

SAFETY COMPLIANCE TESTING FOR FMVSS No. 218 MOTORCYCLE HELMETS

Brand: SPEED AND STRENGTH

Model: SS1710

Size: XL (61-62 cm)

Prepared By

ACT Lab LLC
3280 East 59th Street,
Long Beach CA 90805
www.act-lab.com



10 May 2019

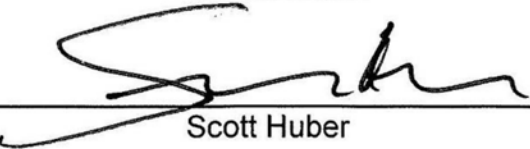
Final Report 218-ACT-19-032

Prepared For

U.S. Department of Transportation
National Highway Traffic Safety Administration
Office of Vehicle Safety Compliance (NEF-220)
1200 New Jersey Ave., S.E.
Washington, DC 20590

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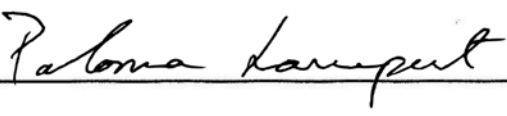
Technician: 
Devon Dahm

Project Manager: 
Scott Huber

Approved By: 
John Bogler

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FINAL REPORT ACCEPTANCE BY OVSC

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Paloma Haupt

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16. Abstract Compliance tests were conducted on the subject model motorcycle helmet in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-218-07. Test failures identified were as follows: S5.6.1 Labeling. The manufacturer's name, discrete size, month & year of manufacture labels do not appear to be permanent.					
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Technician: Devon Dahm

Test Date: 10 May 2019

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PURPOSE OF COMPLIANCE TEST

1. PURPOSE OF COMPLIANCE TEST

This testing was conducted as part of the Department of Transportation, National Highway Traffic Safety Administration's Federal Motor Vehicle Safety Standard (FMVSS) No. 218, "Motorcycle Helmets"¹ Compliance Program. The purpose of the test was to determine if the production helmets supplied by the Office of Vehicle Safety Compliance satisfy the requirements of TP-218-07², as governed by the contract.

2. TEST PROCEDURE

The ACT Lab Helmet Testing Manual, Part I – Motorcycle Helmets³ submitted to the Office of Vehicle Safety Compliance, National Highway Traffic Safety Administration, contains the specific procedures used to conduct this test. The ACT Lab Helmet Testing Manual, Part I – Motorcycle Helmets as modified by Project-Specific notations is in accordance with TP-218-07.

The test procedure shall not be in conflict with any portion of FMVSS No. 218 nor amendments in effect as noted in the applicable contract.

¹ NHTSA, FMVSS No. 218, Motorcycle Helmets, 49 CFR Chapter V Section 571.218, August 20, 1973 as last amended FR 28132 Vol. 76, No. 93, May 13, 2011.

² NHTSA, TP-218-07, Laboratory Test Procedure for FMVSS 218, Motorcycle Helmets, 13 May 2011.

³ ACT Lab Helmet Test Manual, Version 4.2 – Motorcycle Helmets in accordance with FMVSS No. 218, 22 July 2013.

HELMET DATA

HELMET BRAND NAME: SPEED AND STRENGTH

HELMET MODEL DESIGNATION: SS1710

HELMET MANUFACTURER: Jiangmen Pengcheng Helmets Ltd.

HELMET SIZE: XL (61-62 cm)

HELMET COVERAGE: Partial: _____ Full: _____ Complete: X

HELMET POSITIONING INDEX: 60 mm

SHELL MATERIAL: Advanced thermo-poly alloy

LINER MATERIAL: Polystyrene

BUCKLE DESCRIPTION: Double D-Rings

HELMET	A Ambient	B Low Temp	C High Temp	D Water Immersed	E Spare
SHELL COLOR/PATTERN	Black	Black	Black	Black	Black
WEIGHT (grams)	1544	1556	1542	1561	1694
MONTH & YEAR OF MANUFACTURE	05/18	05/18	05/18	05/18	05/18

COMMENTS:

1. All helmets were received in undamaged condition and were appropriate for testing.
2. Weights listed above for helmets A-D are as tested with face shield removed.
3. Weight for helmet E is complete with all components in place.
4. This is a complete coverage helmet with modular flip up chin bar.
5. NHTSA provided the HPI based on information obtained from the manufacturer.

SUMMARY OF TEST RESULTS

INDICATE Pass or Fail

HELMET	A	B	C	D
TEST	AMBIENT	LOW TEMP	HIGH TEMP	WATER IMMERSSED
IMPACT	Pass	Pass	Pass	Pass
PENETRATION	Pass	Pass	Pass	Pass
RETENTION	Pass	Pass	Pass	Pass

INDICATE Pass or Fail

TEST	PASS/FAIL
PERIPHERAL VISION	Pass
LABELING	Fail

COMMENT:

1. S5.6.1 Labeling. The manufacturer's name, discrete size, month & year of manufacture labels do not appear to be permanent.

SELECTION OF APPROPRIATE HEADFORM

Paragraph S6.1 - If the helmet size designation falls into more than one of three size ranges, it shall be tested on each appropriate headform.

HELMET SIZE DESIGNATION	HEADFORM SIZE
Less than or equal to 6-3/4 (European Size 54)	SMALL
Greater than 6-3/4, but less than or equal to 7-1/2 (European Size 60)	MEDIUM
Greater than 7-1/2 (European 60)	LARGE

COMMENTS:

The manufacturer marked the helmet with its corresponding discrete size: XL (61-62 cm), Headform Size: DOT LARGE.

NHTSA provided the discrete size based on information obtained from the manufacturer.

CONDITIONING FOR TESTING — Paragraph S6.4 — The protective headgear shall be conditioned for not less than 4 hours and no more than 24 hours, in the specified environmental condition shown below, prior to test.

Ambient Conditions	16°C to 26°C (61°F to 79°F); 30% to 70% Relative Humidity
Low Temperature	-15°C to -5°C (5°F to 23°F)
High Temperature	45°C to 55°C (113°F to 131°F)
Water Immersion	16°C to 26°C (61°F to 79°F)

The maximum time during which the protective headgear may be out of the conditioning environment shall not exceed 4 minutes. It must then be returned to the conditioned environment for a minimum of 3 minutes for each minute or portion of a minute in excess of 4 minutes out of the conditioning environment or 12 hours, whichever is less, prior to resumption of testing.

AVERAGE LAB TEMPERATURE : 20.9 °C ; AVERAGE LAB HUMIDITY : 58.3 %

IMPACT ATTENUATION

SYSTEMS CHECK	TRIAL DROP	DROP (meters)	VEL. (m/s)	PEAK (g)	DWELL TIME (ms)		TEST RECORD	HEADFORM POSITION
					150 g	200 g		
PRETEST	1	1.3	5.04	404.7	2.5	2.0	Pre 1	Crown
	2	1.3	5.04	401.4	2.6	2.1	Pre 2	Crown
	3	1.3	5.02	395.7	2.5	2.1	Pre 3	Crown
PRETEST AVERAGE		XXXX	XXXX	401.0	XXX	XXX	XXXX	XXXX
POSTTEST	1	1.3	5.09	391.2	2.6	2.2	Post 1	Crown
	2	1.3	5.10	396.6	2.5	2.1	Post 2	Crown
	3	1.3	5.10	396.0	2.5	2.1	Post 3	Crown
POSTTEST AVERAGE		XXXX	XXXX	395.0	XXX	XXX	XXXX	XXXX
DIFFERENCE BETWEEN PRE-TEST AND POST-TEST AVERAGES				-6.0	DIFFERENCE NOT TO EXCEED 15 g			

Helmet Designation	Helmet Condition	Impact Location	Front		Left		Right		Rear	
			1	2	1	2	1	2	1	2
A	Ambient	Anvil	Hemi		Hemi		Flat		Flat	
		Test Record No.	1	2	3	4	5	6	7	8
		Peak g	77	195	94	107	137	214	169	193
		ms @ 150	0.0	1.1	0.0	0.0	0.0	2.7	2.5	3.0
		ms @ 200	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0
		Velocity m/s	5.27	5.26	5.31	5.24	6.05	6.06	6.04	6.11
B	Low Temperature	Anvil	Hemi		Hemi		Flat		Flat	
		Test Record No.	9	10	11	12	13	14	15	16
		Peak g	87	169	97	113	155	152	180	211
		ms @ 150	0.0	1.0	0.0	0.0	0.8	0.3	2.9	3.1
		ms @ 200	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9
		Velocity m/s	5.28	5.27	5.24	5.22	6.06	6.05	6.05	6.05
C	High Temperature	Anvil	Hemi		Hemi		Flat		Flat	
		Test Record No.	17	18	19	20	21	22	23	24
		Peak g	83	252	85	115	148	175	162	184
		ms @ 150	0.0	1.4	0.0	0.0	0.0	1.3	0.8	2.9
		ms @ 200	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0
		Velocity m/s	5.26	5.26	5.24	5.25	6.05	6.06	6.06	6.06
D	Water Immersed	Anvil	Hemi		Hemi		Flat		Flat	
		Test Record No.	25	26	27	28	29	30	31	32
		Peak g	79	224	83	103	144	152	151	187
		ms @ 150	0.0	1.4	0.0	0.0	0.0	0.2	0.3	3.1
		ms @ 200	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0
		Velocity m/s	5.27	5.29	5.26	5.24	6.05	6.06	6.06	6.06

COMMENTS: 1. The actual drop heights were: flat anvil 195 cm, hemi anvil 146 cm.
2. Values reported in the above tables are rounded.

PENETRATION

Paragraph S5.2 and S7.2

WEIGHT OF STRIKER: 2.95 to 3.06 kg (6 pounds, 8 ounces to 6 pounds, 12 ounces)

POINT OF STRIKER: Radius = 0.5 ± 0.1 mm (0.02 ± 0.004 in.), included angle of $60^\circ \pm 0.5^\circ$, hardness minimum of 60 Rockwell "C" Scale and a cone height of not less than 3.8 ± 0.038 cm (1.5 ± 0.015 in.).

HEIGHT OF FALL: $300 \text{ cm} \pm 1.5 \text{ cm}$, measured from the tip of the striker point to the outer surface of the mounted protective headgear.

FAILURE CRITERION: When tested, the protective headgear shall be failed if the penetrator has made an indentation in the headform.

TEST	HELMET	TEST LOCATION	PASS	FAIL	CONDITIONS
1	A	Crown	X		AMBIENT
2	A	Front Right	X		AMBIENT
3	B	Crown	X		LOW TEMPERATURE
4	B	Front Right	X		LOW TEMPERATURE
5	C	Crown	X		HIGH TEMPERATURE
6	C	Front Right	X		HIGH TEMPERATURE
7	D	Crown	X		WATER IMMERSED
8	D	Front Right	X		WATER IMMERSED

COMMENT: Photographs of penetration test locations are found in Appendix C.

RETENTION SYSTEM

Paragraph S5.3 and S7.3

REQUIREMENTS:

READING	APPLIED LOAD
INITIAL	22.68 kg, + 4.54 kg, - 0 kg (50.0 Lbs, + 10 Lbs, - 0 Lbs)
FINAL	136 kg, + 0 kg, - 2.3 kg (300.0 Lbs, + 0 Lbs, - 5 Lbs)

ELONGATION NOT TO EXCEED 2.5 cm (1.0 INCH) AFTER LOAD INCREASE

HELMET	CONDITIONS	INITIAL READING (cm)	FINAL READING (cm)	ELONGATION (cm)
A	AMBIENT	0.60	2.16	1.56
B	LOW TEMPERATURE	0.65	2.24	1.59
C	HIGH TEMPERATURE	0.45	1.74	1.29
D	WATER IMMERSED	0.41	1.90	1.49

CONFIGURATION - Paragraph S5.4 - Helmet shall provide a minimum peripheral vision of 105° to each side of the midsagittal plane. The brow opening shall be at least 2.54 cm (1 inch) above all points in the basic plane that are within the angles of peripheral vision.

