

Table 2. Summary of V₅₀ Ballistic Limit Test Results

Project No.	Sample No.	Weight (lbs)	Size (in)	Threat	Target Obliq. (deg)	Ballistic Limit Data				
						V ₅₀ (ft/s)	No. of Points	RMR (ft/s)	GAP (ft/s)	ROR (ft/s)
OH000006438-A	17gr-V50 - 1 (H)	1.660	Medium	.22-cal., 17-grain FSP	0.0	2553	8	101	NA	151
OH000006438-B	17gr-V50 - 2 (NH)	1.660	Medium	.22-cal., 17-grain FSP	0.0	2585	6	53	NA	135

PROTECTION BALLISTIC LIMIT TEST, V₅₀ BL(P)

NTS-Belcamp
 4603B Compass Point Road
 Belcamp, MD 21017

Client: Hardhead Veterans
 Project No.: OH000006438-A
 Test Date: 11/29/2022
 Page 1 of 2

Test Panel | Description: Helmet.

Manufacturer: Hard Head Veterans LLC

Sample No.: (17gr, V50) 17gr-V50 - 1 (H)

Size: Medium
 Avg. Thickness: 0.302 in
 Thicknesses: 0.306 in, 0.304 in,
 0.293 in, 0.305 in

Weight: 1.660 lbs
 Plies/Laminates: N/A
 Required BL(P): N/A

Date Received: 11/29/2022
 Received Via: FEDEX Ground
 Returned Via: FEDEX Ground

Setup

Shot Spacing: Customer Request
 Witness Panel: 0.02 in 2024-T3
 Aluminum
 Backing Material: N/A
 Condition: Ambient

Primary Vel. Screens (ft): 5.000, 5.333,
 9.666, 10.000
 Primary Vel. Location (ft): 7.500
 Range to Target (ft): 15.000
 Target to Witness (in): 3.000

Range No.: Range 5
 Temp: 66.7 °F
 BP: 30.2 inHg
 RH: 34.2 %
 Barrel/Gun: WC024520
 Gunner: Gregory Bonilla
 Recorder: Joseph Gerdes

Ammunition

Projectile	Lot No.	Manufacturer	Powder
(1) .22-cal., 17-grain FSP	17090821	Contra Threat Sciences	Bullseye

Applicable Standards or Procedures

- (1) MIL-STD-662F
- (2) Customer Request

Shot No.	Ammo	Powder/ Seating	Weight (gr)	Time 1 (µs)	Vel. 1 (ft/s)	Time 2 (µs)	Vel. 2 (ft/s)	Avg. Vel. (ft/s)	Striking Vel. (ft/s)	Result	Include in V ₅₀	Obliq. (°)	Footnotes
1	1	8.5	17.0	2205	2268	1910	2269	2268	2171	P	No	0.0	(a)
2	1	9.2	17.0	2097	2384	1815	2387	2386	2284	P	No	0.0	(b)
3	1	10.0	17.0	1984	2520	1720	2519	2520	2412	P	No	0.0	(c)
4	1	11.0	17.0	1915	2611	1659	2612	2611	2500	C	Yes	0.0	(d)
5	1	10.5	17.0	1928	2593	1668	2598	2596	2485	C	Yes	0.0	(e)
6	1	10.0	17.0	1971	2537	1707	2538	2538	2429	P	No	0.0	(a)
7	1	10.5	17.0	1924	2599	1663	2606	2602	2491	P	Yes	0.0	(b)
8	1	11.0	17.0	1893	2641	1637	2647	2644	2532	P	Yes	0.0	(a)
9	1	11.5	17.0	1863	2684	1615	2683	2683	2569	P	Yes	0.0	(b)
10	1	11.8	17.0	1819	2749	1581	2741	2745	2628	C	Yes	0.0	(c)
11	1	11.5	17.0	1854	2697	1602	2705	2701	2586	P	Yes	0.0	(a)
12	1	11.8	17.0	1819	2749	1572	2756	2753	2636	C	Yes	0.0	(d)

Remarks:
 Requested starting velocity: 2200 ft/s.
 Projectile Yaw Check: 0° on all impacts.
 Helmet shell unpainted, without rails, without shroud, does not include suspension or retention system.

