UV Sterilizers: How They Work

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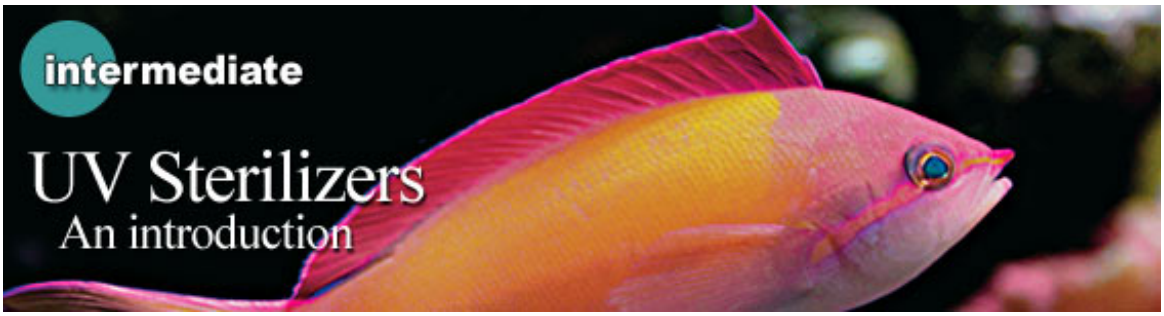

Q. Are UV sterilizers a good replacement for biological and mechanical filtration?

A. NO. UV sterilizers are not a replacement for good biological and mechanical filtration, regular water changes, or proper control of the nitrogen cycle.

A properly selected UV sterilizer can help clarify water, rid free-floating algae, and control outbreaks of harmful bacteria and certain parasites.

UV sterilizers work on the principle that special fluorescent UV lamps can effectively irradiate (kill) microorganisms in aquarium water when they are exposed to this light. UV light, at a peak wavelength of approximately 254 nanometers, alters the genetic material in the organism's nucleus and shortens its normal life cycle. Theoretically, UV sterilizers can kill viruses, bacteria, algae, and protozoa with no residual effects. However, the organisms must be free-floating and travel through the UV sterilizer unit for the sterilizer to work. It has no effect on organisms attached to fish or rocks because they do not flow through the unit and cannot be exposed to the UV light.

Before selecting a UV sterilizer, consider your primary objective. Do you want to help control free-floating algae or do you want to control parasites? By deciding this, you will be able to select the proper unit to achieve your intended results. Though most manufacturers provide a recommended maximum aquarium size for each model they make, the application and the efficiency of a unit are also determined by flow rate, as well as bulb age and wattage.

Flow rate
Shortening or lengthening UV exposure time (dwell time) determines the effectiveness and use of a UV sterilizer. Adjusting the flow rate through the sterilizer controls UV exposure time. In general, larger organisms will need a longer dose of radiation than smaller organisms. For example, a UV sterilizer set at a higher flow rate is capable of controlling bacteria and free-floating algae but may not be effective against parasites. Reduce the flow rate through the UV sterilizer to lengthen the time parasites are exposed to the UV light. With a slower flow rate, the same unit can now be used to help control parasites.

Bulb age
Lamp effectiveness declines with time. Compared to when it was new, your UV sterilizer will no longer produce the same results after months of use. Therefore, you may have to increase the dwell time (by lowering flow rate) to produce desired results. Replace the UV bulbs every 6 months, or per manufacturer's recommendation, in order to maintain UV efficiency. Also, clean the quartz sleeve of the lamp regularly to remove organic buildup. A clean quartz sleeve allows better penetration of UV light and maximizes the efficiency of the unit.

	Maximum Flow Rate to Control:		
UV Bulb	**Bacteria & Algae**	**Parasites**	**Max Gallons**
8W	120 gph	N/A	< 75 gal
15W	230 gph	75 gph	75 gal
18W	300 gph	100 gph	100 gal
25W	475 gph	150 gph	150 gal
30W	525 gph	175 gph	175 gal
40W	940 gph	300 gph	300 gal
65W	1700 gph	570 gph	570 gal
80W	1885 goh	625 gph	625 gal
120W	3200 gph	900 gph	900 gal
130W	3400 gph	1140 gph	1140 gal

Though manufacturers' recommendations will vary, this chart provides a general idea of the wattage you'll need - and the proper flow rates to adjust your pump to –

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flow rates to adjust your pump to when using a sterilizer for controlling bacteria/algae and for controlling parasites.

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