Modified/Abbreviated NIJ 0106.01/STANAG 2920 and NIJ 0101.06 Testing

Prepared By:

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1. Introduction

provided five helmet samples and six hard armor samples for testing in accordance with NIJ 0106.01, STANAG 2920 and NIJ 0101.06.

2. Threats and Instrumentation

2.1. Threats

- 9mm 124 gr. FMJ
- 44 Mag. 240 gr. LSWCGC
- 44 Mag. 240 gr. JHP
- 357 Sig 125 gr. FMJ (TMJ)
- 17 gr. FSP
- 7.62mm 147 gr. M80
- 30 Cal. 166 gr. APM2
- 5.56mm 62 gr. M855 (SS109)
- 7.62x39mm 123 gr. MSC
- 7.62x39mm 119 API-BZ
- 7.62x54R 150 gr. B32

2.2 Instrumentation

Projectile velocity measurements were obtained using Oehler Research Model 57 infrared screens with Oehler Research Model 34 chronographs. Penetration was determined by visual examination of the aluminum witness sheet or Roma Clay. BFS measurement were obtained using a calibrated digital depth gauge.

3. Details of Test

The objective of this project was to determine if the samples provided met the P-BFS requirements of NIJ 0106.01 and NIJ 0101.06 and to determine ballistic limit.

Conditioning, velocity, range length and results are noted on the data sheets. The samples were secured to the helmet test rig or clay block using elastic straps with hook and loop fastening. The witness material was inspected after each impact for penetration.

4. Summary of Results

Table 1. Summary of Helmet Penetration Testing

Test Record	Conditioned	Threat	Shot Number	Velocity (m/s)	Penetration (Y/N)
PGD23001-1	Wet	44 Mag. LSWC-GC	1	431.4	N
			2	419.6	N
			3	412.1	N
			4	433.9	N
PGD23001-2	Wet	9mm FMJ	1	439.1	N
			2	432.3	N
			3	417.9	N
			4	412.4	N
PGD23001-3	Wet	44 Mag. JHP	1	427.5	N
			2	429.1	N
			3	431.0	N
			4	427.7	N
PGD23001-4	Wet	357 Sig TMJ	1	449.2	N
			2	447.3	N
			3	449.4	N
			4	459.3	N

Table 2. Summary of Helmet V50 Testing

Test Record	Conditioned	Threat	V50 (m/s)	Range of Results	Mixed Range of Results
PGD23001-5	Ambient	17 gr. FSP	659.8	27.4	27.4

Table 3. Summary of Helmet Penetration Testing

Test Record	Conditioned	Threat	Shot Number	Velocity (m/s)	BFS (mm) Penetration (Y/N)
PGD23001-6	Dropped/ Submerged	5.56mm SS109	1	954.9	17.92
			2	952.2	16.48
			3	956.1	N
			4	954.9	N
			5	945.4	N
			6	948.9	N
PGD23001-7	Dropped/ Submerged	7.62mm M80	1	850.4	43.86
			2	851.4	40.93
			3	859.1	N
			4	850.9	N
			5	843.9	N
			6	854.3	N
PGD23001-8	Dropped/ Submerged	7.62x39mm MSC	1	718.5	26.28
			2	717.9	25.58
			3	726.4	N
			4	719.2	N
			5	730.2	N
			6	728.1	N
PGD23001-9	Dropped/ Submerged	7.62x39mm API-BZ	1	710.8	24.34
			2	721.2	23.86
			3	713.8	24.38
PGD23001-10	Dropped/ Submerged	30 Cal. APM2	1	877.4	40.01
PGD23001-11	Dropped/ Submerged	7.62x54R B32	1	857.6	41.11

Best Regards,

Matt Lutz
General Manager

NATIONAL TECHNICAL SYSTEMS
NIJ 0106.01 HELMET:
BALLISTIC PENETRATION TEST

Date Received: February 18, 2023
Via: Fed Ex
Returned Via: Fed Ex

Record No.: PGD23001-1
Test Date: March 16, 2023

Test Conditions
Temperature: 21.1 °C
Humidity: 40 %

Test Standard: Modified / Abbreviated NIJ Standard 0106.01 for Ballistic Helmets December 1981
Test Method: IAW Paragraph 5.2 Ballistic Penetration Test
Test Ammunition: IAW NIJ Standard 0108.01, September 1985
Threat Level: IIIA
Conditioning: Wet

