]
0
5
10
15
20
25
0
1
2
3
4
5
3
4
5
6
7

Laminate Interlaminar Tension Properties (ILT)[1]--RTD (70°F) Strength

Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

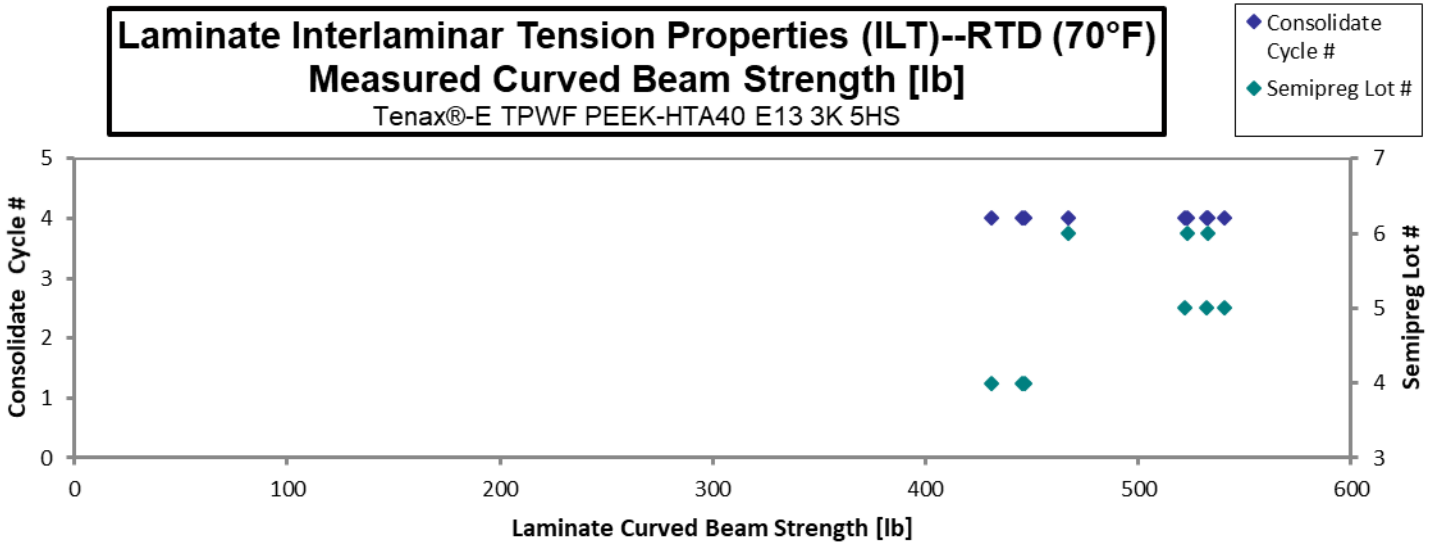
Specimen Number	Semipreg Lot #	Consolidate Cycle #	Curved Beam Strength [lb]	Interlaminar Tension Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode
NTP4013Q1-TTX-T40-E-ILT-D-M4-RTD-1*	4	4	446.6	12.24	0.1725	14	0.01232	ILT
NTP4013Q1-TTX-T40-E-ILT-D-M4-RTD-2*	4	4	445.5	12.07	0.1721	14	0.01229	ILT
NTP4013Q1-TTX-T40-E-ILT-D-M4-RTD-3*	4	4	430.9	11.67	0.1718	14	0.01227	ILT
NTP4013Q1-TTX-T40-E-ILT-E-M4-RTD-1*	5	4	521.7	14.70	0.1650	14	0.01178	ILT
NTP4013Q1-TTX-T40-E-ILT-E-M4-RTD-2*	5	4	540.3	15.61	0.1665	14	0.01190	ILT
NTP4013Q1-TTX-T40-E-ILT-E-M4-RTD-3*	5	4	532.2	15.28	0.1672	14	0.01195	ILT
NTP4013Q1-TTX-T40-E-ILT-F-M4-RTD-1*	6	4	467.4	13.28	0.1644	14	0.01175	ILT
NTP4013Q1-TTX-T40-E-ILT-F-M4-RTD-2*	6	4	532.8	14.88	0.1666	14	0.01190	ILT
NTP4013Q1-TTX-T40-E-ILT-F-M4-RTD-3*	6	4	522.9	14.98	0.1674	14	0.01196	ILT

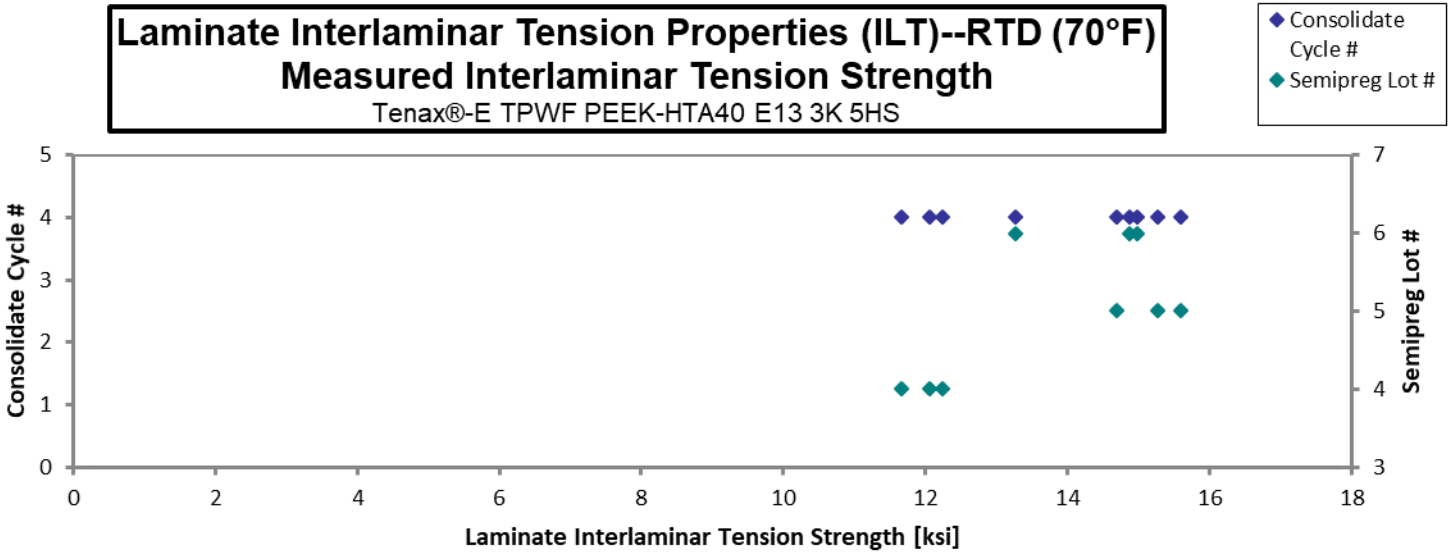
[1] For informational only, please refer to NPS 84013 section 4.5 for processing information

* Cross head displacement exceed 5mm [0.2 in] prior to failure.

* COV highlighted in yellow due to more than 10%

Average	**493.4**	**13.86**		**0.01201**
Standard Dev.	**44.71**	**1.543**		
Coeff. of Var. [%]	**9.062**	**11.14**		
Min.	**430.9**	**11.67**		**0.01175**
Max.	**540.3**	**15.61**		**0.01232**
Number of Spec.	**9**	**9**		**9**


Laminate Interlaminar Tension Properties (ILT)--RTD (70°F)
Measured Curved Beam Strength [lb]
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Curved Beam Strength [lb]
0
100
200
300
400
500
600
0
1
2
3
4
5
3
4
5
6
7


Laminate Interlaminar Tension Properties (ILT)--RTD (70°F)
Measured Interlaminar Tension Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Interlaminar Tension Strength [ksi]
0
2
4
6
8
10
12
14
16
18
0
1
2
3
4
5
3
4
5
6
7

Laminate Interlaminar Tension Properties (ILT)[1]--ETW (180°F) Strength

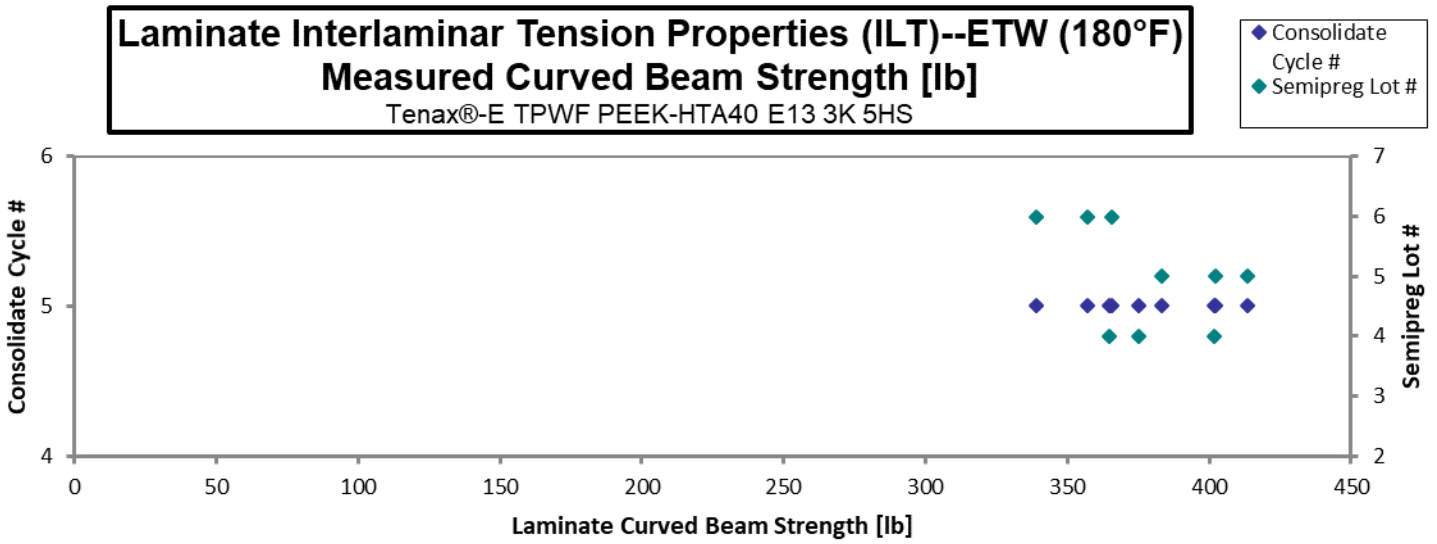
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

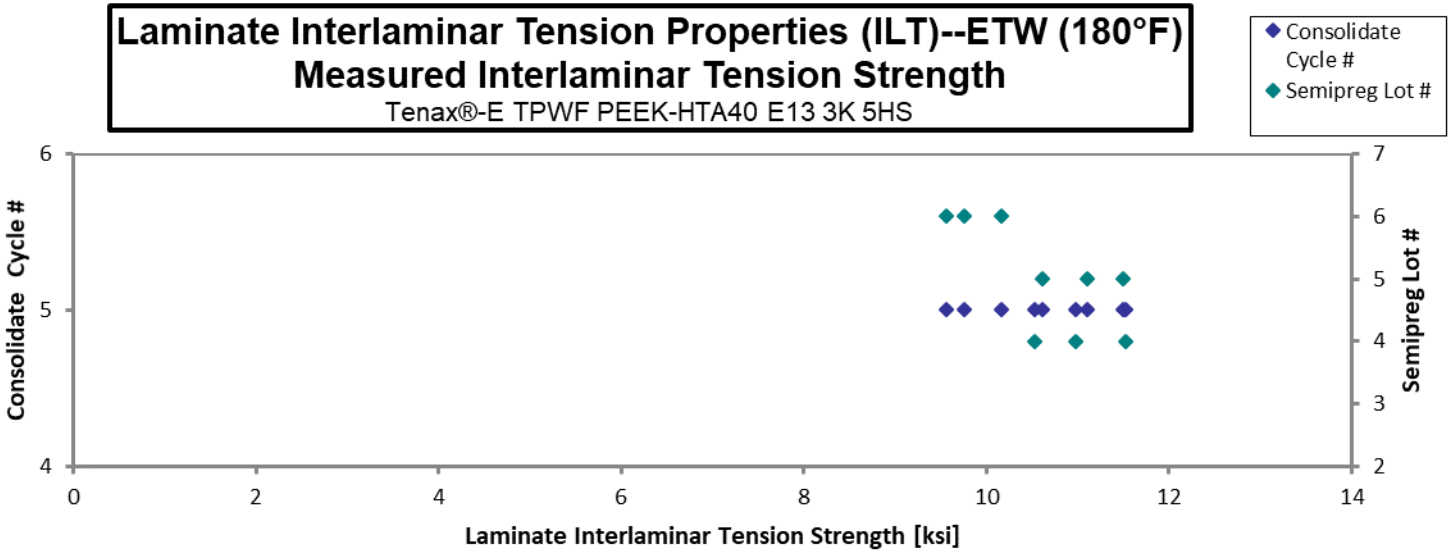
Specimen Number	Semipreg Lot #	Consolidate Cycle #	Curved Beam Strength [lb]	Interlaminar Tension Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode
NTP4013Q1-TTX-T40-E-ILT-D-M5-ETW-1*	4	5	364.5	10.53	0.1661	14	0.01186	ILT
NTP4013Q1-TTX-T40-E-ILT-D-M5-ETW-2*	4	5	401.9	11.53	0.1657	14	0.01183	ILT
NTP4013Q1-TTX-T40-E-ILT-D-M5-ETW-3*	4	5	375.2	10.98	0.1651	14	0.01179	ILT
NTP4013Q1-TTX-T40-E-ILT-E-M5-ETW-1*	5	5	383.2	10.61	0.1701	14	0.01215	ILT
NTP4013Q1-TTX-T40-E-ILT-E-M5-ETW-2*	5	5	413.6	11.51	0.1708	14	0.01220	ILT
NTP4013Q1-TTX-T40-E-ILT-E-M5-ETW-3*	5	5	402.3	11.11	0.1705	14	0.01218	ILT
NTP4013Q1-TTX-T40-E-ILT-F-M5-ETW-2*	6	5	365.5	10.16	0.1835	14	0.01311	ILT
NTP4013Q1-TTX-T40-E-ILT-F-M5-ETW-3*	6	5	357.2	9.758	0.1803	14	0.01288	ILT
NTP4013Q1-TTX-T40-E-ILT-F-M5-ETW-4*	6	5	338.9	9.560	0.1828	14	0.01306	ILT

[1] For informational only, please refer to NPS 84013 section 4.5 for processing information

* Cross head displacement exceed 5mm [0.2 in] prior to failure.

