Product Bulletin

ODYREF G 50

Blend of co-passivating agents

ODYREF G 50 is a blend of co-passivating agents used during the passivation of galvanized cooling towers. It is compatible with natural passivation and enhances penta-zinc hydroxycarbonate (PZHC) structural development.

ODYREF G 50 is made with **ODYLIFE**, the antiscalant 100% made from plants. It boosts the solubility limits of salts, denatures the crystal lattice from the time of germination and prevents suspended material being re-deposited.

The formation and stability of the PZHC layer depend critically on a narrow envelope of water quality parameters during the initial exposure period (typically the first 4 to 12 weeks). Depending on the parameter, manufacturer recommendations may vary. The values presented here reflect a combination of OEM guidance, laboratory research, and field observations. Any passivation strategy must be adapted to the equipment and the specific operating conditions.

PARAMETER	RECOMMENDED RANGE
pH	7.4 – 8.5
CONDUCTIVITY	250 – 2'400 µS/cm
M-ALKALINITY	100 – 500 ppm ($CaCO_3$)
TOTAL HARDNESS (TH)	> 50 ppm (Ca^{2+}/Mg^{2+})
DISSOLVED OXYGEN	Saturated (>6 ppm at 20 °C)
TEMPERATURE	< 60 °C (140 °F)
CHLORIDES / SULFATES	< 250 ppm

These parameters must be monitored and maintained in real time during the passivation phase. Any deviation, such as high pH from caustic leaks or insufficient buffering from low alkalinity, can result in non-adherent $Zn(OH)_2$ or amorphous carbonates, both precursors to white rust.

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To ensure the PZHC layer forms slowly and uniformly, the following must be strictly avoided:

CATEGORY	CRITICAL FACTORS TO AVOID	IMPACT ON PASSIVATION
CHEMICALS AND ADDITIVES	- Oxidizing biocides (e.g., chlorine, bromine, FRC > 0.5 ppm) - Corrosion inhibitors: phosphonates, phosphates, orthophosphates - Molybdates - Polymers with corrosion inhibition properties	Disrupts electrochemical equilibrium, promotes porous oxide films or alters natural layer structure
HYDRAULIC AND OPERATIONAL DESIGN	- Presence of copper upstream or in recirculation loop - No pre-commissioning passivation protocol	Promotes galvanic corrosion and accelerates zinc loss
WATER SYSTEM CONDITIONS	- Water stagnation - Deposits, especially at the bottom of the basin	Localized corrosion cells and heterogeneous layer formation
CONSTRUCTION PRACTICES	- Exposing the CT system to weather before commissioning (e.g., rain ingress, UV, airborne dust)	Surface contamination and premature corrosion before controlled passivation
MATERIAL INTEGRITY	- Poor or non-standard galvanized steel quality (e.g., insufficient zinc layer thickness)	Limits the base material's ability to form protective oxides
THERMAL CONDITIONS	- Temperatures > 60 °C (140 °F) during startup	Accelerates Zn^{2+} release → uncontrolled precipitation
WATER CHEMISTRY INSTABILITY	Cf. Table above	Either prevents layer formation or induces non-coherent precipitates

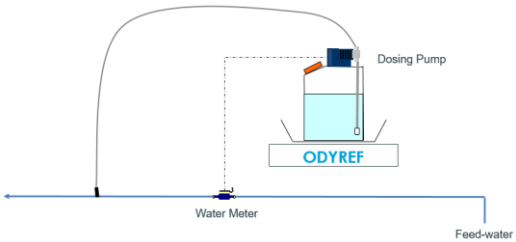
Note: The PZHC layer must not form too quickly to be protective, nor too slowly. The use of effective corrosion inhibitors during the layer formation phase should therefore be avoided.

BENEFITS

- Phosphorus free
- Enhances penta-zinc hydroxycarbonate (PZHC) structural development
- Compatible with most oxidizing and non-oxidizing biocides
- Competitive pricing and low doses
- Easy-to-use, thanks to the field kit
- Biodegradable with low toxicity

SINGLE POINT OF INJECTION INTO THE MAKEUP WATER

We recommend injecting the product into the makeup water pipes, after the pre-treatment.



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GETTING STARTED WITH THE TREATMENT

- Adjust to the material balance:
  - ✓ 90 - 100 / N ppm
- With the kit: check the residuals
  - ✓ ODYLIFE residual: > 10 ppm

PHYSICAL PROPERTIES

Appearance	Liquid
Color	Brown
Odor	Amine
pH	7

STORAGE & HANDLING

When pure, the product is acidic. Take precautions when handling the chemicals (gloves, goggles, etc.), as described in the Safety Data Sheet (SDS).
The product must be stored in a ventilated place at a moderate temperature (40°F – 105°F) and protected from frost.

Do not mix this product with other chemicals without checking with ODYSSEE Environnement first.

PACKAGING

ODYREF G 50 is a liquid product sold in a variety of packaging options.

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