Park Aerospace Corp. 7781 E765 Glass 293 gsm Prepreg at 38% RC Equivalency Material Property Data Report for Park Aerospace Corp.

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REVISIONS:

Rev	By	Date	Pages Revised or Added
N/C	Jamin Perry	2/25/2025	Document Initial Release

TABLE OF CONTENTS

List of Tables

List of Figures

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. Equivalency statistical analysis data is given in NCP-RP-2023-008 N/C and engineering basis values generated from material qualification testing can be obtained from AGATE-WP3.3-033051-105. The equivalency material was procured to Park Aerospace Corp. E-765 MS1001 Rev 5 Type 1 Grade A which is equivalent to NCAMP material specification NMS 765/5. NMS 765/5 shall be used for future procurement. The equivalency test panels were cured in accordance with Park Aerospace Corp. process specification E-765 PS1000 Rev 5 using Section 3.7 bagging “Option 2” and Section 4.0 cure cycle which is equivalent to NCAMP Process Specification NPS 81765 Rev N/C using cure cycle “O” and bagging scheme “Option 2”. Qualification panels were fabricated with bagging scheme “Option 1”. The NCAMP Test Plan NTP 7653E1 Rev D was used for this equivalency 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 Park Aerospace Corp. E-765 MS1001 or NMS 765/5. Park Aerospace Corp. E-765 MS1001 or NMS 765/5 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 Park Aerospace Corp. E-765 MS1001 or NMS 765/5.* Park Aerospace Corp. E-765 MS1001 or NMS 765/5 are free, publicly available, non-proprietary aerospace industry material specifications.

1.2 Symbols

$\mu\varepsilon$	micro-strain
E_1^c	compressive modulus, longitudinal / warp direction
E_1^t	tensile modulus, longitudinal / warp direction
E_2^c	compressive modulus, transverse / fill direction
E_2^t	tensile modulus, transverse / fill direction
F_1^{cu}	ultimate compressive strength, longitudinal / warp direction
F_1^{tu}	ultimate tensile strength, longitudinal / warp direction
F_2^{cu}	ultimate compressive strength, transverse / fill direction
F_2^{tu}	ultimate tensile strength, transverse / fill direction
SBS	short beam strength
$F_{12}^{s5\% \text{ strain}}$	in-plane shear strength at 5% strain
$F_{12}^{s0.2\%}$	in-plane shear strength at 0.2% offset
G_{12}^s	in-plane shear modulus

Superscripts

c	compression
cu	compression ultimate
s	shear
su	shear ultimate
t	tension
tu	tension ultimate

Subscripts

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

Acronyms and Definitions

ASTM	American Society for Testing and Materials
B – Basis	95% lower confidence limit on the tenth population percentile
CV	Coefficient of Variation
CMH-17	Composite Materials Handbook 17 (formerly MIL-HDBK-17)
CTD	Cold Temperature Dry
CPT	Cured Ply Thickness
DMA	Dynamic Mechanical Analysis
ETD	Elevated Temperature Dry
ETW	Elevated Temperature Wet
Gr/Ep	Graphite/Epoxy
norm	normalized
QI	Quasi Isotropic
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
Tg	Glass Transition Temperature

1.3 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 D3518/D3518M-18 – Standard Test Method for In-Plane Shear Response of Polymer Matrix Composite Materials by Tensile Test of a ± 45º Laminate In-Plane Shear Strength and Modulus
- SACMA SRM 1R-94 – SACMA Recommended Test Method for Compressive Properties of Oriented Fiber-Resin Composites
- SACMA SRM 18R-94 – SACMA Recommended Method for Glass Transition Temperature (Tg) Determination by DMA of Oriented Fiber-Resin Composites

1.4 Methodology

1.4.1 Process Definition

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

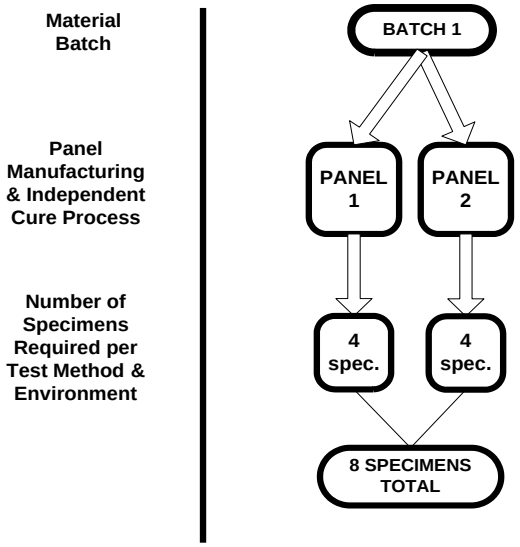


Figure 1-1: Specimen Selection Methodology - Equivalency

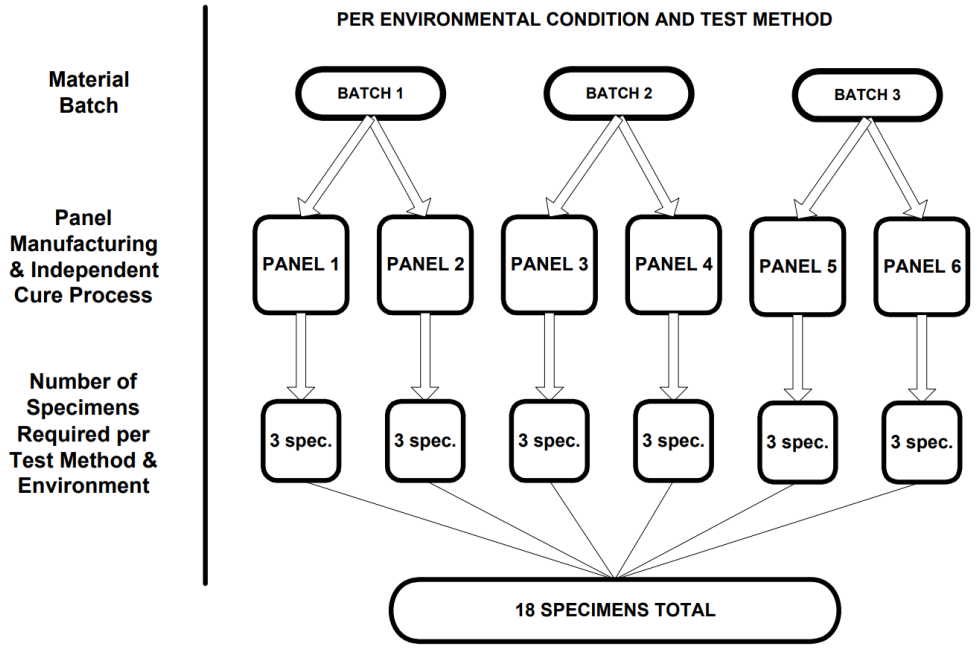


Figure 1-2: Specimen Selection Methodology - Qualification (IPS)

All panels were fabricated in accordance with Park Aerospace Corp. process specification E-765 PS1000 Rev 5 using Section 3.7 bagging “Option 2” and Section 4.0 cure cycle, which is equivalent to NCAMP Process Specification NPS 81765 Rev N/C using cure cycle “O” and bagging scheme “Option 2”.

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

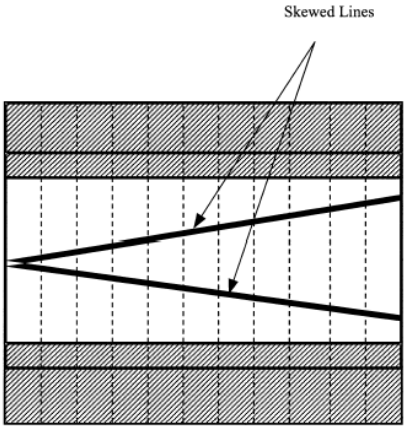


Figure 1-3: Specimen Traceability Line

1.4.2 Specimen & Testing Details

1.4.2.1 Tabbing

Coupons were tabbed with fiberglass material using EA9696 adhesive at 230°F for 150 minutes.

1.4.2.2 Specimen Strain Device Used

Corresponding Gage ID can be obtained from Appendix 1 of NTP 7653E1 Rev D.

Uniaxial gages were used on:

All conditions of FC specimens
All conditions of FT specimens
All conditions of IPS specimens
All conditions of WC specimens
All conditions of WT specimens

1.4.3 Test Matrix

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

Layup	Test Type (2)	Test Method and Direction	Property	Number of Batches x Number of Panels x Number of Test Specimens			
				Test Temperature/Moisture Condition			
				CTD (-65°F)	RTD (70°F)	ETD (180°F)	ETW (180°F)
$[0]_{12}$	WT	ASTM D3039 Warp Tension	Strength & Modulus	1x2x4 (1)	1x2x4 + 1x2x2 (4)	1x2x4 (3)	
$[0]_{14}$	WCS	SACMA SRM 1-94 Warp Compression	Strength	1x2x4 (1)	1x2x4	1x2x4	1x2x4
$[0]_{14}$	WCM	SACMA SRM 1-94 Warp Compression	Modulus	1x2x4	1x2x4	1x2x4	1x2x4
$[90]_{12}$	FT	ASTM D3039 Fill Tension	Strength & Modulus	1x2x4 (1)	1x2x4 + 1x2x2 (4)	1x2x4 (3)	
$[90]_{14}$	FCS	SACMA SRM 1-94 Fill Compression	Strength	1x2x4 (1)	1x2x4	1x2x4	1x2x4
$[90]_{14}$	FCM	SACMA SRM 1-94 Fill Compression	Modulus	1x2x4 (1)	1x2x4	1x2x4	1x2x4
$[0]_{12}$	SBS	ASTM D2344 Short Beam Strength	Strength		1x2x4		

Notes:
1. Equivalency data was compared to AGATE Qualification B-estimates.
2. In-Plane Shear was not included, additional information can be found in Table 1-2.
3. Batch D was used for this testing at ETD since WT and FT ETW data was invalid due to testing error. ETD condition was approved by CMH17 and FAA for Equivalency to replace ETW condition.
4. Batch D was used for 1x1x3 test matrix as additional data points at RTD.

Table 1-1: Equivalency Test Matrix

Layup	Test Type	Test Method and Direction	Property	Number of Batches x Number of Panels x Number of Test Specimens			
				Test Temperature/Moisture Condition			
				CTD (-65°F)	RTD (70°F)	ETD (180°F)	ETW (180°F)
$[45/-45]_{3S}$	IPS	ASTM D3518 In-Plane Shear	0.2% Offset Strength, 5% Strength & Modulus	3x2x3	3x2x3	3x2x3	3x2x3

Note: Park Aerospace Corp. found that In-Plane Shear property via D5379 listed in AGATE-WP3.3-033051-105 was not reproducible based on Park Aerospace Corp. historical data/Equivalency attempts (with an identical strain gage and testing procedure). Therefore, three batch of materials were produced with an intention to supersede In-Plane Shear property in AGATE-WP3.3-033051-105, D3518 test method was selected for re-test.

Table 1-2: Qualification Test Matrix

Table 1-1 shows the single batch equivalency test matrix, and Table 1-2 shows the three batch qualification test matrix. The layup angles 0º, 45º, -45º and 90º refer to the orientation of the warp 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.

1.4.4 Cured Laminate Physical Testing

The properties in Table 1-3 were determined for each panel used for test coupons with the exception of Tg by DMA which were conducted on one laminate per batch from each oven cure conducted where that batch is present. The tests were performed by Park Aerospace Corp. under the supervision of NCAMP.

Property	**Condition/Method** (Note 1)	**Min Replicates per Panel**
Cured Ply Thickness	ASTM D3171-15	All data from mechanical test specimens
Laminate Density	ASTM D792-13	3
Fiber Volume, % by Volume	ASTM D2584-11 (Note 2)	3
Resin Content, % by Weight	ASTM D2584-11 (Note 2)	3
Void Content, % by Volume	ASTM D2734-16 (Note 2)	Per Note 5
Ultrasonic Through Transmission, C-Scan	MIL-HDBK-787A (Note 3)	1
Glass Transition Temperature, Tg	Dry and Wet – SACMA SRM 18R-94 (by DMA)	1 Dry, 1 Wet (Note 4)

Notes:
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.
2. Method II.
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 the C-scans
4. Minimum total of 8 dry and 8 wet. Dry specimens are as-fabricated specimens that have been maintained at ambient conditions in an environmentally controlled laboratory.
5. Required on panels that appear voidy in C-scan or visually only.

Table 1-3: Physical Testing Matrix

1.4.5 Environmental Conditioning

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

CTD = -65±5°F, dry
RTD = 70±10°F, dry
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 AER. All tested specimens were digitally photographed after each test in order to pictorially document failure modes.

For dry testing, as-fabricated condition, specimens were kept at ambient laboratory conditions until mechanical testing. Ambient laboratory conditions are defined as 65°F-75°F. Since moisture absorption or desorption rate of epoxy is very slow at ambient temperature, there was no requirement to maintain relative humidity levels in the mechanical test laboratory.

For wet conditioning, specimens were conditioned to equilibrium at 145°F±5°F and 85%±5% per ASTM D5229 Procedure C. Effective moisture equilibrium was achieved when the average moisture content of the traveler specimen changes by less than 0.05% for two consecutive readings which are 7±0.5 days apart and may be expressed by:

$$\frac{W_i - W_{i-1}}{W_b} < 0.0005$$

Where:

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

When representative specimens could not be measured to determine the moisture content (due to size, fastener and tab effects), traveler coupons of at least 1” by 1” by specimen thickness and weighing at least 15 grams were used to establish weight gain measurements. If the specimens or traveler coupons passed the criteria for two consecutive readings which are 7±0.5 days apart, the specimens were kept in the environmental chamber for up to an additional 60 days. Alternatively, the specimens may be removed from the environmental chamber and placed in a sealed plastic bag, wrapped with a moist cotton towel for a maximum of 14 days until mechanical testing. If storage time exceeded 14 days, the traveler was reweighed to ensure moisture equilibrium. If the readings did not meet the equilibrium criteria, specimens were placed in the chamber until equilibrium was reached. Strain-gaged specimens were removed from the controlled environment for a maximum of 2 hours for application of gages in ambient laboratory conditions.

1.4.6 Non-Ambient Testing

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

For elevated temperature testing, the temperature chamber, test fixture, and grips were preheated to the specified temperature. Each specimen was heated to the required test temperature as verified by a thermocouple in direct contact with and taped to the specimen gage section. The heat-up time of the specimen did not exceed 5 minutes. The test started 2^{+1}_{-0} minutes after the specimen had 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 gauge 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.

1.4.7 Normalization Procedures

Most lamina level tension and compression strength and modulus properties, and all laminate level properties were normalized according to fiber volume fraction. Lamina level properties that were not normalized include 90º tensile strength and modulus (unidirectional only), 90º compressive strength and modulus (unidirectional only), in-plane shear strength and modulus, Poisson's ratio, and SBS. 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 nominal cured ply thickness and/or fiber volume fraction obtained in AGATE-WP3.3-033051-105 was used. This value was used in the normalization of data in the qualification program.

The average as measured CPT of the equivalency panels was 0.009986 inches. The lowest and highest CPT measured were 0.009286 inches and 0.01108 inches respectively.

1.4.8 Inspection Verification

The 1-batch equivalency and 3-batch qualification (IPS) panels have been fabricated according to the requirements of the test plan and conformed by an NCAMP AIR. The test specimens and test setup have also been conformed by an NCAMP AIR.

Testing was witnessed by NCAMP. Test setup and witnessing was delegated to an NCAMP AER. Mechanical testing was carried out at the National Institute for Aviation Research, Wichita State University.

1.4.9 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.

2. Test Results

2.1 Lamina Level Test Summary

Prepreg Material: Park Aerospace Corp. 7781 E765 Glass 293 gsm Prepreg at 38% RC
Material Specification: E-765 MS1001 Rev 5 Type 1 Grade A or NMS 765/5
Process Specification: E-765 PS1000 Rev 5 or NPS 81765 Rev N/C
Fabric: Type 1 Grade A 7781 Glass **Resin:** E765

Park Aerospace Corp. 7781 E765 Glass 293 gsm Prepreg at 38% RC Lamina Properties Summary

Tg(dry): 330.6°F **Tg(wet):** 265.9°F **Tg METHOD:** SACMA SRM 18R-94

Date of fiber manufacture	7/13/2020 - 6/4/2024	**Date of testing**	4/12/2021 - 1/31/2025
Date of resin manufacture	7/27/2020 - 9/17/2024	**Date of data submittal**	2/4/2025
Date of prepreg manufacture	7/28/2020 - 9/18/2024		
Date of composite manufacture	9/10/2020 - 11/19/2024		

LAMINA MECHANICAL PROPERTY SUMMARY
Data reported as: Normalized & Measured
(Normalized by CPT=0.009800 inch)

	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]	84.92	81.74	69.77	70.19	62.44	64.57		
E_1^{t} [Msi]	3.840	3.697	3.683	3.700	3.589	3.711		
F_2^{tu} [ksi]	76.30	72.07	64.49	64.34	61.07	63.45		
E_2^{t} [Msi]	3.853	3.634	3.482	3.472	3.355	3.486		
F_1^{cu} [ksi]	92.60	89.30	79.01	77.99	66.65	63.96	55.01	53.55
E_1^{c} [Msi]	4.241	4.625	3.791	3.868	3.859	4.118	3.846	4.028
F_2^{cu} [ksi]	69.57	69.87	65.19	64.35	54.52	53.41	47.24	46.64
E_2^{c} [Msi]	3.973	3.934	3.711	3.691	3.720	3.702	3.518	3.793
$F_{12}^{s0.2\%}$ [ksi]		7.095		5.002		3.436		2.308
$F_{12}^{s5\%strain}$ [ksi]		12.35		8.962		6.661		4.288
G_{12}^{s} [Msi]		0.8490		0.6857		0.5423		0.3193
SBS [ksi]				8.850				

Note: F_{12} and G_{12} are obtained per Table 1-2.

Table 2-1: Lamina Summary Data

2.2 Individual Test Summaries

2.2.1 Warp Tension Properties (WT)

Material: Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%

Tension, 1-axis
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%
[0]12

Resin content: 30.98 % wt **Comp. density:** 1.869 g/cc
Fiber volume: 50.84 % vol
Ply count: 12

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

Normalized by: 0.009800 in. CPT

		CTD		RTD		ETD			
Test Temperature [°F]		-65		70		180			
Moisture Conditioning		Dry		Dry		Dry			
Equilbrium at T, RH									
Source code prefixed by: NTP7653E1-PAC-P03-PAC-		WT-A-CX-1-CTD-X		WT-A-CX-1-RTD-X		WT-A-CX-1-ETD-X			
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**		
F_1^{tu} [ksi]	**Mean**	84.92	81.74	69.77	70.19	62.44	64.57		
	Minimum	80.63	74.66	60.24	53.90	60.76	63.06		
	Maximum	89.01	86.92	75.97	77.37	65.02	67.02		
	C.V.(%)	2.855	5.464	6.027	9.923	1.962	1.963		
	No. Specimens	8		14		8			
	No. Prepreg Lots	1		2		2			
E_1^t [Msi]	**Mean**	3.840	3.697	3.683	3.700	3.589	3.711		
	Minimum	3.788	3.520	3.576	3.200	3.556	3.653		
	Maximum	3.920	3.934	3.758	3.970	3.643	3.804		
	C.V.(%)	1.121	4.673	1.649	6.453	0.7634	1.426		
	No. Specimens	8		14		8			
	No. Prepreg Lots	1		2		2			

2.2.2 Fill Tension Properties (FT)

Material:	Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%							**Tension, 2-axis** Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38% [90]12	
Resin content:	31.11 % wt		**Comp. density:**	1.866 g/cc					
Fiber volume:	50.69 % vol								
Ply count:	12								
Test method:	ASTM D3039-17		**Modulus calculation:**	1000 to 3000 microstrain					
Normalized by:	0.009800	in. CPT							
			CTD		**RTD**		**ETD**		
Test Temperature [°F]			-65		70		180		
Moisture Conditioning			Dry		Dry		Dry		
Equilbrium at T, RH									
Source code prefixed by:	NTP7653E1-PAC-P03-PAC		FT-A-CX-1-CTD-X		FT-A-CX-1-RTD-X		FT-A-CX-1-ETD-X		
			Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	
F_2^{tu} [ksi]	**Mean**		76.30	72.07	64.49	64.34	61.07	63.45	
	Minimum		68.60	63.36	60.02	56.82	59.02	61.65	
	Maximum		82.03	81.07	68.08	70.83	62.80	65.05	
	C.V.(%)		6.151	8.015	3.470	6.265	1.889	1.670	
	No. Specimens		9		15		8		
	No. Prepreg Lots		1		2		2		
E_2^t [Msi]	**Mean**		3.853	3.634	3.482	3.472	3.355	3.486	
	Minimum		3.473	3.207	3.363	3.066	3.199	3.328	
	Maximum		4.924	4.645	3.596	3.601	3.450	3.604	
	C.V.(%)		12.35	12.71	2.226	4.906	2.279	2.324	
	No. Specimens		8		15		8		
	No. Prepreg Lots		1		2		2		

2.2.3 Warp Compression Properties (WC)

Material: Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%

Resin content: 36.50 % wt **Comp. density:** 1.460 g/cc

Fiber volume: 45.14 % vol

Ply count: 14

Test method: SACMA SRM 1R-94 **Modulus calculation:** 1000 to 3000 microstrain

Normalized by: 0.009800 in. CPT

Compression, 1-axis
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%
[0]14

		CTD		RTD		ETD		ETW	
Test Temperature [°F]		-65		70		180		180	
Moisture Conditioning		Dry		Dry		Dry		Equilbrium	
Equilbrium at T, RH								145 F,85%	
Source code prefixed by: NTP7653E1-PAC-P03-PAC-		WCX-X-CX-1-CTD-X		WCX-X-CX-1-RTD-X		WCX-X-CX-1-ETD-X		WCX-X-CX-1-ETW-X	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
F_1^{cu} [ksi]	**Mean**	92.60	89.30	79.01	77.99	66.65	63.96	55.01	53.55
	Minimum	85.29	82.99	72.09	69.57	60.21	57.68	51.34	48.88
	Maximum	103.2	95.83	85.94	85.14	74.72	69.72	60.02	60.55
	C.V.(%)	7.450	4.693	6.877	7.093	8.115	6.847	6.708	8.523
	No. Specimens	9		9		9		8	
	No. Prepreg Lots	2		2		2		1	
E_1^c [Msi]	**Mean**	4.241	4.625	3.791	3.868	3.859	4.118	3.846	4.028
	Minimum	4.071	4.433	3.699	3.406	3.562	3.514	3.594	3.913
	Maximum	4.356	4.756	3.871	4.216	4.148	4.516	4.120	4.348
	C.V.(%)	2.277	2.430	1.281	8.271	5.339	9.129	5.979	4.013
	No. Specimens	8		9		9		6	
	No. Prepreg Lots	1		1		1		1	

2.2.4 Fill Compression Properties (FC)

Material: Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%

Compression, 2-axis
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%
[90]14

Resin content: 32.01 % wt **Comp. density:** 1.823 g/cc
Fiber volume: 48.79 % vol
Ply count: 14

Test method: SACMA SRM 1R-94 **Modulus calculation:** 1000 to 3000 microstrain

Normalized by: 0.009800 in. CPT

		CTD		RTD		ETD		ETW	
Test Temperature [°F]		-65		70		180		180	
Moisture Conditioning		Dry		Dry		Dry		Equilbrium	
Equilbrium at T, RH								145 F,85%	
Source code prefixed by: NTP7653E1-PAC-P03-PAC-		FCX-A-CX-1-CTD-X		FCX-A-CX-1-RTD-X		FCX-A-CX-1-ETD-X		FCX-A-CX-1-ETW-X	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
F_2^{cu} [ksi]	**Mean**	69.57	69.87	65.19	64.35	54.52	53.41	47.24	46.64
	Minimum	65.80	65.48	61.53	61.14	51.06	50.04	44.43	42.33
	Maximum	74.31	78.29	67.78	68.49	58.42	58.50	49.92	49.32
	C.V.(%)	3.943	6.241	3.037	4.144	4.981	6.065	3.780	4.918
	No. Specimens	8		8		8		8	
	No. Prepreg Lots	1		1		1		1	
E_2^c [Msi]	**Mean**	3.973	3.934	3.711	3.691	3.720	3.702	3.518	3.793
	Minimum	3.795	3.605	3.513	3.501	3.545	3.449	3.338	3.606
	Maximum	4.333	4.267	3.899	4.065	3.901	3.857	3.601	3.953
	C.V.(%)	4.159	5.707	3.313	4.700	3.074	4.067	2.180	2.663
	No. Specimens	8		8		9		8	
	No. Prepreg Lots	1		1		1		1	

2.2.5 In-Plane Shear Properties (IPS)

Material:	Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%		**In-Plane Shear** Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38% [45/-45]3S
Resin content:	33.71 % wt	**Comp. density:** 1.766 g/cc	
Fiber volume:	46.11 % vol		
Ply count:	12		
Test method:	ASTM D3518-18	**Modulus calculation:** 1000 to 3000 microstrain for CTD, RTD, and ETW 1000 to 2500 microstrain for ETD	
Normalized by:	NA		

		CTD		RTD		ETD		ETW	
Test Temperature [°F]		-65		70		180		180	
Moisture Conditioning		Dry		Dry		Dry		Equilbrium	
Equilbrium at T, RH								145 F,85%	
Source code prefixed by: NTP7653E1-PAC-P03-PAC-		IPS-X-CX-1-CTD-X		IPS-X-CX-1-RTD-X		IPS-X-CX-1-ETD-X		IPS-X-CX-1-ETW-X	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
$F_{12}^{s0.2\%}$ [ksi]	**Mean**		7.095		5.002		3.436		2.308
	Minimum		6.378		4.158		3.103		1.943
	Maximum		7.737		5.315		3.722		2.937
	C.V.(%)		4.634		5.265		4.640		12.17
	No. Specimens	18		18		18		18	
	No. Prepreg Lots	3		3		3		3	
$F_{12}^{s5\%strain}$ [ksi]	**Mean**		12.35		8.962		6.661		4.288
	Minimum		10.77		7.504		5.366		3.480
	Maximum		13.43		9.796		7.678		5.212
	C.V.(%)		6.739		6.640		7.938		9.585
	No. Specimens	18		18		18		18	
	No. Prepreg Lots	3		3		3		3	
G_{12}^{s} [Msi]	**Mean**		0.8490		0.6857		0.5423		0.3193
	Minimum		0.7810		0.6152		0.4916		0.2309
	Maximum		0.9138		0.7550		0.6184		0.4273
	C.V.(%)		5.897		5.660		5.779		22.15
	No. Specimens	18		18		18		18	
	No. Prepreg Lots	3		3		3		3	

2.2.6 Lamina Short-Beam Strength Properties (SBS)

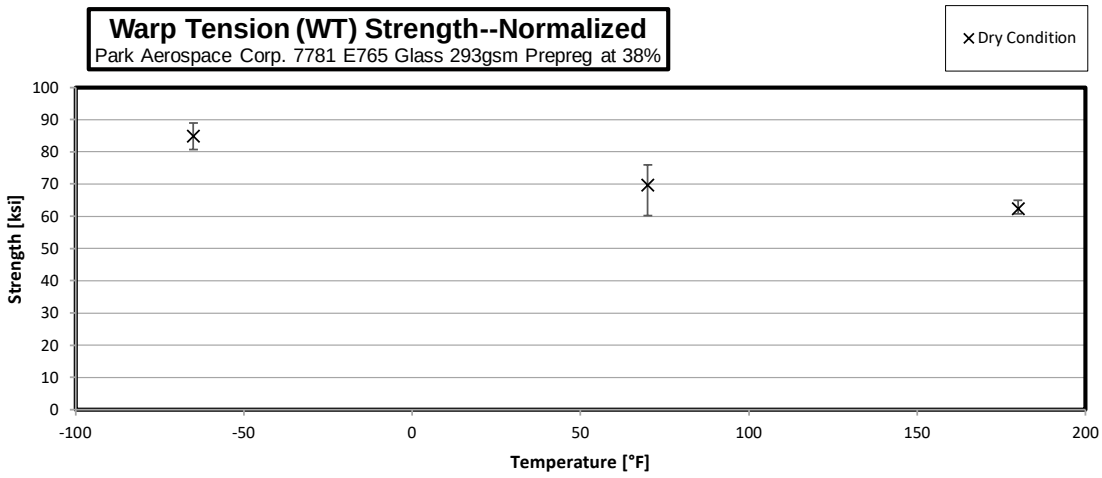
Material:	Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%							**Short-Beam Strength** Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38% [0]12	
Resin content:	33.43 % wt	**Comp. density:**	1.802 g/cc						
Fiber volume:	47.22 % vol								
Ply count:	12								
Test method:	ASTM D2344-16								
Normalized by:	NA								
			RTD						
Test Temperature [°F]			70						
Moisture Conditioning			Dry						
Equilbrium at T, RH									
Source code prefixed by: NTP7653E1-PAC-P03-PAC-			SBS-A-CX-1-RTD-X						
		Normalized	**Measured**						
SBS [ksi]	**Mean**		8.850						
	Minimum		8.253						
	Maximum		9.770						
	C.V.(%)		6.385						
	No. Specimens		8						
	No. Prepreg Lots		1						

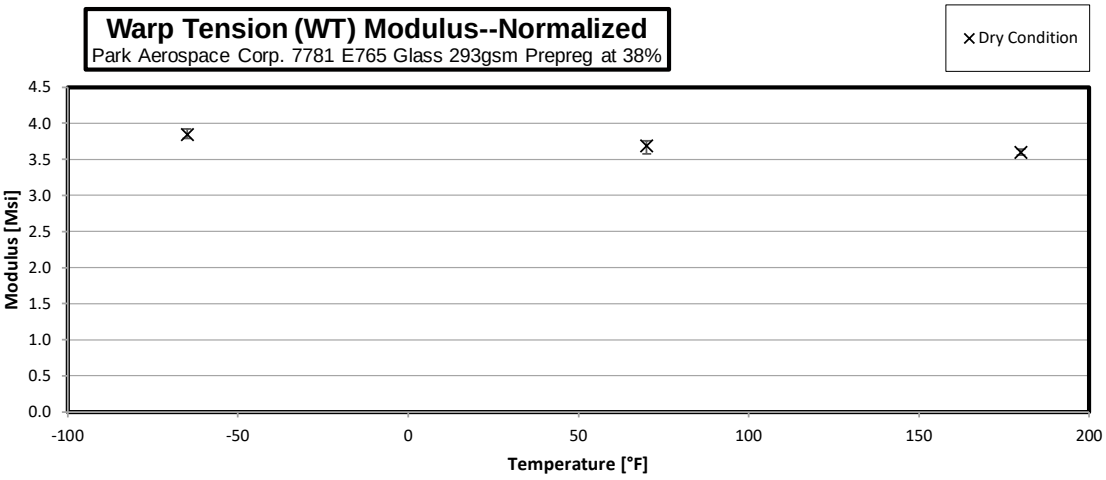
3. Individual Test Charts

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

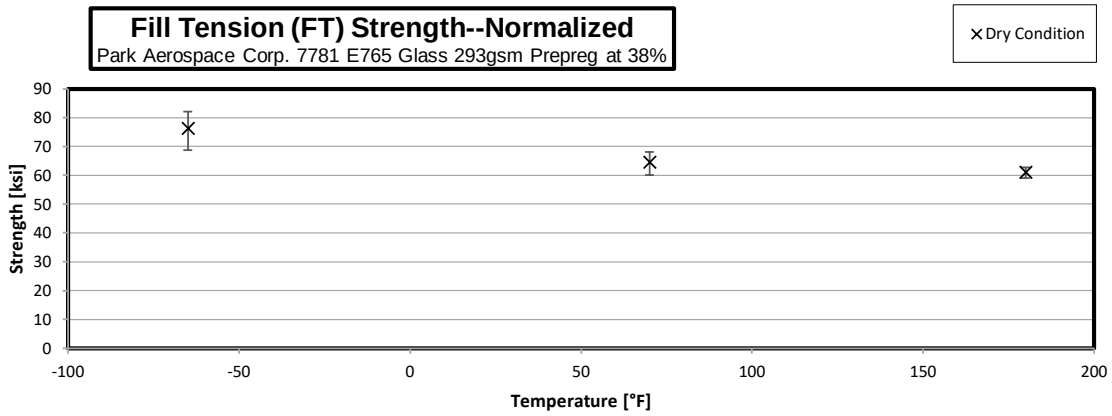
Test temperature for ETD is 180°F but is offset to 170°F in the charts below to allow clarity when reviewing plots.