Footnotes:
 (a) Crown
 (b) Front
 (c) Left
 (d) Back
 (e) Right

V₅₀ Summary:
 No. of Points: 4 and 4
 V₅₀: 2553 ft/s
 High Partial: 2586 ft/s
 Low Complete: 2485 ft/s
 Range of Results (ROR): 151 ft/s
 Range of Mix Results (RMR): 101 ft/s
 Gap: N/A

PROTECTION BALLISTIC LIMIT TEST, V₅₀ BL(P)

NTS-Belcamp
 4603B Compass Point Road
 Belcamp, MD 21017

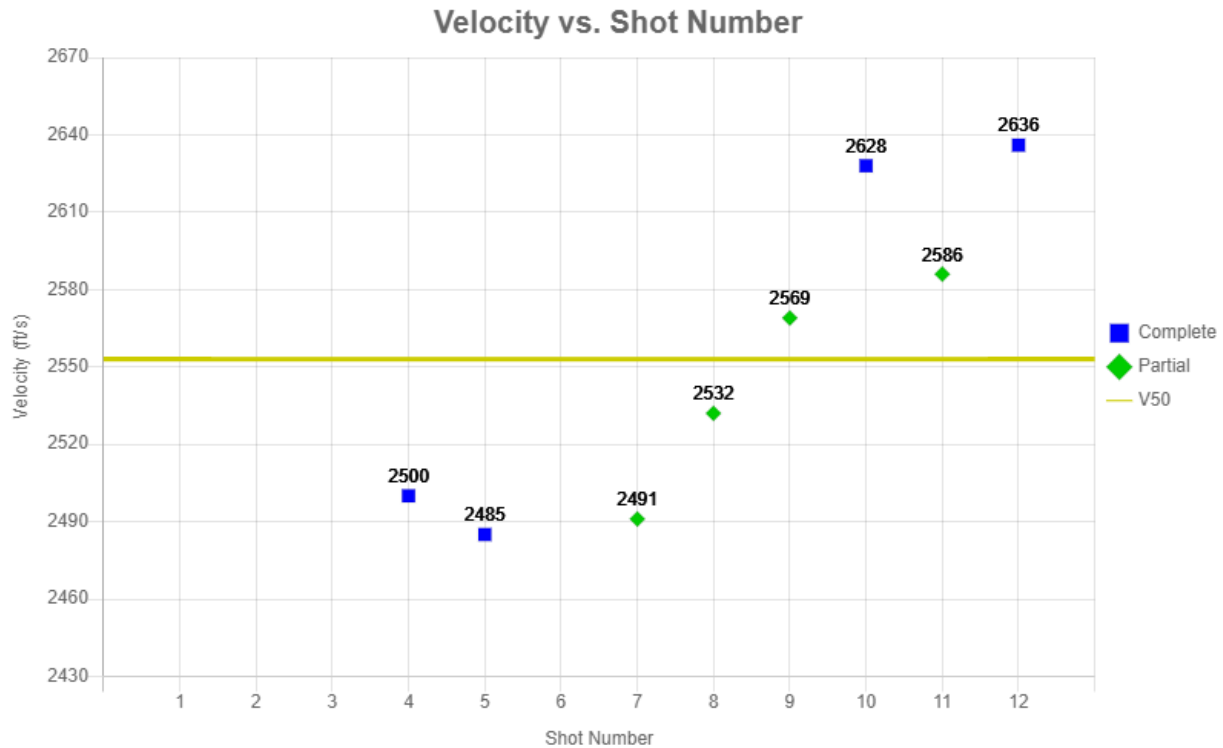
Client: Hardhead Veterans
 Project No.: OH000006438-A
 Test Date: 11/29/2022
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Manufacturer: Hard Head Veterans LLC

Sample No.: (17gr, V50) 17gr-V50 - 1 (H)

V₅₀ Summary:

No. of Points: 4 and 4
 V₅₀: 2553 ft/s
 High Partial: 2586 ft/s
 Low Complete: 2485 ft/s
 Range of Results (ROR): 151 ft/s
 Range of Mix Results (RMR): 101 ft/s
 Gap: N/A



PROTECTION BALLISTIC LIMIT TEST, V₅₀ BL(P)

NTS-Belcamp
4603B Compass Point Road
Belcamp, MD 21017

Client: Hardhead Veterans
Project No.: OH000006438-B
Test Date: 11/29/2022
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Test Panel Description: Helmet

