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Advanced Carbon Adsorption Technology for Cleaner Industrial Air

Activated Carbon Adsorption Equipment & Media





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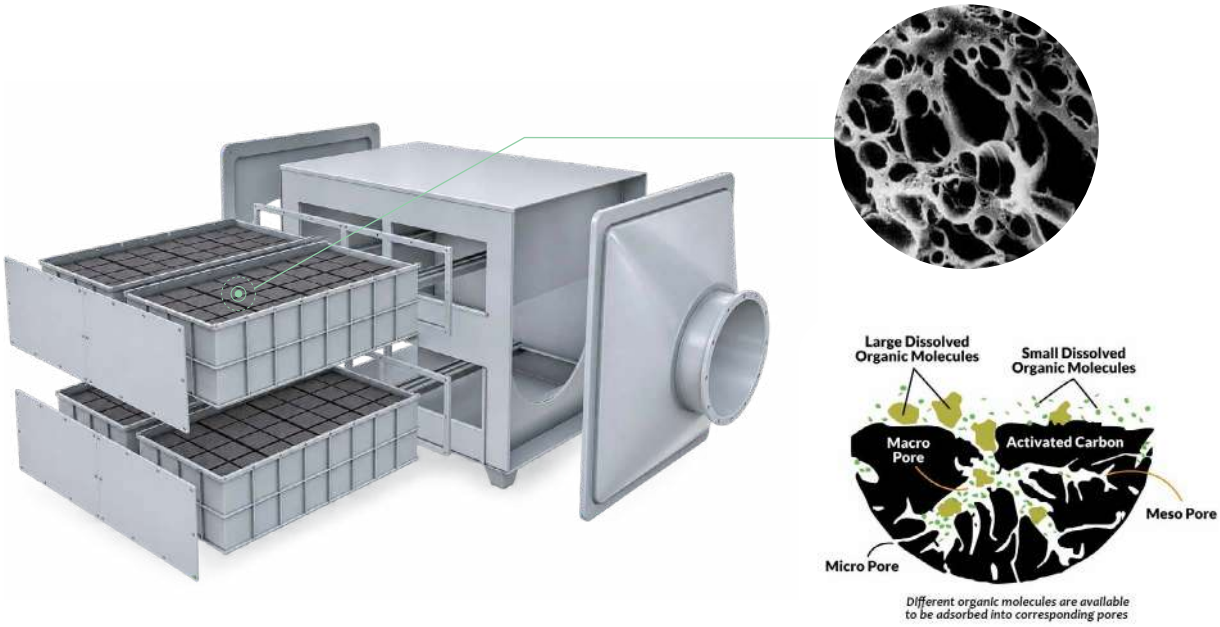
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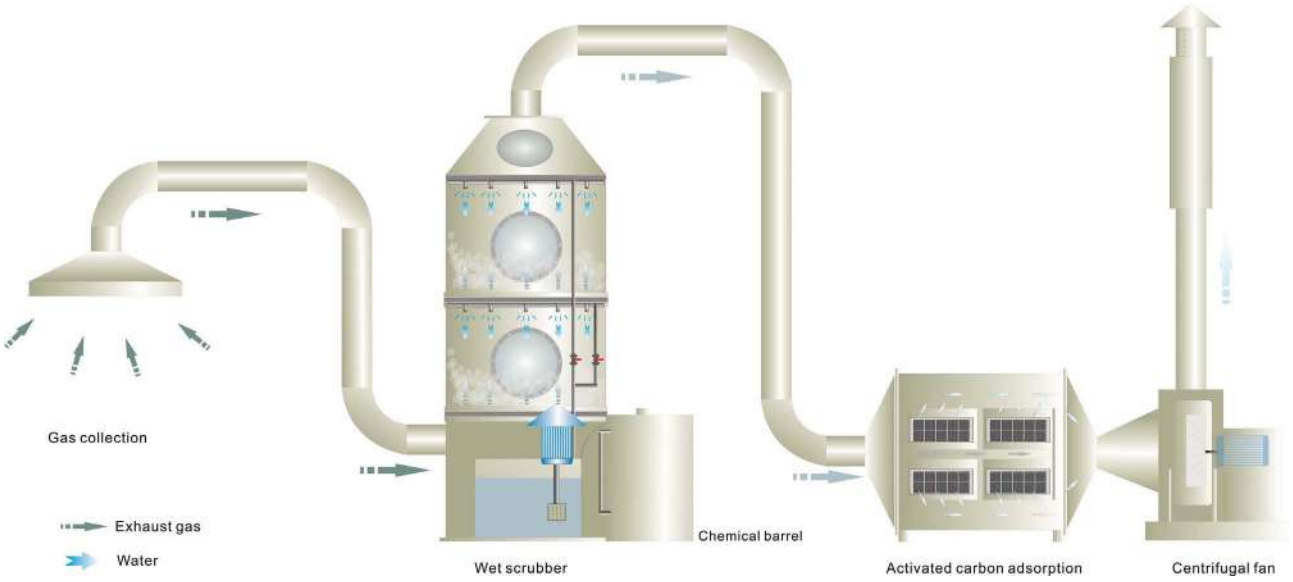
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Activated Carbon Adsorption Technology

