Ballistic Resistance – Test Report

Client:	**C-Bond Systems, LLC.** Attention: Bruce Rich 410 Pierce Street Houston, TX 77002
Date of report:	**6 May 2015**
Report prepared by:	Ashley Gowland, Customer Operations Coordinator
Report reviewed by:	Wesley Mason, Manager of Technical Operations - Hard Armor
Test method and supporting documentation:	Per Customer Instructions NIJ-STD-0108.01, IIA
Job number:	000004257A
Test item receipt date, shipping method, identification information, and inspection results:	The sample(s) were received on **30 April 2015** via Federal Express. Test items were identified as ½" annealed glass. The sample(s) were inspected prior to testing and no anomalies were discovered.
Date of testing, test range, and testing performed:	Testing commenced at the H.P. White Laboratory, Inc. facilities at 3114 Scarboro Road, Street, MD on **6 May 2015**.
Date testing completed, sample disposal, return shipping method:	Testing concluded on **6 May 2015**; sample(s) will be discarded, unless otherwise instructed.
Test data transmittal method and storage location:	This test report and test data were transmitted via email in a manner compliant with ISO 17025 requirements. Permanent electronic and hardcopy files are maintained in accordance with HPWLI data storage policy on data storage systems, filed by job number.
Revision number and date:	NA
Disclaimer:	Testing was performed on samples provided by the client. H.P. White Laboratory, Inc. holds no responsibility for sample selection methods. This report is based on data obtained from testing only the samples submitted, and should NOT be interpreted as an endorsement by H.P. White Laboratory, Inc. of the continuing quality or performance of any other items of the same, or similar, design. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government. This testing was performed by H.P. White Laboratory, Inc. to client specification, and the test results are the property of the client, who holds all rights of reproduction or publication of this report and related test data.

Test Procedures

Ballistic Resistance Testing: All testing was conducted on an indoor range at ambient conditions in accordance with your instructions and the general provisions of NIJ-STD-0108.01. Testing was conducted at threat level IIA, using caliber 9mm, 124 grain, FMJ and 357 magnum, 158 grain, JSP ammunitions. The test sample was positioned 16.5 feet from the muzzle of the barrel to produce zero degree obliquity impacts. Photoelectric infrared screens were located at 6.5 feet and 9.5 feet which, in conjunction with electronic chronographs, were used to compute bullet velocities at 8.0 feet forward of the muzzle. Penetrations was determined by visual examination of the 0.020 inch thick 2024-T3 aluminum alloy witness plate, placed parallel to and at a distance of 6.0 inches behind the test sample. Table I provides a summary of information on the attached data record(s).

Report prepared by:

Ashley Gowland
Customer Operations Coordinator

Report reviewed by:

Wesley Mason
Manager of Technical Operations - Hard Armor

Table I: Ballistic Resistance, Summary of Results

Test Sample			Ballistic Threat			Results		
Sample Number	Thickness (in.) (a)	Weight (lbs.)	Caliber	Obliquity	Shots (b)	Velocity (fps) Max	Velocity (fps) Min	Penetrations
153103CB1	0.541	15.15	9mm	0°	5	1211	1093	0
153103LGPB	0.542	15.15	357 Mag.	0°	4 (c)	1285	1323	0
153103LGPB2	0.555	15.40	357 Mag.	0°	5	1300	1268	0

(a) Based on an average of four corner thicknesses
(b) 4 shot(s) on 8" square – 1 in center
(c) Test terminated due to destruction of test sample

H.P. White Laboratory, Inc.

BALLISTIC RESISTANCE TEST

Client : 5805:C-Bond Systems, LLC

Job No. : 000004257 Test Date : 5/6/15

TEST PANEL

Manufacturer : C-Bond systems, LLC
Size : 18x18 in.
Thicknesses : 0.541, 0.541, 0.541, 0.542 in.
Avg. Thick. : 0.541 in.
Description : 1/2" annealed glass

Sample No. : 153103CB1 (9mm)
Weight : 15.15 lbs.
Hardness : NA
Plies/Laminates : NA

Date Rec'd. : 4/30/15
Via : Federal Express
Returned : N/A

SET-UP

Shot Spacing : 4 ON 8" SQUARE - 1 IN CENTER
Witness Panel : 0.020", 2024-T3 ALUMINUM
Obliquity : 0 deg.
Backing Material : NA
Conditioning : AMBIENT

Primary Vel. Screens : 6.5 ft., 9.5 ft.
Primary Vel. Location : 8.0 ft. From Muzzle
Residual Vel. Screens : NA
Residual Vel. Location : NA
Range to Target : 16.5 ft.
Target to Wit. : 6.0 in.

Range No. : 3
Temp. : 72 F
BP : 30.21 in. Hg
RH : 57%
Barrel No./Gun : R3/ 9mm
Gunner : Ches
Recorder : Bonsall

AMMUNITION

(1) : 9mm FMJ, 124 gr. Lot No. : REMINGTON 23558
(2) : Lot No. :
(3) : Lot No. :
(4) : Lot No. :

APPLICABLE STANDARDS OR PROCEDURES

(1) : NIJ-STD-0108.01
(2) : LEVEL IIA
(3) : REQUIRED VELOCITY: 1050-1130 FPS.

