

SAFETY COMPLIANCE TESTING FOR FMVSS No. 218 MOTORCYCLE HELMETS

Manufacturer: 5X5
Model: SA-08
Size: Medium

Prepared By

**ACT Lab LLC
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13 August 2009

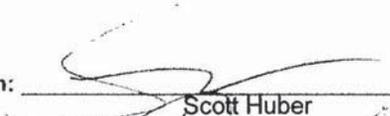
Final Report 218-ACT-09-014

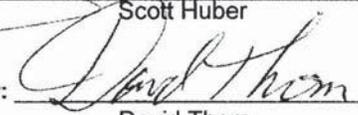
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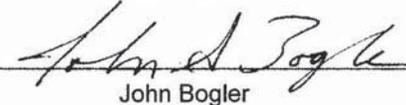
U.S. Department of Transportation
National Highway Traffic Safety Administration
Office of Vehicle Safety Compliance (NVS-220)
1200 New Jersey Ave., S.E.
Washington, DC 20590

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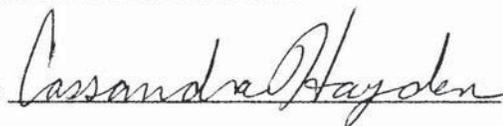
Technician: 
Scott Huber

Project Manager: 
David Thom

Approved By: 
John Bogler

Approval Date: 13 August 2009

FINAL REPORT ACCEPTANCE BY OVSC

Accepted By:  HS# 640706

Acceptance Date: 9-21-09

Contract File No.: 52.0014

Test File: A116

Control Document Rev. 04/01/09

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Date: 8-12-09

TECHNICAL REPORT STANDARD TITLE PAGE

1. Report No. 218-ACT-09-014		2. Government Accession No.		3. Recipient's Catalog No.	
4. Title and Sub-Title FINAL REPORT OF FMVSS NO. 218 COMPLIANCE TESTING OF 5X5, MODEL SA-08, SIZE MEDIUM MOTORCYCLE HELMET				5. Report Date 13 August 2009	
				6. Performing Organization Code ACT	
7. Author(s) David R. Thom, Program Manager				8. Performing Organization Report No. 52.0014.A116	
9. Performing Organization Name and Address ACT Lab LLC 149 Sheldon St. El Segundo, CA 90245-3916				10. Work Unit No.	
				11. Contract or Grant No. DTNH22-08-D-00100	
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Office of Vehicle Safety Compliance (NVS-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 NVS-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-218-06. Test failures identified were as follows: S5.2 Penetration resistance test failures on ambient, cold and wet samples at right rear location. S5.6.1 Labeling missing Month and year of manufacture, Shell construction.					
17. Key Words 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-411) 1200 New Jersey Avenue, S.E. Washington, D.C. 20590		
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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-218-06², 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-218-06.

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 12529 April 15, 1988.

² NHTSA, TP-218-06, Laboratory Test Procedure for FMVSS 218, Motorcycle Helmets, Nov. 30, 2006.

³ ACT Lab, LLC Helmet Test Manual, Part 1 – Motorcycle Helmets in accordance with FMVSS No. 218 and TP-218-06, December 2008.

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HELMET DATA

HELMET BRAND NAME: 5X5

HELMET MODEL DESIGNATION: SA-08

HELMET MANUFACTURER: 5X5

HELMET SIZE: Medium (57-58cm)

TEST HEADFORM SIZE: DOT Medium

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

HELMET POSITIONING INDEX: 50mm Manf. Supplied: _____ ACT Determined: X

SHELL MATERIAL: Not listed

LINER MATERIAL: Expanded Polystyrene

BUCKLE DESCRIPTION: Double D-Ring

HELMET	A Ambient	B Low Temp	C High Temp	D Water Immersed	E Spare
SHELL COLOR/PATTERN	Silver/Black	Silver/Black	Silver/Black	Silver/Black	Silver/Black
WEIGHT (grams)	1338	1327	1356	1340	1474
MONTH & YEAR OF MANUFACTURE	Not listed	Not listed	Not listed	Not listed	Not listed

OTHER STANDARD LABELS PRESENT: None

COMMENTS:

1. All helmets were received in undamaged condition and appropriate for these tests.
2. Weights listed above for helmets A-D are as tested with face shield system removed.
3. Weight for helmet E is complete with all components in place.
4. HPI was determined by ACT Lab test technician.

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SUMMARY OF TEST RESULTS

INDICATE P - Pass or F - Fail

HELMET	A	B	C	D
TEST	AMBIENT	LOW TEMP	HIGH TEMP	WATER IMMERSED
IMPACT	P	P	P	P
PENETRATION	F	F	P	F
RETENTION	P	P	P	P

INDICATE P - Pass or F - Fail

TEST	PASS	FAIL
PERIPHERAL VISION	P	
LABELING		F

COMMENTS:

Penetration test failures (S7.2) – Location: right rear. Conditions - ambient, cold and wet.

Labeling failures (S5.6) –

1. No date of manufacture on helmet.
2. Label includes shell material check boxes. However, neither box is checked, see page 45.

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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.
Discrete Size: 57-58 cm, Headform Size: DOT-C Medium

CONDITIONING FOR TESTING — Paragraph S6.4 — The protective headgear shall be conditioned for not less than 12 hours, in the specified environmental condition shown below, prior to test.

Ambient Conditions	21°C ± 6° (70°F ± 10°F); 40% to 60% Relative Humidity
Low Temperature	-10°C + 4°C, -0°C (14°F, + 8°F, - 0°F)
High Temperature	50°C + 0°C, -4°C (122°F, + 0°F, - 8°F)
Water Immersion	25°C ± 6°C (77°F ± 10°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.

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IMPACT ATTENUATION

SYSTEMS CHECK	TRIAL DROP	DROP HEIGHT (meters)	VEL. (m/s)	PEAK g	DWELL TIME (ms)		TEST RECORD	HEADFORM POSITION
					150 g	200 g		
PRETEST	1	1.40	5.07	392.4	2.6	2.1	Pre-1	Crown
	2	1.40	5.07	387.5	2.6	2.2	Pre-2	Crown
	3	1.40	5.01	391.4	2.6	2.1	Pre-3	Crown
PRETEST AVERAGE		XXXX	XXXX	390.4	XXX	XXX	XXXXXX	XXXXXX
POSTTEST	1	1.40	5.07	383.1	2.5	2.1	Post-1	Crown
	2	1.40	5.00	386.5	2.5	2.1	Post-2	Crown
	3	1.40	5.08	384.6	2.5	2.1	Post-3	Crown
POSTTEST AVERAGE		XXXX	XXXX	384.7	XXX	XXX	XXXXXX	XXXXXX
DIFFERENCE BETWEEN PRETEST AND POSTTEST AVERAGES				5.7	DIFFERENCE NOT TO EXCEED 40 g			

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HELMET DESIGNATION	HELMET CONDITION	Impact Location:	(FR)		(LF)		(RG)		(RR)	
			1	2	1	2	1	2	1	2
		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	115	134	107	104	194	189	175	198
		MS @ 150G	0.0	0.0	0.0	0.0	2.9	2.5	2.8	2.9
		MS @ 200G	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		VELOCITY, m/sec	5.21	5.28	5.28	5.28	6.05	6.05	6.04	5.95
B	LOW TEMP	ANVIL	HEMI		HEMI		FLAT		FLAT	
		TEST RECORD NO.	9	10	11	12	13	14	15	16
		PEAK G	114	139	113	108	178	203	178	214
		MS @ 150G	0.0	0.0	0.0	0.0	2.6	3.0	2.5	3.2
		MS @ 200G	0.0	0.0	0.0	0.0	0.0	0.3	0.0	1.1
		VELOCITY, m/sec	5.20	5.21	5.28	5.28	6.05	6.06	6.04	6.05
C	HIGH TEMP	ANVIL	HEMI		HEMI		FLAT		FLAT	
		TEST RECORD NO.	17	18	19	20	21	22	23	24
		PEAK G	103	172	104	102	178	183	163	189
		MS @ 150G	0.0	1.4	0.0	0.0	3.1	2.5	2.5	3.0
		MS @ 200G	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		VELOCITY, m/sec	5.21	5.28	5.28	5.21	6.05	6.05	5.96	6.05
D	WATER IMMERS-SED	ANVIL	HEMI		HEMI		FLAT		FLAT	
		TEST RECORD NO.	25	26	27	28	29	30	31	32
		PEAK G	104	127	102	108	183	179	166	196
		MS @ 150G	0.0	0.0	0.0	0.0	3.0	2.6	2.7	3.0
		MS @ 200G	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		VELOCITY, m/sec	5.28	5.21	5.28	5.21	6.05	6.04	6.06	6.06

COMMENTS: The actual drop heights were: flat anvil 200 cm, hemi anvil 149 cm

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PENETRATION

Paragraph S5.2 and S7.2

WEIGHT OF STRIKER: 3 kg (6 pounds, 10 ounces)

POINT OF STRIKER: Radius = 0.5mm (0.20 inch), included angle of 60°, + 1.0°, - 0.0°, hardness minimum of 60 Rockwell "C" Scale and a cone height of not less than 3.81 cm (1.5 inches).

HEIGHT OF FALL: 300cm, + 0.0cm, - 3.05cm (118.1 inches, +0.0 inches, 1.2 inches), 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	Front Right Brow	X		AMBIENT
2	A	Right Rear		X	AMBIENT
3	B	Front Right Brow	X		LOW TEMPERATURE
4	B	Right Rear		X	LOW TEMPERATURE
5	C	Front Right Brow	X		HIGH TEMPERATURE
6	C	Right Rear	X		HIGH TEMPERATURE
7	D	Front Right Brow	X		IMMERSED
8	D	Right Rear		X	IMMERSED

COMMENTS: The monorail drop height for the penetration test was 297.0cm. Photographs of penetration test locations are found in Appendix C.

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RETENTION SYSTEM

Paragraph S5.3 and S7.3

AMBIENT TEMPERATURE: 27 °C; AMBIENT HUMIDITY: 48 %

REQUIREMENTS:

READING	APPLIED LOAD
INITIAL	22.68kg, + 4.54kg, - 0kg (50.0 LBS, + 10 LBS, - 0 LBS)
FINAL	136kg, + 0kg, - 2.3kg(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	0.8	2.0	1.2
B	LOW TEMPERATURE	0.9	2.3	1.4
C	HIGH TEMPERATURE	1.1	2.4	1.3
D	WATER IMMersed	1.4	2.8	1.4

PERIPHERAL VISION - 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 2.5cm (1 inch) above all points in the basic plane that are within the angles of peripheral vision.

	REQUIREMENTS	TEST RESULTS
DEGREE EACH SIDE M.S. PLANE	> 105°	111°
BROW OPENING	> 2.5cm (1 inch)	5.8cm

COMMENTS:

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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	Pass	Fail
(a) Manufacturer's name or identification	X	
(b) Precise model designation	X	
(c) Size	X	
(d) Month and year of manufacture		X
(e) The symbol DOT... on the outer surface, in a color that contrasts with the background, in letters at least 1 cm high, centered laterally with the horizontal centerline of the symbol located a minimum of 2.9 cm and a maximum of 3.5 cm from the bottom edge of the posterior portion of the helmet	X	
(f) Instructions to the purchaser as follows:	-----	-----
(1) Shell and liner constructed of (identify type(s) of materials).		X
(2) Helmet can be seriously damaged by some common substances without damage being visible to the user.	X	
(2) Apply only the following: (Recommended cleaning agents, paints, adhesives, etc., as appropriate.	X	
(3) Make no modifications.	X	
(3) Fasten helmet securely.	X	
(3) If helmet experiences a severe blow, return it to the manufacturer for inspection, or destroy it and replace it.	X	
(4) Any additional relevant safety information should be applied at the time of purchase by means of an attached tag, brochure, or other suitable means.	X	

COMMENTS:

1. No date of manufacture on helmet.
2. Label includes shell material check boxes. However, neither box is checked, see page 45.

