SAFETY COMPLIANCE TESTING FOR FMVSS No. 218 MOTORCYCLE HELMETS

Brand: Shark
Model: SKWAL
Size: S (56 cm)

Prepared By

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31 March 2017

Final Report 218-ACT-17-024

Prepared For

U.S. Department of Transportation

National Highway Traffic Safety Administration

Office of Vehicle Safety Compliance (NEF-220)

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Approval Date: 31 March 2017

FINAL REPORT ACCEPTANCE BY OVSC:

Accepted By:

Acceptance Date: 10/16/2017

HS# 645191

TECHNICAL REPORT STANDARD TITLE PAGE

1. Report No. 218-ACT-17-024	**2. Government Accession No.**	**3. Recipient's Catalog No.**
4. Title and Sub-Title FINAL REPORT OF FMVSS NO. 218 COMPLIANCE TESTING OF SHARK, MODEL SKWAL, SIZE S (56 CM) MOTORCYCLE HELMET		**5. Report Date** 31 March 2017
		6. Performing Organization Code ACT
7. Author(s) David R. Thom, Program Manager		**8. Performing Organization Report No.** 52.0824-C042
9. Performing Organization Name and Address ACT Lab LLC 3280 East 59th Street, Long Beach CA 90805		**10. Work Unit No.**
		11. Contract or Grant No. DTNH22-13-D-00314
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Office of Vehicle Safety Compliance (NEF-220) 1200 New Jersey Avenue, S.E. Washington, D.C. 20590		**13. Type of Report and Period Covered** Final Test Report
		14. Sponsoring Agency Code NEF-220

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 label is missing or incomplete.

17. Key Words Helmet Compliance Testing Safety Engineering FMVSS No. 218	**18. Distribution Statement** Copies of this report are available from: National Highway Traffic Safety Administration Technical Information Services Division (NPO-120) 1200 New Jersey Avenue, S.E. Washington, D.C. 20590

19. Security Classification (of this report) Unclassified	**20. Security Classification (of this page)** Unclassified	**21. No. of Pages** 45	**22. Price**

Form DOT F1700.7 (8-69)

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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-218-07[2], as governed by the contract.

2. TEST PROCEDURE

The ACT Lab Helmet Testing Manual, Part I – Motorcycle Helmets[3] 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	Shark										
Model Designation	Skwal										
Manufacturer	Shark										
Helmet Size Label	S (56 cm)										
Test Headform size	Small		Medium	X	Large						
Helmet Positioning Index (HPI)	56 mm		Manufacturer supplied	X	ACT determined						
Helmet Coverage	Partial		Full		Complete	X					
Shell Material	Polycarbonate										
Liner Material	Expanded Polystyrene										
Comfort Padding	Resilient Foam										
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)	1538	1531	1542	1541	1663
MONTH & YEAR OF MANUFACTURE	07/2016	07/2016	07/2016	07/2016	07/2016

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. 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 IMMERSED
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. As of the date of this report, the entity listed on the interior label, “Shark" has not filed in accordance with 49 CFR Part 566, Manufacturer Identification, and cannot be verified as the fabricating manufacturer.

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: S 56 cm
Discrete Size: 56 cm, Headform Size: DOT Medium

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

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.

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	1.4	5.08	393.5	2.4	2.0	Pre 1	Crown
	2	1.4	5.09	395.8	2.4	2.0	Pre 2	Crown
	3	1.4	5.12	396.2	2.4	2.0	Pre 3	Crown
PRETEST AVERAGE		XXXX	XXXX	395.2	XXX	XXX	XXXX	XXXX
POSTTEST	1	1.4	5.08	394.8	2.5	2.1	Post 1	Crown
	2	1.4	5.08	389.9	2.4	2.0	Post 2	Crown
	3	1.4	5.09	389.7	2.5	2.0	Post 3	Crown
POSTTEST AVERAGE		XXXX	XXXX	391.5	XXX	XXX	XXXX	XXXX
DIFFERENCE BETWEEN PRE-TEST AND POST-TEST AVERAGES				3.7	DIFFERENCE NOT TO EXCEED 15 g			

Helmet Designation	Helmet Condition	Impact Location	Front		Left		Right		Rear	
		Impact Number	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	84	108	93	104	159	180	151	168
		ms @ 150	0.0	0.0	0.0	0.0	1.1	3.2	0.2	1.5
		ms @ 200	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Velocity m/s	5.20	5.18	5.21	5.22	6.05	6.02	6.08	6.09
B	Low Temperature	Anvil	Hemi		Hemi		Flat		Flat	
		Test Record No.	9	10	11	12	13	14	15	16
		Peak g	81	115	97	93	168	184	163	168
		ms @ 150	0.0	0.0	0.0	0.0	1.2	3.4	1.4	1.5
		ms @ 200	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Velocity m/s	5.18	5.19	5.21	5.19	5.98	6.02	6.11	6.11
C	High Temperature	Anvil	Hemi		Hemi		Flat		Flat	
		Test Record No.	17	18	19	20	21	22	23	24
		Peak g	79	107	93	95	158	166	149	157
		ms @ 150	0.0	0.0	0.0	0.0	0.8	3.0	0.0	1.0
		ms @ 200	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Velocity m/s	5.17	5.19	5.19	5.21	6.01	6.06	6.11	6.11
D	Water Immersed	Anvil	Hemi		Hemi		Flat		Flat	
		Test Record No.	25	26	27	28	29	30	31	32
		Peak g	77	101	87	97	159	173	145	157
		ms @ 150	0.0	0.0	0.0	0.0	2.8	3.1	0.0	0.8
		ms @ 200	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Velocity m/s	5.20	5.20	5.21	5.20	6.03	5.99	6.11	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.

Contract File No.: 52.0824 Technician: George Stetina
Test File: C042

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 60º ± 0.5°, 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 cm ± 1.5 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

AMBIENT TEMPERATURE: 20 ºC ; AMBIENT HUMIDITY: 38 %

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	0.38	1.74	1.36
B	LOW TEMPERATURE	0.39	1.76	1.37
C	HIGH TEMPERATURE	0.39	1.69	1.30
D	WATER IMMERSED	0.48	1.83	1.35

CONFIGURATION - Paragraph S5.4 - Helmet shall provide a minimum peripheral vision of 105º 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	> 105º	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	Fail	Pass
Discrete size	Pass	Pass
Month and year of manufacture	Pass	Pass
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

COMMENTS:

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

2. S5.6.1 Labeling. As of the date of this report, the entity listed on the interior label, "Shark" has not filed in accordance with 49 CFR Part 566, Manufacturer Identification, and cannot be verified as the fabricating manufacturer.

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:

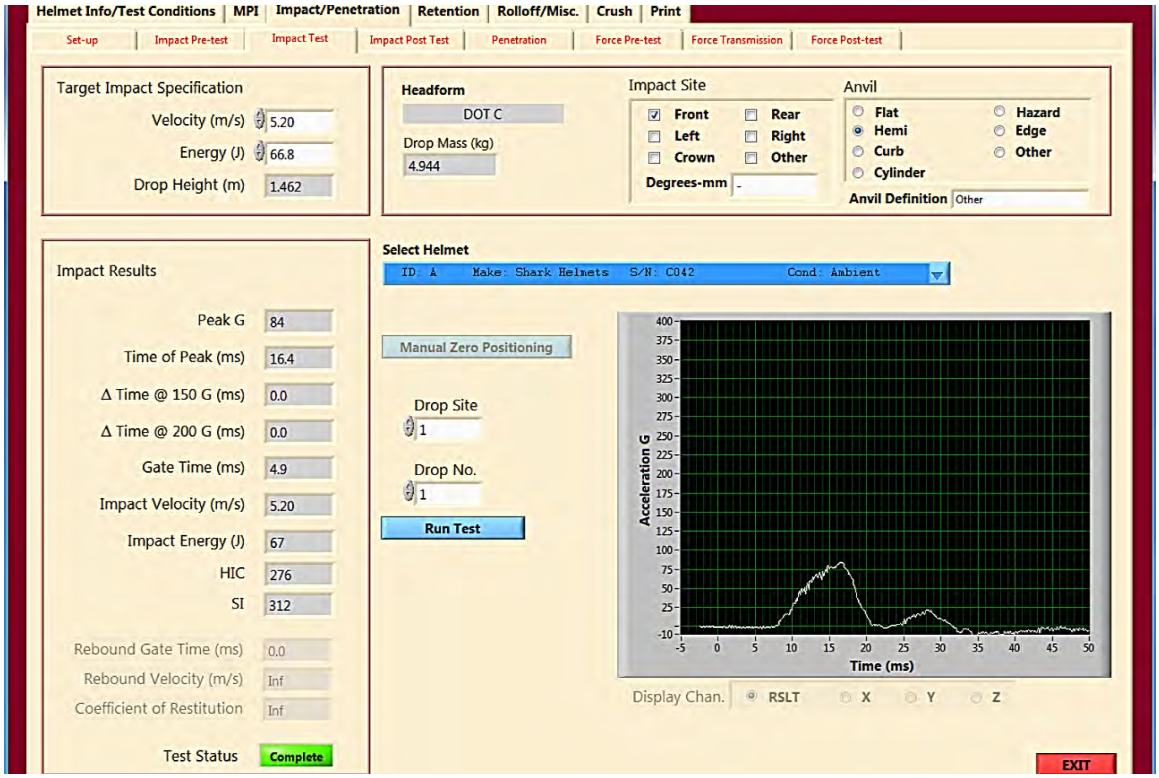
Required Certification Information	Content/ Format	Permanent
The symbol ''DOT,'' horizontally centered on the label, in letters not less than 0.38 inch (1.0 cm) high.	Pass	Pass
The term ''FMVSS No. 218,'' horizontally centered beneath the symbol DOT, in letters not less than 0.09 inches (0.23 cm) high.	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	

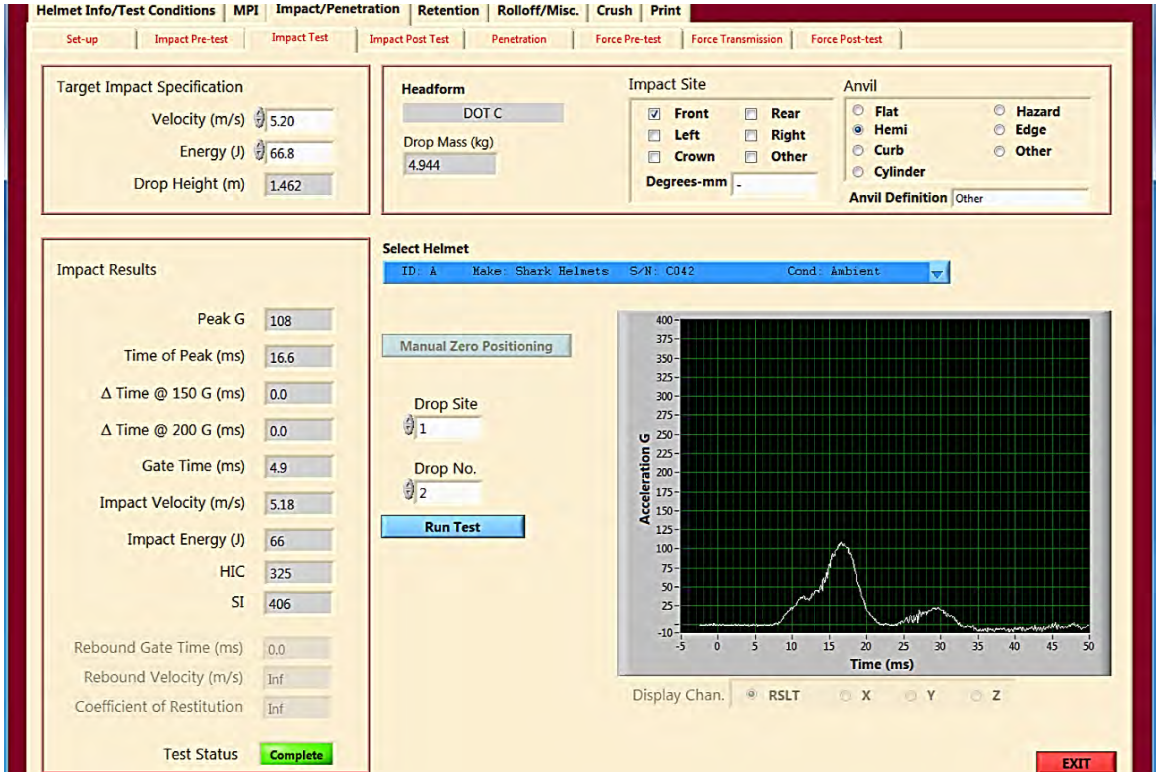
COMMENT: Labels were determined to be both easily read and permanent based on the TP-218-07, Section 12.5.4.

