



CORPORATE STANDARD

AA 049 00 03

Rev. No. 02

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PRESERVATION, PACKING AND MARKING OF U-BENT HEAT EXCHANGER TUBES

1.0 SCOPE:

This standard stipulates the requirements preservation, packing and marking of ferrous and non ferrous U-Bent heat exchanger tubes.

2.0 PRESERVATION:

2.1 End Caps/Guides:

All the tubes shall be provided with plastic end caps of conical shape on both ends, in order to avoid ingress of water and other foreign matter.

A typical figure of the plastic cap is shown in the fig 3 for guidance.

2.2 Rust prevention:

All carbon steel tubes shall be applied with suitable temporary rust preventive on the outer surface of the tubes, and required quantity of rust inhibitive powder shall be inserted inside the tubes before end capping.

3.0 PACKING:

3.1 All tubes shall be packed and blocked in such a manner as to prevent damage in ordinary handling and transportation.

The boxes shall be constructed in such a manner that no nails, staples, screws or similar fasteners are required to close and secure the box after the tubes have been placed in the box. The box shall be lined with plastic sheet or vapour barrier materials so as to prevent chloride contamination of the tubes during handling, transportation and storage. The bottom of the case shall be rigid to enable the tubes to maintain straightness. Special lifting tackles, including beams, wherever necessary shall be provided with each case to avoid damage during transit. The U- bent tubes shall be arranged in boxes so that the smaller radius bends may be removed without disturbing larger radius bends. Tubes for each heat exchanger shall be boxed together.

A suitable amount of desiccant such as silica gel shall be placed in each packing box.

3.2 Each package shall be of convenient weight for ease in handling. The weights shall not exceed 2000 Kg (Gross).

3.3 Plastic/ nylon support guides as shown in fig.2 shall be placed in between the tubes in order to prevent rubbing of tube to tube and internal movement.

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3.4 The U-bent tubes of different radii shall be inserted into the slots of the wooden supports which are firmly fixed in the box as shown in Fig.1

3.5 The recommended packing case design and the method of packing is illustrated in fig 1. Any alternate method of packing shall be submitted to BHEL with full particulars and drawings along with the offer for approval.

4.0 MARKING:

4.1 Each tube shall be stenciled with the following information:

- a) BHEL order number:
- b) BHEL Specification No.
- c) Melt/Heat No:
- d) Size of tube:
- e) Supplier 's mark

4.2 A metal label shall be securely attached to each packing case, punched with the following details :

- a) BHEL order number:
- b) BHEL Specification No.
- c) Consignment or Identification No.
- d) Size of the tubes & Total weight
- e) Supplier's Name

4.3 The packing case shall be marked with the following symbols in order to avoid damage during transit:

- a) A mark indicating UP-DOWN position of the case.
- b) A mark indicating that the case shall not be given any impact.
- c) A mark indicating that the case shall be kept free from contact with moisture.
- d) A mark showing the slinging position.

5.0 HANDLING AT PORT, SITE, SHOP, ETC., 9INCLUDING TRANSPORTATION):

5.1 Procedure:

If the tube length is more than 7000 mm invariably beams are ordered by BHEL, two in numbers which are supplied with first consignment by the vendor.

On receipt of consignment at port, boxes and lifting beams shall be inspected. If boxes are found broken, inspection of tubes shall be carried out. Broken box shall be suitably repaired before sending to site. Boxes shall be inspected before loading on the truck/trailer at supplier's works. Repair shall be carried out if required.

Invariably lifting beam shall be used for handling of boxes.

Boxes shall be placed on the floor on supports (at least 300 mm above the floor). Distance between supports shall not be more than 500 mm. While handling /stacking, vertical direction as marked on the box shall be followed.

Boxes shall be stacked on each other in such a way that are upright, straight and not projecting outside the lower box. Normally not more than 3 boxes shall be kept on each other.



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5.2 Loading of boxes on trailers/trucks:

Preferably trailer shall be of flat floor and its length shall not less than the box. However, in case it is not feasible, following is recommended:

<u>Box length max. in metres</u>	<u>Floor length not less than in metres</u>
20	18.5
15	14
10	9.5
8	7.6

In case, the floor of trailer/truck is not flat, following procedure shall be adopted:

- Packers of suitable strength shall be placed on the floor such that when boxes are placed, the packer's bottom of the boxes is horizontal.
- Packers shall be placed such that at the driver end, the box projects maximum 300 mm from the support and on the opposite end, it is 300 mm less than end of the floor such that total projection from last support shall not be more than as specified above.
- Boxes shall be placed on each other as specified in clause 5.1. The each vertical row shall be secured tight using ropes /wires and tightened with each other and secured with the trailer floor suitably. The gap between the tightening rope/wire shall not be more than 2 metres.
- Out of two lifting beams, one number shall be sent with first consignment and the second lifting beam with the last consignment.
- Boxes shall be covered with tarpaulin and tightened suitably so as to prevent seepage of water.

