

## One of the most substantial cooling water research discovery in decades

ChemTreat's commitment to research and development has always been focused on delivering solutions that provide a significant advantage for our customers.






The **drive for innovation** is greater than ever as our customers look to navigate the requirements of a constantly changing landscape. New regulations and restrictions

pose challenges associated with the need to better protect our environment and conserve water.

Leading the requests of new customer initiatives is the need to **remove phosphate** from cooling water programs without sacrificing performance. Since the elimination of chromate, phosphate based corrosion inhibitors have been

predominate in the industry, yet everyone would agree that PO<sub>4</sub> based programs never delivered the same level of results. With our R&D team firmly committed to developing an alternative solution for our customers, **ChemTreat has completely solved the need for a phosphate-free corrosion inhibitor.**

Millions of pounds of FlexPro® CL have been utilized in the industry, confirming the program results exceed those of previous phosphate-based programs.

TARGETED IMPROVEMENT	CHEMTREAT ADVANTAGE	ANNUAL ECONOMIC IMPACT
Eliminate PO <sub>4</sub> in discharge with improved corrosion protection	 WATER	Permit requirements met and algae blooms eliminated
Reduce bacteria fouling and mineral deposition in cooling water system	 ENERGY	Cleaner system means improved heat transfer efficiency and less biocide demand
Decrease amount of sludge generation in cooling water system	 WASTE	Less bacteria fouling reduces cleaning and disposal costs
Improve algae control to lower air restrictions on cooling tower	 AIR	Cooling tower efficiency improvements while reducing drift/opacity concerns
Corrosion rate improvements to provide extension of outages and reduce heat exchanger replacement	 PRODUCTION	Lower iron and TSS discharge concentrations



## How FlexPro<sup>®</sup> CL works as a metal passivator:

- With FlexPro<sup>®</sup> CL, changes in water chemistry have less impact because the product acts directly on the metal surface.
- FlexPro<sup>®</sup> CL inhibitor can chemically bond to metal surfaces, forming a passive layer.
- Once surface is passivated, only a maintenance amount is required to maintain the passive film.
- It's very similar to how stainless steel works. Stainless steel has materials added, like chrome and molybdenum, that form passive layers as the steel is oxidized.
- Instead of adding inhibitor to internal metal (as with stainless steel), FlexPro<sup>®</sup> CL is added externally through bulk water.

## FlexPro<sup>®</sup> CL offers several key benefits:

- Forms a more persistent film, treating the surfaces rather than the bulk water
- Broad control band and tenacious film offers unprecedented protection during system upsets and excursions
- Reduces the potential for algae growth, providing cleaner systems with reduced biocide consumption
- Performs well in zero hardness or high hardness waters
- Effective on steel, copper, and aluminum metallurgies
- Impacted less by makeup water iron and/or aluminum carryover
- Lower aquatic effects and a more favorable EH&S profile than current phosphorus-based programs

## proper protection

without adding nutrients for bacteria/algae growth

### Laboratory Corrosion Study Results 30-Day Exposure @ 50°C (122°F)



Untreated: 60 mpy



FlexPro<sup>®</sup> CL Program: < 1 mpy

Analyte	Value
pH	7.33
Conductivity, $\mu\text{mho}$	197
"M"-Alk, as $\text{CaCO}_3$ , mg/L	30
Ca, as $\text{CaCO}_3$ , mg/L	28
Mg, as $\text{CaCO}_3$ , mg/L	10
Iron, as Fe, mg/L	<0.05
Copper, as Cu, mg/L	<0.05
Zinc, as Zn, mg/L	<0.05
Sodium, as Na, mg/L	45
Potassium, as K, mg/L	3.9
Chloride, as Cl, mg/L	38
Sulfate, as $\text{SO}_4$ , mg/L	15
Nitrate, as $\text{NO}_3$ , mg/L	<0.10
Silica, as $\text{SiO}_2$ , mg/L	5
LSI	-0.16
Larson Skold index	1.62

