

BHEL Trichy-14	Quality Assurance	Technical Delivery Conditions
Product: Seamless/Welded Pipes to Specification API 5L Grade B-PSL 2		
Document No. TDC: 0:109	Rev.No.02	Effective Date: 17/06/15
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Record of Revision:

Rev 00– Fresh Issue

Rev 01 – Cl 1.1 modified to include API 5L PSL 2, Cl 3.1 – modified, Cl 6.0 – table for NDT inspection methods added, Cl 8.2 – modified to give painting scheme.

Rev 02 – Heading modified. Cl 1, 2, 3, 5, 7, 9 – modified in-line with specification. Cl 8 – modified in-line with MOM on painting issues.

1. SCOPE:

- This TDC specifies the additional requirements for the delivery of plain ends of seamless/welded pipes conforming to API 5L Grade B – PSL 2 (latest). Mill shall have valid license to use API monogram during bidding, manufacturing and despatch of pipes.
- This TDC is supplementary to the mandatory requirements covered in the specification.**
- The size and quantity shall be as specified in the BHEL purchase order.

2. METHOD OF MANUFACTURE & CHEMICAL COMPOSITION:

- The steel shall be made by any one of the allowable processes as per Specification. The manufacturing procedure shall be qualified as per Annex of specification.
- The pipes shall be manufactured by any welding process or seamless, acceptable to API 5L.
- The chemical composition of the steel shall conform to the specification requirements in both heat and product analysis.

3. DIMENSIONAL TOLERANCES:

The dimensional tolerances for the outside diameter, out of roundness, wall thickness, weight and straightness shall be as per specification.

However, the tolerance for the length will be: - 0 / +100 mm

4. HEAT TREATMENT:

The pipes shall be supplied in heat treated condition as per specification.

5. MECHANICAL TESTS:

Test pieces, Sample size & frequency of test & the type, size & orientation of the test specimen: as per specification.

Applicability of test as per manufacturing method and as per specification and the details and results shall be reported in the test certificates.

- | | | |
|---|---|----------------------|
| a) Tensile test: Longitudinal, Transverse and Weld Tensile | : | As per specification |
| b) Yield, Hardness, Bend, Flattening test, Guided bend test | : | As per specification |
| c) CVN impact test, DWI test | : | As per specification |
| d) Weld ductility, Macro or metallographic | : | As per specification |

6. NON-DESTRUCTIVE TESTS:

- The weld seam shall be subjected to non-destructive testing as given below. Acceptance criteria as per Annex E

WELD SEAM TYPE	NDT TYPE
SMI S/TEW	EMI or UT
EW, COW	UT
SAW	UT or RT
Coil/ Plate End	UT or RT

EMI – Electromagnetic inspection; UT – Ultrasonic testing; RT- Radiographic testing.

- Hydro testing:** Extent of test: Each length of pipe shall be hydraulically tested in accordance with the specification.

7. FINISH AND REPAIR:

Repair of base metal involving fusion welding is prohibited. Wherever defects are rectified by mechanical means, the wall thickness requirements shall be satisfactorily met with and the surface shall be smoothly dressed up without any sharp edges.

The inside & outside surfaces of the pipes shall be free from any imperfections. The material shall be plain, uniform in quality and condition, smooth, straight or flat and free of wrinkles, overlaps, tears, cracks & defects like laps, seams, folds, cracks, pitting etc. Pipes (inside & outside) to be cleaned to remove scales after Heat Treatment.

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8. SURFACE PREPARATION, MARKING AND PACKING:

- Surface preparation: Power tool cleaning shall be done prior to the following painting schemes.
Pipes upto WT 10mm: Indigenous: Two coats of alkyd based red oxide Zinc phosphate primer conforms to IS12744 (latest) up to DFT of 30µ/ coat. Import: Two coats of temporary transparent sea worthy rust preventive fluid as per BHEL specification PR: CHEM: 09-06, Rev.02 to DFT of 25µ/ coat (to be sent with enquiry).
Pipes >10mm WT: Indigenous: Two coats of general purpose Aluminium paint as per IS2339 (latest) up to 20µ DFT/ coat. Import category: Two coats of Heat resistant Aluminium paint conforms to IS13183 (latest) grade II to DFT as 20µ/ coat.
Incase of customer specific painting: the same shall be addressed in enquiry and PO.
- Markings and identifications shall be as per specification. In addition, each pipe shall be marked with Melt number and pipe serial number details, Specification, Grade, Melt number, Makers emblem/Code to be stamped on each plate along rolling direction and bordered by white paint. PC. No."BHEL- Tiruchirappalli" & Weight to be painted on the product.
- VCI pellets shall be provided inside, after thorough cleaning. End caps must be provided on all the pipes. The pipes shall be packed suitably and dispatched to avoid any damage during transit.

9. INSPECTION & CERTIFICATION:

All the tests mentioned shall be conducted at the works and the pipes shall be supplied along with the Test certificates legibly written in English and furnishing the following details:

All the pipes shall be inspected at the works and the test certificates shall be countersigned by an Inspecting Authority as specified in the purchase order:

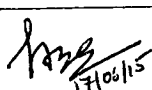
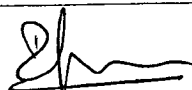
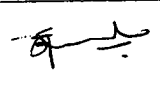
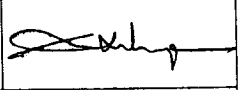
- BHEL Purchase Order reference, TDC No. & Test Certificate number Size and Quantity-Melt wise. Name and location of facilities used for pipe manufacturing, plate/coil rolling and steelmaking
- OD, WT, pipe grade, PSL, type of pipe and delivery condition with applicable year of code
- Process of manufacture, chemical composition (heat & Product) & carbon equivalent (product analysis & acceptance value)
- Heat treatment details with actual temperature and soaking time.
- Mechanical test results: For tests in Cl 5 of this TDC
- Method of NDE results with reference, Acceptance standards and size of reference indicator used.
- Hydraulic test results – with pressure and test duration
- For pipe with welded jointer, certification that the product meets the requirements of Annexes A and/or I as applicable.

10. END USE:

These pipes are intended for use in fuel lines and air lines in boilers.

11. AUDIT CHECKS AT BHEL

BHEL reserves the right to carry out audit checks for chemistry, H/T condition, mechanical test and NDT on representative test samples or job. Supplies found defective during check or subsequent processing at BHEL are liable for rejection.

			
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