Average	**378.0**	**10.64**		**0.01234**
Standard Dev.	**24.39**	**0.712**		
Coeff. of Var. [%]	**6.452**	**6.695**		
Min.	**338.9**	**9.560**		**0.01179**
Max.	**413.6**	**11.53**		**0.01311**
Number of Spec.	**9**	**9**		**9**


Laminate Interlaminar Tension Properties (ILT)--ETW (180°F)
Measured Curved Beam Strength [lb]
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Curved Beam Strength [lb]
0
50
100
150
200
250
300
350
400
450
4
5
6
2
3
4
5
6
7

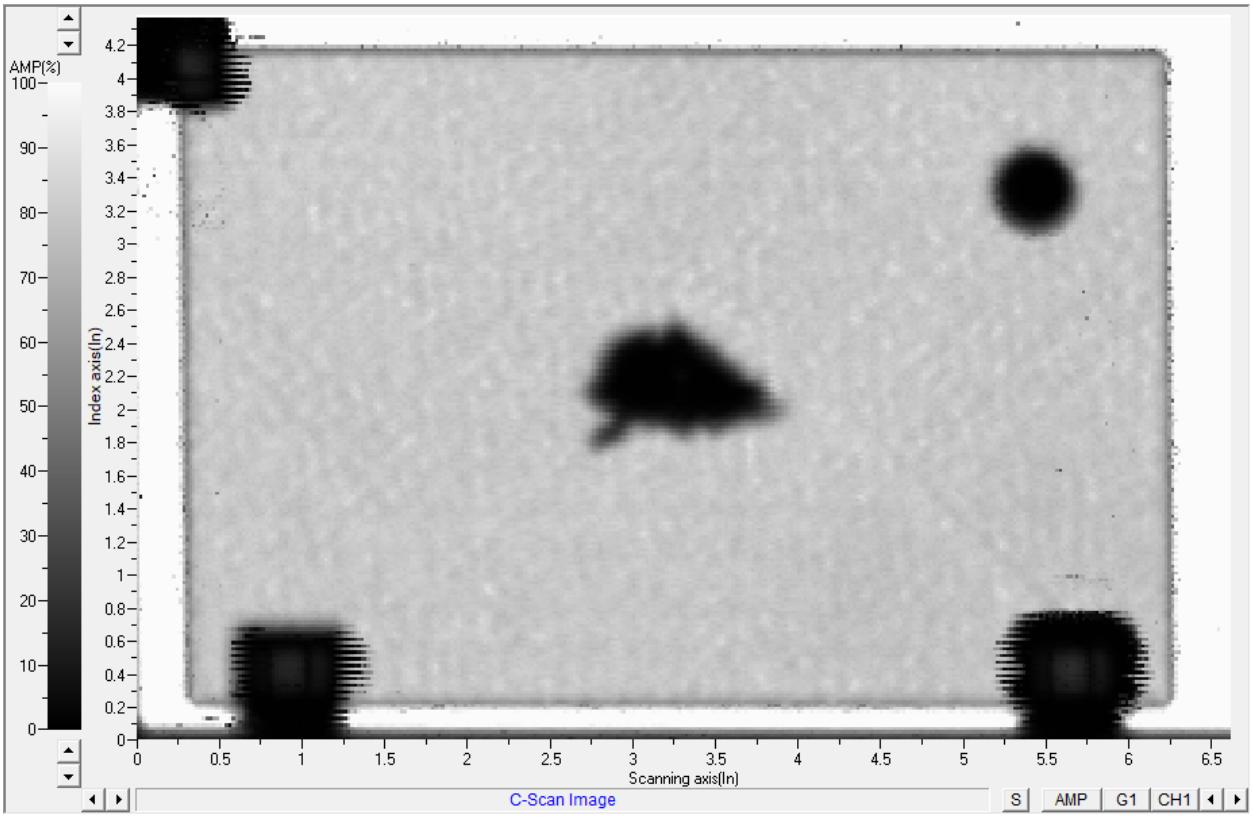

Laminate Interlaminar Tension Properties (ILT)--ETW (180°F)
Measured Interlaminar Tension Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS
Consolidate Cycle #
Semipreg Lot #
Consolidate Cycle #
Semipreg Lot #
Laminate Interlaminar Tension Strength [ksi]
0
2
4
6
8
10
12
14
4
5
6
2
3
4
5
6
7

5. Additional Compression After Impact Data

Target Impact Energy Level: 1500 in-lb/in

Impactor Diameter: 0.625”

Representative of Damage Area:



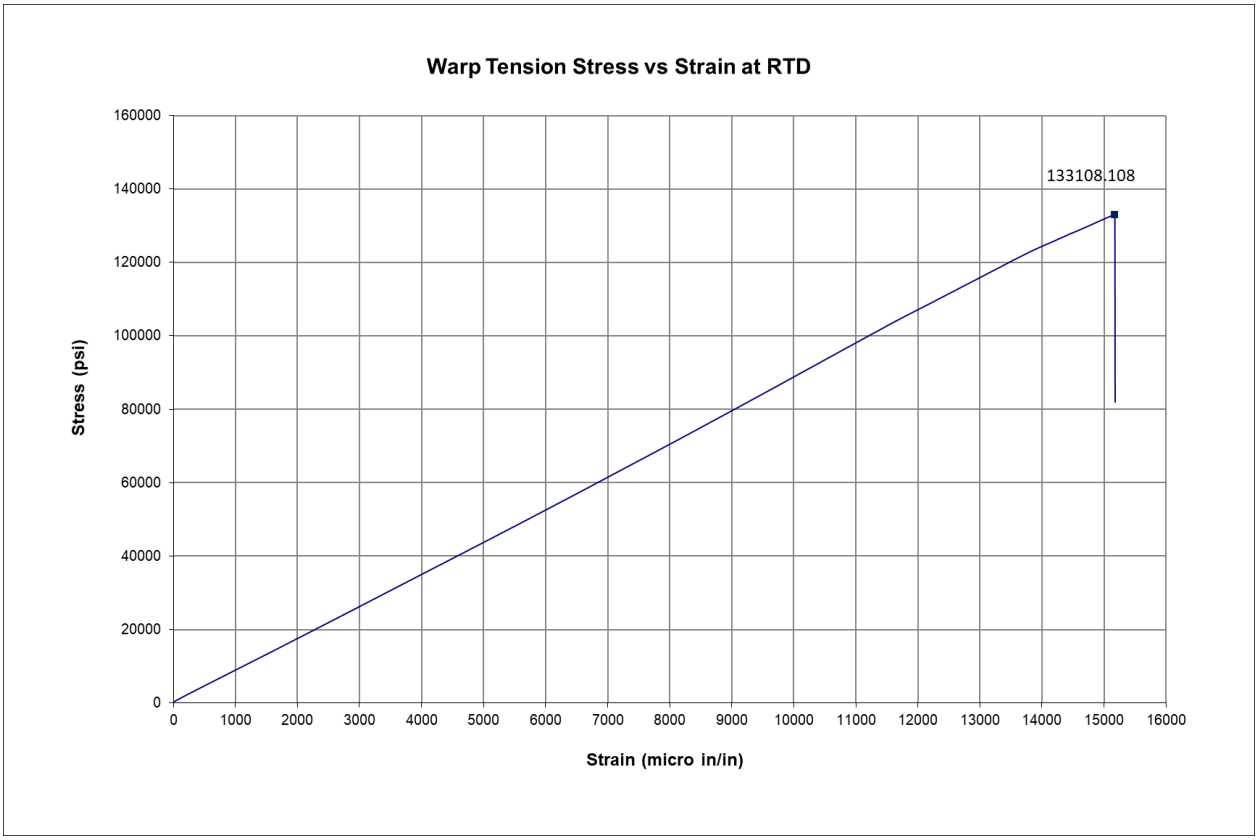
Note: Black area around the edges are clamps areas.

Damage Area and Dent Depth Summary:

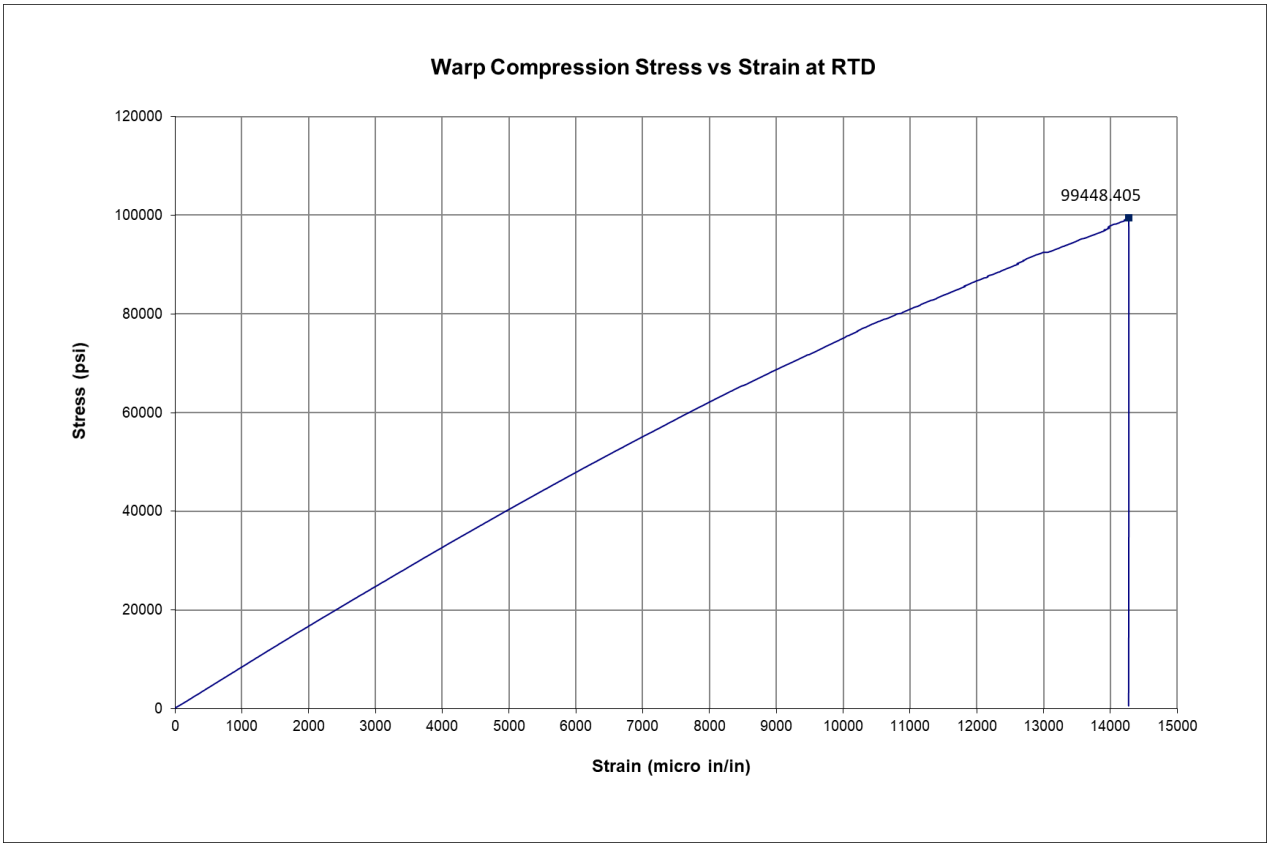
Specimen ID	Damage Area ($inch^2$)	Dent Depth (inch)
NTP4013Q1-TTX-T40-E-CAI1-D-M3-RTD-1	0.5228	0.0275
NTP4013Q1-TTX-T40-E-CAI1-D-M3-RTD-2	0.5656	0.0270
NTP4013Q1-TTX-T40-E-CAI1-D-M3-RTD-3	0.6520	0.0280
NTP4013Q1-TTX-T40-E-CAI1-D-M3-RTD-4	0.5768	0.0275
NTP4013Q1-TTX-T40-E-CAI1-D-M3-RTD-5	0.5684	0.0280
NTP4013Q1-TTX-T40-E-CAI1-D-M3-RTD-6	0.5348	0.0270
NTP4013Q1-TTX-T40-E-CAI1-D-M3-RTD-7	0.5768	0.0270
NTP4013Q1-TTX-T40-E-CAI1-A-M2-RTD-1	N/A	0.0224
NTP4013Q1-TTX-T40-E-CAI1-A-M2-RTD-2	N/A	0.0226
NTP4013Q1-TTX-T40-E-CAI1-A-M2-RTD-4	N/A	0.0224
NTP4013Q1-TTX-T40-E-CAI1-A-M2-RTD-5	N/A	0.0226
NTP4013Q1-TTX-T40-E-CAI1-A-M2-RTD-6	N/A	0.0230
NTP4013Q1-TTX-T40-E-CAI1-A-M2-RTD-7	N/A	0.0230
NTP4013Q1-TTX-T40-E-CAI1-A-M2-RTD-8	N/A	0.0222
NTP4013Q1-TTX-T40-E-CAI1-A-M2-RTD-9	N/A	0.0225
NTP4013Q1-TTX-T40-E-CAI1-A-M2-RTD-13	N/A	0.0224

6. Full Stress vs. Strain Curve

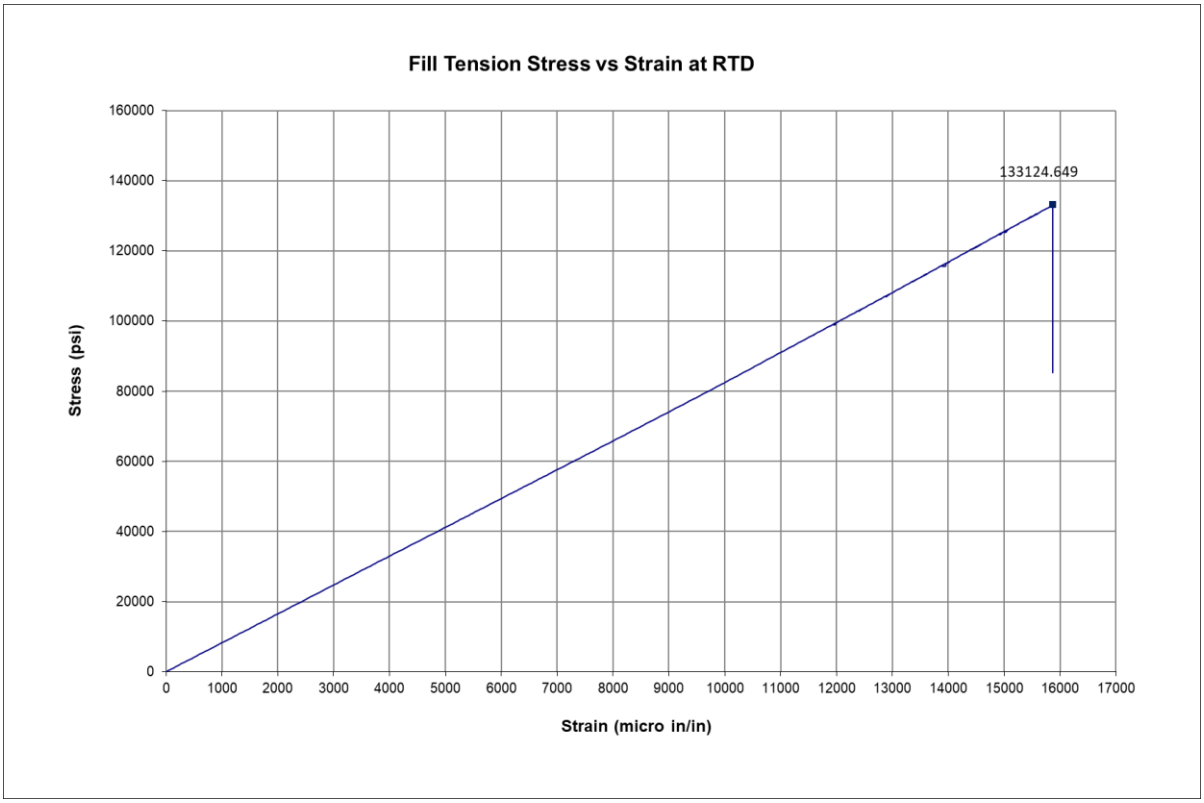
6.1 Warp Tension Properties (WT) – RTD (70°F)



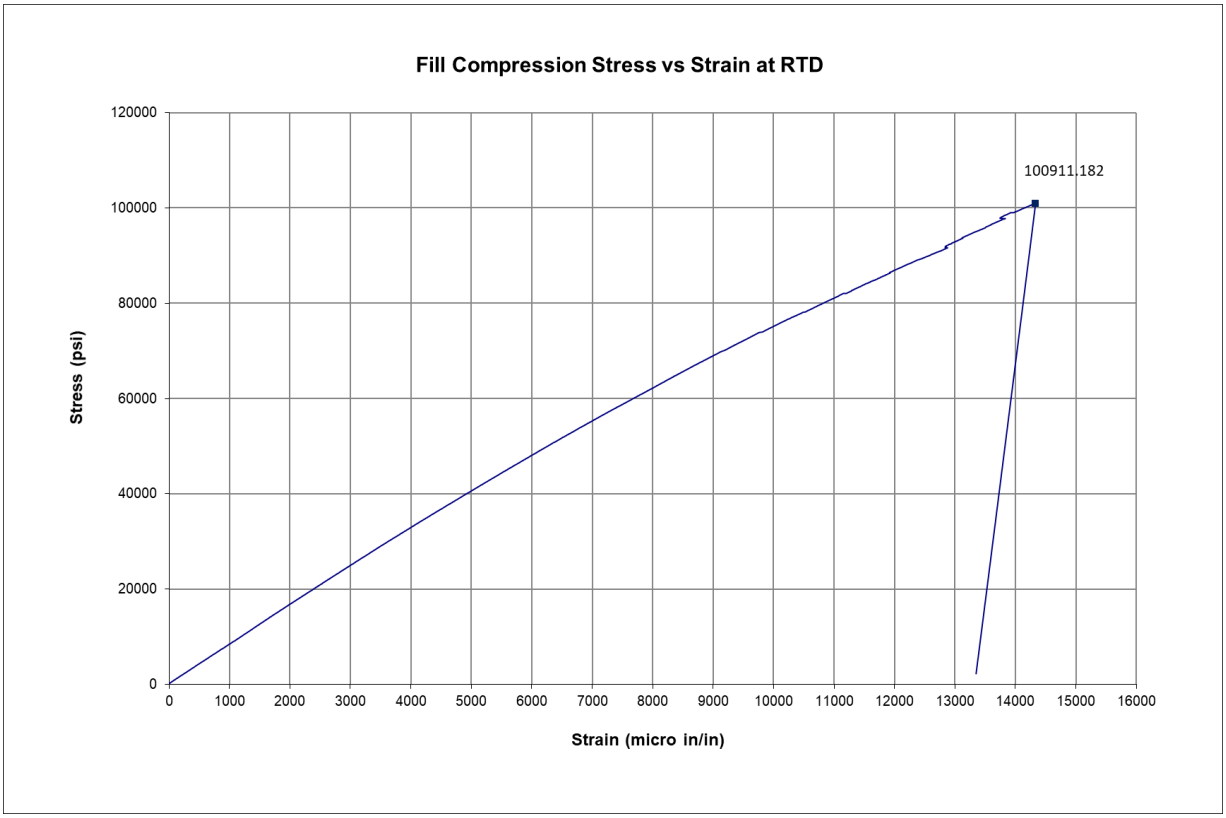
6.2 Warp Compression Properties (WC) – RTD (70°F)



