

## THE LIVING WATER – PUBLIC BATHS AND SWIMMING POOLS AS DANGEROUS ENVIRONMENTS

COVID-19 fundamentally changed the way people think about health and quality of life. As a result, people are prioritising the health and overall well-being of themselves and their family members. Since the pandemic has emphasised the importance of good health, the need for a healthy lifestyle is at the top of people's motivational preference scales in almost every country, and in most cases, at the top of the list, according to current professional research.

This advancement of health-consciousness has also drastically changed consumption habits and the decision-making processes of people and companies. It is therefore unsurprising that since the emergence of COVID, the issue of disease prevention has also become paramount. Before consumers choose a product or service, they want reassurances from credible, professional sources that it is healthy and in no way harmful to them or their loved ones.

This need has allowed issues and information to come to the fore that, although not common knowledge, have been proven facts for decades, but simply have not reached the "threshold" of society's "interest" to be addressed in a meaningful way.

Because of lockdowns and health restrictions, the public was barred from using spas, swimming pools, and similar services during the pandemic. In these areas, ensuring high standards of disinfection and cleanliness was a fundamental expectation even before the pandemic, but since 2020, expectations have increased considerably on the client side. This change has also brought to the fore the issue of water disinfection, where chlorine and its negative health impacts are finally receiving the real and deserved attention.

## THE DANGERS OF CHLORINE DISINFECTION

Chlorination of water dates back to the beginning of the 20th century, but chlorine is still the most widely used solution for disinfecting water because it is cheap and easy to produce. Since the 1970s, however, serious research has been carried out into the risks of chlorination, which has shown the presence of more than 70 identified unwanted by-products and compounds in purified water. The experiments carried out confirmed that the presence of these so-called THM compounds above certain thresholds causes cardiovascular diseases and is also responsible for the development of cancers (mainly digestive tract tumours, bladder cancer, and rectal cancer), which are among the leading causes of death in the adult population.

Most pool owners and spa and hotel managers spend considerable amounts of money on water maintenance. In many cases, they try to reduce exposure to microbial pathogens by adding more chlorine to the residual chlorine already present. If the water contains enough organic substances and the conditions are right, chlorine disinfection is more likely to cause dangerous diseases. For this reason, the majority of spa, thermal, and pool waters aimed at premium audiences are now chlorine-free to avoid the risk of chlorine being ingested, inhaled, or absorbed through the skin. The process, which can also be applied to waters with high ammonium or organic content, is completely safe and does not alter the therapeutic properties of the water or its unique and essential composition. It is therefore critical that anyone spending a significant amount of money to build a state-of-the-art, premium swimming or leisure pool should be aware of the exact composition of the water and the most effective disinfection solutions adapted to it, including chlorine-free disinfection, as required in the post-pandemic period. Just as the quality of the water supplied, the environment, and the number and characteristics of the bathers determine the chemical composition of the water on an individual basis, the disinfection process must be defined on an individual basis, based on independent expert testing, with the dosage of disinfectant precisely adjusted to eliminate the risk of unwanted by-products of chlorine.

The pandemic has highlighted the fact that in the post-COVID era, no responsible spa or pool manager can afford to put their guests or their own health at risk from inappropriate chlorine treatment.

## **Health impact analysis and advice**

The analysis provides the client with a clear demonstration of the short-, medium-, and long-term harmful health effects that existing disinfection procedures have on consumers. Based on the study, an expert will provide the client with clear guidance on what disinfection procedures should be carried out, how extensively and how often, in order to ensure full protection of the health of the clients. The composition of the water will also indicate the level of risk to the health of the water users that the customer is taking on in the case of conventional chlorine disinfection.

## **Drinking water analysis and advice**

The purpose of the analysis is to define the water use options for the client. The customer can also ascertain whether the water to be tested complies with the drinking water quality test parameters stipulated in the current Government Regulation 201/2001 (X.25), i.e. whether it is suitable for use as drinking water.