TEST DATA


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
Pre-test Drop Velocity (m/s) 5.100
Target Drop Height (m) 1.406
Calibration Impactor
ISO A
ISO E
ISO J
ISO M
DoT Small
DoT Medium
DoT Large
Hybrid III
Spherical
Impactor Orientation
Front
Right
Crown
Left
Rear
Other
Manual Zero Positioning
Run Pre-test 1
Run Pre-test 2
Run Pre-test 3
Acceleration G
Time (ms)
Peak G 393 396 396
Time of Peak G (ms) 10.0 5.0 10.0
Δ Time @ 150 G (ms) 2.4 2.4 2.4
Δ Time @ 200 G (ms) 2.0 2.0 2.0
Gate Time (ms) 5.0 10.0 5.0
Impact Velocity (m/s) 5.08 5.09 5.12
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
Post-test Drop Velocity (m/s) 5.100
Target Drop Height (m) 1.406
Calibration Impactor
ISO A
ISO E
ISO J
ISO M
DoT Small
DoT Medium
DoT Large
Hybrid III
Spherical
Impactor Orientation
Front
Right
Crown
Left
Rear
Other
Manual Zero Positioning
Run Post-test 1
Run Post-test 2
Run Post-test 3
Acceleration G
Time (ms)
Peak G 395 390 390
Time of Peak G (ms) 10.3 10.4 10.2
Δ Time @ 150 G (ms) 2.5 2.4 2.5
Δ Time @ 200 G (ms) 2.1 2.0 2.0
Gate Time (ms) 5.0 5.0 0.0
Impact Velocity (m/s) 5.08 5.08 5.09
Average Pre-test Peak G 395
Average Post-test Peak G 391
Δ Average Post - Pre Peak G -4
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) 66.8
Drop Height (m) 1.462
Headform
DOT C
Drop Mass (kg)
4.944
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 84
Time of Peak (ms) 16.4
Δ Time @ 150 G (ms) 0.0
Δ Time @ 200 G (ms) 0.0
Gate Time (ms) 4.9
Impact Velocity (m/s) 5.20
Impact Energy (J) 67
HIC 276
SI 312
Rebound Gate Time (ms) 0.0
Rebound Velocity (m/s) Inf
Coefficient of Restitution Inf
Test Status Complete
Select Helmet
ID: A Make: Shark Helmets S/N: C042 Cond: Ambient
Manual Zero Positioning
Drop Site 1
Drop No. 1
Run Test
Acceleration G
Time (ms)
Display Chan. RSLT X Y Z
EXIT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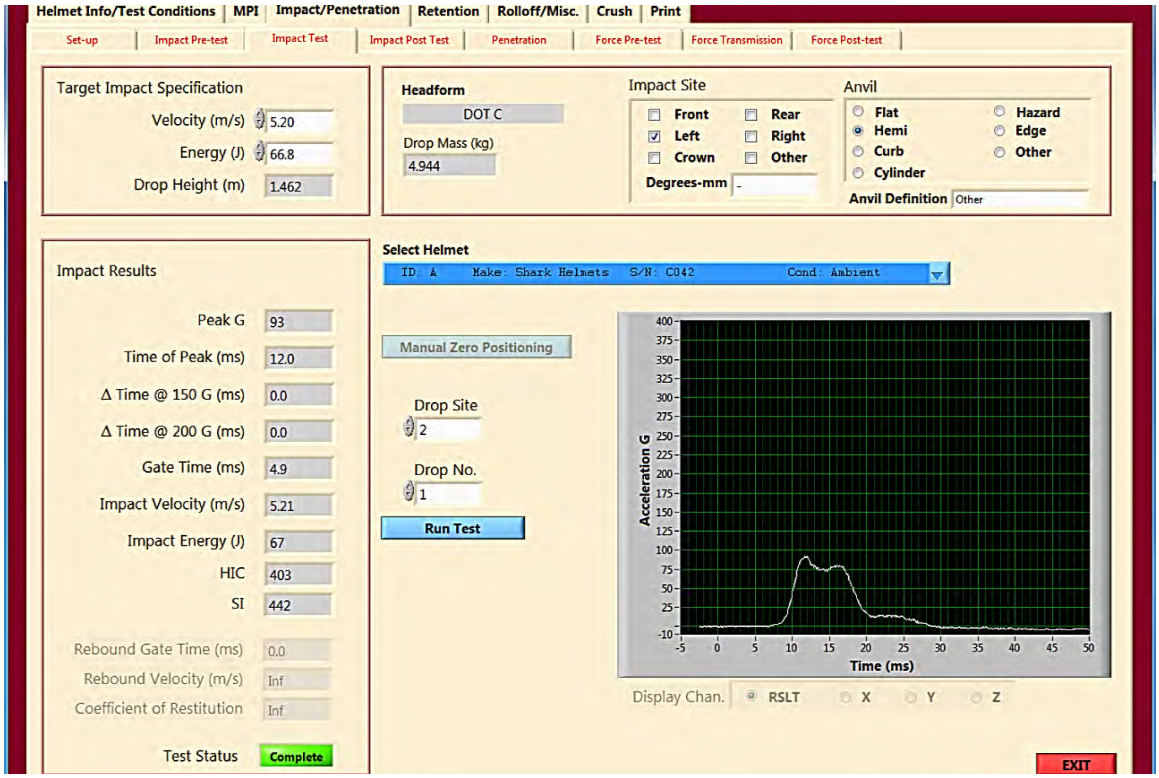
Set-up | Impact Pre-test | Impact Test | Impact Post Test | Penetration | Force Pre-test | Force Transmission | Force Post-test
Target Impact Specification
Velocity (m/s) 5.20
Energy (J) 66.8
Drop Height (m) 1.462
Headform
DOT C
Drop Mass (kg)
4.944
Impact Site
Front
Rear
Left
Right
Crown
Other
Degrees-mm -
Anvil
Flat
Hazard
Hemi
Edge
Curb
Other
Cylinder
Anvil Definition Other
Impact Results
Peak G 108
Time of Peak (ms) 16.6
Δ Time @ 150 G (ms) 0.0
Δ Time @ 200 G (ms) 0.0
Gate Time (ms) 4.9
Impact Velocity (m/s) 5.18
Impact Energy (J) 66
HIC 325
SI 406
Rebound Gate Time (ms) 0.0
Rebound Velocity (m/s) Inf
Coefficient of Restitution Inf
Test Status Complete
Select Helmet
ID: A Make: Shark Helmets S/N: C042 Cond: Ambient
Manual Zero Positioning
Drop Site 1
Drop No. 2
Run Test
Acceleration G
Time (ms)
Display Chan. RSLT X Y Z
EXIT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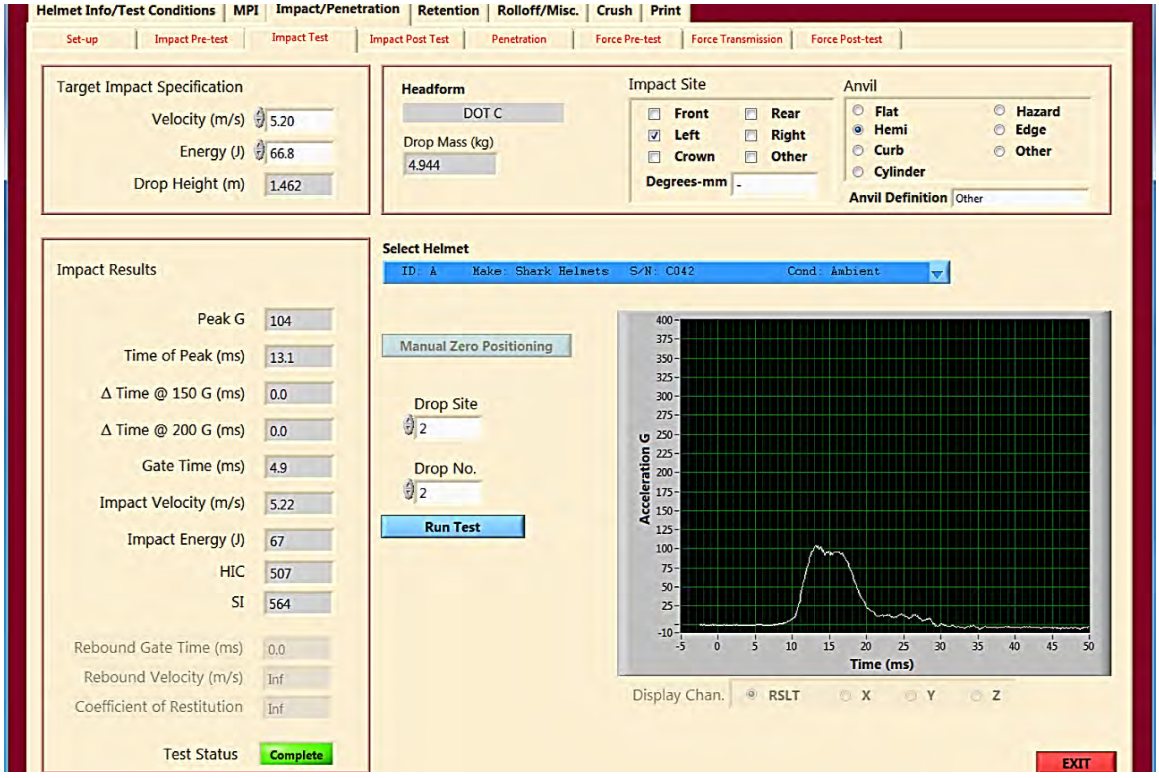
Set-up | Impact Pre-test | Impact Test | Impact Post Test | Penetration | Force Pre-test | Force Transmission | Force Post-test
Target Impact Specification
Velocity (m/s) 5.20
Energy (J) 66.8
Drop Height (m) 1.462
Headform
DOT C
Drop Mass (kg)
4.944
Impact Site
Front
Rear
Left
Right
Crown
Other
Degrees-mm -
Anvil
Flat
Hazard
Hemi
Edge
Curb
Other
Cylinder
Anvil Definition Other
Impact Results
Peak G 93
Time of Peak (ms) 12.0
Δ Time @ 150 G (ms) 0.0
Δ Time @ 200 G (ms) 0.0
Gate Time (ms) 4.9
Impact Velocity (m/s) 5.21
Impact Energy (J) 67
HIC 403
SI 442
Rebound Gate Time (ms) 0.0
Rebound Velocity (m/s) Inf
Coefficient of Restitution Inf
Test Status Complete
Select Helmet
ID: A Make: Shark Helmets S/N: C042 Cond: Ambient
Manual Zero Positioning
Drop Site 2
Drop No. 1
Run Test
Acceleration G
Time (ms)
Display Chan. RSLT X Y Z
EXIT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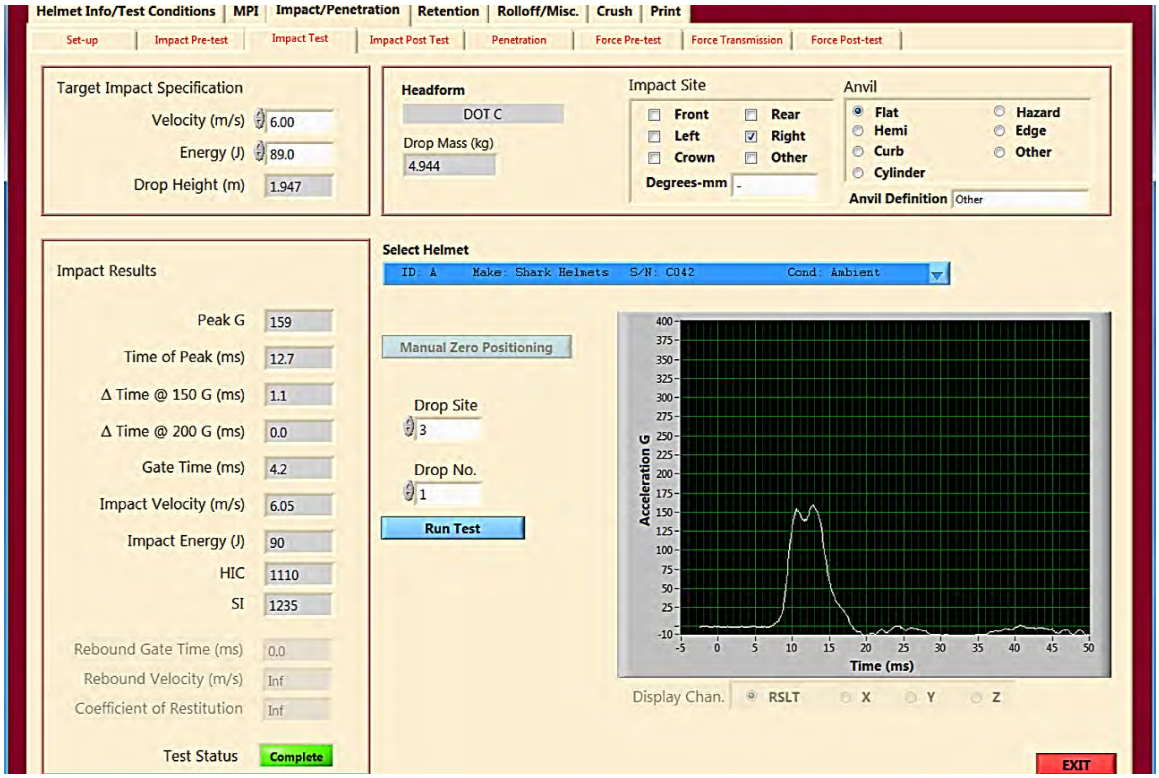
Set-up | Impact Pre-test | Impact Test | Impact Post Test | Penetration | Force Pre-test | Force Transmission | Force Post-test
Target Impact Specification
Velocity (m/s) 5.20
Energy (J) 66.8
Drop Height (m) 1.462
Headform
DOT C
Drop Mass (kg)
4.944
Impact Site
Front
Rear
Left
Right
Crown
Other
Degrees-mm -
Anvil
Flat
Hazard
Hemi
Edge
Curb
Other
Cylinder
Anvil Definition Other
Impact Results
Peak G 104
Time of Peak (ms) 13.1
Δ Time @ 150 G (ms) 0.0
Δ Time @ 200 G (ms) 0.0
Gate Time (ms) 4.9
Impact Velocity (m/s) 5.22
Impact Energy (J) 67
HIC 507
SI 564
Rebound Gate Time (ms) 0.0
Rebound Velocity (m/s) Inf
Coefficient of Restitution Inf
Test Status Complete
Select Helmet
ID: A Make: Shark Helmets S/N: C042 Cond: Ambient
Manual Zero Positioning
Drop Site 2
Drop No. 2
Run Test
Acceleration G
Time (ms)
Display Chan. RSLT X Y Z
EXIT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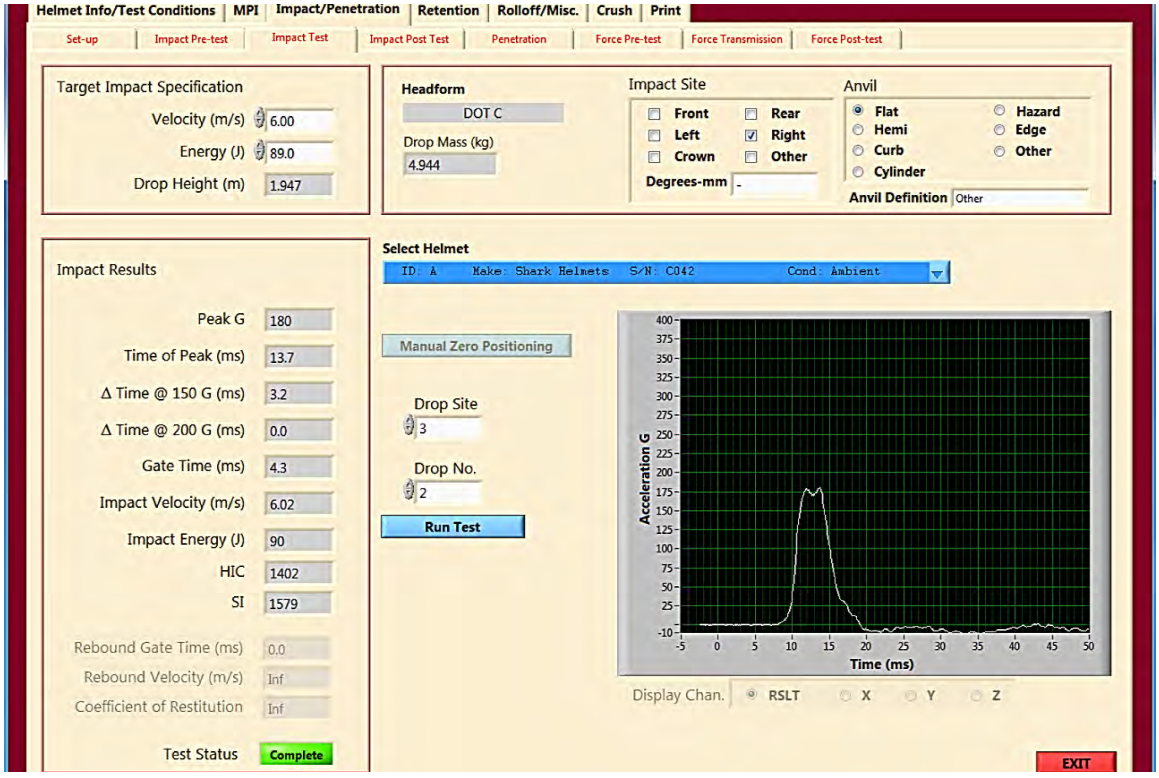
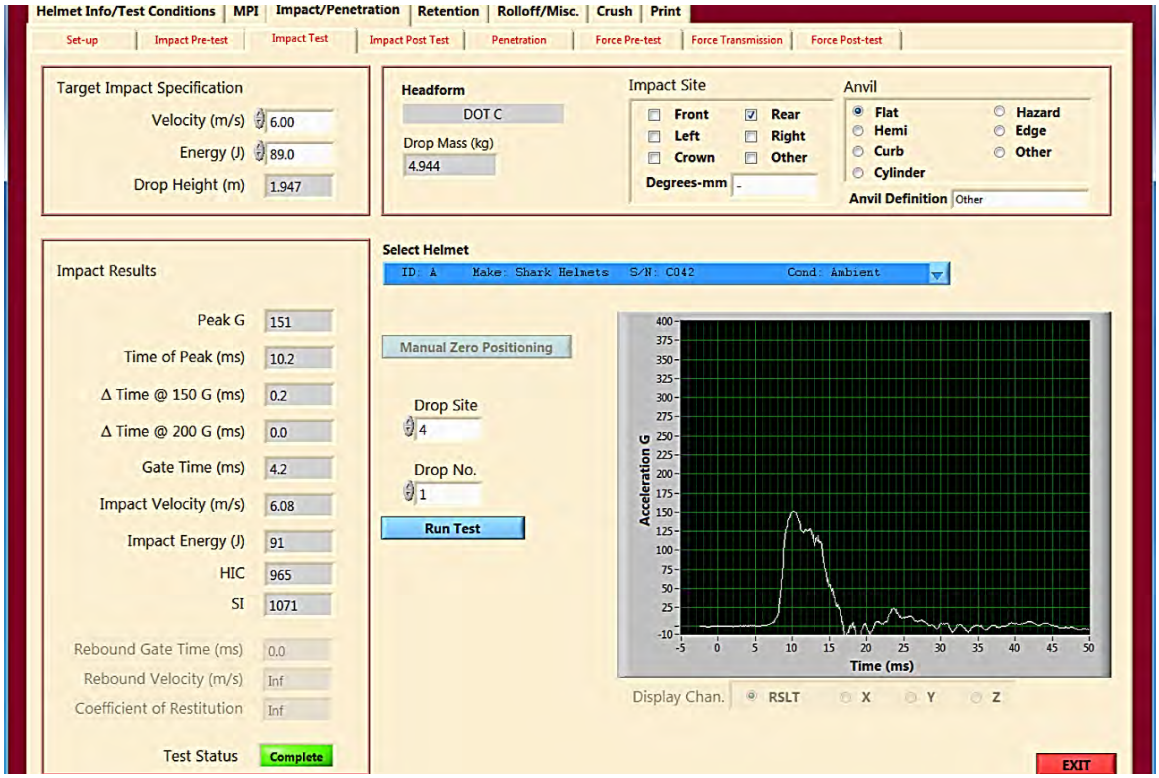
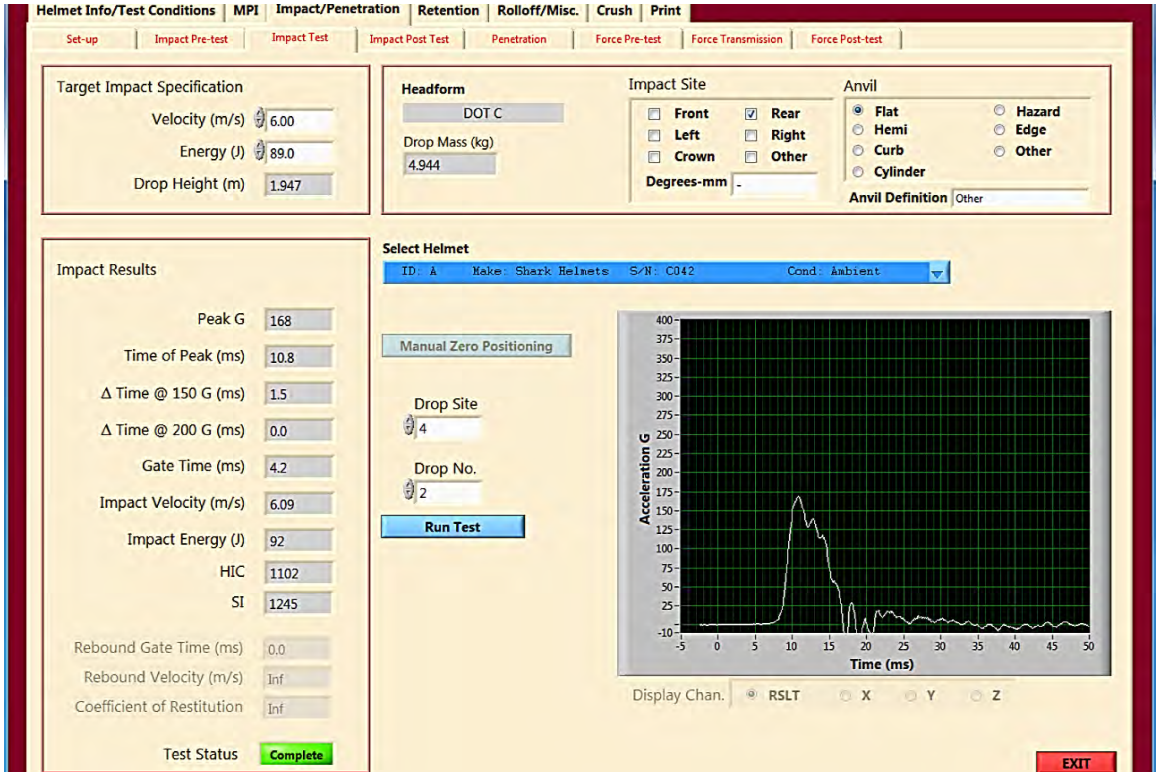
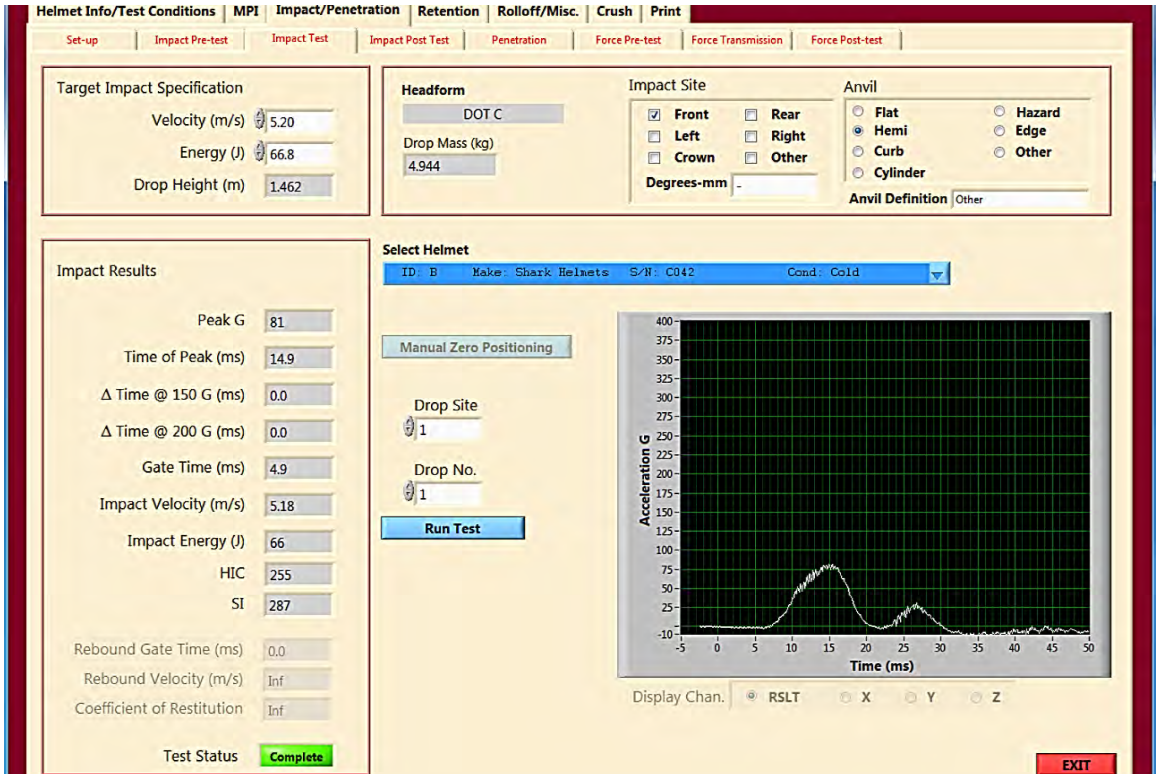
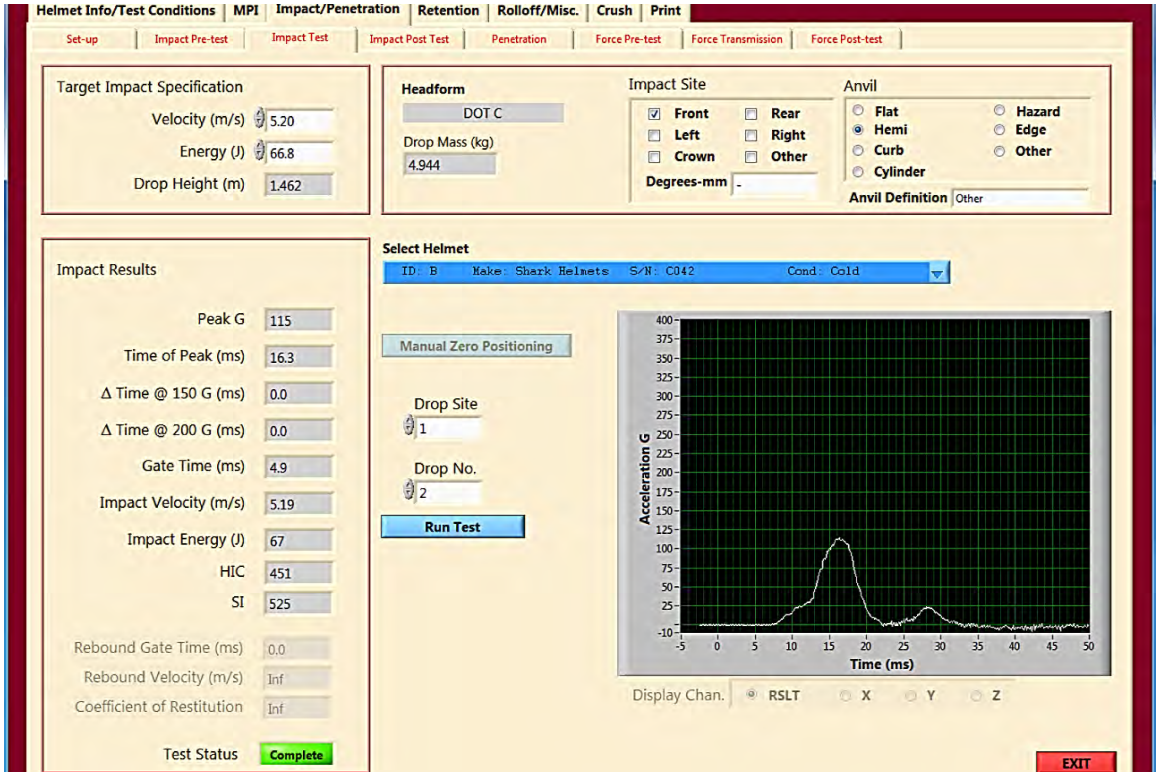
Set-up | Impact Pre-test | Impact Test | Impact Post Test | Penetration | Force Pre-test | Force Transmission | Force Post-test
Target Impact Specification
Velocity (m/s) 6.00
Energy (J) 89.0
Drop Height (m) 1.947
Headform
DOT C
Drop Mass (kg)
4.944
Impact Site
Front
Rear
Left
Right
Crown
Other
Degrees-mm -
Anvil
Flat
Hemi
Curb
Cylinder
Hazard
Edge
Other
Anvil Definition Other
Impact Results
Peak G 159
Time of Peak (ms) 12.7
Δ Time @ 150 G (ms) 1.1
Δ Time @ 200 G (ms) 0.0
Gate Time (ms) 4.2
Impact Velocity (m/s) 6.05
Impact Energy (J) 90
HIC 1110
SI 1235
Rebound Gate Time (ms) 0.0
Rebound Velocity (m/s) Inf
Coefficient of Restitution Inf
Test Status Complete
Select Helmet
ID: A Make: Shark Helmets S/N: C042 Cond: Ambient
Manual Zero Positioning
Drop Site 3
Drop No. 1
Run Test
Acceleration G
Time (ms)
Display Chan. RSLT X Y Z
EXIT

