

New



# Biosirus

Miracarb

## Carbon-Fiber Sewage Treatment Systems

- Minimal Waste Sludge
- Huge Energy Savings
- Carbonaceous and Nutrient Removals
- High Dissolved Oxygen Levels Achieved



### Application:

- Natural and Artificial Waterbodies:
  - Marshes, Lakes, Ponds, Streams, Canals, Rivers
  - City Sewage Plants, Apartments, Septic Tanks
  - Factory Organic Waste Water (Food, Brewing, Chemical, Dairy, Farms)

### Features:

- Huge energy savings – Little aeration needed (if required)
- Small footprint, simple construction and safe trouble-free operations
- Enables nature's decomposition process of organic matter
- Clear discharge water sent for "grey-water" use or to disinfection systems



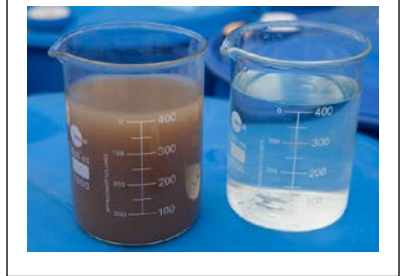
### How Does It Work:

- Carbon-fibers have fine graphite crystal structures with uneven surface
- Special surface treatment causes fibers to unravel and spread in water
- Bacterial and micro-organisms attaches onto fibers
- Reduces waste sludge (mass adhesion onto fibers)
- Large denitrification and dephosphorization effects
- Fast organic matter decomposition rate by activation of microorganisms
- Carbonaceous and biological nutrient removal in a single reactor



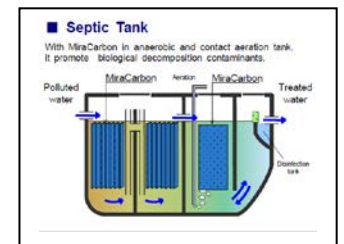
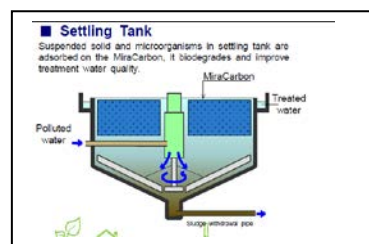
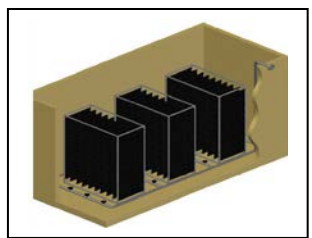
### Technical Data:

- Models:** 25 / 50 / 75 / 100 Kilo-litres per day
- Material:** Carbon fiber bundles of 12,000 ultrafine, 7 µm filaments
- Architecture:** Spatial bundles in lattice formation
- Aeration:** Little aeration needed (if required)



### Operation:

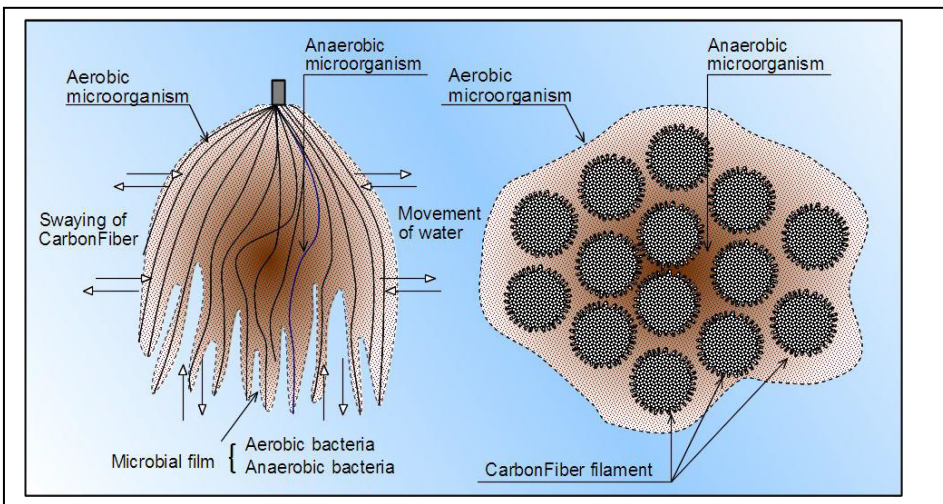
The carbon-fiber organic sewage treatment system is a passive, energy saving, natural, organic matter decomposition by activation of microorganisms. The efficacy and efficiency of this process involves "trapping" the sludge and other organic matter onto to the carbon fibers, in a manner, with the anerobic microorganisms functioning deep inside and the aerobic microorganisms functioning on the outer surface of these clusters. The high adhesion of the sludge onto the fibers allows for the water to become clearer (i.e. less turbid) and hence improving dissolved oxygen levels. Fast organic matter decomposition is thus enabled by activation of microorganisms whereby both carbonaceous and nutrients are removed in a single reactor. The energy savings is huge by not requiring large flocculation, circulation and aeration systems.



