



ALFAQ

AQUATIC LEARNING SESSION



ozone[®]
swim

3
BRAUER
INDUSTRIES

Sanitiser - Chlorine

- * Liquid Chlorine
- * Dry Chlorine
- * Chlorine Dioxide
- * Salt chlorination
- * Mineral chlorination



PRIMARY DISINFECTION

DPD Smart Controllers

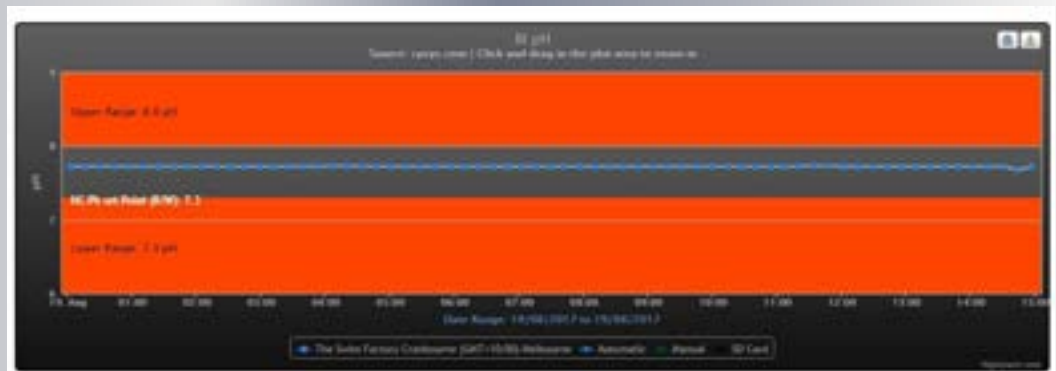


Free Chlorine
Total Chlorine
Combined Chlorine
pH
ORP
Turbidity
TDS
Temperature

Importance of Accurate Chemical Control



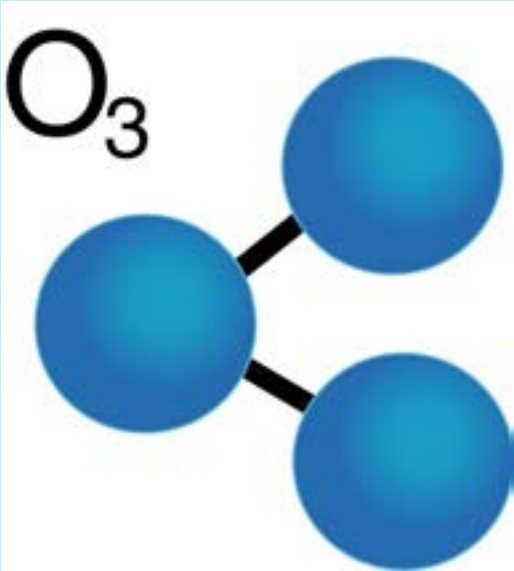

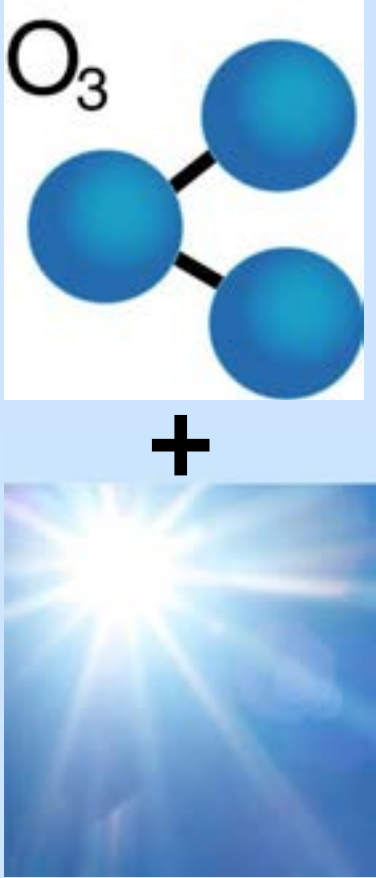
Test Values for BI Chlorine



Wifi Connectivity



Secondary Sanitation

Ozone	UV	AOP (Ozone + UV)
		

THE FACTS

Water Chemistry in High Risk Pools



-Learn to Swim Pools-

Unintentional Release – key facts (do you know what your swimming in?)

- * 0.14 Grams of faecal matter per bather approximately
- * 6 million coliform units of Skin Cells per bather per 15 minutes
- * 30ml of urine per bather
- * 1 litre of sweat per bather per hour
- * Consumer products/ cosmetic products eg. Sunscreen, body lotion.

Intentional Release

- * That we are all aware of – urine!

These all contribute to the challenges of disinfection for swimming pools - especially Learn to Swim Pools.

SECONDARY SANITATION



- * **Chlorine** as a **Primary Disinfectant** does a good job **BUT** is not a 'powerful' oxidiser
 - Cryptosporidium in particular have worked out how to bypass and build an immunity to chlorine at standard pool dose rates.



SECONDARY SANITATION



Typical reason commercial pools use Secondary Sanitation

- Effectively destroy Chloramines (Chloramines **not** to exceed 1.0ppm)
- Kills Crypto and Gardia
- Reduce chlorine demand
- Enhance water clarity
- Ensure bather comfort
- Improve air quality
- Reduce total chlorine
- Energy efficient



SECONDARY DISINFECTION

Current Methods

A little about Ozone.....

A POWERFUL OXIDISER

- Ozone kills cryptosporidium & microorganisms
- Ozone works in cloudy water and acts as a natural flocculent – which assist with water clarity
- Ozone oxidizes the organics and inorganics that create chloramines, reducing their production
- Ozone breaks down into simple Oxygen therefore leaving NO chemical residue
- Ozone destroys contaminants approx 3500 times faster than Chlorine

SECONDARY SANITATION

Current Methods



How does UV work?

UV IS AN INACTIVATOR

- UV is not an oxidizer
- UV inactivates cryptosporidium
- UV affects the water only as it passes through the UV reactor
- Only clear water can be effectively dosed with UV; cloudiness in the water will absorb the UV light.
- UV breaks down chloramines that have been previously created
- UV does not destroy Trihalomethanes

SECONDARY SANITATION

AOP (O_3 + UV)



What happens when combining both Ozone & UV?

Hydroxyl Free Radicals =
One of the most powerful oxidisers
known to water chemistry

Species	Oxidation Potential (Volts)
Fluorine	3.03
Hydroxyl Radical	2.80
Atomic Oxygen	2.42
Ozone	2.07
Hydrogen peroxide	1.78
Perhydroxyl radical	1.70
Permanganate	1.68
Hypobromous acid	1.59
Chlorine dioxide	1.57
Hypochlorous acid	1.49
Hypoiodous acid	1.45
Chlorine	1.36
Bromine	1.09
Iodine	0.54

SECONDARY DISINFECTION

AOP

Advanced Oxidation Process (AOP) Combining Ozone & UV

Suitable for high bather loads

	Chlorine Only	UV & Chlorine	Ozone & Chlorine	Ozone1 AOP
Efficiency against bacteria	Not 100%	Excellent	Excellent	Excellent
Destruction cryptosporidium and giardia	Not very effective	Very effective	Excellent	Excellent
Oxidation power	Low	Effective	Good	Excellent
Removal of inorganics	None	None	Good	Good
Removal of colour, odour, taste	None	Some*	Good	Excellent
Turbidity reduction	None	Poor	Good	Excellent
COD reduction	None	Slow*	Rapid	More rapid
TOC reduction	None	Slow*	Slow	Significant
Destruction of urine components	None	Relatively good	Relatively good	Very good
Chloramine removal	None at normal dose	Good	Good	Very good

*UV dose 60mJ/cm2

Secondary Sanitation

Which AOP?



Which AOP





“Outbreak of disease is frequently linked to inadequately disinfected pools”

“Swimming is an important recreational activity. Learning to swim prevents drowning. Swimming promotes good physical, mental and cardiovascular health. Though in poorly managed pools the risks outweigh the benefits”

Where is this technology used

kirbyswim
passionate about swimming



Sheraton



Ozone Swim Accredited Swim Schools

Are you on the list?

<http://brauerindustries.com/swimschools>



Questions?



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10+
YEARS

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