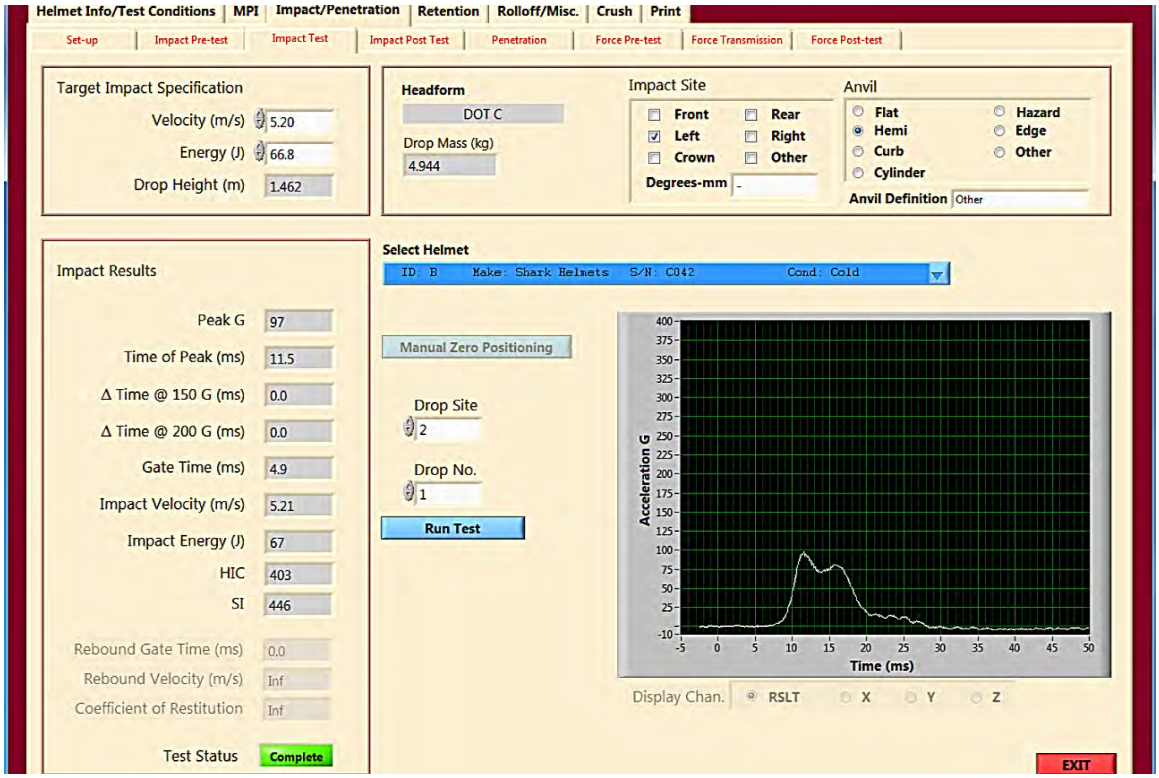

Helmet Info/Test Conditions | MPI | Impact/Penetration | Retention | Rolloff/Misc. | Crush | Print
Set-up | Impact Pre-test | Impact Test | Impact Post Test | Penetration | Force Pre-test | Force Transmission | Force Post-test
Target Impact Specification
Velocity (m/s) 6.00
Energy (J) 89.0
Drop Height (m) 1.947
Headform
DOT C
Drop Mass (kg)
4.944
Impact Site
Front
Rear
Left
Right
Crown
Other
Degrees-mm -
Anvil
Flat
Hemi
Curb
Cylinder
Hazard
Edge
Other
Anvil Definition Other
Impact Results
Peak G 180
Time of Peak (ms) 13.7
Δ Time @ 150 G (ms) 3.2
Δ Time @ 200 G (ms) 0.0
Gate Time (ms) 4.3
Impact Velocity (m/s) 6.02
Impact Energy (J) 90
HIC 1402
SI 1579
Rebound Gate Time (ms) 0.0
Rebound Velocity (m/s) Inf
Coefficient of Restitution Inf
Test Status Complete
Select Helmet
ID: A Make: Shark Helmets S/N: C042 Cond: Ambient
Manual Zero Positioning
Drop Site 3
Drop No. 2
Run Test
Acceleration G
Time (ms)
Display Chan. RSLT X Y Z
EXIT

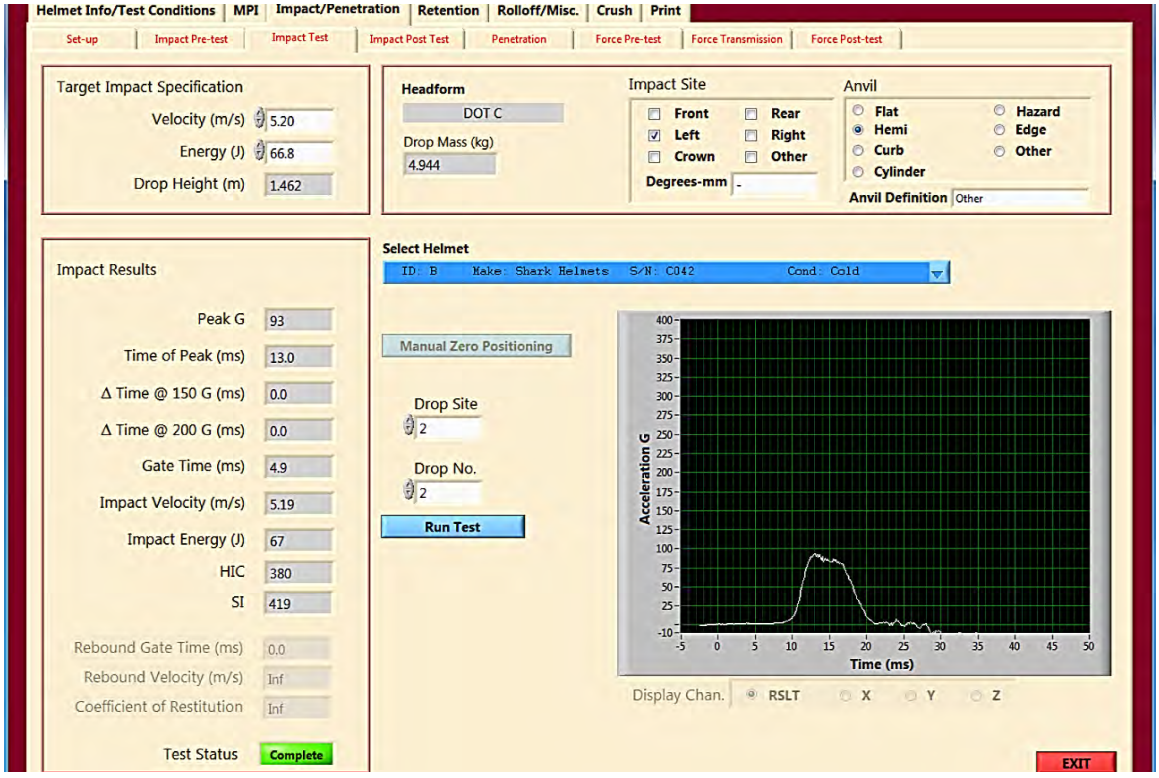

Helmet Info/Test Conditions | MPI | Impact/Penetration | Retention | Rolloff/Misc. | Crush | Print
Set-up | Impact Pre-test | Impact Test | Impact Post Test | Penetration | Force Pre-test | Force Transmission | Force Post-test
Target Impact Specification
Velocity (m/s) 6.00
Energy (J) 89.0
Drop Height (m) 1.947
Headform
DOT C
Drop Mass (kg)
4.944
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) 10.2
Δ Time @ 150 G (ms) 0.2
Δ Time @ 200 G (ms) 0.0
Gate Time (ms) 4.2
Impact Velocity (m/s) 6.08
Impact Energy (J) 91
HIC 965
SI 1071
Rebound Gate Time (ms) 0.0
Rebound Velocity (m/s) Inf
Coefficient of Restitution Inf
Test Status Complete
Select Helmet
ID: A Make: Shark Helmets S/N: C042 Cond: Ambient
Manual Zero Positioning
Drop Site 4
Drop No. 1
Run Test
Acceleration G
Time (ms)
Display Chan. RSLT X Y Z
EXIT

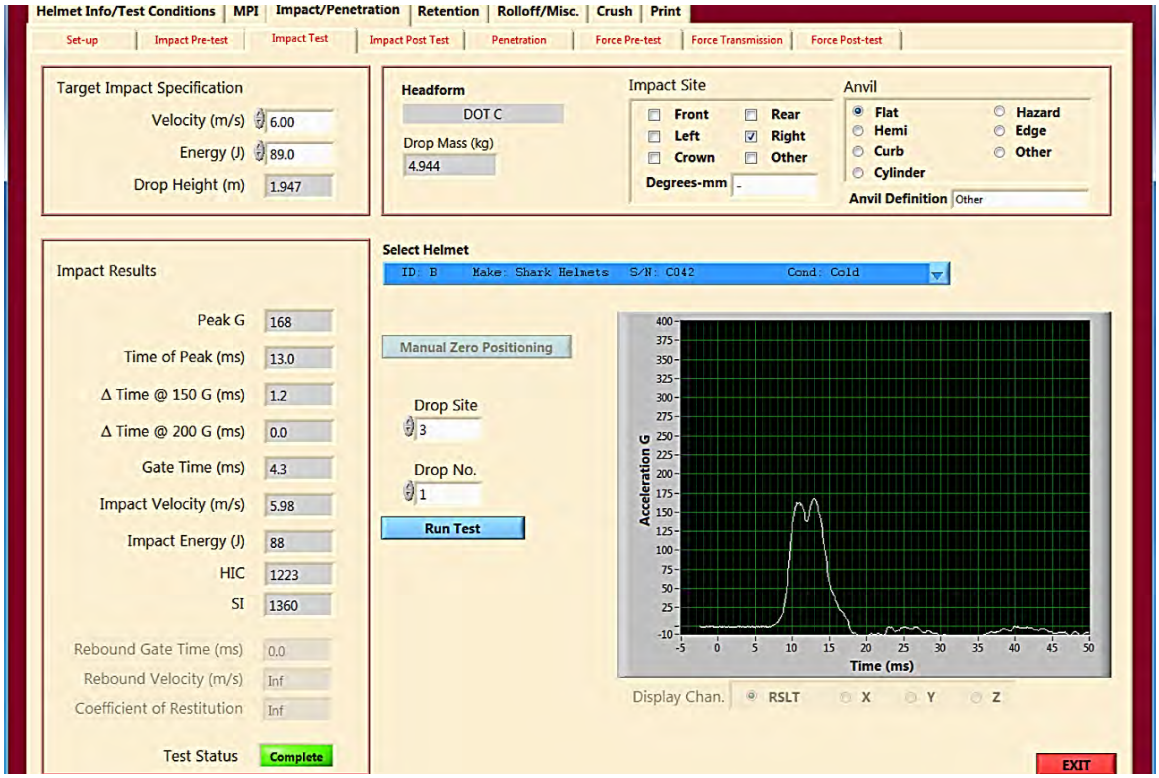

Helmet Info/Test Conditions | MPI | Impact/Penetration | Retention | Rolloff/Misc. | Crush | Print
Set-up | Impact Pre-test | Impact Test | Impact Post Test | Penetration | Force Pre-test | Force Transmission | Force Post-test
Target Impact Specification
Velocity (m/s) 6.00
Energy (J) 89.0
Drop Height (m) 1.947
Headform
DOT C
Drop Mass (kg)
4.944
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 168
Time of Peak (ms) 10.8
Δ Time @ 150 G (ms) 1.5
Δ Time @ 200 G (ms) 0.0
Gate Time (ms) 4.2
Impact Velocity (m/s) 6.09
Impact Energy (J) 92
HIC 1102
SI 1245
Rebound Gate Time (ms) 0.0
Rebound Velocity (m/s) Inf
Coefficient of Restitution Inf
Test Status Complete
Select Helmet
ID: A Make: Shark Helmets S/N: C042 Cond: Ambient
Manual Zero Positioning
Drop Site 4
Drop No. 2
Run Test
Acceleration G
Time (ms)
Display Chan. RSLT X Y Z
EXIT

