

Filtration

Introduction to Filtration

Garden ponds provide a relaxing atmosphere and endless enjoyment. However, most ponds suffer from poor water quality which results in poor health of both fish and plants and an unpleasant smell.

Microscopic algae, the cause of green water, are present in all ponds except those 'sterilised' by chemicals. It is an unavoidable natural occurrence, but it can be minimised. If your pond has adequate depth, and size and has the right ratio of fish and plants, it may be possible to achieve a balanced, healthy pond, but in practice, this is very difficult.

Garden ponds are characteristically shallow which means they cool down and heat up faster than natural ponds. This temperature fluctuation and influences such as fertilisers and garden wastes produce excessive nutrients which encourages extensive algae growth. Also a higher fish population than is found in natural ponds accentuates the problem. The feeding of these fish causes high pollution due to excrement. This algae and excrement causes severe depletion of oxygen, high levels of toxic ammonia and a sick pond!

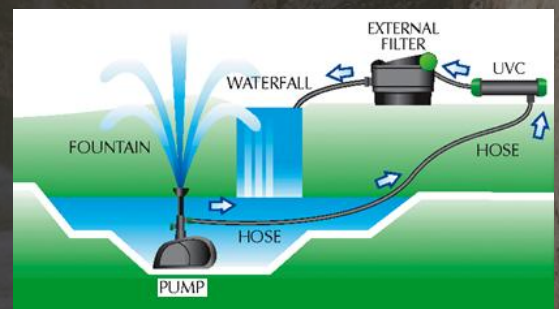
The first step in achieving better water quality is by circulation but this is usually insufficient and filtration becomes necessary. A lot of pond pumps available have small foams but cannot regard these as pond filters — they are only to protect the pump. Foam-style prefilters, if of sufficient size, will successfully 'mechanically' filter the water, but be prepared for the regular maintenance.

Biological Filters

A biological pond filter is like a miniature sewage treatment plant. Most biological filters have two stages. Firstly, mechanical filtration — which removes congealed algae and suspended matter through a Strainer, such as filter brushes or foam pads. Secondly, biological filtration — which breaks down excess nutrients, toxins and suspended matter by naturally-occurring bacteria feeding on it. This takes place in a media compartment. The bacteria converts ammonia into nitrate and nitrite into nitrate. Nitrate is either absorbed by plants or converts to nitrogen which escapes into the atmosphere. The bacteria colonise or live on the surface of the filter media. Therefore, the higher the surface area available to these microbes, the larger their population and efficiency of your filter. As the media is not densely packed and allows for easy water flow, the filters do not block up like sand filters and cartridge filters. The maintenance therefore is much lower. Filter bacteria needs a good supply of well oxygenated water to do their job, so you should only turn your pump off for short periods of time, if at all. Starved or dehydrated bacteria will die and place high demands on the pond's biological system, creating further problems. If problems occur you can boost the filter with a dormant bacteria (Bio-Start, Bio Activator, etc.). Biological filters can be either submerged or externally mounted depending on design features. Submerged filters are easily hidden in a deep pond but are more difficult to maintain. Most biological filters are mounted beside or near the pond with a gravity return line to the pond — often as a waterfall. They may need concealing but are easy to maintain and relatively trouble free. Another variety of biological filter is the pressurized unit, which can be situated anywhere. Submersible biofilters are another variant which are growing in popularity due to their versatile design which allows them to be submerged in the pond.

Installation

Pictured at right is a typical installation of a filter setup. You must always remember if setting up a pressurised biological filter that you have in line with valves attached to the inlet and outlet so that when you perform maintenance, the pond does not siphon out.



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Pre Filters

Tornado Prefilters will cater to most small water feature applications. These filters can be adapted to suit almost every pump.



Model	Description	Outlet Size	Dimensions	Max Pond Size	R/R \$
XF6620	Foam Prefilter,	12mm (½")	75 x 75 x 100mm	80 L	
XF6640	Foam Prefilter	25mm (1")	95 x 95 x 250mm	100 L	
GUPF01	Caged Prefilter	19mm (¾")	250 x 200mmØ	200 L	

Pressure Filters

Although not as effective as a Gravity Filter, Pressurised biological filters are great when there isn't enough room to conceal a Gravity Filter. They can be positioned almost anywhere and some models can be submerged. Coupled with an inbuilt UV makes them an ideal choice. Larger units are available with or without bigger UV Clarifiers.

Model	Description	U.V. (w)	Max Head (m)	Max Flow (lph)	Outlet Size	Cable	Dimensions	Max Pond Size	R/R \$
BF3594	3 in 1 bio filter	---	3.0m	800	25mm (1")		265h x 190Ø	1600	
BF1686	Jetstream 500	---	3.0m	1000	25mm (1¼")		265h x 190Ø	2000	
BF1693	Jetstream 1000	---	3.0m	2000	25mm (1¼")		605h x 370Ø	4000	
AHPF10	Tornado Filter 4000UV	7 w	3.0m	1500	25mm (1")	10m	378h x 366Ø	4000	
AHPF20	Tornado Filter 8000UV	9w	3.0m	2500	25mm (1¼")	10m	525h x 370Ø	8000	
AHPF10	Tornado Filter 12000UV	11w	3.0m	4500	25mm (1¼")	10m	605h x 370Ø	12000	



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Gravity Filters

If you have the room a Gravity type Filter is the way to go. They are the most effective and require the least amount of maintenance. They must be positioned above the water so the water can just run back into the pond. Larger units are available with or without bigger UV Clarifiers.

