

Vishwakarma Sharma

ARORA IRON & STEEL ROLLING MILLS (P) LTD.

DHANDARI KHURD, NEAR PHASE-VII, FOCAL POINT, LUDHIANA- 141 010.

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METALLURGICAL TEST REPORT

| | | | | | | | 4FI | | KG. | | | 311 | KEP | UKI | | 141 | | 00040 | | |
|------------------------------------------------------------------|-----------|-----------|------------------------|---------|----------|------------|-------------|----------|--------------|----------------------------|----------------------|-----------------------|-----------------------------|---------------------|-----------------|----------------------|------------------|-----------|-----------|----------|
| Customer Address: | | | | | | | Materia | | | Billet Route | | | | | rtificati | | 90513 002-201 | 0 | | |
| | | | | | | | Process | | | EAF-LRF-VD-CCM-AMLC-EMS-RM | | | | Date | . Ma | | 1015 | 8 | | |
| M/S -FORGE (INDIA) PVT . LTD #60 , SECTOR-5 , PARWANOO-H.P. | | | | | | | Specific | ation | | Standard A05528 | | | | Invoice | ratio man- | | | | - | |
| | | | | | | | | | | | | | | | t (MT.) | | 13515 MT | | | |
| | | | | | | | Heat No |). | | | | | | | Input/ | Billet Si | ze | 160X160 N | MM | |
| | | | | | | | Grade | | | 16MNC | R5 | | | | Reduct | tion Rat | io | 13:1 | | |
| | | | | | | | Supply Size | | | 50 MMØ | | | | No's o | f Pcs | | NA | | | |
| | | | | | | | Supply | Conditio | n | AS HOT ROLLED | | | | No's of Bundle | | | NA - | | | |
| | | | | | | | Colour Code | | | GREEN+PINK | | | | | | Multiple | | | NA | |
| | | | | | | | | | Т | EST I | RESU | JLT | | | | | | | | |
| | | | | | | C | HEMIC | AL AN | ALYSI | S (AST | ME4 | 15-14 | 1 / IS | 8811- | 1998) | | | | | |
| E | lement | | C% | Mn% | Si% | 5% | P% | Cr% | Ni% | Mo% | V% | Al% | Cu% | Ti% | Sn% | В% | Ca% | Co% | CE% | Cr+Ni+N |
| 5000 | Min | | 0.140 | 1.000 | 0.150 | - 2 | - | 0.800 | 34 | - | :4: | - | (24) | - | - | 2#3 | - | • | - | |
| Spec. | Max | | 0.190 | 1.300 | 0.400 | 0.035 | 0.035 | 1.100 | | - | * | ::=: | | - | = | He0 | - | | | - 5 |
| Α | chieved | | 0.150 | 1.160 | 0.270 | 0.020 | 0.016 | 1.090 | 0.120 | 0.025 | 0.006 | 0.023 | 0.120 | - | | 1.00 | . N | | | - 1 |
| | | | | | | н | ARDEN | NABILI" | ry TE: | ST (IS:3 | 3848. | ASTN | / A25 | 5. SAE | J406 |) | | | | |
| D | istance | | 4/16" | | | | | | | | | | | | | | | | | |
| Spec. | Min | | 33 | | | | | | | | | | | | | | | | | |
| (HRC) | Max | _ | 37 | | | | | | | | | | | | | | | | | |
| 1000/00 | eved (HR | | 37.0 | | | | | | | | | | | | | | | | | |
| r,cm | eved (iii | | 3710 | | _ | | | 100 | | | | | | | | | | | | |
| | | | | | | | Med | hanica | I Pro | perties | (IS 1 | 608/ | ASTN | / A37 | 0) | | | | | |
| | | | | -01 | To | est Cond | | | | | | | | | | | | | | |
| Tensile Yield | | | | | Elong | ation | Redu | uction | | Impact Strength | | | D.I. Value | | | Surface Hardness | | | | |
| Parameters | | | Strength | | Strength | | 4 | | Area | | Charpy V-notch | | | ASTM A255 | | | As Rolled | | | |
