FLUIDRA

POND FILTER SYSTEMS

Finding the ideal solution
for naturalised pools & ponds

POND FILTER SYSTEMS

01 INTRODUCTION

Natural swimming pools have been an attraction for decades, first gaining popularity in Austria in the 1980s. Recreating a pool as similar to a mountain lake as possible, Austrian designers embellished the country's resorts and enabled guests to go for a cold, crisp swim in style.

Nowadays, **natural swimming pools** are seeing a resurgence in popularity, boosted by the public interest in sustainability and more natural solutions for our fitness and leisure pursuits. However, naturalised pools need to be kept clean and safe, so pool operators are faced with challenges: **how can the water be kept clean, filtered and high quality? What are the right pool filter systems to use?**

This e-book will cover:

- **What naturalised pools and ponds are and where they are most suitable**
- **The main types of naturalised pool and pond solutions**
- **The benefits of naturalised pools and ponds**
- **The key types of pond filter systems and their characteristics**

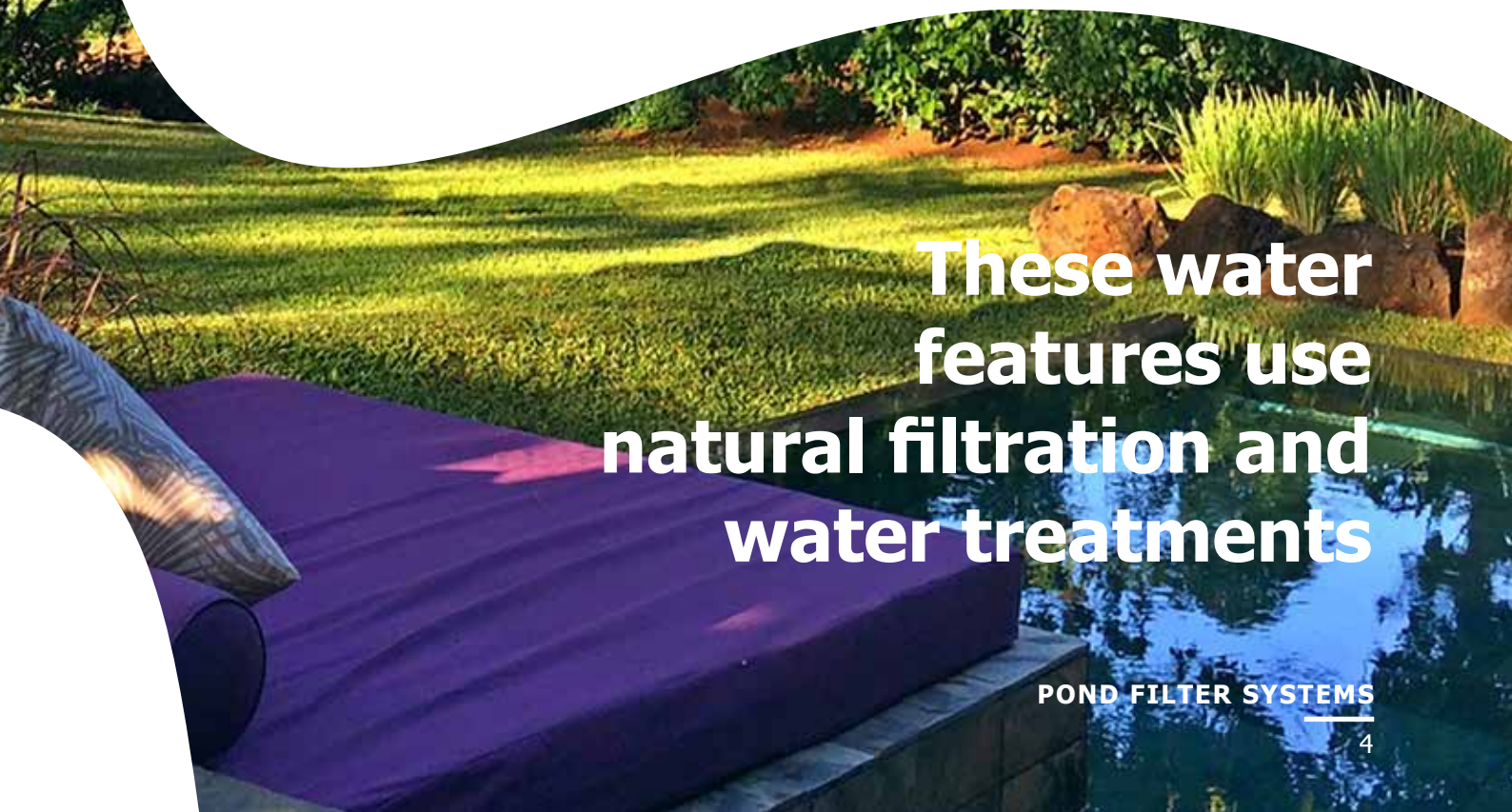
Image: Natural Pond

02 PONDS, NATURALISED POOLS AND THEIR BEST USE

Naturalised ponds and pools offer an authentic outdoor environment with a wide variety of flora and fauna, beautifying indoor and outdoor spaces alike. These water features use natural filtration and water disinfection treatments.

They can be employed to great effect in the following contexts:

- **Hotels and resorts.** Having natural water features enhances a venue's **eco-friendly** credentials and increases its popularity with sustainability-minded tourists. They are also visually appealing, providing unique and beautiful backdrops for guests.
- **Public spaces.** Naturalised ponds and pools fit wonderfully into public parks and gardens, creating an oasis of calm in urban environments.
- **Private spaces, condominiums and malls.** Adding a touch of freshness, naturalised pools will make a built-up space more attractive and add value to it.



These water features use natural filtration and water treatments

03 WHAT'S THE DIFFERENCE BETWEEN NATURALISED PONDS AND LAKES?

When it comes to a naturalised water solution, the two main types are ponds and lakes. Whilst many consider the key distinction between these to be their size, it is actually their depth that sets them apart. This becomes important when we analyse the relevant pond filter system and their application.

Limnology (the study of water bodies and the organisms living within them) defines ponds as shallow enough that plants could conceivably take root and grow across their entire surface. This area is known as the *photic zone*, i.e. where the sun's rays can reach the bottom of the water.

By contrast, a lake has an *aphotic zone*, which means there is at least one area deep enough that sunlight cannot penetrate to the bottom. This means that, logically, some very small bodies of water might have a surface of less than an acre but be deep enough to be classified as lakes. Shallow water bodies covering very large surfaces, however, can actually be considered ponds and their photic zone can span their entire length and width.

