



MONROE
ENVIRONMENTAL

Water & Wastewater Treatment | Air Pollution Control



Water & Wastewater Treatment

Water & Wastewater Treatment

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Reduce suspended solids (TSS), dissolved solids (TDS), grit, metals, and oils

Monroe Environmental® designs and manufactures a wide range of water and wastewater clarifiers for industrial and municipal use. Our equipment utilizes conventional gravitational settling technology, and each system can be customized to meet the specific needs of your application.

We've been in the water and wastewater treatment business for over 50 years, so we know that all water streams are unique. Monroe can provide jar-testing, analysis, and ultimately recommend the correct system to properly treat your specific water or wastewater stream.

Clarifier Design

Laminar Flow Principle — The design of Monroe Clarifiers creates laminar flow conditions and allows gravitational forces to separate the lighter and heavier elements from the fluid.

Chemical Treatment — Monroe Clarifiers can include pre-treatment processes as an integral part of the system. This aids in the separation of the dissolved solids, fine particles, and emulsified oils that tend to remain suspended in water and process fluids.

Separated Solids Removal — Monroe offers a wide variety of sludge collection options for all clarifier designs, carefully selected for each application.

Oil Recovery — Separated oils, process fluids, and other floating materials are guided to an accumulation area for easy removal and reclamation.

Construction Materials — Monroe's manufacturing flexibility includes fabricating with a variety of materials:

- Mild and stainless steel
- High-density polyethylene (HDPE)
- Polypropylene
- FRP
- PVC and CPVC
- And many others



Rebuild of a Secondary Clarifier for municipal wastewater treatment



300 GPM Horizontal Clarifier for truck wash facility fully assembled in Monroe shop



Solids Contact Circular Clarifier



Vertical Plate Clarifier installation, stainless steel construction with integral thickening tank, support structure, and access platform

Monroe Systems and Services

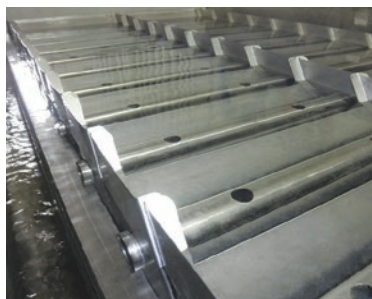
Monroe offers a variety of engineering, assessment, evaluation, and design services to help engineers, operators, and plant personnel get the most out of their wastewater treatment systems.

- Design and manufacture clarifiers
- Retrofit existing tanks and clarifiers to improve:
 - Settling efficiency
 - Throughput
 - Sludge collection systems
 - Oil recovery capability
 - Chemical treatment
- Rebuild worn-out clarifier internals to extend the life of existing units
- Municipal and industrial applications
- Turnkey systems available

The Monroe Method

The Monroe Method is our superior way of doing business that saves our customers time, money, and hassle. It's based upon three main components:

- Design and fabrication
- Shop assembly and testing
- Ongoing support for the life of your equipment



200 GPM Horizontal Clarifier with drag conveyor, truck mounted for portable treatment of hydraulic fracturing water



50 ft. x 13 ft. diameter stainless steel stripping tower for VOC removal at a potable water treatment plant

***Above Left:** Plate Settlers installed and operating at a water treatment facility*

***Right:** 70 GPM Vertical Clarifier with flash and flocculation tanks, thickener, and FRP cover for landfill leachate treatment*

Circular Clarifiers & Thickeners



Left: 46 ft. diameter self-supporting Circular Thickener for separating blast furnace scrubber fines from wastewater at a steel processing plant

Right: 50 ft. diameter Circular Clarifier during final assembly in Monroe shop

New, rebuild, and retrofit designs for nearly all clarifier and thickener applications

Monroe Environmental offers nearly every circular clarifier design preferred by engineers and plant operators for municipal and industrial applications. We will evaluate existing clarifiers and recommend improvements to influent and effluent arrangements, feedwell/EDI design, weir and launder geometry, skimming and scum baffles, sludge removal systems, and drive equipment, as well as a variety of site-specific design requirements.

Our experienced staff will design high efficiency, low maintenance systems that will provide the highest return on investment.

- Customized designs for municipal and industrial applications
- Tank diameter 5 to 250 feet and larger
- Full and half-bridge designs
- Steel or concrete tanks
- Chemical feed system available
- Flocculators available when required
- Energy Dissipating Inlet (EDI) designs available
- Thickener mechanism available
- Skimmer mechanisms
- Corrosion resistant materials and coatings
 - Epoxy coated steel
 - Stainless steel
 - Galvanization
 - And many others
- Custom built replacement parts for all manufacturers
- Clarifier rebuilds



90 ft. diameter wastewater clarifier rebuild at chemical plant



46 ft. diameter stainless steel Circular Clarifier fully assembled in Monroe shop



High rate Solids Contact Clarifier



Installation of a 120 ft. Secondary Clarifier with riser pipes



Above ground Circular Clarifier on legs with access bridge, walkway, and spiral staircase ready for startup at an industrial WWTP

Clarifier Features

Mechanism Support — Bridge supported or center column supported clarifiers and thickeners are available.

Influent — Center feed or peripheral feed, energy-dissipating inlet, and flocculating feed well are available.

Sludge Removal Systems

- Standard scraper
- Spiral scraper
- Hydraulic suction tube header
- Hydraulic suction riser pipes

Skimming Systems — Floating scum and other material can be removed by a traditional rotating skimmer arm and scum removal box or by a ducking skimmer that feeds a radial scum trough. A scum baffle prevents floating matter from entering the effluent launder.

Launder — Inboard, outboard, or radial launders available for effluent collection.

Weirs — A V-notch adjustable weir will be designed to ensure steady overflow rates, even in windy conditions. FRP, stainless steel, and other materials can be used for weir construction.

Walkways, Railing, and Stairways — Designed and built according to OSHA, API, and other applicable standards.

Drives — Monroe Environmental uses only the highest quality drives that are conservatively selected to handle even the most demanding loads.

