ORTHOS

LIQUID SYSTEMS

NSF Certified to NSF/ANSI 61

nqa ISO 9001 Registered Quality Management

Downflow media filtration systems for municipal clientele

POSEIDON

Monolithic Underdrain

Troughs

Controls

Media

Piping

- Conventional Water Treatment
- Wastewater Tertiary Filtration
- Membrane Pretreatment
- Biologically Active Filtration
- GAC Adsorption & Ion Exchange
- Denitrification

Poseidon Filtration System®

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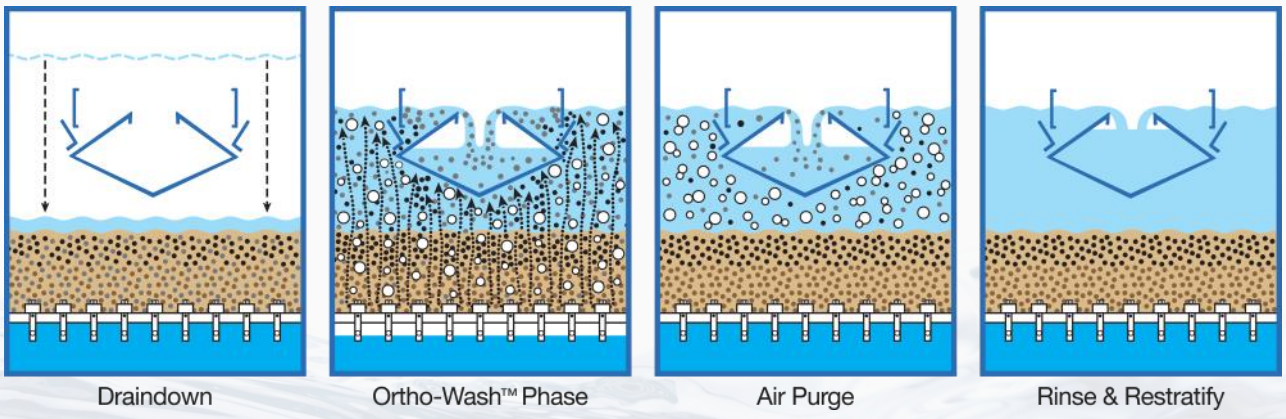
Delivering Comprehensive Filtration Systems to Municipal Clientele

Poseidon Filtration System® downflow filters encompass Orthos Centurion™ nozzle-based monolithic floor underdrains as well as filter system controls, backwash troughs, air header piping, filtration media, pumps, blowers, valves, and instrumentation. Orthos engineers provide facility-specific designs to meet application, configuration, and treatment objectives.

The inherent features of the *Poseidon* ensure dependable filtration quality and repeatable backwash and air scour results. Below the suspended underdrain, velocities are relatively low and changes are buffered, which reliably lead to excellent backwash and air scour distribution. This, along with Ortho-Wash™ controls, create unbeatable media cleaning performance.



Ortho-Wash™ Simultaneous Backwash and Air Scour Process

Ortho-Wash™ Control System

Automation for Simultaneous or Separate Backwash and Air Scour

Ortho-Wash™ includes all control hardware, programming, and instrumentation to fully automate Orthos *Poseidon* downflow filters for municipal water and wastewater treatment applications.

Ortho-Wash PLC-based control algorithms continuously monitor essential upstream and downstream process parameters, to include:

- ✓ Influent channel level
- ✓ Filter level
- ✓ Filter headloss
- ✓ Effluent turbidity
- ✓ Effluent flow rate
- ✓ Valve positions
- ✓ Air flow rate
- ✓ Backwash flow rate

Using this information, *Ortho-Wash* optimizes the operation to minimize cost while enhancing effluent quality, meeting regulatory requirements, and ensuring process and personnel safety. Filtration efficiency is maximized with the longest practicable filtration run. Backwash and air scour sequences are automatically initiated according to real-time conditions, and durations managed to the extent necessary to thoroughly clean the media.

Backwash Troughs with Ortho-Wash™ Baffles

304/316 Stainless Steel or Fiberglass-Reinforced Plastic (FRP) Construction

Fabricated from 304SS, 316SS, or FRP, *Poseidon* backwash troughs are engineered to uniformly and efficiently remove wash water during backwashing of gravity filters. *Ortho-Wash* baffles are used with proprietary polygonal troughs to prevent media loss by deflecting air and providing an adjacent quiescent volume to settle out lightweight anthracite or GAC.

