

Whirl Wet® High Efficiency Dust Collection



Low Maintenance
and Operating Expense



 **Tri-Mer**®
CORPORATION

www.tri-mer.com

High Efficiency Dust Collection with Low Maintenance



Tri-Mer's Whirl Wet® is a time-proven "workhorse" designed for continuous, predictable collection of dusts, both soluble and insoluble, that are 3 microns and above.

For companies in a broad range of industries, Whirl Wet is the most efficient way to collect and manage dusts and particulate, while offering numerous distinct advantages:

Efficiency

Systems are 95% efficient on 2 microns and higher for larger micron sizes.

Superior Design

Patented design has no moving parts and does not use "high maintenance" components such as spray nozzles, pumps or bags that can disrupt production and stress maintenance budgets.

Downtime

Energy generated inside the unit will not allow the system to clog under any operating conditions; therefore, the agglomeration and sticky residues that can plug dry collectors are not an issue with the Whirl Wet system.

Note: Baghouse media that is plugged ("blinded") in this way allows dust to fuel a fire or explosion.

Continuous Operation

Whirl Wet operates continuously, without the need to enter the unit for service.

"Green" Advantage

Whirl Wet is the "greenest" dust collection technology available – in several important ways. Unlike Baghouses, which add to a company's waste volume, Whirl Wet produces a dense filter cake, so quantities are a small fraction of what a dry system would generate. For companies seeking ways to comply with corporate or regulatory mandates on solid waste reduction, Whirl Wet can make a substantial contribution. In addition, the Whirl Wet system uses very little water, and process water is recycled.

Reclamation

Whirl Wet is ideal for applications where materials reclamation is desirable.

Safety

Whirl Wet is well suited to applications involving volatile dusts, and wherever it is necessary to prevent fire or explosion.

Ergonomics

Noise levels are typically 85-90 db or less at 5 ft. The choice of a Whirl Wet has, for some customers, eliminated the need for a monitoring program for long-term hearing loss. The Whirl Wet also contributes to higher quality indoor air.

Water Use

Whirl Wet consumes significantly less water than competitive wet systems.

Housekeeping

Whirl Wet provides both excellent dust collection and a substantial advantage in terms of plant cleanliness. Fugitive dusts are virtually eliminated, as particulate is captured in the water-laden dust chamber.

Self Cleaning

Whirl Wets are self-cleaning. Particulate is deposited at the bottom of the unit for safe and easy recovery, or disposal. This is in sharp contrast to the mechanical shaking cycle used to clean dusts from the walls of dry collectors. As dust is shaken from the bags, sparking potential is high as the gas-dust mixture passes between upper and lower explosive levels.

Versatility

Whirl Wet systems are compatible with highly corrosive dusts, abrasive dusts, high-weight materials, and high temperature applications. Lighter, more porous, dusts are also handled with Whirl Wet dust technology.



Performance and Operating Expense



Applications

There are more than 15,000 Whirl Wet® units in successful operation in more than 20 countries. **The system has a powerful track record:** many systems have been in use for 25 years or longer.

Whirl Wet is frequently specified for the collection of coal, aluminum, fertilizer and sugar dust, and is widely used for the dust elimination requirements of the foundry shakeout industry, lead particulate in the battery industry, and virtually every sector of the process industries, including foods and pharmaceuticals.

Dust collection from grinding processes and spices are excellent applications for the Whirl Wet. Hydrogen venting is provided for applications generating hazardous quantities of hydrogen gas. It is becoming the leading dust collection alternative for plants where metal or plastic finishing generates dust as small as one micron.

Processes that were not formerly candidates for materials recovery have become good candidates as a result of the Whirl Wet, yielding significant economic benefits for the processor.



Design

Whirl Wet units are custom-engineered to the application and the environment. Standard capacities range from 500 cfm to 50,000 cfm. Systems can also be engineered with modules to handle fumes, odors and other contaminants in addition to particulate. Materials of construction include coated steel, 304 and 316 stainless steel, polypropylene, PVC, and alloy materials, including

Hastelloy®. Systems can be designed for indoor or outdoor installation, and to accommodate space restrictions: a vertical format system with a top-mounted fan, for example, is often an excellent solution where equipment footprint is an issue.

Tri-Mer systems have a CE mark approval.

Hastelloy is a registered trademark of Haynes International, Inc.



Operation

Whirl Wet employs a unique process to create intensive mixing of the dust particles and water. To infuse dust particles with water droplets, the mixture is passed with high velocity through a fixed-position dual opposed blade system.

The mixing of the dust-laden airstream and liquid takes place and, to increase turbulence, a tangential airstream is injected through a linear slot in the lower blade assembly. Rotation is accelerated,

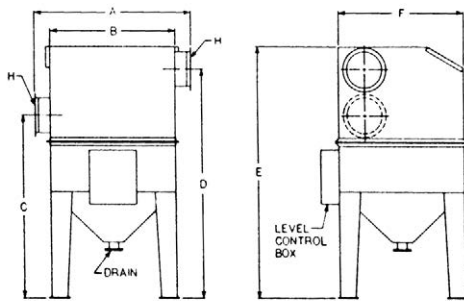
droplets in the airstream are eliminated through a mist eliminator located downstream, and particulate material is deposited on the bottom of the unit for recovery or disposal.

Water level is maintained automatically and make-up water is only necessary to compensate for evaporation or sludge removal. Whirl Wet can operate in the 99% efficiency range for a wide variety of applications, and over a wide range of micron sizes.

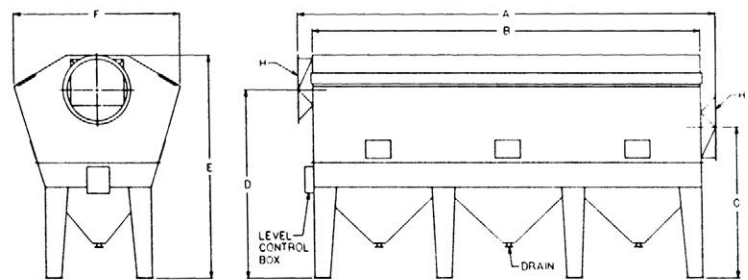
Models Available: 3 Disposal Options

Model "H"

The **Model H** offers an automatically timed drain-down system or manual drain down with sluicing hopper.



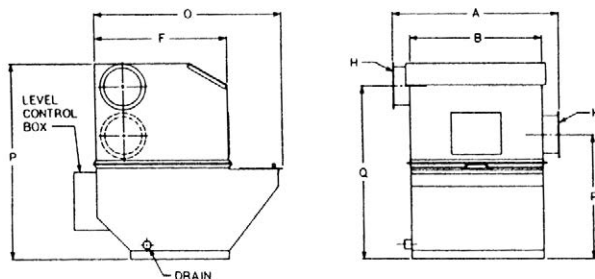
Model "H" (500 cfm – 6000 cfm)



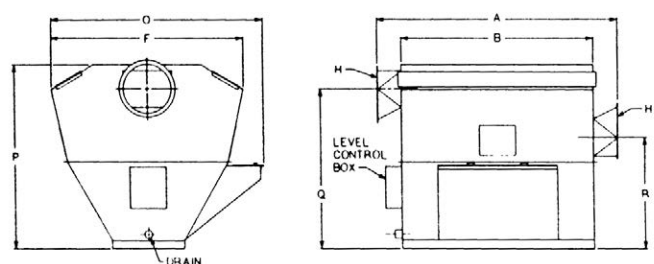
Model "H" (7000 cfm – 50,000 cfm)

Model "M"

The **Model M** Whirl Wet® has manual clean-out, and is often preferable where dust collection volume is low or tends to float.



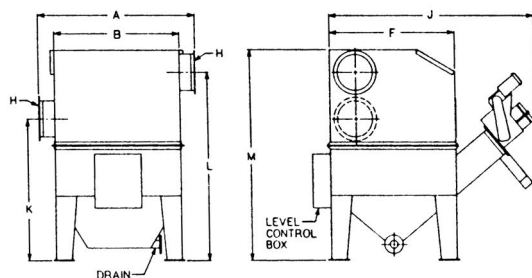
Model "M" (1000 cfm – 6000 cfm)



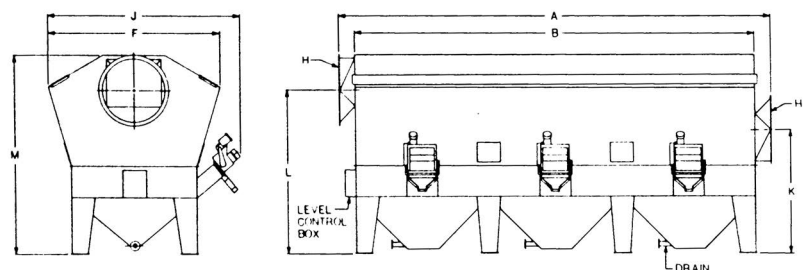
Model "M" (7000 cfm – 14,000 cfm)

MCD (Modular Conveyor Dragout)

MCD is ideal for the heaviest dust loading applications. This unique system has a streamlined, modular design and extraordinarily low maintenance requirements.



