Advanced Composites Group
MTM45-1 CF0526A-36%RW
3K Plain Weave G30-500 Fabric, 193 gsm
Equivalency Material Property Data Report
ACG LH and M Cure Cycle

FAA Special Project Number SP3505WI-Q

Test Report Number: CAM-RP-2010-003 N/C

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N/C	Kristin Marlett	2.8.10	Yeow Ng	Document Initial Release
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Table of Contents

List of Tables

List of Figures

1. Introduction

1.1 Scope

This report contains equivalency test data for MTM45-1 CF0526A-36%RW 3K Plain Wave G30-500 Fabric, 193 gsm Advanced Composites Group produced panels. The material property data has been generated with FAA oversight through FAA Special Project Number SP3505WI-Q; the test panels, test specimens, and test setups have been conformed by the FAA and the testing has been witnessed by the FAA.

The data in this document were intended for equivalency comparison with the qualification material property data report, which is intended to provide basic composite properties essential to most methods of analysis and are consistent with MIL-HDBK-17-1F—Composite Materials Handbook for Polymer Matrix Composites. The equivalency process was performed according to MIL-HDBK-17-1F Section 8.4.1.

Statistical analysis of the data is given in a separate report, NCP-RP-2010-009 N/C Advanced Composites Group MTM45-1 CF0526A-36%RW 3K Plain Wave G30-500 Fabric, 193 gsm Equivalency Statistical Analysis Report – ACG M Cure and NCP-RP-2010-010 N/C – MTM45-1 CF0526A-36%RW 3K Plain Wave G30-500 Fabric, 193 gsm Equivalency Statistical Analysis Report – LH Cure.

The material was procured to ACG Material Specification ACGM 1001–13 Revision A dated November 14, 2007. .An equivalent NCAMP Material Specification NMS 451/13 which contains specification limits that are derived from guidelines in DOT/FAA/AR-03/19 has been created. The equivalency test panels were cured in accordance with ACG process specification ACGP 1001-02 Revision E “LH & M” cure cycles. An equivalent NCAMP Process Specification, NPS 81451 with baseline “MH” Cure Cycle, has been created. The The panels were fabricated at Advanced Composites Group, 5350 South 129th East Avenue, Tulsa, OK 74134-6703. The ACG Test Plan AI/TR/1392 Revision E was used for this equivalency program.

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

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

Aircraft companies should not use the data published in this report without specifying NCAMP Material Specification NMS 451/13. NMS 451/13 may have additional requirements that are listed in its prepreg process control document (PCD), fiber specification, fiber PCD and other raw material specifications and PCDs which impose essential quality controls on the raw materials and raw material manufacturing equipment and processes. *Aircraft companies and certifying agencies should assume that the material property data published in this report is not applicable when the material is not procured to NMS 451/13.* NMS 451/13 is a free, publicly available, non-proprietary aerospace industry material specification.

1.2 Symbols Used

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

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 shear

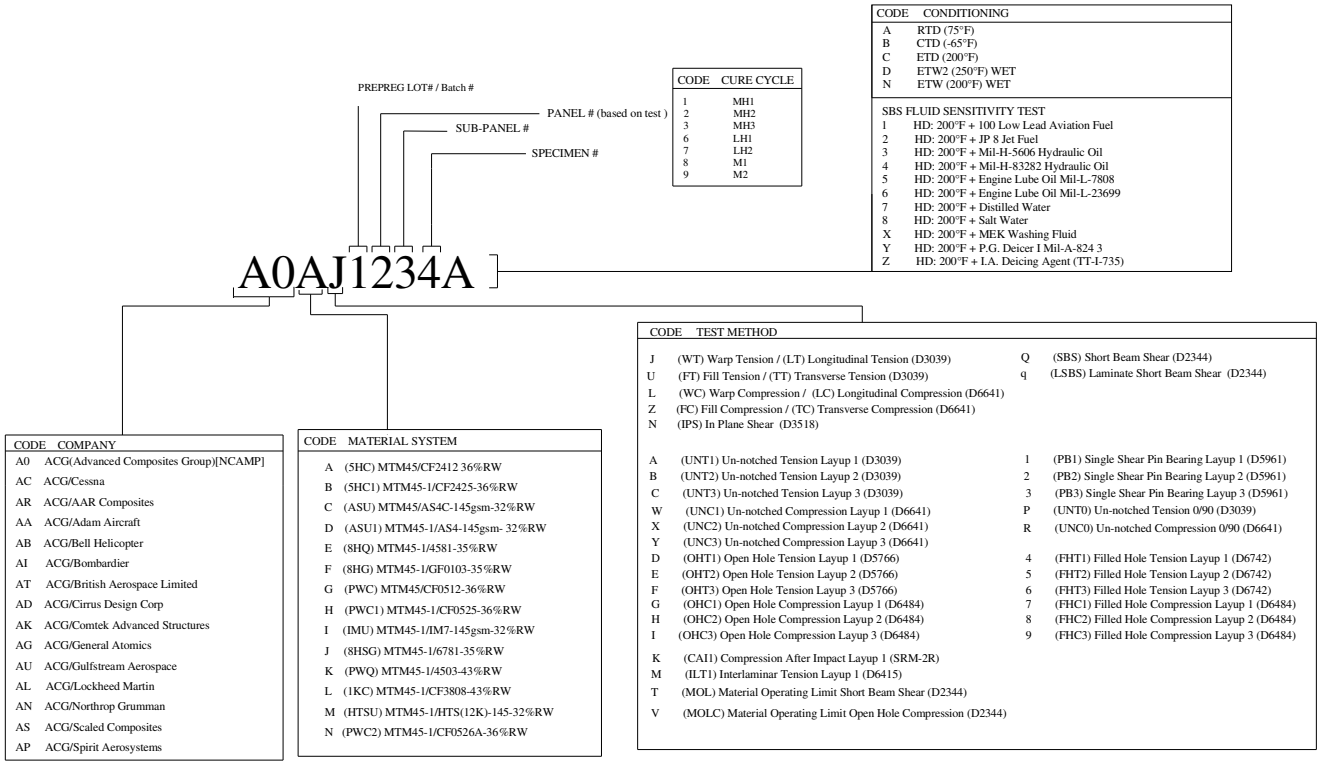
Acronyms and Definitions

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

wet	specimen with an “equilibrium” moisture content
T, RH	temperature, relative humidity

1.3 NIAR NCAMP – ACG Specimen Naming Format

The NIAR specimen names can be correlated to ACG specimen names using the scheme in Figure 1-1.



NIAR NCAMP- ACG SPECIMEN NAMING FORMAT

Figure 1-1: NIAR – ACG Specimen Naming Format Correlation

1.4 ASTM Standards

ASTM D 3039/D 3039M – 00^{e2} *Standard Test Method for Tensile Properties of Polymer Matrix Composite Materials*

ASTM D 6641/D 6641M – 01^{e1} *Standard Test Method for Determining the Compressive Properties of Polymer Matrix Composite Laminates Using a Combined Loading Compression (CLC) Test Fixture*

ASTM D 3518/D 3518M – 94 (2001) *Standard Test Method for In-Plane Shear Response of Polymer Matrix Composite Materials by Tensile Test of a 645°Laminate*

ASTM D 2344/D 2344M – 00^{e1} *Standard Test Method for Short-Beam Strength of Polymer Matrix Composite Materials and Their Laminates*

ASTM D 5766/D 5766M – 02a *Standard Test Method for Open Hole Tensile Strength of Polymer Matrix Composite Laminates*

ASTM D 6484/D 6484M – 04 *Standard Test Method for Open-Hole Compressive Strength of Polymer Matrix Composite Laminates*

SACMA Standards

- SACMA SRM 2R-94 *SACMA Recommended Test Method for Compression After Impact Properties of Oriented Fiber-Resin Composites*

1.5 Methodology

1.5.1 Process Definition

For each combination of test, batch and condition, the specimens were selected from minimum two separate panels cured separately as shown in Figure 1-2 unless otherwise specified.

If more than 2 panels were required to obtain the minimum specimens, the additional panels were labeled accordingly and an equal number of specimens were tested from each panel.

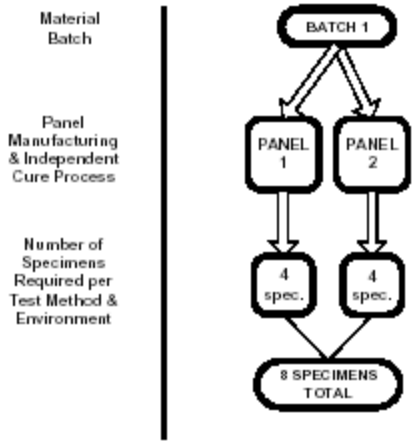


FIGURE 25. AN EXAMPLE OF SPECIMEN SELECTION METHODOLOGY AND PROCESSING TRACEABILITY PER TEST METHOD AND ENVIRONMENTAL CONDITION USED TO ESTABLISH MATERIAL EQUIVALENCE

Figure 1-2: Cure Cycle Definition for Mechanical Test Panels

All panels were cured in accordance with ACG process specification ACGP 1001-02 Revision E.

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

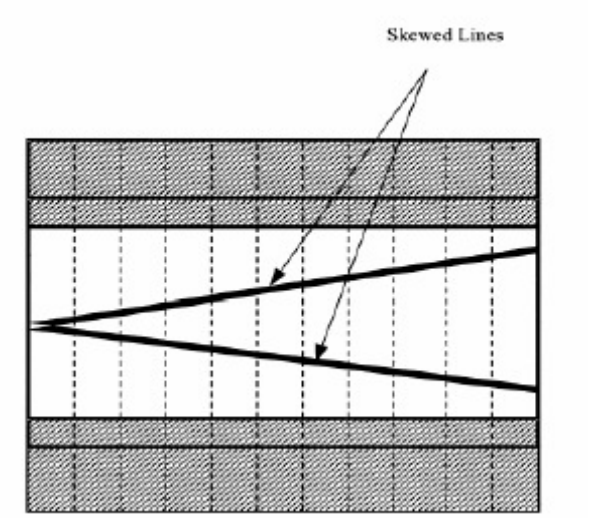


Figure 1-3: Specimen Traceability Line

1.5.2 Specimen & Testing Details

1.5.2.1 Tabbing

No tabs were used for this material system.

1.5.2.2 Strain gages

Strain gages were employed for modulus on selected test methods. The callouts below are requirements of the test plan and actual strain gages used can be found in the CD accompanying this report.

ASTM D3039 tensile: CEA-XX-250UW-120 or 350
ASTM D3518 in-plane shear: CEA-XX-250UW-120 or 350 (one each 0° and 90° to specimen axis) optionally CEA-XX-125UT-120 or 350 biaxial gage
All ASTM D6641 compression: CEA-XX-125UT-120 or 350
Optional ASTM D6641 compression of unidirectional materials and fabric materials of tow/yarn 3K or smaller: CEA-XX-062UT-120 or 350
Where XX = 03 or 06 the self temperature compensation factor for the purposes and procedures of this test plan considered equivalent.

Where modulus was required for other tests, extensometers were used.

1.5.2.3 Specimen Hole Dimensions & Test Configuration

For the open-hole tests, the hole diameter was 0.25 in ±0.003 in. For compression after impact, specimens received nondestructive inspection by c-scan to determine extent and area of damage after impact.

1.5.3 Test Matrix

Table 1-2 summarizes the lamina level tests carried out on fabric materials. The lay-ups chosen have been designed to produce the appropriate thickness required for the various types of tests performed. This table emphasizes those properties and test condition combinations believed to constitute the worst case. Additional testing at some test conditions may be necessary depending on the results contained in this document.

Layup	Test Type and Direction	Property	Number of Batches x Number of Panels x Number of Test Specimens Test Temperature/Moisture Condition				
			CTD	RTD	ETD	ETW	ETW2(1)
[0°]n	0° Tension	Strength + Modulus	1x2x4	1x2x4			1x2x4
[0°]n	0° Compression	Strength + Modulus		1x2x4		1x2x4	1x2x4
[90]n	90° Tension	Strength + Modulus	1x2x4	1x2x4		1x2x4	1x2x4
[90]n	90° Compression	Strength + Modulus		1x2x4	1x2x4	1x2x4	1x2x4
[45°/-45°]ns	In-Plane Shear	Strength + Modulus	1x2x4	1x2x4			1x2x4
[90°]n	Short Beam Strength	Strength		1x2x4		1x2x4	1x2x4
(25%/50%/25% - QI)	Open Hole Tension	Strength	1x2x4	1x2x4			1x2x4
(25%/50%/25% - QI)	Open Hole Compression	Strength		1x2x4		1x2x4	1x2x4
(25%/50%/25% - QI)	Interlaminar Tension	Strength		1x1x4			1x1x4
(25%/50%/25% - QI)	Compression after impact 1500 in-lbs/in	Strength		1x1x4			1x1x4

Table 1-1: Lamina Level Tests - Fabric

1.5.4 Physical Testing

The following tests were conducted for each test laminate with the exception of DMA Tg which was conducted on one separate traveler laminate per batch from each oven cure conducted where that batch is present. This data is included at the top of each individual test summary sheet, located in section 2.1.1.

Property	Condition/Method(1)	# Replicates
Cured Ply Thickness	SACMA SRM10 - Data from mechanical test laminates	Report
Laminate Density	ASTM D792	3
Fiber Volume, % by Volume	ASTM D3171-99(2)	3
Resin Content, % by Volume	ASTM D3171-99(2)	3
Void Content, % by Volume	ASTM D3171-99(2)	3
Glass Transition Temperature, Tg, By DMA	Dry and Wet – SACMA SRM 18R-94	1 dry(3) 1 wet(3)

(1) Where the applicable standard allows variations in specimen form or test method, the specific parameters used are specified in the test work instructions and reported in the applicable test report.
(2) Method II, except for laminates of materials where actual fiber weight is not known accurately prior to impregnation. As is the case for unidirectional materials. For these materials to verify Method II is accurate, a minimum of 12 samples per batch (two from each roll must be included) were tested by Method I, Procedure B for carbon reinforcements and Procedure G for glass or quartz reinforcements.
(3) Minimum 24 dry and 24 wet for each material system, 3 dry & 3 wet per traveler coupon for equivalency testing.

Table 1-2: Cured Laminate Physical Testing

1.5.5 Environmental Conditioning

The following tables define the range of tests and conditions were used to produce design allowable property and other screening data. Test environments are defined as:
CTD = -65±5°F, ambient moisture content dry
RTD = room temperature ambient dry
RTA = room temperature ambient – no drying required
ETD = 200±5°F dry
ETW= 200±5°F, wet (equilibrium moisture content)
ETW2=250±5°F, wet (equilibrium moisture content)

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

For dry testing, specimens were dried at 160°F±5°F for 120 to 130 hours. When drying was completed, specimens were either stored until testing in a sealed oven maintained at 85°F ± 5°F or alternately stored with desiccant in a sealed container. For wet testing, specimens were conditioned to equilibrium in a 160°F±5°F and 85% ± 5% RH environment in accordance with ASTM D 5229/D5229M Procedure C. Equilibrium was determined in accordance with DOT/FAA/AR-03/19 section 3.2. When conditioning was completed the specimens and traveler were stored in the conditioning chamber for up to 60 days or were wrapped in moist cloth or paper towel in a sealed container up no more than 14 days. If storage time exceeded 14 days, the traveler was reweighed to assure moisture equilibrium. In the event that moisture equilibrium was not maintained, the specimens were placed back into the chamber until equilibrium was reached. For non-ambient testing, DOT/FAA/AR-03/19 section 3.3 was followed.

1.5.6 Normalization Procedures

The nominal cure ply thicknesses for each material type are given in appendix 3 of the ACG Test Plan. Lamina level tension and compression strength and modulus properties were normalized to the cured ply thickness indicated. Per ACG's request, the laminate level properties were also normalized. Wherever properties are normalized, both measured and normalized data were reported.

The nominal fiber areal weight was at 193 g/m2 and the average of the one batch of material was 186.92 g/m2 (LH) and 188.23 g/m2 (M) therefore normalization by cured ply thickness (CPT) was used, i.e.:

Normalized strength=Measured Strength x Measured CPT/Nominal CPT

The nominal CPT is 0.0079 and the average CPT was 0.0080. The CPT of the individual specimens were also shown to be close to the nominal CPT.

1.5.7 Conformity

All laminates and specimens for design allowable property and fluid sensitivity screening were inspected for conformance with the requirements of this document and appendices 1 and 2. For all materials requiring FAA approval, the conformance was verified by an FAA approved designated airworthiness representative (DAR). Test setups and testing were approved and witnessed by the FAA or authorized designated engineering representative (DER) as required. FAA conformity and approval documentation can be obtained in folder file entitled Conformity and is included on the CD accompanying this report.

1.5.8 Material Pedigree Information

The PMC Data collection template includes the material pedigree information required, such as material and batch information, as well as environmental conditioning and test results. This file is included in the CD accompanying this report.

ACG Fabric Test results

The files below are available on the CD accompanying this report.

2. Test Results

See pages below for summary tables.

Prepreg Material: Advanced Composites Group - MTM45-1 PWC2 3K PW G30-500 Fabric
ACGM 1001-13 or NMS 451/13 Material Specification

ACG - MTM45-1/ 3K Plain Weave G30-500 Fabric Lamina Properties Summary M CURE CYCLE

Fiber: Tenax-J HTS40 E13 3K 200TEX **Resin** MTM45-1

Tg(dry): 274.57 F **Tg(wet):** 265.17 F **g METHOD:** DMA (SRM 18-94)

PROCESSING: ACGP 1001-02 Process Specification "M" Cure Cycle

Date of fiber manufacture	10/2003; 7/2004; 6/2005	**Date of testing**	02/2006 - 07/2006
Date of resin manufacture	11/2005 -12/2005	**Date of data submittal**	03/2006 - 08/2006
Date of prepreg manufacture	11/2005-12/2005; 4/2006		
Date of composite manufactu	12/2005 -3/2006; 4/2006		

LAMINA MECHANICAL PROPERTY SUMMARY
Data reported as: Normalized & Measured
(Normalized by CPT= .0079 inch)

	CTD Mean		RTD Mean		ETD Mean		ETW Mean		ETW2 Mean	
	Normalized	Measured	Normalized	Measured	Normalized	Measured	Normalized	Measured	Normalized	Measured
F_1^{tu} (ksi)	154.17	152.91	150.51	149.50	---	---	---	---	---	---
E_1^t (Msi)	9.34	9.26	9.11	9.05	---	---	---	---	---	---
F_2^{tu} (ksi)	123.46	122.63	124.42	124.40	---	---	114.14	114.49	---	---
E_2^t (Msi)	8.80	8.74	8.68	8.67	---	---	8.75	8.77	---	---
F_1^{cu} (ksi)	---	---	95.71	97.30	---	---	62.52	63.47	---	---
E_1^c (Msi)	---	---	8.38	8.52	---	---	8.53	8.66	---	---
ν_{12}^c	---	---	---	0.055	---	---	---	0.059	---	---
F_2^{cu} (ksi)	---	---	93.78	92.85	79.11	76.54	57.67	56.18	---	---
E_2^c (Msi)	---	---	8.22	8.14	8.16	7.89	7.29	7.11	---	---
ν_{21}^c	---	---	---	0.059	---	0.068	---	0.048	---	---
$F_{12}^{s5\%strain}$ (ksi)	---	14.73	---	11.24	---	---	---	---	---	---
$F_{12}^{s0.2\%}$ (ksi)	---	8.66	---	6.41	---	---	---	---	---	---
G_{12}^s (Msi)	---	0.69	---	0.60	---	---	---	---	---	---
SBS (ksi)	---	---	---	10.43	---	---	---	6.46	---	---

Table 2-1: Lamina Summary Data- M Cure Cycle

Prepreg Material: Advanced Composites Group - MTM45-1 PWC2 3K PW G30-500 Fabric
ACGM 1001-13 or NMS 451/13 Material Specification

ACG - MTM45-1/ 3K Plain Weave G30-500 Fabric Lamina Properties Summary LH CURE CYCLE

Fiber: Tenax-J HTS40 E13 3K 200TEX **Resin** MTM45-1

Tg(dry): 353.2 F **Tg(wet):** 318.58 F **Tg METHOD DMA (SRM 18-94)**

PROCESSING: ACGP 1001-02 Process Specification "LH" Cure Cycle

Date of fiber manufacture	10/2003; 7/2004; 6/2005	**Date of testing**	02/2006 - 07/2006
Date of resin manufacture	11/2005 -12/2005	**Date of data submittal**	03/2006 - 08/2006
Date of prepreg manufacture	11/2005-12/2005; 4/2006		
Date of composite manufactu	12/2005 -3/2006; 4/2006		

LAMINA MECHANICAL PROPERTY SUMMARY
Data reported as: Normalized & Measured
(Normalized by CPT= .0079 inch)

	CTD Mean		RTD Mean		ETD Mean		ETW Mean		ETW2 Mean	
	Normalized	Measured	Normalized	Measured	Normalized	Measured	Normalized	Measured	Normalized	Measured
F_1^{tu} (ksi)	137.07	136.68	140.97	138.25	---	---	---	---	131.52	131.17
E_1^t (Msi)	9.41	9.38	8.77	8.60	---	---	---	---	10.12	10.10
F_2^{tu} (ksi)	128.39	129.65	129.20	132.99	---	---	120.06	122.61	114.67	112.85
E_2^t (Msi)	9.16	9.25	8.99	9.26	---	---	8.92	9.11	9.48	9.33
F_1^{cu} (ksi)	---	---	92.93	95.05	79.55	79.73	60.41	60.22	55.76	55.87
E_1^c (Msi)	---	---	8.34	8.54	8.08	8.10	8.52	8.50	8.65	8.66
ν_{12}^c	---	---	---	0.062	---	0.060	---	0.059	---	0.065
F_2^{cu} (ksi)	---	---	91.35	91.91	---	---	49.77	49.76	42.06	42.39
E_2^c (Msi)	---	---	8.07	8.12	---	---	7.84	7.83	8.55	8.62
ν_{21}^c	---	---		0.057	---	---	---	0.058	---	0.071
$F_{12}^{s5\%strain}$ (ksi)	---	15.56	---	12.76	---	---	---	---	---	7.51
$F_{12}^{s0.2\%}$ (ksi)	---	9.20	---	6.90	---	---	---	---	---	4.19
G_{12}^s (Msi)	---	0.72	---	0.61	---	---	---	---	---	0.42
SBS (ksi)	---	---	---	9.78	---	---	---	6.47	---	5.16

Table 2-2: Lamina Summary Data- LH Cure Cycle

Prepreg Material:	Advanced Composites Group - MTM45-1 PWC2 3K PW G30-500 Fabric ACGM 1001-13 or NMS 451/13 Material Specification				**ACG - MTM45-1/ 3K Plain Weave G30-500 Fabric Laminate Properties Summary M CURE CYCLE**
Fiber:	Tenax-J HTS40 E13 3K 200TEX		**Resin**	MTM45-1	
Tg(dry):	274.57 F	**Tg(wet):** 265.17 F	**Tg METHOD:**	DMA (SRM 18-94)	
PROCESSING:	ACGP 1001-02 Process Specification "M" Cure Cycle				

Date of fiber manufacture	10/2003; 7/2004; 6/2005	**Date of testing**	02/2006 - 07/2006
Date of resin manufacture	11/2005 -12/2005	**Date of data submittal**	03/2006 - 08/2006
Date of prepreg manufacture	11/2005-12/2005; 4/2006		
Date of composite manufacture	12/2005 -3/2006; 4/2006		

LAMINATE MECHANICAL PROPERTY SUMMARY
Data reported as: Normalized & Measured
(Normalized by CPT= .0079 inch)

	Test Condition	Normalized	Measured	Normalized	Measured	Normalized	Measured
OHT Strength (ksi)	**CTD**	54.31	54.58				
	RTD	54.08	54.43				
OHC Strength (ksi)	**RTD**	42.25	41.56				
	ETW	33.65	32.91				
CAI Strength (ksi)	**RTD**	31.19	31.22				
	ETW2	22.91	22.79				
ILT Strength (ksi)	**RTD**	---	5.00				

Table 2-3: Laminate Summary Data- M Cure Cycle

Prepreg Material:	Advanced Composites Group - MTM45-1 PWC2 3K PW G30-500 Fabric ACGM 1001-13 or NMS 451/13 Material Specification					**ACG - MTM45-1/ 3K Plain Weave G30-500 Fabric Laminate Properties Summary LH CURE CYCLE**	
Fiber:	Tenax-J HTS40 E13 3K 200TEX			**Resin**	MTM45-1		
Tg(dry):	353.2 F	**Tg(wet):**	318.58 F	**Tg METHOD:**	DMA (SRM 18-94)		
PROCESSING:	ACGP 1001-02 Process Specification "LH" Cure Cycle						
Date of fiber manufacture	10/2003; 7/2004; 6/2005				**Date of testing**	02/2006 - 07/2006	
Date of resin manufacture	11/2005 -12/2005				**Date of data submittal**	03/2006 - 08/2006	
Date of prepreg manufacture	11/2005-12/2005; 4/2006						
Date of composite manufacture	12/2005 -3/2006; 4/2006						

LAMINATE MECHANICAL PROPERTY SUMMARY
Data reported as: Normalized & Measured
(Normalized by CPT= .0079 inch)

	Test Condition	Normalized	Measured	Normalized	Measured	Normalized	Measured
OHT Strength (ksi)	**CTD**	51.86	50.62				
	RTD	53.67	52.39				
	ETW2	53.98	52.78				
OHC Strength (ksi)	**RTD**	40.75	40.09				
	ETW	31.31	30.74				
		28.60	27.91				
CAI Strength (ksi)	**RTD**	29.58	29.47				
	ETW2	22.91	22.79				
ILT Strength (ksi)	**RTD**	---	6.25				
	ETW2	---	2.42				

Table 2-4: Laminate Summary Data- LH Cure Cycle

2.1 Individual Test Summaries

2.1.1 Warp Tension Properties

Material:	Advanced Composites Group - MTM45-1/ 3K Plain Weave G30-500 Fabric					**Tension, 1-axis** Gr/ Ep MTM45-1/ 3K Plain Weave G30-500 Fabric $[0]_{14}$	
Resin content:	36.33% vol	**Comp. density:** 1.49 g/cc (.054 lb/cu in)					
Fiber volume:	53.92 % vol						
Ply count:	14						
Test method:	ASTM D3039-00	**Modulus calculation:** linear fit from 1000 to 3000 micro in./in.					
Normalized by:	0.0079 in. CPT						
		CTD (B)		**RTD (A)**		**ETW2 (D)**	
Test Temperature [°F]		-65		75		250	
Moisture Conditioning		dry		dry		equilibrium	
Equilibrium at T, RH						160 F,85%	
Source code		A0NJXXXXB		A0NJXXXXA		A0NJXXXXD	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
	Mean	137.07	136.68	140.97	138.25	131.52	131.17
F_1^{tu}	**Minimum**	132.17	131.75	132.49	130.59	128.01	124.76
(ksi)	**Maximum**	142.35	144.07	149.16	146.02	140.52	137.49
LH CURE CYCLE	**C.V.(%)**	2.65	3.16	3.34	3.05	2.30	3.00
	No. Specimens	8		8		15	
	No. Prepreg Lots	1		1		1	
	Mean	9.41	9.38	8.77	8.60	10.12	10.10
E_1^t	**Minimum**	9.25	9.12	8.63	8.41	9.15	8.96
(Msi)	**Maximum**	9.65	9.56	8.86	8.75	14.29	14.58
LH CURE CYCLE	**C.V.(%)**	1.50	1.47	0.96	1.38	13.40	14.39
	No. Specimens	8		8		15	
	No. Prepreg Lots	1		1		1	
	Mean	154.17	152.91	150.51	149.50		
F_1^{tu}	**Minimum**	148.25	147.69	142.10	142.34		
(ksi)	**Maximum**	158.80	157.47	156.71	155.53		
M CURE CYCLE	**C.V.(%)**	2.68	2.35	2.99	2.71		
	No. Specimens	8		16			
	No. Prepreg Lots	1		1			
	Mean	9.34	9.26	9.11	9.05		
E_1^t	**Minimum**	8.95	8.94	8.70	8.62		
(Msi)	**Maximum**	9.56	9.48	9.62	9.60		
M CURE CYCLE	**C.V.(%)**	1.93	1.72	3.56	3.59		
	No. Specimens	8		16			
	No. Prepreg Lots	1		1			

2.1.2 Fill Tension Properties

Material:	MTM45-1/ 3K Plain Weave G30-500 Fabric							**Tension, 2-axis**	
								Gr/ Ep	
Resin content:	43.03 % vol	**Comp. density:** 1.491 g/cc (.054 lb/ cu in)						**ACG - MTM45-1/ 3K Plain Weave**	
Fiber volume:	56.97 vol%							**G30-500 Fabric**	
Ply count:	14							**$[90]_{14}$**	
Test method:	ASTM D3039-00	**Modulus calculation:** linear fit from 1000 to 3000 micro in./in.							
Normalized by:	0.0079 in. CPT								
		CTD (B)		**RTD (A)**		**ETW (N)**		**ETW2 (D)**	
Test Temperature [°F]		-65		75		200		250	
Moisture Conditioning		dry		dry		equilibrium		equilibrium	
Equilibrium at T, RH						160 F,85%		160 F,85%	
Source code		A0NUXXXXB		A0NUXXXXA		A0NUXXXXN		A0NUXXXXD	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
	Mean	128.39	129.65	129.20	132.99	120.06	122.61	114.67	112.85
F_2^{tu}	**Minimum**	123.98	127.13	119.65	118.93	109.78	112.47	104.60	102.56
(ksi)	**Maximum**	134.80	134.33	134.41	138.36	127.68	135.16	118.82	117.95
LH CURE CYCLE	**C.V.(%)**	2.59	1.76	3.47	4.79	4.96	5.74	3.96	4.47
	No. Specimens	8		8		8		8	
	No. Prepreg Lots	1		1		1		1	
	Mean	9.16	9.25	8.99	9.26	8.92	9.11	9.48	9.33
	Minimum	8.86	8.79	8.85	8.92	8.76	8.83	9.07	8.84
	Maximum	9.38	9.62	9.11	9.75	9.13	9.41	10.09	10.01
E_2^t	**C.V.(%)**	2.36	3.65	1.00	2.86	1.32	2.39	3.85	4.64
(Msi)									
LH CURE CYCLE	**No. Specimens**	8		8		8		8	
	No. Prepreg Lots	1		1		1		1	
	Mean	123.46	122.63	124.42	124.40	114.14	114.49		
F_2^{tu}	**Minimum**	117.71	115.78	119.35	118.40	105.89	104.93		
(ksi)	**Maximum**	126.65	127.21	131.85	131.39	121.23	123.21		
M CURE CYCLE	**C.V.(%)**	2.64	3.22	3.73	4.39	5.48	6.73		
	No. Specimens	7		7		7			
	No. Prepreg Lots	1		1		1			
	Mean	8.80	8.74	8.68	8.67	8.75	8.77		
	Minimum	8.62	8.48	8.46	8.37	8.52	8.44		
	Maximum	9.01	8.96	8.94	8.91	9.14	9.25		
E_2^t	**C.V.(%)**	1.65	2.36	1.96	2.69	2.25	3.08		
(Msi)									
M CURE CYCLE	**No. Specimens**	7		7		7			
	No. Prepreg Lots	1		1		1			

2.1.3 Warp Compression Properties

Material: MTM45-1/ 3K Plain Weave G30-500 Fabric

Resin content: 36.57 wt% **Comp. density:** 1.490 g/cc (.054 lb/cu in)
Fiber volume: 53.69 vol%
Ply count: 18

Test method: ASTM D6641-01
Modulus calculation: linear fit from 1000 to 3000 micro in./in.
Normalized by: 0.0079 in. CPT

Compression, 1-axis
Gr/ Ep
ACG - MTM45-1/ 3K Plain Weave G30-500 Fabric
$[0]_{18}$

		RTD (A)		ETW (N)		ETW2 (D)	
Test Temperature [°F]		75		200		250	
Moisture Conditioning		dry		equilibrium		equilibrium	
Equilibrium at T, RH				160 F,85%		160 F,85%	
Source code		A0NLXXXXA		A0NLXXXXN		A0NLXXXXD	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
	Mean	91.35	91.91	49.77	49.76	42.06	42.39
F_1^{cu}	**Minimum**	84.04	85.04	41.66	41.22	35.56	35.73
(ksi)	**Maximum**	96.92	96.61	56.32	57.05	50.88	50.77
LH CURE CYCLE	**C.V.(%)**	4.59	4.27	10.71	10.96	12.67	12.37
	No. Specimens	8		11		9	
	No. Prepreg Lots	1		1		1	
	Mean	8.07	8.12	7.84	7.83	8.55	8.62
	Minimum	7.82	7.81	6.94	7.15	7.92	7.90
E_1^c	**Maximum**	8.24	8.35	9.67	9.69	9.36	9.39
(Msi)	**C.V.(%)**	1.74	2.18	9.52	9.37	6.30	6.52
LH CURE CYCLE							
	No. Specimens	8				9	
	No. Prepreg Lots	1		1		1	
	Mean	0.057		0.058		0.071	
ν_{12}	**No. Specimens**	8		11		9	
LH CURE CYCLE	**No. Prepreg Lots**	1		1		1	
	Mean	95.71	97.30	62.52	63.47		
F_1^{cu}	**Minimum**	88.32	88.13	48.42	48.47		
(ksi)	**Maximum**	102.52	102.54	75.95	76.74		
M CURE CYCLE	**C.V.(%)**	4.54	5.31	12.79	12.60		
	No. Specimens	8		18			
	No. Prepreg Lots	1		1			
	Mean	8.38	8.52	8.53	8.66		
	Minimum	8.07	8.01	6.32	6.31		
E_1^c	**Maximum**	8.65	8.99	9.48	9.43		
(Msi)	**C.V.(%)**	2.62	4.15	8.33	8.20		
M CURE CYCLE							
	No. Specimens	8		19			
	No. Prepreg Lots	1		1			
	Mean	0.055		0.059			
ν_{12}	**No. Specimens**	8		19			
M CURE CYCLE	**No. Prepreg Lots**	1		1			

2.1.4 Fill Compression Properties

Material: MTM45-1/ 3K Plain Weave G30-500 Fabric

Resin content: not available
Fiber volume: not available
Ply count: 18

Comp. density: 1.491g/cc (.054 lb/ cu in)

Compression, 2-axis
Gr/ Ep
ACG - MTM45-1/ 3K Plain Weave G30-500 Fabric
$[90]_{18}$

Test method: ASTM D6641-01

Modulus calculation: linear fit from 1000 to 3000 micro in./in.

Normalized by: 0.0079 in. CPT

		RTD (A)		ETD (C)		ETW (N)		ETW2 (D)	
Test Temperature [°F]		75		200		200		250	
Moisture Conditioning		dry		dry		equilibrium		equilibrium	
Equilibrium at T, RH						160 F,85%		160 F,85%	
Source code		A0NZXXXXA		A0NZXXXXC		A0NZXXXXN		A0NZXXXXD	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
	Mean	92.93	95.05	79.55	79.73	60.41	60.22	55.76	55.87
	Minimum	80.34	85.85	74.72	74.70	56.10	55.91	51.27	51.17
F_2^{cu}	**Maximum**	100.86	101.13	86.65	86.33	63.79	63.40	59.08	58.99
(ksi)	**C.V.(%)**	7.52	5.68	5.10	4.97	4.80	4.75	4.82	5.02
LH CURE CYCLE									
	No. Specimens	8		8		8		8	
	No. Prepreg Lots	1		1		1		1	
	Mean	8.34	8.54	8.08	8.10	8.52	8.50	8.65	8.66
	Minimum	8.03	8.09	7.78	7.82	8.25	8.25	8.28	8.33
E_2^c	**Maximum**	8.71	9.07	8.50	8.52	8.67	8.63	9.23	9.22
(Msi)	**C.V.(%)**	2.82	4.50	2.69	2.68	1.66	63.79	3.98	3.68
LH CURE CYCLE									
	No. Specimens	8		8		8		8	
	No. Prepreg Lots	1		1		1		1	
	Mean	0.062		0.060		0.059		0.065	
v21	**No. Specimens**	8		8		8		8	
LH CURE CYCLE	**No. Prepreg Lots**	1		1		1		1	
	Mean	93.78	92.85	79.11	76.54	57.67	56.18		
	Minimum	89.40	86.27	71.85	70.33	47.09	45.04		
F_2^{cu}	**Maximum**	96.04	95.65	85.78	83.03	67.92	66.28		
(ksi)	**C.V.(%)**	2.66	3.04	6.31	4.90	13.04	14.28		
M CURE CYCLE									
	No. Specimens	8		8		8			
	No. Prepreg Lots	1		1		1			
	Mean	8.22	8.14	8.16	7.89	7.29	7.11		
	Minimum	8.01	7.90	7.87	7.53	6.20	5.89		
E_2^c	**Maximum**	8.45	8.35	8.48	8.24	8.44	8.34		
(Msi)	**C.V.(%)**	1.74	2.16	2.64	3.53	14.52	16.46		
M CURE CYCLE									
	No. Specimens	8		8					
	No. Prepreg Lots	1		1		1			
	Mean	0.059		0.068		0.048			
v21	**No. Specimens**	8		8		8			
M CURE CYCLE	**No. Prepreg Lots**	1		1		1			

Physical testing data not available

2.1.5 In-Plane Shear Properties

Material:	Advanced Composites Group - MTM45/ 6K5HS AS4C Graphite Fabric					**In Plane Shear Gr/ Ep ACG - MTM45-1/ 3K Plain Weave G30-500 Fabric $[+45/-45]_{2S}$**	
Resin content:	45.81 % vol	**Comp. density:** 1.490 g/cc(.054 lb/cu in)					
Fiber volume:	54.19 % vol						
Ply count:	8						
Test method:	ASTM D3518-94	**Modulus calculation:** linear fit from 1000 to 6000 micro in./in.					
Normalized by:	0.0079 in. CPT						
		CTD (B)		**RTD (A)**		**ETW2 (D)**	
Test Temperature [°F]		-65		75		250	
Moisture Conditioning		dry		dry		equilibrium	
Equilibrium at T, RH						160 F,85%	
Source code		A0NNXXXXB		A0NNXXXXA		A0NNXXXXD	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
	Mean		15.56		12.76		7.51
$F_{12}^{s5\% \text{ strain}}$	**Minimum**		15.33		12.27		7.12
(ksi)	**Maximum**		15.82		12.96		7.83
LH CURE CYCLE	**C.V.(%)**		1.36		2.07		3.59
	No. Specimens	6		6		7	
	No. Prepreg Lots	1		1		1	
	Mean		9.20		6.90		4.19
$F_{12}^{s0.2\%}$	**Minimum**		8.84		6.48		3.82
(ksi)	**Maximum**		9.52		7.30		4.43
LH CURE CYCLE	**C.V.(%)**		2.62		3.99		4.96
	No. Specimens	8		8		8	
	No. Prepreg Lots	1		1		1	
	Mean		0.72		0.61		0.42
G_{12}^{s}	**Minimum**		0.69		0.58		0.39
(Msi)	**Maximum**		0.75		0.65		0.46
LH CURE CYCLE	**C.V.(%)**		3.12		3.91		5.63
	No. Specimens	8		8		8	
	No. Prepreg Lots	1		1		1	

IPS continued

	Mean		14.73	11.24	
$F_{12}^{s5\% \text{ strain}}$	**Minimum**		14.13	10.66	
(ksi)	**Maximum**		15.14	12.01	
M CURE CYCLE	**C.V.(%)**		2.44	3.39	
	No. Specimens	7		16	
	No. Prepreg Lots	1		1	
	Mean		8.66	6.41	
$F_{12}^{s0.2\%}$	**Minimum**		8.31	6.08	
(ksi)	**Maximum**		8.97	6.76	
M CURE CYCLE	**C.V.(%)**		2.41	3.35	
	No. Specimens	8		17	
	No. Prepreg Lots	1		1	
	Mean		0.69	0.60	
G_{12}^{s}	**Minimum**		0.66	0.58	
(Msi)	**Maximum**		0.72	0.63	
M CURE CYCLE	**C.V.(%)**		3.03	2.73	
	No. Specimens	8		17	
	No. Prepreg Lots	1		1	

2.1.6 Lamina Short Beam Strength Properties

Material: ACG - MTM45-1/ 3K Plain Weave G30-500 Fabric

Resin content: See FT **Comp. density:** 1.185 g/cc

Fiber volume: See FT

Ply count: 14

Test method: ASTM D2344-00^{E1}

Normalized by:

Short Beam Strength
Gr/ Ep
ACG - MTM45-1/ 3K Plain Weave G30-500 Fabric
$[90]_{14}$

		RTD (A)		ETW (N)		ETW2 (D)	
Test Temperature [°F]		75		200		250	
Moisture Conditioning		dry		equilibrium		equilibrium	
Equilibrium at T, RH				160 F,85%		160 F,85%	
Source code		A0NQXXXXA		A0NQXXXXN		A0NQXXXXD	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
	Mean		9.78		6.47		5.16
	Minimum		9.51		6.31		5.07
	Maximum		9.96		6.65		5.33
SBS	**C.V.(%)**		1.48		1.85		1.70
Strength (ksi)							
LH CURE CYCLE	**No. Specimens**	8		9		8	
	No. Prepreg Lots	1		1		1	
	Mean		10.43		6.46		
	Minimum		10.16		6.08		
	Maximum		10.95		6.82		
SBS	**C.V.(%)**		2.58		3.83		
Strength (ksi)							
M CURE CYCLE							
	No. Specimens	9		8			
	No. Prepreg Lots	1		1			

2.1.7 Open Hole Tension 1 Properties

Material:	MTM45-1/ 3K Plain Weave G30-500 Fabric					**Open Hole Tension 1** **ACG - MTM45-1/ 3K Plain Weave G30-500 Fabric [45,0,-45,90]2S**	
Resin content:	55.58 vol%	**Comp. density:** 1.49 g/cc					
Fiber volume:	44.42 % vol						
Ply count:	16						
Test method:	ASTM D5766-02a						
Normalized by:	0.0079 in. CPT						
		CTD (B)		**RTD (A)**		**ETW2 (D)**	
Test Temperature [°F]		-65		75		250	
Moisture Conditioning		dry		dry		equilibrium	
Equilibrium at T, RH						160 F,85%	
Source code		A0NDXXXXB		A0NDXXXXA		A0NDXXXXD	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
	Mean	51.86	50.62	53.67	52.39	53.98	52.78
	Minimum	50.89	49.57	52.58	51.29	51.30	49.72
OHT1	**Maximum**	52.89	51.40	54.87	53.49	55.56	54.66
Strength (ksi)	**C.V.(%)**	1.08	1.09	1.20	1.18	2.61	3.22
LH CURE CYCLE							
	No. Specimens	8		8		8	
	No. Prepreg Lots	1		1		1	
	Mean	54.31	54.58	54.08	54.43		
	Minimum	52.73	53.19	50.99	53.24		
OHT1	**Maximum**	56.09	56.29	56.92	55.43		
Strength (ksi)	**C.V.(%)**	2.53	2.21	4.17	1.27		
M CURE CYCLE							
	No. Specimens	8		8			
	No. Prepreg Lots	1		1			

2.1.8 Open Hole Compression 1 Properties

Material:	Advanced Composites Group -MTM45-1/ 3K Plain Weave G30-500 Fabric					**Open Hole Compression 1**	
Resin content:	45.85 % vol	**Comp. density:** 1.49 g/cc (.054 lb/cu in)				**Gr/ Ep**	
Fiber volume:	55.13 % vol					**ACG - MTM45-1/ 3K Plain Weave**	
Ply count:	16					**G30-500 Fabric**	
Test method:	ASTM D6484-04						
Normalized by:	0.0079 in. CPT						
		RTD (A)		**ETW (N)**		**ETW2 (D)**	
Test Temperature [°F]		75		200		250	
Moisture Conditioning		dry		equilibrium		equilibrium	
Equilibrium at T, RH				160 F,85%		160 F,85%	
Source code		A0NGXXXXA		A0NGXXXXN		A0NGXXXXD	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
	Mean	40.75	40.09	31.31	30.74	28.60	27.91
OHC1	**Minimum**	39.69	38.41	29.27	28.84	27.20	26.70
Strength (ksi)	**Maximum**	42.10	41.37	33.40	32.23	30.01	29.50
LH CURE CYCLE	**C.V.(%)**	2.07	2.23	4.77	4.04	3.19	3.30
	No. Specimens	8		8		8	
	No. Prepreg Lots	1		1		1	
	Mean	42.25	41.56	33.65	32.91		
OHC1	**Minimum**	40.43	39.55	32.11	31.22		
Strength (ksi)	**Maximum**	44.24	43.74	36.01	35.25		
M CURE CYCLE	**C.V.(%)**	2.76	3.24	4.02	4.25		
	No. Specimens	8		8			
	No. Prepreg Lots	1		1			

2.1.9 Compression after Impact Properties

Material: MTM45-1/ 3K Plain Weave G30-500 Fabric

Resin content: 56.28 w t%
Fiber volume: 43.72 vol%
Ply count: 20

Comp. density: 1.491 g/cc (.054 lb/ cu in)

Compression After Impact
Gr/ Ep
ACG - MTM45-1/ 3K Plain Weave G30-500 Fabric
[0,45,-45,0]5

Test method: SACMA SRM 2R-94

Modulus calculation: linear fit from 1000 to 3000 micro in./in.

