



**300 Installations across...
14 Countries
and expanding further....**



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ENVIROPOL
An ISO-9001:2008 Company



About Us

ENVIROPOL has been pioneer world-wide in supplying wet scrubbers to solve Air Pollution Control (APC) problems in sugar, power & other process industries. Today, it is rated number one amongst few Indian companies for an active presence in the entire spectrum of APC business.

- Technocrats Promoted Group
- Founded in Year 2003
- Corporate Office Located in Noida, Built up Space: 5000 sqft.
- Total Employee Strength 100+
- Global Presence in 14 Countries
- More than 300 Installations Worldwide
- Manufacturing Facilities Spread Over 90000 sq.ft



Our Mission

To deliver innovative, reliable and cost effective eco-friendly solutions to our customers for producing green energy and managing healthier environment for future generations.

Pollutants are inevitable but pollution is not

Our Vision



Green is Gold

Accreditation



Wet Scrubbers

Our Manufacturing Range

- Fluidized Bed Nye Tray
- Multi Jet Spray Tower
- Fixed Vane Scrubber
- Packed Bed Tower
- High Energy Venturi
- Dynamic Scrubber
- Ventray Scrubber
- Wet Cyclones



Selection Criteria

- Volume of Dust Laden Air/Gas
- Input/Output Dust Concentration
- Allowable Pressure Drop
- Particle Size Distribution
- Dust Characteristics

Fluidized Bed Scrubber

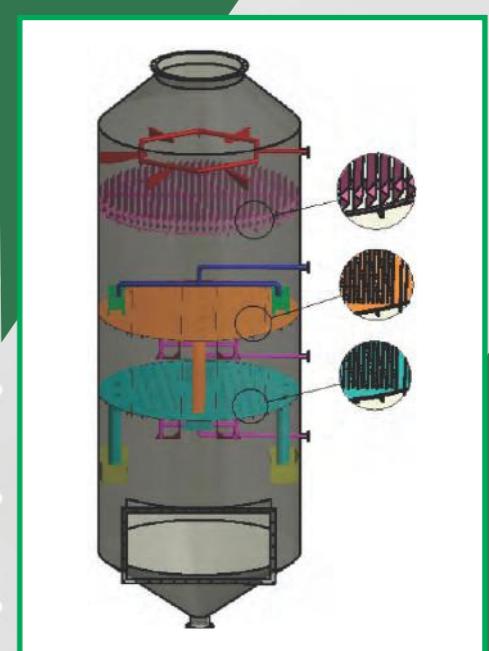
Working Principle

The contaminated gas is brought into intimate contact with curtain of water layer directed at right angle to the gas flow through the multi orifice distribution plate (Bed Tray).

While passing through the orifice of tray, the whole volume of gas is divided into thousand of small streams, which are accelerated to impinge the water layer creating complete fluidization with allowable pressure drop of gas flow.

When the micron sized particulate matter pass through the fluidized bed of water, they are entrapped in the bubbles due to differential density and get precipitated in the scrubbing liquid.

Clean gas swirls upward to the outlet through double stage mist eliminator and centrifugal trap at the top. Liquid (with entrapped particles) drains via bottom cone for solid-liquid separation through mechanized slurry de-watering system.



Advantages

- Two Tier Separation - Dry and Wet
- Higher Scrubbing Efficiency (99 % +)
- Low Pressure Drop (60 mmw)
- Tolerate Very High Dust Loading (over 20 gm/Nm³)
- Trouble Free Operation - Absence of Scrubbing Nozzles
- Flexibility to Install Before or After ID Fan

- Inherent Quality to Reduce Gaseous Pollutant
- Low Water Requirement
- Easily Upgradable to Meet Future Norms
- Available with Integrated Stack Design
- Wide Range of Applications

Fixed Vane Scrubber

Working Principle

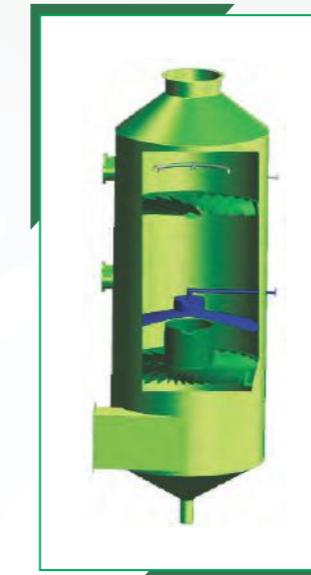
The dust laden flue gas enters the bottom of Fixed Vane Scrubber tangentially and flows upward forming vortex. This vortex / cyclonic action of the saturated gas stream, as it spins upwards, forces the heavier particles to fall out of suspension. Scrubbing liquid is introduced to the scrubber as a spray directed down over circular "Scrubbing Vane" arrangement. As the liquid drains through the vanes, it creates curtain of Scrubbing liquid. The flue gas collides with the curtain and dust particles get trapped in the water curtain. The slurry thus produced is washed down to the outlet.

