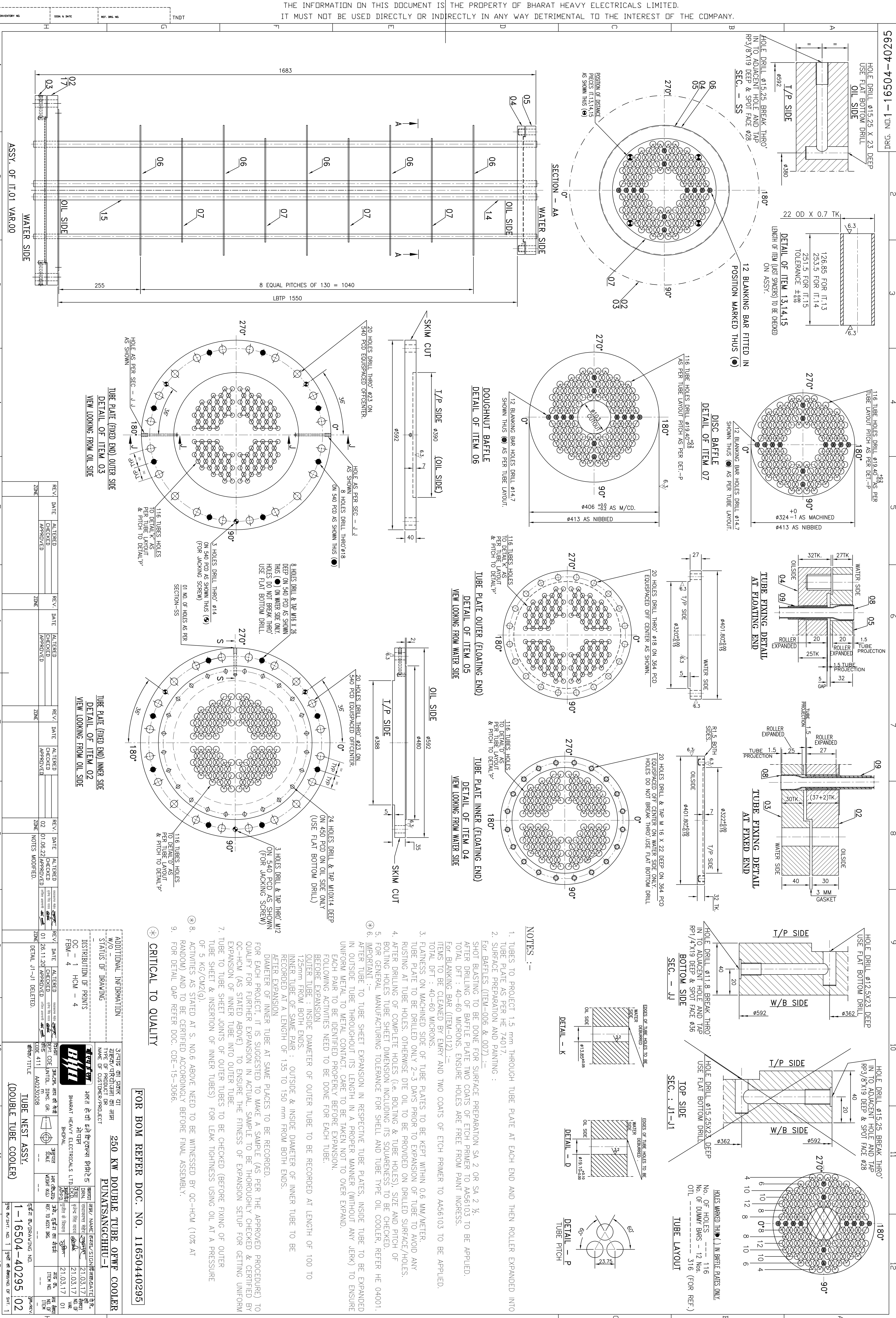


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A-FORM

BHARAT HEAVY ELECTRICALS LIMITED - BHOPAL

MM DEPARTMENT

ESTIMATE SHEET FOR ISSUE OF MATERIAL/COMPONENTS FROM BHEL

CHECKLIST

A-FORM NO : A211B54
REV NO : 0
A-FORM DATE 13-MAR-23
DATE 13-MAR-23
PAGE : 1 / 1

FORM NO BP-0021

DEPARTMENT : 211

PROJECT

: EM WORKS FOR 90

PO NO : A211B54

END PRODUCT : M/CING OF TUBE PLATE

INVENT NO : 221120077

WORK ORDER NO : 68012X14301

PO DATE :

