Press release

A new atomizer generation sets new benchmarks in sustainable production

EcoBell4: Efficiency of up to 98% saves significant amounts of paint and rinsing agent

Bietigheim-Bissingen, May 17, 2023 – Dürr is setting new benchmarks in sustainable production with its new EcoBell4 atomizer family. The innovative application technology achieves up to 98% efficiency for clear coat application. It reduces paint loss and rinsing agent consumption by 50% during color changes, or up to 91% in combination with the EcoProBooth modular paint booth concept. The unique 4-main needle technology and process parameter changes make improvements for paint application possible.

Higher paint application efficiency reduces material, resources and energy consumption for a more sustainable production process. With the latest atomizer generation EcoBell4 Pro Hu with direct charging and EcoBell4 Pro Ux with external charging, Dürr is scaling new heights. For clear coat application, the Dürr atomizer achieves application efficiencies of 95 to 98 percent according to DIN EN 13966-1.

The following process parameters optimize the atomizer’s paint application efficiency: The speed and spray distance are significantly reduced to enhance the impact of the high voltage while maintaining a high paint flow rate. In addition, the shaping air is reduced to a minimum and the high-voltage control is adjusted. Dürr is testing the implementation of this painting process in a concrete automotive paint shop in collaboration with interested OEMs. Existing systems have the potential for retrofitting too.

How the measures impact the process:

Reducing the shaping air volume to a range of 90 and 200 standard liters per minute achieves a gentler spray jet. Together with a reduced bell disk speed, energy consumption is reduced. Simultaneously, more paint reaches the body when the spray distance is decreased to approximately 100 millimeters. Two factors contribute to this effect: firstly, a less dispersed spray pattern, and secondly, an enhanced electrical field between the bell disk and body surface, which optimizes the utilization of electrostatic force via a constant voltage.

Consequently, the atomized paint more effectively reaches the body instead of being lost in the booth air. A paint outflow rate of up to 400 milliliters per minute can be obtained to achieve the required layer thicknesses within the given cycle time. As a result, the EcoBell4 Pro Hu with direct charging reaches up to 98% efficiency for clear coat applications.

Utilizing the EcoBell4 Pro E atomizers with external charging for exterior painting yields a notable efficiency boost for base coat application, elevating it from 75 to 78% compared with the predecessor model EcoBell3. The EcoBell4 Pro Ci atomizer for interior painting continues to achieve unrivaled high efficiencies of up to 70%. By fostering partnerships with OEMs and paint suppliers in Dürr’s technical center, additional opportunities emerge to enhance the efficiency and quality of paint application.

Fast color changes reduce paint and rinsing agent consumption

In addition to advancements in the painting process, technical innovations in the design elevate the EcoBell4 atomizer generation to a new level of quality. This new generation enhances flexibility and efficiency for a more sustainable painting process. The EcoBell4 carries out color changes more quickly than any other high-speed rotary atomizer on the market. This is because the patented 4-main needle technology not only saves time but reduces paint and rinsing agent consumption, as well as VOC emissions.

Here’s how the principle works: Three of the four main needles are reserved exclusively for the most frequently used colors. All other colors go through the fourth main needle. Real-world evidence from the automotive sector shows that more than 50% of bodies are painted in the three most frequently used colors.

The technology leverages this fact and provides the three colors permanently via the main needles, which are located directly behind the bell disk. When a color change is due, the system can switch to another main needle within four seconds with no need to rinse and clean the channel. This reduces both paint loss and rinsing agent consumption associated with color changes. If a less frequently used color is requested, it can easily be primed via the fourth channel while one of the three other needles still applies a main color. This means that each color is available for the next body within a very short timeframe.

Additional savings with the new paint booth concept

Compared with the predecessor model EcoBell3 (1C), paint and rinsing agent consumption is reduced by 51% in the conventional line setup. This is good for the environment and minimizes process costs. The new atomizer generation is efficient and sustainable in combination with the EcoProBooth. As interior and exterior painting can be performed within a single booth, not only are the color change times shorter but handling times are also lower when compared with the line concept.

