

FILTERSORB[®] SP3

COOLING WATER TREATMENT

THE GREEN TECHNOLOGY



BEST COOLING TECHNOLOGIES

"Best"

means most effective for the protection of health and environment

"Cooling"

techniques those developed on a **Scale Prevention** and coating materials applied to surface to form either a low friction surface to reduce scale and a very protective layer to reduce erosion, corrosion and any sort of biofouling.

"Technologies"

includes "Nucleation Assisted Crystallization" (NAC) technology in the way it is designed, installed, built, maintained, operated and commissioned . This is a green technology without using salt, magnets, electric or template devices.

NAC is a trademark of Watch[®] Water

| | | | |
|---------------|-----|----------------|--|
| 1. BCT | for | reduction of | Water requirements |
| 2. BCT | for | reduction of | Chemicals to water by optimized Cooling Water Treatment. |
| 3. BCT | to | reduce | Scaling through coating. |
| 4. BCT | to | reduce | the risk of corrosion and leakages. |
| 5. BCT | to | reduce | Biological growth |
| 6. BCT | to | reduce | Scale inhibitors Corrosion inhibitors Dispersants Oxidising biocides Non oxidising biocides |
| 7. BCT | for | increasing | overall energy efficiency |
| 8. BCT | is | replacement of | OUTDATED Ion-Exchange water softeners with MODERN FILTERSORB SP3 systems. |

Cost reduction Comparison

OUTDATED
Water Softeners

vs.

MODERN
SOFT-NO-R

**To see the cost comparison please visit our website www.watchwater.de*

Coating, Complexing and Corrosion Inhibitor includes dispersant

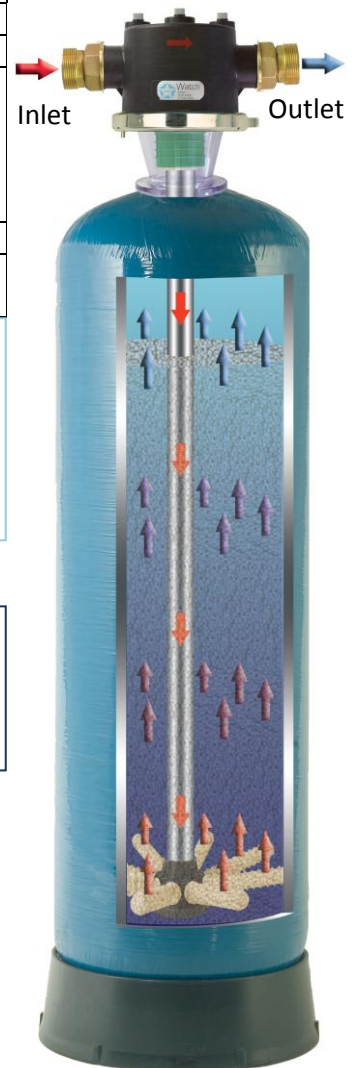
The cost of damages caused by scale and corrosion worldwide in Cooling towers and circulation pipes escalated to more than an annual 150 billion Euros (\$200Billion). Neither classic water softeners or chemicals can yield satisfying results.

Watch Water has developed a combination of **SP3 Technology** to treat temporary hardness in water and **I-SOFT[®]** to prevent sulfate and silica scaling. All corrosion problems are reduced to zero with a smooth coating of CaCO_3 crystal on any surface comes in contact with **SP3 water**. High Silica in water is preferred to make strong crystals for friction. Smooth surface coating will reject any scale as long as it is continuously formed. The formation of inorganic scale that is CaSO_4 and BaSO_4 , is a huge problem and can be now solved with a very small amount of **I-SOFT[®]** Polycarboxylete in combination with **SP3 water**. **I-SOFT[®]** will distort the rate of crystallization through surface adsorption thus blocking the active growth of CaCO_3 . **I-SOFT[®]** will also modify crystal morphology and density of nucleation.

I-SOFT[®] with its unique properties, it is may be the only dispersant which is effective as inhibitor for CaSO_4 and BaSO_4 scales. **I-SOFT[®]** disperse particles and their agglomeration forms larger adherent particles and it contains little complexing inorganic ions, which with its stoichiometrically highest **Threshold Inhibition** property stops scale growth on any metal surface - by integrating with the growth of scale crystals.

In this case with use of **FILTERSORB[®] SP3** the dosage is much lesser than any **ANTISCALANT** in the water treatment industry.

I-SOFT[®] anti-scalant dosing with the combination of water treated with **SP3 System**, needs only **50 mg/liter** of water to stabilize hundreds or thousands times as many of scale forming ions. **WATCH[®] WATER** offer **I-SOFT[®]** Concentrate that all our customer can adopt the dilution according to the problems with CaSO_4 and BaSO_4 .



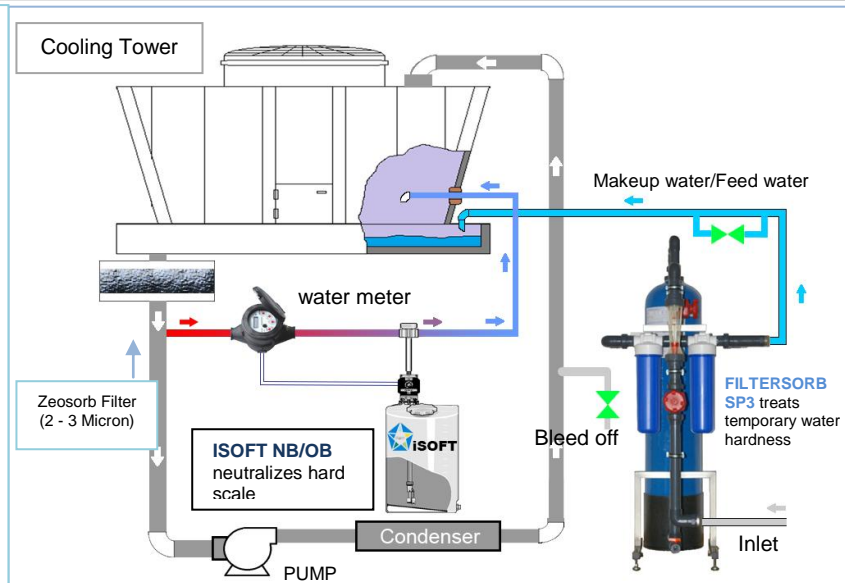
Scale Prevention System with **FILTERSORB SP3** Media inside.



