

R. L. STEELS & ENERGY LTD. TEST CERTIFICATE

Format No.: FT/QAD/01 Issue Dt :10/08/2014, Rev No.: 01

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| tome | r: 141/3 | SHARDA | · · · · · · · · · · · · · · · · · · · | | | | | | | | | | | Selectory | 100000000000000000000000000000000000000 | | | | |
|--------------------------------------|-----------------------|----------------------|---------------------------------------|-------------|---------------------|---|-------------|-------------------|---------------------------|-----------------|-------------|---------------------|-----------|--------------------|---|---------------------------|-----------|---|--|
| NO. K- | 1, MIDC, V | WALUJ, AUR | ANGABAD | | | | | | | | | | | | | | Coloui | oode | |
| neral Information & Material Details | | | | | Total No. | | | | ntity in Length Supply Co | | | ondition | | | | | | | |
| TC NO. Date | | Date | Invoice No. | | Date 18-02-201 | 8 MH 20 W 701 | | - | 110000 | | .410 | 5.00- 6.00MTR | AS ROLLED | | LLED | GREEN+WHITE+ RED+GREEN | | REEN | |
| 17-4456 | 5 1 | 8-02-2018 | RL17-SI-404 | 47 | | | | | st Size | + | Produc | t Size | Reduc | ion Ra | tio | Cus | stomer TI | oc | |
| Pro | cess Route | | Heat No. | | G | rade | | AS Ca | 31 0120 | + | 380 | NA | | | | | | | |
| | D/CCP-with | The second second | 2-WGT-3 | | 161 | MnCr5 | 1353.44 | 130 | X130 | | 301 | | | | | | | | |
| emical | Compos | ition & Tra | mp Elem | ents | | | | | %Ni | | %Cu | %V | %AI | % | 6Ті | %В | %Ca | %As | |
| | %C | %Si | %Mn | %P | %S | | %Cr | %Мо | 70141 | | | | 0.020 | | | - | | - | |
| nt | 0.14 | 0.15 | 1.00 | - | 0.020 | | 0.80 | - | 0.20 | + | | | 0.040 | | - | • | | - | |
| | 0.19 | 0.35 | 1.30 | 0.025 | 0.035 | | 1.10 | 0.060 | 0.20 | | 0.036 | 0.003 | 0.029 | | - | • | • | - | |
| | 0.18 | 0.22 | 1.19 | 0.024 | 0.024 | | 1.05 | 0.025 | 0.086 | | Analy | eie | | | Dime | nsion | Tolera | nce | |
| ual El | | Contd.) & I | DICE | | | | | | \$ 100.57 | Gas | 32410200153 | | N2 | | Size Tol. | (MM) | | - | |
| amp En | | %Pb | %Sb | CE | | l Value | 9 | | | | 02 | H2 | - | | | | | | |
| lement | %Sn | %PD | 1000 | - | | m. | 1 | (Mdd) Min | | | - | in | | | | As per IS 373 | | er IS 3739 | |
| Min | - | - | | | | | | Gas (F | Max | | 25.00 | - | - | | Specification | | Grade I. | | |
| Max | | - | -1 | | - | | | O | Actual | | 10.00 | 1.20 | 76.0 | 0 | | | | 0.0000000000000000000000000000000000000 | |
| Actual | | a self-enterer | water Teers | | | | | 100 mg | | | | | Mac | rostru | cture | M | crostr | ıcture | |
| | cal Prop | erties | | | | | | | + | 40 CX | | | loa) | | | | | | |
| ecnam | | Hardness | | | | | 23 | %EI. | %R | | npact V | act Values (Joules) | | per ASTME-381 | | | | | |
| est Code | Hardness As Rolled | As Rolled Condition) | | YS (Kg/mm²) | | UTS (Kg/mm²) | | 70- | | | Izod | Char | | | | | | | |
| | (BHN) | (BHN) | | - | - | | | | | | | | Bette | r Than | C2R252 | - | • | | |
| Spec. | • | | 7 | | | | | | | | | | | C2R1 | S1 | | • | | |
| Actual | 170-178 | - | | | - | | | | | Charles S (Sec. | | | Off | Other Test Results | | | | | |
| Value | | | | | | | | | | | | | - | T | Spark/ | | | | |
| tallu | rgical Pr | operties | | | | 180 | ner IS 4163 | ASTM | E-45A) Plai | e IR | Mag | naflux Te | st /10 | Test | Spectral Test | | | - | |
| 2 | | Decarb | Grain Size | Incl | lusion Rating (As p | | To Carlon | Laboration of the | | D | (1 | (100% Bars) | | ars) | (100% Bars) | | | | |
| Test Code | | (mm) | E112 | Seri | ries A | | В | С | | | | | | | | - | | | |
| | | | | | /н - | | - | | • | | | | | | | | | | |
| Spec. | | | - | | - | | 0.5 / 0.0 | 0.0/ | 0.0 1.5 | 10.5 | 10.2 | ок | | oK | OK | | | | |
| Act | ual Value | - | 6.0 / 7.0 | T | /H 1. | 5 / 0.5 | 0.570.0 | | | | 1 | | | | | | | | |
| | | Toot Posult | | | | | | | | | 1 | | ۸ | | 50 | 10 | 7 | | |
| | | Test Result | | T | | | | | | + | tec | ut C | ode | - | B] | -12 | -/ | - | |
| Jominy Distance (mm/inc | e J 4/1 | 6" | | | + | | | | | | | 0 | 1 | < | 9- | | | - | |
| Spec (HRC) | | 37 | | | | | | + | - | | | 1 | 1 | -111 | | | - | | |
| Actua Hardne (HRC | ee 35.5 | 50 | | | tomer s | necific | cation. | 1 | | | 1 " | | | | | For RL | STEELS. | E ENERG | |
| - | rks : Mate | erial is confo | rming to the | ne cus | MOUNTER S | ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, | | | | | | | ITY ASSUR | | | | ilat | 3011 | |



