

TECHNICAL DELIVERY CONDITIONS FOR CARBON STEEL HEAT EXCHANGER WELDED (ERW) TUBES					DOC.NO. GIX - AFC - TDC - 003	SHT :1 of 1
REV	DATE	BY	CHKD	APPD.		
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- 1.0 The tubes shall conform to the requirements of relevant material specification referred in enquiry / order
- 2.0 Additional Mandatory requirements :
The tubes shall also meet the following requirements in addition to the requirements of material specification. In the case of conflict between this TDC and the material specification, this TDC governs.

- 2.1 Tubes shall be ERW (Electric resistance welded) and in annealed condition.
- 2.2 Tube ends shall be plain, square cut, free of burrs, tool marks and suitable for expansion into Heat exchanger tube sheet holes. **Weld bead is not allowed at the tube ends.**
- 2.3 Hardness of the outside surface of tubes shall not exceed 65 HRB
- 2.4 All tubes shall be hydrotested as per material specification.
- 2.5 Product analysis shall be carried out and reported in test report (certificate).
- 2.6 Tolerances shall be maintained as follows :

<u>On O D</u>	<u>On Wall thick.</u>	<u>On length</u>
+ 0.15 mm	+ 20 % / - 0 %	+ 3 mm / - 0 mm

- 2.7 Tubes shall be straight enough so as to rotate freely over an approximate 2 % inclined plane with no bumping and jumping . The maximum local deflection measured under a one metre rule shall not exceed one millimetre. Compliance to be certified in the test report (certificate)
- 2.8 Finished tubes shall be free of scales and shall be coated with thin film of easily washable oil. Other types of adhesive coatings (peelable varnish or film) shall not be used.
- 2.9 Inspection agency : As specified in Enquiry or Purchase order
- 2.10 Manufacturer's / mill's test report (certificate) with details of all test results and condition TDC shall be furnished along with material. In case of third party inspection, such test reports shall be attested / certified by the relevant agency.

2.11 Packing

2.11.1 Indigenous supply

- a) Tubes shall be fitted with plastic caps at both ends
- b) Tubes shall be packed in hexagonal bundles of 3000 kgs maximum weight . The tube bundles shall be banded with steel straps at suitable intervals over wooden planks (Iron wire shall not be used), in order to ensure a satisfactory stiffness for Handling operation without damaging the tubes. Bundle ends shall be wrapped polythene bags or equivalent and shall be fitted with a rigid protection against blows .(e.g. projected wooden planks banded with steel straps). At one end a metallic or plastic tag shall show the following details in addition to the requirements of the material specification.,
- * GEA (I) Purchase Order Number
 - * Diameter ,length , thickness of tubes
 - * Quantity of tubes in the bundle and the weight of the bundle
- Quantity of tubes in the bundle shall not exceed as follows
222 for Dia 3/4" tubes ;127 for Dia 1 " tubes ; 91 for Dia 1 1/4 " tubes
61 for Dia 1 1/2" & 2" tubes

2.11.2 Supply by Sea freight

In case of overseas supply , packing shall be sea worthy and rigid enough to withstand loading / Handling during transportation. The supplier shall furnish along with the offer ,the details of packing adopted for our review & acceptance.