FACTORY ACCEPTANCE TEST
FOR
KILL TANK-300LTRS.

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1 INTRODUCTION:

The objective of this Factory Acceptance Test is to verify that the equipment has been built and engineered according to the design specification and as a result approves the equipment for Shipping to …….. site and Handover will be following completion of successful site acceptance test.

This document will be completed as follows:

1. All people who enter data into this report will complete the section of this FAT titled 'FAT Personnel'. See Appendix. A, B, C, D, E, F.
2. Any corrections in handwriting will be made by deleting with a single pen stroke; the correction will be initialed and dated.
3. Entries shall be made in this document using a ball point pen or suitable indelible ink in Blue only.
4. Compliance will be indicated by a written YES or NO in the relevant boxes provided. 'Ticks' and 'crosses' must not be used.
5. Correction fluid is not allowed.
6. Each section will be signed and dated by the tester/s when it is complete.
7. Any non-compliance identified during the execution of the test protocols must be documented in a Deviation report. These report sheets must be attached to the appendix of this protocol. The report will describe the deviation in detail and, whenever possible, identifying the cause.

2 OVERVIEW:

…….. has received an order for the material procurement, and manufacture and supply of 1No. of KILL TANK From M/s. …….. Vide their purchase order No: ……Dated:.

DOCUMENT VERIFICATION				
Objective	Ensure that all relevant design and inspection documentation is in place and referenced.			
Method	Log the document title, reference number, and approval date and revision number. Any discrepancies to be noted on the review form and on the Deviation Report. All attachments should be referenced and appended in the attachment log.			
Acceptance Criteria	All columns in the table should be completed. All documents should be identified, approved and referenced.			
Document Expected	**Reference Number**	**Rev**	**Approval Date**	**Available Yes/No**
Purchase Order				
G A Drawing				
FDS				
Material Chart				

	Signed	**Date**
Executed By:		
Reviewed By:		

FAT for Kill Tank (300 ltrs.)

MAJOR COMPONENT VERIFICATION	
Objective	To verify that the Major Components are installed in accordance with the approved Component List.
Method	Take a Copy of the Approved Component List. Highlight the components present on the machine in the .Approved G.A. Drawing Fill in the table below. Attach the Highlighted drawing with this document. Any discrepancies to be noted on the review form and on the Deviation Report. When the tester has completed the check they will date and sign the marked-up print and write the words: - 'FACTORY ACCEPTANCE TEST COMPONENTS LIST CHECK'
Acceptance Criteria	There should not be any variance with approved Component List.
Drawing No	

S No.	COMPONENT DESCRIPTION	MAKE	MODEL / MOC/SIZE.	VERIFIED (YES /NO)
1.	Shell		SS 316, 4th.	
2.	Jacket		SS 304, 4th	
3.	Insulation Shell		SS 304, 14 SWG.	
4.	Motor		3 HP, 960 RPM., V-415,HZ-50,	
5.	Leg		60 OD, SS304	
6.	Shaft		28 dia SS 316	
7.	Operating cum control Panel		SS 304	

NOZZLES SCHEDULE:

TAG NO.	NOZZLE DESCRIPTION	MODEL / MOC/SIZE.	VERIFIED YES/NO
	Receiver inlet	SS316, 210ID with cover	
	Bottom Outlet.	SS 316,25 OD TC end with Ball valve	
	Cooling water inlet	1'' BSP	
	Cooling water outlet	1'' BSP	
	Jacket Vent	½'' BSP with vent cock	
	Level Gauge	¾'' BSP With level gauge	
	Product inlet	40 NB, With blind	
	Spare	1'' BSP with Pr Gauge	
	Drain	½'' BSP	
	Spare	1 ½'' OD with blind TC	
	Spare coupling for PT-100 sensor at jacket	½'' BSP	

FAT for Kill Tank (300 ltrs.)

Comments		
	Signed	**Date**
Executed By:		
Reviewed By:		

FAT for Kill Tank (300 ltrs.)

INSTRUMENT VERIFICATION	
Objective	To ensure that the Instruments Listed in the Instrument List are available and fixed on the system, as per the drawings.
Method	Referring to the Copy of Instrument List. Verify the ranges, makes, quantities. Using a yellow Highlighter pen mark out the drawings on verification. Fill in the table below in the column. Any discrepancies to be noted on the review form and on the Deviation Report. Certificates for Calibration, whichever required and essential used be available. When the tester has completed the check they will date and sign the marked-up print and write the words: - 'FACTORY ACCEPTANCE TEST INSTRUMENT LIST CHECK'
Acceptance Criteria	All instruments are listed and referenced in the drawing.

