filterra®
Bioretention Systems

Filterra® Bioretention System Overview

imbrium®

About Imbrium® Systems

Imbrium® Systems is dedicated to protecting Canada's waterways. Based on our knowledge and experience in the Canadian stormwater industry, we have the ability to provide the most effective stormwater treatment technologies that capture and retain harmful pollutants from urban runoff before it enters our streams, rivers, lakes, and oceans.

Imbrium's engineered treatment solutions have been third-party tested and verified in accordance with the ISO 14034 Environmental Technology Verification (ETV) protocol to ensure performance in real-world conditions as designed. Our team of highly skilled engineers and partners provide the highest level of service from design to installation and long-term maintenance.

By working with Imbrium and our partners, you can expect superior treatment technology, unparalleled customer service, compliance with local stormwater regulations, and cleaner water. To find your local representative, please visit **www.imbriumsystems.com/localrep**.

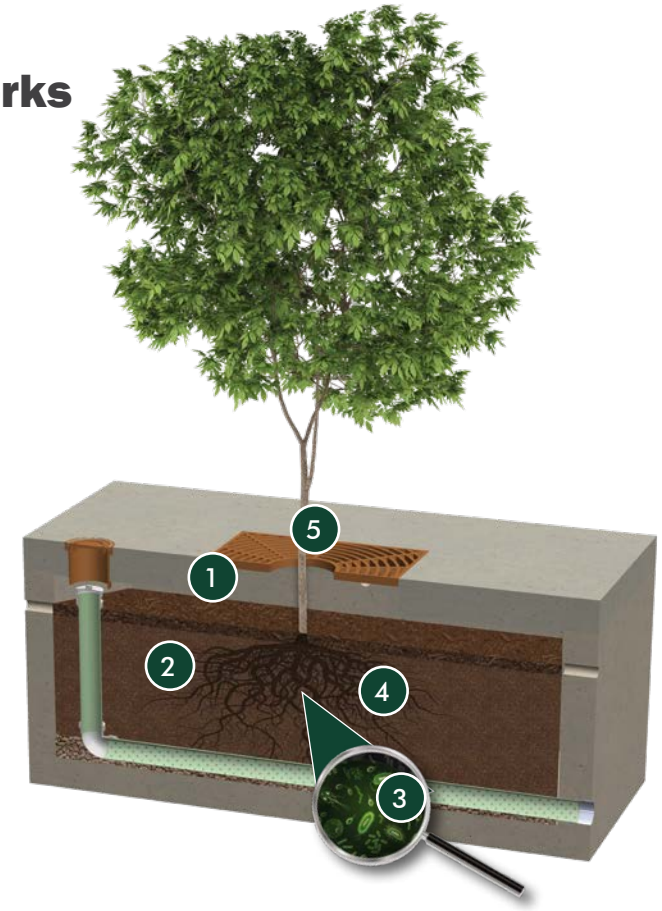
Learn About Filterra®

Go online to www.imbriumsystems.com/filterra and watch our video to learn about the Filterra system, including:

- Components of the Filterra system
- How Filterra removes pollutants such as TSS, phosphorus, nitrogen, metals, oils, and grease
- How Filterra can be paired with other solutions to achieve Low Impact Development (LID) and green infrastructure goals
- How the Filterra system is maintained

To view the Filterra animation, visit www.imbriumsystems.com/filterra.

How the Filterra® Works



TESTED IN THE FIELD AND LABORATORY

1. Stormwater enters the Filterra through a pipe, curb inlet, or sheet flow and ponds over the pretreatment mulch layer, capturing heavy sediment and debris. Organics and microorganisms within the mulch trap and degrade metals and hydrocarbons. The mulch also provides water retention for the system's vegetation.
2. Stormwater flows through engineered Filterra media which filters fine pollutants and nutrients. Organic material in the media removes dissolved metals and acts as a food source for root-zone microorganisms. Treated water exits through an underdrain pipe or infiltrates (if designed accordingly).
3. Rootzone microorganisms digest and transform pollutants into forms easily absorbed by plants.
4. Plant roots absorb stormwater and pollutants that were transformed by microorganisms, regenerating the media's pollutant removal capacity. The roots grow, provide a hospitable environment for the rootzone microorganisms and penetrate the media, maintaining hydraulic conductivity.
5. The plant trunk and foliage utilize nutrients such as Nitrogen and Phosphorus for plant health, sequester heavy metals into the biomass, and provide evapotranspiration of residual water within the system.