- Fabricated steel precision gear
- Cast iron worm gear
- Lift mechanisms available

Applications

- Steel processing
- Oil refineries
- Food processing
- Mining wastewater
- Chemical and petrochemical processing
- Automotive plant wastewater
- Plastics manufacturing
- Municipal treatment plants
- Power plant wastewater
- General water and wastewater treatment
- And many others



18 ft. steel tank Circular Thickener for an industrial steel manufacturer fully assembled in Monroe shop



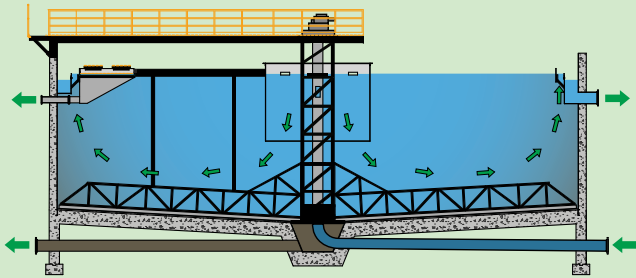
Field welding and final coating of an elevated steel tank clarifier

Circular Clarifier & Thickener Designs

Primary Clarifier

Monroe Environmental's primary Circular Clarifiers are designed to receive raw wastewater after it has been pre-screened to remove large objects and grit.

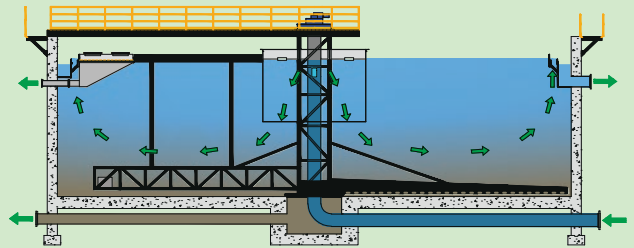
This primary sedimentation tank will produce a homogeneous liquid capable of being treated biologically and a sludge that can be separately treated or processed.



Secondary (Final) Clarifier

Monroe Environmental's secondary Circular Clarifiers for wastewater are designed to provide a high quality effluent suitable for discharge to the environment or further treatment.

The Monroe Environmental secondary clarifier effectively separates the biological floc and colloidal solids to produce wastewater with very low levels of organic material and suspended matter.

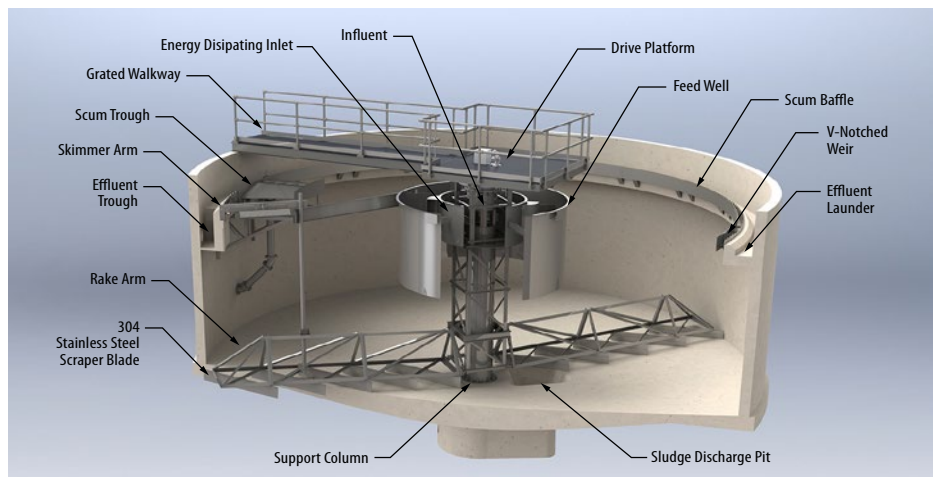


Sludge Removal Designs

Scraper

Scraper type clarifiers are the most common and widely used for wastewater applications. These units are straightforward and simple, utilizing a series of adjustable, angled scraper plows to draw the settled sludge toward the center of the unit and into the sludge collection pit.

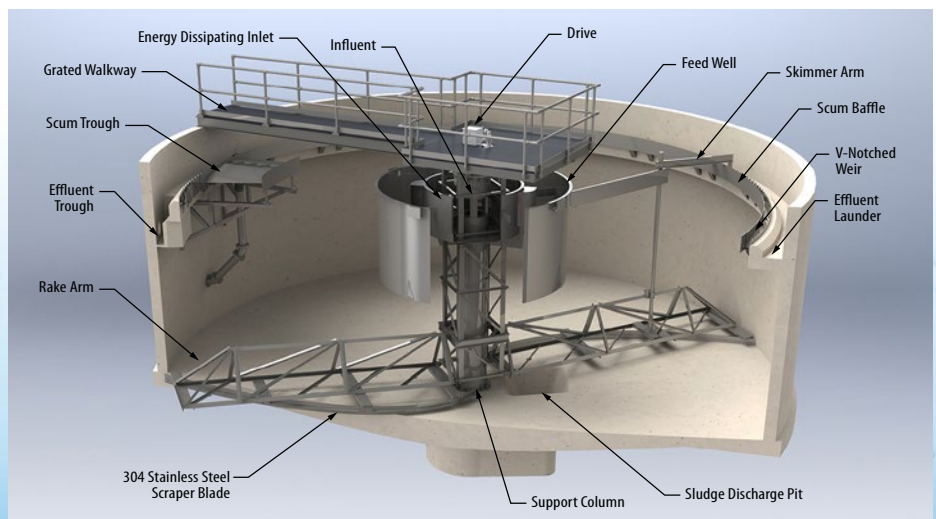
This design is most commonly used for primary treatment, thickening, and general use industrial clarifiers, however, they can be used for secondary (biological) treatment and/or flocculated solids collection.



Spiral Scraper

Spiral scraper type clarifiers utilize long-sweeping, curved scraper blades to move solids across a basin floor. They are similar to scraper-type clarifiers in that they drag settled solids to the collection area, however, they can more quickly remove these solids and thus maintain lower sludge blankets in some applications.

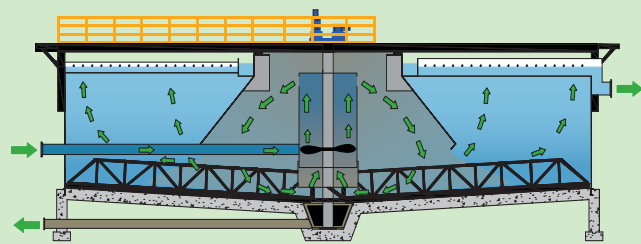
This design can be utilized in primary, secondary, and industrial wastewater applications.



Solids Contact, Flocculating, and Water Treatment Clarifiers

Monroe Environmental manufactures several types of water treatment clarifiers that combine chemical treatment, flocculation, and sedimentation.

