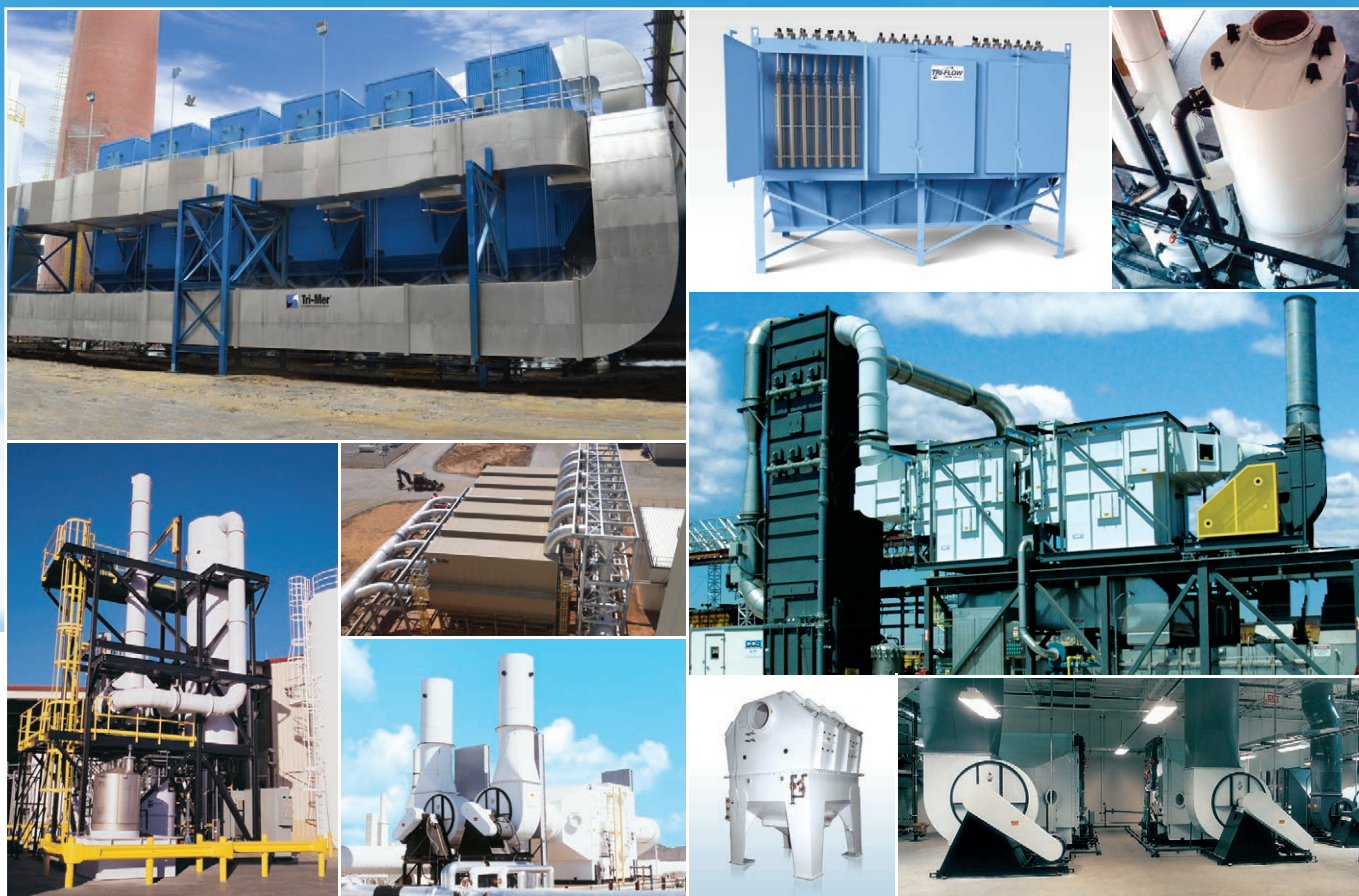


2013 Product Catalog



 **Tri-Mer**[®]
CORPORATION

www.tri-mer.com

UltraCat Catalytic Filters Remove PM, SO₂, HCl, NO_x, Dioxins, Organic HAPs, CO

NO_x Control as Low as 350°F

UltraCat Meets Industry Pollution Control Requirements

UltraCat catalyst filters are composed of fibrous ceramic materials mixed with nanobits of proprietary catalyst. This new generation of light weight, ductile ceramic filter is very efficient in removing NO_x and other pollutants, including submicron particulate, to extremely low levels. UCF is better for applications over 300°F.

Particulate Control

UltraCat filters typically capture particulate to levels less than 0.001 grains/dscf (2.0 mg/Nm³). MACT compliance levels are guaranteed. The unique structure of the filters keeps the collected particles on the surface. The embedded NO_x catalyst is protected from blinding and poisoning.

NO_x and Dioxin Control

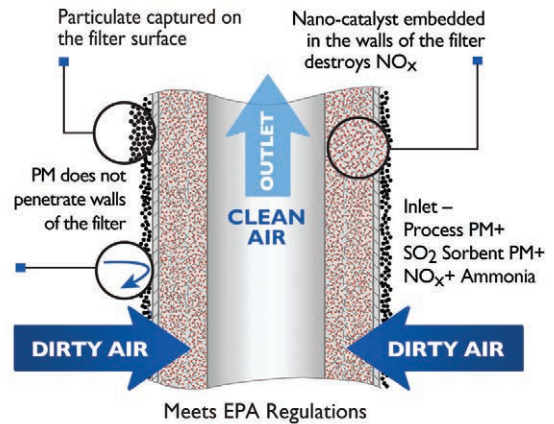
The UltraCat filter tubes have nanobits of proprietary catalyst embedded throughout the filter walls, which are about 3/4" thick. The UltraCat can achieve excellent NO_x removal at temperatures of 350°F and higher. Operating range is approximately 350°F to 950°F. Aqua ammonia is injected upstream of the filters, reacting with NO_x at the catalyst to form harmless nitrogen gas and water vapor, which then exits the system as clean gases. The proprietary catalyst is highly resistant to sulfur poisoning and is protected from particulate contamination because it is embedded inside the filter walls. NO_x removal is up to 95%. UltraCat is also very efficient at destroying dioxins, typically over 97%.

HAPs and THC Control

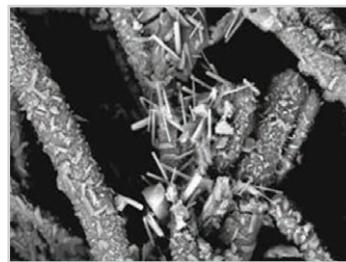
Organic HAPs and THC are associated with many industrial processes, such as cement production. These can be removed by the embedded nano-catalyst to below compliance levels at the same time as PM, NO_x, and other pollutants.

Carbon Monoxide Control

Carbon Monoxide (CO) and NO_x can be simultaneously destroyed in the range of 500°F to 950°F, while removing other pollutants.



NO_x and ammonia react with catalyst to destroy NO_x.



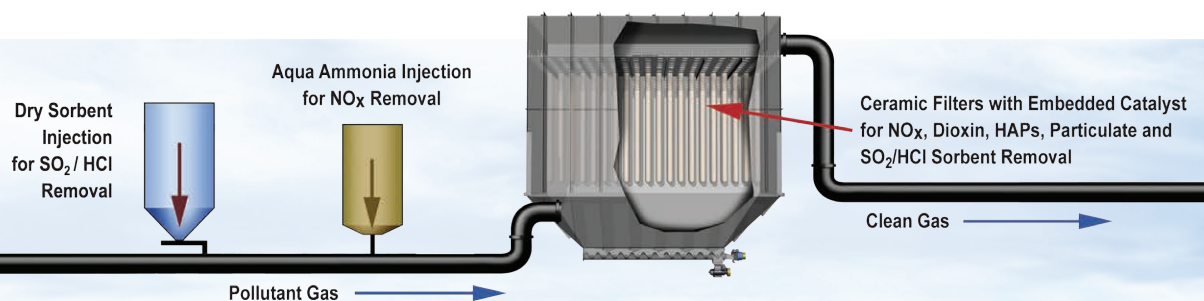
Micrograph of nano-catalysts embedded in ceramic-coated fibers for destruction of NO_x, dioxins, various organic HAPs.

SO₂, HCl, Acid Gas Control

The UltraCat system can incorporate dry sorbent injection of hydrated lime, sodium bicarbonate, or trona for efficient dry scrubbing of SO₂, HCl, HF, and other acid gases. Typical SO₂ and HCl results show 90-98% removal.

Mercury Control

The strategy for mercury control depends on the constituents in the flue gas and is analyzed on an individual basis. Levels of mercury control can be achieved through injection of activated carbon of various formulations. Blended sorbents of hydrated lime and activated carbon can remove acid gases, mercury and THC. Other mercury approaches are also compatible with the UltraCat filter system.



Cloud Chamber Scrubber® (CCS)

Tri-Mer Cloud Chamber Scrubber is Best Control Technology Available for Fine Particulate and Acid Gas Emissions under 300°F.

The Cloud Chamber Scrubber (CCS) treats PM2.5, fine, submicron, ultrafine, and condensable particulate as well as PM10 and more coarse particles. Simultaneously, all soluble acid gases are removed at the same high levels as conventional scrubbers. The CCS is a major advance in multipollutant control devices.

Using highly charged water droplets as collectors, the CCS is a proven solution for simultaneously treating fine particles and pollutant gases. The Cloud Chamber Scrubber sets a new performance standard as a 21st century technology.

CCS Provides Simultaneous Removal of Particles and Acid Gas

- Based on patented discoveries and innovations in electrofluidics
- Proven submicron performance at efficiencies typically greater than 99%
- Capability to capture particles even smaller than 0.1 micron
- Energy efficient. Only 10 watts per 1000 cfm to charge the water droplets, plus moderate pump power for water recirculation
- Less than 1.5" w.g. pressure drop across the system
- Gas temperature, particle solubility, resistivity, and reactivity have little effect on performance
- Handles heavy loadings. Not sensitive to load flux
- Also removes any gas that can be treated by a wet scrubber, including hydrogen chloride (HCl), sulfur dioxide (SO₂), ammonia (NH₃), and hydrogen sulfide (H₂S), plus other acids and caustics

- Ultra-low water usage for "blowdown" discharge of captured pollutants
- Compatible with integrated NO_x system – SCR, or Tri-NO_x
- Energy recovery options available

Typical Applications

- Fiber optic manufacturing
- Solar panel fabrication
- Asphalt shingle manufacturing
- Chemical manufacturing
- Plastics manufacturing
- Sulfuric and nitric acid production

CCS is best for applications under 300°F. For high temperature applications, see the Tri-Mer UltraCat.



Tri-NO_x[®] Multi-Chem NO_x Wet Scrubber System

Tri-NO_x Handles Any NO/NO₂ Ratio, Guarantees a Clear Stack Free of NO₂ Plume

Tri-Mer's versatile Tri-NO_x system accommodates any combination of NO and NO₂, including nitration-related NO_x, which is typically high on the NO₂ scale and combustion-related NO_x, which is generally higher in NO. The system also handles N₂O₄.

Tri-NO_x technology eliminates the visible plume generated by high NO₂ loading. This yellow-brown emission is commonly caused by processes using nitric acid in conjunction with metal refining, metal finishing or chemical nitrations.

Tri-NO_x systems are efficient, versatile workhorses that adapt to a wide range of requirements. Virtually any target stack output can be met, including reducing loads in excess of 100,000 ppm to below 5 ppm. There are no CFM or PPM limitations on gas input.

All Tri-NO_x systems are guaranteed to operate within pre-determined ppm limits for stack output without repeated adjustments. Tri-NO_x is the technology of choice for industry located within districts where NO_x emissions are most restrictive.

Tri-NO_x systems handle highly variable load applications with wide peak/tail profiles without a problem.

Chemically safe Tri-NO_x systems can be engineered to handle NO₂ exclusively if opacity is the only problem, or they will handle complete NO_x output, (NO + NO₂), for comprehensive NO_x control.

The process is applicable to hot and cold gas phase systems. It will handle multiple gas stream residuals, including Cl₂, HCl, SO₂, other acids, other gases and caustics. Systems can also be designed to handle particulates. This wet chemical non-catalytic system cannot be blinded, and there is no catalyst to poison.

Typical Applications

- Pharmaceutical manufacturing
- Resin manufacturing
- Catalytic converter manufacturing
- Catalyst regeneration
- Metal refining
- Metal finishing
- Chemical nitration
- Solar cell manufacturing
- Semiconductor manufacturing

Tri-Packs[®] Tower Media

Tri-Packs is the ultimate in random dump tower packing. It provides maximum surface contact between the gas and the scrubbing liquid by facilitating continuous formation of droplets throughout the packed bed. This results in high scrubbing efficiency, and minimizes total packing depth required.



Whirl Wet[®] Dust Collector Systems

Whirl Wet Collects Dusts Above 3 Microns at Efficiencies of 99% and Higher

The Tri-Mer Whirl Wet is an advanced dust collector system with a smooth interior and encased structure, satisfying the requirements of food processing and pharmaceutical environments.

The system requires very little maintenance and uses little water. Water level is maintained automatically, and make-up water is only necessary to compensate for evaporation or sludge removal. It performs equally well for soluble and insoluble dust loads. Units operate 24/7 without shut-down.

Whirl Wet does not have any internal moving parts to wear or replace. Rather, its unique, dual-opposed internally mounted blades develop 8" of water gauge. The aggressive action of the liquid and particulate over the blade system makes the unit impossible to clog under operating conditions, so the agglomeration and sticky residues that plug dry dust systems are not an issue with the Whirl Wet.

Whirl Wet is the ultimate in streamlined dust collection technology, and does not use filter bags, cartridges or other consumable items. The system is self-cleaning and does not require recirculation pumps and tanks, or complex plumbing.

Whirl Wet is manufactured in single unit capacities to 50,000 cfm, in steel, stainless steel, polypropylene and PVC.

Tri-Flow Filter System

HEPA Level Performance with a MERV 16 Rating

Tri-Flow Compact filters are a higher-performing alternative to bag, cartridge and pocket filters, which are typically rated MERV 10-13. They have a small footprint, and an exceptionally large filter surface area: Tri-Flow Compact filters provide 2-3 times more filtration compared to similarly dimensioned bag (pocket) filters. An even greater increase in filtration area vs. volume is achieved in comparisons with sleeve-type high efficiency filters.

The unique Tri-Flow design provides in-line pulse jet cleaning and maintains an exceptionally low operating pressure drop. Filter efficiencies of 99.999% on 0.5 micron and larger particles (by weight) are typical.

Tri-Flow Compact filters are self-supporting and are manufactured using proprietary filter media tailored to the application. There are 7 filter media, including options for hydrophobic/oleophobic, high temperature and anti-static applications. All media is pleated and continuously bonded for maximum dimensional stability and filter integrity. A resilient mounting flange provides a dust seal that prevents bypass.

Existing dust collectors can often be adapted to accommodate Tri-Flow Compact filters.

Tri-Flow Environmental Control Booth

The Tri-Flow booth with Tri-Flow filter technology is also the only environmental booth customized to the facility. It is ideal for applications demanding high filter efficiency, high noise attenuation, and low life cycle cost. Tri-Flow booths operate at very low pressure drop, which minimizes energy use and extends filter life. The Tri-Flow booth does not use hoods or ducting, and tools are not required for filter access.



Packed Bed Acid and Fume Scrubbers

Crossflow Scrubbers

Tri-Mer's fume scrubber is constructed of UV-stabilized polypropylene, with a mist elimination section. It is completely corrosion-resistant and designed for high inlet concentrations. Tri-Mer's fume scrubber is unique in that it features a dual-action system which continually floods the packing media, insuring optimum contact between the contaminant and the packing material.

All Tri-Mer horizontal crossflow scrubbers are available with mated fan or can be coupled to an existing fan. The Tri-Mer fume scrubber is also available in UV-stabilized PVC and stainless steel. Deep-pack models are available for heavy loadings; for special situations, other scrubber modifications such as multiple stages, redundant fans and pumps, and the Ultra-Scrub® option can be engineered. Crossflow scrubber capacities range through 100,000 cfm.

Vertical Packed Bed Scrubbers

Tri-Mer's packed bed tower system is the industry standard for applications of any flow volume. Single and multi-stage packed beds are available with packing depths sized to the application. Systems can be specified with or without recirculation system; integral or remote recirculation is available.

Top discharges are provided for customers with existing fans. Construction materials include UV-stabilized polypropylene, stainless steel, fiberglass and PVC. Tri-Mer's vertical scrubber is designed for indoor or outdoor installation. This is a high-efficiency wet scrubber that can handle emissions from a wide variety of processes.

Fan/Separator®

Tri-Mer's Fan/Separator controls H_2SO_4 fumes more efficiently than standard wet scrubbers. Fumes generated from steel pickling, hundreds of plating processes, aluminum anodizing and battery charging can be eliminated more efficiently and with less water and energy using Tri-Mer's easy-to-install Fan/Separator.

Fan/Separator scrubber sections and fans are made specifically to mate to each other – no fan undersizing. Fan outlet velocity is precisely controlled, so air crossing the rigid packed media never exceeds design parameters.

The unit is extremely efficient in eliminating corrosive contaminants with a resulting low humidity exhaust stack. This combination of low humidity and high efficiency makes return air possible in certain specialized applications incorporating the closed-loop Tri-Mer design.

