

**PROPOSAL FOR  
114 KLD WASTE WATER  
EVAPORATION PLANT  
FOR  
ZERO LIQUID DISCHARGE**

**Client Details:**

**M/s SMS Envocare Limited  
20, IT Park, Parsodi, Nagpur- 440022**

**Submitted By:**

**KETAV CONSULTANT**

**Plot no. 21,25,26,27 & 28 Block No.-518, Village- Juna Babalpura Patia,  
Dahegam- Modasa Road, Taluka: Dahegam - 382305,  
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# KETAV CONSULTANT

## Company Profile:

KETAV CONSULTANT is a well-established & growing engineering company situated in Ahmedabad. Established in 2005

KETAV has commendable achievements in the field of Design, Manufacture, Installation & Commissioning of Evaporators, Vacuum Ejectors, Vacuum Pumps, High Pressure Pumps, Heat Exchangers, Condenser, Crystallizer, Vacuum System etc.

The asset of the company is young and experienced Engineers who have good theoretical knowledge and sound practical experience.

The team of KETAV CONSULTANT has the vision to solve the problem from the definition to Process Design, basic Engineering, detail engineering, manufacturing and the successful erection & commissioning of the system.

**We have supplied more than 130 Number of ATFD plants within Last 05 Years.**

**We have supplied more than 425 Number of MEE plants within Last 13 Years.**

**We have supplied more than 15 Number of Stripper System within Last 05 Years.**

**We have supplied more than 12 Number of Caustic Recovery Plant within Last 5 Years.**

## Product Range:

- ✚ Multiple Effect Evaporator Plant
- ✚ Forced Circulation Evaporation Plant
- ✚ Falling Film Evaporation Plant
- ✚ Waste Water Evaporation Plant
- ✚ Caustic Recovery Plant
- ✚ Vacuum System
- ✚ Heat Exchangers
- ✚ Condensers
- ✚ Crystallizer
- ✚ Vacuum Ejectors & Vacuum Pumps
- ✚ Solvent Recovery Stripper Plants
- ✚ Distillation Plants
- ✚ MVR System
- ✚ ETP Plant + RO Plant
- ✚ Stripper System
- ✚ Scrubbing System

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Date: 10/08/2019

To,  
The Sir / Madam,

**Subject: Multiple Effect Evaporator Plant for Zero Liquid Discharge.**

**System-1: Four Effect Evaporation Plant + ATFD to recover Mix Salt.**

Feed- 114 KLD  
TDS- 68600 ppm

Feed TDS- 6.8 %  
COD- 4200ppm

Operating Hour- 20 Hr  
Total Hardness- 4500 ppm

Dear Sir,

AS per the discussion, we are pleased to submit herewith the best techno-commercial proposal for following System to achieve Zero Liquid Discharge.

**1- Four Effect Evaporator System:**

The Effluent is send to Balance Tank. Feed pump will transfer the effluent from balance tank to Four Effect Evaporation System where the Concentration of Effluent increases from 6.8 % TDS to 35 % TDS by Evaporation. The concentrated effluent from this System will be taken in to ATFD to recover Salt.

**2- ATFD System :**

In ATFD we will concentrates the effluent from 35 % to 85 % TDS by Evaporation.

Out let Mix Salt coming from the ATFD with 10-15 % MOISTURE

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**We have already Supplied Evaporator Plant for the Following Products.**

- |                         |  |
|-------------------------|--|
| 1- R.O. Reject Water.   | 11- Pharma Industry waste water.                   |
| 2- Caustic Recovery.    | 12- Food Color Industry Waste water.               |
| 3- Dye Bath Water.      | 13- Automobile Industry waste Water.               |
| 4- Zinc Sulphate.       | 14- Chemical & Organic Chemicals waste water.      |
| 5- Manganese Sulphate.  | 15- <b>CETP Plants-09 NOS in Tirupur and more.</b> |
| 6- Sodium Thiosulphate. |  |
| 7- Sodium Sulphate.     |  |
| 8- Sodium Chloride.     |  |
| 9- Mix Salt Recovery.   |  |
| 10- Milk Concentration  |  |
| 11- Ammonium Chloride   |  |

**We are sending the Following attachments with the offer.**

- 1- Offer for **Four** Effect Evaporator System + ATFD System.
- 2- Total project overall cost with structure, Cooling Tower, Electric work, Pipeline fabrication at the site etc.

**Please find attached herewith following Data:**

- ❖ Technical Data Sheet.
- ❖ Material of Construction.
- ❖ Scope of supply.
- ❖ Terms & Conditions.

We are sure that the above is in line with your requirement. If you require any further detail, feel free to contact us.

