# 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 sheer 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 sheer 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

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## 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/m$^3$) 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).

# CLAYTONE-EM

Data Sheet
Issue 02/2015

Additive Guide

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