THE KEY DISTINCTION BETWEEN THESE IT IS THEIR DEPTH

04 BENEFITS OF NATURALISED PONDS AND BIOPOOLS

A naturalised pond or pool at a commercial venue or public space yields a variety of benefits for those who either run or use them.

Amongst these are:

An easily integrated water solution

While naturalised ponds and pools are not naturally occurring, they will generate an entire habitat that blends in with the surrounding environment. Over time, the flora and fauna that benefit from the existence of a pond or lake will extend and mix with vegetation and animals or birds that live in the region where the naturalised water body has been installed. This can result in unique and beautiful spots.

Moreover, a naturalised pond or BioPool can easily integrate into existing environments, looking seamless and blending in with the nature around it. By supporting planted areas, most pool filter systems actually help decorate and enhance the look of the spaces they are deployed in.

Sustainable and eco-conscious solutions

In the case of naturalised ponds and lakes, there is less of a need to use chemicals to influence the balance of the water, so there is a much lower environmental impact from these treatments. In fact, by featuring one of these water solutions, you will be reducing chlorine and diluting your acid usage by 100%.

Additionally, there is a natural water treatment formula based on bacteria called Microbe-Lift "Clean & Clear", with a living bacteria formula that speeds up the natural removal of organic waste. This product contains about 28 different species of beneficial bacteria that can remove organic waste from the water. The strains are cultured in a 100% clean environment and are completely natural (i.e. naturally occurring), not genetically modified and 100% non-pathogenic (they do not cause diseases). One should not drink this straight from the bottle, but once diluted in water it is 100% safe for all

aquatic life, allowing animals to drink the water safely. Humans could also ingest small quantities, thanks to a low concentration of bacteria that won't cause harm.

The bacteria in Microbe-Lift "Clean & Clear" will remove organic waste into CO_2, biomass and water and will thus increase the water quality, while making it healthier.

Natural maintenance

As a free, uninfluenced natural feature, BioPools are sustainable maintenance water solutions. This means they employ only natural, effective water treatment systems with a low environmental impact.

Aesthetics

No less important is the fact that a naturalised pond can have a huge ornamental impact on your surroundings, both indoors and out. They add a touch of escapism whereby end users can imagine themselves whisked away to a different place altogether, whether they are in an outdoor garden or indoors, enjoying a carefully curated green space.

Enhanced user experience

Thanks to BioPools and naturalised ponds, users can experience something truly unique and much closer to nature than in a more artificial setting like that of a sports centre swimming pool. This will make your space more attractive and help it stand out from the competition, while potentially attracting more clients who seek a more authentic, natural experience of swimming or admiring nature.

Image: Biopool

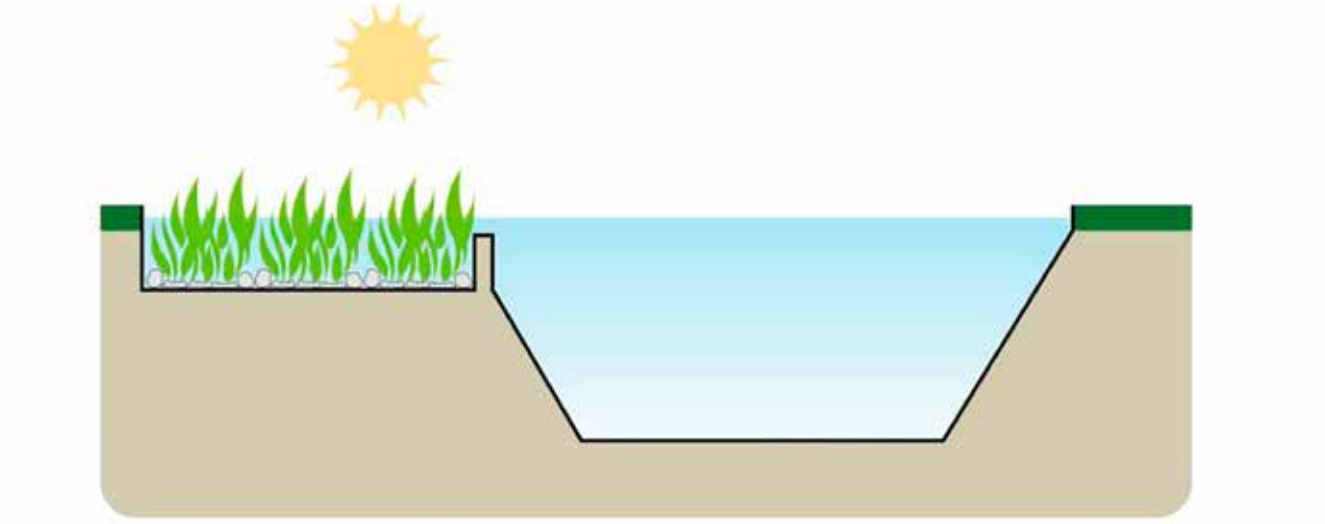
05 POND FILTER SYSTEMS AND THEIR KEY CHARACTERISTICS

Although naturalised pools and ponds are meant to offer an experience that is as close to nature as possible, allowing for either unique decor or swimming in almost-natural pools, they cannot be left untreated and unkept. This is why we advise the use of various natural filtration systems to ensure your water feature is in tip-top condition.

Here are the top pond filter systems and their characteristics:

Pure Nature

This is a natural swimming pond that allows for a highly authentic experience, while also supporting the development of flora and fauna. There is no filter technique, but you could have a small waterfall, fountain or water feature to circulate the water. Just as in nature, the water will not always be 100% transparent, but it is mostly clear.



	GENERAL				TECHNIQUE									MAINTENANCE PRODUCTS	
	CLARITY	MAINTE-NANCE	ENERGY USE	PLANT-ZONE	PUMP (24/7)	UV-C	BOTTOM-DRAIN	SKIMMER	PRE-FILTER	BIO-MECHANICAL FILTER	PHOSPHATE REDUCTION	HYDROLYSIS/ IONISATION	HEATING	BACTERIA	ANTI-ALGAE
1) PURE NATURE	--	--	++	++	-	-	-	-	-	-	-	-	-	++	++

Diagram system for pond type Pure Nature.

Image of a Pure Nature swim pond

One advantage of this type of pool is that there are no (or low) energy costs associated with it and only periodical maintenance is required (such as pruning plants and vacuuming the bottom of the pond).

To cut down on maintenance time, we recommend using bacterial formulas to improve water quality. However, it's important to understand that the walls of this type of pond will not be free of algae and/or biofilm growth.