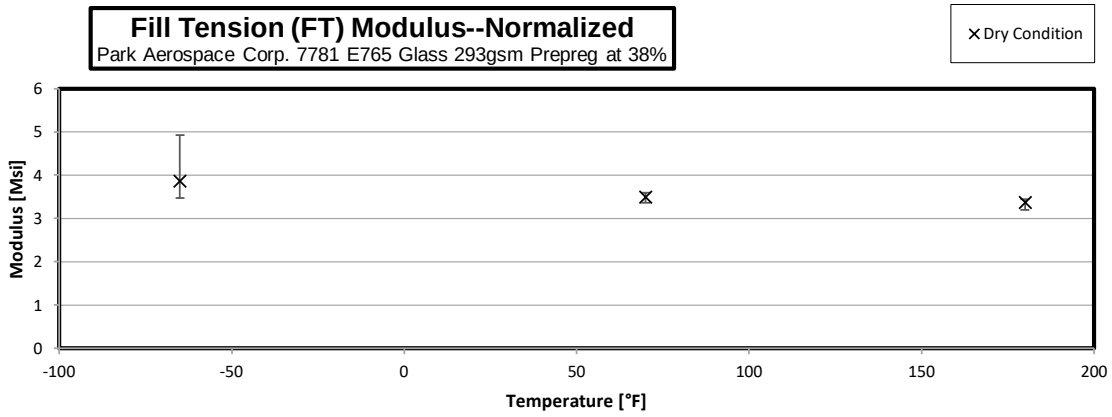
3.1 Warp Tension Properties (WT)



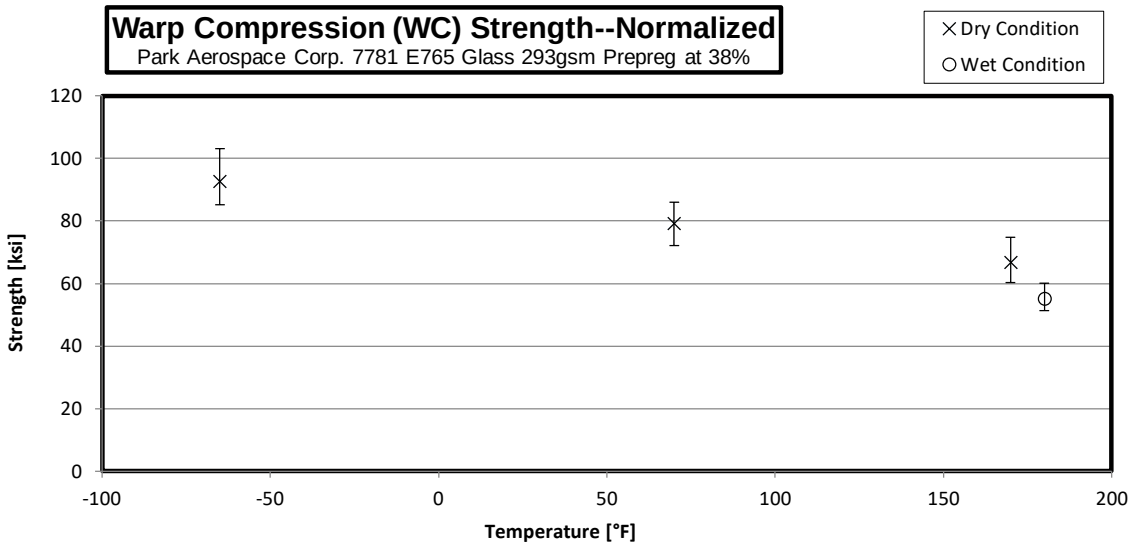


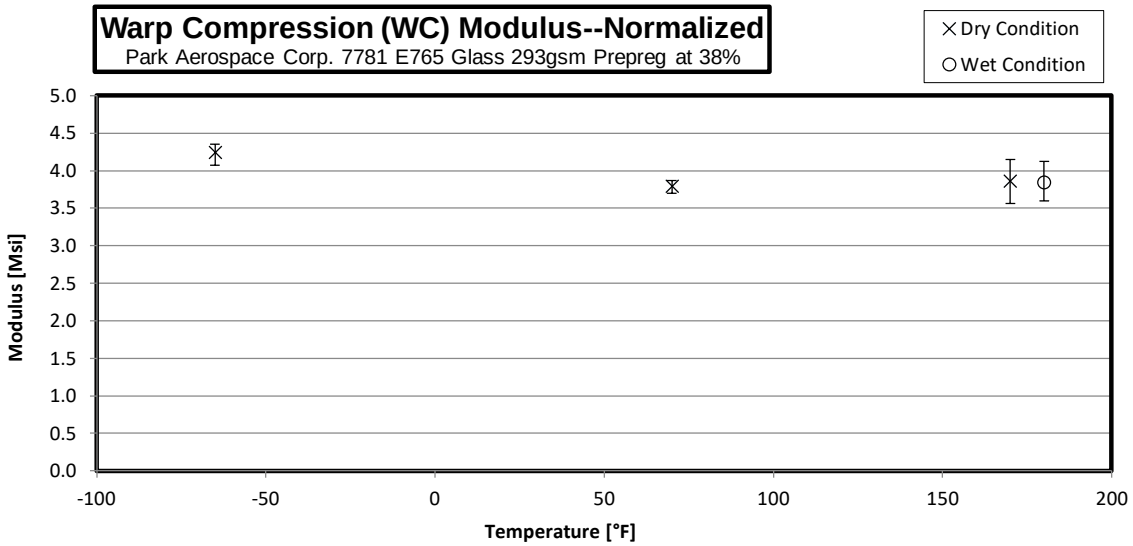
3.2 Fill Tension Properties (FT)



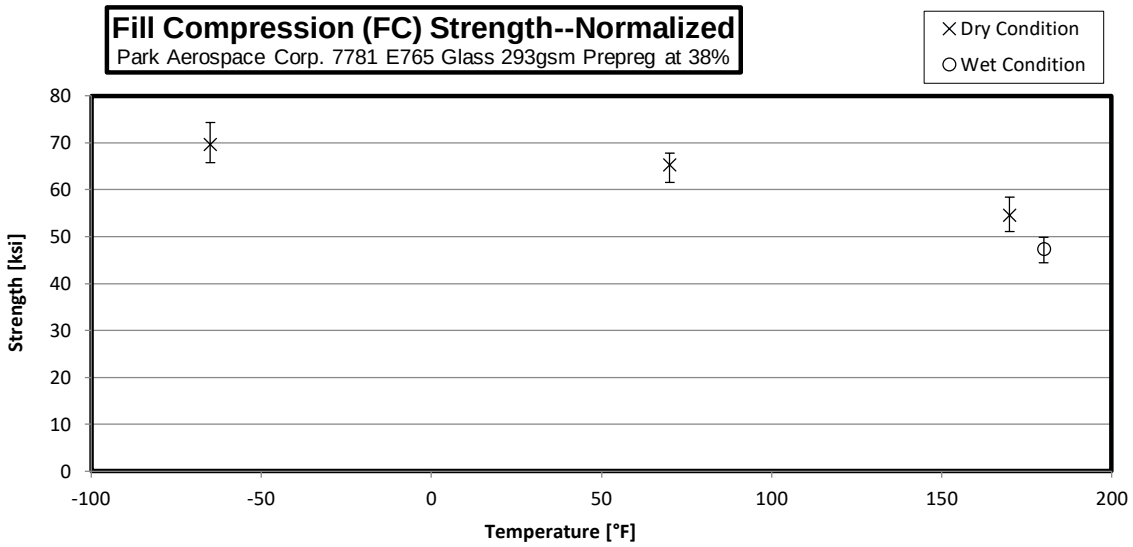


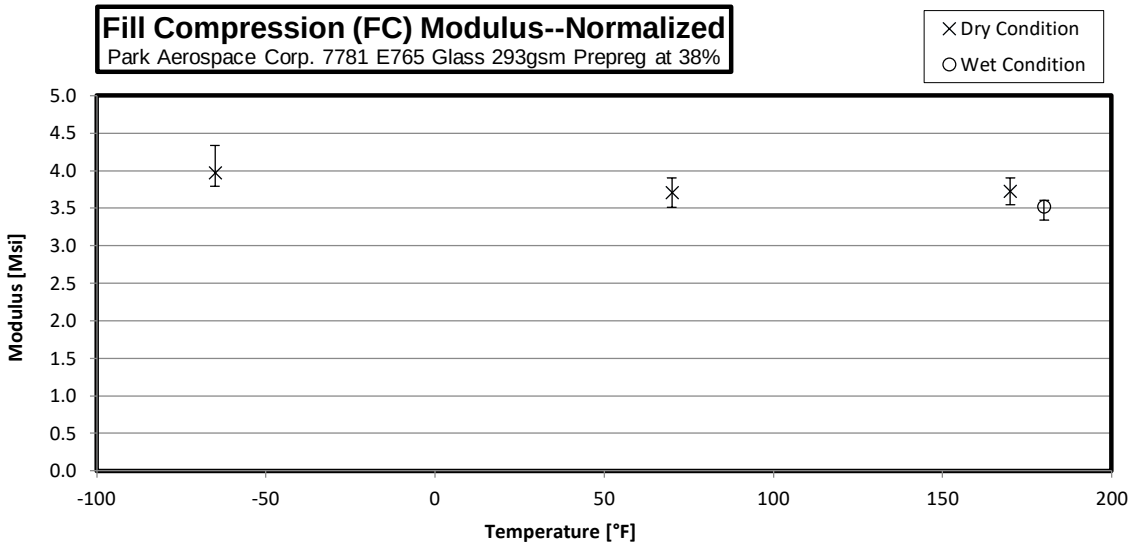
3.3 Warp Compression Properties (WC)



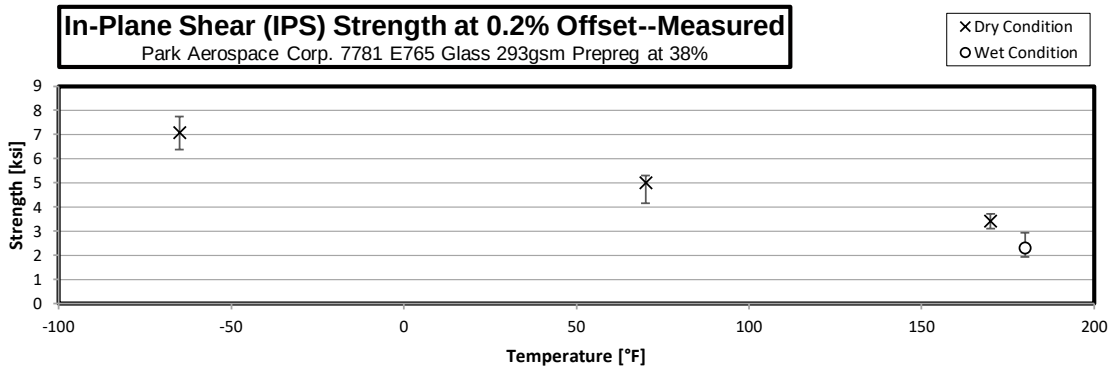


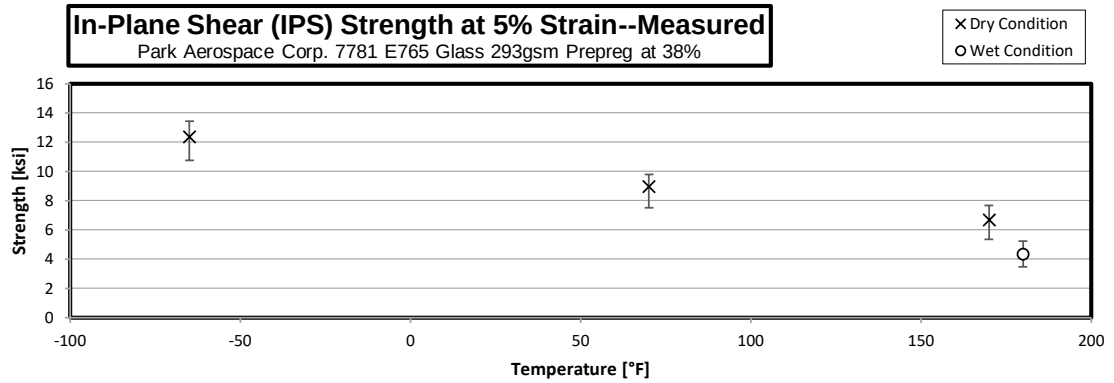
3.4 Fill Compression Properties (FC)

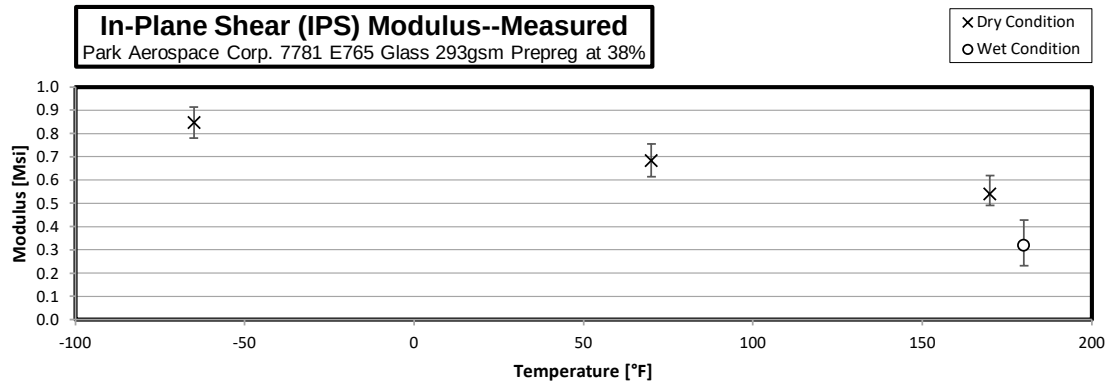




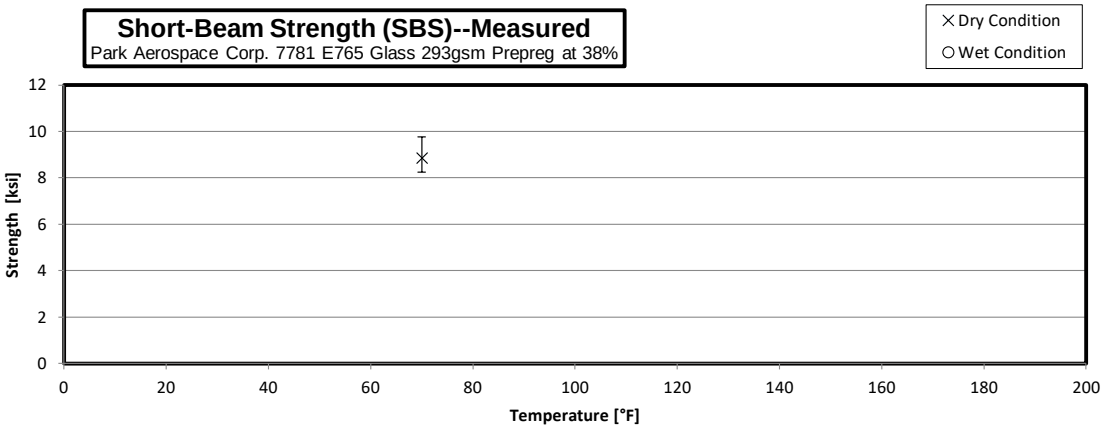
3.5 In-Plane Shear Properties (IPS)







3.6 Lamina Short-Beam Strength Properties (SBS)



4. Raw Data

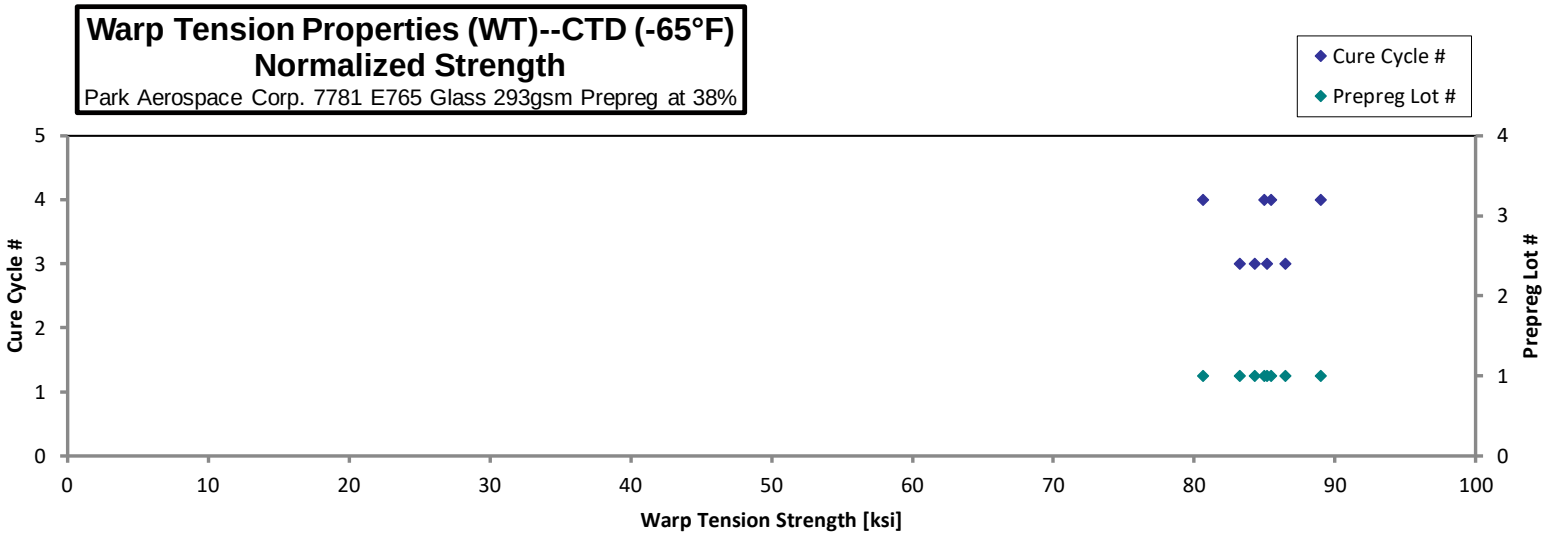
4.1 Warp Tension Properties (WT)

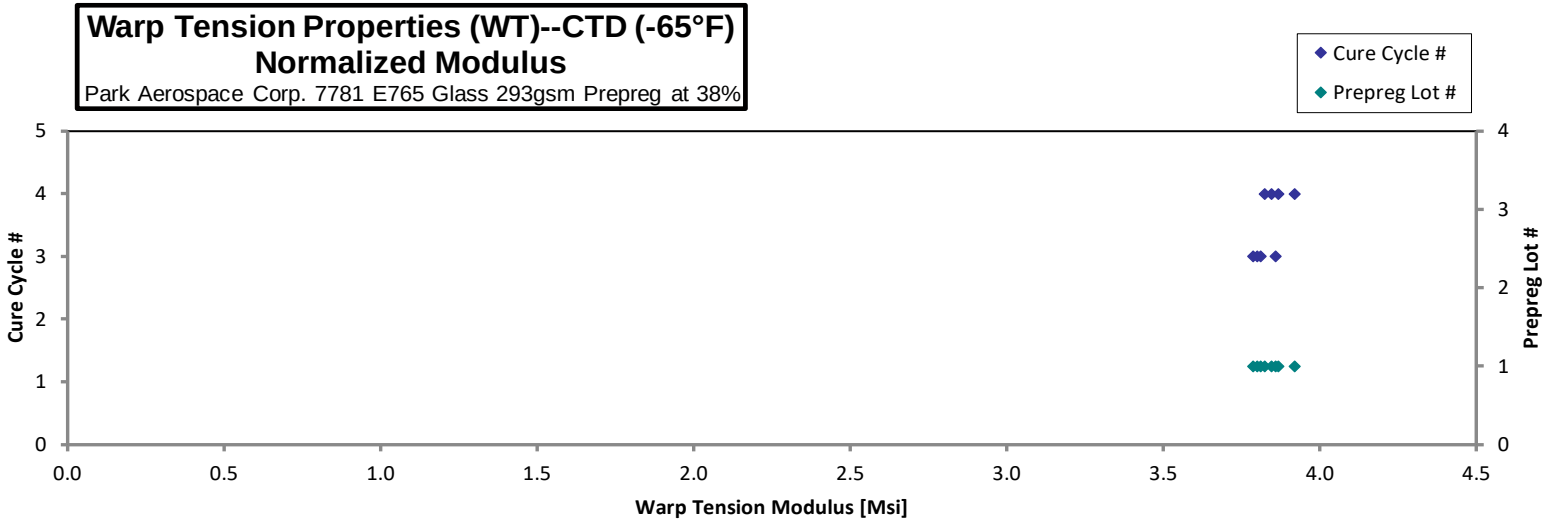
Warp Tension Properties (WT)--CTD (-65°F)
Strength & Modulus
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%

normalizing t_{ply} [in]
0.009800

Specimen Number	Park Aerospace Corp. Batch #	Park Aerospace Corp. Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
NTP7653E1-PAC-P03-PAC-WT-A-C3-1-CTD-1	A	C3	1	3	79.48	3.536	0.1260	12	LIB/LAT	0.01050	85.16	3.788
NTP7653E1-PAC-P03-PAC-WT-A-C3-1-CTD-2	A	C3	1	3	78.07	3.520	0.1270	12	LAT	0.01058	84.31	3.801
NTP7653E1-PAC-P03-PAC-WT-A-C3-1-CTD-3	A	C3	1	3	84.40	3.913	0.1160	12	LAT	0.009667	83.25	3.859
NTP7653E1-PAC-P03-PAC-WT-A-C3-1-CTD-4	A	C3	1	3	85.47	3.767	0.1190	12	LAB	0.009917	86.49	3.812
NTP7653E1-PAC-P03-PAC-WT-A-C4-1-CTD-1	A	C4	1	4	79.15	3.541	0.1270	12	GIT	0.01058	85.48	3.825
NTP7653E1-PAC-P03-PAC-WT-A-C4-1-CTD-2	A	C4	1	4	86.92	3.934	0.1150	12	LIT/LGB	0.009583	84.99	3.847
NTP7653E1-PAC-P03-PAC-WT-A-C4-1-CTD-3	A	C4	1	4	74.66	3.583	0.1270	12	LAT/LAB	0.01058	80.63	3.869
NTP7653E1-PAC-P03-PAC-WT-A-C4-1-CTD-4	A	C4	1	4	85.80	3.779	0.1220	12	LIT/LAB	0.01017	89.01	3.920

	Strength [ksi]	Modulus [Msi]		t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
Average	**81.74**	**3.697**	**$Average_{norm}$**	**0.01020**	**84.92**	**3.840**
Standard Dev.	**4.466**	**0.1727**	**Standard $Dev._{norm}$**		**2.424**	**0.04304**
Coeff. of Var. [%]	**5.464**	**4.673**	**Coeff. of Var. $[\%]_{norm}$**		**2.855**	**1.121**
Min.	**74.66**	**3.520**	**Min.**	**0.009583**	**80.63**	**3.788**
Max.	**86.92**	**3.934**	**Max.**	**0.01058**	**89.01**	**3.920**
Number of Spec.	**8**	**8**	**Number of Spec.**	**8**	**8**	**8**


Warp Tension Properties (WT)--CTD (-65°F)
Normalized Strength
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Warp Tension Strength [ksi]
0
10
20
30
40
50
60
70
80
90
100
0
1
2
3
4
5


Warp Tension Properties (WT)--CTD (-65°F)
Normalized Modulus
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Warp 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

Warp Tension Properties (WT)--RTD (70°F)
Strength & Modulus

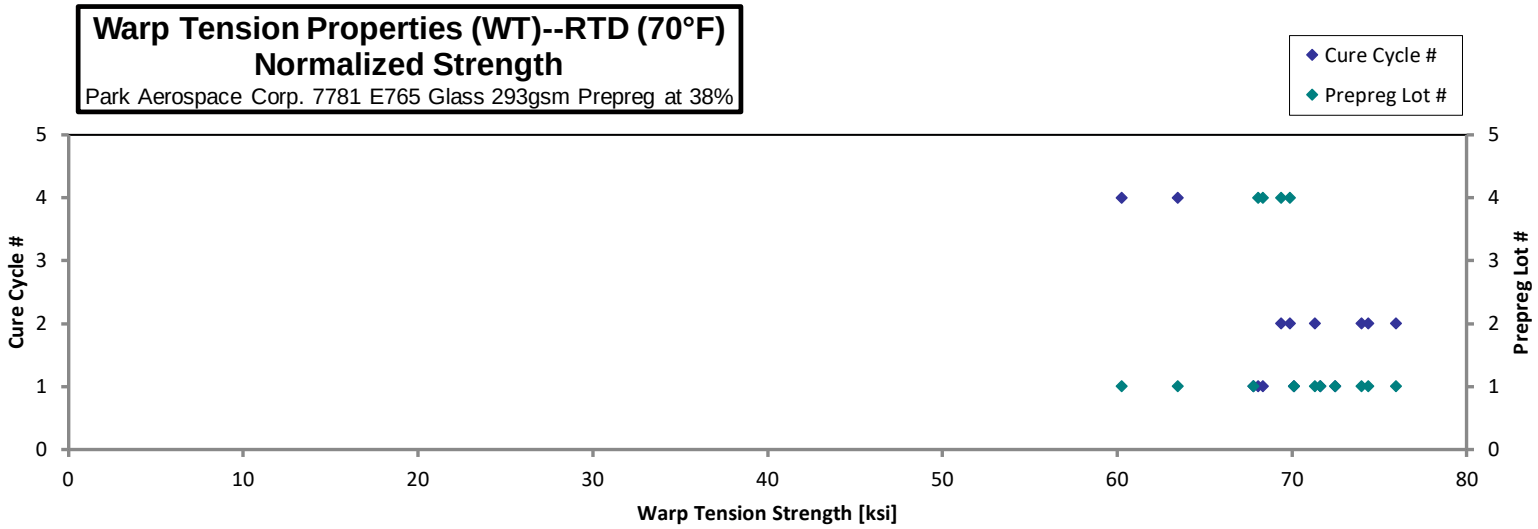
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%

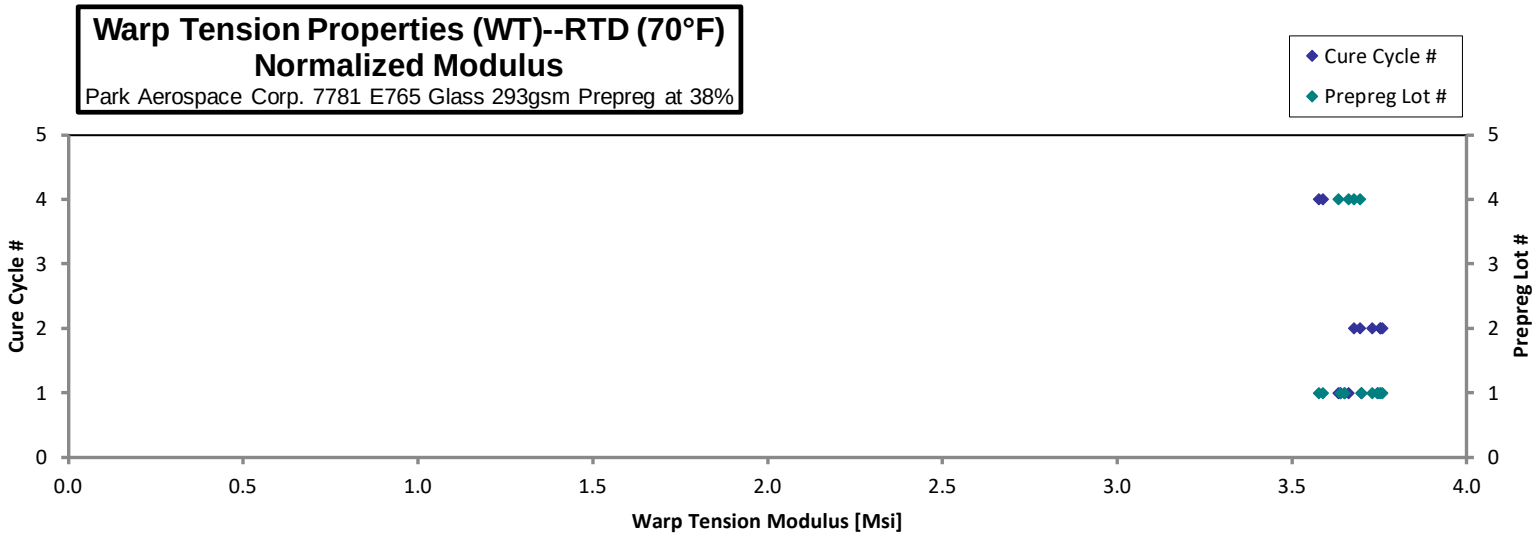
normalizing t_{ply} [in]
0.009800

Specimen Number	Park Aerospace Corp. Batch #	Park Aerospace Corp. Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
NTP7653E1-PAC-P03-PAC-WT-A-C1-1-RTD-1	A	C1	1	1	72.59	3.688	0.1160	12	GAT	0.009667	71.60	3.638
NTP7653E1-PAC-P03-PAC-WT-A-C1-1-RTD-2	A	C1	1	1	66.98	3.607	0.1190	12	GAB	0.009917	67.78	3.650
NTP7653E1-PAC-P03-PAC-WT-A-C1-1-RTD-3	A	C1	1	1	71.00	3.625	0.1200	12	GAT	0.01000	72.45	3.699
NTP7653E1-PAC-P03-PAC-WT-A-C1-1-RTD-4	A	C1	1	1	67.02	3.581	0.1230	12	GAB	0.01025	70.10	3.746
NTP7653E1-PAC-P03-PAC-WT-A-C2-1-RTD-1	A	C2	1	2	73.57	3.871	0.1140	12	GAT	0.009500	71.32	3.752
NTP7653E1-PAC-P03-PAC-WT-A-C2-1-RTD-2	A	C2	1	2	74.99	3.781	0.1160	12	GAB	0.009667	73.97	3.730
NTP7653E1-PAC-P03-PAC-WT-A-C2-1-RTD-3	A	C2	1	2	77.37	3.911	0.1130	12	GAT	0.009417	74.34	3.758
NTP7653E1-PAC-P03-PAC-WT-A-C2-1-RTD-4	A	C2	1	2	76.36	3.773	0.1170	12	GAB	0.009750	75.97	3.753
NTP7653E1-PAC-P03-PAC-WT-A-C4-1-RTD-1*	A	C4	1	4	53.90	3.200	0.1314	12	M(A,D,L)AB	0.01095	60.24	3.576
NTP7653E1-PAC-P03-PAC-WT-A-C4-1-RTD-2*	A	C4	1	4	57.11	3.231	0.1307	12	M(A,D,L)AB	0.01089	63.46	3.590
NTP7653E1-PAC-P03-PAC-WT-D-C1-1-RTD-1*	D	C1	4	1	72.10	3.865	0.1115	12	LAT	0.00929	68.33	3.663
NTP7653E1-PAC-P03-PAC-WT-D-C1-1-RTD-2*	D	C1	4	1	70.60	3.770	0.1134	12	LAT	0.00945	68.05	3.634
NTP7653E1-PAC-P03-PAC-WT-D-C2-1-RTD-1*	D	C2	4	2	75.41	3.970	0.1090	12	LAT	0.00908	69.87	3.678
NTP7653E1-PAC-P03-PAC-WT-D-C2-1-RTD-2*	D	C2	4	2	73.71	3.928	0.1107	12	LAB	0.00922	69.36	3.696

