Is it the Filter's Fault? Probably Not

by Elissa Sard Pollack

Often, when pool water is cloudy, fingers point to the filter. Sometimes, the filter is the problem. Whether or not the problem can actually be traced to the filter, it almost certainly is related to filtration. (We're assuming the pool has balanced water chemistry.)

To begin with, let's define filtration as the process by which undesirable stuff is removed from water as it passes through the filter. When filtration is inadequate, undesirable stuff — mostly dirt and debris, but sometimes algae or dog hair or excessive amounts of suntan lotion — stays in the water, causing cloudiness. The water gets cloudy because the filter can't remove the particles fast enough, if at all.

So, why can't the filter keep up? And what can be done about it?

EXCESSIVE FILTH

If there's more dirt in the pool than the filter can reliably remove, you might solve the problem by reducing the amount of dirt and other undesirable stuff in the pool water. If possible, try one or more of these tips:

- Increase the rate at which pool users shower before swimming.
- Decrease the number of dogs allowed in the pool at any one time.
- Cover the pool whenever possible.
- Use an automatic pool cleaner.

One common practice is to add a flocculating or coagulating agent to the water. These products cause suspended particles to glom onto each other and drop to the pool floor, where they are easier to vacuum up. If the particle clusters make it out of the pool and into the filter, they are more easily caught there.

Another approach might be to increase the capacity of the filter. The most reliable way to do this is upgrade to a larger filter, one with greater filter media area. Be very careful when going this route to make sure the filter and pump are accurately sized for each other. You can put a gigantic filter on a pool, but if the pump can't move enough water through it to make it work efficiently, you won't improve filtration at all.

It is also possible to plumb a pre-filter into the system — again making sure that the pump is sized properly for the whole system. A pre-filter can remove excess dirt, leaving the finer particles for the pool filter to take care of. Of course, the pre-filter also has to be cleaned, but using it could extend the time between cleanings and the product life of the primary filter.

Before upgrading the filter or adding a pre-filter, however, take a look at the length of time between cleanings. Review as much of this history as possible and look for a pattern. If cleanings are required more and more often and water clarity is still falling short of expectations, the filter media could be at the end of its useful life. One sure-fire way to know if the filter media should be replaced is when the pressure reading does not drop noticeably after a standard backwash (for sand) or other cleaning process (for cartridge and DE) is completed.

CLEAN-UP JOB

When you suspect a filter is underperforming, ask yourself when it was last cleaned, and whether the cleaning method has been effective.

Filters should be cleaned when the pressure in the system rises 10 psi. Each type of filter — sand, DE, cartridge — has its general cleaning methods. Sand is simplest; turn the valve to backwash mode and run the pump. D.E. filters are cleaned different ways, depending on the design. (Consult owner's manuals.) Cartridge filter cleaning also varies somewhat from model to model. Some large cartridges can be rinsed off without being removed from the tank bottom. Remove the top half of the tank and hose off in place. For smaller models, it is more common to remove the cartridges for cleaning. Cleaning a cartridge usually involves hosing it down, although soaking may also be necessary.

Improper cleaning can exacerbate an insufficient filtration problem. For example, using muriatic acid to clean cartridges or D.E. grids can harden oils, making them stick to the fabric.

Fingers also often point to biguanide-based sanitizers, especially with cartridge filters, where biguanide-treated water can gunk up the filter cartridges if they are not cleaned with the specially formulated filter cleaner required with a biguanide water care program.

MICROSCOPIC MENACES

Another culprit when it comes to inadequate filtration is the type and size of debris or particles the filter has to manage. As is generally understood, typical sand filters can remove and hold particles as small as about 20 microns. And D.E., known for its ability to "polish" water, can get down as low as 2 microns. Cartridge filtration should be able to achieve something between these two numbers, depending on a variety of factors.

