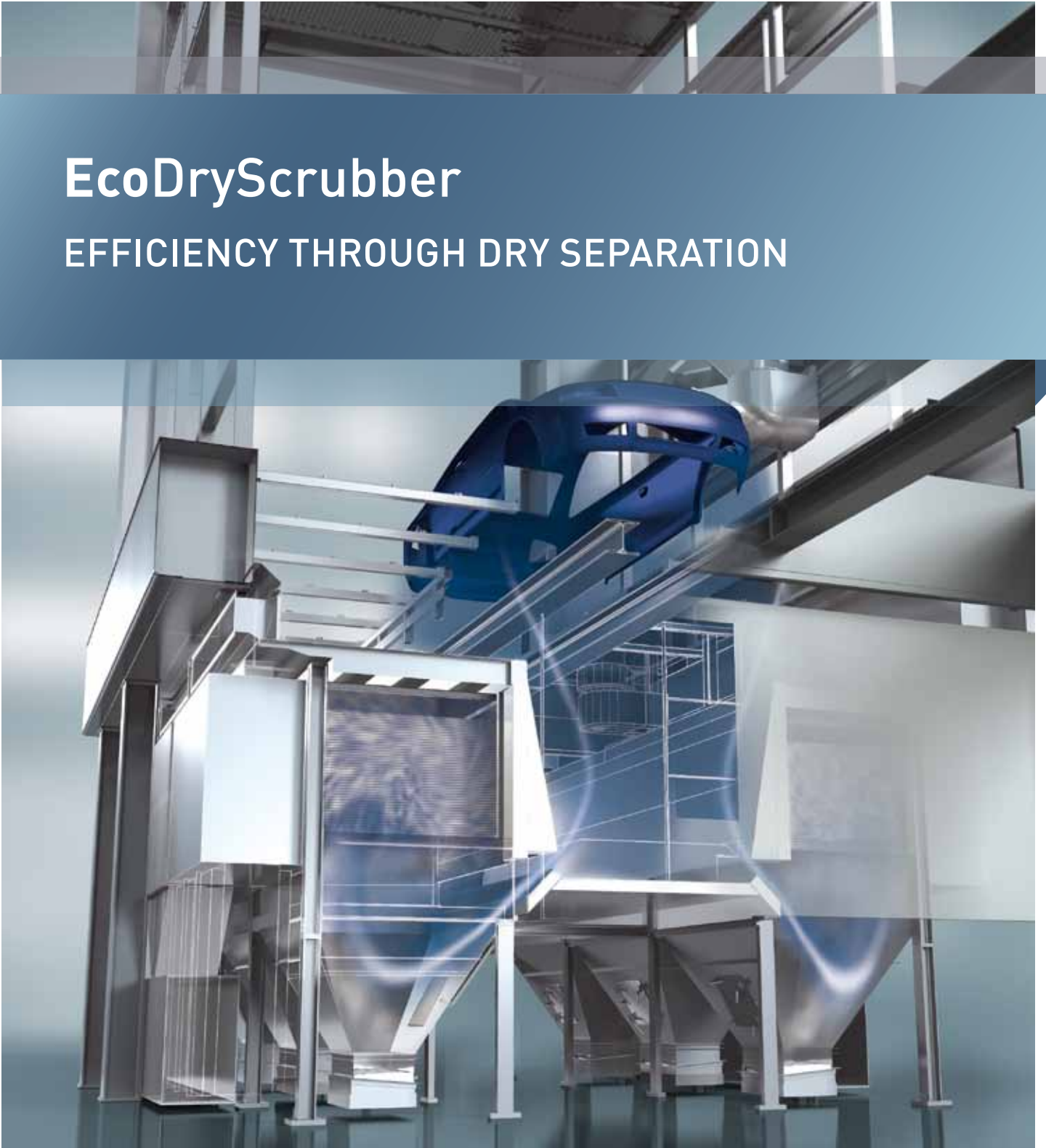




LEADING IN PRODUCTION EFFICIENCY

EcoDryScrubber

EFFICIENCY THROUGH DRY SEPARATION





» Dry separation with the **EcoDryScrubber** at BMW in Regensburg:
maintenance corridor with hoppers

EcoDryScrubber – ENERGY EFFICIENCY ...

