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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 : SADHU FORGING LIMITED (UNIT -II)				PROCESS ROUTE				TC NO. : 0023596				DATE : 25.05.2018			
				MBF-EAF-LRF-VD-CCM-RM				INVOICE NO. : 182703853				DATE : 25.05.2018			
								DELIVERY ORDER NO. : 81066079				TRUCK NO. : MP22H1346			

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)
Q.F.1001 R-1 (NEW)	/01.04.2015	10360	20MNCr5	RND-56	RED+PINK+RED	160x160 AS ROLLED	5.150		25.500

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	0.13	1.00	-	0.015	0.15	0.80	-	-	-	-	0.020	-	-	-	-	-	-	-	-	-	-	-	60	-
-MAX	0.18	1.30	0.020	0.030	0.40	1.10	0.30	0.30	0.10	-	0.050	-	-	0.0005	-	-	-	0.0010	-	-	-	20	120	2.5
ACTUAL	0.17	1.24	0.0140	0.0250	0.3700	1.0600	0.0220	0.0150	0.0030	0.0050	0.0260	0.0002	0.0021	0.0002	0.0010	-	0.0045	0.0006	0.0006	-	0.0028	13	88	0.90

MECHANICAL PROPERTIES												JOMINY VALUE (MM - HRC)											
	PS/YS (N/MM2)	As Rolled / H.T. UTS (N/MM2)	%EL	%RA	IMPACT (IZOD/CHARPY) (JOULES)	HARDNESS (BHN)	DI VALUE	CE VALUE	J1.5	J3	J5	J6	J7	J9	J10	J11	J13	J15	J20	J25	J30		
SPEC-MIN	735.00	1030.00	8.00	-	25.00	-	-	-	39.0	-	34.5	-	-	-	29.0	-	-	25.0	22.5	21.0	20.0		
-MAX	-	1370.00	-	-	-	240	-	-	44.0	-	40.5	-	-	-	35.5	-	-	31.5	29	27.5	26.5		
ACTUAL	984.75	1105.97	9.10	-	31.33	173	-	-	43.0	42.0	38.0	-	34.0	32.0	30.0	29.0	27.0	26.0	24.0	22.0	21.0		

METALLURGICAL PROPERTIES																							
INCLUSION RATING (ASTM-E-45 /IS:4163)										GRAIN SIZE (ASTM - E-112)	SURFACE QUALITY	QUENCH HARDNESS (HRC)	JISG0555			DECARBURIZATION (MM)			MACRO ETCH RESULTS	REDUCTION RATIO			
A	T	AH	B	T	BH	C	T	CH	D	T	DH			dA	+	dB+DC	=	D	Full	Partial	Total	ASTM-E-381	
SPEC-MIN	-	-	-	-	-	-	-	-	-	5		OK	-	-	-	-	-	-	-	-	-	-	7:1
-MAX	2.00	1.50	2.00	1.00	0.50	0.50	1.00	1.00	8		-	-	-	-	-	-	-	-	-	-	-	C2R3S3	-
ACTUAL	2.00	0.50	0.50	-	0.00	-	1.00	-	7/7.5		OK	-	-	-	-	-	0.000	-	0.26	0.26		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.											
STRUCTURE:FERRITE + PEARLITE.												For Sunflag Iron & Steel Co. Ltd.											

UNCLASIFIED IS FREE FM RADIOACTIVE ELEMENTS
UNCLASIFIED BANDING WITHIN GR IV OF UNI8449;AL/N2=2.95