BASIC HOT TUB WATER CHEMISTRY GUIDELINES

Refer to these general guidelines to maintain clean, clear spa water. Should you treat your hot tub with the AquaFinesse water care system, refer to that manual found on this portion of the pdcspas.com web site.

pH CONTROL: CHEMICALLY BALANCED WATER DEPENDS PRIMARILY ON:

1. THE AMOUNT OF ACID OR BASE IN THE WATER (pH),
2. THOSE CHEMICALS THAT HELP MAINTAIN OR STABILIZE pH (TOTAL ALKALINITY) AND,
3. THOSE CHEMICALS THAT CAUSE SCALING (CALCIUM HARDNESS). DESCRIBED AS A MEASURE OF RELATIVE ACIDITY OR ALKALINITY OF WATER, pH IS MEASURED ON A NUMBER SCALE FROM 0 - 14. THE MID-POINT, 7, IS SAID TO BE PRECISELY NEUTRAL, ABOVE WHICH ALKALINITY BECOMES PROGRESS SIVELY GREATER AND BELOW WHICH ACIDITY BECOMES PROGRESSIVELY GREATER. PROPERLY BALANCED SPA WATER SHOULD HAVE A pH BETWEEN 7.2-7.8, A TOTAL ALKALINITY OF 75-150 PPM AND AN OPTIMUM RANGE OF 100-400 PPM OF CALCIUM HARDNESS. WITHIN THESE LIMITS, YOUR SANITIZING CHEMICALS AND FILTERING FUNCTIONS WILL BE MOST EFFECTIVE. TEST KITS ARE AVAILABLE TO MEASURE THE pH AND SHOULD BE REPLACED ON AN AT LEAST ANNUAL BASIS TO ASSURE ACCURACY.

DISINFECTION: THE HIGH TEMPERATURE AND INCREASED VELOCITY OF THE WATER, AS WELL AS THE HEAVY BATHER LOADS, ALL CONTRIBUTE TO THE ORGANIC CONTAMINATION OF SPA WATER. IT IS VERY IMPOR TANT TO MAINTAIN AN EFFECTIVE RESIDUAL OF SANITIZING AGENT, TO SHOCK TREAT AT PERIODIC INTERVALS AND, IF NEEDED, TO CONTROL ALGAE GROWTH.

BROMINE IS THE BEST-SUITED SANITIZER FOR SPA WATER. ALTHOUGH CHLORINE IS POPULAR AS A SWIMMING POOL SANITIZER, THE HIGH TEMPERATURES AND AERATION OF A SPA GREATLY ACCELERATE CHLORINE LOSS. FREE CHLORINE REACTS WITH ORGANIC MATERIALS TO FORM COMBINED CHLORINE, WHICH IS A POOR DISINFECTANT THAT CAUSES OFFENSIVE ODORS AND OFTEN CAUSES EYE BURN. BROMINE IS SIMILAR TO CHLORINE, ALTHOUGH IN THE FREE AND COMBINED FORM IT IS AN EFFECTIVE SANITIZING AGENT AND CAUSES NO OFFENSIVE ODOR OR EYE BURN. IT IS EASIER TO MAINTAIN A BROMINE RESIDUAL THAN CHLORINE AND IT IS EFFECTIVE OVER A WIDER pH RANGE THAN CHLORINE.

THE TEST FOR BROMINE SHOULD READ 1 PPM IN A RESIDENTIAL SPA. DEPENDING UPON BATHER LOAD, AMOUNT OF USAGE, TYPE OF WATER, ULTRAVIOLET EXPOSURE, ETC., THE AMOUNT OF CHEMICALS NEEDED WILL VARY. ON A WEEKLY BASIS, A "SHOCK" TREATMENT SHOULD BE USED TO DESTROY ORGANIC CONTAMINATION NOT READILY DESTROYED BY NORMAL ADDITIONS OF THE SANITIZING AGENT. THIS IS ACCOMPLISHED BY USING A POWERFUL, LONG-LASTING OXIDIZING AGENT CAPABLE OF DESTROY ING THE ORGANIC CONTAMINANTS SO THE SANITIZER CAN BE EFFECTIVE IN KILLING BACTERIA.

CONTACT YOUR CHEMICAL SUPPLIER FOR THE BEST "SHOCKING" AGENT IN CONJUNCTION WITH THE LINE OF CHEMICALS BEING USED. FOR SPAS INSTALLED OUTSIDE AND DIRECTLY IN SUNLIGHT, ALGAE GROWTH MAY BE A PROBLEM. IF THIS OCCURS, CONTACT YOUR RETAILER OR CHEMICAL MANUFACTURER FOR ADVICE ON THE BEST AGENT AVAILABLE TO HANDLE THIS PROBLEM.

ABOVE ALL, REMEMBER:

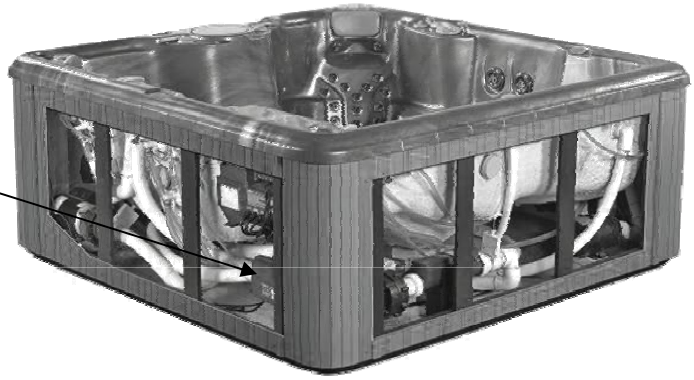
1. BEFORE USING CHEMICALS, READ THE LABELS AND FOLLOW DIRECTIONS CAREFULLY.
2. ALWAYS ADD THE CHEMICALS DIRECTLY TO THE SPA WATER, EITHER IN A SUITABLE FEEDER, DISTRIBUTED OVER THE SURFACE OF THE WATER, OR POURED INTO THE WATER, PREFERABLY WITH THE PUMP AND BUBBLER ON.
3. NEVER ADD CHEMICALS TO THE SPA WHILE PEOPLE ARE USING IT.
4. MAINTAINING TEMPERATURE BETWEEN 95-104°F (35-40°C) IS ESSENTIAL AS A HEALTH FACTOR FOR BATHERS AND IS HELPFUL IN CONTROLLING WATER PROBLEMS.
5. THE BOTTOM LINE TO PROPER WATER MAINTENANCE IS TO ADHERE TO A REGULAR SCHEDULE OF TESTING CHEMICAL LEVELS AND MAINTAINING THEM.

BASIC HOT TUB WATER CHEMISTRY GUIDELINES (cont'd)

OZONE: YOUR SPA MAY BE EQUIPPED WITH OZONE AS THE SANITIZING AGENT. STANDARD ON THE LX SERIES SPAS AND OPTIONAL ON THE SE SERIES UNITS. THIS UTILIZES ULTRAVIOLET LIGHT AND OFFERS A "HANDS-FREE" ROUTINE TO SPA WATER CARE. THE PH MUST BE MAINTAINED AND SHOCKING MAY BE NEEDED AFTER HEAVY BATHER LOADS. WITH THE USE OF OZONE, THE PERIODIC DRAINING MAY BE NEEDED LESS FREQUENTLY, AND THE BROMINE ODOR NO LONGER AN ISSUE. IT IS SUGGESTED THAT 24-HOUR CIRCULATION IS REQUIRED TO EFFECTIVELY SANITIZE THE WATER, AND A CHLORINE SHOCK USED PERIODICALLY. CONTACT YOUR CHEMICAL SUPPLIER FOR MORE INFORMATION.

1. THERE IS NO TEST KIT AVAILABLE TO TEST OZONE PRESENCE IN SPA WATER, ALTHOUGH A 24-HOUR CIRCULATION PERIOD IS RECOMMENDED FOR CLEAN, CLEAR WATER. A CLEAN, "AFTER RAIN" SMELL WILL BE PRESENT WHEN YOU OPEN YOUR SPA COVER AS AN INDICATOR THAT THE OZONE IS DOING IT'S JOB.
2. A PROPER PH MUST BE MAINTAINED AND A ROUTINE BROMINE OR CHLORINE SHOCK IS SUGGESTED.
3. THE OZONE SYSTEM WITH YOUR SPA IS A CORONA DISCHARGE UNIT THAT HAS A BLUE LIGHT AT THE BOTTOM OF THE UNIT INDICATING PROPER FUNCTION TO GAIN ACCESS TO THE OZONE UNIT, REMOVE THE CABINET PANEL SIDE AFTER LOCATING THE POSITION OF THE UNIT. REPLACEMENT PARTS ARE AVAILABLE FROM YOUR RETAILER

OZONE UNIT



Location varies with spa model. Refer to specifications for location and take note during installation positioning.

BASIC WATER CHEMISTRY CHART

PROBLEM	DESCRIPTION	CAUSE	REMEDY
Green Algae	Green Water Green spots on surface Slippery surface	Low ozone, bromine, or chlorine levels Low algaecide levels	Superchlorinate Brush spa; removing algae Vacuum spa; removing algae Increase oxidizer residual
Black Algae	Black spots on spa surface	Low oxidizer levels Low algaecide levels.	Superchlorinate Brush spa; removing algae Vacuum spa; removing algae Increase oxidizer residual
Unpleasant Odor, Burning Eyes	Chlorine-like odor. Burning sensation in eyes.	Combined chlorine and/or pH out of balance	Superchlorinate. Balance pH to 7.2-7.6
Colored Water	Water in newly-filled spa turns black, blue, or brown when treated with ozone	Copper, iron, or manganese in water being oxidized by chlorine or ozone	Adjust pH to 7.2-7.6 Run filter continuously Vacuum settled material Use sequestering agent for prevention
Hard Water	Cloudy water Scaling	Excessive hardness of makeup water or building up of dissolved minerals in the water caused by continued use of spa chemicals.	Clean filter Filter continuously Adjust pH to 7.2-7.6 Use scale inhibitor Dilute with makeup water