S.No.	**COMPONENT DESCRIPTION**	**MAKE**	**SIZE/RANGE**	**VERIFIED YES/NO**
1	Pr Gauge	Waaree	4" dial , Range 0- 10kg/cm^2	
Comments				

	Signed	**Date**
Executed By:		
Reviewed By:		

EQUIPMENT MOC VERIFICATION:

Objective	To verify that the material of construction of the machine is as per approved drawings
Method	Verify the Material chart and that certificates are available with respect to acceptable standards. Attach the copy of the Material chart along with this document. Use a yellow highlighter pen to mark the components verified. Note down any discrepancy in the discrepancy report in this document. When the tester has completed the check they will date and sign the marked-up print and write the words: - 'FACTORY ACCEPTANCE TEST MATERIAL CHART CHECK'
Acceptance Criteria	The MOC and test certificates thereof must comply with the requirement of approved documents.
Comments	

	Signed	**Date**
Executed By:		
Reviewed By:		

EQUIPMENT DIMENSION VERIFICATION	
Objective:	To verify that the equipment manufactured is in accordance with approved drawing.
Procedure:	Refer the approved drawing and compare with the actual dimensions on the equipment. Recheck whether the drawing clearly specifies the manufacturing standards adopted. With a red pen clearly strike off the incorrect dimension and put the correct dimension. Correct the drawing with the proper dimensions name the drawing "AS BUILT". Attach the market drawing with this Document
Acceptance Criteria	The measured dimensions should be within the acceptable limits.
Drawing no.:	
Comments:	

	Signed	**Date**
Executed By:		
Reviewed By:		

FAT for Kill Tank (300 ltrs.)

EQUIPMENT FINISH VERIFICATION	
Objective:	To ensure that the equipment finish is as per the approved GA drawing.
Procedure:	Stainless Steel Internal finish: ▪ Using an RA meter or comparative plate check the internal finish ▪ There should be a No. exposed threads. ▪ There should be no crevices or sharp corners, weld splatters. ▪ Edges should be smooth and rounded off. ▪ Light/sight glasses should be as flush as possible Stainless steel External Finish ▪ No scratches should be present on the surface. Mild Steel: ▪ The part should be properly de scaled, degreased and painted. Other equipments/Components should be properly cleaned; de burred and should have no sharp edges. Any discrepancies to be noted on the review form and on the Deviation Report.
Acceptance Criteria	The finish should be as per the approved drawing and as above

Part	**Finish SS Surface**	**Internal finish as specified in the approved documents**	**Pass/Fail**
Insulation	External	Ra-0.6(180 Grit Matt.)	
Top Dish	External	Ra-0.6(180 Grit Matt.)	
Leg	External	Ra-0.6(180 Grit Matt.)	

Comments:		
	Signed	**Date**
Executed By:		

Reviewed By:		

EQUIPMENT NAME PLATE VERIFICATION

Objective:	To ensure that the Nameplate is provided on the machine and is easily visible. It should clearly mention the name, reference no. of the machine and the date of manufacture.
Procedure:	Visually inspect the machine for the Nameplate and check whether it contains the date, reference no. And date of manufacture. Mark /highlight the Location on the drawing. Any discrepancies to be noted on the review form and on the Deviation Report.
Acceptance Criteria	The Nameplate has all the above data inscribed on it.

DESCRIPTIONS	**VERIFIED (YES/NO)**
Name Plate Location is Acceptable and marked on the drawing?	

Model:	GMP	**Capacity:**	300 LTRS	**Pass/Fail**
Type:	KILL TANK	**Date of Mfg.:**		
MOC:	SS316	**Inspection By:**	CLIENT	
Sr. No:				

Comments:

	Signed	**Date**
Executed By:		
Reviewed By:		

FAT for Kill Tank (300 ltrs.)

CONTROL PANEL BUILD QUALITY	
Objective:	To ensure that the electrical equipments are assembled as per electrical GA drawings.
Procedure:	Check orientations, drawings, and placement of switchgears as per GA. Highlight the components on the GA, so verified. Any discrepancies to be noted on the review form and on the Deviation Report.
Acceptance Criteria	All the equipments are assembled as per GA.

Description	Verified Yes/No
Electrical Equipments orientations are as per GA Drg no. _____	
Electrical Wiring Diagram Attached?	
Panel Build Quality Acceptable?	

