

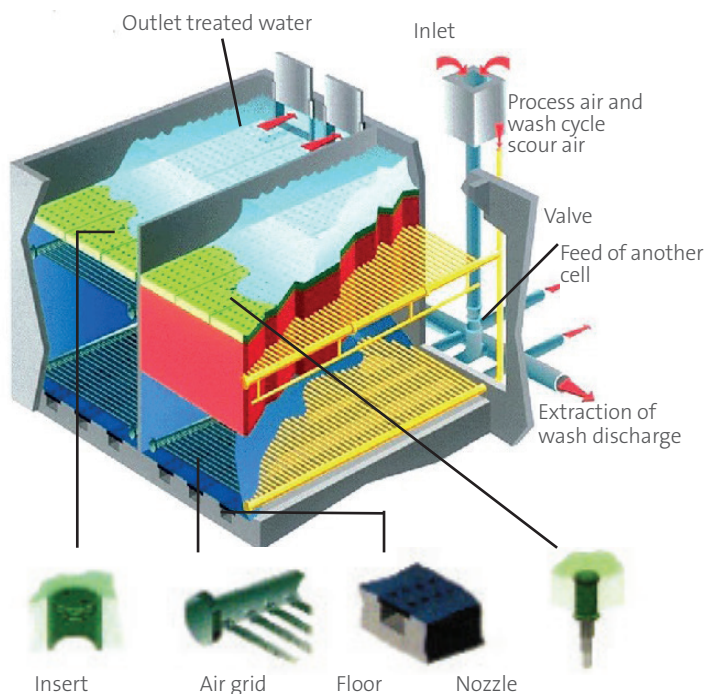
BIOSTYR® WASTEWATER

WATER TECHNOLOGIES

Mastering cutting-edge technology

Veolia Water Technologies Canada has more than 20 years experience of supplying and operation BAFF (Biological Activated Flooded Filter) processes in the municipal wastewater and industrial markets. From this extensive experience we are able to offer our BIOSTYR® process for applications ranging from carbonaceous removal to post-denitrification.

Highly compact, BIOSTYR® combines in a single structure the biodegradation of carbonaceous and nitrogenous pollution (nitrification - denitrification) and the clarification of effluent by filtration through a media bed that acts as an environment for biological activity.



The advanced solution designed to meet the most stringent discharge quality standards for organic and/or nitrogen removal.

The Process

A biological treatment...

Carbonaceous and nitrogenous wastes are degraded by active biomass, which develops on a submerged media called BIOSTYRENE®. The oxygen required for the biological reaction is provided by an upflow of process air, injected co-currently to the water supply.

...combined with upflow filtration

The retention of suspended solids and excess biomass is carried out by the filtration of the flow through the BIOSTYRENE® bed. This low-density media composed of expanded polystyrene beads is submerged and retained by a nozzle floor.

In general, the higher the level of discharge the smaller the grain size of the material.

Solutions adapted to your needs

BIOSTYR® for the elimination of carbone alone

The elimination of biodegradable carbonaceous pollution and suspended solids is carried out in a fully aerated BIOSTYR® cell.

BIOSTYR® for nitrification

This configuration, the design of which is similar to that for carbon removal, is used to eliminate ammonia, biodegradable carbonaceous pollution and suspended solids, in a single step, within the same fully aerated BIOSTYR® cell.

For secondary treatment, after simple clarification, physical-chemical clarification or high-load activated sludge: ammonia nitrogen and carbonaceous pollution are eliminated at the same time.

For tertiary treatment, after medium-load activated sludge, biofilter or trickling filter: Most additional polishing of suspended solids and residual carbon.

BIOSTYR® for nitrification/denitrification

For secondary treatment, after simple clarification or physical-chemical treatment; carbon removal, nitrification and denitrification are carried out in the same cell. The process requires a recirculation loop of the treated water to return the nitrates. Two configurations are possible:

- BIOSTYR® with two separate aerated and non-aerated zones: The nitrate generated by the nitrification process in the aerated zone is recycled and converted into gaseous nitrogen in the anoxic zone, using clarified water as carbon source required for the reaction.
- Fully aerated BIOSTYR®: Thanks to the close monitoring of the dissolved oxygen in the system and fine control of the process air supplied, aerated/non aerated micro-zones are created around the beads. The nitrification and denitrification processes operate simultaneously on each bead. This configuration has the advantage of reducing the recycle rates by about 25%.

BIOSTYR® for post-denitrification

For final treatment, after activated sludge, a nitrifying or nitrifying/denitrifying biofilter: Post-denitrification is carried out in a non aerated medium at the end of treatment, the overall level of nitrogen required.

The denitrification process is used, by adding an external carbon source (methanol), to transform the excess residual into gaseous nitrogen, with a very high denitrification yield.

A whole host of advantages

Advanced biological treatment

- The possibility of eliminating carbon and nitrogen within the same cell.
- High concentration of biomass on the media.
- Proven efficiency during high variations of load and flow rate.

Highly efficient filtration

- No final clarification is needed.
- Excellent capture of suspended solids due to filtration in a direction which compacts the media rather than expanding it.
- Filtration rate between 6 and 30 m/h, depending on application.
- Automated biofilter control system (REGUL-FILTRE™).

An intelligent compact design

- Floating media in conjunction with an upflow system.
- Easy access for nozzles maintenance with no need to empty the media.
- Protection of components sensitive to clogging (nozzles in contact with treated water).
- Wash water reservoir in the top of the filters without a separate storage tank.
- Modular design of the aeration grid, depending on application.

Cost-effective and easy to maintain

- Counter-current washing with the treated water.
- Washing by “gravity flushing” (does not require a pump).
- Sequenced air injection.
- Automated washing.

Fewer harmful substances

- Ambient air only in contact with the treated water
- Used wash water, which is collected at the bottom of the biofilters, is not exposed to the atmosphere.

High quality material for the BIOSTYRENE® beads

- Synthetic and light.
- Spherical and regular.
- Resistant to abrasion.
- From 3 to 5 mm in diameter depending on the purpose of treatment.
- High specific surface for biomass adhesion.
- Size and density adaptable to objectives.

BIOSTYR® Standard Modular Design

Veolia's expertise in the design, manufacture, installation and maintenance of the BIOSTYR® system on almost one hundred sites throughout the world enables it to offer the following:

- Standard parts for the BIOSTYR® cell (nozzles, air grid, filter media, floor, insert) whatever the application.
- A standard range of BIOSTYR® filters, from 2 to 230 m².
- Small sizes are available as package stainless steel units.



FOR HIGH QUALITY DISCHARGE

The nozzles allow the treated water to enter a common water reservoir above the filters. Part of this water is used for regular, counter-current washing, which eliminates excess biological matter and suspended solids retained in the filter bed.

The washing efficiency is optimised by a cyclic air injection sequence.

The dirty wash water can then be returned and treated in the primary settlement tanks of the works or in a specific treatment process.

Ressourcer le monde

Veolia Water Technologies

2000 Argentinia Road, Plaza IV, suite 430 • Mississauga, Ontario • L5N 1W1 Canada

tel: 905-286-4846 • fax: 905-286-0488

salescanada@veolia.com • www.veoliwatertechnologies.ca