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TEST DATA

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CALCULATE BIAS

Bias (mV): #1:

#2:

#3:

#4:

#5:

Present Limit
Value (mV):

PERFORM PRETEST: DROP #: 1

Drop Height (m):

Peak G's:

Peak Time (ms):

▲ Time @ 150 G (ms):

▲ Time @ 200 G (ms):

Gate Time (ms):

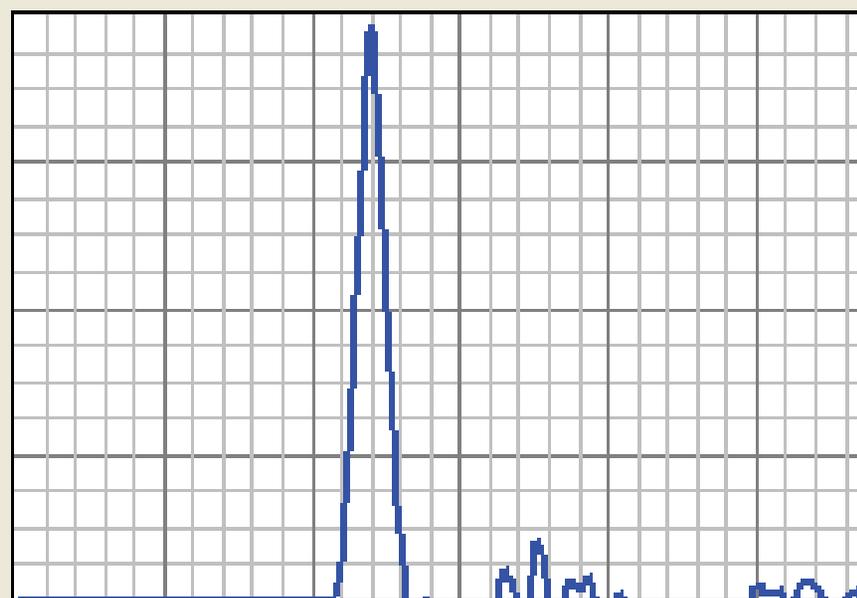
Impact Velocity (m/s):

400

300

200

100



Acceleration (G's) vs Time (ms)

HEADFORM POSITION

- Front Left
 Right Rear
 Crown
 Other

HEADFORM SIZE

- Size A Size C
 Size D Size E
 Size J Size M
 Hybrid-3 Other

CALCULATE BIAS

Bias (mV): #1:

#2:

#3:

#4:

#5:

Present Limit
Value (mV):

PERFORM PRETEST: DROP #: 2

Drop Height (m):

Peak G's:

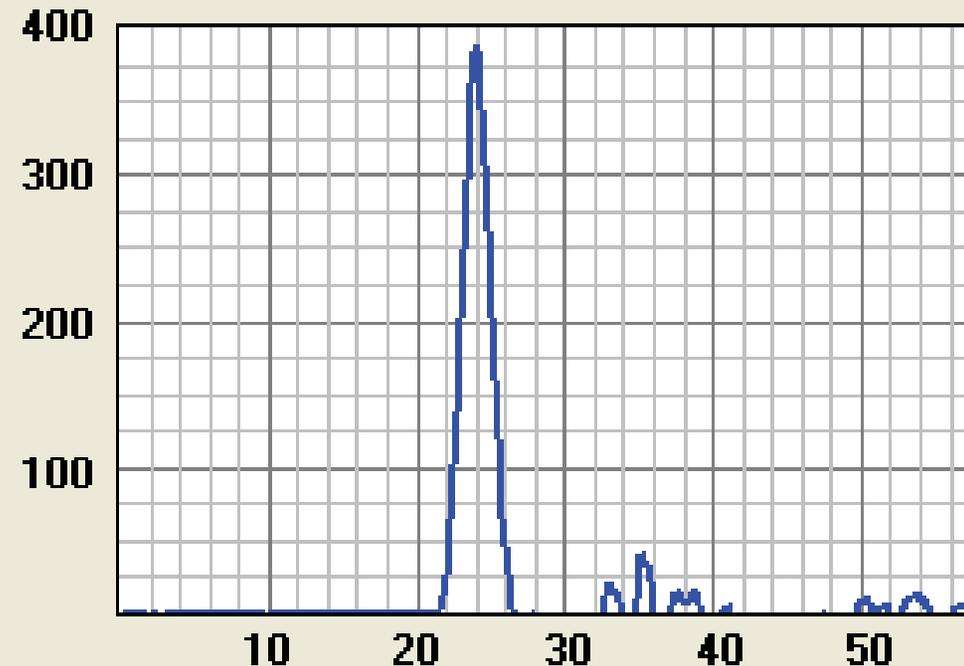
Peak Time (ms):

▲ Time @ 150 G (ms):

▲ Time @ 200 G (ms):

Gate Time (ms):

Impact Velocity (m/s):



Acceleration (G's) vs Time (ms)

HEADFORM POSITION

- Front
- Right
- Crown
- Other
- Left
- Rear

HEADFORM SIZE

- Size A
- Size D
- Size J
- Hybrid-3
- Size C
- Size E
- Size M
- Other

CALCULATE BIAS

Bias (mV): #1:

#2:

#3:

#4:

#5:

Present Limit
Value (mV):

PERFORM PRETEST: DROP #: 3

Drop Height (m):

Peak G's:

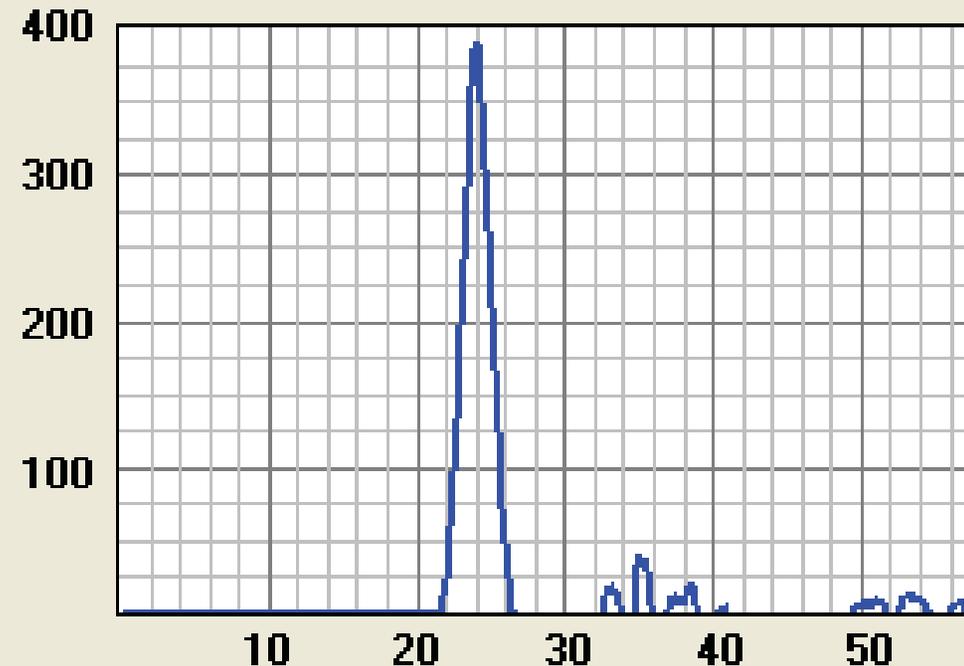
Peak Time (ms):

▲ Time @ 150 G (ms):

▲ Time @ 200 G (ms):

Gate Time (ms):

Impact Velocity (m/s):



Acceleration (G's) vs Time (ms)

