

**xylem**  
Let's Solve Water



# Leopold FilterWorx<sup>®</sup> Filtration Systems

EFFICIENCY AND INNOVATION BUILT INTO EVERY COMPLETE SYSTEM



# Water filtration is more than the sum of its parts.

Leopold is a leading brand in gravity media filtration. Whatever your application, Xylem's Leopold engineers can assist you in developing a cost effective, energy efficient, high performance system designed to meet your requirements. The Leopold FilterWorx system is designed to achieve the longest possible filtration cycles to meet your permit requirements at the lowest possible costs.

## Applications

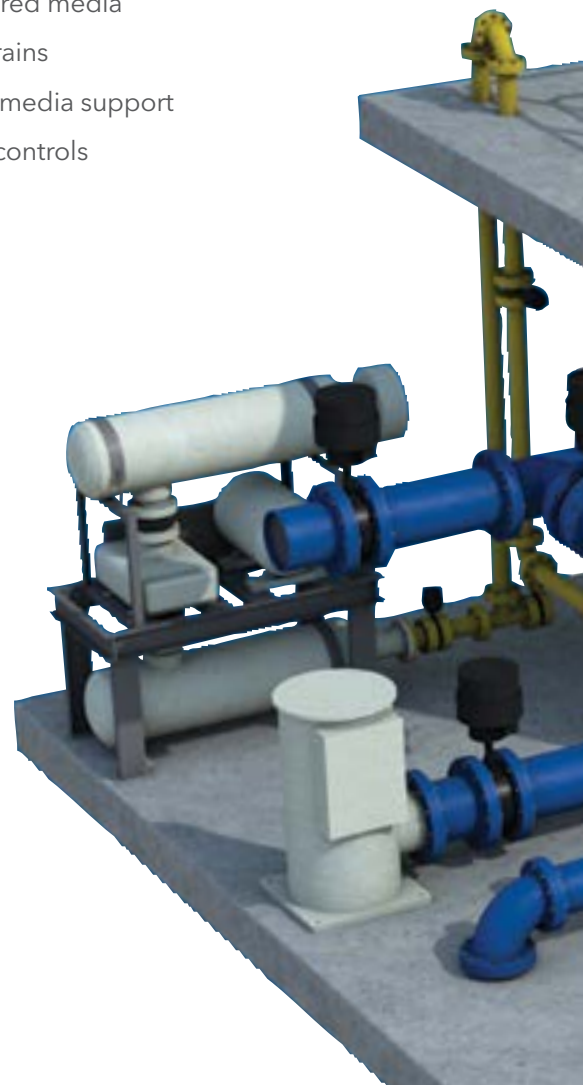
- Potable/drinking water treatment
- Tertiary wastewater treatment
- Nutrient removal in water or wastewater
- Reverse osmosis membrane desalination pretreatment
- Water reuse
- Biological Active Filtration (BAF)

## Water challenges addressed

- Aging infrastructure
- Harmful algal blooms
- Water scarcity
- Contaminants of emerging concern (pharmaceuticals, personal care products)
- Cryptosporidium and giardia
- Reduction of disinfection byproducts
- Taste and odor

