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SUNFLAG IRON & STEEL CO. LTD.

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



TEST CERTIFICATE

CUSTOMER : RAMKRISHNA FORGINGS LTD	PROCESS ROUTE	TC NO. : 0018506	DATE : 31.03.2018
		INVOICE NO. : 172722954	DATE : 31.03.2018
	MBF-EAF-LRF-VD-CCM-RM	DELIVERY ORDER NO.: 81059957	TRUCK NO. : CG07BE5356

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)
RF/14/D-401/150 R-04	14.03.2016	04136	SCR420H	RND-95	RED+PINK DOT+RED	210x232 AS ROLLED	5.500		27.870

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	-	-	-	-	-	-	-	-	-	-	ppm	ppm	ppm
-MAX	0.23	0.90	0.030	0.030	0.35	1.25	0.25	0.25	0.06	0.02	0.050	-	0.020	0.0006	0.02	-	0.01	-	0.010	-	0.0100	15	90	2.0
ACTUAL	0.17	0.84	0.0150	0.0070	0.2500	1.0600	0.0110	0.0080	0.0050	0.0050	0.0220	-	0.0035	0.0003	0.0010	-	0.0050	-	0.0006	-	0.0040	12	76	1.23

MECHANICAL PROPERTIES

	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	-	-	-	-	-	-	-	-	40.0	37.0	32.0	-	29.0	-	-	21.0	-	-	-	-	-
-MAX	-	-	-	-	-	240	-	-	48.0	48.0	37.0	-	34.0	-	-	32.0	-	-	-	-	-
ACTUAL	-	-	-	-	-	167	-	-	42.0	39.0	34.0	-	29.0	25.0	-	22.0	20.0	18.0	16.0	14.0	13.0

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		-		0.50		-		2.00		1.00		8		-	-		-		-		-	-	-	-	C2R2S2	-	
ACTUAL	1.00		-		0.50		-		0.00		-		1.50		-		7/7.5		OK	-		-		0.000		-	0.41		0.41		C2R2S1	6.88

REMARKS : 100% SPARK/SPECTRAL:OK.STEP DOWN TEST: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.

MTRL IS FREE FM RADIOACTIVE ELEMENTS
SURFAC COND. SATISFACTORY

RBT

(Signature)