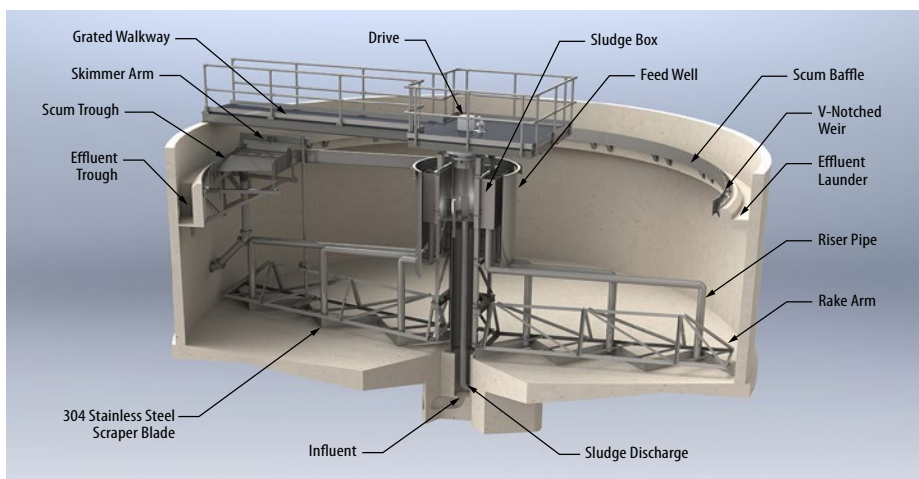
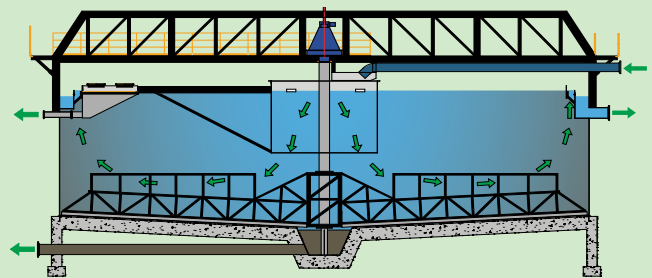
Designs include Flocculating Clarifiers and Solids Contact Clarifiers, and these units are heavily utilized in both industrial and municipal processes for treating groundwater, surface water, and process water.



Thickeners

Circular Thickeners are a crucial step between upstream process clarifiers/separators and downstream de-watering and sludge conditioning processes. A well designed thickener provides storage and equalization, and reduces the costs associated with de-watering.

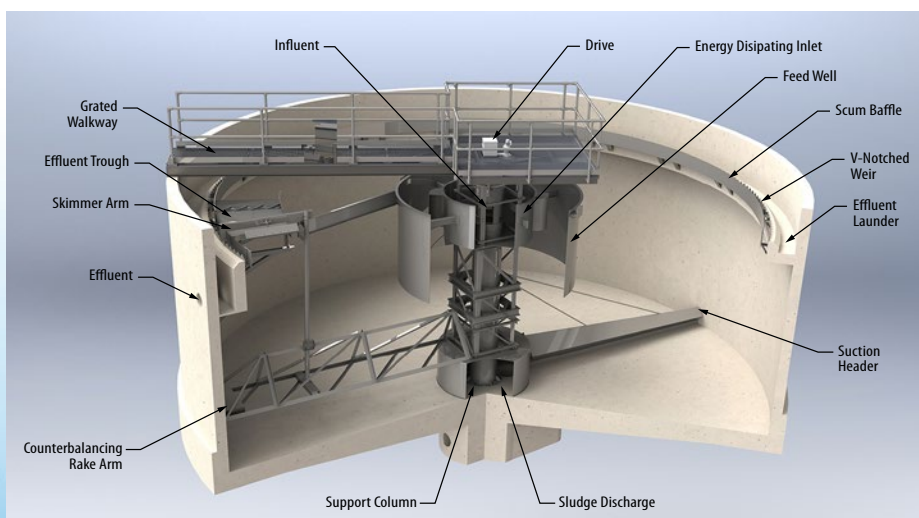
Thickeners are similar to other circular clarifiers in appearance and operation, but typically require higher operating torque and alternate sludge collection designs for optimal performance.



Riser Pipe

Riser pipe clarifiers rely on differential head pressure to collect settled solids from the tank floor. Each riser pipe is situated at the intersection of a v-plow and receives a continuous feed of sludge that returns to a sludge collection box near the center of the clarifier.

This design is intended for secondary, biological, or flocculated solids which are more fluidized and have lower densities than primary wastewater and heavy industrial sludge.



Suction Header

Suction header clarifiers rely on differential head pressure to collect settled solids from the tank floor. These units have a long, tapered collection arm with multiple orifices sized to stabilize and maintain optimum sludge transfer velocities through the header.

This design is intended for secondary, biological, or flocculated solids which are more fluidized and have lower densities than primary wastewater and heavy industrial sludge.

Vertical Plate Clarifiers

Applications

- Chemical processing
- Coolant systems
- Filter backwash clarification
- Food processing
- Foundry operations
- Glass plant operations
- Industrial waste management
- Metal working
- Oil refining
- Paper making
- Plastic manufacturing
- Plating and coating processes
- Process water treatment
- Steel processing
- Storm water systems

Inclined Plate Clarifier for increased flow and reduced footprint

The Monroe Environmental Vertical Clarifier is designed to provide low cost, efficient solids removal from a wide range of waste and process liquids. The inclined plate design allows the total gravity settling area to be as much as ten times more than the actual floor space occupied by the clarifier. Integral chemical mixing and flocculation tanks are available, as well as options for enhanced sludge thickening.

This unit is typically used to remove solids from industrial waste and process waters. For municipal treatment plants, it is often used to clarify and remove solids from sand filter backwash water and other filtration processes.

Optional equipment includes skimmer, access platform, chemical treatment, flocculator, thickener, and control panel.

- Inclined plate separator
- Efficient removal of solids and metals from liquids
- Extremely low space requirements
- Minimum maintenance
- Low installed costs
- No moving parts in settling area
- Capacities from 1 to 2,000 GPM

The unique, modular design of the Monroe Vertical Plate Clarifier allows for easy removal of individual laminar plate modules from the clarifier for inspection.

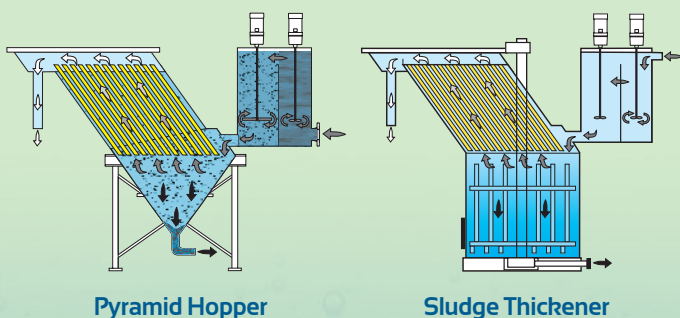


1,500 GPM stainless steel Vertical Clarifier with flash and flocculation tanks

Designed for Your Specific Clarifier Application

While many installations provide adequate solids removal without influent pre-treatment, optional mixers and flocculator tanks are available to enhance efficiency when required. Some solids must be flocculated to achieve adequate mass to be effectively removed. Monroe Environmental can provide jar testing and analysis to determine your flocculation requirements.

Sludge Removal Designs



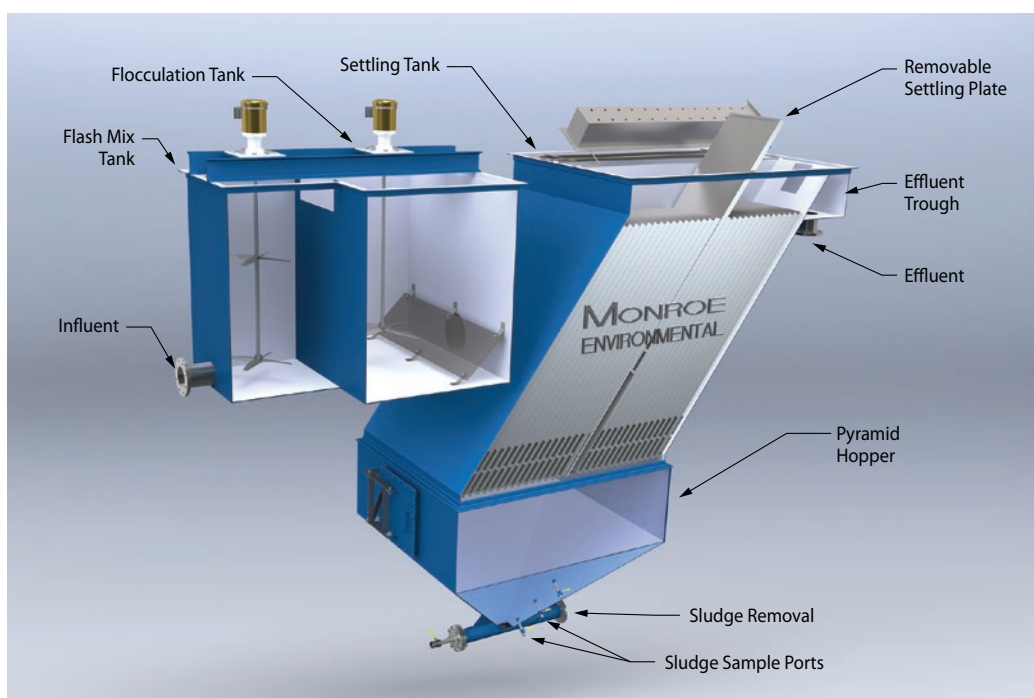
Installation of Vertical Clarifier for disc filter backwash with chemical mix tanks, access platform, ladder, and support structure



Vertical Plate Clarifier with thickener rated for 660 GPM



Vertical Clarifier fully assembled in Monroe shop



Customized covers, access ladders, and platforms are available in a variety of materials including stainless steel, FRP, aluminum, and many others

Special Features

Customized covers, access ladders, and platforms are available in a variety of materials including stainless steel, FRP, aluminum, and many others.

Wide range of construction materials. Mild steel, special coatings, stainless steel, fiberglass, plastics, and other materials are available to meet specific needs.

The unique, modular design of the Monroe Vertical Clarifier allows easy removal of individual laminar plate modules from the clarifier for inspection.

A flash mixer and flocculator tank are available pretreatment options.

A rake thickener with geared drive is available for the bottom of the separator tank to increase solids concentration.

Complete electrical controls are available to meet customer requirements.

Horizontal Plate Clarifiers

Applications

- Chemical processing
- Coolant systems
- Filter backwash clarification
- Food processing
- Foundry operations
- Glass plant operations
- Hydraulic fracturing
- Industrial waste management
- Metal working
- Oil refining
- Oil/water separation
- Plant run-off
- Plastic manufacturing
- Plating and coating processes
- Steel processing
- Storm water systems
- Wash water

Solids separation AND oil recovery

The Monroe Parallel Plate Horizontal Clarifier is one of the most versatile clarifiers available on the market. Because the unique Monroe parallel separator plate design effectively separates both settleable solids and floating materials, ***the Horizontal Clarifier can be used in place of a circular clarifier for nearly any application.*** This allows for significant cost savings and reduced space requirements versus traditional clarifiers. These advantages have made the Horizontal Clarifier the best-selling clarifier offered by Monroe over the past 40+ years.

Broad Range of Capabilities

Oil Recovery — Separated oils, process fluids, and other floatable materials are guided to an accumulation area for easy removal and reclamation. An adjustable overflow weir or a Monroe Oil Recovery Unit can be included to remove these elements.

Separated Solids Removal — Where the dirt load is heavy, a drag conveyor or screw conveyor may be included to provide continuous removal of settled solids from the bottom of the clarifier.

Chemical Treatment — The Monroe Horizontal Clarifier can include a pretreatment process as an integral part of the basic clarifier. This aids in the separation of dissolved solids, very fine particles, and emulsified oils that tend to remain suspended in water or process fluids. A chemical treatment tank and/or flocculation chamber can be added to allow pH control and mixing of emulsion breakers and coagulants into the influent before the laminar flow process.

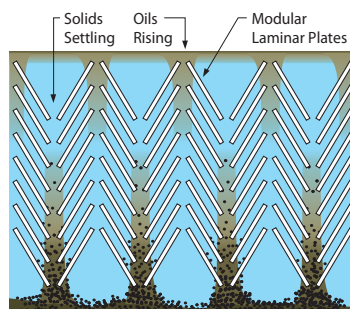


Turnkey Horizontal Clarifier system with pumps, piping, sludge holding tank, filter press, and controls

Laminar Flow Principle

The unique design of the Monroe Horizontal Clarifier creates laminar flow conditions and allows gravitational forces to separate the lighter and heavier elements from the fluid.

Normally, industrial laminar flow separation requires settling areas beyond practical space availability in typical manufacturing plants. Monroe's design engineers, however, have eliminated this problem through the unique capabilities of the Horizontal Clarifier.



In the Monroe Horizontal Clarifier separated particles are required to move only a few inches before reaching an uninterrupted and protected free fall or rise to collection areas.



40 GPM Horizontal Clarifier with full polypropylene construction for treating low pH plating wastewater



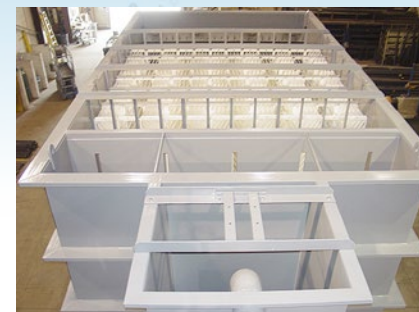
200 GPM Horizontal Clarifier with drag conveyor option



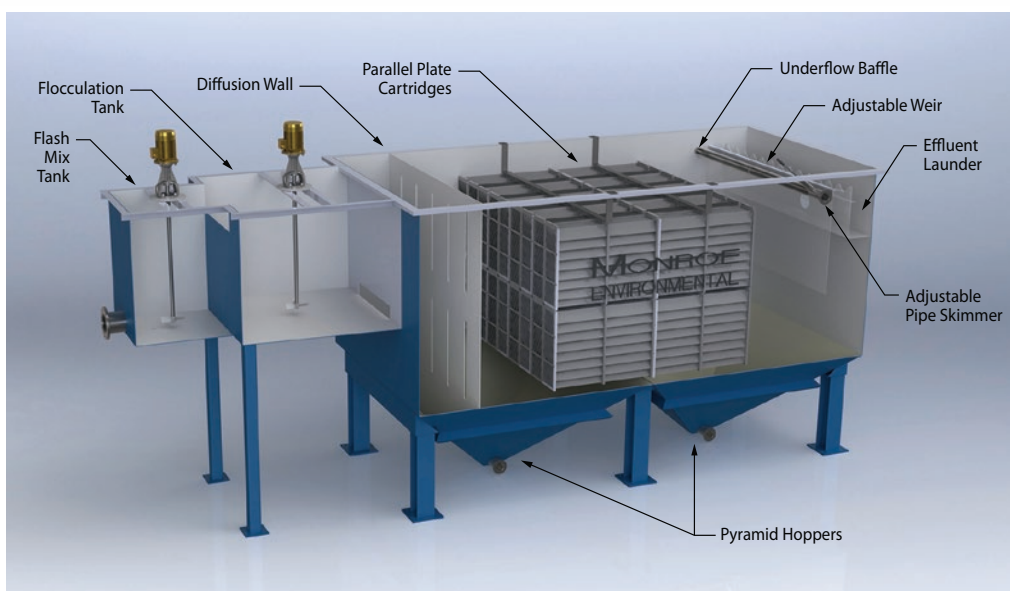
Horizontal Clarifier with screw conveyor design



Three 1,000 GPM Horizontal Plate Clarifiers, stainless steel construction during installation at a plastics production plant



Top view of a 600 GPM Horizontal Clarifier showing installed parallel plate modules



Left: Stainless steel parallel plate cartridges

Right: HDPE (High-Density Polyethylene) parallel plate packs for low pH and highly corrosive applications

Special Features

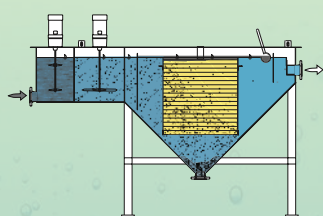
Wide range of construction materials. Mild steel, special coatings, stainless steel, fiberglass, plastics, and other materials are available to meet specific needs.

No moving parts in the clarifier section reduces equipment cost and practically eliminates operating cost when compared with a centrifuge separator.

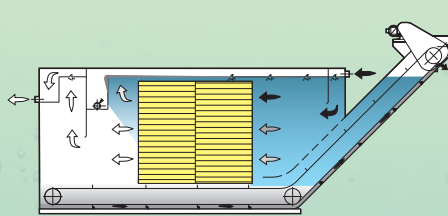
Easily removable laminar plates. The unique, modular design of the Monroe Horizontal Clarifier allows easy removal of individual laminar plate modules from the clarifier for inspection.

Complete electrical controls to meet customer requirements are available if required.

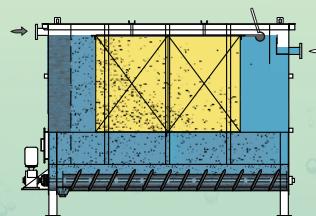
Sludge Removal Designs



Pyramid Hopper



Drag Conveyor



Screw Conveyor

API Oil/Water Separators

Removal of free oils and solids from wastewater at refineries, petrochemical, and other heavy industrial plants

Applications

- Oil/water separation
- Solids/grit removal
- Refinery wastewater
- Petrochemical plants
- Terminal and barge wastewater
- Power plant operations
- Remove oil from wastewater

Monroe Environmental is the leading source for API Separator design, engineering, and manufacturing services. A well designed, properly functioning API Separator is a tremendous piece of wastewater process equipment. Unfortunately, the API Separator has earned a bad reputation among plant personnel and operators due to common engineering and design mistakes that can be avoided. Monroe Environmental understands the shortfalls common with competitive API Separator designs, and continues to lead the way with innovative engineering and continuous design improvements.



900 GPM API Separator, mild steel construction with drag conveyor, screw conveyor, pipe skimmer, and oil roll. The unit, measuring 60 ft. long x 12 ft. wide x 8 ft. high, shipped from our factory fully assembled.



14 ft. x 90 ft. long 105 GPM API Separator with cover, mineral wool insulation, and aluminum cladding. The unit shipped from our factory fully assembled.

