Tri-Mer Global Technologies

WET TECHNOLOGIES

QUICK REFERENCE HANDBOOK:

WHIRL WET

WHIRL WET DUST COLLECTOR



Whirl Wet is the most reliable dust collector for any type of dust larger than 3 microns, whatever its nature, corrosive, sticky, floating, sedimenting, soluble or insoluble. There are no competitors with such a system. It has been applied for decades in a wide variety of sectors, such as (see also the Case Studies section):

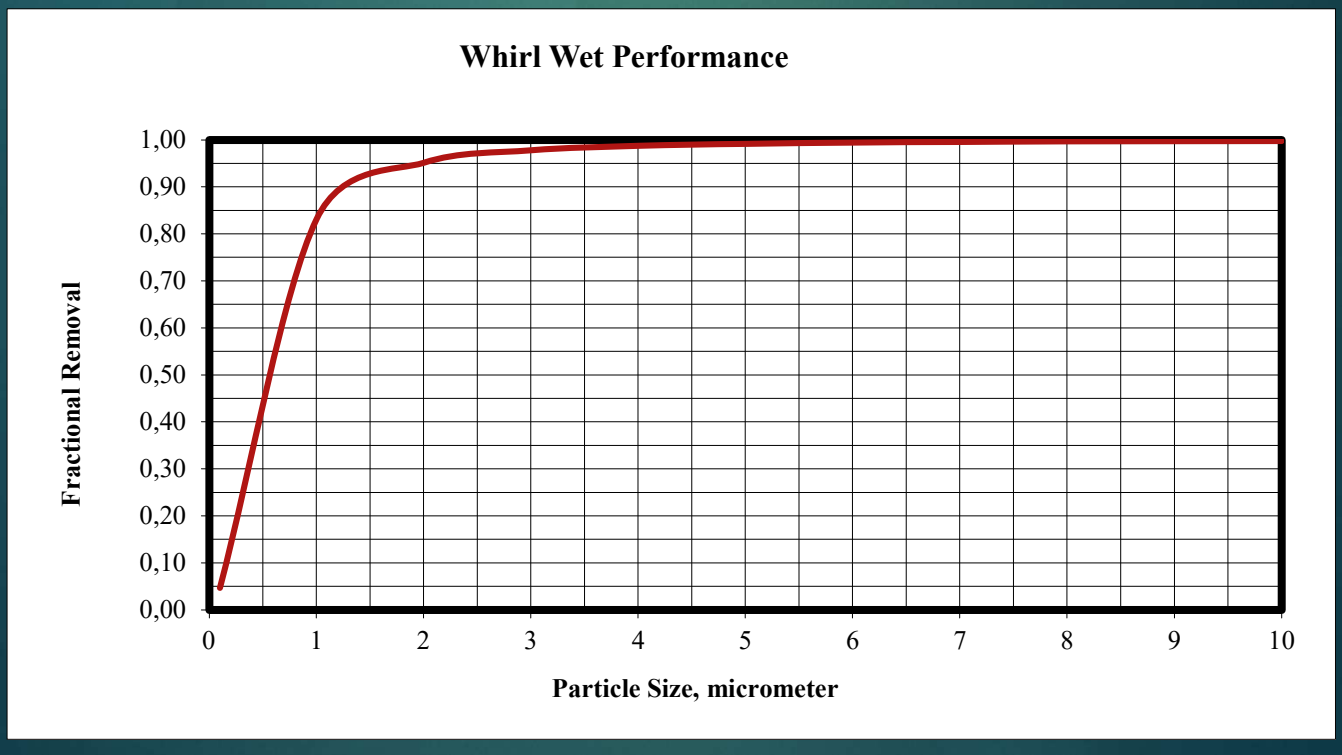
Sector	Applications
Food Industry	Dust from processes and packaging
Flavors/Spices/Fragrances production	Dust from processes and packaging
Coffee/Cocoa beans roasting	Dust from packaging
Pharmaceutical	Dust from processes and packaging
Pet food	Dust from processes and packaging
Metal processing	Grinding, sandblasting, machining
Fertilizers	Dust from acid attack on sands, storage of finished products
Insulation materials	Production of rock wool, ceramic fibers, storage of products
Batteries production	Acid lead
Foundries	Dust from production ovens
Chemical/Petrochemical processing	Dust, waxes, mixed dust from production
Oil&Gas	Sulfur dust from Claus process
Steel Industry	• Agglomeration • Steel pickling • Machining • Foundry dust

The particulate reduction efficiency by means of the Whirl Wet is surprising (and guaranteed by TGT).

It should be noted, among other things, that in the Whirl Wet there are no moving parts. The Whirl Wet is a static unit and the high degree of efficiency is achieved without any type of recirculation

Dust size (micron)	Abatement efficiency (%)
S ≤ 1.0	83
1.0 ≤ S ≤ 2.0	95
2.0 ≤ S ≤ 3.0	97
3.0 ≤ S ≤ 4.0	98
4.0 ≤ S ≤ 5.0	99.2
5.0 ≤ S ≥ 10.0	99.5
S ≥ 10.0	99.8

If the customer can submit a PSD (Particulate Size Distribution), TGT can rigorously calculate the expected dust abatement efficiency



Whirl Wet units operate in a range of min-max flow rates. Out of range, Whirl Wet does not work properly. Below is the table of operating ranges by model:

Model	Min (m^3/hr)	Max (m^3/hr)	Model	Min (m^3/hr)	Max (m^3/hr)
5-H	**720**	**887**	80-H	**11490**	**14196**
6-H	**862**	**1064**	100-H	**14196**	**17745**
8-H	**1064**	**1420**	120-H	**17240**	**21295**
10-H	**1420**	**1775**	140-H	**20110**	**24850**
12-H	**1724**	**2130**	170-H	**24420**	**30160**
15-H	**2130**	**2662**	200-H	**28730**	**35150**
18-H	**2585**	**3195**	240-H	**34470**	**42590**
22-H	**3160**	**3905**	280-H	**40220**	**49680**
28-H	**3905**	**4968**	320-H	**45970**	**56780**
34-H	**4885**	**6035**	360-H	**51720**	**63880**
40-H	**5745**	**7100**	400-H	**57460**	**70980**
50-H	**7100**	**8870**	450-H	**64640**	**79850**
60-H	**8620**	**10640**	500-H	**71820**	**88720**
70-H	**10055**	**12420**			

Note: The important thing is to make sure that the range is within the indicated range, no matter how close to either limit.

The overall dimensions of a Whirl Wet unit vary over a wide range. Below is a reference table that collects the main dimensions (mm)

Modello	L	W	H	Modello	L	W	H
5-H	**470**	**1219**	**2413**	80-H	**1956**	**2235**	**2972**
6-H	**508**	**1219**	**2413**	100-H	**2286**	**2235**	**2972**
8-H	**572**	**1219**	**2413**	120-H	**2629**	**2439**	**3200**
10-H	**635**	**1219**	**2413**	140-H	**2959**	**2439**	**3200**
12-H	**711**	**1219**	**2413**	170-H	**3467**	**2591**	**3429**
15-H	**812**	**1219**	**2413**	200-H	**3975**	**2591**	**3429**
18-H	**915**	**1219**	**2413**	240-H	**4648**	**2845**	**3683**
22-H	**1041**	**1219**	**2413**	280-H	**5321**	**2845**	**3683**
28-H	**1245**	**1219**	**2413**	320-H	**5995**	**3353**	**4267**
34-H	**1448**	**1219**	**2413**	360-H	**6667**	**3353**	**4343**
40-H	**1650**	**1219**	**2413**	400-H	**7340**	**3658**	**4648**
50-H	**1980**	**1219**	**2413**	450-H	**8179**	**3861**	**4826**
60-H	**2324**	**1219**	**2413**	500-H	**9017**	**4064**	**4978**
70-H	**1790**	**2235**	**2972**				

There are no units larger than the 500-H model.
For higher flow rates it is common practice to install the units in parallel, which is also advisable for maintenance and continuity of operations, even if it is mandatory to respect the min-max flow rates.

Below are the images of two units under construction (different MOCs):



Fig. 1 – Whirl Wet 500-H painted steel –



Fig. 2 – Whirl Wet 170-H polypropylene –

Reference link: https://tri-mer.com/pdf/WhirlWet_brochure.pdf

Some Case Studies

Case Study # 1- Flavors production

A leading flavor manufacturer has repeatedly chosen Whirl Wet Tri-Mer dust collector technology for its processing, weighing and packaging operations for years.