	REQUIREMENTS	TEST RESULTS
PERIPHERAL VISION	> 105°	Pass
BROW OPENING	> 2.5 cm (1 inch)	Pass

COMMENT: Values in the above tables are rounded.

LABELING

S5.6.1 *Labeling* - Each helmet shall be permanently and legibly labeled, in a manner such that the label(s) can be easily read without removing padding or any other permanent part, with the following:

Required Information	Content/Format	Permanent
Manufacturer's name	Pass	Fail
Discrete size	Pass	Fail
Month and year of manufacture	Pass	Fail
Instructions to the purchaser as follows:	-----	-----
“Shell and liner constructed of (identify type(s) of materials).”	Pass	Pass
“Helmet can be seriously damaged by some common substances without damage being visible to the user.”	Pass	Pass
“Apply only the following: (Recommended cleaning agents, paints, adhesives, etc., as appropriate.”	Pass	Pass
“Make no modifications.”	Pass	Pass
“Fasten helmet securely.”	Pass	Pass
“If helmet experiences a severe blow, return it to the manufacturer for inspection, or destroy it and replace it.”	Pass	Pass

COMMENT:

1. The manufacturer's name, discrete size label, month and year of manufacture do not appear to be permanent since they can be removed intact from the helmet leaving little or no trace on the helmet.

LABELING

S5.6.2 Certification. Each helmet shall be labeled permanently and legibly with a label, constituting the manufacturer's certification that the helmet conforms to the applicable Federal motor vehicle safety standards, that is separate from the label(s) used to comply with S5.6.1, and complies with paragraphs (a) through (c) of this section.

(a) Content, format, and appearance. The label required by paragraph S5.6.2 shall have the following content, format, and appearance:

Required Certification Information	Content/ Format	Permanent
The symbol "DOT," horizontally centered on the label, in letters not less than 0.38 inch (1.0 cm) high.	Pass	Pass
The term "FMVSS No. 218," horizontally centered beneath the symbol DOT, in letters not less than 0.09 inches (0.23 cm) high.	Pass	
The word "CERTIFIED," horizontally centered beneath the term "FMVSS No. 218," in letters not less than 0.09 inches (0.23 cm) high.	Pass	
The precise model designation horizontally centered above the symbol DOT, in letters and/or numerals not less than 0.09 inch (0.23 cm) high.	Pass	
The manufacturer's name and/or brand, horizontally centered above the model designation, in letters and/or numerals not less than 0.09 inch (0.23 cm) high.	Pass	
All symbols, letters and numerals shall be in a color that contrasts with the background of the label.	Pass	
No information, other than the information specified in subparagraph (a), shall appear on the label.	Pass	
The label shall appear on the outer surface of the helmet and be placed so that it is centered laterally with the horizontal centerline of the DOT symbol located a minimum of 1 inch (2.5 cm) and a maximum of 3 inches (7.6 cm) from the bottom edge of the posterior portion of the helmet.	Pass	

COMMENT:

1. Labels were determined to be both easily read and permanent based on the TP-218-07, Section 12.5.4.

TEST DATA

Contract File No.: 52.1032

Test File: 001

Control Document Official ACT NHTSA DOT TP-07 Report Template USA 12 Mar 2019 Rev.16

Technician: Devon Dahm

Test Date: 10 May 2019



Helmet Info/Test Conditions | MPI | **Impact/Penetration** | Retention | Rolloff/Misc. | Crush | Print

Set-up | Impact Pre-test | **Impact Test** | Impact Post Test | Penetration | Force Pre-test | Force Transmission | Force Post-test

Target Impact Specification

Velocity (m/s) 5.20

Energy (J) 82.2

Drop Height (m) 1.462

Headform

DOT D

Drop Mass (kg) 6.081

Impact Site

Front Rear

Left Right

Crown Other

Degrees-mm -

Anvil

Flat Hazard

Hemi Edge

Curb Other

Cylinder

Anvil Definition Other

Impact Results

Peak G 77

Time of Peak (ms) 13.1

Δ Time @ 150 G (ms) 0.0

Δ Time @ 200 G (ms) 0.0

Gate Time (ms) 4.8

Impact Velocity (m/s) 5.27

Impact Energy (J) 84

HIC 324

SI 368

Rebound Gate Time (ms) 0.0

Rebound Velocity (m/s) Inf

Coefficient of Restitution Inf

Test Status **Complete**

Select Helmet

ID: A Make: SS SPEED AND ST S/N: 52 1032.001 Cond: Ambient

Manual Zero Positioning

Drop Site 1

Drop No. 1

Run Test

Acceleration G vs Time (ms)

Display Chan: RSLT X Y Z

EXIT

Helmet Info/Test Conditions | MPI | **Impact/Penetration** | Retention | Rolloff/Misc. | Crush | Print

Set-up | Impact Pre-test | **Impact Test** | Impact Post Test | Penetration | Force Pre-test | Force Transmission | Force Post-test

Target Impact Specification

Velocity (m/s) 5.20

Energy (J) 82.2

Drop Height (m) 1.462

Headform

DOT D

Drop Mass (kg) 6.081

Impact Site

Front Rear

Left Right

Crown Other

Degrees-mm -

Anvil

Flat Hazard

Hemi Edge

Curb Other

Cylinder

Anvil Definition Other

Impact Results

Peak G 195

Time of Peak (ms) 16.5

Δ Time @ 150 G (ms) 1.1

Δ Time @ 200 G (ms) 0.0

Gate Time (ms) 4.8

Impact Velocity (m/s) 5.26

Impact Energy (J) 84

HIC 729

SI 960

Rebound Gate Time (ms) 0.0

Rebound Velocity (m/s) Inf

Coefficient of Restitution Inf

Test Status **Complete**

Select Helmet

ID: A Make: SS SPEED AND ST S/N: 52 1032.001 Cond: Ambient

Manual Zero Positioning

Drop Site 1

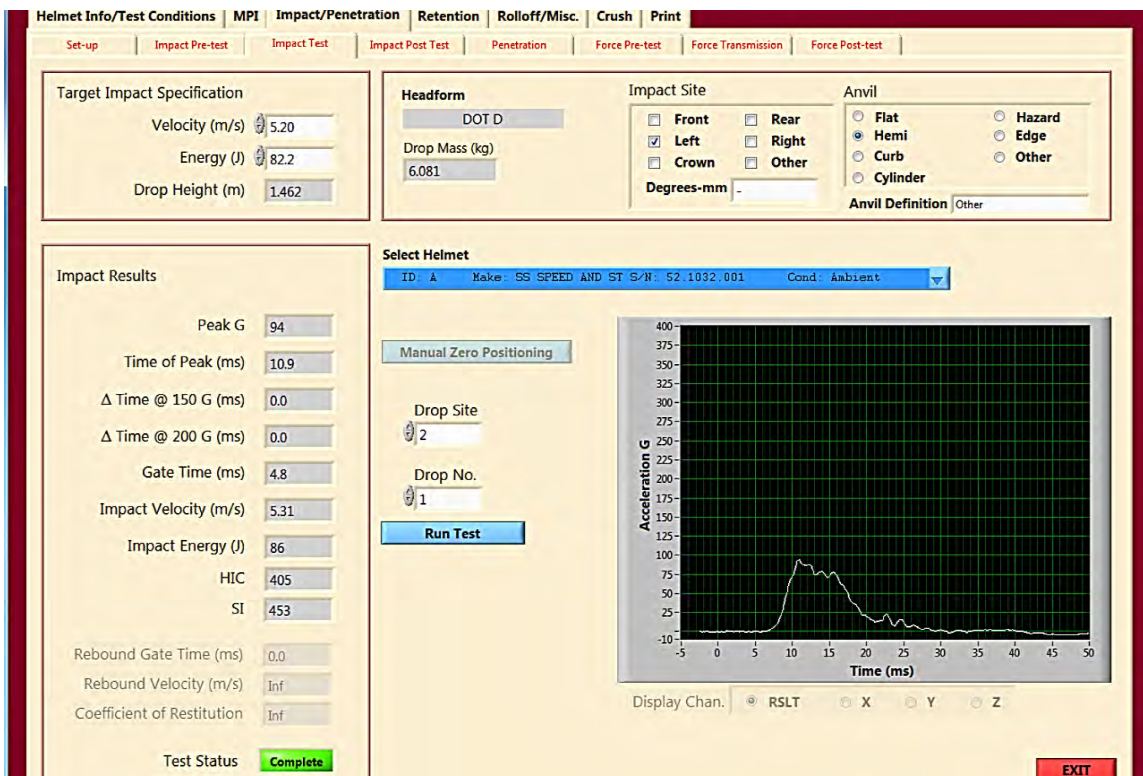
Drop No. 2

Run Test

Acceleration G vs Time (ms)

Display Chan: RSLT X Y Z

EXIT



Helmet Info/Test Conditions | MPI | **Impact/Penetration** | Retention | Rolloff/Misc. | Crush | Print

Set-up | Impact Pre-test | **Impact Test** | Impact Post Test | Penetration | Force Pre-test | Force Transmission | Force Post-test

Target Impact Specification

Velocity (m/s) 6.00

Energy (J) 109.5

Drop Height (m) 1.947

Headform

DOT D

Drop Mass (kg) 6.081

Impact Site

Front Rear
 Left Right
 Crown Other

Degrees-mm -

Anvil

Flat Hazard
 Hemi Edge
 Curb Other
 Cylinder

Anvil Definition Other

Impact Results

Peak G 137

Time of Peak (ms) 11.0

Δ Time @ 150 G (ms) 0.0

Δ Time @ 200 G (ms) 0.0

Gate Time (ms) 4.2

Impact Velocity (m/s) 6.05

Impact Energy (J) 111

HIC 782

SI 884

Rebound Gate Time (ms) 0.0

Rebound Velocity (m/s) Inf

Coefficient of Restitution Inf

Test Status **Complete**

Select Helmet

ID: A Make: SS SPEED AND ST S/N: 52 1032.001 Cond: Ambient

Manual Zero Positioning

Drop Site 3

Drop No. 1

Run Test

Acceleration G

Time (ms)

Display Chan: RSLT X Y Z

EXIT

Helmet Info/Test Conditions | MPI | **Impact/Penetration** | Retention | Rolloff/Misc. | Crush | Print

Set-up | Impact Pre-test | **Impact Test** | Impact Post Test | Penetration | Force Pre-test | Force Transmission | Force Post-test

Target Impact Specification

Velocity (m/s) 6.00

Energy (J) 109.5

Drop Height (m) 1.947

Headform

DOT D

Drop Mass (kg) 6.081

Impact Site

Front Rear
 Left Right
 Crown Other

Degrees-mm -

Anvil

Flat Hazard
 Hemi Edge
 Curb Other
 Cylinder

Anvil Definition Other

Impact Results

Peak G 214

Time of Peak (ms) 13.1

Δ Time @ 150 G (ms) 2.7

Δ Time @ 200 G (ms) 0.7

Gate Time (ms) 4.2

Impact Velocity (m/s) 6.06

Impact Energy (J) 112

HIC 1374

SI 1638

Rebound Gate Time (ms) 0.0

Rebound Velocity (m/s) Inf

Coefficient of Restitution Inf

Test Status **Complete**

Select Helmet

ID: A Make: SS SPEED AND ST S/N: 52 1032.001 Cond: Ambient

Manual Zero Positioning

Drop Site 3

Drop No. 2

Run Test

Acceleration G

Time (ms)

Display Chan: RSLT X Y Z

EXIT

Helmet Info/Test Conditions | MPI | **Impact/Penetration** | Retention | Rolloff/Misc. | Crush | Print

