

METALLURGICAL TEST REPORT

Customer Address: M/S UNIQUE FORGINGS (INDIA) PVT. LTD. 601/1, PHASE-IV, G.I.D.C, NEAR RAILWAY STATION VITTHAL UDYOGNAGAR-388121 GUJARAT, INDIA	Material Process Route Specification Heat No. Grade Material Supply Condition Colour Code	Billet Route EAF-EBT-LRF-VD-CCM-AMLC-EMS-RM DOC NO. RM/PUR/TDC/04/F REV,05 DATE-24/03/2017 A06686 SAE8620 60 MM Ø AS HOT ROLLED PINK	Test Certificate No. Date Invoice No. Weight (MT.) Input/Billet Size Reduction Ratio No's of Pcs No's of Bundle Multiple	95497 18-05-2018 1559 14.535 200X200 MM 14.1:1 (Spec-6:1 min) NA NA NA
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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+Ni+Mo
Spec. Min	0.180	0.700	0.150	-	-	0.400	0.400	0.150	-	0.020	-	-	-	-	-	-	-	-
Spec. Max	0.230	0.900	0.300	0.040	0.035	0.600	0.700	0.250	-	0.060	-	-	-	-	-	-	-	-
Achieved	0.190	0.760	0.260	0.026	0.011	0.435	0.430	0.160	0.003	0.024	0.090	-	-	0.0004	0.0005	-	-	-


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

Distance	3/16"																	
Spec. Min	32																	
(HRC) Max	38																	
Achieved (HRC)	37.5																	

Mechanical Properties (IS 1608 / ASTM A370)

Parameters	Tensile Strength Kg/mm2/(Mpa)	Yield Strength Kg/mm2/(Mpa)	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	-	-	-	-	-	-	-	-
Spec. Max	-	-	-	-	-	-	-	-
Achieved	-	-	-	-	-	-	-	170/179

Metallographic Properties

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			
		WROST FIELD RATING										Complete	Partial	Uniform	Banding	Structure	
		Type	A		B		C		D								DS
Series	Thin	Thick	Thin	Thick	Thin	Thick	Thin	Thick	Thin	Thick							
	Min	-	-	-	-	-	-	-	-	-	-	0.5% of diameter max		-	-	-	
	Max	2.0	1.5	2.0	1.5	2.0	1.5	2.0	1.5	2.0	1.5	-			-	-	-
Achieved		1.5	0.5	0.5	0.0	0.0	0.0	1.0	0.0	0.0	-	6.0 to 6.5	-	0.16	-	15micron max	Pearlite+Ferri te+Bainite

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,R1,S1	Satisfactory	Satisfactory	OK	100%	-

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.	-	-	-	20 MAX	70-100	2 MAX
Achieved	As per IS 3739 Grade 1	100%	100%	13.00	83.00	0.71

Remarks :

material is free from radio active contamination.

Prepared By:
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Approved By: