BASIC aquarium guide

A guide to setting up and maintaining a beautiful aquarium

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Table of Contents

Aquarium Quick Start

For more detailed instructions, refer to the packaging of each item, or consult your local pet retailer.

1. Unpack aquarium and other apparatus.
2. Thoroughly rinse aquarium.
3. NEVER use detergents or commercial cleansers.

2. Place aquarium on a manufacturer recommended stand.
3. Position tank away from drafts, heating ducts and direct sunlight.

3. Add gravel, plants, decorations, etc.

4. Set up and position filter and heater.
4. DO NOT PLUG INTO POWER.

5. Gently fill aquarium with water, using a plate to break the force of water.
5. Verify that it does not leak. Ensure water has been conditioned.

6. Position canopy. Plug in heater, filter and lights.
6. Check that temperature has stabilized between 75 °F & 80 °F (24 °C & 27 °C) (for most fish).
6. Follow instructions on page 38 for adding fish.

Introduction

The popularity of the aquatic hobby has grown steadily over the years as people look to bring a little piece of nature into their homes. Aquariums offer an amazing way to appreciate the beauty and diversity of aquatic life. Regardless of its size, an aquarium can become a decorative focal point in any environment. The large variety of aquariums, cabinets and equipment in the market today provide an unlimited amount of options, ensuring that there is something for everyone.

A variety of options exist when developing, setting up and maintaining a living biotope. Many choices sometimes result in a difficult decision making process. This guide provides helpful guidelines and information that will lead to an easy, enjoyable experience.

Aquariums have many positive attributes that extend well beyond being decorative. Research has indicated a link between watching an aquarium and the reduction of stress. Finding a chance to relax in today's fast paced world has become difficult, at best. The aquarium provides a living display, which allows observers in a variety of environments, such as dental, legal, and medical offices, as well as restaurants, hotel lobbies and homes to relax and compose their thoughts.

Fish keeping can provide experiences and events that stimulate the learning process. Having fish that spawn and the resulting rituals and activities that are demonstrated provide hours of entertainment and fascination. Children and adults can gain a sense of responsibility and accomplishment from establishing and maintaining an aquarium. The dynamic underwater world will present changing situations where fish, plants, corals and invertebrates grow, mature and reproduce, providing a living demonstration of various life processes.

Many excellent sources of information concerning all aspects of the aquatic hobby exist and continue to be developed. It is recommended to consult various books and seek advice from knowledgeable store staff when deciding on the set-up for your aquarium. This will help to ensure that the fish, plants and decorations you have selected are compatible and their care requirements are known.

Aquarium Choices and Considerations

Dimensions

Aquarium surface area is important. This will contribute to providing superior oxygenation and facilitate the creation of an attractive aquatic theme. Height also needs to be considered. Marine and fresh water environments can benefit from taller aquariums, which can provide superior conditions for certain species of fish and plants.

Weight

Generally, a complete aquarium set-up will weigh approximately 10 pounds per gallon. It is important to use a proper aquarium stand or cabinet and to verify that the floor is capable of supporting it. Due to the weight of a finished aquarium set-up, it is not recommended to place it on household furniture.

The Right Size

The size of aquarium is often limited to the space available. In general, select the largest size of aquarium that space, location and budget will allow. This will provide many benefits, such as a more stable aquatic environment, greater choice of fish and plants and an enhanced aesthetic value.

Type of Aquarium

Two basic materials are used for aquarium construction, glass and acrylic. Glass is preferable due to reasonable cost and superior ability to resist scratches and discoloration.

Aquarium Location

Choose an area in your home where you can best enjoy the beauty and serenity of your new aquarium. Avoid placing your aquarium near windows, heating and cooling ducts.

Aquarium Choices and Considerations

Direct sunlight and temperature changes can negatively affect your aquarium.

Overexposure to sunlight can lead to rapid algae growth in and on your tank, plants and decorations. Rapid temperature variations are harmful to fish. It is also recommended to avoid areas of high household traffic to prevent accidental contact with your set-up.

A conveniently located, grounded electrical receptacle is important for heater, canopy and filtration components. Under no circumstances should any household electrical appliances be placed under or in close proximity to your aquarium.

Aquarium Preparations

Gently wipe down the aquarium using wet filter wool or a clean damp cloth and rinse with lukewarm water to clean your aquarium before filling. Never use a commercial glass cleaner, detergent or chemical cleanser to clean inner or outer aquarium glass. Never use a bucket that has been exposed to soap, detergent or any chemicals to transport water for your aquarium.

Canopies & Hoods

A canopy is useful to prevent water evaporation and provide lighting. Rapid water evaporation results in a lower water level that may damage filters and heaters. It also causes a build-up of carbonates and minerals (water hardness) as water evaporates and minerals remain in the aquarium. An aquarium cover also prevents contaminants from getting into the aquarium.

In addition, a canopy will stop fish from jumping out of the aquarium. A completely closed cover has also been shown to be a major factor in maintaining aquarium temperature and keeping electricity costs down.

Aquarium Cabinets & Stands

It is strongly recommended to place your tank on a stand or cabinet designed for that purpose. Proper support for the aquarium is essential at all four corners to prevent stress along the length of the sides. It is extremely important to verify that the stand is level as uneven surfaces or an unsuitable stand can cause a stress facture in the aquarium, breaking the glass.

Remember: an aquarium weighs approximately 10 pounds per gallon, therefore the stand needs to be solid and level to prevent breakage of the aquarium.

Filtration

Filtration

The key to a clean, healthy, thriving aquarium is filtration. In most aquariums the number of fish, plants, corals and invertebrates, in relation to water volume, exceeds what would typically be found in nature. It is essential that the biological waste produced by aquarium inhabitants be removed and metabolized before becoming toxic. Aquarium filters are available in various configurations and should provide mechanical, biological and chemical filtration, as well as oxygenation.

Mechanical Filtration

An essential form of filtration, it involves the removal of particulate waste from the water. Most filter media serve to mechanically filter the water to some degree. Mechanical filter media, which is very fine, will trap greater quantities of debris and plug more rapidly.

To properly exploit the advantages of mechanical filtration, regularly remove accumulated debris. This will help support superior oxygen levels, stable water conditions and reduce nitrate accumulations.

Chemical Filtration

The active control and change of specific water characteristics. Filter media and various products exist that clarify water, eliminate odor, remove chlorine, eliminate medications after disease treatments, neutralize heavy metal ions and effect changes in hardness and pH levels.

This form of filtration is particularly useful when the characteristics of source water (eg: tap water) are known (easily achieved through the use of basic test kits). Specific chemical filter media should be used to optimize water conditions for various groups of fish and plants. This will ensure that fish and plants will look their best and stay healthy.

Biological Filtration

Biological purification of water is accomplished by various beneficial strains of bacteria. Several important sources of waste exist in most aquariums. Fish generate nitrogenous waste as they breathe and excrete organic matter. Plants shed leaves as they grow. Various invertebrates, including corals, also shed organic waste. Beneficial bacteria known as *Nitrosomonas* and *Nitrobacter*, often referred to as nitrifying bacteria, are aerobic and prefer sites within the aquarium that offer superior oxygen levels.

Filter systems equipped with efficient biological filter media, such as Bio Max, provide these beneficial bacteria with the perfect environment. The incoming water is pre-filtered with mechanical filter media providing nitrifying bacteria with clean surfaces and a constant delivery of oxygen.

Nitrifying bacteria utilize two very toxic nitrogenous compounds, ammonia and nitrite, as an energy source, and produce nitrate, a relatively harmless by-product. Nitrate (NO_3) is easily controlled through regular water changes and can be used by plants as a food source (ammonium (NH_4^+)).

Nitrogen Cycle

The Nitrogen Cycle refers to the conversion of toxic nitrogenous compounds, ammonia and nitrite to nitrate. Ammonia and Nitrite are more likely to reach toxic levels when first starting an aquarium, or if certain events take place which eliminate or reduce beneficial nitrifying bacteria, such as disease treatments, filter maintenance or prolonged power failures.

Bacteria take time to establish themselves. Nitrifying bacteria reproduce every eight hours. The initial nitrifying bacteria to populate tend to be *Nitrosomonas*, which convert ammonia to nitrite. This takes approximately ten days, if the aquarium is not supplemented with Nutrafin Cycle. The levels of ammonia during this stage are often toxic and fish populations should consist of a few very hardy species. Additional water changes are recommended, always ensuring that pH levels are not increased (to avoid increasing the toxic ammonia component). The use of Nutrafin Cycle is highly recommended to introduce significant quantities of ideal bacterial strains, critical for rapid biological establishment and purification.

BASIC aquarium guide
Filtration

The second group of nitrifying bacteria to populate are those of *Nitrobacter*, which convert nitrite to nitrate. This period takes up to approximately twenty-one days, after which nitrite should be almost gone if the aquarium is not supplemented with Nutrafin Cycle. During this phase, it is highly beneficial to perform additional partial water changes. Nitrite is also a very toxic compound. When present in high enough concentrations, it is lethal and can affect the red blood cells of fish. Should nitrite levels persist for more than twenty-one days, additional partial water changes should be performed, along with supplemental doses of Nutrafin Cycle.