Normalized by: 0.0079 in. CPT

		RTD (A)		ETW2(D)			
Test Temperature [°F]		75		250			
Moisture Conditioning		dry		HOT WET			
Equilibrium at T, RH				160F			
Source code		A0NKXXXXA		A0NKXXXXD			
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
	Mean	29.58	29.47	22.91	22.79		
	Minimum	29.22	28.99	22.38	22.06		
CAI1	**Maximum**	29.93	30.08	23.86	23.91		
Strength (ksi)	**C.V.(%)**	1.20	1.90	3.60	4.31		
LH CURE							
	No. Specimens	3		3			
	No. Prepreg Lots	1		1			
	Mean	31.19	31.22	22.91	22.79		
	Minimum	30.88	30.85	22.38	22.06		
CAI1	**Maximum**	31.55	31.80	23.86	23.91		
Strength (ksi)	**C.V.(%)**	0.94	1.35	3.60	4.31		
M CURE							
	No. Specimens	4		3			
	No. Prepreg Lots	1		1			

2.1.10 Interlaminar Tension Properties

Material: Advanced Composites Group - MTM45-1/ 3K Plain Weave G30-500 Fabric

Resin content: 36.16 % wt **Comp. density: 1.49 [g/cc]**
Fiber volume: 54.13 % vol
Ply thickness: 0.0086 - 0.0096
Ply count: 20

Test method: ASTM D6415-99^{E1}

Normalized by: NA

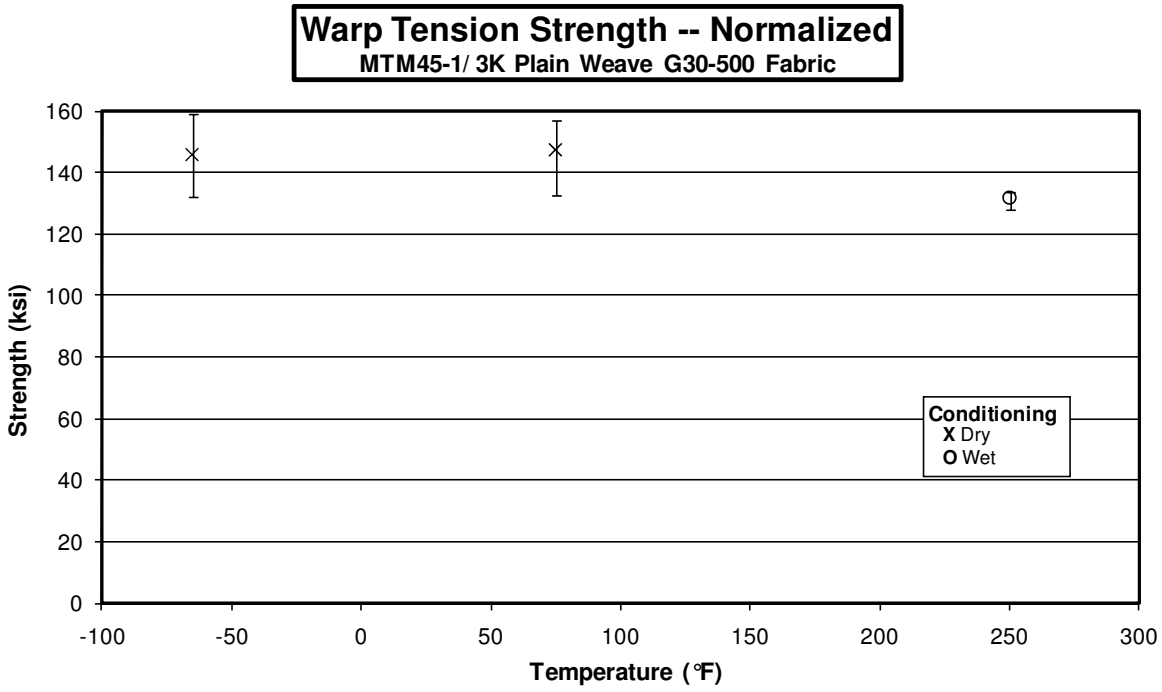
Interlaminar Tension
Gr/ Ep
ACG - MTM45-1/ 3K Plain Weave G30-500 Fabric
[0,45,-45,0]5

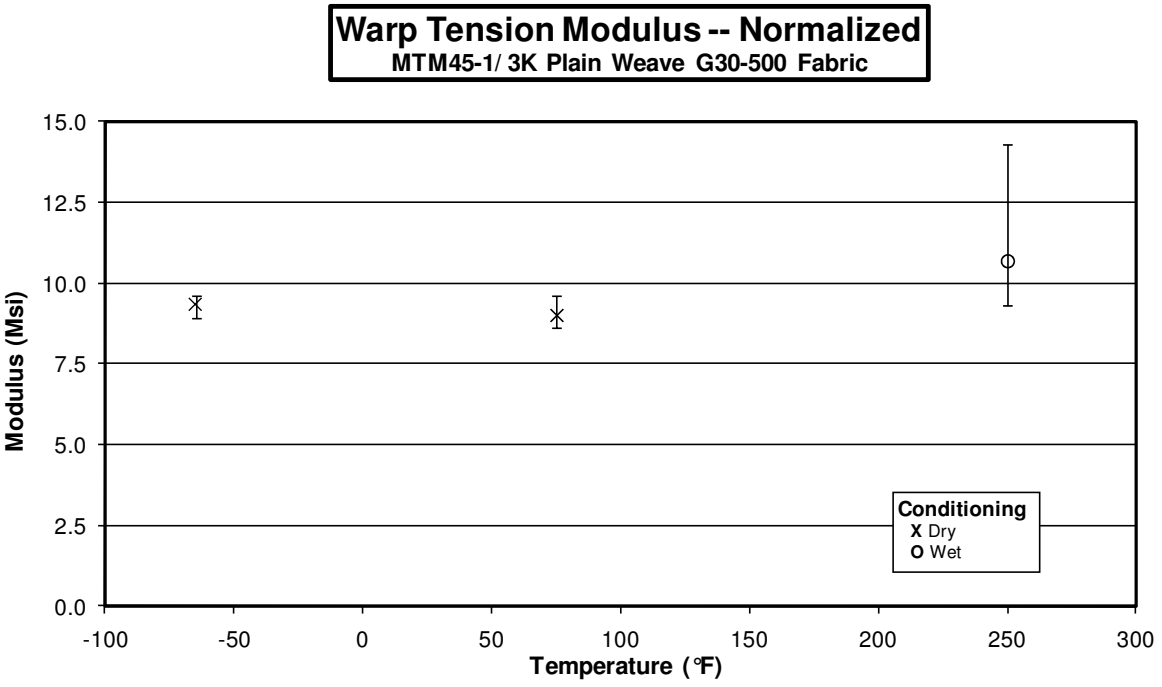
		RTD (A)		ETW2 (D)			
Test Temperature [°F]		75		250			
Moisture Conditioning		dry		equilibrium			
Equilibrium at T, RH				160 F,85%			
Source code		A0NMXXXXA		A0NMXXXXD			
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
	Mean		6.25		2.42		
	Minimum		5.95		2.20		
	Maximum		6.88		2.65		
ILT	**C.V.(%)**		6.80		8.84		
Strength (ksi)							
LH Cure	**No. Specimens**	6		6			
	No. Prepreg Lots	1		1			
	Mean		5.00				
	Minimum		3.62				
	Maximum		6.30				
ILT	**C.V.(%)**		22.76				
Strength (ksi)							
M Cure	**No. Specimens**	6					
	No. Prepreg Lots	1					

3. Individual Test Charts

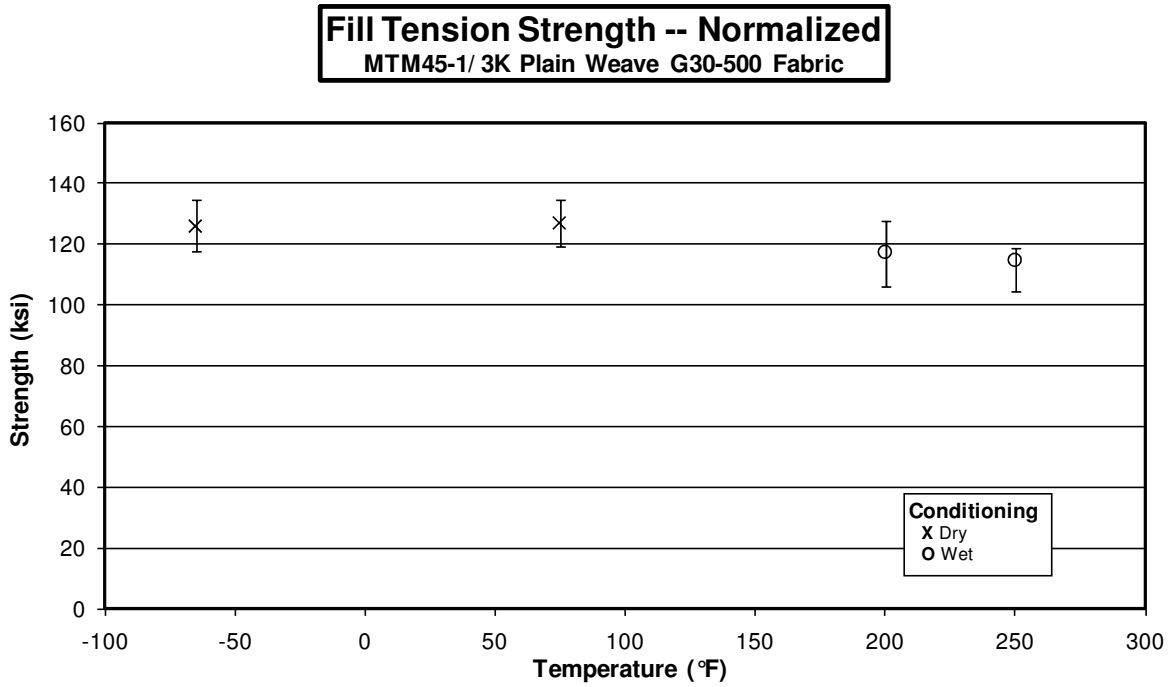
These charts combine all three batches of data and plot the minimum and maximum modulus and strength range based on the test temperature.

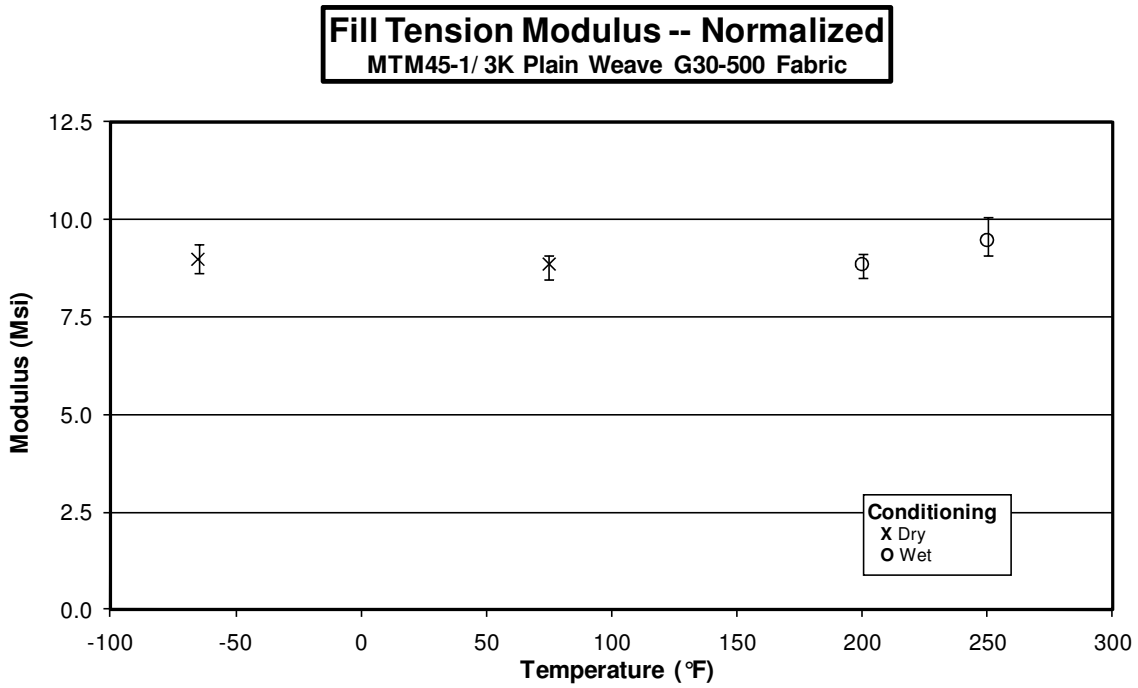
3.1 Warp Tension Properties



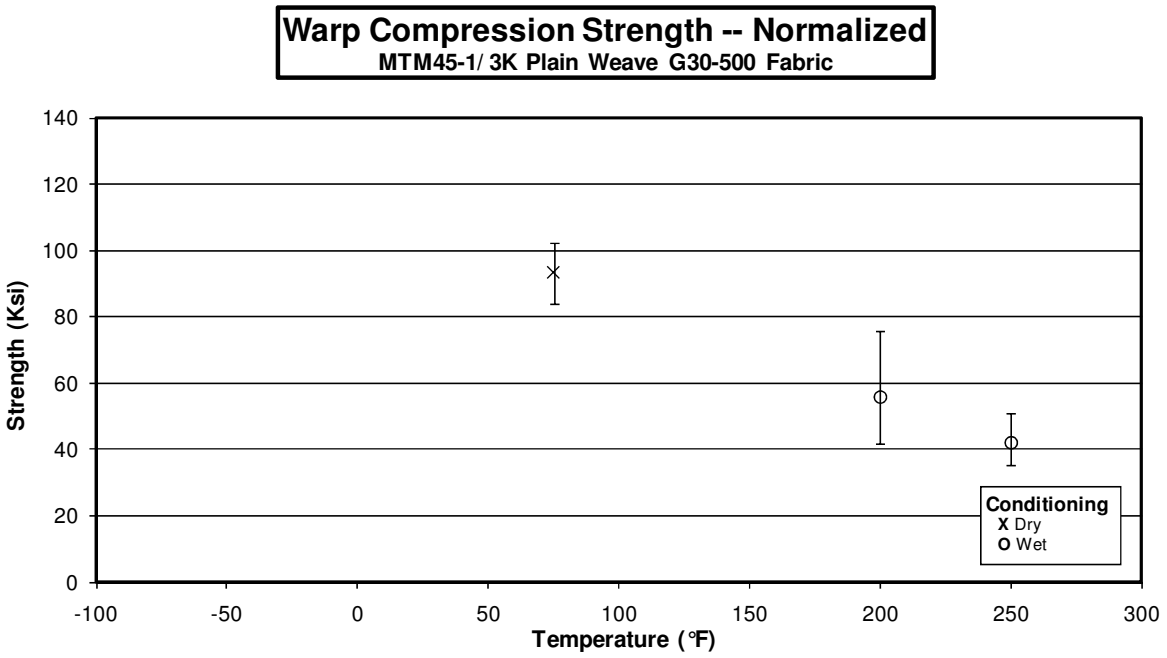


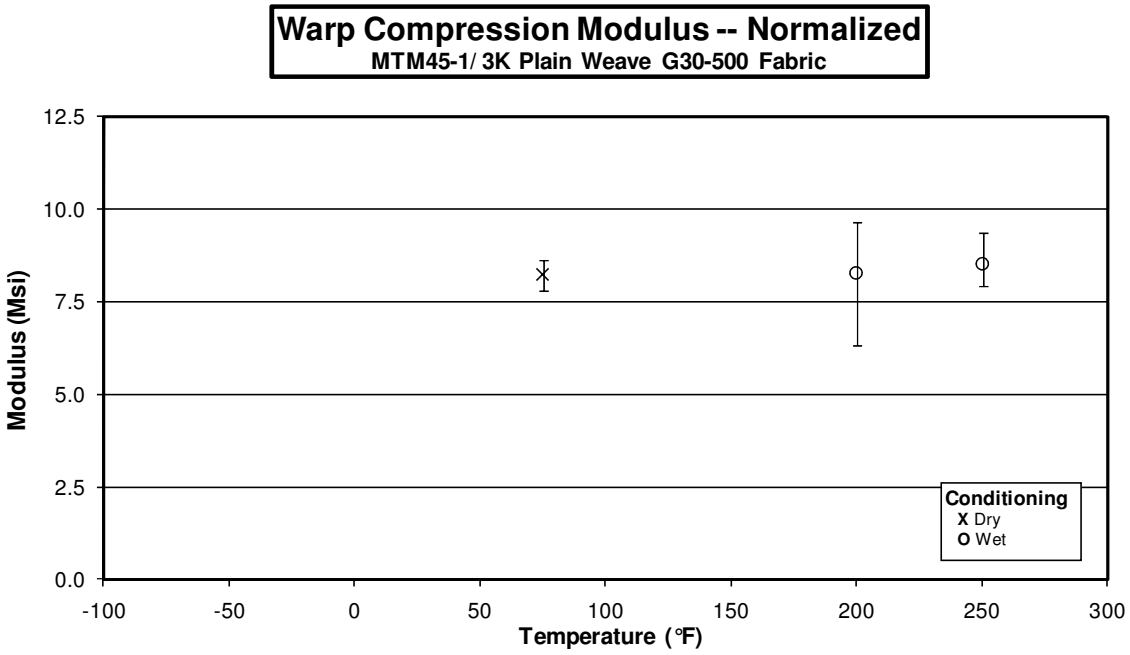
3.2 Fill Tension Properties



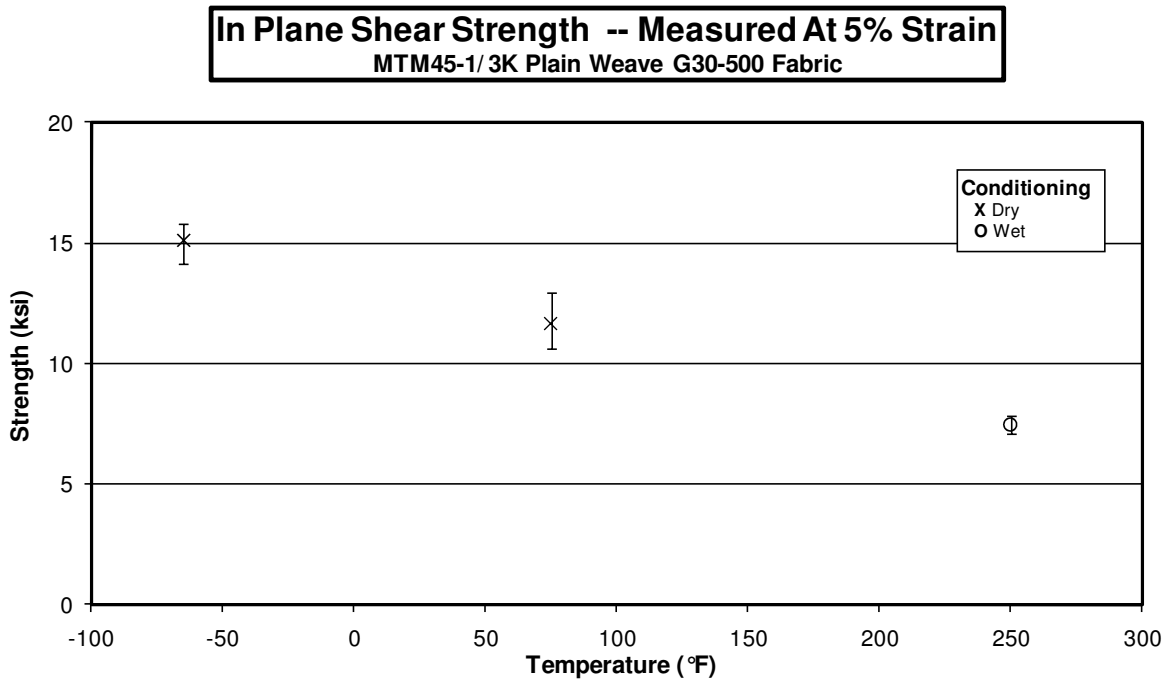


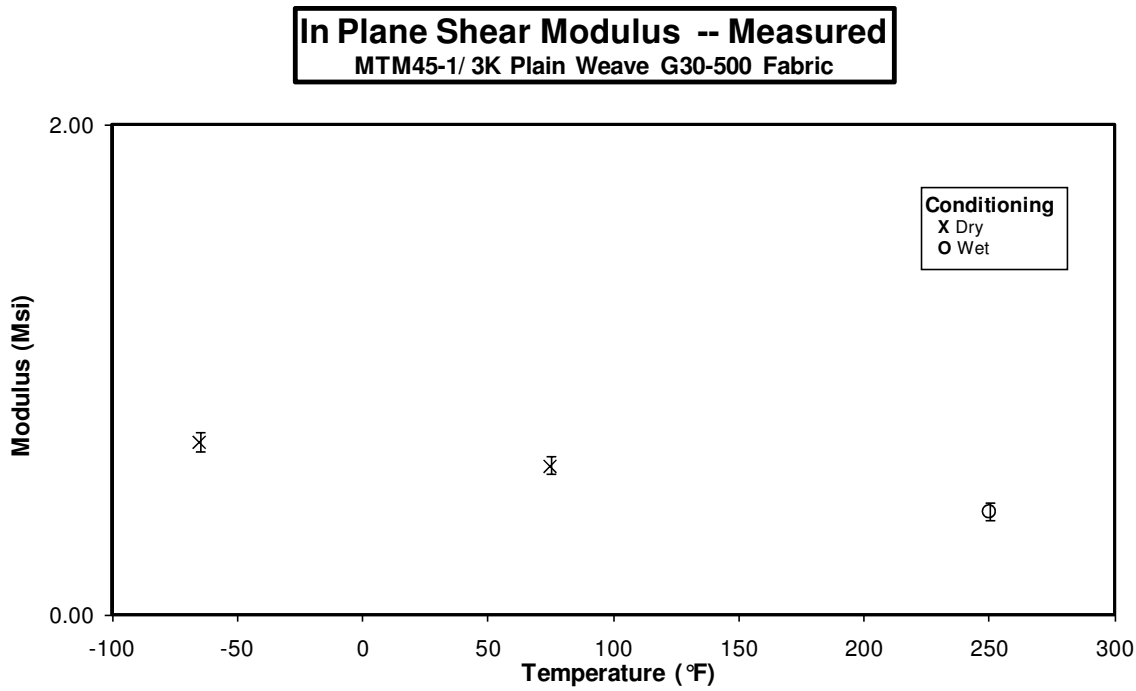
3.3 Warp Compression Properties



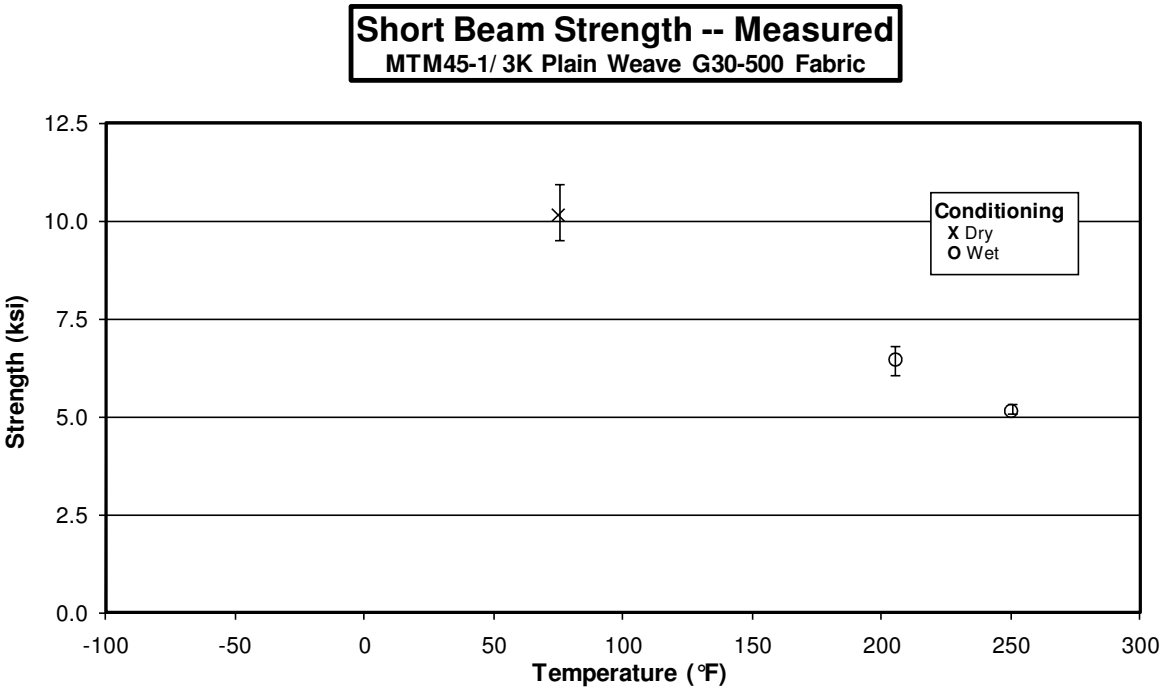


3.4 In-Plane Shear Properties

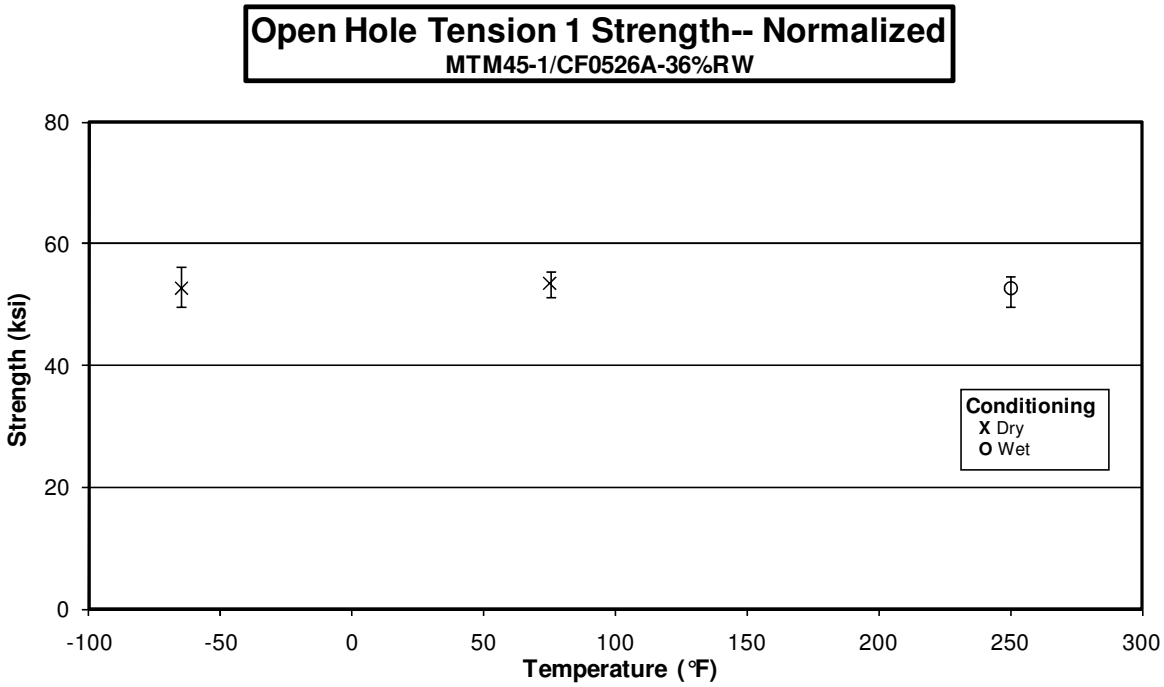




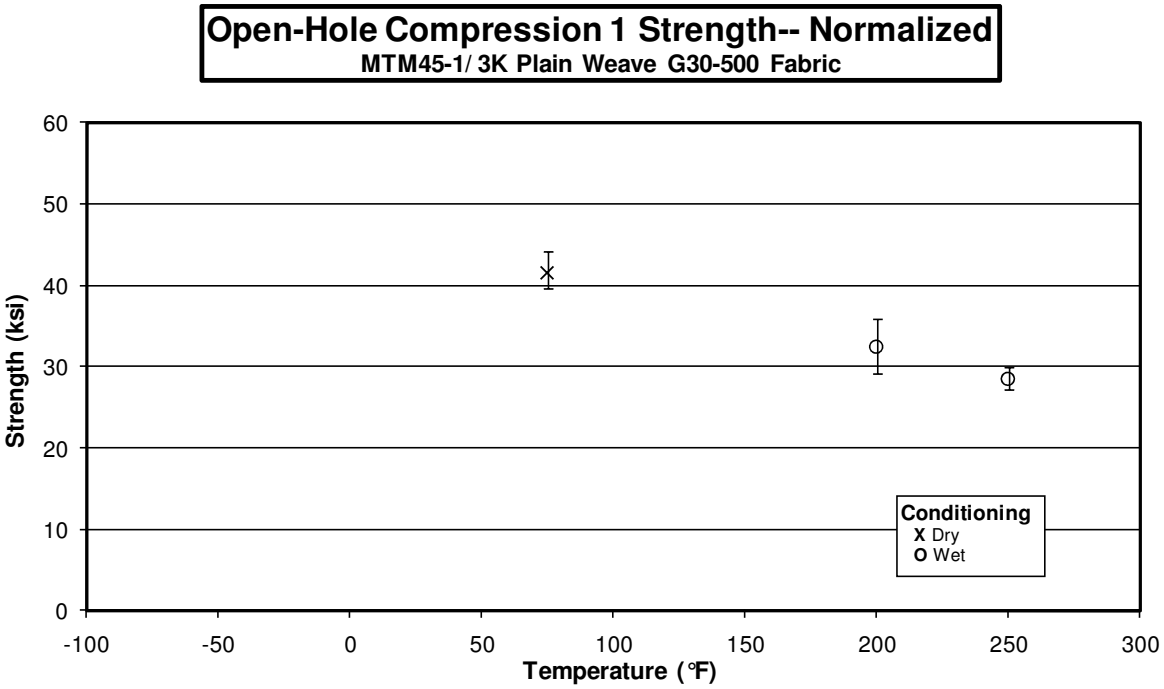
3.5 Lamina Short Beam Strength Properties



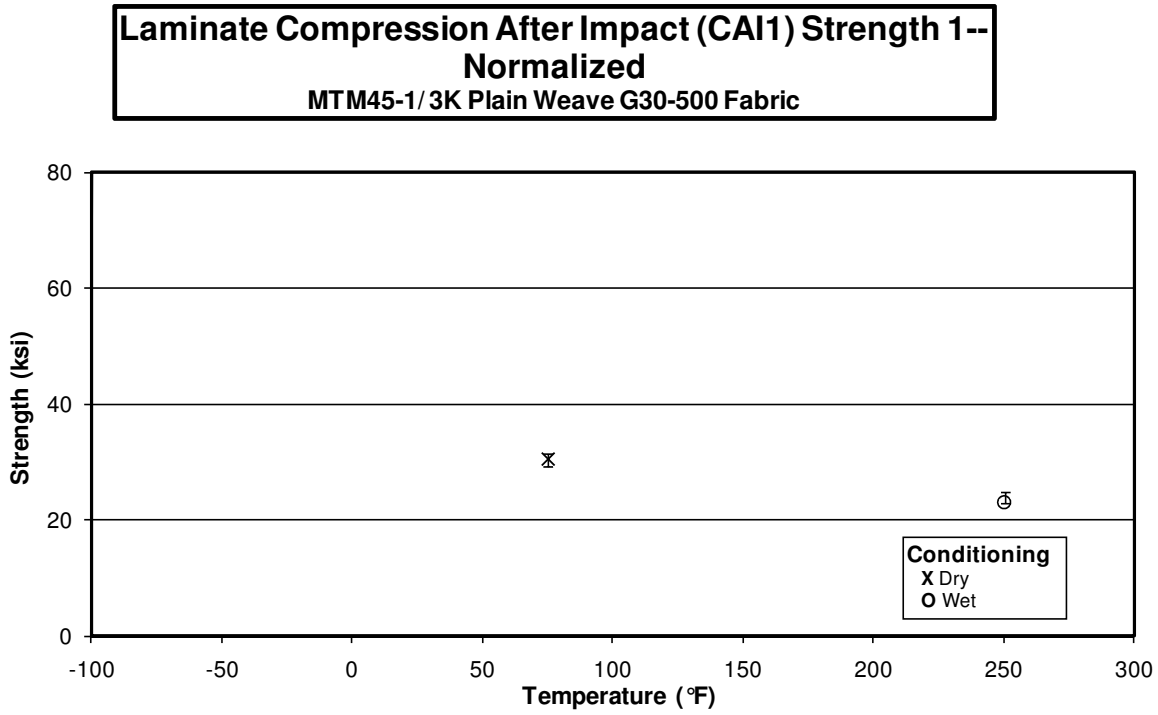
3.6 Open Hole Tension 1 Properties



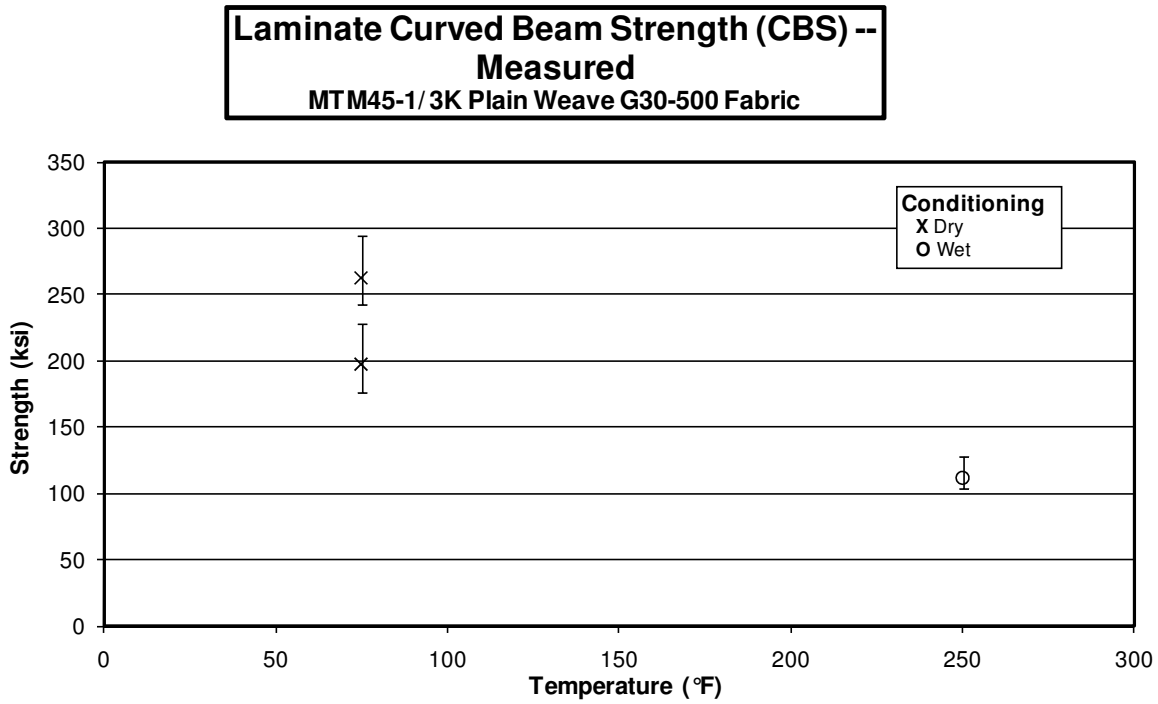
3.7 Open Hole Compression 1 Properties

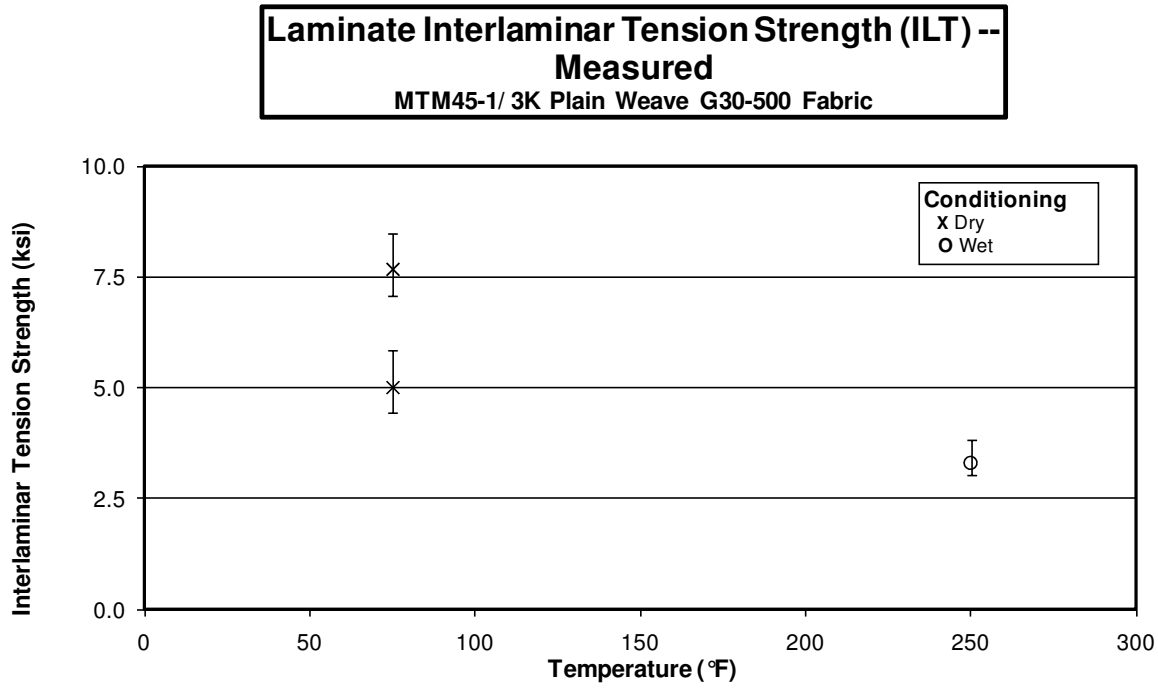


3.8 Compression Strength after Impact 1 Properties



3.9 Interlaminar Tension Strength Properties





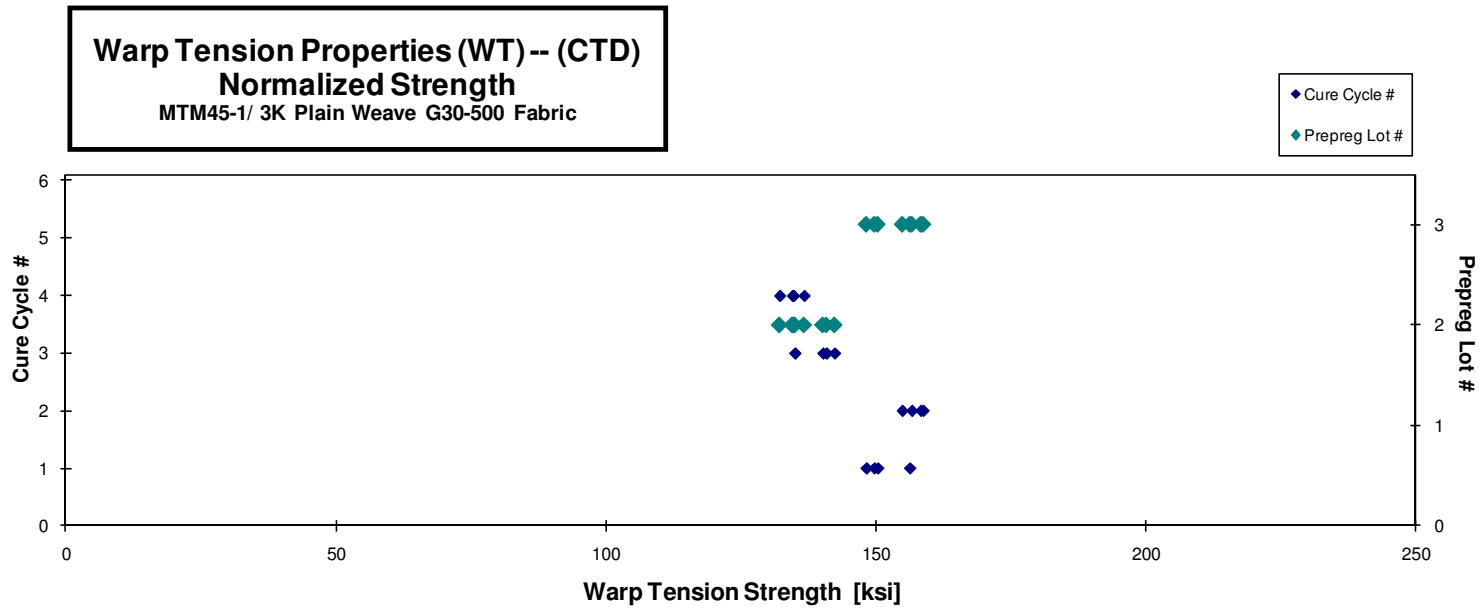
4. Raw Data

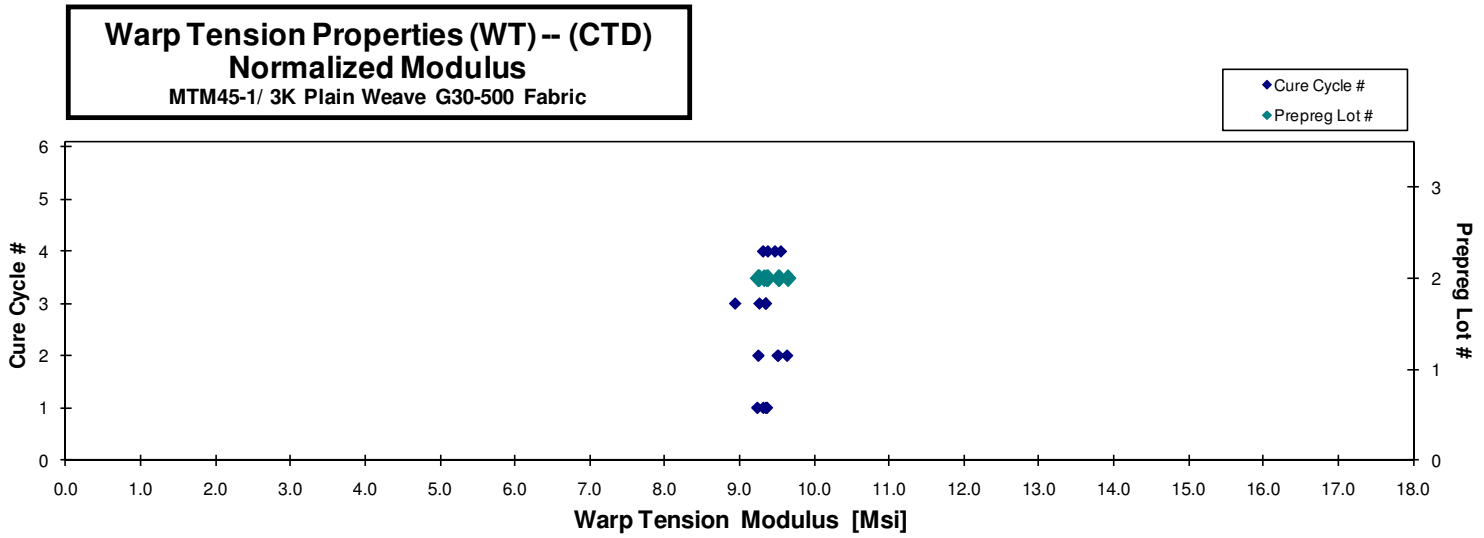
4.1 Warp Tension Properties

Warp Tension Properties (WT) -- (CTD)
Strength & Modulus
MTM45-1/ 3K Plain Weave G30-500 Fabric

normalizing t_{ply} [in]: 0.0079

Specimen Number	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
A0NJB61DB	B	LH1	2	1	139.754	9.333	0.111	14	LAB/LGM	0.0079	140.197	9.363
A0NJB61EB	B	LH1	2	1	140.276	9.339	0.111	14	LAT	0.0079	140.847	9.377
A0NJB61FB	B	LH1	2	1	144.070	9.441	0.109	14	LAT	0.0078	142.355	9.329
A0NJB61GB	B	LH1	2	1	135.929	9.312	0.110	14	LAT	0.0078	135.007	9.249
A0NJB716B	B	LH2	2	2	132.607	9.116	0.112	14	LWB	0.0080	134.745	9.263
A0NJB717B	B	LH2	2	2	135.736	9.462	0.111	14	LAT/LAB	0.0080	136.697	9.529
A0NJB719B	B	LH2	2	2	133.318	9.558	0.112	14	LWB	0.0080	134.544	9.646
A0NJB71AB	B	LH2	2	2	131.751	9.490	0.111	14	LAWT/LWB	0.0079	132.168	9.520
				Average	**136.680**	**9.381**	**0.111**		**$Average_{norm}$**	**0.0079**	**137.070**	**9.409**
				Standard Dev.	**4.320**	**0.138**	**0.001**		**$Standard\ Dev._{norm}$**		**3.629**	**0.141**
				Coeff. of Var. [%]	**3.161**	**1.466**	**0.881**		**Coeff. of Var. $[\%]_{norm}$**		**2.647**	**1.500**
				Min.	**131.751**	**9.116**	**0.109**		**Min.**	**0.0078**	**132.168**	**9.249**
				Max.	**144.070**	**9.558**	**0.112**		**Max.**	**0.0080**	**142.355**	**9.646**
				Number of Spec.	**8**	**8**	**8**		**Number of Spec.**	**8**	**8**	**8**
A0NJC817B	C	M1	3	3	154.319	9.246	0.112	14	LGM/LAB	0.0080	156.296	9.364
A0NJC818B	C	M1	3	3	149.516	8.941	0.111	14	LAT/LWB	0.0079	149.718	8.953
A0NJC819B	C	M1	3	3	147.691	9.193	0.113	14	LAT/LWB	0.0080	150.362	9.359
A0NJC81AB	C	M1	3	3	149.424	9.350	0.110	14	LAB	0.0078	148.253	9.277
A0NJC91AB	C	M2	3	4	157.469	9.247	0.112	14	LAT/LAB	0.0080	158.798	9.325
A0NJC91BB	C	M2	3	4	156.376	9.272	0.112	14	LWT/LWB	0.0080	158.355	9.389
A0NJC91CB	C	M2	3	4	153.543	9.479	0.112	14	LAB	0.0080	154.908	9.563
A0NJC91DB	C	M2	3	4	154.942	9.379	0.112	14	LAT	0.0080	156.693	9.485
				Average	**152.910**	**9.263**	**0.1115**		**$Average_{norm}$**	**0.0080**	**154.173**	**9.340**
				Standard Dev.	**3.590**	**0.159**			**$Standard\ Dev._{norm}$**		**4.135**	**0.181**
				Coeff. of Var. [%]	**2.348**	**1.716**			**Coeff. of Var. $[\%]_{norm}$**		**2.682**	**1.933**
				Min.	**147.691**	**8.941**	**0.1097**		**Min.**	**0.0078**	**148.253**	**8.953**
				Max.	**157.469**	**9.479**	**0.1126**		**Max.**	**0.0080**	**158.798**	**9.563**
				Number of Spec.	**8**	**8**	**8**		**Number of Spec.**	**8**	**8**	**8**

