Filtration of water in public swimming pools
The problem: We must say no to asthma!

The use of chlorine in swimming pools is becoming a major problem. It has been shown that commonly recommended levels of chlorine concentrations significantly increase breathing trouble in even trained athletes. Chloramines are causing the problems.

Recent research has shown that the absolute major part of chloramines is created from dissolved skin cell. Sandfilters hold the skin cells and they dissolve in a few hours, and then this organic matter are pumped back into the pool, becoming chloramines.

Chloramines are formed as a product of nitrogen and active chlorine (hypochlorous acid – HOCl). The nitrogen is partly introduced as “urine” but mostly from bacterial degradation of proteins in sandfilters (eg human skin cells).

The pungent smell of chlorine is caused by mono-, di- and trichloramine, causing the following physical symptoms:

- Red burning eyes.
- Dry skin.
- Burning sensation in respiratory organs.
- Difficult breathing “asthma”.

Particle control in classic systems

Pool ➔ Level holding tank ➔ Pressurized filter coarser material ➔ Pump ➔ Sand filter

Particle control in systems using new technology

Pool ➔ Hydrotech Drumfilter ➔ Level holding tank ➔ Pump ➔ Membrane filter

Filtered water and the sludge water that is removed in the Hydrotech filter

Only 10% of the flow
The solution: Remove particles from the water!

The key benefit of drum-filters is removal of organic particles on a continuous basis so there is little for the free chlorine to combine with! Hydrotech Drum filters backwash a few times every hour and the backwash cycle only last a few seconds. Now compare what is happening in the sand filter with a typically backwash each week: The chlorine and organics are combining constantly; regardless of swimmer load. Thus, the water treatment system is a chloramine factory! Increasing sand filter backwash intervals is impractical because the volume of water lost to backwash is significant and costly.

Since we still employ chlorine as the primary disinfectant, we will still generate some chloramines; but only a fraction because we remove +90% of the organic particles on a continuous basis with the drum filter. We address the soluble nitrogen / ammonia with medium pressure UV and we filter the particles < 10 μm with side loop membrane filtration.

Energy & water savings

Hydrotech Drum Filters work with gravity flow only unlike pressurised sand filters. Circulation pumps need only to overcome 0.3 meter counter pressure over the filter and energy savings are high. Also water savings are high as large volume backwash are not needed.

The results are based on a classic 25 m pool at Bernstorffsminde Efterskole in Denmark that now has 1 year experience with the new technology running continuously. The pool is used by young swimming athletes and as a general offer for the students on the school.
For smaller installations, you will find the newly developed Hydrotech Drum Filter 800-1G series very economical and long lasting solution. Hydrotech has delivered over 6000 filters worldwide and is the leader within microfiltration.