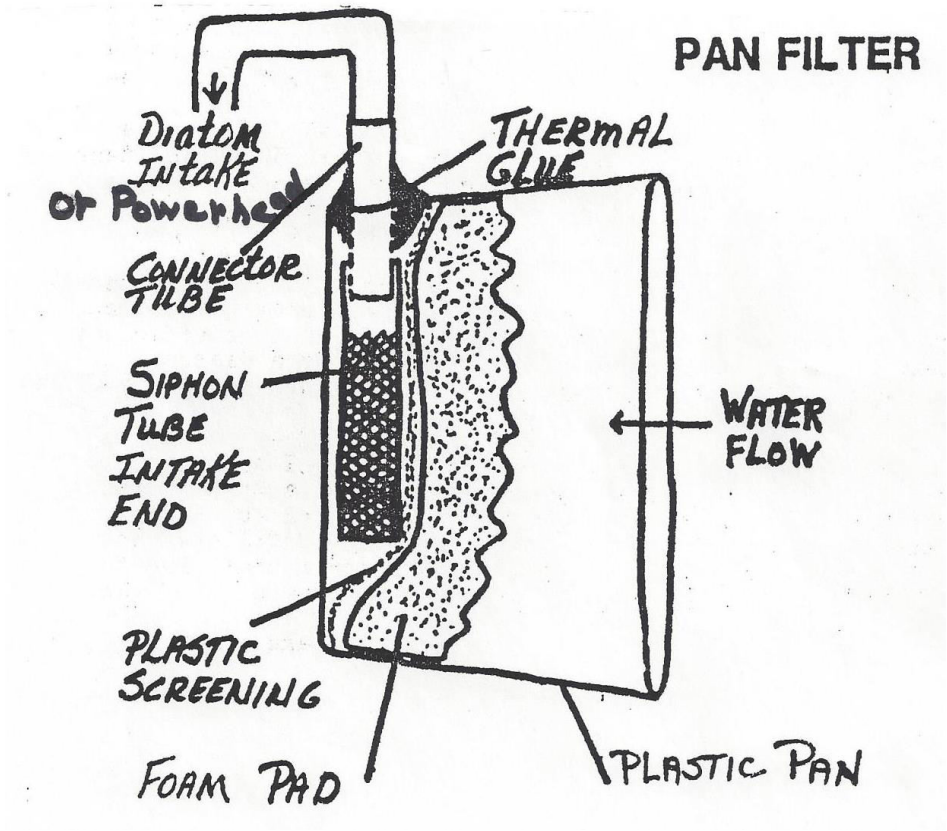
FILTRATION TYPES, PAN FILTER

By Chase Klinesteker SWAM, July-Aug 1987



Pan Filter Diagram

This article discusses the different types of filtration and appeared in the SWAM Newsletter in the July/August 1987 issue. References to diatom filters seem a bit outdated, but the basics of filtration are the same, and I am still using my pan filter in 2016, but with a powerhead, where it is submersed in the tank with the water flow aimed in the opposite direction of the filter pad. The pan filter is best used in tanks with an undergravel filter or bare bottom, not a fully planted tank. CK

FILTRATION TYPES

Efficient filtration, or removal of waste products from the aquarium, is one of the most basic functions in keeping healthy tropical fish. Both mechanical removal of debris and biological breakdown of waste products are necessary for effective filtration. In order to keep my several aquariums and filters cleaned properly, I was spending too much time moving, cleaning, and changing filters. I needed to develop a system of filtering and cleaning my aquariums that was both quick and effective. First, I tried to determine the advantages and disadvantages of the types of filters in general use.

The Diatom Filter. The main advantages of diatom filters are that it pumps a lot of water, can be quickly moved from tank to tank, and polishes water very well. However, debris builds up quickly on the filter bag and it is time consuming (and sometimes messy) to clean. The cost of the diatom powder must be considered also. Every time the filter is started, one must wait for the powder to build up on the bag.

The Outside Power Filter. This is a superb mechanical filter, removing suspended debris from the water quickly and efficiently. Once enough debris builds up on the filter pad, it can be efficient at removing fine debris and clearing the water, as well as some biological filtration. The main disadvantage is that they cannot be moved from tank to tank quickly because the siphon is lost. Also, high water levels are needed for the siphon and it may be difficult to find a place to hang the filter on the tank.

