

BENTONE® 155

Rheological Additive high efficiency and superior anti-sag properties for mud plant manufacture

GENERAL INFORMATION

BENTONE 155 rheological additive is a high efficiency, moderate temperature performance organoclay offering exceptionally rapid yield development. This feature makes it an ideal additive for mud plants having low shear mixing equipment. **BENTONE 155** prevents weighting agent settling in storage and in transit to the well site.

BENTONE 155 does not normally require a polar activator, and finds use in all-oil and invert muds, completion and workover fluids.

CHEMICAL & PHYSICAL PROPERTIES

Composition	organic modified bentonite clay
Color	very light cream
Form	finely divided powder
Specific gravity	1.7
Moisture	3.0% maximum

These are typical properties not to be used for specification purposes.

APPLICATIONS

BENTONE 155 additive is an efficient replacement for organoclay gellants in mud plant and on-site well applications where rapid yield is essential to prevent settling under low shear conditions. Further, the product provides a good balance of rheology and moderate downhole temperature stability, making it suitable as a primary rheological in all-oil and invert muds based on diesel, mineral oil, poly, linear and isomerized alpha olefins, and modified vegetable oil based fluids.

ATTRIBUTES

BENTONE 155 rheological additive

- Highly efficient development of rheological properties
- Rapid yielding
- Excellent antisetling features
- Eliminates need for chemical activators
- Is not harmful to the environment

INCORPORATION

BENTONE 155 rheological additive offers rapid yield development and increased efficiency. It is an attractive alternative to conventional organoclay gellants that require higher shear and chemical activation for optimal dispersion and performance.

BENTONE 155 has unique properties which are especially valuable in low shear mud plant operations. A polar additive is not typically required; however, under low temperature conditions in all-oil fluids, 15% (based on the weight of **BENTONE 155**) of water, propylene carbonate or low molecular weight alcohols can be used to accelerate full viscosity development.

LEVELS OF USE

Use levels are a function of the viscosity properties required and base oil being used. Compared to conventional gellants, typically 25 – 50% less **BENTONE 155** is needed to develop a given viscosity, again depending on base fluid.

The following typical dosage levels are offered to provide starting points for screening **BENTONE 155** in a variety of all-oil and invert muds. Recognizing other ingredients can influence the ultimate YP/PV values, the final **BENTONE 155** level should be optimized to the target rheological values using the complete formulation.

Mud Type	Pounds per Barrel	Kg/m ³
All-Oil		
Diesel Fluid	4 – 10	11 – 28
Mineral Oil	4 – 10	11 – 28
Invert Emulsions		
Diesel Fluid	2 – 5	6 – 14
Mineral Oil	3 – 7	8 – 20
Alpha olefins (PAO, LAO, IAO)	3 – 7	8 – 20
Modified Vegetable Oil	3 – 7	8 – 20

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BENTONE® 155

PERFORMANCE

Diesel Invert, 80/20, 14 ppg

Aged 16 hrs. @ 250°F, Tested at 120°F

Formulation

#2 Diesel, bbl	0.52
Primary Emulsifier, ppb	9
Secondary Emulsifier, ppb	2
Lime, ppb	5
BENTONE 155, ppb	3
Fluid Loss Additive, ppb	8
Brine, 30% CaCl ₂ , bbl	0.17
Barite, ppb	325

Properties

	Initial	@250°F
Plastic Viscosity, cPs	32	32
Yield Point, lbs./100 ft ²	16	18
Gels, 10 sec/10 min, lbs./100 ft ²	10/14	12/13
ES, volts	686	686
Brookfield, 0.3 RPM, cPs	28,000	28,800

Mineral Oil Invert, 80/20, 14 ppg

Aged 16 hrs. @ 300°F, Tested @ 120°F

Formulation

Mineral Oil, bbl	0.52
BENTONE 155, ppb	6
Primary Emulsifier, ppb	9
Secondary Emulsifier, ppb	2
Lime, ppb	5
Fluid Loss Additive, ppb	8
Brine, 30% CaCl ₂ , bbl	0.17
Barite, ppb	325

Properties

	Initial	300°F
Plastic Viscosity, cPs	57	56
Yield Point, lbs./100 ft ²	18	16
Gels, 10 sec/10 min, lbs./100 ft ²	10/14	10/16
ES, volts	845	950
Brookfield, 0.3 RPM, cPs	24,000	32,800

Note: Initial properties – aged 16 hours at 150°F
All viscosities at 120°F

IAO Invert, 80/20, Unweighted Mud

Aged 16 hrs. @ 300°F, Tested @ 120°F

Formulation

IAO, bbl	0.80
BENTONE 155, ppb	10
Primary Emulsifier, ppb	10
Lime, ppb	1
Brine, 30% CaCl ₂ , bbl	0.20

Properties

	5 ppb	10 ppb
Plastic Viscosity, cPs	30	22
Yield Point, lbs./100 ft ²	49	42
Gels, 10 sec/10 min, lbs./ 100 ft ²	32/30	30/29
ES, volts	1395	782
Brookfield, 0.3 RPM, cPs	46,400	53,200

All-Oil*

All-Oil – No polar activator

Aged 16 hrs. @ 150°F, Tested @ 120°F

Formulation

Base Oil, bbl (#2 Diesel or Mineral Oil)	0.73
Emulsifier, ppb	0.75
Lime, ppb	1
BENTONE 155, ppb	5, 7.5 or 10
Barite, ppb	325

Properties - #2 Diesel

	Initial	5 ppb	10 ppb
Plastic Viscosity, cPs	18	18	26
Yield Point, lbs./100 ft ²	12	12	31
Gels, 10 sec/10 min, lbs./100 ft ²	9/10	9/10	13/14
Brookfield, 0.3 RPM, cPs	31,000	31,000	51,000

BENTONE® 155

Properties – Mineral Oil	Initial	
	<u>5 ppb</u>	<u>10 ppb</u>
Plastic Viscosity, cPs	16	15
Yield Point, lbs./100 ft ²	15	29
Gels, 10 sec/10 min, lbs./100 ft ²	20/25	27/32
Brookfield, 0.3 RPM, cPs	34,400	56,000

* All Oil Mud Performance: Properties developed in formulations without a polar activator. Yields and Brookfields will increase if an activator is used.

HEALTH AND SAFETY DATA

Before using this product please consult our Material Safety Data Sheet for information on safe handling.

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