INFORMATION

THERMO-TROL-50

HIGH TEMPERATURE MUD CONDITIONER

DESCRIPTION

THERMO-TROL-50 is a formulation of heat-stable water soluble polymers and organic acid reaction products. The product is a precisely engineered blend of high-performance materials which function synergistically to provide excellent control of high temperature-high pressure (HTHP) filtration while imparting rheological stability to water-base drilling fluids. Its typical properties are:

Form	**Grey-Brown to Grey-Black Powder**
Bulk Density	**40 lb/cu ft (0.64 g/cm^3)**

APPLICATION

THERMO-TROL-50 has been successfully used in a wide variety of water-base muds, including fresh, sea, saturated salt, potassium, and calcium-treated (lime or gyp).

THERMO-TROL-50 effectively reduces API and HTHP filtration, improves filter cake quality, improves and stabilizes mud rheology, controls gel strengths, and helps stabilize water-sensitive formations downhole.

Unlike some competitive synergistic polymer blends, THERMO-TROL-50 does not exhibit strong mud-thinning action. Such excessive thinning may cause undesirable effects such as settling of weight material. THERMO-TROL-50's initial effect on rheology is usually neutral or nearly so, depending upon mud type and condition. THERMO-TROL-50 prevents increase in viscosity and gels which may occur with exposure to temperature and contaminants. Competitive resinated lignite products have been shown to degrade rapidly above 325° F (163° F) while THERMO-TROL-50 maintains performance efficiency at temperatures in excess of 400° F (204° C).

THERMO-TROL-50 is a useful and cost-effective mud conditioner over a broad temperature range, giving benefits in low-to moderate temperature applications as well as in high-temperatures. THERMO-TROL-50 is also unsurpassed as a "thermal failure point" extender for applications which push the upper temperature limit of water-base muds.

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RECOMMENDED TREATMENT

Depending upon mud type, drilling conditions, and desired performance, dosage may range from 1 to 8 ppb (2.9 to 22.8 kg/m^3), with typical treatments falling in the 2 to 6 ppb range (5.7 to 17.1kg/m^3). The higher concentrations may be necessary in saturated salt muds. For best performance, maintain pH at 9.5 or higher.

THERMO-TROL-50 should be mixed through a hopper into the suction tank of the rig circulating system, at a rate of 5 to 30 minutes per sack.

BENEFITS

1. Superior control of API and HTHP filtration.
2. Improves filter cake.
3. Functions in virtually all water-base muds.
4. Controls and stabilizes mud rheology and gels.
5. Effective over a broad temperature range, from 150° to 450° F (66 to 232° C).
6. Extends thermal failure point of water-base muds.
7. Essentially neutral effect on mud viscosity upon initial mixing. Does not markedly thin or thicken most muds.
8. Resistant to contamination from mono and divalent cations.
9. Helps stabilize sloughing shales.
10. Superior cost-efficiency to competitive products.

THERMO-TROL-50 IN FRESH WATER

MUD PROPERTIES AFTER HOT-ROLLING 16 HOURS @ 350° F (177° C)

	Base Mud	Base + 5 ppb THERMO-TROL-50	Base + 5 ppb Competitive Resin Product
Mud Weight, ppg	12.0	12.0	12.0
Apparent Viscosity, cp	36	42	45
Plastic Viscosity, cp	20	33	34
Yield Point, lb/100 ft^2	32	18	22
10 sec gel/10 min gel	24/80	4/20	7/42
pH	8.5	8.7	8.5
HTHP Filtrate, ml (300° F @ 500 psi)	70	34	36
Base Mud:			
1.0 bbl distilled water			
0.5 ppb gypsum			
25 ppb Wyoming bentonite			
30 ppb drilled solids			
200 ppb barite			
1.5 ppb chrome lignosulfonate			
Caustic to pH 10.5			

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Comments: THERMO-TROL-50 shows superior control of filtration, YP, and gels. At 400° F and above, it has been shown that the competitive resin product deteriorates rapidly whereas THERMO-TROL-50 continues to perform.

THERMO-TROL-50 IN SEA WATER

MUD PROPERTIES AFTER HOT-ROLLING 16 HOURS @ 350° F (177° C)

	Base Mud	Base + 5 ppb THERMO-TROL-50	Base + 5 ppb Competitive Resin Product
Mud Weight, ppg	12.5	12.5	12.5
Apparent Viscosity, cp	59	45	47
Plastic Viscosity, cp	9	19	10
Yield Point, lb/100 ft^2	100	52	74
10 sec gel/10 min gel	49/48	29/33	50/68
pH	8.1	8.2	8.1
HTHP Filtrate, ml (300° F @ 500 psi)	124	35	42
Base Mud:			
1.0 bbl sea water			
50 ppb Wyoming bentonite			
50 ppb drilled solids			
220 ppb barite			
4.0 ppb chrome lignosulfonate			
Caustic to pH 11.0			

Comments: THERMO-TROL-50 shows superior control of filtration, YP, and gels. At 400° F and above, it has been shown that the competitive resin product deteriorates rapidly whereas THERMO-TROL-50 continues to perform.

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