

<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: left;"> </div> <div style="text-align: center;"> <h2 style="margin: 0;">GERDAU STEEL INDIA PVT LIMITED</h2> </div> </div>																																		
PLANT: TADIPATRI. DIST.: ANANTPUR. A.P.: 515411																																		
TEST CERTIFICATE										F/QA-TC/12 Rev. 01																								
TC No : 2018/00095019					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:- 35283										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:		28.2 :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	0.14	1.18	0.29	0.018	0.015	1.02	-	-	-	0.030	-	-	-	-																				
OTHER ELEMENTS										<div style="text-align: center;">GAS LEVEL</div> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td></td> <td>O₂ PPM</td> <td>H₂ PPM</td> <td>N₂ PPM</td> </tr> <tr> <td>Min.</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>Max.</td> <td>20</td> <td>2</td> <td>100</td> </tr> <tr> <td>Actual</td> <td>16</td> <td>0.8</td> <td>84</td> </tr> </table>						O ₂ PPM	H ₂ PPM	N ₂ PPM	Min.	-	-	-	Max.	20	2	100	Actual	16	0.8	84				
	O ₂ PPM	H ₂ PPM	N ₂ PPM																															
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Max.	-	-	-	-	-	-	-																											
Actual	-	-	-	-	-	-	-																											
MECHANICAL PROPERTIES																																		
Requirement	Hardness (BHN)	Impact Strength (IZOD/CHARPY)	Yield Strength (N/mm ²)	UTS (N/mm ²)	%Elong.	%RA	JOMINY HARDENABILITY (HRC)																											
							J1/16"	J3/16"	J4/16"	-	-	-																						
Min.	-	-	-	600	800	9	35	Min.	-	-	33	-	-	-																				
Max.	240	-	-	-	1100	-	-	Max.	42	-	37	-	-	-																				
Actual	158	-	-	815	959	14	39	Actual	41.6	37.9	34.7	-	-	-																				
METALLURGICAL PROPERTIES																																		
Require-ment	Depth of Decarb (mm) (SAE J419 TYPE III)	Macro Etch (ASTM E 381)	Max. Depth of Surface Defect (mm)	Grain Size (ASTM E 112)	INCLUSION RATING AS PER ASTM E45 (METHOD A)																													
					A		B		C		D																							
					T	H	T	H	T	H	T	H																						
Min.	-	-	-	6	Min	-	-	-	-	-	-	-																						
Max.	1% of dia max	-	-	8	Max	2.0	1.5	2.0	1.5	2.0	1.5	2.0																						
Actual	0.20	C1R1S1	-	6.5-7	Actual	1.5	0.5	1.0	-	-	-	1.0																						
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">Spark & Spectral Test:</td> <td style="width: 33%;">100% OK</td> <td style="width: 33%;">Other Tests:</td> <td style="width: 33%;">-</td> </tr> <tr> <td>Surface Inspection:</td> <td>100% OK</td> <td>1. MFL:</td> <td>100% OK</td> </tr> <tr> <td>Ultrasonic Test:</td> <td>100% OK</td> <td>2. Step Turn:</td> <td>Found Satisfactory</td> </tr> <tr> <td>MPI:</td> <td>-</td> <td>3. Blue Fracture:</td> <td>-</td> </tr> <tr> <td></td> <td></td> <td>4. Upset Test:</td> <td>-</td> </tr> </table>															Spark & Spectral Test:	100% OK	Other Tests:	-	Surface Inspection:	100% OK	1. MFL:	100% OK	Ultrasonic Test:	100% OK	2. Step Turn:	Found Satisfactory	MPI:	-	3. Blue Fracture:	-			4. Upset Test:	-
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<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td colspan="4" style="text-align: center;">Oil Quenched Core Hardness:</td> </tr> <tr> <td style="width: 33%;">Min. in HRC</td> <td style="width: 33%;">-</td> <td style="width: 33%;">-</td> <td style="width: 33%;">-</td> </tr> <tr> <td>Actual in HRC</td> <td>-</td> <td>-</td> <td>-</td> </tr> </table>															Oil Quenched Core Hardness:				Min. in HRC	-	-	-	Actual in HRC	-	-	-								
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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 29.01.2018																										
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																																		