GERDAU STEEL INDIA PVT LIMITED

GERDAU

PLANT: TADIPATRI. DIST.: ANANTPUR. A.P.: 515411

F/QA-TC/12 Rev. 01

TEST CERTIFICATE

TC No : 2018/00095914	Invoice No. :	Quantity t	Rolling Input : 160X160 mm
Customer : Sample TC		S.O. No. / Date :	
PROCESS ROUTE :- BF>>BOF>>LRF>>VD>>CCM(EMS & AMLC)>>RM		Size : 34 Dia	Truck No.:
Heat No:- 35718		Product : Rolled bar	Colour Code: BASE PURPLE/BLACKDOT
NO OF BUNDLES: NO OF BARS:	Grade :- 16MNCR5		
TAS No. : 2278/2016	TDC No :- MAC-TS-039, Rev: 02, Dated: 04.05.2017	Condition :As Rolled	Reduction Ratio: 28.20 :1

CHEMICAL COMPOSITION

Element	%C	%Mn	%Si	%P	%S	%Cr	%Ni	%Cu	%Mo	%Al	%Pb	%V	%Ti	%Ca
Min.	0.14	1.00	-	-	-	0.80	-	-	-	-	-	-	-	-
Max.	0.19	1.30	0.40	0.035	0.035	1.10	-	-	-	0.040	-	-	-	-
Actual	0.15	1.14	0.26	0.021	0.009	1.07	-	-	-	0.020	-	-	-	-

OTHER ELEMENTS Element	%B	%Nb	%As	%Sb	%Sn	%W	%Bi
Min.	-	-	-	-	-	-	-
Max.	-	-	-	-	-	-	-
Actual	-	-	-	-	-	-	-

GAS LEVEL	O_2 PPM	H_2 PPM	N_2 PPM
Min	-	-	-
Max	20	2	100
Actual	16	0.7	76

MECHANICAL PROPERTIES

Requirement	Hardness (BHN)	Impact Strength (IZOD/CHARPY)		Yield Strength (N/mm^2)	UTS (N/mm^2)	%Elong.	%RA
Min.	-	-	-	600	800	9	35
Max.	240	-	-	-	1100	-	-
Actual	163	-	-	826	978	14	36.5

JOMINY HARDENABILITY (HRC)	J1/16"	J3/16"	J4/16"	-	-	-
Min.	-	-	33	-	-	-
Max.	42	-	37	-	-	-
Actual	41.4	37.2	34	-	-	-

METALLURGICAL PROPERTIES

Requirement	Depth of Decarb (mm) (SAE J419 TYPE III)	Macro Etch (ASTM E 381)		Max. Depth of Surface Defect (mm)	Grain Size (ASTM E 112)
Min.	-	-	-	-	6
Max.	1% of dia max	-	-	-	8
Actual	0.19	C1R1S1		-	6.5-7.5

INCLUSION RATING AS PER ASTM E45 (METHOD A)

	A T	A H	B T	B H	C T	C H	D T	D H
Min	-	-	-	-	-	-	-	-
Max	2.0	1.5	2.0	1.5	2.0	1.5	2.0	1.5
Actual	1.5	0.5	1.0	-	-	-	1.0	0.5

Spark & Spectral Test:	100% OK
Surface Inspection:	100% OK
Ultrasonic Test:	100% OK
MPI:	-

Other Tests:	-
1. MFL:	100% OK
2. Step Turn:	Found Satisfactory
3. Blue Fracture:	-
4. Upset Test:	-

Oil Quenched Core Hardness:		
Min. in HRC	-	-
Actual in HRC	-	-

Remarks: Microstructure : Pearlite + Ferrite. Mechanical properties OK after H&T. Ultrasonic Test: 0.8x15 mm SDH , MFL: 0.3x10 mm

Length of Bar :-

"We certify that the contents of this report are correct & accurate & meet the requirements of the purchase order, technical delivery conditions, general steel requirements & the material certification requirements". Supplied material is free from radioactive element.

Technical Service 12.02.2018

Corporate Office: 304/305 World Trade Centre. Brigade Gateway Complex. Malleswaram (West). Bangalore: 560046. India

Please contact in case of query e-mail id: inml.techservice@gerdau.com