*Tested by NIAR

	Strength	Modulus		$Strength_{norm}$	$Modulus_{norm}$
Average	**70.19**	**3.700**	**$Average_{norm}$**	**0.009789**	**69.77**	**3.683**
Standard Dev.	**6.965**	**0.2388**	**Standard $Dev._{norm}$**		**4.205**	**0.06073**
Coeff. of Var. [%]	**9.923**	**6.453**	**Coeff. of Var. $[\%]_{norm}$**		**6.027**	**1.649**
Min.	**53.90**	**3.200**	**Min.**	**0.009081**	**60.24**	**3.576**
Max.	**77.37**	**3.970**	**Max.**	**0.01095**	**75.97**	**3.758**
Number of Spec.	**14**	**14**	**Number of Spec.**	**14**	**14**	**14**


Warp Tension Properties (WT)--RTD (70°F)
Normalized Strength
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Warp Tension Strength [ksi]
0
10
20
30
40
50
60
70
80
0
1
2
3
4
5


Warp Tension Properties (WT)--RTD (70°F)
Normalized Modulus
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Warp Tension Modulus [Msi]
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
0
1
2
3
4
5

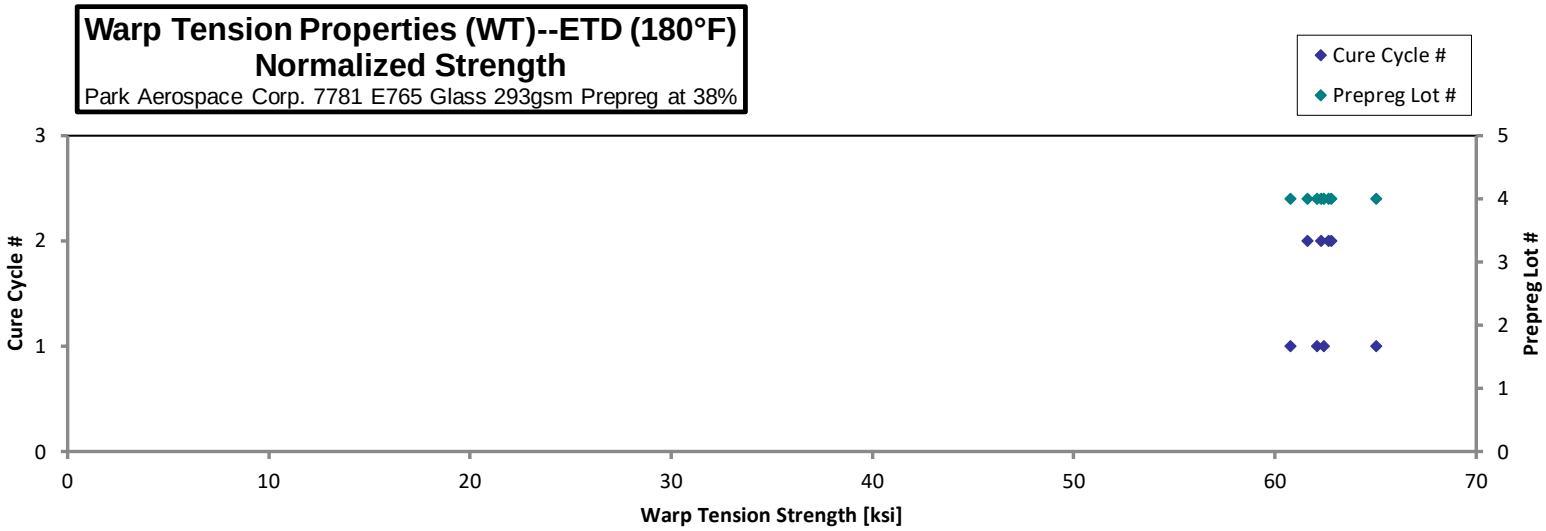
Warp Tension Properties (WT)--ETD (180°F)
Strength & Modulus
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%

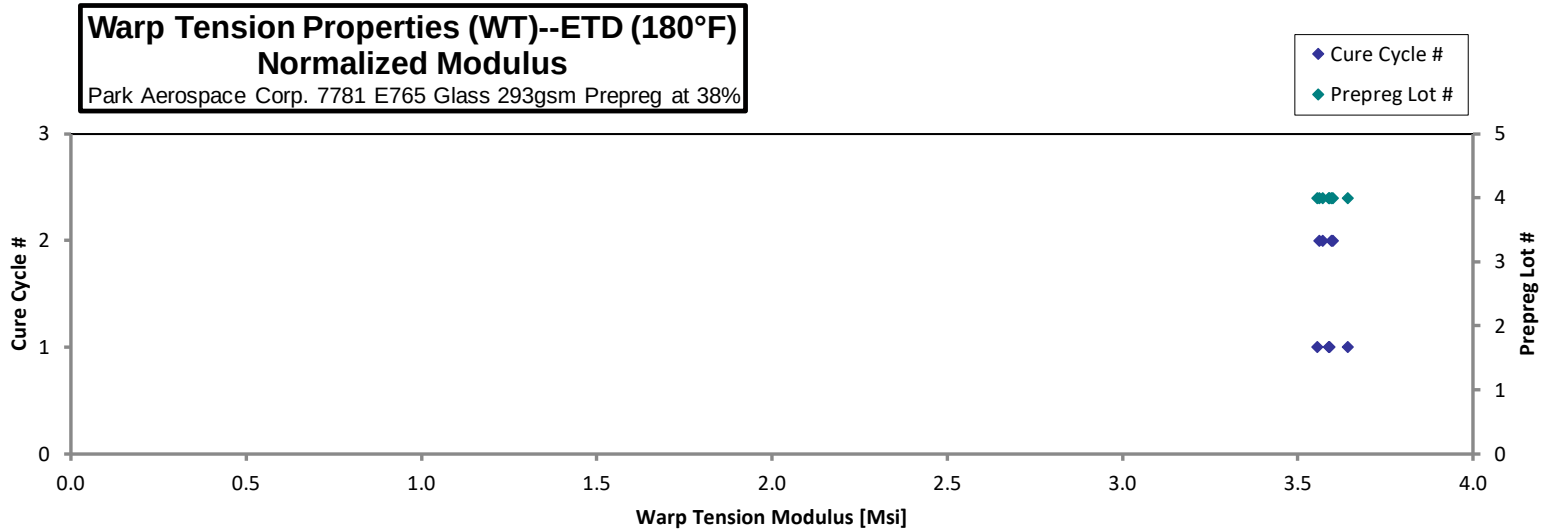
normalizing t_{ply} [in]
0.009800

Specimen Number	Park Aerospace Corp. Batch #	Park Aerospace Corp. Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
NTP7653E1-PAC-P03-PAC-WT-D-C1-1-ETD-1*	D	C1	4	1	67.02	3.755	0.1141	12	LAB	0.009507	65.02	3.643
NTP7653E1-PAC-P03-PAC-WT-D-C1-1-ETD-2*	D	C1	4	1	64.83	3.728	0.1132	12	LAB	0.009435	62.42	3.589
NTP7653E1-PAC-P03-PAC-WT-D-C1-1-ETD-3*	D	C1	4	1	65.02	3.724	0.1123	12	LAB	0.009357	62.08	3.556
NTP7653E1-PAC-P03-PAC-WT-D-C1-1-ETD-4*	D	C1	4	1	64.38	3.804	0.1110	12	LAB	0.009250	60.76	3.590
NTP7653E1-PAC-P03-PAC-WT-D-C2-1-ETD-1*	D	C2	4	2	63.06	3.657	0.1149	12	LAB	0.009571	61.59	3.572
NTP7653E1-PAC-P03-PAC-WT-D-C2-1-ETD-2*	D	C2	4	2	63.95	3.664	0.1154	12	LAB	0.009619	62.77	3.596
NTP7653E1-PAC-P03-PAC-WT-D-C2-1-ETD-3*	D	C2	4	2	63.17	3.653	0.1159	12	LAB	0.009661	62.27	3.601
NTP7653E1-PAC-P03-PAC-WT-D-C2-1-ETD-4*	D	C2	4	2	65.10	3.701	0.1132	12	LAB	0.009432	62.66	3.562

*Tested by NIAR

	Strength [ksi]	Modulus [Msi]		t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
Average	**64.57**	**3.711**	**$Average_{norm}$**	**0.009479**	**62.44**	**3.589**
Standard Dev.	**1.267**	**0.05293**	**Standard $Dev._{norm}$**		**1.225**	**0.02740**
Coeff. of Var. [%]	**1.963**	**1.426**	**Coeff. of Var. $[\%]_{norm}$**		**1.962**	**0.7634**
Min.	**63.06**	**3.653**	**Min.**	**0.009250**	**60.76**	**3.556**
Max.	**67.02**	**3.804**	**Max.**	**0.009661**	**65.02**	**3.643**
Number of Spec.	**8**	**8**	**Number of Spec.**	**8**	**8**	**8**


Warp Tension Properties (WT)--ETD (180°F)
Normalized Strength
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Warp Tension Strength [ksi]
0
10
20
30
40
50
60
70
0
1
2
3
0
1
2
3
4
5


Warp Tension Properties (WT)--ETD (180°F)
Normalized Modulus
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Warp Tension Modulus [Msi]
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
0
1
2
3
0
1
2
3
4
5

4.2 Fill Tension Properties (FT)

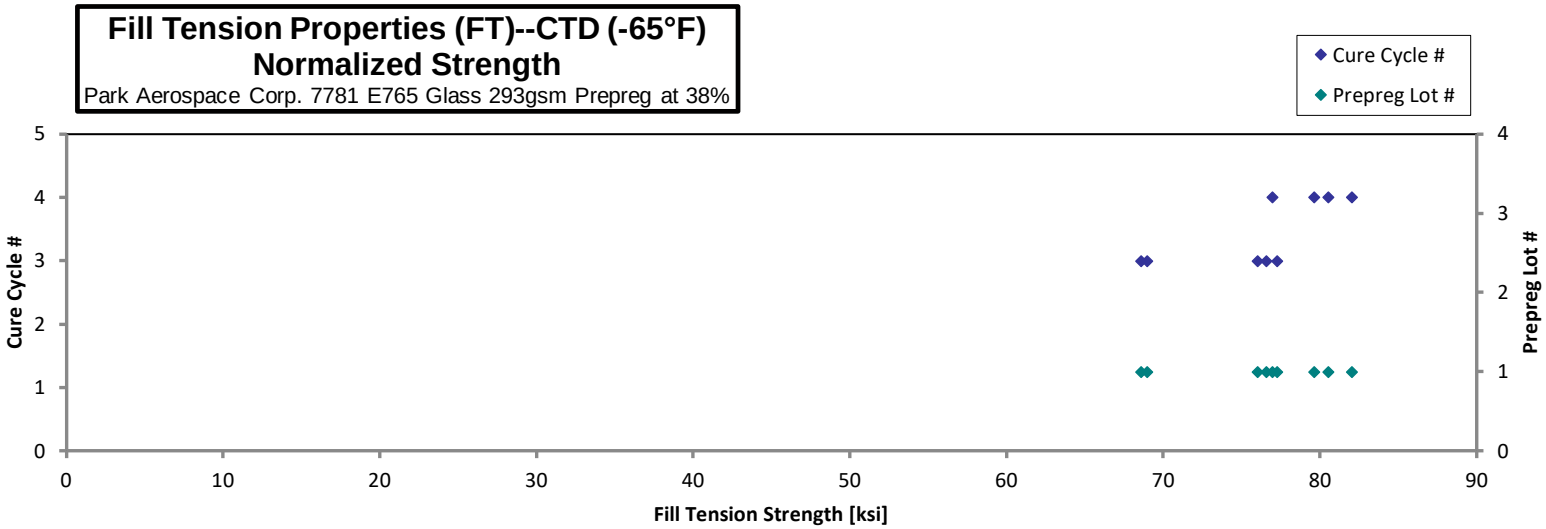
Fill Tension Properties (FT)--CTD (-65°F)
Strength & Modulus
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%

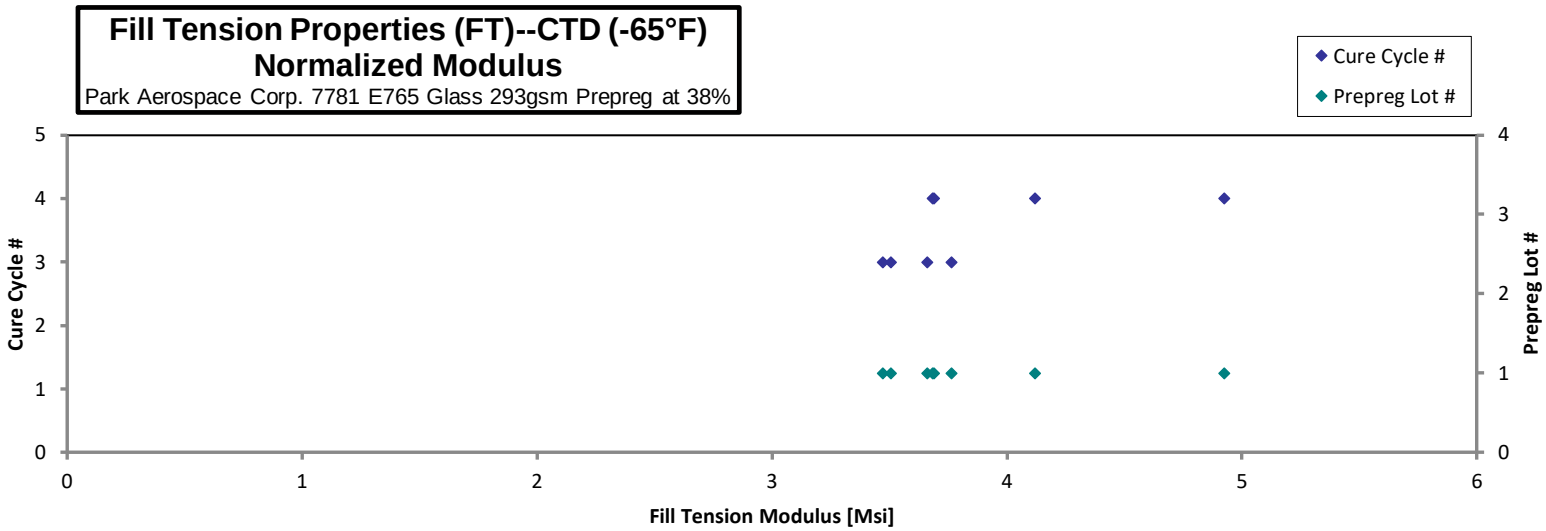
normalizing t_{ply} [in]: 0.009800

Specimen Number	Park Aerospace Corp. Batch #	Park Aerospace Corp. Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
NTP7653E1-PAC-P03-PAC-FT-A-C3-1-CTD-1*	A	C3	1	3	72.12		0.1240	12	AGT	0.01033	76.05	
NTP7653E1-PAC-P03-PAC-FT-A-C3-1-CTD-2	A	C3	1	3	63.39	3.460	0.1280	12	LAT	0.01067	68.99	3.765
NTP7653E1-PAC-P03-PAC-FT-A-C3-1-CTD-3	A	C3	1	3	71.84	3.290	0.1253	12	LAT/LAB	0.01044	76.57	3.507
NTP7653E1-PAC-P03-PAC-FT-A-C3-1-CTD-4	A	C3	1	3	71.93	3.407	0.1263	12	LAB	0.01053	77.27	3.660
NTP7653E1-PAC-P03-PAC-FT-A-C3-1-CTD-5	A	C3	1	3	63.36	3.207	0.1273	12	DGT	0.01061	68.60	3.473
NTP7653E1-PAC-P03-PAC-FT-A-C4-1-CTD-1	A	C4	1	4	72.59	4.645	0.1247	12	LAB/LAT	0.01039	76.96	4.924
NTP7653E1-PAC-P03-PAC-FT-A-C4-1-CTD-2	A	C4	1	4	76.79	3.517	0.1233	12	AGT	0.01028	80.53	3.689
NTP7653E1-PAC-P03-PAC-FT-A-C4-1-CTD-3	A	C4	1	4	75.55	3.907	0.1240	12	LAT	0.01033	79.66	4.120
NTP7653E1-PAC-P03-PAC-FT-A-C4-1-CTD-4	A	C4	1	4	81.07	3.640	0.1190	12	LAB/LAT	0.009917	82.03	3.683

*No strain data was recorded.

	Strength [ksi]	Modulus [Msi]		Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
Average	**72.07**	**3.634**	**$Average_{norm}$**	**0.01039**	**76.30**	**3.853**
Standard Dev.	**5.776**	**0.4617**	**Standard $Dev._{norm}$**		**4.693**	**0.4756**
Coeff. of Var. [%]	**8.015**	**12.71**	**Coeff. of Var. $[\%]_{norm}$**		**6.151**	**12.35**
Min.	**63.36**	**3.207**	**Min.**	**0.009917**	**68.60**	**3.473**
Max.	**81.07**	**4.645**	**Max.**	**0.01067**	**82.03**	**4.924**
Number of Spec.	**9**	**8**	**Number of Spec.**	**9**	**9**	**8**


Fill Tension Properties (FT)--CTD (-65°F)
Normalized Strength
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Fill Tension Strength [ksi]
0
10
20
30
40
50
60
70
80
90
0
1
2
3
4
5


Fill Tension Properties (FT)--CTD (-65°F)
Normalized Modulus
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Fill Tension Modulus [Msi]
0
1
2
3
4
5
6
0
1
2
3
4
5

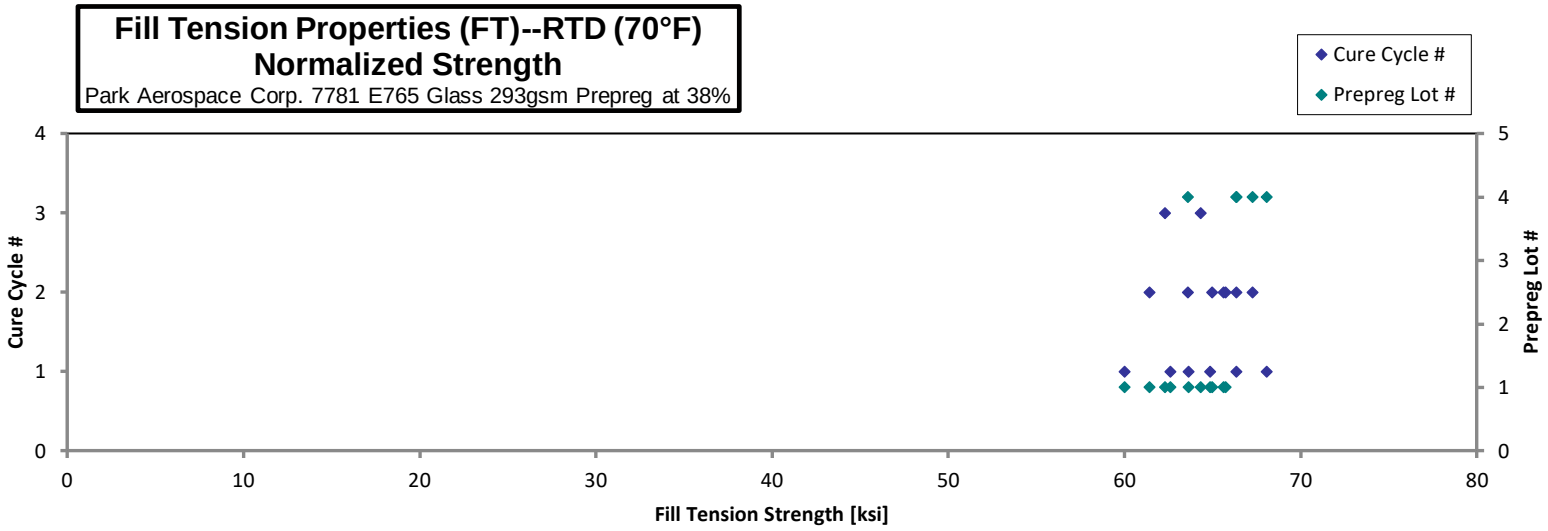
Fill Tension Properties (FT)--RTD (70°F)
Strength & Modulus
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%

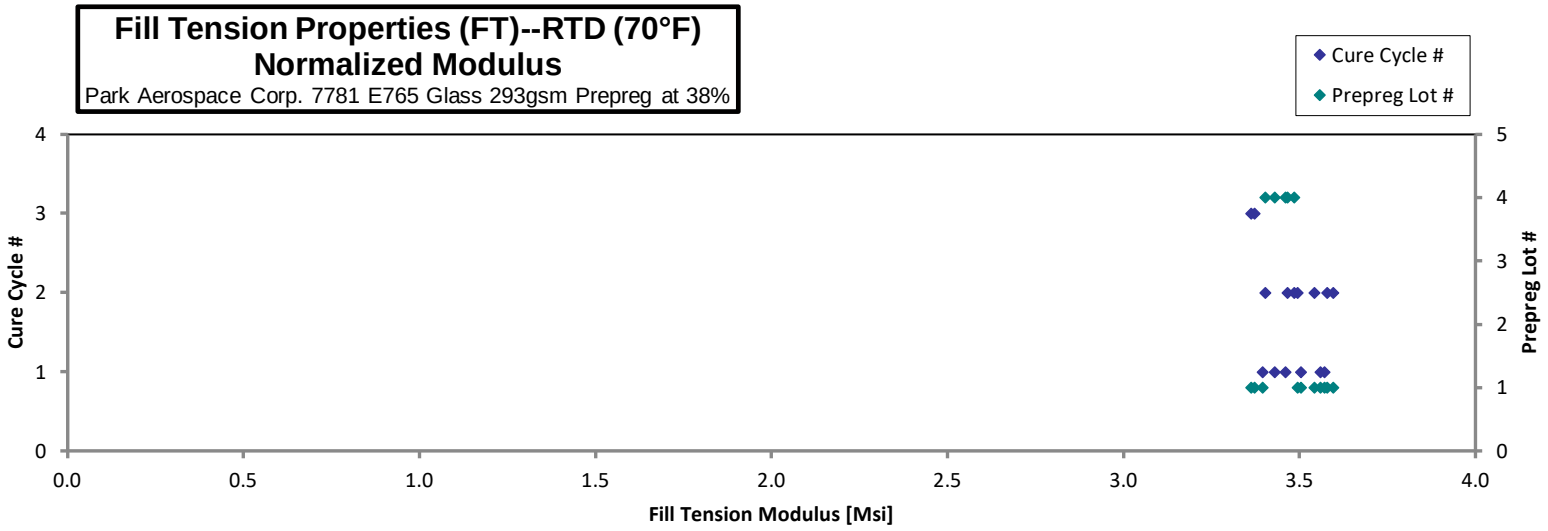
normalizing t_{ply} [in]: 0.009800

Specimen Number	Park Aerospace Corp. Batch #	Park Aerospace Corp. Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
NTP7653E1-PAC-P03-PAC-FT-A-C1-1-RTD-1	A	C1	1	1	63.99	3.413	0.1170	12	LAT	0.009750	63.66	3.395
NTP7653E1-PAC-P03-PAC-FT-A-C1-1-RTD-2	A	C1	1	1	59.81	3.548	0.1180	12	LAT	0.009833	60.02	3.560
NTP7653E1-PAC-P03-PAC-FT-A-C1-1-RTD-3	A	C1	1	1	61.90	3.463	0.1190	12	LAT	0.009917	62.63	3.504
NTP7653E1-PAC-P03-PAC-FT-A-C1-1-RTD-4	A	C1	1	1	64.64	3.559	0.1180	12	LAT	0.009833	64.86	3.572
NTP7653E1-PAC-P03-PAC-FT-A-C2-1-RTD-1	A	C2	1	2	61.74	3.561	0.1170	12	LAT	0.009750	61.43	3.543
NTP7653E1-PAC-P03-PAC-FT-A-C2-1-RTD-2	A	C2	1	2	64.78	3.584	0.1180	12	LAB	0.009833	65.00	3.596
NTP7653E1-PAC-P03-PAC-FT-A-C2-1-RTD-3	A	C2	1	2	64.87	3.537	0.1190	12	LGM	0.009917	65.64	3.580
NTP7653E1-PAC-P03-PAC-FT-A-C2-1-RTD-4	A	C2	1	2	65.52	3.483	0.1180	12	SGM	0.009833	65.75	3.495
NTP7653E1-PAC-P03-PAC-FT-A-C3-1-RTD-1*	A	C3	1	3	56.82	3.066	0.1290	12	M(A,D,L)GM, AWB	0.01075	62.33	3.363
NTP7653E1-PAC-P03-PAC-FT-A-C3-1-RTD-2*	A	C3	1	3	58.70	3.078	0.1289	12	M(A,D,L)WB	0.01074	64.34	3.373
NTP7653E1-PAC-P03-PAC-FT-D-C1-1-RTD-1*	D	C1	4	1	70.83	3.601	0.1130	12	M(A,L)WT, DGM	0.009419	68.08	3.461
NTP7653E1-PAC-P03-PAC-FT-D-C1-1-RTD-2*	D	C1	4	1	69.24	3.579	0.1127	12	M(A,L)WB	0.009394	66.38	3.431
NTP7653E1-PAC-P03-PAC-FT-D-C2-1-RTD-1*	D	C2	4	2	65.04	3.563	0.1150	12	M(A,D,L)WT	0.009586	63.62	3.485
NTP7653E1-PAC-P03-PAC-FT-D-C2-1-RTD-2*	D	C2	4	2	69.06	3.556	0.1146	12	M(A,D,L)WT	0.009550	67.30	3.466
NTP7653E1-PAC-P03-PAC-FT-D-C2-1-RTD-3*	D	C2	4	2	68.20	3.497	0.1144	12	M(A,L)WT	0.009536	66.36	3.402

*Tested by NIAR

	Strength [ksi]	Modulus [Msi]		t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
Average	**64.34**	**3.472**	**Average$_{norm}$**	**0.009843**	**64.49**	**3.482**
Standard Dev.	**4.031**	**0.1704**	**Standard Dev.$_{norm}$**		**2.238**	**0.07751**
Coeff. of Var. [%]	**6.265**	**4.906**	**Coeff. of Var. [%]$_{norm}$**		**3.470**	**2.226**
Min.	**56.82**	**3.066**	**Min.**	**0.009394**	**60.02**	**3.363**
Max.	**70.83**	**3.601**	**Max.**	**0.01075**	**68.08**	**3.596**
Number of Spec.	**15**	**15**	**Number of Spec.**	**15**	**15**	**15**


Fill Tension Properties (FT)--RTD (70°F)
Normalized Strength
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Fill Tension Strength [ksi]
0
10
20
30
40
50
60
70
80
0
1
2
3
4
5


Fill Tension Properties (FT)--RTD (70°F)
Normalized Modulus
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Fill Tension Modulus [Msi]
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
0
1
2
3
4
5

Fill Tension Properties (FT)--ETD (180°F)
Strength & Modulus
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%