Manufacturer: Hard Head Veterans LLC

Sample No.: (17gr, V50) 17gr-V50 - 2 (NH)

Size: Medium
Avg. Thickness: 0.298 in
Thicknesses: 0.300 in, 0.304 in,
0.289 in, 0.298 in

Weight: 1.660 lbs
Plies/Laminates: N/A
Required BL(P): N/A

Date Received: 11/29/2022
Received Via: FEDEX Ground
Returned Via: FEDEX Ground

Setup

Shot Spacing: Customer Request
Witness Panel: 0.02 in 2024-T3
Aluminum
Backing Material: N/A
Condition: Ambient

Primary Vel. Screens (ft): 5.000, 5.333,
9.666, 10.000
Primary Vel. Location (ft): 7.500
Range to Target (ft): 15.000
Target to Witness (in): 3.000

Range No.: Range 5
Temp: 67.1 °F
BP: 30.2 inHg
RH: 33.3 %
Barrel/Gun: WC024520
Gunner: Gregory Bonilla
Recorder: Joseph Gerdes

Ammunition

Projectile	Lot No.	Manufacturer	Powder
(1) .22-cal., 17-grain FSP	17090821	Contra Threat Sciences	Bullseye

Applicable Standards or Procedures

- (1) MIL-STD-662F
- (2) Customer Request

Shot No.	Ammo	Powder/Seating	Weight (gr)	Time 1 (µs)	Vel. 1 (ft/s)	Time 2 (µs)	Vel. 2 (ft/s)	Avg. Vel. (ft/s)	Striking Vel. (ft/s)	Result	Include in V ₅₀	Obliq. (°)	Footnotes
1	1	8.5	17.0	2223	2249	1924	2252	2251	2154	P	No	0.0	(a)
2	1	9.2	17.0	2119	2360	1832	2365	2362	2261	P	No	0.0	(b)
3	1	10.0	17.0	2006	2493	1737	2495	2494	2387	P	No	0.0	(c)
4	1	11.0	17.0	1914	2612	NR	NR	2612	2501	P	Yes	0.0	(d,f)
5	1	10.5	17.0	1984	2520	1720	2519	2520	2412	P	No	0.0	(e)
6	1	10.0	17.0	2001	2499	1733	2500	2500	2393	P	No	0.0	(a)
7	1	11.5	17.0	1872	2671	1615	2683	2677	2563	C	Yes	0.0	(b)
8	1	11.0	17.0	1924	2599	1667	2599	2599	2488	P	No	0.0	(c)
9	1	11.5	17.0	1863	2684	1611	2690	2687	2573	P	Yes	0.0	(d)
10	1	12.0	17.0	1832	2729	1585	2734	2732	2616	P	Yes	0.0	(e)
11	1	12.5	17.0	1763	2836	1528	2836	2836	2716	C	No	0.0	(a)
12	1	12.2	17.0	1828	2735	1581	2741	2738	2622	C	Yes	0.0	(d)
13	1	11.9	17.0	1819	2749	1572	2756	2753	2636	C	Yes	0.0	(d)

Remarks:
Requested starting velocity: 2200 ft/s.
Projectile Yaw Check: 0° on all impacts.
Helmet shell unpainted, without rails, without shroud, does not include suspension or retention system.
Shots 1-6 per customer Request.

V₅₀ Summary:
No. of Points: 3 and 3
V₅₀: 2585 ft/s
High Partial: 2616 ft/s
Low Complete: 2563 ft/s
Range of Results (ROR): 135 ft/s
Range of Mix Results (RMR): 53 ft/s
Gap: N/A

Footnotes:
(a) Crown
(b) Front
(c) Left
(d) Back
(e) Right
(f) No reading on second chronographs.

PROTECTION BALLISTIC LIMIT TEST, V₅₀ BL(P)

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 4603B Compass Point Road
 Belcamp, MD 21017

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 Project No.: OH000006438-B
 Test Date: 11/29/2022
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Manufacturer: Hard Head Veterans LLC

Sample No.: (17gr, V50) 17gr-V50 - 2 (NH)

V₅₀ Summary:

No. of Points: 3 and 3
 V₅₀: 2585 ft/s
 High Partial: 2616 ft/s
 Low Complete: 2563 ft/s
 Range of Results (ROR): 135 ft/s
 Range of Mix Results (RMR): 53 ft/s
 Gap: N/A

Velocity vs. Shot Number

