

TEST CERTIFICATE

Certificate No. : 98171	Date : 09.10.2024	Po Number:OA NO. 1068
Customer Name: Steel and Bright Corporation	SO No : 402433245/10	Po date :21.08.2024
Cust. Address : SURVEY NO. - 267 NH-8B	SO Date : 23.08.2024	Packing Slip No :716869651
RAJKOT,Gujarat-360024,India	Truck No.: RJ42GA8989	Invoice No :0093192916

Heat No	Grade	Size (mm)	Length (mm)	ML (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 :

Tensile Test ()					Hardness Test			Impact Test ()			
Cond.					As rolled			Spec.			
Spec.	YS	UTS	Elong.	RA	As Supply	As Quenched	As Q&T	Test Temp	Imp. Value (min)	Avg.	
			%	%	BHN			°C	J	°C	J
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		B		C		D		DOS µm	Ultrasonic Test			
				Thin	Thick	Thin	Thick	Thin	Thick	Thin	Thick					
Spec	6.0 / 8.0	1.00 % 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

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

(Signature)

ANIL KUMAR GOUDA