

DRILLING FLUIDS GUIDE

BENTONITE

Baroid Industrial Drilling Products, (281) 871-4613, baroididp.com

Aquagel: Premium grade Wyoming sodium bentonite used as viscosifier and filtrate reducer in freshwater drilling fluids. Meets the requirements of API Specification 13A, Section 9. NSF/ANSI Standard 60 certified.

Bore-Gel: Specifically blended system using high-yield Wyoming sodium bentonite. When mixed with freshwater, it develops an easy-to-pump slurry with desirable properties for HDD drilling, pipe jacking lubrication, etc. NSF/ANSI Standard 60 certified.

Quik-Gel: Easy-to-mix, finely ground, premium grade, high-yield Wyoming sodium bentonite. Imparts viscosity, fluid-loss control and gelling characteristics to freshwater-based fluids. NSF/ANSI Standard 60 certified.

CETCO, (800) 527-9948, cetco.com/dpg

HYDRAUL-EZ: Specially treated bentonite drilling fluid designed for directional drilling. Suspends cuttings and maintains borehole integrity with very low water loss and strong gel strength. NSF/ANSI Standard 60 certified.

SUPER GEL-X: A 200-bbl-yield, bentonite drilling fluid for maximum viscosity. Multi-purpose drilling gel provides strong wall cake and formation control for all drilling types. Controls filtration rate for borehole stabilization and prevention of fluid loss. NSF/ANSI Standard 60 certified.

PREMIUM GEL: API 13A 90-bbl-yield, bentonite drilling fluid for freshwater drilling.

PUREGOLD GEL: Organic-free and untreated 90-bbl-yield, high-quality bentonite drilling fluid. Industry standard for environmental monitoring well drilling. NSF/ANSI Standard 60 certified.

Drilling Mud Direct LLC, (720) 489-0300, www.muddirect.net

Barakade High Yield Gel: Premium-grade, high-yield Wyoming sodium bentonite. Easy to mix, quick to yield and provides excellent rheology for HDD applications. NSF/ANSI-standard 60 certified. Stored at 12 different stock points across the USA to ensure big-rig contractors never run out of mud.

M-I SWACO, (601) 649-1500, slb.com/hdd

MAX BORE HDD: One-sack, proprietary-blend system of high-yield Wyoming bentonite with additives for fluid loss control, enhanced suspension and improved lubricating qualities. Designed for gravel and cobble formations where optimum stabilization and suspension are necessary. NSF certified.

MAX GEL: Premium 220+ bbl-yield, Wyoming bentonite capable of yielding more than twice as much viscosity as regular Wyoming bentonite. Easily mixes and yields faster than most other bentonites. NSF certified.

DRILPLEX HDD: Specialty product used to enhance gel strengths of MAX GEL viscosifier. When added to bentonite, slurry produces high-fragile gels for superior suspension and carrying capacity of sand, gravel and rock cuttings from the borehole. Easy to pump, improves hole stability and reduces chances of loss circulation. NSF certified.

Polymer Drilling Systems, (800) 243-7455, pdscoinc.com

High Yield: Specially modified for HDD or wherever a minimum 200-bbl yield is required. Mixes rapidly for quick hydration and carries cuttings in mud with lower soil content.

Wyo-Ben, (406) 652-6351, www.wyoben.com

Extra High Yield: High-yielding, fast-mixing gel that performs well in a variety of water qualities. Used widely in mineral exploration, water well and HDD.

Hydrogel Plus: High-performance bentonite with a unique formula that makes it a very effective viscosifier. This premium-grade, beneficiated Wyoming bentonite is specifically designed for use with mud recycling systems on large HDD bores.

SW-101: Unique modified sodium bentonite product designed to remain stable in either seawater- or salt-contaminated environments. Can be mixed in freshwater or seawater.

Tru-Bore: Complete, one-sack, 240-bbl/ton-yielding, pH-balanced material that controls fluid loss to the well bore for maximum borehole stability. For use in drilling difficult horizontal and vertical wells.

POLYMER

Baroid Industrial Drilling Products, (281) 871-4613, baroididp.com

Aqua-Clear PFD: Concentrated, liquid, polymer dispersant that provides superior mud and sediment removal. Highly effective mud thinner and contains no phosphates. NSF/ANSI Standard 60 certified.

Bio-Bore: Polymer-based system that provides a clay-free, biodegradable drilling fluid in situations where clay-based fluids are restricted.

Diamond Seal: Water-swellable - not water-soluble - 100% crystalline synthetic polymer. It absorbs hundreds of times its weight in water and is used primarily as a lost circulation material in HDD.

EZ-Mud: Liquid polymer emulsion used as a borehole stabilizing agent to prevent reactive shale and clay from swelling and sloughing. Can be added to low-solids drilling fluids to help increase lubricity and fluid viscosity, and improve carrying capacity of air/foam injection fluids.

EZ-Mud Gold: Helps promote inhibition of clay and shale formations in water-based drilling fluids without substantially increasing viscosity. Added to Quik-Gel or Bore-Gel slurry, it yields an inhibitive drilling fluid system while maintaining manageable and effective fluid properties.

No-Sag: Free-flowing, powdered and easily dispersed bio-polymer. Helps enhance the carrying capacity of both clay- and polymer-based drilling fluids without significantly increasing the viscosity of the slurry.

N-Seal: Acid-soluble, lost circulation material is a specially formulated extrusion spun mineral fiber. Due to its solubility in weak acids, it is easily removed from production zones.

Penetrol: Non-ionic wetting agent designed to counteract the sticking tendencies of clay and reduce or eliminate bit balling. Preferentially coats drill bits, drill string and reamers to improve drilling efficiency.

Poly-Bore: Water-soluble, free-flowing, easy-mixing, 100% dry granular polymer that provides a clear solids-free, viscous, borehole stabilizing fluid for use in all types of trenchless construction applications.

Quik-Trot: Modified, natural cellulosic polymer that provides filtration control in most water-based drilling fluids. When added to Quik-Gel (bentonite) slurry, yields a mud system suitable for drilling in sandy formation. Can be added to vegetable or mineral oil for an oil-based fluid suspension that is poured directly into the drill string. Also used in air/gel-foam drilling.

Quik-Trot LV: Modified, natural cellulosic polymer that provides filtration control in most water-based drilling fluids, without substantially increasing viscosity. When added to Quik-Gel or Bore-Gel slurry, it's suitable for drilling in sandy formation. Can also be an oil-based fluid suspension.

Soda Ash: Granular powder primarily used to treat out hardness due to calcium in makeup water, and to raise pH level.

CETCO, (800) 527-9948, cetco.com/dpg

ACCU-VIS: Liquid copolymer designed for fast field mixing, viscosity building, and clay/shale stabilization in aqueous drilling HDD fluids. NSF/ANSI Standard 60 certified.

CETCO C-LUBE: Vegetable-oil-based, filming-type lubricant for water-based drilling fluids that reduces rotational torques and drag. Enhances lubricity of water-based drilling fluids without adversely altering rheology.

CLAY CUTTER: Used on any size HDD bore to greatly reduce or eliminate clay cuttings from sticking to each other and to the drilling tools. Swelling of the bore will be reduced or eliminated; rotation and pullback pressures will be significantly reduced.

CLAY CUTTER PRO: Dry, concentrated, non-hazardous, proprietary clay inhibitor that can be used with either polymer or bentonite drilling fluid systems. An ideal additive for HDD bores in reactive clay soils, and can be used in recycling systems.

DRILL-TERGE: Liquid solution of nonionic surfactant formulated to increase detergency and wetting properties of drilling fluids. Designed to work in fresh or saltwater to reduce torque and drag.

