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Freshwater

AQUARIUM GUIDE

Easy guide on establishing and maintaining freshwater aquariums.

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AF REMINERALIZER

Liquid mineralizer for Reverse Osmosis (RO). It enriches the water with the minerals necessary for plants and aquarium inhabitants. Suitable for mineralizing RO, deionized and distilled water. The complex formula contains easily absorbable calcium and magnesium, increases the general hardness and carbonate hardness in the desirable ratio of 2:1.

AF SHRIMP GH+

Professional preparation for mineralizing RO water, designed especially for breeding shrimps, especially Bee and Crystal species. Thanks to the use of natural ingredients, it enriches the water with all the minerals necessary for the aquarium inhabitants and guarantees the perfect water parameters. The unique formula was enriched with iron. It supplements the water with calcium, magnesium and potassium in the perfect ratio.



AF PURIFYING RESIN

A specialist ion exchange resin designed for use in freshwater aquariums. Dedicated primarily to heavily stocked aquariums, struggling with the problem of elevated nitrates. Dedicated for the chemical absorption of nitrogen compounds dissolved in water. It works selectively, effectively absorbing nitrates from water without affecting the level of minerals necessary for aquatic life.

WELCOME TO THE AQUAFOREST FRESHWATER AQUARIUM GUIDE

Congratulations on stepping into the wonderful underwater world of freshwater aquariums. You've probably already started looking at fish, plants, tanks, filters, and accessories to make your underwater garden an extension of you. This guide was designed to be your companion throughout your journey with helpful tips, tools, practices, and products to help your tank thrive while bestowing vital information to expand on your aquatic knowledge. It would be remiss of us not to mention keeping an aquarium does take time, effort, and patience. There will be times something does not go to plan and you'll need to find a solution. Fear not, we will be here to help you discover the solutions you seek to restore balance and harmony in your tank. Let's get your toes wet and jump right in.

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STEP 1. CHOOSING AN AQUARIUM TYPE

There are as many aquarium types as there are aquarists. For sake of simplicity, this guide will focus on the three most popular aquarium types.

COMMUNITY TANKS (AKA SOCIAL AQUARIUMS)

As the name suggests, a community tank has inhabitants (fish and plants) that can happily coexist to create a mild-tempered tank environment. For many first time fish keepers, this is the most popular aquarium style to start with because of the abundance of fish and plants to choose from. Having said that, when selecting fish, you will want to look for community fish that occupy a specific zone(s) of the tank (top, middle, bottom) to create microhabitats for them while giving you the look you are hoping to achieve. When it comes to adding plants or wood into a community tank, you have the freedom to mix and match to your style and preference. When selecting plants, be aware ahead of time of their growth habits, patterns, and care requirements so as they grow they look natural in our aquarium.

BIOTOPE TANKS

These are aquariums designed to imitate a particular biotope or location such as Lake Malawi or Lake Tanganyika. These aquariums attempt to mimic the biodiversity of fish, plants, aquascaping, and water conditions of that particular area or region. As a result of the additional planning and care, Biotope aquariums are often set up by aquarists in the hobby for a while.

PLANTED AQUARIUMS

As the name suggests, planted aquariums aim to create an underwater garden rich in plant biodiversity and aesthetic allure. If this is the path you seek, be aware there is often the need for additional equipment such as carbon dioxide (CO₂) and stronger lighting and filtration needed to achieve such beauty and awe in these often perfectly manicured aquariums.

Now that you know a little bit more about the three most popular freshwater aquarium types, the next step will be choosing which type of aquarium best meets your needs and time commitments.

STEP 2. CHOOSING THE IDEAL SPOT FOR YOUR AQUARIUM

Now that you have spent some time thinking about the type of aquarium you would like to have, it is time to start thinking about the ideal location for it. We recommend placing the aquarium in a quiet space away from windows and doors with minimal foot traffic to create a safe and comfortable living environment for your fish. While there are no right or wrong places to put it, here are some things to be mindful of to make maintenance easier and the fish generally happier.



LOCATIONS TO AVOID:

Placing a tank in front of a window. Generally, this is not recommended as the light (direct or indirect sunlight) will likely cause faster algae growth and could add additional unwanted heat in the tank.

Placing the aquarium close to the door. Doorways tend to get a lot of foot traffic and noise that could stress out some fish so it is generally advisable not to put too close to walkways or doorways.

Children's room. Without putting in place the necessary safety measures (i.e., ultra stable table/stand, lids, cord management, safety container for fish foods and chemical additives etc.), putting a fishtank in a child's room is generally not advisable for the safety of the child and the aquarium.

THINGS TO BE MINDFUL OF WHEN SELECTING YOUR TANK LOCATION:

Water is heavy. Once an aquarium has water, rock, gravel, equipment, ornamental decorations and fish, the tank will now weigh a few hundred pounds/kilos. If the tank is over 3ft/90cm and you live on a higher floor, it is advisable to place your aquarium evenly across load-bearing studs to disperse the weight for added safety.

Not all stands/cabinets are built the same. If you intend to place the aquarium on a stand or cabinet, it is highly recommended to purchase a well-built solid wood or metal stand/cabinet for your tank.

Will the tank be a focal point in the home. Today, many aquarists like to put their aquarium in their living spaces as a form of living art. This is wonderful for the hobby but could make maintenance a little trickier. Consider how you will do water changes and overall tank maintenance (i.e., cleaning the glass) so it minimizes the intrusiveness in a shared living space.



STEP 3. SELECTING THE RIGHT FILTER FOR YOUR TANKS NEEDS

Filtration is the heart of your aquarium. It is responsible for keeping your water clean and parameters in balance. When selecting a filter, it is critical to buy one that is large enough to meet the requirements of your tank. An undersized filter will not sufficiently clean your aquarium putting your fish at greater risk of disease or unwanted stress due to the parameters being out of balance. It is recommended to have a filter large enough to turn the total water volume at least two to five times per hour. Going larger is always recommended.

Canister or hang on back (HOB) filters work by mechanically catching pollutants out of the water (thanks to sponges) and biologically by the bacteria living on the biological filter media actively consuming ammonia and other harmful compounds from the water. It is important to remember when doing a water change not to let this media dry out or to rinse it in tap water as it can kill the beneficial bacteria required for a stable aquarium.

Most biological filter media on the market needs some time to grow and reproduce before adding fish to your tank for the first time. Using **Life Bio Media** will allow your aquarium to mature faster as it is already seeded with the right blend of beneficial biological bacteria. As the nitrifying bacteria grows, it will also be consuming oxygen from your aquarium so ensure your water flow into and around the tank is providing adequate levels of oxygen (bubbles) into the water. If you are considering or have a canister filter, here are some additional things to be mindful of.



AF Carbon is an effective media to remove pigments from the water polishing it to the eye as well as helping to capture and bind unwanted contaminants in your aquarium. It is recommended to replace carbon at least on a monthly basis to keep it working at its best.



AF Anti Phosphate can be used if phosphate levels are too high. An algae bloom can indicate high levels of phosphate in your aquarium. This is a common problem in Malawi biotope aquariums and tanks with few plants and insufficient filtration.



AF Zeolith is an effective absorption media if you want to remove high levels of metals or nitrogen compounds from the water. AF Zeolith should be used in aquariums using tap water as many pipes are made of metal. Zeolites can also bind minerals dosed into the aquarium so keep that in mind when calculating your dose rates of additives and fertilizers to meet the demands of your aquarium.



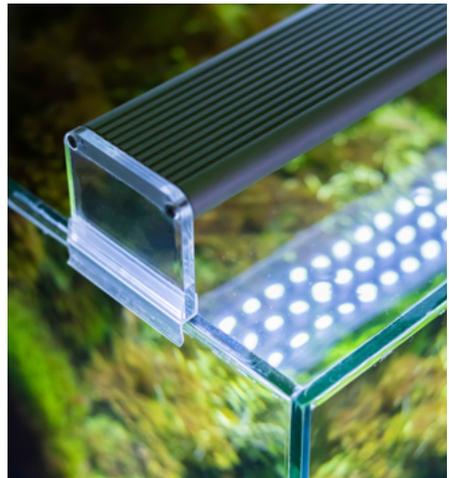


AF Purifying Resin will help to bind and reduce nitrate levels in the water. Excess nitrates can lead to many problems and should be monitored on a daily/weekly basis. The resin works by absorbing nitrogen compounds harmful to the aquarium inhabitants without absorbing water minerals. Regular use can improve water clarity and support prevent nuisance algae outbreaks.

STEP 4. SELECTING THE RIGHT LIGHTING FOR YOUR TANKS NEEDS

If filtration is the heartbeat of your aquarium, adequate lighting is the brains that makes it all grow. Unfortunately, ambient room light or overhead lamps are not adequate for maintaining a thriving aquarium. If your tank did not come with a light setup, additional lighting equipment will be required for plant growth and to maintain the overall health of the fish.

