LEADING IN
PRODUCTION
EFFICIENCY

DÜRR

Clean Technology Systems

September 2019
Bietigheim-Bissingen

1

Dürr Group

Dürr Group: 3 global brands

Dürr AG

Dürr Systems AG	Carl Schenck AG	HOMAG Group AG
		

Dürr Group: 5 global divisions

Sales 2018: € 3.9 billion, employees 2018: approx. 16,300

Paint and Final Assembly Systems

- Paint and final assembly Systems

€ 1.2 billion

3,470

Application Technology

- Paint application, glueing and seam sealing technology; products for industrial painting

€ 0.7 billion

2,250

Clean Technology Systems

- Air pollution control, noise abatement systems and battery coating lines

€ 0.2 billion

1,470

Measuring and Process Systems

- Balancing, assembly, testing and filling technology

€ 0.5 billion

2,280

Woodworking Machinery and Systems

- Machinery and plants for woodworking

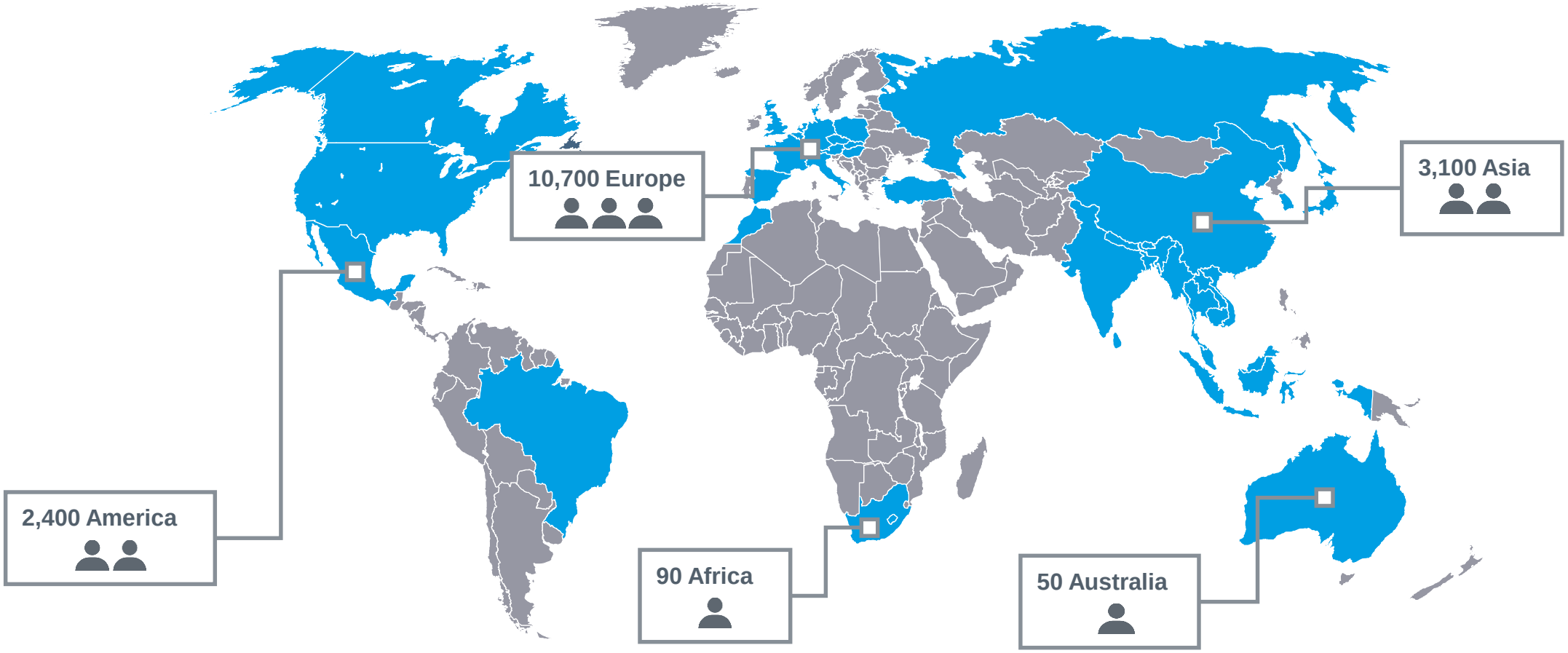
€ 1.3 billion

6,600

Employees Sales

Global positioning

2018: Approx. 16,300 employees at 108 locations in 32 countries



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Division:
Clean Technology Systems

Clean Technology Systems

Experts for Air Pollution Control

Clean Technology Systems
0,2 billion
1.470[1]

Dürr Systems AG

Dürr Megtec

MEGTEC

Dürr Universal

UNIVERSAL

LTB Luft- und Thermotechnik Bayreuth GmbH

LTB

[1]February 2019

Clean Technology Systems

More Competence …More Know-How

Clean Technology Systems

Dürr division with two business segments:
- Air Pollution Control equipment (since 1968)
- Energy efficiency technology (since 2011)
- Approximately 600 employees
- Eight locations in seven countries (Germany, United States, China, India, Italy, South Korea, Thailand)
- Sales revenues in 2017: 186 million euros (220 million US dollars)

Main products: Systems for Air Pollution Control by
- Thermal oxidation
- Catalytic oxidation
- Adsorption
