



1.0 CODES

The pipes shall be manufactured & supplied as per ASME SA691 meeting Indian Boiler regulations (IBR) requirements. The following requirements shall also be taken care.

2.0 RAW MATERIAL : Plate used shall conform to SA691 requirements.

3.0 WELDING : The joints shall have full penetration welds. The welder & welding procedure shall be Qualified as per ASME Sec.IX & IBR.

4.0 HEAT TREATMENT : All Pipes shall be heat treated as per SA691.

5.0 NON DESTRUCTIVE EXAMINATION

5.1 **ULTRASONIC TEST:** All plates used shall be ultrasonically tested to ASME SA578 and Accepted as per Level-A of SA578.

5.2 **RADIOGRAPHY TEST:** All welds shall be radiographically examined as per ASME Sec V and accepted as per UW 51 of ASME Sec VIII.

5.3 **HYDROSTATIC TEST:** Every pipe shall be hydrostatically tested at the pressure specified in the purchase Order.

6.0 PRODUCT ANALYSIS: Product Analysis of Plate and Weld shall be carried out as per SA691.

7.0 MECHANICAL TESTS

7.1 (a) Transverse Tension test and (b) Guided Bend test for weld seams shall be conducted as per SA691.

7.2 (a) All Weld metal tension test (refer IBR reg.259 Fig.19), (b) Impact test and (c) Micro & Macro structure test shall be conducted meeting IBR requirements.

7.3 Test samples shall be chosen meeting material specification / IBR requirements.

7.4 Any other test as called for in the latest revision of SA691 & IBR shall also be conducted.

8.0 DIMENSIONAL TOLERANCE

The dimensional tolerances of the pipe shall be as per SA691. Dimensional report shall be furnished.

9.0 WORKMANSHIP

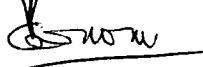
All pipes shall be free from loose scales and defects like cracks, pitting etc and shall meet the requirements of ASME SA691.

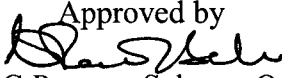
10.0 MARKING, PAINTING & EDGE PREPARATION


10.1 The Pipes dispatched to **BHEL Stores** shall be Paint stencilled and Hard punched on the Pipes 100mm away from pipe ends as indicated below.

- 1) PO Number 2) Supplier's emblem/code 3) Specification & grade 4) Heat number
5) Size 6) No. of pipes 7) Inspector's seal

All pipes shall have squared ends and protected with translucent rust preventive on the outside.


G.Venkataramani, Engg&Quality

Approved by

G.Panneer Selvam, QA


K. Ganeshan, OPC&MPL



10.2 The Pipes if dispatched directly to project site as **DTS** shall be hard punched and paint stencilled with DU code (14 digit work order du detail) as given by purchase in addition to marking done as per Para 9.1. And also Painting and Edge preparation shall be done as indicated in P.O.

11.0 COLOUR CODING

Pipes shall be longitudinally colour coded as follows:

- a) 1 Cr : Black & Red
- b) 1 ¼ Cr : Green & White
- c) 2 ¼ Cr : Blue & Red

12.0 INSPECTION AND CERTIFICATION (In English only): -

All Pipes are to be Inspected at the manufacturer's works by the Inspection agencies / authorities as per IBR and as indicated in the P.O. Inspection certificate in IBR Form III A (IBR Form IIID for well known Pipe maker) shall be submitted along with the Work Test Certificate countersigned by the above authorities and shall include the following.

1. Test Certificate Number & date.
2. BHEL P.O Number & P.O. Serial Number
3. BHEL TDC Number
4. Specification, Grade, Size & Dimension.
5. Heat/Melt Number
6. Steel making process, Chemical analysis, Heat treated condition & Ultrasonic test results with acceptance norms for Plates.
7. Product analysis of the Weld.
8. Mechanical and metallurgical test results of the weld test coupons.
9. Heat Treated condition of the Pipe.
10. Radiography test reports with acceptance standard.
11. Dimensional report.

13.0 RECORDS OF REVISIONS

(i) Rev 03 – Entire document has been modified for better clarity.

G.Venkataramani, Engg&Quality

Approved by

G.Panneer Selvam, QA

K. Ganeshan, OPC&MPL