The cleaned flue gas is then allowed to pass through high efficiency mist eliminator vane (demister) for separation of entrained liquid droplets from flue gas. The change in momentum allows the finer liquid droplets to coagulate and form coarser droplets and gravitational and centrifugal forces are responsible for the separation of liquid droplets from the gas stream.

The filtered flue gas then allowed for discharge to atmosphere through stack.

Advantages

- Can Handle a Wide Range of Particle Sizes
- No Requirement of Nozzles
- Low Water Requirement
- No Moving Parts
- Simple Operation, Only Occasional Cleaning Required
- Can Accept Higher Dust Concentration in Scrubbing Water
- Wide Range of Applications



Venturi Scrubber

Working Principle

The dust laden Flue gas enters the converging section followed by venturi throat, where the velocity of the flue gas increases to its maximum. Scrubbing liquid is injected in the gas stream before or within throat. The scrubbing liquid is atomized by the turbulence in the throat improving gas-liquid contact.

The gas-liquid mixture then decelerates and it move through the diverging section causing additional particle-droplet impacts and agglomeration of the droplets. The liquid droplets are then separated from the gas stream in an entrainment section usually consisting of a cyclonic separator & mist eliminator.

Advantages

- | | |
|-----------------------------|---------------------------------------|
| • Simple Construction. | • Good for Collecting particles >10µm |
| • Reduced Capital Cost. | • Simple Operation |
| • Wide Range of Application | • Lesser Threat of Chocking |



Slurry De-watering Systems

Our Manufacturing Range

Mechanized

- With Lamella Gravity Settler and Sludge Dredger
- With Lamella Gravity Settler and Belt Press Filters

Semi Mechanized

- With Lamella Gravity Settler and Vibro Screens
- With Conventional Clarifier and Vibro Screens

Conventional-Manual

- With Under Flow Type Sludge Drying Beds
- With Over Flow Type Ash Pond



Selection Criteria

- Lay out and Available Space
- Cost-Benefit Considerations
- System Capacity
- Quality of Re-circulation Water
- Availability of Manpower
- Dust Composition
- Ash Disposal Management

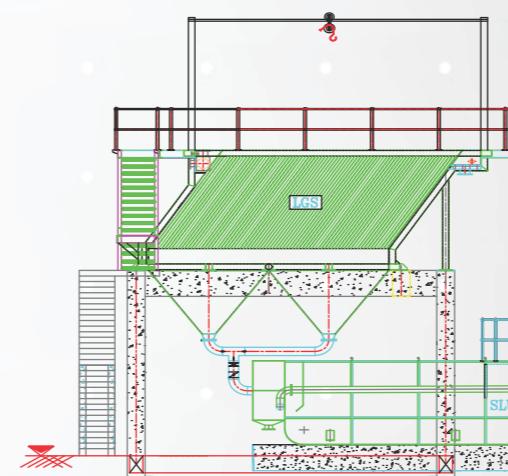
Mechanized Slurry De-watering system

Working Principle

The slurry generated in scrubber is pumped to the Lamella Gravity Settler (LGS). Enviropol design of LGS is self contained package settling unit with a conical sludge hopper.

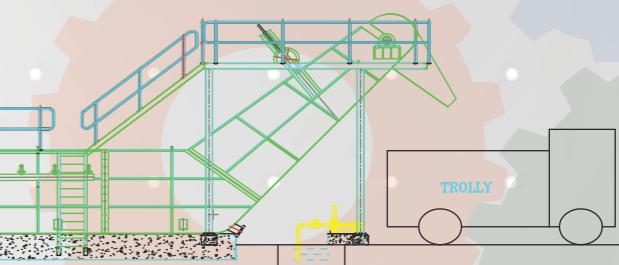
The clarified liquid in LGS leaves the inclined plate assembly through orifices at the top and is distributed into collection channels leading to clarified water outlet for circulation back to the scrubber.

The thick slurry from the hopper flow to slow moving sludge dredger for separation and conveying of ash directly to trolley. Liquid thus separated from the dredger is pumped back to LGS.



Advantages

- | | |
|-----------------------|----------------------|
| • Smaller Foot Prints | • Minimum Water Loss |
| • Online Ash Disposal | • Manless Operation |
| • Sturdy Design | |



Wet Electrostatic Precipitators

For Ultra Clean Gas

With increasing demand, world-wide, for reduction of respirable particulate and aerosols from various industrial processes, **WESP** technology from **Enviropol - Envibat** is gaining recognition due to its ability to capture sub-micron particulate with condensed acid mist unlike other dry separation techniques like Bag Filter & Dry ESP.

Our Manufacturing Range

- Square /Round/Honeycomb Construction
- Tower Construction with Integrated Stack

Working Principle

Gas Conditioning

The dust laden hot flue gases are first conditioned to near saturation to make it more conducive for charging through water spraying. For high dust loading, low pressure drop scrubbing is used for conditioning and reducing the dust load.

Charging

Saturated gas with fine particulate enters the charging section and given strong negative charge by ionizing corona produced by high voltage electrodes.

Collecting

The electrical field causes charged particles to migrate to the grounded walls of the tube where they accumulate.

Removing

The falling water film inside the tubes removes the collected material to a discharge drain.

Advantages

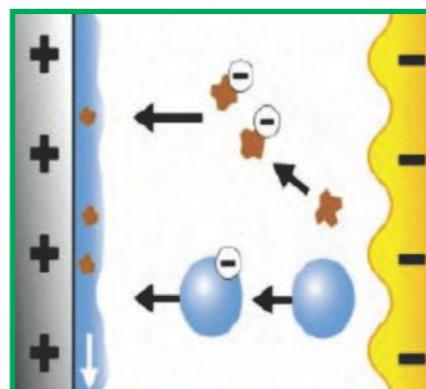
- Ability to Capture High Resistivity ($>10^{10}$ ohm-cm) Particulate
- Low Outlet Emission - Even Below 10mg/Nm³
- Substantial Reduction of Gaseous Pollutants H₂SO₄ mist & SO₂
- Ability to Capture Hg⁺² and HCl
- Low Specific Collecting Area
- Ability to Handle Sticky Dust
- No Rapper Re-Entrainment
- No Fire Hazards
- Smaller Foot Prints

Upgrade your existing Wet Scrubbers to WESP

An opportunity exists, for the users of operating Bio-mass Fired Boilers with Wet Scrubbers, to upgrade their existing system to **WESP** for more effective control of emission of fine particulate and acid mist.

Modular design and adaptability to fit into existing wet scrubber makes installation easy.

WESP has proved to be an effective and more economical solution for air pollution control for the boilers being converted for multi fuel firing application.



Flue Gas Desulfurization (FGD)

Our Manufacturing Range

- Wet FGD (Lime/Caustic/Sea Water)
- Semi- Dry FGD
- Dry FGD

Selection Criteria

- Sorbent Availability
- Effluent Disposal / Byproduct Recovery
- Layout and Available Space
- Location of Proposed Plant
- Operating & Maintenance Cost

Working Principle

WET FGD (DUAL ALKALI)

The flue gas is passed through specially designed Enviropol-Ventray FGD Scrubber to suit dual alkali (Caustic/lime) application for over 95 % SOx removal at optimized operating cost.

This Scrubber is designed to de-sulfurize the flue gas in two stages with lime & Caustic solution as solvents. The primary stage includes a Venturi section operating with lime followed by the final scrubbing with caustic solution using multi stage tray/spray tower.

The clean and de-sulphurised gas is then reheated using steam heater, mounted on top of the tray tower as an optional device before exit to the atmosphere through integrated stack.

The effluent generated is processed for de-watering for sludge disposal or for byproduct recovery in the form of saleable Gypsum/ Sodium Sulphate.

Advantages

- High SOx Removal Efficiency (over 95%)
- Available with Re-Heater & Integrated Stack
- Low Power Consumption
- Up-Gradable to Meet Future Norms
- Byproduct Recovery
- Free from Scaling & Plugging
- Optimum Cost of Operation
- Low Blow Down Rate & Water Usage



Bagasse Dryer

&

Hybrid Model

ENVIRO-EARN

Flash Dryer™ for Bagasse

For Energy Efficient Prolonged Co-generation

Bagasse and its conservation has become a necessity for up coming sugar factories moving towards co-generation. Enviropol-Flash Dryers for Bagasse maximizes the generation of heat energy from the available system through substantial reduction in moisture content.

Working Principle

The hot and de-dusted flue gas from the boiler are made to pass through the flash tower under induced / forced draft. The wet mill bagasse is fed through a rotary air lock feeder at the bottom of the tower. It is then carried upward in a co-current mode with the hot flue gas at a calculated velocity based on Average Particle Retention Time (APRT). During the process, bagasse moisture evaporates and the dried bagasse is subsequently separated through a high efficiency cyclonic separator.

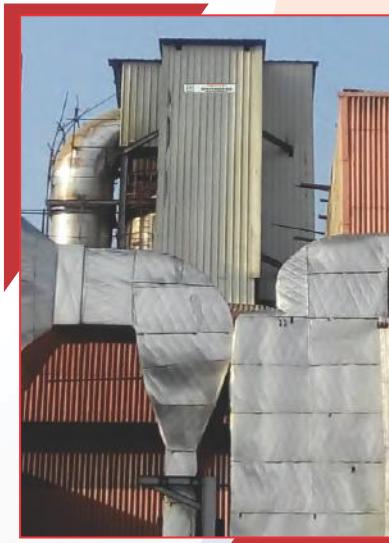
The dried bagasse is continuously evacuated from the bottom of the cyclone(s) through air-lock valves for onward feeding to the boiler. The flue gas are released to the chimney through a booster ID fan. Adequate automation is provided for proper interlocking and protections.

PERFORMANCE RESULTS

PARTICULARS	IMPROVEMENT (%)
Bagasse Moisture Reduction	20 - 27
Bagasse Saving	06 - 10
Excess Air Reduction	20 - 30
Effluent Gas Reduction	09 - 12
Increase in Burnt Bagasse GCV	18 - 24
Increase in Thermal efficiency	09 - 12
Steam Raising Index (kg steam/kg Bagasse)	11 - 14
Reduction in CO Concentration	80 - 90
Reduction in Particulate matter	90 - 98
Reduction in NOx Concentration	20 - 25

- ADVANTAGES**
- Waste Heat Recovery
 - Simplified Fly Ash Management
 - Enhanced Steam Generation
 - Improved Boiler Efficiency

Moisture Reduction of 10-13 Units

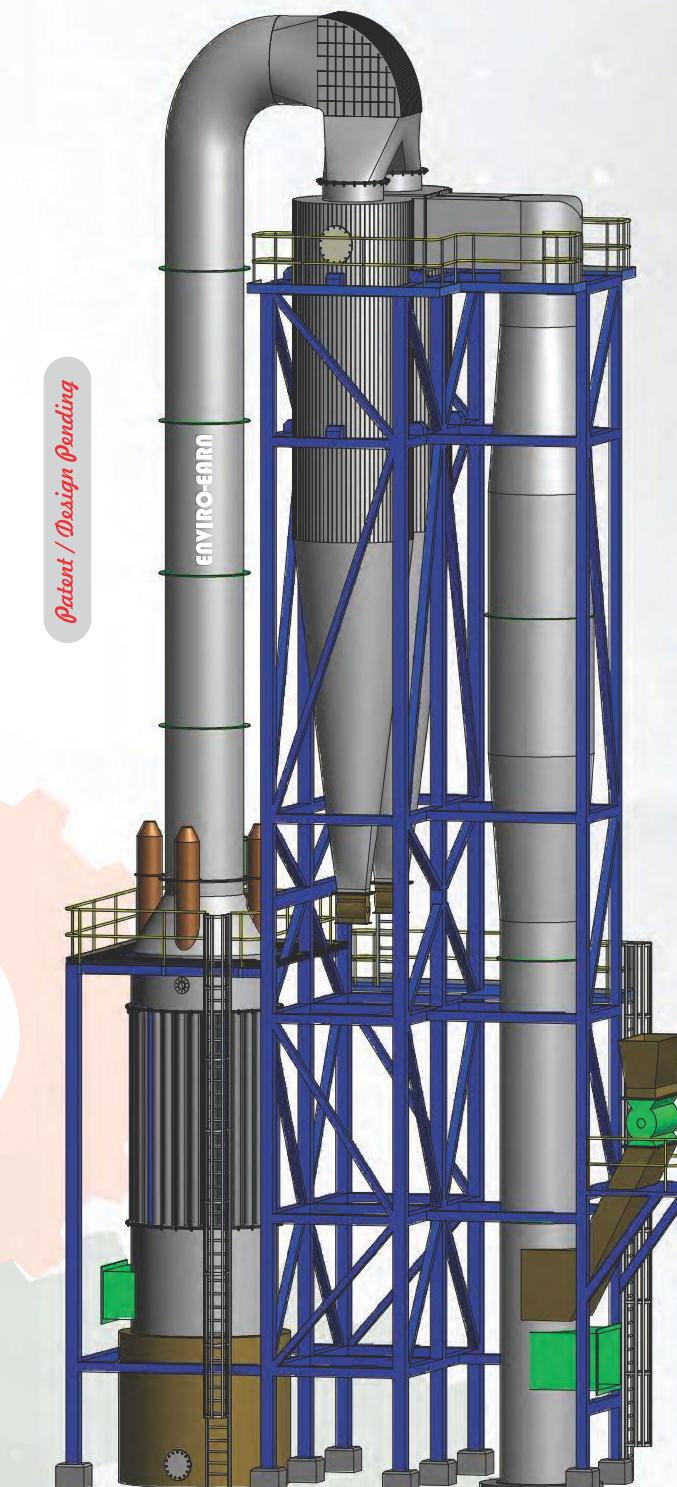


ROI within 200-280 working days



Flash Dryer™ - Hybrid Model

With the emission norms getting more stringent, the capital expenditure on Air Pollution Control (APC) is increasing. ENVIROPOL - Hybrid Model of Bagasse Dryer provides an opportunity to the Millers to dry bagasse and clean the flue gas simultaneously to meet the present/future emission norms.



Patent / Design Pending

Meet Future Emissions Norm With Return On Capital Investment



Dry Electrostatic Precipitator

Our Manufacturing Range

- VEP - Vertical Electrostatic Precipitator - 15000 m³/h
- Conventional Dry Electrostatic Precipitator - Up to 350,000 m³/h

Selection Criteria

- Flue Gas Volume
- Space Availability

VEP-Vertical ESP

The VEP is a dry electrostatic precipitator. The gas direction in VEP is vertical up through the collecting zone. It is designed in modular shape with each module capacity ranging from 1000 to 15000 m³/h

Advantages

- High Efficiency on Sub-Micron Particulate
- Low Cost Equipment
- Robust, Heavy Duty Design
- Integrated Dynamic Pre Collector
- Small Foot-Print
- No Slip Stream
- Few Moving Parts
- Pre Manufactured



Conventional Dry ESP

Charging

Hot gas with fine particulate enters the charging section and given strong negative charge by ionizing corona produced by high voltage electrodes.

Collecting

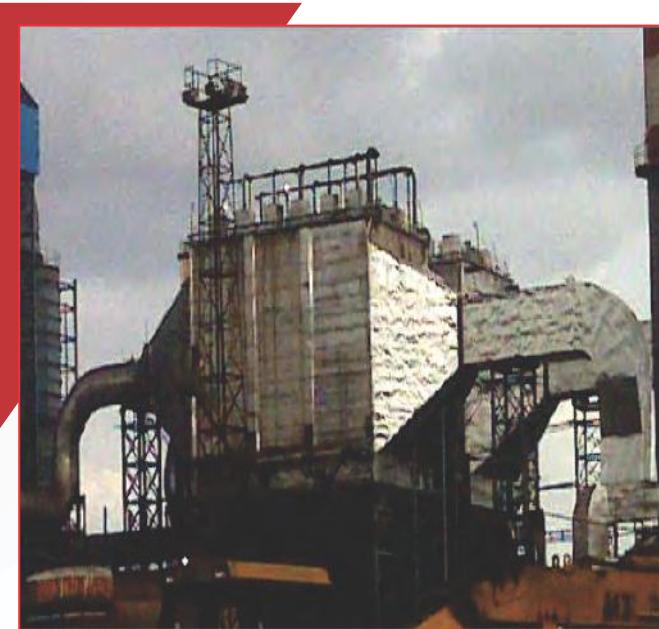
The electrical field causes charged particles to migrate to the grounded walls of the collecting plate where they accumulate.