DELV REQD : 20072023

INVENT DATE : 13032023

MATERIAL ISSUE DIV : 211

SUPP CODE :

SUPP NAME :

DETAILS OF FINISHED GOODS

ASLNO

POIT NO

PLT NO

QUANTITY REQUIRED

UNIT

SHOP NO

DEST CD

COST CD

H.CELL

DESCRIPTION OF SUB-ASSEMBLY ITEM & WEIGHT/VOLUME/AREA

FREE ISSUE MATERIAL PER UNIT OF FINISHED GOODS

MATL CODE	QTY PSL UNIT	PSL UNIT	RATE PSL UNIT	TOTAL MATL TO BE ISSUED	ISSUE PSL/ UNIT WIP	SMIV/ PPMIV NO	MATERIAL VALUE	TARRIF HEAD	MATL ISSUE QTY
-----------	--------------	----------	---------------	-------------------------	---------------------	----------------	----------------	-------------	----------------

DESCRIPTION OF FREE ISSUE MATERIAL AND WEIGHT / VOLUME/AREA

M/CING & DRILLING OF TUBE PLATE INNER FIXED END	1	0	1	40.000 ST	211	211			211
---	---	---	---	-----------	-----	-----	--	--	-----

SA240TP304

1.0000 NO

2441.000

NO WIP

857640.000

1.0000

M/CING & DRILLING OF TUBE PLATE INNER FIXED END DRG NO-11650440295 ITEM 02 MATERIAL SIZE 596X40MM TK R.WT-88.97 KG & F.WT-60.00 KG APPROX.(SCRAP)	2	0	1	40.000 ST	211	211			211
---	---	---	---	-----------	-----	-----	--	--	-----

SA240TP304

1.0000 NO

24100.000

NO WIP

964000.000

1.0000

M/CING & DRILLING OF TUBE PLATE OUTER FIXED END	3	0	1	40.000 ST	211	211			211
---	---	---	---	-----------	-----	-----	--	--	-----

SA240TP304

1.0000 NO

9220.000

NO WIP

368800.000

1.0000

M/CING & DRILLING OF TUBE PLATE INNER FLOATING END	4	0	1	40.000 ST	211	211			211
--	---	---	---	-----------	-----	-----	--	--	-----

SA240TP304

1.0000 NO

9220.000

NO WIP

368800.000

1.0000

M/CING & DRILLING OF TUBE PLATE OUTER FLOATING END DRG NO-11650440295 ITEM 04 MATERIAL SIZE 412X36 MM TK R.WT-38.26 KG & F.WT-30.00 KG APPROX.(SCRAP)	4	0	1	40.000 ST	211	211			211
---	---	---	---	-----------	-----	-----	--	--	-----

SA240TP304

1.0000 NO

9220.000

NO WIP

368800.000

1.0000

M/CING & DRILLING OF TUBE PLATE OUTER FLOATING END	4	0	1	40.000 ST	211	211			211
--	---	---	---	-----------	-----	-----	--	--	-----

SA240TP304

1.0000 NO

9220.000

NO WIP

368800.000

1.0000

M/CING & DRILLING OF TUBE PLATE OUTER FLOATING END TO DRG NO-11650440295 ITEM-05 MATERIAL SIZE 412X36 MM TK R.WT-38.26 KG & F.WT-28.00 KG	4	0	1	40.000 ST	211	211			211
---	---	---	---	-----------	-----	-----	--	--	-----

