

Membrane Bio Reactor Eco Clear

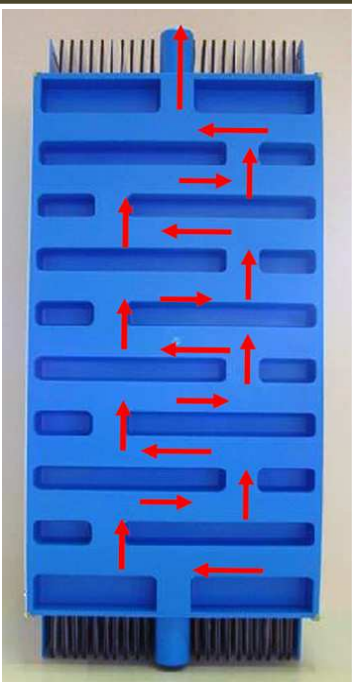
Individual wastewater treatment from 4 to 50 PE

CE NBN EN 12566-3

Our Strengths

- ✓ outstanding and permanent purification results
- ✓ combined biological and physical process
- ✓ small footprint: very compact system
- ✓ extremely reduced bio-fouling
- ✓ household water reduction up to 40%

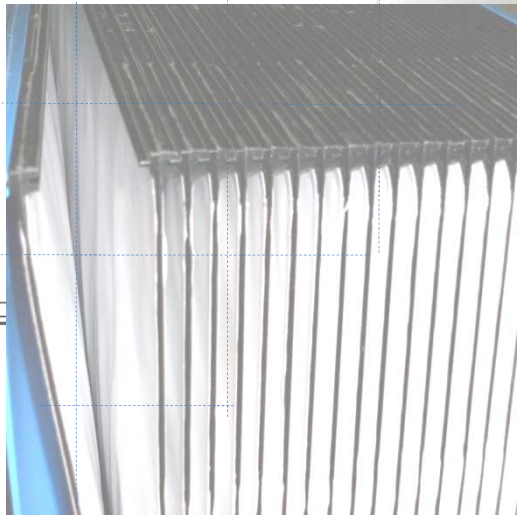
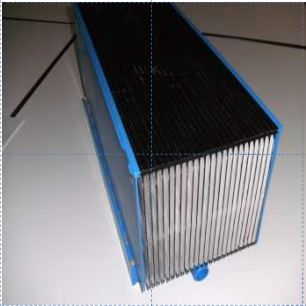
MBR Eco Clear



Permanent 99,99% retention of colloids, germs, viruses and bacteria !

The system

The submerged Membrane Bio Reactor:



Why is it so special ?



Mentality is changing in general and environment protection is becoming a major concern. Following pressure from European legislation and requirements, the re-use of water and the increase of the effluent quality of our wastewaters have become very important.

Pure water is becoming a luxury product; the demand for water already exceeds in many areas the potential of the existing sources!

After several years of research and thanks to a profound knowledge of the different purification processes, our engineers developed this MBR system, in collaboration with different institutions and think tanks from Belgium and elsewhere.

Making this promising purification technology finally accessible for individual wastewater treatment at an affordable price, ecobeton water technologies offers you the possibility to re-use your purified wastewater, where you can save up to 40% and more on your water bill !

The MBR technology is by far the best solution in wastewater treatment for the years to come. At this moment, this technique is state of the art in wastewater treatment, combining the latest technologies and knowledge in water purification. This results in water outputs with magnificent purification values, without the use of any chemicals or any additional disinfection !

The membrane technology ensures an excellent water effluent quality, with extremely low values of colloids, germs, viruses and bacteria.

The exceptional purification results of the Eco Clear membrane bio reactor demonstrate that this system outmatches by far all existing and traditional treatment systems !

This means that the treated water can be re-used for toilets, in gardens or for cleaning.

Now is the time to think about the water for tomorrow !

MBR Eco Clear

water with ID

now available as a compact solution for individual households...