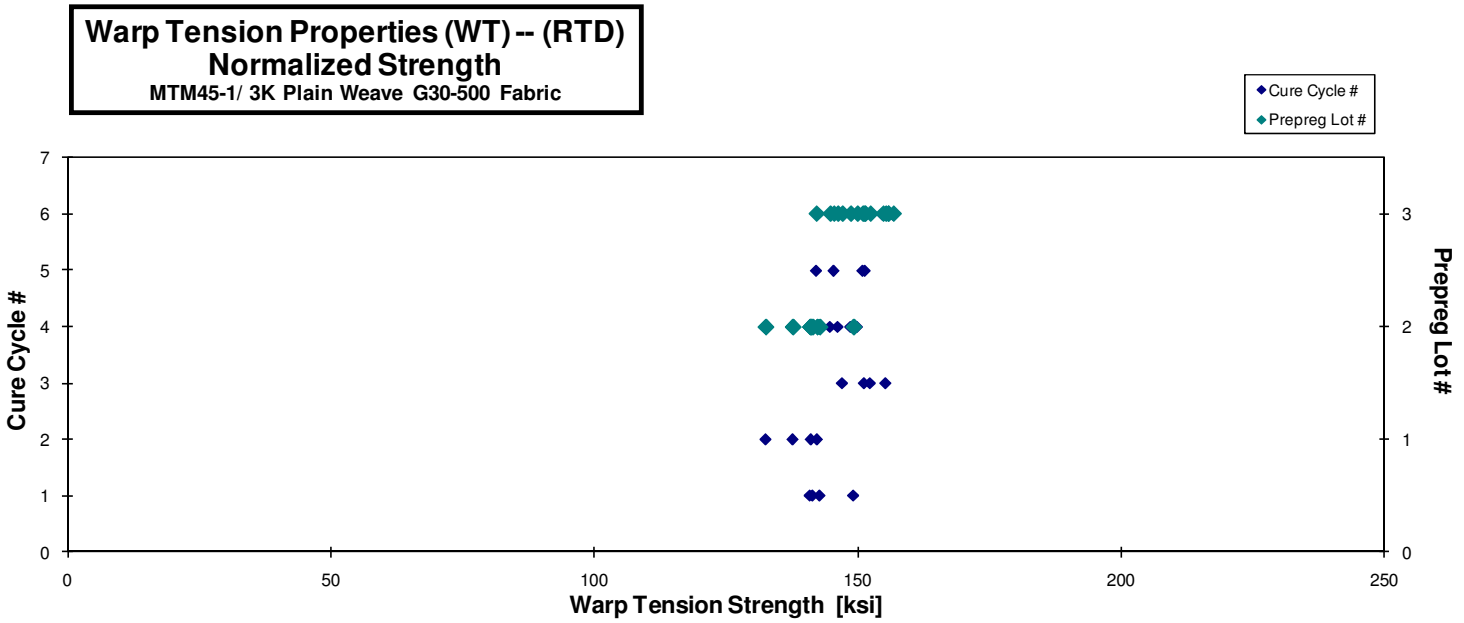

Warp Tension Properties (WT) -- (CTD)
Normalized Strength
MTM45-1/ 3K Plain Weave G30-500 Fabric
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Warp Tension Strength [ksi]
0
50
100
150
200
250
0
1
2
3
4
5
6

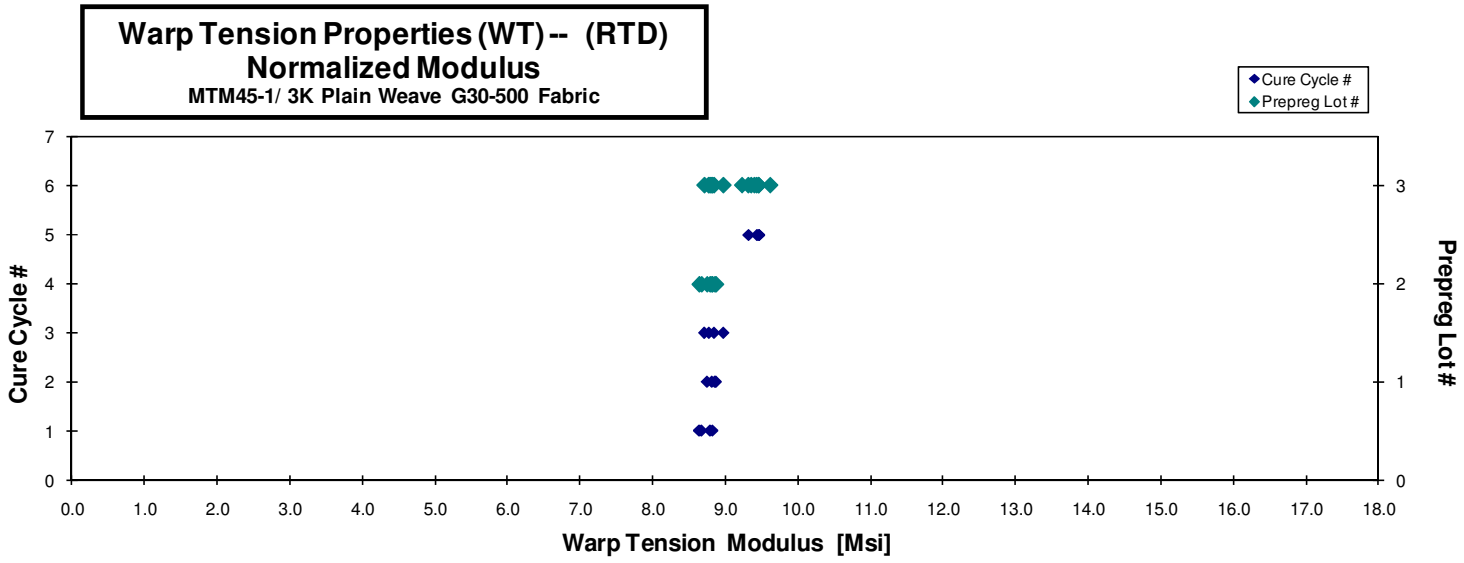

Warp Tension Properties (WT) -- (CTD)
Normalized Modulus
MTM45-1/ 3K Plain Weave G30-500 Fabric
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Warp Tension Modulus [Msi]
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
11.0
12.0
13.0
14.0
15.0
16.0
17.0
18.0
0
1
2
3
4
5
6

Warp Tension Properties (WT) -- (RTD)
Strength & Modulus
MTM45-1/ 3K Plain Weave G30-500 Fabric

normalizing t_{ply} [in]: 0.0079

Specimen Number	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
A0NJB612A	B	LH1	2	1	146.018	8.483	0.113	14	LAB/LAT	0.0081	149.164	8.666
A0NJB613A	B	LH1	2	1	137.645	8.405	0.114	14	LAB	0.0081	141.399	8.634
A0NJB614A	B	LH1	2	1	138.319	8.542	0.114	14	LAB	0.0082	142.759	8.816
A0NJB615A	B	LH1	2	1	138.132	8.611	0.113	14	LAT/LAB	0.0081	140.900	8.784
A0NJB711A	B	LH2	2	2	139.308	8.680	0.113	14	LAT	0.0081	142.268	8.864
A0NJB712A	B	LH2	2	2	136.657	8.745	0.111	14	LAT/LAB	0.0080	137.646	8.808
A0NJB713A	B	LH2	2	2	130.586	8.722	0.112	14	LAT	0.0080	132.494	8.849
A0NJB714A	B	LH2	2	2	139.342	8.632	0.112	14	LAT/LAB	0.0080	141.106	8.741
				Average	**138.251**	**8.603**			**$Average_{norm}$**	**0.0081**	**140.967**	**8.770**
				Standard Dev.	**4.214**	**0.119**			**$Standard\ Dev._{norm}$**		**4.707**	**0.084**
				Coeff. of Var. [%]	**3.048**	**1.379**			**Coeff. of Var. [%]$_{norm}$**		**3.339**	**0.955**
				Min.	**130.586**	**8.405**			**Min.**	**0.0080**	**132.494**	**8.634**
				Max.	**146.018**	**8.745**			**Max.**	**0.0082**	**149.164**	**8.864**
				Number of Spec.	**8**	**8**			**Number of Spec.**	**8**	**8**	**8**
A0NJC812A	C	M1	3	3	151.931	8.772	0.113	14	LAB	0.0081	155.296	8.966
A0NJC813A	C	M1	3	3	152.385	8.841	0.111	14	LAT	0.0079	152.339	8.838
A0NJC814A	C	M1	3	3	145.675	8.624	0.112	14	LAB/LWT	0.0080	147.036	8.705
A0NJC815A	C	M1	3	3	148.930	8.635	0.112	14	LGM/LAT	0.0080	151.219	8.768
A0NJC911A	C	M2	3	4	146.944	8.804	0.110	14	LWT	0.0079	146.191	8.759
A0NJC912A	C	M2	3	4	148.225	8.765	0.111	14	LAB/LWT	0.0079	148.627	8.789
A0NJC913A	C	M2	3	4	145.158	8.832	0.110	14	LGM/LAT	0.0079	144.742	8.807
A0NJC914A	C	M2	3	4	148.833	8.753	0.111	14	LAB/LWT	0.0080	149.887	8.815
A0NJC8R6A	C	M1	3	5	147.313	9.230	0.113	14	LAT / LWB	0.0081	150.932	9.456
A0NJC8RBA	C	M1	3	5	151.799	9.484	0.110	14	LGM	0.0079	151.364	9.457
A0NJC8RCA	C	M1	3	5	144.464	9.249	0.111	14	LWB / LWT	0.0080	145.444	9.312
A0NJC8RDA	C	M1	3	5	142.337	9.443	0.110	14	LWB / LAT	0.0079	142.101	9.428
A0NJC9R5A	C	M2	3	6	153.280	9.205	0.112	14	LGM	0.0080	155.752	9.353
A0NJC9R6A	C	M2	3	6	155.534	9.156	0.111	14	LWT / LAB	0.0080	156.706	9.225
A0NJC9R7A	C	M2	3	6	153.738	9.334	0.111	14	LAT / LGM	0.0080	154.757	9.395
A0NJC9R8A	C	M2	3	6	155.405	9.596	0.111	14	LGM /LAB	0.008	155.733	9.617
				Average	**149.497**	**9.045**			**$Average_{norm}$**	**0.0080**	**150.508**	**9.106**
				Standard Dev.	**4.057**	**0.325**			**$Standard\ Dev._{norm}$**		**4.496**	**0.324**
				Coeff. of Var. [%]	**2.714**	**3.589**			**Coeff. of Var. [%]$_{norm}$**		**2.987**	**3.557**
				Min.	**142.337**	**8.624**			**Min.**	**0.0079**	**142.101**	**8.705**
				Max.	**155.534**	**9.596**			**Max.**	**0.0081**	**156.706**	**9.617**
				Number of Spec.	**16**	**16**			**Number of Spec.**	**16**	**16**	**16**


Warp Tension Properties (WT) -- (RTD)
Normalized Strength
MTM45-1/ 3K Plain Weave G30-500 Fabric
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Warp Tension Strength [ksi]
0
50
100
150
200
250
1
2
3
4
5
6
7

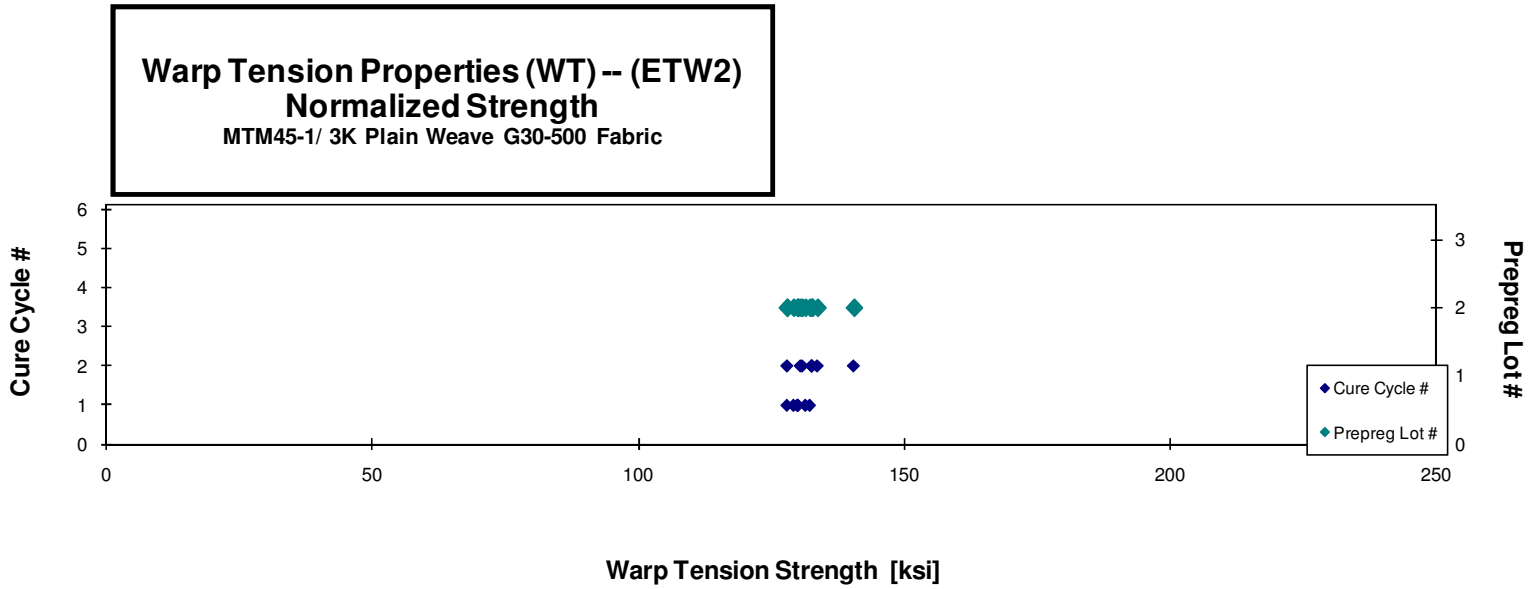

Warp Tension Properties (WT) -- (RTD)
Normalized Modulus
MTM45-1/ 3K Plain Weave G30-500 Fabric
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Warp Tension Modulus [Msi]
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
11.0
12.0
13.0
14.0
15.0
16.0
17.0
18.0

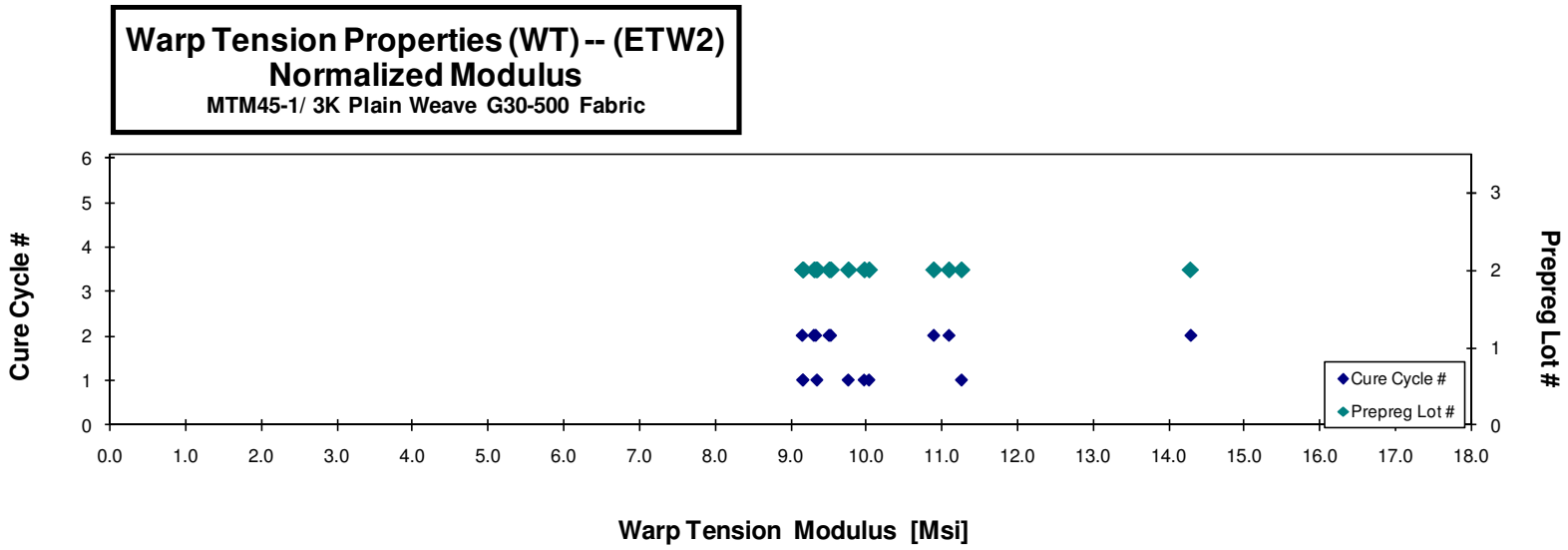
Warp Tension Properties (WT) -- (ETW2)
Strength & Modulus
MTM45-1/ 3K Plain Weave G30-500 Fabric

normalizing t_{ply} [in]: 0.0079

Specimen Number	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
A0NJB616D	B	LH1	2	1	126.032	9.115	0.113	14	LGM	0.0081	129.261	9.348
A0NJB617D	B	LH1	2	1	124.759	9.514	0.113	14	LGM	0.0081	128.011	9.762
A0NJB618D	B	LH1	2	1	131.196	11.165	0.112	14	LGM	0.0080	132.303	11.259
A0NJB619D	B	LH1	2	1	128.568	9.814	0.113	14	LGM	0.0081	131.474	10.036
A0NJB61AD	B	LH1	2	1	128.084	9.829	0.112	14	LWB	0.0080	129.937	9.971
A0NJB61BD	B	LH1	2	1	128.684	9.063	0.112	14	LGM	0.0080	130.099	9.163
A0NJB61CD	B	LH1	2	1	129.996	9.158	0.111	14	LGM	0.0079	130.054	9.163
A0NJB71CD	B	LH2	2	2	126.977	9.451	0.112	14	LWB,LAT	0.0080	128.029	9.529
A0NJB71DD	B	LH2	2	2	132.168	9.475	0.111	14	LGM	0.0079	132.626	9.508
A0NJB71ED	B	LH2	2	2	134.175	11.214	0.109	14	LWT,LWB	0.0078	132.739	11.094
A0NJB71FD	B	LH2	2	2	135.377	14.581	0.108	14	LAB,LWT	0.0077	132.684	14.291
A0NJB71GD	B	LH2	2	2	136.132	11.089	0.109	14	LGM	0.0078	133.711	10.892
A0NJB71HD	B	LH2	2	2	133.696	9.508	0.108	14	LGM	0.0077	130.875	9.307
A0NJB71ID	B	LH2	2	2	134.156	9.590	0.108	14	LWB,LWT	0.0077	130.538	9.331
A0NJB71JD	B	LH2	2	2	137.495	8.956	0.113	14	LGM,LWB	0.0081	140.520	9.153

Average	**131.166**	**10.101**	**Average$_{norm}$**	**0.0079**	**131.524**	**10.120**
Standard Dev.	**3.933**	**1.454**	**Standard Dev.$_{norm}$**		**3.025**	**1.357**
Coeff. of Var. [%]	**2.999**	**14.393**	**Coeff. of Var. [%]$_{norm}$**		**2.300**	**13.405**
Min.	**124.759**	**8.956**	**Min.**	**0.0077**	**128.011**	**9.153**
Max.	**137.495**	**14.581**	**Max.**	**0.0081**	**140.520**	**14.291**
Number of Spec.	**15**	**15**	**Number of Spec.**		**15**	**15**


Warp Tension Properties (WT) -- (ETW2)
Normalized Strength
MTM45-1/ 3K Plain Weave G30-500 Fabric
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
5
6
0
50
100
150
200
250
Warp Tension Strength [ksi]

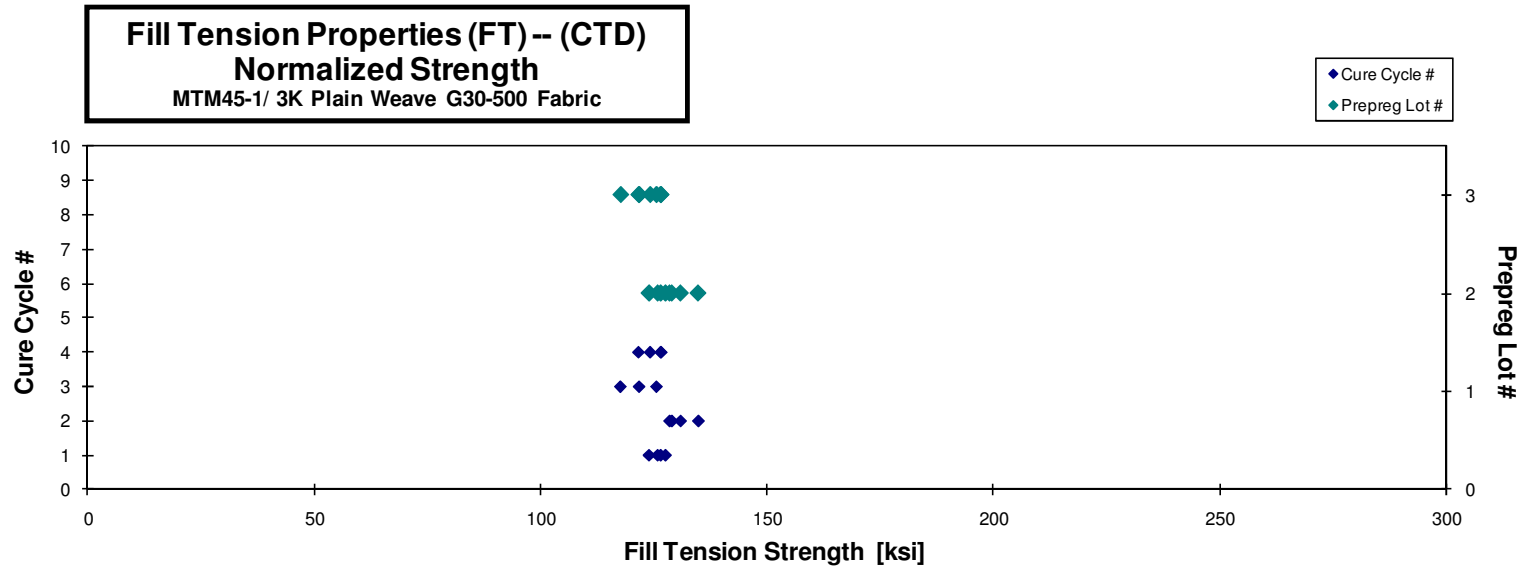

Warp Tension Properties (WT) -- (ETW2)
Normalized Modulus
MTM45-1/ 3K Plain Weave G30-500 Fabric
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
5
6
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
11.0
12.0
13.0
14.0
15.0
16.0
17.0
18.0
Warp Tension Modulus [Msi]

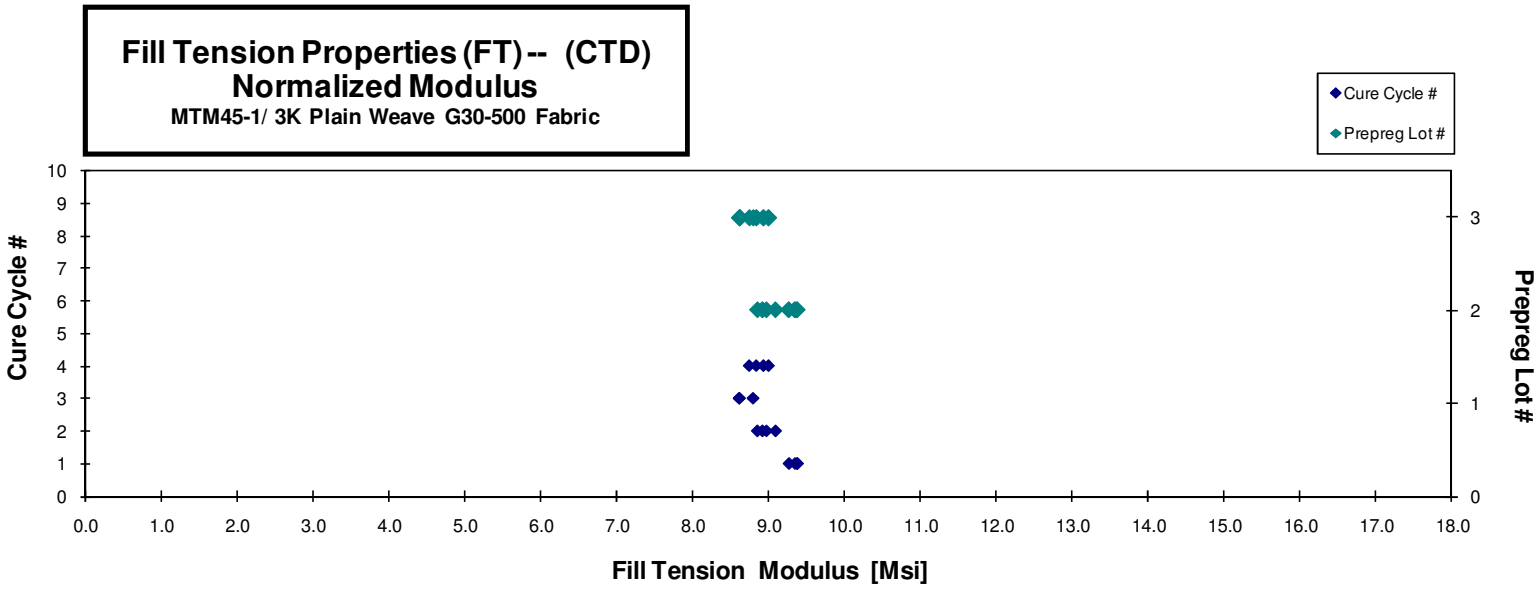
4.2 Fill Tension Properties

Fill Tension Properties (FT) -- (CTD)
Strength & Modulus
MTM45-1/ 3K Plain Weave G30-500 Fabric

normalizing t_{ply} [in]: 0.0079

Specimen Number	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
A0NUB615B	B	LH1	2	1	129.441	9.566	0.108	14	LGM	0.0077	126.535	9.351
A0NUB616B	B	LH1	2	1	130.286	9.578	0.108	14	LGM	0.0077	127.596	9.380
A0NUB617B	B	LH1	2	1	127.126	9.618	0.108	14	LGM	0.0077	123.984	9.380
A0NUB618B	B	LH1	2	1	128.240	9.448	0.109	14	LWT	0.0078	125.863	9.273
A0NUB715B	B	LH2	2	2	130.568	9.074	0.111	14	LGM	0.0079	130.902	9.097
A0NUB716B	B	LH2	2	2	129.769	9.033	0.110	14	LAT,LGM	0.0079	128.986	8.979
A0NUB717B	B	LH2	2	2	127.443	8.789	0.112	14	LGM	0.0080	128.480	8.861
A0NUB718B	B	LH2	2	2	134.332	8.895	0.111	14	LAT,LGM	0.0079	134.798	8.926
				Average	**129.651**	**9.250**			**$Average_{norm}$**	**0.0078**	**128.393**	**9.156**
				Standard Dev.	**2.282**	**0.338**			**$Standard\ Dev._{norm}$**		**3.330**	**0.216**
				Coeff. of Var. [%]	**1.760**	**3.652**			**Coeff. of Var. [%]$_{norm}$**		**2.593**	**2.363**
				Min.	**127.126**	**8.789**			**Min.**	**0.0077**	**123.984**	**8.861**
				Max.	**134.332**	**9.618**			**Max.**	**0.0080**	**134.798**	**9.380**
				Number of Spec.	**8**	**8**			**Number of Spec.**	**8**	**8**	**8**
A0NUC817B	C	M1	3	3	119.698	8.652	0.113	14	LGM	0.0080	121.808	8.805
A0NUC818B	C	M1	3	3	115.778	8.483	0.112	14	LGM	0.0080	117.714	8.625
A0NUC819B	C	M1	3	3	123.422	8.476	0.113	14	LWT,LWT	0.0080	125.598	8.625
A0NUC915B	C	M2	3	4	123.643	8.964	0.111	14	LWB,LWT	0.0079	124.221	9.006
A0NUC916B	C	M2	3	4	126.545	8.939	0.111	14	LGM,LWB	0.0079	126.545	8.939
A0NUC917B	C	M2	3	4	127.206	8.793	0.110	14	LWB,LWT	0.0079	126.650	8.755
A0NUC918B	C	M2	3	4	122.094	8.876	0.110	14	LGM,LWT	0.0079	121.671	8.845
				Average	**122.627**	**8.740**			**$Average_{norm}$**	**0.0080**	**123.458**	**8.800**
				Standard Dev.	**3.953**	**0.206**			**$Standard\ Dev._{norm}$**		**3.260**	**0.145**
				Coeff. of Var. [%]	**3.224**	**2.357**			**Coeff. of Var. [%]$_{norm}$**		**2.641**	**1.653**
				Min.	**115.778**	**8.476**			**Min.**	**0.0079**	**117.714**	**8.625**
				Max.	**127.206**	**8.964**			**Max.**	**0.0080**	**126.650**	**9.006**
				Number of Spec.	**7**	**7**			**Number of Spec.**	**7**	**7**	**7**

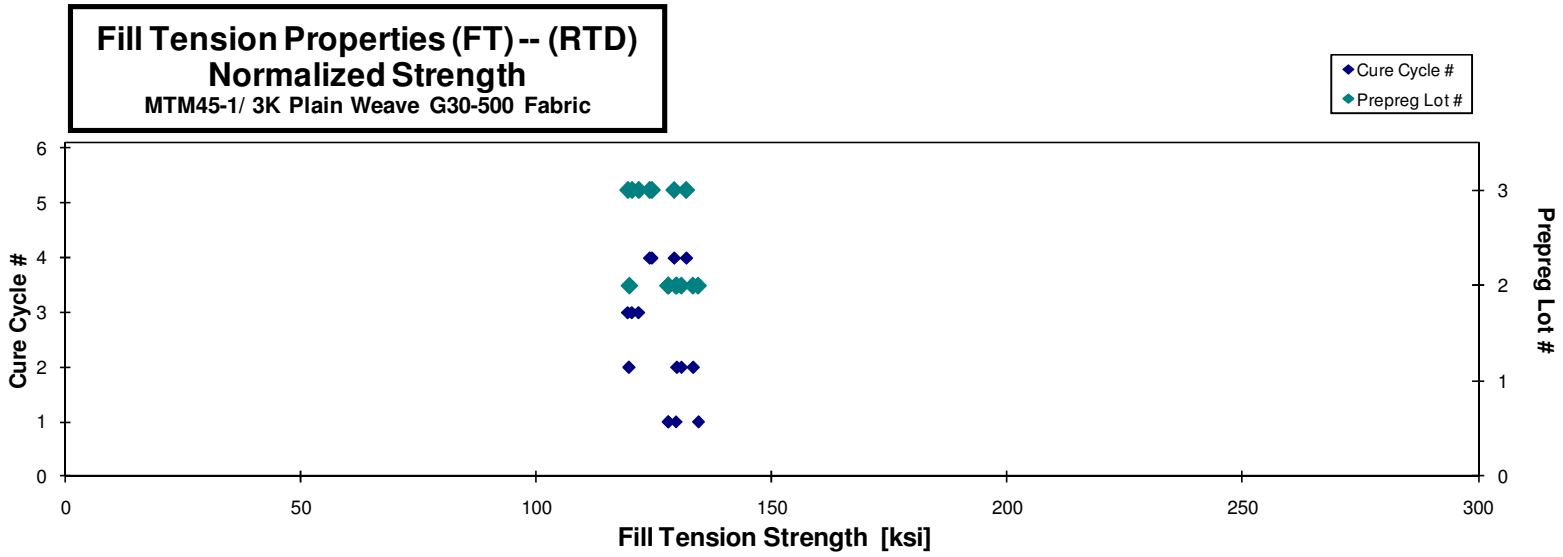

Fill Tension Properties (FT) -- (CTD)
Normalized Strength
MTM45-1/ 3K Plain Weave G30-500 Fabric
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Fill Tension Strength [ksi]
0
50
100
150
200
250
300

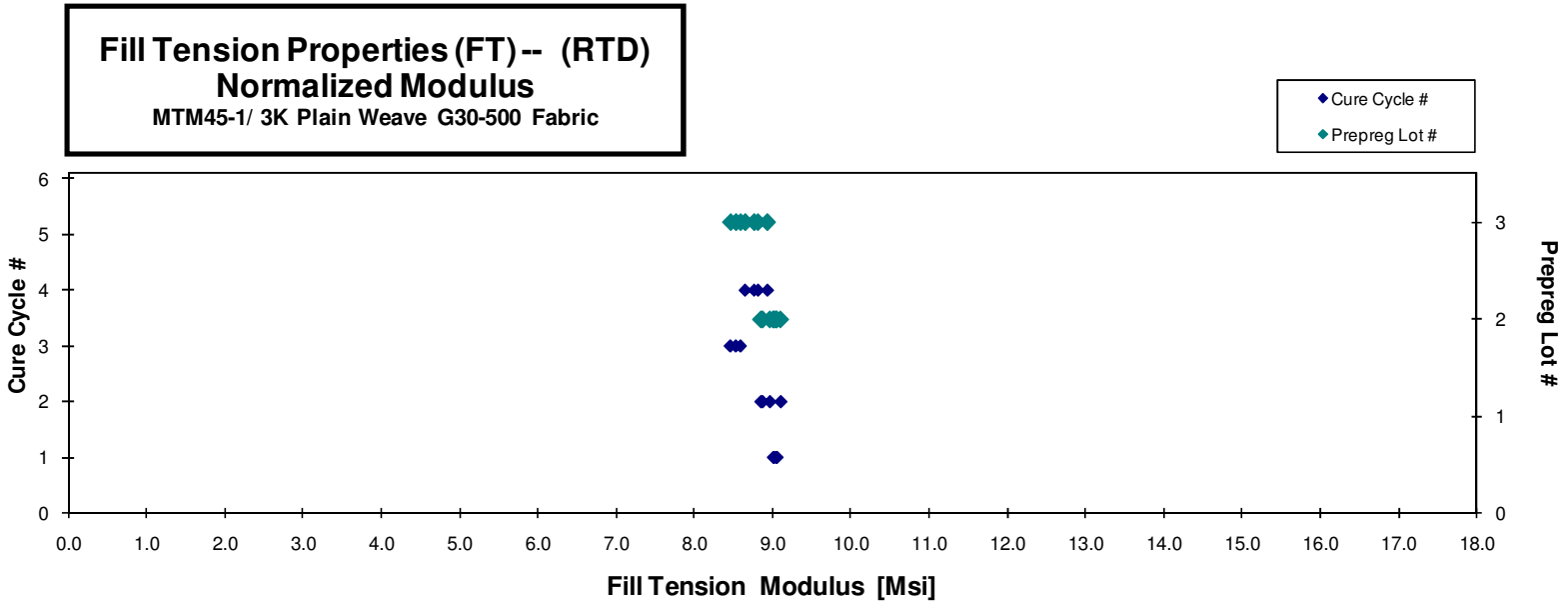

Fill Tension Properties (FT) -- (CTD)
Normalized Modulus
MTM45-1/ 3K Plain Weave G30-500 Fabric
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Fill Tension Modulus [Msi]
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
11.0
12.0
13.0
14.0
15.0
16.0
17.0
18.0

Fill Tension Properties (FT) -- (RTD)
Strength & Modulus
MTM45-1/ 3K Plain Weave G30-500 Fabric

normalizing t_{ply} [in]: 0.0079

Specimen Number	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
A0NUB611A	B	LH1	2	1	138.359	9.754	0.102	14	LAB,LAT	0.0073	127.997	9.023
A0NUB612A	B	LH1	2	1	133.186	9.414	0.106	14	LAB,LAT	0.0076	128.008	9.048
A0NUB613A	B	LH1	2	1	138.220	9.316	0.108	14	LGM	0.0077	134.408	9.059
A0NUB614A	B	LH1	2	1	131.733	9.158	0.109	14	LAB,LAT	0.0078	129.649	9.013
A0NUB711A	B	LH2	2	2	138.149	9.349	0.105	14	LGM	0.0075	130.801	8.852
A0NUB712A	B	LH2	2	2	131.766	9.008	0.109	14	LAB	0.0078	129.800	8.874
A0NUB713A	B	LH2	2	2	133.583	9.128	0.110	14	LGM	0.0079	133.281	9.107
A0NUB714A	B	LH2	2	2	118.928	8.915	0.111	14	LIB	0.0079	119.645	8.969
				Average	**132.991**	**9.255**			**$Average_{norm}$**	**0.0077**	**129.199**	**8.993**
				Standard Dev.	**6.370**	**0.264**			**$Standard\ Dev._{norm}$**		**4.489**	**0.090**
				Coeff. of Var. [%]	**4.789**	**2.856**			**Coeff. of Var. $[\%]_{norm}$**		**3.475**	**1.000**
				Min.	**118.928**	**8.915**			**Min.**	**0.0073**	**119.645**	**8.852**
				Max.	**138.359**	**9.754**			**Max.**	**0.0079**	**134.408**	**9.107**
				Number of Spec.	**8**	**8**			**Number of Spec.**	**8**	**8**	**8**
A0NUC811A	C	M1	3	3	119.510	8.469	0.110	14	LGM	0.0079	119.348	8.458
A0NUC812A	C	M1	3	3	118.397	8.455	0.112	14	LGM	0.0080	120.252	8.588
A0NUC813A	C	M1	3	3	119.421	8.370	0.113	14	LGM	0.0080	121.670	8.528
A0NUC911A	C	M2	3	4	127.602	8.863	0.108	14	LAT / LGM	0.0077	124.506	8.648
A0NUC912A	C	M2	3	4	124.146	8.772	0.111	14	LGM	0.0079	124.034	8.764
A0NUC913A	C	M2	3	4	130.307	8.885	0.110	14	LGM	0.0078	129.266	8.814
A0NUC914A	C	M2	3	4	131.391	8.905	0.111	14	LAT / LAB	0.0079	131.846	8.936
				Average	**124.396**	**8.674**			**$Average_{norm}$**	**0.0079**	**124.418**	**8.676**
				Standard Dev.	**5.459**	**0.233**			**$Standard\ Dev._{norm}$**		**4.645**	**0.170**
				Coeff. of Var. [%]	**4.389**	**2.686**			**Coeff. of Var. $[\%]_{norm}$**		**3.733**	**1.955**
				Min.	**118.397**	**8.370**			**Min.**	**0.0077**	**119.348**	**8.458**
				Max.	**131.391**	**8.905**			**Max.**	**0.0080**	**131.846**	**8.936**
				Number of Spec.	**7**	**7**			**Number of Spec.**	**7**	**7**	**7**

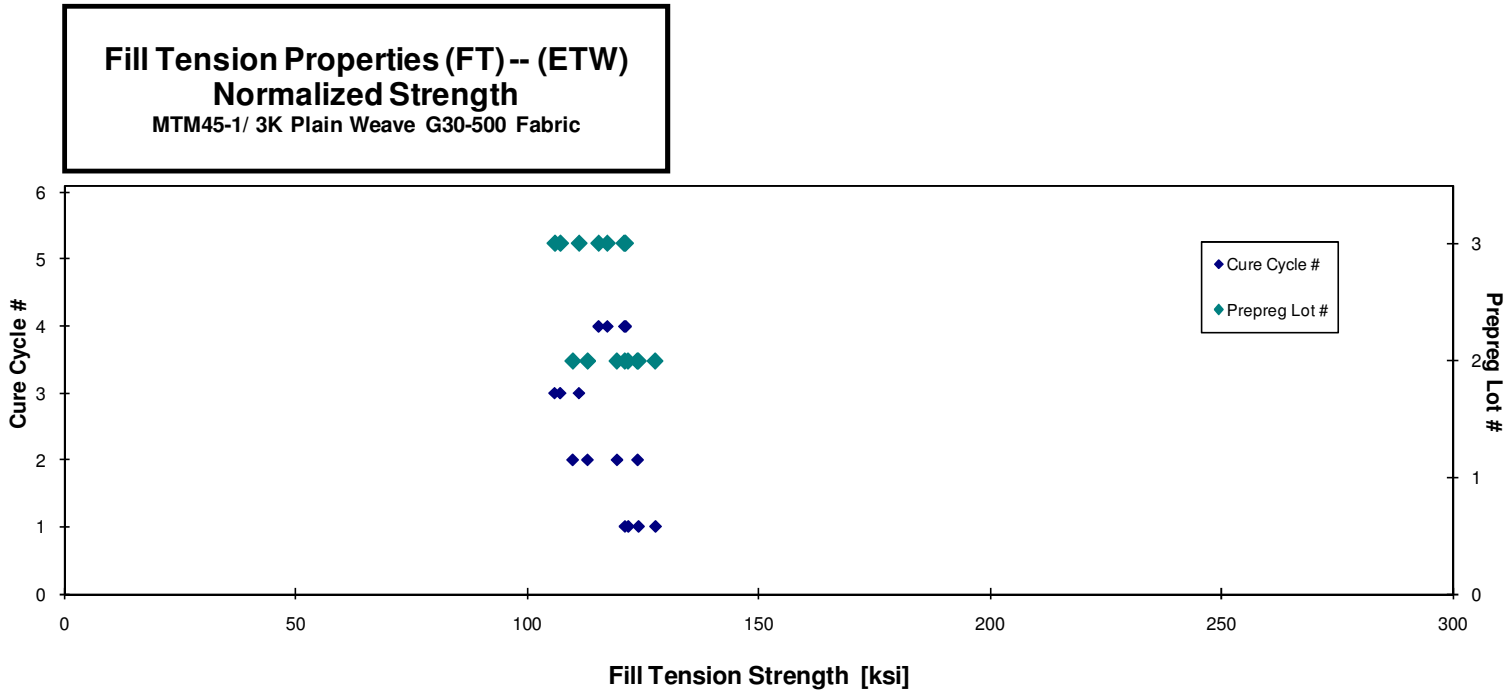

Fill Tension Properties (FT) -- (RTD)
Normalized Strength
MTM45-1/ 3K Plain Weave G30-500 Fabric
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Fill Tension Strength [ksi]
0
50
100
150
200
250
300
0
1
2
3
4
5
6

