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Rollin' on the River

page 18

- **High-efficiency heaters** page 24
- **Can cities afford 50-meter pools?** page 30

PRODUCT FOCUS: The Locker Room p. 40 • Controls & Switches p. 48

Shocking alternatives

Strategies for ridding an indoor pool of pesky chloramines

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Special to Aquatics International

Most indoor-pool operators have a difficult time ridding their pools of chloramines. Chloramine buildup is not as much of a problem at outdoor pools because sunlight helps destroy chloramines and wind often blows objectionable odors away.

Reaching breakpoint chlorination, sometimes known as "shocking," will usually eliminate chloramines (combined chlorine) and other contaminants that create an increased chlorine demand. Chloramines can cause eye and mucous-membrane irritation and give off that unpleasant "chlorine odor" often associated with poorly ventilated indoor pools. When airborne, chloramines can even result in corrosion of metal fixtures and components in the natatorium.

Problems generally arise when pools have enormously high bather loads, resulting in heavy organic loading and high levels of ammoniated impurities in the water.

If a chloramine residual persists even though an operator has followed proper breakpoint-chlorination techniques, the operator can try one or more of the following suggestions:

• Increased exposure time/chlorine concentration

Operators might succeed in reaching breakpoint by superchlorinating longer with higher levels of chlorine.

• Regular dilution

Drain and replace approximately 8 gallons of fresh water per user per day, as recommended in the German DIN Standard 19643. The European Community has adopted the DIN Standard and FINA requires water standards compatible with the DIN standard during international swimming competitions.

• Drawing water from the pool surface

Chloramines concentrate near the surface of the water. During breakpoint chlorination, turn off the valve that draws water from the main drains and direct all the water through the perimeter-overflow system. By circulating only through the gutters, you'll speed up the process by removing the water where chloramines concentrate.

• Increase airflow over the water

When oxidation occurs, chemicals release into the natatorium air. Operators can reduce the chloramine concentration in the air by increasing the percentage of outside air brought into the natatorium.

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Do whatever you can to get more air moving over the pool. Open the windows and doors and turn on exhaust fans or portable fans to move large volumes of air across the pool's surface.

• GAC filtration

Install secondary granulated activated carbon (GAC) filters and remove ammonia through filtration. Operators can use GAC filters to treat a side-stream of water drawn off the main effluent line or to treat chloramine-bearing source water before its addition to the pool.

• Non-chlorine oxidizers

Use potassium peroxymonosulfate (aka monopersulfate) instead of chlorine to remove chloramines and other organic contaminants from the water. Unlike chlorine, which must reach a breakpoint, any amount of potassium peroxymonosulfate will oxidize some material.

• Eliminate chlorine to eliminate the chloramines

Add hydrogen peroxide or sodium thiosulfate to the pool to drop the chlorine level to zero. This eliminates the free-chlorine residual by converting chlorine back to chlorine salt. By eliminating chlorine from the water, you'll also eliminate chloramines.

• Zeolites

Zeolites with at least 80 percent clinoptilolite can be used as filter media in place of #20 silica sand in sand filters. Zeolites can remove ammonia as well as particles down to 5 microns in size, equivalent to the filtering capabilities of a DE filter. Adding a layer of sodium chloride (table salt) to the filter bed — add approximately 10 percent of the filter volume — results in an ionic reaction, which causes the absorption and removal of ammonia as the water passes through the filter.

• Corona discharge ozone systems

Organic contaminants are slightly reactive with ozone. After partial oxidation, however, filters can remove fine, solid contaminants via microflocculation. Unfortunately, ozone also destroys high free-chlorine residuals in the process of destroying chloramines, so operators must constantly replace lost chlorine.

• Ultraviolet light

UV light, whether from natural sunlight or from UV sanitation systems, can destroy chloramines and aerosolized chlorine compounds. If a natatorium has no source of natural sunlight, UV-light sanitation systems can provide supplemental sanitation and destroy chloramines.

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