ELEMENTIS
A global specialty chemicals company

Enhanced Performance Through Applied Innovation

THIXATROL® DW 50

Universal polymeric high temperature / deep water flat rheology viscosifier for oil based drilling fluids

GENERAL INFORMATION

THIXATROL DW 50 is a unique proprietary organic polymer that 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 350ºF and can be extended to applications beyond deep water drilling.

In addition to maintaining a consistent or flat rheological profile from 40ºF through 350ºF, **THIXATROL DW 50** is not toxic to marine life.

THIXATROL DW 50 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.

CHEMICAL & PHYSICAL PROPERTIES

Composition	oil soluble polymer
Color	yellow to amber
Form	liquid
Specific gravity	0.96
Pour Point	0°F
pH	10 - 11
Solubility	water Insoluble
Storage	lined metal, glass or lined plastic

These are typical properties not to be used for specification purposes.

PERFORMANCE CHARACTERISTICS

- "Flat" rheological profile from 40ºF through 350ºF for reduced low temperature viscosity build and improved ECD control for the elimination or reduction of mud losses.
  35% reduction in 40ºF HSRR
- Stable to bottom hole temperatures in excess of 350ºF
- PARCOM (Class D) / Mysid & Lepto compliant for global offshore applications
- Maintains HTHP fluid loss control
- 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 50** 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 organophillic clay. A fluid with a higher oil/water ratio (i.e. 90:10) will require more **THIXATROL DW 50** than a fluid with a lower oil/water ratio (i.e. 70:30). A higher density fluid will generally require less **THIXATROL DW 50** 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 50** will typically range from 1:0.25 to 1:1. Viscosity can be built in:

Oil Based Drilling Fluids
Completion Fluids
Packer Fluids
Invert Emulsion Drilling Fluids
Workover Fluids
Clay Free Drill –In Fluids

THIXATROL DW 50 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 50** should not be used in combination with any other polymeric rheological additives without first pilot testing. **THIXATROL DW 50** 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 300ºF – BENTONE 155
- BHT above 300ºF – BENTONE 38

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The ratio of organoclay and **THIXATROL DW 50** should be maintained while treating at the well. Adequate agitation is necessary when incorporating **THIXATROL DW 50** 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.

THIXATROL DW 50 PARCOM / Mysid / Lepto Data

MW > 600 (bioaccumulation not likely)	**Class D**	
Aerobic Biodegradation in seawater	OECD 306	9.5% at 2.0 mg/l
Marine invertebrate (Acartia Tonsa)	ISO 14669	LC50 (48 h)>2,000 mg/l
Marine Algal (Skeletonema Costatum)	OECD 201	EC50 (72 h): 730 mg/l
Marine Sediment (Corophium volutator)	PC 1995 10 day LC50>10,000 mg/kg	
Re-worker		
Juvenile Turbot fish (Scophthalmus Maximus)	PC 1995	LC50 (96 h)>730 mg/l
Mysidopsis bahia	USEPA LC50	(96 hr)>1,000,000
Leptocheirus plumulosus	USEPA LC50 (96 hr) ratio-0.7	

THIXATROL DW 50:BENTONE 38 PERFORMANCE IN OIL BASED DRILLING FLUIDS

		B 38 10#bbl	B 38:DW 50 6:1.5	B 38:DW 50 6:4.5
120°F				
	600 RPM	98	97	98
	300 RPM	66	62	63
	6 RPM	18	17	19
	ECD	14.4	14.4	14.4
40°F				
	600 RPM	325	190	179
	300 RPM	266	127	109
	6 RPM	102	43	20
	ECD	16.9	14.8	14.5
	Delta ECD	2.5	0.4	0.1

Mud Formulation (14 ppg;85:15)

C16-18IAO-172.1 gms
BENTONE 38-X gms-mix 1'
THIXATROL DW 50-Y mix 5'
1° Emulsifier A(amine)-15 gms mix 4"
Lime-10 gms-mix1'
CaCl2 Brine (12 wt%)-48 gms-mix25'
Barite-337.2 gms-mix 10'

ECD Calculation Basis

Mud Wt-14#gal
HSR Visc-600
LSR Visc-300
Flow Rate-287 gpm
OD hole-8.74 in
OD pipe-4.5 in
length-10,650 ft

