



VENTURI PARTICULATE SCRUBBERS



Monroe Venturi Scrubber and Cyclonic Separator exhausting a lime kiln

Monroe Environmental® Venturi Scrubbers are designed to remove both heavy and light airborne particulate matter from exhaust systems, as well as flue and process gasses. Venturi Scrubbers bring particulate-laden air streams together with water at high velocities to transfer the particulate into the water stream. The water droplets and particulates are then removed from the air stream through centrifugal separation and mist elimination stages.

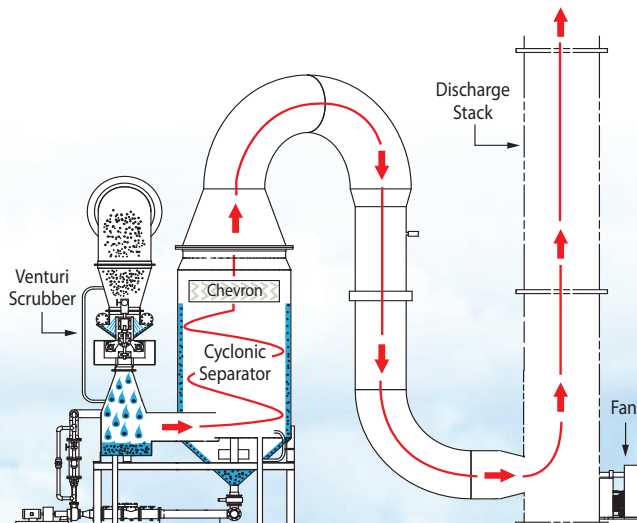
Monroe Environmental offers several venturi design configurations:

- Circular and rectangular venturi scrubbing throats
- Fixed and adjustable throat designs
- Eductor, ejector, and traditional venturi throat designs
- High, medium, and low energy pressure drops
- Dual Throat Venturi Scrubber

Venturi Scrubber Applications

- Automotive manufacturing
- Glass manufacturing
- Machining operations
- Buffing & deburring
- Wax spraying
- Flame laminating
- Synthetic resin fines
- Grease manufacturing
- Explosive dust collection
- Foundry dust & fumes
- Sludge dryer exhaust
- Incineration processes
- Kiln exhaust scrubbing
- Frack sand & proppants
- And many others

Venturi Scrubber with Cyclonic Separator





Venturi Scrubber for frac sand/proppant dust



High pressure drop 80 in. W.C. fixed throat Venturi



Venturi Scrubber and Cyclonic Separator for PM removal from dryer off-gas prior to RTO.

Particulate Removal

Monroe Venturi Air Scrubbers are currently operating continuously at high efficiency in many types of industrial installations throughout the United States, Mexico, and Canada. Independent laboratory tests have shown that many of these units are removing various types of airborne particulate at efficiencies up to 99.9%, even on heavy particulate loads.

Monroe Environmental specializes in wet and dry particulate collection for a wide variety of applications. The company's first project in the early 1970's was a pilot venturi scrubbing system designed to remove oil and particulate from a contaminated air stream at an automotive manufacturing plant. The system was a resounding success. Since that time, Monroe Venturi Air Scrubbers have been successfully used for countless industrial and municipal applications.



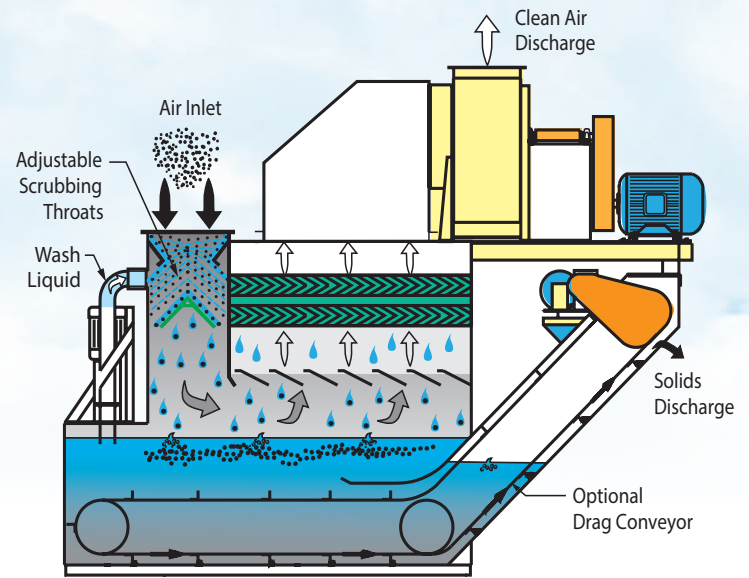
Venturi Scrubber, FRP construction with separation section, integral recirculation reservoir, exhaust fan, stack, and controls.

Pilot & Testing Programs

Monroe Environmental pilot systems are an excellent option for testing your application. This is a cost-effective way to evaluate an environmental solution before making a capital investment in a full scale system. Monroe has several pilot systems available for rent as well as the support services required to install, operate, and evaluate the system's performance.



9,600 CFM Dual Throat Venturi Scrubber for boiler exhaust scrubbing



Dual Throat Wet Air Scrubber with drag conveyor option

DUAL THROAT VENTURI SCRUBBERS

The Monroe Dual Throat Venturi Air Scrubber is a completely self contained unit that needs only to be connected to normal plant electrical, water, and air systems. The Monroe Dual Throat Scrubber is one of the most versatile venturi scrubber designs available because of its ability to handle a wide range of dry, wet, sticky, tacky, and oily particulate loads. Additionally, the system is an excellent choice for explosive dust applications.

- Wet type dust collector
- No screens or filters to clean or replace
- Fan is on clean side of scrubber
- Low water requirements
- Lower energy usage
- Lower horsepower
- Efficiencies up to 99.9%
- No moving parts in wash zone
- Minimum maintenance
- Capacities from 500 to 50,000 CFM for a single unit

A High Volume Water Injector

The Monroe Dual Throat Air Scrubber utilizes a high volume wash water injector system that removes airborne particulate by delivering an initial surface impingement shock to heavy inlet dirt loads.

Recirculate Clean Air to Reduce Climate Control Costs

In many installations, such as buffing and polishing, metal finishing and grinding operations etc., it is possible to recirculate clean, contaminant-free air back to the work area. This reduces the cost of plant ventilation systems and climate control needs.

Dual Adjustable Scrubbing Throats

High velocity atomization takes place as the inlet air is directed through the fixed and dual adjustable scrubbing throats. The easily adjustable dual throats balance the pressure drop through the air flow system at start-up or after system changes are made.

This design feature can eliminate the need for ductwork dampers and blast gates that are prone to particulate build-up and require periodic maintenance. In addition, the increase in pressure drop in the wash zone improves the overall efficiency of the system.

Dual Throat Venturi Scrubber Applications

- Cast iron machining fumes
- Chemical fumes
- Coal dust
- Explosive dusts
- Fiberglass fines
- Forging smoke and fumes
- Foundry dust and fumes
- Buffing operations
- Machining dusts
- Metal deburring dust
- Plastic extrusion fumes and dust
- Synthetic resin fumes
- And many others



Dual Throat Venturi Scrubber with particulate reclamation system



5,000 CFM Dual Throat Wet Air Scrubber



2,800 CFM Dual Throat Wet Air Scrubber, stainless steel construction

Double Row Moisture Eliminators

After passing through the turbulent dual throat wash zone, the air impinges on the liquid surface, changes direction and then continues through deflectors to a large, double row moisture eliminator section. Water droplets in the airstream are removed and drain back to the wash liquid reservoir tank.

The clean, dry air is then recirculated to the work area or discharged through exhaust ducts.

Minimum Wash Liquid Requirements

Wastewater disposal problems are eliminated under normal operating conditions. Each unit has a self-contained wash liquid reservoir and recirculating pump. An automatic water valve replenishes wash liquid lost through evaporation.

Moisture eliminators also are constructed of materials suitable for the intended application, including polyethylene or stainless steel.

Many Configurations Available

Monroe Dual Throat Venturi Air Scrubbers can be configured to meet specific needs. Units can be equipped with drag conveyors to remove heavy, settled particulate and oil recovery units to remove accumulated oil.

Monroe also offers several alternate wet air scrubber design options including:

- Packed Bed Wet Scrubbers
- Multi-Stage Scrubbing Systems
- Multiple Venturi Air Scrubbers



Adjustable scrubbing throats



Chevron mist eliminator



Explosive dust collection for a plastic manufacturing process: 3,500 ACFM Dual Throat Venturi Wet Scrubber unit in Monroe's shop before shipment. The system reservoir included heat traced piping, an electric immersion heater element, and was insulated and clad for protection during winter month operations.