

FEDERATION OF BRITISH AQUATIC SOCIETIES

AQUARIUM MANAGEMENT CARE SHEET No: 1 Filtration

01/01/98

As water is the fish's natural environment, it follows that its quality should be maintained at the highest level at all times.

This is best achieved by using filtration equipment in association with regular partial water changes.

Water can be cleaned by filtration in three methods -

Mechanical, Chemical and Biological

MECHANICAL FILTRATION

Mechanical Filtration removes of solids and physical impurities from the pond or aquarium water by means of sedimentation, settling, or the use of some method of physical straining through a sponge-type medium (in aquariums) or brushes (in ponds). This removal of the visible water pollution will not on its own necessarily provide the best environmental condition for fish.

CHEMICAL FILTRATION

A material such as activated carbon will adsorb pollutants from the water, removing any yellow colouration in the process. Other reagents may be used to change the water's properties: for instance, zeolite can be used to reduce hardness

Zeolites, Activated Charcoal, pH Buffers and other commercially available chemicals all have a use in practical fishkeeping but you are advised to 'complete the basics' prior to adding these sophistications to your filter circuit.

Filter media such as sponges, activated carbon, zeolite etc can easily be contained in chambers within the filter unit itself.

BIOLOGICAL FILTRATION

Biological Filtration is not, in fact, filtration but purification and makes use of naturally-occurring bacteria to remove toxic waste products (generally ammonia-based) and other chemical impurities from pond or aquarium water.

The general principle is to encourage bacteria to colonise as large a surface area as possible, usually within the gravel itself (undergravel filtration) or in a special filter unit containing fine silica sand (fluidised bed filters).

A constant water flow through these two types of media is vital to maintain bacterial life and care should be taken not to interrupt any power supply to these types of filter.

Most filtration media have one main function (Mechanical or Biological) but there is usually a degree of both in any filter once it matures. A biological system may take several weeks before it becomes mature, and should never be overloaded by adding too many fish at any one time.

**Always clean filter media in aquarium or pond water;
using tap water will kill off any beneficial bacteria.**

Where a filter has several layers of media, it is good practice to change only a part of this media at any one time in order to maintain the filter's bacterial efficiency.

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TYPES OF FILTER

Aquarium filters, now generally operated by an electrically-powered impeller than by air from an air-pump, can be for either internal (submerged in the aquarium water) or external (sited outside the aquarium and connected to it by hoses) use.

The latter method is slightly more easy to maintain and disturbs the aquarium less when servicing is required. Most filters are 'dedicated' to certain standard aquarium sizes, so make sure you get the correct size for your aquarium.

Pond filters are usually hidden in the rockery beside the pond and can incorporate not just sedimentation and biological filtration chambers but also ultra-violet lamps too.

Large Koi pond filters (usually at least one-third the size of the pond) are fitted in the ground and connected to the pond by drainage pipes installed during the pond's initial construction; they can be 'gravity-fed' with a pumped return to the main pond after cleansing has occurred.

It is good pond management practice to fit all external filters with 'back-flushing' facilities in order to periodically remove accumulated sludge from the filter.

PROTEIN SKIMMING

Used in marine aquariums, this is another method of removing organic material from the water. This is achieved by using fiercely aerated water within the filtration unit: organic matter is attracted to the water/air bubble interfaces and the resultant pollutant-laden foam is collected in a chamber from where it can be regularly emptied.

ULTRA-VIOLET UNITS

Ultra Violet Units, used correctly are sterilisers and are capable of 99.9% sterilisation of water.

Used in conjunction with a filtration system, they will indirectly clear algal growth (Green Water) in pond or aquarium and have a place in practical fishkeeping if used correctly.

UV Light can be dangerous and such units should be used with care and discretion.

Similar, but not so generally known, are Ozone generators. These utilise high voltage discharges to generate ozone which, unless properly controlled and dissipated, can be just as effective in killing off your fish as well as all the potential nasties at which you aim it!

MISCELLANEOUS EQUIPMENT

Marine aquariums can also use very sophisticated units in order to keep water conditions perfect.

Kalkwasser units can automatically add calcium as and when required. External Trickle Filters and denitrifying units are also used. Much of this extra equipment can be housed in the cabinet below the main aquarium.