

Clean Water. No Waste.®

The HiPOx® process is landmark advancement in the application of Advanced Oxidation Process (AOP) chemistry developed specifically to enable high-performance water reuse. Based on well known ozone (O₃) + hydrogen peroxide (H₂O₂) chemistry, the HiPOx process uses multi-step injection to produce the hydroxyl radical (OH·), the most powerful oxidant available for water treatment. The compact plug-flow reactor design efficiently destroys a wide range of organic compounds via a carefully controlled oxidative chain reaction. The result is a treatment process that exceeds the performance of many conventional technologies, such as carbon adsorption, and does not have the inherent limitations of UV-based oxidation systems.

HiPOx systems offer extremely flexible treatment solutions for many water conditions. Systems can be operated in three different oxidation modes: AOP, O₃ only, or alternating between modes using entirely renewable inputs. This flexibility enables HiPOx systems to simultaneously meet multiple treatment objectives including disinfection, taste/odor/color removal, eliminating VOCs, trace pharmaceutical and micro-contaminant destruction. Contaminants aren't just removed, most are completely destroyed to dissolved CO₂ and H₂O without producing any

process residuals or waste products. Moreover, the HiPOx system is the only ozone-based process approved for unrestricted water reuse under the California Department of Health's stringent Title 22 rules. Across a broad range of contaminants and applications HiPOx systems enable reuse, and deliver value.

Standard Features

- Patented Plug-Flow Reactor Design
- Very High Mass Transfer Efficiency (MTE)
- High Efficiency Organics Destruction
- Unaffected by Water Turbidity, Color, or Transmissivity
- Ozone-Only, AOP, or Combined Operation
- Minimal Waste / Process Residuals
- Standardized, Modular Design
- Low Maintenance / Fully-Automated



Applications



Municipal Drinking Water

Wellhead Treatment: Destroy recalcitrant VOCs and/or Color and Taste & Odor contaminants to meet drinking water standards.

Surface Waters: Remove endocrine disruptors and personal care products, remove taste, odor and color contaminants (such as Geosmin/MIB) and perform disinfection.

Aquifer Storage and Recharge: Treat multiple contaminants and perform disinfection while maximizing disinfection by-product formation.

Advantages

- Performs multiple treatment objectives simultaneously (for example: VOCs, Color and Taste & Odor, and Disinfection).
- Minimizes bromate formation to meet strict drinking water standards.
- Does not form THMs, NDMA, or other disinfection byproducts.
- No waste-streams generated.



Industrial Process Water

Process Water Discharges: Remove process chemicals such as 1,4-Dioxane, personal-care products, pesticides and herbicides prior to discharge.

Process Water Recycling: Purify and decolorize process waters that will be reused in an industrial process.

Process Water Reuse & Disinfection: Remove contaminants and perform disinfection of waters for reclamation and reuse.

Advantages

- Enhances the effectiveness of existing biological treatment systems as either intermediate or post-treatment.
- Treats fugitive compounds such as personal-care products and 1,4-dioxane that are not removed by existing biological treatment systems.
- No waste-streams generated.



Environmental Remediation

Industrial Pollution Sites: Remediate groundwater contaminated by difficult-to-treat industrial chemicals such as 1,4-dioxane, TCE, PCE, vinyl chloride, trichloropropane (TCP), dibromochloropropane (DBCP), and more.

Petroleum Remediation Sites: Remove fuel components and additives from groundwater impacted by MTBE, TBA, BTEX, and TPHg.

Other Applications: Destroy explosives, amines, sulfur-based odors, and more.

Advantages

- Destroys recalcitrant chemicals to non-detect levels.
- Flexible design allows adjustments to reagent utilization as contaminant concentrations change over time.
- No waste-streams or air emissions generated.
- No off-spec water discharges.
- Low consumables costs.



Municipal Wastewater

Water Reuse: Remove microcontaminants, VOCs, and more for indirect and direct potable reuse, reclamation or reinjection.

