



Aquarium Filters - What Type is Best For Your Aquarium?

There are many different types of aquarium filters that are available to the modern day aquarium hobbyist. All of these filters can function to keep your fish alive provided that they are sized to handle the bioload that is being produced within your aquarium. Each type of aquarium filter does have distinct features, advantages and disadvantages associated with it that may impact its suitability for your particular situation.

The objective of this article is to help you understand how the various types of aquarium filters function and the pros and cons associated with each. This knowledge should help you evaluate which type of filter is best for you and your aquarium and optimally configure that filter for use with your aquatic system.

Sponge Filters: Sponge filters are the most basic type of filtration available for your aquarium and are placed inside the aquarium itself. A sponge filter is most often composed of a large sponge that is mounted to a weighted base that allows the filter to be placed on the aquarium bottom. Airline tubing runs through a tube to an air stone that is contained within the centre of the filter. As the bubbles from the airstone rise up through the centre of the filter water gets slowly drawn in through the sponge and out through the top of the filter.

Beneficial bacteria that live within the pores of the sponge consume the ammonia and nitrite that exist in the aquarium water as it is drawn through the sponge filter providing effective biological filtration. Sponge filters also provide a minimum amount of mechanical filtration as particles that exist within the aquarium water get trapped in the sponge as water passes through the filter. Sponge filters do not provide a means to chemically filter aquarium water.

Sponge filters offer the advantages of being low cost and easy to operate and maintain. Please keep in mind that an air pump is required for the sponge filter to operate and this pump is not usually included with the purchase of the filter. A periodic rinsing of the sponge is all that is required to keep a sponge filter functioning properly. Some of the disadvantages associated with sponge filters include the limited mechanical and non-existent chemical filtration that they offer as well as the fact that they can be considered to be an unsightly addition to the interior of the aquarium.



Hang-on-the-Back (HOB) Filters: As the name implies, hang on the back filters usually mount to the back of an aquarium providing a compartment that contains the filter media external to the aquarium. A tube extends from the input of the filter into the aquarium and an impeller is used to draw water in through the filter. Once the water passes through the filter media it typically spills out over top of the filter and back into the aquarium.



HOB filters usually contain sponges, media bags and media cartridges that are used to mechanically, chemically and biologically filter the water. Some HOB filters deploy a filter wheel to provide wet/dry biological filtration. These types of filters usually provide the aquarium hobbyist with some flexibility as to the type and quantity of sponges, media bags and/or cartridges that are contained within the filter. When placing the filter media into the filter, consideration should be given to having the water pass through the mechanical filtration first. This will reduce the amount of debris that gets trapped within the chemical and biological filter media and can extend the amount of time that can be tolerated between filter maintenance.



If left unchecked, HOB filters will eventually clog with debris, significantly reducing the flow rate and capacity of the filter. It is important to establish a filter maintenance schedule that will prevent this from happening. HOB filter maintenance is usually straightforward and consists of removing the filter, removing the filter media from the filter and rinsing it, replacing any media that needs to be replaced and re-installing the filter on the aquarium.

HOB filters offer the advantage of being reasonably priced, relatively unobtrusive to the interior of the aquarium and relatively easy to maintain. Although HOB filters can be used to filter moderately sized aquariums, the limited amount of filter media contained within the filter and limited amount of water passing through the filter usually prevent an HOB filter from being adequate to filter a larger aquarium.

Canister Filters: Canister filters are composed of a variably sized canister that contains filter media and is placed external to the aquarium. An impeller is used to draw water out of the aquarium into the filter, force it through the filter media and return the water to the aquarium. The water typically travels through tubes and hoses as it makes its way to and from the aquarium. The hose that draws water into the aquarium is usually capped with a strainer to prevent large debris and/or fish from getting drawn into the filter. The return hose is usually capped with a spray bar to distribute water within the aquarium and provide surface agitation which increases oxygen levels within the water.

Canister filters usually contain sponges, bags, baskets and/or cartridges that contain the filter media. The aquarium hobbyist is usually afforded with the flexibility to fill the media containers with the media of their choice allowing the filter to be customized to the needs of the aquarium. Various types of mechanical, chemical and biological filter media can be contained within the filter. As is the case with HOB filters, consideration should be given to having the water pass through mechanical filter media first when filling a canister filter with media.

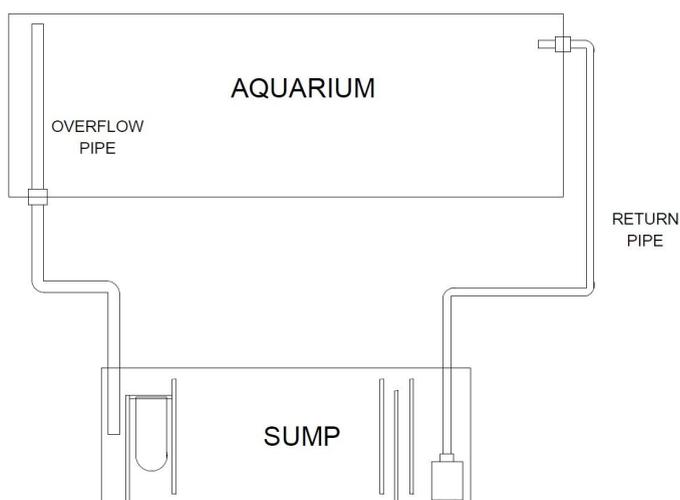




Periodically, the media within the canister filter will become clogged with debris, this will restrict the water flow and reduce the capacity of the filter. It is important to implement a maintenance schedule that provides for filter cleaning before the flow rate through the filter is significantly reduced. Canister filter maintenance usually involves disconnecting the filter from the aquarium, opening the canister to remove and rinse the media as required, replacing any of the media that needs to be replaced and reconnecting the filter. Valves are usually present on the filter hoses, these should be closed when disconnecting the filter for maintenance to prevent water from siphoning out of the aquarium. Remember to open the valves before turning the filter on once the filter has been reconnected. It is best to open the valve on the input hose first as this will allow aquarium water to be siphoned into the filter through the input hose once the valve is opened.

