

PRODUCTS TECHNICAL DATA

1.PRODUCT NAME : Polymeric Alcohol Lubricant, MR-LUB

COMPOSITION / INFORMATION ON INGREDIENTS AND APPLICATIONS

ME-LUB is a kind of water-based or brain based drilling fluid lubricant. Main composition is Polymeric Alcohol has good inhibition and lubricity of shale, depending on its peculiar turbidity point property. It is characterized by swelling inhibition and low pollution to tight sandstone reservoirs. Can disperse in water and dissolve in solvent; Suitable for low solid or solid free drilling fluid. It has a certain viscosity and density, in which the organic salt will interact with the clay and play a certain viscosity increasing effect, which can reduce the ratio of bentonite and reduce the damage of formation of reservoir. The density of the **ME-LUB** reach to 1.0 g/cm³, which reduces the mass fraction of the weighting agent and reduces the solid phase entering the reservoir under the same density, thus reducing the damage to the reservoir due to expansion and blockage

ME-LUB It can greatly improves the high-temperature resistance of drilling fluid up to 160 ° C, maintain a good flow and a strong structure of drilling fluid in high-temperature deep Wells, and ensure the suspension of drilling cutting discharge capacity.

ME-LUB Helps to prevent bit-balling and differential pipe stuck. Helps to reduce torque and drag issues in long-reach wells.

ME-LUB In most cases, will improve the overall API & HTHP fluid loss of the fluid.

◆ Recommended dosage is 1.5~ 2.0% by volume..

2. PRODUCT NAME : Low Fluorescence Shale Inhibitor, ME-POLY (Substitute of Sulfonated Asphalt)

COMPOSITION / INFORMATION ON INGREDIENTS AND APPLICATIONS

ME-POLY is compound from high-grade fatty alcohol resin and surfactant, etc by water-soluble processing. It can emulsify with water and clay, form ductile particles at different temperatures, plug the pores of formation micro fractures and permeable formations, play the role of reducing filtration, preventing formation collapse and protecting oil and gas reservoirs. Compared with asphalt, it has no fluorescence and will not interfere with geological logging. **ME-POLY** has the effect of reducing high temperature and high pressure filtration, obvious temperature resistance effect, can prevent the collapse of hard brittle shale and inorganic salt formation, regular well diameter, smooth electrical logging, downhole safety, easy biodegradation, non-toxic, is an environmental protection drilling fluid additive.

Compared with sulfonated asphalt on anti-swelling effect, non-fluorescent **ME-POLY** has better inhibition on shale and lower swelling height of shale cuttings under its action.

After aging at 120 °C for 16 h, the filtration loss of **ME-POLY** is better than that of sulfonated asphalt and slightly better than that of sulfonated asphalt.

It can be directly added into various water-based drilling fluid systems to disperse quickly in the mud. It has good compatibility with other drilling fluid treating agents. The recommended dosage is 1.5-3.0%

Low fluorescence level (≤ 5), easy to biodegrade, environmental protection.

Application Case

ME-LUB : Polymeric Alcohol lubricant +KCl

ME-POLY : High Temperature tolerate Shale Inhibitor (Substitution of Sulfonated Asphalt)

SINOPEC Liaohe Oilfield Drilling & Exploration , Location: Liaohe oilfield ,Hollow West & South Section well.

The average porosity of the reservoir was less than 10%, the average permeability was less than 1×10^{-10} ~ GM2, the pore throat was small, the permeability was very low, and the reservoir reverse permeability was poor. The reservoir in the area is mainly composed of fine sandstone, siltstone and silty mudstone, and the clay mineral content is relatively high, and the reservoir sensitivity is strong and water lock damage is easy to occur. The operator did not take effective reservoir protection and wellbore stabilization drilling fluid according to the characteristics of tight sandstone reservoir. The instability of wellbore resulted in wellbore collapse and serious reaming. The enlargement of well diameter leads to pipe stuck and the problem of electric logging. The Operator has determined the formulation as below:

3.3% sodium bentonite +0.25% Dispac (LV) +0.1% Dispac (HV) +0.2% Polyacrylate +0.9%AMPS , to make basic mud. Then mixed with 5% KCl + 5% ME-Lub + 2% ME-Poly, made the finished drilling fluid

Followed target and progress have been reached:

The friction resistance between the well tools and the well wall was reduced from 280kn to 90kn-110kn; there was no collapse and block falling, and the hole diameter expansion rate is only 6.68%.

By using of **ME-LUB & ME-POLY** ,In the real drilling mode, the ROP was increased by 16.91%, and the drilling fluid cost was reduced.