HERCUL-EZ: Proprietary additive used in conjunction with bentonite-based drilling muds. With proper formulation, the system will produce a unique drilling fluid with excellent shear thinning characteristics. At low shear or at rest, the fluid will gel and allow for suspension of large cuttings, yet thins immediately under pumping conditions. At rest, HERCUL-EZ fluid looks and behaves like a semisolid but when sheared, even slightly, it reverts back to a thin, almost water-like consistency. NSF/ANSI Standard 60 certified.

INSTA-VIS DRY: Highly concentrated, granular polymer ideal for sticky and swelling clays, and shale. Increases rate of penetration and stabilizes the borehole, while improving cohesion in sandy soil. Can be used in saltwater, such as tidal conditions.

INSTA-VIS LOW VISCOSITY: Easy-mixing, dry, water-soluble polymer used in horizontal and vertical drilling applications. Compatible with recycling equipment.

INSTA-VIS PLUS: Liquid polymer designed to improve drilling efficiency in both horizontal and vertical drilled holes through its rapid field mixing, viscosity development, and clay and shale inhibition. Can be used with VERSAFOAM PLUS to stiffen, and in brackish water. NSF/ANSI Standard 60 certified.

MACRO-FILL: Granular, super-absorbent, solidification and loss circulation material. Rapidly absorbs and retains large volumes of water from aqueous solutions, but only expands 1% in volume.

PUREGOLD CLEANDRILL: For drilling operations where clay-based drilling fluids are restricted and a biodegradable drilling fluid is recommended. Industry standard for use in horizontal and vertical remediation wells.

REL-PAC: Natural cellulosic, granular polymer designed for building a low-solids drilling fluid with increased stability. Forms a tight, thin filter cake that reduces fluid loss to the formation.

REL-PAC XTRA-LOW: Helps increase borehole stability by lowering filtrate and fluid loss more effectively than other polyanionic cellulose (PAC) polymers. Aids cleaning by not significantly raising viscosities and impeding flow. Helps control reactive formations by

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reducing available water, and controls unconsolidated formations by reducing whole fluid loss.

SHORE PAC: Easy-mixing, water-soluble, polymer supplied as a granular powder designed for preparation of viscous earth-reinforcing fluids or slurries in a variety of drilling applications.

SLURRYBOND: Powdered, inorganic mineral formula used for the solidification of high-solids drilling slurries. Made from non-biodegradable mineral designed for use on waste slurry that fails to pass a Paint Filter Liquids Test (PFLT).

SLURRYBOND 200: Proprietary, solid, granular, super-absorbent polymer that rapidly absorbs and retains aqueous matter. Made from non-biodegradable polymer designed for use on waste slurry that fails to pass a Paint Filter Liquids Test (PFLT) or slump test.

SLURRYBOND 2000: Powdered, inorganic mineral and polymer formula used for the solidification of high-solids drilling slurries. Made from a non-biodegradable mineral and polymer mixture designed for use on waste slurry that fails to pass a Paint Filter Liquids Test (PFLT) or slump test.

SUPER PAC: Multi-purpose, liquid polymer designed for minimizing fluid loss to the formation. Enhances properties of bentonite drilling fluids and creates optimum drilling efficiency through filtration control.

SUPER PAC XTRA-LOW: Low-viscosity polymer that aids in the control of reactive and unconsolidated formations by reducing filtrate and whole fluid loss. Assists hole cleaning in HDD work and increases penetration rates in vertical wells by not significantly raising viscosities.

SUPER THIN: Highly concentrated additive engineered to reduce drilling fluid viscosity and assist in settling solids. It offers immediate thinning action, reduces gel strength and is more cost-effective than traditional thinners. NSF/ANSI Standard 60 certified.

SUSPEND-IT: Dry biopolymer used to increase suspension and removal of larger drilling cuttings, gravel and cobble in difficult formations. Enhances gel strength without significantly increasing viscosity.

Drilling Mud Direct LLC, (720) 489-0300, www.muddirect.net

Barakade DWD Solidify: Effectively solidifies leftover slurry and cuttings. Allows for disposal via dump truck instead of vac truck and reduces overall volume to be disposed

DMD Lubra Star: Our most popular liquid additive, it reduces torque and friction, prevents sticking, lubricates many aspects of the bore, and is invaluable as an additive for pipe pull.