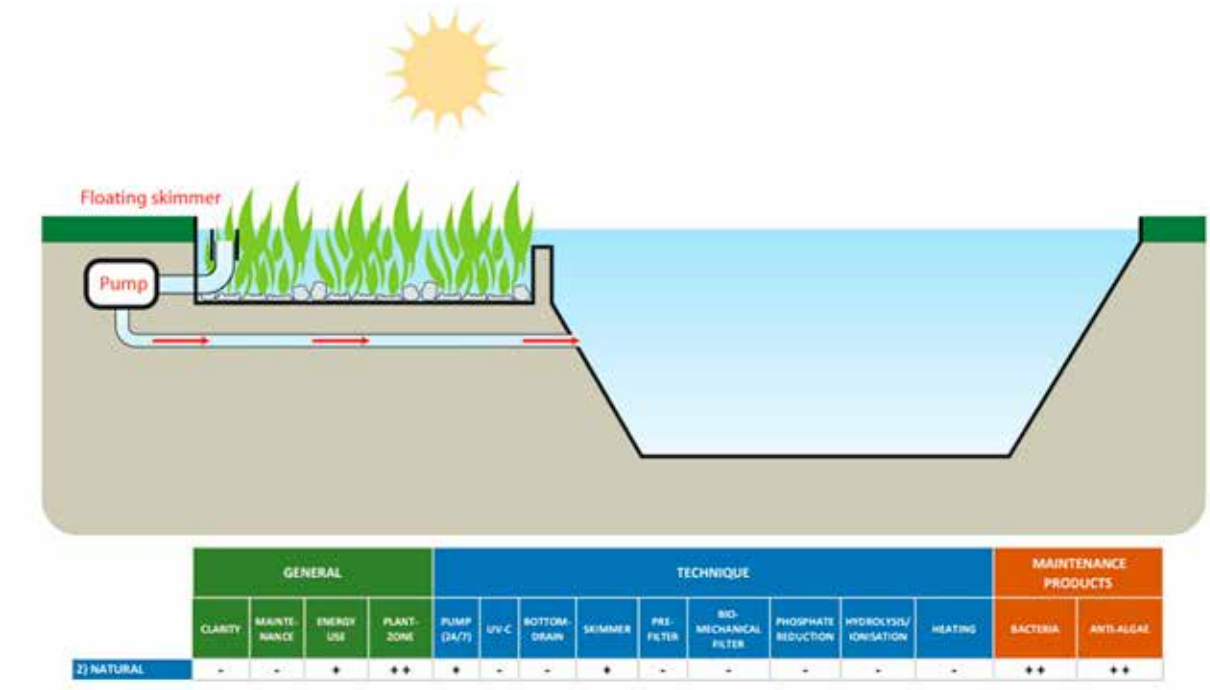
All in all, Pure Nature swim ponds offer an intense, authentic natural experience for water lovers. They rely on nature to clean themselves - through plants - which means it's not going to be a fully clean pond all year round, especially not in summer when most people would want to swim. Therefore, it's a niche solution and one that we would not advise for warm climates (where algae would grow easily and quickly).

Image: Pure Nature pond

Natural

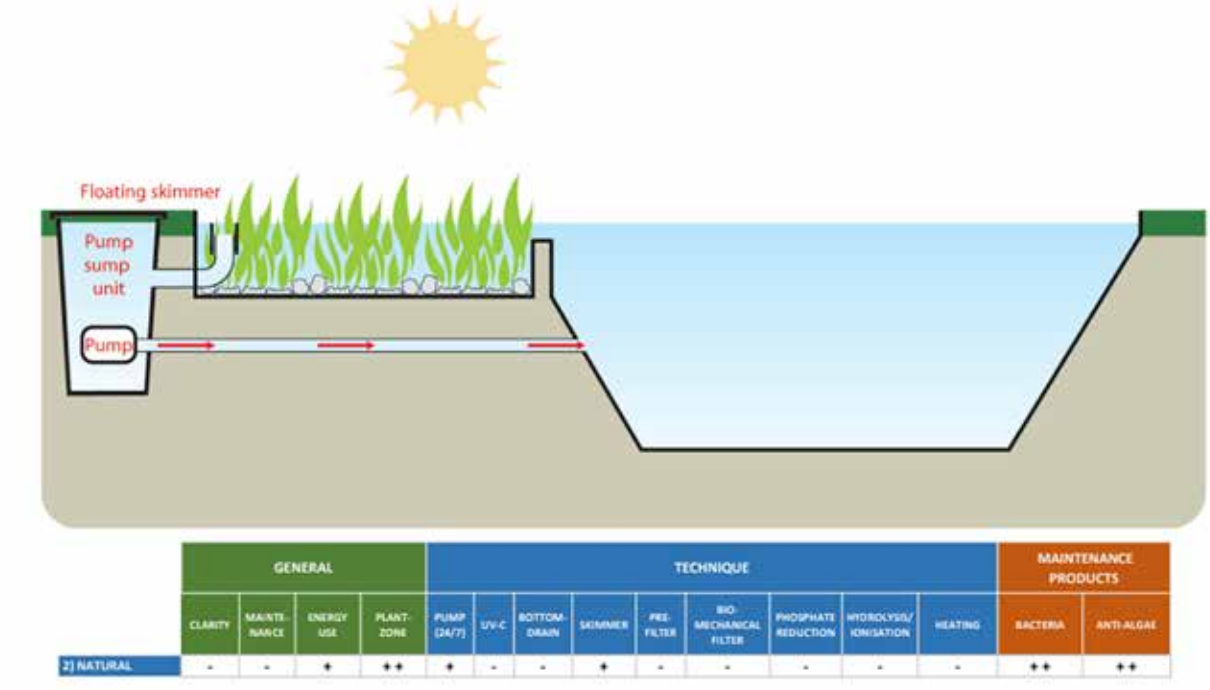
Quite similar to Pure Nature, this pond uses some technology in its functioning. The water stays mostly clear, while power consumption is low. You will need to complete maintenance periodically, but this is a reasonably easy-to-maintain pond where only cleaning the skimmer is required.

