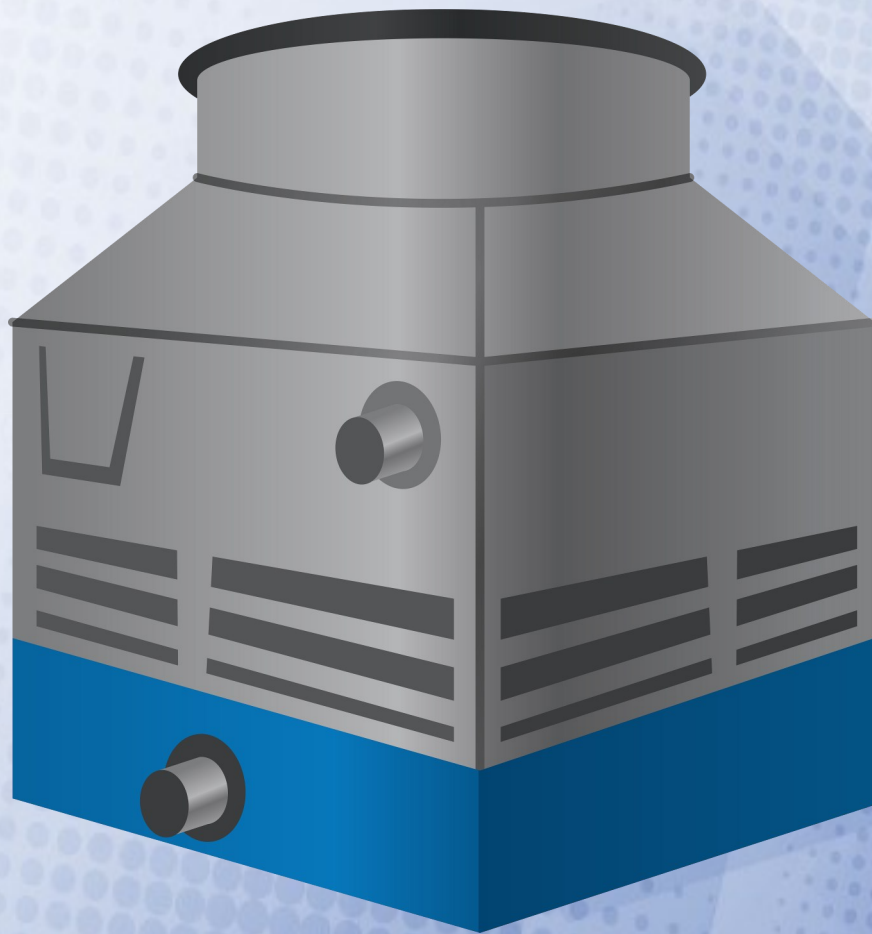




SANOSIL
DISINFECTANTS FOR LIFE 



Sanosil products for

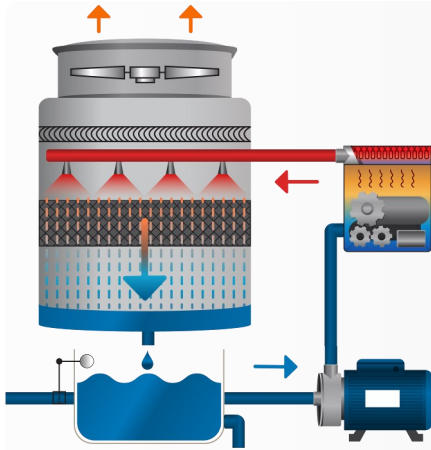
cooling water treatment



Cooling water treatment: Brief overview of the topic



There are a wide variety of models, sizes and designs of water-bearing cooling systems. However, they can generally be divided into three categories. The common feature of the three system categories is that without treatment of the water, problems develop relatively quickly. In addition to affecting the service life and performance of the equipment, these problems may also endanger both the health of employees and local residents.



Open systems

These systems operate by spraying water in a cooling tower or passing it over an irrigated surface. The water evaporates to some extent and releases heat in the process.

The residual cold water accumulates dust and dirt from the air as well as minerals and lime (thickening). It must be removed from the system via a drain (desalination). Fresh water must be added to compensate for the water losses.

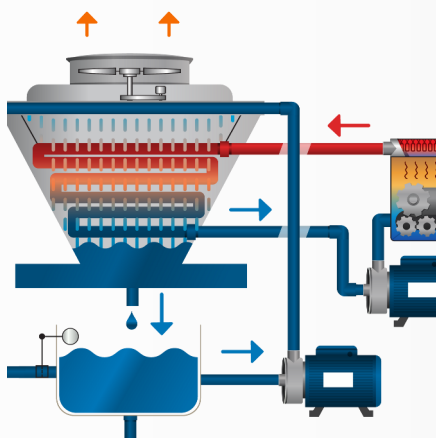
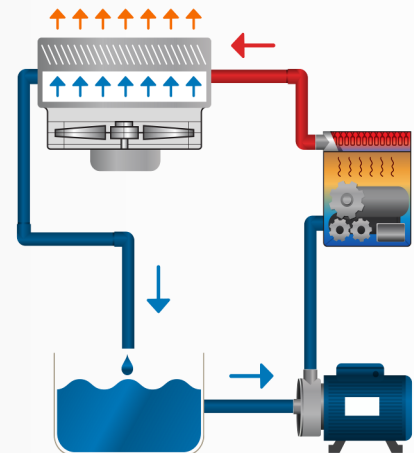
In order for open systems to operate at peak performance, they require biocides, hardness stabilisation measures, corrosion inhibitor and dispersing agents.

Closed systems

Such installations consist of a pool (mass cooling) from which the cooling water is extracted, pumped through the areas to be cooled and returned directly to the pool. A heat exchanger together with a fan is sometimes installed in between. The functional principle here is equivalent to a radiator grille in motor vehicles.

Softened water is typically used in closed systems. They rarely suffer losses except for leakage and slight evaporation. The water is less likely to become contaminated and therefore does not need to be continuously replenished.

To condition the water, closed systems require biocides, corrosion protection, dispersing agents and, where necessary, antifreeze.



Hybrid systems

These cooling systems feature a combination of an open and a closed circuit, which are separated from each other. In the open part of the system, water is evaporated and heat is released. This is used to cool the closed circuit via a heat exchanger. Hybrid systems can also be operated in a "dry" state in cool weather. In this case, the open circuit is drained and the closed circuit is cooled solely using air.

For the open part of the system, hybrid systems require biocides, hardness stabilisation measures, corrosion inhibitor and dispersing agents.

Only corrosion inhibitor and dispersing agents are usually used for the closed part. Biocides are required to a lesser extent.



SANOSIL
DISINFECTANTS FOR LIFE

SANOSIL AG • CH-8634 Hombrechtikon • Switzerland
E-mail: service@sanosil.com

www.sanosil.com



Biocidal treatment

Controlling germs and biofilms in **open, closed** and **hybrid** cooling circuits

Using disinfectant: Why?

In untreated cooling water, microorganisms (primarily in the form of biofilms/slimy coatings) settle within a very short time. This causes problems for the following reasons:

- Biofilms reduce the efficiency of heat exchangers. A 1-mm-thick layer of biofilms reduces the cooling capacity by 30%.
- Some types of bacteria cause corrosion through the formation of acid (similar to dental caries).
- Germs (such as mould spores, Pseudomonas or Legionella) may be released into the environment via aerosols and cause serious infections.

These problems can be prevented through proper treatment using biocides/disinfectants.

Sanosil disinfectant:

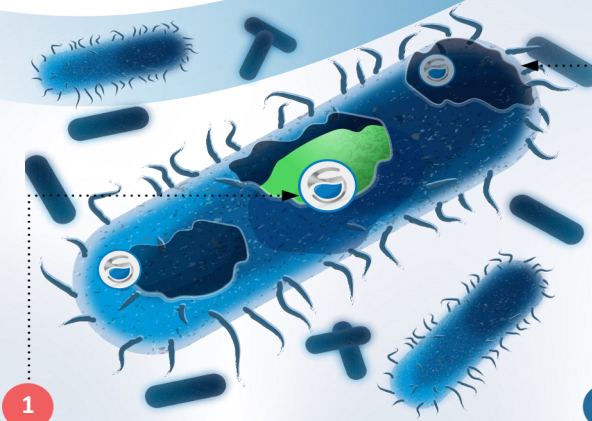
Hydrogen peroxide is used as the active ingredient. It is also stabilised and its disinfecting effect is catalytically enhanced several times over by adding a minimal amount of silver ions.

