



The Monroe Advantage

For over forty years, Monroe Environmental has been designing and manufacturing air quality systems for industrial manufacturers, government agencies, and municipal treatment plants.

Complete Air Quality Solutions

Monroe Environmental offers a broad range of stand-alone equipment as well as complete systems to effectively manage dust, mist, odors, and fumes associated with both industrial manufacturing and municipal water/wastewater treatment.

Monroe continues to solve challenging air and gas cleaning problems with our skilled team of engineers, shop technicians, and knowledgeable sales staff. The largest manufacturing companies in the world routinely look to Monroe to solve their most demanding mist, dust, and fume control problems.

Monroe Systems and Services

- Packed Bed Wet Air Scrubbers
- Venturi Particulate Scrubbers
- Carbon Adsorbers
- Multi-Stage Scrubbing Systems
- Dust Collectors
- Oil Mist Collectors



15,000 CFM Packed Bed Scrubber to remove ethylene glycol and NMP fumes from a glass coating operation

- Design and manufacture new air quality and odor control systems
- Retrofit existing systems to maximize performance and removal efficiency
- Ductwork design
- Permit assistance for EPA compliance
- Industrial and municipal applications
- Turnkey systems available



Stainless steel Multi-Stage Scrubbing System to treat exhaust from a toxic gas incineration process



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20,000 CFM Dust Collector, roof-mounted with stairway and access platform



10,000 CFM Multiple Tray Carbon Adsorber, stainless steel construction for odor control at a grainery



50,000 CFM Oil Mist Collector with custom ductwork and airflow monitoring system



9,000 CFM Mist Collector for an automotive paint spraying operation



25,000 ACFM Scrubbing System at a textile plant to remove particulate and acid gasses



12,500 CFM Packed Tower Scrubber removing SO₂ and Cl₂ from regenerative thermal oxidizer (RTO) exhaust

Scrubbing Applications and Engineering

Monroe Environmental Packed Bed Scrubbers have been used effectively to remove a wide range of air pollutants in many industrial and municipal applications.

Air/Gas Pollutants Removed Include:

- Acid gasses (HBr, HCl, HF, HCN, HNO₃, H₂S, etc.)
- Halogen vapors (Br₂, Cl₂, F₂)
- Sulfur compounds (Hydrogen Sulfide: H₂S, Sulfur Oxides: SO₂, SO₃, SO₄)
- Ammonia (NH₃)/Amines
- Chromic Acids (H₂CrO₄, H₂Cr₂O₇)
- Ethylene Oxide (C₂H₄O)
- Formaldehyde (CH₂O)
- Caustics and Hydroxides (NaOH, etc.)
- N-Methylpyrrolidone (NMP) (C₅H₉NO)
- Ethylene Glycol (C₂H₆O₂)
- As well as other water or chemically soluble pollutants

Common Scrubbing Liquids:

- Sodium Hydroxide (NaOH)
- Sodium Hypochlorite (NaOCl)
- Potassium Hydroxide (KOH)
- Sodium Carbonate (Na₂CO₃)
- Sulfuric Acid (H₂SO₄) and other acids
- Hydrogen Peroxide (H₂O₂)
- H₂S Scavenger



1,500 CFM Packed Tower Scrubber, stainless steel pressure vessel construction to remove H₂S from syngas for a diesel fuel conversion process

High pressure scrubbing system to remove sulphur compounds from a propane gas supply



5,000 CFM Packed Tower Scrubber, polypropylene construction to remove acid gases from chemical tanks at a recycling facility



20,000 CFM Packed Tower Scrubber, FRP construction to remove acid and alkaline fumes from casting processes



Municipal Treatment Plant Odors: Hydrogen sulfide (H_2S) and ammonia (NH_3) odors that are common at municipal water and wastewater treatment plants can be efficiently targeted and removed by a Multi-Stage Packed Bed Scrubbing System.



Landfill Gas and Biogas Scrubbing: PVC constructed Packed Bed Scrubbers for hydrogen sulfide (H_2S) removal from methane (CH_4) gas



Kiln, RTO, and Incinerator Scrubbing: 7,500 CFM skid-mounted Horizontal Packed Bed Scrubber, polypropylene construction to capture and remove NaOH fumes from kiln exhaust



Chemical Storage Tank Vapors: 30,000 CFM Horizontal Packed Bed Scrubber with polypropylene construction to remove chemical fumes emitted from acid-dip tanks at a semiconductor manufacturing facility. Dual-train exhaust ductwork with automated dampers and FRP fans provides maximum control over the scrubbing process.



Packed Bed Fume Scrubbers

In a Packed Bed Scrubber, soluble chemicals, fumes, and odors flow through a specially designed packing media that is irrigated with recirculating scrubbing solution. The liquid solvent absorbs the gas-phase pollutant by physical and chemical means. A blowdown from the tank with makeup water addition removes contaminant pollutants before they precipitate in the reservoir. Packed Bed Scrubbers have a wide range of industrial and municipal applications.

- Capacities: 10 to 75,000 CFM with a single unit
- Efficiencies to 99.99%
- Vertical and horizontal models
- Counter-flow or cross-flow models
- Rectangular or cylindrical construction designs
- Single and multiple stage designs
- Pre-quench and venturi stages available
- Pilot systems available for application and process testing

Design Features

- Wide range of packing media available including rings, saddles, loose-fill, and structured packing in a variety of materials
- Complete instrumentation and electrical controls are available for stand alone operation or connection with a facility's centralized control or monitoring systems
- Chemical treatment, including oxidation and neutralization, is available to increase absorption of gaseous pollutants
- pH control available when applicable
- Corrosion resistant AMCA rated fan on the inlet or outlet side of the scrubber
- Corrosion resistant recirculating pumps for scrubber liquid recirculation
- Non-plugging spray nozzles or specialty liquid distributors available for packing irrigation
- Moisture eliminators with chevron, mist pad, or loose fill type designs



Skid-mounted Packed Bed Scrubber, FRP construction with customized instrumentation, piping, pumps, and control panel fully assembled in Monroe shop

Materials of Construction

- Stainless steel & mild steel
- FRP & FRP-lined mild steel
- PVC & CPVC
- Polypropylene
- Polyethylene
- Nickel alloys & titanium



Non-plugging spray nozzles above bed of loose fill polypropylene packing



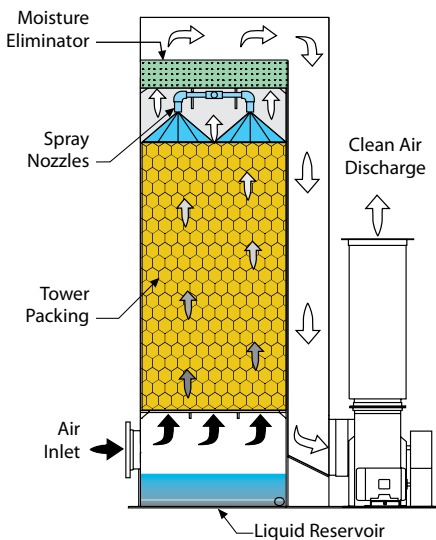
3,500 ACFM High temperature scrubbing system, stainless steel construction with inlet quench and vertical packed bed for SO₂ removal from RTO exhaust



3,500 CFM Packed Tower Scrubber, PVC construction for HCl removal

Vertical Packed Bed Fume Scrubber

This is a counter-flow design that has contaminated gas flowing upwards and recirculated liquid spraying downwards through the packing media. Vertical scrubbers typically have a smaller footprint and can have greater removal efficiency than Horizontal Packed Bed Scrubbers. Multiple scrubbing stages with different scrubbing solutions can be achieved by having more than one scrubbing tower in series (see page 12). Multiple towers provide the highest removal efficiency, as well as multiple gas constituent removal.



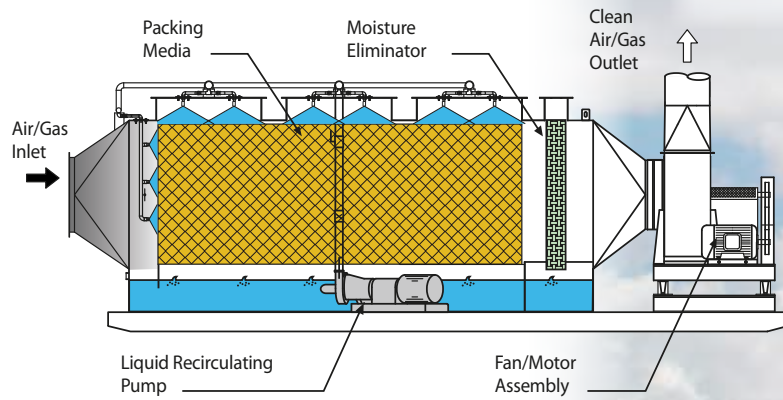
Vertical Packed Tower Air Scrubber



13,500 CFM skid-mounted Horizontal Packed Bed Scrubber, stainless steel construction to scrub acid and caustic fumes

Horizontal Packed Bed Fume Scrubber

This is a cross-flow design that has recirculated scrubbing liquid flowing vertically downwards while the gas passes horizontally through the packing section. This design is more tolerant of solid particulate that may be contained in the air stream. A Horizontal Packed Bed Scrubber is appropriate when limited headroom is an issue, and it also allows for multiple stages in one housing with separate sumps and scrubbing solution pumps if required.



Horizontal Packed Bed Air Scrubber

We will analyze:

- Contaminant solubility
- Vapor pressures
- Wash liquid flow rate
- Liquid to gas ratio
- Packing chamber dimensions
- Packing media type and size
- Chemical additives
- pH control
- Precipitation of reaction products
- Required scrubbing stages
- Pressure drop across packing
- Materials of construction
- Site requirements

Venturi Particulate Scrubbers

Applications:

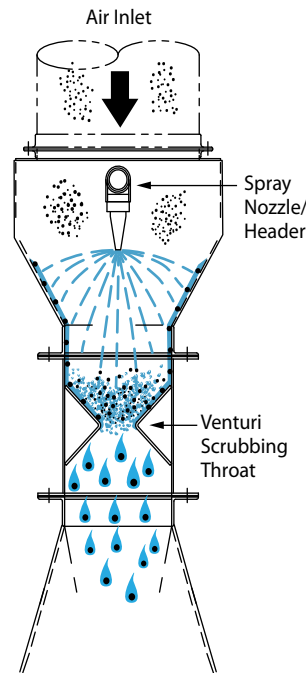
- Automotive manufacturing
- Boiler exhaust
- Buffing & deburring
- Coal & foundry dust
- Explosive dusts
- Fiberglass fines
- Flame laminating
- Incineration processes
- Kiln exhaust scrubbing
- Machining operation
- Paint overspray
- Sludge dryer exhaust
- Synthetic resin fines
- Wax spraying
- And many others

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 Wet Air Scrubber Designs

Monroe Venturi Air Scrubbers are designed to remove both heavy and light airborne particulate matter from exhaust systems, as well as flue and process gases. Venturi Scrubbers bring particulate-laden air streams together with water at high velocities to transfer the particulate into the water stream. Monroe offers several venturi design configurations including:

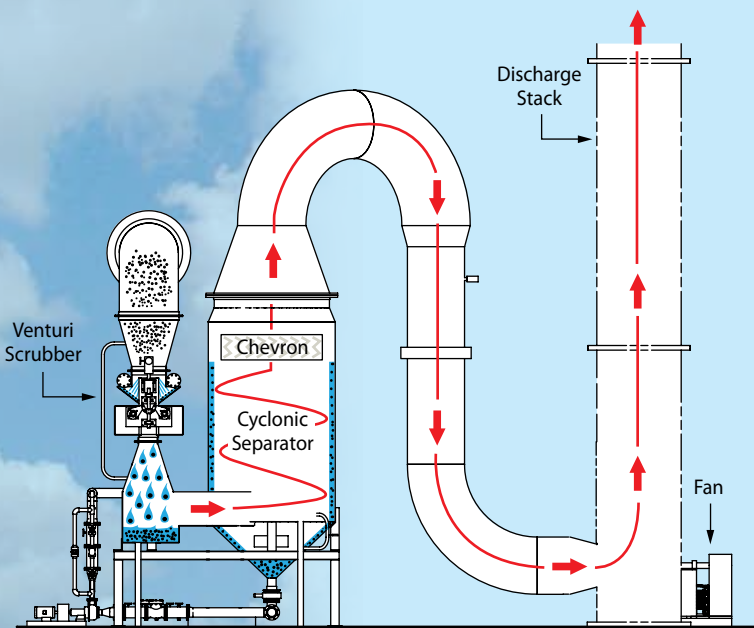
- Circular and rectangular scrubbing throats
- Fixed and adjustable throat designs
- Eductor, ejector, and traditional venturi designs
- High, medium, and low energy pressure drops
- Dual Throat Venturi Scrubbers



Venturi Scrubber



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



Venturi Scrubber with Cyclonic Separator



Adjustable, rectangular Venturi Scrubber throats for wet dust collection



Fixed throat Venturi Scrubber followed by cyclonic separator for a lime dust scrubbing process



Dual Throat Venturi Wet Air Scrubber

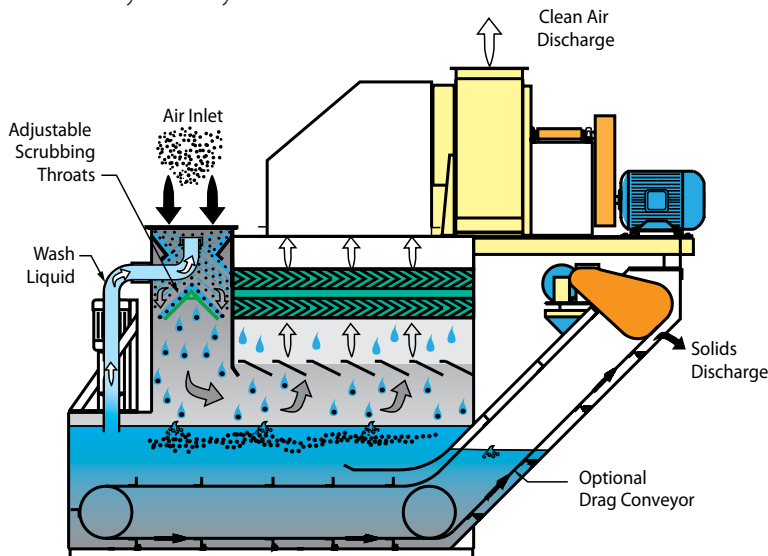
The Monroe Dual Throat Venturi Air Scrubber is a completely self contained unit that needs only to be connected to normal plant electrical, water, and air systems. It is one of the most versatile venturi scrubber designs available because of its ability to handle a wide range of dry, wet, sticky, tacky,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

Recirculate Clean Air

In many installations, such as buffing and polishing, metal finishing and grinding, foundry 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.