## Leopold FilterWorx components

1. Flume
2. Backwash water troughs
3. Engineered media
4. Underdrains
5. Integral media support
6. System controls



## Engineered to maximize treatment and minimize headaches

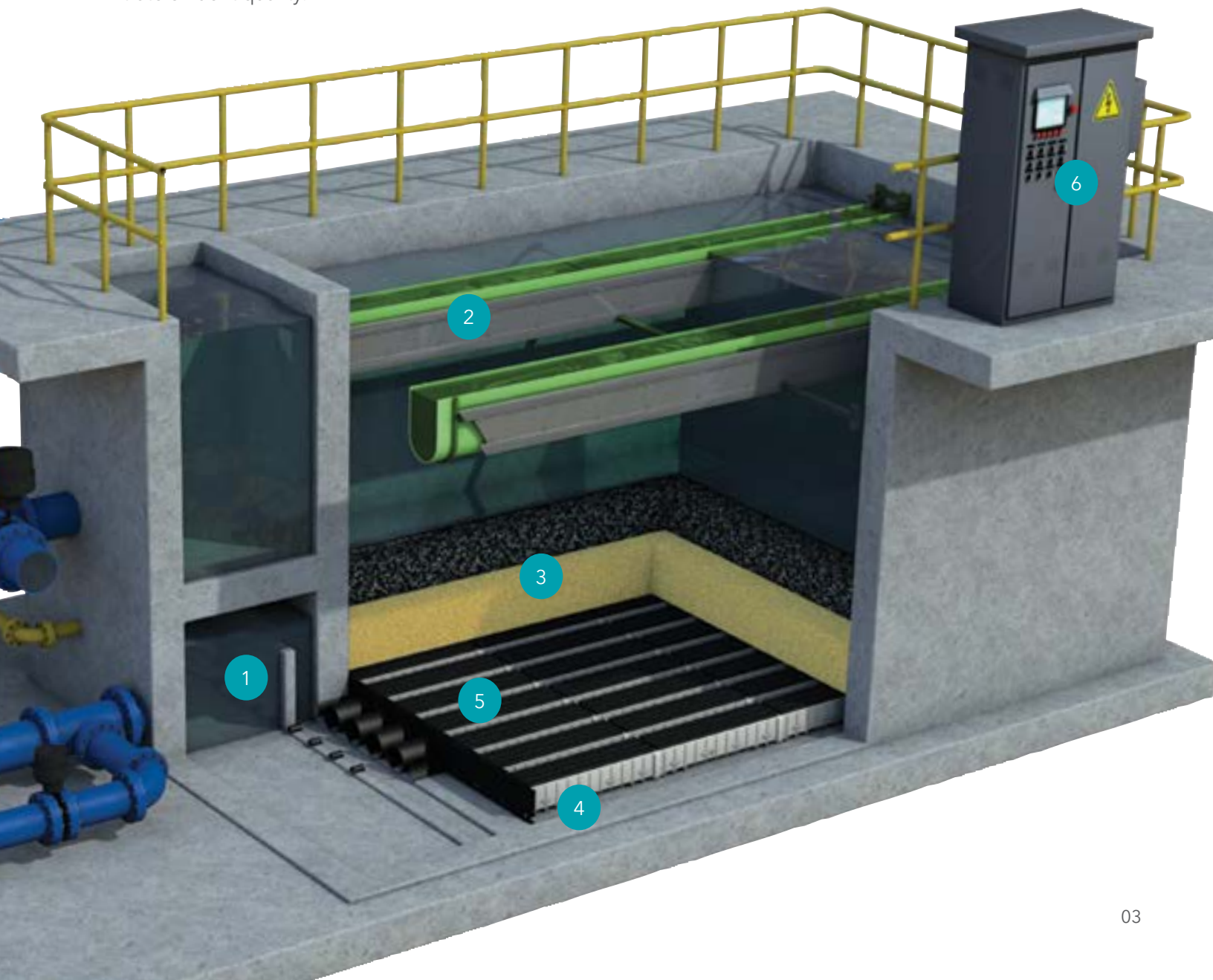
Leopold engineers have been at the forefront of gravity media filtration since 1924. With more experience than anyone in the industry, we can help you analyze, evaluate and design all aspects of your complete filtration system.

Evaluate influent water qualities, including seasonal changes and demand requirements, and determine the best pretreatment options.

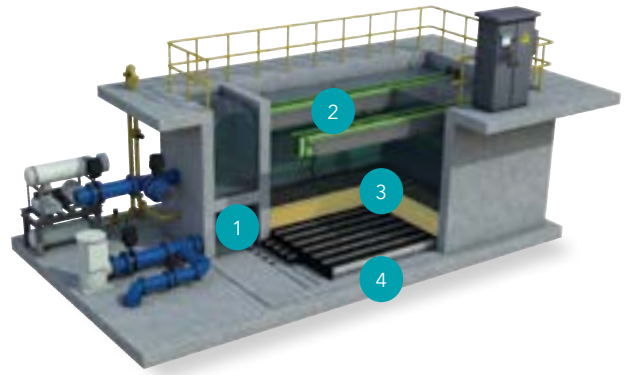
Select the best media characteristics, media quality, bed composition, bed depth and grain size distribution to match the filter configuration, influent quality, pretreatment processes and required filtrate effluent quality.

