SOLVAY
(Formerly known as Advanced Composites Group)
MTM45-1/ IM7-145 32%RW
12k IM7 Unidirectional 145 gsm
Qualification Material Property Data Report

FAA Special Project Number: SP3505WI-Q

NCAMP Test Report Number: CAM-RP-2008-007 Rev C

Report Date: February 12, 2024

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REVISIONS:

Rev	By	Date	Pages Revised or Added
N/C Draft	Allison Crockett and Kristin Marlett	12/4/2008	Document Initial Release
N/C Draft	Allison Crockett and Kristin Marlett	3/30/2009	Several values changed due to copy/paste error
N/C Draft	Allison Crockett and Kristin Marlett	4/7/2009	UNC0 Batch A cure cycle 2 (ETW) should not be included in calculations.
N/C Draft	Allison Crockett and Kristin Marlett	4/13/2009	Backout factor changed for ETW2 from 342.58 to 342.57 normalized and 333.94 to 333.93 as measured
N/C Draft	Allison Crockett and Kristin Marlett	7/15/2009	Strength value removed from LT values since tabs were not used.
N/C Draft	Allison Crockett and Kristin Marlett	11/19/2009	Updated DMA chart – eliminated incorrect values
N/C Draft	Allison Crockett and Kristin Marlett	12/9/2009	UNC0 file updated – all conditions affected by incorrect layup
N/C Draft	Allison Crockett and Kristin Marlett	3/10/2010	Pin bearing ultimate strength values removed
N/C Draft	Allison Crockett and Kristin Marlett	3/11/2010	UNC0 modulus values changed in Lamina summary sheet – modulus values were not changed after file updated on 12/9
N/C Draft	Allison Crockett and Kristin Marlett	4/22/2010	TT(CTD) value updated on Lamina summary to match value on individual summary sheet on page 32
N/C Draft	Allison Crockett and Kristin Marlett	4/21/2011	- Naming Convention changed for ETW2 specimens: OHC1, OHC3, FHT2, FHT3, UNT3 - Section 2.1.10 UNC0 prepreg lot number - Pg. 8, added fabricated and “Machined” at ACG - Section 4.10 changed RTD graph to CTD - Removed gridlines from all tables with gridlines and modified deviations to explain manufacturing problems

Rev	By	Date	Pages Revised or Added
A	Allison Crockett and Kristin Marlett	4/21/2011	Introduction/Scope Section 1.1 wording edited
B	Evelyn Lian	3/18/2018	- Typographical and Editorial changes - Updated Tg wet value in Lamina Summary Data Table 2-1(Pg. 22) & Laminate Summary Data Table 2.2(Pg. 23) to match value on DMA Results Table 3-1(Pg. 263) - Added physical testing values for all test methods in Section 2.3(Pg. 24 – 54) - Updated LC (CTD) strength data using backout factor calculation in Lamina Summary Data Table 2-1(Pg. 22) from 207.71 to 204.89 normalized and 203.47 to 200.54 as measured. - Removed high modulus data for AFLB213B from LC CTD due to strain gage malfunction and recommended by CMH-17 data review working group. Updated data for LC CTD in Section 2.1(Pg. 22), 2.3.3(Pg. 26), 3.3(Pg. 57), 4.3(Pg. 95 – 96) - Removed high strength and modulus data for AFAA211D from UNT1 ETW2(250F) due to strain gage malfunction and recommended by CMH-17 data review working group. Updated data for UNT1 ETW2 in Section 2.2(Pg. 23), 2.3.7(Pg. 30), 3.7(Pg. 62), 4.7(Pg. 135 – 136) - Removed high modulus data for AFCA114D and AFCA214D from UNT3 ETW2 due to strain gage malfunction and recommended by CMH-17 data review working group. Updated data for UNT3 ETW2 in Section 2.2(Pg. 23), 2.3.9(Pg. 32), 3.9(Pg. 64), 4.9(Pg. 147 – 148) - Updated data for IPS 5% Strain (CTD), 0.2% Offset Strength (RTD and ETW) in Section 2.1(Pg. 23), 2.3.5(Pg. 28), 3.5(Pg. 59), 4.5(Pg. 111 – 119) and updated Stress Strain graph in Section 5(Pg. 260)
C	Evelyn Lian	2/12/2024	- Updated IPS data for all conditions; affected sections also updated in Section 2.1(Pg. 22), 2.3.5(Pg. 28), 3.5(Pg. 59-60), 4.5(Pg. 111-125), 5(Pg. 266) and 6.1(Pg. 267).

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1. Introduction

1.1 Scope

The test methods and results described in this document are intended to provide basic composite properties essential to most methods of analysis and are consistent with CMH-17-1G — Composite Materials Handbook for Polymer Matrix Composites.

This report contains material property data of common usefulness to wide range of projects. The lamina and laminate material property data have been generated with 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. However, the data may not fulfill all the needs of any specific company's programs. Specific properties, environments, laminate architecture, and loading situations that individual companies may require additional testing.

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

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

Statistical analysis of the data including the calculations of b-basis values are given in a separate report, Advanced Composites Group MTM45-1/IM7-145gsm-32%RW Qualification Statistical Analysis Report NCP-RP-2008-006 Rev B.

The qualification material was procured to ACG Material Specification ACGM 1001–06 Revision A dated January 19, 2005. An equivalent NCAMP Material Specification NMS 451/6 which contains specification limits that are derived from guidelines in DOT/FAA/AR-03/19 has been created. The qualification test panels were cured in accordance with ACG Process Specification ACGP 1001-02 Revision E “MH” cure cycle. An equivalent NCAMP Process Specification, NPS 81451 with baseline “MH” Cure Cycle, has been created. The panels were fabricated and machined at Advanced Composites Group, 5350 S 129th E. Ave, Tulsa, OK 74134. The ACG Test Plan AI/TR/1392 Revision E was used for this qualification program.

Part fabricators that wish to utilize the material property data, allowables, and specifications may be able to do so by demonstrating the capability to reproduce the original material properties; a process known as equivalency. More information about

this equivalency process including the test statistics and its limitations can be found in Section 6 of DOT/FAA/AR-03/19 and Section 8.4.1 of CMH-17-1G. The applicability of equivalency process must be evaluated on program-by-program basis by the applicant and certifying agency. The applicant and certifying agency must agree that the equivalency test plan along with the equivalency process described in Section 6 of DOT/FAA/AR-03/19 and Section 8.4.1 of CMH-17-1G are adequate for the given program.

Aircraft companies should not use the data published in this report without specifying NCAMP Material Specification NMS 451/6. NMS 451/6 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 451/6.* NMS 451/6 is a free, publicly available, non-proprietary aerospace industry material specification.

1.2 Symbols Used

ν_{12}^{t}	major Poisson's ratio, tension
$\mu\varepsilon$	micro-strain
E_1^{c}	compressive modulus, longitudinal / warp direction
E_1^{t}	tensile modulus, longitudinal / warp direction
E_2^{c}	compressive modulus, transverse / fill direction
E_2^{t}	tensile modulus, transverse / fill direction
F_1^{cu}	ultimate compressive strength, longitudinal / warp direction
F_1^{tu}	ultimate tensile strength, longitudinal / warp direction
F_2^{cu}	ultimate compressive strength, transverse / fill direction
F_2^{tu}	ultimate tensile strength, transverse / fill direction
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

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
ETW2	elevated temperature wet, higher wet temperature
Gr/Ep	graphite/epoxy
norm	normalized
RTD	room temperature dry
SACMA	Suppliers of Advanced Composite Materials Association
SRM	SACMA Recommended Method
Tply	thickness divided by the number of plies provides the thickness average per specimen
wet	specimen with an “equilibrium” moisture content
T, RH	temperature, relative humidity

1.3 NIAR NCAMP – ACG Specimen Naming Format

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

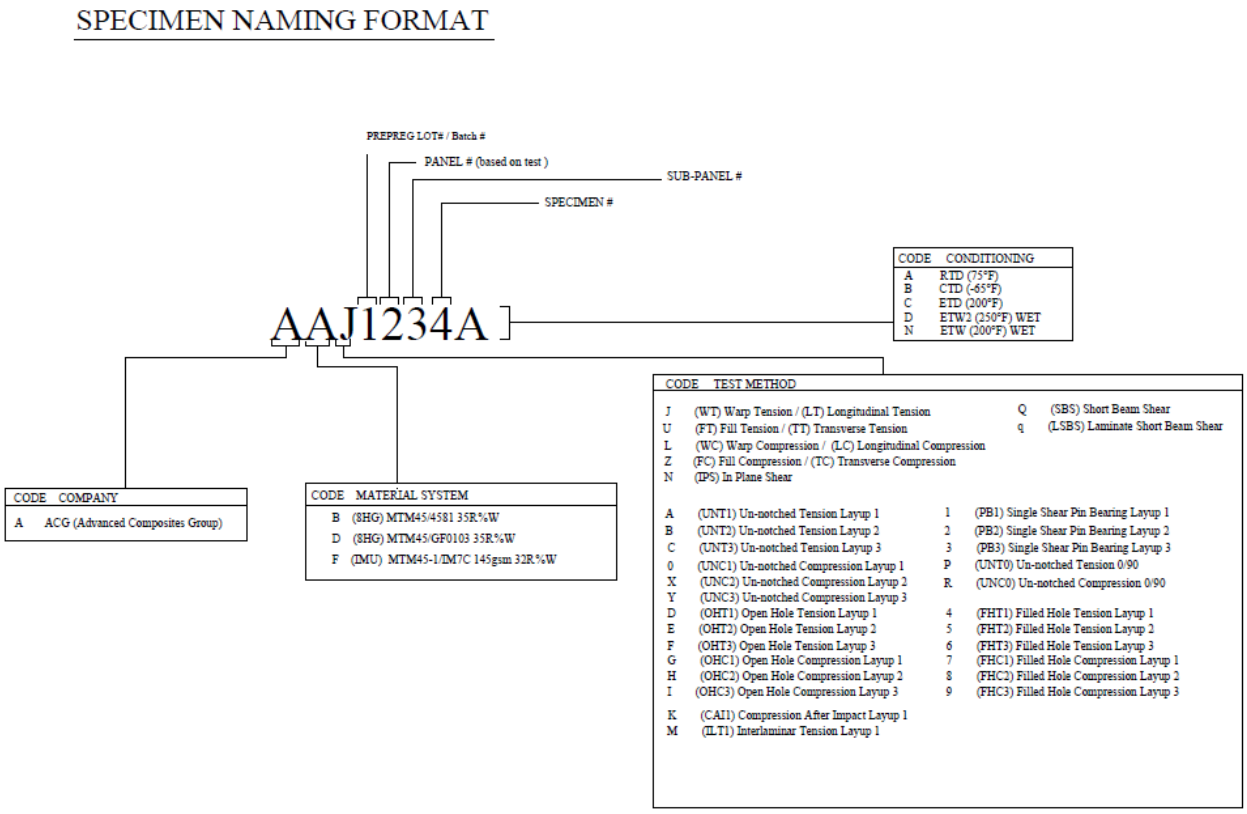


Figure 1-1: NIAR – ACG Specimen Naming Format Correlation

1.4 References

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

ASTM Standards

- ASTM D2344/D2344M-00^{e1} – Standard Test Method for Short-Beam Strength of Polymer Matrix Composite Materials and Their Laminates
- ASTM D3039/D3039M-00^{e2} – Standard Test Method for Tensile Properties of Polymer Matrix Composite Materials
- ASTM D3518/D3518M-94(2001) – Standard Test Method for In-Plane Shear Response of Polymer Matrix Composite Materials by Tensile Test of a ± 45º Laminate In-Plane Shear Strength and Modulus
- ASTM D5766/D5766M-02a – Standard Test Method for Open-Hole Tensile Strength of Polymer Matrix Composite Laminates
- ASTM D5961/D5961M-05 – Standard Test Method for Bearing Response of Polymer Matrix Composite Laminates
- ASTM D6484/D6484M-04 – Standard Test Method for Open-Hole Compressive Strength of Polymer Matrix Composite Laminates
- ASTM D6641/D6641M-01^{e1} – Standard Test Method for Determining the Compressive Properties of Polymer Matrix Composite Laminates Using a Combined Loading Compression (CLC) Test Fixture
- ASTM D6742/D6742M-02 – Standard Practice for Filled-Hole Tension and Compression Testing 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.

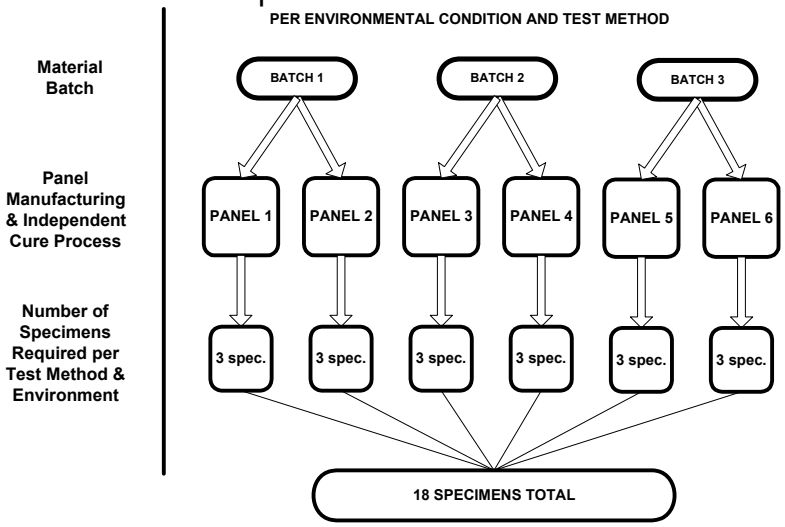


Figure 1-2: Specimen Selection Methodology

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.

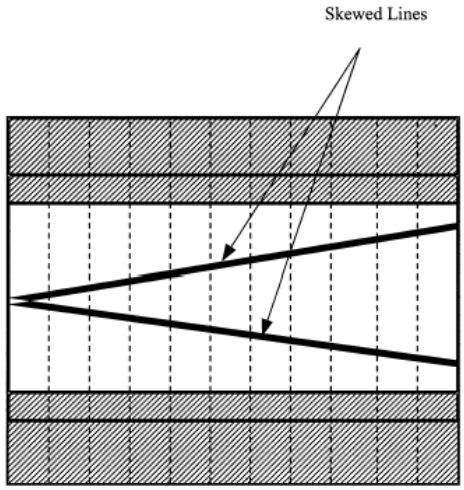


Figure 1-3: Specimen Traceability Line

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.

ASTM D3039 tensile:
CEA-XX-250UW-120 or 350
(refer to AI/TR/1392 Rev E Appendix 1 for specific requirements)

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 filled-hole and bearing tests, the hole diameter as 0.25 in -0.000 +0.003 in. The fastener type was NAS674X, where 'X' is the grip length for each different specimen thickness. The grip lengths chosen are listed in Table 1-1 below.

Fastener Type	Grip Length	Test Method
NAS674 –V2	.125 grip	Filled Hole Tension
NAS674 –V3	.188 grip	Filled Hole Compression
NAS674 –V13	.812 grip	Pin Bearing

Table 1-1: Fastener and Corresponding Grip Length

The washer type was NAS1149C0432R (nominal ID 0.265, nominal OD 0.500and nominal thickness 0.032 inches) and the nut type was NAS1291C4M. Washers were used under both the head and nut as directed by ACG.

For filled hole tensile and pin bearing tests the fastener torque were 10 to 15 in-lbs above the run on torque required to bring the fastener/specimen/fixture flush. For example, if it required 15 in-lbs to flush the specimen/fastener/fixture with no gap, an additional 10-15 in-lb was applied for a total of 25-30 in-lbs. For filled hole compression tests the fasteners were installed as above then torque released approximately one-quarter (1/4) turn to maintain fastener “flushness” and approximate zero (0) torque allowing the fastener to turn/twist with no lateral movement or “slack”. In all cases, for each laminate thickness and given test, the torque applied was equal. Fasteners were installed before conditioning.

For the pin bearing tests, the single shear method was used with one of the pairs of specimens replaced by a steel fixture. The configuration is shown in Figure 1-4 below. Thickness of specimen fixture used was 0.685”.

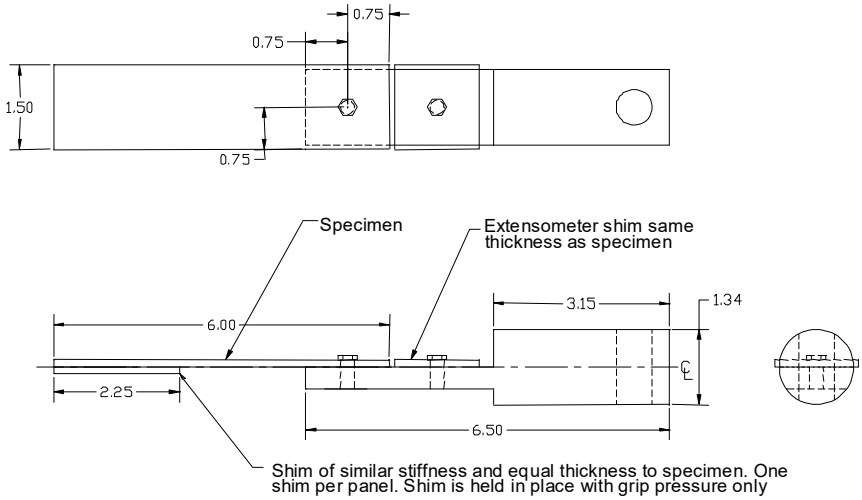


Figure 1-4: Modified ASTM D5961 (Pin Bearing) Specimen and Loading Arrangement

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 unidirectional materials. The lay-ups chosen have been designed to produce the appropriate thickness required for the various types of tests performed. Table 1-3 summarizes the laminate level tests carried out on unidirectional materials. Lamina and Laminate stacking sequence can be obtained from page 13 of Appendix 1 of AI/TR/1392 Rev E Appendix (or later revisions).

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
$[0]_{16}$	ASTM D3039 0° Tension	Modulus	3x2x3	3x2x3		3x2x3	3x2x3
$[0]_{16}$	ASTM D6641 0° Compression (1)	Modulus and Poisson's Ratio	3x2x3	3x2x3		3x2x3	3x2x3
$[90]_{16}$	ASTM D3039 90° Tension	Strength and Modulus	3x2x3	3x2x3		3x2x3	3x2x3
$[90]_{16}$	ASTM D6641 90° Compression	Strength, Modulus and Poisson's Ratio	3x2x3	3x2x3		3x2x3	3x2x3
$[0/90]_{4S}$	ASTM D3039 0° Tension (1)	Strength and Modulus	3x2x3	3x2x3		3x2x3	3x2x3
$[90/0]_{4S}$	ASTM D6641 90° Compression (1)	Strength, Modulus and Poisson's Ratio	3x2x3	3x2x3	3x2x3	3x2x3	3x2x3
$[45/-45]_{2S}$	ASTM D3518 In-Plane Shear (2)	Strength and Modulus	3x2x4	3x2x4	3x1x4	3x2x4	3x2x4
$[0]_{16}$	ASTM D2344 Short Beam Strength	Strength	3x2x3	3x2x3	3x2x3	3x2x3	3x2x3

Table 1-2: Lamina Level Tests – Unidirectional Tape

Note 1: 0° tension and compression strengths will be derived from the 0°/90° tension and compression strength values in accordance with:

$$F^{cu}_{0^\circ} = F^{cu}_{0^\circ/90^\circ} \frac{E_1}{E_{0^\circ/90^\circ}}$$

Where:

$F^{cu}_{0^\circ}$ = 0° strength

$F^{cu}_{0^\circ/90^\circ}$ = 0°/90° or 90°/0° strength

E_1 = 0° modulus

$E_{0^\circ/90^\circ}$ = 0°/90° or 90°/0° modulus

Note 2: IPS properties for all test conditions re-test with 3-batches of material using Greenville, TX materials. This data superseded Tulsa, OK IPS B-basis values. A new set of B-basis values was calculated using Greenville, TX materials and NCAMP Statistical Report NCP-RP-2008-004 was revised with these values.

Table 1-3 below indicates the laminate level tests performed on the IM7 12K unidirectional material. 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.

(%0º/%±45º/%90º) Actual Test Type	Test Type and Layup	Property	Number of Batches x Number of Panels x Number of Test Specimens Test Temperature/Moisture Condition			
			CTD	RTD	ETW	ETW2
(25/50/25 - QI) OHT1	ASTM D5766 Open Hole Tension (1) [45/0/-45/90]3S	Strength	3x2x3	3x2x3	1x2x3	3x2x3
(10/80/10) OHT2	ASTM D5766 Open Hole Tension (1) [45/-45/0/45/-45/90/45/-45/45/-45]S	Strength	3x2x3	1x2x3		1x2x3
(50/40/10) OHT3	ASTM D5766 Open Hole Tension (1) [0/0/45/0/90/-45/0/45/0/-45]S	Strength	3x2x3	1x2x3		1x2x3
(25/50/25 - QI) OHC1	ASTM D6484 Open Hole Compression (1) [45/0/-45/90]3S	Strength		3x2x3	1x2x3	3x2x3
(10/80/10) OHC2	ASTM D6484 Open Hole Compression (1) [45/-45/0/45/-45/90/45/-45/45/-45]S	Strength		1x2x3		3x2x3
(50/40/10) OHC3	ASTM D6484 Open Hole Compression (1) [0/0/45/0/90/-45/0/45/0/-45]S	Strength		1x2x3		3x2x3
(25/50/25 - QI) UNT1	ASTM D3039 Un-notched Tension [45/0/-45/90]3S	Strength & Modulus	3x2x3	3x2x3	1x2x3	3x2x3
(10/80/10) UNT2	ASTM D3039 Un-notched Tension [45/-45/0/45/-45/90/45/-45/45/-45]S	Strength & Modulus	3x2x3	1x2x3		1x2x3
(50/40/10) UNT3	ASTM D3039 Un-notched Tension [0/0/45/0/90/-45/0/45/0/-45]S	Strength & Modulus	3x2x3	1x2x3		1x2x3
(25/50/25 - QI) UNC1	ASTM D6641 Un-notched Compression [45/0/-45/90]3S	Strength & Modulus		3x2x3	1x2x3	3x2x3
(10/80/10) UNC2	ASTM D6641 Un-notched Compression [45/-45/0/45/-45/90/45/-45/45/-45]S	Strength & Modulus		1x2x3		3x2x3
(50/40/10) UNC3	ASTM D6641 Un-notched Compression [0/0/45/0/90/-45/0/45/0/-45]S	Strength & Modulus		1x2x3		3x2x3
(25/50/25 - QI) SBS1	ASTM D2344 Short Beam [45/0/-45/90]3S	Strength		3x2x3	1x2x3	3x2x3
(25/50/25 - QI) FHT1	ASTM D6742 Filled Hole Tension (2) [45/0/-45/90]3S	Strength	3x2x3	1x2x3		
(10/80/10) FHT2	ASTM D6742 Filled Hole Tension (2) [45/-45/0/45/-45/90/45/-45/45/-45]S	Strength	1x2x3	1x2x3		1x2x3
(50/40/10) FHT3	ASTM D6742 Filled Hole Tension (2) [0/0/45/0/90/-45/0/45/0/-45]S	Strength	1x2x3	1x2x3		
(25/50/25 - QI) FHC1	ASTM D6742 Filled Hole Compression (2) [45/0/-45/90]3S	Strength		1x2x3		3x2x3
(10/80/10) FHC2	ASTM D6742 Filled Hole Compression (2) [45/-45/0/45/-45/90/45/-45/45/-45]S	Strength		1x2x3		3x2x3
(50/40/10) FHC3	ASTM D6742 Filled Hole Compression (2) [0/0/45/0/90/-45/0/45/0/-45]S	Strength		1x2x3		3x2x3
(25/50/25 - QI) SSB1	ASTM D5961 Single Shear Bearing (3) [45/0/-45/90]3S	Strength		3x2x3		3x2x3
(10/80/10) SSB2	ASTM D5961 Single Shear Bearing (3) [45/-45/0/45/-45/90/45/-45/45/-45]S	Strength		1x2x3		3x2x3
(50/40/10) SSB3	ASTM D5961 Single Shear Bearing (3) [0/0/45/0/90/-45/0/45/0/-45]S	Strength		1x2x3		3x2x3
(100/0/0) ILT	ASTM D6415 Interlaminar Tension (4) [0/45/90/-45]4S	Strength		1x1x6		1x1x6
(25/50/25 - QI) CAI1	SACMA SRM 2R Compression After Impact (1500 in.lb/in) [0/45/90/-45]4S	Strength		1x1x6		

Note 1: Open-hole configuration: 0.25” hole diameter, 1.5 inch width
Note 2: Filled-hole test configuration: 0.25” diameter, protruding head fastener, 1.5” width
Note 3: Single shear bearing test configuration: 0.25: hole diameter, 1.5” width, one protruding head fastener, e/D=3
Note 4: Interlaminar tension test as specified above

Table 1-3: Laminate Level Tests – Unidirectional Tape

1.5.4 Cured Laminate Physical Testing

The cured physical testing was conducted at ACG can be found in Table 1-4.

The following physical test results were conducted on all test laminates 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.

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)

Table 1-4: Physical Testing Matrix

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

Note 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) shall be tested by Method I, Procedure B for carbon reinforcements and Procedure G for glass or quartz reinforcements.

Note 3: Minimum 24 dry and 24 wet for each material system, 3 dry & 3 wet per traveler coupon for equivalency testing.

1.5.5 Physical Testing

Physical testing was conducted at the prepreg level at ACG. See results in section 8 below. The cured physical testing results obtained by NIAR can be found in the individual summary charts in section 2.1 below.

1.5.6 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.

1.5.7 Fluid Sensitivity Screening

Fluid sensitivity was not conducted on this material. Per the test plan, it is only performed on a limited number of reinforcement types.

1.5.8 Normalization Procedures

The nominal cure ply thicknesses for each material type are given in Appendix 3 of AI/TR/1392 Rev E (or later revisions). 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 145 g/m^2 and the average of the four batches of material was 143.85 g/m^2 therefore normalization by cured ply thickness (CPT) was used, i.e.:

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

The nominal CPT is 0.0055 inch and the average CPT was 0.0056 inch. Individual ply thicknesses can be found in each individual summary sheet, but as an example, the range for each panel was between 0.0050 and 0.0066 inch CPT. The CPT of the individual specimens was also shown to be close to the nominal CPT.

1.5.9 Conformity

All laminates and specimens for design allowable were inspected for conformance with the requirements of this document and Appendices 1 and 2 of AI/TR/1392 Rev E. For all materials requiring FAA approval, the conformance was verified by an FAA approved designated airworthiness representative (DAR). Test setup and methods were approved and witnessed by the FAA or authorized designated engineering representative (DER) as required.

1.5.10 Material Pedigree Information

The PMC Data collection template includes the material pedigree information required, such as material and batch information, as well as environmental conditioning and test results.

2. Test Results

2.1 Lamina Level Test Summary

Prepreg Material: Advanced Composites Group - MTM45-1/IM7-145 gsm Unidirectional Tape
Material Specification: ACGM 1001-06 or NMS 451/6
Process Specification: ACGP 1001-02 or NPS 81451 "MH" Cure Cycle

ACG - MTM45-1/IM7
Unidirectional Tape
Lamina Properties Summary

Fiber: Hexcel Corp., IM7-GP fiber, 12K tow (HS-CP-5000/IM7specification) **Resin:** MTM45-1

Tg(dry): 349.06°F **Tg(wet):** 317.11°F **Tg METHOD:** DMA (SRM 18R-94)

	Batch A/B/C	Batch B/C/D (IPS Retest)
Fiber Batch Information:	3763-7H, 3117-7B, 3666-7E	91M0040153, 91M0041735, 91M0042859, 91M0046147, 91M0048407
Date of fiber manufacture:	12/12/2006, 1/20/2005, 8/31/2006	8/8/2021, 11/30/2021, 2/23/2022, 9/20/2022, 1/23/2023
Resin Batch Information:	2781, 2699, 2751	XXG0DC, XXG0DB, GV094Y
Date of resin manufacture:	1/17/2007, 8/25/2006, 12/6/2006	5/31/2022, 5/31/2022, 1/28/2023
Date of prepreg manufacture:	1/17/2007, 8/25/2006, 12/6/2006	6/10/2022, 6/9/2022, 5/5/2023
Date of composite manufacture:	1/18/2007, 9/25/2006, 12/6/2007	5/4/2023 to 9/19/2023
Date of testing:	3/2007 to 2/2008	5/24/2023 to 11/22/2023
Date of data submittal:	6/1/2008	11/27/2023

LAMINA MECHANICAL PROPERTY SUMMARY
Data reported as: Normalized & Measured
(Normalized by CPT= 0.0055 inch)

Properties	CTD (-65°F) Mean		RTD (75°F) Mean		ETD (200°F) Mean		ETW (200°F) Mean		ETW2 (250°F) Mean	
	Normalized	Measured	Normalized	Measured	Normalized	Measured	Normalized	Measured	Normalized	Measured
F_1^{tu} [ksi] from UNT0*	370.50	354.11	357.65	343.61	---	---	368.98	355.73	342.57	333.93
E_1^t [Msi]	23.36	22.34	22.90	22.00	---	---	22.12	21.37	23.82	23.24
F_2^{tu} [ksi]	---	8.34	---	7.59	---	---	---	4.30	---	3.49
E_2^t [Msi]	---	1.24	---	1.11	---	---	---	0.95	---	0.82
F_1^{cu} [ksi] from UNC0*	204.89	200.54	181.54	177.80	---	---	154.23	154.11	138.09	136.37
E_1^c [Msi]	20.41	19.96	20.24	19.84	---	---	20.25	20.13	20.42	20.21
ν_{12}^c	---	0.346	---	0.361	---	---	---	0.373	---	0.389
F_2^{cu} [ksi]	---	38.26	---	27.96	---	---	---	15.71	---	12.91
E_2^c [Msi]	---	1.30	---	1.22	---	---	---	1.09	---	1.01
ν_{21}^c	---	0.027	---	0.026	---	---	---	0.021	---	0.022
UNT0 Strength [ksi]	184.31	177.76	181.55	174.71	---	---	190.61	186.51	188.22	183.80
UNT0 Modulus [Msi]	11.62	11.21	11.62	11.19	---	---	11.43	11.20	13.09	12.79
UNC0 Strength [ksi]	116.81	113.57	99.65	96.80	90.17	87.80	83.27	82.24	76.56	75.32
UNC0 Modulus [Msi]	11.64	11.30	11.11	10.80	11.24	10.98	10.93	10.74	11.32	11.16
νUNC0	---	0.047	---	0.040	---	0.039	---	0.039	---	0.036
$F_{12}^{s0.2\%}$ [ksi]	---	8.404	---	6.386	---	5.010	---	4.094	---	3.219
$F_{12}^{s5\%strain}$ [ksi]	---	14.04	---	10.45	---	7.592	---	6.087	---	4.829
G_{12}^s [Msi]	---	0.690	---	0.566	---	0.465	---	0.416	---	0.328
SBS [ksi]	---	20.85	---	14.47	---	11.15	---	8.54	---	6.92

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

Table 2-1: Lamina Summary Data

2.2 Laminate Level Test Summary

Prepreg Material:	Advanced Composites Group - MTM45-1/IM7-145 gsm Unidirectional Tape				**ACG - MTM45-1/IM7 Unidirectional Tape Laminate Properties Summary**
Material Specification:	ACGM 1001-06 or NMS 451/6				
Process Specification:	ACGP 1001-02 or NPS 81451 "MH" Cure Cycle				
Fiber:	Hexcel Corp., IM7-GP fiber, 12K tow (HS-CP-5000/IM7specification)			**Resin:** MTM45-1	
Tg(dry)	349.06°F	**Tg(wet)**	317.11°F	**Tg METHOD:**	DMA (SRM 18R-94)

	Batch A	Batch B	Batch C		
Fiber Batch Information:	3763-7H	3117-7B	3666-7E		
Date of fiber manufacture:	12/12/2006	1/20/2005	8/31/2006		
Resin Batch Information:	2781	2699	2751	**Date of testing:**	3/2007 to 2/2008
Date of resin manufacture:	1/17/2007	8/25/2006	12/6/2006	**Date of data submittal:**	6/1/2008
Date of prepreg manufacture:	1/17/2007	8/25/2006	12/6/2006		
Date of composite manufacture:	1/18/2007	9/25/2006	12/6/2007		

LAMINATE MECHANICAL PROPERTY SUMMARY
Data reported as: Normalized & Measured
(Normalized by CPT= 0.0055 inch)

	Layup:	25/50/25		10/80/10		50/40/10	
	Test Condition	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
OHT Strength [ksi]	**CTD**	66.59	65.42	48.77	48.06	108.07	106.97
	RTD	68.01	66.79	46.98	46.41	115.39	113.42
	ETW	73.24	71.45	---	---	---	---
	ETW2	72.99	71.68	42.72	42.04	134.75	133.60
OHC Strength [ksi]	**RTD**	42.87	42.32	38.05	36.76	49.93	49.12
	ETW	34.76	33.97	---	---	---	---
	ETW2	31.91	31.61	25.71	25.20	39.70	39.41
UNT Strength [ksi]	**CTD**	130.69	128.55	78.43	75.90	207.55	200.97
	RTD	132.81	130.80	75.11	73.05	206.81	199.82
	ETW2	124.13	120.97	58.64	57.41	205.72	198.73
UNT Modulus [Msi]	**CTD**	8.27	8.14	5.07	4.90	12.96	12.55
	RTD	8.13	8.01	4.91	4.78	12.68	12.25
	ETW2	8.31	8.10	4.73	4.63	12.78	12.35
UNC Strength [ksi]	**RTD**	80.93	80.24	58.08	57.14	93.43	91.70
	ETW	70.42	67.84	---	---	---	---
	ETW2	59.76	59.32	42.47	41.77	71.40	70.08
UNC Modulus [Msi]	**RTD**	7.59	7.52	4.81	4.73	12.25	12.00
	ETW	7.67	7.39	---	---	---	---
	ETW2	7.52	7.46	4.45	4.37	11.53	11.30
νUNC	**RTD**	---	0.292	---	0.574	---	0.447
	ETW	---	0.319	---	---	---	---
	ETW2	---	0.292	---	0.584	---	0.440
FHT Strength [ksi]	**CTD**	69.79	68.61	52.73	50.82	105.08	100.27
	RTD	70.35	69.65	48.76	47.21	106.60	101.87
	ETW2	---	---	43.80	42.04	---	---
FHC Strength [ksi]	**RTD**	66.57	65.58	53.80	52.58	77.85	77.20
	ETW2	44.43	43.92	35.67	35.34	51.87	51.44
SBS1 Strength [ksi]	**RTD**	---	10.22	---	---	---	---
	ETW	---	7.12	---	---	---	---
	ETW2	---	5.80	---	---	---	---
2% Offset Bearing Strength [ksi]	**RTD**	94.24	93.92	101.38	99.58	99.93	98.65
	ETW2	82.04	82.33	78.84	76.16	77.41	77.50
CAI Strength [ksi]	**RTD**	36.83	36.47	---	---	---	---

Table 2-2: Laminate Summary Data

2.3 Individual Test Summaries

2.3.1 Longitudinal Tension Properties (LT)

Material: Advanced Composites Group - MTM45-1/ IM7 Uni

Tension, 1-axis
Gr/ Ep
ACG - MTM45-1/ IM7 Uni
[0]16

Resin content: 33.997 % w t **Comp. density:** 1.534 [g/cc]
Fiber volume: 57.183 % vol
Ply count: 16

Test method: ASTM D3039-00 **Modulus calculation:** 1000 to 3000 microstrain

Normalized by: 0.0055 in. CPT

		CTD		RTD		ETW		ETW2	
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		AFJX X1XB		AFJX X1XA		AFJX X1XN		AFJX X1XD	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
	Mean	23.36	22.34	22.90	22.00	22.12	21.37	23.82	23.24
	Minimum	21.96	21.22	21.46	21.10	20.73	20.36	22.68	21.56
	Maximum	25.11	22.99	25.47	22.75	23.74	22.34	25.23	25.07
E_1^t **(Msi)**	**C.V.(%)**	4.81	2.21	5.28	2.23	3.64	2.90	3.19	4.52
	No. Specimens	17		16		16		15	
	No. Prepreg Lots	3		3		3		3	

2.3.2 Transverse Tension Properties (TT)

Material:	Advanced Composites Group - MTM45-1/ IM7 Uni						**Tension, 2-axis** Gr/ Ep ACG - MTM45-1/ IM7 Uni [90]16		
Resin content:	34.546 % wt	**Comp. density:** 1.538 [g/cc]							
Fiber volume:	56.863 % vol								
Ply count:	16								
Test method:	ASTM D3039-00	**Modulus calculation:** 1000 to 3000 microstrain							
Normalized by:	NA								
		CTD		**RTD**		**ETW**		**ETW2**	
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		AFUX X1XB		AFUX X1XA		AFUX X1XN		AFUX X1XD	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
	Mean		8.34		7.59		4.30		3.49
	Minimum		5.33		5.41		2.56		2.43
	Maximum		10.42		9.52		5.29		4.52
F_2^{tu} (ksi)	**C.V.(%)**		16.97		16.97		23.44		21.10
	No. Specimens	18		21		19		18	
	No. Prepreg Lots	3		3		3		3	
	Mean		1.24		1.11		0.95		0.82
	Minimum		1.14		1.01		0.87		0.70
	Maximum		1.45		1.24		1.03		0.97
E_2^t (Msi)	**C.V.(%)**		6.07		5.08		5.12		7.55
	No. Specimens	22		23		19		18	
	No. Prepreg Lots	3		3		3		3	

2.3.3 Longitudinal Compression Properties (LC)

Material:	Advanced Composites Group - MTM45-1/ IM7 Uni							**Compression, 1-axis** Gr/ Ep ACG - MTM45-1/ IM7 Uni [0]16	
Resin content:	32.970 % wt		**Comp. density:** 1.536 [g/cc]						
Fiber volume:	58.174 % vol								
Ply count:	16								
Test method:	ASTM D6641-01e1		**Modulus calculation:** 1000 to 3000 microstrain						
Normalized by:	0.0055	in. CPT							
			CTD		**RTD**		**ETW**		**ETW2**	
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			AFLX X1XB		AFLX X1XA		AFLX X1XN		AFLX X1XD	
			Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
E_1^c (Msi)	**Mean**		20.41	19.96	20.24	19.84	20.25	20.13	20.42	20.21
	Minimum		17.71	18.36	18.01	18.25	18.54	18.61	18.91	18.82
	Maximum		22.49	21.60	21.75	21.03	22.22	21.34	21.75	21.45
	C.V.(%)		6.89	5.17	4.86	3.78	5.06	3.73	4.43	3.17
	No. Specimens		20		23		18		20	
	No. Prepreg Lots		3		3		3		3	
ν_{12}^c	**Mean**		0.346		0.361		0.373		0.389	
	No. Specimens		21		22		18		20	
	No. Prepreg Lots		3		3		3		3	

2.3.4 Transverse Compression Properties (TC)

Material: Advanced Composites Group - MTM45-1/ IM7 Uni

Resin content: 34.262 % wt **Comp. density:** 1.534 [g/cc]
Fiber volume: 56.995 % vol
Ply count: 16

Test method: ASTM D6641-01e1 **Modulus calculation:** 1000 to 3000 microstrain

Normalized by: NA

Compression, 2-axis
Gr/ Ep
ACG - MTM45-1/ IM7 Uni
[90]16

		CTD		RTD		ETW		ETW2	
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		AFZX X1XB		AFZX X1XA		AFZX X1XN		AFZX X1XD	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
F_2^{cu} (ksi)	**Mean**		38.26		27.96		15.71		12.91
	Minimum		33.54		26.37		13.58		12.16
	Maximum		43.16		29.30		17.06		14.50
	C.V.(%)		6.20		3.29		5.41		5.03
	No. Specimens	19		18		18		19	
	No. Prepreg Lots	3		3		3		3	
E_2^c (Msi)	**Mean**		1.30		1.22		1.09		1.01
	Minimum		1.18		1.16		0.96		0.93
	Maximum		1.48		1.30		1.15		1.15
	C.V.(%)		6.16		3.07		4.70		6.69
	No. Specimens	18		18		18		19	
	No. Prepreg Lots	3		3		3		3	
ν_{21}^c	**Mean**	0.027		0.026		0.021		0.022	
	No. Specimens	18		18		18		19	
	No. Prepreg Lots	3		3		3		3	

2.3.5 In-Plane Shear Properties (IPS)

Material:	Advanced Composites Group - MTM45-1/ IM7 Uni									**In-Plane Shear** Gr/ Ep ACG - MTM45-1/ IM7 Uni [45/-45]2S	
Resin content:	32.70 %wt	**Comp. density:** 1.521 [g/cc]									
Fiber volume:	57.49 %vol										
Ply count:	8										
Test method:	ASTM D3518-18	**Modulus calculation:** 2000 to 6000 microstrain									
Normalized by:	NA										
		CTD		**RTD**		**ETD**		**ETW**		**ETW2**	
Test Temperature [°F]		-65		75		200		200		250	
Moisture Conditioning		dry		dry		dry		equilibrium		equilibrium	
Equilibrium at T, RH								160 F,85%		160 F,85%	
Source code		AFNX XXXB		AFNX XXXA		AFNX XXXC		AFNX XXXN		AFNX XXXD	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
$F_{12}^{s0.2\%}$ (ksi)	**Mean**		8.404		6.386		5.010		4.094		3.219
	Minimum		8.098		6.068		4.839		3.873		2.997
	Maximum		8.717		6.681		5.214		4.453		3.847
	C.V.(%)		1.692		2.741		2.013		3.272		4.971
	No. Specimens	28		28		16		30		31	
	No. Prepreg Lots	3		3		3		3		3	
$F_{12}^{s5\%strain}$ (ksi)	**Mean**		14.04		10.45		7.592		6.087		4.829
	Minimum		13.37		9.875		7.416		5.764		4.468
	Maximum		14.94		10.92		7.791		6.608		5.326
	C.V.(%)		2.554		2.657		1.392		3.300		4.154
	No. Specimens	28		28		16		30		31	
	No. Prepreg Lots	3		3		3		3		3	
G_{12}^{s} (Msi)	**Mean**		0.690		0.566		0.465		0.416		0.328
	Minimum		0.661		0.529		0.453		0.392		0.306
	Maximum		0.740		0.595		0.482		0.448		0.353
	C.V.(%)		2.451		3.379		1.702		3.059		3.783
	No. Specimens	28		28		16		30		31	
	No. Prepreg Lots	3		3		3		3		3	

2.3.6 "50/0/50" Unnotched Tension 0 Properties (UNT0)

Material:	Advanced Composites Group - MTM45-1/ IM7 Uni							**Unnotched Tension 0** Gr/ Ep ACG - MTM45-1/ IM7 Uni [0/90]4S		
Resin content:	33.477 % w t		**Comp. dens** 1.528 [g/cc]							
Fiber volume:	57.441 % vol									
Ply count:	16									
Test method:	ASTM D3039-00		**Modulus calculation:** 1000 to 3000 microstrain							
Normalized by:	0.0055	in. CPT								
			CTD		**RTD**		**ETW**		**ETW2**	
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			AFPX X1XB		AFPX X1XA		AFPX X1XN		AFPX X1XD	
			Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
UNT0 Strength (ksi)	**Mean**		184.31	177.76	181.55	174.71	190.61	186.51	188.22	183.80
	Minimum		165.01	158.18	167.36	160.60	172.78	165.17	167.83	161.29
	Maximum		202.16	189.25	200.54	192.10	211.61	203.85	205.76	199.45
	C.V.(%)		5.81	4.95	4.94	4.76	5.38	4.82	6.60	6.00
	No. Specimens		18		19		22		20	
	No. Prepreg Lots		3		3		3		3	
UNT0 Modulus (Msi)	**Mean**		11.62	11.21	11.62	11.19	11.43	11.20	13.09	12.79
	Minimum		9.92	9.51	10.69	10.29	10.74	10.34	11.04	10.51
	Maximum		12.53	11.91	12.33	11.77	12.15	11.91	14.90	14.44
	C.V.(%)		5.20	4.70	4.48	3.91	3.99	3.39	6.92	7.41
	No. Specimens		18		20		22		20	
	No. Prepreg Lots		3		3		3		3	

2.3.7 "25/50/25" Unnotched Tension 1 Properties (UNT1)

Material:	Advanced Composites Group - MTM45-1/ IM7 Uni					**Unnotched Tension 1** Gr/ Ep ACG - MTM45-1/ IM7 Uni [45/0/-45/90]3S	
Resin content:	32.666 % wt	**Comp. density:** 1.532 [g/cc]					
Fiber volume:	58.292 % vol						
Ply count:	24						
Test method:	ASTM D3039-00	**Modulus calculation:** 1000 to 3000 microstrain					
Normalized by:	0.0055	in. CPT					
		CTD		**RTD**		**ETW2**	
Test Temperature [°F]		-65		75		250	
Moisture Conditioning		dry		dry		equilibrium	
Equilibrium at T, RH						160 F,85%	
Source code		AFAX X1XB		AFAX X1XA		AFAX X1XD	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
	Mean	130.69	128.55	132.81	130.80	124.13	120.97
	Minimum	119.58	117.88	125.59	123.17	114.85	111.02
	Maximum	144.13	140.31	146.63	142.85	129.07	126.33
UNT1 Strength (ksi)	**C.V.(%)**	5.78	5.26	4.94	4.23	4.37	4.62
	No. Specimens	18		18		6	
	No. Prepreg Lots	3		3		1	
	Mean	8.27	8.14	8.13	8.01	8.31	8.10
	Minimum	7.71	7.59	7.65	7.50	7.89	7.63
	Maximum	8.83	8.83	8.41	8.32	9.00	8.75
UNT1 Modulus (Msi)	**C.V.(%)**	3.58	3.91	2.33	2.59	5.38	5.50
	No. Specimens	18		18		6	
	No. Prepreg Lots	3		3		1	

2.3.8 "10/80/10" Unnotched Tension 2 Properties (UNT2)

Material:	Advanced Composites Group - MTM45-1/ IM7 Uni					**Unnotched Tension 2**	
						Gr/ Ep	
Resin content:	32.040 % wt		**Comp. density:** 1.534 [g/cc]			**ACG - MTM45-1/ IM7 Uni**	
Fiber volume:	58.903 % vol					**[45/-45/0/45/-45/90/45/-45/45/-**	
Ply count:	20						
Test method:	ASTM D3039-00		**Modulus calculation:** 1000 to 3000 microstrain				
Normalized by:	0.0055	in. CPT					
			CTD		**RTD**		**ETW2**
Test Temperature [°F]			-65		75		250
Moisture Conditioning			dry		dry		equilibrium
Equilibrium at T, RH							160 F,85%
Source code			AFBX X1XB		AFBX X1XA		AFBX X1XD
			Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
	Mean		78.43	75.90	75.11	73.05	58.64	57.41
	Minimum		74.13	71.98	73.09	71.66	56.96	55.29
	Maximum		82.57	79.74	77.60	75.28	61.22	60.14
UNT2 Strength (ksi)	**C.V.(%)**		4.06	3.98	1.95	1.69	3.23	3.61
	No. Specimens		6		6		6	
	No. Prepreg Lots		1		1		1	
	Mean		5.07	4.90	4.91	4.78	4.73	4.63
	Minimum		4.82	4.66	4.80	4.67	4.58	4.45
	Maximum		5.30	5.13	5.12	5.00	4.98	4.89
UNT2 Modulus (Msi)	**C.V.(%)**		3.01	3.14	2.35	2.45	3.37	3.75
	No. Specimens		6		6		6	
	No. Prepreg Lots		1		1		1	

2.3.9 "50/40/10" Unnotched Tension 3 Properties (UNT3)

Material:	Advanced Composites Group - MTM45-1/ IM7 Uni					**Unnotched Tension 3**	
						Gr/ Ep	
Resin content:	32.006 % wt		**Comp. density:** 1.538 [g/cc]			**ACG - MTM45-1/ IM7 Uni**	
Fiber volume:	59.072 % vol					**[0/0/45/0/90/-45/0/45/0/-45]S**	
Ply count:	20						
Test method:	ASTM D3039-00		**Modulus calculation:** 1000 to 3000 microstrain				
Normalized by:	0.0055	in. CPT					
			CTD		**RTD**		**ETW2**
Test Temperature [°F]			-65		75		250
Moisture Conditioning			dry		dry		equilibrium
Equilibrium at T, RH							160 F,85%
Source code			AFCX X1XB		AFCX X1XA		AFCX X1XD
			Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
	Mean		207.55	200.97	206.81	199.82	205.72	198.73
	Minimum		186.03	182.87	193.50	185.90	195.18	188.08
	Maximum		217.78	211.81	217.97	213.13	215.26	205.64
UNT3 Strength (ksi)	**C.V.(%)**		5.37	4.95	5.08	4.99	3.91	3.78
	No. Specimens		6		6		6	
	No. Prepreg Lots		1		1		1	
	Mean		12.96	12.55	12.68	12.25	12.78	12.35
	Minimum		11.70	11.50	11.70	11.24	11.78	11.35
	Maximum		13.78	13.40	13.16	12.81	13.70	13.23
UNT3 Modulus (Msi)	**C.V.(%)**		5.51	5.03	4.30	4.42	6.16	6.36
	No. Specimens		6		6		4	
	No. Prepreg Lots		1		1		1	

2.3.10 "50/0/50" Unnotched Compression 0 Properties (UNC0)

Material:	Advanced Composites Group - MTM45-1/ IM7 Uni									**Unnotched Compression 0** Gr/ Ep ACG - MTM45-1/ IM7 Uni [90/0]4S	
Resin content:	34.557 % wt			**Comp. density:** 1.537 [g/cc]							
Fiber volume:	56.824 % vol										
Ply count:	16										
Test method:	ASTM D6641-01e1			**Modulus calculation:** 1000 to 3000 microstrain							
Normalized by:	0.0055	in. CPT									
		CTD		**RTD**		**ETD**		**ETW**		**ETW2**	
Test Temperature [°F]		-65		75		200		200		250	
Moisture Conditioning		dry		dry		dry		equilibrium		equilibrium	
Equilibrium at T, RH								160 F,85%		160 F,85%	
Source code		AFRX X1XB		AFRX X1XA		AFRX X1XC		AFRX X1XN		AFRX X1XD	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
UNC0 Strength (ksi)	**Mean**	116.81	113.57	99.65	96.80	90.17	87.80	83.27	82.24	76.56	75.32
	Minimum	100.64	97.97	82.62	82.16	80.27	77.88	76.37	74.28	59.64	60.63
	Maximum	134.00	131.53	114.34	108.43	98.91	95.86	88.91	89.36	86.65	84.62
	C.V.(%)	8.84	8.99	9.69	8.52	6.76	7.00	6.62	6.71	9.90	9.03
	No. Specimens	10		8		8		6		9	
	No. Prepreg Lots	2		2		2		2		2	
UNC0 Modulus (Msi)	**Mean**	11.64	11.30	11.11	10.80	11.24	10.98	10.93	10.74	11.32	11.16
	Minimum	9.88	9.71	10.16	9.76	9.78	9.59	9.23	9.05	10.31	10.07
	Maximum	13.25	12.70	12.24	11.86	12.05	11.72	12.42	12.10	12.83	12.69
	C.V.(%)	10.38	9.30	6.54	6.64	6.46	6.40	7.90	7.62	6.89	6.95
	No. Specimens	10		8		11		12		11	
	No. Prepreg Lots	2		2		2		2		2	
ν_{UNC0}	**Mean**	0.047		0.040		0.039		0.039		0.036	
	No. Specimens	12		11		11		12		11	
	No. Prepreg Lots	2		2		2		2		2	

*See Section 9 Deviations, for further explanation on the data not included.

2.3.11 "25/50/25" Unnotched Compression 1 Properties (UNC1)

Material:	Advanced Composites Group - MTM45-1/ IM7 Uni					**Unnotched Compression 1** Gr/ Ep ACG - MTM45-1/ IM7 Uni [45/0/-45/90]3S	
Resin content:	32.597 % wt		**Comp. density:** 1.511 [g/cc]				
Fiber volume:	57.543 % vol						
Ply count:	24						
Test method:	ASTM D6641-01e1		**Modulus calculation:** 1000 to 3000 microstrain				
Normalized by:	0.0055	in. CPT					
			RTD		**ETW**		**ETW2**
Test Temperature [°F]			75		200		250
Moisture Conditioning			dry		equilibrium		equilibrium
Equilibrium at T, RH					160 F,85%		160 F,85%
Source code			AF0X X1XA		AF0X X1XN		AF0X X1XD
			Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
UNC1 Strength (ksi)	**Mean**		80.93	80.24	70.42	67.84	59.76	59.32
	Minimum		76.38	73.65	68.74	66.22	54.04	53.78
	Maximum		84.90	84.97	71.71	69.21	68.08	65.41
	C.V.(%)		3.57	4.61	2.16	2.23	7.51	6.29
	No. Specimens		12		3		13	
	No. Prepreg Lots		3		1		3	
UNC1 Modulus (Msi)	**Mean**		7.59	7.52	7.67	7.39	7.52	7.46
	Minimum		7.23	7.22	7.64	7.36	7.09	6.96
	Maximum		8.01	7.90	7.74	7.44	8.07	8.10
	C.V.(%)		3.05	2.52	0.74	0.61	3.36	4.00
	No. Specimens		13		3		15	
	No. Prepreg Lots		3		1		3	

2.3.12 "10/80/10" Unnotched Compression 2 Properties (UNC2)

Material:	Advanced Composites Group - MTM45-1/ IM7 Uni					**Unnotched Compression 2** Gr/ Ep ACG - MTM45-1/ IM7 Uni [45/-45/0/45/-45/90/45/-45/45/-	
Resin content:	33.050 % wt		**Comp. density:** 1.526 [g/cc]				
Fiber volume:	57.736 % vol						
Ply count:	20						
Test method:	ASTM D6641-01e1		**Modulus calculation:** 1000 to 3000 microstrain				
Normalized by:	0.0055	in. CPT					
			RTD		**ETW2**		
Test Temperature [°F]			75		250		
Moisture Conditioning			dry		equilibrium		
Equilibrium at T, RH					160 F,85%		
Source code			AFXX X1XA		AFXX X1XD		
			Normalized	**Measured**	**Normalized**	**Measured**	
UNC2 Strength (ksi)	**Mean**		58.08	57.14	42.47	41.77	
	Minimum		53.44	52.91	41.07	40.49	
	Maximum		63.71	62.96	44.39	43.57	
	C.V.(%)		5.63	5.48	3.14	3.11	
	No. Specimens		7		6		
	No. Prepreg Lots		1		1		
UNC2 Modulus (Msi)	**Mean**		4.81	4.73	4.45	4.37	
	Minimum		4.57	4.52	4.38	4.31	
	Maximum		4.93	4.88	4.52	4.46	
	C.V.(%)		2.71	2.49	1.22	1.30	
	No. Specimens		6		7		
	No. Prepreg Lots		1		1		

2.3.13 "50/40/10" Unnotched Compression 3 Properties (UNC3)

Material:	Advanced Composites Group - MTM45-1/ IM7 Uni					**Unnotched Compression 3**	
Resin content:	33.394 % wt	**Comp. density:** 1.531 [g/cc]				**Gr/ Ep**	
Fiber volume:	57.627 % vol					**ACG - MTM45-1/ IM7 Uni**	
Ply count:	20					**[0/0/45/0/90/-45/0/45/0/-45]S**	
Test method:	ASTM D6641-01e1	**Modulus calculation:** 1000 to 3000 microstrain					
Normalized by:	0.0055	in. CPT					
		RTD		**ETW2**			
Test Temperature [°F]		75		250			
Moisture Conditioning		dry		equilibrium			
Equilibrium at T, RH				160 F,85%			
Source code		AFYX X1XA		AFYX X1XD			
		Normalized	**Measured**	**Normalized**	**Measured**		
UNC3 Strength (ksi)	**Mean**	93.43	91.70	71.40	70.08		
	Minimum	87.24	84.40	65.61	66.02		
	Maximum	98.71	95.83	75.52	73.84		
	C.V.(%)	4.63	4.40	5.28	4.50		
	No. Specimens	6		6			
	No. Prepreg Lots	1		1			
UNC3 Modulus (Msi)	**Mean**	12.25	12.00	11.53	11.30		
	Minimum	11.60	11.57	10.73	10.75		
	Maximum	12.70	12.29	11.91	11.63		
	C.V.(%)	3.14	2.42	3.92	3.24		
	No. Specimens	7		7			
	No. Prepreg Lots	1		1			

2.3.14 Lamina Short-Beam Strength Properties (SBS)

Material: Advanced Composites Group - MTM45-1/ IM7 Uni

Short Beam Strength
Gr/ Ep
ACG - MTM45-1/ IM7 Uni
[0]16

Resin content: NA **Comp. density:** NA
Fiber volume: NA
Ply count: 16

Test method: ASTM D2344-00

Normalized by: NA

		CTD		RTD		ETD		ETW		ETW2	
Test Temperature [°F]		-65		75		200		200		250	
Moisture Conditioning		dry		dry		dry		equilibrium		equilibrium	
Equilibrium at T, RH								160 F,85%		160 F,85%	
Source code		AFQX X1XB		AFQX X1XA		AFQX X1XC		AFQX X1XN		AFQX X1XD	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
	Mean		20.85		14.47		11.15		8.54		6.92
	Minimum		18.95		13.85		10.59		8.33		6.18
	Maximum		22.39		15.18		11.57		9.12		7.65
SBS (ksi)	**C.V.(%)**		4.64		3.75		2.77		2.24		4.10
	No. Specimens	14		6		13		18		19	
	No. Prepreg Lots	3		3		3		3		3	

2.3.15 Laminate Short-Beam Strength Properties (SBS1)

Material:	Advanced Composites Group - MTM45-1/ IM7 Uni				**Laminate Short Beam Strength**		
Resin content:	NA	**Comp. density:** NA			**Gr/ Ep**		
Fiber volume:	NA				**ACG - MTM45-1/ IM7 Uni**		
Ply count:	24				**[45/0/-45/90]3S**		
Test method:	ASTM D2344-00						
Normalized by:	NA						
		RTD		**ETW**		**ETW2**	
Test Temperature [°F]		75		200		250	
Moisture Conditioning		dry		equilibrium		equilibrium	
Equilibrium at T, RH				160 F,85%		160 F,85%	
Source code		AFqX XGXA		AFqX XGXN		AFqX XGXD	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
	Mean		10.22		7.12		5.80
	Minimum		8.85		6.51		3.24
	Maximum		11.65		7.46		6.34
SBS1 (ksi)	**C.V.(%)**		8.59		7.38		13.48
	No. Specimens	12		3		13	
	No. Prepreg Lots	3		1		3	

2.3.16 "25/50/25" Open-Hole Tension 1 Properties (OHT1)

Material:	Advanced Composites Group - MTM45-1/ IM7 Uni							**Open-Hole Tension 1** **Gr/ Ep** **ACG - MTM45-1/ IM7 Uni** **[45/0/-45/90]3S**	
Resin content:	33.396 % wt	**Comp. density:** 1.531 [g/cc]							
Fiber volume:	57.592 % vol								
Ply count:	24								
Test method:	ASTM D5766-02a								
Normalized by:	0.0055	in. CPT							
		CTD		**RTD**		**ETW**		**ETW2**	
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		AFDX X1XB		AFDX X1XA		AFDX X1XN		AFDX X1XD	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
OHT1 Strength (ksi)	**Mean**	66.59	65.42	68.01	66.79	73.24	71.45	72.99	71.68
	Minimum	62.52	60.59	64.64	63.40	70.05	67.65	65.96	65.38
	Maximum	70.75	69.38	73.19	71.30	77.07	75.73	78.69	75.95
	C.V.(%)	3.57	3.72	3.67	3.17	3.36	3.78	5.14	4.54
	No. Specimens	18		19		6		19	
	No. Prepreg Lots	3		3		1		3	

2.3.17 "10/80/10" Open-Hole Tension 2 Properties (OHT2)

Material:	Advanced Composites Group - MTM45-1/ IM7 Uni					**Open-Hole Tension 2** Gr/ Ep ACG - MTM45-1/ IM7 Uni [45/-45/0/45/-45/90/45/-45/45/-45]S	
Resin content:	32.093 % wt	**Comp. density:** 1.533 [g/cc]					
Fiber volume:	58.824 % vol						
Ply count:	20						
Test method:	ASTM D5766-02a						
Normalized by:	0.0055	in. CPT					
		CTD		**RTD**		**ETW2**	
Test Temperature [°F]		-65		75		250	
Moisture Conditioning		dry		dry		equilibrium	
Equilibrium at T, RH						160 F,85%	
Source code		AFEX X1XB		AFEX X1XA		AFEX X1XD	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
OHT2 Strength (ksi)	**Mean**	48.77	48.06	46.98	46.41	42.72	42.04
	Minimum	47.50	46.12	44.34	44.46	40.44	40.34
	Maximum	52.81	52.19	48.68	48.90	44.11	43.79
	C.V.(%)	2.79	2.81	3.50	3.54	3.44	2.75
	No. Specimens	18		6		6	
	No. Prepreg Lots	3		1		1	

2.3.18 "50/40/10" Open-Hole Tension 3 Properties (OHT3)

Material:	Advanced Composites Group - MTM45-1/ IM7 Uni					**Open-Hole Tension 3**	
						Gr/ Ep	
Resin content:	32.707 % wt		**Comp. density:** 1.530 [g/cc]			**ACG - MTM45-1/ IM7 Uni**	
Fiber volume:	58.187 % vol					**[0/0/45/0/90/-45/0/45/0/-45]S**	
Ply count:	20						
Test method:	ASTM D5766-02a						
Normalized by:	0.0055	in. CPT					
		CTD		**RTD**		**ETW2**	
Test Temperature [°F]		-65		75		250	
Moisture Conditioning		dry		dry		equilibrium	
Equilibrium at T, RH						160 F,85%	
Source code		AFFX X1XB		AFFX X1XA		AFFX X1XD	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
OHT3 Strength (ksi)	**Mean**	108.07	106.97	115.39	113.42	134.75	133.60
	Minimum	95.97	94.08	108.07	103.46	109.98	112.02
	Maximum	117.28	118.68	123.73	124.07	147.71	143.92
	C.V.(%)	6.04	6.16	3.80	5.51	9.80	8.14
	No. Specimens	18		8		7	
	No. Prepreg Lots	3		1		1	

2.3.19 "25/50/25" Filled-Hole Tension 1 Properties (FHT1)

Material:	Advanced Composites Group - MTM45-1/ IM7 Uni					**Filled-Hole Tension 1** Gr/ Ep ACG - MTM45-1/ IM7 Uni [45/0/-45/90]3S	
Resin content:	32.804 % wt	**Comp. density** 1.530 [g/cc]					
Fiber volume:	58.097 % vol						
Ply count:	24						
Test method:	ASTM D6742-02						
Normalized by:	0.0055	in. CPT					
		CTD		**RTD**			
Test Temperature [°F]		-65		75			
Moisture Conditioning		dry		dry			
Equilibrium at T, RH							
Source code		AF4X X1XB		AF4X X1XA			
		Normalized	**Measured**	**Normalized**	**Measured**		
FHT1 Strength (ksi)	**Mean**	69.79	68.61	70.35	69.65		
	Minimum	66.98	65.54	67.78	66.18		
	Maximum	74.36	73.75	73.19	72.10		
	C.V.(%)	2.46	2.83	2.51	2.82		
	No. Specimens	22		8			
	No. Prepreg Lots	2		1			

2.3.20 "10/80/10" Filled-Hole Tension 2 Properties (FHT2)

Material:	Advanced Composites Group - MTM45-1/ IM7 Uni					**Filled-Hole Tension 2** **Gr/ Ep** **ACG - MTM45-1/ IM7 Uni** **[45/-45/0/45/-45/90/45/-45/45/-45]S**	
Resin content:	33.586 % wt	**Comp. density** 1.537 [g/cc]					
Fiber volume:	57.662 % vol						
Ply count:	20						
Test method:	ASTM D6742-02						
Normalized by:	0.0055	in. CPT					
		CTD		**RTD**		**ETW2**	
Test Temperature [°F]		-65		75		250	
Moisture Conditioning		dry		dry		equilibrium	
Equilibrium at T, RH						160 F,85%	
Source code		AF5X X1XB		AF5X X1XA		AF5X X1XD	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
FHT2 Strength (ksi)	**Mean**	52.73	50.82	48.76	47.21	43.80	42.04
	Minimum	50.84	48.50	47.37	45.46	41.25	40.00
	Maximum	53.96	52.13	50.72	48.90	45.46	43.36
	C.V.(%)	1.87	2.21	2.44	2.38	3.16	2.75
	No. Specimens	7		7		6	
	No. Prepreg Lots	1		1		1	

2.3.21 "50/40/10" Filled-Hole Tension 3 Properties (FHT3)

Material:	Advanced Composites Group - MTM45-1/ IM7 Uni					**Filled-Hole Tension 3**	
						Gr/ Ep	
Resin content:	34.156 % wt		**Comp. density** 1.538 [g/cc]			**ACG - MTM45-1/ IM7 Uni**	
Fiber volume:	57.213 % vol					**[0/0/45/0/90/-45/0/45/0/-45]S**	
Ply count:	20						
Test method:	ASTM D6742-02						
Normalized by:	0.0055	in. CPT					
			CTD		**RTD**		
Test Temperature [°F]			-65		75		
Moisture Conditioning			dry		dry		
Equilibrium at T, RH							
Source code			AF6X X1XB		AF6X X1XA		
			Normalized	**Measured**	**Normalized**	**Measured**	
FHT3 Strength (ksi)	**Mean**		105.08	100.27	106.60	101.87	
	Minimum		94.56	90.44	103.80	99.11	
	Maximum		109.74	104.73	109.33	104.30	
	C.V.(%)		6.77	6.60	2.84	2.42	
	No. Specimens		4		4		
	No. Prepreg Lots		1		1		

2.3.22 "25/50/25" Open-Hole Compression 1 Properties (OHC1)

Material:	Advanced Composites Group - MTM45-1/ IM7 Uni		**Open-Hole Compression 1** **Gr/ Ep** **ACG - MTM45-1/ IM7 Uni** **[45/0/-45/90]3S**
Resin content:	33.327 % wt	**Comp. density:** 1.527 [g/cc]	
Fiber volume:	57.525 % vol		
Ply count:	24		
Test method:	ASTM D6484-04		
Normalized by:	0.0055	in. CPT	

		RTD		ETW		ETW2	
Test Temperature [°F]		75		200		250	
Moisture Conditioning		dry		equilibrium		equilibrium	
Equilibrium at T, RH				160 F,85%		160 F,85%	
Source code		AFGX X1XA		AFGX X1XN		AFGX X1XD	
		Normalized	**Measured**	**Normalized**	**Measured**	**Normalized**	**Measured**
OHC1 Strength (ksi)	**Mean**	42.87	42.32	34.76	33.97	31.91	31.61
	Minimum	41.35	40.80	34.12	33.57	30.18	30.44
	Maximum	45.10	43.43	35.40	34.89	34.36	33.46
	C.V.(%)	2.44	1.77	1.29	1.39	3.42	2.65
	No. Specimens	18		6		18	
	No. Prepreg Lots	3		1		3	

2.3.23 "10/80/10" Open-Hole Compression 2 Properties (OHC2)

Material:	Advanced Composites Group - MTM45-1/ IM7 Uni				**Open-Hole Compression 2** **Gr/ Ep** **ACG - MTM45-1/ IM7 Uni** **[45/-45/0/45/-45/90/45/-45/45/-45]S**		
Resin content:	33.740 % wt	**Comp. density:** 1.534 [g/cc]					
Fiber volume:	57.424 % vol						
Ply count:	20						
Test method:	ASTM D6484-04						
Normalized by:	0.0055	in. CPT					
			RTD		**ETW2**		
Test Temperature [°F]			75		250		
Moisture Conditioning			dry		equilibrium		
Equilibrium at T, RH					160 F,85%		
Source code			AFHX X1XA		AFHX X1XD		
			Normalized	**Measured**	**Normalized**	**Measured**	
OHC2 Strength (ksi)	**Mean**		38.05	36.76	25.71	25.20	
	Minimum		36.84	35.90	24.11	23.88	
	Maximum		39.94	37.53	27.39	26.78	
	C.V.(%)		3.26	1.53	3.82	3.08	
	No. Specimens		6		18		
	No. Prepreg Lots		1		3		

2.3.24 "50/40/10" Open-Hole Compression 3 Properties (OHC3)

Material:	Advanced Composites Group - MTM45-1/ IM7 Uni				**Open-Hole Compression 3** **Gr/ Ep** **ACG - MTM45-1/ IM7 Uni** **[0/0/45/0/90/-45/0/45/0/-45]S**		
Resin content:	33.155 % wt	**Comp. density:** 1.527 [g/cc]					
Fiber volume:	57.660 % vol						
Ply count:	20						
Test method:	ASTM D6484-04						
Normalized by:	0.0055	in. CPT					
			RTD		**ETW2**		
Test Temperature [°F]			75		250		
Moisture Conditioning			dry		equilibrium		
Equilibrium at T, RH					160 F,85%		
Source code			AFIX X1XA		AFIX X1XD		
			Normalized	**Measured**	**Normalized**	**Measured**	
OHC3 Strength (ksi)	**Mean**		49.93	49.12	39.70	39.41	
	Minimum		44.21	41.99	35.42	34.13	
	Maximum		56.62	56.77	45.27	45.34	
	C.V.(%)		7.64	9.90	6.55	7.49	
	No. Specimens		7		18		
	No. Prepreg Lots		1		3		

2.3.25 "25/50/25" Filled-Hole Compression 1 Properties (FHC1)

Material:	Advanced Composites Group - MTM45-1/ IM7 Uni					**Filled-Hole Compression 1**	
Resin content:	33.465 % wt	**Comp. density**	1.534 [g/cc]			**Gr/ Ep**	
Fiber volume:	57.681 % vol					**ACG - MTM45-1/ IM7 Uni**	
Ply count:	24					**[45/0/-45/90]3S**	
Test method:	ASTM D6742-02						
Normalized by:	0.0055	in. CPT					
			RTD		**ETW2**		
Test Temperature [°F]			75		250		
Moisture Conditioning			dry		equilibrium		
Equilibrium at T, RH					160 F,85%		
Source code			AF7X X1XA		AF7X X1XD		
			Normalized	**Measured**	**Normalized**	**Measured**	
FHC1 Strength (ksi)	**Mean**		66.57	65.58	44.43	43.92	
	Minimum		64.41	63.22	42.09	41.35	
	Maximum		68.25	67.38	48.33	47.89	
	C.V.(%)		2.64	2.80	4.56	4.81	
	No. Specimens		6		18		
	No. Prepreg Lots		1		3		

2.3.26 "10/80/10" Filled-Hole Compression 2 Properties (FHC2)

Material:	Advanced Composites Group - MTM45-1/ IM7 Uni					**Filled-Hole Compression 2** Gr/ Ep ACG - MTM45-1/ IM7 Uni [45/-45/0/45/-45/90/45/-45/45/-45]S	
Resin content:	33.467 % wt	**Comp. density:** 1.537 [g/cc]					
Fiber volume:	57.775 % vol						
Ply count:	20						
Test method:	ASTM D6742-02						
Normalized by:	0.0055	in. CPT					
			RTD		**ETW2**		
Test Temperature [°F]			75		250		
Moisture Conditioning			dry		equilibrium		
Equilibrium at T, RH					160 F,85%		
Source code			AF8X X1XA		AF8X X1XD		
			Normalized	**Measured**	**Normalized**	**Measured**	
FHC2 Strength (ksi)	**Mean**		53.80	52.58	35.67	35.34	
	Minimum		50.93	50.29	32.68	32.17	
	Maximum		55.39	53.45	39.72	40.30	
	C.V.(%)		2.75	2.15	6.07	6.92	
	No. Specimens		7		18		
	No. Prepreg Lots		1		3		

2.3.27 "50/40/10" Filled-Hole Compression 3 Properties (FHC3)

Material:	Advanced Composites Group - MTM45-1/ IM7 Uni					**Filled-Hole Compression 3** Gr/ Ep ACG - MTM45-1/ IM7 Uni [0/0/45/0/90/-45/0/45/0/-45]S	
Resin content:	33.129 % wt	**Comp. density:** 1.539 [g/cc]					
Fiber volume:	58.157 % vol						
Ply count:	20						
Test method:	ASTM D6742-02						
Normalized by:	0.0055	in. CPT					
			RTD		**ETW2**		
Test Temperature [°F]			75		250		
Moisture Conditioning			dry		equilibrium		
Equilibrium at T, RH					160 F,85%		
Source code			AF9X X1XA		AF9X X1XD		
			Normalized	**Measured**	**Normalized**	**Measured**	
FHC3 Strength (ksi)	**Mean**		77.85	77.20	51.87	51.44	
	Minimum		75.38	74.50	42.47	42.73	
	Maximum		80.89	80.52	59.21	58.51	
	C.V.(%)		3.60	3.96	9.18	9.03	
	No. Specimens		3		15		
	No. Prepreg Lots		1		3		

2.3.28 "25/50/25" Pin Bearing 1 Properties (PB1)

Material:	Advanced Composites Group - MTM45-1/ IM7 Uni					**Pin Bearing 1** **Gr/ Ep** **ACG - MTM45-1/ IM7 Uni** **[45/0/-45/90]3S**	
Resin content:	33.291 % wt	**Comp. density** 1.539 [g/cc]					
Fiber volume:	57.993 % vol						
Ply count:	24						
Test method:	ASTM D5961-05						
Normalized by:	0.0055	in CPT					
		RTD		**ETW2**			
Test Temperature [°F]		75		250			
Moisture Conditioning		dry		equilibrium			
Equilibrium at T, RH				160 F,85%			
Source code		AF1X X1XA		AF1X X1XD			
		Normalized	**Measured**	**Normalized**	**Measured**		
PB1 2% Offset Strength (ksi)	**Mean**	94.24	93.92	82.04	82.33		
	Minimum	88.49	89.00	70.97	72.86		
	Maximum	102.71	102.33	89.58	90.73		
	C.V.(%)	3.80	3.77	6.56	6.29		
	No. Specimens	19		18			
	No. Prepreg Lots	3		3			

2.3.29 "10/80/10" Pin Bearing 2 Properties (PB2)

Material:	Advanced Composites Group - MTM45-1/ IM7 Uni					**Pin Bearing 2** Gr/ Ep ACG - MTM45-1/ IM7 Uni [45/-45/0/45/-45/90/45/-45/45/-45]S	
Resin content:	33.576 % wt	**Comp. density** 1.534 [g/cc]					
Fiber volume:	57.576 % vol						
Ply count:	20						
Test method:	ASTM D5961-05						
Normalized by:	0.0055	in CPT					
			RTD		**ETW2**		
Test Temperature [°F]			75		250		
Moisture Conditioning			dry		equilibrium		
Equilibrium at T, RH					160 F,85%		
Source code			AF2X X1XA		AF2X X1XD		
			Normalized	**Measured**	**Normalized**	**Measured**	
PB2 2% Offset Strength (ksi)	**Mean**		101.38	99.58	78.84	76.16	
	Minimum		95.73	94.19	62.31	59.91	
	Maximum		106.99	106.41	89.66	89.83	
	C.V.(%)		3.73	4.26	9.02	10.87	
	No. Specimens		6		18		
	No. Prepreg Lots		1		3		

2.3.30 "50/40/10" Pin Bearing 3 Properties (PB3)

Material:	Advanced Composites Group - MTM45-1/ IM7 Uni					**Pin Bearing 3** **Gr/ Ep** **ACG - MTM45-1/ IM7 Uni** **[0/0/45/0/90/-45/0/45/0/-45]S**	
Resin content:	33.446 % wt	**Comp. density** 1.538 [g/cc]					
Fiber volume:	57.818 % vol						
Ply count:	20						
Test method:	ASTM D5961-05						
Normalized by:	0.0055	in CPT					
			RTD		**ETW2**		
Test Temperature [°F]			75		250		
Moisture Conditioning			dry		equilibrium		
Equilibrium at T, RH					160 F,85%		
Source code			AF3X X1XA		AF3X X1XD		
			Normalized	**Measured**	**Normalized**	**Measured**	
PB3 2% Offset Strength (ksi)	**Mean**		99.93	98.65	77.41	77.50	
	Minimum		89.50	87.90	66.50	66.27	
	Maximum		106.37	103.82	85.63	86.84	
	C.V.(%)		6.04	5.98	5.93	6.19	
	No. Specimens		6		18		
	No. Prepreg Lots		1		3		

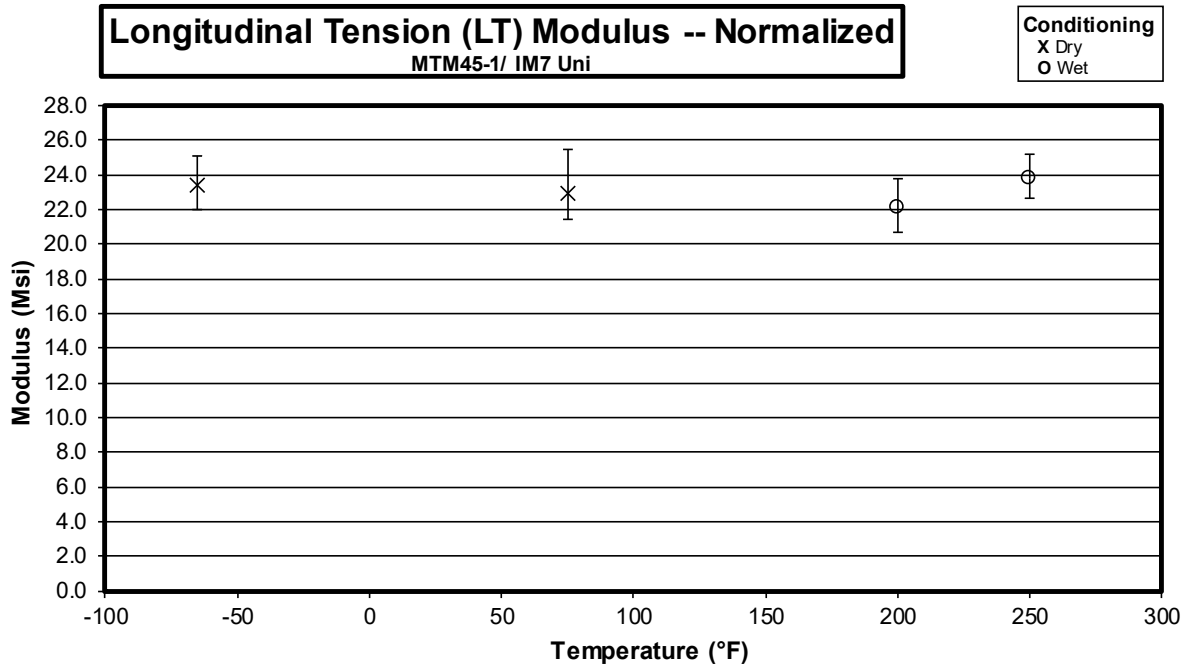
2.3.31 "25/50/25" Compression After Impact Properties (CAI1)

Material:	Advanced Composites Group - MTM45-1/ IM7 Uni			**Compression After Impact Layup 1**			
Resin content:	NA	**Comp. density:**	NA	**Gr/ Ep**			
Fiber volume:	NA			**ACG - MTM45-1/ IM7 Uni**			
Ply count:	32			**[0/45/90/-45]4S**			
Test method:	SACMA SRM 2R-94						
Normalized by:	0.0055	in. CPT					
			RTD				
Test Temperature [°F]			75				
Moisture Conditioning			dry				
Equilibrium at T, RH							
Source code			AFKX X1XA				
		Normalized	**Measured**				
CAI1 Strength (ksi)	**Mean**	36.83	36.47				
	Minimum	35.71	35.05				
	Maximum	39.22	38.84				
	C.V.(%)	3.52	3.85				
	No. Specimens	6					
	No. Prepreg Lots	1					

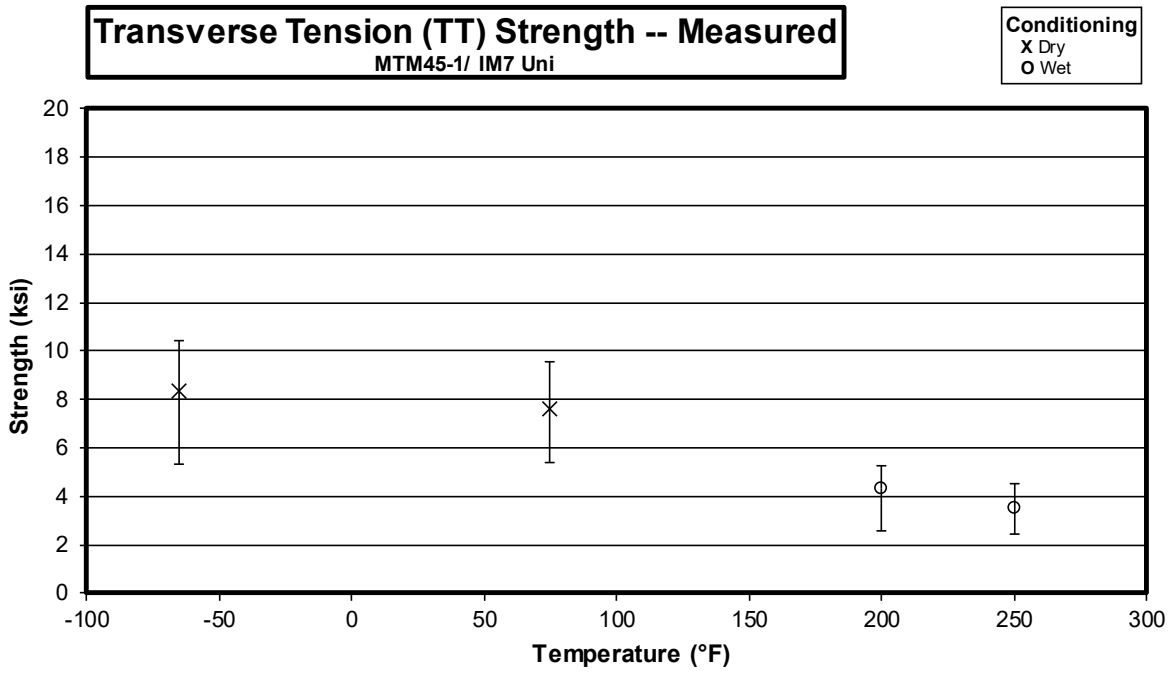
3. Individual Test Charts

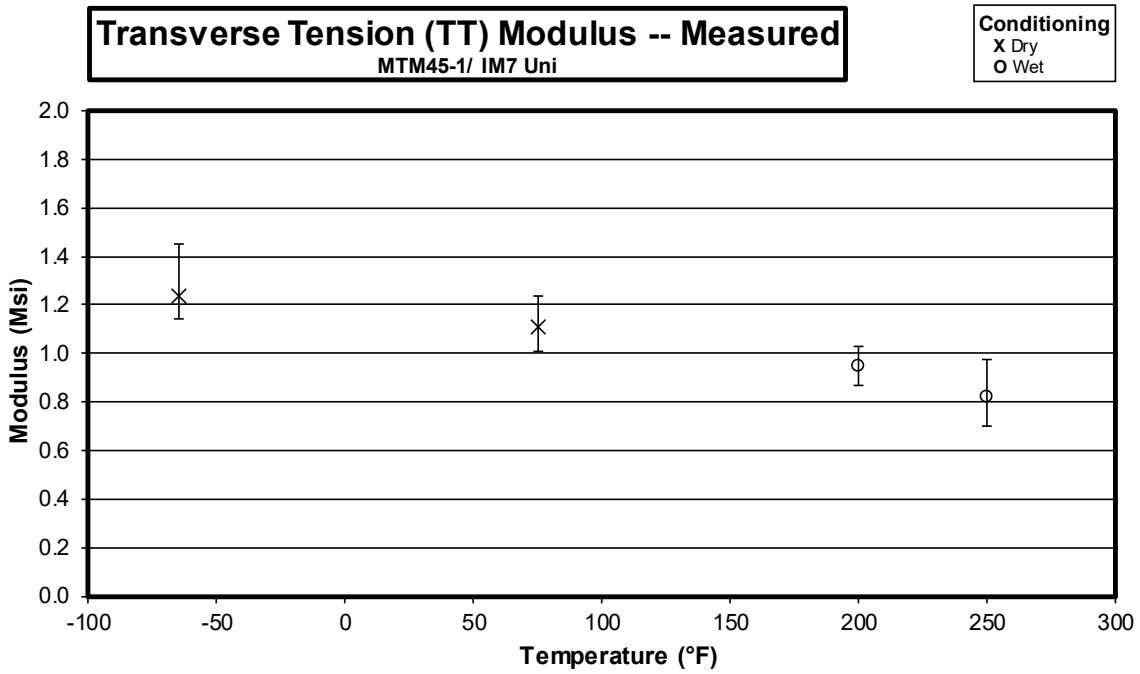
These charts combine all batches of data and plot the minimum and maximum modulus and strength range based on the test temperature.

3.1 Longitudinal Tension Properties (LT)

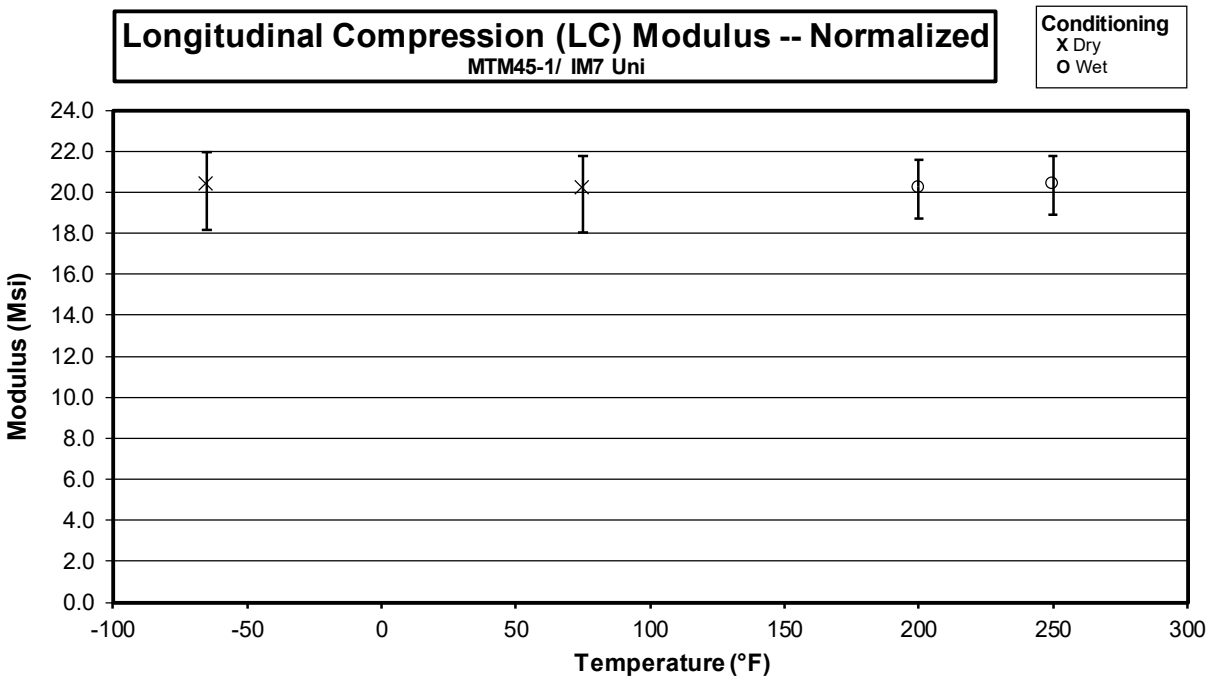


3.2 Transverse Tension Properties (TT)

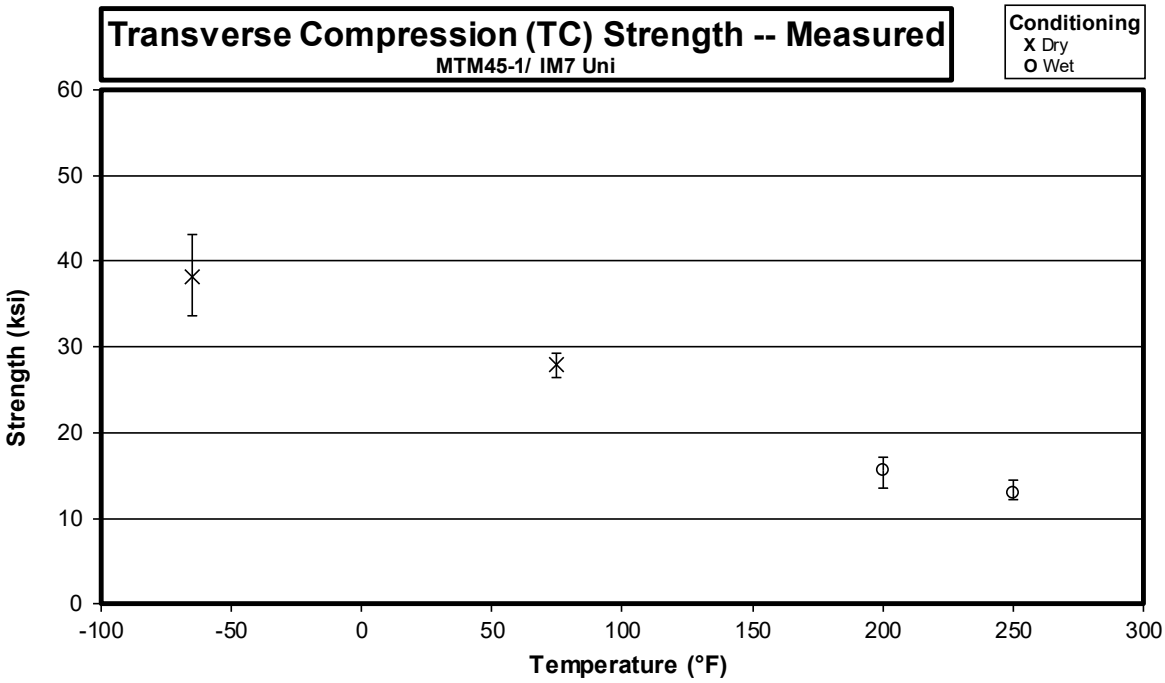


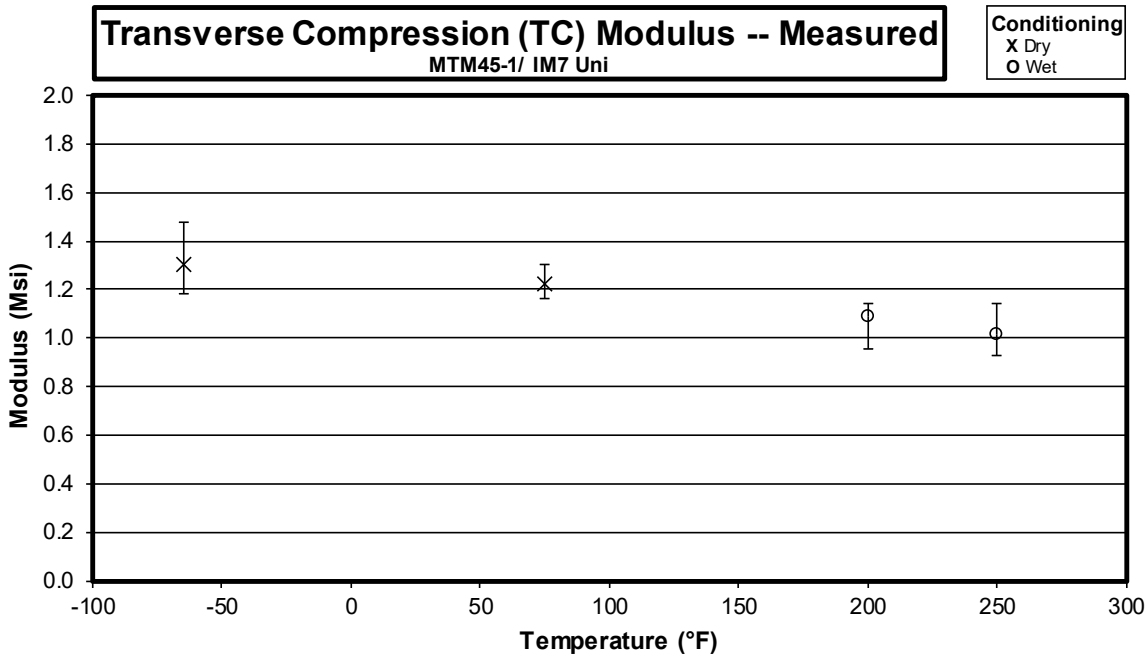


3.3 Longitudinal Compression Properties (LC)

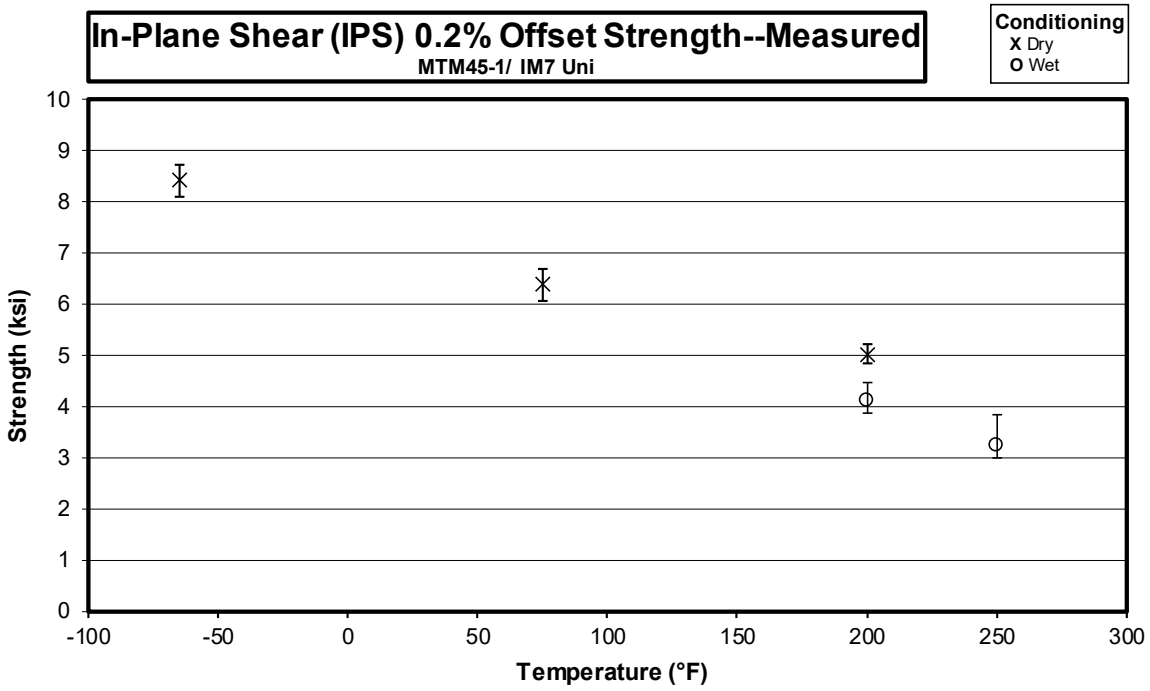


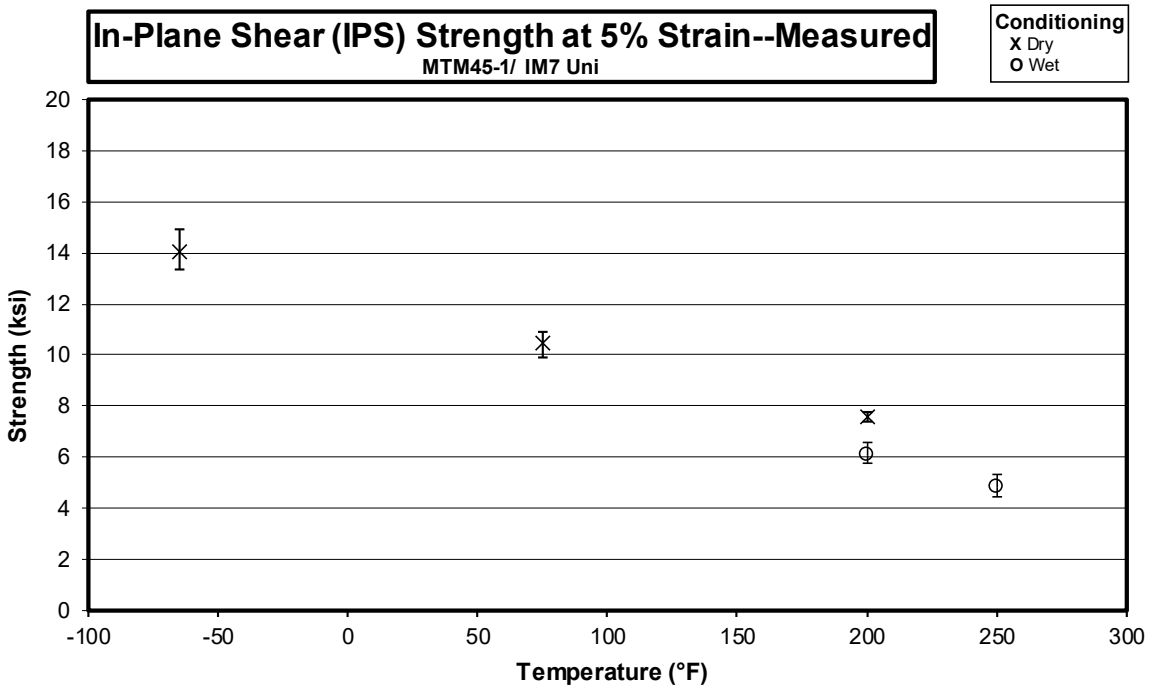
3.4 Transverse Compression Properties (TC)

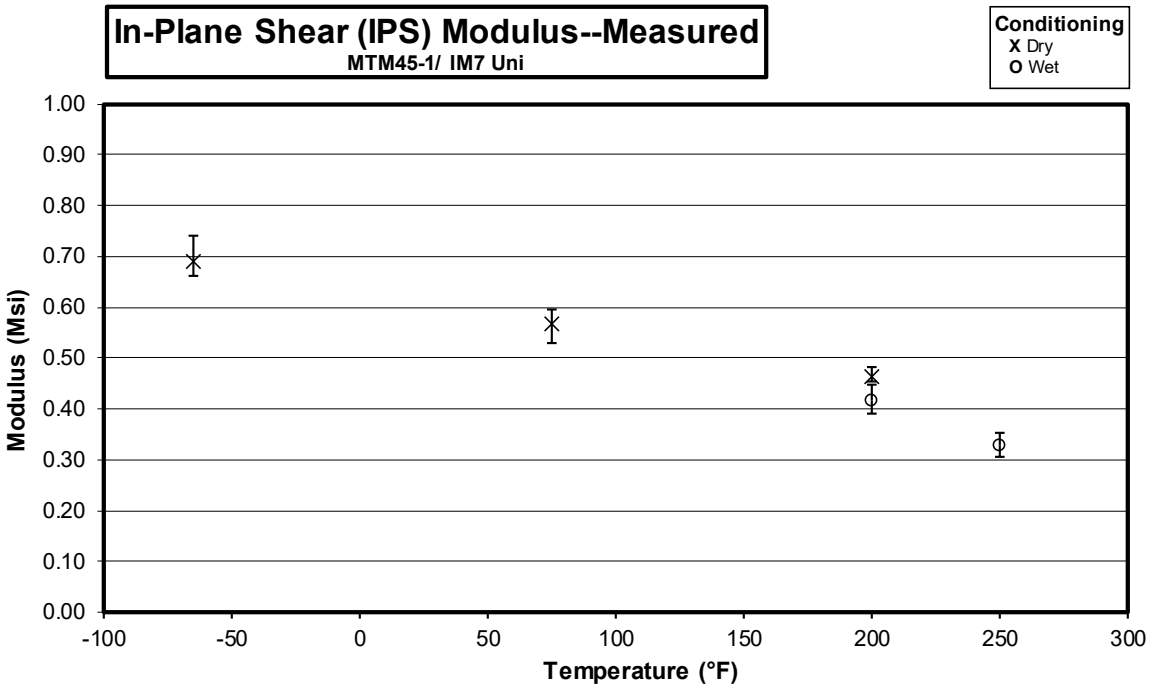




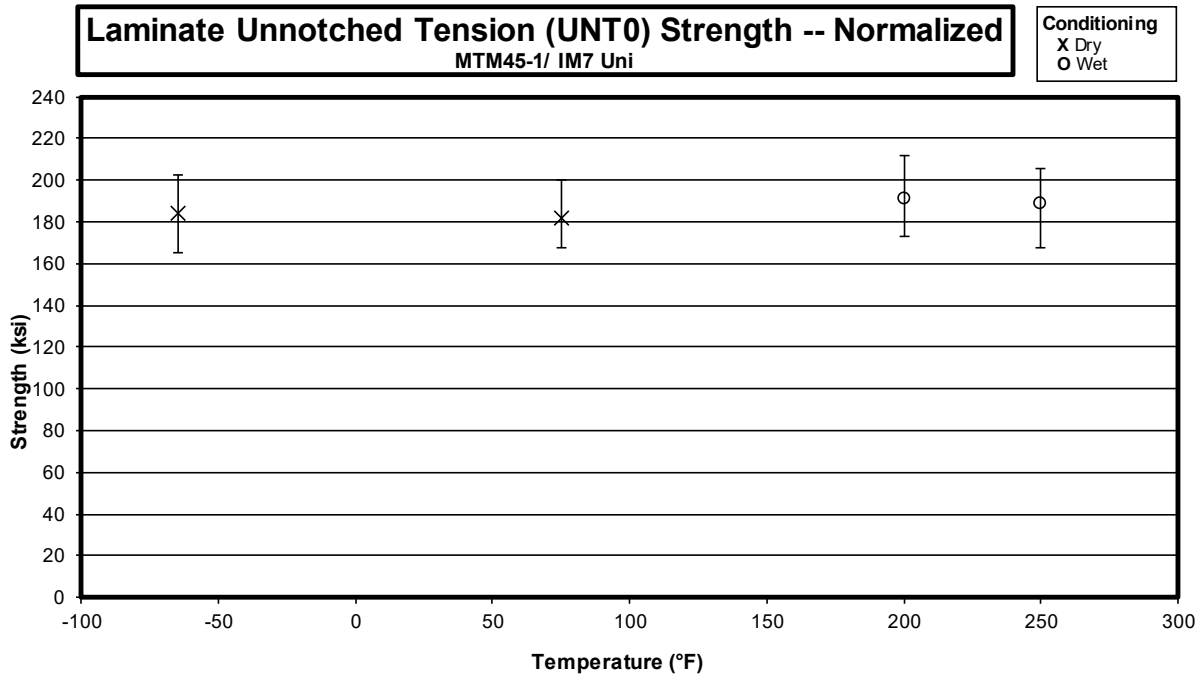
3.5 In-Plane Shear Properties (IPS)

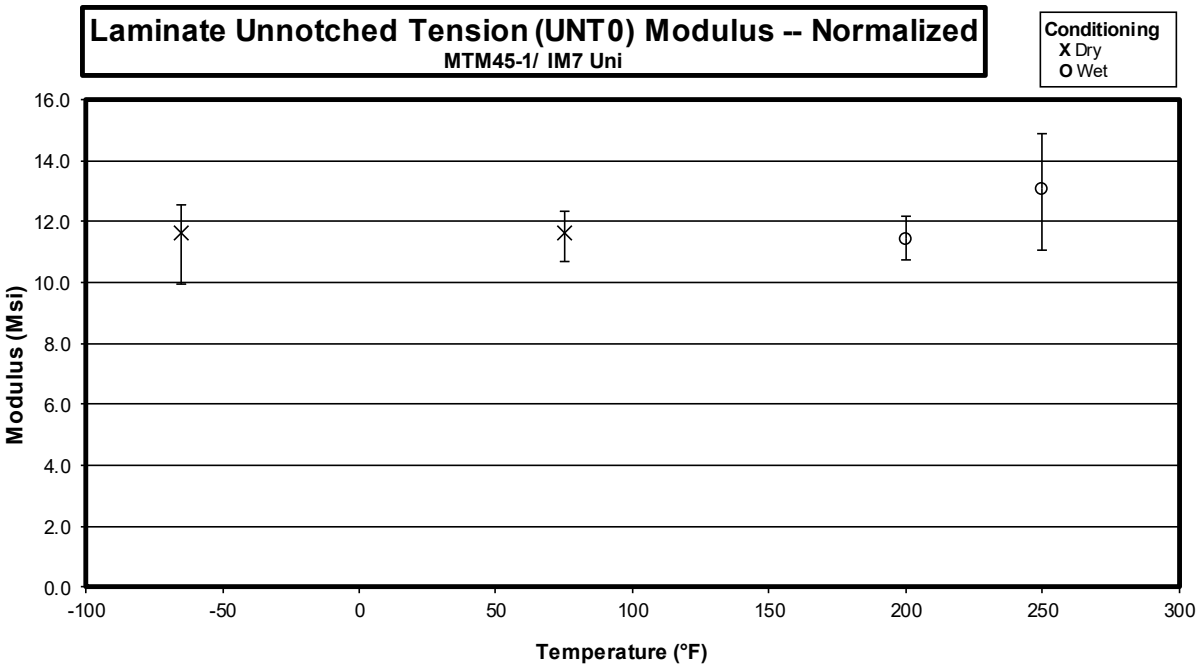




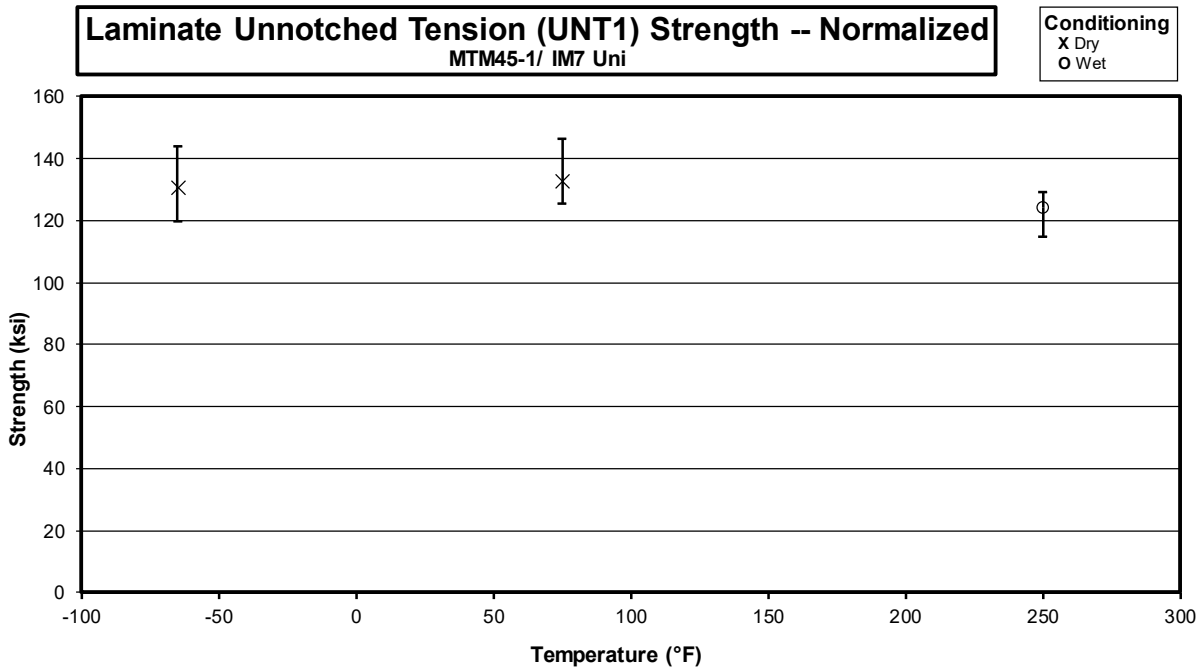

In-Plane Shear (IPS) Modulus--Measured
MTM45-1/ IM7 Uni
Conditioning
X Dry
O Wet
Modulus (Msi)
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
-100
-50
0
50
100
150
200
250
300
Temperature (°F)

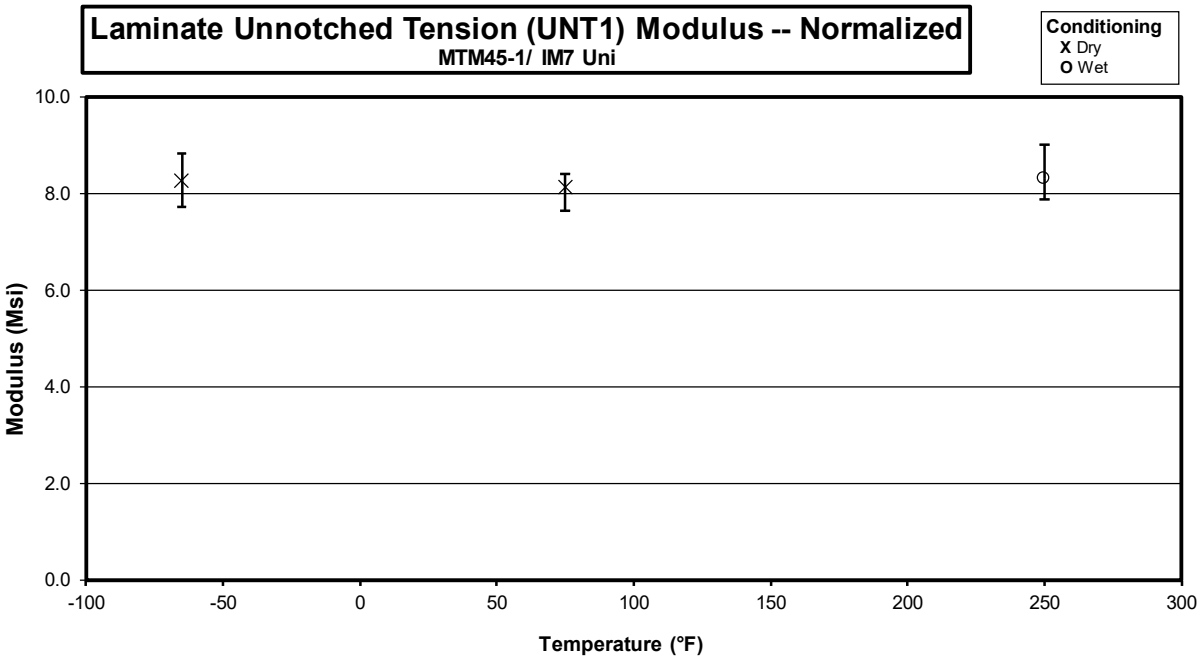
3.6 "50/0/50" Unnotched Tension 0 Properties (UNT0)



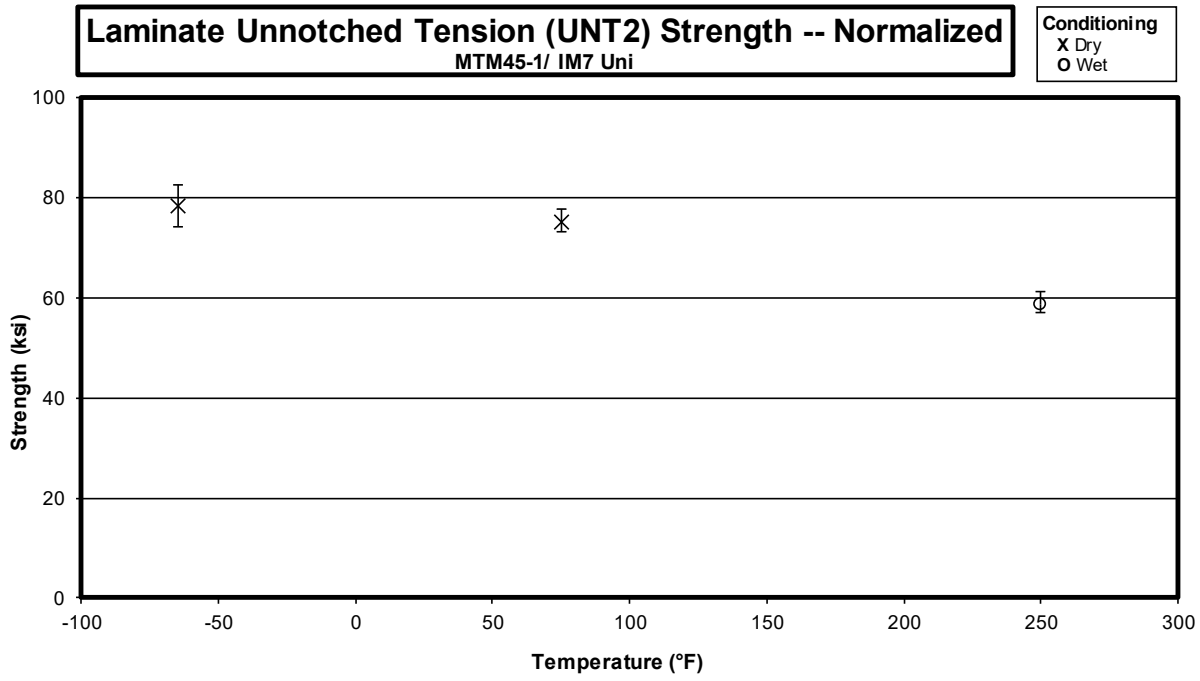


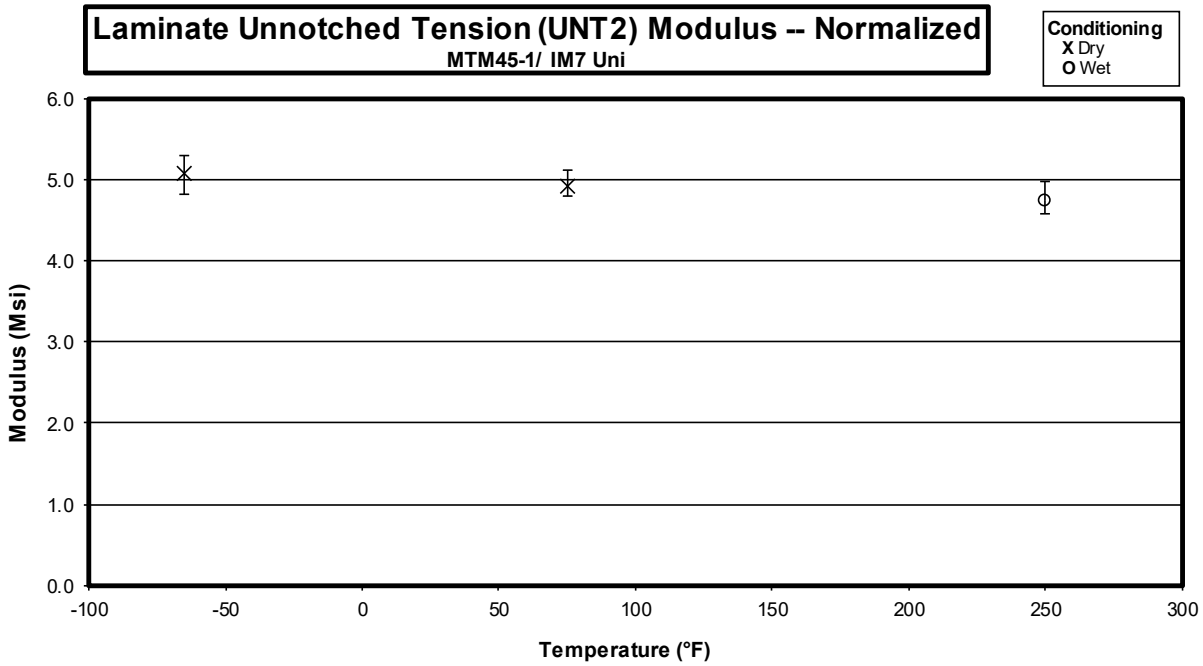
3.7 "25/50/25" Unnotched Tension 1 Properties (UNT1)