The three possible systems are described in the diagrams below:



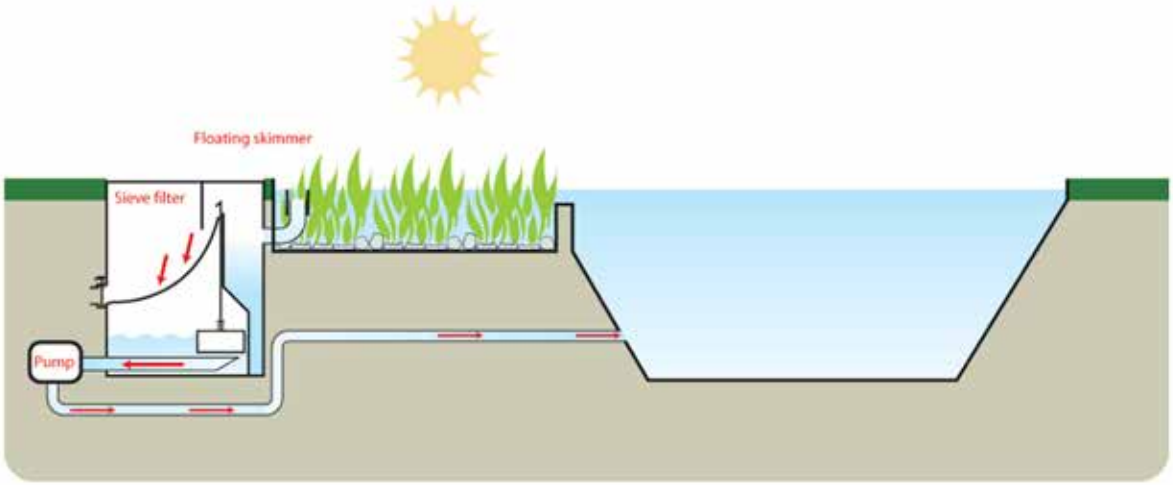
	GENERAL				TECHNIQUE									MAINTENANCE PRODUCTS	
	CLARITY	MAINTE-NANCE	ENERGY USE	PLANT-ZONE	PUMP (24/7)	UV-C	BOTTOM-DRAIN	SKIMMER	PRE-FILTER	BIO-MECHANICAL FILTER	PHOSPHATE REDUCTION	HYDROLYSIS/ IONISATION	HEATING	BACTERIA	ANTI-ALGAE
2) NATURAL	-	-	+	++	+	-	-	+	-	-	-	-	-	++	++

Diagram System 1: aspiration direct from the planter and intake to the Natural pond with a pump.



	GENERAL				TECHNIQUE									MAINTENANCE PRODUCTS	
	CLARITY	MAINTE-NANCE	ENERGY USE	PLANT-ZONE	PUMP (24/7)	UV-C	BOTTOM-DRAIN	SKIMMER	PRE-FILTER	BIO-MECHANICAL FILTER	PHOSPHATE REDUCTION	HYDROLYSIS/ IONISATION	HEATING	BACTERIA	ANTI-ALGAE
2) NATURAL	-	-	+	++	+	-	-	+	-	-	-	-	-	++	++

Diagram System 2: aspiration direct from the planter and intake to the Natural pond with a pump sump unit.



	GENERAL				TECHNIQUE									MAINTENANCE PRODUCTS	
	CLARITY	MAINTE-NANCE	ENERGY USE	PLANT-ZONE	PUMP (24/7)	UV-C	BOTTOM-DRAIN	SKIMMER	PRE-FILTER	BIO-MECHANICAL FILTER	PHOSPHATE REDUCTION	HYDROLYSIS/ IONISATION	HEATING	BACTERIA	ANTI-ALGAE
2) NATURAL	-	-	+	++	+	-	-	+	-	-	-	-	-	++	++

Diagram System 3: Natural pond including a sieve filter as a mechanical filtration system.

Natural ponds offer an authentic natural experience, while relieving some of the pressure from the proliferation of bacteria and viruses (that you might encounter with the Pure Nature option).

To keep the water free of algae and relatively clear, there are pumps, prefilters and UV-C units that provide mechanical filtration. UV offers great help in killing off the floating algae that cause water to turn green, while a well-built natural plant / substrate filter would remove the food that algae thrive on **(phosphate / nitrate)**. The latter option is quite difficult to put into practice though, especially as you might still struggle with plants dying or not growing optimally, which will reduce the water clarity.

Finally, water clarity and cleanliness will depend on many factors (pH, TA, GH, micro and macro-nutrients, etc.). Therefore, all these may need to be adjusted if looking for perfect water conditions.

Image: Natural pond

Clear

The Clear model is a swimming pond where end users can bathe and there is also an opportunity to grow plants and encourage diverse fauna as well. With a technical set-up that uses bottom drains, skimmers, sieve filters, **bead filters (with HDPE beads as filter media)** and UV-C units, clear water can be guaranteed all year round.

With this model, you will still need to perform regular maintenance such as backwashing filters. However, the work is offset by a natural experience that is enhanced with clear water.