| | | | (Kg/mm ²) | | 2000000 | mm²) | (%) | | (%) | | | | (Joules | | (Inch) (mm) | | | (BHN) | | |
| | Min | | (Kg/I | nm) | (Ng/ | mm) | . (2 | - | - 1- | 70] | | | Joures | | | linent | (many | | (Dilly) | |
| Spec. | Max | | | | - | | | | | | | | | | | | | | | |
| ^ | chieved | V | - | | 100 | | | | - 60 | | _ | | | _ | | | | | 156/163 | 2 |
| - | Cilleveu | | | - | 35 | | | | - | | | | _ | - | | | | | 150/105 | 0) |
| | | | | | | | | | Metal | lograp | hic P | roper | ties | | VAR AND | | | | | |
| Inclusion Rating (IS : 416 | | | | | 3 / ASTN | 1 : E45A , | / JK Ch | art) | | 0 | irain Si | ze | Depth of Decarburization | | | N | Micro Structure | | | |
| Parameters | | | | | W | ROST FI | ELD RAT | | | IS 4748 / | | | | | | | | | | |
| Purun | | ре | - 7 | A | | В | | C | 100 | D DS | | ASTM E112 | | IS 6396/ASTM E1077 | | | | | | |
| | Se | ries | Thin | Thick | Thin | Thick | Thin | Thick | Thin | Thick | US | | (No.) | | Complete Partia | | Uniform | Banding | Structure | |
| | Mir | 1 | | | | | - | . 7 | 74.7 | 141 | | | | | | | | | | |
| Spec. | THE FORE | 377 | | 0,000 | 1 | | | | | | | | De S | | TEE | | | - | | |
| 2011250 | Max | | | - | | | - | - | (*) | (a) | - | | A PAIL STATE | | A - A | | N. Hand | | | |
| Achieved | | | 1.0 | 0.0 | 0.5 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | - | 6.0 to 6.5 | | 6.5 | | -: | _ | - | 15 micron | Pearlite |
| | | | . 19128 | 1525 | | 2000 | 58.76 | (2005) | 330 | 2.052 | | 500 | 1 1 1 1 1 1 | | | | | | max | Ferrite |
| | | | | | | Pl | nysical | Prope | rties, | Non D | estru | ctive | Test 8 | & Oth | er Tes | t | | | | |
| | | Int | ternal S | Soundne | ess | 5 | tep Dow | /n | Surfa | acc Inspe | ection | Mag | Magnetic Particle | | | trasonic | Test | Upsetting | | |
| Parameters Spec. | | ASTM E381 | | | | Test | | | | IS 13352 | 2 | Inspectin IS 10138 | | ASTM A388 / IS 2417 | | | Test IS 11169 | | | |
| | | | | | | IS 4075 | | | | | | | | | | | | | | |
| | | | | | | | - | | Ω¥- | | | 2 | | * | | | | | | |
| 33, 0.000 | | Be | Better than C2,R1,S1 | | | S | atisfacto | S | Satisfactory | | | ОК | | 100% | | | - T | | | |
| | K 1 | | | | | | | 110 | | 9 | | | | | | | 1 | | | |
| | | | | | | park Te | st | | X-RF | | | | Gas Analysis Report | | | | | | | |
| Parameters | | | Tolerance | | | | | | | | | | | Test method-Le | | | | | | |
| | | IS 3739 | | | | | | | | | O ₂ (ppm) | | N ₂ (ppm) | | | H ₂ (ppm) | | | | |
| Spec. | | | | | | 271 | | | -5 | | | - | | 127 | | | 3 (7) | | | |
| Achieved As | | As p | As per IS 3739 Grade 1 | | | | 100% | | 100% | | 11.0 | | 89.70 | | | 0.80 | | | | |
| Remar | rks: | | | | | | | | | | | 70. | | | | E1 | | | | |
| | | | | | | | | | | | | | | | | | 50 | | | |
| | | | | | | | | | | | | | | | | | 1 | 1 | | |
| | | | | | | - | | | | | | | | | | | / | 1 | | |
| | | | | | | | | | | | | | | | | | X | | | |
| | | P | repare | d By: | | | | | | | 1 | | | | | | Appr | oved By: | | |
| | , | | | a Sharm | | | | | | | 1 | - | | | | | / 1/ | | | |