

Variety of factors can result in stubborn vinyl liner stains

(The following article was submitted by Yvette Ploskonka, technical director of HPG International.)

The life of a vinyl liner can be seriously compromised by improper sanitation and chemistry. Vinyl liner staining can be grouped in to three categories: biological, chemical and organic. Here's a look at the cause of each and how they can be avoided.

Biological Staining

Biological staining is caused by microorganisms (more commonly known as algae, mold or mildew) coming from behind the liner.

Below the waterline, improper maintenance of pool sanitation chemicals — such as allowing the sanitizer level to drop too low for an extended period of time — can result in colonies of these microorganisms attaching to the face side of the vinyl.

There are many species of microorganisms that may cause staining in various colors. Some are very common and easy to control, while others — such as the one known as "black algae" — are almost impossible to eliminate.

Although this is more common below the water line, especially on the bottom of the pool, attack can also occur at or above the waterline.

It is believed that one strain of "black algae" comes from the ocean and can be introduced into the pool when swimwear that was used in the ocean is worn in a pool or sand is used underneath the pool that has not been properly sanitized.

Groundwater is another common source of algae that will result in attack of the underside of the liner. The resulting stains will eventually transmit through to the printed side of the liner.

Unfortunately, vinyl swimming pool liners that have never had problems can suddenly have an outbreak due to a change in the water-table level or weather conditions. The sanitation of the pool water will not stop this type of problem.

In addition to black, biological staining can also be pink, green, brown or yellow. A stain can look like hard algae or a crust and may appear in blotches or spots and spread in lines.

Pink staining is due to secretion from a microorganism that stains the vinyl. These stains can go all the way through the liner and can be very difficult to remove.

The only way to control algae that is attacking from the face side of the liner is by controlling the pH and chlorine level of the pool water. The vinyl of swimming pool liners contains a biocide protector, but the biocide can be overpowered by the algae and can cause the bond between the ink and the pool liner to be severely weakened. This weakening can even cause the printed inks on the vinyl to ‘rub off’.

If staining has occurred due to some type of microorganism or algae coming through the backside of the liner, it is important that the area underneath the pool liner is treated with a chlorine solution to kill the algae before a new liner is installed or the problem will recur—especially if the liner is going to be replaced.

Other treatments that have had success are treating the surrounding soil with fungicides following manufacturer’s directions and thorough watering to flush the fungicide down to the area under the pool liner.

In areas with severe problems of this nature or high groundwater levels, it may be necessary to install a barrier layer, such as a polyethylene sheet, below the vinyl liner.

Chemical Staining

There are many different causes for chemical staining. Acid-based vinyl cleaners, if not rinsed completely from the liner after use, can attack the vinyl and cause premature deterioration when combined with sunlight and high temperatures.

Alkaline-based cleaners are more compatible with the vinyl and are less likely to cause staining when used according to the manufacturer’s directions.

Other chemical staining can be caused by common items that many people don’t think of as chemicals, such as suntan oils, baby oils and body oils.

These oils can accumulate at or above the water line, near steps or ladders or anywhere where people come in contact with the liners. The oils float on top of the water and may stick to the vinyl if it is not regularly cleaned off.

How often the tile area needs to be cleaned depends on bather load and how often the pool is being used; at least weekly is a good rule of thumb.

Staining occurs when the oils accumulate dirt and if not cleaned regularly will harden into a crust that is very difficult to clean off without something so abrasive that will also remove the print.

Even if the oils do not accumulate dirt, they will eventually oxidize and turn brown due to the high temperature and UV exposure from the sun.

Chemical staining can also occur due to the use of materials underneath the liner that may be incompatible with vinyl.

Foams, adhesives, water-proofing coatings and rubber can be incompatible and cause staining or premature wear on the vinyl. The retailer/installer should always use materials that are sold by pool product manufacturers.

Low-cost substitutes from other sources may not be made from the same materials. When in doubt, always contact the manufacturer with any questions.

Hard water containing iron can cause staining if not properly treated with metal removers. Copper-containing chemicals can also cause staining when used improperly.

Read labels carefully for contents and use products only as directed; keep circulation running for several hours after applications. Over-dosing can lead to problems.

Organic staining

Organic matter (such as grass clippings leaves, dirt and pollen), if allowed to settle on the bottom of the pool or lie against the sides of the pool on top of a solar cover, can also stain a vinyl liner.

These stains will generally be brown and will also be difficult to remove. Debris should be removed regularly with a pool vacuum or automatic cleaner.

Hard objects like nuts, which can settle to the bottom of pool and may not be picked up a cleaner, can be especially troublesome. Black walnuts will permanently stain a liner black.

Keeping overhanging branches on trees pruned will go a long way to help keep leaves, seeds, nuts, etc. out of the pool.

When a pool is closed for the season, a winter cover that tightly seals around the pool perimeter should be used to prevent the accumulation of organic debris such as leaves and insects during the winter months.

Organic debris left on vinyl surfaces can cause staining and bleaching, and under the proper conditions, fungi can grow on this debris, producing a pink stain on the vinyl.

The best defense against biological, chemical and organic staining is a good offense: regular, thorough cleaning, good water circulation and proper use of pool chemicals. With vinyl liners, when adding chemicals, less is best. n

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