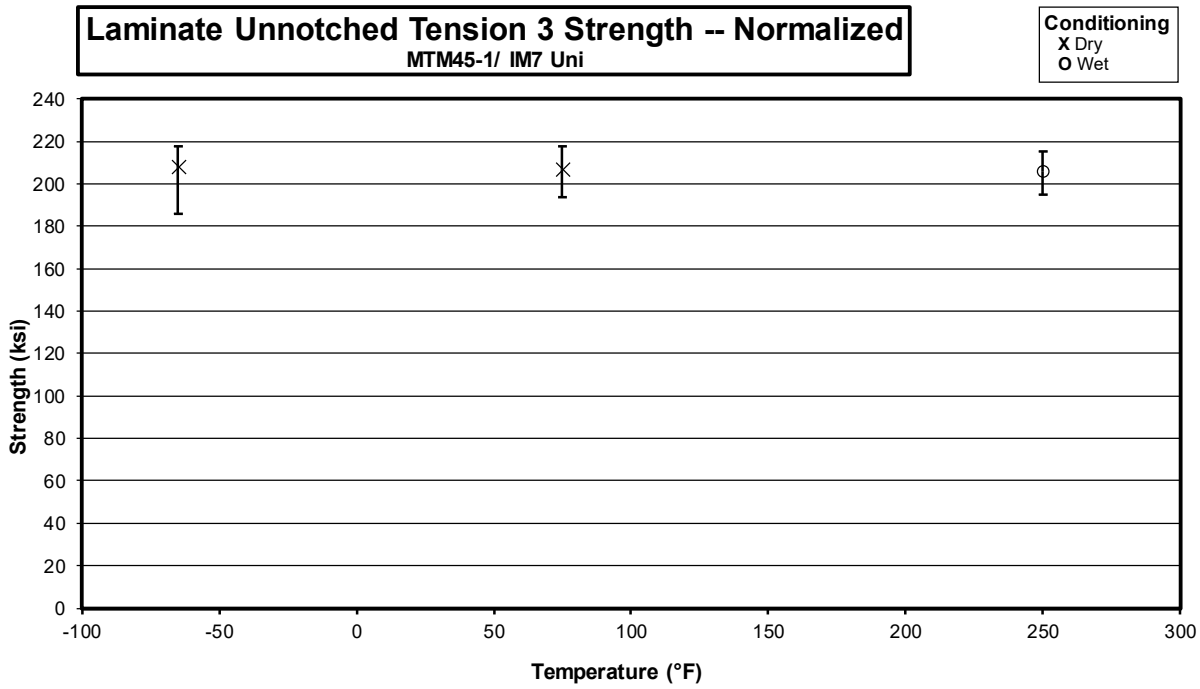


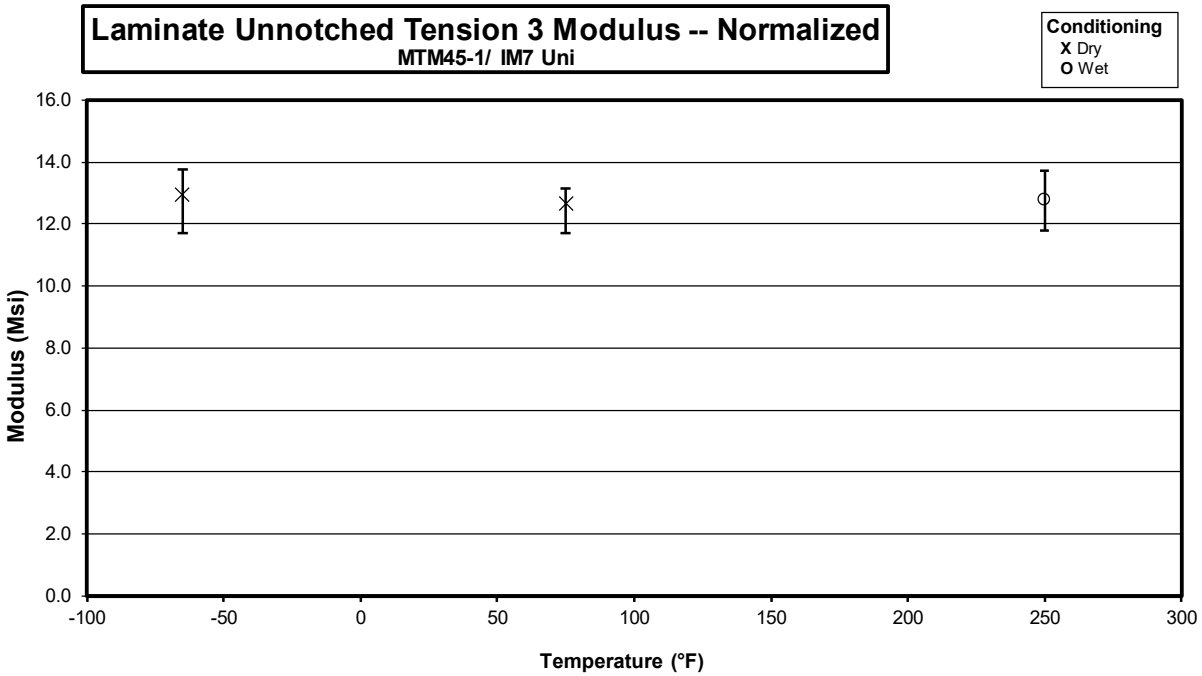
3.8 “10/80/10” Unnotched Tension 2 Properties (UNT2)



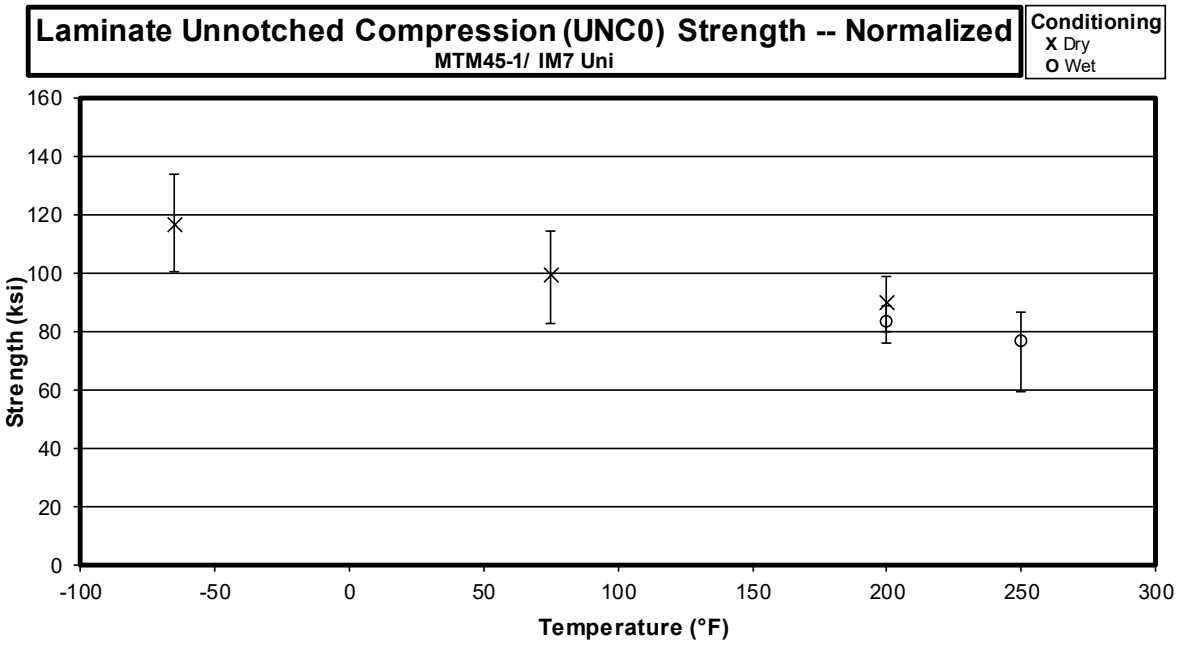


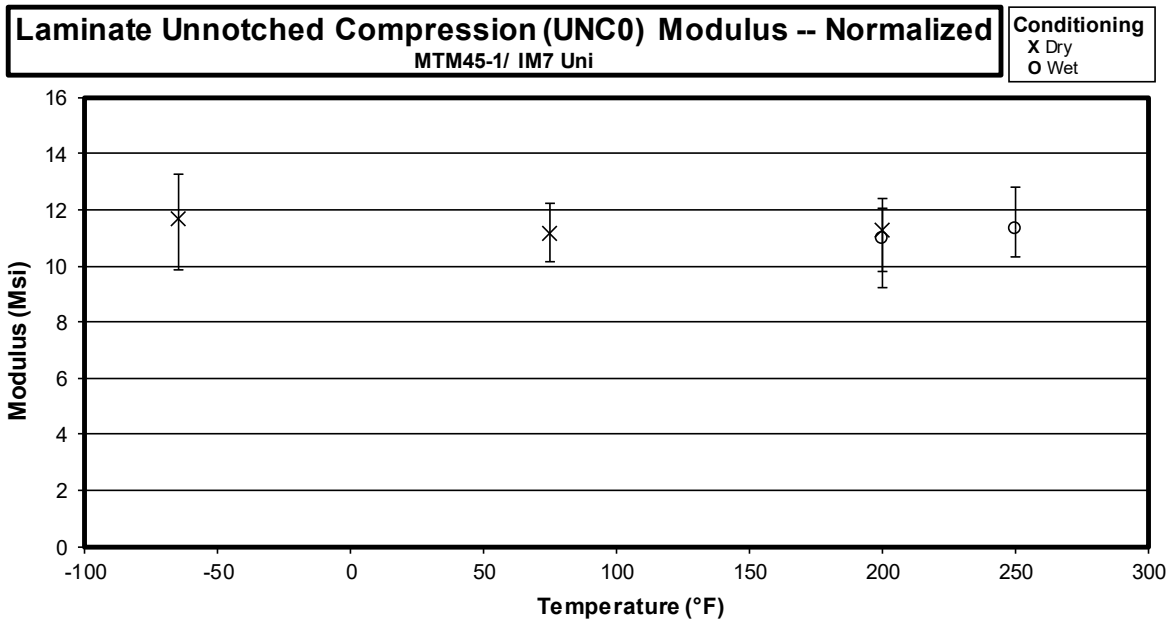
3.9 "50/40/10" Unnotched Tension 3 Properties (UNT3)



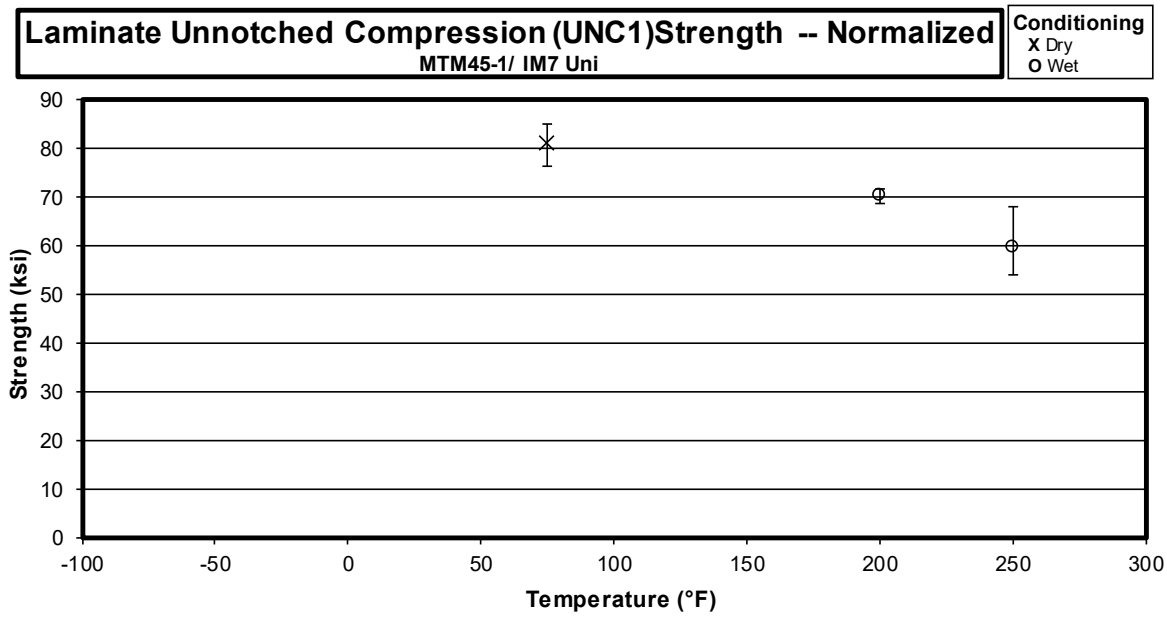


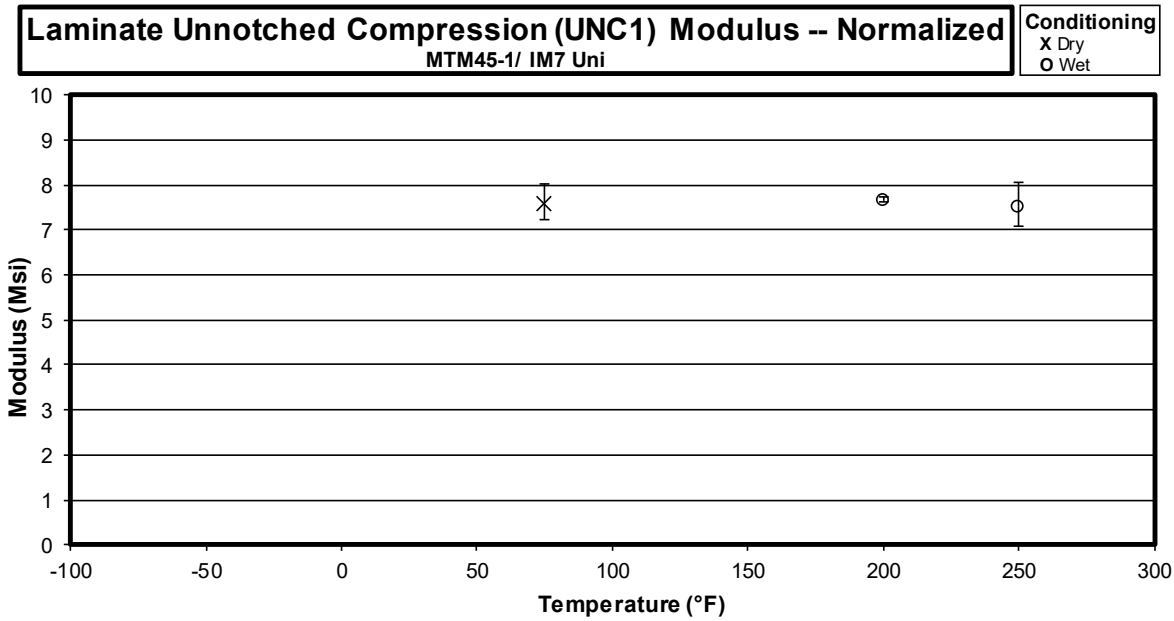
3.10 "50/0/50" Unnotched Compression 0 Properties (UNC0)



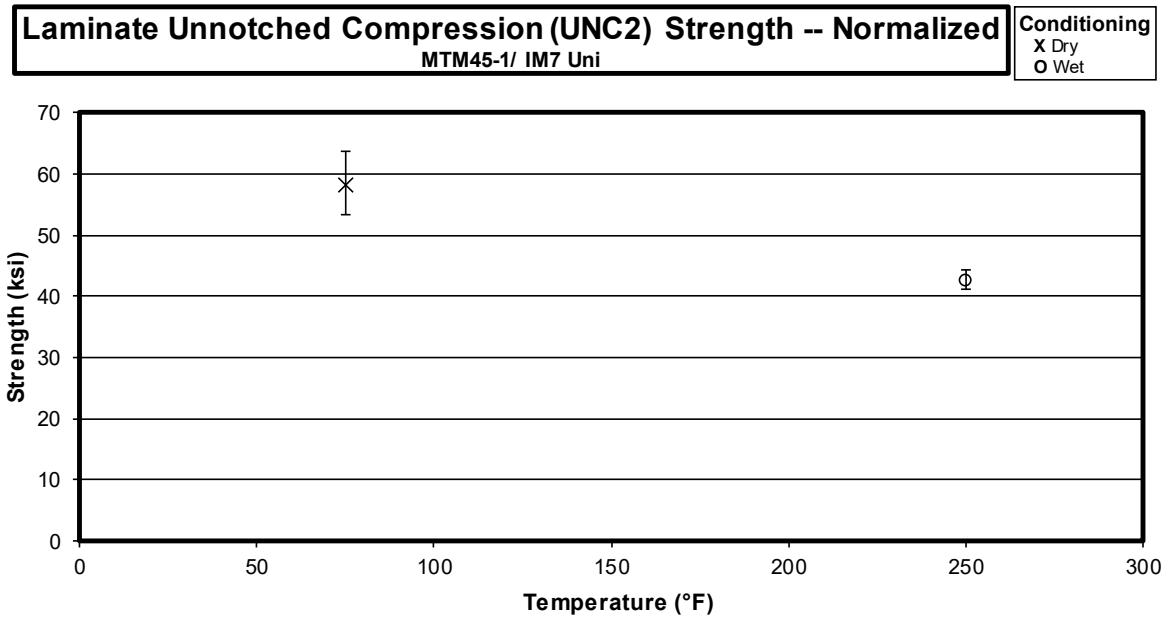


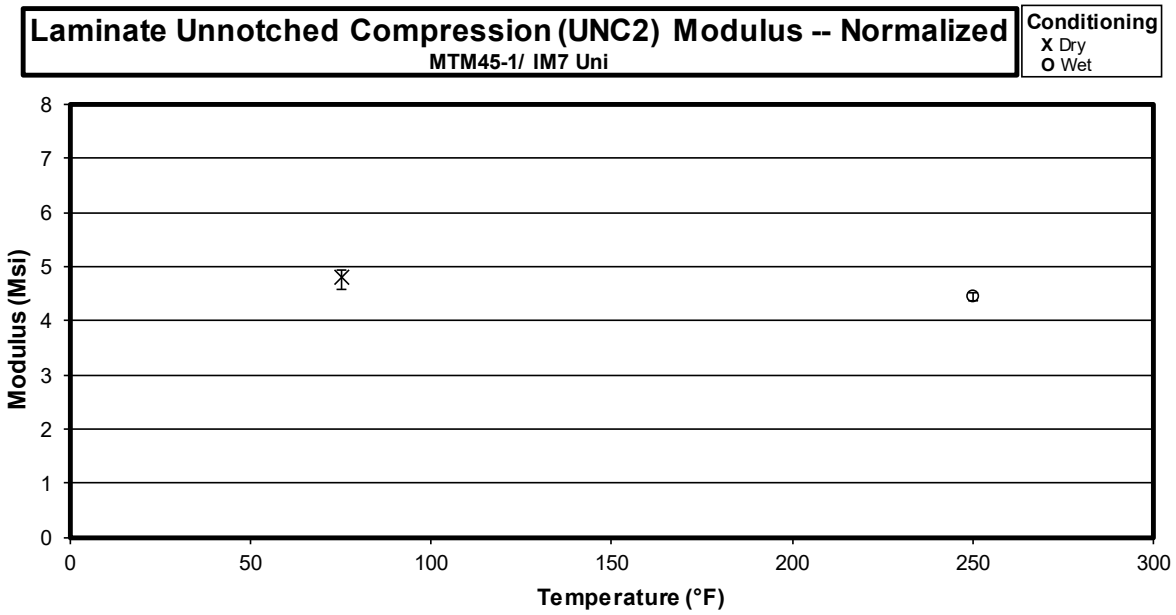
3.11 "25/50/25" Unnotched Compression 1 Properties (UNC1)



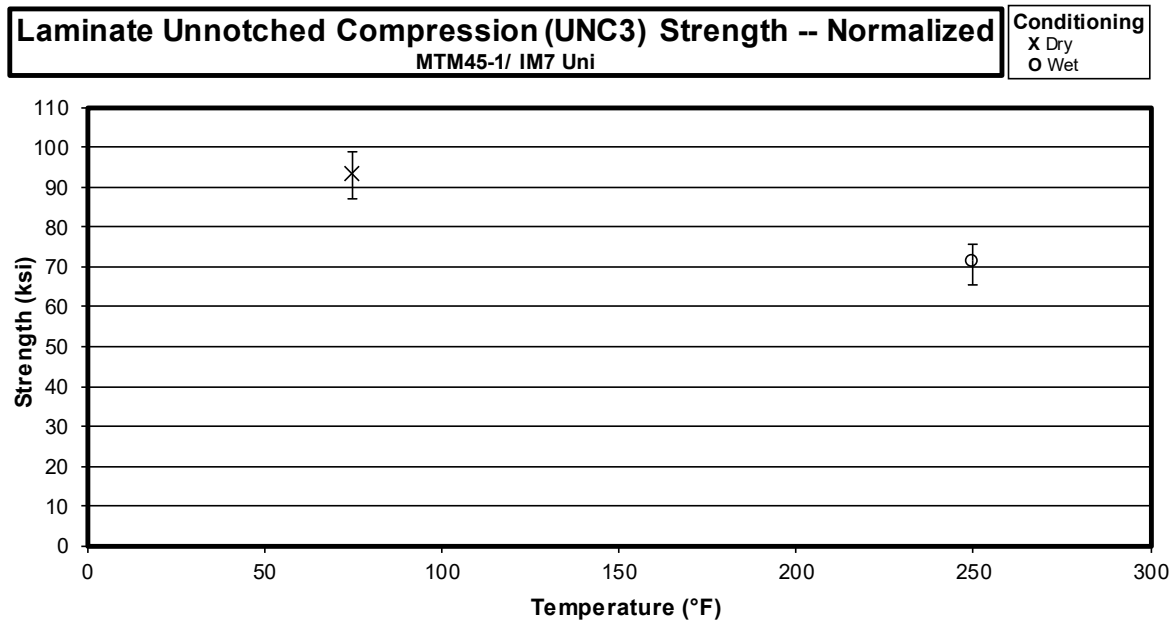


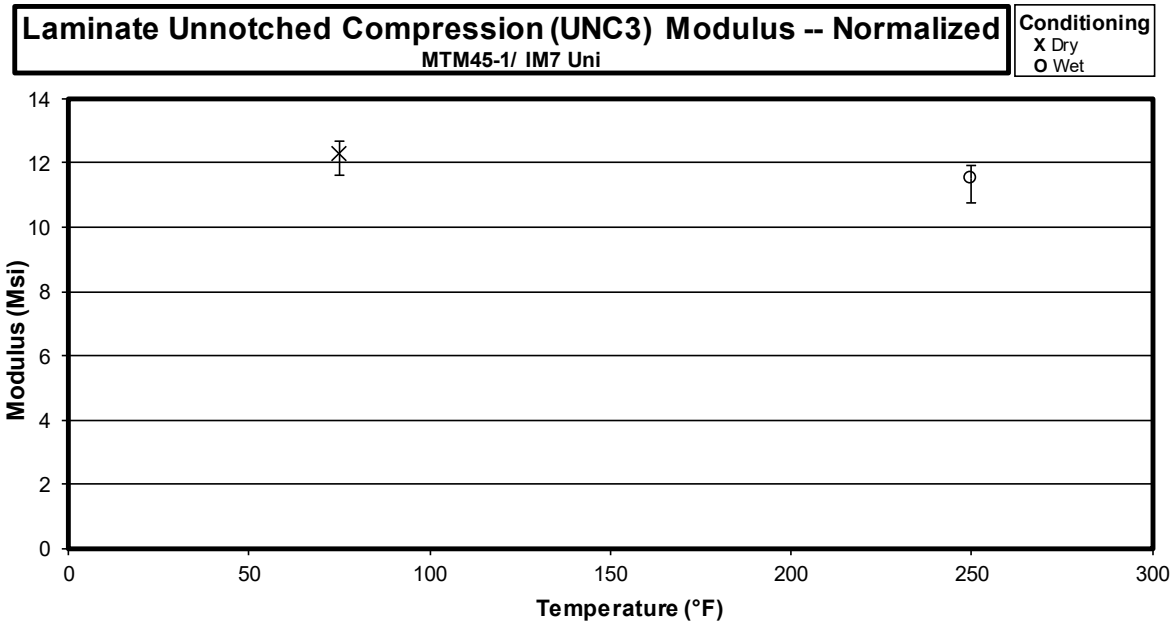
3.12 "10/80/10" Unnotched Compression 2 Properties (UNC2)



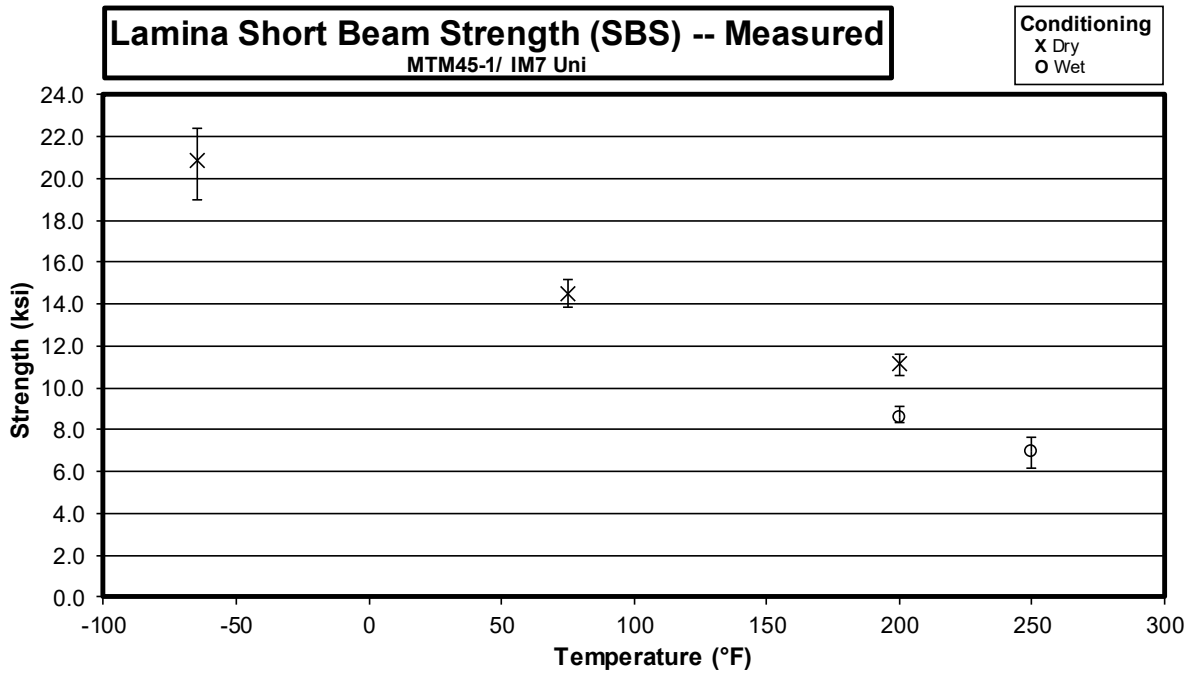


3.13 "50/40/10" Unnotched Compression 3 Properties (UNC3)

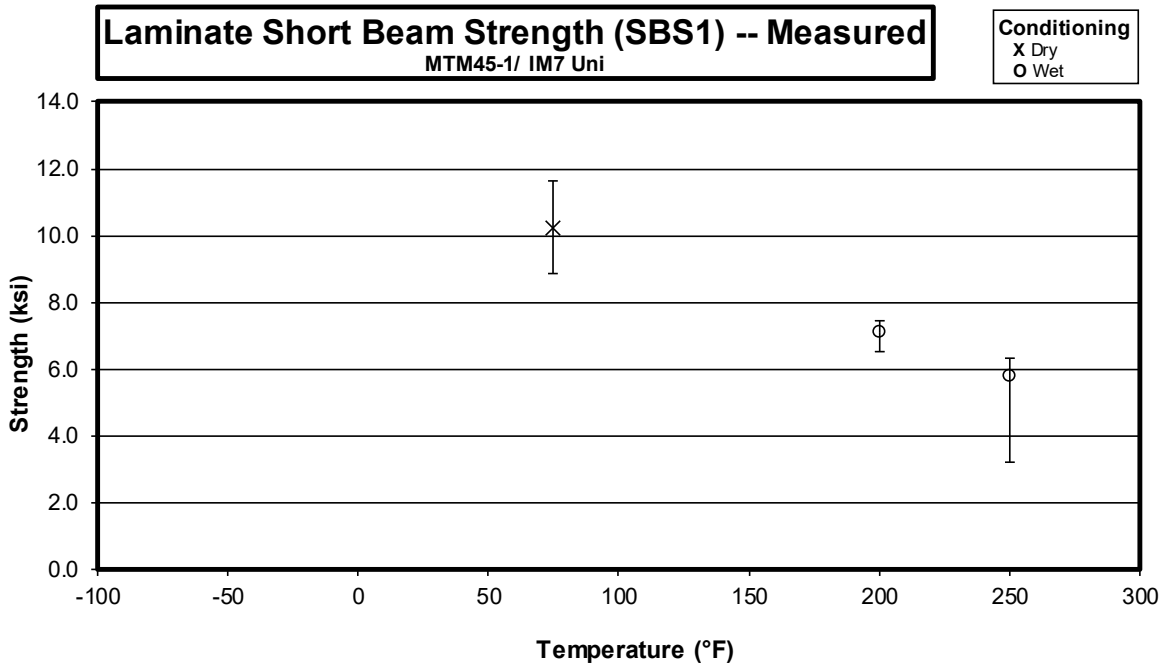




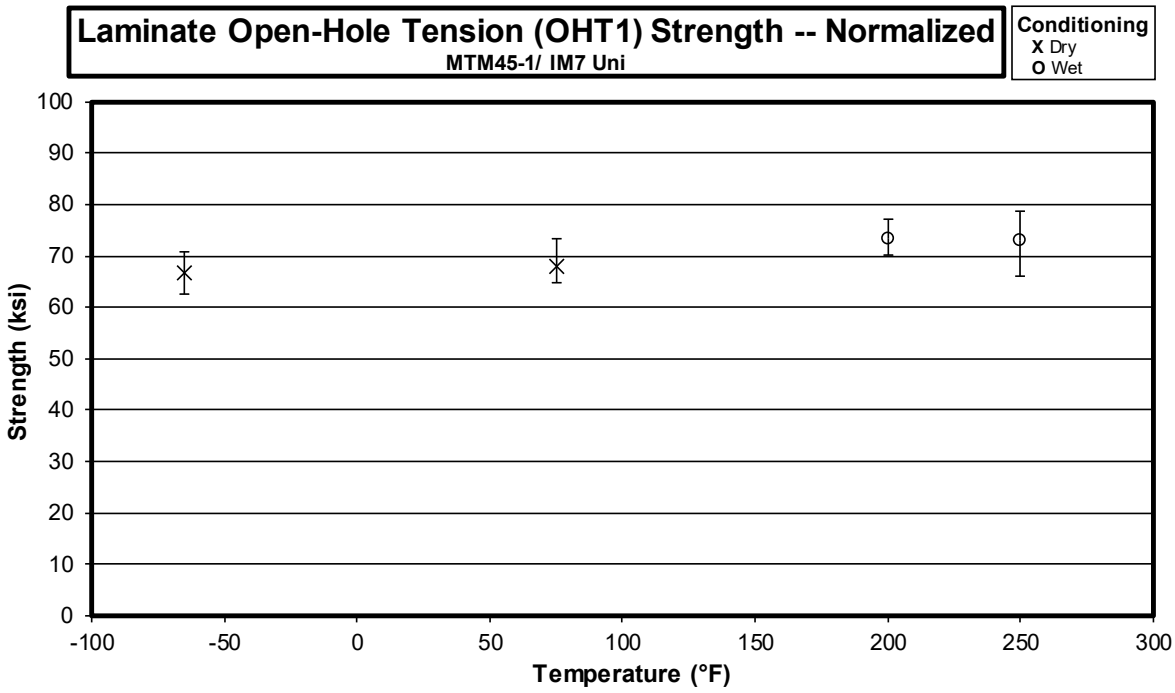
3.14 Lamina Short Beam Strength Properties (SBS)



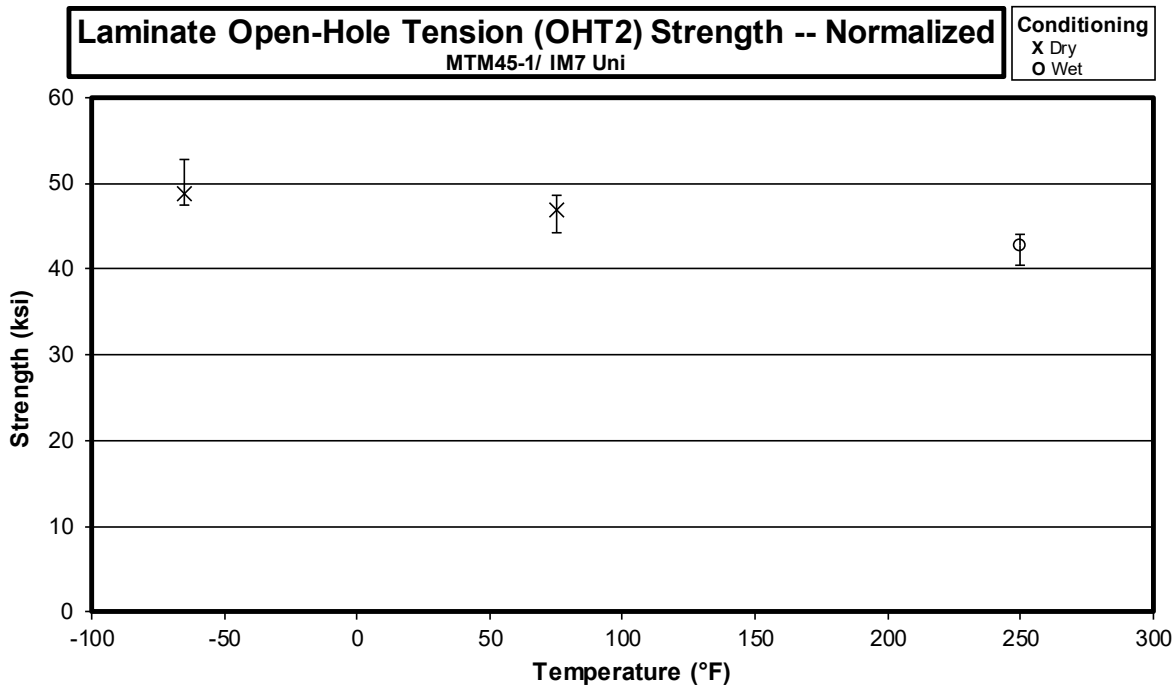
3.15 Laminate Short Beam Strength Properties (SBS1)



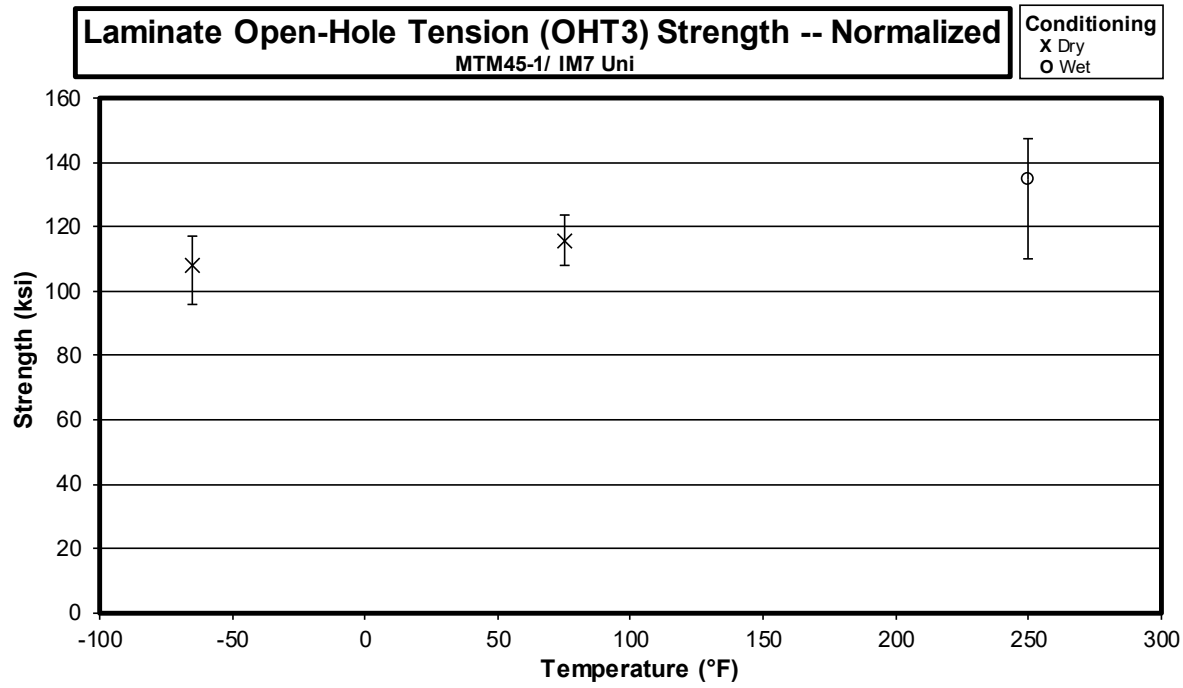
3.16 "25/50/25" Open-Hole Tension 1 Properties (OHT1)



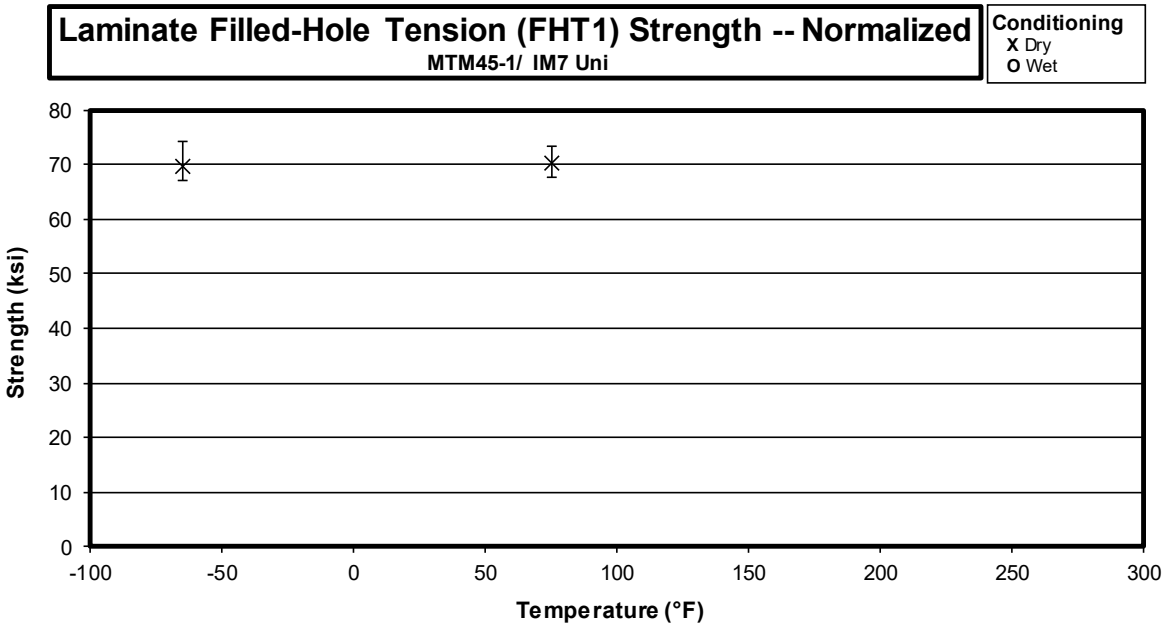
3.17 "10/80/10" Open-Hole Tension 2 Properties (OHT2)



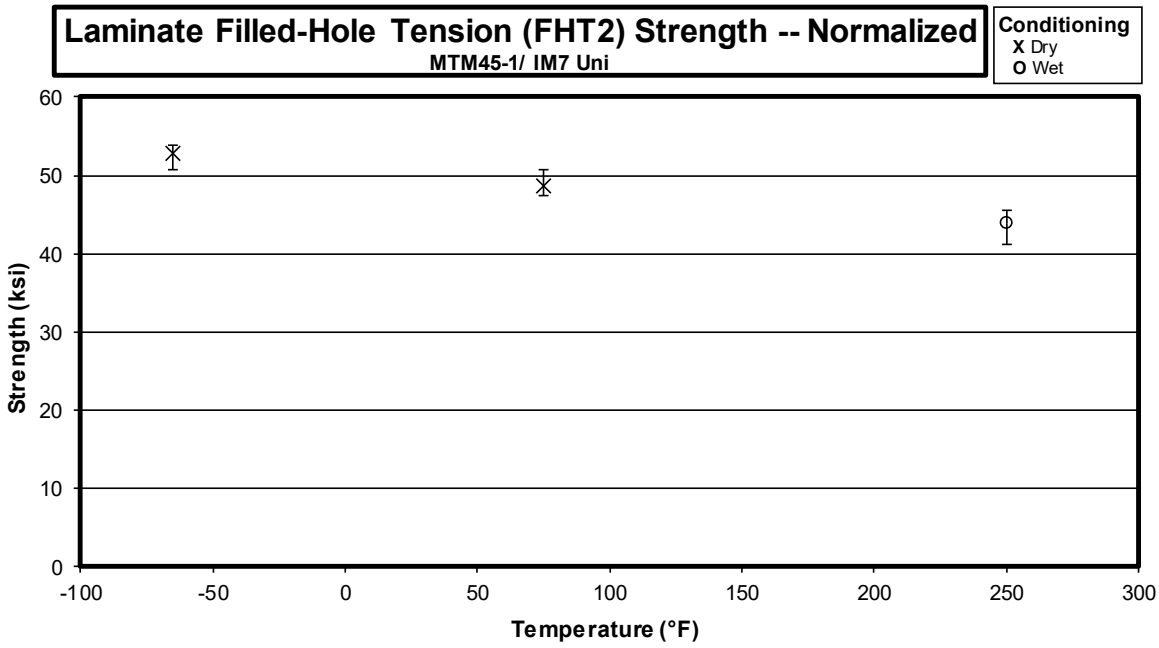
3.18 "50/40/10" Open-Hole Tension 3 Properties (OHT3)



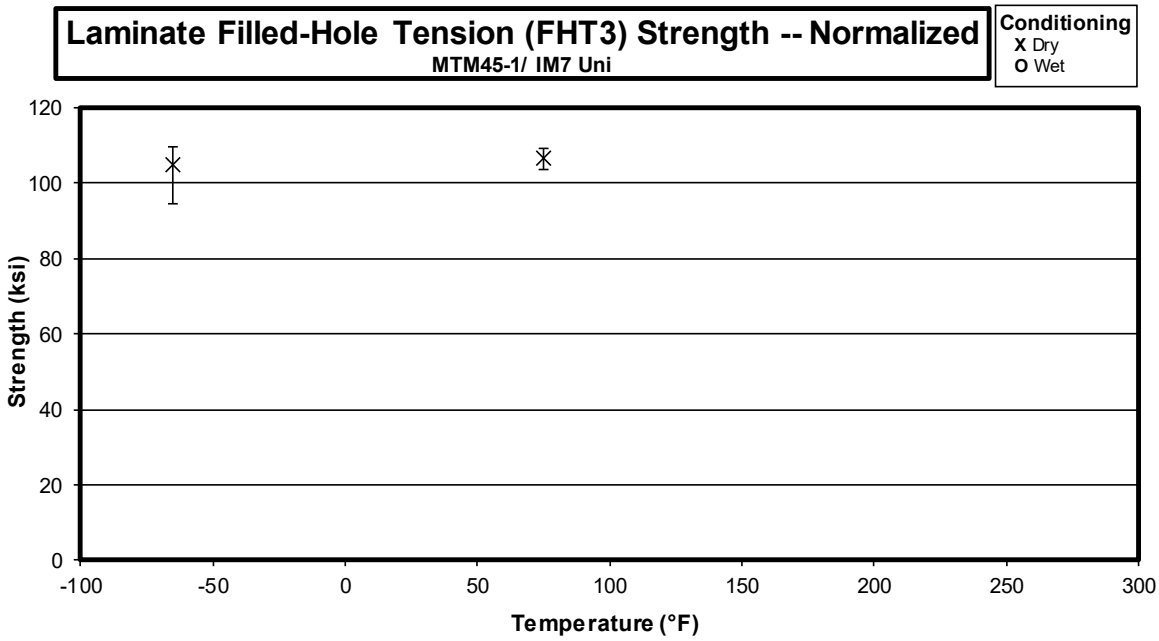
3.19 "25/50/25" Filled-Hole Tension 1 Properties (FHT1)



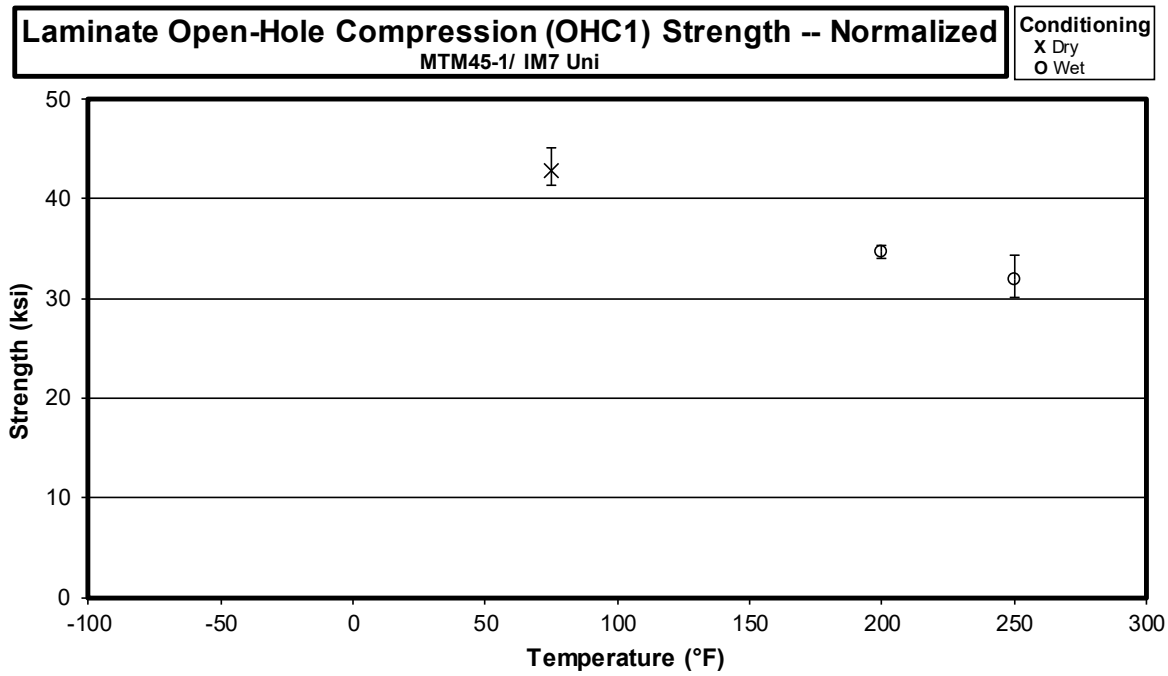
3.20 "10/80/10" Filled-Hole Tension 2 Properties (FHT2)



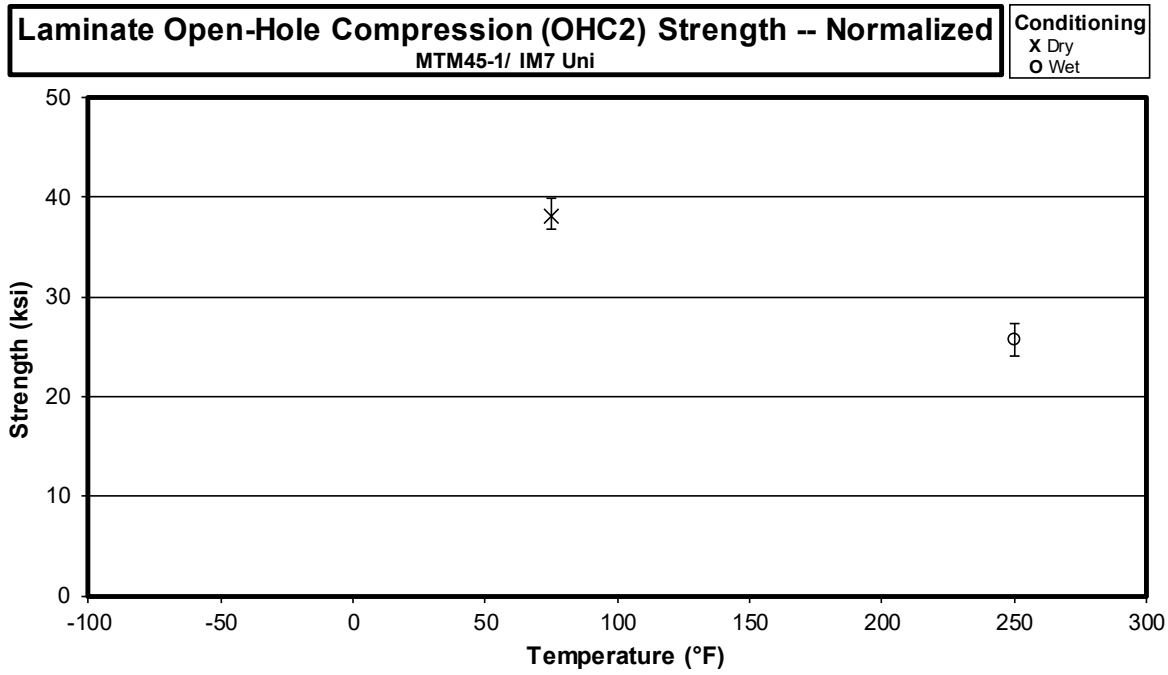
3.21 "50/40/10" Filled-Hole Tension 3 Properties (FHT3)



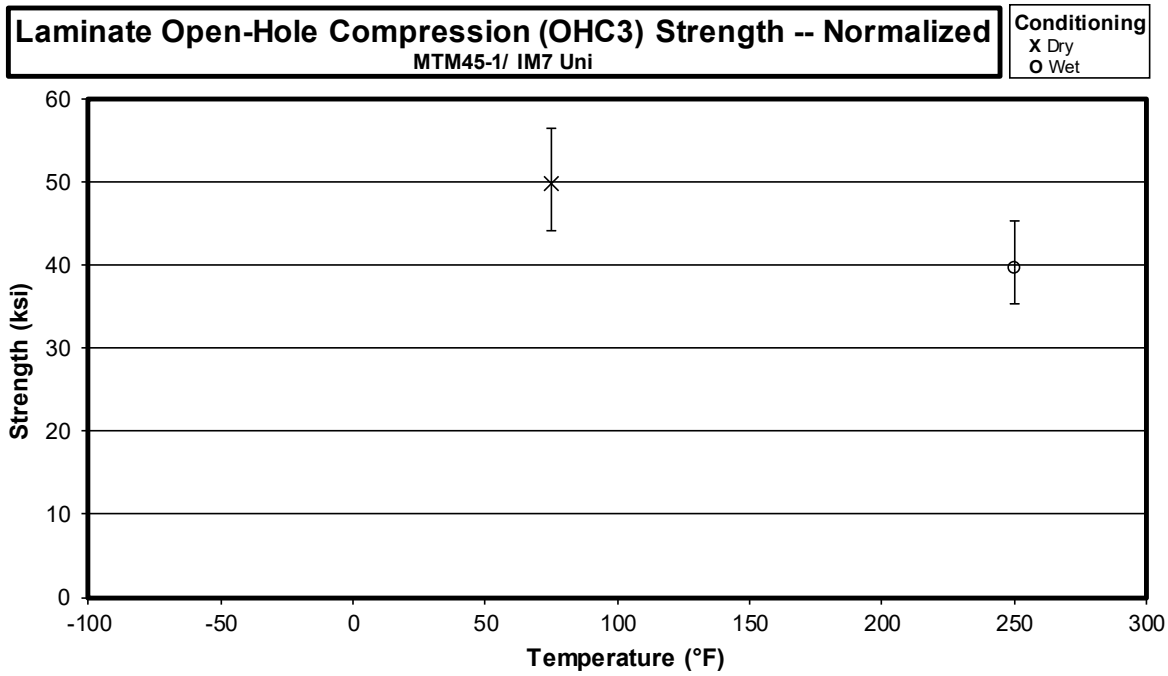
3.22 "25/50/25" Open-Hole Compression 1 Properties (OHC1)



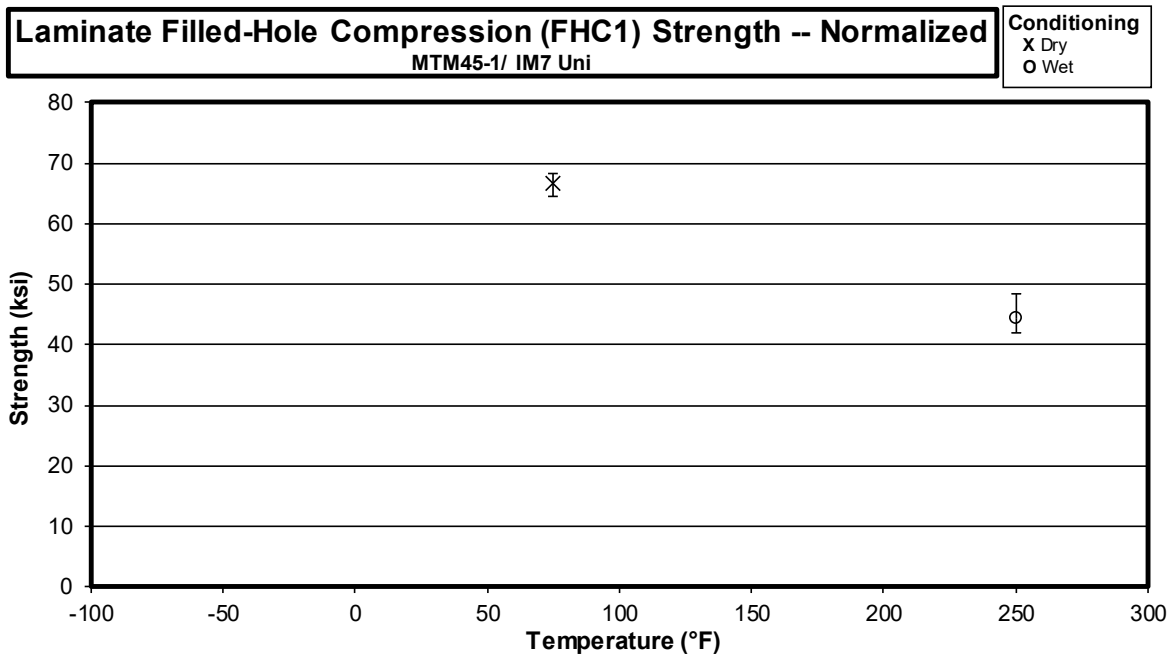
3.23 "10/80/10" Open-Hole Compression 2 Properties (OHC2)



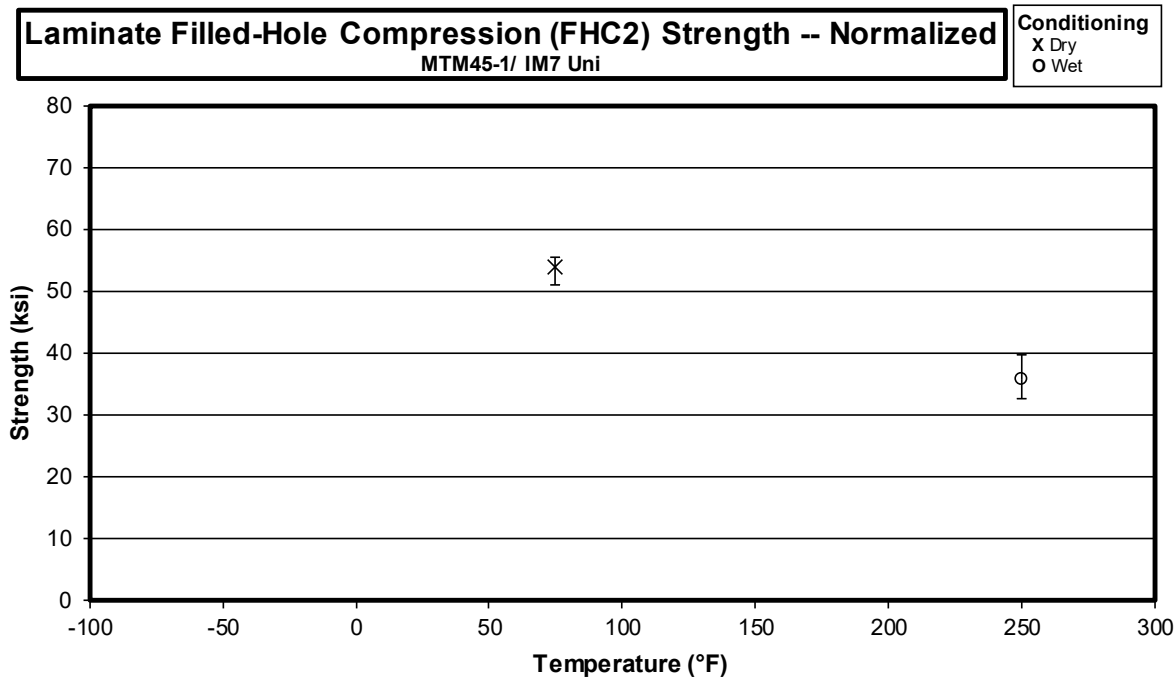
3.24 "50/40/10" Open-Hole Compression 3 Properties (OHC3)



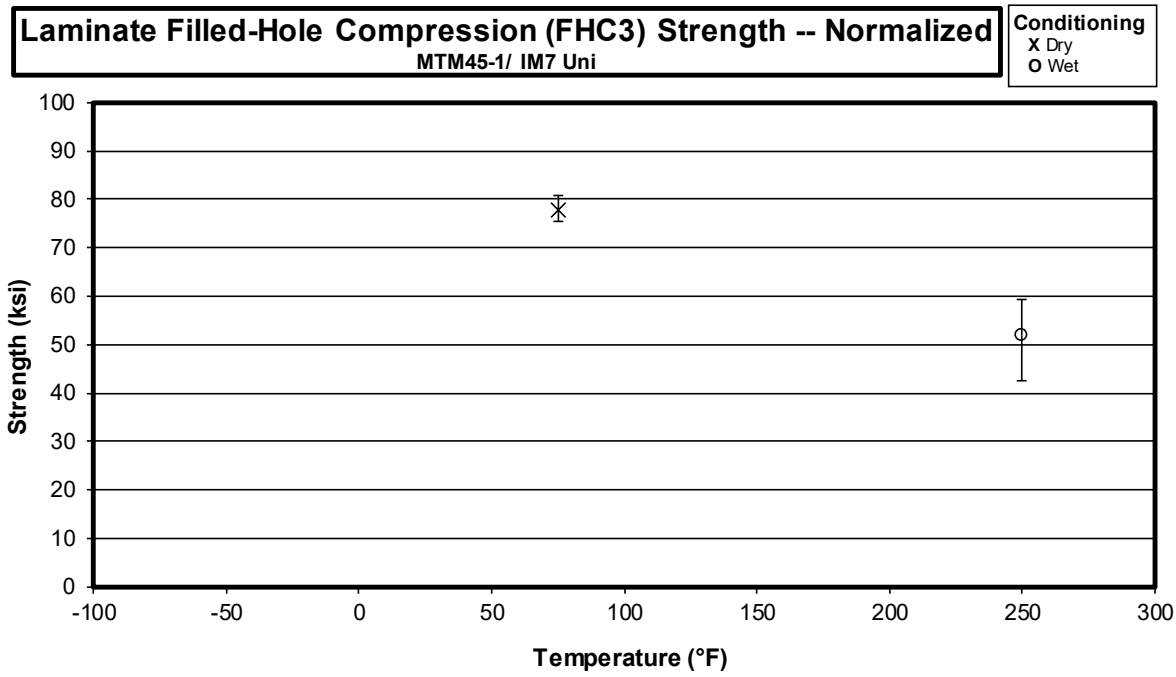
3.25 "25/50/25" Filled-Hole Compression 1 Properties (FHC1)



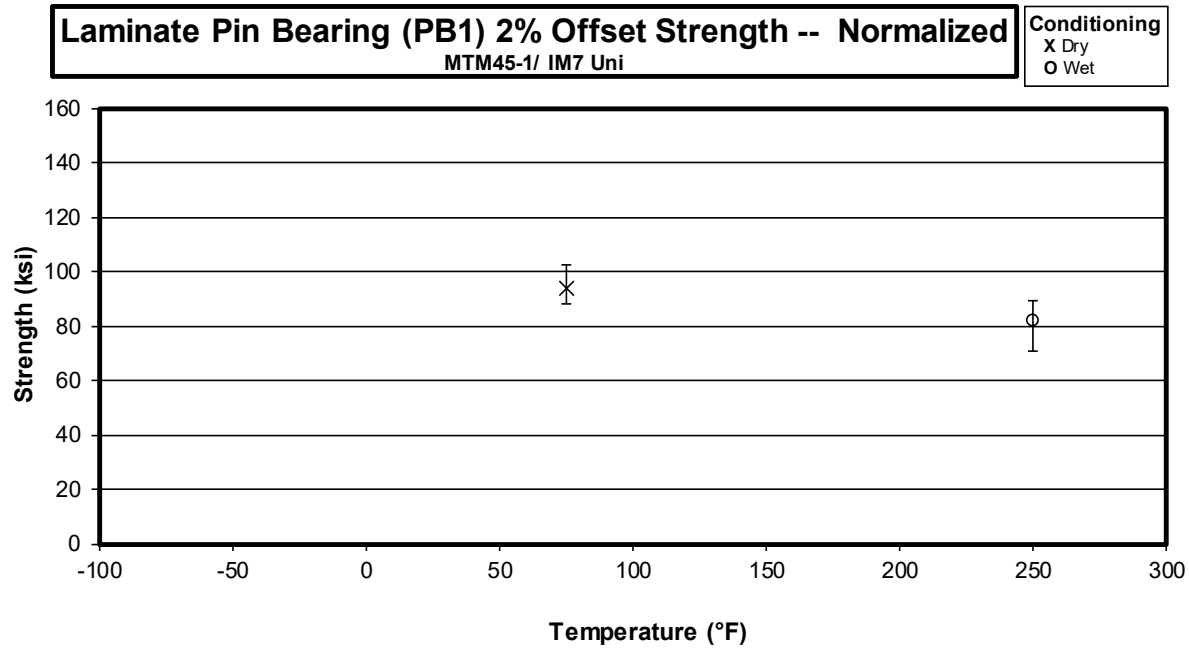
3.26 "10/80/10" Filled-Hole Compression 2 Properties (FHC2)



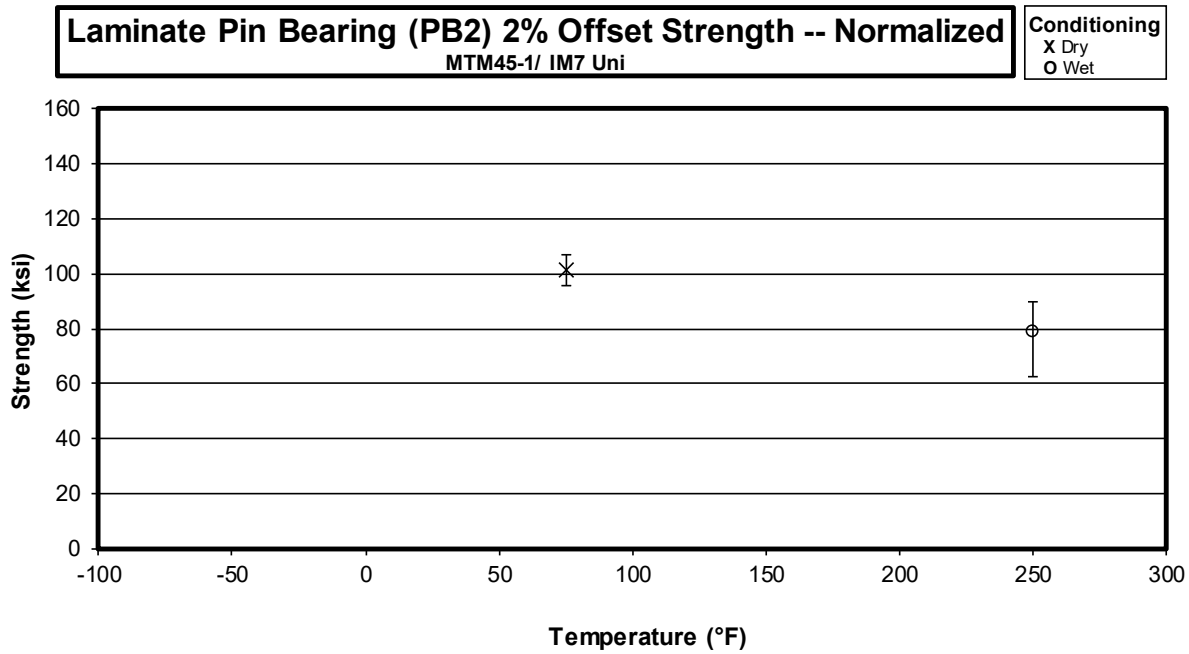
3.27 "50/40/10" Filled-Hole Compression 3 Properties (FHC3)



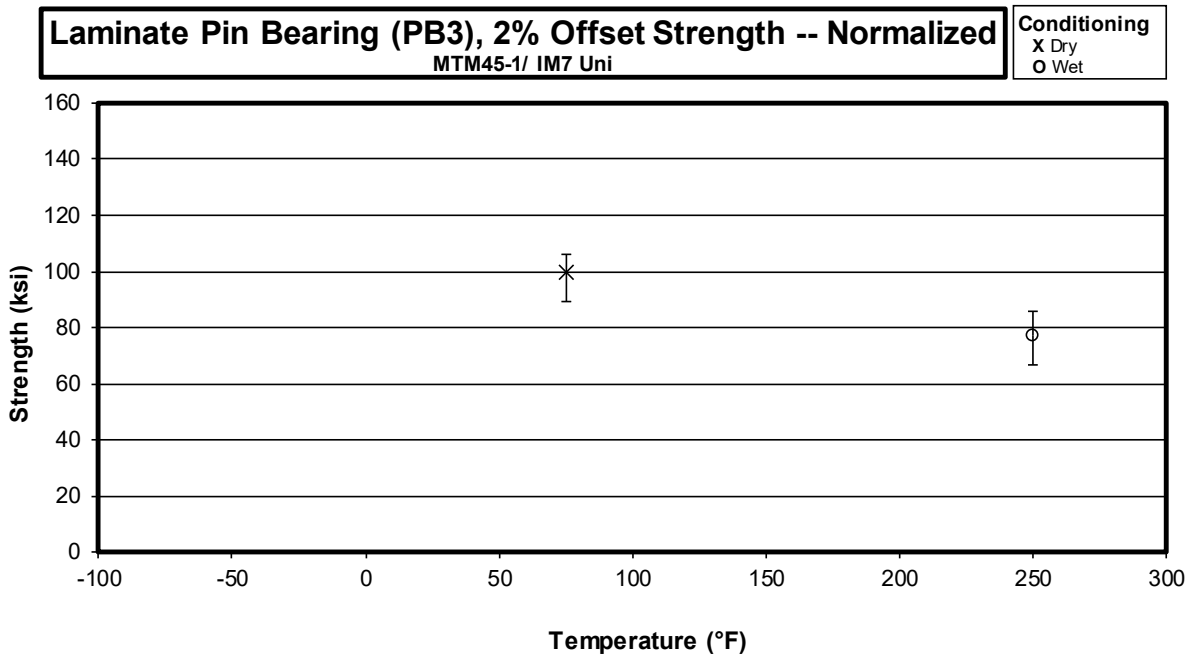
3.28 "25/50/25" Pin Bearing 1 Properties (PB1)



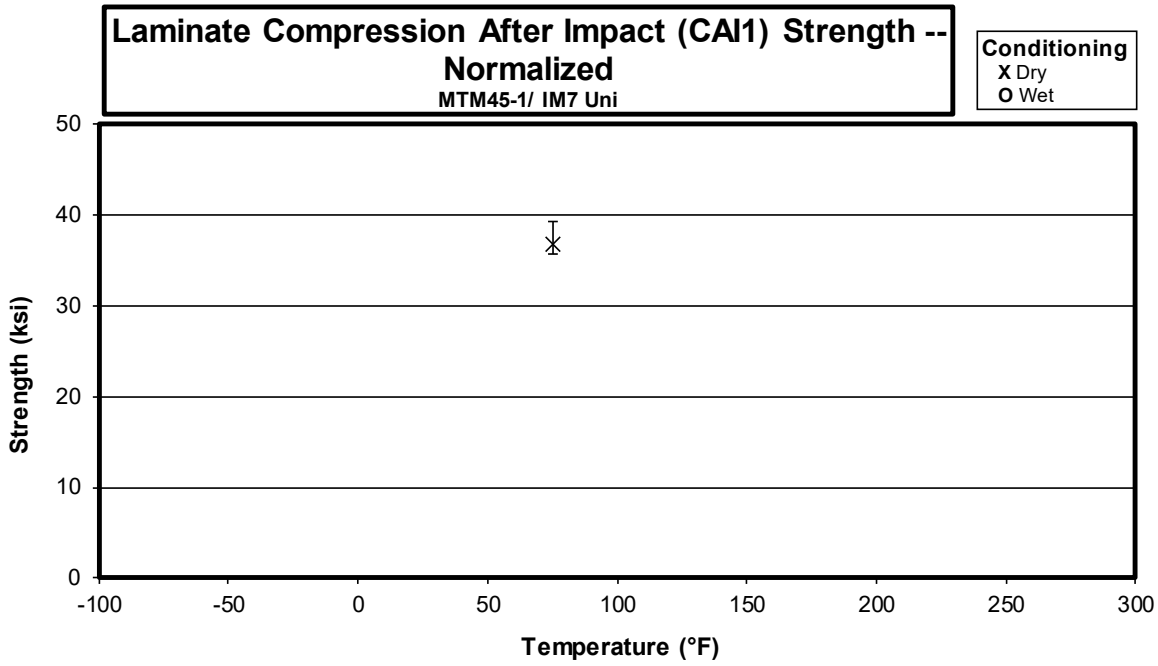
3.29 "10/80/10" Pin Bearing 2 Properties (PB2)



3.30 "50/40/10" Pin Bearing 3 Properties (PB3)



3.31 "25/50/25" Compression After Impact 1 Properties (CAI1)



4. Raw Data

4.1 Longitudinal Tension Properties (LT)

Longitudinal Tension Properties (LT) -- (CTD)
Strength & Modulus
MTM45-1/ IM7 Uni

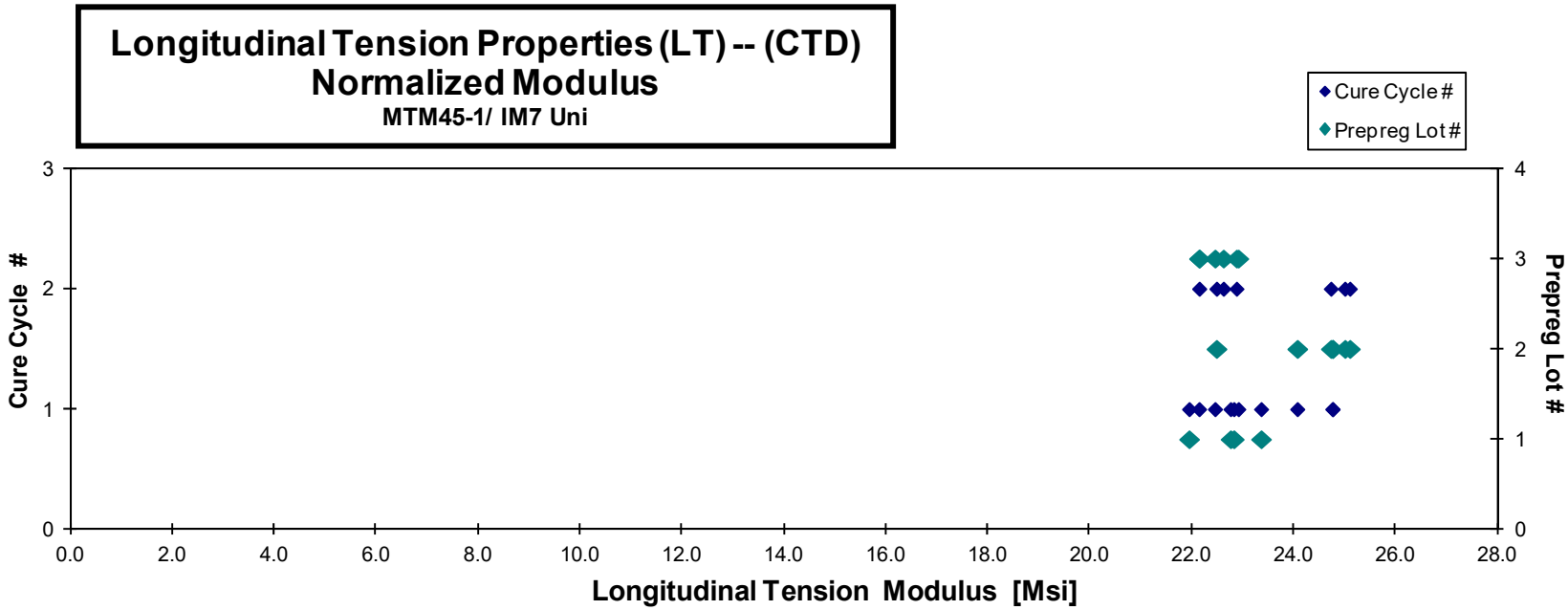
normalizing t_{ply} [in]: 0.0055

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Modulus [Msi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Modulus_{norm}$ [Msi]
IMU-LT-A-MH1-CTD-1	AFJA111B	A	MH1	1	1	21.617	0.089	16	SGM	0.0056	21.961
IMU-LT-A-MH1-CTD-2	AFJA112B	A	MH1	1	1	22.357	0.092	16	SGM	0.0058	23.373
IMU-LT-A-MH1-CTD-3	AFJA113B	A	MH1	1	1	22.023	0.091	16	SGM	0.0057	22.774
IMU-LT-A-MH1-CTD-4	AFJA114B	A	MH1	1	1	22.158	0.091	16	SGM	0.0057	22.838
IMU-LT-B-MH1-CTD-1	AFJB111B	B	MH1	2	1	21.962	0.097	16	XGM	0.0060	24.083
IMU-LT-B-MH1-CTD-2	AFJB112B	B	MH1	2	1	22.616	0.096	16	XGM	0.0060	24.775
IMU-LT-B-MH1-CTD-3	AFJB113B	B	MH1	2	1	22.548	0.097	16	XGM	0.0060	24.777
IMU-LT-B-MH2-CTD-1	AFJB211B	B	MH2	2	2	21.220	0.093	16	XGM	0.0058	22.498
IMU-LT-B-MH2-CTD-2	AFJB212B	B	MH2	2	2	22.691	0.097	16	XGM	0.0061	25.115
IMU-LT-B-MH2-CTD-3	AFJB213B	B	MH2	2	2	22.933	0.096	16	XGM	0.0060	25.018
IMU-LT-B-MH2-CTD-4	AFJB214B	B	MH2	2	2	22.992	0.095	16	XGM	0.0059	24.743
IMU-LT-C-MH1-CTD-2	AFJC112B	C	MH1	3	1	22.182	0.088	16	XGM	0.0055	22.157
IMU-LT-C-MH1-CTD-3	AFJC113B	C	MH1	3	1	22.953	0.088	16	XGM	0.0055	22.927
IMU-LT-C-MH1-CTD-4	AFJC114B	C	MH1	3	1	22.367	0.088	16	XGM	0.0055	22.469
IMU-LT-C-MH2-CTD-2	AFJC212B	C	MH2	3	2	22.582	0.088	16	XGM	0.0055	22.633
IMU-LT-C-MH2-CTD-3	AFJC213B	C	MH2	3	2	21.837	0.089	16	XGM	0.0056	22.160
IMU-LT-C-MH2-CTD-4	AFJC214B	C	MH2	3	2	22.659	0.089	16	XGM	0.0056	22.891

*** Batch A cure cycle 2: data is omitted due to wrong panel layup**

Average	22.335	
Standard Dev.	0.493	
Coeff. of Var. [%]	2.207	
Min.	21.220	
Max.	22.992	
Number of Spec.	17	

$Average_{norm}$	0.0058	23.364
$Standard\ Dev._{norm}$		1.124
$Coeff.\ of\ Var.\ [\%]_{norm}$		4.810
Min.	0.0055	21.961
Max.	0.0061	25.115
Number of Spec.		17


Longitudinal Tension Properties (LT) -- (CTD)
Normalized Modulus
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
20.0
22.0
24.0
26.0
28.0
Longitudinal Tension Modulus [Msi]

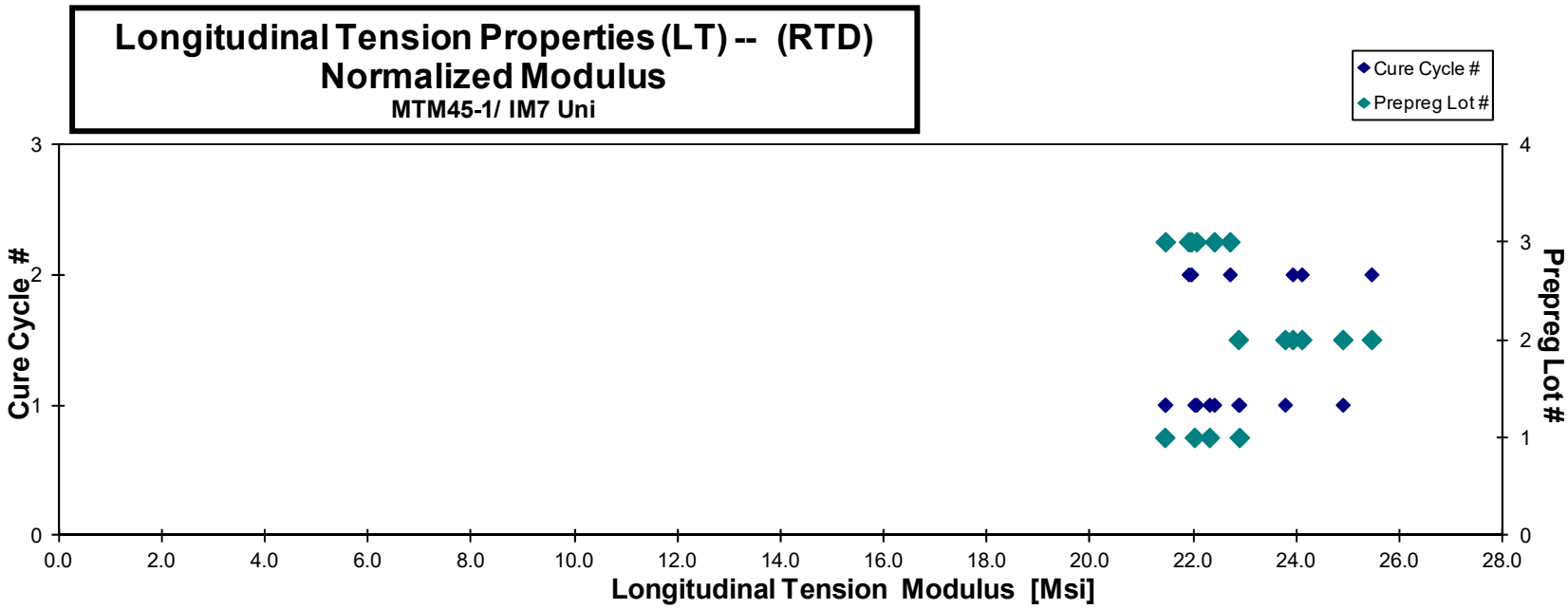
Longitudinal Tension Properties (LT) -- (RTD)
Strength & Modulus
MTM45-1/ IM7 Uni

normalizing t_{ply} [in]: 0.0055

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Modulus [Msi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Modulus_{norm}$ [Msi]
IMU-LT-A-MH1-RTD-1	AFJA111A	A	MH1	1	1	22.052	0.091	16	LAT	0.0057	22.904
IMU-LT-A-MH1-RTD-2	AFJA112A	A	MH1	1	1	21.706	0.091	16	SGM	0.0057	22.323
IMU-LT-A-MH1-RTD-3	AFJA113A	A	MH1	1	1	21.353	0.091	16	SGM	0.0057	22.032
IMU-LT-A-MH1-RTD-4	AFJA114A	A	MH1	1	1	21.099	0.090	16	LAB	0.0056	21.459
IMU-LT-B-MH1-RTD-1	AFJB111A	B	MH1	2	1	21.515	0.094	16	XGM	0.0059	22.884
IMU-LT-B-MH1-RTD-2	AFJB112A	B	MH1	2	1	21.875	0.096	16	XGM	0.0060	23.789
IMU-LT-B-MH1-RTD-4	AFJB113A	B	MH1	2	1	22.645	0.097	16	XGM	0.0061	24.910
IMU-LT-B-MH2-RTD-1	AFJB211A	B	MH2	2	2	22.385	0.095	16	XGM	0.0059	24.115
IMU-LT-B-MH2-RTD-3	AFJB213A	B	MH2	2	2	22.385	0.094	16	XGM	0.0059	23.937
IMU-LT-B-MH2-RTD-4	AFJB214A	B	MH2	2	2	22.500	0.100	16	XGM	0.0062	25.466
IMU-LT-C-MH1-RTD-1	AFJC111A	C	MH1	3	1	22.469	0.088	16	XGM	0.0055	22.418
IMU-LT-C-MH1-RTD-2	AFJC112A	C	MH1	3	1	21.469	0.088	16	XGM	0.0055	21.469
IMU-LT-C-MH1-RTD-3	AFJC113A	C	MH1	3	1	22.022	0.088	16	XGM	0.0055	22.072
IMU-LT-C-MH2-RTD-1	AFJC211A	C	MH2	3	2	21.896	0.088	16	XGM	0.0055	21.921
IMU-LT-C-MH2-RTD-2	AFJC212A	C	MH2	3	2	21.896	0.088	16	XGM	0.0055	21.971
IMU-LT-C-MH2-RTD-3	AFJC213A	C	MH2	3	2	22.747	0.088	16	XGM	0.0055	22.721

*** Batch A cure cycle 2: data is omitted due to wrong panel layup**

Average	**22.001**		**$Average_{norm}$**	**0.0057**	**22.899**
Standard Dev.	**0.491**		**Standard $Dev._{norm}$**		**1.210**
Coeff. of Var. [%]	**2.231**		**Coeff. of Var. $[\%]_{norm}$**		**5.282**
Min.	**21.099**		**Min.**	**0.0055**	**21.459**
Max.	**22.747**		**Max.**	**0.0062**	**25.466**
Number of Spec.	**16**		**Number of Spec.**		**16**


Longitudinal Tension Properties (LT) -- (RTD)
Normalized Modulus
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Longitudinal Tension Modulus [Msi]
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
20.0
22.0
24.0
26.0
28.0
0
1
2
3
4

Longitudinal Tension Properties (LT) -- (ETW)
Strength & Modulus
MTM45-1/ IM7 Uni

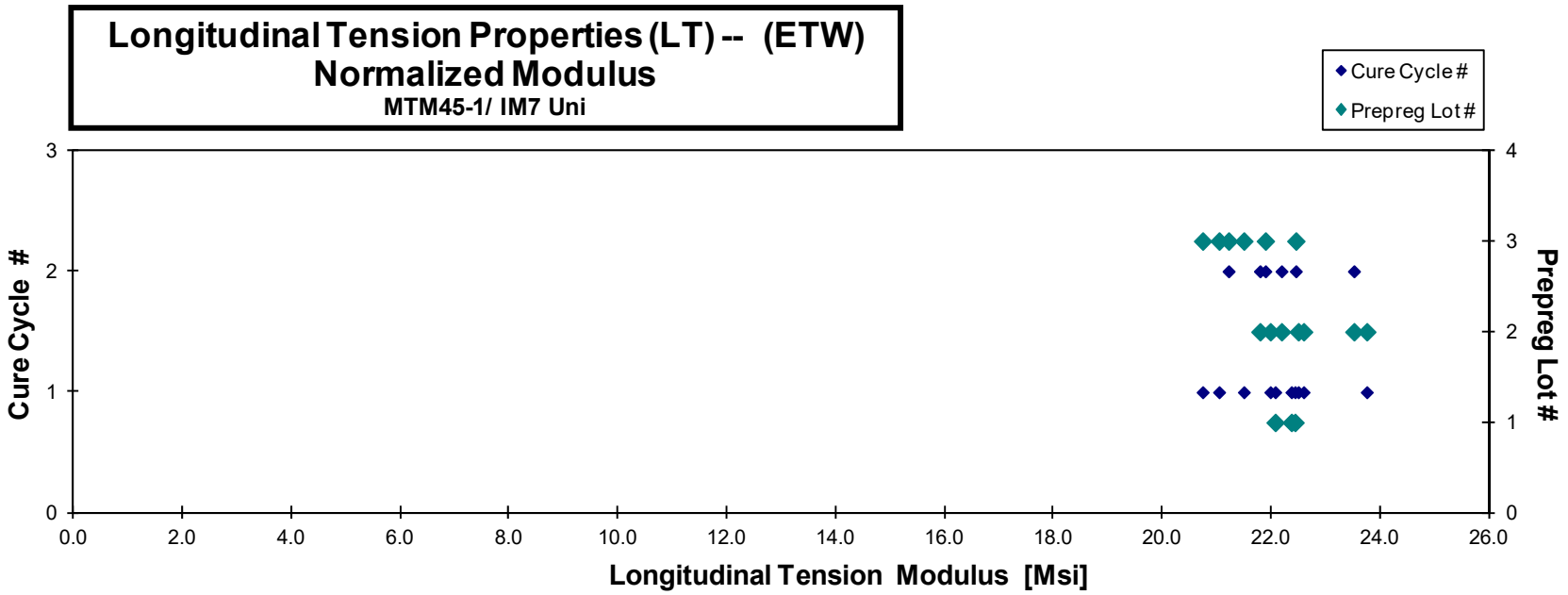
normalizing t_{ply} [in]
0.0055

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Modulus [Msi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Modulus_{norm}$ [Msi]
IMU-LT-A-MH1-ETW-2	AFJA112N	A	MH1	1	1	21.651	0.091	16	NR	0.0057	22.426
IMU-LT-A-MH1-ETW-3	AFJA113N	A	MH1	1	1	21.441	0.091	16	NR	0.0057	22.062
IMU-LT-A-MH1-ETW-4	AFJA114N	A	MH1	1	1	22.096	0.089	16	NR	0.0056	22.360
IMU-LT-B-MH1-ETW-1	AFJB111N	B	MH1	2	1	21.120	0.094	16	NR	0.0059	22.584
IMU-LT-B-MH1-ETW-2	AFJB112N	B	MH1	2	1	20.400	0.095	16	NR	0.0059	21.973
IMU-LT-B-MH1-ETW-3	AFJB113N	B	MH1	2	1	22.336	0.094	16	NR	0.0058	23.745
IMU-LT-B-MH1-ETW-4	AFJB114N	B	MH1	2	1	21.160	0.094	16	NR	0.0058	22.487
IMU-LT-B-MH2-ETW-1	AFJB211N	B	MH2	2	2	20.360	0.094	16	NR	0.0059	21.783
IMU-LT-B-MH2-ETW-3	AFJB213N	B	MH2	2	2	20.656	0.094	16	NR	0.0059	22.178
IMU-LT-B-MH2-ETW-4	AFJB214N	B	MH2	2	2	22.122	0.094	16	NR	0.0058	23.509
IMU-LT-C-MH1-ETW-2	AFJC112N	C	MH1	3	1	21.371	0.087	16	NR	0.0054	21.031
IMU-LT-C-MH1-ETW-3	AFJC113N	C	MH1	3	1	21.245	0.089	16	NR	0.0056	21.486
IMU-LT-C-MH1-ETW-4	AFJC114N	C	MH1	3	1	21.125	0.086	16	NR	0.0054	20.729
IMU-LT-C-MH2-ETW-2	AFJC212N	C	MH2	3	2	22.152	0.089	16	NR	0.0056	22.441
IMU-LT-C-MH2-ETW-3	AFJC213N	C	MH2	3	2	20.897	0.089	16	NR	0.0056	21.206
IMU-LT-C-MH2-ETW-4	AFJC214N	C	MH2	3	2	21.770	0.088	16	NR	0.0055	21.881

NR: Not recorded. Tests were stopped once 4000 microstrain was reached, so max load was not recorded.

*** Batch A cure cycle 2: data is omitted due to wrong panel layup**

Average	**21.369**		**Average$_{norm}$**	**0.0057**	**22.118**
Standard Dev.	**0.620**		**Standard Dev.$_{norm}$**		**0.805**
Coeff. of Var. [%]	**2.899**		**Coeff. of Var. [%]$_{norm}$**		**3.641**
Min.	**20.360**		**Min.**	**0.0054**	**20.729**
Max.	**22.336**		**Max.**	**0.0059**	**23.745**
Number of Spec.	**16**		**Number of Spec.**		**16**


Longitudinal Tension Properties (LT) -- (ETW)
Normalized Modulus
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
20.0
22.0
24.0
26.0
Longitudinal Tension Modulus [Msi]

Longitudinal Tension Properties (LT) -- (ETW2) Strength & Modulus

MTM45-1/ IM7 Uni

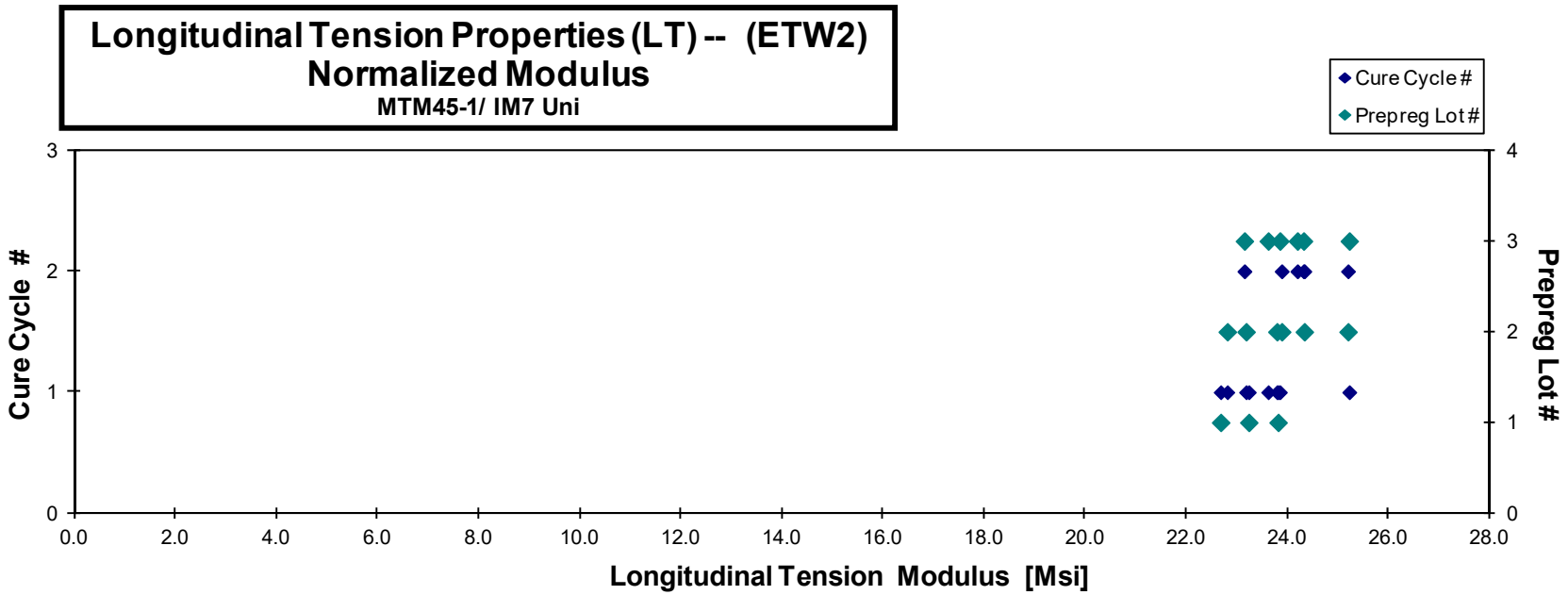
normalizing t_{ply} [in]
0.0055

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Modulus [Msi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Modulus_{norm}$ [Msi]
IMU-LT-A-MH1-ETW2-2	AFJA112D	A	MH1	1	1	22.471	0.091	16	NR	0.0057	23.237
IMU-LT-A-MH1-ETW2-3	AFJA113D	A	MH1	1	1	21.977	0.091	16	NR	0.0057	22.680
IMU-LT-A-MH1-ETW2-4	AFJA114D	A	MH1	1	1	23.288	0.090	16	NR	0.0056	23.817
IMU-LT-B-MH1-ETW2-2	AFJB112D	B	MH1	2	1	21.562	0.093	16	NR	0.0058	22.812
IMU-LT-B-MH1-ETW2-3	AFJB113D	B	MH1	2	1	22.076	0.092	16	NR	0.0058	23.184
IMU-LT-B-MH1-ETW2-4	AFJB114D	B	MH1	2	1	22.192	0.094	16	NR	0.0059	23.793
IMU-LT-B-MH2-ETW2-2	AFJB212D	B	MH2	2	2	23.811	0.093	16	NR	0.0058	25.200
IMU-LT-B-MH2-ETW2-3	AFJB213D	B	MH2	2	2	22.908	0.092	16	NR	0.0057	23.889
IMU-LT-B-MH2-ETW2-4	AFJB214D	B	MH2	2	2	23.011	0.093	16	NR	0.0058	24.336
IMU-LT-C-MH1-ETW2-2	AFJC112D	C	MH1	3	1	23.738	0.088	16	NR	0.0055	23.621
IMU-LT-C-MH1-ETW2-3	AFJC113D	C	MH1	3	1	23.979	0.088	16	NR	0.0055	23.852
IMU-LT-C-MH1-ETW2-4	AFJC114D	C	MH1	3	1	25.069	0.089	16	NR	0.0055	25.226
IMU-LT-C-MH2-ETW2-2	AFJC212D	C	MH2	3	2	23.425	0.087	16	NR	0.0054	23.150
IMU-LT-C-MH2-ETW2-3	AFJC213D	C	MH2	3	2	24.379	0.087	16	NR	0.0055	24.199
IMU-LT-C-MH2-ETW2-4	AFJC214D	C	MH2	3	2	24.666	0.087	16	NR	0.0054	24.320

NR: Not recorded. Tests were stopped once 4000 microstrain was reached, so max load was not recorded.

*** Batch A cure cycle 2: data is omitted due to wrong panel layup**

Average	**23.237**		**$Average_{norm}$**	**0.0056**	**23.821**
Standard Dev.	**1.051**		**$Standard\ Dev._{norm}$**		**0.760**
Coeff. of Var. [%]	**4.521**		**$Coeff.\ of\ Var.\ [\%]_{norm}$**		**3.192**
Min.	**21.562**		**Min.**	**0.0054**	**22.680**
Max.	**25.069**		**Max.**	**0.0059**	**25.226**
Number of Spec.	**15**		**Number of Spec.**		**15**


Longitudinal Tension Properties (LT) -- (ETW2)
Normalized Modulus
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
20.0
22.0
24.0
26.0
28.0
Longitudinal Tension Modulus [Msi]

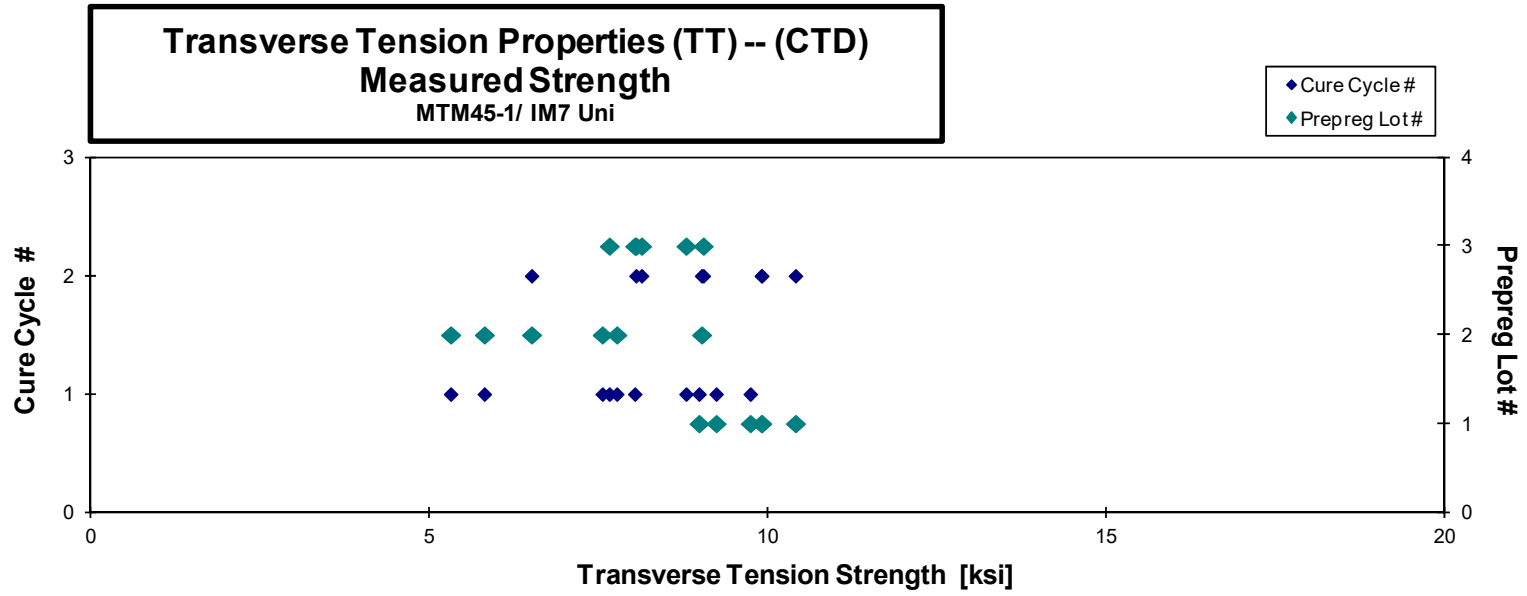
4.2 Transverse Tension Properties (TT)

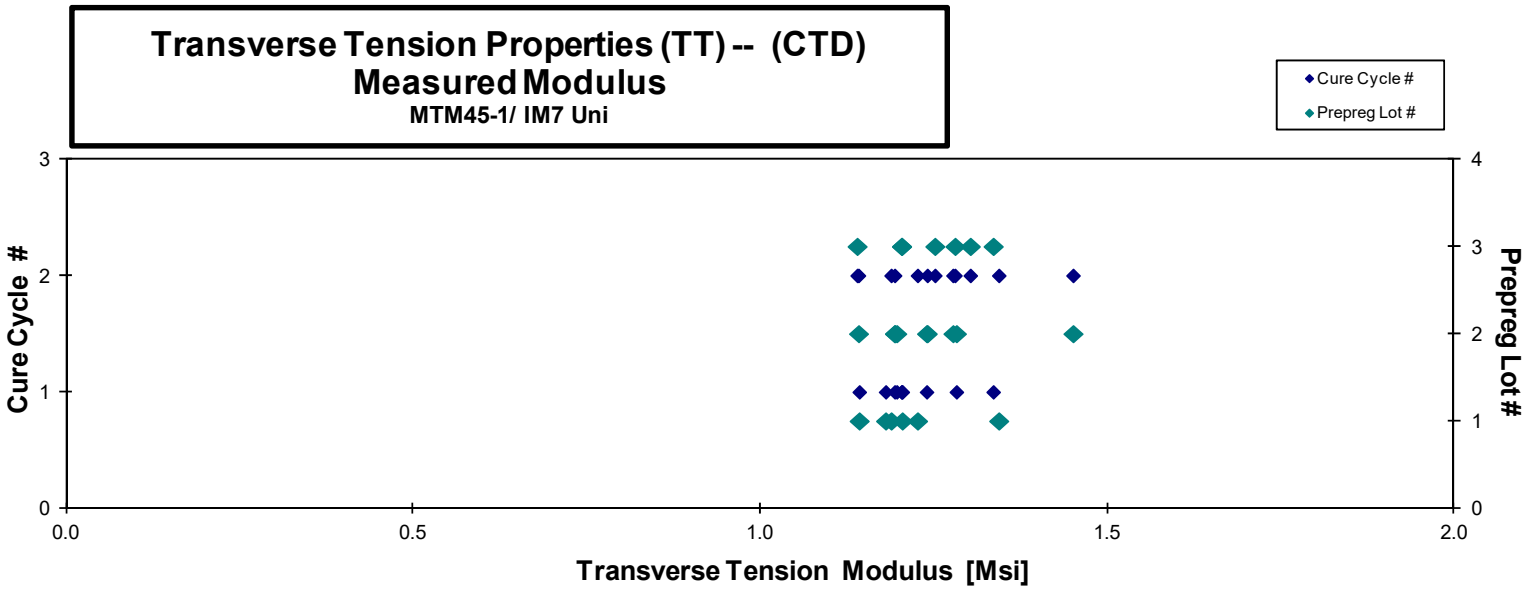
Transverse Tension Properties (TT) -- (CTD)
Strength & Modulus
MTM45-1/ IM7 Uni

Specimen Number	NIAR Naming	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode
IMU-TT-A-MH1-CTD-2	AFUA112B	A	MH1	1	1	9.754	1.181	0.094	16	0.0059	LGM
IMU-TT-A-MH1-CTD-3	AFUA113B	A	MH1	1	1	9.250	1.205	0.093	16	0.0058	LWB
IMU-TT-A-MH1-CTD-4	AFUA114B	A	MH1	1	1	8.997	1.143	0.093	16	0.0058	LAT
IMU-TT-A-MH2-CTD-2	AFUA212B	A	MH2	1	2	9.920	1.344	0.090	16	0.0057	LAB
IMU-TT-A-MH2-CTD-3	AFUA213B	A	MH2	1	2	9.920	1.189	0.092	16	0.0058	LAT
IMU-TT-A-MH2-CTD-4	AFUA214B	A	MH2	1	2	10.422	1.227	0.092	16	0.0057	LAB
IMU-TT-B-MH1-CTD-1	AFUB111B	B	MH1	2	1	7.782	1.283	0.093	16	0.0058	LGM
IMU-TT-B-MH1-CTD-2	AFUB112B	B	MH1	2	1	5.328	1.240	0.096	16	0.0060	LWB
IMU-TT-B-MH1-CTD-3	AFUB113B	B	MH1	2	1	5.826	1.194	0.095	16	0.0059	LWB
IMU-TT-B-MH1-CTD-4	AFUB114B	B	MH1	2	1	7.568	1.197	0.096	16	0.0060	LGM
IMU-TT-B-MH2-CTD-1*	AFUB211B	B	MH2	2	2		1.451	0.089	16	0.0056	LGM
IMU-TT-B-MH2-CTD-2*	AFUB212B	B	MH2	2	2		1.142	0.090	16	0.0056	LWB
IMU-TT-B-MH2-CTD-3	AFUB213B	B	MH2	2	2	9.035	1.194	0.087	16	0.0054	LGM
IMU-TT-B-MH2-CTD-4**	AFUB214B	B	MH2	2	2		1.278	0.087	16	0.0055	LIT
IMU-TT-B-MH2-CTD-R1(IMU-TT-B-MH2-ETW2-2)	AFUB231B	B	MH2	2	2	6.523	1.241	0.087	16	0.0055	LAT
IMU-TT-C-MH1-CTD-1	AFUC111B	C	MH1	3	1	7.672	1.204	0.085	16	0.0053	LAB
IMU-TT-C-MH1-CTD-2	AFUC112B	C	MH1	3	1	8.805	1.204	0.088	16	0.0055	LWT
IMU-TT-C-MH1-CTD-3	AFUC113B	C	MH1	3	1	8.048	1.336	0.084	16	0.0052	LGM
IMU-TT-C-MH2-CTD-1**	AFUC211B	C	MH2	3	2		1.252	0.089	16	0.0056	LIT
IMU-TT-C-MH2-CTD-2	AFUC212B	C	MH2	3	2	8.066	1.281	0.089	16	0.0056	LGM
IMU-TT-C-MH2-CTD-3	AFUC213B	C	MH2	3	2	9.060	1.140	0.089	16	0.0056	LAT
IMU-TT-C-MH2-CTD-4	AFUC214B	C	MH2	3	2	8.148	1.303	0.090	16	0.0056	LGM

*** Tensile strength is not reported due to the load recorded on the specimen is too low.**
**** Tensile strength is omitted due to unacceptable failure mode.**

Average	**8.340**	**1.238**	**Average**	**0.0056**
Standard Dev.	**1.415**	**0.075**		
Coeff. of Var. [%]	**16.970**	**6.074**		
Min.	**5.328**	**1.140**	**Min.**	**0.0052**
Max.	**10.422**	**1.451**	**Max.**	**0.0060**
Number of Spec.	**18**	**22**	**Number of Spec.**	**22**


Transverse Tension Properties (TT) -- (CTD)
Measured Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Transverse Tension Strength [ksi]
0
5
10
15
20
0
1
2
3
4

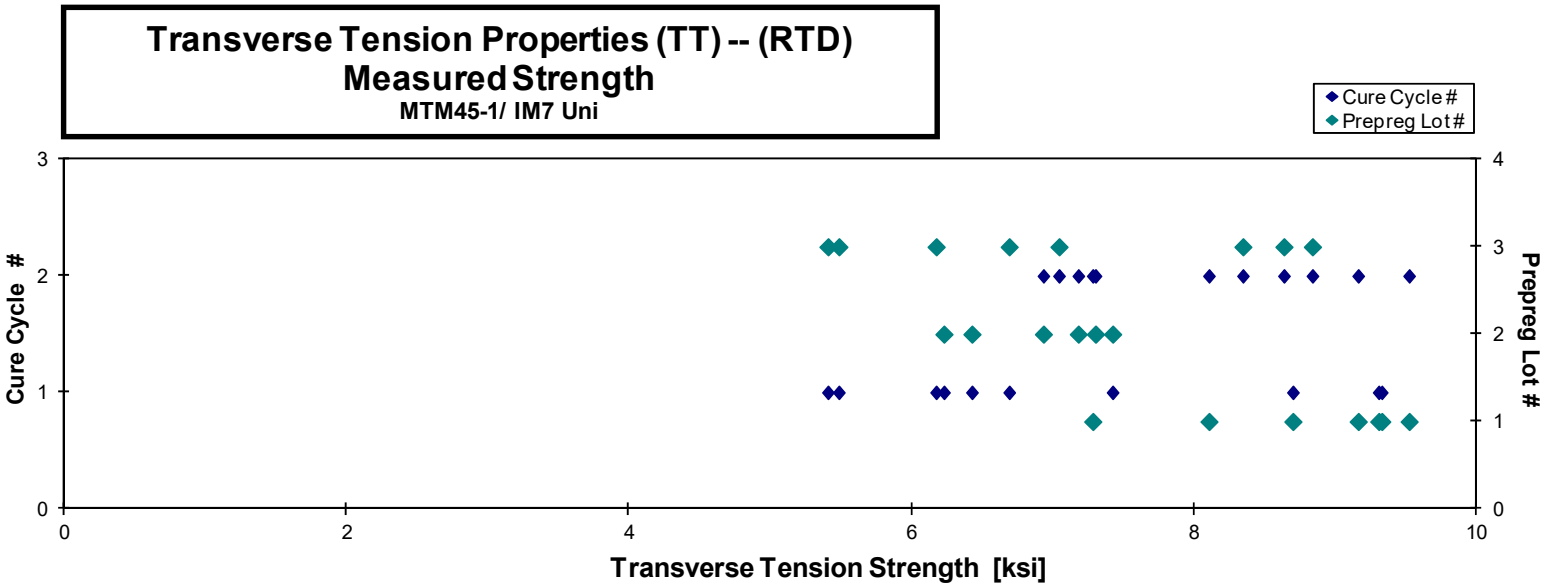

Transverse Tension Properties (TT) -- (CTD)
Measured Modulus
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Transverse Tension Modulus [Msi]
0.0
0.5
1.0
1.5
2.0
0
1
2
3
4

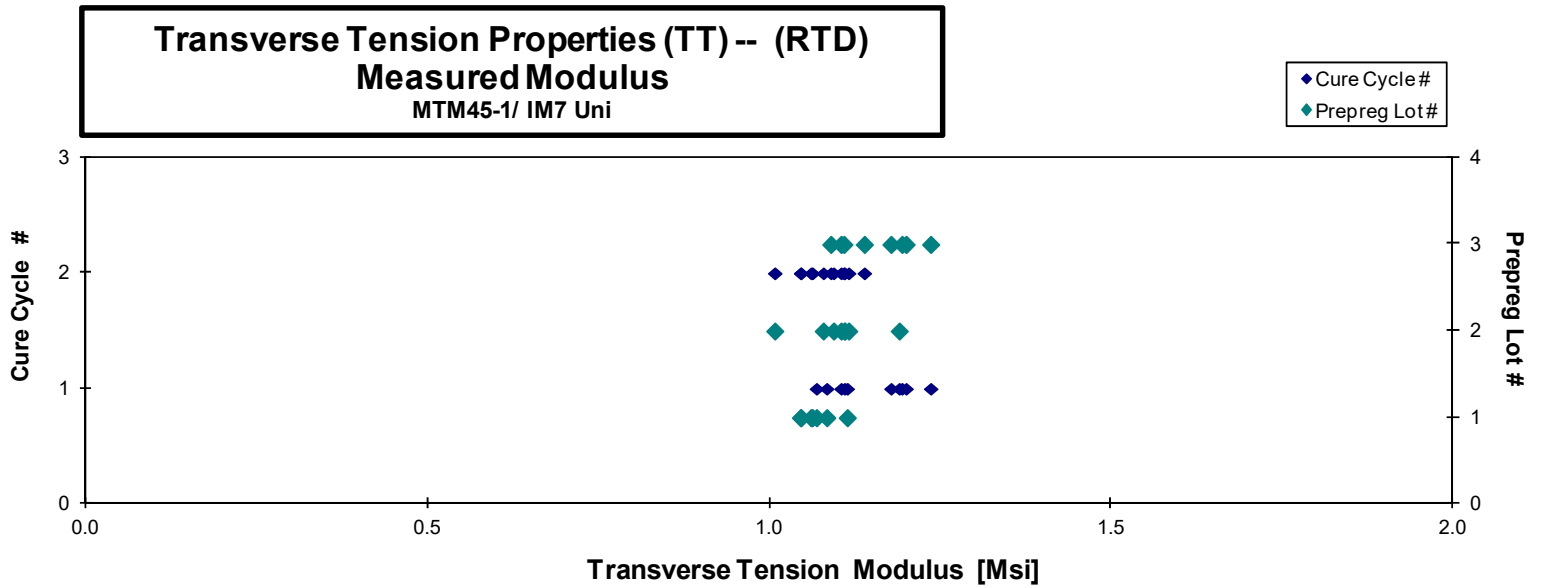
Transverse Tension Properties (TT) -- (RTD)
Strength & Modulus
MTM45-1/ IM7 Uni

