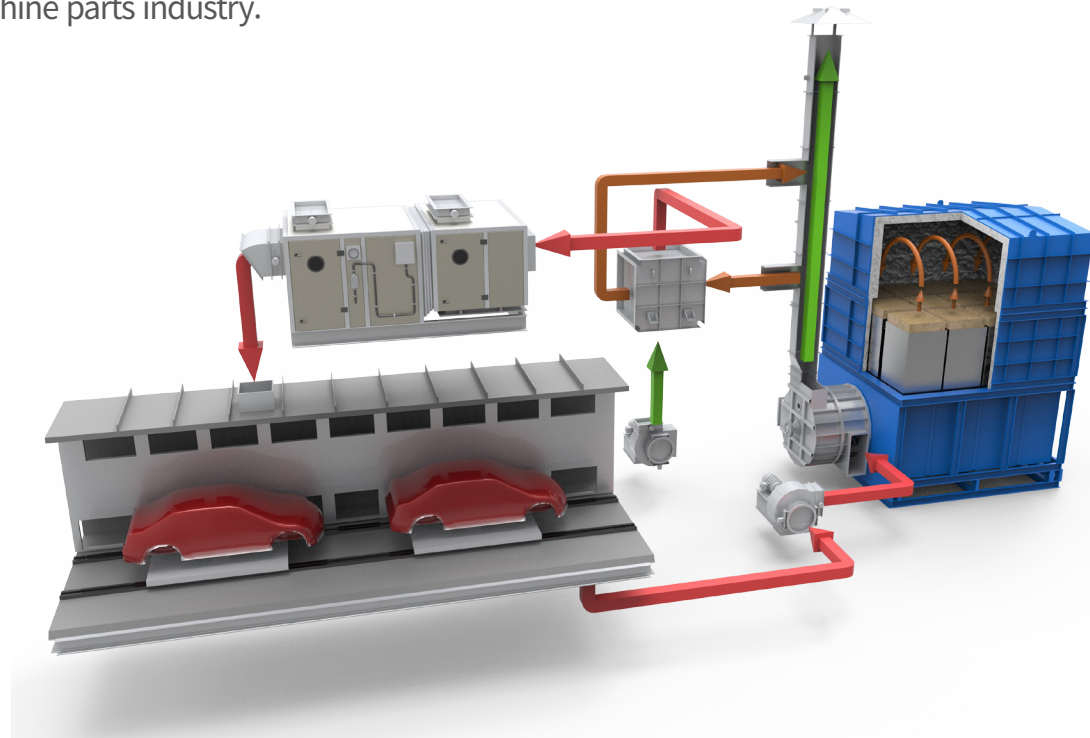




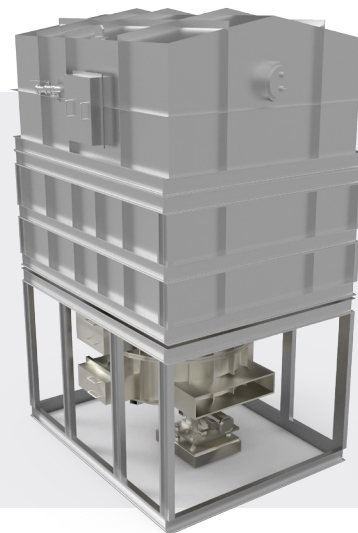
SANG WON

Sang Won Machinery Co., Ltd. started its business by localizing and supplying plant equipment for the automotive industry and is Korea's representative company that provides eco-friendly + energy saving plant equipment to automotive plants and the machine parts industry.

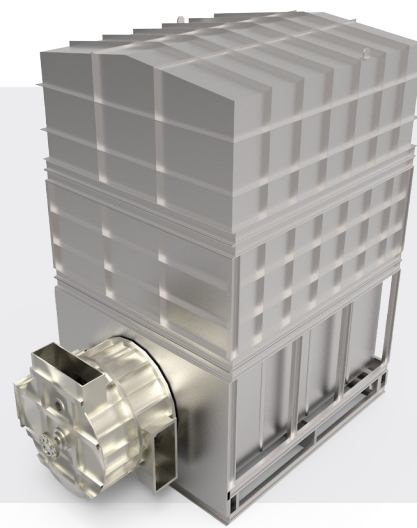


What is RTO System?

