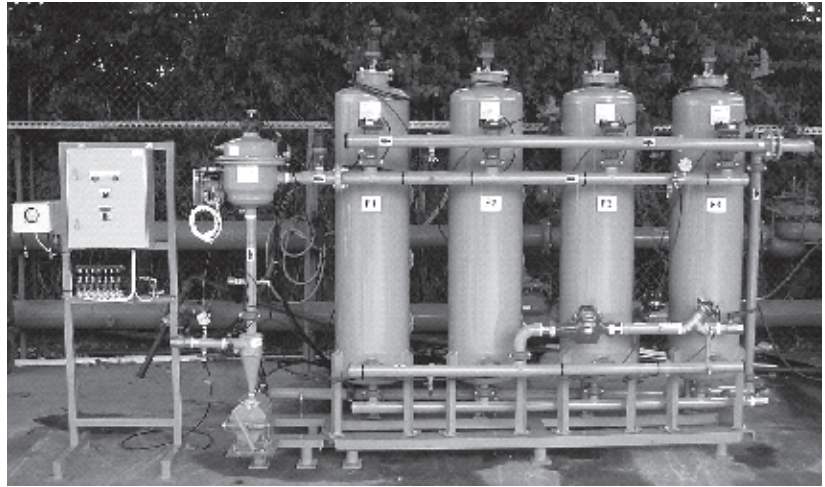


SEWACLEAR® FILTER

WASTEWATER DIVISION

Wastewater Tertiary Treatment System

Reliable and Effective Removal of Organic and Inorganic Contaminants in a Broad Range of Wastewater and Non-Wastewater Applications



25 GPM unit shown

Applications

- Any application where further polishing of treated, reclaimed, recycled or reuse water is desired
- Typically installed following a treatment process and secondary treated water with a BOD/TSS of 20/30 or better
- Applications including municipally-treated effluent designated for irrigation or discharge into receiving waters where permitted
- For batch or continuous treatment systems
- Optional models offer:
 - Flocculation
 - Chlorine dosing
 - Free chlorine monitoring
 - Turbidity monitoring and management
- PLC allows for remote system monitoring (other components may be required)
- Flow rates through the filters of less than 5 GPM per square foot allow for high surface-area-to-flow cleaning
- Isolation valves on each tank allow media to be replaced without shutting the entire unit down
- Filter backwash process uses filtered water from other filters in-line
- Filter backwash flow rates do not exceed system flow rates (except 6 GPM model), eliminating the need for separate hydraulic connections or calculations
- Short cleaning cycles minimize downstream flow interruptions

Features/Benefits

- SewaClear's ability to "polish" 20/30 level secondary-treated effluent to 5/5 means less pollution in lakes, streams and other receiving bodies
- Meets California's Title 22 Water Reuse requirements (when using the flocculation option)
- Complete pre-filtration and main filtration as well as optional disinfection, turbidity management and/or flocculation are available in one complete, small footprint package making installation fast and easy
- Ability to operate up to 24 hours a day means treatment can be continuous
- High quality components ensure reliability and low operating costs
- 110VAC single phase power requirement makes hook-up easy
- Three layers of media in each media tank remove organic and inorganic particles from water as well as more expensive and complex membrane systems
- Siemens PLC (Programmable Logic Controller) provides complete control in all operating modes without the need for further interface
- Control system flexibility means SewaClear can be wired to other control systems if unified project control is required
- All components are weather-proof making protective covering optional (normal winterizing precautions must be taken in freezing conditions)
- Optional flocculation process allows for the capture of microscopic particles in the water, ensuring more particles are captured and filtered out of the water
- Optional disinfection by chlorine/hypochlorite gas solution further purifies the water
- Optional turbidity management allows the user to set clarity requirements for the water without the need for additional systems downstream
- Use of optional flocculants such as alum help manage phosphorus/phosphate

Standard System Functions Include:

Primary Separation: Takes place in an automatic, self-cleaning screen filter.

Multi-Media Depth Filtration: Performed by an array of four multi-media filters with 3 layers of materials in a high-depth media bed for exceptional effluent polish at low filtration rates.

Automation and Control: Controlled by a Siemens PLC which manages all aspects of the filtration and backwash processes. Backwashes are performed automatically by pressure or at preset intervals.

