

Aluminum wheel painting

Excellence in
surface finishing



Surface quality is a matter of process know-how

Excellence in surface finishing

Aluminum wheel painting – As one of the leading suppliers of mechanical and plant engineering, Dürr continually strives to increase the level of efficiency in all aspects of production.



MATERIAL
REDUCTION



ENERGY
REDUCTION



SPACE
REDUCTION



EFFICIENT
PROCESSES



WATER
REDUCTION



DIGITIZATION



OPTIMIZED
LAYOUT



VOC
REDUCTION



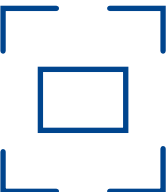
For the painting of aluminum wheels, Dürr delivers powerful technologies along the whole process: starting with wheel surface cleaning and chemical conversion for effective corrosion protection and finishing quality, our expertise goes on to the purification of exhaust air.

Dürr offers its own application technology with specially patented features that fit best with the requirements of quality-oriented aluminum wheel surface painting. Specially developed robust conveyor system lines satisfy our customers'

highest requirements in terms of line availability and chain life. Patented special machines to remove powder from spindles and from wheel areas that should not be coated are also part of the tailored product portfolio.

Dürr focuses on efficiency in all process steps in the paint shop. In addition to systematically improving production efficiency and reducing unit costs while maintaining the highest quality, we attach great importance to all aspects of sustainability.

Master control of the entire production process

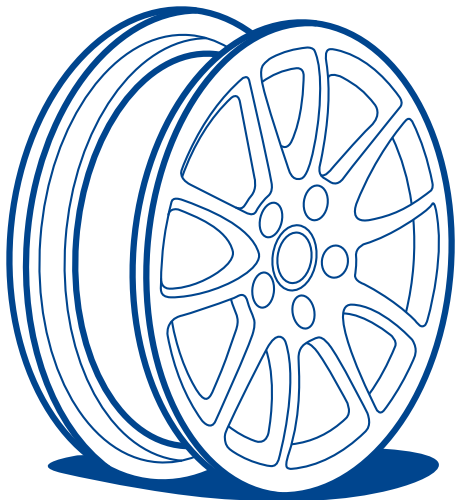


GOOD PLANNING – GOOD PLANT

What looks simple at first glance pays off if done well: a detailed and clear structure, which corresponds to the complexity of the customer's practice and expectations, is the starting point for a successful implementation and leads to a more efficient process with simpler production monitoring, operation and maintenance.

In wheel painting the processes may vary depending on the quality, product design and surface finishing requested by a customer. Dürr offers broad know-how of different layout options based on preconditions and the customer's specifications. We are active from the onset as a complete supplier upon request, and also offer powder coating in cooperation with experienced partners.

We adjust processes to individual customer requirements



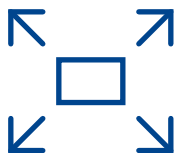
DXQ DIGITAL INTELLIGENCE BY DÜRR

Dürr combines expertise in IT and mechanical engineering to develop digital solutions for optimized production processes. Our powerful **DXQ** software offers tailor-made solutions for the operation, analysis and control of plants. **DXQanalyze** software enables large data volumes to be processed and evaluated to optimize production, thus allowing for extensive energy reductions, increased production rates and intelligent spare part orders. The **DXQoperate** product family allows operators and maintenance technicians to efficiently interact with equipment on the shop floor.



INDIVIDUAL SOLUTIONS AND SMART LAYOUTS

During the planning phase Dürr focuses on easy accessibility to each process of the paint line and a clear observation of the different paint application steps. Whenever possible, our preference is a single-floor solution with all process equipment at ground level. When there are limited dimensions for the installation of a new paint line, Dürr provides compact layouts and looks beyond standardized solutions to develop uniquely individualized layouts upon request. As an example, repeated painting processes with intermediate sanding steps lead to more exclusive wheel designs that require "smart layouts" if only limited space is available.



RELIABLE PROJECT IMPLEMENTATION

In project implementation Dürr's experience meets digitization: all processes of project handling are supported by individually adapted IT tools. From engineering, through procurement and logistical processes to virtual commissioning, all information is managed by a software platform, the Dürr Project Center. Here, all project-related data is managed and made available to all parties at all times. The result of this highly networked project management tool is high transparency, optimized communication and plants that are realized on time, on budget and on scope.