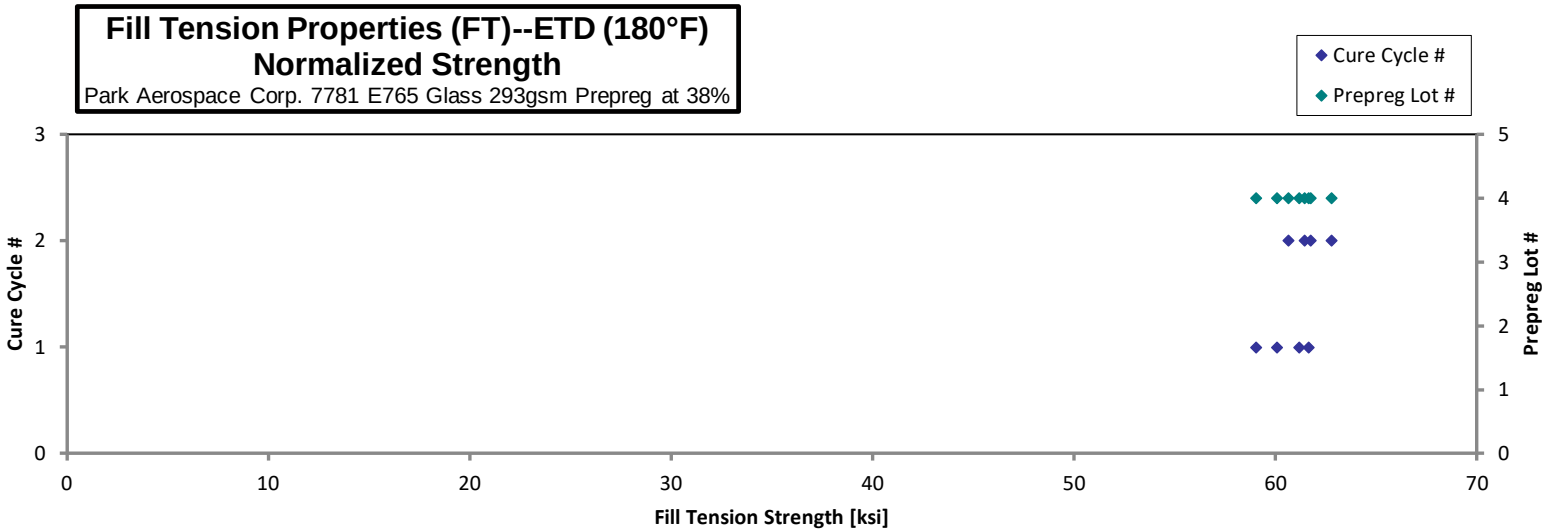
normalizing t_{ply} [in]
0.009800

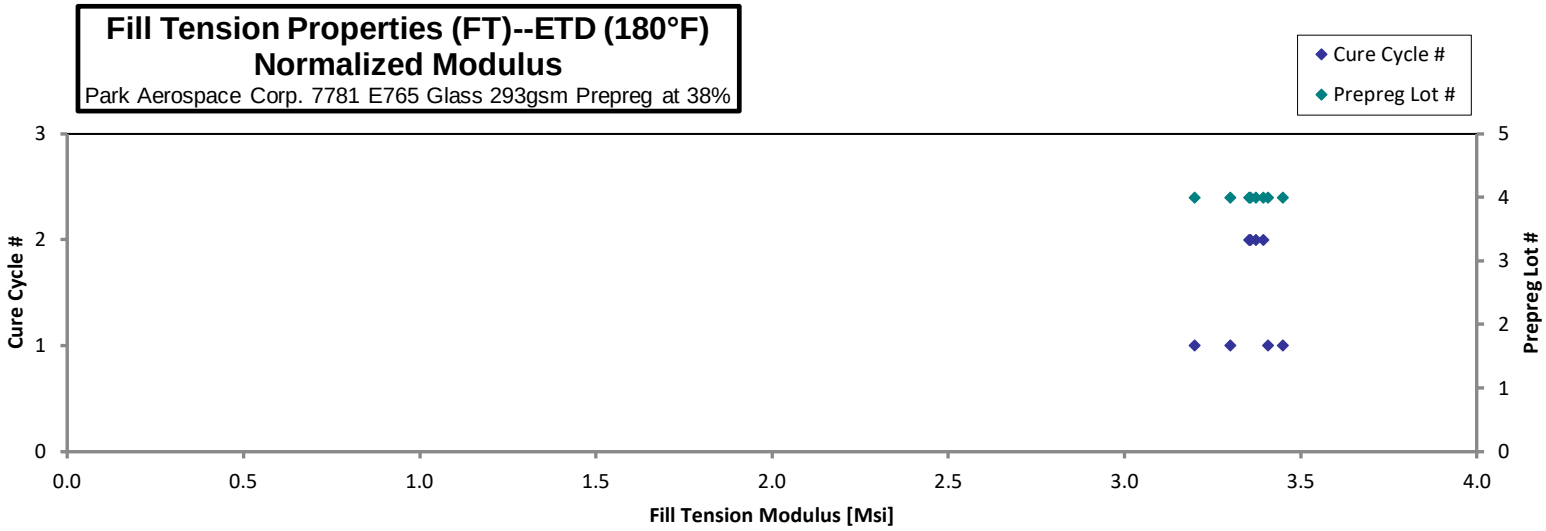
Specimen Number	Park Aerospace Corp. Batch #	Park Aerospace Corp. Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
NTP7653E1-PAC-P03-PAC-FT-D-C1-1-ETD-1*	D	C1	4	1	61.65	3.604	0.1126	12	DGM, M(A,L)GT	0.009382	59.02	3.450
NTP7653E1-PAC-P03-PAC-FT-D-C1-1-ETD-2*	D	C1	4	1	62.73	3.448	0.1126	12	DGM, M(A,L)WT	0.009383	60.06	3.301
NTP7653E1-PAC-P03-PAC-FT-D-C1-1-ETD-3*	D	C1	4	1	64.13	3.328	0.1131	12	DGM, M(A,L)WT	0.009421	61.65	3.199
NTP7653E1-PAC-P03-PAC-FT-D-C1-1-ETD-4*	D	C1	4	1	63.83	3.556	0.1127	12	DGM, M(A,L)WT	0.009392	61.17	3.408
NTP7653E1-PAC-P03-PAC-FT-D-C2-1-ETD-1*	D	C2	4	2	62.62	3.482	0.1139	12	M(D,A,L)GM	0.009492	60.65	3.373
NTP7653E1-PAC-P03-PAC-FT-D-C2-1-ETD-2*	D	C2	4	2	63.74	3.479	0.1134	12	LWT, DGM, M(A,L)WB	0.009446	61.44	3.353
NTP7653E1-PAC-P03-PAC-FT-D-C2-1-ETD-3*	D	C2	4	2	65.05	3.479	0.1135	12	M(A,L)GM	0.009461	62.80	3.359
NTP7653E1-PAC-P03-PAC-FT-D-C2-1-ETD-4*	D	C2	4	2	63.86	3.511	0.1137	12	M(A,L)GT	0.009475	61.75	3.395

*Tested by NIAR

	Strength [ksi]	Modulus [Msi]
Average	**63.45**	**3.486**
Standard Dev.	**1.059**	**0.08102**
Coeff. of Var. [%]	**1.670**	**2.324**
Min.	**61.65**	**3.328**
Max.	**65.05**	**3.604**
Number of Spec.	**8**	**8**

	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
$Average_{norm}$	**0.009431**	**61.07**	**3.355**
Standard $Dev._{norm}$		**1.153**	**0.07644**
Coeff. of Var. $[\%]_{norm}$		**1.889**	**2.279**
Min.	**0.009382**	**59.02**	**3.199**
Max.	**0.009492**	**62.80**	**3.450**
Number of Spec.	**8**	**8**	**8**


Fill Tension Properties (FT)--ETD (180°F)
Normalized Strength
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Fill Tension Strength [ksi]
0
10
20
30
40
50
60
70
0
1
2
3
0
1
2
3
4
5


Fill Tension Properties (FT)--ETD (180°F)
Normalized Modulus
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Fill Tension Modulus [Msi]
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
0
1
2
3
0
1
2
3
4
5

4.3 Warp Compression Properties (WC)

Warp Compression Properties (WC)--CTD (-65°F)
Strength & Modulus
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%

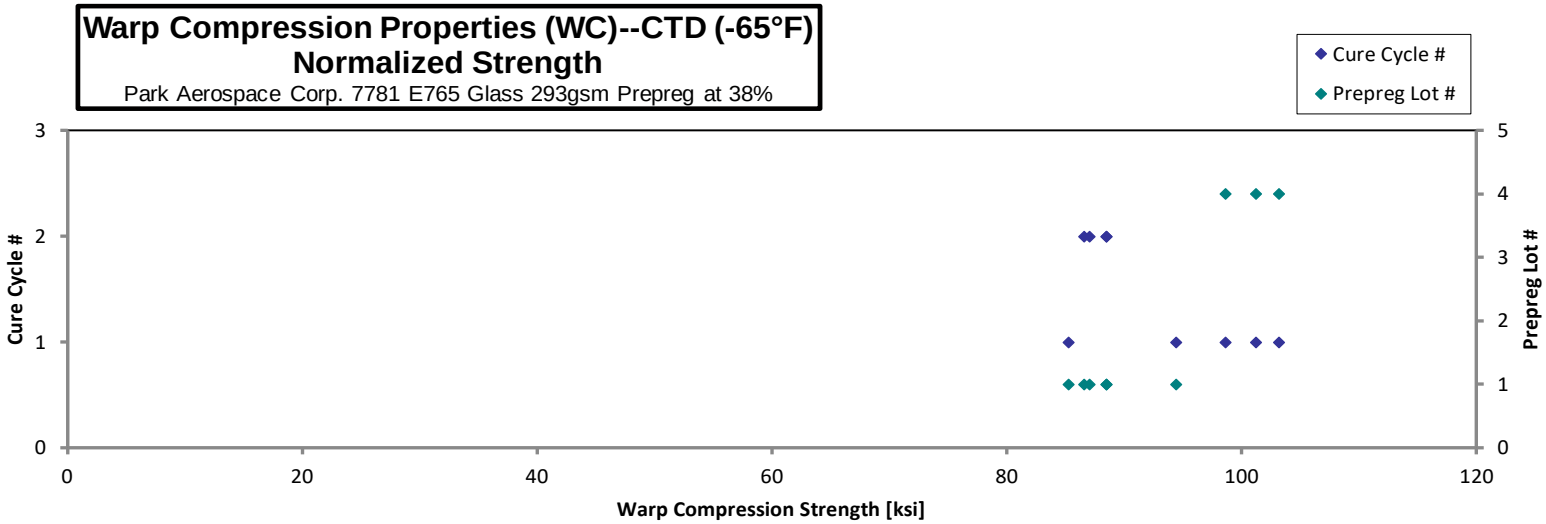
normalizing t_{ply} [in]
0.009800

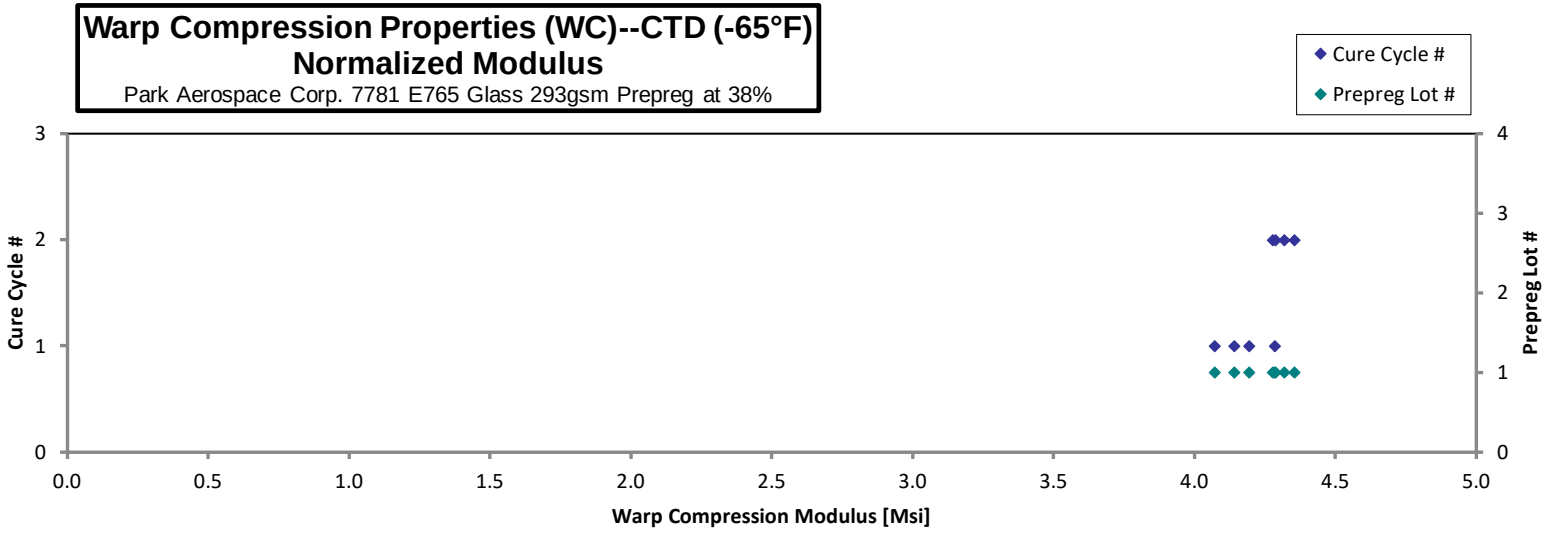
Specimen Number	Park Aerospace Corp. Batch #	Park Aerospace Corp. Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
NTP7653E1-PAC-P03-PAC-WCM-A-C1-1-CTD-1	A	C1	1	1		4.510	0.1260	14	n/a	0.009000		4.142
NTP7653E1-PAC-P03-PAC-WCM-A-C1-1-CTD-2	A	C1	1	1		4.433	0.1260	14	n/a	0.009000		4.071
NTP7653E1-PAC-P03-PAC-WCM-A-C1-1-CTD-3	A	C1	1	1		4.556	0.1263	14	n/a	0.009024		4.195
NTP7653E1-PAC-P03-PAC-WCM-A-C1-1-CTD-4	A	C1	1	1		4.667	0.1260	14	n/a	0.009000		4.286
NTP7653E1-PAC-P03-PAC-WCM-A-C2-1-CTD-1	A	C2	1	2		4.689	0.1263	14	n/a	0.009024		4.318
NTP7653E1-PAC-P03-PAC-WCM-A-C2-1-CTD-2	A	C2	1	2		4.718	0.1247	14	n/a	0.008905		4.287
NTP7653E1-PAC-P03-PAC-WCM-A-C2-1-CTD-3	A	C2	1	2		4.669	0.1257	14	n/a	0.008976		4.277
NTP7653E1-PAC-P03-PAC-WCM-A-C2-1-CTD-4	A	C2	1	2		4.756	0.1257	14	n/a	0.008976		4.356
NTP7653E1-PAC-P03-PAC-WCS-A-C1-1-CTD-1	A	C1	1	1	82.99		0.1410	14	BGM	0.01007	85.29	
NTP7653E1-PAC-P03-PAC-WCS-A-C1-1-CTD-2	A	C1	1	1	91.25		0.1420	14	BGM	0.01014	94.44	
NTP7653E1-PAC-P03-PAC-WCS-A-C2-1-CTD-1	A	C2	1	2	85.48		0.1390	14	BGM	0.009929	86.60	
NTP7653E1-PAC-P03-PAC-WCS-A-C2-1-CTD-2	A	C2	1	2	87.18		0.1370	14	BGM	0.009786	87.05	
NTP7653E1-PAC-P03-PAC-WCS-A-C2-1-CTD-3	A	C2	1	2	87.98		0.1380	14	BGM	0.009857	88.49	
NTP7653E1-PAC-P03-PAC-WCS-A-C2-1-CTD-4	A	C2	1	2	87.35		0.1390	14	BGM	0.009929	88.49	
NTP7653E1-PAC-P03-PAC-WCS-D-C1-2-CTD-1*	D	C1	4	1	91.22		0.1484	14	BGM	0.01060	98.64	
NTP7653E1-PAC-P03-PAC-WCS-D-C1-2-CTD-2*	D	C1	4	1	95.83		0.1478	14	BAB	0.01055	103.2	
NTP7653E1-PAC-P03-PAC-WCS-D-C1-2-CTD-3*	D	C1	4	1	94.38		0.1471	14	BGM	0.01051	101.2	

*Tested by NIAR

Average	**89.30**	**4.625**	
Standard Dev.	**4.191**	**0.1124**	
Coeff. of Var. [%]	**4.693**	**2.430**	
Min.	**82.99**	**4.433**	
Max.	**95.83**	**4.756**	
Number of Spec.	**9**	**8**	

$Average_{norm}$	**0.009605**	**92.60**	**4.241**
$Standard\ Dev._{norm}$		**6.899**	**0.09656**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**7.450**	**2.277**
Min.	**0.008905**	**85.29**	**4.071**
Max.	**0.01060**	**103.2**	**4.356**
Number of Spec.	**17**	**9**	**8**


Warp Compression Properties (WC)--CTD (-65°F)
Normalized Strength
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Warp Compression Strength [ksi]
0
20
40
60
80
100
120
0
1
2
3
0
1
2
3
4
5


Warp Compression Properties (WC)--CTD (-65°F)
Normalized Modulus
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Warp Compression Modulus [Msi]
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
0
1
2
3
0
1
2
3
4

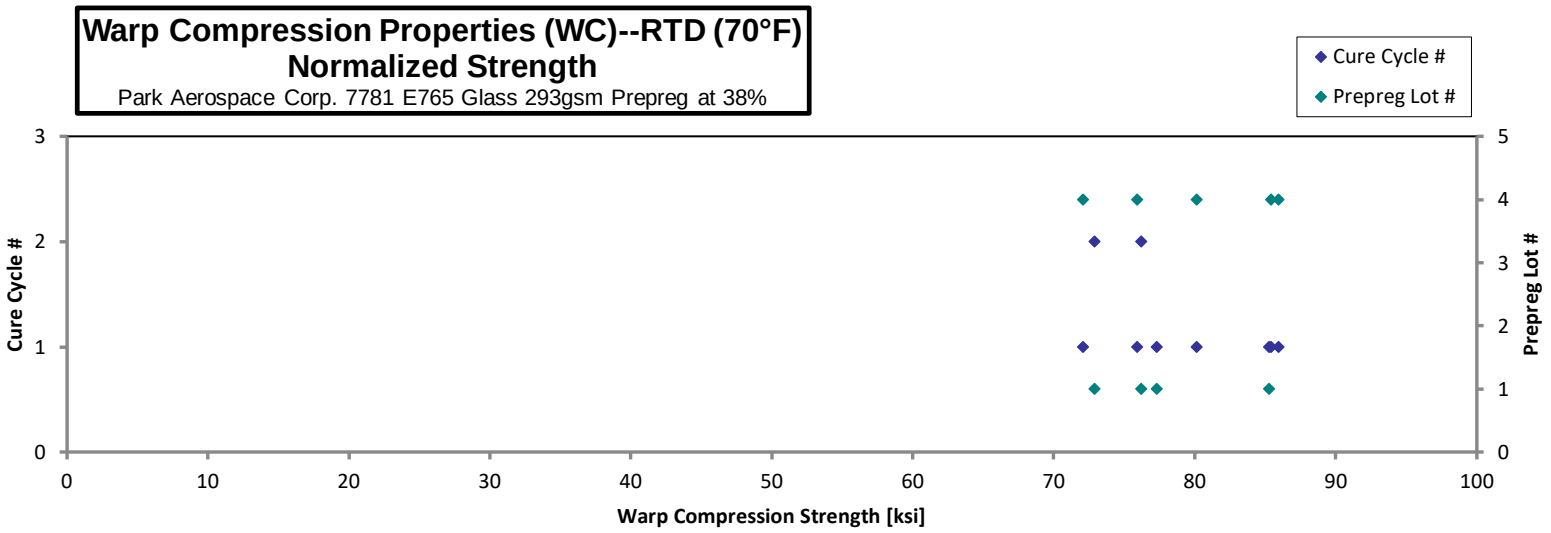
Warp Compression Properties (WC)--RTD (70°F)
Strength & Modulus
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%

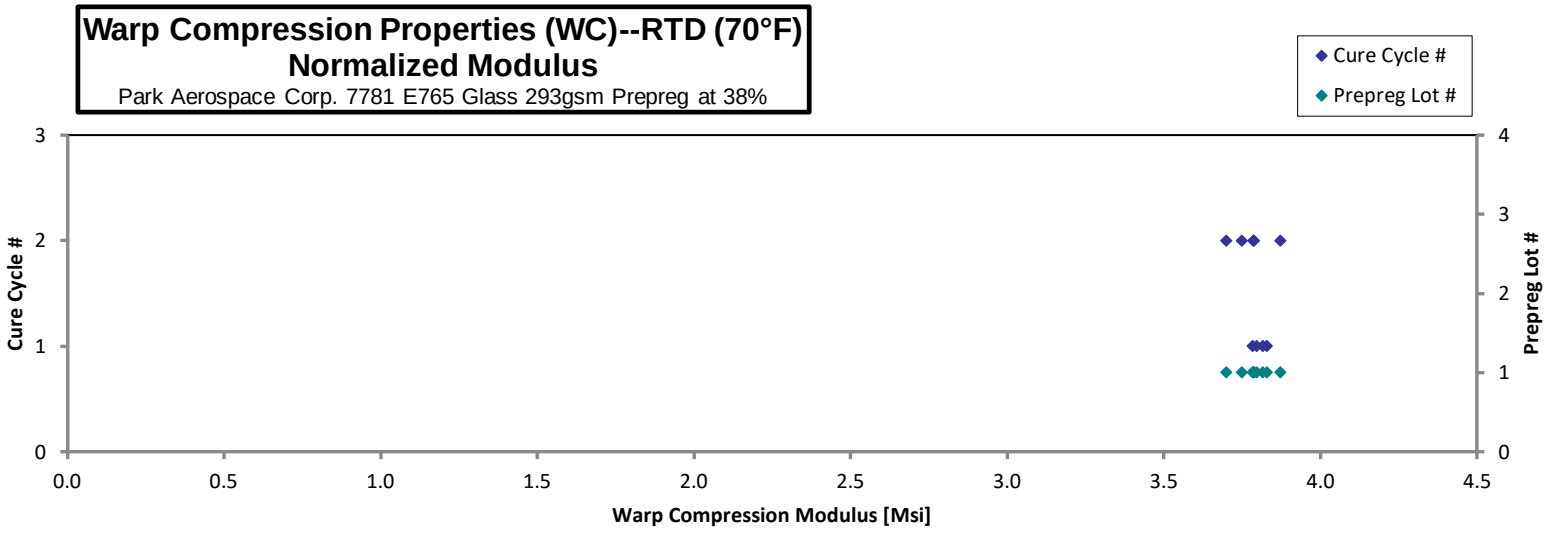
normalizing t_{ply} [in]: 0.009800

Specimen Number	Park Aerospace Corp. Batch #	Park Aerospace Corp. Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
NTP7653E1-PAC-P03-PAC-WCM-A-C1-1-RTD-1	A	C1	1	1		4.134	0.1260	14	n/a	0.009000		3.797
NTP7653E1-PAC-P03-PAC-WCM-A-C1-1-RTD-2	A	C1	1	1		4.170	0.1260	14	n/a	0.009000		3.830
NTP7653E1-PAC-P03-PAC-WCM-A-C1-1-RTD-3	A	C1	1	1		3.902	0.1330	14	n/a	0.009500		3.782
NTP7653E1-PAC-P03-PAC-WCM-A-C1-1-RTD-4	A	C1	1	1		3.907	0.1340	14	n/a	0.009571		3.816
NTP7653E1-PAC-P03-PAC-WCM-A-C2-1-RTD-1	A	C2	1	2		3.509	0.1480	14	n/a	0.01057		3.785
NTP7653E1-PAC-P03-PAC-WCM-A-C2-1-RTD-2	A	C2	1	2		4.082	0.1260	14	n/a	0.009000		3.749
NTP7653E1-PAC-P03-PAC-WCM-A-C2-1-RTD-3	A	C2	1	2		3.487	0.1490	14	n/a	0.01064		3.787
NTP7653E1-PAC-P03-PAC-WCM-A-C2-1-RTD-4	A	C2	1	2		3.406	0.1490	14	n/a	0.01064		3.699
NTP7653E1-PAC-P03-PAC-WCM-A-C2-1-CTD-5**	A	C2	1	2		4.216	0.1260	14	n/a	0.008999		3.871
NTP7653E1-PAC-P03-PAC-WCS-A-C1-1-RTD-2	A	C1	1	1	76.32		0.1390	14	BGM	0.009929	77.32	
NTP7653E1-PAC-P03-PAC-WCS-A-C1-1-RTD-4	A	C1	1	1	84.48		0.1385	14	BGM	0.009893	85.28	
NTP7653E1-PAC-P03-PAC-WCS-A-C2-1-RTD-2	A	C2	1	2	80.39		0.1300	14	BGM	0.009286	76.17	
NTP7653E1-PAC-P03-PAC-WCS-A-C2-1-RTD-3	A	C2	1	2	74.60		0.1340	14	BGM	0.009571	72.86	
NTP7653E1-PAC-P03-PAC-WCS-D-C1-2-RTD-1*	D	C1	4	1	85.14		0.1385	14	BGM	0.009893	85.94	
NTP7653E1-PAC-P03-PAC-WCS-D-C1-2-RTD-2*	D	C1	4	1	83.11		0.1410	14	BGM	0.01007	85.42	
NTP7653E1-PAC-P03-PAC-WCS-D-C1-2-RTD-3*	D	C1	4	1	69.57		0.1422	14	BGM	0.01015	72.09	
NTP7653E1-PAC-P03-PAC-WCS-D-C1-2-RTD-4*	D	C1	4	1	72.57		0.1435	14	BGM	0.01025	75.88	
NTP7653E1-PAC-P03-PAC-WCS-D-C1-2-RTD-5*	D	C1	4	1	75.75		0.1452	14	BGM	0.01037	80.15	

*Tested by NIAR
**Tested by NIAR at RTD

Average	**77.99**	**3.868**		**$Average_{norm}$**	**0.009797**	**79.01**	**3.791**
Standard Dev.	**5.532**	**0.3199**		**Standard $Dev._{norm}$**		**5.434**	**0.04854**
Coeff. of Var. [%]	**7.093**	**8.271**		**Coeff. of Var. $[\%]_{norm}$**		**6.877**	**1.281**
Min.	**69.57**	**3.406**		**Min.**	**0.008999**	**72.09**	**3.699**
Max.	**85.14**	**4.216**		**Max.**	**0.01064**	**85.94**	**3.871**
Number of Spec.	**9**	**9**		**Number of Spec.**	**18**	**9**	**9**


Warp Compression Properties (WC)--RTD (70°F)
Normalized Strength
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Warp Compression Strength [ksi]
0
10
20
30
40
50
60
70
80
90
100
0
1
2
3
0
1
2
3
4
5


Warp Compression Properties (WC)--RTD (70°F)
Normalized Modulus
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Warp Compression 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
0
1
2
3
4

Warp Compression Properties (WC)--ETD (180°F)
Strength & Modulus

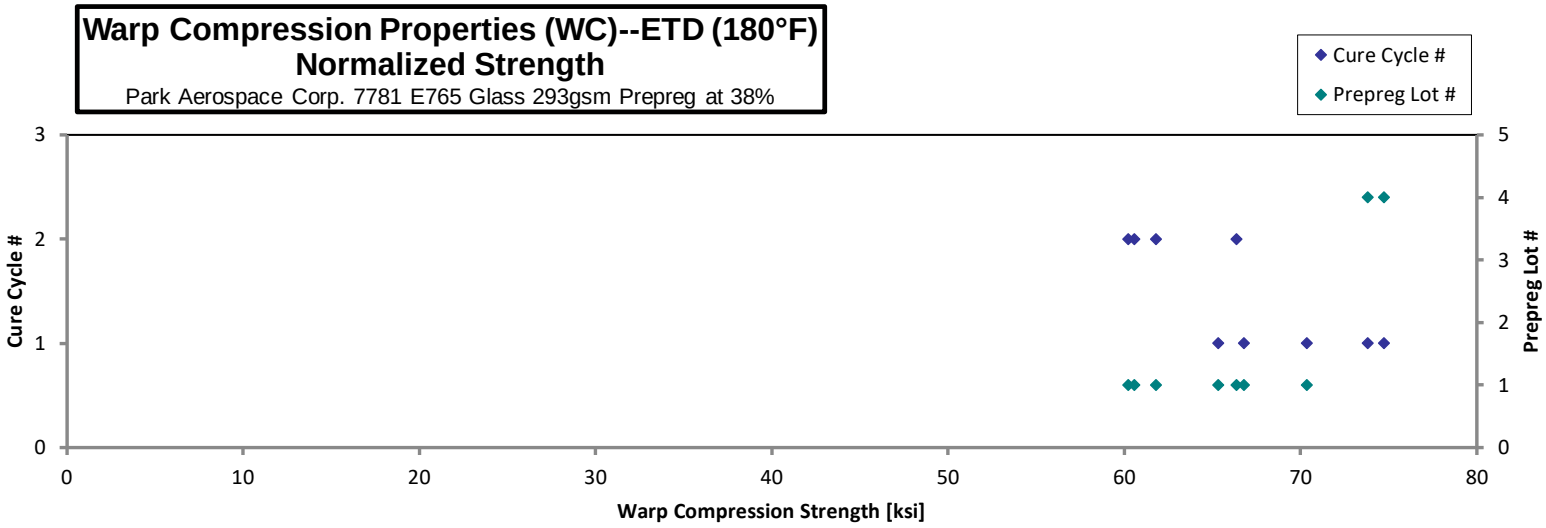
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%

