

**LEADING IN  
PRODUCTION  
EFFICIENCY**

[www.durr.com](http://www.durr.com)



WHITE PAPER

# **Industrial air pollution control**

**Technologies and applications**

# Environmental technologies

## Technological expertise with global availability

From the power loom to the modern factory. From the steam engine to the electric car. Beginning with the Industrial Revolution, recent centuries are synonymous with progress, as well as scientific and technological achievements. But, with increasing world population and the democratization of consumption, comes an increasing need for manufactured goods. No matter how small or unimportant goods might seem, during the fabrication process, almost every item consumes resources and produces pollutants and emissions that are harmful to the climate and environment. Thus, the main goal of the global economy is to reduce those pollutants and emissions and to become climate neutral – thereby making sustainable technologies the biggest challenge of modern society.

### ENVIRONMENTAL TECHNOLOGY AT DÜRR

For more than 50 years, Dürr has been contributing to this goal by developing state-of-the-art systems that dispose exhaust of gases and residues efficiently, reduce energy consumption, and guarantee highly reliable processes. Environmental technologies have been responsible for the environmentally friendly and cost-effective disposal of pollutants in a wide range of industries. Dürr supplies high-quality, complete solutions from planning through implementation and servicing. As a system partner, Dürr combines technological expertise with global availability to support its customers throughout the world.



Picture 1: Application of Oxi.X RM RTO in North America

### PRODUCTS FOR MANY INDUSTRIAL SECTORS

The chemical, food and wood industries: at first glance they don't have that much in common. However, what unifies them is the fact that all of these industrial sectors produce environmentally hazardous substances. Air pollution control is the process of removing these substances before they are released into the atmosphere. This works in four different ways, explained in the section below.



Picture 2: Compact and pre-installed RTO Oxi.X RK

# Product portfolio

## Wide range of suitable solutions



### Oxi.X – Thermal processes:

The thermal processes are based on the separation principle and use combustion to remove pollutants from exhaust air. In all cases in which pollutants cannot be collected for potential re-use respectively recovered, these VOCs have to be destroyed. This involves converting the pollutants in exhaust air into non-hazardous substances at specific temperatures, which allows the air to be purified. Typical applications are regenerative thermal oxidizers, recuperative thermal oxidizers and direct-fired thermal oxidizers.

### Sorpt.X – Sorptive processes:

If the exhaust air comes into contact with a medium that the pollutant dissolves in more effectively than air, the pollutant moves into the medium and the clean air can be discharged from the system. The absorption and adsorption processes differ significantly in the way they function.

Adsorption is used for concentrating the pollutants. After this, pollutants still have to be removed from the exhaust air by another system. Sorptive systems are also able to recover solvents by highly efficient distillation. By contrast, absorption removes pollutants from the exhaust air. It is generally used for cleaning flue gases.

### Part.X – Separation processes:

Dürr delivers environmental technologies to manage emissions of VOCs/HAPs,  $\text{NO}_x$ , acid gasses, acid mists, and particulate control. A strong heritage of technical development and innovative solutions enables Dürr and Dürr Megtec to provide consistently reliable and energy-saving systems for new or upgrade, simple or complex or large or small projects covering a wide spectrum of industrial applications.

A complete engineered systems approach could include wet or dry electrostatic precipitators, wet scrubbers, venturi scrubbers, distillation equipment and purification by distillation systems, as well as oxidizers to help ensure environmental compliance. Dürr delivers technologies that handle VOCs, odors, acid mists, mercury,  $\text{NO}_x$ , particulates, and other emissions.

### Cat.X – Catalytic processes:

To understand the operating principle based on the catalytic process, it is important to explain what a catalytic system is.

Catalytic processes always involve the use of a catalyst. The task of the catalyst is to reduce the amount of activation energy needed to achieve a reaction. Dürr uses catalysts for oxidation processes and for reduction processes.



Picture 3: RTO technology for efficient air pollution control

# Product portfolio

## Wide range of suitable solutions

### SMELLS LIKE COFFEE AND MEDICINE

Who doesn't love the smell of a freshly brewed cup of coffee? Unfortunately, it doesn't always smell that pleasant. During roasting, coffee beans release more than 800 volatile substances and  $\text{NO}_x$  emissions, which produces strong odors. Odor emissions like these, which are specific to certain products, can be a long-term problem for residents and employees. Smells produced by other industries, such as rubber manufacturing, are often linked in our minds with substances that are harmful to our health. In these cases, minimizing the odors is particularly important, in addition to controlling the air pollution.

Processes, such as tablet manufacturing, can offer multiple applications for air pollution control. Both the tablet coating and packaging manufacturing processes require several air pollution control steps. Inks made with solvents begin emitting solvent-laden exhaust air the moment they are manufactured in ink and paint factories, and this continues when they are mixed on site. And, finally, when they are used to print and varnish the packaging. Most packaging is additionally refined with a paint coating or by combining several dissimilar materials into a composite. For example, aluminum foil is affixed on the plastic blister packaging in this lamination process.

# Air pollution control for many industries



# Emission reduction with Dürr

Proven partner for air pollution control



Picture 4: Combination of Dürr Part.X and Oxi.X technology in the wood products industry

## RTO AS AN ALL-ROUND PROBLEM SOLVER

In both production processes mentioned before, regenerative thermal oxidation is applicable. During regenerative thermal oxidation, exhaust air contaminated with organic pollutants is fed through a regenerative heat exchanger with an extremely large surface area. The exhaust air heats up, emerging from the heat exchanger at a temperature close to the required reaction temperature. Nearly all of the pollutants are then converted into harmless substances in the downstream combustion chamber. The purified production exhaust air is now fed through another heat exchanger, where it releases more than 95% of its thermal energy and completes the regenerative circuit.

