VEOLIA

John Meunier Products

Screenings Removal System

WATER TECHNOLOGIES

A long tradition in excellence

John Meunier products have been serving North American municipalities and industries since 1948.

With a wide range of technologies, we design, manufacture and service wastewater treatment plants, offering complete solutions with a wide range of highly efficient screening and grit removal equipment.

There are more than fifteen hundred units installed across North America.

Objectives of Screenings Removal

1. Increase process results

Remove waste inert from the treatment process chain

Improve performance of downstream processes

Improve sludge quality

Improve the overall appearance of the final effluent

2. Reduce operating costs

Reduce expenditures related to poorly functioning treatment systems

Reduce maintenance and operation costs associated to damages to downstream processes (wear, accumulations,...)

Reduce financial penalties associated with non-compliance of effluent quality

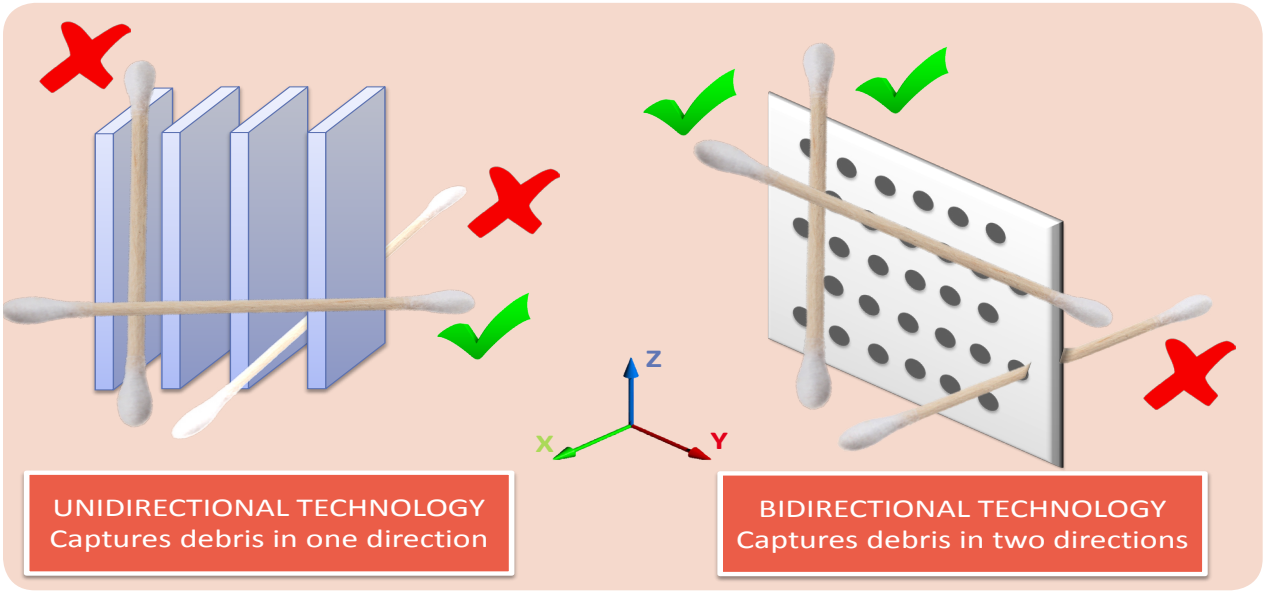
3. Protect process treatment equipment

Prepare for future needs

Improved process treatment technologies have pushed to constrict the size of the authorized screening openings

