

# IONOX<sub>2</sub>

ODOR ELIMINATION

***ELIMINATE ODOR***



IonO<sub>2</sub>x Odor Elimination Systems is a patented, true Non-Thermal Plasma (NTP) Technology that provides proven odor elimination of offensive organic odors, satisfying regulatory requirements and eliminating nearby odor complaints. Odorous gases that can be treated include humid or dry process exhaust gases from animal & fish feed manufacturing, pet food production, human food preparation, sewage-treatment plants and any other nuisance organic odors found in a variety of other industrial and commercial applications. IonO<sub>2</sub>x Odor Elimination Technology provides many advantages over other commonly used odor control alternatives, such as bio filters, thermal oxidizers, regenerative thermal oxidizers, regenerative catalytic oxidizers, packed tower scrubbers, and ozone-injectors.

## Why choose IonO<sub>2</sub>x Odor Elimination Systems?

- Odor Elimination of over 90% \*<sup>1</sup>
- Patented true NTP technology
- Energy Efficient
- Low operating costs
- Only consumable is electrical energy
- Typical power consumption ranges from 0.8 to 1.6 watts per cubic feet per minute (CFM) \*<sup>2</sup>
- No water or chemical usage
- Single-unit systems can treat up to 60,000 CFM \*<sup>3</sup>
- Can treat any volume of air with multiple systems

IonO<sub>2</sub>x systems include a PLC based control system, with an operator interface touch screen, and a Plasma Generation Cell cabinet, which contains all of the system high voltage components. All IonO<sub>2</sub>x systems include a retained key interlock system to ensure that the PGC cabinet cannot be opened unless the system power is turned off. Only extensively field tested and high quality, reliable components are used in IonO<sub>2</sub>x equipment. With simple, routine maintenance, IonO<sub>2</sub>x systems will provide many years of trouble-free operation.

\*<sup>1</sup> Verifiable odor elimination percentage calculated by Detection Threshold (D/T) analysis of “after treatment” samples divided by the D/T of “before treatment” samples.

\*<sup>2</sup> 0.47 to 0.94 watts per cubic metre per hour

\*<sup>3</sup> 102,000 cubic metres per hour

## The Science Behind IonO<sub>2</sub>x:

IonO<sub>2</sub>x NTP technology relies on planar, dielectric barrier, high voltage electrodes, spaced with a narrow gap between ground electrodes. The electrodes are connected to a rapidly pulsing, high voltage power supply. This produces a rapidly reversing, high intensity electrical flux within the electrode air gap. The contaminated gas stream,



Cell view ports on Plasma Generation Cell Cabinet

requiring odor elimination, is passed through the electrode gap. The high intensity electric flux density fractures volatile organic compound (VOC) molecules and strips and heats, to extremely high temperatures, very low mass electrons. Large volumes of micro discharge streamers (essentially miniature lightning bolts, which produce a violet glow) are created. When the discharge streamers collide with diatomic oxygen and water vapour molecules in the gas stream, highly reactive oxidative radicals, known as Reactive Oxygen Species (ROS) and Hydroxyl radicals (OH radicals) are formed. An extremely reactive mixture of ionized gas and very high temperature electrons, described in scientific terms as “Non-Thermal Plasma” or “NTP”, is produced.

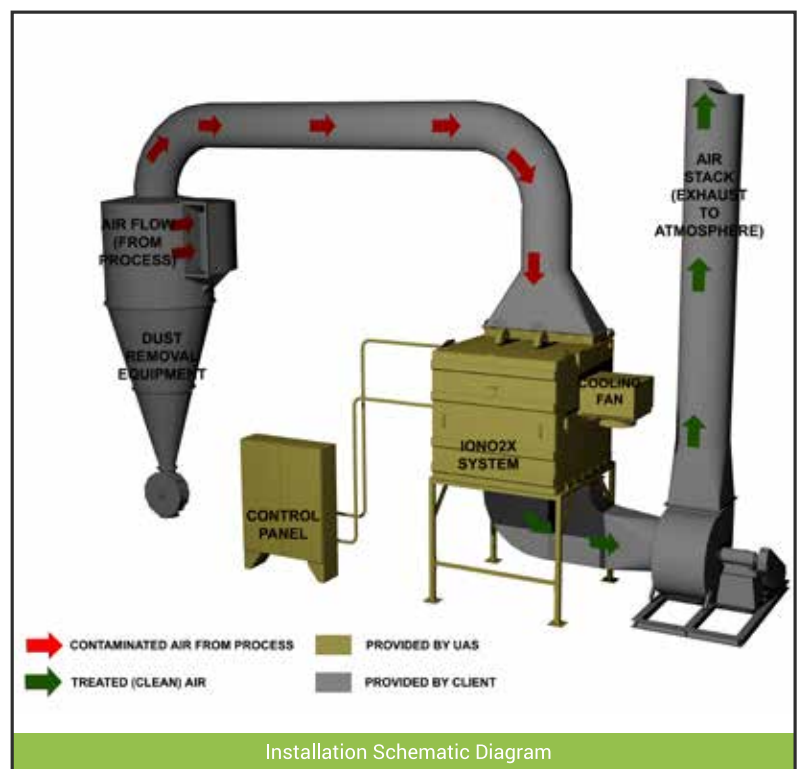
Within the non-thermal-plasma, ROS, OH and free electrons instantaneously react with the fractured VOC molecules, with the predominant end products being water vapor and carbon dioxide. The key advantage of this method of odor elimination (or VOC oxidation), is that it allows oxidation reactions that would otherwise only occur at high temperatures of >1350 degrees Fahrenheit (or 730 degrees Celsius), to proceed rapidly, with very little measurable heat rise. Since there is little sensible heat rise of the treated gas stream, NTP oxidation technology is very energy efficient.

IonO<sub>2</sub>x systems are “true” implementations of NTP oxidation technology. Free high temperature electrons, ROS and OH radicals have a very short half-life and cannot be injected in reactively significant volumes, even over very short distances. So called “NTP” or “Plasma Injectors” can only inject long lived, lower oxidation potential radicals, such as ozone. These systems can be accurately described as “ambient air fed ozone injectors”. Ozone injection is very old technology (first used in the late 1800s). At best, ozone injection can achieve odor reduction of 25% to 35%. “NTP or Plasma Injectors” are designed to produce large volumes of concentrated ozone, which is the opposite of “true” NTP technology, in which the goal is to minimize the production of residual ozone. “True” NTP odor elimination systems always require passing 100% of the contaminated gas stream through the electrode gap. Any system that does not pass 100% of the contaminated gas through the electrodes is not NTP technology.

The technology of IonO<sub>2</sub>x Odor Elimination Systems is covered by three patents (# 6,991,768 , 7,767,167, and 8,475,723). Of key significance is that IonO<sub>2</sub>x Systems utilize hermetically-sealed high voltage electrodes, preventing electrical arcing, which is a common problem in other industrial scale, NTP systems.

**Pilot Scale Testing is available to demonstrate odor elimination effectiveness and to confirm full scale system power requirements. Demonstrations can be scheduled by consultation and appointment.**

For more information, please contact our sales team at 604-607-6400 or by email at [sales@iono2x.com](mailto:sales@iono2x.com)





## Technology

IonO<sub>2</sub>x Odor Elimination Systems is a patented, true NTP technology that has been tested, researched, and developed over a 16-year period.



## Benefits

Cost-Effective, Reliable, and Proven Odor Elimination



## Applications

- Animal & Fish Feed Manufacturing
- Pet Food Production
- Human Food Preparation
- Sewage Treatment Plants
- Other Nuisance Organic Odors



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