The disinfection effect increases by up to 800%

After application, hydrogen peroxide also completely decomposes into water and oxygen. The minimal amount

of silver remaining after the peroxide has broken down inhibits the multiplication of germs and has additional conservation effects in water systems.

The special properties of Sanosil disinfectants make them remarkably effective against biofilms and clearly superior to many other products used for this purpose.



The oxygen ($^1\text{O}_2/\text{O}_2$) released by the hydrogen peroxide attacks the cell walls of the microorganisms. Oxidation denatures and destroys them. **(1)** The effect is supported by silver ions, which enhance the effect of the peroxide in a catalytic process. They also block the germs' metabolism and ability to multiply. **(2)**



SANOSIL
DISINFECTANTS FOR LIFE 

SANOSIL AG • CH-8634 Hombrechtikon • Switzerland
E-mail: service@sanosil.com
www.sanosil.com



Sanosil biocides

Effective and environmentally friendly



...ideal for process-water and cooling-water treatment in open, closed and semi-open cooling systems.

- ✔ Effective water disinfection with a long-lasting effect
- ✔ Highly effective against biofilms, Legionella and biocorrosion
- ✔ Odourless and tasteless in treated water
- ✔ Very high yield – effective from 0.02 ml/l
- ✔ No chlorine/chlorine compounds or QAV, bromine or isothiazolinones
- ✔ Does not develop AOX / trihalomethanes
- ✔ With catalytically enhanced hydrogen peroxide
- ✔ The hydrogen peroxide completely (100%) decomposes into water and oxygen
- ✔ Shelf life of over 2 years
- ✔ High-quality product made in Switzerland



SANOSIL
DISINFECTANTS FOR LIFE 

SANOSIL AG • CH-8634 Hombrechtikon • Switzerland
E-mail: service@sanosil.com
www.sanosil.com



Sanosil biocidal products



Sanosil Super 25



Product type: highly concentrated water disinfectant for use in large drinking, service and cooling water systems (open and closed).

Contains: 50% hydrogen peroxide, 0.05% silver

Highly effective against: biofilms, Legionella, Pseudomonas, MIC (microbiologically induced corrosion)

Ideal pH range: <8

Transport class: hazardous material, UN 2014

Container sizes: 30 kg, 1,100 kg IBC

Shelf life: 2 years

Sanosil C



Product type: highly concentrated water disinfectant for use in large-scale cooling water systems (open and closed)

Contains: 50% hydrogen peroxide, 0.05% silver

Highly effective against: biofilms, Legionella, Pseudomonas, MIC (microbiologically induced corrosion)

Ideal pH range: <8

Transport class: hazardous material, UN 2014

Container sizes: 30 kg, 1,100 kg IBC

Shelf life: 2 years

Sanosil S015



Product type: concentrated water disinfectant for use

in smaller drinking, service and cooling water systems (open and closed)

Contains: 7.5% hydrogen peroxide, 0.0075% silver

Highly effective against: biofilms, Legionella, Pseudomonas, MIC (microbiologically induced corrosion)

Ideal pH range: <8

Transport class: non-hazardous material

Container sizes: 5 kg, 10 kg, 25 kg, 1,000 kg

Shelf life: 2 years



SANOSIL
DISINFECTANTS FOR LIFE

SANOSIL AG • CH-8634 Hombrechtikon • Switzerland
E-mail: service@sanosil.com
www.sanosil.com



Open cooling circuits

Corrosion inhibitor, hardness stabilisation and dispersion in evaporative coolers

Water conditioning in open systems:

The water used in open cooling systems evaporates. As a result, limescale, minerals and dirt remain in the circuit, where they become increasingly concentrated (**thickening**), unless they are flushed out of the system via a controlled water exchange (**desalination**).

Hardness stabilisers ensure that lime and minerals remain dissolved in the water and that no deposits or crusts form in the water-bearing system parts.



Cooling water is inherently corrosive to a greater or lesser extent. **Corrosion** slowly destroys the metal parts in the cooling system and eventually leads to their failure.

Corrosion inhibitors form a very thin protective layer surrounding metal materials and protect the surfaces.

Without proper treatment, contaminants floating in the water settle at deeper points in the circulation system, where they form **sludge deposits**. These not only impair the water flow, but also protect bacteria from biocides. These bacteria form aggressive acids and hydrogen sulphide, which in turn lead to pitting.