Thanking you,  
Kamlesh Patel  
+91-9879097517  
(Proprietor)

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## Operating Parameters:

### Four Effect Evaporator Systems

<b>Sr. No.</b>	<b>Particulars</b>	<b>Unit</b>	<b>Value</b>
1.	Water Evaporation Capacity	Kgs/hr	4593
2.	Feed Rate	Kgs/hr	5700
3.	Concentrate Outlet Rate	Kgs/hr	1107
4.	Total Solids in Product Feed	TDS %	6.8 %
5.	Total Solids in Concentrate Outlet	TDS %	35 %
6.	Concentrate Outlet Temp.	Around °C	65 to 60
7.	Cooling water In let/out let Temp.	Around °C	32 to 40
8.	Cooling Water Quantity	M <sup>3</sup> / hr	100
9.	Require Steam pressure	Kg/cm <sup>2</sup>	07
10.	Motive Steam Consumption	Kgs/hr	1250
11.	Plant Power Requirement	HP	110
12.	Cooling Tower Power with fan	HP	20
13.	Vacuum Pump Power	HP	15
14.	Additional Power for centrifuge	HP	---
15.	Operating hours	Hrs / Day	20
16.	Duty	---	Contin.
17.	<b>Total Power Require</b>	<b>HP</b>	<b>145</b>
		<b>Kwh</b>	<b>96</b>

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## ATFD System- 25 Sq. Mtr x 01 SET

Sr. No.	Particulars	Unit	Value
1.	Water Evaporation Capacity	Kgs/Hr	652
2.	Feed Rate to ATFD	Kgs/Hr	1107
3.	Solid Power Rate	Kgs/Hr	455
4.	Total Solids in Product Feed	TDS %	35 %
5.	Total Solids in Outlet Product	TDS %	85 %
6.	Cooling Water Inlet & Out Let Temp.	°C	32 to 40
7.	Cooling Water Quantity	M <sup>3</sup> /Hr	65
8.	Motive Steam Pressure	Kgs/cm <sup>2</sup> (g)	07
9.	Motive Steam Consumption	Kgs/Hr	800
10.	Operating Hours	Hrs/Day	20
11.	ATFD Power	HP	32
12.	Cooling Tower Power	HP	12
13.	BLOWER Power	HP	05
14.	Total Power Require	HP	49
15.	Absorb Power	Kwh	33

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## Material of construction & Scope of supply with Quantity:

### Four Effect Evaporator Systems

Sr. No.	Particulars	M.O.C.	Four Stage
1.	CALANDRIA: Tubes Tube Sheet Shell	SS316Ti SS316 SS304	04 NO
2.	Vapor Separator	SS316L	04 NO
3.	Pre heaters: Tubes Tube Sheet Shell	SS316Ti SS316 SS304	04 NO
4.	Surface Condenser 19.05 mm OD	SS304	01 NO
5.	PUMPS with Motors: Feed Pump Re circulation Pumps Transfer Pumps Condensate water Pump	SS316 SS316 SS316 SS316	01 NO 04 NO 01 NO 01 NO
6.	Vacuum pumps with motor	PSS316	01 NO
7.	Pipes & Fittings: Process Piping Vapor Ducting Condensate Piping Non Condensate Piping Seal Water Line Vacuum Line	SS316 SS304 SS304 SS304 GI GI	01 LOT
8.	Balance Tank- 600 Liter	SS304	01 NO
9.	Thermo Compressor	SS304	01 NO
10.	CATCH POT	SS304	01 NO

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## Material of construction & Scope of supply with Quantity:

### ATFD System- 20 Sq. Mtr x 01SET

<b>Sr. No.</b>	<b>Particulars</b>	<b>M.O.C.</b>	
11.	ATFD Outer Jacket Shell Inner Shell Shaft With Gear Box & Motors	CS SS316 SS316 STD	01 Set
12.	Catch Pot	SS304	01 NO
13.	Blower	SS304	01 NO
14.	Surface Condenser	SS304	01 NO
15.	Feed Pump to ATFD	SS316	01 NO
16.	Condensate Pump	SS316	01 NO
17.	Feed tank to ATFD	SS304	01 NO
18.	Process Pipes & Fittings	SS316	01 LOT
19.	Condensate cooling Pre Heater	SS304	01 NO
20.	Seal Water System with Tank, Pump, Piping & Condenser	SS304	01 NO
21.	Vapor Pipes & Fittings	SS304	01 LOT



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Scope of Supply of Instruments & it's make:

## Multiple Effect Evaporator Plant

Sr. No.	Particulars	M.O.C.	Quantity
1.	Vacuum Gauge- Forbes	6" Dial	05 No
2.	Temperature Gauge- Forbes	Std	08 No
3.	Pressure Gauge- Forbes	Std	03 No
4.	Temp. Transmitter- Forbes	Std	08 No
5.	DFM for Condensate- Forbes	Std	01 No
6.	DFM- FOR FEED- Forbes	Std	02 No
7.	Rota meters	Std	02 No
8.	VFD	ABB	03 No
9.	Vacuum Transmitters	Forbes	05 No
10.	Safety Valve	Forbes	01 No
	Electric Panel with Hooter, MFM NON Compartment type with PLC PANEL	Std	01 No

## Scope of Work:

We are included in our scope as below item as per the discussion

- ❖ Design, Engineering, Manufacturing, and Supply of the equipments.
- ❖ Supervision of erection & Commissioning of the system.
- ❖ Supply of Operation & Maintenance manual.
- ❖ Supply of the Civil and Structure drawings.
- ❖ Insurance are included in our scope.
- ❖ Included the **Plant running for 03 Days** with supervisors. With help of your company Person. For Daily day time 10 Hours.
- ❖ Commissioning Charges Included.

