

650620/2024/HEP-HCM21100

QAP FOR DRILLING OF Tube holes in SS Overlayed Tube Plates

QA PLAN NO.

QAX/TH/1659



Date

11.08.2023

Rev.

00

Page No.

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Operations for Drilling of Tube Plates as per Approved Drg.

Sr. No.	Component & Operation	Characteristic	Class	Type of check	Quantum of check	Reference Document	Acceptance Norms	Format of Record	Inspection Agency				Remarks
									P	W	R	H	
1	2	3	4	5	6	7	8	9	10				11

1	Identification of Tube Plates and co-relation	Identification	Major	Co-relation of Tube sheet with dispatch note	100%	Approved Drawing	Approved Drawing	Material identification report	3	3	2		
2	Tube plate drilling.	Centre line and angle marking on tube sheet			100%	Approved Drawing	Approved Drawing	Inspection report	3	3	2		
	Tube plate drilling.	Tube plate Setting on deep hole drilling machine. Orientation and flatness check	Major	Set up on machine, Measurement / Visual	Drilling sequence	Approved Drawing	Approved Drawing	Inspection report	3	3	-		
		Spotting	Major	Tube layout check	100%	Approved Drawing	Approved Drawing	Inspection report	3	3,2			
		Drilling of tube sheet	Major	Operation	100%	Approved Drawing	Approved Drawing	Inspection report	3	3	-		
		Hole dia, ligament	Major	Go-No go gauging 100%	100%	Approved Drawing	Approved Drawing	Inspection report	3	2*, 3	2		
		Hole size, Ligament from Both side (Drill side and opposite side), surface finish,	Major	Measurement	5 % Tube plate Holes	Approved Drawing	Approved Drawing	Inspection report	3	2*, 3	2		*All control holes (2% of tube plate holes) shall be witnessed by BHEL/BHEL TPI.

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	drilling			Measurements			Approved drawing	n report					
4	Tube Holes chamfer making details	Chamfer	Major	Visual	100 %	Approved Drawing	As per approved Drawing.	Inspection report	3	2,3	2,3		All control holes (2% of tube plate holes) shall be witnessed by BHEL/BHEL TPI
5	Cleaning of holes & preservation of Tube plate with protective cover. Wooden Packing.	Cleaning of holes from both sides.	Major	Visual	100 %	Approved Drawing	Approved Drawing	Release Note	3	2,3			
6	Documentation	Page Numbering and Indexing of all documents as per QAP clauses	Major	Visual	100 %	Approved Drawing	Approved Drawing	Release Note	3	2,3			

ABBREVIATIONS :

- Customer
- BHEL/BHEL TPI

- Sub-Vendors / Sub-Vendors Authorised agency for imported material

- External laboratory / sub-vendor

- Performed by :

- Hold point : This activity shall be kept under hold till Report/ shipping release note is signed and/or written waiver is obtained from the agency responsible for this stage

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Manager

पंकज निमजे / Pankaj Nimje
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(Customer / its Authorised Representative).

W Witness point: Witness points are critical steps in manufacturing and examination / inspection / testing. Where the supplier is obliged to notify in sufficient advance of the start of the operation / test so that it may be witnessed. The Supplier may proceed with the work past a witness point, if the customer or its authorised representative is not available at the appointed time.

R Document Review : Review / Verification of documents carried out by agency for compliance and acceptance.

LPE Liquid Penetrant Examination

DEFINITIONS :

Critical The characteristic of a component, process or operation failure of which will surely cause operating failure

Major

The characteristic of a component, process or operation whose failure may cause operating failure which cannot be readily corrected at site or cause Substandard performance, increased erection and maintenance cost, reduced life or seriously affect the aesthetics.

Minor

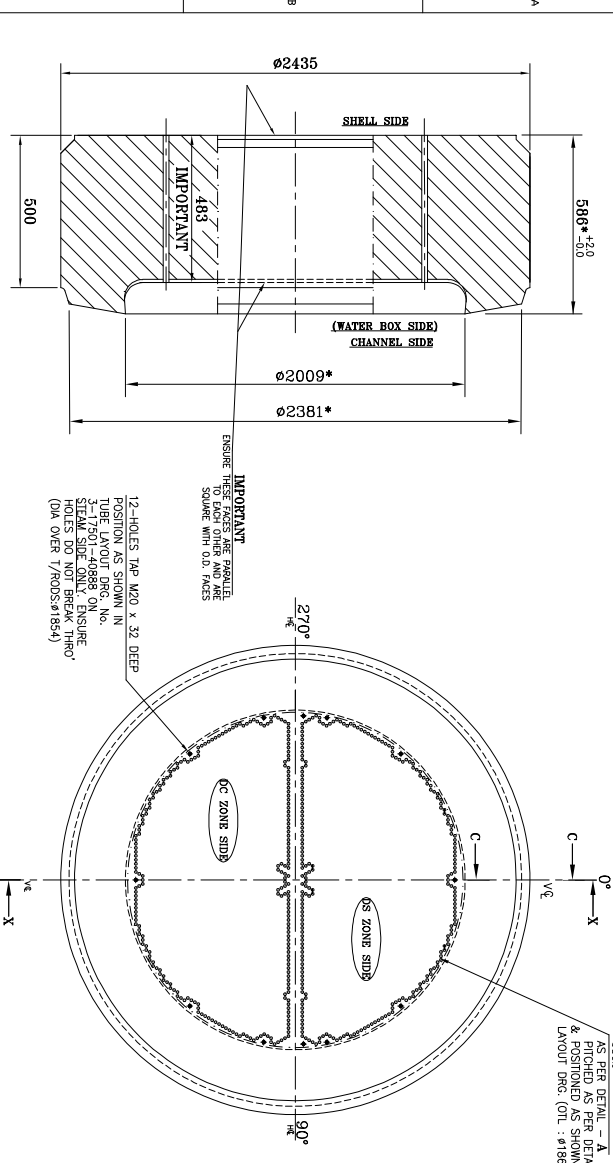
The characteristic of a component, process or operation whose failure neither materially reduce the usability of the product in operation, nor does it affect the aesthetics.

