

Ultracap

Ultracap* additive is a low-molecular-weight, dry acrylamide copolymer designed to provide cuttings encapsulation and clay dispersion inhibition. It provides minimal viscosity contribution, and can enhance filtration properties. Ultracap additive is the encapsulation polymer in the M-I SWACO high-performance water-base drilling fluid system, Ultradril*.

Typical Physical Properties

Physical appearance	Granular or white powder or bead
Odor	Odorless
pH (0.05% solution)	2.5 - 4.5

Applications

Ultracap additive provides excellent cuttings encapsulation by adsorbing onto the clay surfaces and forming a protective film that prevents cuttings from sticking to each other or to the shaker screens. Ultracap encapsulator limits dilution rates and low gravity solids loading by preventing clay solids from dispersing into the mud system. The product is effective in a wide range of base brines including seawater, saturated NaCl, and CaCl₂. Typical concentrations of Ultracap additive range between 1.5 – 3.0 lb/bbl (4.28 - 8.56 kg/m³). Due to the low molecular weight of this polymer, the mixing process requires less shear. The resulting fluid will pass through fine shaker screens without blinding. Ultracap agent should be added to the mud system via premix, to ensure proper hydration and shearing, but can be mixed directly to the active system if needed. Best results are obtained when mixing the polymer through a powerful hopper and then passing once through a shear unit.

Ultracap additive concentration should be monitored using a modified “ammonia extraction” method. It is important to use a calibration curve for Ultracap additive to determine the amount of total encapsulating polymer. Detailed instructions regarding Ultracap testing procedure can be found in the Ultradril Engineering Guidelines.

Dilution rates with premix should be based on the depletion rate of Ultracap encapsulator. Ultracap premix concentrations can range as high as 4 – 5 lb/bbl (11.4 - 14.3 kg/m³), depending on the depletion rates. Ultracap additive will undergo chemical hydrolysis in the presence of high pH. The pH is buffered in the 9.5 – 10 range in the Ultradril system by Ultrahib* shale inhibitor. In other drilling fluids, a pretreatment with citric acid should be used to maintain the pH at less than 10.5.

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Advantages

- Provides excellent cuttings encapsulation and limits cuttings dispersion
- Enhances removal of drill solids by reducing dispersion tendencies
- Minimal contribution to the viscosity of the system
- Easily added to the active system through a premix
- Provides improved shale stabilization
- Significantly lower screen blinding potential, compared to higher molecular weight encapsulators

Limitations

- Fluid systems containing Ultracap encapsulator should be pretreated with citric acid before drilling cement to avoid chemical hydrolysis
- It should not be used in reservoir hole sections in which an acid stimulation treatment may be used

Toxicity and Handling

Bioassay information is available upon request.

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

Packaging and Storage

Ultracap additive is available in 50-lb (22.7-kg) or 25-kg (55.1-lb), multi-wall, paper sacks.

Store in a dry, well-ventilated area. Keep container away from incompatibles. Follow safe warehousing practices regarding palletizing, banding, shrink-wrapping and/or stacking.

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