Filterra® Features & Benefits

FEATURES	BENEFITS
High biofiltration media flow rate (up to 3550 mm/hr+)	Greatly reduced footprint versus traditional bioretention
Rigid and precise quality control parameters for mulch and media	Consistent, superior pollutant removal performance and infiltration rate
Filterra system is packaged, including all components necessary for system performance	Quality control for easy, fast and successful installation
Quick and easy maintenance	Low lifecycle costs
Variety of configurations and aesthetic options	Integrates easily into any site or landscape plan
Natural stormwater management processes featuring organics and vegetation	Meets Low Impact Development requirements and ensures long-term performance

Low Impact Development in a Small Footprint – Filterra®

Filterra is an engineered high-performance bioretention system. While it operates similar to traditional bioretention, its high flow media allows for a reduction in footprint of up to 95% versus traditional bioretention practices. Filterra provides a Low Impact Development (LID) solution for tight, highly developed sites such as urban development projects, commercial parking lots, residential streets, and streetscapes. Its small footprint also reduces installation and life cycle costs versus traditional bioretention. Filterra can be configured in many different ways to enhance site aesthetics, integrate with other LID practices, or increase runoff reduction through infiltration below or downstream of the system

Learn more »
www.imbriumsystems.com/filterra

Filterra® Configurations

Filterra is offered in multiple configurations to meet site specific needs. These configurations make Filterra a versatile yet effective stormwater BMP with a low life-cycle cost.

FILTERRA OFFLINE

The Filterra Offline system is the standard Filterra configuration. A concrete vault houses Filterra media, mulch and vegetation, and includes a top slab with a tree grate ideal for urban areas where sidewalk space is required. The system is typically placed in the curb line with a curb inlet upstream of a bypass catch basin, but can also accept inlet pipes from an upstream bypass structure.

FILTERRA BIOSCAPE VAULT

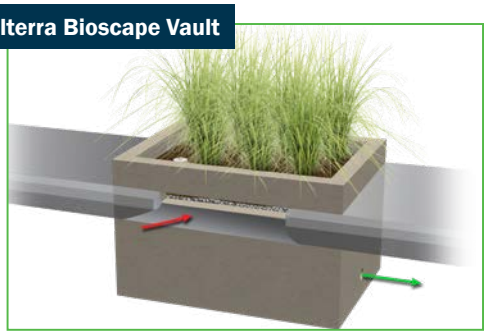
The Filterra Bioscape™ Vault is an open top version of the Filterra Offline system. The open top allows for better integration with site landscaping and increased aesthetics. The system is typically placed in the curb line with a curb inlet upstream of a bypass catch basin, but can also accept inlet pipes from an upstream bypass structure. Low profile vegetation such as grasses may be used to better address line-of-sight limitations.

FILTERRA BIOSCAPE VAULT BASIN

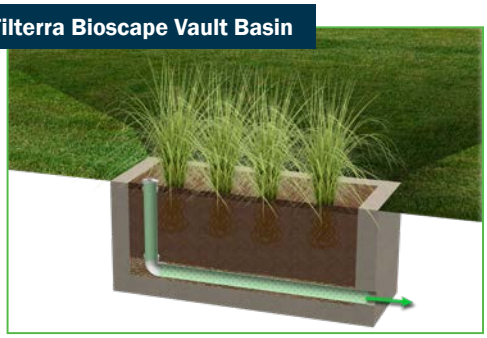
The Filterra Bioscape™ Vault Basin configuration is a variant of the Filterra Bioscape Vault that is designed to be recessed into a depressed basin that captures the treatment flow and provides the necessary ponding. This configuration is ideal for use with upstream swales or for applications where it is preferable that the vault not be visible.

Filterra Offline

Filterra Bioscape Vault



Filterra Bioscape Vault Basin



Cold Climate Considerations

Bioretention systems such as Filterra rely on the vegetation to assist in pollutant removal. Winter road clearing efforts can wreak havoc on roadside landscaping and stormwater structures. For the best performance, Imbrium recommends the following:

- Use salt tolerant plants. Refer to Imbrium's recommended plant list for Filterra systems.
- Consider using taller species with suitable system placement for increased visibility and identification during large snow events.
- Perform maintenance at the end of winter just prior to the growing season to remove mulch contaminated with winter sands and salts. Flush plant with water to wash out remaining salt.