Screenings Capture

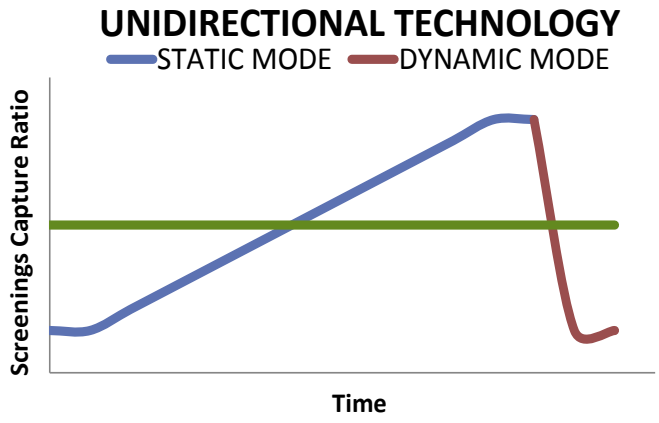
Undirectional vs Bidirectional Technologies

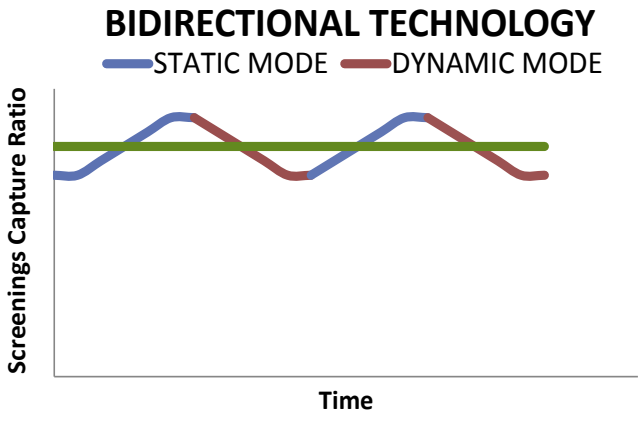


SCREENINGS CAPTURE RATIO (SCR) BY SCREEN TYPE *		
Fine Screen Technology (6 mm)		SCR
1	Center Flow Perforated Plate Screens (Band Screens)	75% - 85%
2	Flow-Through Perforated Plate Screens	70% - 85%
3	Combined Screens – Perforated or Slot	30% - 65%
4	Step Screens	30% - 40%
5	Slot / Bar Screens	30% - 35%

* UK Water Industry Research Limited, *Inlet Screen Evaluation*, Year 3 Comparative Report

Operation Mode vs Screen Technology





Coarse Screens

CONT-FLO® Type CF Vertical Bar Screen

The concept involves a reciprocal movement of the drive system to generate the raking motion of the single rake arm. The main feature of the screen is to be back clean front discharge. The screen mechanism is assembled prior to shipment within a monobloc type frame. The raking method allows the bars to be free at the top and consequently prevents jamming of solids within the bar spacings. This concept provides for higher capture rates. This coarse type screen is ideal for the first stage of pretreatment, such as pump stations, or in places where footprint is limited.

Up to 78 MGD (295 MLD)	Bar spacing down to 1/2" (12 mm)	Vertical

CONT-FLO® Type ER Multi-Rake Bar Screen

The rake drive mechanism is of the travelling endless chain type. The main feature is the front cleaning of the screen. The multiple rakes laterally attached to heavy duty chains ensure the capability to rapidly remove high volumes of solids. The screen mechanism is assembled prior to shipment within a monobloc type frame.

Up to 25 MGD (95 MLD)	Bar spacing down to 1/4" (6 mm)	75°

CONT-FLO® Type SSR Step Screen

The design of this screen is based on the use of two sets of thin flat bars shaped like a staircase from where the name «Step-Screen» originates. One set is stationary and the other one, driven by a cam system, is mobile. Its oscillatory movement provides back cleaning of the stationary steps. All mechanical components are assembled prior to shipment within a monobloc frame. The installation requires little clearance above the operating floor.

Up to 15 MGD (57 MLD)	Bar spacing down to 1/8" (3 mm)	45°

Fine Screens

ESCALATOR® Fine Screen

The pre-assembled unit's design is of the endless mobile belt type, using multiple panels with holes. It gives highly efficient fine screening in any direction. Structural shelf on perforated panels lifts larger «unmattable» solids. Panels are carried on heavy duty chains. The self-adjusting system of the rotating brush provides an annual average capture rate increase of at least 20% resulting in a reduction of plant workround costs.