Model "MCD" (2800 cfm – 6000 cfm)



Model "MCD" (7000 cfm – 50,000 cfm)

Whirl Wet Model #	Min. CFM	Std. CFM	Max. CFM	A	B	C	D	E	F	H	J	K	L	M	O	P	Q	R
W/W-5	425	500	525	18.5"	6.5"	69"	86.5"	95"	48"	5"	-	-	-	-	-	-	-	-
W/W-6	510	600	630	20"	8"	69"	86.5"	95"	48"	5"	-	-	-	-	-	-	-	-
W/W-8	630	800	840	22.5"	10.5"	69"	86.5"	95"	48"	6"	-	-	-	-	-	-	-	-
W/W-10	840	1000	1050	25"	13"	69"	86.5"	95"	48"	7"	-	-	-	-	67.5"	67"	58.5"	41"
W/W-12	1020	1200	1260	28"	16"	69"	86.5"	95"	48"	7"	-	-	-	-	67.5"	67"	58.5"	41"
W/W-15	1260	1500	1575	32"	20"	69"	86.5"	95"	48"	8"	-	-	-	-	67.5"	67"	58.5"	41"
W/W-18	1530	1800	1890	36"	24"	69"	86.5"	95"	48"	9"	-	-	-	-	67.5"	67"	58.5"	41"
W/W-22	1870	2200	2310	41"	29"	69"	86.5"	95"	48"	10"	-	-	-	-	67.5"	67"	58.5"	41"
W/W-28	2310	2800	2940	49"	37"	69"	86.5"	95"	48"	11"	90"	52"	69.5"	78"	67.5"	67"	58.5"	41"
W/W-34	2890	3400	3570	57"	45"	69"	86.5"	95"	48"	12"	90"	52"	69.5"	78"	67.5"	67"	58.5"	41"
W/W-40	3400	4000	4200	65"	53"	69"	86.5"	95"	48"	13"	90"	52"	69.5"	78"	67.5"	67"	58.5"	41"
W/W-50	4200	5000	5250	78"	66"	69"	86.5"	95"	48"	14"	90"	52"	69.5"	78"	67.5"	67"	58.5"	41"
W/W-60	5100	6000	6300	91.5"	79.5"	69"	86.5"	95"	48"	16"	90"	52"	69.5"	78"	67.5"	67"	58.5"	41"
W/W-70	5950	7000	7350	70.5"	46.5"	85"	109"	117"	88"	18"	134"	64"	88"	99"	104"	90"	81.5"	58"
W/W-80	6800	8000	8400	77"	53"	85"	109"	117"	88"	18"	134"	64"	88"	99"	104"	90"	81.5"	58"
W/W-100	8400	10000	10500	90"	66"	85"	109"	117"	88"	20"	134"	64"	88"	99"	104"	90"	81.5"	58"
W/W-120	10200	12000	12600	103.5"	79.5"	89"	117"	126"	96"	22"	142"	68"	96"	105"	112"	96"	86.5"	59"
W/W-140	11900	14000	14700	116.5"	92.5"	89"	117"	126"	96"	24"	142"	68"	96"	105"	112"	96"	86.5"	59"
W/W-170	14450	17000	17850	136.5"	112.5"	94"	124"	135"	102"	26"	148"	73"	103"	114"	-	-	-	-
W/W-200	17000	20000	20800	156.5"	132.5"	94"	124"	135"	102"	30"	148"	73"	103"	114"	-	-	-	-
W/W-240	20400	24000	25200	183"	159"	100"	132"	145"	112"	32"	158"	79"	111"	124"	-	-	-	-
W/W-280	23800	28000	29400	209.5"	185.5"	100"	132"	145"	112"	34"	158"	79"	111"	124"	-	-	-	-
W/W-320	27200	32000	33600	236"	212"	107"	150"	168"	132"	38"	178"	86"	129"	147"	-	-	-	-
W/W-360	30600	36000	37800	262.5"	238.5"	108"	152"	171"	132"	40"	178"	87"	131"	147"	-	-	-	-
W/W-400	34000	40000	42000	289"	265"	119"	163"	183"	144"	42"	190"	98"	142"	169"	-	-	-	-
W/W-450	38250	45000	47250	322"	298"	123"	169"	190"	152"	44"	198"	102"	148"	177"	-	-	-	-
W/W-500	42500	50000	52500	355"	331"	127"	174"	196"	160"	48"	206"	106"	153"	185"	-	-	-	-

Dimensions are approximate; consult Tri-Mer for exact size.

Application Profiles



Barnes Aerospace

Barnes Aerospace specializes in complex airframe and engine components. To meet the needs of increasing product diversity, Barnes expanded its process for hand finishing titanium aircraft parts from one system, to three. The main challenge was to prevent fires from flammable titanium dust, while minimizing maintenance costs.

After researching dry dust collection (baghouses) and wet collection technology, three 3000 cfm Model M Whirl Wet® units were selected. The Whirl Wet technology differs from baghouse

devices in important ways. First, dust particles enter the whirl chamber and are immediately immersed in water, thus there is no combustion risk.

