



## OZONE QUESTIONS AND ANSWERS



### WHY OZONATE MY POOL OR SPA?

**ANSWER:** POOL OWNERS WHO ARE CONCERNED ABOUT THE HARMFUL EFFECTS OF CHLORINE WILL BE INTERESTED IN REDUCING CHLORINE LEVELS IN THE WATER. IN PARTICULAR POOLS WITH CHLORINE ONLY SYSTEMS CAN BE HARMFUL AS THE SKIN'S PORES OPEN UP AND INGEST CHLORINE INTO THE BODY. IN SOME CASES COMPETITIVE SWIMMERS WILL OFTEN REFUSE TO SWIM IN A CHLORINATED ONLY POOL AND OLYMPIC POOLS ARE GENERALLY OZONATED FOR THIS REASON.



### WHAT IS OZONE?

**ANSWER:** OZONE IS ACTIVE OXYGEN, O<sub>3</sub>. OZONE OCCURS NATURALLY IN THE EARTH'S ATMOSPHERE TO PROTECT US FROM THE SUN'S HARMFUL RAYS. BECAUSE A SINGLE OXYGEN ATOM IS VERY UNSTABLE IT TRAVELS AROUND IN PAIRS WHICH ARE WRITTEN SCIENTIFICALLY AS O<sub>2</sub>. OZONE IS MADE UP OF THREE OXYGEN ATOMS WRITTEN AS O<sub>3</sub>. IT IS CALLED TRIATOMIC OXYGEN WHEN ACTIVATED.



### HOW DOES OZONE WORK?

**ANSWER:** OZONE IS UP TO 50 TIMES MORE POWERFUL AT KILLING BACTERIA AND VIRUSES THAN TRADITIONAL POOL CHEMICALS AND UP TO 3000 TIMES FASTER. OZONE IS FASTER THAN CHLORINE AT KILLING BACTERIA BECAUSE CHLORINE NEEDS TO DIFFUSE THROUGH THE CELL WALL AND DISRUPT THE BACTERIA'S METABOLISM. OZONE, HOWEVER RUPTURES THE CELL WALL FROM THE OUTSIDE CAUSING THE CELL'S CONTENTS TO FALL APART. THIS PROCESS IS KNOWN AS "CELLULAR LYSIS" THIS PROCESS TAKES PLACE IN ABOUT 2 SECONDS. WITH OZONE AFTER THE DESTRUCTION OF THE CELL ALL THAT IS LEFT ARE CARBON DIOXIDE, CELL DEBRIS AND WATER. ONCE THIS PROCESS IS COMPLETE OZONE REVERTS BACK TO OXYGEN O<sub>2</sub>. THIS ADDITIONAL OXYGEN IN THE WATER MAKES IT TASTE GOOD, SMELL GOOD AND GIVES IT A SPARKLE. THERE ARE NO TOXIC OR HAZARDOUS BYPRODUCTS.



### WHAT WILL OZONE DESTROY?

**ANSWER:** OZONE KILLS OR REMOVES VIRUSES, BACTERIA, SPORES, AMOEBAE, CYSTS, MILDEW AND FUNGI. OZONE WILL NOT USUALLY ELIMINATE ALGAE AT THE CONCENTRATION AND CONTACT TIMES USED IN SWIMMING POOLS AS IT ONLY LASTS IN THE WATER FOR A FEW MINUTES. AN ADDITIONAL SANITIZER NEEDS TO BE ADDED TO THE WATER TO KILL ALGAE AND PROVIDE PROTECTION WHEN THE OZONE GENERATOR IS OFF.



### IS OZONE AN OXIDIZER?

**ANSWER:** OZONE IS A VERY POWERFUL OXIDIZER. THE TERM "OXIDIZER" AS USED BY THE POOL AND SPA INDUSTRY MEANS TO DESTROY EVERYTHING IN THE WATER BY ADDING A MEGA DOSE OF CHLORINE OR NON CHLORINE SHOCK (SHOCK TREATMENT). THIS SHOCK TREATMENT IS TO RID THE WATER OF AMMONIA, PERSPIRATION AND OTHER ORGANIC MATTER INCLUDING SWIMMER WASTES. ACCORDING TO THE E.P.A. THERE ARE MORE THAN 700 DIFFERENT ORGANIC PRODUCTS AND SWIMMER WASTES THAT CAN BE IN THE WATER. OZONE WILL OXIDIZE MOST OF THEM VERY QUICKLY INCLUDING IRON AND MANGANESE, AS WELL AS THE BONDS OF MANY COLOR PRODUCING CONTAMINANTS LIKE DECAYING LEAVES AND GRASS. OZONE PROVIDES BETTER WATER QUALITY AND OXIDIZES MANY CONTAMINANTS THAT CHLORINE CANNOT