Specifications

- Minimum operating pressure: 44 psi (3.0 bar)
- Maximum operating pressure: 117 psi (8.1 bar) (88 psi (6.1 bar) on 135 GPM model)
- Maximum working temperature: 113° F (46°C)
- Power Supply : 110VAC single phase standard, other power options available

System Components

Automatic Self-Cleaning Screen Filter – Water Inlet

- Provides primary filtration of incoming water
- Removes any coarse materials from the water
- 200 micron screen (80 mesh)

Media Filters

- High depth media bed
- Four filters - each contains three layers of material
- Flow rates < 5 GPM per square feet for thorough filtration

Filters, Hydrocyclone Body and Manifolds Material & Coating

- Made of carbon steel
- All steel parts have a 100 micron protective coating of extra durable polyester protection, applied electrostatically on a zinc-phosphate base coat and oven cured for maximum anti-corrosion protection.

Automation and Control

Controlled by a Siemens PLC which manages all aspects of the filtration and backwash processes. Backwashes are performed automatically by pressure or at pre-set intervals.

MEDIA Components

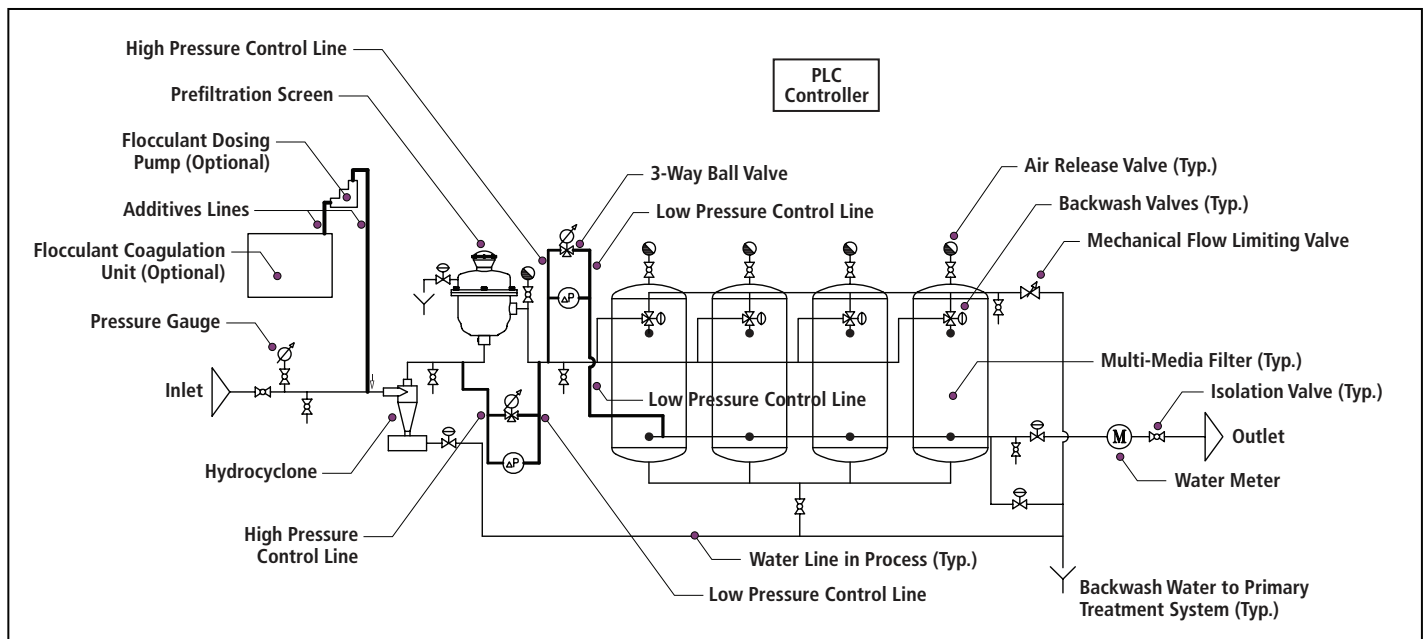
Layer	Media	Size
Top	Anthracite	0.04"
Middle	Quartz Sand	0.02"
Bottom	Crushed Basalt	0.05"

SEWACLEAR® Flow Rates, Dimensions and Weights*

Item Number	Description	Filtration Flow Rate (GPM)	Backflush Flow Rate (GPM)	Estimated Weight Including Pallet (lbs.)	Dimensions L x W x H (ft.)
23SEWACLEAR6	4 X 8" Media Tanks	6	7	895	6.1 x 2.1 x 7.54
23SEWACLEAR10	4 X 10" Media Tanks	10	10	1,151	7.54 x 2.55 x 7.54
23SEWACLEAR15	4 X 12" Media Tanks	15	15	1,407	9.2 x 2.78 x 7.54
23SEWACLEAR25	4 X 16" Media Tanks	25	25	1,662	10.81 x 2.95 x 7.54
23SEWACLEAR37	4 X 20" Media Tanks	37	31	1,854	11.48 x 3.28 x 7.54
23SEWACLEAR60	4 X 24" Media Tanks	60	50	2,046	12.7 x 4.1 x 7.54
23SEWACLEAR92	4 X 30" Media Tanks	92	80	2,685	15.1 x 4.6 x 7.54
23SEWACLEAR135	4 X 36" Media Tanks	135	110	3,325	17.06 x 4.92 x 7.54

*Custom systems with flow rates to over 1,500 GPM are available upon request.

DESCRIPTION OF OPERATION

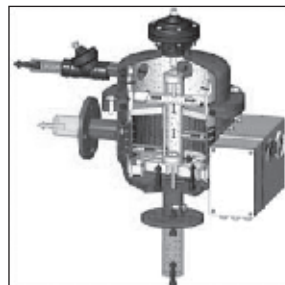


Primary Filtration

This function is performed by an automatic, self-cleaning screen filter. The uniqueness of the filter is its automatic suction system for cleaning the screen.

Incoming water enters the screen filter, passing through a fine screen and on to the outlet port. Sediments that are trapped on the screen create a "cake" of sediment. This "cake" helps to improve filtration efficiency because it serves as a finer filter. The automatic flushing process starts whenever the pressure between the inlet and the outlet of the filter reaches a predetermined differential that lasts for 10 seconds. Inline water pressure controls this operation without interfering with the filtration process.

The automatic screen cleaning process is short and efficient, saving water and time, while leaving the screen clean.



Cutaway view of the Automatic Screen Filter

Flocculation Unit (Optional)

A coagulant is mixed with incoming water. The unit includes a tank, dosing pump and cyclone mixer for improved mixture of coagulants with the water.

This process allows for capturing very small debris by coagulating the microscopic particles into larger particles called "floc". The floc particles are then filtered by passing the water through the layered beds of granular media.

Alum is a commonly-used coagulant but other options such as aluminum chlorohydrate, calcium oxide, iron chloride, iron sulfate, sodium aluminate, sodium silicate may be used.

Multi-Media Depth Filtration

The four multi-media filters use a combination of media layers of basalt, quartz sand and anthracite to remove suspended organic matter and inorganic particles from the water.

The multi-media filters have a total media height of 40" in each filter and employ a unique design of a double-bottom chamber separated by a reinforced steel plate. The upper chamber contains the layers of media and the lower chamber collects the filtered water after it has flowed through the media. The separation plate is covered by slotted, conical "mushroom" diffusers. These diffusers allow the filtered water to flow into the bottom of the tank as well as acting as the "nozzles" during backwash. The diffusers help eliminate channeling and caking of debris by delivering a uniform dispersion of water throughout the entire media bed during the backwash cycle, providing an effective wash of the media layers while using a minimum volume of water.

Filter Flushing:

The flushing process starts automatically, according to whichever of the following conditions occur first:

- The differential pressure between inlet and outlet of the multi-media filters reaches a preset differential
- At a specific time set by the system operator
- Manual activation by the operator

The flushing process includes two stages:

- Backwash of Multi-Media Filters
- Direct Wash



Cutaway view of one of the Four Media Tanks

DESCRIPTION OF OPERATION

Backwash of Multi-Media Filters

During filter backwash, water flow is reversed and sent up into the filters' media beds, fluidizing the media layers and causing a turbulent expansion of the media. This action effectively flushes any debris from the media bed. The debris from the media layers is carried out to the drain through the backwash outlet valve.