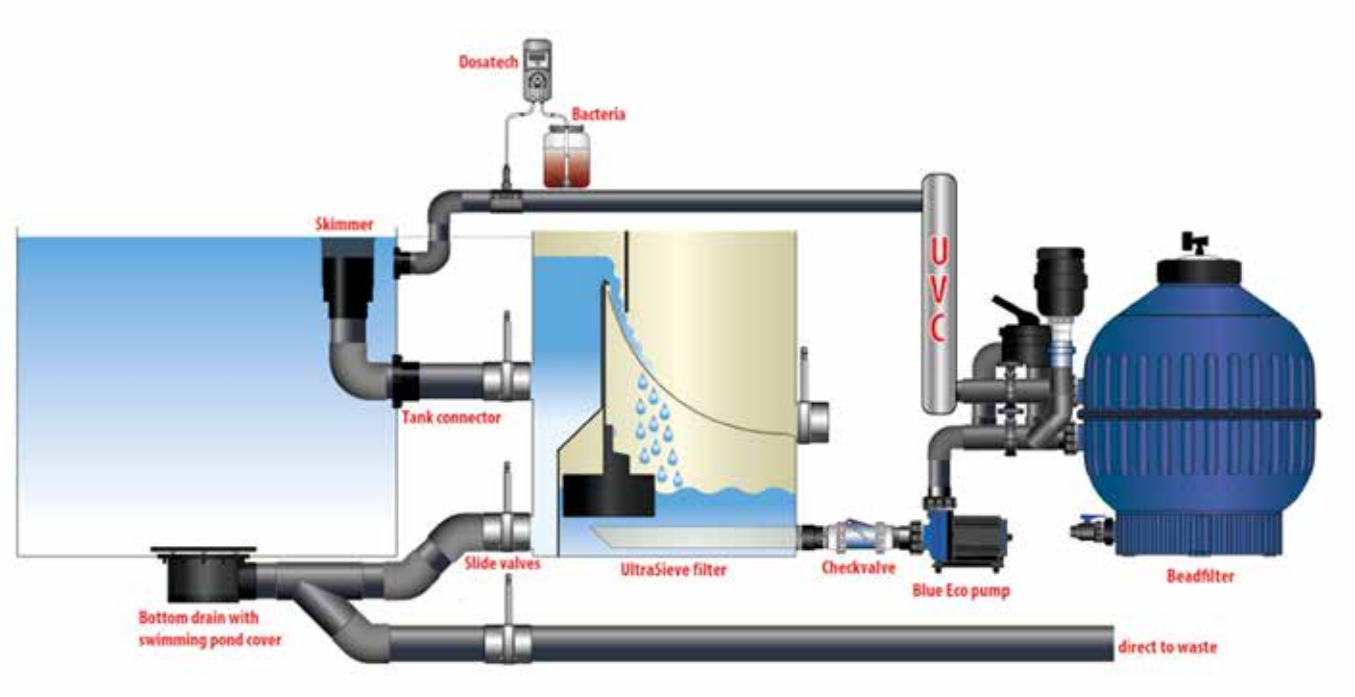


Diagram with skimmer system installation for Clear pond

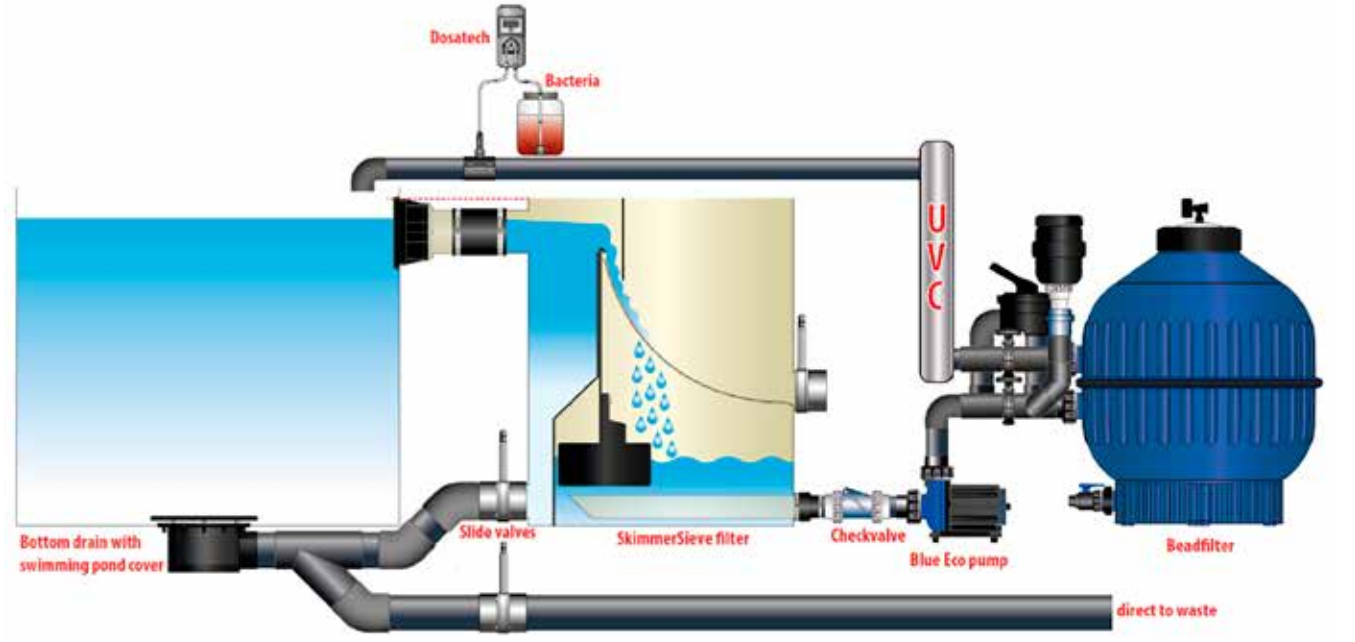


Diagram with direct overflow installation for Clear pond

In the Clear pond, the main additional element is the bead filter which makes a huge difference to the filtration system. While this is a biological filter, it acts like a fine mechanical filter, similar to a sand filter for example. Even with several months of **bacteria** growth around the small plastic beads, this installation can effortlessly filter down to 5-10 micron when backwashing is required.

Image of a Clear swimming pond

Unlike sand filters, which work for a few months but then get blocked by the **biofilm produced by bacteria**, the bead filter is much more efficient. Sand filters become clogged, with the sand coming together in clumps that are hard to remove with backwashing. In time, sand filters become completely blocked by biofilm and water can only flow through them by creating its own channels through the sand and ultimately not being filtered anymore.

With a bead filter, biofilm does build up on the beads. However, they are much bigger than the grains of sand and they float. Before backwashing, an air blower is used for 2-3 minutes to shake the beads and remove any waste on and around them. This removes the biofilm and whatever waste exists is then washed away by backwashing. Ultimately, a bead filter is the best type of mechanical filter thanks to its functionality.