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| | | , WALUJ, A | | | | | TANK COMM | | | | | | | | |
|---------------------------|------------|---|-----------|-------------------------|--------------|--------------------|------------|--------------|-------------------------------|--------------|---|---------------|---|----------------|---------|
| ieneral li | nformati | on & Mate | | | 5.12 | Trunk | No | No. of Bund. | Quantity in | Length | Supp | ply Condition | on | Colou | ır code |
| TC NO. Date | | Invoice No. | | Date 18-02-2018 | Truck No | | 7 | MT 13.220 | 5.00- 6.00MTR | A | GREEN+ | | +WHITE | | |
| | ocess Rou | 40 | Heat N | lo. | Grad | e | As Ca | ast Size | Produ | ct Size | Reductio | n Ratio | Cu | stomer T | DC |
| | | | 2-WG | | 16MnC | Cr5 | 130 | X130 | 361 | DIA | | | | | |
| | /VD/CCP-wi | | | | | | Ar asalise | | | | | | | | |
| hemical | Compo | sition & Tr | | | T 1 | wa- | %Mo | %Ni | %Cu | %V | %AI | %Ti | %В | %Ca | %As |
| lement | %C | %Si | %Mn | %P | %S | %Cr | 761410 | 70141 | -3102- | | 0.020 | | | | - |
| | 0.14 | 0.15 | 1.00 | - | 0.020 | 0.80 | | 0.20 | | | 0.040 | | | | - |
| Marx. | 0.19 | 0.35 | 1.30 | 0.025 | 0.035 | 1.10 | 0.060 | | | 0.003 | 0.029 | | | - 4 | |
| Actual | 0.18 | 0.22 | 1.19 | 0.024 | 0.024 | 1.05 | 0.025 | 0.086 | 0.036 as Analys | | | Dim | ension | Tolera | nce |
| ramp El | ements | (Contd.) & | DI/CE | | | | | , G | | H2 | N2 | Size Tol | 100000000000000000000000000000000000000 | | • |
| Element | %Sn | %Pb | %Sb | CE | DI Val | ue | (PPM) | | O2 | | | | | | |
| Min | - | - | - | • | - | • | | Min | | • | | Specification | | As per IS 3739 | |
| Max | | - | - | - | - | | Gas | Max | 25.00 | • | | Specific | cauon | Gr | rade I. |
| Actual | | -1 | • | | - | | | Actual | 10.00 | 1.20 | 76.00 | | e Microstructur | | |
| Viechani | cal Prop | erties | | | | | | | | | Macrost | ructure | Mic | rostrue | e (uite |
| | Hardness | Hardness | | | | | | A/D4 | Impact Val | ues (Joules) | Macrostr | | | | |
| Test Code As Rolled (BHN) | | (H&T Condition) (BHN) | | /mm²) | UTS (Kg/mm²) | | %El. | %RA | Izod | Charpy | | ME-381 | | | |
| Spec. | | | | 8 | - | | | - | • | • | Better Tha | an C2R2S2 | | • | |
| Actual | 170-178 | | ٠,٠ | | - | | - | | - | • | | R1S1 | | • | |
| - Fallur | gical Pro | perties | | | | | | | English and Hotel | | Other 1 | Spark/ | uits | T . | 1.000 |
| Test Code Spec. | | Decarb Grain Size ASTM J419 as per ASTM | | Inclusion Rating (As pe | | per IS 4163/ | ASTME-4 | 5A) Plate IR | Magnaflux Test (100% Bars) | | UT Test Spectral (100% Test Bars) (100% | | • | | |
| | | (mm) | E112 | Series | A | В | С | D | | | | Bars) | | | |
| | | | - | T/H | | 1 | | • | | • | | - | | | • |
| Actual Value | | - | 6.0 / 7.0 | т/н | 1.5 / 0.5 | 0.5 / 0.0 | 0.0 / 0.0 | 1.5 / 0.5 | ок | | ок | ок | - | | - |
| Hardena | bility Te | st Result | | | | A Physical Company | | | 14 mary 14 | | | 40 | | | |
| Jominy Distance | J 4/16" | | | | | He | A. | code. | 9 | 1- | 27 | | | | |
| (mm/inch) Spec (HRC) | 33-37 | | | | | | | | | R | | | | | |
| Actual | 35.50 | | | | | | | | | 1 | | Eo | RI STE | ELS &ÆN | ERGY |
| Hardness (HRC) | | | 4- 44- | austam | er specifica | tion. | | | | | | 1 | 100 | ELS & EN | SA |

PAHARIMATA ENGINEERING PVT. LTD.

Date:- 22-02-2018

MATERIAL TEST CERTIFICATE FOR CHEMICAL ANALYSIS

TO -

M/S EICHER

Equipment used:-

SPECTROMAXX

Raw Material Size:-

DIA.38.00MM

Heat no

2-WGT-3-4

Heat Code :-

EI 27

Raw Material Supplier :-

R L STEEL

Sample No .:-

Sample no.1

TEST RESULTS

| | TEOTINEOULIO | |
|-------------------|--|--------------------------|
| Test Conducted | Specified as per "16Mncr5" Grade (in %age) | Obsevations (in %age) |
| Chemical Analysis | | |
| % C | 0.14019 | 0.168 |
| % Mn | 1.00-1.30 | 1.15 |
| % Si | 0.40 MAX | 0.21 |
| % S | 0.035 MAX | 0.027 |
| . %P | 0.025MAX | 0.019 |
| % Cr | 0.80-1.10 | 1.00 |
| % Ni | | |
| %Mo | | |
| % AI | 0.05MAX | 0.027 |

Remarks: The checked Parameters of given sample conforms to-16MNCR5 grade.

Jominy Test: SPECIFICATION-J1/16" = 43 HRCMAX, J4/16" = 33-37 HRC

Jominy Test Findings: OBSERVED-J1/16" = 42 HRC, J4/16" = 36 HRC

THIS MATERIAL USED FOR ED2404,2405,2406,2407,2408,2414,2415,2416,2417

For Paharimata enineering pvt. Ltd.