Up tp 78 MGD (295 MLD)	Perforations 5/64"; 1/8"; 1/2" (2 mm; 3 mm; 6 mm)	45° 60° 75°

ROTARC® Type SB Shaftless Spiral Fine Screen

The technology relies on the use of a slow rotating shaftless inclined spiral, pre-assembled prior to shipment. The unit consists of a stationary screen to retain the debris from the ongoing flow, brushes mounted on the first few screw flights for basket cleaning and a transport zone to convey them up to the discharge point where it can include washing and compaction. The basket seal design ensures reliability of the solids capture threshold.

The unit can include a compaction screen. The screen is also supplied with replaceable bush sections, replaceable wear bars, pivoting device, spray wash system for flights and screenings washing and for filtrate flushing.

Up to 7.9 MGD (30 MLD)	Perforations 5/64"; 1/8"; 1/2" (2 mm; 3 mm; 6 mm)	35° 45° 90°

ROTARC® Type SD Rotary Drum Fine Screen

The design uses of a rotating screen shaped like a drum and a conveying spiral, all assembled prior to shipment. As the flow passes through the perforations the solids progressively accumulate. The rotation brings the solids to fall into the conveying section where they are transported to be discharged. The special drum screen seal arrangement ensures a very high capture performance even with the presence of fibers and hairs.

Up to 50 MGD (189 MLD)	Perforations 5/64"; 1/8"; 1/2" (2 mm; 3 mm; 6 mm)	35°

Screenings Handling Equipment

ROTOPAC® Type RPW Screw Washer Compactor

The single stage design is based on the use of a slow rotating spiral inserted into a perforated tube suitable for filtrate drainage. The screw receives solids from the screen, conveys them through dewatering, washing and compaction zones to finally expel them in a non-dripping dry state. The addition of wash water increases the rate of return of washable organics with the filtrate to the main flow stream through a common drainage point. This pre-assembled unit eliminates problems associated with foul odor and unsanitary handling.

Up to 140 ft ^{3}/h (4 m^3/h)	Ø8" (Ø200 mm) Ø12" (Ø300 mm)

ROTOPAC® Type RCW Dual-Stage Screw Washer Compactor

The dual stage design is based on the use of a slow rotating spiral inserted into a perforated tube suitable for filtrate drainage. The screw receives solids from the screen, conveys them through dewatering, washing and compaction zones to finally expel them in a non-dripping dry state. The forward-reverse motion of the screw plus the addition of water into the feed hopper increases the rate of return of washable organics with the filtrate to the main flow stream. This pre-assembled unit eliminates problems associated with foul odor and unsanitary handling.

Up to 420 ft ^{3}/h (12 m^3/h)	Ø16" (Ø400 mm)

Screenings Handling Equipment

ROTOPAC® Type RLK Shaftless Screw Conveyor

The design is based on the use of a slow rotating spiral inserted into a "U" shaped trough. The screw receives the material and transports it along stainless steel trough to ensure a discharge in the original state. This pre-assembled unit can eliminate problems associated with foul odor and unsanitary handling.

Up to 800 ft ^{3}/h (23 m^3/h)	Ø6" (Ø150 mm) Ø24" (Ø600 mm)	Up to 66 ft (20 m)

ROTOPAC® Type RDW Shaftless Screw Compactor

The single stage design is based on the use of a slow rotating shaftless spiral inserted into a trough provided with perforated area suitable for filtrate drainage. The screw receives solids from the screen, conveys through dewatering, washing and compaction zones to finally expel them in a non-dripping dry state. The addition of wash water increases the rate of return of washable organics with the filtrate to the main flow stream through the common drainage point. This pre-assembled unit eliminates problems associated with foul odor and unsanitary handling.