- Oxidizes VOCs (Volatile Organic Compounds) generated during the painting and drying process at temperatures higher than 800°C.
- It is highly efficient, energy-saving equipment that recovers waste heat by using the thermal mass after the oxidation process.



Vertical type



Horizontal type

Advanced RTO System

Horizontal rotor distributor type regenerative thermal oxidation system for 'saving energy' As the only RTO design with a horizontal rotor distributor, it has acquired invention patents in Korea, US, Japan, and China

By performing R&D on the horizontal rotor distributor type regenerative thermal oxidation system (Advanced RTO) since 2002 with the support of the Ministry of Environment, R&D was completed in 2004. This is our company's unique technology that has been formally certified as the No. 91 New Environmental Technology by the Ministry of Environment (acquisition of NET Mark). By supplying our products for exhaust gas treatment in the painting/coating line of domestic automotive plants, our Advanced RTO System and VOC Concentrator were exported to the Gravure Printing Drying Line of TOKKA Co., Ltd. in Saitama, Japan, together with our Japanese partner, SWC Japan in 2006, and from that, exportation to countries around the world, including Japan, Russia, India, Canada, Mexico, and China is gradually on the rise.



900 Nm3/min
(RTO)

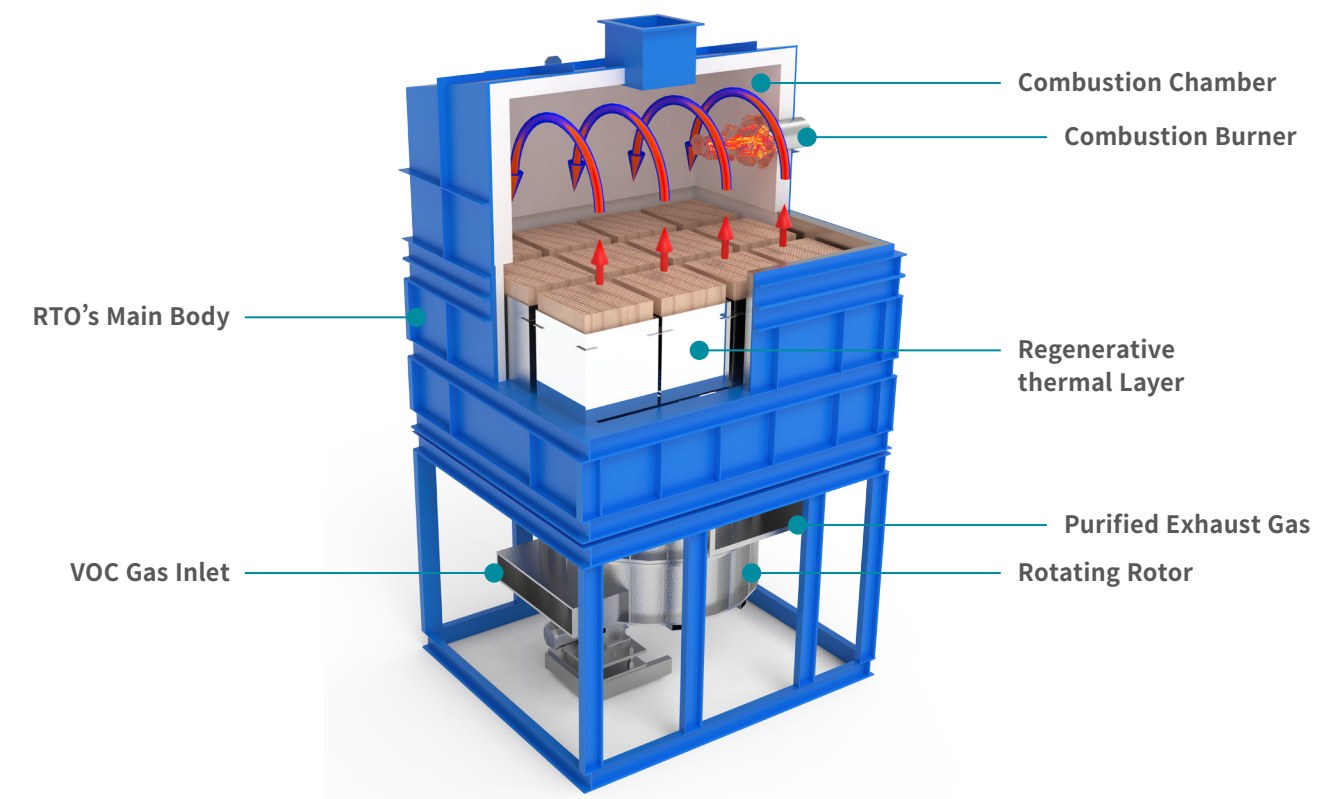


5000 Nm3/min
(Concentrator + RTO)



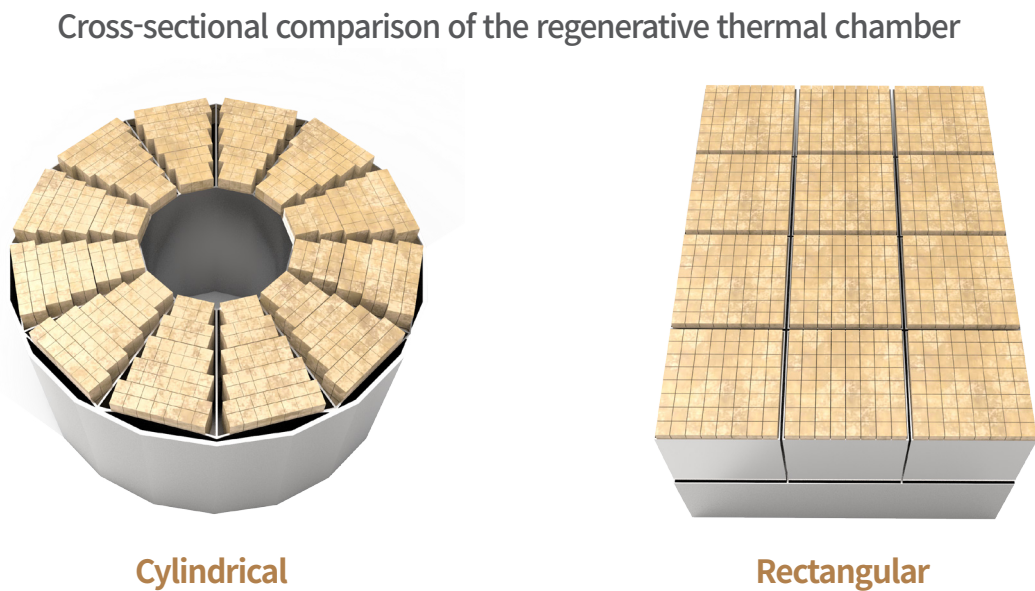
7700 Nm3/min
(Concentrator + RTO)

Composition of Vertical Type RTO System



Features and Advantages of Vertical and Horizontal Type RTO Systems

The 'Vertical rotor distributor type cylindrical RTO' based on foreign technology has several disadvantages: the equipment is large and inefficient due to its dead space, the operating cost (including energy/subsidiary fuel and power) is excessive, and the installation space is limited. In order to make up for such disadvantages, the 'Vertical, horizontal distributor type rectangular RTO' was researched and developed. Moreover, the main component, the 'Vertical, horizontal type of rotor', was developed and installed at the bottom outside the equipment for convenient dismantling and assembly, as well as for easy maintenance. By securing outstanding heat resistance, durability, and air tightness, a semi-permanent lifespan is assured. By securing operation in empty space (baking in zero-load status), it enables hot air flow cleaning for blockages caused by foreign substance in the beehive-shaped ceramic thermal mass, which acts as a heat exchanging medium, ultimately enhancing the reliability of the system. In addition, the rotor for high temperatures between 200~300°C is being developed so that its application can be expanded to wider industries, such as the high temperature coating industry, which releases high temperature exhaust gas. Therefore, we would be able to propose all types of RTOs, such as low temperature/high temperature, vertical/horizontal type RTOs, and low horizontal rectangular RTOs, according to the unique demands of users.



