

PSEUDOMONAS & SWIMMING POOLS

When we address water quality in swimming pools, we talk mostly of coliforms, CFUs, and may be of *S. Faecalis*. It is very rare that any pool owner would look into what people refer to as *Pseudomonas*.

Pseudomonas strains have notorious presence in most swimming pool water. It is almost impossible to completely eradicate them from swimming pool, but they can be very effectively controlled if a little bit of hygiene and better attention is paid to water treatment process.

What is Pseudomonas?

Pseudomonas is a gram negative bacterium. Swimming pool water is contaminated when this bacteria is passed into the pool water from the human skin and gastrointestinal tract. *Pseudomonas* is also present in the soil and landscaping around the pool and carried into the water by the swimmers. If not controlled, *pseudomonas* can cause health issues, most commonly skin rashes and ear infections. Such measures as removing your swim suit and showering with soap after swimming can help prevent illness, but the bacteria must be eradicated as much as possible to truly solve the problem.

Pseudomonas and Ozone

Ozone is considered as the most effective disinfectant for eradicating *Pseudomonas*. This is one main reason why ozone is so popular in swimming pools. Chlorine is effective at high doses which is liable to form by-products that are carcinogenic. Hence, to limit chlorines side effects, ozone is used for pool water treatment. Chlorine's role will be restricted to providing residual disinfectant.

What are UV Lamps?

UV lamps are not very common in pool water management in India. There are many reasons behind this. UV lamps are used in doses of 40 mJ in applications in India. At this dose, UV is not effective against *E.Histolytica*, blue green algae, moulds that are also present in pool water (unfortunately not tested). The other main reason for ineffectiveness of UV lamps in pool management is the photo reactivation. Also in most UV application, they use

low pressure UV lamps for total eradication of *E Coli*, very commonly found in swimming pools. We need to increase the dose to beyond 40 mJ or use medium pressure lamps. Photo reactivation decreases when you increase the UV dose from 40 mJ to 120 mJ/cm².

What is Photo Reactivation?

Most of UV actions are inactivation. Inactivation is different from lysis. Many bacteria are capable of repairing themselves after UV radiation. This includes *E Coli*. This happens within a few hours of treatment. Photo reactivation was seen to be more in warm waters (above 25°C) and also when low pressure UV lamps have been used.

Other Wrong Impressions of UV Lamps

It is often mentioned that UV lamps can do what ozone can, for example, eradication of THM precursors (important to reduce chlorine side effects). But users are not aware that when the medium pressure UV lamps (poly chromatic) are suitable and not low pressure lamps (only mono chromatic). How many UV users are aware of this?

What are the Standards in India?

The bacteriological standards in India for swimming pool water is *pseudomonas* count, not more than 10 counts/ 100 ml. Except in 5 star hotels where testing has been made mandatory (including legionella), no private pool waters are being tested.

Cost of higher doses of UV and medium pressure lamps are high and makes them uneconomical for use in swimming pool water treatment. A solution for *Pseudomonas*, *Legionella*, *E.Histolytica*, and Moulds can easily be achieved with a combination of ozone and residual chlorine.

What About UV Ozone?

UV ozone is different from UV lamps because they work at different wave lengths known as UVC. Austria has banned the use of UVC (UV ozone marketed by some multinationals in India) in pools. This is because this has caused the increase of THMs in swimming pool water. French authorities have regulated the use of these UV lamps generating ozone. Low pressure UV lamps have 30% UVC and this is why they are not suited for swimming pools.

Contributed By: V. Baratharaj - CMD, OTSIL

Ozone Technologies & Systems India Private Limited
E-mail: otsil@vsnl.com, +91 44 2492 8414/ 4211 8266, Website: www.otsil.net