Aqua-Aerobic Cloth Media Filters

featuring OptiFiber® Media

AquaDisk®...Aqua MiniDisk®...AquaDiamond®
For 30 years, Aqua-Aerobic Systems, Inc. has maintained its leadership position in solid/liquid separation for the purification of water and wastewater by offering granular media filters, with the past 20 years dedicated to cloth media filtration.

Our success is justified by our reliable designs, application expertise, quality manufacturing and ongoing research and development. We pledge to continue to partner with our customers, providing solutions with innovative and proven technologies.

A product of our commitment to developing the best solutions for the needs of our customers is the unique media utilized in Aqua-Aerobic Systems’ family of cloth media filtration products. These media have been carefully engineered for quality, durability and performance to provide several process and mechanical advantages compared to alternative filtration media. Our cloth media has been adapted to a variety of mechanical configurations to maximize performance and value. A variety of cloth media are available to provide customized solid/liquid separation solutions for a broad range of municipal and industrial applications.

**Advantages**

- Unique cloth media
- Low backwash rate
- No downtime for backwashing
- Small footprint
- Low head requirements
- Less maintenance than sand filters
- Reuse quality effluent
- New plants or retrofits
- Lowest life-cycle cost

**Applications**

**Municipal Reuse/Recycle**

- 29.8 MGD Avg. Daily Flow
- AquaDisk® filters handle flows in excess of design while maintaining effluent quality.

**Phosphorus Removal**

- 1.5 MGD Avg. Daily Flow
- AquaDisk® filter’s small footprint and ability to expand without adding equipment are advantages with limited land space.

**Traveling Bridge Filter Retrofits**

- 72 MGD Avg. Daily Flow
- AquaDiamond® filter retrofitted into existing 16’ sand filter bed doubled the sand filter’s maximum design hydraulic capacity.

**Deep Bed Filter Retrofits**

- 25 MGD Avg. Daily Flow
- AquaDisk® filter retrofitted into existing 16’ deep bed filter eliminating the need for construction of new basins.

**Industrial Reuse**

- 3 MGD Avg. Daily Flow
- AquaDisk® filter’s effluent is reused at a nearby power plant as cooling tower supply water.
Evolution of Aqua’s Cloth Media Technology

OptiFiber® cloth filtration media is used exclusively in Aqua-Aerobic Systems’ filtration products. The unique cloth media is carefully engineered to provide optimum performance under a variety of conditions. OptiFiber cloth filtration media offers customized performance characteristics for your specific application.

Microscopic view of pile media.

Microscopic view of needlefelt media.

OptiFiber® Cloth Media

Aqua-Aerobic Systems’ proactive experience with research and development results in cloth media filtration products that virtually meet any tertiary requirements. We are dedicated to obtaining extensive knowledge on media, textile construction, durability, and impact on performance by working directly with textile manufacturers and independent testing laboratories. Our research efforts include continued development through partnerships with universities who test our products for durability and performance. Our commitment to research and development and piloting programs provides our customers with a variety of media and configuration options to suit individual application needs.

Evolution of Aqua’s Cloth Media Technology

First AquaDisk® Filter Installation

Introduction to Needlefelt Cloth Media

1991

First Pile Cloth Media

Launched AquaDiamond® Filter

1998

First AquaDiamond® Filter Installation

1999

OptiFiber® Cloth Media

Continuous Testing

Solids retained on and within the cloth form an additional filter layer which provides enhanced filtration.

Backwash

During backwash, filtrate is drawn back through the cloth. The suction causes the pile fibers to revert back to a natural state.
AquaDisk® Operation

Inlet wastewater enters, completely submerging cloth media. By gravity, liquid passes through media. As solids accumulate on and within the media, a mat is formed and the liquid level in the tank increases. The filtered liquid enters the internal portion of the disk and is discharged through the center shaft.

At a predetermined level or time, solids are backwashed from the surface by liquid suction from both sides of each disk. The disks are cleaned in multiples of two (unless a single disk is utilized). Disks rotate slowly, allowing each segment to be cleaned. Filtration is not interrupted and backwash water is directed to the headworks.

During the filtration process heavier solids are allowed to settle to the bottom of the filter tank. These solids are then pumped on an intermittent basis back to the headworks, digester or other solids collection area of the treatment plant.

AquaDisk® Filter

Aqua-Aerobic was first in the market, in 1991, to offer a cloth media disk configuration as an alternative to conventional granular media filtration technologies. A history of exceptional operating experience and durability continues to make AquaDisk® the disk filter of choice.

