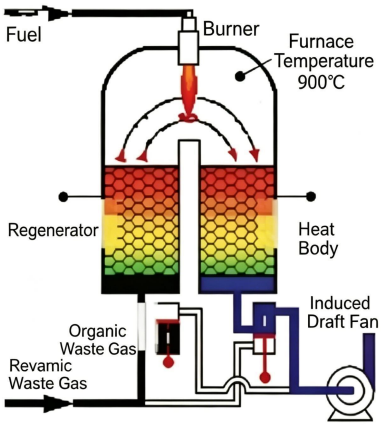
Regenerative Thermal Oxidizer (RTO)

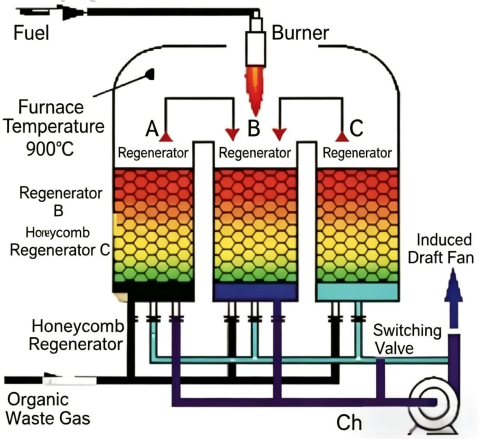
I. Working Process

Regenerative Thermal Oxidizer (RTO) is a high-efficiency energy-saving device designed for treating large-volume, low-concentration VOC exhaust gases. Its core adopts a cyclic process of "heat accumulation—heat release—purge", utilizing ceramic heat storage media to achieve heat recovery and complete oxidative decomposition of organic exhaust. The oxidation temperature can reach 800~850 ° C, with a maximum of 1100 ° C, making it suitable for stringent VOC treatment scenarios—particularly effective for processing exhaust containing corrosive substances, catalyst poisons, or malodorous gases requiring high-temperature oxidation.

Core process flow: Based on VOC emission concentration and rate requirements, a three-bed, five-bed, or rotating twelve-bed structure can be designed. The rotary RTO is equipped with twelve fixed ceramic regenerative beds. VOC exhaust gas from the production line first passes through the ceramic regenerative bed in the preheating zone, where it is heated by previously stored heat. The preheated exhaust gas enters the combustion chamber, where it is completely oxidized and decomposed into harmless carbon dioxide and water under high-temperature conditions, while releasing a significant amount of thermal energy. The high-temperature flue gas then flows through another set of ceramic regenerative beds, transferring heat to the regenerator for storage, while the gas itself cools down before meeting emission standards. Under the action of the rotary switching valve, the ceramic regenerative beds cyclically switch between the intake zone, exhaust zone, purge zone, and transition zone in sequence, with only 1/6 of the ceramic media changing airflow direction each time, effectively reducing air pressure fluctuations and minimizing impact on the front-end production line's air pressure, making it more suitable for sensitive operating conditions such as painting lines. For high-concentration organic exhaust gas (below 20% LEL), secondary waste heat recovery can be performed on the post-oxidation heat to achieve energy recycling.

Beijing Lifeng Zhitong Environmental Technology Development Co., Ltd.













II.Core Parameters

Treatment Process: Regenerative Thermal Oxidation (RTO), Heat Storage—Heat Release—Purge Cyclic Operation

Oxidation Temperature: 800 – 850℃, up to 1100℃

VOC VOC Decomposition Efficiency: ≥99% (Rotary RTO)

Heat Exchange Efficiency: ≥95%

Heat Storage Medium: Ceramic Heat Storage Media

Bed configuration: Three-bed/Five-bed/Rotary twelve-bed (can be customized as needed)

Applicable Exhaust Gas: High-volume, low-concentration VOC exhaust gas; exhaust containing corrosive or catalyst-toxic substances; odors requiring high-temperature oxidation

Applicable Concentration: Primarily low-concentration; capable of treating high-concentration (below20%LEL) organic exhaust gas

Waste Heat Recovery: Heating of thermal oil, steam, hot water, or hot air (filterable for direct reuse)Control Method:Automatic cyclic control with precise regulation by the rotary switching valve; compatible with upstream production line conditions

III. Operating Instructions

1. Startup Preparation: Check the integrity of the ceramic heat storage media, combustion chamber sealing, rotary switching valve condition,waste heat recovery system, and control system. Confirm all components are normal with no leaks or damage. Check the fuel supply (if applicable) and fan operation to ensure startup conditions are met.