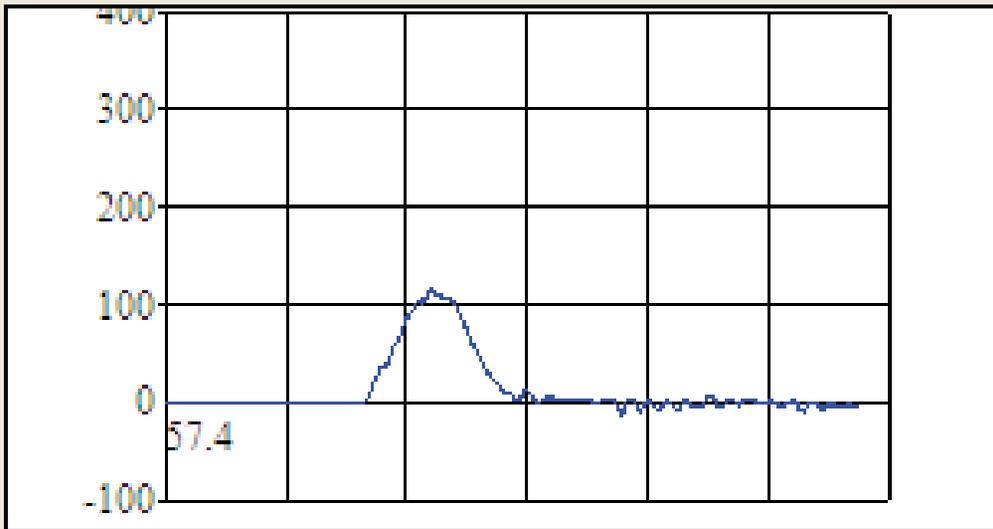
HEADFORM POSITION

- Front Left
 Right Rear
 Crown
 Other

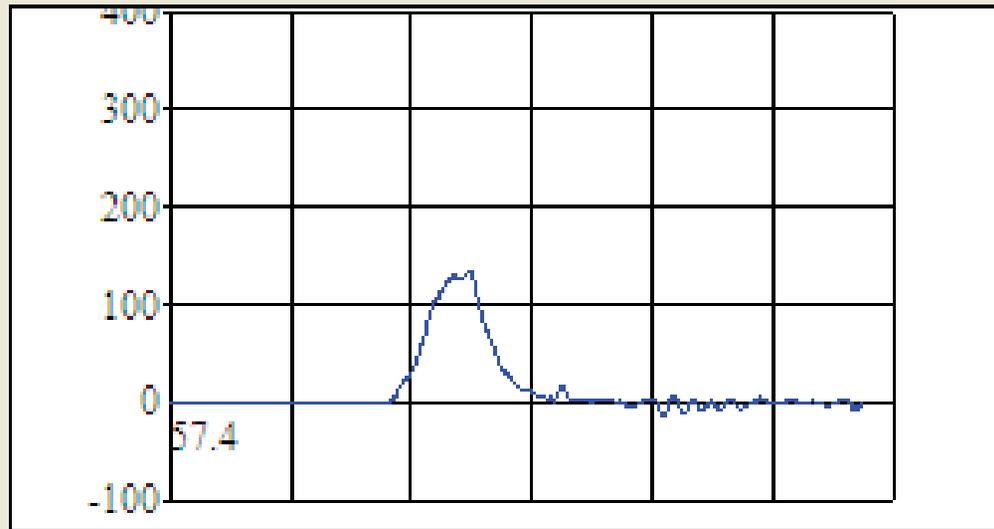
HEADFORM SIZE

- Size A Size C
 Size D Size E
 Size J Size M
 Hybrid-3 Other

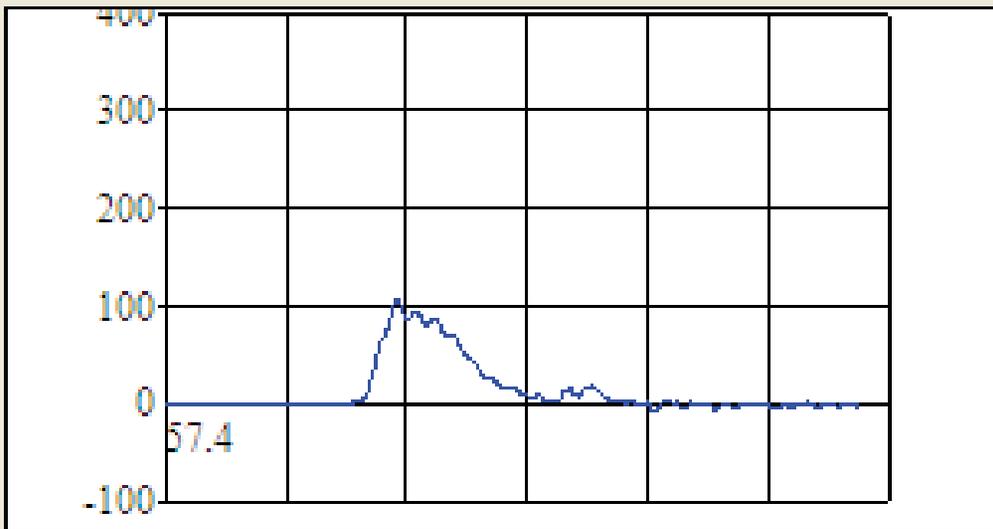
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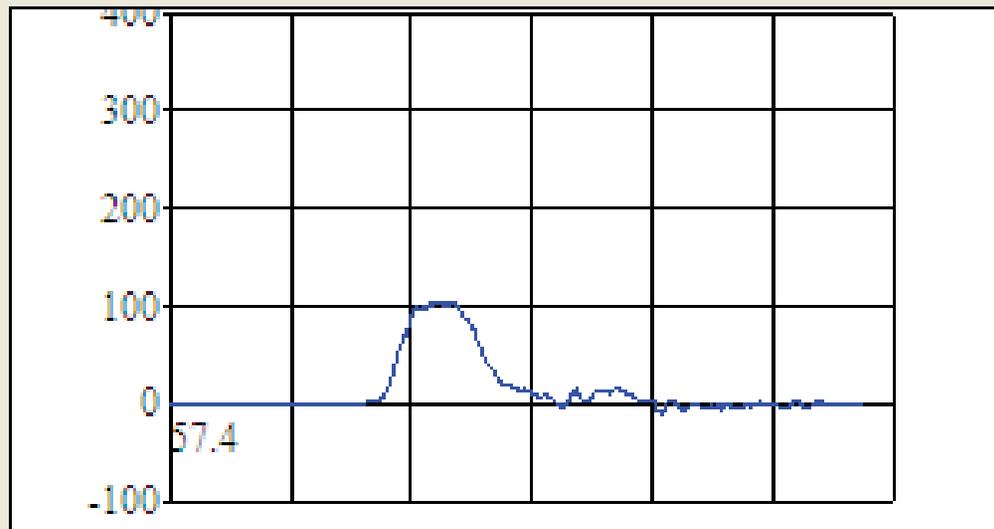
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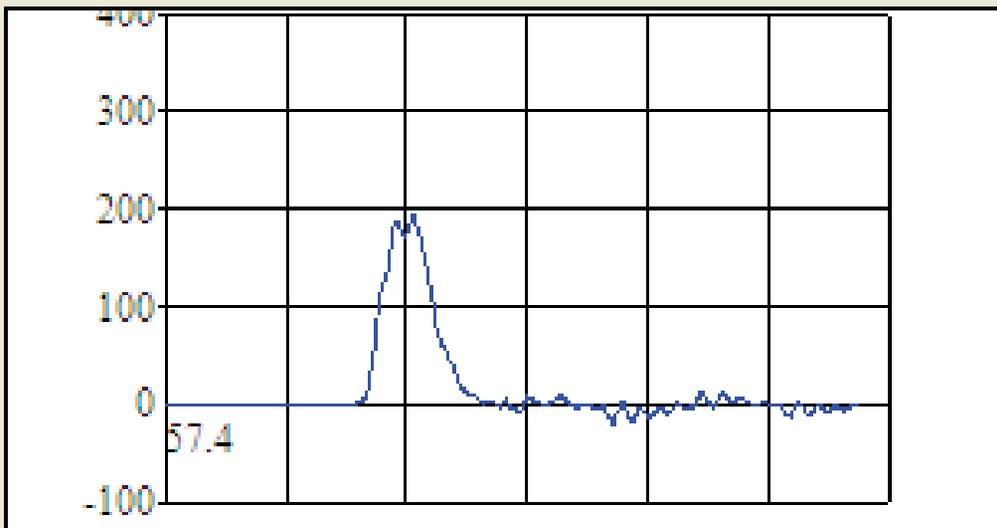
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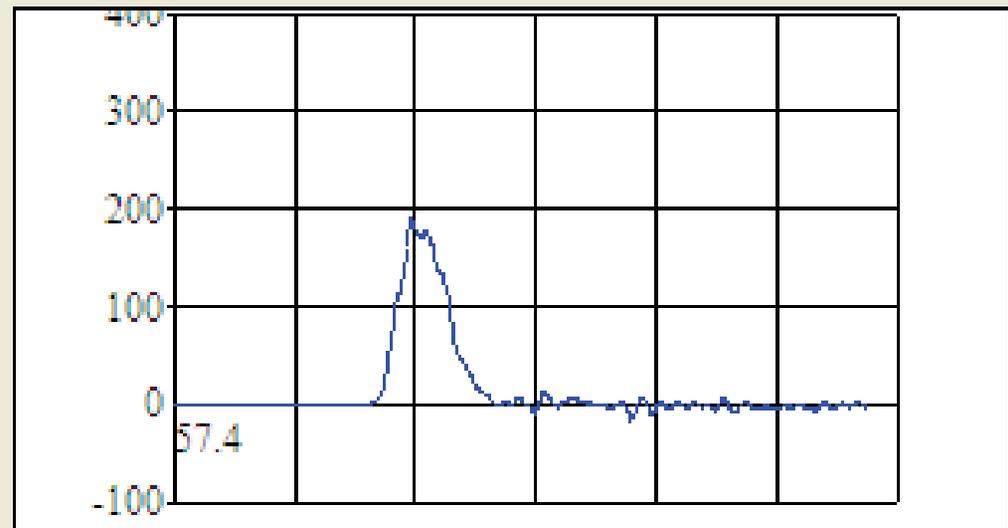
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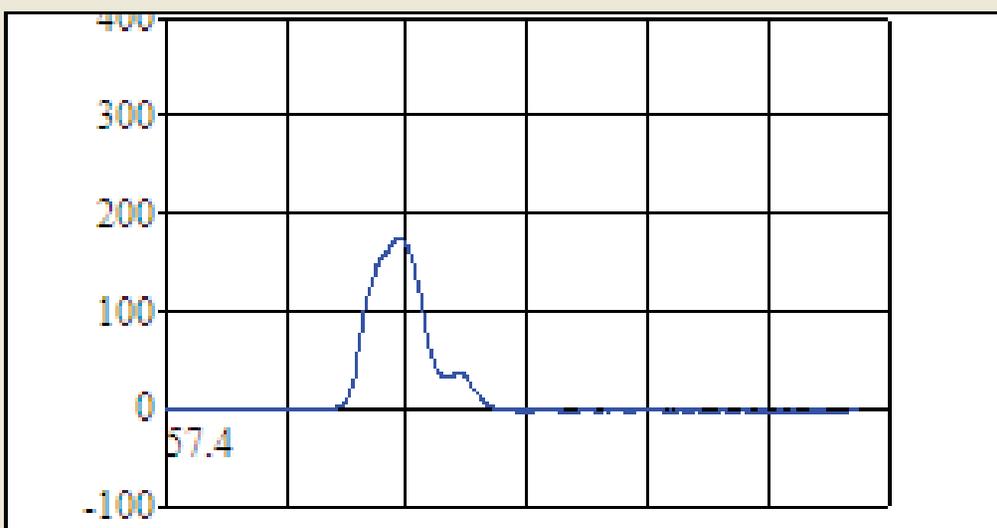
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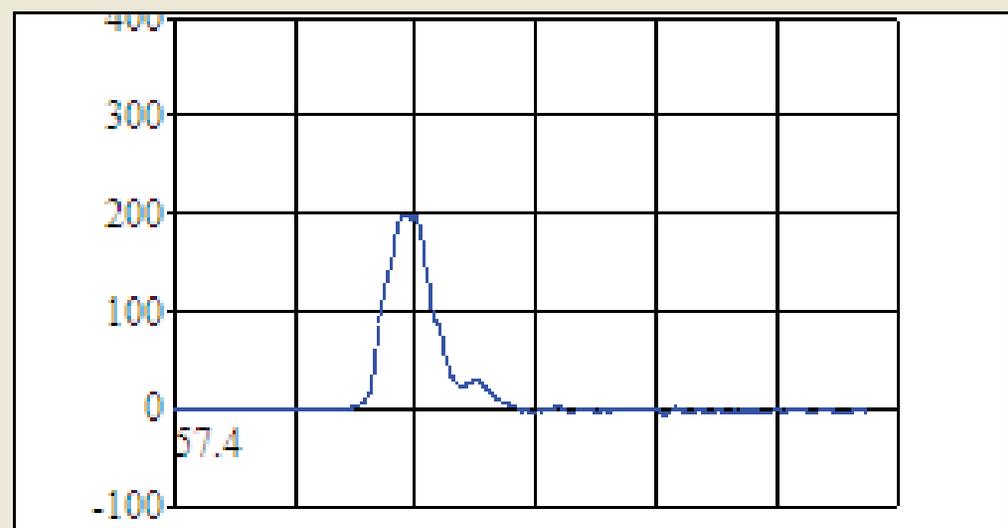