Set-up | Impact Pre-test | **Impact Test** | Impact Post Test | Penetration | Force Pre-test | Force Transmission | Force Post-test

Target Impact Specification

Velocity (m/s) 6.00

Energy (J) 109.5

Drop Height (m) 1.947

Headform

DOT D

Drop Mass (kg) 6.081

Impact Site

Front Rear
 Left Right
 Crown Other

Degrees-mm -

Anvil

Flat Hazard
 Hemi Edge
 Curb Other
 Cylinder

Anvil Definition Other

Impact Results

Peak G 169

Time of Peak (ms) 10.9

Δ Time @ 150 G (ms) 2.5

Δ Time @ 200 G (ms) 0.0

Gate Time (ms) 4.2

Impact Velocity (m/s) 6.04

Impact Energy (J) 111

HIC 1227

SI 1410

Rebound Gate Time (ms) 0.0

Rebound Velocity (m/s) Inf

Coefficient of Restitution Inf

Test Status **Complete**

Select Helmet

ID: A Make: SS SPEED AND ST S/N: 52 1032.001 Cond: Ambient

Manual Zero Positioning

Drop Site 4

Drop No. 1

Run Test

Acceleration G

Time (ms)

Display Chan: RSLT X Y Z

EXIT

Helmet Info/Test Conditions | MPI | **Impact/Penetration** | Retention | Rolloff/Misc. | Crush | Print

Set-up | Impact Pre-test | **Impact Test** | Impact Post Test | Penetration | Force Pre-test | Force Transmission | Force Post-test

Target Impact Specification

Velocity (m/s) 6.00

Energy (J) 109.5

Drop Height (m) 1.947

Headform

DOT D

Drop Mass (kg) 6.081

Impact Site

Front Rear
 Left Right
 Crown Other

Degrees-mm -

Anvil

Flat Hazard
 Hemi Edge
 Curb Other
 Cylinder

Anvil Definition Other

Impact Results

Peak G 193

Time of Peak (ms) 10.7

Δ Time @ 150 G (ms) 3.0

Δ Time @ 200 G (ms) 0.0

Gate Time (ms) 4.1

Impact Velocity (m/s) 6.11

Impact Energy (J) 113

HIC 1504

SI 1771

Rebound Gate Time (ms) 0.0

Rebound Velocity (m/s) Inf

Coefficient of Restitution Inf

Test Status **Complete**

Select Helmet

ID: A Make: SS SPEED AND ST S/N: 52 1032.001 Cond: Ambient

Manual Zero Positioning

Drop Site 4

Drop No. 2

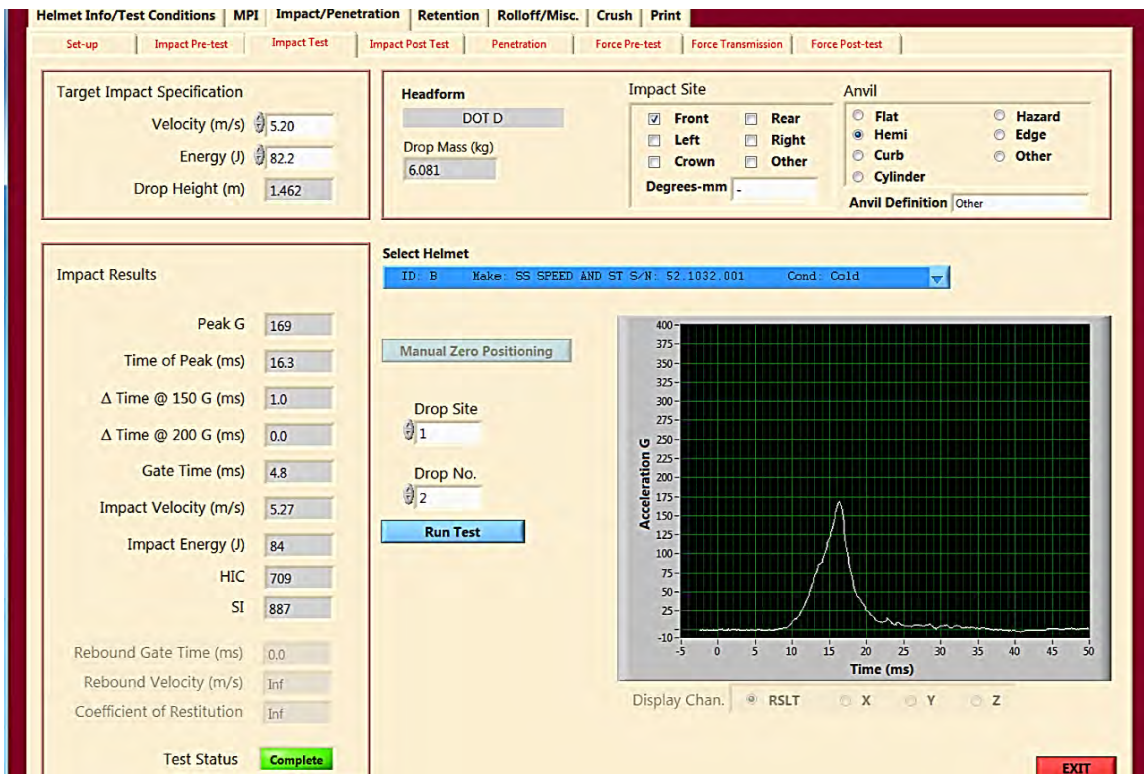
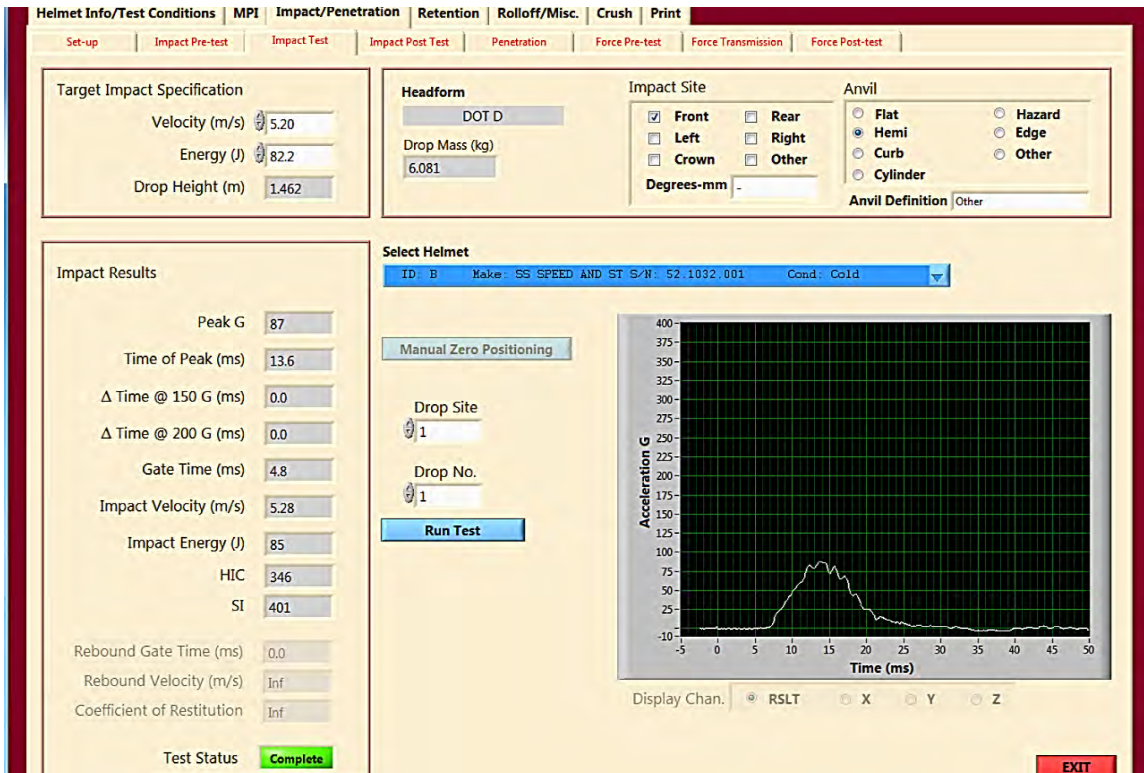
Run Test

Acceleration G

Time (ms)

Display Chan: RSLT X Y Z

EXIT



Helmet Info/Test Conditions | MPI | **Impact/Penetration** | Retention | Rolloff/Misc. | Crush | Print

Set-up | Impact Pre-test | **Impact Test** | Impact Post Test | Penetration | Force Pre-test | Force Transmission | Force Post-test

Target Impact Specification

Velocity (m/s) 5.20

Energy (J) 82.2

Drop Height (m) 1.462

Headform

DOT D

Drop Mass (kg) 6.081

Impact Site

Front Rear
 Left Right
 Crown Other

Degrees-mm -

Anvil

Flat Hazard
 Hemi Edge
 Curb Other
 Cylinder

Anvil Definition Other

Impact Results

Peak G 97

Time of Peak (ms) 11.0

Δ Time @ 150 G (ms) 0.0

Δ Time @ 200 G (ms) 0.0

Gate Time (ms) 4.8

Impact Velocity (m/s) 5.24

Impact Energy (J) 83

HIC 424

SI 486

Rebound Gate Time (ms) 0.0

Rebound Velocity (m/s) Inf

Coefficient of Restitution Inf

Test Status **Complete**

Select Helmet

ID: B Make: SS SPEED AND ST S/N: 52 1032.001 Cond: Cold

Manual Zero Positioning

Drop Site 2

Drop No. 1

Run Test

Acceleration G

Time (ms)

Display Chan: RSLT X Y Z

EXIT

Helmet Info/Test Conditions | MPI | **Impact/Penetration** | Retention | Rolloff/Misc. | Crush | Print

Set-up | Impact Pre-test | **Impact Test** | Impact Post Test | Penetration | Force Pre-test | Force Transmission | Force Post-test

Target Impact Specification

Velocity (m/s) 5.20

Energy (J) 82.2

Drop Height (m) 1.462

Headform

DOT D

Drop Mass (kg) 6.081

Impact Site

Front Rear
 Left Right
 Crown Other

Degrees-mm -

Anvil

Flat Hazard
 Hemi Edge
 Curb Other
 Cylinder

Anvil Definition Other

Impact Results

Peak G 113

Time of Peak (ms) 15.4

Δ Time @ 150 G (ms) 0.0

Δ Time @ 200 G (ms) 0.0

Gate Time (ms) 4.8

Impact Velocity (m/s) 5.22

Impact Energy (J) 83

HIC 537

SI 618

Rebound Gate Time (ms) 0.0

Rebound Velocity (m/s) Inf

Coefficient of Restitution Inf

Test Status **Complete**

Select Helmet

ID: B Make: SS SPEED AND ST S/N: 52 1032.001 Cond: Cold

Manual Zero Positioning

Drop Site 2

Drop No. 2

Run Test

Acceleration G

Time (ms)

Display Chan: RSLT X Y Z

EXIT

Helmet Info/Test Conditions | MPI | **Impact/Penetration** | Retention | Rolloff/Misc. | Crush | Print

Set-up | Impact Pre-test | **Impact Test** | Impact Post Test | Penetration | Force Pre-test | Force Transmission | Force Post-test

Target Impact Specification

Velocity (m/s) 6.00

Energy (J) 109.5

Drop Height (m) 1.947

Headform

DOT D

Drop Mass (kg) 6.081

Impact Site

Front Rear
 Left Right
 Crown Other

Degrees-mm -

Anvil

Flat Hazard
 Hemi Edge
 Curb Other
 Cylinder

Anvil Definition Other

Impact Results

Peak G 155

Time of Peak (ms) 11.5

Δ Time @ 150 G (ms) 0.8

Δ Time @ 200 G (ms) 0.0

Gate Time (ms) 4.2

Impact Velocity (m/s) 6.06

Impact Energy (J) 112

HIC 1068

SI 1214

Rebound Gate Time (ms) 0.0

Rebound Velocity (m/s) Inf

Coefficient of Restitution Inf

Test Status **Complete**

Select Helmet

ID: B Make: SS SPEED AND ST S/N: 52 1032.001 Cond: Cold

Manual Zero Positioning

Drop Site 3

Drop No. 1

Run Test

Acceleration G

Time (ms)

