

IMPROVE PROCESS PERFORMANCE & STABILITY WHILE REDUCING COSTS USING CLEAN CHEMISTRY



Common Problems

Solving These Problems with Nanobubble Technology

- ⚠ Rising energy & chemical costs
- ⚠ FOG, scum and odor issues
- ⚠ Frequent process upsets, toxicity events & inconsistent performance
- ⚠ Bulking sludge, filamentous bacteria problems & poor sludge settling
- ⚠ Treatment capacity constraints
- ⚠ Biogas quality and digester foaming issues

How do nanobubbles enhance wastewater treatment?

Fats, oils and grease (FOG) and amphiphilic compounds, such as quaternary ammonium compounds (QACs), surfactants and soaps, are commonly found in wastewater and can interfere with solids separation, biological processes and oxygen transfer. This significantly reduces the efficiency of wastewater treatment and increases the likelihood of common problems.

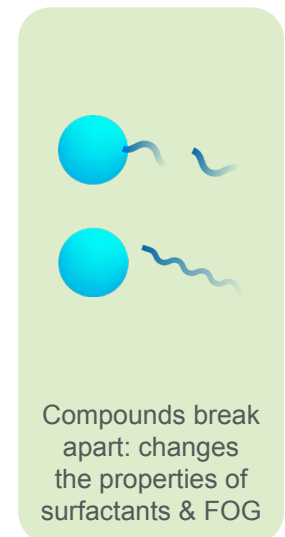
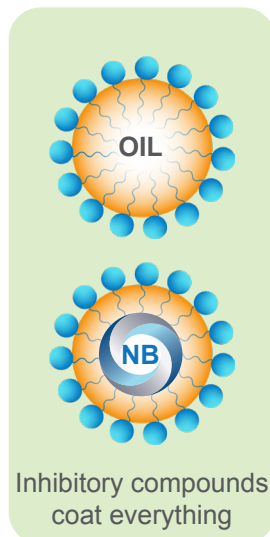
Nanobubbles (NBs) can selectively remove harmful contaminants from wastewater using a clean, in-situ chemical process. This helps wastewater treatment plants achieve the highest wastewater treatment efficiency. Benefits include:

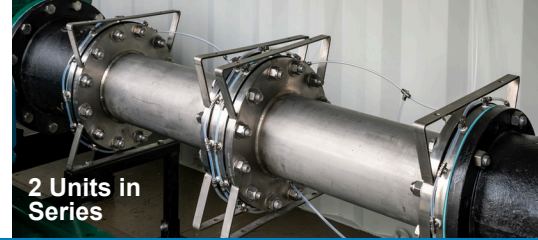
- ✔ Increase treatment capacity
- ✔ Reduce energy and chemical usage
- ✔ Improve BOD / COD / nutrients removal
- ✔ Reduce or eliminate odors
- ✔ Reduce or eliminate digester foaming
- ✔ Increase biogas quality

HOW DO NANOBUBBLES WORK?

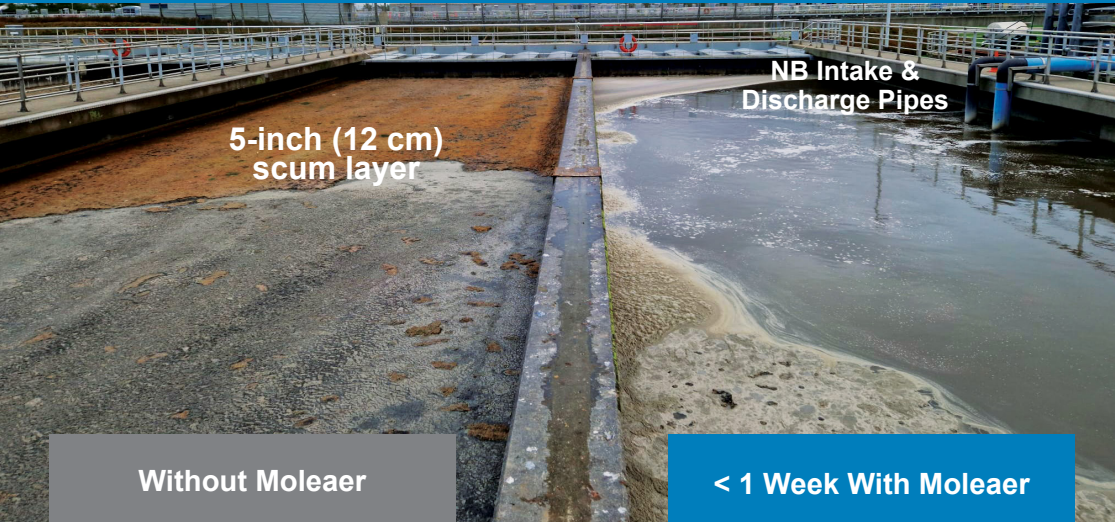
Did You Know only 15 mg/L of Sodium Lauryl Sulfate, a Common Soap Ingredient Reduces Aeration Efficiency by 50%?