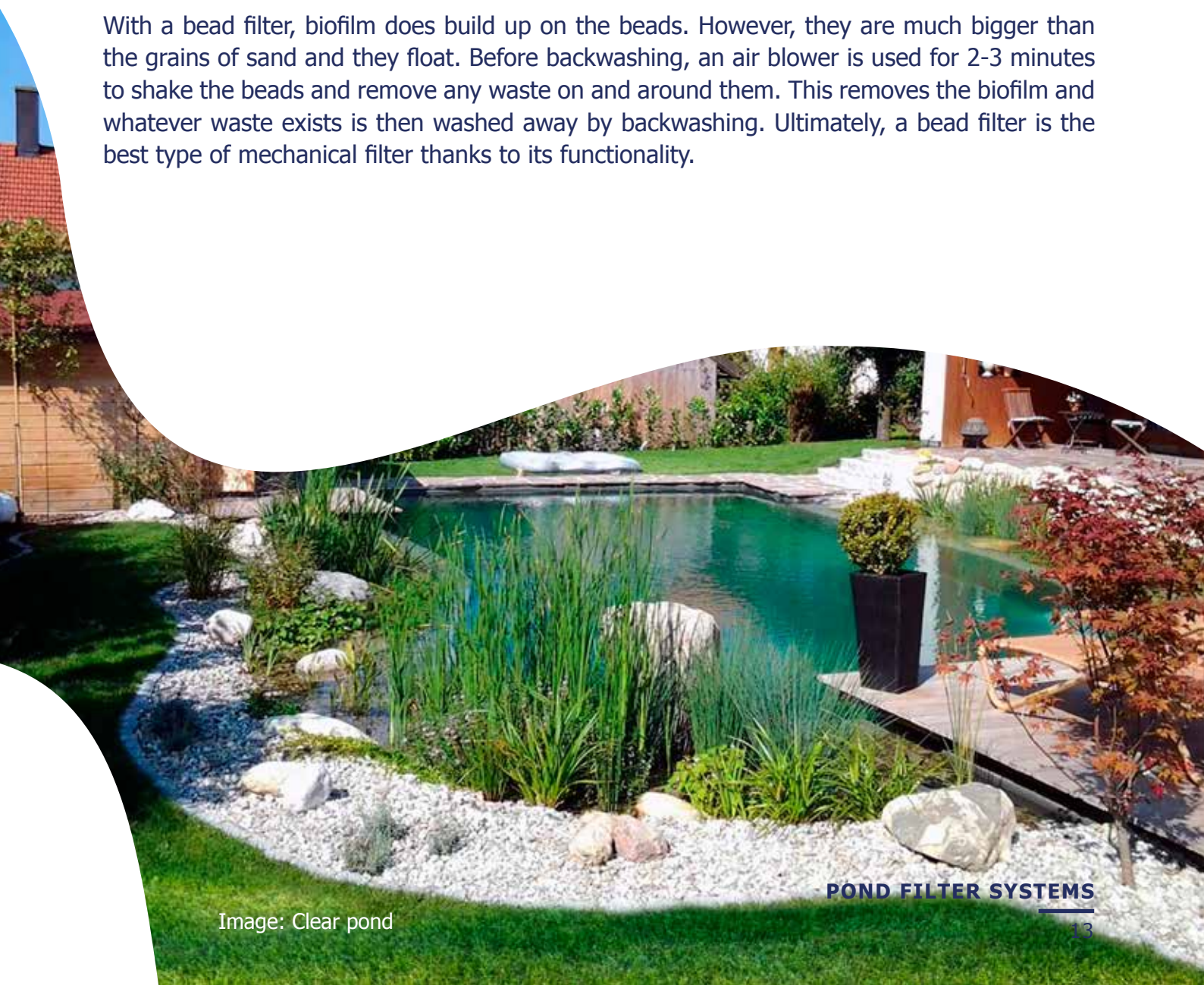


Image: Clear pond

Crystal Clear

Not quite a chlorine filled swimming pool, this option allows users to enjoy a swim in natural water with limited flora and fauna. Crystal Clear type is powered by **swimming pond filter technology (with HDPE beads as filter media)** and nutrient removal **(phosphate filters).**

The Crystal Clear model is fitted with low-consumption pumps that need to run continuously 24/7 throughout high swimming season. Moreover, the season can be extended using heat pumps.

You will need to perform regular care and maintenance on this type of pool.

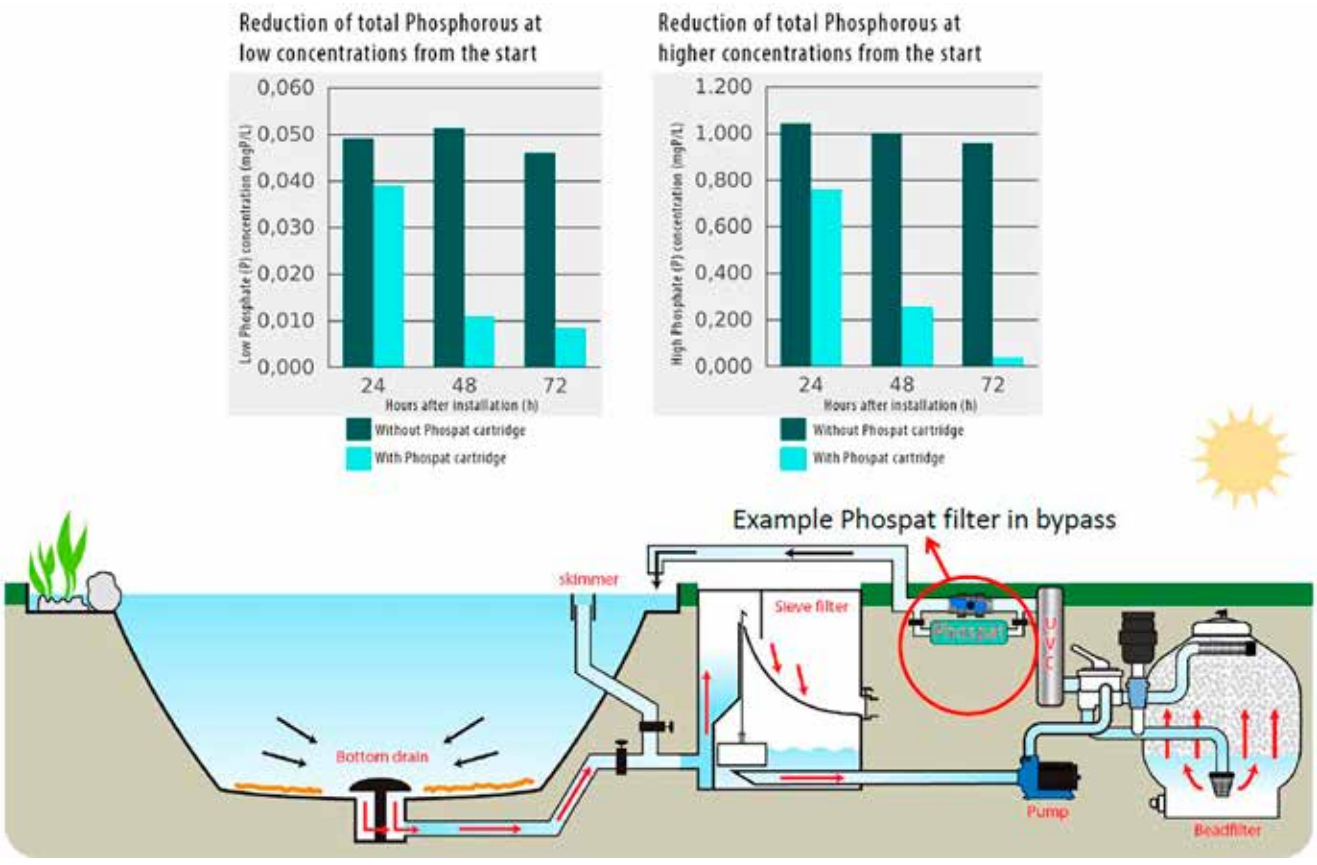


Diagram of a Crystal Clear swimming pond installation

This model features a **phosphate filter** to remove algae's most important food source. This is important as no additional chemicals are needed to kill off the algae, since they don't develop in the first place.

In addition to the **phosphate cartridge filter**, which removes phosphate from the water as it flows through, you may also use Phosfree, a liquid lanthanum chloride solution that is automatically dosed with the Dosatech dosing pump. The latter features a 24-hour clock and can repeat the same dose automatically, at the same time every day.

