ARORA IRON & STEEL ROLLING MILLS (P) LTD.

DHANDARI KHURD, NEAR PHASE-VII, FOCAL POINT, LUDHIANA- 141 010.
Website : www.arorairon.com

IATF 16949:2016 | ISO 14001 : 2015 | ISO 45001 : 2018
ISO 9001:2015

UNIT-I

TEST CERTIFICATE

TEST CERTIFICATE ACCORDING TO EN10204 TYPE 3.1

Customer Address:	**Material**	Billet Route	**Test Certificate No.**	2024-25/0022600
M/S- S.S.B. ENGINEERS PVT.LTD.	**Process Route**	EAF-LRF-VD-CCM-AMLC-EMS-RM	**Date**	09-12-2024
PLOT NO-C-158 A MATSYA INDUSTRIAL AREA	**Specification**	**TDC No:-MAT1052D Dated:-21.10.2021,Rev:-00 MFR No-1516 Date-08.09.2022 Revision No-1 Revision Date-07.11.2022**	**Invoice No.**	15547 25.625
ALWAR -RAJASTHAN-(INDIA)			**Weight (MT.)**	
PIN CODE NO.301030	**Heat No.**	A32084	**Input/Billet Size**	320x250 MM
	Grade	19CrNi5	**Reduction Ratio**	7.08:1(Spec-6:1 min)
	Supply Size	120 MMØ	**No's of Pcs**	62
	Supply Condition	AS HOT ROLLED	**No's of Bundles**	NA
	Colour Code	WHITE	**Length Size**	NA

TEST RESULT

CHEMICAL ANALYSIS (ASTM E 415 / IS 8811)

Element		C%	Mn%	Si%	S%	P%	Cr%	Ni%	Mo%	V%	Al%	Cu%	Ca%	-	-	-	-	-	Al/N2 Ratio
Spec.	Min	0.160	0.700	0.150	0.020	-	0.800	0.800	-	-	0.020	-	-	-	-	-	-	-	2.00
	Max	0.210	1.100	0.350	0.040	0.020	1.200	1.200	0.100	-	0.050	0.300	0.0025	-	-	-	-	-	3.00
Achieved		0.185	0.910	0.230	0.027	0.015	1.140	1.030	0.070	0.003	0.022	0.080	0.0007	-	-	-	-	-	2.34

JOMINY JOMINY HARDENABILITY TEST (IS:3848, ASTM A255, SAE J406)

Distance (mm)		1.5	3	5	7	9	11	13	15	20	25								
Spec. (HRC)	Min	41.5	40	37	35	33	31	34	27	23.5	29								
	Max	47	46.5	45.5	44	43.5	43	41.5	40	36.5	33.5								
Achieved (HRC)		45.5	44.5	43.5	42.0	39.0	36.0	35.0	33.0	29.5	27.5								

Mechanical Properties

Parameters		IS:1608/ASTM A370				IS:1757	ASTM A255		IS:1500
		Tensile Strength	Yield Strength	Elongation	Reduction Area	Impact Strength Charpy U-notch (Joules)	D.I. Value (Inch)	D.I. Value (mm)	Surface Hardness As Rolled (BHN)
Spec.	Min	-	-	-	-	-	-	-	-
	Max	-	-	-	-		-	-	245
Achieved		-	-	-	-		-	-	207/223

Metallurgical Results

Parameters		Inclusion Rating (IS : 4163 / ASTM : E45A / JK Chart) WORST FIELD RATING									Grain Size IS 4748 / ASTM E112 (No.)	Depth of Decarburization IS 6396/ASTM E1077		Micro Structure
		Type	A		B		C		D		DS			
		Series	Thin	Thick	Thin	Thick	Thin	Thick	Thin	Thick			Complete	Partial	
Spec.	Min	-	-	-	-	-	-	-	-	-	6 or finer	-	1% of section/0.5 mm max.	Pearlite + ferrite
	Max	2.0	2.0	1.0	1.0	0.5	0.5	1.5	1.5	-				
Achieved		1.5	0.5	0.5	0.0	0.0	0.0	1.0	0.0	-	6.0 to 7.0	-	0.40 MM	

Physical Properties, Non Destructive Test & Other Test

Parameters	Internal Soundness ASTM E381	Step Down Test IS 4075	Surface Inspection IS 13352	Magnetic Particle Inspection ASTM E1444	Ultrasonic Test ASTM A388	Upsetting Test IS 10167
Spec.	C2,R2,S2 MAX.	-	-	100% bars	100% bars	-
Achieved	Better than C2,R1,S1	Satisfactory	Satisfactory	Tested-Ok	100% bars Auto UT Tested-Ok	-

Parameters	Dimensional Tolerance	Spark Test	X-RF	Gas Analysis Report Test method-Leco		
				O_2 (ppm)	N_2 (ppm)	H_2 (ppm)
Spec.	-	100% bars	100% bars	15 MAX.	90-110	2.0 MAX
Achieved	As per IS 3739 Grade 1	Tested-Ok	Tested-Ok	12.00	94.0	0.56

Remarks :
This material comply with RoHS (Pb, Cd, Hg, Cr6+) and REACH permissible limits. 3TG (Tantalum, Tin, Tungsten and Gold) not added intentionally in the product. Material is free from radioactive contamination.

10/12/24

Prepared By:	Approved By:	Pre Dispatch Inspection:
VISHWAKARMA SHARMA		

In case of any **Test certificate** Issue, please inform Dinesh Singla at dsingla@arorairon.com, Mobile No.+919914538700