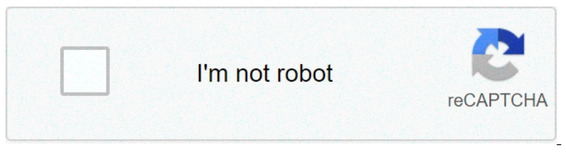

Continue

Water treatment using chlorine

Salt Water pools, also called saline pools, can provide an eco-friendly way to cool off in the hot summer sun. Many people are making the move from the traditional chlorine pool to this greener alternative. All pools use chlorine, which keeps algae and bacteria from forming in the pool, but a saltwater pool produces its own chlorine so you never have to add harsh chemicals as with a traditional pool.Benefits of Salt Water PoolA salt water pool offers many benefits, both for the environment and for the people who are swimming in it. Because of these benefits, it's becoming a popular practice to replace a regular water pump with the chlorine generator used in a saltwater pool.Softer on Skin - The first benefit that you'll notice in a salt water pool is that the water is much softer on the skin. Your eyes are not irritated, and the water does not have a "filmy" feel to it. It slides right off like water should and doesn't leave white marks as the water dries.Constant Chlorination - The chlorine generator actually produces its own chlorine. This means that you no longer have to buy chlorine tablets or mess with putting them in the water. Whenever the generator is on and is circulating water, it is making chlorine.Chlorine Levels are Constant - With a regular pool, there is a weekly influx of new chlorine that reaches a high and then tapers off during the week. It sits in the sun until the water can feel like there is a film on it. Because the chlorine of a salt water pool is created through the water itself, it is kept at a constant low level.Changing to a Salt Water PoolChanging your existing pool over to a salt water version doesn't mean you have to install an entirely new pool. You only have to purchase a chlorine generator, which is simply added to your existing pool's plumbing for filtering and running the water through the chlorination.The generator works using the salt that is added to it to produce the chlorine. You simply add the salt to your pool water when you install the chlorine generator for the first time. The amount of salt you use depends on how large your pool is. Approximately 50 lbs. of salt is needed for a pool with 1,200 gallons of water.Through a process of electrolysis, the salt is split into sodium and chlorine. This is what makes the chlorine for the pool and keeps the water clean and safe for your skin and the environment. Salt Water Pool MaintenanceThe water is cleaner, but the pool stills need to be maintained. Keep the filter clean, and remove any dirt or debris that is floating around the water. And you should still test the water to ensure that the correct balance is maintained at appropriate levels. Woman in Delhi using the SWS (P. Virot, WHO) The Safe Water System (SWS) was developed in the 1990’s in response to epidemic cholera in South America by the Centers for Disease Control and Prevention (CDC) and the Pan American Health Organization (PAHO). The treatment method for the SWS is point-of-use chlorination by consumers with a locally-manufactured dilute sodium hypochlorite (chlorine bleach) solution. The SWS also incorporates emphasis on safe storage of treated water and behavior change communications to improve water and food handling, sanitation, and hygiene practices in the home and in the community. To use the chlorination method, families add one full bottle cap of the sodium hypochlorite solution to clear water (or 2 caps to turbid water) in a standard sized container, agitate, and wait 30 minutes before drinking. Lab Effectiveness, Field Effectiveness, and Health Impact At concentrations that are used for household water treatment programs, the hypochlorite solution is effective at inactivating most bacteria and viruses that cause diarrheal disease. However, it is not effective at inactivating some protozoa, such as Cryptosporidium. Numerous studies have shown complete removal of bacterial pathogens in SWS treated water in developing countries. In seven randomized, controlled trials, the SWS has resulted in reductions in diarrheal disease incidence in users ranging from 22-84%. These studies have been conducted in rural and urban areas, and include adults and children that are poor, living with HIV, or using highly turbid water. Benefits, Drawbacks, and Appropriateness Nurses using the SWS in a hospital ward (A. Parker, CDC) The benefits of chlorination are: Proven reduction of most bacteria and viruses in water Residual protection against recontamination Ease-of-use and acceptability Proven reduction of diarrheal disease incidence Scalability and low cost The drawbacks of chlorination are: Relatively low protection against protozoa Lower disinfection effectiveness in turbid waters Potential taste and odor objections Must ensure quality control of solution Potential long-term effects of chlorination by-products The SWS and chlorination are most appropriate in areas with a consistent supply chain for hypochlorite solution with relatively lower turbidity water, and in urban, rural, and emergency situations where educational messages can reach users to encourage correct and consistent use of the hypochlorite solution.Local manufacturing of sodium hypochlorite solution in Haiti (Lantagne, CDC) Implementation Examples Local manufacturing of sodium hypochlorite solution in Haiti (Lantagne, CDC) The Safe Water System has been implemented in over 35 countries. Social marketing organizations, such as Population Services International (PSI), sell hypochlorite solution in over 20 countries. Since 1998 over 125 million bottles of hypochlorite solution, a volume of product sufficient to treat approximately 118.7 billion liters of household drinking water, were sold (as of 2013). Local organizations use the socially marketed hypochlorite solution in their own programming to provide safe drinking water Cdc-pdf[PDF – 1 page]. For example, in Western Kenya nurses Cdc-pdf[PDF – 1 page] are trained to use SWS water in hospitals and teach patients with diarrhea to use the PSI SWS product WaterGuard™. In Uganda, people living with HIV Cdc-pdf[PDF – 2 pages] are given WaterGuard™ to prevent opportunistic diarrheal diseases. In Kenya, schoolchildren Cdc-pdf[1 page] are taught how and why to use the SWS and safe water clubs treat drinking water for all students. Also in Kenya, HIV self-help groups Cdc-pdf[PDF – 2 pages] sell SWS solution and storage containers as an income generating activity. Faith-based groups, such as the Jolivert Safe Water for Families program Cdc-pdf[PDF – 1 page], make and bottle their own hypochlorite solution in rural areas. Local community health workers teach community members how to use the solution, make and distribute the solution, and follow-up with families to educate them on healthy water and sanitation practices. Government ministries, such as the Ministry of Health in Guyana, work with local private companies to develop and market hypochlorite solution for emergency response. The SWS has also been widely used to respond to emergencies. SWS hypochlorite solution has been widely used to respond to emergencies from the 2004 tsunami in Indonesia to flooding and cholera epidemics in Africa and Haiti. Economics and Scalability A bottle of hypochlorite solution that treats 1,000 liters of water costs about 10 US cents using refillable bottles and 11-50 US cents using disposable bottles, for a cost of 0.01-0.05 cents per liter treated. Education and community motivation add to program costs. SWS programs can achieve full cost recovery (charging the user the full cost of product, marketing, distribution, and education), partial cost recovery (charging the user only for the product, and subsidizing program costs with donor funds), or can be fully subsidized such as in emergency situations. In the PSI/Zambia project, the average cost per bottle (treating 1,000 liters) of production, marketing, and distribution at project initiation in 1999 was $1.88. This decreased by 82% to 0.033 US cents per liter treated in 2003, when 1.7 million bottles were sold, showing that significant cost efficiencies can be gained as programs grow to scale. Additional Resources For more information about chlorination for developing countries, visit: Sun. Chlorine. Salt water. The best parts of summer can leave our hair a complete mess come Labor Day. Our locks take a beating during the warmer months, leaving strands dry, color-faded, frizzy, and greasy. Even air conditioning can do a number on hair. So what gives? Is there any way to keep our hair healthy and still enjoy a dip in the pool? Luckily, there are plenty. We tapped New York City-based hairstylist Nathan Rosenkranz to understand what happens to our hair during the summer, what we can do to fix it, plus a few ways to rehabilitate our hair come fall. RELATED: 11 Genius Summer Beauty Tips to Combat Sweat and Humidity Sun exposure, salt water, and sweat can pull moisture from your strands, leaving them dry and prone to breakage. To avoid this, “start with wearing a nice wide brimmed hat to keep the sun off of your hair,” says Rosenkranz. This will help keep the sun’s rays off your hair, thus protecting your hair from dryness and preserving the color (with the added bonus of protecting your skin!). Double up by using a product that both moisturizes and shields your hair from UV rays. Rosenkranz recommends Bamboo Beach Summer Sun Recovery Spray from Alterna Haircare ($22; dermstore.com). "In the summer we're more frequently exposing our hair to the chemicals in pools, salt water, and spending more time in the heat, all of which will strip your hair of its beautiful color," says Rosenkranz. Before going for a swim in the pool or ocean, he recommends wetting your hair completely and thoroughly applying a leave-in conditioner. “Your hair will absorb the conditioner instead of the chlorine or salt water,” he says. Try EverPure Damage Protect Leave in Treatment from L'Oreal Paris ($9; amazon.com), which is sulfate-free and also works to restore damage. RELATED: 11 Products For Perfectly Air-Dried Hair The key to combating frizzy hair is locking out the humidity. “Humidity is like Miracle Gro for flyaways,” says Rosenkranz, “so anyone who is prone to frizzy hair will be suffering extra during the humidity brought on by summer showers.” You can do this with an oil, like Oleo Miracle Replenishing Oil from DESSANGE Paris ($12; amazon.com). It's loaded with three oils—argan, camelia, and pracaxi, which work together to leave your hair both smooth and soft. A sweatier body leads to greasier hair. "When it's hot, your scalp sweats, transferring the naturally occurring sebum throughout the hair more, which can cause the hair to look greasy," says Rosenkranz. "Not a good look!" To fix this, he recommends using an absorbent dry shampoo, like Batiste Dry Shampoo ($6; amazon.com). RELATED: The Surprising Habit That's Destroying Your Hair Give your heat-styling routine the cold shoulder. “The intense heat from constant blow drying dries out your hair and sets it up for major breakage,” says Siobhan Quinlan, a hairstylist at Art + Autonomy Salon in New York City. Have straight or wavy hair? "After showering, blot hair with a towel, then finger-comb to keep your texture intact,” says Vanessa Ungaro, a hairstylist and cofounder of Lauren+Vanessa salon in New York City. “Scrunch up strands pre-product to avoid losing natural texture, then apply a styling cream for soft, not crunchy, waves.” If your hair is curly: "Brush with a wide-tooth comb while it’s soaking wet, then squeeze—don’t rub—with your towel," says Quinlan. Next, apply a moisturizer and a mousse or curl cream. Once your hair is totally dry (not a minute before, or you’ll create frizz), use your hands to separate curls. "Hair, especially when color-treated, loses its shine over time and even more quickly when it’s in the sun or hot water," says Lauren E. Hack, a hair color specialist and cofounder of Lauren+Vanessa salon. Here are three easy ways to bring back shine: At the salon, get a clear gloss—a shiny seal that gradually washes out. Reap similar benefits with an at-home glaze, like Oribe Glaze for Beautiful Hair Color ($58; nordstrom.com); use it in place of conditioner. For all-natural radiance, grab apple cider vinegar, which removes product buildup and closes the cuticle so light better reflects off hair. Mix one cup water with two tablespoons ACV in a spray bottle. After shampooing, mist it on and massage. Rinse after three minutes, then apply conditioner. While damaged hair can be the result of a summer well spent—pool parties! beach days!—dry ends are a buzzkill. Quinlan recommends slathering on a hydrating mask before working out or going to the beach (the heat will help the mask penetrate deeper), then rinsing it off in the shower. For more serious rehab, says Quinlan, opt for an Olaplex treatment at a salon: "It’s a three step system that goes deep into the hair shaft to repair broken bonds. Two steps are done in the salon, while the third is a conditioner you use at home to prolong the benefits—softer, healthier, shinier hair." (Find participating salons at olaplex.com.) It may be tempting to put off a haircut until fall, but pros say now is the most crucial time to go in for regular trims. “Hair grows faster in summer, and when you don’t cut off split ends, they move farther up the hair shaft and leave hair looking worse,” explains Quinlan, who advises getting dustings (quarter-inch trims) every six weeks. To avoid leaving the salon unhappy with the length, Ungaro recommends pointing to exactly where you want your hair to end. “Bringing a picture is always a good idea,” she adds If you haven't spent the summer protecting your mane from the sun and surf, you can repair damaged locks once the weather starts to cool. "First, look for good treatments," says Rosenkranz. He has been recommending Caviar Moisture Intense Oil Crème Pre-Shampoo Treatment ($30; sephora.com) to revitalize your hair. You apply the treatment 15 minutes before shampooing. "In addition to boosting the moisturizing benefits of your existing shampoo and conditioner regimen, it moisturizes to revitalize dehydrated strands, leaving hair supremely smooth, soft, and shiny." The big takeaway here: moisture! Many of the bread recipes on this site call for chlorine-free water. What is chlorine-free water and do you need to use it? Chlorine is used in many water treatment plants to make water safe to drink. In small quantities, chlorine is not harmful to humans, although many people do not like the taste of water treated this way. Some organisms are more sensitive to chlorine, and some of those are involved in bread-making. The microorganism symbiosis in sourdoughs can be particularly susceptible. That is why, when you are making a sourdough recipe, it is a good idea to use chlorine-free water. The bread may be fine if you use your normal tap water, but when you spend time and money baking, you want to be sure the recipe comes out right. Different recipes also call for water without chlorine, and that is mostly a matter of taste. Sometimes the robust, Baker's yeast may be affected by chemicals in the water, but not usually. So how do you make water without chlorine? There are several ways. Check with your water company. Ask them how the water is treated. If they do not use chlorine or chloramine in the water, you can use tap water without further treatment. Be aware that even if they do not usually treat water with these chemicals, there are times of the year and certain situations which will cause the company to use them for a time. You can buy it. Most bottled water does not contain chlorine. The companies disinfect the water and bottles with ozone or ultraviolet light. To be sure, check the label. We buy gallon sized jugs of mountain spring water and keep it just for bread baking. You can leave your tap water in an open container for 24 hours, and most of the chlorine will escape into the air. Boil water and leave it to cool and most of the chlorine will be gone, as well. Water filters, particularly some charcoal filters remove chlorine adequately. Again, read the label to find out how much is removed. A more recent problem has come up, however. Water companies have also started to use chloramine in treatment plants. This chemical disinfects the water and stays in the water longer than chlorine. It will not dissipate, like chlorine, from an open container of water. If you have chloramine in your water, you will need to filter the water or use bottled water.