

# CHEMICAL TREATMENT OF WATER

## ECOSS STAINLESS STEEL EVAPORATIVE CONDENSER

Chemical treatment of water is of paramount importance to prevent the occurrence of various non-compliances, ensure the proper operation of the equipment and extend its service life. The water used in the equipment, whether from underground or surface sources will have a series of chemical components that will interfere with the operation and performance of the equipment, to a greater or lesser degree, depending on its origin. As a result, to ensure a safe operation of the equipment and good performance, it is inevitably necessary to carry out a chemical treatment of water and a strict monitoring of analytical and operational parameters of each unit.

In addition to the impurities present in the make-up water, there are impurities in the air that are transported into the systems, as well as there may be the formation of organic (microbiological) materials that will become contaminants of these systems. Thus, to avoid the occurrence of the three major possible problems (microbiological formation, formation of mineral scale and formation of corrosive processes) chemical treatment together with continuous monitoring of water quality is essential.

### **Benefits of chemical treatment:**

- Prevent scale formation;
- Prevent the formation of corrosive processes;
- Control microbiological development (algae, fungi and bacteria).

### **The consequences of lack of chemical treatment:**

- Loss of heat exchange efficiency;
- Higher power consumption;
- Coil obstruction;
- Increased maintenance cost;
- Clogging of spray nozzles, decreasing water distribution;
- Increased corrosive processes occurring under deposits (localized corrosion).

### Water control parameters

The table below shows us the maximum analytical parameters for safe operation:

| Parameter                                     | Practice  |
|---|-----------|
| Total alkalinity (mg CaCO <sub>3</sub> /L)    | 750,00    |
| Chloride (mg Cl-/L)                           | 250,00    |
| Conductivity (uS/cm)                          | 3000,00   |
| Hardness in calcium (mg CaCO <sub>3</sub> /L) | 500,00    |
| pH (25°C)                                     | 6,5 a 9,0 |
| Reactive silica (mg SiO <sub>2</sub> /L)      | 150,00    |
| Total Dissolved Solids (mg/L)                 | 1500,00   |
| Sulphates (mg SO <sub>4</sub> /L)             | 250,00    |

Note: it is necessary to adjust the above parameters to each scenario and observe the most restrictive parameter among these above to determine the maximum concentration/operation cycle of each equipment.

**pH:** Water with pH < 7.5 increases acid corrosion. Water with pH > 8.5 may cause precipitation of salts and impair the action of biocides.

**Total Alkalinity:** A high alkalinity makes the environment favorable for the formation and deposition of carbonates and bicarbonate silicates, which in the long run can cause insulating scale in the coil.

**Electrical Conductivity:** High conductivity values accelerate corrosive processes. As well as indicating the concentration of salts in the medium. Attention, the need to increase the frequency and/or flow of water bleed should be checked.

**Total Dissolved Solids:** High values indicate the need for concentration cycle control adjustment with water bleed flow adjustment.

**Total Hardness:** The main mineral scale forming agents in this equipment are calcium and magnesium (total hardness). The monitoring and control of the concentration of these ions in water is essential to avoid the formation of insulating scale on the coil.

**Chlorides:** One of the main forming agents of corrosive processes located in the equipment with stainless steel metallurgy are chlorides. High values indicate the need for concentration cycle control adjustment with water bleed flow adjustment.

**Silica:** One of the main forming agents of mineral scale is also silica in high concentration in the water of the equipment. The control is done to prevent the formation of silicates (too hard and thermal insulators).

**Sulfate:** High concentrations may favor the occurrence of mineral scale formation that can cause damage to the coil.

### **Products for Chemical Treatment of Water**

It is at the customer's discretion to choose the treatment program and the chemicals used in the treatment. However, it is essential to inform the chemical supplier about the building materials of the equipment so that products compatible with the metals are applied. The chemicals used in the chemical treatment of water must **NECESSARILY** be compatible with the materials used in the manufacture of the equipment. That is, they must be compatible with **STAINLESS STEEL**, **ALUMINUM** (fans) and **CARBON STEEL** (water pump volute), in this way, these products must not provide the release of halogens in the water: **CHLORINE**, **BROMINE** and **IODINE**.

The definition of the chemicals, as well as dosages and methods of chemical treatment must be specified by companies specializing in chemical treatment of industrial water. Incorrectly specified products and or treatment methods can damage components such as fan, water pump, valves, sheet metal, pipes, and even condemn equipment.

As a good dosing practice of chemical treatment, it is recommended to dose directly on the water replacement line near the pump suction for better homogenization.

It is recommended to strictly control the quantities of dosed chemicals and water quality through the analytical parameters periodically.

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## **Important!**

It is the responsibility of the customer to carry out the maintenance plan, adapting its operation and performing the chemical treatment of the water, to use a quality water.

For more information, refer to our technical department.