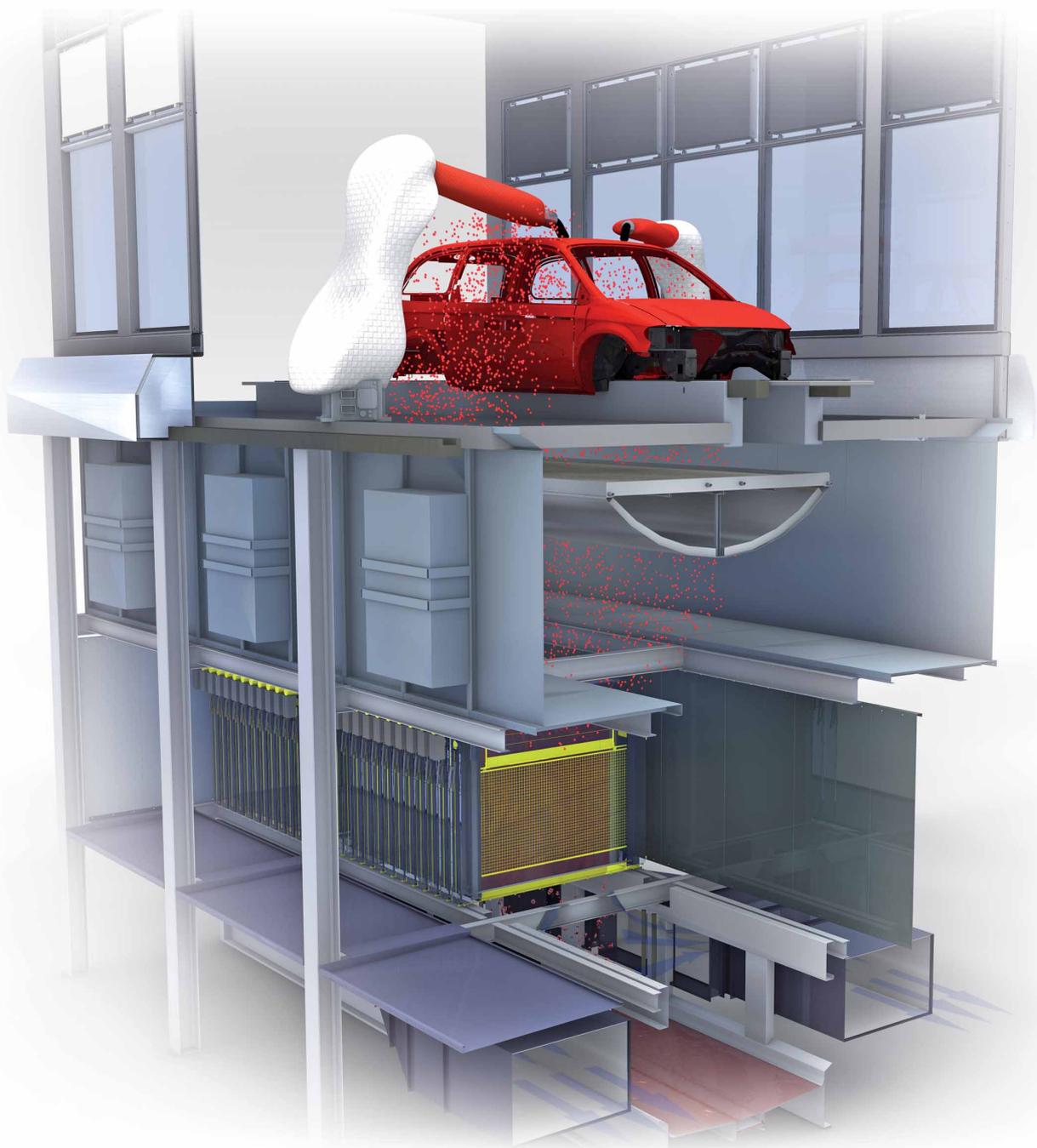


# EISENMANN

Electrostatic separation of overspray

**E** | **SCRUB**



# Tomorrow's separation technology

## Boost efficiency, save energy and avoid CO<sub>2</sub> emissions

These are today's strategies for successful and sustainable production, especially in challenging times.

E|SCRUB is tomorrow's electrostatic separation system for paint overspray with which precisely these strategies are implemented in practice.

A separation system that protects the environment, saves resources, cuts operating costs, and is robust, reliable and easy to use, as well as permitting straightforward conversion of existing plants.

### Advantages

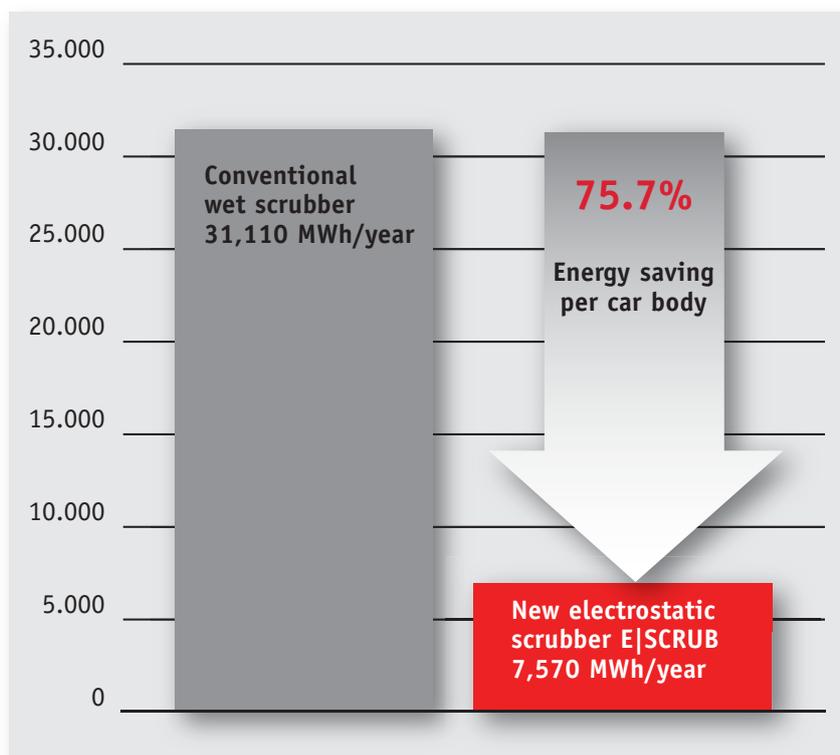
- Less costs
- Less dust
- Less CO<sub>2</sub>
- Less energy
- Higher efficiency

## Comparison of energy consumption

Conventional wet scrubber section vs. new electrostatic scrubber

Basis:

Spray booths for 173,000 bodies per year. Unit costs from a south German automotive plant. Primerless process.



# High voltage instead of filters

The electrostatic scrubber system E|SCRUB is located underneath the grating level of the spray booth [1]. The air contaminated with paint particles [2] during the painting process is sucked in and guided through the separation systems [4].

## Separating the paint from the air

First the exhaust air contaminated with paint overspray [2] flows through the suction section to the separating module [4]. A flow body [3] is installed in the suction section to protect the separation module. The air is guided into the separation modules at the bottom end of the suction section.

The paint overspray is extracted from the air as it passes through the modules. Since the air conditions are only changed slightly, the booth can be operated with circulating air. In this way, most of the cleaned air is sucked in by a circulating air fan and fed back into the spray booth. Depending on the amount of solvent in the exhaust air, a small part is fed directly to the exhaust air stack and compensated by adding fresh air.

## The principle of separation

The separating modules consist of active and passive elements which are arranged alternately. The active element consists of a distributed high voltage supply [5], high voltage wires and a high voltage fence.

