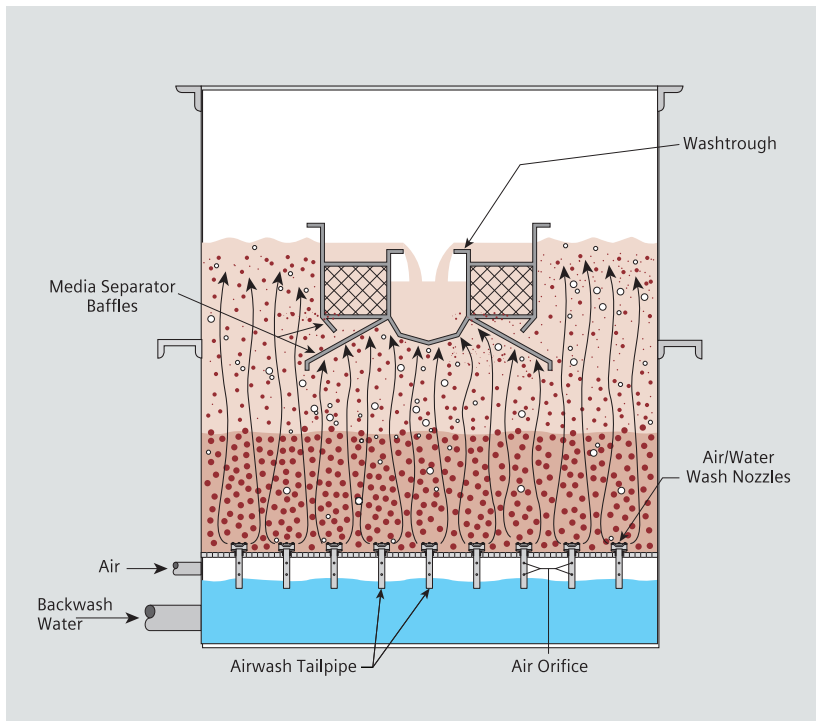




Multiwash® Filtration System

Water Technologies

SIEMENS



Applications

Potable and Industrial Process Water Filtration

- Surface Water
- Ground Water
- Retrofit of Problem Filters

Wastewater Filtration

- Secondary Effluent Polishing
- Primary Effluent and Combined Sewer Overflow
- Industrial Wastewater Treatment
- Reuse/Reclaim

Multiwash[®] System Increases the Production of Filtered Water

The filtration problem and the solution

Conventional granular media filters at both drinking and wastewater treatment plants have a challenging job.

They need to handle the higher solids loadings common to today's plants, the customary use of coagulants aids, and the all too frequent occurrence of biological growths. The result is an increased potential for media fouling, especially when lower performance backwashing procedures are employed.

When fouling occurs, as it often does, filtration performance and run length capabilities are reduced significantly.

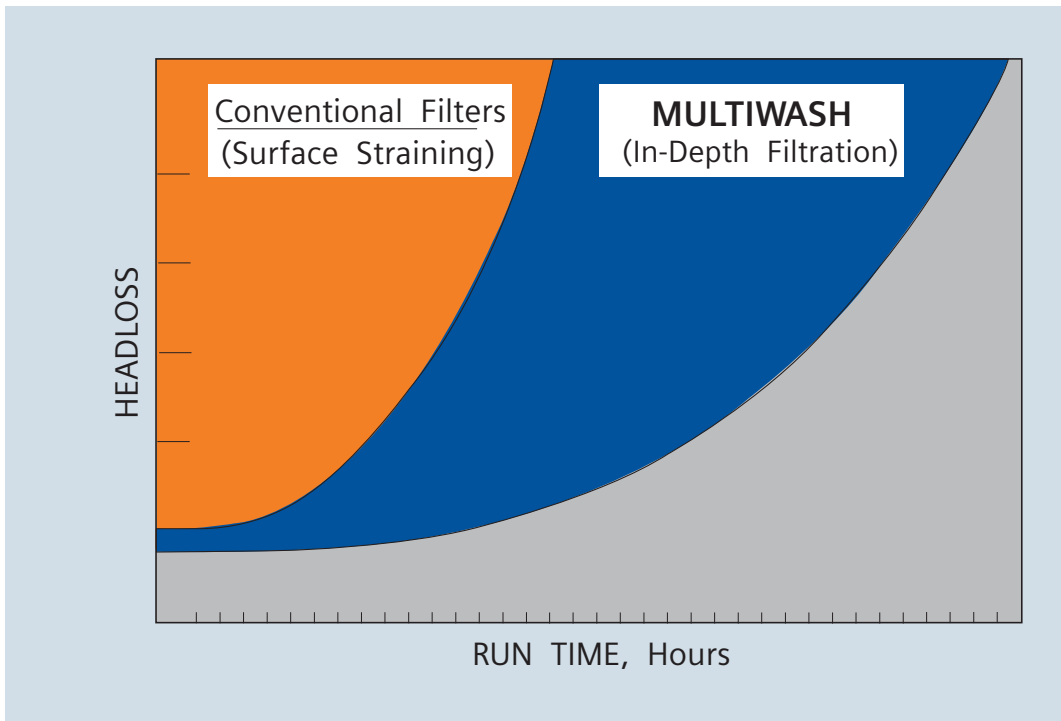
The MULTIWASH[®] filtration system was developed to solve the media fouling and frequent backwash problems that can occur in today's plants. Its high performance backwash eliminates mudball formations, media grain coating and biological solids growth without the need for chemical cleaning

systems. MULTIWASH[®] system improves filter run length and increases the production of filtered water. It incorporates sustained simultaneous air and water backwashing.

It is the filtration process of choice for removing suspended solids from water and wastewater.

MULTIWASH[®] systems deliver benefits

- Increased Scouring Energy
- Superior Cleaning Performance
- Longer Filter Runs
- Significantly Lower Backwash Water Rates
- Lower Operating Costs
- Flexibility in Media Selection
- Chemical Cleaning Systems Eliminated
- Pumping and Piping Costs Reduced



Graph showing increased filter run times.

The MULTIWASH® system advantage

- Keeps filter media clean using sustained simultaneous air and water backwash. No fouling with biological solids or chemical precipitates.
- Optimizes filter performance allowing selection of media size and type that best suits a specific filtration application. MULTIWASH® systems eliminate the constraints of backwash rate limitations.
- Minimizes backwash water requirements by increasing the filter run lengths. This results in reduced backwash wastewater production. MULTIWASH® systems also allow smaller backwash pumps, piping and valves.
- Provides cost effective treatment by eliminating expensive chemical cleaning and frequent media replacements that may be required with other filtration systems.

The best solution for filtration problems

The sustained simultaneous air and water backwashing of the MULTIWASH® system provides a vigorous scouring action that effectively cleans the full media bed, even in the toughest applications.