5.3 Receipt at site:

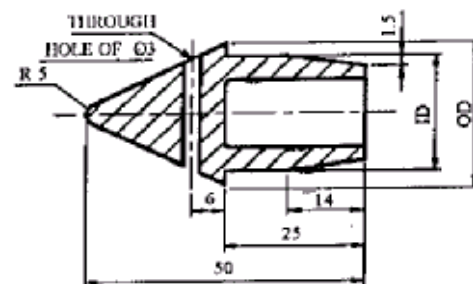
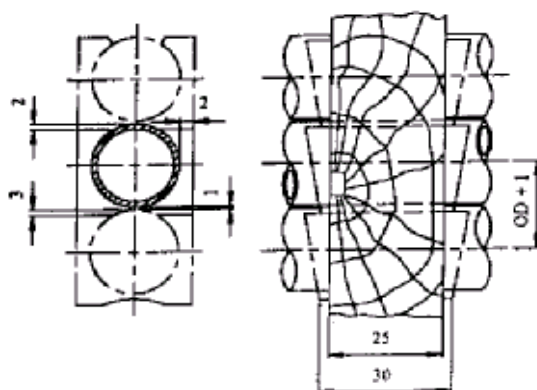
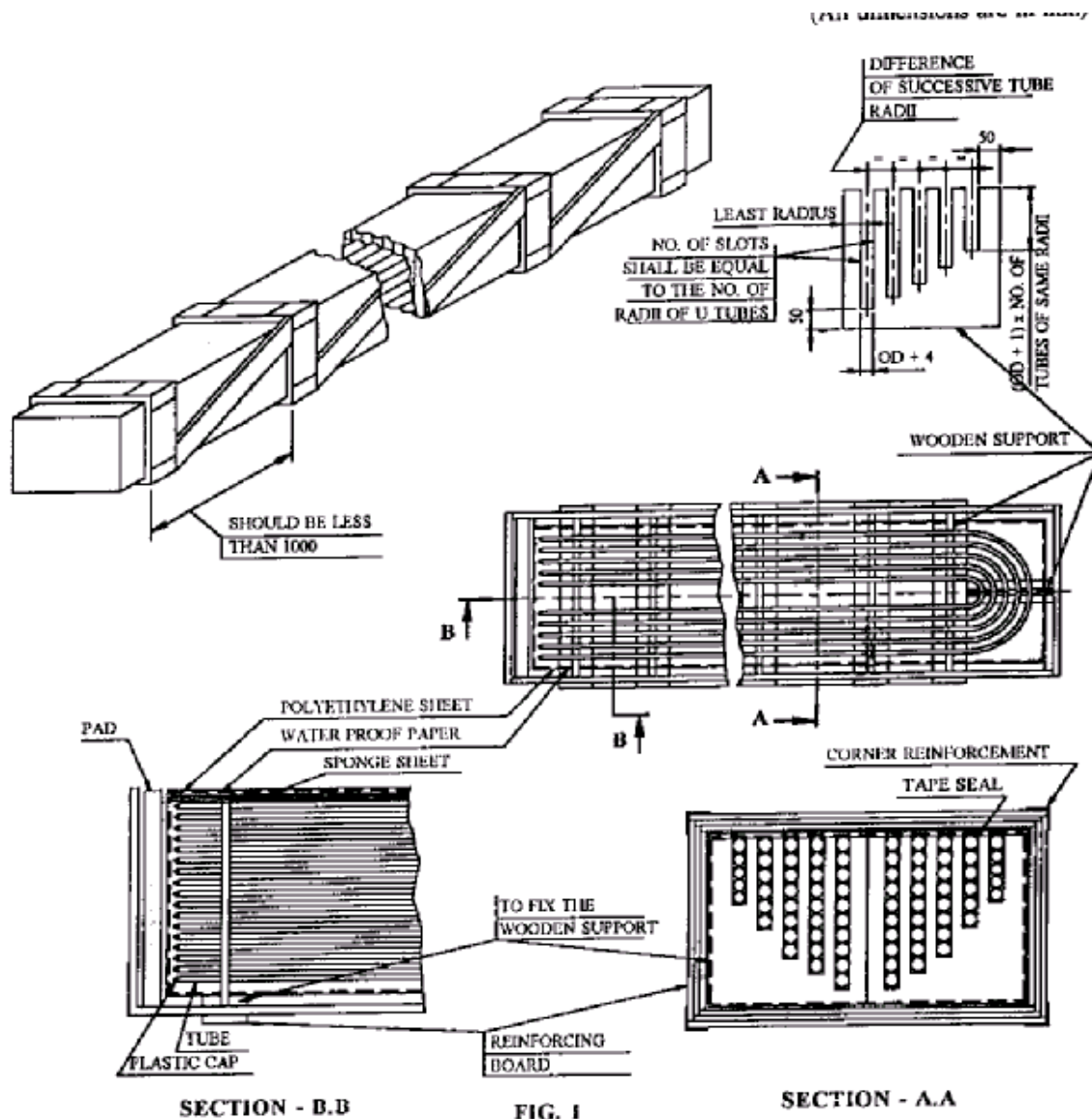
The boxes shall be again inspected at the site for any breakage, if found shall be reported back to concerned unit.

The boxes from trailer/truck shall be lifted using lifting beam only supplied with the first and last consignment and stacked in the store in line with clause 5.1.

The boxes shall be covered with tarpaulin to prevent water seeping in the boxes.

6.0 REFERRED STANDARDS (LATEST PUBLICATIONS INCLUDING AMENDMENTS):

NIL



CAP FOR TUBE END
FIG. 3