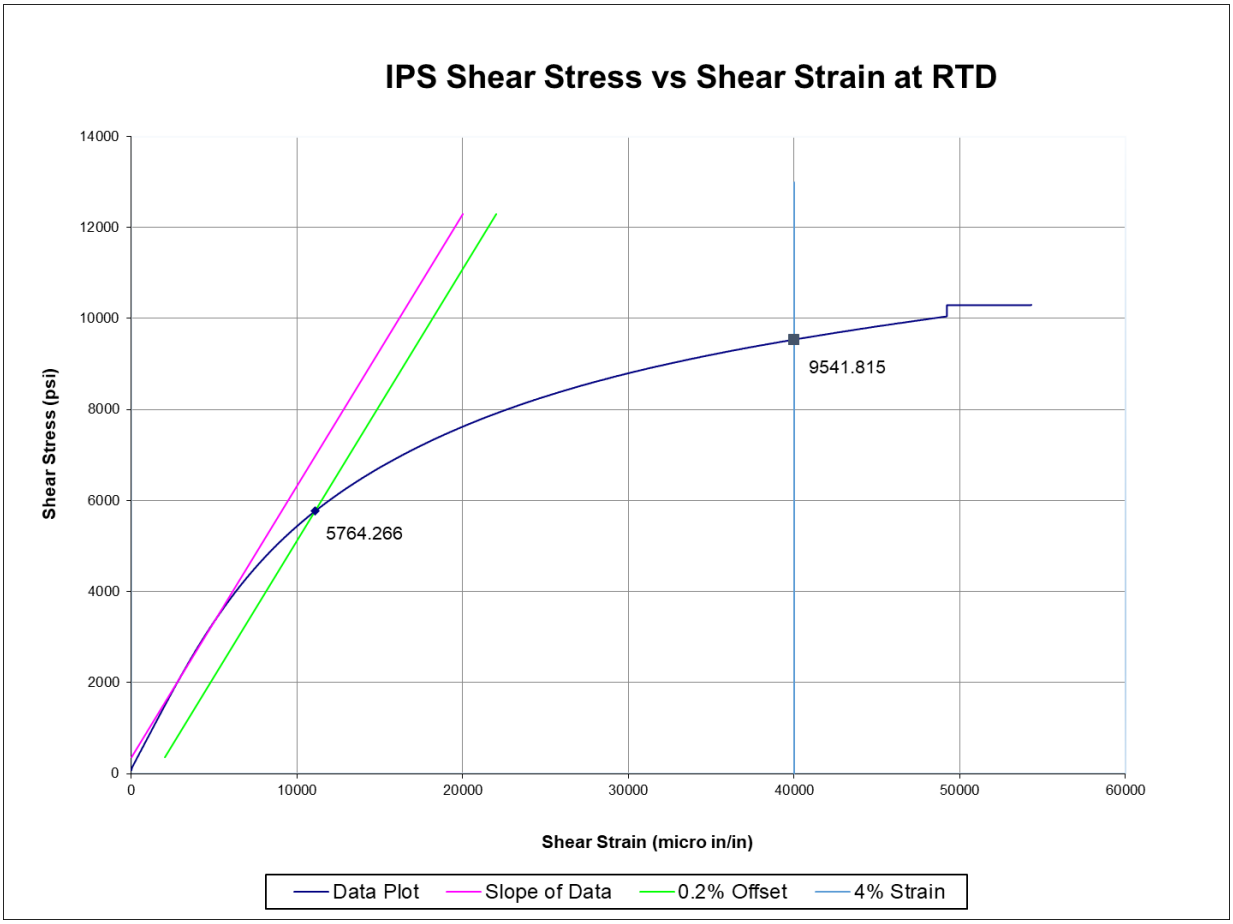
6.3 Fill Tension Properties (FT) – RTD (70°F)



6.4 Fill Compression Properties (FC) – RTD (70°F)

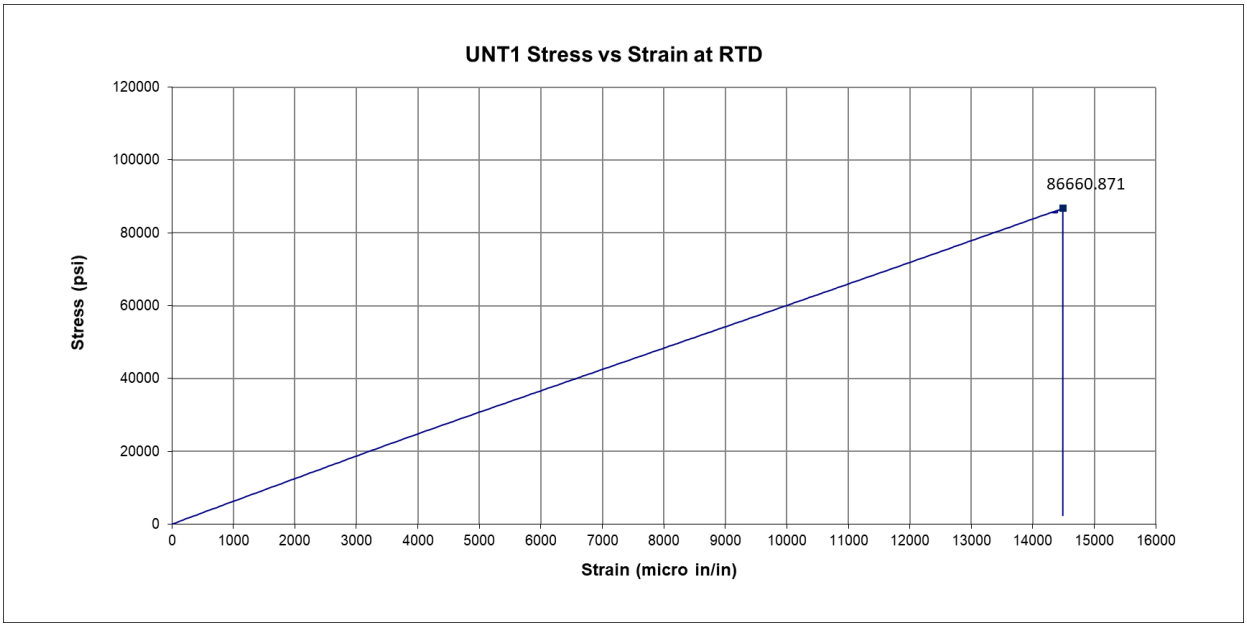


6.5 In-Plane Shear Properties (IPS) – RTD (70°F)

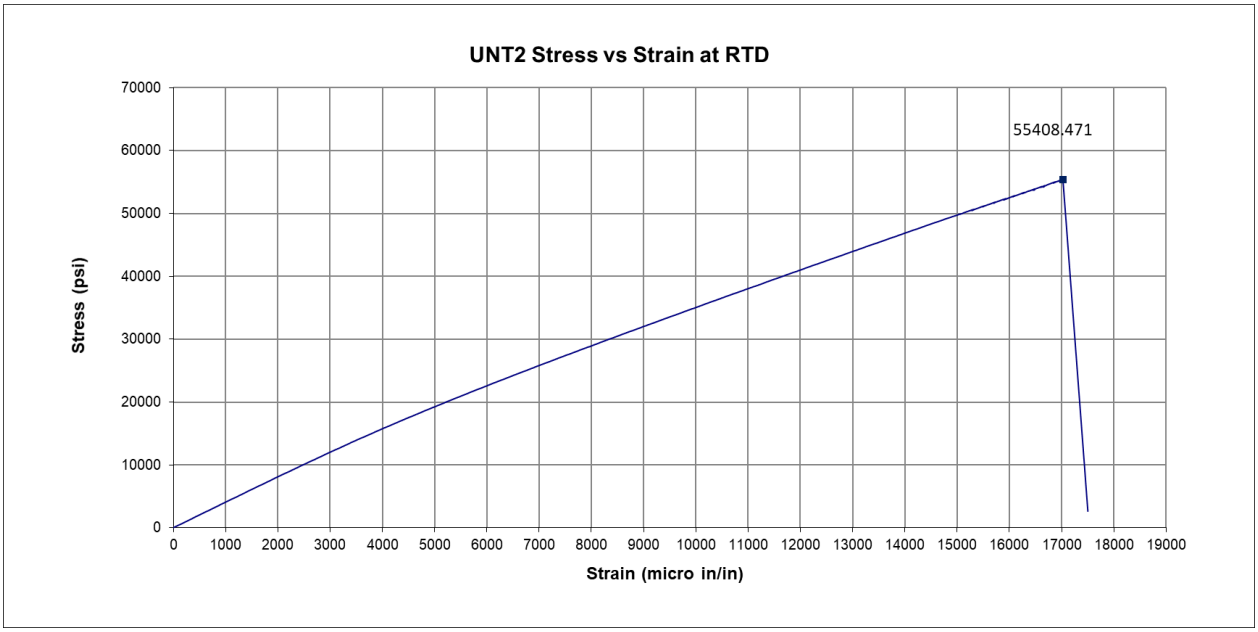


Note: Shear Strength at 5% strain is not valid due to unavailable strain data at 5%.Hence 4 % was used instead.

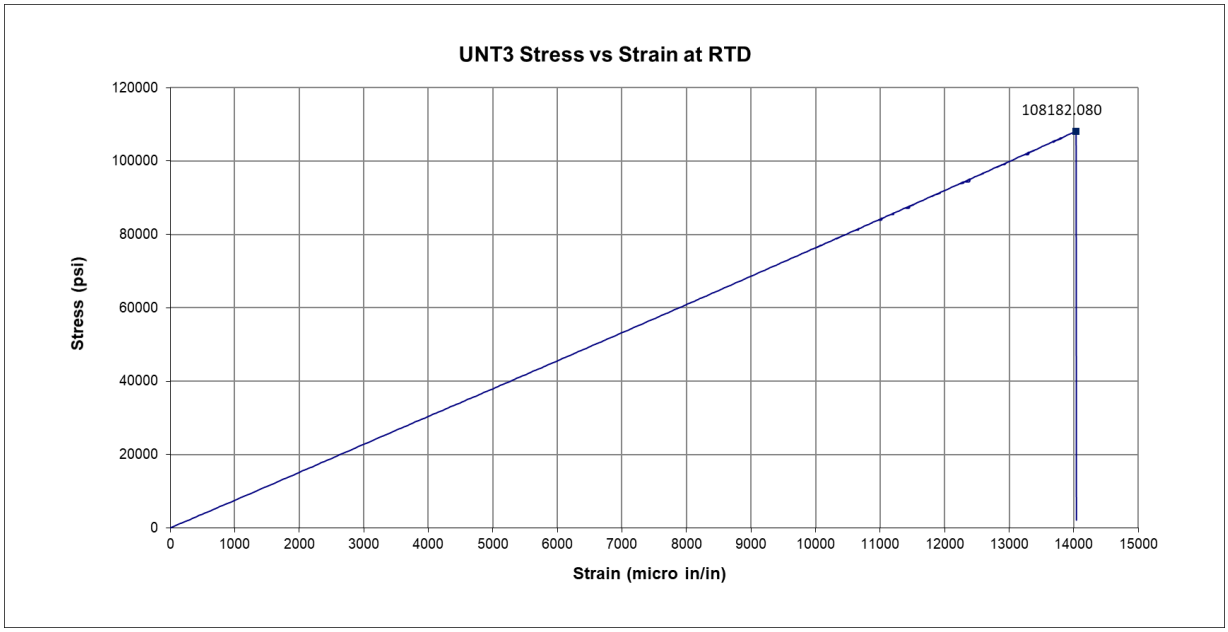
6.6 “25/50/25” Unnotched Tension 1 Properties (UNT1) – RTD



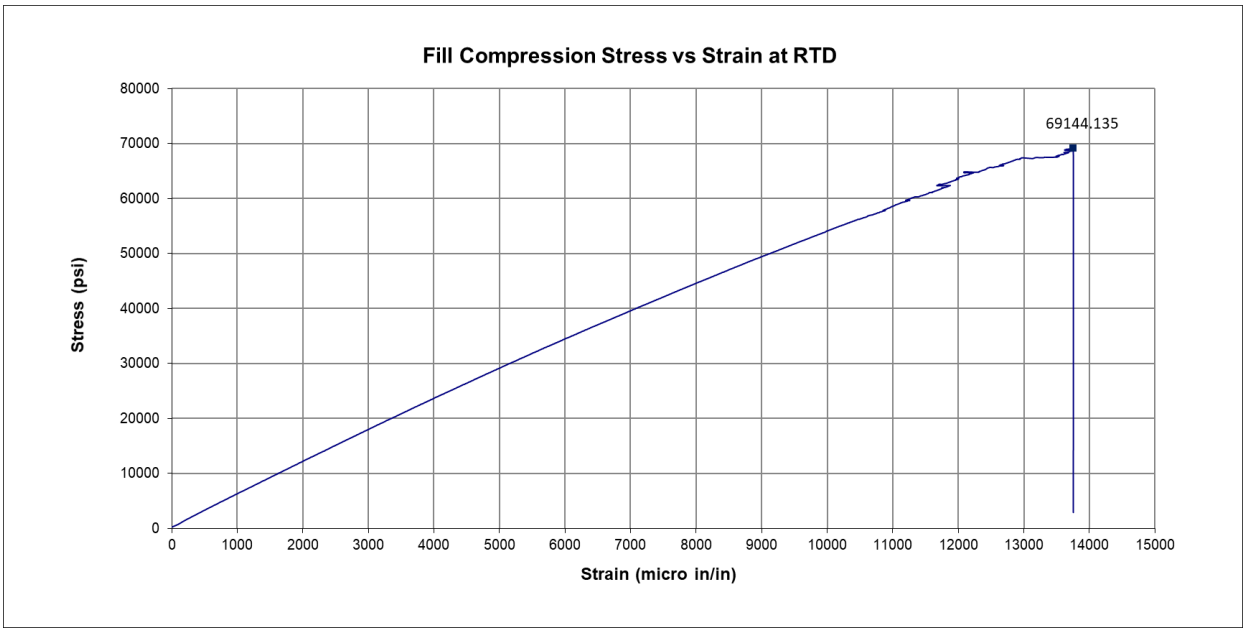
6.7 “10/80/10” Unnotched Tension 2 Properties (UNT2) – RTD



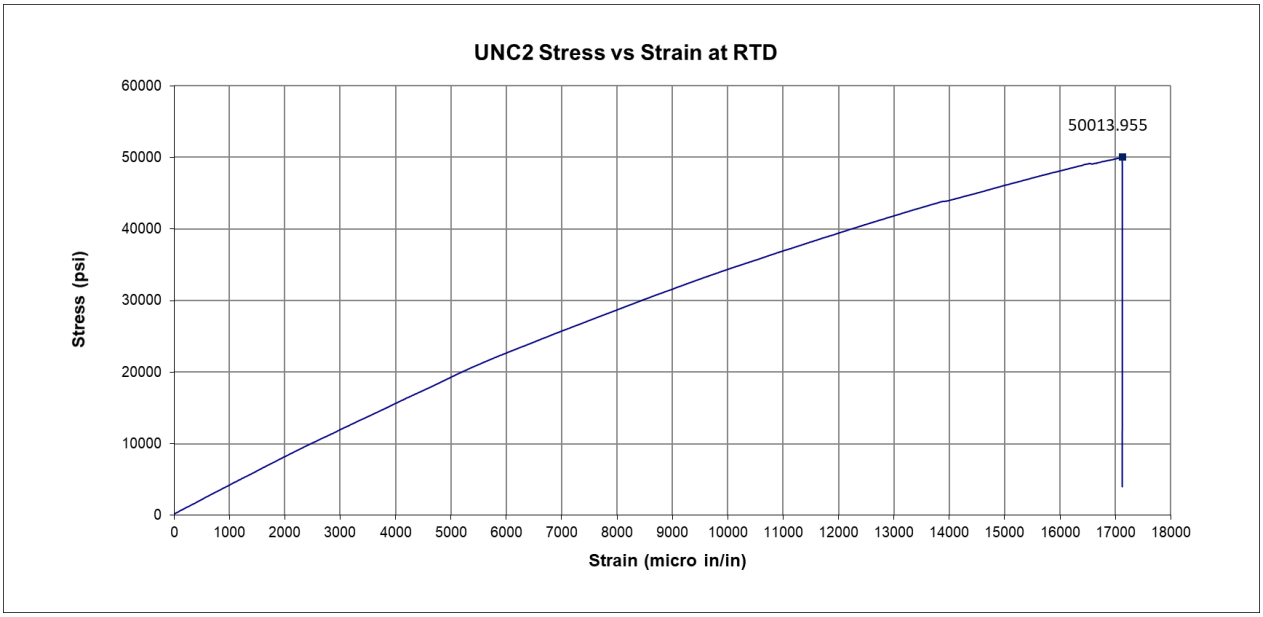
6.8 “40/20/40” Unnotched Tension 3 Properties (UNT3) – RTD