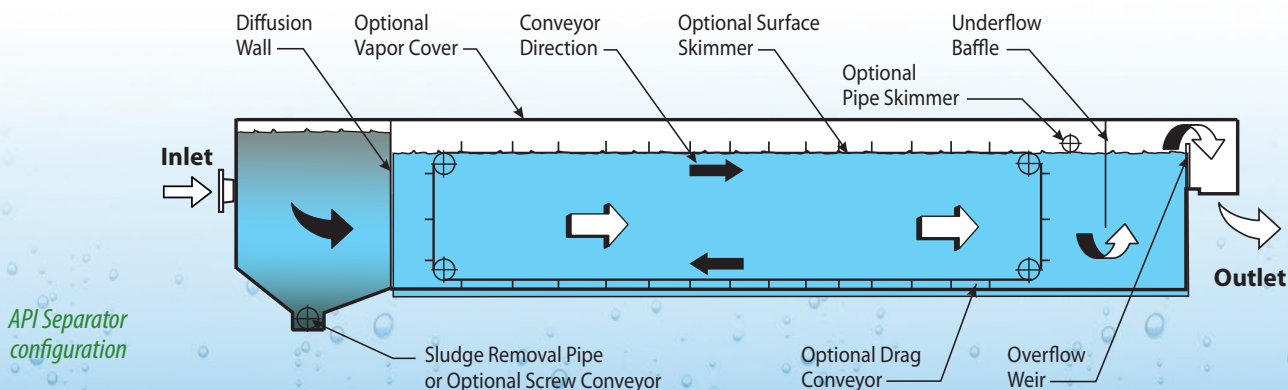
Monroe Environmental utilizes API 421 design specifications while incorporating the latest technological improvements to maximize performance and efficiency for each oil/water separation application. In many cases, we also custom design specialty oil/water separators with process features and site specific configurations

to suit your needs. We are clarification and separation experts, and you can count on our experience, quality of fabrication, and ongoing support to ensure you have a successful system over the long term.

API Separator Design

The basic components of the Monroe API Separator include an inlet section with flow diffusion, a separator channel, an oil retention baffle, and an outlet section. Depending on your requirements, additional options can include trash screens, a slotted pipe skimmer, surface conveyors, and a bottom drag or screw conveyor for solids handling.

Complete covers of various materials are available with necessary environmental and safety features. These provisions may include a nitrogen blanketing system, carbon filtering to remove hydrocarbons from the blanket gas, exhaust flares, pressure relief valves, and access doors.



API Separator configuration



API Separator installation

Circular Separators

Monroe Environmental also provides Circular Oil/Water Separators that can take the place of rectangular API Separators in some cases. These units are equipped with enhanced oil skimming mechanisms, high torque drives, and sludge collection rakes for handling the heaviest oil and solids loading applications.

A Monroe Environmental Applications Engineer can best advise on the pros and cons of each system design based on your project's specific requirements.

API Retrofits

Existing API Separators can be upgraded with new internal components to improve separation, oil reclamation, or any other operational or maintenance problem. In addition, Monroe parallel plate packs can be added to existing API Separators to increase the effective surface area which will provide increased oil removal and wastewater flow capacity.

Monroe Environmental has experience retrofitting existing in ground concrete tanks as well as above ground steel separators.



Circular Separator

Available Options

- Mechanical surface skimmer and pipe skimmer
- Mechanical drag conveyor, screw conveyor, and trash screens
- Vapor covers with environmental and safety equipment
- Retrofit components to upgrade existing separators
- Monroe Parallel Plate packs to improve oil removal in existing separators



Left: Diffusion chamber with reaction jet baffles, screw conveyor for solids removal, and chain and flight drag conveyor. **Middle:** Chain and flight surface skimmer and drag conveyor in separation and settling zone. **Right:** Automated oil roll, adjustable pipe skimmer, underflow baffle, and adjustable overflow weir.

Additional Equipment

Plate Settler Design

- 304 stainless steel
- Increases throughput and capacity
- Reduces solids loading on final filtration processes
- Easy to see and clean the faces of plates without draining tank
- Variably sized influent flow distributors promote better flow across the face of the plates
- Effluent is collected uniformly at the top of the plates through orifices



Parallel Plate Settlers: Greatly increase the effective settling area of existing clarifiers and sedimentation basins

Parallel Plate Settlers

Monroe Environmental Parallel Plate Settlers can greatly increase the effective surface area of the existing clarifiers and sedimentation basins at water treatment facilities. New tanks can be greatly reduced in size when designed to include plate settlers as well. This is because suspended solids removal in gravity separators and clarifiers depends primarily on the surface area for settling and the multiple parallel plates provide a large surface area in a small space.

Monroe features a variety of design improvements over competitive plate settlers. These patent-pending designs provide a more equalized flow through the plate sections and also incorporate several features that make inspection, cleaning, and maintenance much easier for plant operators.



Sludge Collectors: Efficient collection of flocculated solids and sludge with hoseless design

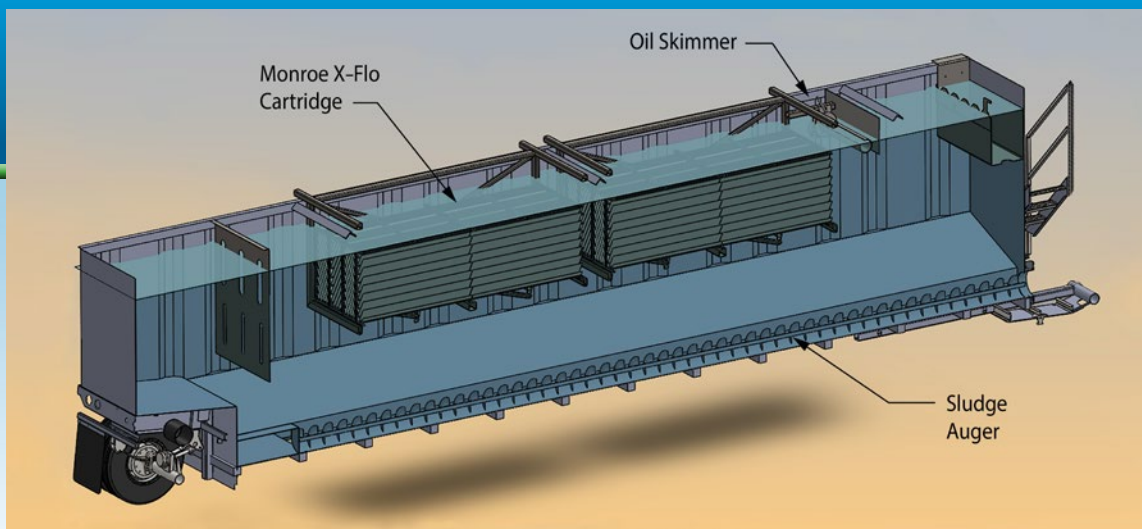
Sludge Collectors

The Monroe Environmental Sludge Collector is a hoseless, hydraulic suction collector designed to uniformly remove settled solids from the floor of a rectangular sedimentation basin. Monroe's patent-pending design improves the flow of sludge through the collector and reduces the chance for in-pipe clogging.

The hoseless-type collector offered by Monroe is a more efficient design for collecting settled solids from sedimentation basins versus flexible hose collectors, fixed grid collectors, and chain and flight scrapers.