Removing

The accumulated dust on collecting plate are removed through heavy duty rapping arrangement.

Advantages

- Low Pressure Drop
- High Efficiency within Permissible Dust Resistivity
- Dry Collection - No Water Requirement
- Wide Range of Application for Product Recovery
- Integrated Pre Dust Collector(Optional)



Bag Filters

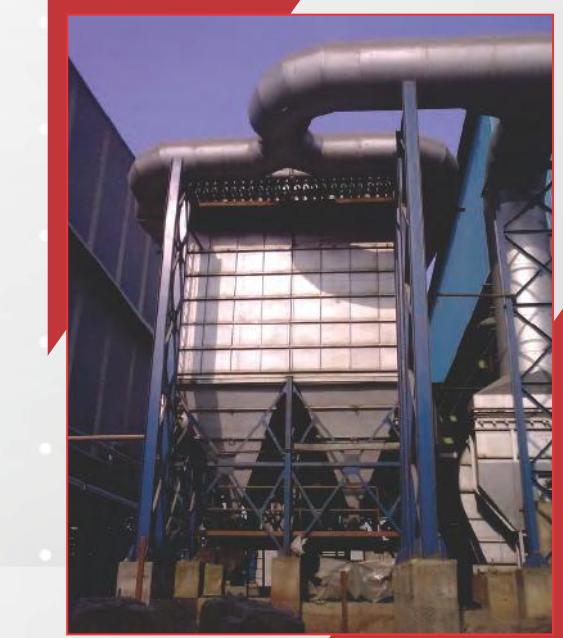
For Efficient Dry Separation

Our Manufacturing Range

- Single Module
- Multiple Module
- Circular Module
- Bag Filter for Spent Wash Application

Selection Criteria

- Volume of Dust Laden Gas/Air
- Layout and Space Availability
- Desired Collection Efficiency
- Dust Composition



Working Principle

Dust laden air enters the dust collector through the hopper or casing depending upon application. An internal baffle distributes the dirty air within the housing, dust laden air slows down as it enters the collector, coarser dust particles drop into the hopper.

The dirty air passes through the bags, dust is captured and collected on the bag exterior. Filtered clean air flows to the clean air chamber and exhausts through outlet. Periodic compressed air pulsing removes accumulated dust from the bags with cleaning frequency and duration adjusted by solid-state timers or PLC. Dust falls into the hopper for collection through the discharge device.

Advantages

- Trouble Free Operation
- High Collection Efficiency
- Can Capture Ultra Fine Particulates
- Mechanized Down Stream
- Low Compressed Air Requirement



FILTER BAGS



CAGES



VENTURIES

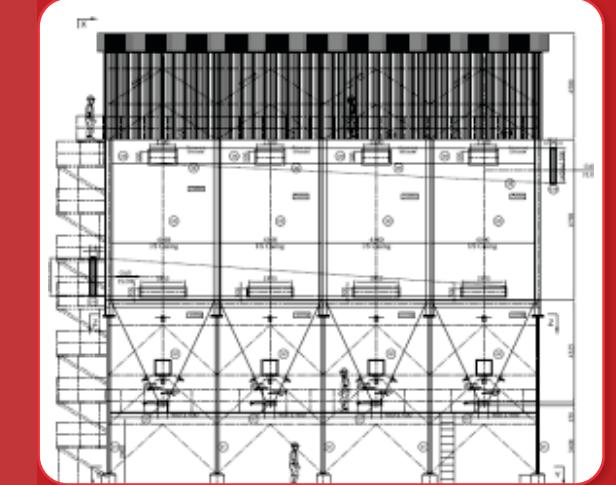
SPECIAL PURPOSE BAG FILTER - FOR SPENT WASH FIRED BOILER

Variants

- Online / Offline Cleaning
- Walk-in-plenum / Pent house
- Hopper Entry / Casing Entry

Special Features

- Very Low Air to Cloth Ratio
- 100 % PTFE Filter Bags
- SS 316L Cages
- Hopper Vibrator - Smooth Evacuation
- Inbuilt Lime Dosing System
- Added Hot Air Re-circulation System
- Complete Instrumentations



Dust / Fume Extraction System

⚙ Our Manufacturing Range

- Dry Type Dust/Fume Extraction System - Bag Filter, MDC, ESP
- Wet Type Dust/Fume Extraction System - Wet Scrubber, WESP

⚙ Selection Criteria

- Volume of Dust Laden Aas/Air
- Temperature of Dust Laden Gas/Air
- Inlet & Outlet Dust Concentration
- Dust Characteristics
- Particle Size Distribution

⚙ Working Principle

A dust / fume extraction system is an air quality improvement system used in industrial and commercial production shops to improve breathable air quality and safety by removing particulate matter from the air and environment. Dust extraction systems work on the basic formula of capture, convey and collect.

