ULTRACAP PLUS advanced encapsulating shale inhibitor
Cuttings encapsulation and clay dispersion inhibition

Where it is used
ULTRACAP PLUS® advanced encapsulating shale inhibitor is designed for use in the ULTRADRIL® high-performance water-based drilling fluid system. The ULTRACAP PLUS inhibitor provides minimal viscosity contribution and can enhance filtration properties. It is used in ULTRADRIL fluid systems based on fresh- and saline-water environments but should not be used in calcium brines.

How it works
ULTRACAP PLUS inhibitor 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. This inhibitor limits dilution rates and low-gravity solids loading by preventing clay solids from dispersing into the mud system. The product is effective in seawater, KCl brine, and saturated NaCl brine. Typical concentrations of the inhibitor range between 0.5 to 4 lb/bbl [1.43 to 11.41 kg/m³].

Due to the low molecular weight of this polymer, the mixing process requires less shear than polymers with higher molecular weights. The resulting fluid passes through fine shaker screens without blinding. ULTRACAP PLUS inhibitor should be added to the mud system via premix to ensure proper hydration and shearing, but it can be mixed directly to the active system if needed.

Inhibitor concentration should be calculated by mass balance assuming an approximate depletion rate and observing the quality of the cuttings at the shakers. Cuttings that appear dry inside, but ball or stick to shakers, may indicate low encapsulator levels. Conventional ammonia extraction tests cannot be used to determine residual concentration because the ULTRACAP PLUS inhibitor does not produce ammonia when exposed to elevated pH.

Dilution rates with premix should be based on the depletion rate of the inhibitor. Premix concentrations can range as high as 4 to 5 lb/bbl [11.4 to 14.3 kg/m³], depending on the depletion rates.

ULTRACAP PLUS inhibitor does not undergo chemical hydrolysis in the presence of high pH, but for optimum performance maintain the pH at less than 10.

Limitations
- Fluid systems containing ULTRACAP PLUS inhibitor should be pretreated with citric acid before drilling cement to avoid chemical precipitation.
- Calcium levels should be less than 500 mg/L.

Toxicity and handling
Bioassay information is available on request. Handle as an industrial chemical, wearing protective equipment and observing the precautions as described in the SDS.

Packaging and storage
This inhibitor is packaged in 25-lb [11.34-kg] multiwall paper sacks. Store in a dry, well-ventilated area. Keep container closed. Store away from incompatibles. Follow safe warehousing practices regarding palletizing, banding, shrink-wrapping, or stacking.

<table>
<thead>
<tr>
<th>Typical Physical Properties</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Physical appearance</td>
<td>White powder</td>
</tr>
<tr>
<td>Specific gravity</td>
<td>1.4—1.6</td>
</tr>
<tr>
<td>pH (1% solution)</td>
<td>~6.0</td>
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<tr>
<td>Solubility in water</td>
<td>Soluble</td>
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</tbody>
</table>

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