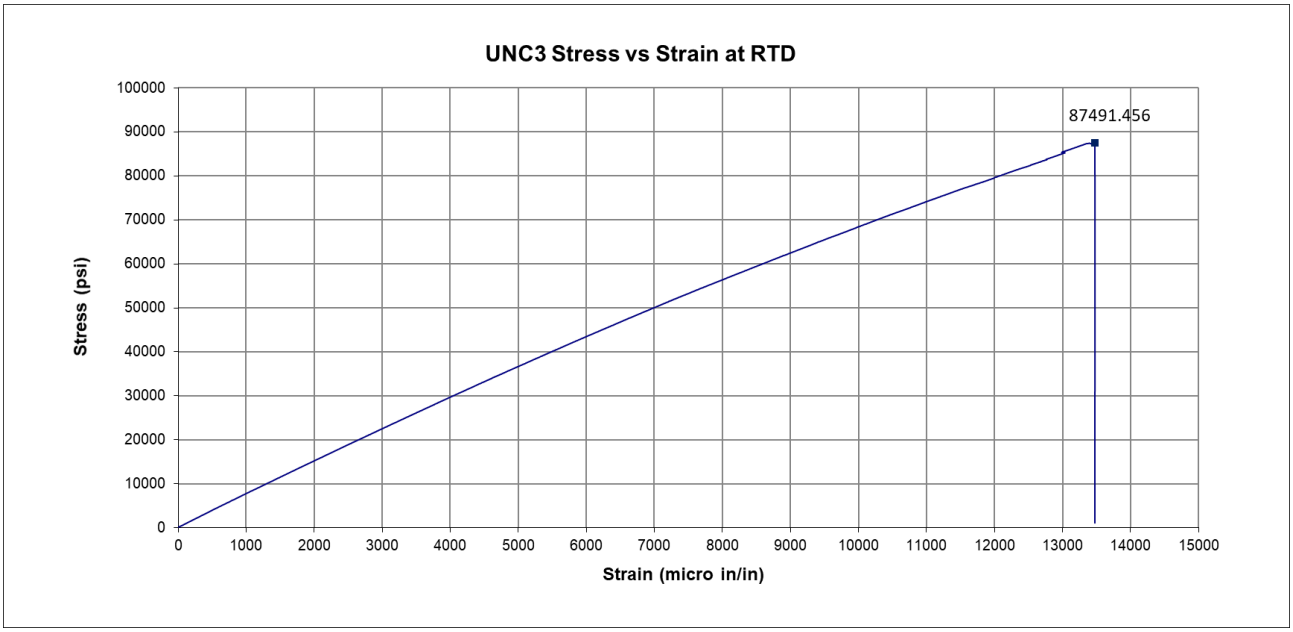
6.9 “25/50/25” Unnotched Compression 1 Properties (UNC1) – RTD

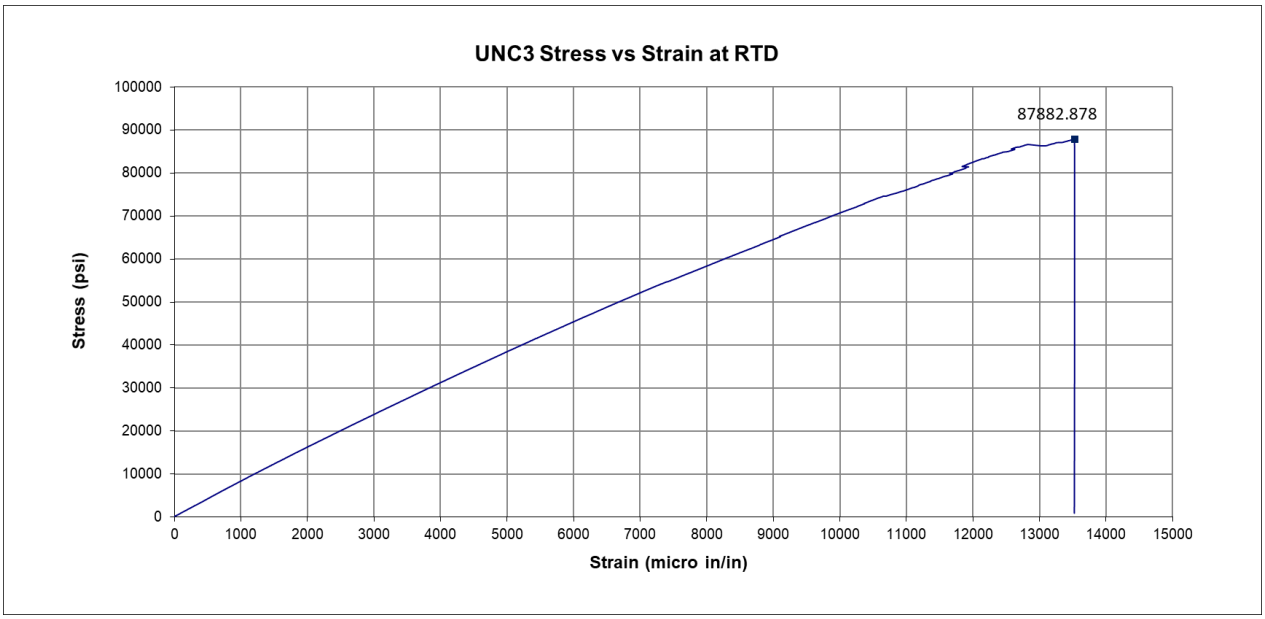


6.10 "10/80/10" Unnotched Compression 2 Properties (UNC2) – RTD



6.11 "40/20/40" Unnotched Compression 3 Properties (UNC3) – RTD

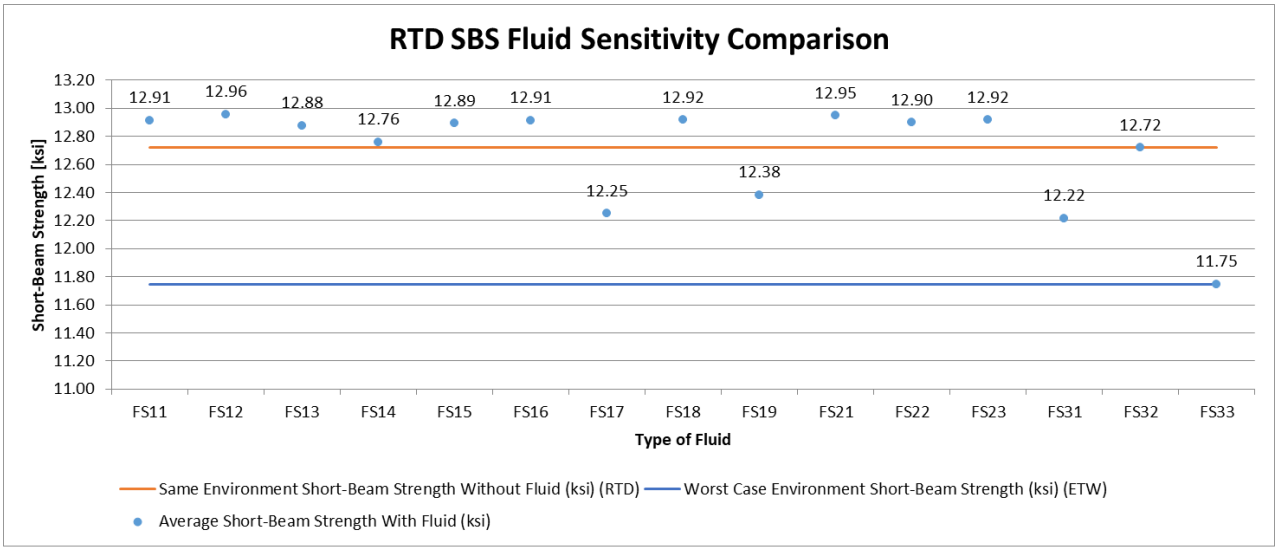


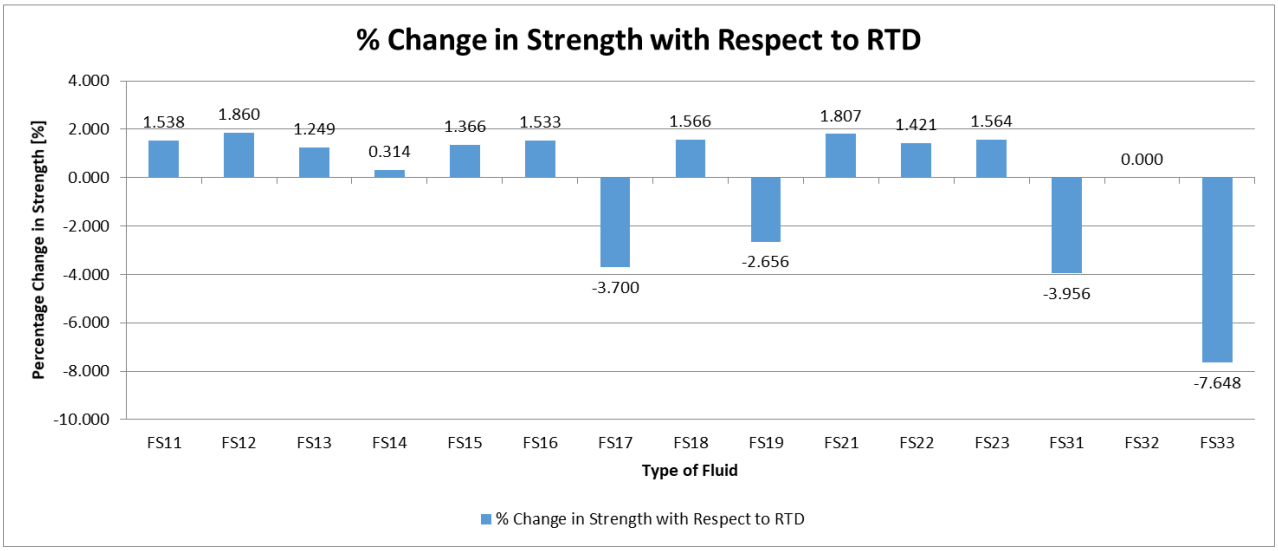

UNC3 Stress vs Strain at RTD
Stress (psi)
Strain (micro in/in)
87882.878
100000
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
11000
12000
13000
14000
15000

7. Fluid Sensitivity Comparison

7.1 Room Temperature Test Data (70°F)

Fluid ID#	Fluid	Exposure
FS11	100 Low lead Fuel	90 days min @ 70°F ± 10F
FS12	Jet A Fuel	
FS13	Mil-H-5606 Hydraulic Oil	
FS14	Mil-H-83282 Hydraulic Oil	
FS15	Engine Lube Oil Mil-L-7808	
FS16	Engine Lube Oil Mil-L-23699	
FS17	Salt Water	
FS18	Skydrol 5	
FS19	50% Water w/ 50% Skydrol 5	
FS31	Distilled Water	
FS21	MEK washing fluid	90 mins @ 70°F ± 10F
FS22	Polypropylene Glycol Deicer	
FS23	Isopropyl Alcohol Deicing	48±4 hrs @ 70°F ± 10F
FS32	Dry	Per section 6.1 Test Plan
FS33	85% Relative Humidity	


RTD SBS Fluid Sensitivity Comparison
Short-Beam Strength [ksi]
13.20
13.00
12.80
12.60
12.40
12.20
12.00
11.80
11.60
11.40
11.20
11.00
12.91
12.96
12.88
12.76
12.89
12.91
12.25
12.92
12.38
12.95
12.90
12.92
12.22
12.72
11.75
FS11
FS12
FS13
FS14
FS15
FS16
FS17
FS18
FS19
FS21
FS22
FS23
FS31
FS32
FS33
Type of Fluid
Same Environment Short-Beam Strength Without Fluid (ksi) (RTD)
Worst Case Environment Short-Beam Strength (ksi) (ETW)
Average Short-Beam Strength With Fluid (ksi)


% Change in Strength with Respect to RTD
Percentage Change in Strength [%]
4.000
2.000
0.000
-2.000
-4.000
-6.000
-8.000
-10.000
1.538
1.860
1.249
0.314
1.366
1.533
-3.700
1.566
-2.656
1.807
1.421
1.564
-3.956
0.000
-7.648
FS11
FS12
FS13
FS14
FS15
FS16
FS17
FS18
FS19
FS21
FS22
FS23
FS31
FS32
FS33
Type of Fluid
% Change in Strength with Respect to RTD

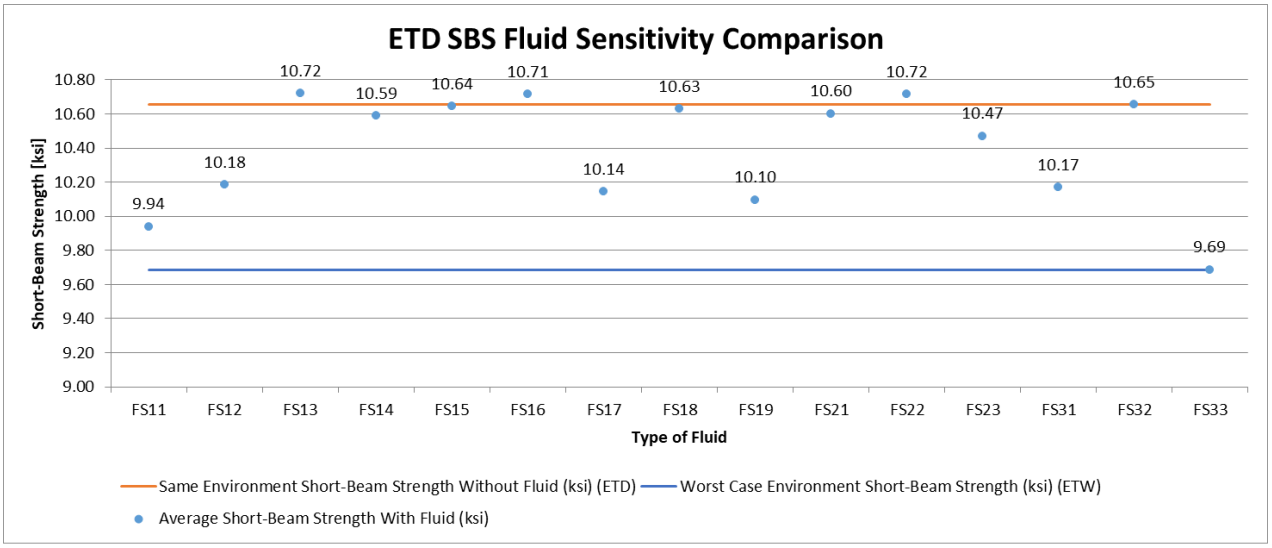
Fluid Sensitivity Screening
Short-Beam Strength Properties (FSSBS)--RT Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