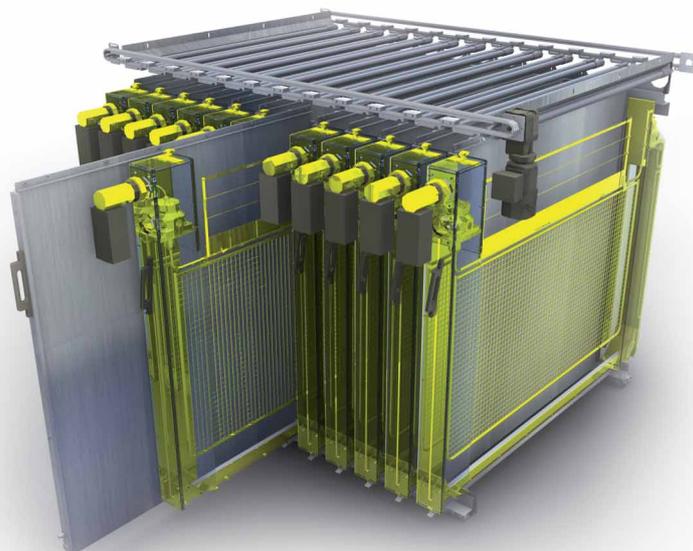
The passive element consists of an earthed separating plate which is wet with a thin film of separating agent by a discharge system above it. The separating agent and its discharge system are designed so that a closed film is formed on the plates.

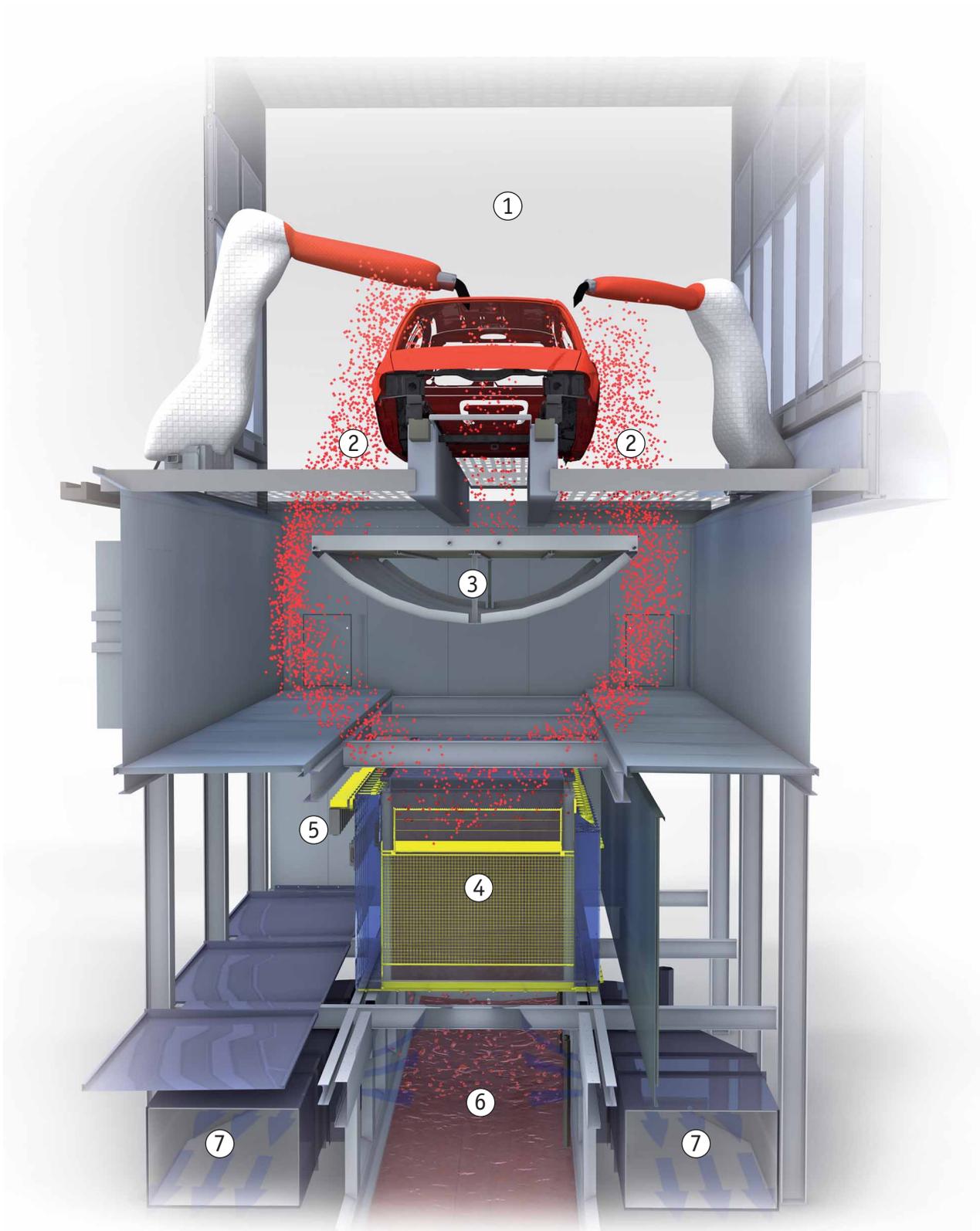
A corona forms around the high voltage wires which ionizes the air molecules in the environment. The paint particles absorb this electrostatic charge and are then attracted by the earthed separating plate. The paint particles are bound on the separating plate wetted with separating agent and removed by the separating agent.

The high separation factor, even of the smallest particles, is achieved by the high voltage wires being installed above the high voltage fence.

The separating agent flows with the overspray into the collecting pan [6] underneath the E|SCRUB system to the side of which exhaust air ducts [7] are connected.

The separating agent runs from the collecting pan into the system tank and is pumped back into the separating modules from the system tank. A discharge system removes the overspray from the separating agent circuit in a partial flow.





- ① Spray booth
- ② Overspray
- ③ Flow body
- ④ Separating module
- ⑤ High voltage generators
- ⑥ Collecting pan with separating agent
- ⑦ Exhaust air duct

## Maximum separating efficiency, minimum pressure loss



### Energy-efficient and environmentally beneficial

E|SCRUB combines maximum separating efficiency with minimum pressure loss; permitting operation with 94% recirculated air for water-based paints and 85% recirculated air for solvent-based paints. Compared with a conventional wet scrubber section, this results in distinct energy savings of up to 75% and a corresponding reduction in CO<sub>2</sub> emissions.

In addition, E|SCRUB requires up to 86% less water. The electrostatic system switches on and off automatically in accordance with production, yielding further energy savings.

Separating efficiency is maximized by electrostatic charging and binding the overspray in the separating agent. The clean air regulation "TA Luft" permits maximum dust emissions of 3 mg/m<sup>3</sup>/h. With E|SCRUB this value can be reduced considerably. In combination with recirculation of the air, this consequently reduces particulate emissions up to 97%.

### Quality and reliability in production

By eliminating complex mechanical filter systems, E|SCRUB ensures constant flow rates without pressure fluctuations in the spray booth. This is an essential prerequisite for optimum production conditions and high quality coatings. In operation, E|SCRUB is characterized by considerably lower noise levels and easy servicing.

### Simple retrofit, rapid amortization

Existing plants can be converted quickly and easily. E|SCRUB is the energy efficient, environmentally friendly and low cost alternative to wet and dry separation in paint booths. This considerably reduces your running costs and leads to rapid amortization of your investments.

## Advantages of the E|SCRUB system

■ Air guidance	up to 94% recirculation possible (depending on the type of paint)	✓
■ Energy requirement	up to 75% lower energy consumption	✓
■ Water requirement	up to 86% lower water consumption	✓
■ Dust emission	in connection with air recirculation an up to 97% particulate emission reduction is possible	✓
■ Waste	considerably less waste due to lower water consumption and elimination of filters and filter materials	✓
■ Noise	considerable reduction in noise emission	✓
■ Availability	low-wear, low-maintenance system	✓
■ Coating conditions	constant pulsation-free flow without cross-flows	✓



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