airprotech

Environmental

Air Protection Technology

Member of Deurotech Group

Since 1995, **Airprotech** is globally active with a wide range of solutions and products for the purification of industrial emissions, including VOC (volatile organic compounds), VIC (volatile inorganic compounds), aerosols, mists, odours and dust.

Due to the large experience in different application fields, the specific know-how and the global presence, **Airprotech** is one of the market leaders for the design, manufacturing and turnkey supply of exhaust gas purification systems and environmental technologies for air pollution control.

Customized Solutions from a Single Source

R&D:

Airprotech constantly improves plant performance and energy efficiency to comply with the newest environmental standards and to reduce the operational as well as the maintenance costs of the systems.

Engineering:

More than 25 years of experience in the design of air purification technologies and customized solutions make **Airprotech** a perfect partner for special applications.

Specialized Workshops:

In-house fabrication of plants with efficient project management and reduced lead time, assuring best performance and highest quality standards.

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Erection on Site:

Experienced internal staff in charge of the on-site operations simplify and minimize activities as well as guarantee reliable results.

Commissioning and Start-up:

Plant tests carried out by skilled process technicians for the start-up of the plant and training of our customer's staff.

After Sales Service and Remote Assistance:

Highly qualified service technicians and technical support during the entire life cycle assure that customers can operate their plants efficiently.

Scrubbers and Washing Towers

Scrubber Solutions may only be with water for water-soluble substances or solutions with reagents that specifically target certain inorganic compounds to be neutralized. The design of the plant and the choice of the chemical reagent depends on the substances contained in the gas to be purified.
To create an appropriate contact surface, where the transfer of the pollutants to the absorbent liquid can take place, the washing towers are equipped with perforated plates or filling material. Gas absorbers are filled with random and structural packaging, based on the specific technical requirements of the application. The scrubbers may be one- or multi-stage towers, depending on the nature of the substances and the number of reagents necessary for the absorption of the pollutants in the exhaust stream.

Venturi Scrubber is a high performance wet dedusting system for fine dust and aerosols. Venturi Scrubbers consist of a Venturi column and a scrubbing separator. In its middle section the Venturi column has a reduced diameter: the throat section. The inlet process gas enters the converging section and, as the area decreases, the velocity of the gas increases. The difference between the high-velocity gases and the free-flowing liquid allows the creation of droplets, by capturing and separating the dust through the surface of the droplets. Upon entering the separator downstream of the Venturi Scrubber, the separation from the gaseous phase takes place.

Venturi Scrubbers

Gas and Liquid Incinerators

Incinerators destroy the pollutants through thermal oxidation at high temperatures. Waste gas, waste liquid or a combination of liquid and gaseous waste are directly conveyed into the combustion chamber. The standard layout is composed of a combustion chamber, a waste heat recovery boiler and a dust collector. A pre-heating of the combustion air can be provided to increase the thermal efficiency of the system, reducing the gas consumption.

The waste gas is sent to the incinerator through a fan, while the liquid waste can either be directly injected into the combustion chamber or used as fuel for the burner. This process is achieved by using an atomized lance with a wide diameter nozzle to limit the possibility of clogging

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Incineration provides a safe option for the destruction of liquid and gaseous waste as well as the recovery of process heat generated to produce hot water, thermal oil, hot air or steam. Each incinerator plant is customized to our client's needs. Especially with respect to our customer's waste management, ensuring savings on transportation, simplifying the handling of waste and increasing the waste reduction efficiency.

Catalytic Oxidizers

Based on a catalytic oxidation reaction, the cleaning of the process gas is carried out at low temperatures using a high-performance base-metal and precious-metal catalysts, which leads to considerable energy and cost savings. **Airprotech** designs Catalytic Oxidizers with different configurations that satisfy customer requirements: catalyst material can be installed in pellets or honeycombs with integrated heat exchangers, using the heat of purified air to pre-heat the exhaust gas which is being treated or to provide heat to the production facility for different services. Properly sized Catalytic Oxidizers guarantee high performances for the oxidation and the reduction of several polluted compounds.