Media, Piping, Pumps, Blowers, and Valves

Tailored Design for Ongoing, Repeatable Results

Orthos' experienced engineers deliver the proper design and selection of media, piping, pumps, blowers, and valves to optimize functionality and longevity of the Poseidon Filtration System®.

Top 5 Reasons to Choose Orthos *Poseidon*

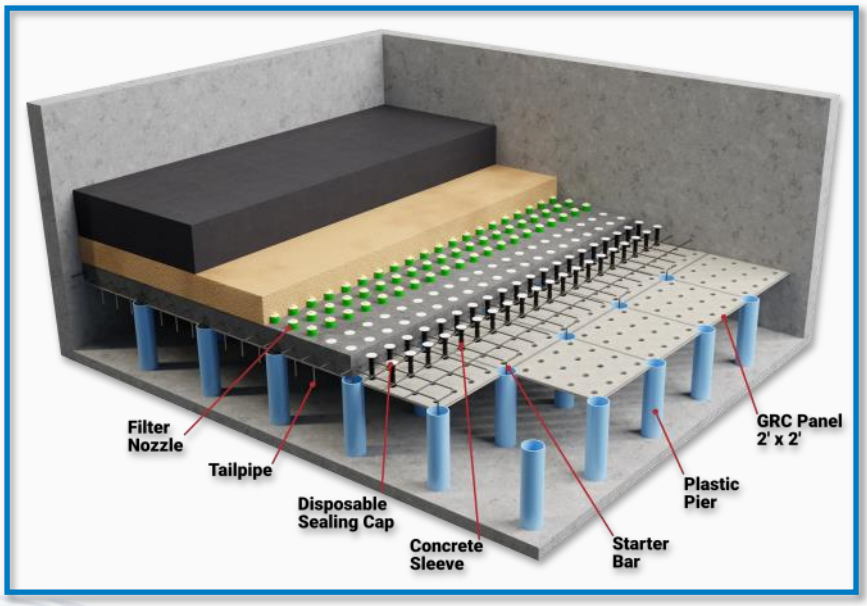
1. **Zero underdrain failures**—Orthos has NEVER had a monolithic underdrain filter failure. Not once. Ever. Longevity is ensured by structurally-superior, reinforced concrete, locked into the sidewalls and filter floor.
2. **Experience**—Orthos is installed in 250 downflow filters, some with 25 years of service.
3. **Huge life cycle cost benefits**—At the end of equipment life cycle, in contrast to a costly lateral underdrain demolition and replacement, nozzles are economically and easily unscrewed and exchanged—the monolithic floor remains part of the civil structure.

   Thus, facility life cycle cost analyses with appropriate 50+ year terms will routinely identify *Poseidon* as the prudent choice over other systems.
4. **Excellent backwash and air scour distribution**—Because of our nozzle back pressure design and that air and water move freely under the monolithic floor, distribution is repeatedly exceptional, resulting in optimal media cleaning and long-lasting structural integrity.
5. **Construction is less dependent on hard-to-control installation practices**—Concrete underdrain slabs are easily constructed in contrast to pouring non-structural grout into narrow spaces with interfering anchor hardware or fastening and leveling long, triangular laterals.

Centurion™ Nozzle-Based Monolithic Underdrain

25 Years of Reliability… Not One Underdrain Failure — Ever.

The Centurion™ monolithic design is cast in-situ and becomes "locked into" the surrounding civil structure, lasting for many, many decades. Unlike block and triangular lateral systems that are not a permanent part of the filter, *Centurion* monolithic underdrains feature reinforced concrete that withstands abnormal vertical forces to afford practically no risk of structural failure.



Creating Ongoing Value:

- An **elevated floor**, supported on columns typically in a 2' x 2' grid, creates a plenum underneath
- The **plenum** space, often with 6" to 30" of vertical height, advantageously provides for inspection and service through an access hatch
- **Monolithic slabs** minimize grouting (i.e., potential leakage points) and include embedded steel reinforcement bars linked to the tank floor and walls
- **Nozzle** sleeves are cast into the concrete floor, and once curing is finished, nozzles are quickly installed

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