(As an interesting aside, a micron is 1/1000 of a millimeter. A grain of salt is about 100 microns. The naked eye (of a young person with good eyesight) can see 40 microns. Bacteria typically measures about 2 microns or smaller, and decomposed algae is 1 micron or less. In reviewing these facts, it's easy to see why a sand filter simply can't do a great job removing algae.)

However, a sand filter with special laterals and other modifications that improve efficiency can be a more effective filter.

Some people recommend adding D.E. to a sand filter as a way to catch very fine particles, such as dead algae. One school of thought on this is that this approach is a good idea if a pool was green from algae, then shocked to kill the algae. This would lead to an unusual concentration of dead algae, necessitating some assistance for a standard sand filter.

It's also possible to add zeolite — an additive with far greater microscopic surface area than sand — to a sand filter bed. One argument in favor of this approach is that the zeolite can catch smaller particles because of its honeycomb crystalline structure. Zeolite can remove particles down to 2 microns — the same range as D.E.

Another argument for zeolite (whether natural or synthetic) is that it can collect more dirt in a shorter period of time, thereby potentially reducing the length of time the filter needs to run. And running the filter less translates to energy savings. Of course, any time you change the demand on the pump, you need to make sure your pump is sized properly and running for the correct amount of time — or programmed correctly, in the case of programmable, variable-speed pumps.

Further, zeolite can absorb ammonium compounds, a byproduct of sanitizing swimmer waste. Sand filters cannot do this. And reducing ammonia compounds cuts down on the need to shock the pool water, saving chemical costs (or reducing wear on a salt chlorine generator).

One other advantage of zeolite is that when used as a complete replacement for sand (rather than an additive to a sand bed), the time between required backwashings can be doubled, according to some experienced zeolite users. This saves water and wastes less chemicals.

Even with all of those advantages, however, most sand filter manufacturers do not openly endorse the addition of zeolite because the filters were designed for sand. The use of zeolite may even void some sand filter warranties.

ADDITIONAL ADDITIVES

Perlite, another crystalline powder, is sometimes added to or used in place of D.E. in D.E filters, with mixed results. Some users report grids clogged by perlite, to the point where flow drops to a noticeably low level — resulting in very little skimming action or perhaps a trickle in a water feature that should have a more active fountain.

And still other attempts to improve filtration, particularly in special-case scenarios like following an algae bloom, involve adding D.E. to cartridge filters. This practice is discouraged by some experts because of the possibility that the D.E. can get embedded in the pleats and ruin the cartridge fabric.

Any of the targeted approaches outlined here — reducing the pool's dirt load, effective filter cleaning, adding a pre-filter, using floccing agents, or attempting to enhance filter performance with an additive or alternative media — can improve filtration.

However, any evaluation of filter performance must also consider flow. Without flow, there is no filtration. Water must move through the filter — and move through it at a proper rate, ideally with maximized hydraulic efficiency — in order to carry the undesirable stuff to the media. The efficiency with which the water passes through the media is what determines how well the filter is performing. That is true for D.E., sand and cartridge — with or without additives.

Filter types are often compared based on the size of the particles the filter can remove (sand having the least impressive capability in this area, D.E. the most), but the difference between 20 microns and 2 is not detectable during the day. (At night, when the pool is illuminated by underwater lighting, some particles may be visible in a sand filtered pool compared with a D.E. filtered pool.)

The more important difference in the three types, some would argue, is operating efficiency. Cartridge filters are the most efficient in terms of energy consumed to filter the water. D.E. is next on this scale, and sand is the least efficient, hydraulically (except in the case of specially designed sand filters that have a unique lateral design).

That said, there is a universal truth about all filter types. Slower flow increases filtration efficacy and efficiency. High flow through the filter can push debris into the media, compacting sand beds, causing tears or impaction in cartridge and D.E. grid fabric.

So go ahead and floc, add a pre-filter, try an additive, or install a bigger filter. But whatever you do, make sure the filter is cleaned when it should be and drop the flow as low as it can go.

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