

OneSTEP EF efficient, low-risk sandstone stimulation solution

A single-step, low-volume treatment that improves production in damaged sandstone formations



Temperature:
130 to 350 degF[†]
[54 to 177 degC]

Where it is used

- Oil and gas wells (both producers and injectors)
- Simple to complex multilayer sandstone formations with high precipitation risk
- Simple to complex completion configurations

How it improves wells

- Removes damage caused by drilling fluids, clays, carbonates, and other aluminosilicates
- Increases production with minimal damage risk
- Achieves more uniform stimulation across long zones with less risk of disintegrating rock
- Reduces wellsite operating time and improves flowback efficiency through lower-volume, high-performance operations
- Lowers associated emissions

Features

- Uses a proprietary blend of acids and other additives in a single-step formulation
- Requires no acid preflush
- Retains precipitate-susceptible ions in solution to minimize damaging precipitation risks
- Works well with acid-sensitive clays
- Adapts reliably to complex, unknown mineralogies, with a high tolerance for calcium
- Suitable for bullheading or coiled tubing applications

What it replaces

Conventional stimulation treatments such as mud acid with acid preflush—at high or low temperatures

A breakthrough in sandstone acidizing

OneSTEP EF* efficient, low-risk sandstone stimulation solution improves well production performance by restoring initial permeability lost as a result of formation damage. The service uses a proprietary blend of acids and additives to deliver a robust, low-risk, high-production performance solution for restoring production in impaired sandstone reservoirs.

Simple, low-risk deployment

OneSTEP EF solution is a single-stage, low-volume, easily deployed solution that minimizes the risk of further damage from precipitation. It combines lower corrosion, low precipitation, and low fluid incompatibility risk with the ease of full reservoir coverage. The solution can be bullheaded or pumped conveniently through coiled tubing while providing a cost-effective, low-resource footprint operation.

Optimized stimulation performance

OneSTEP EF solution optimizes stimulation performance within the constraints of volume capacities and location footprint. Lower volumes become even more attractive in gas wells where minimal volume flowback supports production-lifting efficiency. The service delivers more reliable production performance that improves recovery and increases the life of your maturing assets.

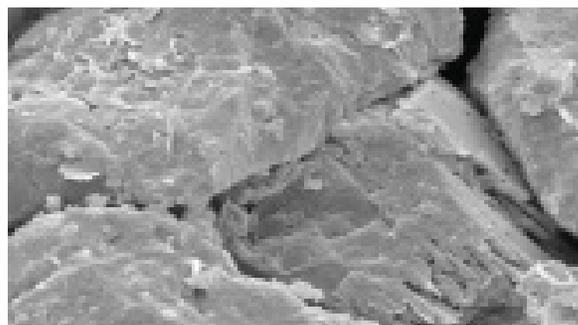
Lower environmental footprint

OneSTEP EF solution delivers higher performance per unit fluid volume when compared with traditional sandstone acidizing fluids. Reduced fluid consumption, handling, and operating time all result in lower associated emissions.

Formation damage

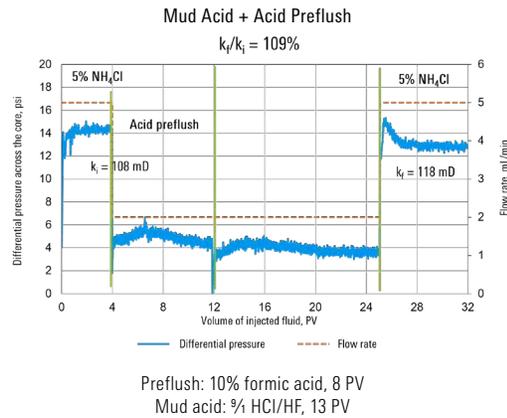
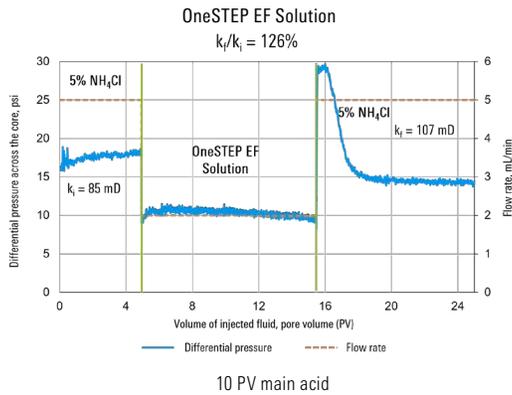