Canister filters offer many advantages to the aquarium hobbyist. They give the aquarium hobbyist a great deal of flexibility when it comes to the type and placement of media within the filter. Canister filters can be sized to meet the needs of moderate to very large aquariums as larger canisters hold more media and are thus capable of filtering greater volumes of aquarium water. Canister filters are reasonably unobtrusive to the interior of the aquarium with only the intake tube and spray bars typically being visible. Although it can take longer to clean a canister filter than it would to clean an HOB filter, the time afforded between cleanings can be significantly longer with a canister filter. Canister filters are typically more expensive than HOB filters with larger canisters costing more than smaller versions.

Sump Filters: Sump filters are by far the most flexible and most complex type of aquarium filter. A sump filter is usually composed of a separate aquarium or container used to hold the filter media, pipes or hoses to carry the water from the aquarium to the filter and return water to the aquarium and a pump or pumps to facilitate the water movement. Water typically overflows into a pipe or pipes within the aquarium and flows down to the sump which is most often mounted beneath the aquarium. There are many different types of



overflows that can be used to direct water to the sump, so many in fact that it would be possible to dedicate an entire article to the different types of overflows that exist. Once the water reaches the sump, it passes through the various forms of media contained within the sump. Baffles are used to separate the sump into different chambers containing the media and other filter components. The baffles also direct the water flow through the sump. Once the



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water passes through all of the media within the filter it typically passes under a baffle and into a chamber that contains the return pump or pumps. These pumps are used to pump water up to the aquarium causing more water to overflow into the pipe leading down to the filter. With all of that being said, it is possible to mount a sump above the aquarium, this type of configuration is called an overhead sump. In the case of an overhead sump, a pump or pumps are located within the aquarium to pump water up to the sump where it eventually overflows into a pipe leading back down to the aquarium.

Sumps can contain filter socks, sponges, media bags, media baskets and various types of mechanical, chemical and biological filter media. They can also be set up in a wet/dry configuration to house wet/dry biological filter media. Another article could easily be devoted to the design and setup of sump filters as well as the different types of media that can be contained within. As always, when configuring the media and flow of water through a sump it is best to have the water pass through mechanical media first.

As with the other types of aquarium filters, the filter media within a sump will eventually become clogged and have to be cleaned. Since the sump can be designed and configured to suit the needs of the aquarium and hobbyist, it is possible to design the sump so that the mechanical filter media is easy to clean and/or replace. It is also possible to design the sump in such a way that very little debris makes its way to the chambers that contain the chemical and biological filter media. When designed with this intention, long periods of time can pass before it is required to clean the biological filter media within a sump making the sump very easy to maintain.

Sumps can offer many advantages to the aquarium hobbyist, the most significant of which is the ability to customize the design to suit the needs of the aquarist, the aquarium and its inhabitants. The size of the sump can be configured to meet the needs of a small aquarium or the largest of aquariums. The bioload of extremely large aquariums can exceed the capacity of the largest canister filters or even multiple canister filters, often leaving a sump as the only practical means to filter them. Although all filters inherently increase the water volume of an aquatic system, sump filters offer the capability to significantly increase the water volume. This can provide more stable water conditions for the aquarium inhabitants, further dilute any contaminants that may be in the water and allow for greater stocking levels within the display aquarium. Salt water aquatic systems, especially those intended to grow coral, often require protein skimmers and various types of reactors to flourish. These can be accommodated within a sump and not within any other type of aquarium filter. Sump filters can also be configured with chambers that can act as a refugium to temporarily house aquarium inhabitants that may need to be temporarily isolated or to grow plants. When considering the visual appeal of your display aquarium, a sump filter can be the least obtrusive of all filter options. A sump filter offers the distinct advantage of providing a place to house heaters and other aquarium accessories, leaving the inside of the display aquarium clear for fish and decorations. A sump filter can be designed to provide redundant features, extra return pumps, overflows and other features can be incorporated into the system to provide protection in the event of a failure. Given the level of effort that most aquarium hobbyists undertake to care for their aquatic pets and the cost that is often associated with



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these pets, redundancy is something that should be considered in the design of any aquarium system.

Sump filters are not the least expensive option for aquarium filtration. Although they can be scaled up to offer increased filtration capacity and built with redundant features this usually comes at an additional cost. While most sumps can be designed to be easy to operate and maintain, the design of a sump filtration system can be a complex process. Sump filters should only be designed and built by those that understand the implications and risks associated with the design.

Conclusion:

Aquarium filters play an important role in any aquarium system. There are many different types of aquarium filters, each with their own set of features and drawbacks that should be considered when selecting a filter for your aquarium. I hope that this article will help you to select the best filtration option for your aquarium system and configure that filter to best suit your needs.