Model	Description	U.V. Power Rating (watts)	Max Head (m)	Max Flow (lph)	Outlet Size	Dimensions	Max Pond Size	R/R \$
BF0528	Minipond Filter 4500	5 w	3.0m	2250	40mm (1½")	410 x 240 x 320mmH	4500	
BF0535	Minipond Filter 6000	9 w	3.0m	3000	40mm (1½")	410 x 240 x 320mmH	6000	
BF0559	Midipond Filter 10000	18 w	3.0m	5000	40mm (1½")x3	515 x 405 x 405mmH	10000	
BF0556	Midipond Filter 14000	24 w	3.0m	7000	40mm (1½")x4	515 x 405 x 405mmH	14000	



U.V. Clarifiers

Ultra-violet clarifiers ensure crystal clear water. These use ultraviolet light from a special lamp that kills algae and other microscopic organisms as the water passes through the unit. It thus 'sterilizes' the pond water and aids in reducing diseases and algae. They should **ONLY BE USED WITH BIOLOGICAL FILTERS**. The filter is required to remove dead algae from the water and the UV units are more effective in clearer water.

Model	Description	U.V. Power Rating (watts)	Max Head (m)	Max Flow (lph)	Outlet Size	Dimensions	Max Pond Size	R/R \$
BF1478	Minipond 4500 UV	5 w	3.0m	2250	25mm (1")	290 x 80mmØ	4500 L	
BF1485	Minipond 6000 UV	9 w	3.0m	3000	25mm (1")	290 x 80mmØ	6000 L	
UVC10K	Algaclear UVC 10000 11w	11 w	3.0m	6000	40mm (1½")	300 x 75mmØ	10000 L	
UVC20K	Algaclear UVC 20000 18w	18 w	3.0m	10000	40mm (1½")	500 x 75mmØ	20000 L	
UVC35K	Algaclear UVC 35000 36w	36 w	3.0m	15000	40mm (1½")	500 x 75mmØ	35000 L	



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Choosing Your Filter Size

Filters are calculated according to pond size. Flow rate is also critical — keep under maximum flow rates or you will lose efficiency and bacteria will not thrive. It will be washed out into the pond! Recommended flow rates; 60 to 80% of the filter's maximum flow rate; pond turnover rates of 1 hour under 1000 litres, 2 hours under 5000 litres, 3 hours for 5000 to 15000 litres and 4 hours over this. Please Note: A new biofilter may take up to 8 weeks to become fully effective — unless it is first boosted with Bio-Start or Bio-Activator'.

Filter	UV w	Max Pond Size	Pond in Full Sunlight	Shallow Pond Under 75cm Depth	Pond in Full Sun and shallow	Pond with Fish, full Sunlight, and shallow
3 in 1 bio filter		1600 L	1000 L	1000 L	500 L	100 L
Jetstream 500		2000 L	1200 L	1200 L	800 L	200 L
Jetstream 1000		4000 L	2000 L	2000 L	1000 L	400 L
Tornado Filter 4000UV	7	4000 L	3000 L	3000 L	2000 L	1500 L
Minipond Filter 4500	5	4500 L	3375 L	3375 L	2531 L	1265 L
Minipond Filter 6000	9	6000 L	4500 L	4500 L	3375 L	1687 L
Tornado Filter 8000UV	9	8000 L	6000 L	6000 L	4000 L	3000 L
Midipond Filter 10000	18	10000 L	7500 L	7500 L	5625 L	2812 L
Tornado Filter 12000UV	11	12000 L	10000 L	10000 L	6000 L	5000 L
Midipond Filter 14000	24	14000 L	10500 L	10500 L	7875 L	3937 L
Tornado Filter 12000UV	11	12000 L	10000 L	10000 L	6000 L	5000 L

Other Filters

There are other filters available on which are designed to do specific jobs. There is the electronic blanket weed control which has two probes which wrapped around pipe work and send out a frequency between the two which de stabilises the ions in the water making it hard for blanket weed to grow. And there is pressurised bead filters which are ideal for use with very high fish stock levels. They have a shake pump mounted on the side to help get rid of waste when they are back washed.



Other methods of controlling algae are chemical or bacterial additives. Chemical additives come in two types — the bromine/chlorine based algaecides and precipitating type additives. Algaecides are effective in killing algae, but will also kill fish and plants. Even 'fish and plant compatible formulae' algaecides WILL retard growth of fish and plants. Precipitative additives (Greenaway) work well. They cause all suspended matter to fall to the bottom of the pond. However, neither style of treatment is a long term cure. They are best used as boosts for biofiltration and occasional pond 'medicine'. Use before installing biofilters or to assist in extreme weather conditions if the bio-system is struggling to cope. Used on their own, they will need regular reapplication.