

Mapal Green Energy

Executive Summary



Galed WWTP

Company Profile:

Mapal Green Energy Ltd., based in Neshet in the north of Israel, offers innovative proven technology that can significantly reduce the operations and maintenance cost of municipal and industrial wastewater treatment plants.

In addition to being a technology provider, Mapal offers full process design and support. Our services include:

- Feasibility studies.
- Design, Supply, Construction.
- Commissioning and Start up.
- O&M contracts.
- Financing arrangements.

Mapal's technology is able to achieve up to a 70% reduction in the operations and maintenance cost of municipal and industrial wastewater treatment facilities equipped with conventional fixed or floated mechanical surface aerators.



- Mapal's internationally patented CNM units comprise a unique fine bubble floating aeration system designed to replace mechanical surface aerators. Mapal's CNM unique system can be implemented in two main applications:
- For excavated biological reactor ponds and lagoons at small and medium size municipal and industrial wastewater treatment facilities where fine bubble aeration is otherwise impossible.
- For upgrading existing medium and large municipal wastewater treatment plants with fixed surface aerators in concrete basin biological reactors. (By replacing them with Mapal's CNM fine bubbles aeration system).

No need to drain the reactors, No damage to the biomass, No process interruption

Advantages:

- Energy Savings –Up to 70% reduction in the energy costs **Guaranteed.**
- Almost Maintenance Free – No moving parts in the water, up to 80% reduction in the maintenance costs **Guaranteed.**
- High efficiency oxygen transfer to the biological process.
- Easy and safe installation.
- Easy to operate- adjustable air flow rate

Fine Bubbles in – Surface Aerators out!

Fine bubbles aeration is the most efficient and cost effective way to supply oxygen to the biological process of the wastewater treatment. However, until now, the installation of a fine bubble aeration system has been limited to treatment facilities with a concrete basin. The sole solution for lagoons lacking a leveled concrete floor has been floating mechanical surface aerators.

biological reactor with fine bubbles diffusers system.



Floating Surface Aerator.

The employment of floating mechanical surface aerators as a solution to supply oxygen for the biological process in wastewater treatment lagoons has many disadvantages:

- High energy consumption
- High maintenance costs
- Electrical and mechanical moving parts in the water.
- Splashing and odor problems.
- Inflexible operation.



biological reactor with fixed surface aeration system.

Mapal Green energy has developed a unique and innovative fine bubbles aeration system using floating diffusers that avoids the drawbacks of mechanical surface aerators and can be employed in municipal or industrial treatment facilities without a concrete basin. Mapal's CNM floating aeration system is proven technology that has operated successful in 13 municipal WWTP in Israel.

Mapal's CNM units offer the advantages of fine bubbles diffusion through an easily inserted able carrier which requires no electrical power to the unit itself.



Tubular Membrane diffusers are used on the bottom of each unit, which are custom manufactured to reach the lowest possible depth of the lagoon in order to increase the oxygen transfer.

Proven Experience:

Mapal CNM units have been working successfully for several years at 13 wastewater treatment plants throughout Israel where they replaced floating mechanical surface aerators installed in WWTP lagoons. At these locations, the Mapal CNM units have achieved required effluent quality and reduced daily energy consumption and maintenance costs:

<u>Project name</u>	<u>Total daily flow (m3/d)</u>
Yagur	750
Hanaton	140
Zarzir	2,200
Magen Shaul	2,700
Ma'ale Eron	2,300
Galed	140
Baram	700
Gonen	1,000
Gvar-am	120
Naot	1,000
Dalton	2,200 (Industrial + Domestic)

Yavne	Balance tank for 20,000 m ³
Ramot Menashe	240
And others....	

Operational and Maintenance cost saving:

After only a few months of successfully operating Mapal CNM Units, the proprietors of the WWTP realized an energy cost savings of nearly 70% while maintenance cost saving were even greater!

For example:

- **Galed WWTP** - designed to operate with the total of 22 kW surface aerators and is now operated with 1 blower of 5.5 kW.
- **Baram WWTP** - designed to operate with the total of 30 kW surface aerators and is now operated with 1 blower of 5.5 kW.
- **Yagor WWTP** - designed to operate with total of 37 kW surface aerators and is now operated with 1 blower of 11 kW.
- **Gonen WWTP** - designed to operate with total of 31.5 kW surface aerators and is now operated with 1 blower of 7.5 kW.
- **Ashkelon WWTP** – waste activated sludge WWTP, daily flow of 15,000 m³/day for each reactor. The WWTP has two reactors with the total of 180kW installed fixed surface aerators. Mapal offered to replace the fixed surface aerators with the CNM system that needed 2 blowers with the total of 81 kW in order to supply the same oxygen requirements.

Mapal "CNM"

Floating Fine Bubbles diffusers Aeration System.

Advantages:

- Innovative cost effective floating fine bubbles high efficiency diffusers aeration system.
- **Minimum energy consumption, low operational costs.**
- Automatically adjusts it self to the water depth 100% level from the lagoon water surface!
- No need to close the plant operation, easy and quick to install and remove.
- **No moving parts in the water, maintenance free!**

Technical description:

- Minimum water operational depth - 2.00 Meter
- Maximum water operational depth - 6.00 Meter
(The aeration efficiency drops dramatically for depth more then 6 Meter)
- Two basic models :
 - CNM 1 - Total air flow of 40 m³/h @ standard conditions
 - CNM 10 - Total air flow of 120 m³/h @ standard conditions
 - CNM 12- Total air flow of 180 m³/h @ standard conditions
 - CNM 11- Total air flow from 300 to 450 m³/h @ standard conditions

Structure:

- Tubular diffusers
- Material of construction :
 - Diffusers Stub - P.P or ABS
 - Membranes - EPDM (standards), Silicone and PTFE (optional).
 - Support structure - SS 304 (standards), SS 316 (optional).
 - Float - welded P.P. filled with foamed Polystyrene.
 - Encore rope - Ø10mm P.P wove rope.
 - Air feed pipe - Ø 63 HDPE 6 Bar pipe.