Airable
RESEARCH LAB
WHERE SUSTAINABLE SOLUTIONS START

Non-Phosphorus Soy-Based Scale Inhibitor

Airable Research Lab, in partnership with LFS Chemistry, has developed a non-phosphorous alternative to its soy-based scale-inhibiting additive. The water treatment industry requires scale inhibitors to prevent the buildup of calcium scale in water systems. As it passes through the ground, water picks up insoluble minerals. These minerals precipitate, resulting in a cement-like mineral coating, known as scale. Over time, these deposits grow and harden, preventing fluid from flowing through pipelines, valves, pumps, and other machinery. Leaving scale buildup unaddressed can permanently damage equipment.

The scale inhibition industry has been historically dominated by phosphorous-based chemistries. Currently, overexploitation of phosphorous—along with a pandemic, geopolitical disputes, trade wars, and escalating fuel prices—has limited access to the element and driven up prices. In addition, phosphorus in our waterways lead to eutrophication, a serious form of water pollution. Airable's renewable, phosphorous-free solution conserves and preserves our natural resources.

TECHNOLOGY DEVELOPMENT

LFS focuses on oil and gas (O&G) operations for the future green economy, providing additives that reflect environmental, social, and corporate governance. LFS engaged Airable in 2022 to develop a bio-based scale inhibitor, then reached out again in 2023 for a non-phosphorous upgrade. Both static and dynamic scale tests were used to evaluate the new formulation, confirming that it significantly delays scale formation.

Airable has transferred both technologies to LFS, which is using its combined executive leadership experience of over 50 years in O&G experience to commercialize this technology.

Furthermore, Airable has begun evaluating the product's application in other water treatment industries. Preliminary tests suggest the formulation can help dissolve scale after it forms.

HIGHLIGHTS

- Highly miscible with water
- Scale inhibition efficiency of up to 90%
- Bio-based, with 80%–90% renewable bio-based carbon
- Non-phosphorus
- Cost-competitive with commercial scale inhibitors
- Domestic feedstocks
- Potential applications in multiple water treatment industries

Airable Research Lab is funded by multiple soybean states:

OHIO SOYBEAN COUNCIL · IOWA SOYBEAN Association · ILLINOIS SOYBEAN ASSOCIATION · MISSOURI SOYBEANS · Kentucky Soybean Board · MICHIGAN SOYBEAN COMMITTEE

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