Specimen Number	NIAR Naming	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode
IMU-TT-A-MH1-RTD-2	AFUA112A	A	MH1	1	1	8.698	1.114	0.092	16	0.0058	LGM
IMU-TT-A-MH1-RTD-3	AFUA113A	A	MH1	1	1	9.306	1.069	0.093	16	0.0058	LAT
IMU-TT-A-MH1-RTD-4	AFUA114A	A	MH1	1	1	9.328	1.084	0.093	16	0.0058	LGM
IMU-TT-A-MH2-RTD-1	AUFA211A	A	MH2	1	2	9.521	1.046	0.091	16	0.0057	LAT
IMU-TT-A-MH2-RTD-2	AUFA212A	A	MH2	1	2	9.161	1.046	0.091	16	0.0057	LAB
IMU-TT-A-MH2-RTD-3	AUFA213A	A	MH2	1	2	8.104	1.063	0.091	16	0.0057	LGM
IMU-TT-A-MH2-RTD-4	AUFA214A	A	MH2	1	2	7.281	1.061	0.091	16	0.0057	LGM
IMU-TT-B-MH1-RTD-2	AFUB112A	B	MH1	2	1	7.421	1.190	0.093	16	0.0058	LAB
IMU-TT-B-MH1-RTD-3	AFUB113A	B	MH1	2	1	6.227	1.110	0.096	16	0.0060	LGM
IMU-TT-B-MH1-RTD-4	AFUB114A	B	MH1	2	1	6.425	1.105	0.094	16	0.0059	LWB
IMU-TT-B-MH2-RTD-1*	AFUB211A	B	MH2	2	2		1.110	0.090	16	0.0056	LWB
IMU-TT-B-MH2-RTD-2	AFUB212A	B	MH2	2	2	7.300	1.079	0.089	16	0.0056	LGM
IMU-TT-B-MH2-RTD-3	AFUB213A	B	MH2	2	2	6.931	1.094	0.090	16	0.0056	LGM
IMU-TT-B-MH2-RTD-4*	AFUB214A	B	MH2	2	2		1.008	0.090	16	0.0056	LGM
IMU-TT-B-MH2-RTD-R1(IMU-TT-B-MH2-ETW-1)	AFUB221A	B	MH2	2	2	7.178	1.116	0.087	16	0.0054	LGM
IMU-TT-C-MH1-RTD-1	AFUC111A	C	MH1	3	1	5.405	1.178	0.087	16	0.0055	LWT
IMU-TT-C-MH1-RTD-2	AFUC112A	C	MH1	3	1	5.482	1.194	0.088	16	0.0055	LWB
IMU-TT-C-MH1-RTD-3	AFUC113A	C	MH1	3	1	6.689	1.200	0.088	16	0.0055	LWT
IMU-TT-C-MH1-RTD-4	AFUC114A	C	MH1	3	1	6.171	1.236	0.088	16	0.0055	LGM
IMU-TT-C-MH2-RTD-1	AFUC211A	C	MH2	3	2	7.042	1.105	0.089	16	0.0056	LWB
IMU-TT-C-MH2-RTD-2	AFUC212A	C	MH2	3	2	8.836	1.109	0.089	16	0.0056	LGM
IMU-TT-C-MH2-RTD-3	AFUC213A	C	MH2	3	2	8.344	1.090	0.090	16	0.0056	LGM
IMU-TT-C-MH2-RTD-4	AFUC214A	C	MH2	3	2	8.635	1.139	0.089	16	0.0056	LGM

*** Tensile strength is not reported due to the load recorded on the specimen is too low.**

Average	**7.595**	**1.111**	**Average**	**0.0057**
Standard Dev.	**1.289**	**0.056**		
Coeff. of Var. [%]	**16.975**	**5.085**		
Min.	**5.405**	**1.008**	**Min.**	**0.0054**
Max.	**9.521**	**1.236**	**Max.**	**0.0060**
Number of Spec.	**21**	**23**	**Number of Spec.**	**23**

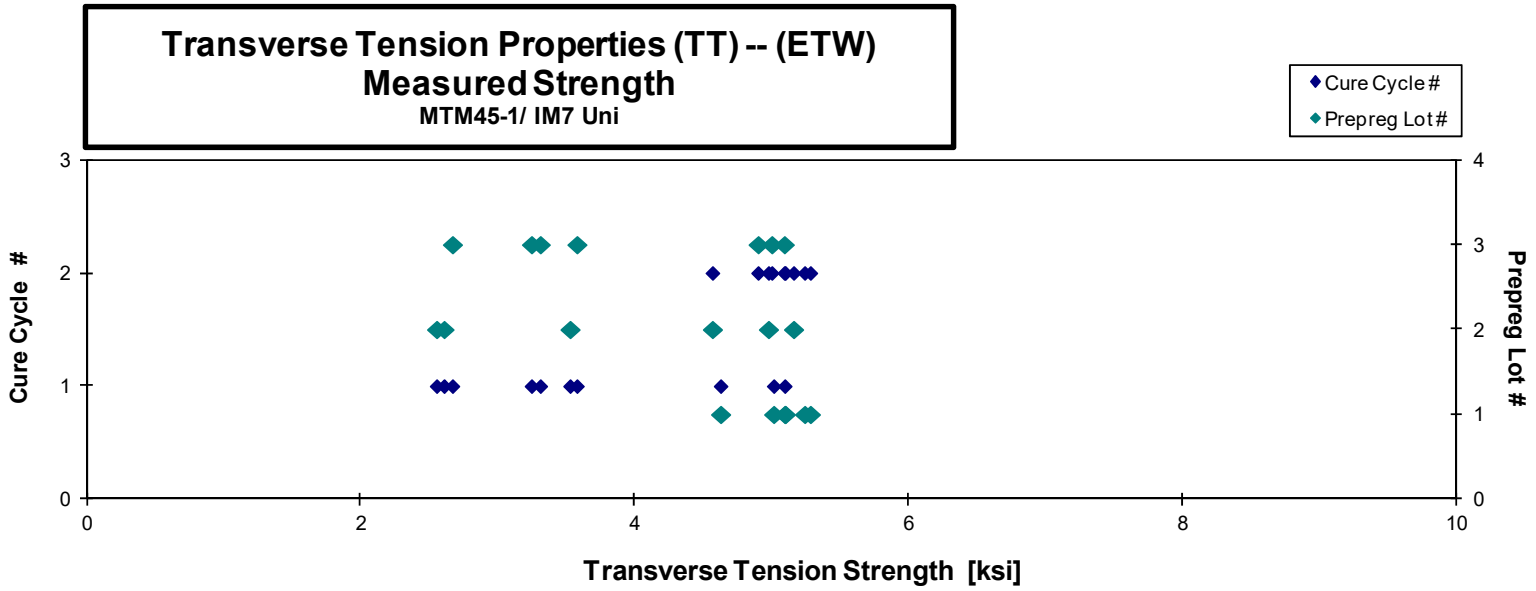

Transverse Tension Properties (TT) -- (RTD)
Measured Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Transverse Tension Strength [ksi]
0
2
4
6
8
10
0
1
2
3
4

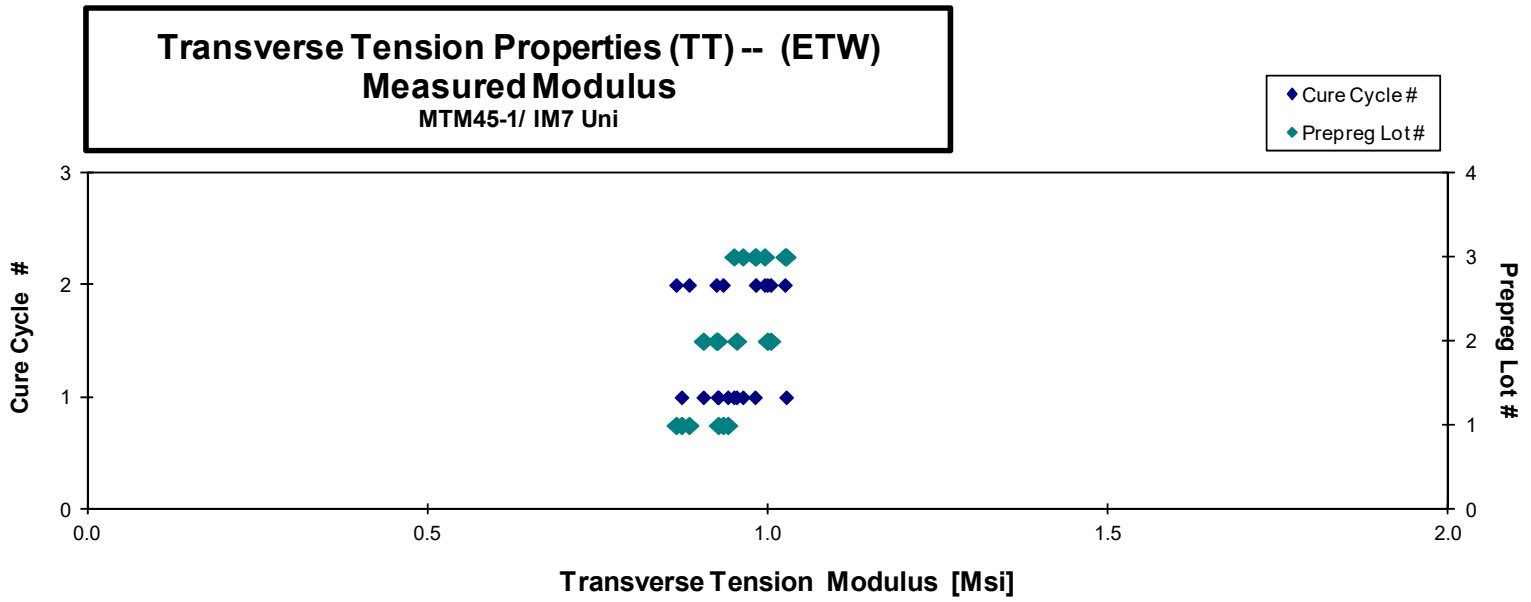

Transverse Tension Properties (TT) -- (RTD)
Measured Modulus
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Transverse Tension Modulus [Msi]
0.0
0.5
1.0
1.5
2.0
0
1
2
3
4

Transverse Tension Properties (TT) -- (ETW)
Strength & Modulus
MTM45-1/ IM7 Uni

Specimen Number	NIAR Naming	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode
IMU-TT-A-MH1-ETW-2	AFUA112N	A	MH1	1	1	5.102	0.874	0.092	16	0.0058	LWB
IMU-TT-A-MH1-ETW-3	AFUA113N	A	MH1	1	1	5.021	0.928	0.091	16	0.0057	LGM
IMU-TT-A-MH1-ETW-4	AFUA114N	A	MH1	1	1	4.633	0.942	0.091	16	0.0057	LAB
IMU-TT-A-MH2-ETW-1	AFUA211N	A	MH2	1	2	5.105	0.866	0.092	16	0.0057	LAT
IMU-TT-A-MH2-ETW-2	AFUA212N	A	MH2	1	2	5.288	0.935	0.091	16	0.0057	LAB
IMU-TT-A-MH2-ETW-3	AFUA213N	A	MH2	1	2	5.247	0.885	0.091	16	0.0057	LGM
IMU-TT-B-MH1-ETW-2	AFUB112N	B	MH1	2	1	2.559	0.955	0.094	16	0.0059	LGM
IMU-TT-B-MH1-ETW-3	AFUB113N	B	MH1	2	1	3.533	0.906	0.095	16	0.0059	LGM
IMU-TT-B-MH1-ETW-4	AFUB114N	B	MH1	2	1	2.614	0.927	0.093	16	0.0058	LGM
IMU-TT-B-MH2-ETW-1	AFUB211N	B	MH2	2	2	5.166	1.005	0.088	16	0.0055	LWB
IMU-TT-B-MH2-ETW-2	AFUB212N	B	MH2	2	2	4.983	1.000	0.088	16	0.0055	LAT
IMU-TT-B-MH2-ETW-4	AFUB214N	B	MH2	2	2	4.573	0.925	0.087	16	0.0055	LAB
IMU-TT-C-MH1-ETW-1	AFUC111N	C	MH1	3	1	3.317	0.951	0.086	16	0.0054	LWT
IMU-TT-C-MH1-ETW-2	AFUC112N	C	MH1	3	1	3.252	0.982	0.087	16	0.0055	LGM
IMU-TT-C-MH1-ETW-3	AFUC113N	C	MH1	3	1	3.584	0.964	0.087	16	0.0055	LGM
IMU-TT-C-MH1-ETW-4	AFUC114N	C	MH1	3	1	2.675	1.028	0.087	16	0.0054	LGM
IMU-TT-C-MH2-ETW-2	AFUC212N	C	MH2	3	2	4.907	1.026	0.087	16	0.0054	LWT
IMU-TT-C-MH2-ETW-3	AFUC213N	C	MH2	3	2	5.099	0.996	0.087	16	0.0054	LGM
IMU-TT-C-MH2-ETW-4	AFUC214N	C	MH2	3	2	5.007	0.983	0.087	16	0.0054	AGM

Average	**4.298**	**0.951**	**Average**	**0.0056**
Standard Dev.	**1.007**	**0.049**		
Coeff. of Var. [%]	**23.440**	**5.117**		
Min.	**2.559**	**0.866**	**Min.**	**0.0054**
Max.	**5.288**	**1.028**	**Max.**	**0.0059**
Number of Spec.	**19**	**19**	**Number of Spec.**	**19**

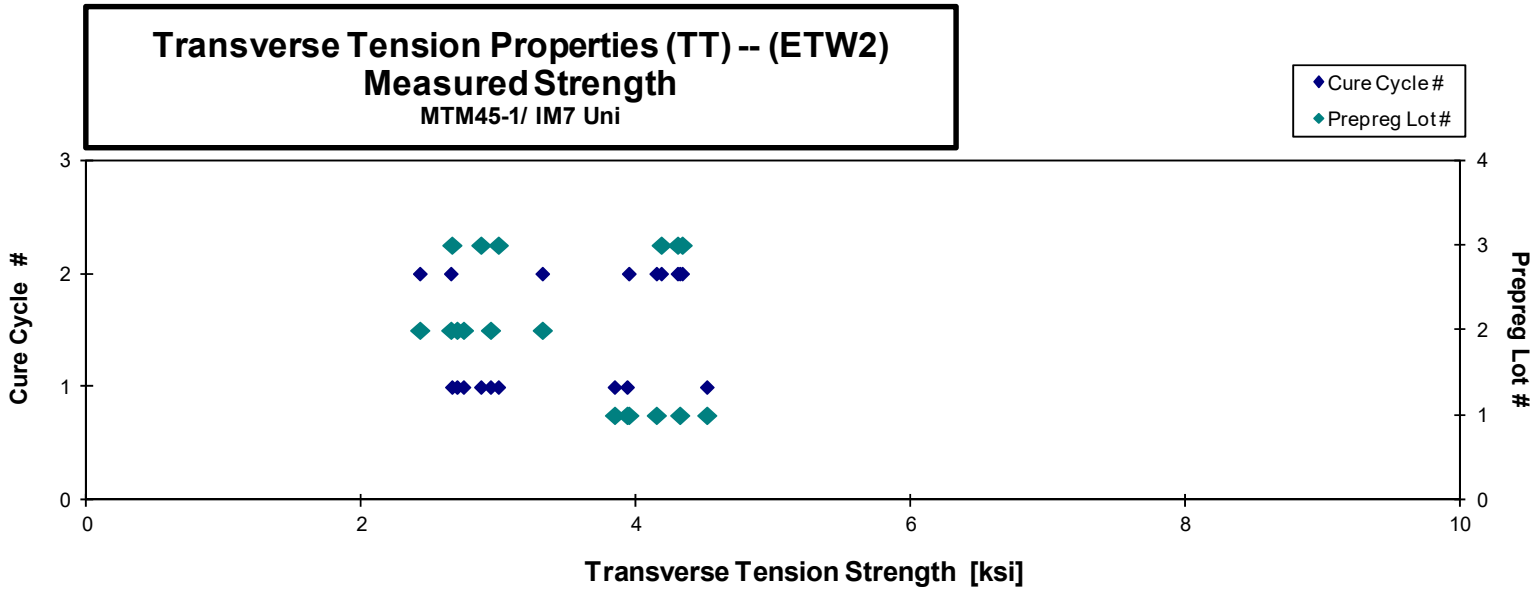

Transverse Tension Properties (TT) -- (ETW)
Measured Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Transverse Tension Strength [ksi]
0
2
4
6
8
10
0
1
2
3
0
1
2
3
4

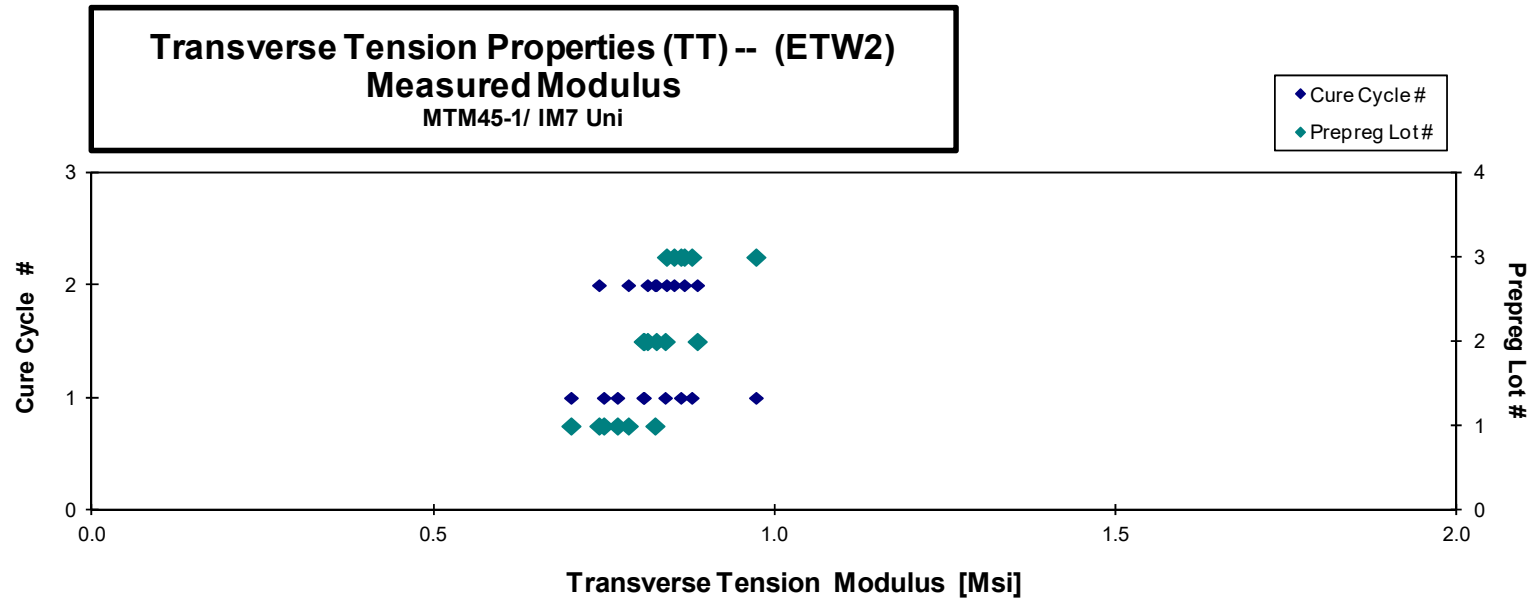

Transverse Tension Properties (TT) -- (ETW)
Measured Modulus
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Transverse Tension Modulus [Msi]
0.0
0.5
1.0
1.5
2.0
0
1
2
3
0
1
2
3
4

Transverse Tension Properties (TT) -- (ETW2)
Strength & Modulus
MTM45-1/ IM7 Uni

Specimen Number	NIAR Naming	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode
IMU-TT-A-MH1-ETW2-1	AFUA111D	A	MH1	1	1	4.519	0.770	0.092	16	0.0057	LGM
IMU-TT-A-MH1-ETW2-3	AFUA113D	A	MH1	1	1	3.846	0.702	0.093	16	0.0058	LGM
IMU-TT-A-MH1-ETW2-4	AFUA114D	A	MH1	1	1	3.937	0.750	0.092	16	0.0057	LGM
IMU-TT-A-MH2-ETW2-2	AFUA212D	A	MH2	1	2	3.950	0.825	0.091	16	0.0057	LWB
IMU-TT-A-MH2-ETW2-3	AFUA213D	A	MH2	1	2	4.321	0.743	0.092	16	0.0057	LGM
IMU-TT-A-MH2-ETW2-4	AFUA214D	A	MH2	1	2	4.151	0.786	0.091	16	0.0057	LGM
IMU-TT-B-MH1-ETW2-2	AFUB112D	B	MH1	2	1	2.698	0.840	0.095	16	0.0059	LGM
IMU-TT-B-MH1-ETW2-3	AFUB113D	B	MH1	2	1	2.746	0.809	0.095	16	0.0059	LGM
IMU-TT-B-MH1-ETW2-4	AFUB114D	B	MH1	2	1	2.943	0.808	0.094	16	0.0059	LGM
IMU-TT-B-MH2-ETW2-1	AFUB211D	B	MH2	2	2	2.654	0.814	0.088	16	0.0055	LGM
IMU-TT-B-MH2-ETW2-3	AFUB213D	B	MH2	2	2	2.428	0.887	0.088	16	0.0055	LGM
IMU-TT-B-MH2-ETW2-4	AFUB214D	B	MH2	2	2	3.320	0.827	0.088	16	0.0055	LGM
IMU-TT-C-MH1-ETW2-2	AFUC112D	C	MH1	3	1	3.000	0.973	0.086	16	0.0054	LGM
IMU-TT-C-MH1-ETW2-3	AFUC113D	C	MH1	3	1	2.661	0.863	0.086	16	0.0054	LGM
IMU-TT-C-MH1-ETW2-4	AFUC114D	C	MH1	3	1	2.873	0.879	0.087	16	0.0054	LGM
IMU-TT-C-MH2-ETW2-2	AFUC212D	C	MH2	3	2	4.306	0.868	0.087	16	0.0054	LGM
IMU-TT-C-MH2-ETW2-3	AFUC213D	C	MH2	3	2	4.186	0.853	0.087	16	0.0054	LGM
IMU-TT-C-MH2-ETW2-4	AFUC214D	C	MH2	3	2	4.339	0.842	0.086	16	0.0054	LGM

Average	**3.493**	**0.824**	**Average**	**0.0056**
Standard Dev.	**0.737**	**0.062**		
Coeff. of Var. [%]	**21.103**	**7.555**		
Min.	**2.428**	**0.702**	**Min.**	**0.0054**
Max.	**4.519**	**0.973**	**Max.**	**0.0059**
Number of Spec.	**18**	**18**	**Number of Spec.**	**18**


Transverse Tension Properties (TT) -- (ETW2)
Measured Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Transverse Tension Strength [ksi]
0
2
4
6
8
10
0
1
2
3
4


Transverse Tension Properties (TT) -- (ETW2)
Measured Modulus
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Transverse Tension Modulus [Msi]
0.0
0.5
1.0
1.5
2.0
0
1
2
3
4

4.3 Longitudinal Compression Properties (LC)

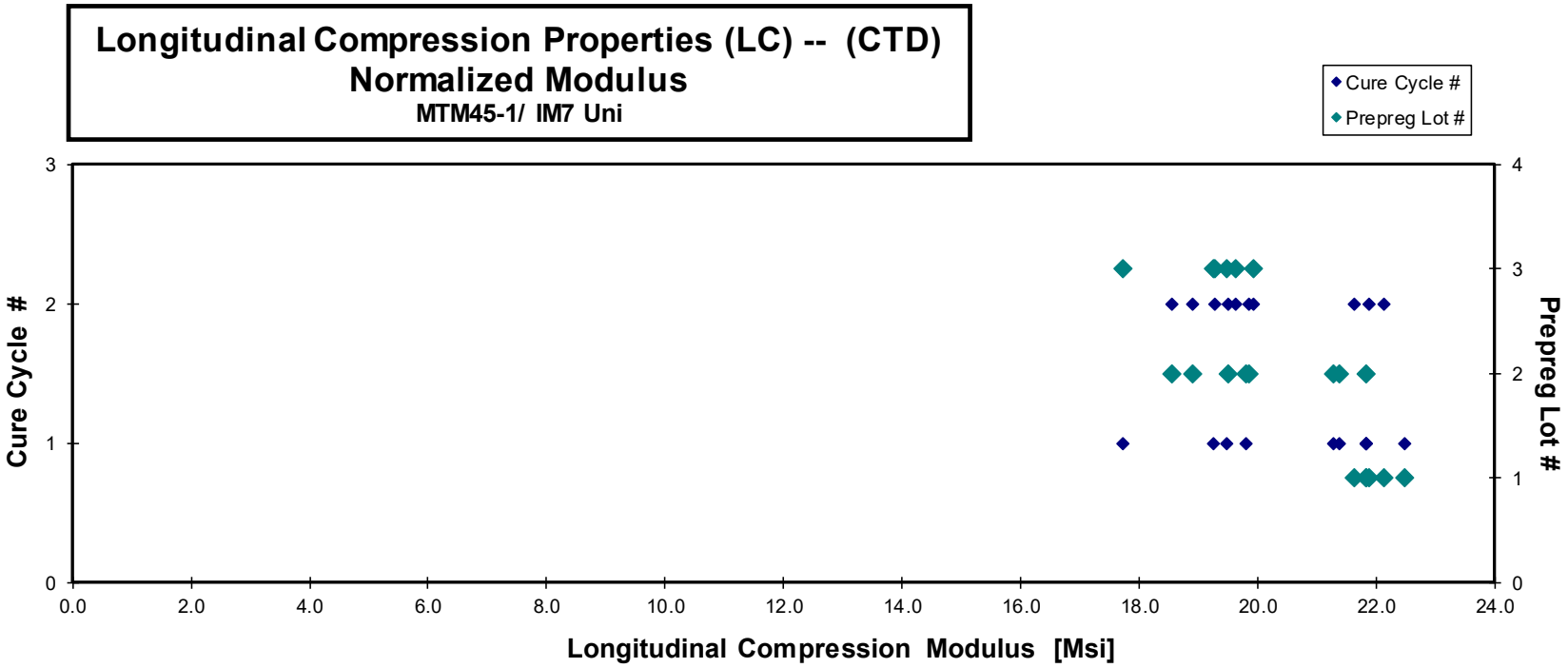
Longitudinal Compression Properties (LC) -- (CTD)
Modulus
MTM45-1/ IM7 Uni

normalizing t_{ply} [in]: 0.0055

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Modulus [Msi]	Poisson's Ratio	Avg. Specimen Thickn. [in]	# Plies in Laminate	Avg. t_{ply} [in]	$Modulus_{norm}$ [Msi]
IMU-LC-A-MH1-CTD-2	AFLA112B	A	MH1	1	1	21.562	0.323	0.092	16	0.0057	22.493
IMU-LC-A-MH1-CTD-3	AFLA113B	A	MH1	1	1	21.177	0.345	0.091	16	0.0057	21.827
IMU-LC-A-MH1-CTD-4	AFLA114B	A	MH1	1	1	21.602	0.337	0.089	16	0.0056	21.823
IMU-LC-A-MH2-CTD-2	AFLA212B	A	MH2	1	2	21.082	0.346	0.091	16	0.0057	21.873
IMU-LC-A-MH2-CTD-3	AFLA213B	A	MH2	1	2	21.019	0.371	0.091	16	0.0057	21.640
IMU-LC-A-MH2-CTD-4	AFLA214B	A	MH2	1	2	21.396	0.367	0.091	16	0.0057	22.125
IMU-LC-B-MH1-CTD-2	AFLB112B	B	MH1	2	1	19.617	0.403	0.096	16	0.0060	21.289
IMU-LC-B-MH1-CTD-3	AFLB113B	B	MH1	2	1	20.038	0.387	0.094	16	0.0059	21.381
IMU-LC-B-MH1-CTD-4	AFLB114B	B	MH1	2	1	18.688	0.308	0.093	16	0.0058	19.814
IMU-LC-B-MH1-CTD-R2	AFLB122B	B	MH1	2	1	20.278	0.409	0.095	16	0.0059	21.830
IMU-LC-B-MH2-CTD-2	AFLB212B	B	MH2	2	2	19.756	0.460	0.088	16	0.0055	19.846
IMU-LC-B-MH2-CTD-3	AFLB213B	B	MH2	2	2	*	0.408	0.089	16	0.0056	
IMU-LC-B-MH2-CTD-4	AFLB214B	B	MH2	2	2	18.465	0.314	0.088	16	0.0055	18.549
IMU-LC-B-MH2-CTD-R2	AFLB222B	B	MH2	2	2	19.089	0.260	0.087	16	0.0054	18.897
IMU-LC-B-MH2-CTD-R3	AFLB223B	B	MH2	2	2	19.089	0.314	0.090	16	0.0056	19.504
IMU-LC-C-MH1-CTD-2	AFLC112B	C	MH1	3	1	18.361	0.349	0.085	16	0.0053	17.714
IMU-LC-C-MH1-CTD-3	AFLC113B	C	MH1	3	1	19.387	0.279	0.087	16	0.0055	19.255
IMU-LC-C-MH1-CTD-4	AFLC114B	C	MH1	3	1	19.696	0.353	0.087	16	0.0054	19.472
IMU-LC-C-MH2-CTD-2	AFLC212B	C	MH2	3	2	19.804	0.287	0.089	16	0.0055	19.939
IMU-LC-C-MH2-CTD-3	AFLC213B	C	MH2	3	2	19.403	0.317	0.087	16	0.0055	19.271
IMU-LC-C-MH2-CTD-4	AFLC214B	C	MH2	3	2	19.592	0.340	0.088	16	0.0055	19.637

*** Modulus is omitted due to strain gage malfunction and recommended by CMH-17 data review working group.**

Average	19.955	0.346	$Average_{norm}$	0.0056	20.409
Standard Dev.	1.032	0.049	$Standard\ Dev._{norm}$		1.405
Coeff. of Var. [%]	5.173	14.030	$Coeff.\ of\ Var.\ [\%]_{norm}$		6.885
Min.	18.361	0.260	Min.	0.0053	17.714
Max.	21.602	0.460	Max.	0.0060	22.493
Number of Spec.	20	21	Number of Spec.		20


Longitudinal Compression Properties (LC) -- (CTD)
Normalized Modulus
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Longitudinal Compression Modulus [Msi]
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
20.0
22.0
24.0
0
1
2
3
4

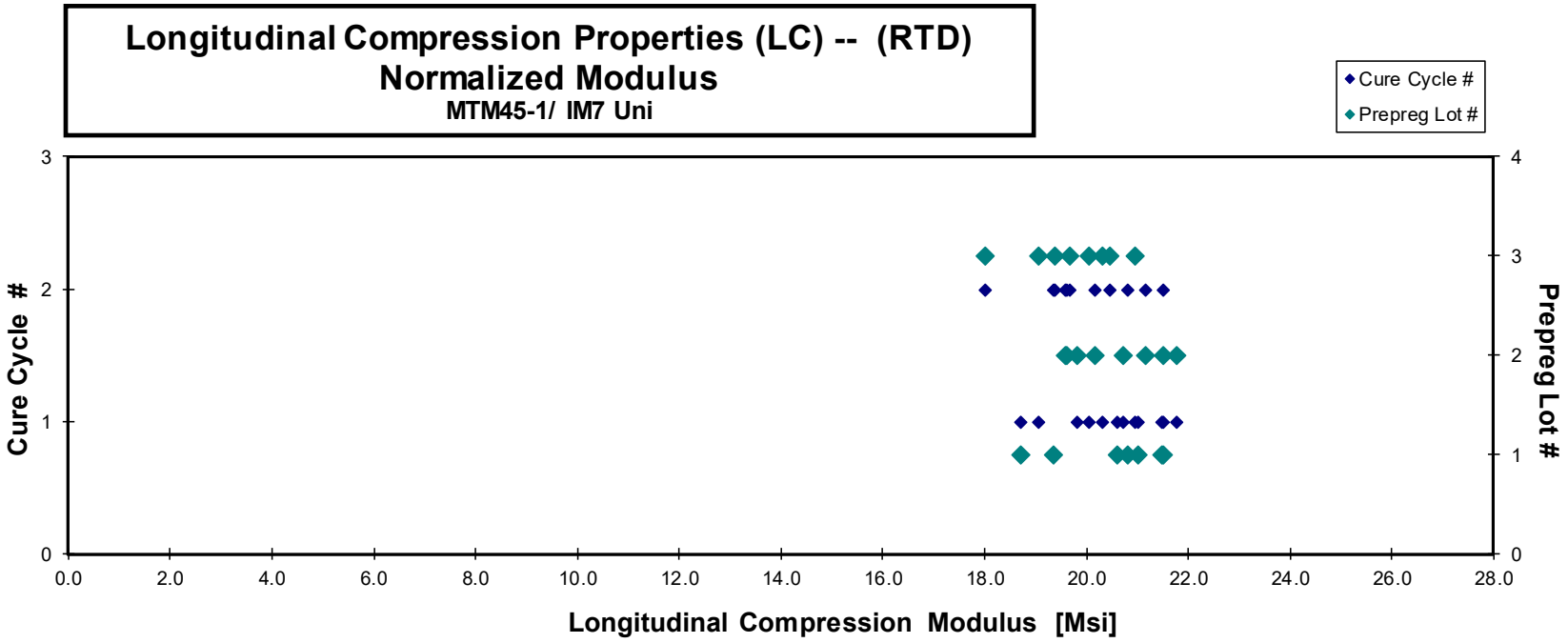
Longitudinal Compression Properties (LC) -- (RTD)
Modulus
MTM45-1/ IM7 Uni

normalizing t_{ply} [in]: 0.0055

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Modulus [Msi]	Poisson's Ratio	Avg. Specimen Thickn. [in]	# Plies in Laminate	Avg. t_{ply} [in]	$Modulus_{norm}$ [Msi]
IMU-LC-A-MH1-RTD-2	AFLA112A	A	MH1	1	1	20.526	0.334	0.090	16	0.0056	20.993
IMU-LC-A-MH1-RTD-3	AFLA113A	A	MH1	1	1	19.100	0.452	0.086	16	0.0054	18.688
IMU-LC-A-MH1-RTD-4	AFLA114A	A	MH1	1	1	20.235	0.365	0.090	16	0.0056	20.603
IMU-LC-A-MH1-RTD-R3	AFLA123A	A	MH1	1	1	21.032	0.420	0.090	16	0.0056	21.466
IMU-LC-A-MH2-RTD-2	AFLA212A	A	MH2	1	2	20.112	0.334	0.091	16	0.0057	20.798
IMU-LC-A-MH2-RTD-3	AFLA213A	A	MH2	1	2	20.621	0.330	0.092	16	0.0057	21.488
IMU-LC-A-MH2-RTD-4	AFLA214A	A	MH2	1	2	18.988	0.327	0.090	16	0.0056	19.333
IMU-LC-B-MH1-RTD-1	AFLB111A	B	MH1	2	1	20.041	*	0.094	16	0.0059	21.499
IMU-LC-B-MH1-RTD-2	AFLB112A	B	MH1	2	1	19.118	0.292	0.095	16	0.0060	20.704
IMU-LC-B-MH1-RTD-3	AFLB113A	B	MH1	2	1	19.918	0.381	0.096	16	0.0060	21.751
IMU-LC-B-MH1-RTD-4	AFLB114A	B	MH1	2	1	18.253	0.322	0.096	16	0.0060	19.809
IMU-LC-B-MH2-RTD-1	AFLB211A	B	MH2	2	2	18.921	0.284	0.091	16	0.0057	19.566
IMU-LC-B-MH2-RTD-2	AFLB212A	B	MH2	2	2	19.730	0.357	0.088	16	0.0055	19.618
IMU-LC-B-MH2-RTD-3	AFLB213A	B	MH2	2	2	20.524	0.349	0.091	16	0.0057	21.154
IMU-LC-B-MH2-RTD-4	AFLB214A	B	MH2	2	2	20.192	0.365	0.088	16	0.0055	20.146
IMU-LC-C-MH1-RTD-1	AFLC111A	C	MH1	3	1	20.269	0.350	0.088	16	0.0055	20.315
IMU-LC-C-MH1-RTD-2	AFLC112A	C	MH1	3	1	20.983	0.374	0.088	16	0.0055	20.935
IMU-LC-C-MH1-RTD-3	AFLC113A	C	MH1	3	1	19.421	0.391	0.086	16	0.0054	19.046
IMU-LC-C-MH1-RTD-4	AFLC114A	C	MH1	3	1	20.011	0.360	0.088	16	0.0055	20.034
IMU-LC-C-MH2-RTD-1	AFLC211A	C	MH2	3	2	19.768	0.404	0.088	16	0.0055	19.656
IMU-LC-C-MH2-RTD-2	AFLC212A	C	MH2	3	2	20.573	0.364	0.088	16	0.0055	20.456
IMU-LC-C-MH2-RTD-3	AFLC213A	C	MH2	3	2	19.334	0.394	0.088	16	0.0055	19.378
IMU-LC-C-MH2-RTD-4	AFLC214A	C	MH2	3	2	18.669	0.392	0.085	16	0.0053	18.011

*** Poisson's ratio is not reported due to strain gauge failed prematurely.**

	Modulus [Msi]	Poisson's Ratio		$Modulus_{norm}$ [Msi]
Average	19.841	0.361	$Average_{norm}$	20.237
Standard Dev.	0.751	0.040	$Standard\ Dev._{norm}$	0.984
Coeff. of Var. [%]	3.785	11.011	$Coeff.\ of\ Var.\ [\%]_{norm}$	4.864
Min.	18.253	0.284	Min.	18.011
Max.	21.032	0.452	Max.	21.751
Number of Spec.	23	22	Number of Spec.	23

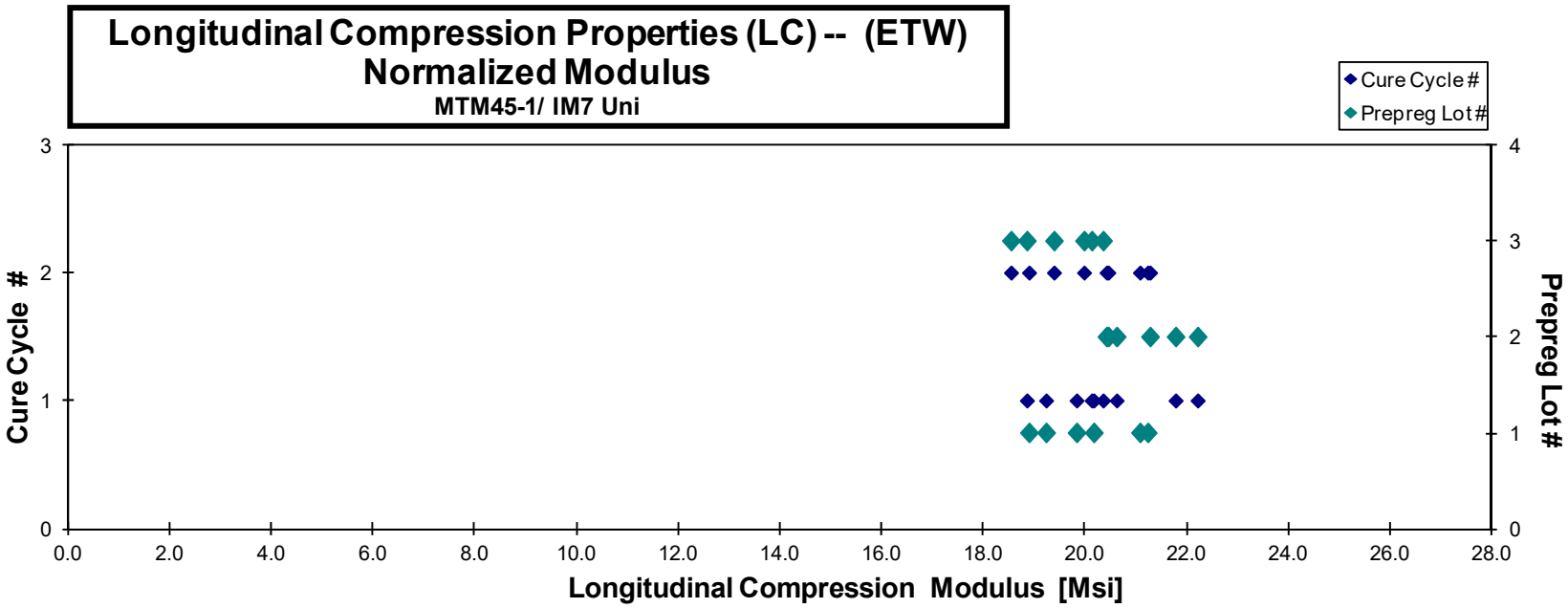

Longitudinal Compression Properties (LC) -- (RTD)
Normalized Modulus
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Longitudinal Compression Modulus [Msi]
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
20.0
22.0
24.0
26.0
28.0
0
1
2
3
4

Longitudinal Compression Properties (LC) -- (ETW)
Modulus
MTM45-1/ IM7 Uni

normalizing t_{ply} [in]: 0.0055

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Modulus [Msi]	Poisson's Ratio	Avg. Specimen Thickn. [in]	# Plies in Laminate	Avg. t_{ply} [in]	$Modulus_{norm}$ [Msi]
IMU-LC-A-MH1-ETW-2	AFLA112N	A	MH1	1	1	19.138	0.390	0.091	16	0.0057	19.834
IMU-LC-A-MH1-ETW-3	AFLA113N	A	MH1	1	1	18.891	0.378	0.090	16	0.0056	19.234
IMU-LC-A-MH1-ETW-4	AFLA114N	A	MH1	1	1	20.051	0.337	0.089	16	0.0055	20.173
IMU-LC-A-MH2-ETW-1	AFLA211N	A	MH2	1	2	20.564	0.424	0.091	16	0.0057	21.234
IMU-LC-A-MH2-ETW-3	AFLA213N	A	MH2	1	2	20.431	0.340	0.091	16	0.0057	21.081
IMU-LC-A-MH2-ETW-4	AFLA214N	A	MH2	1	2	18.606	0.339	0.089	16	0.0056	18.898
IMU-LC-B-MH1-ETW-2	AFLB112N	B	MH1	2	1	20.629	0.354	0.095	16	0.0059	22.215
IMU-LC-B-MH1-ETW-3	AFLB113N	B	MH1	2	1	20.308	0.378	0.094	16	0.0059	21.781
IMU-LC-B-MH1-ETW-4	AFLB114N	B	MH1	2	1	19.506	0.392	0.093	16	0.0058	20.622
IMU-LC-B-MH2-ETW-2	AFLB212N	B	MH2	2	2	20.653	0.356	0.087	16	0.0054	20.457
IMU-LC-B-MH2-ETW-3	AFLB213N	B	MH2	2	2	21.335	0.370	0.088	16	0.0055	21.278
IMU-LC-B-MH2-ETW-4	AFLB214N	B	MH2	2	2	20.622	0.391	0.087	16	0.0054	20.423
IMU-LC-C-MH1-ETW-2	AFLC112N	C	MH1	3	1	20.881	0.390	0.086	16	0.0054	20.355
IMU-LC-C-MH1-ETW-3	AFLC113N	C	MH1	3	1	20.781	0.320	0.080	16	0.0050	18.856
IMU-LC-C-MH1-ETW-4	AFLC114N	C	MH1	3	1	20.544	0.401	0.086	16	0.0054	20.132
IMU-LC-C-MH2-ETW-2	AFLC212N	C	MH2	3	2	20.292	0.372	0.087	16	0.0054	19.981
IMU-LC-C-MH2-ETW-3	AFLC213N	C	MH2	3	2	19.564	0.415	0.087	16	0.0055	19.390
IMU-LC-C-MH2-ETW-4	AFLC214N	C	MH2	3	2	19.582	0.367	0.083	16	0.0052	18.544

Average	**20.132**	**0.373**	**$Average_{norm}$**	**0.0055**	**20.249**
Standard Dev.	**0.750**	**0.028**	**$Standard\ Dev._{norm}$**		**1.025**
Coeff. of Var. [%]	**3.727**	**7.546**	**$Coeff.\ of\ Var.\ [\%]_{norm}$**		**5.062**
Min.	**18.606**	**0.320**	**Min.**	**0.0050**	**18.544**
Max.	**21.335**	**0.424**	**Max.**	**0.0059**	**22.215**
Number of Spec.	**18**	**18**	**Number of Spec.**		**18**

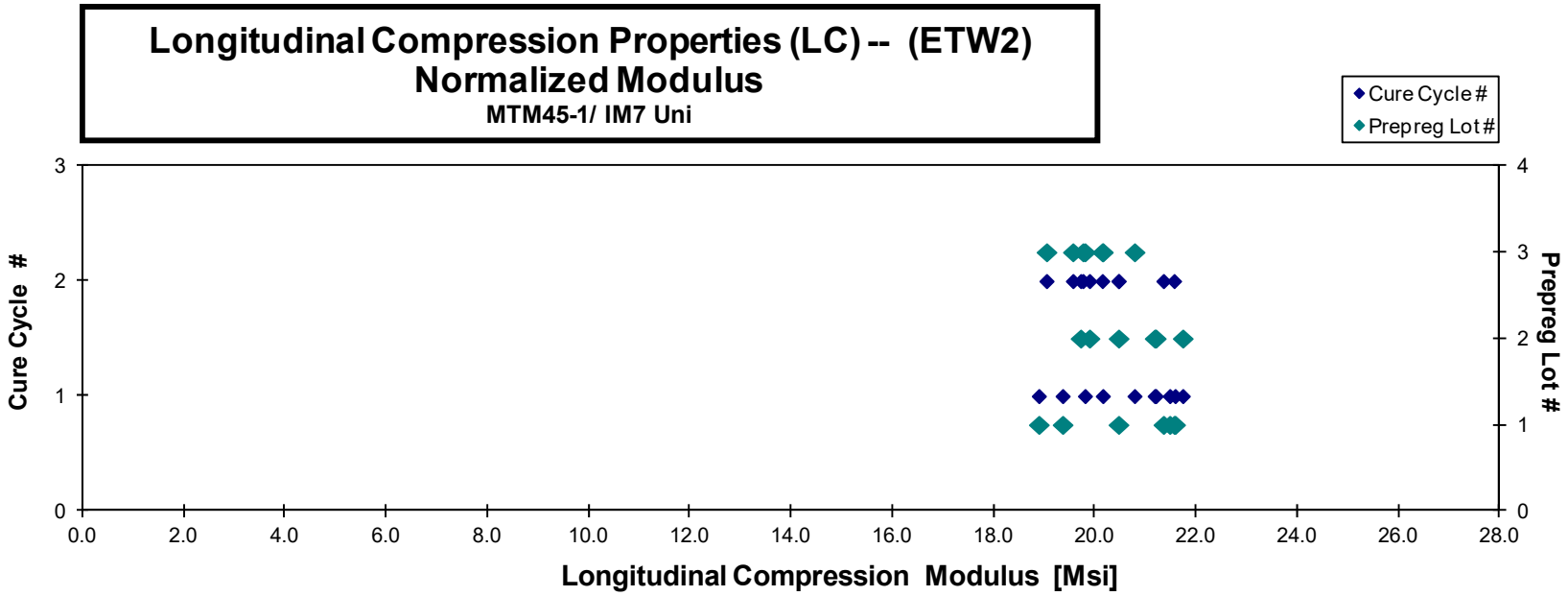

Longitudinal Compression Properties (LC) -- (ETW)
Normalized Modulus
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
20.0
22.0
24.0
26.0
28.0
Longitudinal Compression Modulus [Msi]

Longitudinal Compression Properties (LC) -- (ETW2)
Modulus
MTM45-1/ IM7 Uni

normalizing t_{ply} [in]: 0.0055

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Modulus [Msi]	Poisson's Ratio	Avg. Specimen Thickn. [in]	# Plies in Laminate	Avg. t_{ply} [in]	$Modulus_{norm}$ [Msi]
IMU-LC-A-MH1-ETW2-1	AFLA111D	A	MH1	1	1	21.448	0.365	0.089	16	0.0055	21.598
IMU-LC-A-MH1-ETW2-2	AFLA112D	A	MH1	1	1	20.929	0.368	0.090	16	0.0056	21.492
IMU-LC-A-MH1-ETW2-3	AFLA113D	A	MH1	1	1	18.820	0.370	0.091	16	0.0057	19.376
IMU-LC-A-MH1-ETW2-4	AFLA114D	A	MH1	1	1	20.041	0.358	0.083	16	0.0052	18.906
IMU-LC-A-MH2-ETW2-2	AFLA212D	A	MH2	1	2	20.055	0.365	0.090	16	0.0056	20.480
IMU-LC-A-MH2-ETW2-3	AFLA213D	A	MH2	1	2	21.201	0.379	0.090	16	0.0056	21.578
IMU-LC-A-MH2-ETW2-4	AFLA214D	A	MH2	1	2	20.310	0.458	0.093	16	0.0058	21.368
IMU-LC-B-MH1-ETW2-1	AFLB111D	B	MH1	2	1	19.993	0.432	0.093	16	0.0058	21.216
IMU-LC-B-MH1-ETW2-2	AFLB112D	B	MH1	2	1	19.927	0.408	0.094	16	0.0059	21.195
IMU-LC-B-MH1-ETW2-3	AFLB113D	B	MH1	2	1	20.122	0.448	0.095	16	0.0059	21.749
IMU-LC-B-MH2-ETW2-2	AFLB212D	B	MH2	2	2	19.642	0.399	0.089	16	0.0056	19.906
IMU-LC-B-MH2-ETW2-3	AFLB213D	B	MH2	2	2	20.043	0.444	0.087	16	0.0054	19.732
IMU-LC-B-MH2-ETW2-4	AFLB214D	B	MH2	2	2	20.489	0.375	0.088	16	0.0055	20.481
IMU-LC-C-MH1-ETW2-2	AFLC112D	C	MH1	3	1	21.145	0.377	0.087	16	0.0054	20.797
IMU-LC-C-MH1-ETW2-3	AFLC113D	C	MH1	3	1	20.385	0.386	0.086	16	0.0053	19.817
IMU-LC-C-MH1-ETW2-4	AFLC114D	C	MH1	3	1	20.568	0.357	0.086	16	0.0054	20.171
IMU-LC-C-MH2-ETW2-1	AFLC211D	C	MH2	3	2	20.076	0.394	0.088	16	0.0055	20.160
IMU-LC-C-MH2-ETW2-2	AFLC212D	C	MH2	3	2	19.792	0.366	0.087	16	0.0054	19.578
IMU-LC-C-MH2-ETW2-3	AFLC213D	C	MH2	3	2	19.829	0.370	0.088	16	0.0055	19.776
IMU-LC-C-MH2-ETW2-4	AFLC214D	C	MH2	3	2	19.292	0.358	0.087	16	0.0054	19.058

Average	**20.205**	**0.389**	**$Average_{norm}$**	**0.0056**	**20.422**
Standard Dev.	**0.641**	**0.032**	**$Standard\ Dev._{norm}$**		**0.904**
Coeff. of Var. [%]	**3.172**	**8.329**	**$Coeff.\ of\ Var.\ [\%]_{norm}$**		**4.425**
Min.	**18.820**	**0.357**	**Min.**	**0.0052**	**18.906**
Max.	**21.448**	**0.458**	**Max.**	**0.0059**	**21.749**
Number of Spec.	**20**	**20**	**Number of Spec.**		**20**


Longitudinal Compression Properties (LC) -- (ETW2)
Normalized Modulus
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
20.0
22.0
24.0
26.0
28.0
Longitudinal Compression Modulus [Msi]

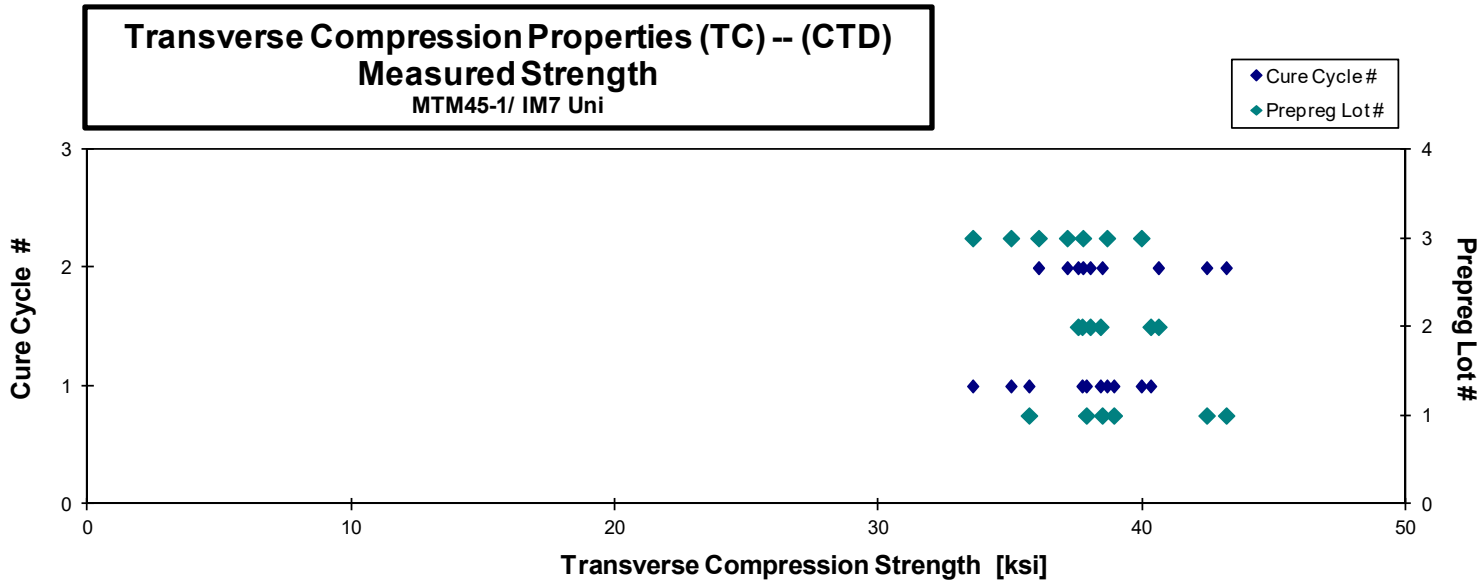
4.4 Transverse Compression Properties (TC)

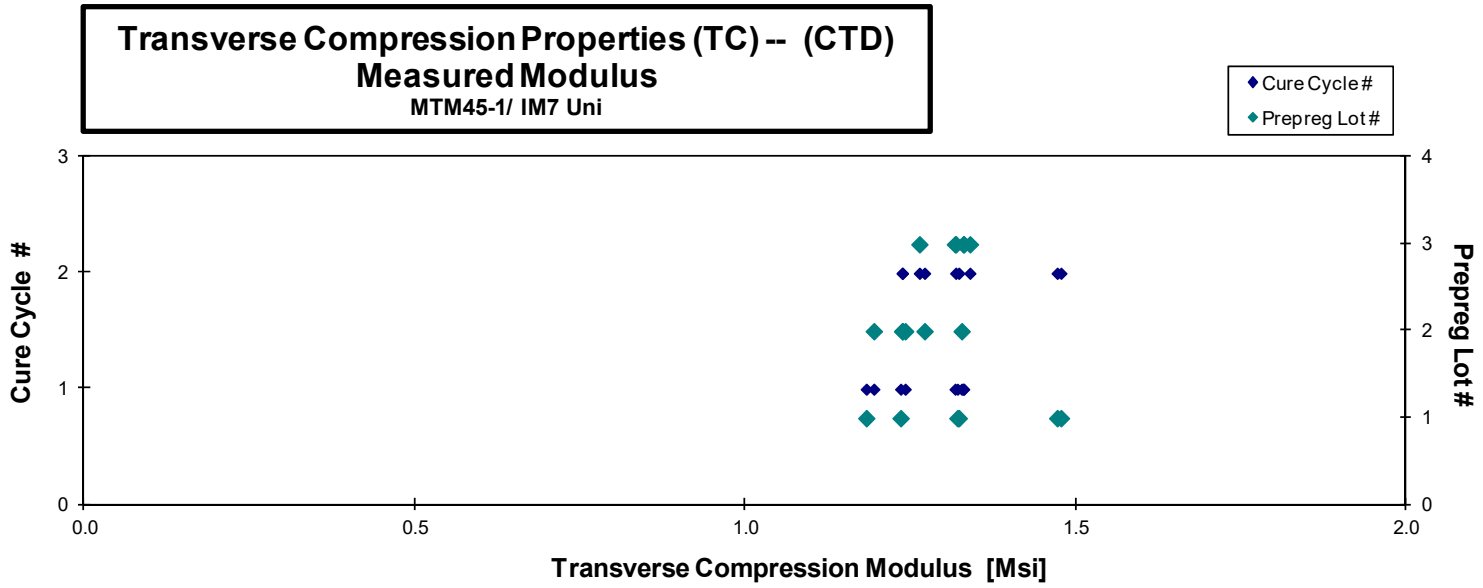
Transverse Compression Properties (TC) -- (CTD)
Strength & Modulus
MTM45-1/ IM7 Uni

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Poisson's Ratio	Avg. Specimen Thickn. [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode
IMU-TC-A-MH1-CTD-2	AFZA112B	A	MH1	1	1	35.676	1.182	0.026	0.092	16	0.0057	HAT
IMU-TC-A-MH1-CTD-3	AFZA113B	A	MH1	1	1	37.850	1.320	0.026	0.091	16	0.0057	HAT
IMU-TC-A-MH1-CTD-4	AFZA114B	A	MH1	1	1	38.895	1.234	0.025	0.092	16	0.0057	HAT
IMU-TC-A-MH2-CTD-2	AFZA212B	A	MH2	1	2	42.417	1.322	0.030	0.092	16	0.0058	HAT/HAB
IMU-TC-A-MH2-CTD-3	AFZA213B	A	MH2	1	2	43.159	1.477	0.025	0.092	16	0.0058	HAT/HAB
IMU-TC-A-MH2-CTD-4	AFZA214B	A	MH2	1	2	38.455	1.471	0.029	0.092	16	0.0057	HAT
IMU-TC-B-MH1-CTD-1	AFZB111B	B	MH1	2	1	38.387	1.327	0.027	0.095	16	0.0059	HAB
IMU-TC-B-MH1-CTD-2	AFZB112B	B	MH1	2	1	40.292	1.194	0.023	0.095	16	0.0059	HAB/HAT
IMU-TC-B-MH1-CTD-4	AFZB114B	B	MH1	2	1	37.692	1.241	0.023	0.094	16	0.0059	HGM
IMU-TC-B-MH2-CTD-1	AFZB211B	B	MH2	2	2	37.539	1.237	0.021	0.091	16	0.0057	HAB
IMU-TC-B-MH2-CTD-2	AFZB212B	B	MH2	2	2	38.000	1.237	0.028	0.087	16	0.0055	HAB
IMU-TC-B-MH2-CTD-3	AFZB213B	B	MH2	2	2	40.587	1.271	0.029	0.090	16	0.0056	HAT/HAB
IMU-TC-C-MH1-CTD-1*	AFZC111B	C	MH1	3	1	33.544			0.088	16	0.0055	HAT
IMU-TC-C-MH1-CTD-2	AFZC112B	C	MH1	3	1	38.637	1.330	0.032	0.088	16	0.0055	HAT
IMU-TC-C-MH1-CTD-3	AFZC113B	C	MH1	3	1	34.993	1.329	0.034	0.088	16	0.0055	HGM
IMU-TC-C-MH1-CTD-4	AFZC114B	C	MH1	3	1	39.939	1.317	0.026	0.089	16	0.0055	HGM
IMU-TC-C-MH2-CTD-1	AFZC211B	C	MH2	3	2	36.040	1.318	0.031	0.087	16	0.0054	HAT/HAB
IMU-TC-C-MH2-CTD-2	AFZC212B	C	MH2	3	2	37.126	1.263	0.029	0.087	16	0.0055	HAT
IMU-TC-C-MH2-CTD-3	AFZC213B	C	MH2	3	2	37.722	1.339	0.029	0.087	16	0.0055	HAB

***Compressive modulus and poisson's ratio values not reported due to strain gauge failed prematurely.**

Average	**38.260**	**1.301**	**0.027**	**Average**	**0.0056**
Standard Dev.	**2.374**	**0.080**	**0.003**		
Coeff. of Var. [%]	**6.204**	**6.164**	**12.215**		
Min.	**33.544**	**1.182**	**0.021**	**Min.**	**0.0054**
Max.	**43.159**	**1.477**	**0.034**	**Max.**	**0.0059**
Number of Spec.	**19**	**18**	**18**	**Number of Spec.**	**19**

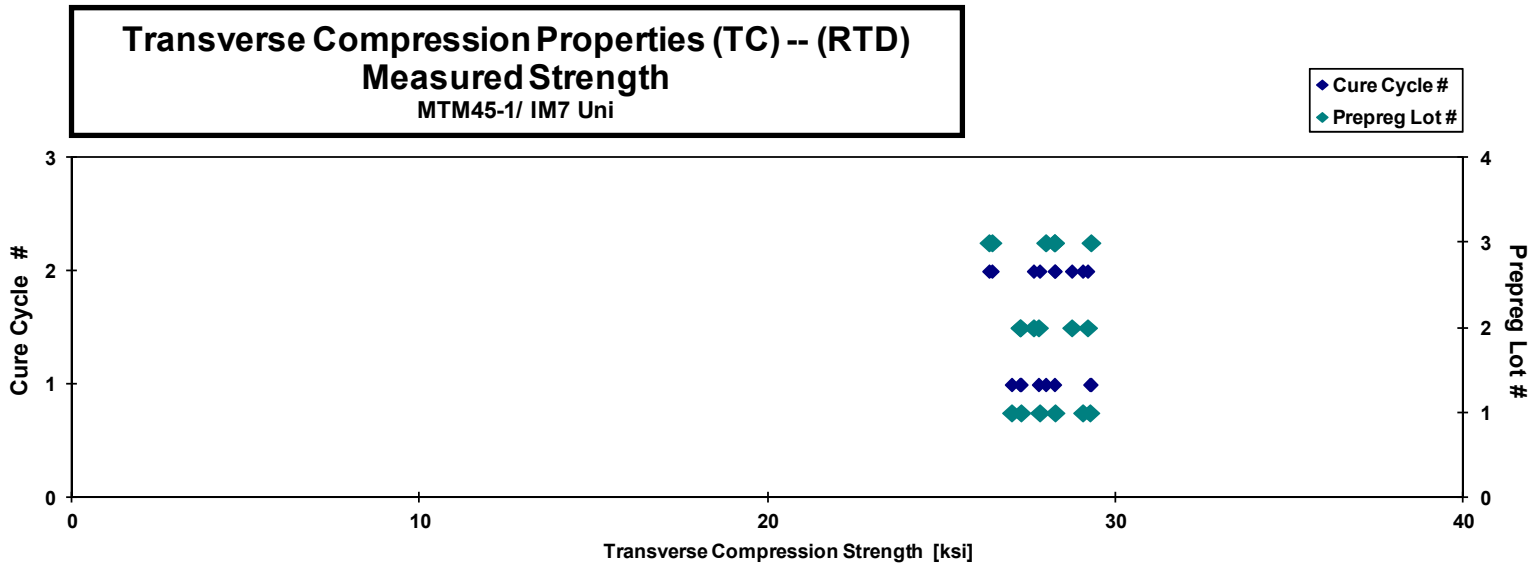

Transverse Compression Properties (TC) -- (CTD)
Measured Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0
10
20
30
40
50
Transverse Compression Strength [ksi]

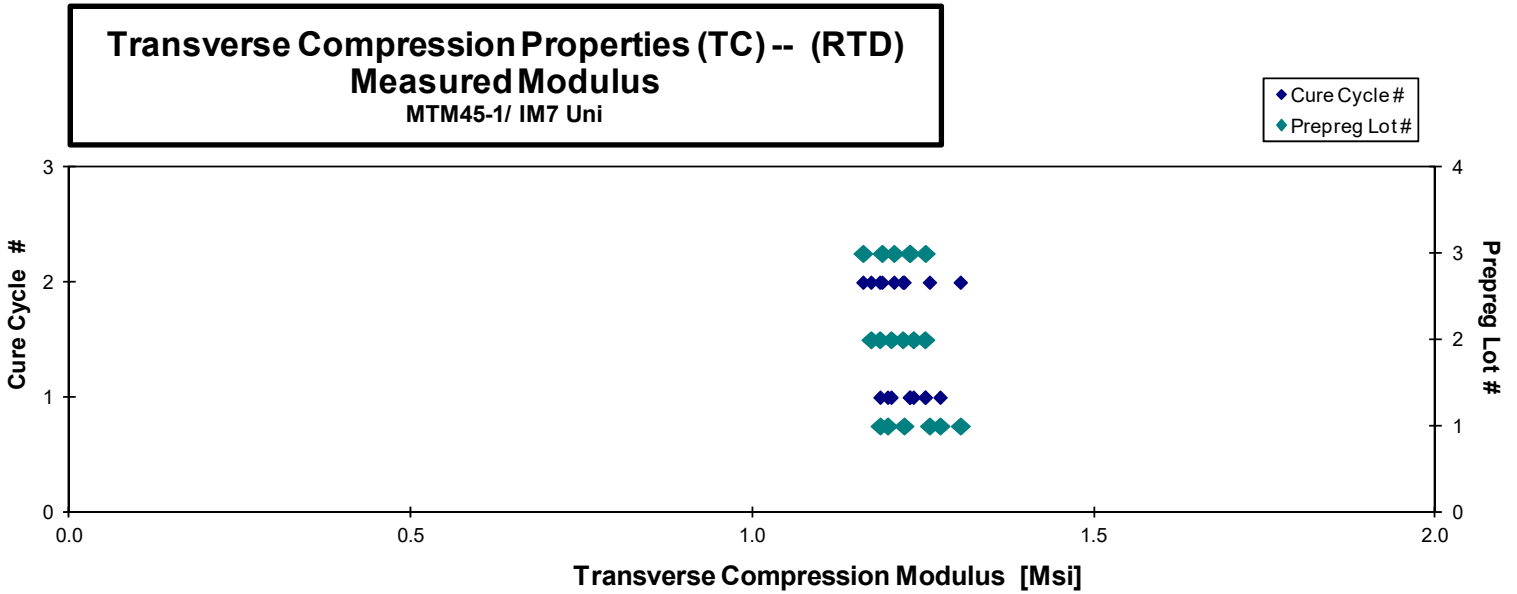

Transverse Compression Properties (TC) -- (CTD)
Measured Modulus
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
0.5
1.0
1.5
2.0
Transverse Compression Modulus [Msi]

Transverse Compression Properties (TC) -- (RTD)
Strength & Modulus
MTM45-1/ IM7 Uni

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Poisson's Ratio	Avg. Specimen Thickn. [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode
IMU-TC-A-MH1-RTD-2	AFZA112A	A	MH1	1	1	29.270	1.275	0.028	0.091	16	0.0057	HAB
IMU-TC-A-MH1-RTD-3	AFZA113A	A	MH1	1	1	27.017	1.187	0.023	0.092	16	0.0058	HAB
IMU-TC-A-MH1-RTD-4	AFZA114A	A	MH1	1	1	27.288	1.198	0.026	0.092	16	0.0058	HAT
IMU-TC-A-MH2-RTD-2	AFZA212A	A	MH2	1	2	28.267	1.222	0.027	0.091	16	0.0057	HAT
IMU-TC-A-MH2-RTD-3	AFZA213A	A	MH2	1	2	29.062	1.305	0.029	0.091	16	0.0057	HGM
IMU-TC-A-MH2-RTD-4	AFZA214A	A	MH2	1	2	27.825	1.259	0.026	0.091	16	0.0057	HAT/HAB
IMU-TC-B-MH1-RTD-1	AFZB111A	B	MH1	2	1	27.258	1.203	0.025	0.095	16	0.0059	HGM
IMU-TC-B-MH1-RTD-2	AFZB112A	B	MH1	2	1	27.270	1.236	0.028	0.094	16	0.0059	HGM
IMU-TC-B-MH1-RTD-3	AFZB113A	B	MH1	2	1	27.792	1.253	0.028	0.095	16	0.0059	HGM
IMU-TC-B-MH2-RTD-1	AFZB211A	B	MH2	2	2	29.202	1.220	0.026	0.089	16	0.0056	HGM
IMU-TC-B-MH2-RTD-2	AFZB212A	B	MH2	2	2	27.649	1.187	0.024	0.089	16	0.0056	HAB
IMU-TC-B-MH2-RTD-3	AFZB213A	B	MH2	2	2	28.747	1.174	0.027	0.089	16	0.0056	HGM
IMU-TC-C-MH1-RTD-2	AFZC112A	C	MH1	3	1	29.299	1.230	0.026	0.087	16	0.0055	HGM
IMU-TC-C-MH1-RTD-3	AFZC113A	C	MH1	3	1	27.997	1.253	0.026	0.088	16	0.0055	HGM
IMU-TC-C-MH1-RTD-4	AFZC114A	C	MH1	3	1	28.252	1.231	0.027	0.088	16	0.0055	HGM
IMU-TC-C-MH2-RTD-1	AFZC211A	C	MH2	3	2	28.250	1.190	0.029	0.087	16	0.0054	HGM
IMU-TC-C-MH2-RTD-2	AFZC212A	C	MH2	3	2	26.368	1.162	0.025	0.087	16	0.0054	HGM
IMU-TC-C-MH2-RTD-3	AFZC213A	C	MH2	3	2	26.455	1.207	0.024	0.088	16	0.0055	HGM

Average	**27.959**	**1.222**	**0.026**	**Average**	**0.0056**
Standard Dev.	**0.920**	**0.037**	**0.002**		
Coeff. of Var. [%]	**3.292**	**3.066**	**6.085**		
Min.	**26.368**	**1.162**	**0.023**	**Min.**	**0.0054**
Max.	**29.299**	**1.305**	**0.029**	**Max.**	**0.0059**
Number of Spec.	**18**	**18**	**18**	**Number of Spec.**	**18**

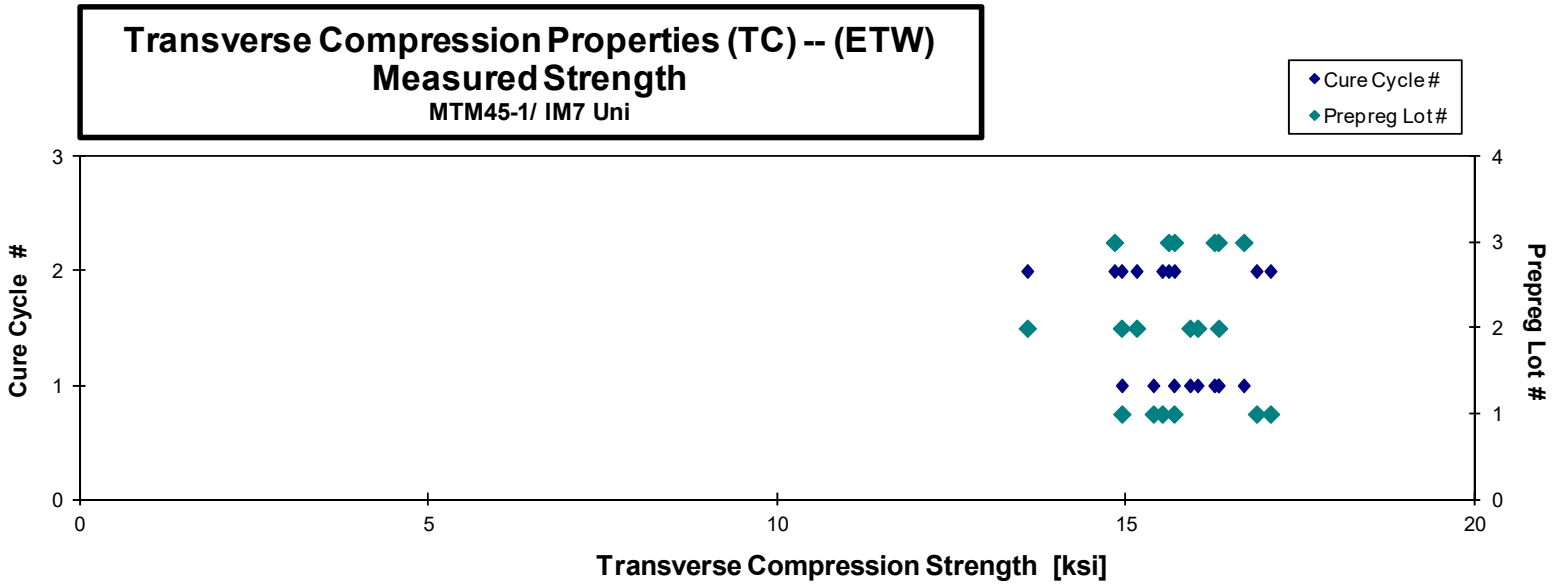

Transverse Compression Properties (TC) -- (RTD)
Measured Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Transverse Compression Strength [ksi]
0
10
20
30
40
0
1
2
3
4

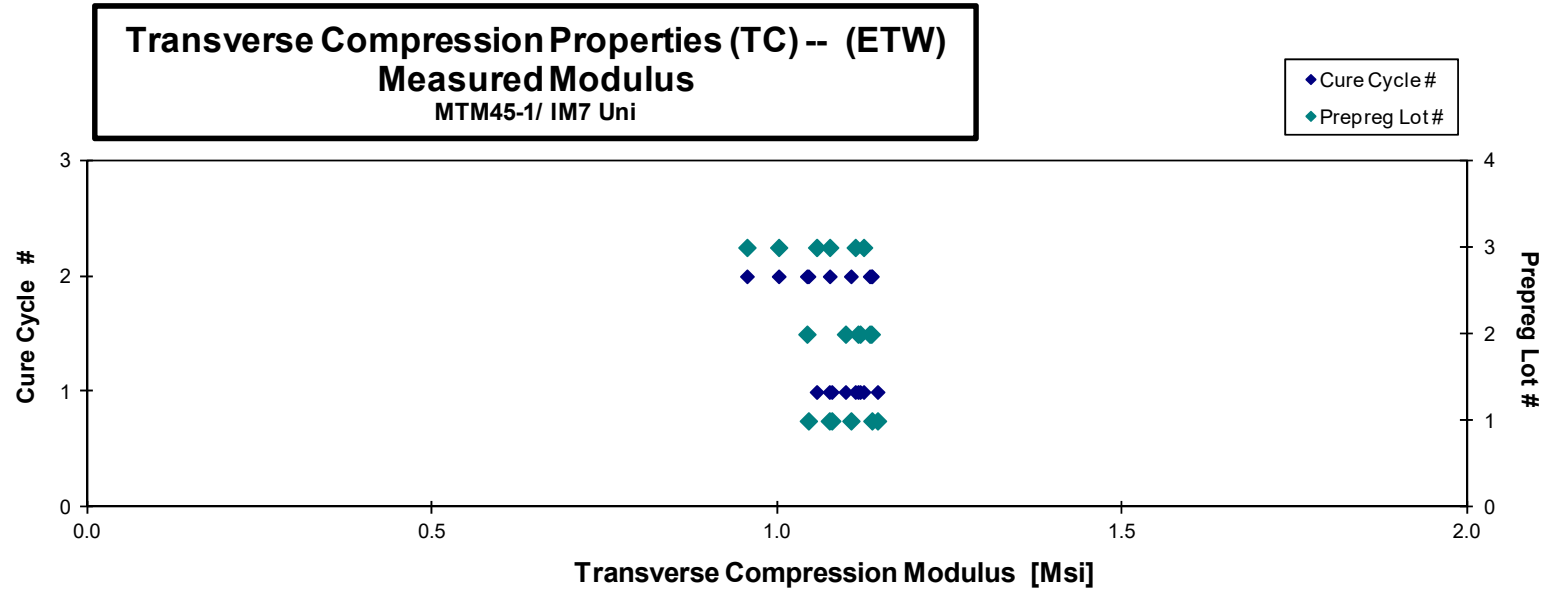

Transverse Compression Properties (TC) -- (RTD)
Measured Modulus
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Transverse Compression Modulus [Msi]
0.0
0.5
1.0
1.5
2.0
0
1
2
3
4

Transverse Compression Properties (TC) -- (ETW)
Strength & Modulus
MTM45-1/ IM7 Uni

Specimen Number	NIAR Naming	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Poisson's Ratio	Avg. Specimen Thickn. [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode
IMU-TC-A-MH1-ETW-2	AFZA112N	A	MH1	1	1	14.935	1.076	0.020	0.091	16	0.0057	HGM
IMU-TC-A-MH1-ETW-3	AFZA113N	A	MH1	1	1	15.386	1.145	0.022	0.090	16	0.0056	HGM
IMU-TC-A-MH1-ETW-4	AFZA114N	A	MH1	1	1	15.681	1.079	0.017	0.091	16	0.0057	HGM
IMU-TC-A-MH2-ETW-2	AFZA212N	A	MH2	1	2	15.513	1.045	0.020	0.090	16	0.0057	HAB
IMU-TC-A-MH2-ETW-3	AFZA213N	A	MH2	1	2	17.065	1.137	0.021	0.091	16	0.0057	HGM
IMU-TC-A-MH2-ETW-4	AFZA214N	A	MH2	1	2	16.865	1.107	0.023	0.090	16	0.0056	BGM
IMU-TC-B-MH1-ETW-1	AFZB111N	B	MH1	2	1	15.912	1.117	0.022	0.094	16	0.0059	HAT/HGM
IMU-TC-B-MH1-ETW-2	AFZB112N	B	MH1	2	1	16.020	1.099	0.023	0.093	16	0.0058	HGM
IMU-TC-B-MH1-ETW-3	AFZB113N	B	MH1	2	1	16.322	1.120	0.024	0.092	16	0.0058	HAT/HGM
IMU-TC-B-MH2-ETW-1	AFZB211N	B	MH2	2	2	14.930	1.043	0.021	0.088	16	0.0055	HGM
IMU-TC-B-MH2-ETW-2	AFZB212N	B	MH2	2	2	15.146	1.134	0.024	0.087	16	0.0055	HAT
IMU-TC-B-MH2-ETW-3	AFZB213N	B	MH2	2	2	13.579	1.136	0.022	0.088	16	0.0055	HGM
IMU-TC-C-MH1-ETW-2	AFZC112N	C	MH1	3	1	16.681	1.113	0.022	0.086	16	0.0054	HGM/HAT
IMU-TC-C-MH1-ETW-3	AFZC113N	C	MH1	3	1	16.260	1.125	0.022	0.086	16	0.0054	HGM
IMU-TC-C-MH1-ETW-4	AFZC114N	C	MH1	3	1	16.315	1.057	0.022	0.086	16	0.0054	HGM
IMU-TC-C-MH2-ETW-2	AFZC212N	C	MH2	3	2	15.604	1.002	0.022	0.086	16	0.0054	HAT/HAB
IMU-TC-C-MH2-ETW-3	AFZC213N	C	MH2	3	2	14.828	0.956	0.020	0.087	16	0.0054	HGM
IMU-TC-C-MH2-ETW-4	AFZC214N	C	MH2	3	2	15.687	1.076	0.018	0.086	16	0.0054	HGM

Average	**15.707**	**1.087**	**0.021**	**Average**	**0.0056**
Standard Dev.	**0.850**	**0.051**	**0.002**		
Coeff. of Var. [%]	**5.414**	**4.705**	**8.555**		
Min.	**13.579**	**0.956**	**0.017**	**Min.**	**0.0054**
Max.	**17.065**	**1.145**	**0.024**	**Max.**	**0.0059**
Number of Spec.	**18**	**18**	**18**	**Number of Spec.**	**18**

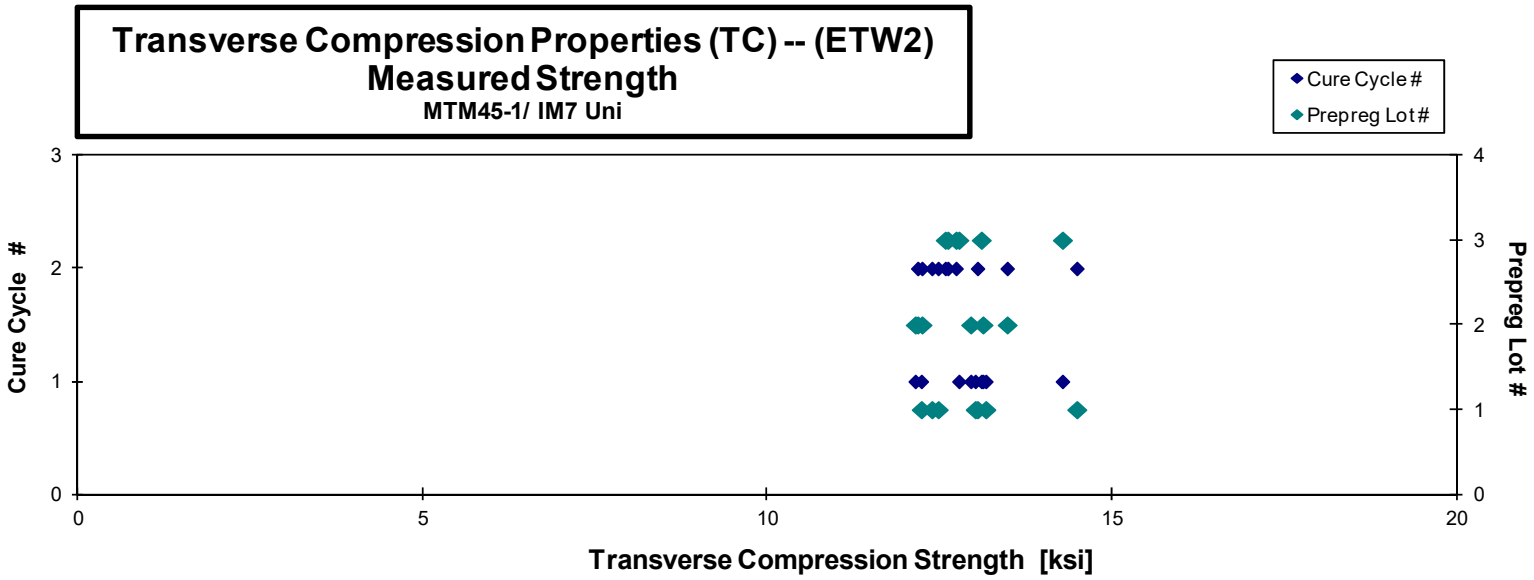

Transverse Compression Properties (TC) -- (ETW)
Measured Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Transverse Compression Strength [ksi]
0
5
10
15
20
0
1
2
3
0
1
2
3
4

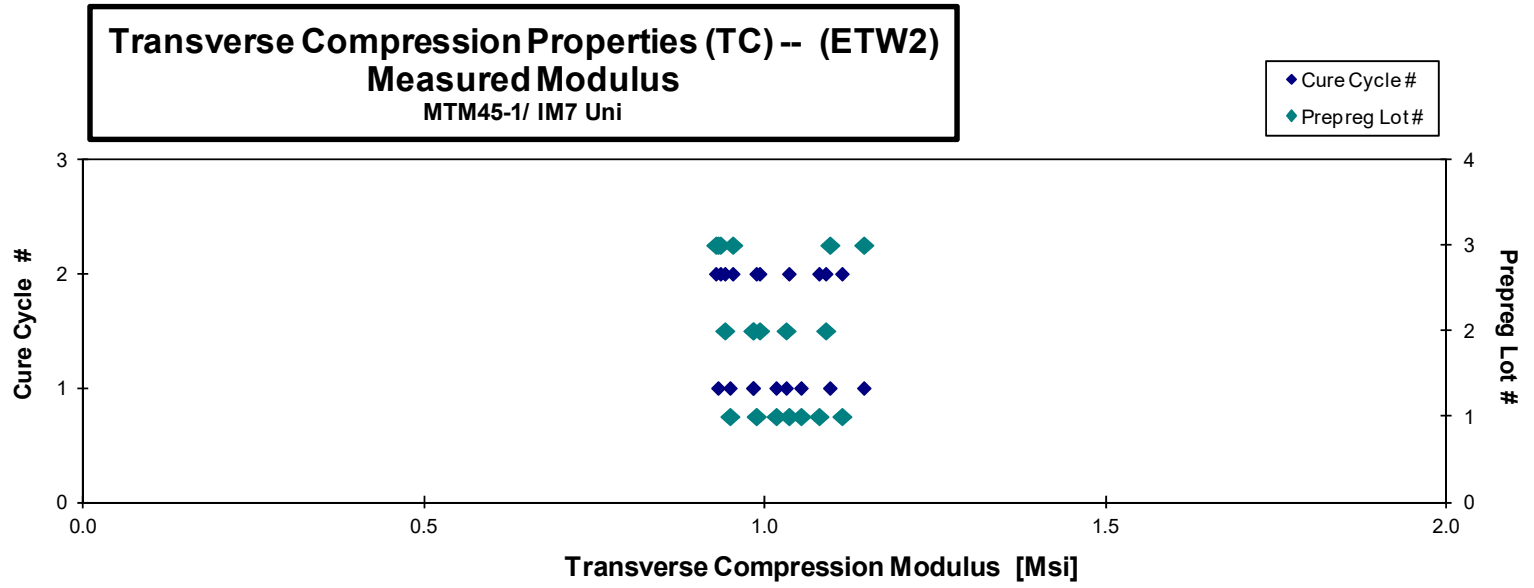

Transverse Compression Properties (TC) -- (ETW)
Measured Modulus
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Transverse Compression Modulus [Msi]
0.0
0.5
1.0
1.5
2.0
0
1
2
3
0
1
2
3
4

Transverse Compression Properties (TC) -- (ETW2)
Strength & Modulus
MTM45-1/ IM7 Uni

Specimen Number	NIAR Naming	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Poisson's Ratio	Avg. Specimen Thickn. [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode
IMU-TC-A-MH1-ETW2-2	AFZA112D	A	MH1	1	1	12.246	0.950	0.021	0.091	16	0.0057	HGM
IMU-TC-A-MH1-ETW2-3	AFZA113D	A	MH1	1	1	13.182	1.017	0.018	0.091	16	0.0057	HGM
IMU-TC-A-MH1-ETW2-4	AFZA114D	A	MH1	1	1	13.029	1.054	0.024	0.091	16	0.0057	HGM
IMU-TC-A-MH2-ETW2-1	AFZA211D	A	MH2	1	2	12.492	0.988	0.021	0.090	16	0.0056	HGM
IMU-TC-A-MH2-ETW2-2	AFZA212D	A	MH2	1	2	14.503	1.036	0.018	0.090	16	0.0056	HGM
IMU-TC-A-MH2-ETW2-3	AFZA213D	A	MH2	1	2	13.062	1.114	0.024	0.091	16	0.0057	HGM
IMU-TC-A-MH2-ETW2-4	AFZA214D	A	MH2	1	2	12.401	1.080	0.025	0.091	16	0.0057	HGM
IMU-TC-B-MH1-ETW2-1	AFZB111D	B	MH1	2	1	13.141	0.983	0.011	0.091	16	0.0057	BAB
IMU-TC-B-MH1-ETW2-2	AFZB112D	B	MH1	2	1	12.963	1.032	0.027	0.093	16	0.0058	BAT
IMU-TC-B-MH1-ETW2-3	AFZB113D	B	MH1	2	1	12.159	0.984	0.024	0.094	16	0.0059	BGM
IMU-TC-B-MH2-ETW2-1	AFZB211D	B	MH2	2	2	13.492	1.090	0.024	0.086	16	0.0054	HGM
IMU-TC-B-MH2-ETW2-2	AFZB212D	B	MH2	2	2	12.195	0.993	0.022	0.088	16	0.0055	HGM
IMU-TC-B-MH2-ETW2-3	AFZB213D	B	MH2	2	2	12.257	0.942	0.026	0.088	16	0.0055	HGM
IMU-TC-C-MH1-ETW2-2	AFZC112D	C	MH1	3	1	14.294	1.146	0.029	0.086	16	0.0054	HGM
IMU-TC-C-MH1-ETW2-3	AFZC113D	C	MH1	3	1	13.117	0.932	0.022	0.087	16	0.0054	HGM
IMU-TC-C-MH1-ETW2-4	AFZC114D	C	MH1	3	1	12.792	1.096	0.031	0.087	16	0.0054	HGM
IMU-TC-C-MH2-ETW2-2	AFZC212D	C	MH2	3	2	12.750	0.935	0.019	0.086	16	0.0054	HGM
IMU-TC-C-MH2-ETW2-3	AFZC213D	C	MH2	3	2	12.594	0.954	0.021	0.086	16	0.0054	HGM
IMU-TC-C-MH2-ETW2-4	AFZC214D	C	MH2	3	2	12.632	0.929	0.020	0.086	16	0.0054	HGM

Average	**12.911**	**1.013**	**0.022**	**Average**	**0.0056**
Standard Dev.	**0.650**	**0.068**	**0.004**		
Coeff. of Var. [%]	**5.032**	**6.692**	**19.570**		
Min.	**12.159**	**0.929**	**0.011**	**Min.**	**0.0054**
Max.	**14.503**	**1.146**	**0.031**	**Max.**	**0.0059**
Number of Spec.	**19**	**19**	**19**	**Number of Spec.**	**19**


Transverse Compression Properties (TC) -- (ETW2)
Measured Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Transverse Compression Strength [ksi]
0
5
10
15
20
0
1
2
3
0
1
2
3
4


Transverse Compression Properties (TC) -- (ETW2)
Measured Modulus
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Transverse Compression Modulus [Msi]
0.0
0.5
1.0
1.5
2.0
0
1
2
3
0
1
2
3
4

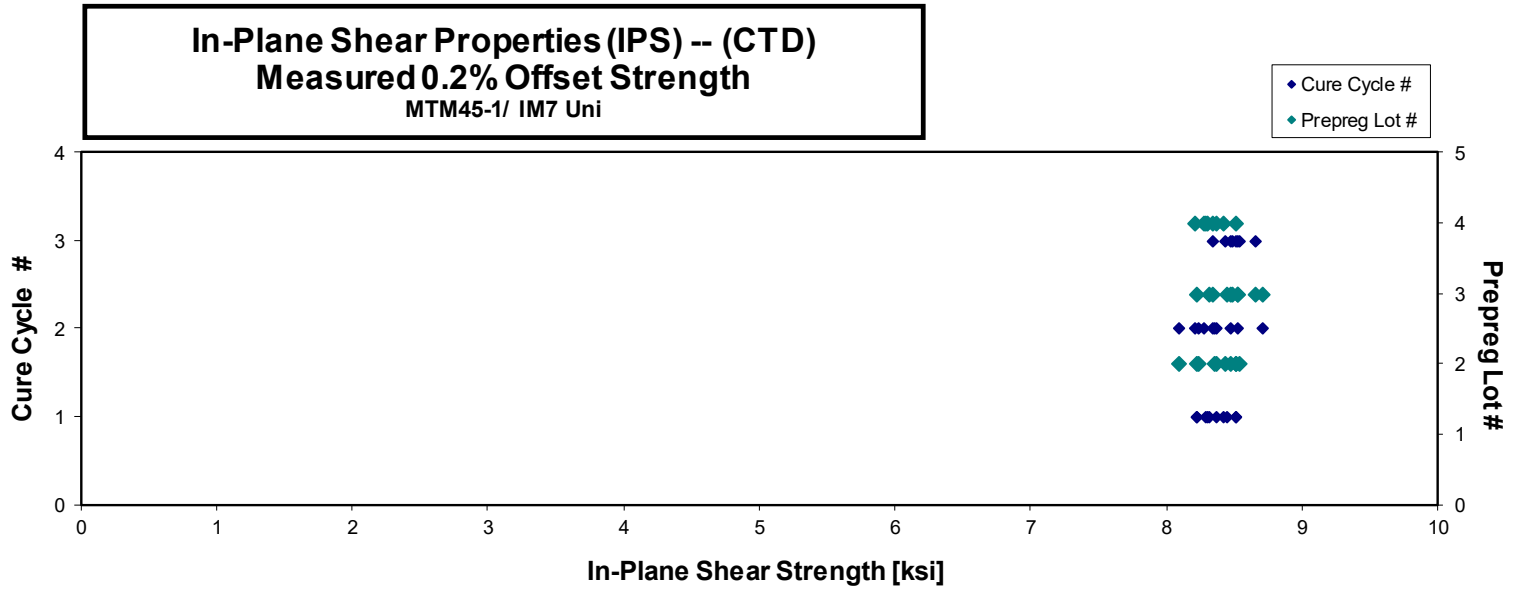
4.5 In-Plane Shear Properties (IPS)

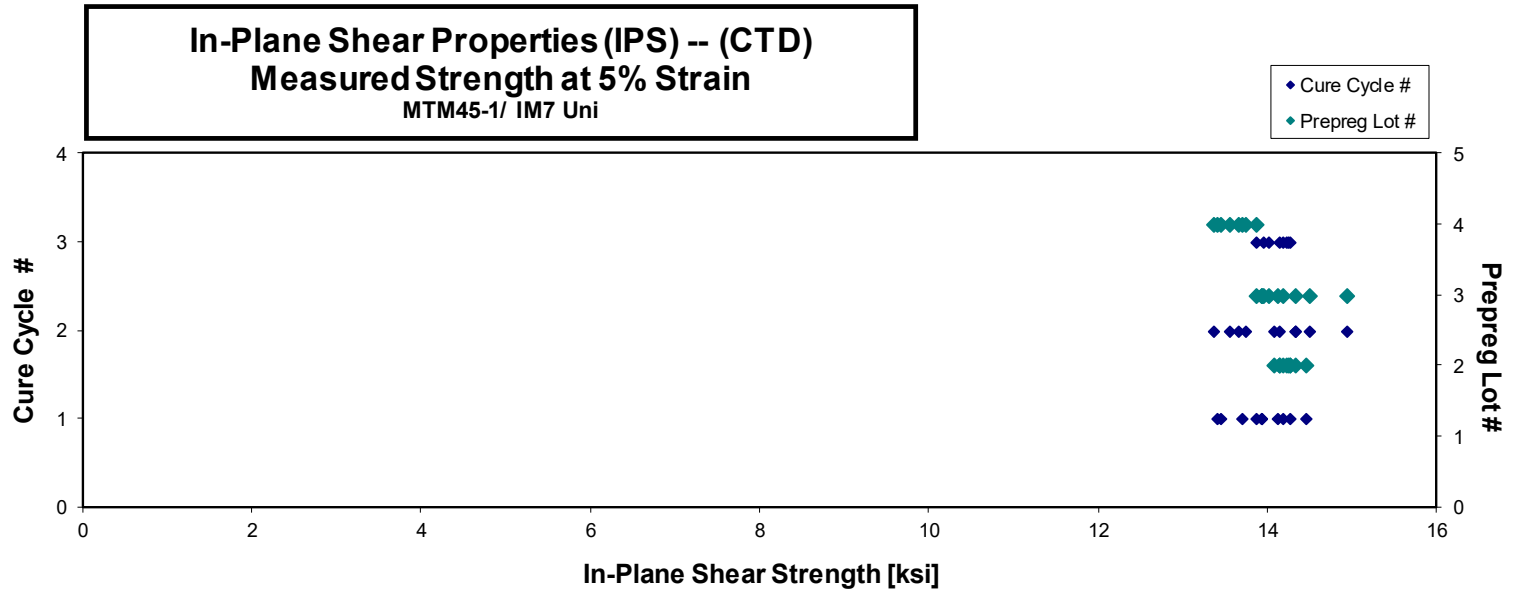
In-Plane Shear Properties (IPS) -- (CTD)
Strength & Modulus
MTM45-1/ IM7 Uni

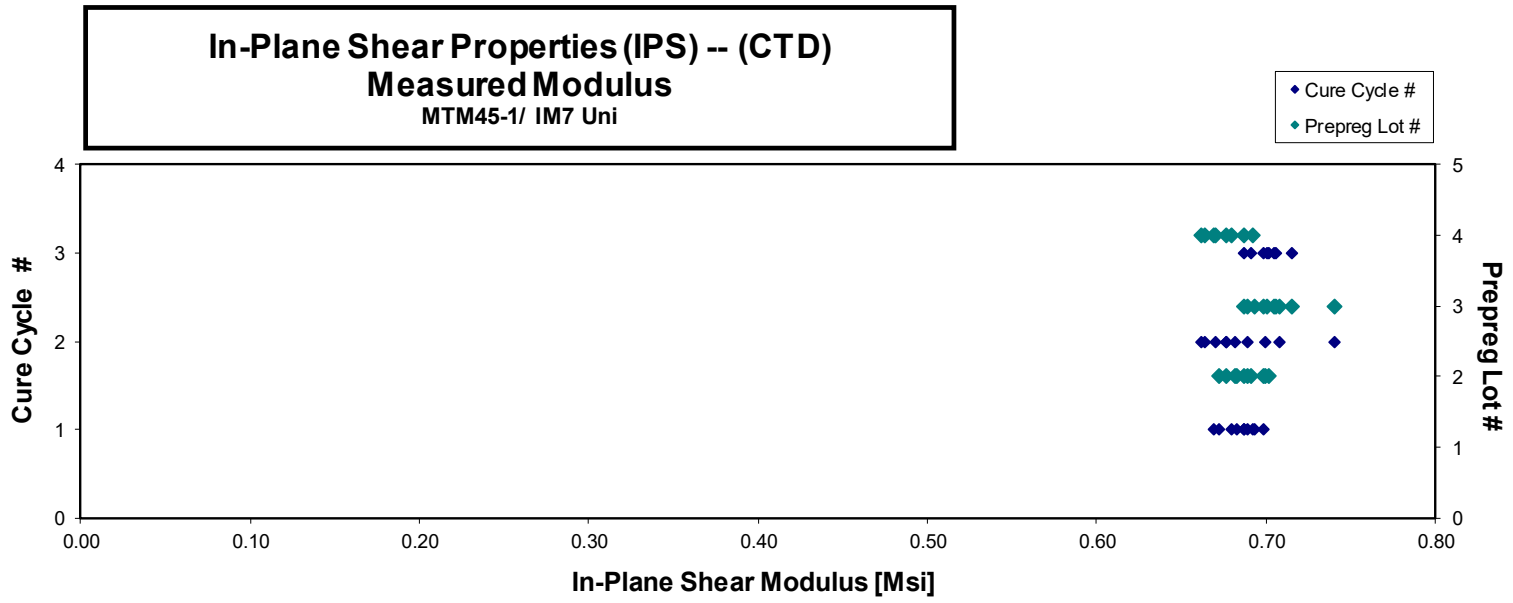
Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	0.2% Offset Strength [ksi]	Strength at 5% Strain [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. tply [in]
AITR1392-IMU-IPS-B-MH1-2-CTD-1	AFNB121B	B	MH1	2	1	8.231	14.19	0.671	0.0450	8	0.0056
AITR1392-IMU-IPS-B-MH1-2-CTD-2	AFNB122B	B	MH1	2	1	8.368	14.27	0.683	0.0449	8	0.0056
AITR1392-IMU-IPS-B-MH1-2-RTD-7	AFNB123B	B	MH1	2	1	8.515	14.47	0.689	0.0437	8	0.0055
AITR1392-IMU-IPS-B-MH2-2-CTD-1	AFNB221B	B	MH2	2	2	8.247	14.08	0.681	0.0442	8	0.0055
AITR1392-IMU-IPS-B-MH2-2-CTD-2	AFNB222B	B	MH2	2	2	8.098	14.14	0.676	0.0442	8	0.0055
AITR1392-IMU-IPS-B-MH2-2-CTD-3	AFNB223B	B	MH2	2	2	8.357	14.35	0.699	0.0438	8	0.0055
AITR1392-IMU-IPS-B-MH3-1-CTD-1*	AFNB313B	B	MH3	2	3	8.538	14.23	0.701	0.0445	8	0.0056
AITR1392-IMU-IPS-B-MH3-1-CTD-2*	AFNB313B	B	MH3	2	3	8.441	14.15	0.687	0.0447	8	0.0056
AITR1392-IMU-IPS-B-MH3-1-CTD-3*	AFNB313B	B	MH3	2	3	8.515	14.25	0.699	0.0444	8	0.0055
AITR1392-IMU-IPS-B-MH3-1-CTD-4*	AFNB314B	B	MH3	2	3	8.483	14.29	0.691	0.0447	8	0.0056
AITR1392-IMU-IPS-C-MH1-2-CTD-1	AFNC121B	C	MH1	3	1	8.227	13.94	0.687	0.0443	8	0.0055
AITR1392-IMU-IPS-C-MH1-2-CTD-2	AFNC122B	C	MH1	3	1	8.455	14.14	0.699	0.0442	8	0.0055
AITR1392-IMU-IPS-C-MH1-2-CTD-3	AFNC123B	C	MH1	3	1	8.319	13.93	0.693	0.0440	8	0.0055
AITR1392-IMU-IPS-C-MH2-2-CTD-1	AFNC221B	C	MH2	3	2	8.477	14.35	0.689	0.0439	8	0.0055
AITR1392-IMU-IPS-C-MH2-2-CTD-2	AFNC222B	C	MH2	3	2	8.532	14.50	0.708	0.0437	8	0.0055
AITR1392-IMU-IPS-C-MH2-2-CTD-3	AFNC223A	C	MH2	3	2	8.717	14.94	0.740	0.0435	8	0.0054
AITR1392-IMU-IPS-C-MH3-1-CTD-1*	AFNC311B	C	MH3	3	3	8.488	14.02	0.706	0.0437	8	0.0055
AITR1392-IMU-IPS-C-MH3-1-CTD-2*	AFNC312B	C	MH3	3	3	8.667	14.20	0.715	0.0439	8	0.0055
AITR1392-IMU-IPS-C-MH3-1-CTD-3*	AFNC313B	C	MH3	3	3	8.347	13.87	0.704	0.0445	8	0.0056
AITR1392-IMU-IPS-C-MH3-1-CTD-4*	AFNC314B	C	MH3	3	3	8.526	13.96	0.700	0.0441	8	0.0055
AITR1392-IMU-IPS-D-MH1-1-CTD-1	AFND111B	D	MH1	4	1	8.517	13.89	0.680	0.0449	8	0.0056
AITR1392-IMU-IPS-D-MH1-1-CTD-2	AFND112B	D	MH1	4	1	8.430	13.42	0.669	0.0449	8	0.0056
AITR1392-IMU-IPS-D-MH1-1-CTD-3	AFND113B	D	MH1	4	1	8.295	13.47	0.686	0.0451	8	0.0056
AITR1392-IMU-IPS-D-MH1-1-CTD-4	AFND114B	D	MH1	4	1	8.306	13.71	0.692	0.0444	8	0.0056
AITR1392-IMU-IPS-D-MH2-1-CTD-1	AFND211B	D	MH2	4	2	8.278	13.56	0.661	0.0460	8	0.0057
AITR1392-IMU-IPS-D-MH2-1-CTD-2	AFND212B	D	MH2	4	2	8.342	13.67	0.677	0.0452	8	0.0056
AITR1392-IMU-IPS-D-MH2-1-CTD-3	AFND213B	D	MH2	4	2	8.222	13.37	0.664	0.0456	8	0.0057
AITR1392-IMU-IPS-D-MH2-1-CTD-4	AFND214B	D	MH2	4	2	8.374	13.75	0.670	0.0455	8	0.0057

*A noise due to material behavior was observed toward 5% shear strain.