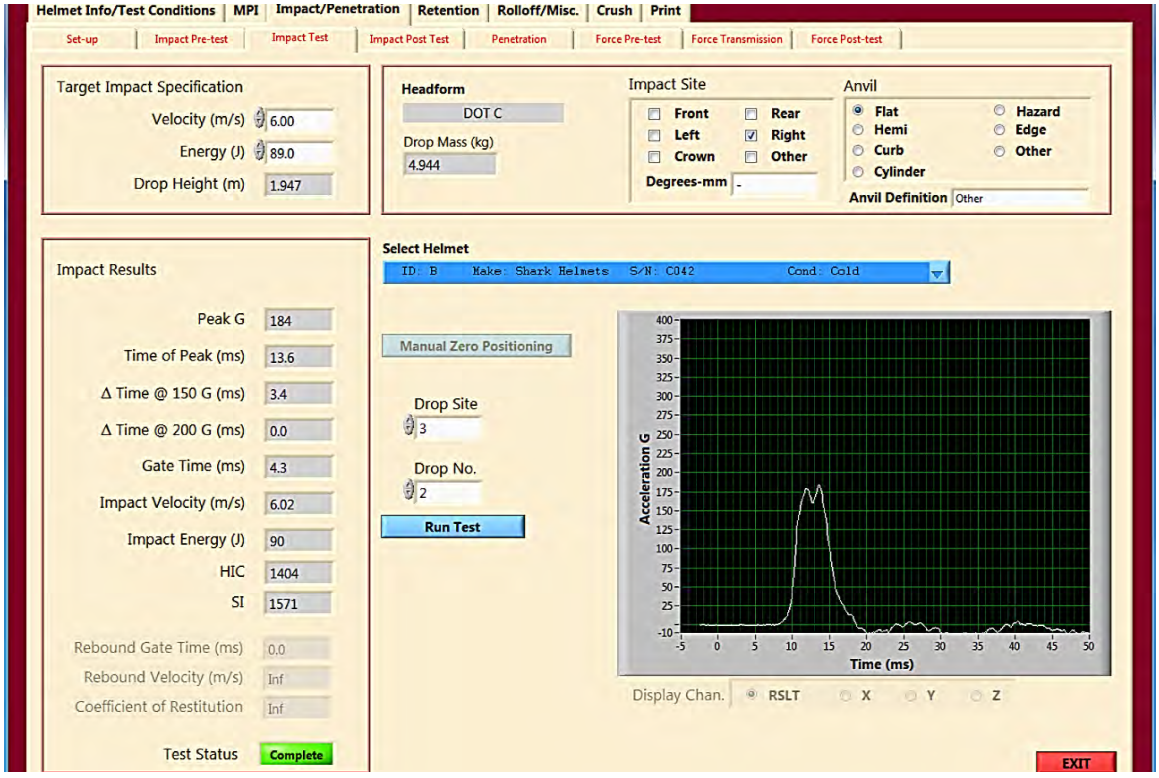

Helmet Info/Test Conditions | MPI | Impact/Penetration | Retention | Rolloff/Misc. | Crush | Print
Set-up | Impact Pre-test | Impact Test | Impact Post Test | Penetration | Force Pre-test | Force Transmission | Force Post-test
Target Impact Specification
Velocity (m/s) 5.20
Energy (J) 66.8
Drop Height (m) 1.462
Headform
DOT C
Drop Mass (kg)
4.944
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 81
Time of Peak (ms) 14.9
Δ Time @ 150 G (ms) 0.0
Δ Time @ 200 G (ms) 0.0
Gate Time (ms) 4.9
Impact Velocity (m/s) 5.18
Impact Energy (J) 66
HIC 255
SI 287
Rebound Gate Time (ms) 0.0
Rebound Velocity (m/s) Inf
Coefficient of Restitution Inf
Test Status Complete
Select Helmet
ID: B Make: Shark Helmets S/N: C042 Cond: Cold
Manual Zero Positioning
Drop Site 1
Drop No. 1
Run Test
Acceleration G
Time (ms)
Display Chan. RSLT X Y Z
EXIT

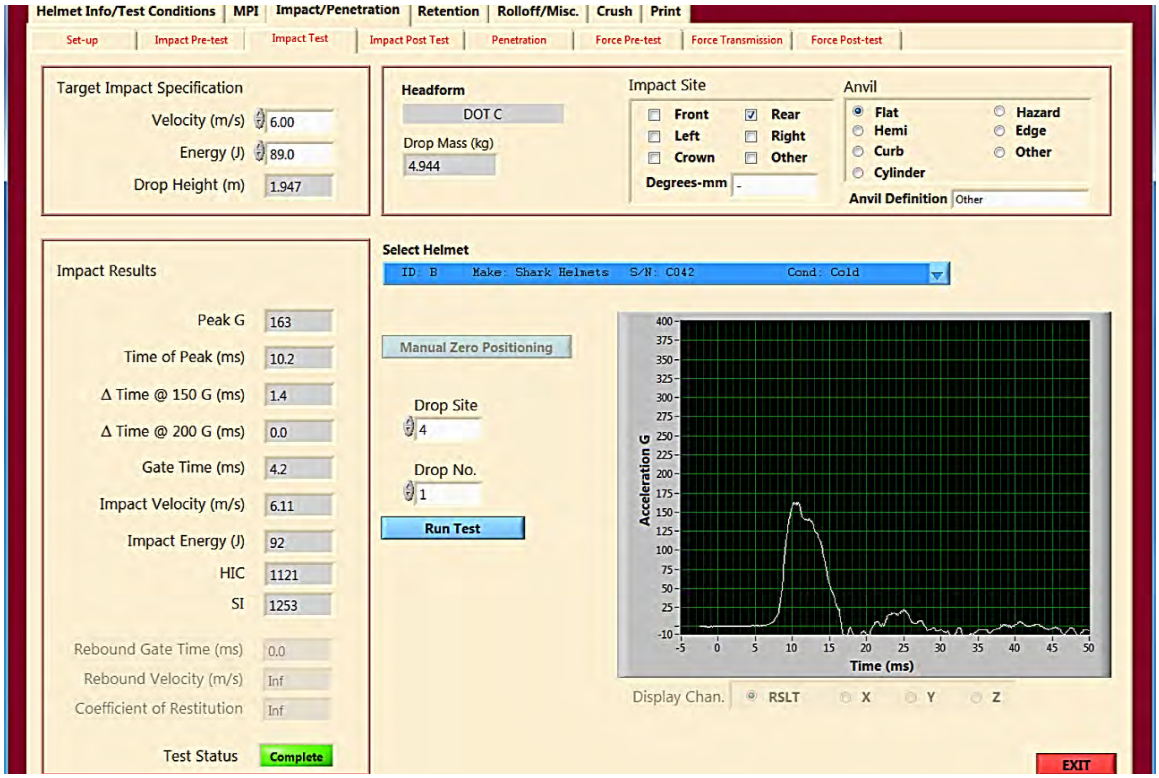

Helmet Info/Test Conditions | MPI | Impact/Penetration | Retention | Rolloff/Misc. | Crush | Print
Set-up | Impact Pre-test | Impact Test | Impact Post Test | Penetration | Force Pre-test | Force Transmission | Force Post-test
Target Impact Specification
Velocity (m/s) 5.20
Energy (J) 66.8
Drop Height (m) 1.462
Headform
DOT C
Drop Mass (kg)
4.944
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) 16.3
Δ Time @ 150 G (ms) 0.0
Δ Time @ 200 G (ms) 0.0
Gate Time (ms) 4.9
Impact Velocity (m/s) 5.19
Impact Energy (J) 67
HIC 451
SI 525
Rebound Gate Time (ms) 0.0
Rebound Velocity (m/s) Inf
Coefficient of Restitution Inf
Test Status Complete
Select Helmet
ID: B Make: Shark Helmets S/N: C042 Cond: Cold
Manual Zero Positioning
Drop Site 1
Drop No. 2
Run Test
Acceleration G
Time (ms)
Display Chan. RSLT X Y Z
EXIT

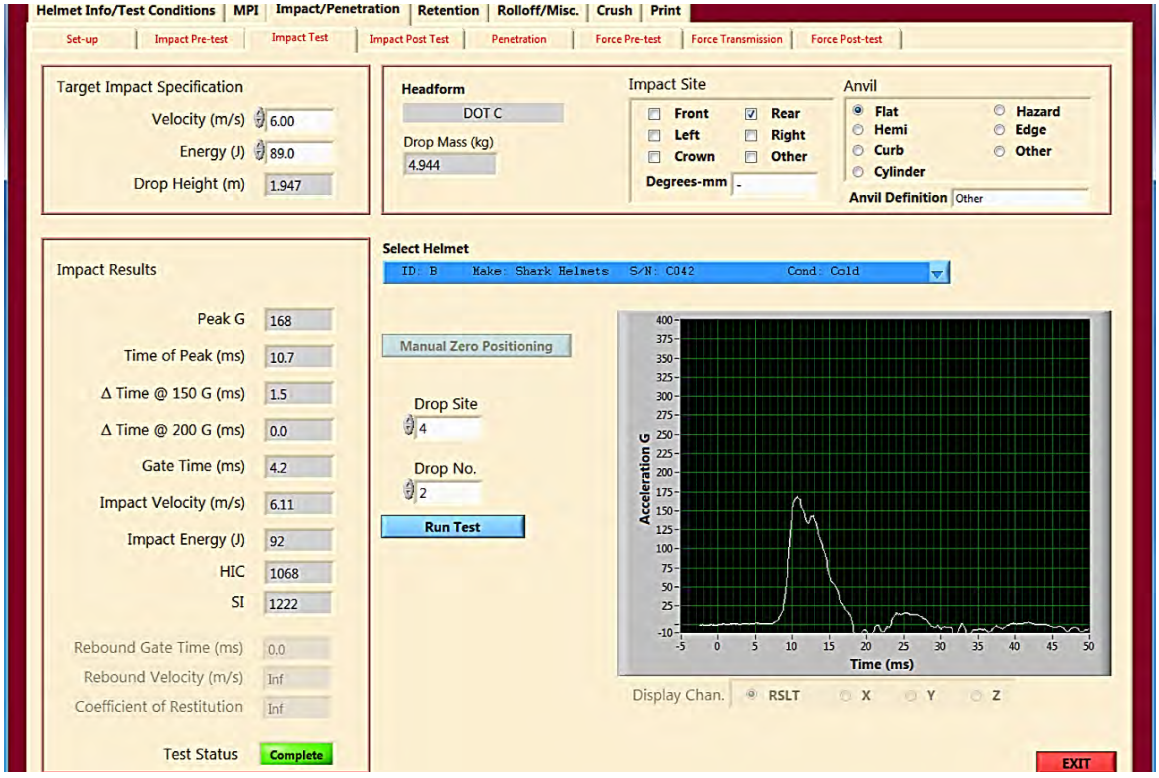

Helmet Info/Test Conditions | MPI | Impact/Penetration | Retention | Rolloff/Misc. | Crush | Print
Set-up | Impact Pre-test | Impact Test | Impact Post Test | Penetration | Force Pre-test | Force Transmission | Force Post-test
Target Impact Specification
Velocity (m/s) 5.20
Energy (J) 66.8
Drop Height (m) 1.462
Headform
DOT C
Drop Mass (kg)
4.944
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) 11.5
Δ Time @ 150 G (ms) 0.0
Δ Time @ 200 G (ms) 0.0
Gate Time (ms) 4.9
Impact Velocity (m/s) 5.21
Impact Energy (J) 67
HIC 403
SI 446
Rebound Gate Time (ms) 0.0
Rebound Velocity (m/s) Inf
Coefficient of Restitution Inf
Test Status Complete
Select Helmet
ID: B Make: Shark Helmets S/N: C042 Cond: Cold
Manual Zero Positioning
Drop Site 2
Drop No. 1
Run Test
Acceleration G
Time (ms)
Display Chan. RSLT X Y Z
EXIT

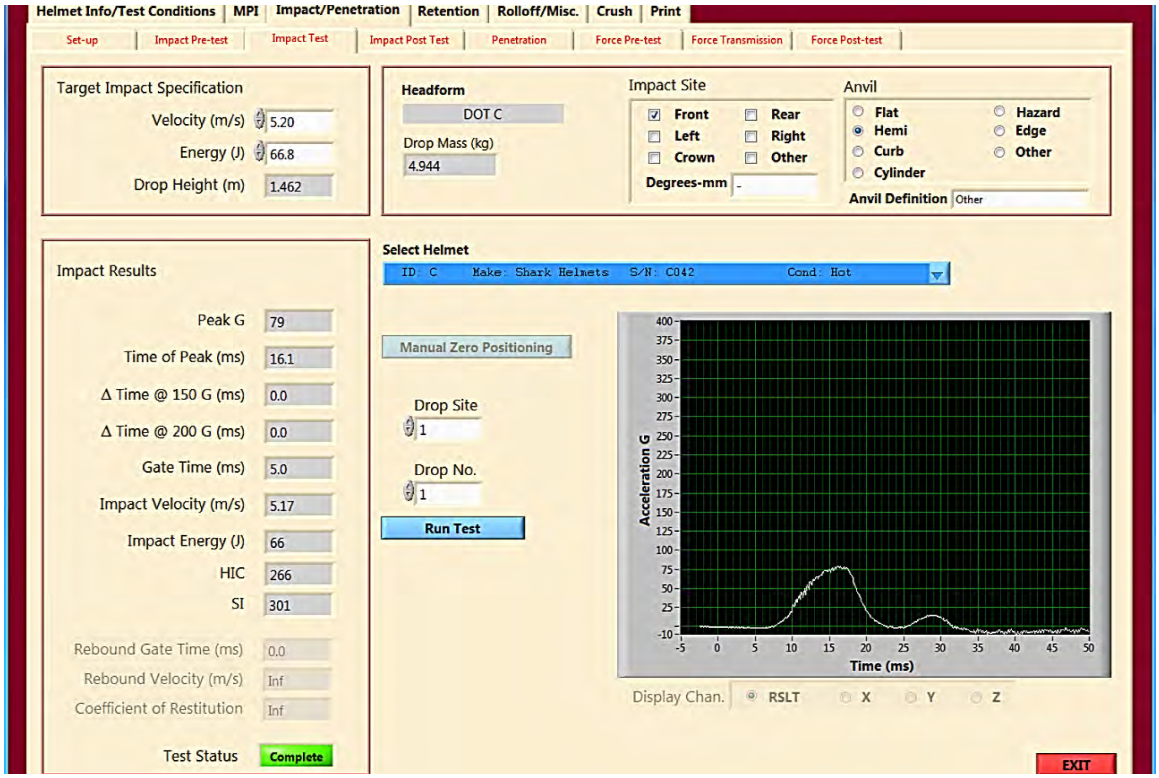

Helmet Info/Test Conditions | MPI | Impact/Penetration | Retention | Rolloff/Misc. | Crush | Print
Set-up | Impact Pre-test | Impact Test | Impact Post Test | Penetration | Force Pre-test | Force Transmission | Force Post-test
Target Impact Specification
Velocity (m/s) 5.20
Energy (J) 66.8
Drop Height (m) 1.462
Headform
DOT C
Drop Mass (kg)
4.944
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 93
Time of Peak (ms) 13.0
Δ Time @ 150 G (ms) 0.0
Δ Time @ 200 G (ms) 0.0
Gate Time (ms) 4.9
Impact Velocity (m/s) 5.19
Impact Energy (J) 67
HIC 380
SI 419
Rebound Gate Time (ms) 0.0
Rebound Velocity (m/s) Inf
Coefficient of Restitution Inf
Test Status Complete
Select Helmet
ID: B Make: Shark Helmets S/N: C042 Cond: Cold
Manual Zero Positioning
Drop Site 2
Drop No. 2
Run Test
Acceleration G
Time (ms)
Display Chan. RSLT X Y Z
EXIT

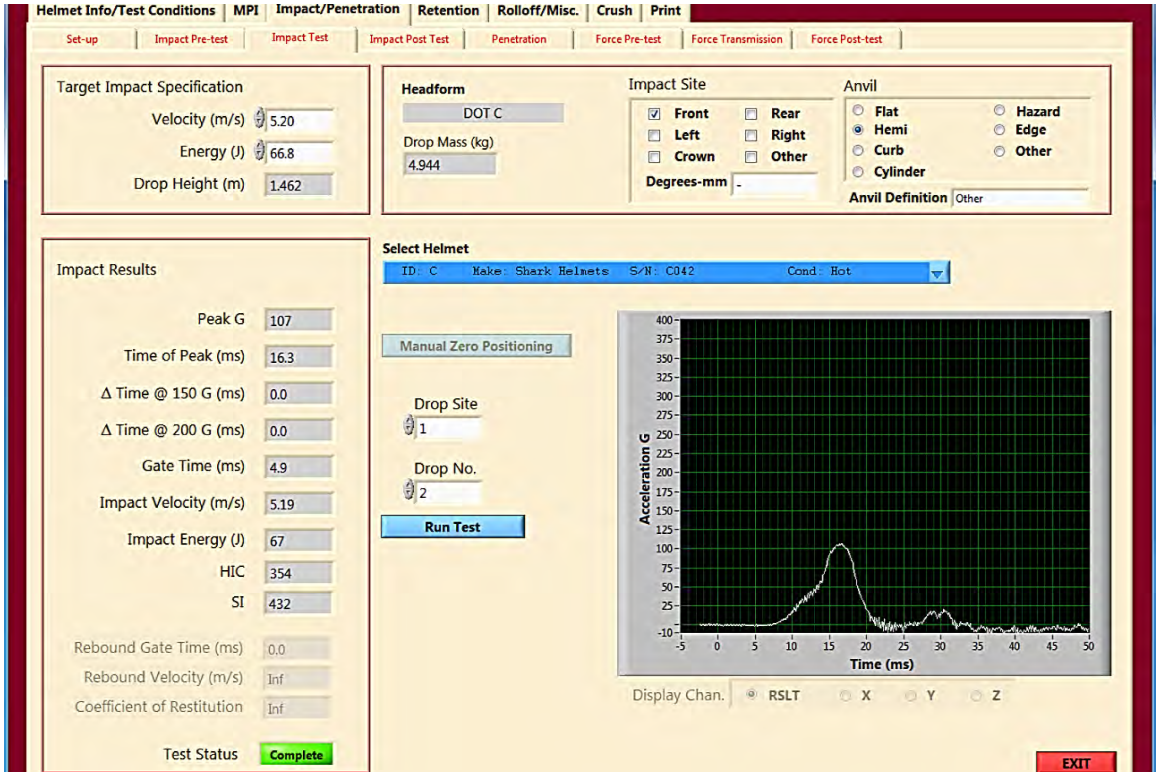

Helmet Info/Test Conditions | MPI | Impact/Penetration | Retention | Rolloff/Misc. | Crush | Print
Set-up | Impact Pre-test | Impact Test | Impact Post Test | Penetration | Force Pre-test | Force Transmission | Force Post-test
Target Impact Specification
Velocity (m/s) 6.00
Energy (J) 89.0
Drop Height (m) 1.947
Headform
DOT C
Drop Mass (kg)
4.944
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 168
Time of Peak (ms) 13.0
Δ Time @ 150 G (ms) 1.2
Δ Time @ 200 G (ms) 0.0
Gate Time (ms) 4.3
Impact Velocity (m/s) 5.98
Impact Energy (J) 88
HIC 1223
SI 1360
Rebound Gate Time (ms) 0.0
Rebound Velocity (m/s) Inf
Coefficient of Restitution Inf
Test Status Complete
Select Helmet
ID: B Make: Shark Helmets S/N: C042 Cond: Cold
Manual Zero Positioning
Drop Site 3
Drop No. 1
Run Test
Acceleration G
Time (ms)
Display Chan. RSLT X Y Z
EXIT

