6. Filter function, cleaning, failure of the filter pump and a little water chemistry

Aquarium filters are biological filters and not mechanical ones, such as strainers. This means that the filters will not retain dirt particles, which have to be removed when cleaning the filters. **Aquarium filters convert water pollutants through bacteria which collect on the filter material.**

This information is important so you understand why you do not have to clean the aquarium filters often! In fact, frequent cleaning would cause an imbalance in the bacterial culture and hence affect their cleaning and filter performance. Oxygen is also fed into the aquarium water through the filter pumps.

Filter systems:

Exterior or interior filters

We recommend using two interior filters to have a backup and to improve the quality of the water. Exterior filters are connected via tubes and therefore are placed outside the aquarium. There is a risk of a tube coming loose or a filter starting to leak. This could cause the aquarium to leak dry. This risk can be avoided by using interior filters.

Hamburg mat filters

We are often asked for the best and simplest aquarium filters. We use only Hamburg mat filters. These filter mats have an extremely large surface area; the polluted aquarium water flows through it very slowly, giving the bacteria enough time and oxygen to break down all pollutants optimally. In addition, in a purely discus aquarium without substrate the Hamburg mat filter can be used as a divider. You can reduce or increase the space for your fish to swim in as you required. A small space for swimming has the great advantage that the fish develop assertiveness when feeding, eat better and live together more harmoniously. In addition, the large volume of the aquarium means you will always have good quality of water and consequently optimum conditions for growth for your fish. Breeding success and optimum growth of your discus fish, free of disease and social stress, is almost guaranteed.

In our breeding operation we only use **Hamburg mat filters**. These filters consist of a foam mat through which the aquarium water flows slowly, assisted by a pump or an air-lift pump. On average the water in an aquarium is filtered two to three times per hour with this system. We have been using these filters for more than 25 years in our company and have never cleaned them. Over the years a microbial culture has developed in our filter mats which helps considerably to improve water quality and hence keep the fish healthy. Since the water throughflow has not yet halved, we do not yet have to clean our filters, even after 25 years.

Interior or exterior 3-chamber filters

We do not recommend using interior or exterior 3-chamber filters. When using exterior filters the water in the aquarium must flow briefly through a small infeed section (e.g. filter floss). This is where most oxygen and nutrient content is broken down and means the bacteria in the layers further back only have a minimal impact on overall filter performance.

A brief explanation of water chemistry

Remains of food and excrement from fish are converted first to ammonium or ammoniac and then to nitrite and finally to nitrate (NO3). Nitrate is a salt and is readily compatible for our discus fish even in higher concentrations (up to 300 mg per litres) When you feed your fish, e.g. with our STENDKER discus feed, you will increase the phosphate content in your water which plants and algae use for growth. In addition, ammonium is created at a pH value below 7 and ammoniac at a pH value above 7. **Both these substances are converted by the filter bacteria firstly to nitrite and then to nitrate**.

Ammoniac and nitrite are toxins which accumulate in the blood of the fish and in high concentrations can cause death. Our discus fish are comfortable with nitrate up to a concentration of 300 mg/litre.

An old filter which still functions well will always ensure that ammonium, ammoniac and nitrite are barely traceable. However, the phosphate and nitrate content will rise slowly and the pH value will drop as a result of microbial activity. This requires the water to be changed regularly. So as not to destroy these bacteria and hence the effect of the filter, an aquarium filter should **not be cleaned until the throughflow of the water is halved**. If this is the case, then follow these instructions:

Cleaning filters

An aquarium filter should not be cleaned until the throughflow of the water is halved. **The longer these filters are not cleaned, the better the biological balance in the aquarium and the better the health of your fish.**

Aquarium filters, **interior and exterior filters,** have a filter chamber containing the filter material. This material is normally structured in layers; the top layer often consists of filter floss. Remove **only the top layer** from the filter and put it in a bucket with two to three litres of water from the aquarium. Now squeeze out the filter material several times in the water. **Do not rinse it using water from the tap** since the valuable microbial culture which has gradually built up will be destroyed. Then return the filter material to the filter and reduce the normal amount of food by 50 per cent in the next two to three days. This will return the filter from a reduced level to its original level of performance.

If you have **pure foam filters**, remove the whole foam mat and squeeze it out once or twice in a bucket with water from the aquarium.

Failure of the filter pump

Do not simply reconnect the filter to the power supply because bacteria will die after only 20 minutes and a sludge will form which would damage your discus fish. The bacterial culture will be destroyed by failure of the pump; **rinse the defective filter thoroughly using tap water to remove all dead bacteria and pollutants.** Rinse the cleaned filter and reconnect it and run it in. Within two weeks the filter will almost have reached its former level of performance and a new bacterial culture will have built up. As a precaution against this type of emergency, we recommend using two interior filters to ensure a sufficient level of filter performance by the reserve filter should one filter fail.