Range 2
Muzzle to Screen 1: 1.52 m
Screen 1 - 2: 1.52 m
Screen 2 - Target: 1.83 m
Midpoint to Target: 2.59 m

Headform Size: 7 1/4
Witness Plate: 2024-T3 Alum.
Barrel Length: 25.4 cm

Sample Tested Description		Test / Ammunition Description					Chronograph		Test Results
		Shot No.	Impact Location	Degree Obliquity	Caliber	Bullet Weight (gr.) / Type	TIME sx-5	VELOCITY m/s	Penetration No Penetration
Model No.:	ARCH HIGH CUT	1	Front	0°	.44 Mag.	240 / LSWC GC	353.3	431.4	No Penetration
Size:	L	2	Back	0°			363.2	419.6	No Penetration
Serial No.:	22081817	3	Right	0°			369.8	412.1	No Penetration
Lot No.:	3777	4	Left	0°			351.2	433.9	No Penetration
Weight (kg.):	1.360								
Protection Level:	NIJ IIIA								

Notes:
•Helmet tested as received from customer with retention / suspension system, chinstrap and pads.

Conditioning:
•Helmet tested at ambient conditions 20 - 28 °C (68 - 82°F) and 30% - 70% RH

Test Ammunition / Velocity Information:
Test Round: .44 Magnum 240 gr. Lead Semi-Wadcutter Gas Checked (LSWCGC)
Test Velocity: 426 +/- 15 m/s (1400 +/- 50 ft/s)

Technician (s): Wilson / Zerger

NATIONAL TECHNICAL SYSTEMS
NIJ 0106.01 HELMET:
BALLISTIC PENETRATION TEST

Date Received: February 18, 2023
Via: Fed Ex
Returned Via: Fed Ex

Record No.: PGD23001-2
Test Date: March 16, 2023

Test Conditions
Temperature: 20.6 °C
Humidity: 40 %

Test Standard: Modified / Abbreviated NIJ Standard 0106.01 for Ballistic Helmets December 1981
Test Method: IAW Paragraph 5.2 Ballistic Penetration Test
Test Ammunition: IAW NIJ Standard 0108.01, September 1985
Threat Level: IIIA
Conditioning: Wet

Range 2
Muzzle to Screen 1: 1.52 m
Screen 1 - 2: 1.52 m
Screen 2 - Target: 1.83 m
Midpoint to Target: 2.59 m

Headform Size: 7 1/4
Witness Plate: 2024-T3 Alum.
Barrel Length: 25.4 cm

Sample Tested Description

Model No.: ARCH HIGH CUT
Size: L
Serial No.: 2208108
Lot No.: 3777R
Weight (kg.): 1.381
Protection Level: NIJ IIIA

Test / Ammunition Description					Chronograph		Test Results
Shot No.	Impact Location	Degree Obliquity	Caliber	Bullet Weight (gr.) / Type	TIME sx-5	VELOCITY m/s	Penetration No Penetration
1	Front	0°	9mm	124 / FMJ	347.1	439.1	No Penetration
2	Back	0°			352.5	432.3	No Penetration
3	Right	0°			364.7	417.9	No Penetration
4	Left	0°			369.5	412.4	No Penetration

Notes:
•Helmet tested as received from customer with retention / suspension system, chinstrap and pads.