Energy-efficient technologies achieve a purification level of more than 99 % while keeping operating costs down. Additional heat recovery options can cycle energy from the oxidized pollutants back into the production process for drying and heating, providing the added benefit of air pollution control as an energy source. Low-maintenance, flexible Oxi.X RTO systems from Dürr are suitable for a host of different applications and designed to run reliably at low operating costs year after year.

## A PROMISE TO ITS CUSTOMERS

Building on a decades-long track record in environmental technologies, Dürr continues to innovate and embrace an encompassing understanding of service.

### DÜRR OFFERS ITS CUSTOMERS:

- An extensive portfolio of products
- Compliance with all environmental legislation
- More than 10,000 systems installed worldwide
- Consultancy for individual industries
- Lifetime servicing
- Global, on-site support

Regardless of the industry, Dürr is well-known for its tailor-made solutions that help companies reduce emissions and, at the same time, increase cost-effectiveness.

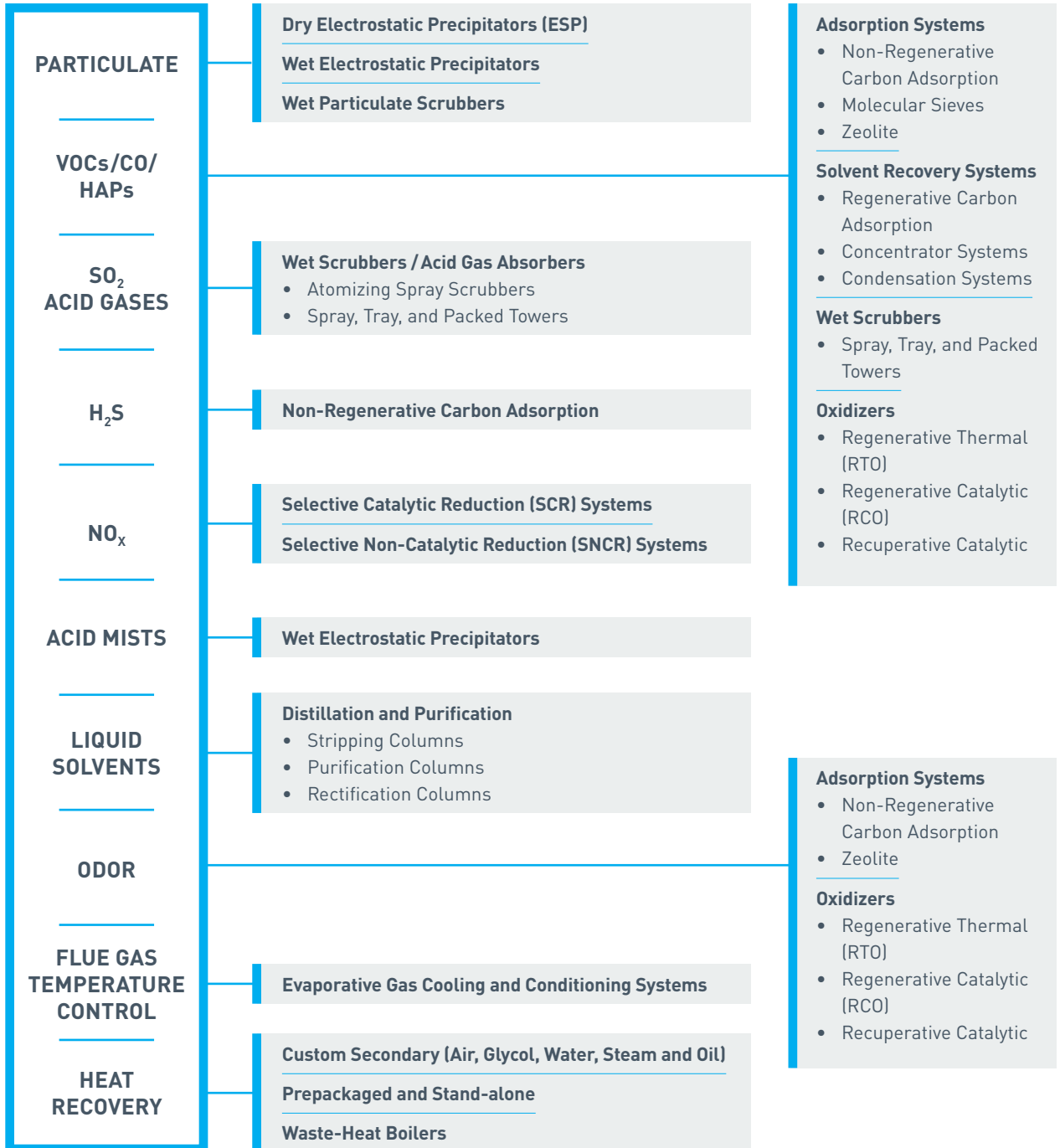
Not sure which environmental solution fits your business best? Have a look:

# Comprehensive product array

## Pollutants, processes and related technologies

### EMISSION/PROCESS

### TECHNOLOGY SOLUTION





**Dürre Systems AG**  
Carl-Benz-Str. 34  
74321 Bietigheim-Bissingen  
Germany

Tel +49 (0)7142 78-0  
E-Mail: [info@durre.com](mailto:info@durre.com)

Subject to change. The information in this white paper 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.  
© Dürre 2021