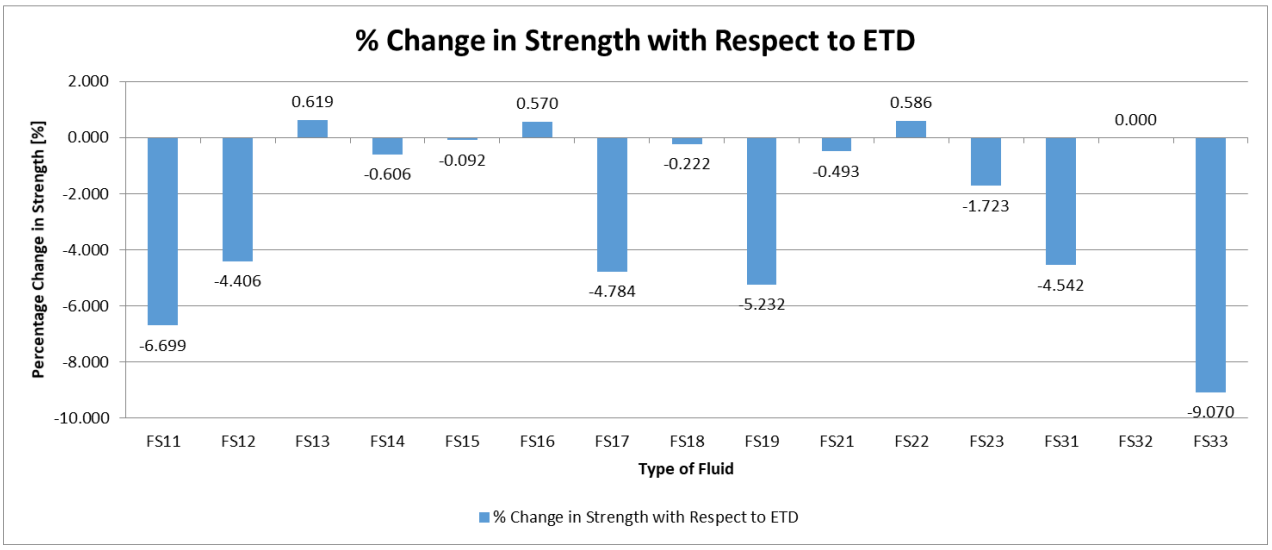
Fluid	Specimen Number	Consolidate Cycle	Semipreg Lot #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode	Average
FS11	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS11RT-1	M2	1	12.996	0.2409	20	0.01204	ILS/COM	12.915
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS11RT-2	M2	1	12.940	0.2410	20	0.01205	ILS/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS11RT-3	M2	1	13.033	0.2375	20	0.01188	ILS/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS11RT-4	M2	1	12.770	0.2391	20	0.01195	ILS/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS11RT-5	M2	1	12.834	0.2418	20	0.01209	ILS/COM	
FS12	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS12RT-1	M2	1	13.030	0.2405	20	0.01202	ILS/COM	12.956
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS12RT-2	M2	1	12.828	0.2428	20	0.01214	ILS/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS12RT-3	M2	1	12.873	0.2412	20	0.01206	ILS/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS12RT-4	M2	1	13.036	0.2425	20	0.01213	ILS/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS12RT-5	M2	1	13.012	0.2403	20	0.01201	ILS/TEN/COM	
FS13	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS13RT-1	M2	1	12.902	0.2398	20	0.01199	ILS/COM	12.878
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS13RT-2	M2	1	12.785	0.2404	20	0.01202	ILS/TEN/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS13RT-3	M2	1	12.918	0.2401	20	0.01200	ILS/TEN/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS13RT-4	M2	1	12.903	0.2446	20	0.01223	ILS/TEN/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS13RT-5	M2	1	12.883	0.2399	20	0.01199	ILS/TEN/COM	
FS14	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS14RT-1	M2	1	12.806	0.2402	20	0.01201	ILS/TEN/COM	12.759
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS14RT-2	M2	1	12.772	0.2444	20	0.01222	ILS/TEN/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS14RT-3	M2	1	12.745	0.2422	20	0.01211	ILS/TEN/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS14RT-4	M2	1	12.704	0.2420	20	0.01210	ILS/TEN/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS14RT-5	M2	1	12.769	0.2437	20	0.01219	ILS/TEN/COM	
FS15	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS15RT-1	M2	1	12.766	0.2403	20	0.01202	ILS/COM	12.893
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS15RT-2	M2	1	12.935	0.2404	20	0.01202	ILS/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS15RT-3	M2	1	13.038	0.2369	20	0.01184	ILS/TEN/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS15RT-4	M2	1	12.895	0.2439	20	0.01220	ILS/TEN/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS15RT-5	M2	1	12.831	0.2443	20	0.01221	ILS/TEN/COM	
FS16	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS16RT-1	M2	1	12.877	0.2441	20	0.01221	ILS/COM	12.914
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS16RT-2	M2	1	12.878	0.2440	20	0.01220	ILS/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS16RT-3	M2	1	12.869	0.2386	20	0.01193	ILS/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS16RT-4	M2	1	12.874	0.2407	20	0.01203	ILS/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS16RT-5	M2	1	13.072	0.2403	20	0.01202	ILS/TEN/COM	
FS17	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS17RT-1	M2	1	12.193	0.2440	20	0.01220	ILS/COM	12.249
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS17RT-2	M2	1	12.256	0.2400	20	0.01200	ILS/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS17RT-3	M2	1	12.171	0.2419	20	0.01209	ILS/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS17RT-4	M2	1	12.244	0.2426	20	0.01213	ILS/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS17RT-5	M2	1	12.378	0.2395	20	0.01197	ILS/COM	
FS18	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS18RT-1	M2	1	12.934	0.2370	20	0.01185	ILS/COM	12.918
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS18RT-2	M2	1	12.926	0.2426	20	0.01213	ILS/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS18RT-3	M2	1	12.922	0.2409	20	0.01205	ILS/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS18RT-4	M2	1	12.867	0.2423	20	0.01212	ILS/TEN/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS18RT-5	M2	1	12.942	0.2438	20	0.01219	ILS/TEN/COM	
FS19	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS19RT-1	M2	1	12.393	0.2439	20	0.01220	ILS/COM	12.381
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS19RT-2	M2	1	12.384	0.2440	20	0.01220	ILS/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS19RT-3	M2	1	12.270	0.2431	20	0.01215	ILS/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS19RT-4	M2	1	12.320	0.2437	20	0.01218	ILS/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS19RT-5	M2	1	12.540	0.2386	20	0.01193	ILS/COM	
FS21	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS21RT-2	M2	1	12.891	0.2420	20	0.01210	ILS/TEN/COM	12.949
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS21RT-3	M2	1	13.014	0.2427	20	0.01213	ILS/TEN/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS21RT-4	M2	1	13.113	0.2396	20	0.01198	ILS/TEN/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS21RT-5	M2	1	12.938	0.2430	20	0.01215	ILS/TEN/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS21RT-6	M2	1	12.789	0.2422	20	0.01211	ILS/COM	
FS22	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS22RT-1	M2	1	12.658	0.2365	20	0.01183	ILS/COM	12.900
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS22RT-2	M2	1	12.974	0.2392	20	0.01196	ILS/TEN/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS22RT-3	M2	1	12.989	0.2411	20	0.01205	ILS/TEN/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS22RT-4	M2	1	12.971	0.2420	20	0.01210	ILS/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS22RT-6	M2	1	12.907	0.2376	20	0.01188	ILS/COM	
FS23	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS23RT-1	M2	1	12.805	0.2431	20	0.01215	ILS/COM	12.918
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS23RT-2	M2	1	12.900	0.2397	20	0.01199	ILS/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS23RT-3	M2	1	12.893	0.2393	20	0.01196	ILS/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS23RT-4	M2	1	12.973	0.2378	20	0.01189	ILS/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS23RT-5	M2	1	13.018	0.2406	20	0.01203	ILS/COM	
FS31	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS31RT-1	M2	1	12.375	0.2427	20	0.01213	ILS/COM	12.216
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS31RT-2	M2	1	12.348	0.2394	20	0.01197	ILS/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS31RT-3	M2	1	12.181	0.2428	20	0.01214	ILS/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS31RT-4	M2	1	12.061	0.2397	20	0.01199	ILS/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS31RT-5	M2	1	12.114	0.2412	20	0.01206	ILS/COM	
FS32	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS32RT-1	M2	1	12.417	0.2436	20	0.01218	TEN/COM	12.719
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS32RT-2	M2	1	12.733	0.2437	20	0.01218	ILS/TEN/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS32RT-3	M2	1	12.691	0.2417	20	0.01209	ILS/TEN/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS32RT-4	M2	1	12.852	0.2390	20	0.01195	TEN/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS32RT-5	M2	1	12.963	0.2375	20	0.01187	ILS/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS32RT-6	M2	1	12.659	0.2411	20	0.01205	ILS/TEN/COM	
FS33	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS33RT-1	M2	1	11.722	0.2401	20	0.01200	ILS/COM	11.746
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS33RT-2	M2	1	11.728	0.2408	20	0.01204	ILS/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS33RT-3	M2	1	11.677	0.2448	20	0.01224	ILS/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS33RT-4	M2	1	11.808	0.2446	20	0.01223	ILS/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS33RT-5	M2	1	11.797	0.2446	20	0.01223	ILS/COM	

Note: SPAN TO THICKNESS RATIO: 3.5:1

7.2 Elevated Temperature Test Data (180°F)

Fluid ID#	Fluid	Exposure
FS11	100 Low lead Fuel	90 days min @ 70°F ± 10F
FS12	Jet A Fuel	
FS13	Mil-H-5606 Hydraulic Oil	
FS14	Mil-H-83282 Hydraulic Oil	
FS15	Engine Lube Oil Mil-L-7808	
FS16	Engine Lube Oil Mil-L-23699	
FS17	Salt Water	
FS18	Skydrol 5	
FS19	50% Water w/ 50% Skydrol 5	
FS31	Distilled Water	
FS21	MEK washing fluid	90 mins @ 70°F ± 10F
FS22	Polypropylene Glycol Deicer	
FS23	Isopropyl Alcohol Deicing	48±4 hrs @ 70°F ± 10F
FS32	Dry	Per section 6.1 Test Plan
FS33	85% Relative Humidity	


ETD SBS Fluid Sensitivity Comparison
Short-Beam Strength [ksi]
10.80
10.60
10.40
10.20
10.00
9.80
9.60
9.40
9.20
9.00
9.94
10.18
10.72
10.59
10.64
10.71
10.14
10.63
10.10
10.60
10.72
10.47
10.17
10.65
9.69
FS11 FS12 FS13 FS14 FS15 FS16 FS17 FS18 FS19 FS21 FS22 FS23 FS31 FS32 FS33
Type of Fluid
Same Environment Short-Beam Strength Without Fluid (ksi) (ETD)
Worst Case Environment Short-Beam Strength (ksi) (ETW)
Average Short-Beam Strength With Fluid (ksi)

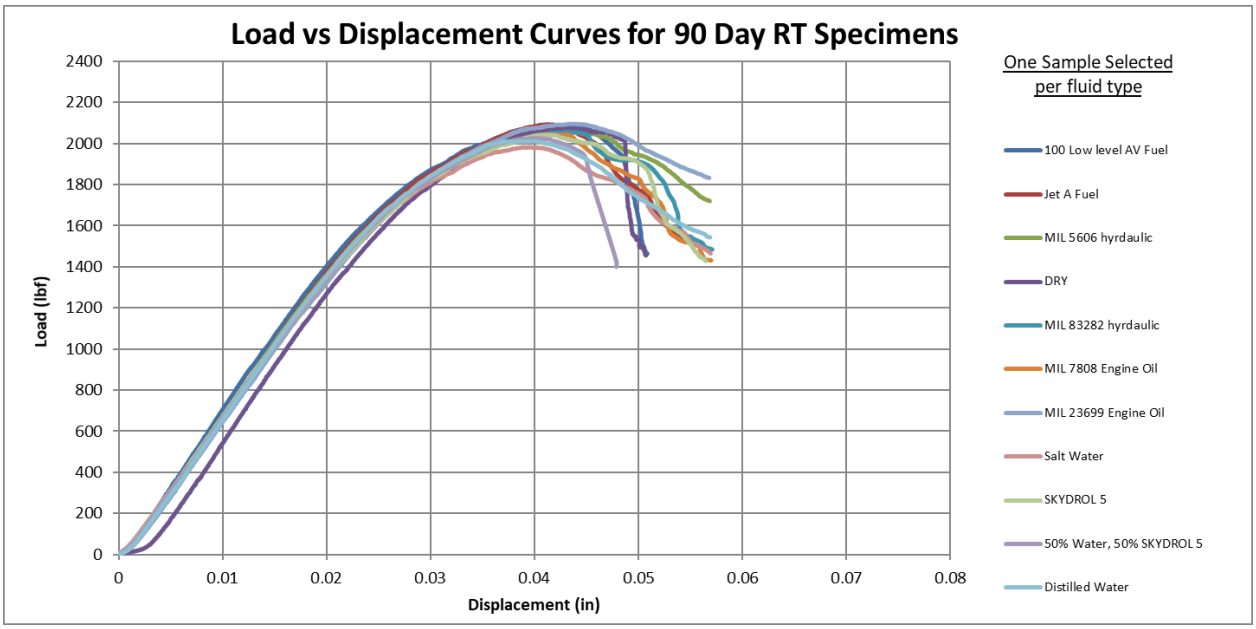

% Change in Strength with Respect to ETD
Percentage Change in Strength [%]
2.000
0.000
-2.000
-4.000
-6.000
-8.000
-10.000
-6.699
-4.406
0.619
-0.606
-0.092
0.570
-4.784
-0.222
-5.232
-0.493
0.586
-1.723
-4.542
0.000
-9.070
FS11 FS12 FS13 FS14 FS15 FS16 FS17 FS18 FS19 FS21 FS22 FS23 FS31 FS32 FS33
Type of Fluid
% Change in Strength with Respect to ETD

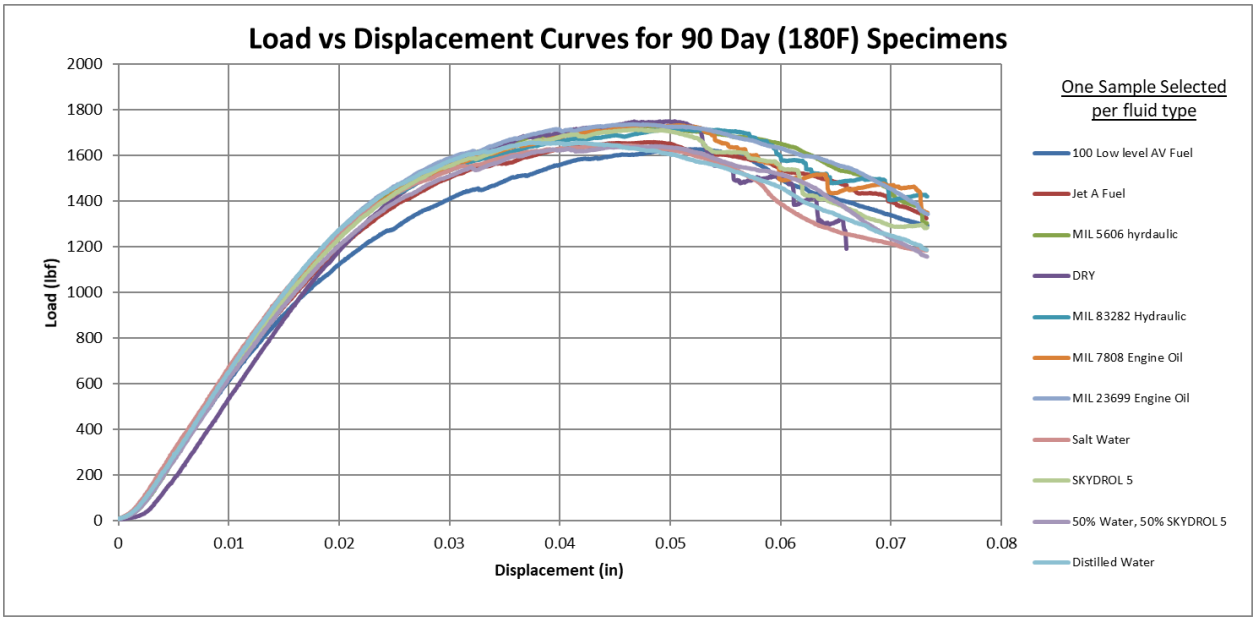
Fluid Sensitivity Screening
Short-Beam Strength Properties (FSSBS)--ET Strength
Tenax®-E TPWF PEEK-HTA40 E13 3K 5HS