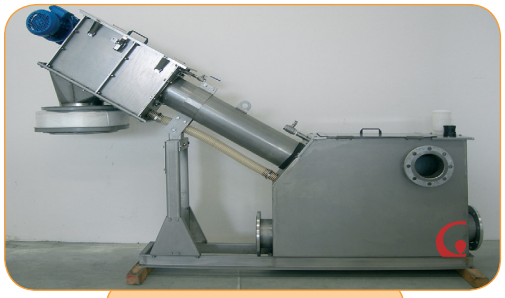
Up to 175 ft ^{3}/h (5 m^3/h)	Ø8" (Ø200 mm) Ø12" (Ø300 mm)	Up to 40 ft (12 m)

Combined Systems

SEPRAPAC® Type PCS Combined Pretreatment System

The concept integrates two or three devices for screenings removal, grit separation and FOG removal. The wastewater mixture passes first through a screenings removal, washing and compaction process stage. The flow then crosses the second stage chamber for grit separation. The settled matter is conveyed horizontally to a grit hopper where an inclined extraction screw achieves washing and dewatering or particles along the transit path to the ejection point. The optional third process step is performed in an adjacent lateral compartment where air is injected to achieve FOG removal. The small footprint of this all-in-one pre-assembled package system makes it quick and easy to install.

SEPRAPAC® Type SRS / SCS Septage Combined System



Type SRS

The perforated basket screen is mounted in a self-standing tank. It is equipped with a tank washing system to dilute the influent and direct solids to the screen media.

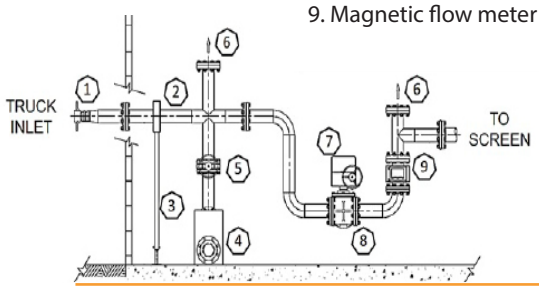
Type SCS

All-in-one unit including screenings and grit removal handling, with optional fat and grease removal.

Applicable Options for a Complete Package System

Inlet Piping Package

1. Inlet quick connect
2. Inlet pipe
3. Adjustable support
4. Rock trap
5. Knife slide gate
6. Inspection cover
7. Electric actuator
8. Plug valve
9. Magnetic flow meter



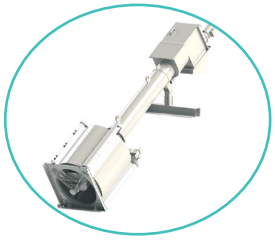
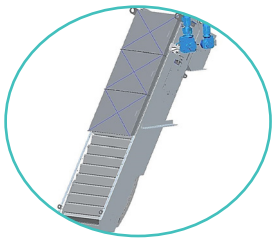
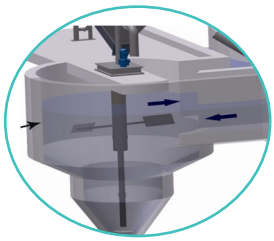
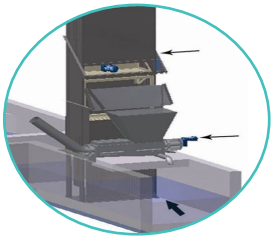
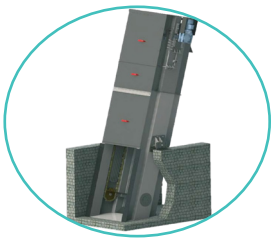
Other Optional Instrumentation

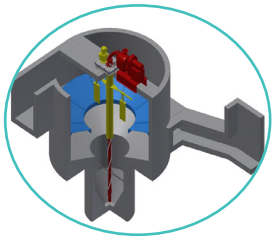
This can include, but is not limited to in-line grinder, pH probes and controllers, ammonia probes and controllers, automatic samplers and temperature probes.

Data Logging

Logging and monitoring system that tracks flow data and records user information.

