MOLEAER
ADVANCING NANOBUBBLE TECHNOLOGY

AQUACULTURE

About Moleaer

Moleaer produces cost-effective and proven solutions that increase productivity, reduce reliance on chemicals, and help restore balance to the environment. We partner with experienced engineering and innovation teams at world-renowned universities, including UCLA, Arizona State University, Clemson University, University of Pittsburgh, Wageningen University, and Virginia Tech University, to validate new applications of our nanobubble technology. Through these partnerships as well as over 1000 installations across 32 countries on 6 continents, we have proven that nanobubbles can solve a wide variety of challenges.

Benefits of Nanobubbles

- 100nm = 2000x surface area of micro bubbles
- Minimal buoyancy
- Improved biomass kinetics in biofiltration
- Emulsion breaking and enhanced fractionation of liquids
- Higher oxygen partial pressure compared to microbubbles – higher driving force, and superior oxygen dissolution
- Excellent mixing - aerates entire water column
- Near perfect gas transfer - maximum utilization potential of every mole of oxygen

Proven Aquaculture Benefits

Farmed fish is one of the most efficient forms of protein to feed a growing population. Our nanobubble generators have been proven to:

Reduce Operational Cost

- Over 85% oxygen transfer rate lowers oxygen usage and cost
- Improve operational costs and save energy

Improve Fish Health

- Better water quality via enhanced oxygen saturation
- Increase oxygen availability and metabolization
- Better sanitary conditions

Reduce Disease

- Reduce the need for sea lice treatments
- Prevent algae blooms
- Improve fish gill health and resistance to disease

Increase Yields

- Safely increase stocking densities
- Decrease mortality and likelihood of fish kills

Enhance the Surrounding Environment

- Remediate seabed and aquatic life
- Reduce off-flavor compounds in RAS operations
- Reduce biofouling
- Improve denitrification efficiency
- Displace dissolved nitrogen concentration with oxygen

Trusted By

U.S. FISH & WILDLIFE SERVICE
DEPARTMENT OF THE INTERIOR

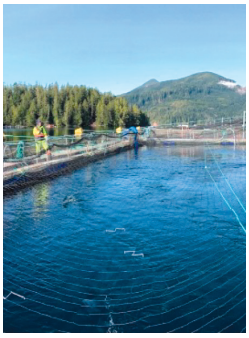
MOWI

CERMAQ

Grieg Seafood®

Case Studies

Increase Fish Health
Reduce Operations Costs
Decrease Fish Mortality



Grieg Seafood + CPI Equipment

Moleaer technology enabled Grieg Seafood to deploy sea lice skirts for extended periods of time while cost-effectively keeping dissolved oxygen levels high, resulting in heathier fish, and decreased operating costs.

- **75%** oxygen use reduction
- Eliminated the need for sea lice treatment
- Improved feed conversion ratio

Dissolved Nitrogen Removal

Hendrix Genetics Broodstock – Chile

- One 250 Nexus nanobubble generator was used as an alternative to a degassing system
- Dissolved oxygen increase: **41%**
- Dissolved nitrogen decrease: **9.5%**

Reduce Operating Costs

Salmon Smolt Hatchery – Cooke Aquaculture – Chile

- One 500 Nexus nanobubble generator replaced 2 oxygen cones while maintaining the DO levels in the tanks with over 95% O_2 saturation
- Total oxygen consumption decreased by **51%**
- Energy consumption decreased by **42%**

Productivity Increase

RAS Smolt Hatchery – BC, Canada

- **17%** Reduction in O_2
- **22%** Increase in biomass growth rate
- **48%** Higher daily average biomass growth per unit of oxygen applied

Products

SCALABLE, RELIABLE, AND SIMPLE TO INTEGRATE

NEXUS

Features & Benefits

- Inline nanobubble generator designed for integration with existing pumped liquids
- Scalable from 100 to 1500 GPM (22 m3/hr to 227 m3/hr)
- Designed for use with oxygen
- Reduce cost of oxygen
- Compatible in both saltwater and freshwater
- Rapid ramp up, ramp down oxygen delivery
- Precise control over delivery rate and saturation points
- High quality, made with premium materials for reliability in the toughest environments
- Optional PLC integration for remote monitoring

NEO

Features & Benefits

- Reduce cost of oxygen
- ~100 nm-sized bubbles
- Optional onboard oxygen generation available
- Saltwater or freshwater models
- Self-priming pump options
- Oxygenation of any tank and any depth of water
- Auto gas shut off if loss of prime feed
- Low feed gas pressure sensor and alarm
- Integrated real-time optical DO monitoring and auto control with PLC
- Corrosion resistant stainless-steel frame and components

Please reach out to aquaculture@moleaer.com to learn more

www.moleaer.com