

ENERREACH

POLYMERIC INVERT EMULSION



AES DRILLING FLUIDS

DESCRIPTION

EnerREACH is a polymeric invert emulsion system designed to drill the most challenging wells by reducing equivalent circulating density, surge, and swab pressures.

EnerREACH incorporates ENERMOD ER, a polymeric viscosifier, to enhance the suspension properties of drilling fluids without causing excessive gelation and increased plastic viscosity commonly observed in traditional invert emulsion systems. This results in improved performance and avoids the need for higher chemical concentrations. The emulsifier and wetting agent combination in the EnerREACH system is designed to maximize the advantages of a polymeric system while effectively handling water influx.

To successfully implement EnerREACH, it is crucial to have a well-optimized drilling fluids program that can effectively mitigate risks and take full advantage of the system's benefits, especially in challenging scenarios like extended reach wells or formations prone to formation losses. AES Drilling Fluids offers comprehensive technical support services to plan, prevent, and manage complex wells, ensuring the successful application of EnerREACH.

| Properties | Before Water Flow | After ~200 bbl Water Flow |
|----------------------------|-------------------|---------------------------|
| MW, lb/gal | 12.5 | 12.1 |
| OWR | 72 : 28 | 61 : 39 |
| 600 RPM | 75 | 110 |
| 300 RPM | 44 | 63 |
| 200 RPM | 34 | 46 |
| 100 RPM | 21 | 29 |
| 6 RPM | 7 | 8 |
| 3 RPM | 6 | 6 |
| PV, cP | 31 | 47 |
| YP, lb/100 ft ² | 13 | 16 |
| ES, volts | 457 | 325 |



■ EnerREACH System: Our customers prefer polymeric systems for water-flow prone areas.

■ EnerREACH provides excellent suspension for hole cleaning while remaining shear-thinning to minimize equivalent circulating density.



DESCRIPTION

E n e r R E A C H

Polymeric invert emulsion drilling fluid compatible with diesel, mineral oils, and synthetics

Superior suspension properties with lower overall solids content

Fragile gel structure minimizes surge pressure when breaking circulation



BENEFITS

E n e r R E A C H

Minimizes pump pressures and overall equivalent circulating density

Reduces risk of losses through weak formations

Tolerates significant water influxes while maintaining invert emulsion



APPLICATIONS

E n e r R E A C H

Extended reach or challenging wells with narrow fracture gradient / density margin

Areas prone to water influx

APPLICATION

EnerREACH is specifically designed to tackle challenging wells, particularly those with a narrow margin between the fracture gradient and required drilling fluid density, such as extended reach wells. Its primary objective is to minimize the risk of losses to the formation and enable high pump rates by maintaining rheology without the need for additional clay. This, in turn, enhances hole cleaning through turbulent flow while operating at a lower overall pump pressure. EnerREACH typically operates within densities ranging from 8.4 to 12.5 lbm/gal, but higher density formulations exceeding 16.0 lbm/gal are available if needed. It remains stable beyond 250°F, although it is advisable to conduct lab optimization for elevated temperatures.

One of the notable advantages of EnerREACH lies in its stability in areas prone to water influxes. Unlike many conventional systems that undergo a disruptive "flip" when faced with water flow, EnerREACH's emulsifier package is specially designed to maintain its invert emulsion properties even with high water content. This unique characteristic provides valuable time to address the influx and treat the system to achieve desired drilling properties, offering added benefits in such water-prone environments.

To maximize the effectiveness of EnerREACH, it is crucial to incorporate it as part of a comprehensive drilling program tailored to specific well conditions. This entails conducting laboratory testing and hydraulic simulations to determine the optimal properties for drilling, circulating, tripping, and running casing. By thoroughly assessing these factors, operators can unlock the full potential of EnerREACH and ensure its successful application in challenging well scenarios.



PERFORMANCE

In areas prone to loss, customers observe fewer losses in the formation. When circulation is interrupted, pressures usually stay within 50-150 psi above the normal circulating pressure. In a water influx situation in West Texas, the oil-to-water ratio dropped as low as 50:50 without causing system failure. This allowed enough time to manage the flow and restore the EnerREACH system to its intended properties. In comparable instances, competing systems had to be entirely replaced because they were unable to maintain stability.

“The oil patch has needed something like this for a long time! It should really change how oil companies drill shale plays. We fight losses less, and if we are in a water-bearing formation, we have run it at a 50:50 oil:water ratio without any problems! It does not tend to flip with an influx of water like conventional clay based-systems.”

- Permian Basin Operator



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