



VARDHMAN SPECIAL STEELS LTD.

C-58, FOCAL POINT, PHASE V, LUDHIANA (PB.) INDIA

Ph. No.: 0161-2670707-09

QF MSD 4.12.06

ISO/TS 16949 : 2009

Certificate : 37659-2008

ISO 14001 : 2004

Certificate : 177315-2015

OHSAS 18001 : 2007

Certificate: 177314-2015

TEST CERTIFICATE

IS : 7283



CM/L-9700028216

TEST CERTIFICATE NO. 2018/02/485

DATE: 24/02/2018

To HAPPY FORGINGS LTD (UNIT-II)

We certify that the material described below fully conforms to IS:7283-1992. Chemical Composition and Mechanical Properties of the product tested in accordance with the Scheme of Testing and Inspection contained in the BIS Certification Marks licence No. CM/L-9700028216 are as indicated below against each order No. etc.

(PLEASE REFER TO IS:7283-1992 FOR DETAILS OF SPECIFICATION REQUIREMENTS)

TEST RESULTS

Order No. & Date	Invoice No.	Grade	Heat No (Cast No)	Finished Section (Nominal Size mm)	Qty	Finish Shape	Cast Section (mm)	Red. Ratio	Supply Cond.	Color Code	Length of Bar	No of Bars						
	SA17000 2560	1E1120	64058	100mm	32796	RCS	200*200	4.0	Hot Rolled	Red Base/White Line	3-6MTR	51						
Manufacturing Route		EAF-LRF-VD-CCP With EMS & AMLC																
% CHEMICAL COMPOSITION																		
	C	Si	Mn	S	P	Ni	Cr	Mo	Cu	Sn	Al	Ti	Ca	B	V			
Min.	0.19	--	0.80	0.015	--	--	0.45	0.08	--	--	0.020	--	--	--	--			
Max.	0.23	0.18	1.10	0.025	0.020	--	0.70	0.25	--	--	--	--	0.0020	--	--			
Actual	0.22	0.13	1.06	0.018	0.014	0.050	0.650	0.105	0.080	0.005	0.029	0.0016	0.0015	0.0002	0.004			
	O2	N2	H2	Grain Size			Total Decarb (mm)			D.I. Value			Micro Structure					
	In PPM			(IS:4748/ASTM E112)			(IS:6396)											
Min.	--	--	--	5			--			43.2 mm			--					
Max.	--	--	--	--			--			61.0 mm			--					
Actual	10	76	1.1	6.5/7.5			--			50.29 mm			--					
INCLUSION RATING - IS:4163 / ASTM E45A/ ISO 4967, Method A													JIS		DIN		Hardness BHN	
	A		B		C		D							IS 1500:1983				
	Thin	Thick	Thin	Thick	Thin	Thick	Thin	Thick	A	B+C	Total	K3	K4		Min Max			
Max.	3.0	2.0	2.0	1.0	0.5	0.5	1.0	1.0							-- 220			
Actual	2.0	--	0.5	--	--	--	1.0	--							180 200			
JOMINY HARDENABILITY (IN HRC) (IS 3848)																		
MM / Inch	J1/16	J3/16	J8/16															
Min.	43	35	--															
Max.	48	--	29															
Actual	44.0	39.5	24.5															
MECHANICAL PROPERTIES (IS 1608)																		
	Test Condition		Tensile Strength		Yield Strength		Elongation		Reduction Area		Impact Strength							
Min.			--		--		--		--		--							
Max.			--		--		--		--		--							
Actual			--		--		--		--		--							
Supplementary Requirements																		
Standard	Internal Soundness (ASTM E381 / IS11371)				Step Down (IS 4075) / Blue Fracture Test (IS:10138)				Surface Defects (Visual /MFLT)				Bend Test (IS1599:1985)					
Required	C3R3S3 max				As per IS 4075				Depth of defect 0.3 mm max.				---					
Actual	C3R3S3 max				OK As per IS 4075				OK				---					
	Ultrasonic Test				MFLT				Dimension Tolerance				Ovality / Lobbing					
Required	Yes				--				IS:3739				IS:3739					
Actual	100% Bars manual ut done & found OK				--				Asper is 3739 gr 1				A s per IS3739 gr 1					
Mixup Test	100% Bars Checked by Spark, Metascope, Ni Spot test, Mobile Spectro - OK																	
The Material Supplied to the Standard rolling Tolerances																		
Remarks:- Free from radioactive material or banned substances.																		
Reference Standard IS 7283:1992, Customer Specification Caterpillar Inc.CHG NO.17,DT.28.04.2010																		
For any Technical Support / Quality related issues please contact - Mr. Dinesh Singh (Sr. Manager - R&D) Mobile no. : 081466-25586 , email : met5.vss@vardhman.com																		
For any Test Certificate related issues please contact - Mr. Rajesh Kalia (Executive - R&D) Mobile no. : 075080-02659 , email : met2.vss@vardhman.com Website : www.vardhmansteel.com																		
Checked by : Engineer - R&D										Approved by : Authorised Signatory								
For VARDHMAN SPECIAL STEELS LTD.																		