

DRILPLEX HDD

A specialty product used to enhance the gel strengths of MAX GEL viscosifier, DRILPLEX* HDD viscosifier is an inorganic chemical viscosifier for water-base bentonite drilling fluids. DRILPLEX HDD viscosifier is only slightly soluble in water.*

Typical Physical Properties

Physical appearance.....Off-white powder
Odor None
Specific gravity2.8–3.1

Applications

DRILPLEX HDD viscosifier allows the formulation of fluids with exceptional shear-thinning properties, resulting in a drilling fluid with both excellent dynamic and static carrying capacity for solids. This is indicated by high-yield point and low plastic-viscosity readings. When not circulating, the mud instantly reverts to a gelled state and results in high suspending capacity indicated by high, non-progressive gel strength readings.

For 300 gal (1,136 L) of drilling fluid mix:

- Add 1½ sacks (75 lb [34 kg]) MAX GEL viscosifier in freshwater and hydrate for 10 min. If higher rheological properties are desired, mix more gel. For every 7 lb (3.2 kg) of additional gel added, the yield point rises approximately 20 points.
- After the gel is hydrated, add 6 lb (2.7 kg) of DRILPLEX HDD (3 vis cups) viscosifier and mix for an additional 5 to 10 min.
- For torque reduction, add 1.5 gal (5.7 L) of ROD EASE* lubricant.

Advantages

- High rate of penetration
- Optimum cuttings transport
- Excellent solids suspension
- Borehole stabilization
- Low drilling costs

Limitations

DRILPLEX HDD fluids are not compatible with anionic products. Do not add any polymers or thinners to this fluid. Polymers and thinners destroy the rheological properties of the fluid. DRILPLEX HDD fluid should only be used to enhance a bentonite-base fluid. The mixing tank must be clean before being used to mix DRILPLEX HDD fluid.

Toxicity and Handling

Bioassay information is available upon request.

Handle as an industrial chemical, wearing protective equipment and observing the precautions described in the Material Safety Data Sheets (MSDS).

Packaging and Storage

DRILPLEX HDD viscosifier comes in 25-lb (11.3-kg) multi-wall, paper sacks with 80 sacks to a pallet.

Store in a dry location away from sources of heat or ignition, and minimize dust.

How does DRILPLEX HDD viscosifier work?

To understand how DRILPLEX HDD-base fluids can help you drill cleaner, more trouble-free holes, it is helpful to understand the chemistry behind the fluid. DRILPLEX HDD viscosifier is not a polymer, so incorporating DRILPLEX HDD product in drilling fluid systems results in low-solids, shear-thinning fluids that do not degrade at high shear rates. DRILPLEX HDD drilling fluids develop a gel structure capable of remarkable solids suspension, yet exhibiting low-viscosity flow characteristics.

Mixed compounds are insoluble, crystalline, inorganic compounds containing two or more metals in a unique hydroxide lattice. Each DRILPLEX HDD crystal has a positive charge because of its crystalline structure.

DRILPLEX HDD crystals are sheet-like platelets that, when dispersed, are considerably smaller than an average particle of bentonite or attapulgite. The combination of small particle size and positive charge causes DRILPLEX HDD crystals to interact with clay particles via an ion-exchange mechanism, resulting in a unique gel structure. When a positively charged DRILPLEX HDD particle reacts with a negatively charged clay particle, the resulting new compound is capable of remarkable solids suspension.

The DRILPLEX HDD/clay complex exhibits unique behavior. At rest, it behaves like an elastic solid. When force is applied, however, the structure is fractured, and flow occurs along the fracture line. When the force is removed, the fracture heals instantly, restoring the structure to its elastic-solid state. Testing confirms that DRILPLEX HDD fluids behave initially like elastic solids, but are transformed to viscous liquids as greater strain is applied to the system.

The most important result of this inter-particle association is the unique ability of DRILPLEX HDD fluids to exhibit low viscosity at the drill bit, yet gel quickly as flow decreases, thereby carrying and suspending cuttings. Suspension occurs during bit/reamer trips, preventing hole-fill and stuck-pipe problems. If the drilling/reaming operation is halted for any reason, it can be restarted at the bottom of the hole, with no significant fill even after several days.

Traditionally, high fluid viscosity or turbulent flow has been required to achieve good hole cleaning performance. Because of their unique rheology, DRILPLEX HDD systems carry and suspend solids better than high-viscosity systems at very low, flat rates. Outstanding hole cleaning coupled with low-solids, shear thinning allows DRILPLEX HDD systems to provide a high rate of penetration.

The rheology modifier is low in toxicity and meets EPA requirements. In environmentally sensitive areas, such as offshore waters, this can mean decreased expenditures for cleanup and reduced handling precautions. Mysid shrimp test performed on generic fluids 1 and 7 containing the rheology modifier showed no increase in toxicity when run by ENSR Laboratories using EPA protocol. All submitted rheology modifier-base fluids passed the required tests for drilling in Gulf of Mexico Federal Waters.

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