The Cannister Filter. This is a self-contained unit with water pump that is connected to an aquarium to remove the water and suspended debris, filter it, and return it to the aquarium. They can be very efficient and fast, but need cleaning periodically. The subject of this article, the Pan Filter, was designed to be a more portable version of the canister filter. Its' filter medium/pad remains in the aquarium and is easily accessible for cleaning.

The Undergravel Filter. This has very effective cleaning and water clearing capabilities. It can "remove" suspended debris and clear the water in a fairly short period of time. The main problem is that the "removed" debris remains in the filter bed (gravel). Biological filtration can take several weeks to establish in a clean gravel bed, but once established, this type of filter seems to be the most efficient and will clear the water the fastest. The problem seems to be that over time, the debris and fish waste buildup in the gravel needs to be removed or frequent water changes are necessary for fish health because PH can drop quickly and pollutants can build up with large amounts of fish waste. For me, the undergravel filter seemed to work the best when it is stirred up every 2-3 weeks with a power filter (pan filter or canister filter) picking up the suspended debris. There is always enough bacteria culture remaining to restart the biologic filtration quickly. (An option here is to use a clear cylinder on a siphon to remove the debris from the gravel, then replace the water.)

The Sponge Filter. This is an effective biological filter that is relatively easy to clean, but also needs several weeks to build up effective biological filtration. If used in bare tanks, regular siphoning will remove the loose debris. However, the water turnover rate is fairly slow and large surface area filters are needed for larger tanks. This type of filter in a well siphoned tank gives the cleanest environment for the most sensitive fish, and likely why it is often used for Discus. Yet they are not as effective as an undergravel filter in a tank that has a high fish population and is heavily fed.

Box Filters. Box filters can be effective in a moderately populated tank. They have the advantage that cleaning or changing the filter floss or pad removes the solid fish waste from the tank without siphoning because it collects in the filter. They are not as efficient as the sponge filter in biological filtration because the surface area for bacterial colonies is usually less.

Each type of filter mentioned is useful in keeping tropical fish, and I have used them all at times for specific situations. Important features beneficial in filtration, especially when one has multiple tanks, include ease in cleaning, rapid moving from tank to tank, and fast water flow to save time.

For quite a while I favored the undergravel filter in my tanks because of its large capacity and water clearing ability. I would stir up the gravel down to the filter plate and get much of the trapped debris in suspension, then use the "Pan Filter" described below to pick up the suspended solid waste and remove it from the aquarium quickly. At first I was concerned that the murky water with suspended debris would bother the fish, but it didn't bother them at all. In fact, they often showed breeding activity after this was done!

THE PAN FILTER

The pan filter is used to quickly remove large amounts of fish waste from the aquarium. It can be made from an empty one quart plastic sherbet container. A hole is drilled on the side near the bottom of the pan for a connector tube to which a siphon tube intake end is attached. Thermal glue is used to seal off the connector tube. A piece of plastic screening is cut to fit inside the pan over the siphon tube and a fine grained foam pad is cut to fit over the screen. A powerhead is connected to the connector tube so the filter can be placed entirely in the aquarium (see diagram). To clean bare bottomed tanks with much detritus, a fine meshed net is first swirled through the tank to pick up the larger particles, and then the pan filter is placed there and turned on to remove the suspended particles. Usually in less than 5 minutes the water is fairly clear and the regular tank filter will finish the job. For cleaning an undergravel filter, the gravel is stirred to put the detritus in suspension, and the pan filter is quickly placed to clear the water. The current from the powerhead will keep the particles in suspension until they are picked up in the foam pad. The foam pad is easy to remove and clean in a bucket of water or laundry sink to be ready for the next tank. Another alternative to cleaning undergravel filters is to use a siphon on a clear plastic cylinder. It works well but requires access to a drain or carrying buckets to change water.

For me, the pan filter is the quickest way to remove tank debris and turbid water in a variety of aquarium environments, especially with many tanks to clean.