Average	**8.404**	**14.04**	**0.690**	**Average**	**0.0056**
Standard Dev.	**0.142**	**0.359**	**0.017**	**Standard Dev.**	
Coeff. of Var. [%]	**1.692**	**2.554**	**2.451**	**Coeff. of Var. [%]**	
Min.	**8.098**	**13.37**	**0.661**	**Min.**	**0.0054**
Max.	**8.717**	**14.94**	**0.740**	**Max.**	**0.0057**
Number of Spec.	**28**	**28**	**28**	**Number of Spec.**	**28**


In-Plane Shear Properties (IPS) -- (CTD)
Measured 0.2% Offset Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
In-Plane Shear Strength [ksi]
0
1
2
3
4
5
6
7
8
9
10

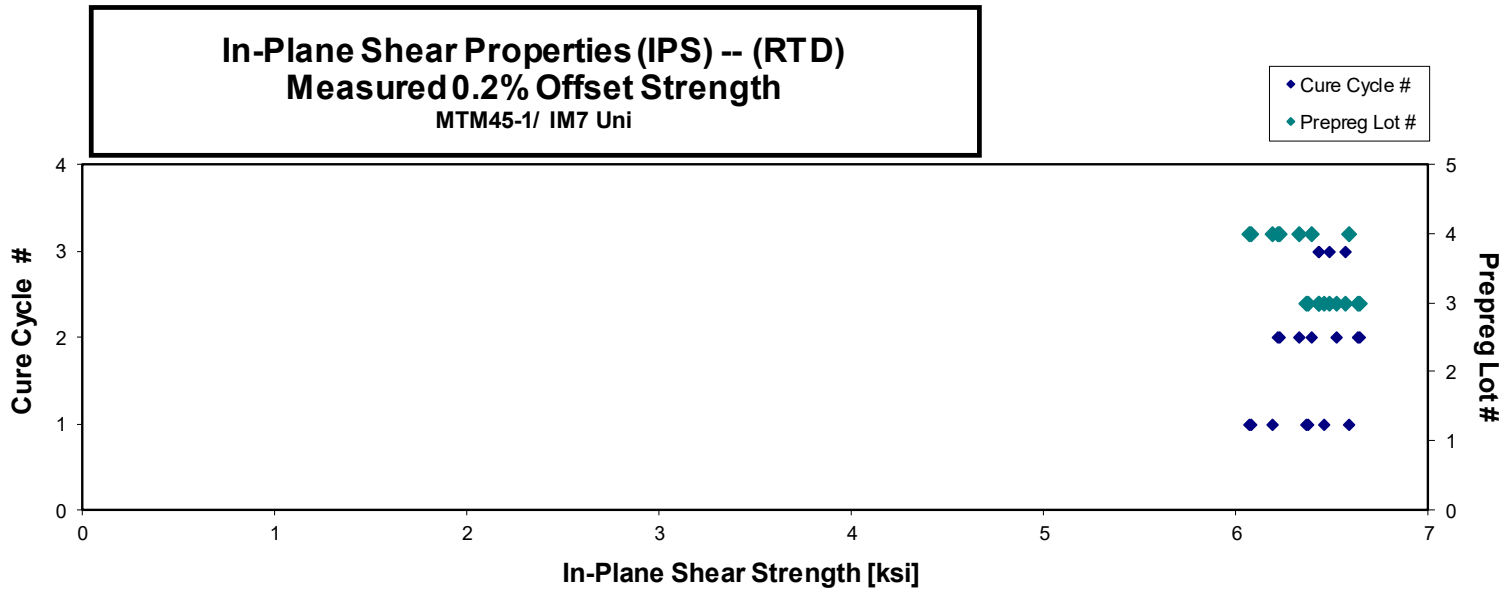

In-Plane Shear Properties (IPS) -- (CTD)
Measured Strength at 5% Strain
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
In-Plane Shear Strength [ksi]
0
2
4
6
8
10
12
14
16

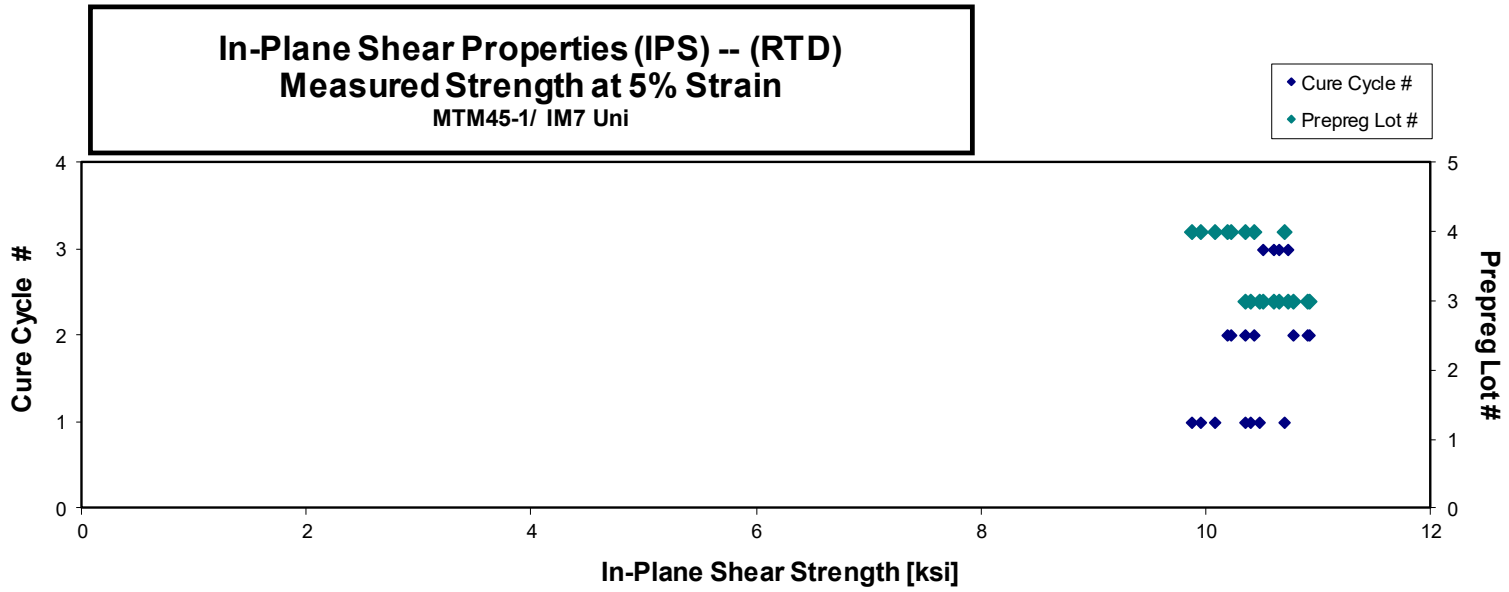

In-Plane Shear Properties (IPS) -- (CTD)
Measured Modulus
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
In-Plane Shear Modulus [Msi]
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
0.80
0
1
2
3
4
5

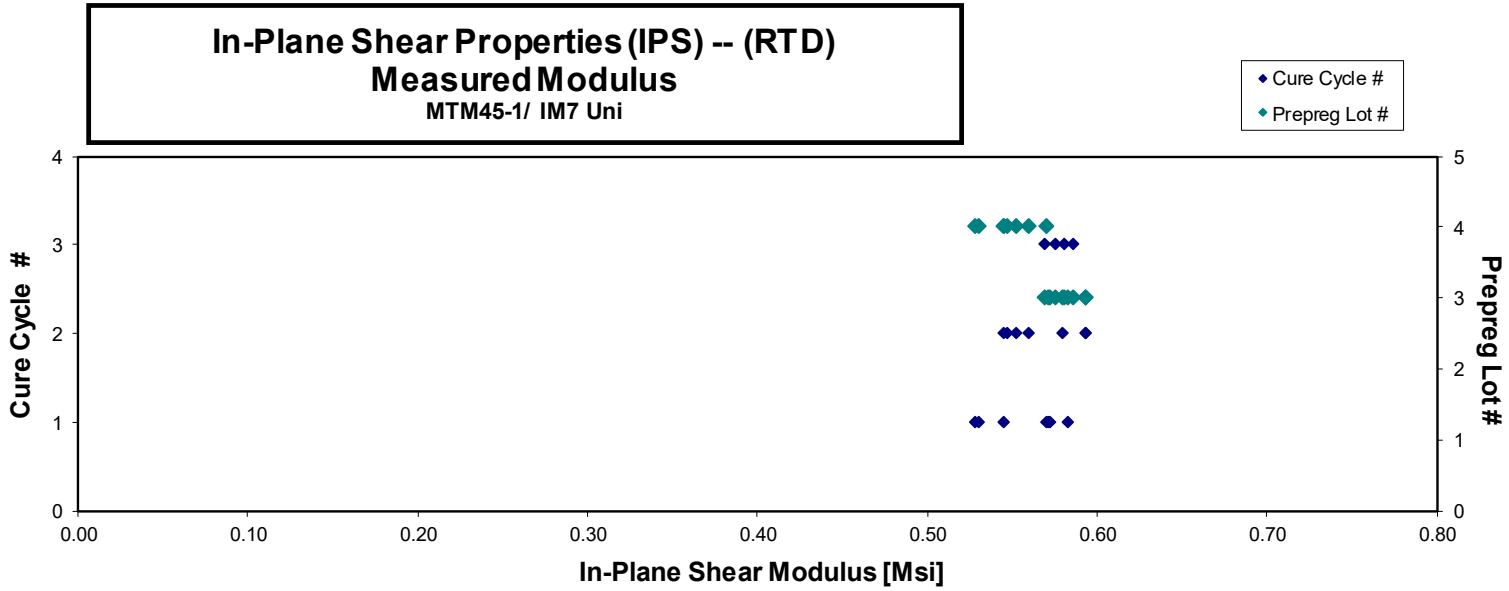
In-Plane Shear Properties (IPS) -- (RTD)
Strength & Modulus
MTM45-1/ IM7 Uni

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	0.2% Offset Strength [ksi]	Strength at 5% Strain [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. tply [in]
AITR1392-IMU-IPS-B-MH1-2-RTD-5	AFNB125A	B	MH1	2	1	6.498	10.69	0.578	0.0439	8	0.0055
AITR1392-IMU-IPS-B-MH1-2-RTD-6	AFNB126A	B	MH1	2	1	6.420	10.50	0.573	0.0444	8	0.0055
AITR1392-IMU-IPS-B-MH2-2-RTD-1	AFNB221A	B	MH2	2	2	6.351	10.39	0.553	0.0441	8	0.0055
AITR1392-IMU-IPS-B-MH2-2-RTD-2	AFNB222A	B	MH2	2	2	6.275	10.28	0.556	0.0448	8	0.0056
AITR1392-IMU-IPS-B-MH2-1-RTD-5	AFNB215A	B	MH2	2	2	6.636	10.71	0.593	0.0434	8	0.0054
AITR1392-IMU-IPS-B-MH2-1-RTD-6	AFNB216A	B	MH2	2	2	6.681	10.84	0.595	0.0429	8	0.0054
AITR1392-IMU-IPS-B-MH3-1-RTD-1	AFNB311A	B	MH3	2	3	6.312	10.36	0.557	0.0443	8	0.0055
AITR1392-IMU-IPS-B-MH3-1-RTD-2	AFNB312A	B	MH3	2	3	6.130	10.15	0.546	0.0447	8	0.0056
AITR1392-IMU-IPS-B-MH3-1-RTD-3	AFNB313A	B	MH3	2	3	6.204	10.26	0.549	0.0445	8	0.0056
AITR1392-IMU-IPS-B-MH3-1-RTD-4	AFNB314A	B	MH3	2	3	6.262	10.27	0.556	0.0440	8	0.0055
AITR1392-IMU-IPS-C-MH1-2-RTD-5	AFNC125A	C	MH1	3	1	6.379	10.40	0.572	0.0440	8	0.0055
AITR1392-IMU-IPS-C-MH1-2-RTD-6	AFNC126A	C	MH1	3	1	6.462	10.47	0.583	0.0441	8	0.0055
AITR1392-IMU-IPS-C-MH1-2-RTD-7	AFNC127A	C	MH1	3	1	6.367	10.34	0.573	0.0444	8	0.0056
AITR1392-IMU-IPS-C-MH2-2-RTD-5	AFNC225A	C	MH2	3	2	6.639	10.92	0.593	0.0439	8	0.0055
AITR1392-IMU-IPS-C-MH2-2-RTD-6	AFNC226A	C	MH2	3	2	6.523	10.79	0.580	0.0439	8	0.0055
AITR1392-IMU-IPS-C-MH2-2-RTD-7	AFNC227A	C	MH2	3	2	6.647	10.91	0.593	0.0437	8	0.0055
AITR1392-IMU-IPS-C-MH3-1-RTD-1	AFNC311A	C	MH3	3	3	6.430	10.50	0.576	0.0441	8	0.0055
AITR1392-IMU-IPS-C-MH3-1-RTD-2	AFNC312A	C	MH3	3	3	6.568	10.73	0.586	0.0436	8	0.0055
AITR1392-IMU-IPS-C-MH3-1-RTD-3	AFNC313A	C	MH3	3	3	6.433	10.65	0.570	0.0437	8	0.0055
AITR1392-IMU-IPS-C-MH3-1-RTD-4	AFNC314A	C	MH3	3	3	6.487	10.61	0.581	0.0435	8	0.0054
AITR1392-IMU-IPS-D-MH1-1-RTD-1	AFND111A	D	MH1	4	1	6.585	10.69	0.571	0.0443	8	0.0055
AITR1392-IMU-IPS-D-MH1-1-RTD-2	AFND112A	D	MH1	4	1	6.195	10.08	0.545	0.0456	8	0.0057
AITR1392-IMU-IPS-D-MH1-1-RTD-3	AFND113A	D	MH1	4	1	6.068	9.875	0.529	0.0460	8	0.0057
AITR1392-IMU-IPS-D-MH1-1-RTD-4	AFND114A	D	MH1	4	1	6.079	9.956	0.530	0.0451	8	0.0056
AITR1392-IMU-IPS-D-MH2-1-RTD-1	AFND211A	D	MH2	4	2	6.392	10.42	0.560	0.0450	8	0.0056
AITR1392-IMU-IPS-D-MH2-1-RTD-2	AFND212A	D	MH2	4	2	6.229	10.19	0.548	0.0453	8	0.0057
AITR1392-IMU-IPS-D-MH2-1-RTD-3	AFND213A	D	MH2	4	2	6.331	10.36	0.553	0.0446	8	0.0056
AITR1392-IMU-IPS-D-MH2-1-RTD-4	AFND214A	D	MH2	4	2	6.220	10.22	0.545	0.0450	8	0.0056

Average	**6.386**	**10.45**	**0.566**	**Average**	**0.0055**
Standard Dev.	**0.175**	**0.2776**	**0.019**	**Standard Dev.**	
Coeff. of Var. [%]	**2.741**	**2.657**	**3.379**	**Coeff. of Var. [%]**	
Min.	**6.068**	**9.875**	**0.529**	**Min.**	**0.0054**
Max.	**6.681**	**10.92**	**0.595**	**Max.**	**0.0057**
Number of Spec.	**28**	**28**	**28**	**Number of Spec.**	**28**


In-Plane Shear Properties (IPS) -- (RTD)
Measured 0.2% Offset Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
In-Plane Shear Strength [ksi]
0
1
2
3
4
5
6
7

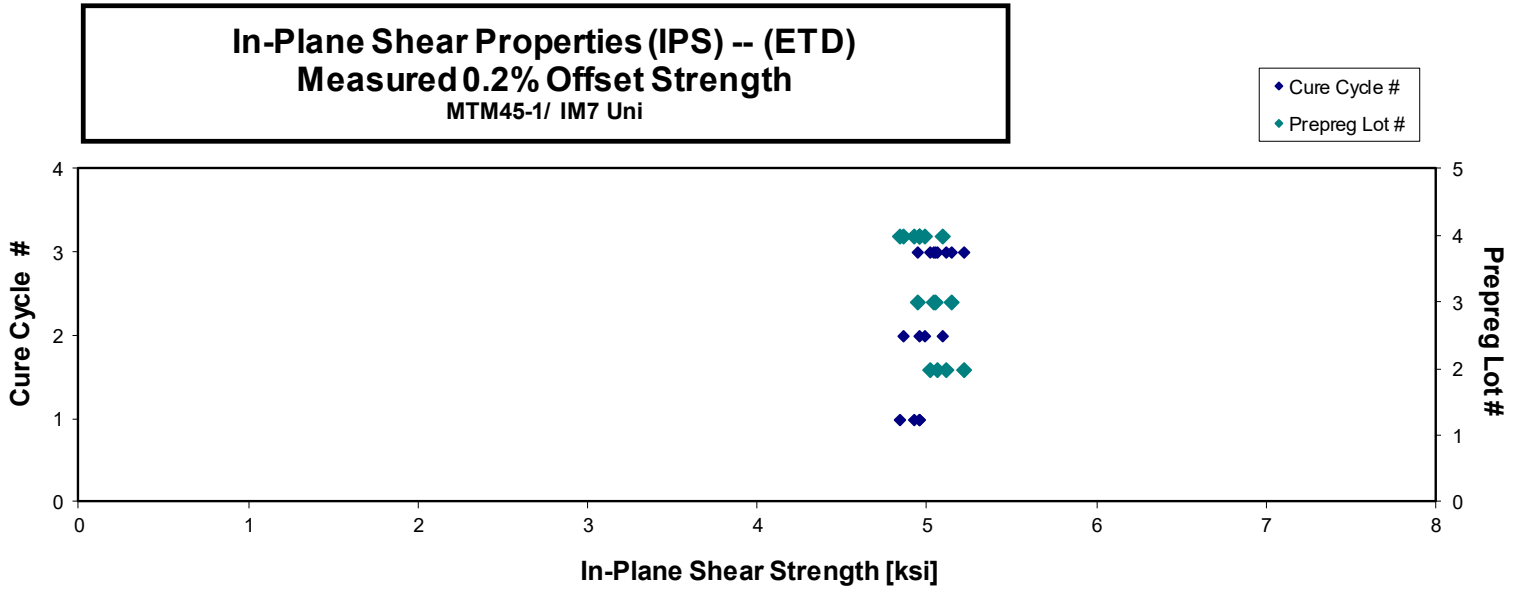

In-Plane Shear Properties (IPS) -- (RTD)
Measured Strength at 5% Strain
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
In-Plane Shear Strength [ksi]
0
2
4
6
8
10
12

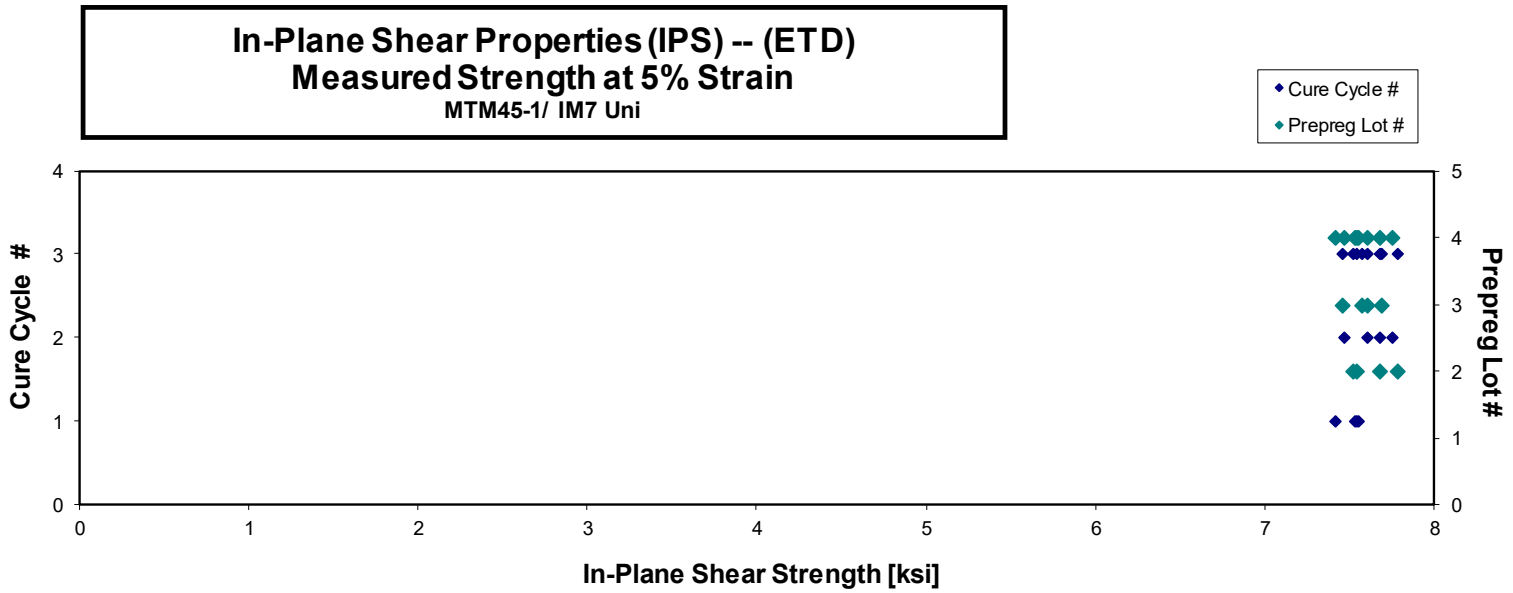

In-Plane Shear Properties (IPS) -- (RTD)
Measured Modulus
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
In-Plane Shear Modulus [Msi]
0
1
2
3
4
5
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
0.80

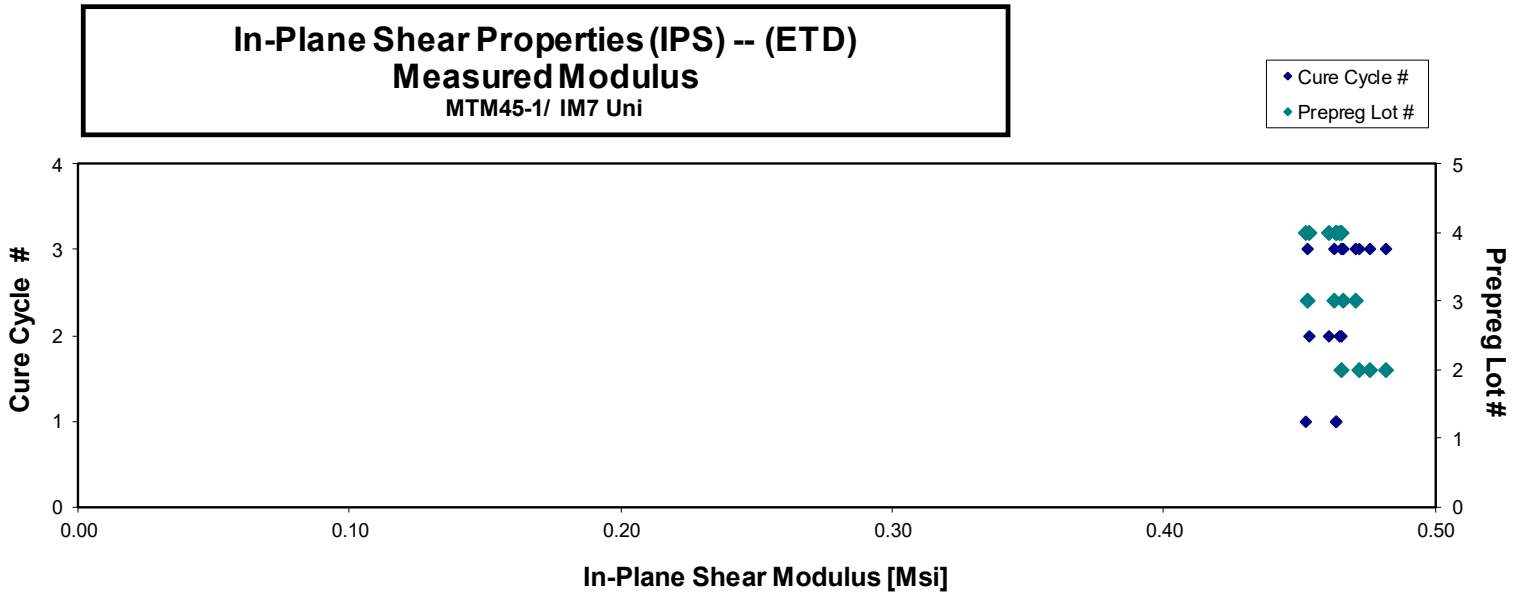
In-Plane Shear Properties (IPS) -- (ETD)
Strength & Modulus
MTM45-1/ IM7 Uni

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	0.2% Offset Strength [ksi]	Strength at 5% Strain [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. tply [in]
AITR1392-IMU-IPS-B-MH3-1-ETD-1	AFNB311C	B	MH3	2	3	5.013	7.525	0.466	0.0444	8	0.0056
AITR1392-IMU-IPS-B-MH3-1-ETD-2	AFNB312C	B	MH3	2	3	5.115	7.681	0.476	0.0443	8	0.0055
AITR1392-IMU-IPS-B-MH3-1-ETD-3	AFNB313C	B	MH3	2	3	5.057	7.551	0.472	0.0449	8	0.0056
AITR1392-IMU-IPS-B-MH3-1-ETD-4	AFNB314C	B	MH3	2	3	5.214	7.791	0.482	0.0438	8	0.0055
AITR1392-IMU-IPS-C-MH3-1-ETD-1	AFNC311C	C	MH3	3	3	5.147	7.694	0.471	0.0437	8	0.0055
AITR1392-IMU-IPS-C-MH3-1-ETD-2	AFNC312C	C	MH3	3	3	4.948	7.464	0.453	0.0438	8	0.0055
AITR1392-IMU-IPS-C-MH3-1-ETD-3	AFNC313C	C	MH3	3	3	5.047	7.607	0.463	0.0435	8	0.0054
AITR1392-IMU-IPS-C-MH3-1-ETD-4	AFNC314C	C	MH3	3	3	5.040	7.582	0.466	0.0439	8	0.0055
AITR1392-IMU-IPS-D-MH1-1-ETD-1	AFND111C	D	MH1	4	1	4.959	7.540	0.463	0.0446	8	0.0056
AITR1392-IMU-IPS-D-MH1-1-ETD-2	AFND112C	D	MH1	4	1	4.957	7.562	0.464	0.0444	8	0.0055
AITR1392-IMU-IPS-D-MH1-1-ETD-3	AFND113C	D	MH1	4	1	4.839	7.416	0.453	0.0455	8	0.0057
AITR1392-IMU-IPS-D-MH1-1-ETD-4	AFND114C	D	MH1	4	1	4.927	7.543	0.463	0.0449	8	0.0056
AITR1392-IMU-IPS-D-MH2-1-ETD-1	AFND211C	D	MH2	4	2	5.087	7.755	0.465	0.0456	8	0.0057
AITR1392-IMU-IPS-D-MH2-1-ETD-2	AFND212C	D	MH2	4	2	4.865	7.474	0.454	0.0461	8	0.0058
AITR1392-IMU-IPS-D-MH2-1-ETD-3	AFND213C	D	MH2	4	2	4.990	7.687	0.465	0.0448	8	0.0056
AITR1392-IMU-IPS-D-MH2-1-ETD-4	AFND214C	D	MH2	4	2	4.950	7.607	0.461	0.0453	8	0.0057

Average	**5.010**	**7.592**	**0.465**	**Average**	**0.0056**
Standard Dev.	**0.101**	**0.106**	**0.008**	**Standard Dev.**	
Coeff. of Var. [%]	**2.013**	**1.392**	**1.702**	**Coeff. of Var. [%]**	
Min.	**4.839**	**7.416**	**0.453**	**Min.**	**0.0054**
Max.	**5.214**	**7.791**	**0.482**	**Max.**	**0.0058**
Number of Spec.	**16**	**16**	**16**	**Number of Spec.**	**16**


In-Plane Shear Properties (IPS) -- (ETD)
Measured 0.2% Offset Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
In-Plane Shear Strength [ksi]

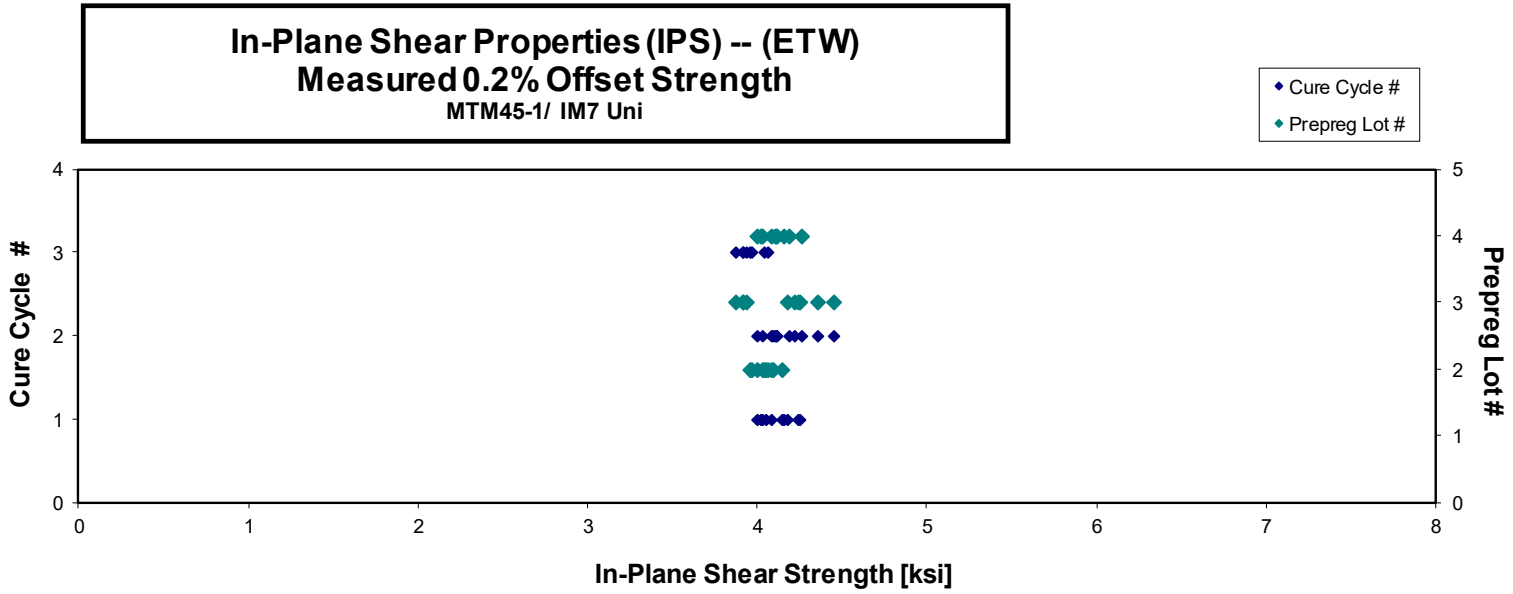

In-Plane Shear Properties (IPS) -- (ETD)
Measured Strength at 5% Strain
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
In-Plane Shear Strength [ksi]

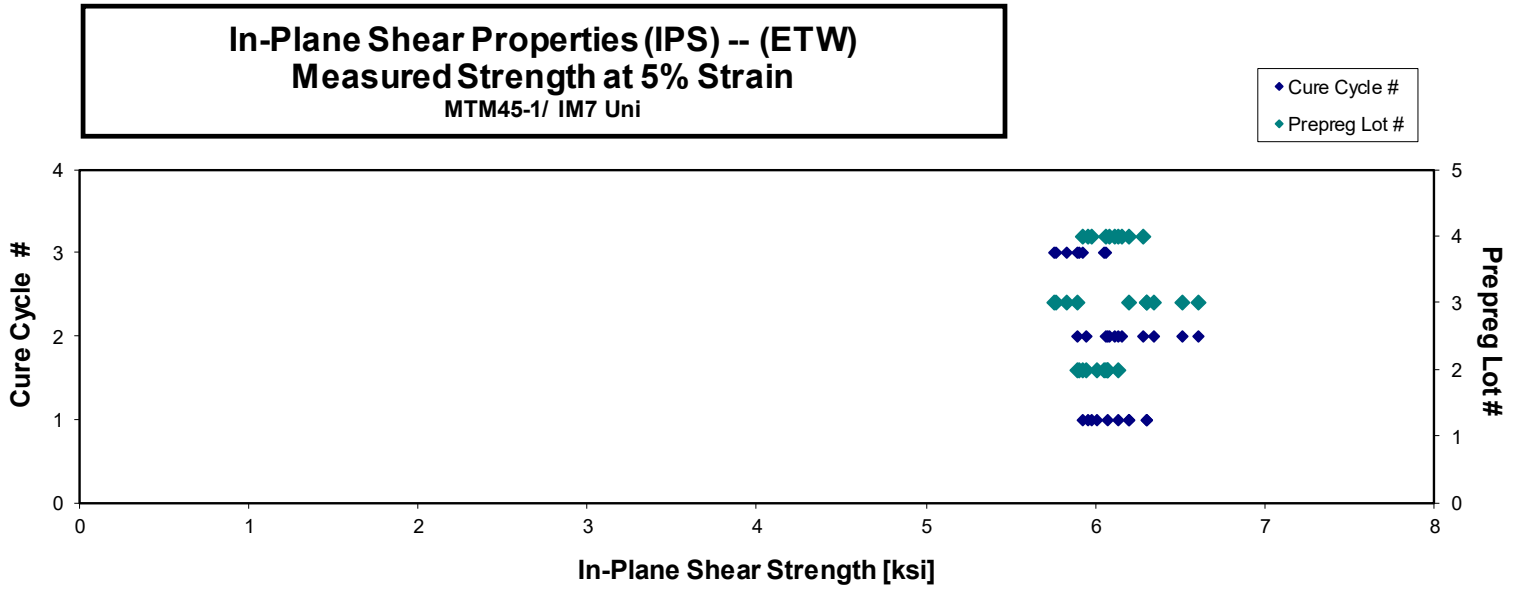

In-Plane Shear Properties (IPS) -- (ETD)
Measured Modulus
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
5
0.00
0.10
0.20
0.30
0.40
0.50
In-Plane Shear Modulus [Msi]

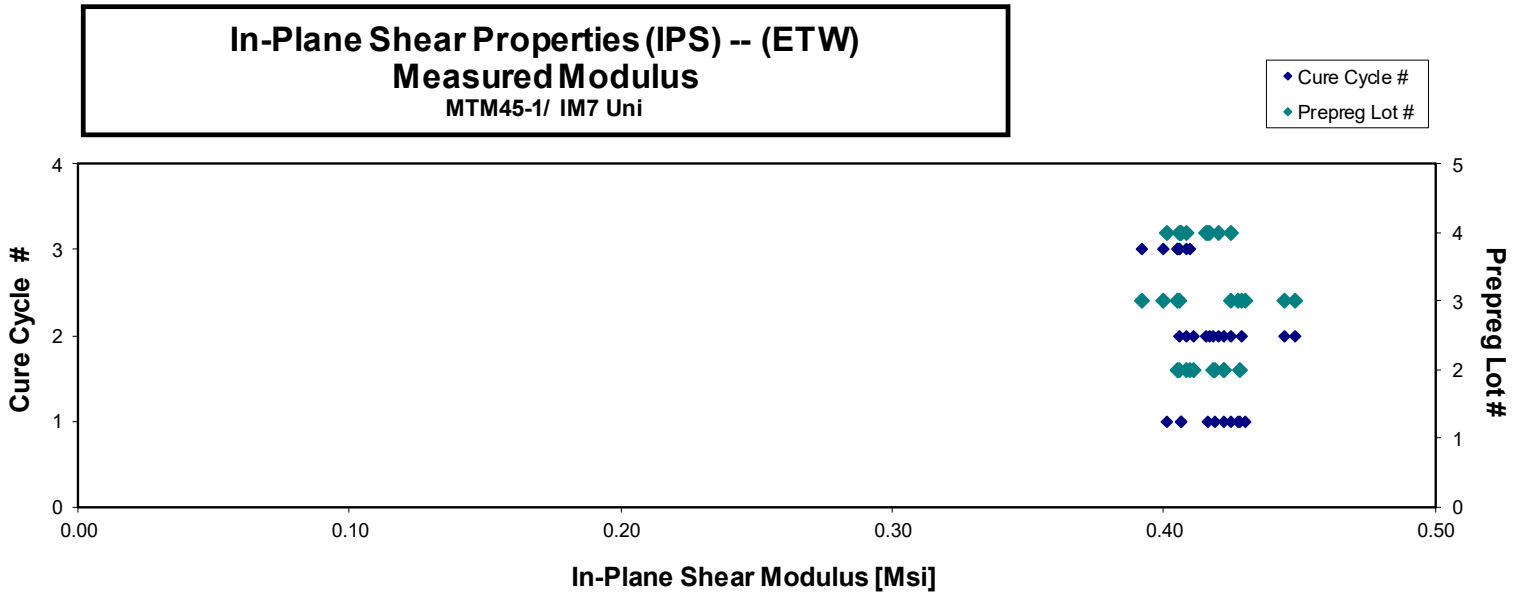
In-Plane Shear Properties (IPS) -- (ETW)
Strength & Modulus
MTM45-1/ IM7 Uni

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	0.2% Offset Strength [ksi]	Strength at 5% Strain [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. tply [in]
AITR1392-IMU-IPS-B-MH1-2-ETW-1	AFNB121N	B	MH1	2	1	4.147	6.141	0.428	0.0449	8	0.0056
AITR1392-IMU-IPS-B-MH1-2-ETW-2	AFNB122N	B	MH1	2	1	4.087	6.080	0.422	0.0448	8	0.0056
AITR1392-IMU-IPS-B-MH1-2-ETW-3	AFNB123N	B	MH1	2	1	4.053	6.013	0.419	0.0450	8	0.0056
AITR1392-IMU-IPS-B-MH2-2-ETW-1	AFNB221N	B	MH2	2	2	4.098	6.078	0.422	0.0442	8	0.0055
AITR1392-IMU-IPS-B-MH2-2-ETW-2	AFNB222N	B	MH2	2	2	4.030	5.944	0.418	0.0446	8	0.0056
AITR1392-IMU-IPS-B-MH2-2-ETW-3	AFNB223N	B	MH2	2	2	4.002	5.898	0.411	0.0455	8	0.0057
AITR1392-IMU-IPS-B-MH3-2-ETW-1	AFNB321N	B	MH3	2	3	3.962	5.926	0.405	0.0439	8	0.0055
AITR1392-IMU-IPS-B-MH3-2-ETW-2	AFNB322N	B	MH3	2	3	4.037	6.051	0.409	0.0433	8	0.0054
AITR1392-IMU-IPS-B-MH3-2-ETW-3	AFNB323N	B	MH3	2	3	4.060	6.069	0.408	0.0434	8	0.0054
AITR1392-IMU-IPS-B-MH3-2-ETW-4	AFNB324N	B	MH3	2	3	3.961	5.904	0.405	0.0437	8	0.0055
AITR1392-IMU-IPS-C-MH1-2-ETW-1	AFNC121N	C	MH1	3	1	4.239	6.312	0.428	0.0440	8	0.0055
AITR1392-IMU-IPS-C-MH1-2-ETW-2	AFNC122N	C	MH1	3	1	4.175	6.202	0.424	0.0441	8	0.0055
AITR1392-IMU-IPS-C-MH1-2-ETW-3	AFNC123N	C	MH1	3	1	4.246	6.306	0.430	0.0442	8	0.0055
AITR1392-IMU-IPS-C-MH2-2-ETW-1	AFNC221N	C	MH2	3	2	4.453	6.608	0.448	0.0426	8	0.0053
AITR1392-IMU-IPS-C-MH2-2-ETW-2	AFNC222N	C	MH2	3	2	4.214	6.345	0.428	0.0440	8	0.0055
AITR1392-IMU-IPS-C-MH2-2-ETW-3	AFNC223N	C	MH2	3	2	4.356	6.513	0.444	0.0434	8	0.0054
AITR1392-IMU-IPS-C-MH3-2-ETW-1	AFNC321N	C	MH3	3	3	3.914	5.764	0.406	0.0446	8	0.0056
AITR1392-IMU-IPS-C-MH3-2-ETW-2	AFNC322N	C	MH3	3	3	3.934	5.901	0.405	0.0444	8	0.0055
AITR1392-IMU-IPS-C-MH3-2-ETW-3	AFNC323N	C	MH3	3	3	3.911	5.838	0.400	0.0443	8	0.0055
AITR1392-IMU-IPS-C-MH3-2-ETW-4	AFNC324N	C	MH3	3	3	3.873	5.772	0.392	0.0441	8	0.0055
AITR1392-IMU-IPS-D-MH1-2-ETW-1	AFND121N	D	MH1	4	1	4.160	6.199	0.416	0.0450	8	0.0056
AITR1392-IMU-IPS-D-MH1-2-ETW-2	AFND122N	D	MH1	4	1	4.026	5.984	0.407	0.0459	8	0.0057
AITR1392-IMU-IPS-D-MH1-2-ETW-3	AFND123N	D	MH1	4	1	3.994	5.928	0.401	0.0456	8	0.0057
AITR1392-IMU-IPS-D-MH1-2-ETW-4	AFND124N	D	MH1	4	1	4.020	5.963	0.407	0.0464	8	0.0058
AITR1392-IMU-IPS-D-MH2-2-ETW-1	AFND221N	D	MH2	4	2	4.118	6.158	0.417	0.0447	8	0.0056
AITR1392-IMU-IPS-D-MH2-2-ETW-2	AFND222N	D	MH2	4	2	4.112	6.118	0.420	0.0448	8	0.0056
AITR1392-IMU-IPS-D-MH2-2-ETW-3	AFND223N	D	MH2	4	2	4.105	6.083	0.406	0.0445	8	0.0056
AITR1392-IMU-IPS-D-MH2-2-ETW-4	AFND224N	D	MH2	4	2	4.085	6.066	0.408	0.0450	8	0.0056
AITR1392-IMU-IPS-D-MH2-2-ETW-5	AFND225N	D	MH2	4	2	4.187	6.143	0.416	0.0457	8	0.0057
AITR1392-IMU-IPS-D-MH2-2-ETW-6	AFND226N	D	MH2	4	2	4.257	6.286	0.424	0.0447	8	0.0056

Average	**4.094**	**6.087**	**0.416**	**Average**	**0.0056**
Standard Dev.	**0.134**	**0.201**	**0.013**	**Standard Dev.**	
Coeff. of Var. [%]	**3.272**	**3.300**	**3.059**	**Coeff. of Var. [%]**	
Min.	**3.873**	**5.764**	**0.392**	**Min.**	**0.0053**
Max.	**4.453**	**6.608**	**0.448**	**Max.**	**0.0058**
Number of Spec.	**30**	**30**	**30**	**Number of Spec.**	**30**


In-Plane Shear Properties (IPS) -- (ETW)
Measured 0.2% Offset Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
In-Plane Shear Strength [ksi]
0
1
2
3
4
5
6
7
8

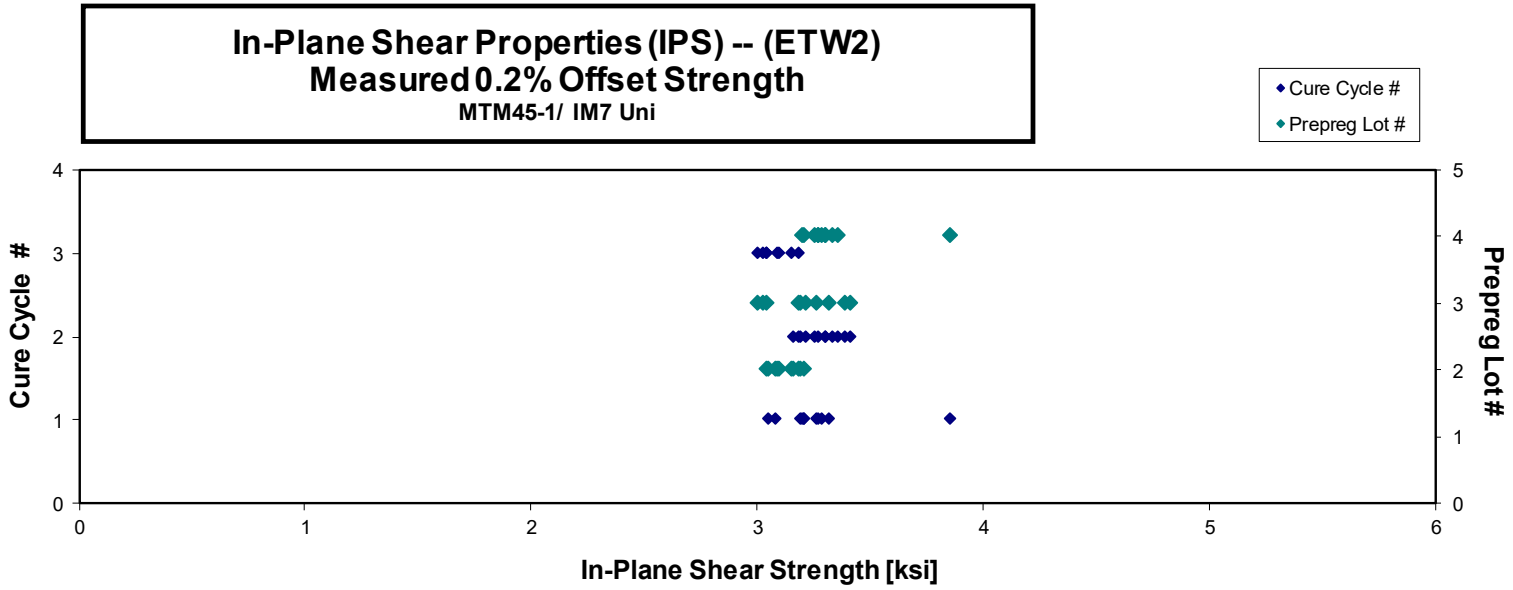

In-Plane Shear Properties (IPS) -- (ETW)
Measured Strength at 5% Strain
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
In-Plane Shear Strength [ksi]
0
1
2
3
4
5
6
7
8

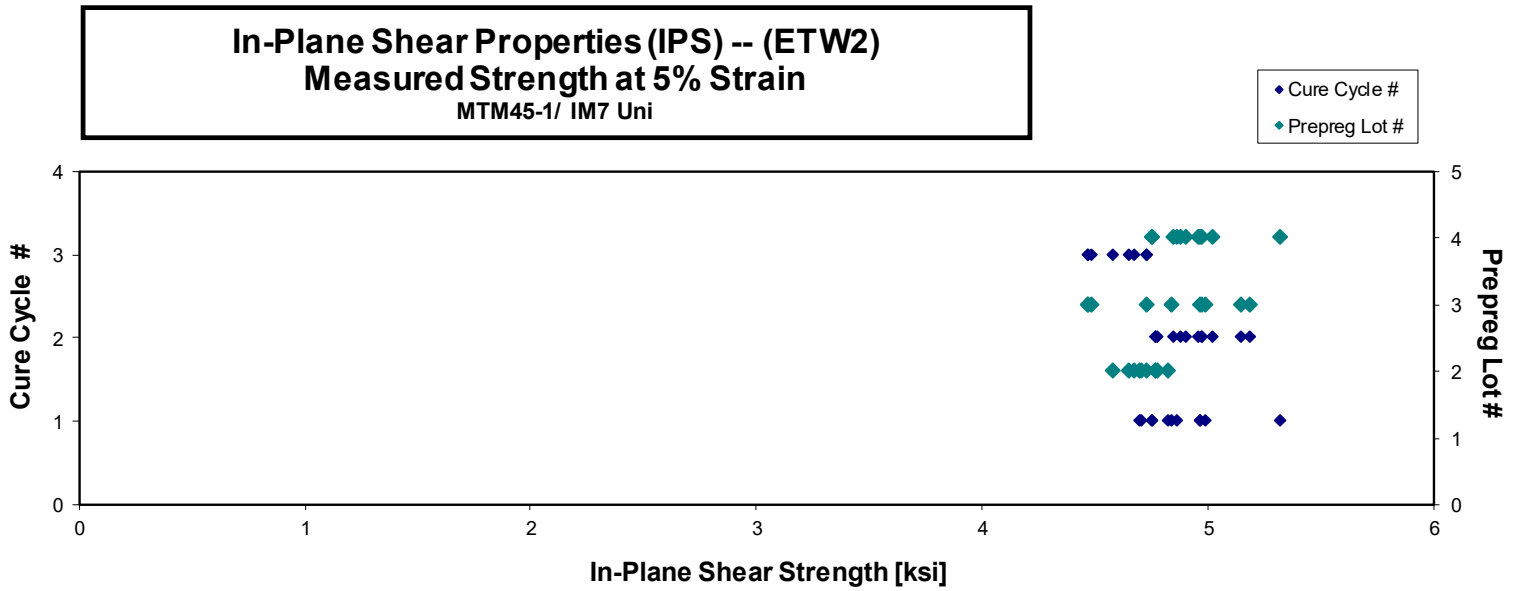

In-Plane Shear Properties (IPS) -- (ETW)
Measured Modulus
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
5
0.00
0.10
0.20
0.30
0.40
0.50
In-Plane Shear Modulus [Msi]

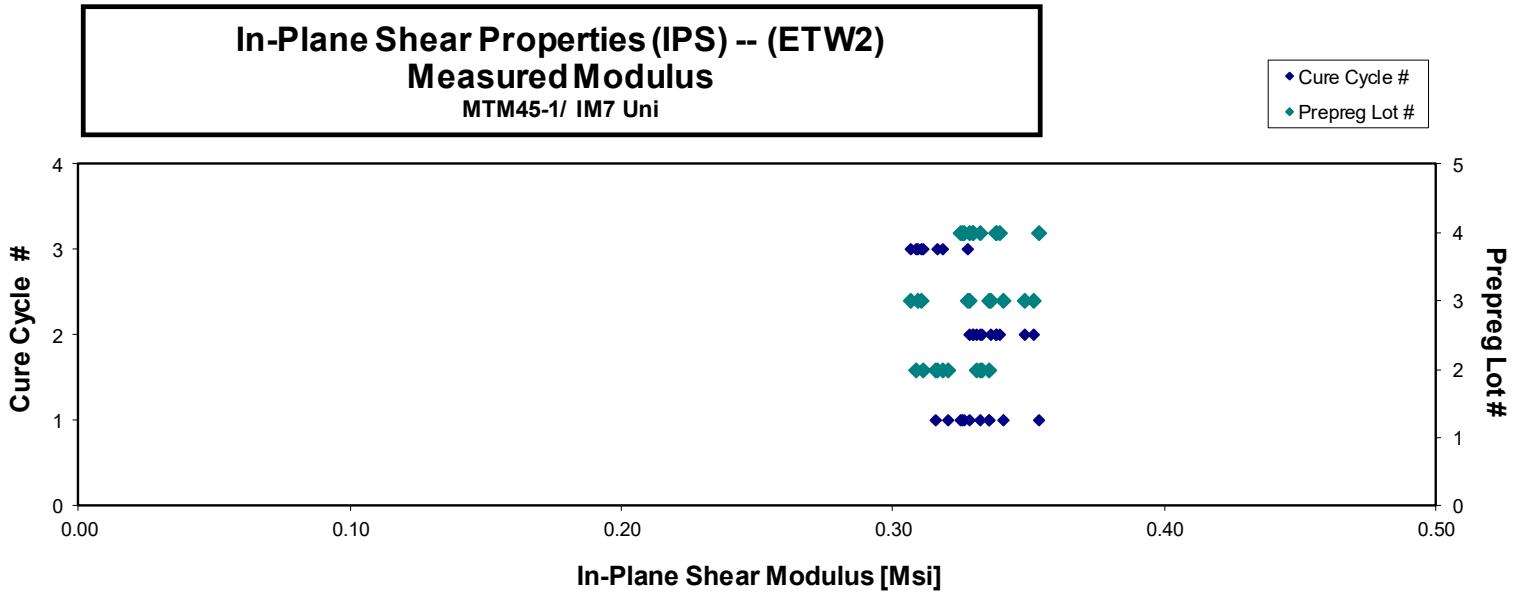
In-Plane Shear Properties (IPS) -- (ETW2)
Strength & Modulus
MTM45-1/ IM7 Uni

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	0.2% Offset Strength [ksi]	Strength at 5% Strain [ksi]	Modulus [Msi]	Avg. Specimen Thickness [in]	# Plies in Laminate	Avg. tply [in]
AITR1392-IMU-IPS-B-MH1-2-ETW2-1	AFNB121D	B	MH1	2	1	3.205	4.824	0.335	0.0445	8	0.0056
AITR1392-IMU-IPS-B-MH1-2-ETW2-2	AFNB122D	B	MH1	2	1	3.048	4.696	0.315	0.0447	8	0.0056
AITR1392-IMU-IPS-B-MH1-2-ETW2-3	AFNB123D	B	MH1	2	1	3.080	4.704	0.320	0.0440	8	0.0055
AITR1392-IMU-IPS-B-MH2-2-ETW2-1	AFNB221D	B	MH2	2	2	3.183	4.771	0.333	0.0441	8	0.0055
AITR1392-IMU-IPS-B-MH2-2-ETW2-2	AFNB222D	B	MH2	2	2	3.185	4.777	0.332	0.0446	8	0.0056
AITR1392-IMU-IPS-B-MH2-2-ETW2-3	AFNB223D	B	MH2	2	2	3.155	4.774	0.330	0.0446	8	0.0056
AITR1392-IMU-IPS-B-MH3-2-ETW2-1	AFNB321D	B	MH3	2	3	3.092	4.676	0.316	0.0435	8	0.0054
AITR1392-IMU-IPS-B-MH3-2-ETW2-2	AFNB322D	B	MH3	2	3	3.149	4.730	0.318	0.0430	8	0.0054
AITR1392-IMU-IPS-B-MH3-2-ETW2-3	AFNB323D	B	MH3	2	3	3.086	4.655	0.311	0.0433	8	0.0054
AITR1392-IMU-IPS-B-MH3-2-ETW2-4	AFNB324D	B	MH3	2	3	3.040	4.584	0.309	0.0433	8	0.0054
AITR1392-IMU-IPS-C-MH1-2-ETW2-1	AFNC121D	C	MH1	3	1	3.311	4.988	0.340	0.0440	8	0.0055
AITR1392-IMU-IPS-C-MH1-2-ETW2-2	AFNC122D	C	MH1	3	1	3.259	4.966	0.335	0.0441	8	0.0055
AITR1392-IMU-IPS-C-MH1-2-ETW2-3	AFNC123D	C	MH1	3	1	3.191	4.844	0.328	0.0439	8	0.0055
AITR1392-IMU-IPS-C-MH2-2-ETW2-1	AFNC221D	C	MH2	3	2	3.405	5.186	0.348	0.0439	8	0.0055
AITR1392-IMU-IPS-C-MH2-2-ETW2-2	AFNC222D	C	MH2	3	2	3.381	5.148	0.351	0.0431	8	0.0054
AITR1392-IMU-IPS-C-MH2-2-ETW2-3	AFNC223D	C	MH2	3	2	3.212	4.973	0.336	0.0440	8	0.0055
AITR1392-IMU-IPS-C-MH3-2-ETW2-1	AFNC321D	C	MH3	3	3	3.178	4.735	0.327	0.0442	8	0.0055
AITR1392-IMU-IPS-C-MH3-2-ETW2-2	AFNC322D	C	MH3	3	3	3.041	4.485	0.310	0.0445	8	0.0056
AITR1392-IMU-IPS-C-MH3-2-ETW2-3	AFNC323D	C	MH3	3	3	3.018	4.470	0.309	0.0443	8	0.0055
AITR1392-IMU-IPS-C-MH3-2-ETW2-4	AFNC324D	C	MH3	3	3	2.997	4.468	0.306	0.0438	8	0.0055
AITR1392-IMU-IPS-D-MH1-2-ETW2-1	AFND121D	D	MH1	4	1	3.202	4.755	0.326	0.0458	8	0.0057
AITR1392-IMU-IPS-D-MH1-2-ETW2-2	AFND122D	D	MH1	4	1	3.193	4.754	0.325	0.0461	8	0.0058
AITR1392-IMU-IPS-D-MH1-2-ETW2-3	AFND123D	D	MH1	4	1	3.281	4.964	0.332	0.0457	8	0.0057
AITR1392-IMU-IPS-D-MH1-2-ETW2-4	AFND124D	D	MH1	4	1	3.263	4.861	0.325	0.0457	8	0.0057
AITR1392-IMU-IPS-D-MH1-2-ETW2-5	AFND125D	D	MH1	4	1	3.847	5.326	0.353	0.0456	8	0.0057
AITR1392-IMU-IPS-D-MH2-2-ETW2-1	AFND221D	D	MH2	4	2	3.351	4.976	0.328	0.0459	8	0.0057
AITR1392-IMU-IPS-D-MH2-2-ETW2-2	AFND222D	D	MH2	4	2	3.249	4.878	0.329	0.0455	8	0.0057
AITR1392-IMU-IPS-D-MH2-2-ETW2-3	AFND223D	D	MH2	4	2	3.269	4.850	0.329	0.0451	8	0.0056
AITR1392-IMU-IPS-D-MH2-2-ETW2-4	AFND224D	D	MH2	4	2	3.331	4.958	0.338	0.0450	8	0.0056
AITR1392-IMU-IPS-D-MH2-2-ETW2-5	AFND225D	D	MH2	4	2	3.301	4.908	0.338	0.0456	8	0.0057
AITR1392-IMU-IPS-D-MH2-2-ETW2-6	AFND226D	D	MH2	4	2	3.301	5.020	0.339	0.0453	8	0.0057

Average	**3.219**	**4.829**	**0.328**	**Average**	**0.0056**
Standard Dev.	**0.160**	**0.201**	**0.012**	**Standard Dev.**	
Coeff. of Var. [%]	**4.971**	**4.154**	**3.783**	**Coeff. of Var. [%]**	
Min.	**2.997**	**4.468**	**0.306**	**Min.**	**0.0054**
Max.	**3.847**	**5.326**	**0.353**	**Max.**	**0.0058**
Number of Spec.	**31**	**31**	**31**	**Number of Spec.**	**31**


In-Plane Shear Properties (IPS) -- (ETW2)
Measured 0.2% Offset Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
In-Plane Shear Strength [ksi]
0
1
2
3
4
5
6


In-Plane Shear Properties (IPS) -- (ETW2)
Measured Strength at 5% Strain
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
In-Plane Shear Strength [ksi]
0
1
2
3
4
5
6


In-Plane Shear Properties (IPS) -- (ETW2)
Measured Modulus
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
5
0.00
0.10
0.20
0.30
0.40
0.50
In-Plane Shear Modulus [Msi]

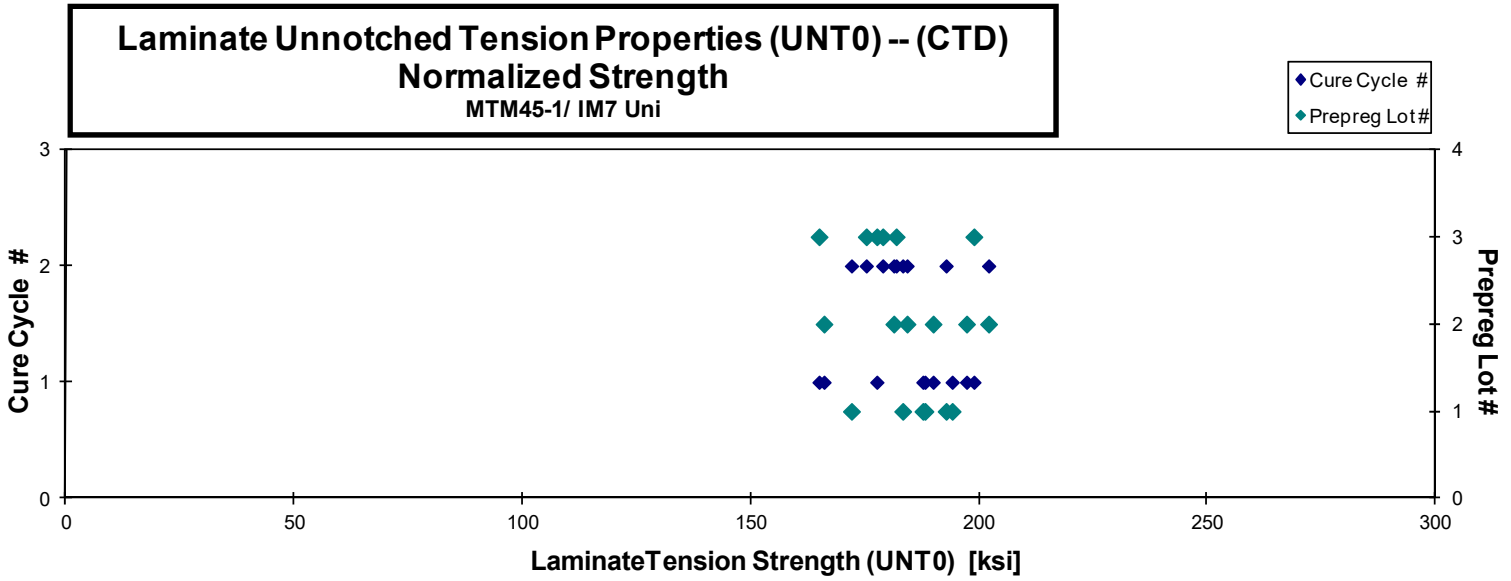
4.6 "50/0/50" Unnotched Tension 0 Properties (UNT0)

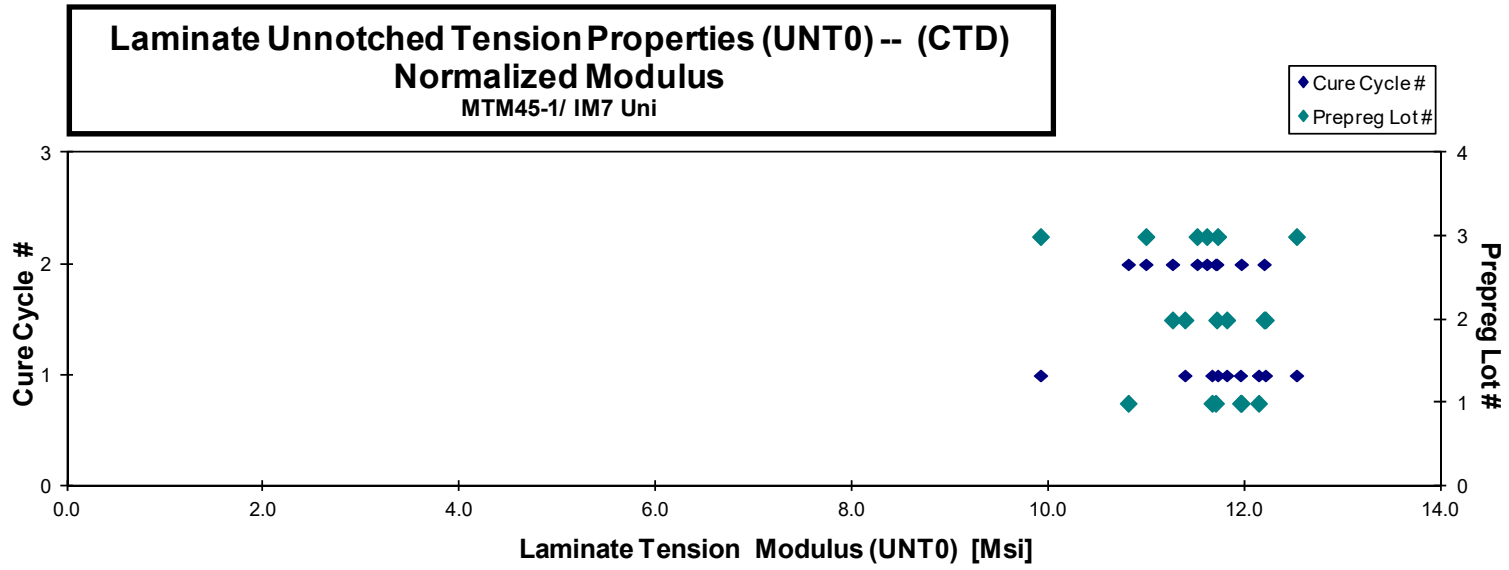
Laminate Unnotched Tension Properties (UNT0) -- (CTD)
Strength & Modulus
MTM45-1/ IM7 Uni

normalizing t_{ply} [in]: 0.0055

Specimen Number	NIAR Naming	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]
IMU-UNT0-A-MH1-CTD-2	AFPA112B	A	MH1	1	1	185.523	11.151	0.092	16	LWT/LAB	0.0058	194.167	11.671
IMU-UNT0-A-MH1-CTD-3	AFPA113B	A	MH1	1	1	179.015	11.580	0.092	16	LAT/LAB	0.0058	187.762	12.146
IMU-UNT0-A-MH1-CTD-4	AFPA114B	A	MH1	1	1	178.855	11.367	0.093	16	LAT/LAB	0.0058	188.204	11.961
IMU-UNT0-A-MH2-CTD-2	AFPA212B	A	MH2	1	2	185.268	11.499	0.092	16	LWB/DWT	0.0057	192.847	11.969
IMU-UNT0-A-MH2-CTD-3	AFPA213B	A	MH2	1	2	165.887	10.426	0.091	16	LWT/LAB	0.0057	172.108	10.817
IMU-UNT0-A-MH2-CTD-4	AFPA214B	A	MH2	1	2	177.483	11.334	0.091	16	XGM	0.0057	183.332	11.708
IMU-UNT0-B-MH1-CTD-2	AFPB112B	B	MH1	2	1	164.045	11.254	0.089	16	LAT/LAB	0.0056	166.095	11.395
IMU-UNT0-B-MH1-CTD-3	AFPB113B	B	MH1	2	1	184.351	11.469	0.091	16	LAT/LAB	0.0057	190.007	11.821
IMU-UNT0-B-MH1-CTD-4	AFPB114B	B	MH1	2	1	186.713	11.558	0.093	16	LAT/LAB	0.0058	197.322	12.215
IMU-UNT0-B-MH2-CTD-2	AFPB212B	B	MH2	2	2	174.634	11.283	0.091	16	LAT/LAB	0.0057	181.382	11.719
IMU-UNT0-B-MH2-CTD-3	AFPB213B	B	MH2	2	2	189.253	11.423	0.094	16	LAT/LAB/DGM	0.0059	202.157	12.202
IMU-UNT0-B-MH2-CTD-4	AFPB214B	B	MH2	2	2	179.398	10.969	0.090	16	LAT/LAB	0.0057	184.291	11.268
IMU-UNT0-C-MH1-CTD-1	AFPC111B	C	MH1	3	1	158.181	9.512	0.092	16	LAT/LAB	0.0057	165.012	9.923
IMU-UNT0-C-MH1-CTD-2	AFPC112B	C	MH1	3	1	169.949	11.219	0.092	16	LAT/LAB	0.0058	177.674	11.729
IMU-UNT0-C-MH1-CTD-3	AFPC113B	C	MH1	3	1	189.048	11.910	0.093	16	LAT/LAB	0.0058	198.930	12.533
IMU-UNT0-C-MH2-CTD-1	AFPC211B	C	MH2	3	2	173.377	11.487	0.089	16	LAT/LAB	0.0056	175.348	11.618
IMU-UNT0-C-MH2-CTD-2	AFPC212B	C	MH2	3	2	180.074	11.402	0.089	16	LAT/LAB	0.0056	181.916	11.519
IMU-UNT0-C-MH2-CTD-3	AFPC213B	C	MH2	3	2	178.570	10.972	0.088	16	LAT/LAB	0.0055	178.976	10.997

Average	**177.757**	**11.212**	**Average$_{norm}$**	**0.0057**	**184.307**	**11.623**
Standard Dev.	**8.791**	**0.527**	**Standard Dev.$_{norm}$**		**10.716**	**0.604**
Coeff. of Var. [%]	**4.945**	**4.700**	**Coeff. of Var. [%]$_{norm}$**		**5.814**	**5.201**
Min.	**158.181**	**9.512**	**Min.**	**0.0055**	**165.012**	**9.923**
Max.	**189.253**	**11.910**	**Max.**	**0.0059**	**202.157**	**12.533**
Number of Spec.	**18**	**18**	**Number of Spec.**		**18**	**18**


Laminate Unnotched Tension Properties (UNT0) -- (CTD)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0
50
100
150
200
250
300
LaminateTension Strength (UNT0) [ksi]


Laminate Unnotched Tension Properties (UNT0) -- (CTD)
Normalized Modulus
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
Laminate Tension Modulus (UNT0) [Msi]

Laminate Unnotched Tension Properties (UNT0) -- (RTD)
Strength & Modulus
MTM45-1/ IM7 Uni

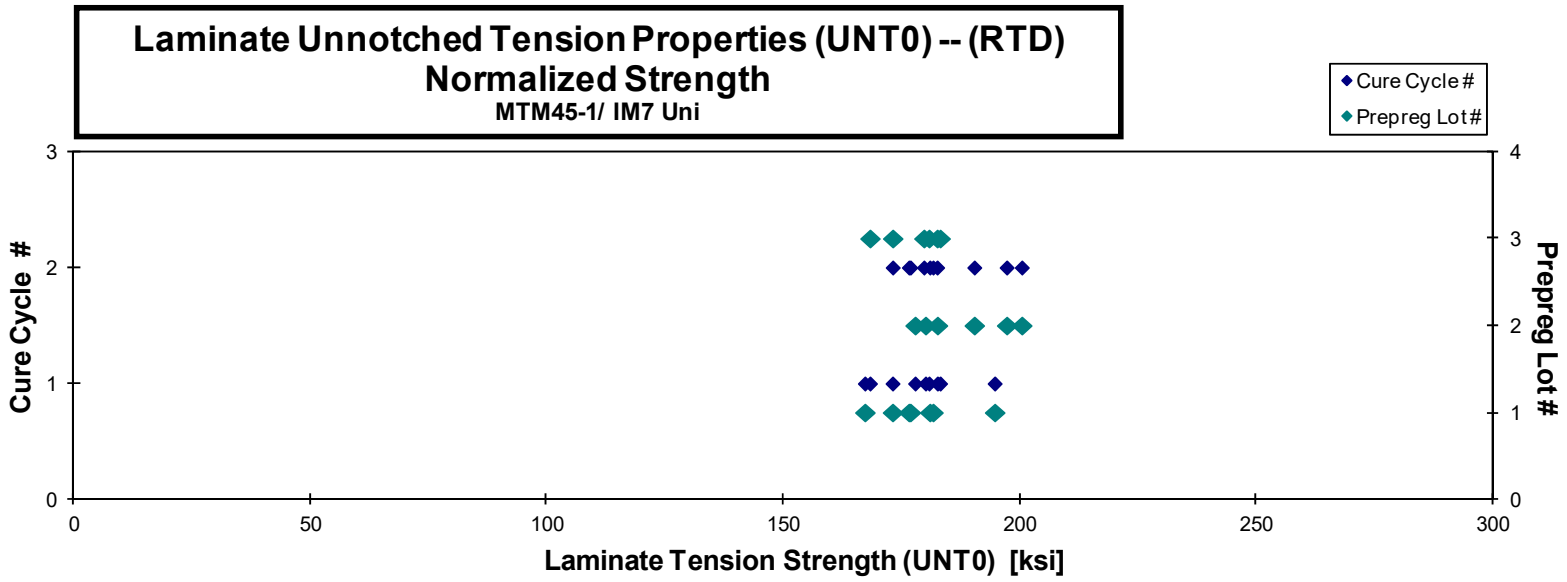
normalizing t_{ply} [in]: 0.0055

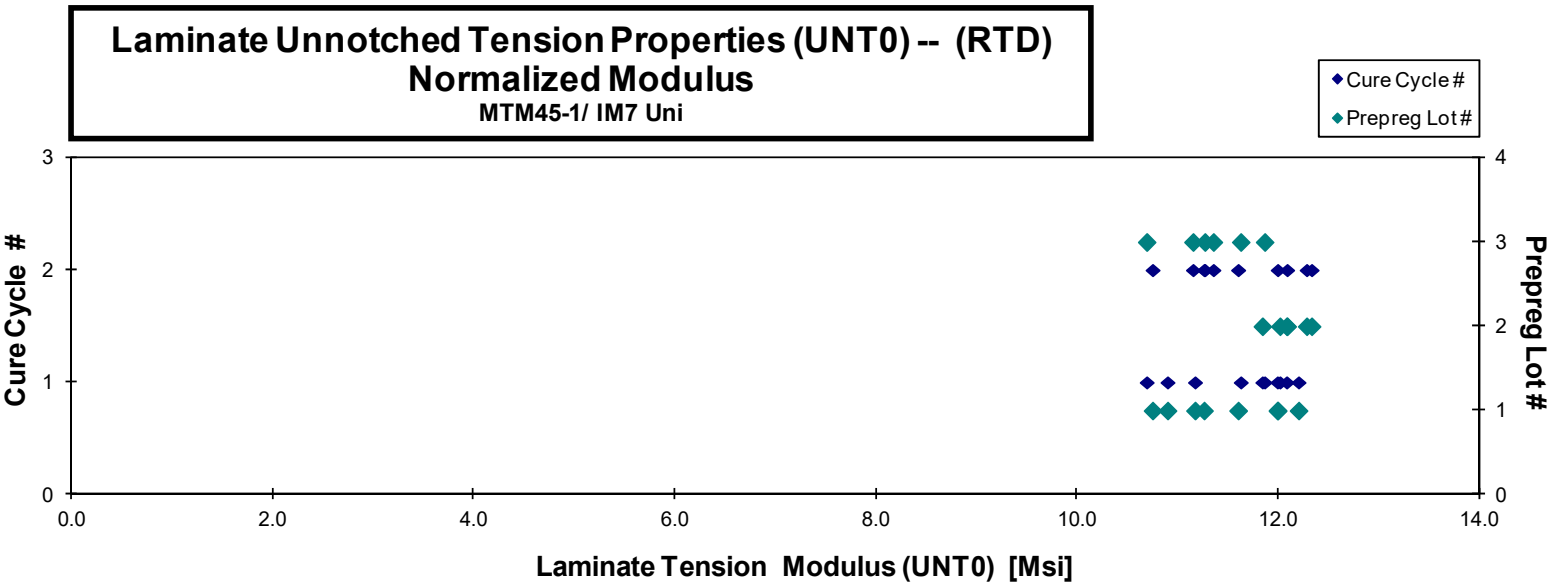
Specimen Number	NIAR Naming	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
IMU-UNT0-A-MH1-RTD-1	AFPA111A	A	MH1	1	1	167.309	10.792	0.091	16	LAT/LWT	0.0057	173.203	11.172
IMU-UNT0-A-MH1-RTD-2	AFPA112A	A	MH1	1	1	160.605	11.508	0.092	16	LAT	0.0057	167.358	11.992
IMU-UNT0-A-MH1-RTD-3	AFPA113A	A	MH1	1	1	*	10.528	0.091	16	LIT	0.0057		10.899
IMU-UNT0-A-MH1-RTD-4	AFPA114A	A	MH1	1	1	185.127	11.596	0.093	16	LAT/LGM/LWB	0.0058	194.804	12.202
IMU-UNT0-A-MH2-RTD-1	AFPA211A	A	MH2	1	2	172.916	10.714	0.093	16	LAT/LAB	0.0058	181.758	11.262
IMU-UNT0-A-MH2-RTD-2	AFPA212A	A	MH2	1	2	174.734	10.373	0.091	16	LAT/LAB	0.0057	181.088	10.750
IMU-UNT0-A-MH2-RTD-3	AFPA213A	A	MH2	1	2	169.348	11.121	0.092	16	LAT/DWB	0.0057	176.661	11.601
IMU-UNT0-A-MH2-RTD-4	AFPA214A	A	MH2	1	2	167.637	11.362	0.093	16	LGM/LAB	0.0058	176.971	11.995
IMU-UNT0-B-MH1-RTD-1	AFPB111A	B	MH1	2	1	171.966	11.469	0.092	16	LAT/LAB	0.0058	180.174	12.016
IMU-UNT0-B-MH1-RTD-2	AFPB112A	B	MH1	2	1	170.615	11.352	0.092	16	LWB/LAT	0.0057	177.982	11.842
IMU-UNT0-B-MH1-RTD-3	AFPB113A	B	MH1	2	1	175.321	11.596	0.092	16	LGM/LAT	0.0057	182.693	12.084
IMU-UNT0-B-MH2-RTD-1	AFPB211A	B	MH2	2	2	189.756	11.669	0.093	16	LWB/LAT/LGM	0.0058	200.537	12.332
IMU-UNT0-B-MH2-RTD-2	AFPB212A	B	MH2	2	2	192.102	11.767	0.090	16	LAT/LWB	0.0057	197.341	12.088
IMU-UNT0-B-MH2-RTD-4	AFPB214A	B	MH2	2	2	179.675	11.585	0.093	16	LAB/LWT/LGM	0.0058	190.497	12.283
IMU-UNT0-C-MH1-RTD-2	AFPC112A	C	MH1	3	1	162.168	10.294	0.091	16	LAT/LAB	0.0057	168.434	10.692
IMU-UNT0-C-MH1-RTD-3	AFPC113A	C	MH1	3	1	173.617	11.158	0.092	16	LAT/LAB	0.0057	180.916	11.627
IMU-UNT0-C-MH1-RTD-4	AFPC114A	C	MH1	3	1	175.298	11.349	0.092	16	LAT/LWB	0.0058	183.266	11.865
IMU-UNT0-C-MH2-RTD-1	AFPC211A	C	MH2	3	2	171.878	11.064	0.089	16	LGM/LAT	0.0055	173.245	11.152
IMU-UNT0-C-MH2-RTD-2	AFPC212A	C	MH2	3	2	180.983	11.252	0.089	16	LGM/LAT	0.0056	182.629	11.354
IMU-UNT0-C-MH2-RTD-3	AFPC213A	C	MH2	3	2	178.413	11.181	0.089	16	LAT/LAB	0.0055	179.832	11.270

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

	Strength	Modulus
Average	174.709	11.187
Standard Dev.	8.308	0.437
Coeff. of Var. [%]	4.755	3.906
Min.	160.605	10.294
Max.	192.102	11.767
Number of Spec.	19	20

	Avg. t_{ply}	$Strength_{norm}$	$Modulus_{norm}$
$Average_{norm}$	0.0057	181.547	11.624
Standard $Dev._{norm}$		8.964	0.520
Coeff. of Var. $[\%]_{norm}$		4.937	4.476
Min.	0.0055	167.358	10.692
Max.	0.0058	200.537	12.332
Number of Spec.		19	20


Laminate Unnotched Tension Properties (UNT0) -- (RTD)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0
50
100
150
200
250
300
Laminate Tension Strength (UNT0) [ksi]


Laminate Unnotched Tension Properties (UNT0) -- (RTD)
Normalized Modulus
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
Laminate Tension Modulus (UNT0) [Msi]

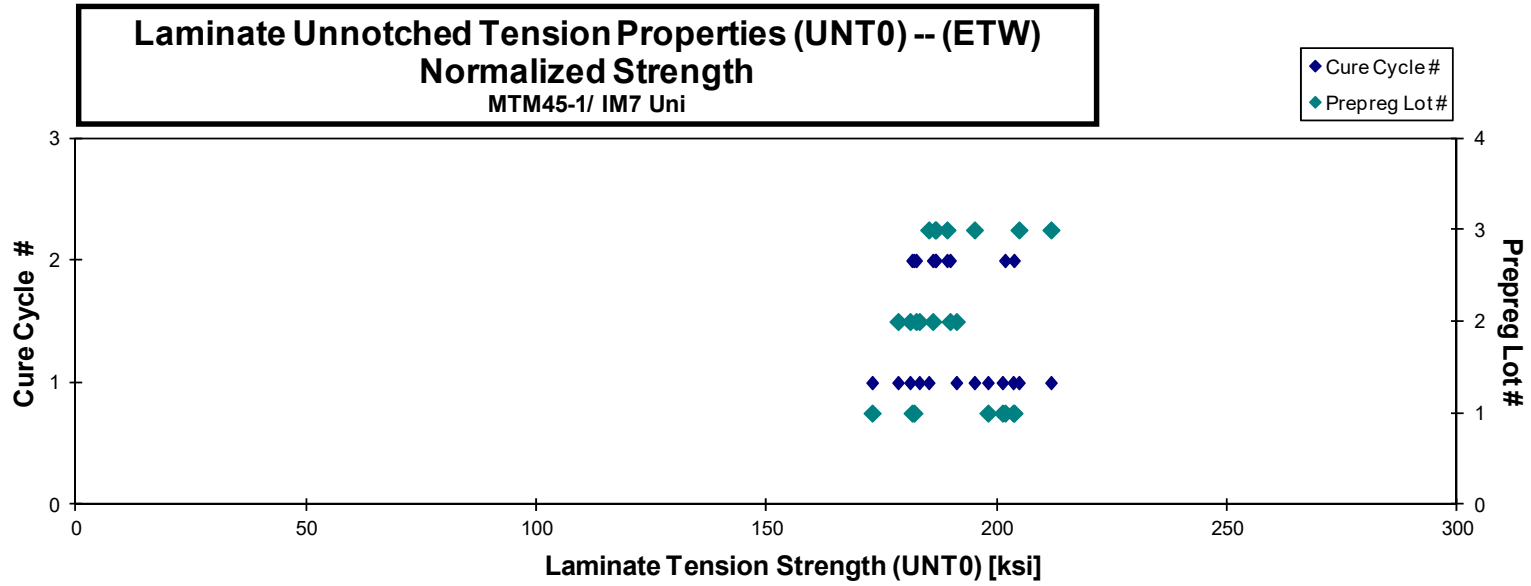
Laminate Unnotched Tension Properties (UNT0) -- (ETW)
Strength & Modulus
MTM45-1/ IM7 Uni

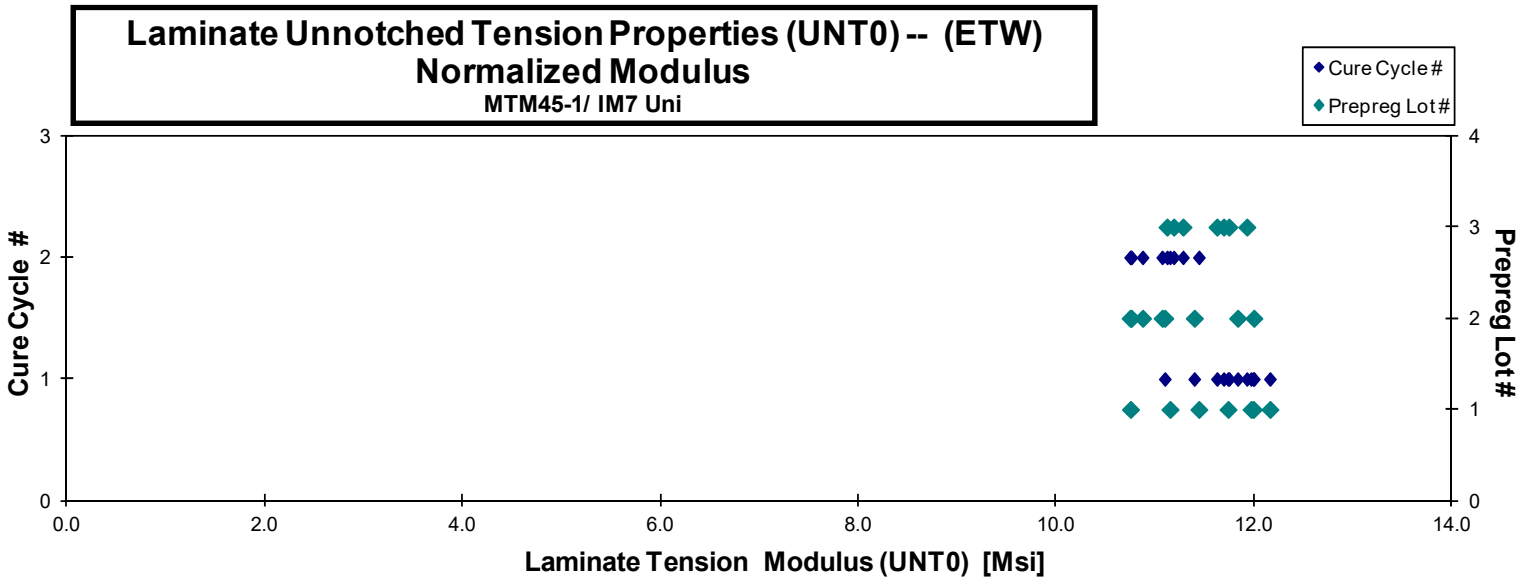
normalizing t_{ply} [in]: 0.0055

Specimen Number	NIAR Naming	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]
IMU-UNT0-A-MH1-ETW-1	AFPA111N	A	MH1	1	1	190.089	11.488	0.093	16	LAB/LAT	0.0058	201.069	12.152
IMU-UNT0-A-MH1-ETW-2	AFPA112N	A	MH1	1	1	165.174	11.212	0.092	16	LAT/LWB	0.0058	172.776	11.728
IMU-UNT0-A-MH1-ETW-3	AFPA113N	A	MH1	1	1	188.869	11.414	0.092	16	LWT	0.0058	197.919	11.961
IMU-UNT0-A-MH1-ETW-4	AFPA114N	A	MH1	1	1	192.917	11.366	0.093	16	LAB/LWT	0.0058	203.403	11.984
IMU-UNT0-A-MH2-ETW-1	AFPA211N	A	MH2	1	2	195.895	10.337	0.091	16	LGM/LAT	0.0057	203.575	10.742
IMU-UNT0-A-MH2-ETW-2	AFPA212N	A	MH2	1	2	175.720	10.790	0.091	16	LWT/LAB	0.0057	181.444	11.141
IMU-UNT0-A-MH2-ETW-3	AFPA213N	A	MH2	1	2	193.630	10.980	0.092	16	LAT/LGM/LAB	0.0057	201.624	11.433
IMU-UNT0-A-MH2-ETW-4	AFPA214N	A	MH2	1	2	174.803	**	0.092	16	LGM/LAT/LAB	0.0057	181.854	
IMU-UNT0-B-MH1-ETW-1	AFPB111N	B	MH1	2	1	180.354	11.346	0.088	16	LWT/LWB	0.0055	181.003	11.387
IMU-UNT0-B-MH1-ETW-2	AFPB112N	B	MH1	2	1	188.459	11.664	0.089	16	LAT/LWB/LGM	0.0056	191.064	11.825
IMU-UNT0-B-MH1-ETW-3	AFPB113N	B	MH1	2	1	181.881	11.914	0.089	16	SGM/LWB/LAT	0.0055	183.018	11.988
IMU-UNT0-B-MH1-ETW-4	AFPB114N	B	MH1	2	1	176.887	10.995	0.089	16	LAB/LGM/LWT	0.0055	178.395	11.089
IMU-UNT0-B-MH2-ETW-1	AFPB211N	B	MH2	2	2	191.878	11.189	0.087	16	LAB/LAT	0.0054	189.698	11.062
IMU-UNT0-B-MH2-ETW-2	AFPB212N	B	MH2	2	2	*	10.939	0.087	16	SLIPPED	0.0055		10.864
IMU-UNT0-B-MH2-ETW-3	AFPB213N	B	MH2	2	2	183.033	10.571	0.089	16	LAT/LWB/LGM	0.0056	185.945	10.739
IMU-UNT0-B-MH2-ETW-4	AFPB214N	B	MH2	2	2	180.822	10.662	0.089	16	LAT/LAB/LGM	0.0055	182.329	10.751
IMU-UNT0-C-MH1-ETW-1	AFPC111N	C	MH1	3	1	200.626	11.683	0.090	16	LGM / LAB	0.0056	204.653	11.918
IMU-UNT0-C-MH1-ETW-2	AFPC112N	C	MH1	3	1	203.849	11.255	0.091	16	LAB / LAT	0.0057	211.610	11.683
IMU-UNT0-C-MH1-ETW-3	AFPC113N	C	MH1	3	1	181.828	11.413	0.090	16	LAT / LAB	0.0056	185.065	11.616
IMU-UNT0-C-MH1-ETW-4	AFPC114N	C	MH1	3	1	188.804	11.365	0.091	16	LAT / LWB	0.0057	194.990	11.737
IMU-UNT0-C-MH2-ETW-1	AFPC211N	C	MH2	3	2	187.488	11.232	0.088	16	LGM / LWT	0.0055	186.600	11.179
IMU-UNT0-C-MH2-ETW-2	AFPC212N	C	MH2	3	2	191.975	11.448	0.087	16	LAB / LWT	0.0054	189.030	11.272
IMU-UNT0-C-MH2-ETW-3	AFPC213N	C	MH2	3	2	188.245	11.220	0.087	16	LAB / LWT	0.0054	186.427	11.112

***Tensile strength is not reported due to specimen slipped prematurely.**
****Tensile modulus is not reported due to strain gauge failed prematurely.**

Average	**186.510**	**11.204**	**$Average_{norm}$**	**0.0056**	**190.613**	**11.426**
Standard Dev.	**8.989**	**0.380**	**Standard $Dev._{norm}$**		**10.257**	**0.455**
Coeff. of Var. [%]	**4.820**	**3.391**	**Coeff. of Var. $[\%]_{norm}$**		**5.381**	**3.986**
Min.	**165.174**	**10.337**	**Min.**	**0.0054**	**172.776**	**10.739**
Max.	**203.849**	**11.914**	**Max.**	**0.0058**	**211.610**	**12.152**
Number of Spec.	**22**	**22**	**Number of Spec.**		**22**	**22**


Laminate Unnotched Tension Properties (UNT0) -- (ETW)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Tension Strength (UNT0) [ksi]
0
50
100
150
200
250
300
0
1
2
3
4


Laminate Unnotched Tension Properties (UNT0) -- (ETW)
Normalized Modulus
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Tension Modulus (UNT0) [Msi]
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
0
1
2
3
4

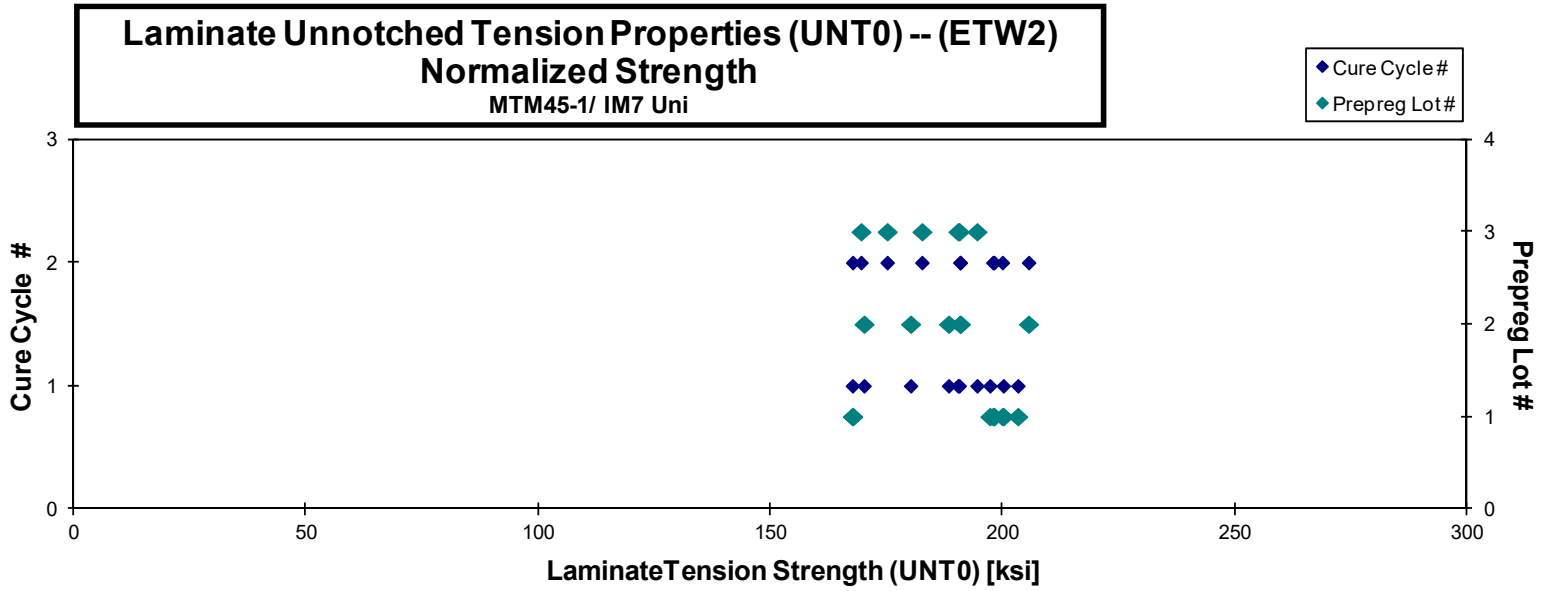
Laminate Unnotched Tension Properties (UNT0) -- (ETW2)
Strength & Modulus
MTM45-1/ IM7 Uni

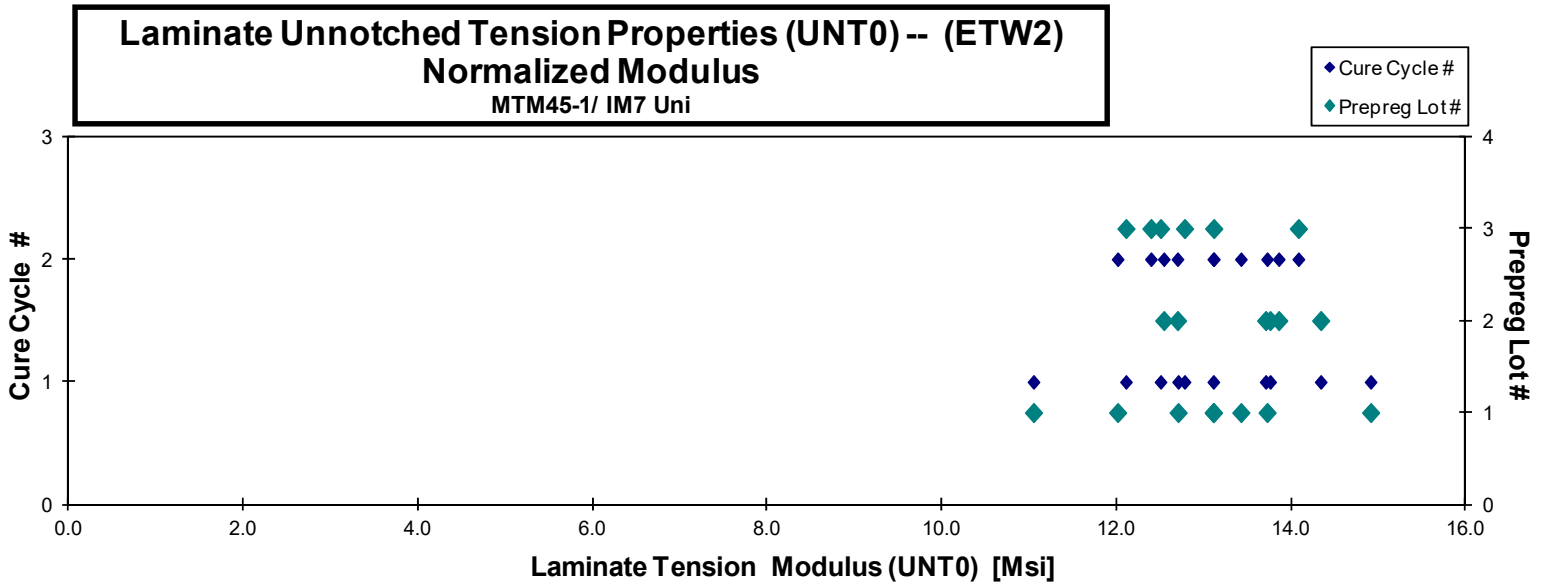
normalizing t_{ply} [in]: 0.0055

Specimen Number	NIAR Naming	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]
IMU-UNT0-A-MH1-ETW2-1	AFPA111D	A	MH1	1	1	161.295	12.590	0.092	16	LWT/LAB	0.0057	167.832	13.100
IMU-UNT0-A-MH1-ETW2-2	AFPA112D	A	MH1	1	1	197.100	14.437	0.091	16	LWT/LAB	0.0057	203.446	14.902
IMU-UNT0-A-MH1-ETW2-3	AFPA113D	A	MH1	1	1	187.984	10.513	0.092	16	LAT/LAB	0.0058	197.419	11.041
IMU-UNT0-A-MH1-ETW2-4	AFPA114D	A	MH1	1	1	192.393	12.193	0.092	16	LWT/LWB	0.0057	200.337	12.696
IMU-UNT0-A-MH2-ETW2-1	AFPA211D	A	MH2	1	2	163.370	12.748	0.090	16	LAB	0.0057	167.887	13.101
IMU-UNT0-A-MH2-ETW2-2	AFPA212D	A	MH2	1	2	192.206	13.293	0.091	16	LAT/LAB	0.0057	198.321	13.716
IMU-UNT0-A-MH2-ETW2-3	AFPA213D	A	MH2	1	2	190.802	12.924	0.091	16	LAB/LWT	0.0057	198.066	13.416
IMU-UNT0-A-MH2-ETW2-4	AFPA214D	A	MH2	1	2	195.242	11.711	0.090	16	LAT/LGM	0.0056	200.123	12.004
IMU-UNT0-B-MH1-ETW2-2	AFPB112D	B	MH1	2	1	182.696	13.274	0.091	16	LAT/LWB	0.0057	188.544	13.699
IMU-UNT0-B-MH1-ETW2-3	AFPB113D	B	MH1	2	1	180.056	14.305	0.088	16	LAT/LAB	0.0055	180.363	14.329
IMU-UNT0-B-MH1-ETW2-4	AFPB114D	B	MH1	2	1	167.262	13.502	0.090	16	LGM	0.0056	170.335	13.750
IMU-UNT0-B-MH2-ETW2-1	AFPB211D	B	MH2	2	2	186.375	12.378	0.090	16	LGM	0.0056	191.070	12.690
IMU-UNT0-B-MH2-ETW2-2	AFPB212D	B	MH2	2	2	199.447	13.424	0.091	16	LGM	0.0057	205.756	13.849
IMU-UNT0-B-MH2-ETW2-3	AFPB213D	B	MH2	2	2	189.253	12.420	0.089	16	LAT/LGM/LAB	0.0056	190.974	12.533
IMU-UNT0-C-MH1-ETW2-2	AFPC112D	C	MH1	3	1	190.684	12.510	0.090	16	LGM / LAT / LAB	0.0056	194.657	12.771
IMU-UNT0-C-MH1-ETW2-3	AFPC113D	C	MH1	3	1	186.001	12.180	0.090	16	LAT / LAB	0.0056	190.827	12.496
IMU-UNT0-C-MH1-ETW2-4	AFPC114D	C	MH1	3	1	184.272	11.700	0.091	16	LAT / LGM	0.0057	190.554	12.099
IMU-UNT0-C-MH2-ETW2-1	AFPC211D	C	MH2	3	2	183.635	12.442	0.088	16	LGM / LWB	0.0055	182.801	12.385
IMU-UNT0-C-MH2-ETW2-2	AFPC212D	C	MH2	3	2	170.357	13.157	0.088	16	LGM / LAB	0.0055	169.680	13.105
IMU-UNT0-C-MH2-ETW2-3	AFPC213D	C	MH2	3	2	175.520	14.090	0.088	16	LAT/ LWB / LGM	0.0055	175.320	14.074

	Strength [ksi]	Modulus [Msi]
Average	183.798	12.790
Standard Dev.	11.037	0.948
Coeff. of Var. [%]	6.005	7.409
Min.	161.295	10.513
Max.	199.447	14.437
Number of Spec.	20	20

	t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
$Average_{norm}$	0.0056	188.216	13.088
$Standard\ Dev._{norm}$		12.421	0.906
$Coeff.\ of\ Var.\ [\%]_{norm}$		6.599	6.925
Min.	0.0055	167.832	11.041
Max.	0.0058	205.756	14.902
Number of Spec.		20	20


Laminate Unnotched Tension Properties (UNT0) -- (ETW2)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0
50
100
150
200
250
300
LaminateTension Strength (UNT0) [ksi]


Laminate Unnotched Tension Properties (UNT0) -- (ETW2)
Normalized Modulus
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
Laminate Tension Modulus (UNT0) [Msi]

4.7 "25/50/25" Unnotched Tension 1 Properties (UNT1)

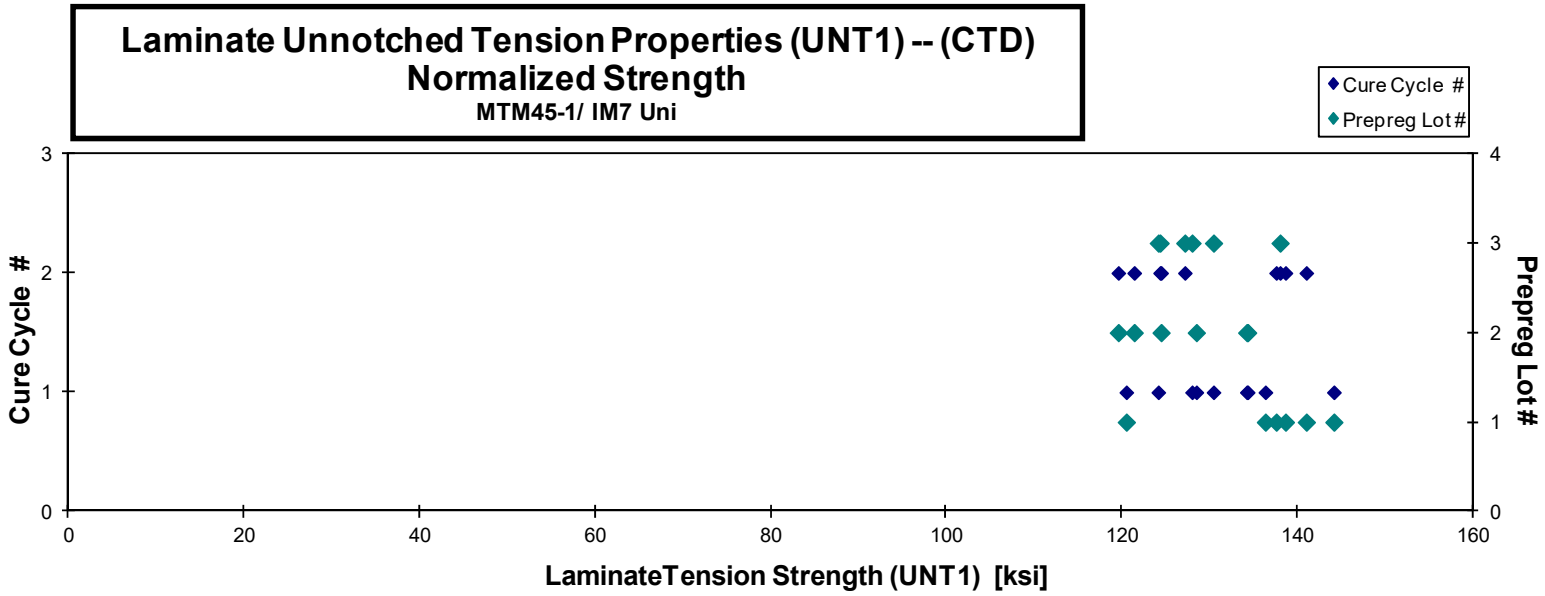
Laminate Unnotched Tension Properties (UNT1) -- (CTD)
Strength & Modulus
MTM45-1/ IM7 Uni

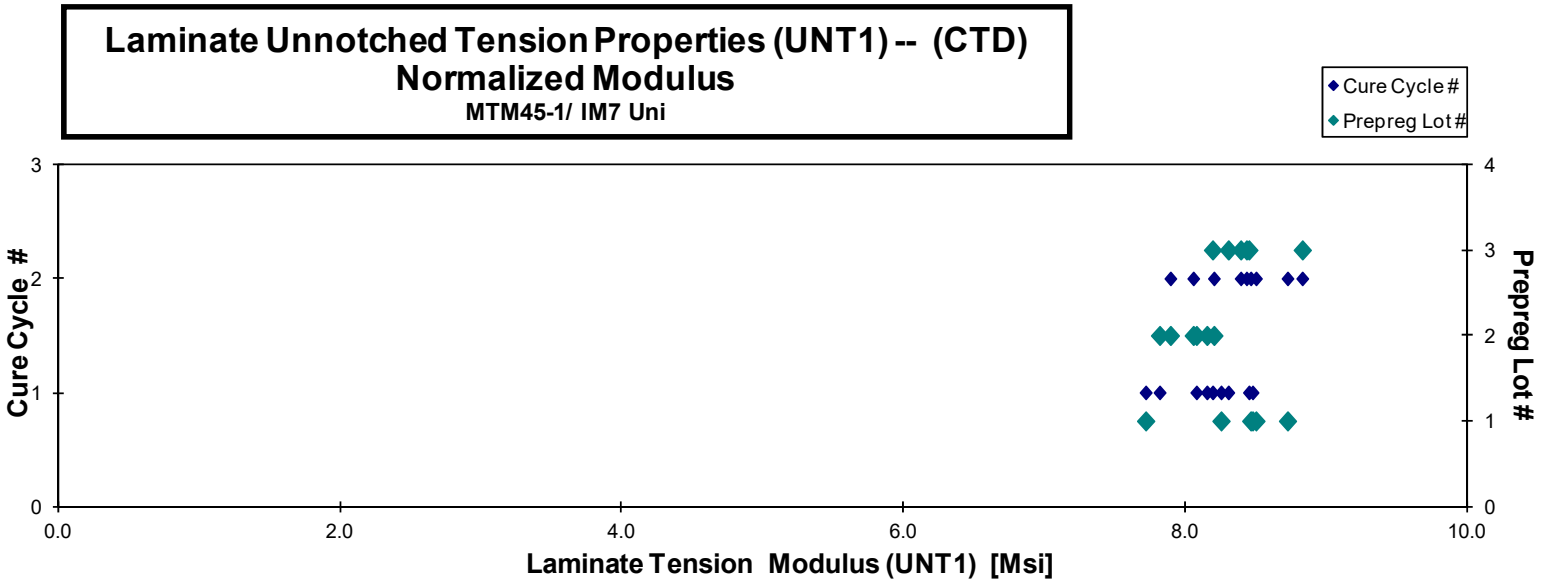
normalizing t_{ply} [in]: 0.0055

Specimen Number	NIAR Naming	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]
IMU-UNT1-A-MH1-CTD-1	AFAA111B	A	MH1	1	1	140.307	8.247	0.136	24	AGM	0.0057	144.133	8.472
IMU-UNT1-A-MH1-CTD-2	AFAA112B	A	MH1	1	1	134.095	8.113	0.134	24	LWT / AGM	0.0056	136.330	8.248
IMU-UNT1-A-MH1-CTD-3	AFAA113B	A	MH1	1	1	118.512	7.587	0.134	24	AGM	0.0056	120.487	7.713
IMU-UNT1-A-MH2-CTD-2	AFAA212B	A	MH2	1	2	133.747	8.162	0.137	24	XGM	0.0057	138.610	8.459
IMU-UNT1-A-MH2-CTD-3	AFAA213B	A	MH2	1	2	137.048	8.476	0.136	24	XWT / LGM / LAB	0.0057	140.994	8.720
IMU-UNT1-A-MH2-CTD-4	AFAA214B	A	MH2	1	2	132.728	8.198	0.137	24	XWB	0.0057	137.554	8.496
IMU-UNT1-B-MH1-CTD-2	AFAB112B	B	MH1	2	1	125.792	7.650	0.135	24	AGM	0.0056	128.460	7.812
IMU-UNT1-B-MH1-CTD-3	AFAB113B	B	MH1	2	1	130.456	7.914	0.136	24	AWT/LWB	0.0057	134.310	8.148
IMU-UNT1-B-MH1-CTD-4	AFAB114B	B	MH1	2	1	131.126	7.888	0.135	24	AGM/LAT	0.0056	134.205	8.073
IMU-UNT1-B-MH2-CTD-2	AFAB212B	B	MH2	2	2	117.880	7.777	0.134	24	LWT/LAB	0.0056	119.576	7.889
IMU-UNT1-B-MH2-CTD-3	AFAB213B	B	MH2	2	2	119.572	7.931	0.134	24	LWT/LAB	0.0056	121.384	8.051
IMU-UNT1-B-MH2-CTD-4	AFAB214B	B	MH2	2	2	121.412	7.998	0.135	24	LGM	0.0056	124.447	8.198
IMU-UNT1-C-MH1-CTD-2	AFAC112B	C	MH1	3	1	124.131	8.300	0.132	24	LGM	0.0055	124.131	8.300
IMU-UNT1-C-MH1-CTD-3	AFAC113B	C	MH1	3	1	129.633	8.139	0.133	24	LGM	0.0055	130.419	8.188
IMU-UNT1-C-MH1-CTD-4	AFAC114B	C	MH1	3	1	127.678	8.427	0.132	24	AGM	0.0055	127.968	8.446
IMU-UNT1-C-MH2-CTD-2	AFAC212B	C	MH2	3	2	124.616	8.407	0.132	24	AGM	0.0055	124.333	8.388
IMU-UNT1-C-MH2-CTD-3	AFAC213B	C	MH2	3	2	127.151	8.429	0.132	24	AWT/LWB	0.0055	127.151	8.429
IMU-UNT1-C-MH2-CTD-4	AFAC214B	C	MH2	3	2	138.003	8.825	0.132	24	LAT/AWB	0.0055	138.003	8.825

	Strength [ksi]	Modulus [Msi]
Average	**128.549**	**8.137**
Standard Dev.	**6.765**	**0.318**
Coeff. of Var. [%]	**5.262**	**3.905**
Min.	**117.880**	**7.587**
Max.	**140.307**	**8.825**
Number of Spec.	**18**	**18**

	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
$Average_{norm}$	**0.0056**	**130.694**	**8.270**
Standard $Dev._{norm}$		**7.550**	**0.296**
Coeff. of Var. $[\%]_{norm}$		**5.777**	**3.577**
Min.	**0.0055**	**119.576**	**7.713**
Max.	**0.0057**	**144.133**	**8.825**
Number of Spec.		**18**	**18**


Laminate Unnotched Tension Properties (UNT1) -- (CTD)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
LaminateTension Strength (UNT1) [ksi]
0
20
40
60
80
100
120
140
160


Laminate Unnotched Tension Properties (UNT1) -- (CTD)
Normalized Modulus
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Tension Modulus (UNT1) [Msi]
0.0
2.0
4.0
6.0
8.0
10.0

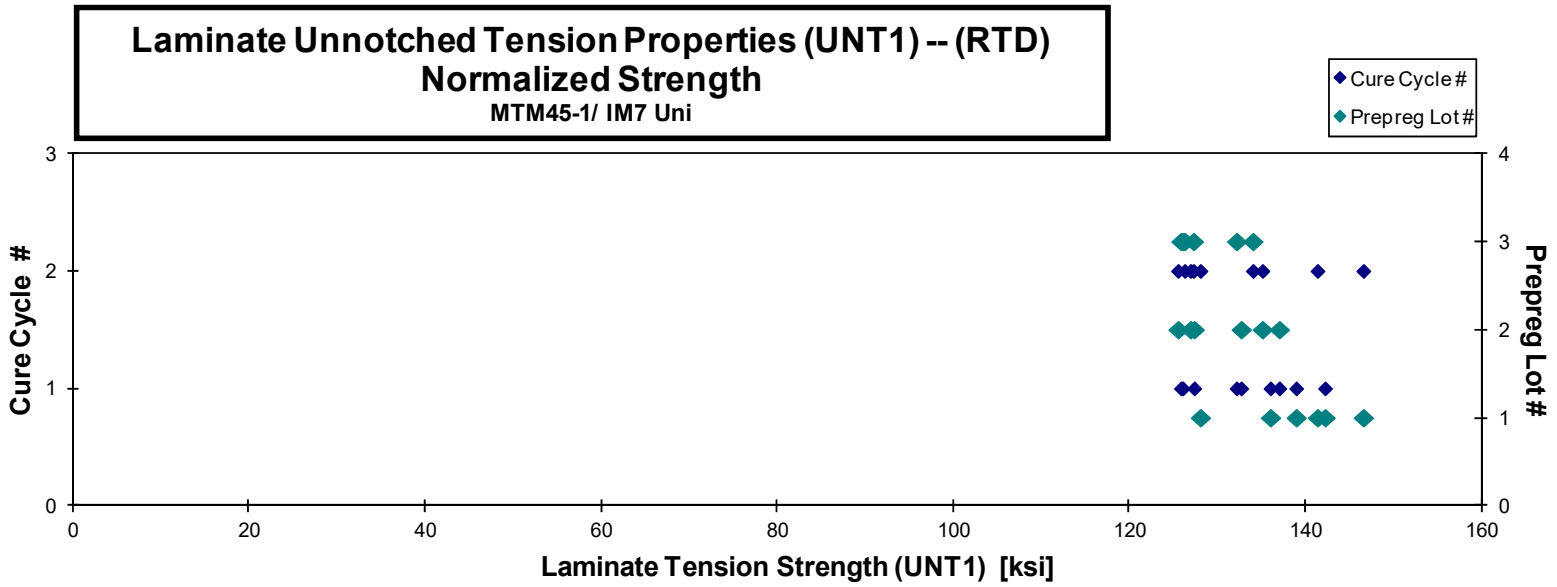
Laminate Unnotched Tension Properties (UNT1) -- (RTD)
Strength & Modulus
MTM45-1/ IM7 Uni

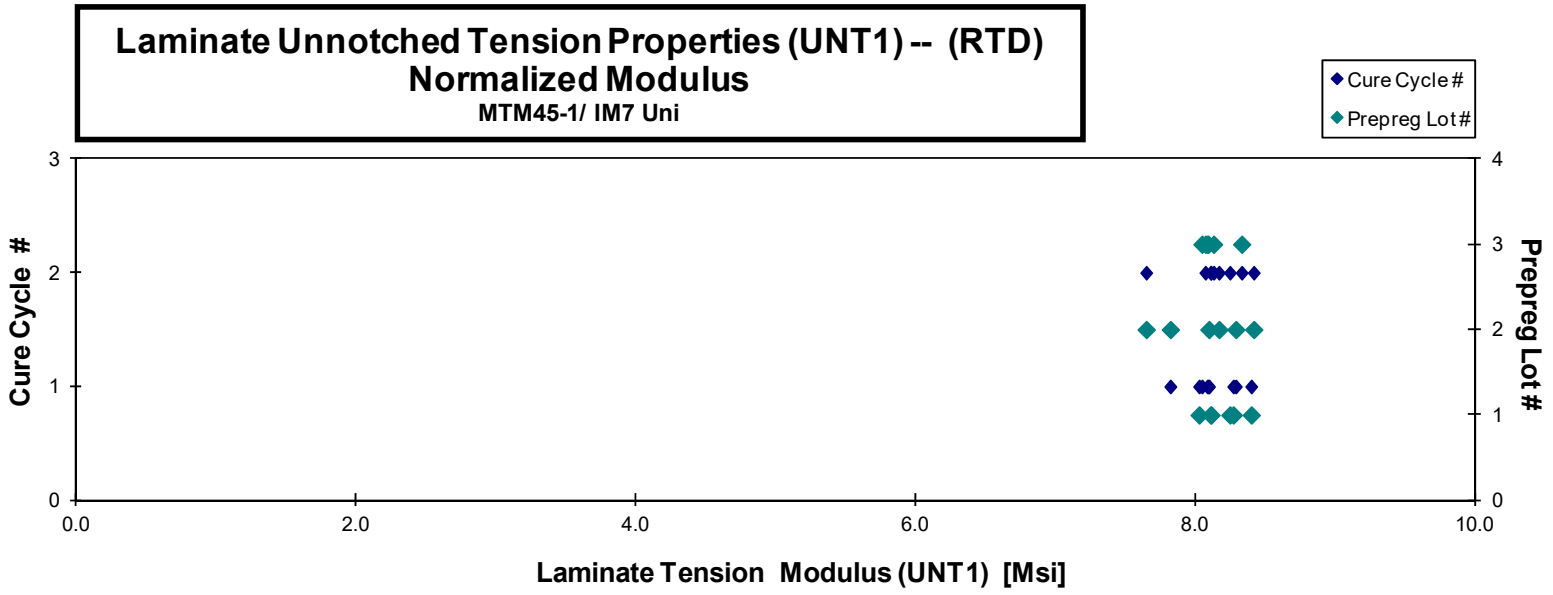
normalizing t_{ply} [in]: 0.0055

Specimen Number	NIAR Naming	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]
IMU-UNT1-A-MH1-RTD-2	AFAA112A	A	MH1	1	1	132.471	7.811	0.136	24	AGM	0.0057	136.084	8.024
IMU-UNT1-A-MH1-RTD-3	AFAA113A	A	MH1	1	1	137.494	7.990	0.137	24	AGM	0.0057	142.286	8.269
IMU-UNT1-A-MH1-RTD-4	AFAA114A	A	MH1	1	1	135.719	8.198	0.135	24	AGM	0.0056	139.009	8.397
IMU-UNT1-A-MH2-RTD-2	AFAA212A	A	MH2	1	2	138.179	8.055	0.135	24	LWT / LWB / DGM	0.0056	141.424	8.244
IMU-UNT1-A-MH2-RTD-3	AFAA213A	A	MH2	1	2	124.451	7.874	0.136	24	AGM	0.0057	128.127	8.107
IMU-UNT1-A-MH2-RTD-4	AFAA214A	A	MH2	1	2	142.847	7.899	0.136	24	AGM / LWB	0.0056	146.634	8.108
IMU-UNT1-B-MH1-RTD-2	AFAB112A	B	MH1	2	1	133.550	8.072	0.136	24	LWB/AGM	0.0056	137.091	8.286
IMU-UNT1-B-MH1-RTD-3	AFAB113A	B	MH1	2	1	128.667	7.845	0.136	24	AGM/LGM	0.0057	132.761	8.095
IMU-UNT1-B-MH1-RTD-4	AFAB114A	B	MH1	2	1	126.656	7.771	0.133	24	LWT/AGM	0.0055	127.423	7.818
IMU-UNT1-B-MH2-RTD-2	AFAB212A	B	MH2	2	2	123.165	7.498	0.135	24	AGM/LGM	0.0056	125.591	7.646
IMU-UNT1-B-MH2-RTD-3	AFAB213A	B	MH2	2	2	133.652	8.320	0.134	24	AGM/LWB	0.0056	135.171	8.415
IMU-UNT1-B-MH2-RTD-4	AFAB214A	B	MH2	2	2	127.875	8.222	0.131	24	LWT/LWB	0.0055	127.003	8.166
IMU-UNT1-C-MH1-RTD-2	AFAC112A	C	MH1	3	1	131.336	8.027	0.133	24	LWB/AGM	0.0055	132.232	8.082
IMU-UNT1-C-MH1-RTD-3	AFAC113A	C	MH1	3	1	124.603	7.948	0.134	24	AGM	0.0056	126.114	8.044
IMU-UNT1-C-MH1-RTD-4	AFAC114A	C	MH1	3	1	125.345	8.052	0.133	24	LWT/LWB	0.0055	125.915	8.089
IMU-UNT1-C-MH2-RTD-1	AFAC211A	C	MH2	3	2	133.992	8.322	0.132	24	LAB/LWT	0.0055	134.094	8.328
IMU-UNT1-C-MH2-RTD-2	AFAC212A	C	MH2	3	2	127.012	8.171	0.131	24	AGM/LAT/LAB	0.0055	126.338	8.128
IMU-UNT1-C-MH2-RTD-3	AFAC213A	C	MH2	3	2	127.431	8.075	0.132	24	LWT/AGM	0.0055	127.335	8.069

	Strength [ksi]	Modulus [Msi]
Average	**130.803**	**8.008**
Standard Dev.	**5.532**	**0.208**
Coeff. of Var. [%]	**4.229**	**2.593**
Min.	**123.165**	**7.498**
Max.	**142.847**	**8.322**
Number of Spec.	**18**	**18**

	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
$Average_{norm}$	**0.0056**	**132.813**	**8.129**
Standard $Dev._{norm}$		**6.558**	**0.189**
Coeff. of Var. $[\%]_{norm}$		**4.938**	**2.330**
Min.	**0.0055**	**125.591**	**7.646**
Max.	**0.0057**	**146.634**	**8.415**
Number of Spec.		**18**	**18**


Laminate Unnotched Tension Properties (UNT1) -- (RTD)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0
20
40
60
80
100
120
140
160
Laminate Tension Strength (UNT1) [ksi]

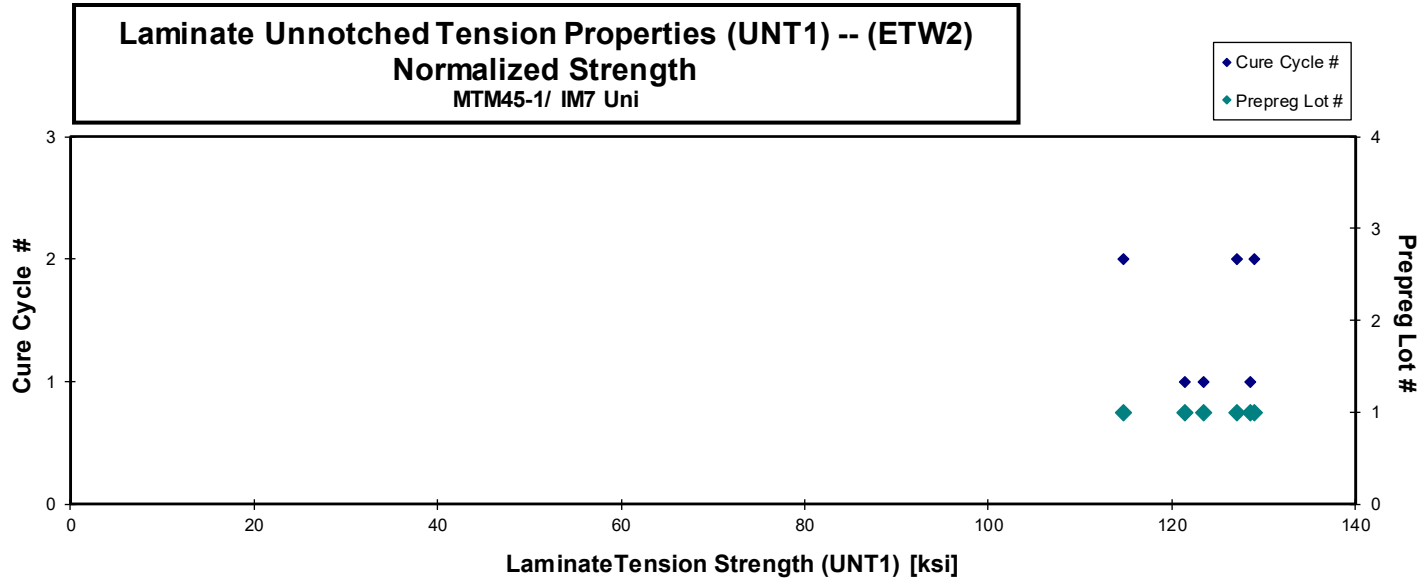

Laminate Unnotched Tension Properties (UNT1) -- (RTD)
Normalized Modulus
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
2.0
4.0
6.0
8.0
10.0
Laminate Tension Modulus (UNT1) [Msi]

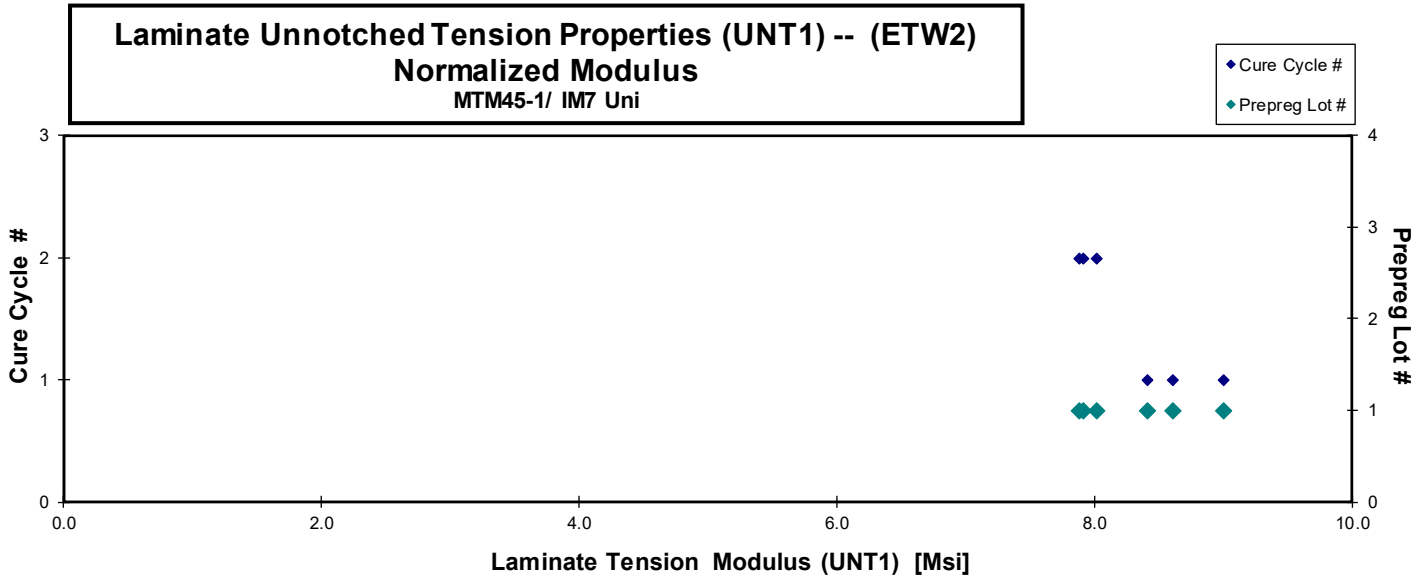
Laminate Unnotched Tension Properties (UNT1) -- (ETW2)
Strength & Modulus
MTM45-1/ IM7 Uni

normalizing t_{ply} [in]: 0.0055

Specimen Number	NIAR Naming	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]
IMU-UNT1-A-MH1-ETW2-1	AFAA111D	A	MH1	1	1	118.629	8.401	0.135	24	LWT / AGM	0.0056	121.550	8.608
IMU-UNT1-A-MH1-ETW2-2	AFAA112D	A	MH1	1	1	124.973	8.745	0.136	24	LWT / AGM	0.0057	128.665	9.003
IMU-UNT1-A-MH1-ETW2-3	AFAA113D	A	MH1	1	1	121.308	8.267	0.134	24	AGM	0.0056	123.498	8.416
IMU-UNT1-A-MH2-ETW2-2	AFAA212D	A	MH2	1	2	111.021	7.627	0.137	24	AGM	0.0057	114.848	7.890
IMU-UNT1-A-MH2-ETW2-3	AFAA213D	A	MH2	1	2	123.541	7.688	0.136	24	AWB/LWT	0.0057	127.144	7.912
IMU-UNT1-A-MH2-ETW2-4	AFAA214D	A	MH2	1	2	126.328	7.849	0.135	24	AGM / SLIP	0.0056	129.072	8.019