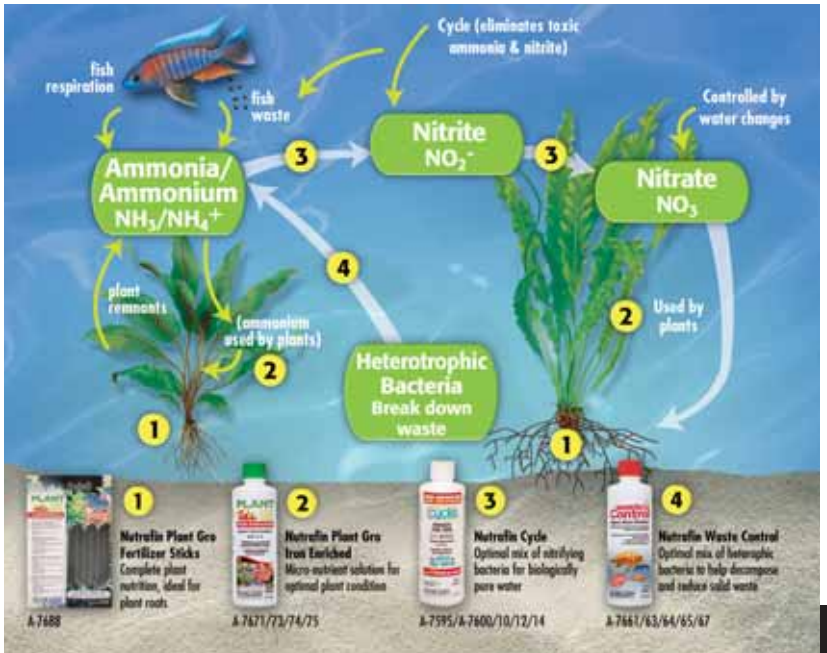
It is important to understand that water chemistry, temperature, pollutants and other factors can affect the performance of nitrifying bacteria. Maintaining stable temperature, pH and water quality is important for all tank inhabitants, even for those that are invisible to the human eye, specifically, bacteria. Although ammonia and nitrite readings may be zero, after approximately one month, the aquarium has not reached full biological stability.

For new aquariums, ensure the following:

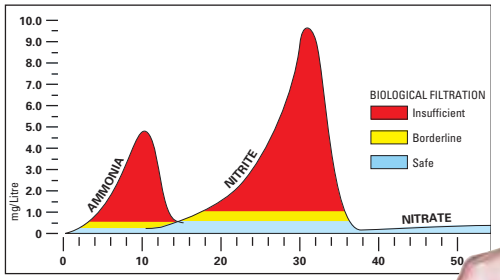
- Avoid overfeeding (2 feedings daily, amount consumed in 2 minutes).
- Regular testing of Ammonia, Nitrite, & pH.
- Stock the aquarium slowly (over a 3 to 4 month period).
- Regular removal of organic debris (dead plant leaves, etc.).
- Use Nutrafin Aqua Plus with all water changes (eliminates toxic elements and reduces stress).
- Regular dosage of Nutrafin Cycle (builds and maintains superior biological filtration).

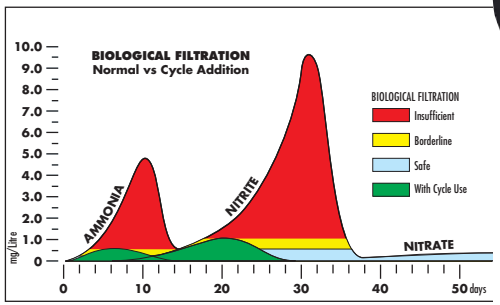
Superior Biological Filtration through Bacterial Supplementation

The aquarium is a closed system, unlike many natural bodies of water which receive constant fresh water from environmental processes. Aquarists should include regular filter maintenance, partial water changes and regular supplementation of optimal bacteria to ensure superior water quality.



Nutrafin Cycle incorporates 5 strains of bacteria at extremely high concentrations to provide aquariums with unique advantages. Inoculating the aquarium with nature's most efficient strains of beneficial bacteria on a weekly basis will not only benefit water quality, but also promote the dominance of these particular strains. One of the additional advantages is a concept termed competitive exclusion, a situation where the most abundant bacteria prevent the establishment of other potentially undesirable strains. The 5 strains of bacteria have been carefully selected to function as a team. Some are responsible for breaking down organic waste from fish and plants, and some convert the resulting byproducts to harmless compounds that are recycled by plants and diluted through regular partial water changes.





Oxygenation

This process takes place at the water surface, the interface between water and air. The most efficient way to increase oxygen levels in water is to move and agitate the surface (without causing stress to aquarium inhabitants). The greater the surface movement, the greater the oxygenation rate. Symptoms of oxygen deficiency sometimes occur in heavily stocked aquariums and are demonstrated by fish exhibiting exaggerated and rapid gill movement. It is important to note that temperature is also a factor. Higher temperatures result in lower dissolved oxygen levels.

Planted aquariums should have gentle surface movement. This will reduce carbon dioxide loss, a key element of photosynthesis for plants. Power filters and powerheads are much more efficient in oxygenation versus air pumps, because of greater water movement over a much larger water surface area.

Powerheads

These highly versatile, submersible pumps are energy efficient and can be used in numerous applications. AquaClear Powerheads are designed with multiple features to provide optimal performance for most installations. They can be used to:

- Drive protein skimmers and wet/dry filters.
- Drive undergravel filters (provide superior flow rates through gravel bed).
- Mix and prepare water for partial water changes (ideal for mixing salt water).
- Provide current for reef tanks and other applications (easy to hide in rock structure).
- Attach to Quick Filters for additional chemical and/or mechanical filtration (ideal for clearing cloudy water in combination with Nutrafin P-Clear).
- Increase oxygen level (position output to move water surface).
- Back-flushing of gravel for maintenance (50 and 70 models only).

Powerheads provide a superior method of driving undergravel filters, helping to improve biological filtration efficiency through optimal flow rates and greater oxygen levels.

AquaClear Powerheads require little maintenance other than periodic cleaning of the impeller and its housing, providing trouble free long-term performance.

Air Pumps

Air pumps are versatile devices which can be used for a variety of purposes in aquariums. They are used to power inside box filters, sponge filters, undergravel filters, airstones, aerating ornaments, and provide oxygenation by moving water to the surface. It is important to understand that a pump introduces ambient air into

the aquarium. Consider any sources of airborne pollutants to be potentially harmful.

To obtain maximum longevity and performance from your air pump, avoid restricting a pump's output. Use a gang valve which provides one more outlet than the objects to be driven. This can allow extra output to be vented, and back pressure will be avoided.

When using airstones, it is recommended to replace them on a regular basis, which will prevent unnecessary back pressure. Always use a check valve to prevent any water from back siphoning into the air pump. Periodically verify that it functions correctly and replace if necessary.

The Elite series of air pumps combine high performance output with quiet operation.

Internal Filters

An internal filter provides easy, convenient filtration and offers a variety of application possibilities:

- Vertical or horizontal filter placement
- Can be used to create waterfalls in turtle and reptile tanks
- Supplemental filtration for many different set-ups
- Useful for creating extra currents in reef tanks
- Driving ultra-violet sterilizers
- Providing filtration when external filters cannot be installed

The Fluval Underwater Filters are optimal water filtration systems that have the capacity to independently filter aquariums up to 57 U.S. gal. (215 L) capacity. The Fluval "Plus" underwater filters feature a clogging indicator, allowing visual indication of when maintenance is required. The convenient dual cartridge design allows alternate replacement for uninterrupted biological filtration as well as prolonged maintenance intervals. There is also additional area for optional media such as polyester filter pads or carbon filter pads.

Another internal filter system to consider is the line of ELITE Stingray Underwater Filters. These filters combine style with silent performance. They provide mechanical, chemical and biological filtration.

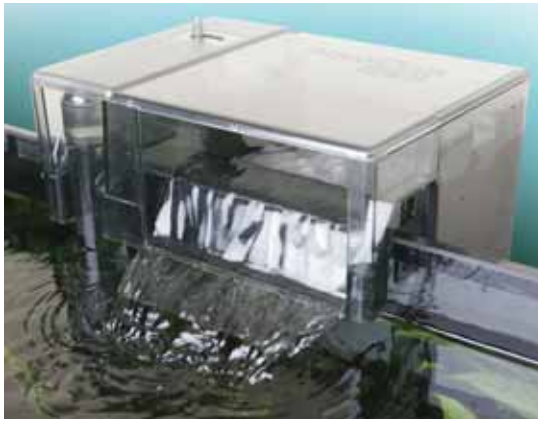
External Filter Systems

These systems represent a common choice for most aquarium keepers. The general principle of operation involves the intake of aquarium water via a siphon that results in filtration through one or more filter media. The return flow is directed at the surface to provide oxygenation. There are various configurations of external filter systems. An important feature is that it should be able to mechanically, biologically and chemically filter water. In order to achieve maximum effect from filter media, it is important to select a design that maximizes contact time. This is easily evaluated when observing how and where water flow is directed within the filter.

Fresh water aquariums generally require a minimum aquarium water volume turnover rate of approximately four times an hour. Marine aquariums usually do best with water turnover rates of 7 to 10 times per hour. Exceptions do exist with respect to the livestock being kept. In general, it is best to select a system(s) which provides somewhat more than the minimum rate. This will help compensate for declining flow rates as the filter system accumulates debris.

Clip-On Power Filters

A common type of filter system that conveniently hangs on the rear of an aquarium, efficiently filtering and oxygenating, providing easy access for maintenance. There are two basic types of systems, one employing a cartridge design, the other with a media compartment designed to accept multiple filter media. Systems which allow greater filter media choices generally offer more complete and versatile filtration.



AquaClear Power Filters

The AquaClear Power Filter represents one of the most versatile clip-on filter systems available. Five models provide a complete selection of flow rates for most popular sizes of aquariums. Contact time with the AquaClear filter system is maximized due to the innovative re-circulation grid and multi-filter media stacking. The re-circulation grid allows water to be passed through filter media more than once when slower flow rate adjustments are selected, improving contact time and significantly contributing to water quality.

AquaClear Filter systems incorporate the exclusive CycleGuard Insert System which ensures that all filtration requirements are fulfilled by providing three distinct filter media. This ensures continuous biological filtration as one insert is replaced at a time, while the remaining filter media supports the re-establishment of essential bacteria (along with a dose of Nutrafin Cycle).

Model	Art. #	Aquarium Size (U.S.Gal)	Flow Rate (GPH)	Flow Rate (LPH)
20	A-595	5-20	100	378.5
30	A-600	10-30	150	567.8
50	A-610	20-50	200	757.1
70	A-615	40-70	300	1,135.6
110	A-620	60-110	500	1,892.7

BASIC aquarium guide
Filter Systems

Elite Hush Power Filters

The complete line of Elite Hush Power Filters are easy to set up and maintain. Each filter incorporates a clogging indicator which lets you know when the filter media needs to be maintained. The one-step cartridge system that is used in these filters contains replaceable media that can be rinsed or changed with ease.

These user friendly filters also include a water flow adjuster, which allows you to easily increase or decrease the flow to your aquarium. In addition, a dual output system maximizes water movement and prevents dead spots in your aquarium.

Model	Art. #	Pumps up to (GPH)	Pumps up to (LPH)	Wattage
5	A-50	63	240	2.6
10	A-60	87	330	3.6
20	A-70	105	400	3.6
35	A-80	145	550	6

Canister Filters

These filtration systems offer the following advantages:

- Greater volume of filter media
- Greater variety of filter media
- Superior contact time of aquarium water with filter media
- Filter placement flexibility
- Superior biological capacity, can support higher fish populations
- Longer periods between maintenance
- Easy connection to additional filtration and water treatment devices, such as the Fluval Surface Skimmer
- Easy priming

The Fluval and AquaClear Surface Skimmers draw water from the surface of the aquarium eliminating undesirable surface films. Working in conjunction with the filter, the surface skimmer also draws water through a mid level intake strainer, for optimal filtering efficiency.

Filter Systems

Fluval Canister Filters

Fluval Canister Filters provide complete filtration for most aquariums. Multiple internal filtration modules allow the use of a variety of different filter media to provide optimal water quality. Amongst the many features and benefits of these filter systems are:

- The Aqua-Stop – barrel valves have been incorporated to eliminate maintenance. The second lever allows for flow adjustment, permitting the use of larger models on smaller aquariums or convenient flow reduction during feeding.
- Multi-media baskets – a variety of filter media is easily installed or removed, providing optimal conditions for most types of aquarium set-ups.
- Self-priming system – quick and easy to start.
- Ribbed opaque hosing – bends and turns easily without kinking, making installation and removal easier while supporting better water flow.
- Quick and easy maintenance

Fluval	Aquarium Capacity L (U.S. Gal)	Pump Output L/h (U.S. Gal/h)	Mechanical Area	Biological Volume	Filtration Volume	Filter Circulation* L/h (U.S. Gal/h)	Water Column Height (max.)
105 (A-201)	100 (25)	480 (125)	36,800 mm^2	1.37 L	3.2 L	330 (85)	1.35 m (4.4 ft)
205 (A-206)	200 (40)	680 (180)	56,000 mm^2	2.0 L	4.6 L	420 (110)	1.35 m (4.4 ft)
305 (A-211)	300 (70)	1000 (260)	56,000 mm^2	3.1 L	6.6 L	710 (185)	1.60 m (5.2 ft)
405 (A-216)	400 (100)	1300 (340)	76,300 mm^2	4.2 L	8.5 L	850 (225)	2.05 m (6.7 ft)

Fluval FX5

The Fluval FX5 offers unparalleled filtration power and maximum versatility in planning your aquarium's setup. The multi-stage system allows you to use up to 8 different types of media simultaneously, and in whatever configuration you desire giving you infinite flexibility in creating and maintaining the ideal environment for your aquatic inhabitants.

The FX5 Filter also offers incomparable ease-of-use features:

- Click-fit connections you just push to seal
- Aqua-stop valves so you can handle routine maintenance without breaking the system's vacuum (no need to disassemble hosing)
- Innovative handles that let you lift the entire stack baskets out to change or clean media
- A drain (and extra valve) so you can empty the canister easily (no need to move or lift a heavy, water-laden tank).

Filter Media

Filter media is the content of a filter system which is in contact with the water flow and is the substance that actually performs the mechanical, biological, and chemical filtering. The following filter media will support a healthy, thriving aquarium.

Foam

Carbon

Ammonia Remover

Aquarium Peat

Foam is an excellent mechanical filter media. The porous channel structure within the foam obliges the incoming water to deviate from a straight path, maximizing contact time and giving the foam a huge holding capacity for debris. This is easily observed when rinsing foam, as large quantities of waste are released. Maximum mechanical effect is achieved after approximately 10 to 14 days. Foam also supports essential bacteria and can be a mechanical and biological filter media, as evidenced by internal filter systems, as long as a regular water change schedule is respected.

Carbon filter media is highly adsorptive and is capable of removing odors and liquid wastes such as urine, dyes and many other impurities from aquarium water. Carbon manufactured for water filtration provides the correct pore size and selection of optimal raw ingredients to provide long lasting aquarium filtration. This is very important as there are carbons that are manufactured using raw materials which are designed for filtering air, not water, and are sold for aquarium use.

Lab Series Opti–Carb is an advanced chemical filter media that combines a high quality carbon with both a synthetic Organic Adsorption and Ion Exchange Resin. This potent combination of ingredients will ensure that aquarium water is effectively free of dissolved protein matter, toxic heavy metals, dissolved gasses that cause odor and discoloration for a crystal clear aquarium. Both fresh and saltwater aquariums will benefit from improved water quality. Fresh and saltwater fish will thrive in ultra pure water while plants and corals will benefit from improved light availability due to ultra clear water conditions.

Ammonia Remover is a natural mineral, which safely and effectively scavenges ammonium from aquarium water. This is particularly useful when chloramine is present in tap water, and in instances where ammonia can occur, such as new aquariums, fish loss, overfeeding, after disease treatment, and overpopulated installations.

Aquarium Peat is a highly desirable filter media which is very beneficial for aquariums containing plants, South American Cichlids, Tetras, Gouramis, Rasboras, Killifish, and many other species of fish originating from acidic waters. Peat will lightly stain the water a natural tan color, lower pH and KH values, and release natural substances, optimizing aquarium water conditions for many fresh water fish and aquatic plants. Fish that originate in acidic water will exhibit optimum coloration, improved behavior and reproduction. Peat can also have a positive effect in supporting acidic water conditions

Filter Media


Phosphate Remover


Bio-Max


Pre-filter


Polywool


Zeo-Carb


Nitrate Remover

Lab Series Phosphate Remover Phosphate is major nutrient and is undesirable within freshwater aquariums that do not contain plants and in marine aquariums in general. It's presence is linked to undesirable aquarium conditions and can result in an unsightly appearance. Lab Series Phosphate Remover has a large capacity to rapidly absorb phosphate, and as such, planted aquariums as well as aquariums containing hard corals (sps corals) should use this product as directed.

Bio-Max is the perfect biological media for fresh or salt water aquariums. BioMax porous cylinders are capable of supporting huge populations of water purifying bacteria. They are composed of 85% Micro-Tunnels, ideal for hosting the beneficial bacteria which consume toxic ammonia and nitrite. The remaining 15% are micro-cavities, ideal for hosting other species of beneficial bacteria that can contribute to biological filtration.

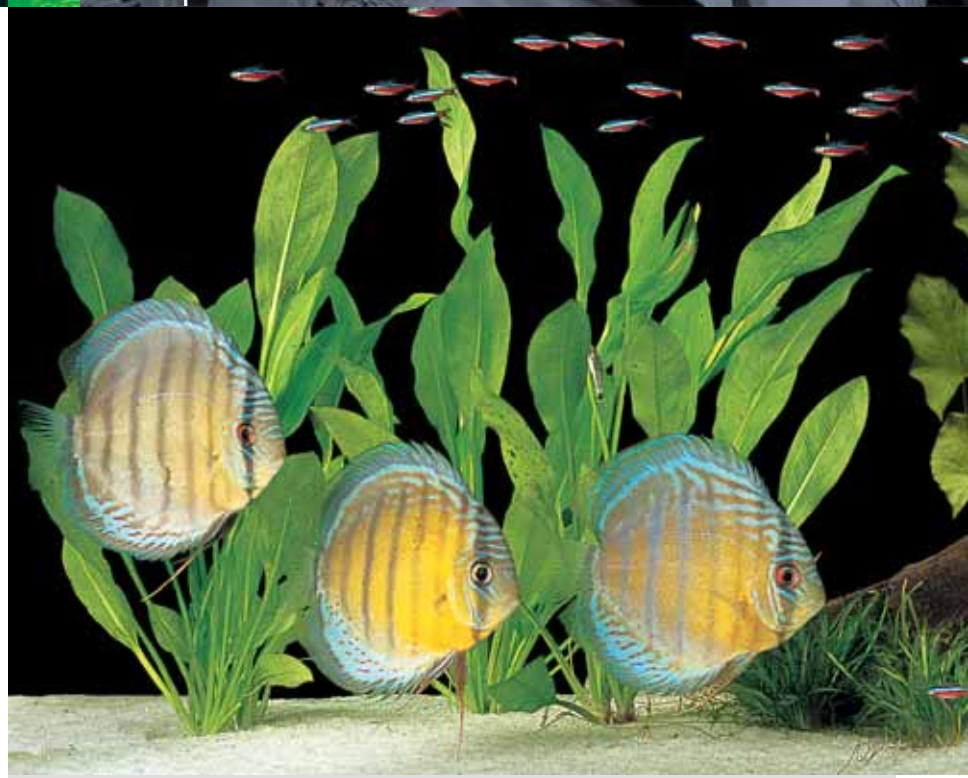
Pre-Filter consists of inert, solid rings that are ideal for medium to coarse filtration. These durable rings also serve as a surface for beneficial bacteria, contributing to biological filtration.

