

METALLURGICAL TEST REPORT

Customer Address: M/S -FORGE (INDIA) PVT . LTD #60 , SECTOR-5 , PARWANOO-H.P.	Material	Billet Route	Report No.	92957
	Process Route	EAF-LRF-VD-CCM-AMLC-EMS-RM	Date	24-03-2018
	Specification	Standard	Invoice No.	11872
	Heat No.	A06355	Weight (MT.)	15.805
	Grade	EN353	Input/Billet Size	200X200 MM
	Supply Size	63 MM RCS	Reduction Ratio	10:1
	Supply Condition	AS HOT ROLLED	No's of Pcs	NA
	Colour Code	WHITE+GREEN DOT	No's of Bundle	NA
			Multiple	NA

TEST RESULT

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

Element	C%	Mn%	Si%	S%	P%	Cr%	Ni%	Mo%	V%	Al%	Cu%	Ti%	Sn%	B%	Ca%	Co%	CE%	Cr+
Spec.	Min	-	0.500	-	-	-	0.750	1.000	0.080	-	-	-	-	-	-	-	-	-
	Max	0.200	1.000	0.350	0.050	0.050	1.250	1.500	0.150	-	-	-	-	-	-	-	-	-
Achieved		0.165	0.720	0.235	0.021	0.016	0.800	1.010	0.095	0.003	0.023	0.130	-	-	-	-	-	-

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

Distance (mm)	4/16"																	
Spec. (HRC)	Min	33																
	Max	37																
Achieved (HRC)		34.0																

Mechanical Properties (IS 1608 / ASTM A370)

Parameters		Tensile Strength (Kg/mm ²)	Yield Strength (Kg/mm ²)	Elongation (%)	Reduction Area (%)	Impact Strength IZOD/Charpy V-notch/U-notch (Joules)	D.I. Value ASTM A255		Surface Hardness As Rolled (BHN)
							(Inch)	(mm)	
Spec.	Min	-	-	-	-	-	-	-	-
	Max	-	-	-	-	-	-	-	-
Achieved		-	-	-	-	-	-	-	192/197

Metallographic Properties

Metallographic Properties														
Parameters		INCLUSION RATING ASTM E45/EN10247 (Degree of Purity)									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	-	-	-	-	-	-	-	-	-	6.5 to 7.0	-	Pearlite+Ferrite+Ba	
	Max	-	-	-	-	-	-	-	-	-				
Achieved		1.5	0.5	0.5	0.0	0.0	0.0	1.0	0.0	-				

Physical Properties, Non Destructive Test & Other Test

Parameters	Internal Soundness ASTM E381	Step Down Test IS 4075	Surface Inspection IS 13352	Magnetic Particle Inspection IS 10138	Ultrasonic Test ASTM A388 / IS 2417	Upsetting Test IS 11169
Spec.	-	-	-	-	-	-
Achieved	Better than C2,R2,S2	Satisfactory	Satisfactory	-	OK	-

Parameters	Dimensional Tolerance IS 3739	Spark Test	X-RF	Gas Analysis Report Test method-Leco		
				O ₂ (ppm)	N ₂ (ppm)	H ₂ (ppm)
Spec.	-	-	-	-	-	-
Achieved	As per IS 3739 Grade 1	100%	100%	18.8	77	1.9

Remarks :

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Checked By:

Approved By: