PhosGuard

PhosGuard™ is a porous chemical agent for removing inorganic phosphate by precipitation at the PhosGuard™-water interface. PhosGuard™ is bead-shaped to promote easy water flow through and around it, thereby increasing both its efficiency and capacity.

The removal of phosphate by interface precipitation is not only possible in sea water but is enhanced by the presence of salts. Most phosphate salts, with the limited exceptions of sodium and potassium, are virtually insoluble in water and less so in marine water. Although PhosGuard™ is effective in both fresh and marine water, it will operate better in sea water and the need for it is better defined in sea water.

Each liter of PhosGuard™ has a theoretical capacity of removing about 40,000 mg of phosphate or about 100 mg/L phosphate in 100 gallons. In actual use, however, phosphate precipitation becomes self-limiting to about 20%–60% of capacity, depending upon original phosphate concentration, alkalinity, and organic content. In practice, then, it can be expected that PhosGuard™ will exhaust after removing 20–60 mg/L phosphate in 100 gallons.

PhosGuard's™ efficiency is maximal when new and will effect a rapid fall in phosphate to less than 0.02 mg/L phosphate. Phosphate is bound irreversibly and will not be released. Carbonate is weakly and reversibly bound so that the tank may experience a slight decline in alkalinity. Phosphate, however, is preferentially bound and will displace carbonate. Silicates and organic acids are also removed and excessive concentrations of these in the water may shorten the useful life of PhosGuard™. Neither PhosGuard™ nor any other phosphate remover can be regenerated by any safe method in the home. Baking a phosphate remover, even to over 900 F, will not remove any of the phosphate it contains. PhosGuard™may be removed, dried, and reused, if it has not exhausted.

For best results, PhosGuard™ should be placed so as to maximize the flow of water through it. It may be used in a canister filter, chemical filtration module, drip tray, external or internal box filter, or any high flow area of a trickle filter.

The principal benefits of low phosphate are remarkable decline of hair algae and both possible and improved maintenance and growth of many beautiful but otherwise delicate reef corals. Since phosphate precipitates out of marine water as calcium and magnesium phosphates, low concentrations of phosphate also make it easier to maintain adequate calcium (400 mg/L) and magnesium concentrations (1,000 mg/L) for the same reef corals. If measurable phosphate is 0.2 mg/L or less, a phosphate removing product is not required. Although not likely, it is possible in some circumstances to remove too much phosphate too rapidly. Trace quantities of phosphates are required by coraline algae, macroalgae, and symbiotic algae.

CAUTION: When wetting the product for the first time, it should be made wet with twice its volume of freshwater by adding the product to the water. Avoid adding water to the product. Avoid using marine water for the initial wetting. Adding marine water to the dry product may generate sufficient heat to boil the water. Freshwater generates much less heat and adding the product to the water allows the heat to dissipate safely.

The solubility of phosphate in marine water preempts the likelihood of attaining phosphate concentrations that are toxic to fish or most invertebrates. Phosphate control becomes an important consideration only when maintenance and growth of delicate reef corals is the

objective. In freshwater, phosphate is better controlled by a well-planted aquarium. The freshwater hobbyist should notice that most commercial freshwater buffers are phosphate based. The use of PhosGuard™ in conjunction with such buffers would not be harmful, but would certainly be a waste of money, since the PhosGuard™ would remove the buffer until saturated. Seachem's new Acid Buffer™ and Alkaline Buffer™ are non-phosphate buffers and do not pose this limitation.