

UNIT-I

TEST CERTIFICATE

TEST CERTIFICATE ACCORDING TO EN10204 TYPE 3.1

Customer Address: M/S- S.S.B. ENGINEERS PVT LTD PLOT NO-C-158 A MATSYA INDUSTRIAL AREA ALWAR -RAJASTHAN (INDIA) PIN CODE NO 301030	Material Process Route Specification Heat No. Grade Supply Size Supply Condition Colour Code	Billet Route EAF LRF VD CCM AMLC EMS RM TDC No: MAT1052D ✓ Dated: 21.10.2021, Rev: 00 MFR No: 1516 Date: 08.09.2022 Revision No: 1 Revision Date: 07.11.2022 A31871 19CrNi5 120 MMØ AS HOT ROLLED WHITE	Test Certificate No. Date Invoice No. Weight (MT.) Input/Billet Size Reduction Ratio No's of Pcs No's of Bundles Length Size	2024-25/0017308 21.11.2024 14445 34.240 120x250 MM 7.08 1(Spec 6.1 min) 80 16 NA
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TEST RESULT

CHEMICAL ANALYSIS (ASTM E 415 / IS 8811)

Element	C%	Mn%	Si%	S%	P%	Cr%	NI%	Mo%	V%	Al%	Cu%	Ca%	-	-	-	-	Al/Ni2 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	0.225	0.025	0.019	1.130	1.045	0.070	0.003	0.025	0.110	0.0008	-	-	-	2.69

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)		45.0	44	43.0	41.5	38.5	36	34.5	32.5	29.5	29.0						

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		Surface Hardness As Rolled (BHN)	
							(Inch)	(mm)		
Spec.	Min	-	-	-	-	-	-	-	245	
	Max	-	-	-	-	-	-	-	201/212	
Achieved	-	-	-	-	-	-	-	-		

Metallurgical Results

Parameters		Inclusion Rating (IS : 4163 / ASTM : E45A / JK Chart)										Grain Size IS 4748 / ASTM E112 (No.)	Depth of Decarburization IS 6396/ASTM E1077		Micro Structure
		WORST FIELD RATING											Complete	Partial	
		Type	A		B		C		D		DS				
		Series	Thin	Thick	Thin	Thick	Thin	Thick	Thin	Thick					
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 6.5	-	0.40 MM		

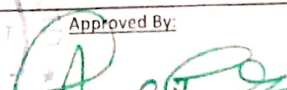
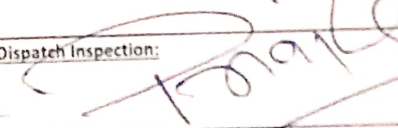
Physical Properties, Non Destructive Test & Other Test

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	-

Gas Analysis Report

Parameters	Dimensional Tolerance	Spark Test	X-RF	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	11.00	93.0	0.82

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.

Prepared By: VISHWAKARMA SHARMA 22/11/24	Approved By: 	Pre Dispatch Inspection: 
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