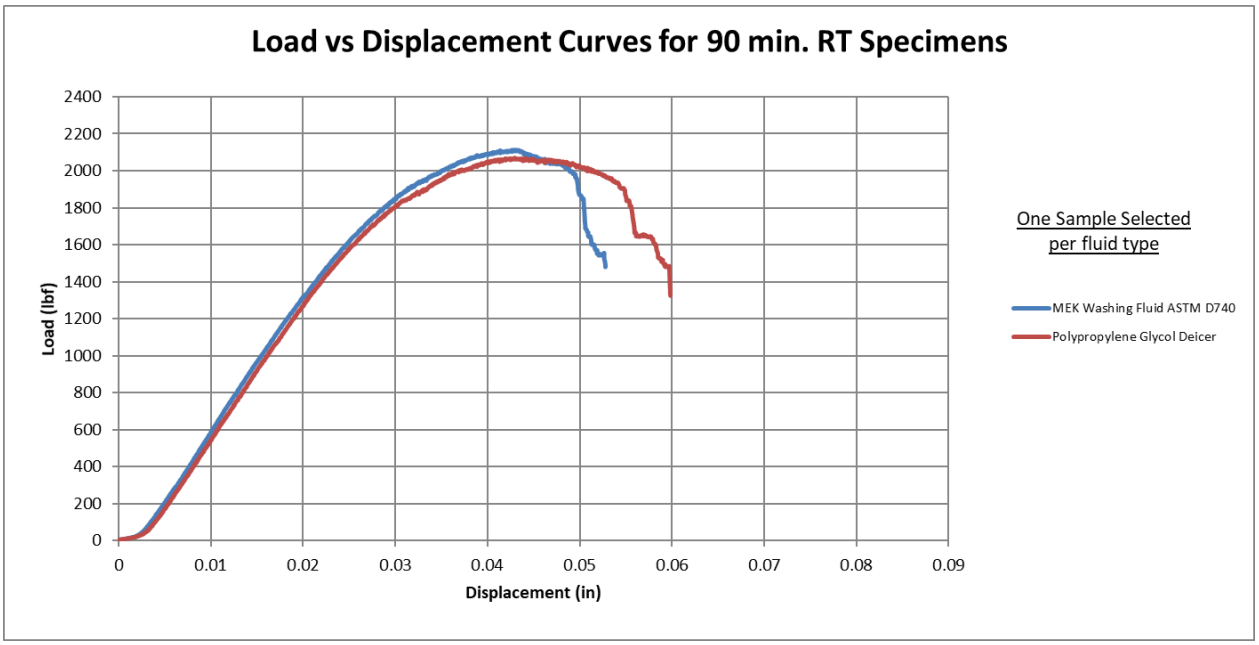
Fluid	Specimen Number	Consolidate Cycle	Semipreg Lot #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode	Average
FS11	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS11ET-1	M2	1	10.177	0.2391	20	0.01195	ILS/COM/ID	9.940
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS11ET-2	M2	1	10.039	0.2386	20	0.01193	ILS/COM/ID	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS11ET-3	M2	1	9.884	0.2383	20	0.01192	ILS/ID	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS11ET-4	M2	1	9.882	0.2432	20	0.01216	ILS/ID	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS11ET-5	M2	1	9.717	0.2432	20	0.01216	ILS/ID	
FS12	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS12ET-1	M2	1	10.220	0.2425	20	0.01213	ILS/COM/ID	10.184
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS12ET-2	M2	1	10.359	0.2392	20	0.01196	ILS/ID	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS12ET-3	M2	1	10.171	0.2405	20	0.01202	ILS/COM/ID	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS12ET-4	M2	1	10.048	0.2362	20	0.01181	ILS/COM/ID	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS12ET-5	M2	1	10.122	0.2395	20	0.01198	ILS/COM/ID	
FS13	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS13ET-1	M2	1	10.690	0.2420	20	0.01210	ILS/COM/TEN/ID	10.719
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS13ET-2	M2	1	10.737	0.2415	20	0.01207	ILS/COM/TEN/ID	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS13ET-3	M2	1	10.742	0.2424	20	0.01212	ILS/COM/ID	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS13ET-4	M2	1	10.660	0.2417	20	0.01208	ILS/COM/ID	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS13ET-5	M2	1	10.768	0.2422	20	0.01211	ILS/COM/ID	
FS14	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS14ET-1	M2	1	10.731	0.2388	20	0.01194	ILS/COM/TEN/ID	10.589
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS14ET-2	M2	1	10.749	0.2410	20	0.01205	ILS/COM/TEN/ID	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS14ET-3	M2	1	10.672	0.2389	20	0.01195	ILS/COM/TEN/ID	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS14ET-4	M2	1	10.498	0.2415	20	0.01208	ILS/COM/TEN/ID	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS14ET-5	M2	1	10.294	0.2398	20	0.01199	ILS/COM/ID	
FS15	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS15ET-1	M2	1	10.681	0.2427	20	0.01213	ILS/COM/TEN/ID	10.644
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS15ET-2	M2	1	10.503	0.2406	20	0.01203	ILS/COM/TEN/ID	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS15ET-3	M2	1	10.601	0.2422	20	0.01211	ILS/COM/TEN/ID	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS15ET-4	M2	1	10.744	0.2375	20	0.01188	ILS/COM/TEN/ID	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS15ET-5	M2	1	10.689	0.2387	20	0.01194	ILS/COM/TEN/ID	
FS16	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS16ET-1	M2	1	10.736	0.2416	20	0.01208	ILS/ID	10.714
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS16ET-2	M2	1	10.785	0.2432	20	0.01216	ILS/ID	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS16ET-3	M2	1	10.636	0.2421	20	0.01210	ILS/ID	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS16ET-4	M2	1	10.699	0.2422	20	0.01211	ILS/TEN/ID	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS16ET-5	M2	1	10.715	0.2427	20	0.01214	ILS/COM/TEN/ID	
FS17	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS17ET-1	M2	1	10.177	0.2414	20	0.01207	ILS/COM/ID	10.144
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS17ET-2	M2	1	10.159	0.2441	20	0.01220	ILS/COM/ID	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS17ET-3	M2	1	10.199	0.2381	20	0.01191	ILS/COM/ID	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS17ET-4	M2	1	10.193	0.2411	20	0.01206	ILS/ID	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS17ET-5	M2	1	9.991	0.2372	20	0.01186	ILS/ID	
FS18	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS18ET-1	M2	1	10.632	0.2408	20	0.01204	ILS/COM/TEN/ID	10.630
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS18ET-2	M2	1	10.737	0.2411	20	0.01206	ILS/COM/ID	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS18ET-3	M2	1	10.538	0.2426	20	0.01213	ILS/COM/ID	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS18ET-4	M2	1	10.648	0.2418	20	0.01209	ILS/COM/TEN/ID	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS18ET-5	M2	1	10.595	0.2400	20	0.01200	ILS/COM/TEN/ID	
FS19	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS19ET-1	M2	1	10.063	0.2436	20	0.01218	ILS/ID	10.096
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS19ET-2	M2	1	10.091	0.2439	20	0.01220	ILS/ID	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS19ET-3	M2	1	10.026	0.2420	20	0.01210	ILS/ID	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS19ET-4	M2	1	10.141	0.2411	20	0.01206	ILS/COM/ID	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS19ET-5	M2	1	10.160	0.2415	20	0.01207	ILS/COM/ID	
FS21	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS21ET-1	M2	1	10.622	0.2405	20	0.01202	ILS/TEN/COM	10.601
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS21ET-2	M2	1	10.619	0.2428	20	0.01214	ILS/TEN/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS21ET-3	M2	1	10.619	0.2401	20	0.01200	ILS/TEN/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS21ET-4	M2	1	10.598	0.2387	20	0.01193	ILS/TEN/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS21ET-5	M2	1	10.547	0.2374	20	0.01187	ILS/TEN/COM	
FS22	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS22ET-1	M2	1	10.720	0.2424	20	0.01212	ILS/TEN/COM	10.716
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS22ET-2	M2	1	10.746	0.2441	20	0.01221	ILS/TEN/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS22ET-3	M2	1	10.819	0.2402	20	0.01201	ILS/TEN/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS22ET-4	M2	1	10.683	0.2440	20	0.01220	ILS/TEN/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS22ET-6	M2	1	10.611	0.2411	20	0.01205	ILS/TEN/COM	
FS23	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS23ET-1	M2	1	10.506	0.2400	20	0.01200	ILS/TEN/COM/ID	10.470
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS23ET-2	M2	1	10.445	0.2427	20	0.01214	ILS/TEN/COM/ID	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS23ET-3	M2	1	10.565	0.2436	20	0.01218	ILS/TEN/COM/ID	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS23ET-4	M2	1	10.294	0.2450	20	0.01225	ILS/TEN/COM/ID	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS23ET-5	M2	1	10.537	0.2444	20	0.01222	ILS/TEN/COM/ID	
FS31	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS31ET-1	M2	1	10.212	0.2424	20	0.01212	ILS/ID	10.169
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS31ET-2	M2	1	10.244	0.2415	20	0.01208	ILS/COM/ID	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS31ET-3	M2	1	10.070	0.2433	20	0.01217	ILS/COM/ID	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS31ET-4	M2	1	10.073	0.2428	20	0.01214	ILS/COM/ID	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS31ET-5	M2	1	10.248	0.2432	20	0.01216	ILS/ID	
FS32	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS32ET-1	M2	1	10.720	0.2435	20	0.01218	ILS/TEN/COM	10.653
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS32ET-2	M2	1	10.550	0.2412	20	0.01206	ILS/TEN/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS32ET-3	M2	1	10.751	0.2421	20	0.01211	ILS/TEN/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS32ET-4	M2	1	10.682	0.2412	20	0.01206	ILS/TEN/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS32ET-6	M2	1	10.563	0.2443	20	0.01221	ILS/TEN/COM	
FS33	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS33ET-1	M2	1	9.703	0.2420	20	0.01210	ILS/COM	9.687
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS33ET-2	M2	1	9.718	0.2419	20	0.01210	ILS/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS33ET-4	M2	1	9.762	0.2395	20	0.01198	ILS/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS33ET-5	M2	1	9.591	0.2444	20	0.01222	ILS/COM	
	NTP4013Q1-TTX-T40-E-SBS-A-M2-1-FS33ET-6	M2	1	9.662	0.2433	20	0.01216	ILS/COM	

