THIXATROL® DW 100

Biodegradable - Yellow - Polymeric High Temperature / Deep Water Flat Rheology Viscosifier for Oil Based Drilling Fluids

THIXATROL DW 100 is a unique proprietary organic polymer that has an OECD306 biodegradability of 43% and Par Com classification of D. DW 100 generates an efficient rheological profile in synthetic based invert emulsion drilling fluids while having a minimal viscosity increase when subjected to reduced temperatures. This highly desirable flat rheological property is stable through 350°F and can be extended to applications beyond deep water drilling.

THIXATROL DW 100 has a greater impact on increasing LSRR as compared to HSRR. This low shear rate rheology enhancement decreases the ratio of PV:YP to maximize hole cleaning and ROPs.

The combination of maintaining a consistent or flat rheological profile from 40°F through 350°F, coupled with being biodegradable and not toxic to marine life, allows for the global application of Thixatrol DW 100.

THIXATROL DW 100 exhibits an excellent balance of dispersibility for initial viscosity build, efficiency for cost effectiveness and tolerance to adverse conditions for reduced depletion rates. Control of ECD is significantly improved as compared to drilling fluids incorporating only conventional rheological additives.

PERFORMANCE CHARACTERISTICS

- “Flat” rheological profile from 40°F through 350°F for reduced low temperature viscosity build and improved ECD control for the elimination or reduction of mud losses.
  - 35% reduction of 40°F HSRR
- Stable to bottom hole temperatures in excess of 350°F
- Reduction in HSRR for a given LSRR or a reduced PV:YP ratio.
- PARCOM (Class D) / OECD 306 Biodegradation (43%) compliant for global offshore applications
- Maintains HTHP fluid loss control above and below use limits.
- Shear thinning rheological profile for improved ROP
- Compatible with conventional invert emulsion drilling fluid additives and contaminants
- Builds viscosity in clay free systems or with organoclays
- Efficient hole cleaning and suspension properties for sag control

APPLICATIONS

The required concentration of THIXATROL DW 100 is dependent on the oil/water ratio, base oil type and density of the system as well as type and concentration of surfactants used as emulsifiers and wetting agents and type and concentration of organophilic clay. A fluid with a higher oil/water ratio (i.e. 90:10) will require more THIXATROL DW 100 than a fluid with a lower oil/water ratio (i.e. 70:30). A higher density fluid will generally require less THIXATROL DW 100 as compared to a lower density fluid. Generally, concentrations will be in the range of 0.5 to 5.0 pounds per barrel. The ratio of organophilic clay to THIXATROL DW 100 will typically range from 1:0.25 to 1:1.

Viscosity can be built in:
- Oil Based & Invert Drilling Fluids
- Completion, Packer & Workover Fluids
- Clay Free Drill –In Fluids
THIXATROL DW 100 can be added at the mud plant when building new mud, or can be added directly to the mud pits when building volume during the drilling process. THIXATROL DW 100 should not be used in combination with any other polymeric rheological additives without first pilot testing. THIXATROL DW 100 can be used with or without organophilic clay. The addition of some organophilic clay is recommended to achieve the most efficient and temperature stable rheological system. Recommended organoclays are as follows:
- BHT below 300°F – BENTONE® 155
- BHT above 300°F – BENTONE 38

The ratio of organoclay and THIXATROL DW 100 should be maintained while treating at the well. Adequate agitation is necessary when incorporating THIXATROL DW 100 into the oil based fluid. The amount of shear necessary will depend on the temperature of the synthetic oil, the rate of rheological additive addition, the oil/water ratio, and the amount of solids and/or weight material in the system.

**CHEMICAL AND PHYSICAL DATA**

Composition……..oil soluble polymer  
Color................yellow to amber  
Form...............liquid  
Specific gravity…0.96  
Pour Point ..........0°F  
Viscosity ..........~4,000 (#3 spindle @ 10 RPM)  
Solubility.........Water Insoluble  
% Volatiles........~ 40%  

**Storage** – lined metal, glass or lined plastic

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**THIXATROL® DW 100 PARCOM / BIODEG Data**

<table>
<thead>
<tr>
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<th>Class D</th>
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<tbody>
<tr>
<td>MW &gt; 600 (bioaccumulation not likely)</td>
<td>OECD 306</td>
<td>43%</td>
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<tr>
<td>Aerobic Biodegradation in seawater</td>
<td>ISO 14669</td>
<td>LC50 (48h)&gt;10,000 mg/l</td>
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<tr>
<td>Marine invertebrate (Acartia Tonsa)</td>
<td>OECD 201</td>
<td>EC50 (72h): 818 mg/l</td>
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<tr>
<td>Marine Algal (Skeletonema Costatum)</td>
<td>PC 1995</td>
<td>10day LC50&gt;14,000 mg/kg</td>
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<tr>
<td>Marine Sediment (Corophium volutator)</td>
<td>PC 1995</td>
<td>LC50 (96h)&gt;818 mg/l</td>
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<tr>
<td>Re-worker</td>
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<td></td>
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<tr>
<td>Juvenile Turbot fish (Scophthalmus Maximus)</td>
<td>PC 1995</td>
<td>LC50 (96h)&gt;818 mg/l</td>
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**Mysidopsis bahia (Control OBM)** USEPA LC50 (96hr)- 692,400 ppm

**Mysidopsis bahia (3PPB Thixatrol DW100)** USEPA LC50 (96hr)>600,000 ppm

**Leptocheirus plumulosus (3PPB Thixatrol DW100)** USEPA LC50 (96hr) ratio [26/103] = 0.2
THIXATROL® DW 100 PERFORMANCE IN OBM

Thixatrol DW 100 Temperature Stability - 1 PPB
1 ppb Thixatrol DW100 / 8 ppb BENTONE 38

6 RPM Fann Reading

Hot Roll Temperature, °F

THIXATROL® DW100 Impact on HSRV:LSRV Ratio
12 PPG; 75:25 SBM

Fann Reading

Fann Shear Rate, RPM

2 PPB BENTONE® 155 / 1 PPB THIXATROL® DW100
4 PPB BENTONE® 155

NOTE: The information herein is currently believed to be accurate. We do not guarantee its accuracy. Purchasers shall not rely on statements herein when purchasing any products. Purchasers should make their own investigations to determine if such products are suitable for a particular use. The products discussed are sold without warranty, express or implied, including a warranty of merchantability and fitness for use. Purchases will be subject to a separate agreement which will not incorporate this document.

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Health and Safety Data

Before using this product please consult our Material Safety Data Sheet for information on safe handling.