

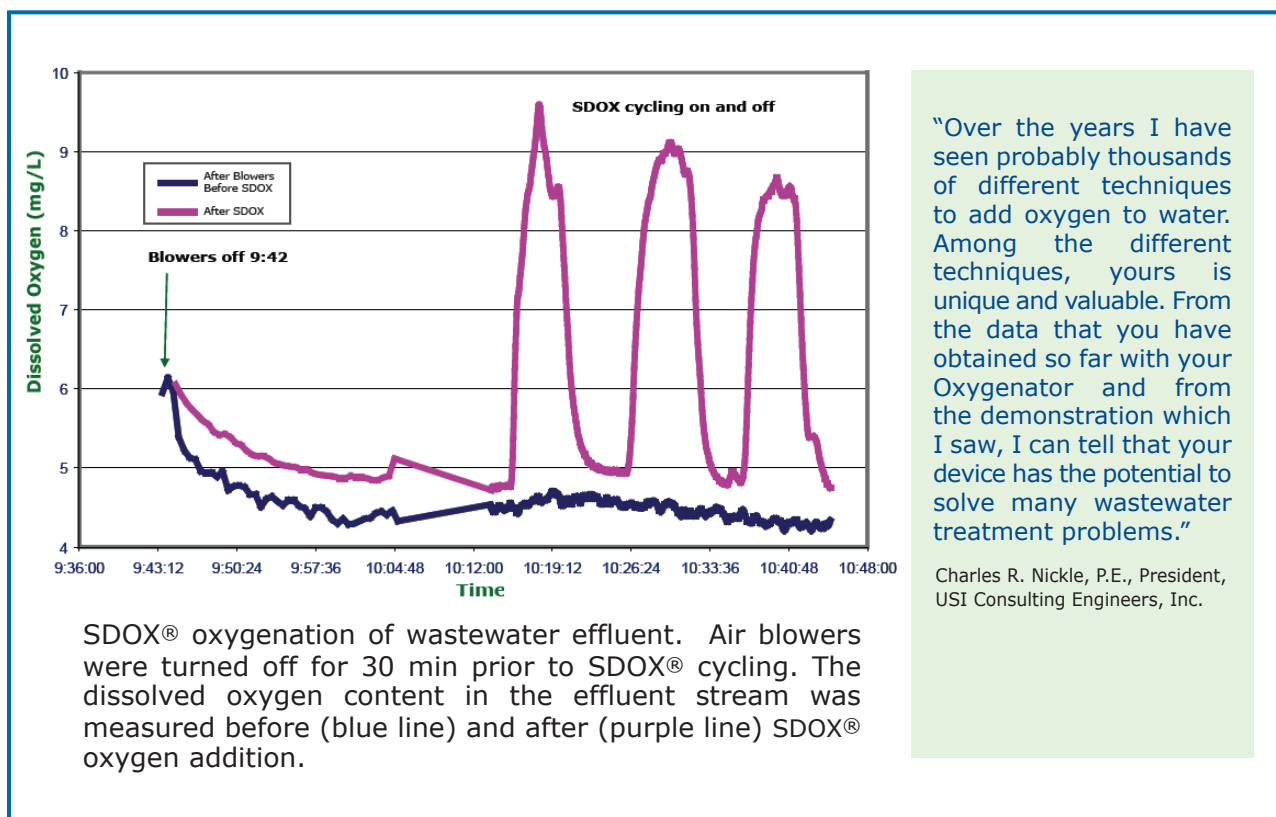
Wastewater Treatment Applications

The Supersaturated Dissolved Oxygen Injector (SDOX[®]) uses a patented and patents pending technology for delivering dissolved oxygen (DO) to water. The benefits of the SDOX[®] over current technology are lower operating costs, far greater flexibility over where and when dissolved oxygen is delivered to any point in the treatment process, and precise control of wastewater DO even as flow rate and oxygen demand are continually changing.

The SDOX[®] can provide either primary or supplemental oxygenation to any wastewater treatment process. The SDOX[®] pumps a side-stream of water from the treatment stream and supersaturates this water with oxygen. Tests of the SDOX[®] within an operating wastewater treatment facility showed over an 80% savings in energy utilization compared with existing blowers for post-treatment aeration.

Unlike typical side-stream systems that increase side-stream DO to 50-60 mg/L, the SDOX[®] provides water with 310 mg/L of DO or greater. This water is then injected at a high velocity into an entrainment tube that can be located anywhere within the treatment process. The energy from the high velocity stream is utilized to mix and distribute the oxygenated water throughout the system. The side-stream can also be delivered by a variety of injection options including plume, flash mixing, and directed injection for site specific needs to either minimize or maximize mixing.

The SDOX[®] provides a high concentration side-stream that is nearly instantaneously mixed with the wastewater (efficient liquid-to-liquid mixing) resulting in a DO concentration below saturation thereby preventing any gas from leaving the water in the form of bubbles. This innovative process results in near 100% efficient utilization of oxygen. In other words, nearly 100% of the oxygen entering the SDOX[®] is delivered in dissolved form to the wastewater; virtually no oxygen gas is lost to the atmosphere.



“Over the years I have seen probably thousands of different techniques to add oxygen to water. Among the different techniques, yours is unique and valuable. From the data that you have obtained so far with your Oxygenator and from the demonstration which I saw, I can tell that your device has the potential to solve many wastewater treatment problems.”

Charles R. Nickle, P.E., President,
USI Consulting Engineers, Inc.

The entrainment tube injection process provides vigorous mixing that can prevent settling of solids with no additional energy requirement for mixing or distribution of the oxygenated water. The side-stream delivery technique also allows for efficient oxygenation of wastewater containing large solids since the treated wastewater need not pass through the SDOX®. The side stream that passes through the SDOX® can contain solids as large as 1/4 inch. The SDOX® internal components are non-fouling and stainless steel to prevent corrosion.

The source of oxygen for the SDOX® can be liquid oxygen, oxygen generators, or compressed air. The SDOX® is available in several sizes, providing delivery rates up to 8 tons of DO per day per unit. SDOX® units can be manually or automatically operated, depending on user requirements. Fully automated SDOX® units utilize a PLC that can easily be integrated into existing plant control systems. Portable SDOX® units are available that can be operated in response to intermittent, site-specific needs. Variable speed pump drives with high efficiency motors are used so delivery rates can be easily varied from 40% to 100% full capacity without compromising efficiency.

Some examples of how the SDOX® can be used in wastewater treatment are:

- Reliable and efficient post-treatment aeration;
- Provide supplemental oxygen during periods of increased demand, or periods of system upset;
- Replace outdated oxygenation equipment with a more efficient system;
- Increase treatment capacity of the plant by providing more dissolved oxygen without a significant increase in infrastructure footprint;
- Odor control;
- Pre-oxygenation at the forced main for odor control and microbial conditioning;
- Provide oxygenation during construction, maintenance and repair of equipment;
- Precise DO control in biological treatment for increased effectiveness of phosphorus removal.



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