# Tech Talk: Dissolved Oxygen (Air) is a significant aspect in sustainable and living waterbodies

Biological Oxygen Demand (BOD), is the dissolved oxygen needed by aerobic organisms in water to breakdown organic materials present. High BOD is an indicator of heavy load of organic matter. it reduces the abundant supply of dissolved oxygen in the water to other aquatic life. This means water will be in anaerobic condition resulting in mortality of living aquatic organisms. In absence of oxygen, anaerobic bacteria become active. When BOD value is medium, water will possess excessive nutrients causing algal bloom. Such condition is again dangerous because during day time water will be supersaturated with oxygen (due to photosynthesis in presence of sun light), but at late night DO may be zero or close to zero. This is primarily due to utilisation of oxygen for respiration by plants and animals (without any production of oxygen in absence of sunlight). BOD levels in pristine waters is very low. Unfortunately, raw/untreated sewage is a big causal factor in rising BOD levels. Boosting dissolved oxygen (DO) is a significant activity to reactivate this balance. This gives the waterbody a fighting chance to rebalance itself naturally (if there are no other harmful chemical pollutants involved).

Mira Carbon is a fibrous carbon substance having a fine graphite crystal structure. They are light, strong, corrosion-resistant, & advanced functional material. This helps the fibers to expand when immersed in water. Microorganism fixing rate is fast, and the amount fixed is large. Deposited microorganisms resist peeling off, and at the same time, their activity is high. Within the groups of microorganisms deposited on the fibers, the aerobic microorganism phase and anaerobic microorganism phase exist in a well-dispersed state. Microorganisms with high bulk are deposited on CarbonFiber bundles. A type of pump motion in the moving water and swaying of CarbonFiber bundles causes mass transfer and accelerates the decomposition of pollutants.



## Typical Applications

Urban Lakes, Canals and Ponds:



Irrigation Canals and Rural Lakes:



Sewage and Waste Water Catchments:



**Call us for any details  
or a trial project**

## And Savings Too:

The carbon-fiber organic sewage treatment system offers significant energy savings by not requiring large flocculation, circulation and aeration systems and significantly improves dissolved oxygen in water naturally. *This ensures savings in energy and a faster (more natural) solution. A two-for-one benefit.*

## Best Value Applications:

Parameters	Platinum Savings	Gold Savings	Silver Savings	Bronze Savings
Organic sewage	*****	****	***	**
Urban lakes, ponds, canals	*****	****	***	**
Rural irrigation canals	*****	****	***	**
Rural Lakes and Ponds	*****	****	***	**
Electricity Tariff (US \$/Kwh)	>0.15	0.12	0.10	0.08
Depth (m)	<3.5	3.5-7.0	7-10	>10
Typical Pay back (simple ROI)	1 Year	2 Years	3 Years	4 Years

## Biosirus Inc.

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