

INFILCO

BIOFOR®



ATTACHED GROWTH

ODOR FREE

COMPACT

COMPLETELY AUTOMATED

← Applications

- BIOFOR® C for BOD, COD and TSS removal
- BIOFOR® N for nitrification of ammonia nitrogen
- BIOFOR® C+N for simultaneous BOD removal and nitrification
- BIOFOR® pre-DN for nitrate removal as a predenitrification step without additional carbon source
- BIOFOR® post-DN for nitrate removal as a final denitrification step with carbon addition



BIOFOR® filters are aerobic or anoxic process biological reactors that use attached growth technology for application in municipal or industrial wastewater treatment.

MAIN FEATURES

- Upflow filtration in which feedwater flow expands the filter media leading to an even distribution of the biomass throughout the bed
- Co-current flow of feedwater and air prevents short circuiting and also extends the length of filter run times
- Quick adaptability to flow and load variations

- Exclusive nozzle floor design which allows for optimum distribution of fluids during filtration as well as wash sequences
- Highly efficient washing system to accommodate filter bed depths up to 13 ft (4.0 m)



BIOFOR® SPECIFIC TECHNOLOGY

The BIOFOR® process is used primarily for the removal of BOD, TSS and ammonia pollution in secondary and tertiary treatment. BIOFOR® units discharge treated water that conforms to high quality standards for every parameter thanks to the filtering action of the Biolite™ filter media.

Because BIOFOR® is designed to treat higher organic loadings than conventional systems, the units can accommodate higher filtration velocities. The BIOFOR® units allow treatment of soluble pollution and solids separation in one compact reactor, so no secondary clarifiers are necessary. The PLC based control system automates the filter operation.



HOW IT WORKS

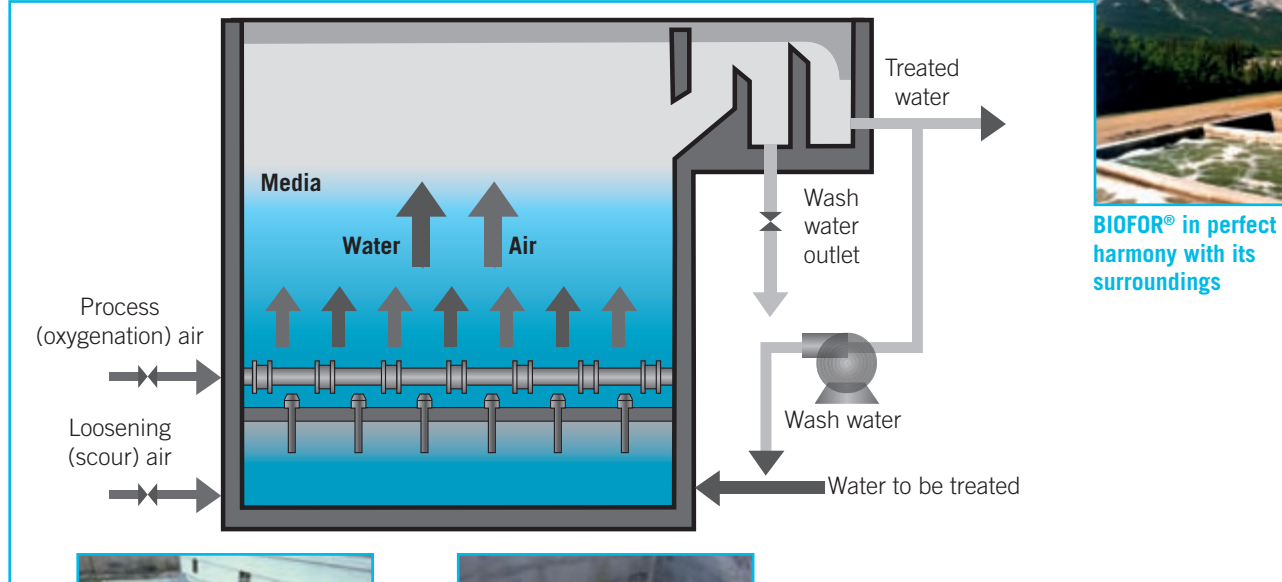
The effluent to be treated enters continuously from the bottom of the reactor and is distributed over the entire filter surface area by the nozzle underdrain. The water then passes through the Biolite™ filter media which retain the suspended solids. Carbonaceous and nitrogenous pollution is eliminated through the high concentration of fixed-film biomass which is retained on the filter media during the filtration cycle.