Also, Tri-Mer's Whirl Wet system has no internal moving parts to wear or replace, or maintenance "consumables." This is in stark contrast with baghouses, whose filter bags must be purchased, inventoried and discarded when the bag reaches capacity. Baghouse waste is also a significant contributor to landfill volume.



Barron Industries

Barron Industries, a leader in the engineered metal products industry, replaced its dry dust collector with a Model 120 H Whirl Wet to collect particulate and metal fines from grinding and finishing operations.

Barron chose the Whirl Wet for its ability to prevent sparks and fire from explosive dusts, its energy efficiency, low water use and minimal maintenance requirements.

Whirl Wet produces a small, dense filter cake, rather than high volumes of bagged particulate, so it is an excellent strategy for companies seeking to comply with mandates for solid waste reduction.



Musashi Auto Parts

Musashi Auto Parts, a manufacturer of transmission gears, camshafts, clutch pistons, balancer shafts and other automotive parts, has installed its 4th Whirl Wet dust collection system.

Musashi's hot forging process generates a chalky residue, when a sodium hydroxide-based forging lubricant is applied to parts. Ductwork was installed to pull the particulate from the process to the Whirl Wet system, where it is infused with water droplets and passed with high velocity through a fixed-position dual

opposed blade system. The droplets in the airstream are eliminated through a mist eliminator, and particulate material is deposited on the bottom of the unit for disposal.

Selection of the Tri-Mer Whirl Wet systems was based on their ability to operate without clogging under any operating conditions, and to do so with less labor involvement. In addition, Whirl Wet units operate at 99% efficiency.



Kraft Foods

Kraft Foods (Chicago, IL), the world's second largest food company, with annual revenues of \$54.4 billion, installed a polypropylene Model 40H Whirl Wet® system for its Nabisco Nutter Butter® product line. The system operates at 97% efficiency at 3 microns and 99% efficiency at 10 microns for the collection of food process dusts from flour and ingredient mixing. The Tri-Mer Whirl Wet was chosen

for its low maintenance. Patented design has no moving parts and does not use components such as spray nozzles, pumps or bags that disrupt production and stress maintenance budgets. In addition, units are self-cleaning. Particulate is deposited at the bottom of the unit in the form of a dense filter cake for easy disposal.



Florida Tile

At Florida Tile, the high-weight, high-pH glaze applied to tiles after firing created an overspray that was challenging to handle. A baghouse was installed, but the capture rate was low; it proved difficult and costly to clean and the high viscosity of the polymer-based spray caused system clogging, resulting in frequent shut-downs.

A decision was made to upgrade to wet dust collection technology. Systems were judged on water and energy use, maintenance requirements, feasibility of

materials reclamation, and ease of worker accessibility.

Two 4500 polypropylene Whirl Wets were installed. The units are self-cleaning by way of an automatic timer; there is no interruption of production. Water use is estimated at 50% that of other units the company considered; energy usage is low.

According to plant operations engineers, reclamation of the glaze material is virtually 100%.



McCormick Spice

McCormick & Co., the world's largest spice company, wanted to maximize dust collection efficiency and reduce the time, cost and labor required for system maintenance. They also wanted a system that had a track record – and one that would accommodate future expansions.

A pair of Whirl Wets, with an outboard structure, rounded corners, and an internal wash-down nozzle system that optimizes cleaning, was selected. The 12,000 cfm polypropylene Whirl Wet units at

McCormick are engineered for continuous operation, and are suitable for installation outdoors. Computer controls monitor outdoor temperatures and, during the winter months, heat the unit's water.

The heated water also helps maintain system cleanliness. Another notable system feature is special hoods, which have a high capture velocity, and allow dusts, even twelve feet from the collector, to be captured efficiently.



Special Conditions

Sometimes, gas streams have high particulate loading, high gas loading, or both. Common cases include SO_2 , NO_x , HCl , Cl_2 , HF ; other compounds or combinations are also found. For these applications, Tri-Mer combines the Whirl Wet® with its packed bed technology.

Water Use

Whirl Wet consumes less water than any wet dust collector. The only make-up water required is that which is lost to evaporation or particulate removal. Water loss is compensated by automatic water level controls. Whirl Wets have no external pumps or recirculation systems to wear or cause problems in severe weather.



Duct Design

For highest efficiency particulate collection, proper duct velocities are a must. Too slow or an improper design invites clogging and loss of air to the dust collector.

To assure optimum air movement, Tri-Mer uses an integrated, computer-engineered process that's the most advanced in the industry. High-temperature applications achieve the highest scrubbing efficiencies with the addition of quenching equipment on the wet duct sections, ahead of the Whirl Wet.



Trial Rental Programs

Tri-Mer is so confident its systems are best for your application that it offers an attractive short-term rental program to demonstrate the effectiveness of Whirl Wet® technology on your production particulate. This trial can also help you determine the practicality of materials recovery.



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