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 airflow system at start-up or after system changes are made. This design feature eliminates 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 scrubbing venturi improves the overall efficiency of the system.



Dual Throat Wet Air Scrubber with drag conveyor option



2,800 CFM Dual Throat Wet Air Scrubber, stainless steel construction with pyramid hopper for sludge dryer exhaust scrubbing

Features:

- Wet type dust collector
- Efficiencies to 99.99%
- 500-50,000 CFM standard unit capacities, special designs available
- No moving parts in the scrubbing zone
- Minimum maintenance
- Optional solids removal conveyor
- Optional oil skimming systems



Chevron mist eliminator



Adjustable scrubbing throats



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

Carbon Adsorbers

Monroe Dry Adsorption units provide highly efficient, continuous odor and pollutant removal with a minimal footprint.

Monroe Environmental manufactures Dry Adsorbers for both physical and chemical adsorption of gas-phase pollutants. Adsorption involves the adhesion of pollutant gas molecules to porous solid surfaces that the contaminated air stream passes through. Physical adsorption relies on intermolecular forces while chemical adsorption involves the formation of chemical bonds.

Ideally Suited For Removal of

- H₂S and other odors from municipal wastewater treatment plant sources including headworks, digesters, and sludge dewatering operations
- Removal of VOCs, oil vapors, and gas phase hydrocarbons
- Recovery of solvents including alcohols, esters, ketones, aromatic compounds, and halogenated solvents
- Industrial emissions from: degreasing, paint spraying, paper coating, plastic film coating, metal foil coating, rubber-coating, semiconductor manufacture, and printing



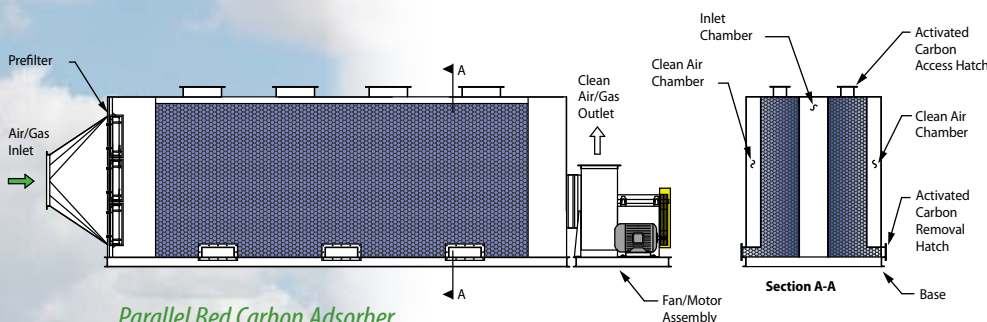
Deep Bed Carbon Adsorber with stainless steel housing

Overview of Adsorber Types

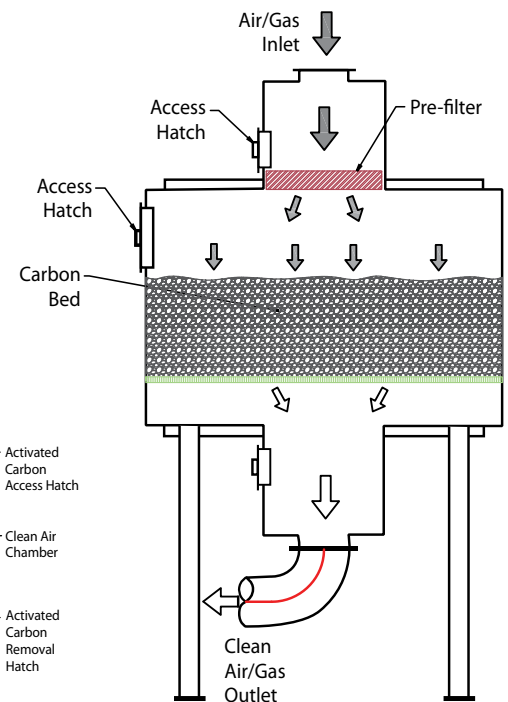
Deep Bed Adsorber: In horizontal or vertical configuration with a single deep bed or multiple beds in series within the adsorber vessel.

Carbon Tray Adsorber: Flow passes through several removable carbon trays in parallel. Each tray contains activated carbon pellets and can be easily removed and refilled when pellets are saturated.

Parallel Bed Adsorber: Airflow passes between two parallel beds in horizontal or vertical configuration, allowing higher airflow because there is a large passageway for initial contact of gas with both of the adsorbent beds.



Parallel Bed Carbon Adsorber



Deep Bed Carbon Adsorber



(2) 15,000 CFM Deep Bed Carbon Adsorbers, mild steel construction with specialty exhaust stacks for odor control at a grease manufacturing facility



8,000 CFM Carbon Tray Adsorber for a recycling facility, shop assembled with stainless steel housing and differential pressure gauge



200 CFM Carbon Adsorber, FRP construction, with control panel for H₂S removal at a municipal lift station

Carbon Adsorber Features

- Wide range of adsorbents including activated carbon, zeolite, and synthetic polymers
- Capacities up to 50,000 CFM for a single unit
- Multiple unit or single unit designs
- Efficiencies to 99.99%

Multi-Stage System Scrubbers

Monroe Scrubbing Systems have been used effectively to remove a wide range of air pollutants for many industrial and municipal applications worldwide.