The Dürr **EcoDryScrubber** has revolutionized
the separation of paint overspray:

The world's most successful technology relies on dry separation with limestone powder as a binding material. It combines high performance with massive energy and resource savings in painting, the most energy-intensive process of vehicle production.

EcoDryScrubber stands for

- » 60% lower energy costs in the spray booth, of which there is
 - » 80% less heat consumption
 - » 50% less power consumption
- » 80% less water consumption for supply air conditioning,
compared to traditional wet separation.

EcoDryScrubber uses limestone powder as a natural binding material for all paint types of paint overspray. The use of water and detackifier chemicals and disposal of paint sludge is eliminated.

Highest painting
standards – worldwide

Not only is the up to 95% air recirculation in the spray booth the key to energy savings, but also to a globally stable process and consistently high application quality. Whether the plant operates in India at 35°C with high humidity or in Russia at -20°C with dry air, it hardly makes a difference. Temperature and humidity in the paint application process can be held constant without effort. The process is nearly independent of the climate.

... RESOURCES AND COSTS

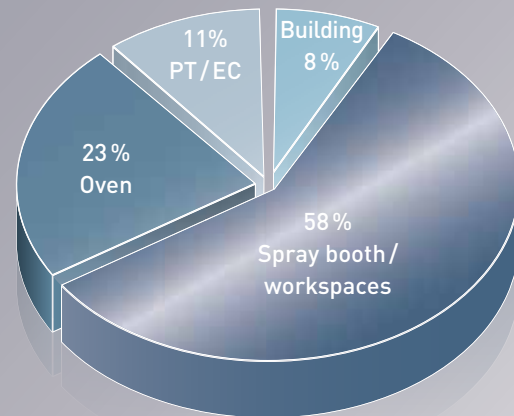
The **EcoDryScrubber** combines environmental, quality and cost aspects into an attractive overall concept.

Everything for environmental protection and sustainability

- » No coagulating chemicals or biocides
- » No water to bond paint
- » No unpleasant odors
- » No admission restrictions
- » No paint sludge
- » Extremely low particle emissions (HEPA 12, nearly 100 % filtration)
- » Reduced CO₂ emissions

A proven technology for efficient processes

- » One binding material for all types of paint overspray
- » Robust and fully automated system
- » Smaller supply air units, air ducts and supply systems
- » Reliable, hygienic air recirculation system
- » Consistent application quality
- » Clean conduit systems without paint sedimentation
- » Installation and commissioning in the shortest time
- » Climate independent



- » Nearly 60 % of the energy required in a paint shop goes to demands of the spray booth and its workspaces.

Efficiency in facts and figures

- » 60 % lower energy costs in the spray booth
- » Compact layout and reduction of booth cross-section by up to 35 %
- » No heat recovery required
- » Galvanized steel ducts – no stainless steel required
- » Low maintenance costs
- » Long filter lifetime (15,000 operating hours guaranteed)

DRY SEPARATION: AN EFFICIENT PROCESS

Material efficiency: A binding material for all paints

One of the greatest strengths of the **EcoDryScrubber** is its universal applicability:

The limestone powder binds all paint types of paint overspray applied in the spray booth. Unlike with wet separation, neither an ongoing control process nor an adaptation to the chemicals used with the utilized paints is necessary. At the same time the process needs no water.

Process efficiency for the highest exhaust air quality

Air filters with Teflon membranes are processes optimized and regenerate automatically. Therefore, during operation the system achieves a residual dust content of less than 0.1 mg/m^3 in the clean air duct. This nearly 100% filtration allows direct recirculation of the process air without the use of other filter stages.

