

# H.P. WHITE LABORATORY, INC.

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January 13, 2006  
[HPWLI 9998-01A]

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 two transparent armor samples received on January 10, 2006 via Continental Air Freight.

All testing was conducted on an indoor range at ambient conditions and in accordance with provisions of NIJ-STD-0108.01, **BALLISTIC RESISTANT PROTECTIVE MATERIALS**, dated September 1985. Testing was conducted at a Level II threat using calibers 9mm, 124 grain FMJ and .357 MAG, 158 grain, JSP ammunition. The test samples were rigidly mounted 16.5 feet from the muzzle of a test barrel to produce zero degree obliquity impacts. Redundant pairs of lumiline screens were located at 6.5 feet and 9.5 feet. Together with electronic chronographs, they provided bullet velocities at 8 feet. Penetrations were determined by visual examination of a 0.020 inch thick witness panel of alloy 2024T3 aluminum positioned 6 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  
[NIJ Level II – Optima Glazing]

Test Sample			Ballistic Threat				Results [Penetrations]
Number	Thickness [in.] [a]	Weight [lbs.]	Caliber	Shots [b]	Velocity		
					Minimum	Maximum	
LEVEL II [9mm]	0.661	16.11	9mm	5	1164	1196	0
LEVELII [.357 MAG]	0.660	16.11	.357 MAG	5	1393	1410	0

[a] – Average of four corner thicknesses  
[b] – At the corners and in the center of an 8-inch square

Based on the data presented, the test samples submitted for testing **SATISFIED** the ballistic resistance requirements of NIJ-STD-0108.01, Level II. This conclusion is 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 samples were 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  
[Enclosures]





# H.P. White Laboratory, Inc.

## BALLISTIC RESISTANCE TEST

Client : OPTIMA BALLISTIC GLASS

Job No. : 9998-01

Test Date : 1/12/06

### TEST PANEL

Manufacturer : OPTIMA BALLISTIC GLASS

Size : 18 x 18 in.

Thicknesses : 0.659, 0.660, 0.659, 0.660 in.

Avg. Thick. : 0.660 in.

Description : LAMINATED TRANSPARENCY

Sample No. : LEVEL II (357MAG)

Weight : 16.11 lbs.

Hardness : NA

Plies/Laminates : NA

Date Rec'd. : 1/10/06

Via : CONTINENTAL AIR

Returned : NA

### 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. : 74 F

BP : 30.06 in. Hg

RH : 56%

Barrel No./Gun : TEST BARREL

Gunner : POOLE

Recorder : POOLE

### AMMUNITION

(1) : 357 MAGNUM, JSP, 158 gr.

(2) :

(3) :

(4) :

Lot No. : REMINGTON 22847

Lot No. :

Lot No. :

Lot No. :

### APPLICABLE STANDARDS OR PROCEDURES

(1) : NIJ-STD-0108.01

(2) : THREAT LEVEL : II

(3) : REQUIRED VELOCITY : 1345-1445 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	2152	1394	2153	1393	1394	None	
2	1	2153	1393	2155	1392	1393	None	
3	1	2128	1410	2130	1408	1409	None	
4	1	2127	1410	2129	1409	1410	None	
5	1	2128	1410	2131	1408	1409	None	

### REMARKS :

### FOOTNOTES :





# H.P. White Laboratory, Inc.

## BALLISTIC RESISTANCE TEST

Client : OPTIMA BALLISTIC GLASS

Job No. : 9998-01

Test Date : 1/12/06

### TEST PANEL

Manufacturer : OPTIMA BALLISTIC GLASS  
 Size : 18 x 18 in.  
 Thicknesses : 0.659, 0.660, 0.661, 0.663 in.  
 Avg. Thick. : 0.661 in.  
 Description : LAMINATED TRANSPARENCY

Sample No. : LEVEL II (9mm)  
 Weight : 16.11 lbs.  
 Hardness : NA  
 Plies/Laminates : NA

Date Rec'd. : 1/10/06  
 Via : CONTINENTAL AIR  
 Returned : NA

### 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. : 74 F  
 BP : 30.06 in. Hg  
 RH : 56%  
 Barrel No./Gun : TEST BARREL  
 Gunner : POOLE  
 Recorder : POOLE

### AMMUNITION

(1) : 9mm LUGER, FMJ, 124 gr.  
 (2) :  
 (3) :  
 (4) :

Lot No. : REMINGTON 23558  
 Lot No. :  
 Lot No. :  
 Lot No. :

### APPLICABLE STANDARDS OR PROCEDURES

(1) : NIJ-STD-0108.01  
 (2) : THREAT LEVEL : II  
 (3) : REQUIRED VELOCITY : 1135-1215 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	2531	1185	2536	1183	1184	None	
2	1	2551	1176	2558	1173	1174	None	
3	1	2505	1198	2512	1194	1196	None	
4	1	2574	1166	2579	1163	1164	None	
5	1	2569	1168	2574	1166	1167	None	

### REMARKS :

### FOOTNOTES :