System supplier for smart wheel-painting lines



PRE-TREATMENT AND CORROSION PROTECTION

The process begins with surface cleaning from upstream manufacturing processes and continues with etching. This prepares the wheel surface for chrome-free chemical conversion and leads to extremely high corrosion resistance. To specially protect conveyor chains and tracks from aggressive vapors, Dürr provides hangers suspended from swan-neck-shaped hooks as standard for water sealing. The hangers' special design with counterweights and shaped supports allows them to safely carry an extended wheel geometry range and maintain vertical empty hangers.

APPLICATION AND ROBOTICS

Dürr has developed a large and innovative range of equipment to guarantee perfect painting solutions with integrated automatic systems – from the paint mix room to the spray equipment in the spray booth. With our **EcoBell** family, there are special solutions available to spray solvent and waterborne paint by means of electrostatic technology.



PAINT MIX ROOM

In the paint mix room – especially for solvent-borne, waterborne and corrosion protection paints – the paints are optimally prepared for the application of various layers. Dürr developed all products such as pumps, color changers and paint supply systems for special paints (**EcoSupply P**) for this purpose.



OVERSPRAY SEPARATION

Solutions by Dürr comply with both current and future standards for overspray separation. The conventional wet scrubbing system **EcoVertijet** is extremely compact and requires limited excavation. But it is the **EcoDry X** that is the leading edge technology for a cleaner and highly energy efficient overall process. Comprehensive process observation is possible through a full-surface glass housing.

CONVEYORS

Dürr offers the entire range of floor and overhead conveyors according to regional and customer-specific preferences. In order to avoid overspray paint deposits, the conveyor system is split into separate loops. The transfer between each conveyor and the process downstream is performed by manipulators, i.e. robots or cranes fitted with multiple grippers.



Ovens

Dürr uses welded oven panels to avoid any condensation leakage and allow easier cleaning. Heater boxes with indirect heating and double filtration lead to higher paint surface quality, as they avoid yellowing and contamination. The heater boxes are easily accessible and maintainable through independent platforms.

ENVIRONMENTAL PROTECTION: AIR AND WATER

The **Ecopure**® RTO air pollution control system cleans the exhaust air through combustion. It is customized for the painting process and avoids condensation that occurs when air streams from the spray booth and the oven are mixed. This leads to significant energy savings, combined with limited maintenance and operational work. Dürr's comprehensive product portfolio includes all applicable technologies to reduce VOCs, including our proprietary **Ecopure**® TAR recuperative oxidizer and **Ecopure**® CRC concentrator technologies. Systems for demineralized and waste water are also designed and realized in-house.



Efficient paint application



Excellence in surface finishing with the atomizers of the **EcoBell** product family

Within the engineering phase of a new application system there are numerous parameters that have to be considered, such as:

- wheel design
- surface coverage and bolt hole painting
- production rate
- paint savings and transfer efficiency
- paint characteristics

The best solution takes into consideration the combination of two spray technologies and the suitable manipulator:

- **EcoGun** product family (automatic spray guns)
- **EcoBell** product family (high-rotational atomizers with or without electrostatic application)
- **EcoRP 10 R1100** (ready2spray robot)

These technologies are part of our ready2integrate concept. At the heart of the concept are technologically mature and proven application solutions that can be easily integrated into individually designed systems.

EcoBell TECHNOLOGY

Dürr relies on its own research and development and uses electrostatic technology for the automatic application of paint with its **EcoBell** product family. Electrostatic application is based on a series of powerful bells with very high transfer efficiency. Bells and spray guns can be fixed in place as well as mounted on moving arms or robots.

The **EcoBell** product family stands for a high-performance spraying solution, used particularly with solvent-based and water-based paints. A large selection of titanium cups is available for the application of base coat, clear coat, metallic base paint and corrosion protection paint.

Wheel painting is a process where excellence in surface finishing and quality coating is a must.