Depending on the type of aquarium you are planning to set up, the lighting requirements will be different. If you are planning to set up a community tank with a combination of live and plastic plants, fluorescent lamps or an LED fixture spanning the length of the tank will be sufficient to start with. If you are considering a planted aquarium, you should consider purchasing a fixture with several lamps or LED strips to provide adequate lighting for the aquarium. In a biotope aquarium, selecting the right light will vary depending on what types of fish and plants you are planning to keep. We recommend consulting your local fish store (LFS) for more information on the right amount of light to meet your aquariums needs.



A FEW THINGS TO BE AWARE OF WHEN IT COMES TO AQUARIUM LIGHTING:

The color of the light. It is advisable to purchase lamps/LED's with a color temperature between 6500 K (day [white] light) to 8500 K.

Quality matters. Water and electricity can be dangerous. We recommend purchasing high-quality light fixtures to reduce the risk of damage associated with water splashing against the light tubes/LED's lamps.

Color Rendering Index (CRI). When selecting a fixture and bulb combination, select a unit that will meet your specific aquarium needs. The more plants you plan to keep the more lights you will need in the right spectrum to grow plants. A high color rendering index (CRI) will ensure better plant growth and a more natural coloration in your fish and other aquatic life.

Power and wattage. More is not always better. It's about the right amount of power/wattage to meet your needs. In the case of the fluorescent lamps, there is a general rule of 0.7 – 1watts per liter or 1.2 – 3 watts per gallon of tank water. With fluorescent lamps largely being replaced by more efficient energy-saving LED lights, you can use a lumen (lm) per liter/gallon converter. Typically, for the cultivation of simple and medium-demanding plants, about 20-30 lm/l of aquarium water is enough, but with appropriate fertilization and CO2 installation, this value can be increased to even 50 lm/l.

Hours per day of light. When setting up a new aquarium, we recommend starting with ~5 hours of light per day for the first week (sometime between 10:00 am - 8:00 pm). With each subsequent week, you can add an additional 30 minutes to 1 hour until we reach 8 hours a day. The reason to do this slowly is to allow time for your filter and biological bacteria time to adjust to the additional algae and waste in the water. When growing red plants, the exposure time can be increased to 10 hours a day. Plants with a red, purple or brown color need much more light to obtain vivid coloration. Breaks in lighting the aquarium during a 24 hour cycle may disturb plant growth and algae development, so we recommend continuous lighting. We recommend putting the lights on a timer (digital or manual) to maintain a consistent schedule.

STEP 5. CHOOSING THE RIGHT SIZE HEATER FOR YOUR TANKS NEEDS



Not all fish like the same temperature. When planning your aquarium be sure to think about their specific temperature requirements and preferences. For example, cold-water zebrafish are not the best choice of fish if you plan on keeping fish such as discus, angelfish or even betta fish which require warmer temperatures to thrive.

The appropriate wattage should closely coincide with the capacity of the tank. For example, if you have a 150 l/40g tank we recommend one 150 watt heater. For a 240 l/63g tank, a 200 or 250 watt heater will keep the tank at the ideal temperature 24 to 27 °C or 75 and 80 °F. For larger tanks, we also recommend having two heaters in the tank on opposite ends to keep the tank stable and should one stop working, the tank will not drop that much until you can replace it. If aesthetics are important to you, there are now inline heaters that connect to your return line for even distribution of warm water throughout the tank.





STEP 6. CHOOSING THE RIGHT SUBSTRATES AND DECORATIONS

When it comes to aquascaping your aquarium, it is critical to select a substrate or various substrates to help give you the aesthetic composition you are looking for. Often when layout out your media, rocks and driftwood we recommend looking at the natural habitat where the fish come from versus pictures of other fish tanks. While taking inspiration from one or the other can generate a beautiful looking aquarium, mother nature has a way of creating beautiful aquascapes that are often pleasing to the eye as well as create suitable habitats for your fish, plants and other creatures.

POPULAR SUBSTRATES



AF Natural Substrate. It is a mixture of carefully selected minerals, peat, and clay designed to gradually break down over time releasing vital nutrients and microelements into the gravel to support the development of healthy root system and plant growth.

When using a sub-gravel substrate, first place a frame made of ordinary gravel along the sides of the aquarium, then pour and compact the substrate inside it. Later cover it with a 3 cm /1.5 inch layer of washed gravel. It is good to form a slope towards the front due to the fact that the water circulation forced by the filter leads to the deposition of dirt in the front of the aquarium.

