

## TWINOXIDE DIAMOND 0.3% SOLUTION IN SWIMMING POOLS

The application of TwinOxide in Swimming pools requires a combination of chlorine (in many countries stipulated by law) and TwinOxide. This minimum prescribed level of chlorine (we call it "under chlorination") is necessary to avoid chlorite building due to the always available urine in a pool.

- a. Chlorine is only effective as a disinfectant within a pH-range of 5-7
- b. In swimming pools the pH-level may vary;
- c. Before chlorine can be effective chemicals are added to manage the pH-level to the required level;
- d. In swimming pools the chloramines (bounded chlorine) cause negative side effects for the human body. (THM's, swimming pool odor)
- e. Chlorine is a blood poison and carcinogenic;
- f. Many micro organism have become resistant against chlorine.

By using TwinOxide the amount of required additional chemicals and chlorine decreases tremendously (up to ±.65% decrease on chlorine is possible!).

### Advantages of the Chlorine-TwinOxide concept in Swimming Pools:

1. Broader pH-level bandwidth of disinfection through TwinOxide (pH 4-10);
2. Negligible level of THM's and other cancer provokers;
3. Negligible level of Chloramines (bounded chlorine) by which the typical swimming pool disappears;
4. No irritation of glances, eyes or skin – no allergic reactions to chlorine;
5. Saving on chemicals as **no** pH-level adjustment is required for maximum disinfection (when using chlorine this is required as chlorine requires a pH-level between 5-7 while the chlorine TwinOxide concept is effective at pH-Levels between 4-10!)

6. Eradication of bio films in the water circuit decreasing risk of contamination with legionella, salmonella
7. Easy application of TwinOxide by adding a dosage pump
8. Expensive and power consuming equipment against chloramines are obsolete.

💧 The chlorine-TwinOxide concept for swimming pools provides clear, safe, disinfected and high quality swimming water without the typical swimming pool odor.

💧 The chlorine-TwinOxide concept for Swimming Pools is easy to implement within present swimming pool installations.

### Economical Savings by the chlorine-TwinOxide concept:

- 💧 Savings on power
- 💧 Savings on chemicals
- 💧 Savings on flow-back of water
- 💧 Savings on adding (and heating) of water into the circuit;
- 💧 Savings on conditioning the water
- 💧 Savings on chlorine usage
- 💧 Savings by no longer using Carbon Filters

### Cost for applying TwinOxide

- 💧 A dosage pump with metrics instruments
- 💧 2 Storage containers to create TwinOxide

### The concept is integrated as following:

- 💧 Removal of carbon layer in the filter
- 💧 Installation of a membrane covered sensor for chlorine dioxide

The chlorine sensor measures the total chlorine in a swimming pool and is not able to distinct the difference between chlorine and TwinOxide.

Therefore a membrane sensor for chlorine dioxide is required in the circuit. The values of this sensor enable to calibrate the chlorine sensor to the actual chlorine level in the circuit.

A ground disinfection of the filters is advised. By doing this stand disinfection during 6 hours all the encrustations and

bio sediments are broken down. This avoids the occurrence of these sediments into the actual swimming pool.

On the contrary this stand disinfection can also be used to see and show to the swimming pool crew what the effects are of the chlorine-TwinOxide concept for swimming pools. This only causes a longer time before the water is actually clear. On the other hand the excellent disinfection characteristics of the chlorine-TwinOxide-concept are very clear.

Beware that strings of sediments can be noticed in the pool! We advise to avoid usage of the pool until these sediments can no longer be noticed.

- 💧 The standard dosage for TwinOxide 0,3% is 2mg/L
- 💧 The standard dosage for Chlorine is depending on local law and regulations. (e.g. in The Netherlands the minimum required dosage is 0.5mg/L Chlorine in Germany that level is 0.2mg/L)

The fine-tuning of the dosage is always a matter of measuring and adjusting. This takes some time but the results are stunning.

### A possible noticeable effect:

When applying the TwinOxide pool concept an interesting trend may be noticeable.

As TwinOxide is a powerful oxidizer it converts the chlorine used for under chlorination into Chlorine Dioxide!!! This effect is very well noticeable when the pool is not in use (e.g. at night).

If the steering equipment is not adjusted for this symptom it might be possible that early in the morning a more than necessary depot of TwinOxide 0.3% solution is available in the pool. Although there is no risk for health and the biocidal residual is fully available it might not be desirable for economic reasons.

The devices used for the pool management should be adjusted accordingly.

#### Disclaimer

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