Polywool is an effective mechanical filter media that will remove fine particles and prevent other filter media from being prematurely clogged. It will contribute to polishing aquarium water for ultra clear conditions.

Zeo-Carb combines Ultra Grade Carbon and Ammonia Remover to protect the aquarium from build-ups of ammonia and liquefied waste, dyes and medication. It effectively controls and removes ammonia while trapping organic compounds. In addition, it also supports biological filtration.

Lab Series Nitrate Remover will effectively bind large quantities of Nitrate and highly toxic Nitrite. As ammonia and nitrite are continuously converted by nitrifying bacteria, there is an accumulation of nitrate. The greater the concentration of fish and other life within the aquarium the faster Nitrate will accumulate. This is a direct reflection of poor water quality as well as being a major factor in unsightly aquarium conditions. Regular use of this product is highly recommended for well stocked freshwater aquariums, especially those that do not contain live plants.

Temperature Control



Fish are "cold-blooded" and maintain the same body temperature as their environment. It is extremely important to maintain a constant temperature as sudden changes can cause stress and lead to disease. It is recommended that the water temperature is verified on a daily basis. A wide variety of thermometers exist for you to choose from. The Marina Aqua-Minder constantly displays the aquarium temperature in either Celsius or Fahrenheit. It features an alarm setting for the programmed aquarium high/low temperature range. The alarm will sound and flash if the water temperature falls outside the chosen range.

Tropical fish originate from areas with warm, temperate climates and as a result they require a constant water temperature usually between 75 to 80 ˚F (24 to 27 ˚C). This makes a heater just as important as a filter in your aquarium.

The general rule is to choose a heater or combination of heaters that provides 3 to 5 watts per U.S. gallon of aquarium water. If the aquarium is located in a cooler area it is strongly recommended that a minimum of 5 watts per U.S. gallon be used.

Placing the heater in an area where there is good water movement will help distribute heat efficiently. A common misconception is that of unplugging the heater during warmer weather – this should NOT be done. Heaters are thermostatically controlled and maintain temperature stability by NOT allowing aquarium temperatures to drop below its setting and automatically shutting off when necessary.

Heaters

There are two basic types of heaters: submersible and electronic.

Clip-on heaters such as the Elite Radiant represent an economical option for providing stable temperatures and are designed to be fastened to the aquarium frame. It is important to respect the indicated water line. This will ensure the proper functioning of the thermostat.

Submersible units such as Elite and AquaClear submersible heaters offer greater flexibility in terms of application and are available in easy-to-hide smaller diameters.

Elite Submersible Heaters:

Tough construction and quality features make Elite Submersible Heater an attractive choice.

Features:

- Easy grasp and adjust Temperature Set Dial
- Easy Read Temperature Settings
- Ceramic Heater Core for even and efficient heat distribution
- Safe, High Impact Safety Glass Heater Tube
- Fresh and salt water aquarium use

Art. #	Wattage	Length	Aquarium Size (up to)
A-748	25 W mini	15 cm (6")	20 L (5.5 US gal)
A-749	50 W mini	15 cm (6")	38 L (10 US gal)
A-750	50 W	26 cm (10.5")	50 L (15 US gal)
A-751	100 W	26 cm (10.5")	100 L (30 US gal)
A-752	150 W	33 cm (13")	150 L (40 US gal)
A-753	200 W	33 cm (13")	200 L (55 US gal)
A-754	300 W	36 cm (14.5")	300 L (80 US gal)

AquaClear Submersible Heaters:

These heaters can be defined as premium:

Features:

- Easy Set Temperature Dial
- Computer calibrated thermostat and assembly for accurate and reliable performance.
- Ceramic Heater Core for even and efficient heat distribution
- Slim-line Boron-Silicate Heater Tube for impact resistance combined with an easy-to-hide design.
- Heater mounting bracket supplied with long lasting suction cups.
- Exclusive sealing system to prevent humidity from entering the heater.
- Can be used in fresh and salt water aquariums.

Art. #	Wattage	Length	Aquarium Capacity
A-710	50 W	28 cm (11")	37.8 L (10 US Gal)
A-712	100W	28 cm (11")	75.6 L (20 US Gal)
A-714	150 W	33 cm (13")	113.6 L (30 US Gal)
A-716	200 W	33 cm (13")	189.3 L (50 US Gal)
A-718	300 W	38 cm (15")	265 L (70 US Gal)

BASIC aquarium guide
Temperature Control

Electronic heaters such as the Fluval Tronic, employ a technologically advanced method of temperature control and eliminate mechanical characteristics found in conventional heaters.

Fluval Tronic Heaters:

These quality heaters offer technologically advanced operation systems that are capable of delivering accurate, responsive, safe and reliable heating for fresh and salt water aquariums:

- Calibrated Control for accurate temperature settings.
- Electronic operational system with no mechanical components that can wear out and potentially become less accurate over time. Advanced Electronic Circuitry accurately and responsively regulates both current flow and is programmed to shut-off once the sensor reads 150°F (65.5 ºC). The Boron-silicate heater tube is rated to withstand temperatures of up to 200 ºF (93ºC).
- Patented Thermal Sensor provides accurate water temperature data for accurate heating. The Thermal Sensor continuously samples water temperature directly through the glass of the heater tube. Bi-metallic conventional heaters utilize air temperature within the heater tube, resulting in less responsive operation.
- Fast Heat Technology is a term used to express the fact that Fluval Tronic heaters will continuously heat aquarium water until the set temperature has been attained. Conventional Bi-Metallic heaters cycle on and off and as a result are not as responsive to temperature changes.
- Recessed Heater Coil to improve heat transfer to the ceramic inner core. This helps heat distribution characteristics of a heating system due to the core dissipating heat evenly.
- Preferred Submersible for Turtle and Other Low Water Aquariums. Functions accurately when placed in a diagonal position, neither conventional bi-metallic nor electronic heaters should be placed completely horizontal. Fluval Tronic Heater Guards are available for heater protection and are strongly recommended for aquariums containing large fish or turtles.

Art. #	Wattage	Length	Aquarium Capacity
A-766	50 W	88 cm (7")	50 L (15 US Gal)
A-767	100W	25 cm (10")	113.6 L (30 US Gal)
A-768	150 W	33 cm (13")	150 L (45 US Gal)
A-769	200 W	33 cm (13")	200 L (65 US Gal)
A-770	300 W	42 cm (16")	300 L (80 US Gal)

Factors that influence the type and quantity of light required for your set-up include:
Size of aquarium • Fish species and other aquatic inhabitants • Plant life • Aesthetics

Fluorescent lighting is an efficient, effective choice for many aquariums. It evenly illuminates the full length of the aquarium and efficiently converts energy consumed into light. The complete line of Glo Fluorescent Bulbs provides fresh water and marine aquariums with lighting which will stimulate photosynthesis, while contributing to a beautiful aquarium display.

Fluorescent lighting is currently available in various formats, including Power Compact, T5, and T5HO (high output). These fluorescents can produce intense light levels from compact dimensions and offer excellent spectral qualities, all of which combine to deliver superior plant and coral growth as well as enhanced aesthetics.

Incandescent lighting is available but does not offer the same aesthetic or efficiency value of fluorescent lighting. When deciding on how much light to provide, a range of 1 to 3 watts per gallon will provide most fresh water aquariums with optimal plant growth and visual presentation. Marine reef aquariums will sometimes require greater quantities of light to support the growth of certain coral species. When using the watts per gallon rule, a deduction of 10 to 15% of volume should be included to account for water displacement due to aquarium contents.

BASIC aquarium guide
Lighting

Waterhome canopies are available in single and double bulb configurations, equipped with high efficiency reflectors that maximize light emission. Revolutionary features of this lighting system include an anti-capillary barrier that prevents water seepage, water proof light bulb sockets, and a sleek, modern look.

Elite canopies feature power compact fluorescent lighting. Well known for intense light levels, this type of illumination can accentuate a wide variety of aquarium set-ups.

