

Chlorine for safe water

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A proven life saver through powerful disinfection

Chlorine was first used in drinking water in the late 19th century to control the spread of water-borne diseases such as typhoid, cholera, dysentery and gastro-enteritis, which have collectively killed more people than all the wars in history. Fighting these diseases remains a vital and on-going process.

An on-going health battle

The World Health Organization (WHO) estimates that each year, more than three million people still die as a direct result of drinking unsafe water, of which 1.7 million from diarrheal diseases. Globally today, 783 million people do not have access to safe water sources (joint Report UNICEF/United Nations, April 2012). At the 2002 World Summit on Sustainable development, by 2015 the Global Community committed to halve the proportion of people without access to safe and healthy drinking water. Clean water is also one of the UN global post-2015 sustainable development goals.

The world seems to be well on track to meet the drinking water target and **is even five years ahead**, as [reported by a member of the American Water Quality and Health Council in April 2012](#). This is to a large extent thanks to water chlorination and the use of sustainable PVC piping for clean water transport. **But, given rapid population growth, it is estimated that over 780 million people could still be without safe drinking water by 2015.** Read [the WHO press release on this issue](#).

Powerful disinfection necessary

Chlorine acts as a powerful disinfection agent when used either on its own or as sodium hypochlorite ('bleach'). Added to water in small quantities, it quickly kills bacteria and other micro-organisms, by chemically oxidizing their cell walls.

Chlorine has the major advantage of ensuring clean water right up to the tap, whereas the action of other disinfectants, such as ozone, ultraviolet light and ultra filtration, is only temporary. Chlorine also helps remove tastes and odours, controls the growth of slime and algae in pipes and storage tanks, and helps to remove unwanted nitrogen compounds from water.

Proven life saver

Many events testify to the importance of chlorine in water purification:

- In the US, annual deaths from cholera totalled 25,000 in 1900. By 1960, this figure had fallen to fewer than 20;
- In 1991, a misinterpretation of US law resulted in a voluntary suspension by Peru's government of chlorination of water supplies. The resulting cholera epidemic spread to neighbouring countries causing 1,000,000 cases of cholera and more than 10,000 deaths;
- In 1986, 4,000 people in Tenerife were hospitalised due to water contamination which followed the temporary withdrawal of chlorine for disinfection.
- Even today, the world is fighting killers like cholera in many regions, for instance in Africa.

Poor living conditions can easily lead to rapid spreading of dangerous bacteria





Finding potable water can imply a daily search, miles away from home

The African cholera fight

The lack of access to potable water is the single most important cause of recurring outbreaks of cholera in many countries. The United Nations combat this disease by funding projects to distribute chlorinated water to local, rural peoples for example in Congo.

Cholera symptoms appear shortly after a person has been infected with the bacteria; a toxin is produced that causes continuous watery diarrhoea, a condition that can quickly lead to severe dehydration of the body and death if treatment is not administered promptly. Vomiting also occurs in most patients.

As the efforts to combat the spread of cholera in the Democratic Republic of Congo (DRC) remained underfunded, the disease began to spreading further (February 2012).

Over the following twelve months, the UN-managed Central Emergency Response Fund (CERF) allocated more than 13 million US dollars (more than 9 million euro) to support the fight against cholera, according to the UN Office for the Coordination of Humanitarian Affairs (OCHA) in Geneva.

The UN World Health Organization (WHO) confirmed that cholera had spread to the Bas-Congo province in the east, which meant that nine of the country's 11 provinces had been affected by the disease. The UN and other humanitarian agencies have been working with the Congolese Government since to combat the disease.

The response has included establishing cholera treatment centres, providing **water chlorination points** and refurbishing water points, conducting

awareness campaigns using the media, training of medical staff, and disinfecting boats. (Source: [World Health Organization Press Release](#), 6 March 2012)



Providing quality drinking water is a major challenge in many regions of the world

Also needed in Europe

Today, more than 90% of Western Europe's drinking water is chlorinated.

A range of chlorine compounds, including ferric chloride and hydrochloric acid, are also used to purify waste water and sewage.

In the home, chlorine-based products are used in laundry bleach, dishwasher detergents, scouring powders and paper towels, and as all-purpose disinfectants to kill common germs (including *Staphylococcus*, *Salmonella*, *Pseudomonas* and athlete's foot fungus).

Swimming remains a very popular, healthy pastime thanks in part to the benefits of chlorine. Disinfectants based on this element keep swimming pool water safe by killing a range of dangerous microbes that could otherwise threaten health.

Much more about chlorine on www.eurochlor.org.

Chlorine chemistry applications: www.chlorinethings.eu