Whirl Wet captures 99% of particles of 10.0 microns and larger and has been widely used in food processing for decades.

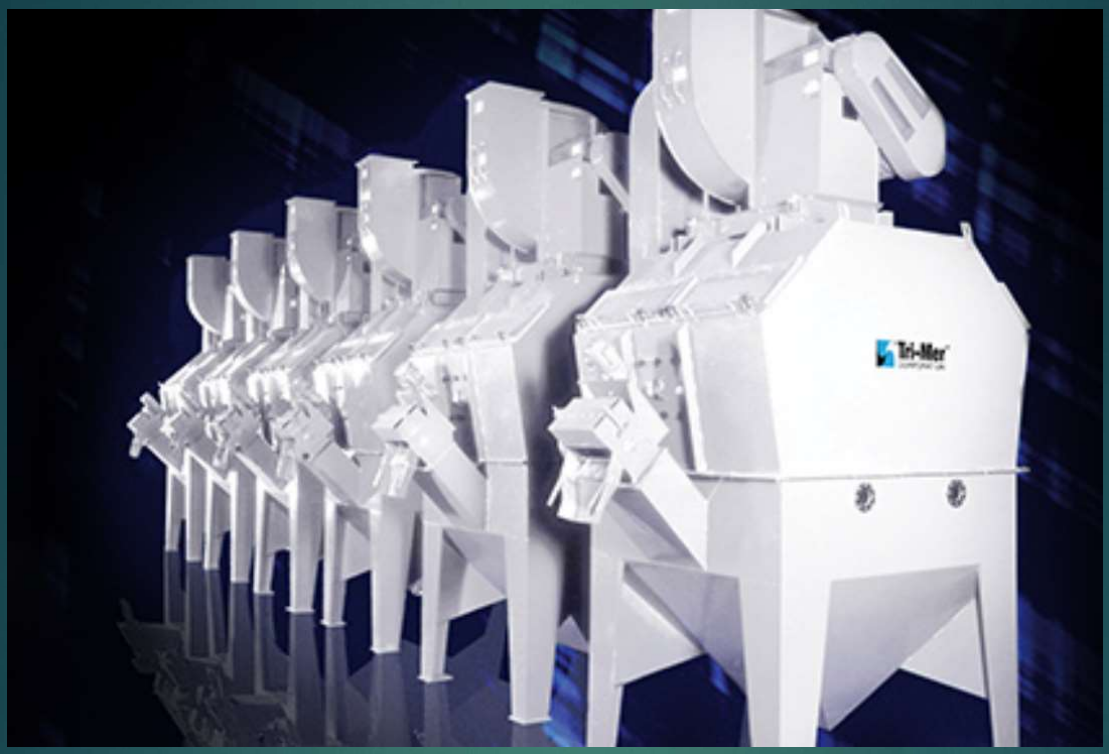
The specified dust collector is a 1700 mc / hr model H, designed for continuous service. It has an automatic timed drainage system for removing the collected material from the hopper. It is one of the 3 disposal options offered on the Whirl Wet.

The system is entirely in polypropylene; Tri-Mer also manufactures its stainless steel dedusting systems for food and pharmaceutical applications. Control is via an Allen Bradley PLC.

The Tri-Mer dust collector design uses very little water; the only make-up water required is that necessary to compensate for evaporation. Whirl Wets can be supplied alone or together with the material handling system collected.

Some Case Studies

Case Study # 2- Fishery Product International



The application is a breading line where excess breading is blown away before cooking, creating dust that would otherwise settle on pipes and other surfaces. In applications like this, the Whirl Wet scrubber contributes greatly to maintaining a clean environment.

A key factor in Whirl Wet's favor has been the successful use of WW technology by Pierce Foods, a division of ConAgra Poultry, which also uses hygroscopic breading products. The high humidity wash environment of both facilities would quickly blind the dry filters, rendering them unusable. Conversely, Whirl Wet is particularly suited to these industrial food applications.

Fishery Products specializes in the collection and primary processing of seafood and shellfish and the secondary processing of value-added seafood. It is Canada's largest fish processing company.

