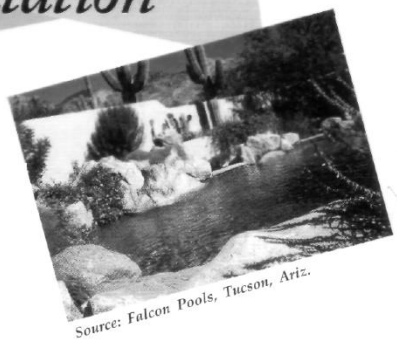
# POOLS & SPAS:
# *Utilizing Ozone Systems for Proper Sanitation*

By Ted Rich



Source: Falcon Pools, Tucson, Ariz.

**Summary:** *The residential pool and spa market has been a target for virtually every form of water sanitation technology available. In addition to established chlorine and bromine methods, such alternatives as ozone, ion exchange and UV/peroxide vie for market share. Use of ozone as a recreational water sanitation alternative is discussed here, including a summary of its properties, advantages and shortcomings, as well as which segments of the residential pool and spa market can benefit most from using ozone.*

It's important to begin our exploration of pool and spa sanitation by making two general but important points. First, the water being treated isn't drinking water; it's swimming pool water and therefore has different purity standards, placing different demands on the sanitizer. Second, the same water is being treated over and over—vs. treating a continuous stream of new water. Accordingly, some adjustments in mindset—as well as the approach to new standards and procedures—may be necessary.

## Properties of ozone

Ozone is a very powerful oxidizer[1] of most organic materials, including swimming pool contaminants such as soaps, body oils, perspiration and chloramines. In the presence of halogens such as chlorine or bromine, ozone will also oxidize ammonia, urea and amino acids. Ozone is also extremely effective for killing bacteria, viruses, spores and cysts. Considering its powerful qualities as an oxidizer of a broad range of waterborne contaminants, ozone is more effective than chlorine. Because it's so effective in oxidizing organic matter, and since it also acts as a microflocculant of these wastes, the performance of the spa or pool filter system may actually be enhanced. This, of course, will add brilliant clarity to the water—an important quality relative to aesthetics and swimmer safety.

Another advantage of ozone is it's generated on-site. It doesn't need to be transported, stored or re-filled, and can be made quite cost effectively us- ping one of two general types of ozone generators—ultraviolet (UV) lamp or corona discharge. As we will discuss later, cost considerations should be evaluated in terms of ozone system longevity, overall water quality and reduced chemical usage. While UV-generated ozone is typically not of sufficient concentration to be considered a heavy sanitizer, it's frequently used in low-load spa applications.

Ozone as a general sanitizer in the pool and spa environment has certain drawbacks. First, it's inherently short- lived. If fed at low levels or if a considerable organic demand exists, ozone quickly reverts back to common oxygen. While the by-products of ozone oxidation—oxygen, heat and carbon dioxide—are not hazardous, health officials don't normally recognize ozone as a stand-alone sanitizer. Because ozone is so unstable, it's not practical to maintain an ozone residual. Rather, the use of a more stable oxidizer in conjunction with ozone is recommended.

It's important to keep in mind that while a residual oxidizer is condoned, the quantities required to maintain proper sanitation are significantly reduced with the use of ozone. For example, two of the three swimming pools pin the 1984 Los Angeles Olympics used ozone and the area health department allowed half the normal chlorine levels required to maintain proper water psanitation.[2] Ozone residual at the surface of the pool is no danger to swimmers if the system is sized correctly and if proper contact is provided for.

Again, since ozone quickly reverts back to oxygen, it's not effective in treating algae. Proper levels of a residual sanitizer (commonly either chlorine or bromine) will take care of any algae problems. Finally, ozone is corrosive to some metals, including copper and iron. Careful consideration must be given to the pool or spa's