



Record of Revision:

Rev 07: Applicable Pipe Size indicated in para 1.3; Para 2.0, 8.3 & 9.1 revised. Para 4.4, 5.0 & 10.0 added further clauses re-numbered;

Rev 08: dtd.05.12.2019: Modified based on Internal Discussion regarding BIS license requirement dt 28.11.2019.

Rev 09: dtd.02.03.2026: Cl 1.0 – Applicability limit modified to cover all sizes, Cl 1.2 – Service lines removed. Cl.3.0(e) – Length tolerance will be specified in drawing, Cl 4.1 – Method of manufacturing as per vendor. It will not be mentioned in PO, Cl.4.2 – EP details as per BHEL drawing, Cl.4.3 – Circumferential Seam minimum distance modified to 1000mm, Cl. 6.1 – added for LPI on root/back gouging, Cl.6.2 – NDE quantum modified, Cl.6.3 – Quantum modified and options revised. Cl.6.4 – NDE procedure shall be BHEL approved. Cl. 7.0 – Cl.9.0 modified to this clause and revised to include better checks, further clauses re-numbered. Cl.9.3 – Cutback length defined as 150 mm. Cl.9.5 – Spider and Lifting lug as per BHEL drawing.

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 Non-IBR Piping system only.

1.3 The pipes shall conform to the size, grade and quantity as specified in the purchase order.

Applicability: For all Pipe size with outside Diameter above 168.30mm

2.0 RAW MATERIAL

Raw material (IS 2062 plates / IS 10748 coils) used for pipe shall meet the requirements as per IS: 3589 Grade Fe410 MPa including Chemical (Ladle analysis) & 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: +/- 6mm
- 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 centre of the pipe at the end.
- e) Length and quantity tolerance as per P.O & BHEL drawing.

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.

4.2 The ends shall be edge prepared as indicated in the Tender/P.O & BHEL Drawing.

4.3 Circumferential seams shall be minimum 1000 mm apart from each other and from ends.

4.4 For longitudinal SAW pipes the offset between any two subsequent longitudinal joints shall be more than 90deg.

4.5 All pipes shall be completely finished and free from surface, sub surface defects such as pits, cracks, weld spatters & laminations etc.

5.0 CHEMICAL & MECHANICAL TEST

5.1 **Product Analysis:** - Shall be done for One sample per heat per size as per IS3589. Chemical values shall meet the IS3589 table - 2 & 3 requirements.

5.2 **Mechanical Tests:** -

- a) **Tensile test for ERW / SAW Pipes:** Shall be done for One sample per heat per size as per IS3589. Values shall meet the IS3589 table - 4 requirements.
- b) **Flattening test for ERW Pipes:** Shall be done for One sample per heat per size as per IS3589 and shall confirm to para 9.2.1 of IS3589.
- c) **Guided Bend test for SAW Pipes:** Shall be done for One sample per heat per size as per IS3589 and shall confirm to para 9.3.2 & 9.3.3 of IS3589.



6.0 NDE

- 6.1 For Weld Fit-up root run / after back gouging – 100% LPI.
- 6.2 For Pipe dia. less than 1000 mm: - 100% Hydro test on each pipe + 5% RT including 100mm weld length at both ends of each pipe.
- 6.3 For Pipe dia. 1000 mm & above: - The NDT for each pipe shall be done by any one of the following options.
- 100% Hydro test on each pipe + 5% RT including 100mm weld length at both ends of each pipe.
 - 100% Radiography test on complete weld length of each pipe.
 - 100% PAUT* + 5% RT including 100mm weld length at both ends of each pipe.
- * Using PAUT as one of the options is subject to customer acceptance and same shall be indicated in the enquiry/PO conditions.**
- 6.4 Radiography /PAUT / LPI test shall be carried out as per BHEL Approved procedure. Procedure to be prepared in line with ASME Sec-V and acceptance criteria shall be as per ASME B31.1 Cl:136.4.5 / Cl:136.4.6 /Cl:136.4.4.

7.0 QUALITY PLAN

- 7.1 Inspection shall be as per BHEL SQP QPG:94, latest Revision.
- 7.2 Vendor shall submit all procedures as required in QP for BHEL approval before commencement of production.

8.0 INSPECTION

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.

