Eco+ Paintshop

EFFICIENCY AND QUALITY IN THE PAINTING PROCESS
Production efficiency in the painting process

Dürr is a world leader in the planning and realization of paint shops for the automotive industry. This applies both to the modernization of existing plants and to the construction of new lines. Decades of experience and well-founded process knowledge guarantee an integrated approach to projects implemented by Dürr. The continuous further development of products, plants and concepts improves the entire painting process in terms of energy optimization, quality improvement and unit cost reduction.

Painting – expensive and hard on the environment?

In automotive production, painting is at the top of the list of energy consumers with an average energy consumption of 700 – 900 kWh per car body, and thus has a significant impact on the balance sheet value. The emissions created during the entire manufacturing process of an automobile corresponds to a distance driven of 40,000 km. At the same time, due to its great complexity the painting process offers many approaches to improve the use of energy, materials and space, as well as reduce emissions.

Eco Paintshop – sustainable today and tomorrow!

Dürr analyzes and optimizes these potentials and to this point has reduced its use of energy in the painting process by over 60% with the Eco Paintshop. And that’s just the beginning: The principle of the Eco Paintshop is based on the continuous development and holistic consideration of individual requirements. This way Dürr is able to offer specially customized solutions with standardized equipment. The Eco Paintshop is always based on the latest plant technology and regarded as the current benchmark in automotive painting.
The automotive industry demands the highest quality along with permanent unit cost reductions. In order to achieve both, all the processes must be considered, analyzed and optimized. Major cost-cutting measures are found in the minimum and best possible use of energy and material, that is, in resource-saving processes, products and complete systems.

The Eco+ Paintshop means efficiency in all areas:
» Process efficiency
» Emissions efficiency
» Material efficiency
» Space efficiency
» Efficiency through flexibility

Optimization potentials exist all along the entire process chain. They start with the design of an intelligent plant layout.

We consider all areas, from pretreatment, electro-dip painting, modern paint booth concepts with robots and application technology, to new methods of heating ovens. Powerful exhaust air purification with integrated heat recovery rounds out the process.

We work on the constant optimization of the material balance in the painting process. How much energy, water, paint, CO₂, material, solvent, waste water or waste is used or released?
IN REAL TERMS – SAVINGS IN THE PAINTING PROCESS

The Eco®Paintshop is the sum of our know-how and our high standards for functionality and quality. Dürr contributes robust individual components and sophisticated complete systems – whether it be a high quality complete system or a building block for a targeted performance improvement at existing paint shops.

Minimal water consumption and low waste water volume

Water is one of the future’s particularly valuable resources. The Eco®Paintshop from Dürr saves water wherever possible: for example, through dry separation of paint overspray with the EcoDryScrubber or through space and volume-saving tanks in the pretreatment with the rotational dip process Ecopaint RoDip. With this we have reduced water consumption by nearly 60%. And where less goes in, less comes out. Even with waste water we achieve the smallest amounts.

Energy efficiency and energy monitoring

The Eco®Paintshop stands for comprehensive energy efficiency, and in ideal cases is less than 400 kWh per painted car body. Many products from Dürr help with this, such as the EcoDryScrubber, which has been recognized for its sustainability with several international awards. At the same time, comprehensive energy monitoring with our EcoEMOS process control system provides control and optimization of all consumers. Closely related to energy consumption is CO₂ emissions, which Dürr has reduced by half in just two years.
Less paint consumption – fewer resources and waste products

Less paint consumption means less consumption of resources as early as in the manufacture of paint. At the same time, saving paint costs means reducing unit costs. With this goal Dürr is breaking new ground, whether it is with optimized plants for compact painting processes, through technologies such as the efficient EcoBell3 high speed rotating atomizer, or with the EcoLCC color changer. The material balance is being improved in all directions: less paint consumption not only means fewer resources used in the manufacture of paint, but also fewer waste products and solvents from the painting process that must be disposed of. The bonus from paint savings for our customers: a reduction in unit costs by 27% in the last three years. In sealing processes like seam sealing, underbody protection and cavity preservation, the extensive automation of processes also leads to lower labor and material costs.

EcoBell3

» Simple technology with higher performance
» Continuous painting of water-based paint without voltage block
» Compact atomizer for easy accessibility to all painted surfaces
» Highly flexible in spray jet formation
» Interior and exterior painting possible in one zone

EcoLCC

» Color change time: < 10 s with push-out process
» Prevents color mixing during docking
» Paint loss: < 10 – 15 ml per color change
» Number of colors: 36 water-based paint colors without paint circulation, max. 24 colors with paint circulation
» Only 5 solenoid valves for control of the color changer
The **Eco⁺ Paintshop** means space-saving concepts in almost all areas. Through innovative concepts Dürr makes tangible cost benefits possible with large space savings, particularly in the field of paint booths.

**Space-saving spray booths**

Travel rails arranged one above the other in interior paint booths allow the handling robot on the upper travel rail to “overtake” the painting robot on the lower rail for opening the hood. This way shorter booth lengths of 1 to 2 m are possible. This leads to a reduction of investment and operating costs.

**Modular, compact booth concept**

With **EcoReBooth**, Dürr has completely transformed the paint booth. We integrate the ducts, the air conditioning and the air recirculation system in the booth cross-section. As with the proven **EcoDryScrubber** modules, these are located below the spray booth. This way all of the relevant components are arranged on one level. The building-independent concept is modular and means fewer paint overspray separation modules, less complexity and maximum space efficiency.

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**EcoRP**

- Shorter booths through increased space performance
- Lower investment and operating costs
- Synchronized, high-precision movement and process functions
- Less material consumption and greater quality

**EcoReBooth**

- Innovative process air technology in the booth cross-section
- Less energy, water and chemical consumption
- Space-saving, flexible and modular
- Proven **EcoDryScrubber** technology
- Compact booth concept with excellent energy efficiency
Sustainable concepts from Dürr cover all aspects of energy production and its reuse. The Eco Paintshop makes great strides towards decentralized energy production and energy independence with innovative oven concepts and heat recovery.

**The power of the sun**

The oven is the largest energy consumer in the painting process after the spray booth. Dürr breaks new ground here and relies on solar thermal energy. While normal collectors only produce heat outputs of 80°C, Dürr’s high performance collectors provide more than the 220°C required for oven operation. Even when the sun is not shining Dürr offers a sustainable alternative: electricity is generated with a combined heat and power unit via a low-emission combustion process in a gas turbine whose waste heat is used to heat the oven.

**Clean exhaust air**

In the Eco Paintshop from Dürr, exhaust air purification and heat recovery go hand in hand. The oven exhaust air is purified particularly economically by means of the integrated thermal afterburner. The waste heat from it can optionally be used to preheat the oven supply air. Modern exhaust air systems are guaranteed to fall clearly below specified emission limits. At the same time they make an improved energy balance for the entire system possible.

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**Oven heating**

- Use of solar thermal energy and cogeneration
- Reduced unit costs through decentralized energy generation
- CO₂ reduction per year: 1,000 tons with solar energy, 2,000 tons with combined heat and power generation
- An important step in energy independence

**Ecopure exhaust air purification**

- Particularly efficient exhaust air purification process
- Extremely high VOC destruction efficiency
- Low operating and maintenance costs
- Modular and compact design
- Very high heating-up performance – rapid preheating of the plant
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
» **Clean Technology Systems**: exhaust-air purification systems and energy-efficiency technology
» **Measuring and Process Systems**: balancing systems as well as assembly, testing and filling technology
» **Woodworking Machinery and Systems**: machinery and systems for the woodworking industry