



Test Report

Client:	Essar Steel India Limited Attention: Mr. Sunil Patil 27th KM, Surat-Hazira Road Hazira, Surat-394270, Gujarat India
Report date:	10 May 2018
Job number:	000008110A
Test procedure and supporting documentation:	Per Customer Instructions MIL-A-12560H
Sample receipt, identification information, and disposition:	The sample(s) were received on 8 May 2018 . Sample item(s) were identified as steel armor plate(s). The test sample(s) were inspected prior to testing and no anomalies were discovered. Sample(s) will be returned, discarded, or held, per customer instructions.
Test date(s) and location:	Testing commenced on 10 May 2018 , at the H.P. White Laboratory, Inc. facilities located at 3114 Scarboro Road, Street, Maryland. Testing concluded on 10 May 2018 .
Report prepared by:	Ashley Gowland, Customer Operations Coordinator
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.
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Test Procedures

Ballistic Limit Testing: All testing was conducted on an indoor range at ambient conditions, in accordance with your instructions and the general provisions of MIL-A-12560H. Testing was conducted using caliber .30 AP, M2, 166 grain ammunition. The test sample(s) were positioned 45.0 feet from the muzzle of the barrel to produce zero (0°) degree obliquity impacts. Photoelectric infrared screens were located at 15.0 feet and 35.0 feet which, in conjunction with electronic chronographs, were used to compute bullet velocities at 25.0 feet forward of the muzzle. Complete and partial penetrations were determined by visual examination of the 0.020-inch-thick 2024-T3 aluminum alloy witness plate, placed 6.0 inches behind and parallel to the test sample(s). Table I provides a summary of information on the attached data record(s).

Based on the data presented in Table I, the test sample(s) submitted for testing **satisfy** the requirements of MIL-A-12560H.

Table I: Ballistic Limit V50, Summary of Results [GOI]

Test Sample				Set-Up				Results (fps)		
Sample No.	Thickness (in.) (a)	Ordered Thickness (mm.)	Weight (lbs.)	Caliber	Obliquity	Shots Total/V50	Required V50 (fps)	Test Result V50	High Partial	Low Complete
WJ0961 112H-1	0.530	13.5	66.2	.30 AP	0°	4/4	2525	2627	2632	2625
(a) Nominal four corner average thickness										

Report prepared by:



Ashley Gowland
 Customer Operations Coordinator

Report reviewed by:



Chris D'Amario
 Engineer



H.P. White Laboratory, Inc.

PROTECTION BALLISTIC LIMIT TEST, V50 BL(P)

Client : 7097:Essar Steel India Ltd.

Job No. : 000008110 Test Date : 5/10/18

TEST PANEL

Manufacturer : Essar Steel India Ltd.	Sample No. : WJ0961112H-1 (0.531)	Date Rec'd. : 5/8/18
Size : 12 X 36 in.	Heat No. : N/A	Via :
Thicknesses : 0.527, 0.531, 0.531, 0.530 in.	Weight : 66.2 lbs.	Returned :
Avg. Thick. : 0.530 in.	Hardness : NA	
Required BL(P) : 2525 ft/s	Plies/Laminates : NA	
Description : Armor Plate, Steel, Wrought, Homogeneous ORDERED THICKNESS- 13.5mm		

SET-UP

Shot Spacing : PER MIL-A-12560H	Primary Vel. Screens : 15.0 ft., 35.0 ft.	Range No. : 3
Witness Panel : 0.020", 2024-T3 ALUMINUM	Primary Vel. Location : 25.0 ft. From Muzzle	Temp. : 66 F
Obliquity : 0 deg.	Residual Vel. Screens : NA	BP : 30.20 in. Hg
Backing Material : NA	Residual Vel. Location : NA	RH : 54%
Conditioning : AMBIENT	Range to Target : 45.0 ft.	Barrel No./Gun : R3/ .308
	Target to Wit. : 6.0 in.	Gunner : Linkous
		Recorder : Bonsall

AMMUNITION

Projectile : CAL. .30 AP, M2, 166 gr.	Lot No. : HPW-1901
Powder : N133	

APPLICABLE STANDARDS OR PROCEDURES

- (1) : MIL-A-12560H
- (2) :
- (3) :

Shot No.	Powder/ Seating	Time 1 (usec)	Velocity 1 (ft/s)	Time 2 (usec)	Velocity 2 (ft/s)	Avg. Vel. (ft/s)	Vel. Loss (ft/s)	V-Strike (ft/s)	Result	Include in V50	Footnotes
1	39.7	7559	2646	7563	2644	2645	13	2632	P	Y	
2	40.0	7572	2641	7572	2641	2641	13	2628	C	Y	
3	39.5	7586	2636	7586	2636	2636	13	2623	P	Y	
4	40.0	7581	2638	7581	2638	2638	13	2625	C	Y	

<u>REMARKS :</u> Velocity loss computed using standard formulas.	<u>FOOTNOTES :</u>	<u>V50 SUMMARY :</u> No. Points : 2 & 2 V50 : 2627 High Partial : 2632 Low Complete : 2625 Range of Results : 9 Range of Mixed : 7
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