Some Case Studies

Case Study # 3- Mears Fertilizer

Other factors included a high dust load, a very fine (4-5 micron) and highly hygroscopic dust composition and recovery of collected material.

Modeling showed that a Whirl Wet dust collection system was the best alternative. Whirl Wet has a long experience in collecting soluble and insoluble powders with efficiencies between 99% and 99.8%. It has no external pumps, recirculation devices or internal moving components. Nothing moves inside the unit except air.

Whirl Wet is self-cleaning. And because the unit is made of solid polypropylene, no lining or reinforcement is ever needed. At Mears, the unit is housed in a semi-heated room and the water is not heated.

Whirl Wet units are manufactured in mild and stainless steel, PVC, FRP and polypropylene. The free acids involved in the fertilizer formulas have made solid polypropylene the best construction choice for Whirl Wet thanks to the resistance of polypropylene to corrosive agents.

The Whirl Wet system collects "fine powder" from Mears processing lines with an average efficiency of 99.5% and higher. In addition to the benefits of clean indoor air and highly efficient material recovery, the company benefits from easier and less expensive cleaning.

Some Case Studies

Case Study # 4 - Horween Leather

For the purposes of leather and other light, porous materials, dry harvesting was thought to be preferable to wet picking due to the buoyancy of the material.

The Horween Leather Company disputed this hypothesis. Originally, two bag filters collected particulate matter, but problems occurred with each of them. First, the cold winter drought caused high levels of static electricity. The resulting sparks in the ducts went to the bag filters, creating a fire hazard.

Worse still was the problem of tanning: steel shot trapped in the hides during the tanning process and the use of sandpaper on the hides created an additional fire hazard. The danger was compounded by the coloring chemicals.

Horween installed an 8,500 m3 / hr Whirl Wet dust collection system, channeling three machines to the unit. The Whirl Wet eliminated the risk of fire and explosion in the finishers. With 98.6% dust collection efficiency, dust throughout the plant has been eliminated and product quality has improved very satisfactorily.

Alcuni Case Studies

Case Study # 5 – Production of food supplements

An ingredient handling and mixing systems specialist for the food, beverage and pharmaceutical industries specified a Whirl Wet dust collection system for food powders.

The unit is a Whirl Wet, made entirely of polypropylene, with Allen Bradley controls.



In addition to polypropylene and other engineered plastics, Tri-Mer produces Whirl Wet stainless steel for these applications.)

Whirl Wet has long been the dust collection system of choice for food and beverage companies for 3 reasons. It has a high collection efficiency: 99% + for particles of 10 microns and above; 98% for particles of 5 microns and larger. It is self-cleaning.

And its unique design has no internal moving parts to wear or replace. The system chosen, a Modular Conveyor Drag-out (MCD) Model, allows for the removal of particulate matter without system pauses.

The system specified for this customer's application has a maximum capacity of 6000 m3 / hr.

The Whirl Wet range allows the treatment of a wide range of flow rates for each unit ranging from a minimum of 800 to a maximum of 150,000 m3 / hr.

For higher flow rates it is necessary to install more units in parallel.

Alcuni Case Studies

Case Study # 6 – Pharmaceutical production of medicines and vaccines

A major multinational manufacturer of pharmaceuticals and vaccines chose Whirl Wet technology for a pill coating operation. The aqueous sugar solution created heavy loads of sticky over spray in the 3 micron size range. This blinded existing pocket filters after only six batches despite the use of PTFE cartridges (the best option available for bags used in this type of application).

6 (six) Whirl Wet units of 4200 m3 / hr each were installed at this Customer. The units are made of carbon steel. Whirl Wet dust collectors are exceptionally suitable for collecting dust of three microns and above. The energy generated inside the unit will not allow the system to clog under any operating conditions and agglomeration and sticky residue never becomes a problem.

Whirl Wet dust collectors have no internal moving parts; they are also self-cleaning and energy-efficient. Water consumption is low: after the initial charge at the time of installation, only small additions of water are needed to compensate for evaporation and carry-over.

The dust collectors exhibited 99% + removal efficiency in this over spray collection application. Whirl Wet technology is widely used throughout the pharmaceutical industry, for the collection of powders from crushing, blending, pelletizing, tableting and packaging operations. The systems are made of stainless steel and engineered plastic, as well as carbon steel.