

## Keeping Your Head Above Water in Pool Maintenance

by Diana Lomont

Summertime is here. For condominiums or hotels with pools, that means increased bather loads – more suntan oils and body fluids that contribute to unclean water. Proper maintenance is essential to not only keep a pool looking good, but operating well.

Jan Kilgore, president of pool maintenance company Diamond Head Chemical Co., says building managers must pay close attention to both physical and chemical maintenance of a pool. "If you de-emphasize one or the other, you're going to have problems."

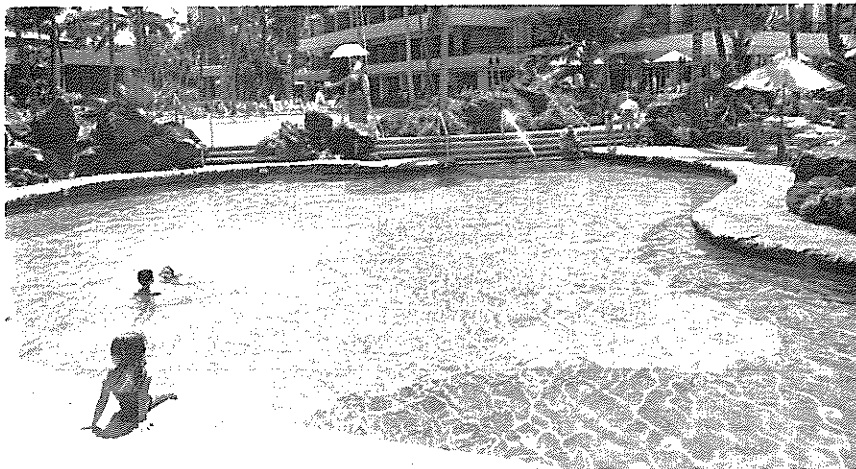
Basic physical maintenance consists of vacuuming the pool, scrubbing the tiles with a tile cleaner, emptying the baskets at the skimmers and pumps, cleaning the filters and washing the deck. How often these tasks are done depends on a pool's usage. For some condos, a weekly cleaning may be sufficient, while busy hotels may require daily cleaning.

The Hilton Hawaiian Village's four pools undergo a thorough routine of maintenance daily. A pool maintenance company does the above chores plus checks all mechanical components – motors, pumps, valves, piping – for any corrosion.

The pools' sand filters are also cleaned daily through backwashing, which reverses the flow of water through containers two-thirds filled with silica sand, 800 pounds per filter. Dirty water is discarded, requiring addition of water to refill the pool. For the HHV's four pools, that amounts to 2,000 gallons of fresh water per day.

### Chemical Balancing

Chemical maintenance may take less work, but requires technical knowledge and consistent monitor-



The Hilton Hawaiian Village's 95,000 gallon "Superpool" is backwashed daily through six sand filters.

ing. Failure to balance chemicals properly can even harm a pool's physical components.

The biggest problem Kilgore sees with chemical care is people not maintaining proper pH and alkalinity levels.

"The pool might look perfectly fine," said Kilgore, "but it might be on the corrosive side, and it might be eating up the pipes, equipment and everything else."

Kilgore has a physical example he shows clients to demonstrate what corrosiveness can do. It's an impeller that was more than half dissolved by corrosive water (see photo page 12).

Corrosiveness is caused by high temperature, low pH, and low alkalinity or low hardness. Contrary to popular belief, irritated eyes and skin are caused not by too much chlorine but a too low pH level. The ideal pH level is between 7.4 to 7.6. To raise pH and alkalinity, soda ash should be added, Kilgore said.

Scaling, or the formation of calcium carbonate deposits on pool walls, the filter and heater, is caused by the opposite conditions of corrosiveness:

high pH and high alkalinity. To lower pH and total alkalinity, add muriatic acid.

A pool's materials also play a role in chemical balancing. If a pool is concrete and plaster, it will cause a base reaction with the chemicals because of the plaster's base materials. "So therefore, the base materials are going to absorb whatever acids are in the water, and the pH is going to go up," explained Kilgore. "And if you don't test for it, then it's going to form scale."

On the other hand, a pool with a painted, vinyl or fiberglass surface will not cause a chemical reaction. "So therefore, any acid that gets in the water is going to stay there, and the pH and alkalinities are going to go down," said Kilgore.

Brian Staszko, pool service supervisor with All Pool & Spa, pointed out how the need for more chemicals increases with higher bather loads. A swimmer perspires one to three pints of ammonia per hour. That ammonia mixes with chlorine to form chloramines, a poor sanitizer that causes eye irritation.