In the aerated versions (for BOD removal and nitrification) process air is introduced continuously into the lower part of the reactor by Oxazur® air diffusers.

The use of a co-current upflow design helps to limit odor generation since the treated water is situated at the surface of the filter (in contact with the atmosphere), and the untreated water enters at the bottom of the filter.

The number of filters in filtration service is according to the flow entering the plant. During low flow periods, off-duty filters are aerated periodically to maintain the biomass in optimum condition. Since filters can be taken out of service when not required, operating costs (due to process air production) can be reduced.

BIOFOR® PROCESS



Typical BIOFOR® installation

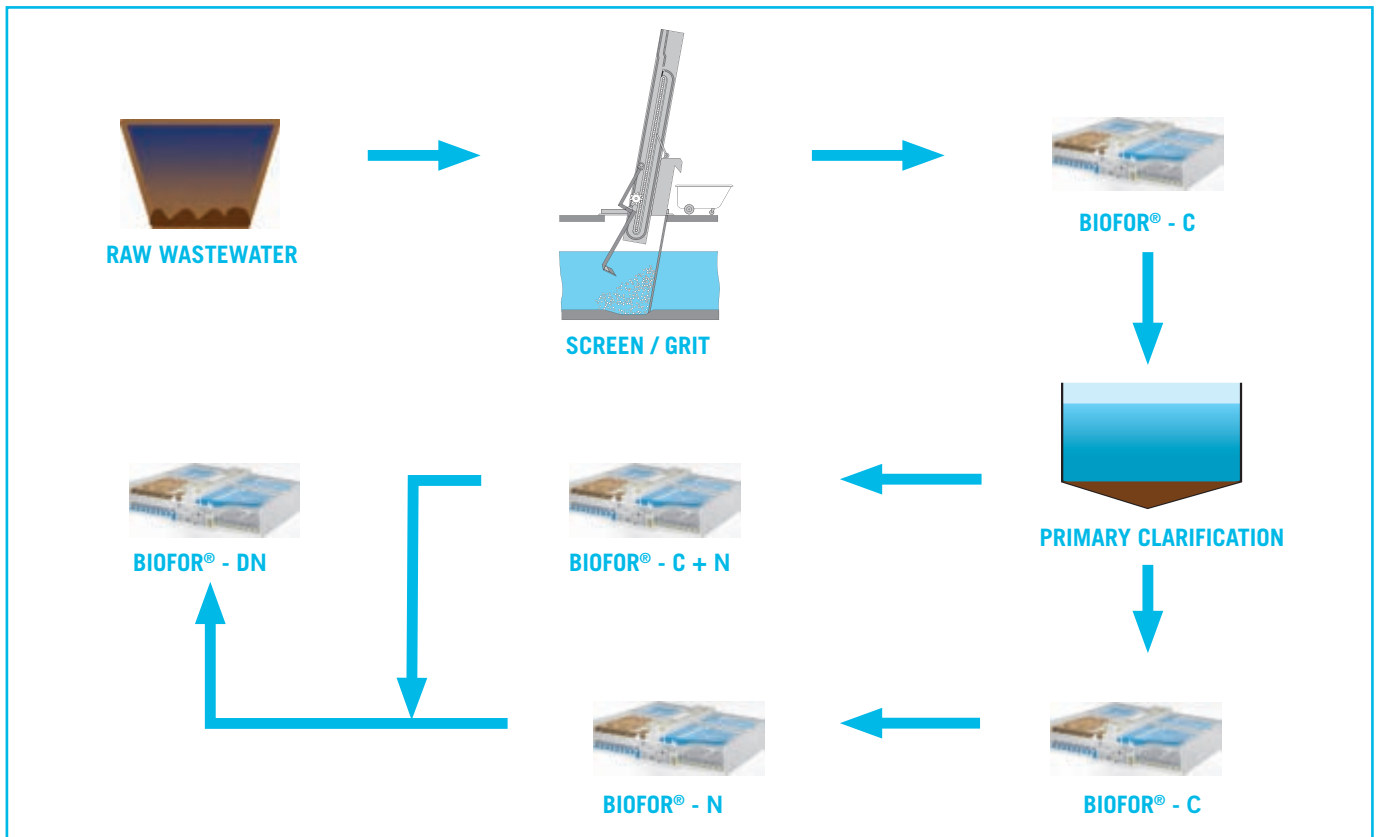


Nozzle installation in filter

- Periodically the BIOFOR® filter is washed after a pre-determined run time (24 or 48 hours) or due to a headloss build-up in the filter.
- Filtered water and scour air are used to efficiently clean the filter, preparing it for the next filter run.
- The water for the backwashes is drawn from a dedicated clean backwash tank using pumps.
- The backwash waste water is collected in a dirty backwash water tank for pumping to the backwash water treatment.