- Absorption

Customer groups for air pollut
mainly chemical, pharmaceutical, printing and coating companies, automotive OEMs and their suppliers

Energy efficiency technology products:
- ORC (Organic Rankine Cycle)

Customer groups in energy efficiency technology:
primarily woodworking industry, energy industry and operators of decentralized energy plants

Megtec

- Supplier of environmental technology, especially for air pollution control
- Headquarters: De Pere (Wisconsin, United States)
- Until October 5, subsidiary of Babcock & Wilcox Enterprises, Inc. (B&W)
- Approximately 550 employees
- Twelve locations in nine countries (United States, Canada, Australia, China, India, Great Britain, Sweden, Germany, France)
- Sales revenues in 2017: 129 million euros (147 million US dollars)

Main products: Air pollution control equipment, e.g. for volatile organic compounds (VOC), particles and other air emissions from industrial processes, e.g.
- Oxidation systems
- Electrostatic filters
- Solvent recovery and distillation Systems as well as industrial dryers, wet electrostatic precipitators and coating systems for lithium-ion-battery electrodes

Customer groups: primarily packaging, printing, energy-generation, mining and wood industries

Universal

- Provider of acoustic solutions for sound emissions
- Headquarters: Stoughton (Wisconsin, United States)
- Until October 5, subsidiary of Babcock & Wilcox Enterprises, Inc. (B&W)
- Approximately 350 employees
- Five locations in four countries (United States, Mexico, India, Great Britain)
- Sales revenues in 2017: 62 million euros (71 million US dollars)

Main products: Sound insulation systems and air filters, e.g. for gas turbines, and integrated emission and filtration systems

Customer groups: automotive OEMs, oil and gas companies and their transport service providers (“packagers”)

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Segments

Air Pollution Control Technologies

Solutions for all applications

Chemicals

Metals & Mining

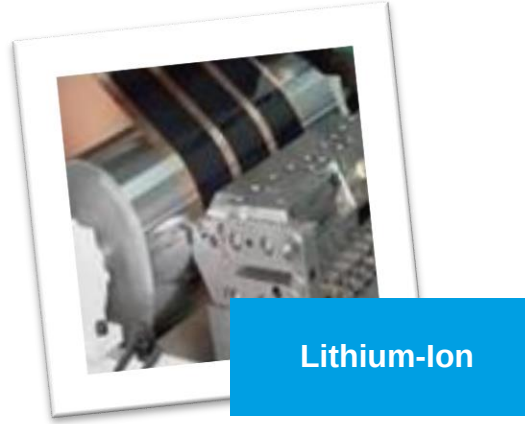
Surface Treatment

Automotive

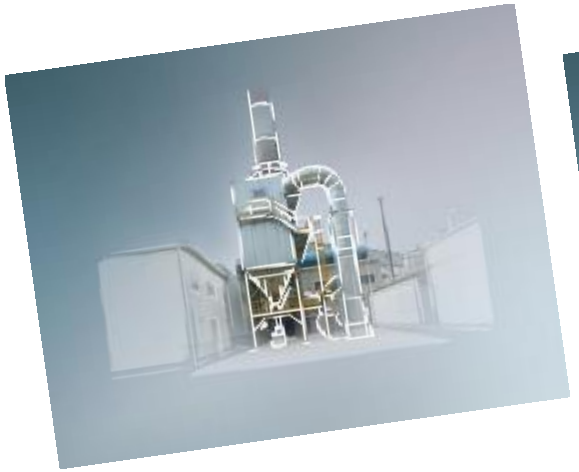
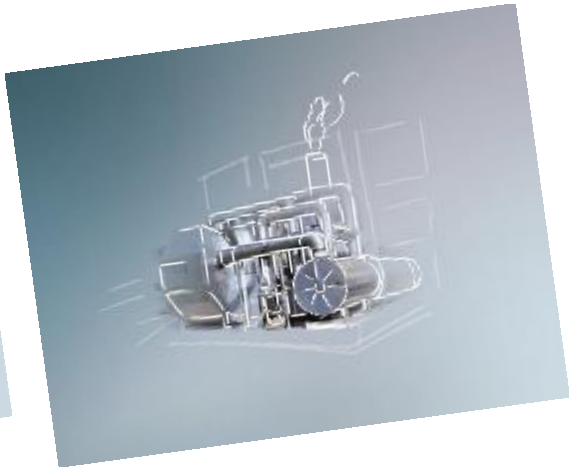
Odor Control

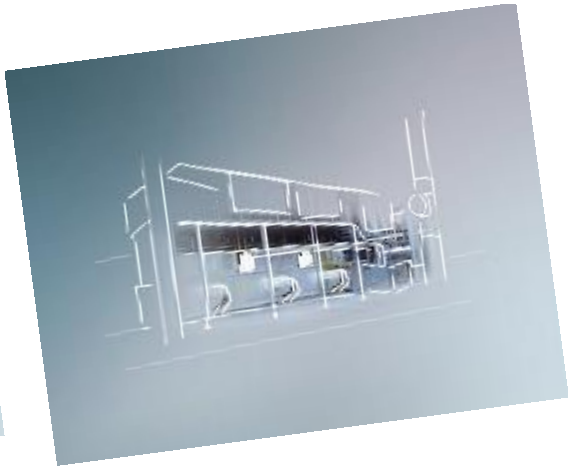
Wood

Acoustical Systems



Lithium-Ion



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Ecopure® Product portfolio

Air Pollution Control

Thermal oxidation

The process:

The organic substances contained in the process exhaust fumes are heated in the incineration (oxidation) to a very high temperature, so that the contained hydrocarbons connect with oxygen and form water vapor and carbon dioxide. For the disposal of flammable organic substances oxidation is the most efficient method of air purification.

Product range:

- **Ecopure**® RTO — Regenerative Thermal Oxidation
- **Ecopure**® TAR — Recuperative Thermal Oxidizer
- **Ecopure**® DFTO — Direct Fired Thermal Oxidizer

Air Pollution Control

Ecopure® RTO

Ecopure® RTO

Regenerative Thermal Oxidation

Air Pollution Control

Ecopure® TAR

The process:

The only condition for the use of recuperative thermal Air Pollution Control is that the pollutants have to be combustible. The organic and inorganic compounds present as vapor, Steam, or gas in the process exhaust air are oxidized and/or burnt. In thermal oxidation, the hydrocarbons contained in the solvent react and combine with oxygen and are transformed into wet steam and carbon dioxide.

