CLAYTONE-IMG 400

General purpose rheological additive for diesel and mineral oil 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):	80 % minimum
Specific Gravity:	1.6
Loss on ignition (1 h, 1000 °C):	40 %
Bulk density:	42 lb/ft³/673 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 to moderate shear required
- High YP/PV ratio
- Effective in most base oils
- Wet processed organoclay
- Secondary benefits include: filtration control and emulsion stability

Recommended Uses
CLAYTONE-IMG 400 is recommended for drilling fluids utilizing mineral or synthetic fluids as the base oil and where the bottom hole temperatures will not exceed 350 °F (175 °C). This product is well suited for mud plants with minimal mixing shear capability.

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-IMG 400	8 g	Mix 5 min.
Lime	3 g	Mix 5 min.
Emulsifier Package	10 g	Mix 5 min.
$CaCl_2$ (25 % in Wasser)	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	74	73	93
300 rpm reading	46	50	60
200 rpm reading	34	40	46
100 rpm reading	22	29	32
6 rpm reading	5	12	12
3 rpm reading	4	10	10
Plastic Viscosity (cP)	28	23	33
Yield Point (lb/100 ft²)	18	27	27
Electrical Stability	895	690	644

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-IMG 400	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	56	54	48
300 rpm reading	35	38	31
200 rpm reading	24	30	23
100 rpm reading	16	23	16
6 rpm reading	5	10	6
3 rpm reading	4	9	5
Plastic Viscosity (cP)	21	16	17
Yield Point (lb/100 ft²)	14	22	14
Electrical Stability	920	627	451S

figure 4

Example formulation #3: 15 pounds/gallon 80/20 Diesel #2

	350 ml formulation	Multi-mixer at 11,000 rpm
Diesel #2	184 ml	
CLAYTONE-IMG 400	3,5 g	Mix 5 min.
Lime	6 g	Mix 5 min.
Primary Emulsifier	12 g	
Secondary Emulsifier	6 g	Mix 5 min.
$CaCl_2$ (25 % in water)	51 ml	Mix 20 min.
Barite	395 g	Mix 20 min.
Rev Dust	20 g	Mix 5 min.

* Invermul and EZ MUL are products of Halliburton
** Silverson mixer at 6,000 rpm for 5 minutes after mixing.
** System not stable through 400 °F.

figure 5

Lab results

Properties (at 120 °F)	Initial	After Hot Rolling	
		16 h at 350 °F	16 h at 400 °F
Rheological properties			
600 rpm reading	92	98	82
300 rpm reading	54	54	40
200 rpm reading	41	40	27
100 rpm reading	27	25	15
6 rpm reading	10	7	2
3 rpm reading	9	6	1
Plastic Viscosity (cP)	38	44	42
Yield Point (lb/100 ft²)	16	10	-2
Electrical Stability	1099	456	371

figure 6

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-IMG 400 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-IMG 400 requires low to moderate shear and temperature to fully yield. A small stream of water can be used to reduce yield time. (The water phase of invert emulsions provides the polar activation).

BYK-Chemie GmbH
P.O. Box 10 02 45
46462 Wesel
Germany
Tel +49 281 670-0
Fax +49 281 65735

info@byk.com
www.byk.com