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High-efficiency monocyclone saves energy and powder

Many companies ask themselves how they can use less energy to reduce costs and protect the environment more. For powder coating, WAGNER has an excellent solution: the EEP series with its potential savings of up to 40 %.

One of the biggest global trends is energy-saving. This also affects powder coating systems. Here, energy is needed directly in the form of electrical power, for example to drive motors, and also indirectly in the form of compressed air.

Even in the past, WAGNER has used energy-efficient components and energy-optimised processes in its powder coating systems. They have a function, for example, which switches off the lifting devices in gaps, or only activates guns if a workpiece actually travels in front of it. This function is known as gap and height control. These savings may appear small, however they add up to a significant sum at the end of the year.

Cutting energy costs for powder coating by up to 40 %

The biggest energy consumer in powder coating, however, remained the fan motor in the final filter, which still consumes up to 37 kW of power and more. Now, WAGNER has developed a comprehensive energy-saving concept for this fan motor and successfully implemented it in 2016 in the "EEP" monocyclone and final filter series. EEP stands for "Energy Efficiency Package".

In the EEP concept, two measures come together to reduce airflow resistance and therefore compressed air consumption: first is an optimised pipe conduit between the cabin and the cyclone, and second is a special air guide within the monocyclone. With this setup, a smaller motor is sufficient to generate the same volume of suction. In this way the EEP series is able to reduce energy costs by up to 40 % overall.



This is also illustrated by the example worked out below:

| Volume of suction | Conventional monocyclone solution | Final filter from the EEP series | Savings* in € a per year | ind % | Additional savings |
|----------------------|---|--|-----------------------------|--------|---|
| 12,000 m³/h | 30 kW | 18.5 kW | Euro 3,974 | 38.3 % | Lower installation costs for power supply |
| 16,000 m³/h | 37 kW | 22 kW | Euro 5,154 | 40.5 % | |
| 20,000 m³/h | 45 kW | 30 kW | Euro 5,184 | 33.3 % | |
| 24,000 m³/h | 45 kW | 37 kW | Euro 2,765 | 17.7 % | |

* Based on 240 days, 8 hours, 18 ct/kWh

These values can be achieved by combining a high-efficiency monocyclone with a corresponding conduit and matching filter to create the "Energy Efficiency Package" (EEP) (see illustration).

Powder savings by boosting cyclone efficiency

In addition to energy savings, the flow-optimised construction of the cyclone also increases the cyclone efficiency by 1-2%. This is a positive side effect that should not be under-estimated. Depending on the system configuration, powder savings can be quite considerable. In example calculations (see table), cost savings of 20% can be achieved. "Energy and powder savings are important for many industrial clients and their significance is increasing. Partly, of course, due to lower costs – but also because more and more companies have set themselves the goal of reducing their energy consumption to protect the environment. With the EEP series, we are able to help our clients to achieve these goals", explains Michael Topp, Global Product Manager at WAGNER.



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| Example calculation 1 | Starting position | Cyclone efficiency + 1 % |
|--------------------------------------|-------------------|-----------------------------|
| Transfer efficiency on the workpiece | 30% | 30% |
| Cyclone efficiency | 95.0% | 96.0% |
| Powder output [g/min]/gun | 180 | 180 |
| Number of guns | 16 | 16 |
| Powder loss [%] | 10.4% | 8.5% |
| Powder loss per work shift (7h) [kg] | 42 | 34 |
| Powder loss per year (230 days / € | | |
| 4/kg) [€] | €38,949 | €31,159 |
| Cost saving | | 20 % |

| Example calculation 2 | Starting position | Cyclone efficiency + 1 % |
|--------------------------------------|-------------------|-----------------------------|
| Transfer efficiency on the workpiece | 50% | 50% |
| Cyclone efficiency | 95.0% | 96.0% |
| Powder output [g/min]/gun | 180 | 180 |
| Number of guns | 16 | 16 |
| Powder loss [%] | 4.8% | 3.8% |
| Powder loss per work shift (7h) [kg] | 30 | 24 |
| Powder loss per year (230 days / € | | |
| 4/kg) [€] | €27,821 | €22,257 |
| Cost saving | | 20 % |