

# PHOSPHATES & ALGAE

The association between algae and phosphate is fast becoming recognized as a major factor in the presence of algae in swimming pools-and its removal.

For the swimming pool owner, removal of phosphate is imperative to maintain good water quality. Then, once the phosphate has been removed, it's important to maintain a low phosphate level. This will ensure clean water, better O3 performance and no algae.

All living things, including algae in swimming pools, need phosphate to survive and grow. It is common industry knowledge that removing the phosphate will result in less algae in the pool.

How are the two related and how can the phosphate concentration be reduced?

Phosphate enters the pool water from a variety of sources including dust and rain, runoff from lawns and gardens fill water, some pool chemicals and leaves. Over time, this causes an increase in the phosphate concentration. Small amounts of algae attached to dust, leaves and the like are constantly being introduced into pools. They need only warmth, nutrients like phosphate, and sunlight to rapidly multiply and become a threat to pool sanitisation.

Chlorine has long been used not just to sanitise swimming pools but also to kill algae, as chlorine is a reasonably effective but short-lived algaecide. One traditional treatment to visible algae in pools has been to "shock" the pool with high concentrations of chlorine which kills off most of the algae. However, this does not reduce the amount of phosphate in the pool, so when the chlorine level in the pool drops back to normal, the conditions which allowed algae to grow before "shocking" are still there. And the algae will start to re grow. Preventing algae from regrouping requires that the conditions in the water are changed to be less favorable for algae growth.

In traditionally treated pools, phosphate concentrations tended to be limited to the removal of algae by filtration. This is not very effective because wet algae weigh 1000 times more than the phosphate needed to nourish it. Further, a portion of the phosphate contained in the algae is released back in the water as the algae die in the filter.

A more effective traditional treatment, especially when treating massive blooms of algae, is super-chlorination until the algae turn white, followed by flocking with aluminium sulphate. Aluminium sulphate is best suited for pools moderately polluted with phosphate, in the range of 1000 to 5000ppb phosphate and where the operator is familiar with vacuuming to waste or regular backwashing. Aluminium sulphate is effective for removing most of the phosphate, down to approximately 500ppb, but without regular small quantity use, they cannot keep the phosphates below the 100ppb, which is required to be effective for algae control. Therefore it is crucial that small quantities of

aluminium sulphate are applied regularly to the pool. (example - 1 tablespoon weekly per 10kl of water or when dust is found to be settling on steps or pool bottom. This should be sprinkled lightly on the pool surface and then the pool brushed well. Water may turn slightly milky but will clear up quickly. Normally on the following day, you will find that the aluminium sulphate has trapped all the phosphates + other particles and dropped to the pool floor. Vacuum this drop-out to waste or backwash immediately after vacuuming if not to waste for smaller pools.) The principle advantages of aluminium sulphate is that it is cheap and therefore suitable for a regular process of removing the phosphate accumulated in a pool.

Lanthanum compounds are also well suited for maintaining low levels of phosphate in pools where convenience and performance are important considerations. They are much easier to use and require much less operator time than aluminium sulphate. They are well suited to the typical pool owners who don't like to put much effort into their pools. Considering cost and convenience, they work well for pools with less than 2000ppb of phosphate. These lanthanum compounds are typically used in the pool blue/sparkle blocks that are intended to be dropped weekly or bi-weekly into the leaf catcher.

To sum up, phosphate removal is the key to keeping pools algae-free, maintaining quality water and allowing other chemicals/O3 to work at their most effective level. Chlorine, as mentioned earlier, can be categorized as a short-term algacide and works very well in conjunction with O3.

Pool owners can avoid high levels of phosphate and keep their pools algae free in various ways.

1. They should prohibit runoff from lawns, landscaping or washing decks entering the pool;
2. They should remove leaves and other rubbish from the pool regularly;
3. They should apply aluminium sulphate or a lanthanum compound phosphate removal treatment regularly;
4. They should get their pool professional to regularly test their pool water for phosphate.

Pool shops have at their disposal special test kits to check the level of phosphate in swimming pools. Should the result of the test exceed the recommended level then a product to remove the excess phosphate must be used.