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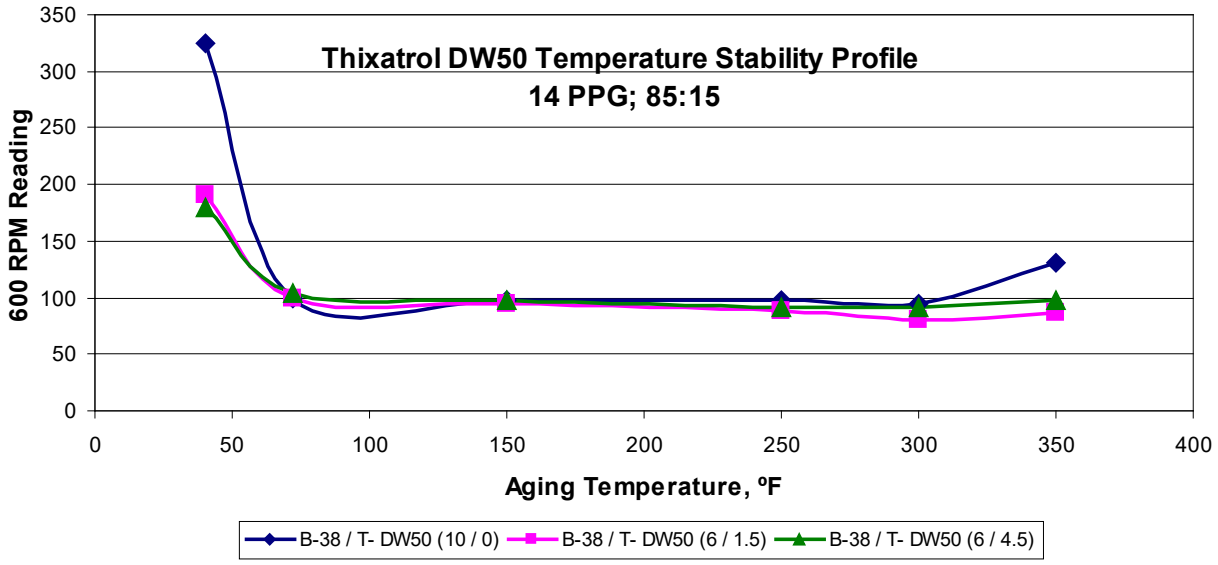
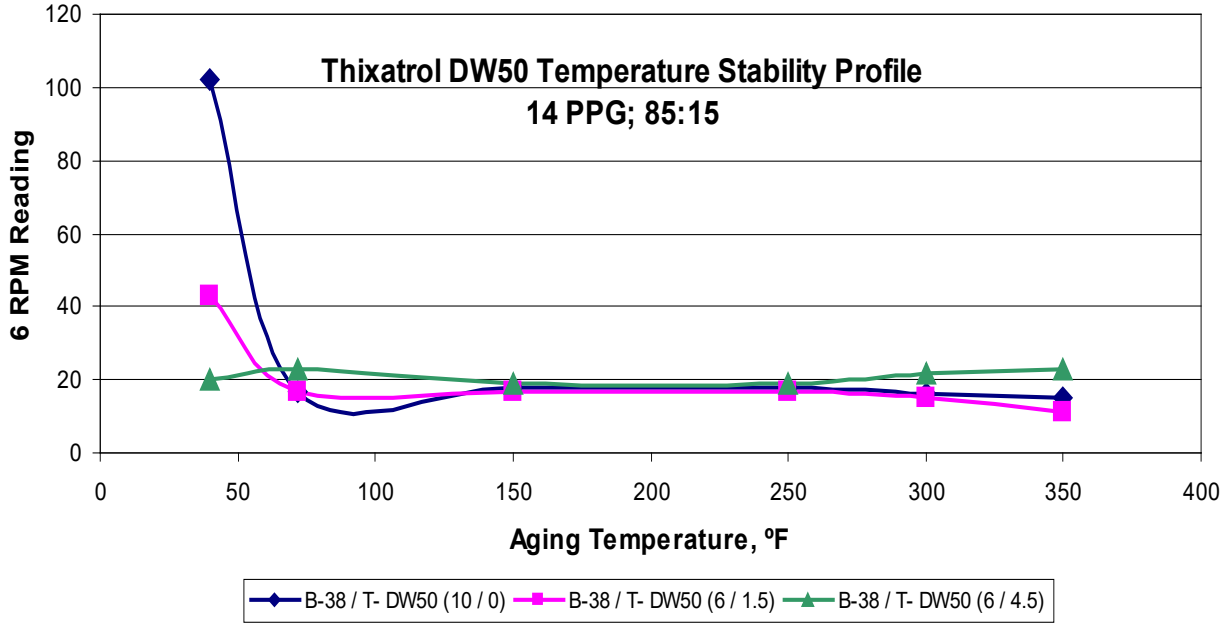
THIXATROL® DW 50

