Shivam Autotech Ltd.

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58th K.M.Stone Delhi-Jaipur Highway Binola
Dist- Gurgaon (Haryana)-122413

Record No :
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METALLURGICAL TEST REPORT OF FINISHED FORGINGS

Test Certificate No : SAL/GGN/17-18/EV-35/03/0
Part Name :
Date : 03 /03/2018
Qty. :

Customer : VECV LTD
Part No. :
P/O No. :
Ch. No. & date :

Material Spec. : 16MnCr5 (MAC-TS-039) , Used: 16MnCr5 (MAC-TS-039)			
Heat No.	Name of Main Producer	SAL – Heat code	Reduction Ratio
35281	Gerdau Steel India Pvt. Ltd	PN	20.3:1

Chemistry{ AS Per ASTM E 415 :2014 / IS 8811 - 1998} & Visual

Status	% C	% Mn	% Si	% S	% P	% Ni	% Cr	% Mo	%Cu	%Ca	%Al	Visual	Remarks
Specified	0.14/ 0.19	1.00/ 1.30	0.40 Max.	0.035 Max.	0.035 Max.	…	0.80/ 1.10	….	….	…..	…..	Ok	Acceptable
Observed	0.170	1.243	0.241	0.021	0.016	0.035	1.047						

Metallurgy, Mechanical & Qualitative

Status	Macro Test 50%HCl; Microscope/Lens		Micro Structure	Grain Size (ASTM E-112)	Inclusion Rating: ASTM E-45								*Qualitative Test (100%)	
	Segregation Level ASTM E-381	Grain Flow Pattern			A		B		C		D		Spark	Mobile Spectro meter
					T	H	T	H	T	H	T	H		
Specn	C3R3S3 max	Must follow contour	P in F matrix ; no banding	6/8	2.0	1.5	2.0	1.5	2.0	1.5	2.0	1.5	Ok	Ok
Obsvd	C1R1S1	Satisfactory	Ok	6.5-7.0	1.5	0.5	1.0	-	-	-	1.0	0.5		

Magnetic Crack Detection		H/T –Status : Normalising				UTS N/mm^2	YS N/mm^2	% EL	Hardness (RM) HB IS1500:2013
		Hardness HB (spec)	Hardness HB (obsvd)	Microstructure: (100X, 2% Nital)					
Specn.	Obsvd.	150~190		Spec	Ferrite & Pearlite	Spec.	Spec	Spec.	Spec
…..	----			Obsrvd	Ferrite & Pearlite	NA	NA	NA	240 Max.
						Obsvd	Obsvd.	Obsvd.	Obsvd.

Hardenability Test: IS 3848:1981 HRC				*Ch/Iz Impact Test ('V'/'U') Joules / ft-lbs / kg-mtrs		*Upsettability Test
Jominy Value at Specified Distance (inch)				Specn.	Observed	
J1/16		J4/16		NA	----	Ok
Spec.	Obsvd.	Spec.	Obsvd.			
42MAX.	42	33~37	37			

Remarks : ** This heat is approved by customer.
Above said components are found to be metallurgically ok .
The tests marked with an * are not accredited by NABL.
This certificate is guarrantee for the samples tested by Laboratory.
It should not be reproduced in part without written approval from Laboratory.

Prepared By

Approved By