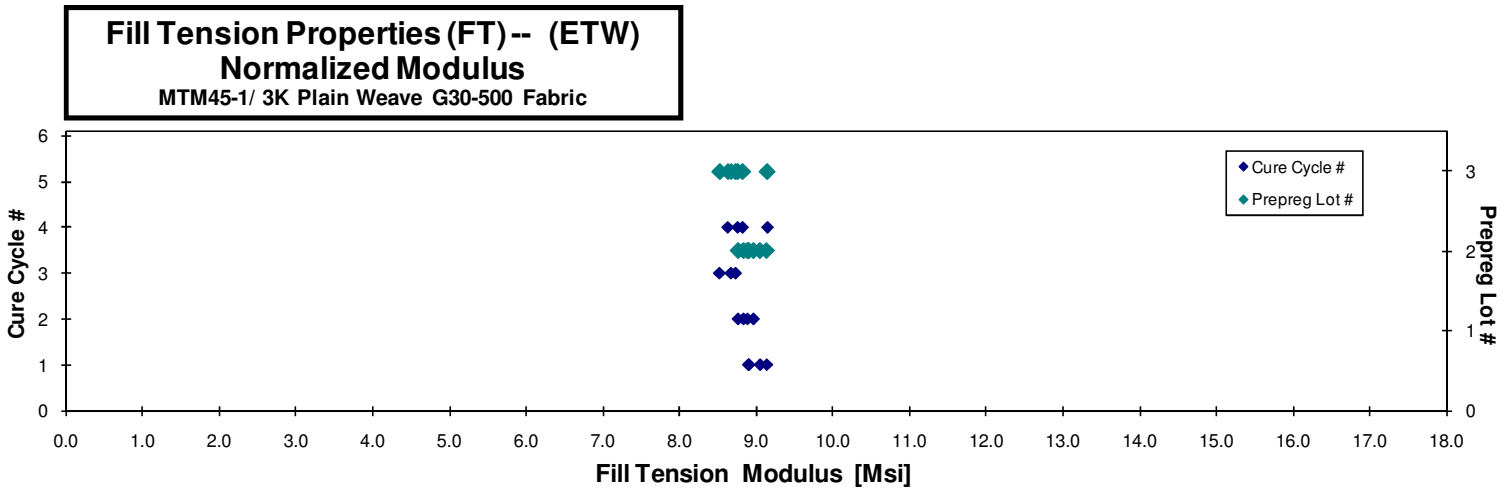

Fill Tension Properties (FT) -- (RTD)
Normalized Modulus
MTM45-1/ 3K Plain Weave G30-500 Fabric
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Fill Tension Modulus [Msi]
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
11.0
12.0
13.0
14.0
15.0
16.0
17.0
18.0
0
1
2
3
4
5
6

Fill Tension Properties (FT) -- (ETW)
Strength & Modulus
MTM45-1/ 3K Plain Weave G30-500 Fabric

normalizing t_{ply} [in]: 0.0079

Specimen Number	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
A0NUB619N	B	LH1	2	1	125.285	9.356	0.107	14	LGM	0.0076	121.075	9.042
A0NUB61AN	B	LH1	2	1	135.158	9.413	0.104	14	LGM	0.0075	127.683	8.892
A0NUB61BN	B	LH1	2	1	126.518	9.078	0.108	14	LWT	0.0077	124.002	8.897
A0NUB61CN	B	LH1	2	1	122.192	9.158	0.110	14	LGM	0.0079	121.787	9.128
A0NUB719N	B	LH2	2	2	119.435	8.833	0.111	14	LGM	0.0079	119.363	8.828
A0NUB71AN	B	LH2	2	2	124.325	8.995	0.110	14	LGM	0.0079	123.800	8.957
A0NUB71BN	B	LH2	2	2	115.526	9.216	0.105	14	LGM	0.0075	109.781	8.758
A0NUB71CN	B	LH2	2	2	112.466	8.838	0.111	14	LGM	0.0079	112.992	8.879
				Average	**122.613**	**9.111**			**Average**	**0.0077**	**120.060**	**8.923**
				Standard Dev.	**7.032**	**0.217**			**Standard Dev.**		**5.949**	**0.118**
				Coeff. of Var. [%]	**5.735**	**2.386**			**Coeff. of Var. [%]**		**4.955**	**1.319**
				Min.	**112.466**	**8.833**			**Min.**	**0.0075**	**109.781**	**8.758**
				Max.	**135.158**	**9.413**			**Max.**	**0.0079**	**127.683**	**9.128**
				Number of Spec.	**8**	**8**			**Number of Spec.**	**8**	**8**	**8**
A0NUC814N	C	M1	3	3	104.928	8.439	0.112	14	LWT	0.0080	105.892	8.517
A0NUC815N	C	M1	3	3	110.221	8.593	0.112	14	LWB,LGM	0.0080	111.151	8.666
A0NUC816N	C	M1	3	3	105.188	8.569	0.113	14	LGM	0.0080	107.090	8.724
A0NUC91AN	C	M2	3	4	122.301	8.829	0.110	14	LWT	0.0078	121.232	8.752
A0NUC91BN	C	M2	3	4	118.659	9.245	0.109	14	LGM	0.0078	117.283	9.138
A0NUC91CN	C	M2	3	4	116.940	8.933	0.109	14	LWB,LGM	0.0078	115.407	8.816
A0NUC91DN	C	M2	3	4	123.211	8.786	0.109	14	LWT,LWB	0.0078	120.946	8.624
				Average	**114.493**	**8.771**			**$Average_{norm}$**	**0.0079**	**114.143**	**8.748**
				Standard Dev.	**7.710**	**0.270**			**$Standard\ Dev._{norm}$**		**6.255**	**0.197**
				Coeff. of Var. [%]	**6.734**	**3.078**			**Coeff. of Var. $[\%]_{norm}$**		**5.480**	**2.251**
				Min.	**104.928**	**8.439**			**Min.**	**0.0078**	**105.892**	**8.517**
				Max.	**123.211**	**9.245**			**Max.**	**0.0080**	**121.232**	**9.138**
				Number of Spec.	**7**	**7**			**Number of Spec.**	**7**	**7**	**7**


Fill Tension Properties (FT) -- (ETW)
Normalized Strength
MTM45-1/ 3K Plain Weave G30-500 Fabric
Cure Cycle #
Prepreg Lot #
Fill Tension Strength [ksi]
0
50
100
150
200
250
300
0
1
2
3
4
5
6


Fill Tension Properties (FT) -- (ETW)
Normalized Modulus
MTM45-1/ 3K Plain Weave G30-500 Fabric
Cure Cycle #
Prepreg Lot #
Fill Tension Modulus [Msi]
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
11.0
12.0
13.0
14.0
15.0
16.0
17.0
18.0
0
1
2
3
4
5
6

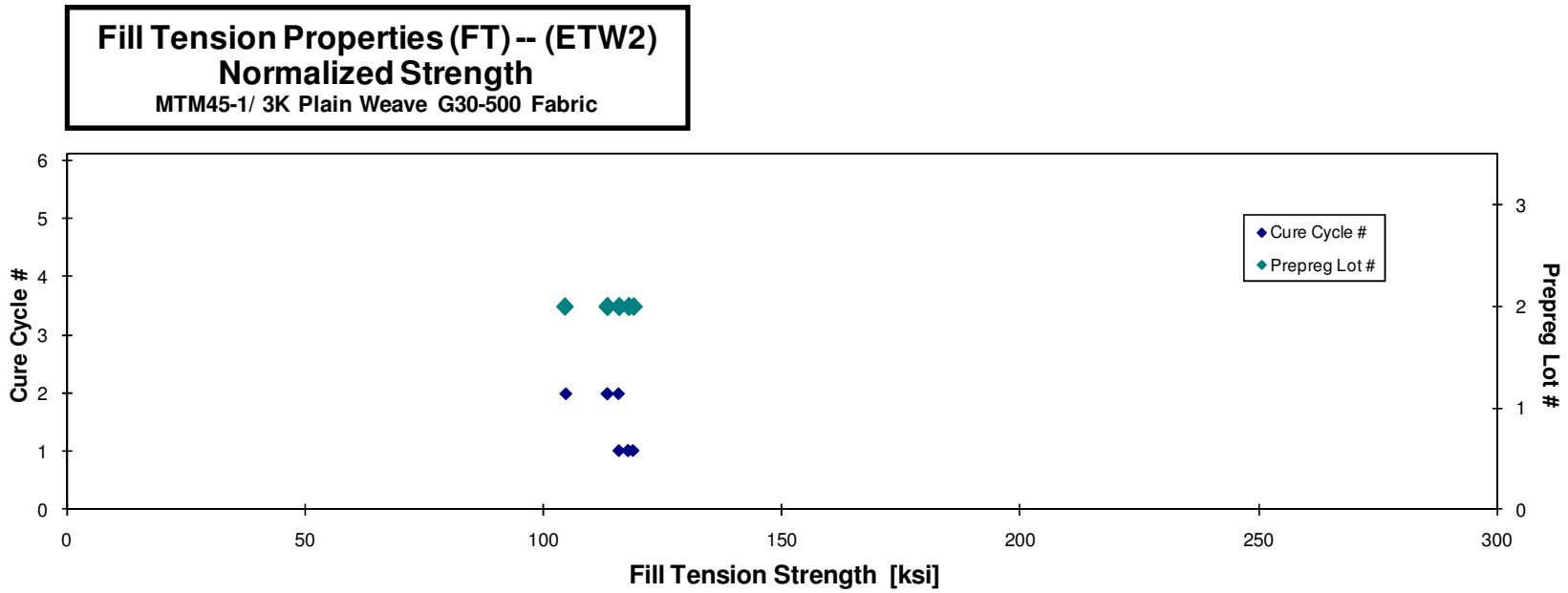
Fill Tension Properties (FT) -- (ETW2)
Strength & Modulus
MTM45-1/ 3K Plain Weave G30-500 Fabric

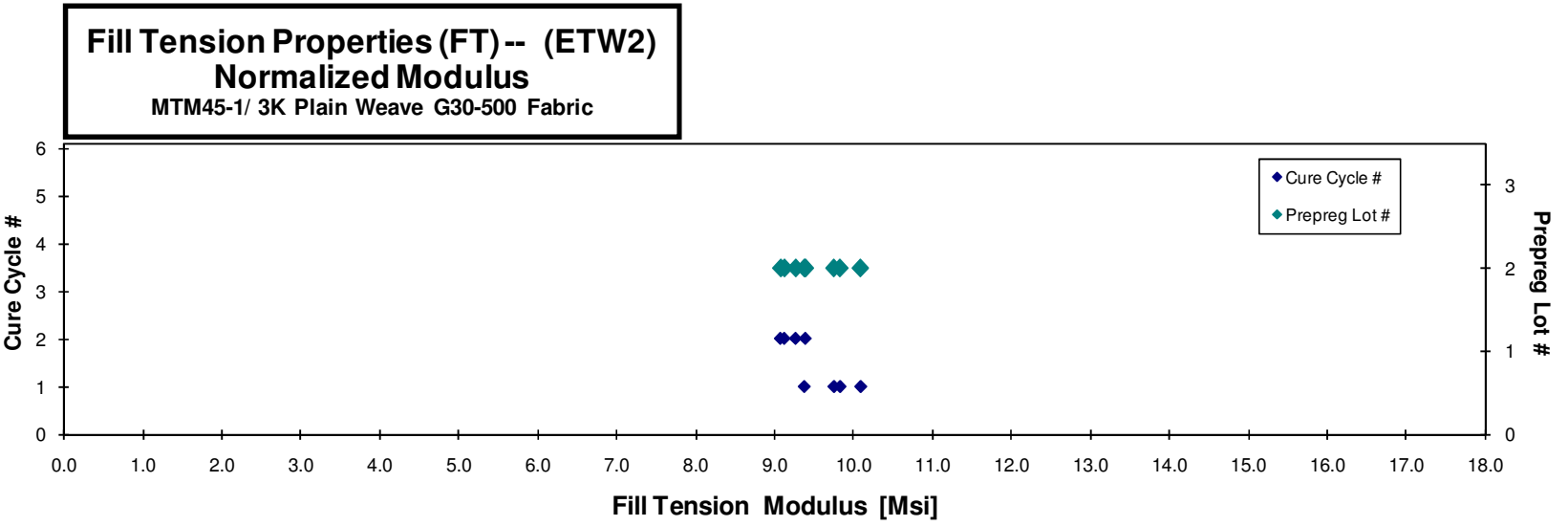
normalizing t_{ply} [in]: 0.0079

Specimen Number	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
A0NUB61ED	B	LH1	2	1	116.893	9.675	0.111	14	AGM	0.0080	117.791	9.749
A0NUB61FD	B	LH1	2	1	117.953	9.754	0.111	14	LGM	0.0080	118.824	9.826
A0NUB61GD	B	LH1	2	1	114.958	10.011	0.111	14	LGM	0.0080	115.842	10.088
A0NUB61HD	B	LH1	2	1	116.731	9.288	0.112	14	LGM	0.0080	117.787	9.372
A0NUB71GD	B	LH2	2	2	112.555	8.865	0.114	14	LGM	0.0081	115.761	9.117
A0NUB71HD	B	LH2	2	2	110.693	9.159	0.113	14	LGM	0.0081	113.429	9.385
A0NUB71ID	B	LH2	2	2	110.498	8.842	0.113	14	LGM	0.0081	113.328	9.069
A0NUB71JD	B	LH2	2	2	102.556	9.080	0.113	14	LGM	0.0081	104.596	9.261

	Strength [ksi]	Modulus [Msi]
Average	**112.855**	**9.334**
Standard Dev.	**5.045**	**0.433**
Coeff. of Var. [%]	**4.470**	**4.635**
Min.	**102.556**	**8.842**
Max.	**117.953**	**10.011**
Number of Spec.	**8**	**8**

	t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
$Average_{norm}$	**0.0080**	**114.670**	**9.483**
Standard $Dev._{norm}$		**4.537**	**0.365**
Coeff. of Var. $[\%]_{norm}$		**3.957**	**3.846**
Min.	**0.0080**	**104.596**	**9.069**
Max.	**0.0081**	**118.824**	**10.088**
Number of Spec.		**8**	**8**


Fill Tension Properties (FT) -- (ETW2)
Normalized Strength
MTM45-1/ 3K Plain Weave G30-500 Fabric
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Fill Tension Strength [ksi]
0
50
100
150
200
250
300
0
1
2
3
4
5
6

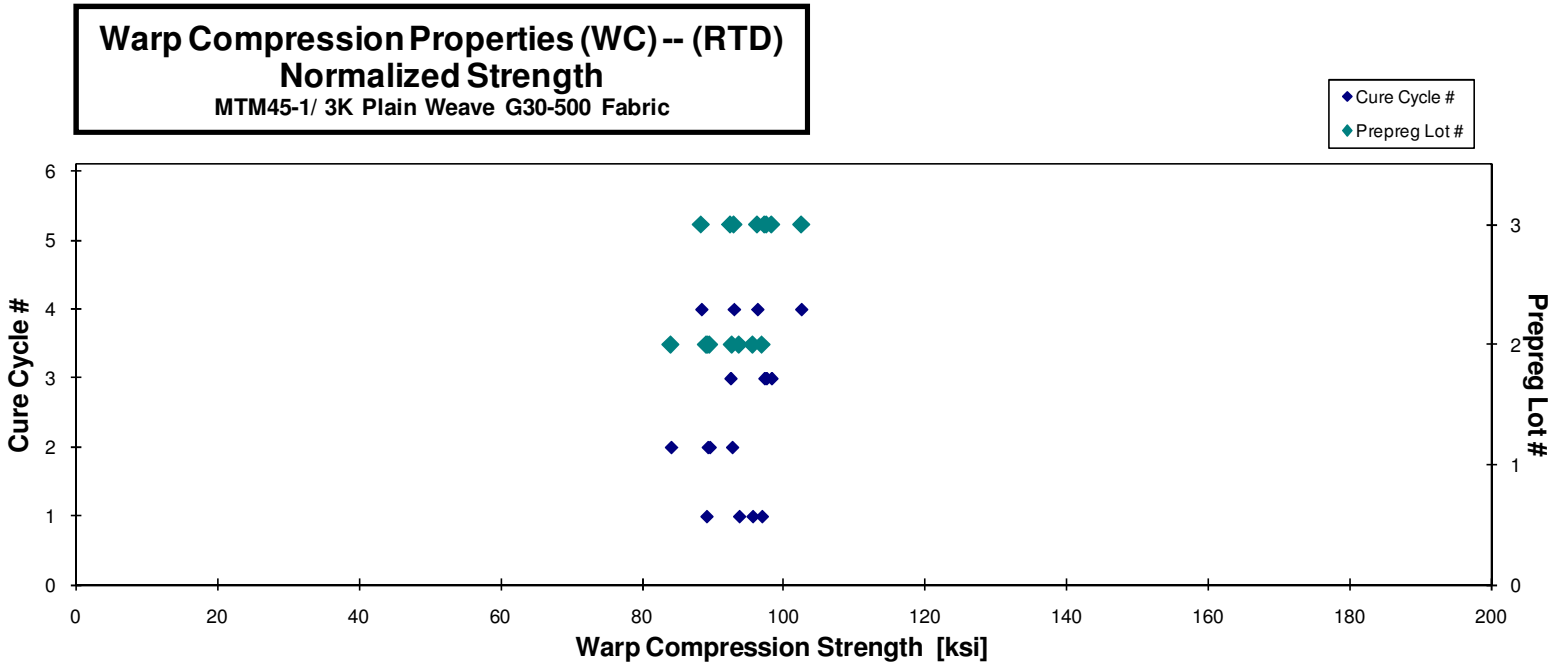

Fill Tension Properties (FT) -- (ETW2)
Normalized Modulus
MTM45-1/ 3K Plain Weave G30-500 Fabric
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Fill Tension Modulus [Msi]
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
11.0
12.0
13.0
14.0
15.0
16.0
17.0
18.0
0
1
2
3
4
5
6

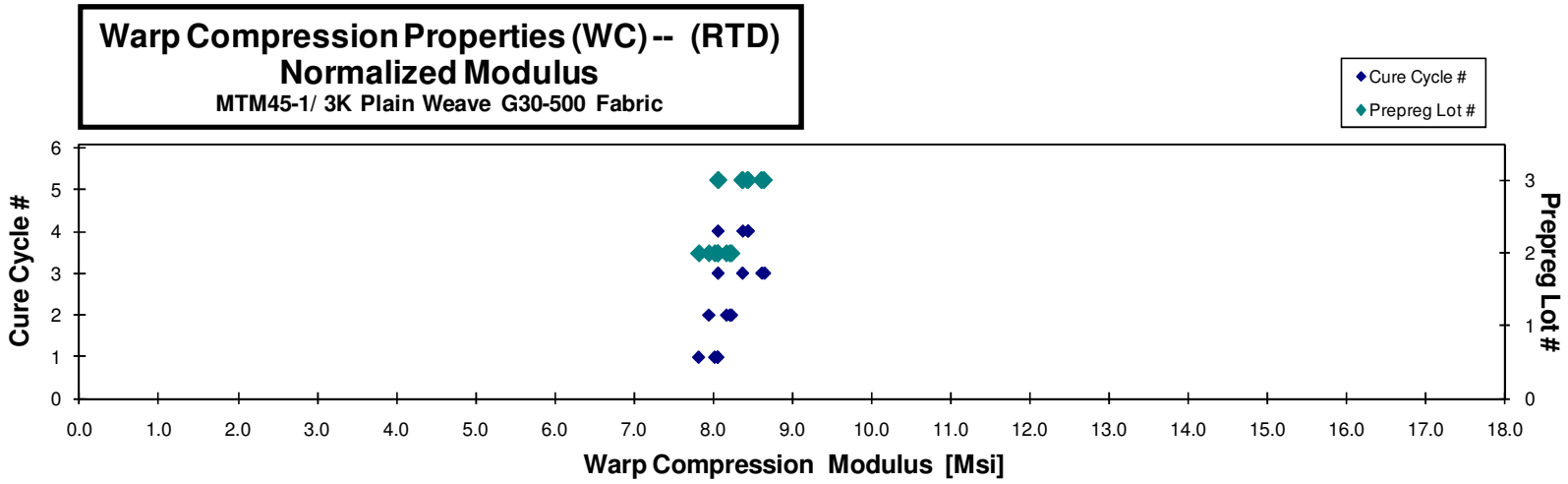
4.3 Warp Compression Properties

Warp Compression Properties (WC) -- (RTD)
Strength & Modulus
MTM45-1/ 3K Plain Weave G30-500 Fabric

normalizing t_{ply} [in]: 0.0079

Specimen Number	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Poisson's Ratio	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
A0NLB611A	B	LH1	2	1	94.921	8.170	0.046	0.140	18	BGM	0.0078	93.697	8.065
A0NLB612A	B	LH1	2	1	89.073	8.063	0.070	0.142	18	BGM	0.0079	89.052	8.061
A0NLB613A	B	LH1	2	1	95.416	7.805	0.070	0.143	18	BGM	0.0079	95.629	7.822
A0NLB614A	B	LH1	2	1	96.605	7.998	0.043	0.143	18	BGM	0.0079	96.922	8.024
A0NLB71EA	B	LH2	2	2	93.691	8.261	0.087	0.141	18	HAT	0.0078	92.703	8.174
A0NLB71FA	B	LH2	2	2	89.847	8.267	0.043	0.142	18	BGM	0.0079	89.521	8.237
A0NLB71GA	B	LH2	2	2	90.667	8.349	0.054	0.140	18	BGM/BAT	0.0078	89.233	8.217
A0NLB71HA	B	LH2	2	2	85.045	8.046	0.046	0.141	18	HGM	0.0078	84.038	7.951
				Average	**91.908**	**8.120**	**0.057**			**$Average_{norm}$**	**0.0079**	**91.349**	**8.069**
				Standard Dev.	**3.920**	**0.177**	**0.016**			**$Standard\ Dev._{norm}$**		**4.197**	**0.140**
				Coeff. of Var. [%]	**4.265**	**2.180**	**28.610**			**Coeff. of Var. [%]$_{norm}$**		**4.594**	**1.740**
				Min.	**85.045**	**7.805**	**0.043**			**Min.**	**0.0078**	**84.038**	**7.822**
				Max.	**96.605**	**8.349**	**0.087**			**Max.**	**0.0079**	**96.922**	**8.237**
				Number of Spec.	**8**	**8**	**8**			**Number of Spec.**	**8**	**8**	**8**
A0NLC811A	C	M1	3	3	101.300	8.919	0.056	0.138	18	BGM	0.0077	98.285	8.653
A0NLC812A	C	M1	3	3	96.405	8.989	0.047	0.136	18	BAB/BGM	0.0076	92.461	8.621
A0NLC813A	C	M1	3	3	102.536	8.828	0.055	0.135	18	BGM	0.0075	97.297	8.377
A0NLC814A	C	M1	3	3	102.004	8.433	0.060	0.136	18	HAT	0.0076	97.581	8.067
A0NLC911A	C	M2	3	4	88.126	8.430	0.072	0.143	18	BAB/BGM	0.0079	88.322	8.449
A0NLC912A	C	M2	3	4	100.206	8.191	0.050	0.145	18	BGM	0.0081	102.520	8.380
A0NLC913A	C	M2	3	4	92.294	8.010	0.049	0.143	18	BAB	0.0080	92.953	8.067
A0NLC914A	C	M2	3	4	95.545	8.380	0.050	0.143	18	BAB	0.0080	96.273	8.444
				Average	**97.302**	**8.523**	**0.055**			**$Average_{norm}$**	**0.0078**	**95.711**	**8.382**
				Standard Dev.	**5.170**	**0.354**	**0.008**			**$Standard\ Dev._{norm}$**		**4.344**	**0.220**
				Coeff. of Var. [%]	**5.314**	**4.155**	**15.082**			**Coeff. of Var. [%]$_{norm}$**		**4.538**	**2.619**
				Min.	**88.126**	**8.010**	**0.047**			**Min.**	**0.0075**	**88.322**	**8.067**
				Max.	**102.536**	**8.989**	**0.072**			**Max.**	**0.0081**	**102.520**	**8.653**
				Number of Spec.	**8**	**8**	**8**			**Number of Spec.**	**8**	**8**	**8**

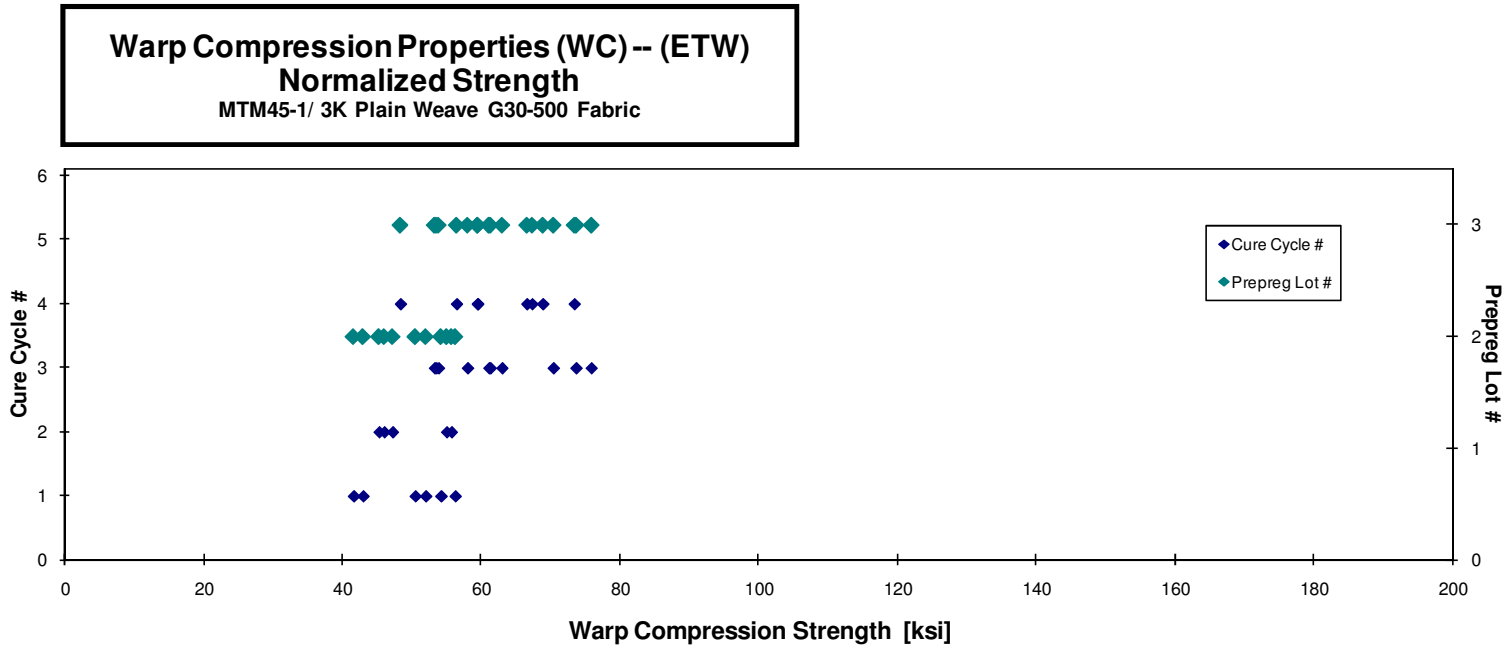

Warp Compression Properties (WC) -- (RTD)
Normalized Strength
MTM45-1/ 3K Plain Weave G30-500 Fabric
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Warp Compression Strength [ksi]
0
20
40
60
80
100
120
140
160
180
200
0
1
2
3
4
5
6

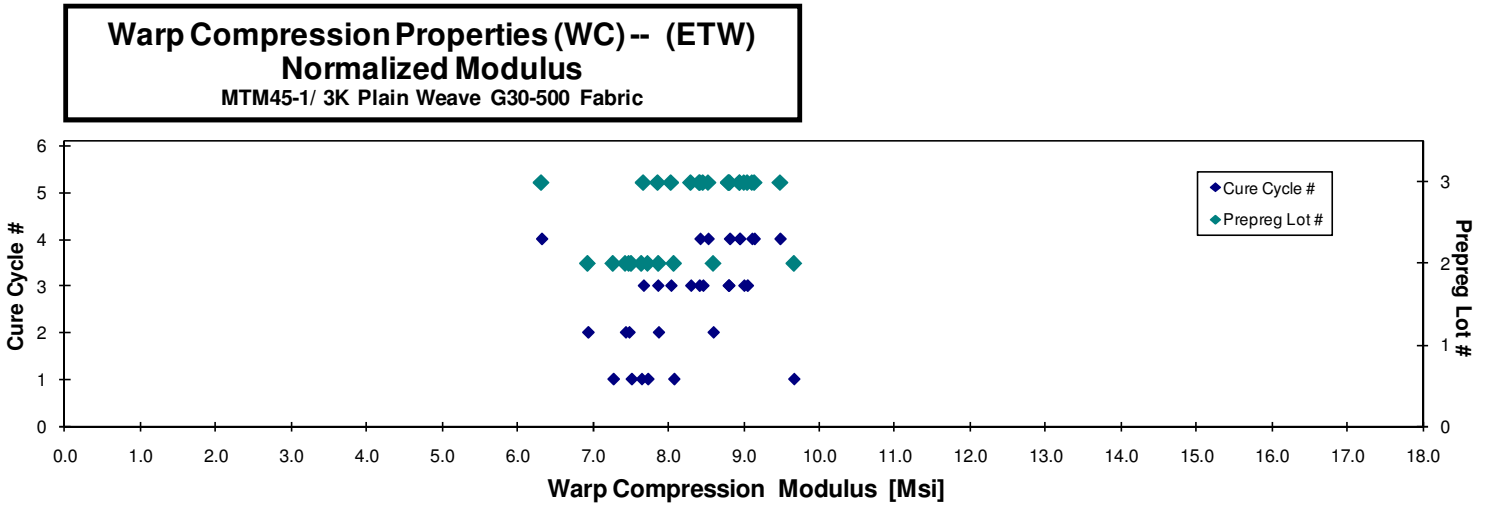

Warp Compression Properties (WC) -- (RTD)
Normalized Modulus
MTM45-1/ 3K Plain Weave G30-500 Fabric
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Warp Compression Modulus [Msi]
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
11.0
12.0
13.0
14.0
15.0
16.0
17.0
18.0
0
1
2
3
4
5
6

Warp Compression Properties (WC) -- (ETW)
Strength & Modulus
MTM45-1/ 3K Plain Weave G30-500 Fabric

normalizing t_{ply} [in]: 0.0079

Specimen Number	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Poisson's Ratio	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
A0NLB617N	B	LH1	2	1	57.046	7.829	0.040	0.140	18	BGM	0.0078	56.324	7.730
A0NLB618N	B	LH1	2	1	50.153	7.213	0.047	0.143	18	HGM/HAT	0.0080	50.558	7.271
A0NLB619N	B	LH1	2	1	42.536	7.429	0.030	0.144	18	BGM/BAT	0.0080	43.015	7.513
A0NLB61AN	B	LH1	2	1	41.224	7.992	0.045	0.144	18	HGM	0.0080	41.659	8.076
A0NLB61BN	B	LH1	2	1	52.129	7.657	0.059	0.142	18	HGM//BGM	0.0079	52.062	7.647
A0NLB61CN	B	LH1	2	1	54.370	9.687	0.052	0.142	18	BAT	0.0079	54.262	9.668
A0NLB712N	B	LH2	2	2	48.741	7.149	0.034	0.138	18	HGM	0.0077	47.284	6.935
A0NLB713N	B	LH2	2	2	55.720	7.864	0.045	0.142	18	HGM	0.0079	55.779	7.872
A0NLB714N	B	LH2	2	2	46.104	7.439	0.106	0.142	18	BAT,BGM	0.0079	46.071	7.434
A0NLB715N	B	LH2	2	2	45.072	8.549	0.090	0.143	18	HGM	0.0079	45.330	8.598
A0NLB716N	B	LH2	2	2	54.253	7.368	0.097	0.144	18	HGM/BGM	0.0080	55.080	7.480
				Average	**49.759**	**7.834**	**0.058**			**$Average_{norm}$**	**0.0079**	**49.766**	**7.839**
				Standard Dev.	**5.452**	**0.734**	**0.027**			**$Standard\ Dev._{norm}$**		**5.332**	**0.746**
				Coeff. of Var. [%]	**10.957**	**9.375**	**45.499**			**Coeff. of Var. $[\%]_{norm}$**		**10.714**	**9.517**
				Min.	**41.224**	**7.149**	**0.030**			**Min.**	**0.0077**	**41.659**	**6.935**
				Max.	**57.046**	**9.687**	**0.106**			**Max.**	**0.0080**	**56.324**	**9.668**
				Number of Spec.	**11**	**11**	**11**			**Number of Spec.**	**11**	**11**	**11**
A0NLC817N	C	M1	3	3	55.572	7.954	0.053	0.137	18	HGM	0.0076	53.605	7.672
A0NLC819N	C	M1	3	3	59.636	9.037	0.104	0.139	18	HAT/HGM	0.0077	58.098	8.804
A0NLC81AN	C	M1	3	3	55.613	8.290	0.065	0.138	18	HGM	0.0077	53.919	8.037
A0NLC81BN	C	M1	3	3	62.945	8.091	0.038	0.138	18	HGM	0.0077	61.167	7.862
A0NLC81CN	C	M1	3	3	54.892	9.055	0.101	0.138	18	HGM/HAT	0.0077	53.342	8.799
A0NLC81DN	C	M1	3	3	64.589	8.500	0.046	0.139	18	HAT	0.0077	63.075	8.301
A0NLC918N	C	M2	3	4	56.208	9.432	0.068	0.143	18	HGM/BGM	0.0079	56.518	9.484
A0NLC91AN	C	M2	3	4	60.051	8.492	0.012	0.141	18	HAT	0.0078	59.566	8.423
A0NLC91BN	C	M2	3	4	48.472	8.540	0.030	0.142	18	BAT/HGM	0.0079	48.415	8.530
A0NLC91CN	C	M2	3	4	59.387	6.306	0.039	0.143	18	BAB	0.0079	59.526	6.321
A0NLC 8R2N	C	M1	3	3	71.777	9.172	0.055	0.140	18	HGM	0.0078	70.473	9.005
A0NLC 8R3N	C	M1	3	3	61.980	9.138	0.056	0.141	18	HAT	0.0078	61.385	9.050
A0NLC 8R4N	C	M1	3	3	76.742	8.501	0.065	0.141	18	HAT	0.0078	75.951	8.414
A0NLC 8R5N	C	M1	3	3	75.219	8.629	0.052	0.139	18	HAT	0.0077	73.755	8.461
A0NLC 9R2N	C	M2	3	4		9.212	0.067	0.141	18	HIB / HGM	0.0078		9.111
A0NLC 9R3N	C	M2	3	4	67.508	9.156	0.066	0.142	18	HGM	0.0079	67.405	9.142
A0NLC 9R4N	C	M2	3	4	68.133	9.145	0.067	0.139	18	HAB	0.0077	66.656	8.946
A0NLC 9R5N	C	M2	3	4	71.106	9.231	0.074	0.138	18	HAT	0.0077	68.947	8.950
A0NLC9R6N	C	M2	3	4	72.709	8.722	0.055	0.144	18	HAT	0.0080	73.502	8.817
				Average	**63.474**	**8.663**	**0.059**			**$Average_{norm}$**	**0.0078**	**62.517**	**8.533**
				Standard Dev.	**7.997**	**0.711**	**0.022**			**$Standard\ Dev._{norm}$**		**7.993**	**0.710**
				Coeff. of Var. [%]	**12.598**	**8.204**	**37.179**			**Coeff. of Var. $[\%]_{norm}$**		**12.785**	**8.325**
				Min.	**48.472**	**6.306**	**0.012**			**Min.**	**0.0076**	**48.415**	**6.321**
				Max.	**76.742**	**9.432**	**0.104**			**Max.**	**0.0080**	**75.951**	**9.484**
				Number of Spec.	**18**	**19**	**19**			**Number of Spec.**	**19**	**18**	**19**


Warp Compression Properties (WC) -- (ETW)
Normalized Strength
MTM45-1/ 3K Plain Weave G30-500 Fabric
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Warp Compression Strength [ksi]


Warp Compression Properties (WC) -- (ETW)
Normalized Modulus
MTM45-1/ 3K Plain Weave G30-500 Fabric
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Warp Compression Modulus [Msi]

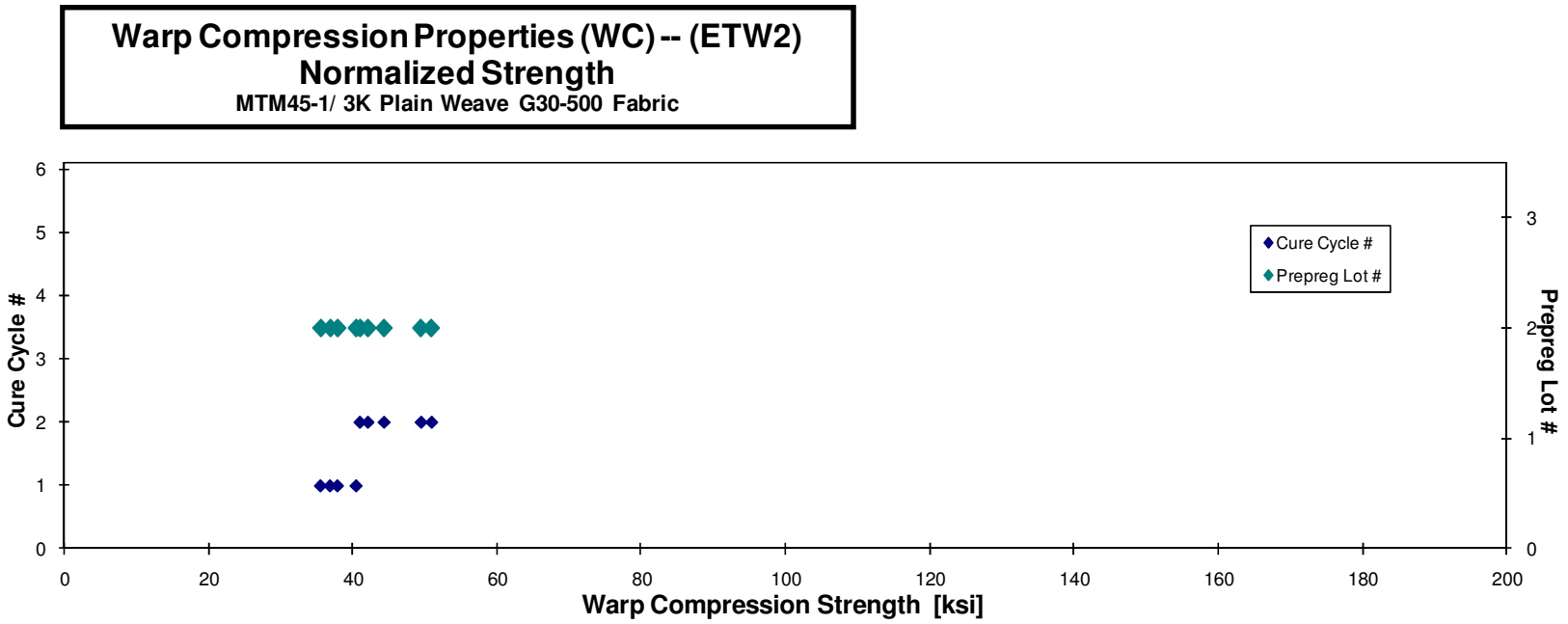
Warp Compression Properties (WC) -- (ETW2)
Strength & Modulus
MTM45-1/ 3K Plain Weave G30-500 Fabric

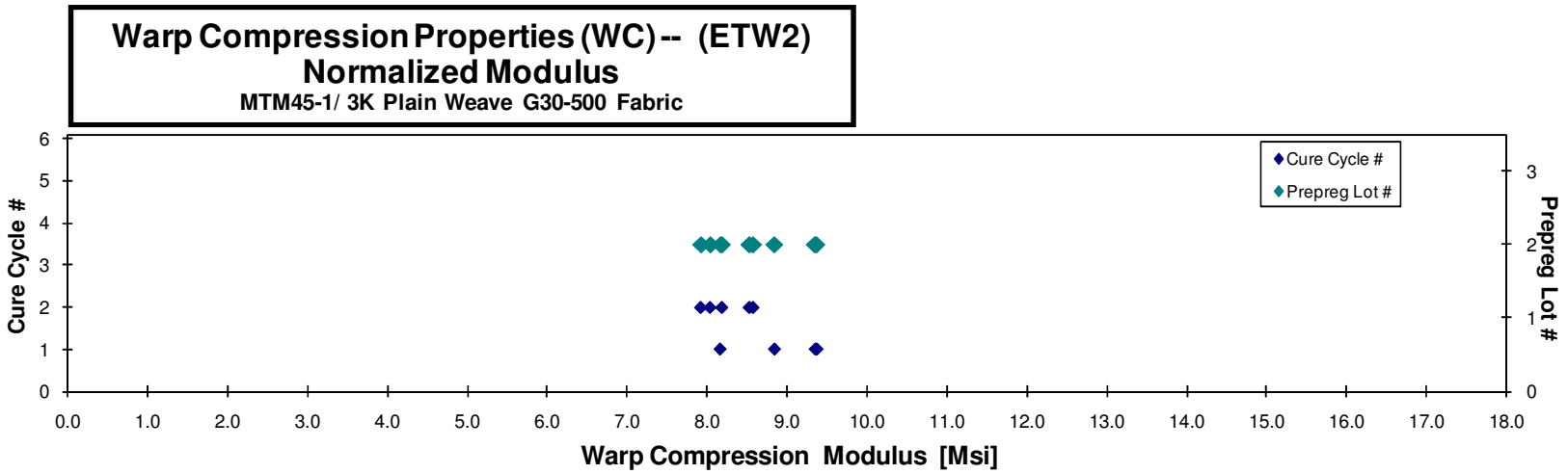
normalizing t_{ply} [in]: 0.0079

Specimen Number	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Poisson's Ratio	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
A0NLB61DD	B	LH1	2	1	41.219	8.312	0.058	0.140	18	BAB	0.0078	40.475	8.162
A0NLB61FD	B	LH1	2	1	35.735	9.387	0.068	0.142	18	HAT	0.0079	35.563	9.342
A0NLB61GD	B	LH1	2	1	36.982	9.388	0.074	0.142	18	BAB	0.0079	36.887	9.364
A0NLB61ID	B	LH1	2	1	39.061	9.108	0.067	0.138	18	HAT	0.0077	37.898	8.837
A0NLB718D	B	LH2	2	2	44.355	8.187	0.076	0.142	18	HGM	0.0079	44.330	8.182
A0NLB719D	B	LH2	2	2	41.113	8.592	0.061	0.142	18	BAB	0.0079	41.007	8.570
A0NLB71AD	B	LH2	2	2	50.018	8.624	0.072	0.141	18	BGM	0.0078	49.437	8.524
A0NLB71CD	B	LH2	2	2	42.225	8.059	0.082	0.142	18	HAT	0.0079	42.106	8.036
A0NLB71DD	B	LH2	2	2	50.771	7.903	0.081	0.143	18	BAT	0.0079	50.878	7.920

	Strength [ksi]	Modulus [Msi]	Poisson's Ratio
Average	**42.387**	**8.618**	**0.071**
Standard Dev.	**5.243**	**0.562**	**0.008**
Coeff. of Var. [%]	**12.370**	**6.523**	**11.559**
Min.	**35.735**	**7.903**	**0.058**
Max.	**50.771**	**9.388**	**0.082**
Number of Spec.	**9**	**9**	**9**

	t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
$Average_{norm}$	**0.0078**	**42.065**	**8.548**
Standard $Dev._{norm}$		**5.330**	**0.538**
Coeff. of Var. $[\%]_{norm}$		**12.671**	**6.299**
Min.	**0.0077**	**35.563**	**7.920**
Max.	**0.0079**	**50.878**	**9.364**
Number of Spec.		**9**	**9**


Warp Compression Properties (WC) -- (ETW2)
Normalized Strength
MTM45-1/ 3K Plain Weave G30-500 Fabric
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Warp Compression Strength [ksi]
0
20
40
60
80
100
120
140
160
180
200
1
2
3
4
5
6

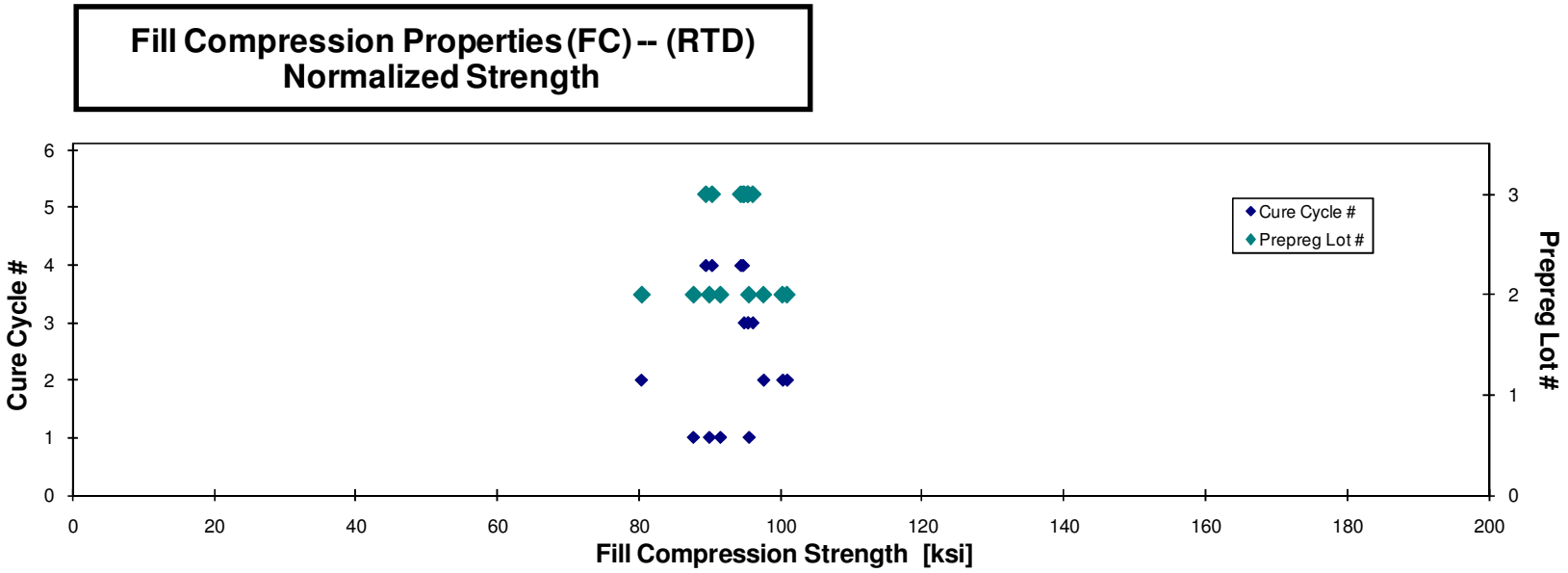

Warp Compression Properties (WC) -- (ETW2)
Normalized Modulus
MTM45-1/ 3K Plain Weave G30-500 Fabric
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Warp Compression Modulus [Msi]
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
11.0
12.0
13.0
14.0
15.0
16.0
17.0
18.0
1
2
3
4
5
6

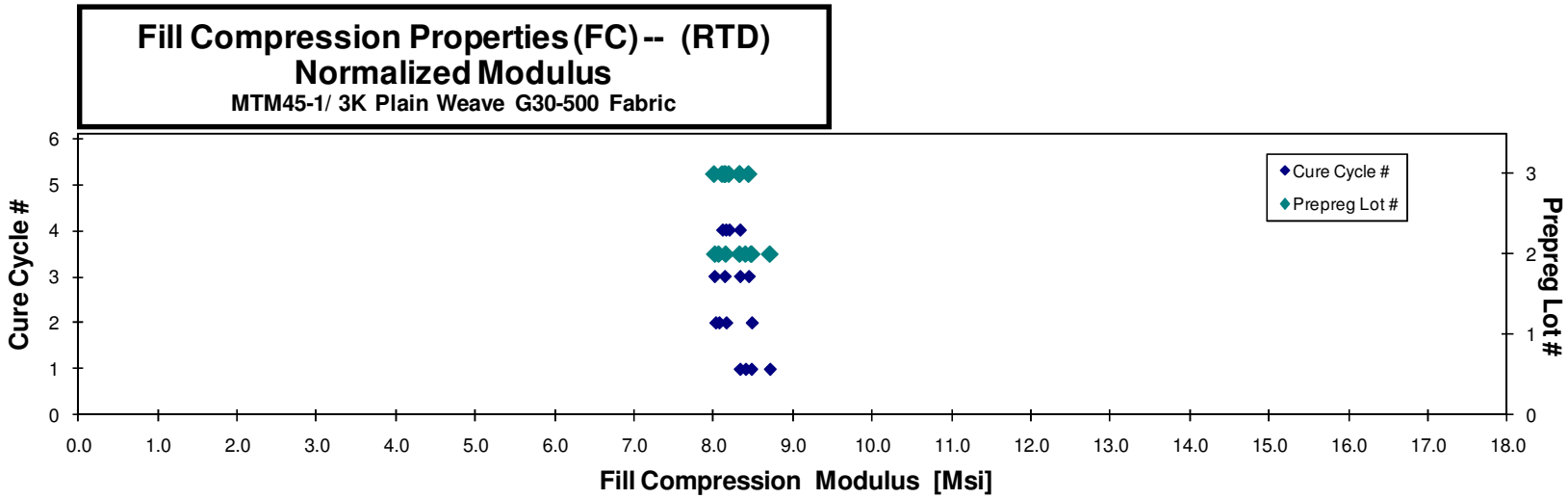
4.4 Fill Compression Properties

Fill Compression Properties (FC) -- (RTD)
Strength & Modulus
MTM45-1/ 3K Plain Weave G30-500 Fabric

normalizing t_{ply} [in]
0.0079

Specimen Number	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Poisson's Ratio	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
A0NZB611A	B	LH1	2	1	96.141	8.762	0.041	0.135	18	BGM	0.0075	91.454	8.335
A0NZB612A	B	LH1	2	1	90.203	8.968	0.047	0.138	18	BGM	0.0077	87.655	8.715
A0NZB613A	B	LH1	2	1	91.567	8.637	0.084	0.140	18	HAB	0.0078	89.904	8.480
A0NZB614A	B	LH1	2	1	96.449	8.492	0.080	0.141	18	BGM/HGM	0.0078	95.489	8.407
A0NZB711A	B	LH2	2	2	85.846	9.067	0.054	0.133	18	HAB	0.0074	80.342	8.486
A0NZB712A	B	LH2	2	2	98.266	8.086	0.063	0.141	18	HAB	0.0078	97.540	8.026
A0NZB713A	B	LH2	2	2	101.135	8.184	0.058	0.142	18	HAB	0.0079	100.862	8.162
A0NZB714A	B	LH2	2	2	100.778	8.116	0.069	0.141	18	HAB	0.0079	100.222	8.071
				Average	**95.048**	**8.539**	**0.062**			**$Average_{norm}$**	**0.0077**	**92.933**	**8.335**
				Standard Dev.	**5.394**	**0.384**	**0.015**			**$Standard\ Dev._{norm}$**		**6.985**	**0.235**
				Coeff. of Var. [%]	**5.675**	**4.502**	**24.399**			**Coeff. of Var. $[\%]_{norm}$**		**7.516**	**2.824**
				Min.	**85.846**	**8.086**	**0.041**			**Min.**	**0.0074**	**80.342**	**8.026**
				Max.	**101.135**	**9.067**	**0.084**			**Max.**	**0.0079**	**100.862**	**8.715**
				Number of Spec.	**8**	**8**	**8**			**Number of Spec.**	**8**	**8**	**8**
A0NZC811A	C	M1	3	3	93.014	8.132	0.046	0.146	18	BGM	0.0081	95.347	8.336
A0NZC812A	C	M1	3	3	93.321	8.016	0.042	0.144	18	BGM	0.0080	94.797	8.143
A0NZC813A	C	M1	3	3	93.721	8.305	0.104	0.145	18	BGM	0.0080	95.325	8.447
A0NZC814A	C	M1	3	3	94.693	7.901	0.020	0.144	18	BGM	0.0080	96.036	8.013
A0NZC911A	C	M2	3	4	92.897	8.347	0.074	0.138	18	BGM	0.0077	90.295	8.113
A0NZC912A	C	M2	3	4	95.654	8.270	0.060	0.140	18	BGM	0.0078	94.342	8.157
A0NZC913A	C	M2	3	4	93.234	8.209	0.068	0.144	18	BGM	0.0080	94.666	8.335
A0NZC914A	C	M2	3	4	86.273	7.913	0.057	0.147	18	BGM	0.0082	89.398	8.200
				Average	**92.851**	**8.137**	**0.059**			**$Average_{norm}$**	**0.0080**	**93.776**	**8.218**
				Standard Dev.	**2.820**	**0.176**	**0.025**			**$Standard\ Dev._{norm}$**		**2.490**	**0.143**
				Coeff. of Var. [%]	**3.037**	**2.158**	**42.303**			**Coeff. of Var. $[\%]_{norm}$**		**2.656**	**1.738**
				Min.	**86.273**	**7.901**	**0.020**			**Min.**	**0.0077**	**89.398**	**8.013**
				Max.	**95.654**	**8.347**	**0.104**			**Max.**	**0.0082**	**96.036**	**8.447**
				Number of Spec.	**8**	**8**	**8**			**Number of Spec.**	**8**	**8**	**8**

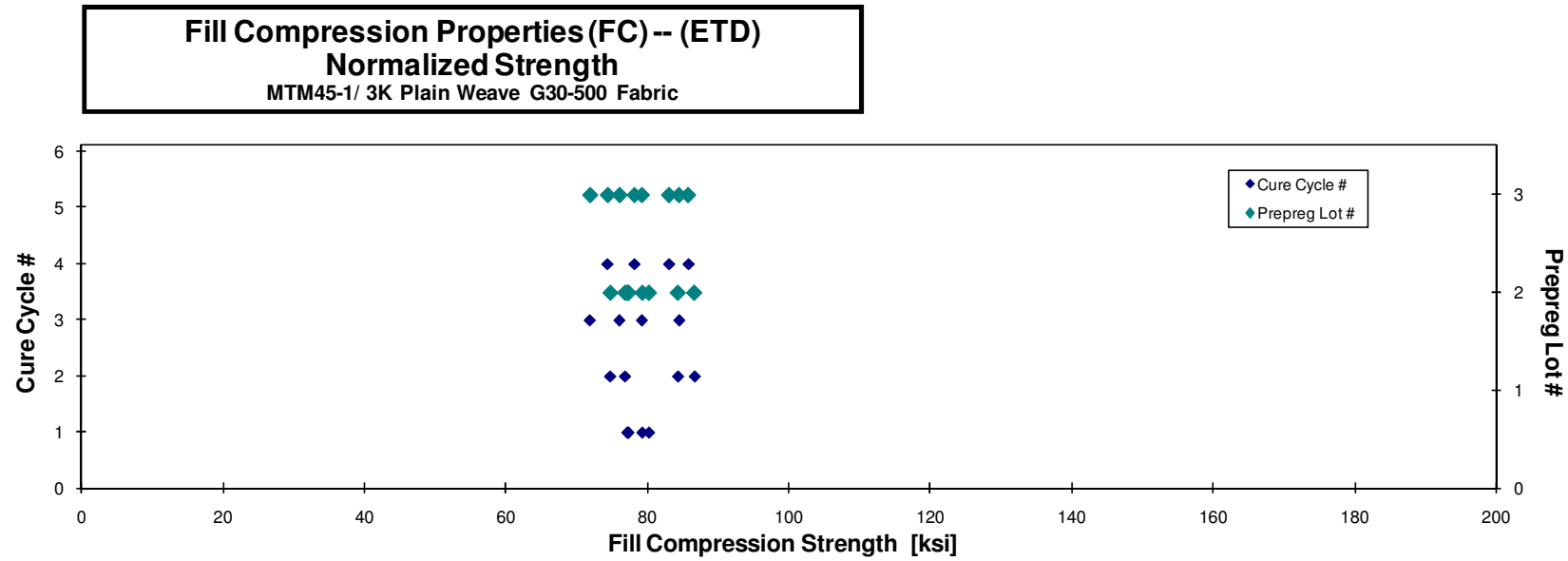

Fill Compression Properties (FC) -- (RTD)
Normalized Strength
Cure Cycle #
Prepreg Lot #
Fill Compression Strength [ksi]
0
20
40
60
80
100
120
140
160
180
200
0
1
2
3
4
5
6

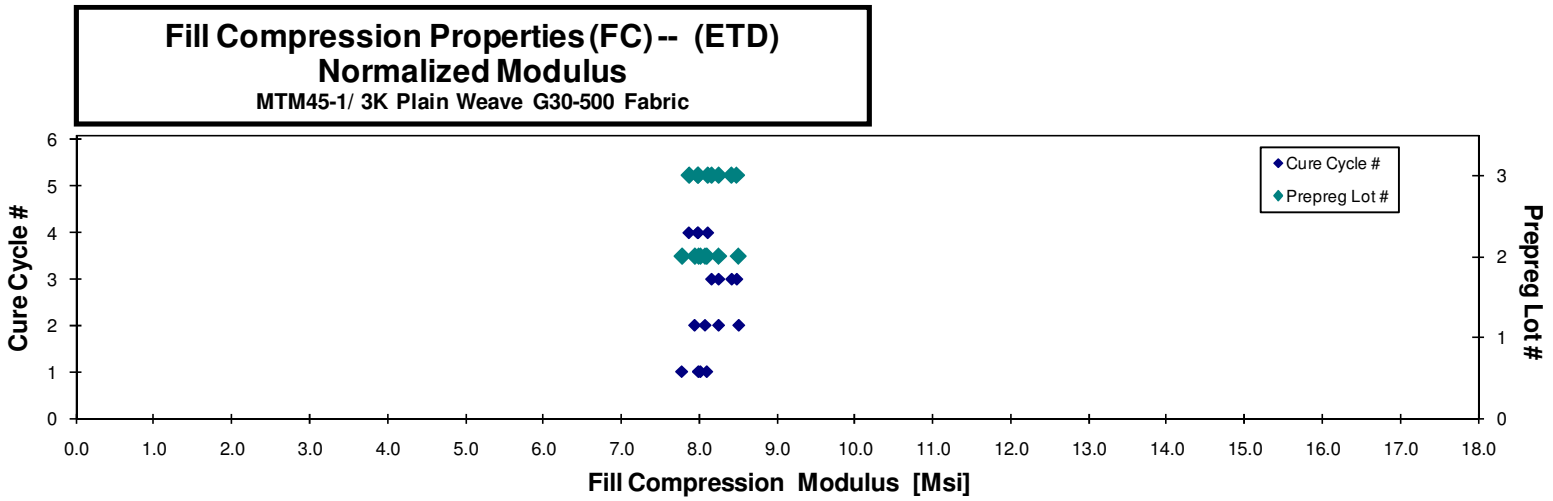

Fill Compression Properties (FC) -- (RTD)
Normalized Modulus
MTM45-1/ 3K Plain Weave G30-500 Fabric
Cure Cycle #
Prepreg Lot #
Fill Compression Modulus [Msi]
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
11.0
12.0
13.0
14.0
15.0
16.0
17.0
18.0
0
1
2
3
4
5
6

Fill Compression Properties (FC) -- (ETD)
Strength & Modulus
MTM45-1/ 3K Plain Weave G30-500 Fabric

normalizing t_{ply} [in]: 0.0079

Specimen Number	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Poisson's Ratio	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
A0NZB615C	B	LH1	2	1	77.276	8.005	0.048	0.142	18	BGM	0.0079	77.131	7.990
A0NZB616C	B	LH1	2	1	79.664	7.817	0.065	0.141	18	BGM	0.0079	79.263	7.778
A0NZB617C	B	LH1	2	1	80.640	8.059	0.062	0.141	18	HGM	0.0079	80.206	8.015
A0NZB618C	B	LH1	2	1	77.812	8.150	0.044	0.141	18	BGM	0.0078	77.301	8.096
A0NZB715C	B	LH2	2	2	76.932	8.516	0.058	0.142	18	HAB	0.0079	76.815	8.503
A0NZB716C	B	LH2	2	2	84.495	8.267	0.063	0.142	18	HAB	0.0079	84.297	8.247
A0NZB717C	B	LH2	2	2	86.329	7.912	0.064	0.143	18	BGM	0.0079	86.653	7.942
A0NZB718C	B	LH2	2	2	74.702	8.072	0.076	0.142	18	HGM	0.0079	74.720	8.074
				Average	**79.731**	**8.100**	**0.060**			**$Average_{norm}$**	**0.0079**	**79.548**	**8.081**
				Standard Dev.	**3.962**	**0.217**	**0.010**			**$Standard\ Dev._{norm}$**		**4.057**	**0.217**
				Coeff. of Var. [%]	**4.970**	**2.681**	**16.797**			**Coeff. of Var. [%]$_{norm}$**		**5.100**	**2.686**
				Min.	**74.702**	**7.817**	**0.044**			**Min.**	**0.0078**	**74.720**	**7.778**
				Max.	**86.329**	**8.516**	**0.076**			**Max.**	**0.0079**	**86.653**	**8.503**
				Number of Spec.	**8**	**8**	**8**			**Number of Spec.**	**8**	**8**	**8**
A0NZC816C	C	M1	3	3	77.773	8.099	0.050	0.145	18	BGM	0.0080	79.204	8.248
A0NZC817C	C	M1	3	3	83.034	8.021	0.075	0.145	18	BGM	0.0080	84.464	8.159
A0NZC818C	C	M1	3	3	70.326	8.236	0.063	0.145	18	BGM	0.0081	71.851	8.415
A0NZC819C	C	M1	3	3	73.569	8.204	0.086	0.147	18	BAB	0.0082	76.036	8.479
A0NZC917C	C	M2	3	4	82.581	7.688	0.065	0.148	18	BAB	0.0082	85.784	7.986
A0NZC918C	C	M2	3	4	79.252	7.739	0.070	0.149	18	BGM	0.0083	83.042	8.109
A0NZC919C	C	M2	3	4	71.119	7.529	0.054	0.149	18	BAB	0.0083	74.337	7.870
A0NZC91AC	C	M2	3	4	74.661	7.625	0.084	0.149	18	HAT	0.0083	78.144	7.981
				Average	**76.539**	**7.892**	**0.068**			**$Average_{norm}$**	**0.0082**	**79.108**	**8.156**
				Standard Dev.	**4.897**	**0.279**	**0.013**			**$Standard\ Dev._{norm}$**		**4.994**	**0.215**
				Coeff. of Var. [%]	**6.398**	**3.530**	**18.983**			**Coeff. of Var. [%]$_{norm}$**		**6.312**	**2.635**
				Min.	**70.326**	**7.529**	**0.050**			**Min.**	**0.0080**	**71.851**	**7.870**
				Max.	**83.034**	**8.236**	**0.086**			**Max.**	**0.0083**	**85.784**	**8.479**
				Number of Spec.	**8**	**8**	**8**			**Number of Spec.**	**8**	**8**	**8**

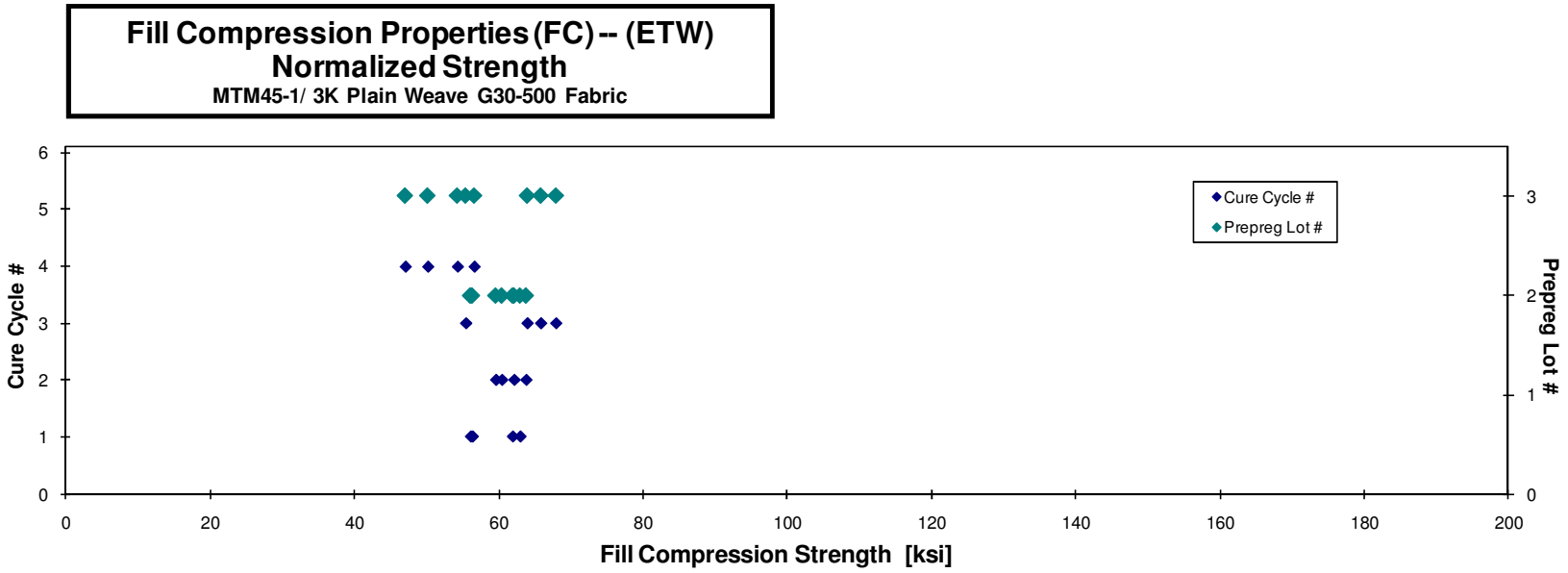

Fill Compression Properties (FC) -- (ETD)
Normalized Strength
MTM45-1/ 3K Plain Weave G30-500 Fabric
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Fill Compression Strength [ksi]
0
20
40
60
80
100
120
140
160
180
200
0
1
2
3
4
5
6

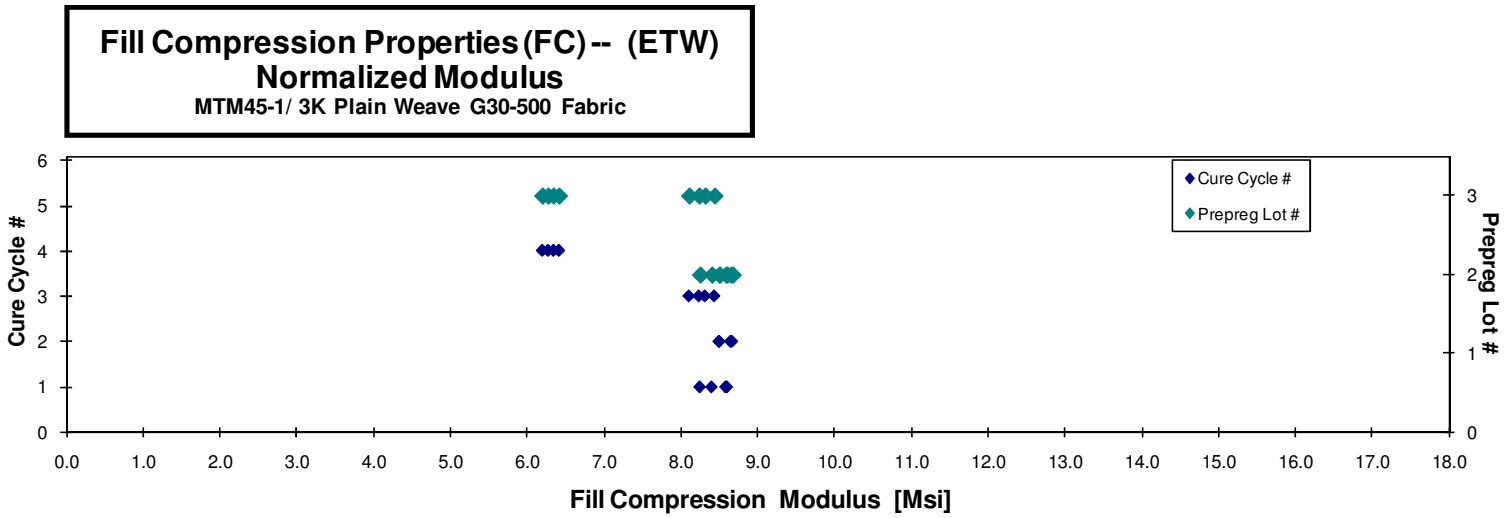

Fill Compression Properties (FC) -- (ETD)
Normalized Modulus
MTM45-1/ 3K Plain Weave G30-500 Fabric
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Fill Compression Modulus [Msi]
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
11.0
12.0
13.0
14.0
15.0
16.0
17.0
18.0
0
1
2
3
4
5
6

Fill Compression Properties (FC) -- (ETW)
Strength & Modulus
MTM45-1/ 3K Plain Weave G30-500 Fabric

normalizing t_{ply} [in]: 0.0079

Specimen Number	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Poisson's Ratio	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
A0NZB619N	B	LH1	2	1	63.100	8.626	0.065	0.142	18	BGM	0.0079	62.952	8.606
A0NZB61AN	B	LH1	2	1	61.657	8.368	0.044	0.143	18	HGM	0.0079	61.924	8.404
A0NZB61BN	B	LH1	2	1	56.377	8.254	0.077	0.142	18	HGM	0.0079	56.351	8.250
A0NZB61CN	B	LH1	2	1	55.906	8.558	0.073	0.143	18	BGM	0.0079	56.103	8.588
A0NZB71EN	B	LH2	2	2	63.400	8.622	0.053	0.143	18	HGM	0.0079	63.786	8.675
A0NZB71FN	B	LH2	2	2	59.353	8.468	0.048	0.143	18	BGM	0.0079	59.596	8.503
A0NZB71GN	B	LH2	2	2	60.058	8.453	0.057	0.143	18	HGM	0.0079	60.431	8.506
A0NZB71HN	B	LH2	2	2	61.880	8.617	0.056	0.143	18	HAB	0.0079	62.134	8.652
				Average	**60.216**	**8.496**	**0.059**			**$Average_{norm}$**	**0.0079**	**60.410**	**8.523**
				Standard Dev.	**2.863**	**0.136**	**0.012**			**Standard $Dev._{norm}$**		**2.899**	**0.141**
				Coeff. of Var. [%]	**4.755**	**1.597**	**19.991**			**Coeff. of Var. $[\%]_{norm}$**		**4.798**	**1.660**
				Min.	**55.906**	**8.254**	**0.044**				**0.0079**	**56.103**	**8.250**
				Max.	**63.400**	**8.626**	**0.077**				**0.0079**	**63.786**	**8.675**
				Number of Spec.	**8**	**8**	**8**				**8**	**8**	**8**
A0NZC81CN	C	M1	3	3	65.068	8.343	0.058	0.144	18	HAB	0.0080	65.823	8.440
A0NZC81DN	C	M1	3	3	63.187	8.141	0.060	0.144	18	BAB	0.0080	63.942	8.238
A0NZC81EN	C	M1	3	3	56.180	8.216	0.067	0.140	18	BGM	0.0078	55.442	8.108
A0NZC81GN	C	M1	3	3	66.276	8.118	0.058	0.146	18	HGM	0.0081	67.915	8.319
A0NZC91DN	C	M2	3	4	51.617	5.892	0.032	0.150	18	HGM	0.0083	54.297	6.198
A0NZC91EN	C	M2	3	4	45.043	6.067	0.049	0.149	18	HGM/HAT	0.0083	47.086	6.342
A0NZC91FN	C	M2	3	4	47.666	6.090	0.045	0.150	18	BAT	0.0083	50.197	6.413
A0NZC91GN	C	M2	3	4	54.442	6.031	0.015	0.148	18	HGM/HAT	0.0082	56.624	6.273
				Average	**56.185**	**7.112**	**0.048**			**$Average_{norm}$**	**0.0081**	**57.666**	**7.291**
				Standard Dev.	**8.021**	**1.171**	**0.017**			**Standard $Dev._{norm}$**		**7.522**	**1.059**
				Coeff. of Var. [%]	**14.277**	**16.464**	**35.674**			**Coeff. of Var. $[\%]_{norm}$**		**13.044**	**14.517**
				Min.	**45.043**	**5.892**	**0.015**				**0.0078**	**47.086**	**6.198**
				Max.	**66.276**	**8.343**	**0.067**				**0.0083**	**67.915**	**8.440**
				Number of Spec.	**8**	**8**	**8**				**8**	**8**	**8**


Fill Compression Properties (FC) -- (ETW)
Normalized Strength
MTM45-1/ 3K Plain Weave G30-500 Fabric
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Fill Compression Strength [ksi]


Fill Compression Properties (FC) -- (ETW)
Normalized Modulus
MTM45-1/ 3K Plain Weave G30-500 Fabric
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Fill Compression Modulus [Msi]

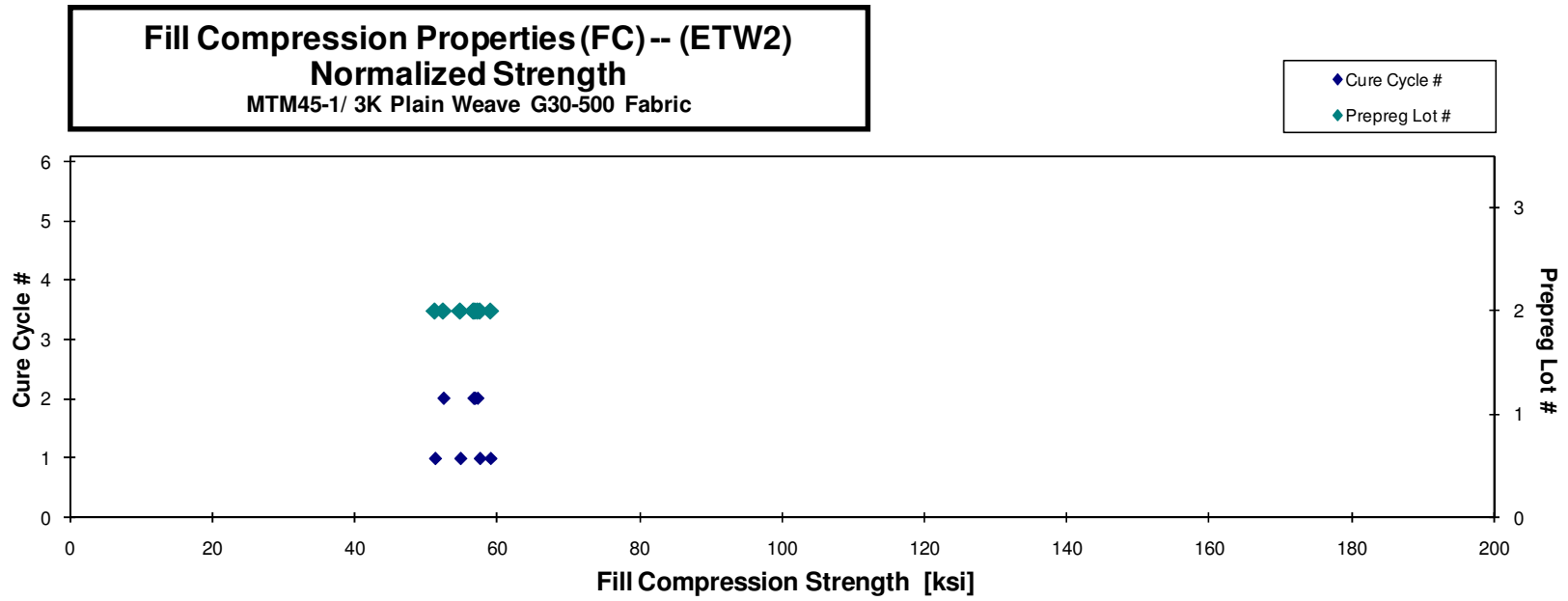
Fill Compression Properties (FC) -- (ETW2)
Strength & Modulus
MTM45-1/ 3K Plain Weave G30-500 Fabric

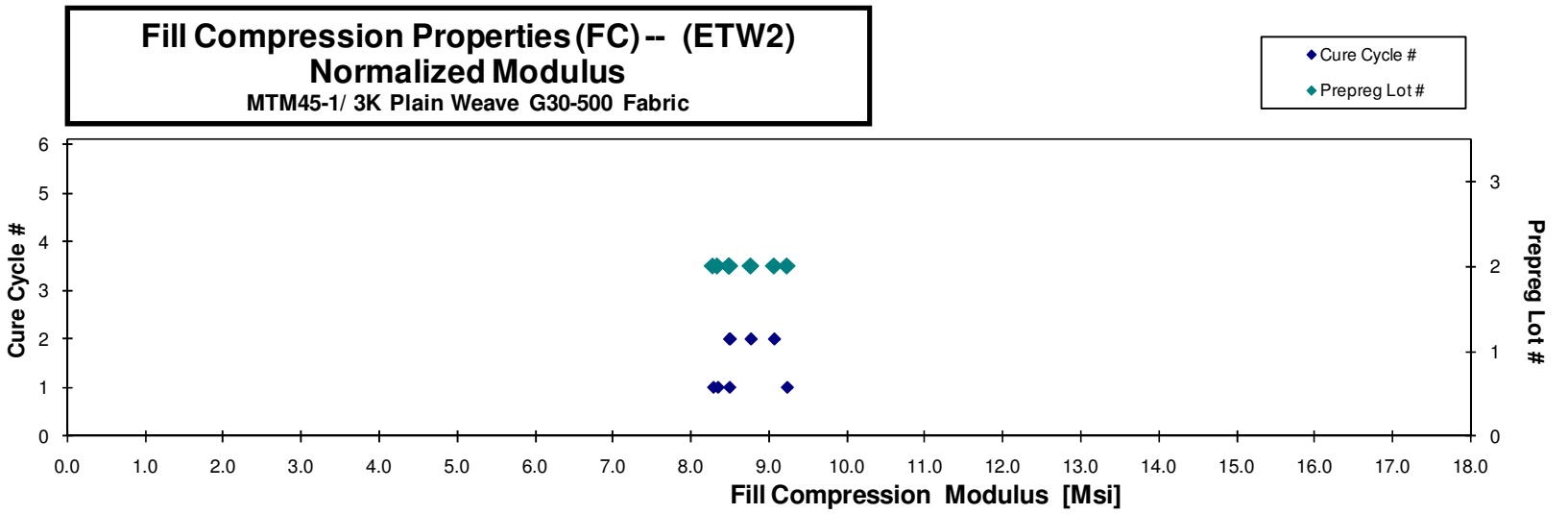
normalizing t_{ply} [in]: 0.0079

Specimen Number	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Poisson's Ratio	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
A0NZB61ED	B	LH1	2	1	51.175	8.326	0.074	0.142	18	HGM	0.0079	51.271	8.342
A0NZB61FD	B	LH1	2	1	58.985	9.217	0.088	0.142	18	HGM/HAT	0.0079	59.082	9.232
A0NZB61GD	B	LH1	2	1	55.485	8.592	0.069	0.141	18	HGM	0.0078	54.841	8.492
A0NZB61HD	B	LH1	2	1	58.518	8.419	0.062	0.140	18	HGM	0.0078	57.579	8.284
A0NZB719D	B	LH2	2	2	56.842	8.492	0.069	0.142	18	BGM	0.0079	56.889	8.499
A0NZB71AD	B	LH2	2	2	56.554	9.044	0.059	0.143	18	HGM	0.0079	56.700	9.067
A0NZB71BD	B	LH2	2	2	52.253	8.457	0.045	0.143	18	HGM	0.0079	52.461	8.491
A0NZB71CD	B	LH2	2	2	57.186	8.757	0.052	0.142	18	HGM	0.0079	57.253	8.767

Average	**55.875**	**8.663**	**0.065**
Standard Dev.	**2.807**	**0.319**	**0.014**
Coeff. of Var. [%]	**5.023**	**3.678**	**20.930**
Min.	**51.175**	**8.326**	**0.045**
Max.	**58.985**	**9.217**	**0.088**
Number of Spec.	**8**	**8**	**8**

$Average_{norm}$	**0.0079**	**55.759**	**8.647**
$Standard\ Dev._{norm}$		**2.689**	**0.344**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**4.823**	**3.980**
Min.	**0.0078**	**51.271**	**8.284**
Max.	**0.0079**	**59.082**	**9.232**
Number of Spec.		**8**	**8**


Fill Compression Properties (FC) -- (ETW2)
Normalized Strength
MTM45-1/ 3K Plain Weave G30-500 Fabric
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Fill Compression Strength [ksi]
0
20
40
60
80
100
120
140
160
180
200


Fill Compression Properties (FC) -- (ETW2)
Normalized Modulus
MTM45-1/ 3K Plain Weave G30-500 Fabric
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Fill Compression Modulus [Msi]
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
11.0
12.0
13.0
14.0
15.0
16.0
17.0
18.0

4.5 In-Plane Shear Properties

In-Plane Shear Properties (IPS) -- (CTD)
Strength & Modulus
MTM45-1/ 3K Plain Weave G30-500 Fabric

Specimen Number	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength at 5% Strain [ksi]	0.2% Offset Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Avg. tply [in]
A0NNB617B	B	LH1	2	1	15.398	9.137	0.747	0.065	8	0.0081
A0NNB618B	B	LH1	2	1	15.534	9.275	0.731	0.064	8	0.0080
A0NNB619B*	B	LH1	2	1		9.516	0.732	0.064	8	0.0080
A0NNB61AB*	B	LH1	2	1		9.462	0.741	0.064	8	0.0081
A0NNB717B	B	LH2	2	2	15.824	9.308	0.706	0.064	8	0.0080
A0NNB718B	B	LH2	2	2	15.328	8.911	0.700	0.064	8	0.0080
A0NNB719B	B	LH2	2	2	15.471	8.835	0.685	0.064	8	0.0080
A0NNB71AB	B	LH2	2	2	15.813	9.160	0.703	0.064	8	0.0080

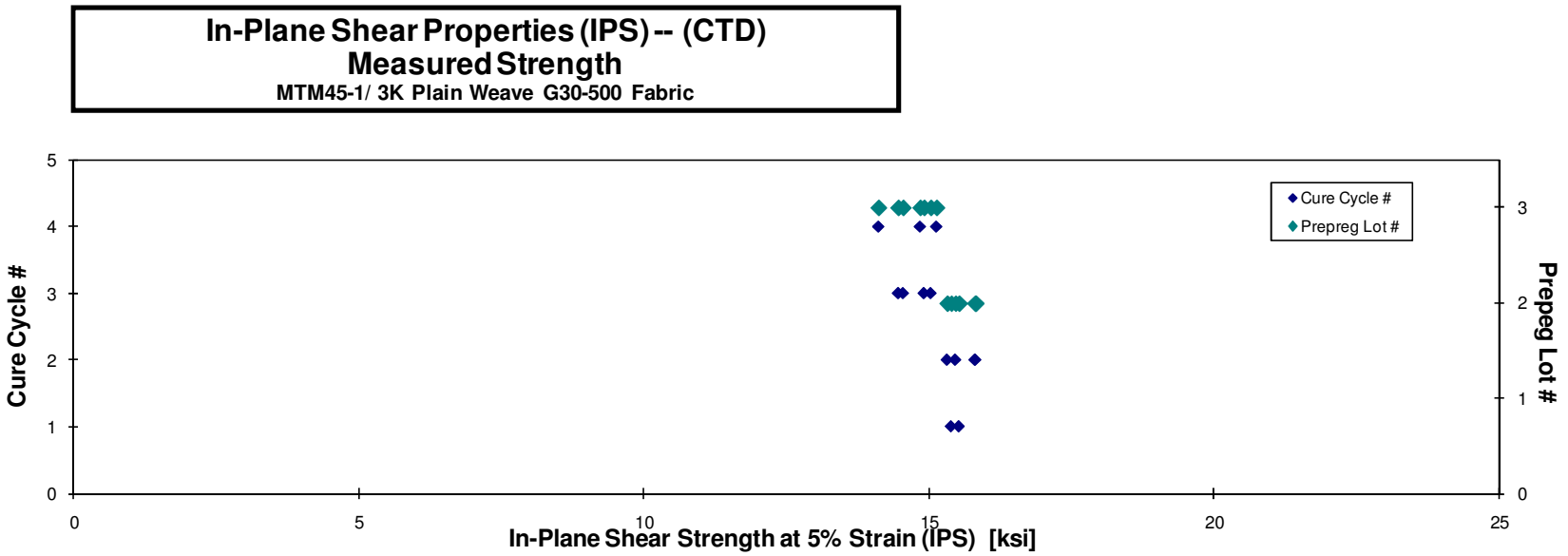
*5% values not available, strain gauge failed before 50 000 micro strain reached

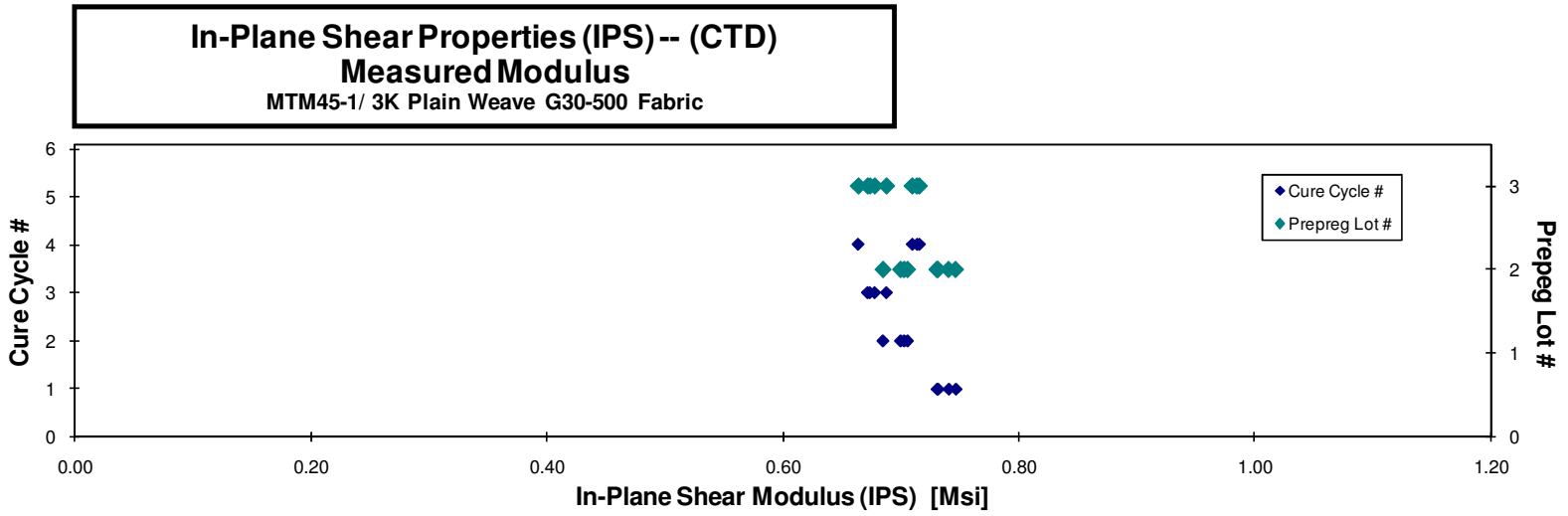
				Average	**15.561**	**9.200**	**0.718**		**Average**	**0.0080**
				Standard Dev.	**0.211**	**0.241**	**0.022**		**Standard Dev.**	
				Coeff. of Var. [%]	**1.356**	**2.623**	**3.121**		**Coeff. of Var. [%]**	
				Min.	**15.328**	**8.835**	**0.685**		**Min.**	**0.0080**
				Max.	**15.824**	**9.516**	**0.747**		**Max.**	**0.0081**
				Number of Spec.	**6**	**8**	**8**		**Number of Spec.**	**8**

A0NNC817B	C	M1	3	3	14.922	8.600	0.688	0.064	8	0.0080
A0NNC818B	C	M1	3	3	15.040	8.715	0.674	0.065	8	0.0082
A0NNC819B	C	M1	3	3	14.556	8.496	0.678	0.064	8	0.0080
A0NNC81AB	C	M1	3	3	14.472	8.613	0.672	0.065	8	0.0081
A0NNC917B	C	M2	3	4	14.855	8.883	0.710	0.062	8	0.0078
A0NNC918B*	C	M2	3	4		8.725	0.714	0.063	8	0.0078
A0NNC919B	C	M2	3	4	15.141	8.969	0.716	0.065	8	0.0081
A0NNC91AB	C	M2	3	4	14.127	8.314	0.664	0.065	8	0.0081

*5% values not available, strain gauge failed before 50 000 micro strain reached

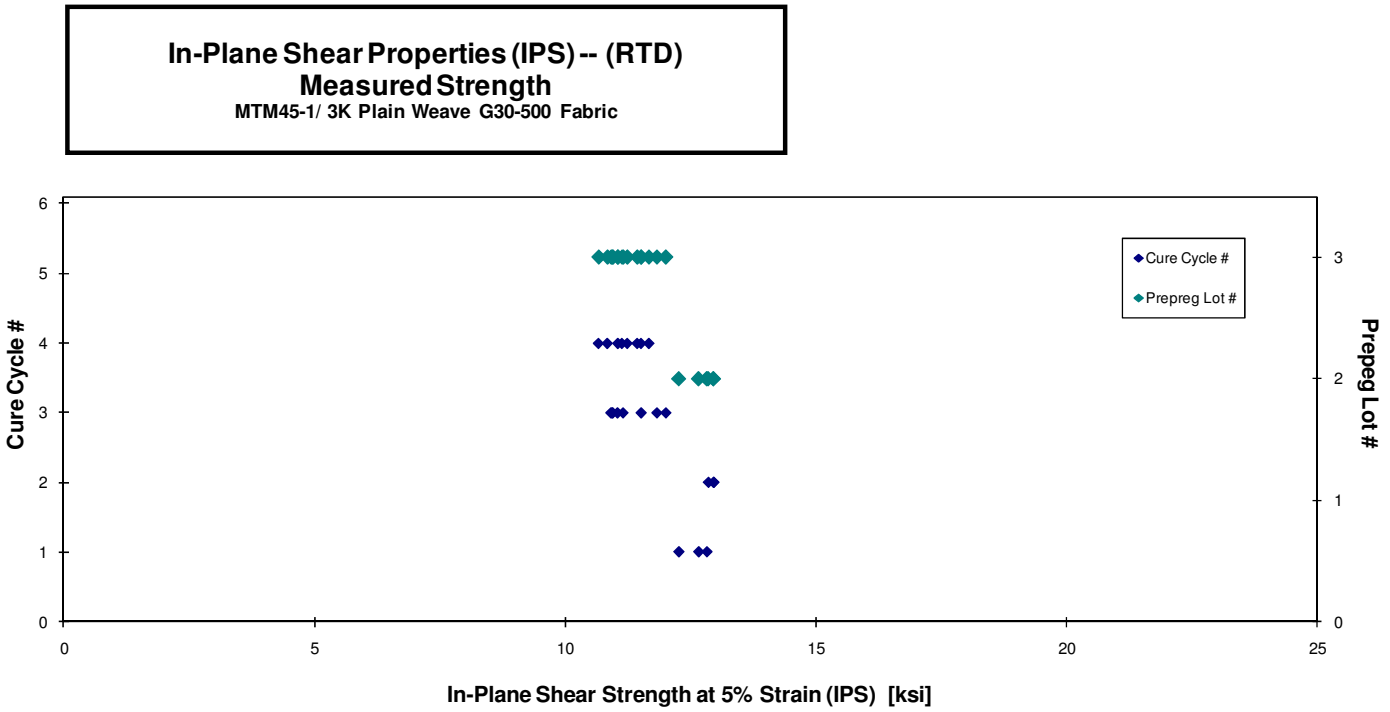
				Average	**14.731**	**8.664**	**0.690**		**Average**	**0.0080**
				Standard Dev.	**0.360**	**0.209**	**0.021**		**Standard Dev.**	
				Coeff. of Var. [%]	**2.444**	**2.407**	**3.029**		**Coeff. of Var. [%]**	
				Min.	**14.127**	**8.314**	**0.664**		**Min.**	**0.0078**
				Max.	**15.141**	**8.969**	**0.716**		**Max.**	**0.0082**
				Number of Spec.	**7**	**8**	**8**		**Number of Spec.**	**8**

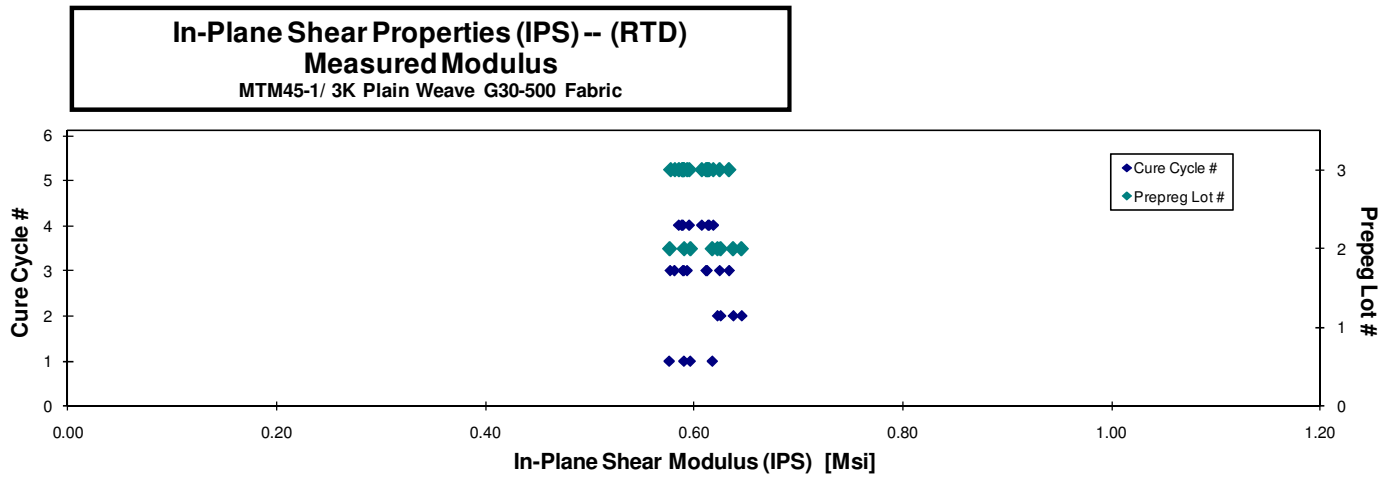

In-Plane Shear Properties (IPS) -- (CTD)
Measured Strength
MTM45-1/ 3K Plain Weave G30-500 Fabric
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
5
0
1
2
3
0
5
10
15
20
25
In-Plane Shear Strength at 5% Strain (IPS) [ksi]


In-Plane Shear Properties (IPS) -- (CTD)
Measured Modulus
MTM45-1/ 3K Plain Weave G30-500 Fabric
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
5
6
0
1
2
3
0.00
0.20
0.40
0.60
0.80
1.00
1.20
In-Plane Shear Modulus (IPS) [Msi]

In-Plane Shear Properties (IPS) -- (RTD)
Strength & Modulus
MTM45-1/ 3K Plain Weave G30-500 Fabric

Specimen Number	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength at 5% Strain [ksi]	0.2% Offset Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Avg. tply [in]
A0NNB61DA	B	LH1	2	1	12.662	6.927	0.617	0.064	8	0.0080
A0NNB61EA	B	LH1	2	1		6.584	0.596	0.064	8	0.0080
A0NNB61FA	B	LH1	2	1	12.266	6.484	0.576	0.065	8	0.0081
A0NNB61GA	B	LH1	2	1	12.825	6.759	0.590	0.064	8	0.0080
A0NNB711A	B	LH2	2	2	12.854	7.062	0.622	0.064	8	0.0079
A0NNB712A	B	LH2	2	2		7.305	0.645	0.064	8	0.0080
A0NNB713A	B	LH2	2	2	12.960	7.049	0.637	0.063	8	0.0079
A0NNB714A	B	LH2	2	2	12.962	7.064	0.625	0.064	8	0.0080
				Average	**12.755**	**6.904**	**0.614**		**Average**	**0.0080**
				Standard Dev.	**0.264**	**0.276**	**0.024**		**Standard Dev.**	
				Coeff. of Var. [%]	**2.067**	**3.995**	**3.909**		**Coeff. of Var. [%]**	
				Min.	**12.266**	**6.484**	**0.576**		**Min.**	**0.0079**
				Max.	**12.962**	**7.305**	**0.645**		**Max.**	**0.0081**
				Number of Spec.	**6**	**8**	**8**		**Number of Spec.**	**8.0000**
A0NNC812A	C	M1	3	3	10.911	6.253	0.581	0.065	8	0.0081
A0NNC813A	C	M1	3	3	11.153	6.221	0.577	0.064	8	0.0080
A0NNC814A	C	M1	3	3	10.934	6.256	0.612	0.063	8	0.0079
A0NNC815A	C	M1	3	3	11.042	6.159	0.593	0.065	8	0.0081
A0NNC911A	C	M2	3	4	11.129	6.389	0.607	0.063	8	0.0079
A0NNC912A	C	M2	3	4	10.663	6.082	0.585	0.063	8	0.0079
A0NNC913A	C	M2	3	4	10.838	6.184	0.595	0.063	8	0.0079
A0NNC914A	C	M2	3	4	11.509	6.478	0.613	0.063	8	0.0078
A0NNC8R2A	C	M1	3	3	10.948	6.281	0.589	0.067	8	0.0083
A0NNC8R3A	C	M1	3	3	12.007	6.759	0.633	0.066	8	0.0083
A0NNC8R4A	C	M1	3	3		6.657	0.590	0.066	8	0.0083
A0NNC8R5A	C	M1	3	3	11.829	6.714	0.611	0.065	8	0.0082
A0NNC8R6A	C	M1	3	3	11.515	6.609	0.624	0.064	8	0.0080
A0NNC9R5A	C	M2	3	4	11.048	6.377	0.588	1.004	8	0.1254
A0NNC9R6A	C	M2	3	4	11.236	6.444	0.589	1.004	8	0.1254
A0NNC9RBA	C	M2	3	4	11.668	6.716	0.614	1.004	8	0.1255
A0NNC9RDA	C	M2	3	4	11.435	6.387	0.618	1.004	8	0.1254
				Average	**11.242**	**6.410**	**0.601**		**Average**	**0.0357**
				Standard Dev.	**0.381**	**0.215**	**0.016**		**Standard Dev.**	
				Coeff. of Var. [%]	**3.393**	**3.353**	**2.734**		**Coeff. of Var. [%]**	
				Min.	**10.663**	**6.082**	**0.577**		**Min.**	**0.0078**
				Max.	**12.007**	**6.759**	**0.633**		**Max.**	**0.1255**
				Number of Spec.	**16**	**17**	**17**		**Number of Spec.**	**17**


In-Plane Shear Properties (IPS) -- (RTD)
Measured Strength
MTM45-1/ 3K Plain Weave G30-500 Fabric
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepeg Lot #
0
1
2
3
4
5
6
0
5
10
15
20
25
In-Plane Shear Strength at 5% Strain (IPS) [ksi]

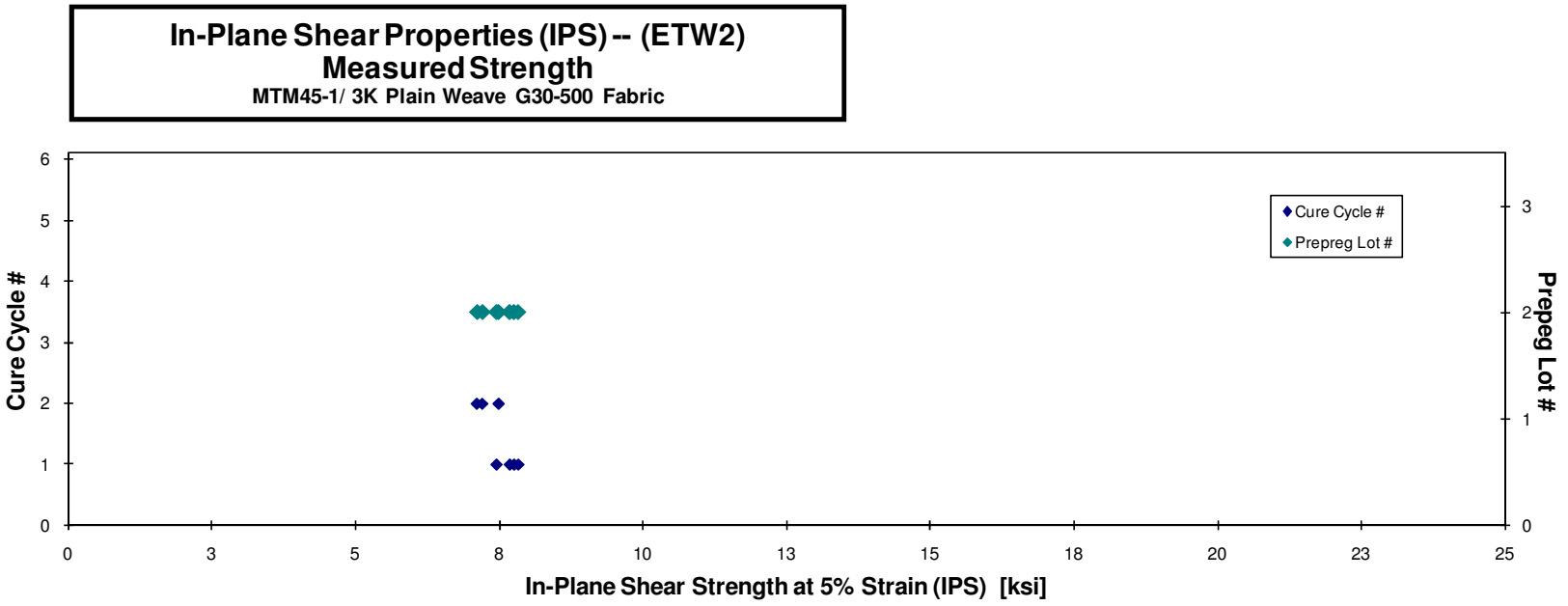

In-Plane Shear Properties (IPS) -- (RTD)
Measured Modulus
MTM45-1/ 3K Plain Weave G30-500 Fabric
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepeg Lot #
0
1
2
3
4
5
6
0.00
0.20
0.40
0.60
0.80
1.00
1.20
In-Plane Shear Modulus (IPS) [Msi]

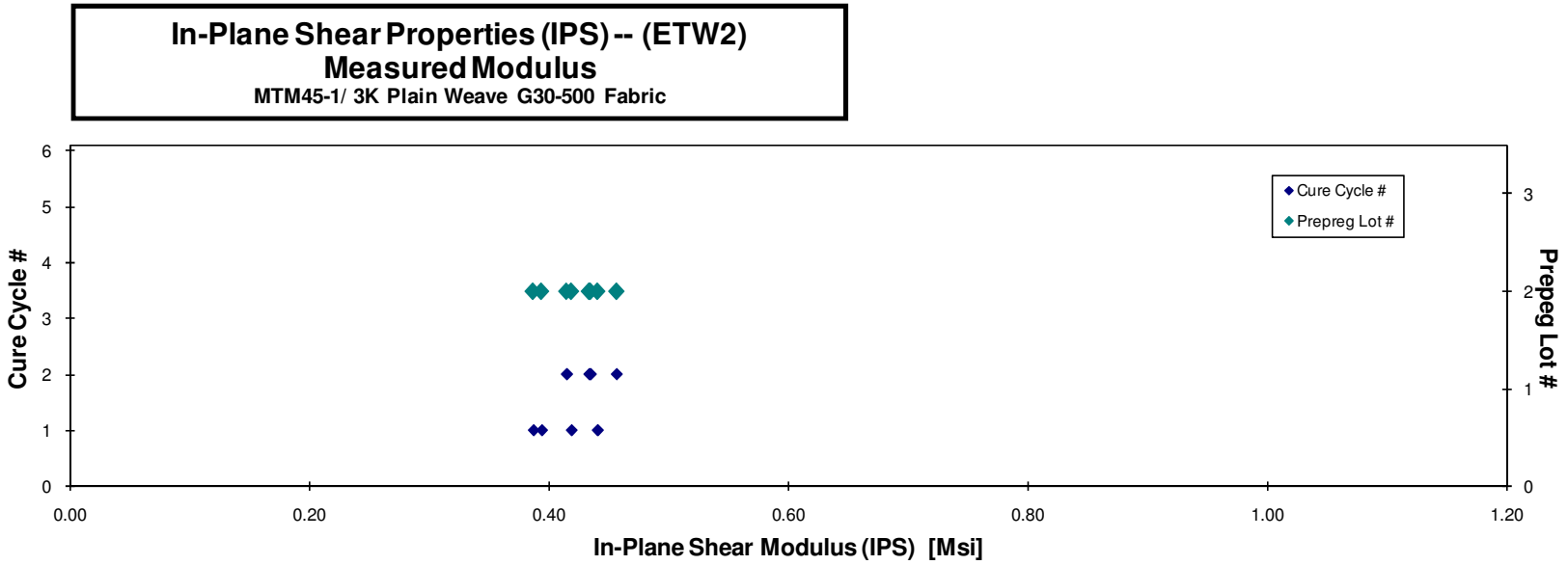
In-Plane Shear Properties (IPS) -- (ETW2)
Strength & Modulus
MTM45-1/ 3K Plain Weave G30-500 Fabric

Specimen Number	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength at 5% Strain [ksi]	0.2% Offset Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Avg. tply [in]
A0NNB612D	B	LH1	2	1	7.829	4.271	0.441	0.065	8	0.0081
A0NNB613D	B	LH1	2	1	7.757	3.965	0.394	0.064	8	0.0080
A0NNB614D	B	LH1	2	1	7.456	3.817	0.387	0.064	8	0.0080
A0NNB615D	B	LH1	2	1	7.682	4.176	0.419	0.064	8	0.0080
A0NNB71FD*	B	LH2	2	2		4.392	0.434	0.064	8	0.0080
A0NNB71GD	B	LH2	2	2	7.492	4.187	0.415	0.064	8	0.0080
A0NNB71HD	B	LH2	2	2	7.212	4.434	0.457	0.064	8	0.0080
A0NNB71ID	B	LH2	2	2	7.120	4.259	0.435	0.064	8	0.0080

*5% values not available, strain gauge failed before 50 000 micro strain reached

Average	**7.507**	**4.188**	**0.423**	**Average**	**0.0080**
Standard Dev.	**0.270**	**0.208**	**0.024**	**Standard Dev.**	
Coeff. of Var. [%]	**3.591**	**4.957**	**5.627**	**Coeff. of Var. [%]**	
Min.	**7.120**	**3.817**	**0.387**	**Min.**	**0.0080**
Max.	**7.829**	**4.434**	**0.457**	**Max.**	**0.0081**
Number of Spec.	**7**	**8**	**8**	**Number of Spec.**	**8**


In-Plane Shear Properties (IPS) -- (ETW2)
Measured Strength
MTM45-1/ 3K Plain Weave G30-500 Fabric
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
In-Plane Shear Strength at 5% Strain (IPS) [ksi]
0
3
5
8
10
13
15
18
20
23
25
0
1
2
3
4
5
6
0
1
2
3

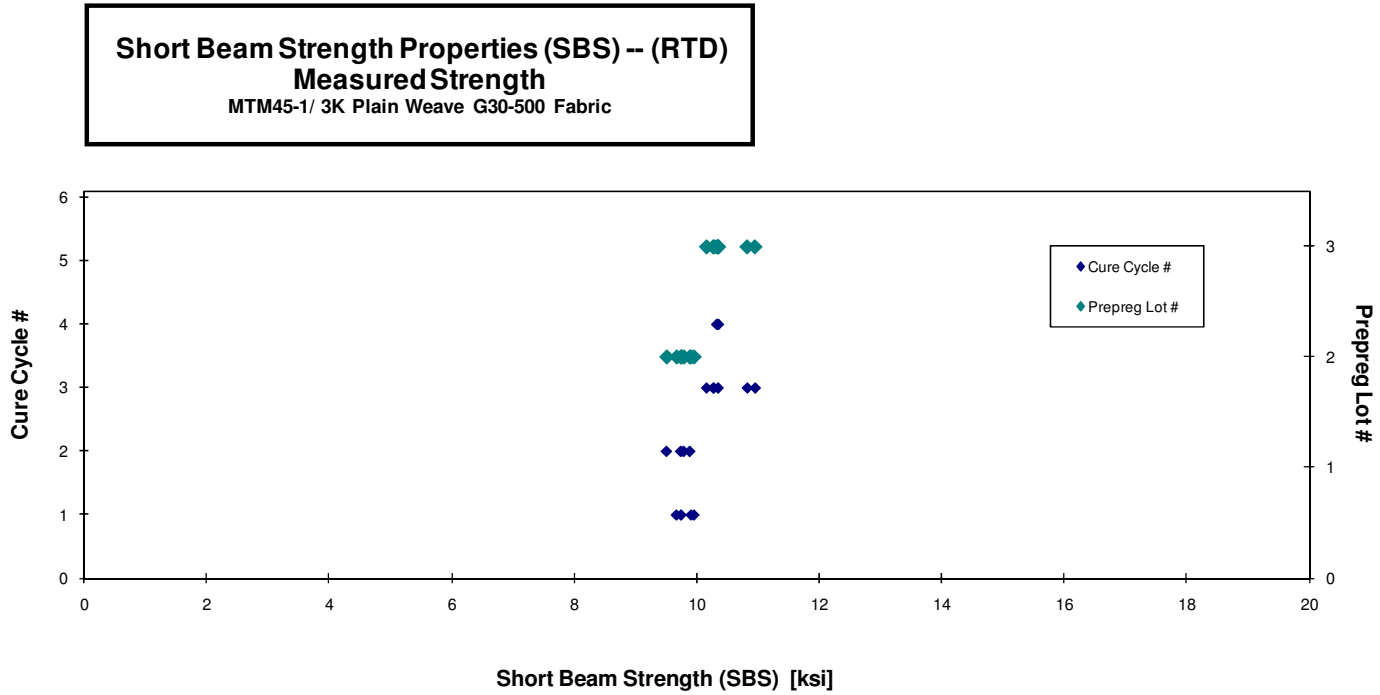

In-Plane Shear Properties (IPS) -- (ETW2)
Measured Modulus
MTM45-1/ 3K Plain Weave G30-500 Fabric
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
In-Plane Shear Modulus (IPS) [Msi]
0.00
0.20
0.40
0.60
0.80
1.00
1.20
0
1
2
3
4
5
6
0
1
2
3

4.6 Lamina Short Beam Strength Properties

Short Beam Strength Properties (SBS) -- (RTD) Strength

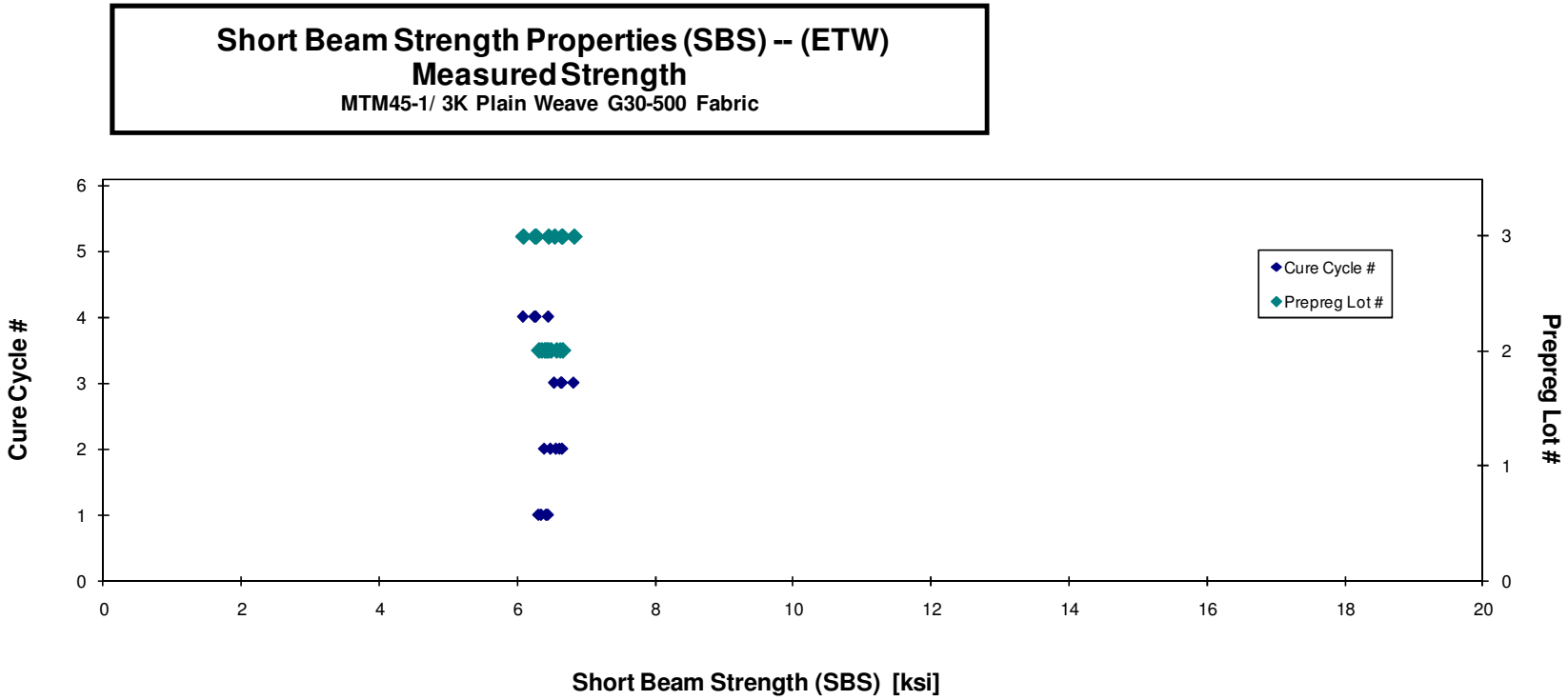
MTM45-1/ 3K Plain Weave G30-500 Fabric

Specimen Number	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Avg. tply [in]	Failure Mode
A0NQB6U1A	B	LH1	2	1	9.748	0.113	14	0.0081	Interlaminar shear
A0NQB6U2A	B	LH1	2	1	9.957	0.113	14	0.0081	Interlaminar shear
A0NQB6U3A	B	LH1	2	1	9.910	0.113	14	0.0081	Interlaminar shear
A0NQB6U4A	B	LH1	2	1	9.672	0.114	14	0.0081	Interlaminar shear
A0NQB7U2A	B	LH2	2	2	9.889	0.103	14	0.0073	Interlaminar shear
A0NQB7U3A	B	LH2	2	2	9.790	0.105	14	0.0075	Interlaminar shear
A0NQB7U4A	B	LH2	2	2	9.742	0.106	14	0.0075	Interlaminar shear
A0NQB7U5A	B	LH2	2	2	9.509	0.107	14	0.0077	Interlaminar shear
				Average	**9.777**		**Average**	**0.0078**	
				Standard Dev.	**0.145**		**Standard Dev.**		
				Coeff. of Var. [%]	**1.485**		**Coeff. of Var. [%]**		
				Min.	**9.509**		**Min.**	**0.0073**	
				Max.	**9.957**		**Max.**	**0.0081**	
				Number of Spec.	**8**		**Number of Spec.**	**8**	
A0NQC8U2A	C	M1	3	3	10.282	0.111	14	0.0079	interlaminar shear
A0NQC8U3A	C	M1	3	3	10.162	0.112	14	0.0080	interlaminar shear
A0NQC8U4A	C	M1	3	3	10.274	0.113	14	0.0080	interlaminar shear
A0NQC8U5A	C	M1	3	3	10.352	0.113	14	0.0081	interlaminar shear
A0NQC8U6A	C	M1	3	3	10.827	0.113	14	0.0081	interlaminar shear
A0NQC8U7A	C	M1	3	3	10.955	0.113	14	0.0081	interlaminar shear
A0NQC9U1A	C	M2	3	4	10.328	0.108	14	0.0077	interlaminar shear
A0NQC9U2A	C	M2	3	4	10.344	0.108	14	0.0077	interlaminar shear
A0NQC9U3A	C	M2	3	4	10.359	0.109	14	0.0078	interlaminar shear
				Average	**10.431**		**Average**	**0.0079**	
				Standard Dev.	**0.269**		**Standard Dev.**		
				Coeff. of Var. [%]	**2.581**		**Coeff. of Var. [%]**		
				Min.	**10.162**		**Min.**	**0.0077**	
				Max.	**10.955**		**Max.**	**0.0081**	
				Number of Spec.	**9**		**Number of Spec.**	**9**	


Short Beam Strength Properties (SBS) -- (RTD)
Measured Strength
MTM45-1/ 3K Plain Weave G30-500 Fabric
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Short Beam Strength (SBS) [ksi]
0
1
2
3
4
5
6
0
2
4
6
8
10
12
14
16
18
20

Short Beam Strength Properties (SBS) -- (ETW)
Strength
MTM45-1/ 3K Plain Weave G30-500 Fabric

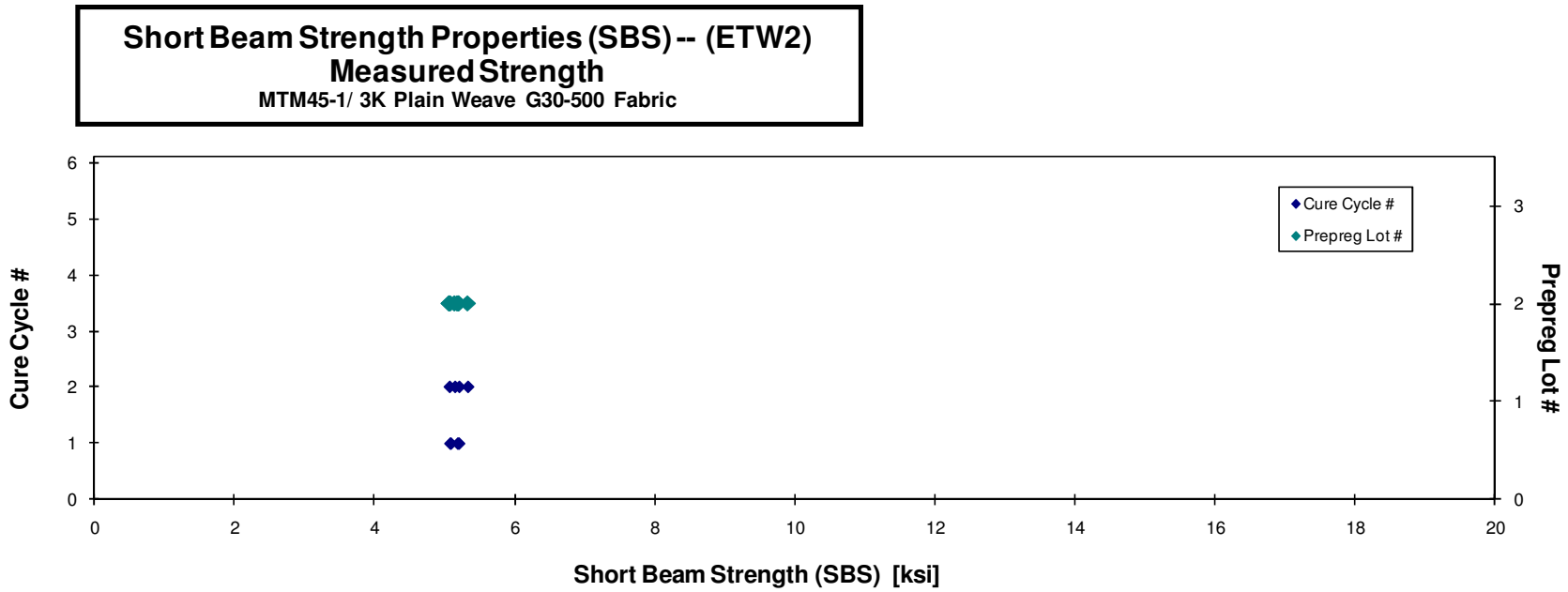
Specimen Number	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Avg. tply [in]	Failure Mode
A0NQB6U6N	B	LH1	2	1	6.308	0.109	14	0.0078	interlaminar shear
A0NQB6U7N	B	LH1	2	1	6.420	0.109	14	0.0078	interlaminar shear
A0NQB6U9N	B	LH1	2	1	6.445	0.111	14	0.0079	interlaminar shear
A0NQB6UAN	B	LH1	2	1	6.346	0.110	14	0.0079	interlaminar shear
A0NQB7U7N	B	LH2	2	2	6.654	0.108	14	0.0077	interlaminar shear
A0NQB7U8N	B	LH2	2	2	6.616	0.108	14	0.0077	interlaminar shear
A0NQB7U9N	B	LH2	2	2	6.392	0.109	14	0.0078	interlaminar shear
A0NQB7UAN	B	LH2	2	2	6.563	0.108	14	0.0077	interlaminar shear
A0NQB7UBN	B	LH2	2	2	6.484	0.108	14	0.0077	interlaminar shear
				Average	**6.470**		**Average**	**0.0078**	
				Standard Dev.	**0.120**		**Standard Dev.**		
				Coeff. of Var. [%]	**1.852**		**Coeff. of Var. [%]**		
				Min.	**6.308**		**Min.**	**0.0077**	
				Max.	**6.654**		**Max.**	**0.0079**	
				Number of Spec.	**9**		**Number of Spec.**	**9**	
A0NQC8UCN	C	M1	3	3	6.820	0.113	14	0.0081	interlaminar shear
A0NQC8UDN	C	M1	3	3	6.537	0.113	14	0.0081	interlaminar shear
A0NQC8UEN	C	M1	3	3	6.651	0.113	14	0.0081	interlaminar shear
A0NQC8UFN	C	M1	3	3	6.638	0.113	14	0.0081	interlaminar shear
A0NQC9UAN	C	M2	3	4	6.451	0.111	14	0.0079	interlaminar shear
A0NQC9UBN	C	M2	3	4	6.249	0.111	14	0.0079	interlaminar shear
A0NQC9UCN	C	M2	3	4	6.081	0.111	14	0.0079	interlaminar shear
A0NQC9UDN	C	M2	3	4	6.270	0.111	14	0.0079	interlaminar shear
				Average	**6.462**		**Average**	**0.0080**	
				Standard Dev.	**0.247**		**Standard Dev.**		
				Coeff. of Var. [%]	**3.826**		**Coeff. of Var. [%]**		
				Min.	**6.081**		**Min.**	**0.0079**	
				Max.	**6.820**		**Max.**	**0.0081**	
				Number of Spec.	**8**		**Number of Spec.**	**8**	


Short Beam Strength Properties (SBS) -- (ETW)
Measured Strength
MTM45-1/ 3K Plain Weave G30-500 Fabric
Cure Cycle #
Prepreg Lot #
Short Beam Strength (SBS) [ksi]
0
1
2
3
4
5
6
0
2
4
6
8
10
12
14
16
18
20

Short Beam Strength Properties (SBS) -- (ETW2)
Measured Strength
MTM45-1/ 3K Plain Weave G30-500 Fabric

Specimen Number	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle Batch #	Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Avg. tply [in]	Failure Mode
A0NQB6UCD	B	LH1	2	1	5.179	0.112	14	0.0080	Interlaminar shear
A0NQB6UDD	B	LH1	2	1	5.071	0.113	14	0.0081	Interlaminar shear
A0NQB6UFD	B	LH1	2	1	5.198	0.111	14	0.0079	Interlaminar shear
A0NQB6UGD	B	LH1	2	1	5.084	0.112	14	0.0080	Interlaminar shear
A0NQB7UCD	B	LH2	2	2	5.326	0.108	14	0.0077	Interlaminar shear
A0NQB7UDD	B	LH2	2	2	5.141	0.108	14	0.0077	Interlaminar shear
A0NQB7UED	B	LH2	2	2	5.065	0.108	14	0.0077	Interlaminar shear
A0NQB7UFD	B	LH2	2	2	5.202	0.108	14	0.0077	Interlaminar shear

Average	**5.158**	**Average**	**0.0078**
Standard Dev.	**0.088**	**Standard Dev.**	
Coeff. of Var. [%]	**1.704**	**Coeff. of Var. [%]**	
Min.	**5.065**	**Min.**	**0.0077**
Max.	**5.326**	**Max.**	**0.0081**
Number of Spec.	**8**	**Number of Spec.**	**8**

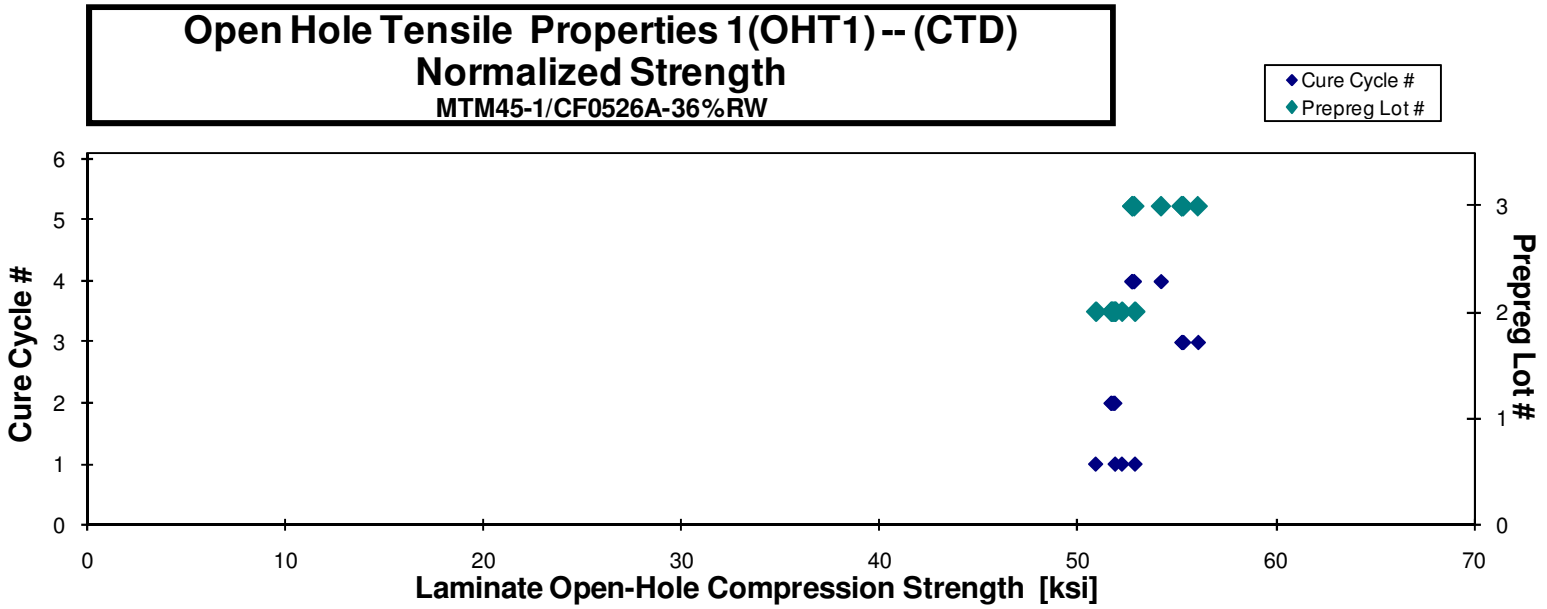

Short Beam Strength Properties (SBS) -- (ETW2)
Measured Strength
MTM45-1/ 3K Plain Weave G30-500 Fabric
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Short Beam Strength (SBS) [ksi]
0
1
2
3
4
5
6
0
2
4
6
8
10
12
14
16
18
20

4.7 Open Hole Tension 1 Properties

Open Hole Tensile Properties 1 (OHT1) -- (CTD) Strength
MTM45-1/CF0526A-36%RW

normalizing t_{ply} [in]
0.0079

Specimen Number	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Modes	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
A0NDB616B	B	LH1	2	1	49.566	0.130	16	0.0081	LGM	0.0081	50.886
A0NDB617B	B	LH1	2	1	51.401	0.130	16	0.0081	LGM	0.0081	52.886
A0NDB618B	B	LH1	2	1	50.518	0.131	16	0.0082	LGM	0.0082	52.216
A0NDB619B	B	LH1	2	1	50.431	0.130	16	0.0081	LGM	0.0081	51.881
A0NDB716B	B	LH2	2	2	50.954	0.129	16	0.0080	LGM	0.0080	51.861
A0NDB717B	B	LH2	2	2	50.836	0.129	16	0.0080	LGM	0.0080	51.701
A0NDB718B	B	LH2	2	2	50.974	0.128	16	0.0080	LGM	0.0080	51.787
A0NDB719B	B	LH2	2	2	50.314	0.130	16	0.0081	LGM	0.0081	51.674
				Average	**50.624**		**Average**	**0.0081**		**$Average_{norm}$**	**0.0081**	**51.862**
				Standard Dev.	**0.554**					**$Standard\ Dev._{norm}$**		**0.560**
				Coeff. of Var. [%]	**1.094**					**Coeff. of Var. $[\%]_{norm}$**		**1.079**
				Min.	**49.566**		**Min.**	**0.0080**		**Min.**	**0.0080**	**50.886**
				Max.	**51.401**		**Max.**	**0.0082**		**Max.**	**0.0082**	**52.886**
				Number of Spec.	**8**			**8**		**Number of Spec.**	**8**	**8**
A0NDC817B	C	M1	3	3	53.379	0.131	16	0.0082	LGM	0.0082	55.265
A0NDC818B	C	M1	3	3	53.189	0.132	16	0.0082	LGM	0.0082	55.349
A0NDC819B	C	M1	3	3	53.378	0.131	16	0.0082	LGM	0.0082	55.271
A0NDC81AB	C	M1	3	3	54.091	0.131	16	0.0082	LGM	0.0082	56.088
A0NDC917B	C	M2	3	4	56.294	0.122	16	0.0076	LGM	0.0076	54.208
A0NDC918B	C	M2	3	4	55.492	0.120	16	0.0075	LGM	0.0075	52.726
A0NDC919B	C	M2	3	4	55.243	0.121	16	0.0075	LGM	0.0075	52.752
A0NDC91AB	C	M2	3	4	55.539	0.120	16	0.0075	LGM	0.0075	52.844
				Average	**54.576**		**Average**	**0.0079**		**$Average_{norm}$**	**0.0079**	**54.313**
				Standard Dev.	**1.206**					**$Standard\ Dev._{norm}$**		**1.372**
				Coeff. of Var. [%]	**2.211**					**Coeff. of Var. $[\%]_{norm}$**		**2.526**
				Min.	**53.189**		**Min.**	**0.0075**		**Min.**	**0.0075**	**52.726**
				Max.	**56.294**		**Max.**	**0.0082**		**Max.**	**0.0082**	**56.088**
				Number of Spec.	**8**			**8**		**Number of Spec.**	**8**	**8**

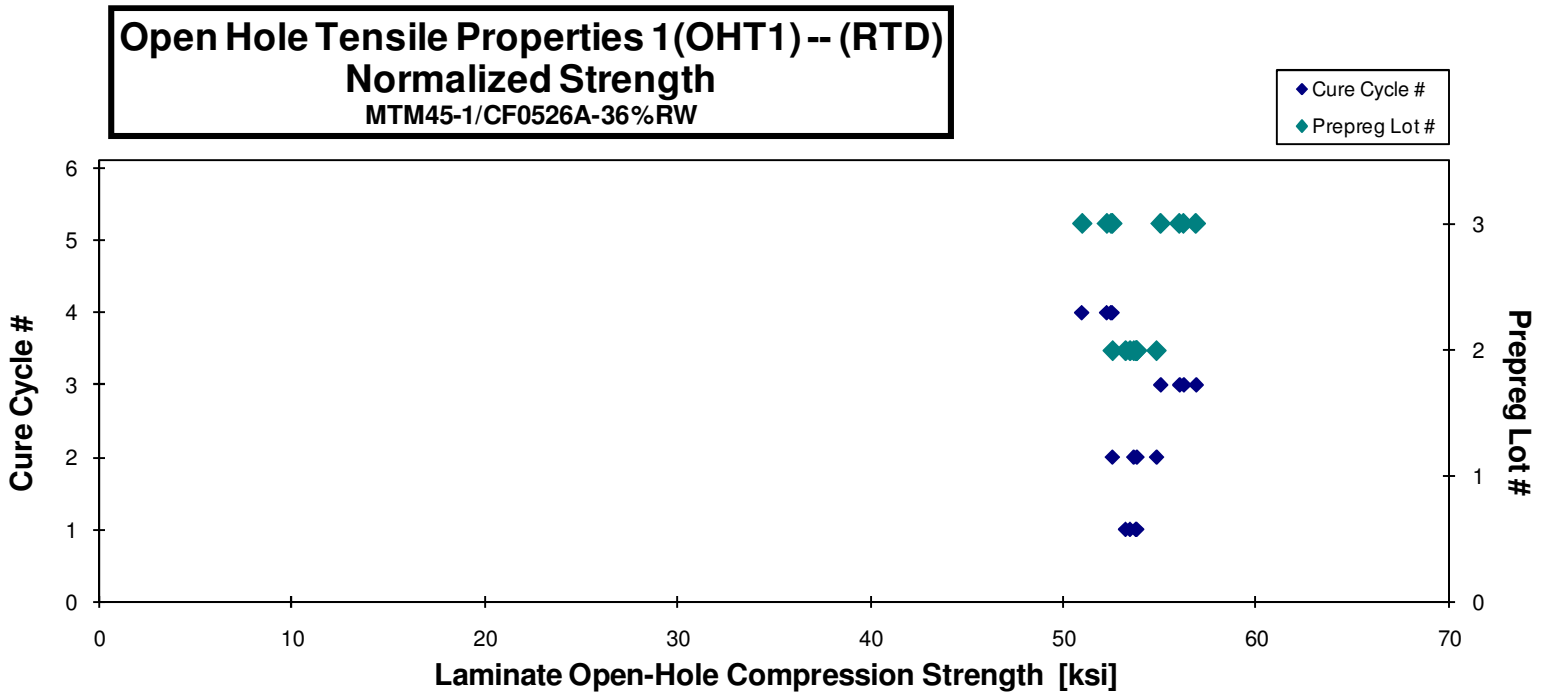

Open Hole Tensile Properties 1(OHT1) -- (CTD)
Normalized Strength
MTM45-1/CF0526A-36%RW
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
5
6
0
1
2
3
0
10
20
30
40
50
60
70
Laminate Open-Hole Compression Strength [ksi]

Open Hole Tensile Properties 1 (OHT1) -- (RTD) Strength

MTM45-1/CF0526A-36%RW

normalizing t_{ply} [in]
0.0079

Specimen Number	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Modes	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
A0NDB611A	B	LH1	2	1	52.704	0.129	16	0.0081	LGM	0.0081	53.837
A0NDB612A	B	LH1	2	1	52.157	0.129	16	0.0081	LGM	0.0081	53.258
A0NDB613A	B	LH1	2	1	52.132	0.130	16	0.0082	LGM	0.0082	53.789
A0NDB614A	B	LH1	2	1	52.521	0.129	16	0.0080	LGM	0.0080	53.490
A0NDB711A	B	LH2	2	2	51.292	0.130	16	0.0081	LGM	0.0081	52.577
A0NDB712A	B	LH2	2	2	52.327	0.130	16	0.0081	LGM	0.0081	53.679
A0NDB713A	B	LH2	2	2	52.528	0.130	16	0.0081	LGM	0.0081	53.844
A0NDB714A	B	LH2	2	2	53.492	0.130	16	0.0081	LGM	0.0081	54.867
				Average	**52.394**		**Average**	**0.0081**	**$Average_{norm}$**	**0.0081**	**53.668**
				Standard Dev.	**0.619**				**Standard $Dev._{norm}$**		**0.644**
				Coeff. of Var. [%]	**1.181**				**Coeff. of Var. $[\%]_{norm}$**		**1.200**
				Min.	**51.292**		**Min.**	**0.0080**	**Min.**	**0.0080**	**52.577**
				Max.	**53.492**		**Max.**	**0.0082**	**Max.**	**0.0082**	**54.867**
				Number of Spec.	**8**			**8**	**Number of Spec.**	**8**	**8**
A0NDC811A	C	M1	3	3	54.222	0.131	16	0.0082	LGM	0.0082	56.281
A0NDC812A	C	M1	3	3	53.238	0.131	16	0.0082	LGM	0.0082	55.084
A0NDC813A	C	M1	3	3	54.972	0.131	16	0.0082	LGM	0.0082	56.921
A0NDC814A	C	M1	3	3	54.130	0.131	16	0.0082	LGM	0.0082	56.064
A0NDC911A	C	M2	3	4	53.998	0.119	16	0.0075	LGM	0.0075	50.986
A0NDC912A	C	M2	3	4	55.428	0.120	16	0.0075	LGM	0.0075	52.563
A0NDC913A	C	M2	3	4	54.517	0.121	16	0.0076	LGM	0.0076	52.274
A0NDC914A	C	M2	3	4	54.962	0.121	16	0.0075	LGM	0.0075	52.490
				Average	**54.433**		**Average**	**0.0079**	**$Average_{norm}$**	**0.0079**	**54.083**
				Standard Dev.	**0.689**				**Standard $Dev._{norm}$**		**2.253**
				Coeff. of Var. [%]	**1.265**				**Coeff. of Var. $[\%]_{norm}$**		**4.165**
				Min.	**53.238**		**Min.**	**0.0075**	**Min.**	**0.0075**	**50.986**
				Max.	**55.428**		**Max.**	**0.0082**	**Max.**	**0.0082**	**56.921**
				Number of Spec.	**8**			**8**	**Number of Spec.**	**8**	**8**

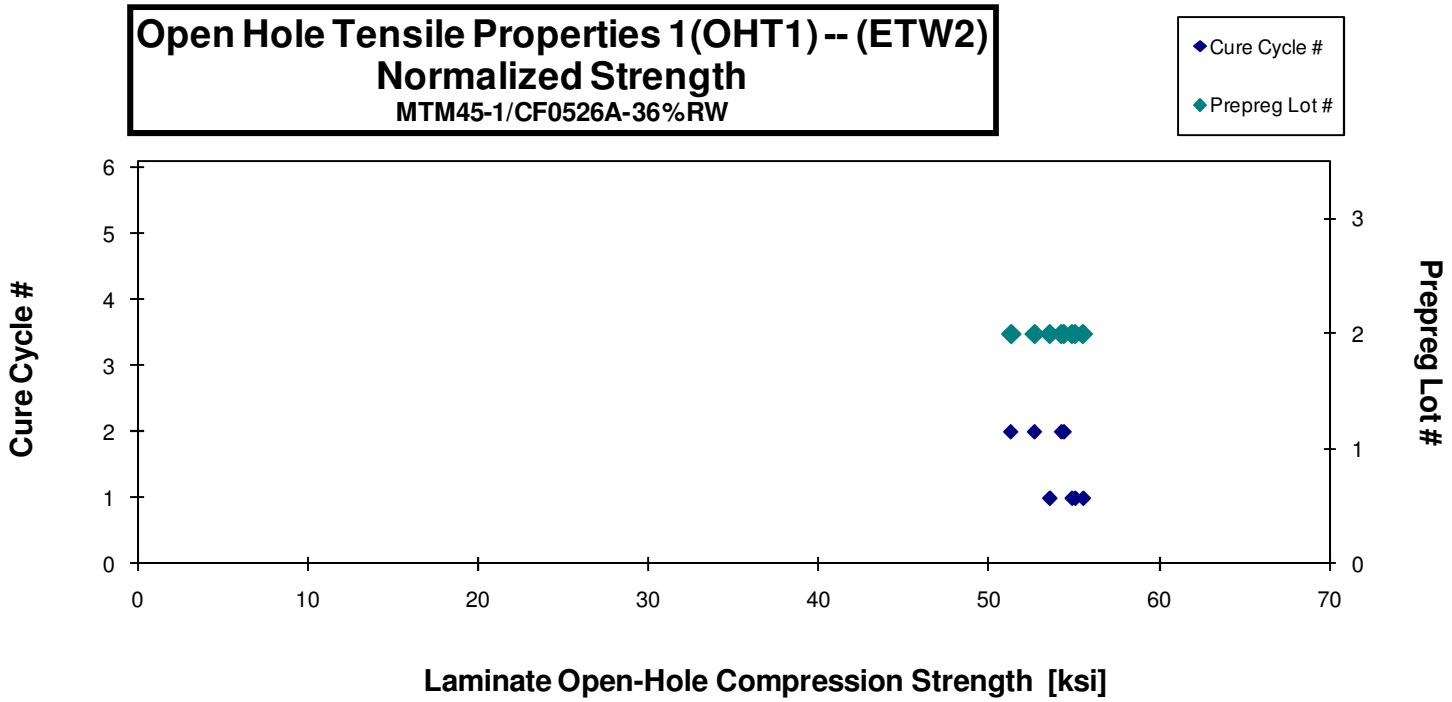

Open Hole Tensile Properties 1(OHT1) -- (RTD)
Normalized Strength
MTM45-1/CF0526A-36%RW
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
5
6
0
1
2
3
0
10
20
30
40
50
60
70
Laminate Open-Hole Compression Strength [ksi]

Open Hole Tensile Properties 1 (OHT1) -- (ETW2)
Strength
MTM45-1/CF0526A-36%RW

normalizing t_{ply} [in]
0.0079

Specimen Number	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Modes	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
A0NDB61CD	B	LH1	2	1	54.661	0.128	16	0.0080	LGM	0.0080	55.562
A0NDB61DD	B	LH1	2	1	52.585	0.129	16	0.0081	LGM	0.0081	53.598
A0NDB61ED	B	LH1	2	1	54.530	0.128	16	0.0080	LGM	0.0080	55.098
A0NDB61FD	B	LH1	2	1	54.195	0.128	16	0.0080	LGM	0.0080	54.910
A0NDB71CD	B	LH2	2	2	51.320	0.130	16	0.0081	LGM	0.0081	52.694
A0NDB71DD	B	LH2	2	2	49.717	0.130	16	0.0082	LGM	0.0082	51.297
A0NDB71ED	B	LH2	2	2	52.572	0.131	16	0.0082	LGM	0.0082	54.278
A0NDB71FD	B	LH2	2	2	52.696	0.131	16	0.0082	LGM	0.0082	54.426

Average	**52.785**	**Average**	**0.0081**	**$Average_{norm}$** **0.0081** **53.983**
Standard Dev.	**1.699**			**$Standard\ Dev._{norm}$** **1.409**
Coeff. of Var. [%]	**3.218**			**$Coeff.\ of\ Var.\ [\%]_{norm}$** **2.611**
Min.	**49.717**	**Min.**	**0.0080**	**Min.** **0.0080** **51.297**
Max.	**54.661**	**Max.**	**0.0082**	**Max.** **0.0082** **55.562**
Number of Spec.	**8**		**8**	**Number of Spec.** **8** **8**

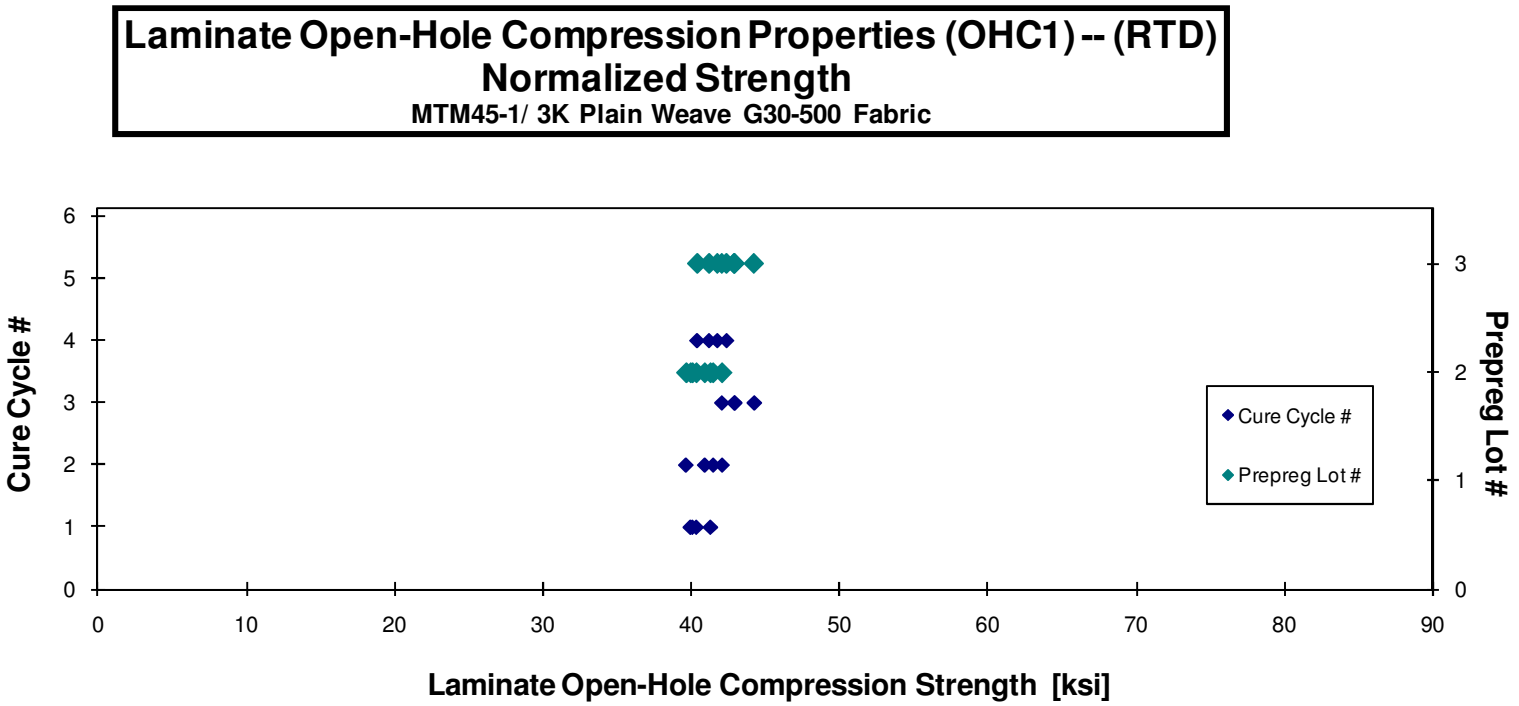

Open Hole Tensile Properties 1(OHT1) -- (ETW2)
Normalized Strength
MTM45-1/CF0526A-36%RW
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
5
6
0
1
2
3
0
10
20
30
40
50
60
70
Laminate Open-Hole Compression Strength [ksi]

4.8 Open-Hole Compression 1 Properties

Laminate Open-Hole Compression Properties (OHC1) -- (RTD) Strength
MTM45-1/ 3K Plain Weave G30-500 Fabric

normalizing t_{ply} [in]: 0.0079

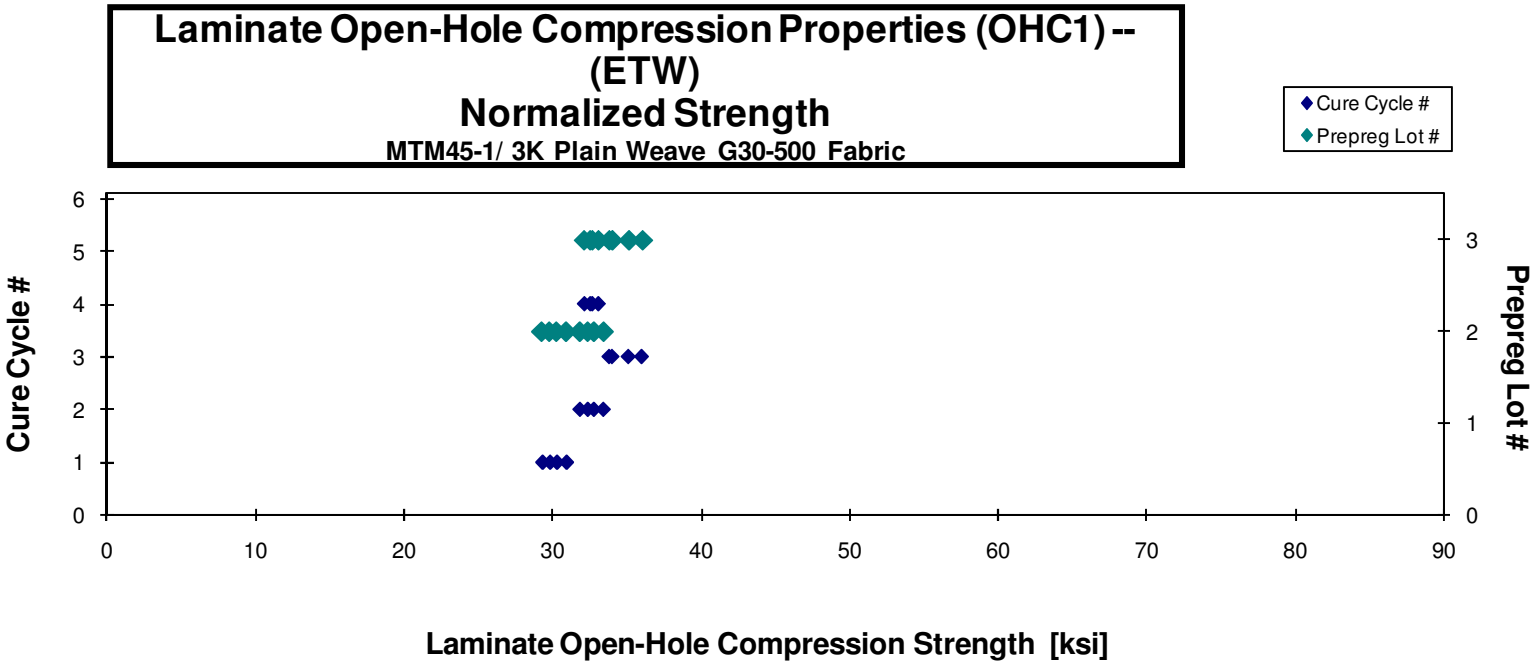
Specimen Number	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Modes	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
A0NGB612A	B	LH1	2	1	41.374	0.126	16	0.0079	LGM	0.0079	41.319
A0NGB613A	B	LH1	2	1	39.940	0.127	16	0.0079	LGM	0.0079	39.987
A0NGB614A	B	LH1	2	1	40.378	0.126	16	0.0079	LGM	0.0079	40.378
A0NGB615A	B	LH1	2	1	39.682	0.128	16	0.0080	LGM	0.0080	40.117
A0NGB718A	B	LH2	2	2	38.410	0.131	16	0.0082	LGM	0.0082	39.691
A0NGB719A	B	LH2	2	2	40.826	0.130	16	0.0081	LGM	0.0081	42.102
A0NGB71AA	B	LH2	2	2	40.420	0.130	16	0.0081	LGM	0.0081	41.501
A0NGB71BA	B	LH2	2	2	39.670	0.130	16	0.0082	LGM	0.0082	40.941
				Average	**40.087**		**Average**	**0.0080**	**$Average_{norm}$**	**0.0080**	**40.755**
				Standard Dev.	**0.892**				**Standard $Dev._{norm}$**		**0.845**
				Coeff. of Var. [%]	**2.225**				**Coeff. of Var. $[\%]_{norm}$**		**2.073**
				Min.	**38.410**		**Min.**	**0.0079**	**Min.**	**0.0079**	**39.691**
				Max.	**41.374**		**Max.**	**0.0082**	**Max.**	**0.0082**	**42.102**
				Number of Spec.	**8**			**8**	**Number of Spec.**	**8**	**8**
AONGC811A	C	M1	3	3	42.888	0.126	16	0.0079	LGM	0.0079	42.916
AONGC812A	C	M1	3	3	43.741	0.128	16	0.0080	LGM	0.0080	44.237
AONGC813A	C	M1	3	3	42.343	0.128	16	0.0080	LGM	0.0080	42.935
AONGC814A	C	M1	3	3	41.259	0.129	16	0.0081	LGM	0.0081	42.075
A0NGC911A	C	M2	3	4	40.858	0.128	16	0.0080	LGM	0.0080	41.229
A0NGC912A	C	M2	3	4	39.548	0.129	16	0.0081	LGM	0.0081	40.429
A0NGC913A	C	M2	3	4	41.096	0.130	16	0.0082	LGM	0.0082	42.397
A0NGC914A	C	M2	3	4	40.728	0.130	16	0.0081	LGM	0.0081	41.776
				Average	**41.558**		**Average**	**0.0080**	**$Average_{norm}$**	**0.0080**	**42.249**
				Standard Dev.	**1.346**				**Standard $Dev._{norm}$**		**1.165**
				Coeff. of Var. [%]	**3.238**				**Coeff. of Var. $[\%]_{norm}$**		**2.757**
				Min.	**39.548**		**Min.**	**0.0079**	**Min.**	**0.0079**	**40.429**
				Max.	**43.741**		**Max.**	**0.0082**	**Max.**	**0.0082**	**44.237**
				Number of Spec.	**8**			**8**	**Number of Spec.**	**8**	**8**


Laminate Open-Hole Compression Properties (OHC1) -- (RTD)
Normalized Strength
MTM45-1/ 3K Plain Weave G30-500 Fabric
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Open-Hole Compression Strength [ksi]
0
1
2
3
4
5
6
0
10
20
30
40
50
60
70
80
90

Laminate Open-Hole Compression Properties (OHC1) -- (ETW)
Strength
MTM45-1/ 3K Plain Weave G30-500 Fabric

normalizing t_{ply} [in]
0.0079

Specimen Number	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Modes	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
A0NGB616N	B	LH1	2	1	29.986	0.128	16	0.0080	LGM	0.0080	30.250
A0NGB617N	B	LH1	2	1	30.613	0.128	16	0.0080	LGM	0.0080	30.904
A0NGB618N	B	LH1	2	1	29.479	0.128	16	0.0080	LGM	0.0080	29.778
A0NGB619N	B	LH1	2	1	28.838	0.128	16	0.0080	LGM	0.0080	29.268
A0NGB71EN	B	LH2	2	2	32.234	0.131	16	0.0082	LGM	0.0082	33.403
A0NGB71FN	B	LH2	2	2	30.997	0.130	16	0.0081	LGM	0.0081	31.814
A0NGB71GN	B	LH2	2	2	31.646	0.129	16	0.0081	LGM	0.0081	32.343
A0NGB71HN	B	LH2	2	2	32.121	0.129	16	0.0081	LGM	0.0081	32.756
				Average	**30.739**		**Average**	**0.0080**	**$Average_{norm}$**	**0.0080**	**31.315**
				Standard Dev.	**1.243**				**Standard $Dev._{norm}$**		**1.493**
				Coeff. of Var. [%]	**4.044**				**Coeff. of Var. $[\%]_{norm}$**		**4.767**
				Min.	**28.838**		**Min.**	**0.0080**	**Min.**	**0.0080**	**29.268**
				Max.	**32.234**		**Max.**	**0.0082**	**Max.**	**0.0082**	**33.403**
				Number of Spec.	**8**			**8**	**Number of Spec.**	**8**	**8**
AONGC816N	C	M1	3	3	33.351	0.128	16	0.0080	LGM	0.0080	33.791
AONGC817N	C	M1	3	3	35.246	0.129	16	0.0081	LGM	0.0081	36.008
AONGC818N	C	M1	3	3	33.469	0.128	16	0.0080	LGM	0.0080	33.994
AONGC819N	C	M1	3	3	34.246	0.130	16	0.0081	LGM	0.0081	35.104
A0NGC917N	C	M2	3	4	32.229	0.130	16	0.0081	LGM	0.0081	33.066
A0NGC918N	C	M2	3	4	31.644	0.130	16	0.0082	LGM	0.0082	32.654
A0NGC919N	C	M2	3	4	31.894	0.129	16	0.0081	LGM	0.0081	32.512
A0NGC91AN	C	M2	3	4	31.224	0.130	16	0.0081	LGM	0.0081	32.109
				Average	**32.913**		**Average**	**0.0081**	**$Average_{norm}$**	**0.0081**	**33.655**
				Standard Dev.	**1.398**				**Standard $Dev._{norm}$**		**1.353**
				Coeff. of Var. [%]	**4.249**				**Coeff. of Var. $[\%]_{norm}$**		**4.020**
				Min.	**31.224**		**Min.**	**0.0080**	**Min.**	**0.0080**	**32.109**
				Max.	**35.246**		**Max.**	**0.0082**	**Max.**	**0.0082**	**36.008**
				Number of Spec.	**8**			**8**	**Number of Spec.**	**8**	**8**


Laminate Open-Hole Compression Properties (OHC1) -- (ETW)
Normalized Strength
MTM45-1/ 3K Plain Weave G30-500 Fabric
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
5
6
0
1
2
3
0
10
20
30
40
50
60
70
80
90
Laminate Open-Hole Compression Strength [ksi]

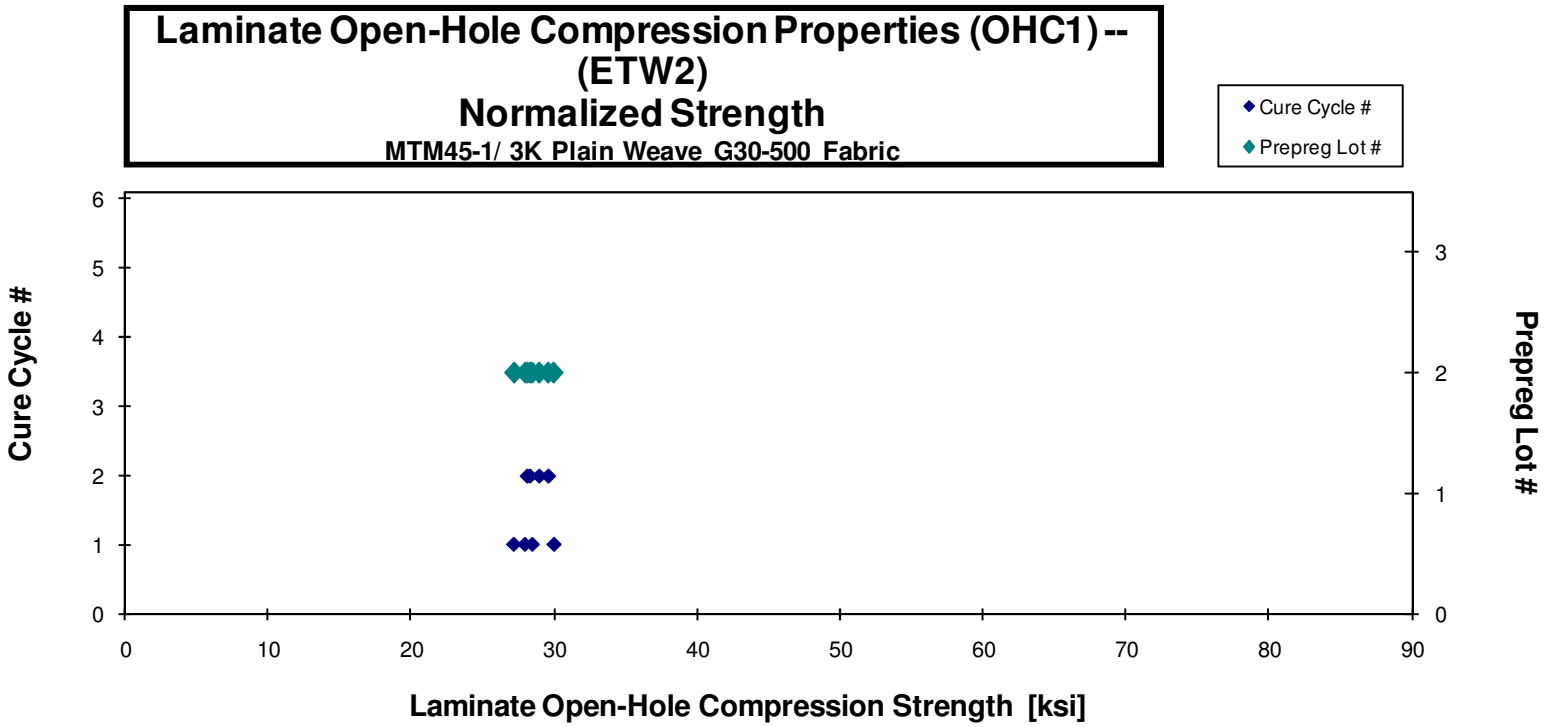
Laminate Open-Hole Compression Properties (OHC1) -- (ETW2) Strength

MTM45-1/ 3K Plain Weave G30-500 Fabric

normalizing t_{ply} [in]
0.0079

Specimen Number	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Modes	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
A0NGB61BD	B	LH1	2	1	26.703	0.129	16	0.0080	LGM	0.0080	27.200
A0NGB61CD	B	LH1	2	1	29.499	0.129	16	0.0080	LGM	0.0080	30.013
A0NGB61DD	B	LH1	2	1	27.853	0.129	16	0.0081	LGM	0.0081	28.492
A0NGB61ED	B	LH1	2	1	27.286	0.130	16	0.0081	LGM	0.0081	27.991
A0NGB711D	B	LH2	2	2	28.449	0.129	16	0.0081	LGM	0.0081	28.989
A0NGB712D	B	LH2	2	2	28.745	0.130	16	0.0081	LGM	0.0081	29.628
A0NGB713D	B	LH2	2	2	27.382	0.130	16	0.0081	LGM	0.0081	28.151
A0NGB714D	B	LH2	2	2	27.380	0.131	16	0.0082	LGM	0.0082	28.347

Average	**27.912**	**Average**	**0.0081**	
Standard Dev.	**0.920**			**$Average_{norm}$** **0.0081** **28.601**
Coeff. of Var. [%]	**3.295**			**Standard $Dev._{norm}$** **0.911**
Min.	**26.703**	**Min.**	**0.0080**	**Coeff. of Var. $[\%]_{norm}$** **3.186**
Max.	**29.499**	**Max.**	**0.0082**	**Min.** **0.0080** **27.200**
Number of Spec.	**8**			**Max.** **0.0082** **30.013**
				Number of Spec. **8**

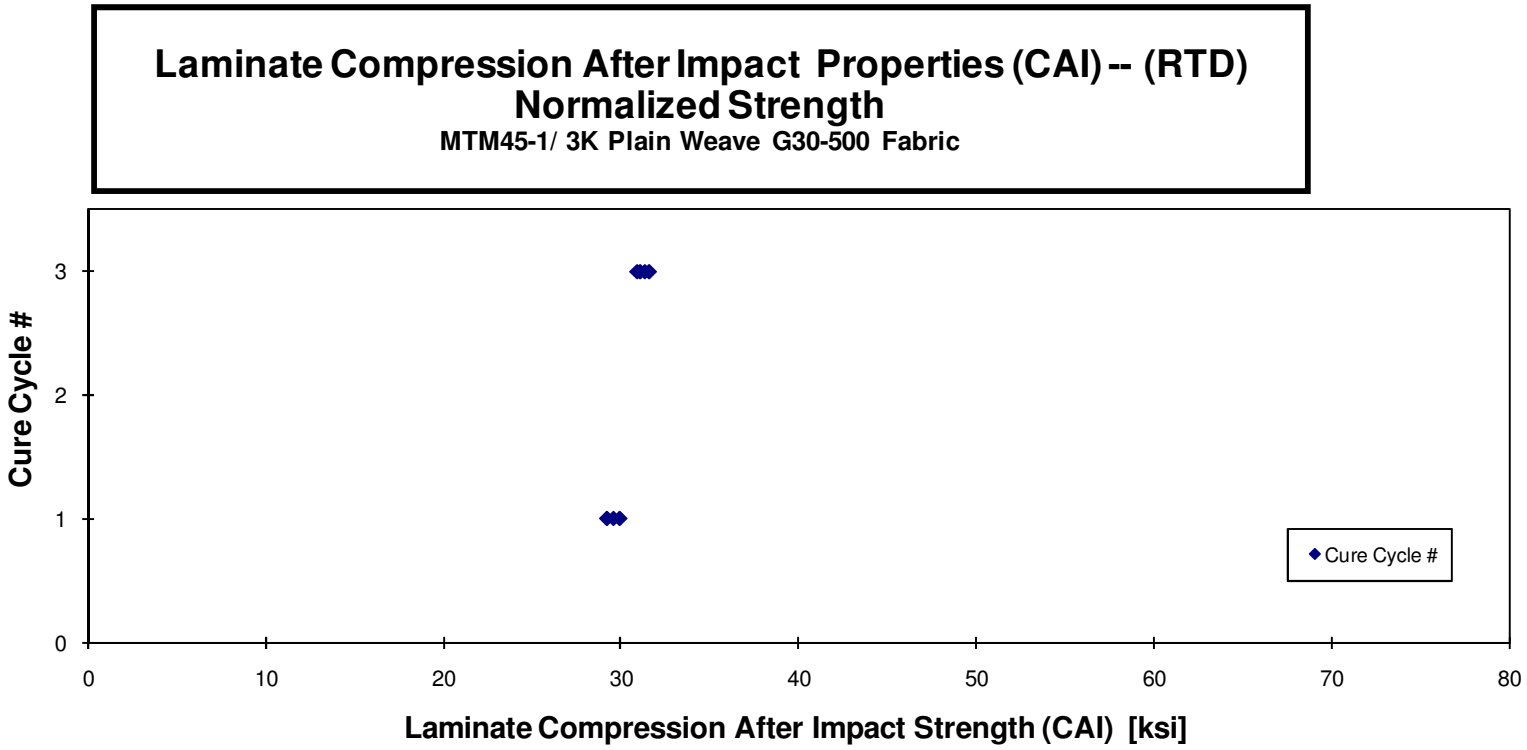

Laminate Open-Hole Compression Properties (OHC1) -- (ETW2)
Normalized Strength
MTM45-1/ 3K Plain Weave G30-500 Fabric
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
5
6
0
1
2
3
0
10
20
30
40
50
60
70
80
90
Laminate Open-Hole Compression Strength [ksi]

4.9 Compression Strength after Impact 1 Properties

Laminate Compression After Impact Properties (CAI) -- (RTD) Strength
MTM45-1/ 3K Plain Weave G30-500 Fabric

normalizing t_{ply} [in]
0.0079

Specimen Number	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Measured Impact Energy (in-lbf)	Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
A0NKB611A	B	LH1	2	1	236.81	28.989	0.159	20	LDM	0.0080	29.218
A0NKB612A	B	LH1	2	1	237.19	30.081	0.157	20	LDM	0.0079	29.926
A0NKB613A	B	LH1	2	1	237.84	29.334	0.159	20	LDM	0.0080	29.584
					Average	**29.468**				**$Average_{norm}$**	**0.0079**	**29.576**
					Standard Dev.	**0.559**				**Standard $Dev._{norm}$**		**0.354**
					Coeff. of Var. [%]	**1.896**				**Coeff. of Var. $[\%]_{norm}$**		**1.197**
					Min.	**28.989**				**Min.**	**0.0079**	**29.218**
					Max.	**30.081**				**Max.**	**0.0080**	**29.926**
					Number of Spec.	**3**				**Number of Spec.**	**3**	**3**
A0NKC812A	C	M1	3	3	238.12	30.846	0.159	20	LDM	0.0080	31.048
A0NKC813A	C	M1	3	3	235.98	31.002	0.157	20	LDM	0.0079	30.878
A0NKC814A	C	M1	3	3	234.06	31.227	0.158	20	LDM	0.0079	31.306
A0NKC815A	C	M1	3	3	237.24	31.805	0.157	20	LDM	0.0078	31.546
					Average	**31.220**				**$Average_{norm}$**	**0.0079**	**31.194**
					Standard Dev.	**0.420**				**Standard $Dev._{norm}$**		**0.293**
					Coeff. of Var. [%]	**1.345**				**Coeff. of Var. $[\%]_{norm}$**		**0.940**
					Min.	**30.846**				**Min.**	**0.0078**	**30.878**
					Max.	**31.805**				**Max.**	**0.0080**	**31.546**
					Number of Spec.	**4**				**Number of Spec.**	**4**	**4**


Laminate Compression After Impact Properties (CAI) -- (RTD)
Normalized Strength
MTM45-1/ 3K Plain Weave G30-500 Fabric
Cure Cycle #
0
1
2
3
0
10
20
30
40
50
60
70
80
Cure Cycle #
Laminate Compression After Impact Strength (CAI) [ksi]

Laminate Compression After Impact Properties (CAI) -- (ETW) Strength

MTM45-1/ 3K Plain Weave G30-500 Fabric

Specimen Number	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Measured Impact Energy (in-lbf)	Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Mode
A0NKB614D	A	LH1	2	1	237.18	22.409	0.158	20	LDM
A0NKB615D	A	LH1	2	1	238.32	22.062	0.161	20	LDM
A0NKB616D	A	LH1	2	1	237.82	23.912	0.158	20	LDM

	Strength [ksi]
Average	22.794
Standard Dev.	0.983
Coeff. of Var. [%]	4.315
Min.	22.062
Max.	23.912
Number of Spec.	3

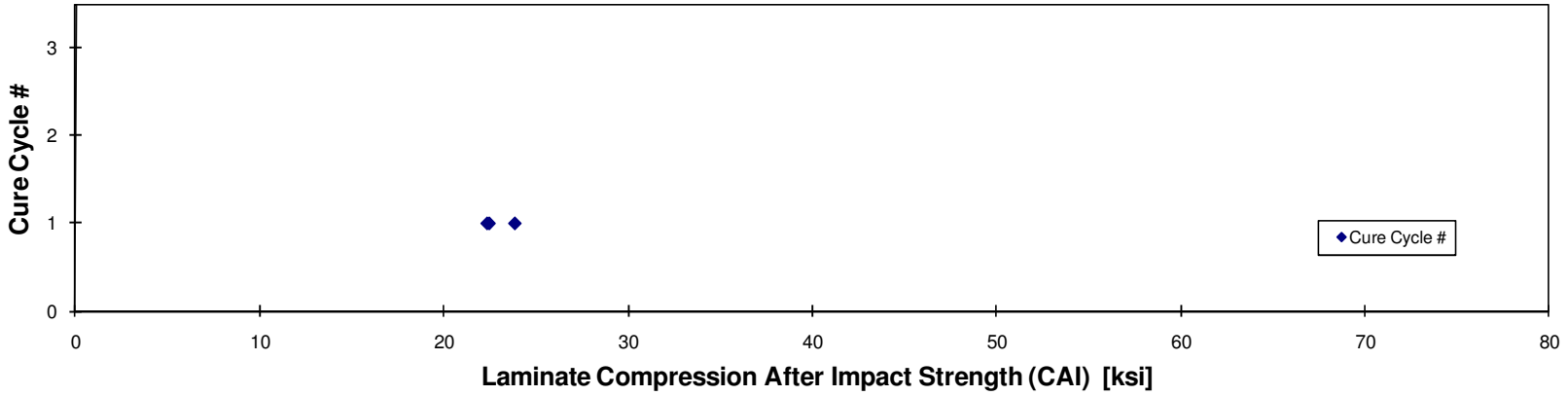
normalizing t_{ply} [in]: 0.0079

Avg. t_{ply} [in]	Strength$_{norm}$ [ksi]
0.0079	22.380
0.0081	22.497
0.0079	23.864

		Strength$_{norm}$ [ksi]
Average$_{norm}$	0.00794	22.914
Standard Dev.$_{norm}$		0.825
Coeff. of Var. [%]$_{norm}$		3.601
Min.	0.0079	22.380
Max.	0.0081	23.864
Number of Spec.		3

Laminate Compression After Impact Properties (CAI) -- (ETW) Normalized Strength

MTM45-1/ 3K Plain Weave G30-500 Fabric

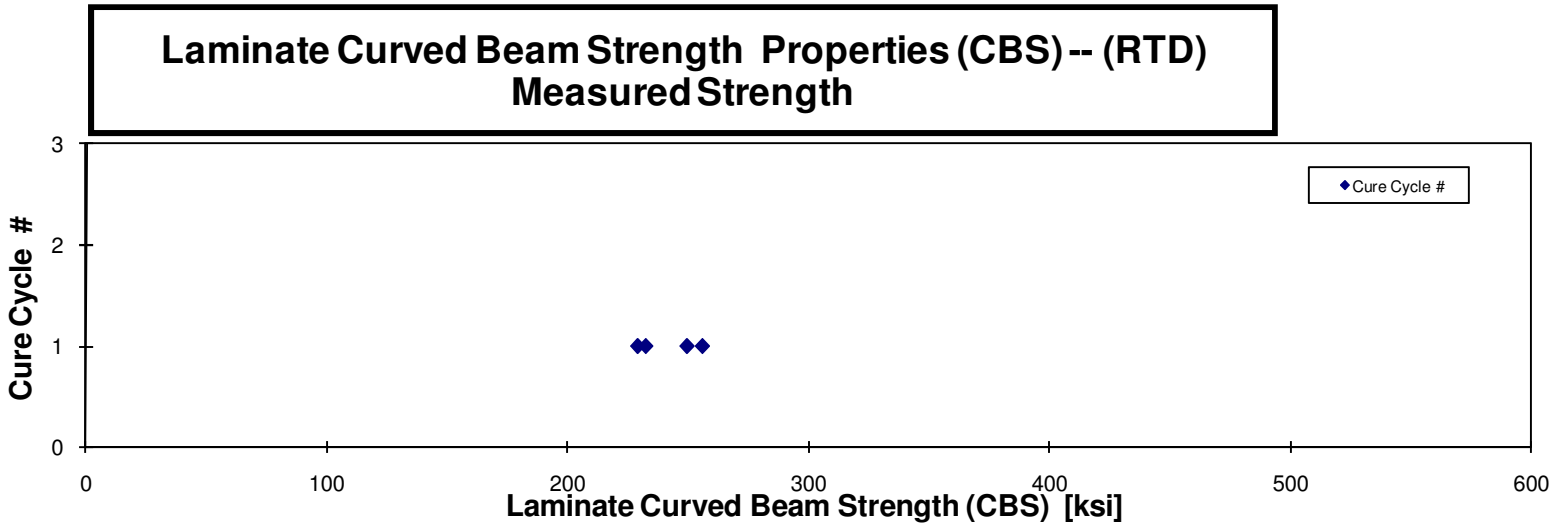


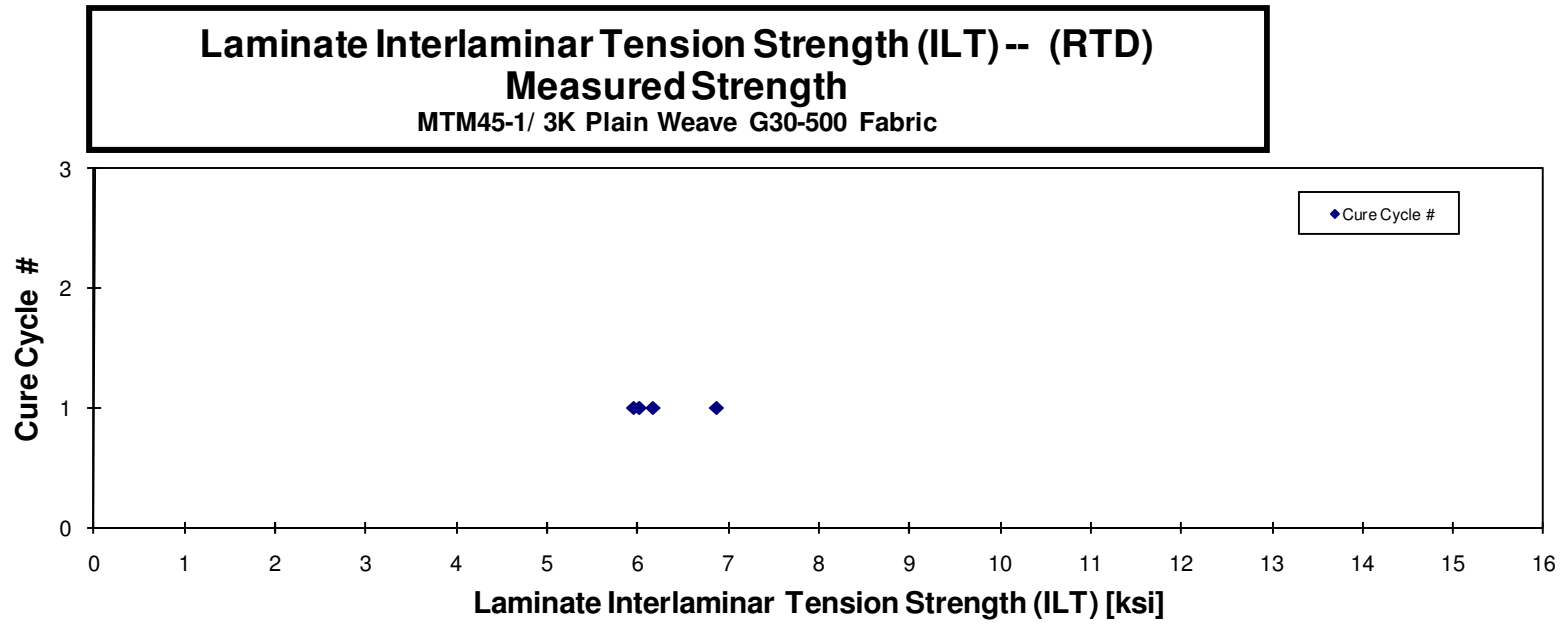
4.10 Interlaminar Tension Strength Properties

Laminate Curved Beam Strength Properties (ILT) -- (RTD) Strength
MTM45-1/ 3K Plain Weave G30-500 Fabric

Specimen Number	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Curved Beam Strength [psi]	Interlaminar Tension Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate
A0NMB611A	A	LH1	1	1	249.418	6.168	0.184	20
A0NMB612A	A	LH1	1	1	228.866	5.953	0.177	20
A0NMB613A	A	LH1	1	1	232.256	6.015	0.177	20
A0NMB614A	A	LH1	1	1	255.853	6.876	0.172	20
				Average	**241.598**	**6.253**		
				Standard Dev.	**13.086**	**0.425**		
				Coeff. of Var. [%]	**5.416**	**6.796**		
				Min.	**228.866**	**5.953**		
				Max.	**255.853**	**6.876**		
				Number of Spec.	**4**	**4**		

Specimen Number	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Curved Beam Strength [psi]	Interlaminar Tension Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate
A0NMC8R6A	A	M1	1	1	239.741	6.302	0.175	20
A0NMC8R7A	A	M1	1	1	183.140	4.665	0.180	20
A0NMC8R8A	A	M1	1	1	212.072	5.420	0.179	20
A0NMC8R9A	A	M1	1	1	152.801	3.620	0.191	20
				Average	**196.939**	**5.002**		
				Standard Dev.	**37.415**	**1.138**		
				Coeff. of Var. [%]	**18.998**	**22.758**		
				Min.	**152.801**	**3.620**		
				Max.	**239.741**	**6.302**		
				Number of Spec.	**4**	**4**		


Laminate Curved Beam Strength Properties (CBS) -- (RTD)
Measured Strength
Cure Cycle #
Cure Cycle #
0
1
2
3
0
100
200
300
400
500
600
Laminate Curved Beam Strength (CBS) [ksi]