Display Chan: RSLT X Y Z

EXIT

Helmet Info/Test Conditions | MPI | **Impact/Penetration** | Retention | Rolloff/Misc. | Crush | Print

Set-up | Impact Pre-test | **Impact Test** | Impact Post Test | Penetration | Force Pre-test | Force Transmission | Force Post-test

Target Impact Specification

Velocity (m/s) 6.00

Energy (J) 109.5

Drop Height (m) 1.947

Headform

DOT D

Drop Mass (kg) 6.081

Impact Site

Front Rear
 Left Right
 Crown Other

Degrees-mm -

Anvil

Flat Hazard
 Hemi Edge
 Curb Other
 Cylinder

Anvil Definition Other

Impact Results

Peak G 152

Time of Peak (ms) 12.7

Δ Time @ 150 G (ms) 0.3

Δ Time @ 200 G (ms) 0.0

Gate Time (ms) 4.2

Impact Velocity (m/s) 6.05

Impact Energy (J) 111

HIC 920

SI 1023

Rebound Gate Time (ms) 0.0

Rebound Velocity (m/s) Inf

Coefficient of Restitution Inf

Test Status **Complete**

Select Helmet

ID: B Make: SS SPEED AND ST S/N: 52 1032.001 Cond: Cold

Manual Zero Positioning

Drop Site 3

Drop No. 2

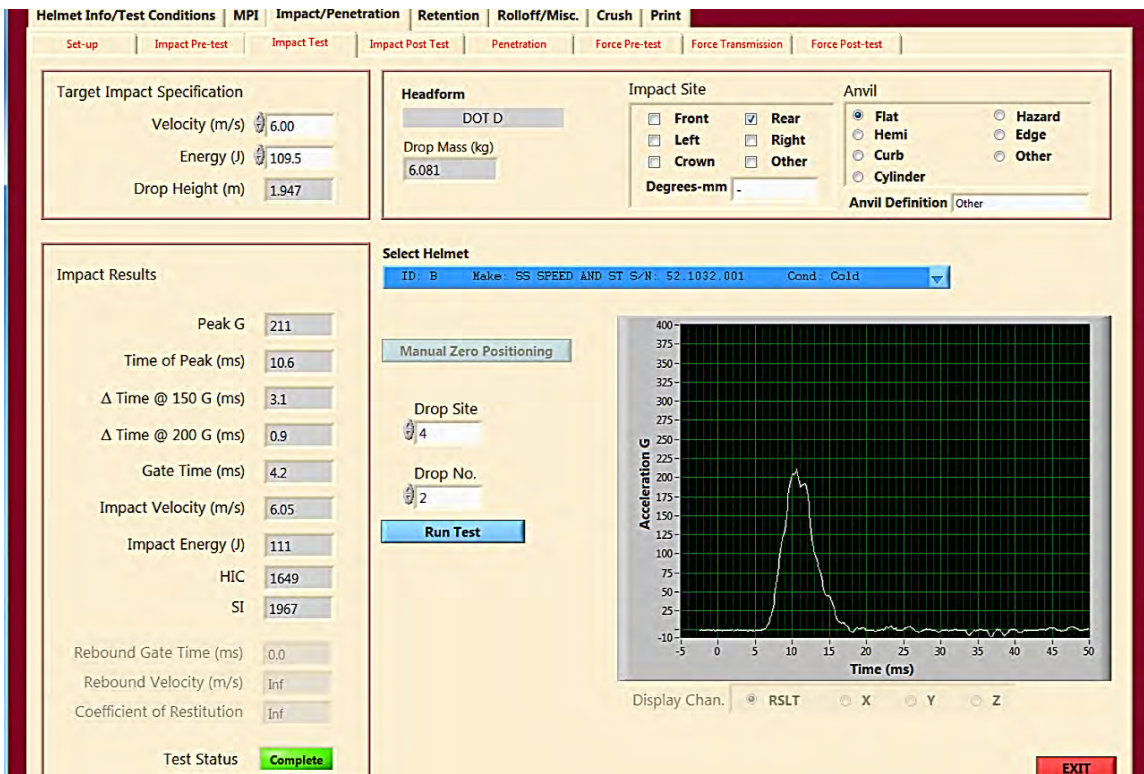
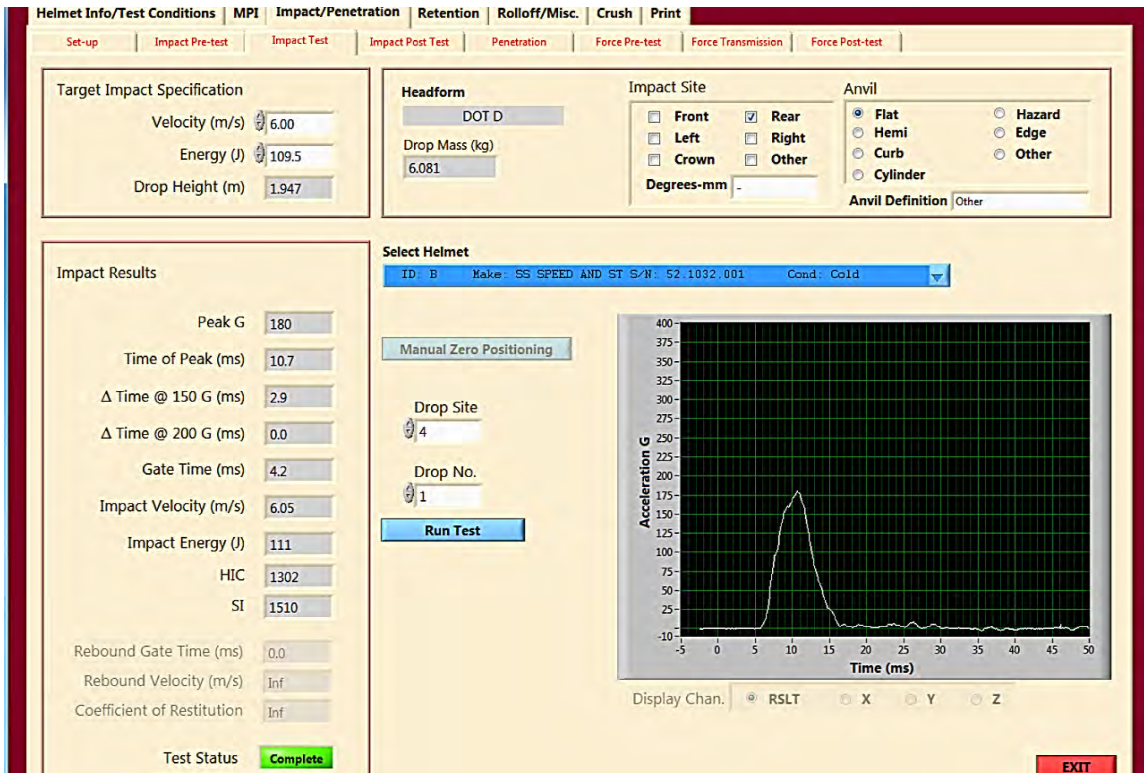
Run Test

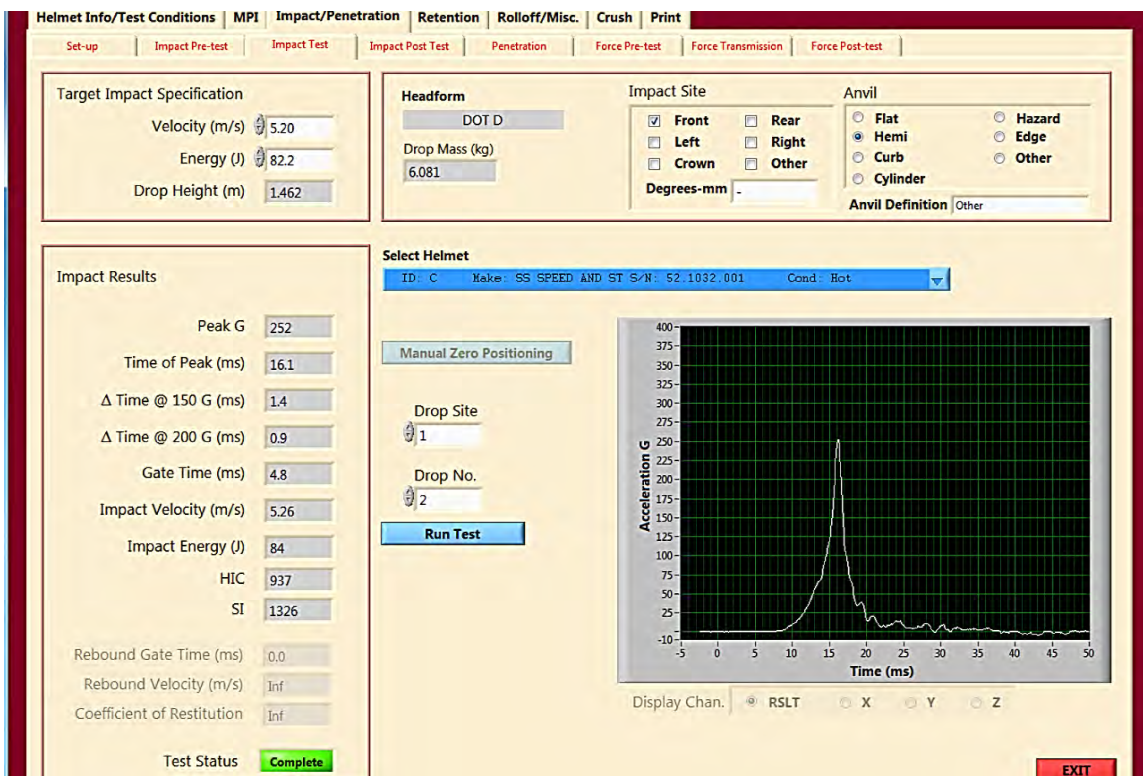
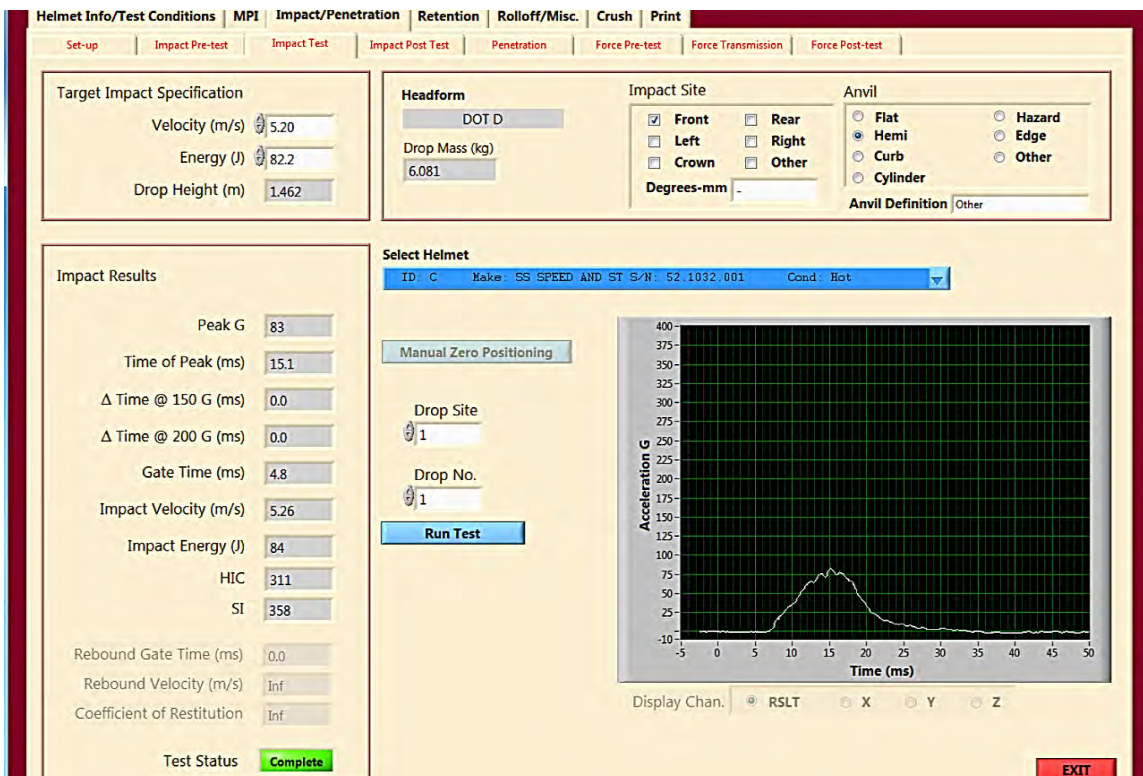
Acceleration G