The Monroe Sludge Collector is the perfect compliment to the highly efficient Monroe Plate Settlers for potable water treatment. The unit can also be provided separately should your plant only require a more efficient settled solids removal system.

Chain and flight collectors are also available when required.



X-Flo Mobile Clarifier: A complete solution for mobile wastewater treatment that removes oil and solids

X-Flo Mobile Clarifier™

The Monroe X-Flo Mobile Clarifier™ is a completely integrated mobile clarification solution for temporary job sites and/or bypass operations. The system can be utilized as a stand-alone clarifier or as a retrofit to improve the performance of existing mobile storage tanks.

The Monroe X-Flo Mobile Clarifier is designed to be a combination of traditional clarification technologies with standard mobile water storage tanks to produce an

economic means of solids separation, oil removal, and waste stream clarification on a job site.

The truly unique design of the X-Flo Cartridge allows for the removal of settle-able solids as well as floating solids/oils from your wastewater and process liquids — something that cannot be achieved with other mobile treatment tanks or plate clarifier systems!

Oil Recovery Units

The Monroe Environmental Oil Recovery Unit is heavily constructed for industrial applications and consists of an endless belt, an electric motor drive unit, and a complete enclosure. The belt is suspended from a specially designed driven pulley, with the lower portion immersed in an oil supporting liquid.

The Monroe Oil Recovery Unit operates unattended in any area of tranquil oil accumulation. It will continuously recover floating oil in a condition that permits disposal or reclaiming for other industrial purposes.

Many different industries can prevent water pollution by recovering oily waste with a Monroe Oil Recovery Unit. Even the lightest oils from food processing can be easily removed.



Oil Recovery Unit: The highest quality belt skimmer available on the market

Air Strippers

Monroe Environmental designs and manufactures high-efficiency air strippers for industrial and municipal applications. An air stripper removes volatile gaseous compounds dissolved in a contaminated water stream and transfers them to an air stream. Clean water from the Monroe stripper may then be sent to a sump or drain as required.

Monroe manufactures Packed Tower Air Strippers as well as a complete line of scrubbers and gas adsorbers that may be used to treat the resulting contaminated air before it is emitted to the atmosphere.

Applications

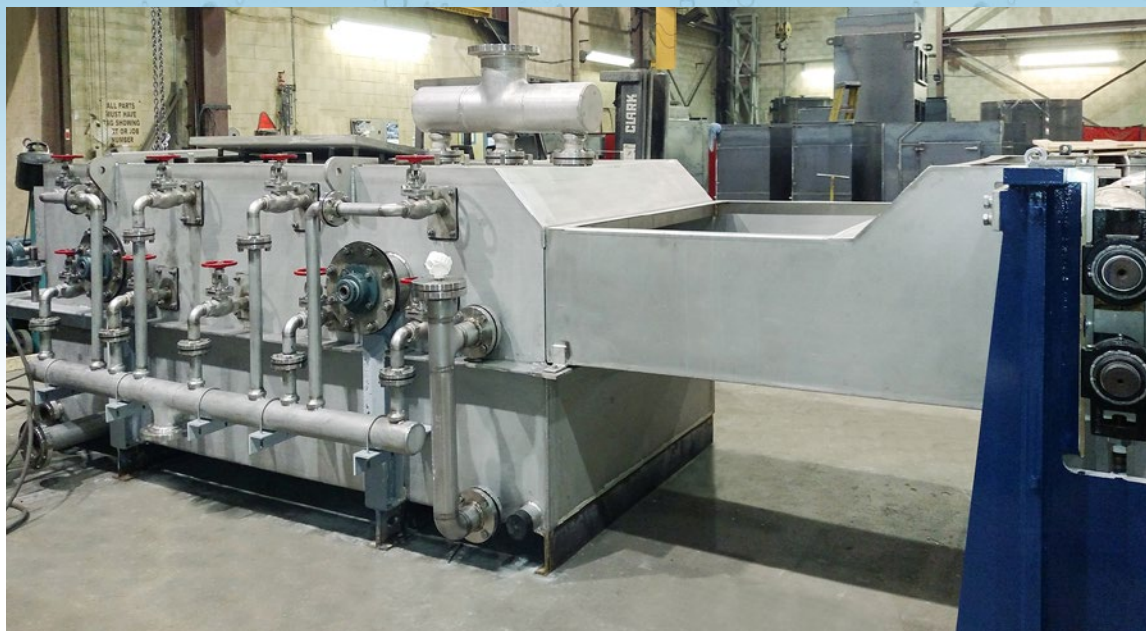
- Removal of Volatile Organic Compounds (VOCs) and other compounds with high vapor pressure and low aqueous solubility including: BTX, ethylbenzene, PCE, TCE, DCE, MTBE, ethylenes, and ammonia
- Removal of groundwater contaminants from petroleum fuel leakage
- Water treatment plant removal of VOCs from potable water



Air Strippers: Removes VOCs, ammonia, and other pollutants from contaminated water streams

Custom Clarifiers & Separators

Specially designed quench and rinse tank for steel coil treatment prior to finishing for galvanizing plant



Applications

- Solids removal
- Oil separation and recovery
- Scum/foam removal
- Dissolved air flotation
- Aeration processes
- Metals reduction
- Process water recycle
- Filtration
- pH adjustment
- Flocculation
- Skimmers and conveyors
- CPI separators
- Tube settlers
- And many more

Water Treatment Experience and Expertise

Monroe Environmental has the experience and expertise to offer custom designed treatment systems for non-standard, site, and process specific applications. These systems typically afford the end user lower maintenance and operational costs than standard equipment which may not be optimized for the application.

Our ability to offer these systems comes from flexible and experienced application and mechanical design capabilities not possessed by other environmental system providers. That's why Monroe Environmental is truly a "solutions" provider.

We also offer other traditional water and wastewater process equipment such as CPI Separators, DAFs, aeration tanks, oil/water separators, and many others.

What is a 'Custom Clarifier or Separator'?

A custom clarifier or separator is any type of equipment that is specially designed to meet a specific water treatment requirement not found among conventional equipment designs. Often these needs arise from changing manufacturing processes, batch irregularities, specialized production processes, new discharge requirements, space limitations, or maintenance reduction plans.

Monroe Environmental has the capability to help assess a treatment process and respond with innovative, targeted solutions to fill the gaps in these areas.

Contact a Monroe Applications Engineer today to review your requirements.