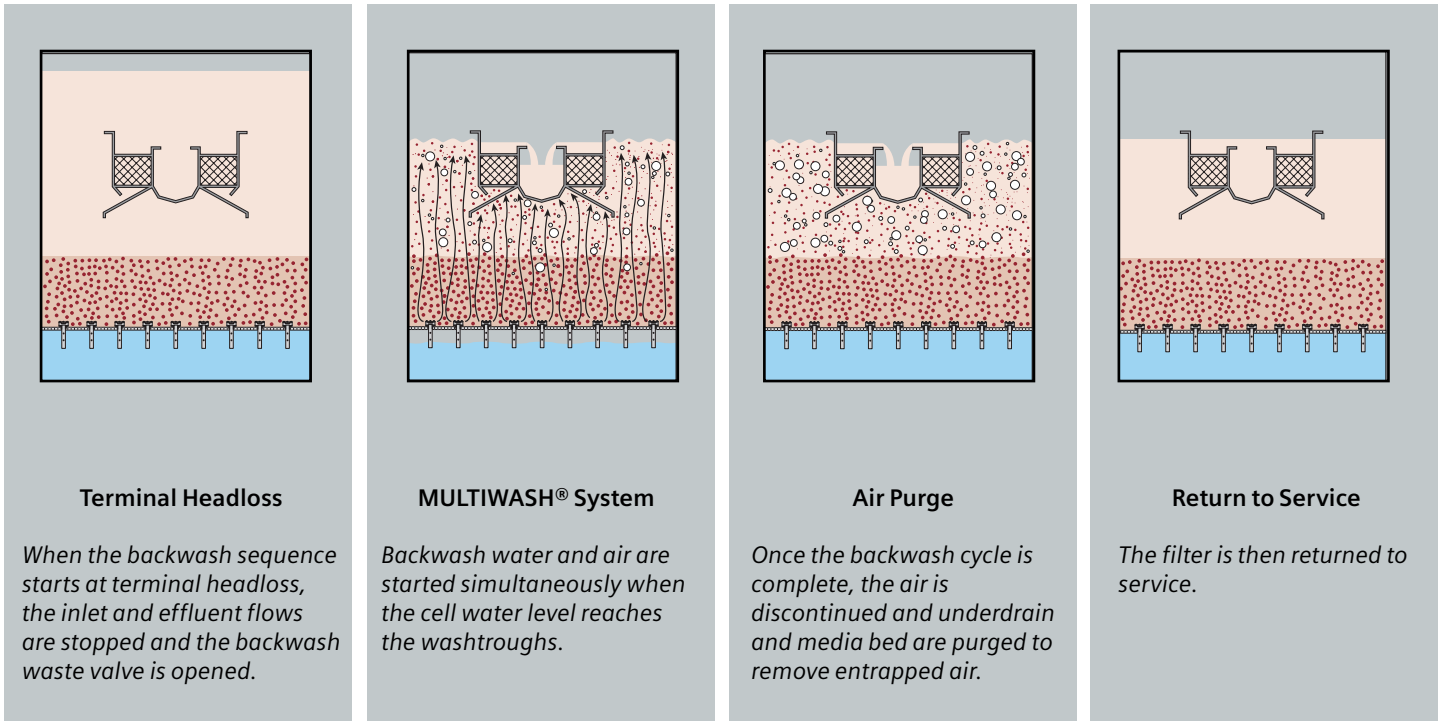
During MULTIWASH® backwash, all media in the filter is lifted to the bed surface by an air lift pumping action. The highly agitated backwash water promotes intense collisions

of the media grains, which effectively detach and dislodge adhered solids. The pumping action lifts the solids from the bottom of the bed to the top where they are removed. The additional energy provided by the air reduces the backwash water rate required, thus saving on pumping and piping costs. No other filtration process provides as thorough or as consistent a backwashing method.

A further advantage with the MULTIWASH® system: Larger media can be used with this state-of-the-art process without compromising effluent quality. When larger media is used, filter run lengths are increased substantially effectively increasing finished water production and reducing the volume of backwash water. Limitations of backwash rate, insufficient solids detachment, and hydraulic gradation of the media reduce the effectiveness of conventional filter designs.

Conventional designs require the use of smaller granular media which promote surface straining, leading to rapid headloss buildup. In turn, the rapid accumulation of solids at the surface leads to frequent backwashing and decreased finished water production.

The MULTIWASH® system in-depth filtering capabilities with an effective sustained simultaneous air and water backwash method. It is the best solution available for virtually any filtration need.



Multiwash® Proven Performance

Guarantees a return to clean bed operation

MULTIWASH® systems consistently remove difficult solids from the filter, even polyelectrolyte's and biological growth which adhere tenaciously to the media grains.

It does so using a simple but highly effective backwash of sustained simultaneous air and water. In operation, high energy generated by the MULTIWASH® system promotes media grain collisions which result in particles being dislodged and removed from the filter cell. Specially designed baffles prevent media loss during the air and water backwash while allowing the solids to be removed.

MULTIWASH® system versus conventional methods

A study conducted at Iowa State University (ISU) found that the most effective media cleaning is provided by sustained, simultaneous air and water backwash; that is, the MULTIWASH® system.

The MULTIWASH® system had 1/10th of solids remaining in the filter bed, as compared to the other systems. The ISU study also determined the following about other backwashing procedures:

- Water wash alone is an inherently weak cleaning system. Media grains have little lateral movement and do not contact one another because a water cushion forms around the individual grains. The results? Solids stay attached to the media grains and eventually form mudballs.
- Surface washers may break up the solids on the surface, but do not affect the solids deep in the bed.
- Air scouring prior to water backwash aids in breaking up the media surface, but media grain movement below the surface is limited.
- Chemical cleaning offers resistance to media fouling, but the use of chemicals and feeding systems increases capital and operational costs.
- Details of the study of the MULTIWASH® filtration system are available upon request.