Comments:

	Signed	**Date**
Executed By:		
Reviewed By:		

ELECTRICAL WIRING DIAGRAM

Objective:	To compare the electrical components in the panel and the wiring identification with the electrical drawings
Procedure:	The tester will compare the installed components with those specified on the drawings and check the wiring identification is as shown on the drawings and will mark with a 'highlighter' pen each of the details on the drawing which are verified. A minimum of 20% of the components fitted will be checked and highlighted. Any correction to the drawing will be written on the drawing by the relevant item in RED ink. When the tester has completed the check they will date and sign the marked-up print and write the words. 'FACTORY ACCEPTANCE TEST ELECTRICAL COMPONENTS CHECKED' The tester will attach the Marked-Up print to this report as an appendix given below. All attachments to this protocol to be marked up with this protocol number including the number of pages and the appendix to which it is attached. Any items on the drawings in non-compliance will be detailed in a deviation report.
Acceptance Criteria	The connections are as per the wiring diagrams.

Component Name	Drawing No. (Sheet No.)	Rev. No.	Pass/Fail

Comments:

	Signed	Date
Executed By:		
Reviewed By:		

WIRING TUG TEST	
Objective	Confirm that all the wires are connected to the electrical components tightly.
Method	Lightly Pull all the wires connected to the electrical components one by one testing any loose connections. Re do the connection if any is found loose. Any discrepancies to be noted on the review form and on the Deviation Report.
Acceptance Criteria	Ensure all wires connected tightly to the electrical components.
Comments:	

	Signed	**Date**
Executed By:		
Reviewed By:		

TEST INSTRUMENTS	
Objective	To identify the equipment and instruments used for testing during the Factory Acceptance Test phase and to verify that they were calibrated.
Method	List all test or reference instruments used during the Factory Acceptance Test of the system. Include the description, serial number, manufacturer, and calibration for each item, as applicable. Verify that all such instruments are calibrated. Document the results in the table below. Any discrepancies to be noted on the review form and on the Deviation Report.

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Acceptance Criteria	All instruments used to qualify the system during Factory Acceptance Test shall be listed along with their description, serial number, Certificate number, calibration dates, as applicable. For each instrument, a copy of the calibration certification is to be included with this protocol or its location referenced.

Instrument	Serial Number	Certificate Number	Available Yes / No
RA METER			

Comments:

	Signed	Date
Executed By:		
Reviewed By:		

JACKET PRESSURE TEST

Objective	To check the pressure of the jacket.
Method	Fill the jacket with water. Close all nozzles to jacket (Inlet, outlet, drain, etc.). Pressurize jacket using the pump to desired pressure. Monitor the pressure developed using calibrated Pressure Gauge. Monitor the pressure for half and hour and check the pressure drop in the Gauge. Any discrepancies to be noted on the review form and on the Deviation Report.
Acceptance Criteria	No appreciable pressure drop.

S.No.	**Time**	**Pressure as shown on gauge**	**Pressure drop**	**Acceptable YES/NO**
1	1HR			

Comments:

	Signed	**Date**
Executed By:		
Reviewed By:		

FAT for Kill Tank (300 ltrs.)

SHELL SIDE PRESSURE TEST	
Objective	To check the Water Fill up Test inside the Vessel..
Method	Fill the Vessel with water. Close all nozzles to shell . Monitor the pressure for one hour and check the Leakage. Any discrepancies to be noted on the review form and on the Deviation Report.
Acceptance Criteria	No appreciable Leakage

S.No.	Time	Acceptance Criteria	Acceptable YES/NO
		No Leakage	

Comments:

	Signed	**Date**
Executed By:		
Reviewed By:		

FAT for Kill Tank (300 ltrs.)

EQUIPMENT OPERATION VERIFICATION	
Objective	To verify the operation of the machine.
Method	Check the operation of unit as per given below. Any discrepancies to be noted on the review form and on the Deviation Report.
Acceptance Criteria	The start sequence should be as specified.

Motor rpm	**Time**	**Motor Temp. <80^{0c}**	**Current (Amp)**	**Sound <80db**	**Verify Yes/Nio**
1400					

Comments:

	Signed	**Date**
Executed By:		
Reviewed By:		

FAT for Kill Tank (300 ltrs.)

Post approval

Acceptance of the successful completion of the FAT, including satisfactory resolution of all discrepancies noted during execution, will be documented below, signed by the person with overall review responsibility for the protocol and by the client's authorized signatories who approved the protocol.

The FAT data for this equipment has been reviewed and found to be acceptable as per acceptance criteria.

Agreed criteria	Agreement YES / NO
1. Approval subjected to shipment as is	
2. Machine is approved with correction of all Deviation noted during FAT	
3. Machine is not approved & will require repeat FAT following correction of all deviation.	
……..	

