Industrial Oil Mist Collector (ESP)

How Does KLEAN ESP Work

Theoretically speaking, ESP technologies are used for the purpose of removing particulate matters from gas streams by applying an electrostatic charge to the fume & mist particulate with electrons emitted from the cathode section of the high voltage electric field, and negative ions produced as a result of co-mingling and collision of electrons and air molecules.

Following the negative electrostatic field created by the power supply, the negatively charged particulates would be attracted to the positively charged anode section and get captured, while the purified exhaust gas comes out clean.

Given the tiny size of the electrons (which is several orders of magnitude smaller than that of the fume & mist particulates) and the high density of electrons discharged (≥1 x 10^8/cm³), ionization of fume & mist particulates entrained in the exhaust airflow would be practically inescapable.

Rather than simply due to the occasional collision, fume & mist particulates in the electric field are bound to be charged according to the rules of basic charging mechanisms, namely field and diffusion charging. Negatively charged particulates are bound to be attracted to the positively charged anode section and get captured, thus achieving an extremely high air cleaning efficiency.

In contrast to other air cleaning devices, ESP applies energy only to the particulate matter being collected and therefore impart very low pressure drop on the air stream. In most cases, it is not necessary to choose an ID fan with much higher pressure for ventilation, resulting in a high-efficiency in its total consumption of energy (in the form of electricity).
KLEAN’s Solution to Collect Stenter Oil Mist Emissions

A frequent result of heatsetting process of fabrics with a stenter is the release of heavy hot fumes containing organic oil vapors, dye stuff particulates, finishing auxiliary mist, lint, etc. causing prodigious heat losses and air pollution.

Hot exhaust fume thus released passes through a pre-filtration device, where fiber particulates can be separated, then enters a heat exchanger and gets cooled down to a certain level where our ESP performs best, and finally enters our ESP, where organic oil vapors, dye stuff particulates, finishing auxiliary mist getting captured and condensed can be collected and put into other proper use, leaving the processed flue gas coming out clean.
Features of KLEAN ESP system for Stenter Exhaust Air Cleaning

1. Enormous efficiency: Oil Mist Removal efficiency ≥ 99%. Particulate removal efficiency ≥ 99% (at rated airflow capacity).

2. Quantity of waste oil collected by the ESP system can be huge, and collected oil features a comparatively high purity, which can be used as fuel, re-used for lower end products or resold to waste collectors for further processing, thus the financial investment in this system can pay off over a short period of time.

3. Maximum security against fire hazards: Consummate electrical protection functions, complemented with an efficient Fire Detection and Suppression system, leaving no fire hazards undetected and no open flame unquenched.

4. Modular structure, plus multi-power control, ensuring the proper performance of the whole system even if some of the power packs failed to work.

5. Ease of cleaning and maintenance: Filter cells are washable and can be easily accessible through the cell access door.

specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Airflow Capacity (m³/h)</th>
<th>Size (mm)</th>
<th>Net Weight (KG)</th>
<th>Power Consumption (KW)</th>
<th>Suitable for</th>
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<tbody>
<tr>
<td>BSG-216-12K</td>
<td>12000</td>
<td>2616</td>
<td>2060</td>
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A Sure Win Investment

Specially designed to tackle oil-laden fumes, our ESP is not only a perfect solution to reduce exhaust emissions resulting from the volatilization of solvent-base textile auxiliaries during heatsetting. Given the enormous oil mist removal efficiency of our unit and the comparatively high purity of the collected waste oil, it is also a sure win investment.

Suppose you have a five-chamber stenter working 24 hours a day and 330 days a year, we’d recommend an ESP that features an airflow capacity of 12000 m³/h for this stenter. Given an average fume concentration of up to 470 mg/m³, we would know that the amount of collected waste oil per day would be:

\[
Q = C \cdot V \cdot H \cdot \eta = 170 \cdot 12000 \cdot 24 \cdot 10^{-6} \cdot 99\% = 134 \text{ kg}
\]

See the table below and get to know how much our ESP can save you and create for you.

<table>
<thead>
<tr>
<th>Main Electric Power Equipment of a Typical System</th>
<th>Power Consumption (KW)</th>
<th>Operating Time (330 days/year)</th>
<th>Electricity Fees (RMB/kg/day)</th>
<th>Collected Waste Oil (134 kg)</th>
<th>Waste Oil Price (RMB/kg)</th>
<th>Returns (132660 RMB/year)</th>
<th>Profit (50214 RMB/year)</th>
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<tbody>
<tr>
<td>ESP</td>
<td>5.4</td>
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<td>Exhaust Fan</td>
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<td>Water Pump</td>
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</tr>
<tr>
<td>Cooling Tower</td>
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</table>
Outdoor Installation

- Process Line
- Chimney
- Exhaust Fan
- Fire Damper
- Cooling Tower
- Industrial Oil Mist Collector (ESP)
- Heat Exchanger
- Bypass Valve

Indoor Installation

- Process Line
- Chimney
- Exhaust Fan
- Fire Damper
- Industrial Oil Mist Collector (ESP)
- Heat Exchanger
- Bypass Valve
Why Choose KLEAN ESP

Patented Cylindrical Honeycomb Structure Electric Field
Maximized corona discharging uniformity & electric field intensity, hence maximized purification efficiency. Superior mechanical strength compared with other conventional electric fields, which are apt to get deformed easily during the maintenance and cleaning procedures.

High-Performance Power Pack
High-frequency high-voltage solid-state transformer with epoxy resin encapsulation, driven by half-bridge switching converter, and is powerful, stable and energy-saving.

Additional Neutralization Device
Neutralizer is introduced to modulate the resistivity of the particles in order to improve the collection efficiency as well as shorten the maintenance cycle of the electrostatic precipitator.

International-standard Safety
Our products are CE certified and UL 867 and UL 710 tested, epitomizing the internationally accredited safety of our ESP’s.

Consummate Control Circuit
Perfect circuit control can make sure the facility have the following functions, soft startup, invariable current output, arc extinction and auto reposition, short circuit protection, power over loading protection, transformer over-heated protection and malfunction diagnosis.

Flexible Assembly Combinations
Modular design, allowing for flexible assembly combinations of electric field cells as well as of the whole ESP set. Almost all components can be easily knocked-down and assembled.
Honors and Awards

Guangdong High & New Technology Enterprise Certificate
Guangdong Technical Private Enterprise Certificate

Recommended Enterprise for Energy-saving and Emission-reduction Technologies
Registered with China Dyeing and Printing Industry

Member of China Dyeing and Printing Association

ISO9001: 2008 Quality System Certificate
National Environmental Certificate

Technology Innovation Certificate
Member of China Environmental Protection Industry Association

33 Patent Certificates
Applications