



1.0 GENERAL

Materials: ASME SA 312 (Austenitic Stainless Steel Pipes), SA 790 (Duplex Stainless Steel Pipes).

- 1.1 This Technical Delivery Conditions specify the additional requirements for the supply of Austenitic and Duplex Stainless Steel Pipes (Seamless and Welded) to material specification indicated above.
- 1.2 The pipes shall conform to the size, grade and quantity as specified in the purchase order.
- 1.3 Seamless pipes shall be supplied unless welded pipe requirement is specified in the purchase order.

2.0 PROCESS AND CHEMICAL ANALYSIS

- 2.1 The chemical composition of the steel shall conform to the requirements of the respective material specification.
- 2.2 If the welded pipes are specified in the P.O, then they shall be made by an automatic welding process with no addition of filler metal in the welding operation.
- 2.3 Product analysis as per material specification shall be furnished in the Test certificate.

3.0 DIMENSIONAL TOLERANCES

The pipes shall conform to the dimensional tolerances specified in ASTM A999.

4.0 HEAT TREATMENT

All pipes shall be supplied in the heat treated condition as specified in the respective material specification.

5.0 MECHANICAL TEST

- 5.1 The pipes shall be subjected to mechanical tests as specified in material specification and report shall be furnished.
- 5.2 The number of test samples shall be selected as per respective material specification.

6.0 HARDNESS TEST FOR DUPLEX SS PIPES

Hardness test shall be carried out on each pipe in case of SA 790 duplex Stainless Steel. The hardness values shall be indicated in test certificate.

7.0 HYDROSTATIC PRESSURE TEST

Each length of pipe shall be subjected to hydrostatic pressure test, at a pressure as specified in the purchase order.

8.0 FINISH & REPAIR

The Inside & outside surfaces of the pipes shall be free from any imperfections & defects like laps, seams, folds, cracks, pitting etc;. Repair by welding is prohibited. Localised imperfections, if any, may be removed mechanically ensuring the wall thickness. Local depressions or ground spots are not acceptable.

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The pipe shall meet the dimensional tolerance (clause 3.0 above) after any mechanical repair as permitted in the standard.

All pipes shall have a finish as specified in respective material specification.

9.0 MARKING AND PACKING

The following details are to be marked on the consignment for identification

- | | | |
|----------------|---------------------------|--------------------------|
| 1) PO Number | 2) Supplier's emblem/code | 3) Specification & grade |
| 4) Heat number | 5) Size | 6) Inspector's seal |

OD up to 31.8 mm (excluding)	Details 1 to 6 shall be stamped on metal / plastic tag attached to bundle
OD 31.8 mm to OD 76.1mm (including)	- Details 1 to 5 shall be paint stencilled on each pipe. - Details 1 to 6 to be stamped on Metal / Plastic tag attached to bundle.
OD above 76.1 mm	- Details 2 to 6 shall be hard stamped / engraved at 100mm from an end of each pipe. - Details 1 to 5 shall be paint stencilled on each pipe.

- 9.1 The Pipes dispatched directly to project site as **DTS** shall be 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 9.0.

10.0 COLOUR CODING : All pipes shall be colour coded longitudinally to full length of the pipe as given below.

SA312 TP304 : Blue & Yellow.

SA312 TP304H : Black, Blue & Yellow.

SA312 TP316 : Black & Green.

SA312 TP316L : Black, Blue & Brown.

SA312 TP321 : Blue & Brown.

SA312 TP347 : Blue, Red & White.

SA790 UNS S32205 : Red , White & Green

11.0 PRESERVATION & END PROTECTION

All Pipes shall be surface treated as per ASTM A380 both inside and outside. Pipe ends shall be machined as per PO and shall be secured with caps.

12.0 INSPECTION & CERTIFICATION

- 12.1 All pipes shall be inspected and test certificates shall be countersigned by BHEL/BHEL approved inspection agency.

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- 12.2 Test Certificate shall include BHEL PO no., TDC no., Pipe size and quantity- melt wise, specification and grade with year of code, Heat no., Steel & Pipe making process, Product analysis, Heat treatment details with actual temperature and soaking time, Mechanical test results and hydrostatic test pressure and results.

13.0 RECORDS OF REVISIONS

Rev 02 – New material specification (SA 790 UNS S32205) and Para 6.0 are included. Also minor corrections made for better clarity.

Rev 03 – Para 8.0, 9.1, 10.0 & 11.0 are revised.

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