

GERDAU STEEL INDIA PVT. LTD., FARIDABAD

Customer Name: SHIVAM AUTOTECH

Invoice No: ED2218300015 Date: 13.04.18

Quantity: 15.750 Truck No: HR-55 H-4379

SP New

| GERDAU STEEL INDIA PVT LIMITED | | | | | | | | | | | | | | | |
|---|---|--|-------------------------------------|--------------------------|--|---|------------------------------|-----------------------------|--------|-------------------------|--------------------|------------------------------|-----|-------------------------|--|
| PLANT: TADIPATRI. DIST.: ANANTPUR. A.P.: 515411 | | | | | | | | | | | | | | | |
| TEST CERTIFICATE | | | | | | | | | | F/QA-TC/12 Rev. 01 | | | | | |
| TC No : 2018/00099301 | | | | | Invoice No. : ST2018000270 | | | | | Quantity : 8.887 t | | Rolling Input : 160X160 mm | | | |
| Customer : GERDAU STEEL INDIA PVT. LTD | | | | | | | | | | S.O. No. / Date : 54771 | | | | | |
| PROCESS ROUTE :- BF>>BOF>>LRF>>VD>>CCM(EMS & AMLC)>>RM | | | | | | | | | | Size:- 40 Dia | | Truck No.: RJ06GC 5677 | | | |
| Heat No:- 36219 | | | | | | | | | | Product : Rolled bar | | Colour Code: | | BASE PURPLE/BLACKDOT | |
| NO OF BUNDLES: 5 NO OF BARS: 150 | | | | | 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 | 0.15 | 1.17 | 0.27 | 0.014 | 0.006 | 1.05 | - | - | - | 0.030 | - | - | - | - | |
| THER 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 | 0.8 | 73 | | |
| 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 | - | - | 625 | 930 | 15 | 41 | Actual | 40.9 | 38.6 | 36 | - | - | - | |
| METALLURGICAL PROPERTIES | | | | | | INCLUSION RATING AS PER ASTM E45 (METHOD A) | | | | | | | | | |
| 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) | | | A | | B | | C | | D | | |
| | | | | | | | T | H | T | H | T | H | T | H | |
| Min. | - | - | - | 6 | Min | - | - | - | - | - | - | - | - | - | |
| | 1% of dia max | - | - | 8 | Max | 2.0 | 1.5 | 2.0 | 1.5 | 2.0 | 1.5 | 2.0 | 1.5 | | |
| Actual | 0.20 | C1R1S1 | - | 6.5-7 | Actual | 1.0 | 0.5 | 1.0 | - | - | - | 1.0 | 0.5 | | |
| Spark & Spectral Test: | | 100% OK | | Other Tests: | | - | | Oil Quenched Core Hardness: | | | | | | | |
| Surface Inspection: | | 100% OK | | 1. MFL: | | 100% OK | | | | | | | | | |
| Ultrasonic Test: | | 100% OK | | 2. Step Turn: | | Found Satisfactory | | | | | | | | | |
| MPI: | | - | | 3. Blue Fracture: | | - | | Min. in HRC | | | | | | | |
| | | | | 4. Upset Test: | | - | | 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 :- 6000MM | | "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 12.04.2018 | | | |
| 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 | | | | | | | | | | | | | | | |