Determine optimal loading rates and best design configuration to meet site conditions and operational requirements.

Design the backwash process to restore original head loss, maintain solids storage capacity and maximize filter runs while minimizing power costs and wastewater generation.



# Leopold FilterWorx components

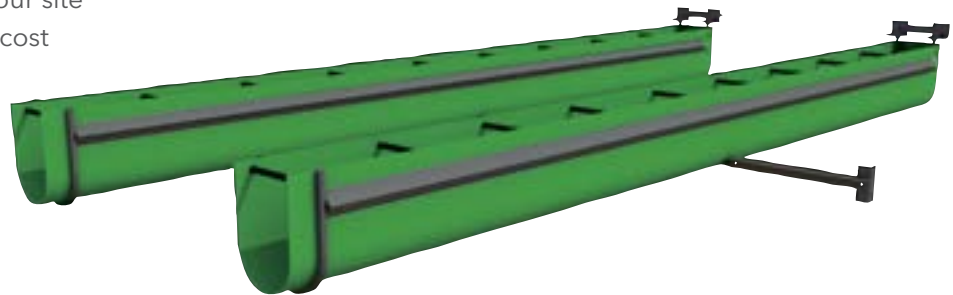


## 1 Flume

Our flat-bottom flume reduces excavation requirements and support structures. This simplifies new construction, resulting in substantial cost savings. We can also design FilterWorx systems with front flumes, center flumes or H flumes, or even wall sleeves for conversion of an existing basin. We will carefully evaluate your site requirements to provide the most cost effective flume configuration.

## 2 Backwash water troughs

Our troughs help conserve media while removing backwash water efficiently. Made of durable fiberglass reinforced plastic (FRP), backwash water troughs are sized and configured to match your process needs.



## 3 Engineered media

We carefully evaluate your influent water characteristics and process requirements to determine the optimal media configuration, including depth, type, effective size and uniformity coefficient.

We can provide anthracite engineered media with the lowest uniformity coefficient in the industry.

A lower uniformity coefficient provides:

- Superior filtration qualities
- Increased filter run volumes
- Less water required to thoroughly backwash

Less frequent and more efficient backwash saves energy and increases overall water production.



## 4 Underdrains

Leopold features four types of underdrains to meet any configuration need.

Underdrains collect filtered water during the filter run, and distribute air and water during the backwash cycle.

- **Superior air and water distribution** for effective backwash and less than +/- 5% maldistribution, guaranteeing no dead zones in all lateral length.
- **Cleaner filters** have longer filter runs which means more filtered water, less waste. This lowers your overall operating costs.
- **Air flow adjustability** allows you more control and saves energy and water. Air scour rate can be adjusted from 2 to 5 SCFM/SQ.FT. (0.6 to 1.5 m/min), enabling collapse pulse cleaning during concurrent air/water backwash with various media configurations. Air scour provides higher shear forces and cleaner media, with less backwash water.
- **Faster installation** with fewer parts than nozzle systems and no false floor. Underdrain blocks are lightweight for easy handling and snap together for quick installation, shortening construction time and putting you in production quicker.
- **Design flexibility** with different heights to allow for different combinations of lateral lengths and vertical filter heights, as well as different flume configurations and installation techniques.

	HEIGHT INCH (CM)	LATERAL LENGTH FEET (METERS)			
		CENTER FLUME	FRONT FLUME	WALL FEED/ H FLUME	LEOPOLD FLAT BOTTOM
<b>Type 360</b>	10 (25)	64 (20)	32 (10)	32 (10)	32 (10)
<b>Type XA</b>	8.25 (21)	64 (20)	32 (10)	32 (10)	32 (10)
<b>Type S</b>	12 (30)	96 (29)	48 (15)	48 (15)	48 (15)
<b>Type SL</b>	8 (20)	32 (10)	16 (5)	-	-



