

BIOTEST RESULTS

ADERCO'S IMPACT ON METAL CORROSION

This document presents the outcomes of an investigation into the corrosion inhibitor of the Aderco active molecule, conducted by a reputable independent laboratory.

It is important to note that the Aderco technology uses a surfactant as the active molecule, at a high concentration*.

The objective of the conducted test was to showcase the efficiency of the Aderco molecule in mitigating metallic corrosion, representing the metal used to assemble a fuel system. The steel rods, of the ASTM A108 grade, were tested after following a strict experimental protocol of aging to accelerate the corrosion phenomenon.

The Results

Following the aging process, the laboratory obtained the following results:

Sample	Aged Biofuel	
Biofuel (B100) with 2.5% water	Untreated	Rust & white/yellow layer
	18 ppm	White/yellow layer
	25 ppm	White/yellow layer
	36 ppm	White/yellow layer
	72 ppm	No deposited material or rust

Sample	Aged Biofuel	
Biofuel (B100) with 5% water	Untreated	Rust & white/yellow layer
	18 ppm	White/yellow layer
	25 ppm	White/yellow layer
	36 ppm	White/yellow layer
	72 ppm	White layer

The following image illustrates the various metallic rods used in the test, each subjected to different concentrations of the Aderco additive:



Discussions and conclusions:

The test results unequivocally demonstrate the efficacy of the **Aderco** active molecule in preventing corrosion of the steel rods immersed in aged biofuel mixed with water.

As a surfactant, the **Aderco** active molecule forms a protective layer on all surfaces, acting as a barrier that prevents the acidic compounds present in the fuel from coming into contact with the metallic components. This barrier effectively inhibits the formation of rust, as indicated by the absence of deposited material or rust in the highest concentration (72 ppm) scenario. This can be seen in the representation below:

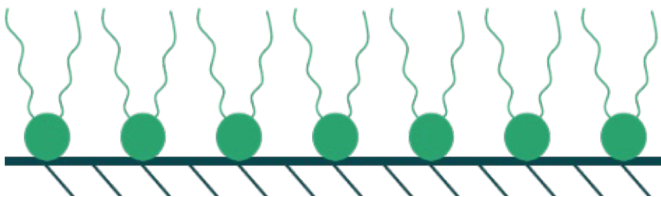


Figure 1 : The Aderco Molecule with a Polar Head and Non-Polar Tails

The observed layer on the rods can be attributed to the deposition of acidic molecules onto the **Aderco** molecule layer. These acidic compounds may originate from the fuel itself, commonly known as free fatty acids, or result from a partial oxidation of the fuel that may have occurred prior to the addition of **Aderco**.

Furthermore, it is crucial to note that the steel grade chosen for this test closely mirrors those used in ship construction, particularly in the creation of storage tanks. This similarity implies that the behaviour observed for both metals in the test is representative and comparable to real-world scenarios in shipbuilding and related industries.

In conclusion, the **Aderco** technology, with its surfactant-based active molecule, demonstrates a remarkable ability to protect against corrosion, providing a valuable solution for preserving the integrity of metal components within fuel systems, especially in challenging environments.

*The **Aderco** molecule is the primary component in all our products, present at different concentrations, except for the LI050, which serves as a lubricity improver.



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