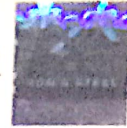


## UNIT-I

## 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  A32083 ✓ 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	2024-25/0017311 05-11-2024 13435  34.545 320x250 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/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	0.190	0.905	0.225	0.027	0.014	1.140	1.040	0.070	0.003	0.021	0.095	0.0007	-	-	-	-	2.19

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

Distance (mm)	1.5	3	5	7	9	11	13	15	20	25	-	-	-	-	-	-	-
Spec. 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	44.5	43.0	42.0	39.5	37.5	35.0	34.0	31.0	29.5	-	-	-	-	-	-	-

## 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		Surface Hardness As Rolled (BHN)	
Spec. Min	-	-	-	-	-		(Inch)	(mm)	-	
Max	-	-	-	-	-		-	-	245	
Achieved	-	-	-	-	-		-	-	207/223	

## 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										DS	Complete		Partial
		Type	A		B		C		D						
	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	-	0.41 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		
Spec.	-	100% bars	100% bars	O <sub>2</sub> (ppm)	N <sub>2</sub> (ppm)	H <sub>2</sub> (ppm)
Achieved	As per IS 3739 Grade 1	Tested-Ok	Tested-Ok	15 MAX 10.00	90-110 96.0	2.0 MAX 0.83

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.

MACHINE STRAIGHTENED MATERIAL ✓

Prepared By:  
VISHWAKARMA SHARMA

Approved By:

Pre Dispatch Inspection: