

**Item details for Enq no: 1001800011 DT 03/07/2018 to the Specn SA515Gr70**

| Sr No                     | Thickness (mm) | Width (mm) | Length (mm) | No of pieces | Qty (MT) | Package Evaluation |
|---------------------------|----------------|------------|-------------|--------------|----------|--------------------|
| 1                         | 8              | 2500       | 6300        | 21           | 20.772   | Package - I        |
| 2                         | 10             | 2500       | 6300        | 159          | 196.584  |                    |
| SUBTOTAL (PACKAGE - I)    |                |            |             |              | 217.356  |                    |
| 3                         | 12             | 2500       | 6300        | 61           | 90.503   | Package - II       |
| SUBTOTAL (PACKAGE - II)   |                |            |             |              | 90.503   |                    |
| 4                         | 16             | 2500       | 6300        | 376          | 743.804  | Package - III      |
| SUBTOTAL (PACKAGE - III)  |                |            |             |              | 743.804  |                    |
| 5                         | 20             | 2500       | 6300        | 244          | 603.351  | Package - IV       |
| SUBTOTAL (PACKAGE - IV)   |                |            |             |              | 603.351  |                    |
| 6                         | 22             | 2500       | 6300        | 76           | 206.722  | Package - V        |
| SUBTOTAL (PACKAGE - V)    |                |            |             |              | 206.722  |                    |
| 7                         | 25             | 2500       | 6300        | 99           | 306.003  | Package - VI       |
| SUBTOTAL (PACKAGE - VI)   |                |            |             |              | 306.003  |                    |
| 8                         | 30             | 2500       | 6300        | 24           | 89.019   | Package - VII      |
| 9                         | 32             | 2500       | 6300        | 6            | 23.739   |                    |
| SUBTOTAL (PACKAGE - VII)  |                |            |             |              | 112.758  |                    |
| 10                        | 35             | 2500       | 6300        | 35           | 151.456  | Package - VIII     |
| SUBTOTAL (PACKAGE - VIII) |                |            |             |              | 151.456  |                    |
| 11                        | 40             | 2500       | 6300        | 21           | 103.856  | Package - IX       |
| SUBTOTAL (PACKAGE - IX)   |                |            |             |              | 103.856  |                    |
| 12                        | 45             | 2500       | 6300        | 7            | 38.946   | Package - X        |
| 13                        | 50             | 2500       | 6300        | 20           | 123.638  |                    |
| SUBTOTAL (PACKAGE - X)    |                |            |             |              | 162.584  |                    |
| 14                        | 55             | 2500       | 6300        | 5            | 34.001   | Package - XI       |
| 15                        | 60             | 2500       | 6300        | 3            | 22.255   |                    |
| SUBTOTAL (PACKAGE - XI)   |                |            |             |              | 56.256   |                    |
| 16                        | 70             | 2500       | 6300        | 5            | 43.274   | Package - XII      |
| 17                        | 75             | 2500       | 6300        | 8            | 74.183   |                    |
| SUBTOTAL (PACKAGE - XII)  |                |            |             |              | 117.457  |                    |
| 18                        | 90             | 2500       | 6300        | 4            | 44.510   | Package - XIII     |
| SUBTOTAL (PACKAGE - XIII) |                |            |             |              | 44.510   |                    |
| TOTAL                     |                |            |             |              | 2916.616 |                    |

Note:

- Supply shall be strictly as per TDC 202/ Rev.09.
- Alternate width of 2000mm and length in between 6300 – 10000 mm also acceptable. Deviation in width & length of plate other than specified in tender is not acceptable.
- Supply shall be in dual specification only, i.e, SA515GR70/ Equivalent IS standard/ grade. Also refer Quality Control Order issued by Steel Ministry (Govt. of India) for Plates. All items in the tender are covered in the said QC order, hence all items shall be certified and marked in dual spec (ASME Specification & grade / IS Specification & grade), pls confirm acceptance to the same. **Offer on ASME specification alone is not acceptable and offer will be rejected.**

|                                                                                               |                                                                                                                               |                                                                                                        |
|-----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
|               | <b>BHEL – Tiruchirappalli - 620014, India.</b><br><b>Quality Assurance Department</b><br><b>TECHNICAL DELIVERY CONDITIONS</b> | DOC No: <b>TDC:0:202</b> Rev No: <b>09</b><br>Effective Date: <b>21/11/2017</b><br>Page: <b>1 of 2</b> |
| <b>Product: BOILER QUALITY STEEL PLATES AS PER SA 515, SA 516 &amp; SA 387 SPECIFICATIONS</b> |                                                                                                                               |                                                                                                        |

#### Record of revisions:

Rev 04: 18/07/2008 Cl 1.0 to Cl 6.0 modified.  
Rev 05: 02/02/2011: SA387 Gr 91 Class 2 added, Cl 2.0, 3.0, 5.0, 6.0, 9.0, and 10.0 modified.  
Rev 06: 28/06/2014 Cl 1.0: Material spec SA516 included. CL 3.0 and 5.0 modified.  
Rev 07: Dt: 27/04/2016 – Cl 1 modified; Cl 3- Heat treatment temperatures revised; Cl 4 to 8- modified; Cl 10- revised as per latest IBR requirements.  
Rev 08: Dt: 04/10/2017: Cl 2 (b), 2 (d), 10 (iii), 10(v) modified and Cl 5.0 (e), 10 (c) & 10 (d-ix) added.  
*Rev 09: Dt: 21/11/2017: Cl. 5(c), Cl.10 (ix)- modified.*

#### 1.0 MATERIALS

Specification : ASME (Latest as on the date of Enquiry or PO, whichever is earlier)  
Carbon steel (CS) : SA515 Gr.70, SA516 Gr.70  
Alloy Steel (AS) : SA387 Gr.12 Class 2, Gr. 22 Class 2, Gr. 91 Class 2  
Additional Requirements : As listed below (Supplementary to the above material specifications)  
Size and Quantity : As per Purchase Order (PO)

#### 2.0 CHEMICAL COMPOSITION & PROCESS

- All plates shall be of Fully Killed steel.
- Drum plates shall be Vacuum Degassed. (S1 of SA20).
- Final rolling: Length-wise.
- Plates may be made from ingots or strand cast slabs. Reduction ratio in thickness from slab/ingot to plate shall be at least 3:1.  
Sufficient "Top of Ingot" to be discarded to ensure plate free of segregation. After top discard, the increase in Carbon content at the top-mid width, mid thickness of the plate shall not exceed 20% of the reported ladle analysis value. This value shall be reported in Test Certificate.
- Ladle analysis: 1 sample per cast; Product analysis: Min.1 sample per plate as rolled.  
Max. Carbon: CS: 0.25%. Max. Carbon Equivalent for Carbon Steel: As per S20 of SA20.

#### 3.0 HEAT TREATMENT (HT) (as delivered condition)

| Materials                      | Heat Treatment Temperature (°C) |           |
|--------------------------------|---------------------------------|-----------|
|                                | Normalising                     | Tempering |
| CS: SA 515 Gr 70, SA 516 Gr 70 | 880-920                         | -         |
| AS: SA387 Gr 12 Class 2        | 920-960                         | 650-700   |
| AS: SA387 Gr 22 Class 2        | 920-960                         | 680-750   |
| AS: SA387 Gr 91 Class 2        | 1040-1080                       | 750-780   |

#### 4.0 SIMULATION HEAT TREATMENT for test coupons in addition to Cl.:3.0 (For CS Drum plates only as indicated in the Enquiry/PO):

Normalizing: 880-920°C, Stress Relieving (SR): 615±10°C, 3 hr/inch of thick (t), furnace cool to 400°C;  
ROH/ROC for SR: <220°C/hr divided by t in inches, but need not be slower than 55°C/hr.

#### 5.0 MECHANICAL TESTS (In simulation heat treated condition for CS Drum plates and in as delivered condition for other CS plates & all AS plates):

Extent of test: For each rolled/mother plate.

- Tensile Test
- Bend Test: Angle of bend: 180 deg. Diameter of the Mandrel = 2xThickness of the plate as rolled.
- High temperature tensile test for carbon steel drum plates shall be as per S7 of SA 20. Min yield strength at 350°C: 19.7 kg/mm<sup>2</sup>.
- For Gr 91 - Hardness: 195 – 250 HBW, Tensile strength: Min: 630 MPa, Yield Strength: Min: 450 MPa.
- Creep testing shall be carried out as per SIP:RM:01 (latest revision) whenever indicated in the Enquiry/Purchase Order/Engineering Drawing.*

#### 6.0 NON DESTRUCTIVE TEST (For all plates of thickness >10mm)

Ultrasonic test: As per SA578. Acceptance: Level B.

#### 7.0 DIMENSIONAL CHECKS

All dimensions shall be as per PO. Tolerance on thickness of plates shall be positive only.

#### 8.0 REPAIRS AND FINISH

Plates to be free of mill scales, edge crack & other injurious defects. Repairs by fusion welding are prohibited. Mechanical removal of defects are permitted subject to availability of min. thickness & smooth surface.

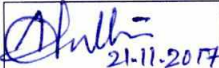
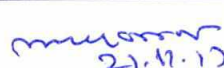
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| <b>Product: BOILER QUALITY STEEL PLATES AS PER SA 515, SA 516 &amp; SA 387 SPECIFICATIONS</b> |                                                                                                                               |                                                                                                        |

## 9.0 MARKING

- Specification, grade, Melt number, Size, Plate number, Maker's emblem/ code and Inspecting Authority's seal to be stamped on each plate.
- For plates of thickness > 6mm, marking shall be by stencilling & steel die stamping
- For plates of thickness ≤ 6mm, marking shall be by stencilling & steel die stamping using low stress on each plate & bordered by white paint.
- In addition, for SA387, each plate shall be legibly stamped with the letter N to indicate for normalised and tempered plate. Rolling direction shall be marked by paint. PO No., "BHEL - Tiruchirappalli" & weight to be painted on the product.

## 10.0 INSPECTION AND CERTIFICATION:

- Products shall be inspected at works & the test certificates (in English only) countersigned by Inspecting Authority as below:
  - ☐ **Imported:** Inspecting Authority approved by IBR for the country of origin (to be concurred by BHEL).
  - ☐ **Indigenous Supply:** Director of Boilers/Chief Inspector of Boilers/Inspecting Authority approved by IBR, for the respective state.
- All the products shall be accompanied by IBR Form-IV (for IBR well-known steel makers & others) and manufacturer's mill test certificate (in English only) supplied against every purchase order.
- For Non-IBR application, Form IV is not applicable and certification shall be as per EN 10204 3.1
- Additionally, manufacturer's test certificate shall be submitted meeting all the requirements contained in the purchase order, this TDC, and the applicable ASME Specification with the following details:
  - Purchase Order No (BHEL), TDC No & Rev No, Test certificate number & Date, Quantity.
  - Specification and Grade with applicable year of code, Heat Number, Plate number.
  - Steel making process, Chemistry including incidental elements - Ladle and Product analysis [as per Cl 2(d) & 2(e)].
  - Heat Treatment details of material and test coupons like temperature, soaking time, cooling medium etc.
  - The certification of reduction ratio in thickness ≥ 3:1 from a strand-cast slab/ingot to plate shall be reported in the test certificate.
  - Mechanical, NDE & other test results with reference & acceptance standards.
  - Print of the stamp of Inspecting Officer, which is used on the plate.
  - The manufacturer shall furnish a certificate of compliance stating that the plates have been manufactured, inspected, and tested in accordance with the requirements of the applicable product specification.
  - Creep test report as per SIP:RM:01 (latest revision) whenever indicated in the Enquiry/Purchase Order/Engineering Drawing.*

|                                                                                                  |                                                                                                 |                                                                                                 |                                                                                                  |                                                                                                   |                                                                                                   |
|--------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| <br>21.11.2017 | <br>21/11/17 | <br>21.11.17 | <br>21/11/17 | <br>21/11/17 | <br>21/11/17 |
| Abdur Rahman                                                                                     | G. Panneer Selvam                                                                               | N. Kirubakaran                                                                                  | R. Rajappan                                                                                      | R. Dharmar                                                                                        | Amit Roy                                                                                          |
| Sr.Engineer /QA                                                                                  | DGM/QA                                                                                          | SDGM/PE/FB                                                                                      | SDGM/MM                                                                                          | AGM/QC                                                                                            | AGM/QA&BE                                                                                         |
| Prepared By                                                                                      | Reviewed By                                                                                     |                                                                                                 |                                                                                                  |                                                                                                   | Approved By                                                                                       |