High Intensity Disinfection: Perform on-site disinfection of challenging wastewaters.

Quaternary Treatment: Remove fugitive organic compounds missed by reverse osmosis or microfiltration systems, perform disinfection.

Advantages

- Extremely robust log kill of bacterial and viral pathogens (up to 7 log demonstrated).
- On-site disinfection and contaminant destruction.
- Treats endocrine disruptors, personal-care products, and other compounds that cannot be removed by reverse osmosis or microfiltration.
- No waste streams generated.

	Micro	Mini	SRS	HDS	HCU	DW	Mega
Flow	1-30 GPM	1-100 GPM	3-250 GPM	3-500 GPM	3-500 GPM	1-5000 GPM	1000-5000 GPM
Ozone	Up to 2 lbs/day w/o ozone pump or compressor Pressure standard to 20 psi (option: to 40 psi w/o using ozone booster pump)	Up to 5 lbs/day w/o ozone pump or compressor Pressure standard to 20 psi (option: to 40 psi w/o using ozone booster pump)	On-Board: 20-100 lbs/day Off-Board: Up to 500 lbs/day	Up to 6 lbs/day w/o ozone pump or compressor Pressure standard to 20 psi (option: to 40 psi w/o using ozone booster pump)	Up to 20 lbs/day Pressure standard to 35 psi	On-Board: Up to 100 lbs/day Off-Board: Up to 1,000 lbs/day	As required up to 10-ppm dose
Oxygen	PSA oxygen concentrator delivers 90% oxygen purity to ozone generator						
Hydrogen Peroxide	35 gal. Double-Contained Tank 5 to 35% Solution	60 gal. Double-Contained Tank 5 to 35% Solution	150 gal. Double-Contained Tank 5 to 35% Solution	35 gal. Double-Contained Tank 5 to 35% Solution	25 gal. Double-Contained Tank 5 to 35% Solution	500 gal. Double-Contained Tank 5 to 35% Solution	1000 gal. Double-Contained Tank 5 to 35% Solution
Dimensions	5'2"(h) x 4'(w) x 2'(d)	5' 7"(h) x 4'(w) x 2'(d)	8'6"(h) x 24'(w) x 8'(d)	5'10"(h) x 5'(w) x 2'0"(d)	7'6"(h) x 8'(w) x 4'6"(d)	<1,000 GPM: 9'6"(h) x 28'(w) x 8'(d) >1,000 GPM: 9'6"(h) x 40'(w) x 8'(d)	9'6"(h) x 40'(w) x 8'(d)
Weight	Approx. 300 lbs	Approx. 300 lbs	Approx. 15,000-20,000 lbs	Approx. 300 lbs	Approx. 4,500 lbs	Approx. 10,000-30,000 lbs	Approx. 10,000-30,000 lbs
Electrical	115 V Single Phase 60 Hz (15 A service)	240 V Single Phase 60 Hz (12 A service)	208 VAC Triple Phase 60 Hz (120 A maximum)	110 VAC Single Phase 60 Hz (10A maximum)	208 VAC Triple Phase or 240 VAC Single Phase 60 Hz (55 A maximum)	On-Board: 208 VAC Triple Phase 60 Hz Off-Board: 480 VAC Triple Phase 60 Hz	230/460 VAC Triple Phase 60 Hz
Power Consumption	0.8-1.2 kW (without climate control)	2-2.9 kW (without climate control)	22-44 kW	1.2 kW (110 VAC) 2.5 (220 VAC)	7-13 kW	Varies-allow 6 kW for each lb. per day of O ₃ generated	Varies-allow 6 kW for each lb. per day of O ₃ generated
Safety	Shop tested. Ambient ozone sensor and destruct unit. Fail-safe shutdown features. All ozone-containing piping is joint-free or double-contained.						

HiPOx® is a patented advanced oxidation process owned by APTwater, Inc., Patents #5,851,407 and #6,024,882.
Specifications subject to change without notice.
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