Conditioning:
•Helmet tested at ambient conditions 20 - 28 °C (68 - 82°F) and 30% - 70% RH

Test Ammunition / Velocity Information:
Test Round: Remington (23558), 9mm 124 gr. FMJ RN
Test Velocity: 426 +/- 15 m/s (1400 +/- 50 ft/s)

Technician (s): Wilson / Zerger

NATIONAL TECHNICAL SYSTEMS
NIJ 0106.01 HELMET:
BALLISTIC PENETRATION TEST

Date Received: February 18, 2023
Via: Fed Ex
Returned Via: Fed Ex

Record No.: PGD23001-3
Test Date: March 16, 2023

Test Conditions
Temperature: 21.7 °C
Humidity: 40 %

Test Standard: Modified / Abbreviated NIJ Standard 0106.01 for Ballistic Helmets December 1981
Test Method: IAW Paragraph 5.2 Ballistic Penetration Test
Test Ammunition: IAW NIJ Standard 0101.06, July 2008
Threat Level: IIIA
Conditioning: Wet

Range 2
Muzzle to Screen 1: 1.52 m
Screen 1 - 2: 1.52 m
Screen 2 - Target: 1.83 m
Midpoint to Target: 2.59 m

Headform Size: 7 1/4
Witness Plate: 2024-T3 Alum.
Barrel Length: 25.4 cm

Sample Tested Description

Model No.: ARCH HIGH CUT
Size: L
Serial No.: 22081775
Lot No.: 3777
Weight (kg.): 1.361
Protection Level: NIJ IIIA

Test / Ammunition Description					Chronograph		Test Results
Shot No.	Impact Location	Degree Obliquity	Caliber	Bullet Weight (gr.) / Type	TIME sx-5	VELOCITY m/s	Penetration No Penetration
1	Front	0°	.44 Mag.	240 / JHP	356.5	427.5	No Penetration
2	Back	0°			355.2	429.1	No Penetration
3	Right	0°			353.6	431.0	No Penetration
4	Left	0°			356.3	427.7	No Penetration

Notes:
•Helmet tested as received from customer with retention / suspension system, chinstrap and pads.

Conditioning:
•Helmet tested at ambient conditions 20 - 28 °C (68 - 82°F) and 30% - 70% RH

Test Ammunition / Velocity Information:
Test Round: Speer (4453 or 4736), .44 Magnum 240 gr. Jacketed Hollow Point (JHP)
Test Velocity: 436 +/- 10 m/s (1430 +/- 30 ft/s)

Technician (s): Wilson / Zerger

NATIONAL TECHNICAL SYSTEMS
NIJ 0106.01 HELMET:
BALLISTIC PENETRATION TEST

Date Received: February 18, 2023
Via: Fed Ex
Returned Via: Fed Ex

Record No.: PGD23001-4
Test Date: March 16, 2023

Test Conditions
Temperature: 21.1 °C
Humidity: 37 %

Test Standard: Modified / Abbreviated NIJ Standard 0106.01 for Ballistic Helmets December 1981
Test Method: IAW Paragraph 5.2 Ballistic Penetration Test
Test Ammunition: IAW NIJ Standard 0101.06, July 2008
Threat Level: IIIA
Conditioning: Wet

Range 2
Muzzle to Screen 1: 1.52 m
Screen 1 - 2: 1.52 m
Screen 2 - Target: 1.83 m
Midpoint to Target: 2.59 m

Headform Size: 7 1/4
Witness Plate: 2024-T3 Alum.
Barrel Length: 25.4 cm

Sample Tested Description		Test / Ammunition Description					Chronograph		Test Results
		Shot No.	Impact Location	Degree Obliquity	Caliber	Bullet Weight (gr.) / Type	TIME sx-5	VELOCITY m/s	Penetration No Penetration
Model No.:	ARCH HIGH CUT	1	Front	0°			339.3	449.2	No Penetration
Size:	L	2	Back	0°	.357 Sig	125 / TMJ	340.4	447.7	No Penetration
Serial No.:	22081533	3	Right	0°			339.1	449.4	No Penetration
Lot No.:	3777	4	Left	0°			331.8	459.3	No Penetration
Weight (kg.):	1.353								
Protection Level:	NIJ IIIA								

Notes:
•Helmet tested as received from customer with retention / suspension system, chinstrap and pads.

