



Technical Specification for Drilling of Tube holes in SS-overlayed Tube plates

1. Item: Drilling of tube holes in SS-overlayed forged carbon steel tube plates.
2. Material of construction: SS-overlayed CS Tubeplates

Base Plate: Carbon steel forging to SA 266 Gr. 2

Overlay material: Stainless Steel, SS-304

3. Salient Details

S.No.	Identification	Unit	HP Heater (Ropar) PI item 1 (21750540489)	LPH (KAPP) PI item 2 (31621840155)
1	Tube plate thickness	mm	266	150
2	Tube plate diameter	mm	1350	1532
3	No of tube holes		1608	1956
4	Tube hole size	mm	$16.08 \pm \frac{0.10}{0.00}$	$19.25 \pm \frac{0.05}{0.05}$
5	Tube pitch	mm	20.64x60° triangular	23.81x60° triangular
6	Hole finish	microns	3.2	3.2
7	Chamfer of tube holes both from shell side & tube side face		Yes, as per detail B & C in the drg.	Not required
8	Tube holes & chamfer details		As per drg. No. 21750540489 Rev 00 item 1 & tube layout drg 31750540395 Rev 00.	As per drg. No. 31621840155 rev 00 item 2 & tube layout drg 31622240051 Rev 00.
9	Weight of undrilled tube plate	Kg	3522	2170
10	Finished weight of tube plate	Kg	2876	1461
11	Quantity	Nos	2 (two)	3 (three)

4. Scope covers Deburring of all machined edge.

5. Protection:

After drilling & inspection tube plate shall be protected by applying light oil based rust preventive.



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6. Inspection

Tube plates shall be subjected to inspection by BHEL/BHEL appointed inspection agency.

7. Issue of tube plate by BHEL for drilling at vendors work
 - a. Tube plates with SS overlay and face machined condition, shall be issued by BHEL
 - b. Each tube plate will have unique PF number as a minimum for identification & co-relation with inspection reports.
 - c. HP Heater Tube plates (2 nos) & LP Heater Tube plates (3 nos) shall be issued separately.
 - d. Free issue tube plate forging shall be released with 'A' form under CEX rule-4(5)(X).

8. Transportation:

Transportation from BHEL, Bhopal to vendor works would be in BHEL's terms.
Transportation from vendor works to BHEL, Bhopal would be in vendor's terms.
Transportation cost for each items to be quoted separately.

9. Delivery schedule:

Delivery shall be 4 weeks after receiving of tube plates at vendors works. This includes transportation time taken in final delivery.

10. Deduction rate of ED & ST on SWARF shall be as indicated in item material description note.
11. Each item of PO shall be weighed (by CRX) before dispatch and this weight shall be mentioned (item wise) in Store Receipt Voucher (SRV).
12. Difference in weight of forging & drilled tube plate shall be considered as scrap. Cost of scrap shall be deducted at the prevailing rates which is presently Rs 25/- per kg.