Air Pollution Control

Ecopure® DFTO - Direct Fired Thermal Oxidizer

The process:

Organic substances in process exhaust gases are combusted (oxidized) at temperatures high enough for the hydrocarbons in these gases to combine with oxygen and produce mainly water vapor and carbon dioxide. Oxidation is the most efficient air purification process for the disposal of combustible organic pollutants.

Air Pollution Control

Ecopure® CAT - Catalytic Air Pollution Control

Process:
The catalytic Air Pollution Control is characterized by a flameless oxidation of the pollutants contained in the exhaust gas at temperatures between 200 ° C and 500 ° C. After heating the polluted exhaust gas, it flows through the catalyst, thereby the pollutants will be oxidized to CO_2 and H_2O. The method is only applicable to certain pollutants and dust-free exhaust gas.

Product range:

- **Ecopure®** CAT SCR - Selective Catalytic Reduction
- **Ecopure®** CAT CCF - Catalytic Candle Filter
- **Ecopure®** CAT LPX - Low Pressure Catalytic
- **Ecopure®** CAT HPX - High Pressure Catalytic
- **Ecopure®** CAT RCO- Regenerative Catalytic Oxidation

Air Pollution Control

Ecopure® ACS – Adsorptive Concentrator System

The process:

The adsorption process is used for concentrating the pollution content in the air. Here, activated carbon and zeolites are typically used. The pollutant must be adsorbable and must be in a gas or steam phase. Often oxidation systems (catalytic or thermal) or systems for condensation and solvent recovery are used to treat the concentrated air stream.

Product range:

- **Ecopure®** ACS - Continuous Rotor Concentrator

Introduction to Wet ESP Technology

Wet ESP - Application

- Wet ESP is intended to be a secondary removal stage
  - After particulate wet scrubber or wet FGD scrubber
  - Final Particulate Matter (PM) filter after scrubber
  - After flue gas is saturated
- Removal of submicron particulate, heavy metals, acid mists, and fumes from process gas streams
- Can achieve extremely low emissions to achieve “optically clear” stack
- Excellent turndown
- Low maintenance
- Low power consumption

Acoustic, Emission and Filtration solutions

Solutions	Systems	Benefits
Turbine	Silencers, stacks, structural steel, inlet / exhaust systems	• Cost-effective design • Engineered to balance air filtration and acoustic treatment • Optimal turbine performance
Engine	Silencers, stacks, catalysts, enclosure gensets, exhaust manifolds, locomotive exhaust components, turbo inlet scrolls	• Best performance for all applications • Noise reduction • Back pressure minimization • Temperature management • Optimization of flow • Structural integrity • Emissions treatment
Industrial Process	Blower packages, blowdown silencers, high pressure vent silencers, ASME code vessels	• Design solutions for all filtration and acoustic requirements/challenges • Wide range of materials and paints






ORC (Organic rankine cycle)

Product Overview - For high and low temperatures:

- Standardised compact modules with electrical power range between 40 kW and 1,000 kW
- High and low temperatures of heat sources can be used to generate electricity
- In high temperature plants, the condensation heat can be supplied at a temperature which enables further use and thus combines heat and power operation

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Worldwide Environmental Services

Worldwide Environmental Services

Inspection

- High-quality support includes inspection and maintenance
- Short reaction time due to global service network
- Proactively identify of weak points

Spare Parts

- Full-service package for spare parts
- A highly efficient spare parts management service from planning to shipping

Revamp

- Modification of your system to meet current production needs
- Upgrade to the latest technology
- Analysis of the existing plant through to engineering and turnkey solutions

CLUSTAIR
Your alliance for clean air.

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“Subject to change. The information in this presentation contains only general descriptions or performance characteristics, which may vary in different cases. The requested performance characteristics are only binding it they are expressly agreed in the contract.”

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