VOCSIDIZER™
Flameless Regenerative Thermal VOC Oxidation
VOCSIDIZER™

VOCSIDIZER™ RTO

The Dürr Megtec VOCSIDIZER™ regenerative thermal oxidizer features an innovative, patented design that meets most environmental regulations with remarkable energy efficiency and design simplicity. The oxidation reactions, which purify the process exhaust, occur entirely within the heat exchange media. There is no open flame and therefore none of the unwanted by-products of flame combustion.

The VOCSIDIZER combines effective VOC control with exceptional energy efficiency. Little, if any, supplementary fuel is required to sustain oxidation once initial thermal operating conditions are established. The VOCSIDIZER easily achieves thermal efficiencies as high as 98%. Even at very low VOC concentrations, the latent energy in the solvent is enough to sustain thorough oxidation.

A natural gas injection system provides supplementary fuel if needed. The absence of a burner and a classical combustion chamber, combined with its modular design, reduce capital and installation costs. In addition, the low-maintenance design provides years of trouble-free operation.

The system normally uses a forced-draft fan and fast-acting, pneumatically operated poppet valves to ensure uninterrupted, smooth operation of the process source. The advanced PLC system automatically controls temperature and flow in the reaction bed.

Simple, Innovative Design

The Dürr Megtec VOCSIDIZER uses a patented in-bed regenerative heat-exchange principle. Compared to conventional systems, there is no burner or combustion chamber, and only a single reactor instead of three. The thermal profile of the media is self-regulating and the media bed has a high heat absorption capacity to level out variations in solvent concentration.

VOCSIDIZER Regenerative Thermal Oxidizer Performance Benefits

- Exhaust Volume: 1000-110 000 Nm³/h (single unit)
- Heat Exchanger Efficiency: 95%-98% – Ensures almost no energy consumption
- VOC Destruction Efficiency: 98%-99.7% – Depending on model
- Self-Sustaining Operation: 0.7-2 g/Nm³
- CO: <50 mg/Nm³
- NOx: <5 mg/Nm³
- Complies with the strictest European legislation
- Low operating costs
- Rugged construction and simplicity ensure long life and minimum service costs
**Operating Principle**

The unit consists of a single heat-transfer bed filled with ceramic media. Plenums are located above and below the bed and serve as the inlet or outlet route for process or cleaned air. Pneumatically operated valves control the airflow direction from the forced-draft fan. The dampers periodically switch position to reverse airflow and allow thermal regeneration of the bed. A grid of electrical coils initially heat the bed to 1000°C (1832°F), but only during initial start-up.

The VOC-laden process air passes through the porous ceramic heat-exchange media. As the solvents move through the inlet side of the bed, they get hot enough to undergo thorough oxidation to water vapor and carbon dioxide. The ceramic media on the outlet side of the bed recovers the energy in the cleaned process air stream, which includes the thermal energy released during solvent oxidation.

The purified air is then released to the atmosphere. The exhaust temperature will rise due to the shifting of the temperature profile towards the outlet side of the bed.

**Reversed Bed Direction**

Airflow direction through the media bed is periodically reversed (typically 90-120 seconds) to maintain the high heat exchanger efficiency of >95%. The energy recovered and stored in one side of the bed heats the incoming process air to oxidation temperature. The system is so effective, it recovers almost all the heat required to sustain the temperature of the bed.

The exhaust temperature is typically only 20°C-50°C (68°F to 122°F) higher than the incoming process air. Destruction efficiency can be increased with an optional residual air cleaner, which treats the brief emission peaks during valve movement, when the outlet direction is reversed. The programmable logic control (PLC) system monitors the temperature profile of the bed to ensure the set-point temperature is properly maintained. If needed, supplementary fuel may be added by natural gas injection. The PLC also optimizes the frequency of valve switching to maximize energy efficiency.

**Low Operating Costs**

The VOCSIDISER offers remarkable energy efficiency. After reaching initial operating conditions, the system requires almost no additional fuel to maintain oxidation temperatures. The VOCSIDIZER achieves nominal thermal efficiencies of 95%–98%. The latent energy of the solvents sustain operation in most of the typical applications like package printing, coating, and odor destruction. At lower solvent levels, a natural gas injection system provides any needed energy. Heat recovery is a further possibility to reduce total plant energy costs.

**High VOC Destruction**

The system achieves high VOC destruction rates with none of the by-products commonly associated with flame oxidation. The non-degrading ceramic heat exchange media ensures dependable, trouble-free operation.

**Control & Reliability**

A PLC system regulates operation, ensuring dependable performance and easy operation. The forced-draft fan ensures smooth upstream process flow. To control fluctuating exhaust flow from multi-source operation, the exhaust duct is controlled to a constant negative pressure. A sensor in the main duct adjusts the process fan in a closed loop control. The variable-speed drive ensures minimum electrical energy consumption. Remote service surveillance and self-diagnostic systems are available.
Low Maintenance & Long Life

The Dürr Megtec VOCSIDIZER requires little maintenance because it has few moving parts, and is manufactured with durable materials. Only the thermocouples and dampers normally require maintenance. There is no burner to maintain. The metal-to-metal sealing poppet valves for the inlet and outlet ducts to the combustion bed offer carefree operation by eliminating the use of conventional sealing materials. The simple design, rugged construction, and advanced control deliver many years of reliable performance and emission-control compliance.

Low Installation Costs

The compact modular design and high degree of pre-assembly minimize installation time and costs. Even high-flow units can be delivered completely filled with media bed material and ready to connect to power supplies.

Applications

The VOCSIDIZER is ideal for multiple-source installations with low- to mid-level solvent concentrations, such as package printing, coating, and odor destruction.

Dürr Megtec provides a complete choice of all available VOC technologies to ensure the selection of the optimum system for each individual application.

Dürr Megtec’s approach to design and engineering ensures process compatibility, while providing effective regulatory compliance. This commitment facilitates planning, simplifies maintenance, reduces service, and lowers overall costs.

Dürr Megtec is responsible for most of the major advances in heat-set drying and oxidation technologies during the last 40+ years, and is the only company offering a complete choice of all available technologies. In addition, Dürr Megtec has unrivaled experience from 6,000+ oxidizer and 7,000+ dryer installations.

Dürr Systems, Inc.
830 Prosper Street
De Pere, Wisconsin, 54115 USA
Phone: +1 920.336.5715
www.durr-megtec.com

Subject to change. The information in this brochure contains only general descriptions or performance characteristics which may vary in actual cases. The requested performance parameters shall be binding only if they are explicitly agreed to within the sales contract. © Dürr 2020

© Dürr 2020. All rights reserved.

For more information or to contact us, visit our website at www.durr-megtec.com