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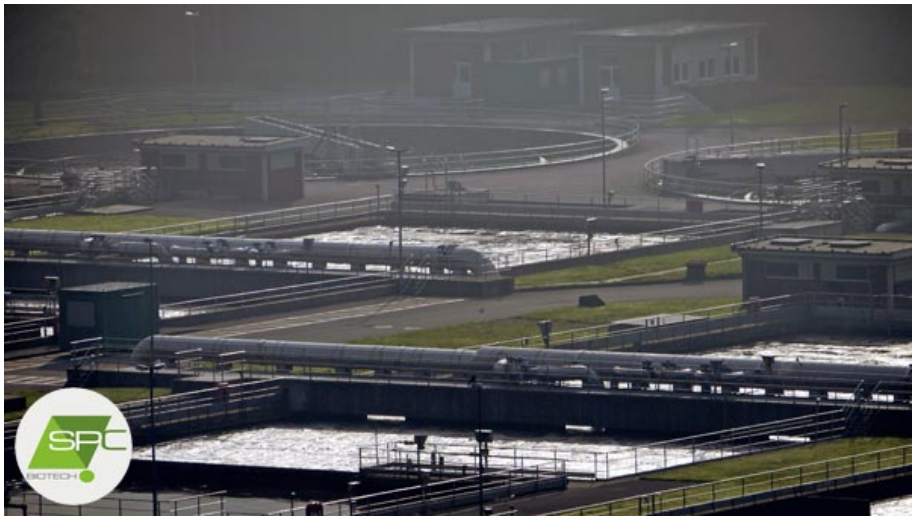
Technical Information: SPC crystallization inhibitor for water circuits



Chemical name : SPC crystallization inhibitor for water circuits

Additive blend for preventing salt accumulation

General informations :

In industrial water circuits, such as those found in cooling towers, steam boilers, or heat exchangers, water is used as a medium for heat transport. During this process, physical changes in the water inevitably occur. In cooling circuits, the evaporation of pure water leads to an increase in the concentration of salts dissolved in the water, a process known as concentration. In boiler systems, extreme temperatures and pressures cause the solubility limits of dissolved minerals to be exceeded.

Crystallization begins with nucleation, the formation of microscopic nuclei from a supersaturated solution. Once a critical nucleus radius is reached, crystal growth begins. Without chemical intervention, these crystals follow strict geometric lattice structures, leading to dense, hard, and thermally insulating deposits, known as "scale".

SPC crystallization inhibitor intervenes in this process through various mechanisms:

1. Threshold effect:
This is the most remarkable property of inhibitors such as phosphonates. Even in amounts far below the stoichiometric concentration (often only a few mg/L), they prevent precipitation by disrupting the formation of stable crystal nuclei.

2. Crystal distortion:
The inhibitor is incorporated into the growing crystal faces. This causes the crystals to lose their regular form and instead form amorphous, unstable structures that cannot adhere to surfaces.

3. Dispersion:
Polymeric additives give the resulting microparticles an electrical charge, causing them to repel each other and remain suspended instead of agglomerating and settling.

4. Sequestration:
The inhibitor forms soluble complexes with hardness-forming ions (calcium, magnesium) and thus keeps them in solution.

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Application :

Advantages:

Maximization of energy efficiency:
Mineral deposits have extremely low thermal conductivity. Even a layer of limescale as thin as 0.5 mm can increase the energy demand of a heat exchanger by about 10–15%. The goal is to maintain a constant heat transfer coefficient.

Extension of system service life:
Deposits promote what is known as under-deposit corrosion. Beneath the solid crusts, local galvanic cells form that can severely damage the metal (usually steel or copper). Inhibition therefore indirectly protects the integrity of the system.

Reduction of downtime:
Mechanical or chemical cleaning of scaled systems usually requires production shutdown. Effective inhibitors massively extend the intervals between maintenance cycles.

Water savings:
High-performance inhibitors can increase the concentration ratio. This means the water can remain in the circuit longer before it needs to be replaced with fresh water, reducing operating costs and the ecological footprint.

Legal compliance:
In Germany in particular, operators must meet the hygiene requirements of the 42nd German Federal Immission Control Ordinance (42. BImSchV). Clean systems without mineral deposits offer less surface area for biofilms and Legionella.

Application instructions:
Add SPC crystallization inhibitor for water circuits at approx. 150–200 ppm to the water circuit.

Hazard Informations :

Hazard statements:
The usual precautions for chemicals as well as the hazard and safety instructions on the product label must be observed.

Label :

GHS07

Version: 30.07.2026

This data is only for your information purposes and does not imply a guarantee for a certain application.

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