Ballistic Resistance & Forced Entry – Test Report

Client:	**Riot Glass, Inc.** Attention: Brad Campbell 17941 Brookshire Lane Huntington Beach, CA 92647 United States
Report date:	**23 August 2019**
Job number:	000009447A
Test procedure and supporting documentation:	Per Customer Instructions
Sample receipt, identification information, and disposition:	The sample(s) were received on **15 August 2019**. Sample item identification and description details are provided on the attached data record(s). The test sample(s) were inspected prior to testing and no anomalies were discovered. Sample(s) will be returned or discarded per customer instructions. H.P. White will only hold sample(s) as required by specific test protocols.
Test date(s) and location:	Testing commenced on **21 August 2019**, at the H.P. White Laboratory, Inc. facilities located at 3114 Scarboro Road, Street, Maryland. Testing concluded on **22 August 2019**.
Report prepared by:	Colleen McElroy, Customer Operations Associate
Report reviewed by:	Chris D'Amario, Engineer
Revision number and date:	NA
Supplement to report:	NA
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.
Disclaimer:	Testing was performed on sample(s) 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 sample(s) 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.
Destination control statement:	This document may contain items controlled by the U.S. government and authorized for export only to the country of ultimate destination for use by the ultimate consignee or end-user(s) herein identified. They may not be resold, transferred, or otherwise disposed of, to any other country or to any person other than the authorized ultimate consignee or end-user(s), either in their original form or after being incorporated into other items, without first obtaining approval from the U.S. government or as otherwise authorized by U.S. law and regulations.

Test Procedures

Ballistic Resistance Testing: All testing was conducted on an indoor range at ambient conditions, in accordance with your instructions and the provisions of test plan 5-aa1. Testing was conducted using caliber 7.62mm Ball, M80, CJ, 149 grain ammunition. The test sample(s) were positioned 25.0 feet from the muzzle of the barrel to produce various degree obliquity impacts. Photoelectric infrared screens were located at 5.0 feet and 20.0 feet which, in conjunction with electronic chronographs, were used to compute bullet velocities at 12.5 feet forward of the muzzle. Table I provides a summary of information on the attached data record(s).

Table I: Ballistic Resistance, Summary of Results

Sample No.	Thickness (in) (a)	Weight (lbs.)	Conditioning	Caliber	Obliquity (degrees°)	Shots (b)	Velocity (fps)		Penetrations
							Max	Min	
1	NA	NA	AMBIENT	7.62mm Ball, M80	0	3	2764	2754	3
					30	1	2734		1
					45	1	2756		1

(a) Average of thickness measurements
(b) Average of thickness measurements

Forced Entry Testing: All testing was conducted in accordance with your instructions and the provisions of test plan 5aa-1. This was a timed and sequential test. The data record attached, shows detailed information about the forced entry test. The test was stopped as a result of technician fatigue and the assault technician was unable to enter the enclosure.

Report prepared by:

Colleen McElroy
Customer Operations Associate

Report reviewed by:

Chris D'Amario
Engineer

H.P. White Laboratory, Inc.

BALLISTIC RESISTANCE TEST

Client : 7414: RIOT GLASS, INC.

Job No. : 000009447 Test Date : 8/21/19

TEST PANEL

Manufacturer : RIOT GLASS, INC.
Size : 36 X 83.250 in.
Thicknesses : NA
Avg. Thick. : NA
Description : AP 25 SURFACE MOUNT

Sample No. : 1
Weight : lbs.
Hardness : NA
Plies/Laminates : NA

Date Rec'd. : 8/15/19
Via :
Returned :

SET-UP

Shot Spacing : PER TEST PLAN 5-AA1
Witness Panel : NA
Obliquity : 0 deg.
Backing Material : NA
Conditioning : AMBIENT

Primary Vel. Screens : 5.0 ft., 20.0 ft.
Primary Vel. Location : 12.5 ft. From Muzzle
Residual Vel. Screens : NA
Residual Vel. Location : NA
Range to Target : 25.0 ft.
Target to Wit. : 0.0 in.

Range No. : 3
Temp. : 72 F
BP : 29.97 in. Hg
RH : 71%
Barrel No./Gun : R3/ .308
Gunner : LINKOUS
Recorder : BONSALL

AMMUNITION

(1) : 7.62mm Ball, M80, CJ, 149 gr. Lot No. : HPW- 0081
(2) : Lot No. :
(3) : Lot No. :
(4) : Lot No. :

APPLICABLE STANDARDS OR PROCEDURES

(1) : TEST PLAN 5-AA1
(2) : REQUIRED VELOCITY: 2700-2850 FPS
(3) :

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	5431	2762	5434	2760	2761	Bullet	
2	1	5448	2753	5447	2754	2754	Bullet	
3	1	5430	2762	5425	2765	2764	Bullet	
4	1	5487	2734	5487	2734	2734	Bullet	(a)
5	1	5441	2757	5444	2755	2756	Bullet	(b)

REMARKS :

FOOTNOTES :

(a) 30° OBLIQUITY
(b) 45° OBLIQUITY

Forced Entry Data Record
TEST 5-aa 1

Client: RIOT GLASS,INC
Job No.: 9447 **Test Date:** 08/21/19

Make/Model/Sample No.: AP 25 SURFACE MOUNT-1
Size: 36" X 83.250"
Thicknesses: NA
Weight: NA

Date Received: 08/15/19

Test Sequence/Designation	Resource/Description (tools)	Procedure (location, duration, etc.)	Results
TEST A-1	BRICK	20 IMPACTS FROM 15'	SHATTERING OF INNER GLASS,NO ENTRY
TEST A-2	STEEL TOE BOOT	10 IMPACTS	MORE SHATTERING OF INNER GLASS,NO ENTRY
TEST B	36" 2X4,14" WRENCH,13" CLAW HAMMER	2 MINUTES	NO FURTHER DAMAGE,NO ENTRY
TEST C	3lb 12" HAMMER,33" 32oz ALUMINUM BAT	3 MINUTES	BACK SPALL LINER CAME OFF HALF WAY OF THE DOOR, ALL GLASS FELL OUT,NO ENTRY
TEST D	12lb SLEDGE	UNTIL FAILURE	TECH STOPPED AFTER 3 MINUTES TOTALLING 8 MINUTES OF OVERALL FE TESTING, NO ENTRY (a,b)

(a) Testing was stopped as the test technician was fatigued and could not safely continue to attack the test sample.
(b) Technician: D'AMARIO