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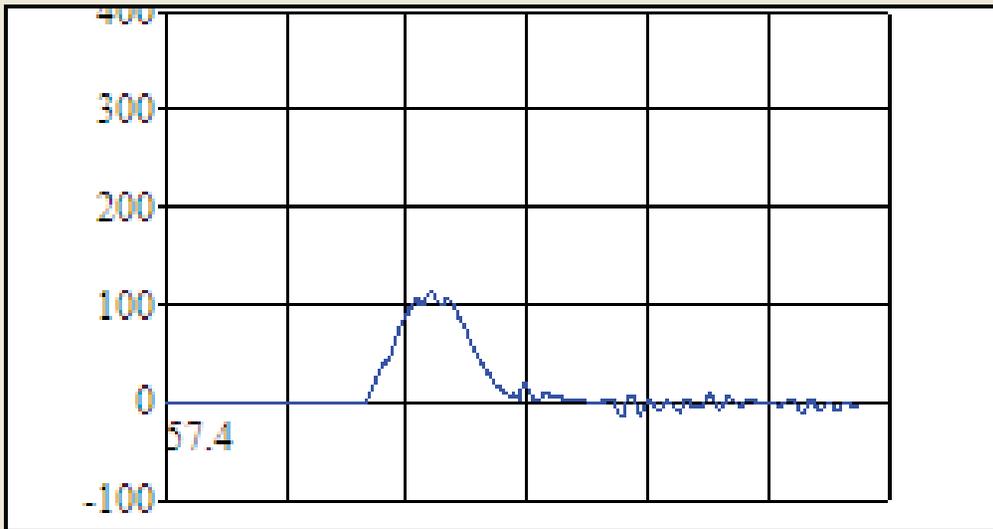
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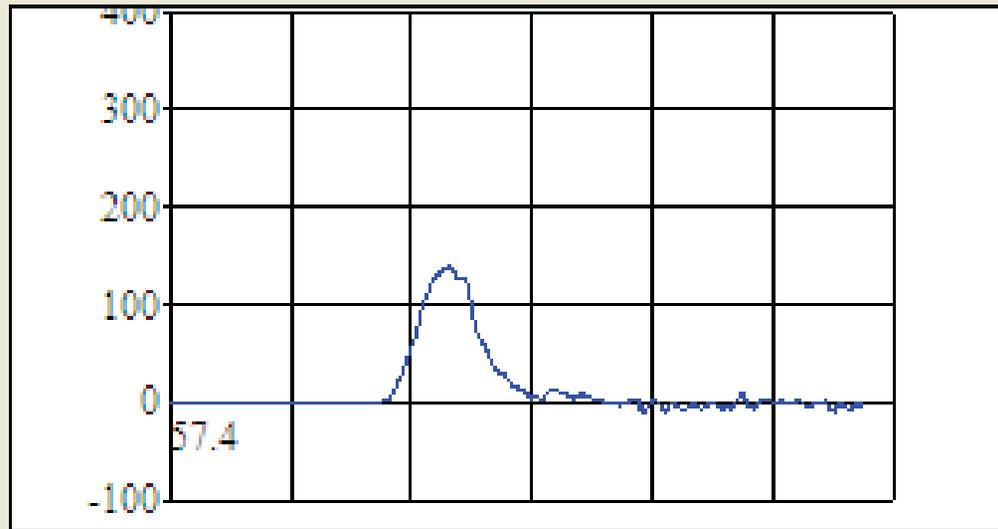
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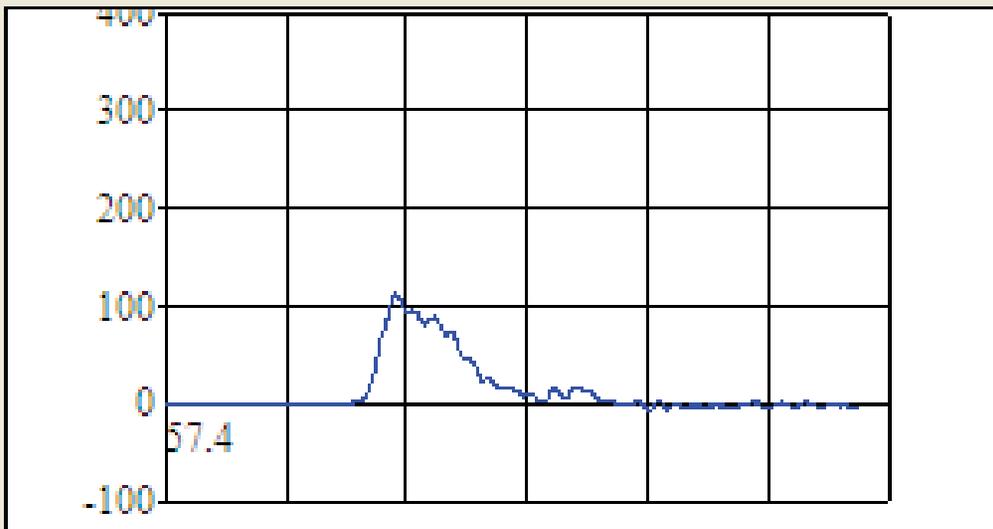
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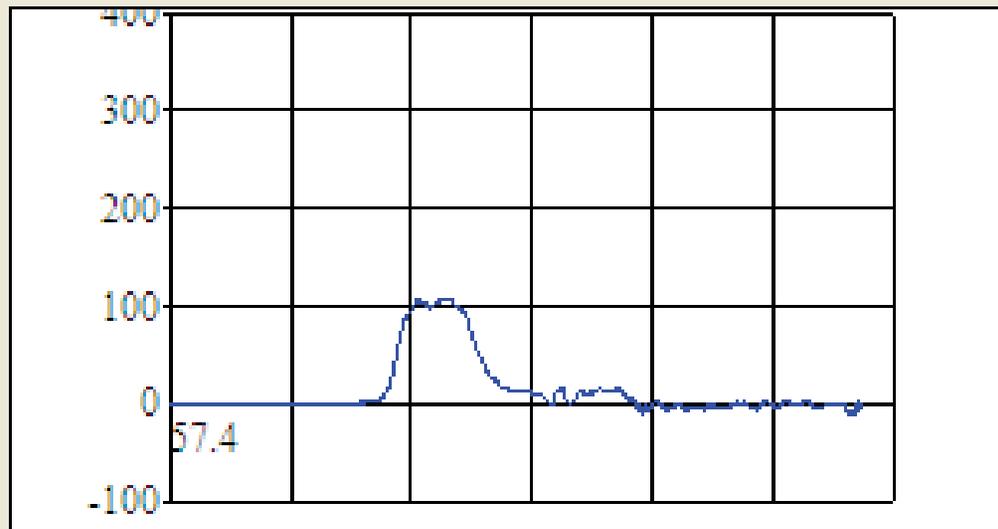
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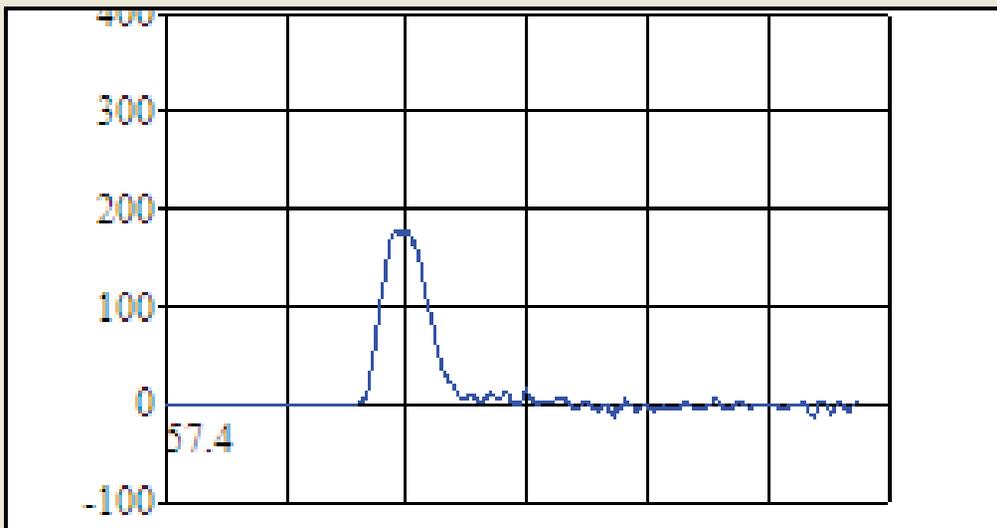
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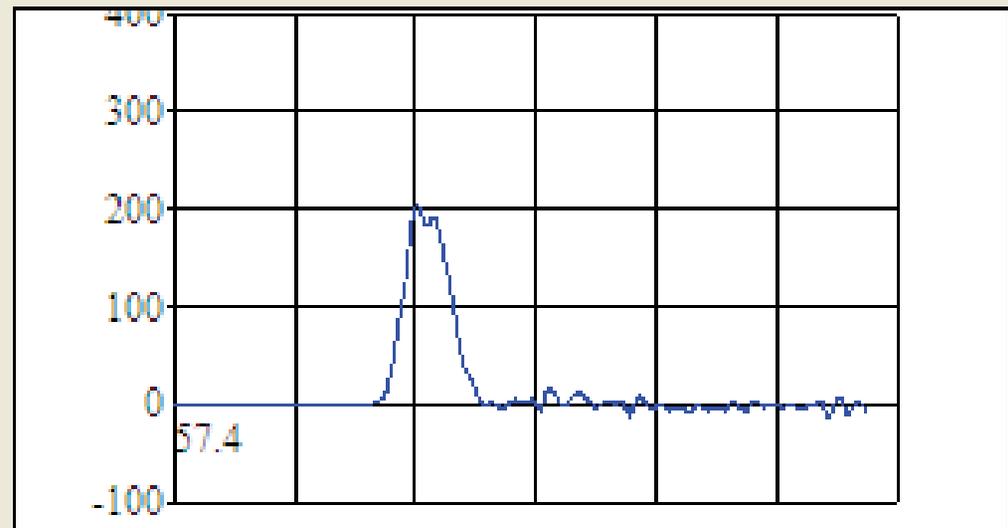
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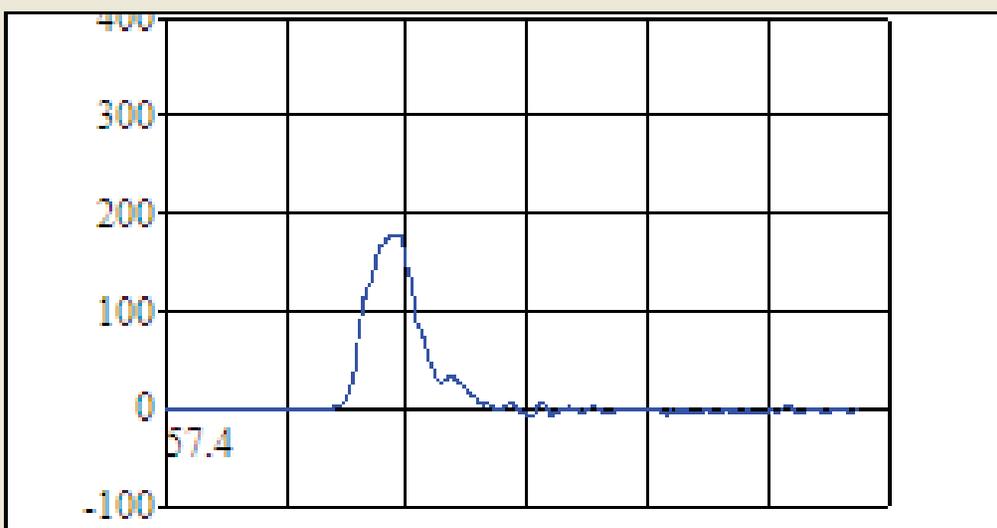
A1160213.TR1-Medium -Cold -RG -FLAT ▼