9.0 PAINTING AND PACKING

- 9.1 The pipes if dispatched to BHEL Stores shall be coated with resin type translucent rust preventive on the outside unless otherwise specified in the Tender/P.O. Pipes of diameter above NB 450 mm, shall be coated inside also.
- 9.2 The pipes if dispatched to project site directly shall be coated outside & inside as indicated in Tender/P.O.
- 9.3 Internal Coating: - In case of any special coating like PU, Glass Flake, 100% Solid Epoxy etc. the vendor shall use BHEL approved make/coating materials. And also vendor shall submit Inspection & Testing Plan (ITP) and Procedure for internal coating for BHEL approval. Coating shall not be applied for cutback length of 150 mm from each end to facilitate site joints.
- 9.4 Annexure-A for Painting and Marking report to be followed for painting report.
- 9.5 Spiders & Lifting lugs are to be provided as per the BHEL drawing indicated in the Tender / Purchase Order.

10.0 MARKING

- 10.1 The following details are to be marked on the pipes for identification.
- Supplier's emblem/code
 - Size & Specification
 - Material code
 - Pipe number
 - Inspector's seal
 - Work Order-DU details

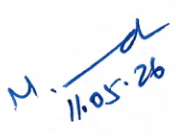
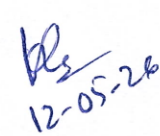
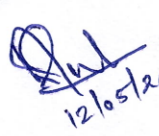
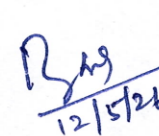
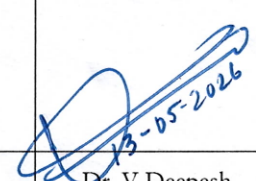
	Pipes dispatched to BHEL Stores	Pipes dispatched to BHEL Project Site
Paint Stencilling	Details 1 to 6	Details 1 to 6
Hard Punch	Details 1, 2, & 5	Details 1, 4, 5 & 6



- 10.2 For the pipe dia 1000mm and above marking shall be done on internal surface in the uncoated area (i.e) within 150mm 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.

11.0 CERTIFICATES

- 11.1 Full set of inspection documents shall be shared before despatch.
- 11.2 The test certificate shall necessarily contain following details.
- BHEL P.O Number & Amendment Number (if any)
 - BHEL P.O. Serial Number
 - Test Certificate number.
 - Specification, grade, size, quantity
 - Heat number of plate (or pipe number with traceability to heat number)
 - Chemical composition and Mechanical properties
 - Hydrostatic test, LPI, RT reports as applicable.
 - Dimensional report
 - Painting details

 11.05.26	 11/05/26	 12-05-26	 12/05/26	 12/5/26	 13-05-2026
M. Manoj Pandi, Mgr/QA (Piping)	K Saranya, Mgr/QA(Piping)	Venkata Ramana Emandi, DGM / Piping Engg	Anilsree Mgr/ MM/RM	P.K.Ramesh Kumar, AGM/MM,RM,Planning	Dr. V Deepesh, DGM/QA
Prepared by	Reviewed by				Approved by

	BHEL – Tiruchirappalli - 620014, India. Quality Assurance Department Technical Delivery Conditions for IS 3589 Pipes / Rolled & Welded Pipes using IS2062 plates or IS 10748 coils, confirming to IS 3589.	Doc: TDG: 07 Rev: 09 Date: 11.05.2026 Page 4 of 4
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ANNEXURE-A

PAINTING & MARKING REPORT

Doc No: TDG07:001, Rev.00

Report No:

Date:

BHEL PO. NO & Date :
 TDG No :
 Applicable Painting Scheme :
 Surface Preparation :
 Primer Coat :
 Primer paint Batch no & Expiry date :
 Finish Coat & Shade :
 Finish paint Batch no & Expiry date :
 Internal surface coating (if applicable) :

PO. Sl.No	Description	Quantity	Total DFT Required	Total DFT Measured	Remarks

(Add Annexure, if no of PO Sl.no is more)

Color Code (marked Circumferentially at all ends) :

Marking

: As per TDG & PO requirements.

It is hereby confirmed that the above mentioned components/items/equipment was/were painted as per the TDG & PO requirements as referred above and found acceptable.

Verified
 (Vendor QC Sign & Seal)

Reviewed
 (BHEL QC Sign & Seal)