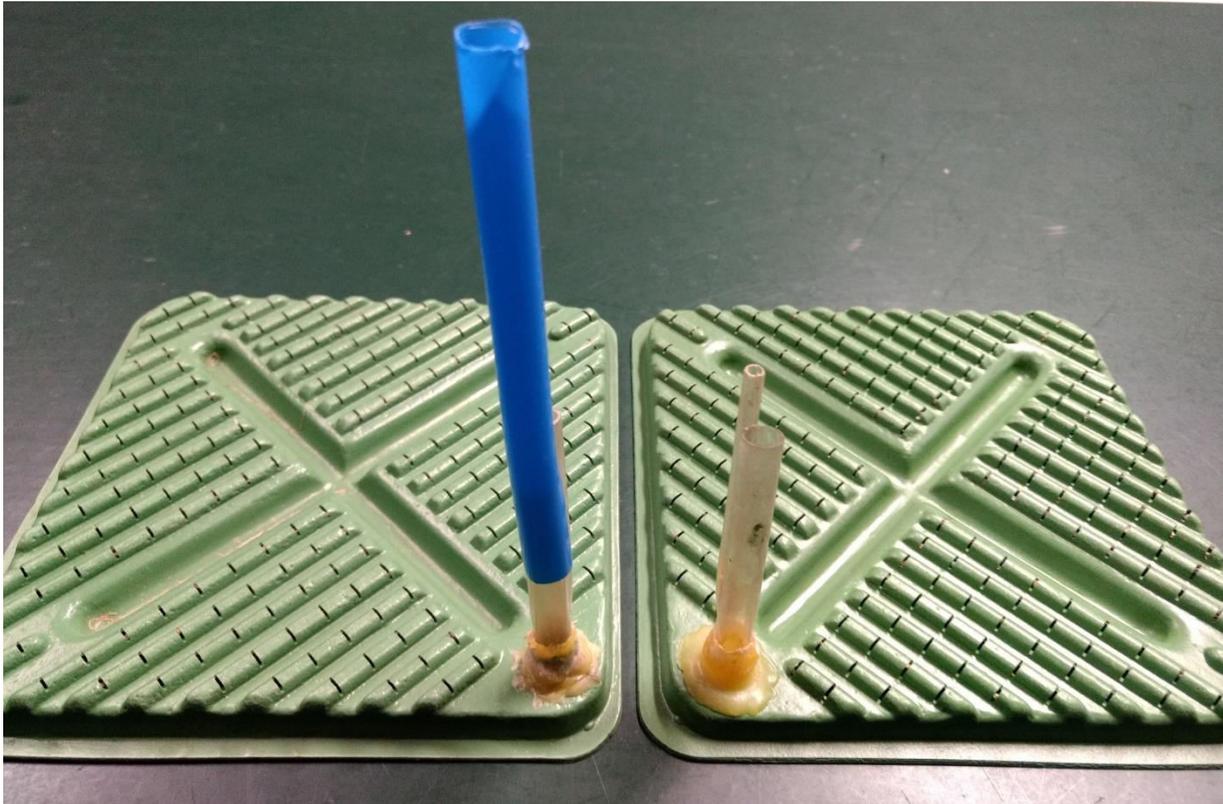


UNDERGRAVEL EFFICIENCY

By Chase Klinesteker



2 short lift undergravel filter plates; Left has been lengthened for greater flow

If I had to pick the type of water filtration that has worked the best for me in my tanks over the years I would say it was the undergravel filter. It seems to clear the water faster than most. Sponge filters seem slow in water exchange and have limited surface area for biological filtration. Undergravel filters can have a huge surface area to collect bacterial colonies and mechanically trap debris. The most efficient undergravel filtration is with a powerhead lift, but with 40 or more aquariums in my fishroom, limited space and excessive electrical consumption makes that impossible. Years ago I utilized undergravel filters in most all my tanks, then later switched to pan-sponge filters with large gravel over the top. In 2017, I switched back to mostly undergravel filters, and it seems they are easier to clean and more efficient for my setup.

KINDS OF FILTRATION

The undergravel filter provides both mechanical and biological filtration, although initially it requires a few weeks to establish biological colonies. Once established, cleaning the gravel will only require a few days' recovery, as some bacteria always remain in the gravel bed. Regular removal of the solid waste trapped in the gravel greatly benefits the fish.

FILTER PLATES

Undergravel filter plates come in many sizes and shapes, from bowl to 5 gallon and larger. Most sets consist of 2 plates and 2 lift tubes to cover the entire bottom of the tank. With 2-3 inches of gravel over the plates, it is very efficient, and the tendency is to not siphon the debris from the gravel for long periods of time. This can result in greater debris buildup and toxins dissolved in the water. Because I have mostly 20 gallon-long tanks arranged end-out, I use only one plate (5-20 gallon size) in each tank covered with 1 ½ -2 inches of gravel. The far end is kept bare with a gravel rake for easier maintenance. With easy access at the front, a gravel cylinder-siphon that reaches the sump is used to clean 27 undergravel filters every 2-3 weeks in about ¾ of an hour. Regular water changes are still needed, but water quality can be maintained at a higher level.

LIFT TUBES

It seems that the narrower lift tubes of the older style undergravel filters pull more water through the filter plate because the air bubbles fill up the tube. When a wider tube has smaller bubbles dispersed in the water column, the pull is less, and more air is needed to increase efficiency. The length of the tube is important also, with a longer tube pulling faster. The ideal setup would be an adjustable length tube tailored to the needs (population) of the tank at any given time. Many of my older filter lift tubes have been made adjustable by adapting plastic Smoothie straws of a similar diameter.

CONCLUSION

There are many ways to filter aquarium water and an array of filtering equipment to aid us. The needs of each aquarist and their setups differ considerably. For my setup, the undergravel filter seems to be the most efficient, simplest, and easiest to maintain.