

The Cost Of The (Back)Wash

by Scott Webb

For all the press it receives, one might think water conservation is a pressing concern for the pool industry. But for most homeowners outside the Southwest and a few localized areas of drought, it's only a mild interest.

Even in the driest regions, while local governments may be focused on the issue, there's little urgency among homeowners to purchase water-saving pool equipment or to adopt conservation methods.

A growing number of scientists and governmental agencies, however, assure us that this is going to change.

To cite just one voice in the chorus, the Scripps Institution, part of the University of California at San Diego, has computer models that point to a looming crisis in water supply in the coming two decades. Tim Barnett, a climate researcher there, noted in the journal *Science*, "Our results are not good news for those living in the western United States."

Like every prediction by scientists, the assertion of an impending water crisis is somewhat controversial, but it seems clear that the resource that is the basis of our entire industry — water — is likely to become more precious and expensive, and its use more regulated in coming years.

Pool equipment companies have been aware of this for some time, and all elements of the pool system have come under scrutiny as engineers look for areas where pool water can be saved. Filtration has become a focus because of the amount of water lost in cleaning out filters.

The backwashing of DE and sand filters is the main culprit. A little math can quickly demonstrate just how much water is being lost in the backwash, notes Frank Swindell, senior product manager of filters and valves, Pentair Water Pool and Spa, Sanford, N.C. "If you are backwashing a filter, and you're running the pump for three to five minutes at 80 gallons per minute, well, you do the math — that's between 240 and 400 gallons of water every time you have to clean," he says.

Cartridge filters waste much less water in the cleaning process, but still leave water running down the drain. When cartridge filters are clogged, the elements are removed, perhaps soaked in a solution to help loosen debris, and then hosed off, typically with a garden hose or a pressure washer. Swindell figures a typical cartridge cleaning uses about five to 10 gallons of water, something in that range.

In either case, and although cartridge filtration wastes much less water than sand or DE, engineers are looking into ways to minimize the water loss. A good way to do that is to clean the filter less often (while retaining filter effectiveness, of course).

Looking at the problem this way has yielded a couple of excellent water-saving ideas. One is to increase filter size. The more filter you have, the longer it takes to fill it, and the fewer times you have to clean it.

In recent years, Swindell says, water-conscious people have been upsizing filters to get longer cycles between cleaning. "So an existing pool may only need a 2.4-square-foot sand filter or a Triton 60, and they may put a Triton 100, which gives them another 2 feet of filtration area, to double their filter media, thinking that will make it twice as long before they have to clean it."

Like A White Tornado

With the same idea in mind — lengthening cycle times — Waterco USA, an international company based in Augusta, Ga., has invented a product that keeps most debris from ever entering the filter in the first place. Called the MultiCyclone, it's generally used as a pre-filtration device to remove 90 percent of debris over 20 microns in diameter before it enters the main filter chamber, keeping the filter cleaner and in need of fewer cleanings, according to Mike Melaney, engineering manager.

This statement is backed by testing at NSF labs, which are accredited by the Occupational Safety and Health Administration (OSHA) and by the American National Standards Institute (ANSI).

It is the first pre-filtration device to be NSF International Certified to American National Pool and Spa Standard, according to the lab. And it also won the Piscina Barcelona Sustainability Award at the International Swimming Pool Exhibition, Piscina BCN, held in Barcelona, in competition with 63 other new products.

The idea behind it is to not only dramatically increase cycle times and therefore potentially save copious amounts of water, but to extend the service life of the primary filter.

It works with sand, DE or cartridge filters, fitting between the pump and the existing filter. For a sand filter, the water savings can be well over 1,000 gallons a year through less-frequent backwashing.

According to Melaney, even if the homeowner has a cartridge filter, and the service pro is removing the cartridge for cleaning once every two months, the MultiCyclone will remove most of the particulate that will plug up the cartridge, and the client can go from cleaning once every two months to once every 10 months.

This cuts down on the wear and tear in the cartridges as well, he adds. "Every time filter elements are removed and cleaned, there's the potential for damage. So the less you have to handle them the better off you are and the longer they will last for you.

"So if you remove 90 percent of the particles over 20 microns in size before they even get to the filter, you reduce your backwash frequency by — well, the test data actually said a factor of seven but the NSF was only willing to put their stamp on a four times reduction of backwash frequency."

There is an added benefit to the Multi Cyclone in terms of chemical usage. In normal filtration, when organic debris sticks to the filter, it continues to consume chlorine as the water passes around it and through the filter. But debris filtered out by the MultiCyclone is removed from circulation entirely, and therefore does not consume chlorine as it waits to be purged.

"It's not a huge chemical savings," Melaney says, "and that's not the main benefit of the MultiCyclone, but we've done tests on it and found that the chemical savings are there."

The Good Stuff — How It Works

Any engineer (including the author of this article) will be fascinated by the design of the MultiCyclone. There are no moving parts, instead the MultiCyclone contains 16 small centrifuges driven by the incoming water pressure, and water is directed into each of them. Within each of the 16 chambers, dirt is spun out to the side where it falls to the bottom, while a pressure differential, exactly like the one that exists inside a tornado, pushes the clean water back into the system.

"When you see a tornado," Melaney says, "you see things revolving around the outside of it, but what you don't see is air going straight up through the center of the tornado and straight out the top of it. Using that

exact same principle, this unit forces the clean water up through an outlet chamber in the top, while the dirt and debris sinks to the bottom.”

The accumulation of sediment can be visibly monitored through the wall of the unit, and is cleaned out by opening its purge valve. This process uses less than four gallons of water.

Finding a Niche

The unit does have to be installed inline between the pump and the filter. There are two different methods: It can be installed directly on the exit fitting on top of the pump, or it can be mounted on a base and plumbed inline just like a filter. The unit weighs a maximum of 27 pounds when filled with water.

How's it doing so far?

“In other places in the world that are really pressed to save water, such as Australia,” Melaney says, “it's been very successful.”

Melaney notes that the marketing message in North America has been more focused on the maintenance- and time-savings benefits of the unit, and directed toward the service pros who go out and actually backwash the filters and clean the cartridges and add the chemicals.

“Our selling technique is a little different here,” he says, “because as much as people may say that water conservation is very important to them, the reality is that few people are willing to pay money for something that will save them water.”

To that statement, Melaney adds with some significance, “At least not right now.”

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