Average	**120.967**	**8.096**	**$Average_{norm}$**	**0.0056**	**124.130**	**8.308**
Standard Dev.	**5.584**	**0.445**	**$Standard\ Dev._{norm}$**		**5.427**	**0.447**
Coeff. of Var. [%]	**4.616**	**5.499**	**$Coeff.\ of\ Var.\ [\%]_{norm}$**		**4.372**	**5.382**
Min.	**111.021**	**7.627**	**Min.**	**0.0056**	**114.848**	**7.890**
Max.	**126.328**	**8.745**	**Max.**	**0.0057**	**129.072**	**9.003**
Number of Spec.	**6**	**6**	**Number of Spec.**		**6**	**6**


Laminate Unnotched Tension Properties (UNT1) -- (ETW2)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
LaminateTension Strength (UNT1) [ksi]
0
20
40
60
80
100
120
140

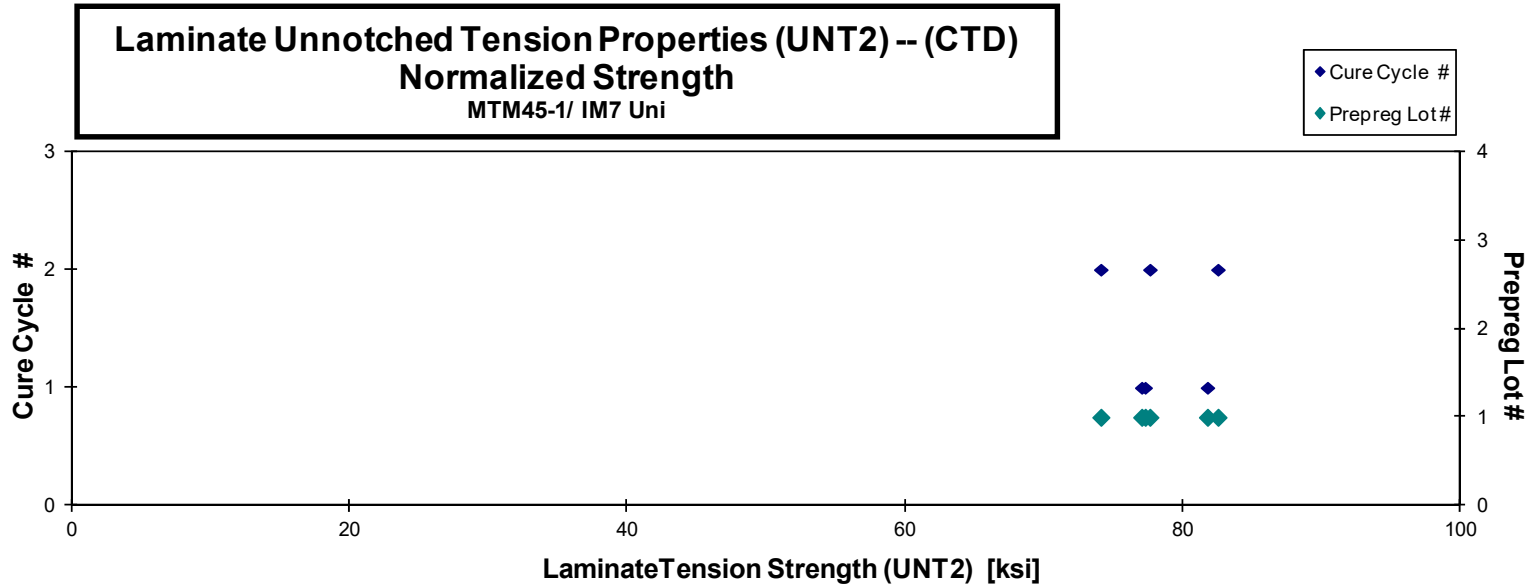

Laminate Unnotched Tension Properties (UNT1) -- (ETW2)
Normalized Modulus
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Tension Modulus (UNT1) [Msi]
0.0
2.0
4.0
6.0
8.0
10.0

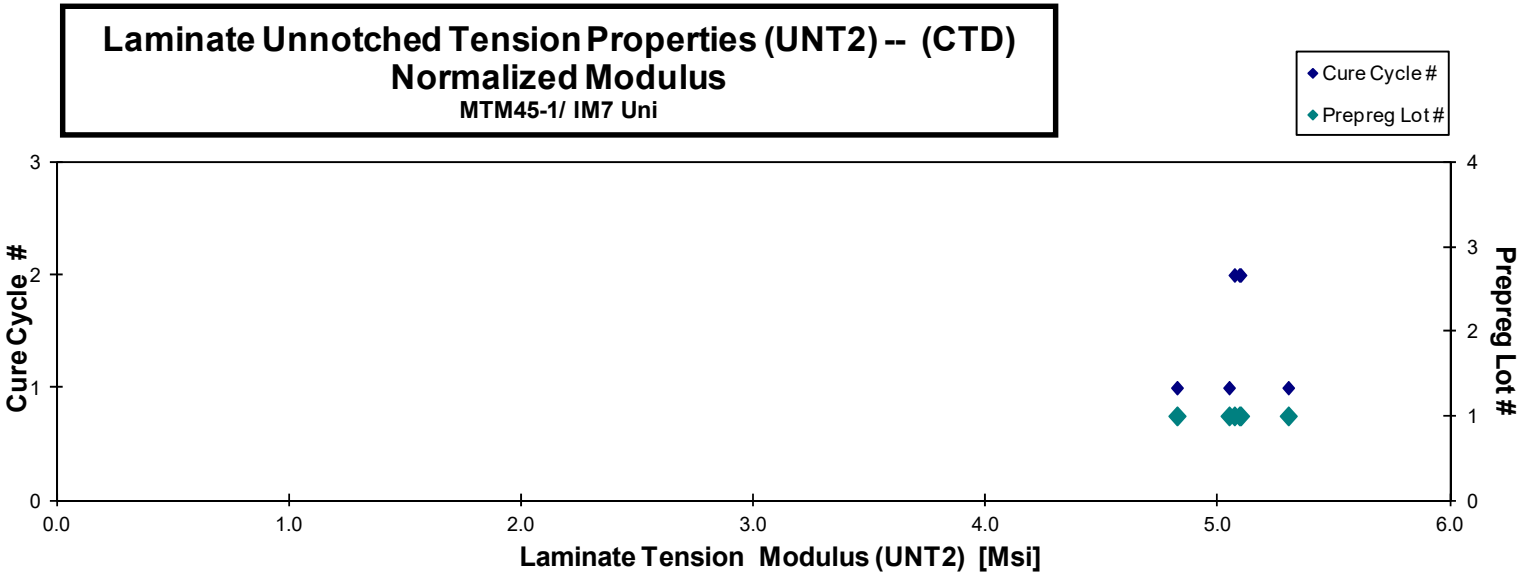
4.8 "10/80/10" Unnotched Tension 2 Properties (UNT2)

Laminate Unnotched Tension Properties (UNT2) -- (CTD)
Strength & Modulus
MTM45-1/ IM7 Uni

normalizing t_{ply} [in]: 0.0055

Specimen Number	NIAR Naming	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]
IMU-UNT2-A-MH1-CTD-2	AFBA112B	A	MH1	1	1	74.505	4.658	0.114	20	AGM	0.0057	77.078	4.819
IMU-UNT2-A-MH1-CTD-3	AFBA113B	A	MH1	1	1	74.353	4.850	0.114	20	AGM	0.0057	77.327	5.043
IMU-UNT2-A-MH1-CTD-4	AFBA114B	A	MH1	1	1	79.219	5.131	0.114	20	DWB	0.0057	81.811	5.298
IMU-UNT2-A-MH2-CTD-2	AFBA212B	A	MH2	1	2	79.739	4.893	0.114	20	AWT	0.0057	82.566	5.066
IMU-UNT2-A-MH2-CTD-3	AFBA213B	A	MH2	1	2	71.975	4.940	0.113	20	AWT	0.0057	74.134	5.088
IMU-UNT2-A-MH2-CTD-4	AFBA214B	A	MH2	1	2	75.607	4.958	0.113	20	AGM	0.0057	77.669	5.093
Average						**75.900**	**4.905**				**Average$_{norm}$**	**0.0057**	**78.431**	**5.068**
Standard Dev.						**3.019**	**0.154**				**Standard Dev.$_{norm}$**		**3.182**	**0.153**
Coeff. of Var. [%]						**3.978**	**3.144**				**Coeff. of Var. [%]$_{norm}$**		**4.057**	**3.013**
Min.						**71.975**	**4.658**				**Min.**	**0.0057**	**74.134**	**4.819**
Max.						**79.739**	**5.131**				**Max.**	**0.0057**	**82.566**	**5.298**
Number of Spec.						**6**	**6**				**Number of Spec.**		**6**	**6**


Laminate Unnotched Tension Properties (UNT2) -- (CTD)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0
20
40
60
80
100
LaminateTension Strength (UNT2) [ksi]

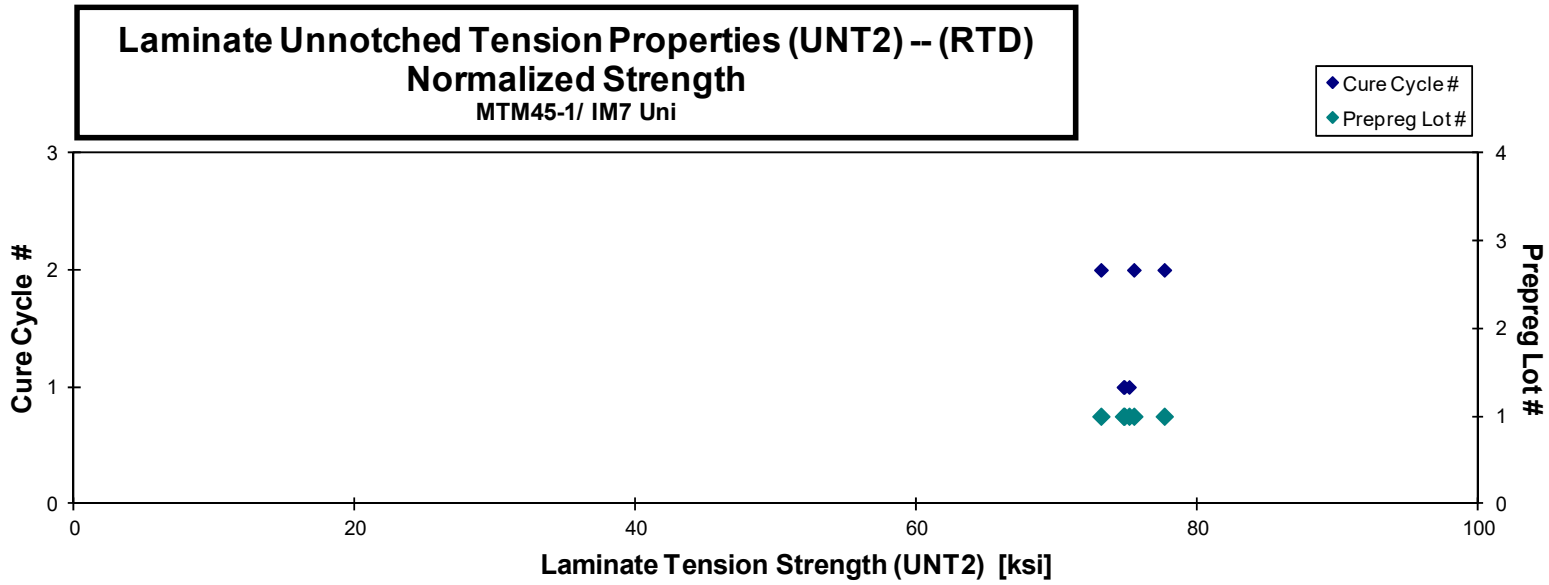

Laminate Unnotched Tension Properties (UNT2) -- (CTD)
Normalized Modulus
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
1.0
2.0
3.0
4.0
5.0
6.0
Laminate Tension Modulus (UNT2) [Msi]

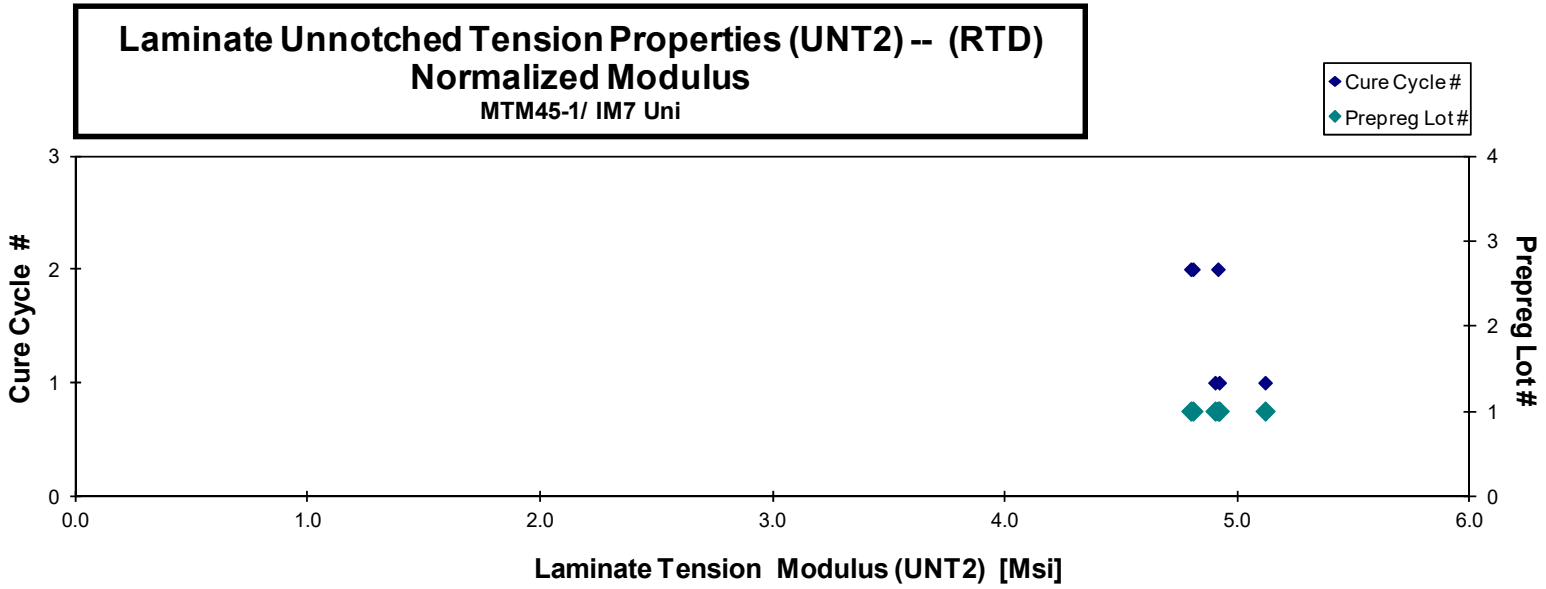
Laminate Unnotched Tension Properties (UNT2) -- (RTD)
Strength & Modulus
MTM45-1/ IM7 Uni

normalizing t_{ply} [in]: 0.0055

Specimen Number	NIAR Naming	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]
IMU-UNT2-A-MH1-RTD-2	AFBA112A	A	MH1	1	1	72.388	4.768	0.114	20	DGM	0.0057	74.757	4.924
IMU-UNT2-A-MH1-RTD-3	AFBA113A	A	MH1	1	1	72.588	4.767	0.113	20	DGM	0.0057	74.700	4.906
IMU-UNT2-A-MH1-RTD-4	AFBA114A	A	MH1	1	1	73.360	5.003	0.113	20	DGM	0.0056	75.094	5.121
IMU-UNT2-A-MH2-RTD-2	AFBA212A	A	MH2	1	2	71.659	4.708	0.112	20	DGM	0.0056	73.092	4.802
IMU-UNT2-A-MH2-RTD-3	AFBA213A	A	MH2	1	2	73.047	4.763	0.114	20	DGM	0.0057	75.438	4.918
IMU-UNT2-A-MH2-RTD-4	AFBA214A	A	MH2	1	2	75.277	4.667	0.113	20	DGM	0.0057	77.604	4.811

	Strength [ksi]	Modulus [Msi]			$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
Average	73.053	4.779	$Average_{norm}$	0.0057	75.114	4.914
Standard Dev.	1.237	0.117	$Standard\ Dev._{norm}$		1.462	0.115
Coeff. of Var. [%]	1.693	2.449	$Coeff.\ of\ Var.\ [\%]_{norm}$		1.947	2.346
Min.	71.659	4.667	Min.	0.0056	73.092	4.802
Max.	75.277	5.003	Max.	0.0057	77.604	5.121
Number of Spec.	6	6	Number of Spec.		6	6


Laminate Unnotched Tension Properties (UNT2) -- (RTD)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0
20
40
60
80
100
Laminate Tension Strength (UNT2) [ksi]

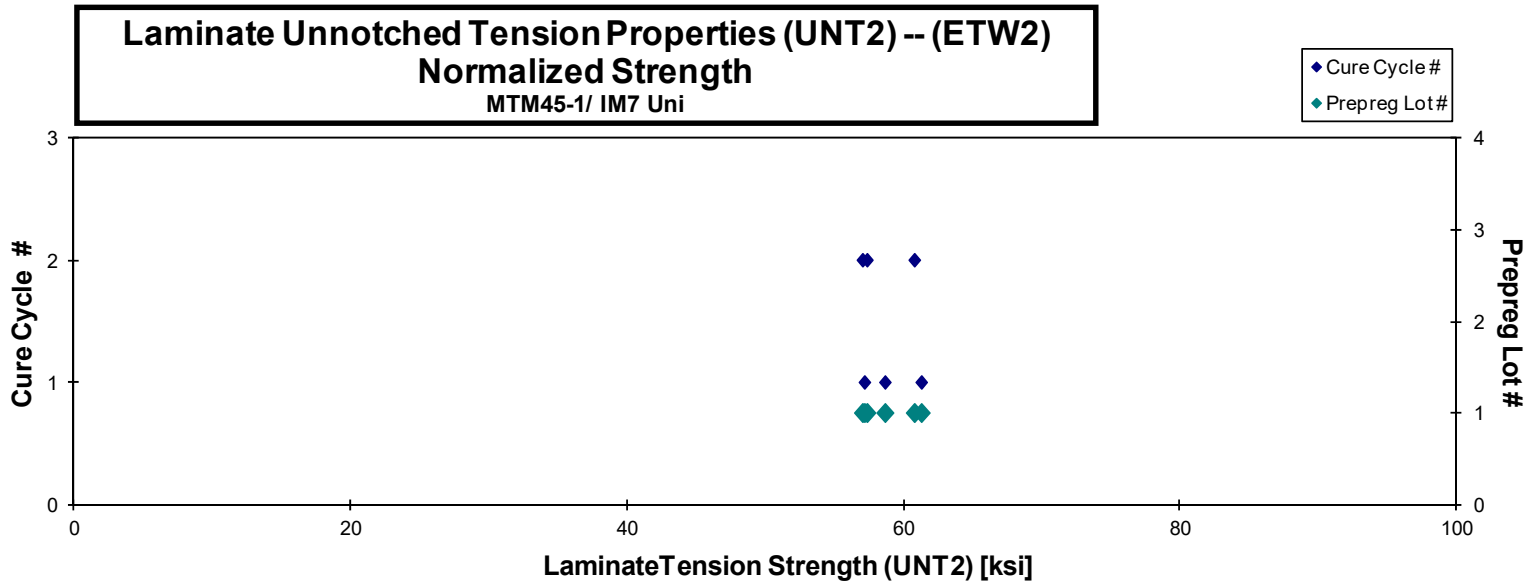

Laminate Unnotched Tension Properties (UNT2) -- (RTD)
Normalized Modulus
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
1.0
2.0
3.0
4.0
5.0
6.0
Laminate Tension Modulus (UNT2) [Msi]

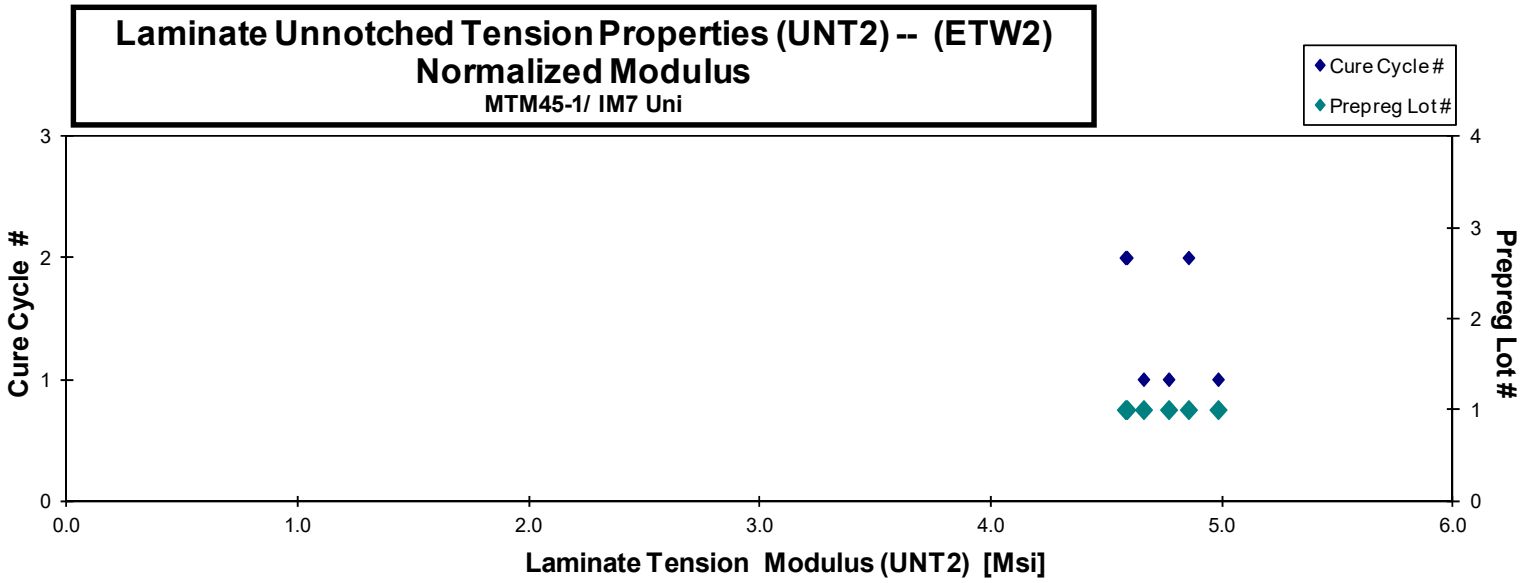
Laminate Unnotched Tension Properties (UNT2) -- (ETW2)
Strength & Modulus
MTM45-1/ IM7 Uni

normalizing t_{ply} [in]: 0.0055

Specimen Number	NIAR Naming	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]
IMU-UNT2-A-MH1-ETW2-2	AFBA112D	A	MH1	1	1	56.444	4.602	0.111	20	DGM	0.0056	57.102	4.655
IMU-UNT2-A-MH1-ETW2-3	AFBA113D	A	MH1	1	1	56.822	4.621	0.113	20	DGM	0.0057	58.587	4.764
IMU-UNT2-A-MH1-ETW2-4	AFBA114D	A	MH1	1	1	60.141	4.891	0.112	20	DGM	0.0056	61.216	4.978
IMU-UNT2-A-MH2-ETW2-1	AFBA211D	A	MH2	1	2	55.894	4.466	0.113	20	DGM	0.0056	57.283	4.577
IMU-UNT2-A-MH2-ETW2-2	AFBA212D	A	MH2	1	2	55.295	4.449	0.113	20	DGM	0.0057	56.962	4.583
IMU-UNT2-A-MH2-ETW2-4	AFBA214D	A	MH2	1	2	59.850	4.781	0.112	20	DGM	0.0056	60.712	4.850

	Strength [ksi]	Modulus [Msi]			$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
Average	**57.407**	**4.635**	**$Average_{norm}$**	**0.0056**	**58.643**	**4.735**
Standard Dev.	**2.072**	**0.174**	**Standard $Dev._{norm}$**		**1.895**	**0.160**
Coeff. of Var. [%]	**3.609**	**3.750**	**Coeff. of Var. $[\%]_{norm}$**		**3.231**	**3.372**
Min.	**55.295**	**4.449**	**Min.**	**0.0056**	**56.962**	**4.577**
Max.	**60.141**	**4.891**	**Max.**	**0.0057**	**61.216**	**4.978**
Number of Spec.	**6**	**6**	**Number of Spec.**		**6**	**6**


Laminate Unnotched Tension Properties (UNT2) -- (ETW2)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0
20
40
60
80
100
LaminateTension Strength (UNT2) [ksi]

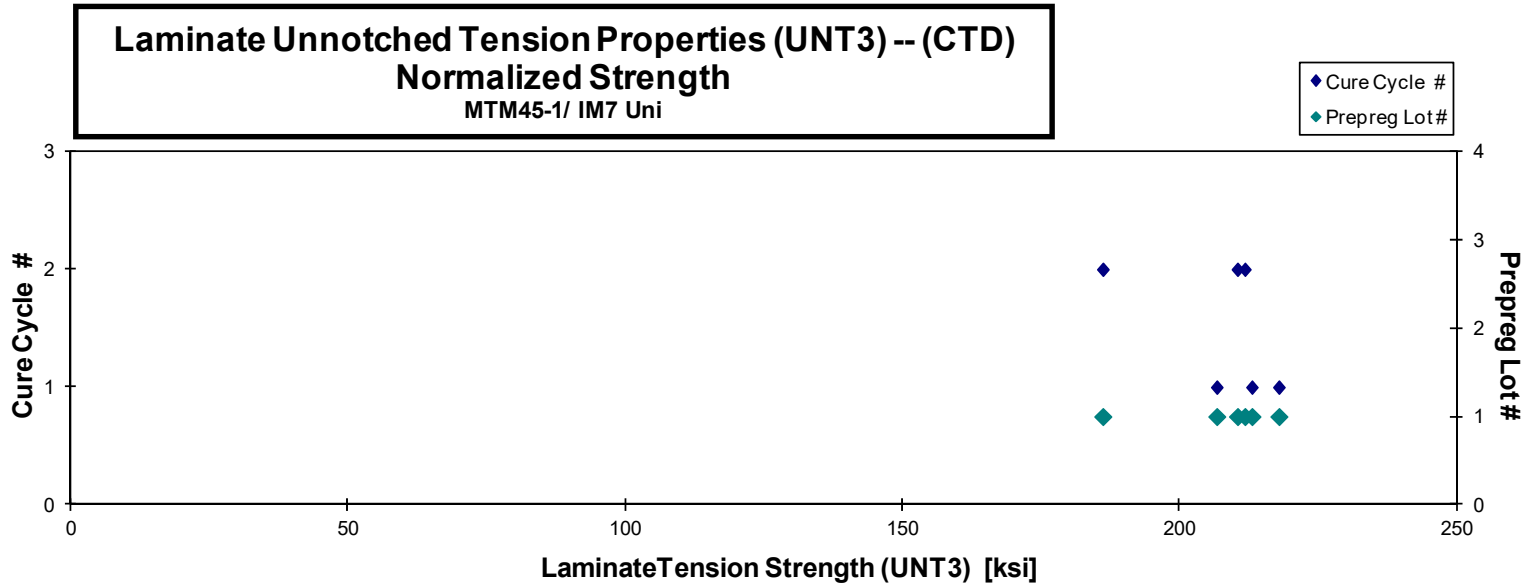

Laminate Unnotched Tension Properties (UNT2) -- (ETW2)
Normalized Modulus
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
1.0
2.0
3.0
4.0
5.0
6.0
Laminate Tension Modulus (UNT2) [Msi]

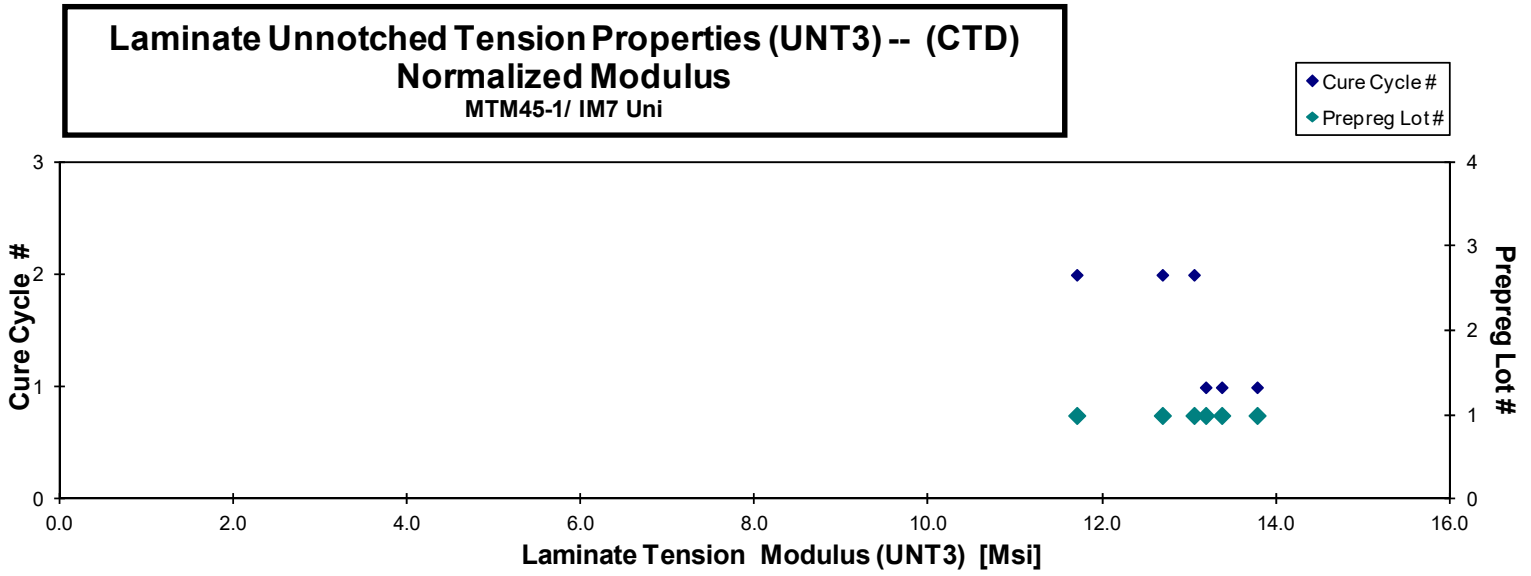
4.9 "50/40/10" Unnotched Tension 3 Properties (UNT3)

Laminate Unnotched Tension Properties (UNT3) -- (CTD)
Strength & Modulus
MTM45-1/ IM7 Uni

normalizing t_{ply} [in]: 0.0055

Specimen Number	NIAR Naming	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]
IMU-UNT3-A-MH1-CTD-2	AFCA112B	A	MH1	1	1	211.814	13.398	0.113	20	LAT / AWB	0.0057	217.784	13.776
IMU-UNT3-A-MH1-CTD-3	AFCA113B	A	MH1	1	1	202.085	12.688	0.116	20	LAT / LWB	0.0058	212.924	13.369
IMU-UNT3-A-MH1-CTD-4	AFCA114B	A	MH1	1	1	198.288	12.654	0.115	20	LWT / DGM	0.0057	206.580	13.183
IMU-UNT3-A-MH2-CTD-2	AFCA212B	A	MH2	1	2	204.585	12.261	0.114	20	LWT / LWB	0.0057	211.653	12.685
IMU-UNT3-A-MH2-CTD-3	AFCA213B	A	MH2	1	2	182.870	11.501	0.112	20	LAT	0.0056	186.029	11.700
IMU-UNT3-A-MH2-CTD-4	AFCA214B	A	MH2	1	2	206.185	12.793	0.112	20	LGM	0.0056	210.309	13.049
Average						**200.971**	**12.549**				**$Average_{norm}$**	**0.0057**	**207.546**	**12.960**
Standard Dev.						**9.939**	**0.631**				**Standard $Dev._{norm}$**		**11.155**	**0.715**
Coeff. of Var. [%]						**4.945**	**5.030**				**Coeff. of Var. $[\%]_{norm}$**		**5.375**	**5.515**
Min.						**182.870**	**11.501**				**Min.**	**0.0056**	**186.029**	**11.700**
Max.						**211.814**	**13.398**				**Max.**	**0.0058**	**217.784**	**13.776**
Number of Spec.						**6**	**6**				**Number of Spec.**		**6**	**6**


Laminate Unnotched Tension Properties (UNT3) -- (CTD)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
LaminateTension Strength (UNT3) [ksi]
0
50
100
150
200
250


Laminate Unnotched Tension Properties (UNT3) -- (CTD)
Normalized Modulus
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Tension Modulus (UNT3) [Msi]
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0

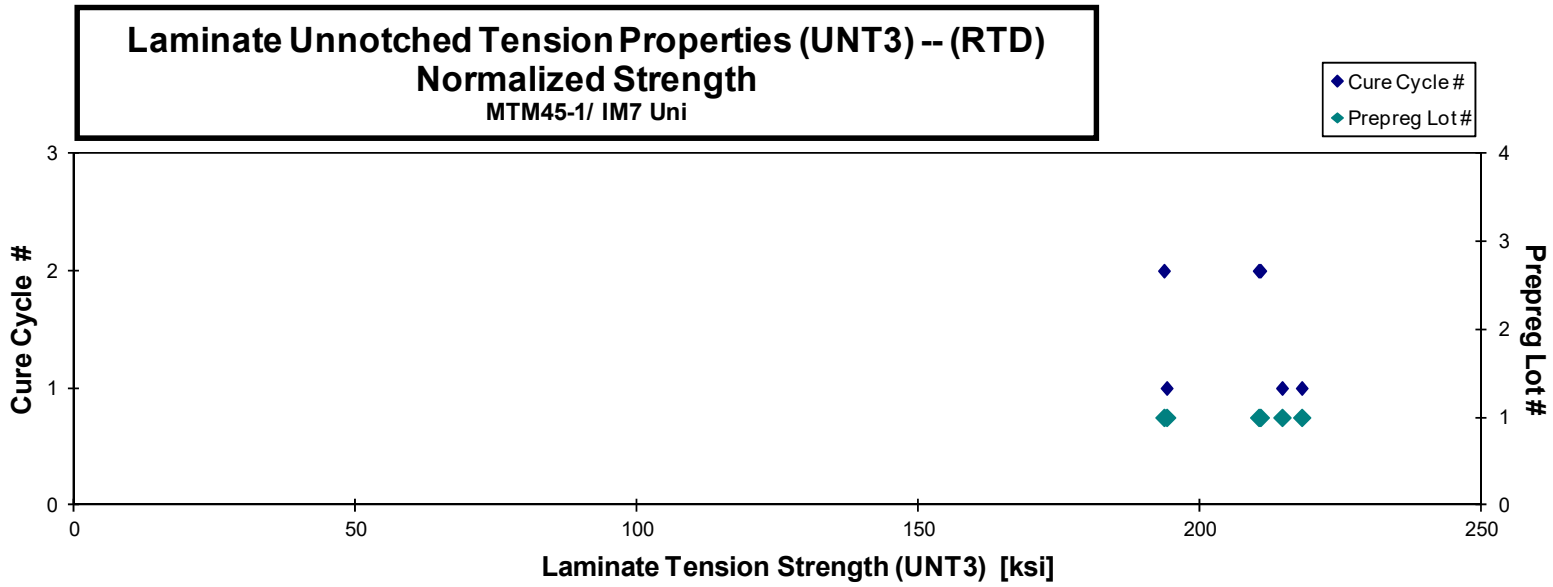
Laminate Unnotched Tension Properties (UNT3) -- (RTD)
Strength & Modulus
MTM45-1/ IM7 Uni

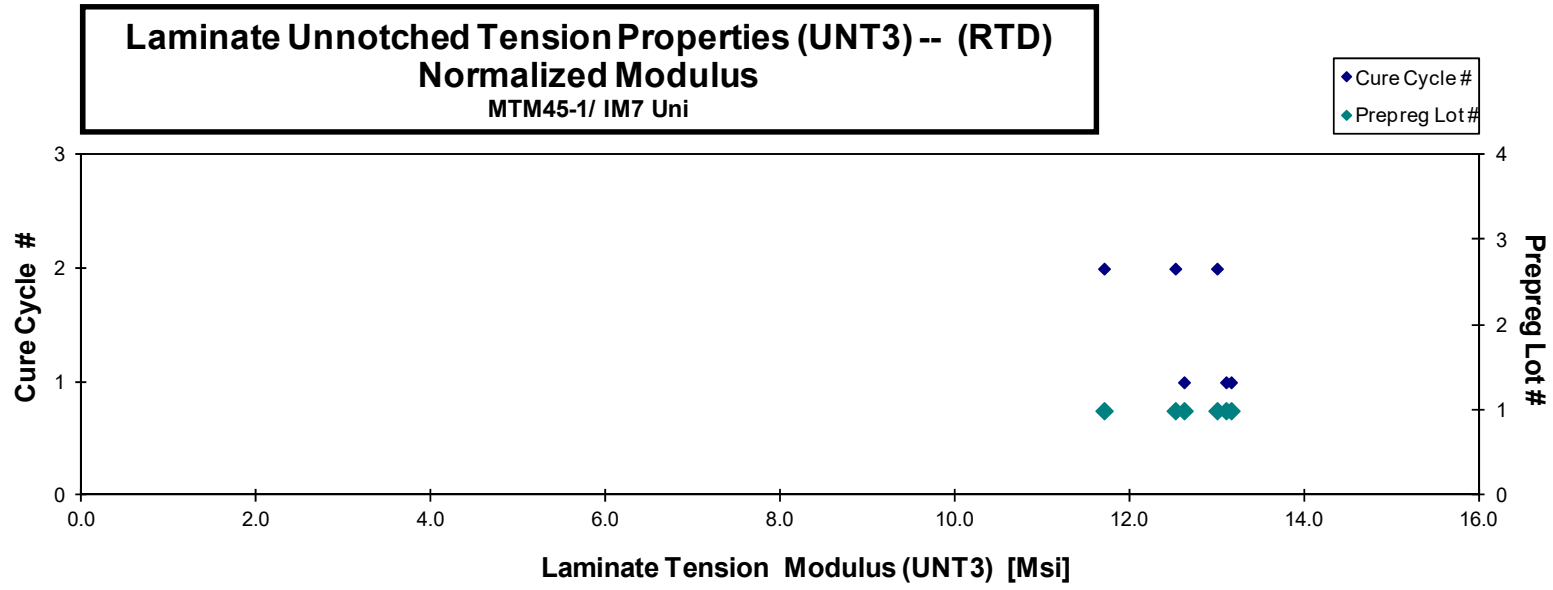
normalizing t_{ply} [in]: 0.0055

Specimen Number	NIAR Naming	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]
IMU-UNT3-A-MH1-RTD-2	AFCA112A	A	MH1	1	1	190.344	12.382	0.112	20	LAT / LWB	0.0056	193.978	12.618
IMU-UNT3-A-MH1-RTD-3*	AFCA113A	A	MH1	1	1	213.130	12.808	0.113	20	LAT / LWB	0.0056	217.974	13.099
IMU-UNT3-A-MH1-RTD-4	AFCA114A	A	MH1	1	1	203.556	12.487	0.116	20	LAT / LWB	0.0058	214.474	13.157
IMU-UNT3-A-MH2-RTD-2*	AFCA212A	A	MH2	1	2	204.121	12.132	0.114	20	LAT / LWB	0.0057	210.615	12.518
IMU-UNT3-A-MH2-RTD-3*	AFCA213A	A	MH2	1	2	201.889	12.474	0.115	20	LAT / LAB	0.0057	210.332	12.996
IMU-UNT3-A-MH2-RTD-4	AFCA214A	A	MH2	1	2	185.898	11.242	0.115	20	LAT / LWB	0.0057	193.503	11.702

***Specimen slipped during testing.**

	Strength [ksi]	Modulus [Msi]			$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
Average	**199.823**	**12.254**	**$Average_{norm}$**	**0.0057**	**206.813**	**12.682**
Standard Dev.	**9.975**	**0.541**	**Standard $Dev._{norm}$**		**10.507**	**0.546**
Coeff. of Var. [%]	**4.992**	**4.417**	**Coeff. of Var. $[\%]_{norm}$**		**5.081**	**4.304**
Min.	**185.898**	**11.242**	**Min.**	**0.0056**	**193.503**	**11.702**
Max.	**213.130**	**12.808**	**Max.**	**0.0058**	**217.974**	**13.157**
Number of Spec.	**6**	**6**	**Number of Spec.**		**6**	**6**


Laminate Unnotched Tension Properties (UNT3) -- (RTD)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0
50
100
150
200
250
Laminate Tension Strength (UNT3) [ksi]


Laminate Unnotched Tension Properties (UNT3) -- (RTD)
Normalized Modulus
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
Laminate Tension Modulus (UNT3) [Msi]

Laminate Unnotched Tension Properties (UNT3) -- (ETW2)
Strength & Modulus
MTM45-1/ IM7 Uni

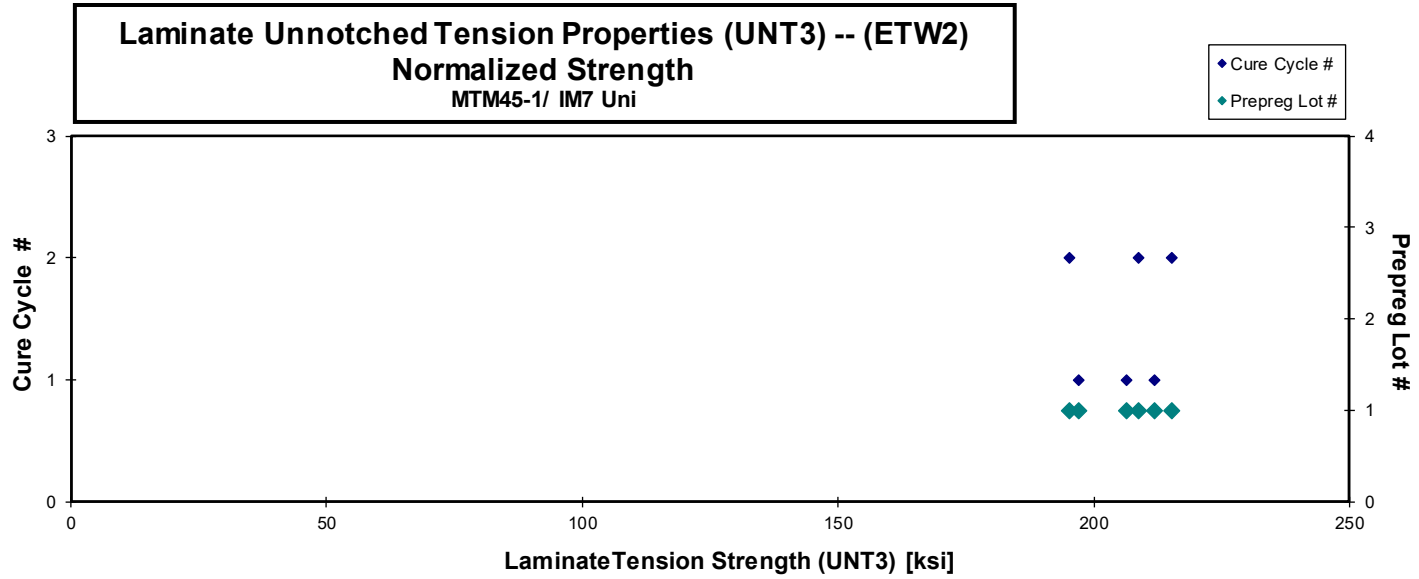
normalizing t_{ply} [in]: 0.0055

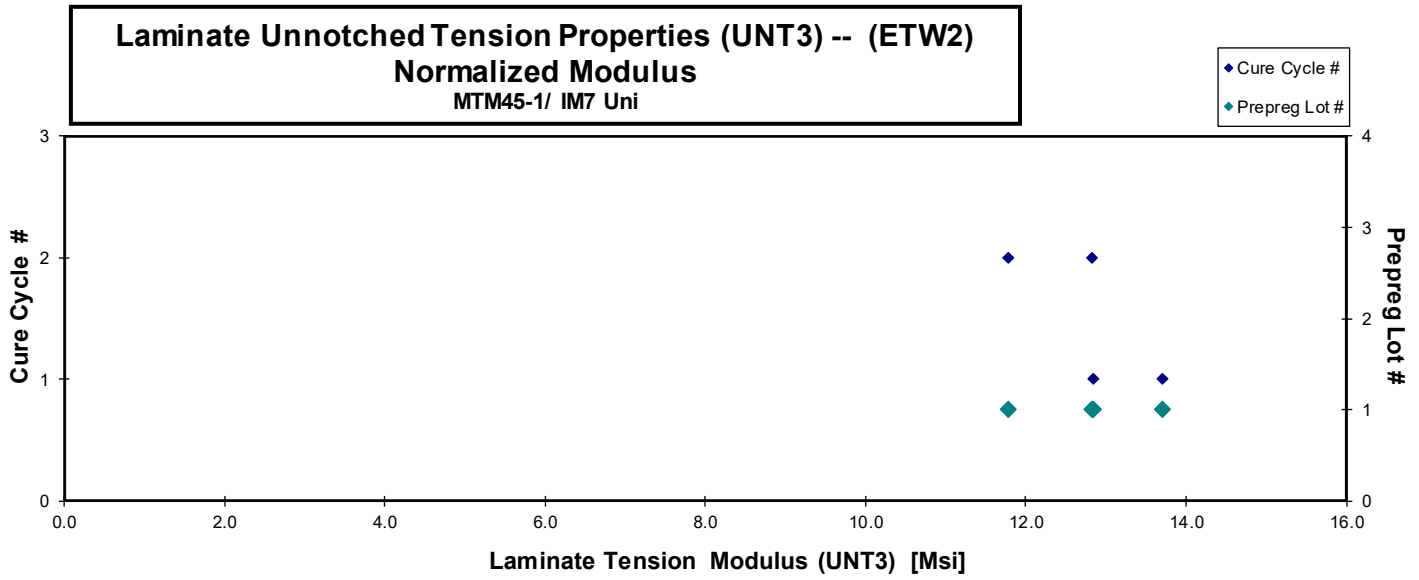
Specimen Number	NIAR Naming	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
IMU-UNT3-A-MH1-ETW2-2	AFCA112D	A	MH1	1	1	202.405	12.594	0.112	20	DGM/AWT	0.0056	206.269	12.834
IMU-UNT3-A-MH1-ETW2-3	AFCA113D	A	MH1	1	1	190.363	13.231	0.114	20	LWT/AWB/DGM	0.0057	197.083	13.698
IMU-UNT3-A-MH1-ETW2-4	AFCA114D	A	MH1	1	1	201.763	*	0.116	20	DGM/AWT/LAB	0.0058	211.942	
IMU-UNT3-A-MH2-ETW2-1	AFCA211D	A	MH2	1	2	205.636	12.244	0.115	20	DGM	0.0058	215.263	12.817
IMU-UNT3-A-MH2-ETW2-3	AFCA213D	A	MH2	1	2	188.083	11.347	0.114	20	DGM	0.0057	195.179	11.775
IMU-UNT3-A-MH2-ETW2-4	AFCA214D	A	MH2	1	2	204.110	*	0.112	20	DGM/LAB	0.0056	208.594	

*** Modulus is omitted due to strain gage malfunction and recommended by CMH-17 data review working group.**

	Strength [ksi]	Modulus [Msi]
Average	198.726	12.354
Standard Dev.	7.519	0.786
Coeff. of Var. [%]	3.784	6.361
Min.	188.083	11.347
Max.	205.636	13.231
Number of Spec.	6	4

	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
$Average_{norm}$	0.0057	205.722	12.781
$Standard\ Dev._{norm}$		8.051	0.787
Coeff. of Var. $[\%]_{norm}$		3.913	6.156
Min.	0.0056	195.179	11.775
Max.	0.0058	215.263	13.698
Number of Spec.		6	4


Laminate Unnotched Tension Properties (UNT3) -- (ETW2)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
LaminateTension Strength (UNT3) [ksi]
0
50
100
150
200
250
0
1
2
3
4


Laminate Unnotched Tension Properties (UNT3) -- (ETW2)
Normalized Modulus
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Tension Modulus (UNT3) [Msi]
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
0
1
2
3
4

4.10 "50/0/50" Unnotched Compression 0 Properties (UNC0)

Laminate Unnotched Compression Properties (UNC0) -- (CTD)
Strength & Modulus
MTM45-1/ IM7 Uni

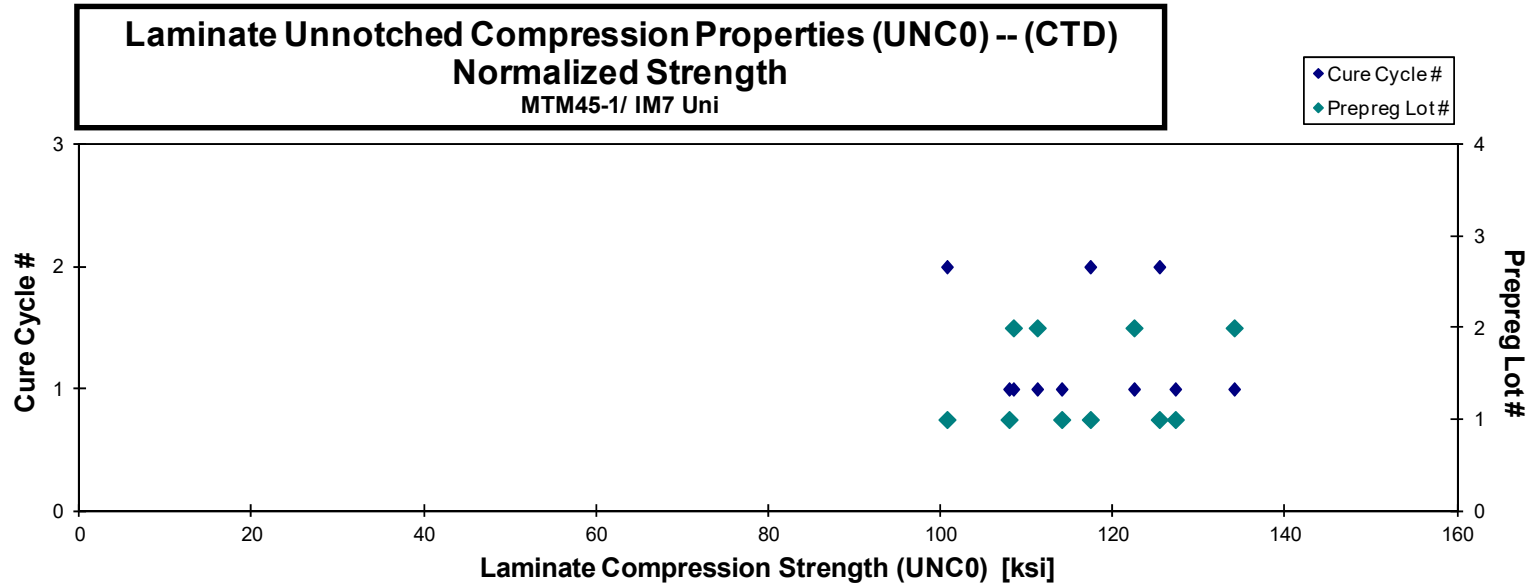
normalizing t_{ply} [in]: 0.0055

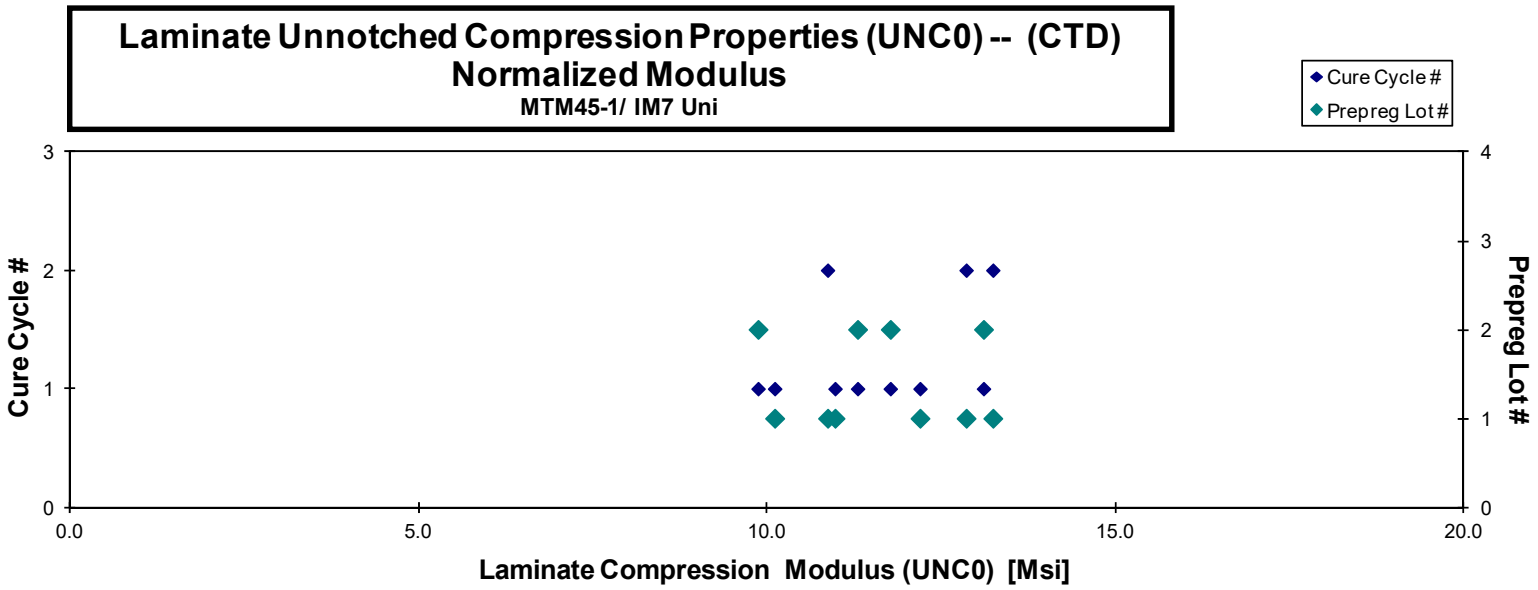
Specimen Number	NIAR Naming	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle Batch #	Strength [ksi]	Modulus [Msi]	Poisson's Ratio	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
IMU-UNC0-A-MH1-CTD-1**	AFRA111B	A	MH1	1	1			0.033	0.089	16	END CRUSH	0.0056		
IMU-UNC0-A-MH1-CTD-2	AFRA112B	A	MH1	1	1	110.449	11.825	0.043	0.091	16	HAT	0.0057	113.963	12.201
IMU-UNC0-A-MH1-CTD-3	AFRA113B	A	MH1	1	1	107.124	10.047	0.014	0.089	16	HAB	0.0055	107.854	10.116
IMU-UNC0-A-MH1-CTD-4	AFRA114B	A	MH1	1	1	123.782	10.690	0.043	0.090	16	HGM	0.0057	127.158	10.982
IMU-UNC0-A-MH2-CTD-1**	AFRA211B	A	MH2	1	2			0.038	0.091	16	END BLOOM	0.0057		
IMU-UNC0-A-MH2-CTD-2*	AFRA212B	A	MH2	1	2	121.178	12.439	0.047	0.091	16	HAB	0.0057	125.309	12.863
IMU-UNC0-A-MH2-CTD-3	AFRA213B	A	MH2	1	2	112.432	12.698	0.058	0.092	16	HAB	0.0057	117.287	13.246
IMU-UNC0-A-MH2-CTD-4	AFRA214B	A	MH2	1	2	97.973	10.586	0.029	0.090	16	HAB	0.0057	100.645	10.875
IMU-UNC0-B-MH1-CTD-1**	AFRB111B	B	MH1	2	1			***	0.091	16	END BLOOM	0.0057		
IMU-UNC0-B-MH1-CTD-2	AFRB112B	B	MH1	2	1	109.265	9.712	0.040	0.090	16	HAB	0.0056	111.128	9.877
IMU-UNC0-B-MH1-CTD-3	AFRB113B	B	MH1	2	1	118.862	11.437	0.055	0.091	16	BAT	0.0057	122.374	11.775
IMU-UNC0-B-MH1-CTD-4	AFRB114B	B	MH1	2	1	103.082	12.474	0.122	0.093	16	BAT	0.0058	108.353	13.112
IMU-UNC0-B-MH1-CTD-R3	AFRB123B	B	MH1	2	1	131.535	11.097	0.047	0.090	16	BAB	0.0056	134.001	11.305

***Modulus is taken from 1000-2400 microstrain.**
****Compressive strength is not reported due to bad failure.**
*****Poisson's ratio is not reported due to strain gauge failed prematurely.**
Batch B cure cycle 2 and Batch C cure cycle 1 & 2 - Data is not reported due to incorrect panel layup.

Average	**113.568**	**11.301**	**0.047**
Standard Dev.	**10.205**	**1.051**	**0.026**
Coeff. of Var. [%]	**8.986**	**9.300**	**55.657**
Min.	**97.973**	**9.712**	**0.014**
Max.	**131.535**	**12.698**	**0.122**
Number of Spec.	**10**	**10**	**12**

$Average_{norm}$	**0.0057**	**116.807**	**11.635**
Standard $Dev._{norm}$		**10.325**	**1.208**
Coeff. of Var. $[\%]_{norm}$		**8.839**	**10.384**
Min.	**0.0055**	**100.645**	**9.877**
Max.	**0.0058**	**134.001**	**13.246**
Number of Spec.		**10**	**10**


Laminate Unnotched Compression Properties (UNC0) -- (CTD)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0
20
40
60
80
100
120
140
160
Laminate Compression Strength (UNC0) [ksi]


Laminate Unnotched Compression Properties (UNC0) -- (CTD)
Normalized Modulus
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
5.0
10.0
15.0
20.0
Laminate Compression Modulus (UNC0) [Msi]

Laminate Unnotched Compression Properties (UNC0) -- (RTD)
Strength & Modulus
MTM45-1/ IM7 Uni

normalizing t_{ply} [in]: 0.0055

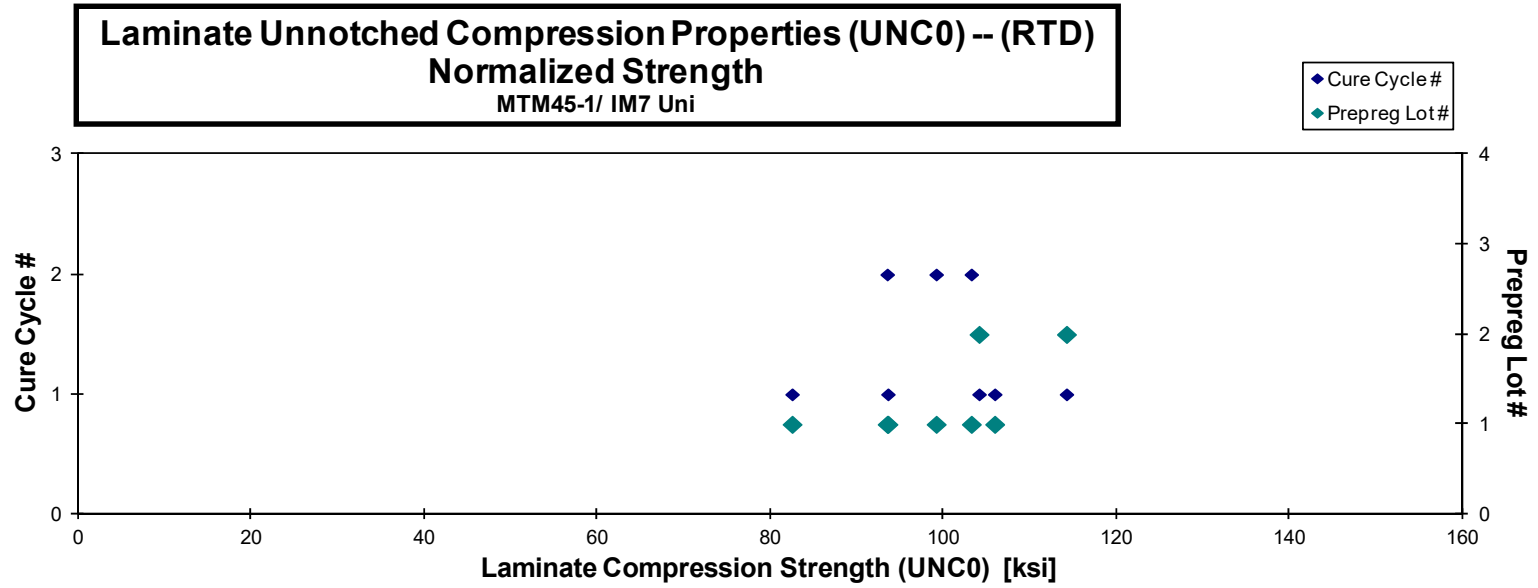
Specimen Number	NIAR Naming	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle Batch #	Strength [ksi]	Modulus [Msi]	Poisson's Ratio	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
IMU-UNC0-A-MH1-RTD-1	AFRA111A	A	MH1	1	1	103.112	11.148	0.041	0.091	16	HAB	0.0057	106.041	11.465
IMU-UNC0-A-MH1-RTD-2	AFRA112A	A	MH1	1	1	90.810	11.861	0.043	0.091	16	BAT	0.0057	93.700	12.238
IMU-UNC0-A-MH1-RTD-3*	AFRA113A	A	MH1	1	1	82.155	10.899	0.035	0.089	16	HAT	0.0055	82.622	10.961
IMU-UNC0-A-MH1-RTD-4**	AFRA114A	A	MH1	1	1			0.036	0.091	16	HIT	0.0057		
IMU-UNC0-A-MH2-RTD-2	AFRA212A	A	MH2	1	2	100.154	9.880	0.032	0.091	16	BAB	0.0057	103.340	10.194
IMU-UNC0-A-MH2-RTD-3	AFRA213A	A	MH2	1	2	92.882	10.726	0.037	0.089	16	BAB	0.0055	93.621	10.811
IMU-UNC0-A-MH2-RTD-4	AFRA214A	A	MH2	1	2	95.378	9.759	0.041	0.092	16	BAB	0.0057	99.280	10.158
IMU-UNC0-B-MH1-RTD-1	AFRB111A	B	MH1	2	1	101.468	11.433	0.044	0.090	16	BAT	0.0057	104.236	11.745
IMU-UNC0-B-MH1-RTD-2**	AFRB112A	B	MH1	2	1			0.048	0.090	16	HIB	0.0056		
IMU-UNC0-B-MH1-RTD-3	AFRB113A	B	MH1	2	1	108.426	10.707	0.041	0.093	16	BAB	0.0058	114.340	11.291
IMU-UNC0-B-MH1-RTD-4**	AFRB114A	B	MH1	2	1			0.045	0.088	16	HIB	0.0055		

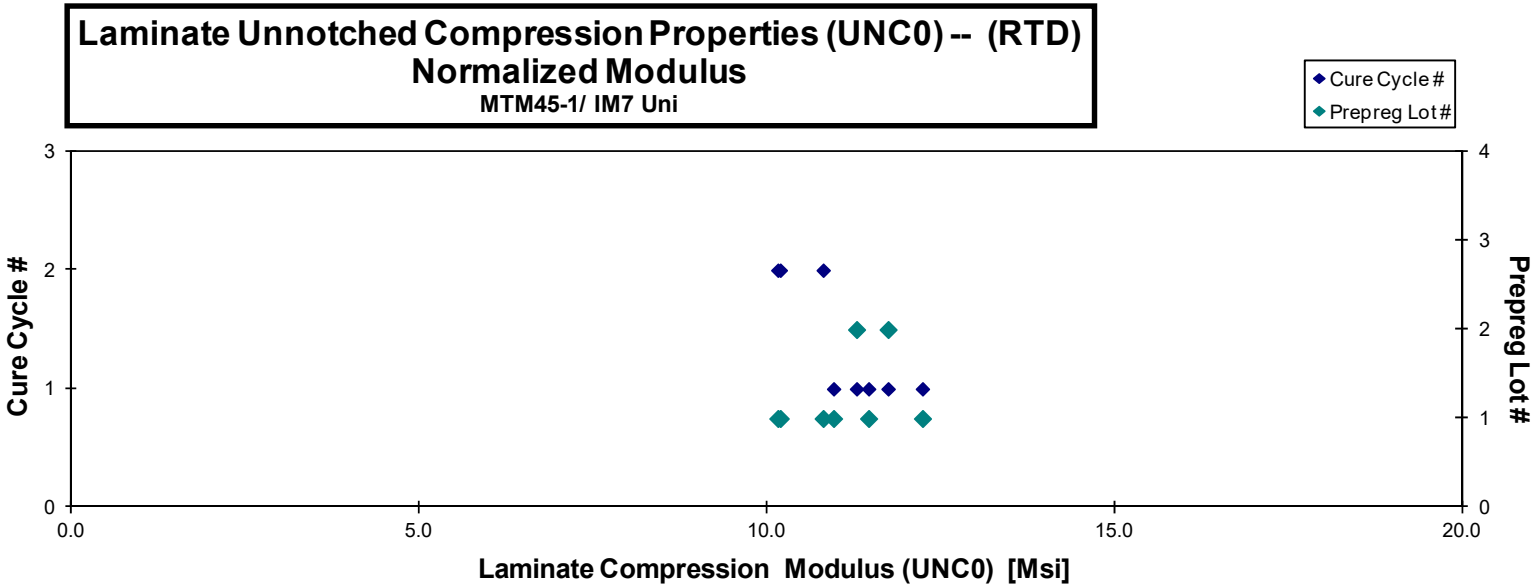
***Modulus is taken from 1000-2400 microstrain.**

****Compressive strength is not reported due to bad failure.**

Batch B cure cycle 2 and Batch C cure cycle 1 & 2 - Data is not reported due to incorrect panel layup.

Average	**96.798**	**10.802**	**0.040**	**Average$_{norm}$**	**0.0056**	**99.647**	**11.108**
Standard Dev.	**8.244**	**0.717**	**0.005**	**Standard Dev.$_{norm}$**		**9.660**	**0.726**
Coeff. of Var. [%]	**8.517**	**6.641**	**12.096**	**Coeff. of Var. [%]$_{norm}$**		**9.694**	**6.537**
Min.	**82.155**	**9.759**	**0.032**	**Min.**	**0.0055**	**82.622**	**10.158**
Max.	**108.426**	**11.861**	**0.048**	**Max.**	**0.0058**	**114.340**	**12.238**
Number of Spec.	**8**	**8**	**11**	**Number of Spec.**		**8**	**8**


Laminate Unnotched Compression Properties (UNC0) -- (RTD)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0
20
40
60
80
100
120
140
160
Laminate Compression Strength (UNC0) [ksi]


Laminate Unnotched Compression Properties (UNC0) -- (RTD)
Normalized Modulus
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
5.0
10.0
15.0
20.0
Laminate Compression Modulus (UNC0) [Msi]

Laminate Unnotched Compression Properties (UNC0) -- (ETD)
Strength & Modulus
MTM45-1/ IM7 Uni

normalizing t_{ply} [in]: 0.0055

Specimen Number	NIAR Naming	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle Batch #	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]
IMU-UNC0-A-MH1-ETD-1	AFRA111C	A	MH1	1	1	85.861	10.265	0.038	0.091	16	HAT	0.0057	88.495	10.580
IMU-UNC0-A-MH1-ETD-2*	AFRA112C	A	MH1	1	1	95.858	11.496	0.035	0.091	16	HAT	0.0057	98.908	11.862
IMU-UNC0-A-MH1-ETD-3**	AFRA113C	A	MH1	1	1		11.641	0.033	0.090	16	END BLOOM	0.0056		11.945
IMU-UNC0-A-MH1-ETD-4	AFRA114C	A	MH1	1	1	92.240	11.176	0.042	0.090	16	HAT	0.0056	94.022	11.392
IMU-UNC0-A-MH2-ETD-1	AFRA211C	A	MH2	1	2	89.545	11.372	0.038	0.091	16	HAT	0.0057	92.191	11.708
IMU-UNC0-A-MH2-ETD-2**	AFRA212C	A	MH2	1	2		11.596	0.031	0.088	16	HIT	0.0055		11.583
IMU-UNC0-A-MH2-ETD-3	AFRA213C	A	MH2	1	2	85.540	11.041	0.032	0.091	16	HAT	0.0057	88.262	11.392
IMU-UNC0-A-MH2-ETD-4**	AFRA214C	A	MH2	1	2		9.592	0.041	0.090	16	HIT	0.0056		9.777
IMU-UNC0-B-MH1-ETD-2	AFRB112C	B	MH1	2	1	93.606	10.253	0.041	0.089	16	HAT	0.0056	95.095	10.416
IMU-UNC0-B-MH1-ETD-3	AFRB113C	B	MH1	2	1	81.830	11.720	0.049	0.091	16	HAB	0.0057	84.154	12.053
IMU-UNC0-B-MH1-ETD-4	AFRB114C	B	MH1	2	1	77.880	10.602	0.046	0.091	16	HAB	0.0057	80.270	10.927

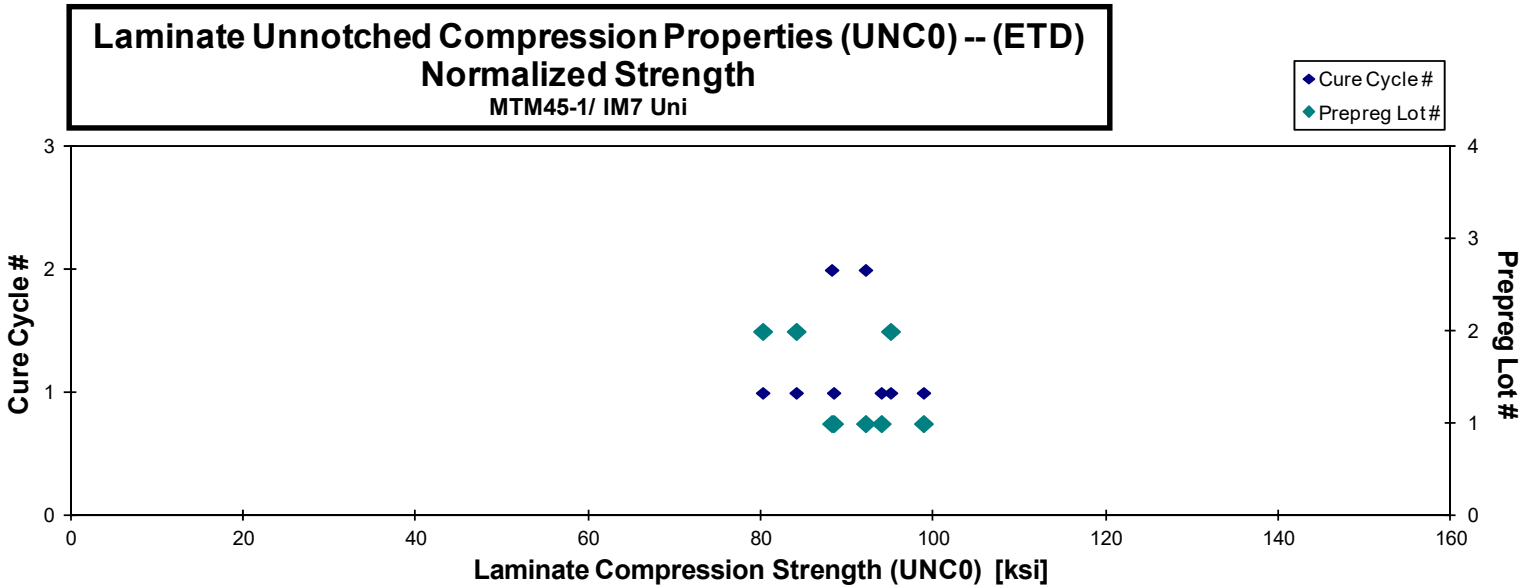
***Poisson's ratio is taken from 1800-3800 microstrain.**

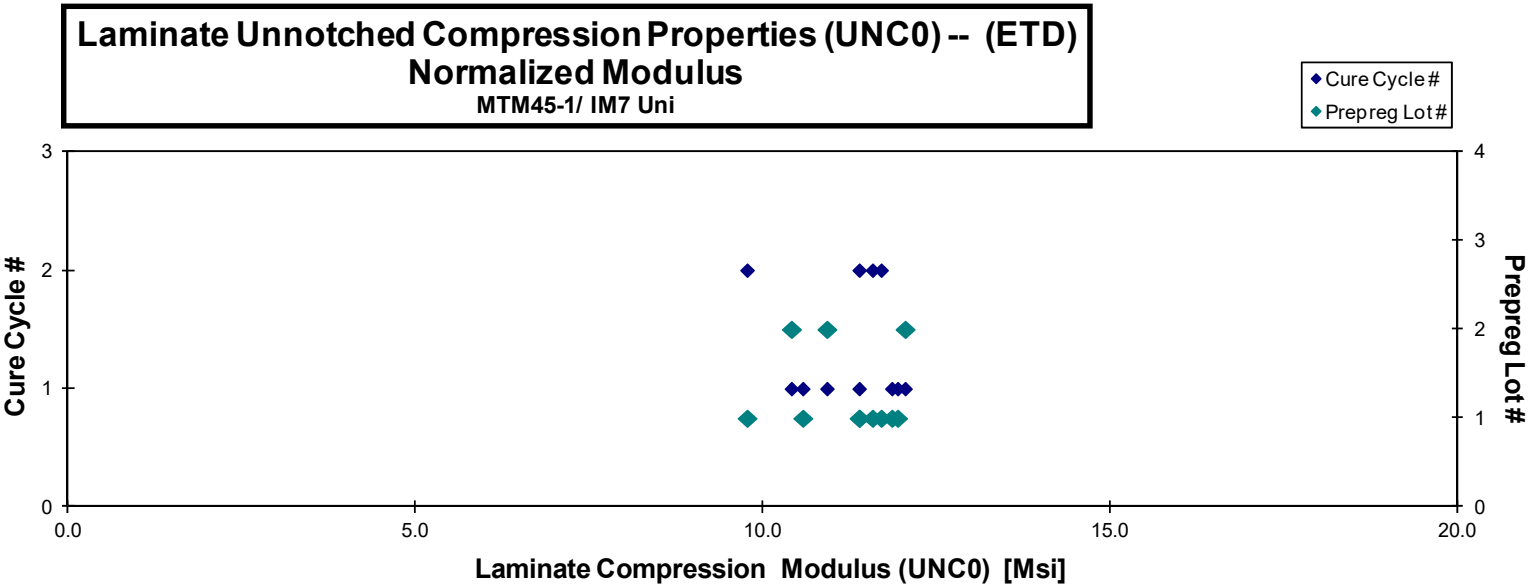
****Compressive strength is not reported due to bad failure.**

Batch B cure cycle 2 and Batch C cure cycle 1 & 2 - Data is not reported due to incorrect panel layup.

Average	**87.795**	**10.978**	**0.039**
Standard Dev.	**6.145**	**0.702**	**0.006**
Coeff. of Var. [%]	**6.999**	**6.399**	**15.063**
Min.	**77.880**	**9.592**	**0.031**
Max.	**95.858**	**11.720**	**0.049**
Number of Spec.	**8**	**11**	**11**

$Average_{norm}$	**0.0056**	**90.175**	**11.240**
$Standard\ Dev._{norm}$		**6.097**	**0.727**
Coeff. of Var. $[\%]_{norm}$		**6.761**	**6.464**
Min.	**0.0055**	**80.270**	**9.777**
Max.	**0.0057**	**98.908**	**12.053**
Number of Spec.		**8**	**11**


Laminate Unnotched Compression Properties (UNC0) -- (ETD)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0
20
40
60
80
100
120
140
160
Laminate Compression Strength (UNC0) [ksi]


Laminate Unnotched Compression Properties (UNC0) -- (ETD)
Normalized Modulus
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
5.0
10.0
15.0
20.0
Laminate Compression Modulus (UNC0) [Msi]

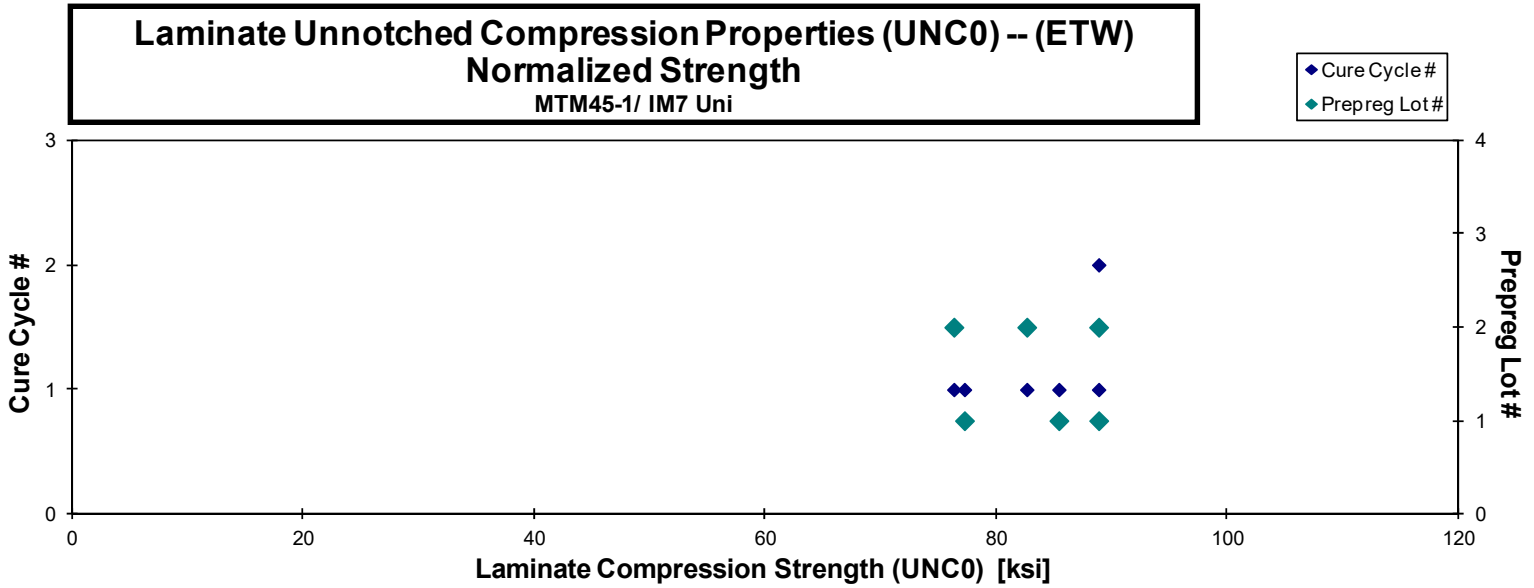
Laminate Unnotched Compression Properties (UNC0) -- (ETW)
Strength & Modulus
MTM45-1/ IM7 Uni

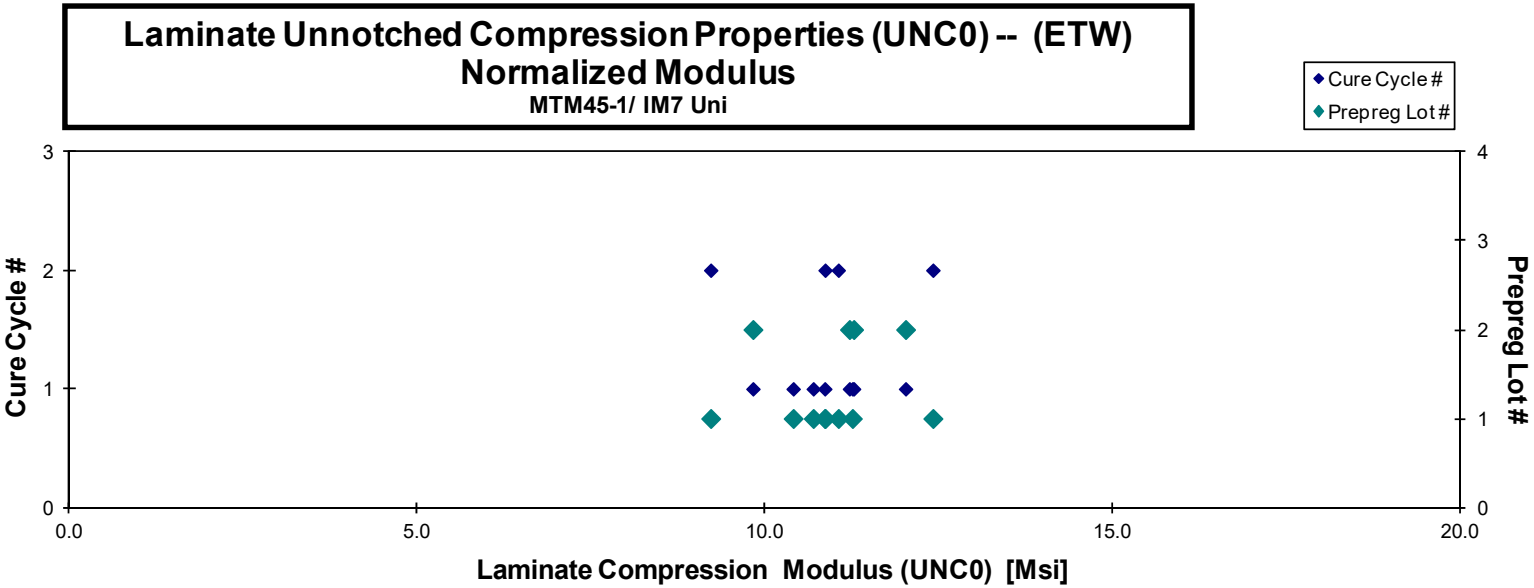
normalizing t_{ply} [in]: 0.0055

Specimen Number	NIAR Naming	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle Batch #	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]
IMU-UNC0-A-MH1-ETW-1**	AFRA111N	A	MH1	1	1		10.210	0.031	0.090	16	TIT	0.0056		10.413
IMU-UNC0-A-MH1-ETW-2**	AFRA112N	A	MH1	1	1		10.800	0.038	0.092	16	END BLOOM	0.0057		11.264
IMU-UNC0-A-MH1-ETW-3	AFRA113N	A	MH1	1	1	78.197	10.995	0.034	0.087	16	TAT	0.0054	77.293	10.868
IMU-UNC0-A-MH1-ETW-4	AFRA114N	A	MH1	1	1	83.845	10.499	0.047	0.090	16	TAT	0.0056	85.465	10.702
IMU-UNC0-A-MH2-ETW-1**	AFRA211N	A	MH2	1	2		10.541	0.033	0.091	16	TIT	0.0057		10.872
IMU-UNC0-A-MH2-ETW-2	AFRA212N	A	MH2	1	2	86.502	10.762	0.038	0.090	16	BAB	0.0057	88.911	11.062
IMU-UNC0-A-MH2-ETW-3**	AFRA213N	A	MH2	1	2		9.051	0.026	0.090	16	TIT	0.0056		9.227
IMU-UNC0-A-MH2-ETW-4**	AFRA214N	A	MH2	1	2		12.095	0.040	0.090	16	END BLOOM	0.0056		12.423
IMU-UNC0-B-MH1-ETW-1	AFRB111N	B	MH1	2	1	81.283	11.826	0.037	0.090	16	BAT	0.0056	82.684	12.030
IMU-UNC0-B-MH1-ETW-2	AFRB112N	B	MH1	2	1	74.277	10.973	0.052	0.090	16	BAB	0.0057	76.373	11.283
IMU-UNC0-B-MH1-ETW-3	AFRB113N	B	MH1	2	1	89.362	11.280	0.048	0.088	16	BAB	0.0055	88.905	11.222
IMU-UNC0-B-MH1-ETW-4**	AFRB114N	B	MH1	2	1		9.895	0.045	0.087	16	BIB	0.0055		9.835

****Compressive strength is not reported due to bad failure.**
Batch B cure cycle 2 and Batch C cure cycle 1 & 2 - Data is not reported due to incorrect panel layup.

Average	**82.244**	**10.744**	**0.039**	**$Average_{norm}$**	**0.0056**	**83.272**	**10.933**
Standard Dev.	**5.516**	**0.819**	**0.008**	**Standard $Dev._{norm}$**		**5.514**	**0.864**
Coeff. of Var. [%]	**6.707**	**7.623**	**20.228**	**Coeff. of Var. $[\%]_{norm}$**		**6.622**	**7.898**
Min.	**74.277**	**9.051**	**0.026**	**Min.**	**0.0054**	**76.373**	**9.227**
Max.	**89.362**	**12.095**	**0.052**	**Max.**	**0.0057**	**88.911**	**12.423**
Number of Spec.	**6**	**12**	**12**	**Number of Spec.**		**6**	**12**


Laminate Unnotched Compression Properties (UNC0) -- (ETW)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Compression Strength (UNC0) [ksi]
0
20
40
60
80
100
120


Laminate Unnotched Compression Properties (UNC0) -- (ETW)
Normalized Modulus
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Compression Modulus (UNC0) [Msi]
0.0
5.0
10.0
15.0
20.0

Laminate Unnotched Compression Properties (UNC0) -- (ETW2)
Strength & Modulus
MTM45-1/ IM7 Uni

normalizing t_{ply} [in]: 0.0055

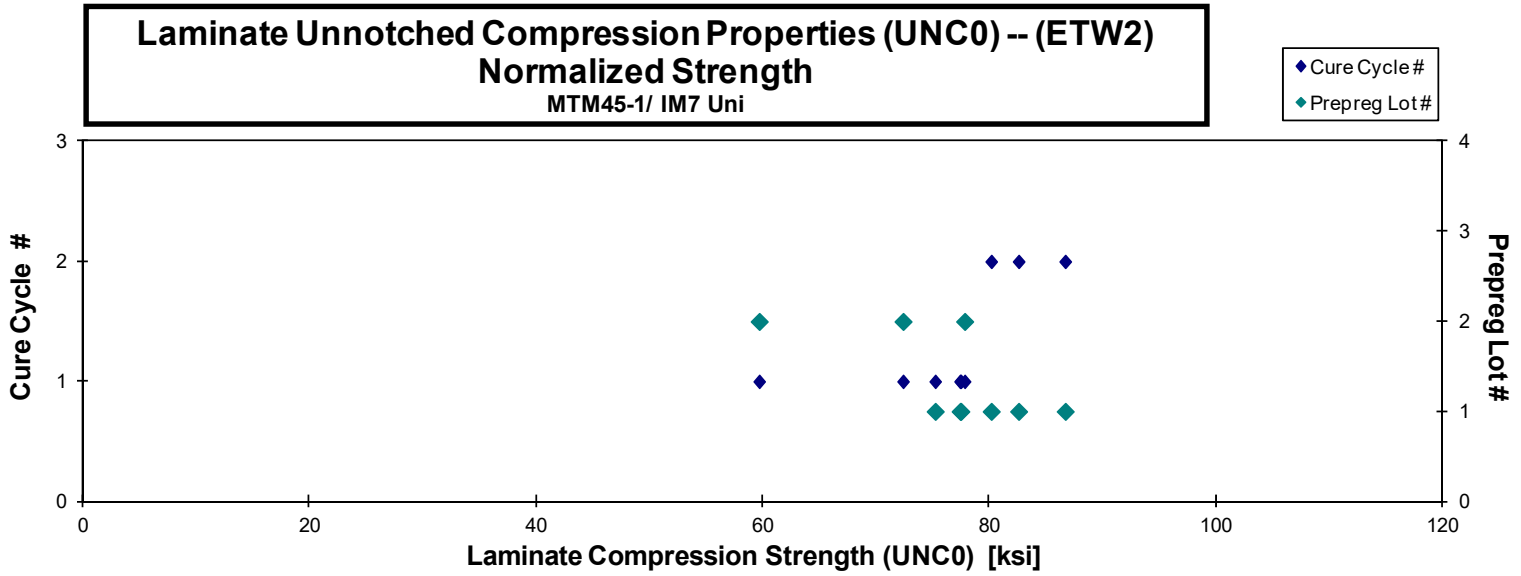
Specimen Number	NIAR Naming	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Poisson's Ratio	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
IMU-UNC0-A-MH1-ETW2-1	AFRA111D	A	MH1	1	1	73.440	10.072	0.031	0.090	16	HAT	0.0056	75.179	10.310
MU-UNC0-A-MH1-ETW2-2*	AFRA112D	A	MH1	1	1		11.391	0.043	0.091	16	END BLOOM	0.0057		11.723
IMU-UNC0-A-MH1-ETW2-3	AFRA113D	A	MH1	1	1	76.492	12.688	0.039	0.089	16	HAB	0.0056	77.376	12.835
IMU-UNC0-A-MH1-ETW2-4	AFRA114D	A	MH1	1	1	76.908	10.670	0.038	0.089	16	TAB/HAB	0.0055	77.432	10.743
IMU-UNC0-A-MH2-ETW2-2	AFRA212D	A	MH2	1	2	80.737	10.282	0.027	0.090	16	HAT	0.0056	82.541	10.512
IMU-UNC0-A-MH2-ETW2-3	AFRA213D	A	MH2	1	2	84.618	11.426	0.029	0.090	16	HAT	0.0056	86.654	11.701
IMU-UNC0-A-MH2-ETW2-4	AFRA214D	A	MH2	1	2	77.868	10.882	0.042	0.091	16	HAB	0.0057	80.124	11.197
IMU-UNC0-B-MH1-ETW2-1	AFRB111D	B	MH1	2	1	60.627	11.362	0.041	0.087	16	HAB	0.0054	59.639	11.177
IMU-UNC0-B-MH1-ETW2-2	AFRB112D	B	MH1	2	1	76.659	10.520	0.035	0.089	16	HAB	0.0056	77.777	10.673
MU-UNC0-B-MH1-ETW2-3*	AFRB113D	B	MH1	2	1		11.444	0.034	0.087	16	HIT	0.0055		11.349
IMU-UNC0-B-MH1-ETW2-4	AFRB114D	B	MH1	2	1	70.560	12.025	0.041	0.090	16	HAB	0.0056	72.337	12.328

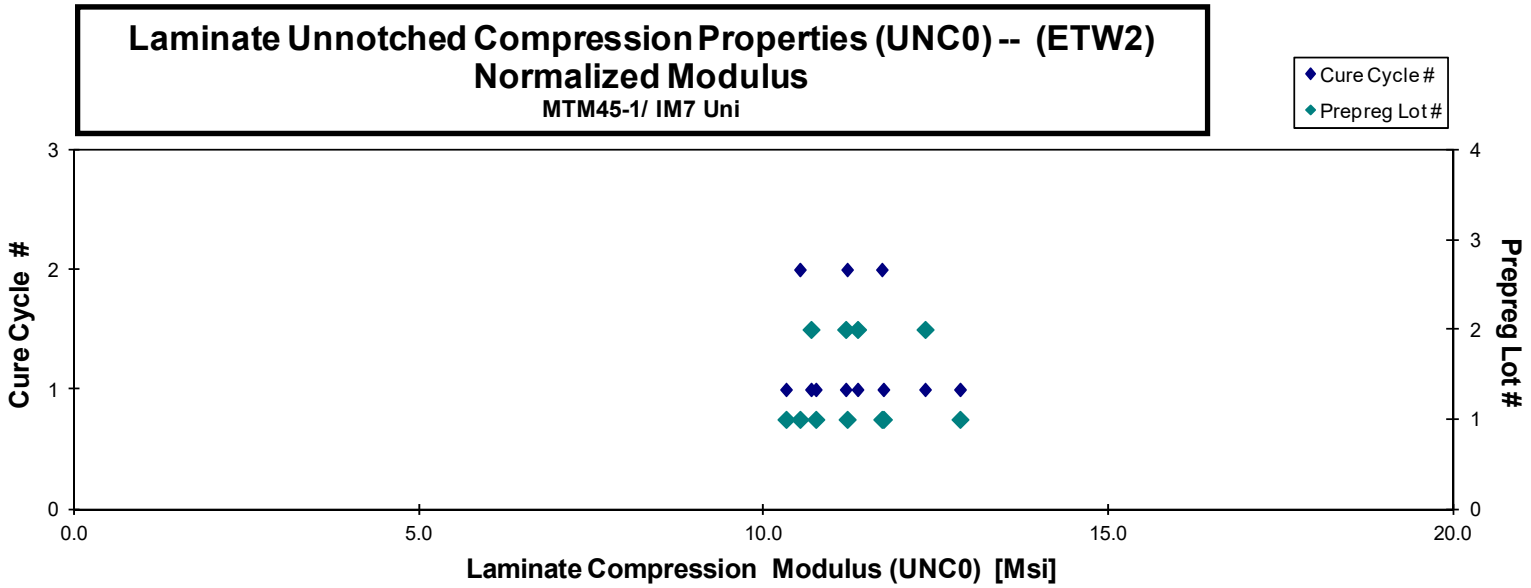
****Compressive strength is not reported due to unacceptable failure mode.**

Batch B cure cycle 2 and Batch C cure cycle 1 & 2 - Data is not reported due to incorrect panel layup.

Average	75.323	11.160	0.036
Standard Dev.	6.801	0.775	0.006
Coeff. of Var. [%]	9.029	6.947	15.359
Min.	60.627	10.072	0.027
Max.	84.618	12.688	0.043
Number of Spec.	9	11	11

$Average_{norm}$	0.0056	76.562	11.323
$Standard\ Dev._{norm}$		7.577	0.780
Coeff. of Var. $[\%]_{norm}$		9.897	6.885
Min.	0.0054	59.639	10.310
Max.	0.0057	86.654	12.835
Number of Spec.		9	11


Laminate Unnotched Compression Properties (UNC0) -- (ETW2)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0
20
40
60
80
100
120
Laminate Compression Strength (UNC0) [ksi]


Laminate Unnotched Compression Properties (UNC0) -- (ETW2)
Normalized Modulus
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
5.0
10.0
15.0
20.0
Laminate Compression Modulus (UNC0) [Msi]

4.11 "25/50/25" Unnotched Compression 1 Properties (UNC1)

Laminate Unnotched Compression Properties (UNC1) -- (RTD)
Strength & Modulus
MTM45-1/ IM7 Uni

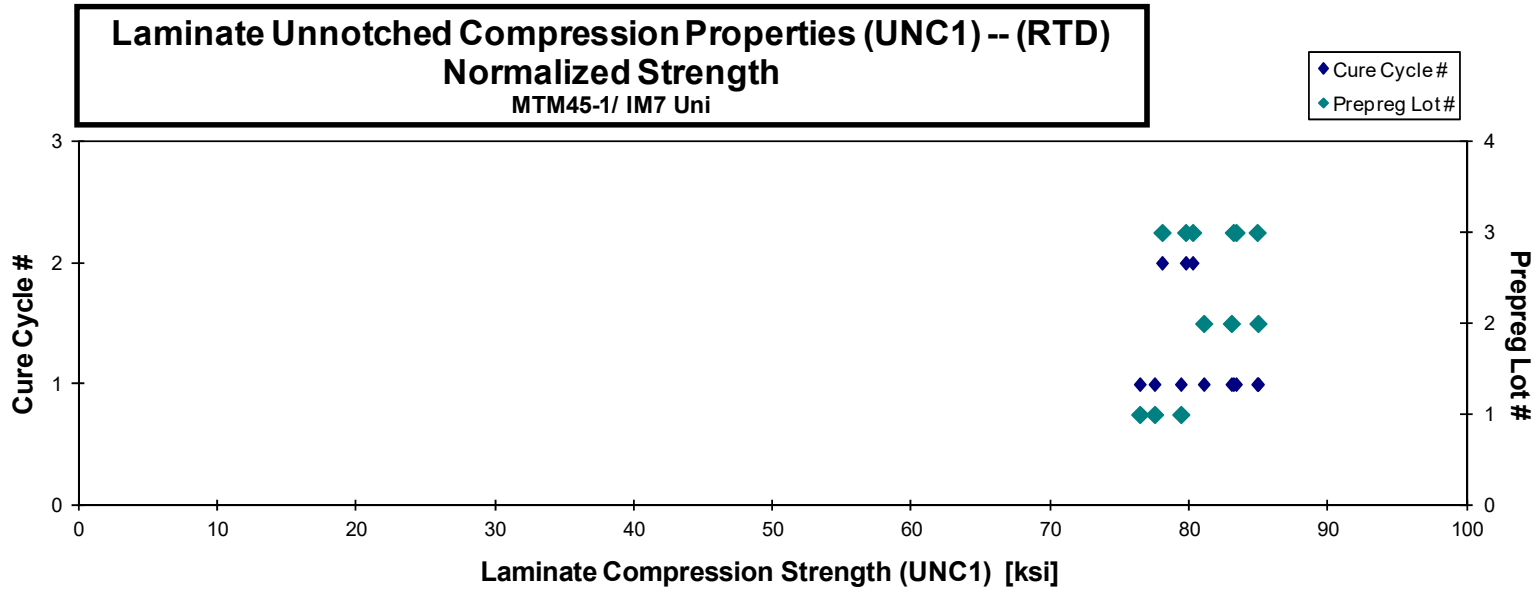
normalizing t_{ply} [in]: 0.0055

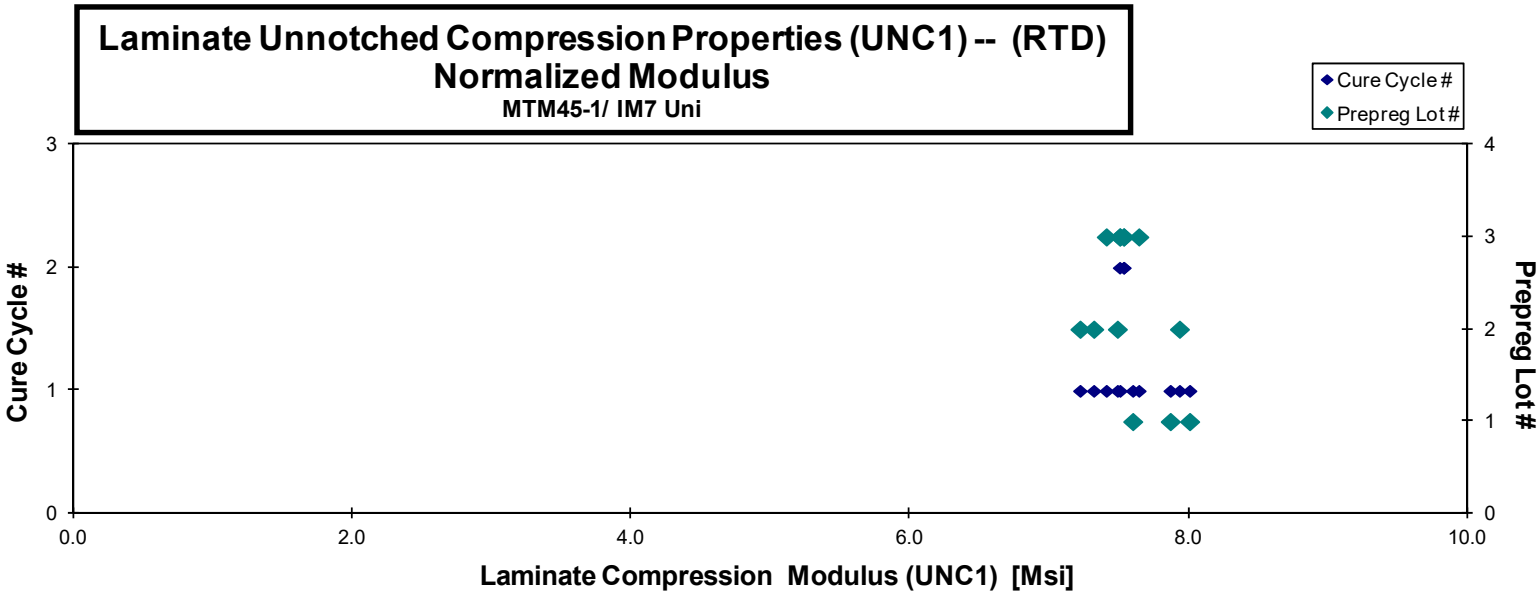
Specimen Number	NIAR Naming	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Poisson's Ratio	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
IMU-UNC1-A-MH1-RTD-1	AF0A111A	A	MH1	1	1	73.650	7.592	0.344	0.137	24	HGM	0.0057	76.384	7.874
IMU-UNC1-A-MH1-RTD-2	AF0A112A	A	MH1	1	1	74.786	7.344	0.310	0.137	24	BAB	0.0057	77.449	7.605
IMU-UNC1-A-MH1-RTD-3	AF0A113A	A	MH1	1	1	77.521	7.829	0.286	0.135	24	HGM	0.0056	79.342	8.013
IMU-UNC1-B-MH1-RTD-1	AF0B111A	B	MH1	2	1	*	7.216	0.309	0.132	24	BGM / END BLOOM	0.0055		7.227
IMU-UNC1-B-MH1-RTD-2	AF0B112A	B	MH1	2	1	80.869	7.314	0.341	0.132	24	TAT	0.0055	80.992	7.325
IMU-UNC1-B-MH1-RTD-3	AF0B113A	B	MH1	2	1	84.514	7.904	0.336	0.133	24	BGM	0.0055	84.899	7.940
IMU-UNC1-B-MH1-RTD-4	AF0B114A	B	MH1	2	1	82.672	7.466	0.297	0.133	24	TAT / BGM	0.0055	82.985	7.495
IMU-UNC1-C-MH1-RTD-2	AF0C112A	C	MH1	3	1	82.754	7.597	0.346	0.133	24	BAB	0.0055	83.318	7.648
IMU-UNC1-C-MH1-RTD-3	AF0C113A	C	MH1	3	1	84.970	7.525	0.323	0.132	24	BGM	0.0055	84.841	7.513
IMU-UNC1-C-MH1-RTD-4	AF0C114A	C	MH1	3	1	83.379	7.438	0.322	0.132	24	BGM	0.0055	83.127	7.415
IMU-UNC1-C-MH2-RTD-1	AF0C211A	C	MH2	3	2	79.872	7.528	0.259	0.132	24	BGM	0.0055	79.690	7.511
IMU-UNC1-C-MH2-RTD-3	AF0C213A	C	MH2	3	2	80.193	7.540	0.173	0.132	24	BGM	0.0055	80.193	7.540
IMU-UNC1-C-MH2-RTD-4	AF0C214A	C	MH2	3	2	77.696	7.512	0.155	0.133	24	HAB	0.0055	77.990	7.540

*** Compressive strength is not reported due to unacceptable failure mode.**
Batch A and B cure cycle 2 - Data is omitted due to incorrect panel processing.

	Strength [ksi]	Modulus [Msi]	Poisson's Ratio
Average	80.240	7.523	0.292
Standard Dev.	3.696	0.189	0.062
Coeff. of Var. [%]	4.607	2.517	21.294
Min.	73.650	7.216	0.155
Max.	84.970	7.904	0.346
Number of Spec.	12	13	13

	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
$Average_{norm}$	0.0055	80.934	7.588
Standard $Dev._{norm}$		2.889	0.232
Coeff. of Var. $[\%]_{norm}$		3.570	3.055
Min.	0.0055	76.384	7.227
Max.	0.0057	84.899	8.013
Number of Spec.		12	13


Laminate Unnotched Compression Properties (UNC1) -- (RTD)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0
10
20
30
40
50
60
70
80
90
100
Laminate Compression Strength (UNC1) [ksi]


Laminate Unnotched Compression Properties (UNC1) -- (RTD)
Normalized Modulus
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
2.0
4.0
6.0
8.0
10.0
Laminate Compression Modulus (UNC1) [Msi]

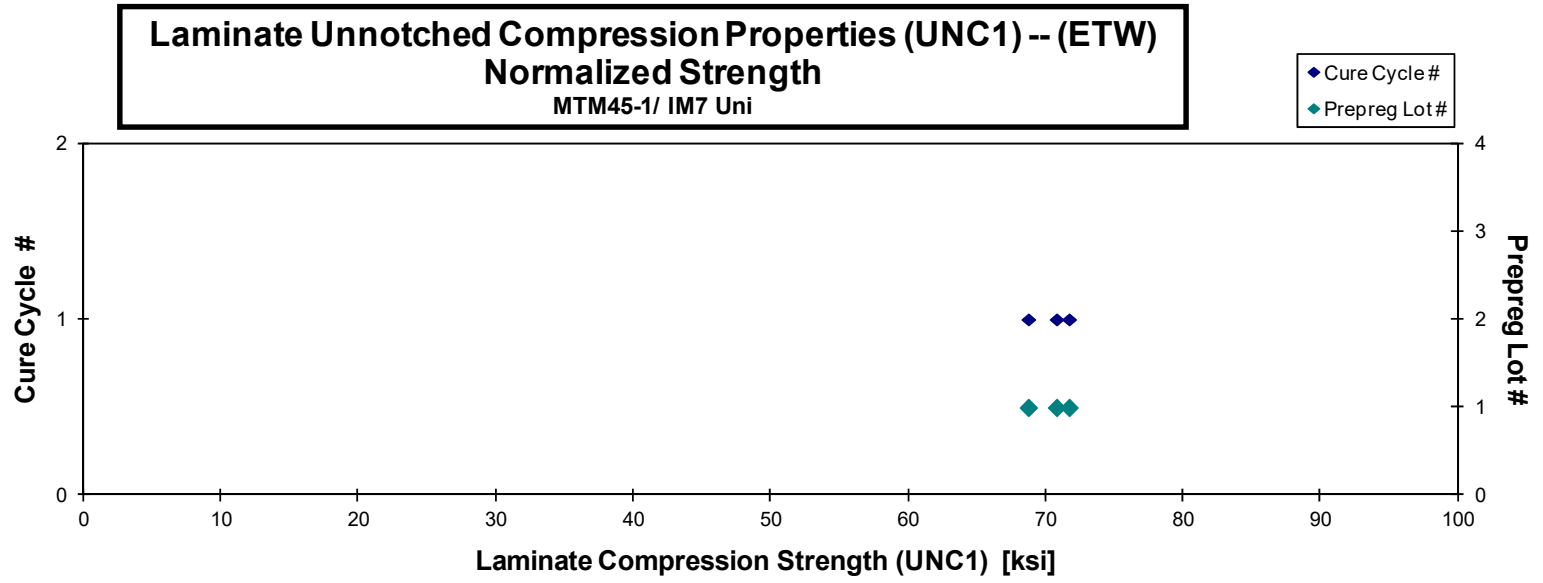
Laminate Unnotched Compression Properties (UNC1) -- (ETW)
Strength & Modulus
MTM45-1/ IM7 Uni

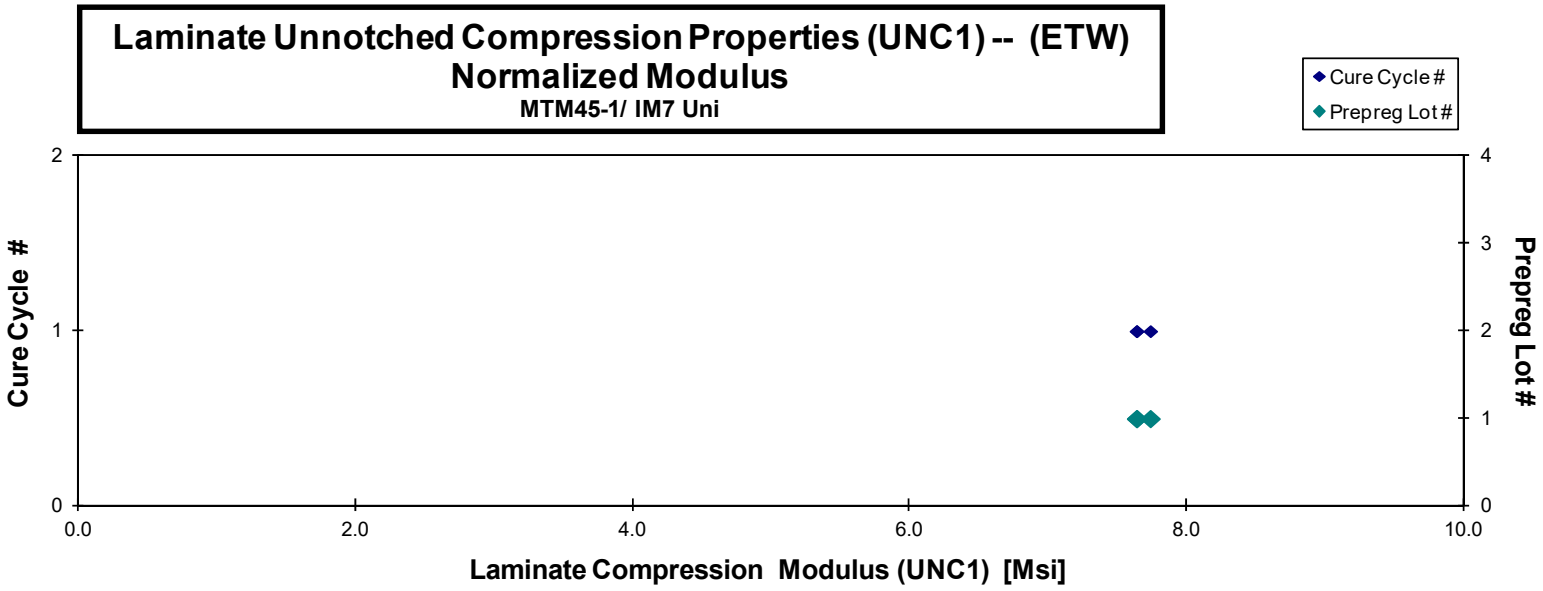
normalizing t_{ply} [in]: 0.0055

Specimen Number	NIAR Naming	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]
IMU-UNC1-A-MH1-ETW-2	AF0A112N	A	MH1	1	1	68.097	7.445	0.309	0.137	24	HAB	0.0057	70.797	7.740
IMU-UNC1-A-MH1-ETW-3	AF0A113N	A	MH1	1	1	66.218	7.361	0.338	0.137	24	HAB	0.0057	68.743	7.642
IMU-UNC1-A-MH1-ETW-4	AF0A114N	A	MH1	1	1	69.207	7.374	0.310	0.137	24	HAB	0.0057	71.707	7.640

Batch A cure cycle 2 - Data is omitted due to incorrect panel processing.

