

H.P. WHITE LABORATORY, INC.

3114 Scarboro Road
Street, Maryland 21154-1822
Telephone: (410) 838-6550
Facsimile: (410) 838-2802
email: info@hpwhite.com
www.hpwhite.com



February 24, 2006
[HPWLI 9998-03A]
[Duplicate Original]

Optima Ballistic Glass Corporation
Zona Procesadora de Exportacion Albrook
Call Marginal Este, Ave. Curundu, Local G
Panama
Republica de Panama

Attention: Juan Jose Estrada

Dear Juan Jose Estrada:

You recently requested ballistic resistance testing of one transparent armor sample received on February 15, 2006 via FedEx.

All testing was conducted on an indoor range at ambient conditions and using procedures prescribed for EN-1063, Level B5, but using caliber 7.62x39mm, 123 grain, Ball [MSC] ammunition. The test sample was rigidly mounted 32.8 feet from the muzzle of a test barrel to produce zero degree obliquity impacts. Redundant pairs of lumiline screens were located at 23.5 feet and 26.5 feet. Together with electronic chronographs, they provided bullet velocities at 25.0 feet. Penetrations were determined by visual examination of a 0.001 inch thick witness panel of aluminum foil positioned 20 inches behind, and parallel to, the rear of the test sample. Table I provides a summary of information on the attached Data Record.

TABLE I - SUMMARY OF RESULTS
[Optima Glazing]

Test Sample			Ballistic Threat				Results [Penetrations]
Number	Thickness [in.] [a]	Weight [lbs.]	Caliber	Shots [b]	Velocity		
					Minimum	Maximum	
HPW-1	1.363	34.52	7.62x39mm, MSC	3	2386	2413	0


[a] - Average of four corner thicknesses
[b] - At the corners of a 5-inch equilateral triangle

These results are based solely on data obtained from the sample provided, and should not be interpreted as an endorsement by H.P. white Laboratory, Inc.

Thank you for the opportunity to conduct these tests. The sample was discarded after testing as you requested. If you should have any questions, please feel free to contact us.

Very truly yours,

H.P. WHITE LABORATORY, INC.


Lester W. Roane

LWR/mw
[Enclosure]



H.P. White Laboratory, Inc.

BALLISTIC RESISTANCE TEST

Client : OPTIMA BALLISTIC GLASS

Job No. : 9998-03

Test Date : 2/24/06

TEST PANEL

Manufacturer : OPTIMA BALLISTIC GLASS
 Size : 18 x 18 in.
 Thicknesses : 1.369, 1.366, 1.356, 1.360 in.
 Avg. Thick. : 1.363 in.
 Description : LAMINATED TRANSPARENCY

Sample No. : HPW-1
 Weight : 34.52 lbs.
 Hardness : NA
 Plies/Laminates : NA

Date Rec'd. : 2/15/06
 Via : Federal Express
 Returned : NA

SET-UP

Shot Spacing : 3 SHOTS ON 5" TRIANGLE
 Witness Panel : 0.001" ALUMINUM FOIL
 Obliquity : 0 deg.
 Backing Material : NA
 Conditioning : AMBIENT

Primary Vel. Screens : 23.5 ft., 26.5 ft.
 Primary Vel. Location : 25.0 ft. From Muzzle
 Residual Vel. Screens : NA
 Residual Vel. Location : NA
 Range to Target : 32.8 ft.
 Target to Wit. : 20.0 in.

Range No. : 3
 Temp. : 74 F
 BP : 29.85 in. Hg
 RH : 27%
 Barrel No./Gun : TEST BARREL
 Gunner : POOLE
 Recorder : POOLE

AMMUNITION

- (1) : 7.62 x 39mm, BALL, MSC, 123 gr.
- (2) :
- (3) :
- (4) :

Lot No. : CHINESE TYPE 56 BALL
 Lot No. :
 Lot No. :
 Lot No. :

APPLICABLE STANDARDS OR PROCEDURES

- (1) : EN-1063 (MODIFIED)
- (2) : REQUIRED VELOCITY : 2360-2460 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	1242	2415	1245	2410	2413	None	
2	1	1256	2389	1259	2383	2386	None	
3	1	1246	2408	1250	2400	2404	None	

REMARKS :

FOOTNOTES :