

AcquaCore® Series

Low Carbon, Multifunctional Corrosion Inhibitors for Azole Reduction

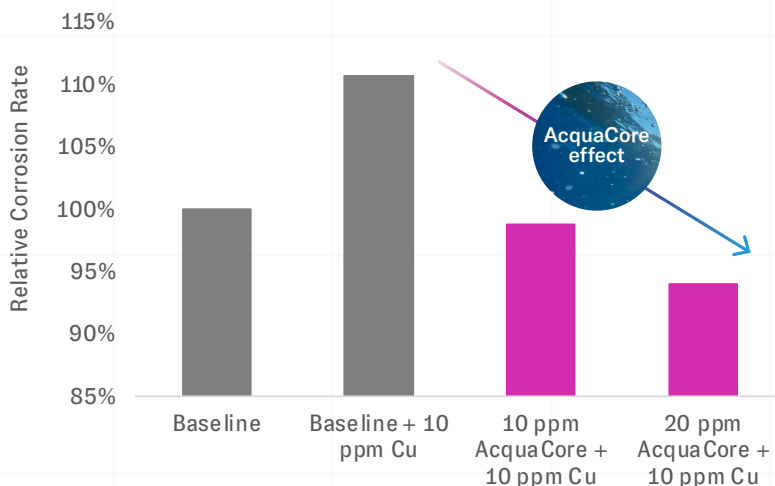
The Challenge

IWT companies have a growing interest for more sustainable, lower-cost alternatives to Azoles, such as TTA and BZT, with improved performance. Azoles are widely used in cooling towers to help mitigate copper and yellow metal alloys corrosion but are expensive, mostly imported from China, produced from known carcinogens, and often suffer from formulation difficulty and performance degradation due to system stresses, resulting in higher treatment costs, compromised performance, asset integrity, and increased effluent toxicity.

The Solution – AcquaCore®

- High selectivity for forming soluble complexes with Fe^{3+} and Cu^{2+} to eliminate interference with actives
- Wide pH range compatibility
- Lowers azole use and related treatment costs
- Improves protection against copper and yellow metal alloys corrosion
- Enables higher water cycles with reduced azole consumption
- Sustainable US supply via carbon-negative chemienzymatic process
- Non-toxic, biodegradable, N- & S-free
- Lowers safety risks associated with high levels of azole use, such as discharge water toxicity
- Resistant to rather than reactive with oxidizers
- Multifunctional scale inhibitor and biocide potentiator

Reduce Azole Use & Boost Performance with AcquaCore-Based Treatment



Impact of AcquaCore on copper corrosion in Cu^{2+} contaminated water.

The AcquaCore-based treatment is a proven solution to mitigating corrosion in the presence of copper, further enabling a reduction in azole demand while improving performance.



Case Study: AcquaCore® Enables >60% Azole Reduction and 15-20% Raw Material Cost Savings while Improving Performance and Sustainability Profile

The Challenge

-World-renowned University & Medical Center achieving marginal performance using 4 ppm Azole blend to treat excess yellow metal corrosion and soluble copper

-Coupled with increasing treatment costs, volatility of imported azoles, and potential increase in aquatic toxicity of discharge water, water treatment service company seeks more effective, sustainable solution

The Field Trial

Adjunct drum of AcquaCore used in place of adjunct drum of Azoles while closely monitoring corrosion rates in the cooling tower system.

Table 1. Cycled Conditions	
Cu ²⁺	1.4 ppm
Ca	250 – 300 ppm CaCO ₃
Ortho-PO ₄	8 – 10 ppm
Conductivity	1500 uS/cm
COC	4
pH	8.2 – 8.5
Biocide	ClO ₂

The Outcome

- 15-20% raw material cost savings
- >60% azole reduction
- Avoided sewer water discharge costs
- Corrosion rates below maximum targets
- Formulation ease/flexibility with AcquaCore
- Improved sustainability profile

About Solugen

Solugen is a bio-based specialty chemicals manufacturer and supplier whose mission is to decarbonize the chemical industry by revolutionizing the way chemicals are made for use across a variety of markets and applications.

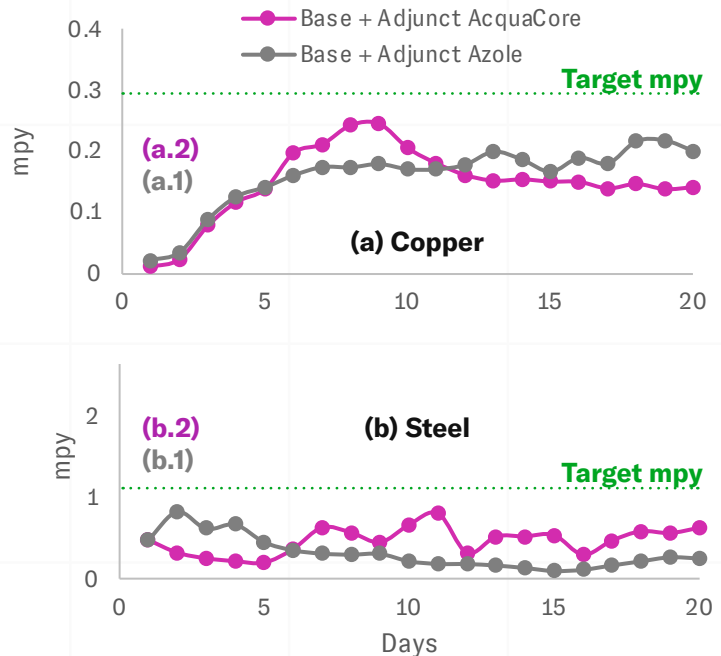


Figure 1. Corrosion rates after 20-day field trial with (a.1) Cu - base* + 8 ppm azoles, (a.2) Cu - base + 10 ppm AcquaCore, (b.1) steel - base + 8 ppm azoles, (b.2) steel - base + 10 ppm AcquaCore

*Base "all organic" formulation = PBTC + Polymer + PTSA + 4 ppm Azole blend (TTA+BZT+Specialty)