



LEADING IN PRODUCTION EFFICIENCY

# ALUMINUM WHEEL PAINTING

## EXCELLENCE IN SURFACE FINISHING





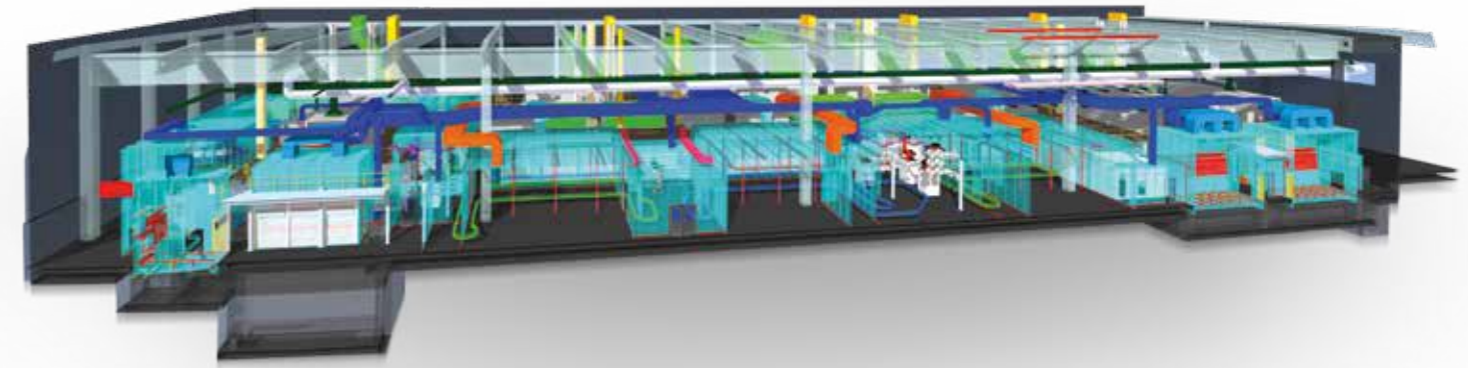
# ALUMINUM WHEEL PAINTING EXCELLENCE IN SURFACE FINISHING

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

Dürr offers full turnkey paint shops all over the world based on their long-term expertise in the automotive field.

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, painting and curing, to the purification of air exhaust. Dürr offers their own application technology with specially patented features that fit best with the requirements of quality-oriented aluminum wheel surface painting. Robust conveyor systems especially developed for aluminum wheel painting lines satisfy our customer's highest requests in terms of line availability and chain life.

Throughout all process stages, Dürr focuses on the reduction of material and energy consumption, be it in the separation of paint overspray or by means of heat recovery based on their broad portfolio of products and technologies.



» 3D rendering for a complete aluminum wheel paint shop

## Good planning – good plant

What sounds simple at first glance pays off if done well: a sophisticated and clear layout is the starting point for a successful implementation and leads to a more efficient process including easier production supervision, 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 a broad know-how of different layout options based on preconditions and a customer's specifications. Upon request we act as a turnkey supplier right from the start.

## Reliable project implementation

In project implementation Dürr's experience meets digitization: all processes of project handling are supported by individually adapted IT tools. From the 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, which are realized on time, on budget and on scope.

## Individual solutions and smart layouts

During the planning phase Dürr focuses on easy accessibility to each phase 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 grinding lead to more exclusive wheel designs that require "smart layouts" if only limited space is available.

## Supervision systems

In-house supervision system developments deliver tailor made solutions to customers with a focus on aluminum wheel paint line needs. While PCs and Servers (if used) are connected by a 1Giga Ethernet TCP network, all automation devices are connected via Ethernet based fieldbus (as Profinet), allowing a faster commissioning and later implementation of improvements and additional operation and supervision features. The separation among PC networks and fieldbus networks improves reliability and communication capacity in order to support Industry 4.0 concepts and data sharing among IT and automation levels. Furthermore, all our automation components are reachable remotely to achieve better support.

# DÜRR – SMART SYSTEM SUPPLIER FOR ALUMINUM WHEEL PAINTING LINES



## Pre-treatment and corrosion protection

The process begins with the surface clean-up from upstream manufacturing processes and continues with etching. This prepares the wheel surface for a chrome-free chemical conversion and leads to extremely high corrosion resistance. To specially protect the conveyor chains and tracks from aggressive vapours, Dürr provides goose neck shaped hooks as a standard for water sealing.

## 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 efforts. Systems for demineralized and waste water are also designed and realized in-house.



## Application

Dürr has developed a large and innovative range of equipment to guarantee perfect painting solutions with integrated automatic systems: from paint mix room to the spray equipment in the spray booth. Special solutions are available to spray solvent and waterborne paint by means of electrostatic technology.

## Ovens

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



## Paint mix room

In the paint mix room – specific for solvent-borne, waterborne and corrosion protection paint (KSL) – the paints are optimally prepared for the application of various layers. This process requires an extreme precise coat thickness and repeated accuracy. Dürr developed all products such as pumps and color changers for this purpose.

