EnerCLEAR

BRINE DRILLING FLUID

AES DRILLING FLUIDS

DESCRIPTION

EnerCLEAR is a brine drilling fluid system designed to maximize rate of penetration and extend bit life while inhibiting corrosion associated with brine systems.

EnerCLEAR has proven effective in challenging tight or hard formations where traditional invert emulsion systems struggle. It has achieved impressive results, increasing drilling rates by over 60% and reducing rig release dates by almost 40%.

One of the key features of EnerCLEAR is its patented inhibitor package, which works well with a wide range of brines, including calcium brines. While most EnerCLEAR systems use calcium chloride or calcium ammonium nitrate, there are also options available for sodium chloride and other types of brines.

To combat corrosion, the EnerCLEAR system employs a dual approach. The additive ENERHIB C† creates a protective layer, while ENERSCAV C† helps scavenge oxygen. These additives are specifically designed for use in calcium brines, where conventional additives often fall short. In laboratory tests, untreated calcium chloride brine with a density of 10.4 lbm/gal had a corrosion rate of almost 100 mpy, whereas the same brine treated with ENERHIB C† and ENERSCAV C† showed a corrosion rate of only 2 mpy.

The EnerCLEAR system also includes supplemental flocculant additives that effectively remove fine solids from the drilling fluid. When combined with optimized solids control setup recommendations, this reduces the need for dilution, resulting in lower chemical consumption and less waste brine.

A corrosion test was performed comparing 10.4 lbm/gal calcium chloride brine with and without the EnerCLEAR corrosion package at a pH of 11. The untreated sample had an equivalent corrosion rate of nearly 100 mpy while the treated sample was less than 2 mpy.

DESCRIPTION
ENERCLEAR

Brine drilling fluid with patented corrosion inhibitor package

Compatible with numerous brines, including calcium based brines

BENEFITS
ENERCLEAR

Superior corrosion control

Exceeds invert emulsion rates of penetration in low activity shales

Minimizes waste through flocculating additives designed to maximize solids separation

APPLICATIONS
ENERCLEAR

Tight/hard formations where invert emulsions fail to perform

Drilling applications where a brine drilling fluid is desired

APPLICATION

EnerCLEAR is a suitable choice for tight or hard formations where invert emulsion systems struggle or in any situation where a brine system is preferred. It achieves a density of 11.6 lbm/gal in calcium chloride brine and 13.4 lbm/gal in calcium ammonium nitrate. The compatibility with calcium brines is advantageous in terms of inhibition and cost efficiency, particularly at higher densities. The additives in EnerCLEAR remain stable even at temperatures exceeding 250°F. Conducting laboratory tests will help determine the appropriate concentrations for challenging well conditions.

In this example, a sample with solids (left) is treated with EnerCLEAR 1102 and the solids flocculate and settle (right). This aids the removal of fine solids that typically remain with conventional solids control equipment alone.

EnerCLEAR is suitable for both vertical and horizontal wells. To ensure effective hole cleaning, turbulence is utilized to transport cuttings. Additional sweeps may be employed to assess or enhance hole cleaning as needed. When necessary, specific lubricants approved for use with EnerCLEAR can be used to reduce torque and drag.

Close collaboration with the directional drilling company is crucial in identifying suitable materials for high chloride brine applications. Corrosion control is achieved by maintaining sufficient amounts of ENERHIB C† and ENERSCAV C† in the system and following proper corrosion control practices, such as maintaining an elevated pH and minimizing the presence of oxygen.

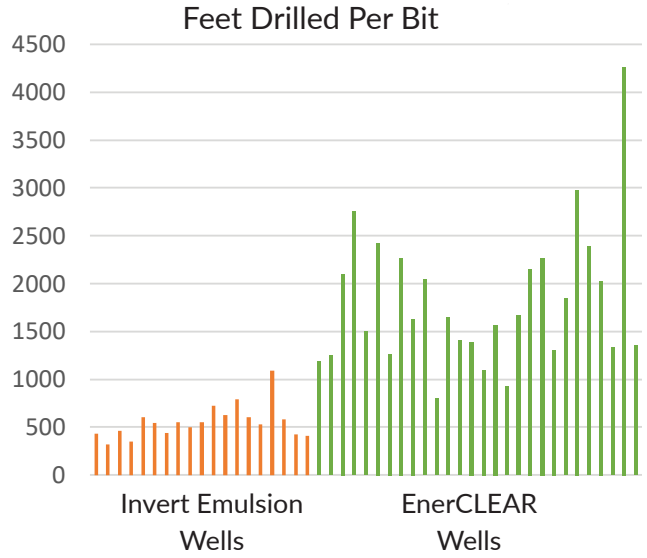
PERFORMANCE

In the Montney shale, invert emulsion systems were commonly used but faced issues of slow drilling and short bit life. This resulted in higher costs and longer drilling times for vertical and horizontal intervals. However, the introduction of EnerCLEAR brought significant improvements. Rates of penetration tripled, reducing drilling times to less than 30 days compared to the previous 40-65 days with invert emulsions. As a result, average drilling fluid expenses were nearly halved.

CASE HISTORY RESULTS

3x Instantaneous ROP
> 25% Longer Bit Life

38% Fewer Days to Rig Release
50% Lower Fluid Cost



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