Conditioning:
•Helmet tested at ambient conditions 20 - 28 °C (68 - 82°F) and 30% - 70% RH

Test Ammunition / Velocity Information:
Test Round: Speer (4362), .357 Sig 125 gr. TMJ
Test Velocity: 448 +/- 10 m/s (1430 +/- 30 ft/s)

Technician (s): Wilson / Zerger

NATIONAL TECHNICAL SYSTEMS
V50 BALLISTIC LIMIT TEST

Date Received: February 18, 2023
Via: Fed Ex
Returned Via: Fed Ex

Record No.: PGD23001-5
Test Date: March 16, 2023

Test Conditions
Temperature: 20.5 °C
Humidity: 51 %

Sample Description

Model No.: ARCH HIGH CUT
Size: L
Serial No.: 22081474
Lot No.: 3777
Weight (kg.): 1.365
Protection Level: NIJ IIIA

Threat
Projectile: Fragment Simulating Projectile
Weight: 1.1 g (17 gr.)
Type: Type 2 (HRC 27 +/- 3)
Powder: Bullseye
Barrel Length: 60.96 cm
Obliquity: 0º
Yaw: ≤ 5º

Test Standard / Specification
STANAG 2920, Edition 2
31 July 2013
Target: Helmet Shell
Conditioning: Ambient

Range 2
Muzzle to Screen 1: 1.36 m
Screen 1 - 4: 1.52 m
Screen 2 - 3: 1.25 m
Screen 4 - Target: 2.35 m
Midpoint to Target: 3.11 m

Witness Information
Witness Sheet: 0.5mm Aluminum Alloy
Target to Witness: 5 cm

Shot No.	Powder Charge (gr.)	CHRONOGRAPHS 1 - 4 TIME sx-5	CHRONOGRAPHS 1 - 4 VELOCITY m/s	CHRONOGRAPHS 2 - 3 TIME sx-5	CHRONOGRAPHS 2 - 3 VELOCITY m/s	AVERAGE VELOCITY m/s	LOSS VELOCITY m/s	STRIKING VELOCITY m/s	TEST RESULTS IMPACT LOCATION	TEST RESULTS Shot Included Y or N	TEST RESULTS Complete - C Partial - P
1	4.7	204.0	747.1	166.2	749.1	748.1	38.7	709.4	Crown	N	C
2	4.4	214.3	711.2	174.6	713.1	712.1	36.7	675.4	Front	Y	P
3	4.6	211.9	719.2	172.5	721.7	720.5	37.2	683.2	Right	N	C
4	4.4	223.4	682.2	181.9	684.4	683.3	35.4	648.0	Back	Y	C
5	4.2	219.6	694.0	178.9	695.9	695.0	35.9	659.0	Left	Y	C
6	4.1	232.1	656.6	189.1	658.4	657.5	33.9	623.6	Crown	N	P
7	4.2	221.4	688.3	180.3	690.5	689.4	35.5	653.9	Front	Y	P
8	4.3	215.2	708.2	175.3	710.2	709.2	36.7	672.5	Right	Y	C
9	4.2	222.6	684.6	181.3	686.7	685.7	35.5	650.2	Back	Y	P

This test was performed in accordance with the specification requirements and the results properly reflect the ballistic performance of the listed sample.

V50 VELOCITY	HIGH PARTIAL	LOW COMPLETE	RANGE OF RESULTS	RANGE OF MIXED RESULTS
659.8 m/s	**675.4** m/s	**648.0** m/s	**27.4** m/s	**27.4** m/s

Notes:
•Helmet was tested as a finished helmet shell with retention/suspension system removed for V50 consistency.
•Helmet Shell secured using helmet V50 fixture IAW Annex E to STANAG 2920, Figures E1 and E2.

Projectile Used:
.22 Caliber, 1.1g +/- 0.03g (17 gr.) Chisel Nose Fragment Simulating Projectile (FSP)
IAW Appendix 1 to Annex A - Category A2: Type 2 (27 +/- 3 HRC) IAW Figure A1a

Starting Velocity / V50 Calculation:
•Starting Velocity: 700 m/s
•V50 based on (6) fair impacts using (3) partial and (3) complete penetrations with a range of results ≤ 40 m/s.