The Complete John Meunier Headworks Set-up

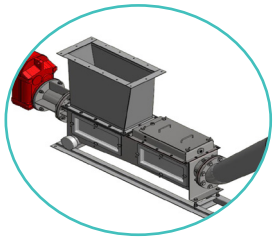


Coarse and Fine Screens, bar type
CONT-FLO® type CF Vertical Bar Screen
CONT-FLO® type ER Multi-Rake Bar Screen

Fine Screens, mobile screening plate type
ESCALATOR® Fine Screen
ROTARC® type SD Rotary Drum Fine Screen

Fine Screens, stationary screening plate type
ROTARC® type SB Shaftless Spiral Fine Screen

Solids' Handling
ROTOPAC® type RPW Screw Washer Compactor
ROTOPAC® type RCW Dual-Stage Screw Washer Compactor
ROTOPAC® type RDW Shaftless Screw Compactor
ROTOPAC® type RLK Screw Conveyor



Grit Removal Systems
MECTAN® Vortex Grit Removal System
SAM® type GDS Grit Dewatering Screw
SAM® type GFW Grit Washer

Combined Systems
SEPRAPAC® type PCS Pretreatment Combined System
SEPRAPAC® type SRS/SCS Septage Combined System

Veolia Water Technologies Canada is the final choice for the design, manufacture and servicing of wastewater pretreatment works. We target excellence and innovation. We also invest in R&D to meet growing environmental regulations and market needs.

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Grit Removal System

WATER TECHNOLOGIES

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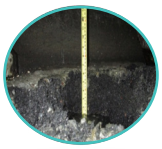
Grit in Wastewater Applications

Grit is a source of problems in wastewater treatment facilities. It consists of inert and organic abrasive particles which are between 50 and 200 MESH (300 and 75 µm) in diameter and have a specific gravity of approximately 2.65.

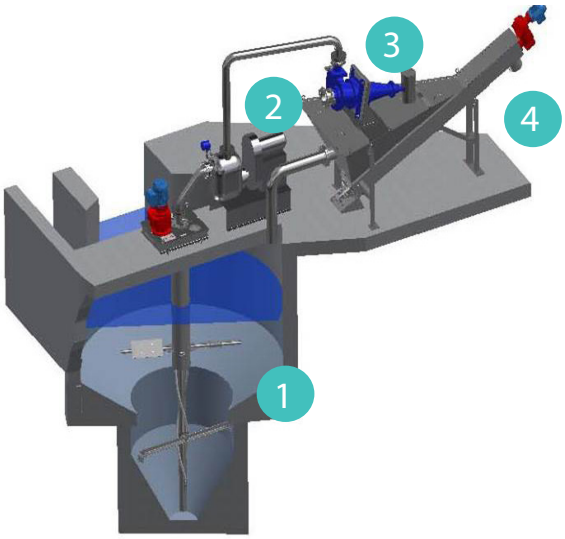
Grit is know to cause wear and tear on mechanical equipment, reduce the effective treatment volume in basins, and increase the occurrence of pipe blockages.

Historically, rectangular aerated grit removal systems were very large, resulting in high land, civil and equipment costs.

Since the early 1980s, Veolia Water Technologies Canada has been offering complete grit removal systems, which feature the MECTAN® vortex grit chamber technology.



Overview of Veolia Grit Removal System



Veolia offers a fully integrated, highly efficient, grit removal system that operates based on the following grit removal process:

Step 1: Grit capture

Step 2: Grit extraction

Step 3: Grit concentration

Step 4: Grit washing and dewatering

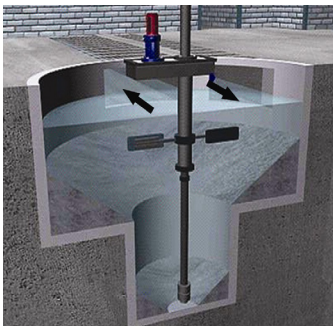
Grit Capture in the Veolia system is achieved through the use of the MECTAN® Grit Chamber. The MECTAN® grit chamber is available in several configurations that each incorporate a circular top chamber where the vortex is created and a bottom grit well for grit collection. The circular chamber is designed to handle large flow rates in a fraction of the footprint of conventional aerated degritters.