Energy efficiency par excellence

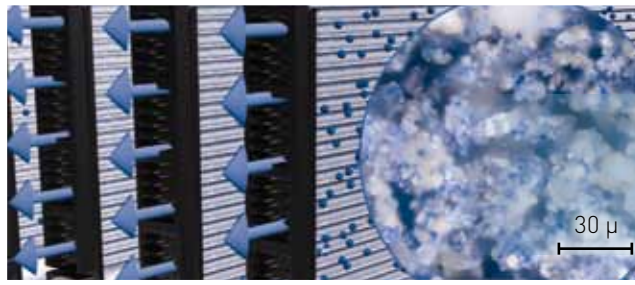
60% of the energy consumed in a paint shop is for the processes in the spray booth and their workspaces. Much of this in turn is used for the conditioning of the air. This is where the **EcoDryScrubber** comes in: The high air recirculation of up to 95% is the core of the massive energy savings that are made possible by the **EcoDryScrubber**. At a production volume of 160,000 car bodies in total, 16 million kilowatt hours of energy can be saved with the **EcoDryScrubber**. This corresponds to a reduction of 5,200 tons in CO_2 emissions, or enough electricity to supply 3,000 households per year.

Direct recirculation of
the cleaned air stream.

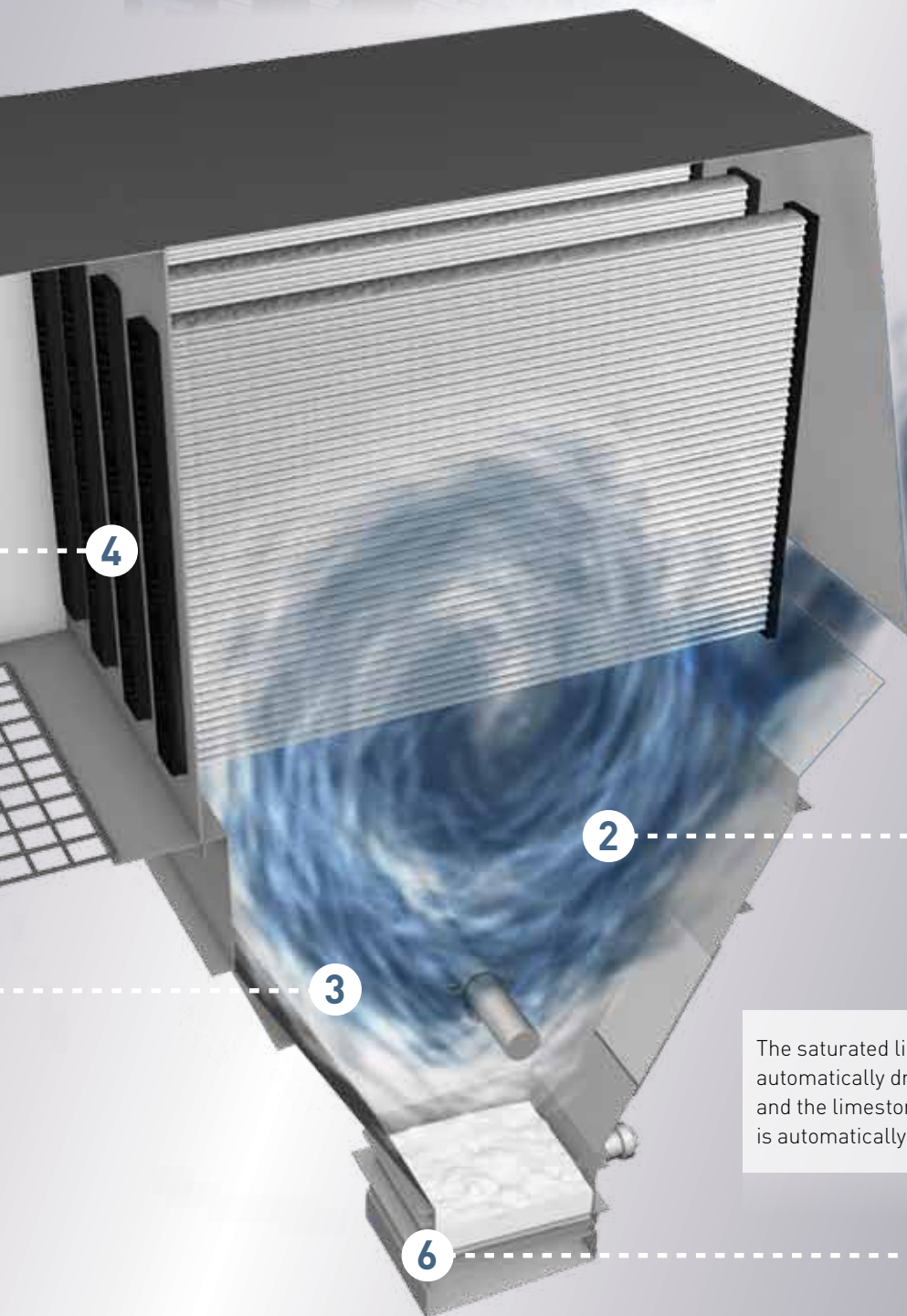
After reaching a defined filter
differential pressure, the filter
cake from the overspray and
limestone powder is blown off
and falls downward.

