CLAYTONE-3

Economy rheological additive suitable for use in diesel, clean mineral oil and synthetic olefin-based drilling fluids to increase the carrying capacity and hole cleaning capabilities.

Product Data

Composition
Alkyl quaternary ammonium bentonite

Typical Properties
The values indicated in this data sheet describe typical properties and do not constitute specification limits.

Sieve passing (200 mesh/74µm):	85 %
Specific Gravity:	1.6
Loss on ignition (1 h, 1832 °F):	37 %
Packaging:	25 kg bags
Supplied as:	Free-flowing powder

Food Contact Legal Status
For the current food contact legal status, please contact our product safety department or visit www.byk.com for further information.

Storage and Transportation
Moisture sensitive. Pallet stacking should be no more than two pallets high in order to prevent compaction.

Applications

Oil-Based Drilling Fluids

Special Features and Benefits
CLAYTONE-3 is an economy organo-modified clay rheological additive suitable for use in a range of base oils. In addition to imparting excellent rheological properties, it increases the carrying capacity and hole cleaning capabilities of the drilling fluid. CLAYTONE 3 also has the secondary benefit of providing stability to inverse emulsions and improving filtration control. CLAYTONE 3 disperses easier and yields faster than alternative products, therefore, it is well suited for mud plant conditions.

Recommended Use

CLAYTONE-3 is recommended for non-aqueous drilling fluids where the bottom hole temperatures do not exceed 300 °F (150 °C). CLAYTONE-3 is also suitable for use in packer fluids.

Example formulation: 11.0 pounds/gallon 75/25 Diesel

	350 ml formulation	Multi-mixer at 11,000 rpm
Diesel #2	218 ml	
CLAYTONE-3	6 g	Mix 5 min.
Lime	3 g	Mix 5 min.
EnvaMul™ 1699 *	4 g	Mix 5 min.
$CaCl_2$ (25 % in water)	79 ml	Mix 20 min.
Barite	150 g	Mix 5 min.
OCMA (drill solids)	20 g	Mix 5 min.
Silverson homogenizer at 6,000 rpm		Shear 5 min.

* EnvaMul™ 1699 is a product of MWV Specialty Chemicals

figure 1

Results of aging test

Properties (at 120 °F)	Initial	After Hot Rolling	
		16 h at 150 °F	16 h at 250 °F
Rheological properties			
600 rpm reading	53	60	54
300 rpm reading	38	43	35
200 rpm reading	31	35	32
100 rpm reading	24	27	23
6 rpm reading	14	16	13
3 rpm reading	12	14	11
Plastic Viscosity (cP)	15	19	19
Yield Point (lb/100 ft²)	23	22	19
Electrical Stability			
Peak Volts	643	771	710

figure 2

Example formulation: 11.0 pounds/gallon 75/25 LTMO

	350 ml formulation	Multi-mixer at 11,000 rpm
LVT 200	218 ml	
CLAYTONE-3	8 g	Mix 5 min.
Lime	3 g	Mix 5 min.
EnvaMul™ 1699 *	4 g	Mix 5 min.
$CaCl_2$ (25 % in water)	79 ml	Mix 20 min.
Barite	150 g	Mix 5 min.
OCMA (drill solids)	20 g	Mix 5 min.
Silverson homogenizer at 6,000 rpm		Shear 5 min.

* EnvaMul™ 1699 is a product of MWV Specialty Chemicals, LVT-200 low toxic mineral oil from Calumet Specialty

figure 3

Results of aging test

Properties (at 120 °F)	Initial	After Hot Rolling	
		16 h at 150 °F	16 h at 250 °F
Rheological properties			
600 rpm reading	45	53	54
300 rpm reading	30	36	35
200 rpm reading	22	29	26
100 rpm reading	15	21	18
6 rpm reading	8	13	10
3 rpm reading	5	9	7
Plastic Viscosity (cP)	15	17	19
Yield Point (lb/100 ft²)	15	19	16
Electrical Stability			
Peak Volts	486	569	646

figure 4

Yield Point – LVT 200 mud

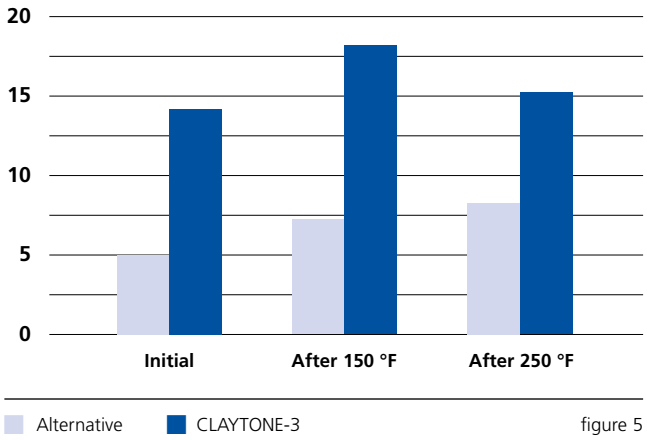

figure 5

Alternative Clay – LVT-200 Mud

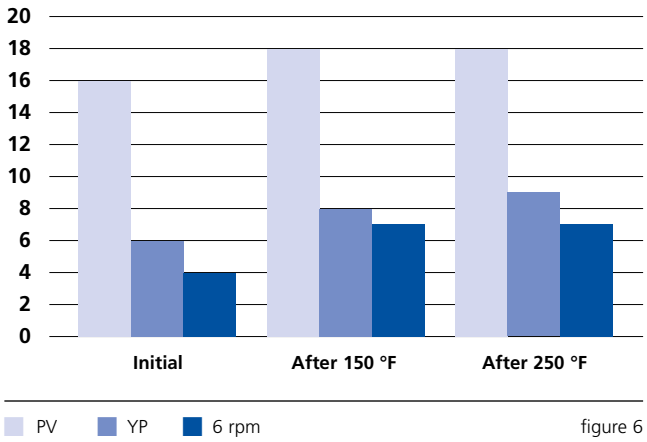

figure 6

CLAYTONE-3 – LVT 200 Mud

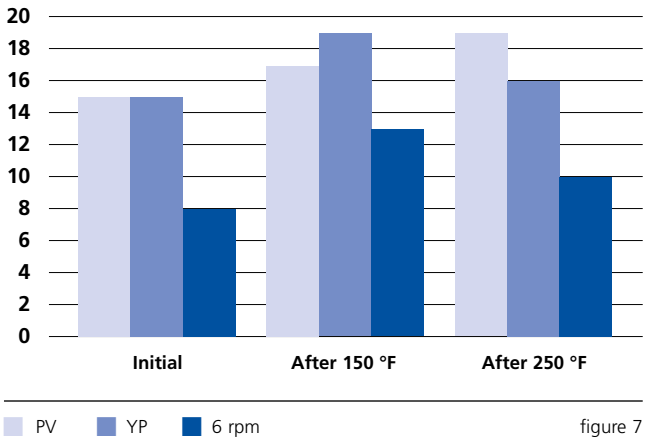

figure 7

Recommended Levels

A 2-8 lb/barrel (5.7-23 kg/m^3) addition is typically used for most conventional oil-based invert drilling fluids. Actual CLAYTONE-3 usage will depend on the base oil, oil/water ratio, solids, and the emulsifier package. The above recommended levels can be used for orientation. Optimal levels are determined through a series of laboratory tests.

Incorporation and Processing Instructions

CLAYTONE-3 achieves faster yield with high shear mixing and temperature. A small stream of water can be used to reduce yield time. (The water phase of invert emulsions provides the polar activation).

CLAYTONE-3

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Additive Guide

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