Poly-Select DMD Power PAC L/DMD Power PAC R: Dry, polyanionic-cellulose (PAC) polymer that improves filtrate/water-loss control and improves borehole stability. Available in "L" grade (viscosity neutral) and "R" grade (boosts viscosity).

Poly-Select DMD Power XAN: Premium-quality biopolymer used as a suspension enhancer and hole cleaning aid. Helps suspend cuttings, sand and gravel.

Poly-Select DMD Soda Ash: Boosts pH level of make-up water to improve bentonite mixing and performance.

Poly-Select Power DET: Drilling detergent formulated for HDD. Low foaming, it helps manage bit balling and prevents sticking tendencies of clay.

Poly-Select Power Swell: Plugging and sealing granular polymer that absorbs water to swell to 200 times its original particle size. Effective LCM for HDD.

Elgin Separation Solutions, (281) 261-5778, elginseparationsolutions.com

CLAY-KATCH: Very-low-molecular-weight, liquid polymer with a high-cationic charge. Used for clay inhibition instead of potassium chloride. Lower mud densities can be achieved by causing drill solids to be enmeshed with CLAY-KATCH additions, and removed with hydrocyclones and decanter centrifuge liquid-solids separation equipment.

KEM-VIS: Medium-molecular-weight, anionic polyacrylamide in emulsion form that is specifically developed as a viscosifier/friction reducer additive for water-based drilling fluids. Environmentally safe, contains no alkylphenols and has a category C toxicity classification.

KEM-THIN: Liquid thinner used to control viscosity in high-solids, high-viscosity drilling fluids. A sulfonated copolymer in liquid form providing a quick and efficient reduction of viscosity and gel strengths in drilling fluids containing moderate levels of calcium and salts, while subjected to high bottom hole temperatures. An environmentally safe anti-scalant featuring rapid solubility and better performance, it is less toxic than traditional dispersants containing heavy metals. Contains no alkylphenols and has a category C toxicity classification. Stable up to 350 degrees F.

RHEO-CLAY: Provides a high-inverted yield point (YP)/plastic viscosity (PV) ratio for improved rate of penetration, optimum hole cleaning and greater liquid/solids separation efficiency from hydrocyclones. It differs from sodium bentonite (montmorillonite) by having lower cation exchange capacity and greater yield in the presence of high hardness (Ca++ / Mg++) and sodium (Na+) values.

POLY KEM D: Dry polymer drilling fluids additive. Excellent borehole properties and can be used to enhance or substitute bentonite properties.

POLY SEAL: Water-absorbing polymer sealant for preventing loss of drilling fluids to porous, unconsolidated formations or through cracks/crevices. When pumped down to area of loss circulation, it quickly settles and seals formation due to its swelling properties – up to 300 times its volume.

M-I SWACO, (601) 649-1500, slb.com/hdd

DUO-VIS/SUPER-VIS: High-molecular-weight biopolymer used for increasing carrying capacity in water-based systems, and to increase low-shear viscosity for cuttings transport and suspension.

PLATINUM D-D: Aqueous blend of surface-active agents designed to reduce the surface tension of all water-based mud systems and reduce the sticking tendency of water-sensitive shale cuttings, which minimizes bit balling.

PLATINUM PAC: Premium, specially coated PAC designed for easy mixing without fish-eye formation. It provides filtration control and clay swelling inhibition in freshwater systems. NSF certified.

PLATINUM PAC UL: This polyanionic cellulose (PAC) is a high-quality, readily dispersible, water-soluble polymer designed to control fluid loss. And, as an "ultra-low" (UL) additive, it causes minimal increase in viscosity in water-based muds. NSF certified.

PLATINUM ROD EASE: Superior, environmentally friendly lubricant that reduces torque, corrosion and wear on equipment, while increasing ROP and overall rig potential.