Monroe Environmental can provide complete multi-stage air scrubbing systems for a wide variety of applications. High temperature and volatile chemical processes often require a more complex, customized air scrubbing solution than what a simple packed tower scrubber or venturi particulate scrubber can provide.

In many cases, several technologies must be integrated together to provide adequate removal and treatment efficiencies. Monroe's experience includes the engineering and fabrication of customized multi-stage scrubbers utilizing the following equipment:

- Packed Bed Scrubbers
- Venturi Particulate Scrubbers
- Carbon Adsorbers
- Quench Towers
- Cyclonic Separators
- Heat Exchangers
- Fiberglass Filters
- Specialty Ducting Systems
- Clarifiers and Oil Recovery Units

Right: Multi-Stage Scrubbing system with inlet quench, 3-stage Packed Bed Scrubber, high energy Venturi Scrubber, electric gas reheater, and Carbon Adsorber for toxic gas incineration

Monroe has the experience and knowledge to evaluate your process and recommend a customized scrubbing system for your specific application. Monroe has successfully treated contaminated air streams resulting from:

- Solid waste and/or chemical gas incineration
- Kiln & RTO exhaust scrubbing
- Flame laminating and glass coating
- Grease & chemical production
- Textile manufacturing
- Chemical and compound reclamation
- High temperature scrubbing processes
- And many others

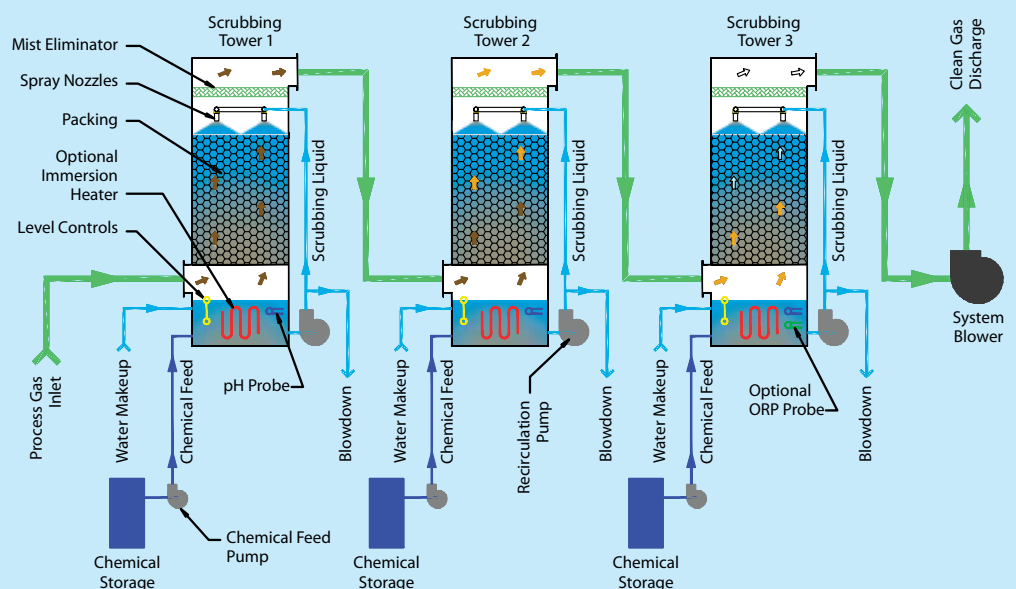


Multiple Packed Bed Scrubbing Stages

Multiple scrubbing stages with different scrubbing solutions can be achieved by providing multiple scrubbing towers in series.

This type of system is common when there is a high pollutant loading, multiple pollutants, or when removal efficiencies greater than 99.9% are required.

The diagram to the right includes three towers in series that could be used for H₂S and NH₃ removal, HCl and SO₂ removal, or a variety of other harmful gas combinations.





20,000 CFM Multi-Stage Scrubbing System for solid waste incineration process. (From right): Ceramic-lined inlet duct, rapid water quench, adjustable Venturi Scrubber, liquid clarification tanks, Packed Bed Scrubber, and Carbon Adsorber.



6,000 ACFM Two-Stage Scrubbing System, stainless steel construction with adjustable Venturi followed by Packed Bed Scrubber to treat exhaust from a flame lamination process



Oil Recovery Unit (Belt Skimmer) continually recovers condensed grease from scrubbing process



15,000 CFM Scrubbing System to condense and reclaim vaporized grease and remove hydrocarbon fumes from a chemical manufacturing process. The system includes a Dual Throat Venturi Scrubber with drag conveyor, Oil Recovery Unit, and Packed Bed Scrubber for odor control.



1,000 CFM Scrubbing System to remove lime dust from a chemical manufacturing process. (From left): Ejector Venturi, liquid clarification tank, high energy Venturi Scrubber, and cyclonic separator. The unit was designed to achieve 95% efficiency on 0.5 micron particles.

