

TEST CERTIFICATE

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CUSTOMER : M M FORGINGS LIMITED				PROCESS ROUTE		TC NO. : 0022296		DATE : 13.05.2018		
				MBF-EAF-LRF-VD-CCM-RM		INVOICE NO. : 182702897		DATE : 13.05.2018		
						DELIVERY ORDER NO.: 81064357		TRUCK NO. : TN52K9987		
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	09672	SCR420H	RND-56	RED+PINK DOT+RED	160x160	AS ROLLED	5.500		16.490

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
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	0.18	0.88	0.0280	0.0040	0.2900	0.9800	0.0250	0.0350	0.0070	0.0050	0.0340	0.0006	0.0034	0.0002	0.0010	-	0.0056	0.0011	0.0007	-	0.0020	16	93	1.10

MECHANICAL PROPERTIES

JOMINY VALUE (MM - HRC)

	PS/YS	As Rolled UTS	H.T. %EL	%RA	IMPACT (IZOD/CHARPY)	HARDNESS (BHN)	DI VALUE	CE 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	-	-	-	-	-	173	-	-	-	-	36.0	-	30.0	-	-	-	-	-	-	-	-

METALLURGICAL PROPERTIES

	INCLUSION RATING (ASTM-E-45 /IS:4163)								GRAIN SIZE (ASTM - E- 112)	SURFACE QUALITY	QUENCH HARDNESS ()	JISG0555			DECARBURIZATION (MM)			MACRO ETCH RESULTS ASTM-E-381	REDUCTION RATIO							
	A	T	A	H	B	T	B	H				C	T	C	H	D	T			D	H	=	D	Full	Partial	Total
	-	-	-	-	-	-	-	-				-	-	-	-	-	-			-	-	-	-	-	-	-
SPEC-MIN	-	-	-	-	-	-	-	-	6	OK	-	-	-	-	-	-	-	-	-	-	-	-				
-MAX	2.00	1.00	2.00	1.00	0.50	0.50	2.00	1.00	8	-	-	-	-	-	-	-	-	-	0.44	0.44	C2R2S2	6:1				
ACTUAL	1.00	-	0.50	-	0.00	-	1.50	-	7/7.5	OK	-	-	-	-	0.000	-	0.19	0.19	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

3.3.2015 GSR-002 REV 7 13.09.2013

[Signature]
DGM QA&CS