POLYPAC R: This polyanionic cellulose is a high-quality, water-soluble polymer designed to control fluid loss and increase viscosity in water-based muds.

POLY-PLUS & POLY-PLUS 2000: Both PHPA polymers boost viscosity and lubricity, and provide clay inhibition. POLY-PLUS 2000 is 52% active and will not separate under any conditions. Both polymers are NSF certified.

POLY-PLUS EHV: Very-high-molecular-weight polymer designed to provide high viscosity at low concentrations, cuttings encapsulation and clay stabilization. Also acts as a viscosifier, friction reducer and flocculant. NSF certified.

POLY-PLUS LV: Low-molecular-weight, medium-charge PHPA additive designed to provide cuttings encapsulation and clay dispersion inhibition, and for use in fluids based on fresh and saline water environments. Provides minimal viscosity contribution and can enhance filtration properties. When added to MAX GEL or MAX BORE HDD, it produces an inhibitive drilling fluids system without affecting fluid properties. NSF certified.

POLY-PLUS RD: Polymer product that is readily dispersed and designed to provide cuttings encapsulation and clay stabilization. Formulated for easy mixing with improved dispersion to eliminate "fish eyes." This is beneficial when rapidly mixing either large quantities or high concentrations of polymer, where good mixing equipment is

unavailable. Also acts as a viscosifier, friction reducer and flocculant, and provides some fluid-loss control. NSF certified.

POLYSWELL: Unique, crosslinked polymer designed to swell many times its original weight when added to a drilling fluid. Its primary application is for lost circulation.

RINGFREE: Low-molecular-weight, liquid polymer designed to thin bentonite-based fluids. Also aids in breaking up sticky or swelling clays to help reduce torque and drag. NSF certified.

Polymer Drilling Systems, (800) 243-7455, pdscoinc.com

Super Mud: Liquid polymer emulsion primarily used as a viscosifying agent and soil stabilizer to prevent sloughing and/or collapse of a borehole.

Super Mud Dry: Granular polymer used as viscosifier and soil stabilizer to prevent sloughing and/or collapse of borehole.

Wyo-Ben, (406) 652-6351, www.wyoben.com

Borzan: This true biopolymer is highly concentrated to minimize the cost per gallon. Its gel strengths suspend solids and prevent sticking, reducing loss circulation problems.

Claymaster: Concentrated, nonhazardous, proprietary clay inhibitor that can be used with either polymer or bentonite drilling fluid systems.

Drill-X: Low-foaming, drilling detergent and wetting agent used in freshwater systems. It also offers lubrication characteristics.

Drill-X HP: Low-foaming, drilling detergent and wetting agent used in freshwater systems. It also offers lubrication characteristics.

Dril-Trol QD: Dry version of Uni-Drill, offering fluid loss control, moderate viscosity and superior clay inhibition.

Kwik-Vis "D": Premium PHPA polymer in a dry granular form. Designed to achieve high viscosities in shaft, caisson, horizontal drilling and slurry trenching operations, and in small drill applications.

Thinz-It: High-performance thinning agent for heavy clay applications. Can be used in conjunction with Drill-X to produce a unique "dispersed" mud system for better hole cleaning and faster penetration rates.

Uni-Drill: Proprietary liquid polymer designed for use in rotary and HDD operations. It mixes quickly and controls fluid loss, preventing the formation clays from swelling.

Wyo-Lube RR: Premium drilling fluid lubricant designed for HDD, rotary drilling and mining industries. Its superior lubricating properties decrease torque and drag, increase the penetration rate and reduce wear on tooling.

Wyo-Vis DP: High-performance, viscosifying dry PHPA polymer that reduces instances of bit balling, lowers rotary torque and shields swelling borehole clays.

Wyo-Vis HP: High-performance, viscosifying liquid PHPA polymer that reduces instances of bit balling, lowers rotary torque and shields swelling borehole clays.

Wyo-Vis LVP: Powder polymer that shields clays from swelling during the boring operation, while adding limited viscosity to the mud system.