Reviewed By	Print Name	Signature	

Client			
	Print Name	**Signature**	**Date**
Consultant			
Engineering			
Quality Assurance			

APPENDIX A - FACTORY ACCEPTANCE TEST (FAT) PERSONNEL

Print Name	Signature	Date	Company

APPENDIX B - CALIBRATION CERTIFICATES REGISTER

Number	Description	Attached Yes/No

Comments

Tested By:		Approved By	
Date		Date	

APPENDIX C - DEVIATION REPORTS PROCEDURE

During FAT testing, a Deviation Report must be raised when there is a failure to meet acceptance criteria.

The aim is to:

- Clearly describe the deviation.
- To document and approve the evaluation of the impact of the deviation.
- To document and approve the corrective action required to resolve it.
- To document the closing out of the deviation with the appropriate approvals.

Procedure

a. If a test step fails to meet test acceptance criteria/method then a Deviation Report must be raised. See Appendix.

b. All Deviation Reports must be logged by completing the Deviation Report Register. See Appendix

c. Each Deviation Report must reference the following identification numbers: -
    a. `Protocol document reference number.
    b. The applicable test reference number (XX) as defined in the protocol.
    c. A unique deviation reference number, which comprises the specific test number and a sequential deviation number (YY) for that test in the format XX/YY. Subsequent deviations on the same

d. The person raising the deviation must clearly describe the exact nature of the deviation (why acceptance criteria/method has not been met) using the ‘details of deviation noted’ box provided.

e. The deviation must be fully evaluated and the necessary corrective action formulated and must be pre-approved by Bectochem & the Client. The findings of this evaluation together with details of corrective action required to resolve the deviation should be clearly documented by completing the ‘evaluation of deviation/corrective actions to be taken’ box.

f. Once the proposed corrective action has been pre-approved, the tester will execute the corrective work and verify implementation of corrective action by completing the ‘Results of Corrective Action’ box. The tester will then sign and date the Deviation report.

g. The completed Deviation Report will require approval by the appropriate personnel on the Deviation Report.

h. Completed Deviation Reports must be attached to the Appendix of this FAT protocol.

APPENDIX D - FAT DEVIATION REGISTER:

Deviation Report No.	Brief Description	Date Raised	Date Closed	Checked By

APPENDIX E - DEVIATION REPORT SHEET

Deviation No:		Test Reference:	
Details Of Deviation Noted:			
Completed By:			**Date:**
Evaluation Of Deviation / Corrective Actions To Be Taken:			
Completed By:		**Date:**	
PRE-APPROVALS - EVALUATION / CORRECTIVE ACTIONS			
The following signatures pre-approve the content of the evaluation and the necessary corrective actions to be taken.			

Function	Pre-Approval Required (Yes / No)	Name (Print)	Signature	Date
BCEPL				
Client				

Results Of Corrective Action:	
Completed By:	**Date:**
APPROVALS - RESULTS OF CORRECTIVE ACTIONS/ DEVIATION CLOSE OUT	
The following signatures approve the results corrective actions taken and the closure of the deviation.	

Approvals	Name (Print)	Signature	Date
Client			

APPENDIX F - ATTACHMENTS REGISTER:

Description	Number/Revision

Comments

Tested By:		Approved By	
Date		Date	

FAT for Kill Tank (300 ltrs.)

CLEANLINESS AND APPEARANCE

Objective	Equipment and parts thereof properly cleaned after the Factory acceptance tests
Method	Physically examine the internal wetted part of equipment. Ensure there is no material retention, all surfaces are properly washed and fit for client use fill out the table below. External Surface: All surfaces should be cleaned for stains or marks if any. Visually inspect the cleaning after it is complete. Any discrepancies to be noted on the review form and on the Deviation Report.
Acceptance Criteria	Machine should be thoroughly cleaned

Part		**Part Cleaned / Yes / No.**
Insulation	External	
Shell	Internal	
	External	
Support Leg	Internal	
	External	
Nozzle	Internal	
	External	
Bottom outlet	External	

	Signed	**Date**
Executed By:		
Reviewed By:		

FAT for Kill Tank (300 ltrs.)

POST FAT DOCUMENT	
Objective	The machine has been dismantled and packed in accordance with PO and site conditions
Method	Machine should be dismantled, marked and matched to facilitate ease of Installation. Individual Sub-assemblies/components so dismantled should be wrapped in plastic and packed in accordance with the Shipment protocol. In case of over seas assignments painted parts should be greased and labeled" DE-GREASE BEFORE USE". Sub-assemblies/components should be properly secured to packing to prevent transit damage A detailed packing list will be filled as per format and signed out.
Acceptance Criteria	Packing list should be complete and no. of components must tally with list. Packing sizes should be in accordance with commercial documentation.
Comments	

	Signed	**Date**
Executed By:		
Reviewed By:		