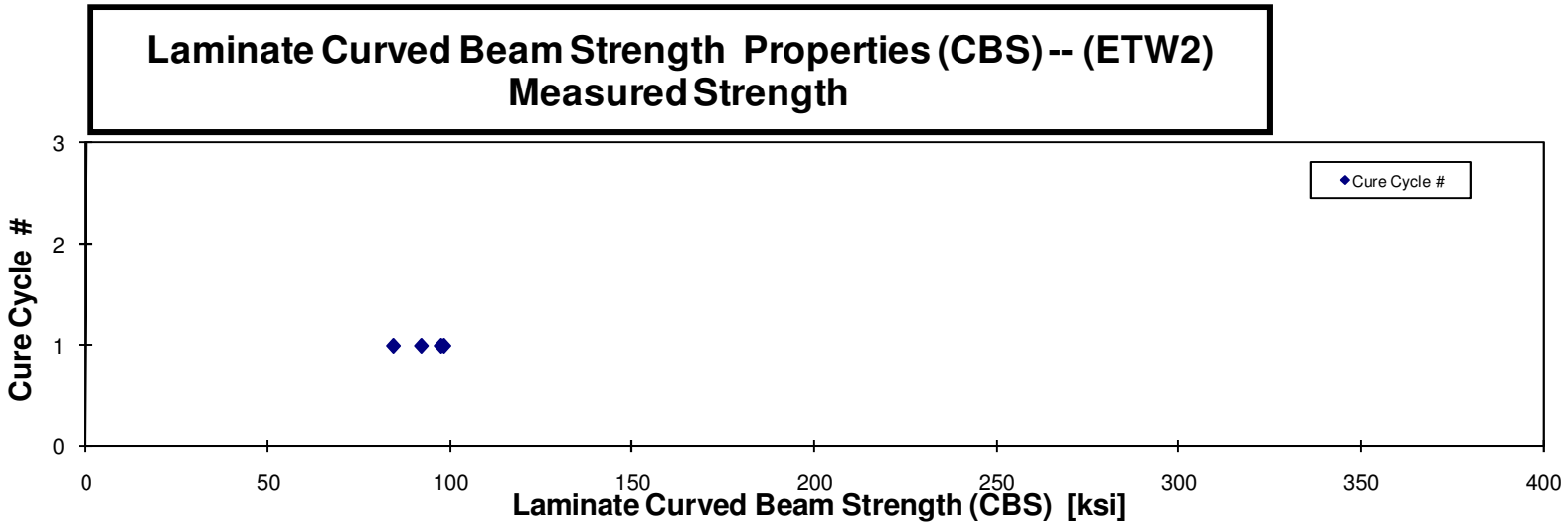

Laminate Interlaminar Tension Strength (ILT) -- (RTD)
Measured Strength
MTM45-1/ 3K Plain Weave G30-500 Fabric
Cure Cycle #
Cure Cycle #
0
1
2
3
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
Laminate Interlaminar Tension Strength (ILT) [ksi]

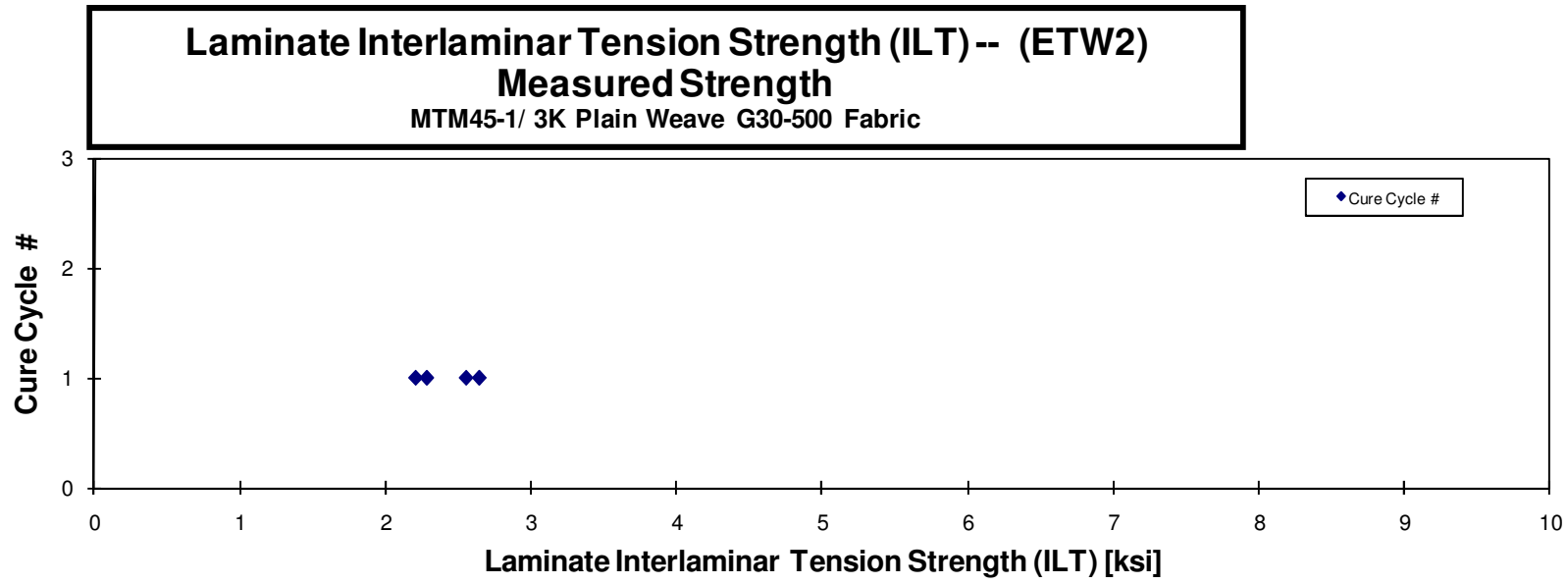
Laminate Curved Beam Strength Properties (ILT) -- (ETW2) Strength

MTM45-1/ 3K Plain Weave G30-500 Fabric

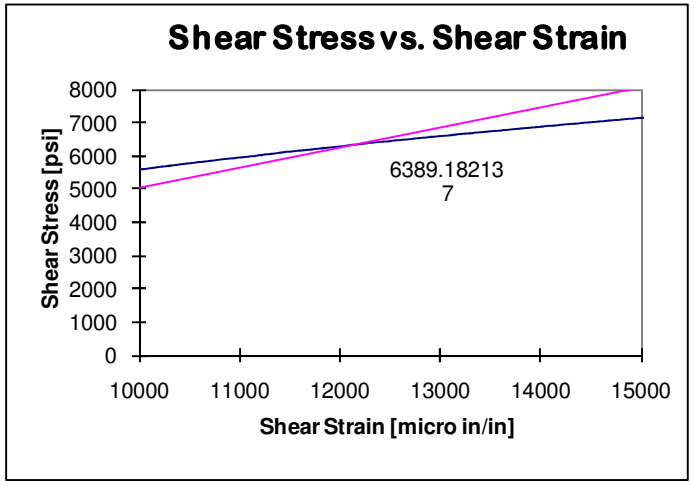
Specimen Number	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Curved Beam Strength [psi]	Interlaminar Tension Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate
A0NMB617D	A	LH1	1	1	98.520	2.650	0.172	20
A0NMB618D	A	LH1	1	1	97.685	2.558	0.176	20
A0NMB619D	A	LH1	1	1	84.259	2.204	0.176	20
A0NMB61AD	A	LH1	1	1	92.182	2.283	0.184	20

Average	**93.161**	**2.424**
Standard Dev.	**6.568**	**0.214**
Coeff. of Var. [%]	**7.050**	**8.839**
Min.	**84.259**	**2.204**
Max.	**98.520**	**2.650**
Number of Spec.	**4**	**4**


Laminate Curved Beam Strength Properties (CBS) -- (ETW2)
Measured Strength
Cure Cycle #
Cure Cycle #
0
1
2
3
0
50
100
150
200
250
300
350
400
Laminate Curved Beam Strength (CBS) [ksi]

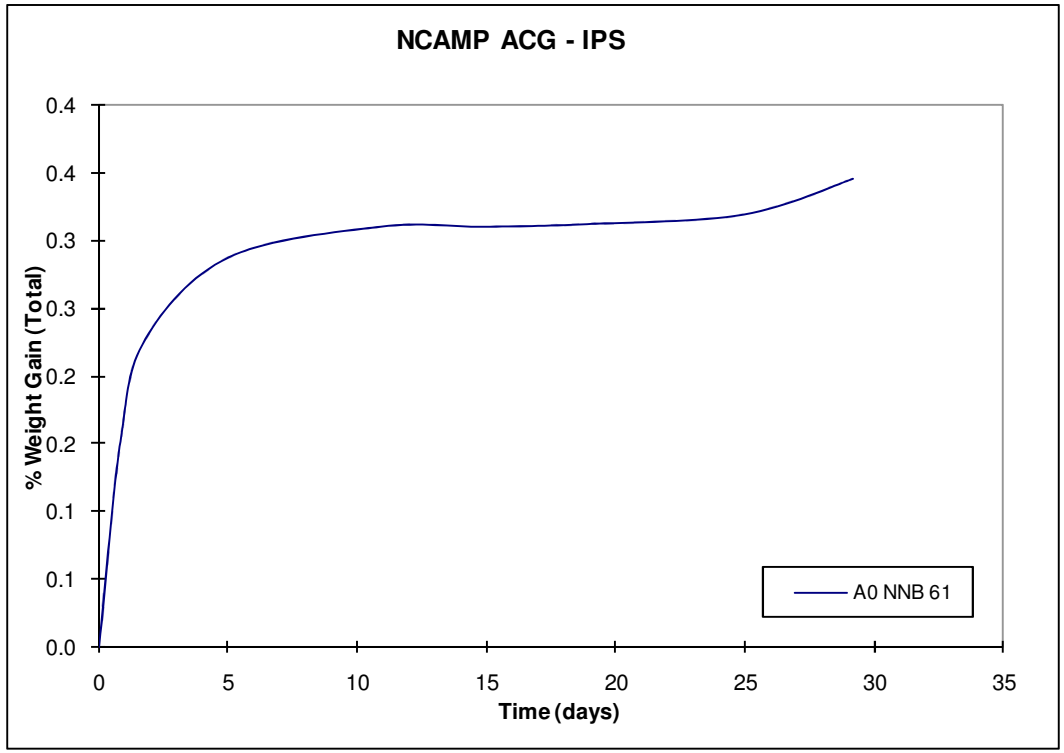

Laminate Interlaminar Tension Strength (ILT) -- (ETW2)
Measured Strength
MTM45-1/ 3K Plain Weave G30-500 Fabric
Cure Cycle #
Cure Cycle #
0
1
2
3
0
1
2
3
4
5
6
7
8
9
10
Laminate Interlaminar Tension Strength (ILT) [ksi]

5. Shear Stress vs. Shear Strain, RTD, M Cure



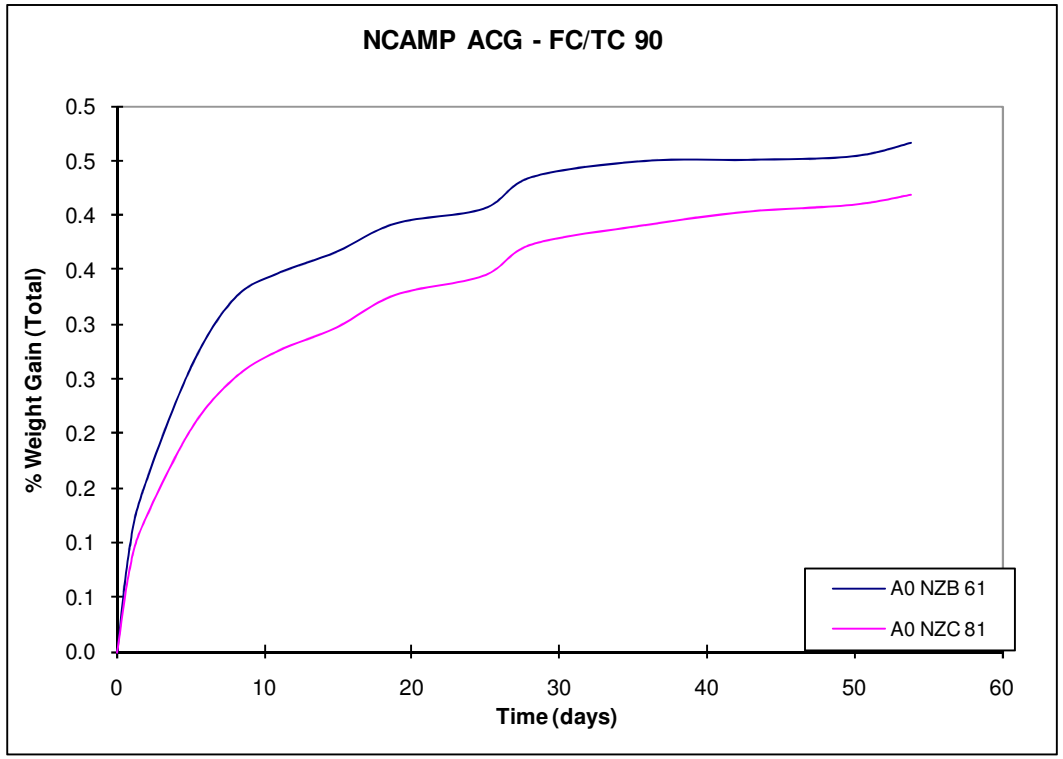
6. MOISTURE CONDITIONING CHARTS

6.1 In-Plane Shear Properties – Thinnest Panel



The remaining stress strain curves can be found on the CD that is available with this report.

6.2 Fill Compression - Thickest Panel



The remaining moisture conditioning curves can be found on the CD that is available this report.

7. DMA Results

Test Panel Part Number					Representative DMA Sample #	LH Cure DMA Results - Onset Storage Modulus AITR1392-PWC2						LH Cure DMA Results - Peak Tangent Delta AITR1392-PWC2					
						DRY		Batch	85% RH WET		Batch	DRY		Batch	85% RH WET		Batch
Test Plan-	Material-	Test-	Batch-	Cure		Tg [°C]	Tg [°F]	Average	Tg [°C]	Tg [°F]	Average	Tg [°C]	Tg [°F]	Average	Tg [°C]	Tg [°F]	Average
AITR1392-	PWC2-	WT-	B-	LH1													
AITR1392-	PWC2-	WC-	B-	LH1													
AITR1392-	PWC2-	FT-	B-	LH1													
AITR1392-	PWC2-	FC-	B-	LH1	DMA-B-MP1507LLH1;	180.89	357.60		158.44	317.19		202.56	396.608		197.45	387.41	
AITR1392-	PWC2-	IPS-	B-	LH1	DMA-B-MP1507LLH1;	179.96	355.93		161.15	322.07		201.6	394.88		197.85	388.13	
AITR1392-	PWC2-	OHT1-	B-	LH1	DMA-B-MP1507LLH1	181.27	358.29		161.51	322.72		202.64	396.752		198.13	388.634	
AITR1392-	PWC2-	OHC1-	B-	LH1													
AITR1392-	PWC2-	CAI1-	B-	LH1													
AITR1392-	PWC2-	WT-	B-	LH2				**353.20**			**318.58**			**392.43**			**385.86**
AITR1392-	PWC2-	WC-	B-	LH2													
AITR1392-	PWC2-	FT-	B-	LH2	DMA-B-MP1507MLH2;	178	352.4		161.33	322.394		200.63	393.134		198.7	389.66	
AITR1392-	PWC2-	FC-	B-	LH2	DMA-B-MP1507MLH2;	176.71	350.078		158.39	317.102		200.22	392.396		198.08	388.544	
AITR1392-	PWC2-	IPS-	B-	LH2	DMA-B-MP1507MLH2	177.22	350.996		158.38	317.084		200.76	393.368		196.74	386.132	
AITR1392-	PWC2-	OHT1-	B-	LH2													
AITR1392-	PWC2-	OHC1-	B-	LH2													
AITR1392-PWC2 - ILT1-B-LH1					DMA-B-MP1507NLH1;	176.82	350.276		158.77	317.786		198.12	388.616		194.76	382.568	
					DMA-B-MP1507NLH1;	177.65	351.77		157.72	315.896		197.64	387.752		194.25	381.65	
					DMA-B-MP1507NLH1	177.49	351.482		157.2	314.96		197.97	388.346		193.34	380.012	
					Average [°F]		353.20			318.58			392.43			385.86	
					Standard Deviation [°F]		3.19			2.98			3.48			3.53	
					Coefficient of Var. [%]		0.90			0.94			0.89			0.92	

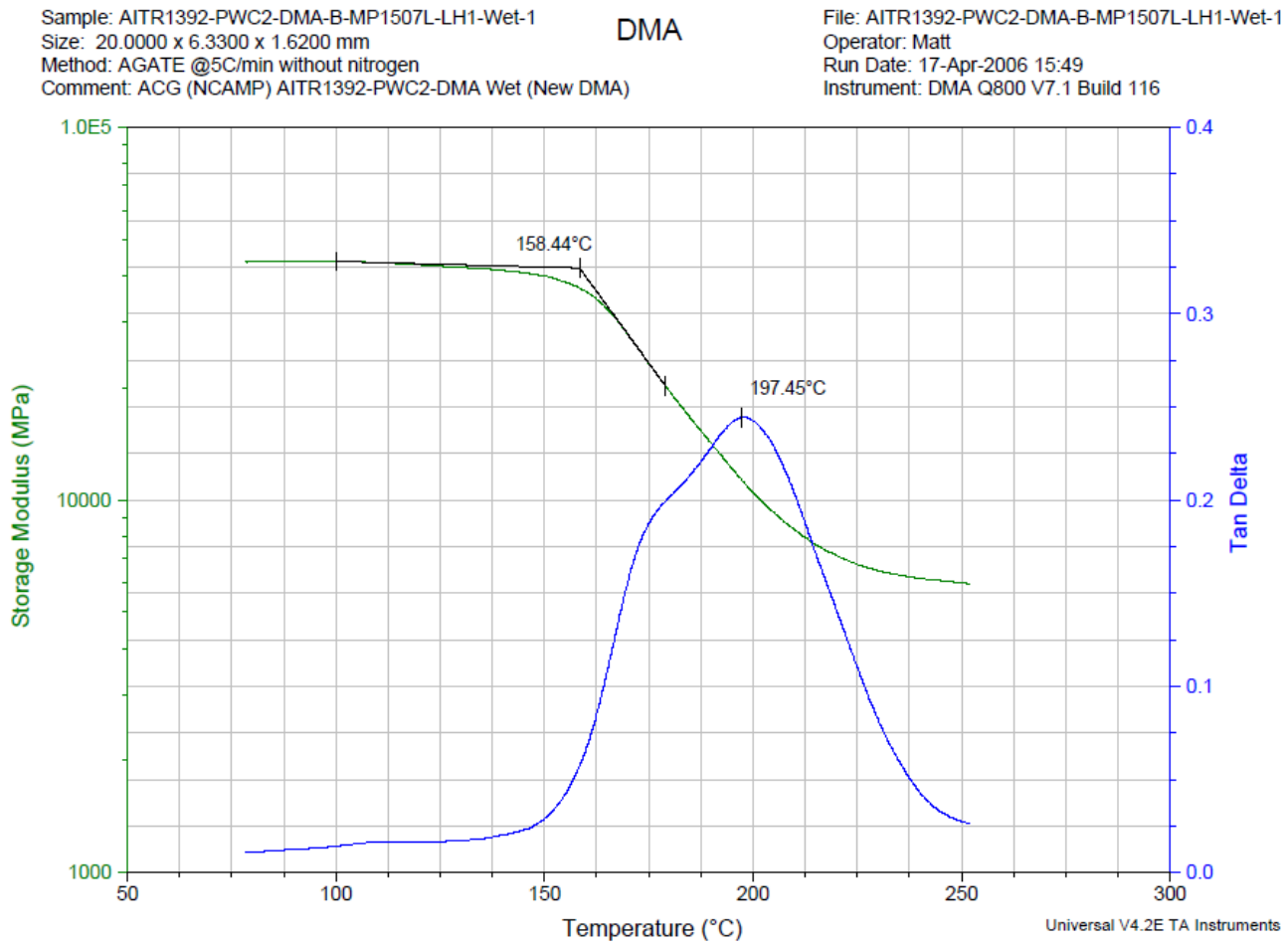
.

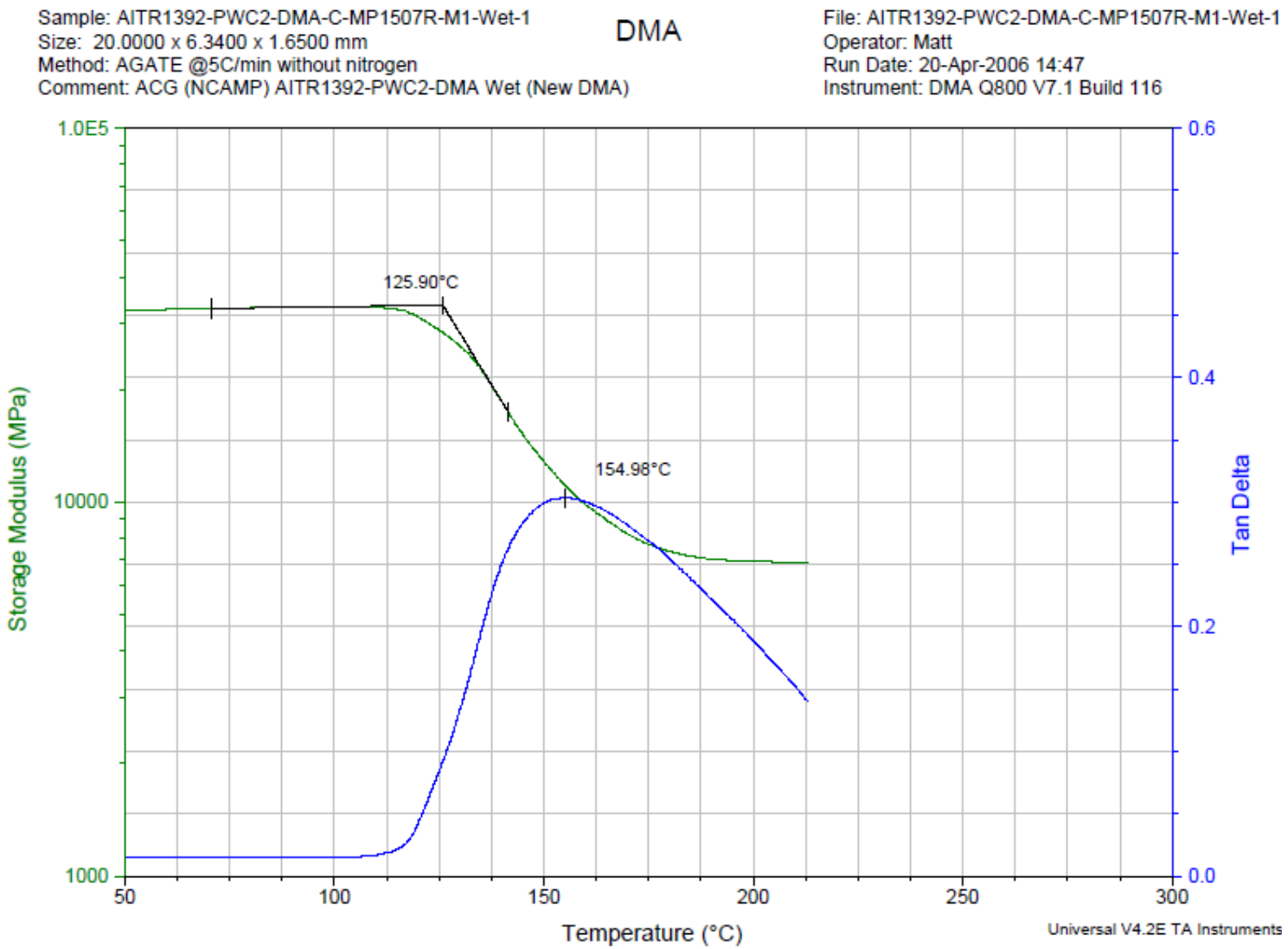
Test Panel Part Number					Representative DMA Sample #	M Cure DMA Results - Onset Storage Modulus						M Cure DMA Results - Peak Tangent Delta					
						AITR1392-PWC2						AITR1392-PWC2					
						DRY		Batch	85% RH WET		Batch	DRY		Batch	85% RH WET		Batch
Test Plan-	Material-	Test-	Batch-	Cure		Tg [°C]	Tg [°F]	Average	Tg [°C]	Tg [°F]	Average	Tg [°C]	Tg [°F]	Average	Tg [°C]	Tg [°F]	Average
					DMA-C-MP1507RM1;	131.11	268.00		125.9	258.62		150.47	302.85		154.98	310.96	
AITR1392-	PWC2-	ILT1-	C-	M1	DMA-C-MP1507RM1;	130.42	266.76		125.74	258.33		151.4	304.52		151.72	305.10	
					DMA-C-MP1507RM1;	130.18	266.32		127.98	262.36		149.91	301.84		152.29	306.12	
AITR1392-	PWC2-	WT-	C-	M1													
AITR1392-	PWC2-	WC-	C-	M1													
AITR1392-	PWC2-	FT-	C-	M1													
AITR1392-	PWC2-	FC-	C-	M1	DMA-C-MP1507SM1;	137.11	278.80		131.69	269.04		159.7	319.46		161.84	323.312	
AITR1392-	PWC2-	IPS-	C-	M1	DMA-C-MP1507SM1;	137.12	278.82		129.75	265.55		159.84	319.71		159.07	318.33	
AITR1392-	PWC2-	OHT1-	C-	M1	DMA-C-MP1507SM1;	137.73	279.91		130.31	266.56		158.48	317.264		160.57	321.026	
AITR1392-	PWC2-	OHC1-	C-	M1				**274.57**			**265.16**			**313.73**			**315.51**
AITR1392-	PWC2-	CAI1-	C-	M1													
AITR1392-	PWC2-	WT-	C-	M2													
AITR1392-	PWC2-	WC-	C-	M2													
AITR1392-	PWC2-	FT-	C-	M2	DMA-C-MP1507TM2; DMA	139.14	282.452		131	267.8		160.09	320.162		157.91	316.238	
AITR1392-	PWC2-	FC-	C-	M2	C-MP1507TM2; DMA-C-	134.88	274.784		132.93	271.274		159.42	318.956		158.64	317.552	
AITR1392-	PWC2-	IPS-	C-	M2	MP1507TM2;	135.15	275.27		130.48	266.864		159.32	318.776		160.52	320.936	
AITR1392-	PWC2-	OHT1-	C-	M2													
AITR1392-	PWC2-	OHC1-	C-	M2													
					Average [°F]		274.57			265.16			313.73			315.51	
					Standard Deviation [°F]		6.12			4.50			8.06			6.62	
					Coefficient of Var. [%]		2.23			1.70			2.57			2.10	

Table 7-1: DMA Results Summary

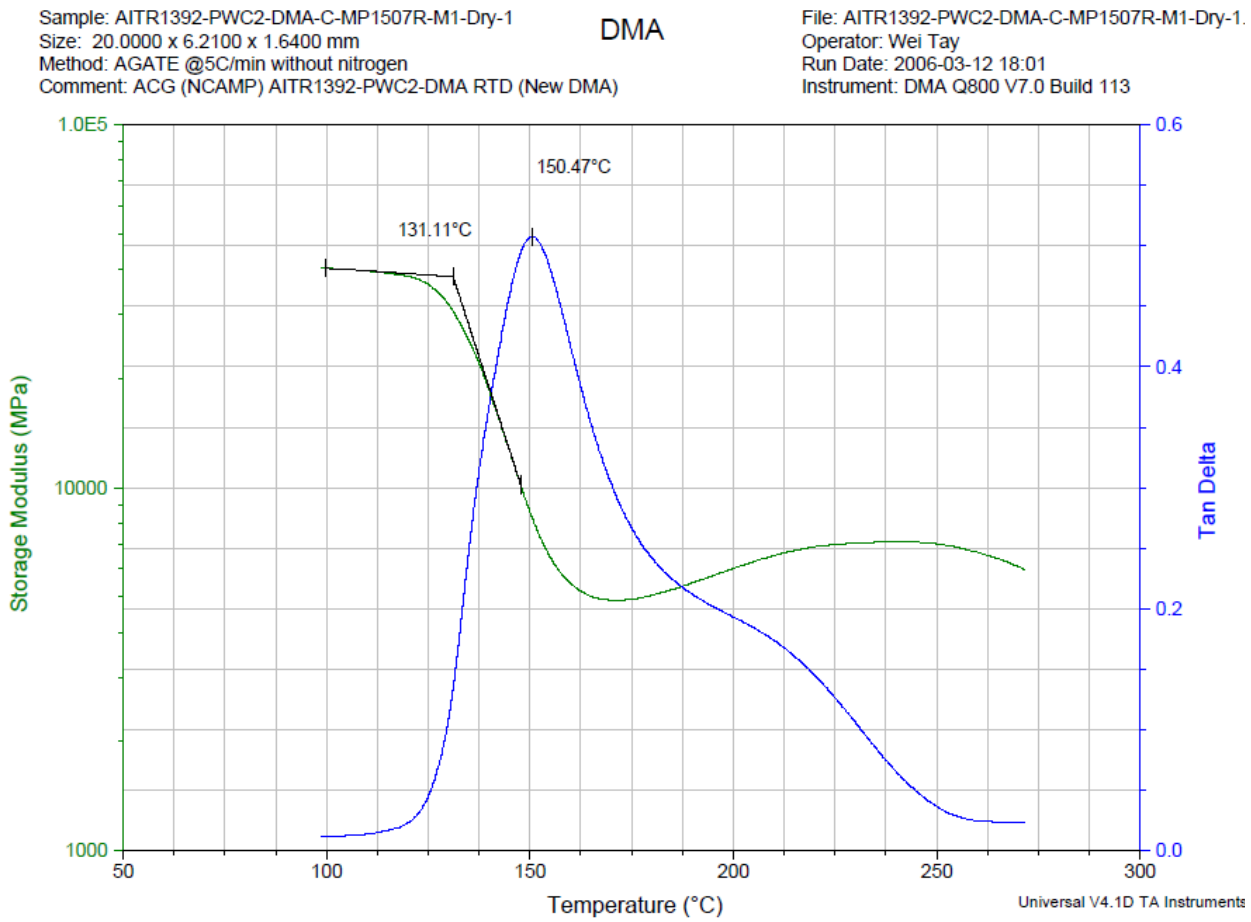
7.1 DMA Wet Batch B (LH Cure) & C (M Cure)

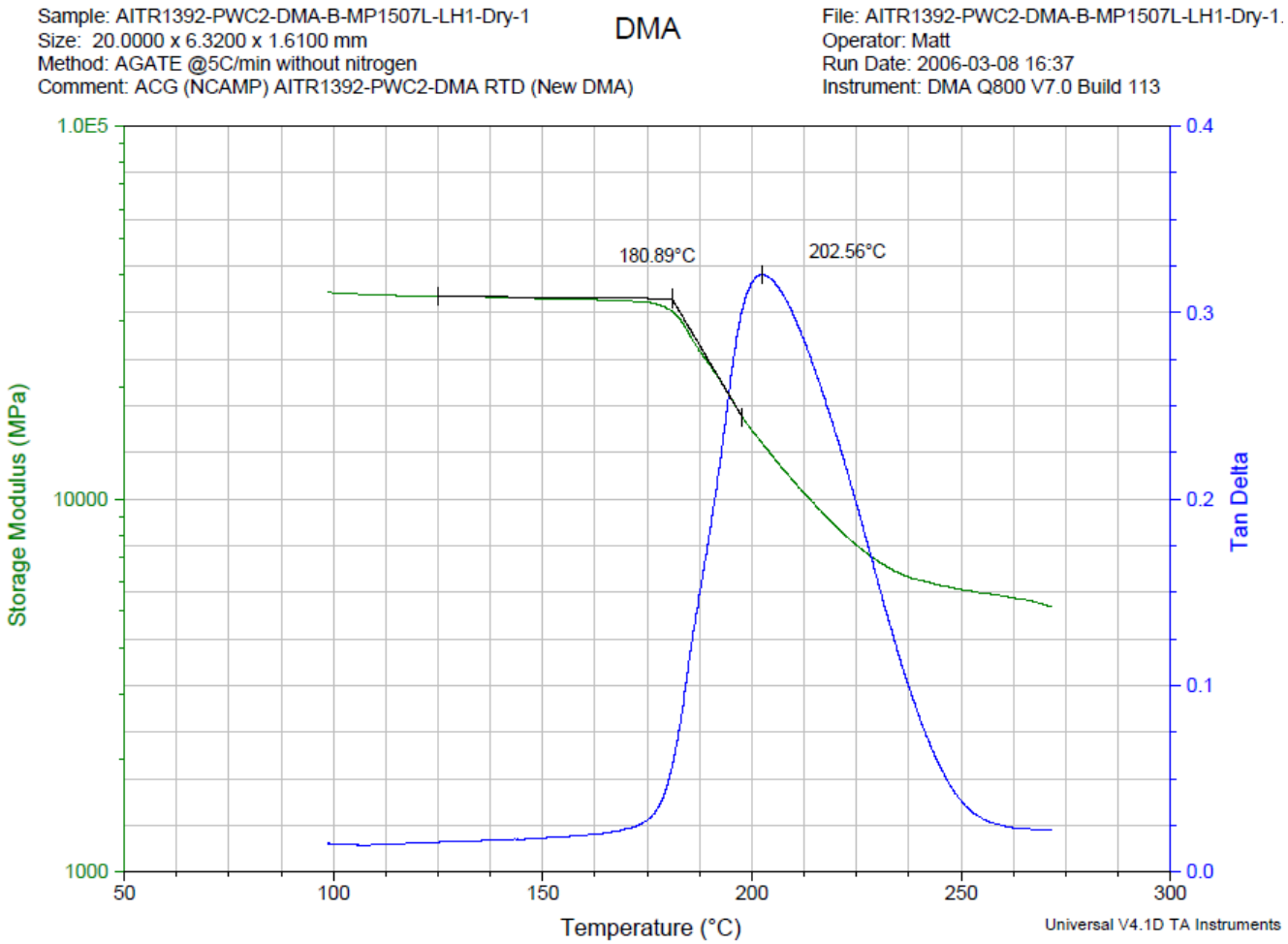
These graphs are only examples. The remaining files can be obtained in the CD accompanying this report.




Sample: AITR1392-PWC2-DMA-C-MP1507R-M1-Wet-1
Size: 20.0000 x 6.3400 x 1.6500 mm
Method: AGATE @5C/min without nitrogen
Comment: ACG (NCAMP) AITR1392-PWC2-DMA Wet (New DMA)
DMA
File: AITR1392-PWC2-DMA-C-MP1507R-M1-Wet-1
Operator: Matt
Run Date: 20-Apr-2006 14:47
Instrument: DMA Q800 V7.1 Build 116
125.90°C
154.98°C
Storage Modulus (MPa)
Tan Delta
Temperature (°C)
Universal V4.2E TA Instruments

7.2 DMA Dry Batch B (LH Cure) & C (M Cure)




Sample: AITR1392-PWC2-DMA-B-MP1507L-LH1-Dry-1
Size: 20.0000 x 6.3200 x 1.6100 mm
Method: AGATE @5C/min without nitrogen
Comment: ACG (NCAMP) AITR1392-PWC2-DMA RTD (New DMA)
DMA
File: AITR1392-PWC2-DMA-B-MP1507L-LH1-Dry-1.
Operator: Matt
Run Date: 2006-03-08 16:37
Instrument: DMA Q800 V7.0 Build 113
180.89°C
202.56°C
Storage Modulus (MPa)
Tan Delta
Temperature (°C)
Universal V4.1D TA Instruments

8. Physical Test Results

The following physical test results were obtained at ACG's Tulsa, OK facility.

RESIN	FIBER	BATCH #	D.O.M.	J/G	PEAK TEMP	RC% RANGE	FAW RANGE	CUSTOMER:	LTCP
						INDIVIDUAL:	INDIVIDUAL:	MAT SPEC:	ACGM1001-13
MTM45-1	CF0526a	17277	18-Nov-05	N/A	N/A	AVERAGE: 36%+/-3%RC	AVERAGE:	SHIP DATE:	
								INITIALS:	
								S.O. # :	18866

ALL INFORMATION SHOULD BE OBTAINED FROM THE SALES ORDER

	TEST PIECE	SAMPLE WEIGHT (GRAMS)	FOIL WEIGHT (GRAMS)	PREPREG WEIGHT (G.S.M.)	SAMPLE AFTER DEVOL	FIBER WEIGHT (G.S.M.)	FIBER WEIGHT (%)	RESIN WEIGHT (%)	VOLATILE CONTENT (%)	GEL TIME N/A
ROLL 1	M	2.9015	1.2953	290.15	3.1721	187.68	64.68378	35.31622	1.2883	FOIL WEIGHT
	C	2.8992	1.2921	289.92	3.1604	186.83	64.44192	35.55808	4.2404	SAMPLE & FOIL
	O	2.9445	1.295	294.45	3.1585	186.35	63.28749	36.71251	4.2309	AFTER DEVOL.
AVERAGE				**291.51**		**186.95**	**64.14**	**35.86**	**0.32**	VOL (%)
ROLL 2	M	2.9424	1.2928	294.24	3.1749	188.21	63.96479	36.03521	1.2877	FOIL WEIGHT
	C	3.0037	1.2918	300.37	3.1568	186.5	62.09009	37.90991	4.2405	SAMPLE & FOIL
	O	3.0034	1.2904	300.34	3.1553	186.49	62.09296	37.90704	4.2283	AFTER DEVOL.
AVERAGE				**298.32**		**187.07**	**62.72**	**37.28**	**0.41**	VOL (%)
ROLL 3	M	2.9791	1.2851	297.91	3.1599	187.48	62.93176	37.06824	1.2917	FOIL WEIGHT
	C	2.9113	1.2838	291.13	3.171	188.72	64.82327	35.17673	4.2802	SAMPLE & FOIL
	O	2.9347	1.2817	293.47	3.1672	188.55	64.24848	35.75152	4.2703	AFTER DEVOL.
AVERAGE				**294.17**		**188.25**	**64.00**	**36.00**	**0.33**	VOL (%)
ROLL 4	M	2.9472	1.2807	294.72	3.1531	187.24	63.53149	36.46851	1.2807	FOIL WEIGHT
	C	3.0151	1.2809	301.51	3.1457	186.48	61.84869	38.15131	4.17	SAMPLE & FOIL
	O	3.0084	1.2821	300.84	3.1485	186.64	62.03962	37.96038	4.1586	AFTER DEVOL.
AVERAGE				**299.02**		**186.79**	**62.47**	**37.53**	**0.39**	VOL (%)
ROLL 5	M	2.9436	1.2886	294.36	3.1539	186.53	63.36798	36.63202	1.2942	FOIL WEIGHT
	C	2.9655	1.289	296.55	3.142	185.3	62.48525	37.51475	4.2142	SAMPLE & FOIL
	O	2.9194	1.2888	291.94	3.1366	184.78	63.29383	36.70617	4.2058	AFTER DEVOL.
AVERAGE				**294.28**		**185.54**	**63.05**	**36.95**	**0.29**	VOL (%)
									1.2812	FOIL WEIGHT
									4.2054	SAMPLE & FOIL
									4.196	AFTER DEVOL.
									0.32	VOL (%)
										FOIL WEIGHT
										SAMPLE & FOIL
										AFTER DEVOL.
										VOL (%)
										FOIL WEIGHT
										SAMPLE & FOIL
										AFTER DEVOL.
										VOL (%)

ACG431I/102196/ISSUE3

DSC Results		Flow Results		Gel Times	
Peak Exo.	232.60 ℃	1	20.00%	Neat@200c	6m 25s
Enthalpy	333.55 j/g	2	21.00%	Prepreg@120℃	
		3	20.00%	1	60m 44s
		Avg.	20.30%	2	60m 52s
		1	19.70%	3	61m 53s
		2	21.00%	Prepreg@120℃	
		3	19.00%	1	61m 16s
		Avg.	19.90%	2	61m 38s
				3	61m 44s

RESIN	FIBER	BATCH #	D.O.M.	J/G	PEAK TEMP	RC% RANGE	FAW RANGE	CUSTOMER:	LTCP
						INDIVIDUAL:	INDIVIDUAL:	MAT SPEC:	ACGM1001-13
MTM45-1	CF0526a	17289	22-Nov-05	N/A	N/A	AVERAGE: 36%+/-3%RC	AVERAGE:	SHIP DATE:	
								INITIALS:	
								S.O. # :	18866

ALL INFORMATION SHOULD BE OBTAINED FROM THE SALES ORDER

	TEST PIECE	SAMPLE WEIGHT (GRAMS)	FOIL WEIGHT (GRAMS)	PREPREG WEIGHT (G.S.M.)	SAMPLE AFTER DEVOL	FIBER WEIGHT (G.S.M.)	FIBER WEIGHT (%)	RESIN WEIGHT (%)	VOLATILE CONTENT (%)	GEL TIME N/A
ROLL 1	M	2.9025	1.2743	290.25	3.1552	188.09	64.80276	35.19724	1.2765	FOIL WEIGHT
	C	3.0243	1.2775	302.43	3.1611	188.36	62.28218	37.71782	4.3057	SAMPLE & FOIL
	O	3.0572	1.2823	305.72	3.1729	189.06	61.8409	38.1591	4.292	AFTER DEVOL.
AVERAGE				299.47		188.50	62.98	37.02	0.45	VOL (%)
ROLL 2	M	2.9863	1.2879	298.63	3.1559	186.8	62.55232	37.44768	1.2742	FOIL WEIGHT
	C	3.0029	1.2822	300.29	3.1884	190.62	63.47864	36.52136	4.3301	SAMPLE & FOIL
	O	3.0535	1.2789	305.35	3.1687	188.98	61.88963	38.11037	4.32	AFTER DEVOL.
AVERAGE				301.42		188.80	62.64	37.36	0.33	VOL (%)
ROLL 3	M	2.9116	1.2768	291.16	3.1542	187.74	64.48001	35.51999	1.2736	FOIL WEIGHT
	C	3.0172	1.2821	301.72	3.1731	189.1	62.674	37.326	4.2677	SAMPLE & FOIL
	O	3.049	1.2816	304.9	3.168	188.64	61.86947	38.13053	4.2579	AFTER DEVOL.
AVERAGE				299.26		188.49	63.01	36.99	0.33	VOL (%)
ROLL 4	M	3.0101	1.2844	301.01	3.1572	187.28	62.2172	37.7828	1.272	FOIL WEIGHT
	C	2.9905	1.2892	299.05	3.1673	187.81	62.80221	37.19779	4.1718	SAMPLE & FOIL
	O	2.9015	1.2849	290.15	3.1646	187.97	64.78373	35.21627	4.1622	AFTER DEVOL.
AVERAGE				296.74		187.69	63.27	36.73	0.33	VOL (%)
ROLL 5	M	2.9862	1.2854	298.62	3.149	186.36	62.40707	37.59293	1.2733	FOIL WEIGHT
	C	3.0161	1.2822	301.61	3.1624	188.02	62.33878	37.66122	4.2386	SAMPLE & FOIL
	O	3.0228	1.282	302.28	3.1688	188.68	62.41895	37.58105	4.2268	AFTER DEVOL.
AVERAGE				300.84		187.69	62.39	37.61	0.40	VOL (%)
									1.2902	FOIL WEIGHT
									4.1933	SAMPLE & FOIL
									4.185	AFTER DEVOL.
									0.29	VOL (%)
										FOIL WEIGHT
										SAMPLE & FOIL
										AFTER DEVOL.
										VOL (%)
										FOIL WEIGHT
										SAMPLE & FOIL
										AFTER DEVOL.
										VOL (%)

ACG431I/102196/ISSUE3

DSC Results		Flow Results		Gel Times	
Peak Exo.	231.34 ℃	1	20.23%	Neat@200c	5m 33s
Enthalpy	389.96 j/g	2	20.70%	Prepreg@120℃	
		3	21.77%	1	60m 24s
		Avg.	20.90%	2	60m 46s
		1	22.34%	3	60m 59s
		2	21.38%	Prepreg@120℃	
		3	22.80%	1	59m 30s
		Avg.	22.17%	2	59m 59s
				3	60m 09s

Table 8-1: Physical Test Results Summary

9. Deviations

1. Short beam shear specimen length is 6 times thickness, not 1.5 inches. Justification: Longer specimens may restrict shear failure to the center section only and preclude shear failures that run to one end of the specimens.
2. Use 350 ohm instead of 120 ohm strain gages. Specifically, in page 6,
    a. D3039: CEA-XX-250UW-120 will be replaced by CEA-XX-250UW-350
    b. D6641: CEA-XX-125UT-120 will be replaced by CEA-XX-125UT-350

Justification: 350 ohm gages will produce less heat than 120 ohm gages so we can increase excitation voltage to increase signal to noise ratio.

3. Option to use one 350 ohm biaxial gage instead of using two 120 ohm single axial gage
    a. D3518: two CEA-XX-250UW-120 were replaced by one CEA-XX-125UT-350

Justification: Using one biaxial gage ensured that the two single axial elements are perfectly perpendicular to each other.