filterra®
Bioretention Systems

Filterra® High Performance Bioretention 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.

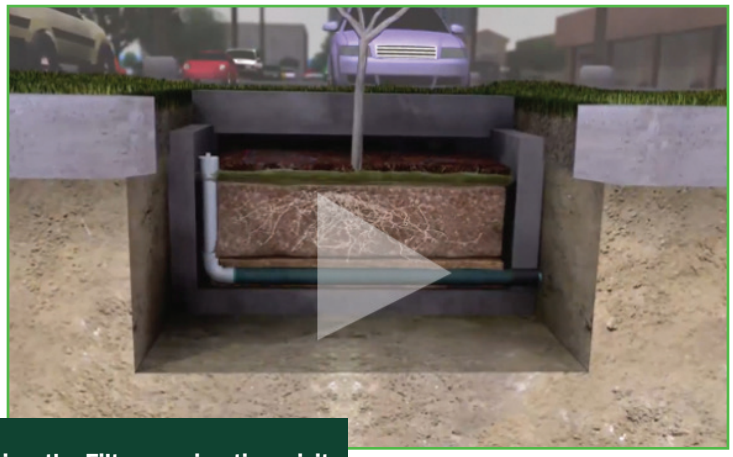
Imbrium's engineered treatment solutions have been third-party tested and verified in accordance with the ISO 14034 Environmental Technology Verification (ETV) protocol to ensure performance in real-world conditions as designed. Our team of highly skilled engineers and partners provide the highest level 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 **ImbriumSystems.com/find-a-local-representative**.

Learn About Filterra®

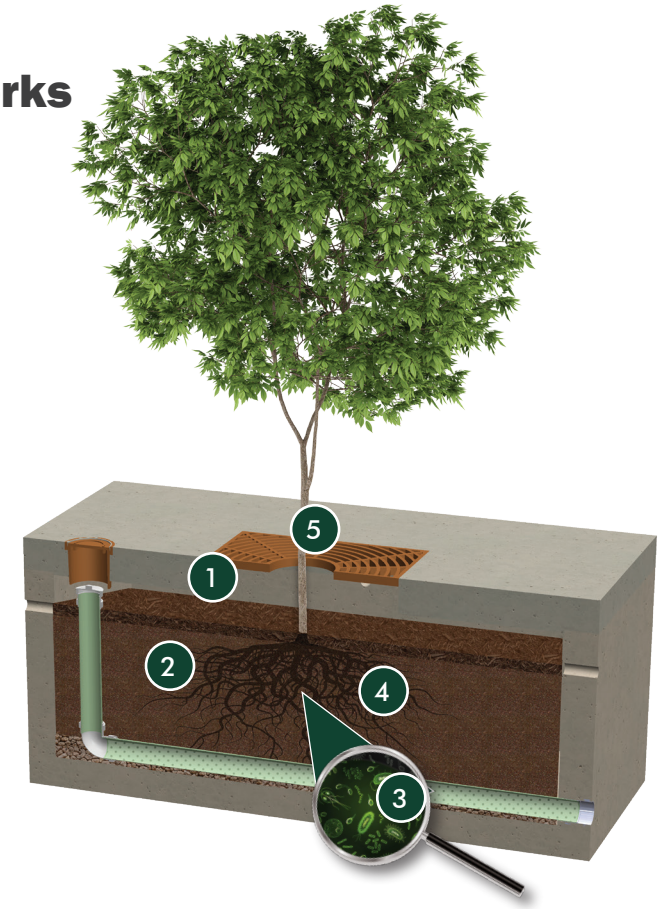
Go online to ImbriumSystems.com/filterra and watch our video to learn about the Filterra system, including:

- 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 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 8230 mm/hr).	Greatly reduced footprint versus traditional bioretention.
Multiple third-party tests in accordance with WA State TAPE Protocol; ISO 14034 ETV verified results.	General Use Level Designation (GULD) for Basic (80% TSS removal), Metals, Phosphorous, and Oil Treatment.
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.

How is Filterra Different?

Standard bioretention used for water quality treatment can take up 5% to 15% or more of the total land development area. Filterra Bioretention is unique in that it provides a much faster infiltration rate than standard bioretention thereby only using less than 1% of the total land development area. See below general sizing table targeting 1/2 inch per hour (12.7 mm per hour) stormwater quality treatment. Model size may vary based on location.