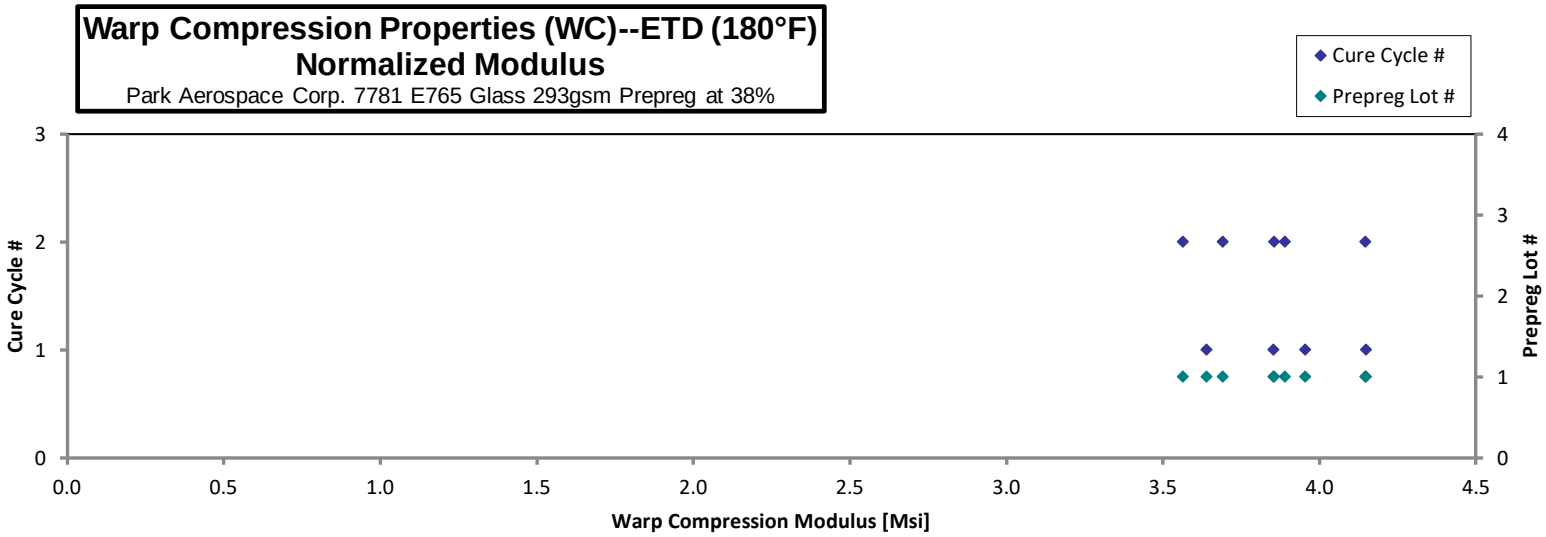
normalizing t_{ply} [in]
0.009800

Specimen Number	Park Aerospace Corp. Batch #	Park Aerospace Corp. Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
NTP7653E1-PAC-P03-PAC-WCM-A-C1-1-ETD-1	A	C1	1	1		4.305	0.1260	14	n/a	0.009000		3.954
NTP7653E1-PAC-P03-PAC-WCM-A-C1-1-ETD-2	A	C1	1	1		4.516	0.1260	14	n/a	0.009000		4.148
NTP7653E1-PAC-P03-PAC-WCM-A-C1-1-ETD-4	A	C1	1	1		4.263	0.1240	14	n/a	0.008857		3.853
NTP7653E1-PAC-P03-PAC-WCM-A-C1-1-ETD-5	A	C1	1	1		3.636	0.1373	14	n/a	0.009810		3.639
NTP7653E1-PAC-P03-PAC-WCM-A-C2-1-ETD-1	A	C2	1	2		4.513	0.1260	14	n/a	0.009000		4.145
NTP7653E1-PAC-P03-PAC-WCM-A-C2-1-ETD-3	A	C2	1	2		4.302	0.1240	14	n/a	0.008857		3.888
NTP7653E1-PAC-P03-PAC-WCM-A-C2-1-ETD-4	A	C2	1	2		4.231	0.1250	14	n/a	0.008929		3.855
NTP7653E1-PAC-P03-PAC-WCM-A-C2-1-ETW-5**	A	C2	1	2		3.779	0.1340	14	n/a	0.009570		3.691
NTP7653E1-PAC-P03-PAC-WCM-A-C2-1-ETW-6**	A	C2	1	2		3.514	0.1391	14	n/a	0.009936		3.562
NTP7653E1-PAC-P03-PAC-WCS-A-C1-1-ETD-1	A	C1	1	1	64.52		0.1420	14	BGM	0.01014	66.78	
NTP7653E1-PAC-P03-PAC-WCS-A-C1-1-ETD-2	A	C1	1	1	64.48		0.1390	14	BGM	0.009929	65.32	
NTP7653E1-PAC-P03-PAC-WCS-A-C1-1-ETD-4	A	C1	1	1	68.94		0.1400	14	BGM	0.01000	70.35	
NTP7653E1-PAC-P03-PAC-WCS-A-C2-1-ETD-1	A	C2	1	2	61.09		0.1360	14	BGM	0.009714	60.55	
NTP7653E1-PAC-P03-PAC-WCS-A-C2-1-ETD-2	A	C2	1	2	59.01		0.1400	14	BGM	0.01000	60.21	
NTP7653E1-PAC-P03-PAC-WCS-A-C2-1-ETD-3	A	C2	1	2	57.68		0.1470	14	BGM	0.01050	61.80	
NTP7653E1-PAC-P03-PAC-WCS-A-C2-1-ETD-4	A	C2	1	2	61.92		0.1470	14	BGM	0.01050	66.34	
NTP7653E1-PAC-P03-PAC-WCS-D-C1-2-ETD-1*	D	C1	4	1	69.72		0.1470	14	BGM	0.01050	74.72	
NTP7653E1-PAC-P03-PAC-WCS-D-C1-2-ETD-2*	D	C1	4	1	68.25		0.1484	14	BGM	0.01060	73.81	

*Tested by NIAR
**Tested by NIAR at ETD

Average	**63.96**	**4.118**		**$Average_{norm}$**	**0.009714**	**66.65**	**3.859**
Standard Dev.	**4.379**	**0.3759**		**$Standard\ Dev._{norm}$**		**5.409**	**0.2061**
Coeff. of Var. [%]	**6.847**	**9.129**		**$Coeff.\ of\ Var.\ [\%]_{norm}$**		**8.115**	**5.339**
Min.	**57.68**	**3.514**		**Min.**	**0.008857**	**60.21**	**3.562**
Max.	**69.72**	**4.516**		**Max.**	**0.01060**	**74.72**	**4.148**
Number of Spec.	**9**	**9**		**Number of Spec.**	**18**	**9**	**9**


Warp Compression Properties (WC)--ETD (180°F)
Normalized Strength
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Warp Compression Strength [ksi]
0
10
20
30
40
50
60
70
80
0
1
2
3
0
1
2
3
4
5


Warp Compression Properties (WC)--ETD (180°F)
Normalized Modulus
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Warp Compression 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
0
1
2
3
4

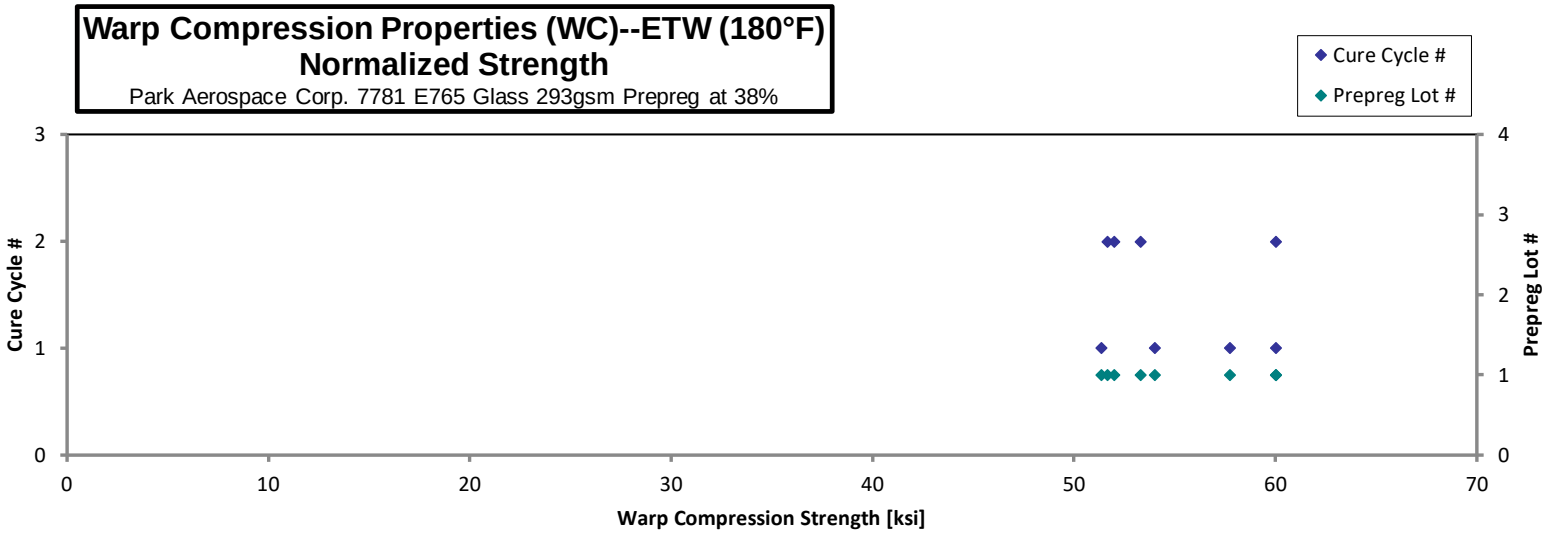
Warp Compression Properties (WC)--ETW (180°F)
Strength & Modulus
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%

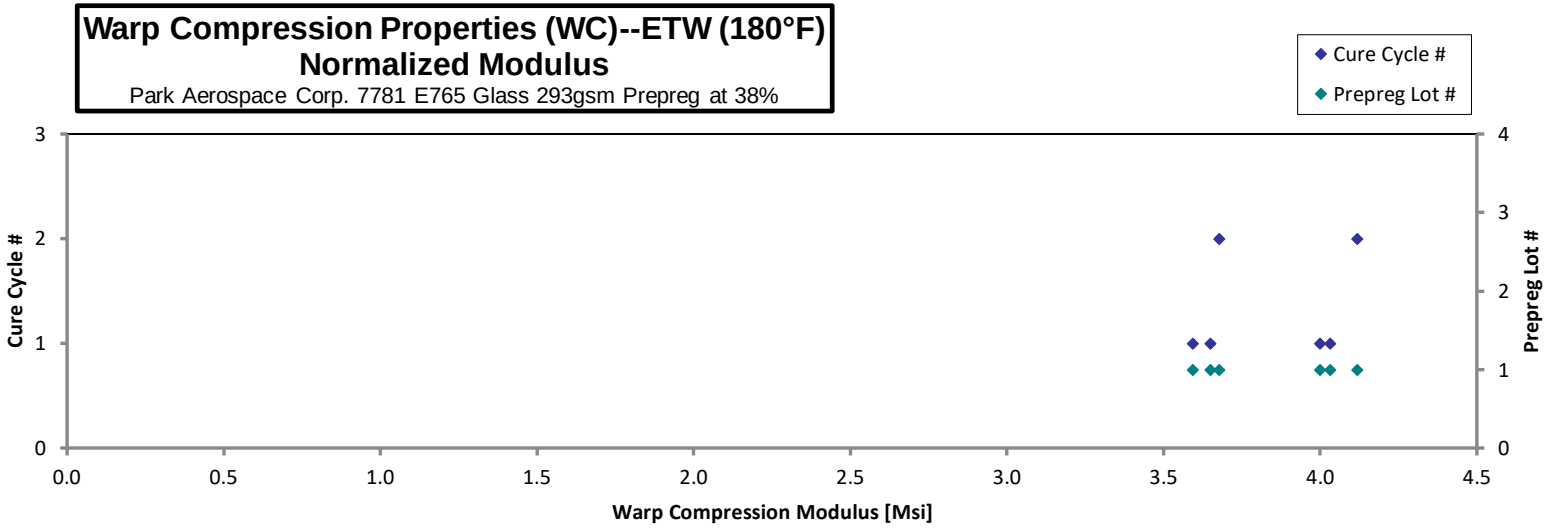
normalizing t_{ply} [in]
0.009800

Specimen Number	Park Aerospace Corp. Batch #	Park Aerospace Corp. Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
NTP7653E1-PAC-P03-PAC-WCM-A-C1-1-ETW-1	A	C1	1	1		3.913	0.1260	14	n/a	0.009000		3.594
NTP7653E1-PAC-P03-PAC-WCM-A-C1-1-ETW-2	A	C1	1	1		4.006	0.1250	14	n/a	0.008929		3.650
NTP7653E1-PAC-P03-PAC-WCM-A-C1-1-ETW-3	A	C1	1	1		4.010	0.1380	14	n/a	0.009857		4.033
NTP7653E1-PAC-P03-PAC-WCM-A-C1-1-ETW-4	A	C1	1	1		3.921	0.1400	14	n/a	0.01000		4.001
NTP7653E1-PAC-P03-PAC-WCM-A-C2-1-ETW-1	A	C2	1	2		4.348	0.1300	14	n/a	0.009286		4.120
NTP7653E1-PAC-P03-PAC-WCM-A-C2-1-ETW-3	A	C2	1	2		3.973	0.1270	14	n/a	0.009071		3.678
NTP7653E1-PAC-P03-PAC-WCS-A-C1-1-ETW-1	A	C1	1	1	49.96		0.1410	14	BGM	0.01007	51.34	
NTP7653E1-PAC-P03-PAC-WCS-A-C1-1-ETW-2	A	C1	1	1	52.56		0.1410	14	BGM	0.01007	54.01	
NTP7653E1-PAC-P03-PAC-WCS-A-C1-1-ETW-3	A	C1	1	1	56.17		0.1410	14	BGM	0.01007	57.73	
NTP7653E1-PAC-P03-PAC-WCS-A-C1-1-ETW-4	A	C1	1	1	59.25		0.1390	14	BGM	0.009929	60.02	
NTP7653E1-PAC-P03-PAC-WCS-A-C2-1-ETW-1	A	C2	1	2	60.55		0.1360	14	BGM	0.009714	60.02	
NTP7653E1-PAC-P03-PAC-WCS-A-C2-1-ETW-2	A	C2	1	2	51.87		0.1410	14	BGM	0.01007	53.31	
NTP7653E1-PAC-P03-PAC-WCS-A-C2-1-ETW-3	A	C2	1	2	48.88		0.1450	14	BGM	0.01036	51.65	
NTP7653E1-PAC-P03-PAC-WCS-A-C2-1-ETW-4	A	C2	1	2	49.20		0.1450	14	BGM	0.01036	52.00	

Average	**53.55**	**4.028**	
Standard Dev.	**4.564**	**0.1617**	
Coeff. of Var. [%]	**8.523**	**4.013**	
Min.	**48.88**	**3.913**	
Max.	**60.55**	**4.348**	
Number of Spec.	**8**	**6**	

$Average_{norm}$	**0.009770**	**55.01**	**3.846**
$Standard\ Dev._{norm}$		**3.690**	**0.2300**
Coeff. of Var. $[\%]_{norm}$		**6.708**	**5.979**
Min.	**0.008929**	**51.34**	**3.594**
Max.	**0.01036**	**60.02**	**4.120**
Number of Spec.	**14**	**8**	**6**


Warp Compression Properties (WC)--ETW (180°F)
Normalized Strength
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Warp Compression Strength [ksi]
0
10
20
30
40
50
60
70
0
1
2
3
4


Warp Compression Properties (WC)--ETW (180°F)
Normalized Modulus
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Warp Compression 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

4.4 Fill Compression Properties (FC)

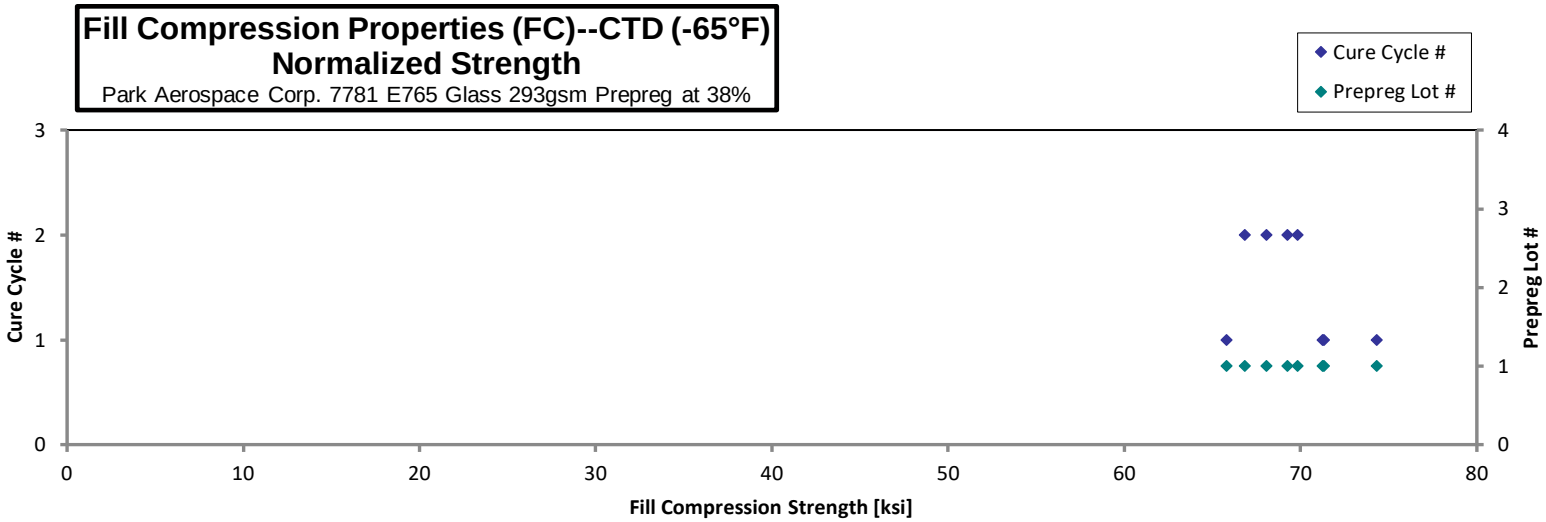
Fill Compression Properties (FC)--CTD (-65°F)
Strength & Modulus
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%

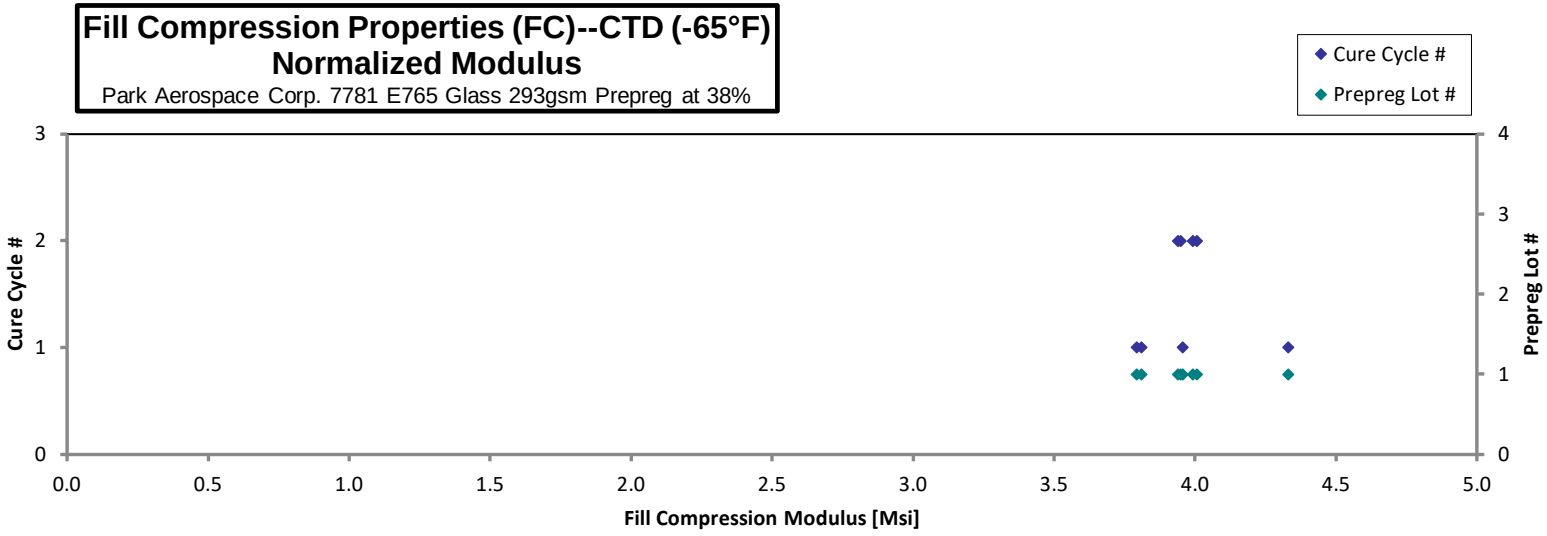
normalizing t_{ply} [in]
0.009800

Specimen Number	Park Aerospace Corp. Batch #	Park Aerospace Corp. Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
NTP7653E1-PAC-P03-PAC-FCM-A-C1-1-CTD-1	A	C1	1	1		4.128	0.1440	14	n/a	0.01029		4.333
NTP7653E1-PAC-P03-PAC-FCM-A-C1-1-CTD-2	A	C1	1	1		3.605	0.1450	14	n/a	0.01036		3.810
NTP7653E1-PAC-P03-PAC-FCM-A-C1-1-CTD-3	A	C1	1	1		4.267	0.1220	14	n/a	0.008714		3.795
NTP7653E1-PAC-P03-PAC-FCM-A-C1-1-CTD-4	A	C1	1	1		3.669	0.1480	14	n/a	0.01057		3.958
NTP7653E1-PAC-P03-PAC-FCM-A-C2-1-CTD-1	A	C2	1	2		3.976	0.1360	14	n/a	0.009714		3.941
NTP7653E1-PAC-P03-PAC-FCM-A-C2-1-CTD-2	A	C2	1	2		4.059	0.1350	14	n/a	0.009643		3.994
NTP7653E1-PAC-P03-PAC-FCM-A-C2-1-CTD-3	A	C2	1	2		3.927	0.1400	14	n/a	0.01000		4.008
NTP7653E1-PAC-P03-PAC-FCM-A-C2-1-CTD-4	A	C2	1	2		3.844	0.1410	14	n/a	0.01007		3.951
NTP7653E1-PAC-P03-PAC-FCS-A-C1-1-CTD-1	A	C1	1	1	78.29		0.1250	14	BGM	0.008929	71.33	
NTP7653E1-PAC-P03-PAC-FCS-A-C1-1-CTD-2	A	C1	1	1	73.88		0.1380	14	BGM	0.009857	74.31	
NTP7653E1-PAC-P03-PAC-FCS-A-C1-1-CTD-3	A	C1	1	1	67.88		0.1330	14	BGM	0.009500	65.80	
NTP7653E1-PAC-P03-PAC-FCS-A-C1-1-CTD-4	A	C1	1	1	67.88		0.1440	14	BGM	0.01029	71.24	
NTP7653E1-PAC-P03-PAC-FCS-A-C2-1-CTD-1	A	C2	1	2	66.88		0.1420	14	BGM	0.01014	69.22	
NTP7653E1-PAC-P03-PAC-FCS-A-C2-1-CTD-2	A	C2	1	2	67.17		0.1390	14	BGM	0.009929	68.05	
NTP7653E1-PAC-P03-PAC-FCS-A-C2-1-CTD-3	A	C2	1	2	71.48		0.1340	14	BGM	0.009571	69.81	
NTP7653E1-PAC-P03-PAC-FCS-A-C2-1-CTD-4	A	C2	1	2	65.48		0.1400	14	BGM	0.01000	66.81	

Average	**69.87**	**3.934**	
Standard Dev.	**4.360**	**0.2245**	
Coeff. of Var. [%]	**6.241**	**5.707**	
Min.	**65.48**	**3.605**	
Max.	**78.29**	**4.267**	
Number of Spec.	**8**	**8**	

$Average_{norm}$	**0.009848**	**69.57**	**3.973**
$Standard\ Dev._{norm}$		**2.743**	**0.1652**
Coeff. of Var. $[\%]_{norm}$		**3.943**	**4.159**
Min.	**0.008714**	**65.80**	**3.795**
Max.	**0.01057**	**74.31**	**4.333**
Number of Spec.	**16**	**8**	**8**


Fill Compression Properties (FC)--CTD (-65°F)
Normalized Strength
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Fill Compression Strength [ksi]
0
10
20
30
40
50
60
70
80
0
1
2
3
4


Fill Compression Properties (FC)--CTD (-65°F)
Normalized Modulus
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Fill Compression Modulus [Msi]
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
0
1
2
3
4

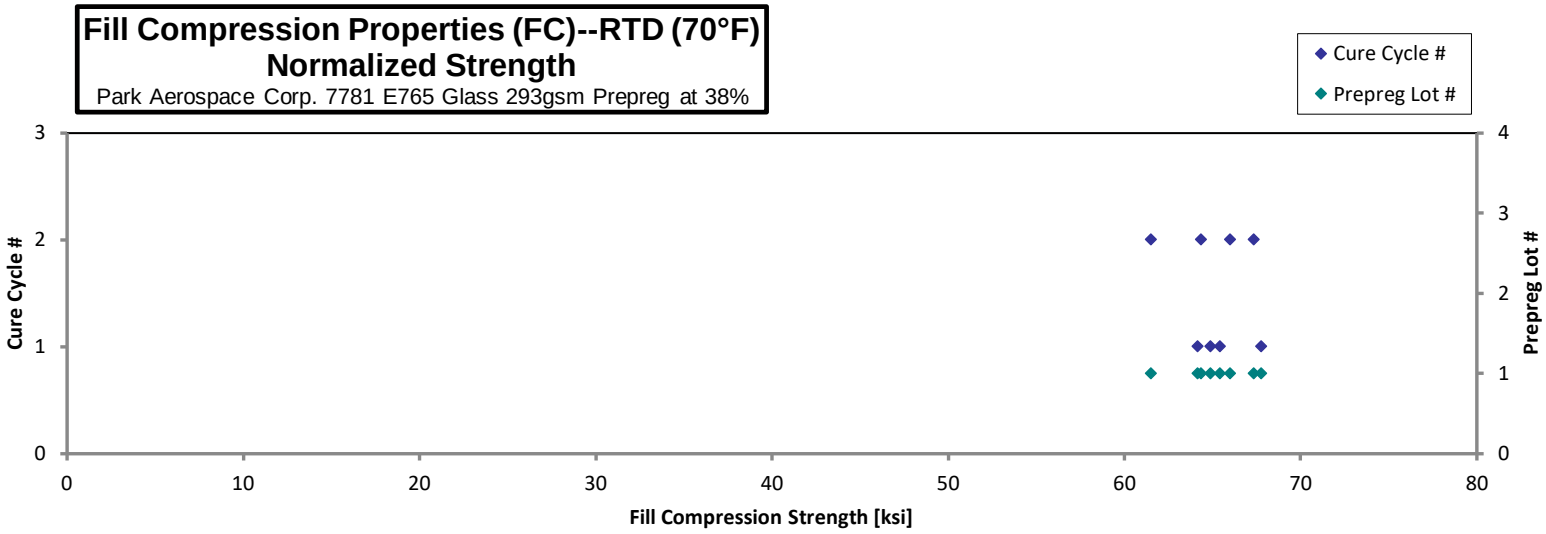
Fill Compression Properties (FC)--RTD (70°F)
Strength & Modulus
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%

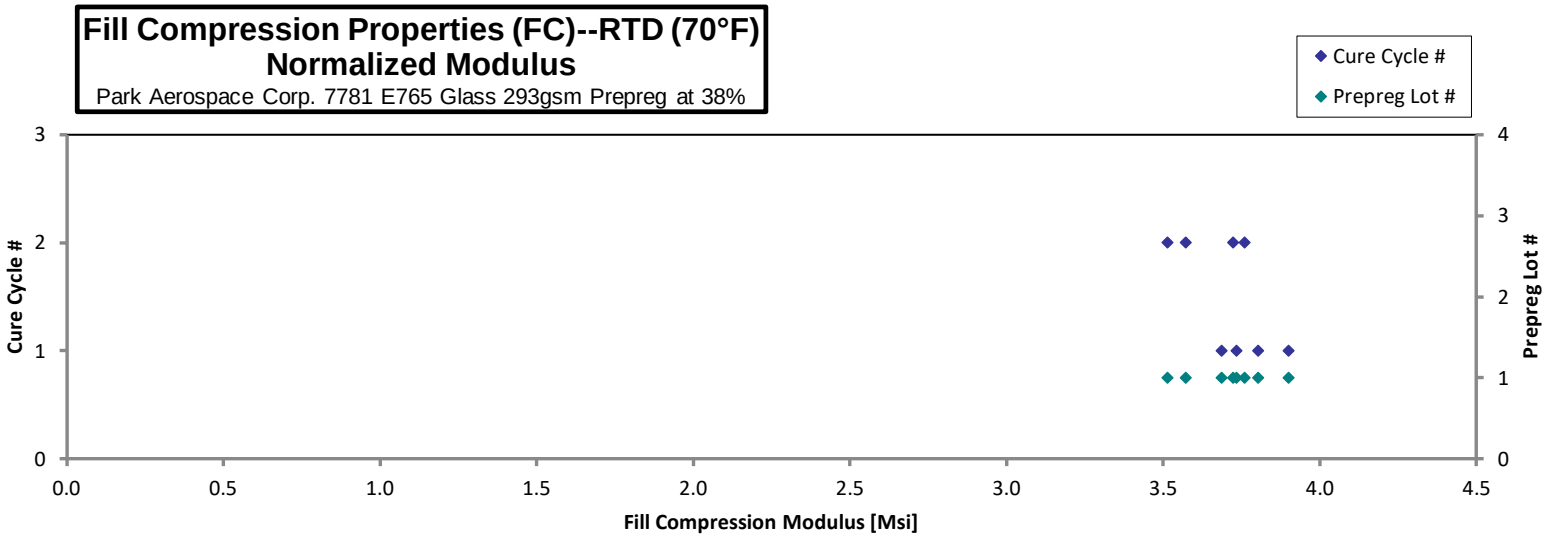
normalizing t_{ply} [in]: 0.009800

Specimen Number	Park Aerospace Corp. Batch #	Park Aerospace Corp. Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
NTP7653E1-PAC-P03-PAC-FCM-A-C1-1-RTD-1	A	C1	1	1		3.615	0.1480	14	n/a	0.01057		3.899
NTP7653E1-PAC-P03-PAC-FCM-A-C1-1-RTD-2	A	C1	1	1		4.065	0.1260	14	n/a	0.009000		3.733
NTP7653E1-PAC-P03-PAC-FCM-A-C1-1-RTD-3	A	C1	1	1		3.501	0.1490	14	n/a	0.01064		3.802
NTP7653E1-PAC-P03-PAC-FCM-A-C1-1-CTD-5*	A	C1	1	1		3.772	0.1341	14	n/a	0.00958		3.687
NTP7653E1-PAC-P03-PAC-FCM-A-C2-1-RTD-2	A	C2	1	2		3.685	0.1330	14	n/a	0.009500		3.572
NTP7653E1-PAC-P03-PAC-FCM-A-C2-1-RTD-4	A	C2	1	2		3.711	0.1390	14	n/a	0.009929		3.759
NTP7653E1-PAC-P03-PAC-FCM-A-C2-1-RTD-5	A	C2	1	2		3.561	0.1353	14	n/a	0.009667		3.513
NTP7653E1-PAC-P03-PAC-FCM-A-C2-1-ETW-5*	A	C2	1	2		3.618	0.1411	14	n/a	0.01008		3.722
NTP7653E1-PAC-P03-PAC-FCS-A-C1-1-RTD-1	A	C1	1	1	61.14		0.1440	14	BGM	0.01029	64.17	
NTP7653E1-PAC-P03-PAC-FCS-A-C1-1-RTD-2	A	C1	1	1	64.58		0.1440	14	BGM	0.01029	67.78	
NTP7653E1-PAC-P03-PAC-FCS-A-C1-1-RTD-3	A	C1	1	1	68.49		0.1300	14	BGM	0.009286	64.90	
NTP7653E1-PAC-P03-PAC-FCS-A-C1-1-RTD-4	A	C1	1	1	62.35		0.1440	14	BGM	0.01029	65.44	
NTP7653E1-PAC-P03-PAC-FCS-A-C2-1-RTD-1	A	C2	1	2	65.40		0.1350	14	BGM	0.009643	64.36	
NTP7653E1-PAC-P03-PAC-FCS-A-C2-1-RTD-2	A	C2	1	2	66.97		0.1380	14	BGM	0.009857	67.36	
NTP7653E1-PAC-P03-PAC-FCS-A-C2-1-RTD-3	A	C2	1	2	61.17		0.1380	14	BGM	0.009857	61.53	
NTP7653E1-PAC-P03-PAC-FCS-A-C2-1-RTD-4	A	C2	1	2	64.70		0.1400	14	BGM	0.01000	66.02	