Activated carbon adsorption technology is a gas purification technology that uses porous carbon materials to capture and remove pollutants and is widely used in industrial exhaust-gas treatment, VOC (volatile organic compound) control, odor control, and air purification. Its core principle is to use the well-developed pore structure and large specific surface area of activated carbon to adsorb pollutant molecules at the gas–solid interface, thereby purifying the gas. Activated carbon adsorption technology is generally suitable for treating organic exhaust gases at low to moderate concentrations and is one of the established technologies for industrial VOC control.



Activated carbon has extensive micropore, mesopore, and macropore structures and can effectively adsorb a variety of organic pollutants, including benzene and its homologues, alcohols, ketones, esters, hydrocarbons, and malodorous gases. With its simple equipment design, stable operation, and relatively low energy consumption, activated carbon adsorption has become an important technological approach to industrial air pollution control.



Common Combined Processes Using Activated Carbon Adsorption Technology

• Application



Chemical and pharmaceutical process ventilation



Painting, coating, and surface-finishing exhaust



Printing, packaging, and laminating operations



Odor control at wastewater and waste-handling facilities

Activated Carbon Adsorption Box

Activated carbon adsorption box adopts high-performance activated carbon as the core filtration medium. Through the porous structure and strong adsorption capacity of activated carbon, it effectively captures and removes VOCs, odors, and other airborne contaminants from industrial exhaust streams.

It is widely used in industrial ventilation systems, exhaust gas treatment, chemical processing, coating lines, wastewater treatment plants, laboratories, food processing facilities, and other applications requiring odor and VOC control.



01

Efficiently adsorbs VOCs and odors

Activated carbon has a well-developed microporous structure and a large specific surface area, enabling effective capture of organic pollutants and odor molecules.

02

Suitable for low-concentration exhaust gas treatment

Activated carbon adsorption provides effective treatment for low-concentration, high-volume VOC exhaust gas.

03

Flexible selection of adsorption materials

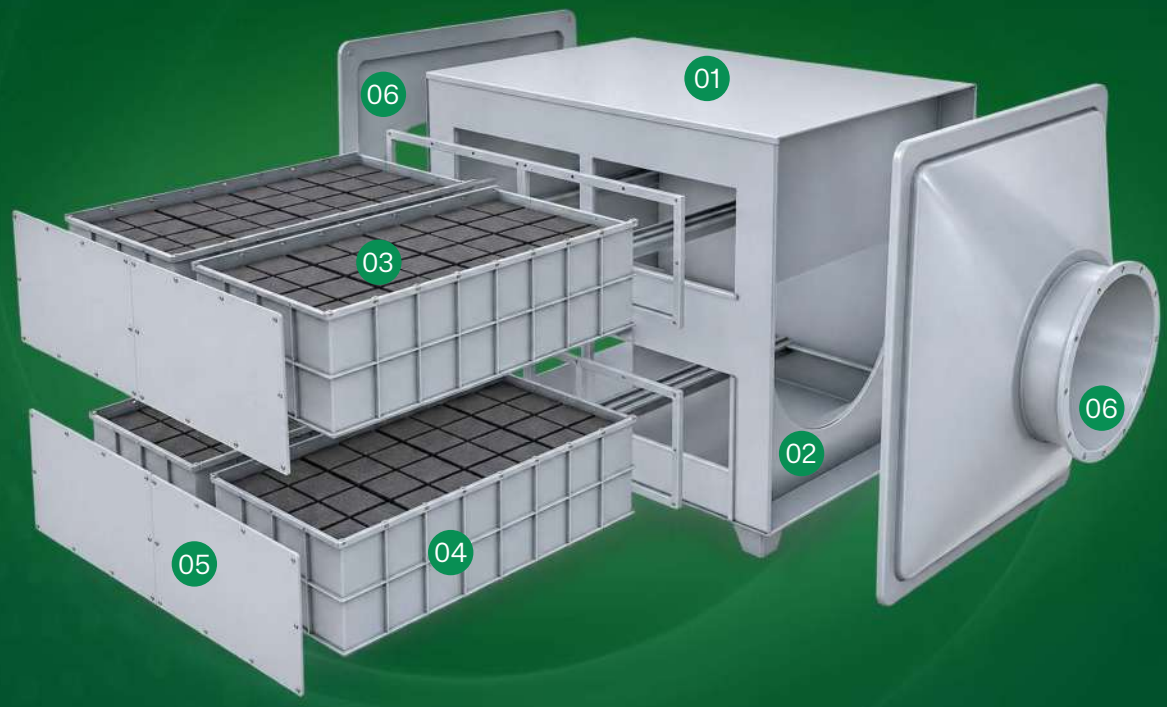
Select different activated carbon types according to pollutant type.