The backwash process occurs in one media filter at a time, allowing for filtered water from the other three filters to be used. The filtered water enters through the outlet/backwash manifold. In this stage, the backwashed filter inlet/backwash outlet valve is closed to inlet and open to backwash outlet.

Options to the Standard SewaClear System

Flocculation: Flocculants remove colloidal particles from the effluent to improve the permeate quality. They also assist in reducing phosphorus levels in the water. This option increases the collective capacity of the system and is recommended where maximum particle removal is desired.

This option includes a tank, dosing pump and cyclone mixer.

Alum is a commonly-used coagulant but other options such as aluminum chlorohydrate, calcium oxide, iron chloride, iron sulfate, sodium aluminate, sodium silicate may be used.

While no claims regarding phosphorus levels are made, coagulants such as alum do have a positive effect on phosphorus reduction.

Direct Wash

A direct wash is performed automatically in all four filters at the same time immediately following the backwash. This operation helps resettle the media into layers so the filtration process can resume.

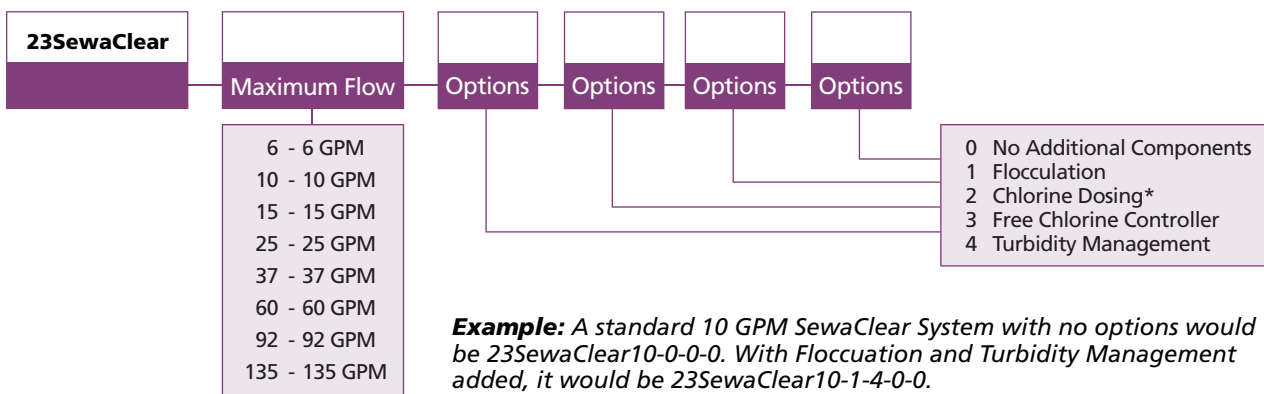
Water enters the filters through inlet/backwash outlet valves, (valves are open to inlet and closed to backwash outlet), exits the filters from the drain manifold in the bottom of the filters and flows out through the drain valve.

Chlorine Dosing*: Automated dosing of hypochlorite/ chlorine gas to destroy pathogens and micro-organisms in the treated water.

Free Chlorine Monitoring: This fully automatic option integrates with the chlorine dosing option and provides for additional dosing control as well as residual chlorine monitoring and readout.

Turbidity Management: Turbidity can be reduced to 5 ntu with this option. The entire filtration process is constantly monitored and automatic adjustments are made to deliver the desired clarity of water. The Flocculation option must be added with Turbidity Management for optimum results.

Ordering Guidelines for SewaClear®**

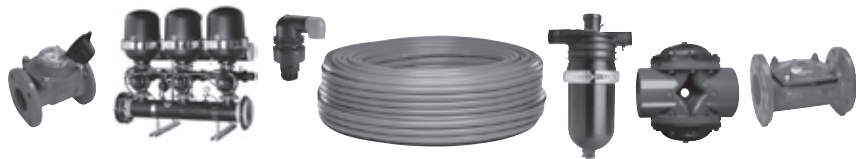


*When using chlorine dosing with Netafim Bioline or Techline chlorine concentrations should not exceed 10 ppm.

**When ordering turbidity management, flocculation must also be ordered. When ordering free chlorine control, chlorine dosing must also be added.

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