#### **CAN I STOP USING CHLORINE WHEN I OZONATE MY POOL?**

**ANSWER:** TO PROVIDE PROTECTION DURING TIMES WHEN OZONE IS NOT BEEN PRODUCED AND TO CONTROL ALGAE A SMALL RESIDUAL OF CHLORINE NEEDS TO BE MAINTAINED, KEEP THE LEVEL BETWEEN 0.5 AND 1.0 PPM. CHLORINE CANNOT BE ELIMINATED ENTIRELY BUT YOU WILL CERTAINLY REDUCE CHLORINE LEVELS BY UP TO 70% LEAVING YOU HEALTHIER CLEANER WATER.



#### **WHAT'S WRONG WITH USING CHLORINE AS AN OXIDIZER?**

**ANSWER:** CHLORINE REACTS WITH ORGANIC WASTE AND FORMS A LARGE NUMBER OF HIGHLY TOXIC CHLORO-ORGANIC COMPOUNDS, ALSO REFERRED TO AS "COMBINED CHLORINE" LIKE CHLORAMINES. THESE ARE WELL KNOWN CARCINOGENS. IN SWIMMING POOLS THEY ACCUMULATE IN VERY HIGH CONCENTRATIONS. RED EYES AND RASHES ARE THE MOST INSTANT AND OBVIOUS EFFECTS. ON AVERAGE THE HUMAN BODY WILL ABSORB HALF A LITER OF POOL WATER EVERY HOUR. SO YOU CAN ONLY IMAGINE WHAT SORT OF HARMFUL CONTAMINANTS ARE BEING ABSORBED INTO YOUR BODY WHILST SWIMMING. THE USE OF OZONE REDUCES THE LEVEL OF CHLORINE DRASTICALLY AND ALLOWS THE CHLORINE TO WORK PRIMARILY AS A WATER DISINFECTANT.



#### **DOES OZONE AFFECT WATER BALANCE?**

**ANSWER:** OZONE HAS A NEUTRAL PH ( ABOUT 7.0 ), NO CALCIUM, NO ALKALINITY OR DISSOLVED SOLIDS THEREFORE OZONE DOES NOT AFFECT WATER BALANCE.



#### **IS OZONE SAFE FOR SWIMMERS?**

**ANSWER:** OZONE DISSOLVED IN THE WATER IS PH NEUTRAL SO IT WILL NOT HARM EQUIPMENT OR PEOPLE. THE AMOUNT OF OZONE ADDED TO THE WATER IS SAFE AND NON TOXIC TO HUMANS AND PETS.



#### **HOW DOES THE " CLEAR O3 " MAKE OZONE?**

**ANSWER:** OZONE IS MADE BY EXPOSING OXYGEN MOLECULES TO A SPECIFIC ULTRAVIOLET ( UV ) LAMP. AIR OR OXYGEN TRAVELS INTO AND OUT OF A CHAMBER CONTAINING THE UV LAMP WHICH IN TURN CONVERTS IT INTO OZONE. THE OZONE IS INJECTED INTO THE POOL WATER USING THE " CLEAR O3 " SUCTION INJECTION SYSTEM, WHERE THE OZONE ENRICHED AIR IS MIXED WITH THE WATER GOING INTO THE POOL CIRCULATION PUMP. THIS CREATES A DYNAMIC ENVIRONMENT THAT BEST MIXES THE OZONE AND WATER AT HIGH PRESSURE AS IT IS SENT TO THE FILTER.



#### **WILL THERE BE A VISIBLE CHANGE TO THE QUALITY OF THE POOL WATER?**

**ANSWER:** WITHIN A FEW DAYS OF THE " CLEAR O3 " OXIDIZING ALL THE PARTICLES AND METALS IN THE WATER YOU WILL NOTICE A DEFINITE CLARITY AND SPARKLE THAT YOU MAY NOT HAVE EXPERIENCED BEFORE.



#### **DOES OZONE REQUIRE ANY SPECIAL MAINTENANCE?**

**ANSWER:** IN FACT YOU MAY DISCOVER THAT WITH THE " CLEAR O3 " THAT SOME OF YOUR POOL MAINTENANCE JOBS ARE EASIER TO DO AND NEED TO BE DONE LESS FREQUENTLY. SOME OF THE BENEFITS INCLUDE FEWER CHEMICALS TO MAINTAIN THE POOL, LESS FREQUENT FILTER CLEANING CYCLES, DIMINISHED SCUM LINE AROUND THE POOL TILE AND INCREASED LIFE FOR SALT CHLORINE CELLS ( IF PRESENT ).