



CONDENSER & HEAT EXCHANGER ENGINEERING DIVISION
- BHEL BHOPAL

TECHNICAL ANNEXURE - A TO P.I. NO. 241130578

Double Tube Specification and dimensional details.

- Material :
- a) Outer tube : Copper to SB III C 12000
of ASME Sec. II Part B: 2013
 - b) Inner tube : 90-10 Cu – Ni to SB III C 70600
of ASME Sec. II Part B: 2013

(1) Dimensional details :-

A : Outer tube :- (having outer integral low fins and spiral grooves on ID)

- a) **Plain section**
 - OD – 19.0 mm.
 - Thk – 1.45 mm
- b) **Finned section**

Dia over fins	18.8 mm
Root dia	15.8 mm
Wall thickness	0.65 mm (Excluding groove depth)
Internal diameter	13.8 mm
Fin thickness	0.3 mm (min)
No of fins	19 per inch.
No of grooves	34 (spiral, 30 deg. angle)
Depth of grooves	0.35 mm
External Surface area	0.15 m ² /m

(Important : Grooves continue till 25mm from tube ends)

B : Inner tube : (Plain)

OD : 13.6 mm
Thk : 1.0 mm

C: Tolerance :

OD : (+) 0.0 / (-) 0.1

Thk : (±) 10%

Dia. Over fin : (+) 0.0 / (-) 0.2

Root dia. ± 0.15

Length : (+) 1.0 / (-) 0.0

No negative tolerance is acceptable on thickness of 0.65 mm at outer tube finned portion.



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D: Length of outer tube : Total 2468 mm

- a) Un-finned portion from ends 38 mm
- b) Finned portion 2392 mm

Length of inner tube : Total 2539 mm

Note :-

1. Supplier to furnish the drawing with offer as per above details.
2. Supplier to ensure assembly of inner tube in outer tube at their end so that it is ensured that inner tubes at our end can be inserted in outer tube without any problem.
3. Supplier to furnish a 400 mm sample with the offer of inner and outer tube with above spec. and dimension except length.

Testing : All testing as per specification SB III of ASME Sec. II, Part B: 2013 and clauses cross referred there in.

Hydro testing : Base tube (inner and outer) shall be tested at 70 Kg./cm², (outer tube before fining).

After fining outer tube shall be tested at 20 Kg./cm²

All test certificates to be duly signed by inspection agency and shall be sent to BHEL along-with the supply.

Important :

- Supplier to submit the above specification with duly signed and stamped along-with their offer as an acceptance of all the points as mentioned there-in. Supplier to also furnish the drawing of the subject tubes showing all the dimensional details and weight of inner & outer tubes separately.
- It is very important that the gap between inner and outer tube is no more than permitted as per the mentioned dimensions i.e. 0.1 mm radially. Gap more than this will affect performance of cooler.