

CLAYTONE-EM

High efficiency rheological additive suitable for use in synthetic base fluids and all-oil systems to increase the carrying capacity and hole cleaning capabilities. The product is also an effective suspension agent for polymer slurries.

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): 90 %
Specific Gravity: 1.6
Loss on ignition (1 h, 1000 °C): 46.7 %
Bulk density: 23 lb/ft³/368 kg/m³
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

- Minimal shear required
- Dispersible under cold mixing conditions
- Improves sag resistance
- High YP/PV ratio
- Effective in most base oils
- Wet processed, highly refined
- Secondary benefits include: filtration control and emulsion stability

Recommended Uses

CLAYTONE-EM is recommended for drilling fluids utilizing synthetic fluids as the base oil and in all-oil fluids where the bottom hole temperatures will not exceed 300 °F (150 °C). This product is well suited for mud plants with minimal mixing shear capability.

CLAYTONE-EM is useful as a suspension agent for concentrated polymer slurries, such as xanthan or guar gum.

Example formulation #1: 10.5 pounds/gallon 70/30 Internal Olefin C16-C18

	350 ml formulation	Multi-mixer at 11,000 rpm
Amodrill* 1000	207 ml	
CLAYTONE-EM	8 g	Mix 5 min.
Lime	3 g	Mix 5 min.
Emulsifier Package	10 g	Mix 5 min.
CaCl ₂ (25 % in water)	97 ml	Mix 20 min.
Barite	120 g	Mix 5 min.

* Amodrill 1000 is a product of Ineos
Silverson mixer at 6,000 rpm for 5 minutes after mixing.

figure 1

Lab results

Properties (at 150 °F)	Initial	After Hot Rolling	
		16 h at 150 °F	16 h at 250 °F
Rheological properties			
600 rpm reading	71	66	54
300 rpm reading	52	46	33
200 rpm reading	41	38	25
100 rpm reading	31	29	18
6 rpm reading	15	14	8
3 rpm reading	14	12	7
Plastic Viscosity (cP)	19	20	21
Yield Point (lb/100 ft²)	33	26	12
Electrical Stability	1048	697	482

figure 2

Example formulation #2: 10.7 pounds/gallon 67/33 Mineral Oil

	350 ml formulation	Multi-mixer at 11,000 rpm
Distillate 822*	199 ml	
CLAYTONE-EM	2.3 g	Mix 5 min.
Lime	3 g	Mix 5 min.
Emulsifier Package	10 g	Mix 5 min.
CaCl ₂ (25 % in water)	97 ml	Mix 20 min.
Barite	130 g	Mix 5 min.

* Distillate 822 is a product of Gibson's Energy
Silverson mixer at 6,000 rpm for 5 minutes after mixing.

figure 3

Lab results

Properties (at 150 °F)	Initial	After Hot Rolling	
		16 h at 150 °F	16 h at 250 °F
Rheological properties			
600 rpm reading	53	58	44
300 rpm reading	33	39	26
200 rpm reading	23	31	18
100 rpm reading	15	23	12
6 rpm reading	5	10	4
3 rpm reading	4	9	3
Plastic Viscosity (cP)	20	19	18
Yield Point (lb/100 ft²)	13	20	8
Electrical Stability	787	670	404

figure 4

Recommended Levels

A 2-8 lb/barrel (6-23 kg/m³) addition is typically used for most conventional oil-based invert drilling fluids. Actual CLAYTONE-EM 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-EM requires low to moderate shear and temperature to fully yield. Full yield is typically achieved through one bit pass. A small stream of water can be used to reduce yield time. (The water phase of invert emulsions provides the polar activation).



Additive Guide



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