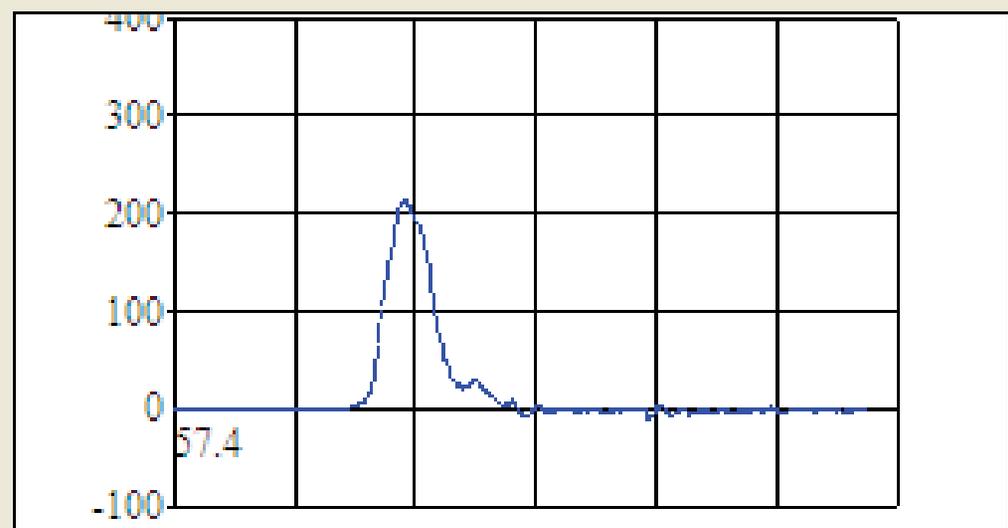
A1160213.TR2-Medium -Cold -RG -FLAT ▼



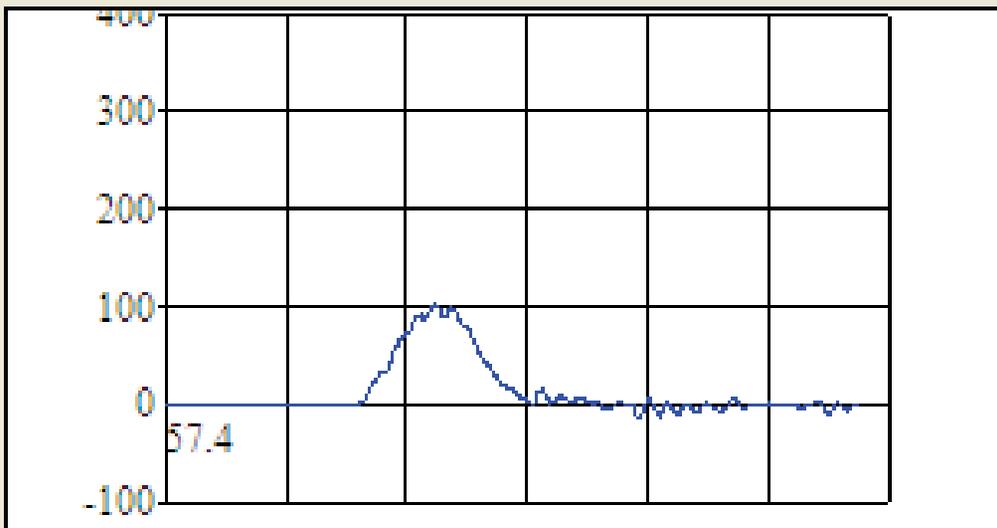
A1160214.TR1-Medium -Cold -RR -FLAT ▼



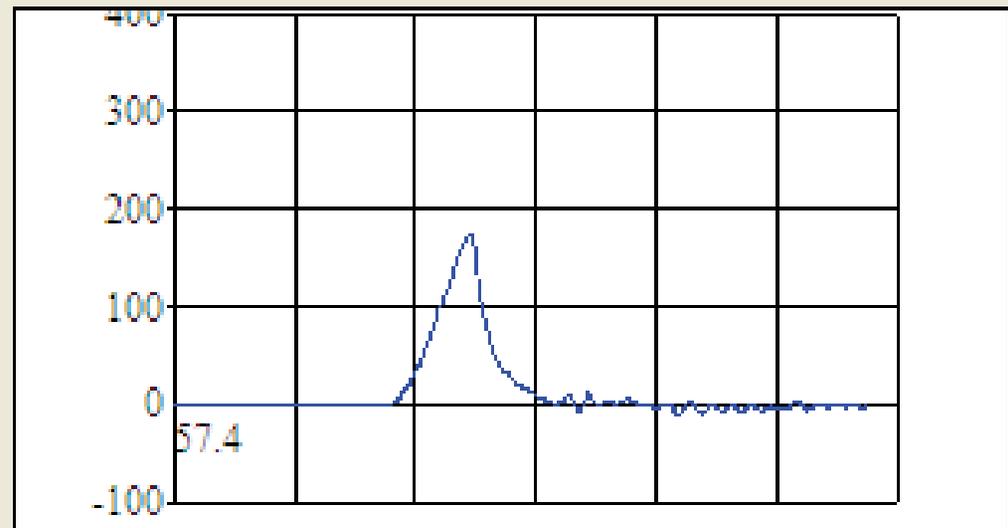
A1160214.TR2-Medium -Cold -RR -FLAT ▼



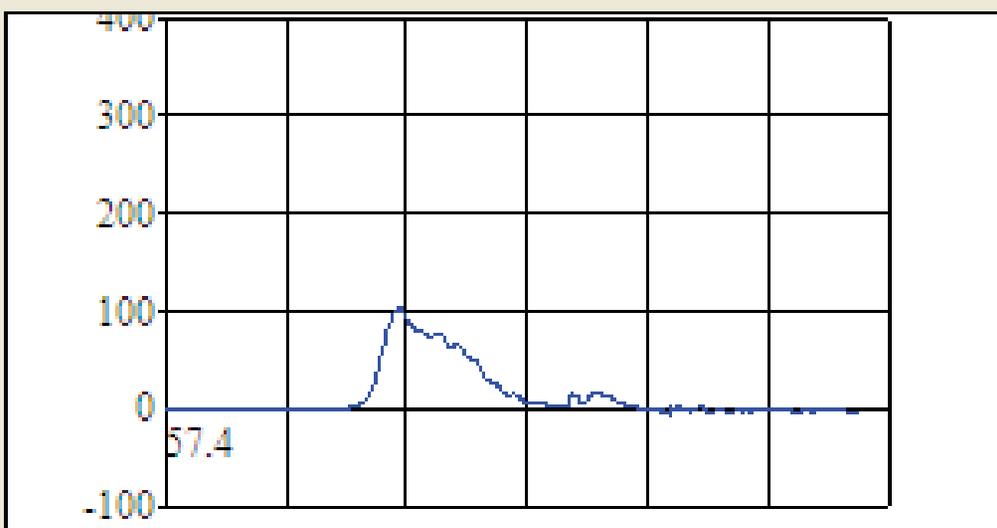
A1160311.TR1-Medium -Hot -PR -HEMI ▼



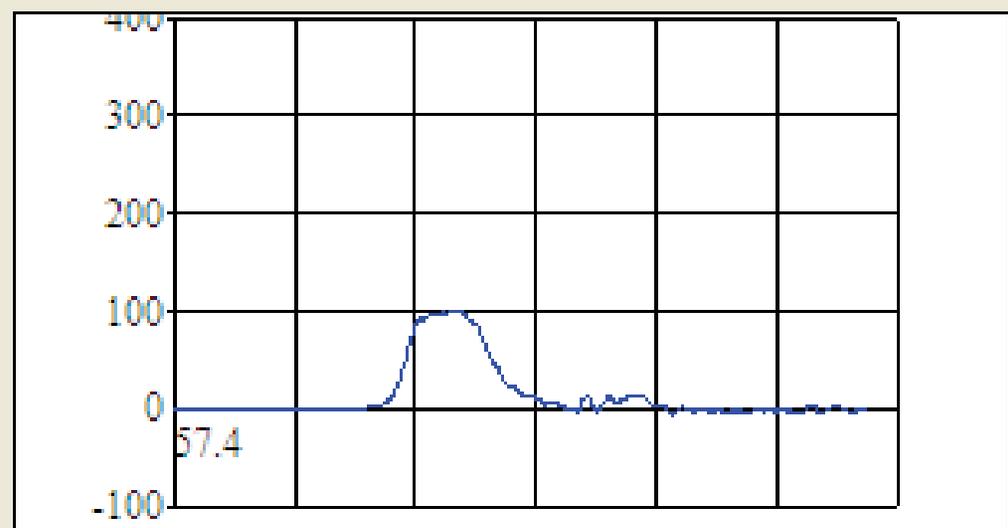
A1160311.TR2-Medium -Hot -PR -HEMI ▼



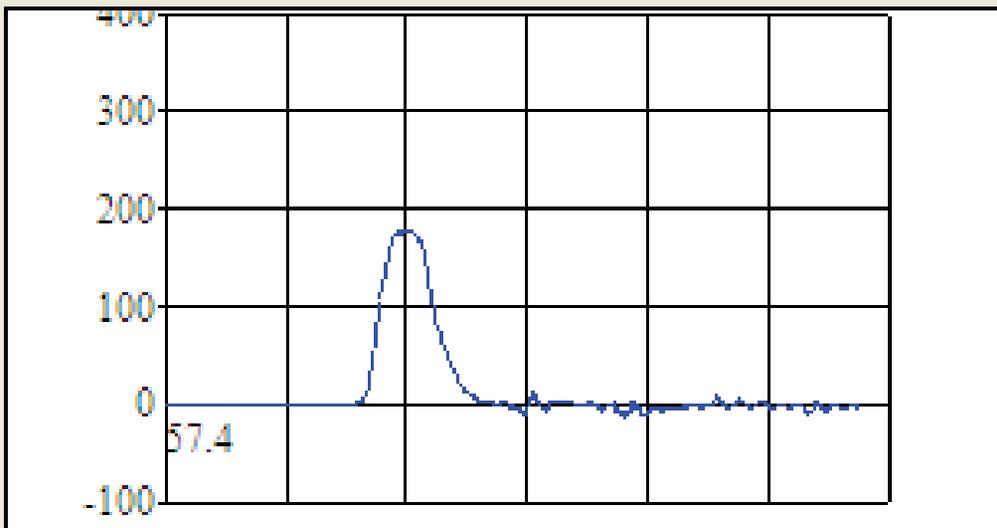
A1160312.TR1-Medium -Hot -LF -HEMI ▼



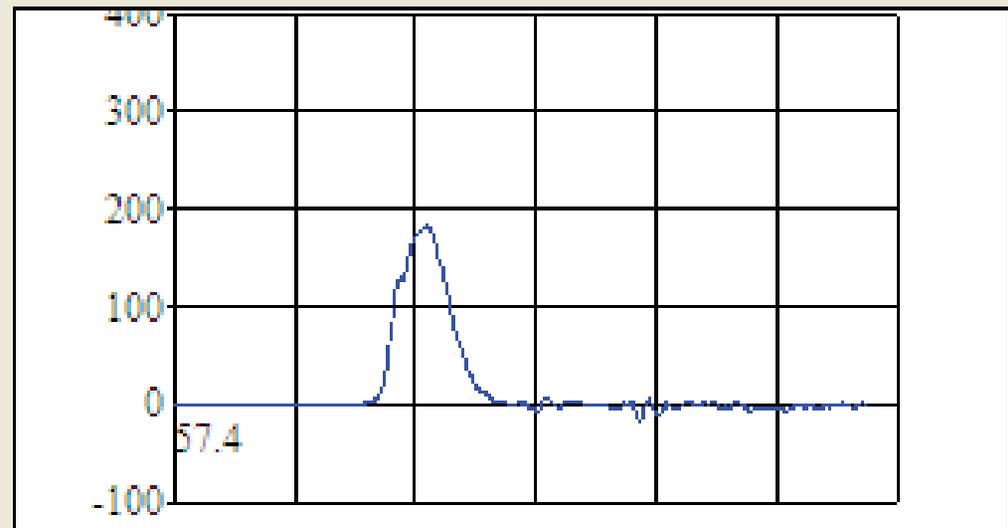
A1160312.TR2-Medium -Hot -LF -HEMI ▼



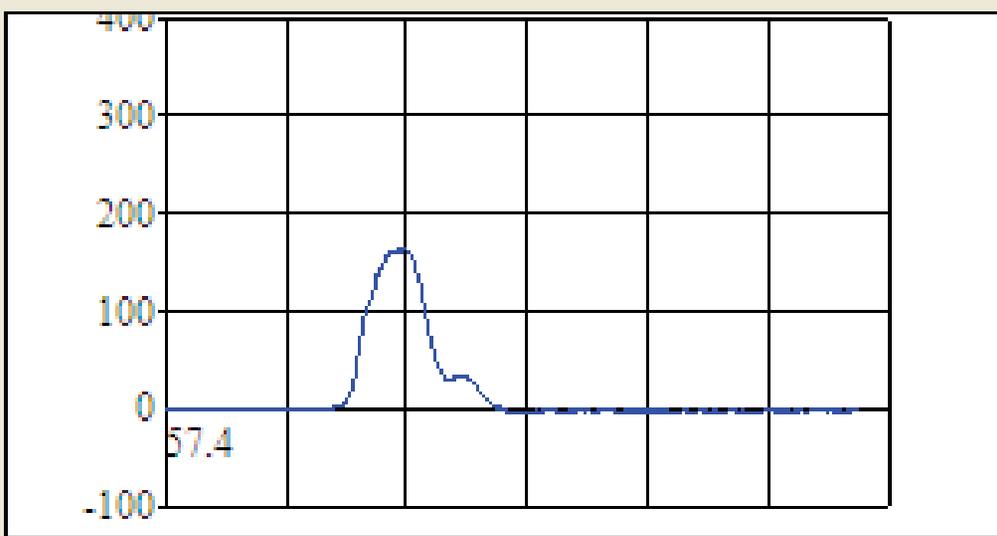
A1160313.TR1-Medium -Hot -RG -FLAT ▼



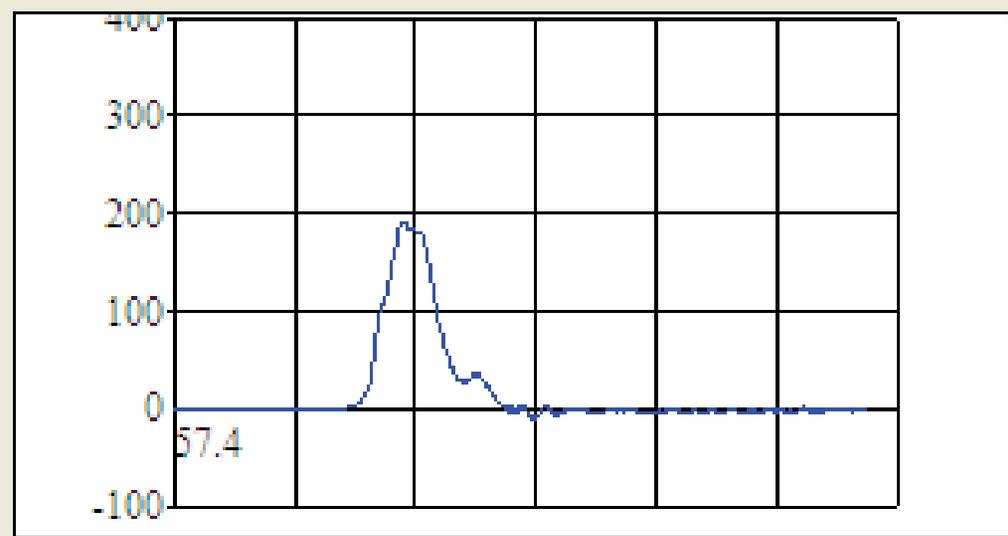
A1160313.TR2-Medium -Hot -RG -FLAT ▼



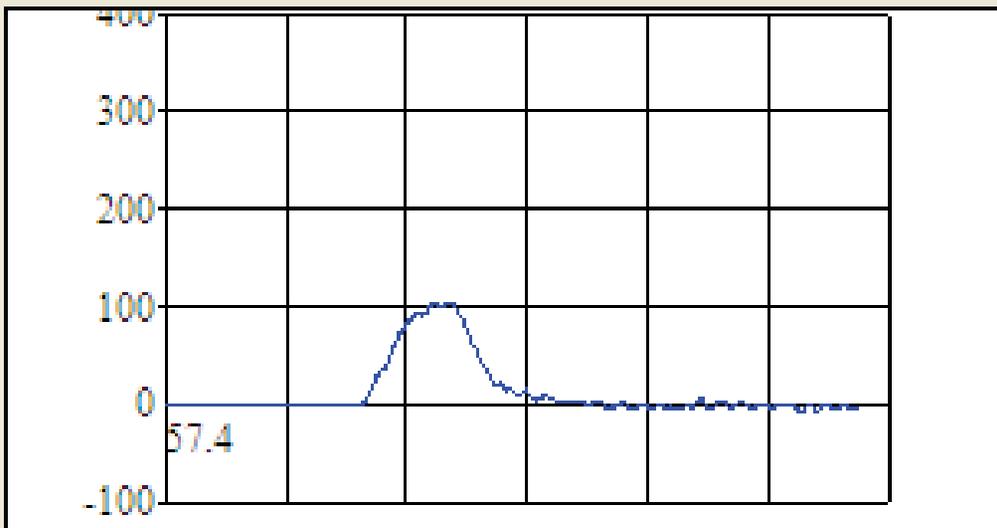
A1160314.TR1-Medium -Hot -RR -FLAT ▼