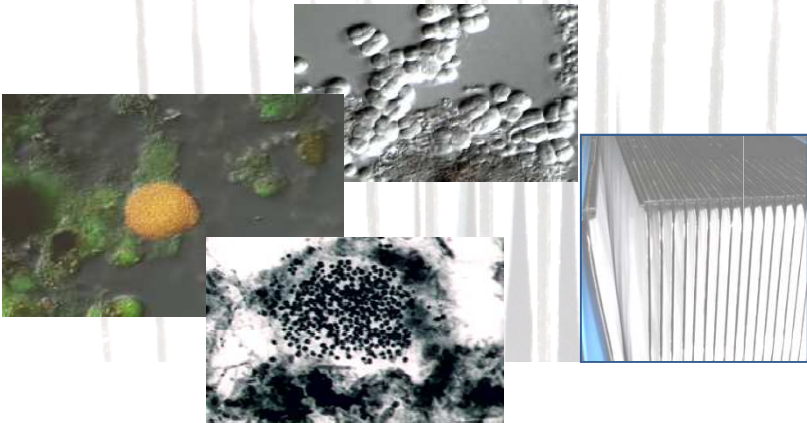
Ultra filtration

The membrane technology:

The MBR Eco Clear uses a very compact purification process, combining biological purification processes with physical purification: the membrane ultra-filtration. The membranes are used to separate the biomass from the purified wastewaters, and replace for that matter the post-settlement process, which is indispensable in the traditional activated sludge treatment systems.

Our engineers have chosen a completely integrated and submerged system, where the membranes are submerged in the activated sludge.

- Our plate membranes:
- High quality membranes for ultra filtration (fine pore size).
 - No back-flush cleaning of the membranes necessary
 - The membrane modules are very compact and can be removed as a package.
 - The design of the membrane frame ensures the best possible purification properties.
 - The ideal flux of 20 L/m²/hour is guaranteed permanently.
 - The ultra-filtration process: the chosen filtration capacity of our membranes filters out 99,99 % of the colloids, micro-organisms, bacteria and viruses.



Suitable for:

- The optimal solution for using in:
- Bathing areas (EU directive)
 - Drinking water catchment areas
 - Sensitive fish population areas
 - Water scarcity areas
 - Zones without water infiltration possibility
 - Sports- and irrigation infrastructures
 - Revaluation of existent treatment systems

Astounding purification results:

Parameter	Unit	Results
Biochemical Oxygen Demand (BOD ₅)	mg/L	3
Chemical Oxygen Demand (COD)	mg/L	26
Suspended Solids (SS)	mg/L	5
Ammonium-Nitrogen (NH ₄ -N)	mg/L	3
pH value		6,5...8
E-Coli	x/100mL	64,4
Virus retention	%	99,9999

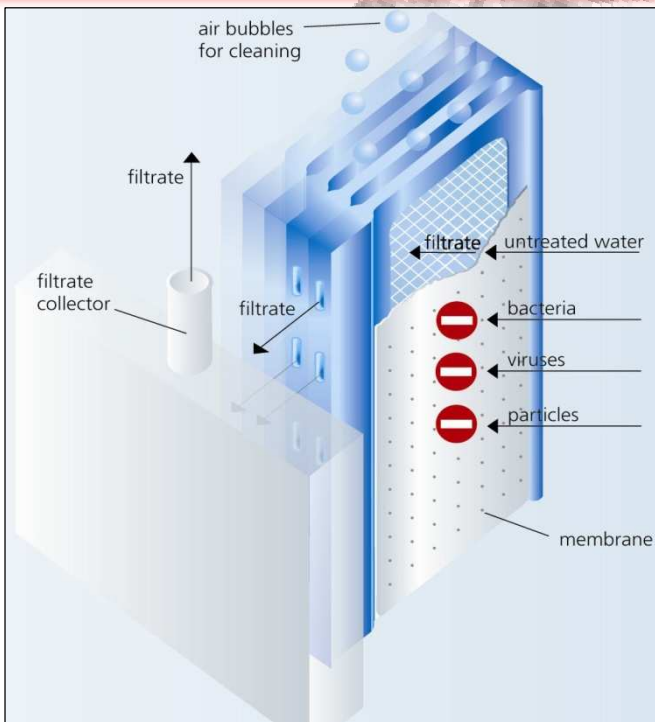
- The test results show:
- Purification results that outshine all CE requirements (cfr. EN 12566-3).
 - Extraordinary removal of BOD, COD, SS etc...



MBR Eco Clear

“ ... no need for

Eco Clear membrane bio reactor



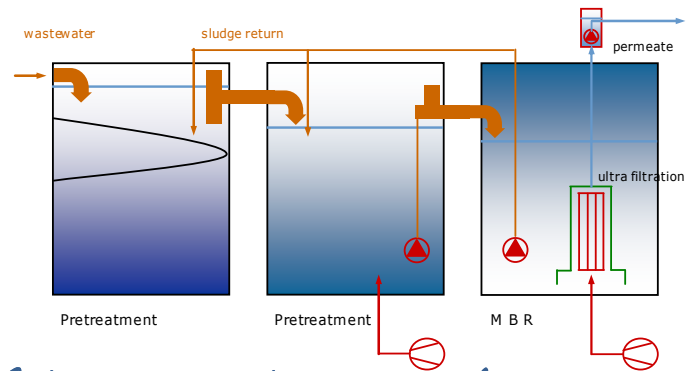
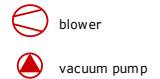
The specific purification technology by ultra filtration, using membrane filtration.

**symbiosis
of natural forces
and human knowledge**
extraordinary system -

Influent specifications:

It is from the utmost importance that the influent is well controlled:

- Only grey and black water may enter the system
- No rainwater may enter the wastewater treatment system
- Reverse flow of the effluent must be avoided



Advantages of our membranes:

- No additional disinfection system needed
- Plate & frame system: highest performance / cost rate type of membranes
- No back-flushes needed for cleaning / guaranteed flux
- Submerged system with minimal energy consumption
- Minimal maintenance: fine bubble aeration for self cleaning

	< raster electron microscope	microscope	< direct light microscope	< visible to the naked eye			
Micrometer	0.001	0.01	0.1	1.0	10	100	1000
relative size in comparison	dissolved salts	active charcoal	colour pigments	hair			
	pyrogens			yeast cells		sand	
	metal ions	viruses		bacteria		fog	
			tobacco smoke	coal dust			
			respiratory hazardous dust	red blood corp.		pollen	
atom radius	sugar	colloidal silica/particles		albumin protein	flour		
separation process	reverse osmosis			micro-filtration			
		nano-filtration				particle filtration	
		ultra-filtration					

MBR Eco Clear

water with ID

any additional disinfection...“

Eco Clear Membrane Bio Reactor

symbiosis
of natural forces
and human knowledge

- extraordinary results

Safe and easy access:

The membranes can easily be removed to be cleaned outside the tank. All other components are positioned in such way that it is not necessary to enter the tank when needed. No back-flushes needed to clean the membranes.



Purification process:

Pre-settlement

The grey (shower, sink,...) and the black water (toilets) of the house are conducted to this compartment. This is where the heavy sediment parts can settle down and liquefy. A separated grease and oil trap (a real threat for the membranes) is built in. From here on, the gravitary system ensures that the wastewater is sent to the bioreactor.

Pre-treatment

This compartment is of vital importance: a first biological process is initiated, so that small particles can not disturb the good functioning of the membranes. The biological purification ensures at the same time a better peak load resistance. A hydraulic buffer is created to ensure a constant load towards the membrane bioreactor. During normal use, optimal anoxic removal of Nitrogen takes place, making use of the available oxygen.