How to Maximize Efficiency of Fluorescent Lighting

- Keep any glass between bulb and water surface free of algae and mineral deposits.
- Clean the bulb surface weekly (with damp soft sponge).
- If bulbs or lenses accumulate mineral deposits, clean with a mild acid.
- In situations requiring higher light intensities, it is recommended to line fluorescent fixtures with a reflector.
- Replace fluorescent tubes annually, for maximum efficiency.
- Make note of installation date of fluorescent bulbs.
- Combine different tubes for certain specialty applications to maximize spectral representation.
- Use electronic ballast(s) when possible.
- Avoid turning lights on and off unnecessarily.

Lighting Tips

- Most plants require approximately 12 hours per day of light from a fluorescent fixture.
- Sudden changes in light may stress fish. When turning canopy lights on or off, it is beneficial to have room lights on for at least 30 minutes.
- Fish fed during the day should be allowed 30 minutes of light before and after feeding.
- Use timers when possible. Plants and fish will respond better to consistent lighting periods.
- Plants and fish will adapt to gradual light changes. When changing bulbs in a multiple bulb installation, change 1 to 2 weeks apart.
- A remote ballast should be mounted in an area where there is adequate ventilation to efficiently dissipate heat. This is especially important in ballast types that generate more heat.
- Electrical wiring leading to the ballast should always incorporate a drip loop.
- Consider a GFI (Ground Fault Interrupter) power bar as an inexpensive insurance to avoid unpleasant circumstances surrounding any potential electrical mishaps.
- Do not leave lights on 24 hours a day. As in nature, fish and plants require dark periods as well.

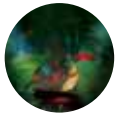
Marina Micro LED lights:

Marina Micro LED Lights allow you to create spectacular highlights in your aquarium and are ideal to use as a night light in the home. The low wattage LED lights are fully submersible and can be used in fresh or saltwater aquariums.
The Marina Micro LED Lights come in four colors:

Red
ideal for viewing nocturnal species

Green
accentuates live plants

Blue
simulates moonlight



White Neutral
creates natural highlights

Fluorescent Aquarium Bulbs

SUN-GLO

Daylight Aquarium Bulb

Features a refreshing natural white light with a color temperature relatively close to sunlight.

MARINE-GLO

Actinic Blue Marine Aquarium Bulb

A mandatory bulb for all salt water aquariums. Features a strong actinic blue spectral peak, highly beneficial to photosynthetic corals, invertebrates and other marine life.

POWER-GLO

Super Bright Aquarium Bulb

Provides a strong blue spectrum component and high color temperature, excellent for photosynthetic corals while intensifying fish color.

LIFE-GLO

Premium Full Spectrum Aquarium Bulb

Accurate color rendering, closely mimics natural mid-day sun. Full spectrum light with a powerful output, effectively stimulates photosynthetic processes in plants, corals and other invertebrates.

AQUA-GLO

Fish Color Enhancing Aquarium Bulb

Ideal spectral peaks that efficiently enhance fish color.

FLORA-GLO

Freshwater Plant Growth Aquarium Bulb

Photosynthetic spectrum ideal for planted aquariums and terrariums, stimulates plant growth.

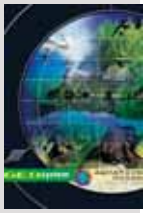
Ideal for:

- Fresh water aquariums
- Salt water aquariums
- Planted aquariums
- Corals
- Invertebrates
- Vivariums

Creating the Aquatic Environment

This is perhaps one of the most interesting and enjoyable aspects of setting up an aquarium. The decorations should be chosen in consideration of the species of plants and fish that will be kept. Plants require room to grow and their locations should take into account their full size and light requirements. The value of live plants in the aquarium goes well beyond that of decoration, as they are major contributors to water quality and benefit fish in many ways. For species of fish that cannot be housed with live plants, the use of plastic plants represents an excellent solution.

It is important to conduct a little research before deciding on the theme of your aquarium. A great resource for setting up a natural aquarium is the GEOsystem aquarium guide. This guide provides 12 different possible set-ups with three distinct aquatic themes for each of the 4 continental regions featured. It contains important and interesting background information on tropical fish along with step-by-step diagrams and images to create a thriving and captivating aquatic environment that will be the focal point of any room.



Some of the possible aquarium types and suggested decorations are:

Community Aquariums

This broad classification of aquarium generally refers to a mix of fish and plants originating from different geographical areas, with emphasis placed on color and hardiness. This type of aquarium can be very successful if it follows basic rules for compatibility of its inhabitants with respect to temperature, water chemistry, aquarium size, and character.

For example, various species of gouramis, tetras, and rasboras could be combined with a selection of hardy aquatic plants such as *Hygrophila difformis, Hygrophila polysperma,* and *Vallisneria spiralis*. A piece or two of root wood and some smooth pebbles would complete the decor, along with gravel at a 2 to 3 inch depth and a diameter of 2 to 5 mm.

Goldfish Aquariums

The bright colors of goldfish make for an attractive display and often are a first choice for many beginners. A combination of Ryunkins and Lionheads, Pearlscaper plastic plants, black gravel, and grey and white granite stones represents a combination which would attractively contrast with the vivid colors of goldfish.

BASIC aquarium guide

Creating the Aquatic Environment

African Cichlid Aquariums

The most common African Cichlid aquariums consist of either Lake Tanganyika or Lake Malawi cichlids. It is suggested not to mix these two groups together due to character and dietary differences. Both types of set-ups would generally consist of large quantities of rockwork combined with a fine substrate, gravel or sand. These fish dig, so careful attention should be paid to setting up rocks, to avoid possible collapses. Plastic plants can be used or live plants such as species of *Vallisneria* and/or *Anubias* can be attempted.

Planted Aquariums

This type of aquarium features emphasis on plants and limited fish populations.

An example of a plant tank could feature a backdrop of large groupings of faster growing species, such as species of *Hygrophila, Limnophila, Rotala, Vallisneria,* with an *Echinodorus species* in the middle and groupings of *Cryptocorynes* in the foreground. The gravel would be a 2 to 5 mm diameter at an average depth of 2-3 inches. Other decor is limited due to the space requirement of the plants and is usually limited to a piece or two of driftwood. Typical choices for fish could be smaller tetras or rasboras and some angelfish. It would also be suggested in this type of set-up to include some algae controlling species of fish, such as Siamese Flying Fox. Lighting, CO_2 injection, fertilization, and attention to appropriate filtration media are important details.

Rocks

Rocks and gravel sold for aquarium use are generally safe and relatively non-reactive. When natural aquarium gravel and rocks are used, it is recommended to use test kits, pH adjustment products and appropriate filter media to achieve and maintain desired water conditions.

When decorating with rocks, make sure any structures created are stable and will not collapse. It is also recommended to use only one or two types of rock and create groupings. This will lend a natural look to the set-up. Smooth pebbles in a variety of colors are available and provide a natural accent which can highlight various fish and plants.

Gravel

For planted aquariums, a size range of 2 to 5 mm is ideal for most plants. In general, it is suggested to avoid very light colored substrates, as they can make fish appear less colorful. If epoxy coated gravel is being used, make sure to avoid rinsing with hot water and excessively agitating when cleaning, to preserve the epoxy coating.

Use gravel to aquascape and create a depth perspective. Slope from back to front and employ some terracing to provide deeper areas. This also benefiting plants which have heavier root networks, such as the larger *Echinodorus* species.

Driftwood

Commonly used in many natural type aquarium settings. Hard root wood found in pet stores is probably the safest type of wood to use. Wood is organic and can decompose. It is suggested to verify its condition if water quality problems arise. It is normal for wood to discolor aquarium water at the beginning. Pre-soaking and the use of carbon can help reduce this phenomenon. An excellent method of keeping driftwood clean is to keep *Ancistrus* or *Plecostomus* (clown plecostomus) species which scrape and ingest it as part of their diet. Driftwood adds an interesting dimension to many aquariums and provides an ideal anchor for plants such as *Anubias barteri*, *Bolbitis heudelotii*, and *Vesicularia dubyana* (Java Moss).

BASIC aquarium guide
Aquarium Decor

Ornaments

Marina provides a wide variety of safe, non-toxic, natural and artificial decorations to enhance the aquatic environment. Creating an attractive and interesting aquascape is easy and beneficial to fish, providing them with structure that supports natural behavior patterns.

Polyresin Planting Rocks

These rocks furnish a natural look while being completely non-reactive in aquarium water. Planting rocks provide an advantage in that natural plants can be conveniently moved without significantly disturbing their root systems.

Artificial Plants

Aquariums containing fish that uproot or consume live plants (ex: Cichlids, Goldfish, Koi or Barb species) are ideal for artificial plants.

Within this category there are also silk plants which feature natural looking movement. Attach plastic and silk plants to rocks or wood when fish, reptiles or amphibians uproot them.

Aquarium Backgrounds

Marina aquarium backgrounds are available in a variety of sizes to fit most aquarium applications. The scenery can contrast or complement most any aquarium, while also hiding unsightly electrical cords or hoses. Aquarium backgrounds provide the finishing touch to any decorated tank, ensuring that fish and plants look their best.

Water is the most important and basic element in keeping a healthy, successful aquarium. There are many factors that affect the quality of water for aquarium use.

Chlorine and Chloramine are added to water to eliminate harmful bacteria in drinking water for human consumption, but are very toxic to fish, beneficial bacteria and plants. When first setting up an aquarium and whenever partial water changes are conducted, always use Nutrafin Aqua Plus to make tap water safe. Nutrafin Aqua Plus also contains Pure Herbal Extracts, a U.S. patented formulation that reduces stress when fish are handled, transported or introduced to new aquariums.

