

**TEST CERTIFICATE**

Certificate No. : 98171 Customer Name: Steel and Bright Corporation Cust. Address : SURVEY NO. - 267 NH-8B RAJKOT,Gujarat-360024,India								Date : 09.10.2024 SO No : 402433245/10 SO Date : 23.08.2024 Truck No.: RJ42GA8989	Po Number:OA NO. 1068 Po date : 21.08.2024 Packing Slip No : 716869651 Invoice No : 0093192916
Heat No	Grade	Size (mm)	Length (mm)	MIL (mm)	No. of Bundles	No. of PCS	Weight	Billet Size	
F241363	20MNCR5	50.00 mm DIA	6,000.00 mm		3		7.865 MT	180 X 180 mm	

TDC NO : MFR\_2471

Process Route : BF-EAF-LRF-VD-CCM-RM

Reduction Ratio : 16.50 : 1

CHEMICAL ANALYSIS																		Prod STD No : 20MNCR5			
Element	C%	Si%	Mn%	P%	S%	Cr%	Mo%	Ni%	B %	V%	Cu%	Pb%	Sn%	Ti%	Nb%	Zr%	As%	Sb%	Al%	Ca %	CE%
MIN	0.1900	0.150	1.100		0.020	1.000														0.0200	
MAX	0.2200	0.400	1.400	0.025	0.0350	1.300														0.0400	
Actual	0.208	0.298	1.300	0.012	0.024	1.260	0.001	0.015	0.0003	0.002	0.006	0.001	0.001	0.0039	0.001	0.000	0.002	0.000	0.026	0.0011	0.679

Gas Levels : N ppm : [ / 80 ] -60 O ppm : [ / 20 ] -12.0 H ppm : [ / 2.00 ] -1.70

**MECHANICAL PROPERTIES :**

Cond.	Tensile Test ( )				Hardness Test				Impact Test ( )							
					As rolled				Spec.							
	YS	UTS	Elong.	RA	As Supply	As Quenched		As Q&T	Test Temp	Imp. Value (min)	Avg.		°C	J	°C	J
Min			%	%	BHN											
Max																
Actual					172											

Upset Type :

Upset Result :

**JOMINY HARDENABILITY ( IS\_3848 )**

Ideal Diameter (DI) : [ / ] -

Distance	J1.5	J3	J5	J7	J9	J11	J13	J15	J20	J25							
MIN (HRC)	45.0	44.0	42.0	40.0	37.0	35.5	34.0	32.5	30.0	28.0							
MAX (HRC)	49.0	49.0	48.0	45.0	44.0	42.0	41.0	40.0	37.0	35.0							
Actual(HRC)	46.00	44.50	43.00	41.50	40.00	37.50	35.00	33.00	31.50	29.00							

**METALLURGICAL PROPERTIES & PHYSICAL INSPECTION**

	%C.SEG		Step Down Test		Non-metallic Inclusion K3		MPI Test		Pearlite Amount		Spark Test		Non-metallic Inclusion K4		Anti Mixup Check(100%)	
	Pass		CN	CZ Looser	CZ Closer	GBC Level	DEG. SPH	MFLT/ECT								
Spec	C2R2S2		/	/	/											
Actual	C2R2S1		FERRITE & PEARLITE													
	Grain Size (mm)	Decarb (µm)	Banding	A	B	C	D	DOS µm	Ultrasonic Test							
Spec	6.0 / 8.0	1.00 % of Dia Max	/	2.5	1.5	1.5	1.0	1.0								
Actual	7.00	0.250 mm		1.50		1.00	0.50	1.50								Pass

Inclusion Rating Test Standard: ASTM\_E45\_A  
Macro Etch Test Standard: ASTM\_E381  
Banding Test Standard:Decarb Standard: SAE\_J419  
UT Standard:

JSW COLOR CODE : BLUE+GREEN CUSTOMER COLOR CODE : BLUE+GREEN

**INSPECTION CERTIFICATE 3.1 ACCORDING TO EN 10204 : 2004**

Supply Condition : AS ROLLED

Remarks :

Reference : WE HEREBY CERTIFY THAT THE MATERIAL SHIPPED UNDER THIS TEST CERTIFICATE DID NOT COME IN DIRECT CONTACT WITH ANY MERCURY, CADMIUM HEXAVALENT CHROMIUM CONTAINING DEVICES, FREE FROM RADIOACTIVE CONTAMINATION EMPLOYING A SINGLE BOUNDARY OF CONTAINMENT DURING THE MANUFACTURING PROCESS,TESTS, INSPECTION AND STORAGE.

WE CERTIFY THAT CONTENTS OF THIS REPORT ARE CORRECT AND ACCURATE AND MEET THE REQUIREMENTS OF THE PURCHASE ORDER,TECHNICAL DELIVERY CONDITION, GENERAL STEEL REQUIREMENTS AND THE MATERIAL CERTIFICATION REQUIREMENTS.

NOTE:

1. THE RESULTS RELATES ONLY TO THE ITEM TESTED.
2. CERTIFICATE SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN APPROVAL OF ISSUING AUTHORITY.

For BHUSHAN POWER AND STEEL LIMITED

ANIL KUMAR GOUDA