Why is the biOrb filtration system unique?

Tropical Fish · https://shirleyaquatics.co.uk/knowledge/why-is-the-biorb-filtration-system-unique/

Reef One aquariums use multi-stage filtration to ensure the water remains in the best condition, creating and maintaining an environment which is safe for fish and other inhabitants.

The unique cartridge based filtration system inside all biOrbs and biUbes has been specifically designed to effectively and safely eliminate the organic waste produced by fish and uneaten food, keeping the water clear and the fish healthy. In order to keep water quality high all our aquariums use five separate stages to optimize the water, meaning less maintenance for you and a healthier environment for your fish. The 5 stages of water optimization consist of biological, mechanical, chemical, water stabilization, and oxygenation. An overview of the 5 stages are presented here.

Biological:

Ceramic Media –

- Beneficial bacteria breaks down the ammonia and nitrite
- Beneficial bacteria live on and inside the ceramic media
- Ceramic media is highly porous and has a large surface area for the beneficial bacteria to thrive
- Highly oxygenated water passes over the beneficial bacteria allowing them to multiply rapidly
- Beneficial bacteria occur naturally but a bacteria booster is also supplied to seed the aquarium

The biological filtration processes the waste, principally ammonia and nitrite, which is produced by fish. Unlike many traditional aquariums, specialized ceramic media is used to create a highly effective biological filtration. This ceramic media provides a highly effective home for beneficial bacteria and the air powered system ensures that highly oxygenated water is constantly flushing over the bacteria so they can obtain the necessary nutrients and oxygen. The biological filtration remains inside the aquarium at all times ensuring the beneficial bacteria are not killed during maintenance.

Mechanical:

- Chemically nonreactive filter

- Removal of any suspended debris
- Collects the solid organic waste inside the filter cartridge for easy removal.

The standard filter cartridge includes our chemically nonreactive mechanical filter that traps particulates, like fish waste and uneaten food, as they pass through. Unlike many aquariums, our mechanical filter is separate from the biological filtration allowing the removal and disposal of the filter cartridge, containing the mechanical filter, without affecting the biological filtration. Replacing the mechanical filter housed in the easy to change filter cartridge ensures that the trapped particulates don’t have time to break down and adversely affect the water quality.

Chemical:

biOrb Freshwater Filter Cartridge-

- Combination of resin particles
- Microscopic pollutants which can affect the water quality or colour of the water is absorbed by the resin particles
- The highly effective resin particles are housed in the easy to change cartridge ensuring that they can be simply replaced when they become exhausted

The chemical filtration in the filter cartridge is a blend of different resin particles selected to remove toxic substances, other than ammonia and nitrite which is broken down by the biological filtration. Certain organics can discolor aquarium water making it yellow, while also reducing light penetration. The highly effective resins bond with these substances at a molecular level to ensure the aquarium water quality remains high. The chemical filtration is located in the easy to change filter cartridge ensuring that chemical filtration can be removed when depleted (typically every 6 weeks).

Water Stabilization:

- Fish require a stable water pH, our natural water stabilizers work to keep the pH constant
- The water stabilizers increase the buffering capacity of the water ensuring that the conditions stay more constant
- The stabilizers work to limit any rapid changes in water chemistry.

The filter cartridges used in all our aquariums include water stabilizers to increase control over the water chemistry. These natural water stabilizers are used to limit any rapid changes which could be

detrimental to the health of the aquarium inhabitants. The water stabilizers work by gradually breaking down if a pH of 8 is exceeded, this gradual process reduces the chance of a pH swing which is likely to be harmful to fish. The water stabilizers are included in the filter cartridge ensuring that they are easily replaced before they are exhausted.

Oxygenation:

- Fish and other aquatic life require oxygen. Our aquariums provide maximum water oxygenation
- The bubbles breaking on the surface ensure there is constant surface agitation
- The shape of the biOrb ensures that there is no area where the highly oxygenated water doesn’t pass. This keeps the water fresh and safe for the fish
- The filtration system and the biOrb have been independently scientifically tested to ensure it provides a superior system for keeping fish.

One of the key advantages of the filtration system in all our aquariums is the highly effective air powered system which provides 100% oxygenation. The water in all our aquariums has been independently analysed to prove our systems produce water with 100% dissolved oxygen saturation which the inhabitants, including fish need to thrive. This highly oxygenated water also improves the efficiency of the biological filtration as beneficial bacteria require oxygen in order to break down the toxic ammonia and nitrate.

Placement of filter

The optimum placement of the filter is often overlooked by many manufacturers. Our filter cartridge is located at the bottom of the aquarium where solid fish waste naturally settles. The waste is then pulled into the filter cartridge allowing for quick and easy removal.

To illustrate the filtration process, as the air is blown into the bottom of the aquarium it rises bringing water with it to the surface of the aquarium where the bubbles burst and saturates the water, with the maximum levels of oxygen possible. To complete the natural flow, water from the aquarium is drawn over the ceramic media and back into the filter for the cycle to start again. The Nitrosomonas & Nitrospira beneficial bacteria live on and in the ceramic media and extract the ammonia and nitrite, utilizing the oxygen from the water that they need to survive. Also during this water flow, solid waste is also pulled passed the ceramic media and into the filter cartridge where the mechanical filtration sieves this out.