Mist and Dust Collection

Worldwide Leader in Mist and Dust Collection Equipment

Monroe Environmental has been the premier supplier of Mist and Dust Collectors for over 40 years. The largest manufacturing companies in the world have routinely looked to Monroe to solve their most challenging in-plant air quality problems, and there are several reasons why they keep coming back to Monroe for their mist and dust collection needs.

The Highest Quality Collectors Available in the Industry

We know that every company, every plant, and every process is different. That's why Monroe designs and builds Mist and Dust Collectors to meet the specific standards of your unique plant. You provide the standards that you would like your equipment built to, then we provide a unit that meets those standards at a cost comparable to competitive off-the-shelf units. Monroe has been the leader in mist and dust collection for over 40 years. Our customers, our repeat business, and the performance of our Collectors all testify to that fact.

If you have an under-performing mist collector that was provided by another company, we can help. We know the competition inside and out, and we can evaluate your system and make



8,000 CFM Oil Mist Collector to filter parts washer exhaust at an automotive manufacturing facility

recommendations to get the most out of your existing equipment. The leaders of the machining world consistently look to Monroe Environmental to fix the problems created by other, lower-quality mist collectors. We frequently repair and rehabilitate competitive mist collectors for our customers to achieve optimal performance.

Don't be fooled by the competition – **no company in the world can provide a collector that will outperform the Monroe Oil Mist Collector.**



1,500 CFM Spiral Tube Mist Collector for precision machining operation



The Monroe Oil Mist Collector – A Machinist's Best Friend

No machining operation is too small to benefit from the quality, craftsmanship, and reliability of a Monroe Mist Collector.

No machining operation is large enough to go beyond the scope of what Monroe Environmental is capable of supplying.

No other mist collector can compare in terms of performance, reliability, and quality over the long term.

Assembly of 37 Spiral Tube Oil Mist Collectors for an automotive engine and transmission machining operation

Wet and Dry Dust Collection

Monroe has the expertise to recommend, design, and manufacture a system capable of collecting and filtering many types of wet, dry, and explosive dusts as well as long, stringy solids generated by a variety of industrial manufacturing operations.

The unique, self-contained designs of the Monroe Cartridge Dust Collector and Dual Throat Venturi Scrubber (Wet Type Dust Collector) allow for recovery and disposal of collected particulate with minimal maintenance over the long term.



9,600 CFM Dual Throat Venturi Scrubber for removal and recovery of fly ash from the exhaust of a wood fired boiler



Left: 5,000 CFM Cartridge Dust Collector to capture exhaust from CNC plasma cutting operation

Ductwork Design

Monroe offers a variety of ductwork designs and configurations depending on the application, plant layout, and other site specific requirements.

- Plenum or tapered systems
- Dampers and louvers
- Discharge and no-loss rain stacks
- Capture hoods and enclosures
- Custom and standard designs
- Single unit ducts or complete systems

Free standing 145 ft. tall steel discharge stack for a hydrocarbon removal system at a steel mill



Custom designed ductwork system with supports for recirculating climate-controlled clean air after filtration through a 30,000 CFM Oil Mist Collector



Tapered ductwork system with individual source hoods for multiple Oil Mist Collectors on a high production machining line



Dry Dust Collectors

Cartridge Dust Collectors

Monroe Dry Dust Collectors, with reverse pulse cleaning of cartridges during operation, provide continuous collection and removal of airborne particulate without shutdown.

- Long life pleated cartridge filters
- Applications up to 450°F
- Easy to install and remove cartridges via pull-out racks when replacement is necessary
- Efficiencies to 99.9+%
- Capacities from 500 to 50,000 CFM
- AMCA rated fans on the outlet side of the collector
- Integral pressure gauges indicate filter performance
- Variety of removal configurations available

Monroe also has the capability to design and build custom baghouse dust collection units when applicable.

The cartridges in the Monroe collector are mounted in a vertical position to provide continuous high volume collection and removal of airborne dust.



Custom configurations, including ceiling or roof designs, are available where a standard collector cannot be used. 30,000 CFM Dust Collector with multiple pyramid hoppers and screw conveyor options shown.



Vertically mounted, pleated fabric filters ensure high efficiencies for both dust collection and filter cleaning

Top Performance with Optimum Filter Cleaning

The Monroe Cartridge Dust Collector's modular design incorporates high efficiency, pleated fabric cartridge filters to achieve maximum filter surface area in a relatively small housing. The cartridges in the Monroe collector are mounted in a vertical position to provide continuous high volume collection and removal of airborne dust and fumes. This assures that when the collected dust is pulsed from the cartridges, it falls to the bottom of the collector.

In competitor units with horizontal cartridges, dust pulsed from the above cartridges falls onto the cartridges below. This reduces filtration capability and requires additional maintenance for rotating cartridges – problems avoided with a Monroe unit.



