Duo-Vis

DUO VIS* xanthan gum is a dispersible, high-molecular-weight biopolymer used for increasing viscosity in water-base base drilling fluid systems.

Small quantities provide viscosity and weight material suspension for all water-base mud systems. DUO-VIS biopolymer has the unique ability to produce a fluid that is highly shear-thinning and thixotropic.

Typical Physical Properties

Physical appearance ..... Cream-to-tan powder
Specific gravity 1.5
Bulk density 50 lb/ft3 (800 kg/m3)

Applications

The primary function of Duo-Vis additive is to increase viscosity for cuttings transport and suspension. It will perform effectively in all water-base fluids, from highly weighted to low-solids systems. This includes fresh water, seawater, salt and heavy-brine systems.

Duo-Vis additive works to provide an optimized rheological profile with elevated low- shear-rate viscosity and highly shear-thinning characteristics with low “n” values. These characteristics frequently result in fluids with inverted flow properties, i.e., the yield point being greater than the plastic viscosity. Shear-thinning fluids have low effective viscosities at the high shear rates encountered inside the drill string and at the bit. This low effective viscosity for minimal pressure losses and standpipe pressures allows optimized hydraulics and maximized rates of penetration. Conversely, at the low shear rates experienced in the annulus, Duo-Vis additive enables the fluid to have a high effective viscosity for adequately cleaning the well and suspending cuttings.

UO-VIS biopolymer should be added slowly through the hopper to prevent lumping and minimize waste. It should be added at the rate of approximately one 25 lb sack every seven minutes. The time required for the product to yield its ultimate viscosity depends on salinity, temperature and shear.

The amount of DUO-VIS biopolymer required depends upon the desired viscosity. Normal concentrations range from 0.25 to 2 lb/bbl (0.71 to 5.7 kg/m 3) for most mud systems. Special fluids and difficult hole-cleaning conditions can require higher concentrations of, up to 4 lb/bbl (11.4 kg/m 3).

The addition of salt, an antioxidant and thermal stabilizers improve temperature stability in fluids from 250 to >280° F (121 to >138° C). Specially formulated systems have been used at temperatures of 400° F (204° C). DUO-VIS biopolymer is subject to bacterial degradation, and treatments with a biocide is recommended to prevent fermentation.

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Advantages

- Highly effective viscosifier, with minimal treatments producing significant results
- Shear-thinning rheological profile for improved hydraulics
- Minimum frictional pressure losses for additional hydraulic horsepower at the bit and low, high-shear-rate viscosity for max penetration rates
- Viscous laminar flow in the annulus for improved wellbore stability with maximum hole-cleaning and suspension capacity
- Mixes easily

Limitations

- Trivalent ions such as chromium and iron may cause biopolymer precipitation and loss of viscosity or crosslinking
- Not tolerant of high-pH or high-calcium-ion conditions Duo-Vis systems should be pre-treated with either sodium bicarbonate or SAPP and possibly citric acid prior to drilling cement
- Subject to bacterial degradation, a biocide should be used to prevent fermentation
- Slightly anionic nature of Duo-Vis additive requires special mixing procedures when mixed with cationic materials

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 Sheet (MSDS).

Packaging and Storage

Duo-Vis additive is packaged in 25-lb (11.3-kg) or 25-kg (55.1-lb), plastic-lined, multi-wall, paper sacks.

Store at room temperature in a dry, well-ventilated area. Keep in original container. Keep container closed. Store away from incompatibles

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