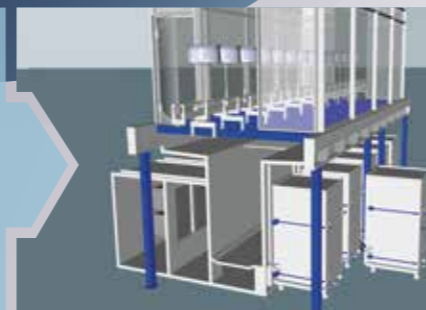
## Conveyors

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.



## Overspray separation

With **EcoVertijet** and **EcoDry X** Dürr offers both wet and dry separation of overspray. **EcoVertijet** is extremely compact and requires limited excavation, while **EcoDry X** is the leading edge technology for an energy efficient process. Both systems allow a perfect process observation with full-face glass housing.





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

## EcoBell – EFFICIENT PAINT APPLICATION

Wheel painting is a process where excellence in surface finishing and quality coating is a must. 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 penetration
- » Production rate
- » Paint savings & transfer efficiency
- » Paint characteristics

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

- » Automatic spray guns from the **EcoGun** product family
- » Electrostatic high-rotational atomizers with the **EcoBell** product family

### Highlight 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. The electrostatic application is based on a series of powerful bells with very high transfer efficiency, backed up by automatic spray guns to reach the hidden parts of the wheels. Bells and spray guns can stand fixed 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.

### COMPLETE APPLICATION PORTFOLIO

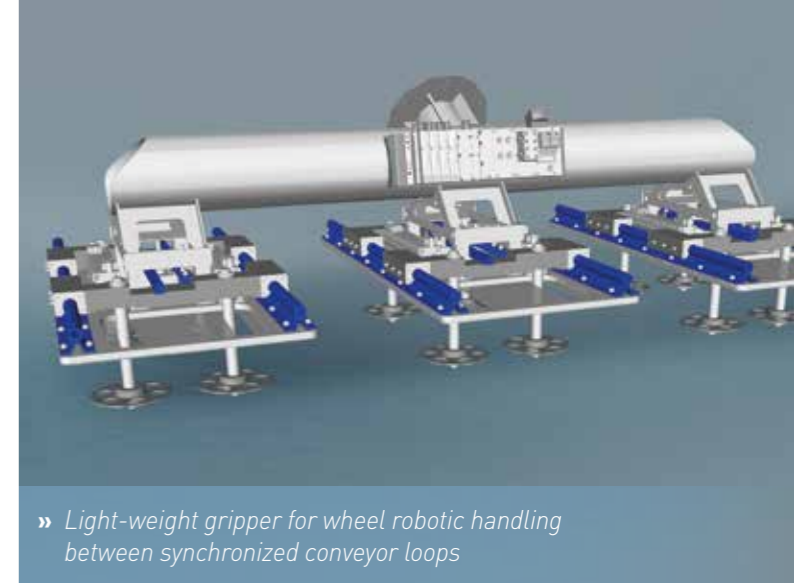
- » Agitators with low air consumption
- » Vertical (**EcoPump VP**), horizontal (**EcoPump HP**) and diaphragm pumps (**EcoPump AD**) and pressure pots
- » Paint flow regulators (**EcoFlow**)
- » Automativ multi colour changer (**EcoMCC**)
- » Gear dosing pumps with servomotor (**EcoPump9**)
- » Automatic spray guns (**EcoGun** product family)
- » High tension power-pack
- » High rotational, electrostatic atomizers (**EcoBell** product family)
- » Vertical and horizontal reciprocators
- » Automatic tracking system
- » Multi-axis robots (**EcoRP** product family)

## SPINDLES, JIGS, CLEANERS & GRIPPERS

Dürr provides a wide range of geometry and features for spindles and jigs. Wet and powder overspray that remains accumulated on the spindles can be removed with continuous inline cleaner systems.

Dürr has developed special cleaning devices such as their newly designed mounting face cleaner to remove powder paint particles from the wheel mounting face. The benefit: No more brushes stuck with powder paint particles. Only a smart use of compressed air.

As an additional benefit, automatic masking devices are individually customized to protect the bolt holes of the wheel.



» Light-weight gripper for wheel robotic handling between synchronized conveyor loops



» Brushless hub cleaner

## SERVICES & SOLUTIONS

Dürr's Services & Solutions customer service offers support around the world.

With 65 service sites in 28 countries 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.

### Our service at your demand

- » Ramp-up and launch management
- » Modifications and upgrades
- » Engineering with experience
- » Spare parts service
- » Inspection and maintenance
- » Service locations all over the world



LEADING IN PRODUCTION EFFICIENCY

## Dürr – Leading in Production Efficiency

Five divisions, one goal: maximum production efficiency for our customers

- » **Paint and Final Assembly Systems:** paint shops and final assembly systems for the automotive industry
- » **Application Technology:** robot technologies for the automatic application of paint as well as sealants and adhesives
- » **Measuring and Process Systems:** balancing systems as well as assembly, testing and filling technology
- » **Clean Technology Systems:** exhaust-air purification systems and energy-efficiency technology
- » **Woodworking Machinery and Systems:** machinery and systems for the woodworking industry

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