POLY-PLUS RD POLYMER

POLY-PLUS RD polymer is a readily dispersible product designed to provide cuttings encapsulation and shale stabilization. It is 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 of where good mixing equipment is unavailable.

POLY-PLUS RD also acts as a viscosifier, friction reducer, flocculant, and provides some fluid-loss control.

POLY-PLUS RD is a specially treated, high-molecular-weight acrylic copolymer (PHPA). It can be used in mud systems ranging from low-solids to weighted muds, utilizing makeup waters from fresh to saltwater.

Typical Physical Properties

Physical appearance ..... White granular powder
Odor .....Slightly Hydrocarbon
Specific gravity ..... 1.25 – 1.40
pH (1% Solution) 7.7
Bulk Density .....40 – 46 lbs/ft2 (641 – 737kg/m3)
Nature of Charge .....Anionic
Activity ..... >90%

Applications

POLY-PLUS RD polymer mud systems. POLY-PLUS RD provides excellent cuttings encapsulation and improved wellbore stability. Typical concentrations of POLY-PLUS RD are 0.25 to 1 lb/bbl (0.71 to 2.85 kg/m3). It is also effective in salt muds, such as KCl– or NaCl– enhanced fluids, although slightly higher concentrations of POLY-PLUS RD may be required.

Clear-Water fluids. POLY-PLUS RD may be used in clear-water, solids-free drilling fluids. POLY-PLUS RD enhances solids removal by flocculating the undesired solids and increasing viscosity. The polymer also provides cuttings encapsulation and improve wellbore stability. This system is frequently used in slimhole continuous-coring applications.

TYPICAL PROPERTIES OF POLY-PLUS IN FRESH WATER			
Concentration (lb/bbl [kg/m3])	**PV (cP)**	**YP (lb/100 ft2)**	**Marsh Funnel (sec / qt)**
0.125 (0.4)	2	1	28
0.25 (0.7)	3	2	31
0.50 (1.4)	4	4	34
0.75 (2.1)	6	8	46
1.00 (2.9)	9	11	60
1.50 (4.3)	15	17	110

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Low-Solids, Non-Dispersed (LSND) muds. POLY-PLUS RD is well suited to LSND systems. In reducedbentonite muds, POLY-PLUS RD extends bentonite to increase viscosity, flocculates drill solids for more efficient removal, encapsulates cuttings and improves wellbore stability.

Weighted muds. POLY-PLUS RD can be used in weighted muds for cuttings encapsulation, improved wellbore stability, secondary viscosity and to improve filter cake integrity. The effectiveness of the polymer is reduced as the concentration of organic, anionic dispersants is increased.

POLY-PLUS RD sweeps. Viscous POLY-PLUS RD sweeps are effective for periodic hole cleaning. Circulating such a sweep through the well helps clear accumulated cuttings and maintain a clean hole.

METHOD OF ADDITION

POLY PLUS RD may be mixed directly into the active mud system or premixed at higher concentrations in a separate pit or chemical barrel, then blended into the active system. Sweeps may be prepared by mixing

POLY-PLUS RD directly in the active system at the suction pit or by pre-mixing a high concentration in a separate pit and allowing the polymer to fully yield before being pumped.

Advantages

- Readily dispersible and does not form “fish-eyes”
- Excellent cuttings encapsulator that limits cuttings dispersion
- Provides improved shale stabilization
- Powdered material with significantly lower toxicity than invert emulsion liquid polymers
- Highly concentrated product (>90% activity) reduces transportation costs and storage space requirements
- Aids in preventing balling on the bit, stabilizers and bottom-hole assembly by coating and lubricating solids
- Enhances the removal of drill solids
- Improves the lubricity of most mud systems, particularly non-dispersed muds, when used in combination with LUBE-167
- Can be used to viscosify clear-water and low-solids drilling fluids
- Compatible with other polymers such as UNITROL, POLYPAC, TACKLE, starch and DUO-VIS / SUPER-VIS

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Limitations

- During the initial treatment of POLY-PLUS RD in a non-dispersed mud system, severe flocculation my occur causing high viscosity until all of the solids are coated. POLY-PLUS RD polymer mud systems utilize low concentrations (<15 lb/bbl [<43 kg/m3]) of Max Gel to reduce this interaction. Continued additions of POLY-PLUS RD result in a stable system with the desired rheology.
- Calcium-sensitive and begins to precipitate when the calcium concentration exceeds 300 mg/l.
- pH-sensitive with an optimum pH range of 8.5 to 10.5. At levels above this range, hydrolysis may convert acrylamid into acrylate and release ammonia (NH3).
- Temperature-stable to approximately 350ºF (177ºC) although the copolymer may begin to hydrolyze into polyacrylate when exposed to prolonged temperatures above 275ºF (135ºC) and release ammonia (NH3).
- Subject to shear degradation of its viscosity and may eventually lose its ability to viscosify, but cuttings encapsulation and shale stabilization are not affected.

Contamination

POLY-PLUS RD reacts with multivalent cations such as calcium. In concentrations greater than 300 mg/L, calcium causes the polymer to precipitate. Use soda ash to remove calcium concentrations above 300 mg/L.

Treat cement contamination to keep the calcium and pH as low as possible. Use sodium bicarbonate along with a pH-reducing product such as lignite or citric acid to treat cement contamination.

Toxicity and Handling

Bioassay information available upon request. No special requirements are necessary for handling and storage. Avoid inhalation of dust. A dust respirator and goggles are recommended if mixing in an enclosed area.

Packaging and Storage

POLY-PLUS RD is packaged in 50-lb (22.7 kg), multi-wall, paper sacks or 5 gal buckets.

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

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