AF Lava Soil. Is a volcanic lava based substrate based ideal for aquariums in which you plan to change the arrangement more frequently or looking for a media that does not form a compact layer, so you can safely and easily replant your plants without harming them. The use of AF Lava Soil will also allow you to avoid getting the water cloudy when moving plants or changing decorative elements. In addition, the porous nature of AF Lava Soil makes it a perfect surface for the settlement of nitrifying bacteria. It also contains the optimal amount of minerals and microelements without causing an algae bloom.

NATURAL DECORATIONS

Congratulations. You are almost ready to add fish. Before doing so, you might want to think about what kinds of decorations you would like to add to the tank. You will quickly discover there are as many different types of decorations as there are fish and plants. So we thought it would be best to share a few things to consider when looking for natural decorations for your aquascape.



Not every root or rock can be safely placed in the aquarium. Some woods and rocks can leach unwanted substances (i.e., chemical compounds, parasites and undesirable bacteria, etc.) into your water. If you are not sure if the decoration is aquarium safe, it is worth buying roots and rocks from a trained professional/store. Specialist shops offer a wide range of ornaments and you'll surely find something matching your preferences.

Wooden roots often release tannins (which cause the water to look reddish/brown like a cup of tea) that can affect the health of aquarium inhabitants. If you don't plan black water style aquarium, we recommend also using AF Carbon in your filtration to remove these tannins from your water. The carbon will also help reduce the fishy smell some aquariums can have.

When choosing rocks, be sure to consult your local fish shop before adding any rock into your aquarium. Many river rocks, backyard rocks or beach rocks can affect your water parameters, for example, they can significantly increase its hardness. Limestone is mainly suitable for Malawi and Tanganyika biotope aquariums.

When designing your aquascape, we recommend keeping in mind the types of fish you plan to have. The larger the fish will grow, the more large caves and hiding places you'll want to create for them to feel safe. Also keep in mind some fish species thrive in dense vegetation while others prefer rocky terrains to hide and sleep.

STEP 7. ADDING PLANT FOR ENHANCED BIODIVERSITY

Planting a variety of plants in your tank will really bring the aquarium to life. Today, most local fish shops carry a wide variety of plants that surely you'll be able to choose something suitable for your arrangement. When choosing plants, remember your lighting situation, temperature and types of fish. Not all plants will thrive in the same tank conditions.

Plant settlements are best divided into 3 plains. The tallest plants in the background. Medium sized on the second plain and the smallest, lawn like in the front. For lush vegetation advanced aquarists dose carbon dioxide (CO₂) into the water to boost plant growth and a beautiful appearance.



GOOD TO KNOW

- Substrates absorb nitrates and phosphates. Moving plants or elements in your arrangement may cause an increase in nitrates and phosphates into the water column which could result in faster growth of algae.
- Artificial decorations won't affect the comfort of the aquarium inhabitants, however they provide no beneficial benefits to your aquarium's biology. These are also not very long-lasting, as they quickly get full of algae and are more disfiguring than decorating the tank.
- Replacing artificial plants with live plants will help absorb compounds that are in excess and potentially harmful. They also support biological filtration and create a natural shelter for small fish.
- Seashells harden the water in the aquarium, so if you are not planning a Tanganyika or Malawi biotope, you should choose other decorations.
- Replacing artificial ornaments with natural ones, such as a root or volcanic rock, can release tannins back into the water to support the health and immunity of the fish.

STEP 8. IDEAL WATER PARAMETERS

PREPARING THE WATER

After arranging your plants, it is time to fill the aquarium with water. Although most aquarists use tap water to fill their tanks, those with tap water that is heavily treated may want to explore the use of a reverse osmosis (RO) water purification filter to clean and polish the water. To prevent creating a divot in the media due to the pressure of the water, we recommend placing a small bowl or plate on to the media. Allow the water to overflow from the bowl or plate filling your tank. Before the aquarium is full, be sure to add the proper dosage of water conditions to remove any unwanted chlorine from the water. You will want to repeat this step every time you do a water change.

CONDITIONING THE WATER

AF Water Conditioner treats tap water to be fish safe as well as contains a colloid that protects fish during stressful water changes. It binds and neutralizes heavy metals and makes the compounds in the water bioavailable for plants, guaranteeing their healthy growth. It eliminates chlorine, making tap water usable immediately, without having to leave it for several hours. In addition there are vitamins added to the conditioner to support a healthy fish immune system.