2. Startup Operation: First, start the preheating system to raise the combustion chamber temperature to the set oxidation temperature (800 – 850℃).Once the temperature stabilizes, open the exhaust inlet system to ensure exhaust flows evenly into the heat storage beds. Start the cyclic switching program to enter normal operation.

3. Operational Monitoring: Monitor key parameters in real time: combustion chamber temperature, heat storage media temperature, exhaust inlet/outlet concentration, and system air pressure.If abnormal temperature, excessive air pressure fluctuation, or reduced decomposition efficiency occurs, promptly adjust operating parameters or shut down for inspection. For high-concentration exhaust, activate waste heat recovery system and make rational use of recovered heat.

4.Daily Maintenance: Regularly clean ash inside the combustion chamber and debris on the ceramic heat storage media surface to prevent blockages affecting heat exchange efficiency. Inspect the rotary switching valve sealing and replace worn parts promptly. Periodically inspect the waste heat recovery system piping to ensure smooth heat recovery. Regularly calibrate the control system for precise and reliable cyclic switching.

5. Safety Precautions: During operation, do not disassemble the combustion chamber, heat storage beds,or piping. Open flames are strictly prohibited near the equipment. Strictly control the combustion chamber temperature to prevent overheating damage. Exhaust concentration must be kept below20%LEL to avoid safety hazards. During

shutdown, first stop the exhaust inlet; wait until the combustion chamber cools to a safe temperature, then close all systems.

IV. Product Advantages

1. Complete Decomposition, Guaranteed Compliance: High oxidation temperature (800 – 1100℃), VOCVOC decomposition efficiency ⩾99%,heat exchange efficiency ⩾95%; exhaust emissions fully meet environmental standards, satisfying strict VOCVOC emission concentration and rate requirements.

2. Energy-saving and efficient operation: Utilizing ceramic heat accumulators to recover heat generated from exhaust gas decomposition, preheating the incoming exhaust gas, significantly reducing energy consumption; high-concentration exhaust gas enables secondary waste heat recovery, further enhancing energy utilization and lowering operational costs.

3. Wide Adaptability, Broad Application Scenarios: Capable of treating high-volume, low-concentration VOCexhaust gas, while also compatible with exhaust containing corrosive,catalyst-toxic substances and odors requiring high-temperature oxidation—especially suitable for coating lines and applications sensitive to upstream air pressure conditions.

4. Stable Operation, Minimal Impact: The rotaryRTORTO switches smoothly, with only a small amount of ceramic media changing the airflow direction each time, effectively reducing inlet/outlet air pressure fluctuations, minimally affecting upstream production line pressure, ensuring continuous production.

5. Long service life and convenient maintenance: The ceramic heat accumulator is resistant to high temperatures and corrosion, ensuring a long service life; the equipment features a mature structure with daily maintenance mainly involving cleaning and inspection, offering simple operation and long-term stable performance.

V. Applicable Industries

Widely applicable for high-volume, low-concentration VOC VOC exhaust treatment scenarios, covering coating, printing, electronics, plastics processing, chemicals, petroleum/petrochemicals, furniture, packaging, rubber, and pharmaceuticals—especially

for low-concentration organic exhaust gases such as spray booth fumes, printing ink exhaust, solvent vapor, chemical raw material exhaust, and plastic molding exhaust.It can also handle special conditions involving corrosive, catalyst-toxic substances and odors requiring high-temperature oxidation.It is the efficient, preferred solution for in-depth industrial VOC VOC exhaust treatment.

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