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CIN : L27100MH1984PLC034003

SUNFLAG IRON & STEEL CO. LTD.

Regd. Office : 33, Mount Road, Sadar, Nagpur - 440 001 India  
Works : Bhandara Road, Bhandara - 441 905 (Maharashtra)

TEST CERTIFICATE

ZIP



CUSTOMER : M M FORGINGS LIMITED				PROCESS ROUTE		TC NO. : 0016534		DATE : 14.03.2018			
				MBF-EAF-LRF-VD-CCM-RM		INVOICE NO. : 172721481		DATE : 15.03.2018			
						DELIVERY ORDER NO.: 81057805		TRUCK NO. : TN888617			
CUSTOMER SPECIFICATION No.		HEAT No.	GRADE	SECTION IN (mm)	GRADE COLOUR CODE	BLT/BLM SIZE (mm)	SUPPLY CONDITION		LENGTH (Mtrs)	NO.OF PIECES	QTY (MT)
MSA044A R-3 /10.10.2017		08683	SCR420H	RND-56	RED+PINK DOT+RED	160x160	AS ROLLED		5.250		4.030

CHEMICAL COMPOSITION																								
	%C	%Mn	%P	%S	%Si	%Cr	%Cu	%Ni	%Mo	%V	%Al	%Pb	%Ti	%B	%Sn	%W	%As	%Ca	%Sb	%Co	%Nb	O2	N2	H2
																						ppm	ppm	ppm
SP-MIN	0.17	0.55	-	-	0.15	0.85	-	-	-	-	0.020	-	-	-	-	-	-	-	-	-	-	-	-	-
-MAX	0.23	0.90	0.030	0.030	0.35	1.05	0.30	0.25	0.06	0.02	-	0.01	0.020	0.0006	0.02	-	0.01	-	0.01	-	0.0100	20	100	2.0
ACTUAL	0.19	0.84	0.0170	0.0130	0.2400	0.9800	0.0280	0.0240	0.0030	0.0060	0.0240	0.0003	0.0032	0.0002	0.0011	-	0.0055	0.0013	0.0007	-	0.0030	17	89	1.20

MECHANICAL PROPERTIES									JOMINY VALUE (MM - HRC)												
	As Rolled	/ H.T.			IMPACT	HARDNESS	DI	CE													
	PS/YS	UTS	%EL	%RA	(IZOD/CHARPY)	(BHN)	VALUE	VALUE	J1.5	J3	J5	J6	J7	J9	J10	J11	J13	J15	J20	J25	J30
	( )	( )			( )																
SPEC-MIN	-	-	-	-	-	-	-	-	-	-	32.0	-	29.0	-	-	-	-	-	-	-	-
-MAX	-	-	-	-	-	-	-	-	-	-	37.0	-	34.0	-	-	-	-	-	-	-	-
ACTUAL	-	-	-	-	-	165	-	-	-	-	34.0	-	31.0	-	-	-	-	-	-	-	-

METALLURGICAL PROPERTIES																						
INCLUSION RATING (ASTM-E-45 /IS:4163)										GRAIN	SURFACE	QUENCH	JISG0555				DECARBURIZATION (MM)			MACRO ETCH	REDUCTION	
										SIZE (ASTM	QUALITY	HARDNESS								RESULTS	RATIO	
A T A H B T B H C T C H D T D H - E- 112)												( )	dA	+	dB+dC	=	D	Full	Partial	Total	ASTM-E-381	
SPEC-MIN	-	-	-	-	-	-	-	-	-	6	OK	-	-	-	-	-	-	-	-	-	6:1	
-MAX	2.00	1.00	2.00	1.00	0.50	0.50	2.00	1.00	8		-	-	-	-	-	-	-	0.44	0.44	C2R2S2	-	
ACTUAL	1.00	-	0.50	-	0.00	-	1.50	-	7/7.5	OK	-	-	-	-	-	0.000	-	0.24	0.24	C2R1S1	10.40	

REMARKS :100% SPARK/SPECTRAL:OK.U.S.T. (100%):OK.M.P.T. (100%):OK.MICRO  
STRUCTURE:FERRITE + PEARLITE.

We certify that the material described above conforms to the specs.  
For Sunflag Iron & Steel Co. Ltd.

%PB=0.00,%HG=0.00,%CD=0.00 HEXAVALENT CHROME=0.00

MCR001 REV 05 3.3.2015 GSR-002 REV 7 13.09.2013

*[Signature]*

BGM QA&CS