EnerCLEAR

BRINE DRILLING FLUID

NEXT GENERATION

AES DRILLING FLUIDS

AES DRILLING FLUIDS

DESCRIPTION

- Brine drilling fluid with patented corrosion inhibitor package
- Compatible with numerous brines, including calcium based brines

BENEFITS

- Superior corrosion control
- Exceeds invert emulsion rates of penetration in low activity shales
- Minimizes waste through flocculating additives designed to maximize solids separation

APPLICATIONS

- Tight/hard formations where invert emulsions fail to perform
- Drilling applications where a brine drilling fluid is desired

EnerCLEAR†
Brine Drilling Fluid

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. In tight or hard formations where invert emulsions fail to perform, EnerCLEAR has increased drilling rates by over 60%, reducing rig release dates by nearly 40%.

EnerCLEAR features a patented inhibitor package compatible with a wide variety of brines, including calcium brines. Most EnerCLEAR systems utilize calcium chloride or calcium ammonium nitrate, although formulations are available for sodium chloride and other monovalent brines.

The EnerCLEAR corrosion control strategy addresses multiple corrosion mechanisms. ENERHIB C† forms a protective layer while ENERSCAV C† scavenges oxygen. Both additives are designed for use in calcium brines where most conventional additives fail. In a lab study using a rotating cylinder electrode with linear polarization resistance, an untreated 10.4 lbm/gal calcium chloride brine had a corrosion rate of nearly 100 mpy while the same brine treated with ENERHIB C and ENERSCAV C had a corrosion rate of 2 mpy.

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.

The EnerCLEAR system includes supplemental flocculant additives designed to remove fine solids from the system. In combination with optimized solids control setup recommendations, dilution is minimized to lower chemical consumption and brine waste.

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.

Applications

EnerCLEAR is ideal for tight/hard formations where invert emulsions fail to perform or anywhere a brine system is desired. EnerCLEAR reaches a density of 11.6 lbm/gal in calcium chloride brine and 13.4 lbm/gal in calcium ammonium nitrate. Compatibility with calcium brines is a key benefit both for inhibition and cost efficiency at higher densities. EnerCLEAR additives are stable above 250°F. Lab testing will aid to determine appropriate concentrations for challenging well conditions.

EnerCLEAR performs in both vertical and horizontal wells. Hole cleaning utilizes turbulence to transport cuttings. Sweeps may be used to evaluate or supplement hole cleaning. There are several lubricants approved for use in EnerCLEAR to lower torque and drag, where necessary.

Collaboration with the directional drilling company is essential to identify materials appropriate for high chloride brine applications. Corrosion control is achieved by maintaining excess ENERHIB C and ENERSCAV C in the system and using proper corrosion control practices, including an elevated pH and minimizing entrained oxygen.

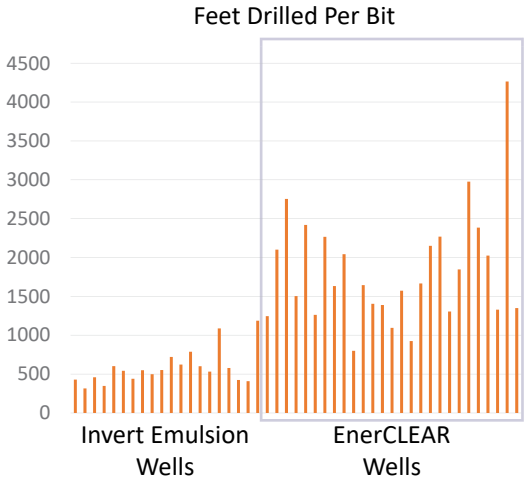
Performance

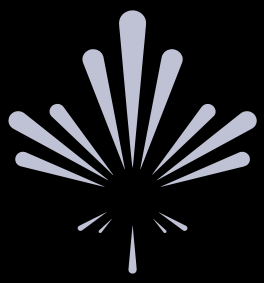
In the Montney shale, invert emulsion systems were the standard choice. Persistent issues of low rate of penetration and short bit life increased costs and days required to drill both vertical and horizontal intervals. Upon the introduction of EnerCLEAR, instantaneous rates of penetration tripled. Wells requiring 40-65 days to drill with invert emulsions required less than 30 days with EnerCLEAR. These performance benefits reduced average drilling fluid expenses by nearly 50%.

Case History Results

3x Instantaneous ROP
> 25% Longer Bit Life

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





AES DRILLING FLUIDS

© 2018 AES Drilling Fluids. All rights reserved. The information provided is for informational purposes and is believed to be accurate, although this cannot be guaranteed. No guarantees or warranties are stated or implied. †Marks of AES Drilling Fluids, LLC.