Once the grit has been captured in the grit well, the grit slurry is extracted with a grit pump or an airlift system. The grit pump can be installed in a top mounted or bottom suction configuration. The airlift system can only be installed in the top mounted configuration and is limited to smaller applications. Once the grit slurry, which contains a high water content, is extracted, the grit and water are separated by a hydrocyclone (grit pump extraction) or an air separator (airlift system). The concentrated grit slurry is discharged into the SAM® type GDS Grit Dewatering Screw which further cleans the grit and reduces water content. The overflows from the grit separator and grit classifier are returned upstream of the grit chamber.

MECTAN® Vortex Grit Chambers

MECTAN® Classic Vortex Grit Chamber

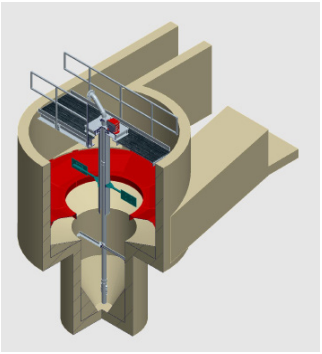
The MECTAN® C (270) unit takes full advantage of the tangential inflow velocity along the periphery of the chamber to initiate the grit separation process. The reliable system operates efficiently over a wide range of daily flow rates with low head loss as a result of the open channel design. The top chamber sloped transition along with the rotating motion eliminates accumulation of grit in the uppermost separation chamber under all conditions and maintains grit removal performances even during a power failure.



MECTAN® V Vortex Grit Chamber

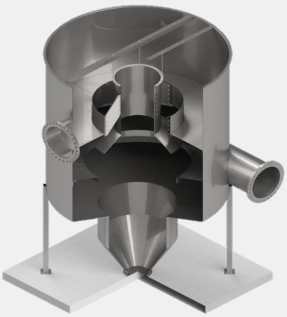
The MECTAN® V (Variangle) unit, launched in 2009, is an innovative re-engineering of the Classic MECTAN® technology. The concept capitalizes on the classic tank geometry to enhance the effective conical transition between chamber sections to obtain a dynamic and revolutionary configuration. The use of a separation disc ensures process stability and reliability at any flow rate with a 20% overall increase in grit capture efficiency, mainly in fine particles. With its multi-directional outlet channel positioning capability, the Variangle unit provides wastewater treatment plant layout flexibility.

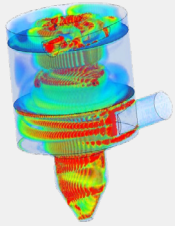
Patent Nos. CA2743003 and US871551



BioMECTAN® Advanced Hybrid Vortex Grit Removal System

The BioMECTAN® is the latest addition to the Grit Removal System product line. Based on the MECTAN® V tank geometry and hydraulic concepts, the BioMECTAN® includes additional internal baffles which further promote grit settling and capture, to ultimately increase the overall system performance. High shear mixing zones are created through the use of eductors, which separate organics from the grit particles and keep organics in suspension, eliminating the need for paddles. The BioMECTAN® is a more environmentally-conscious solution that uses gray water instead of potable water for grit fluidization. There are no moving parts below the water level, thus reducing maintenance requirements.





The BioMECTAN® is available in self-standing stainless steel tanks, includes standard piped inlet and outlet connections, and features a 360+ outlet pipe configuration. Although the inlet must be submerged and tangential to the tank walls, the outlet pipe can be positioned anywhere along the tank circumference, above the baffle system, further increasing the site layout possibilities.

