

## Are Metal Stains in Pools Preventable?

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Most metal staining is preventable. The best way to control metal staining is to take a proactive approach rather than waiting for problems to occur. This can be done by following four easy steps:

**Step 1: Balance pool water.** Because poor water chemistry will eventually destroy pool equipment and surfaces in any pool, maintaining the correct pH, alkalinity and hardness of pool water is always the first step to prevent metal stains. The most significant factor in preventing metal stains – and often the most overlooked – is pH. Pool water can look clear even at very high or very low pH levels, but this is no accurate indicator of metal contamination. Pool water with a low pH (less than 7) is acidic, and can actually dissolve metals found in pool equipment and heat exchangers. Acidic pool water will also dissolve stone and brick materials used around the pool, as it will the pool's plaster surface, resulting in more surface pitting and etching and the release of imbedded metals into the water.

High pH levels (greater than 8) cause metals to “plate out” of the water and form metal stains. If pool water does not contain enough carbonate (alkalinity) or calcium (hardness), it will draw these materials out of the plaster surface, dissolving it in the process and causing even more etching, pitting and release of the metals naturally found in plaster into the pool water.

Unfortunately, maintaining balanced pool water only delays the onset of metal stains. Metals are constantly being added to the pool water from multiple sources, and unless they are eliminated from the water, staining will eventually occur – even in pools with properly balanced pool water.

**Step 2: Measure the level of metals in the pool water.** Many metal test kits are available for the home and commercial pool market, but the vast majority of these only measure the free form of dissolved metals. Dissolved metals typically exist in two forms: the *free form*, and the *complexed* or *sequestered form*. It is absolutely essential that both forms are measured when determining the *total metal concentration* of pool water. Make certain the metal test kit contains a releasing agent that is added to the water sample. Generally, common liquid dropper or strip format tests involving one-step procedures only measure “free” metal concentration, while

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two-step testing procedures measure “total” metal concentration. Periodic Products’ EZ-DX® Digital Pool Water Test Kit easily and accurately measures these desired total copper, total iron and manganese levels in pool water.

It’s important to note that oxidized metals that have already stained pool surfaces are not measurable by any pool water test. While the exact amount of metal that can remain dissolved in water depends upon numerous factors – including the type of metal, the water chemistry, the total dissolved solid (TDS) content, and the amount of oxidizer present – total metal concentrations exceeding 0.3 ppm frequently result in surface staining.

**Step 3: Use a sequestering agent to temporarily protect the pool surface.** Sequestering agents are liquid soluble metal chelators added to pool water to temporarily protect pool surfaces from oxidizing metals. There is widespread misunderstanding in the pool and spa industry regarding the use and effect of sequestering agents. Sequestering agents have been used in municipal water treatment facilities for decades and require highly sophisticated filtration systems for the removal of sequestered metal particles. The size of these sequestered metal particles is simply too small to be effectively removed by pool filtration systems. (The only exception occurs during pool start-ups. When plaster dust from the pool surfaces mix with the sequestering agents, metals tend to stick together in larger particles. Depending on the size of these particles, some – but not all – may be large enough to be removed by the pool filtration system; the smaller particles will simply pass through the filter and return to the pool.) Sequestering agents, therefore, only temporarily bind with dissolved metals to prevent them from oxidizing onto pool surfaces; they do not effectively remove or eliminate metals from the water, and metal stains will inevitably occur.

It is still important to use sequestering agents in your metal control regimen, as they provide needed “insurance” by allowing for the use of the pool while other methods are employed to eliminate the dissolved metals from the water.

**Step 4: Eliminate metals from the pool water.** The final step – and the most effective – is to reduce the concentration of metal in the pool water. Until recently, there was no safe or efficient way to eliminate metals from pool water short of replacing the metal-contaminated water with new metal-free water – an impractical and costly solution for most pool owners. A new procedure involves using an insoluble chelating polymer product to remove and eliminate dissolved metals from pool water.

There is only one such product available on the market: CuLator® Metal Eliminator and Stain Preventer. CuLator Metal Eliminator and Stain Preventer is an insoluble chelating polymer that rapidly and permanently binds to dissolved metals to that they can be physically eliminated from pool water. The polymer is contained in a cloth bag that is either placed in the skimmer basket, or housed in a cartridge placed in the pump basket. As pool water passes over the polymer, metals are quickly bound, absorbed and eliminated from the water. After use, the bag is simply discarded – and with it, the metals.

The CuLator polymer is pre-measured, easy to use, and works in both fresh and salt water. The polymer does not dissolve in water, impact the hardness of the water, or interact with other pool chemicals or systems. CuLator Metal Eliminator and Stain Preventer is also non-toxic and does not add phosphates to the water.

**Conclusion:** By following these four simple steps – keeping your pool water balanced, measuring the total level of metals in the pool water, using a sequestering agent for temporary stain protection, and eliminating the metals from the pool water with CuLator Metal Eliminator and Stain Preventer – it is possible to enjoy years of stain-free pool ownership.

For additional information, visit [www.culator.com](http://www.culator.com).