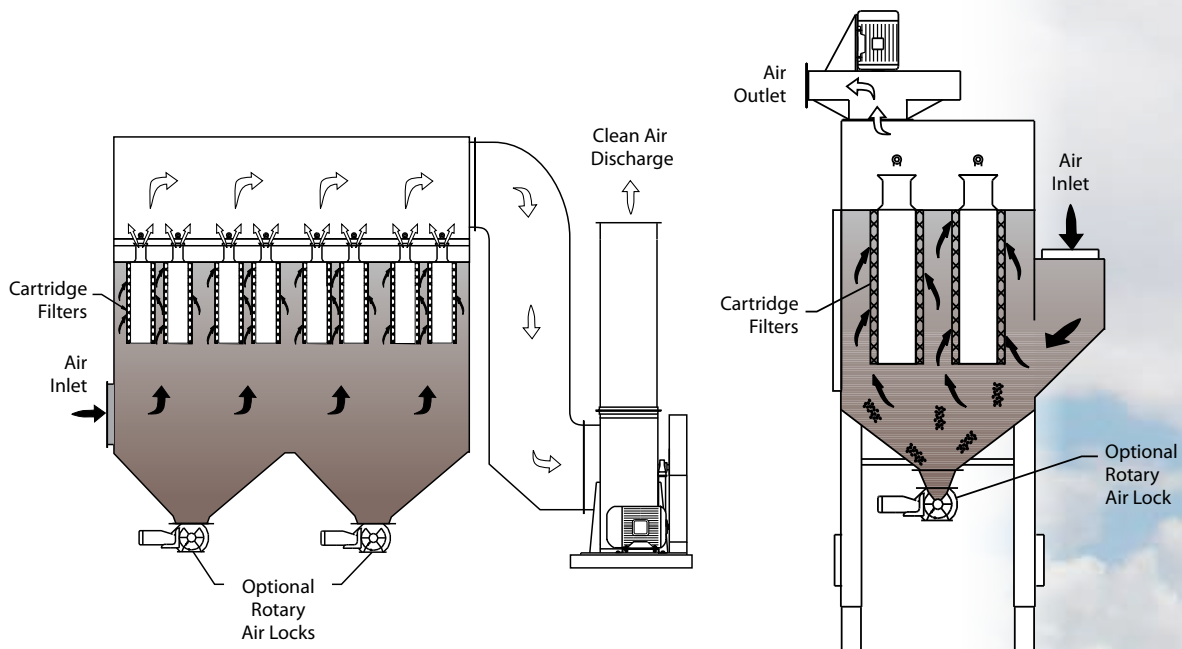
(1) 500 CFM and (2) 1,500 CFM Cartridge Dust Collectors for welding and wire brush deburring at an automotive plant



6,000 CFM Cartridge Dust Collector with inlet duct and storage drum exhausting a sandblasting and paint spraying operation



15,000 CFM Cartridge Dust Collector with rotary air lock, explosion proof panel, and floor mounted fan options



Cartridge Dust Collector Configurations

Oil Mist Collectors

Monroe is able to provide equipment and services to meet in-plant level criteria of $0.5\text{mg}/\text{m}^3$ or less.

Self-Contained, Single Unit Design

Monroe Oil Mist Collectors are designed to collect and remove airborne oil mist, smoke, and sub-micron vapors generated by operations such as high production machining and cold forming. It is a multiple stage collector that has proven capabilities exceeding 99% efficiency on many installations. After installation of a Monroe Oil Mist Collector, high production machining areas using water soluble, synthetic, or mineral coolants can discharge clean, filtered air back into the work area, significantly reducing climate control costs.

Features

- Oil, mist, smoke, and vapor removal
- Efficiencies up to 99.9% on 0.3 micron
- Capacities from 500 to 80,000 CFM
- Low energy requirement
- Continuous draining during operation
- Low maintenance
- An AMCA rated fan on the outlet side of the collector
- Rubber isolation fan connection and sound attenuators for quiet operation



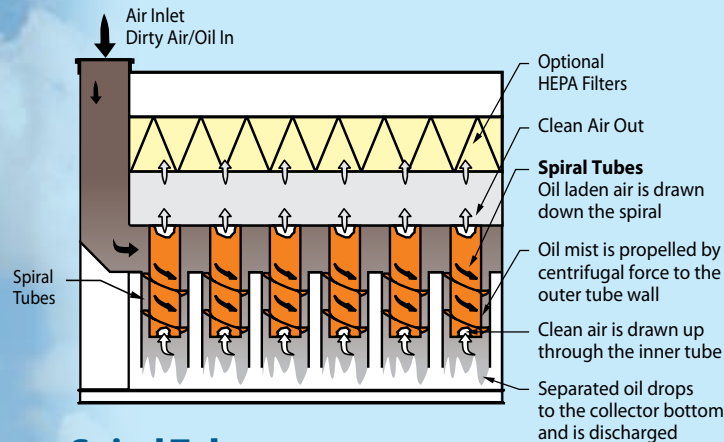
12,400 CFM Spiral Tube Oil Mist Collector



Right: 18,000 CFM Spiral Tube Oil Mist Collector at an automotive engine assembly plant



1,000 CFM Spiral Tube Oil Mist Collector, stainless steel construction to filter mist from a washer at a food processing facility



Spiral Tube

Two stage collector uses spiral tubes to provide a high level of mist agglomeration and removal without using filters. Centrifugal force and impaction provide the mechanism for primary oil mist removal.



