THERMAX

Water & Waste Solutions

Fluidised Aerobic Bio- Reactor

A Moving Bed Bio-Reactor Technology

Improving your business is our business

Thermax offers products, systems and solutions in energy and environment engineering to industrial and commercial establishments around the world. Its business expertise covers
heating, cooling, waste heat recovery, captive power, water treatment & recycling, air pollution control & waste management and performance chemicals.

Thermax brings to customers extensive experience in industrial applications, and expertise through technology partnerships and strategic alliances.

Operating from its headquarters in Pune (Western India), Thermax has built an international sales & service network spread over South East Asia, Middle East, Africa, Russia, UK and the US. It has a full fledged ISO 9001:2000 and ISO 14000 accredited manufacturing setup.

In **Water & Waste Solutions**, Thermax offers expertise in water management and recycling. Its water and waste water treatment systems support power plants, oil & gas installations, fertilisers, petrochemicals and other industries. Its waste management systems serve the health and hospitality sectors, townships and colonies, chemical and allied industries.

Thermax

The long cherished belief that Ecology and Economy are inversely related now stands to be challenged. We, at Thermax believe the two can thrive hand in hand. In our attempt to bring the two together on a common front, Thermax becomes one of the few companies in the world offering integrated solutions in energy and environment.

Waste Water

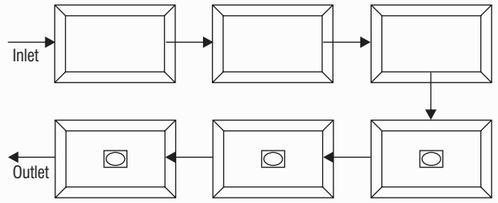
As increasing urbanisation brings with it the comforts and glamour of modern living, quietly and steadily mankind has been paying the price through the degeneration of ecological resources.

Enormous volumes of untreated waste water are discharged everyday as sewage and industrial effluents. These pollute the water bodies in which they are released. There is an urgent need therefore to treat and also recycle this waste water thereby reducing the burden on fresh water sources.

Waste water treatment is carried out in three stages -the primary, secondary and tertiary stage... the second or biological stage is the most important of them all.

Evolution of Biological Treatment

Aerobic / Anaerobic & Facultative Lagoons



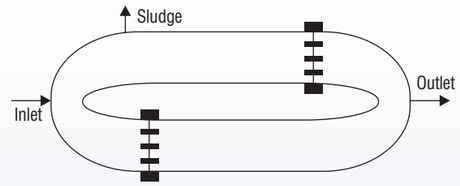
- Simplest form of treatment
- Large unlined shallow tanks excavated in earth
- Provision for mixing / providing oxygen
- Slow reaction, Retention time : 10 - 60 days
- Incomplete treatment
- Low maintenance
- Large surface area required
- Percolation to ground water

Submerged Aerated Fixed Film Reactor

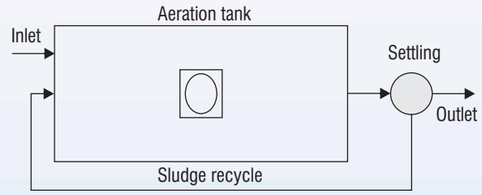
- Attached growth process
- Plug flow for high treatment efficiency
- Utilises plastic media and high efficiency diffusers
- No recycle of sludge & monitoring of M.L.S.S.
- Retention time : 6 - 8 hours
- Compact

Oxidation Ditch

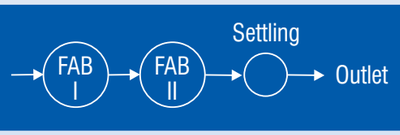
- Lined channel construction
- Area required is less than lagoons
- Retention time 1 - 7 days
- Stabilised sludge produced
- Expensive construction
- No percolation to ground water



Activated Sludge Process



- A revolutionary concept as compared to lagoons
- Widely accepted practice
- Based on the concept of suspended growth of bacteria
- Requires sludge recycling and M.L.S.S. monitoring
- Retention time : 16 - 24 hours



Fluidised Aerobic Bio-Reactor

This miniature FAB reactor performs the same function as any of the above with greater efficiency

Fluidised Aerobic Bio (FAB) Reactor

In its endeavour to improve and upgrade technology, Thermax offers the most advanced technology of Fluid Bed for aerobic treatment. This technology provides:

Small space requirement
1/10th of space with respect to conventional treatment plants.

Lower operating power requirements

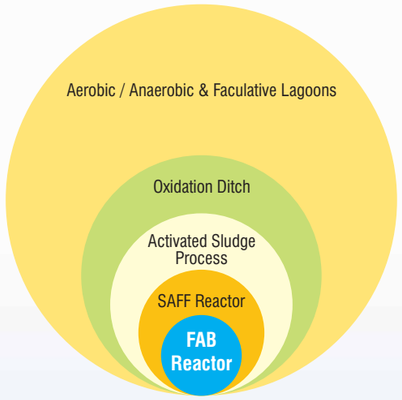
Self regulating System
The system does not require monitoring of any parameters and is capable of taking shock loads.

No sludge recycling

E-coli (coliform) removal
The treated sewage outlet coliform count conforms to WHO standards, with such low chlorine doses and thus also limiting residual chlorine.

Simplicity in operation and maintenance
With few moving parts the FAB reactor is easy to operate and maintain under widely fluctuating conditions.

Requires Small Footprint Area



Chandigarh Municipal Corporation
136 MLD

HINDALCO – Renukoot, UP
24 MLD

Pimpri Chinchwad Municipal Corporation, Pune
15 MLD

Our Customers

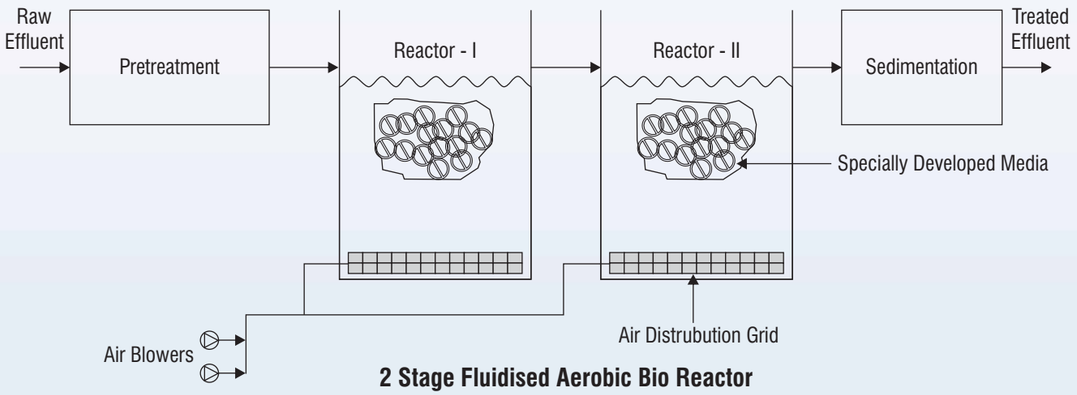
- Chandigarh Municipal Corporation, Chandigarh
- Uttar Pradesh Jal Nigam, Lucknow
- Uttar Pradesh Jal Nigam, Allahabad
- Uttar Pradesh Jal Nigam, Pratapgarh
- Uttranchal Pey Jal Nigam, Pauri Garwal
- Hindalco Industries Ltd, Renukoot, Uttar Pradesh
- Kukatpally Municipal Corporation, Hydrabad
- Greater Visakhapatnam Municipal Corporation, Visakhapatnam
- Public Health Engineering Department, Sikkim
- Hydrabad Metropolitan Water Supply and Sewerage Board, Hydrabad
- Pimpri Chinchwad Municipal Corporation, Pune
- Punjab Urban Planning & Development Authority, Patiala
- Punjab Urban Planning & Development Authority, Jalandhar
- Punjab Water Supply and Sewerage Board, Roopnagar, Punjab
- Jammu & Kashmir Lakes and Waterways Development, Authority, Shrinagar, J&K (Three Plants)
- Municipal Corporation of Delhi, Bakkarwalla
- Municipal Corporation of Delhi, Mollarbund
- Military Engineering Services, Chandi Mandir

FAB - A Decentralised Waste Water Treatment Technology

The conventional waste water treatment plants are large sized, power intensive and require a lot of monitoring. Scarcity of open space, geographical network of piping, rising power and land cost has forced to look out for a space saving, compact and efficient treatment option.

FAB - a decentralised waste water treatment technology therefore acts as a better alternative.

Working Principle



2 Stage Fluidised Aerobic Bio Reactor

The Fluidised Aerobic Bio-Reactor includes a tank in any shape filled up with small carrier elements. The elements are specially developed materials of controlled density such that they can be fluidised using an aeration device. A bio-film develops on the elements, which move along with the effluent in the reactor. The movement within the reactor is generated by providing aeration with the help of diffusers placed at the bottom of the reactor. The thin bio-film on the elements enables the bacteria to act upon the bio-degradable matter in the effluent and reduce BOD/COD content in the presence of oxygen from the air that is used for fluidisation.

FAB - Specially Developed For

- Municipal corporation
- Housing colonies
- Hotels
- Hospitals
- IT parks
- Industries

Low / High strength industrial effluents from

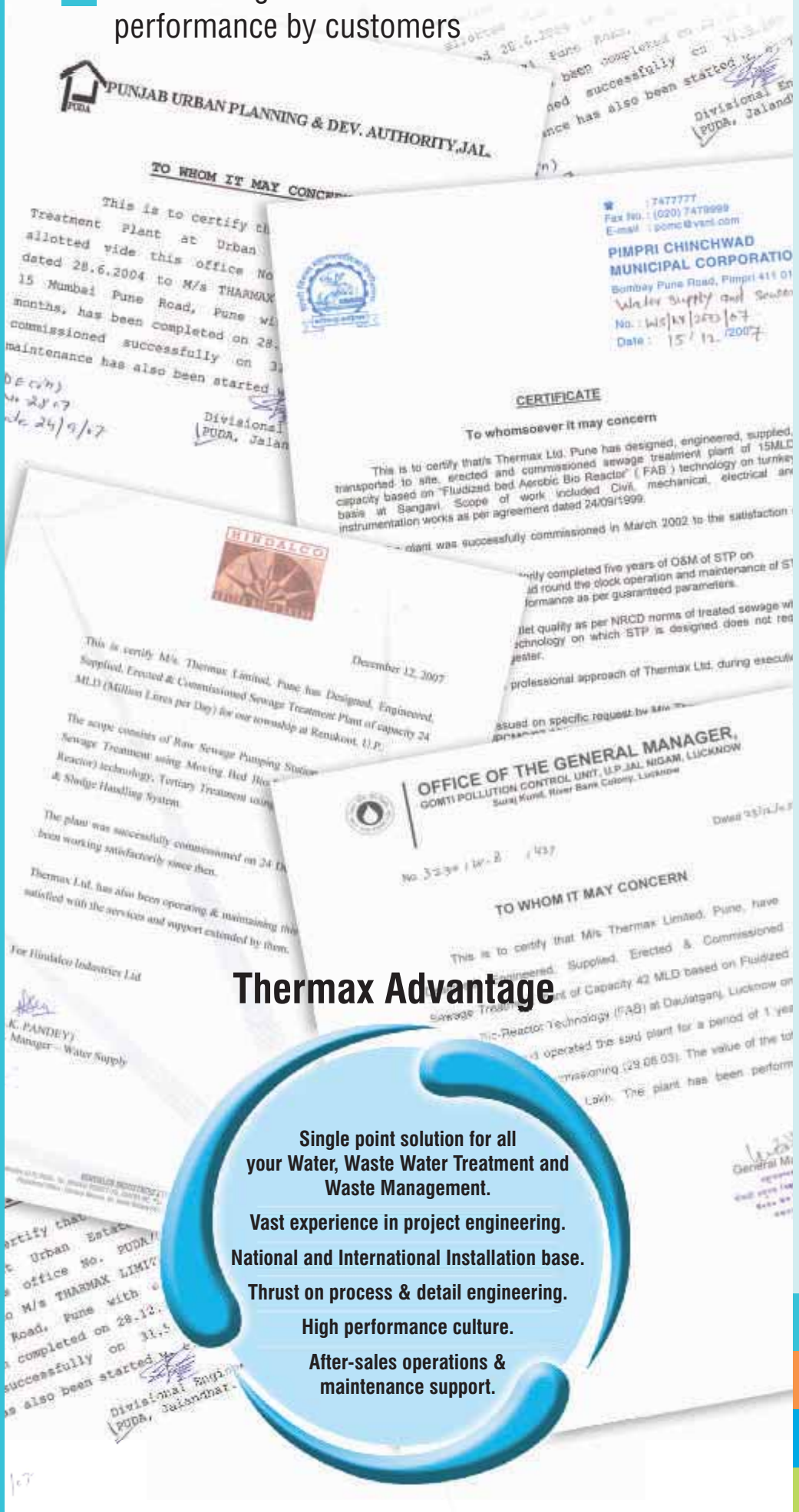
- Brewery
- Vegetable oil refining
- Poultry
- Fruit processing
- Rice mills
- Dairy
- Textiles
- Food Industry

We also upgrade existing treatment facility by conversion of existing tank or adding a small FAB Reactor

FAB - A Summary

Features	Benefits
Attached growth process	No sludge recycle No monitoring of M.L.S.S. Low sludge production
High Bio-film surface area	High loading rates Compact plants Small foot print
Fluidised Bed	Non clogging design Better oxygen transfer efficiency Reduced power consumption Reduces coliform Low-maintenance Tank of any shape can be utilised

Acknowledgment of Thermax performance by customers



Thermax Advantage

Single point solution for all your Water, Waste Water Treatment and Waste Management.

Vast experience in project engineering.

National and International Installation base.

Thrust on process & detail engineering.

High performance culture.

After-sales operations & maintenance support.

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THERMAX

Sustainable Solutions in Energy & Environment

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Thermax Business Portfolio

- Water & Waste Solutions
- Boiler & Heater
- Cooling & Heating
- Air Pollution Control
- Power Generation
- Chemicals