Filterra Model	Standard Filterra Box Size		Maximum Drainage Area*	Standard Bioretention Footprint**	Filterra Footprint
Offline	mm	mm	m^2	m^2	m^2
FT0404	1200	1200	1000	100	1.44
FT0606	1800	1800	2200	220	3.24
FT1005	3000	1500	3000	300	4.5
FT0808	2400	2400	4000	400	5.76
FT1307	4000	2100	6000	600	8.4

*Based on 12.7 mm/hr rainfall intensity
**Based on 10% of maximum drainage area

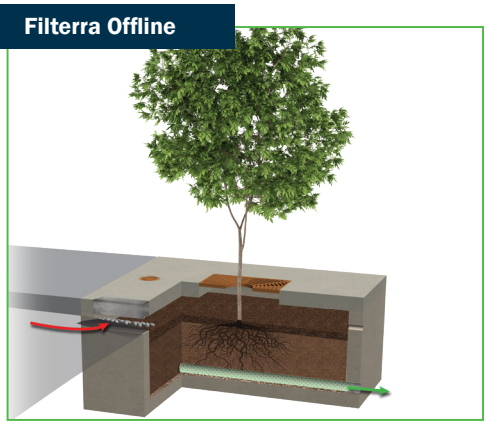
Filterra® Configurations

Filterra is offered in multiple configurations to meet site specific needs. These configurations make Filterra a versatile yet effective stormwater best management practices (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.

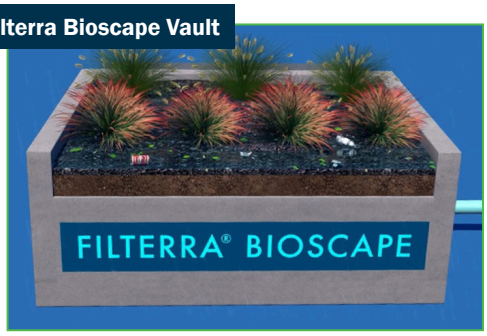
Filterra Offline



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.

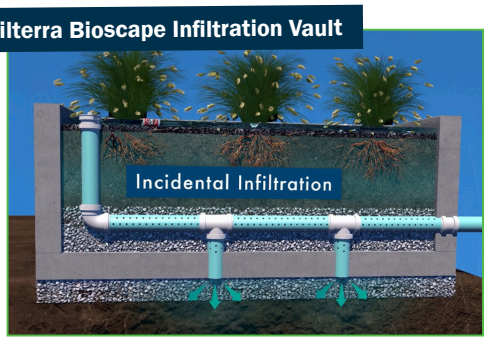
Filterra Bioscape Vault



FILTERRA BIOSCAPE INFILTRATION VAULT

In areas where runoff reduction and infiltration are mandated or desirable, Filterra can be designed with openings in the bottom of the box for incidental infiltration aligning with LID goals.

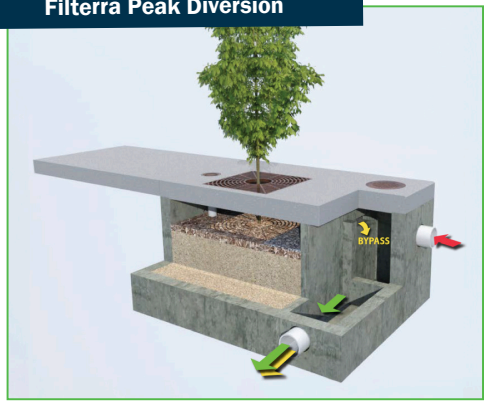
Filterra Bioscape Infiltration Vault



FILTERRA PEAK DIVERSION

The inlet pipe conveys stormwater into a forebay that allows treatment flow to enter the media chamber. Larger storm events bypass the media chamber and exit downstream via an overflow/bypass weir design.

Filterra Peak Diversion



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. 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 **(vegetation not required)** 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.

Filterra has been tested for long-term (10+ year) pollutant removal and hydraulic performance. Results demonstrate consistent pollutant removal and infiltration rate comparable to the WA TAPE field monitoring results.

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®.*

Cold Climate Considerations

Bioretention systems such as Filterra may 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:

- You may forego the vegetation altogether as it is not required in the Filterra system.
- 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® – 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.

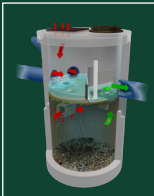
FILTERRA – ACTIVATION

- Contractor - completes and returns Activation Checklist paperwork. Do Not remove E&S Controls from device.
- Vegetation, if wanted, 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.

Explore More with Imbrium:



STORMCEPTOR® EF OIL-GRIT SEPARATOR

The enhanced flow Stormceptor® EF 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.

MODULAR WETLANDS® BIOFILTRATION

The Modular Wetlands® Linear is the only biofiltration system to utilize patented horizontal flow, allowing for a small footprint, high treatment capacity, and design versatility. It is also the only biofiltration system that can be routinely installed downstream of storage for additional volume control and treatment.

LEARN MORE

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

REQUEST DESIGN ASSISTANCE

- Call us at 416-960-9900 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 **ImbriumSystems.com/pdw.**

FIND A LOCAL REPRESENTATIVE

- Visit **ImbriumSystems.com/find-a-local-representative** for contact information for your local Imbrium representative.

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By Canadians, for Canadians.

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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 ImbriumSystems.com or call +1 416-960-9900.

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