Wilson / Zerger

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HARD ARMOR STAND-ALONE PLATE:
P-BFS TEST

Date Received: February 16, 2023
Via: FedEx
Returned Via: FedEx

Record No.: PGD23001-6
Test Date: March 28, 2023

Test Conditions

Temperature:	20.0	ºC
Humidity:	34	%
Clay Block No.:	11	
Clay Block Size:	24" x 24" x 5.5"	
Clay Temperature:	35.6	ºC
Drop Average:	19.06	mm

Range 3

Muzzle to Screen 1:	11.98	m
Screen 1 - 4:	1.52	m
Screen 4 - Target:	1.74	m
Midpoint to Target:	2.50	m
Barrel Length:	66.04	cm

Test Standard: IAW Modified / Abbreviated NIJ 0101.06, July 2008
Threat Level: III++

Conditioning: Ambient
Drop Test: Yes
Submersion: Yes

Sample Description		Shot / Projectile Description					Chronograph		Test Results
		Shot No.	Shot Location	Degree Obliquity	Caliber	Bullet Weight (gr.) / Type	TIME sx-5	VELOCITY m/s	Perforation BFS (mm)
Model No.:	B-line-Single-NIJ3	1	Top Left	0°	5.56x45mm	62 / SS109	159.6	954.9	17.92
Lot No.:	N/A	2	Bottom Right	0°			160.0	952.5	16.48
Serial No.:	N/A	3	Middle Left	0°			159.4	956.1	No Perforation
Size (cm):	30x25	4	Middle Right	0°			159.6	954.9	No Perforation
Weight (kg.):	2.550	5	Top Right	0°			161.2	945.4	No Perforation
		6	Bottom Left	0°			160.6	948.9	No Perforation

This test was performed in accordance with the specification requirements listed in addition to any customer testing modifications or requests. The test results properly reflect the ballistic performance of the listed sample. This test report shall not be reproduced except in full without written approval of National Technical Systems.

Notes:
•Stand-Alone plate tested non-planar (with clay mound / build-up)

Ammunition Description:
5.56x45mm, 62 gr. FMJ (SS109)
Velocity: 950 +/- 9.1 m/s

Sample Description:
•Customer Proprietary

Project Manager: Montgomery
Range Tech(s): Zerger

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HARD ARMOR STAND-ALONE PLATE:
P-BFS TEST

Date Received: February 16, 2023
Via: FedEx
Returned Via: FedEx

Record No.: PGD23001-7
Test Date: March 28, 2023

Test Conditions

Temperature:	20.4	ºC
Humidity:	33	%
Clay Block No.:	11	
Clay Block Size:	24" x 24" x 5.5"	
Clay Temperature:	35.4	ºC
Drop Average:	18.55	mm

Range 3

Muzzle to Screen 1:	11.98	m
Screen 1 - 4:	1.52	m
Screen 4 - Target:	1.74	m
Midpoint to Target:	2.50	m
Barrel Length:	66.04	cm

Test Standard: IAW Modified / Abbreviated NIJ 0101.06, July 2008
Threat Level: III

Conditioning: Ambient
Drop Test: Yes
Submersion: Yes

Sample Description

Model No.: B-line-Single-NIJ3
Lot No.: N/A
Serial No.: N/A
Size (cm): 30x25
Weight (kg.): 2.558

Shot / Projectile Description					Chronograph		Test Results
Shot No.	Shot Location	Degree Obliquity	Caliber	Bullet Weight (gr.) / Type	TIME sx-5	VELOCITY m/s	Perforation BFS (mm)
1	Top Left	0°	7.62mm NATO	147 / FMJ (M80)	179.2	850.4	43.86
2	Bottom Right	0°			179.0	851.4	40.93
3	Middle Left	0°			177.4	859.1	No Perforation
4	Middle Right	0°			179.1	850.9	No Perforation
5	Top Right	0°			180.6	843.9	No Perforation
6	Bottom Left	0°			178.4	854.3	No Perforation

This test was performed in accordance with the specification requirements listed in addition to any customer testing modifications or requests. The test results properly reflect the ballistic performance of the listed sample. This test report shall not be reproduced except in full without written approval of National Technical Systems.

Notes:
•Stand-Alone plate tested non-planar (with clay mound / build-up)

Ammunition Description:
7.62mm NATO, 147 gr. (9.6g) FMJ (U.S. Military M80)
Velocity: 847 +/- 9.1 m/s

Sample Description:
•Customer Proprietary

Project Manager: Montgomery
Range Tech(s): Zerger

National Technical Systems

HARD ARMOR STAND-ALONE PLATE:
P-BFS TEST

Date Received: February 16, 2023
Via: FedEx
Returned Via: FedEx

Record No.: PGD23001-8
Test Date: March 28, 2023

Test Conditions

Temperature:	21.9	ºC
Humidity:	33	%
Clay Block No.:	11	
Clay Block Size:	24" x 24" x 5.5"	
Clay Temperature:	35.3	ºC
Drop Average:	18.89	mm

Range 3

Muzzle to Screen 1:	11.98	m
Screen 1 - 4:	1.52	m
Screen 4 - Target:	1.74	m
Midpoint to Target:	2.50	m
Barrel Length:	50.80	cm

Test Standard: IAW Modified / Abbreviated NIJ 0101.06, July 2008
Threat Level: III+

Conditioning: Ambient
Drop Test: Yes
Submersion: Yes

Sample Description

Model No.: B-line-Single-NIJ3
Lot No.: N/A
Serial No.: N/A
Size (cm): 30x25
Weight (kg.): 2.532

Shot / Projectile Description					Chronograph		Test Results
Shot No.	Shot Location	Degree Obliquity	Caliber	Bullet Weight (gr.) / Type	TIME sx-5	VELOCITY m/s	Perforation BFS (mm)
1	Top Left	0°	7.62x39mm	123 / MSC	212.1	718.5	26.28
2	Bottom Right	0°			212.3	717.9	25.58
3	Middle Left	0°			209.8	726.4	No Perforation
4	Middle Right	0°			211.9	719.2	No Perforation
5	Top Right	0°			208.7	730.2	No Perforation
6	Bottom Left	0°			209.3	728.1	No Perforation

This test was performed in accordance with the specification requirements listed in addition to any customer testing modifications or requests. The test results properly reflect the ballistic performance of the listed sample. This test report shall not be reproduced except in full without written approval of National Technical Systems.

Notes:
•Stand-Alone plate tested non-planar (with clay mound / build-up)

Ammunition Description:
Russian 7.62x39mm 123 gr. MSC (M43)
Velocity: 725 +/- 9.1 m/s

Sample Description:
•Customer Proprietary

Project Manager: Montgomery
Range Tech(s): Zerger

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HARD ARMOR STAND-ALONE PLATE:
P-BFS TEST

Date Received: February 16, 2023
Via: FedEx
Returned Via: FedEx

Record No.: PGD23001-9
Test Date: March 28, 2023

Test Conditions

Temperature:	21.1	ºC
Humidity:	34	%
Clay Block No.:	11	
Clay Block Size:	24" x 24" x 5.5"	
Clay Temperature:	34.7	ºC
Drop Average:	17.23	mm

Range 3

Muzzle to Screen 1:	11.98	m
Screen 1 - 4:	1.52	m
Screen 4 - Target:	1.74	m
Midpoint to Target:	2.50	m
Barrel Length:	50.80	cm

Test Standard: IAW Modified / Abbreviated NIJ 0101.06, July 2008
Threat Level: III+

Conditioning: Ambient
Drop Test: Yes
Submersion: Yes

Sample Description		Shot / Projectile Description					Chronograph		Test Results
		Shot No.	Shot Location	Degree Obliquity	Caliber	Bullet Weight (gr.) / Type	TIME sx-5	VELOCITY m/s	Perforation BFS (mm)
Model No.:	B-line-Single-NIJ3	1	Top Center	0°	7.62x39mm	119 / API BZ	214.4	710.8	24.34
Lot No.:	N/A	2	Bottom Right	0°			211.3	721.2	23.86
Serial No.:	N/A	3	Bottom Left	0°			213.5	713.8	24.38
Size (cm):	30x25								
Weight (kg.):	2.569								

This test was performed in accordance with the specification requirements listed in addition to any customer testing modifications or requests. The test results properly reflect the ballistic performance of the listed sample. This test report shall not be reproduced except in full without written approval of National Technical Systems.

Notes:
•Stand-Alone plate tested non-planar (with clay mound / build-up)

Ammunition Description:
Russian 7.62x39mm 119 gr. API BZ
Velocity: 715 +/- 9.1 m/s

Sample Description:
•Customer Proprietary

Project Manager: Montgomery
Range Tech(s): Zerger

National Technical Systems

HARD ARMOR STAND-ALONE PLATE:
P-BFS TEST

Date Received: February 16, 2023
Via: FedEx
Returned Via: FedEx

Record No.: PGD23001-10
Test Date: March 28, 2023

Test Conditions

Temperature:	21.1	ºC
Humidity:	34	%
Clay Block No.:	11	
Clay Block Size:	24" x 24" x 5.5"	
Clay Temperature:	34.7	ºC
Drop Average:	17.23	mm

Range 3

Muzzle to Screen 1:	11.98	m
Screen 1 - 4:	1.52	m
Screen 4 - Target:	1.74	m
Midpoint to Target:	2.50	m
Barrel Length:	71.12	cm

Test Standard: IAW Modified / Abbreviated NIJ 0101.06, July 2008
Threat Level: IV

Conditioning: Ambient
Drop Test: Yes
Submersion: Yes

Sample Description		Shot / Projectile Description					Chronograph		Test Results
		Shot No.	Shot Location	Degree Obliquity	Caliber	Bullet Weight (gr.) / Type	TIME sx-5	VELOCITY m/s	Perforation BFS (mm)
Model No.:	U-line-ESAPI-NIJ4	1	Center	0°	.30 Cal. (.30-06)	166 / M2AP	173.7	877.4	40.01
Lot No.:	N/A								
Serial No.:	N/A								
Size (cm):	30x25								
Weight (kg.):	2.950								

This test was performed in accordance with the specification requirements listed in addition to any customer testing modifications or requests. The test results properly reflect the ballistic performance of the listed sample. This test report shall not be reproduced except in full without written approval of National Technical Systems.

Notes:
•Stand-Alone plate tested non-planar (with clay mound / build-up)

Ammunition Description:
.30 Cal. (.30-06) 166 gr. (10.8g) AP (U.S Military M2AP)
Velocity: 878 +/- 9.1 m/s

Sample Description:
•Customer Proprietary

Project Manager: Montgomery
Range Tech(s): Zerger

National Technical Systems

HARD ARMOR STAND-ALONE PLATE:
P-BFS TEST

Date Received: February 16, 2023
Via: FedEx
Returned Via: FedEx

Record No.: PGD23001-11
Test Date: March 28, 2023

Test Conditions

Temperature:	20.8	ºC
Humidity:	33	%
Clay Block No.:	11	
Clay Block Size:	24" x 24" x 5.5"	
Clay Temperature:	34.7	ºC
Drop Average:	17.23	mm

Range 3

Muzzle to Screen 1:	11.98	m
Screen 1 - 4:	1.52	m
Screen 4 - Target:	1.74	m
Midpoint to Target:	2.50	m
Barrel Length:	71.12	cm

Test Standard: IAW Modified / Abbreviated NIJ 0101.06, July 2008
Threat Level: IV

Conditioning: Ambient
Drop Test: Yes
Submersion: Yes

Sample Description		Shot / Projectile Description					Chronograph		Test Results
		Shot No.	Shot Location	Degree Obliquity	Caliber	Bullet Weight (gr.) / Type	TIME sx-5	VELOCITY m/s	Perforation BFS (mm)
Model No.:	U-line-ESAPI-NIJ4	1	Center	0°	7.62x54R	155 / B32 API	177.7	857.6	41.11
Lot No.:	N/A								
Serial No.:	N/A								
Size (cm):	30x25								
Weight (kg.):	2.943								

This test was performed in accordance with the specification requirements listed in addition to any customer testing modifications or requests. The test results properly reflect the ballistic performance of the listed sample. This test report shall not be reproduced except in full without written approval of National Technical Systems.

Notes:
•Stand-Alone plate tested non-planar (with clay mound / build-up)

Ammunition Description:
7.62x54R, 150 gr. API B32
Velocity: 854 +/- 9.1 m/s

Sample Description:
•Customer Proprietary

Project Manager: Montgomery
Range Tech(s): Zerger