Time (ms)

Display Chan: RSLT X Y Z

EXIT





Helmet Info/Test Conditions | MPI | **Impact/Penetration** | Retention | Rolloff/Misc. | Crush | Print

Set-up | Impact Pre-test | **Impact Test** | Impact Post Test | Penetration | Force Pre-test | Force Transmission | Force Post-test

Target Impact Specification

Velocity (m/s) 5.20

Energy (J) 82.2

Drop Height (m) 1.462

Headform

DOT D

Drop Mass (kg) 6.081

Impact Site

Front Rear
 Left Right
 Crown Other

Degrees-mm -

Anvil

Flat Hazard
 Hemi Edge
 Curb Other
 Cylinder

Anvil Definition Other

Impact Results

Peak G 85

Time of Peak (ms) 11.0

Δ Time @ 150 G (ms) 0.0

Δ Time @ 200 G (ms) 0.0

Gate Time (ms) 4.8

Impact Velocity (m/s) 5.24

Impact Energy (J) 83

HIC 364

SI 408

Rebound Gate Time (ms) 0.0

Rebound Velocity (m/s) Inf

Coefficient of Restitution Inf

Test Status **Complete**

Select Helmet

ID: C Make: SS SPEED AND ST S/N: 52 1032.001 Cond: Hot

Manual Zero Positioning

Drop Site 2

Drop No. 1

Run Test

Acceleration G

Time (ms)

Display Chan: RSLT X Y Z

EXIT

Helmet Info/Test Conditions | MPI | **Impact/Penetration** | Retention | Rolloff/Misc. | Crush | Print

Set-up | Impact Pre-test | **Impact Test** | Impact Post Test | Penetration | Force Pre-test | Force Transmission | Force Post-test

Target Impact Specification

Velocity (m/s) 5.20

Energy (J) 82.2

Drop Height (m) 1.462

Headform

DOT D

Drop Mass (kg) 6.081

Impact Site

Front Rear
 Left Right
 Crown Other

Degrees-mm -

Anvil

Flat Hazard
 Hemi Edge
 Curb Other
 Cylinder

Anvil Definition Other

Impact Results

Peak G 115

Time of Peak (ms) 15.5

Δ Time @ 150 G (ms) 0.0

Δ Time @ 200 G (ms) 0.0

Gate Time (ms) 4.8

Impact Velocity (m/s) 5.25

Impact Energy (J) 84

HIC 527

SI 610

Rebound Gate Time (ms) 0.0

Rebound Velocity (m/s) Inf

Coefficient of Restitution Inf

Test Status **Complete**

Select Helmet

ID: C Make: SS SPEED AND ST S/N: 52 1032.001 Cond: Hot

Manual Zero Positioning

Drop Site 2

Drop No. 2

Run Test

Acceleration G

Time (ms)

Display Chan: RSLT X Y Z

EXIT

Helmet Info/Test Conditions | MPI | **Impact/Penetration** | Retention | Rolloff/Misc. | Crush | Print

Set-up | Impact Pre-test | **Impact Test** | Impact Post Test | Penetration | Force Pre-test | Force Transmission | Force Post-test

Target Impact Specification

Velocity (m/s) 6.00

Energy (J) 109.5

Drop Height (m) 1.947

Headform

DOT D

Drop Mass (kg) 6.081

Impact Site

Front Rear
 Left Right
 Crown Other

Degrees-mm -

Anvil

Flat Hazard
 Hemi Edge
 Curb Other
 Cylinder

Anvil Definition Other

Impact Results

Peak G 148

Time of Peak (ms) 12.7

Δ Time @ 150 G (ms) 0.0

Δ Time @ 200 G (ms) 0.0

Gate Time (ms) 4.2

Impact Velocity (m/s) 6.05

Impact Energy (J) 111

HIC 934

SI 1063

Rebound Gate Time (ms) 0.0

Rebound Velocity (m/s) Inf

Coefficient of Restitution Inf

Test Status **Complete**

Select Helmet

ID: C Make: SS SPEED AND ST S/N: 52 1032.001 Cond: Hot

Manual Zero Positioning

Drop Site 3

Drop No. 1

Run Test

Acceleration G

Time (ms)

Display Chan: RSLT X Y Z

EXIT

Helmet Info/Test Conditions | MPI | **Impact/Penetration** | Retention | Rolloff/Misc. | Crush | Print

Set-up | Impact Pre-test | **Impact Test** | Impact Post Test | Penetration | Force Pre-test | Force Transmission | Force Post-test

Target Impact Specification

Velocity (m/s) 6.00

Energy (J) 109.5

Drop Height (m) 1.947

Headform

DOT D

Drop Mass (kg) 6.081

Impact Site

Front Rear
 Left Right
 Crown Other

Degrees-mm -

Anvil

Flat Hazard
 Hemi Edge
 Curb Other
 Cylinder

Anvil Definition Other

Impact Results

Peak G 175

Time of Peak (ms) 12.6

Δ Time @ 150 G (ms) 1.3

Δ Time @ 200 G (ms) 0.0

Gate Time (ms) 4.2

Impact Velocity (m/s) 6.06

Impact Energy (J) 112

HIC 1086

SI 1233

Rebound Gate Time (ms) 0.0

Rebound Velocity (m/s) Inf

Coefficient of Restitution Inf

Test Status **Complete**

Select Helmet

ID: C Make: SS SPEED AND ST S/N: 52 1032.001 Cond: Hot

Manual Zero Positioning

Drop Site 3

Drop No. 2

Run Test

Acceleration G

Time (ms)

Display Chan: RSLT X Y Z

EXIT

Helmet Info/Test Conditions | MPI | **Impact/Penetration** | Retention | Rolloff/Misc. | Crush | Print

Set-up | Impact Pre-test | **Impact Test** | Impact Post Test | Penetration | Force Pre-test | Force Transmission | Force Post-test

Target Impact Specification

Velocity (m/s) 6.00

Energy (J) 109.5

Drop Height (m) 1.947

Headform

DOT D

Drop Mass (kg) 6.081

Impact Site

Front Rear
 Left Right
 Crown Other

Degrees-mm -

Anvil

Flat Hazard
 Hemi Edge
 Curb Other
 Cylinder

Anvil Definition Other

Impact Results

Peak G 162

Time of Peak (ms) 11.4

Δ Time @ 150 G (ms) 0.8

Δ Time @ 200 G (ms) 0.0

Gate Time (ms) 4.2

Impact Velocity (m/s) 6.06

Impact Energy (J) 112

HIC 1047

SI 1218

Rebound Gate Time (ms) 0.0

Rebound Velocity (m/s) Inf

Coefficient of Restitution Inf

Test Status **Complete**

Select Helmet

ID: C Make: SS SPEED AND ST S/N: 52 1032.001 Cond: Not

Manual Zero Positioning

Drop Site 4

Drop No. 1

Run Test

Acceleration G

Time (ms)

Display Chan: RSLT X Y Z

EXIT

Helmet Info/Test Conditions | MPI | **Impact/Penetration** | Retention | Rolloff/Misc. | Crush | Print

Set-up | Impact Pre-test | **Impact Test** | Impact Post Test | Penetration | Force Pre-test | Force Transmission | Force Post-test

Target Impact Specification

Velocity (m/s) 6.00

Energy (J) 109.5

Drop Height (m) 1.947

Headform

DOT D

Drop Mass (kg) 6.081

Impact Site

Front Rear
 Left Right
 Crown Other

Degrees-mm -

Anvil

Flat Hazard
 Hemi Edge
 Curb Other
 Cylinder

Anvil Definition Other

Impact Results

Peak G 184

Time of Peak (ms) 10.9

Δ Time @ 150 G (ms) 2.9

Δ Time @ 200 G (ms) 0.0

Gate Time (ms) 4.2

Impact Velocity (m/s) 6.06

Impact Energy (J) 112

HIC 1341

SI 1590

Rebound Gate Time (ms) 0.0

Rebound Velocity (m/s) Inf

Coefficient of Restitution Inf

Test Status **Complete**

Select Helmet

ID: C Make: SS SPEED AND ST S/N: 52 1032.001 Cond: Not

Manual Zero Positioning

Drop Site 4

Drop No. 2

Run Test

Acceleration G

Time (ms)

Display Chan: RSLT X Y Z

EXIT

Helmet Info/Test Conditions | MPI | **Impact/Penetration** | Retention | Rolloff/Misc. | Crush | Print

Set-up | Impact Pre-test | **Impact Test** | Impact Post Test | Penetration | Force Pre-test | Force Transmission | Force Post-test

Target Impact Specification

Velocity (m/s) 5.20

Energy (J) 82.2

Drop Height (m) 1.462

Headform

DOT D

Drop Mass (kg) 6.081

Impact Site

Front Rear

Left Right

Crown Other

Degrees-mm -

Anvil

Flat Hazard

Hemi Edge

Curb Other

Cylinder

Anvil Definition Other

Impact Results

Peak G 79

Time of Peak (ms) 15.4

Δ Time @ 150 G (ms) 0.0

Δ Time @ 200 G (ms) 0.0

Gate Time (ms) 4.8

Impact Velocity (m/s) 5.27

Impact Energy (J) 84

HIC 305

SI 350

Rebound Gate Time (ms) 0.0

Rebound Velocity (m/s) Inf

Coefficient of Restitution Inf

Test Status **Complete**

Select Helmet

ID: D Make: SS SPEED AND ST S/N: 52 1032.001 Cond: Wet

Manual Zero Positioning

Drop Site 1

Drop No. 1

Run Test

Acceleration G

Time (ms)

Display Chan: RSLT X Y Z

EXIT

Helmet Info/Test Conditions | MPI | **Impact/Penetration** | Retention | Rolloff/Misc. | Crush | Print

Set-up | Impact Pre-test | **Impact Test** | Impact Post Test | Penetration | Force Pre-test | Force Transmission | Force Post-test

Target Impact Specification

Velocity (m/s) 5.20

Energy (J) 82.2

Drop Height (m) 1.462

Headform

DOT D

Drop Mass (kg) 6.081

Impact Site

Front Rear

Left Right

Crown Other

Degrees-mm -

Anvil

Flat Hazard

Hemi Edge

Curb Other

Cylinder

Anvil Definition Other

Impact Results

Peak G 224

Time of Peak (ms) 16.2

Δ Time @ 150 G (ms) 1.4

Δ Time @ 200 G (ms) 0.7

Gate Time (ms) 4.8

Impact Velocity (m/s) 5.29

Impact Energy (J) 85

HIC 832

SI 1142

Rebound Gate Time (ms) 0.0

Rebound Velocity (m/s) Inf

Coefficient of Restitution Inf

Test Status **Complete**

Select Helmet

ID: D Make: SS SPEED AND ST S/N: 52 1032.001 Cond: Wet

Manual Zero Positioning

Drop Site 1

Drop No. 2

Run Test

Acceleration G

Time (ms)