Effective damage removal



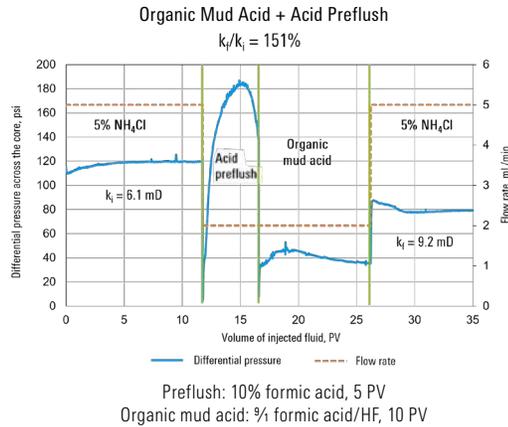
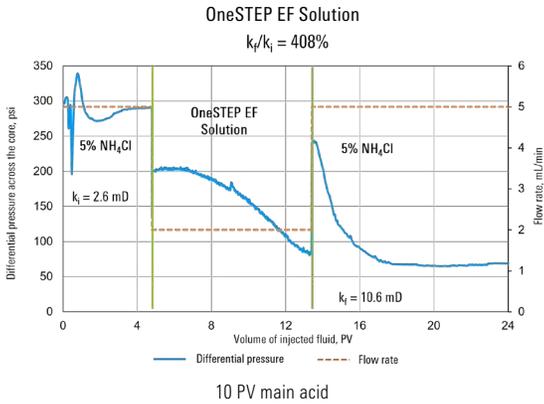
This comparison shows restoration of formation permeability from damage caused by clay swelling and fines migration.

Fluid Performance at Low Temperature



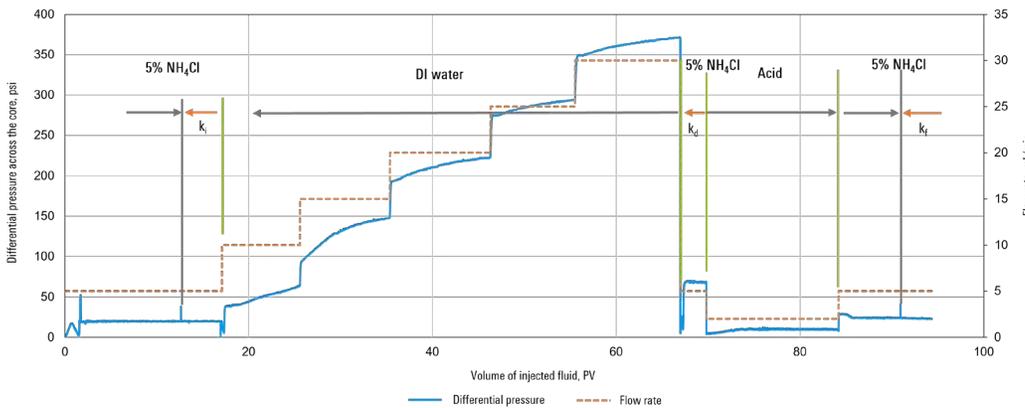
This comparison shows fluid performance at low temperatures when using OneSTEP EF solution without acid preflush versus a mud acid treatment with acid preflush at these conditions: Berea Gray core, 160 degF, 500-psi backpressure, 2,000-psi confining pressure. The results show that half the volume of the OneSTEP EF solution provided better stimulation than the total volume of the mud acid treatment.

Fluid Performance at High Temperature



This chart shows fluid performance at high temperature when using OneSTEP EF solution without acid preflush versus an organic mud acid treatment with acid preflush at these conditions: Berea Gray core, 300 degF, 500-psi backpressure, 2,000-psi confining pressure. The results show lower volume of OneSTEP EF solution provided better stimulation compared with total volume needed for the organic mud acid treatment.

Performance on Damage Removal



$$\frac{k_d}{k_i} = 29\%$$

$$\frac{k_f}{k_d} = 294\%$$

$$\frac{k_f}{k_i} = 86\%$$

This chart shows stimulation performance improvements after OneSTEP EF solution without acid preflush removes the damage caused by clay swelling and fines migration at these conditions: Berea Gray core, 160 degF, 10 PV main acid, 500-psi backpressure, 2,000-psi confining pressure. The results show permeability restoration close to the initial undamaged core state.