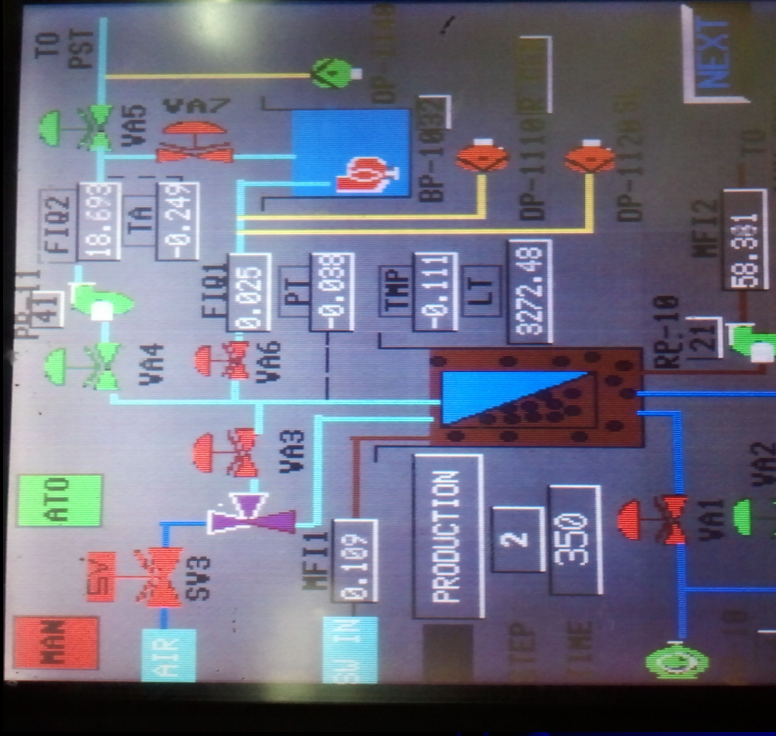


# THERMAX IN SEWAGE TREATMENT PLANTS ( STP)



## MBR INSTALLATION AT IISC BANGALORE



AUTOMATION

MEMBRANE ELEMENT

# **THERMAX** IN SEWAGE TREATMENT PLANTS ( STP )

## **SKID MOUNTED STP - BIOFILTER**



# Sewage Treatment Plants Existing offerings FAB – Fluidized Aerobic Bio Reactor



Capacity - 15 m<sup>3</sup>/day to 150 MLD

## PER CAPITA WATER CONSUMPTION

Ltrs /person/day	Housing	Hotels
	175	225

Sewage generation @  
85% of the above

### Raw Sewage

PH	-	7 - 8
BOD	mg/l	300/500
COD	mg/l	600/1000
O & G	mg/l	100
TSS	mg/l	400

## Urbanization – Existing offerings

### FAB

- Prefabricated structure
- Civil

The above are available in following configuration:

Std FAB ( 5 Mtr SWD)

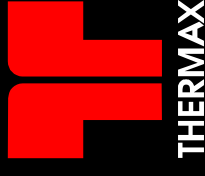
Basement Fab ( 3 Mtr SWD ) – 100 to 400 m<sup>3</sup>/day

Low Flow Fab – ( 2.5 Mtr SWD) – 15 to 55 m<sup>3</sup>/day

## **Basement FAB**

**REDUCED SWD FROM 5 TO 3 MTR**  
**OVERALL HEIGHT – 4.8 MTR INCLUDING HEAD ROOM**  
**CAPACITY – 100 – 150 – 200 – 250 - 300 - 400 M3/DAY**  
**PREFABRICATED AND CIVIL UNITS**  
**BASEMENT INSTALLATION**  
**CAPITAL COST MORE THAN NORMAL FAB( 8-10%)**  
**OPERATING COST – MARGINALLY UP – 5%**  
**CLARISSETTLER IN PLACE OF TUBE SETTLER**  
**CLARISSETTLER – 2.5 MSWD**  
**CLARISSETTLER HT OVERALL – 3.1 M**  
**AREA MORE COMPARED TO STD FAB DUE TO HIGHER DIA**  
**SLUDGE HOLDING TANK FOR 7 DAYS – SDB NOT POSSIBLE**

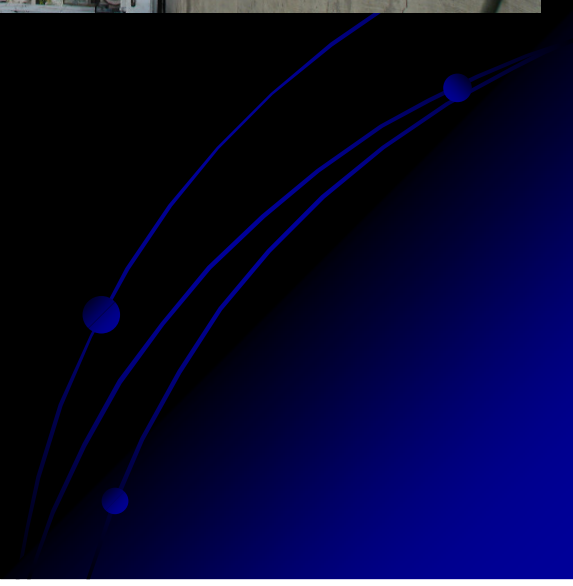
## **Low Flow FAB**



**REDUCED SWD FROM 5 TO 2.5 MTR  
OVERALL HEIGHT – 5.3 MTR INCLUDING HEAD  
ROOM  
CAPACITY – 15 – 25 – 35 – 55 M3/DAY  
PREFABRICATED – ALL ABOVE CAPACITIES  
CIVIL – 35 – 55 M3/DAY**

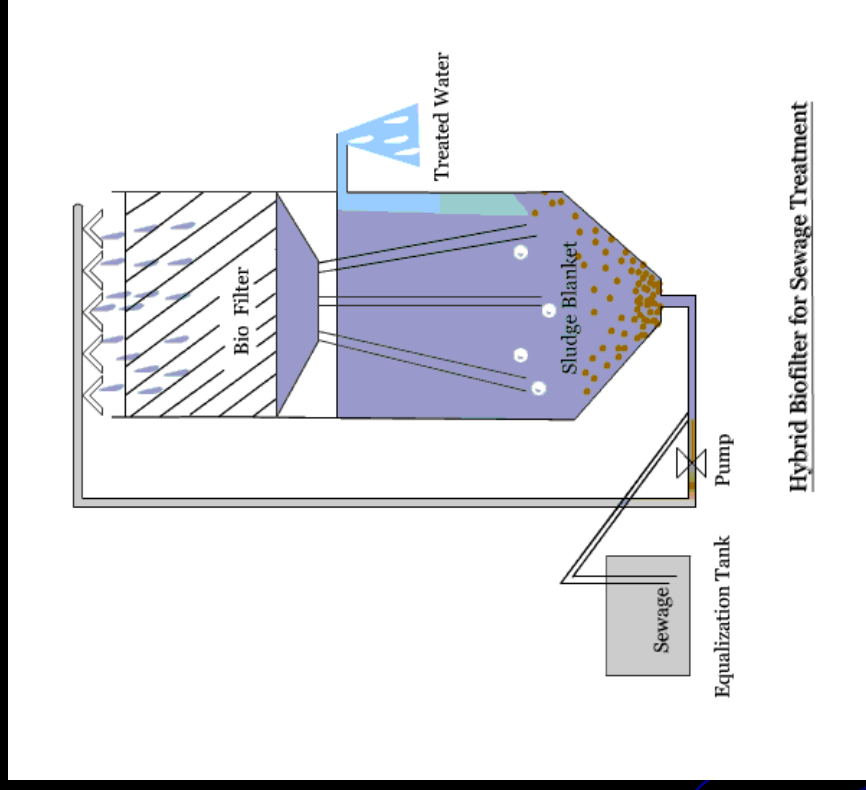


# HYBRID BIOFILTER





# WORKING OF BIOFILTER



PATENT APPLICATION NO :- 1419/MUM/2009

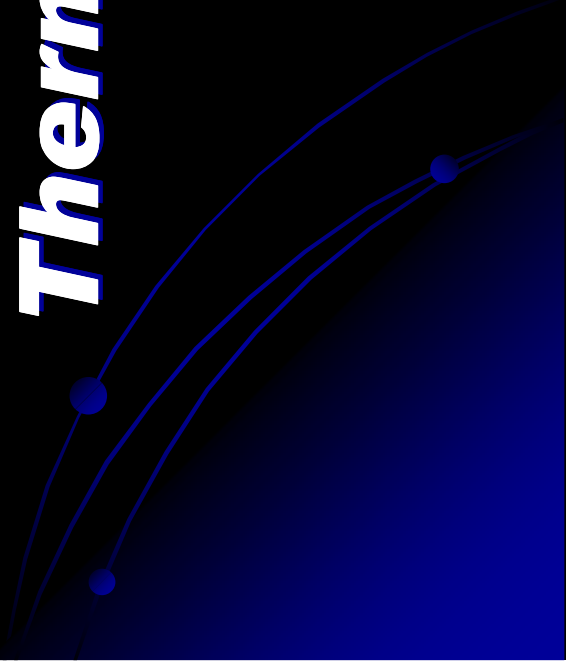
# HYBRID BIOFILTER



- **Single stage process based on combination of attached growth and aerobic digestion**
- **Capacity – 10, 20 , 30 and 50 M3/day**
- **With TTP by default**
- **End use – Gardening, HVAC**
- **Toilet flushing post UF**
- **M.S. Epoxy – prefabricated offering**
- **Skid mounted unit**
- **Clients scope – Bar screen chamber, Eq tank**
- **Ideal for Basement installations. Terrace installations possible with add ons**
- **Clear height required – 3.8 Mtr. Unit ht 3.3 Mtrs**
- **Operation with Minimum Noise**
- **Process Patent pending**



# ***Quality Requirements and Thermax Solutions***



## Quantitative Water Quality Tests

- Fecal Coliform/Coliform
- Biochemical Oxygen Demand (BOD)
- Chemical Oxygen Demand (COD)
- Temperature
- Turbidity/Total Suspended Solids (TSS)
- Heavy metals, (e.g., lead, mercury, cadmium)
- Carbon dioxide
- Nitrite
- Salinity
- Ammonia
- Macro or micronutrients (e.g., K, S, Mo)
- Chlorine
- Iron
- Selenium
- Hardness
- Sulfate and Sulfite
- Methane
- Conductivity/Total Dissolved Solids (TDS)
- Alkalinity/Acid Neutralizing Capacity (ANC) Color Odor
- Synthetic organics (e.g., pesticides, PCBs)

## TREATED SEWAGE CHARACTERISTICS AFTER CCT

For disposal in  
water body

PH	-	7 - 8
BOD	mg / l	< 30
COD	mg / l	< 250
O & G	mg / l	< 10.0
TSS	mg / l	< 100

## TREATED SEWAGE CHARACTERISTICS AFTER TTP

For disposal on  
land

PH	-	7 - 8
BOD	mg / l	< 20
COD	mg / l	< 100
O & G	mg / l	< 10.0
TSS	mg / l	< 30

# Application-wise Quality Requirements

- Cooling towers
  - BOD < 10 mg/l
  - COD < 100 mg/l
  - TSS < 10 mg/l
  - Hardness < 200 mg/l (Variable)

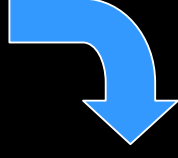
# For cooling towers



+



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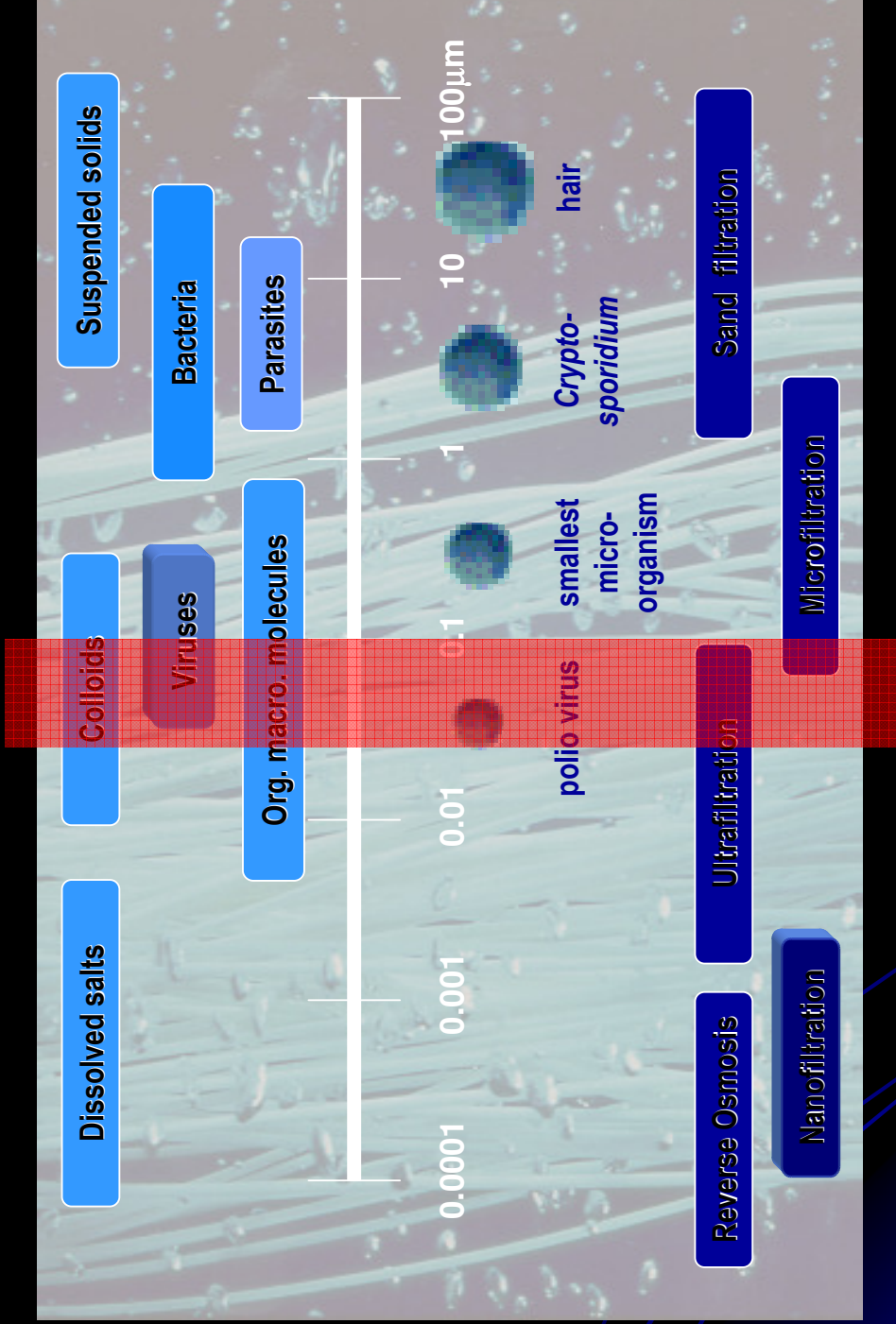


# Application-wise Quality Requirements

- Gardening / horticulture
  - BOD < 20 mg/l
  - COD < 100 mg/l
  - TSS < 100 mg/l
  - Pathogens : De-activated

(TSS would also be decided by sprinkler system.)

# Membranes for Water Treatment



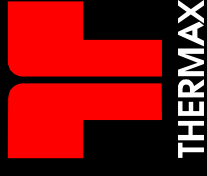
ZENON membrane range

# Comparison of Process Water

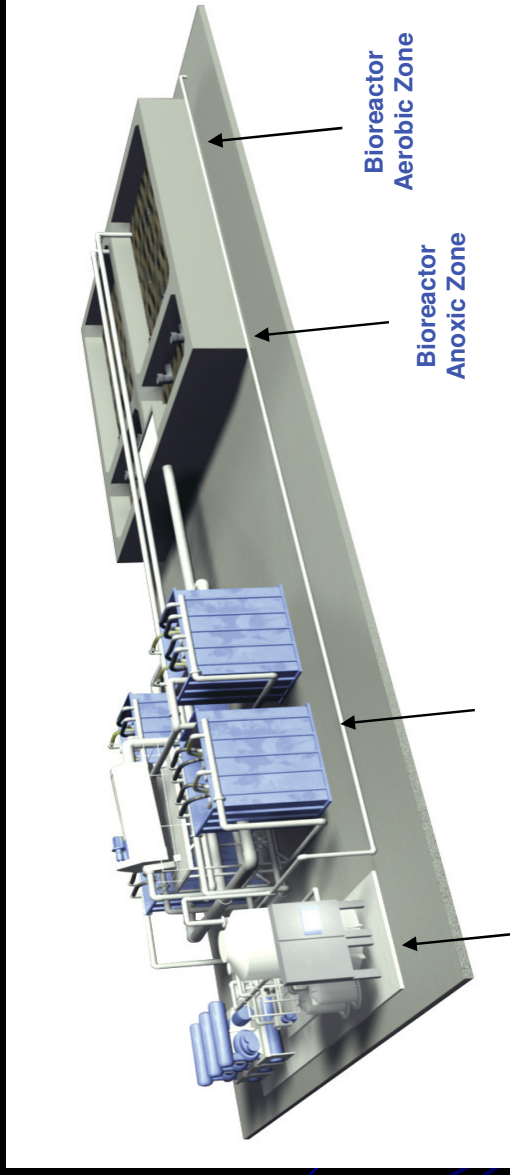


**(a): Raw sewage, (b): aeration tank,  
(c ):Bioreactor tank of MBR,  
(d): MBR permeate, (e): RO permeate**

# Sewage Treatment Plants Emerging Technologies



## Membrane Bio Reactor



# For Toilet flushing

# UF



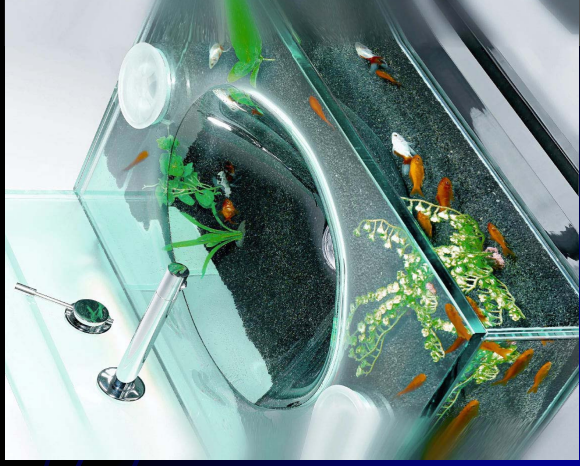
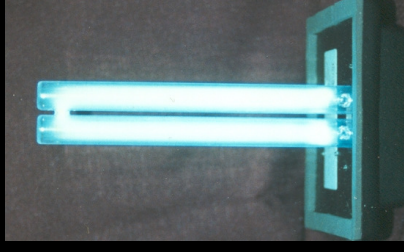
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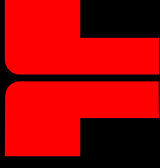
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For bathing



THERMAX



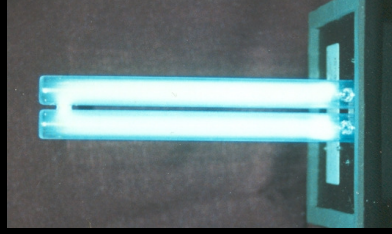
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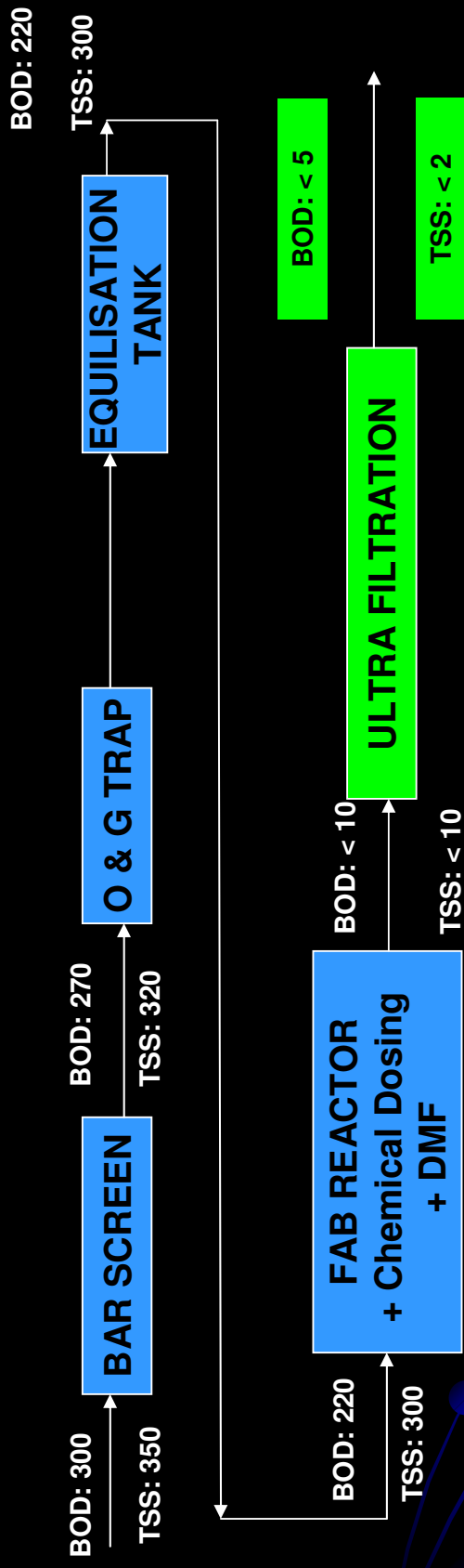
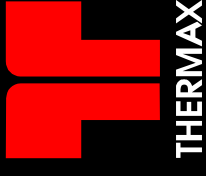
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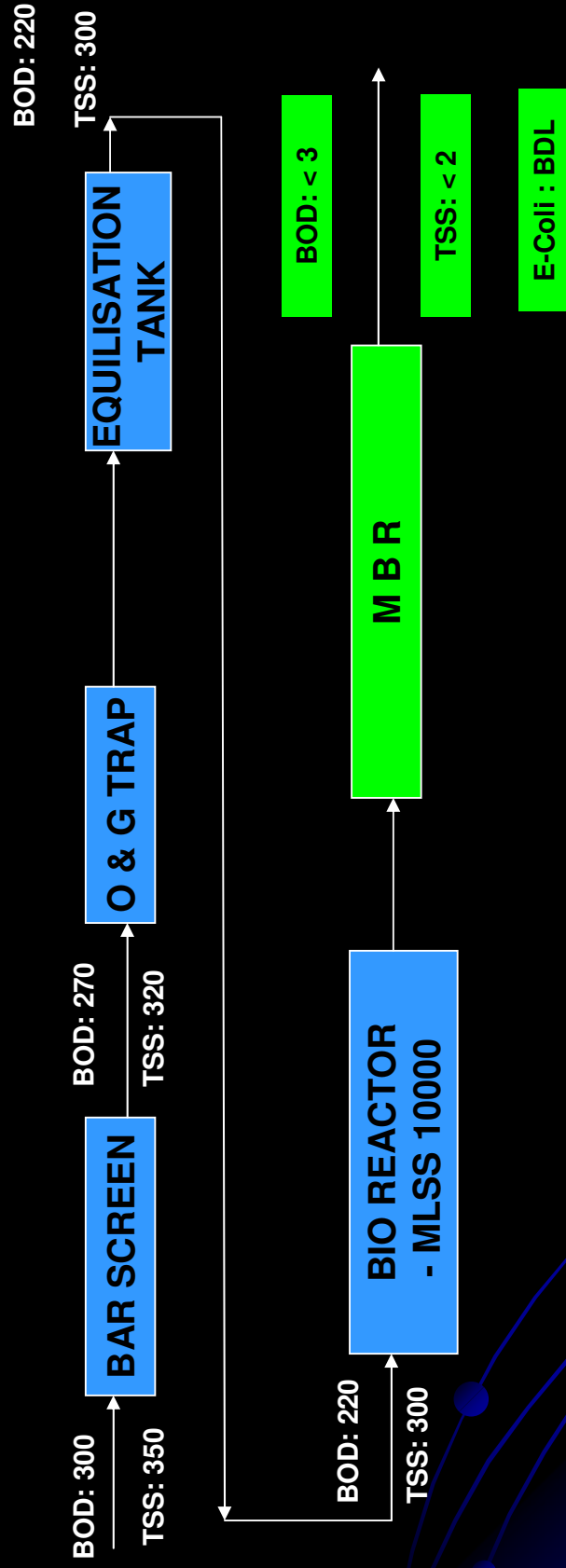
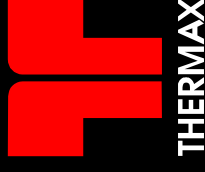
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# FAB + UF SYSTEM

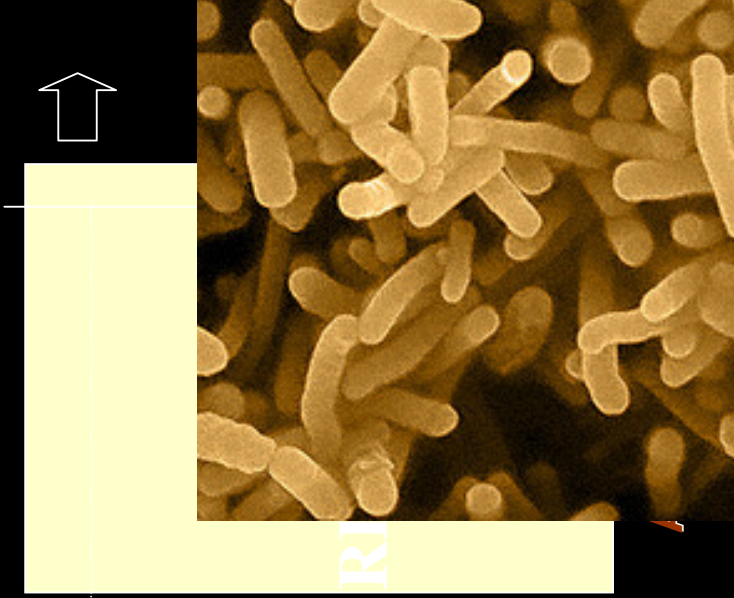


# M B R SYSTEM





# BACTERIAL POPULATION DISTRIBUTION



CONVERSION



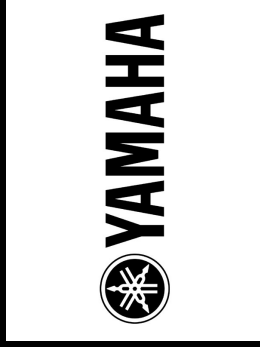
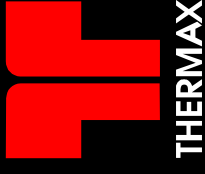
OUR ESTEEMED CLIENTS IN C&I SECTOR INCLUDE ...



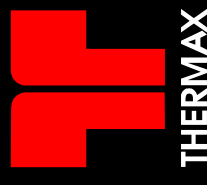
Shapoorji Pallonji



# OUR ESTEEMED CLIENTS ...

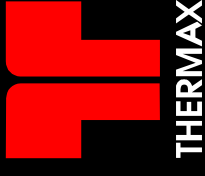


# Some of our References



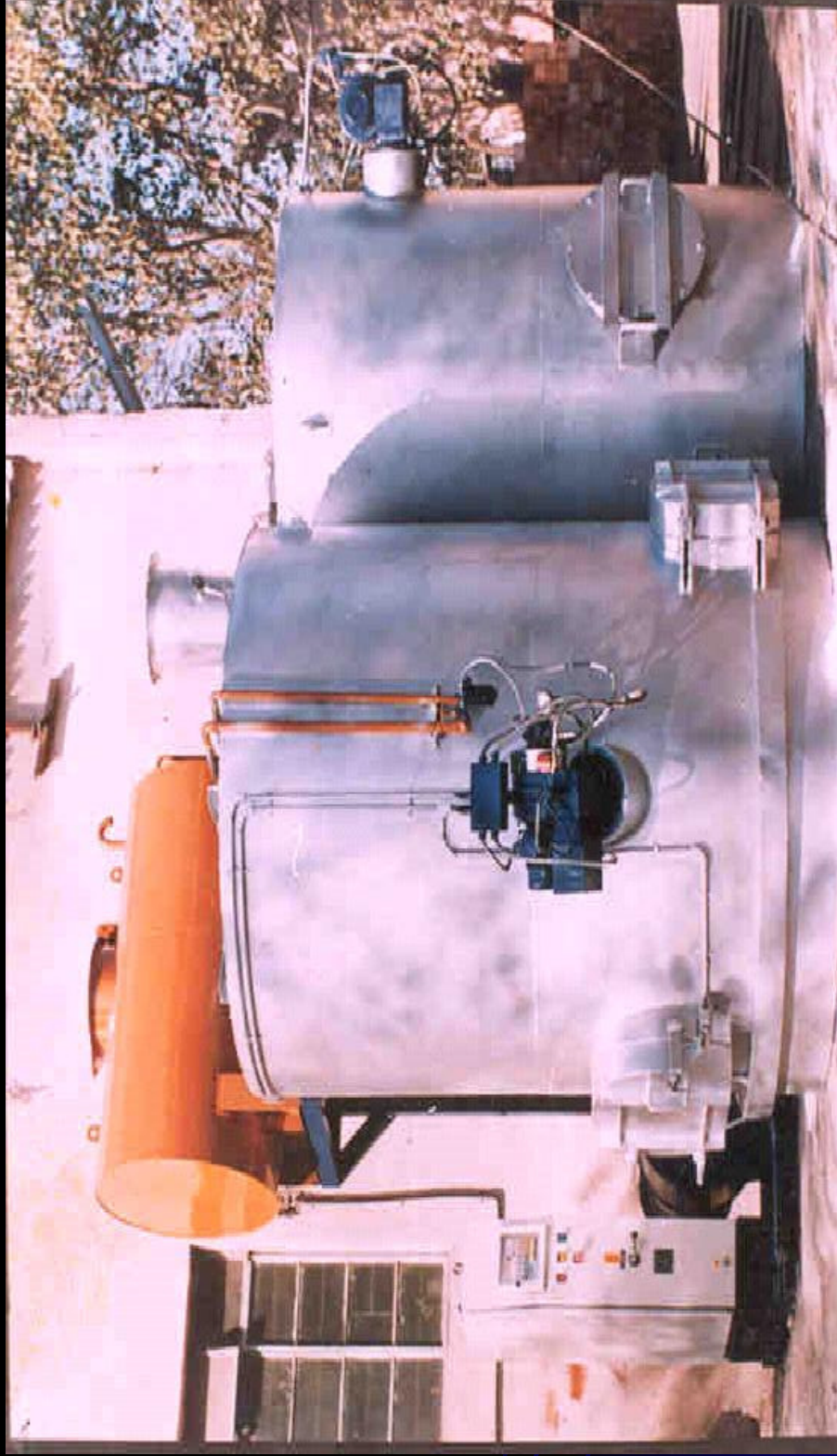
- Arcellor Mittal – Liberia – 225 + 300 M3/day FAB + UF
- Chemitreat- Siemens / Shell – Singapore – 300 M3/day x 4 Nos ( Labor camp STP )
- Manama Textile Baharin – 600 M3/day - ETP
- Arasco – Saudi – 720 M3/day ETP
- Utah Knitting – Bangladesh - 1200 m3/day
- Kenpart Infrastructure – Bangladesh – 125 M3/day

# HYBRID BIOFILTER- CONSTRUCTION



- Single pump for feed and recycling
- Pump motor - 3.7 – 5.5 kw for 30 and 50 M3/day cap
- No Air Blower required.
- Small compressor ( 0.75 Kw – 2- 3 CFM ) for Eq tank.
- Compressor operation – 3-4 hr a day
- Prefabricated units – Biofilter ( MSEP), CCT FFT and TWT ( FRP /LDPE)
- Skid – Biofilter , Feed Pump, FF Pump, CCT, FFT,TWT, TTP
- Chlorination with hypo – 4 ppm post Biofilter by Dosing pump
- TTP – Standard units.
- Expected life of media – approx 5 – 6 years
- Media ht – 1.2 Mtrs, MOC – PVC
- Regular maintenance units – Pumps
- Installation time – 10 days
- Commissioning time – 21 days including stabilization

# SOLID WASTE MANAGEMENT INCINERATOR





# **THERMAX - BIOENERGEN Biogas System Eco- friendly solution for Solid waste management**

