

**1.0 Scope:**

- 1.1 This technical delivery condition (TDC) covers the requirements for the supply of Electric Resistance Welded (ERW) plain carbon steel tubes for structural purposes.

**2.0 Material specification:**

- 2.1 The applicable specification is EN 10219  
2.2 The size, length, quantity and specification are as per the purchase order.

**3.0 Designation:**

- 3.1 ERW tubes covered by this standard shall be designated by the following information
- a) Length
  - b) Details of product form - Cold formed circular hollow section
  - c) Grade of material as S235JRH, S275J0H, and S355J0H

**4.0 Dimensions and Weights**

- 4.1 The standard sizes and weights of tube for structural purposes shall be as per EN-10219 Part-2

**5.0 Special requirement of Tolerances for BHEL's applications:**

5.1 Outside diameter

- a) Up to and including 48.3mm shall be (+) or (-) 0.2mm
- b) Over 48.3mm shall be (+) or (-) 1(One) percent.

5.2 Thickness (for all sizes)

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

5.3 Weight

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

5.4 Straightness:

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

5.5 Lengths:

- 5.5.1 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
- 5.5.2 Exact length: for specific length (exact length) of each tube, the tolerance shall be (+) 6mm and (-) minus 0.0mm.

**6 Workmanship:**

- 6.2 Plain end- The ends of the tubes shall be finished clean and supplied with square cut.
- 6.3 For welded tubes-, the height of the internal weld fin shall not be greater than 60 percent of the specified wall thickness.
- 6.4 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.
- 6.5 Surface imperfections such as handling marks, light die or roll marks, or shallow pits – not acceptable.
- 6.6 Welded tubing shall be free of protruding metal on the outside surface of the weld seam.

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**7 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 Mechanical Tests and Chemical composition:**

- 8.1 Mechanical tests and Chemical composition shall be as per the EN10219 part 1.  
8.2 Bend test as per EN ISO 8491 upto 50mm OD, above 50mm OD flattening test as per EN ISO 8492

**9 Inspection:**

- 9.1 Non-alloy steel hollow sections shall be supplied with non-specific inspection in accordance with EN 10021.  
9.2 The process inspection to be carried out by the manufacturer shall be as per the Table-2 of the EN 10219-1.

**10 Marking:**

- 10.1 Each tube shall be marked with steel designation, Manufacturer's name or trade mark. (Steel designation e.g. EN 10219-S275J0H)

**11 Oiling**

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

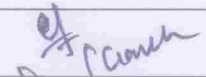
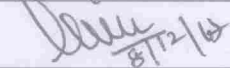
**12 Bundling and packing:**

- 12.1 Tubes are to be bundled for transport and shall be packed in accordance with IS 4740. End caps on each tube to be provided.

**13 Test certificate:**

- 13.1 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.

- 14 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.

| Prepared by                                                                                                           | Reviewed by       |                                  | Signature                                                                            | Approved by                                                                                                                   |
|-----------------------------------------------------------------------------------------------------------------------|-------------------|----------------------------------|--------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
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| Issued by Quality Assurance                                                                                           |                   |                                  |                                                                                      |                                                                                                                               |