



By Roger Nathanson

About the Author

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The O-Zone

Today's Lesson: Design Parameters for Using Ozone on Swimming Pools

The main purpose of an ozone pool system is to eliminate the following.

- 50-100 percent chlorine use
- Detrimental affects of chlorine
- Chlorine taste and odor
- Unsafe levels of harmful microbes
- Cloudiness
- Instability of the water
- Unusual feel of the water

The principle of proper operation behind an ozone pool system is to circulate enough water or gallons per minute (gpm) to properly interface and mix the ozone and water. The only time the water is ozonated is when the pool pump is operating. If insufficient water is circulated, then more chemicals such as chlorine will have to be used.

Ozone is used primarily to make the water safe from harmful bacteria and viruses. Ozone is not a good algaecide. This is because algae are plants with roots that can penetrate and/or adhere to the pools surface. Plants are far more resistant to ozone than bacteria. It would take a far greater amount of ozone to kill algae than it would to kill bacteria. Most pool designs in the United States do not circulate enough water to afford the proper contact of ozone for the elimination or prevention of algae. Europeans pools are built to a much different standard with greater circulation rates. This is why ozone is often used in Europe and chemicals such as chlorine are used minimally.

A benefit of an ozone system is the altering of chlorine's detrimental effects. The taste, odor and other

detrimental effects will, in most cases, be minimal due to the alteration of the chlorine on a molecular level. Ozone will convert chlorine and chloramines to a dissolved salt, therefore reducing or eliminating the detrimental effects.

Ozone systems can make a good pool pristine and a bad pool fair to good. What differentiates a good from a bad pool? Design, care and organic load.

Design

Once the pool is built there is little you can do. You can install a larger pump and filter but only to the extent of the plumbing size and layout.

Care

This is where you can make a lot of difference. Most pool owners do not take proper care of their pool and are looking for the "silver bullet" that will yield perfect water quality without doing a thing. No such luck! Pools are maintenance intensive. Some devices such as an ozone system will make your job easier, but you still have to

perform the normal/proper janitorial activities.

- Sweep one to two times per week.
- Vacuum one to four times per month.
- Maintain the proper pH, alkalinity, hardness, TDS and algaecide.
- Operate properly. Most people under-operate their pool. Yes, you

turnover means that all the water will go from the pool, through the filter and back into the pool. Most pools are designed at a far lower rate than this, which compromises the water quality and the ability to keep it clean and safe. More chemicals are required to supplement the lack of circulation. This means that the pump, filter and plumbing have to be sufficient to handle the increased/proper flow.

- **Filter selection is vital.**
 - *Sand filters* are the least effective at removing particles, and they waste a tremendous amount of water during backwash and rinse.
 - *DE filters* remove the smallest particles and, therefore, yield the highest water quality. However, DE requires slightly more maintenance. The trade-off can be quite beneficial.
 - *Cartridge filters* are the most common. Their removal is fair/good and the maintenance is low.
- **The size of the pool will determine the number of skimmers and returns.** Again, most builders design only what is necessary based on United States standards. This assumes low circulation rates and high chemical usage. European circulation rates far exceed the United States. Ozone is the European standard and certain chemicals such as chlorine are illegal in some areas. **WQP**

Ozone primarily is used for prevention of bacteria and viruses. Most pool designs do not circulate enough water to afford the proper contact of ozone for the elimination or prevention of algae.

will have lower electrical consumption, but you will make up the difference in chemical use.

Organic Load

This is the amount of leaves, dirt, dust, debris, rain, run-off and swimmers that enter the pool. Swimmers contribute the highest organic load with skin, hair, mucus, urine and various microbes.

The following design considerations would be helpful in setting a pool up for an ozone system.

- **Be sure the circulation rate is at least five turnovers per day. One**

Next month's column will discuss various types of air dryers and their importance to ozone systems.

For more information on this subject, write in 1011 on the reader service card.



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