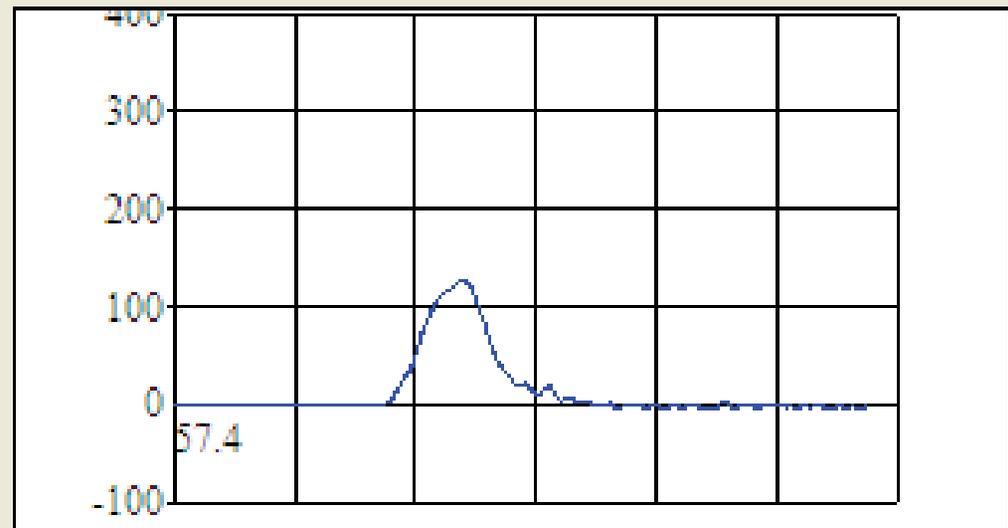
A1160314.TR2-Medium -Hot -RR -FLAT ▼



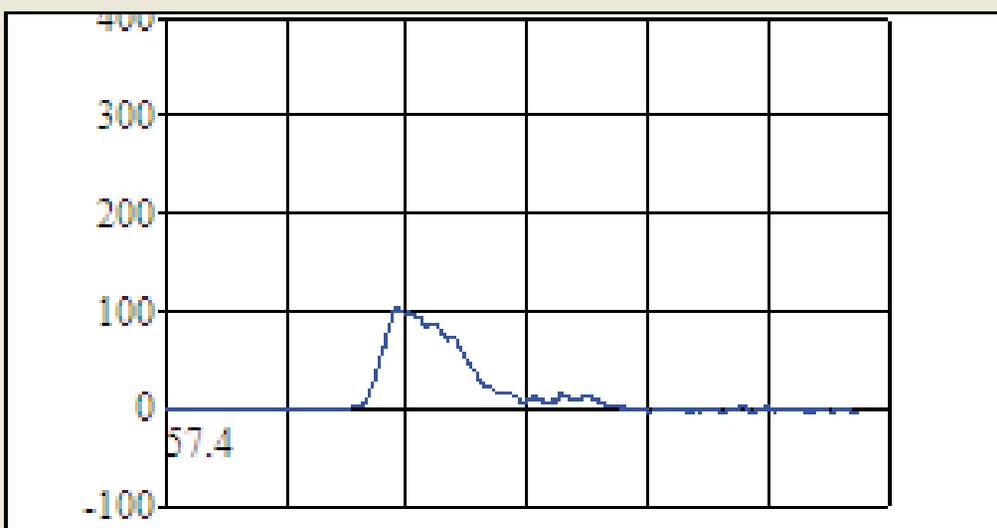
A1160411.TR1-Medium -Wet -PR -HEMI ▼



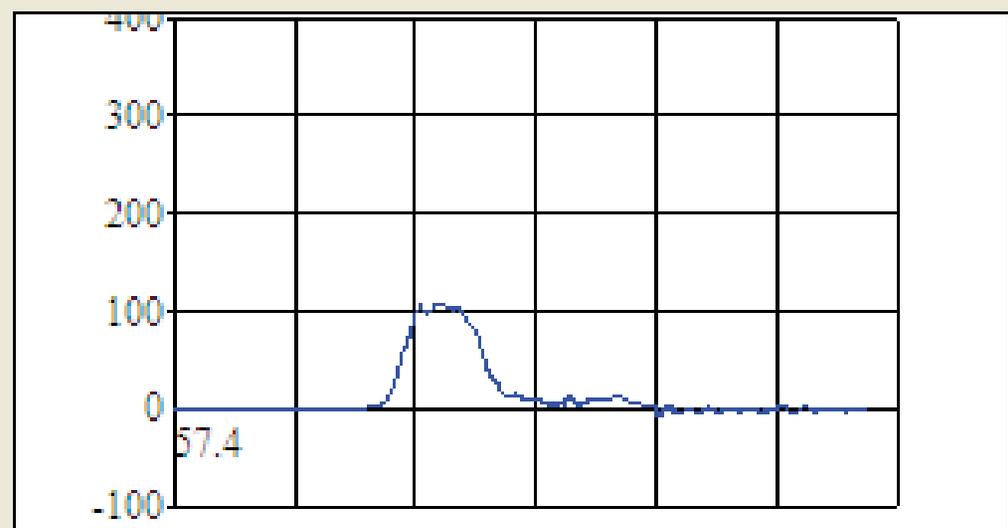
A1160411.TR2-Medium -Wet -PR -HEMI ▼



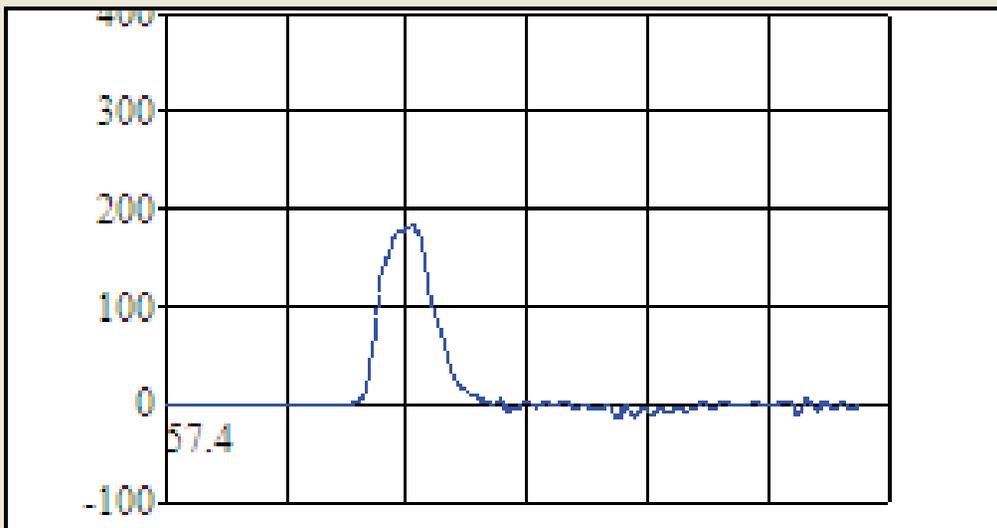
A1160412.TR1-Medium -Wet -LF -HEMI ▼



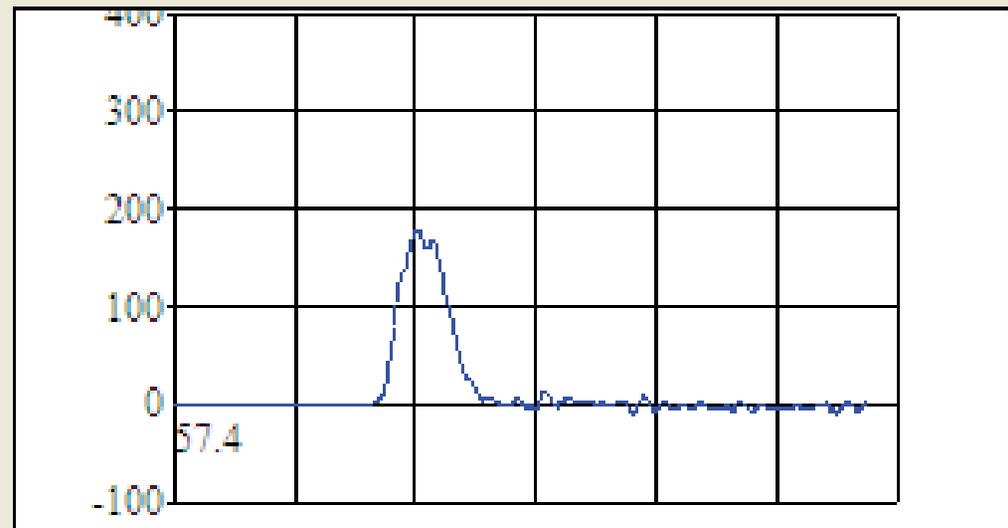
A1160412.TR2-Medium -Wet -LF -HEMI ▼



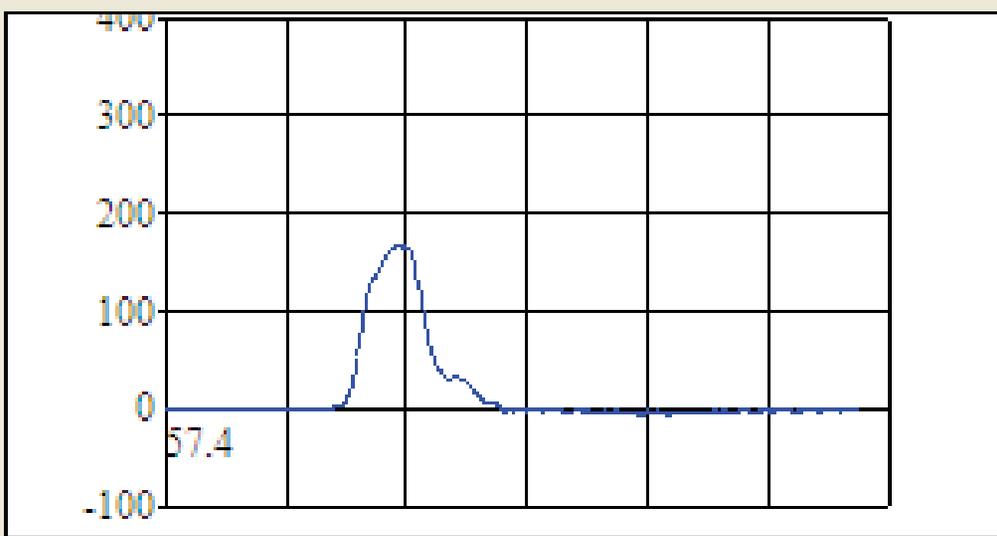
A1160413.TR1-Medium -Wet -RG -FLAT ▼



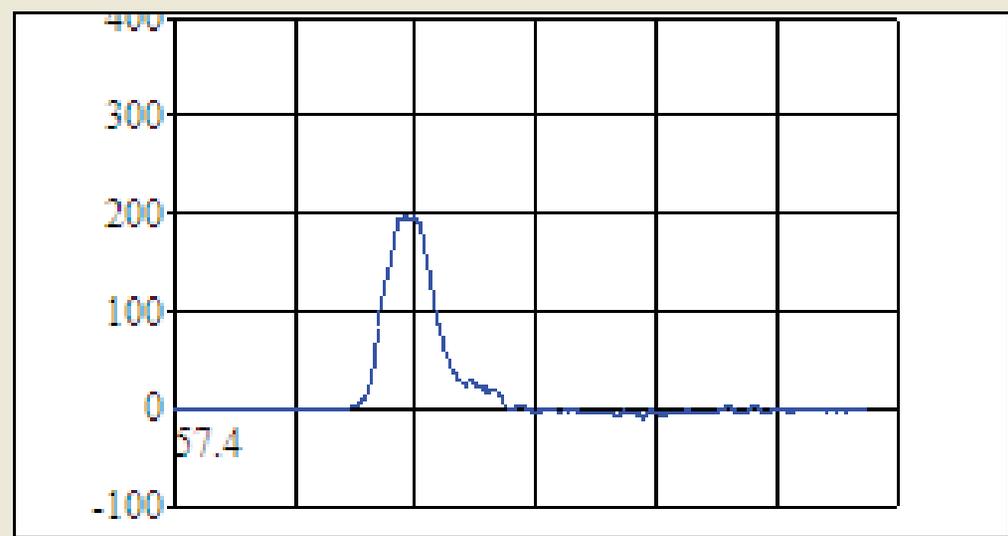
A1160413.TR2-Medium -Wet -RG -FLAT ▼



A1160414.TR1-Medium -Wet -RR -FLAT ▼



A1160414.TR2-Medium -Wet -RR -FLAT ▼



CALCULATE BIAS

Bias (mV): #1:

#2:

#3:

#4:

#5:

Present Limit
Value (mV):

PERFORM POSTTEST: DROP #: 1

Drop Height (m):

Peak G's:

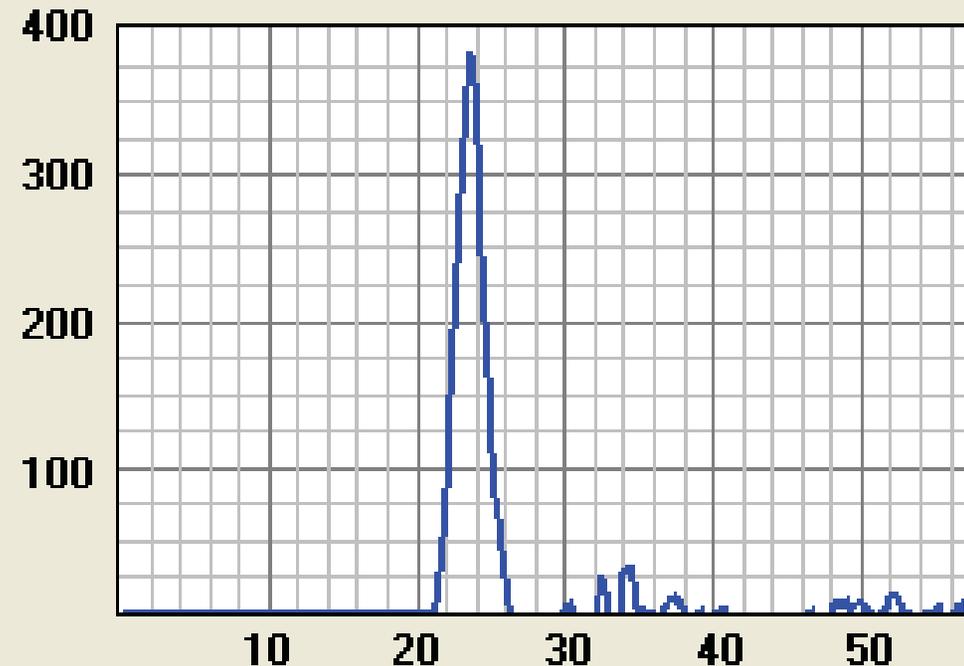
Peak Time (ms):

▲ Time @ 150 G (ms):

▲ Time @ 200 G (ms):

Gate Time (ms):

Impact Velocity (m/s):



Acceleration (G's) vs Time (ms)

HEADFORM POSITION

- Front Left
 Right Rear
 Crown
 Other

HEADFORM SIZE

- Size A Size C
 Size D Size E
 Size J Size M
 Hybrid-3 Other

CALCULATE BIAS

Bias (mV): #1:

#2:

#3:

#4:

#5:

Present Limit
Value (mV):

PERFORM POSTTEST: DROP #: 2

Drop Height (m):

Peak G's:

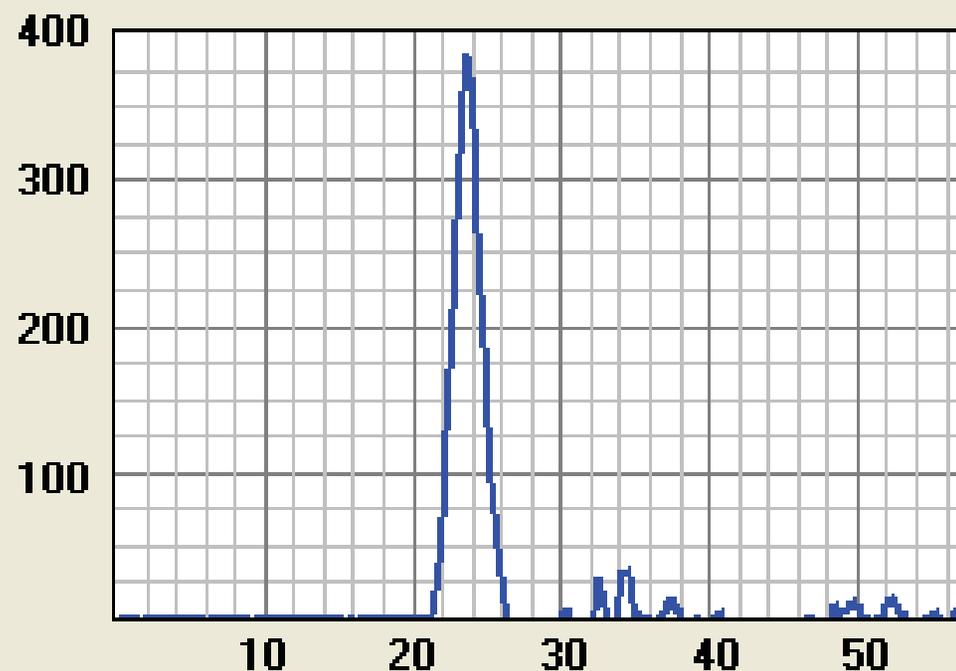
Peak Time (ms):

▲ Time @ 150 G (ms):

▲ Time @ 200 G (ms):

Gate Time (ms):

Impact Velocity (m/s):



Acceleration (G's) vs Time (ms)

HEADFORM POSITION

- Front Left
 Right Rear
 Crown

Other

HEADFORM SIZE

- Size A Size C
 Size D Size E
 Size J Size M
 Hybrid-3 Other

CALCULATE BIAS

Bias (mV): #1:

#2:

#3:

#4:

#5:

Present Limit
Value (mV):

PERFORM POSTTEST: DROP #: 3

Drop Height (m):

Peak G's:

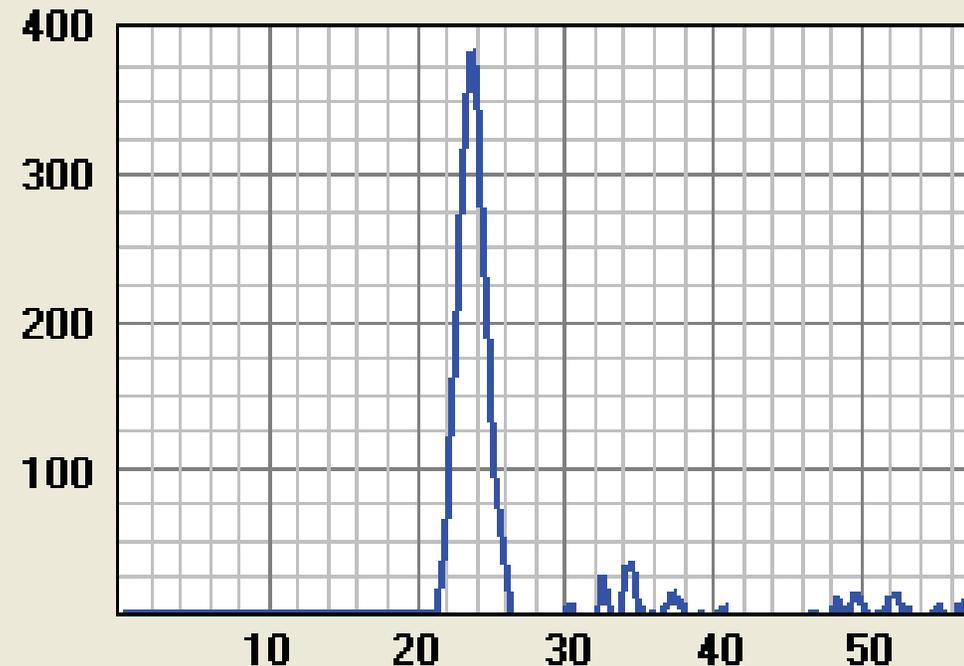
Peak Time (ms):

▲ Time @ 150 G (ms):

▲ Time @ 200 G (ms):

Gate Time (ms):

Impact Velocity (m/s):



Acceleration (G's) vs Time (ms)

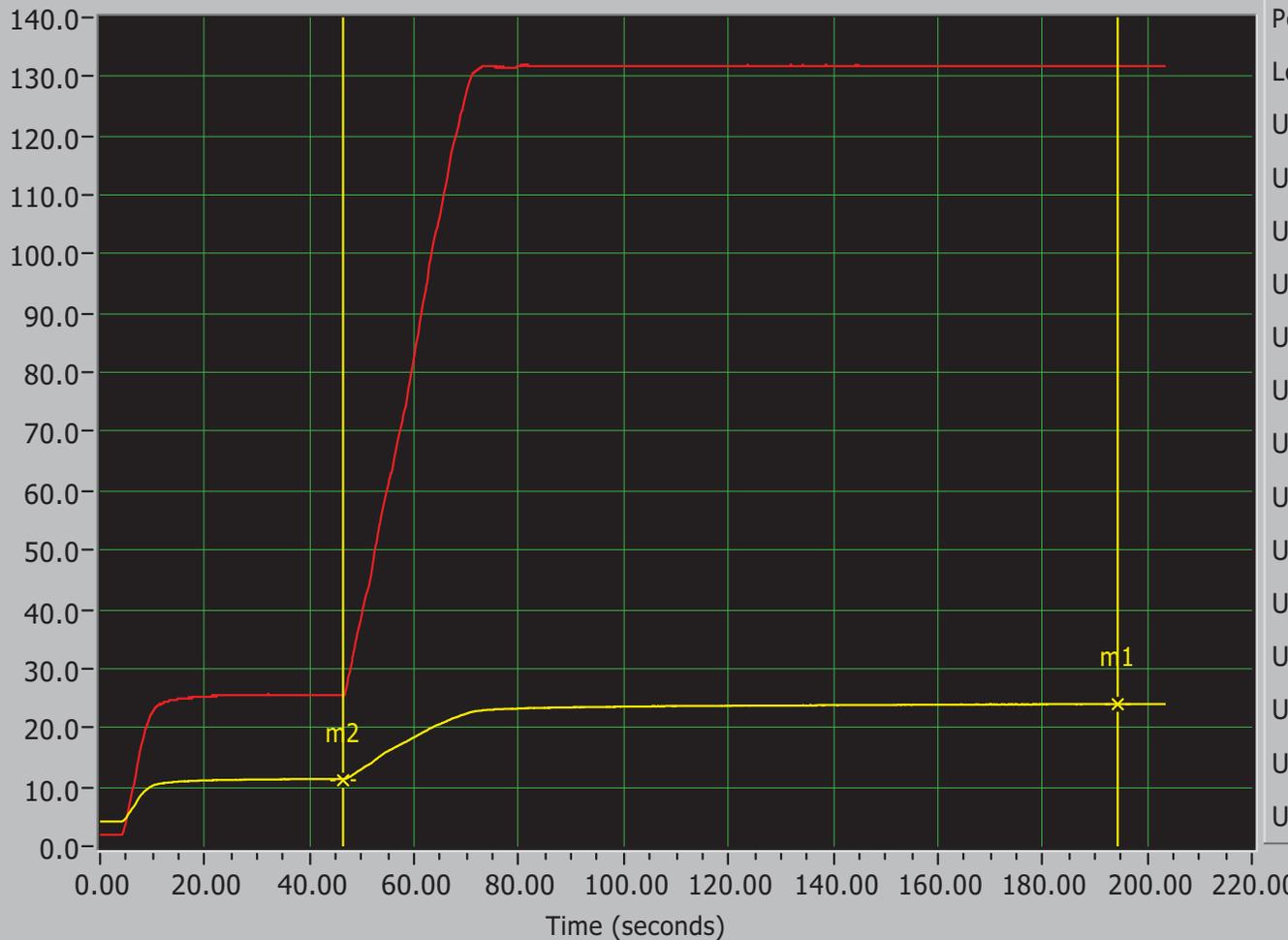
HEADFORM POSITION

- Front Left
 Right Rear
 Crown
 Other

HEADFORM SIZE

- Size A Size C
 Size D Size E
 Size J Size M
 Hybrid-3 Other

Comment 5X5 SA-08 Medium - Hot



- Position (mm)
- Load (kg)
- Unused

	Min.	Max.	Avg.
Position (mm)	4.169	23.980	19.848
Load (kg)	1.912	132.032	100.109
Unused	0.000	0.000	0.000
Unused	0.000	0.000	0.000
Unused	0.000	0.000	0.000
Unused	0.000	0.000	0.000
Unused	0.000	0.000	0.000
Unused	0.000	0.000	0.000
Unused	0.000	0.000	0.000
Unused	0.000	0.000	0.000
Unused	0.000	0.000	0.000
Unused	0.000	0.000	0.000
Unused	0.000	0.000	0.000
Unused	0.000	0.000	0.000
Unused	0.000	0.000	0.000
Unused	0.000	0.000	0.000
Unused	0.000	0.000	0.000
Unused	0.000	0.000	0.000
Unused	0.000	0.000	0.000

Zoom In (+) / Zoom Out (-) / Pan (Hand)

Processing
Average

Delta T
m2 - m1: 148.0000
m4 - m3: 0.0000

Delta Y
m2 - m1: 12.6567
m4 - m3: 0.0000

Math
m1,m2: 0.0855
m3,m4: NaN
Delta Y/Delta T

Cursor Control

m1	194.400	23.980		
m2	46.400	11.323		
m3	0.000	-100.18		
m4	0.000	-100.18		

Printing ...

Print Datasheet (F9)

Return (Esc)

APPENDIX A

INTERPRETATIONS OR DEVIATIONS FROM FMVSS 218

Some of the impact velocities for these tests may be less than the minimum velocities specified in FMVSS 218 at S7.1.4.