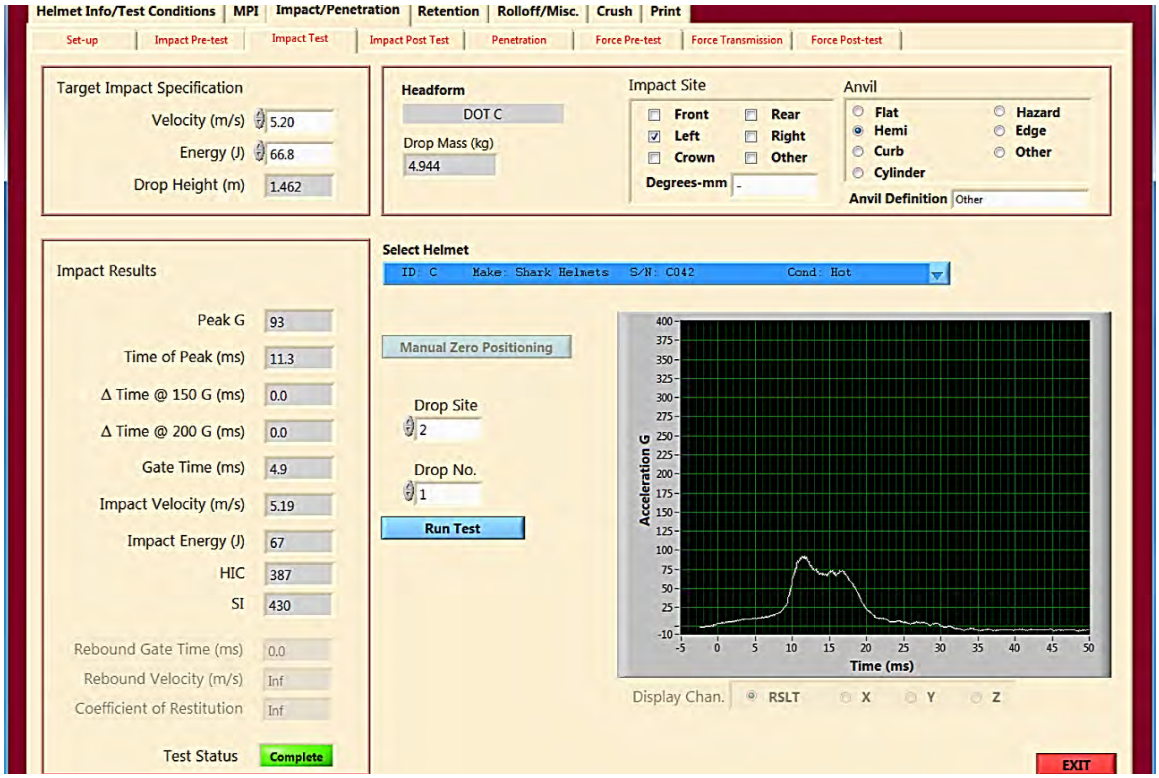

Helmet Info/Test Conditions | MPI | Impact/Penetration | Retention | Rolloff/Misc. | Crush | Print
Set-up | Impact Pre-test | Impact Test | Impact Post Test | Penetration | Force Pre-test | Force Transmission | Force Post-test
Target Impact Specification
Velocity (m/s) 6.00
Energy (J) 89.0
Drop Height (m) 1.947
Headform
DOT C
Drop Mass (kg)
4.944
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) 13.6
Δ Time @ 150 G (ms) 3.4
Δ Time @ 200 G (ms) 0.0
Gate Time (ms) 4.3
Impact Velocity (m/s) 6.02
Impact Energy (J) 90
HIC 1404
SI 1571
Rebound Gate Time (ms) 0.0
Rebound Velocity (m/s) Inf
Coefficient of Restitution Inf
Test Status Complete
Select Helmet
ID: B Make: Shark Helmets S/N: C042 Cond: Cold
Manual Zero Positioning
Drop Site 3
Drop No. 2
Run Test
Acceleration G
Time (ms)
Display Chan. RSLT X Y Z
EXIT

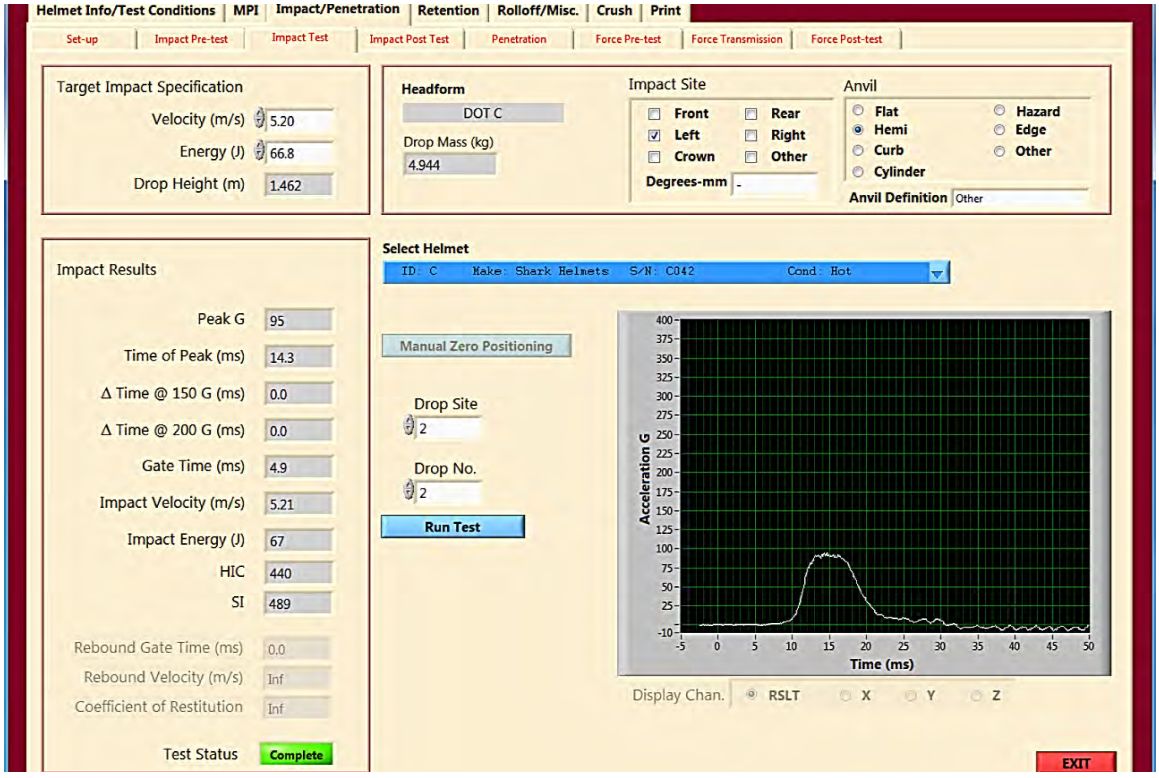

Helmet Info/Test Conditions | MPI | Impact/Penetration | Retention | Rolloff/Misc. | Crush | Print
Set-up | Impact Pre-test | Impact Test | Impact Post Test | Penetration | Force Pre-test | Force Transmission | Force Post-test
Target Impact Specification
Velocity (m/s) 6.00
Energy (J) 89.0
Drop Height (m) 1.947
Headform
DOT C
Drop Mass (kg)
4.944
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 163
Time of Peak (ms) 10.2
Δ Time @ 150 G (ms) 1.4
Δ Time @ 200 G (ms) 0.0
Gate Time (ms) 4.2
Impact Velocity (m/s) 6.11
Impact Energy (J) 92
HIC 1121
SI 1253
Rebound Gate Time (ms) 0.0
Rebound Velocity (m/s) Inf
Coefficient of Restitution Inf
Test Status Complete
Select Helmet
ID: B Make: Shark Helmets S/N: C042 Cond: Cold
Manual Zero Positioning
Drop Site 4
Drop No. 1
Run Test
Acceleration G
Time (ms)
Display Chan. RSLT X Y Z
EXIT

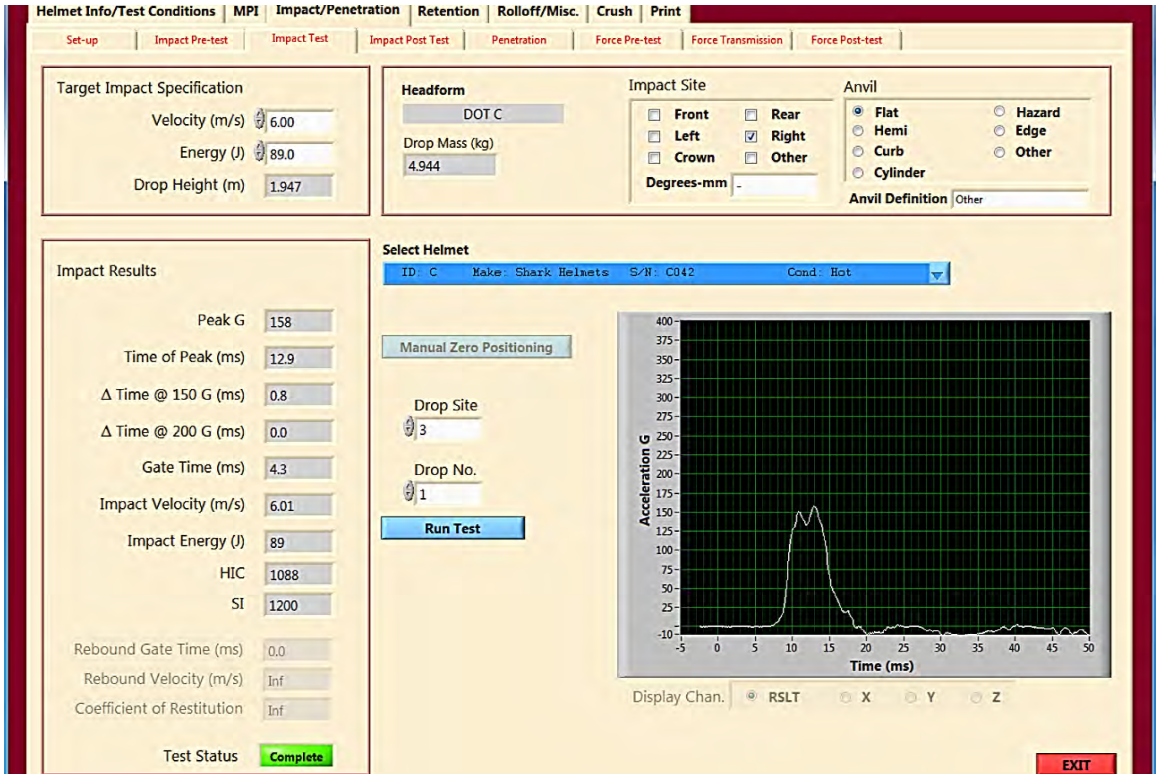

Helmet Info/Test Conditions | MPI | Impact/Penetration | Retention | Rolloff/Misc. | Crush | Print
Set-up | Impact Pre-test | Impact Test | Impact Post Test | Penetration | Force Pre-test | Force Transmission | Force Post-test
Target Impact Specification
Velocity (m/s) 6.00
Energy (J) 89.0
Drop Height (m) 1.947
Headform
DOT C
Drop Mass (kg)
4.944
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 168
Time of Peak (ms) 10.7
Δ Time @ 150 G (ms) 1.5
Δ Time @ 200 G (ms) 0.0
Gate Time (ms) 4.2
Impact Velocity (m/s) 6.11
Impact Energy (J) 92
HIC 1068
SI 1222
Rebound Gate Time (ms) 0.0
Rebound Velocity (m/s) Inf
Coefficient of Restitution Inf
Test Status Complete
Select Helmet
ID: B Make: Shark Helmets S/N: C042 Cond: Cold
Manual Zero Positioning
Drop Site 4
Drop No. 2
Run Test
Acceleration G
Time (ms)
Display Chan. RSLT X Y Z
EXIT

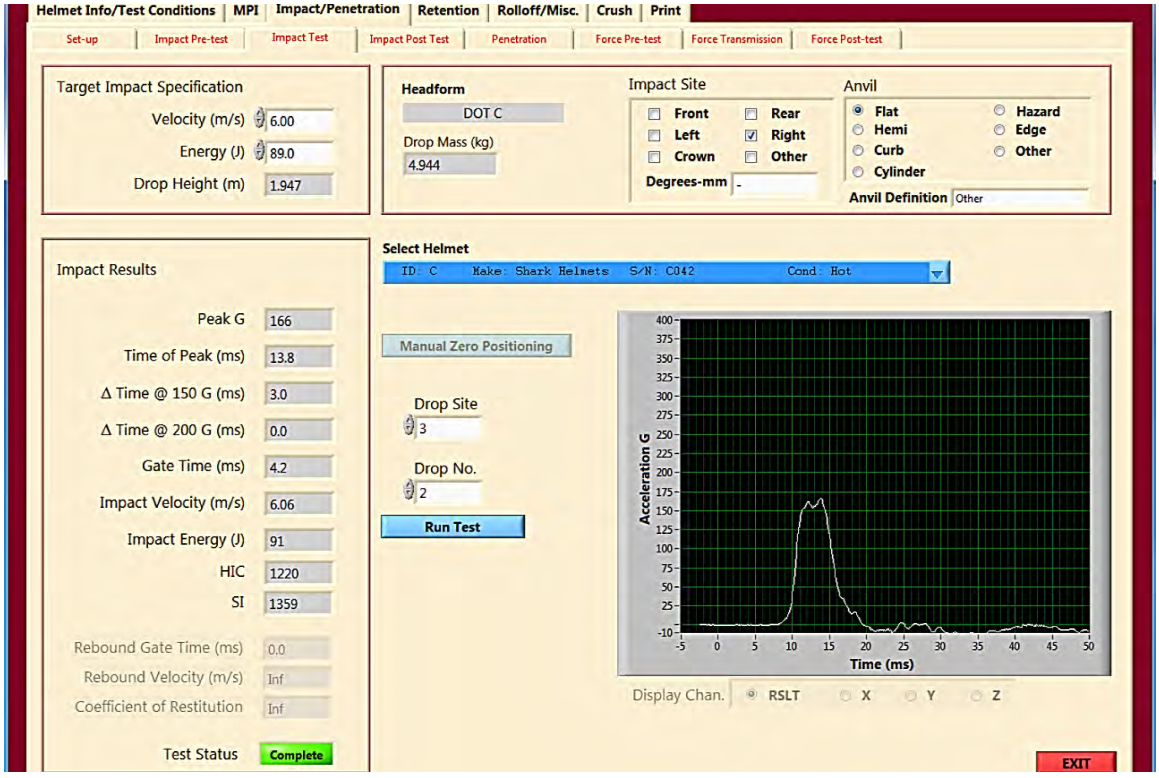

Helmet Info/Test Conditions | MPI | Impact/Penetration | Retention | Rolloff/Misc. | Crush | Print
Set-up | Impact Pre-test | Impact Test | Impact Post Test | Penetration | Force Pre-test | Force Transmission | Force Post-test
Target Impact Specification
Velocity (m/s) 5.20
Energy (J) 66.8
Drop Height (m) 1.462
Headform
DOT C
Drop Mass (kg)
4.944
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) 16.1
Δ Time @ 150 G (ms) 0.0
Δ Time @ 200 G (ms) 0.0
Gate Time (ms) 5.0
Impact Velocity (m/s) 5.17
Impact Energy (J) 66
HIC 266
SI 301
Rebound Gate Time (ms) 0.0
Rebound Velocity (m/s) Inf
Coefficient of Restitution Inf
Test Status Complete
Select Helmet
ID: C Make: Shark Helmets S/N: C042 Cond: Hot
Manual Zero Positioning
Drop Site 1
Drop No. 1
Run Test
Acceleration G
Time (ms)
Display Chan. RSLT X Y Z
EXIT

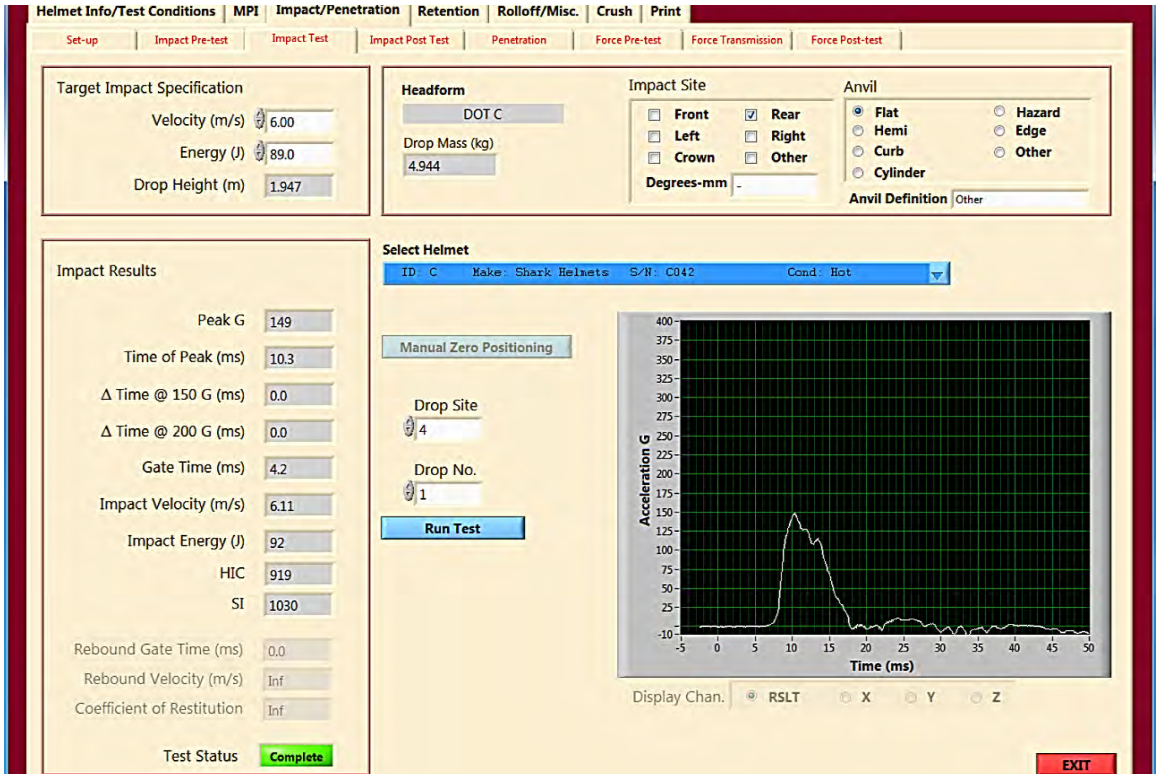

Helmet Info/Test Conditions | MPI | Impact/Penetration | Retention | Rolloff/Misc. | Crush | Print
Set-up | Impact Pre-test | Impact Test | Impact Post Test | Penetration | Force Pre-test | Force Transmission | Force Post-test
Target Impact Specification
Velocity (m/s) 5.20
Energy (J) 66.8
Drop Height (m) 1.462
Headform
DOT C
Drop Mass (kg)
4.944
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 107
Time of Peak (ms) 16.3
Δ Time @ 150 G (ms) 0.0
Δ Time @ 200 G (ms) 0.0
Gate Time (ms) 4.9
Impact Velocity (m/s) 5.19
Impact Energy (J) 67
HIC 354
SI 432
Rebound Gate Time (ms) 0.0
Rebound Velocity (m/s) Inf
Coefficient of Restitution Inf
Test Status Complete
Select Helmet
ID: C Make: Shark Helmets S/N: C042 Cond: Hot
Manual Zero Positioning
Drop Site 1
Drop No. 2
Run Test
Acceleration G
Time (ms)
Display Chan. RSLT X Y Z
EXIT