"So, you figure if you have 50 bath-ers in that pool, you have at least 50 pints of ammonia in that pool water," said Staszko. To restore proper chemical balance, an oxidizing agent, most commonly chlorine, must be added. It takes five chlorine molecules to kill one ammonia molecule.

"So, you can imagine how much (chlorine) you'll have to keep adding," said Staszko. "That's why it's a state law to have a chlorinator installed on a commercial pool, so you have a constant feed of chlorine."

Low levels of sanitizer, or chlorine, also encourage growth of algae, a common problem in Hawaii with our year-round sunshine.

In addition to continual feeding of stabilized chlorine in a tablet, stick or gas form, a pool should also receive a "shock" treatment at least once a week. A shock treatment uses unstabilized chlorine that releases immediately to provide thorough sanitation. Unstabilized chlorine comes in a cake form that contains 2 percent cyanuric acid, or water conditioner, which forms hypochlorous acid when released.

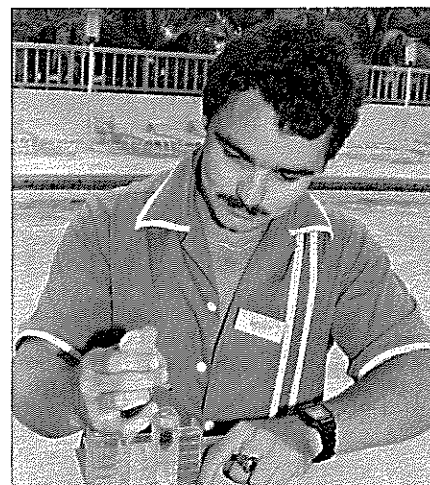
"Hypochlorous acid is the only thing that destroys bacteria in water. All the other chemical processes don't count," said Kilgore.

However, too much hypochlorous acid, which is caused by a low pH level, will use up the chlorine too quickly.

### In-House Maintenance

With all the chemical processes involved in a pool, it's easy to see why a building manager may need professional assistance at some point. Kilgore said he instructs his clients on how to do basic chemical testing of pH and chlorine. State Department of Health regulations, under Chapter 13, require testing of pH and chlorine three times per day.

Anyone can learn to use a pool testing kit to measure pH, chlorine and other chemicals. Kilgore said he services some pools just every six months to conduct more in-depth water chemistry tests. These include measuring temperature; cyanuric acid, or water conditioner; and total dissolved solids, or broken-down



**Scott Shultis, pool captain at the Ilikai, does all chemical testing himself.**

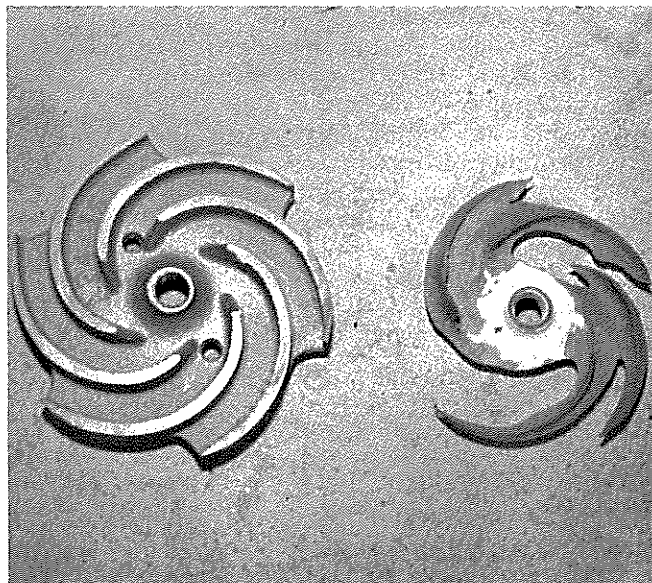
chemicals that contribute to a water's hardness. Water that is too hard will inhibit correct chemical reactions from occurring.

"By taking all these things into consideration, we can determine if the water in the pool is scale-forming, or if it's extremely corrosive," Kilgore said.

It is, however, possible for in-house maintenance people to test for these chemicals. Scott Shultis, pool captain of the Ilikai's two pools, tests for total alkalinity and hardness once a week.

"It's usually real consistent. But every now and then the calcium hardness drops and begins to eat away at the plaster, so we add calcium chloride. When things get out of hand, then we'll call a pool company."

**Corrosiveness can eat up equipment, as it did to this impeller (below right).**



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