

METALLURGICAL TEST REPORT

Customer Address:	Material	Billet Route	Test Certificate No.
M/S UNIQUE FORGINGS (INDIA) PVT. LTD.	Process Route	EAF-EBT-LRF-VD-CCM-AMLC-EMS-RM	93812
601/1, PHASE-IV, G.I.D.C.,	Specification	DOC NO.RM/PUR/TDC/04/F	Date
NEAR RAILWAY STATION		REV,05 DATE-24/03/2017	11-04-2018
VITTHAL UDYOGNAGAR-388121	Heat No.	A06300	Invoice No.
GUJARAT, INDIA	Grade	SAE8620	340
	Material	60 MM Ø	Weight (MT.)
	Supply Condition	AS HOT ROLLED	20.880
	Colour Code	PINK	Input/Billet Size
			200X200 MM
			Reduction Ratio
			14.1:1 (Spec-6:1 min)
			No's of Pcs
			NA
			No's of Bundle
			NA
			Multipie
			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+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	0.185	0.850	0.200	0.022	0.021	0.510	0.455	0.180	0.003	0.026	0.150	-	-	0.0004	0.0003	-	-	-

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

Distance	4/16"																	
Spec. Min	36																	
Spec. (HRC) Max	40																	
Achieved (HRC)	37.0																	

Mechanical Properties (IS 1608 / ASTM A370)

Parameters	Tensile Strength	Yield Strength	Elongation	Reduction Area	Impact Strength	D.I. Value	Surface Hardness
	Kg/mm2/(Mpa)	Kg/mm2/(Mpa)	(%)	(%)	IZOD/Charpy V-notch/U-notch (Joules)	ASTM A255 (Inch) (mm)	As Rolled (BHN)
Spec. Min	-	-	-	-	-	-	-
Spec. Max	-	-	-	-	-	-	-
Achieved	-	-	-	-	-	-	163/167

Metallographic Properties

Parameters	Inclusion Rating (IS : 4163 / ASTM : E45A / JK Chart)	Grain Size	Depth of Decarburization	Micro Structure
	WROST FIELD RATING	IS 4748 / ASTM E112 (No.)	IS 6396/ASTM E1077	
	Type Series A B C D DS		Complete Partial	Uniform Banding Structure
Spec. Min	-	-	-	-
Spec. Max	2.0 1.5 2.0 1.5 2.0 1.5 2.0 1.5 -	-	0.5% of diameter max	-
Achieved	1.0 0.5 0.5 0.0 0.0 0.0 1.0 0.0 -	6.0 to 6.5	- 0.16	- 15micron max Pearlite+Ferrite+Bainite

Physical Properties, Non Destructive Test & Other Test

Parameters	Internal Soundness	Step Down Test	Surface Inspection	Magnetic Particle Inspection	Ultrasonic Test	Upsetting Test
	ASTM E381	IS 4075	IS 13352	IS 10138	ASTM A388 / IS 2417	IS 11169
Spec.	-	-	-	-	-	-
Achieved	Better than C2,R1,S1	Satisfactory	Satisfactory	OK	100%	-

Parameters	Dimensional Tolerance	Spark Test	X-RF	Gas Analysis Report
	IS 3739			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%	8.00 84.00 0.85

Remarks :

material is free from radio active contamination.

REVIEWED
OK
accepted
Date 16/4/18
Approved By:

Prepared By:
Santosh Sharma