

Praxair® In-Situ Oxygenation (I-SO™) System

- Higher wastewater treatment rates
- Lower odor and VOC emissions
- Lower power consumption
- Lower capital investment
- Reduced foaming
- Higher dissolved oxygen levels
- Improved process control
- No compression required
- Transportable, floatable units

Emissions Reduction

U.S. air emission regulations have a significant impact on the chemical and refining industry's wastewater treatment operations. Similar rules apply to pharmaceutical, pulp and paper, and other industrial operations. According to these regulations, wastewater treatment systems at a major emission source must either physically cover the units and vent the off-gases to a control device, or treat the process wastewater to physically remove the emissions compounds. However, these expensive control processes are not required when the operator can demonstrate 95 percent biodegradation of the total mass of Hazardous Air Pollutant (HAP) emissions.

Pure oxygen aeration with Praxair's I-SO™ System has been shown to reduce emissions of volatile organic compounds (VOC's) by over 80%¹. VOC's retained in the aeration basin, due to pure-oxygen aeration with the I-SO, can be treated biologically. The ISO-pure oxygen aeration system reduces emissions of VOC's and odor without covering aeration tanks, capturing off gases and treating them.



Capacity Increase

Operators often face capacity limitations. The capacity-limiting factor for aerobic treatment of wastewater is typically the aeration system.

Replacement or supplementation of existing aeration systems with high-purity oxygen and the Praxair I-SO™ System easily increases the oxygen dissolution capacity. Further, because the system can dissolve as much as 82%² of the high-purity oxygen into wastewater, oxygen costs are low. Finally, the Praxair® I-SO™ System simultaneously provides excellent solids suspension, reduced foaming, and decreased emissions of odors and VOC's.

Easy To Install

The Praxair® I-SO™ System is transportable. Its two major subassemblies are bolted together on site, and the

complete assembly is lifted into the tank or lagoon, where it floats. No support structures are needed.

Operational Flexibility

Operational flexibility is constrained in mechanical and submerged diffuser aeration systems, conventional aeration systems must be run to meet dissolved oxygen (DO) and mixing requirements simultaneously. With Praxair's I-SO™ system, mixing is maintained constantly by the impeller and oxygen gas is supplied only as needed to maintain the target dissolved oxygen level. This allows mixing to be optimized and constant, regardless of the oxygen requirement, with no variation in power consumption.

Reduced Power Requirements

Experience with installed units has demonstrated that the total power required to operate the Praxair® I-SO™

System, is less than an air system. The I-SO™ system has been shown to have a standard aeration efficiency (SAE) of up to 5.7 kg/kWh².

For wastewater treatment at a specific facility, Praxair can determine the optimal oxygen supply and dissolution system by use of mathematical modeling, design tools, and the plant's historical data.

Commercial Experience

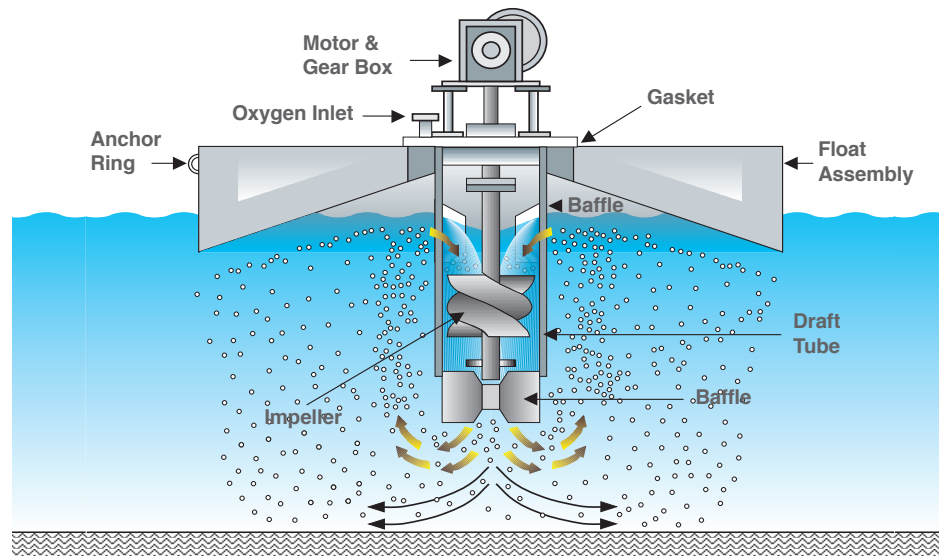
With excellent oxygen transfer and utilization, as well as reduced emissions, the Praxair's I-SO™ System is being rapidly accepted for industrial usage. Currently, chemical, pulp and paper, ceramic, tannery, textile, and food facilities are successfully using this method to meet their wastewater treatment demands.

To date, over 200 systems have been installed in the U.S., Europe, Latin America and Asia. Units in the U.S. are available with oxygen dissolution rates (SOTR) of up to 210 lb/h² and standard oxygen transfer efficiencies (SOTE) of up to 82 percent². Effluent requirements are achieved with reduced off-gas and minimal foam generation. The superior oxygen transfer of the Praxair® I-SO™ System has been demonstrated in both field tests and standard clean water test facilities.

Contact Us

Call us at 1-800-PRAXAIR or visit us at our web site, www.praxair.com.

Praxair® In-Situ Oxygenation (I-SO™) System



| Parameter | |
|------------------|--------------------------|
| Height | 57.9" |
| Width | 131.0" |
| Assembly Weight | 4,100 lbs. |
| Motor | 40 HP, 460 VAC, 3 phase |
| Oxygen Flow Rate | 4300 SCFH = 4.3 tons/day |

Footnote:

- ¹ Rodieck, A.G., C. Geiling, E. L. Bailey, C. J. Reith, Jr., J. Cohn, 2001. "Alternative Treatment Strategy for a High-Strength Pharmaceutical Wastewater" WEFTEC 2001.
- ² Praxair, Inc. 2014 I-SO™ Clean water tests.



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