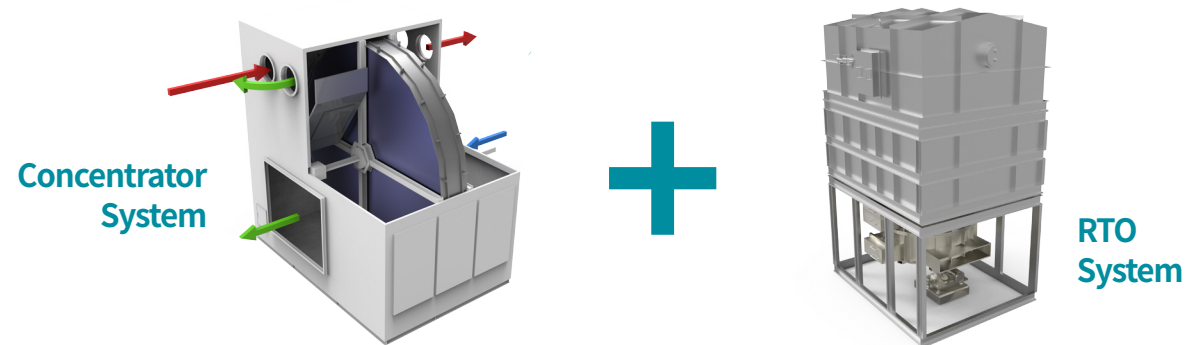
Flexibility of the Vertical and Horizontal Type RTO System Design, which can be installed in various spaces

Acquired invention patents for related series: 7 in South Korea, 1 in USA, 1 in Japan, 2 in China

- Offers highly efficient 95~99% VOC/odor removal and higher than 94% heat energy recovery rate
- Outstanding space utilization and on-site adaptability with a flexible installation area, height, and direction control
- Enhanced economic feasibility with downsized equipment due to minimized dead space and reduced installation space, as well as greater than 30% operating energy being saved.
- Saves maintenance costs while assuring reliability with the Rotor and Metal Seal with outstanding durability and air tightness.
- Fuel costs can be saved by recovering waste heat.
- Zero-fuel operation is possible if the concentration of the incoming VOC is 1.5~2g/Nm³.
- With the application of the HMI/Touch Screen System, the temperature, pressure, equipment faults, and the like are saved in real-time, and the integrated management and operation system facilitates easy searching.

VOC Concentrator + Advanced RTO System

The energy-saving vertical and horizontal type RTO system equipped with a VOC concentrator utilizes concentrated VOC gas as substitute source of energy.

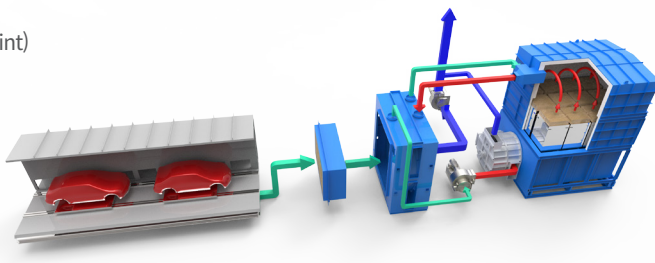


Features and Advantages

- It is the most cost effective system for burning and removing concentrated VOC gas with Advanced RTO by absorbing low concentration VOC gases/odors below 50°C with the VOC concentrator, and then desorbing/regenerating them.
- The size of the RTO equipment becomes smaller depending on the concentration ratio more than 5~12 times the exhaust VOC gas quantity,. The highly concentrated VOC gas is used as a replacement subsidiary fuel, and the waste heat from the exhaust can be reused as energy for Dry Ovens or Boilers.
- Outstanding on-site applicability by minimizing installation space, along with flexible installation area, height, and directional control.
- Stable system guaranteed in terms of variable VOC gas quantity and concentration.
- Saves maintenance costs while assuring reliability with Rotors and Seals with outstanding durability, heat resistance, and air tightness.