*Tested by NIAR at RTD

Average	**64.35**	**3.691**		**$Average_{norm}$**	**0.009904**	**65.19**	**3.711**
Standard Dev.	**2.666**	**0.1735**		**Standard $Dev._{norm}$**		**1.980**	**0.1229**
Coeff. of Var. [%]	**4.144**	**4.700**		**Coeff. of Var. $[\%]_{norm}$**		**3.037**	**3.313**
Min.	**61.14**	**3.501**		**Min.**	**0.009000**	**61.53**	**3.513**
Max.	**68.49**	**4.065**		**Max.**	**0.01064**	**67.78**	**3.899**
Number of Spec.	**8**	**8**		**Number of Spec.**	**16**	**8**	**8**


Fill Compression Properties (FC)--RTD (70°F)
Normalized Strength
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Fill Compression Strength [ksi]
0
10
20
30
40
50
60
70
80
0
1
2
3
0
1
2
3
4


Fill Compression Properties (FC)--RTD (70°F)
Normalized Modulus
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Fill Compression 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
0
1
2
3
4

Fill Compression Properties (FC)--ETD (180°F)
Strength & Modulus

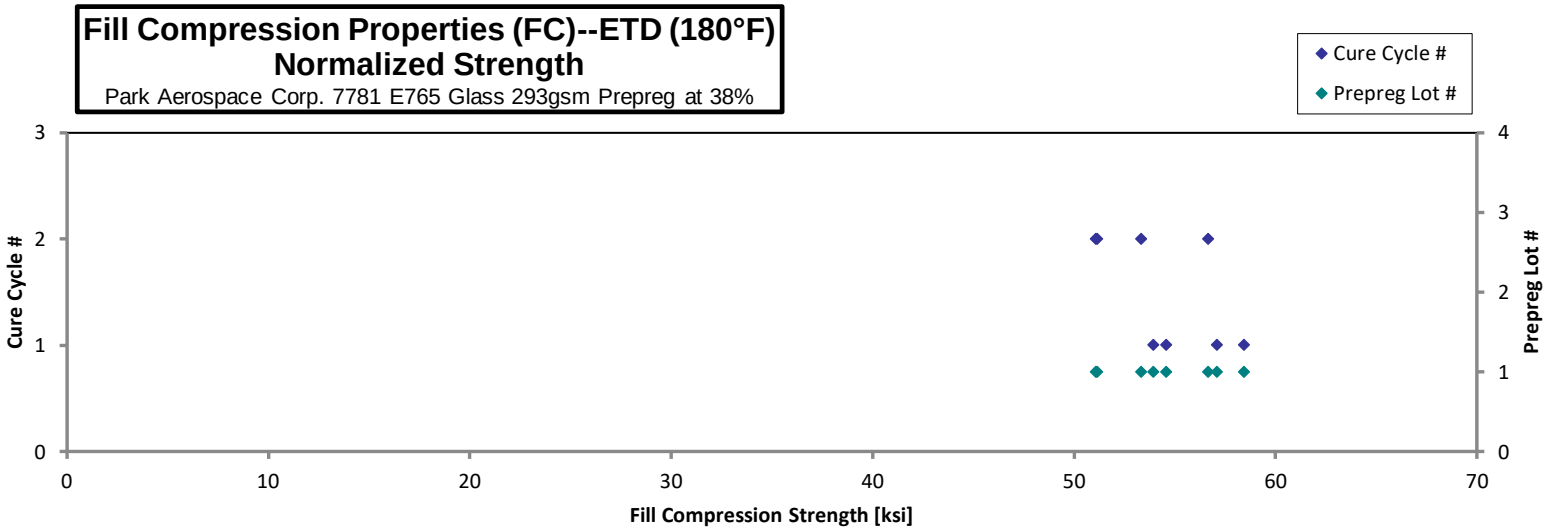
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%

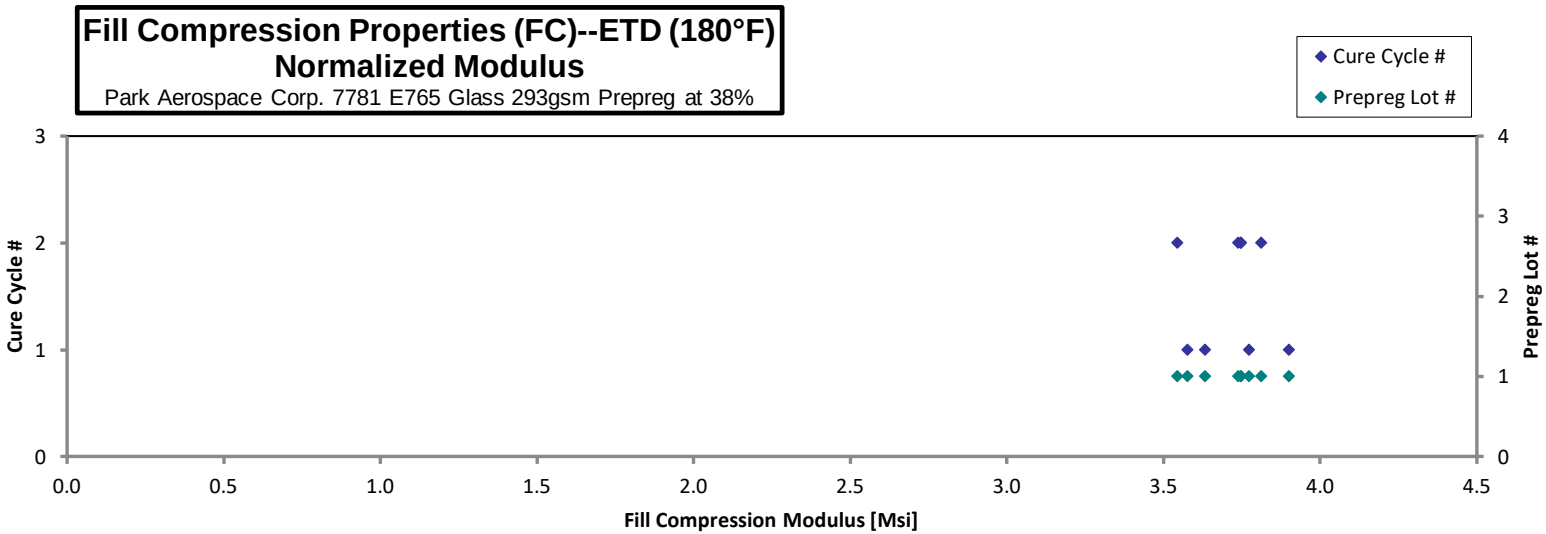
normalizing t_{ply} [in]: 0.009800

Specimen Number	Park Aerospace Corp. Batch #	Park Aerospace Corp. Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
NTP7653E1-PAC-P03-PAC-FCM-A-C1-1-ETD-1	A	C1	1	1		3.775	0.1300	14	n/a	0.009286		3.577
NTP7653E1-PAC-P03-PAC-FCM-A-C1-1-ETD-2	A	C1	1	1		3.752	0.1380	14	n/a	0.009857		3.774
NTP7653E1-PAC-P03-PAC-FCM-A-C1-1-ETD-3	A	C1	1	1		3.823	0.1400	14	n/a	0.01000		3.901
NTP7653E1-PAC-P03-PAC-FCM-A-C1-1-ETD-4	A	C1	1	1		3.836	0.1300	14	n/a	0.009286		3.635
NTP7653E1-PAC-P03-PAC-FCM-A-C2-1-ETD-1	A	C2	1	2		3.717	0.1383	14	n/a	0.009881		3.747
NTP7653E1-PAC-P03-PAC-FCM-A-C2-1-ETD-2	A	C2	1	2		3.857	0.1330	14	n/a	0.009500		3.739
NTP7653E1-PAC-P03-PAC-FCM-A-C2-1-ETD-4	A	C2	1	2		3.449	0.1410	14	n/a	0.01007		3.545
NTP7653E1-PAC-P03-PAC-FCM-A-C2-1-ETD-6*	A	C2	1	2		3.615	0.1447	14	n/a	0.01033		3.812
NTP7653E1-PAC-P03-PAC-FCM-A-C2-1-ETD-7*	A	C2	1	2		3.489	0.1474	14	n/a	0.01053		3.749
NTP7653E1-PAC-P03-PAC-FCS-A-C1-1-ETD-1	A	C1	1	1	57.17		0.1370	14	BGM	0.009786	57.09	
NTP7653E1-PAC-P03-PAC-FCS-A-C1-1-ETD-2	A	C1	1	1	58.50		0.1370	14	BGM	0.009786	58.42	
NTP7653E1-PAC-P03-PAC-FCS-A-C1-1-ETD-3	A	C1	1	1	51.36		0.1440	14	BGM	0.01029	53.91	
NTP7653E1-PAC-P03-PAC-FCS-A-C1-1-ETD-4	A	C1	1	1	52.36		0.1430	14	BGM	0.01021	54.57	
NTP7653E1-PAC-P03-PAC-FCS-A-C2-1-ETD-1	A	C2	1	2	50.10		0.1400	14	BGM	0.01000	51.12	
NTP7653E1-PAC-P03-PAC-FCS-A-C2-1-ETD-2	A	C2	1	2	52.26		0.1400	14	BGM	0.01000	53.33	
NTP7653E1-PAC-P03-PAC-FCS-A-C2-1-ETD-3	A	C2	1	2	50.04		0.1400	14	BGM	0.01000	51.06	
NTP7653E1-PAC-P03-PAC-FCS-A-C2-1-ETD-4	A	C2	1	2	55.51		0.1400	14	BGM	0.01000	56.64	

*Tested by NIAR

	Strength [ksi]	Modulus [Msi]		t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
Average	**53.41**	**3.702**	**$Average_{norm}$**	**0.009930**	**54.52**	**3.720**
Standard Dev.	**3.239**	**0.1505**	**$Standard\ Dev._{norm}$**		**2.716**	**0.1143**
Coeff. of Var. [%]	**6.065**	**4.067**	**$Coeff.\ of\ Var.\ [\%]_{norm}$**		**4.981**	**3.074**
Min.	**50.04**	**3.449**	**Min.**	**0.009286**	**51.06**	**3.545**
Max.	**58.50**	**3.857**	**Max.**	**0.01053**	**58.42**	**3.901**
Number of Spec.	**8**	**9**	**Number of Spec.**	**17**	**8**	**9**


Fill Compression Properties (FC)--ETD (180°F)
Normalized Strength
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Fill Compression Strength [ksi]
0
10
20
30
40
50
60
70
0
1
2
3
4


Fill Compression Properties (FC)--ETD (180°F)
Normalized Modulus
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Fill Compression 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

Fill Compression Properties (FC)--ETW (180°F)
Strength & Modulus

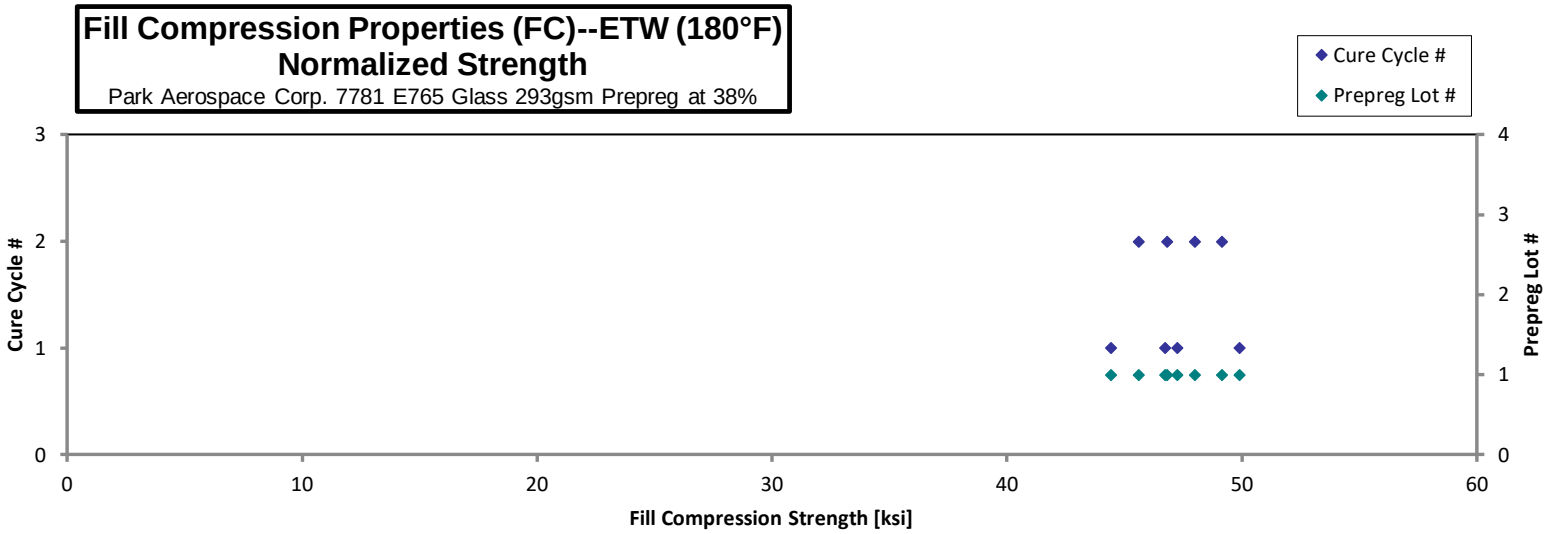
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%

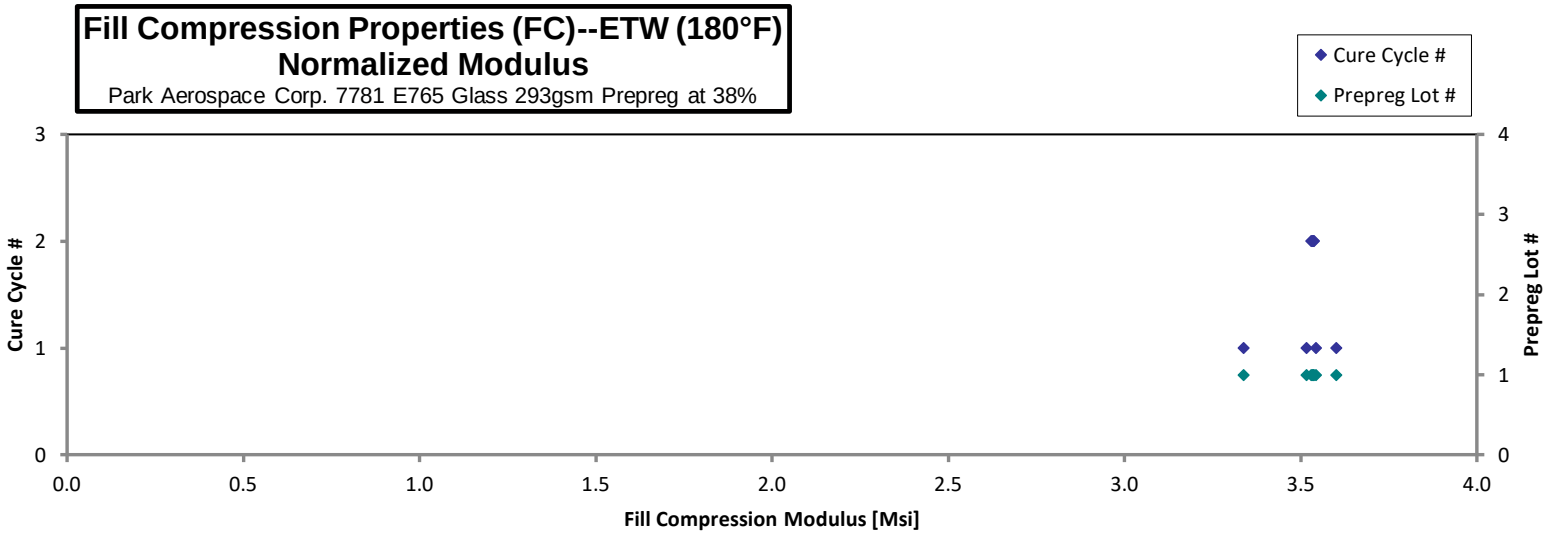
normalizing t_{ply} [in]
0.009800

Specimen Number	Park Aerospace Corp. Batch #	Park Aerospace Corp. Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
NTP7653E1-PAC-P03-PAC-FCM-A-C1-1-ETW-1	A	C1	1	1		3.606	0.1270	14	n/a	0.009071		3.338
NTP7653E1-PAC-P03-PAC-FCM-A-C1-1-ETW-2	A	C1	1	1		3.860	0.1260	14	n/a	0.009000		3.545
NTP7653E1-PAC-P03-PAC-FCM-A-C1-1-ETW-3	A	C1	1	1		3.953	0.1250	14	n/a	0.008929		3.601
NTP7653E1-PAC-P03-PAC-FCM-A-C1-1-ETW-4	A	C1	1	1		3.771	0.1280	14	n/a	0.009143		3.518
NTP7653E1-PAC-P03-PAC-FCM-A-C2-1-ETW-1	A	C2	1	2		3.726	0.1300	14	n/a	0.009286		3.531
NTP7653E1-PAC-P03-PAC-FCM-A-C2-1-ETW-2	A	C2	1	2		3.789	0.1280	14	n/a	0.009143		3.535
NTP7653E1-PAC-P03-PAC-FCM-A-C2-1-ETW-3	A	C2	1	2		3.820	0.1270	14	n/a	0.009071		3.536
NTP7653E1-PAC-P03-PAC-FCM-A-C2-1-ETW-4	A	C2	1	2		3.822	0.1270	14	n/a	0.009071		3.538
NTP7653E1-PAC-P03-PAC-FCS-A-C1-1-ETW-1	A	C1	1	1	47.56		0.1440	14	BGM	0.01029	49.92	
NTP7653E1-PAC-P03-PAC-FCS-A-C1-1-ETW-2	A	C1	1	1	45.03		0.1440	14	BGM	0.01029	47.26	
NTP7653E1-PAC-P03-PAC-FCS-A-C1-1-ETW-3	A	C1	1	1	49.32		0.1300	14	BGM	0.009286	46.73	
NTP7653E1-PAC-P03-PAC-FCS-A-C1-1-ETW-4	A	C1	1	1	42.33		0.1440	14	BGM	0.01029	44.43	
NTP7653E1-PAC-P03-PAC-FCS-A-C2-1-ETW-1	A	C2	1	2	47.59		0.1350	14	BGM	0.009643	46.82	
NTP7653E1-PAC-P03-PAC-FCS-A-C2-1-ETW-2	A	C2	1	2	45.36		0.1380	14	BGM	0.009857	45.63	
NTP7653E1-PAC-P03-PAC-FCS-A-C2-1-ETW-3	A	C2	1	2	48.87		0.1380	14	BGM	0.009857	49.15	
NTP7653E1-PAC-P03-PAC-FCS-A-C2-1-ETW-4	A	C2	1	2	47.03		0.1400	14	BGM	0.01000	47.99	

Average	**46.64**	**3.793**	
Standard Dev.	**2.294**	**0.1010**	
Coeff. of Var. [%]	**4.918**	**2.663**	
Min.	**42.33**	**3.606**	
Max.	**49.32**	**3.953**	
Number of Spec.	**8**	**8**	

$Average_{norm}$	**0.009513**	**47.24**	**3.518**
$Standard\ Dev._{norm}$		**1.786**	**0.07670**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**3.780**	**2.180**
Min.	**0.008929**	**44.43**	**3.338**
Max.	**0.01029**	**49.92**	**3.601**
Number of Spec.	**16**	**8**	**8**

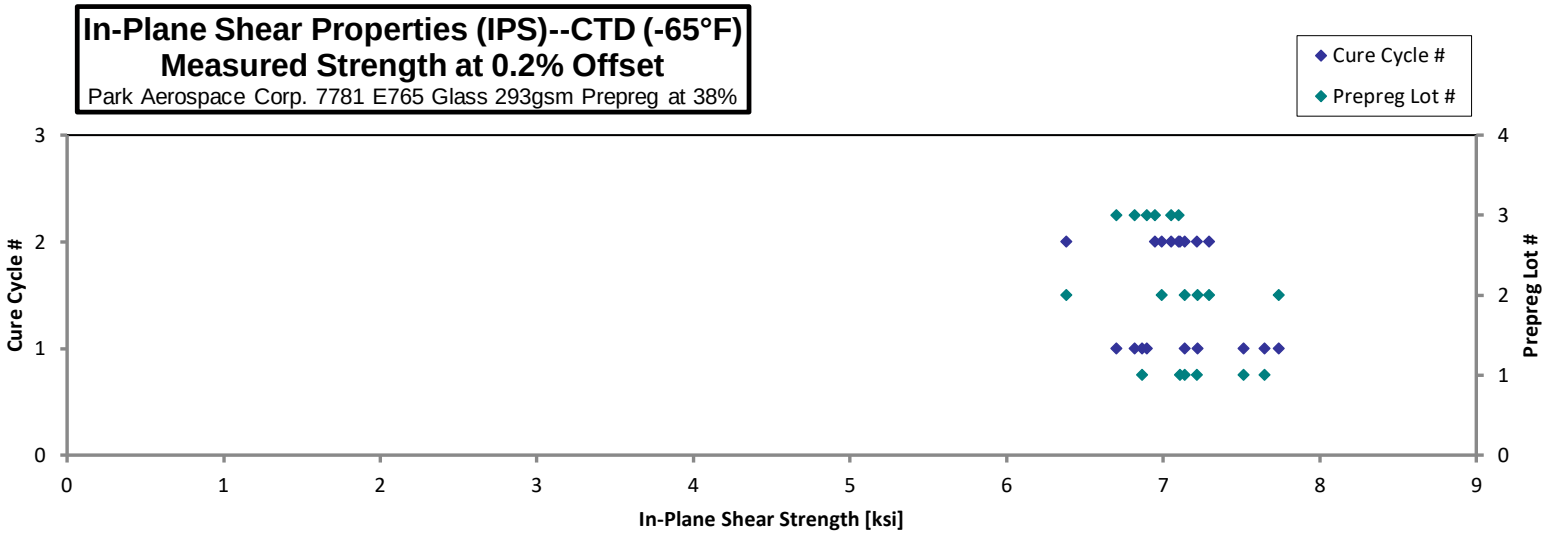

Fill Compression Properties (FC)--ETW (180°F)
Normalized Strength
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Fill Compression Strength [ksi]
0
10
20
30
40
50
60
0
1
2
3
4

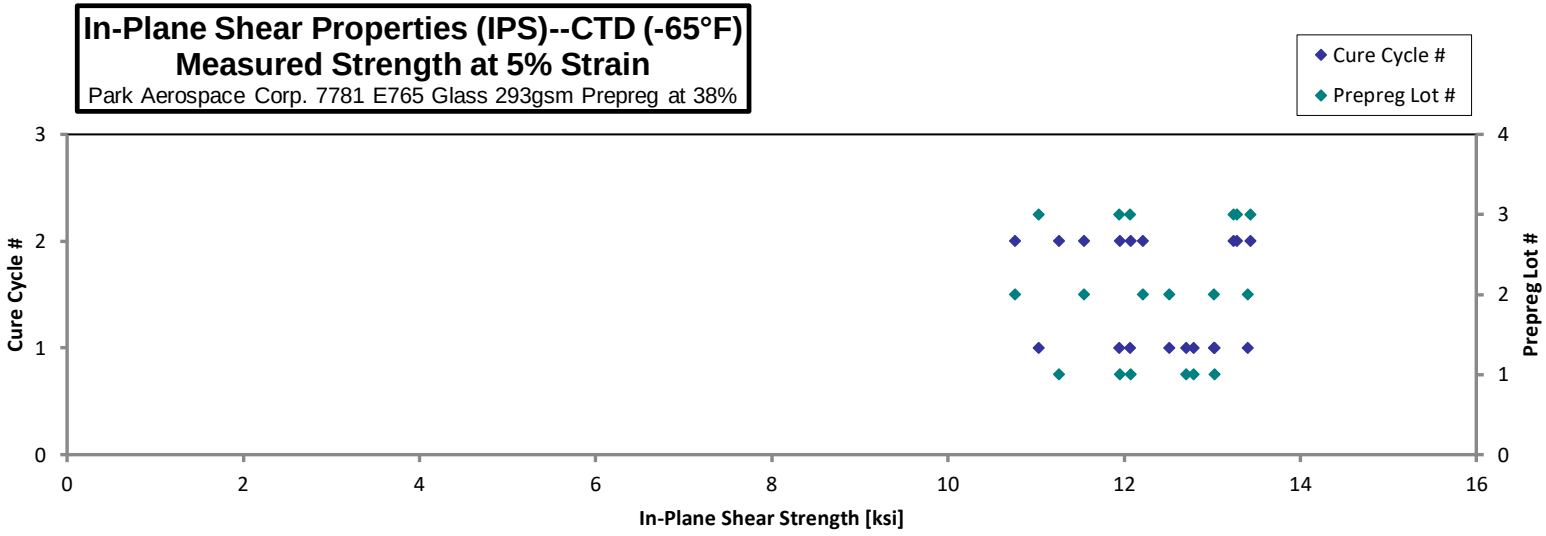

Fill Compression Properties (FC)--ETW (180°F)
Normalized Modulus
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Fill Compression Modulus [Msi]
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
0
1
2
3
4

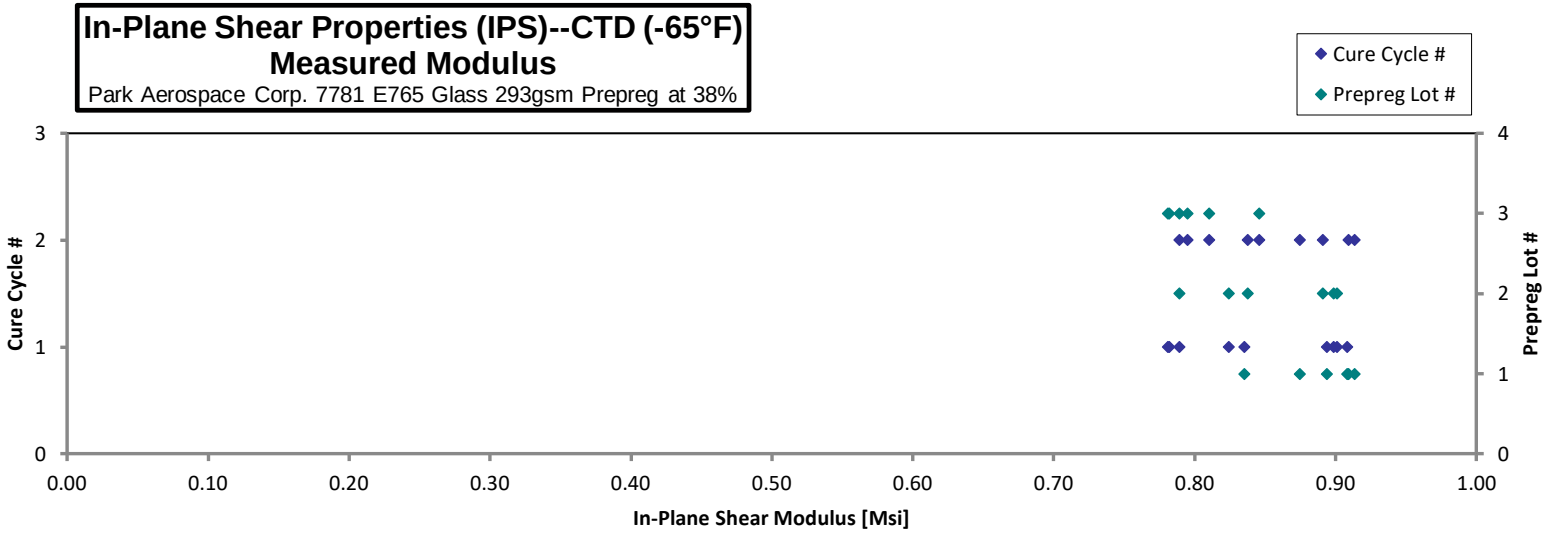
4.5 In-Plane Shear Properties (IPS)

In-Plane Shear Properties (IPS)--CTD (-65°F)
Strength & Modulus
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%

Specimen Number	Park Aerospace Corp. Batch #	Park Aerospace Corp. Cure Cycle	Prepreg Lot #	Cure Cycle #	0.2% Offset Strength [ksi]	Strength at 5% Strain [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]
NTP7653E1-PAC-P03-PAC-IPS-A-C1-1-CTD-1	A	C1	1	1	7.513	13.03	0.8940	0.1170	12	0.009750
NTP7653E1-PAC-P03-PAC-IPS-A-C1-1-CTD-2	A	C1	1	1	7.643	12.79	0.9083	0.1140	12	0.009500
NTP7653E1-PAC-P03-PAC-IPS-A-C1-1-CTD-3	A	C1	1	1	6.864	12.70	0.8355	0.1150	12	0.009583
NTP7653E1-PAC-P03-PAC-IPS-A-C2-1-CTD-1	A	C2	1	2	7.212	11.96	0.8747	0.1180	12	0.009833
NTP7653E1-PAC-P03-PAC-IPS-A-C2-1-CTD-2	A	C2	1	2	7.136	12.07	0.9138	0.1170	12	0.009750
NTP7653E1-PAC-P03-PAC-IPS-A-C2-1-CTD-3	A	C2	1	2	7.103	11.26	0.9093	0.1130	12	0.009417
NTP7653E1-PAC-P03-PAC-IPS-B-C1-1-CTD-1	B	C1	2	1	7.134	12.51	0.8986	0.1170	12	0.009750
NTP7653E1-PAC-P03-PAC-IPS-B-C1-1-CTD-2	B	C1	2	1	7.737	13.41	0.8242	0.1100	12	0.009167
NTP7653E1-PAC-P03-PAC-IPS-B-C1-1-CTD-3	B	C1	2	1	7.217	13.02	0.9013	0.1130	12	0.009417
NTP7653E1-PAC-P03-PAC-IPS-B-C2-1-CTD-1	B	C2	2	2	6.378	10.77	0.7891	0.1250	12	0.01042
NTP7653E1-PAC-P03-PAC-IPS-B-C2-1-CTD-2	B	C2	2	2	6.987	11.55	0.8377	0.1190	12	0.009917
NTP7653E1-PAC-P03-PAC-IPS-B-C2-1-CTD-3	B	C2	2	2	7.291	12.21	0.8910	0.1110	12	0.009250
NTP7653E1-PAC-P03-PAC-IPS-C-C1-1-CTD-1	C	C1	3	1	6.700	11.95	0.7822	0.1300	12	0.01083
NTP7653E1-PAC-P03-PAC-IPS-C-C1-1-CTD-2	C	C1	3	1	6.891	11.03	0.7810	0.1270	12	0.01058
NTP7653E1-PAC-P03-PAC-IPS-C-C1-1-CTD-3	C	C1	3	1	6.814	12.07	0.7891	0.1280	12	0.01067
NTP7653E1-PAC-P03-PAC-IPS-C-C2-1-CTD-1	C	C2	3	2	7.047	13.43	0.8461	0.1260	12	0.01050
NTP7653E1-PAC-P03-PAC-IPS-C-C2-1-CTD-2	C	C2	3	2	6.947	13.28	0.8102	0.1290	12	0.01075
NTP7653E1-PAC-P03-PAC-IPS-C-C2-1-CTD-3	C	C2	3	2	7.097	13.24	0.7950	0.1300	12	0.01083
Average					**7.095**	**12.35**	**0.8490**		**Average**	**0.01000**
Standard Dev.					**0.3288**	**0.8322**	**0.05006**		**Standard Dev.**	
Coeff. of Var. [%]					**4.634**	**6.739**	**5.897**		**Coeff. of Var. [%]**	
Min.					**6.378**	**10.77**	**0.7810**		**Min.**	**0.009167**
Max.					**7.737**	**13.43**	**0.9138**		**Max.**	**0.01083**
Number of Spec.					**18**	**18**	**18**		**Number of Spec.**	**18**