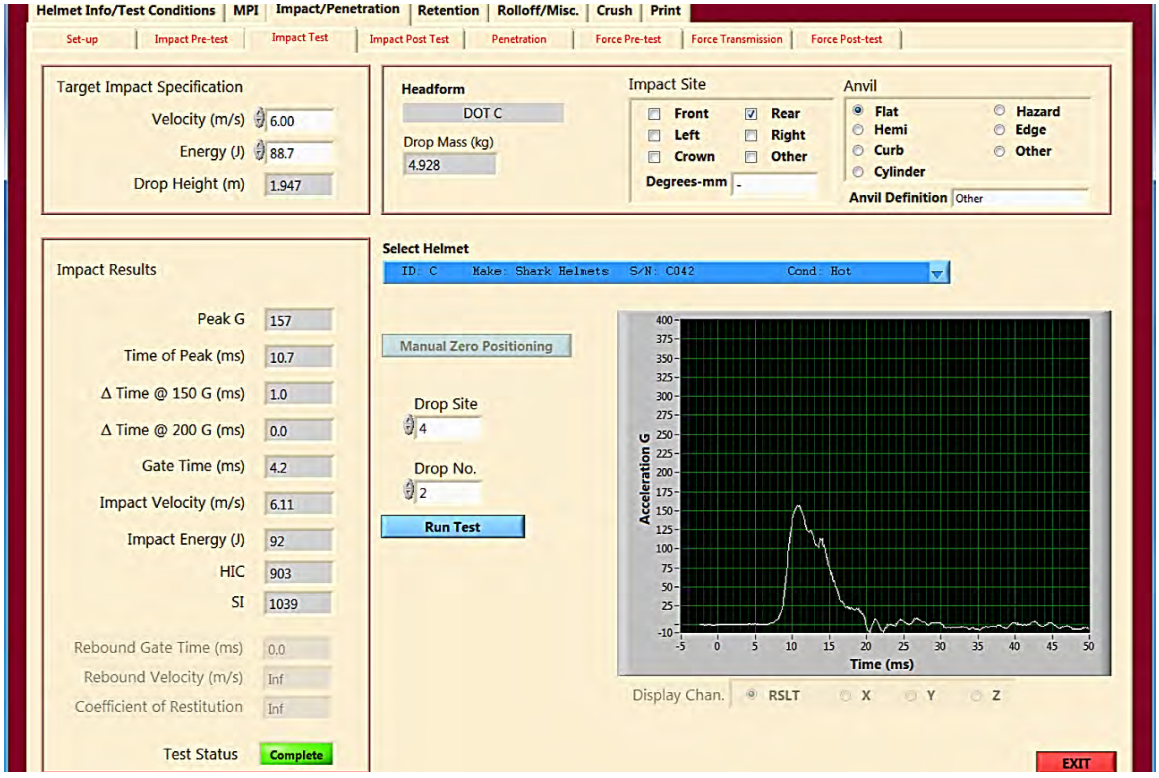

Helmet Info/Test Conditions | MPI | Impact/Penetration | Retention | Rolloff/Misc. | Crush | Print
Set-up | Impact Pre-test | Impact Test | Impact Post Test | Penetration | Force Pre-test | Force Transmission | Force Post-test
Target Impact Specification
Velocity (m/s) 5.20
Energy (J) 66.8
Drop Height (m) 1.462
Headform
DOT C
Drop Mass (kg)
4.944
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 93
Time of Peak (ms) 11.3
Δ Time @ 150 G (ms) 0.0
Δ Time @ 200 G (ms) 0.0
Gate Time (ms) 4.9
Impact Velocity (m/s) 5.19
Impact Energy (J) 67
HIC 387
SI 430
Rebound Gate Time (ms) 0.0
Rebound Velocity (m/s) Inf
Coefficient of Restitution Inf
Test Status Complete
Select Helmet
ID: C Make: Shark Helmets S/N: C042 Cond: Hot
Manual Zero Positioning
Drop Site 2
Drop No. 1
Run Test
Acceleration G
Time (ms)
Display Chan. RSLT X Y Z
EXIT

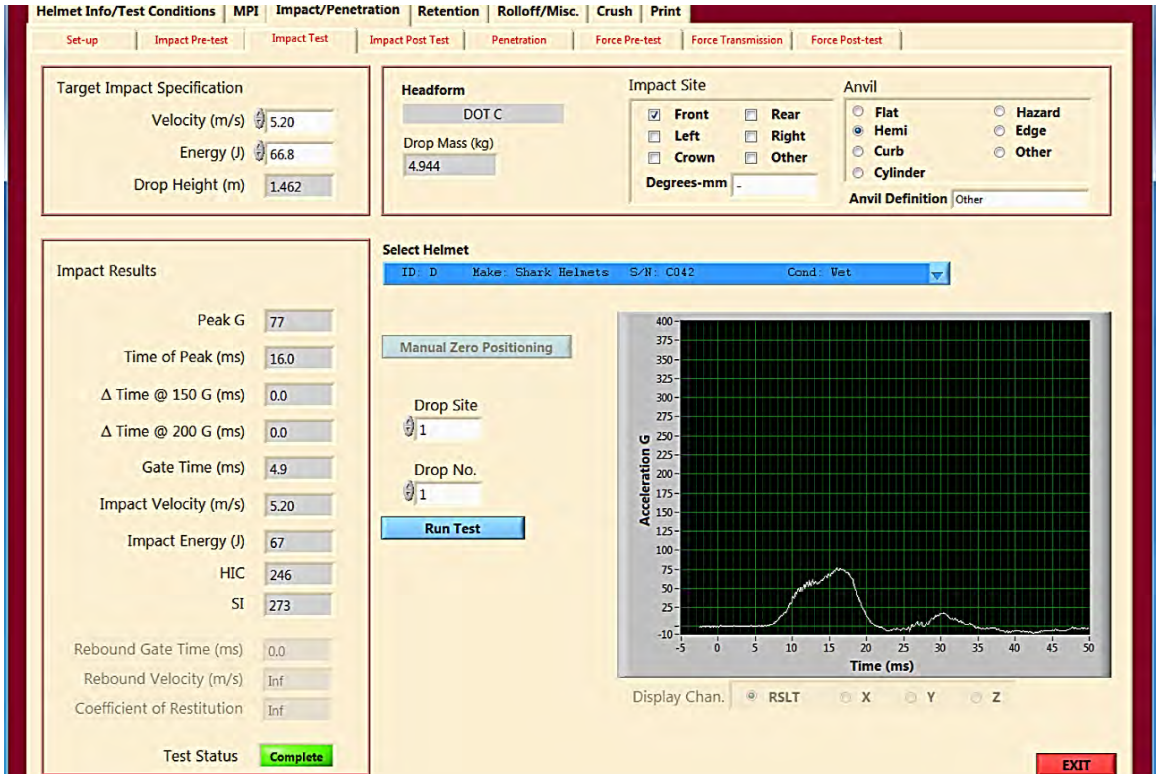

Helmet Info/Test Conditions | MPI | Impact/Penetration | Retention | Rolloff/Misc. | Crush | Print
Set-up | Impact Pre-test | Impact Test | Impact Post Test | Penetration | Force Pre-test | Force Transmission | Force Post-test
Target Impact Specification
Velocity (m/s) 5.20
Energy (J) 66.8
Drop Height (m) 1.462
Headform
DOT C
Drop Mass (kg)
4.944
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 95
Time of Peak (ms) 14.3
Δ Time @ 150 G (ms) 0.0
Δ Time @ 200 G (ms) 0.0
Gate Time (ms) 4.9
Impact Velocity (m/s) 5.21
Impact Energy (J) 67
HIC 440
SI 489
Rebound Gate Time (ms) 0.0
Rebound Velocity (m/s) Inf
Coefficient of Restitution Inf
Test Status Complete
Select Helmet
ID: C Make: Shark Helmets S/N: C042 Cond: Hot
Manual Zero Positioning
Drop Site 2
Drop No. 2
Run Test
Acceleration G
Time (ms)
Display Chan. RSLT X Y Z
EXIT

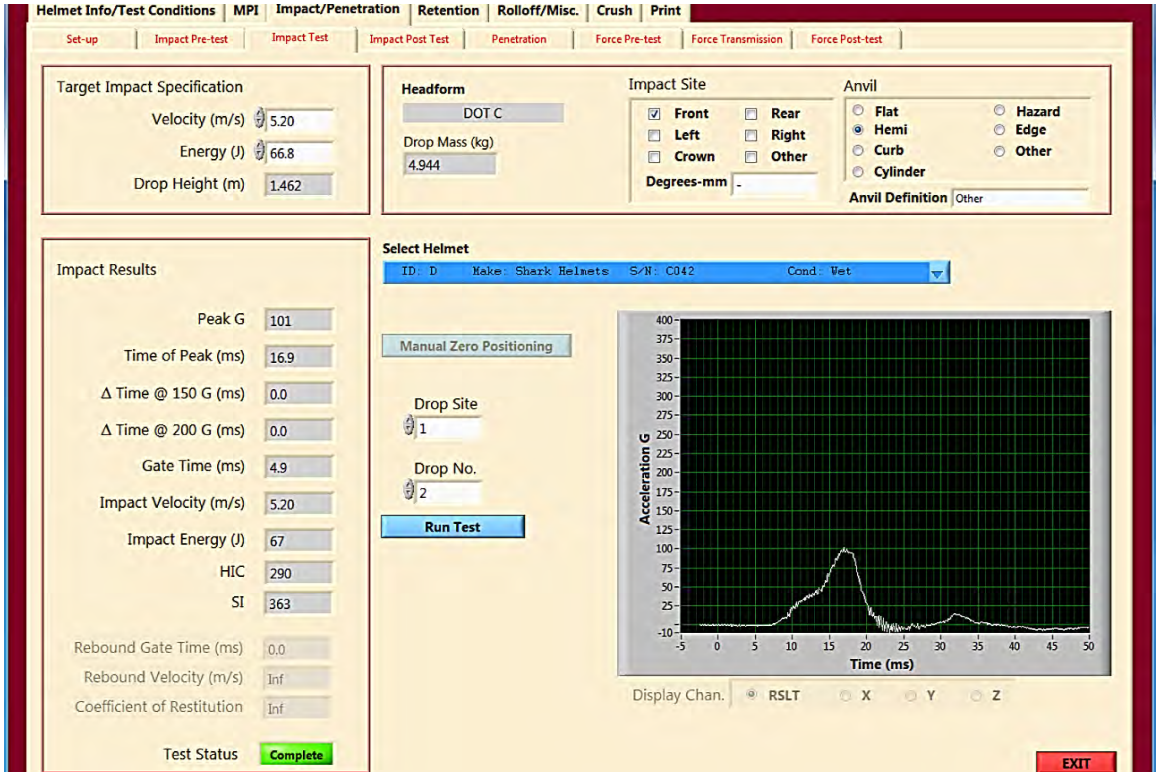

Helmet Info/Test Conditions | MPI | Impact/Penetration | Retention | Rolloff/Misc. | Crush | Print
Set-up | Impact Pre-test | Impact Test | Impact Post Test | Penetration | Force Pre-test | Force Transmission | Force Post-test
Target Impact Specification
Velocity (m/s) 6.00
Energy (J) 89.0
Drop Height (m) 1.947
Headform
DOT C
Drop Mass (kg)
4.944
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 158
Time of Peak (ms) 12.9
Δ Time @ 150 G (ms) 0.8
Δ Time @ 200 G (ms) 0.0
Gate Time (ms) 4.3
Impact Velocity (m/s) 6.01
Impact Energy (J) 89
HIC 1088
SI 1200
Rebound Gate Time (ms) 0.0
Rebound Velocity (m/s) Inf
Coefficient of Restitution Inf
Test Status Complete
Select Helmet
ID: C Make: Shark Helmets S/N: C042 Cond: Hot
Manual Zero Positioning
Drop Site 3
Drop No. 1
Run Test
Acceleration G
Time (ms)
Display Chan. RSLT X Y Z
EXIT

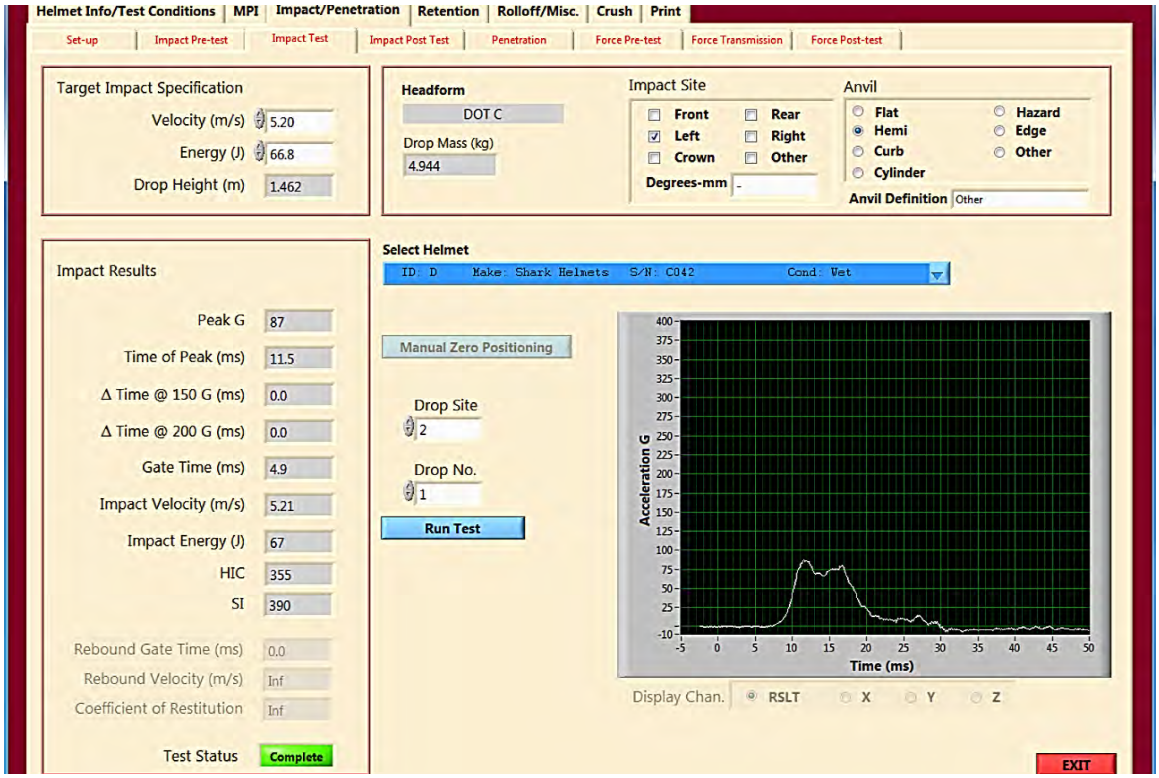

Helmet Info/Test Conditions | MPI | Impact/Penetration | Retention | Rolloff/Misc. | Crush | Print
Set-up | Impact Pre-test | Impact Test | Impact Post Test | Penetration | Force Pre-test | Force Transmission | Force Post-test
Target Impact Specification
Velocity (m/s) 6.00
Energy (J) 89.0
Drop Height (m) 1.947
Headform
DOT C
Drop Mass (kg)
4.944
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 166
Time of Peak (ms) 13.8
Δ Time @ 150 G (ms) 3.0
Δ Time @ 200 G (ms) 0.0
Gate Time (ms) 4.2
Impact Velocity (m/s) 6.06
Impact Energy (J) 91
HIC 1220
SI 1359
Rebound Gate Time (ms) 0.0
Rebound Velocity (m/s) Inf
Coefficient of Restitution Inf
Test Status Complete
Select Helmet
ID: C Make: Shark Helmets S/N: C042 Cond: Hot
Manual Zero Positioning
Drop Site 3
Drop No. 2
Run Test
Acceleration G
Time (ms)
Display Chan. RSLT X Y Z
EXIT

