

Bolts and nuts shall be stainless steel conforming to ASTM A 193 Gr B8 / A 194/A 194M Gr 8 and have regular square and hexagonal dimensions. Bolts and nuts shall be supplied with necessary washers.

Screw threads shall be UNC for 1 inch and smaller bolt diameters and 8-UN for larger diameters, Class 2 fit, in accordance with ASME B1.1.

23.2.6 Quality Control Tests

- A. The routine factory quality control tests listed below shall be carried out at the required frequencies and records of all tests and inspections shall be maintained by the manufacturer. The Engineer shall be provided with two copies of all test certificates and reports.
- i. Quality testing of all raw materials to ensure that they comply with the relevant specification.
 - ii. Visual inspection of the pipes to check general appearance, dimensional compliance and any indication of inclusions or processing flaws in pipe barrels and joining ends.
 - iii. Production short-term tests to identify any variations in the plant functioning.
- B. Contractor shall submit a detailed Inspection and Test Plan (ITP) or Quality Control Plan (QCP) for approval showing manufacturing, inspection and testing activities, its acceptance criteria prior to commencement of manufacturing. All Certification shall be 3.1.B as per ISO 10474. The radiography test and hydro test shall be witnessed by Engineer.
- C. The Contractor shall conduct quality checks at the manufacturer's premises to ensure that the in-process manufacturing quality checks are being conducted correctly and at the stated frequency. Test certificates relating to the batch shall be furnished to the Engineer before acceptance of the delivery. The test certificates shall contain all the details in the agreed format of reporting.
- D. The Contractor/Manufacturer shall make suitable provisions for testing and inform Client/Engineer sufficiently (at least one month) in advance to enable their representatives to witness the test. If witnessing of any tests is not satisfactory and a retest is required, the cost of the witnessed retest shall be borne by the Contractor.
- E. Manufacturer shall ensure that all the applicable codes and standards available at their works for Client/Engineer's reference during their visit to manufacturer's works for shop inspection/test. The test and material certificates for all the items