

**H.P. WHITE LABORATORY, INC.**

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2 April 2010  
 (HPWLI 11371-09A)

Astralloy Steel Products  
 P.O. Box 170974  
 1550 Red Hollow Road  
 Birmingham, Alabama 35217-0974

Attention: Mr. Brian Hand

Gentlemen:

In accordance with your purchase order number 24470, dated 25 March 2010, H.P. White Laboratory, Inc. conducted ballistic resistance testing of one steel plate received 30 March 2010 via Federal Express.

Testing was conducted in accordance with the provisions of NIJ-STD-0108.01, BALLISTIC RESISTANT PROTECTIVE MATERIALS, dated September 1985, Level III, using caliber 7.62x51mm, 149 grain, M80, Ball ammunition. The test sample was mounted on an indoor range 50.0 feet from the muzzle of a test barrel to produce zero degree obliquity impacts. Velocity screens were positioned at 6.5 and 9.5 feet which, in conjunction with elapsed time counters (chronographs), were used to compute projectile velocities 8.0 feet from the muzzle. Penetrations were determined by visual examination of a 0.020 inch thick aluminum alloy 2024T3 witness panel positioned 6.0 inches behind, and parallel to, the test sample. Table I is a summary of the enclosed data record.

TABLE I. SUMMARY OF RESULTS

Test Sample			Ballistic Threat			Results
Number	Thickness (in) (a)	Weight (lb)	Caliber	Shots (b)	Velocity (fps) Max. Min.	Penetrations
HT# R4547	0.317	13.04	7.62, M80	5	2757 2741	0
(a) Average of four corner thicknesses.						
(b) Four impacts on 8 inch square, one impact in center.						

Based on the data presented in Table I, the test sample submitted for testing SATISFIED the ballistic resistance requirements of NIJ-STD-0108.01, Level III. This conclusion is based on data obtained from having tested only the sample 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.

The test sample is being returned via Federal Express. Should you have any questions regarding this matter, or if we may be of any further service, please do not hesitate to contact us.

Very truly yours,

H.P. WHITE LABORATORY, INC.

Craig B. Dunn

CBD/sh  
 Enclosure

RESEARCH • DEVELOPMENT • ENGINEERING

**H.P. White Laboratory, Inc.**  
**BALLISTIC RESISTANCE TEST**

Client: ASTRALLOY STEEL  
 Job No.: 11371-09 Test Date: 4/2/10

**TEST PANEL**

Manufacturer: ASTRALLOY	Sample No.: HT # R4547	Date Rec'd: 03/30/10
Size: 12 X 12 in.	Weight: 13.04 lbs.	Via: Federal Express
Thicknesses: 0.318, 0.318, 0.318, 0.315 in.	Hardness: NA	Returned: Federal Express
Avg. Thick.: 0.317 in.	Plies/Laminates: NA	
Description: 5/16" STEEL ARMOR-V R4547-04AA		

**SET-UP**

Shot Spacing: 4 ON 8" SQUARE - 1 IN CENTER	Primary Vel. Screens: 6.5 ft., 9.5 ft.	Range No.: 3
Witness Panel: 0.020", 2024-T3 ALUMINUM	Primary Vel. Location: 8.0 ft. From Muzzle	Temp.: 56 F
Obliquity: 0 deg.	Residual Vel. Screens: NA	BP: 29.91 in. Hg
Backing Material: NA	Residual Vel. Location: NA	RH: 71%
Conditioning: AMBIENT	Range to Target: 50.0 ft.	Barrel No./Gun: 308, R3
	Target to Wit.: 6.0 in.	Gunner: MILLETTE
		Recorder: BONSALL

**AMMUNITION**

(1): 7.62mm Ball, M80, 149 gr.	Lot No.: UNKNOWN
(2):	Lot No.:
(3):	Lot No.:
(4):	Lot No.:

**APPLICABLE STANDARDS OR PROCEDURES**

(1): NIJ-STD-0108.01 (LEVEL III)  
 (2): REQUIRED VELOCITY: 2700-2800 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	1097	2735	1092	2747	2741	None	
2	1	1088	2757	1088	2757	2757	None	
3	1	1088	2757	1088	2757	2757	None	
4	1	1097	2735	1092	2747	2741	None	
5	1	1088	2757	1092	2747	2752	None	

REMARKS:

FOOTNOTES:





# Prüfzeugnis

Test Certificate

13Z233H01

**Inhaber des Dokumentes:** Ruukki Metals Oy  
*Holder of the document* Rautaruukintie 155  
92100 Raahe  
Finland

Prüfung der durchschusshemmenden Eigenschaften von Material nach:

*Test of the bullet resistance of material according to:*

**VPAM Durchschusshemmende plattenartige Materialien (PM) 2007, 08.05.2008**

**Hersteller:** Ruukki Metals Oy  
*Manufacturer*

**Auftraggeber:** Ruukki Metals Oy  
*Applicant*

**Prüfgegenstand:** Stahlblech (4,4mm x 500mm x 500mm)  
*Sample* steel plate

**Probenbezeichnung:** Ramor 500 (heat-No. 72163-041)  
*Designation*

**Prüfdatum:** 30. Juli 2013  
*Test date*

**Detaillerggebnisse siehe**  
**Prüfbericht Nr.:** 13M233H01  
*Detailed results see test report No.*

Die vorgelegte Probe erfüllte die Anforderungen nach:

*The submitted sample met the requirements according to:*

**VPAM PM 2007**

**Klasse 6**

Die Prüfergebnisse beziehen sich ausschließlich auf die im zugehörigen Prüfbericht beschriebenen Prüfgegenstände. Die Verwendbarkeit dieses Dokumentes ist auf zehn Jahre ab dem Tag der Prüfung begrenzt und erlischt vorzeitig, wenn Veränderungen oder Modifizierungen des Herstellungsprozesses, der Materialien oder ggf. des Qualitätsmanagementsystems vorgenommen werden, die zu einer Beeinflussung der Produktkonformität führen können. Dieses Dokument ist nur mit Unterschrift und Dienstsiegel gültig. Original nur mit Prägung im Staatswappen. Die auszugsweise Vervielfältigung dieses Dokumentes ist nur mit schriftlicher Genehmigung des Beschussamtes Mellrichstadt erlaubt.

*The test results relate only to the tested samples described in the accompanying test report. The applicability of this document is limited to ten years beginning with the day of testing. It will expire prematurely, if an alteration or modification to the manufacturing process, materials and/or quality management system could impact the product conformity. This document is only valid with signature and official seal. Only the original document has an embossed coat of arms. The duplication in extracts only is allowed with written approval of the Beschussamt Mellrichstadt.*

Beschussamt Mellrichstadt, 1. August 2013

Böttsch