In specific areas around the country where Chloramine is present in the water, always use a highly concentrated chlorine neutralizer such as Nutrafin ChlorXChange as well as Ammonia Remover filter media to absorb ammonia. Nutrafin ChlorXChange is also recommended for preparing water for marine aquariums. Metallic Ions present in tap water are chelated by Nutrafin ChlorXChange and made available for consumption by plants.

Tap water that originates from wells can be plagued with many other potential undesirable elements, such as phosphates, nitrates, extremely high metal levels (ex.- iron) and many other organic and inorganic compounds. The use of Nutrafin Aqua Plus is mandatory and it may even be necessary to consider the use of special filtration devices located at the tap.

Plumbing with copper pipes can be potentially lethal, especially with soft water. It would be highly recommended to add double doses of Nutrafin Aqua Plus and use generous quantities of carbon to help remove copper. In marine systems containing invertebrates, this is a situation which would necessitate careful attention.

Water hardness and pH are two basic parameters that are easily measured with test kits and are important in providing an optimal aquarium environment. It is suggested to test tap water at least on a seasonal basis to make note of any fluctuations and adjust accordingly with effective products such as Nutrafin pH Adjust Up, pH Adjust Down and pH Stabilizer.

Source water may necessitate the use of certain filter media to help achieve favorable conditions for fish and plants. When keeping soft water species of fish in regions with hard alkaline water the use of peat is indispensible.

Testing the Water

It is important to monitor the quality of your aquarium water on a regular basis. Test kits allow easy analysis of aquarium water, to determine the right corrective action. They provide the information necessary for tailoring characteristics such as pH, Carbonate Hardness (KH), Iron (Fe) and General Hardness (GH) that are important for the particular type of aquarium being maintained.

With respect to its role in the blood system of aquatic organisms, pH is one of the most important chemical parameters. It should be verified on a regular basis to maintain the appropriate aquatic environment for the types of fish and plants that are being kept. An assortment of Nutrafin pH Test Kits exist for this purpose. Color, behavior and reproduction of fish are affected by pH. It is a vital element for the control of aquarium conditions.

Weekly testing of ammonia levels will indicate if the biological filter level of activity is sufficient or the ammonia is reaching dangerous levels. Nutrafin provides two different test kits to measure ammonia in aquariums.

Nitrite should be tested on a weekly basis as it is a toxic and potentially lethal nitrogen compound for fish. The Nutrafin Nitrite test kit accurately measures nitrite for aquariums.

Carbonate Hardness (KH) levels need to be tested on a regular basis because they fluctuate over time and can negatively impact the pH balance of aquarium water. Low Carbonate

Hardness will result in poor plant growth. In addition, testing for General Hardness (GH) should be done to determine if the Calcium (Ca) and Magnesium (Mg) levels are optimal for specific species of fish. Use the Nutrafin Carbonate and General Hardness Test Kit to conduct both of these tests.

Iron levels need to be carefully monitored in order to maintain lush, planted aquariums. It is recommended to test iron with a frequency that will maintain an iron level of 0.25 to 0.5 mg/L. Nutrafin offers a variety of products such as Nutrafin Plant Gro Iron Enriched, Nutrafin Plant Gro NPK, Nutrafin Plant Gro Aquatic Plant Fertilizer Sticks and Nutrafin Natural CO_2 system to provide plants with all the essential elements.

Phosphate levels should be monitored weekly as high levels of phosphate, often the result of overfeeding or infrequent water changes, can contribute to unsightly aquarium conditions. Phosphate levels should generally never exceed 1 mg/L. The Nutrafin Phosphate test kit allows you to simply and easily monitor phosphate levels in your aquarium.

Nitrate should be tested on a regular basis as a measure of pollution in the aquarium and to determine if a water change is necessary. The Nutrafin Nitrate test kit is ideal for this. Nitrate accumulates in aquariums over a period of time and is difficult to remove by conventional filtration. The regular use of Nutrafin Waste Control, Nutrafin Cycle and Lab-series Nitrate Remover combined with regular water changes and the removal of debris represent the best preventative measures against nitrate accumulation.

Marine reef aquariums, especially those containing hard corals and strong growths of coralline algae absorb calcium and carbonates at a rapid rate, often requiring daily testing to ensure that the calcium levels remain at an optimal level for the aquarium inhabitants. The Nutrafin Calcium and KH/GH Test Kits allow you to monitor the calcium levels of your aquarium.

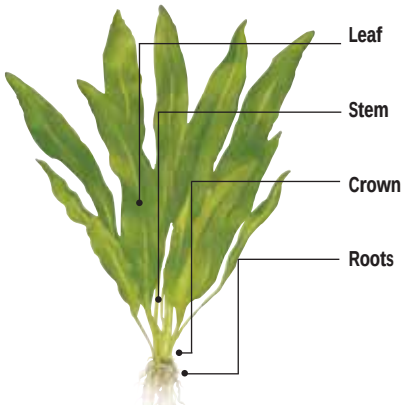
Water Conditioning & Start-Up

- Initially fill the aquarium one third full.
- Carefully pour in aquarium gravel, then plant and decorate.
- Once complete, place a plate at the bottom and carefully finish filling the aquarium with water. The plate prevents the incoming water from disturbing the set-up.
- Install all support equipment, heaters, filters (inoculate bio-filter media with Nutrafin Cycle), lighting.
- Condition the new water with Nutrafin Aqua Plus.
- Perform basic water testing, then adjust pH, KH, and GH to levels required for aquarium inhabitants.

After this is complete, dose with Cycle and allow the system a minimum of several days before adding fish. This period will allow plants to initially root and allow for any re-adjustments of pH. For areas subject to chloramine, this period is highly recommended. It is possible to add fish immediately due to products such as Nutrafin Cycle and Nutrafin Aqua Plus, however it is recommended to be patient.

Most fresh water aquariums can be set up with live plants and whenever possible, it is recommended to do so. The vast selection of plants suitable for aquariums is constantly growing along with affordable, effective, support equipment, providing the aquarist with choices for almost any set-up. Some of the benefits of live plants include:

- Supplement filtration – they absorb ammonium, nitrates and phosphates.
- Live Plants produce oxygen and absorb carbon dioxide when the aquarium is illuminated.
- They provide natural shelters for fish, thereby reducing stress and supporting natural behavior.
- Live plants provide the main decorative feature in an aquarium and become a dynamic element as they grow.
- Live Plants complete with algae through the intake of essential nutrients and absorption of light.



When purchasing aquatic plants, there are several important points to consider:

1 Ensure that you are actually purchasing aquatic plants. It is recommended that you consult knowledgeable store staff and/or books.

2 Look for healthy specimens. Avoid plants that are damaged (holes, broken leaves and/or stems) or exhibit yellow or brown leaves. Rooted plants should have clean looking (usually white) healthy root masses (with the exception of bunch plants).

3 Look for proper holding facilities. Plant tanks should be well-lit and kept at approximate tropical aquarium temperatures.

4 Purchase rapid growing plants at the beginning, commonly sold as bunch plants. This will provide maximum competition for algae.

5 Make sure plants stay wet or damp during the trip home, do not allow any part to dry out.

Planting Tips:

- Incorporate groups of plants in your décor. Select a few species with a quantity of each, as opposed to many different species and minor quantities of each.
- Position plants in appropriate positions with respect to species. Plant taller plants to the rear and shorter plants towards the front. Take into consideration lighting requirements when choosing prospective sites for your plants. For example, plants that prefer lower light levels may be planted in the shade of tall plants.
- Always remove devices used to bunch plants together. Any damaged or dead leaves should be removed. Bunch plants should have only the bottom 1 to 2 inches of stem planted.
- Planting should allow for a little space between groups of stems of plants (bunch plants).
- Never bury the crown of a plant. Expose the crown and avoid gravel between stems. Remember – plants grow! Be aware of their maximum size and provide the room and correct initial placement to account for this.

Recommended Aquatic Plants

The following species should be readily available at pet stores and are good groups to choose from with respect to their durability, adaptability, and use in tropical aquariums:

– Various species of *Vallisneria*: Tolerate a wide range of lighting and water conditions, rapid growing, excellent for background.

– Various species of *Hygrophila*: Prefer bright light, tolerate wide range of water conditions, rapid growing, suitable for mid to rear of aquarium.

– *Microsorum* (Java Fern): Tolerate wide range of lighting and water conditions, slow growth, can be anchored to driftwood or stones.

– Various species of *Echinodorus*: Tolerate wide varieties of light and water conditions. Certain species are excellent for feature or center plants (*Echinodorus bleheri*), many species feature broad attractive leaves. The dwarf Amazon sword (*Echinodorus griese bachii*) is an excellent foreground plant.

– Various species of *Cryptocoryne:* Usually will take some time for adaptation, great for foreground placement, generally will tolerate or prefer low light levels, tolerate a wide variety of water conditions.

BASIC aquarium guide
Live Plants

Proper Nutrition for Plants:

In order to maintain optimal nutrient levels for aquatic plants most aquariums require supplementation. Nutrafin Plant Gro Iron Enriched is a complete micronutrient formulation that contains all essential trace elements in the right concentrations to ensure optimal plant growth and condition. Micro-nutrients required by plants are constantly depleted through absorption as they grow and are also removed by chemical filtration. It is strongly recommended to use a Nutrafin Iron Test Kit to efficiently dose micro-nutrient supplements when they are required.