REMARKS

NA

TOTAL NO OF CANCEL ITEM 0

A-FORM TOTAL 2559240.000

1 MATERIAL TO BE ISSUED ON :-

FREE ISSUE BASIS

2 TRANSPORT TO BE PROVIDED BY :-

SUPPLIER

3 EXCESS DUTY ON ISSUE MATL TO BE BORNE BY :-

SUPPLIER

4 SCRAP TO BE RETURNED :-

NO

5 INVIARIBLY ISSUE WT. TO BE RECORDED ON SMIV/PMIV

SIGNATURE OF BATHNAIK
NAME / Dy. Manager

DESIGNATION MM Division

TELEPHONE BHEL BHOPAL

SIGNATURE OF ASC EXECUTIVE
NAME
DESIGNATION
TELEPHONE

Annexture-A				
PI ITEM NO	Set Description	One Set consist of Following Items	TOTAL QTY(SET)	PI QTY
1	SET OF M/CING & DRILLING OF Tube Plate inner Fixed End to drg no-11650440295 item 02, Tube Plate outer Fixed End to drg no-11650440295 item 03, Tube Plate inner Floating End to drg no-11650440295 item 04 & Tube Plate outer Floating End to drg no-11650440295 item 05	MACHINING & DRILLING OF TUBE PLATE INNER FIXED END TO DRG NO-11650440295 REV-02 ITEM-02-01 No	40 SET	01 SET =(01+01+01+01) NOS
		MACHINING & DRILLING OF TUBE PLATE OUTER FIXED END TO DRG NO-11650440295 REV-02 ITEM-03-1 No		
		MACHINING & DRILLING OF TUBE PLATE INNER FLOATING END TO DRG NO-11650440295 REV-02 ITEM-04-1 No		
		MACHINING & DRILLING OF TUBE PLATE OUTER FLOATING END TO DRG NO-11650440295 REV-02 ITEM-05-1 No		


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 13/03/23
 विनोद पटनायक / VINOD PATNAIK
 उप प्रबंधक / Dy. Manager
 एच.सी.एम. विभाग / HCM Division
 बी.एच.ई.एल. भोपाल / BHEL, Bhopal

Pre-Qualification Requirement: 221120077

S.No.	DESCRIPTION	Requirement	Vendor to specify
1	Details of past experience in Drilling/Machining of jobs of Minimum 300 X 450 mm including job executed and under progress, in last five year.	PO Copy/Job Completion Certificate	
2	Facility of CNC machine for Drilling of Tube Plate for drilling as per respective items of the Drawing.	As mentioned below	Vendor to confirm
2.1	Make	Vendor to Specify	
2.2	Qty	Vendor to Specify and confirm	
2.3	Capacity X Axis	Vendor to Specify and confirm.	
2.4	Capacity Y Axis	Vendor to Specify and confirm	
3	Facility of Machine for Machining of Tube Plate as per respective items of the Drawing.	Vendor to Specify machine details and confirm.	

All machineries, measuring instrument and inspection tool shall be in good working condition and valid calibration reports shall be available.


13/03/23
Prepared by


Checked by


पंकज निमजे / BANKAJ NIMJE
उप महाप्रबंधक / DGM
एच. सी.एम. विभाग / HCM Division
बी.एच.ई.एल., भोपाल / B.H.E.L., BHOPAL



Heat Exchanger Group
BHEL Bhopal

STANDARD QUALITY ASSURANCE PLAN (SQAP)

QAP No.

QAX/TH/1597

Revision No.

01

Date of Issue

13.06.2022

Page

Page 1 of 2

S. No.	Components & Operations	Characteristics	Category	Type / Method of Check	Quantum of check	Reference Document	Acceptance Norms	Format of Records	Agency			Remarks
									1	2	3	
1	2	3	4	5	6	7	8	9	10	11		
1.0 TUBE PLATE (MACHINED & DRILLED)												
1.1 MATERIAL INSPECTION												
a.	Verification of Co-related Mill Test Certificates - MTCs.	Chemical composition (Heat & Product Analysis) Mechanical Properties	Major	Visual	100%	BHEL Drawing / BHEL Specification	BHEL Drawing / BHEL Specification	MTC	R	R	-	Not Applicable in Case of BHEL supplied plate.
b.	Correlation of MTC & Attestation marks before use.	Marking & transfer of Heat Nos.	---do---	---do---	---do---	---do---	---do---	IR	P	R	-	Identification mark on each part before cutting of plates.
1.2 IN PROCESS INSPECTION												
a.	Machining of Tube Plate	Machining of Outer Periphery (OD/Length & width) & surface as mentioned in the drawing.	Major	I + Visual	100%	BHEL Drawing	BHEL Drawing	IR	P	-	-	
b.	Surface Preparation and primer painting	--	Major	Visual	---do---	BHEL Drawing	BHEL Drawing	---do---	P	W	-	For CS T/P only
c.	Drilling of Tube Plate	Drilling of tube holes, Bolt/stud hole, Lifting holes (if any) etc. and holes surface finish as mentioned in the drawing.	Major	I + Visual	100%	BHEL Drawing	BHEL Drawing	IR	P	-	-	Surface Finish to be ensured using comparator.
1.3 FINAL INSPECTION												
a.	Dimensional check	Measurement of overall dimensions (e.g. Thickness (Tk.), Outside diameter (OD)/Length & Width, Groove depth etc.), Location & Size of tube holes, Grooves in tube holes, Bolt/Stud hole, Lifting holes (if any), drain-vent holes etc.	Critical	I + Visual	100%	BHEL Drawing	BHEL Drawing	IR	P	W	-	Refer Note-c & d also. BHEL-IA to ensure the same. All dimensions to be within tolerance limit.
b.	Surface finish check for tube holes	Surface finish.	Major	I + Visual	100%	BHEL Drawing BHEL Drawing	BHEL Drawing	IR	P	W	-	Comparator to be used. Tube holes of tube plate should be free from any tool mark, scratches & roughness.

APPROVED BY: 13/6/2022

QAP/TH/1597



Heat Exchanger Group
BHEL Bhopal

STANDARD QUALITY ASSURANCE PLAN (SQAP)

ITEM
MACHINED AND DRILLED TUBE PLATES
FOR COOLERS

QAP No. QAX/TH/1597
Revision No. 01
Date of Issue 13.06.2022
Page 2 of 2

S. No.	Components & Operations	Characteristics	Category	Type / Method of Check	Quantum of check	Reference Document	Acceptance Norms	Format of Records	Agency			Remarks
									1	2	3	
1	2	3	4	5	6	7	8	9	10			11
c.	Machined side/surfaces of Tube plate	Flatness	Critical	I + Visual	100%	BHEL Drawing	≤ 0.6 mm/meter)	IR	P	W	-	<ul style="list-style-type: none">• Bed Plate with suitable method to be used to ensure flatness.• Machined surfaces of tube plate should be free from any tool mark, scratches & roughness.• 20% by BHEL TPJA (First one to be offered then random)
d.	Final Painting & Paint thickness (For CS tube plates only, if applicable).	Visual & Measurement for ensuring thickness	Minor	I + Visual	100%	BHEL Drawing	BHEL Drawing	IR	P	W	-	<ul style="list-style-type: none">• Color shade and DFT to be checked.• Adhesion Test.• Ensure holes shall be free from paint ingress.
e.	Documentation	Verification of Quality Documents.	Minor	Visual	100%	BHEL Drawing	BHEL Drawing	Two (02) sets of all the above documents (i.e. MTC & Inspection Reports-IR) duly signed and stamped by the BHEL-IA.	P	R	-	<ul style="list-style-type: none">• Out of two sets, minimum one set shall be in original format.

Approval does not relieve supplier from meeting our requirements as per the drawing/specification.

Notes: - (a) All the inspection report & test certificates shall be part of the final QA Document.

BHEL-IA to ensure that all reports shall be arranged in sequential manner as per this QAP with proper index sheet at top.

(b) Size of tube plate, tube holes & its location to be ensured using suitable CNC make templates.

(c) Size of tube holes to be checked with calibrated GO & No-Go gauges.

(d) Sharp edge if any to be removed.

LEGEND: 1: Supplier, 2: BHEL IA, 3: Customer, P-Perform, W-Witness, R-Record review, MTC: Mill Test Certificates,

IR: Inspection report, IA: Inspection Agency, I: Instrument to be used for check.

QC Manager / Dy. Manager
BHEL BHOPAL

Shm

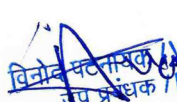
बुजेंद्र यादव / Brajendra Yadav
उप प्रबंधक (निर्माण) / Dy. Manager (Design)
श्री.सी.ई. सेल, भोपाल / CODE BHEL, BHOPAL


15/06/2022

Scope of work for Machining & Drilling of SS Tube Plate

1. Collection of raw Materials from BHEL Store.(Transportation TO & FRO in your scope)
2. Preparation of Operation process sheet and submission by the vendor.
3. Machining, & drilling to be done as per drawing.
4. All the dimensions shall be maintained as per drawing and surface finish requirement also shall met as per drawing.
5. Inspection by BHEL appointed Third Party TPI/BHEL QC.
6. Packing of Tube Plates individually with proper identification tags.
7. Scrap deduction as per scrap weight. (Note-scrap rate-66.4 Rs /kg)
8. Drilling & machining to be done in house.
 1. Drilling: Drilling process shall be carried out using CNC machine.
 2. Machining: Machining shall be carried out using Boring/Milling machine.
9. Qty may decrease as per BHEL requirement after placement of PO. Before taking action for drilling tools and fixture, BHEL confirmation will be required lot wise.
10. Drilling & Machine tools, Jigs and Fixture shall be in vendor scope.
11. Plug gauge tools preferably shall be in vendor scope. BHEL may provide subject to Plug Gauge availability for issuing on loan basis.




विनोद पटनायक / VINOD PATNAIK
उप प्रबंधक / Dy. Manager
एच.सी.एम. विभाग / HCM Division
बी.एच.ई.एल. भोपाल / BHEL, BHOPAL


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