



## **Water Chemistry and Water Quality Data**

**Discus fish caught in the wild** prefer water, which closely resembles the water of the Amazon, their original habitat. Amazon water is very soft (general hardness: GH 0 – 3, carbonate hardness: KH 0 – 3, very low pH value: pH 4 – 6) and very low conductivity (100 – 400 µs).

**Our discus fish**, however, have been accustomed to harder water (tap water) for many breeding generations. The water chemistry data in our hatchery is: general hardness: GH 15, carbonate hardness KH 8, pH value 7, conductivity 800 µs, water temperature 29° – 30° C / 84-86°F.

For our discus fish, the key water parameters have the following tolerances: GH 0 – 30, KH 0 – 25, pH value 4.0 – 8.3, electrical conductivity 150 – 1200 µs. Tolerance for short-term water temperature changes: 25° – 34 ° C / 77 - 93°F.

**This means our discus fish are suitable for over 95% of all types of tap water in Europe.**

### **Water chemistry**

There is a range of simple methods for modifying the water chemistry values of your aquarium water. For instance, by using reverse osmosis or demineralisation equipment, you can convert tap water into what is almost distilled water. In these processes, you reduce the water hardness by approx. 99% and strongly reduce the conductivity to approx. 50 µs. You can then mix this treated water with your tap water, until you have achieved the desired water chemistry values. This allows you to produce water which is suitable for discus fish caught in the wild, or for discus pairs, which you want to breed.

### **How does feeding your fish affect the water chemistry values?**

First and foremost, it is important to note that the water chemistry in small aquariums (nano aquariums or aquariums with a capacity of less than 150 litres / 40 US gallons) can change very quickly and very markedly. In larger aquariums (180 – 1,000 litres / 50-265 US gallons) the water chemistry values change more gradually, due to the large volume. This makes larger aquariums more suitable for first-time aquarium owners.

When you feed your fish, for example using our STENDKER Discus Feed, you are increasing the phosphate content of your water, which plants and algae can use for their growth. In addition, if the pH value of your water is less than 7, ammonium develops; if the pH value is above 7, ammonia develops. These two substances are broken down by filter bacteria. They are first broken down into nitrite and then into nitrate. Ammonia and nitrite are toxic, and can accumulate in the bloodstream of your fish, leading to death at high concentrations.

An older and well run-in filter, which has developed a well-functioning bacteria culture, will always ensure the ammonium, ammonia and nitrite content are close to zero. By contrast, the microbial activity of the filter bacteria cause the phosphate and nitrate content to gradually increase and the pH value of the water to decrease. This makes regular water changes necessary. How much of the water volume you exchange and how frequently you carry out a water change depends on the amount of feed you give your fish and on the amount of excrement the fish produce.

e.g. fewer fish = less feed = fewer water changes

e.g. for a 180 litre / 40 US gallons aquarium with 12 discus fish (10 cm / 4"), 50 neons, 6 catfish and 4 dwarf cichlids, we recommend a water change 1 x per week, exchanging 1/3 of the aquarium water.

To test the water chemistry values named here, you can purchase suitable drop test kits or indicator strips in specialist pet shops. These water chemistry values should be tested regularly.



## Drop Test Kits/ Indicator Kits and Water Chemistry

### Ammonium

develops when the pH value of the water is below 7, or when a filter is not yet functioning fully. You can prevent the ammonium value from rising, by minimising the amount of feed you give your fish.

### Ammonia

develops when the pH value of the water is over 7. It is toxic and will develop if a filter is not yet functioning fully. You can prevent the ammonia value from rising, by minimising the amount of feed you give your fish.

### Nitrite

levels should be tested daily in new aquariums. Once you are feeding normal (full) amounts and nitrite traces are no longer present, **you can then cease testing for nitrite.**

Only if the filter performance drops due to filter cleaning or after a filter outage/ failure do you need to test for nitrite daily again (for approx. 1 week). This is to check whether the filter has reached its full performance again.

You can also tell from the behaviour of your fish, if nitrite levels are extremely high. Generally, the fish start refusing their feed and breathe heavily and quickly. If this is the case, please test for nitrite immediately. If nitrite levels are high, stop feeding immediately and carry out a 90% water change.

### Nitrate

levels should be tested three or four times a year, just prior to a water change. If nitrate levels are over 380 mg per 3,8 litre / 1 gallon, it is advisable to exchange more water and/ or carry out water changes more often, to ensure healthy growth for your fish.

### pH value

1 x per week

If the pH value falls from, say, 7.5 to 6.0 before a full week has passed, then it is already time to carry out your water change. Otherwise the pH value – and hence the acidity of your aquarium water – will drop very quickly. If the pH value reaches 3.6, the acidity is so high that it is lethal for your fish.

### Phosphate

levels only need to be tested if you observe increased algae growth. You can lower phosphate levels by exchanging more water and/ or carrying out water changes more often.

### General hardness

If you mix tap water with osmosis water to keep discus fish caught in the wild or to keep breeding discus pairs, you need to test the water mix **only at the beginning**, to ensure an ideal GH value of between 1 and 4.

### Carbonate hardness

If you mix tap water with osmosis water to keep discus fish caught in the wild or to keep breeding discus pairs, you need to test the water mix **only at the beginning**, to ensure an ideal KH value of between 1 and 2.