Product Highlights

- Applicable to cold water operation
- Easily adapts to variable flows and pollution loads
- Treats dilute effluents
- Excellent solution where limited space is available
- Very limited odor production
- Because of small foot-print, can be easily covered and enclosed
- Modular construction allows for easy plant expansions in the future
- Eliminates the need for secondary clarifiers



BIOFOR® TREATMENT LINE

TECHNICAL ADVANTAGES

- Valves and machinery (pumps/blowers) can be installed indoors for easy and convenient maintenance.
- Available in sizes up to 1935 ft² (180 m²) per filter.
- Variable numbers of filters can allow for energy savings during low flow periods.

DESIGN LOADING

Application	Performance	
BOD removal	Filtration rate	1.2 – 4.9 gpm/ft ² (3-12 m/h)
	Loading	90 – 360 lb/kft ³ per day (2 – 8 kg BOD ₅ /m ³ per day)
Nitrification	Filtration rate	1.2 – 6.6 gpm/ft ² (3-16 m/h)
	Loading	20 – 90 lb/kft ³ per day (0.5 – 2 kg NH ₃ -N/m ³ per day)
Pre-denitrification	Filtration rate	4.1 – 14.3 gpm/ft ² (10 -35 m/h)
	Loading	135 –310 lb/kft ³ per day (3 – 7 kg NO ₃ -N/m ³ per day)
Post-denitrification	Filtration rate	4.1 – 12.3 gpm/ft ² (10 -30 m/h)
	Loading	45 – 70 lb/kft ³ per day (1–1.5 kg/ NO ₃ -N/m ³ per day)

Performances

- TSS and BOD removal to < 10 mg/L
- Ammonia removal to < 1.5 mg/L NH₃-N
- Nitrate removal to < 1.5 mg/L NO₃-N
- Total Nitrogen removal to < 3 mg/L TN
- Aeration oxygen transfer efficiency of 15 - 25%

COMPLETE TREATMENT SOLUTIONS

Infilco Degremont offers an array of water, wastewater and industrial treatment solutions for any size client. Headworks, clarification, filtration, biological and disinfection systems are several of the product disciplines in our portfolio. With a variety of

If interested in this product, check out some of the complementary products:

- Ferazur®/Mangazur®
- METEOR® ActiveCell®
- Climber Screen®
- Helico®
- Vortex®
- AquaDAF®

product disciplines in our BIOLOGICAL department, our engineers carefully evaluate each application to provide the most cost-effective and efficient treatment solution.

- ABW®
- Cannon® Mixer
- 2PAD
- Thermylis™
- DensaDeg®

PILOTING SERVICES

Degremont Technologies offers pilot systems and services for this and many other of our product offerings. Pilot studies are a practical means of optimizing physical-chemical and biological process designs and offer the client several benefits, such as:

- Proof of system reliability
- Optimal design conditions for the full-scale system
- Free raw water lab analysis
- Regulatory approval

If interested in a pilot study for this system, please contact us for a proposal and more information.



SERVICES INFILCare®

Part Sales

Infilco Degremont sells parts and components for most INFILCO brand equipment as well as parts for demineralizers, thickeners, nozzles, pressure filters, and valves. We offer reliable spare parts at competitive prices. We maintain records of previous installations to quickly identify your requirements. Many items are shipped directly from stock for quick delivery.



Rebuilds, Retrofits and Upgrades

Infilco Degremont offers cost-effective rebuilds and upgrades for INFILCO provided systems, no matter what year they were built. If you are interested in an economical alternative to installing a whole new system, contact us for a proposal.



Contacts

www.DEGREMONT-TECHNOLOGIES.COM

Infilco Degremont Inc.

8007 Discovery Drive
Richmond, VA 23229-8605, USA
Tel: +1 804 756 7600
Fax: +1 804 756 7643
info-infilco@degtec.com

Degrémont Limitée

1375, route Transcanadienne,
Bureau 400
Dorval (Qc) H9P 2W8, Canada
Tel: +1 514 683 1200
Fax: +1 514 683 1203
info-canada@degtec.com

Manufacturers' Representative: