

LamFlo+CI™

Technical Document

LamFlo+CI™ represents the latest breakthrough for Ideal Energy Solutions LLC in the oil and gas industry. This innovative product surpasses traditional solvent additives such as xylene, diesel, or other conventional surfactants by combining the benefits of LamFlo® with a corrosion inhibitor.

LamFlo+CI™ is not subject to DOT regulations, has a low odor, and only requires hand and eye protection, ensuring a safer handling experience. LamFlo+CI™ has been specifically engineered to offer corrosion protection in both acidic and neutral brine and is especially effective for wells utilizing carbon dioxide flooding. Its advanced formulation disperses thoroughly through oil and brine, ensuring comprehensive protection.

How Does LamFlo+CI™ Work?

The LamFlo® component retains its core functionality, effectively reducing viscosity and suppressing pour point. LamFlo® achieves this by targeting the “asphaltene complex” – a highly complex and still somewhat theoretical structure primarily composed of aromatic rings containing sulfur, nitrogen, and alkyl side chains up to C₃₀. Unlike conventional solvents such as xylene and diesel, which merely move around these chains in the asphaltene structure without breaking them apart, LamFlo® actively disassembles and unwinds these chains, resulting in a small physical modification of the asphaltene complex, with minor reductions in viscosity. This process transforms them into effective suspending agents for larger n-paraffin waxes, leading to a significant reduction in the physical properties of crude oil and maintaining it in laminar flow.

An oil-based corrosion additive package has been added to LamFlo® to create LamFlo+CI™, combining two different products which our competitors sell separately. This formulation is designed to follow the water stream, which is crucial for several reasons. Firstly, to ensure consistent protection, inhibitors must be uniformly distributed throughout the water. If the inhibitor fails to follow the water stream, it may not reach all the areas where corrosion can occur, leading to uneven protection and potential damage. Secondly, the inhibitor needs to interact with metal surfaces in the water stream to form a protective layer. If it is not properly located, its effectiveness in preventing corrosion is reduced. Thirdly, corrosion occurs when water contacts metal surfaces. By following the water stream, LamFlo+CI™ continuously shields these surfaces from corrosive elements like oxygen, acids, and salts. Finally, ensuring the inhibitor follows the water stream optimizes its use, prevents overuse, and minimizes waste. This approach leads to more cost-effective corrosion management and extends the life of both the inhibitor and the equipment.

Testing of LamFlo+CI™ was conducted on blank iron bar stock to simulate the conditions of black iron pipe in the field. The tests used a 50:50 mixture of 32 API gravity oil and 8% salt water. The jars were shaken twice daily for one minute in order to represent movement associated with oil flow. The panels remained submerged for 72 hours. The results were as follows:

- At 300 ppm: 1.7115 mpy
- At 500 ppm: 0.20539 mpy
- At 700 ppm: 0.0758 mpy

To simulate an acidic environment, additional testing was performed with 1N HCl, yielding the following results:

- At 300 ppm: 2.27395 mpy
- At 500 ppm: 1.4690 mpy
- At 700 ppm: 1.13697 mpy

The recommended dosage rate for LamFlo+CI™ is between 300 and 700 ppm for most applications, which is considerably lower than the typical dosage rates of 1,000 to 1,200 ppm for other corrosion inhibitors.

Advantages

- Reduces the viscosity of heavy oils containing a large asphaltene content.
- Lowers the pour point of heavy oils.
- Reduces shipping costs as it is non-DOT regulated.
- Lowers costs – typical use concentrations vary between 300 to 700 ppm.
- Serves as a 2-in-1 viscosity reduction agent and corrosion inhibitor.

Packaging

Available in drums, totes, or tank trucks. Manufactured in Lafayette, Louisiana.