Display Chan: RSLT X Y Z

EXIT

Helmet Info/Test Conditions | MPI | **Impact/Penetration** | Retention | Rolloff/Misc. | Crush | Print

Set-up | Impact Pre-test | **Impact Test** | Impact Post Test | Penetration | Force Pre-test | Force Transmission | Force Post-test

Target Impact Specification

Velocity (m/s) 5.20

Energy (J) 82.2

Drop Height (m) 1.462

Headform

DOT D

Drop Mass (kg) 6.081

Impact Site

Front Rear
 Left Right
 Crown Other

Degrees-mm -

Anvil

Flat Hazard
 Hemi Edge
 Curb Other
 Cylinder

Anvil Definition Other

Impact Results

Peak G 83

Time of Peak (ms) 11.8

Δ Time @ 150 G (ms) 0.0

Δ Time @ 200 G (ms) 0.0

Gate Time (ms) 4.8

Impact Velocity (m/s) 5.26

Impact Energy (J) 84

HIC 353

SI 397

Rebound Gate Time (ms) 0.0

Rebound Velocity (m/s) Inf

Coefficient of Restitution Inf

Test Status **Complete**

Select Helmet

ID: D Make: SS SPEED AND ST S/N: 52 1032.001 Cond: Wet

Manual Zero Positioning

Drop Site 2

Drop No. 1

Run Test

Acceleration G

Time (ms)

Display Chan: RSLT X Y Z

EXIT

Helmet Info/Test Conditions | MPI | **Impact/Penetration** | Retention | Rolloff/Misc. | Crush | Print

Set-up | Impact Pre-test | **Impact Test** | Impact Post Test | Penetration | Force Pre-test | Force Transmission | Force Post-test

Target Impact Specification

Velocity (m/s) 5.20

Energy (J) 82.2

Drop Height (m) 1.462

Headform

DOT D

Drop Mass (kg) 6.081

Impact Site

Front Rear
 Left Right
 Crown Other

Degrees-mm -

Anvil

Flat Hazard
 Hemi Edge
 Curb Other
 Cylinder

Anvil Definition Other

Impact Results

Peak G 103

Time of Peak (ms) 15.6

Δ Time @ 150 G (ms) 0.0

Δ Time @ 200 G (ms) 0.0

Gate Time (ms) 4.8

Impact Velocity (m/s) 5.24

Impact Energy (J) 83

HIC 447

SI 521

Rebound Gate Time (ms) 0.0

Rebound Velocity (m/s) Inf

Coefficient of Restitution Inf

Test Status **Complete**

Select Helmet

ID: D Make: SS SPEED AND ST S/N: 52 1032.001 Cond: Wet

Manual Zero Positioning

Drop Site 2

Drop No. 2

Run Test

Acceleration G

Time (ms)

Display Chan: RSLT X Y Z

EXIT

Helmet Info/Test Conditions | MPI | **Impact/Penetration** | Retention | Rolloff/Misc. | Crush | Print

Set-up | Impact Pre-test | **Impact Test** | Impact Post Test | Penetration | Force Pre-test | Force Transmission | Force Post-test

Target Impact Specification

Velocity (m/s) 6.00

Energy (J) 109.5

Drop Height (m) 1.947

Headform

DOT D

Drop Mass (kg) 6.081

Impact Site

Front Rear
 Left Right
 Crown Other

Degrees-mm -

Anvil

Flat Hazard
 Hemi Edge
 Curb Other
 Cylinder

Anvil Definition Other

Impact Results

Peak G 144

Time of Peak (ms) 12.5

Δ Time @ 150 G (ms) 0.0

Δ Time @ 200 G (ms) 0.0

Gate Time (ms) 4.2

Impact Velocity (m/s) 6.05

Impact Energy (J) 111

HIC 967

SI 1088

Rebound Gate Time (ms) 0.0

Rebound Velocity (m/s) Inf

Coefficient of Restitution Inf

Test Status **Complete**

Select Helmet

ID: D Make: SS SPEED AND ST S/N: 52 1032.001 Cond: Wet

Manual Zero Positioning

Drop Site 3

Drop No. 1

Run Test

Acceleration G

Time (ms)

Display Chan: RSLT X Y Z

EXIT

Helmet Info/Test Conditions | MPI | **Impact/Penetration** | Retention | Rolloff/Misc. | Crush | Print

Set-up | Impact Pre-test | **Impact Test** | Impact Post Test | Penetration | Force Pre-test | Force Transmission | Force Post-test

Target Impact Specification

Velocity (m/s) 6.00

Energy (J) 109.5

Drop Height (m) 1.947

Headform

DOT D

Drop Mass (kg) 6.081

Impact Site

Front Rear
 Left Right
 Crown Other

Degrees-mm -

Anvil

Flat Hazard
 Hemi Edge
 Curb Other
 Cylinder

Anvil Definition Other

Impact Results

Peak G 152

Time of Peak (ms) 11.2

Δ Time @ 150 G (ms) 0.2

Δ Time @ 200 G (ms) 0.0

Gate Time (ms) 4.2

Impact Velocity (m/s) 6.06

Impact Energy (J) 112

HIC 834

SI 948

Rebound Gate Time (ms) 0.0

Rebound Velocity (m/s) Inf

Coefficient of Restitution Inf

Test Status **Complete**

Select Helmet

ID: D Make: SS SPEED AND ST S/N: 52 1032.001 Cond: Wet

Manual Zero Positioning

Drop Site 3

Drop No. 2

Run Test

Acceleration G

Time (ms)

Display Chan: RSLT X Y Z

EXIT

Helmet Info/Test Conditions | MPI | **Impact/Penetration** | Retention | Rolloff/Misc. | Crush | Print

Set-up | Impact Pre-test | **Impact Test** | Impact Post Test | Penetration | Force Pre-test | Force Transmission | Force Post-test

Target Impact Specification

Velocity (m/s) 6.00

Energy (J) 109.5

Drop Height (m) 1.947

Headform

DOT D

Drop Mass (kg) 6.081

Impact Site

Front Rear
 Left Right
 Crown Other

Degrees-mm -

Anvil

Flat Hazard
 Hemi Edge
 Curb Other
 Cylinder

Anvil Definition Other

Impact Results

Peak G 151

Time of Peak (ms) 11.5

Δ Time @ 150 G (ms) 0.3

Δ Time @ 200 G (ms) 0.0

Gate Time (ms) 4.2

Impact Velocity (m/s) 6.06

Impact Energy (J) 112

HIC 1020

SI 1175

Rebound Gate Time (ms) 0.0

Rebound Velocity (m/s) Inf

Coefficient of Restitution Inf

Test Status **Complete**

Select Helmet

ID: D Make: SS SPEED AND ST S/N: 52 1032.001 Cond: Wet

Manual Zero Positioning

Drop Site 4

Drop No. 1

Run Test

Acceleration G

Time (ms)

Display Chan: RSLT X Y Z

EXIT

Helmet Info/Test Conditions | MPI | **Impact/Penetration** | Retention | Rolloff/Misc. | Crush | Print

Set-up | Impact Pre-test | **Impact Test** | Impact Post Test | Penetration | Force Pre-test | Force Transmission | Force Post-test

Target Impact Specification

Velocity (m/s) 6.00

Energy (J) 109.5

Drop Height (m) 1.947

Headform

DOT D

Drop Mass (kg) 6.081

Impact Site

Front Rear
 Left Right
 Crown Other

Degrees-mm -

Anvil

Flat Hazard
 Hemi Edge
 Curb Other
 Cylinder

Anvil Definition Other

Impact Results

Peak G 187

Time of Peak (ms) 11.2

Δ Time @ 150 G (ms) 3.1

Δ Time @ 200 G (ms) 0.0

Gate Time (ms) 4.2

Impact Velocity (m/s) 6.06

Impact Energy (J) 112

HIC 1325

SI 1568

Rebound Gate Time (ms) 0.0

Rebound Velocity (m/s) Inf

Coefficient of Restitution Inf

Test Status **Complete**

Select Helmet

ID: D Make: SS SPEED AND ST S/N: 52 1032.001 Cond: Wet

Manual Zero Positioning

Drop Site 4

Drop No. 2

Run Test

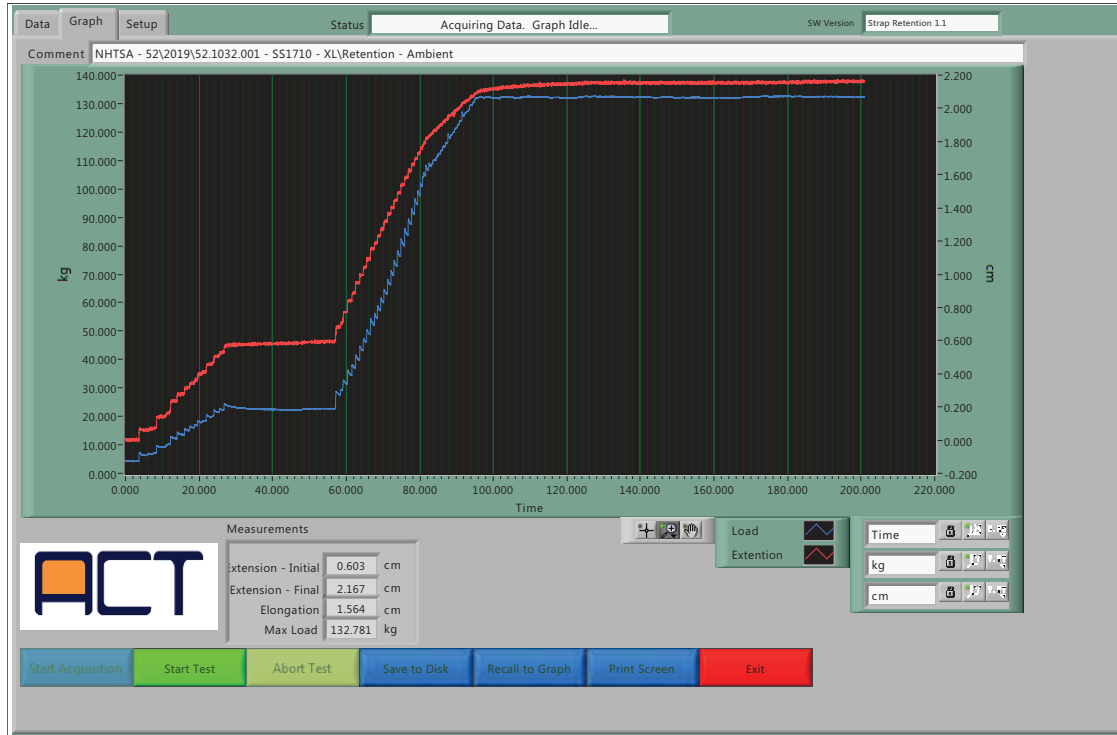
Acceleration G

Time (ms)

