

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 F241363	Grade 20MNCR5	Size (mm) 50.00 mm DIA	Length (mm) 6,000.00 mm	M/L (mm)	No. of Bundles 3	No. of PCS	Weight 7.865 MT	Billet Size 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.				Avg.										
Spec.	YS	UTS	Elong.	RA	As Supply	As Quenched		As Q&T		Test Temp	Imp. Value (min)	J		°C		J			
			%	%	BHN														
Min																			
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%)		
	Actual		Pass				OK				100% OK						
Macro Etch Test			Micro Structure		CN		CZ Looser		CZ Closer		GBC Level		DEG. SPH		MFLT/ECT		
Spec	C2R2S2			/		/			/								
Actual	C2R2S1		FERRITE & PEARLITE														
	Grain Size	Decarb (mm)	Banding (µm)	A	Thin	Thick	B	Thin	Thick	C	Thin	Thick	D	Thin	Thick	DOS µm	Ultrasonic Test
Spec	6.0 / 8.0	100 % of Dia Max	/	2.5	1.5	1.5	1.0	1.0	1.0	1.5	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

Grain Size Standard: ASTM_E112

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