millennium energy
Drilling Fluids & Chemicals

PRODUCTS TECHNICAL DATA

1.PRODUCT NAME : ME-VISL Biopolymeric viscosifier

COMPOSITION / INFORMATION ON INGREDIENTS AND APPLICATIONS

Biopolymeric viscosifier, is made of modified Xanthan gum polymer, with surfactant treating, has high temperature resistant but weak Gelation property, mainly is used in water based Drilling.
fluids ,Completion fluid, Workover fluid and other downhole working fluid as viscosity & Gel Strength increasing agent.

ME-VISL Biopolymeric viscosifier can also be used in solid free or low solid drilling fluid to improve structural viscosity and enhance the carrying capacity of working fluid. At the same time, it can effectively prevent formation pollution caused by the filtration of working fluid.

Benefits:

1. Temperature resistant up to 130° C and salt resistance ;
2. Increasing the viscosity under the lower shearing rate;
3. The permeability recovery value can be 89.8%;
4. which has good inhibition ;
   performance and reservoir protection performance;
5. Suspension & carrying & washing capacity of sand ;
6. The recovery rate of cuttings is much higher than that in clear water and polysulfonated drilling fluid;
7. Biodegradable, no damage to the formation and reservoir.
8. ME-VISL Biopolymeric viscosifier should be used when high shear is unavailable, or fast dispersion is required.

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PRODUCTS TECHNICAL DATA

PRODUCT NAME: ME-SC, polglyl based anti-bit balling agent.

COMPOSITION / INFORMATION ON INGREDIENTS AND APPLICATIONS

ME-SC, It is mainly composed of several polglyl hydrocarbon derivatives, surfactants and fast penetrating agents. It can improve the lubricating performance of drilling fluids, clean drilling tools and prevent mud Balling drills.

It can provide improved wellbore stability, lubricity,high-temperature filtration control, plus reduce dilution rates and bit balling. While **ME-SC** are most effective when used in conjunction with an inhibitive salt, such as KCl, in a non-dispersed polymer system, they can be used as additives in most water-base systems. "Cloud point" is the temperature where **ME-SC** polglyl change from being soluble (at lower temperatures) to being insoluble (at higher temperatures). Shale inhibition is improved when the**ME-SC** polglyl is insoluble or "clouded out." The cloud point temperature can be reduced by increasing salinity (or KCI) and/or by increasing the concentration of **ME-SC** polglyl.

Once Above the cloud point , the friction coefficient of the drilling fluid added with **ME-SC** polyol would be reduced, the lubrication performance would be improved, and the HTHP fluid loss would be reduced. Therefore, the drilling fluid with **ME-SC** polyol should be used as far as possible in deep well section and complex collapsible well section. It is not recommended to use in shallow well or if the bottom hole temperature is lower than cloud point. The cloud point should be 20 ℃～ 30 ℃ higher than the outlet temperature. The recommended dosage of **ME-SC** polyol is 2.5% ～ 3.5%.

Appearance	straw yellow to amber color viscous liquid
Specific Gravity	0.9-1.0
Solubility in water	Variable
Cloud point	66-70°C 3% in 10% NaCl
Contact angle (°）， ≤	30
Reduction rate of lubrication coefficient %,≥	50

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Application Case

ME-SC: Medium-cloud-point water insoluble polglyl based anti-bit balling agent.
MENEX: Asphalt based fluid loss control agents， Cationic Surfactant Anti-collapse agent.
ME-VISL :High temperature and weak gel viscosifier.

ME-HALAD: Anionic polymer fluid loss control agent.

ME-POLY: Low Fluorescence shale inhibitor

Operator: CNPC Chuanqing Drilling & Exploration Co.
Location: Chongqing, Natural Gas Well # Tiandong 017-X2 ,Sichuan province.

The lithology is mainly dissolved pore dolomite and limestone. The strata pressure pressure (mpa) is 43.369, the formation temperature is 112° c, the bottom hole pressure is 32.68 mpa, the well depth is 4339 m, the porosity is 8.08, the permeability (d) is 3.38, the pores are mainly intercrystalline dissolved pore， dissolution pores, and the fractures are mainly pressure - dissolution, and structural fractures.

In the Well section :0~2446 m, operator selected polymeric solid-free drilling fluid system with lower-cost to drilled vertical section. The formula is as below:
Free water ,0.05～0.1% KPAM , 0.05～0.1% PHP, 3～5% **MENEX,** 1～2% LV-CMC, 7～15% KCI
Mud shale of upper formation in Tiandong 017-x2 well occurred collapse. The drilling fluid was adjusted to KCl + Sulphonated Asphalt drilling fluid system, the downhole becaume stable. The drilling fluid was gradually adjusted to polysulfonate drilling fluid.The formula is as below:
2% SMP-1 (powder)+2%SPNH+3%+7%KCl+2% **ME-VISL**+0.1%CaO
In order to prevent the formation from dispersing and mud making, according to the designing, when the ground temperature exceeds the cloud point temperature at 2300 m, **ME-SC polglyl** was added by 2.5%, the entire well has consumed 12.8 t of **ME-SC** totally. The formula is as below:
Well fluids + 10% Lignin sulfonate thinner (3:1, 1/5n) + 2% **ME--HALAD** + 3% Mineral oil lubricant + 5% **ME-POLY** + 3% **ME-SC** + 5% KCl +1 .5 %CaO.

The drilling fluid successfully traversed 6 high-pressure saline formations and formations with significant gypsum contamination with a thickness of over 1200 m. Total 25 short trip RIH & POOH, every time was smoothly, without pipe stuck, one-time reaching to bottom rate was 100%.