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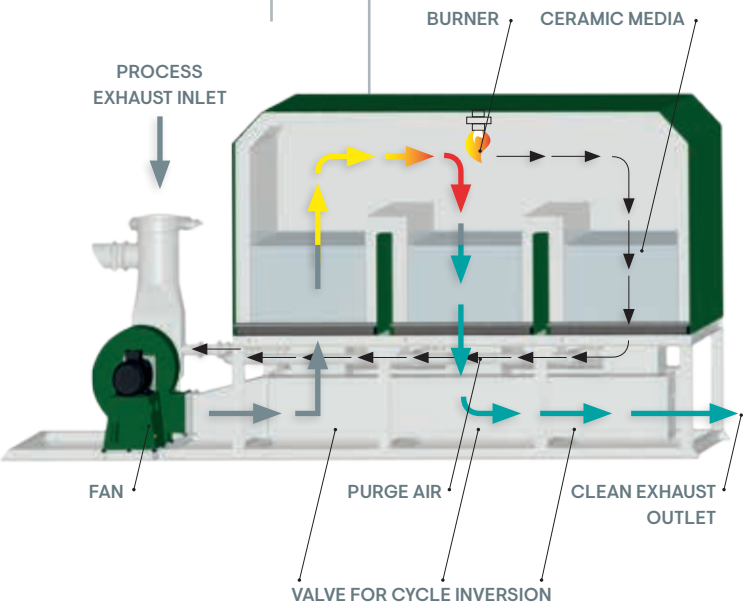
A catalyst is used to reduce the reaction temperature and therefore the energy consumption. This allows the oxidation process to be performed at lower temperatures between 300°C and 500°C, which leads to considerable energy and cost savings.

Regenerative Thermal Oxidizers

Regenerative Thermal Oxidizers are based on highly efficient thermal processes with a regenerative heat exchanger composed of beds of ceramic material which operate as “pre-heater” and “recovery” of heat according to the direction of the airflow.
The thermal recovery is up to 97% and the heat produced by VOC oxidation allows the plant to work in auto-thermal mode, without additional fuel, which results in a significant reduction of the energy consumption of the plant. Regenerative Thermal Oxidizers can achieve a purification level of over 99.8%. Therefore, it is the ideal solution for almost all industry sectors, as well as for the abatement of unpleasant odour.



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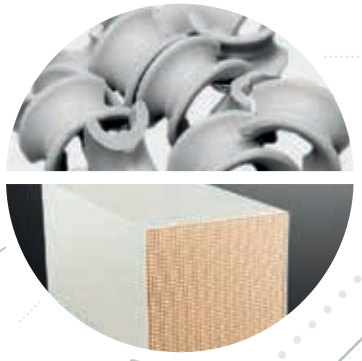

The **Airprotech** technology is characterized by low operating and maintenance costs, with different configurations according to the specific applications:

- RTO 2 chambers with an optional compensation chamber
- RTO 3-5-7 chambers according to the gas volume

Recuperative and Direct Thermal Oxidizers

Direct Thermal Oxidizers are composed of a main combustion chamber for the thermal oxidation of pollutants at high temperatures. Recuperative Thermal Oxidizers have an integrated heat exchanger to recover the heat from purified gas to pre-heat the exhaust gas inlet to the plant. The efficiency of the heat recovery can reach up to 65% reducing the amount of energy required by the system. Before releasing the hot cleaned air into the atmosphere, any residual heat can be used by a downstream heat recovery system. This allows the plant to produce hot water, thermal oil, hot air or steam based on the quantity and heating value of the pollutants.

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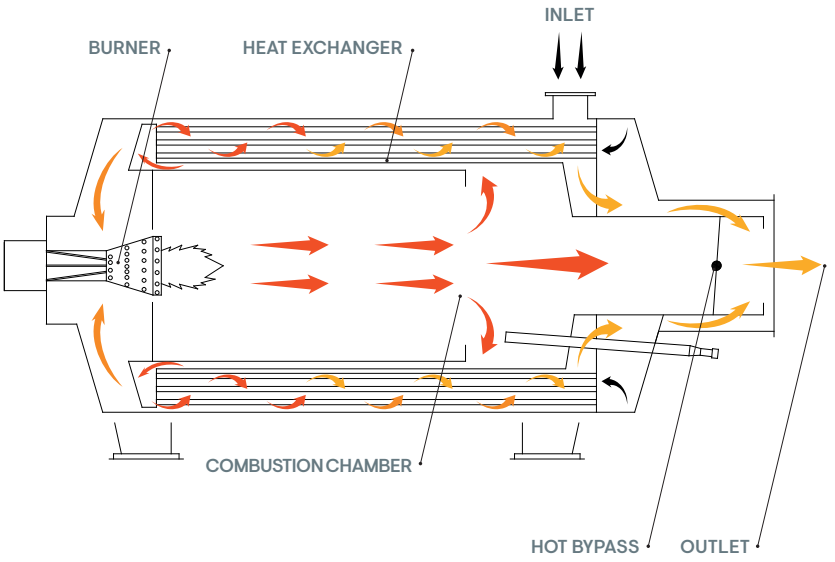
The recuperative thermal oxidation process is particularly cost-effective, when the energy extracted from the cleaned gas by the downstream heat recovery system can be reused in the production process.



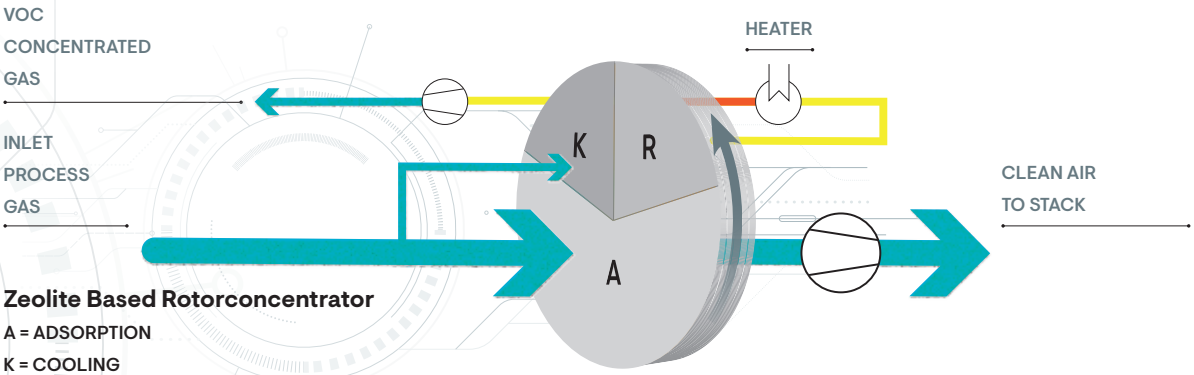
Systems for Halogenated Compounds

Thermal and catalytic oxidation can be applied to the treatment of halogenated organic compounds. When halogenated hydrocarbons such as chlorine, bromine and fluorine are components of the process gas, the oxidation plant requires special considerations due to the variability of the sources.
Intermittent emissions with different concentrations of polluted compounds can cause the creation of acids during the reaction process, due to the low temperature combustion of these hydrocarbons. These systems for the treatment of halogenated compounds are integrated with washing towers downstream of the oxidizer for the absorption of the acids produced by the oxidation. **Airprotech** supplies customized systems designed at the requirements of our customers for each specific production process.

Airprotech assures the high destruction efficiency of pollutants in a safe and controlled environment, ensuring an effective combustion chamber temperature and residence time suitable for the complete oxidation of halogenated compounds. In addition, specialized engineering of **Airprotech** plants ensures high reliability and resistance to aggressive substances over time.