Treating tap water is the fastest method of conditioning your water, however as explained above, reverse osmosis (RO) water or reverse osmosis deionized water (RODI) makes the purest water possible. It is worth noting, RODI water is devoid of all minerals, and its direct use in an aquarium could harm its inhabitants, therefore it should be remineralized to provide a balanced environment for your fish and plants.



AF Remineralizer enriches RO/RODI water with the necessary minerals needed for plants and aquarium inhabitants. Increasingly, aquarists are also deciding to set up shrimp tanks and due to the specific requirements of these animals, appropriate conditions should be provided for them using a dedicated **AF Shrimp GH+** mineralizer. Both of the preparations are convenient to use - just add the recommended dose to the volume of tank water being added.

THE PH VALUE

For most fish, the ideal pH range is 6.0-7.5. Having said that, there are species that require a more acidic water (lower pH) like discus living in the Amazon River basin or some tetras. There are also some species of fish that, although they naturally live in different conditions, they adapt to the more alkaline water. However, they will still require acidic water for breeding. Most plants prefer a similar pH. If after testing your tap water the pH is too high, AF Minus pH can be used to lower it to the desired pH.



WATER HARDNESS

Another important parameter of water is its hardness. Most plants, as well as fish, do not like hard water. Hard water tends to contain large amounts of calcium, which block the absorption of other necessary substances in plants. Additionally, fish eggs (roe) are more likely to mold in hard water. However, it doesn't mean that the lower water hardness is better. Water that is too soft generally contains very little amount of minerals resulting in significantly slower growth in plants.

Strained water is also devoid of minerals and overtime can cause many diseases. It is best to supplement soft water with the ideal ratio of minerals to create an ideal fish environment. You can do this quickly and easily by adding a small amount of AF Remineralizer to the water. Water mineralized with it will be an ideal environment for fish development and plant growth.

BENEFICIAL BACTERIA

At some point during your aquarium adventure you will likely come across the term „aquarium maturation“. Simply put, this just means you have created a stable biological environment suitable for you to safely keep fish. This is due to the proper biological bacteria balance. Mature aquariums contain ample levels of beneficial bacteria required to neutralize fish water and other compounds from the water column. This is a reaction where NH_4 is converted by bacteria into less harmful NO_2 , and then into safe for fish and essential for plants, NO_3 , we call it the nitrogen cycle.



Up until now, aquarists had to wait several weeks for biological stabilization to occur and the nitrogen cycle to run its course in the aquarium before it was safe enough to add your first fish. Today however, aquarists can add Aquaforest Life Bio Media filter stones which are already populated with beneficial bacteria and the AF Life Essence containing nitrifying bacteria, to significantly shorten this process. Aquariums that use these products can mature much faster and be ready for their first inhabitants in about 24 hours.



MACRO AND MICROELEMENTS

For plants to grow, they need a steady supply of macro and microelements. These elements are quickly absorbed by the plant's roots and leaves directly from the water column. The optimal parameters for plant wellbeing and growth are:

Ca	25 - 40 mg/l (ppm)	Mn	0.15 mg/l (ppm)
Mg	10 - 20 mg/l (ppm)	NO₃	5-25 mg/lq (ppm)
K	10 - 20 mg/l (ppm)	PO₄	0.5-1.5 mg/l (ppm)
Fe	0.3 - 0.5 mg/l (ppm)		

In order to maintain ideal water parameters for growing plants it is often essential to supplement the water with missing/consumed elements and fertilizers. The consumption of elements will vary depending on the strength of light, the species and number of plants, so it should be selected under the control of tests or experimentally. By using water tests, you will precisely determine the consumption of elements in the aquarium and you will be able to choose the correct doses of fertilizers. Water testing is the most accurate method of determining aquarium parameters, but it also involves additional costs - buying drop tests or ICP tests. A less accurate and safer method of applying fertilizers is by constantly monitoring the tank. Green soft coating on glass panes and leaves will indicate an overdose of fertilizers and less gains, yellowing and slower growth - deficiencies.

The basic fertilizer for everyday use is AF Micro. However, you must remember, that after using Aquaforest substrates, the microelements will be gradually released into the water, therefore the use of AF Micro should be started one month after from the 1/2 of the recommended dose.



