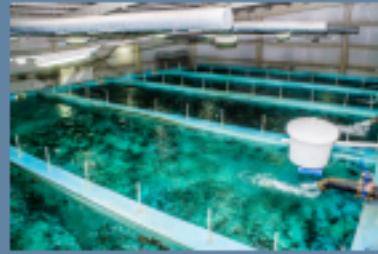




## Applications



Aquaculture



Agriculture



Livestock



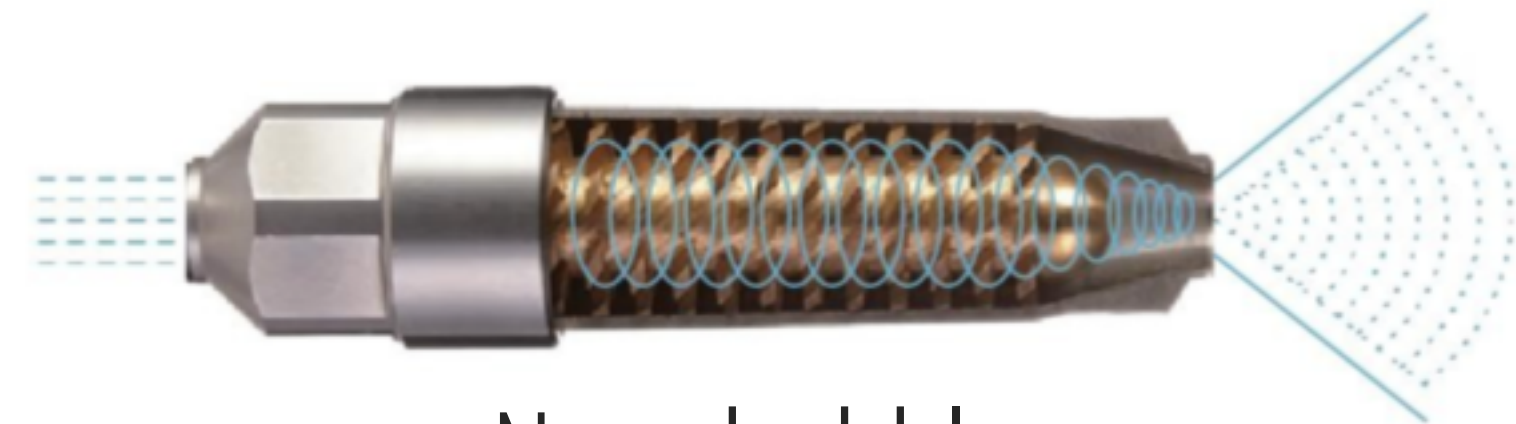
Sanitation / CIP



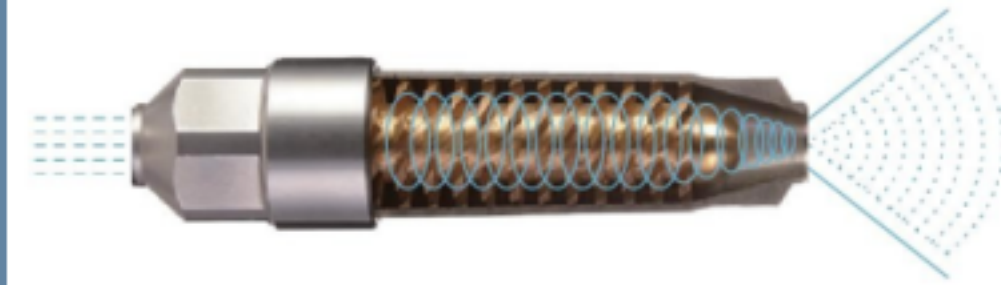
CNC machining



Cooling Towers



# Nanobubbles

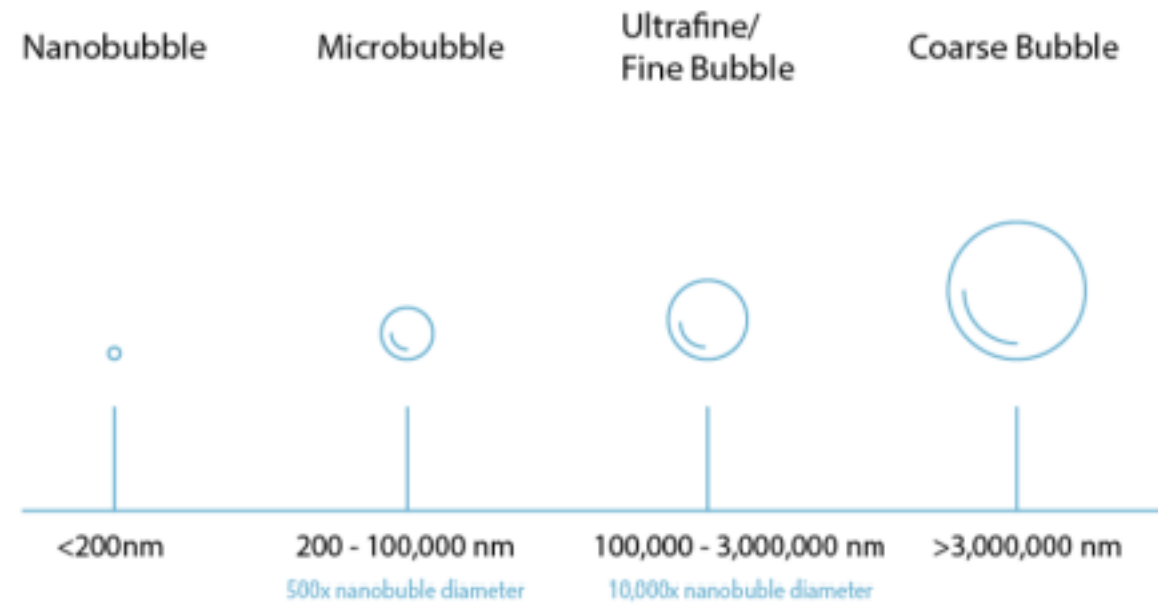


### Nanobubbles advantages:

- \* Increase Oxygen levels in water
- \* Nanobubbles can significantly eliminate microbial biofilms on surfaces
- \* Nanobubbles will burst with Ultrasound and kill the bacteria
- \* Nanobubbles efficacy will be enhanced in combination with (chlorine-based) sanitizers
- \* Nanobubbles bacterial removal efficacy will be improved with shear force
- \* Nanobubbles can induce microbial injury
- \* Reduce chemical applications
- \* Increase sanitizers delivery to bacteria
- \* Penetrate into biofilms
- \* Proper for water treatment
- \* Proper for agricultural water treatment
- \* Could be used for removing biofilms from pipes

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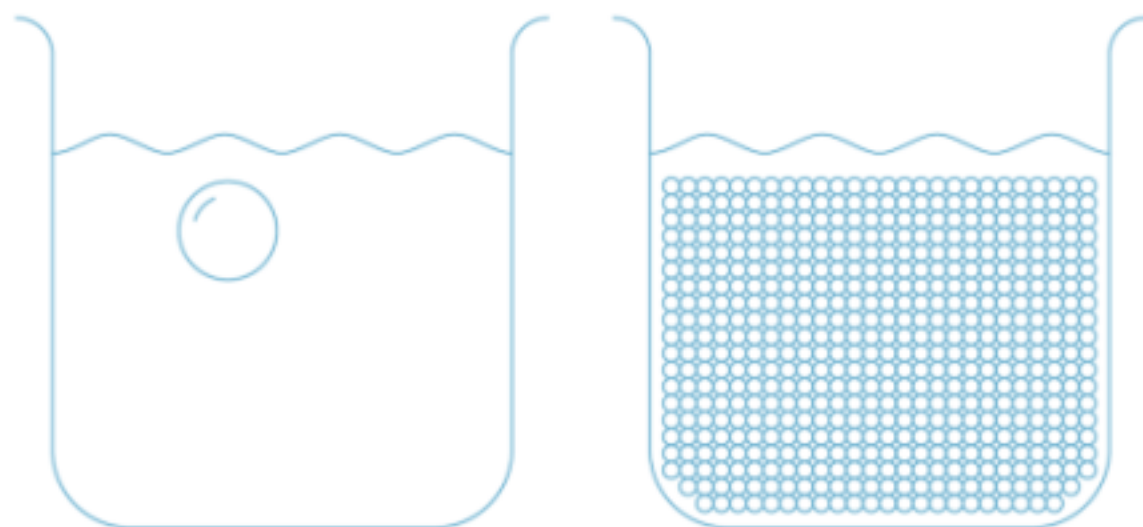
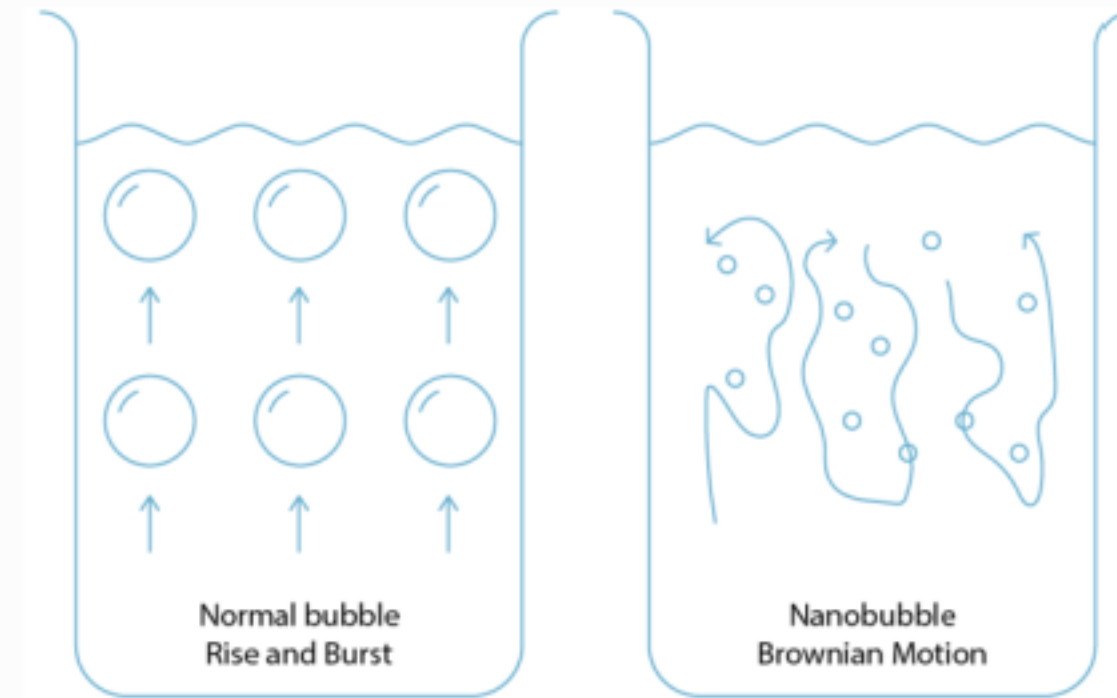
Nanobubbles are long-lasting gas-containing cavities in aqueous solutions. Due to their size, nanobubbles exhibit unique properties that improve numerous physio-chemical, physio-mechanical and biological processes

The Aquaox Nanobubble generation method consistently produces high density solutions of optimally sized nanobubbles, averaging 100 nm in diameter and ranging between 50 and 100 nm. Nanobubbles of this size are stable in liquid because they have reached equilibrium with bubble surface tension, internal pressure, external pressure, surface charge, and their environment. Their stability and size give them neutral buoyancy and remain suspended until they interact with surfaces or contaminants.

Nanobubbles are one of the smallest known bubble sizes, roughly 2500 times smaller than a single grain of salt, or less than 200 nanometers (nm) in diameter.

Nanobubbles have a strong negative surface charge that keeps them stable in liquid and enables them to continuously participate in and stimulate physical, biological, and chemical interactions.

Nanobubbles are neutrally buoyant and can remain suspended in liquid for weeks without rising to the surface and off-gassing



When one square mm of water is filled with nanobubbles, the surface area-to-volume mass increases exponentially as compared to water filled with normal bubbles.

The increase in surface area dramatically enhances aerobic bacteria activities in the liquid and the efficiency of chemical reaction between the supplied gas and liquid ingredients.

#### Increased Surface Area-to-Volume Mass

- \* Creates a stabilized fluid platform for process optimization
- \* Shortens reaction times
- \* Improves Heat Exchange efficiency Improves chemical conversion efficiency
- \* Penetrates into organic materials including biofilms Drastically reduces pipeline & equipment corrosion

## AquaOX Patented Internal Structure

Our unique, patented technology combines three fluid mechanic principals to produce a high concentration of stable, extremely small size nanobubbles without the need of any external gasses.

### Static Mixing

A method for combining fluid materials which are forced feed over a pattern of mixing elements to generate a homogenous fluid stream.