The universal atomizer EcoBell4 Pro Ux is a perfect match for the EcoProBooth, suitable for interior, exterior, and metallic painting applications. It utilizes a unified bell disk/shaping air ring system and an external charging system for all three painting tasks.

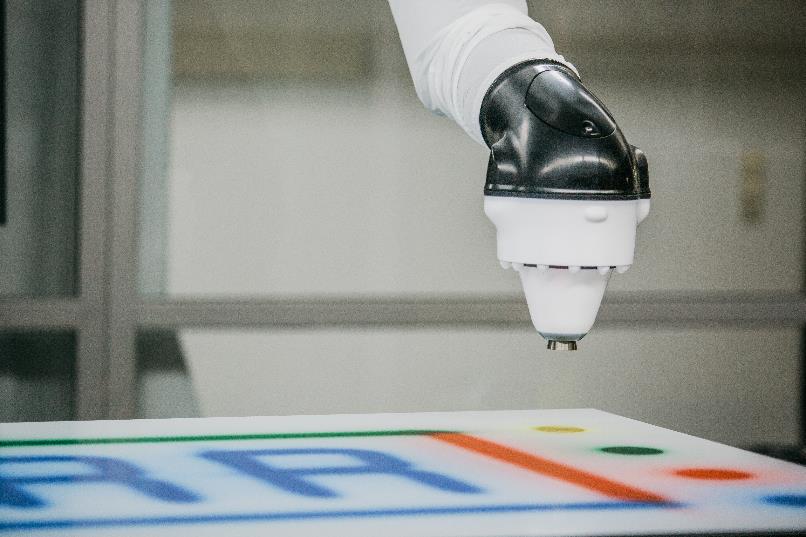
Combining the EcoBell4 Pro Ux and EcoProBooth can result in savings of up to 91% during color changes by reducing paint loss and rinsing agent consumption. “This is a huge step. Our model calculations are based on a paint shop that uses 24 colors and coats 30 bodies an hour, 230 days a year on a three-shift basis. The amount of paint saved would be enough to paint an additional 15,600 bodies,” says Frank Herre, Head of Application Technology Development at Dürr.

Just four robots reduce color change and handling times

The system includes up to four main needles, which meets all painting needs ranging from the 4x1C solution for base coats to the 3x2C solution for clear coats. Dürr offers ten versions of the EcoBell4, suitable for all exterior and interior painting applications with direct or external charging. For the first time, the product family includes a basic version for standard applications and a pro version for special processes such as 4x1C or 3x2C.

Pictures

High resolution pictures are available for download [here](https://www.durr.com/fileadmin/durr.com/06_Media/01_News/2023/Files/duerr-ecobell-4-en.zip).



**Bild 1:** Thanks to the four main needles, **Eco**Bell4 Pro manages color changes in just four seconds without paint loss.



**Bild 2:** The flexible universal atomizer EcoBell4 Pro Ux.

The Dürr Group is one of the world's leading mechanical and plant engineering firms with extensive expertise in automation, digitalization and energy efficiency. Its products, systems and services enable highly efficient and sustainable manufacturing processes in different industries. The Dürr Group primarily supplies the automotive industry, producers of furniture and timber houses as well as the chemical, pharmaceutical, medical devices and electrical engineering sectors. It generated sales of €4.3 billion in 2022. The company has about 18,700 employees and 123 business locations in 32 countries. The Dürr Group operates in the market with the brands Dürr, Schenck and HOMAG and with five divisions:

* **Paint and Final Assembly Systems:** paint shops as well as final assembly, testing and filling technology for the automotive industry, assembly and test systems for medical devices
* **Application Technology:** robot technologies for the automated application of paint, sealants and adhesives
* **Clean Technology Systems:** air pollution control, coating systems for battery electrodes and noise abatement systems
* **Measuring and Process Systems:** balancing equipment and diagnostic technology
* **Woodworking Machinery and Systems:** machinery and equipment for the woodworking industry

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