Note: Latest revision of documents shall be applicable for QAP.

11/8/23
JITENDRA SINGH
Manager

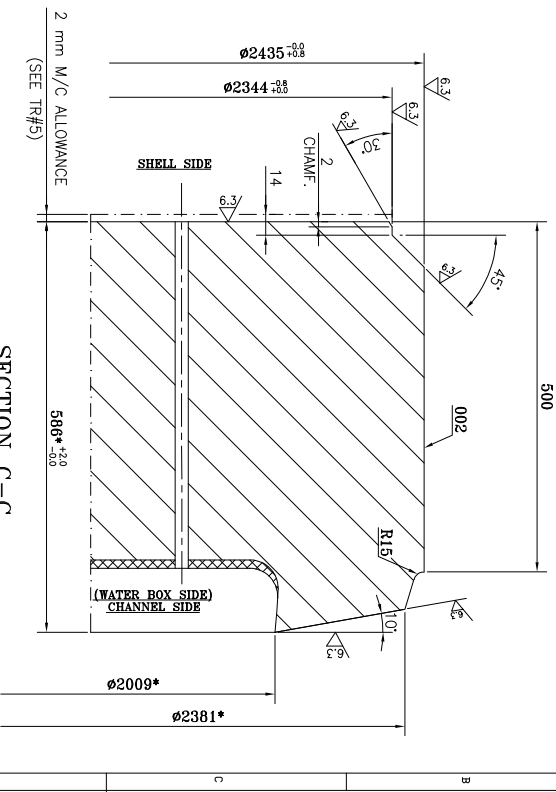
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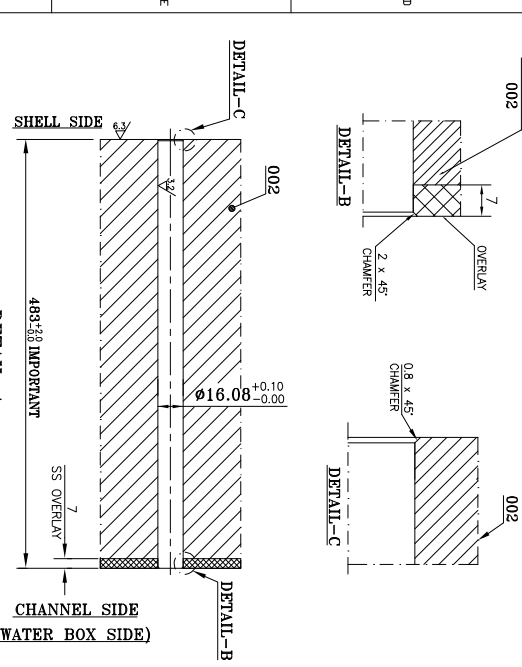


SECTION - X X

DETAIL OF ITEM-001
(VIEW LOOKING FROM SHELL SIDE)



SECTION C-C



DETAIL - P
TUBE HOLE PITCHING
(20.23x60°)

ISSUED BY
CHECKED BY
APPROVED BY

TOOL LIST
REF. DRG. NO. 4-17500-40051

REV. DATE	ALTERED
CHECKED	APPROVED

REV. DATE	ALTERED
CHECKED	APPROVED

(*) DIMENSION WILL BE FINALIZED AFTER ACTUAL MEASUREMENT OF OLD W/BOX AFTER OPENING FROM OLD HEATER.

- TECHNICAL REQUIREMENTS (TR)
1. ALL WELDS PREPARATION TO BE CHECKED BY MAGNETIC PARTICLE EXAMINATION, AS PER AA-0850185.
 2. ALL PREPARATIONS TO BE MADE BY MACHINING. MACHINE FINISH SHALL BE 6.3 MICRONS OR BETTER, UNLESS OTHERWISE SPECIFIED.
 3. TOLERANCE ± 1 UNLESS OTHERWISE SPECIFIED.
 4. SURFACE TO BE COATED WITH INHIBITIVE OIL AS TEMPORARY RUST PROTECTION.
 5. ONLY 2 mm MACHINING ALLOWANCE PROVIDED ON THE SHELL SIDE FACE OF TUBERATE. MACHINE (IF REQUIRED) FOR SETTING.
 6. TUBE HOLE DRILLING TOLERANCES : AS PER TEMA/HE-04012.
 7. FOR TUBE LAYOUT REFER DRG. NO. 3-17501-40888

REV. DATE	ALTERED
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888804-10521-13

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