### Venturi Effect

The Venturi Effect is the reduction in fluid pressure caused by fluids passing through multiple channels of different widths. At the same time, it induces cavitation which leads to the formation of bubbles.

### Swirling Flow

A method in which a swirling flow is generated in the device. The strong centrifugal force of the flow generates fine bubbles due to high smash and shear action of the fluids.

# SIO Advantages



No electricity required



Nano & Microbubbles generated at same time (VS series)



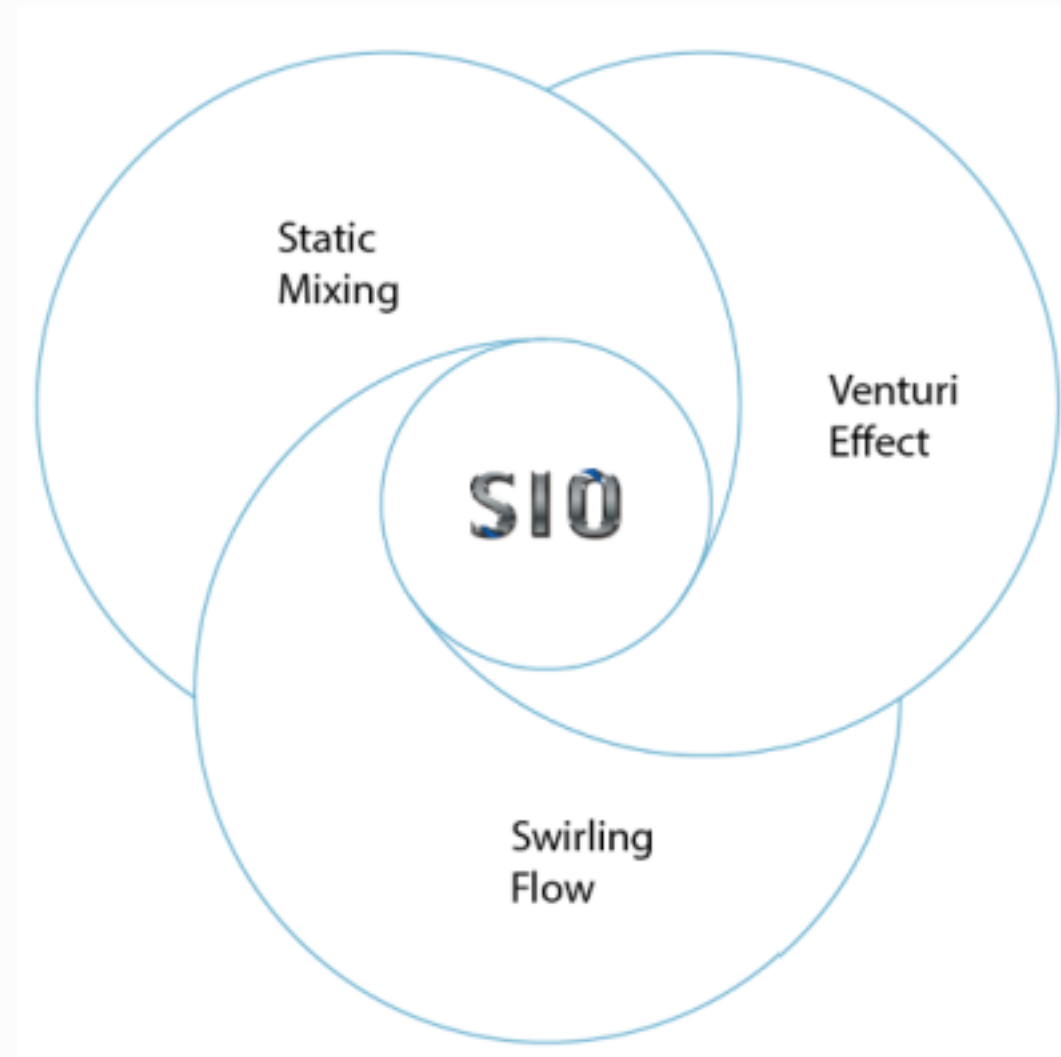
No power unit, no moving parts



Compact and space saving



No running cost



## AquaOX Nano Multiple Functions

### Mixing

The AquaOX Nano generator has a superior ability to blend gas and liquids into a stable solution with consistent particle distribution.

