

# Nanobubble Aeration

## Naturally Control Algae and Improve Water Quality

Each year, the news is filled with headlines warning of invasive species, harmful algal blooms, and deadly cyanotoxins plaguing our lakes, ponds and waterways. As urban development, pollution and natural habitat loss continue to rise, our aquatic ecosystems suffer from nutrient loading and poor water quality as a result. Thankfully, new industry-changing innovations, like nanobubble technology, are becoming available to help combat these unprecedented obstacles.

Nanobubble aeration treatments offer a premium lake management tool that is designed and EPA-registered to naturally control algae by providing unparalleled direct and lasting oxygenation of the waterbody. This new technology is an exciting solution poised to transform the entire freshwater management industry.

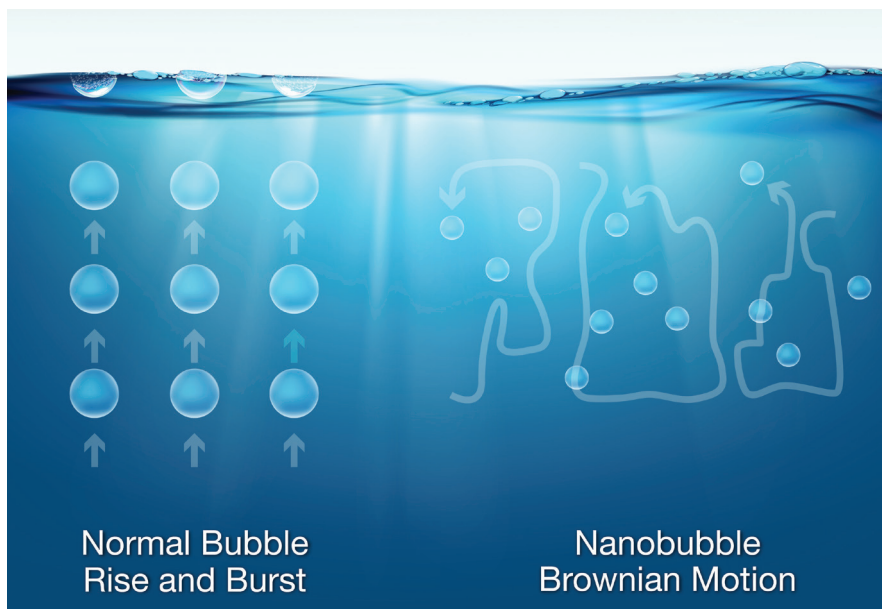
## What are Nanobubbles and How Do They Improve Water Quality?

Nanobubbles produced by small onshore generators are ultra-fine and nearly invisible to the eye; in fact, at less than 1 micrometer, they are about 400 times smaller in diameter than human hair and 1 million times smaller than ordinary lake and pond aeration bubbles. As a result of their size, nanobubbles have no natural buoyancy.

**Unlike traditional aeration systems, which use rising larger bubbles to induce circulation and transfer of atmospheric oxygen throughout the water column, nanobubbles :**

- Remain within the water column for extended periods of time, as long as two to three months.
- Provide unparalleled direct oxygenation of the water and the typically anoxic sediment water interface at the bottom.
- Are EPA-registered to control algae and dangerous cyanobacteria, as demonstrated by laboratory testing.

**Put simply, nanobubbles are like traditional lake and pond aeration systems on steroids!**



Normal Bubble  
Rise and Burst

Nanobubble  
Brownian Motion

Nanobubble aeration is a premium innovative technology that is designed to exceed the capabilities of traditional lake and pond aeration systems by providing up to 79,000x more oxygen!

# Water Quality Restoration Utilizing Nanobubble Aeration Treatments: Before and After



## Immediate Benefits of Nanobubble Aeration

- Saturates water with up to 79,000x more oxygen than traditional aeration
- Can remain within the water column for 2-3 months
- Sustains the rapid growth of beneficial bacteria and desirable microbes
- Prevents accumulation of anaerobic bottom muck and sediments
- Helps reduce the impact of nutrients responsible for fueling weeds, algae and cyanotoxins
- Within a few days—and even hours—water quality can return to its natural balance without traditional herbicides

## The Positive Power Of Negatively-Charged Bubbles

Another interesting characteristic of nanobubbles is that they are negatively charged, and therefore are attracted to positively charged organic matter in the water column. When they connect with positively charged metals and pollutants, nanobubbles will oxidize and neutralize them—preventing undesirable water quality conditions.

While nanobubbles are traditionally infused with oxygen from the atmosphere, they can also be infused with concentrated oxygen or ozone from small onshore generators that can easily be added to the system where faster or more immediate results are needed.