12 MGD (45MI/d) MULTIWASH CentROL Installation



100 gpm(23m3/hr)MULTIWASH system AERALATER

MARKETS

- Automotive
- Food & Beverage
- HPI/CPI
- Power
- Pulp & Paper
- Enhanced Nutrient Removal
- Microelectronics
- Metal Finishing
- Municipal Wastewater
- Municipal Water
- Pharmaceutical



MULTIWASH Filter System

Designed for virtually any new or retrofit installation.

Siemens products that benefit from MULTIWASH®

A wide variety of MULTIWASH® filter systems are offered for all applications.

CentROL® LP filter is a conventional gravity filter design in a cluster arrangement. Elaborate pipe galleries, rate controllers and possibly backwash pumps and storage are eliminated to provide simple control and operation. The MULTIWASH® system is standard for additional media cleanliness.

Trident® HS package treatment plants incorporate 2 stages of upflow clarification with a mixed media filter for multi-barrier treatment. Coagulants and polymers are added to improve clarifier performance. Multiwash is used in the filter to clean the media of solids and treatment chemicals.

AERALATER® packaged iron and manganese removal plants employ the MULTIWASH® system for high iron and manganese loadings or when the potential for iron bacteria exists. AERALATER® units eliminate the need for backwash supply pumps.

Pressure Filters are ideally suited for use in water treatment applications where single stage pumping into a distribution system is desired.

Existing Installations can be retrofit with Low-Profile MULTIWASH® filtering equipment. The Low-Profile design is ideally suited for filters with limited head space available. Rehabilitations may include replacing or upgrading washtroughs, underdrains, media, controls and accessory equipment. In some cases, the retrofit of a MULTIWASH® system may allow the placement of additional media depths.



Compact 21 MGD (79 MI/d) CentROL Installation



20 MGD (76 MI/d) Water Treatment Plant Utilizing MULTIWASH systems CentROL Filters

Multiwash[®] System Proven Flexible and Efficient

Ground water processes

Iron and Manganese – Precipitated iron and manganese, polymer and iron bacteria, which are typically found in this treatment process, will adhere to the filter media. The vigorous scouring action of MULTIWASH[®] system effectively removes these solids during each backwash.

Lime Softening – Chemically pretreated processes typically require flocculent aids and polymers which increase the solids loading on filters. The MULTIWASH[®] system provides an unstratified media bed which reduces surface blinding and increases the solids holding capacity, in turn providing longer filter runs.

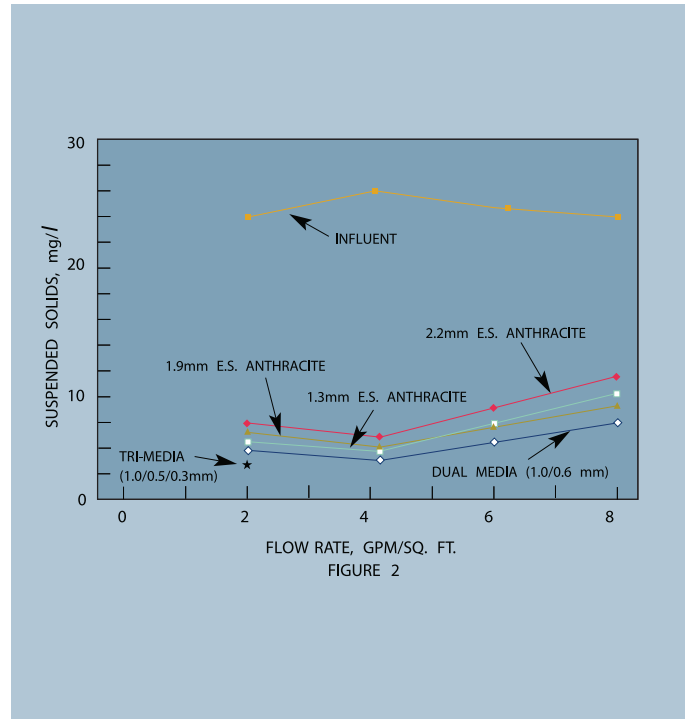
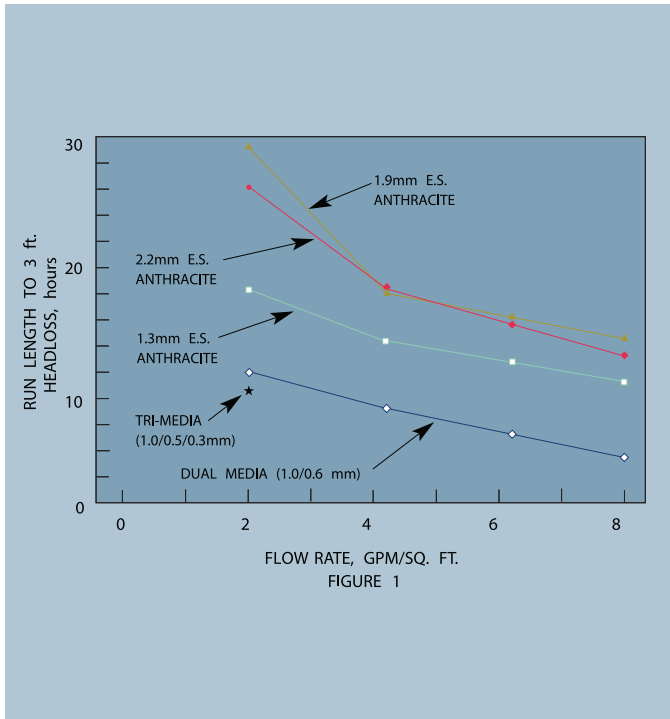
Surface water processes

