

Chlorine Phase-Out

For many years the use of chlorine has been considered effective in water purification, although some bacteria had developed resistance to it. However, over time, this view has changed because of the heavy downside, and its use is being phased out world over.

Chlorine, while killing or inactivating pathogens in water, reacts with natural organic matter to produce various by-products such as bromate, chlorite, haloacetic acid and trihalomethanes which are considered toxic, carcinogenic and likely to trigger cardiovascular diseases. A study conducted by the Medical College of Wisconsin, USA clearly associates cancer with chlorinated water. "The cancer risk among people drinking chlorinated water is 93% higher than among those whose water does not contain chlorine" says the US Council of Environmental Quality. Moreover, production of chlorine is energy intensive and wasteful while its storage, transportation and handling can be a potential safety hazard as chlorine is a hazardous substance.

The trend against use of chlorine is not restricted to drinking water purification. Even industries such as food & beverages, pharmaceutical, chemical, and breweries are moving away from chlorine as the conventional disinfectant to state-of-the-art treatment such as ozonation, ultra violet sterilization and UV sterilizers, and chlorine dioxide (ClO₂) generators.

Apart from its ability to kill micro-organisms, ozone has many distinct advantages over chlorine – the principal ones being that there is no production of haloform and no secondary byproducts, besides removal of unpleasant taste and smell. Ozone treatment of swimming pool water is widely accepted and has proven to provide a water quality that cannot be achieved with traditional chlorine treatment. The high oxidation potential of ozone, considerably higher than chlorine, has also prompted many industries to use ozone equipment in their manufacturing facilities. The major applications of ozone treatment are in municipal water and waste water treatment, industrial process water treatment, waste water treatment and water disinfection for residential needs, hotels and clubs.

One of the most common economical and environment friendly water disinfection systems is ultra violet (UV) treatment. Strategic placement of properly designed and sized UV water treatment equipment may solve, prevent and minimise microbiological, organic, and TOC problems in many industries such as packaged water, food processing, pharmaceutical, semiconductor, power etc. In short, UV offers protection without the use of chemicals and, with recent developments in high energy UV technology, higher quality standards are achievable in a more simplified, efficient and cost-effective manner.

The latest trend is to use chlorine dioxide which is more effective in removing odour and taste and very effective against many difficult micro-organisms with no significant formation of trihalomethanes. In short ClO₂ is a superior disinfectant to chlorine and is an extremely effective and selective oxidiser for textiles and wood pulp. ClO₂ is now coming into much more general use as a disinfectant deodoriser, steriliser and cleaning agent in many industrial applications such as food and beverages, dairy, process/cooling/waste water treatment, apart from drinking water and swimming pool applications.

Conclusion:

"Putting chlorine in water supplies or using it for any other application is like starting a time bomb. Cancer, heart trouble, premature senility, both mental and physical, are conditions attributable to chlorine treated water. It is making us grow old before our time by producing symptoms of aging such as hardening of arteries" says a medical expert. Leading market research and environment protection agencies have predicted the increased use of alternative techniques such as ozone, UV and chlorine dioxide (ClO₂) and these will soon become far more popular with both domestic and industrial customers; many believe it would be desirable if chlorination of water is entirely phased out because of the known health and environmental risks.