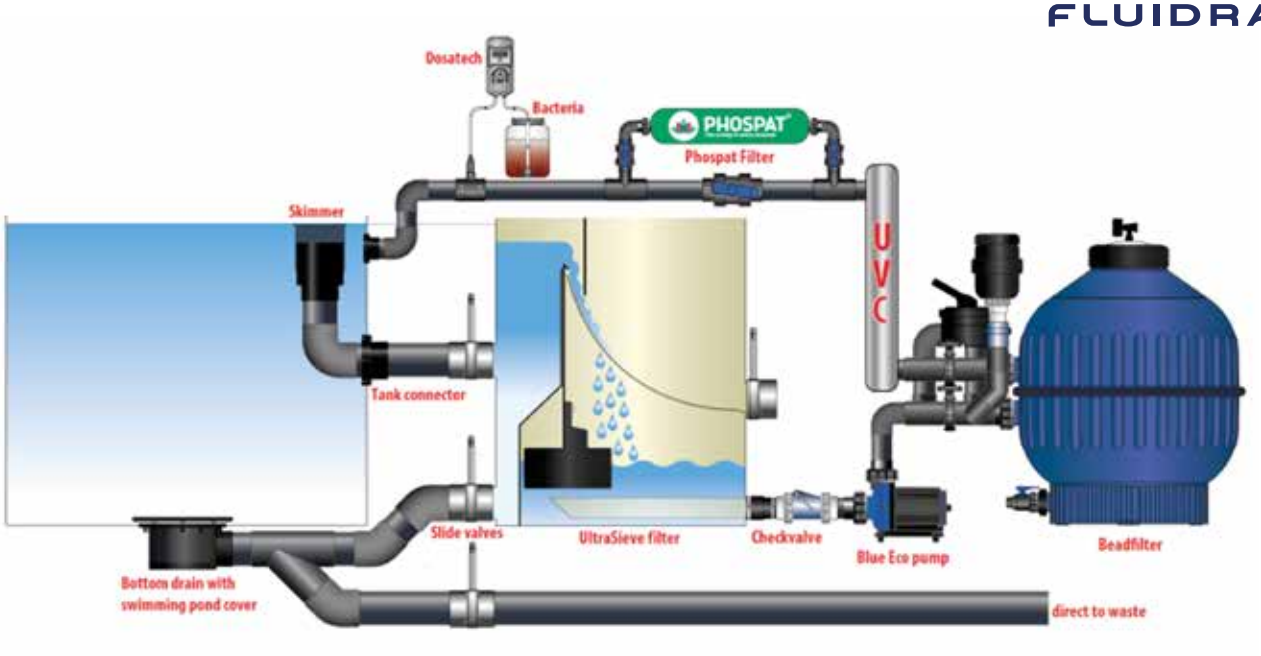


Diagram featuring a skimmer system installation for Crystal Clear pond

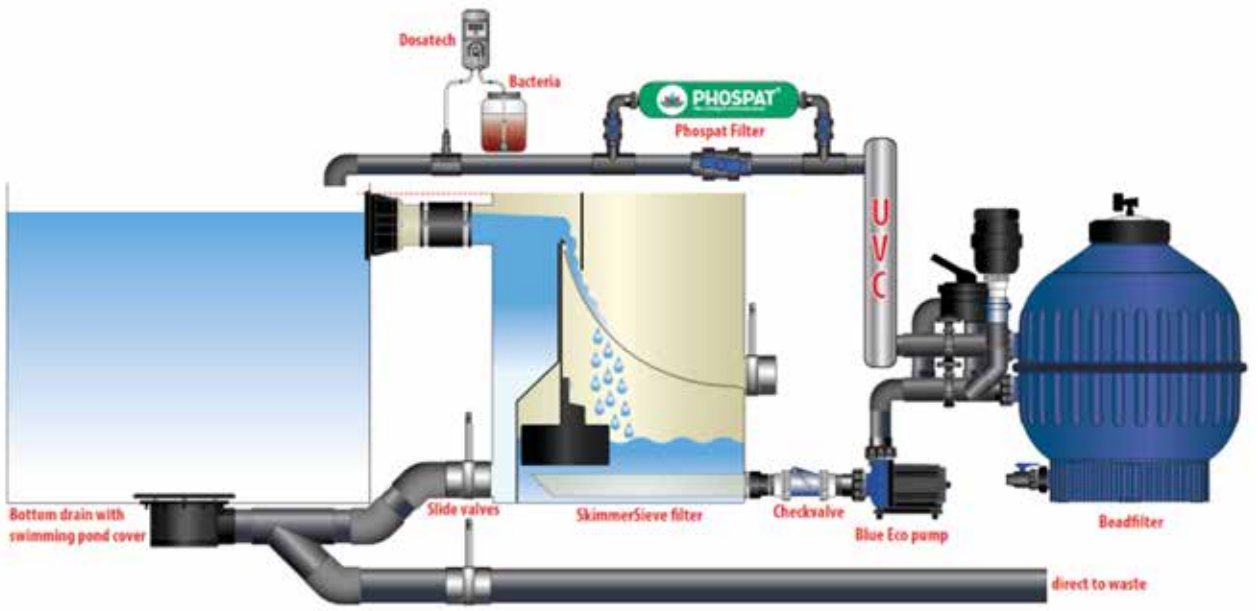


Diagram with direct overflow installation for Crystal Clear pond

Image: Crystal Clear pond

BioPool

This final option looks like a traditional pool, powered by swimming pond filter technology and **phosphate filters** that ensure the nutrient removal for algae. This is also called a "hybrid" swimming pond, as a low salt hydrolysis unit can also be used.

As an additional option, heat pumps can be fitted to extend the swimming season when it gets colder.

BioPools don't have a planting area, and the bottom and walls can be cleaned with a pool robot.

Biopool model

The difference between BioPools and ponds is that the former looks the most like an actual pool. However, it still doesn't use chemicals and it can feature a "low salt" hydrolysis system to produce oxidants and very low amounts of chlorine if needed. The redox value is much lower than that of a traditional pool (around 400 mV compared to 700-750 mV) - which means the water has less chlorine than the average tap water in Europe.