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## **Not Included in Scope of Supply:**

- ❖ Air, Raw Water & Waste Water Feed Line up to the plant.
- ❖ Steam condensate & Process Condensate Water Outlet line from the Plant.
- ❖ Steam line to Steam Header. And Steam line From Header to TVR.
- ❖ All civil work related with the evaporator plant.
- ❖ Provide the area for salt storage- Having 20 TON Storage.
- ❖ Provide the RO Reject Storage around 3 Days. 250 KLD- RCC
- ❖ Provide Storage For ATFD Feed With Pump & Piping. Concentrate Waste Water- 03 Days.- 75 KLD.
- ❖ Main cable incomer to our Panel with require control.
- ❖ Supporting Structure / platform / stair case etc.
- ❖ Cooling Tower, Cooling Water inlet & Outlet circulation line.
- ❖ Equipment Erection & Process pipe line fabrication.
- ❖ Electric work with cabling, Lighting, etc.
- ❖ Insulation of the Equipments.
- ❖ Transport Charges Extra.
- ❖ All taxes to be paid by you.
- ❖ Erection charges extra.
- ❖ Cooling Water Pump.
- ❖ Roof of the Structure ON Top Side.
- ❖ Panel room RCC.

## **Space Requirement:**

- ❖ Space Require For Plant- 4.3 Mtr W x 20 Mtr Length x 15 Mtr HT.

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## **TERMS AND CONDITIONS:**

**PRICE** : Price for Supply of the Following System- For Zero Discharge.  
**Feed- 114 KLD**

**DELIVERY** : Within 10 to 12 weeks from the date of receipt of order.  
**Transport Charges Extra. And Insurance Charges Included.**

**PAYMENT** : 20 % advance with the order.  
75 % against Performa Invoice Prior to dispatch with taxes  
05 % After Successful commissioning

For Plant Commissioning we run the Plant 10 Days. At that time we are record the Plant Capacity and salt Recovery etc. At that time we require Utility & Feed requirement as per our offer.

**TAXES** : GST – 18% Extra as applicable at the time of dispatch.

**Performance Warranty** : 10 % + OR - with Efficiency and Utility.

### **Warranty for Equipment:**

We are giving warranty for Equipment for 12 months from the date of the Supply for any manufacturing defect. Not For the Moving part like Pump, motor etc.  
Above warrantee does not apply on damage caused by accident, normal wear & tear, improper storage or transportation.

### **Order Cancellation :**

Order received and acknowledged by the seller shall not be subject to cancellation either wholly or partly for any reason whatsoever without the seller's written consent.  
The Amount already paid as advance will not be returned in case the order is cancelled in whole or in part.

Thanking You,  
Kamlesh Patel  
+91 9879097517  
(Proprietor)

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**System: 114 KLD- 4 FC + ATFD Cost & Additional cost for Evaporation System:**

**(Total Project Cost)**

Sr. No.	Particulars	Price In Rupees
1	Four Stage Evaporator Systems- <b>114 KLD with SS316Ti Tubes</b>	145.00 Lacs
2	ATFD System- 25 Sq. Mtr x 01 SET	78.00 Lacs
3	PLC + Panel with Instruments	35.00 Lacs
<b>Total (A)</b>		<b>258.00 Lacs</b>
<b>Additional Cost :-</b>		
1	Cooling Tower Cost	04.00 Lacs
2	Cooling Tower Pipelines Cost (For MS Pipe Line) With Cooling Tower Pump with motor	04.00 Lacs
3	MS Pipe lines cost (Inside our plant only)	As Actual
4	MS Structure	28.00 Lacs
5	Structure Roof Top Side	03.00 Lacs
6	Paint- with Primer	03.00 Lacs
7	Cables for Pumps, Lighting Cable, Light Lamp, Motor Guard, Earthing, Etc.	08.00 Lacs
8	Erection & Fabrication cost of Equipments and pipe line at site	18.00 Lacs
9	Insulation-LRB Pad- 50mm THK x 100 Densities. For All Equipment and Piping. With GI Sheet	06.00 Lacs
<b>Total (B)</b>		<b>74.00 Lacs</b>
<b>Grand Total (A+B)</b>		<b>332.00 Lacs</b>
9	RO Reject Tank to MEE plant Feed tank - Line with Pumps. ATFD Condensate Line from Pump Discharge to steam Condensate Tank.	As Actual
10	Steam Pipe lines cost (Inside our plant only) PRV + Header Etc + Boiler Cost with Chimney	As Actual
11	RCC Work for Foundation , RCC Storage tank + other storage tank with Pumps & Piping Cost is Extra	As actual
12	RCC Tank- 1- RO Reject- 94.5 KLD, ATFD Feed Tank- 20 KLD	As actual

- Civil Columns for foundations and Equipments Extra.
- Storage tank for Feed Tank Etc.
- **Boiler cost is extra - Boiler Require – 03 Ton/hr capacity max.**

Thanking You,  
Kamlesh Patel  
Mo. No.-09879097517