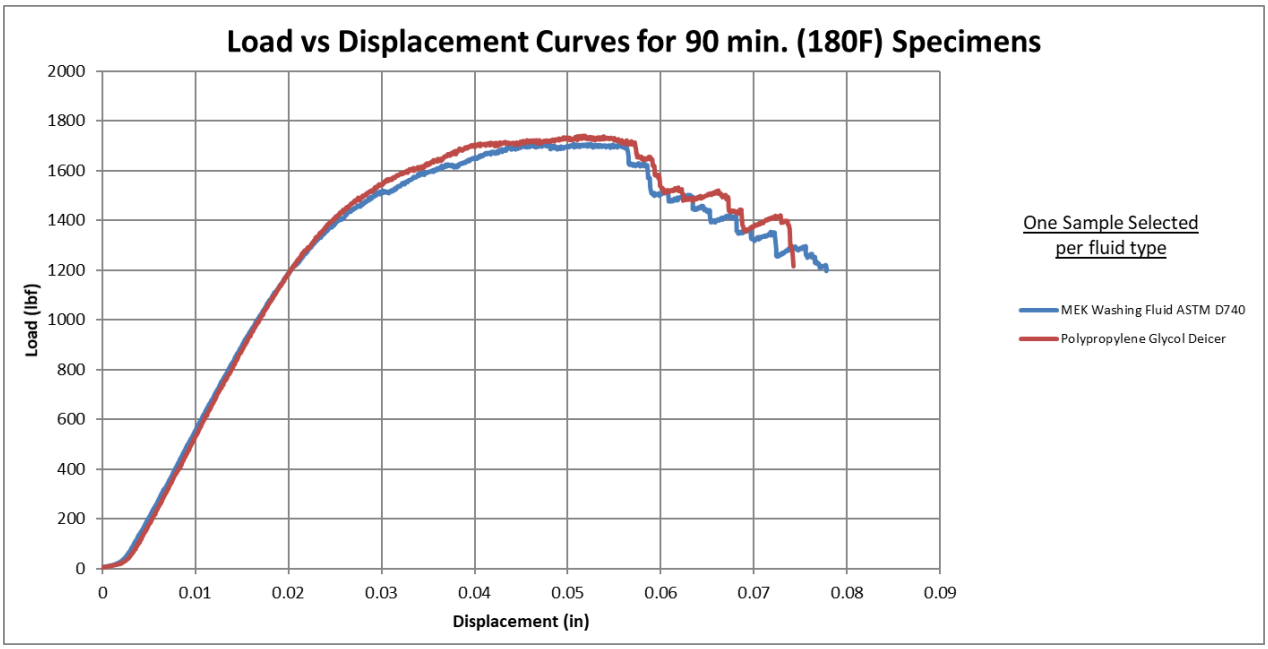
Note: SPAN TO THICKNESS RATIO: 3.5:1

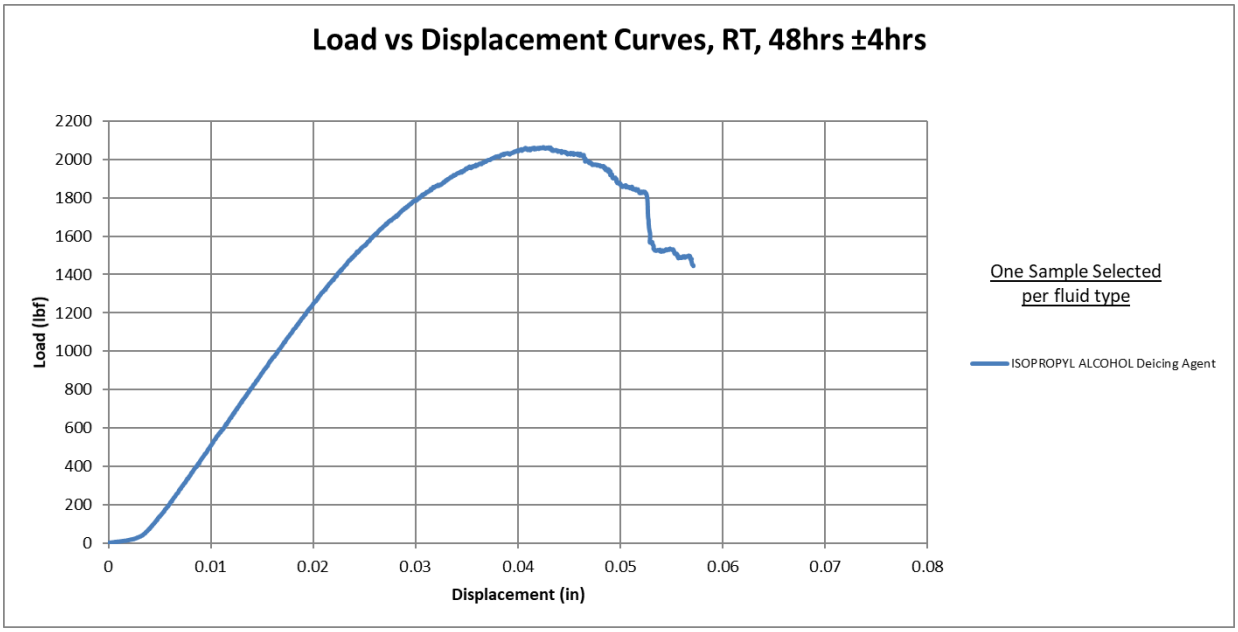
7.3 Load Displacement Curves

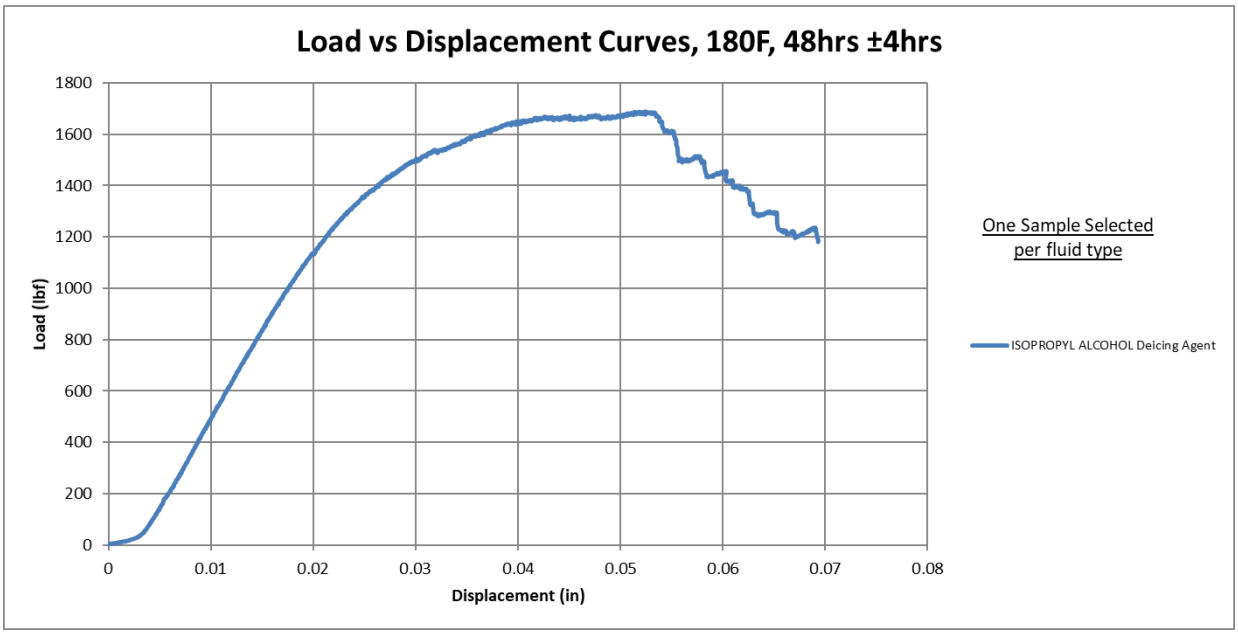


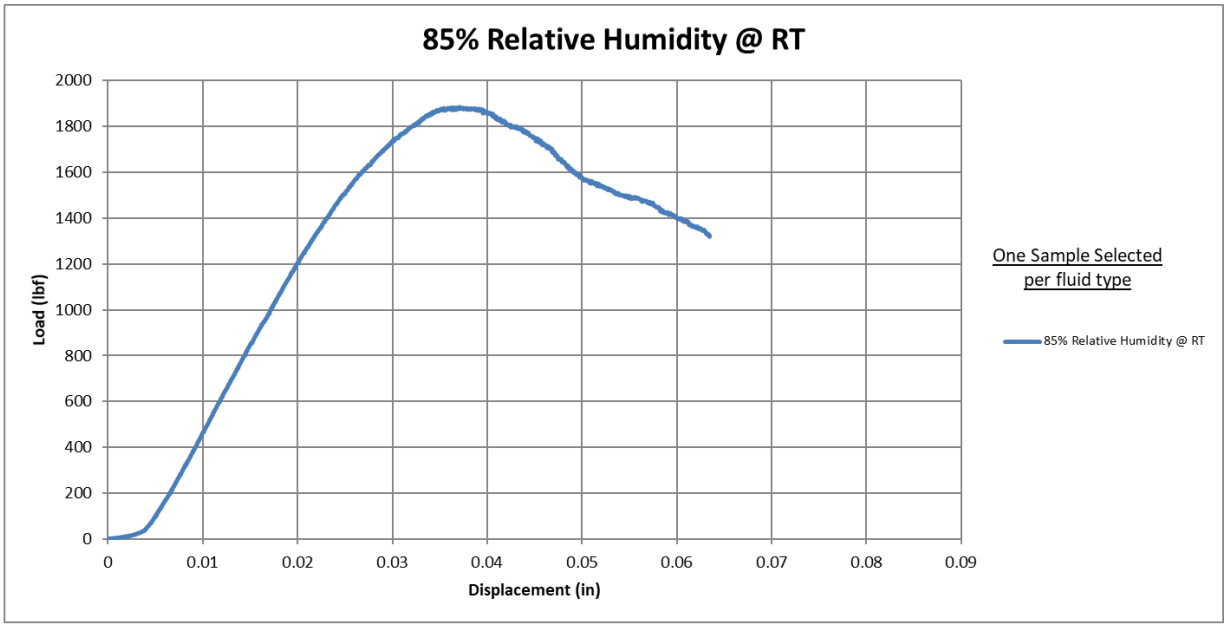


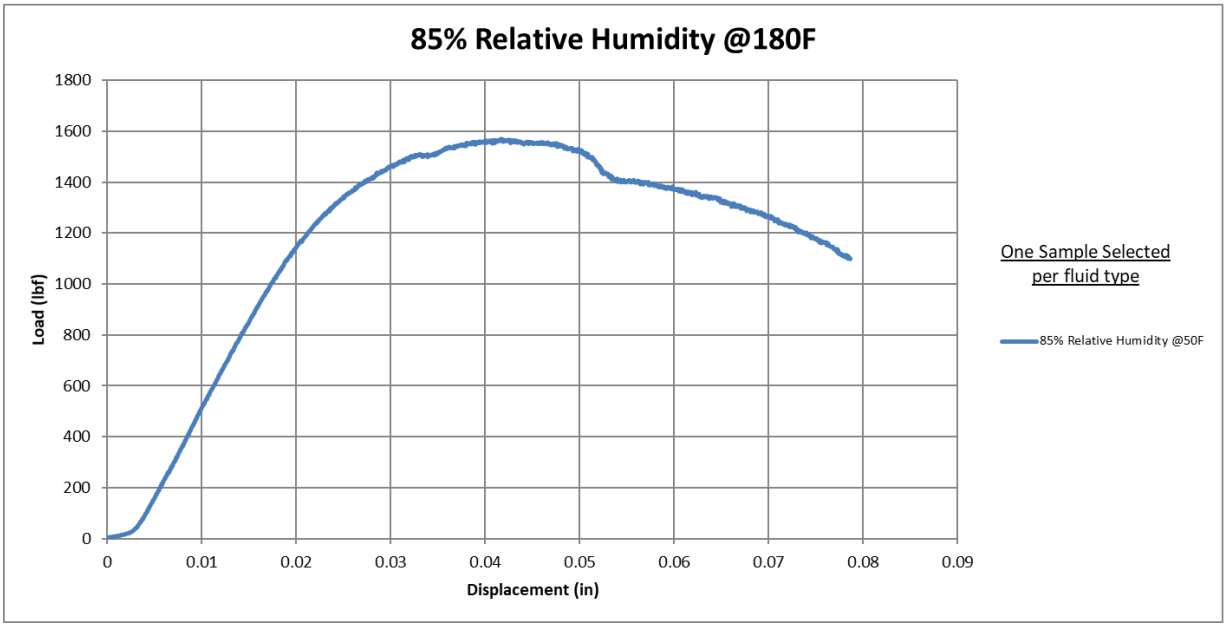

Load vs Displacement Curves for 90 min. RT Specimens
Load (lbf)
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
Displacement (in)
One Sample Selected per fluid type
MEK Washing Fluid ASTM D740
Polypropylene Glycol Deicer


Load vs Displacement Curves for 90 min. (180F) Specimens
Load (lbf)
2000
1800
1600
1400
1200
1000
800
600
400
200
0
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
Displacement (in)
One Sample Selected per fluid type
MEK Washing Fluid ASTM D740
Polypropylene Glycol Deicer


Load vs Displacement Curves, RT, 48hrs ±4hrs
Load (lbf)
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
Displacement (in)
One Sample Selected per fluid type
ISOPROPYL ALCOHOL Deicing Agent

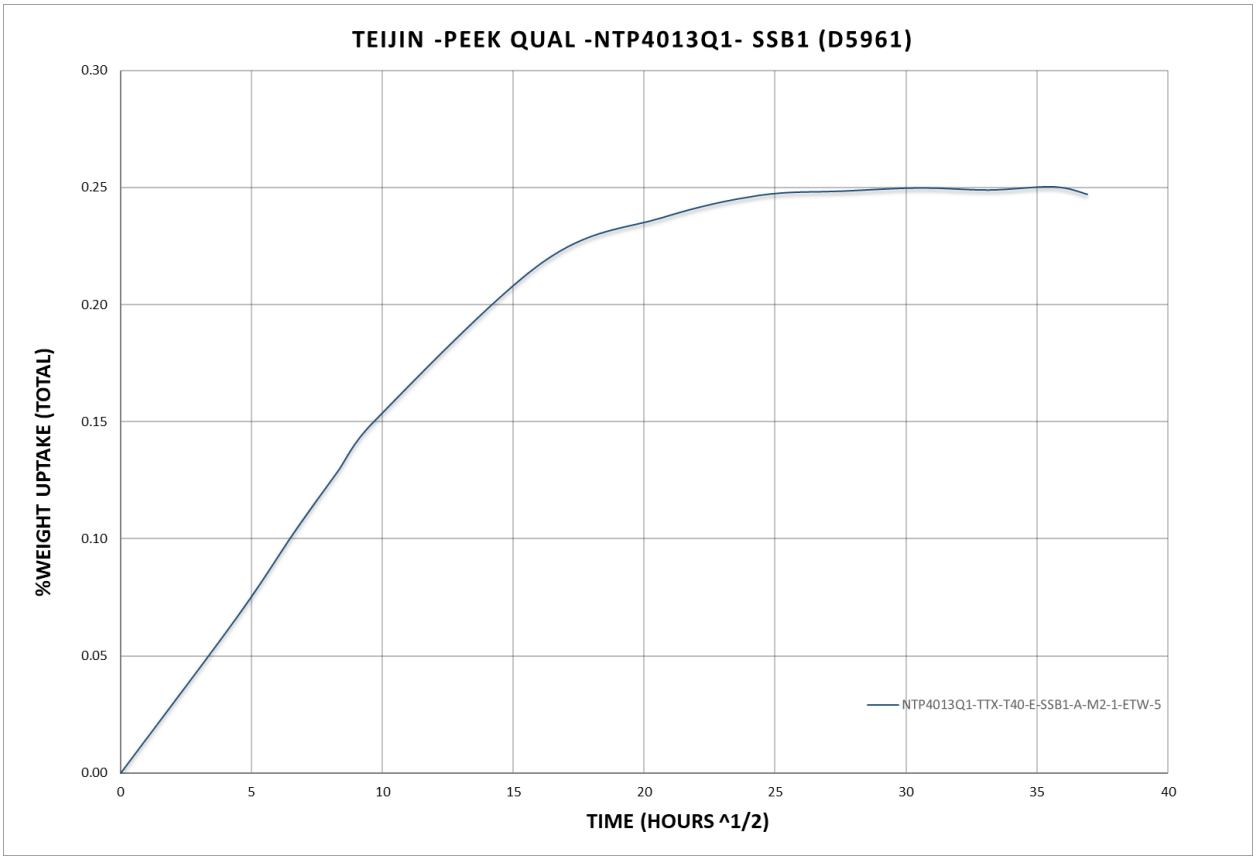

Load vs Displacement Curves, 180F, 48hrs ±4hrs
Load (lbf)
1800
1600
1400
1200
1000
800
600
400
200
0
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
Displacement (in)
One Sample Selected per fluid type
ISOPROPYL ALCOHOL Deicing Agent


85% Relative Humidity @ RT
Load (lbf)
2000
1800
1600
1400
1200
1000
800
600
400
200
0
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
Displacement (in)
One Sample Selected per fluid type
85% Relative Humidity @ RT

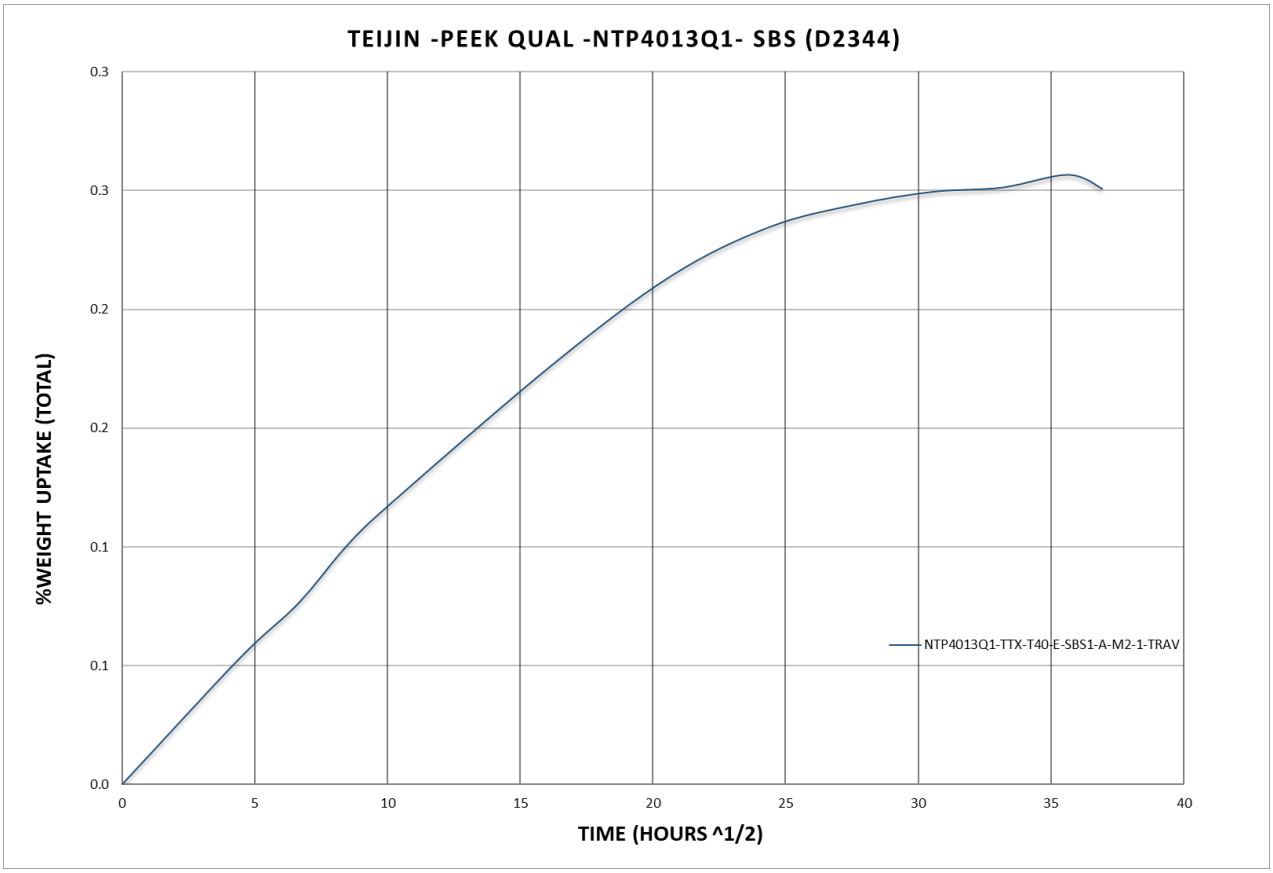

85% Relative Humidity @180F
Load (lbf)
1800
1600
1400
1200
1000
800
600
400
200
0
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
Displacement (in)
One Sample Selected per fluid type
85% Relative Humidity @50F

8. Moisture Conditioning Charts

8.1 Single-Shear Bearing – Thinnest Panel (8 plies panel)



8.2 Short-Beam Strength - Thickest Panel (20 plies panel)



9. DMA Results

*DMA Results Summary						
Toho Tenax NTP 4013Q1 PEEK DMA Dry						
Sample #	Batch	Consolidate Cycle	Onset Storage Modulus		Peak of Tangent Delta	
			Average		Average	
			T_g [°C]	T_g [°F]	T_g [°C]	T_g [°F]
NTP4013Q1-TTX-T40-E-SBS1-A-M2-1-DMA-D-1	1	2	129.91	265.84	157.60	315.68
NTP4013Q1-TTX-T40-E-SBS1-A-M2-1-DMA-D-2	1	2	130.76	267.37	157.12	314.82
NTP4013Q1-TTX-T40-E-SBS1-A-M2-1-DMA-D-3	1	2	132.97	271.35	158.16	316.69
NTP4013Q1-TTX-T40-E-UNC3-A-M2-1-DMA-D-1	1	2	128.18	262.72	154.58	310.24
NTP4013Q1-TTX-T40-E-UNC3-A-M2-1-DMA-D-2	1	2	126.22	259.20	152.05	305.69
NTP4013Q1-TTX-T40-E-SBS1-B-M2-1-DMA-D-1	2	2	133.53	272.35	157.41	315.34
NTP4013Q1-TTX-T40-E-SBS1-B-M2-1-DMA-D-2	2	2	133.45	272.21	157.92	316.26
NTP4013Q1-TTX-T40-E-SBS1-B-M2-1-DMA-D-3	2	2	131.97	269.55	158.49	317.28
NTP4013Q1-TTX-T40-E-WC-B-M2-1-DMA-D-1	2	2	128.83	263.89	154.28	309.70
NTP4013Q1-TTX-T40-E-WC-B-M2-1-DMA-D-2	2	2	127.99	262.38	155.78	312.40
NTP4013Q1-TTX-T40-E-SBS1-C-M2-1-DMA-D-1	3	2	131.99	269.58	159.84	319.71
NTP4013Q1-TTX-T40-E-SBS1-C-M2-1-DMA-D-2	3	2	133.29	271.92	158.21	316.78
NTP4013Q1-TTX-T40-E-SBS1-C-M2-1-DMA-D-3	3	2	131.09	267.96	157.93	316.27
NTP4013Q1-TTX-T40-E-WC-C-M2-1-DMA-D-1	3	2	128.25	262.85	153.70	308.66
NTP4013Q1-TTX-T40-E-WC-C-M2-1-DMA-D-2	3	2	128.63	263.53	155.45	311.81
NTP4013Q1-TTX-T40-E-WT-D-M3-1-DMA-D-1	4	3	130.95	267.71	160.11	320.20
NTP4013Q1-TTX-T40-E-WC-D-M3-1-DMA-D-1	4	3	132.93	271.27	157.79	316.02
NTP4013Q1-TTX-T40-E-UNT2-D-M3-1-DMA-D-1	4	3	126.77	260.19	151.96	305.53
NTP4013Q1-TTX-T40-E-UNT2-D-M4-1-DMA-D-1	4	4	127.45	261.41	152.59	306.66
NTP4013Q1-TTX-T40-E-UNT1-D-M3-1-DMA-D-1	4	3	132.59	270.66	158.53	317.35
NTP4013Q1-TTX-T40-E-UNT1-D-M4-1-DMA-D-1	4	4	130.73	267.31	158.26	316.87
NTP4013Q1-TTX-T40-E-UNT3-D-M3-1-DMA-D-1	4	3	133.54	272.37	159.24	318.63
NTP4013Q1-TTX-T40-E-UNT3-D-M4-1-DMA-D-1	4	4	131.54	268.77	158.92	318.06
NTP4013Q1-TTX-T40-E-CAI-D-M3-1-DMA-D-1	4	3	131.77	269.19	157.76	315.97
NTP4013Q1-TTX-T40-E-SBS-D-M3-1-DMA-D-1	4	3	135.69	276.24	161.38	322.48
NTP4013Q1-TTX-T40-E-SBS1-D-M3-1-DMA-D-1	4	3	132.13	269.83	159.43	318.97
NTP4013Q1-TTX-T40-E-SBS1-D-M4-1-DMA-D-1	4	4	131.43	268.57	158.86	317.95
AVERAGE			130.91	267.64	157.16	314.89
STANDARD DEVIATION			2.40	4.32	2.51	4.52