Dispersants ensure that suspended solids do not settle to form sludge layers. Instead, they remain suspended in the cooling water and can be washed off.



Corfit CT Protect product line:

The Sanosil CT Protect products for open evaporative coolers are largely based on environmentally compatible polyphosphonates and **combine all three necessary efficiency classes**.

In contrast to other "all-in-one" products, however, they do not contain biocides. These must be dosed separately according to the individual cooling-circuit requirements.

This means that cooling water can be treated in a much more targeted and specific way.

Only two products are still required for daily conditioning.



SANOSIL
DISINFECTANTS FOR LIFE 

SANOSIL AG • CH-8634 Hombrechtikon • Switzerland
E-mail: service@sanosil.com
www.sanosil.com



Products for open cooling circuits

Corrosion inhibitor, hardness stabilisation and dispersion for evaporative coolers

Sanosil CT-Protect (3-in-1) products:

Corfit CT Protect A



Product type: hardness stabiliser, corrosion inhibitor (for iron and steel materials) and dispersant

Contains: phosphonates, polyelectrolytes

Preferably used for: open circuits with no non-ferrous metal elements. Also suitable for very hard water and an increased concentration of solids

Can be used in the pH range: 6–10

Dosage: 50–100 ml/m³ in circulation = approx. 12–25 ml/m³ fresh water with a thickening factor of 4

Transport class: non-hazardous material, no transport restrictions

Container size: 25 kg

Corfit CT Protect B



Product type: corrosion inhibitor (for iron and steel materials, copper materials), hardness stabiliser and dispersant

Contains: organic corrosion inhibitors, phosphonates, polyelectrolytes

Preferably used for: open cooling circuits with a mixture of materials and increased corrosion protection requirements. Also suitable for very hard water and an increased concentration of solids

Can be used in the pH range: 6–10 (ideally 7–8)

Dosage: 100–150 ml/m³ in circulation = 25–38 ml/m³ of fresh water with a thickening factor of 4

Transport class: non-hazardous material, no transport restrictions

Container size: 20 kg



SANOSIL
DISINFECTANTS FOR LIFE 

SANOSIL AG • CH-8634 Hombrechtikon • Switzerland
E-mail: service@sanosil.com

www.sanosil.com



Closed cooling circuits

Corrosion inhibitor, dispersion and hardness stabilisation

Water conditioning in closed systems



The cooling water inside closed systems is not dynamically evaporated. It only serves to transfer heat. Softened water is generally used for this purpose. It does not produce any limescale or mineral deposits, but it is very **corrosive**. Conditioning agents for closed cooling circuits consequently put special demands on **corrosion inhibitors** for protection against corrosion.

Without proper treatment, contaminants floating in the water settle at deeper points in the circulation system, where they form **sludge deposits**. These not only impair the water flow, but also protect bacteria from biocides. These bacteria form aggressive acids and hydrogen sulphide, which in turn lead to pitting.

Dispersants ensure that suspended solids do not settle to form sludge layers. Instead, they remain suspended in the cooling water.



In contrast to open evaporative cooling systems, hardness stabilisation is typically not the most important requirement in closed systems. Filling systems with partially desalinated or untreated tap water (emergency cooling), for example, may however provide a valuable additional benefit.

Corfit CT Closed product line:

The Sanosil CT Closed products for closed circuits are based on molybdate. This is widely regarded as one of the best corrosion inhibitors. In new systems or those that have just been pickled, they form a continuous protective layer on all iron and steel materials over a few days. Non-ferrous metal inhibitors or aluminium protection agents are also added. Phosphonates also provide corrosion protection as well as any necessary hardness stabilisation measures in case of emergencies.

Polyelectrolytes serve as effective dispersants and counteract the formation of sludge deposits.

Since CT Closed products do not evaporate, they remain in the system. You only need to add them in case of leaks or when the water is replaced.