Tri-Mer's Fan/Separators can operate in the 99% efficiency range, removing fumes containing sulfuric acid, plating exhaust, and corrosive fumes from battery charging operations.

Fan/Separator requires less than 1/10 the water of most wet scrubbers and uses 20% less brake horsepower due to its unique design, which incorporates the fan as a centrifuge in the scrubbing process.

Single units are available up to 100,000 cfm. UV-stabilized PVC or polypropylene are standard materials of construction; 304 and 316L stainless steel or mild steel are also available.



Specialized Products, Tanks, Blowers

Custom Fabrications and Ducting

Tri-Mer is an experienced designer/builder of custom fabrications using high-technology plastics. Tanks, ducting, process hooding and lab consoles can be fabricated quickly and cost-effectively. Tri-Mer specializes in products engineered to your specific requirements and offers a wide variety of products not available through catalog suppliers.

In addition to high-performance plastics such as PVC, polypropylene, Kynar® (PDVF), and Teflon®, Tri-Mer also fabricates using mild steel, stainless steel, Hastelloy® and other alloys. Custom laboratory consoles, cabinets and workstations are a specialty Tri-Mer product.

Kynar is a registered trademark of Arkema, Inc. Hastelloy is a registered trademark of Haynes International. Teflon is a registered trademark of DuPont.

Heavy Duty Polypropylene Tanks

Tri-Mer process tanks are typically fabricated in 5' to 70' lengths, although our capacity ranges to 100' and beyond with field connections. Tanks can be free-standing or steel-supported. Standard material of construction is 1" to 1-1/2" solid polypropylene. Tri-Mer has developed a unique manufacturing system which insures maximum strength of the material at any joint.

Tri-Mer tanks are ideally suited for nitric and hydrofluoric acids, plating baths, anodizing operations and other finishing processes requiring a rugged, corrosion-proof tank. Tri-Mer polypropylene tanks are also highly resistant to mechanical abuse.

The unique exterior grid structure supports the tank walls. Unlike fiberglass or lined tanks, the 100% homogeneous polypropylene fabricated tank will not delaminate. For this reason, Tri-Mer polypropylene tanks are widely specified as replacements for fiberglass, rubber brick, flexible PVC-lined, and other types of vessels and storage tanks.

In addition to polypropylene, Tri-Mer manufactures tanks in stainless steel, mild steel, PVC and FRP. All Tri-Mer tanks undergo exhaustive quality control testing and are backed by over 50 years of experience in tank design and manufacture.

Corrosion-Resistant Fans and Blowers

Tri-Mer offers heavy-duty, direct-drive exhaust blowers to efficiently and effectively handle corrosive exhausts. In centrifugal designs, capacities range from 50 cfm through 150,000 cfm of air. Wheels are backward-inclined; construction varies depending on size and static pressure.

Optional materials include PVC, polypropylene, fiberglass, 304 and 316L stainless steel and mild steel. Variable frequency drive blowers are standard.

Tri-Mer fans are the industry standard for many applications and have a long history of high reliability under the most punishing conditions. In addition, Tri-Mer offers a series of laboratory exhaust fans for lower capacity air handling situations.

Designs include belt and direct drive.



Special Use Scrubbers

The C/E-1 Advanced Technology Chrome Scrubber

C/E-1 chrome scrubber scrubs all chrome, including Cr6 and Cr3, at efficiencies meeting all current environmental codes.

The C/E-1 system has an all-mechanical pad design and does not consume chemicals or generate waste. It can be scaled to facilities of all sizes.

The C/E-1 chrome scrubber features a multi-layer polypropylene pad system which operates under negative pressure. The filter apparatus is washed continuously in a virtually closed loop configuration. When chrome levels approach set point (generally 3000 ppm), water can be forwarded to chrome recovery, or returned to the plating bath.

The Tri-Mer C/E-1 is a low energy system generating less than 6" of internal static pressure, therefore energy consumption is extraordinarily low. Total water use is also low: average consumption is 10 gallons per hour for a 20,000 cfm unit.

The C/E-1 chrome scrubber has no internal moving parts to wear or replace. Construction is usually from Type 1 PVC.

Q-Scrub® Incinerator Scrubbers

Tri-Mer's Q-Scrub wet scrubber section interfaces with all industrial, medical and municipal incinerators. Q-Scrub predictably and reliably handles HCl, SO₂, NO_x, particulates and other gas stream contaminants. The process can incorporate heat recovery, gas quenching and wet or dry particulate control and can incorporate the Tri-NOx process if required.

Odor Control

Tri-Mer odor control systems incorporate single, dual and triple-stage wet sections. The process includes alkali or acidic sections depending on the odor source. Mercaptins, amines and dozens of uncommon industrial odor problems can be eliminated with the Tri-Mer system. Carbon systems can be incorporated if required.

Tri-Mer's multi-stage system is guaranteed to operate free of detectable odor at the stack under all conditions.

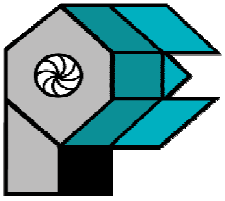
Emergency Scrubbers and Venturi

Tri-Mer's catastrophic scrubbers handle emission problems resulting from tank or cylinder rupture. These systems offer stand-by capability and are available in two design configurations: venturi stationary mass flow and packed bed systems. Tri-Mer also offers venturi designs for a variety of applications.



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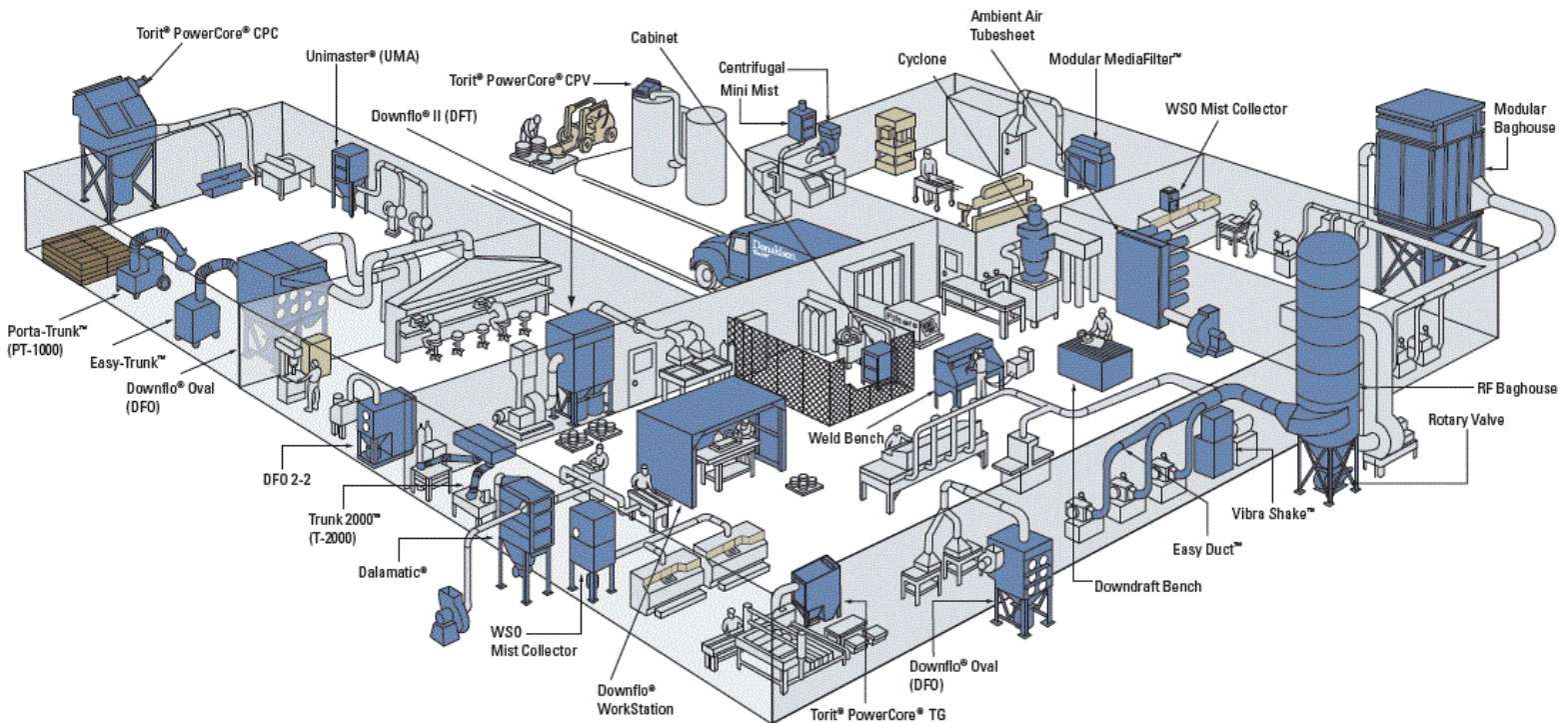
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