

Factors that Affect Light Output

Drs. Foster & Smith Educational Staff



optimizing aquarium light output

Selecting the right aquarium light involves research and forethought. After considering aquarium size and your aquarium inhabitants' lighting needs, you finally have the right light system for your setup. But do you know that common aquarium factors can conspire to compromise light output? Learn how to get the best performance out of your light fixtures by understanding factors that affect light output.

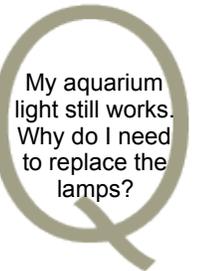
Water Clarity

Water clarity plays an important role in the transmission of aquarium light. In addition to the health and aesthetic quality of your aquarium, water clarity affects the amount and type of light that penetrates into the aquarium. As the primary medium in which aquarium light must travel through, water can either enhance or hinder light transmission based on clarity. Needless to say, cloudy, turbid, or murky water blocks out more light while clean, clear water allows more light to enter deeper into the aquarium. Factors that affect water clarity include overfeeding, discoloration due to high levels of dissolved organic compounds (such as tannins), medications, bacteria bloom, algae bloom, particulates, surface oils, dissolved protein, and dissolved solids.

Solution

There are many ways to improve aquarium water clarity.

[Water clarifiers](#) flocculate or clump together fine particles floating in the water column. These particles are then removed through [mechanical filtration](#) to improve overall water clarity.



My aquarium light still works. Why do I need to replace the lamps?

A: Aquarium lamps will continue to emit light well past the recommended replacement date. However, over time, the "quality" of light diminishes and may no longer emit the proper light spectrum necessary for healthy growth of

[Chemical filter media](#) such as [activated carbon](#) remove a wide variety of dissolved compounds that can stain or discolor aquarium water.

[Protein skimmers](#) can be employed in marine aquariums to help ensure excellent water quality and clarity.

[UV sterilizers](#), also known as UV clarifiers, can be used in fresh or saltwater aquariums to help improve water clarity. This useful aquarium equipment has the added benefit of reducing potentially harmful microorganisms. Depending on UV lamp wattage and the flow rate through the device, free-floating algae or disease-causing bacteria or parasites can be managed effectively with a UV sterilizer.

[Routine water changes](#) are the most simple and effective way to help maintain aquarium water clarity. This low-tech part of aquarium care helps ensure the best performance from your high-tech aquarium lighting equipment.

...likely growth of
photosynthetic
inhabitants.

Dirty Glass Canopy or Cover/Top

While it may seem obvious, maintaining a clean aquarium canopy/glass cover is crucial for proper light transmission. The use of a [glass top or canopy](#) is recommended for all light fixtures, especially fixtures with exposed bulbs or without a protective lens or splashguard. Not only do glass canopies provide additional stability for your light fixture, they also protect the fixture from condensation and splashing. Contact with water can damage the unit or cause serious injury. However, as it serves its protective function, the benefits of a glass canopy can gradually diminish as buildup reduces the transparency of glass. Because light fixtures often obscure it, it can be difficult to determine if your glass top or canopy needs cleaning. As mineral deposits or organic buildup progressively coat the surface of the glass canopy, less light is able to penetrate into the aquarium. A dirty glass canopy that remains unnoticed can significantly reduce the performance of any aquarium light fixture.

Solution

Make it a habit to inspect your glass top each time you feed your aquarium inhabitants. If your glass top needs cleaning or maintenance, be sure to turn off your light fixture first and remove the glass top. Never clean your glass top directly above your aquarium.

Dust can be a real problem, especially during the winter season. Use our nontoxic, pre-saturated [Aquarium Wipes](#) to simplify maintenance. Regular use helps minimize recurrence of dust and water spots.

Mineral buildup or scale can be more of a challenge to remove. In certain cases the hard deposits will simply come off in layers. For more stubborn cases, use products specifically designed for use on aquariums.

Algae and organic film is easily removed with an [Algae Scraper](#). The non-scratch pad safely removes film and organic buildup without damaging the glass cover.

Salt creep or salt buildup in marine aquariums should be removed regularly to ensure optimum light output and aquarium safety. If left unchecked, salt creep can form on the fixture and create potentially hazardous conditions. The easiest way to remove salt creep from glass canopies is to soak the canopy in fresh water. [Reverse osmosis](#) or de-mineralized water works the best.

Lamp Age & Temperature

Aquarium lamps experience steady decline in light output through regular use. Over time, light characteristics including intensity and spectral output begin to shift. Older lamps are not able to produce the same quality of light as new lamps. Many of these changes are imperceptible to the human eye but the effects are evident to the photosynthetic inhabitants of your aquarium. Poor growth, changes in coloration, and lack of vigor are common signs demonstrated by photosynthetic organisms exposed to old lamps with diminished light output. In addition to natural "wear and tear," lamp performance declines when exposed to prolonged high temperatures. Light fixtures that run hot or fixtures without adequate ventilation experience shortened lamp life.

Solution

Keep on top of lamp replacement and routine light fixture care. Mark your calendar to help remind you when it's time to replace your existing lamp with a fresh, new one. This is also a good time to dust your lighting fixture, untangle and tidy up cords, and ensure nothing is impeding [proper ventilation](#) in and around your aquarium light fixture.

Light Type	Replacement
Incandescent	every 2 to 4 months
Standard Fluorescent	every 6 to 18 months
VHO Fluorescent	every 4 to 18 months
T-5 HO Fluorescent	every 16 to 24 months
Compact Fluorescent	every 14 to 24 months
Metal Halide	every 6 to 18 months