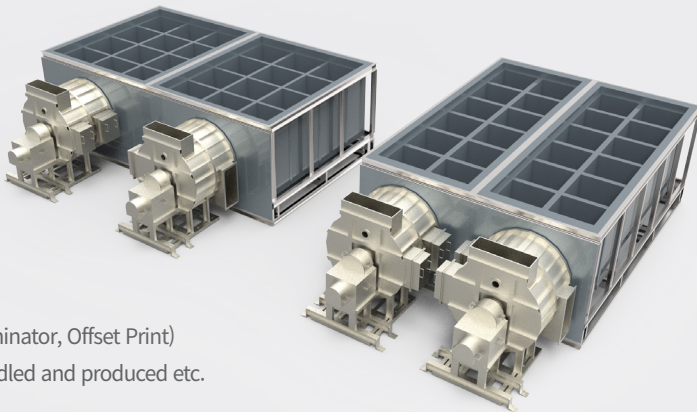
Application Fields

- Printing industry (Gravure, Dry Laminator, Offset Print)
- Painting industry
- Semi-conductor industry
- Pharmaceutical industry
- Paper/Wallpaper industry
- Waste treatment industry etc.
- Coating industry
- Chemical industry
- Food industry
- Textile industry



Application Fields

- Painting industry
- Semi-conductor industry
- Coating industry
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- Paper/Wallpaper industry
- Textile industry
- Food industry etc.
- Waste treatment industry
- Printing industry (Gravure, Dry Laminator, Offset Print)
- All businesses where VOCs are handled and produced etc.



Green Dry Oven

Energy Saving Dry Oven without Air Pollution

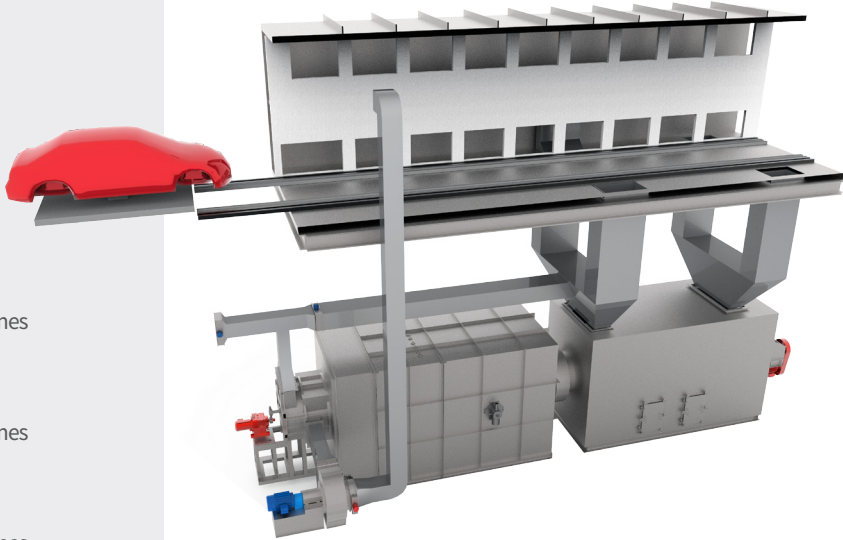
Sang Won Machinery Co., Ltd. successfully completed research and development of the Green Dry Oven, which is a dry oven that has evolved into an energy-saving type oven without air pollution with the support of the Ministry of the Environment. Our company's unique, advanced heat recovery technology, called 'Vertical and Horizontal RTO' technology, was applied to the design and development of this Green Dry Oven. We look forward to positive responses and orders from those in the painting, coating, and printing industries.