THIXATROL DW 50 BENTONE 38 PERFORMANCE IN OIL BASED DRILLING FLUIDS





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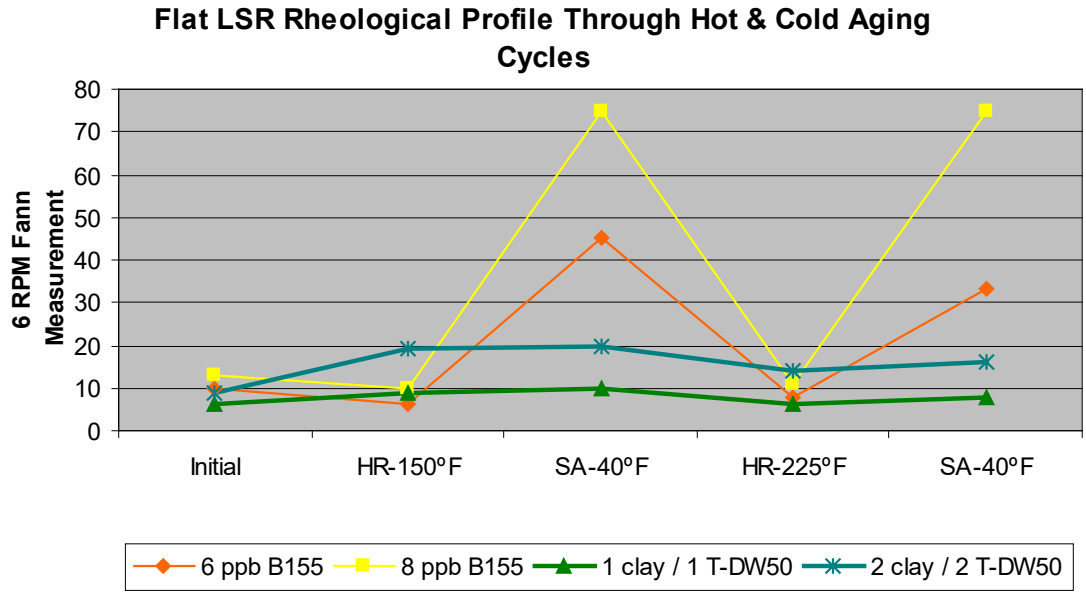
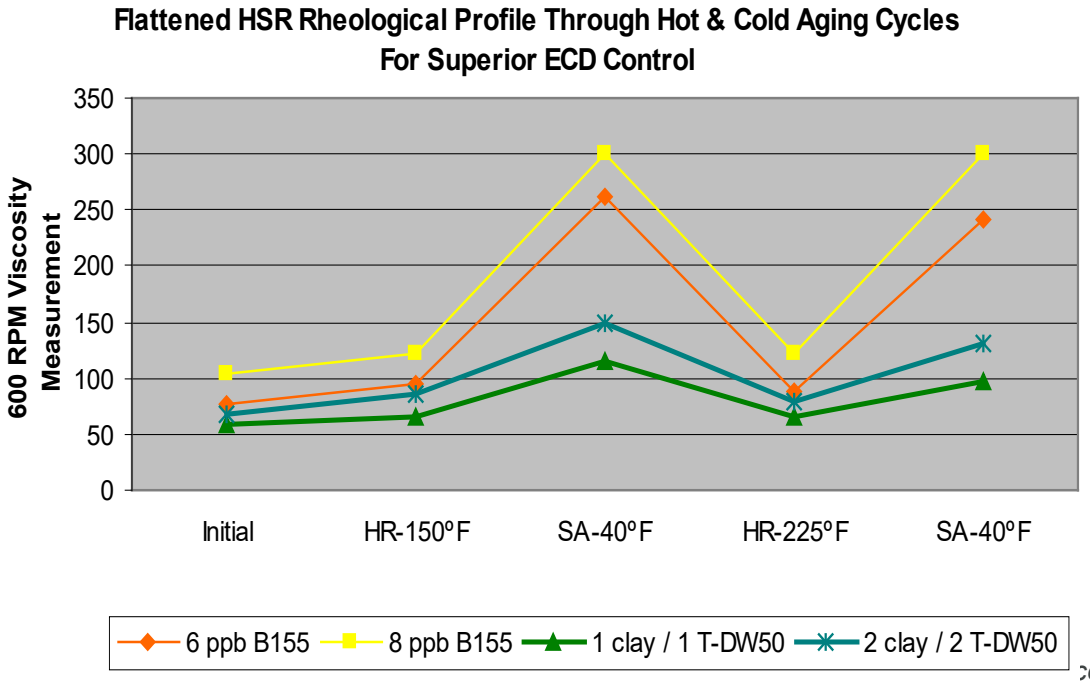
THIXATROL® DW 50

THIXATROL DW 50 : BENTONE 155

Low Temperature Viscosity Profile





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Mud Formulation

C_{16} – C_{18} IAO	
Barite	12 #/gal
30% $CaCl_2$ Brine	80:20
Primary Emulsifier	4 #/bbl
Wetting Agent	2 #/bbl
Lime	4 #/bbl

Health and Safety Data

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

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