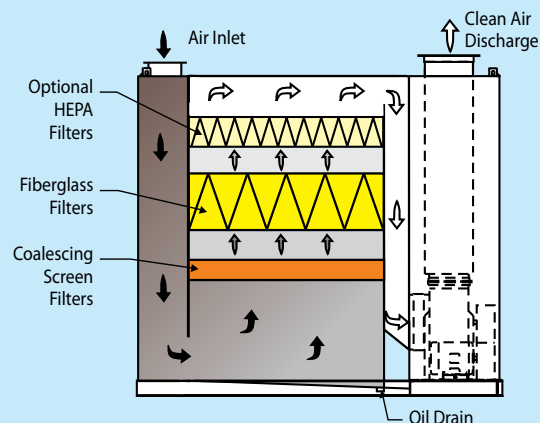
Design Leadership

Monroe Environmental Oil Mist Collectors, with longer operating cycles and higher efficiencies, outperform all other collectors. Because of slower internal velocities through the collector, media replacement and maintenance labor costs are reduced. Collected oil mist and solids are continuously drained from the media without shut-down, significantly prolonging filter life and lowering overall operating costs. Monroe can integrate new units into existing ductwork and ventilation systems or design and furnish new ductwork depending on customer requirements.

HEPA Type Filters

Monroe Oil Mist Collectors are available with specially constructed HEPA type fiberglass filter cartridges as the optional final filter system. These filters are normally supplied with a 95% efficiency rating at 0.3 micron. These filters have a long service life, normally 4,500 hours or more, because the majority of contaminants are removed during the preceding stages and are continuously drained from the unit.

Air processed by a Monroe Oil Mist Collector meets air quality standards for in-plant discharge as well as outside exhaust. Discharging clean, filtered air back into the work area can significantly reduce climate control costs.



Multi-Stage

Multiple stage collector that has proven capabilities exceeding 99% efficiency on many installations. Includes drop-out chamber, separator mesh elements, and fiberglass filters.



7,000 CFM Multi-Stage Oil Mist Collector during final assembly at Monroe shop



15,000 CFM Multi-Stage Oil Mist Collector



1,000 CFM Compact Oil Mist Collector

The Test:

A major American automotive manufacturer commissioned the University of North Carolina to perform efficiency testing on various Oil Mist Collectors for possible use in their machining facilities. The following quote is from the findings at the conclusion of this test period:

"The Monroe Three Stage Collector removed virtually all mist droplets of Mineral Oil, Soluble Oil and Synthetic Fluid to the limit of our ability to detect them."

Department of Environmental Sciences and Engineering
University of North Carolina at Chapel Hill

Water & Wastewater Treatment

Monroe Environmental provides liquid clarification equipment to **municipal water and wastewater treatment** plants as well as industrial manufacturing and processing plants in the following fields:

Automotive Manufacturing | Chemical Processing | Food Processing | Glass & Plastics
Mining & Metals | Oil & Gas | Pulp & Paper | Steel Processing | Utilities/Energy | Waste Management



Circular Clarifiers

- Primary and secondary clarification at wastewater treatment plants
- Lime softening and flocculation for clean water treatment
- Sludge thickening at municipal and industrial wastewater treatment plants
- Clarifier rebuilds for existing tanks

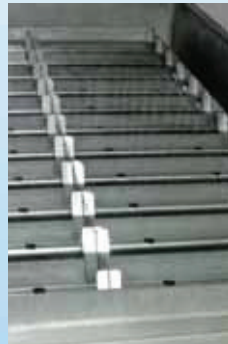


Plate Settlers and Sludge Collection

- Increase solids settling capacity of new and existing sedimentation basins at water & wastewater treatment plants
- Low cost alternative to building new settling tanks
- New, retrofit, and rebuild services
- Can include a **Monroe Sludge Collection System**



Parallel Plate Clarifiers

- Suspended and dissolved solids removal
- FOG removal and recovery (Horizontal Clarifier)
- Industrial process/wash liquids clarification
- Filter backwash clarification
- Integral flocculation and pH adjustment capabilities
- Variety of sludge thickening and removal configurations



API Oil/Water Separators

- Oil/water separation and recovery at industrial wastewater treatment plants
 - Oil refineries
 - Tar sands
 - Steel manufacturing
 - Chemical manufacturing
 - Any application removing oil from water



Oil Skimmers

- Recovery of oil and coolants from industrial process liquids and wastewater
 - Bunker "C" oils
 - Cooking oils
 - Hydraulic and lubricating oils
 - Machine and mineral seal oils
 - Other organic and synthetic fluids



Air Strippers

- Groundwater remediation at water treatment plants to remove VOCs
- Remediation of surface water for use in industrial manufacturing processes
- Removal of odorous compounds from water streams



MONROE
ENVIRONMENTAL

Liquid Clarification & Air/Gas Cleaning Systems

Registered ISO 9001 and ISO 14001