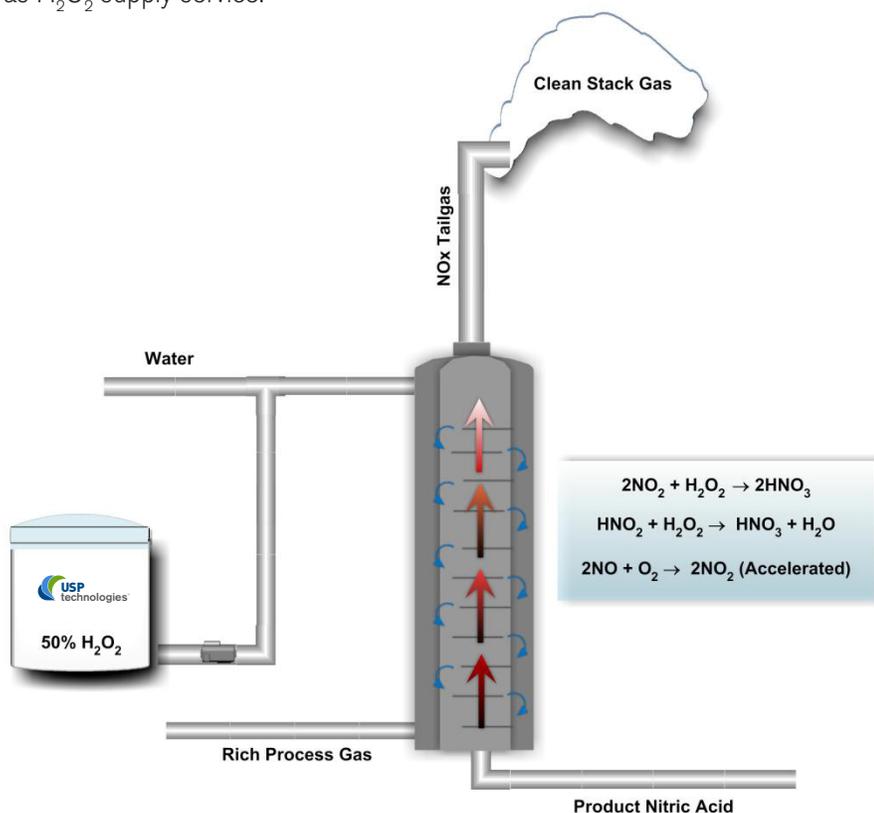




ELIMINATE VISUAL EMISSIONS DURING START-UPS

NO_x Control with Hydrogen Peroxide

This proprietary technology introduces diluted H₂O₂ into the NO_x absorber during start-ups to reduce emissions of NO_x compounds such as NO and NO₂. Removal of >90% is achieved, with the NO_x being converted to high-quality HNO₃ product. The process is offered under license and is designed to minimize risk and disruption to operations. The license includes chemical storage and feed equipment, piping and instrumentation, process safety controls, installation and maintenance, training and documentation as well as H₂O₂ supply service.



Benefits

- **Effective:** Reduces NO_x emissions from > 3,000 - 4,000 ppm to < 200 ppm
- **Versatile:** Always ready, covers a wide range of NO_x concentrations and gas flow rates
- **Credits:** Produces high-quality nitric acid as the end-product
- **Low Risk:** Minimal capital investment needed as the equipment lease included in chemical price
- **Proven:** Operated on plant scale for over 15 years with > 30 successful start-ups per year
- **Safe:** Engineered through Process Hazards Analysis with built-in limit controls
- **Rapid:** Deployment within 2-3 months
- **Convenient:** License includes technology transfer package with start-up assistance
- **Ongoing:** Can be utilized for ongoing NO_x emissions reduction

Which Facilities Will Benefit

The process was designed to control concentrated NOx vapors emitted from stationary industrial sources such as manufacturing of nitric acid, fertilizer, explosives, and other chemicals that use nitric acid. The process eliminates visual NOx emissions during the start-up of Selective Catalytic Reduction (SCR) processes, thereby satisfying public and regulatory expectations. SCR processes, while very effective for removing NOx during normal operations, require high temperatures that are not typically achieved until 1-2 hours after the process has been started. It is during this interim period when visible NOx emissions occur and when H₂O₂ feed is needed.

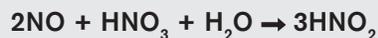
Principle of Operation

The process entails injecting H₂O₂ into the absorber feed water to provide a dilute solution containing 0.5 - 1 wt.% H₂O₂. This solution is passed through the absorber where NOx constituents are transferred from the vapor into the solution and oxidized to high-grade HNO₃. The oxidation reactions are rapid at moderate temperatures (30-80 degrees C), with about 1.7 and 0.4 lbs H₂O₂ required per lb of NO and NO₂, respectively.

Safety

A thorough process hazards analysis was performed on the process, which has resulted in several interlocks and controls being incorporated into the basic design. The process is used safely in over 30 start-ups per year at two HNO₃ manufacturing units. All piping, components, and controls needed to operate the process safely are included with the license and are installed by experienced H₂O₂ specialists. The H₂O₂ storage and feed systems are of modular design and are code-compliant, with years of safe operating history.

Principle of Operation



About USP Technologies

USP Technologies is the leading supplier of peroxygen-based technologies and services for environmental applications. We have been serving the water, wastewater and remediation markets for over 20 years and have offices and field service locations throughout North America. Our consultative approach to problem solving includes application assessment, technology selection and development of a tailored treatment approach. Our full service programs successfully integrate storage and dosing equipment systems, chemical supply, inventory and logistics management, and ongoing field and technical support. This approach provides cost-effective, "hands-off" solutions to our customers. USP Technologies also can provide access to experienced application partners for a turn-key program encompassing engineering, site characterization and technology selection, program implementation, execution and report generation.

Getting Started

We look forward to supporting your treatment needs, whatever the scale of your requirements. To obtain a streamlined treatment solution tailored to your specific project, give us a call at (877) 346-4262.

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