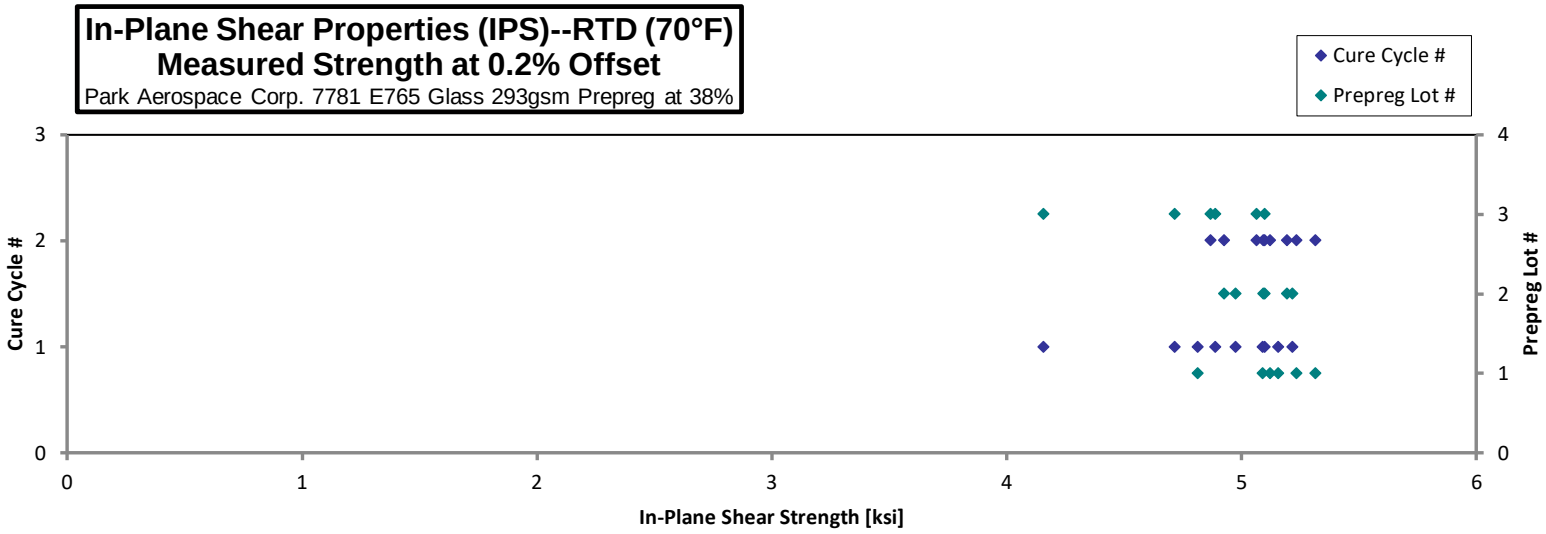

In-Plane Shear Properties (IPS)--CTD (-65°F)
Measured Strength at 0.2% Offset
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
In-Plane Shear Strength [ksi]
0
1
2
3
4
5
6
7
8
9

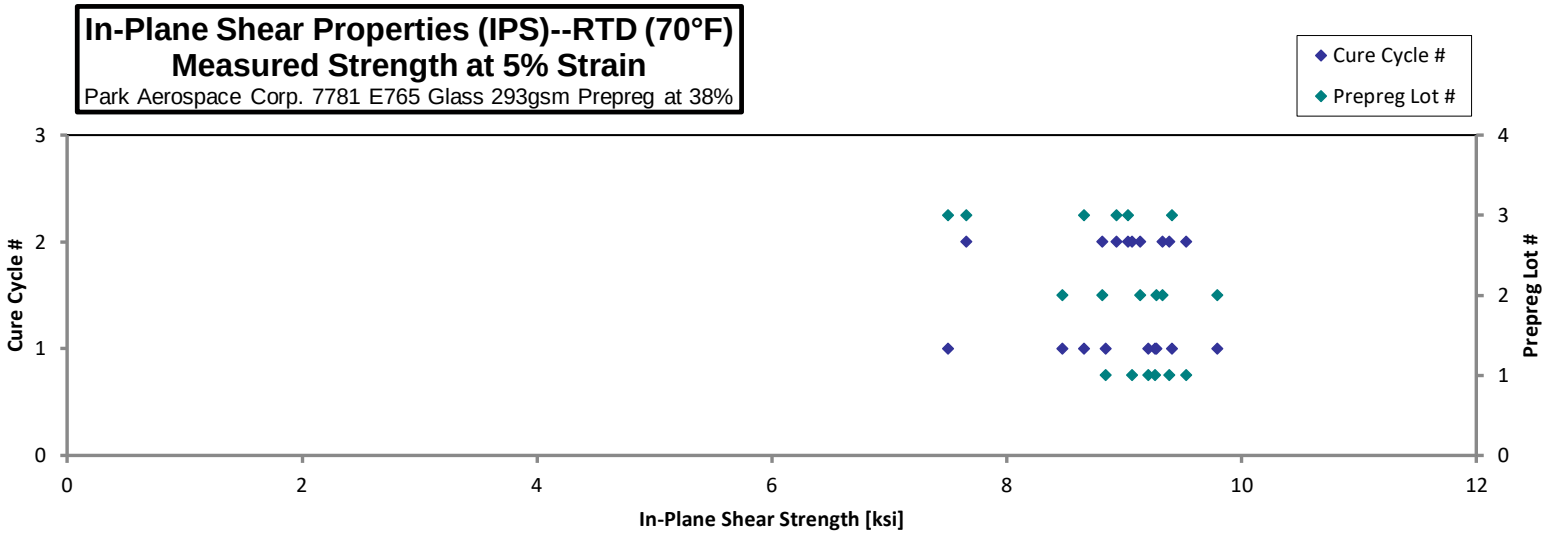

In-Plane Shear Properties (IPS)--CTD (-65°F)
Measured Strength at 5% Strain
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
In-Plane Shear Strength [ksi]
0
2
4
6
8
10
12
14
16

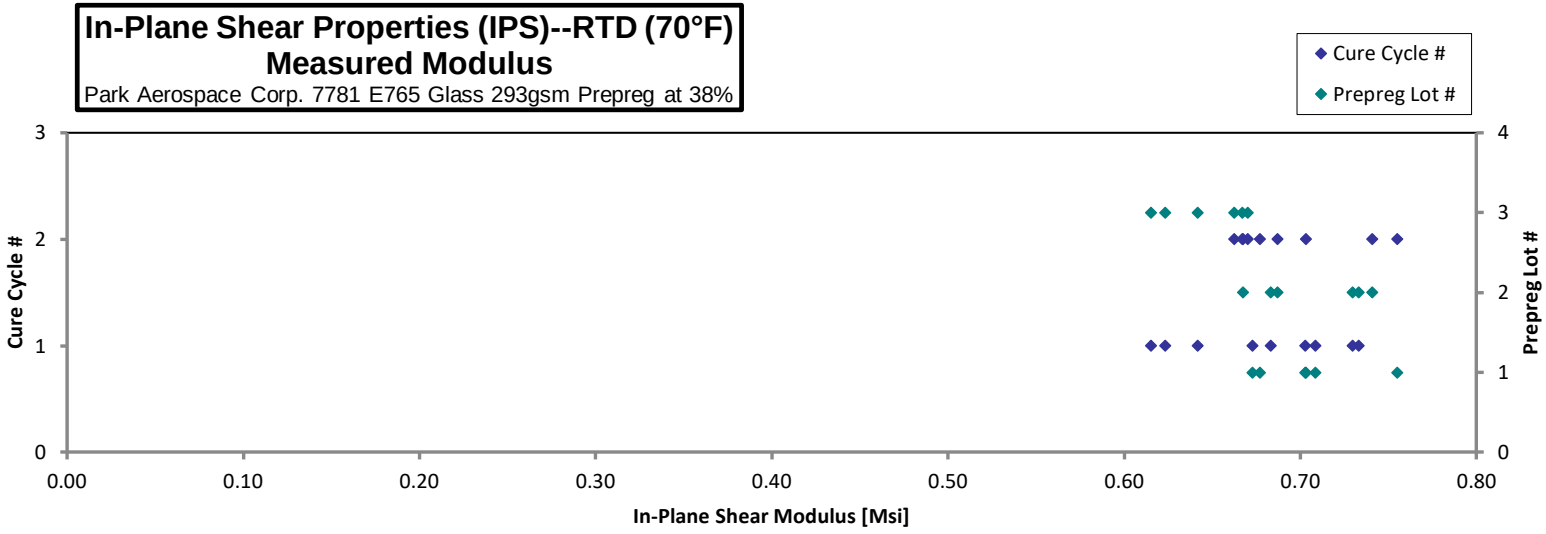

In-Plane Shear Properties (IPS)--CTD (-65°F)
Measured Modulus
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
0.80
0.90
1.00
In-Plane Shear Modulus [Msi]

In-Plane Shear Properties (IPS)--RTD (70°F)
Strength & Modulus
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%

Specimen Number	Park Aerospace Corp. Batch #	Park Aerospace Corp. Cure Cycle	Prepreg Lot #	Cure Cycle #	0.2% Offset Strength [ksi]	Strength at 5% Strain [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]
NTP7653E1-PAC-P03-PAC-IPS-A-C1-1-RTD-1	A	C1	1	1	5.089	9.205	0.6731	0.1220	12	0.01017
NTP7653E1-PAC-P03-PAC-IPS-A-C1-1-RTD-2	A	C1	1	1	5.155	9.267	0.7085	0.1180	12	0.009833
NTP7653E1-PAC-P03-PAC-IPS-A-C1-1-RTD-3	A	C1	1	1	4.814	8.844	0.7028	0.1210	12	0.01008
NTP7653E1-PAC-P03-PAC-IPS-A-C2-1-RTD-1	A	C2	1	2	5.315	9.388	0.7550	0.1100	12	0.009167
NTP7653E1-PAC-P03-PAC-IPS-A-C2-1-RTD-2	A	C2	1	2	5.235	9.530	0.7031	0.1180	12	0.009833
NTP7653E1-PAC-P03-PAC-IPS-A-C2-1-RTD-3	A	C2	1	2	5.123	9.068	0.6772	0.1200	12	0.01000
NTP7653E1-PAC-P03-PAC-IPS-B-C1-1-RTD-1	B	C1	2	1	4.976	8.473	0.6833	0.1170	12	0.009750
NTP7653E1-PAC-P03-PAC-IPS-B-C1-1-RTD-2	B	C1	2	1	5.099	9.279	0.7296	0.1100	12	0.009167
NTP7653E1-PAC-P03-PAC-IPS-B-C1-1-RTD-3	B	C1	2	1	5.217	9.796	0.7332	0.1130	12	0.009417
NTP7653E1-PAC-P03-PAC-IPS-B-C2-1-RTD-1	B	C2	2	2	4.927	9.136	0.6675	0.1250	12	0.01042
NTP7653E1-PAC-P03-PAC-IPS-B-C2-1-RTD-2	B	C2	2	2	5.092	9.327	0.6870	0.1190	12	0.009917
NTP7653E1-PAC-P03-PAC-IPS-B-C2-1-RTD-3	B	C2	2	2	5.194	8.812	0.7409	0.1110	12	0.009250
NTP7653E1-PAC-P03-PAC-IPS-C-C1-1-RTD-1	C	C1	3	1	4.888	9.411	0.6419	0.1260	12	0.01050
NTP7653E1-PAC-P03-PAC-IPS-C-C1-1-RTD-2	C	C1	3	1	4.158	7.504	0.6152	0.1310	12	0.01092
NTP7653E1-PAC-P03-PAC-IPS-C-C1-1-RTD-3	C	C1	3	1	4.715	8.661	0.6235	0.1280	12	0.01067
NTP7653E1-PAC-P03-PAC-IPS-C-C2-1-RTD-1	C	C2	3	2	4.869	7.659	0.6703	0.1180	12	0.009833
NTP7653E1-PAC-P03-PAC-IPS-C-C2-1-RTD-2	C	C2	3	2	5.063	8.934	0.6627	0.1220	12	0.01017
NTP7653E1-PAC-P03-PAC-IPS-C-C2-1-RTD-3	C	C2	3	2	5.099	9.032	0.6672	0.1220	12	0.01017
				Average	**5.002**	**8.962**	**0.6857**		**Average**	**0.009958**
				Standard Dev.	**0.2633**	**0.5952**	**0.03881**		**Standard Dev.**	
				Coeff. of Var. [%]	**5.265**	**6.640**	**5.660**		**Coeff. of Var. [%]**	
				Min.	**4.158**	**7.504**	**0.6152**		**Min.**	**0.009167**
				Max.	**5.315**	**9.796**	**0.7550**		**Max.**	**0.01092**
				Number of Spec.	**18**	**18**	**18**		**Number of Spec.**	**18**

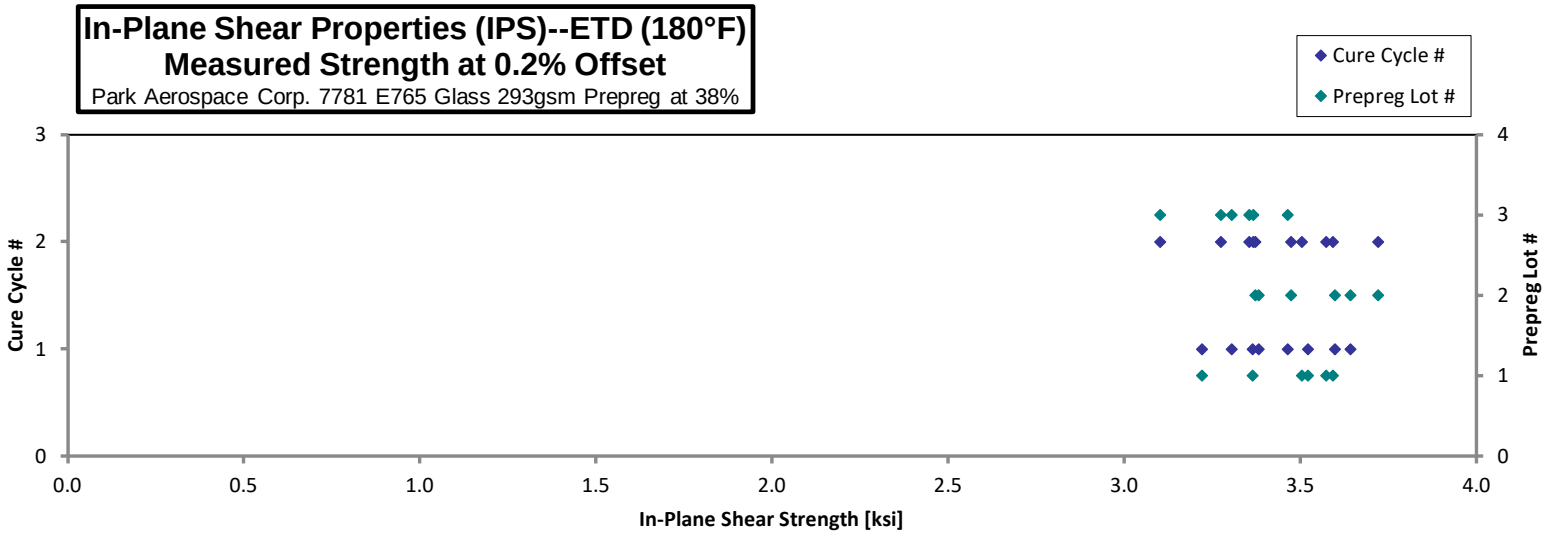

In-Plane Shear Properties (IPS)--RTD (70°F)
Measured Strength at 0.2% Offset
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
In-Plane Shear Strength [ksi]
0
1
2
3
4
5
6

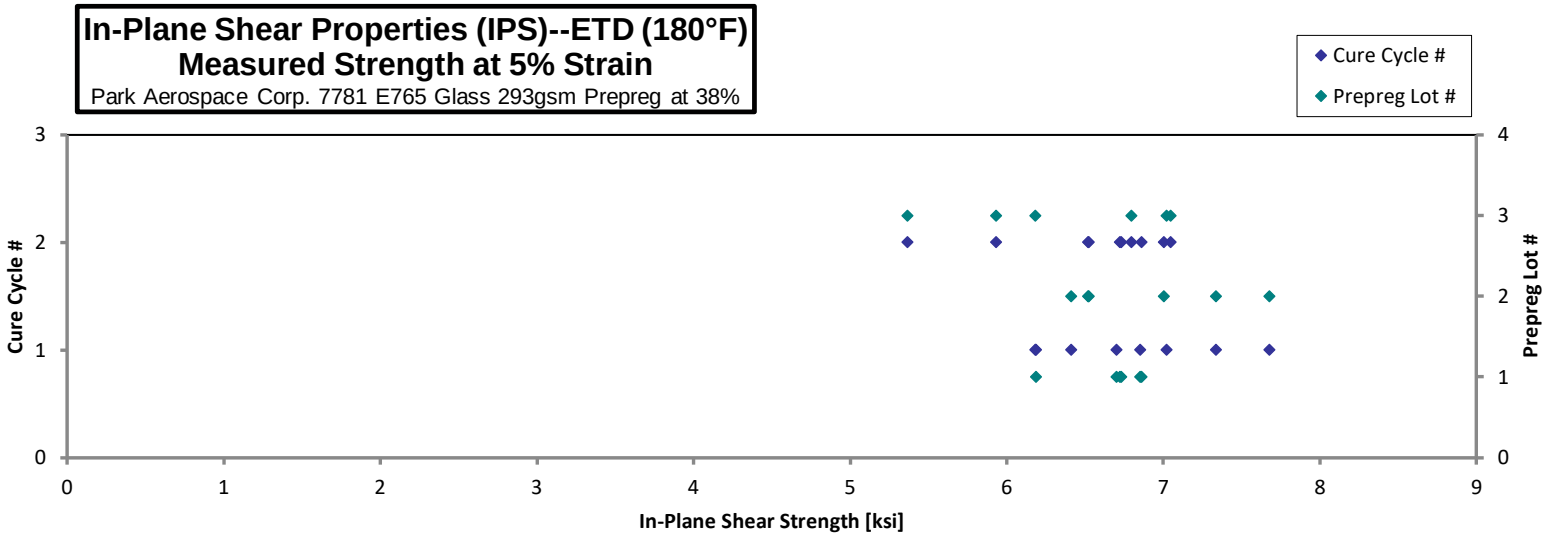

In-Plane Shear Properties (IPS)--RTD (70°F)
Measured Strength at 5% Strain
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
In-Plane Shear Strength [ksi]
0
2
4
6
8
10
12

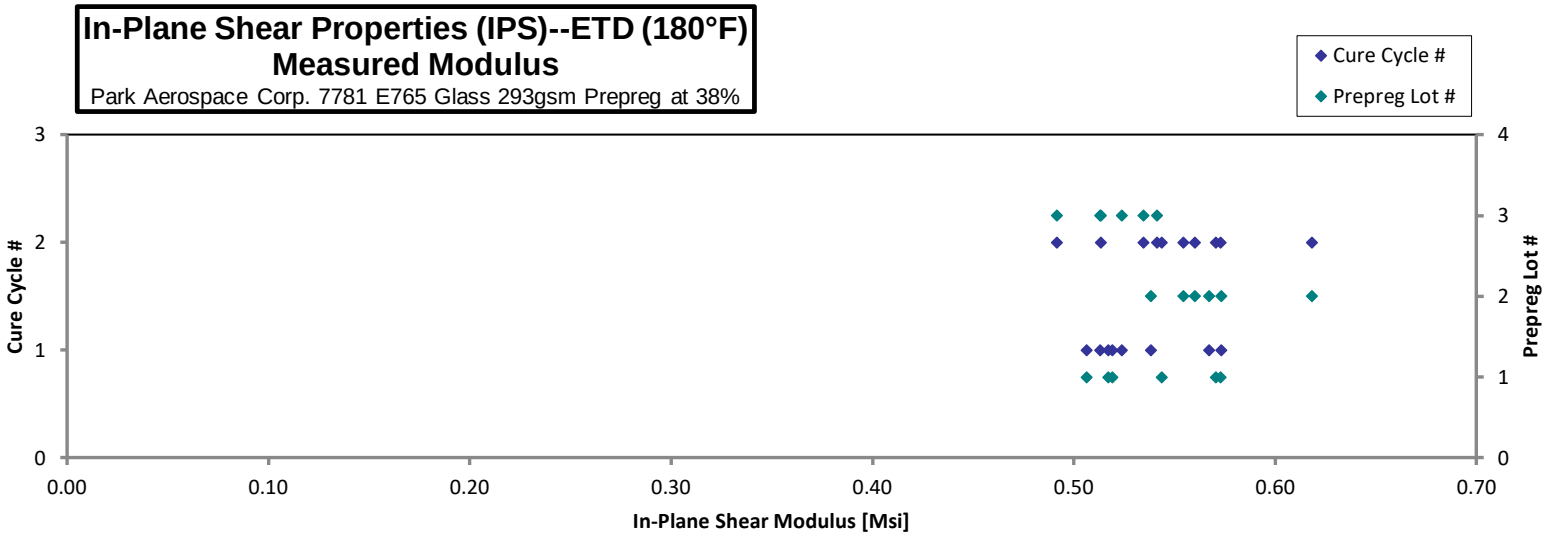

In-Plane Shear Properties (IPS)--RTD (70°F)
Measured Modulus
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
0.80
In-Plane Shear Modulus [Msi]

In-Plane Shear Properties (IPS)--ETD (180°F)
Strength & Modulus
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%

Specimen Number	Park Aerospace Corp. Batch #	Park Aerospace Corp. Cure Cycle	Prepreg Lot #	Cure Cycle #	0.2% Offset Strength [ksi]	Strength at 5% Strain [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]
NTP7653E1-PAC-P03-PAC-IPS-A-C1-1-ETD-1	A	C1	1	1	3.365	6.701	0.5172	0.1237	12	0.01031
NTP7653E1-PAC-P03-PAC-IPS-A-C1-1-ETD-2	A	C1	1	1	3.523	6.852	0.5193	0.1250	12	0.01042
NTP7653E1-PAC-P03-PAC-IPS-A-C1-1-ETD-3	A	C1	1	1	3.222	6.187	0.5064	0.1260	12	0.01050
NTP7653E1-PAC-P03-PAC-IPS-A-C2-1-ETD-1	A	C2	1	2	3.506	6.725	0.5729	0.1180	12	0.009833
NTP7653E1-PAC-P03-PAC-IPS-A-C2-1-ETD-2	A	C2	1	2	3.594	6.861	0.5708	0.1180	12	0.009833
NTP7653E1-PAC-P03-PAC-IPS-A-C2-1-ETD-3	A	C2	1	2	3.575	6.732	0.5437	0.1187	12	0.009889
NTP7653E1-PAC-P03-PAC-IPS-B-C1-1-ETD-1	B	C1	2	1	3.599	7.337	0.5734	0.1170	12	0.009750
NTP7653E1-PAC-P03-PAC-IPS-B-C1-1-ETD-2	B	C1	2	1	3.643	7.678	0.5673	0.1180	12	0.009833
NTP7653E1-PAC-P03-PAC-IPS-B-C1-1-ETD-3	B	C1	2	1	3.383	6.411	0.5383	0.1200	12	0.01000
NTP7653E1-PAC-P03-PAC-IPS-B-C2-1-ETD-1	B	C2	2	2	3.373	6.525	0.6184	0.1210	12	0.01008
NTP7653E1-PAC-P03-PAC-IPS-B-C2-1-ETD-2	B	C2	2	2	3.722	6.521	0.5605	0.1180	12	0.009833
NTP7653E1-PAC-P03-PAC-IPS-B-C2-1-ETD-3	B	C2	2	2	3.474	7.006	0.5544	0.1170	12	0.009750
NTP7653E1-PAC-P03-PAC-IPS-C-C1-1-ETD-2	C	C1	3	1	3.464	7.023	0.5239	0.1290	12	0.01075
NTP7653E1-PAC-P03-PAC-IPS-C-C1-1-ETD-3	C	C1	3	1	3.306	6.185	0.5133	0.1270	12	0.01058
NTP7653E1-PAC-P03-PAC-IPS-C-C2-1-ETD-1	C	C2	3	2	3.276	5.935	0.5347	0.1210	12	0.01008
NTP7653E1-PAC-P03-PAC-IPS-C-C2-1-ETD-2	C	C2	3	2	3.356	7.049	0.5136	0.1250	12	0.01042
NTP7653E1-PAC-P03-PAC-IPS-C-C2-1-ETD-3	C	C2	3	2	3.103	5.366	0.4916	0.1260	12	0.01050
NTP7653E1-PAC-P03-PAC-IPS-C-C2-1-ETD-4	C	C2	3	2	3.368	6.796	0.5415	0.1250	12	0.01042
				Average	**3.436**	**6.661**	**0.5423**		**Average**	**0.01015**
				Standard Dev.	**0.1595**	**0.5287**	**0.03134**		**Standard Dev.**	
				Coeff. of Var. [%]	**4.640**	**7.938**	**5.779**		**Coeff. of Var. [%]**	
				Min.	**3.103**	**5.366**	**0.4916**		**Min.**	**0.009750**
				Max.	**3.722**	**7.678**	**0.6184**		**Max.**	**0.01075**
				Number of Spec.	**18**	**18**	**18**		**Number of Spec.**	**18**

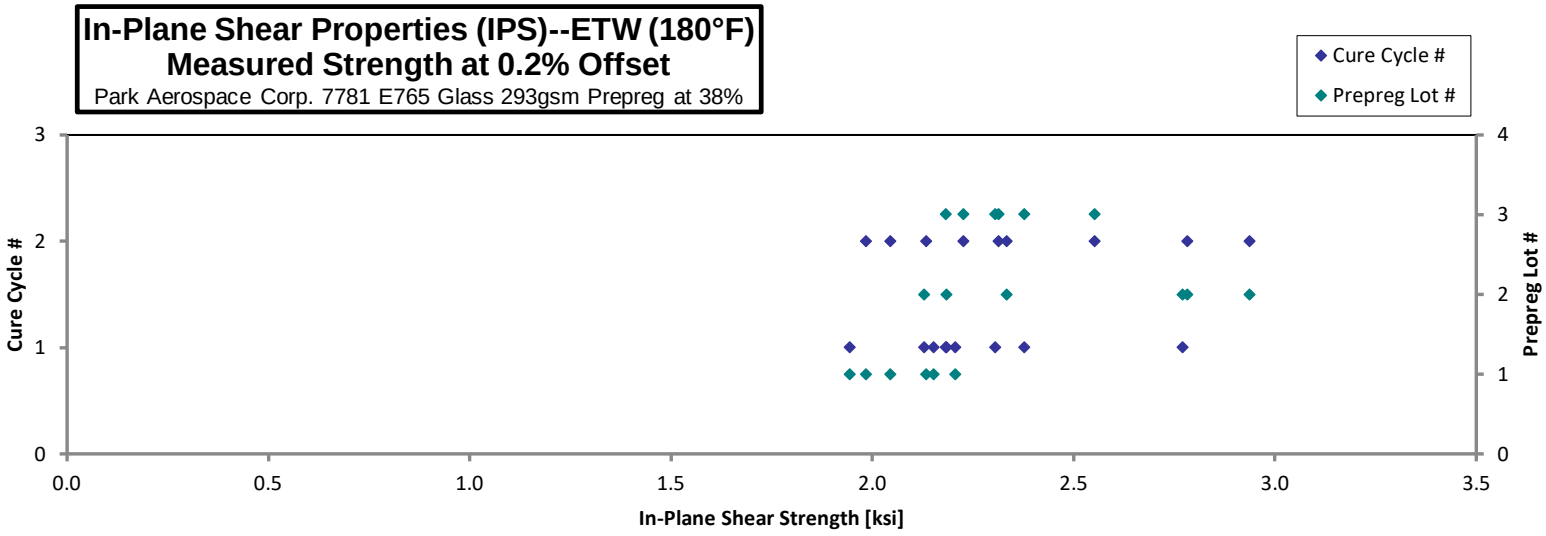

In-Plane Shear Properties (IPS)--ETD (180°F)
Measured Strength at 0.2% Offset
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
In-Plane Shear Strength [ksi]
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
0
1
2
3
4

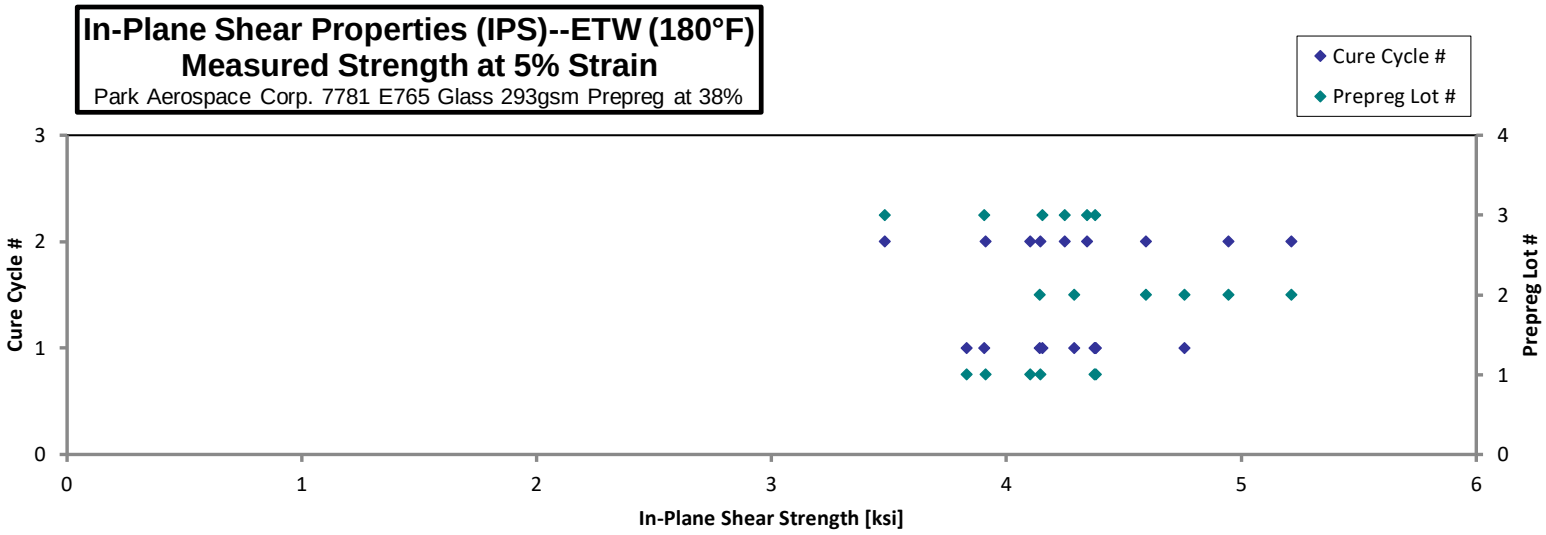

In-Plane Shear Properties (IPS)--ETD (180°F)
Measured Strength at 5% Strain
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
In-Plane Shear Strength [ksi]
0
1
2
3
4
5
6
7
8
9
0
1
2
3
4