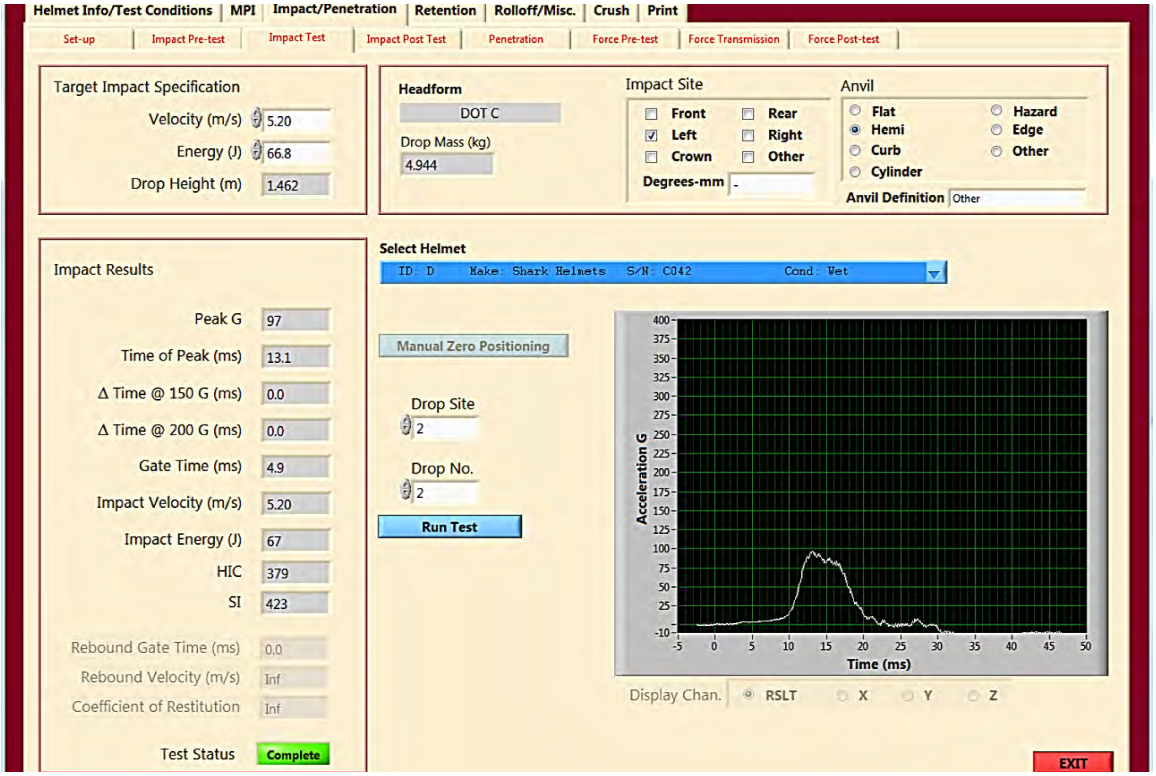

Helmet Info/Test Conditions | MPI | Impact/Penetration | Retention | Rolloff/Misc. | Crush | Print
Set-up | Impact Pre-test | Impact Test | Impact Post Test | Penetration | Force Pre-test | Force Transmission | Force Post-test
Target Impact Specification
Velocity (m/s) 6.00
Energy (J) 89.0
Drop Height (m) 1.947
Headform
DOT C
Drop Mass (kg)
4.944
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 149
Time of Peak (ms) 10.3
Δ Time @ 150 G (ms) 0.0
Δ Time @ 200 G (ms) 0.0
Gate Time (ms) 4.2
Impact Velocity (m/s) 6.11
Impact Energy (J) 92
HIC 919
SI 1030
Rebound Gate Time (ms) 0.0
Rebound Velocity (m/s) Inf
Coefficient of Restitution Inf
Test Status Complete
Select Helmet
ID: C Make: Shark Helmets S/N: C042 Cond: Hot
Manual Zero Positioning
Drop Site 4
Drop No. 1
Run Test
Acceleration G
Time (ms)
Display Chan. RSLT X Y Z
EXIT

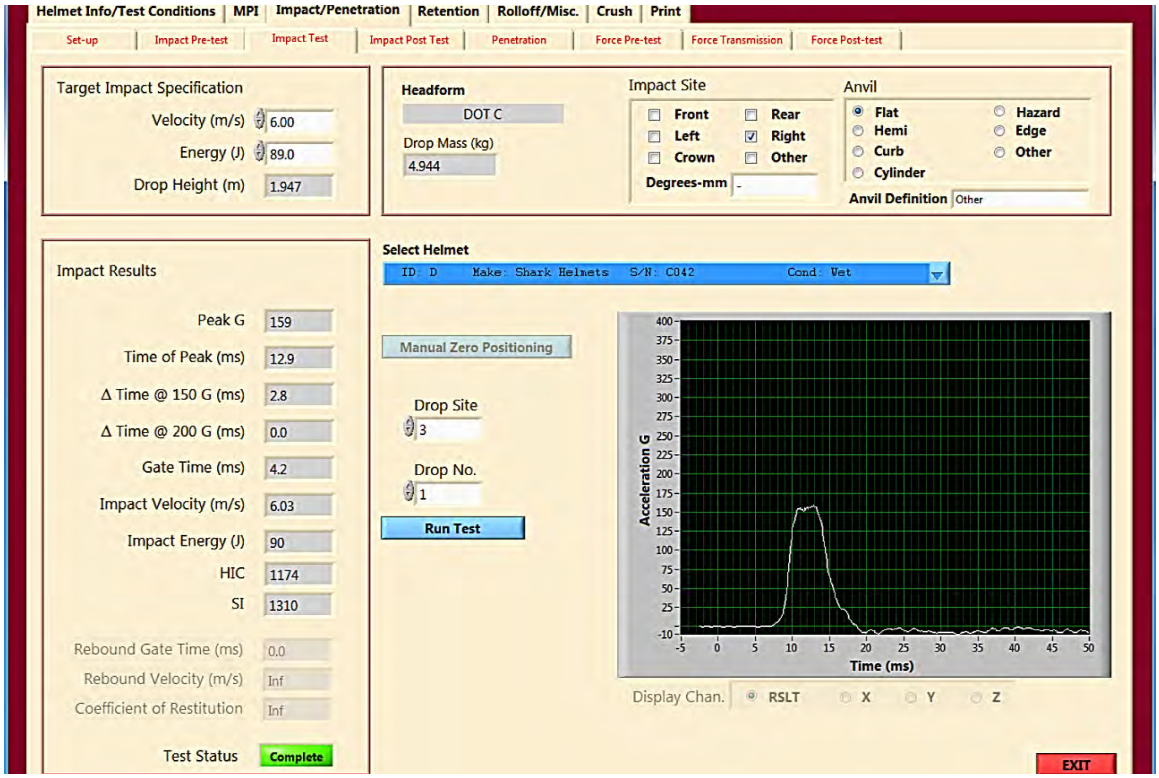

Helmet Info/Test Conditions | MPI | Impact/Penetration | Retention | Rolloff/Misc. | Crush | Print
Set-up | Impact Pre-test | Impact Test | Impact Post Test | Penetration | Force Pre-test | Force Transmission | Force Post-test
Target Impact Specification
Velocity (m/s) 6.00
Energy (J) 88.7
Drop Height (m) 1.947
Headform
DOT C
Drop Mass (kg)
4.928
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 157
Time of Peak (ms) 10.7
Δ Time @ 150 G (ms) 1.0
Δ Time @ 200 G (ms) 0.0
Gate Time (ms) 4.2
Impact Velocity (m/s) 6.11
Impact Energy (J) 92
HIC 903
SI 1039
Rebound Gate Time (ms) 0.0
Rebound Velocity (m/s) Inf
Coefficient of Restitution Inf
Test Status Complete
Select Helmet
ID: C Make: Shark Helmets S/N: C042 Cond: Hot
Manual Zero Positioning
Drop Site 4
Drop No. 2
Run Test
Acceleration G
Time (ms)
Display Chan. RSLT X Y Z
EXIT

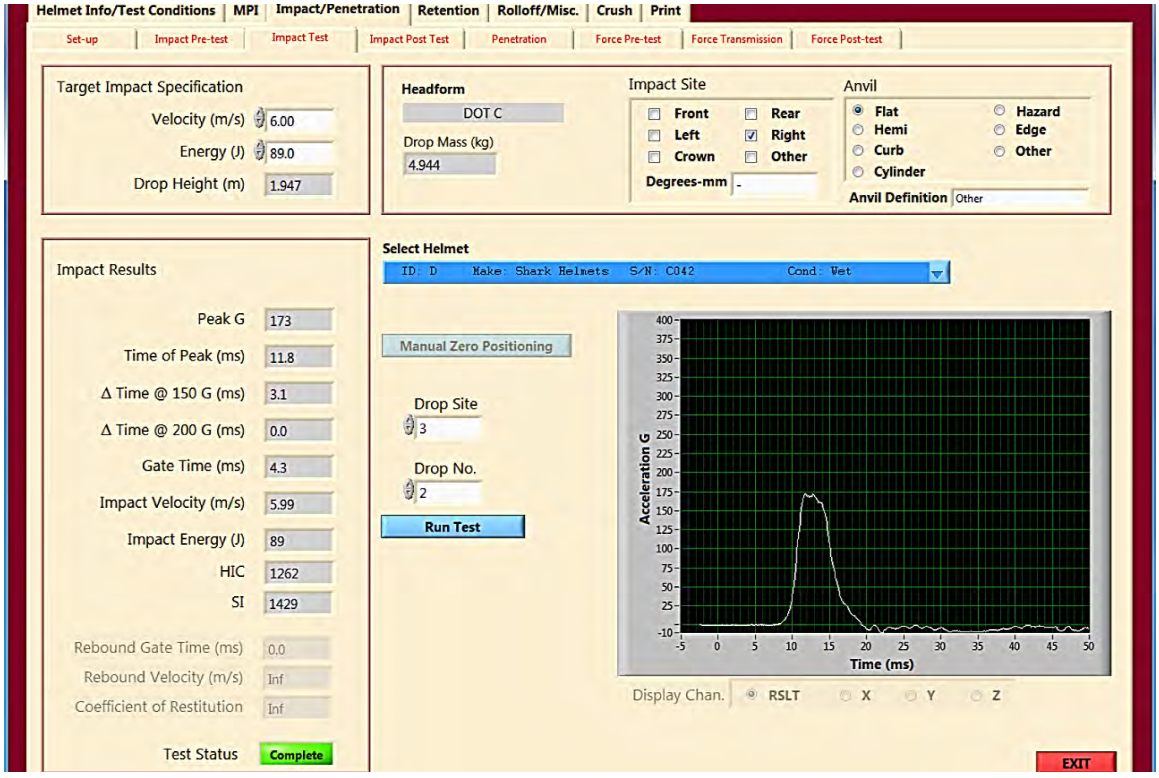

Helmet Info/Test Conditions | MPI | Impact/Penetration | Retention | Rolloff/Misc. | Crush | Print
Set-up | Impact Pre-test | Impact Test | Impact Post Test | Penetration | Force Pre-test | Force Transmission | Force Post-test
Target Impact Specification
Velocity (m/s) 5.20
Energy (J) 66.8
Drop Height (m) 1.462
Headform
DOT C
Drop Mass (kg)
4.944
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) 16.0
Δ Time @ 150 G (ms) 0.0
Δ Time @ 200 G (ms) 0.0
Gate Time (ms) 4.9
Impact Velocity (m/s) 5.20
Impact Energy (J) 67
HIC 246
SI 273
Rebound Gate Time (ms) 0.0
Rebound Velocity (m/s) Inf
Coefficient of Restitution Inf
Test Status Complete
Select Helmet
ID: D Make: Shark Helmets S/N: C042 Cond: Wet
Manual Zero Positioning
Drop Site 1
Drop No. 1
Run Test
Acceleration G
Time (ms)
Display Chan. RSLT X Y Z
EXIT

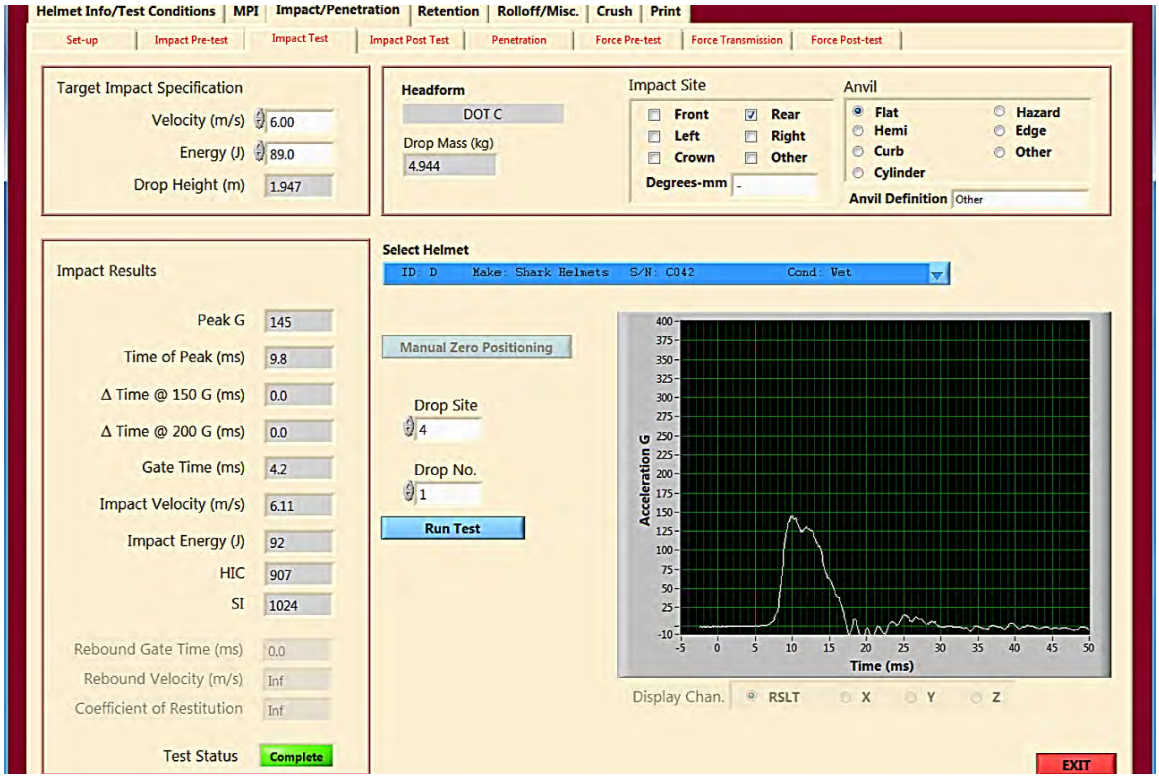

Helmet Info/Test Conditions | MPI | Impact/Penetration | Retention | Rolloff/Misc. | Crush | Print
Set-up | Impact Pre-test | Impact Test | Impact Post Test | Penetration | Force Pre-test | Force Transmission | Force Post-test
Target Impact Specification
Velocity (m/s) 5.20
Energy (J) 66.8
Drop Height (m) 1.462
Headform
DOT C
Drop Mass (kg)
4.944
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 101
Time of Peak (ms) 16.9
Δ Time @ 150 G (ms) 0.0
Δ Time @ 200 G (ms) 0.0
Gate Time (ms) 4.9
Impact Velocity (m/s) 5.20
Impact Energy (J) 67
HIC 290
SI 363
Rebound Gate Time (ms) 0.0
Rebound Velocity (m/s) Inf
Coefficient of Restitution Inf
Test Status Complete
Select Helmet
ID: D Make: Shark Helmets S/N: C042 Cond: Wet
Manual Zero Positioning
Drop Site 1
Drop No. 2
Run Test
Acceleration G
Time (ms)
Display Chan. RSLT X Y Z
EXIT

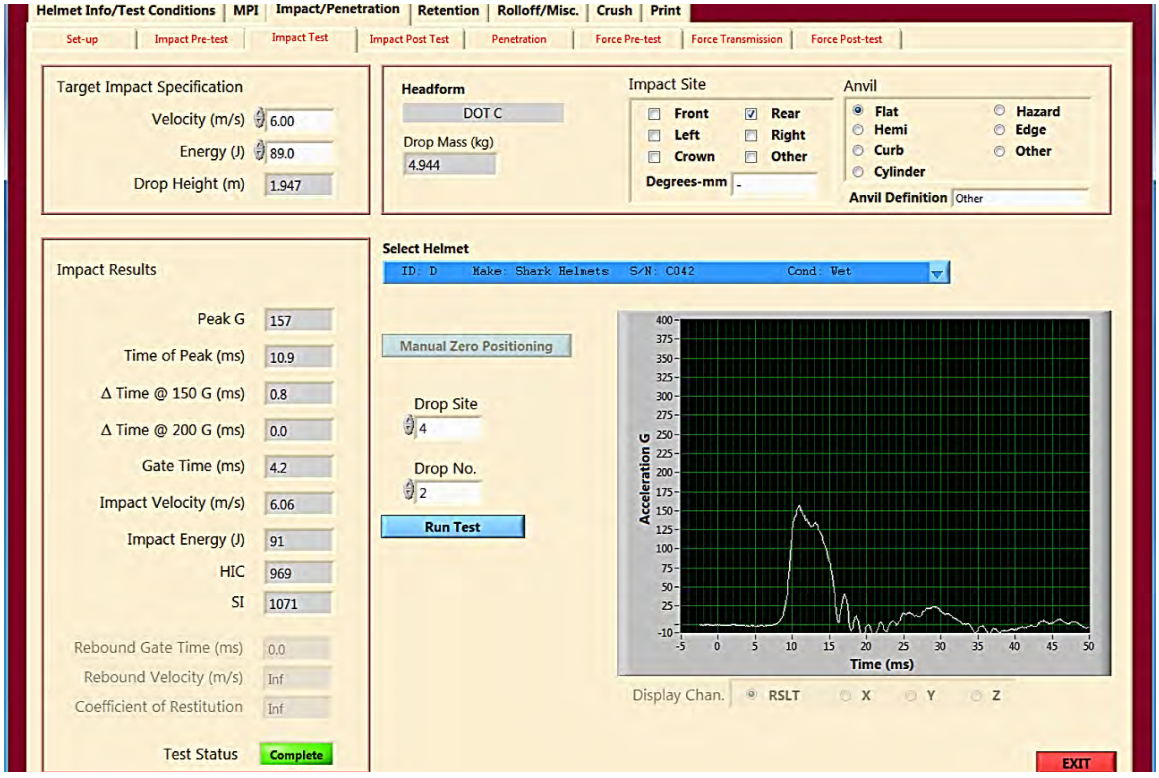

Helmet Info/Test Conditions | MPI | Impact/Penetration | Retention | Rolloff/Misc. | Crush | Print
Set-up | Impact Pre-test | Impact Test | Impact Post Test | Penetration | Force Pre-test | Force Transmission | Force Post-test
Target Impact Specification
Velocity (m/s) 5.20
Energy (J) 66.8
Drop Height (m) 1.462
Headform
DOT C
Drop Mass (kg)
4.944
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 87
Time of Peak (ms) 11.5
Δ Time @ 150 G (ms) 0.0
Δ Time @ 200 G (ms) 0.0
Gate Time (ms) 4.9
Impact Velocity (m/s) 5.21
Impact Energy (J) 67
HIC 355
SI 390
Rebound Gate Time (ms) 0.0
Rebound Velocity (m/s) Inf
Coefficient of Restitution Inf
Test Status Complete
Select Helmet
ID: D Make: Shark Helmets S/N: C042 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) 66.8
Drop Height (m) 1.462
Headform
DOT C
Drop Mass (kg)
4.944
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) 13.1
Δ Time @ 150 G (ms) 0.0
Δ Time @ 200 G (ms) 0.0
Gate Time (ms) 4.9
Impact Velocity (m/s) 5.20
Impact Energy (J) 67
HIC 379
SI 423
Rebound Gate Time (ms) 0.0
Rebound Velocity (m/s) Inf
Coefficient of Restitution Inf
Test Status Complete
Select Helmet
ID: D Make: Shark Helmets S/N: C042 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) 89.0
Drop Height (m) 1.947
Headform
DOT C
Drop Mass (kg)
4.944
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 159
Time of Peak (ms) 12.9
Δ Time @ 150 G (ms) 2.8
Δ Time @ 200 G (ms) 0.0
Gate Time (ms) 4.2
Impact Velocity (m/s) 6.03
Impact Energy (J) 90
HIC 1174
SI 1310
Rebound Gate Time (ms) 0.0
Rebound Velocity (m/s) Inf
Coefficient of Restitution Inf
Test Status Complete
Select Helmet
ID: D Make: Shark Helmets S/N: C042 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) 89.0
Drop Height (m) 1.947
Headform
DOT C
Drop Mass (kg)
4.944
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 173
Time of Peak (ms) 11.8
Δ Time @ 150 G (ms) 3.1
Δ Time @ 200 G (ms) 0.0
Gate Time (ms) 4.3
Impact Velocity (m/s) 5.99
Impact Energy (J) 89
HIC 1262
SI 1429
Rebound Gate Time (ms) 0.0
Rebound Velocity (m/s) Inf
Coefficient of Restitution Inf
Test Status Complete
Select Helmet
ID: D Make: Shark Helmets S/N: C042 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) 89.0
Drop Height (m) 1.947
Headform
DOT C
Drop Mass (kg)
4.944
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 145
Time of Peak (ms) 9.8
Δ Time @ 150 G (ms) 0.0
Δ Time @ 200 G (ms) 0.0
Gate Time (ms) 4.2
Impact Velocity (m/s) 6.11
Impact Energy (J) 92
HIC 907
SI 1024
Rebound Gate Time (ms) 0.0
Rebound Velocity (m/s) Inf
Coefficient of Restitution Inf
Test Status Complete
Select Helmet
ID: D Make: Shark Helmets S/N: C042 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) 89.0
Drop Height (m) 1.947
Headform
DOT C
Drop Mass (kg)
4.944
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 157
Time of Peak (ms) 10.9
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) 91
HIC 969
SI 1071
Rebound Gate Time (ms) 0.0
Rebound Velocity (m/s) Inf
Coefficient of Restitution Inf
Test Status Complete
Select Helmet
ID: D Make: Shark Helmets S/N: C042 Cond: Wet
Manual Zero Positioning
Drop Site 4
Drop No. 2
Run Test
Acceleration G
Time (ms)
Display Chan. RSLT X Y Z
EXIT