Patent Pending No. 62/701,976

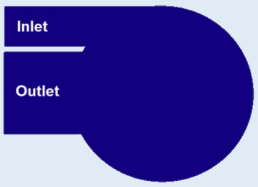
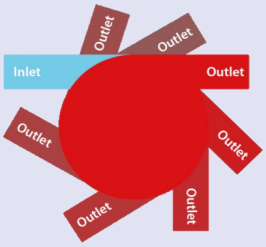
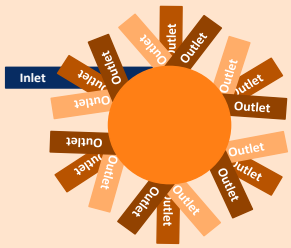
Available Options:

1. Integral Emergency Bypass System: The MECTAN® V and BioMECTAN® can include a built-in overflow that has a bypass capability up to 25% in excess of the unit's maximum rated capacity, while slightly reducing overall performance during an overflow event.

2. Reduced Potable Water Consumption: Gray water re-use systems are availble for the Mectan® fluidization system and the SAM® type GDS Grit Dewatering Screw optional washing system.

MECTAN® Vortex Grit Chambers

Product Characteristics

	MECTAN® C	MECTAN® V	BioMECTAN®
Inlet Channel	Open	Submerged	Submerged
Inlet and Outlet Channel Configurations			
Headloss Created	¼ inch	Up to 4 inches	Up to 8 inches
Organics Separation	Average	Average	High
Concrete Installation	✓	✓	✗
Self-Standing Tank	✓	✓	✓
Increased Flow Capacity	✗	✗	✓

Model Sizing

Model		0-12	1-20	2-25	3-30	4-35	5-42	6-50	7-60	8-73
Diameter		48" [1200 mm]	78" [2000 mm]	102" [2500 mm]	120" [3000 mm]	138" [3500 mm]	168" [4200 mm]	198" [5000 mm]	240" [6000 mm]	288" [7300 mm]
Maximum Flow	MECTAN® C and MECTAN® V	0.8 MGD* [3.03 MLD]	2.5 MGD [9.5 MLD]	4.3 MGD [16.3 MLD]	7.2 MGD [27.3 MLD]	10.7 MGD [40.5 MLD]	18.7 MGD [70.8 MLD]	30 MGD [113.6 MLD]	50 MGD [189.25 MLD]	78.0 MGD [295.25 MLD]
	BioMECTAN®		3.1 MGD [11.7 MLD]	5.4 MGD [20.4 MLD]	9 MGD [34.1 MLD]	13.4 MGD [50.7 MLD]				

Note: Model 0-12 in a concrete installation is only available for the MECTAN® C grit chamber configuration

Performances

Veolia Grit Removal systems are sized based on the application peak flow. There is no minimum flow required to operate the MECTAN® grit chamber. Grit removal performances increase as the flow rate in the system decreases since the velocity across the grit chamber is lower, which increases retention time and promotes particle settling. The stated performances are based on typical municipal wastewater grit distribution (weight/million gallons of water).

Grit Removal Efficiency (2.65 S.G.)				
TYPE	PARTICLE SIZE			
	≥ 50 Mesh (≥ 300 µm)	≥ 70 & < 50 Mesh (≥ 210 & < 300 µm)	≥ 100 & < 70 Mesh (≥ 150 & < 210 µm)	≥ 140 & < 100 Mesh (≥ 100 & < 150 µm)
MECTAN® C	95 %	85%	65%	38%
MECTAN® V	96%	87%	75%	68%
	95% grit removal down to 140 Mesh (100 µm)			
BioMECTAN®	95% grit removal down to 200 Mesh (75 µm)			

Grit Removal System

SAM® type GDS Grit Dewatering Screw

The SAM® type GDS Grit Dewatering Screw provides the final separation between grit and water. This is achieved through the use of an inclined spiral installed in a uniquely shaped trough. The concentrated grit slurry is fed to the inlet hopper where grit classification and settling is achieved. The excess water overflows back to the influent channel. The slow rotation of the screw causes the grit to dewater as it moves toward the discharge point. The unit is supplied with an air separator or hydrocyclone separator according to the feed mean used. This pre-assembled unit can eliminate problems associated with foul odor and unsanitary handling.

Grit Removal Combined Unit

The Grit Removal Combined unit is an integral grit removal system that can accommodate flows up to 30,000 m^3/d (7.925 MGD). These systems are fabricated in enclosed self-standing stainless steel tanks, which reduces the overall required civil work and provides a certain amount of odour control. The Grit Removal Combined units are available for the MECTAN® V (360°) Grit tank configuration.

A pumping system is not required as the captured grit is deposited by gravity directly into the lower SAM® Grit Dewatering Screw.

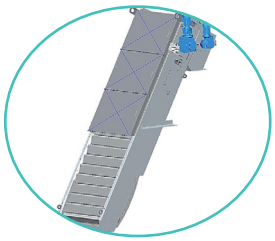
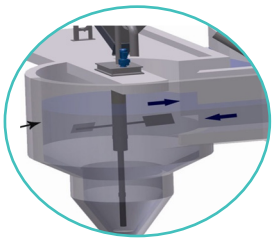
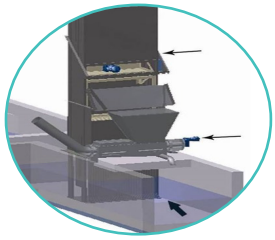
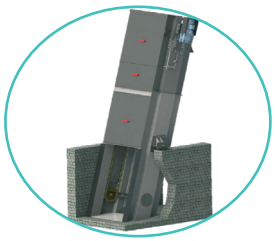
Control System

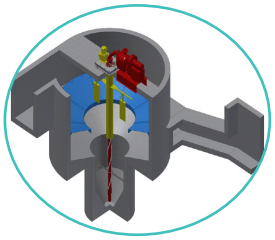
Dedicated control system with Intelligent programmable relay (Zelio) or PLC with HMI. All automatic sequences of operation, manual operation, protections and alarms included. Local control station for tests and maintenance (if applicable). Standard control system and custom system upon client standards are available. Design and engineering by Veolia.

On-Site Testing

Veolia offers full-scale on-site grit removal sampling and testing, in accordance with the latest published wet and dry sieving test methods. Sampling is performed with MultiPoint Integrated Samplers that are designed to collect representative samples simultaneously across the entire flow cross-section in the inlet and outlet channels respectively. The samples are pumped to grit collection settling tanks. Once a sufficient grit volume has been collected, the collected samples will undergo grit characterization analysis to evaluate performances.

The Complete John Meunier Headworks Set-up

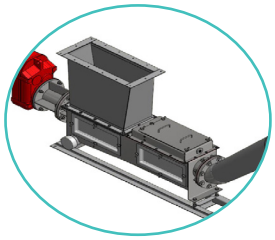


Coarse and Fine Screens, bar type
CONT-FLO® type CF Vertical Bar Screen
CONT-FLO® type ER Multi-Rake Bar Screen

Fine Screens, mobile screening plate type
ESCALATOR® Fine Screen
ROTARC® type SD Rotary Drum Fine Screen

Fine Screens, stationary screening plate type
ROTARC® type SB Shaftless Spiral Fine Screen

Solids' Handling
ROTOPAC® type RPW Screw Washer Compactor
ROTOPAC® type RCW Dual-Stage Screw Washer Compactor
ROTOPAC® type RDW Shaftless Screw Compactor
ROTOPAC® type RLK Screw Conveyor



Grit Removal Systems
MECTAN® Vortex Grit Removal System
SAM® type GDS Grit Dewatering Screw
SAM® type GFW Grit Washer

Combined Systems
SEPRAPAC® type PCS Pretreatment Combined System
SEPRAPAC® type SRS/SCS Septage Combined System

Veolia Water Technologies Canada is the final choice for the design, manufacture and servicing of wastewater pretreatment works. We target excellence and innovation. We also invest in R&D to meet growing environmental regulations and market needs.

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