Types

- Conveyor Green Dry Oven
- Batch Green Dry Oven

Application Fields

- Painting industry: Remodeling/upgrade of newly constructed lines and existing dry oven lines
- Coating industry: Remodeling/upgrade of newly constructed lines and existing dry oven lines
- Printing industry: Remodeling/upgrade of newly constructed lines and existing dry oven lines



Characteristics and Advantages

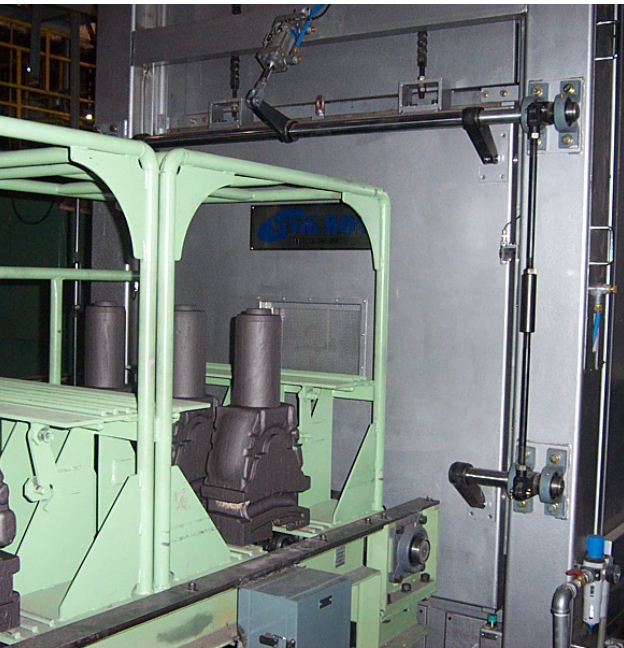
- Hybrid module type drying oven with integrated horizontal RTO + hot air blower
- Offers high performance and greater than 35% energy savings
- Offers high efficiency and a compact system without air pollution (minimal discharge)
- Reduces production cost and enhances productivity
- Can be applied to a newly constructed drying oven line and notably can be applied to remodeling/modification for upgrade and improvement of existing drying oven lines
- Maximized installation space with flexible system design enabling the area, height, and direction to be adjusted
- Semi-permanent components guarantee reliability and affordable maintenance cost
- Horizontal Rotor-RTO can be maintained conveniently as key components are mounted externally
- Highly reliable 95~99% VOC/odor removal efficiency and greater than 94% of heat energy recovery



Microwave Dry System

Energy Saving + Eco-Friendly Microwave Drying System

In 2000, Sang Won Machinery Co., Ltd. successfully completed the pilot scale system for localization, research, and development of industrial microwave dryers as governmental energy saving research tasks. Following such, in 2002, we successfully supplied 400 Kw large capacity products to an automotive material plant. Thanks to the customer's support, we have become Korea's representative manufacturer and supplier of eco-friendly + energy-saving microwave drying systems.



Microwave Drying Technology using Dielectric Medium Heating

If microwaves are applied to the inner aspect of the dielectric medium, bipolar rotation oscillations occurs inside the dielectric medium/ molecules, and heat is created by its friction. As internal heating at the inner aspect of the substance, water's export/expansion from the inner aspect to the surface is rapid and the conversion into heat energy is highly efficient, so perfect drying can be achieved in a short period of time. The problems of surface contraction ~ surface hardening ~ cracks ~ residual moisture ~ bubble defects have all been significantly improved, and this is a technology that is widely used in the drying process of various industrial fields which require enhanced productivity and a more pleasant and safe environment.

Features and Advantages

- Significantly less time, enhanced productivity, and energy-saving effects compared to the hot air/gas drying method.
- Color is maintained, perfect high quality drying/enhanced quality through selective heating of moisture inside the object being dried.
- Eco-friendly dryer that offers a safe and pleasant environment with minimized noise/exhaust gas/heat loss in the external wall.
- Does not require a separate cooling process as the surface temperature of the product during transportation immediately after drying is low.
- Optimized cycle time and convenient control concerning the product type/size and production quantity.
- Convenient opening and maintenance, reduced installation area (Less than 1/4 the area of the conventional general dryer).

Application Fields

- Foundry core dry lines of automotive plants
- Drying/sterilization of food and medicine
- Various material drying
- Drying/heat treatment of textile and wood
- Ceramic drying
- Drying of paper/printing and semiconductor industries
- Rubber and plastic industries



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