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Last modified on 1/21/2013 at 7:38 PM
Printed on 4/12/2017 at 11:03 AM

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Last modified on 1/21/2013 at 7:38 PM
Printed on 4/12/2017 at 11:18 AM

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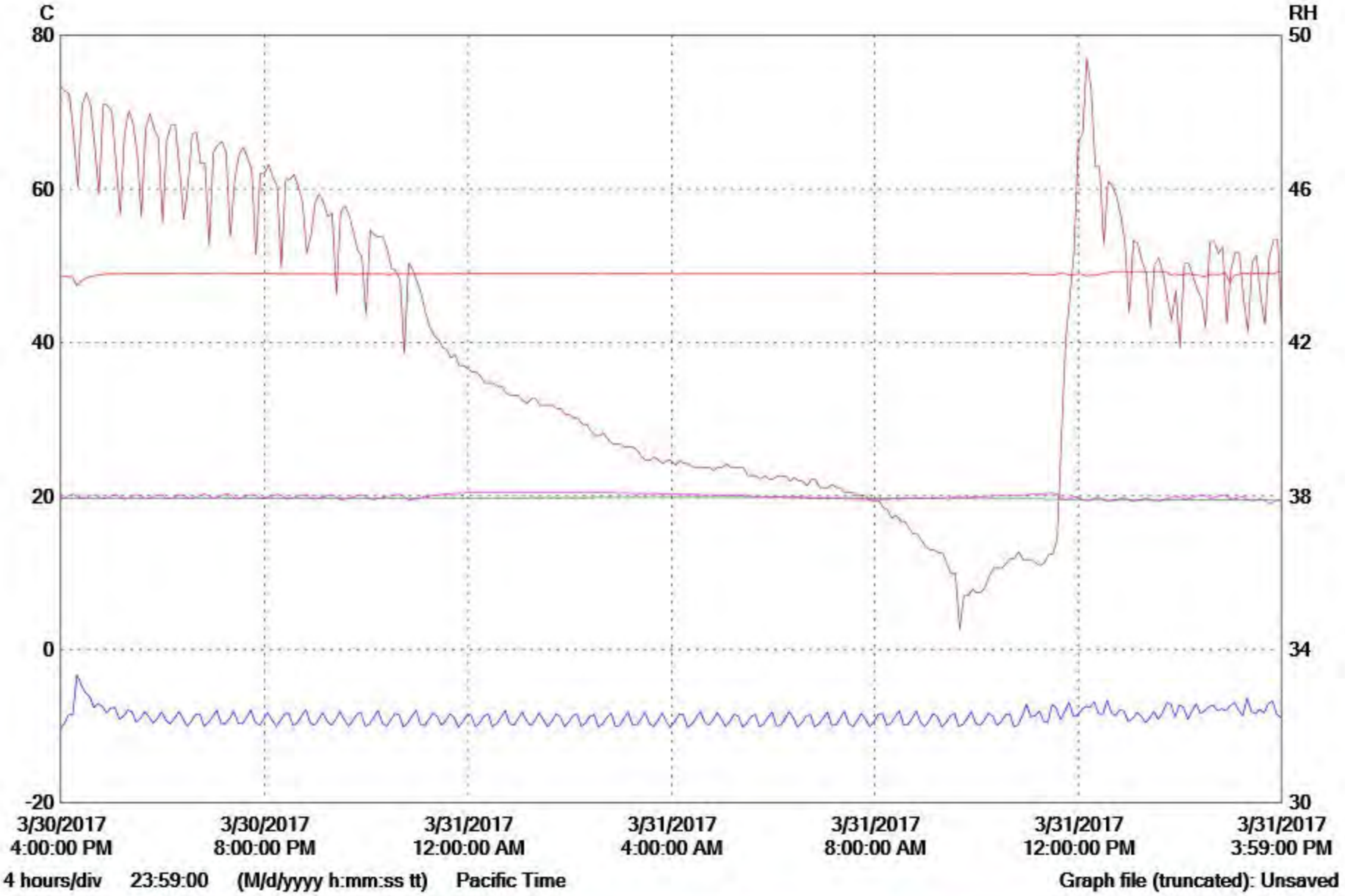
Printed on 4/12/2017 at 11:23 AM



LN	Serial #	Description	CH	Value	Maximum	Average	Minimum	Units	CH description	Logger file
1	09021116	Oven/Water	1		49.22	48.92	47.42	C	Oven	Oven_Water-09021116-2017-04-18 09-15-08.spl
2	09021116	Oven/Water	2		19.77	19.65	19.40	C	Water	Oven_Water-09021116-2017-04-18 09-15-08.spl
3	08071106	Freezer	1		-3.26	-8.84	-10.16	C	Freezer	Freezer-08071106-2017-04-18 09-15-03.spl
4	08052076	LAB TEMP/RH	1		20.48	19.92	19.03	C	Lab Temp.	LAB TEMP_RH-08052076-2017-04-18 09-14-59.spl
5	08052076	LAB TEMP/RH	2		49.4	41.8	34.5	RH	Humidity	LAB TEMP_RH-08052076-2017-04-18 09-14-59.spl

APPENDIX A

INTERPRETATIONS OR DEVIATIONS FROM FMVSS 218

None

APPENDIX B

EQUIPMENT LIST AND CALIBRATION SCHEDULES

Equipment List					
ACT ID	**Description**	**Make/Model**	**S/N**	**Dimensional Check**	**Next**
H0079	Monorail	US Testing	NA	11/18/2016	11/18/2017
H0004	DOT Small Headform	Controlled Casting	NA	11/18/2016	11/18/2017
H0005	DOT Medium Headform	Controlled Casting	NA	11/18/2016	11/18/2017
H0006	DOT Large Headform	Controlled Casting	NA	11/18/2016	11/18/2017
H0028	Anvil	Hemispherical	C070911-01	11/18/2016	11/18/2017
H0029	Anvil	Flat	C310811-02	11/18/2016	11/18/2017
H0078	Anvil	MEP	16100801	11/18/2016	11/18/2017
H0088	Penetration Height Spacer	La Cienega Manufacturing	NA	11/18/2016	11/18/2017
H0064	Penetration Striker	Cadex	4324	11/18/2016	11/18/2017
H0111	Peripheral Vision	1 inch Block	NA	11/18/2016	11/18/2017
H0059	Drop Carriage Assembly	Cadex	NA	11/18/2016	11/18/2017
H0080	Penetrator Tube	La Cienega Manufacturing	NA	NA	NA
H0087	Penetration Headform Mount	La Cienega Manufacturing	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	Scientemp	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

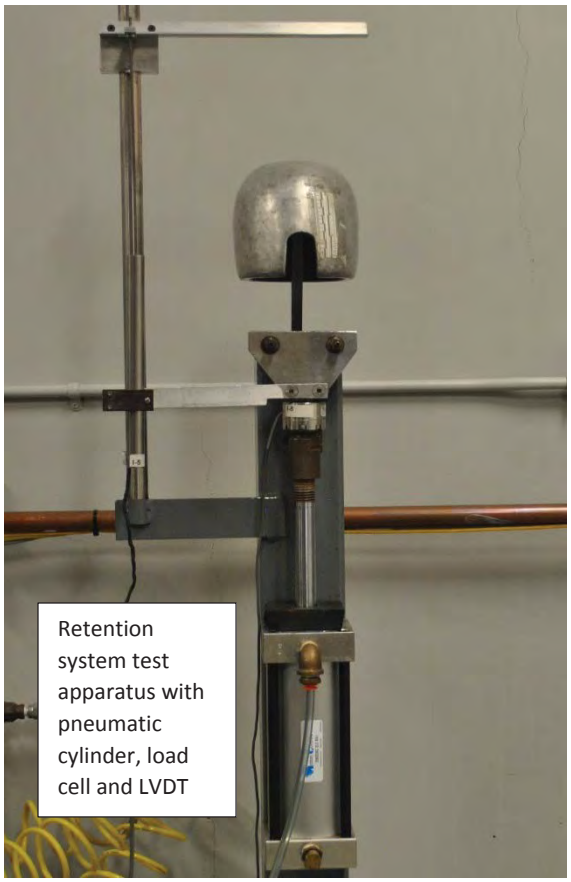
Calibrated Measurement Equipment								
ACT ID	**Description**	**Make/Model**	**S/N**	**Range**	**Accuracy from Cal. Certs**	**Last Calibration**	**Next Calibration**	**Calibration By:**
H0102	Velocity Gate	Biok-Gate 9304	9304-001	--	0.16 ms	11/18/2016	11/18/2017	ACT
H0097	Accelerometer/ Amplifier/Filter	2279/104/109	ANTP2/AK/A P23	2000 g	±2.60%	8/25/2016	8/25/2017	Precision Labs
H0112	Peripheral Vision	D&K 125	NA	180 ˚	0.7 ˚	11/17/2016	11/17/2017	Micro Quality Calibration
H0098	LVDT - Retention	Schaevitz 2000-HR	16071	2 in	±0.06 mm	11/21/2016	11/21/2017	Micro Quality Calibration
H0099	Load Cell - Retention	LSB350	490706	500 lbs	±0.2%	11/22/2016	11/22/2017	Micro Quality Calibration
H0103	Ohaus Scale	Scout Pro SP6000	7126321419	0-6000 gm	±1 g	11/17/2016	11/17/2017	Micro Quality Calibration
H0104	Digital Height Gauge	Starrett Digitape D34-16	64639	300 cm	±0.0625 in	11/18/2016	11/18/2017	Micro Quality Calibration
H0105	Height Gage	Mitutoyo	3121016	12 in	±0.002 in	11/30/2016	11/30/2017	Micro Quality Calibration
H0106	Environmental Data Logger	Veriteq SP-2000-20R	8052076	-40 To +95C, 0-100% RH	±0.03 ˚C	6/21/2016	6/21/2017	Veriteq
H0107	Environmental Data Logger	Veriteq SP-1000-22N	8071106	-40 To +95 ˚C	±0.02 ˚C	6/21/2016	6/21/2017	Veriteq
H0108	Environmental Data Logger	Veriteq SP-1000-22N	9021116	-40 To +95 ˚C	±0.02 ˚C	6/21/2016	6/21/2017	Veriteq

APPENDIX C

PHOTOGRAPHS

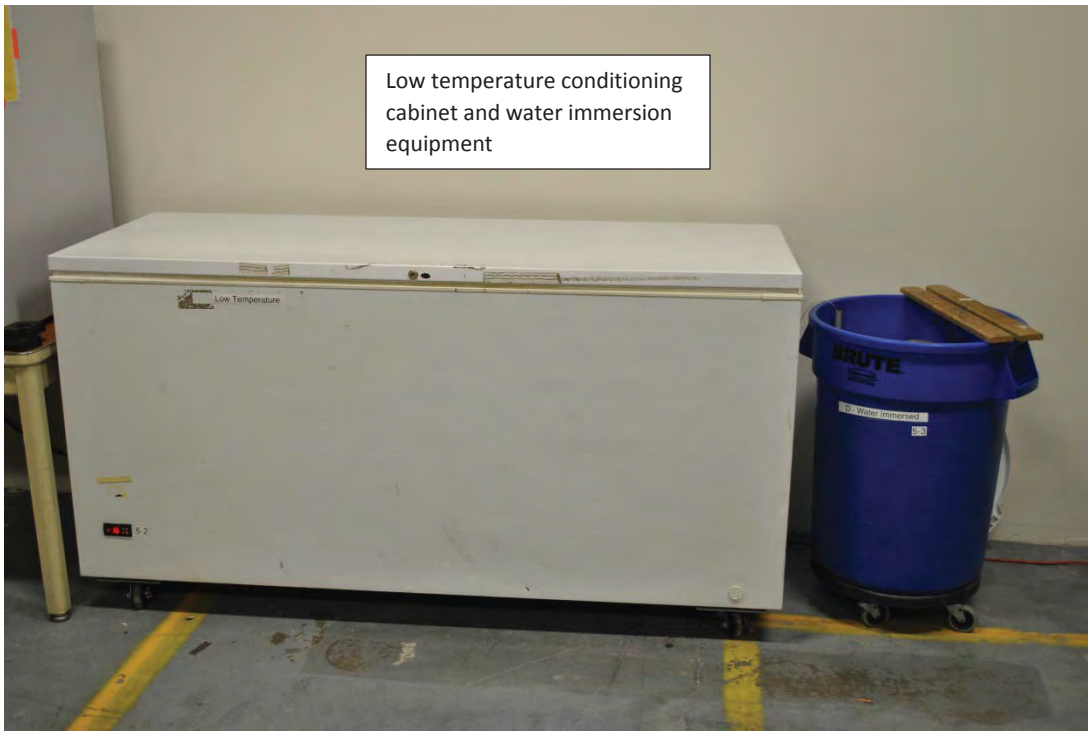
Impact attenuation test apparatus with three headforms (S, M, L), flat, hemi and MEP anvils

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
Low Temperature
BRUTE


High temperature chamber

Shark SKWAL helmet and box showing model designation

Shark SKWAL helmet with test line, front left view

Shark SKWAL helmet with test line, rear left view

Shark SKWAL helmet interior view

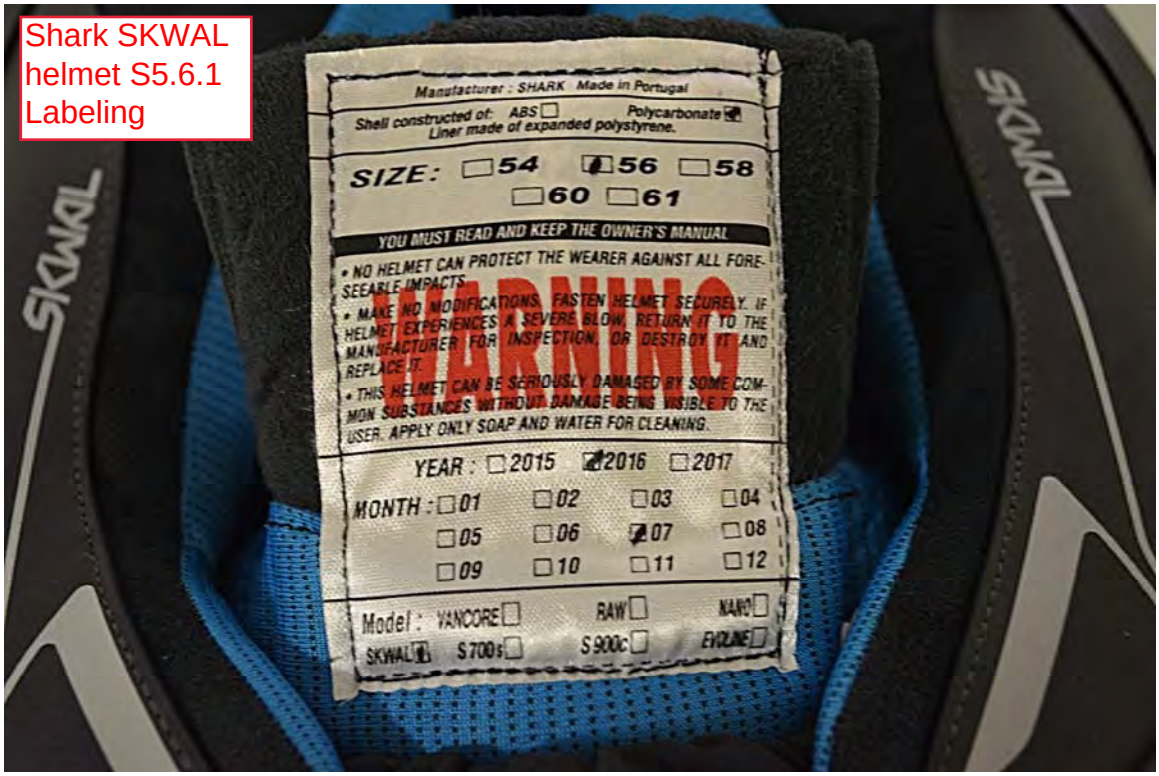

Shark SKWAL front and left side hemispherical anvil impact locations
SHARK
SKWAL


Shark SKWAL right side and rear flat anvil impact locations
SHARK
SKWAL
F2
SHARK
DOT


Shark SKWAL crown
penetration test location
SHARK


Shark SKWAL front right
penetration test location
SHARK

Shark SKWAL helmet S5.6.1 Labeling



Shark SKWAL helmet S5.6.2 Certification Label