Filterra® Media – Proven Pollutant Removal

At the heart of the Filterra system is Filterra engineered biofiltration media; a specified gradation of washed aggregate and organic material homogeneously blended under strict quality controlled conditions. Using data from independent, third-party field studies including the University of Virginia (TARP), Herrera Environmental Consultants (TAPE), Terraphase Engineering (NJCAT), North Carolina State University (TAPE & TARP) and Geosyntec Consultants, the filter media has been optimized to operate under high flow rates while providing superior, pollutant removal performance. Filterra media is tested for hydraulic functionality, fertility, and particle size distribution to ensure uniform performance.

Filterra media also supports a vegetation component with suitable hardiness for the local region consisting of grasses, shrubs, or trees that assist with the adsorption of pollutants through biological uptake/storage and pollutant consumption by microbes within the plant root zone.

MEASURED POLLUTANT REMOVAL PERFORMANCE

(Ranges varying with particle size, pollutant loading and site conditions)

TSS Removal	89 - 97%*
Phosphorus Removal	52 - 85%*
Nitrogen Removal	43%
Total Copper Removal	58%
Dissolved Copper Removal	46%
Total Zinc Removal	66%
Dissolved Zinc Removal	58%
Oil & Grease	93%

Information on the pollutant removal efficiency of the filter media/plant media is based on third-party lab and field studies.

** Based on data from multiple field studies as reported in the ISO 14034 ETV Verification Statement for Filterra®.*

Filterra media has been optimized to operate under high flow rates while providing superior pollutant removal performance.

Filterra® – Verified Performance

Filterra is approved through numerous local, state, and federal agencies and verification programs, including:

- **ISO 14034 Environmental Management - Environmental Technology Verification (ETV)**
- New Jersey Department of Environmental Protection (NJ DEP)
- Washington Department of Ecology (GULD) – Basic, Enhanced, Phosphorus, and Oil
- Maryland Department of the Environment - Environmental Site Design (ESD)
- Texas Commission on Environmental Quality (TCEQ)
- Virginia Department of Environmental Quality (VA DEQ)
- Maine Department of Environmental Protection (ME DEP)
- Atlanta, GA Regional Commission
- Los Angeles County, CA - Alternate to Attachment H
- City of Portland, Oregon Bureau of Environmental Services
- North Carolina Department of Environmental Quality (NC DEQ)

Filterra® – In the Field

We make it easy! The Filterra system is delivered to the job site with all components except plant and mulch.

FILTERRA – INSTALLATION

- Bioretention system sealed from construction sediment.
- Contractor off-loads top and vault separately.
- Set vault to grade on 6 inches (150 mm) compacted #57, pipe up, backfill, set top.

FILTERRA – ACTIVATION

- Contractors: Do NOT remove throat plate nor tree grate covers.
- Vegetation selection guidance based on your climate zone.
- Imbrium-certified providers conduct on-site activation with installation of mulch and plant.

FILTERRA – MAINTENANCE

- The first year of maintenance is included with every system.
- Maintenance is low-cost, low-tech and simple:
  - » Remove trash, sediment, and mulch.
  - » Replace with a fresh layer of 3 inches (75 mm) of mulch.
  - » Can be done by landscape contractor.
  - » No confined space entry.

ADDITIONAL SOLUTIONS

STORMCEPTOR® EF SYSTEM

The enhanced flow "EF" Stormceptor® effectively targets sediment (TSS), free oils, gross pollutants and other pollutants that attach to particles, such as nutrients and metals, Stormceptor delivers protection 24/7.

JELLYFISH® FILTER

The Jellyfish® Filter is a stormwater treatment technology featuring pretreatment and membrane filtration in a compact stand-alone treatment system that removes a high level and a wide variety of stormwater pollutants.

LEARN MORE

- Access project profiles, photos, videos, and more online at **www.imbriumsystems.com/filterra.**

REQUEST DESIGN ASSISTANCE

- Call us at (888) 279-8826 or 301-279-8827 to talk to one of our engineers for technical support or design assistance.

START A PROJECT

- Submit your system requirements on our product Design Worksheet at **www.imbriumsystems.com/pdw.**

FIND A LOCAL REPRESENTATIVE

- Visit **www.imbriumsystems.com/localrep** for contact information for your local Imbrium representative.

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www.imbriumsystems.com

Imbrium® Systems is an engineered stormwater treatment company that designs and manufactures stormwater treatment solutions that protect water resources from harmful pollutants. By developing technologies to address the long-term impact of urban runoff, Imbrium ensures our clients' projects are compliant with government water quality regulations. For information, visit www.imbriumsystems.com or call +1 416-960-9900.

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By Canadians, for Canadians.