* DMA Results tested at NIAR

*DMA Results Summary

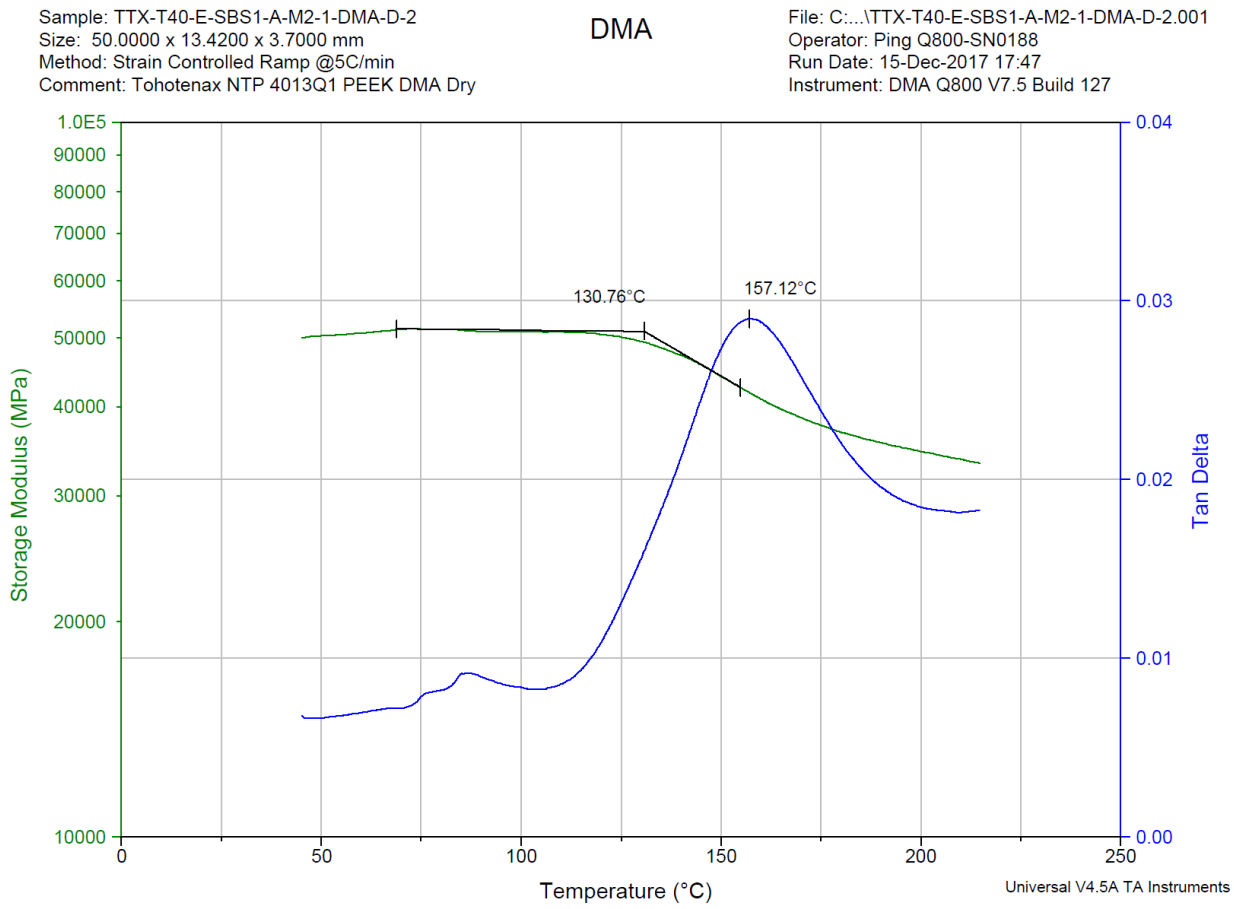
Toho Tenax NTP 4013Q1 PEEK DMA Wet

Sample #	Batch	Consolidate Cycle	Onset Storage Modulus		Peak of Tangent Delta	
			Average		Average	
			T_g [°C]	T_g [°F]	T_g [°C]	T_g [°F]
NTP4013Q1-TTX-T40-E-SBS1-A-M2-1-DMA-W-1	1	2	121.25	250.25	147.90	298.22
NTP4013Q1-TTX-T40-E-SBS1-A-M2-1-DMA-W-2	1	2	125.33	257.59	147.24	297.03
NTP4013Q1-TTX-T40-E-SBS1-A-M2-1-DMA-W-3	1	2	124.27	255.69	147.20	296.96
NTP4013Q1-TTX-T40-E-UNC3-A-M2-1-DMA-W-1	1	2	122.90	253.22	148.57	299.43
NTP4013Q1-TTX-T40-E-UNC3-A-M2-1-DMA-W-2	1	2	122.07	251.73	148.20	298.76
NTP4013Q1-TTX-T40-E-SBS1-B-M2-1-DMA-W-1	2	2	122.15	251.87	148.13	298.63
NTP4013Q1-TTX-T40-E-SBS1-B-M2-1-DMA-W-2	2	2	122.01	251.62	148.18	298.72
NTP4013Q1-TTX-T40-E-SBS1-B-M2-1-DMA-W-3	2	2	123.67	254.61	147.75	297.95
NTP4013Q1-TTX-T40-E-WC-B-M2-1-DMA-W-1	2	2	123.43	254.17	148.94	300.09
NTP4013Q1-TTX-T40-E-WC-B-M2-1-DMA-W-2	2	2	123.37	254.07	148.42	299.16
NTP4013Q1-TTX-T40-E-SBS1-C-M2-1-DMA-W-1	3	2	122.77	252.99	146.94	296.49
NTP4013Q1-TTX-T40-E-SBS1-C-M2-1-DMA-W-2	3	2	122.81	253.06	147.22	297.00
NTP4013Q1-TTX-T40-E-SBS1-C-M2-1-DMA-W-3	3	2	122.06	251.71	148.20	298.76
NTP4013Q1-TTX-T40-E-WC-C-M2-1-DMA-W-1	3	2	122.70	252.86	150.84	303.51
NTP4013Q1-TTX-T40-E-WC-C-M2-1-DMA-W-2	3	2	123.05	253.49	148.52	299.34
NTP4013Q1-TTX-T40-E-WT-D-M3-1-DMA-W-1	4	3	124.25	255.65	149.86	301.75
NTP4013Q1-TTX-T40-E-WC-D-M3-1-DMA-W-1	4	3	126.45	259.61	149.89	301.80
NTP4013Q1-TTX-T40-E-UNT2-D-M3-1-DMA-W-1	4	3	117.43	243.37	144.90	292.82
NTP4013Q1-TTX-T40-E-UNT2-D-M4-1-DMA-W-1	4	4	117.63	243.73	144.06	291.31
NTP4013Q1-TTX-T40-E-UNT1-D-M3-1-DMA-W-1	4	3	120.94	249.69	149.35	300.83
NTP4013Q1-TTX-T40-E-UNT1-D-M4-1-DMA-W-1	4	4	123.80	254.84	149.61	301.30
NTP4013Q1-TTX-T40-E-UNT3-D-M3-1-DMA-W-1	4	3	124.04	255.27	148.30	298.94
NTP4013Q1-TTX-T40-E-UNT3-D-M4-1-DMA-W-1	4	4	123.92	255.06	149.98	301.96
NTP4013Q1-TTX-T40-E-CAI-D-M3-1-DMA-W-1	4	3	119.77	247.59	148.99	300.18
NTP4013Q1-TTX-T40-E-SBS-D-M3-1-DMA-W-1	4	3	121.32	250.38	150.75	303.35
NTP4013Q1-TTX-T40-E-SBS1-D-M3-1-DMA-W-1	4	3	122.68	252.82	151.37	304.47
NTP4013Q1-TTX-T40-E-SBS1-D-M4-1-DMA-W-1	4	4	122.19	251.94	150.41	302.74
AVERAGE			122.53	252.55	148.51	299.31
STANDARD DEVIATION			1.99	3.58	1.67	3.00

* DMA Results tested at NIAR

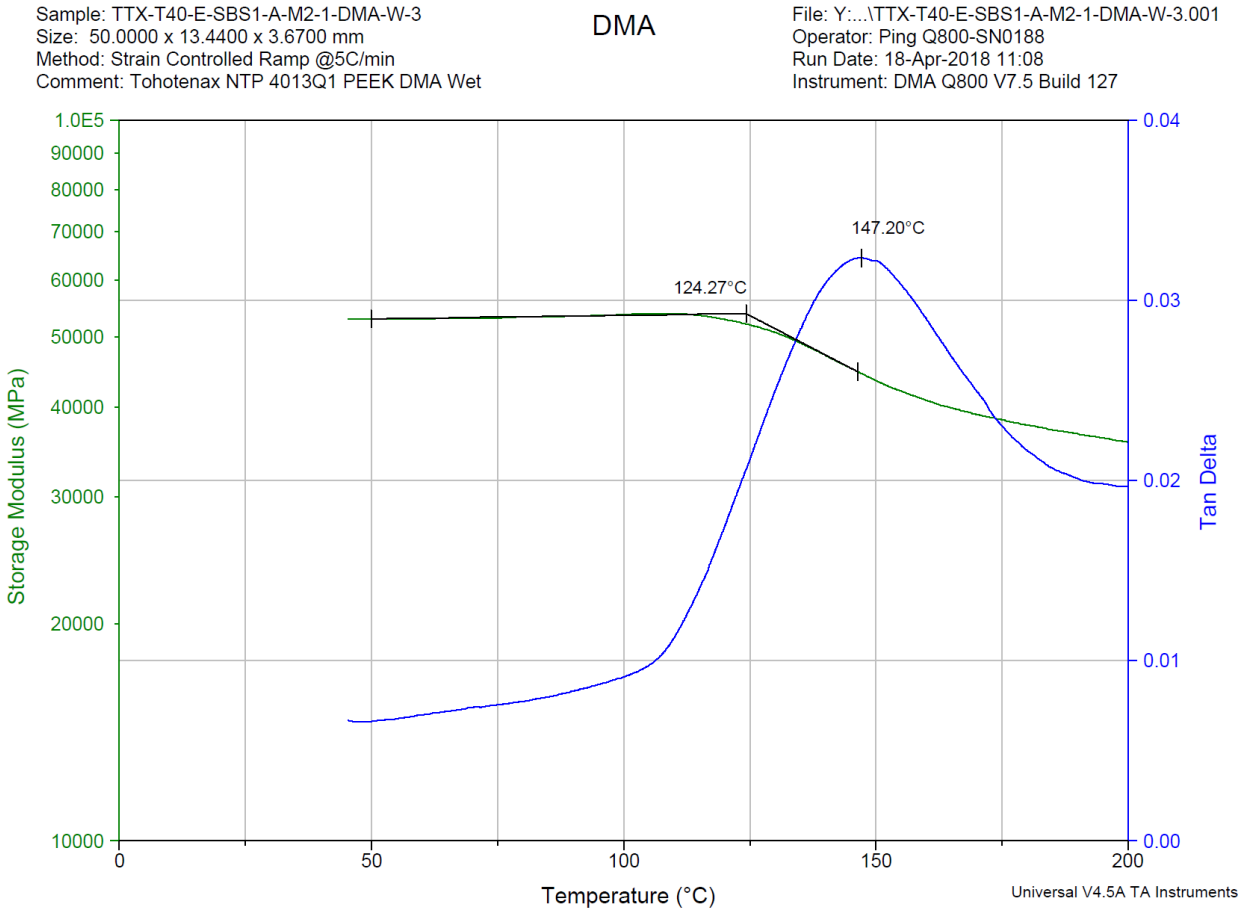
9.1 DMA Dry Batch A

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



9.2 DMA Wet Batch B

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



10. DSC Results

DSC Results

Toho Tenax NTP 4013Q1 PEEK DSC

Sample #	Onset of Melting Temperature		Peak of Melting Temperature		Enthalpy of Fusion	Crystallinity Percentage
	T_{mo} [°C]	T_{mo} [°F]	T_{mp} [°C]	T_{mp} [°F]	ΔH_f [J/g]	%
14402-DSC-1	330.45	626.81	341.27	646.29	12.77	28.89
14402-DSC-2	330.78	627.40	341.72	647.10	14.05	31.79
14402-DSC-3	331.06	627.91	341.32	646.38	11.54	26.11
14402-DSC-4	330.89	627.60	341.68	647.02	13.61	30.79
14425-DSC-1	329.66	625.39	340.40	644.72	15.06	34.07
14425-DSC-2	329.98	625.96	340.76	645.37	13.00	29.41
14425-DSC-3	329.56	625.21	340.83	645.49	12.42	28.10
14425-DSC-4	330.37	626.67	341.06	645.91	11.35	25.68
14441-DSC-1	330.91	627.64	342.33	648.19	13.73	31.06
14441-DSC-2	331.36	628.45	341.99	647.58	12.58	28.46
14441-DSC-3	331.02	627.84	342.02	647.64	13.63	30.84
14441-DSC-4	330.85	627.53	341.68	647.02	13.90	31.45
14455-DSC-1	330.03	626.05	341.16	646.09	13.96	31.58
14455-DSC-2	330.19	626.34	341.29	646.32	12.93	29.25
14455-DSC-3	330.24	626.43	341.00	645.80	12.72	28.78
14455-DSC-4	330.29	626.52	341.03	645.85	13.97	31.61
14481-DSC-1	331.66	628.99	341.63	646.93	13.29	30.07
14481-DSC-2	330.60	627.08	341.63	646.93	15.07	34.10
14481-DSC-3	331.94	629.49	342.16	647.89	14.29	32.33
14481-DSC-4	331.80	629.24	342.01	647.62	14.60	33.03
14484-DSC-1	331.15	628.07	341.83	647.29	13.41	30.34
14484-DSC-2	330.85	627.53	341.61	646.90	13.04	29.50
14484-DSC-3	331.35	628.43	341.62	646.92	14.35	32.47
14484-DSC-4	331.41	628.54	341.57	646.83	13.01	29.43
Average	330.77	627.38	341.48	646.67	13.43	30.38
Standard Deviation	0.65	1.17	0.48	0.86	0.96	2.16

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

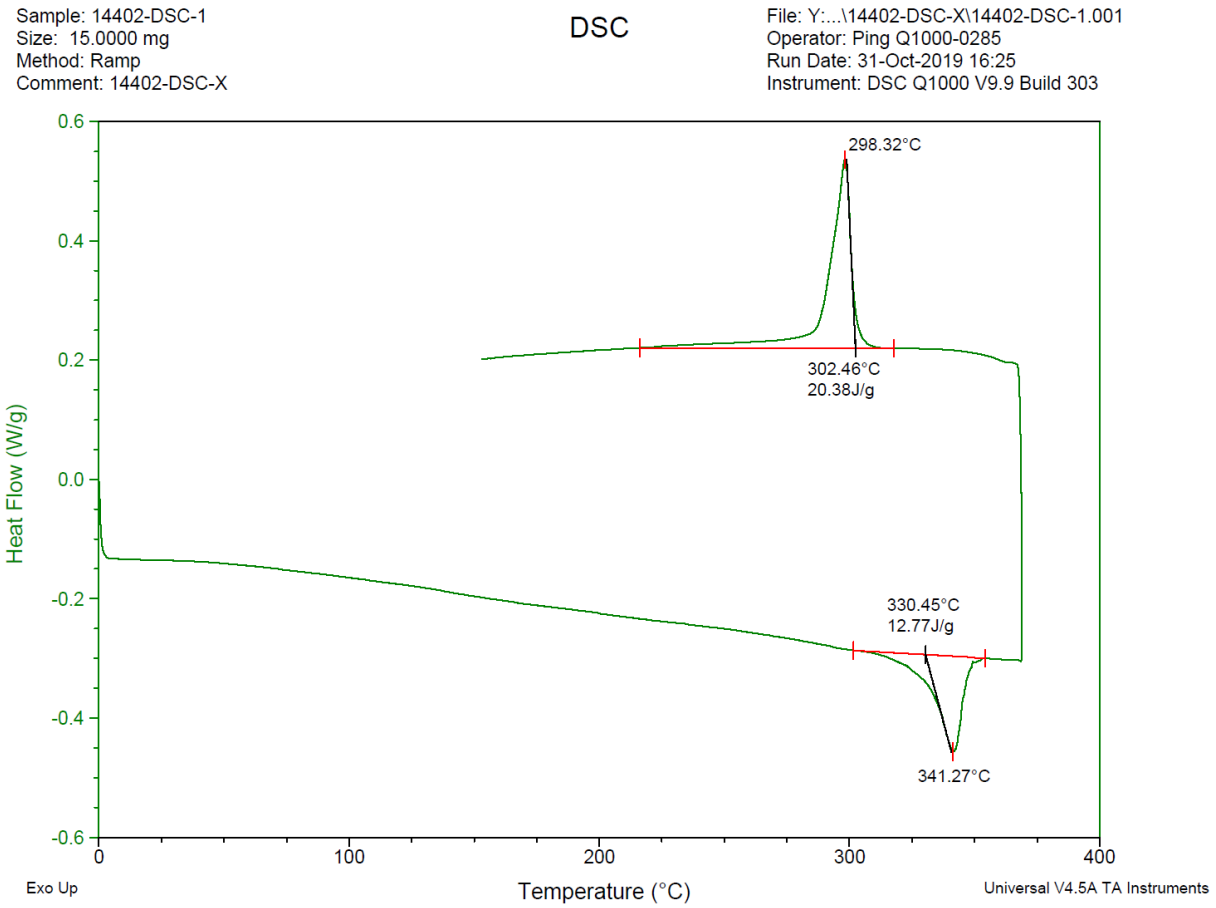
R_c (resin content) *34 %*

Test Parameters:

Machine:	TA DSC Q1000
Pan & Lid Type:	Standard Aluminum
Test Method:	ASTM D3418
Ramp Rate:	10ºC/min (Heat & Cool)
Temperature Range:	0ºC to 390ºC (Heating)
Atmosphere:	Nitrogen

10.1 DSC Graph

A representative of DSC Dry profile is provided below.



11. Deviations

1) The Lamina SBS specimens and Fluid Sensitivity SBS specimens were tested with 3.5 span length-to-specimen thickness ratio, instead of ASTM D2344 recommendation of loading span length-to-specimen thickness ratio of 4.0, to achieve interlaminar shear failure mode.
2) The IPS strength at 4% strain were reported, since strength at 5% strain was not available for some test data.