Contract File No.: 52.0014

Test File: A116

Control Document Rev. 04/01/09

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Technician: Scott Huber

Date: 8-12-09

APPENDIX B

EQUIPMENT LIST AND CALIBRATION SCHEDULES

DOT Fixtures						
Label	Description	Manufacturer	Model	S/N	Dimensional Check	Next
1-1	Monorail	US Testing	Tespac 800	None	12/19/2008	12/19/2009
3-7	DOT Small Headform	Controlled Casting	None	None	12/23/2008	12/23/2009
3-8	DOT Medium Headform	Controlled Casting	None	None	12/23/2008	12/23/2009
3-9	DOT Large Headform	Controlled Casting	None	None	12/23/2008	12/23/2009
3-10	Reference Head form	Hong Jin Crown	DOT-Small	None	12/19/2008	12/19/2009
3-11	Reference Head form	Hong Jin Crown	DOT-Medium	None	12/19/2008	12/19/2009
3-12	Reference Head form	Hong Jin Crown	DOT-Large	None	12/19/2008	12/19/2009
4-3	MEP	Cadex	Flat, 1.0 inch	16100801	12/19/2008	12/19/2009
4-5	Anvil	US Testing	Flat	None	12/19/2008	12/19/2009
4-6	Anvil	Biokinetics	Hemispherical	None	12/19/2008	12/19/2009
5-1	High Temp. Cabinet	Barnstead International	OV116040 – LC-8	116005-0891414	12/19/2008	12/19/2009
5-2	Low Temp. Cabinet	Scientemp	34-25	S8001170	12/19/2008	12/19/2009
5-3	Water Conditioning Container	Rubbermaid	32 gallon	None	12/19/2008	12/19/2009
6-1	Retention Strength Tester	La Cienega Manufacturing	D&K 250	None	12/19/2008	12/19/2009

Contract File No.: 52.0014

Test File: A116

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Technician: Scott Huber

Date: 8-12-09

DOT Calibrated Measurement Equipment											
Label	Description	Manufacturer	Model	S/N	Range	Accuracy from Cal. Certs	Calibration			Maintenance	
							Last	Next	by	Last	Next
1-4	Velocity Gate Flag	Lightening Powder Co.	None	None	31.4 mm	1.01mm	12/23/2008	12/23/2009	ACT	12/23/08	12/23/09
2-1	Accelerometer	Endevco	7702A-50	GE557	2000g	2.71%	12/16/2008	12/16/2009	Precision Labs	12/17/08	12/16/09
2-2	Power Supply	Endevco	109	AP23	-		12/16/2008	12/16/2009	Precision Labs	12/17/08	12/16/09
2-3	Charge Amplifier	Endevco	104	AK27	-		12/16/2008	12/16/2009	Precision Labs	12/17/08	12/16/09
2-4	Analog Filter	Endevco	in 104	None	2000g		12/16/2008	12/16/2009	Precision Labs	12/17/08	12/16/09
2-6	Computer	Dell	Optiplex GX 520	67G5891	-		12/16/2008	12/16/2009	Precision Labs	12/17/08	12/16/09
2-7	I-O Board	National Instruments	PCI-6023E	None	-		12/16/2008	12/16/2009	Precision Labs	12/17/08	12/16/09
2-5	Velocity Gate	Biokinetics	001-2-186 9404	9411-005	-	0.16msec	12/16/2008	12/16/2009	Precision Labs	12/17/08	12/16/09
7-1	Environmental Monitoring	Veriteq	SP-2000-20R, Temp. & RH	8052076	-40 To +95C, 0-100% RH	0.03 C .6%RH	7/16/2008	7/16/2009	Veriteq	12/23/08	12/23/09
7-2	Environmental Monitoring	Veriteq	SP-1000-22N, Temp.	08071106	-40 To +95C	.02 C	7/16/2008	7/16/2009	Veriteq	12/23/08	12/23/09
7-3	Environmental Monitoring	Veriteq	SP-1000-22N, Temp. (2 channels)	08071102	-40 To +95C	.02 C .02 C	7/16/2008	7/16/2009	Veriteq	12/23/08	12/23/09
7-4	Scale	O'Haus	Scout PRO	None	0-6000gm	0.067 g	12/19/2008	12/19/2009	A-CAL	12/19/08	12/19/09
7-5	Load Cell	Transducer Techniques	DSM 1000	154988	0-1000lbf	0.009 mV	12/19/2008	12/19/2009	A-CAL	12/19/08	12/19/09
7-6	LVDT	Schaevitz	2000HR	16071	two inch	0.06 mm	12/19/2008	12/19/2009	A-CAL	12/19/08	12/19/09
7-7	Peripheral Vision Apparatus	La Cienega Manufacturing	D&K 125	None	180 degrees	0.7 degree	12/19/2008	12/19/2009	A-CAL	12/19/08	12/19/09
7-9	Digital Height Gauge	Starrett	D34-16	None	300cm	0.05 in	12/19/2008	12/19/2009	A-CAL	12/19/08	12/19/09
7-10	Digital Caliper	Mitutoyo	CD-6"CSX	08158285	6 inch	0.04 in	12/19/2008	12/19/2009	A-CAL	12/19/08	12/19/09
7-11	Height Gauge	Mitutoyo	unknown	3121016	12 inch	0.002in	12/23/2008	12/23/2009	A-CAL	12/19/08	12/19/09

Contract File No.: 52.0014

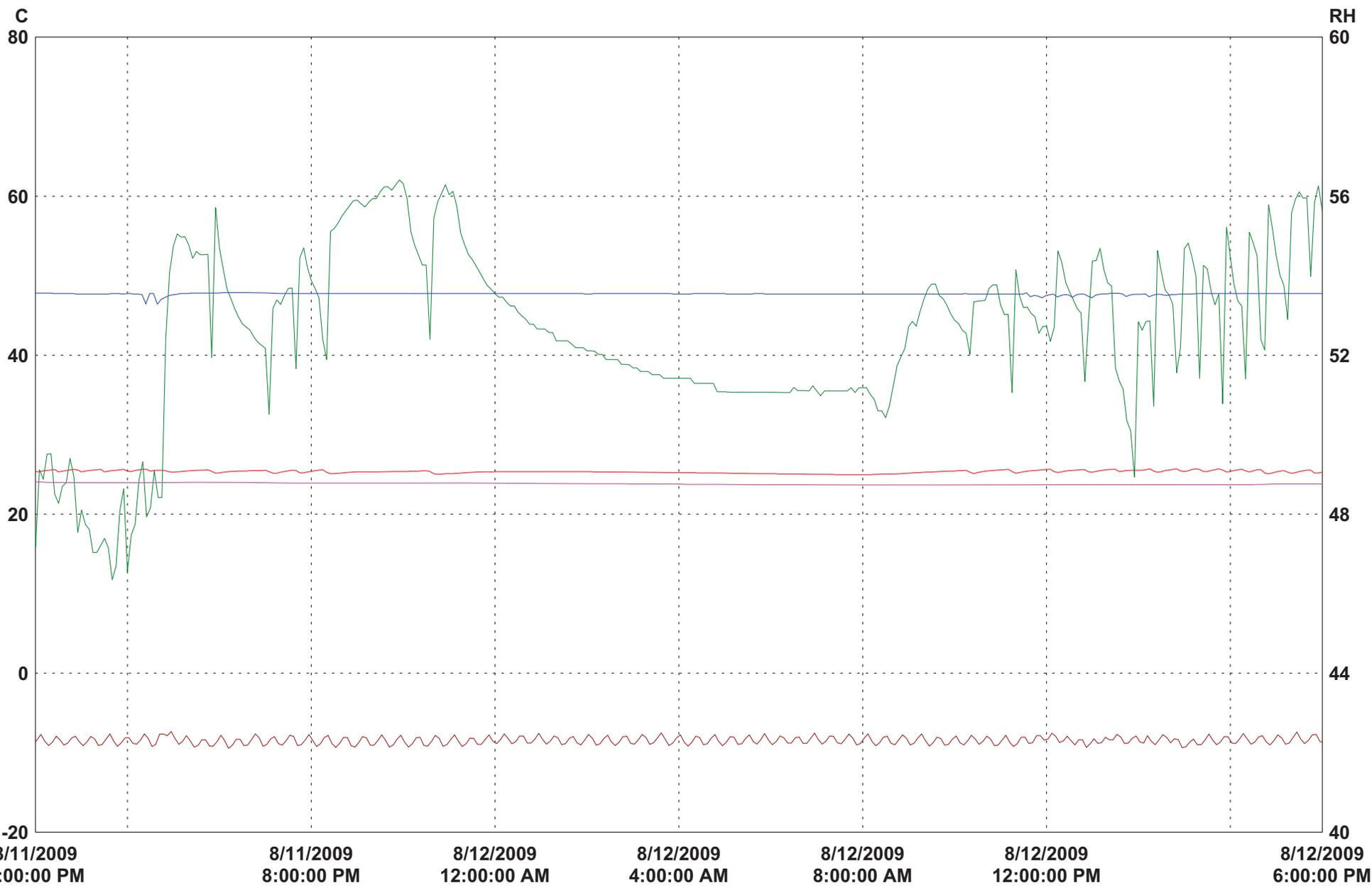
Technician: Scott Huber

Test File: A116

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Date: 8-12-09



4 hours/div 1 day 04:00:00 (M/d/yyyy h:mm:ss tt)

Graph file: Unsaved

LN	Serial #	CH	Units	Description	Logger file	Logger description
1	08052076	1	C	Lab Temp.	C:\Program Files\Veriteq Instruments\viewLinc 3.0\transfers\Logger 1-08052076-2009-08-13 10-16-42.spl	Logger 1
2	08052076	2	RH	Humidity	C:\Program Files\Veriteq Instruments\viewLinc 3.0\transfers\Logger 1-08052076-2009-08-13 10-16-42.spl	Logger 1
3	09021116	1	C	Oven	C:\Program Files\Veriteq Instruments\viewLinc 3.0\transfers\Logger 3-09021116-2009-08-13 10-16-43.spl	Logger 3
4	09021116	2	C	Water	C:\Program Files\Veriteq Instruments\viewLinc 3.0\transfers\Logger 3-09021116-2009-08-13 10-16-43.spl	Logger 3
5	08071106	1	C	Freezer	C:\Program Files\Veriteq Instruments\viewLinc 3.0\transfers\logger 2-08071106-2009-08-13 10-17-07.spl	logger 2

APPENDIX C
PHOTOGRAPHS

Contract File No.: 52.0014

Test File: A116

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Technician: Scott Huber

Date: 8-12-09



Monorail Apparatus with Three Headforms (S, M, L), Flat, Hemi and MEP Anvils, and Data Acquisition Equipment



Retention System Strength Test Apparatus with Pneumatic Cylinder, Load Cell, and LVDT



Penetration Resistance Test Apparatus with Adjustable Base



5X5 SA-08 Front view with test line



5X5 SA-08 Rear view with test line



5X5 SA-08 Interior view



5X5 SA-08 Right front penetration location





5X5 SA-08 Ambient
right rear penetration
failure location



5X5 SA-08 Cold
right rear penetration
failure location



Report No: 52.0014
Make & Model: 5X5 SA.08
Condition: AMBIENT
Location: Right Rear
Boss 

Report No: 52.0014
Make & Model: 5X5 SA.08 
Condition: COND
Location: Right Rear Boss

Report No: 52.0014
Make & Model: 5X5 SA.08 
Condition: Wet
Location: Right Rear
Boss

WARNING

No helmet can protect the from all possible impacts.

To provide maximum protection the helmet must:

1. Fit snugly enough to move your skin and scalp when you try to move helmet on your head with chin strap fastened. Test by attempting to move helmet from side to side, and from rear edge upwards and forward.
2. Must allow adequate peripheral vision, especially when worn with goggles or eye protection. Tinted goggles or face shields should not be worn at night or in any condition of poor visibility.
3. The chin strap must always be fastened securely, back and tight against your throat.
4. Helmet can be seriously damaged by some common substances without damage being visible to the user. After any blow or impact replace or return to manufacturer for inspection and/or replacement.
5. Helmets should be replaced after five years. The helmets are made of materials which deteriorate with age and therefore have a limited life span.
6. Make no modification whatever to the outer shell, liner or retention system. Any modification may imply the protective capability of the helmet.
7. Apply only the following materials to clean your helmet: Mild soap and water or a solution of bicarbonate of soda for the liner and automotive wax or polish for the outer shell.
8. The liner material is polystyrene.

IMPORTANT: Review your helmet owner's Manual for additional information on proper fit, care and storage prior to using your helmet.

Material of the outer shell:

ABS Plastic

Fiberglass

Shell material box not checked to identify shell material for this model helmet.