### Cleaning

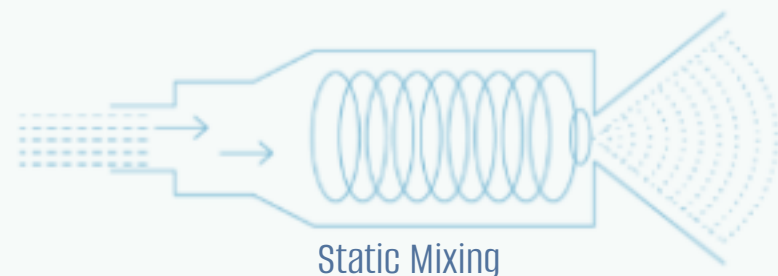
The AquaOX Nano generator produces a large number of nanobubbles with a strong negative surface charge which allows them to attract and remove dirt. By using nanobubbles you can reduce the amount of detergents and solvents used for cleaning.

### Permeability

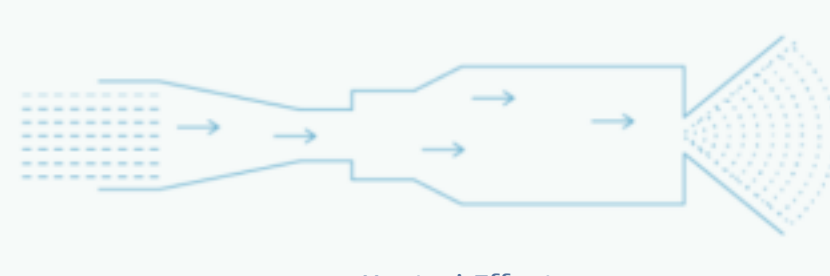
The patented design of the AquaOX processor reduces surface tension of fluids which improves its permeability and makes it possible to apply it in various fields.

### Disinfection

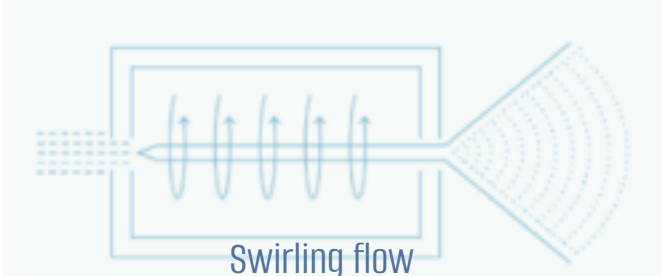
Nanobubbles facilitate the formation of chemical-free disinfection products, including hydrogen radicals, which are a type of reactive oxygen species (ROS)



Static Mixing



Venturi Effect



Swirling flow

## Advantages Nanobubbles in Aquaculture

- \* Increased Dissolved Oxygen level
- \* Water Quality Improvement
- \* Improved plant health
- \* Faster growth rates
- \* Effective on Algae
- \* Cost effective and Sustainable
- \* Biofilm Elimination
- \* Improved nutrient absorption
- \* Easy installation



### Increased Dissolved Oxygen Delivery

Increasing dissolved oxygen in irrigation water enhances water oxygenation, surpassing alternative techniques and boosting crop yield. Elevated oxygen levels promote better root development and nutrient absorption, fostering healthier plant growth.

### Cost effective and Sustainable

The use of nanobubbles allows for a reduction in the quantity of oxygen added to the water. Additionally, it will reduce energy consumption. This not only contributes to cost savings but also aligns with sustainable and eco-friendly practices

### Disinfection

Nanobubbles facilitate the formation of chemical-free disinfection products, including hydrogen radicals, which are a type of reactive oxygen species (ROS)

### Water Quality Improvement

Nanobubbles effectively eliminate microbial biofilms on surfaces and irrigation lines, a crucial advantage in professional horticulture. Beyond preventing the harboring of harmful pathogens, this process also hinders algae growth. The removal of biofilm and algae enhances overall efficiency and productivity for horticultural operations.

## Elevate your greenhouse productivity with AquaOx Nanobubbles!

Our advanced water oxygenation ensures superior plant growth, increased nutrient uptake, and resistance to root diseases. Experience enhanced metabolism, optimized photosynthesis, and improved water quality for a stable, climate-regulated environment. AquaOx Nanobubbles reduce environmental stress, providing resilience for a more adaptable crop. Achieve consistently higher yields with our revolutionary technology. Transform your greenhouse, transform your harvest –

Choose AquaOx for a greener, more prosperous future!