VOC Rotor-Concentrators

Zeolite-based VOC Rotor-Concentrators are suitable for high flow rate of process gas with low inlet concentration of pollutants. The organic compounds in the process gas are concentrated by adsorption in the zeolite-based Rotor-Concentrator, while the cleaned airflow is sent directly to the exhaust stack in compliance with legislation emission limits. The pollutants concentrated in the rotor-concentrator are released from the rotor by a small, heated air stream and treated by an oxidizer with reduced size. The aim of a Roto-Concentrator is to send the oxidizer an airflow up to 20-times lower than the initial volume to be treated with a sufficient VOC concentration while allowing the process to be auto-thermal with a significant reduction of the operating costs of the system.



Zeolite Based Rotorconcentrator

A = ADSORPTION
K = COOLING
R = DESORPTION

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SCR DeNO$_x$ Plants

Nitrogen oxides NO_x are removed by a Selective Catalytic Reduction composed of an active catalyst operating in combination with injected ammonia or urea into the process gas. This converts the nitrogen oxides (NO and NO_2) to nitrogen (N_2) and water (H_2O). The required performance can be achieved at low temperatures, supporting the overall energy reduction program of the facility.

Airprotech supplies plants for the reduction of NO_x generated by several industrial applications for energy production, as co-generation plant, or downstream a thermal oxidizer.

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During the adsorption process pollutants are adsorbed on a solid surface - in this case, activated carbon.
Among the different purification processes, adsorption with activated carbon is effective when you need to remove traces or small quantities of substances contained in gaseous streams.

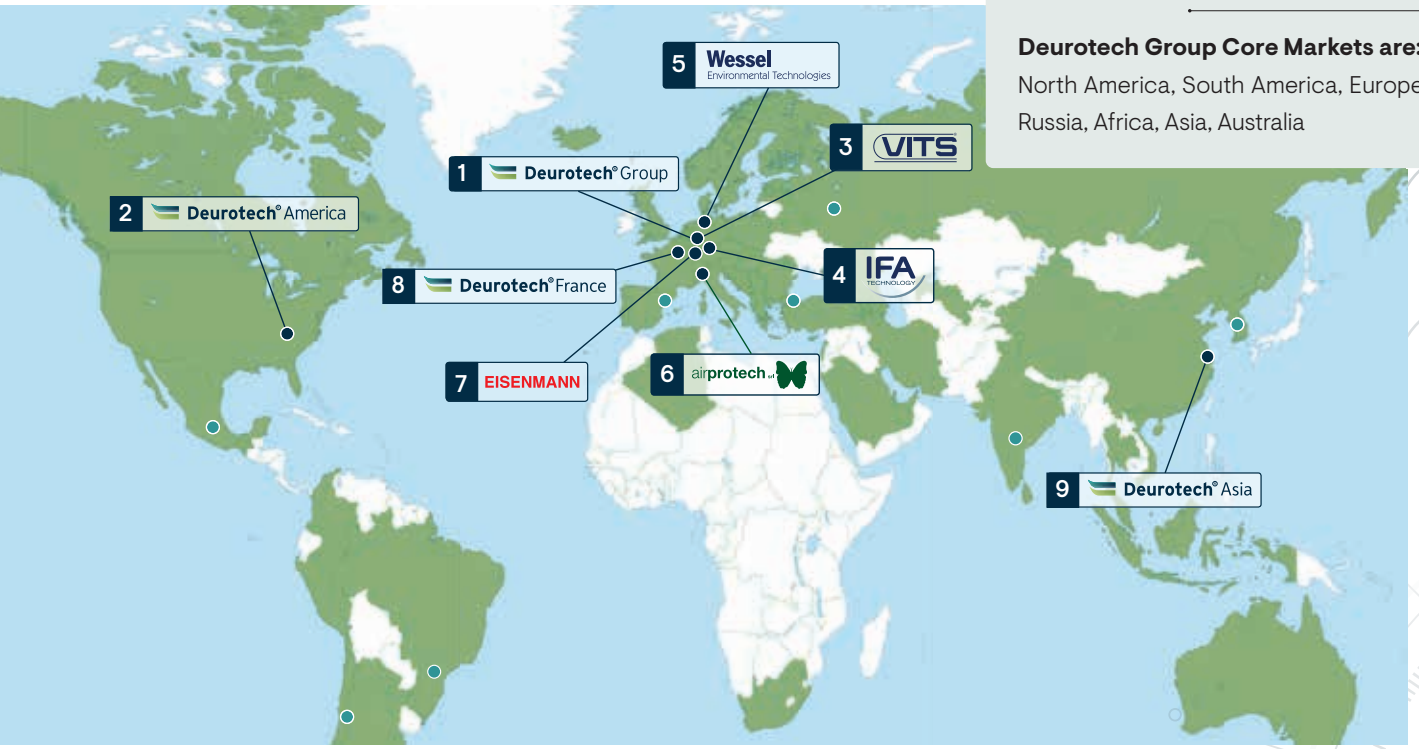
Under specific conditions of high mono- or bi-solvent concentration, the use of activated carbon is suitable for the internal regeneration process after being saturated with organic substances.
The VOCs can be desorbed and recovered through a specific cleaning system with direct steam or inert gas injection.