Features

- Up to 12 vertically oriented disks per unit
- Gravity flow operation
- Average hydraulic capacity from 0.25 to 3.0 MGD per unit
- Available in painted steel, stainless steel or concrete tanks
- Steel tank package units minimize field installation requirements
- Fully automatic, PLC based control system

AquaDisk® Components

- Overflow Weir
- Influent Weir
- Solids Valve
- Backwash Valve
- Solids Collection Manifold
- Backwash/Solids Pump
- Drive Motor
- Effluent Weir
- Influent Valve
- Backwash Waste
AquaDiamond® Filter

The AquaDiamond® filter is a unique combination of two time-proven technologies; traveling bridge and cloth media filtration. The result is two to three times the flow capacity of a traveling bridge filter with an equivalent footprint, making it ideal for new plants or sand filter retrofits.

Features

- Up to 8 vertically oriented, diamond-shaped cloth media laterals per unit
- Gravity flow operation
- Variable speed drive platform and backwash pump for immediate response to solids excursions
- Enhanced drive and tracking systems for better guidance and traction
- Fully automatic, PLC based control system
- Available in concrete tanks

Drive and Tracking System

The AquaDiamond filter's advanced tracking system consists of one stainless steel guide angle, two main drive wheels, and two pairs of guide wheels to avoid misalignment. Drive and guide wheels are made of hard, wear resistant rubber.

AquaDiamond® Operation

The cloth media is completely submerged during filtration. Solids are deposited on the outside of the cloth as the influent wastewater flows through. The filtered effluent is collected inside the diamond lateral and flows by gravity, to discharge. The filtration process requires no moving parts. Increased headloss due to the deposited solids automatically initiates periodic backwashing.

During backwash, a pump provides suction to the vacuum heads, allowing solids to be vacuumed from the cloth as the platform traverses the length of the diamond laterals. The platform operates only during backwashing and solids collection.

Because of the vertical orientation of the media, some solids will settle to the basin floor during normal operation. Small suction headers provide a means for collecting and discharging the settled solids. The solids collection process utilizes the backwash pump for suction.
Aqua MiniDisk® Operation

Inlet wastewater enters, completely submerging cloth media. By gravity, liquid passes through the media. As solids accumulate on and within the media, a mat is formed and the liquid level in the tank increases. The filtered liquid enters the internal portion of the disk and is discharged through the center shaft.

At a predetermined level or time, solids are backwashed from the surface by liquid suction from both sides of each disk. The disks are cleaned in multiples of two (unless a single disk is utilized). Disks rotate slowly, allowing each segment to be cleaned. Filtration is not interrupted and backwash water is directed to the headworks.

During the filtration process heavier solids are allowed to settle to the bottom of the filter tank. These solids are then pumped on an intermittent basis back to the headworks, digester or other solids collection area of the treatment plant.

Aqua MiniDisk® Filter

The Aqua MiniDisk® filter provides the solution for smaller flows. It is based on the same operating strategies as its larger counterpart, the AquaDisk®, but with smaller diameter disks.

Features

- Up to 6 vertically oriented disks per unit
- Average hydraulic capacity from 50,000 to 300,000 GPD
- Available in painted steel or stainless steel tanks
- Gravity flow operation
- Steel tank packaged units minimize field installation requirements
- Fully automatic, PLC based control system

Aqua MiniDisk® Operation

Internal view of a 4-disk Aqua MiniDisk® Filter in a painted steel tank (above).

Technology Comparison

Of course, performance is not the only factor in choosing the right filter technology. Life-cycle cost plays an equally important role in the decision making process. Several other key factors should also be considered during the evaluation process.

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<th>Feature</th>
<th>Aqua-Aerobic Cloth Media</th>
<th>Granular Media</th>
<th>Microscreen</th>
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<tr>
<td>Depth of Filtration</td>
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<td>High Solids Loading</td>
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<td>Ease of Media Handling</td>
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<td>Multiple Media Options</td>
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The exceptional performance of Aqua-Aerobic Systems’ cloth media filtration technology has been fully documented through years of testing and gathering of operating data from full-scale installations. The table below resulted from independent testing and summarizes the performance of both our needlefelt and pile cloth media in comparison to other, more conventional wastewater filtration technologies. It shows that Aqua-Aerobic Systems’ unique cloth media produces consistently lower effluent turbidity values over a wider range of influent turbidities than the other technologies tested. This high standard of performance has been demonstrated on all of the cloth media mechanical configurations offered by Aqua-Aerobic Systems.

This chart indicates the comparison of effluent versus influent turbidity for cloth media filtration at 14.7 m/hr and various filters at 9.8 m/hr.

The information contained herein relative to data, dimensions and recommendations as to size, power and assembly are for purpose of estimation only. These values should not be assumed to be universally applicable to specific design problems. Particular designs, installations and plants may call for specific requirements. Consult Aqua-Aerobic Systems, Inc. for exact recommendations or specific needs. Patents Apply.