**Type 360**  
integral  
media retainer

**Type XA**  
with I.M.S 200  
media retainer

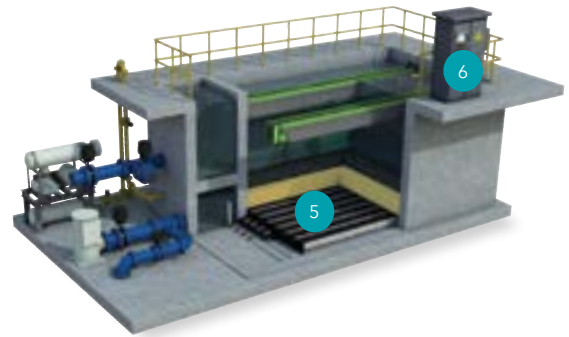
**Type SL**  
with I.M.S 200  
media retainer

**Type S**  
with I.M.S 1000  
media retainer

## 5 Integral media support

### I.M.S® media retainers

- Replace up to 14 inches (36 cm) of media support gravel allowing for the same media depth in less vertical space, reducing construction costs.
- Compatible with all Leopold underdrains, I.M.S media retainers are factory installed on the Leopold underdrains saving time and labor during installation.
- Provide even backwash distribution to deep clean filters.



### Two sizes for different applications

**I.M.S 200 media retainers** with 0.2 mm ( $\pm 0.1$  mm) slots are specifically designed for drinking water treatment including biologically active filters and water reuse. It retains media of effective sizes down to 0.4 mm.

**I.M.S 1000 media retainers** with 1 mm tapered slots are specifically designed for wastewater treatment applications, including the Leopold elimi-NITE® 2.0 denitrification system. It retains media of effective size down to 1.7 mm.



I.M.S 200  
media retainer



I.M.S 1000  
media retainer

## 6 System controls and process optimization


**Efficiency:** The Leopold FilterWorx control system optimizes the filtration process as well as operating costs. By continuously monitoring filtrate quality and filter bed conditions, the filter is backwashed only when, and as long as, needed. Filtrate quality and filter run volumes are optimized while reducing energy consumption and wastewater generation. Our controls keep the filter media well-conditioned, extending the life of the filter, all while lowering operating costs.

**Complete integration:** By using standard communication protocols the FilterWorx control system seamlessly integrates into the overall plant SCADA systems, while providing the option of local control to ensure processes remain in operation even if there's an issue in the primary SCADA system.

### Advanced process control:

By combining our FilterWorx control system with Xylem's advanced process analytics and control algorithms, we are able to offer two of the most advanced biologically active filtration systems on the market, the Leopold elimi-NITE® 2.0 denitrification system for nitrate removal in tertiary wastewater and the Leopold Oxelia® ozone enhanced biologically active filtration system for water reuse, sensitive receiving streams, and potable water treatment.





# Energy and water efficiency in every filter component. Support in every step of the process.

Our commitment to your satisfaction goes beyond designing the best system for your application and providing single source supply of all components.

**Pilot testing:** We can run a pilot test at your site, to demonstrate performance. Or we can test a full-scale lateral run with your flume configuration at our Product Development Center. There you can witness first hand the head loss and flow distribution during backwash.

**Construction and start-up assistance:**

Our experienced technicians are available to supervise the correct installation of your system, to ensure proper operation. We can also provide ongoing support through calibration, commissioning and start-up. Throughout the life of your system, we can assist with service and rehabilitation, to keep your operations at peak efficiency.

**Rehabilitation services:** We offer to analyze your existing filter performance and provide a cost effective rehabilitation to upgrade your system to current standards. From underdrains to trough configuration, media selection, and controls, we can custom design your solution to provide optimum performance.

# Xylem |'zīləm|

- 1) The tissue in plants that brings water upward from the roots;
- 2) a leading global water technology company.

We're a global team unified in a common purpose: creating advanced technology solutions to the world's water challenges. Developing new technologies that will improve the way water is used, conserved, and re-used in the future is central to our work. Our products and services move, treat, analyze, monitor and return water to the environment, in public utility, industrial, residential and commercial building services settings. Xylem also provides a leading portfolio of smart metering, network technologies and advanced analytics solutions for water, electric and gas utilities. In more than 150 countries, we have strong, long-standing relationships with customers who know us for our powerful combination of leading product brands and applications expertise with a strong focus on developing comprehensive, sustainable solutions.

**For more information on how Xylem can help you, go to [www.xylem.com](http://www.xylem.com)**



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