

UNIT-I

TEST CERTIFICATE

TEST CERTIFICATE ACCORDING TO EN10204 TYPE 3.1



Customer Address:	Material Process Route Specification	Billet Route EAF-LRF-VD-CCM-AMLC-EMS-RM DOC NO- R/TS 267 D5M Rev.No.02 Rev.Date: 21.05.2022 PO No. PO 01/38166 PO Date:-08-03-2024	Report No. Date Invoice No. Weight (MT.)	2023-24/035640 10-04-2024 495 21525
M/S.				
RAMCO STEEL PVT.LTD, PLOT NO-75.SECTOR-25 FARIDABAD	Heat No. Grade Supply Size Supply Condition Colour Code	A29315 20MnCr5 90 MMØ AS HOT ROLLED BLUE+YELLOW	Input/Billet Size Reduction Ratio No's of Pcs No's of Bundle Multiple	250X250 MM 9.8:1(Spec7:1 Min) 80 10 NA

TEST RESULT

CHEMICAL ANALYSIS (ASTM E 415-14 / IS 8811-1998)

Element	C%	Mn%	Si%	S%	P%	Cr%	Ni%	Mo%	V%	Al%	Cu%	-	-	-	-	-	-
Spec.	Min	0.180	1.150	0.200	-	-	1.150	-	-	-	0.020	-	-	-	-	-	-
	Max	0.220	1.280	0.400	0.035	0.025	1.250	-	-	-	0.040	-	-	-	-	-	-
Achieved		0.200	1.250	0.240	0.026	0.013	1.220	0.110	0.030	0.003	0.026	0.095	-	-	-	-	-

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

Distance (MM)	1.5	3	5	7	9	11	13	15	20	25	30	40					
Spec.	Min	44	44	42	40	37	35	32	30	28	26	23	22				
(HRC)	Max	49	47	46	44	42	40	39	37	35	33	31	30				
Achieved (HRC)		46.0	45.0	44.0	43.0	41.0	38.0	35.5	33.5	32.0	30.5	29.0	28.0				

Mechanical Properties

Parameters	IS:1608/ASTM A370 Test Condition:-Q&T				IS:1757		ASTM A255		IS:1500	
	Tensile Strength (MPa)	Yield Strength (MPa)	Elongation (%)	Reduction Area (%)	Impact Strength Charpy U-notch (Joules)		D.I. Value		Surface Hardness As Rolled (BHN)	
	(Inch)	(mm)								
Spec.	Min	1200	885	8	25 J		-	-	-	
	Max	1420	-	-	-		-	-	240	
Achieved		1249	1074	9.4	33 J		-	-	183/201	

Metallographic Properties

Parameters	Inclusion Rating (ISO : 4967 / EN: 10247 / JK Chart) WORST FIELD RATING										Grain Size IS 4748 / ASTM E112 (No.)	Depth of Decarburization IS 6396/ASTM E1077 (mm)	Micro Structure
	Type	A		B		C		D		DS			
	Series	Thin	Thick	Thin	Thick	Thin	Thick	Thin	Thick				
Spec.	Min	-	-	-	-	-	-	-	-	-	6-8	0.60 MM MAX	P+Fe OK
	Max	2.0	1.0	2.0	1.0	1.0	0.5	2.0	1.0	-			10104124
Achieved		1.5	0.5	0.5	0.0	0.0	0.0	1.0	0.0	-	6.0 to 7.0	0.34 MM	Pearlite+Ferrite

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 11169
Spec.	C2,R2,S2 MAX	-	-	100%	100%	-
Achieved	Better than C2,R1,S1	Satisfactory	Satisfactory	100% DONE OK	100% DONE OK	OK

Parameters	Dimensional Tolerance	Spark Test	X-RF	Gas Analysis Report Test method-Leco		
				O ₂ (ppm)	N ₂ (ppm)	H ₂ (ppm)
Spec.	As per IS 3739 Grade 1	100%	100%	20 MAX	100 MAX	2.0 MAX
Achieved	Ok As per IS 3739 Grade 1	100% DONE OK	100% DONE OK	12.0	83.00	0.77

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	Approved By:	Pre Dispatch Inspection:
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