SANOSIL
DISINFECTANTS FOR LIFE 

SANOSIL AG • CH-8634 Hombrechtikon • Switzerland
E-mail: service@sanosil.com
www.sanosil.com



Closed cooling circuits

Corrosion inhibitor, hardness stabilisation and dispersion

Sanosil CT-Closed (3-in-1) products:

Corfit CT Closed Al



Product type: corrosion inhibitor (iron and steel materials, non-ferrous metals aluminium), hardness stabiliser and dispersant

Contains: molybdate, polyelectrolytes and neutralised phosphonates

Preferably used for: closed circuits with a mixture of materials made of steel, copper / non-ferrous metals and/or aluminium parts

Can be used in the pH range: 6–8.5

Dosage: 6–10 ml/l with fully demineralised water

Transport class: non-hazardous material

Container size: 20 kg

Corfit CT Closed Std



Product type: corrosion inhibitor (for iron and steel materials, copper / non-ferrous metals), hardness stabiliser and dispersant

Contains: molybdate, polyelectrolytes, phosphonocarboxylates and non-ferrous metal inhibitors

Preferably used for: closed circuits with a mixture of materials made of steel, copper / non-ferrous metals (without any aluminium parts)

Can be used in the pH range: 6–10

Dosage: 4–6 ml/l with fully demineralised water

Transport class: hazardous material, UN 1824

Container size: 20 kg



SANOSIL
DISINFECTANTS FOR LIFE 

SANOSIL AG • CH-8634 Hombrechtikon • Switzerland
E-mail: service@sanosil.com

www.sanosil.com



Auxiliary and additional products

For open and closed cooling circuits

Sanosil auxiliary products for treating cooling towers:

Corfit Initial



Product type: dispersant, booster for shock disinfections

Contains: non-ionic polymers

Preferably used for: for initial treatment and to support shock disinfection with Sanosil C / Sanosil S015 in case of severe biofilm growth

- Dissolves and mobilises biological deposits / biofilms
- Enhances the effect of biocides
- Disperses oil, sludge and clay in cooling water systems

Dosage: 100–500 g/m³ Transport class: non-hazardous material
Container size: 20 kg

Corfit CT Bright



Product type: powdered pickling and descaling agent with indicator dye and corrosion inhibitor. Dissolves limescale and rust deposits. The colour changes automatically when the effectiveness limit is reached

Contains: amidosulphonic acid, corrosion inhibitor, indicator dye

Preferably used for: calcified and/or systems with rust formation in the water-bearing parts

Dosage: 120–150 g/l (depending on the thickness of the lime deposits) 1 g of Corfit Bright dissolves 0.5 g of lime deposits

Transport class: hazardous material, UN 2967

Container size: 25 kg



SANOSIL
DISINFECTANTS FOR LIFE 

SANOSIL AG • CH-8634 Hombrechtikon • Switzerland
E-mail: service@sanosil.com

www.sanosil.com



Measuring and analysis equipment

For controlling the Sanosil biocide content in water

eXact I Dip



Product type: photometric measuring device for precisely determining the Sanosil biocide content in water

Preferably used for: for analysing the Sanosil content in water. (Additional analysis parameters, such as phosphate content, alkalinity and pH value, iron, etc. with separate reagents are available on request)

Measuring range: 2–4200 ppm

Sanostrips 200



Product type: test strips for quickly determining the approximate Sanosil content in cooling water (colour change)

Preferably used for: quickly determining the Sanosil content in water systems

Measuring range: 0–200 ppm



SANOSIL
DISINFECTANTS FOR LIFE 

SANOSIL AG • CH-8634 Hombrechtikon • Switzerland
E-mail: service@sanosil.com

www.sanosil.com



Germ control

Microbiological measurements in cooling water

Hygicult Inkubator



Product type: compact incubator for incubating Hygicult Culture media

Preferably used for: determining the bacterial count of aerobic mesophilic germs on surfaces and in water. (Together with suitable ready-mixed media, such as Hygicult TPC or Rodac Plates)

Legionella Field Test



Product type: rapid test for Legionella (antibody test)

- No expensive laboratory tests required
- Untrained personnel can use the device
- The result is known within approx. 30 minutes

Preferably used for: checking for Legionella (Legionella Pneumophila) in cooling water

Sensitivity > 1000 CFU



SANOSIL
DISINFECTANTS FOR LIFE 

SANOSIL AG • CH-8634 Hombrechtikon • Switzerland
E-mail: service@sanosil.com

www.sanosil.com





SANOSIL AG

CH-8634 Hombrechtikon, Switzerland

Tel.: +41 55 254 00 54

E-mail: service@sanosil.com

www.sanosil.com