In densely planted aquariums macro-nutrients such as nitrogen, phosphate and potassium may have to be added. Aquariums featuring heavy plant density may employ high intensity light systems and carbon dioxide injection units which push growth to extreme levels, depleting macro-nutrients rapidly. Nutrafin Plant Gro NPK is an aquatic fertilizer that is essential for these types of aquariums, featuring a balanced formulation of nitrogen, phosphate and potassium. It is strongly recommended to use Nutrafin Phosphate and Nitrate Test Kits to efficiently dose macro-nutrient supplements when they are required.

Plants also absorb nutrients through their roots. Many aquatic plants, such as various species of Echinodorus and Cryptocorynes have substantial root masses and greatly benefit from nutrients found in the substrate. Nutrafin Plant Gro Fertilizer Sticks contain a complete slow release micro and macro nutrient mix that will efficiently nourish plant roots for one full year.

For further information on feeding and general care of aquatic plants please consult the Nutrafin Aquatic Plants, Care & Nutrition Leaflet.

SUGGESTED AQUATIC PLANTS: Respecting the basic information provided in this brochure will help provide hobbyists with a useful foundation for success with aquatic plants. The presence of plants in a properly maintained display will contribute to a full appreciation of the aquatic hobby. The following list of aquatic plants serves as a guide for species which flourish in tropical aquariums. These species are tolerant of a variety of temperature, light and water conditions:

***Hygrophila Difformis* (Wisteria):** Grows rapidly, recommended for new aquariums, rapidly absorbs mico-nutrients, Plant Gro Iron Enriched strongly recommended.

Microsorium pteropus (Java Fern): Attaches to driftwood or rocks, flourishes in low to high light and at various pH and hardness values.

Vallisneria spiralis: Suggested for background placement, good choice for new installations & hardwater

Aponogeton crispus: Attractive olive green color, rapid growth.

Aponogeton ulvaceus: Suited for tanks 30 U.S. gallons & up, rapid growth.

Echinodorus osiris: Excellent feature plant, provides red colored leaves, suited to 30 U.S. gal. tanks & up.

Hydrocotyle leucocephala (Pennywort): Can be used as a floating plant, provides refuge for fry (babies), grows rapidly.

Hygrophila polysperma (Hygro): Extremely hardy, recommended for new aquariums.

Ceratophyllum demersum (Hornwort): Rapid growing, typically a floating plant, good choice for bowls.

Cryptocoryne wendtii: Plant in groups, mid-ground placement, grows rapidly, provides brownish leaves.

***Anubias barteri* (nana):** Suggested for foreground and attaching to driftwood (slow growth).

***Echinodorus bleheri* (Amazon Sword):** Excellent feature plant, needs room, responds well to regular pruning.

Cryptocoryne walkeri: Plant in groups in the foreground, grows rapidly once established.

CO_2 in the Aquarium

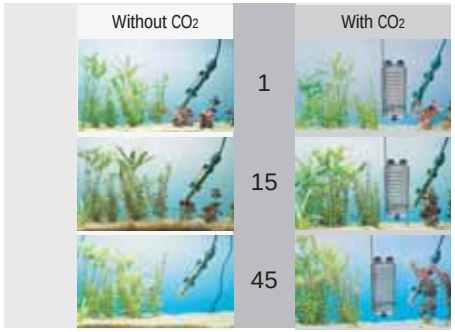
Carbon Dioxide (CO_2) is highly soluble in water in relation to the other two important gases found in H_2O, specifically oxygen and nitrogen. Dissolved carbon dioxide and oxygen levels in water are very important since they directly affect water chemistry (pH, KH) and are involved in essential biological processes, such as photosynthesis in plants. There is a gas exchange which takes place at the surface of the water between carbon dioxide (CO_2) and oxygen. The exchange results in carbon dioxide (CO_2) leaving the water and oxygen entering due to the fact that there is more oxygen in air than water and vice versa for carbon dioxide. Agitating the water surface accelerates this effect. The significance for planted aquariums is that surface agitation should allow just enough oxygen for fish demonstrated by comfortable behavior, respiration and not so much that it drives out all available carbon dioxide for plants.

Planted aquariums will often benefit from the addition of carbon dioxide. Concentrations of dissolved carbon dioxide are linked to pH and KH values, with the ideal pH range being 6.8 to 7.0, and a carbonate hardness (KH) value of 90 mg/L (5dKH). When adding carbon dioxide to an aquarium, it is advisable to maintain a KH value of 90 mg/L and allow the addition of CO_2 to slowly lower the pH value to the ideal range. Various species of fish may react differently with respect to dissolved carbon dioxide levels, it is advisable to monitor their reactions.

Benefits of CO_2 Injection:

- Most aquariums do not contain sufficient CO_2 levels for optimal plant growth and condition.
- Provides the most essential and available carbon source for plants.
- Excellent method of lowering pH in aquariums.

DRAMATIC RESULTS IN 15-20 DAYS!



Introducing Fish

It is recommended to be patient when first stocking an aquarium. Purchasing a small group of fish every two weeks will serve to gradually load the system and allow essential bacteria the time required to multiply and establish (dose regularly with Nutrafin Cycle), biologically converting toxic nitrogenous compounds produced by fish. In a new fresh water aquarium, a gradual build up of fish to achieve 1 inch of fish per gallon is recommended. Remember, fish grow.

Species to Start With

Select hardy species and make sure to incorporate some algae controlling species, such as Pencil Fish, Livebearers, *Ancistrus*, *Otocynclus* or Sailfin Plecostomus. The algae controlling species you select will depend on whether the aquarium contains plants and the other species of fish purchased. Fish that naturally consume algae will especially benefit the aquarium during the start up period. Once aquarium plants become established they will help to control algae.

It is recommended to select species that are compatible in terms of water chemistry, temperature, and behavior. Consult books and knowledgeable store staff for suggestions in this regard.

The GEOsystem guide provides simple and easy to follow guidelines for creating harmonious aquarium environments. Amongst the information contained in the guide is a sample listing of fish, their approximate size, behavior and the recommended aquarium size range.

Selecting Healthy Fish

The following list represents general characteristics of most healthy fish:

- Clear Eyes (not cloudy).
- Erect, undamaged fins.
- Scales should be intact, parallel with body (not sticking outwards) and no red blotches.
- No holes, ulcerations, or lumps.
- Species with translucent bodies, no inner appearing whitish areas.
- Active, lively, normal swimming patterns (some species are naturally shy and reclusive).
- No white spots (salt grain size) or white cottony growths on the fins or body.
- Respiration rate should be regular and steady (in unstressed circumstances).

- Gills should be red inside, not faded or discolored, and not distended or puffy.
- Actively feeding.
- Avoid selecting fish from a system that contains any sick specimens.

Choosing fish that are healthy from the beginning will help avoid problems. It is always a good idea to maintain a small quarantine tank for observation of newly purchased specimens and possible treatment. The quarantine aquarium will also serve as a hospital or isolation tank should compatibility problems arise, or other unavoidable circumstances which could result in disease.

Acclimation of New Fish

Transport new fish after purchase as soon as possible and avoid temperature change. The following steps are recommended to provide a stress-free introduction:

1. Close the aquarium lights during the acclimation period. Float the bag in the aquarium for approximately 20 minutes to equalize water temperatures.
2. Open the bag and gently pour in some aquarium water (approximately 1/3 the bag volume), wait 10 minutes. Repeat this water introduction twice more at the same interval.
   NOTE: Add a full dose of Nutrafin Aqua Plus to the aquarium. Its patented stress reducing ingredients will benefit the newly introduced specimens.
3. Carefully net the fish out of the bag and place them in the aquarium. Dispose of the water in the bag, DO NOT release this water into the aquarium.
4. If the newly introduced specimens are the only ones in the aquarium, wait 24 hours before initial feeding.

Examples of Species Requiring Extra Precautions

Discus

Discus are extremely sensitive to pH differences. During acclimation, it is suggested to adjust pH values accordingly and take twice the regular time to introduce new specimens.

African Cichlids

These cichlids are often very territorial. Rearranging the rock structure can reduce aggression towards newly introduced specimens. Certain species of Lake Tanganyika cichlids (especially fry) are sensitive to changes in water chemistry. Slowly dripping water into the bag for 30 to 40 minutes is recommended.

Marine (Salt Water Aquarium)

Marine fish should be introduced with caution, slowly dripping water into the bag for 30 to 40 minutes until the bag volume has doubled. Marine tanks with larger, territorial species such as surgeons and angels may require the use of a see-through divider (that does not impede water flow) to prevent serious attacks on new specimens.

