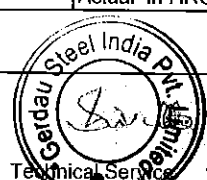


87-9
AGJ

GERDAU		GERDAU STEEL INDIA PVT LIMITED																						
		PLANT: TADIPATRI. DIST.: ANANTPUR. A.P.: 515411																						
TEST CERTIFICATE																								
TC No : 2017/00092181		Invoice No. : ST2017004834																						
Customer : GERDAU STEEL INDIA PVT. LTD		Quantity : 8.101 t																						
PROCESS ROUTE :- BF>>BOF>>LRF>>VD>>CCM(EMS & AMLC)>>RM		Rolling Input : 160X160 mm																						
Heat No:- 34189		S.O. No. / Date : 50854																						
NO OF BUNDLES: 3		Size : 28 Dia																						
NO OF BARS: 273		Truck No.: AP02TA 1589																						
Grade :- 16MNCR5		Product : Rolled Bar																						
TAS No. : 903/2014		Colour Code: WHITE/GREEN																						
TDC No :- PFG/MQC/52,REV.NO.-00/02, DATE:08/08/2014		Condition :As Rolled																						
		Reduction Ratio: 41.58 :1																						
CHEMICAL COMPOSITION																								
Element	%C	%Mn	%Si	%P	%S	%Cr	%Ni	%Cu	%Mo	%Al	%Pb	%V	%Ti	%Ca										
Min.	0.14	1.00	0.15	-	0.015	0.80	-	-	-	0.015	-	-	-	-										
Max.	0.19	1.30	0.35	0.025	0.035	1.10	-	-	-	0.035	-	-	-	-										
Actual	0.14	1.13	0.25	0.016	0.027	1.06	-	-	-	0.025	-	-	-	-										
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 25 2 80																								
Actual 17 0.8 75																								
MECHANICAL PROPERTIES																								
Requirement	Hardness (BHN)	Impact Strength (IZOD/CHARPY)	Yield Strength (Kg/mm ²)	UTS (Kg/mm ²)	%Elong.	%RA	JOMINY HARDENABILITY (HRC)																	
							J1/16"	J4/16"																
Min.	-	-	-	-	-	-	Min.	32	-	-	-	-	-	-										
Max.	190	-	-	-	-	-	Max.	42	37	-	-	-	-	-										
Actual	156	-	-	-	-	-	Actual	41.6	32.7	-	-	-	-	-										
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)	INCLUSION RATING AS PER ASTM E45 (METHOD A)																			
					A B C D																			
					T H T H T H T H																			
Min.	-	-	-	6	Min.	-	-	-	-	-	-	-	-	-										
Max.	0.50	C2R2S2	-	8	Max.	2.0	1.5	2.0	1.5	2.0	1.5	2.0	1.5	2.0										
Actual	0.19	C1R1S1	-	7.5-8	Actual	2.0	0.5	1.0	-	-	-	1.0	0.5	-										
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td>Spark & Spectral Test:</td> <td>100% OK</td> <td rowspan="4"> Other Tests: 1. MFL: 100% OK 2. Step Turn: Found Satisfactory 3. Blue Fracture: - 4. Upset Test: - </td> <td rowspan="4"> Oil Quenched Core Hardness: Min. in HRC: - Actual in HRC: - </td> </tr> <tr> <td>Surface Inspection:</td> <td>100% OK</td> </tr> <tr> <td>Ultrasonic Test:</td> <td>100% OK</td> </tr> <tr> <td>MPI:</td> <td>-</td> </tr> </table>															Spark & Spectral Test:	100% OK	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: -	Surface Inspection:	100% OK	Ultrasonic Test:	100% OK	MPI:	-
Spark & Spectral Test:	100% OK	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: -																					
Surface Inspection:	100% OK																							
Ultrasonic Test:	100% OK																							
MPI:	-																							
Remarks	Microstructure : Pearlite + Ferrite (free from harmful banding)																							
Length of Bar :- 6000mm	<p>"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.</p> <div style="text-align: right;">  Technical Service 17.12.2017 </div>																							
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																								

