

Nexus Acid Enhancer

Nexus Acid Enhancer is an environmentally friendly single phase Hydrochloric Acid retarder that improves wormhole penetration and reservoir contact during acid fracturing and matrix acidisation.

Calcite reservoirs represent a significant portion of hydrocarbon resources in subterranean formations. Most acid-based stimulation treatments for carbonate and sandstone reservoirs, particularly under high temperature encounter a fundamental problem, i.e. the etching rates are so fast that the treatment fluid is fully spent before it can penetrate deeper into the formation, resulting in an ineffective matrix treatment. Nexus Acid Enhancer modulates the critical etching rate of Hydrochloric Acid so that it can penetrate deeper into the formation, generate a more extensive and robust wormhole network and foster higher production.

Nexus Acid Enhancer is a single phase solution combining a modulator to control the dissolution rate of the carbonate and a suspension aid to prevent fall out of the reaction products. Nexus is particularly effective in carbonate reservoirs at high temperatures and long intervals where placement can be challenging with acid only. Because Nexus adds no viscosity to the system, there are no adverse effects on pumping pressure and the single phase nature of the additive means that it can be added on the fly or batch mixed. Nexus is compatible with commonly used additives including corrosion inhibitor and has the added benefit of scavenging H₂S. Nexus Acid Enhancer is effective at exceptionally low concentration making it operationally easy and cost effective.

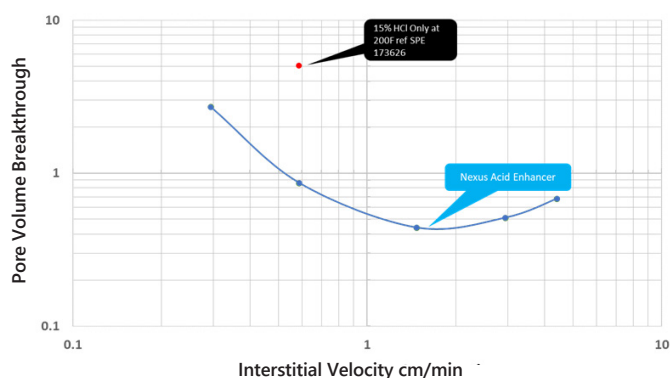


Fig 1. Optimal Acidising Performance Profile

Features

- Single phase aqueous additive
- Generates dominant wormhole with low pore volume to breakthrough
- Effective at low concentration
- No viscosity
- Sustainably sourced and environmentally friendly
- Thermally stable
- Reduces corrosion of Hydrochloric Acid

Benefits

- Easy handling and well site delivery
- Reliable wormhole formation leading to deeper penetration and skin reduction whilst maintaining rock strength
- Cost effective
- No adverse effects on pumping pressure
- Minimal impact to environment
- Suitable for high temperature applications
- Less corrosion inhibitor required

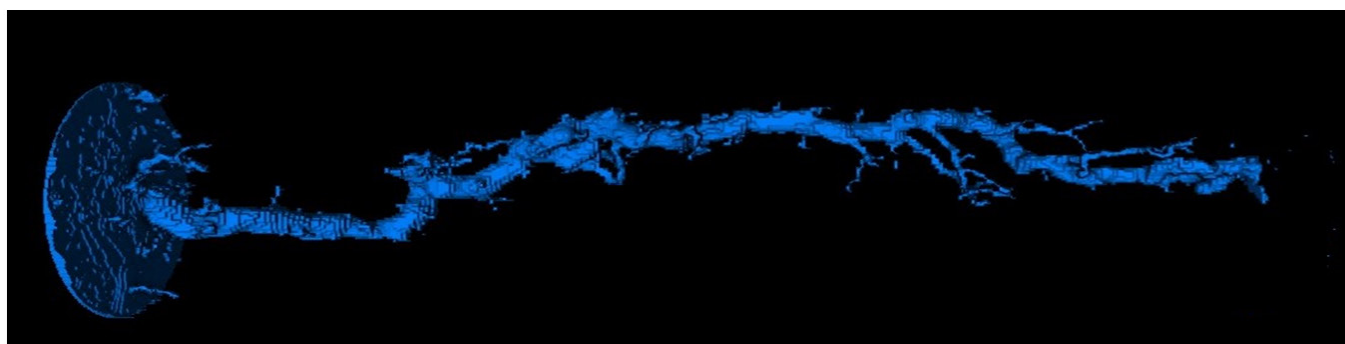


Fig 2. CT Scan showing dominant wormhole generation at high temperature

Performance Comparison

| Characteristic / Acid Type | HCl | Emulsified Acid | Organic/Specialty Acid | Nexus Acid Enhancer |
|----------------------------|-----|-----------------|------------------------|---------------------|
| Live Acid Penetration | ● | ● | ● | ● |
| Dominant Wormhole | ● | ● | ● | ● |
| Rate Dependence | ● | ● | ● | ● |
| HT Reaction Rate | ● | ● | ● | ● |
| Friction Pressure | ● | ● | ● | ● |
| Environmentally Friendly | ● | ● | ● | ● |
| Sustainable | ● | ● | ● | ● |
| Ease of Handling | ● | ● | ● | ● |
| H ₂ S Control | ● | ● | ● | ● |
| Cost | ● | ● | ● | ● |