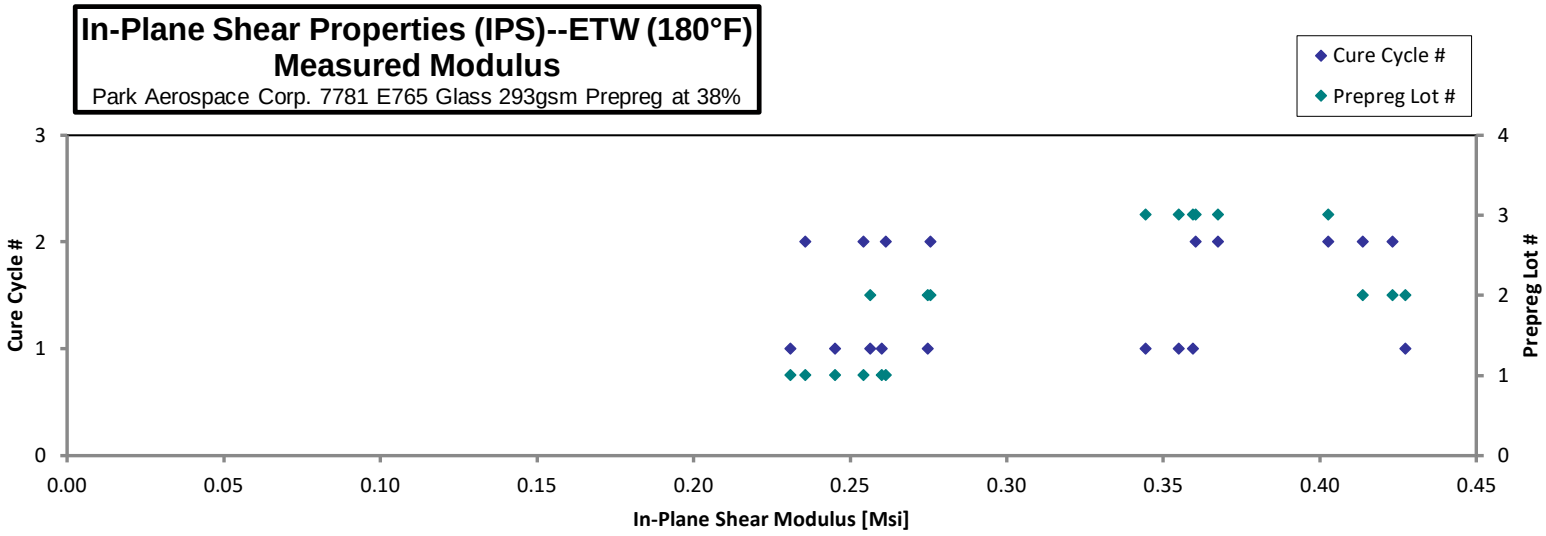

In-Plane Shear Properties (IPS)--ETD (180°F)
Measured Modulus
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
In-Plane Shear Modulus [Msi]
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
0
1
2
3
4

In-Plane Shear Properties (IPS)--ETW (180°F)
Strength & Modulus
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%

Specimen Number	Park Aerospace Corp. Batch #	Park Aerospace Corp. Cure Cycle	Prepreg Lot #	Cure Cycle #	0.2% Offset Strength [ksi]	Strength at 5% Strain [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]
NTP7653E1-PAC-P03-PAC-IPS-A-C1-1-ETW-1	A	C1	1	1	2.152	4.375	0.2601	0.1173	12	0.009778
NTP7653E1-PAC-P03-PAC-IPS-A-C1-1-ETW-2	A	C1	1	1	2.206	4.381	0.2452	0.1167	12	0.009722
NTP7653E1-PAC-P03-PAC-IPS-A-C1-1-ETW-3	A	C1	1	1	1.943	3.830	0.2309	0.1253	12	0.01044
NTP7653E1-PAC-P03-PAC-IPS-A-C2-1-ETW-1	A	C2	1	2	1.984	3.911	0.2357	0.1213	12	0.01011
NTP7653E1-PAC-P03-PAC-IPS-A-C2-1-ETW-2	A	C2	1	2	2.133	4.145	0.2614	0.1180	12	0.009833
NTP7653E1-PAC-P03-PAC-IPS-A-C2-1-ETW-3	A	C2	1	2	2.044	4.100	0.2542	0.1187	12	0.009889
NTP7653E1-PAC-P03-PAC-IPS-B-C1-1-ETW-1	B	C1	2	1	2.128	4.141	0.2566	0.1170	12	0.009750
NTP7653E1-PAC-P03-PAC-IPS-B-C1-1-ETW-2	B	C1	2	1	2.770	4.759	0.4273	0.1160	12	0.009667
NTP7653E1-PAC-P03-PAC-IPS-B-C1-1-ETW-3	B	C1	2	1	2.183	4.288	0.2748	0.1180	12	0.009833
NTP7653E1-PAC-P03-PAC-IPS-B-C2-1-ETW-1	B	C2	2	2	2.333	4.593	0.2756	0.1200	12	0.01000
NTP7653E1-PAC-P03-PAC-IPS-B-C2-1-ETW-2	B	C2	2	2	2.782	5.212	0.4233	0.1190	12	0.009917
NTP7653E1-PAC-P03-PAC-IPS-B-C2-1-ETW-3	B	C2	2	2	2.937	4.943	0.4138	0.1170	12	0.009750
NTP7653E1-PAC-P03-PAC-IPS-C-C1-1-ETW-1	C	C1	3	1	2.182	3.906	0.3444	0.1280	12	0.01067
NTP7653E1-PAC-P03-PAC-IPS-C-C1-1-ETW-2	C	C1	3	1	2.304	4.153	0.3549	0.1300	12	0.01083
NTP7653E1-PAC-P03-PAC-IPS-C-C1-1-ETW-3	C	C1	3	1	2.376	4.378	0.3594	0.1290	12	0.01075
NTP7653E1-PAC-P03-PAC-IPS-C-C2-1-ETW-1	C	C2	3	2	2.551	4.344	0.4027	0.1270	12	0.01058
NTP7653E1-PAC-P03-PAC-IPS-C-C2-1-ETW-2	C	C2	3	2	2.313	4.248	0.3674	0.1290	12	0.01075
NTP7653E1-PAC-P03-PAC-IPS-C-C2-1-ETW-3	C	C2	3	2	2.226	3.480	0.3603	0.1290	12	0.01075
				Average	**2.308**	**4.288**	**0.3193**		**Average**	**0.01017**
				Standard Dev.	**0.2810**	**0.4110**	**0.07074**		**Standard Dev.**	
				Coeff. of Var. [%]	**12.17**	**9.585**	**22.15**		**Coeff. of Var. [%]**	
				Min.	**1.943**	**3.480**	**0.2309**		**Min.**	**0.009667**
				Max.	**2.937**	**5.212**	**0.4273**		**Max.**	**0.01083**
				Number of Spec.	**18**	**18**	**18**		**Number of Spec.**	**18**


In-Plane Shear Properties (IPS)--ETW (180°F)
Measured Strength at 0.2% Offset
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
In-Plane Shear Strength [ksi]
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
0
1
2
3
4


In-Plane Shear Properties (IPS)--ETW (180°F)
Measured Strength at 5% Strain
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
In-Plane Shear Strength [ksi]
0
1
2
3
4
5
6
0
1
2
3
4

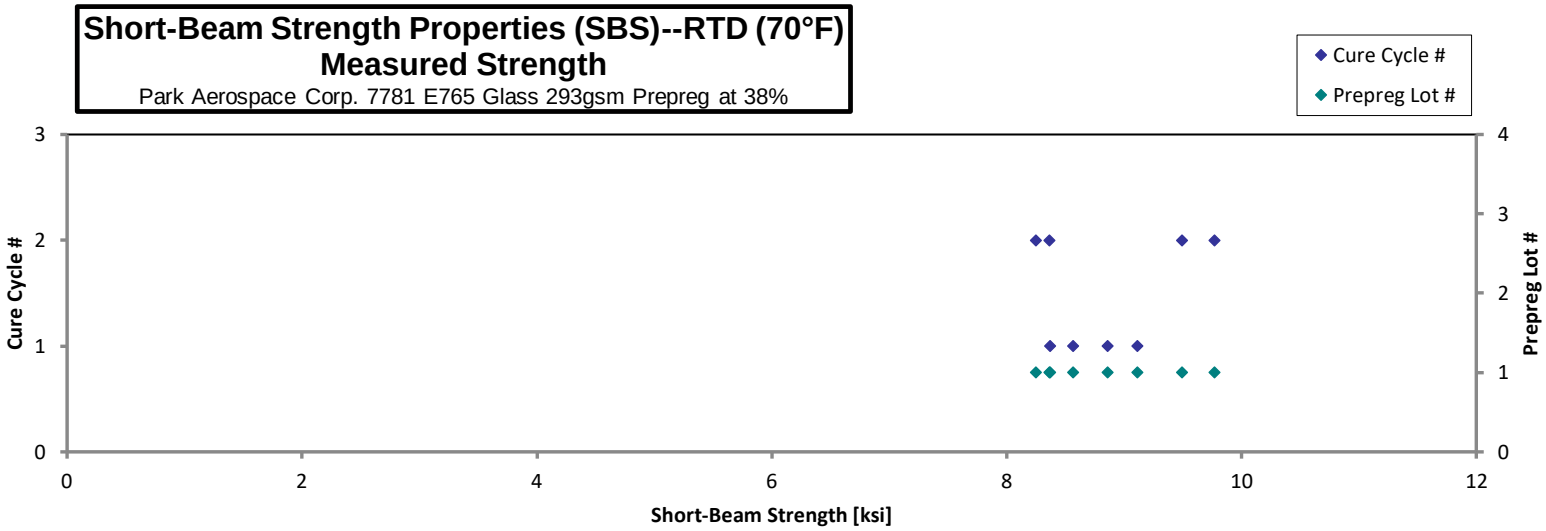

In-Plane Shear Properties (IPS)--ETW (180°F)
Measured Modulus
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
In-Plane Shear Modulus [Msi]
0
1
2
3
4
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
0.45

4.6 Lamina Short-Beam Strength Properties (SBS)

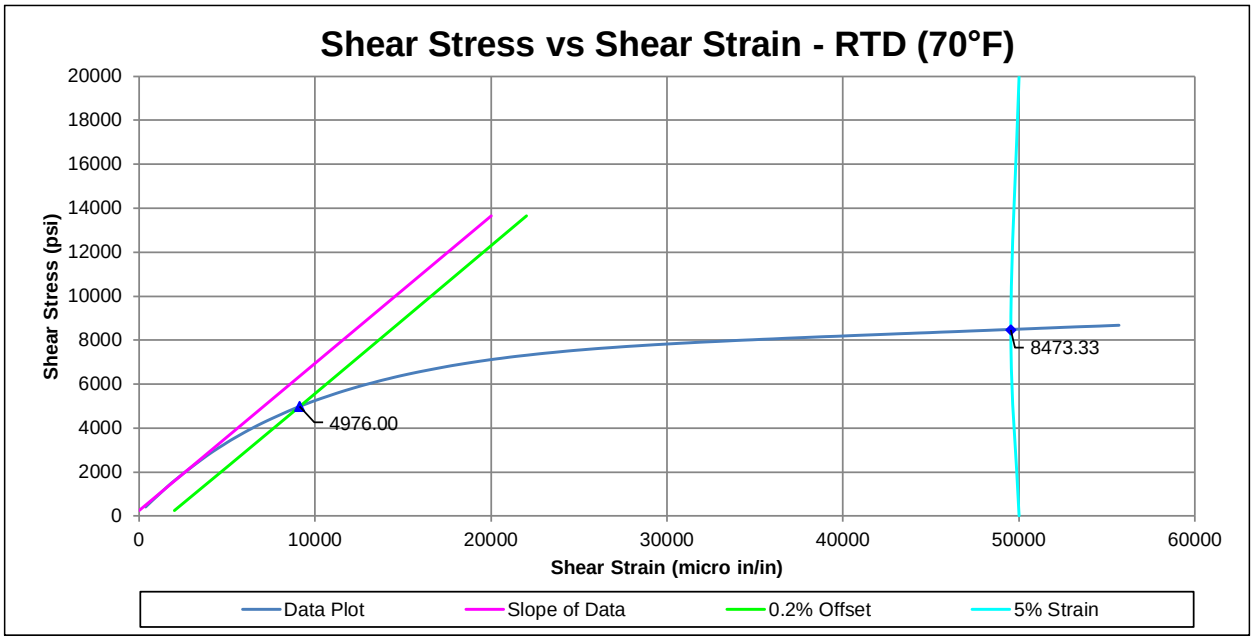
Short-Beam Strength Properties (SBS)--RTD (70°F)
Strength
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%

Specimen Number	Park Aerospace Corp. Batch #	Park Aerospace Corp. Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode
NTP7653E1-PAC-P03-PAC-SBS-A-C1-1-RTD-1	A	C1	1	1	9.118	0.1150	12	0.009583	ILS
NTP7653E1-PAC-P03-PAC-SBS-A-C1-1-RTD-2	A	C1	1	1	8.567	0.1170	12	0.009750	ILS
NTP7653E1-PAC-P03-PAC-SBS-A-C1-1-RTD-3	A	C1	1	1	8.370	0.1150	12	0.009583	ILS
NTP7653E1-PAC-P03-PAC-SBS-A-C1-1-RTD-4	A	C1	1	1	8.863	0.1160	12	0.009667	ILS
NTP7653E1-PAC-P03-PAC-SBS-A-C2-1-RTD-1	A	C2	1	2	9.494	0.1150	12	0.009583	ILS
NTP7653E1-PAC-P03-PAC-SBS-A-C2-1-RTD-2	A	C2	1	2	9.770	0.1140	12	0.009500	ILS
NTP7653E1-PAC-P03-PAC-SBS-A-C2-1-RTD-3	A	C2	1	2	8.364	0.1120	12	0.009333	ILS
NTP7653E1-PAC-P03-PAC-SBS-A-C2-1-RTD-4	A	C2	1	2	8.253	0.1170	12	0.009750	ILS

Average	**8.850**	**Average**	**0.009594**
Standard Dev.	**0.5650**	**Standard Dev.**	
Coeff. of Var. [%]	**6.385**	**Coeff. of Var. [%]**	
Min.	**8.253**	**Min.**	**0.009333**
Max.	**9.770**	**Max.**	**0.009750**
Number of Spec.	**8**	**Number of Spec.**	**8**

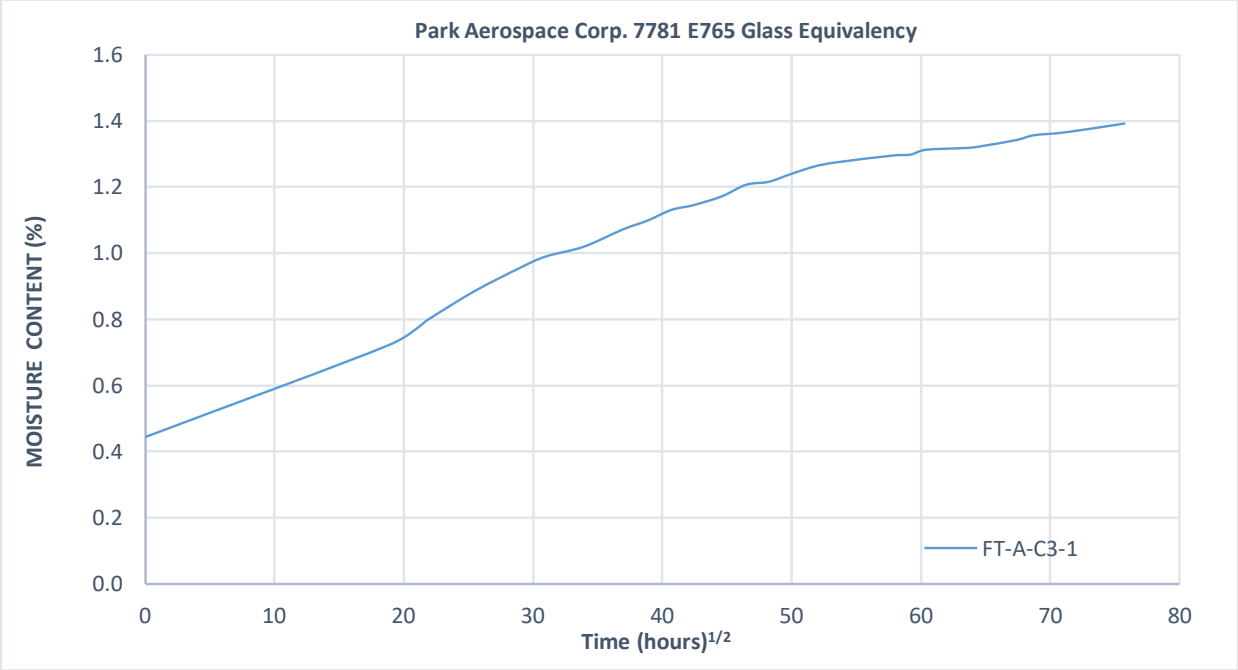

Short-Beam Strength Properties (SBS)--RTD (70°F)
Measured Strength
Park Aerospace Corp. 7781 E765 Glass 293gsm Prepreg at 38%
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Short-Beam Strength [ksi]
0
1
2
3
4
0
2
4
6
8
10
12

5. Full Shear Stress vs. Shear Strain Curve

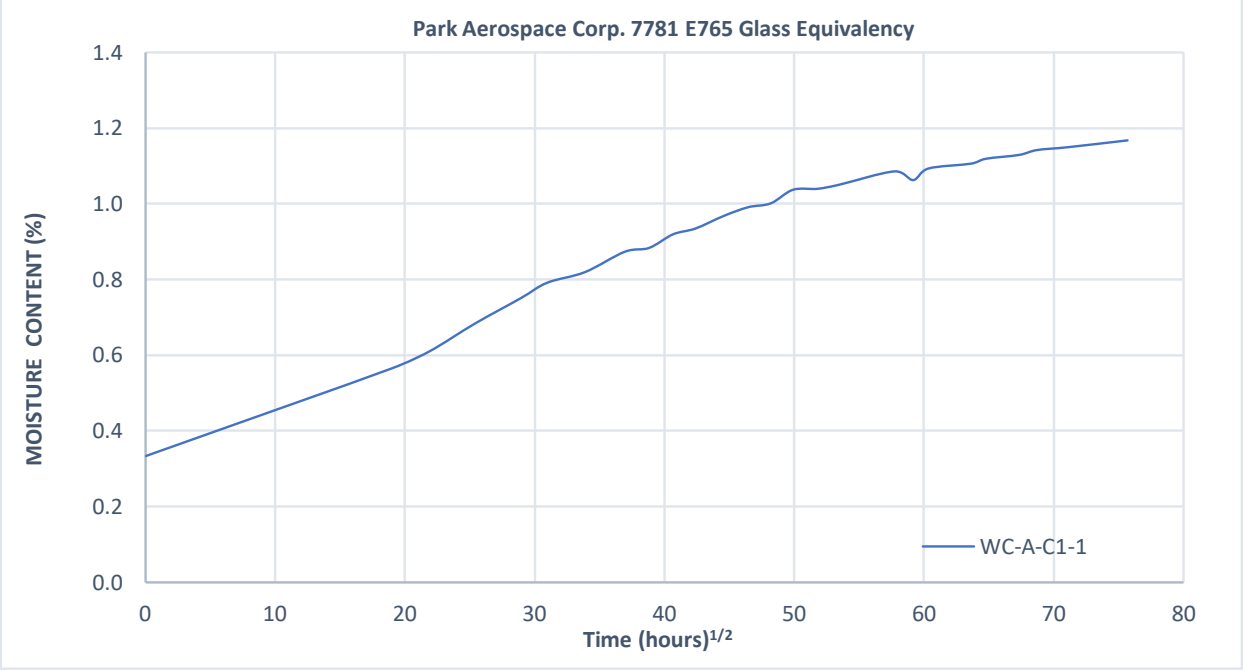


6. Moisture Conditioning Charts

6.1 Fill Tension (FT) – Thinnest Panel



6.2 Warp Compression (WC) – Thickest Panel



7. DMA Results

DMA Results Summary
Park Aerospace Corp. 7781 E765 Glass Equivalency DMA Dry

Panel ID	Onset Storage Modulus		Peak of Tangent Delta	
	T_g[°C]	T_g[°F]	T_g[°C]	T_g[°F]
NTP7653E1-PAC-P03-PAC-FC-A-C1-1*	172.39	342.30	183.61	362.50
NTP7653E1-PAC-P03-PAC-FC-A-C2-1*	170.89	339.60	186.11	367.00
NTP7653E1-PAC-P03-PAC-FT-A-C1-1*	165.00	329.00	187.22	369.00
NTP7653E1-PAC-P03-PAC-FT-A-C2-1*	168.17	334.70	189.06	372.30
NTP7653E1-PAC-P03-PAC-WC-A-C1-1*	173.56	344.40	187.17	368.90
NTP7653E1-PAC-P03-PAC-WC-A-C2-1*	173.06	343.50	186.50	367.70
NTP7653E1-PAC-P03-PAC-WT-A-C1-1*	171.33	340.40	188.83	371.90
NTP7653E1-PAC-P03-PAC-WT-A-C2-1*	172.28	342.10	186.28	367.30
NTP7653E1-PAC-P03-PAC-WC-D-C1-2-DMA**	145.23	293.41	196.77	386.19
NTP7653E1-PAC-P03-PAC-DMA-D-C2-1**	147.19	296.94	198.86	389.95
Average	165.91	330.64	189.04	372.27
Standard Deviation	10.70	19.26	4.89	8.80
No. of Specimen	10	10	10	10

***Park data - tested by Park**

****NIAR data - tested by NIAR per ASTM D7028 (High variability possibly caused by test setup and calibration method)**

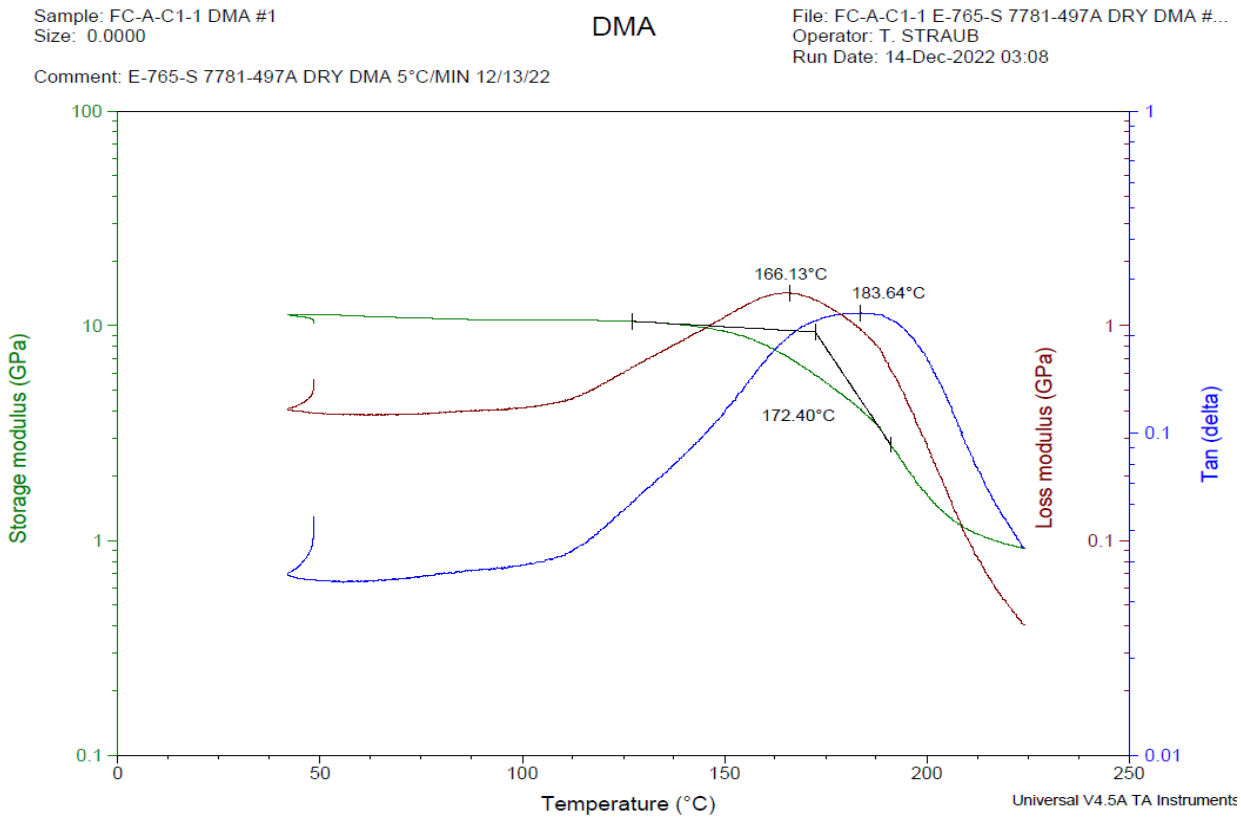
DMA Results Summary
Park Aerospace Corp. 7781 E765 Glass Equivalency DMA Wet

Panel ID	Onset Storage Modulus		Peak of Tangent Delta	
	T_g[°C]	T_g[°F]	T_g[°C]	T_g[°F]
NTP7653E1-PAC-P03-PAC-FC-A-C1-1	133.61	272.50	146.83	296.30
NTP7653E1-PAC-P03-PAC-FC-A-C2-1	132.61	270.70	146.56	295.80
NTP7653E1-PAC-P03-PAC-FT-A-C1-1	129.28	264.70	145.28	293.50
NTP7653E1-PAC-P03-PAC-FT-A-C2-1	133.72	272.70	147.50	297.50
NTP7653E1-PAC-P03-PAC-WC-A-C1-1	129.61	265.30	144.50	292.10
NTP7653E1-PAC-P03-PAC-WC-A-C2-1	125.22	257.40	144.00	291.20
NTP7653E1-PAC-P03-PAC-WT-A-C1-1	130.06	266.10	145.78	294.40
NTP7653E1-PAC-P03-PAC-WT-A-C2-1	125.50	257.90	146.11	295.00
Average	129.95	265.91	145.82	294.48
Standard Deviation	3.33	5.99	1.18	2.13
No. of Specimen	8	8	8	8

***Park data - tested by Park**

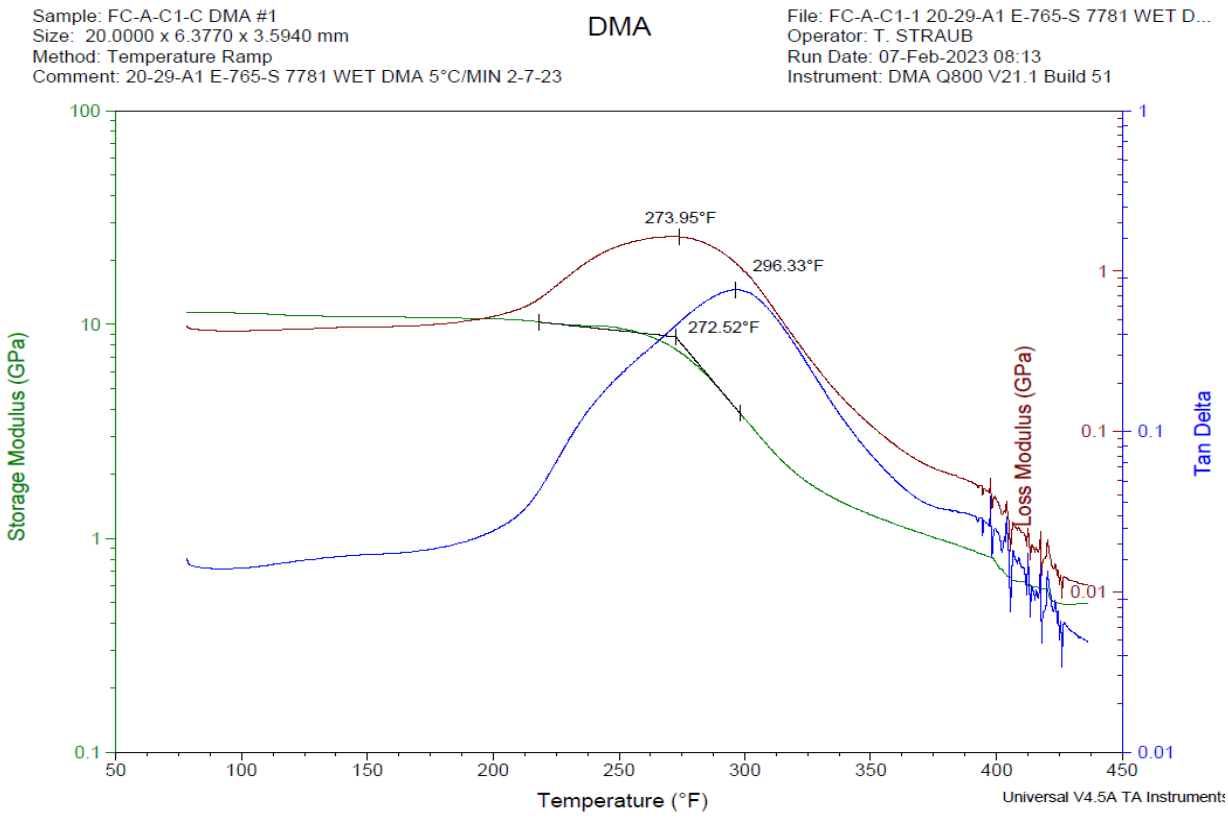
7.1 DMA Dry Batch A

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



7.2 DMA Wet Batch A

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



8. Deviations

N/A