Adsorption on Activated Carbon Plants

Deurotech Group

Airprotech is a member of the **Deurotech Group**, a partnership of international machinery and plant engineers specialized in the wood-based panels and paper industry. Together with the companies **Vits Technology**, **IFA Technology**, **Wessel-Umwelttechnik** and **Eisenmann Environmental Technology** we offer coordinated process technologies from a single source: impregnation and coating lines, systems for resin production and preparation as well as for exhaust air purification and energy recovery.

Partnering for Efficiency



- **Deurotech Group and Companies**
- **Deurotech Group Agencies**

Deurotech Group Core Markets are:
North America, South America, Europe, Russia, Africa, Asia, Australia

Our Partners for Biological Exhaust Air Purification & Energy Recovery Plants as well as Thermal Oxidation, Water Purification & Wastewater Treatment

Wessel-Umwelttechnik GmbH is one of the leading specialists for biological air treatment, heat recovery and all other aspects of exhaust air cleaning.
Based on long-time know-how and international experience, **Wessel** engineers, projects and designs exhaust air cleaning and turnkey plants for various environmental tasks and different industries.
Wessel is mainly focused to develop plants with high operational safety and reliability.

Eisenmann Environmental Technology GmbH has been a reliable and competent partner in the industry for more than fifty years when it comes to the development and design of energy-efficient and resource-saving plants for exhaust air purification, heat recovery and wastewater treatment.
Eisenmann also has extensive know-how in complex waste disposal with recycling and is recognized specialist in the field of ammunition disposal and chemical weapons destruction.

Wessel
Environmental Technologies

EISENMANN
Environmental Technology

Emissions of gaseous Pollutants

Our other Product Categories:

Biogas & Bioenergy
Oil & Gas
Aluminium & Metals

ISO 9001
UKAS
Certificate nr. 6886

Our activity

Volatile Organic Compounds

- Thermal Oxidizers:
  - Regenerative Thermal Oxidizers
  - Recuperative Thermal Oxidizers
  - Direct Thermal Oxidizers
- VOC Rotor - Concentrators
- Gas and Liquid Incinerators
- Adsorption on Activated Carbon Plants
- Venturi Scrubbers
- Biofilters and Bio Scrubbers
- Condensation Plant
- Catalytic Oxidizers
- Systems for Halogenated Compounds
- Gas Venting and Flares
- Oil Recovery from Aluminium Rolling
- Coalescent Filters

Inorganic Compounds

- Scrubbers and Washing Towers
- Venturi Scrubbers
- Biofilters and Bio Scrubbers
- Adsorption on Activated Carbon Plants
- SCR DeNOx Plant

Dust and/or Aerosols

- Scrubbers and Washing Towers
- Venturi Scrubbers
- Baghouse Filters
- Cartridge Dust Collector
- Cyclones
- Coalescent Filters

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