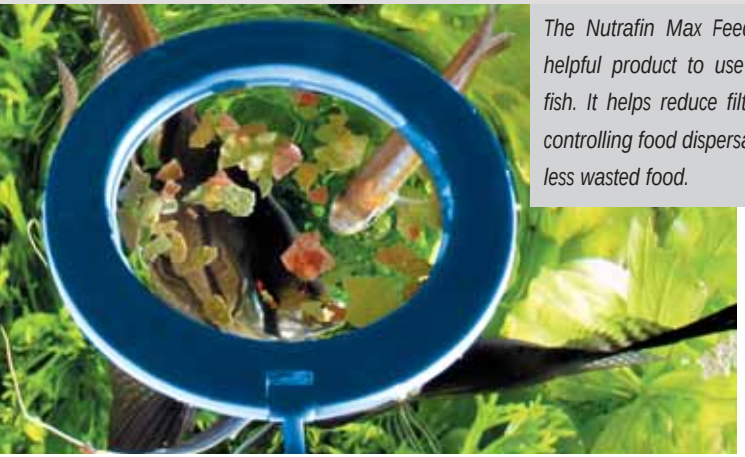
Observation and daily verification of aquarium inhabitants is an important preventative measure. A quick daily check will reveal any problems before they become serious. Specimens that are hiding and/or exhibiting torn or damaged body parts could indicate fighting and territorial disputes. Early recognition and diagnosis of any abnormalities or problems will allow timely treatment and much better chances of success. Regular use of products such as Nutrafin Cycle and Aqua Plus contribute significantly to providing optimal water quality and reducing fish stress. Nutrafin Aqua Plus contains a patented formula that provides fish with natural herbs known to have calming effects. Along with the capability of neutralizing chlorine and breaking the chloramine bond when first introducing water or doing partial changes, Nutrafin Aqua Plus provides complete conditioning. Biological stability is key to providing consistent water quality. Nutrafin Cycle provides a balanced community of highly beneficial bacteria. Nutrafin Cycle, dosed on a weekly basis, will build a stable population of these friendly bacteria.

Disease Prevention

Most living organisms can suffer illness at one time or another. The most effective way to deal with this reality is to prevent, rather than wait for a possible problem. The consequences of having to treat a stocked aquarium with a medication can be stressful and damaging in itself. Many plants, fish and helpful bacteria can suffer as a result of using medication.

The following list provides tips on preventing disease:

- Choose only healthy fish, avoid purchases from aquariums containing sick fish.
- Purchase fish in limited groups, slowly build fish populations.
- Consider a quarantine aquarium. This will allow observation and preventative treatments before exposing new fish to established aquarium inhabitants.
- Follow proper acclimation of new specimens.
- Always condition new water properly. Chlorine, chloramine, and metals are damaging to aquarium inhabitants. Use Nutrafin Aqua Plus.
- If plumbing repairs or changes occur that involve copper pipe, exercise caution.
- Perform basic water tests and maintenance on a regular basis.
- After power failures, ensure that all equipment is working properly. Observe fish carefully, temperature variations will stress them.
- Use timers for lighting. Regular illumination periods are important for fish and plants.
- If a medication has been used, after the treatment is complete, perform additional water changes and use carbon to remove residual traces. Test water and dose with Nutrafin Cycle and Aqua Plus.
- Supply regular feedings of various quality foods such as Nutrafin Max.



The Nutrafin Max Feeding Ring is a helpful product to use when feeding fish. It helps reduce filter clogging by controlling food dispersal and results in less wasted food.

Feeding

A regular feeding schedule is important to provide fish with essential nutrients, vitamins, and minerals. Disease resistance, coloration, activity level and reproduction are all major factors directly linked to a quality nutrition source.

Nutrafin Max uses top quality ingredients combined with special production methods to ensure maximum nutrition through high bio-availability.

Certain Nutrafin Max products use natural color enhancing ingredients such as Red Algae Pigment (R.A.P.), rich in astaxanthin, a powerful carotenoid, a proven immune system booster, while improving growth rates. Spirulina provides fish with numerous health benefits and is a valuable source of a number of pigments, allowing the enhancement of a variety of colors.

Variety is important. Nutrafin Max provides a complete selection of flake, freeze-dried, granular, stick, and tablet foods, designed to effectively feed most species of aquarium fish.

Nutrafin Max Plus fish foods are formulated to provide a complete diet for most tropical and marine fish. Each diet contains a unique blend of flakes and freeze dried ingredients, providing fish with two nutritious foods in one container. Each Nutrafin Max Plus food is formulated to naturally enhance fish color while offering a safe, convenient alternative to frozen foods. In addition the proprietary multi-vitamin ensures optimum growth and disease resistance. An important part of any staple diet Nutrafin Max Plus foods also makes ideal feeding supplement.

BASIC aquarium guide
Fish Nutrition

How Much Do I Feed?

A good rule of thumb is to use time as a guiding factor. Most aggressive feeders can easily consume their requirements within two to three minutes, two to three times daily. Fish such as Discus and Bottom dwellers (Catfish, Loaches, Sharks, Plecostomus) require approximately 5 minutes to properly nourish themselves. It is suggested to consult books and knowledgeable pet store staff to obtain specific details about the species being kept.

Feeding Tips

- Identify feeding requirements of species kept (herbivores, omnivores, etc.).
- Try to avoid feeding large predatory species with live fish. Use appropriate dry or frozen foods. There is less chance of disease transmission and this will facilitate the feeding of your fish if you are away.
- Allow a minimum of 30 minutes after the lights are turned on and 30 minutes before the lights are turned off before feeding.
- Keep dry food away from moisture and try not to handle food (especially with wet hands).
- Use a Nutrafin Max Feeding Ring for dry foods. It helps prevent food from entering the gravel and filter.
- Use an automatic feeder (ex.- Nutrafin Profeed or Nutramatic 2x), if your schedule does not permit regular feeding.
- Aquariums containing bottom feeders (botias, corydoras, etc.) should be fed regularly with bottom feeding tablets.
- Use quality foods. Nutrafin Max provides complete, high quality nutrition.
- Provide a varied diet, minimum of 2 dry foods (1 flake and 1 freeze dried) and 1 frozen food.
- Always try to incorporate some Spirulina in a fish's diet, especially for herbivores.

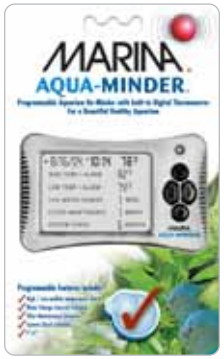
Maintenance Tips

Aquarium maintenance is an essential regular activity that provides a stable, healthy environment for fish and plants. The key to an effective program is to fulfill basic, simple tasks, which, when performed on a regular basis, take very little time and result in a clean, thriving aquarium display. Ongoing biological processes can deplete water of essential ingredients and cause nitrate accumulation and other non-desirable substances. Most expert aquarists will agree that regular partial water changes represent a key element in fish health and condition. Always ensure that the replacement water has been treated with Nutrafin Aqua Plus and is of the same temperature as the aquarium. The following lists of maintenance activities and equipment serve as a general guide to maintaining a stable aquatic environment. Variations in percentage and frequency can exist due to stocking density and types of livestock kept.

Maintenance Tips

1. Never change more than 40% of aquarium water at a time.
2. Never empty the entire aquarium to clean it. This causes undue stress on fish and will disturb the biological balance of your aquarium.
3. Only change half of your filter media at a time, to retain the established biological balance.
4. NEVER use soap or any detergent on your aquarium or any products used in or around your aquarium.
5. When cleaning the inside glass of your aquarium, avoid picking up pieces of gravel, as this will scratch the glass.
6. Limit the amount of times you put your hands in the water. Oils and films may cause stress in fish. It is preferable to use the Marina Multi-Tool.

The Marina Aqua-Minder has been designed to provide aquarium owners with an aquarium monitoring system. The Marina Aqua-Minder constantly displays the aquarium temperature in either Celsius or Fahrenheit. It features an alarm setting for the aquarium high/low temperature. The alarm will sound and flash if the water temperature falls outside the chosen range. Other programmable features include water change interval schedule, filter maintenance schedule and system check schedule.



BASIC aquarium guide

Maintenance Tips

Maintenance Checklist:

Daily:

- ❒ Perform a visual check of the aquarium inhabitants to make sure that none of them are sick, hurt, or acting strangely.
- ❒ Check that all the equipment is working properly(filters, heaters, lighting, etc.).
- ❒ Remove any dead fish, plants, or obvious debris (such as plant leaves attached to intake strainer of filter).

Weekly:

- ❒ Perform a partial water change, 5 to 10% is recommended. Use a gravel washer to clean trapped waste from the gravel. Partial water changes on a regular basis will provide stable water quality and maintain ideal conditions.
- ❒ Clean the glass inside and outside. This will eliminate any algae, and ensure full viewing pleasure.
- ❒ Clean fluorescent tube(s) and fixture. This will maintain consistent light levels.
- ❒ Test the aquarium water.

Monthly:

- ❒ Check supplies, food, water conditioners and all other regularly used items.
- ❒ Perform filter maintenance and replace filter media as per manufacturer's recommendations and in accordance with the results of your water test.

10 basic rules for a successful aquarium

1
Provide regular, varied, feeding for fish. Feed two to three times per day, the amount consumed in approximately two minutes (for most fish).

2
Keep fish populations within reasonable limits.

3
Follow the daily, weekly, and monthly checklist in this guide.

4
Select fish that enjoy similar temperatures, water chemistry, are compatible with respect to behavior, and occupy different levels of the aquarium.

5
When choosing filtration, consider contact time, filter media volume, and factors which affect filter output.

6
Incorporate live plants whenever possible.

7
Choose the largest aquarium possible. Volume equals stability and greater flexibility in choices.

8
Stable conditions are important. Following the provided checklist will help achieve this.

9
Try to plan your aquarium set-up. Select plants, rocks, wood, gravel, and other décor which are complementary.

10
Enjoy the hobby! Use it as an experience to learn about a fascinating underwater world.

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