Membrane-bioreactor

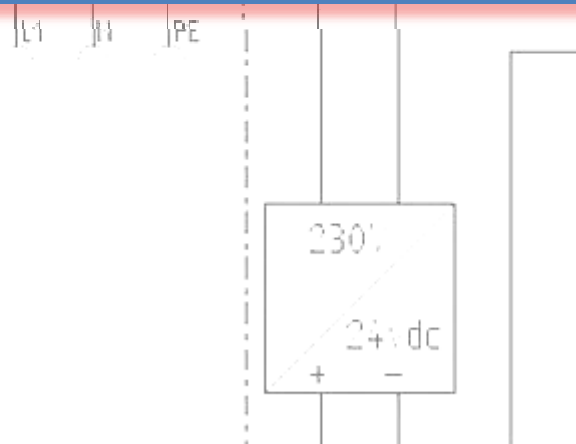
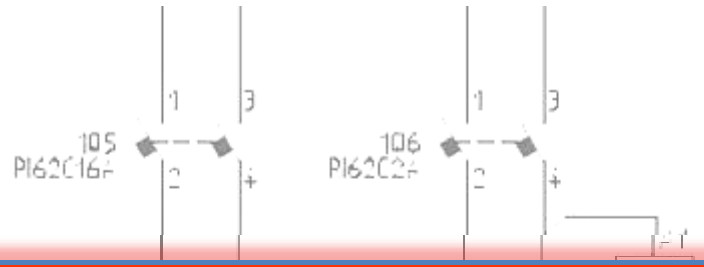
Combining biological and physical purification, optimal conditions are created for the different aerobic processes to take place. Membrane filters ensure a physical separation, reducing both COD and BOD to exceptional low values. The water is filtered batch ways, using a vacuum pump and the pressure of the water above, through the membranes into the permeate box. An airlift ensures the return of sludge both to the pre-settlement compartment and the bioreactor. A controlled 3-phased aeration avoids bio-fouling and guarantees the highest permeate flux.

denitrification

nitrification

Mbr Eco Clear

water with ID



Switch-cupboard, **CE** conform, cfr. machine-regulations 2006/42/EG.

Instructions for transport, installation, electronic control, connections, start-up and use for the treatment system are situated on the inside of the switch-cupboard.

What is the Intel-EC control system?

During the development of our small wastewater treatment systems, we attached a lot of importance to the design of a simple but at the same time reliable electronic control system for the plant.

The electronic Intel-EC control system:

- A system that works automatically and autonomously.
- Simple, functional and easy to work with (no need for a portable computer for programming or operation).
- An innovative system (specially designed for small wastewater treatment systems).
- Electronic operation manual included.
- With independent differential.
- With pre-programmed start-up phase when using for the first time.
- With minimal intervention of technician and/or end-user.

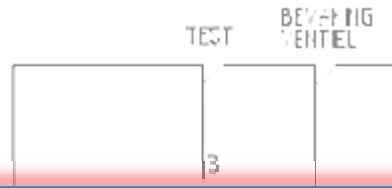
LED control signs on the front of the switch-cupboard indicate the operational condition of the treatment plant. All functions can be controlled and checked quickly at any moment using the test program button. Swift and efficient!



Easy control:

- ✓ Visual control if the system is active or not.
- ✓ An eventual malfunction is indicated visually by the LED-sign.
- ✓ Integrated test program to check the functions of the different components.

Electronic control Intel-EC



A complete control system:

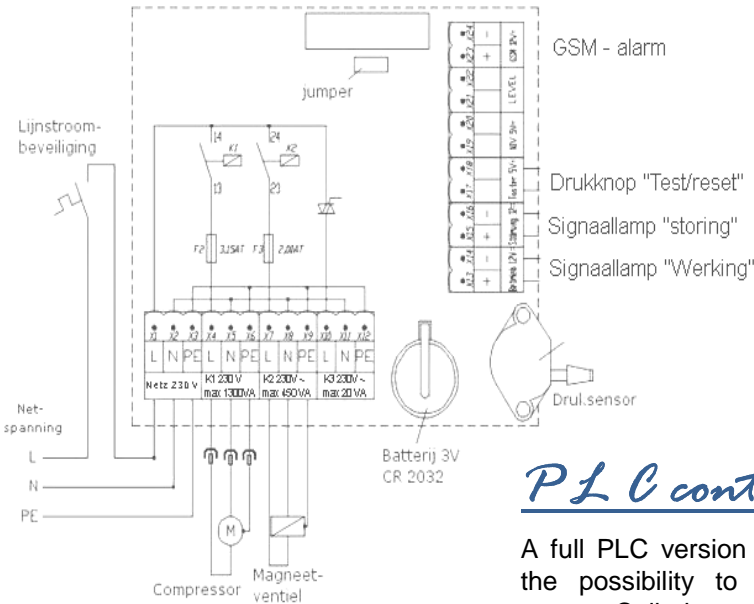
- Indication of date and time / total operating time of the installation / operating time of the compressors / sequence of the airlift function / aeration time of bioreactor / relaxation time / current average filtration flow and daily filtration volume.
- Integrated electronic operation manual with indication of power failure / low filtration flow / malfunction of:
 - one of the pumps or the valves
 - the aeration system
 - sludge return
 - level control
 - hydraulic buffer
- Easy programming of the Intel-EC control system:
 - duration of the start-up phase
 - determination of the aeration, loading and airlift sequence
- Indication of active / inactive aeration, loading and sludge return.

Minimal energy consumption:

The electronic control Intel-EC has been designed specially for wastewater treatment systems for individual households, including all important features. The system is reliable and easy to operate, at a minimal energy cost.

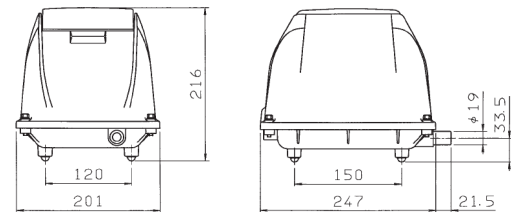
Why full control ?

The complex purification process of the MBR treatment system requires a control system with follow-up from a distance. The Intel-EC was designed to send and receive information by SMS/GPRS so that status and alerts can be acknowledged and responded.



PLC control system:

A full PLC version is available, with the possibility to expand (several pumps, Cell-phone module etc...).



MBR Eco Clean

water with ID

Eco-Clear Membrane Bio Reactor

the strengths of ecobeton water technologies:

Professionalism:

Professional experience and knowhow in individual wastewater treatment: governmental and technical demands concerning small wastewater treatment systems are becoming more severe every day. That is the reason why we continuously invest in the best and latest purification technologies. Our knowhow, based on many years of experience in wastewater treatment, combined with a close collaboration with the best renowned national and international organisations and institutes, allow us to provide the necessary certificates and attestations. This guarantees, when used properly, a perfect working treatment plant.

Your distributor

Quality and craftsmanship:

Unique high quality concrete tanks, using the most recent and modern concrete technologies:

- Wastewater treatment system in one single concrete tank, with cover.
- Monolithic tank, in one single production, T- and I-walls included.
- All connection pieces are fitted and included in the tank concrete production process.
- Total water tightness is therefore guaranteed between the different compartments.
- Concrete quality: C35/45.
- Cement: HSR.
- Resistance class:
 - EE3: frost, contact with rain.
 - EA2: average aggressive environment according table 2 of NBN EN 206-1:2001.
- Environment class:
 - XC4: alternating wet and dry.
 - XF1: moderate water saturation without thaw salts.
 - XA2: moderate aggressive chemical environment according table 1 of NBN EN 206-1:2001.

Tried & tested results:

Small wastewater treatment systems with astounding purification results: purification tests and trials (cfr. EN 12566-3 + VLAREM) have proven that we can present magnificent results.

CE NBN EN 12566-3

Our installations are produced and assembled in series.