The basic chemical analysis of drinking water will show whether the water tested is of drinking water quality and, if not, what technology and treatment can be used to improve it to the right quality. Based on the deviations detected during the test, the expert creates a proposal for other non-drinking water uses (irrigation, domestic, pool water) and for the water treatment or additive methods to optimise water use in the proposed uses. The advice and recommendation shall also indicate if the water under consideration is not suitable for any of the other uses or if the expected cost of the proposed technology is not proportionate to the benefits of the use.

## **Swimming pool water analysis and advice**

The purpose of the analysis is to ensure that the water to be tested complies with the bathing water quality test parameters prescribed in the applicable government regulation, i.e. that it is suitable for use as pool water (bathing water).

The pool water test will show the general quality and condition of the pool water being tested and the type of treatments that have been applied in the past. Testing is recommended in all cases where the user detects problems with the functioning of the pool (e.g. precipitation, algae growth, irritation, pH adjustment problems, abnormal parameter values). If, based on the anomalies previously outlined, the reported problem is multi-directional, with apparent inconsistencies in the water during dosing or use, then an expert examination is always required.

Based on the summary and evaluation of the test parameters, our experts describe in detail the steps to be followed for the use of the pool water, together with a calculated dosage recommendation and a summary of the procedure to be followed to deal with any discrepancies arising from the results. If the presence of certain parameters or extreme differences in parameter values indicate that the water has been used for too long or is in an extreme condition due to incorrect dosing, the advice may include partial or complete water replacement. In such cases, specific information on refilling or recharging will also be provided.

## **Cooling circuit water analysis and advice**

The aim of the cooling circuit water test is to identify any deviations in the use of the most commonly used, strictly pre-treated, pre-set, additive-quality feed waters.

The cooling circuit water analysis will show whether and to what extent there is a detectable deviation from the original values. The test is necessary if the periodicity of the test period prescribed in the operating instructions for the cooling circuit has elapsed or if a specific problem (leakage, blockage, corrosion, scale or biological fouling, odour, deterioration of cooling/heating efficiency) is detected.

Based on the test results, which must always be compared with the initial quality of the original feed water, results measured in accordance with the standard are produced. If a deviation from the original quality is found, the cause and a detailed, specific treatment proposal will be identified.

## Chemical engineering advice

When designing and renovating spas and hotels, the contractor in charge of mechanical engineering is often also responsible for the preparation of the water treatment plan. However, design or construction companies specialising in mechanical engineering do not have the latest knowledge of health-conscious chemical and water treatment solutions. As a result, the technical content of the installations may not meet the water quality requirements and the relevant professional standards, which may result in additional costs for the client.

Therefore, the aim of chemical engineering advice is to ensure the optimal design and construction of the equipment and processes required for disinfection and decontamination, based on the specific characteristics of the water and the environment.

WATERCOMP's experts will prepare a chemical plan based on the analysis of the site, the number of guests expected, the amount of water to be used, the diameter of the pipes used in the system, the volume of water, all while preparing the documentation of risks and hazards (scale removal, water balance restoration, etc.). The advice includes the sizing of the equipment according to the flow rate, determining the chemicals to be dosed and their quantities, recommending the dosing pumps, and the most efficient way of treating the wastewater.

## WATERCOMP INSTITUTE

The WATERCOMP INSTITUTE is the first independent laboratory specialised in water testing, which, after a detailed evaluation of the tested water sample, not only provides its partners with a professional opinion, but also a detailed, itemised proposal for use and disinfection. The aim of the water testing packages is to provide the customer with an objective expert advice, tailored to the parameters of the water in question, from recognised experts in the field of water testing in Hungary, on modern chlorine or chlorine-free disinfection procedures tailored to the exact composition of the water, which will not only ensure the purity of the water but also the long-term health of the bathers. The WATERCOMP INSTITUTE's knowledge is based on 27 years of water analysis experience, several patents, and the testing and complex treatment recommendations of many leading spas, hotels, and private pools.