

1.0 Scope:

- 1.1 This technical delivery condition (TDC) covers the requirements for the supply of Welded steel tubes intended for use for Water, Non- Hazardous gas, Air and Steam. This TDC is applicable to tubes of size Outer diameter 10.2mm to 165.1mm outside diameter.

2.0 Material specification:

- 2.1 The applicable specification is EN 10255
2.2 The size, length, quantity and specification are as per the purchase order.

3.0 Designation:

- 3.1 The tubes covered by this standard shall be designated by the following information
- Outside diameter and wall thickness
 - Classification of L, L1, L2, Medium and Heavy depending on wall thickness
 - Screwed and socketed or plain end/ bevel end to denote end condition and
 - Black or galvanized to denote surface condition.

4.0 Dimensions and Weights

- 4.1 The dimensions and weights of tubes shall be given in Annex- B of EN 10255 (L, L1, L2) and Table- 2 of EN-10255 for medium and heavy series subject to the tolerances mentioned in clause 5.0 of this TDC.

5.0 Special requirement of Tolerances for BHEL's applications:

5.1 Thickness (for all sizes)

Welded tubes shall be (+) Not limited (-) minus 2.0 (Two) percent

5.2 Weight

Weight of 10 Ton Lots- restricted to two (2) percent

5.3 Straightness:

Straightness of Tubes shall be 1mm for a length of 1000mm subject to maximum of 4mm for a length of 6 mtr.

5.4 Lengths:

- 5.4.1 Random length: The tubes shall be supplied in 6.0 mtrs unless otherwise specified and length tolerances for the same shall be plus (+) or minus (-) 10mm
5.4.2 Exact length: for specific length (exact length) of each tube, the tolerance shall be (+) 6mm and (-) minus 0.0mm.

6.0 Workmanship:

- 6.1 Plain end- The ends of the tubes shall be finished clean and supplied with square cut.
6.2 For welded tubes-, the height of the internal weld fin shall not be greater than 60 percent of the specified wall thickness.
6.3 The tubes shall be cleanly finished and reasonably free from scale. Further tube shall be free from cracks, surface flaws, laminations and other defects. The ends shall be cut cleanly and square with the axis of the tube.
6.4 Surface imperfections such as handling marks, light die or roll marks, or shallow pits shall be removed without affecting wall thickness.
6.5 Welded tubing shall be free of protruding metal on the outside surface of the weld seam.
6.6 Welded tubes used for steam services shall be normalized. Only medium and heavy series shall normally be used for steam services.



7.0 Galvanizing:

- 7.1 If the tubes are required in galvanizing condition for zinc coating on the tubes shall be conforming to the requirements and tested as per the methods specified in EN 10240 coating quality A1.

8 Leak Proof Test

- 8.1 Each tube shall be tested for leak-tightness as an in-process test at manufacturer's work either by hydrostatic test or alternatively by Eddy current test in accordance with EN 10246-1.

9 Mechanical Tests:

- 9.1 Tensile test shall be performed on bare tube in accordance with EN 10002-1 and following shall be determined- tensile strength and percentage of elongation
9.2 Bend test to be conducted on tubes with specified outside diameter of 17.2mm up to and including 60.3mm which shall be carried out as per EN ISO 8491.
9.3 Flattening Test shall be conducted on tubes with specified outside diameter greater than 60.3mm which shall be carried out as per EN ISO 8492.

10 Inspection:

- 10.1 Conformity to the requirements of the order shall be checked by non-specific inspection and testing in accordance with EN 10021.
10.2 The process inspection to be carried out by the manufacturer shall be as per the EN 10255 standard.
10.3 Dimensions shall be inspected for compliance with Cl.8.4 of EN 10255 standard.

11 Marking:

- 11.1 Each tube shall be marked with steel designation, Manufacturer's name or trade mark and symbol to indicate the series (H or M or L, L1, L2).
11.2 The symbol W (welded) to indicate the tube manufacturing process.
11.3 The different classes of tubes shall be distinguished by colour bands which shall be applied as follows before the tubes leaves the manufacturer's works:
a) Medium Tubes: Blue
b) Heavy Tubes: Red
c) L, L1, L2- Yellow

12 Oiling

- 12.1 All tubes shall be oiled externally to protect the surfaces from rusting for a minimum coating of 20 microns.

13 Bundling and packing:

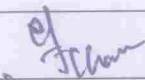
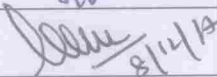
- 13.1 Tubes are to be bundled for transport and shall be packed in accordance with IS 4740.
13.2 Each tube both ends should be provided with end caps.



14 Test certificate:

14.1 Detailed correlated test certificates in English to be submitted along with the supply, for the tests conducted as required in the specification and in this TDC.

15 BHEL reserves the right to carry out tests and to reject the items wherever non-conformance to the TDC/ EN 10219 is observed in the supply.

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