

**1.0 SCOPE**

- 1.1 This Technical Delivery Conditions specify the requirements in addition to IS:3589 for electrically welded (ERW \ SAW) steel pipes.
- 1.2 The pipes are intended for water services (under Non-IBR Piping system only).
- 1.3 The pipes shall conform to the size, grade and quantity as specified in the purchase order.

2.0 MATERIAL

- 2.1 The plates / coils used for pipe shall meet the requirements as per IS: 3589 Grade Fe 410 MPa including mechanical test requirements.

3.0 DIMENSIONAL TOLERANCES

- 3.1 The tolerances limits are:
- a) OD:- Upto NB 1600 mm: ± 4 mm; Above NB 1600 mm: ± 6 mm
 - b) Thickness:- Upto 14mm : +1.3mm / -0.8mm; Above 14 mm : +1.4mm / - 0.8mm.
 - c) Ovality (Difference between major and minor inside diameter): 0.5% maximum
 - d) Squareness of ends: The ends of pipe section shall not vary by more than 3mm at any point from a true plane perpendicular to the axis of the pipe and passing through the center of the pipe at the end.
 - e) Length and quantity tolerance as per P.O.
- 3.2 Other tolerances shall be as per IS: 3589

4.0 MANUFACTURING

- 4.1 The pipe shall be of longitudinally welded or spirally welded as indicated in the P.O.
- 4.2 The ends shall be edge prepared as indicated in the purchase order.
- 4.3 Circumferential seams shall be minimum 1500 mm apart from each other and from ends.
- 4.4 All pipes shall be completely finished and free from surface, sub surface defects such as pits, cracks, weld spatters & laminations etc..

5.0 NDE

- 5.1 For Pipe dia less than 1000mm:- 100 % Hydro test on each pipe + Radiography test for 100mm weld length at both the ends for 10% of the pipes.
- 5.2 For Pipe dia 1000 mm & above :-The NDT for each pipe shall be done by any one of the following options. The vendor shall indicate their choice in the offer.
- a) 100 % Hydro test along with Radiography test for 100mm weld length on both the ends of each pipe.
 - b) 100 % Ultrasonic test + 10 % Radiography test on weld length (including all T- joints and 100mm weld length at both the ends) for each pipe.
 - c) 100 % Radiography test on weld length of each pipe.
- 5.3 The Ultrasonic test / Radiography test shall be carried out as per ASME Sec-V and shall be accepted as per ASME B31.1 Cl:136.4.6 / Cl:136.4.5.

6.0 INSPECTION

- 6.1 All pipes shall be inspected by the vendor prior to BHEL / Customers' Inspection. BHEL or BHEL authorized inspector / Customer will select the pipes at random and carryout the inspection. The necessary Material Despatch Clearance Certificate is to be obtained by the vendor prior to the despatch of material.

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**7.0 PAINTING AND PACKING**

- 7.1 The pipes if dispatched to BHEL Stores shall be coated with resin type translucent rust preventive on the outside unless otherwise specified in the P.O. Pipes of diameter above NB 450 mm, shall be coated inside also.
- 7.2 The pipes if dispatched to project site directly shall be coated outside & inside as indicated in P.O.
- 7.3 In case of any special coating like PU, Glass Flake etc.. the vendor shall get BHEL approval for their QP and Procedure for application of coating.
- 7.4 Internal coating shall not be applied for 100mm length from each end to facilitate site joints.
- 7.5 Spiders are to be provided on both ends of the pipes as per the drawing indicated in the enquiry / Purchase Order.

8.0 MARKING

- 8.1 The pipes dispatched to **BHEL Stores** shall be **paint stencilled & hard punched** with the following details.
- 1) PO Number 2) Supplier's emblem/code 3) Size & Specification 4) Heat number
5) Pipe number 6) Inspector's seal
- 8.2 The pipes despatched directly to project site as **DTS**, the following details (furnished in the P.O. or separately) shall be **paint stencilled & hard punched** on both ends of the pipes in addition to the above.
- Work order No ➤ DU No ➤ Project name
➤ Quantity ➤ Weight
- 8.3 For the pipe dia 1000mm and above marking shall be done on internal surface in the uncoated area (i.e) within 100mm from pipe ends. The hard punching shall be done at one end and paint stencilling at other end. In case of pipes of dia less than 1000mm the marking shall be done on outside surface.

9.0 CERTIFICATES

- 9.1 Three original test certificates typed in English shall be submitted along with the inspection report.
- 9.2 The test certificate shall furnish the following details.

- a. BHEL P.O Number & Amendment Number(if any)
- b. BHEL P.O. Serial Number
- c. Test Certificate number.
- d. Specification, grade, size, quantity
- e. Heat number of plate (or pipe number with traceability to heat number)
- f. Chemical composition and Mechanical properties
- g. Hydrostatic test, UT, RT reports as applicable.
- h. Dimensional report
- i. Painting details

Records of Revn:06 :- i) Para 3.1, 5.1, 7.1, 8.1, 8.2 & 9.2 are revised
ii) Para 5.2, 5.3, 7.2, 7.3, 7.4 & 8.3 are added.

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