Average	67.841	7.393	0.319	$Average_{norm}$	0.0057	70.416	7.674
Standard Dev.	1.511	0.045	0.017	$Standard\ Dev._{norm}$		1.518	0.057
Coeff. of Var. [%]	2.227	0.608	5.188	$Coeff.\ of\ Var.\ [\%]_{norm}$		2.156	0.743
Min.	66.218	7.361	0.309	Min.	0.0057	68.743	7.640
Max.	69.207	7.445	0.338	Max.	0.0057	71.707	7.740
Number of Spec.	3	3	3	Number of Spec.		3	3


Laminate Unnotched Compression Properties (UNC1) -- (ETW)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
0
1
2
3
4
0
10
20
30
40
50
60
70
80
90
100
Laminate Compression Strength (UNC1) [ksi]


Laminate Unnotched Compression Properties (UNC1) -- (ETW)
Normalized Modulus
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
0
1
2
3
4
0.0
2.0
4.0
6.0
8.0
10.0
Laminate Compression Modulus (UNC1) [Msi]

Laminate Unnotched Compression Properties (UNC1) -- (ETW2)
Strength & Modulus
MTM45-1/ IM7 Uni

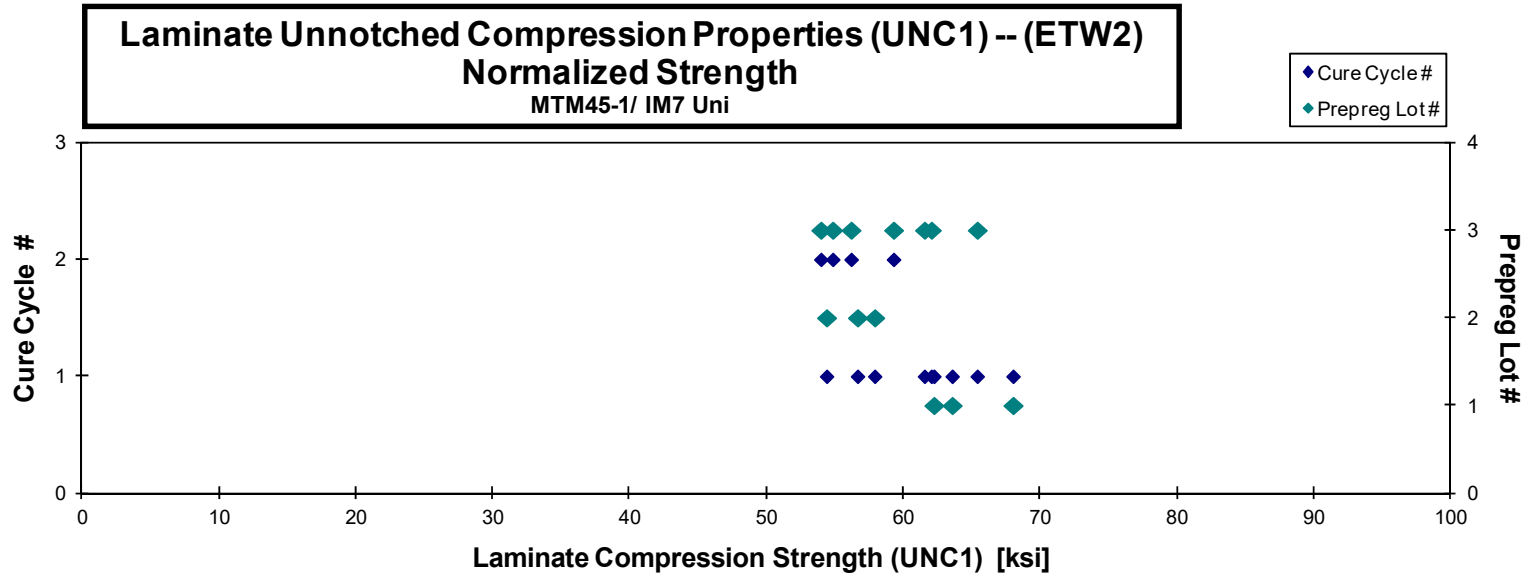
normalizing t_{ply} [in]: 0.0055

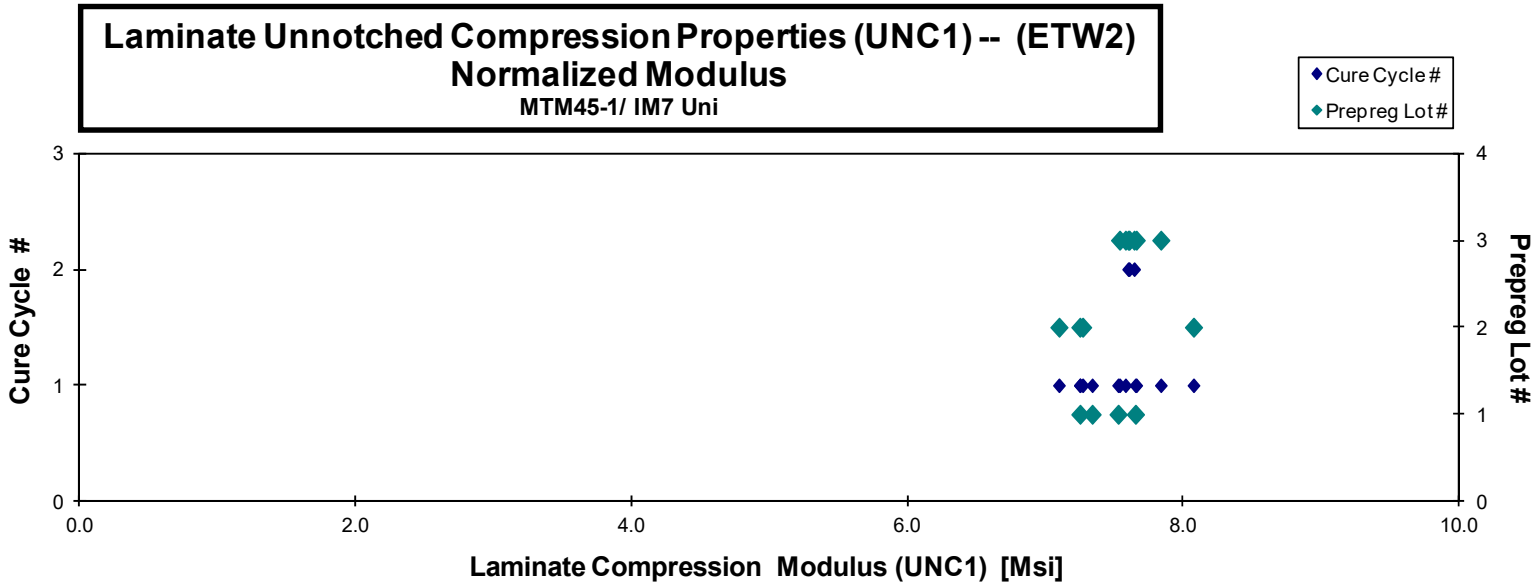
Specimen Number	NIAR Naming	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Poisson's Ratio	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
IMU-UNC1-A-MH1-ETW2-1	AF0A111D	A	MH1	1	1	*	7.289	0.336	0.136	24	HIB	0.0057		7.520
IMU-UNC1-A-MH1-ETW2-2	AF0A112D	A	MH1	1	1	61.745	7.418	0.345	0.136	24	HAT	0.0057	63.632	7.645
IMU-UNC1-A-MH1-ETW2-3	AF0A113D	A	MH1	1	1	59.684	7.023	0.304	0.138	24	HGM / HAT	0.0057	62.299	7.331
IMU-UNC1-A-MH1-ETW2-4	AF0A114D	A	MH1	1	1	65.412	6.959	0.299	0.137	24	HGM / HAT	0.0057	68.080	7.243
IMU-UNC1-B-MH1-ETW2-1	AF0B111D	B	MH1	2	1	55.073	7.345	0.284	0.131	24	HGM	0.0054	54.454	7.262
IMU-UNC1-B-MH1-ETW2-2	AF0B112D	B	MH1	2	1	58.631	7.324	0.289	0.131	24	BGM	0.0054	57.973	7.242
IMU-UNC1-B-MH1-ETW2-3	AF0B113D	B	MH1	2	1	*	8.105	0.290	0.131	24	HIT	0.0055		8.066
IMU-UNC1-B-MH1-ETW2-4	AF0B114D	B	MH1	2	1	57.121	7.141	0.324	0.131	24	BAB	0.0055	56.717	7.091
IMU-UNC1-C-MH1-ETW2-1	AF0C111D	C	MH1	3	1	*	7.525	0.330	0.133	24	HIB	0.0055		7.573
IMU-UNC1-C-MH1-ETW2-2	AF0C112D	C	MH1	3	1	62.104	7.529	0.337	0.132	24	HGM/HAT	0.0055	62.112	7.530
IMU-UNC1-C-MH1-ETW2-3	AF0C113D	C	MH1	3	1	65.267	7.628	0.350	0.132	24	HAB	0.0055	65.464	7.651
IMU-UNC1-C-MH1-ETW2-4	AF0C114D	C	MH1	3	1	61.098	7.764	0.339	0.133	24	BAB	0.0055	61.607	7.829
IMU-UNC1-C-MH2-ETW2-1	AF0C211D	C	MH2	3	2	59.409	7.643	0.149	0.132	24	HGM	0.0055	59.349	7.635
IMU-UNC1-C-MH2-ETW2-2	AF0C212D	C	MH2	3	2	55.583	7.694	0.204	0.130	24	HGM	0.0054	54.902	7.600
IMU-UNC1-C-MH2-ETW2-3	AF0C213D	C	MH2	3	2	56.197	**	**	0.132	24	HAB	0.0055	56.247	
IMU-UNC1-C-MH2-ETW2-4	AF0C214D	C	MH2	3	2	53.785	7.558	0.207	0.133	24	HAB	0.0055	54.036	7.593

***Compressive strength is not reported due to unacceptable failure mode.**
****Compressive modulus and poisson's ratio not reported due to strain gauge failed prematurely.**
Batch A and B cure cycle 2 - Data is omitted due to incorrect panel processing.

Average	**59.316**	**7.463**	**0.292**
Standard Dev.	**3.732**	**0.299**	**0.060**
Coeff. of Var. [%]	**6.291**	**4.003**	**20.569**
Min.	**53.785**	**6.959**	**0.149**
Max.	**65.412**	**8.105**	**0.350**
Number of Spec.	**13**	**15**	**15**

$Average_{norm}$	**0.0055**	**59.759**	**7.521**
$Standard\ Dev._{norm}$		**4.487**	**0.253**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**7.509**	**3.362**
Min.	**0.0054**	**54.036**	**7.091**
Max.	**0.0057**	**68.080**	**8.066**
Number of Spec.		**13**	**15**


Laminate Unnotched Compression Properties (UNC1) -- (ETW2)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Compression Strength (UNC1) [ksi]
0
10
20
30
40
50
60
70
80
90
100
0
1
2
3
4


Laminate Unnotched Compression Properties (UNC1) -- (ETW2)
Normalized Modulus
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Compression Modulus (UNC1) [Msi]
0.0
2.0
4.0
6.0
8.0
10.0
0
1
2
3
4

4.12 "10/80/10" Unnotched Compression 2 Properties (UNC2)

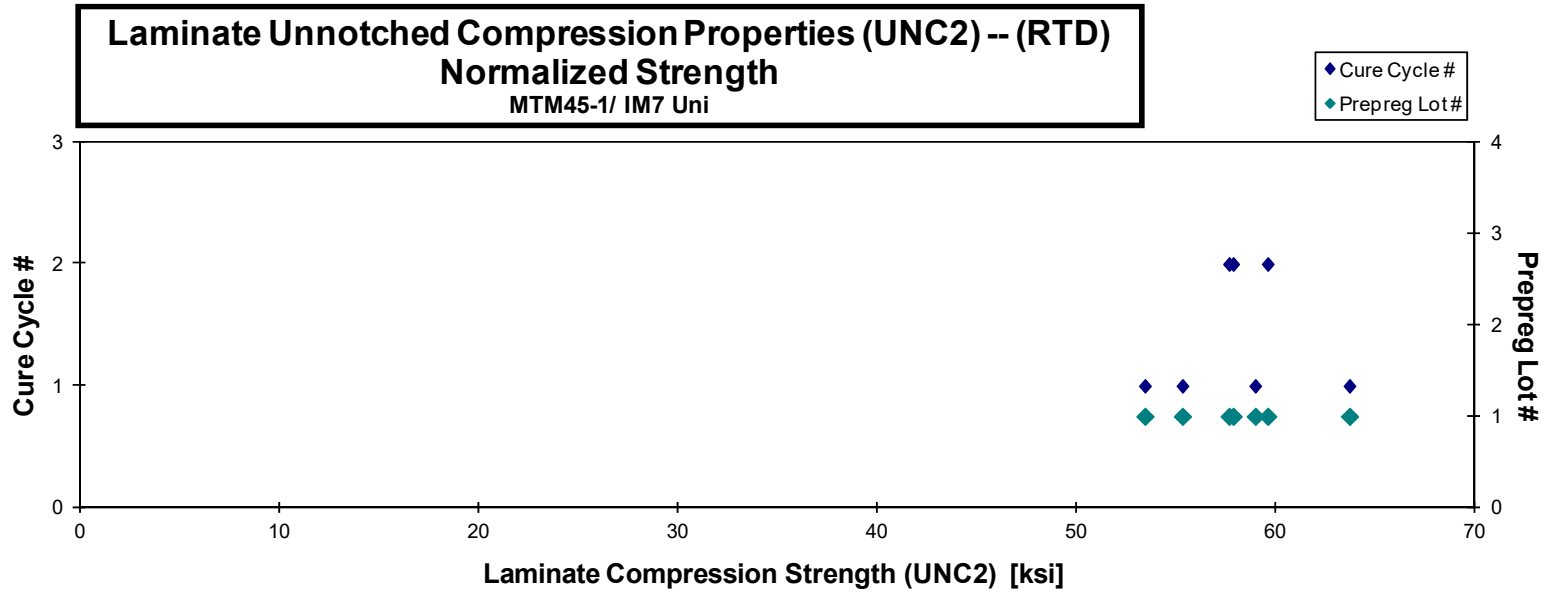
Laminate Unnotched Compression Properties (UNC2) -- (RTD)
Strength & Modulus
MTM45-1/ IM7 Uni

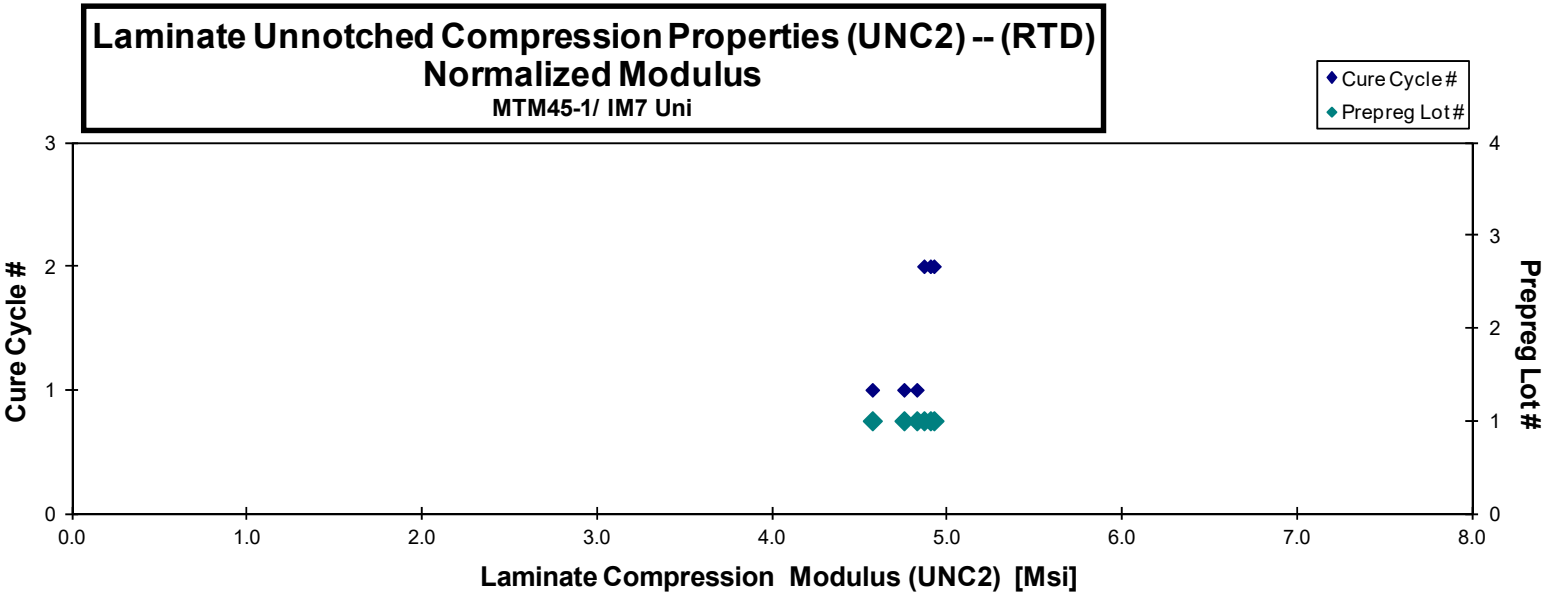
normalizing t_{ply} [in]: 0.0055

Specimen Number	NIAR Naming	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]
IMU-UNC2-A-MH1-RTD-1	AFXA111A	A	MH1	1	1	62.964	4.520	0.523	0.111	20	BGM	0.0056	63.708	4.574
IMU-UNC2-A-MH1-RTD-2	AFXA112A	A	MH1	1	1	57.719	4.725	0.554	0.112	20	BGM	0.0056	58.978	4.828
IMU-UNC2-A-MH1-RTD-3	AFXA113A	A	MH1	1	1	52.911	4.708	0.566	0.111	20	BAB	0.0056	53.440	4.755
IMU-UNC2-A-MH1-RTD-4	AFXA114A	A	MH1	1	1	54.872	*	*	0.111	20	BAT	0.0055	55.321	
IMU-UNC2-A-MH2-RTD-2	AFXA212A	A	MH2	1	2	57.347	4.881	0.594	0.111	20	HGM	0.0056	57.869	4.926
IMU-UNC2-A-MH2-RTD-3	AFXA213A	A	MH2	1	2	57.970	4.771	0.589	0.113	20	HGM	0.0057	59.603	4.905
IMU-UNC2-A-MH2-RTD-4	AFXA214A	A	MH2	1	2	56.232	4.748	0.616	0.113	20	HGM	0.0056	57.664	4.869

***Compressive modulus and poisson's ratio is not reported because strain gauge failed prematurely.**

Average	**57.145**	**4.726**		**$Average_{norm}$**	**0.0056**	**58.083**	**4.809**
Standard Dev.	**3.131**	**0.118**		**$Standard\ Dev._{norm}$**		**3.270**	**0.131**
Coeff. of Var. [%]	**5.480**	**2.492**		**$Coeff.\ of\ Var.\ [\%]_{norm}$**		**5.630**	**2.714**
Min.	**52.911**	**4.520**		**Min.**	**0.0055**	**53.440**	**4.574**
Max.	**62.964**	**4.881**		**Max.**	**0.0057**	**63.708**	**4.926**
Number of Spec.	**7**	**6**		**Number of Spec.**		**7**	**6**


Laminate Unnotched Compression Properties (UNC2) -- (RTD)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0
10
20
30
40
50
60
70
Laminate Compression Strength (UNC2) [ksi]


Laminate Unnotched Compression Properties (UNC2) -- (RTD)
Normalized Modulus
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
Laminate Compression Modulus (UNC2) [Msi]

Laminate Unnotched Compression Properties (UNC2) -- (ETW2)
Strength & Modulus
MTM45-1/ IM7 Uni

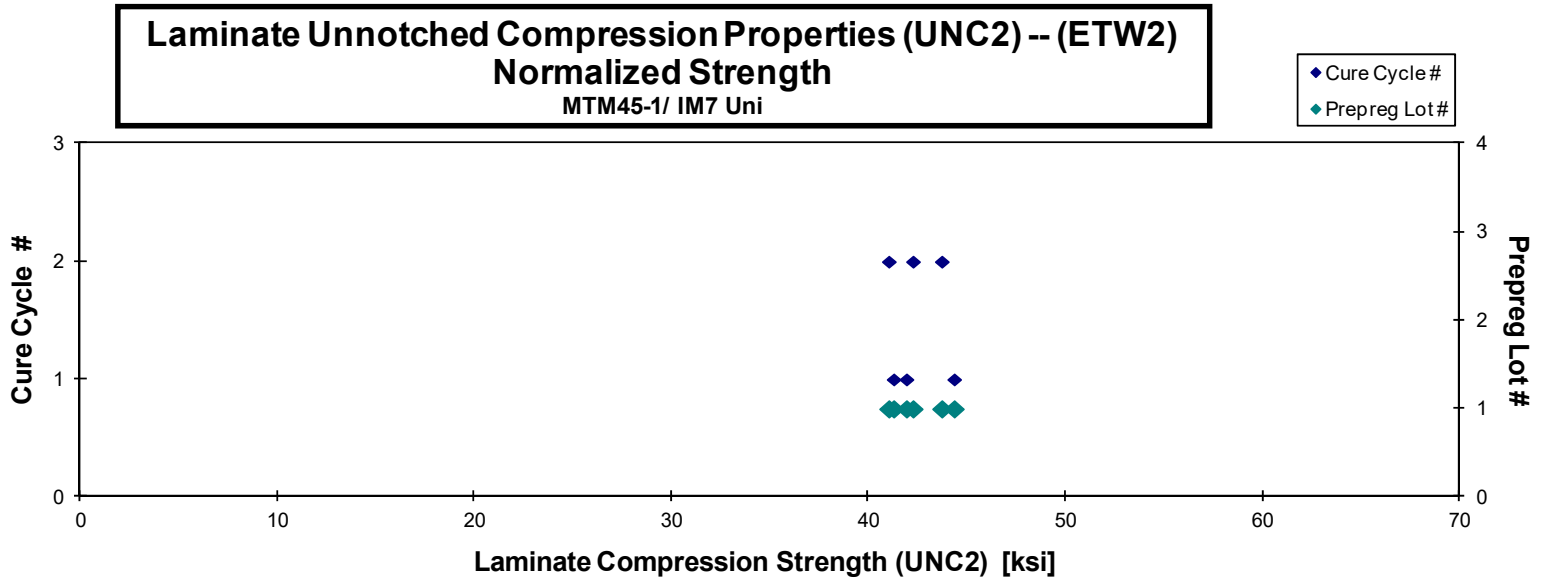
normalizing t_{ply} [in]: 0.0055

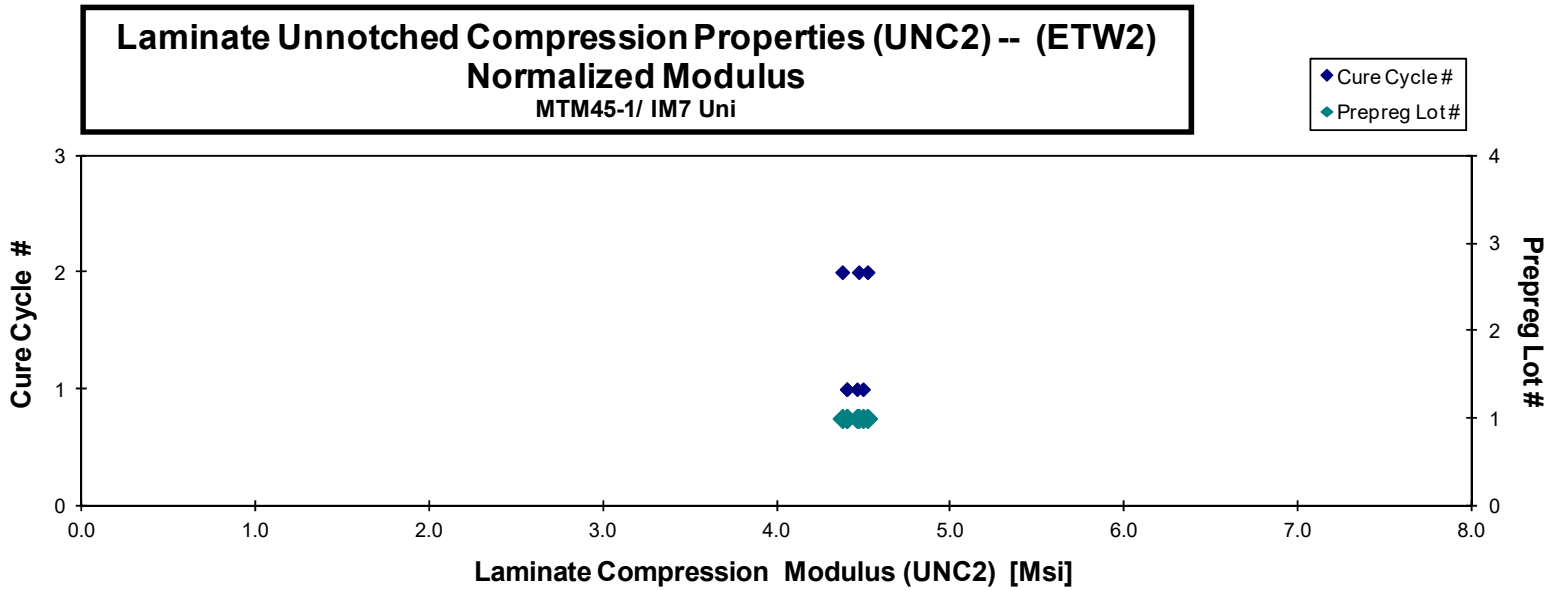
Specimen Number	NIAR Naming	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Modulus [Msi]	Poisson's Ratio	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
IMU-UNC2-A-MH1-ETW2-1	AFXA111D	A	MH1	1	1	40.494	4.317	0.584	0.112	20	HAT	0.0056	41.322	4.405
IMU-UNC2-A-MH1-ETW2-2	AFXA112D	A	MH1	1	1	*	4.360	0.584	0.113	20	END BLOOM	0.0056		4.463
IMU-UNC2-A-MH1-ETW2-3	AFXA113D	A	MH1	1	1	41.246	4.329	0.546	0.112	20	DAB	0.0056	41.971	4.405
IMU-UNC2-A-MH1-ETW2-4	AFXA114D	A	MH1	1	1	43.568	4.415	0.530	0.112	20	DAB	0.0056	44.393	4.498
IMU-UNC2-A-MH2-ETW2-2	AFXA212D	A	MH2	1	2	43.093	4.311	0.610	0.112	20	HAB	0.0056	43.766	4.379
IMU-UNC2-A-MH2-ETW2-3	AFXA213D	A	MH2	1	2	40.521	4.414	0.607	0.112	20	HAB	0.0056	41.074	4.474
IMU-UNC2-A-MH2-ETW2-4	AFXA214D	A	MH2	1	2	41.672	4.457	0.629	0.112	20	HGM	0.0056	42.303	4.524

***Compressive strength is not reported due to unacceptable failure.**

	Strength [ksi]	Modulus [Msi]
Average	41.766	4.372
Standard Dev.	1.300	0.057
Coeff. of Var. [%]	3.113	1.303
Min.	40.494	4.311
Max.	43.568	4.457
Number of Spec.	6	7

	t_{ply} [in]	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
$Average_{norm}$	0.0056	42.472	4.450
$Standard\ Dev._{norm}$		1.336	0.054
$Coeff.\ of\ Var.\ [\%]_{norm}$		3.145	1.221
Min.	0.0056	41.074	4.379
Max.	0.0056	44.393	4.524
Number of Spec.		6	7


Laminate Unnotched Compression Properties (UNC2) -- (ETW2)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Compression Strength (UNC2) [ksi]
0
10
20
30
40
50
60
70
0
1
2
3
0
1
2
3
4


Laminate Unnotched Compression Properties (UNC2) -- (ETW2)
Normalized Modulus
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Compression Modulus (UNC2) [Msi]
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
0
1
2
3
0
1
2
3
4

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

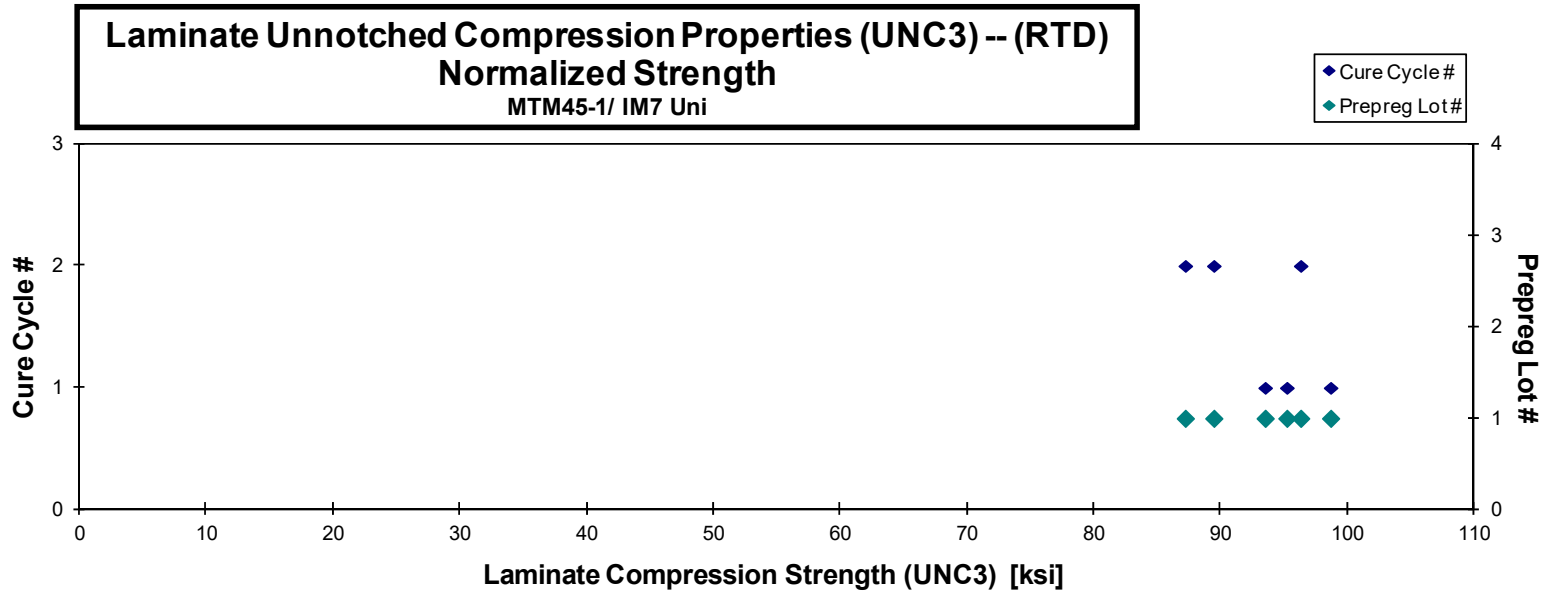
Laminate Unnotched Compression Properties (UNC3) -- (RTD)
Strength & Modulus
MTM45-1/ IM7 Uni

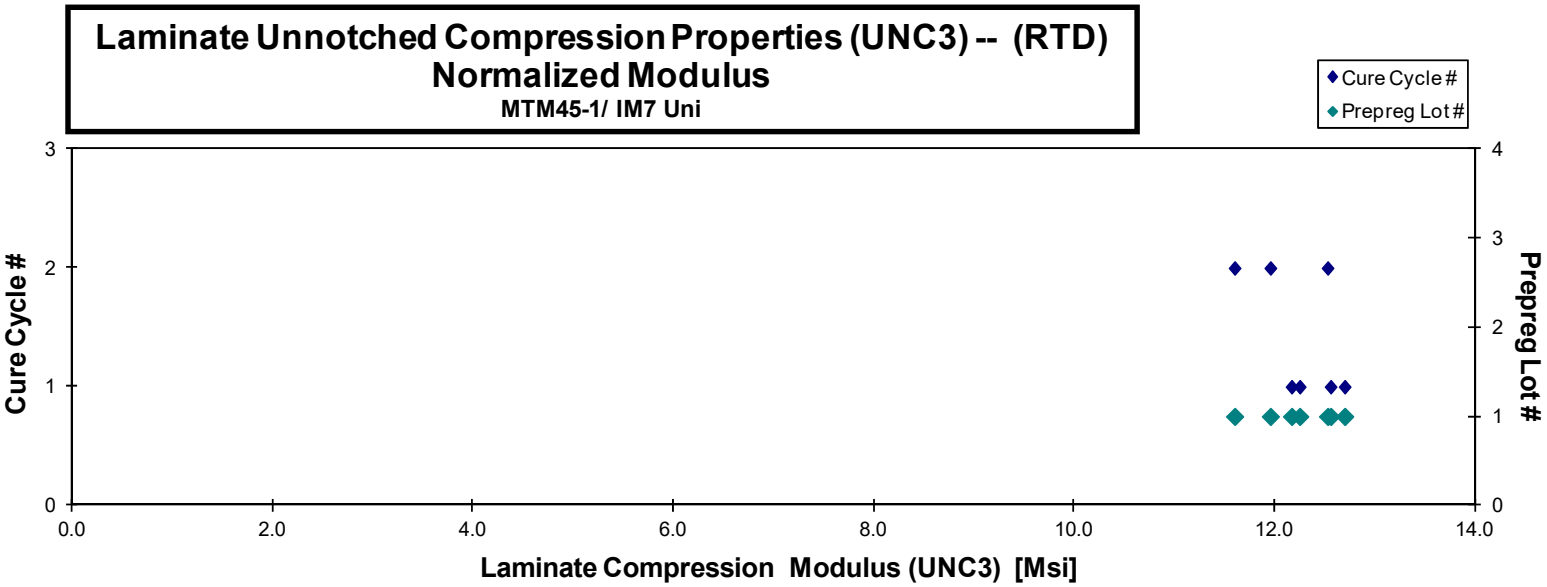
normalizing t_{ply} [in]: 0.0055

Specimen Number	NIAR Naming	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]
IMU-UNC3-A-MH1-RTD-1	AFYA111A	A	MH1	1	1	95.831	11.891	0.465	0.113	20	HGM	0.0057	98.706	12.248
IMU-UNC3-A-MH1-RTD-2	AFYA112A	A	MH1	1	1	91.790	11.939	0.458	0.112	20	HGM	0.0056	93.542	12.167
IMU-UNC3-A-MH1-RTD-3	AFYA113A	A	MH1	1	1	*	12.273	0.455	0.114	20	HIT	0.0057		12.697
IMU-UNC3-A-MH1-RTD-4	AFYA114A	A	MH1	1	1	93.055	12.267	0.436	0.113	20	BAT	0.0056	95.254	12.557
IMU-UNC3-A-MH2-RTD-2	AFYA212A	A	MH2	1	2	90.563	11.737	0.449	0.109	20	HAT	0.0054	89.493	11.598
IMU-UNC3-A-MH2-RTD-3	AFYA213A	A	MH2	1	2	84.404	11.566	0.447	0.114	20	BGM	0.0057	87.243	11.955
IMU-UNC3-A-MH2-RTD-4	AFYA214A	A	MH2	1	2	94.539	12.292	0.418	0.112	20	BAB	0.0056	96.344	12.527

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

	Strength [ksi]	Modulus [Msi]	Poisson's Ratio	$Average_{norm}$	$Strength_{norm}$ [ksi]	$Modulus_{norm}$ [Msi]
Average	91.697	11.995	0.447	0.0056	93.430	12.250
Standard Dev.	4.037	0.290	0.016	$Standard\ Dev._{norm}$	4.323	0.385
Coeff. of Var. [%]	4.403	2.416	3.479	$Coeff.\ of\ Var.\ [\%]_{norm}$	4.627	3.143
Min.	84.404	11.566	0.418	0.0054	87.243	11.598
Max.	95.831	12.292	0.465	0.0057	98.706	12.697
Number of Spec.	6	7	7		6	7


Laminate Unnotched Compression Properties (UNC3) -- (RTD)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0
10
20
30
40
50
60
70
80
90
100
110
Laminate Compression Strength (UNC3) [ksi]


Laminate Unnotched Compression Properties (UNC3) -- (RTD)
Normalized Modulus
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
Laminate Compression Modulus (UNC3) [Msi]

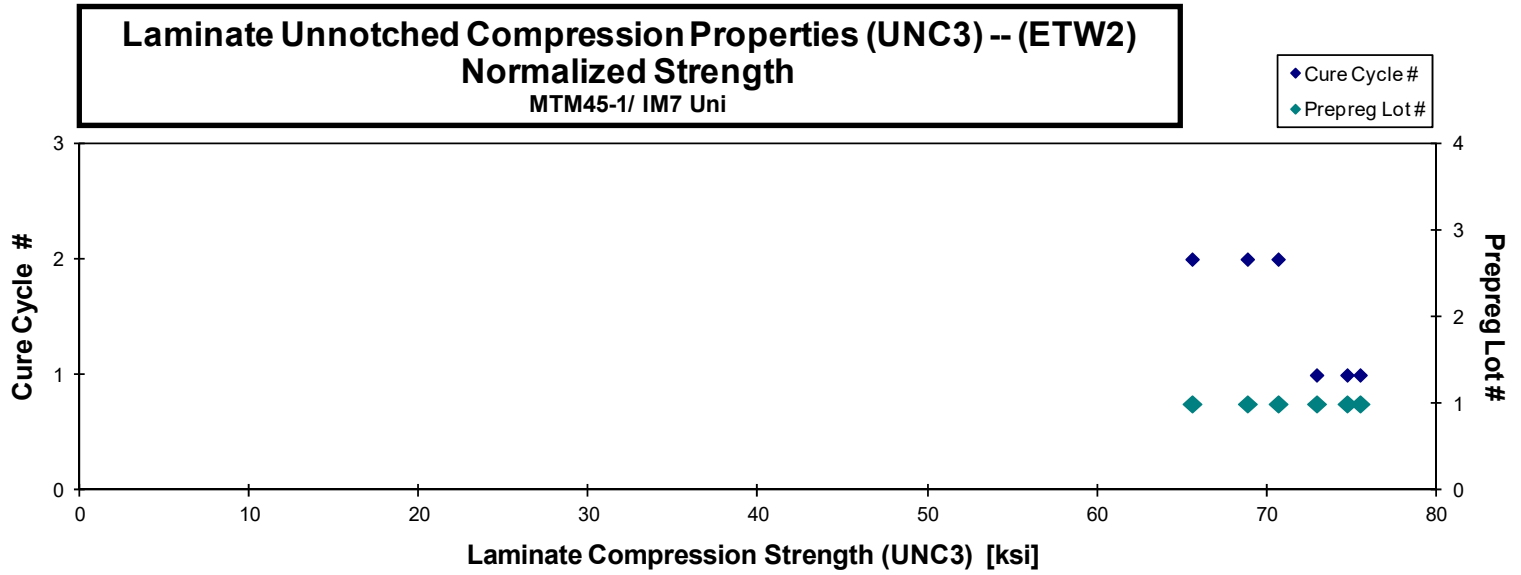
Laminate Unnotched Compression Properties (UNC3) -- (ETW2)
Strength & Modulus
MTM45-1/ IM7 Uni

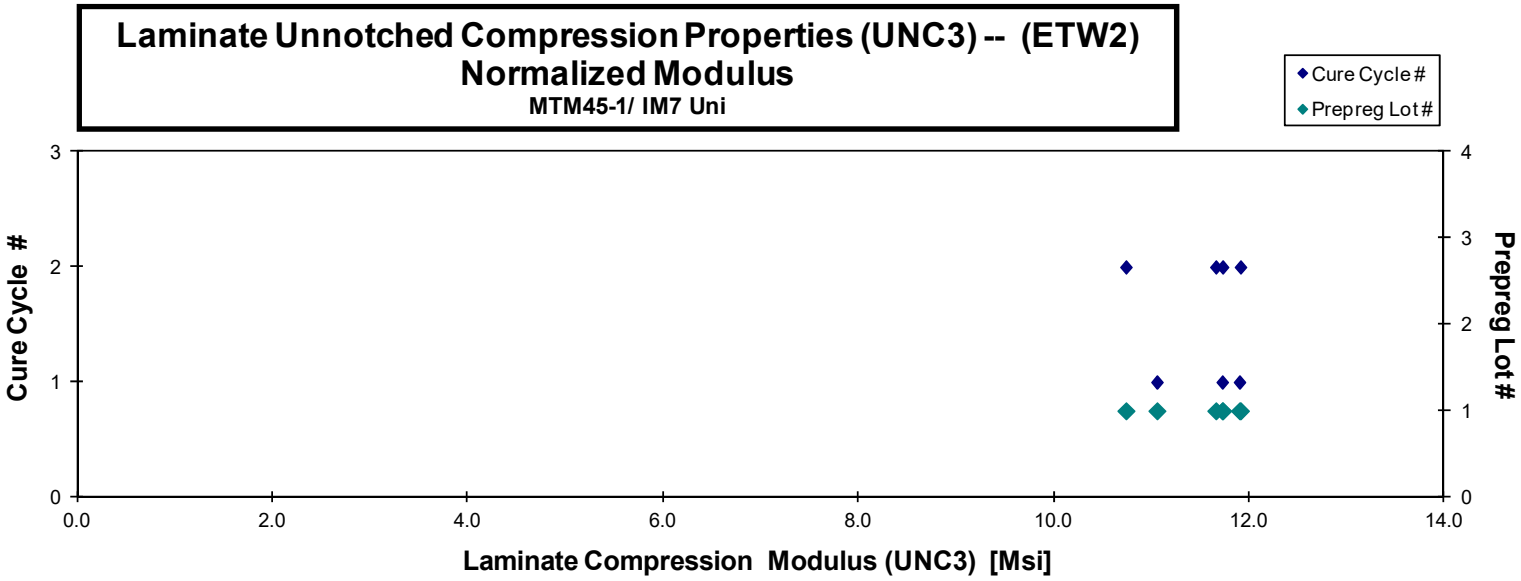
normalizing t_{ply} [in]: 0.0055

Specimen Number	NIAR Naming	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]
IMU-UNC3-A-MH1-ETW2-2	AFYA112D	A	MH1	1	1	72.736	10.753	0.425	0.113	20	HAT	0.0057	74.753	11.051
IMU-UNC3-A-MH1-ETW2-3	AFYA113D	A	MH1	1	1	71.868	11.545	0.451	0.112	20	HAB	0.0056	72.957	11.720
IMU-UNC3-A-MH1-ETW2-4	AFYA114D	A	MH1	1	1	73.844	11.632	0.450	0.113	20	HAB	0.0056	75.523	11.896
IMU-UNC3-A-MH2-ETW2-1	AFYA211D	A	MH2	1	2	68.390	11.519	0.449	0.114	20	HAB	0.0057	70.690	11.906
IMU-UNC3-A-MH2-ETW2-2	AFYA212D	A	MH2	1	2	67.614	11.441	0.439	0.112	20	BAB/HAB	0.0056	68.874	11.654
IMU-UNC3-A-MH2-ETW2-3	AFYA213D	A	MH2	1	2	*	11.426	0.444	0.113	20	HIT	0.0056		11.724
IMU-UNC3-A-MH2-ETW2-4	AFYA214D	A	MH2	1	2	66.024	10.801	0.425	0.109	20	HAT	0.0055	65.614	10.734

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

Average	**70.079**	**11.302**	**0.440**	**$Average_{norm}$**	**0.0056**	**71.402**	**11.527**
Standard Dev.	**3.157**	**0.366**	**0.011**	**$Standard\ Dev._{norm}$**		**3.769**	**0.452**
Coeff. of Var. [%]	**4.504**	**3.235**	**2.568**	**$Coeff.\ of\ Var.\ [\%]_{norm}$**		**5.279**	**3.925**
Min.	**66.024**	**10.753**	**0.425**	**Min.**	**0.0055**	**65.614**	**10.734**
Max.	**73.844**	**11.632**	**0.451**	**Max.**	**0.0057**	**75.523**	**11.906**
Number of Spec.	**6**	**7**	**7**	**Number of Spec.**		**6**	**7**


Laminate Unnotched Compression Properties (UNC3) -- (ETW2)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Compression Strength (UNC3) [ksi]
0
10
20
30
40
50
60
70
80
0
1
2
3
4


Laminate Unnotched Compression Properties (UNC3) -- (ETW2)
Normalized Modulus
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Compression Modulus (UNC3) [Msi]
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
0
1
2
3
4

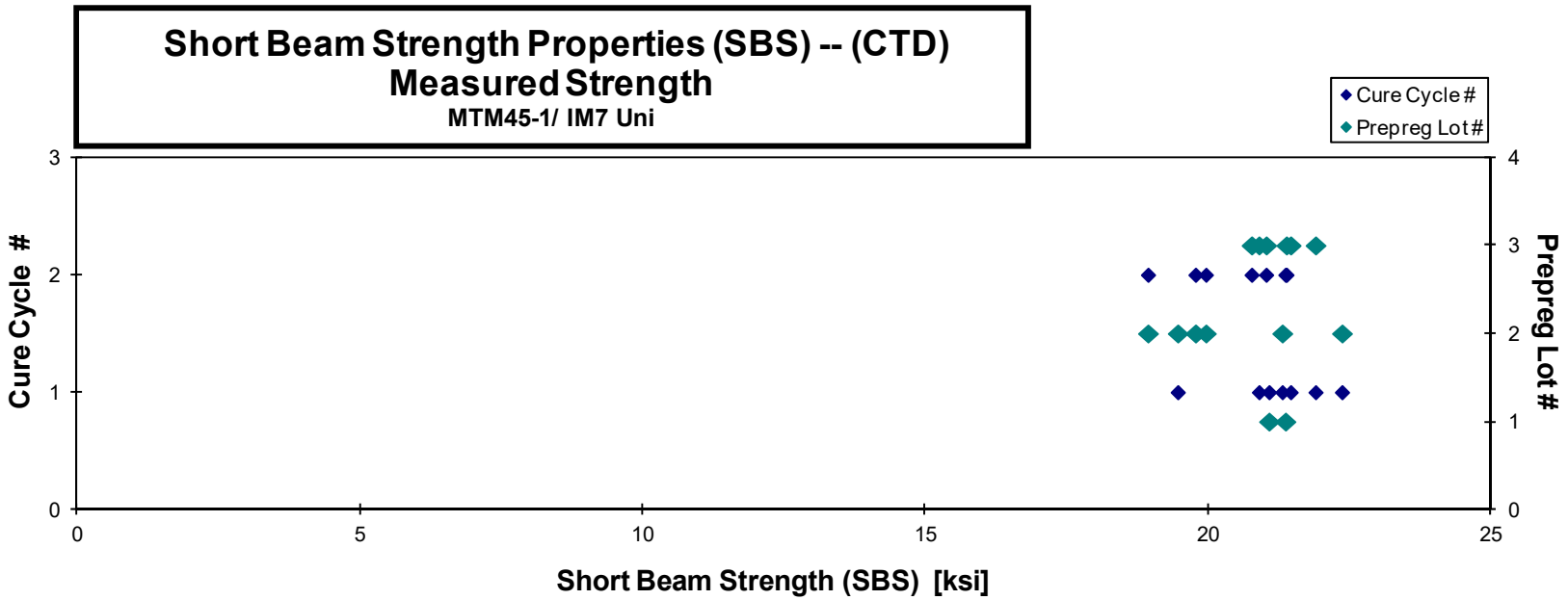
4.14 Lamina Short-Beam Strength Properties (SBS)

Short Beam Strength Properties (SBS) -- (CTD)
Strength
MTM45-1/ IM7 Uni

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Avg. tply [in]	Failure Mode
IMU-SBS-A-MH1-CTD-1*	AFQA111B	A	MH1	1	1		0.091	16	0.0057	COMPRESSION
IMU-SBS-A-MH1-CTD-2*	AFQA112B	A	MH1	1	1		0.091	16	0.0057	COMPRESSION
IMU-SBS-A-MH1-CTD-3*	AFQA113B	A	MH1	1	1		0.088	16	0.0055	COMPRESSION
IMU-SBS-A-MH1-CTD-4	AFQA114B	A	MH1	1	1	21.095	0.090	16	0.0056	ILS
IMU-SBS-A-MH2-CTD-1*	AFQA211B	A	MH2	1	2		0.091	16	0.0057	COMPRESSION
IMU-SBS-A-MH2-CTD-2*	AFQA212B	A	MH2	1	2		0.092	16	0.0057	COMPRESSION
IMU-SBS-A-MH2-CTD-3*	AFQA213B	A	MH2	1	2		0.090	16	0.0056	COMPRESSION
IMU-SBS-A-MH2-CTD-4	AFQA214B	A	MH2	1	2	21.386	0.088	16	0.0055	ILS
IMU-SBS-B-MH1-CTD-1	AFQB111B	B	MH1	2	1	21.329	0.093	16	0.0058	ILS
IMU-SBS-B-MH1-CTD-2	AFQB112B	B	MH1	2	1	19.482	0.093	16	0.0058	ILS
IMU-SBS-B-MH1-CTD-3	AFQB113B	B	MH1	2	1	22.386	0.093	16	0.0058	ILS
IMU-SBS-B-MH2-CTD-1	AFQB211B	B	MH2	2	2	19.979	0.088	16	0.0055	ILS
IMU-SBS-B-MH2-CTD-2	AFQB212B	B	MH2	2	2	19.795	0.088	16	0.0055	ILS
IMU-SBS-B-MH2-CTD-3	AFQB213B	B	MH2	2	2	18.954	0.088	16	0.0055	ILS
IMU-SBS-C-MH1-CTD-1	AFQC111B	C	MH1	3	1	21.918	0.088	16	0.0055	ILS
IMU-SBS-C-MH1-CTD-2	AFQC112B	C	MH1	3	1	21.477	0.087	16	0.0054	ILS
IMU-SBS-C-MH1-CTD-3	AFQC113B	C	MH1	3	1	20.917	0.087	16	0.0054	ILS
IMU-SBS-C-MH2-CTD-1	AFQC211B	C	MH2	3	2	20.788	0.088	16	0.0055	ILS
IMU-SBS-C-MH2-CTD-2	AFQC212B	C	MH2	3	2	21.045	0.087	16	0.0054	ILS
IMU-SBS-C-MH2-CTD-4	AFQC214B	C	MH2	3	2	21.403	0.087	16	0.0054	ILS

*** Strength data is omitted for those that failed in compression.**

Average	**20.854**	**Average**	**0.0056**
Standard Dev.	**0.967**	**Standard Dev.**	
Coeff. of Var. [%]	**4.638**	**Coeff. of Var. [%]**	
Min.	**18.954**	**Min.**	**0.0054**
Max.	**22.386**	**Max.**	**0.0058**
Number of Spec.	**14**	**Number of Spec.**	**20**

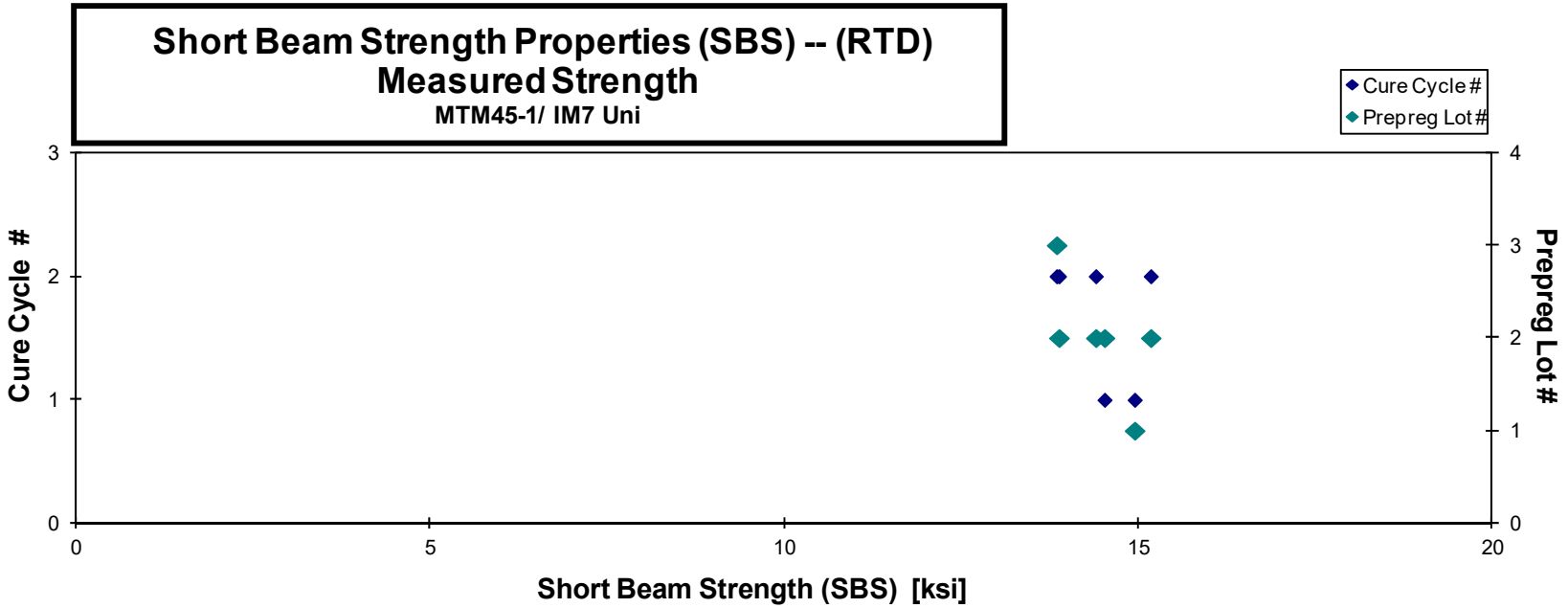

Short Beam Strength Properties (SBS) -- (CTD)
Measured Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0
5
10
15
20
25
Short Beam Strength (SBS) [ksi]

Short Beam Strength Properties (SBS) -- (RTD)
Strength
MTM45-1/ IM7 Uni

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle	Strength	Avg. Specimen	# Plies in Laminate	Avg. tply [in]	Failure Mode
IMU-SBS-A-MH1-RTD-1	AFQA111A	A	MH1	1	1	14.952	0.089	16	0.0056	COMPRESSION/ILS
IMU-SBS-A-MH1-RTD-2*	AFQA112A	A	MH1	1	1		0.090	16	0.0056	COMPRESSION
IMU-SBS-A-MH1-RTD-3*	AFQA113A	A	MH1	1	1		0.090	16	0.0056	COMPRESSION
IMU-SBS-A-MH2-RTD-1*	AFQA211A	A	MH2	1	2		0.091	16	0.0057	COMPRESSION
IMU-SBS-A-MH2-RTD-2*	AFQA212A	A	MH2	1	2		0.091	16	0.0057	COMPRESSION
IMU-SBS-A-MH2-RTD-3*	AFQA213A	A	MH2	1	2		0.091	16	0.0057	COMPRESSION
IMU-SBS-A-MH2-RTD-4*	AFQA214A	A	MH2	1	2		0.091	16	0.0057	COMPRESSION
IMU-SBS-B-MH1-RTD-1*	AFQB111A	B	MH1	2	1		0.093	16	0.0058	COMPRESSION
IMU-SBS-B-MH1-RTD-2*	AFQB112A	B	MH1	2	1		0.092	16	0.0058	COMPRESSION
IMU-SBS-B-MH1-RTD-3*	AFQB113A	B	MH1	2	1		0.093	16	0.0058	COMPRESSION
IMU-SBS-B-MH1-RTD-4	AFQB114A	B	MH1	2	1	14.526	0.094	16	0.0058	ILS
IMU-SBS-B-MH2-RTD-1*	AFQB211A	B	MH2	2	2		0.086	16	0.0054	COMPRESSION
IMU-SBS-B-MH2-RTD-2	AFQB212A	B	MH2	2	2	14.404	0.087	16	0.0055	ILS
IMU-SBS-B-MH2-RTD-3	AFQB213A	B	MH2	2	2	13.883	0.087	16	0.0054	ILS
IMU-SBS-B-MH2-RTD-4	AFQB214A	B	MH2	2	2	15.180	0.087	16	0.0054	ILS
IMU-SBS-C-MH1-RTD-1*	AFQC111A	C	MH1	3	1		0.087	16	0.0054	COMPRESSION
IMU-SBS-C-MH1-RTD-2*	AFQC112A	C	MH1	3	1		0.087	16	0.0054	COMPRESSION
IMU-SBS-C-MH1-RTD-3*	AFQC113A	C	MH1	3	1		0.087	16	0.0054	COMPRESSION
IMU-SBS-C-MH2-RTD-1*	AFQC211A	C	MH2	3	2		0.088	16	0.0055	COMPRESSION
IMU-SBS-C-MH2-RTD-2*	AFQC212A	C	MH2	3	2		0.087	16	0.0054	COMPRESSION
IMU-SBS-C-MH2-RTD-3	AFQC213A	C	MH2	3	2	13.851	0.086	16	0.0054	ILS
IMU-SBS-C-MH2-RTD-4*	AFQC214A	C	MH2	3	2		0.086	16	0.0054	COMPRESSION

*** Strength data is omitted for those that failed in compression.**

Average	**14.466**	**Average**	**0.0056**
Standard Dev.	**0.542**	**Standard Dev.**	
Coeff. of Var. [%]	**3.750**	**Coeff. of Var. [%]**	
Min.	**13.851**	**Min.**	**0.0054**
Max.	**15.180**	**Max.**	**0.0058**
Number of Spec.	**6**	**Number of Spec.**	**22**

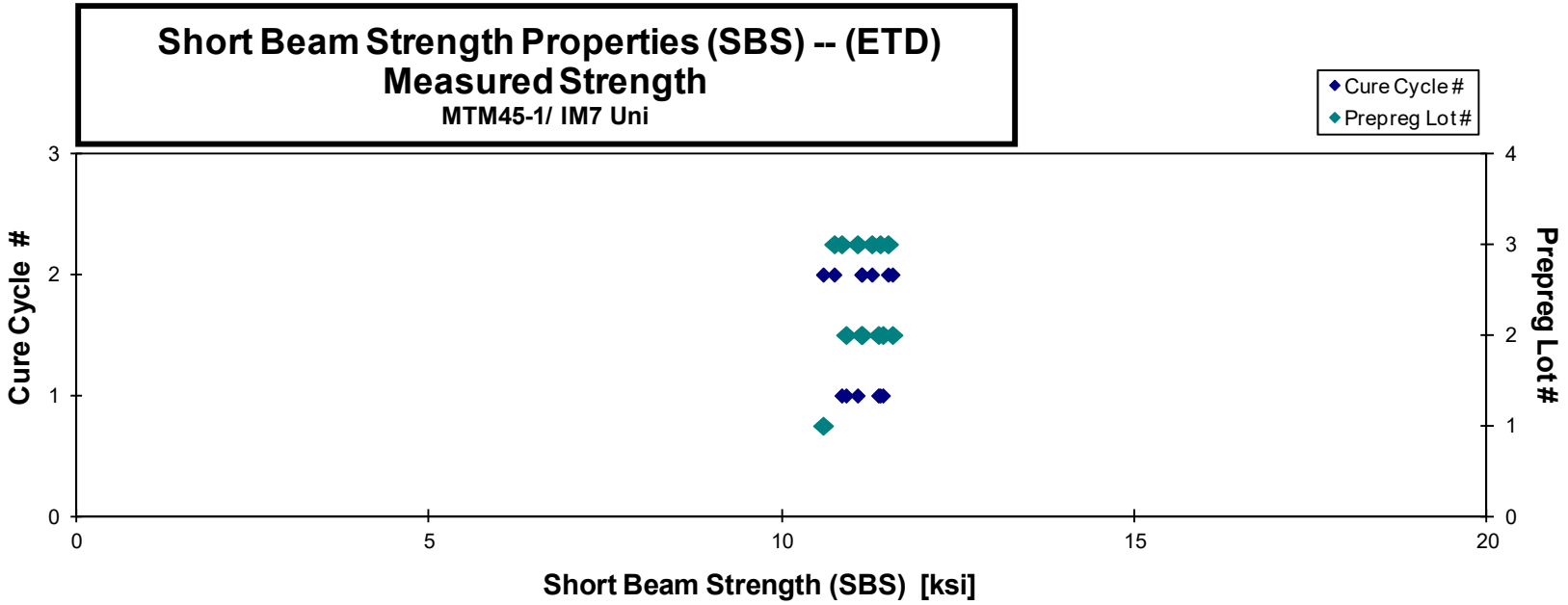

Short Beam Strength Properties (SBS) -- (RTD)
Measured Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0
5
10
15
20
Short Beam Strength (SBS) [ksi]

Short Beam Strength Properties (SBS) -- (ETD)
Strength
MTM45-1/ IM7 Uni

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Avg. tply [in]	Failure Mode
IMU-SBS-A-MH1-ETD-1*	AFQA111C	A	MH1	1	1		0.089	16	0.0056	COMPRESSION
IMU-SBS-A-MH1-ETD-2*	AFQA112C	A	MH1	1	1		0.090	16	0.0056	COMPRESSION
IMU-SBS-A-MH1-ETD-3*	AFQA113C	A	MH1	1	1		0.090	16	0.0056	COMPRESSION
IMU-SBS-A-MH1-ETD-4*	AFQA114C	A	MH1	1	1		0.090	16	0.0056	COMPRESSION
IMU-SBS-A-MH2-ETD-1*	AFQA211C	A	MH2	1	2		0.091	16	0.0057	COMPRESSION
IMU-SBS-A-MH2-ETD-2	AFQA212C	A	MH2	1	2	10.586	0.093	16	0.0058	ILS/COMPRESSION
IMU-SBS-A-MH2-ETD-3*	AFQA213C	A	MH2	1	2		0.092	16	0.0058	COMPRESSION
IMU-SBS-A-MH2-ETD-4*	AFQA214C	A	MH2	1	2		0.092	16	0.0058	COMPRESSION
IMU-SBS-B-MH1-ETD-1	AFQB111C	B	MH1	2	1	11.369	0.093	16	0.0058	ILS
IMU-SBS-B-MH1-ETD-2	AFQB112C	B	MH1	2	1	11.433	0.093	16	0.0058	ILS
IMU-SBS-B-MH1-ETD-3	AFQB113C	B	MH1	2	1	10.911	0.093	16	0.0058	ILS
IMU-SBS-B-MH2-ETD-1	AFQB211C	B	MH2	2	2	11.569	0.087	16	0.0055	ILS
IMU-SBS-B-MH2-ETD-2	AFQB212C	B	MH2	2	2	11.128	0.087	16	0.0054	ILS
IMU-SBS-B-MH2-ETD-3	AFQB213C	B	MH2	2	2	11.135	0.087	16	0.0055	ILS
IMU-SBS-C-MH1-ETD-1	AFQC111C	C	MH1	3	1	11.394	0.087	16	0.0054	ILS
IMU-SBS-C-MH1-ETD-2	AFQC112C	C	MH1	3	1	10.848	0.087	16	0.0054	ILS
IMU-SBS-C-MH1-ETD-3	AFQC113C	C	MH1	3	1	11.073	0.087	16	0.0054	ILS
IMU-SBS-C-MH2-ETD-1	AFQC211C	C	MH2	3	2	11.506	0.087	16	0.0054	ILS
IMU-SBS-C-MH2-ETD-2	AFQC212C	C	MH2	3	2	10.744	0.087	16	0.0054	ILS
IMU-SBS-C-MH2-ETD-3	AFQC213C	C	MH2	3	2	11.276	0.087	16	0.0054	ILS

*** Strength data is omitted for those that failed in compression.**

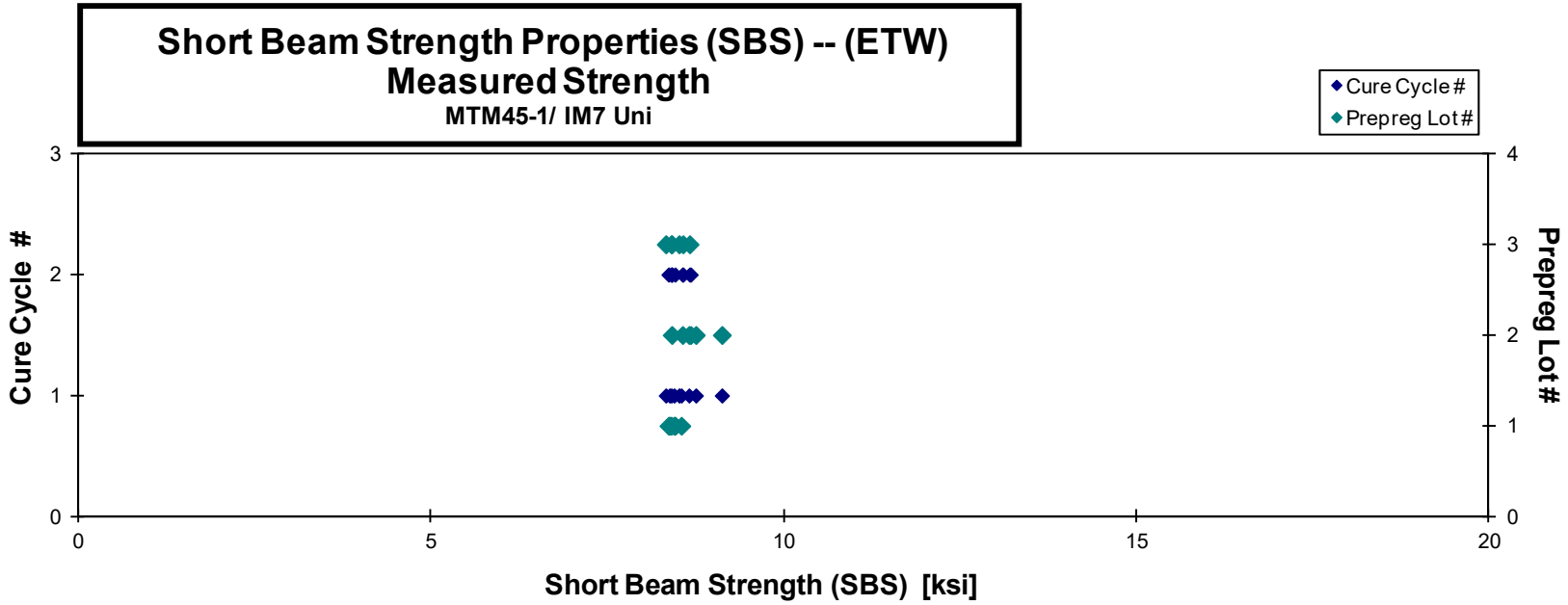
Average	**11.152**	**Average**	**0.0056**
Standard Dev.	**0.309**	**Standard Dev.**	
Coeff. of Var. [%]	**2.768**	**Coeff. of Var. [%]**	
Min.	**10.586**	**Min.**	**0.0054**
Max.	**11.569**	**Max.**	**0.0058**
Number of Spec.	**13**	**Number of Spec.**	**20**


Short Beam Strength Properties (SBS) -- (ETD)
Measured Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0
5
10
15
20
Short Beam Strength (SBS) [ksi]

Short Beam Strength Properties (SBS) -- (ETW)
Strength
MTM45-1/ IM7 Uni

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Avg. tply [in]	Failure Mode
IMU-SBS-A-MH1-ETW-2	AFQA112N	A	MH1	1	1	8.383	0.088	16	0.0055	ILS
IMU-SBS-A-MH1-ETW-3	AFQA113N	A	MH1	1	1	8.548	0.089	16	0.0055	ILS
IMU-SBS-A-MH1-ETW-4	AFQA114N	A	MH1	1	1	8.446	0.091	16	0.0057	ILS
IMU-SBS-A-MH2-ETW-1	AFQA211N	A	MH2	1	2	8.368	0.090	16	0.0056	ILS
IMU-SBS-A-MH2-ETW-2	AFQA212N	A	MH2	1	2	8.405	0.089	16	0.0056	ILS
IMU-SBS-A-MH2-ETW-3	AFQA213N	A	MH2	1	2	8.460	0.091	16	0.0057	ILS
IMU-SBS-B-MH1-ETW-2	AFQB112N	B	MH1	2	1	9.124	0.095	16	0.0059	ILS
IMU-SBS-B-MH1-ETW-3	AFQB113N	B	MH1	2	1	8.657	0.094	16	0.0059	IN-ELASTIC
IMU-SBS-B-MH1-ETW-4	AFQB114N	B	MH1	2	1	8.754	0.094	16	0.0059	IN-ELASTIC
IMU-SBS-B-MH2-ETW-1	AFQB211N	B	MH2	2	2	8.566	0.088	16	0.0055	ILS
IMU-SBS-B-MH2-ETW-2	AFQB212N	B	MH2	2	2	8.682	0.088	16	0.0055	ILS
IMU-SBS-B-MH2-ETW-3	AFQB213N	B	MH2	2	2	8.413	0.088	16	0.0055	ILS
IMU-SBS-C-MH1-ETW-1	AFQC111N	C	MH1	3	1	8.408	0.086	16	0.0053	INTERLAMINAR SHEAR
IMU-SBS-C-MH1-ETW-2	AFQC112N	C	MH1	3	1	8.517	0.082	16	0.0051	INTERLAMINAR SHEAR
IMU-SBS-C-MH1-ETW-3	AFQC113N	C	MH1	3	1	8.329	0.086	16	0.0054	INTERLAMINAR SHEAR
IMU-SBS-C-MH2-ETW-1	AFQC211N	C	MH2	3	2	8.667	0.086	16	0.0054	INTERLAMINAR SHEAR
IMU-SBS-C-MH2-ETW-2	AFQC211N	C	MH2	3	2	8.572	0.084	16	0.0053	INTERLAMINAR SHEAR
IMU-SBS-C-MH2-ETW-3	AFQC211N	C	MH2	3	2	8.413	0.086	16	0.0054	INTERLAMINAR SHEAR

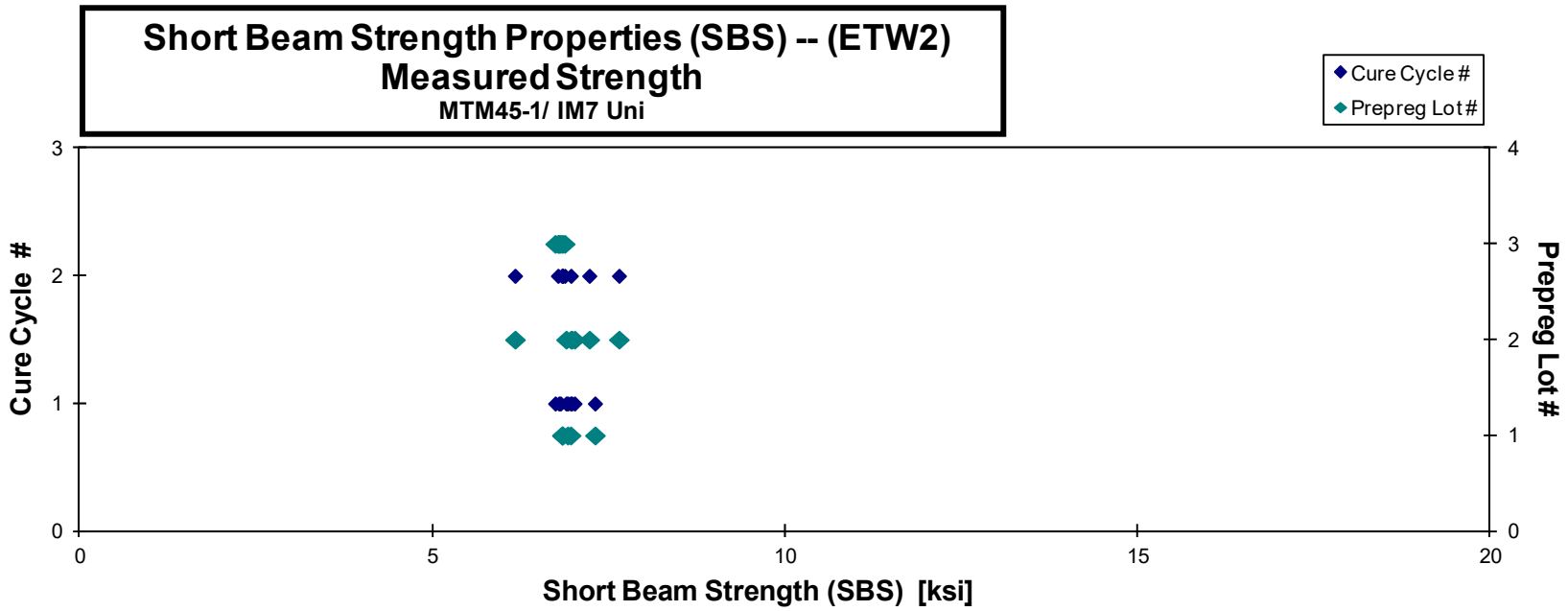
Average	**8.540**	**Average**	**0.0055**
Standard Dev.	**0.191**	**Standard Dev.**	
Coeff. of Var. [%]	**2.238**	**Coeff. of Var. [%]**	
Min.	**8.329**	**Min.**	**0.0051**
Max.	**9.124**	**Max.**	**0.0059**
Number of Spec.	**18**	**Number of Spec.**	**18**


Short Beam Strength Properties (SBS) -- (ETW)
Measured Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0
5
10
15
20
Short Beam Strength (SBS) [ksi]

Short Beam Strength Properties (SBS) -- (ETW2)
Strength
MTM45-1/ IM7 Uni

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Avg. tply [in]	Failure Mode
IMU-SBS-A-MH1-ETW2-1	AFQA111D	A	MH1	1	1	7.309	0.089	16	0.0056	IN-ELASTIC
IMU-SBS-A-MH1-ETW2-2	AFQA112D	A	MH1	1	1	6.922	0.091	16	0.0057	IN-ELASTIC
IMU-SBS-A-MH1-ETW2-3	AFQA113D	A	MH1	1	1	6.964	0.089	16	0.0055	IN-ELASTIC
IMU-SBS-A-MH2-ETW2-1	AFQA211D	A	MH2	1	2	6.841	0.091	16	0.0057	IN-ELASTIC
IMU-SBS-A-MH2-ETW2-2	AFQA212D	A	MH2	1	2	6.847	0.090	16	0.0056	IN-ELASTIC
IMU-SBS-A-MH2-ETW2-3	AFQA213D	A	MH2	1	2	6.847	0.090	16	0.0056	IN-ELASTIC
IMU-SBS-B-MH1-ETW2-1	AFQB111D	B	MH1	2	1	6.979	0.095	16	0.0059	IN-ELASTIC
IMU-SBS-B-MH1-ETW2-2	AFQB112D	B	MH1	2	1	6.900	0.094	16	0.0059	IN-ELASTIC
IMU-SBS-B-MH1-ETW2-3	AFQB113D	B	MH1	2	1	7.020	0.092	16	0.0058	ILS
IMU-SBS-B-MH2-ETW2-1	AFQB211D	B	MH2	2	2	7.229	0.088	16	0.0055	IN-ELASTIC
IMU-SBS-B-MH2-ETW2-2	AFQB212D	B	MH2	2	2	6.968	0.087	16	0.0054	IN-ELASTIC
IMU-SBS-B-MH2-ETW2-3	AFQB213D	B	MH2	2	2	6.176	0.088	16	0.0055	IN-ELASTIC
IMU-SBS-B-MH2-ETW2-4	AFQB214D	B	MH2	2	2	7.650	0.083	16	0.0052	IN-ELASTIC
IMU-SBS-C-MH1-ETW2-1	AFQC111D	C	MH1	3	1	6.820	0.086	16	0.0053	INTERLAMINAR SHEAR
IMU-SBS-C-MH1-ETW2-2	AFQC112D	C	MH1	3	1	6.745	0.086	16	0.0053	INTERLAMINAR SHEAR
IMU-SBS-C-MH1-ETW2-3	AFQC113D	C	MH1	3	1	6.798	0.086	16	0.0054	INTERLAMINAR SHEAR
IMU-SBS-C-MH2-ETW2-1	AFQC211D	C	MH2	3	2	6.848	0.086	16	0.0054	INTERLAMINAR SHEAR
IMU-SBS-C-MH2-ETW2-2	AFQC212D	C	MH2	3	2	6.785	0.086	16	0.0054	INTERLAMINAR SHEAR
IMU-SBS-C-MH2-ETW2-3	AFQC213D	C	MH2	3	2	6.880	0.086	16	0.0054	INTERLAMINAR SHEAR

Average	**6.923**	**Average**	**0.0055**
Standard Dev.	**0.284**	**Standard Dev.**	
Coeff. of Var. [%]	**4.099**	**Coeff. of Var. [%]**	
Min.	**6.176**	**Min.**	**0.0052**
Max.	**7.650**	**Max.**	**0.0059**
Number of Spec.	**19**	**Number of Spec.**	**19**


Short Beam Strength Properties (SBS) -- (ETW2)
Measured Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Short Beam Strength (SBS) [ksi]
0
5
10
15
20
0
1
2
3
4

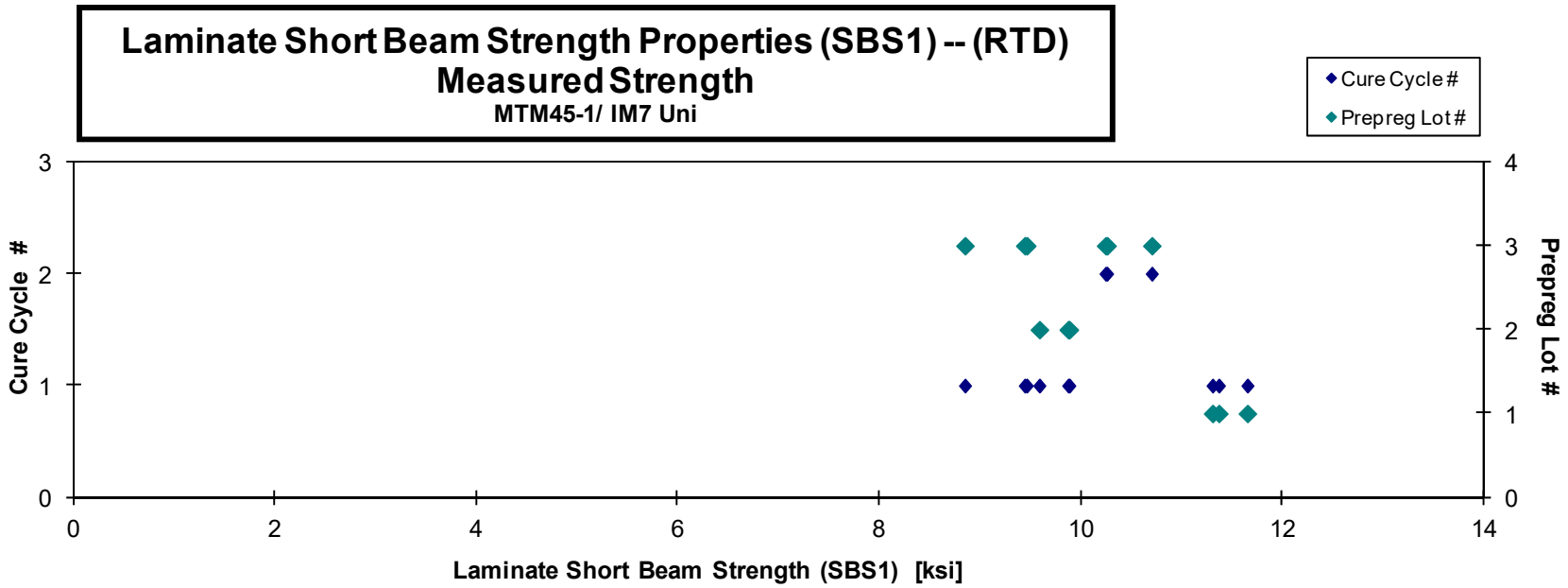
4.15 Laminate Short-Beam Strength Properties (SBS1)

Laminate Short Beam Strength Properties (SBS1) -- (RTD) Strength
MTM45-1/ IM7 Uni

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode
IMU-SBS1-A-MH1-RTD-1	AFqA111A	A	MH1	1	1	11.306	0.135	24	0.0056	ILS
IMU-SBS1-A-MH1-RTD-2	AFqA112A	A	MH1	1	1	11.651	0.136	24	0.0057	ILS
IMU-SBS1-A-MH1-RTD-3	AFqA113A	A	MH1	1	1	11.367	0.135	24	0.0056	ILS
IMU-SBS1-B-MH1-RTD-1	AFqB111A	B	MH1	2	1	9.872	0.132	24	0.0055	ILS
IMU-SBS1-B-MH1-RTD-2	AFqB112A	B	MH1	2	1	9.883	0.134	24	0.0056	ILS
IMU-SBS1-B-MH1-RTD-3	AFqB113A	B	MH1	2	1	9.586	0.132	24	0.0055	ILS
IMU-SBS1-C-MH1-RTD-1	AFqC111A	C	MH1	3	1	9.460	0.132	24	0.0055	ILS
IMU-SBS1-C-MH1-RTD-2	AFqC112A	C	MH1	3	1	9.440	0.131	24	0.0055	ILS
IMU-SBS1-C-MH1-RTD-3	AFqC113A	C	MH1	3	1	8.847	0.132	24	0.0055	ILS
IMU-SBS1-C-MH2-RTD-1	AFqC211A	C	MH2	3	2	10.258	0.132	24	0.0055	ILS
IMU-SBS1-C-MH2-RTD-2	AFqC212A	C	MH2	3	2	10.702	0.133	24	0.0055	ILS
IMU-SBS1-C-MH2-RTD-3	AFqC213A	C	MH2	3	2	10.243	0.132	24	0.0055	ILS

Batch A and B cure cycle 2 - Data is omitted due to incorrect panel processing.

Average	**10.218**	**Average**	**0.0055**
Standard Dev.	**0.878**	**Standard Dev.**	
Coeff. of Var. [%]	**8.595**	**Coeff. of Var. [%]**	
Min.	**8.847**	**Min.**	**0.0055**
Max.	**11.651**	**Max.**	**0.0057**
Number of Spec.	**12**	**Number of Spec.**	**12**

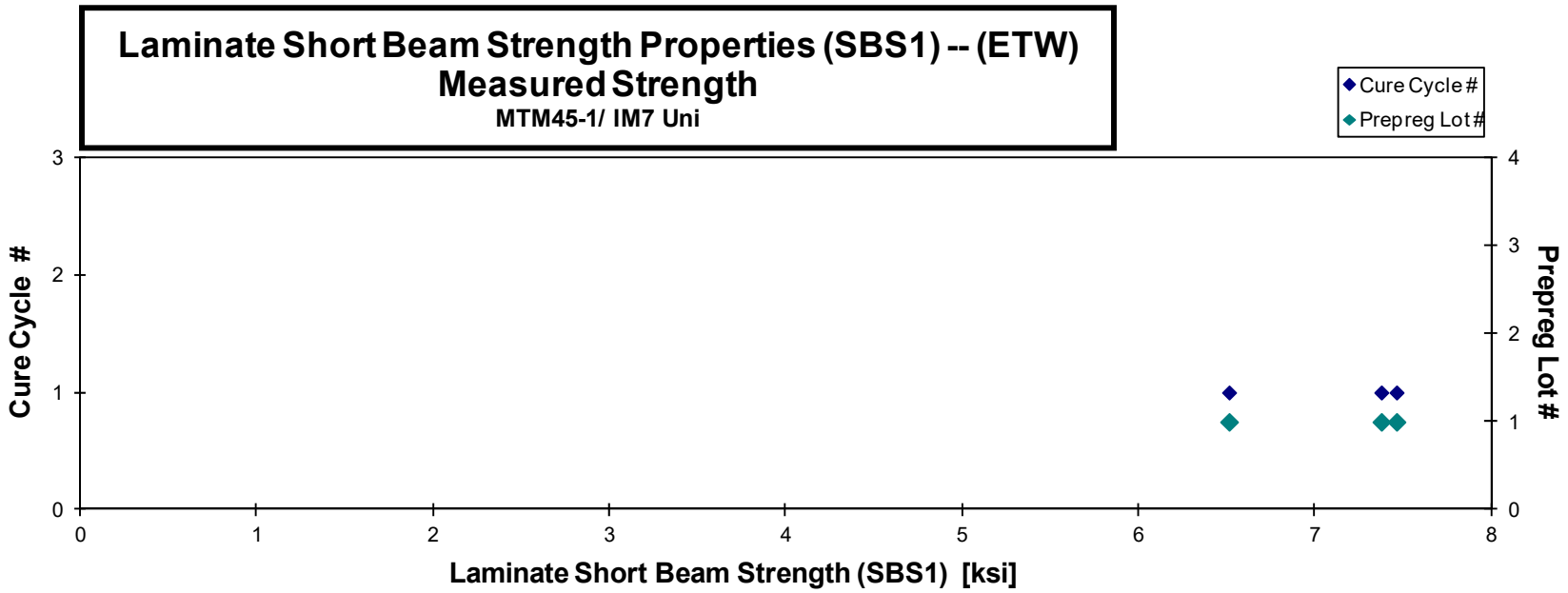

Laminate Short Beam Strength Properties (SBS1) -- (RTD)
Measured Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0
2
4
6
8
10
12
14
Laminate Short Beam Strength (SBS1) [ksi]

Laminate Short Beam Strength Properties (SBS1) -- (ETW)
Strength
MTM45-1/ IM7 Uni

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode
IMU-SBS1-A-MH1-ETW-1	AFqA111N	A	MH1	1	1	7.377	0.136	24	0.0057	ILS
IMU-SBS1-A-MH1-ETW-2	AFqA112N	A	MH1	1	1	7.464	0.135	24	0.0056	ILS
IMU-SBS1-A-MH1-ETW-3	AFqA113N	A	MH1	1	1	6.514	0.135	24	0.0056	ILS

Batch A cure cycle 2 - data is omitted due to incorrect panel processing.

Average	**7.118**	**Average**	**0.0056**
Standard Dev.	**0.525**	**Standard Dev.**	
Coeff. of Var. [%]	**7.376**	**Coeff. of Var. [%]**	
Min.	**6.514**	**Min.**	**0.0056**
Max.	**7.464**	**Max.**	**0.0057**
Number of Spec.	**3**	**Number of Spec.**	**3**

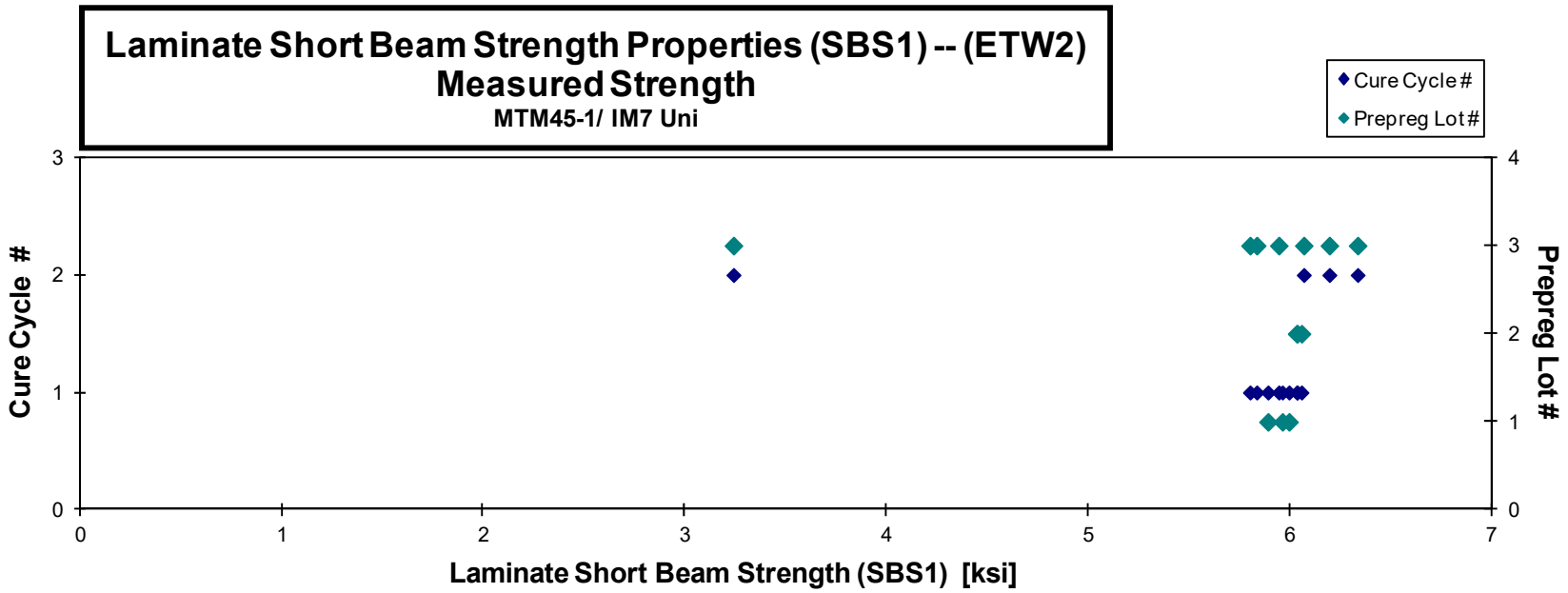

Laminate Short Beam Strength Properties (SBS1) -- (ETW)
Measured Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Short Beam Strength (SBS1) [ksi]
0
1
2
3
4
5
6
7
8

Laminate Short Beam Strength Properties (SBS1) -- (ETW2)
Strength
MTM45-1/ IM7 Uni

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Avg. t_{ply} [in]	Failure Mode
IMU-SBS1-A-MH1-ETW2-1	AFqA111D	A	MH1	1	1	5.997	0.136	24	0.0057	ILS
IMU-SBS1-A-MH1-ETW2-2	AFqA112D	A	MH1	1	1	5.893	0.135	24	0.0056	ILS
IMU-SBS1-A-MH1-ETW2-3	AFqA113D	A	MH1	1	1	5.964	0.134	24	0.0056	ILS
IMU-SBS1-B-MH1-ETW2-1	AFqB111D	B	MH1	2	1	6.059	0.131	24	0.0055	ILS
IMU-SBS1-B-MH1-ETW2-2	AFqB112D	B	MH1	2	1	6.035	0.132	24	0.0055	ILS
IMU-SBS1-B-MH1-ETW2-3	AFqB113D	B	MH1	2	1	6.038	0.133	24	0.0056	ILS
IMU-SBS1-C-MH1-ETW2-1	AFqC111D	C	MH1	3	1	5.804	0.132	24	0.0055	ILS
IMU-SBS1-C-MH1-ETW2-2	AFqC112D	C	MH1	3	1	5.947	0.133	24	0.0055	ILS
IMU-SBS1-C-MH1-ETW2-3	AFqC113D	C	MH1	3	1	5.837	0.131	24	0.0055	ILS
IMU-SBS1-C-MH2-ETW2-1	AFqC211D	C	MH2	3	2	6.338	0.132	24	0.0055	ILS
IMU-SBS1-C-MH2-ETW2-2	AFqC212D	C	MH2	3	2	3.241	0.131	24	0.0055	ILS
IMU-SBS1-C-MH2-ETW2-3	AFqC213D	C	MH2	3	2	6.198	0.130	24	0.0054	ILS
IMU-SBS1-C-MH2-ETW2-4	AFqC214D	C	MH2	3	2	6.070	0.131	24	0.0055	ILS

Batch A and B cure cycle 2 - Data is omitted due to incorrect panel processing.

Average	**5.802**	**Average**	**0.0055**
Standard Dev.	**0.782**	**Standard Dev.**	
Coeff. of Var. [%]	**13.484**	**Coeff. of Var. [%]**	
Min.	**3.241**	**Min.**	**0.0054**
Max.	**6.338**	**Max.**	**0.0057**
Number of Spec.	**13**	**Number of Spec.**	**13**


Laminate Short Beam Strength Properties (SBS1) -- (ETW2)
Measured Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Short Beam Strength (SBS1) [ksi]
0
1
2
3
4
5
6
7

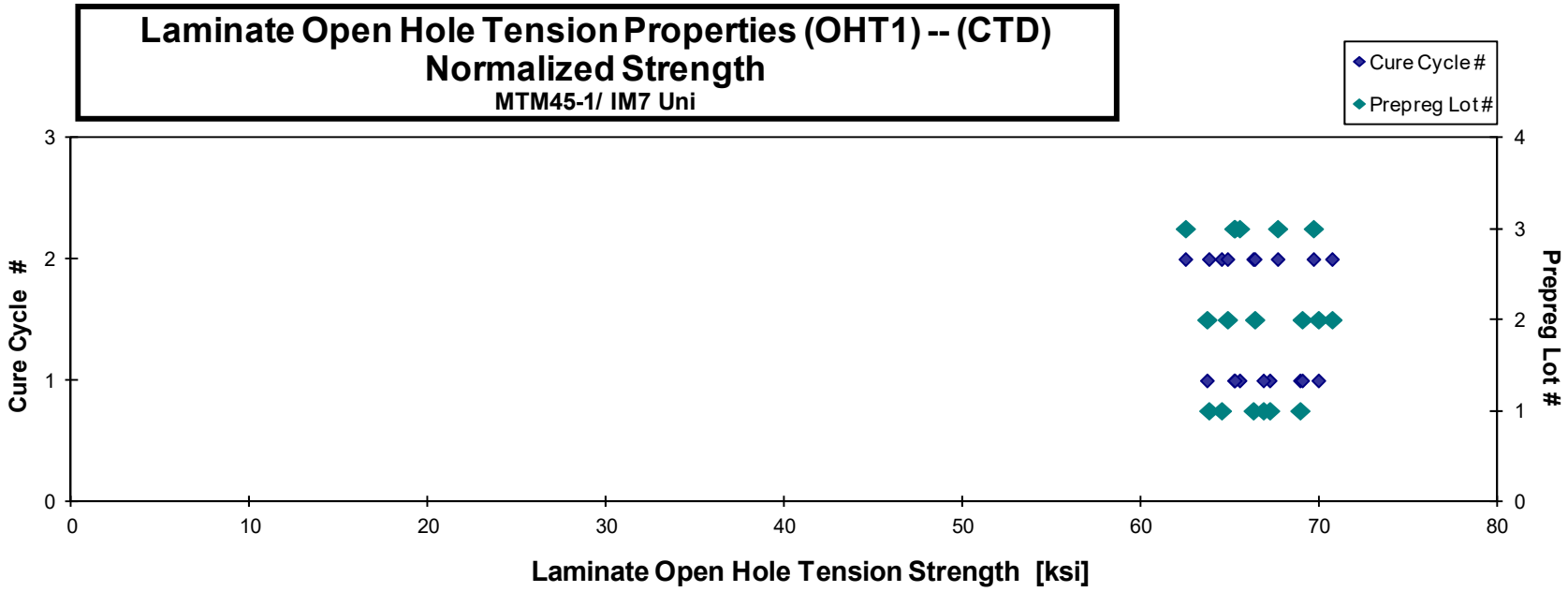
4.16 "25/50/25" Open Hole Tension 1 Properties (OHT1)

Laminate Open Hole Tension Properties (OHT1) -- (CTD)
Strength
MTM45-1/ IM7 Uni

normalizing t_{ply} [in]: 0.0055

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Modes	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
IMU-OHT1-A-MH1-CTD-1	AFDA111B	A	MH1	1	1	67.924	0.134	24	AGM	0.0056	68.953
IMU-OHT1-A-MH1-CTD-2	AFDA112B	A	MH1	1	1	66.051	0.134	24	LGM	0.0056	67.252
IMU-OHT1-A-MH1-CTD-3	AFDA113B	A	MH1	1	1	65.699	0.134	24	LGM	0.0056	66.894
IMU-OHT1-A-MH2-CTD-1	AFDA211B	A	MH2	1	2	61.507	0.137	24	LGM	0.0057	63.836
IMU-OHT1-A-MH2-CTD-2	AFDA212B	A	MH2	1	2	64.519	0.136	24	LGM	0.0057	66.327
IMU-OHT1-A-MH2-CTD-3	AFDA213B	A	MH2	1	2	62.926	0.135	24	LGM	0.0056	64.547
IMU-OHT1-B-MH1-CTD-1	AFDB111B	B	MH1	2	1	62.965	0.134	24	LGM	0.0056	63.728
IMU-OHT1-B-MH1-CTD-2	AFDB112B	B	MH1	2	1	69.250	0.133	24	LGM	0.0056	69.984
IMU-OHT1-B-MH1-CTD-3	AFDB113B	B	MH1	2	1	67.791	0.135	24	LGM	0.0056	69.075
IMU-OHT1-B-MH2-CTD-1	AFDB211B	B	MH2	2	2	66.210	0.132	24	LGM	0.0055	66.411
IMU-OHT1-B-MH2-CTD-2	AFDB212B	B	MH2	2	2	64.297	0.133	24	LGM	0.0056	64.881
IMU-OHT1-B-MH2-CTD-3	AFDB213B	B	MH2	2	2	69.384	0.135	24	LGM	0.0056	70.751
IMU-OHT1-C-MH1-CTD-1	AFDC111B	C	MH1	3	1	65.263	0.133	24	LGM	0.0055	65.560
IMU-OHT1-C-MH1-CTD-2	AFDC112B	C	MH1	3	1	65.395	0.132	24	LGM	0.0055	65.246
IMU-OHT1-C-MH1-CTD-3	AFDC113B	C	MH1	3	1	65.043	0.133	24	LGM	0.0055	65.289
IMU-OHT1-C-MH2-CTD-1	AFDC211B	C	MH2	3	2	60.593	0.136	24	LGM	0.0057	62.521
IMU-OHT1-C-MH2-CTD-2	AFDC212B	C	MH2	3	2	67.456	0.136	24	AGM	0.0057	69.705
IMU-OHT1-C-MH2-CTD-3	AFDC213B	C	MH2	3	2	65.321	0.137	24	LGM	0.0057	67.696

Average	**65.422**		**Average$_{norm}$**	**0.0056**	**66.592**
Standard Dev.	**2.433**		**Standard Dev.$_{norm}$**		**2.378**
Coeff. of Var. [%]	**3.719**		**Coeff. of Var. [%]$_{norm}$**		**3.571**
Min.	**60.593**		**Min.**	**0.0055**	**62.521**
Max.	**69.384**		**Max.**	**0.0057**	**70.751**
Number of Spec.	**18**		**Number of Spec.**		**18**


Laminate Open Hole Tension Properties (OHT1) -- (CTD)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Open Hole Tension Strength [ksi]
0
10
20
30
40
50
60
70
80
0
1
2
3
4

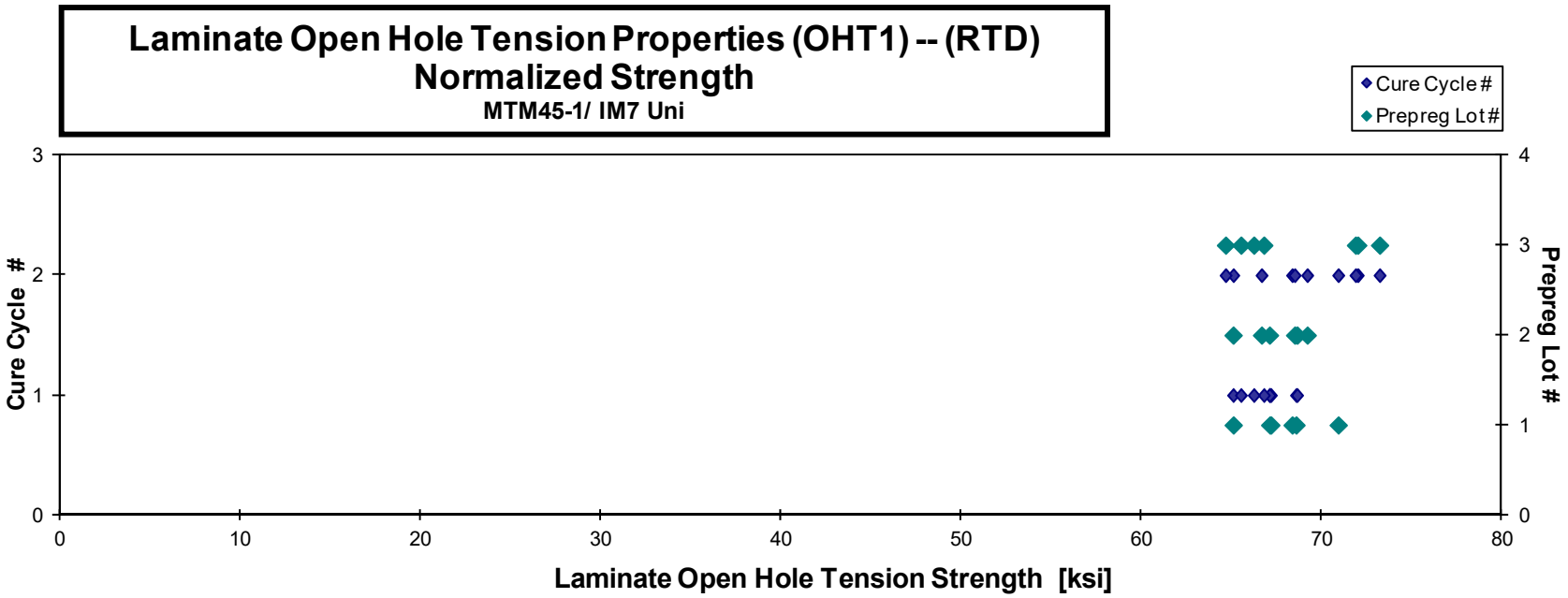
Laminate Open Hole Tension Properties (OHT1) -- (RTD)
Strength
MTM45-1/ IM7 Uni

normalizing t_{ply} [in]
0.0055

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Modes	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
IMU-OHT1-A-MH1-RTD-1	AFDA111A	A	MH1	1	1	66.830	0.135	24	AGM	0.0056	68.551
IMU-OHT1-A-MH1-RTD-2	AFDA112A	A	MH1	1	1	66.351	0.134	24	AGM	0.0056	67.155
IMU-OHT1-A-MH1-RTD-3	AFDA113A	A	MH1	1	1	65.312	0.136	24	AGM	0.0057	67.094
IMU-OHT1-A-MH2-RTD-1	AFDA211A	A	MH2	1	2	63.671	0.135	24	AGM	0.0056	65.070
IMU-OHT1-A-MH2-RTD-2	AFDA212A	A	MH2	1	2	69.111	0.135	24	AGM	0.0056	70.891
IMU-OHT1-A-MH2-RTD-3	AFDA213A	A	MH2	1	2	66.669	0.135	24	AGM	0.0056	68.336
IMU-OHT1-B-MH1-RTD-1	AFDB111A	B	MH1	2	1	67.992	0.133	24	AGM	0.0056	68.610
IMU-OHT1-B-MH1-RTD-2	AFDB112A	B	MH1	2	1	66.473	0.133	24	AGM	0.0056	67.077
IMU-OHT1-B-MH1-RTD-3	AFDB113A	B	MH1	2	1	64.334	0.134	24	AGM	0.0056	65.065
IMU-OHT1-B-MH2-RTD-1	AFDB211A	B	MH2	2	2	65.157	0.135	24	AGM	0.0056	66.638
IMU-OHT1-B-MH2-RTD-2	AFDB212A	B	MH2	2	2	67.503	0.134	24	AGM	0.0056	68.475
IMU-OHT1-B-MH2-RTD-3	AFDB213A	B	MH2	2	2	68.343	0.134	24	AGM	0.0056	69.171
IMU-OHT1-C-MH1-RTD-1	AFDC111A	C	MH1	3	1	66.765	0.132	24	AGM	0.0055	66.765
IMU-OHT1-C-MH1-RTD-2	AFDC112A	C	MH1	3	1	65.957	0.133	24	AGM	0.0055	66.207
IMU-OHT1-C-MH1-RTD-3	AFDC113A	C	MH1	3	1	64.952	0.133	24	AGM	0.0055	65.493
IMU-OHT1-C-MH2-RTD-1	AFDC211A	C	MH2	3	2	63.395	0.135	24	LGM	0.0056	64.644
IMU-OHT1-C-MH2-RTD-2	AFDC212A	C	MH2	3	2	69.605	0.137	24	AGM	0.0057	71.978
IMU-OHT1-C-MH2-RTD-3	AFDC213A	C	MH2	3	2	71.295	0.136	24	LGM	0.0056	73.185
IMU-OHT1-C-MH2-RTD-4	AFDC214A	C	MH2	3	2	69.281	0.137	24	AGM	0.0057	71.853

Average	**66.789**	
Standard Dev.	**2.117**	
Coeff. of Var. [%]	**3.170**	
Min.	**63.395**	
Max.	**71.295**	
Number of Spec.	**19**	

$Average_{norm}$	**0.0056**	**68.014**
$Standard\ Dev._{norm}$		**2.495**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**3.668**
Min.	**0.0055**	**64.644**
Max.	**0.0057**	**73.185**
Number of Spec.		**19**

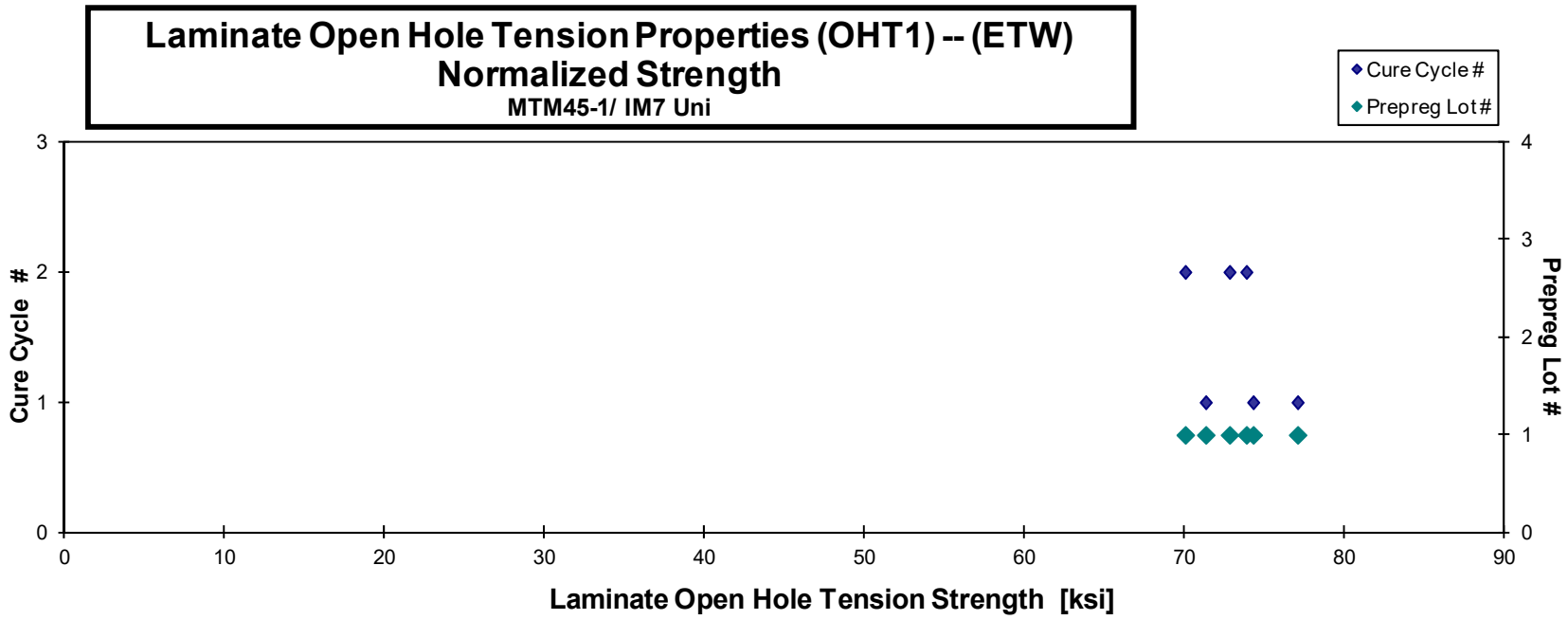

Laminate Open Hole Tension Properties (OHT1) -- (RTD)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Open Hole Tension Strength [ksi]
0
10
20
30
40
50
60
70
80
0
1
2
3
4

Laminate Open Hole Tension Properties (OHT1) -- (ETW)
Strength
MTM45-1/ IM7 Uni

normalizing t_{ply} [in]
0.0055

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Modes	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
IMU-OHT1-A-MH1-ETW-1	AFDA111N	A	MH1	1	1	75.732	0.134	24	AGM	0.0056	77.071
IMU-OHT1-A-MH1-ETW-2	AFDA112N	A	MH1	1	1	70.255	0.134	24	AGM	0.0056	71.329
IMU-OHT1-A-MH1-ETW-3	AFDA113N	A	MH1	1	1	72.716	0.135	24	AGM	0.0056	74.295
IMU-OHT1-A-MH2-ETW-1	AFDA211N	A	MH2	1	2	70.723	0.136	24	AGM	0.0057	72.813
IMU-OHT1-A-MH2-ETW-2	AFDA212N	A	MH2	1	2	67.649	0.137	24	AGM	0.0057	70.049
IMU-OHT1-A-MH2-ETW-3	AFDA213N	A	MH2	1	2	71.632	0.136	24	AGM	0.0057	73.866

Average	71.451	$Average_{norm}$	0.0056	73.237
Standard Dev.	2.697	$Standard\ Dev._{norm}$		2.458
Coeff. of Var. [%]	3.775	Coeff. of Var. $[\%]_{norm}$		3.356
Min.	67.649	Min.	0.0056	70.049
Max.	75.732	Max.	0.0057	77.071
Number of Spec.	6	Number of Spec.		6

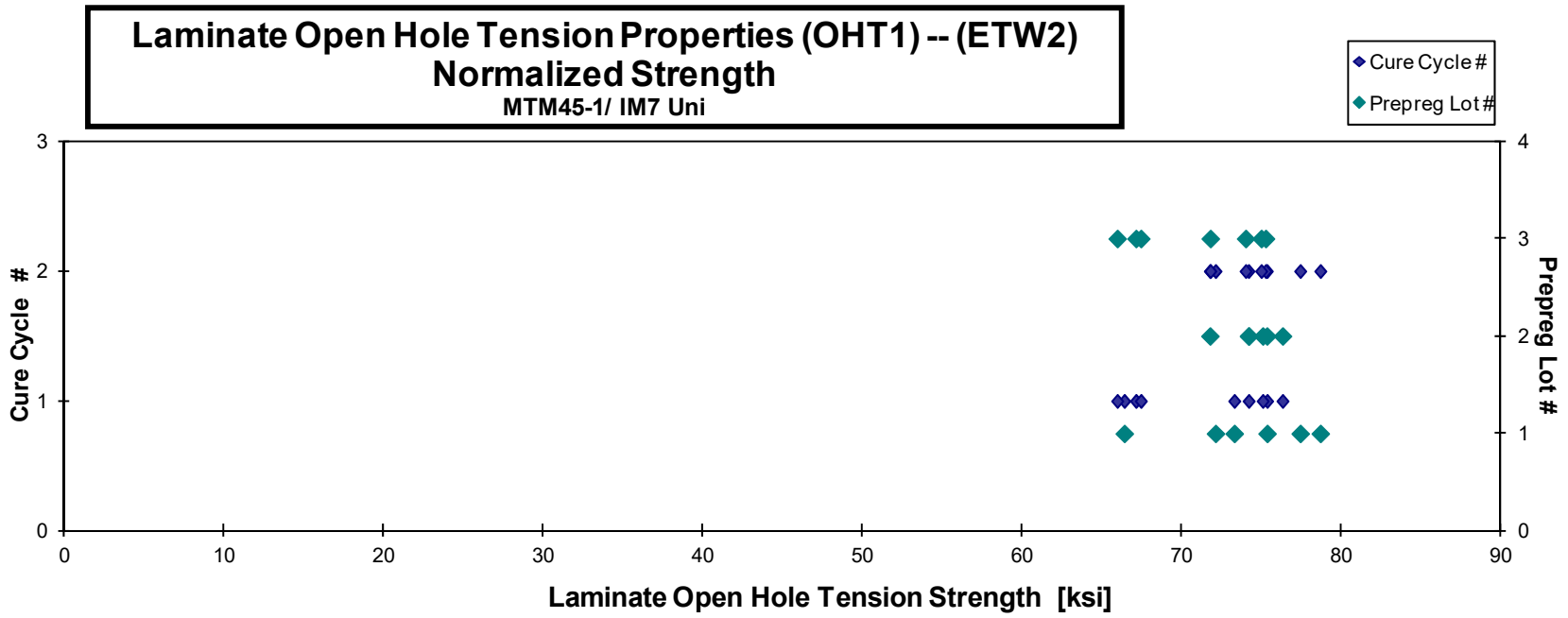

Laminate Open Hole Tension Properties (OHT1) -- (ETW)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Open Hole Tension Strength [ksi]
0
1
2
3
4
0
10
20
30
40
50
60
70
80
90

Laminate Open Hole Tension Properties (OHT1) -- (ETW2)
Strength
MTM45-1/ IM7 Uni

normalizing t_{ply} [in]: 0.0055

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Modes	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
IMU-OHT1-A-MH1-ETW2-1	AFDA111D	A	MH1	1	1	71.027	0.136	24	AGM	0.0057	73.296
IMU-OHT1-A-MH1-ETW2-2	AFDA112D	A	MH1	1	1	65.381	0.134	24	AGM	0.0056	66.405
IMU-OHT1-A-MH1-ETW2-3	AFDA113D	A	MH1	1	1	73.226	0.136	24	AGM	0.0057	75.353
IMU-OHT1-A-MH2-ETW2-1	AFDA211D	A	MH2	1	2	70.178	0.136	24	AGM	0.0057	72.118
IMU-OHT1-A-MH2-ETW2-2	AFDA212D	A	MH2	1	2	74.767	0.137	24	AGM	0.0057	77.430
IMU-OHT1-A-MH2-ETW2-3	AFDA213D	A	MH2	1	2	75.953	0.137	24	AGM	0.0057	78.686
IMU-OHT1-B-MH1-ETW2-1	AFDB111D	B	MH1	2	1	74.634	0.135	24	AGM	0.0056	76.321
IMU-OHT1-B-MH1-ETW2-2	AFDB112D	B	MH1	2	1	74.878	0.132	24	AGM	0.0055	75.076
IMU-OHT1-B-MH1-ETW2-3	AFDB113D	B	MH1	2	1	73.753	0.133	24	AGM	0.0055	74.200
IMU-OHT1-B-MH2-ETW2-1	AFDB211D	B	MH2	2	2	72.548	0.135	24	AGM	0.0056	74.188
IMU-OHT1-B-MH2-ETW2-2	AFDB212D	B	MH2	2	2	75.140	0.132	24	AGM	0.0055	75.339
IMU-OHT1-B-MH2-ETW2-3	AFDB213D	B	MH2	2	2	71.340	0.133	24	AGM	0.0055	71.773
IMU-OHT1-C-MH1-ETW2-1	AFDC111D	C	MH1	3	1	66.713	0.133	24	AGM	0.0055	67.134
IMU-OHT1-C-MH1-ETW2-2	AFDC112D	C	MH1	3	1	66.045	0.132	24	AGM	0.0055	65.961
IMU-OHT1-C-MH1-ETW2-3	AFDC113D	C	MH1	3	1	67.504	0.132	24	AGM	0.0055	67.445
IMU-OHT1-C-MH2-ETW2-1	AFDC211D	C	MH2	3	2	73.150	0.136	24	AGM	0.0057	75.256
IMU-OHT1-C-MH2-ETW2-2	AFDC212D	C	MH2	3	2	69.872	0.136	24	AGM	0.0057	71.795
IMU-OHT1-C-MH2-ETW2-3	AFDC213D	C	MH2	3	2	73.091	0.135	24	AGM	0.0056	74.983
IMU-OHT1-C-MH2-ETW2-4	AFDC214D	C	MH2	3	2	72.712	0.134	24	AGM	0.0056	74.006

Average	**71.680**	**$Average_{norm}$**	**0.0056**	**72.988**
Standard Dev.	**3.257**	**$Standard\ Dev._{norm}$**		**3.751**
Coeff. of Var. [%]	**4.544**	**$Coeff.\ of\ Var.\ [\%]_{norm}$**		**5.140**
Min.	**65.381**	**Min.**	**0.0055**	**65.961**
Max.	**75.953**	**Max.**	**0.0057**	**78.686**
Number of Spec.	**19**	**Number of Spec.**		**19**


Laminate Open Hole Tension Properties (OHT1) -- (ETW2)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Open Hole Tension Strength [ksi]
0
10
20
30
40
50
60
70
80
90
0
1
2
3
4

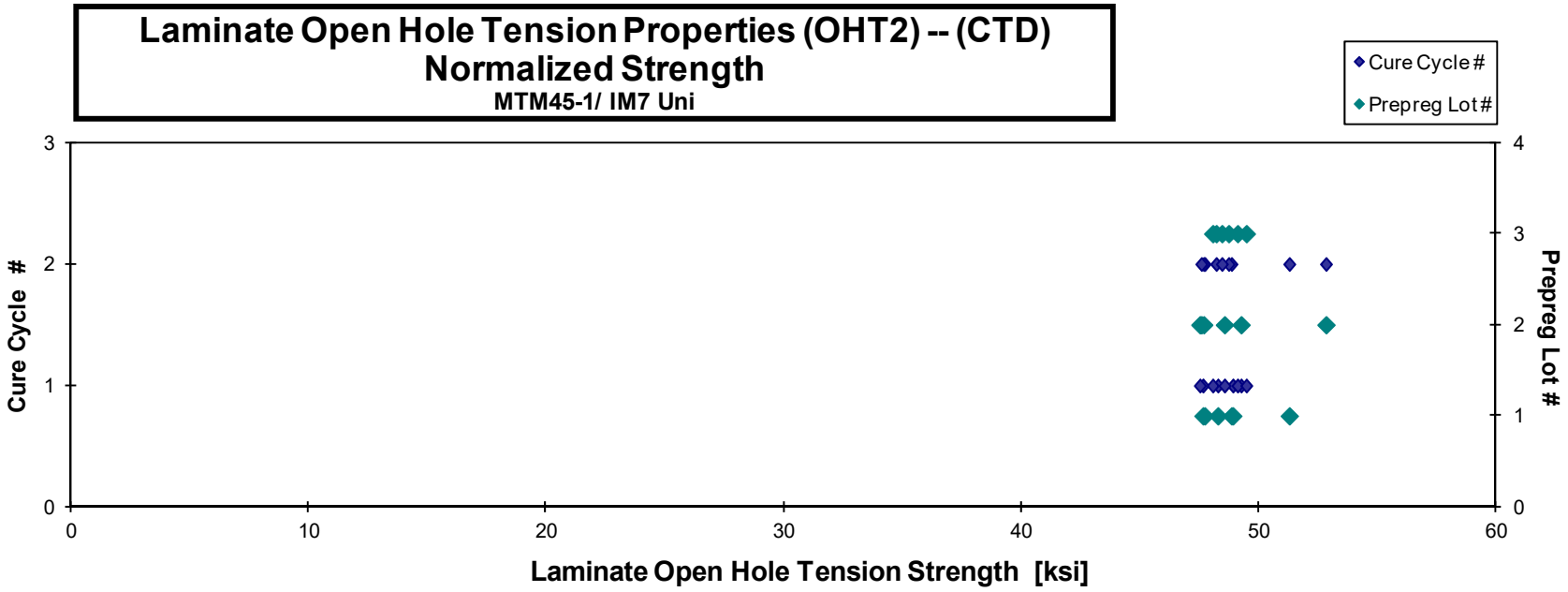
4.17 "10/80/10" Open Hole Tension 2 Properties (OHT2)