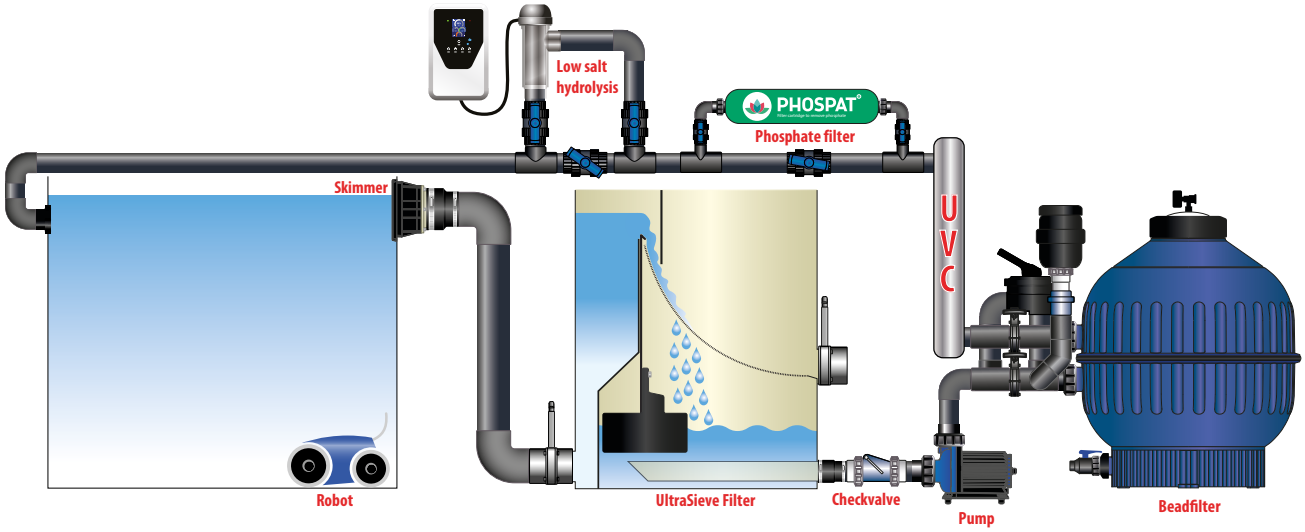


Diagram BioPool installation

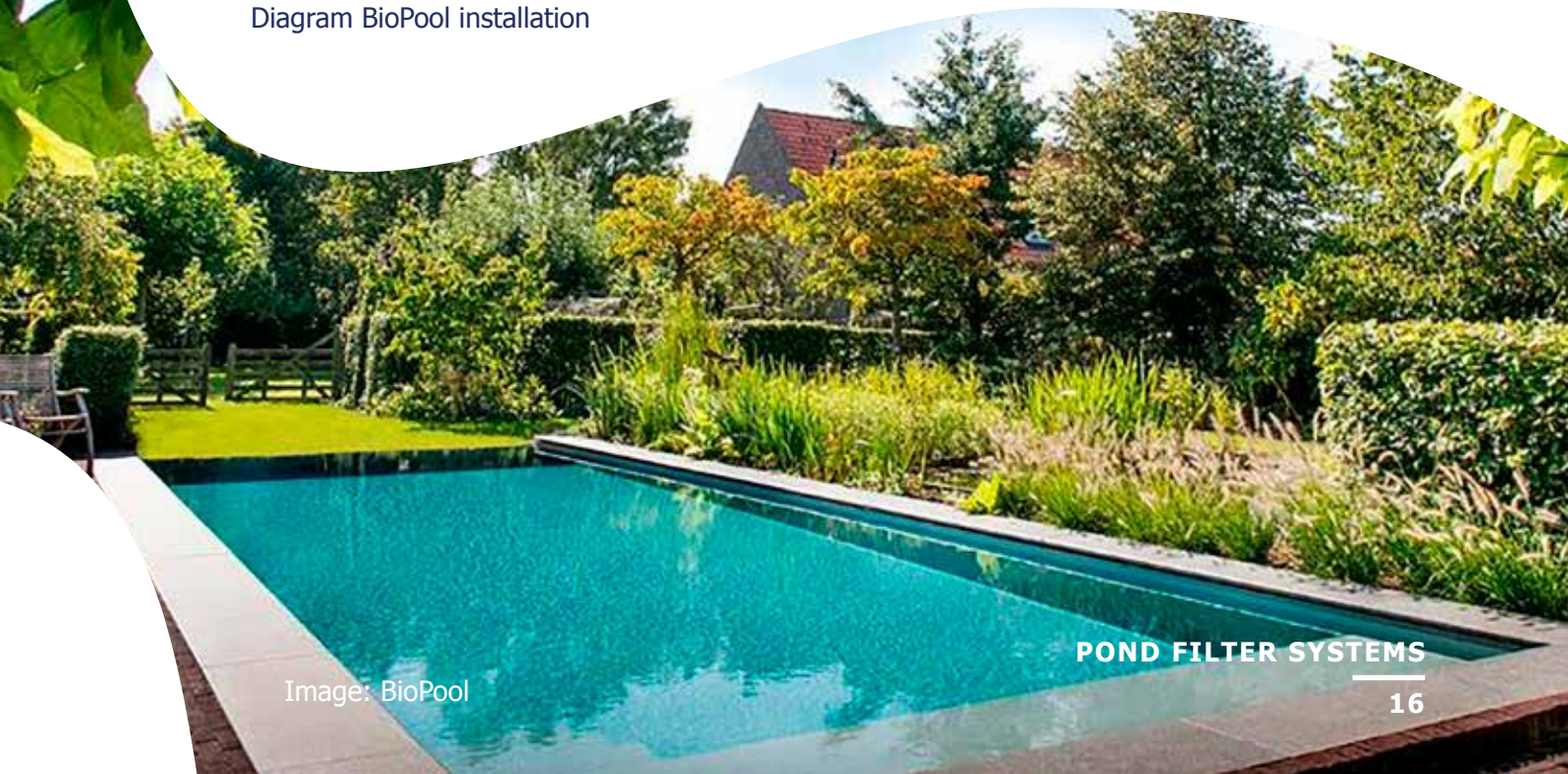


Image: BioPool

06 CONCLUSION

Thanks to their seamless integration and authentic natural vibe, naturalised ponds and BioPools offer unique and appealing solutions for swimming and spending time in the water. Choosing the right installation, however, is very important in order to keep the water clean and offer end users an optimal, enjoyable experience.

Moreover, **it is the regulations of each country that determine whether a naturalised pond or BioPool can be used for bathing in a commercial venue**. These aspects must therefore be checked before making any decision to install a naturalised water solution in your space.

If built and deployed well, in the right environment, naturalised swimming ponds and BioPools will be an important asset to your space and a great attraction for end users.

Image: Crystal Clear pond

"This information contains general recommendations that must be taken into consideration on a case-by-case basis. This information is not an instruction manual and cannot be considered as such for any purpose. Any implementation or installation to be made must be made by a professional and under the appropriate guidelines. In this regard, each user is responsible for the application it makes of the information contained herein. Fluidra will not be responsible for its use. Consequently, under no circumstances will Fluidra be liable or responsible for any claim, damages or loss that may arise as a consequence of the use of this information".

FLUIDRA

www.fluidra.com

Fluidra projects

Fluidra projects

Fluidra Group