BOLT HOLE PAINTING

To ensure a perfect surface of the complete bolt holes, Dürr offers an innovative solution for automated painting. One of its major advantages is that the application of one bolt hole takes less than a second. Thus, all bolt holes of a typical wheel can be painted in less than 10 seconds, including robot movements. In addition, the atomizer does not need to enter the bolt, which eliminates the risk of collisions between atomizer and wheel. Due to the low-pressure atomization technology, existing paint supplies may be reused.



ready2spray ROBOT

The six-axis robot **EcoRP 10 R1100** with a maximum reach of 1,100 mm and a total payload of up to 10 kg is unbeatable in terms of repeatability and precision. The robot is equipped with state-of-the-art application technology including mixing and dosing technology for two components (2K), paint supply and control.

COMPLETE APPLICATION PORTFOLIO



Agitators with low air consumption

Paint circulation equipment:
Vertical (**EcoPump VP**), horizontal (**EcoPump HP**) and diaphragm pumps (**EcoPump AD**) and pressure pots

Paint flow regulators (**EcoFlow**)

Automatic multi-color changer (**EcoMCC**)

Gear dosing pumps with servomotor (**EcoPump9**)

Automatic spray guns (**EcoGun** product family)

High rotational, electrostatic atomizers (**EcoBell** product family)

High-tension controller (**EcoHT**)

Vertical and horizontal reciprocators (**EcoRecip**)

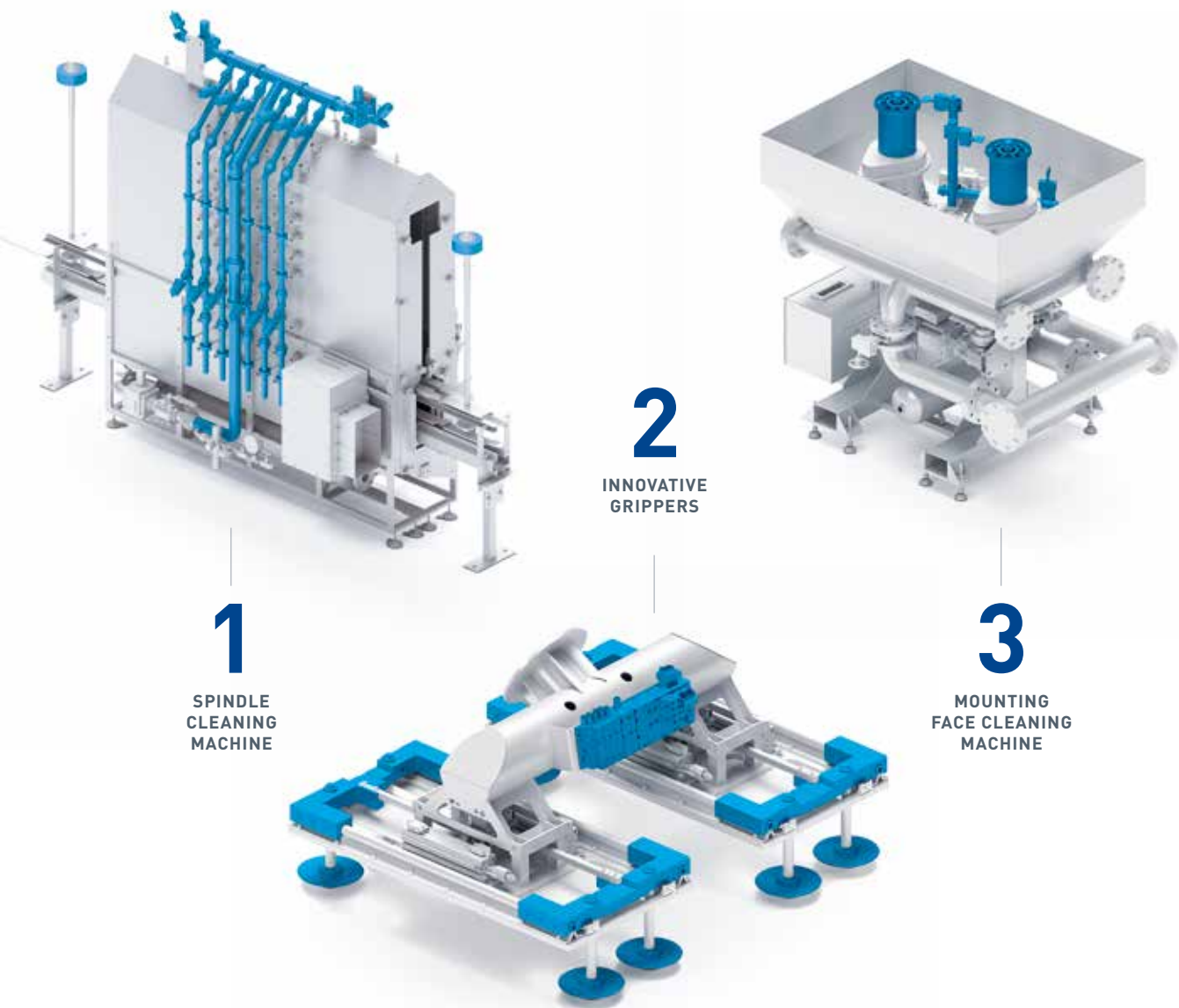
Multi-axis robots (**EcoRP** product family) with line tracking functionality