04

Simple structure and stable operation

The equipment primarily relies on physical adsorption, without complex chemical reactions, making maintenance convenient and operation reliable.

• Structure



01 Housing

The housing is made of carbon steel, stainless steel, or PP materials to ensure structural stability, corrosion resistance, and good sealing performance.

02 Pre-filtration layer

An initial or medium-efficiency filtration layer can be installed to remove dust, oil mist, and other particulate matter, preventing particles from blocking the pores of the activated carbon.

03 Activated carbon layer

The core adsorption medium, typically using granular activated carbon or honeycomb activated carbon. The thickness is determined according to airflow rate and pollutant concentration. A multi-layer structure can improve purification efficiency.

04 Support layer

Mainly used to fix the activated carbon and prevent the adsorption layer from collapsing or causing uneven airflow distribution. Stainless steel mesh, support frames, or filter cotton can be used to support the activated carbon.

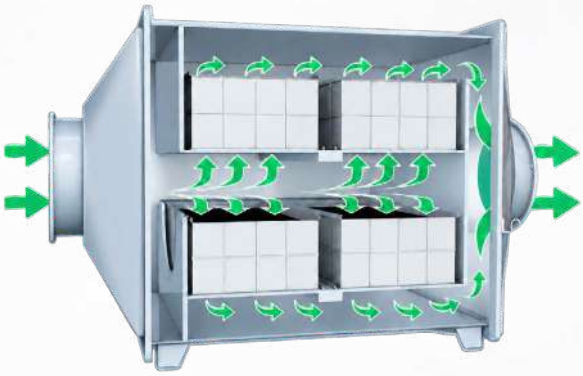
05 Maintenance door

Designed for convenient activated carbon replacement and equipment cleaning and maintenance. The door is usually equipped with sealing strips to prevent leakage.

06 Air inlet and outlet

Ensure smooth gas flow through the equipment. The size and dimensions of the inlet and outlet can be customized according to specific requirements.

• Principle



Exhaust gas enters the adsorption tower.
Exhaust gas containing VOCs or odor pollutants enters the tower through the ductwork.

Uniform airflow distribution.
After passing through the flow-directing structure, the exhaust gas enters the activated carbon adsorption zone evenly.

Contaminant adsorption.
As the exhaust gas passes through the activated carbon bed, contaminant molecules enter the activated carbon pores and are adsorbed by intermolecular forces, transferring from the gas phase to the solid surface.

Clean gas discharge.
The gas after adsorption treatment is discharged through the outlet.

Activated carbon replacement or regeneration.
As operating time increases, the activated carbon gradually reaches saturation and must be replaced with new activated carbon or have its adsorption capacity restored through thermal regeneration, steam regeneration, or similar methods.

• Adsorbent Material Specifications

Coconut Shell Activated Carbon			
Parameter Name/Name	Water Purification Carbon	Golden Carbon	Fine Granular Carbon
Iodine No, mg/g ≥	1000	1000	1000
Methylene Blue Adsorption, mg/g ≥	135	135	135
Bulk Density, g/ml ≥	90	95	90
Hardness, % ≥	0.45	0.45	0.45
Ash Content, % ≤	5	5	5
Moisture as Packed, % ≤	10	10	10
Iron Salt Content, % ≤	0.1	0.1	0.1
pH	7-9	7-9	7-9





Activated Carbon Adsorption Tower

Activated carbon adsorption tower is an exhaust gas treatment device that uses the adsorption capacity of activated carbon's porous structure to remove organic pollutants and odorous substances from industrial exhaust gas.

The activated carbon adsorption tower is primarily used to treat VOCs, odorous gases, and other adsorbable pollutants, and is widely used in coating, printing, chemical, electronics, pharmaceutical, laboratory, and industrial ventilation systems.



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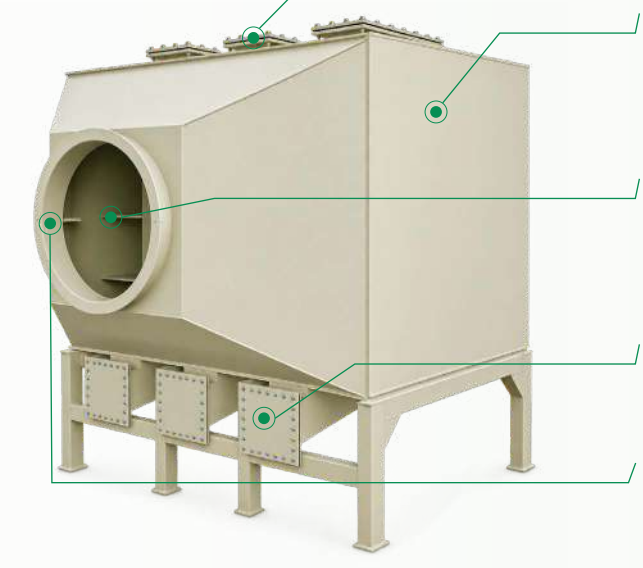
Select different activated carbon types according to pollutant type.

04

Simple structure and stable operation

The equipment primarily relies on physical adsorption, without complex chemical reactions, making maintenance convenient and operation reliable.

• Structure



Activated carbon filling port.
Used to add new activated carbon material.

Tower body.
Main equipment structure, available in PP, FRP, and other materials.

Pre-filtration layer.
Prevents clogging and ensures stable adsorption efficiency.

Discharge outlet.
Used to discharge saturated activated carbon.

Exhaust gas inlet.
Introduces contaminant-laden exhaust gas into the tower.

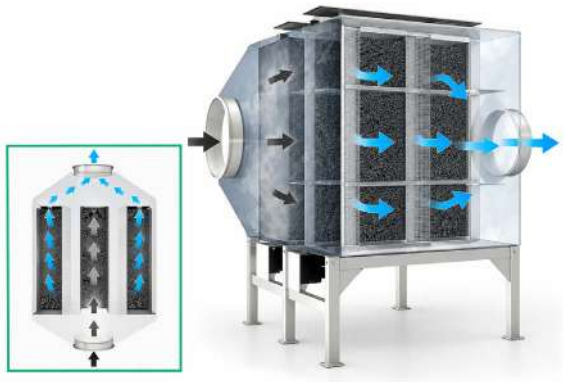
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Ash Content, % ≤	5	5	5
Moisture as Packed, % ≤	10	10	10
Iron Salt Content, % ≤	0.1	0.1	0.1
pH	7-9	7-9	7-9







Activated Carbon

Activated carbon is an adsorbent material with a highly developed pore structure and large specific surface area, primarily removing pollutants from gases or liquids through physical adsorption and surface chemical interactions.

Activated carbon is typically produced from carbonaceous materials such as coconut shells, coal, and wood through an activation process. After specialized processing, a large number of micropores, mesopores, and macropores are formed internally, providing abundant adsorption sites that capture pollutant molecules on the carbon material surface.

In the field of industrial air pollution control, activated carbon is primarily used to adsorb VOCs, odorous gases, and certain harmful gases, and is widely used in exhaust gas treatment, air purification, wastewater treatment, and industrial filtration systems.



01

High specific surface area

Activated carbon contains a large number of micropores, providing a vast adsorption area.

02

Excellent VOC adsorption capacity

Effectively adsorbs a wide range of organic pollutants.

03

Excellent odor control performance.

Activated carbon can adsorb a variety of gas molecules that cause odors.

04

Easy to use and replace

Can be replenished, replaced, or regenerated according to operating conditions.

• Types



Granular Activated Carbon



Pelletized Activated Carbon



Powdered Activated Carbon



Honeycomb Activated Carbon

• Specifications

Activated Carbon Specifications				
Raw Material	Coconut Shell	Fruit Shell	Coal-Based	Coal-Based
Shape	Granular	Granular	Pelletized	Granular
Iodine Value (mg/g)	900-1100	800-950	600-950	600-900
pH Value	7-11	7-11	7-11	7-11
Hardness (%)	≥95	≥90	≥95	≥90
Pore Volume (cm^3/g)	~0.90	~0.85	~0.70	~0.75
Bulk Vensity (g/cm^3)	0.50-0.60	0.45-0.58	0.45-0.65	0.45-0.65
Methylene Vlue(mg/g)	≥130	≥105	≥150	≥150
Specific Vurface area (m^2/g)	1200±50	900±50	800±50	800±50
Ash Vontent (%)	≤13	≤13	≤10	≤13

Reliable Adsorption Equipment & Media for VOC Removal and Odor Control

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