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Water Movement in the Aquarium cont.

There are also devices that allow you to create a moving outlet of water in your aquarium. These rotator type devices such as the Osci-wave, Sea-Swirl, Ocean currents Revolutions Hydor change the direction of water current be it the return from your sump pump if you have one or the output of a powerhead via a rotating device. The devices that operation via an electrical motor work very well, but do have fairly high price tags. The devices that operate on the water flowing through them, are much less expensive but can and will jam up at some time from the same crude that was discussed earlier.

Another way of creating bulk water movement is via a closed loop. A closed loop is generally created by using a large pump to pump water from one area of the tank to another, similar to a powerhead, only in this case the pump is plumbed into the tank and the pump is mounted outside of the tank. This allows you to use a pump with a much higher flow rate than a normal powerhead and you can use an air-cooled pump which will add very little heat to the aquarium. To setup a closed loop you will either need a tank with some extra drilled bulkheads installed in the tank either in the bottom or the back or the ends, or with plumbing that goes up and over the top of the aquarium. The intake to the pump is normally done via a pipe that is drilled with many small holes allow the water flow into the pump to be pulled from a larger area of the aquarium keeping creatures from being sucked into the intake or from plugging it up. The output of this pump is normally plumbed into multiple outlets of the aquarium many times with either a SCWD type of device or a motorized ball valve to help create more random water movements. At first thought this seems very similar to the water movement created via the sump return pump but it has one very big advantage. A closed loop pump even with the pump setting on the floor does not have to work as hard picking the water up to the tank level since the water in the tank is pushing the water into the pump with the same amount of force, so you get more water movement out of the same size pump sometimes as much as double the water movement.

One very important consideration when plumbing any type of an external pump in your aquarium is the size and type of plumbing that you use. Many people like to use normal flexible vinyl tubing of the same size as the pump output. This is a very bad way to do your plumbing for a couple of reasons. First with any bends the tubing will collapse causing a loss in flow from the pump. Second the size of the plumbing coupled with the velocity of the water moving in it determines how much friction loss there is in the plumbing. The friction loss is normally expressed in feet of head which can be used to determine what rate of flow you will actually get out of the pump. Because of this the larger the size of the tubing that you use the more water flow you will get out of the pump. My normal suggestion is to go at least 1/4 inch larger in diameter than the pump intake and even better go 1/2 inch larger. So if you are using a pump that has a 3/4 inch intake and outlet use at least 1 inch plumbing and even better 1 1/4 inch. The reason behind this is that with the larger pipe there is more area for the water to flow through, so the water actually moves slower causing less friction. Also when doing your plumbing try to keep the pipe/tubing as straight as possible, any bends and or elbows will increase the friction of the water decreasing the flow rate. The larger diameter of the plumbing the less friction is created. If you use pipe that is 1/2 inch larger than the pumps inlet or outlet or even larger the number of elbows really does not effect the water flow a measurable amount. If your plumbing is the same size or smaller a couple of elbows could decrease the flow rate of your pump by 1/2 or even more.

Many people will use more than one current generator to create even more water movement, combined with multiple devices to create a changing water pattern which better mimics the nature conditions that our creatures live in. While each of these devices have advantages and disadvantages the importance of water flow can not be overstated. Most tanks with a proper flow of water will have currents that are random and chaotic. Water movement brings nourishment to sessile corals it also washes away wastes and chemicals. Proper water movement will also allow your filtration devices to work better by not allowing the waste products to settle in the main aquarium; instead they can be removed via the skimmer or used as food in a refugium.

This article does not cover everything needed to create enough proper water movement in your aquarium but hopefully it will open your eyes to the needs of water movement and give you some ideas on what you can do with your aquarium. If you have any questions on this please feel free to contact either of us.