Filtration -

A good filter can handle a number of tasks;

- Mechanical filtration
- Biological filtration
- Chemical filtration

MECHANICAL FILTRATION is the removal of suspended particulate waste matter from the water. This is done by passing water through some form of sieve of filtering media such as filter wool, foam or gravel. The finer the media, the better the mechanical removal of particles from the aquarium. Though the finer the media, the faster it will become clogged with particulate waste, which would require more frequent cleaning.

BIOLOGICAL FILTRATION depends on beneficial bacteria to break toxic organic by-products into safer compounds for fish. It usually takes several weeks before there are sufficient bacteria in the filter to accomplish the task efficiently. The bacteria live on the surface of the filter media, hence the larger the surface area of the media, the greater the number of bacteria. The more bacteria, the greater amount of waste break-down possible. Bacteria do not 'filter' out the wastes, but convert it to less toxic forms. Fish excrete waste in the form of ammonia. Ammonia is highly toxic, especially in alkaline water. In water of pH less than 7.0, the ammonia converts to the less toxic form called ammonium. So fish kept in water of a very high pH level (7.5 and above) run the greatest risk of being affected by toxic ammonia levels due to insufficient biological filtration. The bacteria convert both ammonia and ammonium into the relatively non-toxic form called nitrate. This conversion is done in two stages, from ammonia and ammonium into a form called nitrite, and then into Nitrate. Nitrite is toxic in small amounts and can be measured by a simple test. If one obtains a nitrite reading of more than 0.1mg/l (0.1ppm) then this is a result of insufficient bacteria in the filter to carry on the conversion to Nitrate. Nitrates are absorbed by plants and algae and can also be removed by doing water changes. If nitrates are allowed to accumulate in the aquarium, then the pH will drop, the health of the fish will deteriorate and various problems will begin to occur.

CHEMICAL FILTRATION is the change of water chemistry such as; change of pH or the hardness of the water, removal of ammonia, dyes, medications and any harmful gasses. Peat moss is often used in filters, it softens the water and it releases humic acid which acidifies the water. This is not really necessary in most of the metropolitan area due to the water already being fairly soft (free of carbonate and sulphate salts). Ammonia removers such as “Ammorid” will actually absorb ammonia. This is particularly useful where too many fish have been added to the aquarium or too much food has been fed. Activated carbon is the most common filter insert, this is due to its wide range of properties. It can remove ammonia and any other dissolved harmful gasses. It also removes chemicals such as excess medication, dyes and any other compounds discolouring the water. There are various types of carbon on the market, some better than others. Ordinary 'charcoal' has very limited capabilities and may only last for up to a week. Activated carbon is manufactured such that it has a far greater capacity and can last for up to six months, though it is recommended to renew it every three to four months, depending upon the number of fish in the aquarium, to ensure that full removal of waste is taking place. Carbon is recommended for use in newly set up aquariums or were large numbers of fish are kept in an aquarium, to remove any harmful substances that are produced in these unstable environments. It can also be used as a safeguard in established aquariums. If you are unsure about any of the above information or you wish to learn more about filtration or any other aspect of fish keeping, please feel free to contact any of the experienced AQUOTIX staff for help.