

VARDHMAN SPECIAL STEELS LTD.

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

Ph. No.: 0161-2670707-09

ISO/TS 16949 : 2009 Certificate: 37659-2008

ISO 14001: 2004

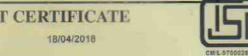
QF MSD 4.12.06

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

TEST CERTIFICATE

YEST ENTIFICATE NO. __ 2018/04/392 To HAPPY FORGINGS LTD (UNIT-II)

DATE.



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-970002816 are as indicated below against each order No. etc.

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

			TS

Order No. & Date		Invoice No.		Grade	No (Cast No)	Finished Section (Nominal Size mm) 90mm	Qty	Finish Shape	Cast Section (mm) 200*200	Red. Ratio	Supply Cond.	Color Code Red Base / White Line		Length of Bar		No of Bars	
				1E1120													
/lanufactu	ring Rou	te		F-VD-CCI	With E	MS & AML	0										
6 CHEMIC																	
	С	Si	Mn	S	Р	Ni	Cr	Mo	Cu	Sn	Al	Ti	Ca	В	V		
Min.	0.19		0.80	0.015	**	- 60	0.45	0.08		-	0.020	,**			-,		
Max.	0.23	0.18	1.10	0.025	0.020		0.70	0.25	-	-	***	199	0.0020				
Actual	0.22	0.13	1.05	0.018	0.016	0.045	0.665	0.11	0.09	0.005	0.026	0.0015	0.0010	0.0002	0.004		
Actual	02	N2	H2		Grain Si	ze	Tota	I Decarb	(mm)	D.I	. Value		Mic	cro Struct	ture		
	In PPM (IS:4748/ASTM				W E112)	Control of the Contro											
Min.	-	A STATE OF THE STA			MANAGE AND				43.2 mm								
Max.	-				**		-			61.0 mm		***************************************					
Actual	13	78	1.2		6.5/7.5	5				50.76 mm		4					
NCLUSIO	ON RATING - IS:4163 / ASTM E45A/ ISO 4967						od A					DIM			Hardness BH		
		A E				D		1	JIS			DIN	DIN		IS 1500:1983		
	Thin	Thick	Thin	Thick	Thin	Thick	Thin	Thick	A	B+C	Total	Кз	K4		Min	Max	
Max.	3.0	2.0	2.0	1.0	0.5	0.5	1.0	1.0								223	
Actual	2.0	-	0.5	-	144	-	1.0	-							190	210	
				1		JOMINY	HARDE	NABILITY	(IN HRC)	(IS 3848)						
VIM / Inch	J1/16	J3/16	J8/16														
Min.	43	35															
Max.	48		29														
Actual	44.5	39.5	24.0														
A Para California						MEC	HANICAL	PROPE	RTIES (IS	1608)							
	Test Condition Tensile Stre					ength	Yield Strength			Elongation Re		Reduction Area Im		Imp	mpact Strength		
Min.	13.			2 1				-				/inc					
Max.						-					-		/# 1 I = 11				
Actual	A section of the									# 4/4							
						8	uppleme	entary Re	quiremen	ts							
Standard	Internal	Soundne	ss (AST	M E381 /	IS11371	Step Dov		75) / Blue 3:10138)	Fracture	Surfa	ace Defects (Visual /	VIFLT)	Bend Te	est (IS15	99:198	
Required		C	3R3S3 max As per IS 407					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					MT.				Asper is 3739 gr 1			A s per IS3739 gr 1				
Mixup Tes		100% B	ars Chec	ked by Sr	ark Mets	scope,Ni S	annt test	Mobile Sn	nectro - OK				7				

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)

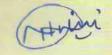
Mobile no.: 081466-25586, email: met5.vss@vardhman.com

For any Test Certificate related issues please contact -

Mr. K.K.Shukla (Officer - R&D)

Mobile no.: 075080-02659, email: met2.vss@vardhman.com

Website; www.vardhmansteel.com



Checked by : Engineer - R&D Approved by:

neer - R&D Authorised Signatory
For VARDHMAN SPECIAL STEELS LTD.