Nanobubbles have unique properties that make them effective at enhancing physical, chemical, and biological reactions. Their charged hydrophobic surface, neutral buoyancy and high internal pressure allow them the time to attract, break apart, and change the characteristics of inhibitory compounds such as surfactants and FOG. This enhances all the downstream biological processes and makes wastewater easier to treat.





RESULTS FROM OUR CUSTOMERS



Measured Benefits

AERATION ENERGY
+40% reduction

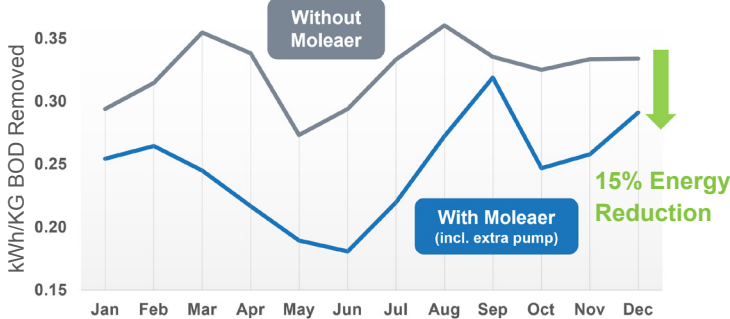
DISINFECTION
+40% less chlorine

PRIMARY CLARIFIER
10% more solids removal

SECONDARY TREATMENT
20% more capacity

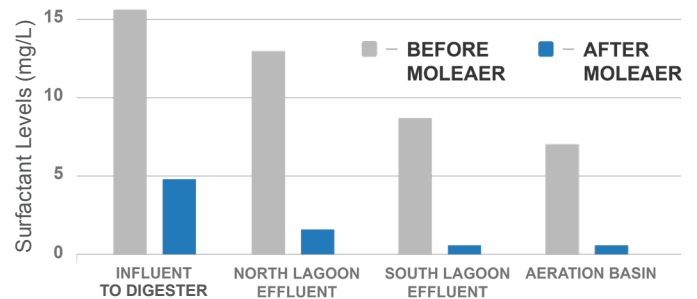
ANAEROBIC DIGESTION
20% more methane

Total Plant Energy-to-Treat (kWh/KG BOD Removed)
Goleta Sanitary District WRRF, California



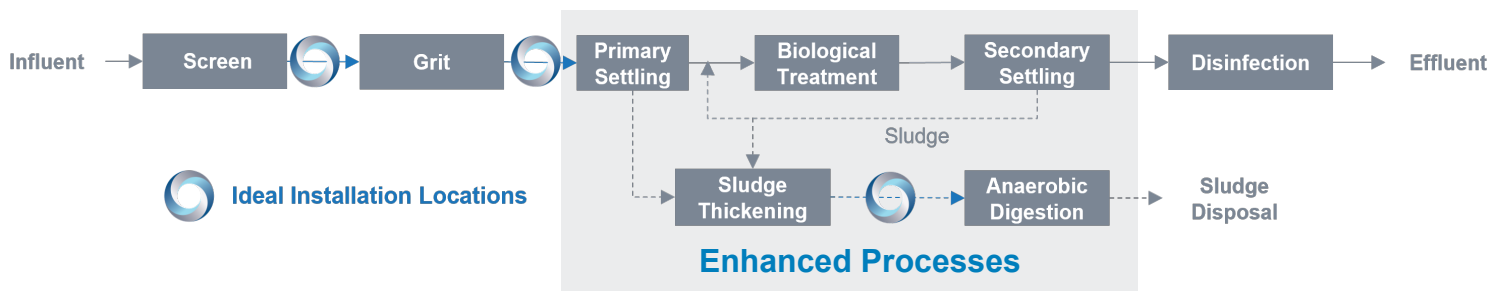
Reduce Aeration Energy

Surfactant Levels in Wastewater
Meister Cheese, Wisconsin



Improve Wastewater Treatment

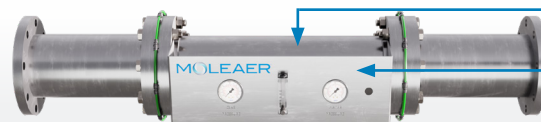
RECOMMENDED INSTALLATION LOCATION



Simple Installation with CAPEX-Free Leasing



Scan to
Talk to an
Expert



Nanobubble Generator

Removable Faceplate