Direct Filtration – Design normally use either dual media or deep bed single media filters which need to have high solids storage capacity. Flocculent aids and polymers are commonly used to enhance performance. MULTIWASH[®] backwash is ideally suited for this application.

Tihalomethanes and Other Organics – Water treatment plants are now choosing granular activated carbon (GAC) as an excellent media for organics removal due to its adsorption characteristics and filtering properties.

The MULTIWASH[®] system provides an effective method of removing these contaminants while maintaining the GAC adsorption ability.

Clarification – The use of flocculent aids and polymers is essential to strengthen the weak particulate typical of high turbidity surface water. MULTIWASH[®] systems provide the ability to handle these high turbidity applications without rapid buildup of headloss and frequent backwashing.

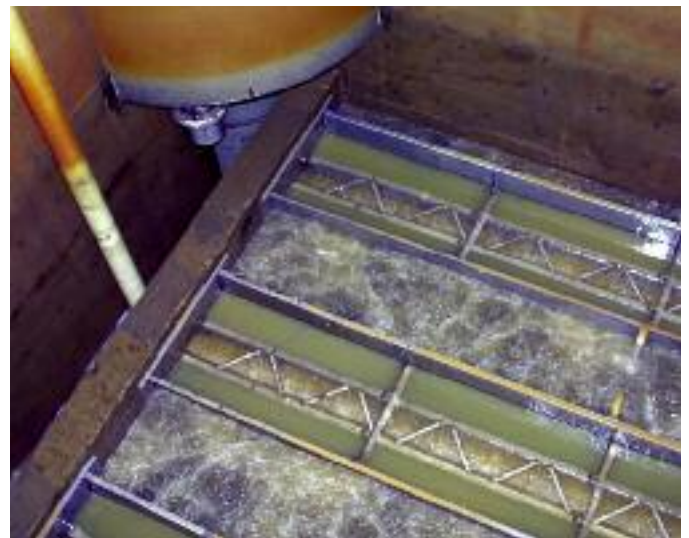


Chemically treated wastewater

Chemically treated wastewater is often difficult to filter and may require the use of flocculent aids. These cause the solids to adhere to the media grains, but if the wastewater is chemically unstable, precipitates may coat the media. MULTIWASH® effectively prevents buildup on the media while providing high solids holding capacity and efficient treatment.

Primary effluent or combined sewer

The MULTIWASH® system is designed to handle the toughest wastewater filtration requirements. In addition to filtration of final clarifier effluent, MULTIWASH® systems can be used to filter primary effluent or combined sewer overflow during peak wet weather flow conditions. As illustrated in Fig. 1, use of large media such as 2 mm anthracite permits operation at high flow rates while maintaining acceptable filter run lengths. During these conditions, acceptable effluent quality can be maintained as shown in Fig. 2. MULTIWASH® backwash is the only filtration system capable of maintaining large granular mono-media in a cleaning condition.



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East Tel: +1.508.849.4600

Central and International Tel: +1. 515.268.8400

West Tel: +1.719.622.5320

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