**BHEL-TRICHY**

**MM/RM/PURCHASE/STEEL**

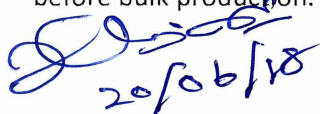
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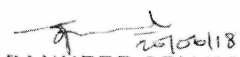
**Pre-Qualification requirements (PQR) for the procurement of Carbon Steel Plate SA515 Gr70 through Open Tender (As per TDC:0: 202 Rev 09)**

**A) Organizational Capability:**

1. Manufacturers having Plate rolling mill are only eligible to participate. Offer from traders, fabricators, re-rollers and stockists are not acceptable and will not be considered for evaluation. Vendor to indicate the nature of the firm. Product catalogue shall be submitted.
2. Suppliers without basic manufacturing facilities in-house, shall not be considered for evaluation. In house facilities for Heat treatment & Non-Destructive Testing are mandatory requirements for consideration of the offer.
3. If the supplier is not having steel making facility then source of raw material for the manufacturing shall be from IBR approved well known steel maker or certified by IBR approved inspecting authority (Form-IV to be attached). *If the supplier is dependent on more than one source for steel making, all the sources should be indicated; and the supplies should be restricted to the indicated list of raw material suppliers.* For the submitted raw material sources, the supplier shall confirm that the raw material test certificate/s will be furnished along with product test certificate/s.
4. Chemical, Mechanical testing shall be done in house or at Labs certified as per ISO 17025 or Government approved labs.
5. Suppliers shall submit a valid ISO 9001 certificate or Quality management system certificate or Written down procedure.
6. Suppliers shall submit filled in Spot Visit Check list (Format enclosed).
7. BHEL reserve the right to inspect the item ordered at any stage at vendor's works and if found not meeting the stipulated conditions, material is liable for rejection.
8. BHEL reserves the right to inspect the first lot of materials at vendor's works for giving clearance before bulk production.

  
20/06/18

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20/06/18  
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**BHEL-TRICHY**

**MM/RM/PURCHASE/STEEL**

REF: MM:PUR: CS PLATE

DT :20.06.18

**Pre-Qualification requirements (PQR) for the procurement of Carbon Steel Plate SA515 Gr70 through Open Tender (As per TDC:0: 202 Rev 09)**

**B) Technical Competence:**

1. Point by point confirmation to the TDC requirements is mandatory for consideration of offer and signed TDC shall be submitted.
2. Suppliers shall submit manufacturing process flow chart (Raw material to finished product) & manufacturing quality plan to meet the TDC requirements along with technical bid.
3. Suppliers shall submit the experienced manpower details specific to Manufacturing, Quality and NDE requirements.

**C) Past Experience/ Performance:**

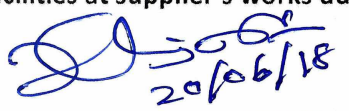
1. Suppliers shall indicate their annual installed capacity for the tendered specifications & it shall be more than the tendered quantity.
2. Suppliers shall have supplied Plates to the tendered specification. Details of supplies made in recent past detailing the quantity, Specification, size & customer details, year wise along with the unpriced PO copies, proof of supply (such as invoice / bill of lading copies and test certificates) covering minimum and maximum sizes for the tendered specification shall be submitted.

**D) Financial Soundness:**

1. Indigenous suppliers shall submit Audited copies of annual reports/complete set of annual accounts for the last four years (or from date of incorporation whichever is less).
2. Import suppliers shall submit latest D&B report.

**Necessary supporting documents shall be submitted for meeting each of the above Pre-Qualification Criteria for evaluation of the offers.**

**BHEL reserves the right to consider/Not-consider the offers based on the evaluation of documents submitted for the above Pre-Qualification Criteria. BHEL also reserves the right to have on-site assessment of the facilities at supplier's works during the bid evaluation.**

  
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