Capture

This is accomplished with well designed capturing suction hood (Conventional or Swiveling) to catch dust from its source of origin. Many times, the machine producing the dust will have a port to which a duct can be directly attached.

Conveying

This is done via a properly designed ducting system and manifolds to maintain a consistent minimum air velocity required to keep the dust in suspension for conveying to the collection device.

Collection

This is done via a variety of means, depending on the application and the dust being handled. It can be as simple as a basic pass-through filter, a cyclonic separator or an impingement baffle. It can also be as complex as an electrostatic precipitator, a multistage bag house or a chemically treated / water based wet scrubber.

⚙ Advantages

- Reducing Risk of Dust Explosion or Fire
- Increasing Visibility at Workplace
- Preventing Unpleasant Odors
- Reducing Cleanup and Maintenance Costs
- Increasing Worker Morale and Productivity
- Assuring Compliance with Health Regulations



Dust Suppression System

⚙ Our Manufacturing Range

- Dry Fog (Compressed Air Assisted) Dust Suppression
- Cold Fog (High Pressure) Dust Suppression
- Plain Water (Low Pressure) Dust Suppression
- Sprinkler Water Dust Suppression

⚙ Selection Criteria

- Material Characteristics
- Permissible Moisture Limit
- Application Point
- Feasibility of Dust Source Enclosure

⚙ Working Principle

Dry Fog System works on the agglomeration principle, fugitive dust particles collide with fine water droplets, generated by air assisted atomizers, get heavier and settle down on material stream.

Cold Fog System works on same principle as Dry Fog, fine water droplets generates through high water pressure nozzles.

Plain Water System adds some moisture into material stream to reduce it's dust generation tendency at following material transfer point.

Sprinkler Water System wets upper layer of stacked material to eliminate wind erosion risk.



⚙ Advantages

- Dry Fog System is capable to control fugitive dust emission with allowable moisture addition in material stream, less risk of air atomizer clogging & no wetting of conveyor belts.
- Cold Fog System is capable to control fugitive emission adding some moisture in material stream to reduce dust generation tendency at transfer points.
- Plain Water System is a low cost solution, easy maintenance & less risk of nozzle clogging.
- Sprinkler Water System is an appropriate solution for stacked bulk material, low water consumption is possible adding some crusting agent in water, easy maintenance & robust design.

A Comparison at Glance

Features	Scrubber	Bag house	Dry ESP	WESP
Extremely Fine Particles		✓	✓	✓
Aerosol	✓			✓
Heavy Metals				✓
Dioxins and Furans			✓	✓
Eliminates Opacity		✓	✓	✓
Low Gas Temp/High Dewpoint	✓			✓
Sticky Particulate	✓			✓
High Efficiency	✓	✓	✓	✓
Gas Absorption Required	✓			✓
High Resistivity Particles	✓			✓
Low Energy Consumption			✓	✓
Low Maintenance Costs			✓	✓

Industries Served

- SUGAR
- PAPER
- POWER & STEEL
- PALM OIL
- OIL & GAS
- DISTILLERY
- AUTOMOBILES
- TEXTILE
- FERTILIZER
- CEMENT
- CHEMICAL
- OTHERS PROCESS INDUSTRIES.....

Few of our Clients



Industries & Applications



Our Divisions

Environment

- Wet Scrubber
- Electrostatic Precipitator (Dry & Wet)
- Flue Gas De-Sulphurization
- Bag Filters (Online & Offline)
- Dust and Fume Extraction
- Dust Suppression
- Mechanical Dust Collectors

Energy

- Bagasse Dryer
- Flash Dryer - Hybrid Model
- Bio-Mass Dryers
- Co-generation Power Projects

Material Handling

- Slurry De-Watring System
- Fuel/Ash Handling System
- Pneumatic Conveying System