Apart from other fertilizers, in order for plants to carry out their natural photosynthetic processes require carbon. If you don't have a CO₂ system, such a deficiency can cause algae bloom and weaker plant growth. For aquariums without a CO₂ system **AF Carbon Boost** will be a perfect choice - it is a product that degrades in the aquarium and releases carbon which is easily absorbed by the plants. It may be also used with the CO₂ system as its support. Additionally, AF Carbon Boost can prevent the formation of algae.



Macronutrients, except for potassium, appear spontaneously in the aquarium and come from the decomposition of organic matter. However, their production may be too low related to the needs of the aquarium. In such a situation, apply an appropriate dose of **AF Macro**, in order to reach the desired phosphorus and nitrogen values. It is very important to maintain the appropriate ratio of the two elements, when that balance is disturbed - algae may appear. In situations where only one of the three elements is missing, should not be used AF Macro, only supplement the missing mineral level with the appropriate product. In the case of low nitrogen it will be **AF N Boost**, in the case of phosphorus **AF PO₄ Boost**, and in the case of potassium **K Boost**.



If you notice that your plants begin to look pale or yellowish in color, grow slower they may be deficient in iron. Iron should be supplemented using **AF Iron Boost**. Similar symptoms can be caused by potassium deficiency in which you should use **AF K Boost**.

UNWANTED ALGAE

There are multiple reasons why algae appears. It is completely normal and natural to have some amount of algae growth if you are using a light and adding fertilizers. On the other hand, an outbreak of unwanted algae is often the result of something like high doses of fertilizers, too strong or weak lighting, low CO₂ content, excess organic acids and too frequent of water changes. While it is important to clean the algae, it is critical to get to the root of what caused the outbreak to begin with. We should treat the causes not the effects, that's why Aquaforest does not release algae-reducing media into the market. We believe they are very often harmful to the aquarium inhabitants and algae reducing media are effective as long as you dose them, however when you stop – the algae will be back. When algae does appear we recommend diagnosing what kind of algae it is and look at for those root causes before rushing to just remove the algae.



The most common algae that appears in the aquarium are red algae. They occur in places well oxygenated, in hard water with a lot of phosphorus. Brown algae are usually present in aquariums with not enough light. Green algae appear with excessive supplementation of microelements.

Rhizoclonium takes the form of long threads and usually appears under too much light, CO₂ deficiency and „old water“. Hard, threadlike algae are the result of insufficient filtration. Cyanobacteria are not actually algae, but bacteria that create slippery, dark green blooms with an unpleasant smell. They appear in the aquarium as a result of frequent changes in the arrangement interference with the substrate, as well as with excess nitrogen. AF Carbon Boost will effectively dissolve some of the algae. However, remember that conscientious water changes, balanced fertilization and properly set lighting of the aquarium will allow you to avoid algae blooms.