Laminate Open Hole Tension Properties (OHT2) -- (CTD)
Strength
MTM45-1/ IM7 Uni

normalizing t_{ply} [in]: 0.0055

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Modes	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
IMU-OHT2-A-MH1-CTD-1	AFEA111B	A	MH1	1	1	48.388	0.110	20	AGM	0.0055	48.256
IMU-OHT2-A-MH1-CTD-2	AFEA112B	A	MH1	1	1	48.890	0.110	20	AGM	0.0055	48.890
IMU-OHT2-A-MH1-CTD-3	AFEA113B	A	MH1	1	1	48.112	0.109	20	AGM	0.0054	47.630
IMU-OHT2-A-MH2-CTD-1	AFEA211B	A	MH2	1	2	46.853	0.112	20	AGM	0.0056	47.705
IMU-OHT2-A-MH2-CTD-2	AFEA212B	A	MH2	1	2	47.829	0.112	20	AGM	0.0056	48.829
IMU-OHT2-A-MH2-CTD-3	AFEA213B	A	MH2	1	2	50.038	0.113	20	AGM	0.0056	51.266
IMU-OHT2-B-MH1-CTD-1	AFEB111B	B	MH1	2	1	46.117	0.113	20	AGM	0.0057	47.501
IMU-OHT2-B-MH1-CTD-2	AFEB112B	B	MH1	2	1	48.487	0.112	20	AGM	0.0056	49.236
IMU-OHT2-B-MH1-CTD-3	AFEB113B	B	MH1	2	1	47.083	0.113	20	AGM	0.0057	48.538
IMU-OHT2-B-MH2-CTD-1	AFEB211B	B	MH2	2	2	47.318	0.111	20	AGM	0.0055	47.662
IMU-OHT2-B-MH2-CTD-2	AFEB212B	B	MH2	2	2	52.194	0.111	20	AGM	0.0056	52.811
IMU-OHT2-B-MH2-CTD-3	AFEB213B	B	MH2	2	2	47.049	0.111	20	AGM	0.0056	47.562
IMU-OHT2-C-MH1-CTD-1	AFEC111B	C	MH1	3	1	47.614	0.113	20	AGM	0.0057	49.086
IMU-OHT2-C-MH1-CTD-2	AFEC112B	C	MH1	3	1	48.016	0.113	20	AGM	0.0057	49.456
IMU-OHT2-C-MH1-CTD-3	AFEC113B	C	MH1	3	1	47.099	0.112	20	AGM	0.0056	48.041
IMU-OHT2-C-MH2-CTD-1	AFEC211B	C	MH2	3	2	48.142	0.111	20	AGM	0.0056	48.711
IMU-OHT2-C-MH2-CTD-2	AFEC212B	C	MH2	3	2	48.102	0.110	20	AGM	0.0055	48.189
IMU-OHT2-C-MH2-CTD-3	AFEC213B	C	MH2	3	2	47.818	0.111	20	AGM	0.0056	48.427

	Strength [ksi]		Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
Average	48.064	$Average_{norm}$	0.0056	48.766
Standard Dev.	1.350	$Standard\ Dev._{norm}$		1.359
Coeff. of Var. [%]	2.809	$Coeff.\ of\ Var.\ [\%]_{norm}$		2.787
Min.	46.117	Min.	0.0054	47.501
Max.	52.194	Max.	0.0057	52.811
Number of Spec.	18	Number of Spec.		18

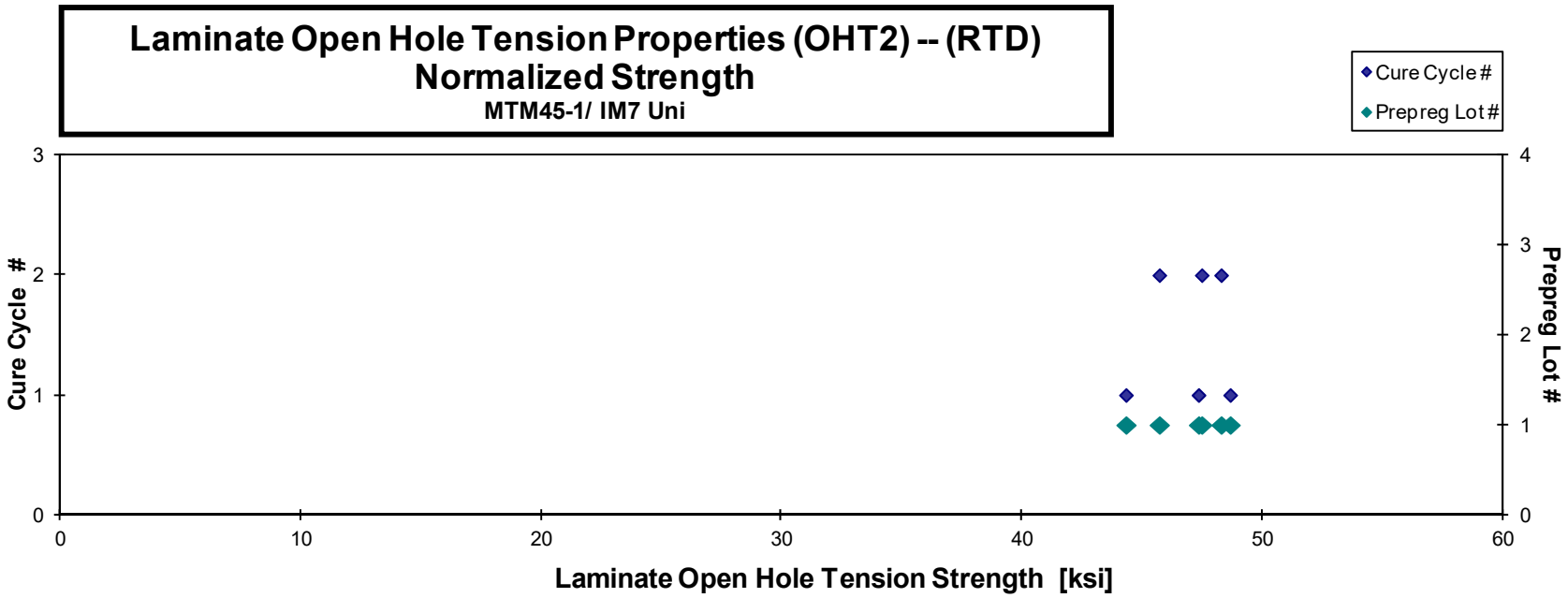

Laminate Open Hole Tension Properties (OHT2) -- (CTD)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0
10
20
30
40
50
60
Laminate Open Hole Tension Strength [ksi]

Laminate Open Hole Tension Properties (OHT2) -- (RTD)
Strength
MTM45-1/ IM7 Uni

normalizing t_{ply} [in]
0.0055

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Modes	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
IMU-OHT2-A-MH1-RTD-1	AFEA111A	A	MH1	1	1	48.898	0.110	20	AGM	0.0055	48.675
IMU-OHT2-A-MH1-RTD-2	AFEA112A	A	MH1	1	1	47.060	0.111	20	AGM	0.0055	47.359
IMU-OHT2-A-MH1-RTD-3	AFEA113A	A	MH1	1	1	44.461	0.110	20	AGM	0.0055	44.340
IMU-OHT2-A-MH2-RTD-1	AFEA211A	A	MH2	1	2	46.850	0.113	20	AGM	0.0057	48.298
IMU-OHT2-A-MH2-RTD-2	AFEA212A	A	MH2	1	2	46.478	0.112	20	AGM	0.0056	47.492
IMU-OHT2-A-MH2-RTD-3	AFEA213A	A	MH2	1	2	44.711	0.113	20	AGM	0.0056	45.728

Average	**46.410**		**$Average_{norm}$**	**0.0056**	**46.982**
Standard Dev.	**1.643**		**$Standard\ Dev._{norm}$**		**1.647**
Coeff. of Var. [%]	**3.539**		**$Coeff.\ of\ Var.\ [\%]_{norm}$**		**3.505**
Min.	**44.461**		**Min.**	**0.0055**	**44.340**
Max.	**48.898**		**Max.**	**0.0057**	**48.675**
Number of Spec.	**6**		**Number of Spec.**		**6**

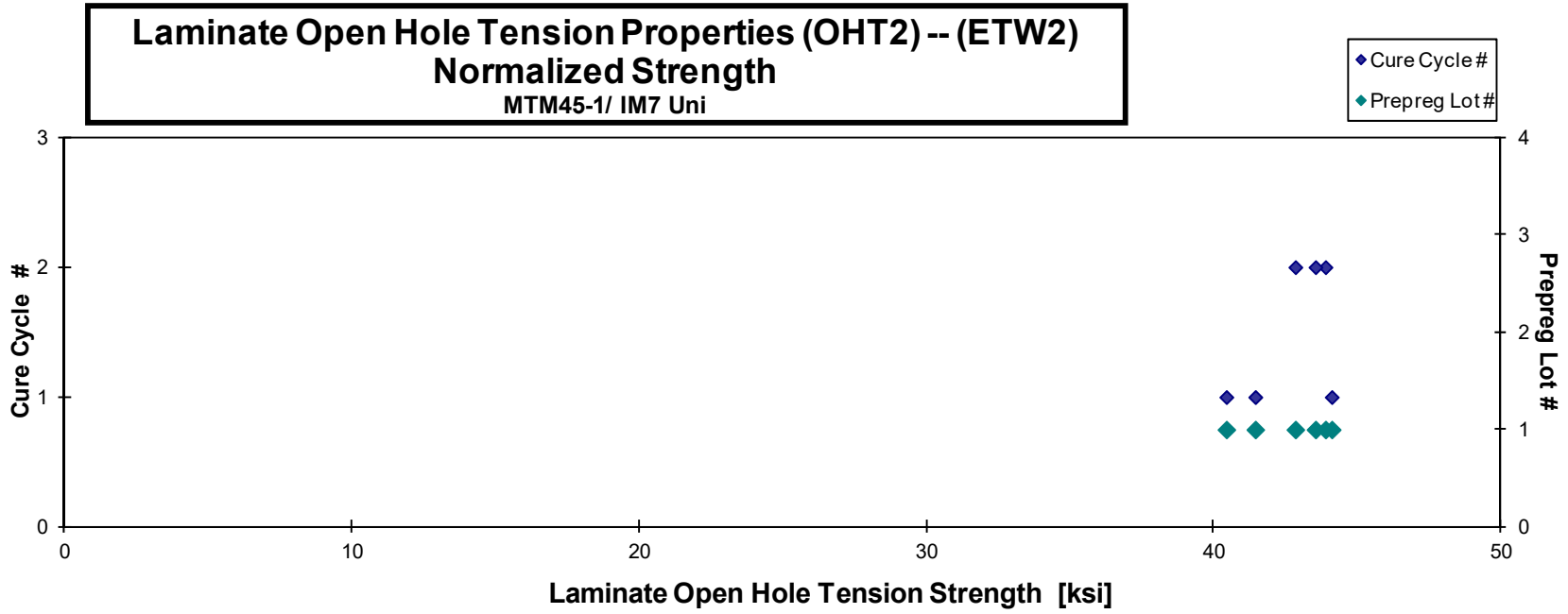

Laminate Open Hole Tension Properties (OHT2) -- (RTD)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0
10
20
30
40
50
60
Laminate Open Hole Tension Strength [ksi]

Laminate Open Hole Tension Properties (OHT2) -- (ETW2)
Strength
MTM45-1/ IM7 Uni

normalizing t_{ply} [in]
0.0055

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Modes	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
IMU-OHT2-A-MH1-ETW2-1	AFEA111D	A	MH1	1	1	41.510	0.110	20	AGM	0.0055	41.453
IMU-OHT2-A-MH1-ETW2-2	AFEA112D	A	MH1	1	1	43.789	0.111	20	AGM	0.0055	44.114
IMU-OHT2-A-MH1-ETW2-3	AFEA113D	A	MH1	1	1	40.341	0.110	20	AGM	0.0055	40.445
IMU-OHT2-A-MH2-ETW2-1	AFEA211D	A	MH2	1	2	41.716	0.113	20	AGM	0.0056	42.847
IMU-OHT2-A-MH2-ETW2-2	AFEA212D	A	MH2	1	2	42.368	0.114	20	AGM	0.0057	43.896
IMU-OHT2-A-MH2-ETW2-3	AFEA213D	A	MH2	1	2	42.524	0.113	20	AGM	0.0056	43.548

Average	**42.041**		**$Average_{norm}$**	**0.0056**	**42.717**
Standard Dev.	**1.155**		**$Standard\ Dev._{norm}$**		**1.470**
Coeff. of Var. [%]	**2.748**		**$Coeff.\ of\ Var.\ [\%]_{norm}$**		**3.442**
Min.	**40.341**		**Min.**	**0.0055**	**40.445**
Max.	**43.789**		**Max.**	**0.0057**	**44.114**
Number of Spec.	**6**		**Number of Spec.**		**6**


Laminate Open Hole Tension Properties (OHT2) -- (ETW2)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Open Hole Tension Strength [ksi]
0
1
2
3
4
0
10
20
30
40
50

4.18 "50/40/10" Open Hole Tension 3 Properties (OHT3)

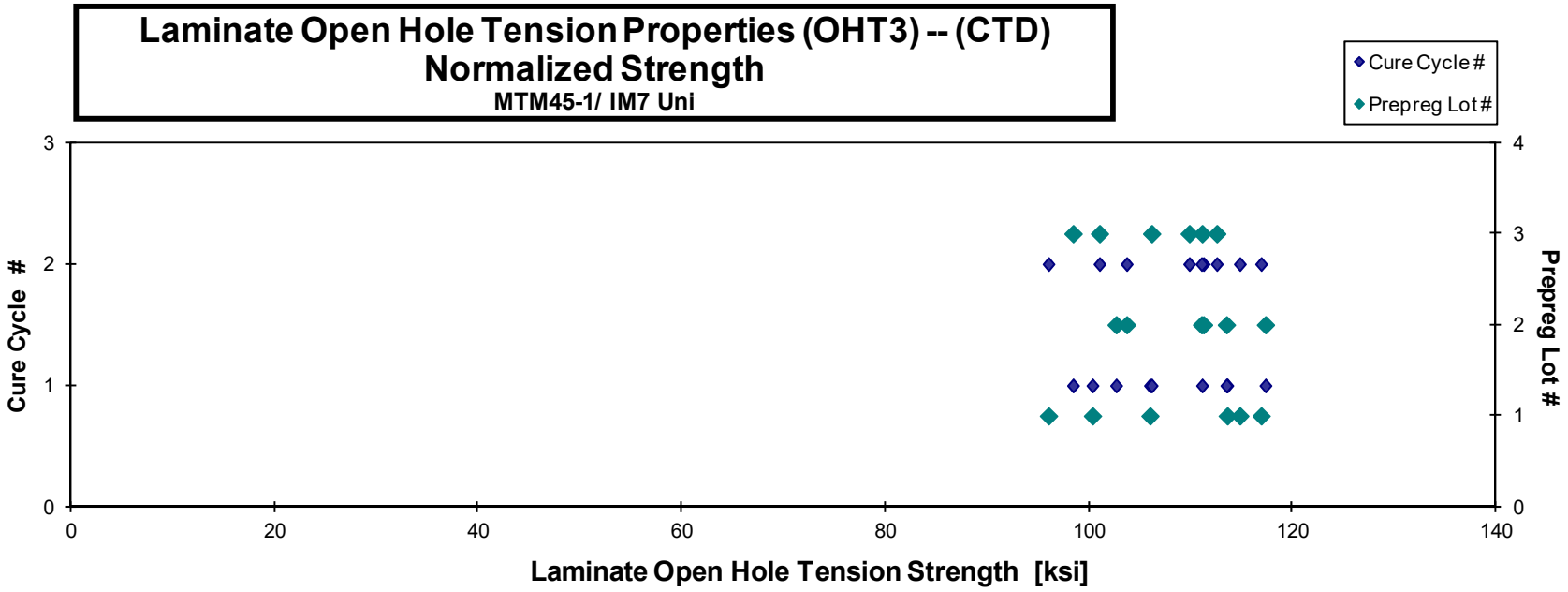
Laminate Open Hole Tension Properties (OHT3) -- (CTD)
Strength
MTM45-1/ IM7 Uni

normalizing t_{ply} [in]: 0.0055

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Modes	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
IMU-OHT3-A-MH1-CTD-1	AFFA111B	A	MH1	1	1	106.709	0.109	20	SGM / LGM	0.0055	105.933
IMU-OHT3-A-MH1-CTD-2	AFFA112B	A	MH1	1	1	101.392	0.109	20	SGM / LGM	0.0054	100.286
IMU-OHT3-A-MH1-CTD-3	AFFA113B	A	MH1	1	1	114.880	0.109	20	LGM	0.0054	113.523
IMU-OHT3-A-MH2-CTD-1	AFFA211B	A	MH2	1	2	94.084	0.112	20	AGM	0.0056	95.966
IMU-OHT3-A-MH2-CTD-2	AFFA212B	A	MH2	1	2	112.559	0.114	20	AGM / SGM	0.0057	116.857
IMU-OHT3-A-MH2-CTD-3	AFFA213B	A	MH2	1	2	109.294	0.116	20	DGM / SGM	0.0058	114.759
IMU-OHT3-B-MH1-CTD-1	AFFB111B	B	MH1	2	1	103.934	0.109	20	LGM	0.0054	102.611
IMU-OHT3-B-MH1-CTD-2	AFFB112B	B	MH1	2	1	118.679	0.109	20	LGM	0.0054	117.277
IMU-OHT3-B-MH1-CTD-3	AFFB113B	B	MH1	2	1	113.445	0.110	20	LGM	0.0055	113.445
IMU-OHT3-B-MH2-CTD-1	AFFB211B	B	MH2	2	2	98.454	0.116	20	LGM / DGM	0.0058	103.645
IMU-OHT3-B-MH2-CTD-2	AFFB212B	B	MH2	2	2	107.672	0.114	20	LGM / DGM	0.0057	111.196
IMU-OHT3-B-MH2-CTD-3	AFFB213B	B	MH2	2	2	107.386	0.114	20	LGM / DGM	0.0057	110.998
IMU-OHT3-C-MH1-CTD-1	AFFC111B	C	MH1	3	1	110.750	0.110	20	LGM / DGM	0.0055	111.052
IMU-OHT3-C-MH1-CTD-2	AFFC112B	C	MH1	3	1	97.668	0.111	20	LGM / DGM	0.0055	98.379
IMU-OHT3-C-MH1-CTD-3	AFFC113B	C	MH1	3	1	106.099	0.110	20	LGM / DGM	0.0055	106.099
IMU-OHT3-C-MH2-CTD-1*	AFFC211B	C	MH2	3	2	109.397	0.110	20	LGM / DGM	0.0055	109.795
IMU-OHT3-C-MH2-CTD-2	AFFC212B	C	MH2	3	2	100.515	0.111	20	LGM / DGM	0.0055	100.972
IMU-OHT3-C-MH2-CTD-3*	AFFC213B	C	MH2	3	2	112.597	0.110	20	LGM / DGM	0.0055	112.494

*** Specimen slipped during testing.**

	Strength [ksi]		$Strength_{norm}$ [ksi]
Average	106.973	$Average_{norm}$	108.072
Standard Dev.	6.592	$Standard\ Dev._{norm}$	6.527
Coeff. of Var. [%]	6.162	Coeff. of Var. $[\%]_{norm}$	6.040
Min.	94.084	Min.	95.966
Max.	118.679	Max.	117.277
Number of Spec.	18	Number of Spec.	18


Laminate Open Hole Tension Properties (OHT3) -- (CTD)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Open Hole Tension Strength [ksi]
0
20
40
60
80
100
120
140
0
1
2
3
4

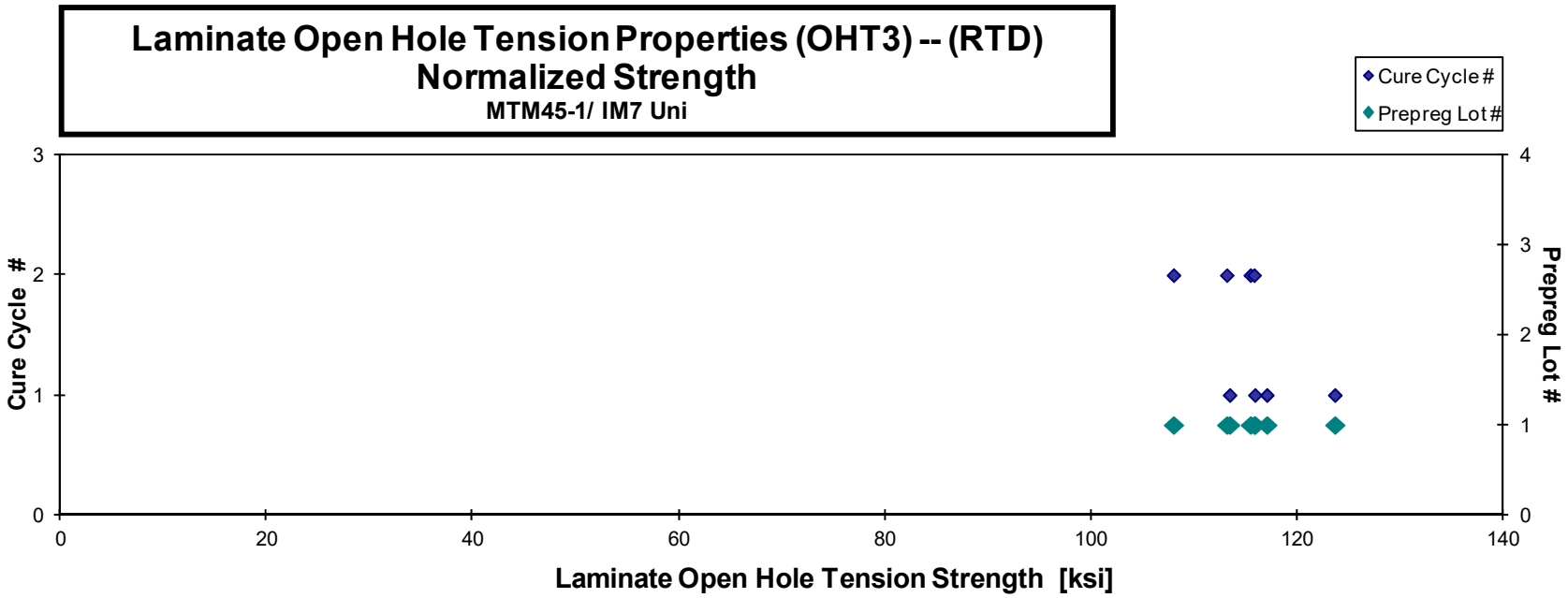
Laminate Open Hole Tension Properties (OHT3) -- (RTD)
Strength
MTM45-1/ IM7 Uni

normalizing t_{ply} [in]: 0.0055

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Modes	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
IMU-OHT3-A-MH1-RTD-1*	AFFA111A	A	MH1	1	1	124.068	0.110	20	LGM	0.0055	123.730
IMU-OHT3-A-MH1-RTD-2	AFFA112A	A	MH1	1	1	113.831	0.110	20	LGM / SGM	0.0055	113.521
IMU-OHT3-A-MH1-RTD-3	AFFA113A	A	MH1	1	1	116.293	0.110	20	LGM	0.0055	115.976
IMU-OHT3-A-MH1-RTD-4	AFFA114A	A	MH1	1	1	118.313	0.109	20	LGM	0.0054	117.130
IMU-OHT3-A-MH2-RTD-1	AFFA211A	A	MH2	1	2	109.268	0.114	20	LGM	0.0057	113.242
IMU-OHT3-A-MH2-RTD-2	AFFA212A	A	MH2	1	2	103.462	0.115	20	LGM / DGM	0.0057	108.071
IMU-OHT3-A-MH2-RTD-3	AFFA213A	A	MH2	1	2	110.995	0.115	20	LGM	0.0057	115.536
IMU-OHT3-A-MH2-RTD-4	AFFA214A	A	MH2	1	2	111.143	0.115	20	LGM / DGM	0.0057	115.892

*** Specimen slipped during testing.**

Average	**113.422**		**Average$_{norm}$**	**0.0056**	**115.387**
Standard Dev.	**6.247**		**Standard Dev.$_{norm}$**		**4.389**
Coeff. of Var. [%]	**5.508**		**Coeff. of Var. [%]$_{norm}$**		**3.804**
Min.	**103.462**		**Min.**	**0.0054**	**108.071**
Max.	**124.068**		**Max.**	**0.0057**	**123.730**
Number of Spec.	**8**		**Number of Spec.**		**8**

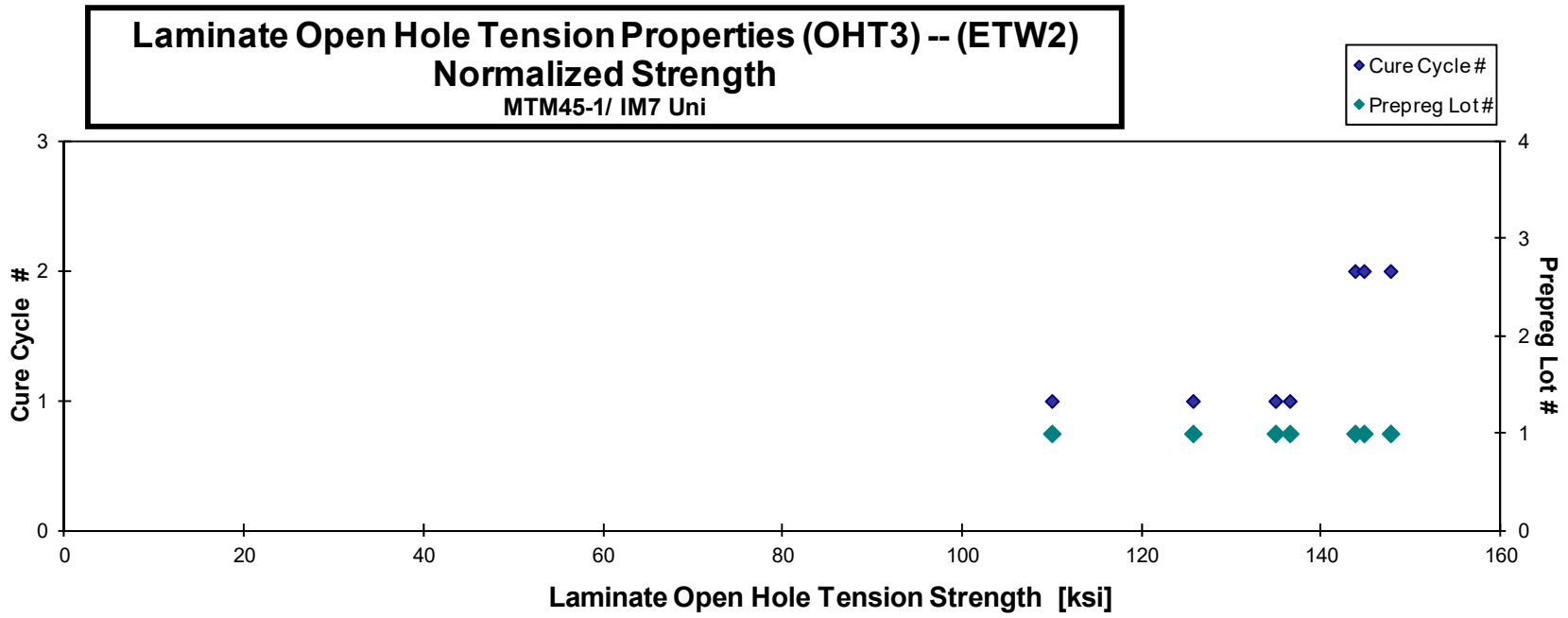

Laminate Open Hole Tension Properties (OHT3) -- (RTD)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0
20
40
60
80
100
120
140
Laminate Open Hole Tension Strength [ksi]

Laminate Open Hole Tension Properties (OHT3) -- (ETW2)
Strength
MTM45-1/ IM7 Uni

normalizing t_{ply} [in]
0.0055

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Modes	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
IMU-OHT3-A-MH1-ETW2-1	AFFA111D	A	MH1	1	1	112.018	0.108	20	AGM	0.0054	109.981
IMU-OHT3-A-MH1-ETW2-2	AFFA112D	A	MH1	1	1	136.210	0.109	20	AGM	0.0054	134.889
IMU-OHT3-A-MH1-ETW2-3	AFFA113D	A	MH1	1	1	137.904	0.109	20	AGM	0.0054	136.483
IMU-OHT3-A-MH1-ETW2-4	AFFA114D	A	MH1	1	1	126.932	0.109	20	AGM	0.0054	125.701
IMU-OHT3-A-MH2-ETW2-2	AFFA212D	A	MH2	1	2	141.013	0.112	20	AGM	0.0056	143.747
IMU-OHT3-A-MH2-ETW2-3	AFFA213D	A	MH2	1	2	143.917	0.113	20	AGM	0.0056	147.711
IMU-OHT3-A-MH2-ETW2-4	AFFA214D	A	MH2	1	2	137.235	0.116	20	AGM	0.0058	144.741

Average	**133.604**	**$Average_{norm}$**	**0.0055**	**134.751**
Standard Dev.	**10.880**	**$Standard\ Dev._{norm}$**		**13.211**
Coeff. of Var. [%]	**8.143**	**$Coeff.\ of\ Var.\ [\%]_{norm}$**		**9.804**
Min.	**112.018**	**Min.**	**0.0054**	**109.981**
Max.	**143.917**	**Max.**	**0.0058**	**147.711**
Number of Spec.	**7**	**Number of Spec.**		**7**


Laminate Open Hole Tension Properties (OHT3) -- (ETW2)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Open Hole Tension Strength [ksi]
0
20
40
60
80
100
120
140
160
0
1
2
3
4

4.19 "25/50/25" Filled-Hole Tension 1 Properties (FHT1)

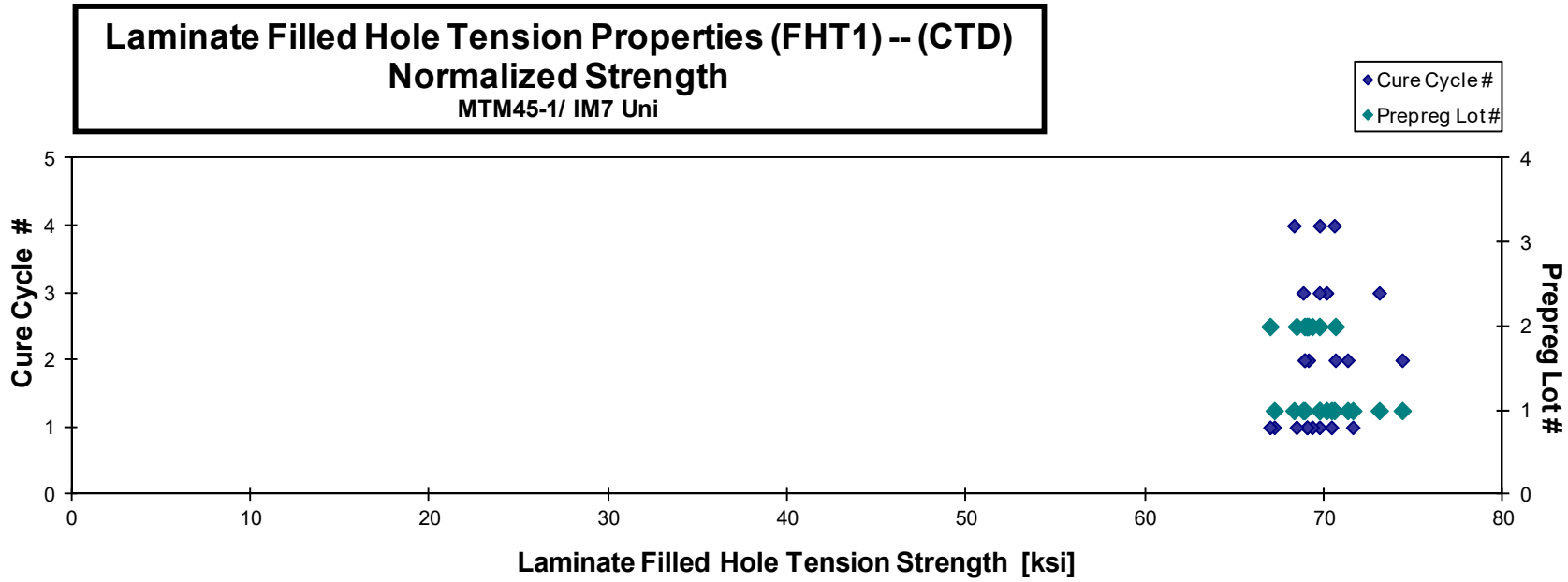
Laminate Filled Hole Tension Properties (FHT1) -- (CTD)
Strength
MTM45-1/ IM7 Uni

normalizing t_{ply} [in]
0.0055

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
IMU-FHT1-A-MH1-CTD-1	AF4A111B	A	MH1	1	1	65.913	0.135	24	LGM	0.0056	67.212
IMU-FHT1-A-MH1-CTD-2	AF4A112B	A	MH1	1	1	70.248	0.132	24	AGM	0.0055	70.407
IMU-FHT1-A-MH1-CTD-3	AF4A113B	A	MH1	1	1	70.952	0.133	24	LGM	0.0056	71.597
IMU-FHT1-A-MH2-CTD-1	AF4A211B	A	MH2	1	2	71.096	0.132	24	LGM	0.0055	71.311
IMU-FHT1-A-MH2-CTD-2	AF4A212B	A	MH2	1	2	68.799	0.132	24	AGM	0.0055	68.903
IMU-FHT1-A-MH2-CTD-3	AF4A213B	A	MH2	1	2	73.746	0.133	24	LGM / AGM	0.0055	74.361
IMU-FHT1-B-MH1-CTD-1	AF4B111B	B	MH1	2	1	67.999	0.134	24	LGM	0.0056	69.030
IMU-FHT1-B-MH1-CTD-2	AF4B112B	B	MH1	2	1	68.743	0.134	24	LGM	0.0056	69.733
IMU-FHT1-B-MH1-CTD-3	AF4B113B	B	MH1	2	1	65.535	0.135	24	LGM	0.0056	66.975
IMU-FHT1-B-MH1	AF4B121B*	B	MH1	2	1	68.718	0.133	24	AGM	0.0055	69.325
IMU-FHC1-B-MH1	AF4B171B*	B	MH1	2	1	69.012	0.132	24	AGM	0.0055	69.038
IMU-OHT1-B-MH1	AF4B1D1B*	B	MH1	2	1	68.947	0.131	24	AGM	0.0055	68.451
IMU-FHT1-B-MH2-CTD-1	AF4B211B	B	MH2	2	2	67.829	0.135	24	AGM	0.0056	69.114
IMU-FHT1-B-MH2-CTD-2	AF4B212B	B	MH2	2	2	68.751	0.136	24	LGM	0.0057	70.627
IMU-FHT1-B-MH2-CTD-3	AF4B213B	B	MH2	2	2	67.670	0.134	24	AGM	0.0056	68.900
IMU-FHT1-A-MH3-CTD-1	AF4C111B	A	MH3	1	3	68.418	0.135	24	AGM	0.0056	70.128
IMU-FHT1-A-MH3-CTD-2	AF4C112B	A	MH3	1	3	66.649	0.136	24	LGM	0.0057	68.820
IMU-FHT1-A-MH3-CTD-3	AF4C113B	A	MH3	1	3	67.779	0.136	24	LGM	0.0057	69.730
IMU-FHT1-A-MH3-CTD-4	AF4C114B	A	MH3	1	3	70.825	0.136	24	LGM	0.0057	73.079
IMU-FHT1-A-MH4-CTD-1	AF4C211B	A	MH4	1	4	67.151	0.137	24	AGM	0.0057	69.746
IMU-FHT1-A-MH4-CTD-2	AF4C212B	A	MH4	1	4	65.818	0.137	24	AGM	0.0057	68.311
IMU-FHT1-A-MH4-CTD-3	AF4C213B	A	MH4	1	4	68.792	0.135	24	AGM	0.0056	70.564

* Additional test specimens were machined from respective panel

Average	**68.609**		**$Average_{norm}$**	**0.0056**	**69.789**
Standard Dev.	**1.941**		**$Standard\ Dev._{norm}$**		**1.718**
Coeff. of Var. [%]	**2.829**		**Coeff. of Var. $[\%]_{norm}$**		**2.462**
Min.	**65.535**		**Min.**	**0.0055**	**66.975**
Max.	**73.746**		**Max.**	**0.0057**	**74.361**
Number of Spec.	**22**		**Number of Spec.**		**22**

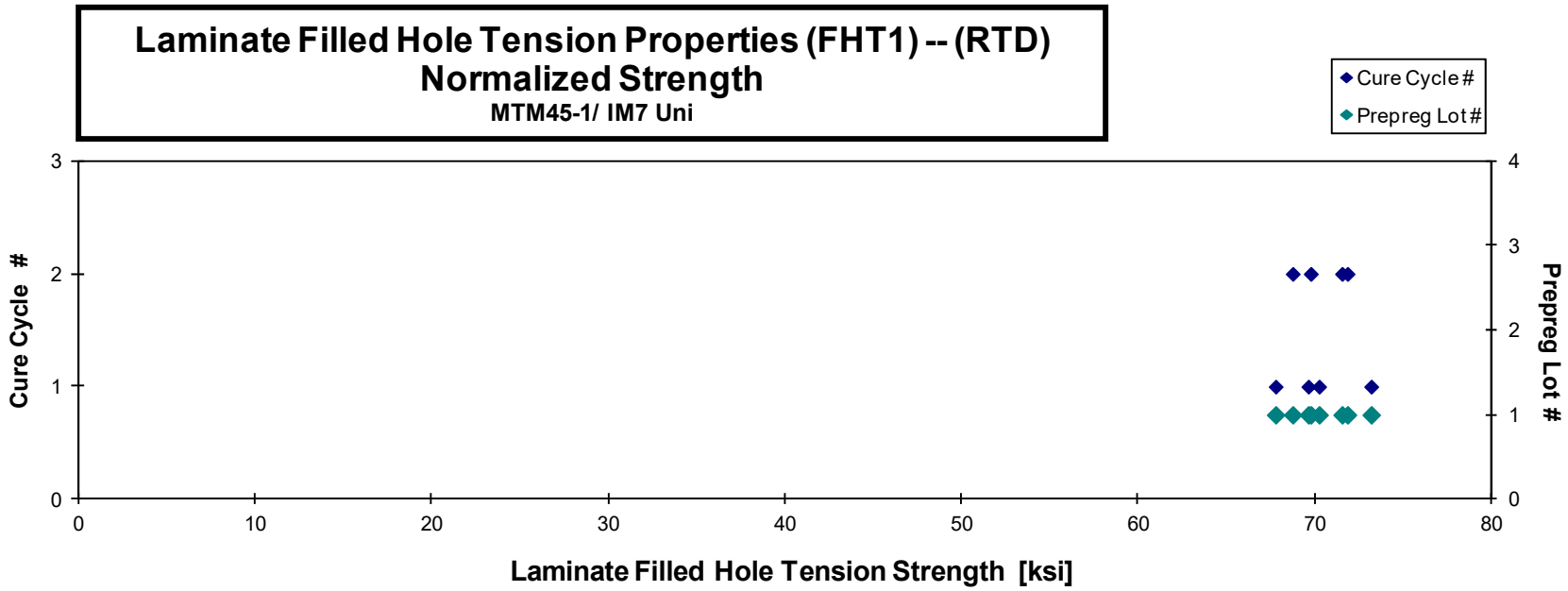

Laminate Filled Hole Tension Properties (FHT1) -- (CTD)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
5
0
10
20
30
40
50
60
70
80
Laminate Filled Hole Tension Strength [ksi]

Laminate Filled Hole Tension Properties (FHT1) -- (RTD)
Strength
MTM45-1/ IM7 Uni

normalizing t_{ply} [in]
0.0055

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
IMU-FHT1-A-MH1-RTD-1	AF4A111A	A	MH1	1	1	68.902	0.133	24	AGM	0.0056	69.633
IMU-FHT1-A-MH1-RTD-2	AF4A112A	A	MH1	1	1	72.100	0.134	24	AGM	0.0056	73.193
IMU-FHT1-A-MH1-RTD-3	AF4A113A	A	MH1	1	1	68.683	0.135	24	LGM	0.0056	70.244
IMU-FHT1-A-MH1-RTD-4	AF4A114A	A	MH1	1	1	66.179	0.135	24	LGM	0.0056	67.783
IMU-FHT1-A-MH2-RTD-1	AF4A211A	A	MH1	1	2	68.541	0.132	24	AGM	0.0055	68.749
IMU-FHT1-A-MH2-RTD-2	AF4A212A	A	MH1	1	2	69.985	0.132	24	AGM	0.0055	69.773
IMU-FHT1-A-MH2-RTD-3	AF4A213A	A	MH1	1	2	71.273	0.133	24	AGM	0.0055	71.543
IMU-FHT1-A-MH2-RTD-4	AF4A214A	A	MH1	1	2	71.522	0.133	24	AGM	0.0055	71.847

Average	**69.648**		**$Average_{norm}$**	**0.0056**	**70.346**
Standard Dev.	**1.965**		**$Standard\ Dev._{norm}$**		**1.763**
Coeff. of Var. [%]	**2.821**		**$Coeff.\ of\ Var.\ [\%]_{norm}$**		**2.506**
Min.	**66.179**		**Min.**	**0.0055**	**67.783**
Max.	**72.100**		**Max.**	**0.0056**	**73.193**
Number of Spec.	**8**		**Number of Spec.**		**8**


Laminate Filled Hole Tension Properties (FHT1) -- (RTD)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Filled Hole Tension Strength [ksi]
0
1
2
3
0
10
20
30
40
50
60
70
80
4

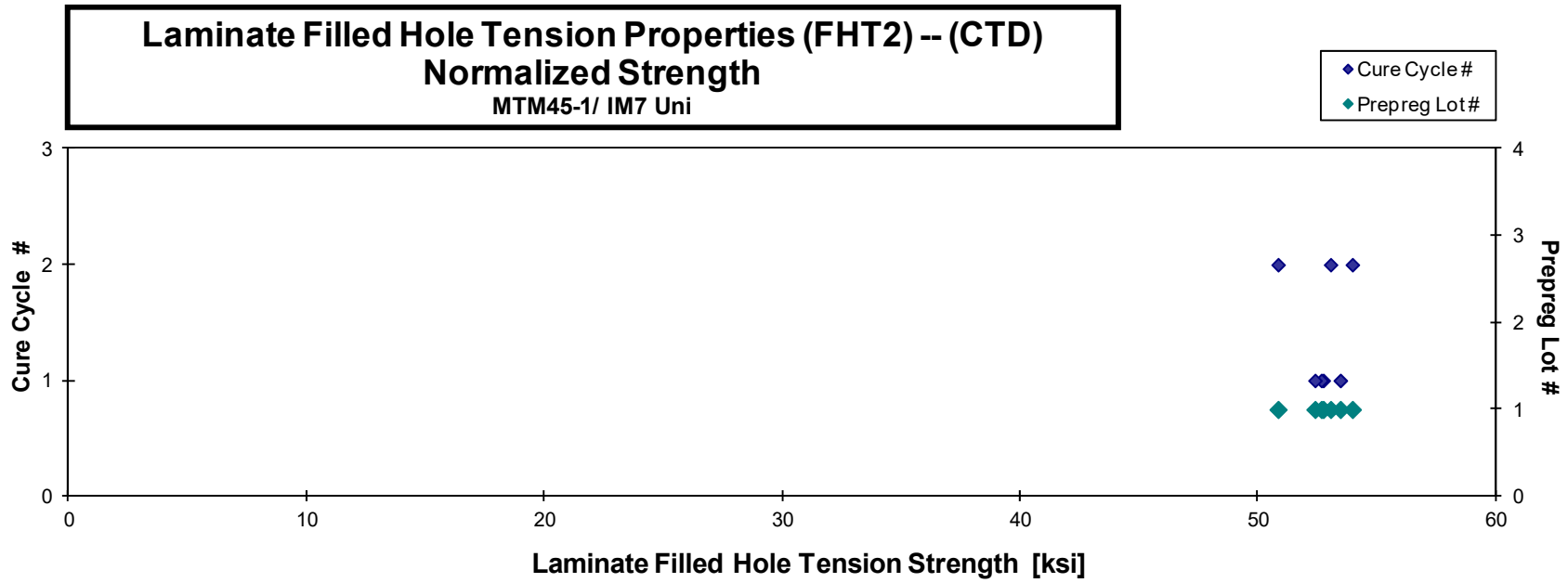
4.20 "10/80/10" Filled-Hole Tension 2 Properties (FHT2)

Laminate Filled Hole Tension Properties (FHT2) -- (CTD)
Strength
MTM45-1/ IM7 Uni

normalizing t_{ply} [in]: 0.0055

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
IMU-FHT2-A-MH1-CTD-1	AF5A111B	A	MH1	1	1	50.975	0.114	20	AGM	0.0057	52.736
IMU-FHT2-A-MH1-CTD-2	AF5A112B	A	MH1	1	1	52.130	0.113	20	AGM	0.0056	53.457
IMU-FHT2-A-MH1-CTD-3	AF5A113B	A	MH1	1	1	50.899	0.114	20	AGM	0.0057	52.657
IMU-FHT2-A-MH1-CTD-4	AF5A114B	A	MH1	1	1	50.730	0.114	20	AGM	0.0057	52.390
IMU-FHT2-A-MH2-CTD-1	AF5A211B	A	MH2	1	2	51.007	0.114	20	AGM	0.0057	53.048
IMU-FHT2-A-MH2-CTD-2	AF5A212B	A	MH2	1	2	48.503	0.115	20	AGM	0.0058	50.840
IMU-FHT2-A-MH2-CTD-3	AF5A213B	A	MH2	1	2	51.480	0.115	20	AGM	0.0058	53.961

Average	**50.818**		**Average$_{norm}$**	**0.0057**	**52.727**
Standard Dev.	**1.125**		**Standard Dev.$_{norm}$**		**0.986**
Coeff. of Var. [%]	**2.214**		**Coeff. of Var. [%]$_{norm}$**		**1.871**
Min.	**48.503**		**Min.**	**0.0056**	**50.840**
Max.	**52.130**		**Max.**	**0.0058**	**53.961**
Number of Spec.	**7**		**Number of Spec.**		**7**

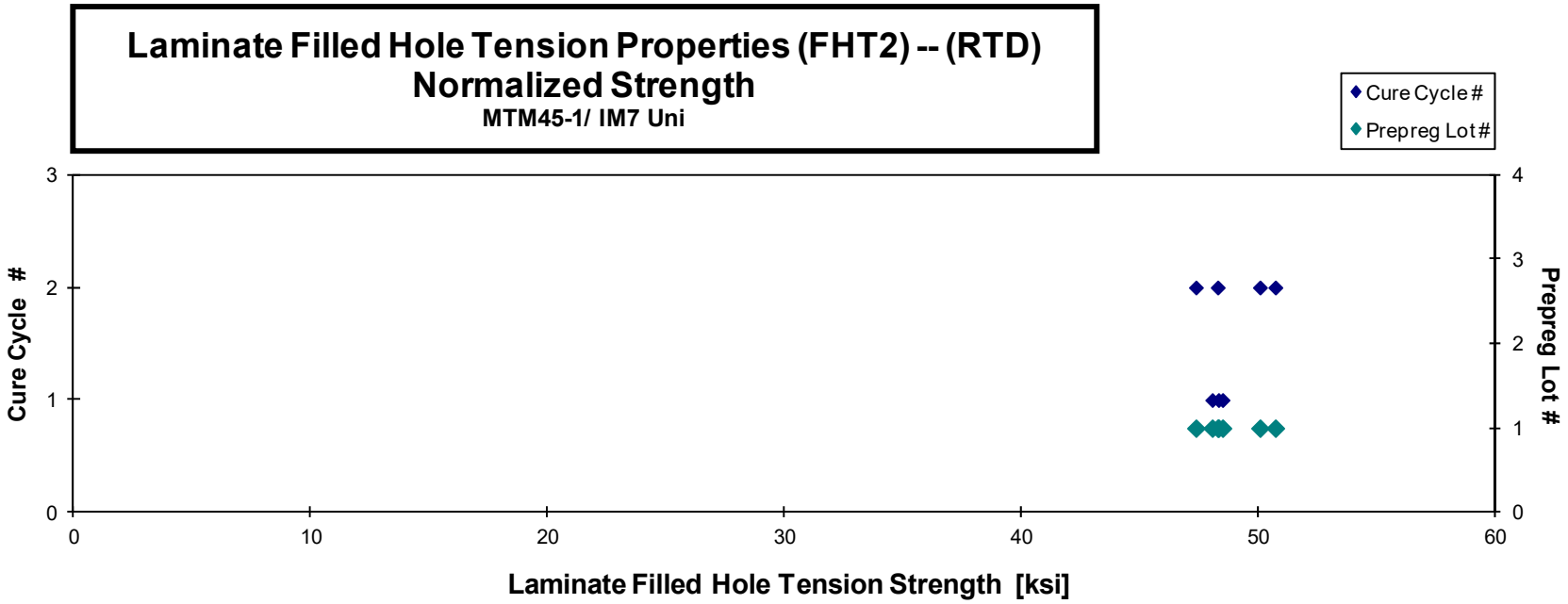

Laminate Filled Hole Tension Properties (FHT2) -- (CTD)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0
10
20
30
40
50
60
Laminate Filled Hole Tension Strength [ksi]

Laminate Filled Hole Tension Properties (FHT2) -- (RTD)
Strength
MTM45-1/ IM7 Uni

normalizing t_{ply} [in]: 0.0055

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
IMU-FHT2-A-MH1-RTD-1	AF5A111A	A	MH1	1	1	47.285	0.113	20	AGM	0.0056	48.488
IMU-FHT2-A-MH1-RTD-2	AF5A112A	A	MH1	1	1	46.954	0.113	20	AGM	0.0057	48.320
IMU-FHT2-A-MH1-RTD-3	AF5A113A	A	MH1	1	1	46.860	0.113	20	AGM	0.0056	48.053
IMU-FHT2-A-MH2-RTD-1	AF5A211A	A	MH2	1	2	46.672	0.114	20	LGM	0.0057	48.284
IMU-FHT2-A-MH2-RTD-2	AF5A212A	A	MH2	1	2	45.464	0.115	20	AGM	0.0057	47.365
IMU-FHT2-A-MH2-RTD-3	AF5A213A	A	MH2	1	2	48.898	0.114	20	AGM	0.0057	50.720
IMU-FHT2-A-MH2-RTD-4	AF5A214A	A	MH2	1	2	48.311	0.114	20	AGM	0.0057	50.068

Average	**47.206**		**Average$_{norm}$**	**0.0057**	**48.757**
Standard Dev.	**1.125**		**Standard Dev.$_{norm}$**		**1.190**
Coeff. of Var. [%]	**2.383**		**Coeff. of Var. [%]$_{norm}$**		**2.440**
Min.	**45.464**		**Min.**	**0.0056**	**47.365**
Max.	**48.898**		**Max.**	**0.0057**	**50.720**
Number of Spec.	**7**		**Number of Spec.**		**7**

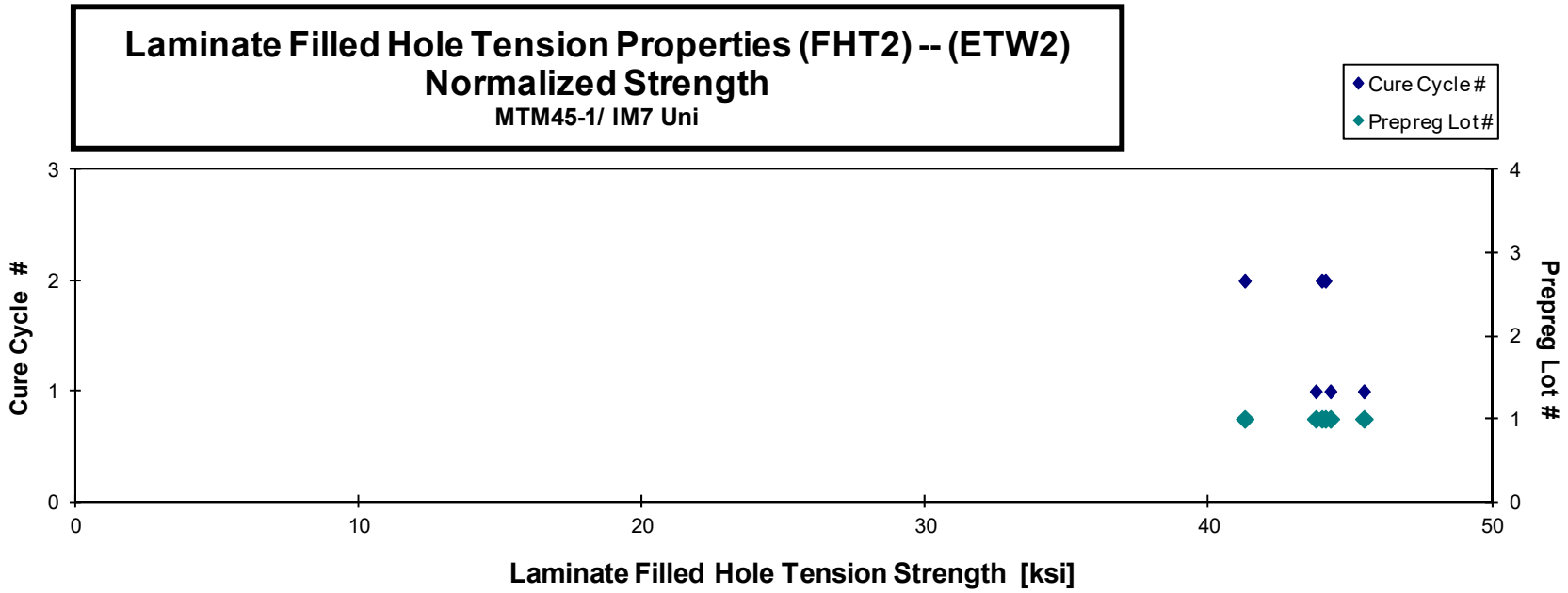

Laminate Filled Hole Tension Properties (FHT2) -- (RTD)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Filled Hole Tension Strength [ksi]
0
1
2
3
4
0
10
20
30
40
50
60

Laminate Filled Hole Tension Properties (FHT2) -- (ETW2)
Strength
MTM45-1/ IM7 Uni

normalizing t_{ply} [in]
0.0055

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
IMU-FHT2-A-MH1-ETW2-1	AF5A111D	A	MH1	1	1	41.597	0.116	20	AGM	0.0058	43.759
IMU-FHT2-A-MH1-ETW2-2	AF5A112D	A	MH1	1	1	42.572	0.114	20	AGM	0.0057	44.275
IMU-FHT2-A-MH1-ETW2-3	AF5A113D	A	MH1	1	1	43.362	0.115	20	AGM	0.0058	45.458
IMU-FHT2-A-MH2-ETW2-1	AF5A211D	A	MH2	1	2	42.593	0.114	20	AGM	0.0057	44.096
IMU-FHT2-A-MH2-ETW2-2	AF5A212D	A	MH2	1	2	40.003	0.113	20	AGM	0.0057	41.251
IMU-FHT2-A-MH2-ETW2-3	AF5A213D	A	MH2	1	2	42.088	0.115	20	AGM	0.0057	43.969

Average	**42.036**		**$Average_{norm}$**	**0.0057**	**43.801**
Standard Dev.	**1.156**		**$Standard\ Dev._{norm}$**		**1.385**
Coeff. of Var. [%]	**2.751**		**$Coeff.\ of\ Var.\ [\%]_{norm}$**		**3.162**
Min.	**40.003**		**Min.**	**0.0057**	**41.251**
Max.	**43.362**		**Max.**	**0.0058**	**45.458**
Number of Spec.	**6**		**Number of Spec.**		**6**


Laminate Filled Hole Tension Properties (FHT2) -- (ETW2)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Filled Hole Tension Strength [ksi]
0
10
20
30
40
50
0
1
2
3
0
1
2
3
4

4.21 "50/40/10" Filled-Hole Tension 3 Properties (FHT3)

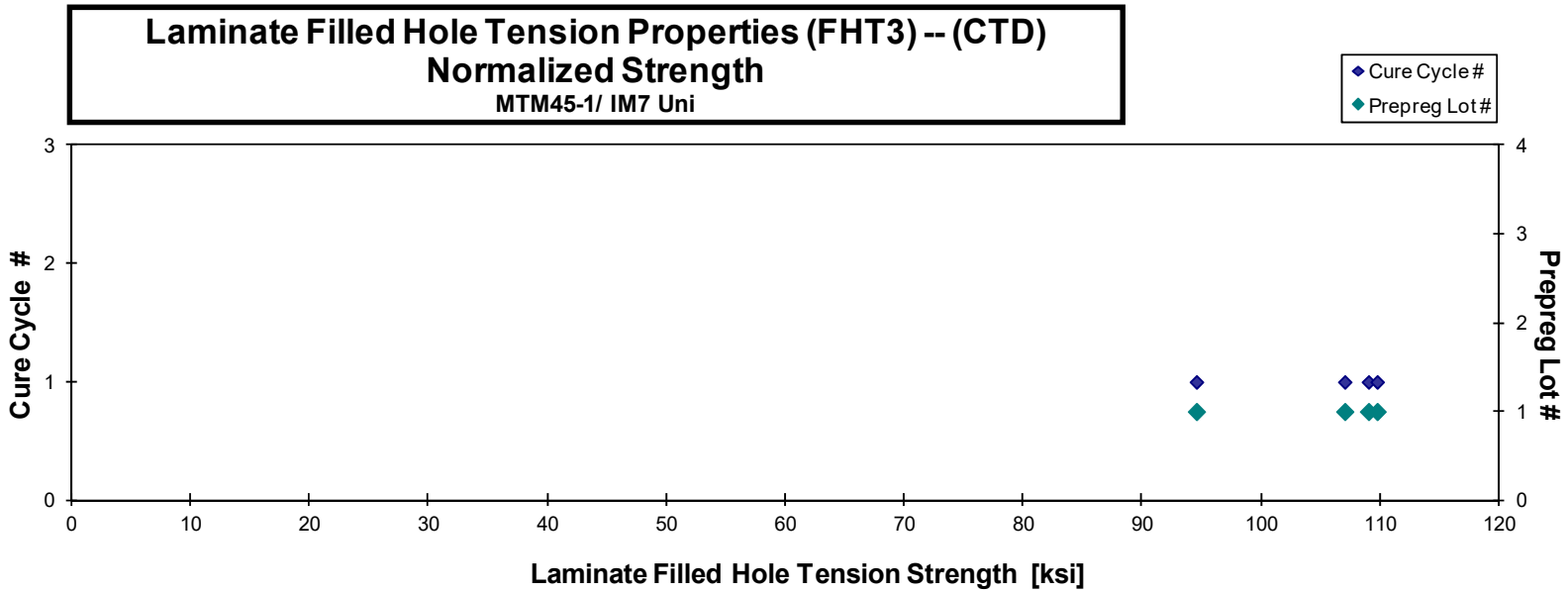
Laminate Filled Hole Tension Properties (FHT3) -- (CTD)
Strength
MTM45-1/ IM7 Uni

normalizing t_{ply} [in]
0.0055

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
IMU-FHT3-A-MH1-CTD-1	AF6A121B	A	MH1	1	1	102.370	0.115	20	LGM	0.0058	107.023
IMU-FHT3-A-MH1-CTD-2	AF6A122B	A	MH1	1	1	104.730	0.115	20	AGM/SGM	0.0057	109.014
IMU-FHT3-A-MH1-CTD-3	AF6A123B	A	MH1	1	1	90.445	0.115	20	LGM	0.0058	94.556
IMU-FHT3-A-MH1-CTD-4	AF6A124B	A	MH1	1	1	103.532	0.117	20	LGM	0.0058	109.744

*Data for IMU-FHT3-A-MH2 was not included, refer to Section 9.0 Deviations for further explanation.

Average	**100.269**	**Average$_{norm}$**	**0.0058**	**105.084**
Standard Dev.	**6.620**	**Standard Dev.$_{norm}$**		**7.112**
Coeff. of Var. [%]	**6.602**	**Coeff. of Var. [%]$_{norm}$**		**6.768**
Min.	**90.445**	**Min.**	**0.0057**	**94.556**
Max.	**104.730**	**Max.**	**0.0058**	**109.744**
Number of Spec.	**4**	**Number of Spec.**		**4**


Laminate Filled Hole Tension Properties (FHT3) -- (CTD)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0
10
20
30
40
50
60
70
80
90
100
110
120
Laminate Filled Hole Tension Strength [ksi]

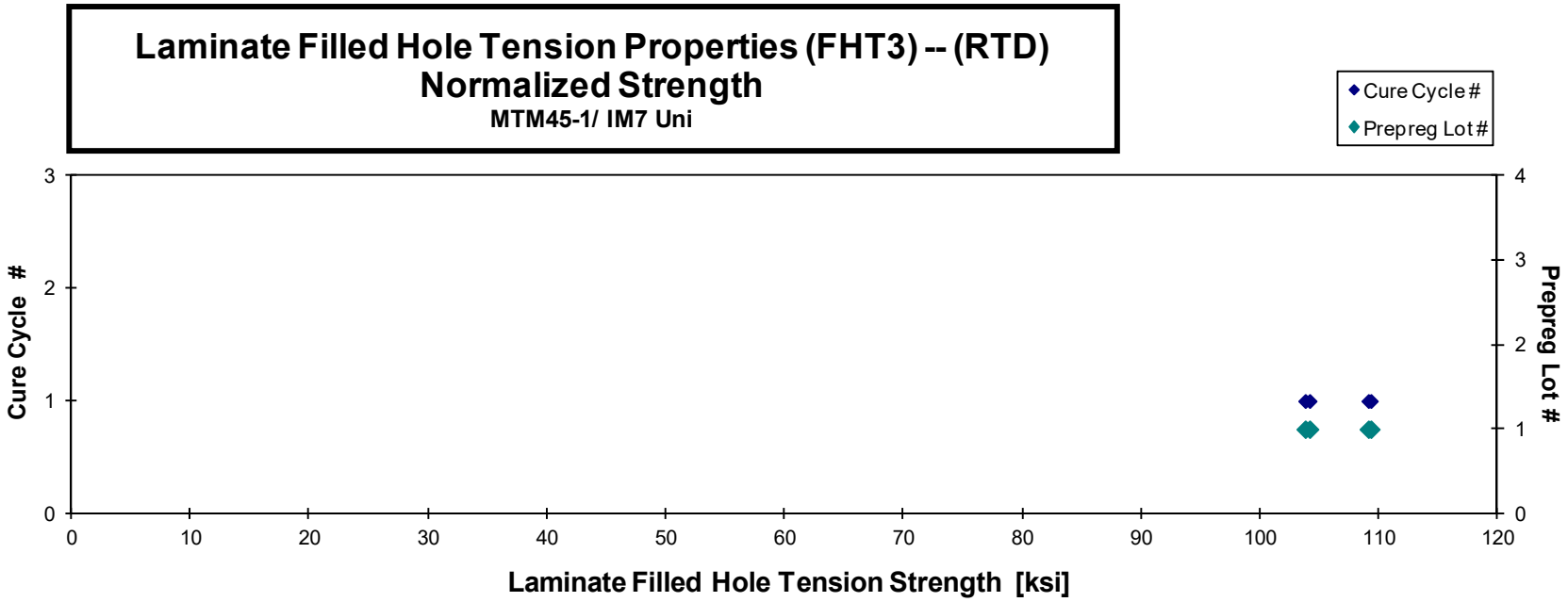
Laminate Filled Hole Tension Properties (FHT3) -- (RTD)
Strength
MTM45-1/ IM7 Uni

normalizing t_{ply} [in]
0.0055

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
IMU-FHT3-A-MH1-RTD-1	AF6A111A	A	MH1	1	1	103.560	0.116	20	LGM	0.0058	109.115
IMU-FHT3-A-MH1-RTD-2	AF6A112A	A	MH1	1	1	99.114	0.115	20	LGM	0.0058	103.799
IMU-FHT3-A-MH1-RTD-3	AF6A113A	A	MH1	1	1	104.301	0.115	20	LGM	0.0058	109.326
IMU-FHT3-A-MH1-RTD-4	AF6A114A	A	MH1	1	1	100.517	0.114	20	LGM	0.0057	104.172

*Data for IMU-FHT3-A-MH2 was not included, refer to Section 9.0 Deviations for further explanation.

Average	**101.873**		**$Average_{norm}$**	**0.0058**	**106.603**
Standard Dev.	**2.462**		**Standard $Dev._{norm}$**		**3.027**
Coeff. of Var. [%]	**2.417**		**Coeff. of Var. $[\%]_{norm}$**		**2.840**
Min.	**99.114**		**Min.**	**0.0057**	**103.799**
Max.	**104.301**		**Max.**	**0.0058**	**109.326**
Number of Spec.	**4**		**Number of Spec.**		**4**


Laminate Filled Hole Tension Properties (FHT3) -- (RTD)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Filled Hole Tension Strength [ksi]
0
1
2
3
4
0
10
20
30
40
50
60
70
80
90
100
110
120

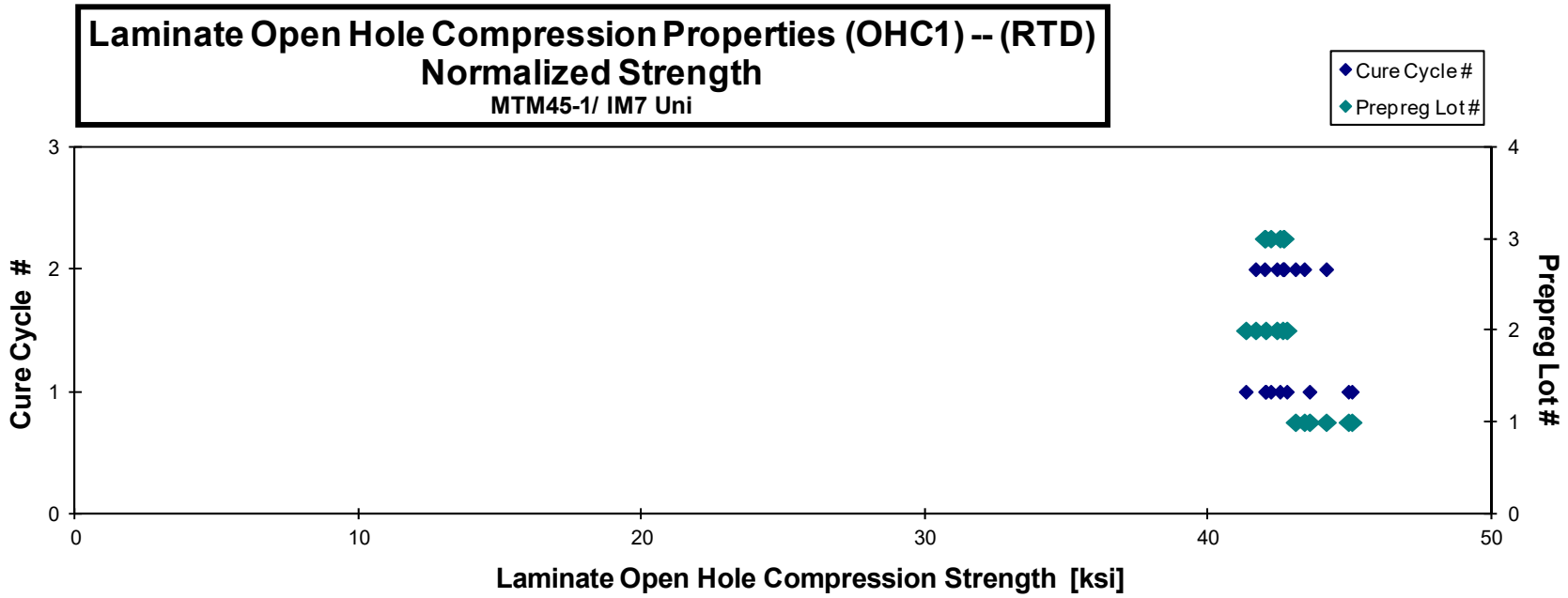
4.22 "25/50/25" Open-Hole Compression 1 Properties (OHC1)

Laminate Open Hole Compression Properties (OHC1) -- (RTD)
Strength
MTM45-1/ IM7 Uni

normalizing t_{ply} [in]: 0.0055

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Modes	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
IMU-OHC1-A-MH1-RTD-1	AFGA111A	A	MH1	1	1	43.428	0.137	24	LGM	0.0057	44.974
IMU-OHC1-A-MH1-RTD-2	AFGA112A	A	MH1	1	1	43.357	0.137	24	LGM	0.0057	45.098
IMU-OHC1-A-MH1-RTD-3	AFGA113A	A	MH1	1	1	42.476	0.136	24	LGM	0.0056	43.602
IMU-OHC1-A-MH2-RTD-1	AFGA211A	A	MH2	1	2	43.081	0.135	24	LGM	0.0056	44.191
IMU-OHC1-A-MH2-RTD-2	AFGA212A	A	MH2	1	2	42.140	0.136	24	LGM	0.0057	43.417
IMU-OHC1-A-MH2-RTD-3	AFGA213A	A	MH2	1	2	42.113	0.135	24	LGM	0.0056	43.102
IMU-OHC1-B-MH1-RTD-1	AFGB111A	B	MH1	2	1	41.788	0.135	24	LGM	0.0056	42.801
IMU-OHC1-B-MH1-RTD-2	AFGB112A	B	MH1	2	1	40.795	0.134	24	LGM	0.0056	41.351
IMU-OHC1-B-MH1-RTD-3	AFGB113A	B	MH1	2	1	41.000	0.135	24	LGM	0.0056	42.056
IMU-OHC1-B-MH2-RTD-1	AFGB211A	B	MH2	2	2	42.256	0.133	24	LGM	0.0055	42.448
IMU-OHC1-B-MH2-RTD-2	AFGB212A	B	MH2	2	2	41.539	0.133	24	LGM	0.0055	41.696
IMU-OHC1-B-MH2-RTD-3	AFGB213A	B	MH2	2	2	41.956	0.134	24	LGM	0.0056	42.655
IMU-OHC1-C-MH1-RTD-1	AFGC111A	C	MH1	3	1	42.226	0.131	24	LGM	0.0055	42.034
IMU-OHC1-C-MH1-RTD-2	AFGC112A	C	MH1	3	1	42.490	0.131	24	LGM	0.0055	42.232
IMU-OHC1-C-MH1-RTD-3	AFGC113A	C	MH1	3	1	43.113	0.130	24	LGM	0.0054	42.558
IMU-OHC1-C-MH2-RTD-1	AFGC211A	C	MH2	3	2	42.925	0.131	24	LGM	0.0055	42.698
IMU-OHC1-C-MH2-RTD-2	AFGC212A	C	MH2	3	2	42.109	0.132	24	LGM	0.0055	42.013
IMU-OHC1-C-MH2-RTD-3	AFGC213A	C	MH2	3	2	42.938	0.131	24	LGM	0.0055	42.678

	Strength [ksi]		$Strength_{norm}$ [ksi]
Average	42.318	$Average_{norm}$	42.867
Standard Dev.	0.749	$Standard\ Dev._{norm}$	1.046
Coeff. of Var. [%]	1.770	Coeff. of Var. $[\%]_{norm}$	2.440
Min.	40.795	Min.	41.351
Max.	43.428	Max.	45.098
Number of Spec.	18	Number of Spec.	18

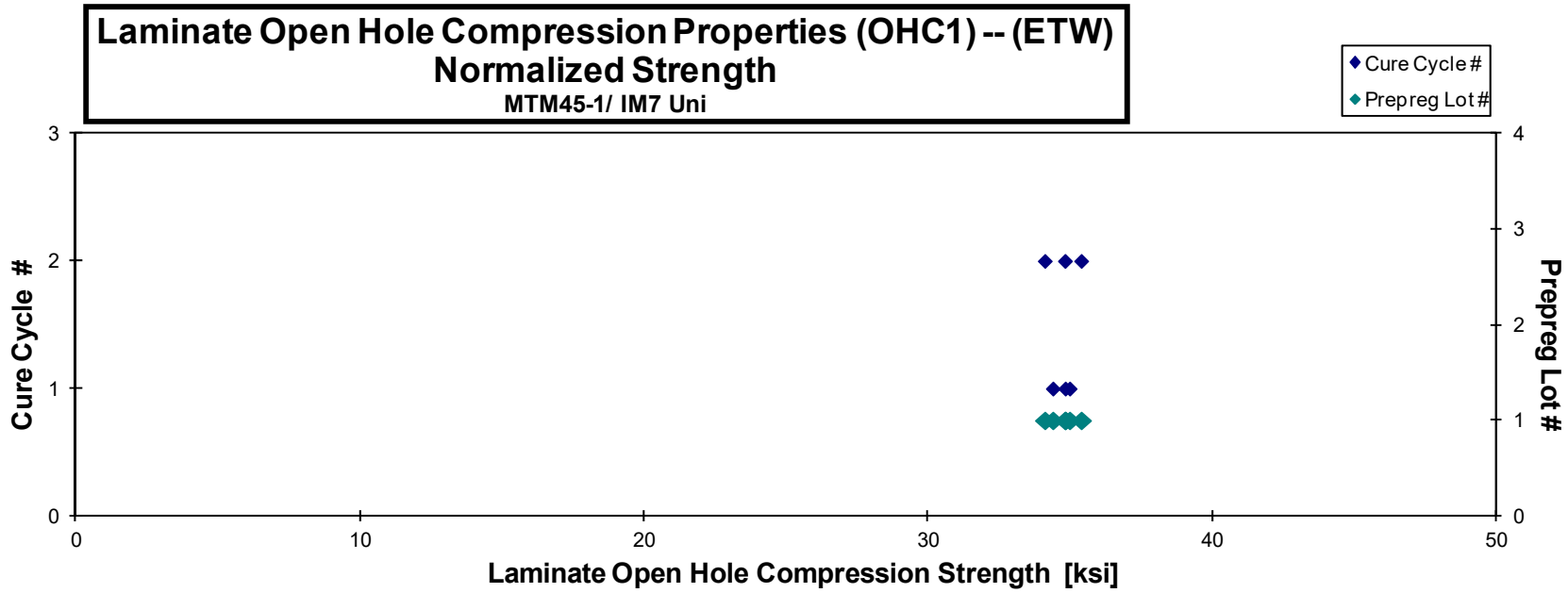

Laminate Open Hole Compression Properties (OHC1) -- (RTD)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Open Hole Compression Strength [ksi]
0
10
20
30
40
50
0
1
2
3
4

Laminate Open Hole Compression Properties (OHC1) -- (ETW)
Strength
MTM45-1/ IM7 Uni

normalizing t_{ply} [in]
0.0055

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Modes	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
IMU-OHC1-A-MH1-ETW-1	AFGA111N	A	MH1	1	1	33.677	0.135	24	LGM	0.0056	34.404
IMU-OHC1-A-MH1-ETW-2	AFGA112N	A	MH1	1	1	33.831	0.137	24	LGM	0.0057	34.993
IMU-OHC1-A-MH1-ETW-3	AFGA113N	A	MH1	1	1	33.886	0.136	24	LGM	0.0057	34.840
IMU-OHC1-A-MH2-ETW-1	AFGA211N	A	MH2	1	2	34.890	0.134	24	LGM	0.0056	35.401
IMU-OHC1-A-MH2-ETW-2	AFGA212N	A	MH2	1	2	33.964	0.135	24	LGM	0.0056	34.830
IMU-OHC1-A-MH2-ETW-3	AFGA213N	A	MH2	1	2	33.569	0.134	24	LGM	0.0056	34.120

Average	**33.970**		**$Average_{norm}$**	**0.0056**	**34.765**
Standard Dev.	**0.473**		**$Standard\ Dev._{norm}$**		**0.450**
Coeff. of Var. [%]	**1.393**		**$Coeff.\ of\ Var.\ [\%]_{norm}$**		**1.295**
Min.	**33.569**		**Min.**	**0.0056**	**34.120**
Max.	**34.890**		**Max.**	**0.0057**	**35.401**
Number of Spec.	**6**		**Number of Spec.**		**6**


Laminate Open Hole Compression Properties (OHC1) -- (ETW)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0
10
20
30
40
50
Laminate Open Hole Compression Strength [ksi]

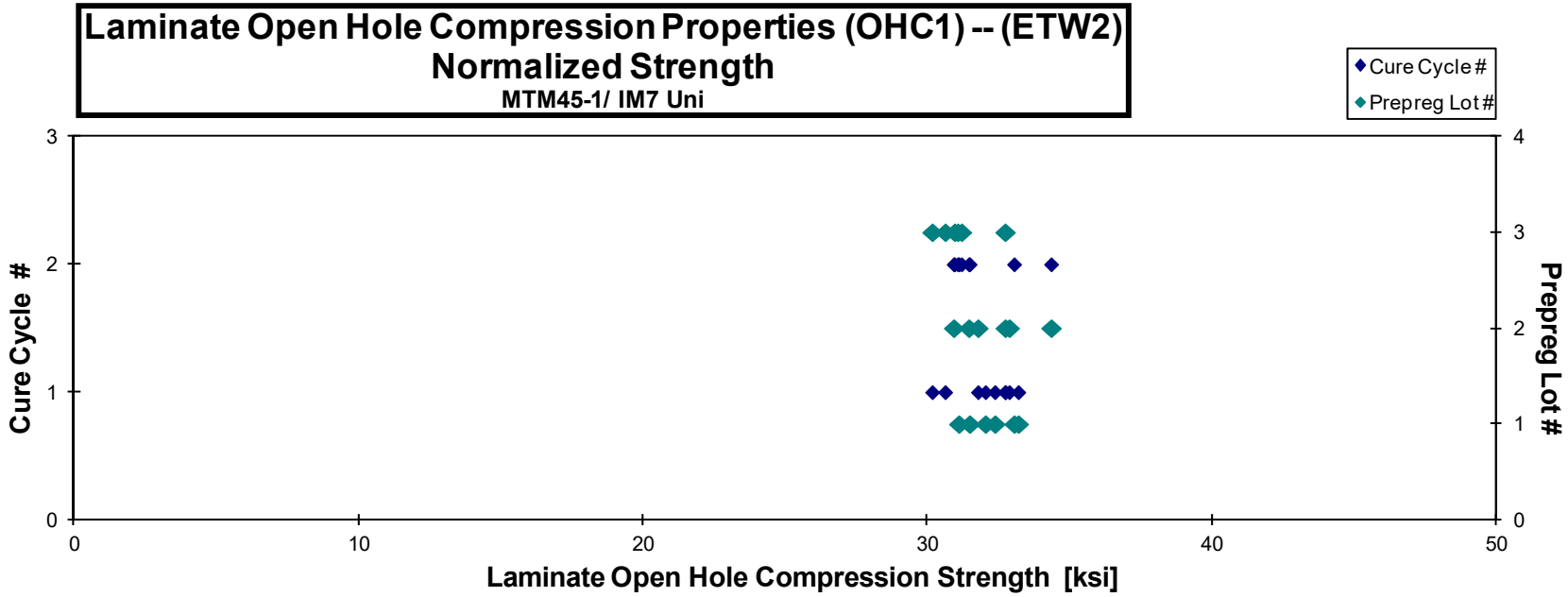
Laminate Open Hole Compression Properties (OHC1) -- (ETW2)
Strength
MTM45-1/ IM7 Uni

normalizing t_{ply} [in]
0.0055

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Modes	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
IMU-OHC1-A-MH1-ETW2-1	AFGA111D	A	MH1	1	1	31.434	0.136	24	LGM	0.0057	32.386
IMU-OHC1-A-MH1-ETW2-2	AFGA112D	A	MH1	1	1	31.198	0.136	24	LGM	0.0057	32.053
IMU-OHC1-A-MH1-ETW2-3	AFGA113D	A	MH1	1	1	32.289	0.136	24	LGM	0.0057	33.210
IMU-OHC1-A-MH2-ETW2-1	AFGA211D	A	MH2	1	2	30.439	0.135	24	LGM	0.0056	31.119
IMU-OHC1-A-MH2-ETW2-2	AFGA212D	A	MH2	1	2	32.305	0.135	24	LGM	0.0056	33.063
IMU-OHC1-A-MH2-ETW2-3	AFGA213D	A	MH2	1	2	30.776	0.135	24	LGM	0.0056	31.498
IMU-OHC1-B-MH1-ETW2-1	AFGB111D	B	MH1	2	1	31.648	0.133	24	LGM	0.0055	31.792
IMU-OHC1-B-MH1-ETW2-2	AFGB112D	B	MH1	2	1	31.843	0.136	24	LGM	0.0057	32.892
IMU-OHC1-B-MH1-ETW2-3	AFGB113D	B	MH1	2	1	32.979	0.131	24	LGM	0.0055	32.750
IMU-OHC1-B-MH2-ETW2-1	AFGB211D	B	MH2	2	2	31.235	0.131	24	LGM	0.0054	30.939
IMU-OHC1-B-MH2-ETW2-2	AFGB212D	B	MH2	2	2	31.470	0.132	24	LGM	0.0055	31.470
IMU-OHC1-B-MH2-ETW2-3	AFGB213D	B	MH2	2	2	33.465	0.136	24	LGM	0.0056	34.365
IMU-OHC1-C-MH1-ETW2-1	AFGC111D	C	MH1	3	1	30.880	0.131	24	LGM	0.0055	30.638
IMU-OHC1-C-MH1-ETW2-2	AFGC112D	C	MH1	3	1	32.721	0.132	24	LGM	0.0055	32.746
IMU-OHC1-C-MH1-ETW2-3	AFGC113D	C	MH1	3	1	30.717	0.130	24	LGM	0.0054	30.182
IMU-OHC1-C-MH2-ETW2-1	AFGC211D	C	MH2	3	2	31.029	0.132	24	LGM	0.0055	30.970
IMU-OHC1-C-MH2-ETW2-2	AFGC212D	C	MH2	3	2	31.366	0.131	24	LGM	0.0055	31.081
IMU-OHC1-C-MH2-ETW2-3	AFGC213D	C	MH2	3	2	31.166	0.132	24	LGM	0.0055	31.213

Average	**31.609**	
Standard Dev.	**0.837**	
Coeff. of Var. [%]	**2.647**	
Min.	**30.439**	
Max.	**33.465**	
Number of Spec.	**18**	

$Average_{norm}$	**0.0056**	**31.909**
$Standard\ Dev._{norm}$		**1.092**
Coeff. of Var. $[\%]_{norm}$		**3.422**
Min.	**0.0054**	**30.182**
Max.	**0.0057**	**34.365**
Number of Spec.		**18**


Laminate Open Hole Compression Properties (OHC1) -- (ETW2)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Open Hole Compression Strength [ksi]
0
10
20
30
40
50
0
1
2
3
4

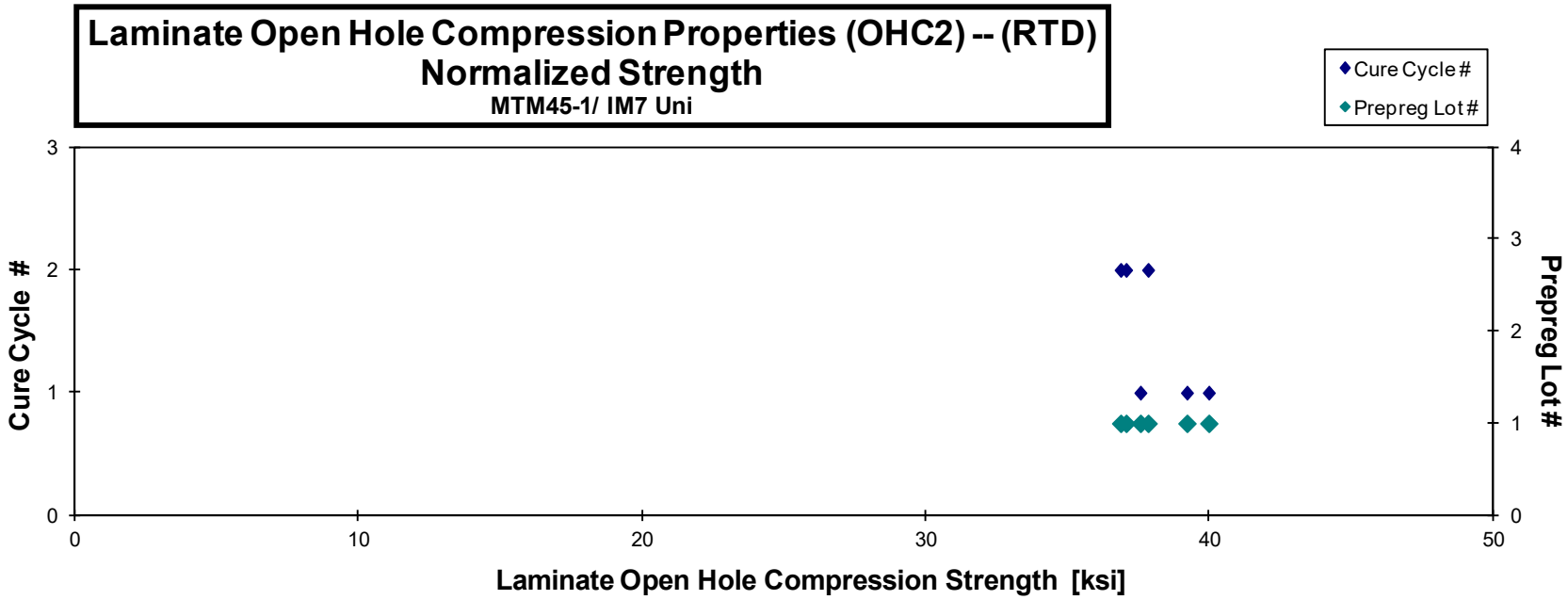
4.23 "10/80/10" Open-Hole Compression 2 Properties (OHC2)

Laminate Open Hole Compression Properties (OHC2) -- (RTD)
Strength
MTM45-1/ IM7 Uni

normalizing t_{ply} [in]: 0.0055

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Modes	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
IMU-OHC2-A-MH1-RTD-1	AFHA111A	A	MH1	1	1	37.110	0.118	20	LGM	0.0059	39.943
IMU-OHC2-A-MH1-RTD-2	AFHA112A	A	MH1	1	1	36.925	0.117	20	LGM	0.0058	39.174
IMU-OHC2-A-MH1-RTD-3	AFHA113A	A	MH1	1	1	35.899	0.115	20	LGM	0.0058	37.531
IMU-OHC2-A-MH2-RTD-1	AFHA211A	A	MH2	1	2	36.539	0.111	20	LGM	0.0055	36.837
IMU-OHC2-A-MH2-RTD-2	AFHA212A	A	MH2	1	2	37.531	0.111	20	LGM	0.0055	37.804
IMU-OHC2-A-MH2-RTD-3	AFHA213A	A	MH2	1	2	36.531	0.112	20	LGM	0.0056	37.029

Average	36.756		Average$_{norm}$	0.0057	38.053
Standard Dev.	0.563		Standard Dev.$_{norm}$		1.240
Coeff. of Var. [%]	1.533		Coeff. of Var. [%]$_{norm}$		3.259
Min.	35.899		Min.	0.0055	36.837
Max.	37.531		Max.	0.0059	39.943
Number of Spec.	6		Number of Spec.		6

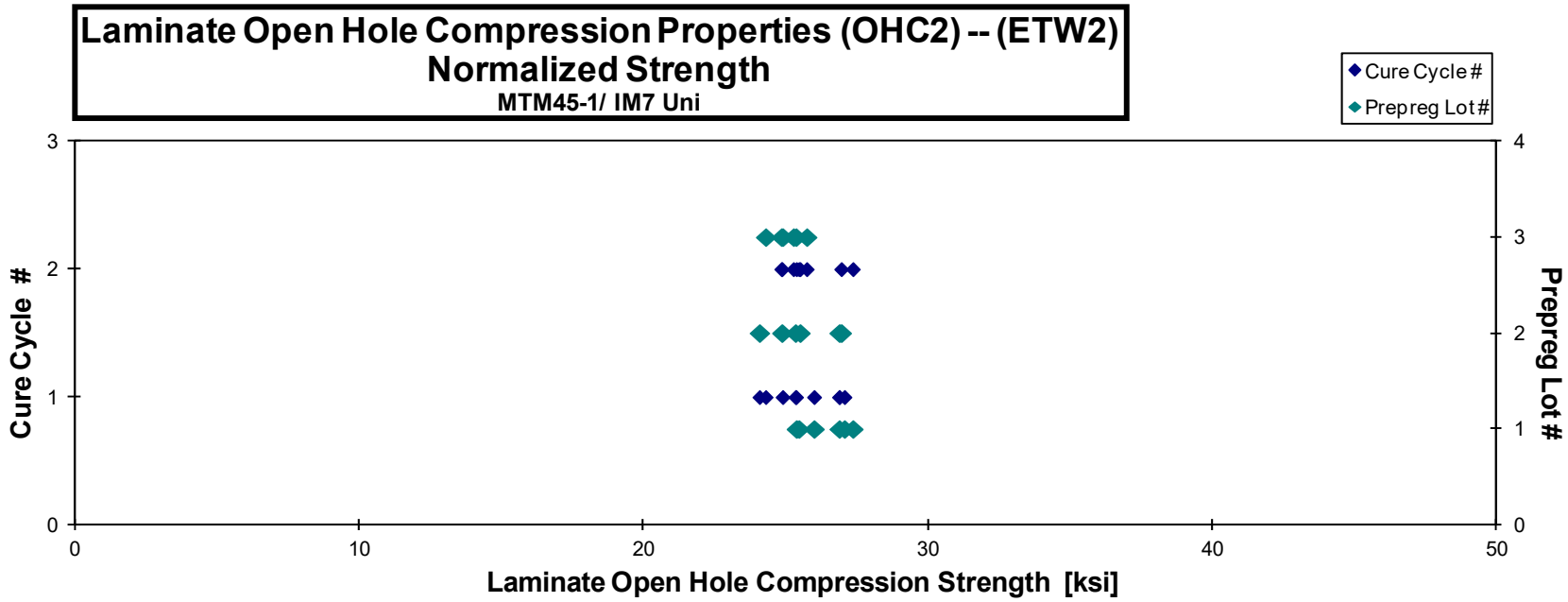

Laminate Open Hole Compression Properties (OHC2) -- (RTD)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Open Hole Compression Strength [ksi]
0
10
20
30
40
50
0
1
2
3
4

Laminate Open Hole Compression Properties (OHC2) -- (ETW2)
Strength
MTM45-1/ IM7 Uni

normalizing t_{ply} [in]: 0.0055

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Modes	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
IMU-OHC2-A-MH1-ETW2-1	AFHA111D	A	MH1	1	1	25.974	0.114	20	LGM	0.0057	26.914
IMU-OHC2-A-MH1-ETW2-2	AFHA112D	A	MH1	1	1	26.127	0.114	20	LGM	0.0057	27.097
IMU-OHC2-A-MH1-ETW2-3	AFHA113D	A	MH1	1	1	24.915	0.115	20	LGM	0.0057	26.029
IMU-OHC2-A-MH2-ETW2-1	AFHA211D	A	MH2	1	2	26.781	0.113	20	LGM	0.0056	27.394
IMU-OHC2-A-MH2-ETW2-2	AFHA212D	A	MH2	1	2	24.621	0.114	20	LGM	0.0057	25.408
IMU-OHC2-A-MH2-ETW2-3	AFHA213D	A	MH2	1	2	24.826	0.113	20	LGM	0.0056	25.496
IMU-OHC2-B-MH1-ETW2-1	AFHB111D	B	MH1	2	1	24.727	0.113	20	LGM	0.0056	25.375
IMU-OHC2-B-MH1-ETW2-2	AFHB112D	B	MH1	2	1	23.877	0.111	20	LGM	0.0056	24.109
IMU-OHC2-B-MH1-ETW2-3	AFHB113D	B	MH1	2	1	26.406	0.112	20	LGM	0.0056	26.914
IMU-OHC2-B-MH2-ETW2-1	AFHB211D	B	MH2	2	2	24.420	0.112	20	LGM	0.0056	24.898
IMU-OHC2-B-MH2-ETW2-2	AFHB212D	B	MH2	2	2	24.997	0.112	20	LGM	0.0056	25.535
IMU-OHC2-B-MH2-ETW2-3	AFHB213D	B	MH2	2	2	25.397	0.117	20	LGM	0.0058	26.986
IMU-OHC2-C-MH1-ETW2-1	AFHC111D	C	MH1	3	1	25.124	0.111	20	LGM	0.0056	25.395
IMU-OHC2-C-MH1-ETW2-2	AFHC112D	C	MH1	3	1	24.771	0.111	20	LGM	0.0055	24.925
IMU-OHC2-C-MH1-ETW2-3	AFHC113D	C	MH1	3	1	24.301	0.110	20	LGM	0.0055	24.327
IMU-OHC2-C-MH2-ETW2-1	AFHC211D	C	MH2	3	2	25.952	0.109	20	LGM	0.0055	25.771
IMU-OHC2-C-MH2-ETW2-2	AFHC212D	C	MH2	3	2	25.322	0.110	20	LGM	0.0055	25.303
IMU-OHC2-C-MH2-ETW2-3	AFHC213D	C	MH2	3	2	25.082	0.109	20	LGM	0.0055	24.880

Average	**25.201**		**Average$_{norm}$**	**0.0056**	**25.709**
Standard Dev.	**0.775**		**Standard Dev.$_{norm}$**		**0.982**
Coeff. of Var. [%]	**3.077**		**Coeff. of Var. [%]$_{norm}$**		**3.818**
Min.	**23.877**		**Min.**	**0.0055**	**24.109**
Max.	**26.781**		**Max.**	**0.0058**	**27.394**
Number of Spec.	**18**		**Number of Spec.**		**18**


Laminate Open Hole Compression Properties (OHC2) -- (ETW2)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0
10
20
30
40
50
Laminate Open Hole Compression Strength [ksi]

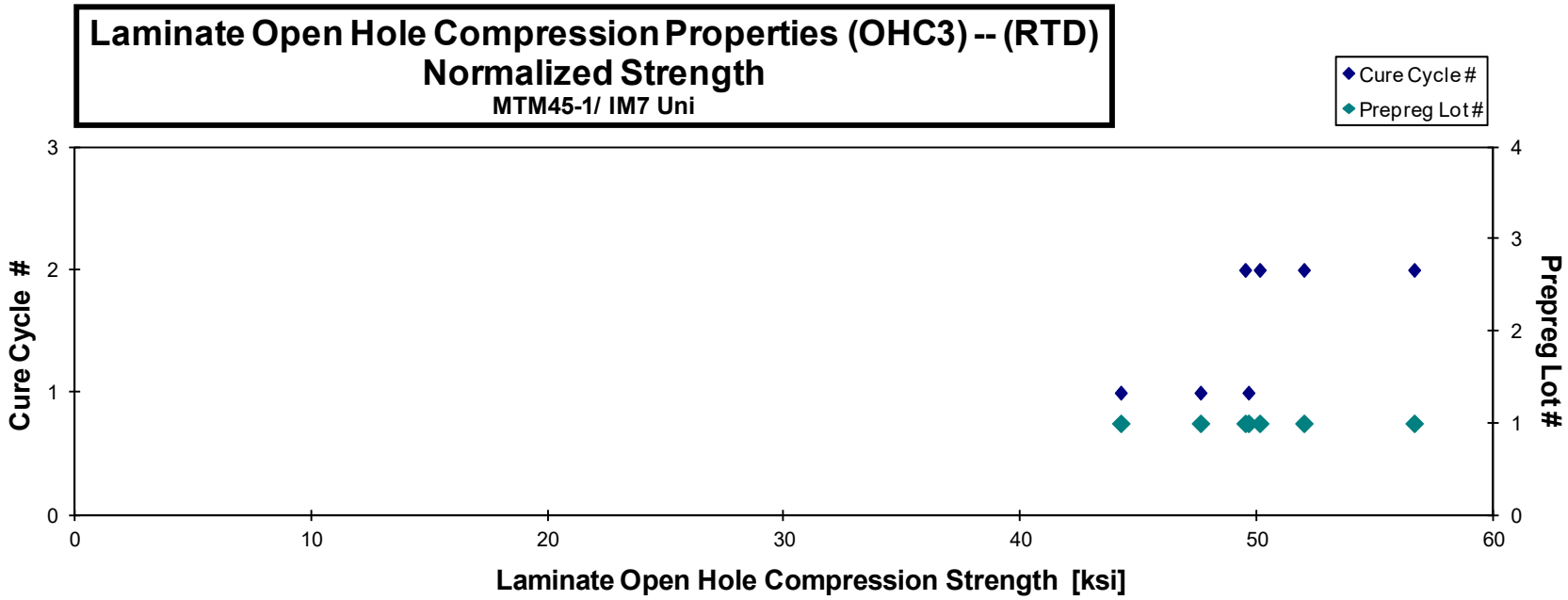
4.24 "50/40/10" Open-Hole Compression 3 Properties (OHC3)

Laminate Open Hole Compression Properties (OHC3) -- (RTD)
Strength
MTM45-1/ IM7 Uni

normalizing t_{ply} [in]
0.0055

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Modes	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
IMU-OHC3-A-MH1-RTD-1	AFIA111A	A	MH1	1	1	45.080	0.116	20	LGM	0.0058	47.579
IMU-OHC3-A-MH1-RTD-2	AFIA112A	A	MH1	1	1	41.994	0.116	20	LGM	0.0058	44.208
IMU-OHC3-A-MH1-RTD-3	AFIA113A	A	MH1	1	1	47.246	0.116	20	LGM	0.0058	49.608
IMU-OHC3-A-MH2-RTD-1	AFIA211A	A	MH2	1	2	56.771	0.110	20	LGM	0.0055	56.616
IMU-OHC3-A-MH2-RTD-2	AFIA212A	A	MH2	1	2	50.312	0.110	20	LGM	0.0055	50.083
IMU-OHC3-A-MH2-RTD-3	AFIA213A	A	MH2	1	2	50.109	0.109	20	LGM	0.0054	49.471
IMU-OHC3-A-MH2-RTD-4	AFIA214A	A	MH2	1	2	52.335	0.109	20	LGM	0.0055	51.954

Average	**49.121**		**$Average_{norm}$**	**0.0056**	**49.931**
Standard Dev.	**4.863**		**$Standard\ Dev._{norm}$**		**3.817**
Coeff. of Var. [%]	**9.900**		**Coeff. of Var. $[\%]_{norm}$**		**7.644**
Min.	**41.994**		**Min.**	**0.0054**	**44.208**
Max.	**56.771**		**Max.**	**0.0058**	**56.616**
Number of Spec.	**7**		**Number of Spec.**		**7**


Laminate Open Hole Compression Properties (OHC3) -- (RTD)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Open Hole Compression Strength [ksi]
0
10
20
30
40
50
60
0
1
2
3
4

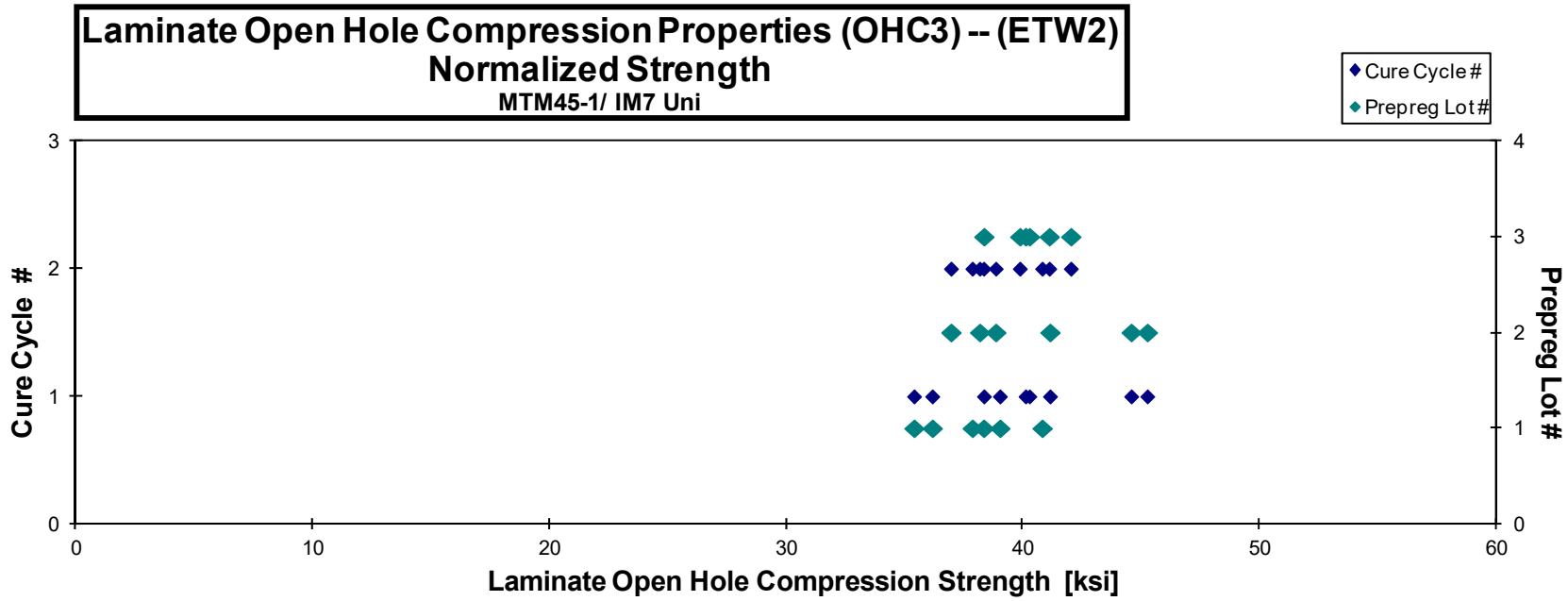
Laminate Open Hole Compression Properties (OHC3) -- (ETW2)
Strength
MTM45-1/ IM7 Uni

normalizing t_{ply} [in]
0.0055

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Modes	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
IMU-OHC3-A-MH1-ETW2-1	AFIA111D	A	MH1	1	1	35.081	0.113	20	LGM	0.0057	36.192
IMU-OHC3-A-MH1-ETW2-2	AFIA112D	A	MH1	1	1	34.133	0.114	20	LGM	0.0057	35.421
IMU-OHC3-A-MH1-ETW2-3	AFIA113D	A	MH1	1	1	37.623	0.114	20	LGM	0.0057	39.048
IMU-OHC3-A-MH2-ETW2-1	AFIA211D	A	MH2	1	2	37.700	0.111	20	LGM	0.0055	37.882
IMU-OHC3-A-MH2-ETW2-2	AFIA212D	A	MH2	1	2	38.449	0.110	20	LGM	0.0055	38.361
IMU-OHC3-A-MH2-ETW2-3	AFIA213D	A	MH2	1	2	41.112	0.109	20	LGM	0.0055	40.832
IMU-OHC3-B-MH1-ETW2-1	AFIB111D	B	MH1	2	1	44.007	0.111	20	LGM	0.0056	44.593
IMU-OHC3-B-MH1-ETW2-2	AFIB112D	B	MH1	2	1	45.337	0.110	20	LGM	0.0055	45.275
IMU-OHC3-B-MH1-ETW2-3	AFIB113D	B	MH1	2	1	40.355	0.112	20	LGM	0.0056	41.163
IMU-OHC3-B-MH2-ETW2-1	AFIB211D	B	MH2	2	2	38.121	0.112	20	LGM	0.0056	38.872
IMU-OHC3-B-MH2-ETW2-2	AFIB212D	B	MH2	2	2	36.407	0.112	20	LGM	0.0056	36.981
IMU-OHC3-B-MH2-ETW2-3	AFIB213D	B	MH2	2	2	36.957	0.114	20	LGM	0.0057	38.194
IMU-OHC3-C-MH1-ETW2-1	AFIC111D	C	MH1	3	1	40.547	0.109	20	LGM	0.0055	40.295
IMU-OHC3-C-MH1-ETW2-2	AFIC112D	C	MH1	3	1	38.304	0.110	20	LGM	0.0055	38.373
IMU-OHC3-C-MH1-ETW2-3	AFIC113D	C	MH1	3	1	41.064	0.108	20	LGM	0.0054	40.131
IMU-OHC3-C-MH2-ETW2-1	AFIC211D	C	MH2	3	2	41.365	0.109	20	LGM	0.0055	41.133
IMU-OHC3-C-MH2-ETW2-3	AFIC213D	C	MH2	3	2	42.097	0.110	20	LGM	0.0055	42.046
IMU-OHC3-C-MH2-ETW2-4	AFIC214D	C	MH2	3	2	40.642	0.108	20	LGM	0.0054	39.890

Average	**39.406**	
Standard Dev.	**2.952**	
Coeff. of Var. [%]	**7.492**	
Min.	**34.133**	
Max.	**45.337**	
Number of Spec.	**18**	

$Average_{norm}$	**0.0055**	**39.705**
$Standard\ Dev._{norm}$		**2.599**
$Coeff.\ of\ Var.\ [\%]_{norm}$		**6.546**
Min.	**0.0054**	**35.421**
Max.	**0.0057**	**45.275**
Number of Spec.		**18**


Laminate Open Hole Compression Properties (OHC3) -- (ETW2)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Open Hole Compression Strength [ksi]
0
10
20
30
40
50
60
0
1
2
3
4

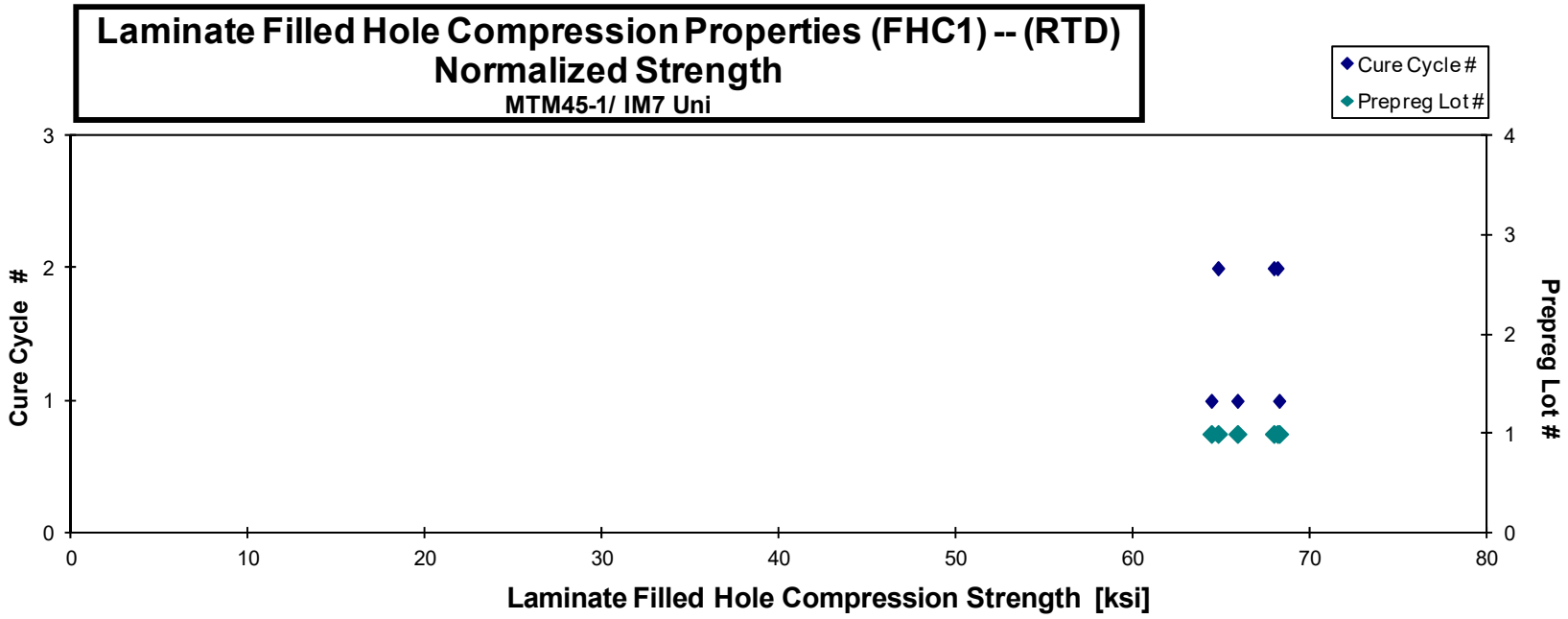
4.25 "25/50/25" Filled-Hole Compression 1 Properties (FHC1)

Laminate Filled Hole Compression Properties (FHC1) -- (RTD)
Strength
MTM45-1/ IM7 Uni

normalizing t_{ply} [in]
0.0055

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
IMU-FHC1-A-MH1-RTD-1	AF7A111A	A	MH1	1	1	67.078	0.134	24	LGM	0.0056	68.247
IMU-FHC1-A-MH1-RTD-2	AF7A112A	A	MH1	1	1	64.473	0.135	24	LGM	0.0056	65.889
IMU-FHC1-A-MH1-RTD-3	AF7A113A	A	MH1	1	1	63.216	0.135	24	LGM	0.0056	64.413
IMU-FHC1-A-MH2-RTD-1	AF7A211A	A	MH2	1	2	67.180	0.134	24	LGM	0.0056	67.944
IMU-FHC1-A-MH2-RTD-2	AF7A212A	A	MH2	1	2	67.384	0.134	24	LGM	0.0056	68.150
IMU-FHC1-A-MH2-RTD-3	AF7A213A	A	MH2	1	2	64.160	0.133	24	LGM	0.0056	64.792

Average	**65.582**		**$Average_{norm}$**	**0.0056**	**66.572**
Standard Dev.	**1.838**		**$Standard\ Dev._{norm}$**		**1.759**
Coeff. of Var. [%]	**2.803**		**$Coeff.\ of\ Var.\ [\%]_{norm}$**		**2.643**
Min.	**63.216**		**Min.**	**0.0056**	**64.413**
Max.	**67.384**		**Max.**	**0.0056**	**68.247**
Number of Spec.	**6**		**Number of Spec.**		**6**

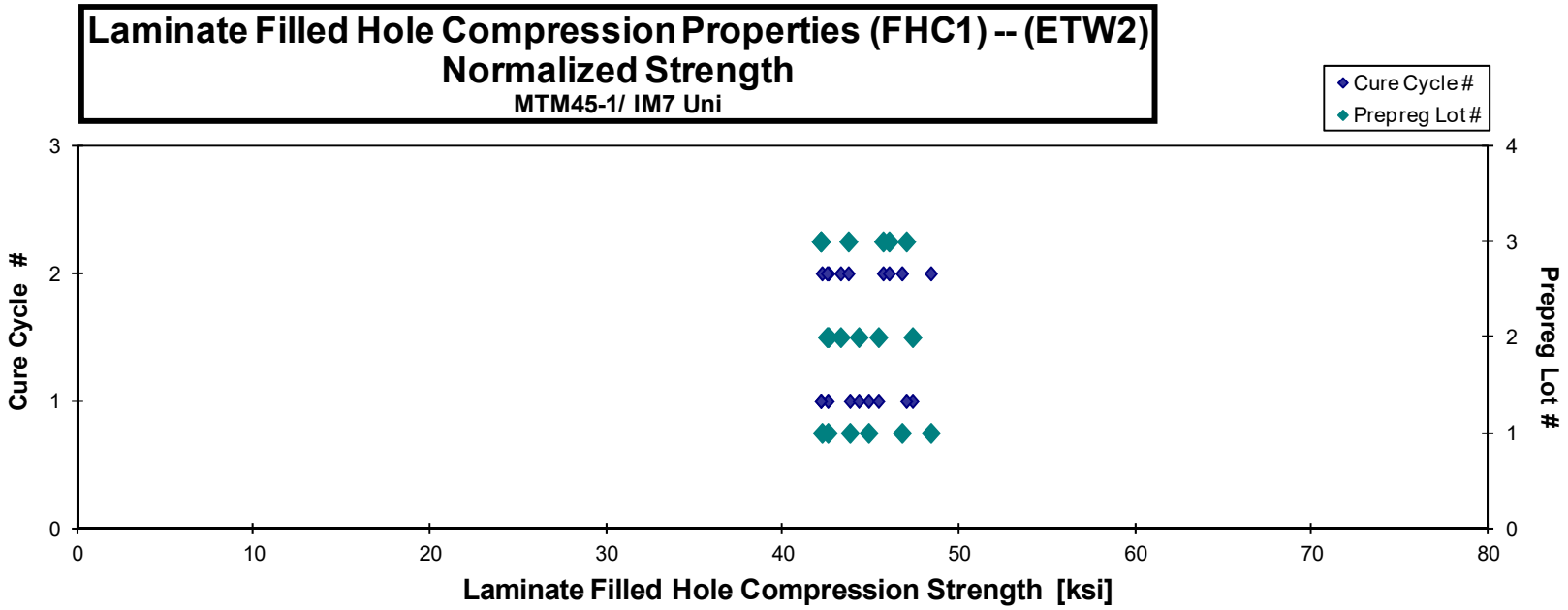

Laminate Filled Hole Compression Properties (FHC1) -- (RTD)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Filled Hole Compression Strength [ksi]
0
1
2
3
4
0
10
20
30
40
50
60
70
80

