

# NICO DRONA NANOBUBBLE SYSTEM PRECISION OXYGENATION FOR ETHANOL PRODUCTION & FERMENTATION SYSTEMS

Ethanol production demands consistent fermentation performance, efficient water management, and optimized process control. The **NICO DRONA Nanobubble System** is engineered to enhance oxygen transfer, improve fermentation efficiency, and optimize wastewater treatment, delivering higher yields and more sustainable plant operations.

## Challenges In Ethanol Production Systems

Ethanol plants commonly face critical operational challenges:



### Limited Oxygen Transfer

Restricts yeast activity and fermentation efficiency



### Inconsistent Fermentation Performance

Leads to yield variability and unstable batch output



### High COD in Spent Wash

Increases load on wastewater treatment systems



### Energy-Intensive Aeration

Drives up operational costs with low gas efficiency



### Low Water Reuse Efficiency

Results in high freshwater consumption

## Why NICO DRONA?

NICO DRONA is purpose-built for ethanol plants, delivering advanced performance through nanobubble technology:



Enhances oxygen availability during yeast propagation



Improves fermentation stability and batch consistency



Boosts biological oxidation and COD reduction



Reduces aeration energy and chemical dependency



Seamlessly integrates into fermentation, ETP, and reuse systems

## Measured Performance Improvements

Delivering quantifiable impact across ethanol operations:



### Fermentation Performance

- 3–8% increase in ethanol yield
- 10–20% reduction in fermentation cycle time
- Improved batch consistency and throughput



### Water & Resource Optimization

- 30–60% increase in water reuse potential
- Up to 40% reduction in freshwater intake
- Reduced chemical consumption and sludge generation



### Wastewater Treatment Efficiency

- 20–40% COD reduction (oxidative stage)
- 30–50% reduction in aeration energy consumption
- Reduced hydraulic retention time (HRT)

## Key Application Areas

Designed to optimize performance across ethanol production systems:



### Fermentation Enhancement

Improves oxygen transfer for higher yield and faster cycles



### Process Water Reuse

Improves water quality for recycling within the plant



### Yeast Propagation Optimization

Enhances microbial health and stress tolerance



### Biofilm & Pipeline Control

Prevents fouling and maintains system hygiene



### Wastewater Treatment (ETP)

Boosts COD breakdown and treatment efficiency



### Oxidation & Disinfection

Supports chemical-free or reduced-chemical treatment processes



ISO Certified Quality Standards



Global Presence



Customizable, Application-Specific Solution

Enhance Ethanol Production with Advanced Nanobubble Oxygenation

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