

<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 :			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 : 40 Dia			Truck No.:																										
Heat No:- 35281							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:		20.3 :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	1.14	0.27	0.021	0.016	1.07	-	-	-	0.027	-	-	-	-																						
OTHER ELEMENTS											GAS LEVEL																									
Element	%B	%Nb	%As	%Sb	%Sn	%W	%Bi				O ₂ PPM	H ₂ PPM	N ₂ PPM																							
Min.	-	-	-	-	-	-	-				Min	-	-	-																						
Max.	-	-	-	-	-	-	-				Max	20	2	100																						
Actual	-	-	-	-	-	-	-				Actual	16	0.7	70																						
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	160	-	-	819	968	14	38	Actual	40.9	37.5	33.8	-	-	-																						
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: 30%;">Spark & Spectral Test:</td> <td style="width: 30%;">100% OK</td> <td style="width: 20%;">Other Tests:</td> <td style="width: 20%;">-</td> <td style="width: 20%;"></td> </tr> <tr> <td>Surface Inspection:</td> <td>100% OK</td> <td>1. MFL:</td> <td>100% OK</td> <td rowspan="4" style="vertical-align: top;">Oil Quenched Core Hardness:</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	Oil Quenched Core Hardness:	Ultrasonic Test:	100% OK	2. Step Turn:	Found Satisfactory	MPI:	-	3. Blue Fracture:	-			4. Upset Test:	-
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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																																				