Laminate Filled Hole Compression Properties (FHC1) -- (ETW2)
Strength
MTM45-1/ IM7 Uni

normalizing t_{ply} [in]: 0.0055

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
IMU-FHC1-A-MH1-ETW2-1	AF7A111D	A	MH1	1	1	41.517	0.135	24	LGM	0.0056	42.492
IMU-FHC1-A-MH1-ETW2-2	AF7A112D	A	MH1	1	1	42.873	0.135	24	LGM	0.0056	43.744
IMU-FHC1-A-MH1-ETW2-3	AF7A113D	A	MH1	1	1	43.769	0.135	24	LGM	0.0056	44.803
IMU-FHC1-A-MH2-ETW2-1	AF7A211D	A	MH2	1	2	47.887	0.133	24	LGM	0.0056	48.334
IMU-FHC1-A-MH2-ETW2-2	AF7A212D	A	MH2	1	2	41.347	0.135	24	LGM	0.0056	42.161
IMU-FHC1-A-MH2-ETW2-3	AF7A213D	A	MH2	1	2	45.913	0.134	24	LGM	0.0056	46.695
IMU-FHC1-B-MH1-ETW2-1	AF7B111D	B	MH1	2	1	45.588	0.137	24	LGM	0.0057	47.297
IMU-FHC1-B-MH1-ETW2-2	AF7B112D	B	MH1	2	1	42.098	0.139	24	LGM	0.0058	44.246
IMU-FHC1-B-MH1-ETW2-3	AF7B113D	B	MH1	2	1	44.679	0.134	24	LGM	0.0056	45.362
IMU-FHC1-B-MH2-ETW2-1	AF7B211D	B	MH2	2	2	42.025	0.134	24	LGM	0.0056	42.518
IMU-FHC1-B-MH2-ETW2-2	AF7B212D	B	MH2	2	2	42.152	0.133	24	LGM	0.0055	42.450
IMU-FHC1-B-MH2-ETW2-3	AF7B213D	B	MH2	2	2	42.291	0.135	24	LGM	0.0056	43.220
IMU-FHC1-C-MH1-ETW2-1	AF7C111D	C	MH1	3	1	47.306	0.131	24	LGM	0.0055	46.942
IMU-FHC1-C-MH1-ETW2-2	AF7C112D	C	MH1	3	1	42.375	0.131	24	LGM	0.0055	42.102
IMU-FHC1-C-MH1-ETW2-3	AF7C113D	C	MH1	3	1	42.237	0.132	24	LGM	0.0055	42.093
IMU-FHC1-C-MH2-ETW2-1	AF7C211D	C	MH2	3	2	45.953	0.131	24	LGM	0.0055	45.628
IMU-FHC1-C-MH2-ETW2-2	AF7C212D	C	MH2	3	2	44.183	0.130	24	LGM	0.0054	43.659
IMU-FHC1-C-MH2-ETW2-3	AF7C213D	C	MH2	3	2	46.339	0.131	24	LGM	0.0055	45.965

Average	**43.918**		**$Average_{norm}$**	**0.0056**	**44.428**
Standard Dev.	**2.115**		**Standard $Dev._{norm}$**		**2.024**
Coeff. of Var. [%]	**4.815**		**Coeff. of Var. $[\%]_{norm}$**		**4.555**
Min.	**41.347**		**Min.**	**0.0054**	**42.093**
Max.	**47.887**		**Max.**	**0.0058**	**48.334**
Number of Spec.	**18**		**Number of Spec.**		**18**


Laminate Filled Hole Compression Properties (FHC1) -- (ETW2)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0
10
20
30
40
50
60
70
80
Laminate Filled Hole Compression Strength [ksi]

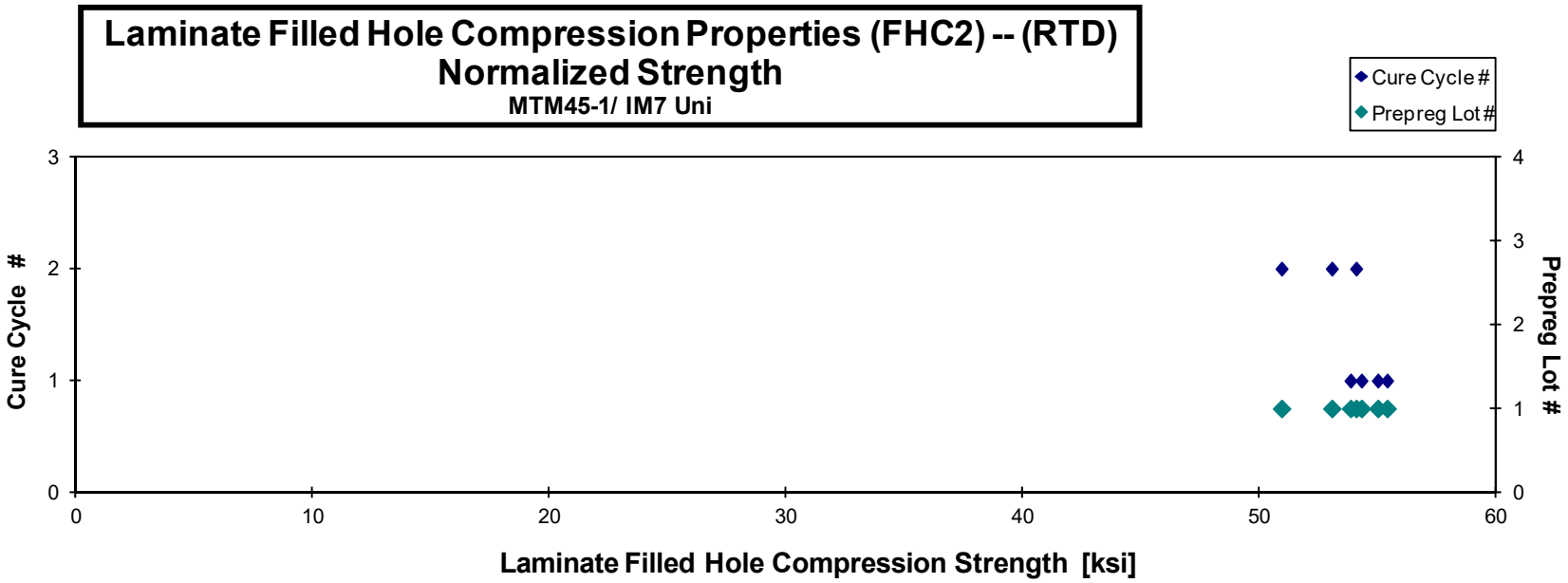
4.26 "10/80/10" Filled-Hole Compression 2 Properties (FHC2)

Laminate Filled Hole Compression Properties (FHC2) -- (RTD)
Strength
MTM45-1/ IM7 Uni

normalizing t_{ply} [in]
0.0055

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
IMU-FHC2-A-MH1-RTD-1	AF8A111A	A	MH1	1	1	52.955	0.113	20	LGM	0.0056	54.303
IMU-FHC2-A-MH1-RTD-2	AF8A112A	A	MH1	1	1	52.092	0.114	20	LGM/LWB	0.0057	53.844
IMU-FHC2-A-MH1-RTD-3	AF8A113A	A	MH1	1	1	53.395	0.113	20	LGM	0.0057	54.997
IMU-FHC2-A-MH1-RTD-4	AF8A114A	A	MH1	1	1	53.446	0.114	20	LGM/LWT	0.0057	55.389
IMU-FHC2-A-MH2-RTD-1	AF8A211A	A	MH2	1	2	53.351	0.112	20	LGM	0.0056	54.079
IMU-FHC2-A-MH2-RTD-2	AF8A212A	A	MH2	1	2	52.528	0.111	20	LGM	0.0056	53.053
IMU-FHC2-A-MH2-RTD-3	AF8A213A	A	MH2	1	2	50.290	0.111	20	LGM	0.0056	50.930

Average	**52.580**		**$Average_{norm}$**	**0.0056**	**53.799**
Standard Dev.	**1.128**		**$Standard\ Dev._{norm}$**		**1.477**
Coeff. of Var. [%]	**2.145**		**$Coeff.\ of\ Var.\ [\%]_{norm}$**		**2.745**
Min.	**50.290**		**Min.**	**0.0056**	**50.930**
Max.	**53.446**		**Max.**	**0.0057**	**55.389**
Number of Spec.	**7**		**Number of Spec.**		**7**

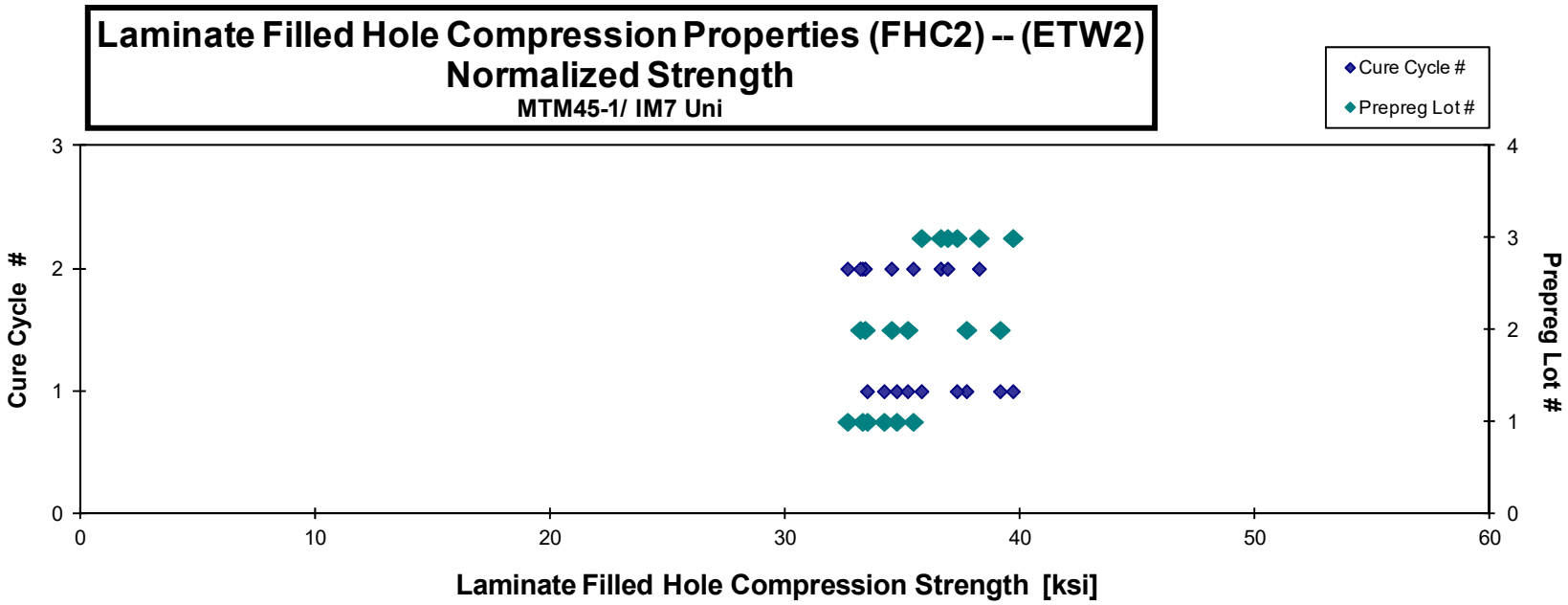

Laminate Filled Hole Compression Properties (FHC2) -- (RTD)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0
10
20
30
40
50
60
Laminate Filled Hole Compression Strength [ksi]

Laminate Filled Hole Compression Properties (FHC2) -- (ETW2)
Strength
MTM45-1/ IM7 Uni

normalizing t_{ply} [in]: 0.0055

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
IMU-FHC2-A-MH1-ETW2-1	AF8A111D	A	MH1	1	1	33.182	0.114	20	LGM	0.0057	34.238
IMU-FHC2-A-MH1-ETW2-2	AF8A112D	A	MH1	1	1	32.168	0.115	20	LGM	0.0057	33.519
IMU-FHC2-A-MH1-ETW2-3	AF8A113D	A	MH1	1	1	34.111	0.112	20	LGM	0.0056	34.773
IMU-FHC2-A-MH2-ETW2-1	AF8A211D	A	MH2	1	2	35.014	0.111	20	LGM	0.0056	35.476
IMU-FHC2-A-MH2-ETW2-2	AF8A212D	A	MH2	1	2	32.318	0.111	20	LGM	0.0056	32.680
IMU-FHC2-A-MH2-ETW2-3	AF8A213D	A	MH2	1	2	33.081	0.111	20	LGM	0.0055	33.316
IMU-FHC2-B-MH1-ETW2-1	AF8B111D	B	MH1	2	1	37.608	0.115	20	LGM	0.0057	39.175
IMU-FHC2-B-MH1-ETW2-2	AF8B112D	B	MH1	2	1	34.205	0.113	20	LGM	0.0057	35.241
IMU-FHC2-B-MH1-ETW2-3	AF8B113D	B	MH1	2	1	37.227	0.112	20	LGM	0.0056	37.746
IMU-FHC2-B-MH2-ETW2-1	AF8B211D	B	MH2	2	2	34.249	0.111	20	LGM	0.0055	34.555
IMU-FHC2-B-MH2-ETW2-2	AF8B212D	B	MH2	2	2	32.957	0.112	20	LGM	0.0056	33.426
IMU-FHC2-B-MH2-ETW2-3	AF8B213D	B	MH2	2	2	33.055	0.111	20	LGM	0.0055	33.220
IMU-FHC2-C-MH1-ETW2-1	AF8C111D	C	MH1	3	1	36.319	0.109	20	LGM	0.0054	35.829
IMU-FHC2-C-MH1-ETW2-2	AF8C112D	C	MH1	3	1	37.871	0.108	20	LGM/LGF	0.0054	37.337
IMU-FHC2-C-MH1-ETW2-3	AF8C113D	C	MH1	3	1	40.296	0.108	20	LGM/LGF	0.0054	39.722
IMU-FHC2-C-MH2-ETW2-1	AF8C211D	C	MH2	3	2	36.768	0.110	20	MGF	0.0055	36.645
IMU-FHC2-C-MH2-ETW2-2	AF8C212D	C	MH2	3	2	38.977	0.108	20	LGM/LGF	0.0054	38.280
IMU-FHC2-C-MH2-ETW2-3	AF8C213D	C	MH2	3	2	36.628	0.111	20	LGF	0.0055	36.939

Average	**35.335**		**$Average_{norm}$**	**0.0056**	**35.673**
Standard Dev.	**2.444**		**$Standard\ Dev._{norm}$**		**2.165**
Coeff. of Var. [%]	**6.915**		**Coeff. of Var. $[\%]_{norm}$**		**6.068**
Min.	**32.168**		**Min.**	**0.0054**	**32.680**
Max.	**40.296**		**Max.**	**0.0057**	**39.722**
Number of Spec.	**18**		**Number of Spec.**		**18**


Laminate Filled Hole Compression Properties (FHC2) -- (ETW2)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0
10
20
30
40
50
60
Laminate Filled Hole Compression Strength [ksi]

4.27 "50/40/10" Filled-Hole Compression 3 Properties (FHC3)

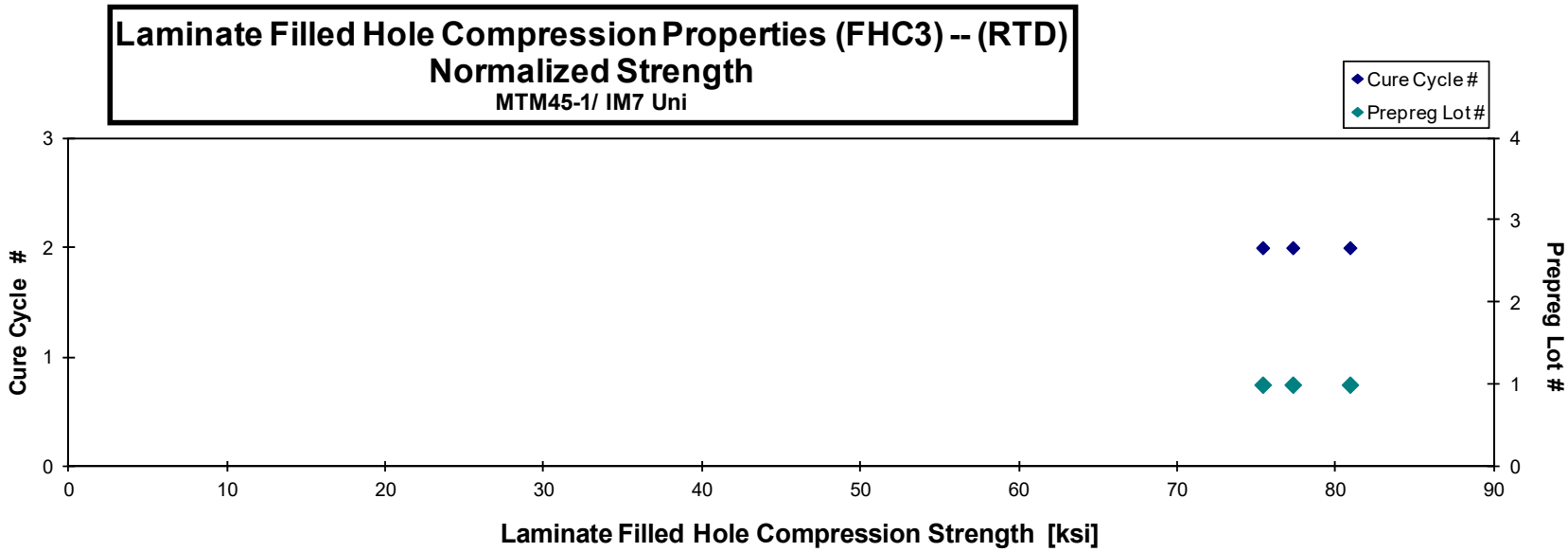
Laminate Filled Hole Compression Properties (FHC3) -- (RTD)
Strength
MTM45-1/ IM7 Uni

normalizing t_{ply} [in]
0.0055

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
IMU-FHC3-A-MH2-RTD-1	AF9A211A	A	MH2	1	2	76.585	0.111	20	LGM	0.0056	77.281
IMU-FHC3-A-MH2-RTD-2	AF9A212A	A	MH2	1	2	80.524	0.111	20	LGM	0.0055	80.890
IMU-FHC3-A-MH2-RTD-3	AF9A213A	A	MH2	1	2	74.499	0.111	20	LGM	0.0056	75.379

*Data for IMU-FHC3-A-MH1 was not included, refer to Section 9.0 Deviations for further explanation.

Average	**77.203**		**$Average_{norm}$**	**0.0055**	**77.850**
Standard Dev.	**3.060**		**$Standard\ Dev._{norm}$**		**2.799**
Coeff. of Var. [%]	**3.963**		**$Coeff.\ of\ Var.\ [\%]_{norm}$**		**3.596**
Min.	**74.499**		**Min.**	**0.0055**	**75.379**
Max.	**80.524**		**Max.**	**0.0056**	**80.890**
Number of Spec.	**3**		**Number of Spec.**		**3**


Laminate Filled Hole Compression Properties (FHC3) -- (RTD)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0
10
20
30
40
50
60
70
80
90
Laminate Filled Hole Compression Strength [ksi]

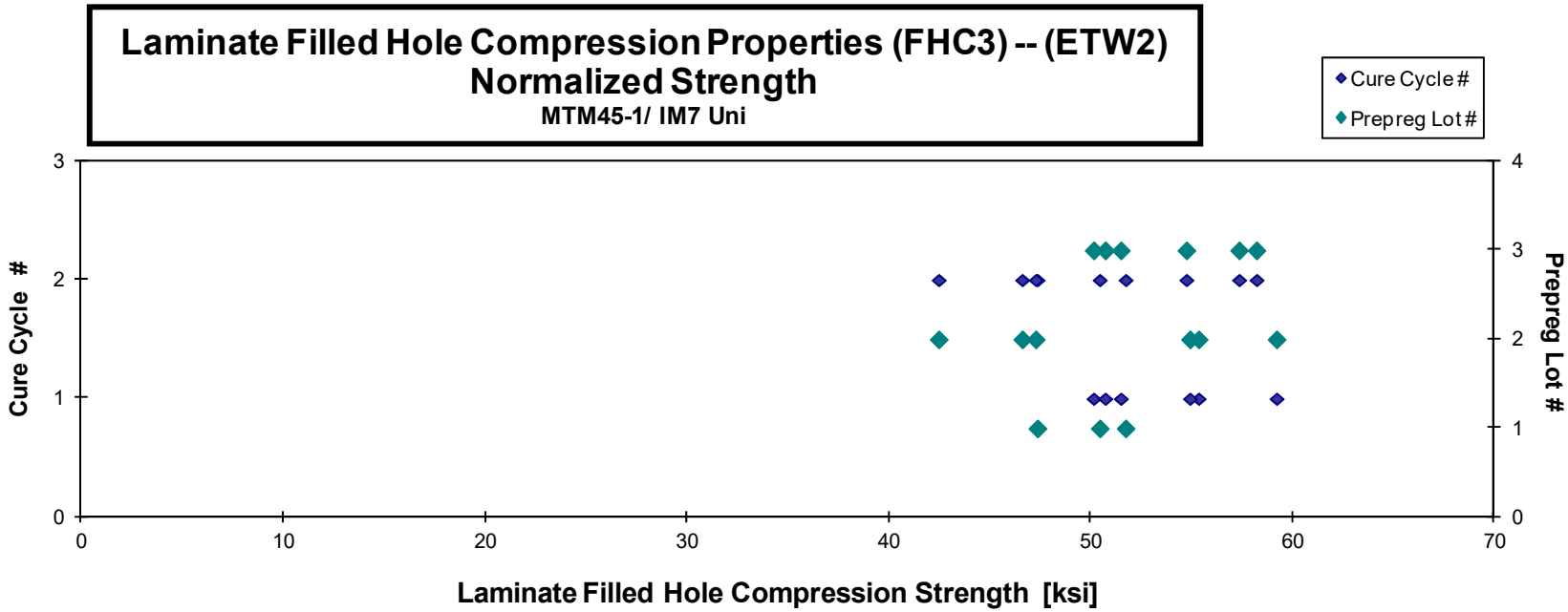
Laminate Filled Hole Compression Properties (FHC3) -- (ETW2)
Strength
MTM45-1/ IM7 Uni

normalizing t_{ply} [in]
0.0055

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Failure Mode	Avg. t_{ply} [in]	$Strength_{norm}$ [ksi]
IMU-FHC3-A-MH2-ETW2-1	AF9A211D	A	MH2	1	2	46.717	0.112	20	LGM	0.0056	47.362
IMU-FHC3-A-MH2-ETW2-2	AF9A212D	A	MH2	1	2	49.927	0.111	20	LGM	0.0056	50.449
IMU-FHC3-A-MH2-ETW2-3	AF9A213D	A	MH2	1	2	50.905	0.112	20	LGM	0.0056	51.730
IMU-FHC3-B-MH1-ETW2-1	AF9B111D	B	MH1	2	1	55.196	0.110	20	LGM	0.0055	55.346
IMU-FHC3-B-MH1-ETW2-2	AF9B112D	B	MH1	2	1	54.285	0.111	20	LGM	0.0056	54.918
IMU-FHC3-B-MH1-ETW2-3	AF9B113D	B	MH1	2	1	58.508	0.111	20	LGM	0.0056	59.208
IMU-FHC3-B-MH2-ETW2-1	AF9B211D	B	MH2	2	2	47.078	0.110	20	LGM	0.0055	47.278
IMU-FHC3-B-MH2-ETW2-2	AF9B212D	B	MH2	2	2	46.595	0.110	20	LGM	0.0055	46.609
IMU-FHC3-B-MH2-ETW2-3	AF9B213D	B	MH2	2	2	42.725	0.109	20	LGM	0.0055	42.473
IMU-FHC3-C-MH1-ETW2-1	AF9C111D	C	MH1	3	1	49.250	0.112	20	LGM	0.0056	50.145
IMU-FHC3-C-MH1-ETW2-2	AF9C112D	C	MH1	3	1	51.028	0.111	20	LGM	0.0056	51.492
IMU-FHC3-C-MH1-ETW2-3	AF9C113D	C	MH1	3	1	50.113	0.111	20	LGM	0.0056	50.721
IMU-FHC3-C-MH2-ETW2-1	AF9C211D	C	MH2	3	2	57.890	0.111	20	LGM	0.0055	58.214
IMU-FHC3-C-MH2-ETW2-2	AF9C212D	C	MH2	3	2	54.699	0.110	20	LGM / LGF	0.0055	54.740
IMU-FHC3-C-MH2-ETW2-3	AF9C213D	C	MH2	3	2	56.699	0.111	20	LGM	0.0056	57.352

*Data for IMU-FHC3-A-MH1 was not included, refer to Section 9.0 Deviations for further explanation.

Average	**51.441**		**$Average_{norm}$**	**0.0055**	**51.869**
Standard Dev.	**4.645**		**$Standard\ Dev._{norm}$**		**4.763**
Coeff. of Var. [%]	**9.030**		**Coeff. of Var. $[\%]_{norm}$**		**9.183**
Min.	**42.725**		**Min.**	**0.0055**	**42.473**
Max.	**58.508**		**Max.**	**0.0056**	**59.208**
Number of Spec.	**15**		**Number of Spec.**		**15**


Laminate Filled Hole Compression Properties (FHC3) -- (ETW2)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
0
1
2
3
4
0
10
20
30
40
50
60
70
Laminate Filled Hole Compression Strength [ksi]

4.28 "25/50/25" Pin Bearing 1 Properties (PB1)

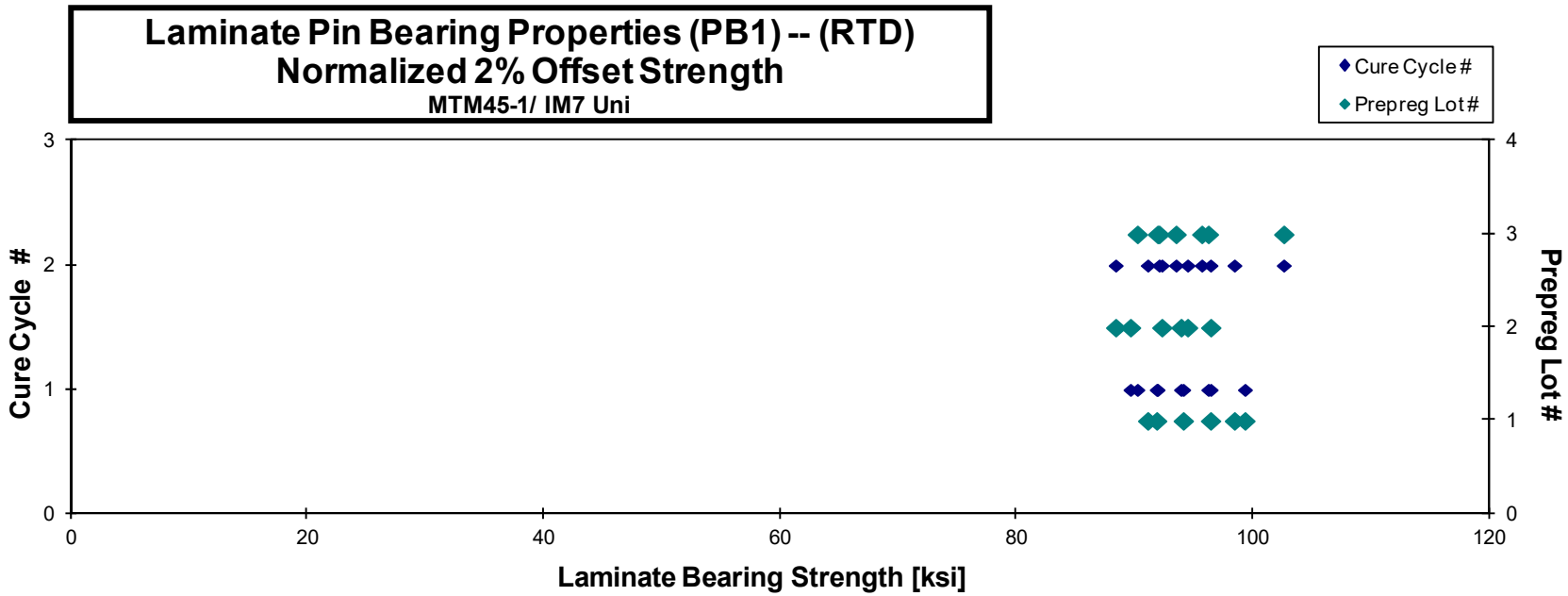
Laminate Pin Bearing Properties (PB1) -- (RTD)
Strength
MTM45-1/ IM7 Uni

normalizing t_{ply} [in]
0.0055

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	2% Offset Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Comments	Avg. t_{ply} [in]	2% Offset Strength$_{norm}$ [ksi]
IMU-PB1-A-MH1-RTD-1	AF1A111A	A	MH1	1	1	89.980	0.135	24	2% Offset for UBS* / B1I	0.0056	91.957
IMU-PB1-A-MH1-RTD-2	AF1A112A	A	MH1	1	1	92.182	0.135	24	2% Offset for UBS* / B1I	0.0056	94.207
IMU-PB1-A-MH1-RTD-3	AF1A113A	A	MH1	1	1	98.603	0.133	24	2% Offset for UBS* / B1I	0.0055	99.424
IMU-PB1-A-MH2-RTD-1	AF1A211A	A	MH2	1	2	95.780	0.136	24	2% Offset for UBS* / B1I	0.0057	98.537
IMU-PB1-A-MH2-RTD-2	AF1A212A	A	MH2	1	2	95.076	0.134	24	2% Offset for UBS* / B1I	0.0056	96.516
IMU-PB1-A-MH2-RTD-3	AF1A213A	A	MH2	1	2	89.770	0.134	24	2% Offset for UBS* / B1I	0.0056	91.198
IMU-PB1-B-MH1-RTD-1	AF1B111A	B	MH1	2	1	88.999	0.133	24	2% Offset for UBS* / B1I	0.0055	89.741
IMU-PB1-B-MH1-RTD-2	AF1B112A	B	MH1	2	1	95.805	0.133	24	2% Offset for UBS* / B1I	0.0055	96.531
IMU-PB1-B-MH1-RTD-3	AF1B113A	B	MH1	2	1	93.242	0.133	24	2% Offset for UBS* / B1I	0.0055	94.019
IMU-PB1-B-MH2-RTD-1	AF1B211A	B	MH2	2	2	94.253	0.129	24	2% Offset for UBS* / B1I	0.0054	92.396
IMU-PB1-B-MH2-RTD-2	AF1B212A	B	MH2	2	2	98.295	0.127	24	2% Offset for UBS* / B1I	0.0053	94.572
IMU-PB1-B-MH2-RTD-3	AF1B213A	B	MH2	2	2	90.197	0.130	24	2% Offset for UBS* / B1I	0.0054	88.489
IMU-PB1-C-MH1-RTD-1	AF1C111A	C	MH1	3	1	90.665	0.132	24	2% Offset for UBS* / B1I	0.0055	90.322
IMU-PB1-C-MH1-RTD-2	AF1C112A	C	MH1	3	1	91.341	0.133	24	2% Offset for UBS* / B1I	0.0055	92.033
IMU-PB1-C-MH1-RTD-3	AF1C113A	C	MH1	3	1	96.329	0.132	24	2% Offset for UBS* / B1I	0.0055	96.329
IMU-PB1-C-MH2-RTD-1	AF1C211A	C	MH2	3	2	94.239	0.131	24	2% Offset for UBS* / B1I	0.0055	93.597
IMU-PB1-C-MH2-RTD-2	AF1C212A	C	MH2	3	2	102.327	0.133	24	2% Offset for UBS* / B1I	0.0055	102.714
IMU-PB1-C-MH2-RTD-3	AF1C213A	C	MH2	3	2	91.676	0.133	24	2% Offset for UBS* / B1I	0.0055	92.163
IMU-PB1-C-MH2-RTD-4	AF1C214A	C	MH2	3	2	95.631	0.132	24	2% Offset for UBS* / B1I	0.0055	95.775
									Ultimate Bearing Strength / B1I: B:Bearing, 1:first hole, I: Inapplicable (not on bolt, nut or head side)		

Average	**93.915**	
Standard Dev.	**3.540**	
Coeff. of Var. [%]	**3.770**	
Min.	**88.999**	
Max.	**102.327**	
Number of Spec.	**19**	

Average$_{norm}$	**0.0055**	**94.238**
Standard Dev.$_{norm}$		**3.579**
Coeff. of Var. [%]$_{norm}$		**3.798**
Min.	**0.0053**	**88.489**
Max.	**0.0057**	**102.714**
Number of Spec.		**19**

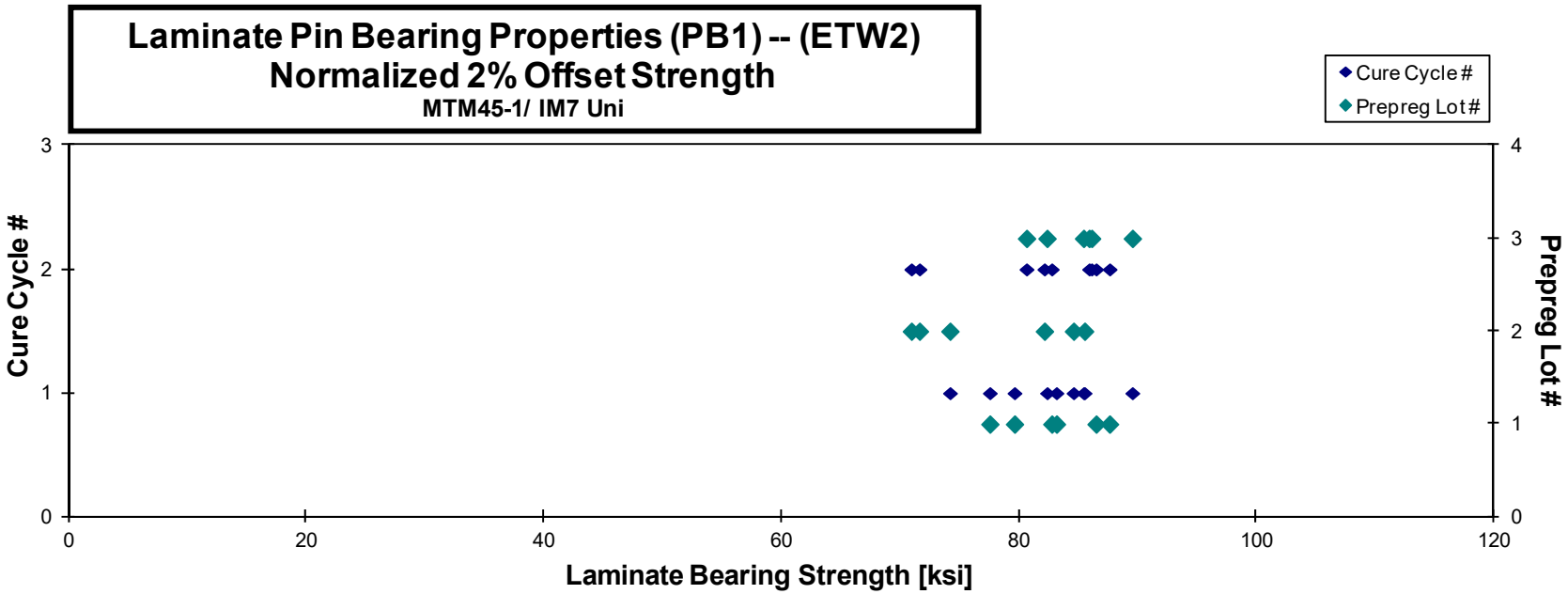

Laminate Pin Bearing Properties (PB1) -- (RTD)
Normalized 2% Offset Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Bearing Strength [ksi]
0
20
40
60
80
100
120
0
1
2
3
4

Laminate Pin Bearing Properties (PB1) -- (ETW2)
Strength
MTM45-1/ IM7 Uni

normalizing t_{ply} [in]: 0.0055

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	2% Offset Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Comments	Avg. t_{ply} [in]	2% Offset Strength$_{norm}$ [ksi]
IMU-PB1-A-MH1-ETW2-1	AF1A111D	A	MH1	1	1	78.871	0.133	24	2% Offset for UBS* / B1I	0.0056	79.657
IMU-PB1-A-MH1-ETW2-2	AF1A112D	A	MH1	1	1	82.272	0.133	24	2% Offset for UBS* / B1I	0.0056	83.186
IMU-PB1-A-MH1-ETW2-3	AF1A113D	A	MH1	1	1	76.947	0.133	24	2% Offset for UBS* / B1I	0.0055	77.578
IMU-PB1-A-MH2-ETW2-1	AF1A211D	A	MH2	1	2	84.936	0.134	24	2% Offset for UBS* / B1I	0.0056	86.523
IMU-PB1-A-MH2-ETW2-2	AF1A212D	A	MH2	1	2	81.364	0.134	24	2% Offset for UBS* / B1I	0.0056	82.792
IMU-PB1-A-MH2-ETW2-3	AF1A213D	A	MH2	1	2	86.125	0.134	24	2% Offset for UBS* / B1I	0.0056	87.658
IMU-PB1-B-MH1-ETW2-1	AF1B111D	B	MH1	2	1	72.860	0.134	24	2% Offset for UBS* / B1I	0.0056	74.221
IMU-PB1-B-MH1-ETW2-2	AF1B112D	B	MH1	2	1	84.926	0.132	24	2% Offset for UBS* / B1I	0.0055	84.626
IMU-PB1-B-MH1-ETW2-3	AF1B113D	B	MH1	2	1	85.588	0.132	24	2% Offset for UBS* / B1I	0.0055	85.555
IMU-PB1-B-MH2-ETW2-1	AF1B211D	B	MH2	2	2	73.114	0.128	24	2% Offset for UBS* / B1I	0.0053	70.972
IMU-PB1-B-MH2-ETW2-2	AF1B212D	B	MH2	2	2	74.396	0.127	24	2% Offset for UBS* / B1I	0.0053	71.653
IMU-PB1-B-MH2-ETW2-3	AF1B213D	B	MH2	2	2	84.841	0.128	24	2% Offset for UBS* / B1I	0.0053	82.173
IMU-PB1-C-MH1-ETW2-1	AF1C111D	C	MH1	3	1	82.959	0.131	24	2% Offset for UBS* / B1I	0.0055	82.393
IMU-PB1-C-MH1-ETW2-2	AF1C112D	C	MH1	3	1	90.735	0.130	24	2% Offset for UBS* / B1I	0.0054	89.578
IMU-PB1-C-MH1-ETW2-3	AF1C113D	C	MH1	3	1	86.373	0.131	24	2% Offset for UBS* / B1I	0.0054	85.467
IMU-PB1-C-MH2-ETW2-1	AF1C211D	C	MH2	3	2	81.659	0.130	24	2% Offset for UBS* / B1I	0.0054	80.669
IMU-PB1-C-MH2-ETW2-2	AF1C212D	C	MH2	3	2	87.263	0.130	24	2% Offset for UBS* / B1I	0.0054	86.150
IMU-PB1-C-MH2-ETW2-3	AF1C213D	C	MH2	3	2	86.761	0.131	24	2% Offset for UBS* / B1I	0.0054	85.939
									Ultimate Bearing Strength / B1I: B:Bearing, 1:first hole, I: Inapplicable (not on bolt, nut or head side)		

	2% Offset Strength [ksi]		2% Offset Strength$_{norm}$ [ksi]
Average	82.333	Average$_{norm}$	82.044
Standard Dev.	5.180	Standard Dev.$_{norm}$	5.382
Coeff. of Var. [%]	6.291	Coeff. of Var. [%]$_{norm}$	6.559
Min.	72.860	Min.	70.972
Max.	90.735	Max.	89.578
Number of Spec.	18	Number of Spec.	18


Laminate Pin Bearing Properties (PB1) -- (ETW2)
Normalized 2% Offset Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Bearing Strength [ksi]
0
1
2
3
4
0
20
40
60
80
100
120

4.29 "10/80/10" Pin Bearing 2 Properties (PB2)

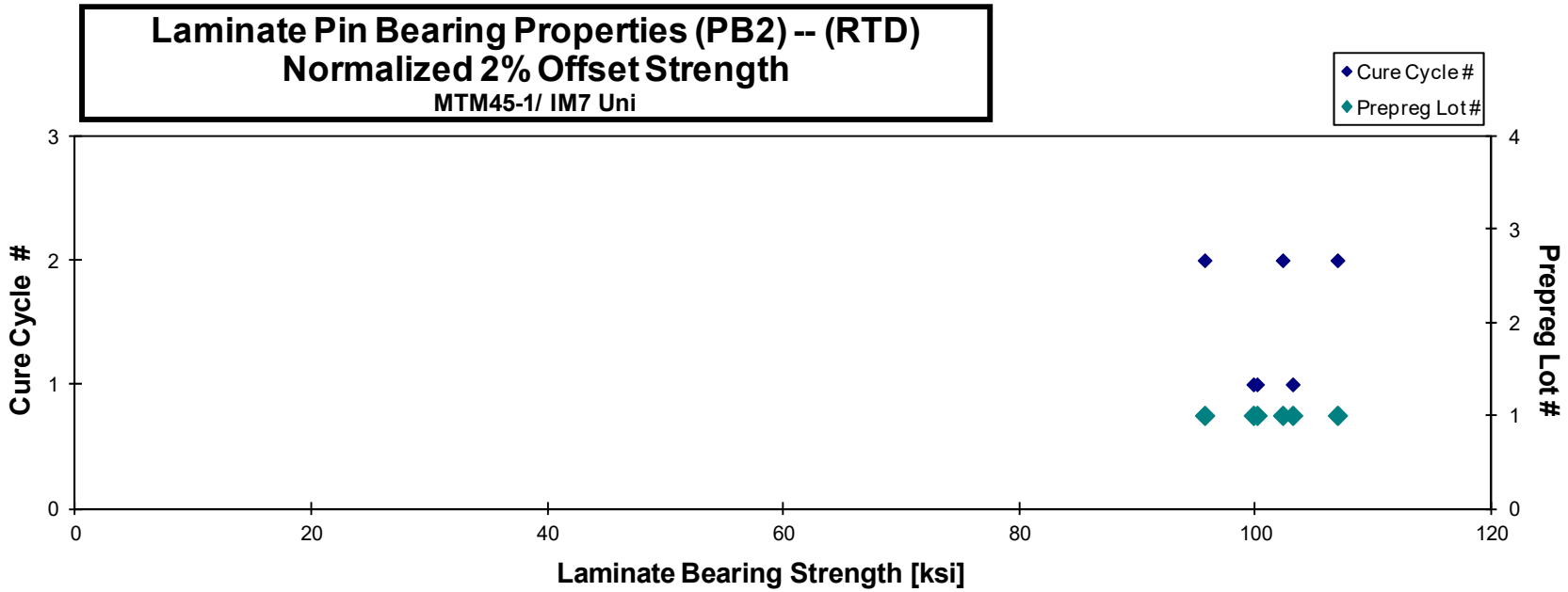
Laminate Pin Bearing Properties (PB2) -- (RTD) Strength
MTM45-1/ IM7 Uni

normalizing t_{ply} [in]
0.0055

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	2% Offset Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Comments	Avg. t_{ply} [in]	2% Offset Strength$_{norm}$ [ksi]
IMU-PB2-A-MH1-RTD-1	AF2A111A	A	MH1	1	1	96.866	0.113	20	2% Offset for UBS* / B1I	0.0057	99.860
IMU-PB2-A-MH1-RTD-2	AF2A112A	A	MH1	1	1	101.263	0.112	20	2% Offset for UBS* / B1I	0.0056	103.196
IMU-PB2-A-MH1-RTD-3	AF2A113A	A	MH1	1	1	97.948	0.113	20	2% Offset for UBS* / B1I	0.0056	100.174
IMU-PB2-A-MH2-RTD-1	AF2A211A	A	MH2	1	2	106.408	0.111	20	2% Offset for UBS* / B1I	0.0055	106.988
IMU-PB2-A-MH2-RTD-2	AF2A212A	A	MH2	1	2	94.190	0.112	20	2% Offset for UBS* / B1I	0.0056	95.732
IMU-PB2-A-MH2-RTD-4	AF2A214A	A	MH2	1	2	100.791	0.112	20	2% Offset for UBS* / B1I	0.0056	102.348
									Ultimate Bearing Strength / B1I: B:Bearing, 1:first hole, I: Inapplicable (not on bolt, nut or head side)		

Average	**99.578**	
Standard Dev.	**4.243**	
Coeff. of Var. [%]	**4.261**	
Min.	**94.190**	
Max.	**106.408**	
Number of Spec.	**6**	

Average$_{norm}$	**0.0056**	**101.383**
Standard Dev.$_{norm}$		**3.778**
Coeff. of Var. [%]$_{norm}$		**3.726**
Min.	**0.0055**	**95.732**
Max.	**0.0057**	**106.988**
Number of Spec.		**6**


Laminate Pin Bearing Properties (PB2) -- (RTD)
Normalized 2% Offset Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Bearing Strength [ksi]
0
20
40
60
80
100
120
0
1
2
3
4

Laminate Pin Bearing Properties (PB2) -- (ETW2) Strength

MTM45-1/ IM7 Uni

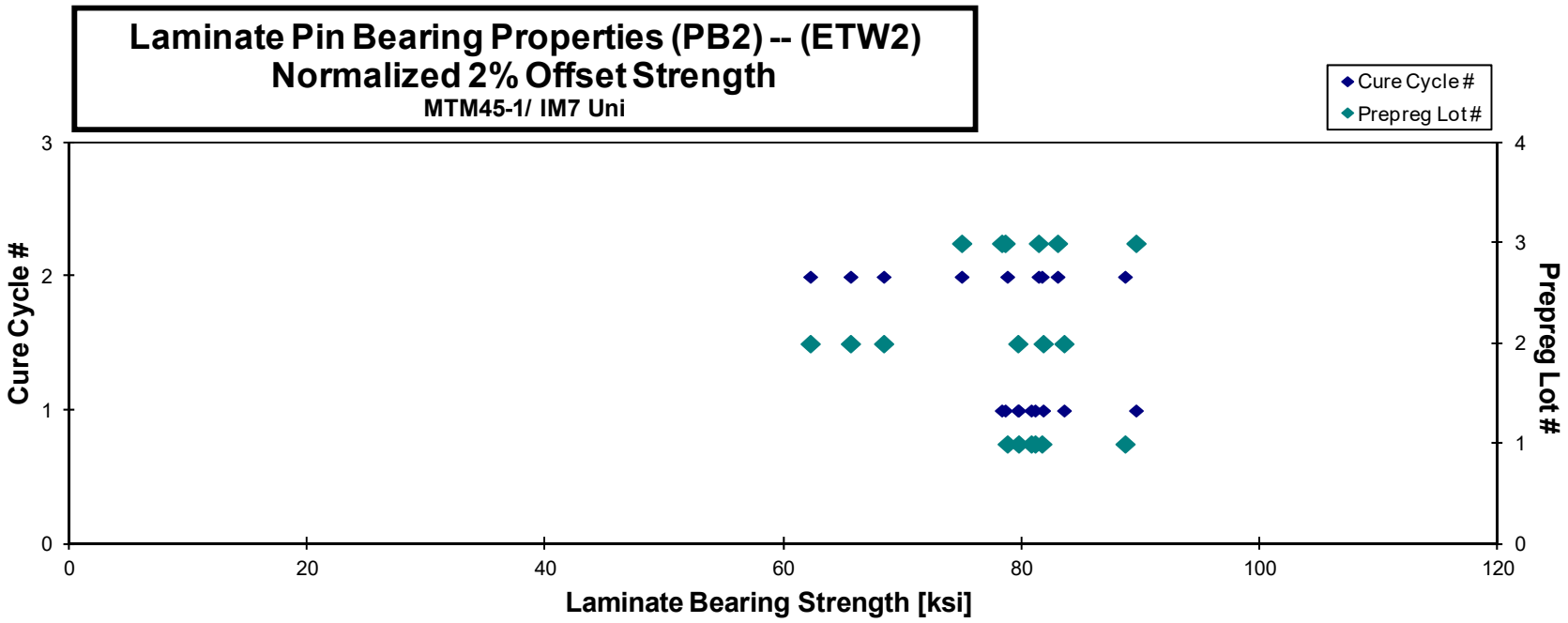
normalizing t_{ply} [in]
0.0055

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	2% Offset Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Comments	Avg. t_{ply} [in]	2% Offset Strength$_{norm}$ [ksi]
IMU-PB2-A-MH1-ETW2-1	AF2A111D	A	MH1	1	1	80.701	0.111	20	2% Offset for UBS* / B1I	0.0055	81.190
IMU-PB2-A-MH1-ETW2-2	AF2A112D	A	MH1	1	1	81.107	0.110	20	2% Offset for UBS* / B1I	0.0055	80.861
IMU-PB2-A-MH1-ETW2-3	AF2A113D	A	MH1	1	1	78.609	0.112	20	2% Offset for UBS* / B1I	0.0056	79.800
IMU-PB2-A-MH2-ETW2-1	AF2A211D	A	MH2	1	2	79.332	0.109	20	2% Offset for UBS* / B1I	0.0055	78.851
IMU-PB2-A-MH2-ETW2-2	AF2A212D	A	MH2	1	2	82.508	0.109	20	2% Offset for UBS* / B1I	0.0055	81.758
IMU-PB2-A-MH2-ETW2-3	AF2A213D	A	MH2	1	2	89.833	0.109	20	2% Offset for UBS* / B1I	0.0054	88.744
IMU-PB2-B-MH1-ETW2-1	AF2B111D	B	MH1	2	1	79.204	0.111	20	2% Offset for UBS* / B1I	0.0055	79.744
IMU-PB2-B-MH1-ETW2-2	AF2B112D	B	MH1	2	1	81.296	0.111	20	2% Offset for UBS* / B1I	0.0055	81.869
IMU-PB2-B-MH1-ETW2-3	AF2B113D	B	MH1	2	1	83.390	0.110	20	2% Offset for UBS* / B1I	0.0055	83.617
IMU-PB2-B-MH2-ETW2-1	AF2B211D	B	MH2	2	2	65.595	0.115	20	2% Offset for UBS* / B1I	0.0057	68.472
IMU-PB2-B-MH2-ETW2-2	AF2B212D	B	MH2	2	2	59.910	0.114	20	2% Offset for UBS* / B1I	0.0057	62.307
IMU-PB2-B-MH2-ETW2-3	AF2B213D	B	MH2	2	2	63.703	0.113	20	2% Offset for UBS* / B1I	0.0057	65.687
IMU-PB2-C-MH1-ETW2-1	AF2C111D	C	MH1	3	1	66.416	0.130	20	2% Offset for UBS* / B1I	0.0065	78.673
IMU-PB2-C-MH1-ETW2-2	AF2C112D	C	MH1	3	1	76.031	0.130	20	2% Offset for UBS* / B1I	0.0065	89.665
IMU-PB2-C-MH1-ETW2-3	AF2C113D	C	MH1	3	1	65.796	0.131	20	2% Offset for UBS* / B1I	0.0066	78.387
IMU-PB2-C-MH2-ETW2-1	AF2C211D	C	MH2	3	2	81.792	0.112	20	2% Offset for UBS* / B1I	0.0056	83.074
IMU-PB2-C-MH2-ETW2-2	AF2C212D	C	MH2	3	2	80.834	0.111	20	2% Offset for UBS* / B1I	0.0055	81.477
IMU-PB2-C-MH2-ETW2-3	AF2C213D	C	MH2	3	2	74.888	0.110	20	2% Offset for UBS* / B1I	0.0055	75.024

Ultimate Bearing Strength / B1I: B:Bearing, 1:first hole, I: Inapplicable (not on bolt, nut or head side)

Average	**76.164**	
Standard Dev.	**8.277**	
Coeff. of Var. [%]	**10.868**	
Min.	**59.910**	
Max.	**89.833**	
Number of Spec.	**18**	

Average$_{norm}$	**0.0057**	**78.844**
Standard Dev.$_{norm}$		**7.115**
Coeff. of Var. [%]$_{norm}$		**9.024**
Min.	**0.0054**	**62.307**
Max.	**0.0066**	**89.665**
Number of Spec.		**18**


Laminate Pin Bearing Properties (PB2) -- (ETW2)
Normalized 2% Offset Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Bearing Strength [ksi]
0
20
40
60
80
100
120
0
1
2
3
4

4.30 "50/40/10" Pin Bearing 3 Properties (PB3)

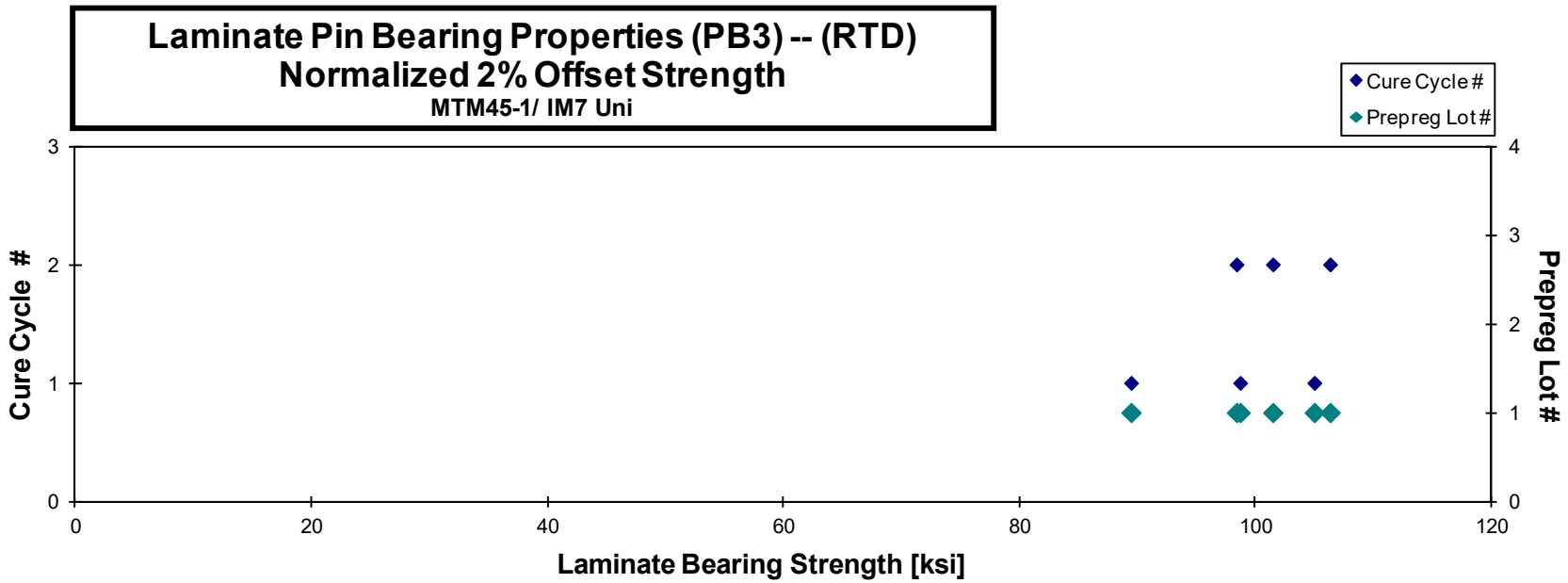
Laminate Pin Bearing Properties (PB3) -- (RTD)
Strength
MTM45-1/ IM7 Uni

normalizing t_{ply} [in]: 0.0055

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	2% Offset Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Comments	Avg. t_{ply} [in]	2% Offset Strength$_{norm}$ [ksi]
IMU-PB3-A-MH1-RTD-1	AF3A111A	A	MH1	1	1	97.856	0.111	20	2% Offset for UBS* / B1I	0.0056	98.746
IMU-PB3-A-MH1-RTD-2	AF3A112A	A	MH1	1	1	87.903	0.112	20	2% Offset for UBS* / B1I	0.0056	89.501
IMU-PB3-A-MH1-RTD-3	AF3A113A	A	MH1	1	1	103.435	0.112	20	2% Offset for UBS* / B1I	0.0056	105.034
IMU-PB3-A-MH2-RTD-1	AF3A211A	A	MH2	1	2	97.554	0.111	20	2% Offset for UBS* / B1I	0.0056	98.441
IMU-PB3-A-MH2-RTD-2	AF3A212A	A	MH2	1	2	103.818	0.113	20	2% Offset for UBS* / B1I	0.0056	106.366
IMU-PB3-A-MH2-RTD-3	AF3A213A	A	MH2	1	2	101.334	0.110	20	2% Offset for UBS* / B1I	0.0055	101.518

Ultimate Bearing Strength / B1I: B:Bearing, 1:first hole, I: Inapplicable (not on bolt, nut or head side)

Average	98.650	Average$_{norm}$	0.0056	99.934
Standard Dev.	5.902	Standard Dev.$_{norm}$		6.040
Coeff. of Var. [%]	5.982	Coeff. of Var. [%]$_{norm}$		6.044
Min.	87.903	Min.	0.0055	89.501
Max.	103.818	Max.	0.0056	106.366
Number of Spec.	6	Number of Spec.		6


Laminate Pin Bearing Properties (PB3) -- (RTD)
Normalized 2% Offset Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Bearing Strength [ksi]
0
20
40
60
80
100
120
0
1
2
3
4

Laminate Pin Bearing Properties (PB3) -- (ETW2) Strength

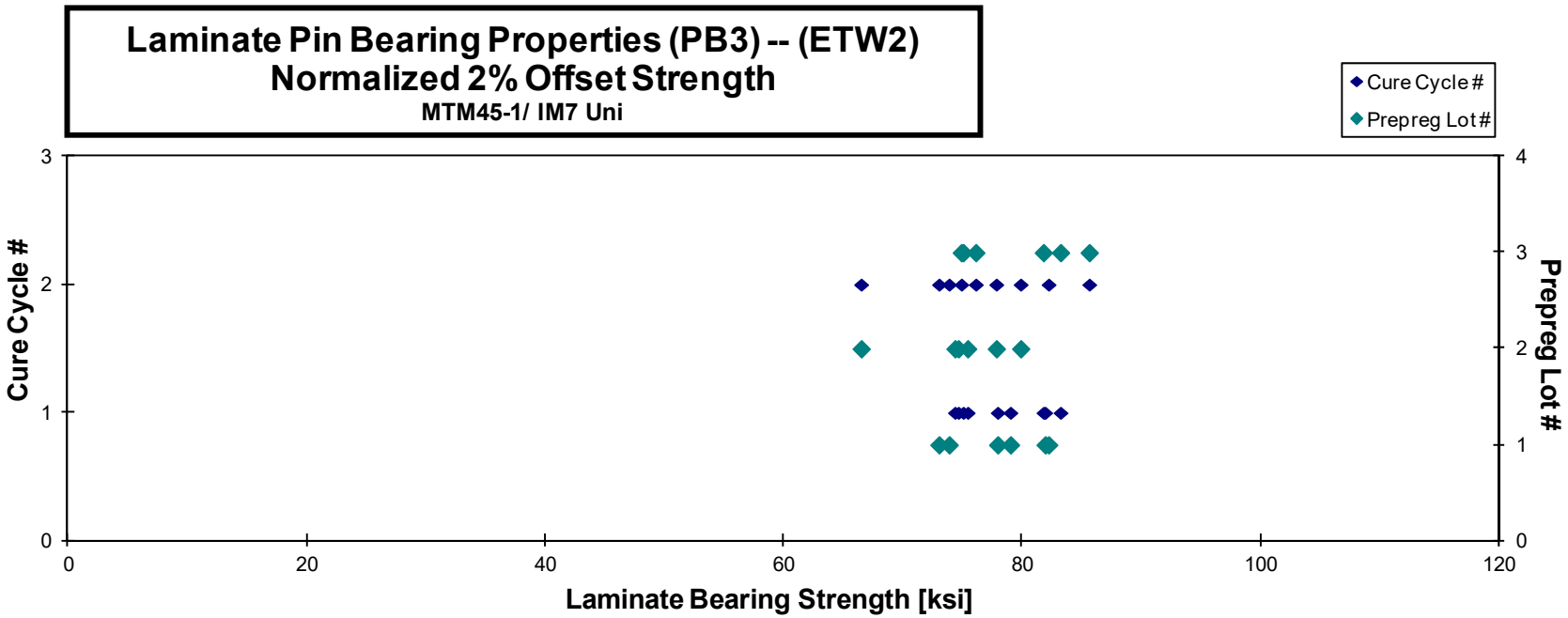
MTM45-1/ IM7 Uni

normalizing t_{ply} [in]
0.0055

Specimen Number	NIAR Name	ACG Batch #	ACG Cure Cycle	Prepreg Lot #	Cure Cycle #	2% Offset Strength [ksi]	Avg. Specimen Thickn. [in]	# Plies in Laminate	Comments	Avg. t_{ply} [in]	2% Offset Strength$_{norm}$ [ksi]
IMU-PB3-A-MH1-ETW2-1	AF3A111D	A	MH1	1	1	78.166	0.110	20	2% Offset for UBS* / B1I	0.0055	77.953
IMU-PB3-A-MH1-ETW2-3	AF3A113D	A	MH1	1	1	82.399	0.109	20	2% Offset for UBS* / B1I	0.0055	81.937
IMU-PB3-A-MH1-ETW2-4	AF3A114D	A	MH1	1	1	79.057	0.110	20	2% Offset for UBS* / B1I	0.0055	79.021
IMU-PB3-A-MH2-ETW2-1	AF3A211D	A	MH2	1	2	74.386	0.109	20	2% Offset for UBS* / B1I	0.0055	73.879
IMU-PB3-A-MH2-ETW2-2	AF3A212D	A	MH2	1	2	72.700	0.111	20	2% Offset for UBS* / B1I	0.0055	73.030
IMU-PB3-A-MH2-ETW2-3	AF3A213D	A	MH2	1	2	81.531	0.111	20	2% Offset for UBS* / B1I	0.0055	82.223
IMU-PB3-B-MH1-ETW2-1	AF3B111D	B	MH1	2	1	75.008	0.111	20	2% Offset for UBS* / B1I	0.0055	75.434
IMU-PB3-B-MH1-ETW2-2	AF3B112D	B	MH1	2	1	74.371	0.110	20	2% Offset for UBS* / B1I	0.0055	74.371
IMU-PB3-B-MH1-ETW2-3	AF3B113D	B	MH1	2	1	74.657	0.110	20	2% Offset for UBS* / B1I	0.0055	74.657
IMU-PB3-B-MH2-ETW2-1	AF3B211D	B	MH2	2	2	79.591	0.110	20	2% Offset for UBS* / B1I	0.0055	79.881
IMU-PB3-B-MH2-ETW2-2	AF3B212D	B	MH2	2	2	66.275	0.110	20	2% Offset for UBS* / B1I	0.0055	66.501
IMU-PB3-B-MH2-ETW2-3	AF3B213D	B	MH2	2	2	76.603	0.112	20	2% Offset for UBS* / B1I	0.0056	77.839
IMU-PB3-C-MH1-ETW2-1	AF3C111D	C	MH1	3	1	82.747	0.109	20	2% Offset for UBS* / B1I	0.0054	81.788
IMU-PB3-C-MH1-ETW2-2	AF3C112D	C	MH1	3	1	83.508	0.110	20	2% Offset for UBS* / B1I	0.0055	83.223
IMU-PB3-C-MH1-ETW2-3	AF3C113D	C	MH1	3	1	75.542	0.109	20	2% Offset for UBS* / B1I	0.0055	75.062
IMU-PB3-C-MH2-ETW2-1	AF3C211D	C	MH2	3	2	86.836	0.108	20	2% Offset for UBS* / B1I	0.0054	85.632
IMU-PB3-C-MH2-ETW2-2	AF3C212D	C	MH2	3	2	75.555	0.109	20	2% Offset for UBS* / B1I	0.0055	74.902
IMU-PB3-C-MH2-ETW2-3	AF3C213D	C	MH2	3	2	76.027	0.110	20	2% Offset for UBS* / B1I	0.0055	76.114
									Ultimate Bearing Strength / B1I: B:Bearing, 1:first hole, I: Inapplicable (not on bolt, nut or head side)		

Average	**77.498**	
Standard Dev.	**4.800**	
Coeff. of Var. [%]	**6.194**	
Min.	**66.275**	
Max.	**86.836**	
Number of Spec.	**18**	

Average$_{norm}$	**0.0055**	**77.414**
Standard Dev.$_{norm}$		**4.591**
Coeff. of Var. [%]$_{norm}$		**5.930**
Min.	**0.0054**	**66.501**
Max.	**0.0056**	**85.632**
Number of Spec.		**18**


Laminate Pin Bearing Properties (PB3) -- (ETW2)
Normalized 2% Offset Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Prepreg Lot #
Cure Cycle #
Prepreg Lot #
Laminate Bearing Strength [ksi]
0
1
2
3
4
0
20
40
60
80
100
120

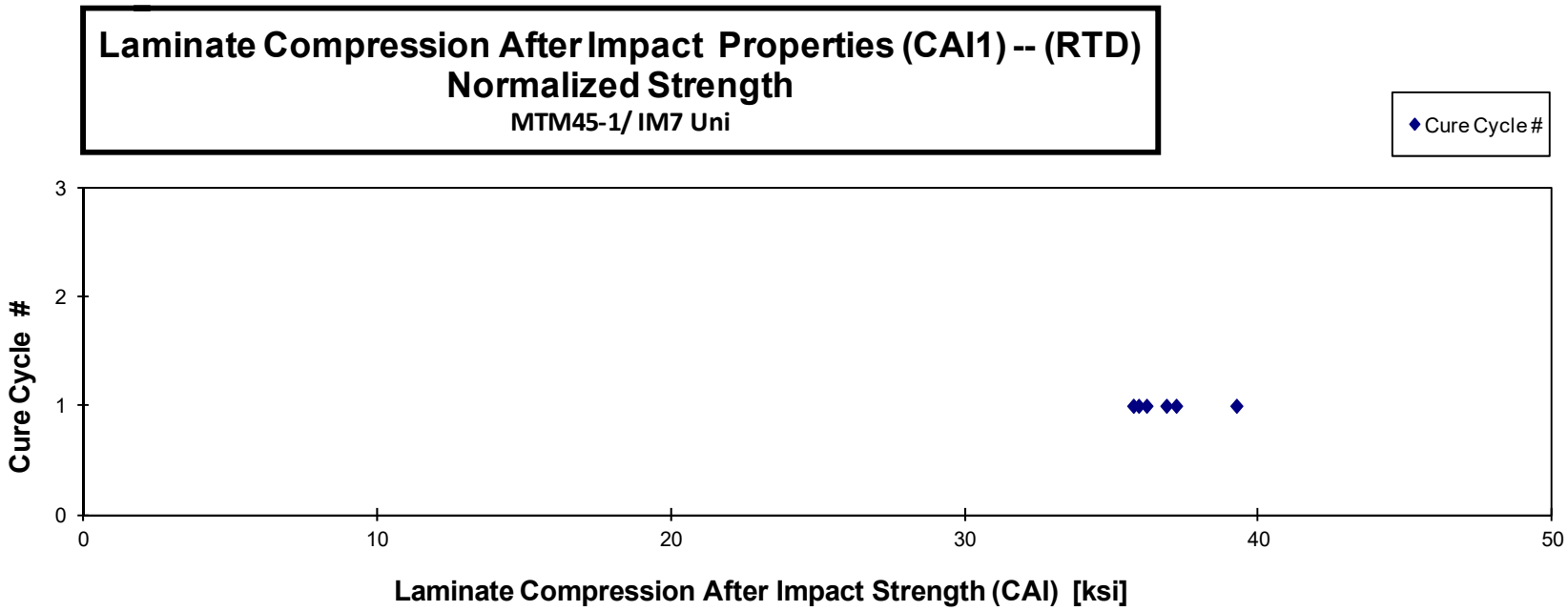
4.31 "25/50/25" Compression After Impact 1 Properties (CAI1)

Laminate Compression After Impact Properties (CAI1) -- (RTD) Strength
MTM45-1/ IM7 Uni

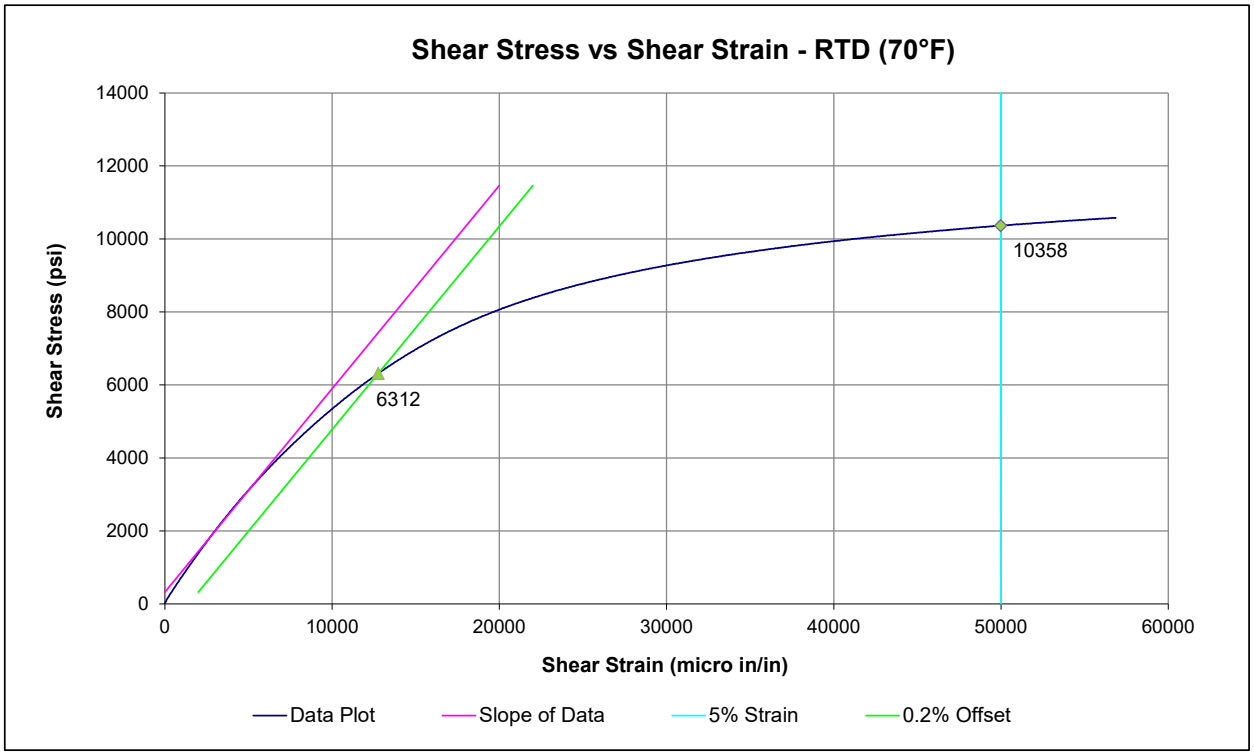
normalizing t_{ply} [in]: 0.0055

Specimen Number	NIAR Name	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]
IMU-CAI1-A-MH1-RTD-1	AFKA111A	A	MH1	1	1	269.70	35.450	0.180	32	LDM	0.0056	36.155
IMU-CAI1-A-MH1-RTD-2	AFKA112A	A	MH1	1	1	270.03	36.745	0.178	32	LDM	0.0056	37.163
IMU-CAI1-A-MH1-RTD-3	AFKA113A	A	MH1	1	1	269.36	37.086	0.175	32	LDM	0.0055	36.833
IMU-CAI1-A-MH1-RTD-4	AFKA114A	A	MH1	1	1	270.95	35.624	0.177	32	LDM	0.0055	35.887
IMU-CAI1-A-MH1-RTD-5	AFKA115A	A	MH1	1	1	270.24	38.840	0.178	32	LDM	0.0056	39.215
IMU-CAI1-A-MH1-RTD-6	AFKA116A	A	MH1	1	1	268.33	35.050	0.179	32	LDM	0.0056	35.707

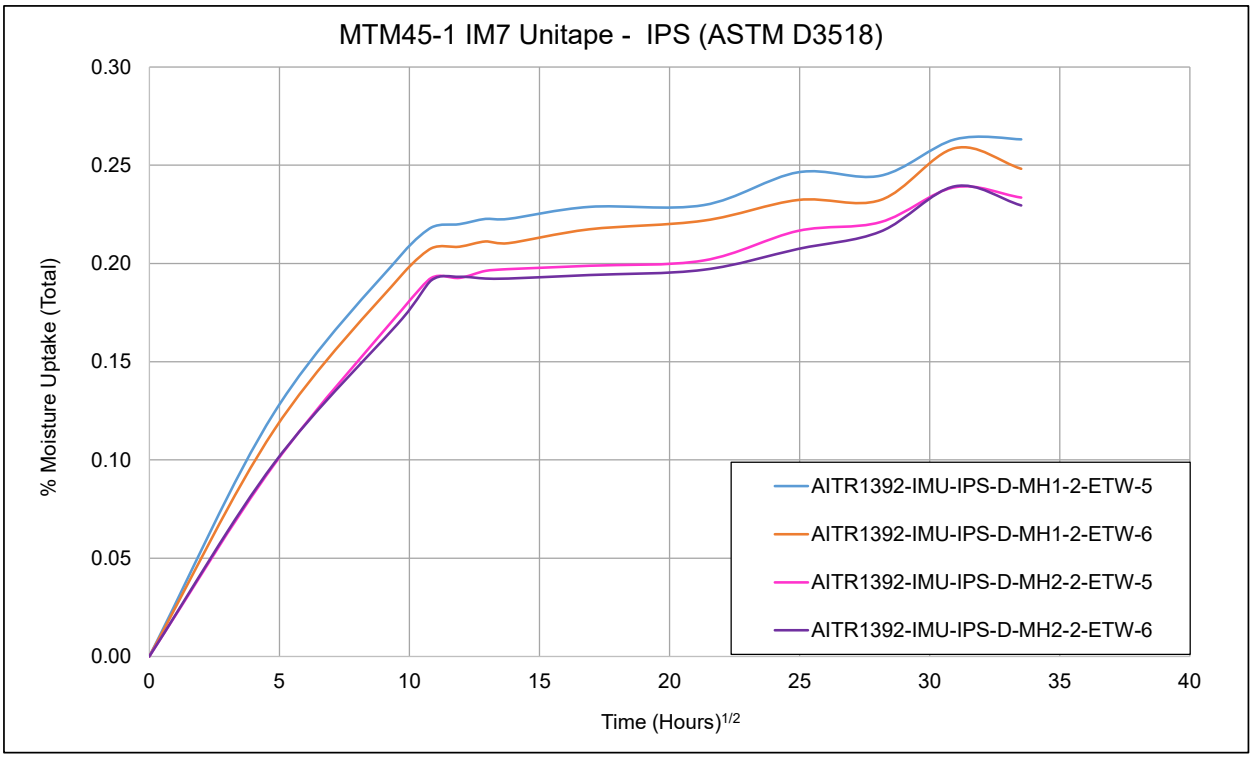
Average	**36.466**		**$Average_{norm}$**	**0.0056**	**36.827**
Standard Dev.	**1.403**		**$Standard\ Dev._{norm}$**		**1.297**
Coeff. of Var. [%]	**3.848**		**$Coeff.\ of\ Var.\ [\%]_{norm}$**		**3.521**
Min.	**35.050**		**Min.**	**0.0055**	**35.707**
Max.	**38.840**		**Max.**	**0.0056**	**39.215**
Number of Spec.	**6**		**Number of Spec.**		**6**

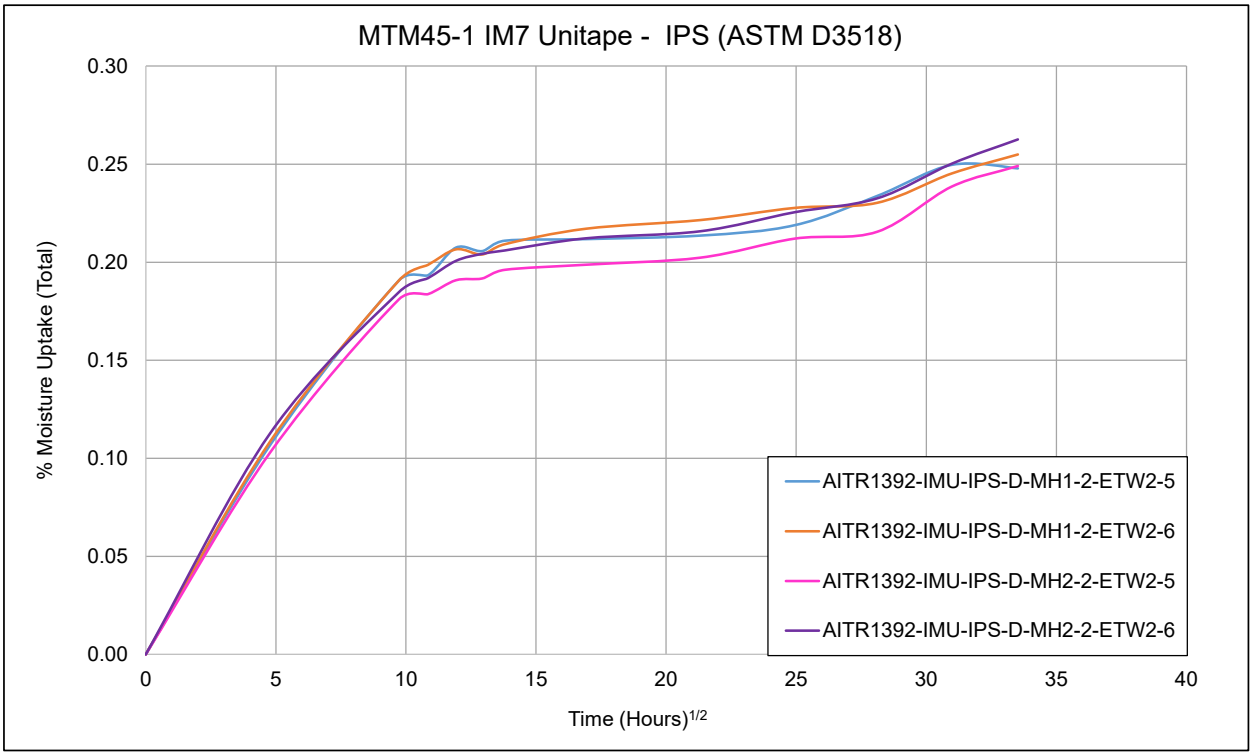

Laminate Compression After Impact Properties (CAI1) -- (RTD)
Normalized Strength
MTM45-1/ IM7 Uni
Cure Cycle #
Cure Cycle #
0
1
2
3
0
10
20
30
40
50
Laminate Compression After Impact Strength (CAI) [ksi]

5. Shear Stress vs. Shear Strain, RTD

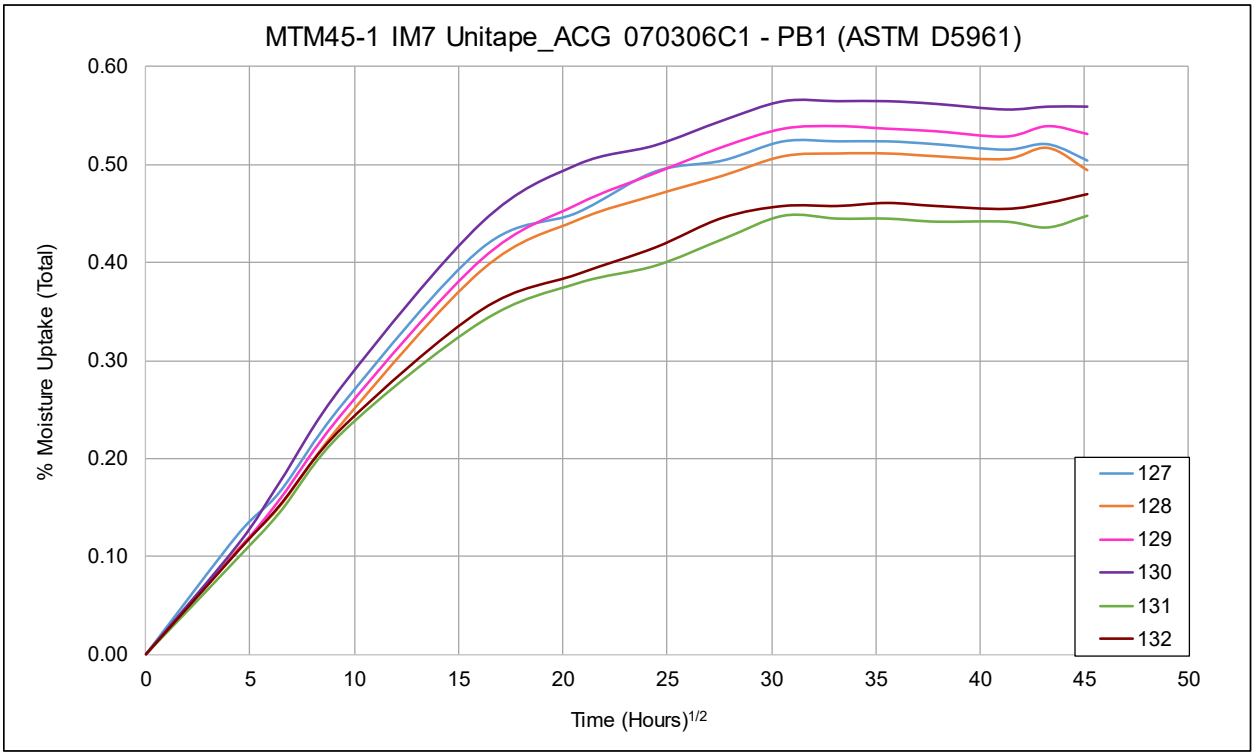


6. MOISTURE CONDITIONING CHARTS
6.1 In-Plane Shear Properties – Thinnest Panel





6.2 Pin Bearing 1 - Thickest Panel



7. DMA Results

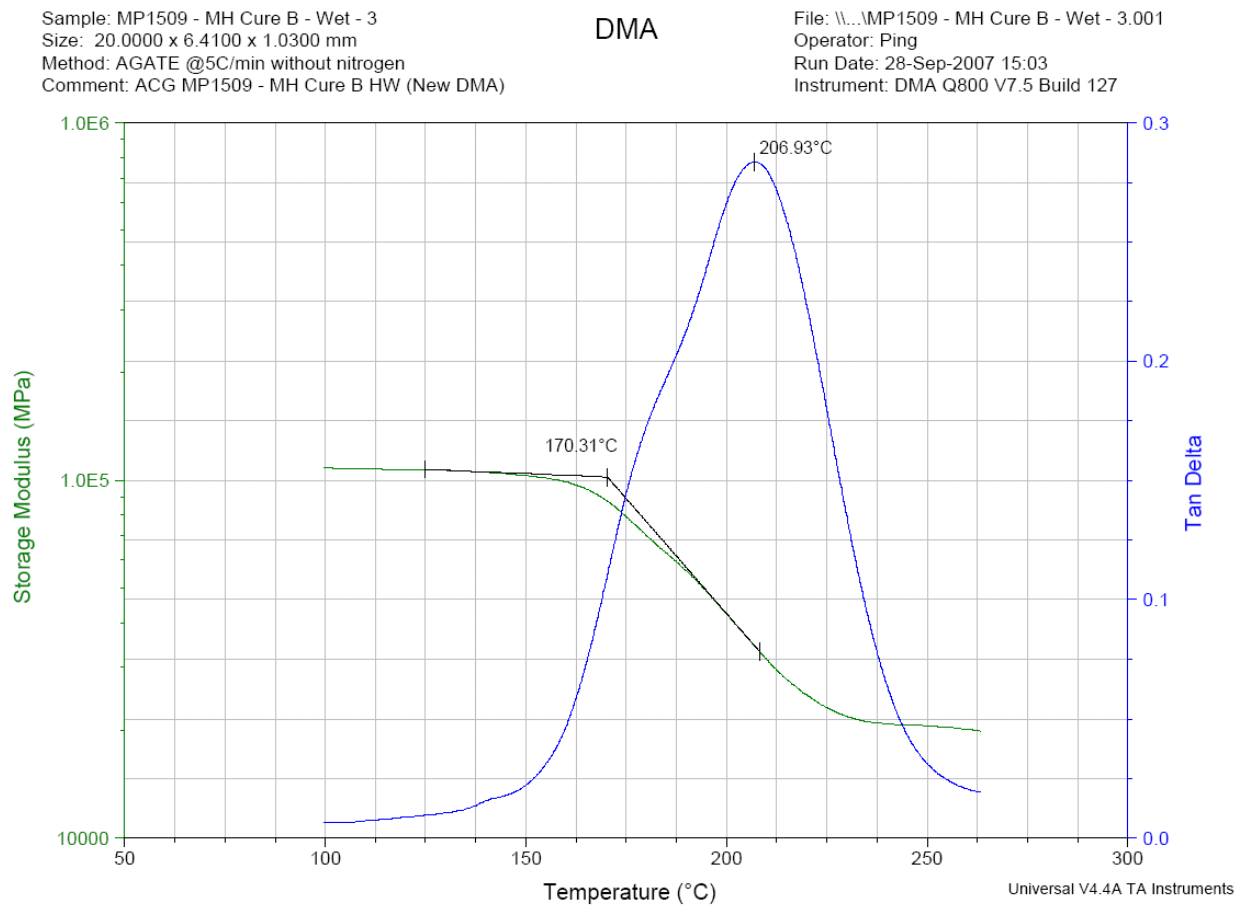
The variability in the DMA data below is higher than expected; however, ACG and NCAMP have reviewed the cure cycle records, and could not find any assignable cause. NCAMP and ACG agreed to remove the data which resulted in Dry DMA values greater than Wet DMA values.

Test Panel Part Number					Representative DMA Sample #	MH Cure DMA Results - Onset Storage Modulus				MH Cure DMA Results - Peak Tangent Delta			
						AITR1392-IMU				AITR1392-IMU			
						DRY		85% RH WET		DRY		85% RH WET	
Test Plan-	Material-	Test-	Batch-	Cure		Tg [°C]	Tg [°F]	Tg [°C]	Tg [°F]	Tg [°C]	Tg [°F]	Tg [°C]	Tg [°F]
AITR1392-	IMU	LT-	B-	MH1	MP1509A	182.09	359.77			209.04	408.27		
AITR1392-	IMU	TT-	B-	MH1									
AITR1392-	IMU	LC-	B-	MH1									
AITR1392-	IMU	TC-	B-	MH1									
AITR1392-	IMU	UNT0-	B-	MH1									
AITR1392-	IMU	UNT1-	B-	MH1									
AITR1392-	IMU	UNC0-	B-	MH1									
AITR1392-	IMU	UNC1-	B-	MH1									
AITR1392-	IMU	OHT2-	B-	MH1									
AITR1392-	IMU	OHT3-	B-	MH1									
AITR1392-	IMU	OHC3-	B-	MH1									
AITR1392-	IMU	FHC2-	B-	MH1									
AITR1392-	IMU	FHC3-	B-	MH1									
AITR1392-	IMU	PB2-	B-	MH1									
AITR1392-	IMU	PB3-	B-	MH1									
AITR1392-	IMU	LT-	B-	MH2	MP1509B	178.16	352.69	175.99	348.78	209.90	409.82	209.01	408.22
AITR1392-	IMU	TT-	B-	MH2									
AITR1392-	IMU	LC-	B-	MH2									
AITR1392-	IMU	TC-	B-	MH2									
AITR1392-	IMU	IPS-	B-	MH1									
AITR1392-	IMU	UNT0-	B-	MH2									
AITR1392-	IMU	UNT1-	B-	MH2									
AITR1392-	IMU	UNC0-	B-	MH2									
AITR1392-	IMU	OHT1-	B-	MH1									
AITR1392-	IMU	FHT1-	B-	MH1									
AITR1392-	IMU	OHC1-	B-	MH1									
AITR1392-	IMU	OHC2-	B-	MH1									
AITR1392-	IMU	FHC1-	B-	MH1									
AITR1392-	IMU	PB1-	B-	MH1									
AITR1392-	IMU	FHT1-	A-	MH2	MP1509BB	178.49	353.28	157.62	315.71	204.53	400.16	187.11	368.80
AITR1392-	IMU	PB1-	C-	MH2									
AITR1392-	IMU	PB2-	C-	MH2									
AITR1392-	IMU	OHC3-	C-	MH1	MP1509BC	179.41	354.94	157.49	315.48	203.50	398.29	198.59	389.47
AITR1392-	IMU	PB2-	A-	MH2	MP1509BD	187.65	369.76	160.78	321.41	210.44	410.79	184.21	363.58
AITR1392-	IMU	PB3-	A-	MH2									
AITR1392-	IMU	IPS-	A-	MH3	MP1509BE	169.91	337.83	156.24	313.23	199.51	391.12	195.75	384.34
AITR1392-	IMU	UNT0-	A-	MH3									
AITR1392-	IMU	OHT1-	A-	MH3									
AITR1392-	IMU	OHT2-	A-	MH3									
AITR1392-	IMU	FHT1-	A-	MH3									
AITR1392-	IMU	FHC3-	A-	MH3									
AITR1392-	IMU	PB2-	A-	MH3									
AITR1392-	IMU	PB1-	A-	MH2	MP1509BK	173.95	345.10	155.32	311.57	201.08	393.94	189.64	373.35
AITR1392-	IMU	IPS-	A-	MH4	MP1509BL	195.65	384.17			212.36	414.24		
AITR1392-	IMU	CAI1-	A-	MH1									
AITR1392-	IMU	IPS-	B-	MH2	MP1509C	186.77	368.19			211.74	413.13		
AITR1392-	IMU	UNC1-	B-	MH2									
AITR1392-	IMU	OHT3-	B-	MH2									
AITR1392-	IMU	OHC2-	B-	MH2									
AITR1392-	IMU	OHC3-	B-	MH2									
AITR1392-	IMU	FHC1-	B-	MH2									
AITR1392-	IMU	FHC2-	B-	MH2									
AITR1392-	IMU	FHC3-	B-	MH2									
AITR1392-	IMU	PB1-	B-	MH2									
AITR1392-	IMU	PB2-	B-	MH2									
AITR1392-	IMU	PB3-	B-	MH2									
AITR1392-	IMU	OHT1-	B-	MH2	MP1509D	168.55	335.40	157.15	314.86	201.02	393.83	198.51	389.31
AITR1392-	IMU	OHT2-	B-	MH2									
AITR1392-	IMU	FHT1-	B-	MH2									
AITR1392-	IMU	LT-	C-	MH2	MP1509E	---	---			---	---		
AITR1392-	IMU	TT-	C-	MH2									
AITR1392-	IMU	LC-	C-	MH2									
AITR1392-	IMU	TC-	C-	MH2									
AITR1392-	IMU	UNT0-	C-	MH2									
AITR1392-	IMU	UNT1-	C-	MH2									
AITR1392-	IMU	LT-	C-	MH1	MP1509F	171.89	341.41	159.07	318.32	201.70	395.06	198.16	388.68
AITR1392-	IMU	TT-	C-	MH1									
AITR1392-	IMU	OHC1-	B-	MH2									

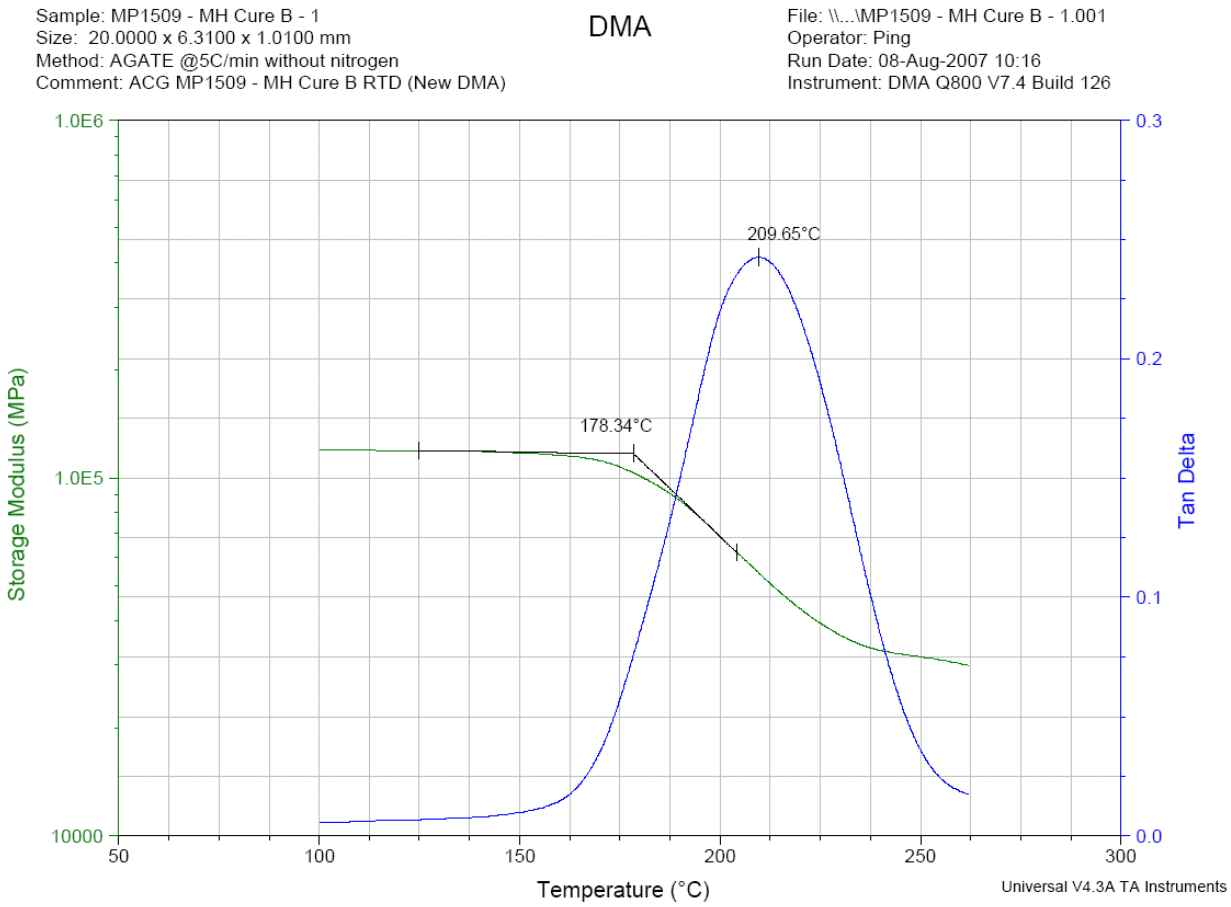
AITR1392-	IMU	UNC0-	C-	MH2	MP1509O	196.79	386.22			213.61	416.50		
AITR1392-	IMU	UNC1-	C-	MH1									
AITR1392-	IMU	OHT2-	C-	MH2									
AITR1392-	IMU	OHT3-	C-	MH2									
AITR1392-	IMU	OHC1-	C-	MH1									
AITR1392-	IMU	OHC2-	C-	MH2									
AITR1392-	IMU	OHT1-	C-	MH1	MP1509P	195.64	384.16			211.72	413.09		
AITR1392-	IMU	OHT3-	A-	MH2									
AITR1392-	IMU	OHC3-	C-	MH2									
AITR1392-	IMU	FHC1-	C-	MH2									
AITR1392-	IMU	FHC2-	C-	MH2									
AITR1392-	IMU	FHC3-	C-	MH2									
AITR1392-	IMU	PB3-	C-	MH2									
AITR1392-	IMU	LT-	A-	MH1	MP1509Q	168.98	336.17	157.91	316.24	198.67	389.61	191.11	376.00
AITR1392-	IMU	TT-	A-	MH1									
AITR1392-	IMU	LC-	A-	MH1									
AITR1392-	IMU	LC-	C-	MH1									
AITR1392-	IMU	TC-	A-	MH1									
AITR1392-	IMU	TC-	C-	MH1									
AITR1392-	IMU	IPS-	A-	MH1									
AITR1392-	IMU	UNT0-	A-	MH1									
AITR1392-	IMU	UNT1-	C-	MH1									
AITR1392-	IMU	UNC0-	A-	MH1									
AITR1392-	IMU	UNC0-	C-	MH1									
AITR1392-	IMU	OHC2-	C-	MH1									
AITR1392-	IMU	TC-	A-	MH2	MP1509R	167.09	332.76	156.20	313.17	197.88	388.18	189.42	372.95
AITR1392-	IMU	UNC1-	C-	MH2									
AITR1392-	IMU	OHC1-	C-	MH2									
AITR1392-	IMU	FHC1-	C-	MH1									
AITR1392-	IMU	FHC2-	C-	MH1									
AITR1392-	IMU	UNT1-	A-	MH1	MP1509S	169.35	336.82	158.33	316.99	199.19	390.55	191.37	376.47
AITR1392-	IMU	UNT2-	A-	MH1									
AITR1392-	IMU	UNT3-	A-	MH1									
AITR1392-	IMU	UNC1-	A-	MH1									
AITR1392-	IMU	UNC3-	A-	MH1									
AITR1392-	IMU	OHT1-	A-	MH1									
AITR1392-	IMU	OHT2-	A-	MH1									
AITR1392-	IMU	OHC1-	A-	MH2									
AITR1392-	IMU	UNT1-	A-	MH2	MP1509T	169.59	337.26	156.91	314.43	198.60	389.49	196.41	385.54
AITR1392-	IMU	UNT2-	A-	MH2									
AITR1392-	IMU	UNT3-	A-	MH2									
AITR1392-	IMU	UNC1-	A-	MH2									
AITR1392-	IMU	UNC3-	A-	MH2									
AITR1392-	IMU	OHT3-	A-	MH1									
AITR1392-	IMU	FHT1-	A-	MH1									
AITR1392-	IMU	FHT2-	A-	MH1									
AITR1392-	IMU	FHT3-	A-	MH1									
AITR1392-	IMU	OHC1-	A-	MH1									
AITR1392-	IMU	OHT1-	A-	MH2	MP1509U	168.35	335.03	156.17	313.10	198.25	388.84	196.86	386.35
AITR1392-	IMU	OHT2-	A-	MH2									
AITR1392-	IMU	FHT2-	A-	MH2									
AITR1392-	IMU	FHT3-	A-	MH2									
AITR1392-	IMU	OHC2-	A-	MH1									
AITR1392-	IMU	OHC3-	A-	MH1									
AITR1392-	IMU	FHC1-	A-	MH1									
AITR1392-	IMU	FHC2-	A-	MH1									
AITR1392-	IMU	FHC3-	A-	MH1									
AITR1392-	IMU	OHT3-	C-	MH1	MP1509V	169.22	336.60	159.91	319.84	199.57	391.22	193.55	380.40
AITR1392-	IMU	FHT1-	A-	MH4									
AITR1392-	IMU	OHC2-	A-	MH2									
AITR1392-	IMU	OHC3-	A-	MH2									
AITR1392-	IMU	FHC1-	A-	MH2									
AITR1392-	IMU	FHC2-	A-	MH2									
AITR1392-	IMU	FHC3-	A-	MH2									
AITR1392-	IMU	PB1-	A-	MH1									
AITR1392-	IMU	PB1-	C-	MH1									
AITR1392-	IMU	PB2-	A-	MH1									
AITR1392-	IMU	PB3-	A-	MH1									
AITR1392-	IMU	PB3-	C-	MH1									
AITR1392-	IMU	LT-	A-	MH2	MP1509W	167.76	333.97	157.21	314.97	198.44	389.19	190.67	375.20
AITR1392-	IMU	TT-	A-	MH2									
AITR1392-	IMU	LC-	A-	MH2									
AITR1392-	IMU	IPS-	A-	MH2									
AITR1392-	IMU	UNT0-	A-	MH2									
AITR1392-	IMU	UNC0-	A-	MH2									
AITR1392-	IMU	UNC2-	A-	MH1	MP1509X	168.98	336.16	157.73	315.91	200.12	392.21	186.04	366.88
AITR1392-	IMU	UNC2-	A-	MH2	MP1509Y	160.96	321.73	152.66	306.79	190.06	374.11	184.70	364.46
					Average [°F]		349.06		317.11		398.93		379.41
					Standard Deviation [°F]		18.80		8.80		11.28		11.42
					Coefficient of Var. [%]		5.39		2.77		2.83		3.01
					Batch Averages	A	342.55	A	314.95	A	392.94	A	374.97
Not 100 percent accurate since some					Batch Averages	B	354.01	B	331.82	B	406.26	B	398.77
specimens came from different batches					Batch Averages	C	355.56	C	315.78	C	400.13	C	379.18

Table 3-1: DMA Results Summary

7.1 DMA Wet Batch B



7.2 DMA Dry Batch B



8. Prepreg Physical Test Results

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

RESIN	FIBER	BATCH #	D.O.M.	J/G	PEAK TEMP	RC% RANGE INDIVIDUAL:		FAW RANGE INDIVIDUAL:		CUSTOMER:	LTCP
										MAT SPEC:	ACGM1001/PCD-033
MTM45-1	IM7-GP	2781 UD3	1/16/2007	N/A	N/A	29	35	136.3	153.7	SHIP DATE:	
						AVERAGE:		AVERAGE:		INITIALS:	
						30	34	137.75	152.25	S.O. # :	20719

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	
	M	2.1824	1.2689	218.24	2.7425	147.36	67.52199	32.47801	1.2744	FOIL WEIGHT	
ROLL 1	C	2.1653	1.2634	216.53	2.7132	144.98	66.95608	33.04392	3.3757	SAMPLE & FOIL	
	O	2.1499	1.2519	214.99	2.7181	146.62	68.19852	31.80148	3.3662	AFTER DEVOL.	
AVERAGE				216.59		146.32	67.56	32.44	0.45	VOL (%)	
	M	2.2153	1.2689	221.53	2.7508	148.19	66.89387	33.10613	1.2826	FOIL WEIGHT	
ROLL 2	C	2.1907	1.2634	219.07	2.7148	145.14	66.2528	33.7472	3.3871	SAMPLE & FOIL	
	O	2.1869	1.2519	218.69	2.7251	147.32	67.36476	32.63524	3.3766	AFTER DEVOL.	
AVERAGE				219.76		146.88	66.84	33.16	0.50	VOL (%)	
	M	2.2258	1.2507	222.58	2.7528	150.21	67.48585	32.51415	1.2859	FOIL WEIGHT	
ROLL 3	C	2.2027	1.2621	220.27	2.7091	144.7	65.69211	34.30789	3.4157	SAMPLE & FOIL	
	O	2.2386	1.28	223.86	2.7495	146.95	65.64371	34.35629	3.4065	AFTER DEVOL.	
AVERAGE				222.24		147.29	66.27	33.73	0.43	VOL (%)	
	M	2.1311	1.2507	213.11	2.7216	147.09	69.02069	30.97931	1.2786	FOIL WEIGHT	
ROLL 4	C	2.1216	1.2621	212.16	2.6904	142.83	67.32183	32.67817	3.3691	SAMPLE & FOIL	
	O	2.1503	1.2801	215.03	2.7598	147.97	68.81365	31.18635	3.3591	AFTER DEVOL.	
AVERAGE				213.43		145.96	68.39	31.61	0.48	VOL (%)	
	M	2.1233	1.2507	212.33	2.7214	147.07	69.26482	30.73518	1.2789	FOIL WEIGHT	
ROLL 5	C	2.1132	1.2621	211.32	2.6891	142.7	67.52792	32.47208	3.3761	SAMPLE & FOIL	
	O	2.1411	1.2801	214.11	2.7421	146.2	68.28266	31.71734	3.3666	AFTER DEVOL.	
AVERAGE				212.59		145.32	68.36	31.64	0.45	VOL (%)	
	M								1.2754	FOIL WEIGHT	
ROLL 6	C								3.3464	SAMPLE & FOIL	
	O								3.3382	AFTER DEVOL.	
AVERAGE									0.40	VOL (%)	
	M									FOIL WEIGHT	
ROLL 7	C									SAMPLE & FOIL	
	O									AFTER DEVOL.	
AVERAGE										VOL (%)	
	M									FOIL WEIGHT	
ROLL 8	C									SAMPLE & FOIL	
	O									AFTER DEVOL.	
AVERAGE										VOL (%)	

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Table 8-1: Batch A Prepreg Physical Test Results

RESIN	FIBER	BATCH #	D.O.M.	J/G	PEAK TEMP	RC% RANGE	FAW RANGE	CUSTOMER:	PCD CUSTOMER
						INDIVIDUAL:	INDIVIDUAL:	MAT SPEC:	PCD033
MTM45-1	IM7-GP	2699 UD3	9/25/2006	N/A	N/A	29 35	137 153	SHIP DATE:	
						AVERAGE:	AVERAGE:	INITIALS:	
						30 34	137 153	S.O. # :	20719

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
	M	2.113	1.2603	211.3	2.6854	142.51	67.44439	32.55561	1.2683	FOIL WEIGHT
ROLL 1	C	2.0771	1.2862	207.71	2.7044	141.82	68.27789	31.72211	3.3811	SAMPLE & FOIL
	O	2.0615	1.2685	206.15	2.6579	138.94	67.39753	32.60247	3.3739	AFTER DEVOL.
AVERAGE				208.39		141.09	67.71	32.29	0.34	VOL (%)
	M	2.1067	1.2736	210.67	2.6576	138.4	65.69516	34.30484	1.2688	FOIL WEIGHT
ROLL 2	C	2.1455	1.2733	214.55	2.7061	143.28	66.78164	33.21836	3.4443	SAMPLE & FOIL
	O	2.1597	1.2719	215.97	2.6881	141.62	65.57392	34.42608	3.4388	AFTER DEVOL.
AVERAGE				213.73		141.10	66.02	33.98	0.25	VOL (%)
	M	2.0774	1.2815	207.74	2.6696	138.81	66.8191	33.1809	1.2668	FOIL WEIGHT
ROLL 3	C	2.0883	1.2644	208.83	2.6852	142.08	68.0362	31.9638	3.3759	SAMPLE & FOIL
	O	2.1151	1.2686	211.51	2.6913	142.27	67.26396	32.73604	3.3712	AFTER DEVOL.
AVERAGE				209.36		141.05	67.37	32.63	0.22	VOL (%)
	M	2.1128	1.2732	211.28	2.69	141.68	67.05793	32.94207	1.2692	FOIL WEIGHT
ROLL 4	C	2.1004	1.2753	210.04	2.6948	141.95	67.58237	32.41763	3.3819	SAMPLE & FOIL
	O	2.1018	1.2746	210.18	2.678	140.34	66.77134	33.22866	3.3759	AFTER DEVOL.
AVERAGE				210.50		141.32	67.14	32.86	0.28	VOL (%)
	M								1.2645	FOIL WEIGHT
ROLL 5	C								3.3724	SAMPLE & FOIL
	O								3.3654	AFTER DEVOL.
AVERAGE									0.33	VOL (%)
	M								1.2663	FOIL WEIGHT
ROLL 6	C								3.3991	SAMPLE & FOIL
	O								3.3925	AFTER DEVOL.
AVERAGE									0.31	VOL (%)
	M									FOIL WEIGHT
ROLL 7	C									SAMPLE & FOIL
	O									AFTER DEVOL.
AVERAGE										VOL (%)
	M									FOIL WEIGHT
ROLL 8	C									SAMPLE & FOIL
	O									AFTER DEVOL.
AVERAGE										VOL (%)

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Table 8-2: Batch B Prepreg Physical Test Results

RESIN	FIBER	BATCH #	D.O.M.	J/G	PEAK TEMP	RC% RANGE	FAW RANGE	CUSTOMER:	LTCP
						INDIVIDUAL:	INDIVIDUAL:	MAT SPEC:	pcd33
MTM45-1	IM7-GP	2751 UD3	12/6/2006	374.13	231.48	28 36	136.3 153.7	SHIP DATE:	
						AVERAGE:	AVERAGE:	INITIALS:	
						29 35	137.75 152.25	S.O. # :	20719

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
	M	2.0258	1.2264	202.58	2.6475	142.11	70.15006	29.84994	1.2664	FOIL WEIGHT
ROLL 1	C	2.032	1.2325	203.2	2.6705	143.8	70.76772	29.23228	3.2946	SAMPLE & FOIL
	O	2.0705	1.2297	207.05	2.6489	141.92	68.54383	31.45617	3.2796	AFTER DEVOL.
AVERAGE				204.28		142.61	69.82	30.18	0.74	VOL (%)
	M	2.0899	1.2633	208.99	2.6996	143.63	68.72578	31.27422	1.2614	FOIL WEIGHT
ROLL 2	C	2.0891	1.2306	208.91	2.6792	144.86	69.34086	30.65914	3.4552	SAMPLE & FOIL
	O	2.11	1.2504	211	2.6752	142.48	67.52607	32.47393	3.4408	AFTER DEVOL.
AVERAGE				209.63		143.66	68.53	31.47	0.66	VOL (%)
	M	2.1132	1.2745	211.32	2.7139	143.94	68.11471	31.88529	1.2573	FOIL WEIGHT
ROLL 3	C	2.1273	1.2791	212.73	2.7408	146.17	68.71151	31.28849	3.3275	SAMPLE & FOIL
	O	2.1314	1.2715	213.14	2.704	143.25	67.20935	32.79065	3.3154	AFTER DEVOL.
AVERAGE				212.40		144.45	68.01	31.99	0.58	VOL (%)
	M	2.0958	1.2918	209.58	2.7187	142.69	68.08379	31.91621	1.2806	FOIL WEIGHT
ROLL 4	C	2.1346	1.284	213.46	2.7406	145.66	68.23761	31.76239	3.3153	SAMPLE & FOIL
	O	2.1483	1.2457	214.83	2.7113	146.56	68.22138	31.77862	3.3047	AFTER DEVOL.
AVERAGE				212.62		144.97	68.18	31.82	0.52	VOL (%)
	M	2.1321	1.2918	213.21	2.7415	144.97	67.994	32.006	1.2791	FOIL WEIGHT
ROLL 5	C	2.1181	1.284	211.81	2.7227	143.87	67.92408	32.07592	3.4386	SAMPLE & FOIL
	O	2.1457	1.2457	214.57	2.6975	145.18	67.6609	32.3391	3.4299	AFTER DEVOL.
AVERAGE				213.20		144.67	67.86	32.14	0.40	VOL (%)
	M								1.2829	FOIL WEIGHT
ROLL 6	C								3.2726	SAMPLE & FOIL
	O								3.2579	AFTER DEVOL.
AVERAGE									0.74	VOL (%)
	M									FOIL WEIGHT
ROLL 7	C									SAMPLE & FOIL
	O									AFTER DEVOL.
AVERAGE										VOL (%)
	M									FOIL WEIGHT
ROLL 8	C									SAMPLE & FOIL
	O									AFTER DEVOL.
AVERAGE										VOL (%)

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Table 8-3: Batch C Prepreg Physical Test Results

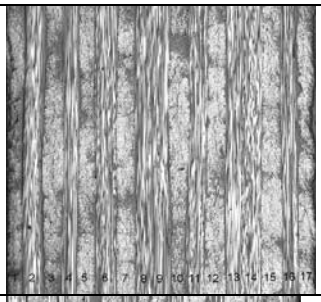
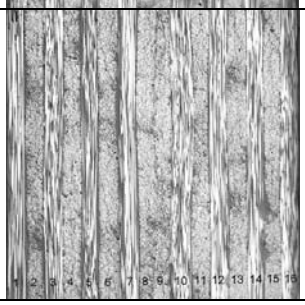
9. Deviations

Some of the data from specific panels and cures has been removed from this report and statistical calculations because there were problems during the panel fabrication process. As seen in the section 4 in this report for the following test types and test conditions:

1. LT [RTD, CTD, ETW,ETW2]
    a. IMU-LT-A-MH2
2. UNC0 [RTD, CTD, ETD, ETW, ETW2]
    a. IMU-UNC0-B-MH2
    b. IMU-UNC0-C-MH1
    c. IMU-UNC0-C-MH2
3. UNC1 [RTD, ETW, ETW2]
    a. IMU-UNC1-A-MH2
    b. IMU-UNC1-B-MH2
4. SBS1 [RTD, ETW and ETW2]
    a. IMU-SBS1-A-MH2
    b. IMU-SBS1-B-MH2

After reviewing batch plots, photomicrographs, DMA data, and cure cycle charts there is enough substantial evidence to discard the data from the statistical calculations. During a panel inspection process it was shown that the panels with data thrown out contained no visible glass strings or remnant of such embedded in the surface of the panels on or near the corners, thus evidence that these were not used during the panel fabrication as recommended per ACG Process Specification ACGP 1001-02 Revision E Test Panel Fabrication Specification. Incorrect panel processing led to missing glass breather strings and the scatter across multiple data points and cure cycles allow us to contribute the problem the panel processing instead of a material or testing flaw.

Material property data from panels with the incorrect layup was removed from both the qualification material property data report and the statistical analysis. The incorrect layups were found after testing of some of the unnotched compression specimens yielded unacceptable failure modes. The differences in the panel symmetry and ply count seen in the unnotched compression specimens were not significant enough in all cases to cause inconsistent results. The following images were taken to verify the incorrect panel fabrication.

		Per Test Plan		Panel Received		
Panel ID	Photomicrograph of Panel Received	Correct Layup	No. of Plies	Incorrect Layup	No. of Plies	Comment
UNC0-B-MH2-ETW		[90/0]4S	16	[90/0/90/0/90/0/90/0/0/90/0/90/0/0/90/0/90]	17	The panel has 17 plies instead of 16 plies.
UNC0-C-MH1-ETW		[90/0]4S	16	[0/90]4S	16	The 0° plies are swapped with 90° plies
UNC0-C-MH2-ETW		[90/0]4S	16	[0/90]4S	16	The 0° plies are swapped with 90° plies
UNC0-C-MH2-ETW2		[90/0]4S	16	[0/90]4S	16	The 0° plies are swapped with 90° plies

From the beginning a series of specimens were never tested nor included in the panel shipments to NIAR for testing. The specimens removed from the test matrix from the very beginning are the following:

- FHT3-A-MH2-RTD
- FHT3-A-MH2-CTD
- FHC3-A-MH1-ETW2
- FHC3-A-MH1-RTD
- ILT-A-MH1-ETW2
- ILT-A-MH2-ET2
- ILT-A-MH1-RTD
- ILT-A-MH2-RTD

From the material shortage noticed in the beginning, additional panels were later fabricated using two alternate cure cycles Cure 3 and Cure 4 were added.

- IPS-A-MH3
- IPS-A-MH4
- FHT1-A-MH3
- FHT1-A-MH4

350ohm strain gauges were used instead of 120ohm.

No Fluid Sensitivity Short-Beam Strength testing was conducted for this series of testing.