INTRODUCTION TO FISH DISEASES

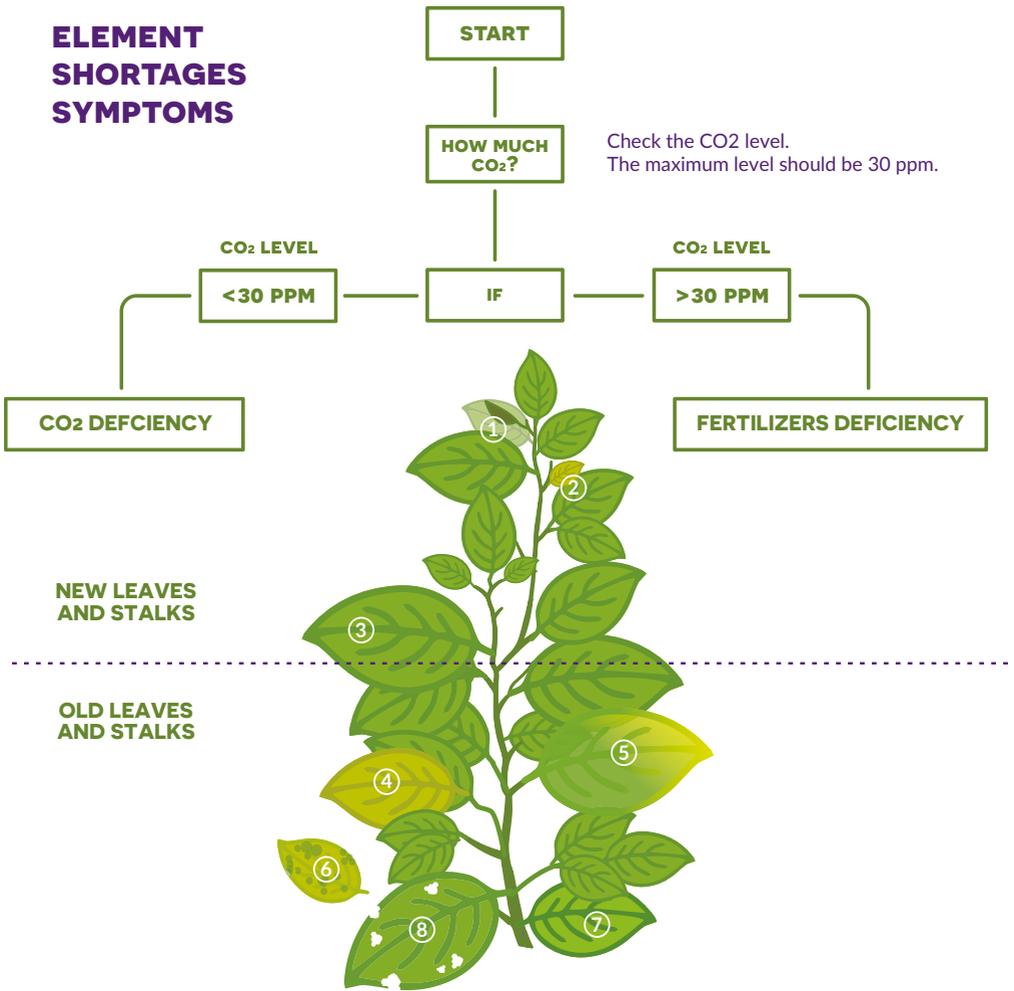


The most common fish disease is fishpox also known as ick. It manifests as little dots all over the fish body. The disease is caused by the spherociliate protozoan. Fish attacked by it rub against the bottom, lose appetite and turn pale. Fish are particularly at risk of getting fishpox after long transport or sudden changes in water parameters or temperature. Untreated disease often leads to death. If you notice the symptoms you should increase the water temperature as quickly as possible (depending on the species of fish) to 28-30°C/ 82-86°F) and apply **AF Purify** according to the instructions until the fishpox is gone. After which you can slowly reduce the temperature of the tank back down to your normal levels.

The fish suffer from thrush just as often as from fishpox. It's caused by inadequate conditions in the aquarium, that is why proper chemical filtration is so important (**AF Carbon**, **AF Anti Phosphate**, **AF Zeolith**) and biological (**AF Life Essence**, **Life Bio Media**). In immature aquariums fish can suffer from ammonia poisoning. The water parameters must be improved as quickly as possible to prevent the fish from suffering further damage. There are also parasite-related diseases such as spironucleosis and capillary disease. They appear especially often in discus and angelfish, who are the carriers of these parasites.



ELEMENT SHORTAGES SYMPTOMS



NEW LEAVES AND STALKS

OLD LEAVES AND STALKS

1. Twisted, dwarf stalks and leaves.
2. White or yellow small leaves.
5. Transparent leaves with structural loss, condition worsens.
6. Algae development on lower leaves and places with poor water flow. Common in densely planted spots
8. Holes may appear on older leaves of some plant species

1. **Calcium/micronutrient deficiencies:** twisted and pale leaves.
2. **Significant nitrogen deficiencies:** white or yellow leaves.
3. Regular leaf development.
4. **Iron deficiency:** the whole plant is yellowish.
5. **Minor nitrogen deficiencies:** old leaves are absorbed from tip.
6. **Phosphorus deficiency:** old leaves get yellowish, parts of them are absorbed, causing dead spots. Leaves fall rapidly, looking similarly to early nitrogen deficiency. Older leaves are overgrown with algae.
7. **Magnesium deficiency:** dark veins and light tissues.
8. **Potassium deficiency:** leaf with holes with yellowing edges. Besides all that the leaves are looking good.



FREQUENTLY ASKED QUESTIONS

WHAT ARE WATER CHANGES?

Water changes are the manual removal of water from the tank and replenishing it with fresh clean water. Water changes are supposed to eliminate excess or harmful and unwanted substances accumulated in the water. These substances appear as a result of metabolic processes and their excess can cause algae blooms and fish diseases. Regular water changes also eliminate excess macro elements. Water changes frequency varies, but the most common attitude is to do it once a week or in bigger aquariums – twice a month. You replace 10 to 50% of water depending on the needs of the aquarium.

HOW OFTEN SHOULD I FEED MY FISH?