Grit Separator



Custom separator with skimmer for vacuum pump seal ring water treatment



Insulated, steam heated tanks for oil separation/reclamation and solids settling

Pilot & Testing Programs



Pilot Horizontal Clarifier used on a rental basis to determine the chemical dosing requirements and settling characteristics of suspended and dissolved metals in an industrial wastewater stream

Pilot System Services

Monroe Environmental Pilot Systems are an excellent option for testing a technology's performance capability and suitability for a particular 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 performance.

- Pilot clarifiers and separators available for rent
- Installation and operation services
- On-site support
- System optimization
- Data and analysis reports

Upon completion of a Pilot System test, Monroe Environmental can evaluate and analyze the system's performance and present a written report summarizing the results and recommendations in order to properly scale up for a full system. We work with your operators, engineers, and maintenance personnel to design a true solution that will meet the needs of your plant and application.

Please contact a Monroe Environmental Applications Engineer to learn more about our pilot system capabilities.

Pilot Systems are a cost-effective option for determining if a particular technology is a suitable solution for your plant's specific application. You can truly "know before you buy" a full scale system.



Horizontal Clarifier pilot



X-Flo Mobile Clarifier cartridge pilot



Vertical Clarifier pilot

Clarifier Rebuilds & Retrofits

100 ft. diameter Circular Clarifier rebuild with existing concrete tank

Clarifier Rebuild Services

- Site visit and clarifier evaluation
- Exact replacement or modified designs to improve performance
- Variety of construction materials and coatings available
- Demolition and installation
- Bypass services to keep plant online during replacement



Rebuild and replace clarifier internals for long term performance

Rebuilding and replacing the internals of a concrete or steel tank clarifier is a quick, cost-effective solution versus constructing an entirely new system. The clarifier tanks often maintain a suitable operating condition while the skimmer arm, center well, drive assembly, and sludge rakes corrode and wear beyond an acceptable level.

The benefits of a Monroe Environmental Clarifier Rebuild are straightforward and simple:

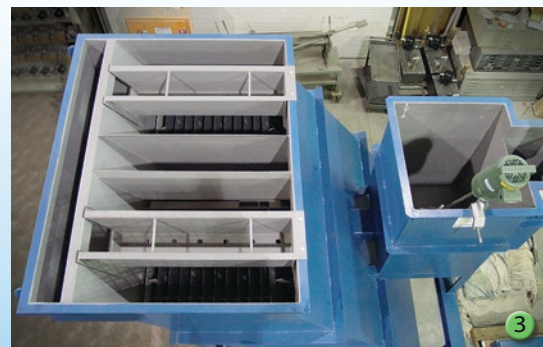
- Faster installations with minimal clarifier downtime
- Reduces total cost
- Improves performance
- Reduces future maintenance costs

In most cases, a Monroe Environmental Clarifier Rebuild is the perfect solution to restore the clarifier to its peak operating performance level, ensuring several decades of future use.

Vertical Clarifier: Plating Company

Refurbished Plate Clarifier Tank & Internals

Before (Photo 1 & 2): Existing Vertical Clarifier at a plating company. **After (Photo 3):** Refurbished Vertical Clarifier in Monroe Shop.



Circular Clarifier: Chemical Manufacturing Plant

Exact Replacement of Clarifier Internals

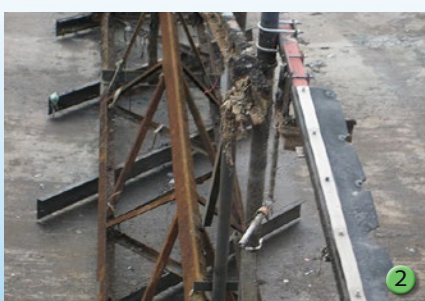
Before (Photo 1): Existing 55 ft. diameter Scraper Clarifier at chemical manufacturing plant. **Photo 2:** New Clarifier internals completely assembled in Monroe shop. **After (Photo 3):** Installation of new internals as well as drive, bridge, and walkway.



Primary Clarifier: Municipal Wastewater Treatment

Conversion to Spiral Scrapers

Before (Photos 1 & 2): Upgrade of four 250 ft. Primary Clarifiers. The project included converting the sludge rakes to higher efficiency spiral scrapers and rehabilitating existing drive units, as well as replacing influent wells, column supports, weirs, baffles, and launders with a combination of mild, coated steel and non-corrosive stainless steel members. **After (Photo 3):** One of the new Primary Clarifiers ready to return to operation.



Air Pollution Control Systems

Monroe Environmental® provides air pollution control technologies for a variety of air/gas treatment processes at nearly every type of industrial manufacturing plant and municipal treatment works, including those in the following fields:

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



Packed Bed Scrubbers

Removal of soluble pollutants, odors, and acid gases from municipal and industrial air streams

- FRP, PVC, CPVC, polypropylene, stainless steel, and specialty alloys
- Quench towers
- Removal of H_2S , HCl , HF , SO_2 , NH_3 , HCN , HNO_3 , formaldehyde, and many other soluble pollutants
- Chemical feed systems
- Scrubber blowdown wastewater treatment systems



Venturi Scrubbers

Particulate removal from industrial air streams and process gases, including flue exhaust

- Dryer exhaust scrubbing
- Buffing operations
- Cast iron machining fines
- Explosive dusts
- Fiberglass fines
- Forging and foundry dust, fumes
- Machining and grinding dusts
- And many others



Multi-Stage Scrubbing Systems

- High temperature and volatile chemical processes
- Kiln, RTO, boiler, dryer, and incinerator exhaust scrubbing
- PM (particulate matter) removal and acid gas neutralization
- Metals, dioxin/furan, mercury, and opacity control
- Flame laminating and glass coating operations



Carbon Adsorbers

Removal of VOCs, odorous compounds, oil vapors, and gas phase hydrocarbons

- Municipal water and wastewater treatment odors
- Industrial emissions from paint spraying, paper coating, plastic film coating, metal foil coating, rubber coating, and printing
- Odor control for food processing and other industrial process applications



Dust Collectors

Removal of airborne dust from manufacturing and processing operations

- Bulk solids handling
- Chemical processing
- Dry machining and grinding
- CNC operations
- Powder coating
- Shot blast
- Welding and metal cutting operations
- MQL machining
- Fire protection available



Mist Collectors

Mist, oil, smoke, and vapor removal from metal cutting fluids, metal processing coolants, processing oils, and other mist applications

- Metal cutting, forming, and machining
- Parts washer exhaust
- Steel and aluminum processing
- Rolling mills
- Synthetic fiber processing



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