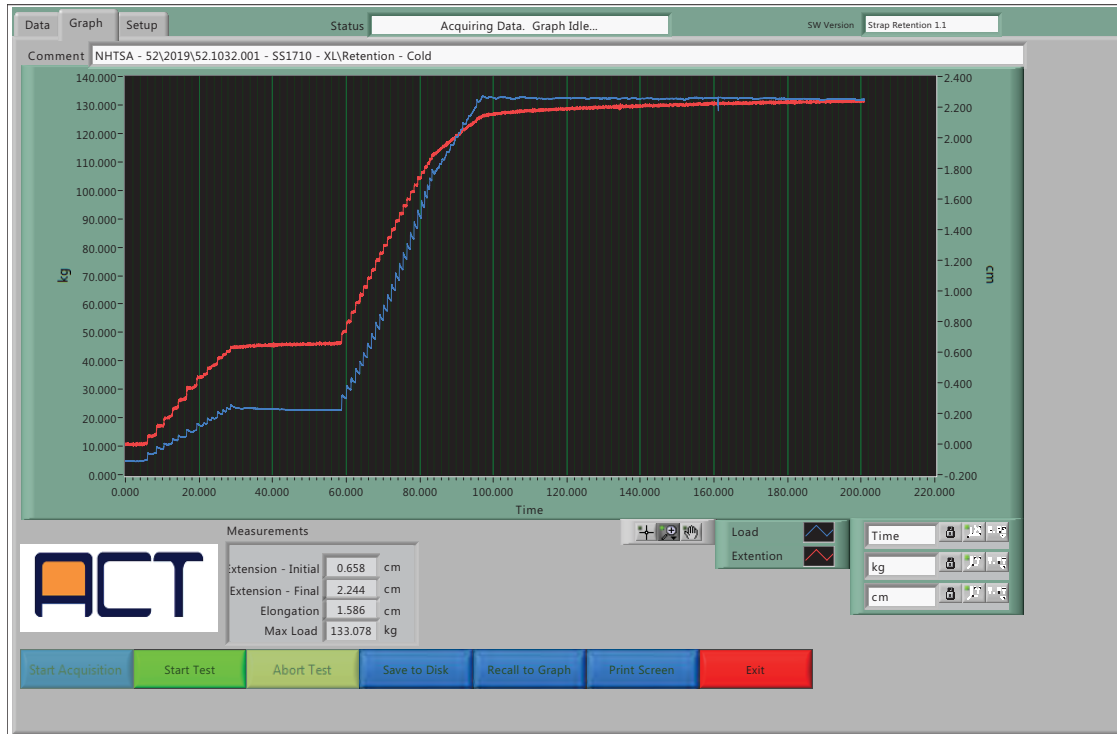
Display Chan: RSLT X Y Z

EXIT

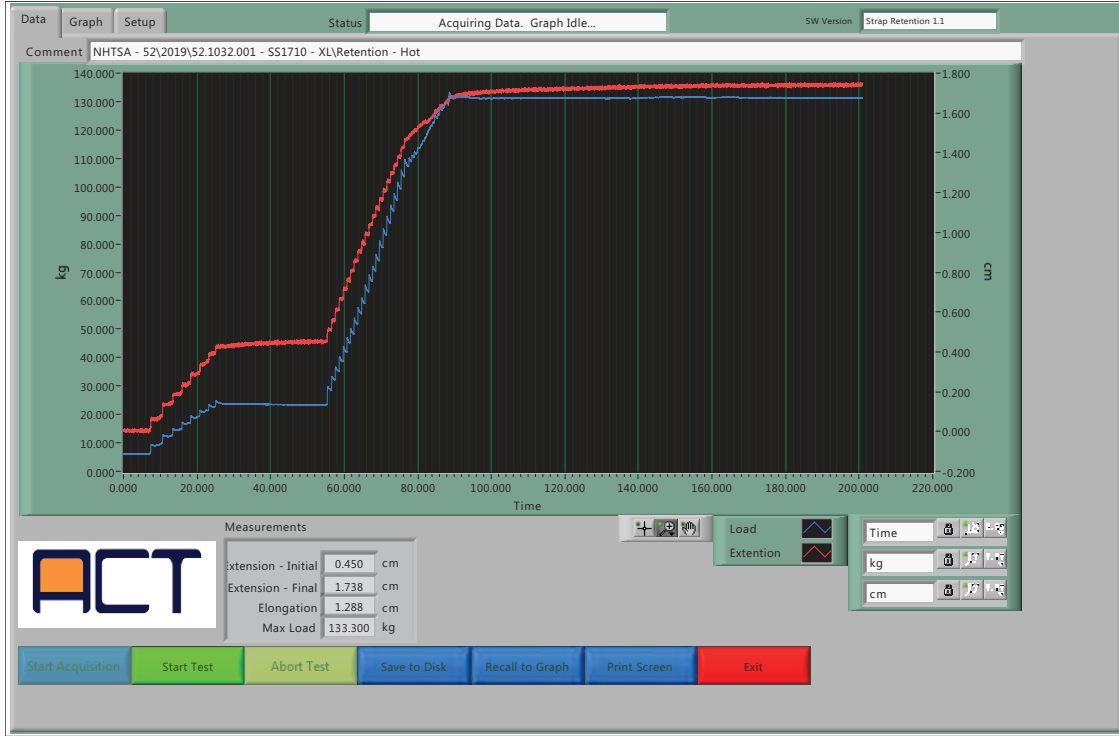
ACT DOT Strap Retention Acquisition
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 Last modified on 10/1/2017 at 4:36 PM
 Printed on 5/10/2019 at 3:05 PM



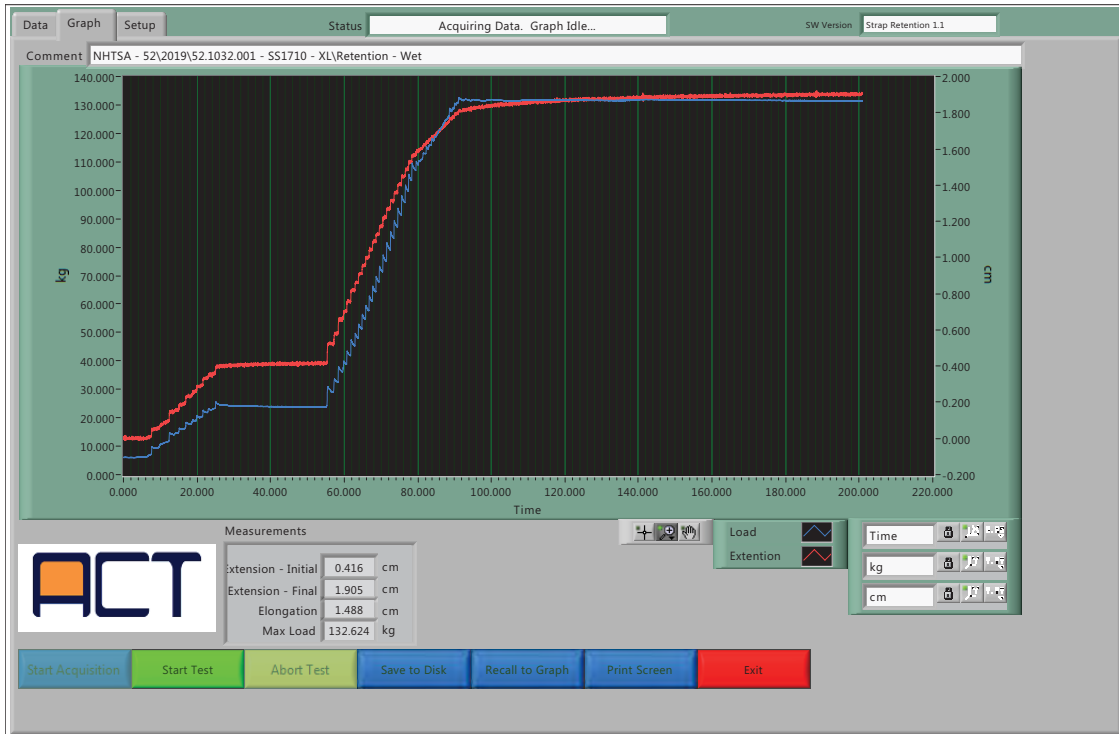
ACT DOT Strap Retention Acquisition
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 Last modified on 10/1/2017 at 4:36 PM
 Printed on 5/10/2019 at 3:12 PM

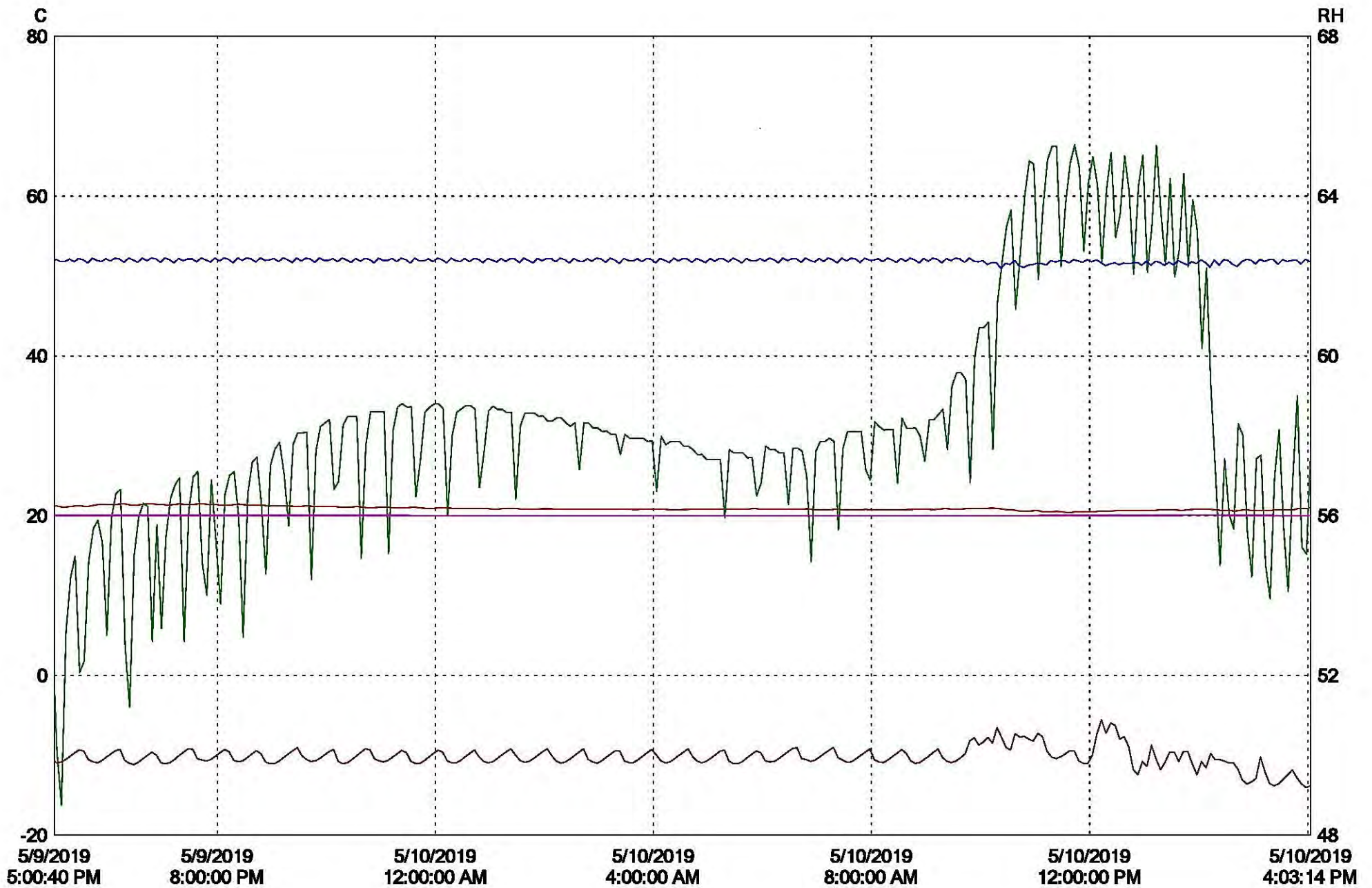


ACT DOT Strap Retention Acquisition
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Last modified on 10/1/2017 at 4:36 PM
Printed on 5/10/2019 at 3:25 PM



ACT DOT Strap Retention Acquisition
C:\DAQ\DAQ_ADMIN\Strap_Retention\Strap_Retention.exe\Strap Retention - Main.vi
Last modified on 10/1/2017 at 4:36 PM
Printed on 5/10/2019 at 3:31 PM





LN	Serial #	Description	CH	Value	Maximum	Average	Minimum	Units	CH description	Logger file
1	08052076	LAB TEMP/RH	1	21.48	20.90	20.41	20.41	C	Lab Temp.	LAB_TEMP_RH-08052076-2019-05-10 16-32-20.spl
2	08052076	LAB TEMP/RH	2	65.3	58.3	48.8	48.8	RH	Humidity	LAB_TEMP_RH-08052076-2019-05-10 16-32-20.spl
3	09021116	Oven/Water	1	52.25	51.91	50.92	50.92	C	Oven	Oven_Water-09021116-2019-05-10 16-32-16.spl
4	09021116	Oven/Water	2	20.06	20.00	19.98	19.98	C	Water	Oven_Water-09021116-2019-05-10 16-32-16.spl
5	08071106	Freezer	1	-5.56	-10.21	-14.02	-14.02	C	Freezer	Freezer-08071106-2019-05-10 16-32-11.spl

APPENDIX A

INTERPRETATIONS OR DEVIATIONS FROM FMVSS No. 218

Excess water on the water immersed sample was allowed to drip off before testing to prevent water damage to test equipment.

**APPENDIX B
EQUIPMENT LIST AND CALIBRATION SCHEDULES**

Equipment List					
ACT ID	Description	Make/Model	S/N	Dimensional Check	Next
H0079	Monorail	US Testing	NA	12/8/2018	12/1/2019
H0138	Headform	Cadex DOT Small	7611	12/8/2018	12/1/2019
H0139	Headform	Cadex DOT Medium	7613	12/8/2018	12/1/2019
H0140	Headform	Cadex DOT Large	7616	12/8/2018	12/1/2019
H0028	Anvil	Hemispherical	C070911-01	12/8/2018	12/1/2019
H0029	Anvil	Flat	C310811-02	12/8/2018	12/1/2019
H0078	Anvil	MEP	16100801	12/8/2018	12/1/2019
H0088	Penetration Height Spacer	La Cienega Manufacturing	NA	12/8/2018	12/1/2019
H0064	Penetration Striker	Cadex	4324	12/8/2018	12/1/2019
H0089	Fixture - Peripheral Vision	---	NA	12/8/2018	12/1/2019
H0111	Peripheral Vision	1 inch Block	NA	12/8/2018	12/1/2019
H0059	Drop Carriage Assembly	Cadex	NA	12/8/2018	12/1/2019
H0117	DOT Penetration Headform - Small	Cadex	7293	12/8/2018	12/1/2019
H0118	DOT Penetration Headform - Medium	Cadex	7294	12/8/2018	12/1/2019
H0119	DOT Penetration Headform - Large	Cadex	7296	12/8/2018	12/1/2019
H0080	Penetrator Tube	La Cienega Manufacturing	NA	12/8/2018	12/1/2019
H0120	Penetration Headform Mount	Cadex	NA	NA	NA
H0082	Retention Strength Tester	La Cienega Manufacturing	NA	NA	NA
H0090	High Temperature Chamber	Thermolyne	116005-0891414	NA	NA
H0091	Low Temperature Chamber	Sciencemp	S8001170	NA	NA
H0092	Water Immersion Container	Rubbermaid	NA	NA	NA
H0114	Laser Level	Ryobi	NA	NA	NA
H0115	Computer	Dell	67G5891	NA	NA
H0116	I-O Board	National Instruments	PCI-6023E	NA	NA

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Calibrated Measurement Equipment								
ACT ID	Description	Make/Model	S/N	Range	Accuracy from Cal. Certs	Last Calibration	Next Calibration	Calibration By:
H0102	Velocity Gate	Biok-Gate 9304	9304-001	--	0.16 ms	12/1/2018	12/1/2019	ACT
H0097	Accelerometer/ Amplifier/Filter	2279/104/109	ANTP2/AK/A P23	2000 g	±2.60%	8/14/2018	8/14/2019	Precision Labs
H0098	LVDT - Retention	Schaevitz 2000-HR	16071	2 in	±0.06 mm	12/4/2018	12/4/2019	Micro Quality Calibration
H0099	Load Cell - Retention	LSB350	490706	500 lbs	±0.2%	12/4/2018	12/4/2019	Micro Quality Calibration
H0150	Ohaus Scale	V11P6	50921366	0-6000 gm	±1 g	10/12/2018	10/12/2019	Micro Quality Calibration
H0124	Digital Measuring Tape	Etape	-	16.5 ft	±0.0625 in	12/4/2018	12/4/2019	Micro Quality Calibration
H0105	Height Gage	Mitutoyo	3121016	12 in	±0.002 in	12/5/2018	12/5/2019	Micro Quality Calibration
H0106	Environmental Data Logger	Veriteq SP-2000-20R	8052076	-40 To +95C, 0-100% RH	±0.03 °C	8/14/2018	8/14/2019	Vaisala
H0107	Environmental Data Logger	Veriteq SP-1000-22N	8071106	-40 To +95 °C	±0.02 °C	8/14/2018	8/14/2019	Vaisala
H0108	Environmental Data Logger	Veriteq SP-1000-22N	9021116	-40 To +95 °C	±0.02 °C	8/14/2018	8/14/2019	Vaisala
H0130	Timer	Traceable 5017	181009252	0-99hrs/59 mins/59 sec	±0.01%	02/07/2018	02/07/2020	Control Company

APPENDIX C
PHOTOGRAPHS

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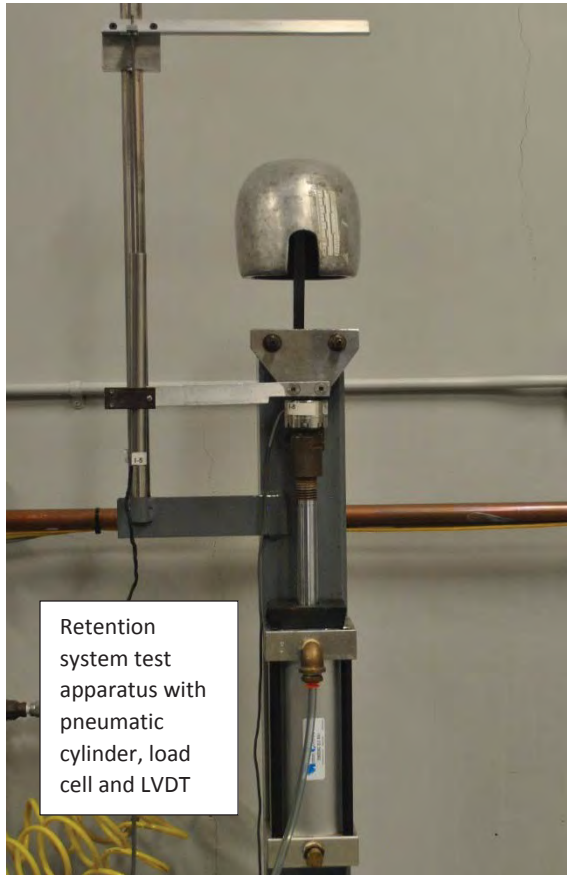
Test Date: 10 May 2019



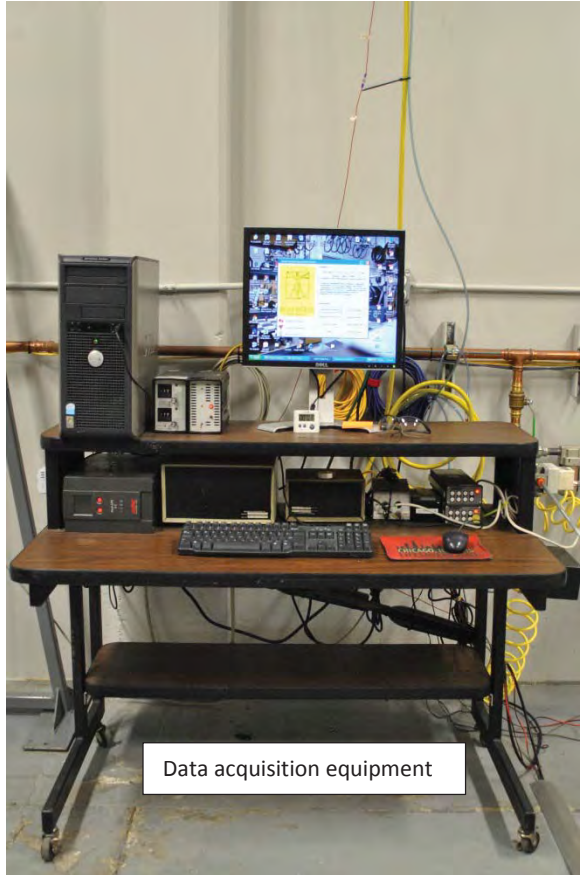
Impact attenuation test apparatus with three headforms (S, M, L), flat, hemi and MEP anvils



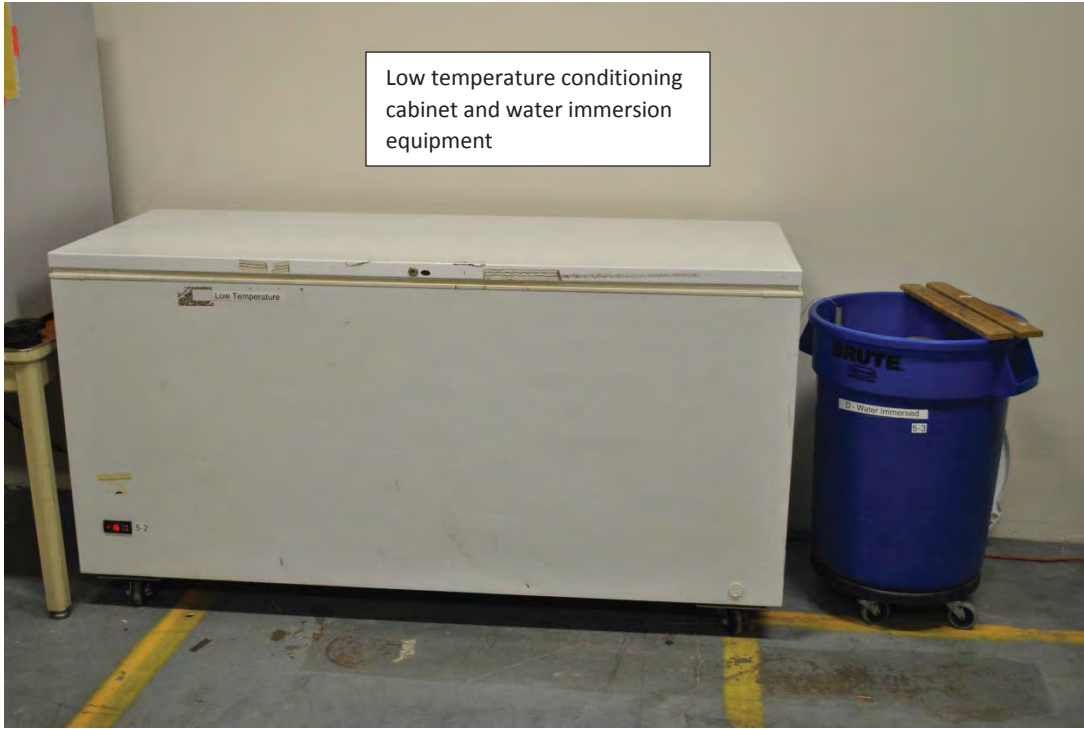
Penetration test apparatus with adjustable base



Retention system test apparatus with pneumatic cylinder, load cell and LVDT



Data acquisition equipment



Low temperature conditioning cabinet and water immersion equipment



High temperature chamber