Every fish has different dietary requirements, however, we recommend feeding once a day when the lights are on. Typically you will want to feed them small portions, so they eat everything before it reaches the bottom of the tank if it is a floating granular or flake. Another benchmark is to feed them what they can eat in 1-2 minutes. A one day of fasting is beneficial for almost all fish species. It's a good practice to perform a day without feeding on a day of the water change. After each feeding it's good to add half to the recommended dose of AF Life Essence – it'll prevent worsening the water parameters in case of fish food leftovers.

HOW OFTEN SHOULD I REPLACE FILTRATION MEDIA?

Mechanical filtration, as sponges and wool, should be replaced when they get used. All the other filtration media should be replaced according to producers recommendation. Filters may be cleaned, but not too often. Biological media should be rinsed in the aquarium water. You should never replace the whole biological medium, do it gradually with max. 50% change.

CAN I SWITCH OFF THE FILTER?

Filter should work continuously. Switching it off may cause worse water parameters and even fish death due to the lack of water movement caused by oxygen deficiencies or the death of the beneficial bacteria.

HOW CAN I OXYGENATE MY WATER?

In most cases, the mere movement of the water in the tank is sufficient. Remember to properly direct the filter outlet to create a good swirl in the tank from either front to back or left to right. A good solution will also be to use a sprinkler bar in place of the traditional filter outlet. It ejects water from the filter over a larger area, which makes it aerate the water even more effectively. If you notice that your fish are swimming near the water and taking air from it, then this is a clear sign of poor oxygenation. In this case, it is worth increasing the movement of the water surface (if possible) or using an additional oxygenator.

PRODUCT DOSAGE



FERTILIZERS

AF CARBON BOOST	Professional, easily absorbable liquid carbon supplement	1 ml/100 l (27 US gal)
AF IRON BOOST	Professional, easily absorbable chelated iron supplement	1 ml/100 l (27 US gal)
AF K BOOST	Professional, readily-absorbable potassium supplement	1 ml/100 l (27 US gal)
AF MACRO	Composition based on nitrogen, phosphorus and potassium	5 ml/100 l (27 US gal)
AF MICRO	Essential for healthy and balanced growth of tropical plants	8 drops /100 l (27 US gal)
AF N BOOST	Professional and highly efficient nitrogen supplement	10 ml/100 l (27 US gal)
AF PO4 BOOST	Professional & highly efficient phosphorus supplement	10 ml/100 l (27 US gal)
AF RED BOOST	Color enhancing composition of carefully selected micro & macro elements	4 drops /100 l (27 US gal)

FILTRATION MEDIA

AF ANTI PHOSPHATE	High quality nitrifying bacteria for aquarium start-up and ammonia reduction	50 ml/100 l (27 US gal)
AF CARBON	Essential for healthy and balanced growth of tropical plants	160 ml/100 l (27 US gal)
AF ZEOLITH	Specially selected zeolites who adsorb ammonia and excess heavy metals	500 ml/100 l (27 US gal)
LIFE BIO MEDIA	Filtration medium enriched with bacteria	250 ml/100 l (27 US gal)

WATER TREATMENT

AF LIFE ESSENCE	High quality nitrifying bacteria for aquarium start-up and ammonia reduction	10 ml/100 l (27 US gal)
AF PURIFYING RESIN	Ion exchange resin to absorb nitrogen compounds	125 ml/400 l (106 US gal)
AF REMINERALIZER	Liquid mineralizer setting up a perfect GH to KH ratio	1 ml/3 l (0.8 US gal)
AF SHRIMP GH+	Professional mineralizer designed for shrimp breeding	3 ml/5 l (1.3 US gal)
AF MINUS PH	Professional conditioner designed to reduce the pH level of aquarium water	1 ml/1 l (0.3 US gal)
AF WATER CONDITIONER	Instantly neutralizes harmful chlorine in tap water and makes it safe for aquarium use	10 ml/100 l (27 US gal)

CARE

AF PURIFY	Boosts immune system during bacterial infections, fungal infections and parasites	10 ml/100 l (27 US gal)
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SUBSTRATE

AF LAVA SOIL BROWN/BLACK	Natural soil based on volcanic lava, enriched with essential minerals	7.5 l/54 l (14.3 US gal)
AF NATURAL SUBSTRATE	Nutrient rich, peat & clay based substrate base	10 l/200 l

Aquaforest® Freshwater



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ICP-OES technology & quality control



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Aquaforest® Freshwater

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