



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

IS : 7283
Certificate : 177315-2015
OHSAS 18001 : 2007
Certificate: 177314-2015



CML-9700028216

TEST CERTIFICATE

Vardhman
TEST CERTIFICATE NO. 2018/02/478

DATE: 23/02/2018

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. CML-970002816 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												
	SAHA 7000 2559	1E1120	63833	100mm	3269	RCS	200*200	4.0	Hot Rolled	Red Base/White Line	3-6MTR	81												
Manufacturing Route EAF-IRF-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	0.21	0.125	1.06	0.022	0.016	0.055	0.660	0.105	0.100	0.005	0.026	0.0018	0.0010	0.0003	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	77	1.1	6.5/7.5			--	--	48.51 mm															
INCLUSION RATING - IS:4163 / ASTM E45A/ ISO 4967, Method A													JIS			DIN			Hardness BHN					
													A			B			C			D		
	Thin	Thick	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	0.5	1.0	1.0						--	220							
Actual	2.0	--	0.5	--	--	--	1.0	--	--	--						185	205							

MECHANICAL PROPERTIES (IS 1608)

Test Condition		Tensile Strength		Yield Strength		Elongation		Reduction Area		Impact Strength	
Min.	--	--	--	--	--	--	--	--	--	--	--
Max.	--	--	--	--	--	--	--	--	--	--	--
Actual	--	--	--	--	--	--	--	--	--	--	--
Supplementary Requirements											
Step Down (IS 4075) / Blue Fracture Test (IS:10138)											
As per IS 4075											
OK As per IS 4075											
MFLT											
Yes											
100% Bars manual ut done & found OK											
100% Bars Checked by Spark, Metascope, Ni Spot test, Mobile Spectro - OK											
Bend Test (IS1599:1985)											
Depth of defect 0.3 mm max.											
OK											
Dimension Tolerance											
IS:3739											
Ovality / Lobbing											
IS:3739											
As per IS3739 gr 1											
A s per IS3739 gr 1											

The Material Supplied to the Standard rolling Tolerances

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	---
Required	Ultrasonic Test	MFLT	Dimension Tolerance	Ovality / Lobbing
Actual	Yes	--	IS:3739	IS:3739
Mixup Test	100% Bars manual ut done & found OK	--	Asper is 3739 gr 1	A s per IS3739 gr 1

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 -

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For any Test Certificate related issues please contact -

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Checked by :
Engineer - R&D

Approved by :
Authorised Signatory

For VARDHMAN SPECIAL STEELS LTD.