Shot No.	Ammo.	Time 1 (usec)	Velocity 1 (ft/s)	Time 2 (usec)	Velocity 2 (ft/s)	Avg. Vel. (ft/s)	Penetration	Footnotes
1	1	2478	1211	2478	1211	1211	None	
2	1	2676	1121	2676	1121	1121	None	
3	1	2652	1131	2652	1131	1131	None	
4	1	2712	1106	2712	1106	1106	None	
5	1	2744	1093	2744	1093	1093	None	

REMARKS :

FOOTNOTES :

Filename : 000004257 (153103CB1 (9mm)) 5805 C-Bond Systems, LLC.Pen

H.P. White Laboratory, Inc.

BALLISTIC RESISTANCE TEST

Client : 5805:C-Bond Systems, LLC

Job No. : 000004257 Test Date : 5/6/15

TEST PANEL

Manufacturer : C-Bond systems, LLC
Size : 18x18 in.
Thicknesses : 0.542, 0.542, 0.543, 0.543 in.
Avg. Thick. : 0.542 in.
Description : 1/2" annealed glass

Sample No. : 153103LGPB (357mag)
Weight : 15.15 lbs.
Hardness : NA
Plies/Laminates : NA

Date Rec'd. : 4/30/15
Via : Federal Express
Returned : N/A

SET-UP

Shot Spacing : 4 ON 8" SQUARE - 1 IN CENTER
Witness Panel : 0.020", 2024-T3 ALUMINUM
Obliquity : 0 deg.
Backing Material : NA
Conditioning : AMBIENT

Primary Vel. Screens : 6.5 ft., 9.5 ft.
Primary Vel. Location : 8.0 ft. From Muzzle
Residual Vel. Screens : NA
Residual Vel. Location : NA
Range to Target : 16.5 ft.
Target to Wit. : 6.0 in.

Range No. : 3
Temp. : 72 F
BP : 30.21 in. Hg
RH : 57%
Barrel No./Gun : R3/ 357 mag
Gunner : Ches
Recorder : Bonsall

AMMUNITION

(1) : 357 Magnum, JSP, 158 gr. Lot No. : REMINGTON 22847
(2) : Lot No. :
(3) : Lot No. :
(4) : Lot No. :

APPLICABLE STANDARDS OR PROCEDURES

(1) : NIJ-STD-0108.01
(2) : LEVEL IIA
(3) : REQUIRED VELOCITY: 1200-1300 FPS.

Shot No.	Ammo.	Time 1 (usec)	Velocity 1 (ft/s)	Time 2 (usec)	Velocity 2 (ft/s)	Avg. Vel. (ft/s)	Penetration	Footnotes
1	1	2480	1210	2480	1210	1210	None	
2	1	2362	1270	2362	1270	1270	None	
3	1	2267	1323	2267	1323	1323	None	
4	1	2334	1285	2334	1285	1285	None	(a)

REMARKS :

FOOTNOTES :

(a) TEST TERMINATED DUE TO DESTRUCTION OF TEST SAMPLE.

H.P. White Laboratory, Inc.

BALLISTIC RESISTANCE TEST

Client : 5805:C-Bond Systems, LLC

Job No. : 000004257 Test Date : 5/6/15

TEST PANEL

Manufacturer : C-Bond systems, LLC
Size : 18x18 in.
Thicknesses : 0.554, 0.554, 0.556, 0.556 in.
Avg. Thick. : 0.555 in.
Description : 1/2" annealed glass

Sample No. : 153103LGPB2 (357mag)
Weight : 15.40 lbs.
Hardness : NA
Plies/Laminates : NA

Date Rec'd. : 4/30/15
Via : Federal Express
Returned : N/A

SET-UP

Shot Spacing : 4 ON 8" SQUARE - 1 IN CENTER
Witness Panel : 0.020", 2024-T3 ALUMINUM
Obliquity : 0 deg.
Backing Material : NA
Conditioning : AMBIENT

Primary Vel. Screens : 6.5 ft., 9.5 ft.
Primary Vel. Location : 8.0 ft. From Muzzle
Residual Vel. Screens : NA
Residual Vel. Location : NA
Range to Target : 16.5 ft.
Target to Wit. : 6.0 in.

Range No. : 3
Temp. : 72 F
BP : 30.21 in. Hg
RH : 57%
Barrel No./Gun : R3/ 357 mag
Gunner : Ches
Recorder : Bonsall

AMMUNITION

(1) : 357 Magnum, JSP, 158 gr. Lot No. : REMINGTON 22847
(2) : Lot No. :
(3) : Lot No. :
(4) : Lot No. :

APPLICABLE STANDARDS OR PROCEDURES

(1) : NIJ-STD-0108.01
(2) : LEVEL IIA
(3) : REQUIRED VELOCITY: 1200-1300 FPS.

Shot No.	Ammo.	Time 1 (usec)	Velocity 1 (ft/s)	Time 2 (usec)	Velocity 2 (ft/s)	Avg. Vel. (ft/s)	Penetration	Footnotes
1	1	2307	1300	2307	1300	1300	None	
2	1	2317	1295	2317	1295	1295	None	
3	1	2366	1268	2366	1268	1268	None	
4	1	2339	1283	2339	1283	1283	None	
5	1	2366	1268	2366	1268	1268	None	

REMARKS :

FOOTNOTES :

Filename : 000004257 (153103LGPB2 (357mag)) 5805 C-Bond Systems, LLC.Pen