
TRITON-Series RTO

SOLUTIONS FOR THE PROPOSED NATURAL GAS REGULATIONS

Catalytic Products International
Product Highlight • www.cpilink.com • February 2012



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TRITON-Series RTO



The photo details the innovative TRITON-Series Regenerative Thermal Oxidizer.

HOW THE TRITON-SERIES RTO WORKS

The TRITON-Series Regenerative Thermal Oxidizer system has been specifically engineered to meet the extreme needs of the natural gas processing industry. The midstream gas process involves cleaning natural gas of harmful impurities and water. When natural gas is extracted from the ground it contains high amounts of CO₂, water, and corrosive sulfur compounds. A common processing operation includes glycol dehydration and amine stripping. The vent gas from these processes is subject to EPA guidelines; 40 CFR, Part 63, Subpart HH. Under this rule, greater than 95 percent of the pollutants must be destroyed prior to release to atmosphere.

The typical off gas from an amine treatment system is rich in CO₂, contains substantial amounts of water, and varying concentrations of hydrogen sulfide (H₂S). These three components combine to form a corrosive gas that has a tendency to condense and form a corrosive liquid. The gas also contains a variety of hydrocarbons such as; methane, ethane, propane, butane, benzene and others, all in varying concentrations. To further complicate the abatement plan, the gas contains no oxygen. Oxygen is a necessary ingredient when “oxidizing” Volatile Organic Compounds (VOC’s).

TRITON-Series Regenerative Thermal Oxidizers are two-tower systems and all are custom engineered to your exact needs. Each system incorporates specialized ceramic media in the regenerator (heat transfer bed) to allow thermal rate efficiencies up to 97 percent, thus making TRITON Systems among the world’s most cost effective air pollution control alternative. TRITON

RTO's take advantage of our unique valve technology to deliver greater than 98 percent destruction rate efficiency. Designed around the world's most stringent emission requirements, TRITON RTO's confidently assure you of exceptional performance and reliability.

Catalytic Products International has been designing, manufacturing, and installing the world's most innovative thermal oxidizers now for more than 45 years. Throughout our long history, we have continually strived to offer the most advanced air pollution control equipment. These constant efforts have led us to the development of the TRITON-Series Regenerative Thermal Oxidizer. Each system is custom engineered to exceed all worldwide air compliance guidelines at the lowest overall costs.

DESIGN FEATURES BUILT INTO EVERY TRITON SYSTEM

Modular Regenerator Technology

TRITON RTO's are custom designed for the highest reliability with the lowest overall costs. The complete system is designed with a modular approach for the most cost-effective solution. The TRITON is supplied as a 2-tower regenerator system fitted to our EvenFlo valve manifold. This modular approach satisfies your needs for a competitive installation cost and insures that the Posi-Seal valves are properly installed and aligned prior to leaving the factory.

Posi-Seal Valves

Posi-Seal valves are designed to take advantage of a vertical axis that allows for soft seating action with self-centering guidance. The innovative feature about all Posi-Seal valves is the air tight machined seal that eliminates valve bypass and maintenance intensive gaskets. The Posi-Seal valve will be pneumatically operated and will cycle open or closed based on the program logic called for in your application.

EvenFlo Manifold Insulation

In most natural gas sweetening applications, the EvenFlo Manifolds are insulated to ensure the pollutants that enter the oxidizer remain in a gaseous state. If the process constituents should condense inside in the oxidizer, they can become a maintenance issue, or worse yet, become a hazard to the equipment. Some pollutants will condense and collect on certain surfaces inside the oxidizer, leaving a corrosive substance that is difficult to remove and may damage the equipment. Insulating our EvenFlo Manifold helps to prevent any condensation, and keeps your process air in a gaseous state.

Thermal Heat Transfer Matrix

Each TRITON system is designed around the specific ceramic heat transfer matrix recommended for the application. TRITON-Series systems can be designed using a layered structural ceramic matrix or a mix of structured and random media, depending on your application's requirements. The thermal heat transfer matrix is the key to a well designed and efficient system. With thermal

rate efficiencies (TRE) ranging from 85 percent to 97 percent you can be assured that even the lowest VOC concentrations can be economically destroyed.

FEATURES SPECIFIC FOR THE MIDSTREAM NATURAL GAS PROCESSOR

Extensive Materials Selection – Metallurgical conformity and assessment process to insure corrosion and thermally resistant materials are in used throughout the system.

Complete shop assembly – Gas plants are located in remote areas. A drop in-place installation has proven to be highly desirable. For size ranges up to 15,000 scfm this includes; media loading, pre-wiring and extensive I/O quality control that insures the control system is ready to operate.

Hot Air Recirculation – An innovative technique of introducing sufficient oxygen to maximize VOC removal efficiency – while using pre-heated air to lower operating cost – all the while helping to eliminate condensing corrosive gases from entering the oxidizer. Hot Air Recirculation uses a series of specially designed and constructed dampers to deliver a hot air source to the inlet of the RTO. The system is mounted atop the RTO to save space and arrives pre-assembled and wired for simplicity.

Hot Gas Bypass – Provides a method of controlling the RTO under high VOC conditions and insures VOC destruction is maintained without cause for high temperature shut-down.

Component Selection – API grade components are used in every TRITON System used in gas processing facilities.

Gas processors are focused on reliable, efficient operations of their plants. The modern gas processing facility understands that the gas they use in their operations is less gas they can sell downstream. Plus, recent modifications to EPA standards consider Greenhouse Gas (GHG) emissions in their inventory of emissions. Methane, the primary component in natural gas, is a GHG with a Global Warming Potential 21 times that of carbon dioxide, according to EPA.

ISSUES MIDSTREAM PROCESSORS NEED TO THINK ABOUT WHEN DESIGNING A PLANT

- Reliable VOC abatement systems
- Long lasting designs that consider the corrosive nature of the vent gas
- Safe designs that are capable of operating in remote and/or hazardous areas
- Fuel efficient to help lower processing costs, provide more product for sale, and limit GHG emissions

HIGHLIGHTS OF THE PROPOSED CHANGES IN EPA REGULATIONS

EPA published a proposed new regulation and changes to two existing regulations that are targeted at reducing air pollution emissions in the oil and natural gas industries. Here's some of the highlights of those proposed changes:

Three proposed rules/changes covering:

- Methane and VOC emission at the well-head (40 CFR, Part 60, Subpart OOOO)
- VOC and HAP emissions at processing facilities (changes to 40 CFR, Part 63, Subpart HH)
- VOC and HAP emissions at storage/transmission facilities (changes to 40 CFR, Part 63, Subpart HHH)

Subpart OOOO

- Processes affected: completions/recompletions, compressors, pneumatic controllers, storage vessels, sweetening units
- "Green completions" preferred - add-on controls allowed when green completions are infeasible
- Limits on pneumatic controller bleed rates
- Control of emissions from storage tanks of lower sizes
- Leak Detection and Repair (LDAR) requirements
- New control requirements for sweetening plants
- Extensive new monitoring, inspection, record keeping and reporting requirements

Subparts HH and HHH

- Control of small dehydration units required
- Small unit: gas throughput < 1 MM cf/day
- 0.90 Mg/year "baseline" benzene limit goes away
- Start up/shut down/malfunction exemption goes away (ie; compliance required at all times)
- If used, flares must meet EPA design standards
- More storage tanks at processing facilities must be controlled
- Extensive new monitoring, inspection, record keeping and reporting requirements

EPA history suggests that these proposed changes will be final this year.

Are you ready?

Catalytic Products International remains focused on the needs of the natural gas industry and is one of the only companies that offers a truly complete solution.