Customized solutions for optimized processes

Dürr provides a wide range of geometries and features for spindles and jigs. Wet and powder overspray that accumulates on the spindles can be removed using patented continuous inline cleaner systems **(1)**. Dürr has developed special cleaning devices, such as its newly designed, patented center

bore and mounting face cleaner **(3)** to remove powder paint particles from the wheel mounting face. As an additional benefit, automatic masking devices are individually customized to protect the bolt holes of the wheel. Customized grippers **(2)** ensure reliable positioning of the wheels.

DÜRR HAS DEVELOPED SPECIAL SOLUTIONS FOR EFFICIENT PROCESSES



Your partner for successful production

Dürr's Services & Solutions customer service offers support around the world. Dürr is always on-site to help to reduce production costs, increase plant availability and guarantee rapid technical support. Whether you are dealing with an emergency or planning or implementing a revamp project – we are available.

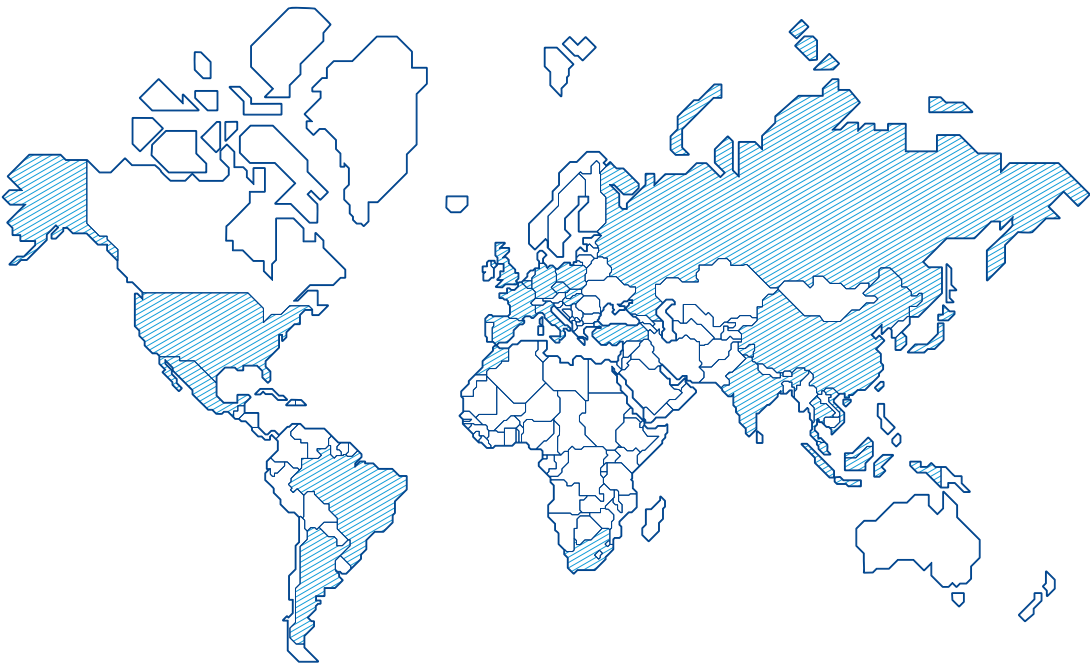


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LEADING IN PRODUCTION EFFICIENCY



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