



## WATER TREATMENT FOR GLYCOL CIRCUITS

SOLUTIONS AND TECHNOLOGIES



The addition of ethylene or propylene glycol profoundly changes the behaviour of water, making it more aggressive towards metals, prone to forming sludge, and susceptible to colonization by microorganisms such as bacteria and moulds. These phenomena are favoured by the slow but inevitable decomposition of glycols, caused by their reaction with oxygen and the normal operating conditions to which the plants are subjected. The consequences of glycol decomposition include a reduction in the overall efficiency of the systems, the need for frequent and costly maintenance, a reduction in the useful life of the equipment installed in the circuit (recirculation pumps, valves, sensors, etc.) and, ultimately, a net reduction in heat exchange.



#### HOW TO PROTECT WATER-GLYCOL CIRCUITS? CHEMICAL CONDITIONING TECHNIQUES

Proper conditioning of glycol water circuits is achieved by:

• **Controlling pH**, maintained within narrow ranges depending on the metallurgy of the system.

• **Corrosion inhibition**, achieved by blending different inhibitors, chosen based on the main characteristics of the system, the type of glycol used and the quality of the water.

• **Dispersion of sludge**, prevents fouling and substantial deposits and allows, with appropriate plant interventions, control of the suspended solids value of the recirculated solution.

• **Control of microbial contamination**, to avoid biofilm formation, which is also responsible for the reduction of heat exchange on surfaces.

Usually, pH control, corrosion inhibition and sludge dispersion are carried out using a single conditioning additive, while for microbiological control, specific additives with biocidal action are used.



#### HOW TO SELECT THE CORRECT CHEMICAL CONDITIONERS

The selection of the most suitable product to condition a closed circuit with glycol water is made by our technician after a **careful examination of the system** in question. Some of our technologies are also suitable and certified for use in the food industry.

The most commonly applied biocide products are:

- DBNPA-based biocides in glycol solution
  ideal for plants with a low glycol concentration (< 10%).</li>
- Isothiazolinone-based biocides
  ideal for plants with medium glycol concentration.

Pragma Chimica's product line allows conditioning of all water circuits operating in the temperature range between - 35  $^{\circ}$ C and 95  $^{\circ}$ C.

# PRAGMA CHIMICA'S TECHNOLOGIES FOR THE REMEDIATION OF GLYCOL WATER CIRCUITS

There are two different cleaning methods for glycol water circuits to remove sludge and remediate the glycol solution, e.g. from biofilm.

• The first method involves **emptying the circuit** and washing it with a specific cleaning product solution with an alkaline pH to remove sludge, swage and biofilm adhered to the heat exchanger surfaces.

The second method is applicable in large-volume systems or systems that cannot be shut down (side stream cleaning) and enables the desired results to be achieved without affecting the operation of the systems. This is done through calibrated dosages of dispersants, alkalising/ dispersant mixtures and biocides. The remediation technique does not require plant downtime, partial or total circuit emptying, effluent disposal or significant circulating water changes.

### PRAGMA CHIMICA'S SOLUTIONS

Pragma Chimica's research and development department is at your complete disposal for the development of new technologies and procedures to safeguard and correctly manage circuits and machinery working with glycol solutions. We customize intervention according to specific needs, with a constant focus on the employed metallurgy.





**PRAGMA CHIMICA SRL** Via dell'Industria, 48/b - 36071 Arzignano (VI) Tel: +39 0444 451373 – 0444 450334 | Fax: +39 0444 452153

pragma@pragmachimica.it www.pragmachimica.it/en