I-SOFT[®] -Intelligent Softener

ADVANTAGES

- Cost Effective
- Less Chemical required
- Less hazardous chemicals
- Better control of bacteria
- Innovative Technology
- Only one injection pump
- Water can be reused for irrigation



Typical Cooling loop with complete Scale Prevention Solution

NO CHEMICALS RELEASED INTO ENVIRONMENT

Scale & Corrosion Control

Most of the Corrosion in Cooling Tower Systems or Boilers comes from

- Softened Water
- Phosponates
- High TDS

So by removing Water Softener and avoiding the use of softened water and using the SP3 water treatment systems and very little dosing of I-SOFT[®] in cooling tower and boiler water applications, corrosion and scale problem can be completely eliminated.

The calcium carbonate that coats the suspended particles in a state of saturation while it precipitates and will act as a very powerful CATHODIC-Corrosion Inhibitor. It will immediately slow down the corrosion process by blocking the reception of particles those are thrown off by the corrosion process. This corrosion process is physical, most effective and controlled.

CaCO₃ Crystals Prevent Scale Formation

The microscopic seed crystals formed by the FILTERSORB[®] SP3, flow with the water throughout the cooling system. As the seed crystals enter areas of heat exchangers or high pH where Calcium Carbonate (CaCO₃) would normally form scale, the precipitating CaCO₃ will attach itself to the existing seed crystals instead. In this way the seed crystals grow larger and have the tendency to settle in low flow regions such as cooling tower basin, where they can be removed by Zeosorb[®] filtration system.

Removal of Scale

When the bicarbonate is changed into the seed crystals of CaCO₃ by the FILTERSORB[®] SP3 System, the microscopic bubbles of Carbon dioxide (CO₂) gas are transported downstream along with the seed crystals of Calcium Carbonate. When the microscopic bubbles come in contact with existing scale and react with them to form the very soluble Calcium bicarbonate. CO₂ is so effective to destroy any bio film present and all hidden scale falls out of the fill in large pieces. In all the heat exchangers scale normally spreads by making use of cracks that are formed during the normal thermal cycling. As everybody knows that scale is not flexible, so it cracks when underlying metal expands or contracts due to heat. By providing fresh seed crystals that effectively stop the filling in the hot spots, the cracks increase in size and the scale will soon start coming off the tube surface as flakes. The FILTERSORB[®] SP3 formed seed crystals as mentioned will also tend to trap nearby bacteria incorporating them into the crystal mass. That bacteria that are thus entombed are effectively prevented from reproducing and are eliminated from cooling water system.

ZEOSORB® Side Stream Filtration

If the makeup water contains a high concentration of suspended matters, it is very important to do Filtration at recirculation systems. Between 10 to 20% of recirculation water is passed through **ZEOSORB® Filter** (Filtration < 2 microns) to control the fouling in the system. It is also very important to treat recirculation water as follows.

I-SOFT® Chemical Treatment

The continual addition of **100% Biodegradable** Antifouling **I-SOFT®** will minimize deposition within cooling water systems. **I-SOFT®** is a very low molecular weight organic Polycarboxylate which will prevent agglomeration of deposited particles which again will be removed by **ZEOSORB® Filter**.

Chemical dosages are expressed as mg/liter or ml/m³

Required I-SOFT® dosing: 50 mg/liter or 50 ml/m³

(Thus, one can treat 2000 m³ of water with only 100 liters of I-SOFT®)

Bacteria and Biofilm control

Very huge effect of **FILTERSORB® SP3** water treatment is that to reduce possible bacterial growth in cooling water applications. Seed crystals as very often mentioned in the literature, will trap microbial organisms by incorporating them into the crystal mass. As the seed crystals start to agglomerate or stick together and become heavy enough to settle down at the bottom of the tower sump, where they are removed by **ZEOSORB®** side stream filtration. As because of bacteria present in the water it cannot form a biofilm. If the bacteria population is reduced below the required quorum then the biofilm will not be able to sustain and will gradually be eliminated.

FILTERSORB® SP3 Systems have proven to be the most effective at controlling and eliminating biocides.

| Products recommended for complete Scale Prevention in Cooling Water Treatment | | | |
|--|---|------------------|--------------------------------|
| Products | Packaging | Order Nr. | Web link |
| SOFTNOR® | As per requirement. | | SOFTNOR |
| FILTERSORB® SP3 | Packed in 60 liters drum | | Filtersorb SP3 |
| ZEOSORB® | Packed in 30 liters bag | | Zeosorb |
| Contact Water Meter | Available from ¾" up to DN150 | | Water Meter |
| Dosing System | Available in 100 liters, 200 liters and 300 liters capacity | | Dosing System |
| I-SOFT® | Available in INSTANT powder form | | I-SOFT |

**Please visit our website www.watchwater.de for detailed information about each product.*



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FILTERSORB® SP3, The Non-Chemical Scale Prevention Media
BEST COOLING TECHNOLOGIES for Cooling Water Treatment