The paint overspray combines
with the limestone powder and
is deposited on the filter.

5



» An **EcoDryScrubber** module filter (at the bottom) consists of a hopper with limestone powder, the filter elements above it and the clean air duct.



The paint overspray enters the filter module from the application area via air flow.

1

Limestone powder is stirred up about every 30 seconds. It is deposited onto the filters and protects them from bonding with paint.

2

3

4

The saturated limestone powder is automatically drawn out of the unit and the limestone powder container is automatically refilled.

6



FIVE STARS FOR ENERGY EFFICIENCY

The **EcoDryScrubber** is considered a key technology in our **Eco+Paintshop** shop concept. For us, in terms of efficient production this means continuous further development of our products and solutions with regard to the painting process. To achieve this we take all aspects of efficiency, such as energy, flexibility and material into consideration. The result: An excellent innovation.



EcoDryScrubber has received several awards for its positive record regarding environmental friendliness and profitability.

REUTILIZATION AND ENERGY RECOVERY

Assured quality worldwide

The limestone powder used for the binding of the paint overspray was specified by Dürr especially for the implementation of the **EcoDryScrubber** in automated production systems.

A close-knit quality management system and partner network ensures quality, cost-orientation and supply worldwide – no matter where the respective production line is located.

Easy supply and disposal

The supply of limestone powder is carried out by silo trucks and filled directly at the silos. The saturated limestone powder is also stored in silos. The silos can be used for the supply and disposal of several lines. The supply and disposal of limestone powder between hopper modules and silos occurs automatically in a self-enclosed system.

As an alternative to the silos, material handling can be also realized with big bags.

» *Natural binding material*



Recycling at “its best”

The paint-saturated limestone powder can also be used in other production processes such as the cement industry.

The bound overspray is used for energy generation and the limestone powder is subsequently processed directly as a raw material in the cement industry.

This not only has a positive effect on the environment, but also on the operator's annual profit.

EcoDryScrubber – The advantages:

- » Energy reduction by 60 % in the spray booth
- » CO₂ reduction by 50 % in the spray booth
- » Limestone powder as a natural binding material for all types of paint overspray
- » Water and chemical free process
- » Nearly 100 % air filtration quality
- » Nearly climate-independent process
- » Fully automatic paint supply
- » Simplified accessibility concept for the paint booth
- » No paint sludge
- » No high voltage needed
- » Lower noise levels
- » No unpleasant odor
- » No paint particles in the spray booth exhaust



LEADING IN PRODUCTION EFFICIENCY

Dürr – Leading in Production Efficiency

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

- » **Paint and Assembly Systems:** Paint shops and final assembly plants for the automotive industry and aerospace construction
- » **Application Technology:** Robot and application technology for applying paint, adhesives and sealants
- » **Measuring and Process Systems:** Balancing technology, cleaning and surface processing technology as well as testing, filling and assembly products
- » **Clean Technology Systems:** Exhaust air purification systems, energy efficiency technologies